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IMPORTANT:

1. Customers connecting this equipment to the telephone network shall, before such connection is made, give notice to the telephone company of the particular line(s) to which such connection is to be made, and shall provide the telephone company with the following information:

   — Complies with Part 68, FCC Rules

   — FCC Registration Number: BE2USA-61193-MF-E (for MF-rated systems) or BE287V-16449-KF-E (for KF-rated systems)

   — Ringer equivalence number (REN) or service code: 0.8B

   — Type and USOC number of the interface jack to be ordered from the telephone company: 2-Wire Loop, RJ21X

   — Facility interface code by position: 02LS2

   The telephone company should also be given notice upon final disconnection of this equipment from the particular line(s).

   It is also the responsibility of the customer to provide the telephone company with registration numbers of any other devices which are configured for connection to the telephone network.

2. It is prohibited to make connections to party lines.

3. Under certain circumstances the telephone company may temporarily discontinue service and make changes in facilities and services which may affect the operation of this equipment; however, the customer shall be given adequate notice in writing to allow the customer an opportunity to maintain uninterrupted service.

4. Users should not adjust, repair, or attempt to service this equipment. In the event that a problem originates, contact the local authorized factory service representative.

   In the event of trouble with the telephone line(s), this equipment must be disconnected from the telephone line(s). If trouble ceases, the equipment must be repaired by an authorized factory service representative. If the trouble continues to occur with the equipment disconnected, the telephone company should be notified that they have a problem. If this is the case, repairs or adjustments made by the telephone company will be made at their expense.

NOTICE

THIS SYSTEM INCLUDES HEARING-AID COMPATIBLE HANDSETS THAT ARE IN COMPLIANCE WITH SECTION 68.316 OF THE FCC RULES.

WARNING:

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rule. Operation of this equipment in a residential area may cause unacceptable interference to radio and TV reception requiring the operator to take whatever steps are necessary to correct the interference. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

— Reorient the receiving antenna

— Relocate the KSU with respect to the receiver

— Check that the KSU and receiver are not on the same circuit; the KSU must be powered from an isolated, dedicated AC outlet

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems"

This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402, Stock No. 004-000-00398-5.

If RFI problems persist, contact Inter-Tel Customer Support.

SAFETY REGULATIONS

At the date of this publication, the GMX-48 System was being submitted for updated safety approval from a Nationally Recognized Testing Laboratory (NRTL), such as Underwriters Laboratories Inc. (UL). If you receive a GMX-48 System prior to such approval, you may contact Customer Support at a later date to inquire about the specific NRTL(s) and the date(s) of approval. *Before installation, check your local electrical codes for installation of telephone and electronic equipment.*

The following safety information is reprinted from UL 1459, a product safety specification governing telephone equipment.

IMPORTANT SAFETY INSTRUCTIONS

When using your telephone equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and injury to persons, including the following:

1. Read and understand all instructions.

2. Follow all warnings and instructions marked on the product.

3. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

4. Do not use this product near water (for example, in a wet basement).

5. Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.

6. Slots and openings in the cabinet and the back or bottom are provided for ventilation, to protect it from overheating; these openings must not be blocked or covered. This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.

7. This product should be operated only from the type of power source indicated in the manual. If you are not sure of the type of power source to your building, consult your dealer or local power company.

8. This product is equipped with a three-wire grounding type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding type plug.

9. Do not allow anything to rest on the power cord. Do not locate this product where the cord will be abused by persons walking on it.

10. Do not use an extension cord with this product's AC power cord. The AC outlet for this product should not be used for any other electrical equipment.

11. Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.

12. To reduce the risk of electric shock, do not disassemble this product, but take it to a qualified serviceman when some service or repair work is required. Opening or removing covers may expose you to dangerous voltages or other risks. Incorrect reassembly can cause electric shock when the product is subsequently used.

13. Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

    A. When the power supply cord or plug is damaged or frayed.

    B. If liquid has been spilled into the product.

    C. If the product has been exposed to rain or water.

    D. If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions because improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.

    E. If the product has been dropped or the cabinet has been damaged.

    F. If the product exhibits a distinct change in performance.

14. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.

15. Do not use the telephone to report a gas leak in the vicinity of the leak.

SAVE THESE INSTRUCTIONS

LIMITED WARRANTY

For a period of one (1) year from the date of shipment to Buyer, INTER-TEL warrants the Equipment (except for fuses and lamps) to be free from defects in material, workmanship, or both, and to comply with specifications for the Equipment, as set forth in the *Installation and Field Maintenance Manual*. Buyer's sole and exclusive remedy for breach of this Limited Warranty shall be to have the defective Equipment (or parts) repaired or replaced at INTER-TEL's option. Shipping costs incurred returning warranty work to INTER-TEL shall be paid for by the Buyer. **This Limited Warranty extends only to the Buyer, not to any customer, user, or third party.** This Limited Warranty does not apply to Equipment (or parts) damaged by improper handling, normal wear and tear, accidents, lightning damage, negligence, or improper use or maintenance, and does not apply to Equipment altered without authorization by INTER-TEL. This Limited Warranty does not extend to any claims, suits, damages, liabilities, costs, and expenses arising from any act, action, or inaction of Buyer. Although the Moss-Magnuson Act should not apply, in the event that it is held to apply by a court of competent jurisdiction, the implied warranty of fitness for a particular purpose shall extend for the one-year (1-year) period from the date that the Equipment was shipped to the Buyer.

THIS WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THIS LIMITED WARRANTY. IN NO EVENT SHALL INTER-TEL BE LIABLE FOR LOSS OF ANTICIPATED PROFITS, INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSS OF TIME OR OTHER LOSSES INCURRED BY BUYER IN CONNECTION WITH THE PURPOSE, POSSESSION, OPERATION, OR USE OF THE EQUIPMENT, SUCH CLAIMS BEING EXPRESSLY WAIVED BY THE INSTALLING COMPANY.

For complete information on returning equipment, refer to the current Inter-Tel Incorporated *Material Return Policy* (document part number 835.1065). This document includes specific information on the following subjects: warranty, procedures to follow when returning equipment, equipment damaged in shipment, insurance, repair policy, and advance replacement policy.

OVERVIEW

1. INTRODUCTION

1.1 Inter-Tel's GMX-48 System is a unique electronic key telephone system that is designed to meet the needs of growing businesses. The compact, modular design makes the system easy to install, service, and expand. The programmable features provide over 120 user-friendly applications to meet each customer's needs.

1.2 The main processing unit of the GMX-48 System, called the KSU Control Board (KCB), is used to install C.O. lines, keysets, and DSS/BLF Units. For increased capacity, as many as five modules can be attached to the KCB. All five can be Expansion Modules (EXPs) for installing additional C.O. lines, keysets, and DSS/BLF Units. Or, up to two of the five can be Accessory Port Modules (APMs) for installing single-line devices (such as single-line sets, playback devices, voice mail units, facsimile machines, etc.). For a drawing showing some of the equipment that can be connected to the system, see Figure 2-1 on page 2-20 in SPECIFICATIONS.

1.3 The maximum number of stations and C.O. lines available depends on the number and type of modules installed. For complete information on system capacities and a system configuration chart, refer to page 2-2 in SPECIFICATIONS.

1.4 Highlights of the GMX-48 System's design include:

● Advanced microprocessor technology.

● Flexible programming to customize many system and station features.

● Modular, easily replaceable hardware with add-on capabilities for optional features.

● Capacity for *up to*:

  NOTE: In many circumstances, the following maximum capacities will never be reached because there will be a combination of modules installed.

  — 24 Central Office (C.O.) Lines (Loop start lines installed in increments of four, depending on the number of EXPs installed.)

  — 48 Stations (Combinations of keysets, DSS/BLF Units, and single-line devices in six- or eight-station increments, depending on the number of EXPs and APMs installed. EXPs can have up to eight keysets and DSS/BLF Units connected, while APMs can have up to six single-line devices connected. Keysets can be any combination of 24-line standard keysets, 24-line display keysets, and 12-line [non-display] keysets.)

NOTE: At least one 24-line display keyset should be installed to program selected system data, receive system alarm messages, act as the attendant for unsupervised C.O. recalls, etc.

— 5 Direct Station Selection/Busy Lamp Field (DSS/BLF) Units (Keysets and DSS/BLF Units use separate keyset circuits. For each DSS/BLF Unit installed, one less keyset may be installed. If desired, all five DSS/BLF Units may be connected to the KCB or the same EXP.)

1.5 The GMX-48 System is available in three software "packages" — one KF-rated and two MF-rated. The KF-rated system permits only one line to be accessed per line key, and there can be only one auto line and only one line in each of the line groups. The MF-rated systems permits one-key access to multiple outgoing lines. The three software packages are listed below.

● **KF-rated** *Basic* **package** (part no. 827.6007):

— The *Basic* software package has all of the features described in this manual *except* single-line device capability (APMs cannot be used), direct inward system access (DISA), automated attendant, intercom/C.O. directory, automatic route selection (ARS), system activity report (SAR), and voice mail/computer hunt groups.

● **MF-rated** *Intermediate* **package** (part no. 827.6006):

— The *Intermediate* software package has all of the features described in this manual *except* playback device capability, direct inward system access (DISA), automated attendant, automatic route selection (ARS), system activity report (SAR), and voice mail/computer hunt groups.

● **MF-rated** *Advanced* **package** (part no. 827.6005):

— The *Advanced* software package has all of the features described in this manual.

2. HARDWARE SUMMARY

2.1 The SPECIFICATIONS section of this manual explains environmental requirements of the system, describes the hardware, and gives pre-installation information. The hardware descriptions include: Key Service Unit (KSU), power supply, station instruments, and additional equipment needed for the optional features.

3. INSTALLATION AND MAINTENANCE SUMMARY

3.1 The modular design and self-diagnostic capabilities of the system facilitate installation and repair with minimal down-time. Strict quality control standards for manufacturing and thorough field testing provide the system with the reliability demanded by today's high-technology market.

3.2 The INSTALLATION section contains instructions for assembling the main distribution frame (MDF) and for installing the KSU Control Board (KCB), power supply, Expansion Modules (EXPs), Accessory Port Modules (APMs), station instruments, and optional hardware.

3.3 After the system is installed, the flexible software allows the database to be customized to meet the customer's needs. A programming terminal is used to perform this task. The PROGRAMMING section describes the procedures for initializing and programming the system features.

3.4 The TROUBLESHOOTING section gives instructions for correcting system problems and replacing defective parts. A list of part numbers and a recommended inventory of spare parts are located in the REPLACEMENT PARTS section.

4. FEATURES SUMMARY

4.1 System, keyset, single-line set, DSS/BLF Unit, and attendant features are listed below and on the following pages. *Those features marked with an asterisk (*) require additional equipment.* For descriptions and operating instructions, refer to the SPECIFICA-TIONS and FEATURES sections of this manual.

A. SYSTEM FEATURES

Hardware and General System Features

- KF-rated *Basic* and MF-rated *Intermediate* or *Advanced* software

- Flexible station instrument configuration and numbering plan

- RS-232-C connectors on the KCB and APMs for connecting a programming terminal, SMDR/SAR output devices, or a modem for remote maintenance — APMs available only in the *Intermediate* and *Advanced* software packages; SAR available only in the *Advanced* software package

- Easily accessible system voltage test points

- Database battery back-up with voltage test points

- Adjustable baud rates for on-site programming (300, 1200, 2400, and 4800 baud using the KCB; 1200 baud using an APM)

- Variable system timers

- * Optional external music source

- * Optional off-premises stations with variable ring cadence — available only in the *Intermediate* and *Advanced* software packages

- * Optional OPX repeaters — available only in the *Intermediate* and *Advanced* software packages

- * Programmable reports for toll restriction, automatic route selection (ARS), and station data — ARS available only in the *Advanced* software package

- * Optional auto-answer modem for remote programming

- * Optional multi-port voice mail system — available only in the *Intermediate* and *Advanced* software packages

- * Optional facsimile machine — available only in the *Intermediate* and *Advanced* software packages

- * Optional doorbox

- * Optional battery back-up

- * Optional external paging equipment

- * Optional station message detail recording (SMDR) and/or system activity report (SAR) output device(s) — SAR available only in the *Advanced* software package

- * Optional playback devices for use with the automated attendant and hunt group announcement/overflow station features — available only in the *Advanced* software package

System Organization and Record Keeping Features

- Six paging zones

- * Station message detail recording (SMDR)

- * System activity report (SAR) — available only in the *Advanced* software package

- Call cost accounting

- Forced, standard, and optional account codes

- Flexible attendant arrangements

- Four tenant groups

- Five hunt groups — optional *playback-equipped* overflow/announcement station(s) available only in the *Advanced* software package

- System alarm display and reporting

C.O. Line Features

- Direct inward system access (DISA) — available only in the *Advanced* software package

- * Automated attendant — available only in the *Advanced* software package

- Dual-tone multi-frequency (DTMF) and/or dial-pulse signalling

- Outgoing-access, allowed-answer, and ring-in assignments on a station-by-station basis (day lists and night lists)

- Day and night modes of operation

- Day and night toll restriction on a station-by-station basis (including provisions for area/office code restrictions and provisions for PBX, absorbed-digit, and equal access dialing)

- Auto lines and line groups — restricted to one line each with the KF-rated *Basic* software package

- Automatic incoming line answering

- Automatic outgoing line selection — restricted to a single auto line with the KF-rated *Basic* software package

- Automatic out-of-range line selection/status on 12-line keysets (may also be assigned to 24-line keysets if needed)
- Automatic route selection (ARS) — available only in the *Advanced* software package
- System-wide C.O. line privacy release option
- C.O. reseize capability on a station-by-station basis

General Station Features

- Programmable feature codes for easy station operation
- Call privacy/privacy release
- Station-to-station intercom calls
- Off-hook voice announce (OHVA) calls (requires special installation and programming)
- Inter-station messages and message cancel
- Ring intercom always
- Automatic camp-on (station, C.O. line, and ARS)
- Busy line/station callback (queue)
- Individual hold
- System hold
- Call splitting
- Hold recall
- Call waiting
- Transfer to hold
- Transfer recall
- Call transfer to outside telephone numbers (un-amplified) and intercom numbers
- Reverse transfer and group call pick-up
- Five-way conference calls (unamplified)
- Secretarial intercept
- Call forward to outside telephone numbers (un-amplified) and intercom numbers (the ability to forward outside calls or all calls may be enabled/disabled on a station-by-station basis)
- System speed dialing (including non-display and tenant-specific numbers)
- Station speed dialing
- Redial (last number dialed or, at keysets only, last number saved)
- Do-not-disturb with customized messages (the ability to place a station in do-not-disturb may be enabled/disabled on a station-by-station basis)

- Cancel miscellaneous operations
- Hookflash
- Hunt group remove/replace
- House phone
- Station call monitoring (hunt group supervisors only) with optional periodic monitoring tones — the optional tones feature requires an APM and is available only in the *Intermediate* and *Advanced* software packages

B.   24-LINE KEYSET FEATURES

- * Optional liquid crystal display (LCD) for viewing: numbers dialed; speed-dial numbers; inter-station, do-not-disturb, and reminder messages; date/time; keyset identification; station programming; call cost data; etc.
- * Optional Data Port Module for installing a modem-equipped data device, or for installing a loud ringing adapter (LRA) and signalling device(s)
- * Simultaneous voice/data communication (requires an optional Data Port Module, a modem-equipped data device, and special secondary voice path installation)
- 12-key pushbutton keypad
- 18 feature keys for one-key access to feature codes (ten of the keys are user programmable)
- 10 speed-dial (SD) keys with light-emitting diode (LED) indicators
- 24 direct-access C.O. line keys with LED indicators (for incoming and outgoing call indication/access)
- Integrated speakerphone (allows handsfree operation on outside calls and intercom calls; can be disabled on a station-by-basis)
- Speakerphone on/off
- Slide-out directory card
- Ring and voice volume controls
- User-programmable ring tone
- Self-test function
- Hearing aid-compatible (HAC) handset
- Reversible baseplate for wall mounting
- * Optional headset
- * Optional handset amplifier
- * Background music
- Microphone mute

- Handsfree answer enable/disable
- On-hook dialing/monitoring
- Page remove/replace
- Intercom and C.O. (system speed-dial) directories for display keyset users — available only in the *Intermediate* and *Advanced* software packages
- Automatic intercom and/or C.O. call access

C. 12-LINE KEYSET FEATURES

- 12-key pushbutton keypad
- 10 feature keys for one-key access to feature codes (three of the keys are user programmable)
- 8 speed-dial (SD) keys with light-emitting diode (LED) indicators
- 12 direct-access C.O. line keys with LED indicators (for incoming and outgoing call indication/access)
- Integrated speakerphone (allows handsfree operation on outside calls and intercom calls; can be disabled on a station-by-basis)
- Speakerphone on/off
- Slide-out directory card
- Ring and voice volume controls
- User-programmable ring tone
- Self-test function
- Hearing aid-compatible (HAC) handset
- Reversible baseplate for wall mounting
- * Optional headset
- * Optional handset amplifier
- * Background music
- Microphone mute
- Handsfree answer enable/disable
- On-hook dialing/monitoring
- Page remove/replace
- Automatic intercom and/or C.O. call access

D. SINGLE-LINE INSTRUMENT (SLI) FEATURES

- 12-key pushbutton keypad

- Four user-programmable feature keys for one-key access to feature codes
- Timed hookflash (FLASH) key
- Ring volume control
- Hearing aid-compatible (HAC) handset
- Reversible baseplate for wall mounting
- Selectable AC/DC ringer
- Optional message waiting indication tones — available only in the *Intermediate* and *Advanced* software packages
- * Optional handset amplifier

E. DIRECT STATION SELECTION/BUSY LAMP FIELD (DSS/BLF) UNIT FEATURES

- * Up to 5 units may be installed
- Each unit has 60 keys with LED indicators for one-key access to up to 60 station intercom numbers and/or hunt group pilot numbers (the LEDs show the status of the assigned stations and/or hunt groups)

F. ATTENDANT FEATURES

- System speed-dial number/name programming
- System alarm reporting
- Night answer and night ring-in programming
- Enable/disable system night mode
- Set date and time of day
- Attendant recall
- System do-not-disturb and reminder message programming
- Station feature programming (user name, tenant group, secretarial intercept, and attendant)
- * Immediate off-hook voice announce (OHVA) calls (requires a DSS/BLF Unit and special installation and programming)
- Enable/disable background music to external paging speaker(s)
- Line maintenance feature for taking C.O. lines out of service and placing them back in again
- SAR report can be generated at any time by entering a feature code — available only in the *Advanced* software package

G. MAXIMUM CAPACITIES

4.2 Some of the features have maximum capacities that are dependent on the availability of system channels and/or circuits. The features that have capacities include the following:

Paging zones	6
Simultaneous five-party conference calls (unamplified)	8
System speed dialing	
Numbers per system	100
Digits per number	32
Station speed dialing	
Numbers per station	10 C.O.,
— keyset	10 intercom
Numbers per station	10 C.O. or
— single-line set	intercom
Digits per entry	16 C.O.,
	4 intercom*

* The three-digit intercom number can be preceded with a pound (#) to speed dial private intercom calls to the station. Or, a "4" may be entered before a station intercom number or hunt group pilot number to quickly reverse transfer (pick up) calls from that station or hunt group.

Redialing per station	1 number,
	32 digits
ARS (*Advanced* software only)	
Route groups	8
Lines per route group	24
Dial rules (16 digits each)	10 (7 programmable)
Route group callback requests per system	25
Callback (queue) request per station	1
Camp on by a station	1
Stations camped on to a station	47
Stations camped on to a line	48
Inter-station messages per system	126
Programmable reminder messages	20
Message requests per system	120
Do-not-disturb messages	20
Messages per system	48

Allowed long distance numbers	20
Digits per number	10
Alternate carrier numbers	20
Digits per number	10
Account codes	
Forced	120
Standard	32
Digits per code	4–8
Attendants	48
DSS/BLF-equipped keysets	5
Intercom numbers per DSS/BLF Unit	60
Hunt groups	
Per system	5
Stations per hunt group	60 in hunt group 1, 20 in hunt groups 2–5
Announcement stations per hunt group (*Basic* and *Advanced* software only)	3
Overflow stations per hunt group	1
Overflow count maximum	25
Tenant groups	4

Voice computer hunt groups (*Advanced* software only)

Per system	15
Units per hunt group	16 in groups 6–10, 8 in groups 11–20
C.O. lines —MF-rated	
Auto lines	24
Line groups	8
Lines per line group	24
C.O. lines —KF-rated	
Auto lines	1
Line groups	8
Lines per line group	1
24-line keysets installed with secondary voice paths (for receiving OHVA calls and/or for simultaneous voice/data communication)	24*

* Two keyset circuits are needed for each 24-line keyset installed with a secondary voice path. Refer to SPECIFICATIONS, page 2-3, for more information.

SPECIFICATIONS

CONTENTS   *PAGE*

1. INTRODUCTION

1.1 This section describes the following hardware:

- Cabling and the Main Distribution Frame (MDF)
- Key Service Unit (KSU)
- Station Instruments
- Optional System Equipment

1.2 The GMX-48 System can be equipped with up to 24 loop start C.O. lines and up to 48 station instruments. The lines and stations are controlled by the Key Service Unit (KSU). Without Expansion Modules (EXPs) or Accessory Port Modules (APMs) installed, the KSU Control Board (KCB) can be equipped with up to four C.O. lines and up to eight keysets (or DSS/BLF Units).

1.3 For increased capacity, up to five EXPs may be installed. Each EXP can have up to four C.O. lines and up to eight keysets connected to it. Or, in place of one or two of the EXPs, up to two APMs can be installed. Each APM can have up to six single-line devices (such as single-line sets, playback devices, voice mail units, FAX machines, etc.) connected to it. Possible system configurations are are shown in the chart below.

1.4 A wide variety of station instruments are available on the GMX-48 System, including:

- 24-Line Standard Keysets
- 24-Line Display Keysets
- 12-Line (non-display) Keysets
- Direct Station Selection/Busy Lamp Field (DSS/BLF) Units
- Single-Line Instruments (SLIs)
- Industry-standard single-line, dual-tone multi-frequency (DTMF) sets

1.5 A wide variety of optional system equipment can also be installed, including:

- Off-premises stations and OPX repeaters; refer to pages 2–14 and 3–18.
- Playback devices; refer to pages 2–15 and 3–46.
- Output device(s) for the station message detail recording (SMDR), error recording, and system activity report (SAR) features; refer to pages 2–16 and 3–48.
- Auto-answer modem for remote system programming; refer to pages 2–17 and 3–48.
- System battery back-up; refer to page 2–17.
- External music source; refer to pages 2–7 and 3–49.
- External paging speaker equipment; refer to pages 2–7 and 3–50.
- Doorbox; refer to page 2–18.
- Voice mail equipment; refer to page 2–18.
- Facsimile (FAX) machine; refer to page 2–18.

NO. OF MODULES INSTALLED	NO. OF C.O. LINE CIRCUITS AVAILABLE	NO. OF KEYSET CIRCUITS AVAILABLE*	NO. OF SINGLE-LINE CIRCUITS AVAILABLE	TOTAL CONFIGURATION
KCB Only	4	8	0	4 x 8
— Plus 1 EXP	8	16	0	8 x 16
— Plus 2 EXPs	12	24	0	12 x 24
— Plus 3 EXPs	16	32	0	16 x 32
— Plus 4 EXPs	20	40	0	20 x 40
— Plus 5 EXPs	24	48	0	24 x 48
— Plus 1 APM	4	8	6	4 x 14
— Plus 2 APMs	4	8	12	4 x 20
— Plus 1 EXP & 1 APM	8	16	6	8 x 22
— Plus 1 EXP & 2 APMs	8	16	12	8 x 28
— Plus 2 EXPs & 1 APM	12	24	6	12 x 30
— Plus 2 EXPs & 2 APMs	12	24	12	12 x 36
— Plus 3 EXPs & 1 APM	16	32	6	16 x 38
— Plus 3 EXPs & 2 APMs	16	32	12	16 x 44
— Plus 4 EXPs & 1 APM	20	40	6	20 x 46

* To equip a keyset with a secondary voice path (for off-hook voice announce and/or simultaneous voice/data communication), two keyset circuits are required. Also, each DSS/BLF Unit installed requires a separate keyset circuit.

2. CABLING AND THE MAIN DISTRIBUTION FRAME (MDF)

2.1 Connections between the central office (C.O.) lines, station instruments, external equipment, and KSU are made at the MDF. The MDF is made up of industry-standard, 66M1-50-type terminal blocks and, depending on the type of installation, modular jack assemblies. Bridging clips are used on all terminal blocks to complete the connections. Blocks used include:

● 1 block for C.O. line and C.O. circuit terminations (unless the telephone company has terminated the C.O. lines on RJ-type jacks, then a C.O. block is not necessary).

● 1–6 blocks for station cabling and station circuit terminations.

2.2 The KSU and power supply are also mounted on the MDF backboard. The MDF requires at least a 4 x 6-foot (1.2 x 1.8-meter), ¾-inch plywood backboard. This allows room to mount the KSU, power supply, terminal blocks, modular jack assemblies (if needed), and any optional peripheral equipment.

A. STATION CONNECTIONS

2.3 For each keyset, DSS/BLF Unit, and single-line device, three-pair cable is run from the station location to the MDF. All station cables are terminated on blocks at the MDF and on six-conductor modular jack assemblies at the station locations.

NOTE: It is recommended that three-pair cable and six-conductor modular jacks be used for all station connections. This allows the various types of station instruments to be easily interchanged, if necessary. However, if desired, single-line devices can be installed using one-pair cable and four-conductor modular jacks.

2.4 Industry-standard, 25-pair telephone cable is used to connect station blocks to the KSU. Female 50-pin amphenol-type connectors on the cables attach to the male connectors on the KSU Control Board (KCB), Expansion Modules (EXPs), and Accessory Port Modules (APMs).

2.5 If desired, the system can be configured to allow 24-line keyset users to *receive* off-hook voice announce (OHVA) calls and/or to use the *simultaneous* voice/data communication feature. To accomplish this, the keyset is installed on an odd-numbered station circuit (e.g., 1.1, 1.3, 1.5, etc.). Then, the following even-numbered circuit (1.2, 1.4, 1.6, etc.) is used to create a secondary voice path.

NOTE: To simply *place* OHVA calls (from both 12-line and 24-line keysets) or to use the *standard* data communication feature (24-line keysets only), no special secondary voice path installation is necessary. However, for data communication (whether standard or simultaneous voice/data), 24-line keysets must be equipped with optional Data Port Modules. 12-line keysets cannot have Data Port Modules installed.

2.6 Although secondary voice path-equipped keysets are installed with three-pair cable as usual, the configuration at the station block is somewhat different than the standard configuration. In standard installations, the KSU uses the first pair for power and ground, the second pair for the primary voice path, and the third pair for auxiliary transmissions between the keyset and the KSU. To create a secondary voice path, the auxiliary pair is not used; instead, the primary pair from the following even-numbered circuit is used in its place. (Refer to INSTALLATION, pages 3–14 to 3–16, for complete instructions.)

2.7 Because the primary path of the even-numbered circuit is used to create a secondary voice path for the preceding odd-numbered circuit, the even-numbered circuit cannot have a station instrument installed on it. The maximum number of 24-line keysets that may be equipped with a secondary voice path is 24 (2 circuits x 24 keysets = the 48 circuit capacity of the system).

2.8 Each secondary voice path keyset must have its corresponding station circuit strap in the KSU set in the OHVA position. When a secondary voice path is not installed, the strap must be in the NORM position. Also, each secondary voice path circuit must be designated as such in database programming. (See PROGRAMMING, page 5–49, for details.)

B. C.O. LINE CONNECTIONS

2.9 The C.O. lines are terminated on telephone company RJ-type jacks or on an RJ-type block, as required by FCC regulations. Three methods of connecting C.O. lines to the KSU are outlined in the INSTALLATION section, along with details concerning necessary supplies. Briefly, the three methods are as follows:

● **If the C.O. lines are terminated on RJ-type jacks mounted near the MDF:** Using two-pair mod-to-mod line cords, every two C.O. lines are connected directly to the corresponding C.O. jack on the KSU.

```
                      CAUTION

  If the above installation method is used, the light-
  ning protection procedures outlined in paragraph
  2.10 cannot be followed. For lightning protection
  capability, use one of the following installation
  methods instead.
```

● **If the C.O. lines are terminated on RJ-type jacks mounted away from the MDF:** Using two-pair mod-to-mod line cords, every two C.O. lines are first terminated from the RJ-type jacks onto four-conductor modular jack assemblies mounted next to the RJ-type jacks. Then, using standard two-pair cable, the C.O. lines are extended to modular jack assemblies mounted at the MDF. Finally, two-pair mod-to-mod line cords complete the connection from the modular jack assemblies to the corresponding C.O. jacks on the KSU. For a diagram of this method, see Figure 3–10 on page 3–22.

● **If the C.O. lines are terminated on an RJ-type block:** A 25-pair cable is used to connect the RJ-type block to a C.O. terminal block on the MDF. Then, for every two C.O. lines, two-pair cable (or cross-connect cable) is connected from the C.O. block to four-conductor modular jack assemblies mounted next to the KSU. Finally, two-pair mod-to-mod line cords complete the connection from the modular jack assemblies to the corresponding C.O. jacks on the KSU. For a diagram of this method, see Figure 3–12 on page 3–23.

2.10 It is recommended that gas discharge tubes with silicon avalanche suppressors be installed on the C.O. lines and OPX lines for lightning protection. Also, in areas with frequent occurrences of lightning, it is recommended that the cable between the telephone company termination and the gas discharge tubes be at least 75 feet long (the cable may be coiled up if desired).

2.11 The GMX-48 System has the following C.O. line characteristics:

CHARACTERISTICS

Loss from:	
CO to keyset	0dB (@1kHz, 0 ft.)
CO to single-line set	0dB (@1kHz, 0 ft.)
CO to CO	2dB (@1kHz, 0 ft.)
Ringer equivalence	0.8B
Ringing voltage	40VRMS minimum
Ring frequency	17–63Hz
Loop current	20mA minimum

PROTECTION

Tip-to-ring	390V transient

3. KEY SERVICE UNIT (KSU)

A. KSU DESCRIPTION

3.1 The KSU performs the switching activities for the system, detects incoming calls, processes data-controlled features, and controls the interaction of station instruments, C.O. lines, and intercom channels. The KSU can house up to five modules. All five can be Expansion Modules (EXPs), or up to two of the five can be Accessory Port Modules (APMs). For a drawing of the KSU, see Figure 2–2 on page 2–21. KSU dimensions are as follows:

WITHOUT ANY MODULES INSTALLED

Height	20.0 in. (50.8 cm.)
Width	13.5 in. (34.3 cm.)
Depth	2.0 in. (5.1 cm.)
Weight	11.0 lbs. (5.0 kg.)

WITH FIVE MODULES INSTALLED

Height	20.0 in. (50.8 cm.)
Width	13.5 in. (34.3 cm.)
Depth	8.0 in. (20.3 cm.)
Weight	41.0 lbs. (18.5 kg.)

3.2 The system is a microprocessor-controlled, space-division system. Memory includes up to 384K bytes ROM and up to 112K bytes RAM. Each keyset contains a microprocessor that communicates with the microprocessor in the KSU.

3.3 Without any EXPs or APMs, the KSU can be installed with up to four C.O. lines and up to eight keysets and/or DSS/BLF Units. For increased capacity, as many as five EXPs may be attached to the main KSU Control Board (KCB) unit. Each EXP can have up to four C.O. lines and up to eight keysets or DSS/BLF Units connected to it. A fully loaded system can have 24 C.O. lines and 48 keysets. Possible system configurations are are shown in the chart on page 2–2.

3.4 For single-line device capability (i.e., single-line sets, playback devices, voice mail units, FAX machines, etc.), up to two APMs can be attached to the KCB. However, for each APM installed, one less EXP can be installed. No matter what the combination, there can be no more than five modules attached to the KCB. Each APM can have up to six single-line devices connected to it.

3.5 The system has 22 voice channels, one paging channel, and one background music channel. The 22 voice channels are available for C.O. calls and up to six intercom calls on a first come, first served basis. If fewer than 16 C.O. lines are installed, more voice channels are available for intercom calls (one channel for each line not installed). In the rare occurrence that all voice channels are in use, a user attempting to place a call will hear reorder tones and may try again. Detailed traffic analysis indicates that if this occurs, a voice channel will likely be available on the second attempt.

3.6 Each EXP and APM has address selection switches or straps that are used to indicate the position of the modules in relation to the KSU. These switches/straps *must* be set correctly in order for the system to operate properly. To aid in proper installation, these settings are silkscreened directly on the modules.

3.7 A ground lug on the bottom edge of the KSU is used to connect the KSU to an earth ground. Refer to INSTALLATION, page 3–26, for details.

3.8 The KSU and the station instruments require the following environmental conditions:

REQUIREMENTS	IN OPERATION	IN STORAGE
Temperature — KSU	32° to 104° F 0° to 40° C	–40° to 185° F –40° to 85° C
Temperature — Station Instruments	32° to 113° F 0° to 45° C	–40° to 185° F –40° to 85° C
Relative Humidity (Non-Condensing)	5% to 95%	5% to 95%
Altitude	Up to 10,000 ft. (3,048 m.)	Up to 40,000 ft. (12,192 m.)

NOTE: It is recommended that the maximum operating temperatures (as stated above) *never* be exceeded. Therefore, when installing the KSU and the station instruments, allow a sufficient margin for error in case of air conditioning failure, routine mechanical maintenance, plant shutdown, etc. As a general guideline, if the conditions are suitable for office personnel, they are also suitable for KSU and station instrument operation. A properly controlled environment will help to extend the operating life of the equipment.

B. SYSTEM POWER SUPPLY

3.9 The 662.0600, 662.0200, or 662.0100 system power supply is installed to provide power to the KSU and to all stations. The power supply *must* have an isolated, dedicated, 105–125VAC, 15A, 57–63Hz, single-phase commercial power source (for details, refer to the first NOTE on page 3-3 of the INSTALLATION section).

3.10 The smaller power supply (662.0600) may be used on systems with up to one module installed. The medium-sized power supply (662.0200) may be used on systems with up to two modules installed. For systems with three or more modules installed, the large power supply (662.0100) must be used.

3.11 Maximum power outputs and fuse values for each power supply are shown below.

662.0600	**662.0200**
For systems with up to one module:	*For systems with up to two modules:*
+5VDC, 700mA (logic)	+5VDC, 800mA (logic)
+12VDC, 275mA (RS-232-C, audio)	+12VDC, 400mA (RS-232-C, audio)
–12VDC, 25mA (RS-232-C)	–12VDC, 25mA (RS-232-C)
+30VDC, 2.25A (keyset)	+30VDC, 3.25A (keyset)
	AC breaker — 115VAC, not replaceable

662.0100
For all systems, including those with three or more modules:
+5VDC, 1.25A (logic)
+12VDC, 900mA (RS-232-C, audio)
–12VDC, 25mA (RS-232-C)
+30VDC, 8.0A (keyset)
AC breaker — 115VAC, not replaceable

3.12 To provide back-up power in the event of a power failure or brownout condition, the power supplies can have optional battery back-up using the unit designed for the system (part no. 662.0110) or using a customer-provided uninterruptable power supply (UPS) unit or standby power supply (SPS) unit. Refer to page 2-17 for more information.

3.13 To reduce the effects of AC voltage surges and spikes that may cause system malfunctions, false logic, and/or damage to the electronic components, it is recommended that a surge/spike protector be installed.

3.14 Check the manufacturer's specifications to ensure that the surge/spike protector meets the following requirements:

● Clamp voltage transients at 300VDC within 5 nanoseconds when exposed to waveforms as described in the ANSI/IEEE Standard C62.41–1980 (IEEE 587).

● Reduce RFI/EMI noise by at least 20dB at frequencies between 5kHz and 30MHz.

C. KSU CONTROL BOARD, EXPANSION MODULE, AND ACCESSORY PORT MODULE

3.15 Descriptions of the KSU Control Board, Expansion Module, and Accessory Port Module are given in the following paragraphs. Drawings of them are located in the INSTALLATION section.

KSU Control Board (KCB)

3.16 The KCB contains the main controlling microprocessor and associated control logic and memory circuits. It is under the control of a program, stored in the ROM, which is activated when the system is powered up. ROMs containing the system software are on a Memory (MEM) Board attached to the KCB.

3.17 The KCB and its attached MEM Board contain the following:

- **Power supply connector** (12-pin connector on the end of a cable) for attaching the power supply DC cable to the KSU. For installation instructions, refer to page 3-24.

- **Music-on-hold connector** (⅛-inch, two-conductor, miniature phone jack with an input impedance of 9K ohms) is the input connection for an external music source (such as a radio, tape player, etc.). An AGC circuit on the KCB automatically holds the volume to a predetermined level that is slightly lower than the normal voice volume, as required by FCC regulations. Optimal input level is 0.775VRMS (0dB). For installation instructions, refer to page 3-49.

- **External paging connector** (RCA-type phono jack with an output impedance of 600 ohms) can be used to connect an amplifier and external paging network to allow paging to large areas, such as warehouses or loading docks. For external paging speaker installation instructions, refer to page 3-50.

- **RS-232-C connector** (25-pin subminiature "D" female connector) is the interface for an SMDR/SAR output device, a programming terminal, or a modem for remote system maintenance. For more information, refer to page 2-16.

- **Baud rate DIP switches** are used to select the baud rate for the RS-232-C interface. The baud rates available for this port are 300, 1200, 2400, and 4800.

  NOTE: Only one of the four DIP switches should be in the ON (down) position at one time.

- **Voltage test points** for checking the system +5VDC, -12VDC, +30VDC, and +12VDC levels. To measure system voltage levels, voltmeter probes are placed on the ground test point and the desired voltage test point. Refer to INSTALLATION, page 3-30, for details.

- **LED indicators** show proper operation (RUN), C.O. call(s) active (CO BUSY), intercom call(s) active (IC BUSY), system alarms (MINOR ALARM), database error occurrences (D-BASE ERROR), and database back-up battery connection (BATT OFF). Refer to TROUBLESHOOTING for detailed LED information.

- **Reset switch** is used to manually reset the system during troubleshooting. This is a software reset (minor reset), not a hardware reset (major reset). Pushing this switch does the following:

  — Preserves the battery-backed database information, non-conference calls in progress, outside calls being dialed, inter-station messages, calls on individual hold, do-not-disturb messages, and reminder messages. A call on system hold is changed to individual hold at the station that placed it on hold.

  — Restores DTMF decoders and speech channels, and resets the station clocks to match the system clock. Updates line key, DSS/BLF key, speed-dial key, and feature key lamp status.

  — Interrupts system operation, which disconnects pages in progress, calls ringing in, and calls that are using the conference resources (as described on the next page). Camped-on calls are disconnected and queue requests are cancelled.

  — Terminates system and user programming.

- **Database back-up battery** (3.5V lithium battery located on the MEM Board) that can support the database for at least two months of accumulated system down time.

- **Back-up battery voltage test points and battery check button** (located on the MEM Board) for checking the database back-up battery charge. If the battery voltage is not greater than 2.5VDC, the KCB must be returned for battery replacement.

- **Back-up battery strap** (JMP 1 located on the MEM Board) for activating the database back-up battery. The strap should be placed in the A position (over the lower two pins) before the KSU is turned on. When the KSU is taken out of service for repair or storage, the strap should be placed in the B position (upper two pins) to preserve the battery charge.

  NOTE: Placing the BBU strap in the OFF position erases the database.

- **Conferencing resources** for up to eight simultaneous, five-way conferences. The conferencing resources also support the call forward, call transfer, and DISA features when two C.O. lines are connected. Conferencing is not amplified.

- **DTMF transmitter circuit** generates DTMF tones whenever a keyset user manually dials a number or uses one of the system auto-dial features (ARS, call forward to the public network, station or system speed dialing, etc.).

- **Music-on-hold (MOH) ON/OFF strap** for enabling an external music source that is heard by callers when they are placed on hold or camped on. If connecting an external music source, place the strap in the ON position (over the left two pins) to enable music, or place the strap in the OFF position (right two pins) to disable music. If enabled, outside callers will hear music when placed on hold. If disabled, outside callers will not hear music when placed on hold.

  NOTE: If a music source is connected, the position of the MOH ON/OFF strap will not affect the ability of keyset users to receive background music. Also, regardless of the strap location, internal station users will hear music when placed on hold by another station or when camped on.

- **MOH HI/LO strap** for setting the music-on-hold volume level. For a higher MOH volume level, place the strap in the HI position (over the right two pins). Or, for a lower MOH volume level, place the strap in the LO position (over the left two pins).

- **Station circuitry** for installing up to eight keysets or DSS/BLF Units.

  NOTE: Keysets and DSS/BLF Units require separate station circuits. Also, to equip a keyset with a secondary voice path, two station circuits are needed.

- **Secondary voice path straps** for enabling an odd-numbered station circuit to use the primary voice path of the following even-numbered station circuit for off-hook voice announce and/or simultaneous voice data communication. (Refer to pages 3-14 to 3-16 for more information and necessary installation instructions.) If the station circuit is to have a secondary voice path, place the associated strap on the KCB in the OHVA position. Or, for normal station installation, place the strap in the NORM position.

- **Male 50-pin amphenol-type connector** for connecting a cable from a station terminal block to the KCB.

- **C.O. circuitry and modular jacks** for connecting up to four loop start C.O. lines to the KCB.

- **2A, 250VAC, AGC 2 (fast-acting) fuse** to protect the KSU from damage due to a short circuit in the station cabling.

Expansion Module (EXP)

3.18 Up to five modules may be attached to the KCB. If desired, all five modules can be EXPs. Each EXP can be equipped with up to eight keysets or DSS/BLF Units and up to four C.O. lines. An EXP contains the following:

- **Station circuitry** for installing up to eight keysets or DSS/BLF Units.

  NOTE: Keysets and DSS/BLF Units require separate station circuits. Also, to equip a keyset with a secondary voice path, two station circuits are needed.

• **Secondary voice path straps** for enabling an odd-numbered station circuit to use the primary voice path of the following even-numbered station circuit for off-hook voice announce and/or simultaneous voice data communication. (Refer to pages 3-14 to 3-16 for more information and special installation instructions.) If the station circuit is to have a secondary voice path, place the associated strap on the EXP in the OHVA position. Or, for normal station installation, place the strap in the NORM position.

• **Male 50-pin amphenol-type connector** for connecting a cable from a station terminal block to the EXP.

• **C.O. circuitry and modular jacks** for connecting up to four loop start C.O. lines to the EXP.

• **Address selection switches** for indicating the position of the EXP in relation to the KSU. These switches must be set correctly in order for the system to operate properly. (Refer to INSTALLATION, page 3-32, for proper switch settings.)

• **2A, 250VAC, AGC 2 (fast-acting) fuse** to protect the KSU from damage due to a short circuit in the station cabling.

Accessory Port Module (APM)

NOTE: To install APMs, an Extended MEM Board with *Advanced* software (part no. 662.2101) or an Extended MEM Board with *Intermediate* software (part no. 662.2103) is required.

3.19 Up to two of the five modules that may be attached to the KCB can be APMs. Each APM can be equipped with up to six single-line devices (such as single-line sets, playback devices, voice mail units, FAX machines, etc.). Off-premises stations can be connected using an HVRA Unit, power supply, and ring generator. An APM contains the following:

• **RS-232-C connector** (using one of two six-conductor modular jacks) is the interface for an SMDR/SAR output device, a programming terminal, or an auto-answer modem for remote programming. This port operates only at 1200 baud. For more information, refer to page 2-16.

NOTE: Although there are two RS-232-C modular jack connectors on the APM, only one connector can be used at a time.

• **DTMF decoding circuits** (two) are used by the system whenever single-line devices are dialing and whenever features such as DISA and automated attendant are used. They are also used for the unsupervised C.O. call continuation feature (see the NOTE on page 5-17 of the PROGRAMMING section). These two decoders convert DTMF signals to the digital codes used by the system. They are in use only while the dialed number is being processed, not for the duration of the call. If both DTMF decoders are busy, the user may camp on.

• **Tone generators** are used to produce all of the system tones (busy, reorder, do-not-disturb, etc.) heard by single-line set, DISA, and automated attendant users. (Keysets generate their own system tones.)

• **Station circuitry** for installing up to six single-line devices.

• **AC/DC straps** for setting each station circuit to accept either AC-ringing devices or DC-ringing devices.

• **Male 50-pin amphenol-type connector** for connecting a cable from a station terminal block to the APM.

• **Address selection strap** for indicating the position of the APM in relation to the KSU. This strap must be set correctly in order for the system to operate properly. (Refer to INSTALLATION, page 3-34, for proper strap settings.)

• **2A, 250VAC, AGC 2 (fast-acting) fuse** to protect the +30V output.

Station and C.O. Line Circuits

3.20 The KCB and EXPs each have circuitry for up to eight keysets or DSS/BLF Units. APMs have circuitry for up to six single-line devices. Each circuit is assigned a number (X.Y) according to its location in relation to the KSU (X = 1-6) and its location on the KCB (Y = 1-8), EXP (Y = 1-8), or APM (Y = 1-6). For example, station circuit 1.2 is the second station circuit on the KCB. Station circuit 2.4 is the fourth station circuit on the first EXP attached to the KSU.

3.21 When the system is initialized, the intercom numbers for the KCB and EXPs are assigned in order from circuit 1.1 (intercom number 100) to circuit 6.8 (intercom number 147). The intercom numbers for the APMs are assigned in order from circuit 7.1 (intercom number 148) to circuit 8.6 (intercom number 159). Intercom number assignments may be changed through database programming. Only circuit 1.1 is equipped (as the primary attendant's keyset) when the system is initialized. Refer to PROGRAMMING, page 5–49, for more information.

NOTE: No matter what position the APMs are located in relation to the EXPs, the first APM attached to the system is always assigned circuits 7.1 to 7.6 and the second APM installed is always assigned circuits 8.1 to 8.6.

3.22 The KCB and EXPs each have circuitry for up to four loop start C.O. lines. Each of the four circuits is assigned a number (X.Y) according to its location in relation to the KSU (X = 1–6) and its location on the KCB or EXP (Y = 1–4). For example, C.O. line circuit 2.4 is the fourth circuit on the first EXP attached to the KSU. C.O. line circuit 6.4 is the fourth circuit on the fifth EXP.

3.23 When the system is initialized, C.O. line circuits 1.1–6.4 are assigned to line keys 1–24; circuit 1.1

is under line key 1, circuit 1.2 is under line key 2, and so on. Line key assignments can be reprogrammed through database programming. Also, unused line keys can be designated as feature keys.

3.24 If desired, line key numbers may be assigned on a tenant-by-tenant basis. Up to 24 lines can be distributed among the tenant groups using four different line key arrangements (one for each tenant group). Refer to FEATURES, page 4–16, for more information.

3.25 When the system is initialized, all C.O. lines are configured for DTMF signalling. If necessary, some or all of the lines can be reprogrammed for dial-pulse signalling through database programming.

NOTE: Single-line sets generate their own DTMF tones when dialing. If used on dial-pulse lines, both the DTMF tones generated by the phone and the dial-pulse signals generated by the system (via the DTMF decoders) are sent to the central office, which may be a problem if the central office recognizes both. To avoid this problem, single-line sets should be restricted to LCR only when using dial-pulse lines. Then, only the LCR-generated dial-pulse signals will be sent to the central office.

4. STATION INSTRUMENTS

4.1 A variety of station instruments can be used on the GMX-48 System. The system capacity for stations is:

Total Station Instruments	48
Keysets (24-line or 12-line)	0–48*
Single-Line Sets	0–12
DSS/BLF Units	0–5**
Keysets with secondary voice paths installed (24-line keysets only)	0–24***

* It is strongly recommended that at least one 24-line display keyset be installed to receive system alarm messages and act as attendant for unsupervised C.O. recalls. When the system is initialized, circuit 1.1 is designated as a keyset and the primary attendant.

** Keysets and DSS/BLF Units use separate station circuits. Therefore, for each DSS/BLF Unit installed, one less keyset may be installed.

*** Two station circuits are required for each secondary voice path installation. Therefore, for each 24-line keyset installed with a secondary voice path, one less keyset may be installed.

A. KEYSETS

4.2 A maximum of 48 keysets can be connected to the GMX-48 System. Keysets are available in 24-line standard, 24-line display, and 12-line (non-display) models. For illustrations of the keysets, refer to Figures 2–3 and 2–4 on pages 2–22 and 2–23. Keyset dimensions are:

24-LINE KEYSETS	**12-LINE KEYSETS**
Height 3.5 in. (8.9 cm.)	Height 3.5 in. (8.9 cm.)
Width 8.8 in. (22.3 cm.)	Width 7.5 in. (19.1 cm.)
Length 9.0 in. (22.9 cm.)	Length 9.0 in. (22.9 cm.)
Weight 2.8 lb. (1.3 kg.)	Weight 2.5 lb. (1.1 kg.)

4.3 The 24-line model has:

- 12-key pushbutton keypad
- 18 feature keys (10 of which are user programmable)
- 10 speed-dial (SD) keys with light-emitting diode (LED) indicators
- 24 direct-access C.O. line keys with LED indicators (unused line keys may be designated as feature keys through database programming)
- Integrated speakerphone
- Ring and voice volume controls
- Slide-out directory card
- Self-test feature (for testing keyset functions)
- Hearing aid-compatible (HAC) handset
- Reversible baseplate for wall mounting

4.4 The 12-line model has:

- 12-key pushbutton keypad
- 10 feature keys (three of which are user programmable)
- 8 speed-dial (SD) keys with light-emitting diode (LED) indicators
- 12 direct-access C.O. line keys with LED indicators (unused line keys may be designated as feature keys through database programming)
- Integrated speakerphone
- Ring and voice volume controls
- Slide-out directory card
- Self-test feature (for testing keyset functions)
- Hearing aid-compatible (HAC) handset
- Reversible baseplate for wall mounting

4.5 A built-in, integrated speakerphone is standard in all keysets. The integrated speakerphone allows users to place and receive outside calls and intercom calls without lifting the handset. Once a call is connected, the keyset user may speak handsfree over the speakerphone or lift the handset to speak privately. When using the handset, the user may switch to the speakerphone by pressing the SPKR key and replacing the handset. If enabled, pages and/or background music may be broadcast over the speaker when the phone is not being used. (If desired, the integrated speakerphone can be disabled on a station-by-station basis through database programming.)

Optional Liquid Crystal Display (LCD)

4.6 Each 24-line display keyset has a liquid crystal display (LCD) with two 16-character lines. The display helps the user to process calls more efficiently and professionally. There are display messages for date and time, numbers dialed, call cost data, reminders, do-not-disturb, incoming calls, station and system status, system alarms, and programming. These displays are indicated throughout the FEATURES section of the manual. Standard 24-line keysets can be converted to display sets by installing an LCD Unit (part number 828.1052). 12-line keysets cannot be equipped with displays.

Optional Headsets

4.7 A headset may be attached to any keyset by unplugging the handset from the handset jack on the base of the keyset, plugging the headset into the handset jack, and entering a feature code to enable the headset. The SPKR key, which is used to turn the headset on and off, is lit when placing or receiving calls and unlit when the headset is not in use. The keysets are compatible with industry-standard, four-conductor, modular headsets that have dynamic microphones, or carbon-microphone headsets that have an external AC power source. Refer to page 3-41 for installation instructions.

Optional Handset Amplifiers

4.8 The typical handset amplifier is an external device that plugs into the keyset (where the handset is normally connected); the handset is then plugged into the amplifier. Receiver voice volume is controlled by turning a thumbwheel (or similar control) located on the amplifier. Such amplifiers are generally equipped with a transformer that requires a 110VAC outlet. Refer to page 3-41 for installation instructions.

Optional Data Port Module

4.9 24-line keysets may be equipped with optional Data Port Modules (part number 828.1094). The module board contains a four-conductor, RJ11 modular jack that can be used to connect *either* a data device (such as a personal computer equipped with a modem) *or* a loud ringing adapter (LRA) and an external signalling device (such as a loud bell, horn, flashing light, etc.) to the keyset. The Data Port Module is a source for 20-26mA of loop current (constant current source). Refer to page 3-42 for instructions on installing the optional Data Port Module.

4.10   Specifications for modem-equipped data device: The data device must have a direct-connection modem. The modem must be externally powered (or capable of operating on 20mA of loop current) and have an RJ11 C.O. line interface. The data device can be used with the keyset to communicate with remote data equipment over the C.O. lines or intercom channels. Refer to pages 3-42 and 4-90 for installation and operation instructions.

4.11   Specifications for loud ringing adapter (LRA): An external LRA may be connected to the Data Port Module to provide a relay for controlling external signalling devices. The LRA is connected to the Data Port Module, and the external signalling device is connected to the LRA. Refer to page 3-44 for installation instructions. Each time the keyset rings, the Data Port Module provides 20-26mA of loop current to the LRA. This causes the LRA contacts to close and activates the signalling device. The LRA is not affected by the ring tone or the ringer volume of the keyset. The LRA must be capable of operating on 20mA current (0-20VDC).

4.12 Some types of signalling devices generate a current/voltage rating that could damage the LRA. The following Wheelock products have been found to work properly with the GMX-48 System.

- Wheelock DCI-24-24 is an adapter that is used with any of a wide variety of Wheelock signalling devices.

- Wheelock CRT-D-37 is a dry contact relay that is used with other manufacturer's signalling devices.

4.13 The LRA output of the Data Port Module is connected to the dry contact input on the Wheelock unit. Wheelock products can be ordered from a local supply house, or call Wheelock directly at (201) 222-6880. Installation and operation instructions are included with each device.

B. DIRECT STATION SELECTION/BUSY LAMP FIELD (DSS/BLF) UNITS

4.14 There may be a maximum of five DSS/BLF Units installed on the system. These units are programmed to be used with specific keysets, but are not physically attached to the keysets. Each unit requires a KCB or EXP circuit that is separate from the keyset's circuit. If five station circuits are used for DSS/BLF Units, five fewer keysets can be installed. If desired, all five DSS/BLF Units may be connected to the KCB or to the same EXP.

4.15 For a drawing of the DSS/BLF Unit, refer to Figure 2–5 on page 2–24. DSS/BLF Unit dimensions are:

Height	3.5 in.	(8.9 cm.)
Width	8.8 in.	(22.3 cm.)
Length	9.0 in.	(22.9 cm.)
Weight	2.0 lb.	(0.9 kg.)

4.16 Each DSS/BLF Unit provides one-key access to up to 48 intercom numbers and up to 5 hunt group pilot numbers. The intercom numbers or hunt group pilot numbers accessed by the keys are programmed in the database on a system-wide basis.

4.17 Together, the lamps in the keys create a busy lamp field that indicates the status of each station or hunt group assigned to the keys. The LED indicator in the key is solidly lit when the associated station is busy, flashes slowly when the station is in do-not-disturb, flashes fast when the station has a call ringing in, or flutters continuously if the station is causing a STATION OFF-HOOK system alarm. If assigned to a hunt group, the LED indicator is solidly lit when all stations in the hunt group are unavailable (busy, forwarded, in do-not-disturb, or removed from the hunt group) and it flashes fast when a call is camped on to a hunt group.

C. SINGLE-LINE SETS

NOTE: To install APMs for single-line set capability, an Extended MEM Board with *Advanced* software (part no. 662.2101) or an Extended MEM Board with *Intermediate* software (part no. 662.2103) is required.

4.18 Up to 12 single-line sets may be installed on the GMX-48 System. They can be Single-Line Instruments (SLIs) or industry-standard, single-line DTMF sets. See Figure 2–6 on page 2–25 for a drawing of the SLI.

4.19 The dimensions of the SLI are:

Height	3.5 in.	(8.8 cm.)
Width	7.5 in.	(18.8 cm.)
Length	9.0 in.	(22.5 cm.)
Weight	2.0 lb.	(0.9 kg.)

4.20 SLI design features include:

- Four user-programmable feature keys and a non-programmable timed hookflash (FLASH) key
- A ring volume thumbwheel control
- Hearing aid-compatible (HAC) handset (may be equipped with a handset amplifier as described on page 2–12)
- Reversible baseplate for wall mounting
- A ringer that can be set for AC or DC by moving a strap located on the control board

4.21 Single-line set users access some station features simply by lifting the handset and pressing a feature key (or entering a feature code). Other features are accessed using a combination of a hookflash (FLASH key) and a feature key or code. Refer to the FEATURES section of this manual for details.

4.22 If single-line sets are used as off-premises stations, they must be equipped with AC ringers (SLIs have an internal strap that can be moved to set the ringer for AC or DC). When used on premises, single-line sets may have AC ringers by setting the APM circuit for AC ringing, or they may have DC ringers by setting the circuit for DC ringing. (Refer to page 3–46 for single-line set installation instructions.)

D. OFF-PREMISES SINGLE-LINE STATIONS

4.23 The off-premises station is an SLI or single-line DTMF set that is placed in a remote location and connected to the system through a telephone company OPX line or a customer-provided line.

4.24 The OPX lines provided by the telephone company are identified with Facility Interface Codes (FIC): Class A, OL13A; Class B, OL13B; or Class C, OL13C. The service order code is 9.0F (fully protected private line). If the impedance does not exceed a loop measurement of 800 ohms (loop of 15,600 feet using 24AWG wire), a customer-provided line between the remote location and the system may be used.

4.25 The 800-ohm loop limitation is usually suitable for accessing on-premises stations from off-premises stations. However, for applications where one off-premises station will be calling another through the APM, the impedance between the two off-premises stations (both lines added together) must be less than 800 ohms (loop measurement). In this situation, a Class A or B FIC line is preferable, since the APM does not amplify voice levels (or see paragraph 4.27 for an alternate solution).

4.26 Off-premises stations are connected to APMs (up to six circuits on a module). Additional equipment needed to install an off-premises station includes the following:

- One High Voltage Ringing Adapter (HVRA) Unit for every two off-premises stations. (Part number 680.73.)

- A 48VDC power supply with a current rating of at least 200mA per HVRA Unit.

- A 110VAC (30Hz) ring generator. Total the ringer equivalence numbers of the off-premises stations to determine the REN of the ring generator. For example, three single-line sets, each with a ringer equivalence of 0.9A, would require a 2.7REN

minimum ring generator to ring all sets at once. Check the manufacturer's specifications for the ringer equivalence of single-line sets used. SLIs have a ringer equivalence of 0.9A.

- One terminal block (66M1-50 type) and a supply of bridging clips for each HVRA Unit.

- 25-pair cable to connect the HVRA Unit to the HVRA block.

- One 50-pin female amphenol-type connector for each HVRA Unit. Used to connect the cable to the HVRA Unit.

- Cross-connect cable to run from the HVRA block to the station block.

- 10AWG wire for grounding the power supply.

- Two screws for mounting the HVRA Unit to the MDF backboard. (Drilling may be necessary.)

- Cabling for customer-provided line, if used.

4.27 In certain off-premises applications, voice volume levels may not be acceptable. This degradation in voice volume is due to the natural voice frequency range limitations of the telephone company or customer-provided line. To increase the frequency range, installation of a 2-wire, negative impedance repeater unit is recommended. Such units typically provide from 0–15 decibels of voice volume gain and allow regulation of the gain in each direction when simultaneous voice transmission occurs. The switching sensitivity on the unit should also be adjustable.

4.28 The repeater unit is installed at the MDF between the High Voltage Ringing Adapter (HVRA) Unit and the cabling to the off-premises single-line station. (Refer to page 3–18 for OPX installation instructions.) When ordering a repeater unit, consult with the supplier for ordering the proper mounting shelf and power supply for the unit. Additional information on operating and adjusting the repeater unit is included with the product.

E. PLAYBACK DEVICES

NOTE: To install APMs for playback device capability, an Extended MEM Board with *Advanced* software (part no. 662.2101) is required.

4.29 A playback device is an answering machine that answers the call, plays a message, and then disconnects from the call to transfer it to the appropriate destination. Playback devices are installed like single-line sets, using three-pair cable and six-conductor modular jacks (or, if desired, one-pair cable and four-conductor modular jacks). The device must be capable of the following functions: detect ringing, provide ring trip, and automatically disconnect when the announcement is completed. Because most playback devices respond to AC ring signals, they are attached to APM circuits that are set for AC ringing. If the playback device responds to DC ring signals, the APM circuit must be set for DC ringing.

4.30 Hunt groups can have two special stations that help process calls: announcement stations and overflow stations. These stations can be equipped with station instruments or with playback devices. (Playback device capability is available only in the *Advanced* software package. See FEATURES, page 4–17, for more details.) Automated attendant stations — available only in the *Advanced* software package — can also be equipped with playback devices. (See FEATURES, page 4–14.)

4.31 The playback device is programmed as a regular single-line station and is assigned an intercom number. If the device is sensitive to camp-on tones, causing it to disconnect calls, the programmer can disallow the camp-on tone for that station circuit (refer to PROGRAMMING, page 5–49).

5. OPTIONAL SYSTEM EQUIPMENT

A. PROGRAMMING TERMINAL, SMDR/SAR OUTPUT DEVICE, AND REMOTE MAINTENANCE MODEM REQUIREMENTS

5.1 The programming terminal and the output devices for the station message detail recording (SMDR) and system activity report (SAR) features must have the characteristics described in the following paragraphs.

5.2 If using the port on the KCB, the terminal or output device must be RS-232-C compatible with a male 25-pin subminiature "D" connector. Consult the owner's guide for the device to verify that the pin functions are the same as those of the KCB (as shown below). If necessary, rewire the connector on the device to match the requirements for the processor board.

SIGNAL NAME	DIRECTION	PIN
Protective Ground	Ground — tied to pin 7	1
Transmit Data (TXD)	Data to KSU	2
Receive Data (RXD)	Data from KSU	3
Request to Send (RTS)	Signal to KSU	4
Clear to Send (CTS)	Signal from KSU	5
Data Set Ready (DSR)	Signal from KSU (always true*)	6
Signal Ground	Ground — tied to pin 1	7
Data Carrier Detect (DCD)	Signal from KSU (always true*)	8

*True = steady signal > +5V

NOTE: If using a Texas Instruments (TI) Silent 700 programming terminal, the 25-pin connector that plugs into the KCB must be modified. Cut the wire going to pin number 8 and splice it to the wire going to pin number 20 (Data Terminal Ready — DTR). Pin number 8 will not have a connecting wire. Although the GMX-48 System does not use pin number 20, this procedure must be performed.

5.3 If using the J2 (to DTE) port on the APM, the terminal or output device must be RS-232-C compatible with a male six-conductor RJ-11 connector and an inverting cable. Consult the owner's guide for the device to verify that the pin functions are the same as those of the APM J2 port (as shown at the top of the next column). If necessary, rewire the connector on the device to match the requirements for the processor board.

SIGNAL NAME	DIRECTION	PIN
Request to Send (RTS)	Signal to KSU	1
Signal Ground	Ground	2
Transmit Data (TXD)	Data to KSU	3
Ready*	Signal from KSU (always true)	4
Receive Data (RXD)	Data from KSU	5
Clear to Send (CTS)	Signal from KSU	6

*The "ready" signal (pin 4) is tied to the +12V in the KSU and, if necessary, may be used to provide a constant (true) signal to the Data Set Ready (DSR) pin on the customer-provided device.

5.4 If using the J1 (to DCE) port on the APM, the terminal or output device must be RS-232-C compatible with a male six-conductor RJ-11 connector and an inverting cable. Consult the owner's guide for the device to verify that the pin functions are the same as those of the APM J1 port (as shown below). If necessary, rewire the connector on the device to match the requirements for the processor board.

SIGNAL NAME	DIRECTION	PIN
Clear to Send (CTS)	Signal from KSU	1
Signal Ground	Ground	2
Receive Data (RXD)	Data from KSU	3
Ready*	Signal from KSU (always true)	4
Transmit Data (TXD)	Data to KSU	5
Request to Send (RTS)	Signal to KSU	6

*The "ready" signal (pin 4) is tied to the +12V in the KSU and, if necessary, may be used to provide a constant (true) signal to the Data Set Ready (DSR) pin on the customer-provided modem.

5.5 When the system is initialized, the KCB and APM RS-232-C connectors are enabled for "software" handshaking. Most programming terminals and output devices are designed for software handshaking, which is the use of "X-ON" and "X-OFF" characters to indicate readiness to send or receive data. Refer to the device's operating manual to determine if it uses X-ON/X-OFF characters.

5.6 If the device does not support X-ON/X-OFF characters, hardware handshaking may be enabled (see PROGRAMMING, page 5-24). When enabled for hardware handshaking, signals are sent over the connector pins to indicate readiness to send or receive data. The KCB port will send a logic true (> +5V) on pin 5 (Clear to Send) while it is ready to receive data. If the buffer on the KCB becomes full, a logic false (< -5V) will be sent. In addition, the KCB will monitor pin 4 (Request to Send). The KCB will only send data if it receives a logic true (> +5V) over pin 4. If the KCB receives a logic false (< -5V) to

indicate that the buffer on the attached device is full, the KCB will not send data.

5.7 The APM J2 port will send a logic true (> + 5V) on pin 6 (Clear to Send) while it is ready to receive data. If the buffer on the APM becomes full, a logic false (< -5V) will be sent. In addition, the APM will monitor pin 1 (Request to Send). The APM will only send data if it receives a logic true (> + 5V) over pin 1. If the APM receives a logic false (< -5V) to indicate that the buffer on the attached device is full, the APM will not send data.

5.8 The APM J1 port will send a logic true (> + 5V) on pin 1 (Clear to Send) while it is ready to receive data. If the buffer on the APM becomes full, a logic false (< -5V) will be sent. In addition, the APM will monitor pin 6 (Request to Send). The APM will only send data if it receives a logic true (> + 5V) over pin 6. If the APM receives a logic false (< -5V) to indicate that the buffer on the attached device is full, the APM will not send data.

5.9 If using the port on the KCB, the programming terminal and output device must communicate at 300, 1200, 2400, or 4800 baud. Baud rates are set by placing the DIP switches on the KCB in the desired position. (The location of the switches is shown in Figure 3–16 on page 3–31.)

5.10 If using the J2 (to DTE) or J1 (to DCE) port on the APM, the programming terminal and output device must communicate at 1200 baud.

5.11 Other programming terminal and output device specifications include:

- The data format must be 8 bit standard ASCII.
- Parity is off (ignored).
- Communication is full duplex.
- There is one start bit and one stop bit.

5.12 For remote programming, the system requires an external, auto-answer modem that is capable of ASCII asynchronous serial data communication. The customer-provided modem is connected directly to an RS-232-C port (either the KCB or an APM) and to an available APM circuit or an available C.O. line (refer to INSTALLATION, page 3–48, for details). The programming device must also be equipped with a modem.

5.13 The SMDR/SAR output device(s) must be able to print reports with a width of either 60 or 80 characters. Also, the cable(s) between the device(s) and the KSU must not be longer than 50 feet (15 meters).

5.14 For save/restore operation, the storage device (e.g., a personal computer) must be capable of storing a minimum of 100K bytes of text. All other characteristics are the same as described for the programming terminal.

B. SYSTEM BATTERY BACK-UP

5.15 To provide back-up power in the event of an AC power failure or brownout condition, the GMX-48 System power supplies can have optional battery back-up using the unit designed for the system or using a customer-provided uninterruptable power supply (UPS) unit or standby power supply (SPS) unit.

5.16 If installing the battery back-up unit (part no. 662.0110) designed specifically for use with the GMX-48 System, complete information and installation instructions are included with the unit.

5.17 If installing a UPS or SPS unit, it is recommended that it have the following characteristics:

- Sine wave output
- Transfer time of less than 20 milliseconds
- Output rating of 365 Watts (minimum) for the 662.0100 power supply, 175 Watts (minimum) for the 662.0200 power supply, and 100 Watts (minimum) for the 662.0600 power supply
- Batteries can be external or internal
- Low voltage cutoff circuit of 105VAC (minimum)

NOTE: Even if the power supply unit has the specifications listed above, it cannot be guaranteed that it will work properly with the GMX-48 System. Contact Inter-Tel Customer Support for a listing of approved units.

5.18 Batteries connected in series form a "string." The voltage of the string is equal to the sum of the individual battery voltages. For example, five 6V batteries connected in series form a 30V battery pack. If desired, connect two strings in parallel to double the amp/hour rating, which results in longer discharge rates; the voltage level remains the same as a single string.

5.19 Batteries must be fully charged when installed. Charge each individually using a constant-voltage, current-limited charger with less than three percent ripple. The charge voltage per cell must be set according to the manufacturer's specifications. Be careful not to damage the batteries by overcharging them. For example, new Globe brand batteries require 25 days of float voltage or 25–30 discharge cycles to attain full capacity. Initial capacity might only be 80 percent of rated capacity.

5.20 All batteries should be of the same age and ampere-hour (AH) rating. Some manufacturers date batteries by stamping them with a date code. For example, Globe stamps their batteries with a code such as 410-B, where 4 = the last digit of year, 10 = the month, and B = the type of electrolyte. If a battery in a string needs to be replaced, the age of the string will determine if a fresh battery can be added. If the string is two to three years old, adding a fresh battery will reduce the life of the entire string. This is because a fresh battery will be overcharged, while the older batteries are undercharged.

5.21 Batteries may give off explosive and/or corrosive gases. To reduce the effects of this gas, place the batteries (or battery compartment) in a room with good ventilation and coat the terminals with an anti-corrosive agent. Avoid storing batteries; they will self-discharge and their capacity decreases with age. If you must store batteries, recharge them every six months. Recharge time may vary depending on the charger's current limit and the battery's state of charge.

C. DOORBOX

5.22 For a doorbox application, Inter-Tel recommends the Valcom V-2901 Universal Door Answering Unit. This unit, along with the Valcom V-1070A Door Plate Speaker, is hooked up to a C.O. circuit on the GMX-48 System. When a person presses a button on the door plate speaker, the unit generates ringing on the C.O. line. By answering the ringing line, a system user can talk with the person at the door. If the door is equipped with an electric strike plate, the system user may allow access by dialing a code or pressing an external button. To call the Valcom doorbox, the system user goes off hook and presses the line key assigned to the unit (or dials the appropriate C.O. line access code).

5.23 In database programming, the C.O. circuit assigned to the Valcom unit should be programmed as "not subject to toll restrict." It should also be assigned a C.O. line identification name, such as: DOOR 1.

5.24 The Valcom door answering unit and talkback speaker can be ordered from a local supply house. Installation and operation instructions are included with the unit.

D. VOICE MAIL

NOTE: Available only in the *Intermediate* and *Advanced* software packages.

5.25 If desired, an optional single- or multi-port voice mail system can be connected to an APM on the GMX-48 System. Depending on the specific capabilities of the voice mail system used, calls can easily be placed, transferred, or forwarded to the voice mail unit. After a message is recorded, a message waiting indication is left at the appropriate station location, and the message can easily be retrieved by the user.

5.26 For additional information and for specific voice mail unit recommendations, contact Customer Support.

E. FAX MACHINE

NOTE: Available only in the *Intermediate* and *Advanced* software packages.

5.27 A facsimile (FAX) machine allows the transmission of a picture, drawing, or document over a standard phone line to be reproduced by another machine at the receiving end. This can be an efficient, cost-effective communication tool.

5.28 Standard installation procedures for FAX machines involve connecting the machine to a dedicated line for sending and receiving documents. With a GMX-48 System, the FAX facilities are integrated with the telephone system and make use of many of the GMX-48 call processing and money saving features. Some of the special capabilities that a GMX-48 System can add to a FAX installation include the following:

- Outgoing FAX calls can be placed using automatic route selection (ARS) to make the best use of long distance lines and reduce costs.

- Incoming FAX calls can ring in directly to a FAX machine or a group of machines, and/or they can be answered by an attendant (human or automated) and transferred to the FAX machine. This allows FAX calls to come in on any line; there is no need for a dedicated line.

- Multiple FAX machines can be placed in a hunt group or in a "call forward no-answer" chain. Incoming FAX calls can then be sent to a single intercom number where they can be processed even if one machine is busy or out of service.

- When FAX documents are received, a designated operator (keyset station) is notified immediately by a flashing MSG key and a display. Each FAX machine can have a different designated operator.

- Assigning forced account codes to the FAX stations can prevent unauthorized use of the machines or their telephones.

- The SMDR and SAR features can help track outgoing FAX calls for billing purposes.

- The GMX-48 System is compatible with standard FAX machines; there are no special requirements.

5.29 A FAX machine can be installed on any unused APM circuit. The circuit is identified as a FAX port and assigned a FAX message center in station programming. The station can also be placed in a hunt group, assigned incoming and outgoing lines, assigned a forced account code, assigned a user name, etc.

5.30 An example of a FAX installation that uses the automated attendant, hunt group, and message center features is shown below. In this example:

- Incoming calls are answered by an automated attendant.
- Three FAX machines are connected to APM circuits.
- The FAX machines are in a hunt group.
- A 24-line display keyset station is the designated FAX message center for the FAX machines.

(1) A call rings in and is answered by the automated attendant.

(2) The caller hears a message such as, "Thank you for calling. Dial 1 for Sales, 2 for Service, or 3 to send a FAX."

(3) The caller dials 3.

(4) FAX #1 is busy (being used to send or receive a document) so the call goes to the next machine in the hunt group.

(5) FAX #2 is out of service and does not answer so the call goes to the third machine in the hunt group.

(6) FAX #3 answers the call and receives the FAX transmission.

(7) The MSG key at the FAX message center lights and the display shows "MESSAGE RECEIVED FROM FAX #3".

(8) The keyset user clears the message by pressing the asterisk (*) key and goes to pick up the transmitted document from the FAX machine.

5.31 The following example shows the use of ARS, forced account codes, and SMDR/SAR records. The FAX circuit has been programmed with ARS-only and a forced account code.

(1) Using the FAX machine telephone, the user dials the ARS feature code (default is 80) and the assigned forced account code.

(2) The system checks the account code. If it is not valid, the user hears reorder tones. If the code is valid, the user can dial the telephone number of the receiving FAX machine.

(3) The system checks ARS and places the call on the selected line.

(4) The receiving FAX machine answers and the user transmits the document.

(5) The system logs the call and its account code in the SMDR and SAR records.

FIGURE 2–1.   EXAMPLES OF EQUIPMENT THAT CAN INTERFACE
WITH THE GMX-48 SYSTEM
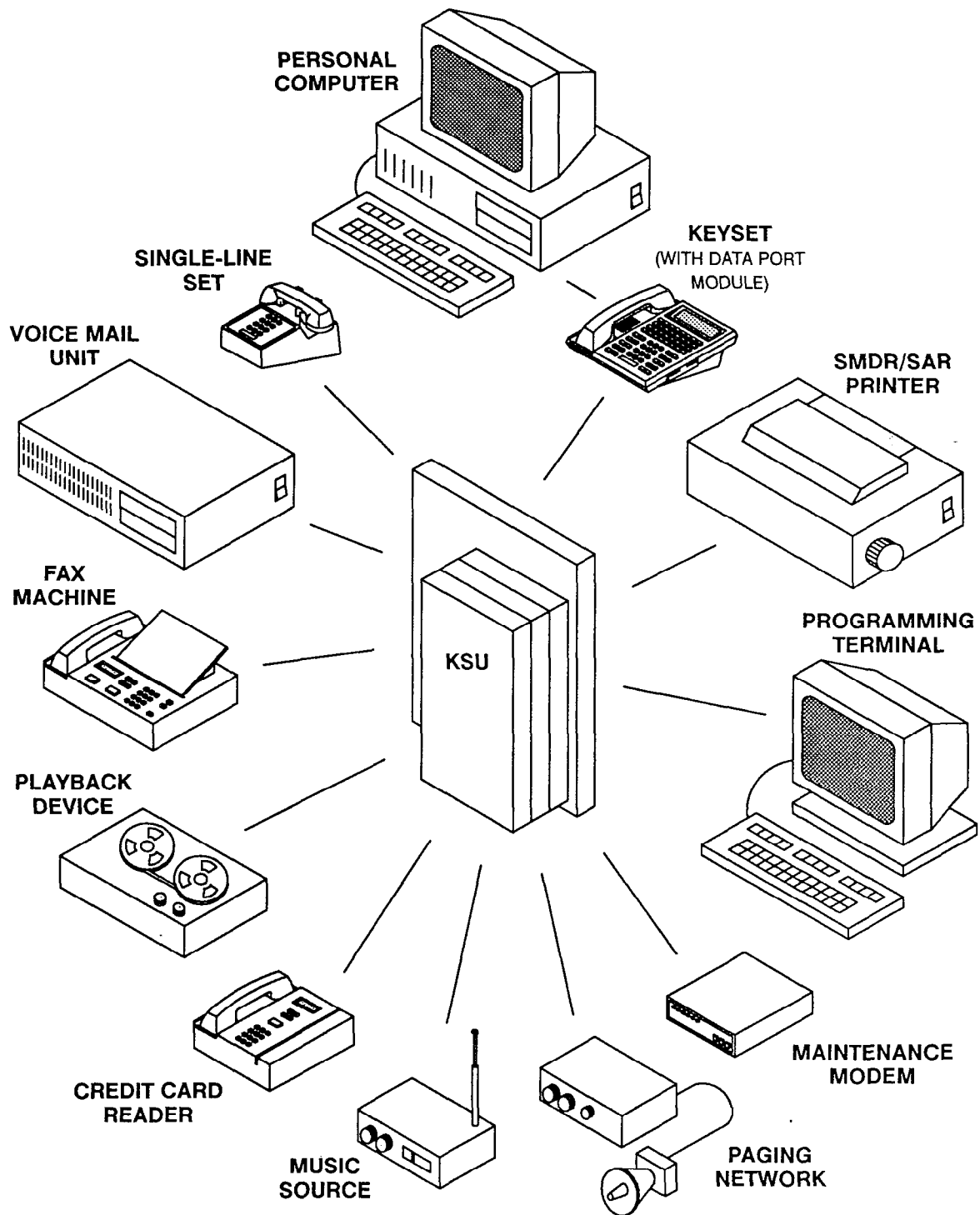
FIGURE 2–2.   KEY SERVICE UNIT (KSU)
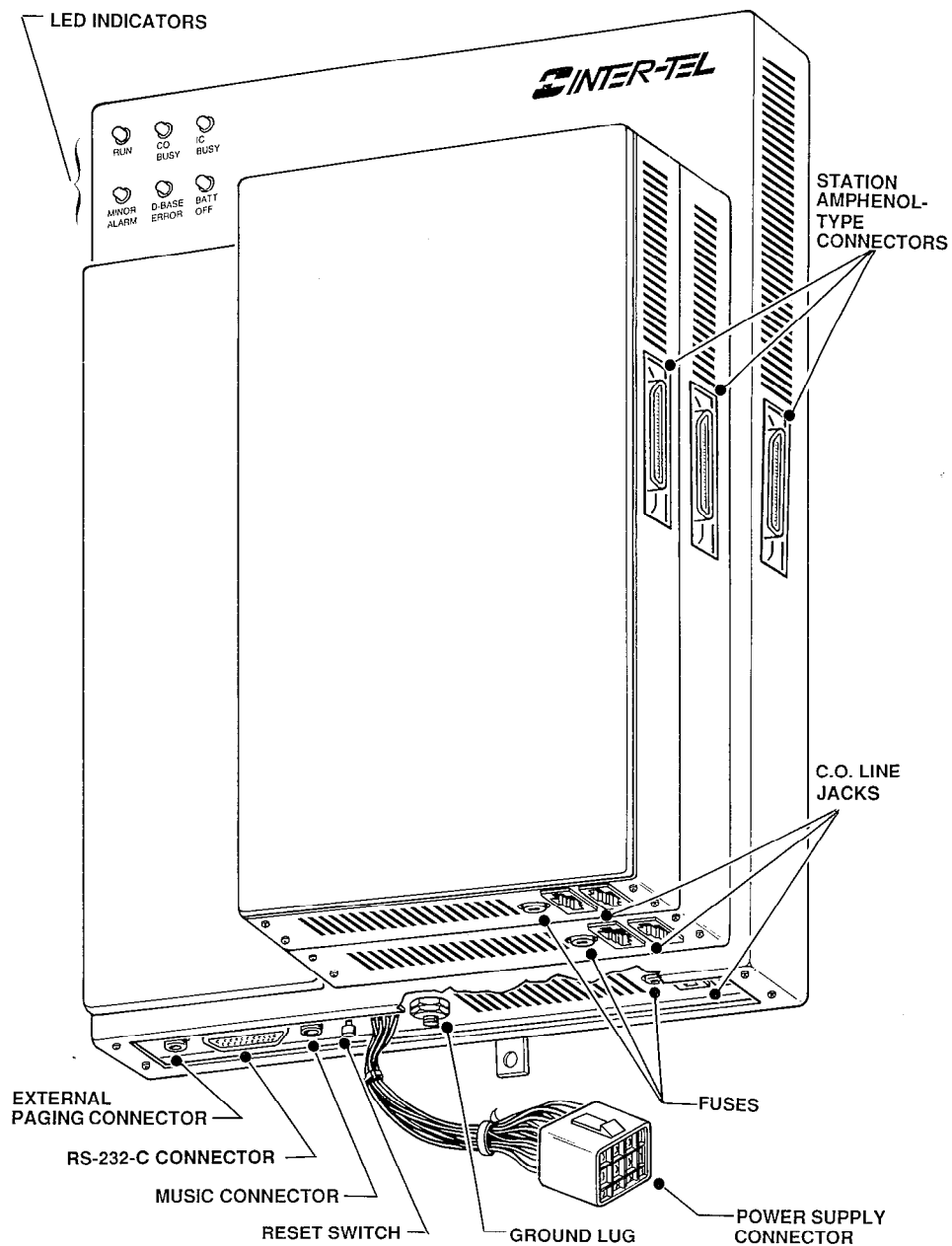
FIGURE 2–3. 24-LINE KEYSET
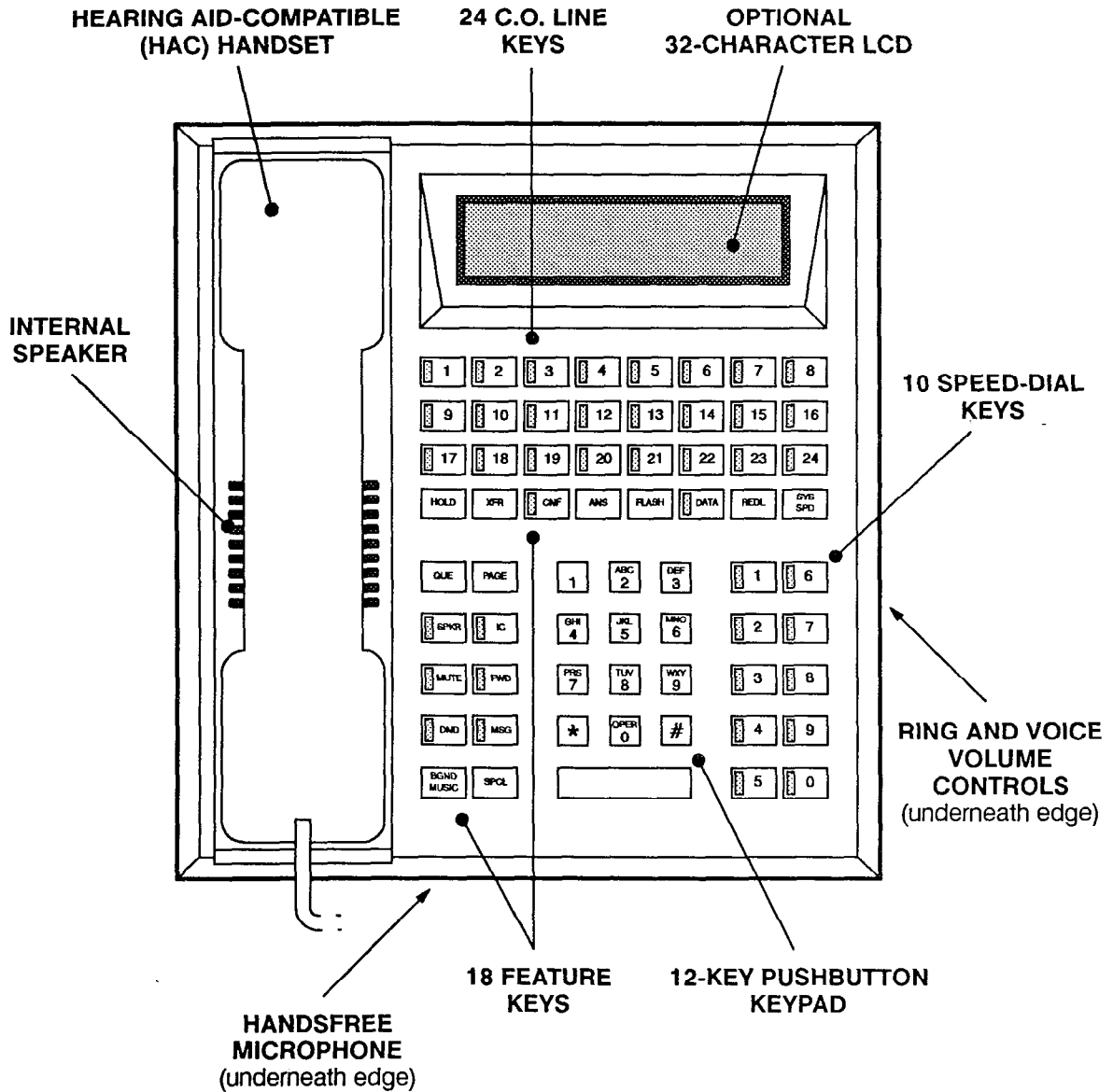
NOTE: The keys are shown as they appear in the default configuration.

FIGURE 2-4. 12-LINE KEYSET
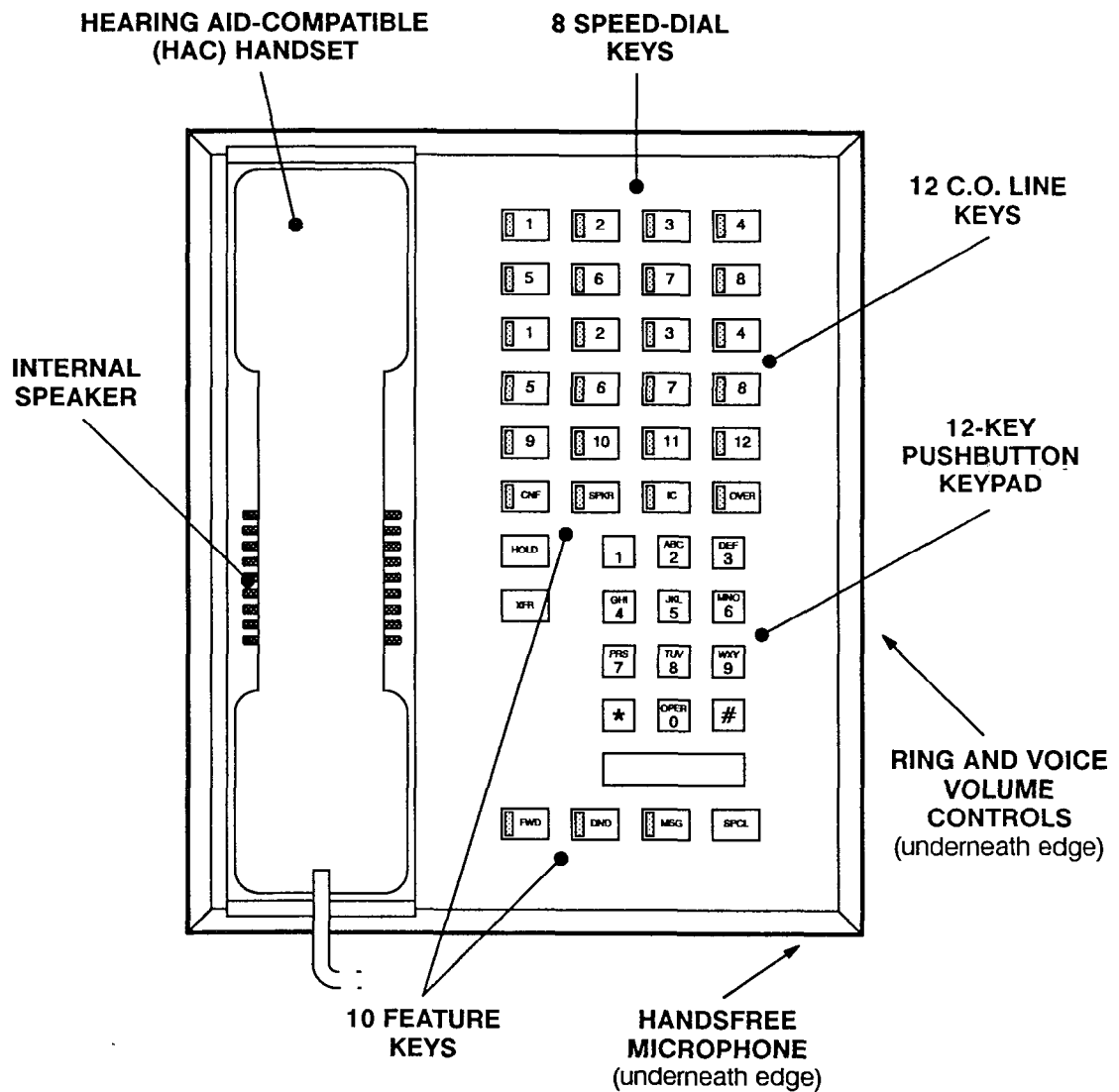
HEARING AID-COMPATIBLE
(HAC) HANDSET

8 SPEED-DIAL
KEYS

12 C.O. LINE
KEYS

INTERNAL
SPEAKER

12-KEY
PUSHBUTTON
KEYPAD

RING AND VOICE
VOLUME
CONTROLS
(underneath edge)

10 FEATURE
KEYS

HANDSFREE
MICROPHONE
(underneath edge)

NOTE: The keys are shown as they appear in the default configuration.

FIGURE 2–5.   DIRECT STATION SELECTION/BUSY LAMP FIELD
(DSS/BLF) UNIT

60 DSS KEYS

FIGURE 2-6.   SINGLE-LINE INSTRUMENT (SLI)

**HEARING AID-COMPATIBLE
(HAC) HANDSET**

**12-KEY PUSHBUTTON
KEYPAD**

**4 FEATURE
KEYS**

**RING VOLUME
CONTROL**
(underneath edge)

**TIMED HOOKFLASH
KEY**

NOTE: The keys are shown as they appear in the default configuration.

INSTALLATION

CONTENTS   PAGE

1. INTRODUCTION

1.1 This section describes the recommended procedures for installing the system hardware. Refer to SPECIFICATIONS for hardware descriptions.

2. SYSTEM INSTALLATION OUTLINE

2.1 System installation is performed in the following order. Detailed instructions and figures for each step are located throughout the INSTALLATION section.

(1) Plan the installation, including the Key Service Unit (KSU) and main distribution frame (MDF) location, station locations, cable runs, and optional equipment.

(2) Run cables to the keysets, Direct Station Selection/Busy Lamp Field (DSS/BLF) Units, single-line sets, and playback devices. Run wiring to any optional equipment, such as the external paging network, external music source, etc.

(3) Terminate the station cables on modular jack assemblies at the station locations.

(4) Mount the MDF backboard, assemble the station blocks on the backboard, and connect the station cables to the corresponding station blocks.

(5) Perform the station loop resistance test for each station cable.

(6) If necessary, terminate the C.O. lines on modular jack assemblies at the MDF.

(7) Mount the KSU and power supply on the MDF backboard.

(8) Ground the KSU and perform the power supply electrical test.

(9) Install any Expansion Modules (EXPs) and/or Accessory Port Modules (APMs), if used.

(10) Connect the KSU to the cables and line cords that run from the MDF.

(11) Install the station instruments and any optional station equipment, such as headsets, handset amplifiers, and Data Port Modules.

(12) Install any optional system equipment, such as output device(s) for station message detail recording (SMDR) and system activity report (SAR), external music source, external paging network, voice mail, etc.

(13) Ensure that all equipment is working properly.

(14) Refer to the PROGRAMMING section of this manual to initialize and program the system.

NOTICE

This *GMX-48 Installation and Field Maintenance Manual* instructs field technicians on the proper installation practices for the GMX-48 System. This manual does *not* provide step-by-step instructions for premises wiring practices as dictated by the National Electrical Code, which includes, but is not limited to, cable layouts, cable installation, AC power installation, proper AC grounding, eliminating or preventing external interference (including, but not limited to, RFI, EMI, lightning, AC power disturbances, static discharge), and other telephony practices standard within the industry. Cable installers, electricians, and field technicians are expected to be properly trained and, if applicable, licensed in their trade practices.

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3. PRE-INSTALLATION CHECKLIST

3.1 To make installation easier, use the checklist on the following pages when preparing to install the system. (Hardware specifications are included in the SPECIFICATIONS section.)

A. ESTABLISH SUITABLE ENVIRONMENTAL CONDITIONS FOR THE SYSTEM

— Place the KSU within 5 feet (1.5 meters) of an isolated, dedicated, 105–125VAC, 57–63Hz, 15A, single-phase commercial power source.

   NOTE: This *must* be an isolated, dedicated AC circuit for proper operation. All three wires (power, neutral, and ground) must be run separately from the outlet to the breaker panel without being bonded to any other wire or circuit. *DO NOT* plug any other equipment into this outlet. To maintain the protection provided by the isolated, dedicated circuit, the length of the AC power cord limits the distance between the power supply and the outlet; *DO NOT* use an extension cord. Also, to protect the system from AC voltage surges, a surge/spike protector is recommended (refer to page 2-6 for specifications).

— Select the KSU location to minimize cable run length. Station instruments connected to the system must not exceed the limits (using 24AWG wire) listed in the table on page 3–17. The ohm values are loop measurements; feet (meter) values are the maximum one-way measurements from the KSU.

— The KSU location should not be exposed to direct sunlight, high humidity, heat, dust, or strong magnetic fields (such as those generated by heavy motors and large copy machines).

— The MDF requires a 4 x 6-foot (1.2 x 1.8-meter), ¾-inch plywood backboard. This should provide sufficient room for the KSU and power supply, plus all blocks, modular jack assemblies, and peripheral equipment. For off-premises stations, allow additional room for HVRA blocks, 48VDC power supplies, and ring generators.

— For cooling purposes, ample air space (at least four inches on the top, bottom, and left and right sides) should be provided for both the KSU and the power supply. They should be mounted on the wall at least four inches apart (with the power supply off to the side of the KSU). *Never place the power supply below the KSU, and never place anything on top of the KSU or the power supply.*

— The cable(s) between the SMDR/SAR output device(s) and the KSU must not be longer than 50 feet (15 meters).

— The equipment should be located in a climate-controlled room with the following environmental conditions:

REQUIREMENTS	IN OPERATION	IN STORAGE
Temperature — KSU	32° to 104° F 0° to 40° C	–40° to 185° F –40° to 85° C
Temperature — Station Instruments	32° to 113° F 0° to 45° C	–40° to 185° F –40° to 85° C
Relative Humidity (Non-Condensing)	5% to 95%	5% to 95%
Altitude	Up to 10,000 ft. (3,048 m.)	Up to 40,000 ft. (12,192 m.)

   NOTE: It is recommended that the maximum operating temperatures (as stated above) *never* be exceeded. Therefore, when installing the KSU and station instruments, allow a sufficient margin for error in case of air conditioning failure, routine maintenance, plant shutdown, etc. As a general rule, if conditions are suitable for office personnel, they are also suitable for KSU and station instrument operation. A properly controlled environment will help to extend the operating life of the equipment.

From UL 1459, a product safety specification governing telephone equipment:

— Never install telephone wiring during a lightning storm.

— Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.

— Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.

— Use caution when installing or modifying telephone lines.

B. ASSEMBLE THE NECESSARY TOOLS AND SUPPLIES

— Industry-standard, three-pair (six-conductor) cable to run from the MDF to keysets, DSS/BLF Units, Single-Line Instruments (SLIs), single-line DTMF sets, playback devices, etc. (For exceptions, see the NOTE under "Running Cable" on page 3-6.)

— Six-conductor modular jack assemblies for keysets, DSS/BLF Units, SLIs, single-line DTMF sets, playback devices, etc. (For exceptions, see the NOTE under "Running Cable" on page 3-6.)

— A high-impedance digital multimeter to check the power supply and ensure correct wiring of the modular jack assemblies. Multimeter accuracy must be ±0.5% or better.

— Standard terminal blocks (66M1-50 type) and bridging clips for terminating the station cables at the MDF.

— Industry-standard, 25-pair cable for connecting the MDF station blocks to the station connections on the KSU.

— 50-pin female amphenol-type connectors and a connecting machine.

— Voltage surge/spike protector.

— Grounding terminal and 10AWG wire for grounding the KSU (and, if off-premises stations are installed, the 48VDC power supply).

— Standard telephone hand tools and the mounting hardware for the KSU (two ¾-inch #12 pan head screws and one ¾-inch #10 pan head screw), power supply, MDF backboard, modular jack assemblies, etc.

— Programming terminal for initializing and customizing the database (refer to page 2-16 for specifications).

3.2 Depending on the type of C.O. termination used by the telephone company and how close it is to the MDF, the following tools and supplies are also needed.

For C.O. lines terminated on RJ-type jacks near the MDF:

— Two-pair mod-to-mod line cords (one for every two C.O. lines installed).

For C.O. lines terminated on RJ-type jacks away from the MDF (see Figure 3-10 on page 3-22):

— Four-conductor modular jack assemblies (two for every two C.O. lines installed).

— Two-pair mod-to-mod line cords (two for every two C.O. lines installed).

— Industry-standard, two-pair cable (enough to extend from each RJ-type jack location to the MDF).

— Gas discharge tubes with silicon avalanche suppressors for lightning protection on the C.O. lines.

For C.O. lines terminated on an RJ-type block (see Figure 3-12 on page 3-23):

— One 66M1-50 type terminal block and a supply of bridging clips.

— Industry-standard, 25-pair cable for connecting the RJ-type block to the C.O. block.

— A 50-pin male amphenol-type connector and a connecting machine.

— Four-conductor modular jack assemblies (one for every two C.O. lines installed).

— Two-pair mod-to-mod line cords (one for every two C.O. lines installed).

— Industry-standard, two-pair cable (enough to extend from the C.O. block to each modular jack assembly on the MDF).

— Gas discharge tubes with silicon avalanche suppressors for lightning protection on the C.O. lines.

C. PLAN STATION LOCATIONS AND TYPES OF STATION INSTRUMENTS

— Prepare a cable identification plan using station circuit numbers; do not use intercom numbers (see page 3-6 for details). If any 24-line keysets are to have secondary voice paths installed, refer to the information on pages 3-14 to 3-16.

— Keysets: The GMX-48 System has the capacity for up to 48 keysets. Keysets are available in 24-line (standard or display) and 12-line (non-display) models. 24-line standard keysets can be converted to display keysets by installing optional Liquid Crystal Display (LCD) Units (part number 828.1052).

— DSS/BLF Units: Up to five DSS/BLF Units can be installed on the system. Each unit requires one station circuit and its own cabling. If desired, all five units can be connected to the KSU Control Board (KCB) or to the same Expansion Module (EXP).

— Single-Line Sets: Up to 12 single-line sets can be installed on the system. Single-line sets can be Single-Line Instruments (SLIs) or industry-standard, single-line DTMF sets.

— Playback Devices: Playback devices can be used in place of single-line sets. They are especially useful as hunt group overflow/announcement stations and automated attendants. (Refer to page 2-15 for specifications.)

D. ASSEMBLE THE OPTIONAL EQUIPMENT

— Headsets for keyset stations and handset amplifiers for keyset stations or single-line set stations. (Refer to page 2-12 for more information.)

— Data Port Modules (part number 828.1094) for 24-line keysets. These are installed on keysets and are used for hooking up either modem-equipped data terminals or loud ringing adapters and external signalling devices. (Refer to page 2-12 for more information.)

— The cable(s) between the SMDR/SAR output device(s) and the KSU must not be longer than 50 feet (15 meters). (See page 2-16 for specifications.)

— 48VDC power supply, ring generator, and High Voltage Ringing Adapter (HVRA) for off-premises stations. (See page 3-18 for procedures.)

— OPX repeater(s) for amplifying voice volume levels, if necessary. (Refer to page 2-14 for specifications.)

— External music source (the cable that connects to the KSU must be equipped with an ⅛-inch miniphone plug).

— External paging speakers and an amplifier (the cable that connects to the KSU must be equipped with an RCA-type phono plug).

— Auto-answer modem for remote system programming. (Refer to page 2-17 for requirements.)

— Power supply for system battery back-up. (Refer to page 2-17 for specifications.)

— Doorbox equipment. (Refer to page 2-18 for requirements.)

— Voice mail equipment. (Refer to page 2-18 for more information.)

— Facsimile (FAX) machine. (Refer to page 2-18 for more information.)

4. STATION CABLING AND TERMINATIONS

4.1 Floor plans should be developed to aid in proper station cabling in a star (home run) configuration from the KSU. The cables are run from the station locations to the station blocks at the MDF. Refer to page 2-3 for cabling requirements.

4.2 Both ends of each cable should be labeled with the station's circuit number. The circuit number (X.Y) designates the circuit's position in relation to the KSU (X = 1-6) and the circuit's position on the KSU Control Board (Y = 1-8), Expansion Module (Y = 1-8), or Accessory Port Module (Y = 1-6). For example, station circuit number 4.6 identifies the sixth circuit on the third EXP attached to the KSU.

4.3 When the system is initialized, the intercom numbers for the KCB and EXPs are assigned in order from circuit 1.1 (intercom number 100) to circuit 6.8 (intercom number 147). The intercom numbers for the APMs are assigned in order from circuit 7.1 (intercom number 148) to circuit 8.6 (intercom number 159). The intercom numbers can be changed in database programming.

NOTE: No matter what position the APMs are located in relation to the EXPs, the first APM installed is always assigned circuits 7.1 to 7.6 and the second APM installed is always assigned circuits 8.1 to 8.6.

4.4 A DSS/BLF Unit requires a station circuit and cabling that is separate from the keyset's circuit and cabling. If five station circuits are used for DSS/BLF Units, five fewer keysets can be installed. If desired, all five DSS/BLF Units can be installed on the KCB or on the same EXP.

4.5 In order to use the off-hook voice announce feature and/or the simultaneous voice data feature, 24-line keysets can be installed with secondary voice paths. To accomplish this, the keyset is installed on an odd-numbered station circuit (e.g., 1.1, 1.3, 1.5, etc.). Then, the primary voice pair from the following even-numbered circuit (1.2, 1.4, 1.6, etc.) is used to create a secondary voice path. Therefore, for every secondary voice path keyset installed, the following even-numbered circuit cannot have a station instrument installed. Refer to pages 3-14 to 3-16 for complete secondary voice path installation instructions.

A. RUNNING CABLE

NOTE: It is recommended that three-pair cable and six-conductor modular jacks be used for all station connections. This allows the various types of station instruments to be easily interchanged, if necessary. However, if desired, SLIs, single-line DTMF sets, and playback devices can be installed using one-pair cable and four-conductor modular jacks.

4.6 From the MDF location, run industry standard, three-pair (six-conductor) cable to keysets, DSS/BLF Units, single-lines sets, and playback devices following these guidelines:

● Install proper type cable for the application according to the National Electrical Code and local building codes.

● Avoid cable runs parallel to fluorescent light fixtures or AC lines not in conduit. If these obstacles are unavoidable, run the cables across them at right angles.

● Do not run station cables inside electrical conduit already occupied by AC power cable. (To do so is a violation of the National Electrical Code.)

● Do not run station cables near equipment with electric motors or through strong magnetic fields, such as those generated by large copy machines, arc welding equipment, heavy motors, etc.

● Do not place station cables where they can be stepped on or where they can be rolled over by office furniture.

● If using multi-pair (e.g., 25-pair) cable runs to multiple station locations do not include C.O. lines, AC-ringing single-line sets, or AC-ringing auxiliary equipment in a cable being used for keysets or DSS/BLF Units. Stations using keyset circuits should be included in separate multi-pair cable runs.

● Do not exceed the loop limit measurements (using 24AWG wire) for the station cable lengths as outlined in the table on page 3-17. The ohm values are loop measurements; feet (meter) values are the maximum one-way measurements from the KSU.

B. TERMINATING THE CABLES AT STATION LOCATIONS

4.7 Terminate the keyset, DSS/BLF Unit, single-line set, and playback device station cables on six-conductor modular jack assemblies at the station location. (For exceptions to this, refer to the NOTE under "Running Cable" on the previous page.)

4.8 Do not mount the assemblies on the wall at this time; they will be wall mounted later when the station instruments are installed. Refer to Figure 3–1 below for a wiring diagram.

CAUTION

If the power pair (W/BL, BL/W) is reversed, installing a keyset or DSS/BLF Unit will open the fuse on the KSU Control Board or Expansion Module. This affects operation of all keysets and DSS/BLF Units connected to the board or module. If tip and ring (W/BL, BL/W) is reversed for single-line sets, the instrument may ring continuously.

FIGURE 3–1.   MODULAR JACK ASSEMBLY WIRING

FOR KEYSETS
AND
DSS/BLF UNITS

FOR SINGLE-LINE SETS
AND
PLAYBACK DEVICES
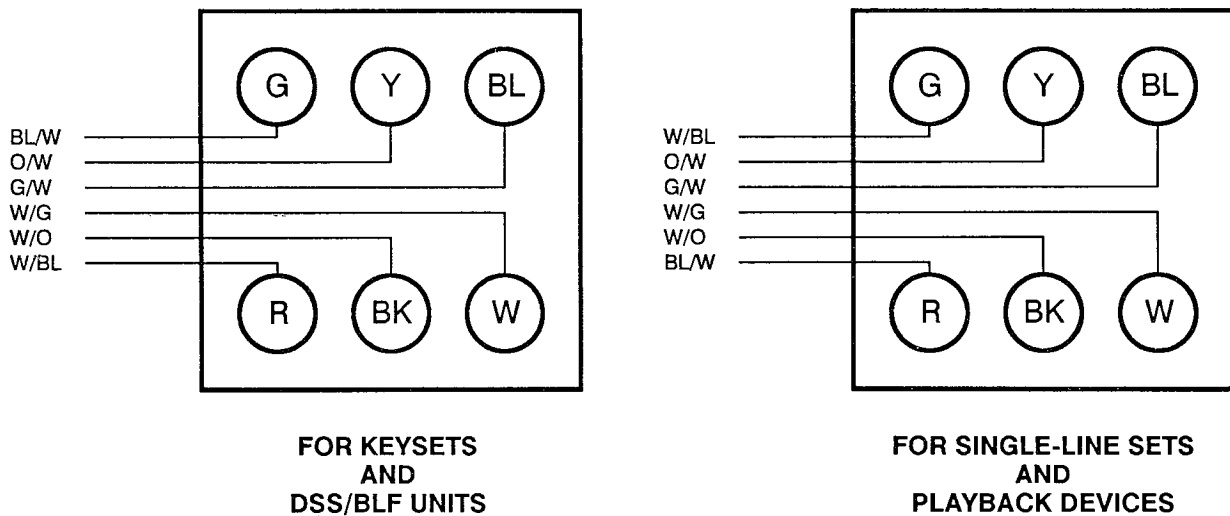
NOTE: The W/BL and BL/W conductors for the two types of stations are reversed. If the type of station instrument is changed, the modular jack must be rewired.

C. TERMINATING STATION CABLES AT THE MAIN DISTRIBUTION FRAME

4.9 The main distribution frame (MDF) is the point at which the KSU, station instruments, C.O. lines, and miscellaneous equipment are connected to one another. It is extremely important that the connections be made carefully and accurately. (Refer to Figure 3–2 below for a sample MDF station block layout and cable assignments. For diagrams of possible MDF C.O. layouts, refer to Figures 3–10 and 3–12.)

4.10 Assemble the MDF:

(1) Mount a 4 x 6-foot (1.2 x 1.8-meter), ¾-inch plywood backboard at the MDF location.

(2) Attach up to six 66M1-50-type terminal blocks to the plywood backboard. Refer to Figure 3–2 below for a sample MDF station block layout and cable assignments. Station blocks include:

● Up to 6 blocks for connecting station cables and the 25-pair cables for the KSU Control Board, Expansion Module(s), and Accessory Port Module(s). (KCB and EXP blocks for keysets and DSS/BLF Units; APM blocks for single-line devices.)

● Optional block(s) for off-premises stations. One block is used for each HVRA (two stations). The block is also used to connect the power supply and ring generator to the off-premises station(s).

FIGURE 3–2.   SAMPLE MDF STATION BLOCK LAYOUT AND CABLE ASSIGNMENTS
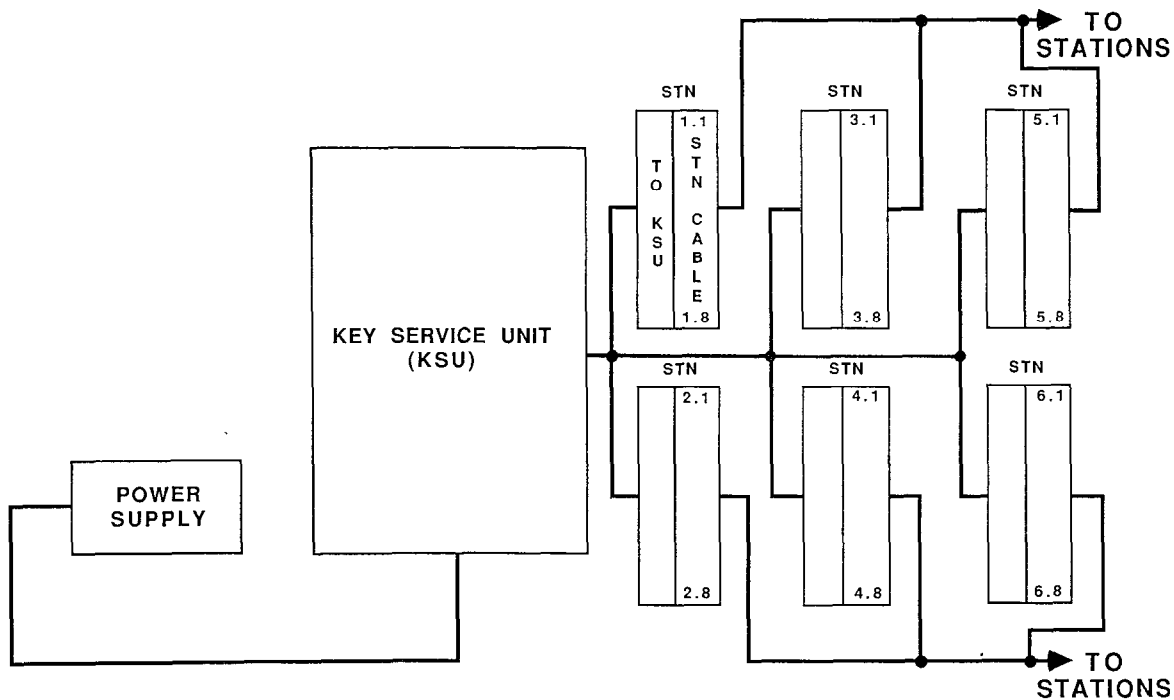
4.11 Each type of station instrument is connected to a specific board or module. Keysets and DSS/BLF Units are connected to the KSU Control Board (KCB) or to Expansion Modules (EXPs). Single-line devices (such as single-line sets, playback devices, voice mail units, FAX machines, etc.) are connected to Accessory Port Modules (APMs).

4.12 Connect the station cables to the STN blocks on the MDF as follows:

(1) Ensure that both ends of each station cable are labeled with the circuit number of the associated station instrument.

(2) Terminate each station cable on the *right* side of the corresponding STN block. Refer to Figures 3-3 through 3-6 on the following pages for station cable terminations.

NOTE: Secondary voice path-equipped keysets can only be installed on odd-numbered station circuits. Refer to the installation information on pages 3-14 to 3-16 before terminating the station cables on the STN block.

(3) Using enough 25-pair cable to run from each STN block to the KSU, make the termination cables. Attach a 50-pin female amphenol-type connector to one end of each cable. Label each connector and cable end with the proper location. (For example, KCB, EXP-1, EXP-2, APM-1, etc.) These connectors will be attached after the KSU is installed.

(4) Terminate the other end of each 25-pair cable on the *left* side of the corresponding STN block.

(5) *DO NOT* attach bridging clips until the loop resistance tests have been performed (as described on page 3-17).

(6) *For APMs that will have off-premises stations installed:* Install an HVRA, power supply, and ring generator as described on page 3-18.

(7) Terminate unused keyset circuits on the MDF as shown in Figure 3-6 on page 3-13. Terminations must be made on the *left* side of the block. Bridging clips *must not be used.* This procedure helps prevent the system from accidentally equipping unused keyset circuits. If a keyset circuit is terminated, the termination strap must be removed prior to future station installation on that circuit.

NOTE: This termination procedure is for unused keyset (KCB or EXP) circuits only. Do no terminate unused single-line device (APM) circuits.

FIGURE 3-3. STANDARD KCB AND EXP BLOCK TERMINATIONS
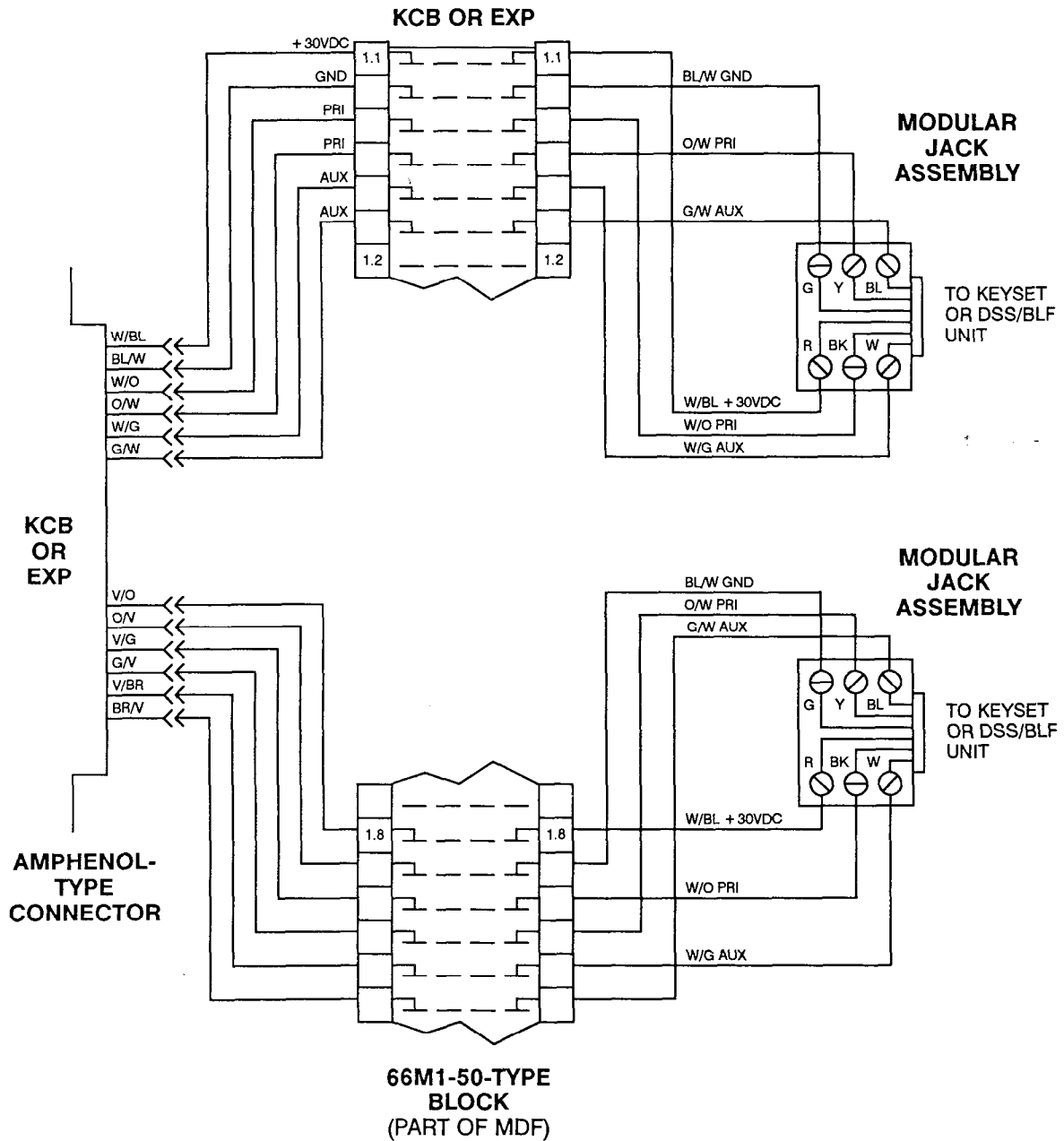
NOTE: For proper keyset operation, all three pairs (power/ground, primary, and auxiliary) are required.

FIGURE 3–4. APM BLOCK TERMINATIONS
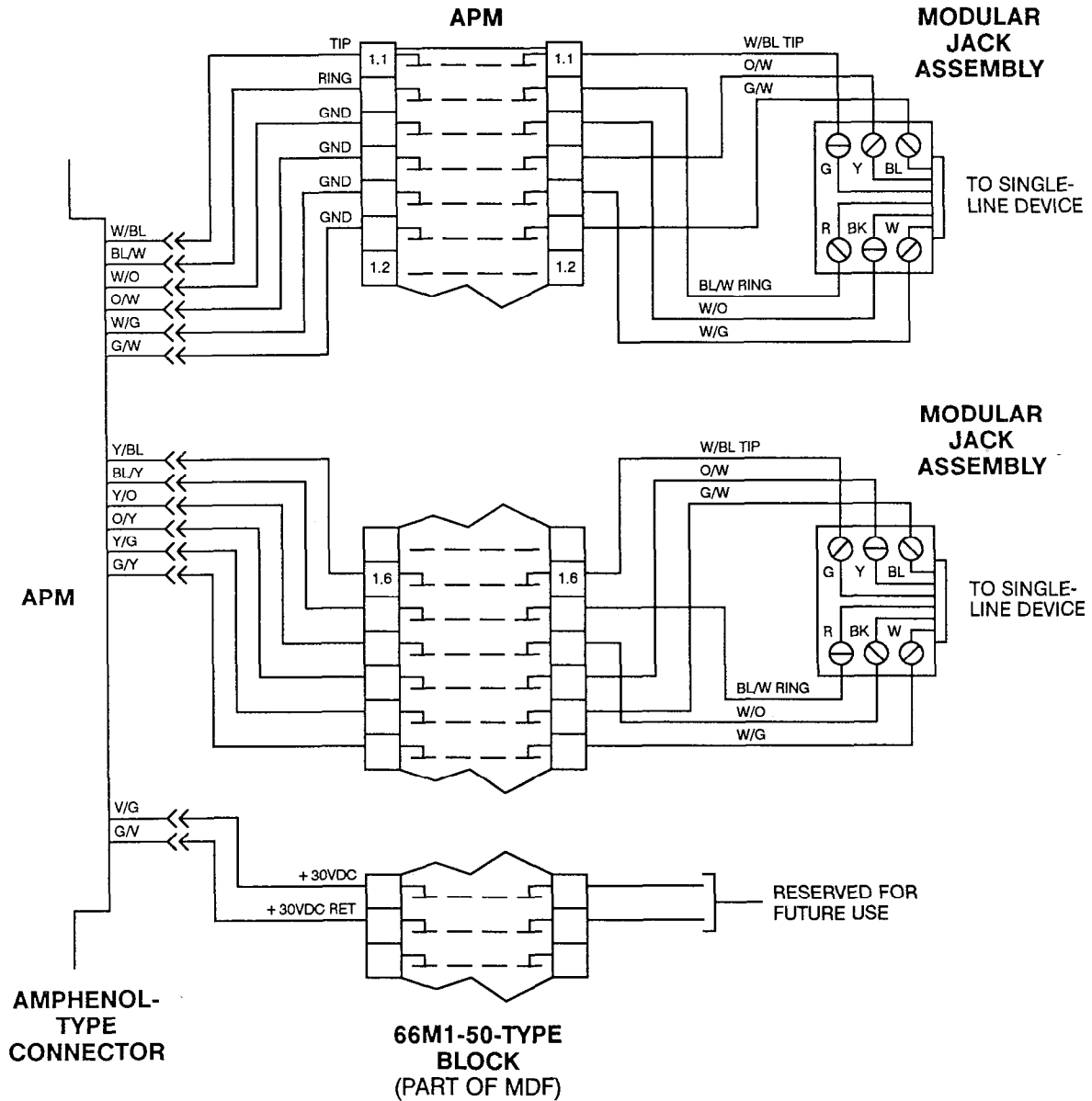
FIGURE 3-5. STANDARD STATION CABLE TERMINATIONS ON THE STATION BLOCK

AMPHENOL	CABLE PAIR	KCB & EXP*	APM
26	W - BL	CKT 1 +30VDC	CKT 1 TIP
1	BL - W	CKT 1 GND	CKT 1 RING
27	W - O	CKT 1 PRIMARY PATH	CKT 1 GND**
2	O - W	CKT 1 PRIMARY PATH	CKT 1 GND**
28	W - G	CKT 1 AUXILIARY PATH	CKT 1 GND**
3	G - W	CKT 1 AUXILIARY PATH	CKT 1 GND**
29	W - BR	CKT 2 +30VDC	CKT 2 TIP
4	BR - W	CKT 2 GND	CKT 2 RING
30	W - S	CKT 2 PRIMARY PATH	CKT 2 GND**
5	S - W	CKT 2 PRIMARY PATH	CKT 2 GND**
31	R - BL	CKT 2 AUXILIARY PATH	CKT 2 GND**
6	BL - R	CKT 2 AUXILIARY PATH	CKT 2 GND**
32	R - O	CKT 3 +30VDC	CKT 3 TIP
7	O - R	CKT 3 GND	CKT 3 RING
33	R - G	CKT 3 PRIMARY PATH	CKT 3 GND**
8	G - R	CKT 3 PRIMARY PATH	CKT 3 GND**
34	R - BR	CKT 3 AUXILIARY PATH	CKT 3 GND**
9	BR - R	CKT 3 AUXILIARY PATH	CKT 3 GND**
35	R - S	CKT 4 +30VDC	CKT 4 TIP
10	S - R	CKT 4 GND	CKT 4 RING
36	BK - BL	CKT 4 PRIMARY PATH	CKT 4 GND**
11	BL - BK	CKT 4 PRIMARY PATH	CKT 4 GND**
37	BK - O	CKT 4 AUXILIARY PATH	CKT 4 GND**
12	O - BK	CKT 4 AUXILIARY PATH	CKT 4 GND**
38	BK - G	CKT 5 +30VDC	CKT 5 TIP
13	G - BK	CKT 5 GND	CKT 5 RING
39	BK - BR	CKT 5 PRIMARY PATH	CKT 5 GND**
14	BR - BK	CKT 5 PRIMARY PATH	CKT 5 GND**
40	BK - S	CKT 5 AUXILIARY PATH	CKT 5 GND**
15	S - BK	CKT 5 AUXILIARY PATH	CKT 5 GND**
41	Y - BL	CKT 6 +30VDC	CKT 6 TIP
16	BL - Y	CKT 6 GND	CKT 6 RING
42	Y - O	CKT 6 PRIMARY PATH	CKT 6 GND**
17	O - Y	CKT 6 PRIMARY PATH	CKT 6 GND**
43	Y - G	CKT 6 AUXILIARY PATH	CKT 6 GND**
18	G - Y	CKT 6 AUXILIARY PATH	CKT 6 GND**
44	Y - BR	CKT 7 +30VDC	GND**
19	BR - Y	CKT 7 GND	GND**
45	Y - S	CKT 7 PRIMARY PATH	GND**
20	S - Y	CKT 7 PRIMARY PATH	GND**
46	V - BL	CKT 7 AUXILIARY PATH	GND**
21	BL - V	CKT 7 AUXILIARY PATH	GND**
47	V - O	CKT 8 +30VDC	GND**
22	O - V	CKT 8 GND	GND**
48	V - G	CKT 8 PRIMARY PATH	+30VDC**
23	G - V	CKT 8 PRIMARY PATH	+30VDC RET**
49	V - BR	CKT 8 AUXILIARY PATH	GND**
24	BR - V	CKT 8 AUXILIARY PATH	GND**
50	V - S	NOT USED	GND**
25	S - V	NOT USED	GND**

* For proper keyset operation, all three pairs (power/ground, primary, and auxiliary) are required.
** Reserved for future +30VDC and GND applications.

FIGURE 3–6. STANDARD TERMINATION OF UNUSED KEYSET CIRCUITS

KCB OR EXP

BRIDGING
CLIPS

Strap ground to pri-
mary pair for unused
keyset circuits

1.1

1.2 +30VDC

GND

PRI

PRI

AUX

AUX

1.3

**66M1-50-TYPE
BLOCK
(PART OF MDF)**

NOTE: To later install a station instrument on an unused keyset circuit that has been termi-
nated as shown above, first remove the termination strap.

D. SECONDARY VOICE PATH INSTALLATION

4.13 If desired, the system can be configured to allow 24-line keyset users to *receive* off-hook voice announce (OHVA) calls and/or to use the *simultaneous* voice/data communication feature. To accomplish this, the keyset is installed on an odd-numbered station circuit (e.g., 1.1, 1.3, 1.5, etc.). Then, the following even-numbered circuit (1.2, 1.4, 1.6, etc.) is used to create a secondary voice path.

NOTE: To simply *place* OHVA calls (from both 12-line and 24-line keysets) or to use the *standard* data communication feature (24-line keysets only), no special secondary voice path installation is necessary. However, for data communication (whether standard or simultaneous voice/data), 24-line keysets must be equipped with optional Data Port Modules. 12-line keysets cannot have Data Port Modules installed.

4.14 Although secondary voice path-equipped keysets are installed with three-pair cable as usual, the configuration at the station block is somewhat different than the standard configuration as outlined on pages 3–9 to 3–13. In standard installations, the KSU uses the first pair for power and ground, the second pair for the primary voice path, and the third pair for auxiliary transmissions between the keyset and the KSU. (**NOTE:** All three pairs are required.) To create a secondary voice path, the auxiliary pair is not used; instead, the primary pair from the following even-numbered circuit is used in its place. Refer to Figures 3–7 and 3–8 on the following pages for secondary voice path terminations.

4.15 Because the primary pair of the even-numbered circuit is used to create a secondary voice path for the preceding odd-numbered circuit, the even-numbered circuit cannot have a station instrument installed on it.

4.16 If desired (and, if cabled correctly), each module can have a combination of keysets with secondary voice paths and keysets without secondary voice paths.

4.17 Follow these procedures for each secondary voice path installation:

(1) Ensure that the station cables have been connected to the STN blocks on the MDF as outlined on page 3–9.

NOTE: Secondary voice path-equipped keysets can only be installed on odd-numbered station circuits.

(2) Using one-pair cable (or cross-connect cable), connect the primary pair of the even-numbered station circuit to the auxiliary pair of the preceding odd-numbered station circuit. Connections are made on the *right* side of the block. (Refer to Figures 3–7 and 3–8 on the following pages.)

(3) Terminate the auxiliary pair of the even-numbered circuit to ground as shown in Figure 3–7 on the next page. Terminations must be made on the *left* side of the block. This procedure prevents the system from trying to send system data transmissions over the auxiliary pair.

(4) After performing the loop resistance tests (as described on page 3–17), attach bridging clips *only* in the positions indicated in Figure 3–7. The third pair of the odd-numbered circuit and the first and third pair of the even-numbered circuit will *not* have bridging clips installed.

4.18 Later, when the KSU is installed, each secondary voice path keyset must have its corresponding KCB or EXP circuit strap set in the OHVA position. If a secondary voice path is not installed, the strap must be in the NORM position. (See Figure 3–16 on page 3–31 for strap locations.) Also, each secondary voice path circuit must be designated as such in database programming. (Refer to PROGRAMMING, page 5–49, for details.)

FIGURE 3-7. STATION CABLE TERMINATIONS FOR SECONDARY VOICE PATH KEYSETS
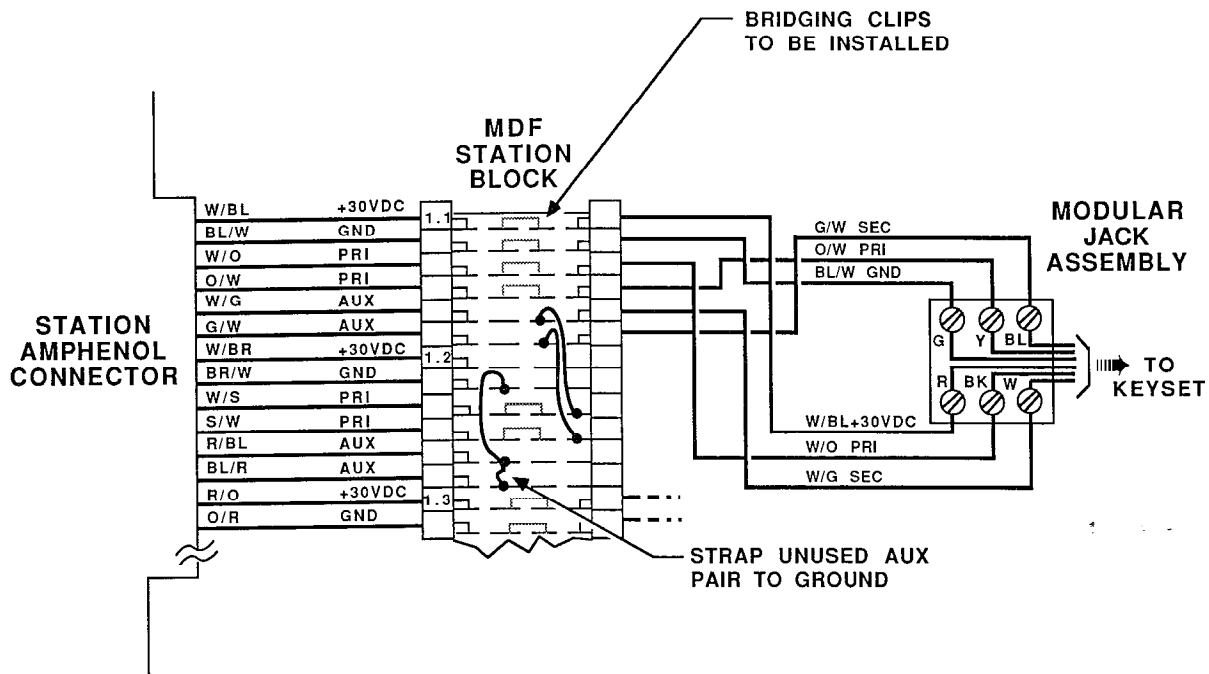
NOTE: For proper keyset operation, all three pairs (power/ground, primary, and secondary) are required.
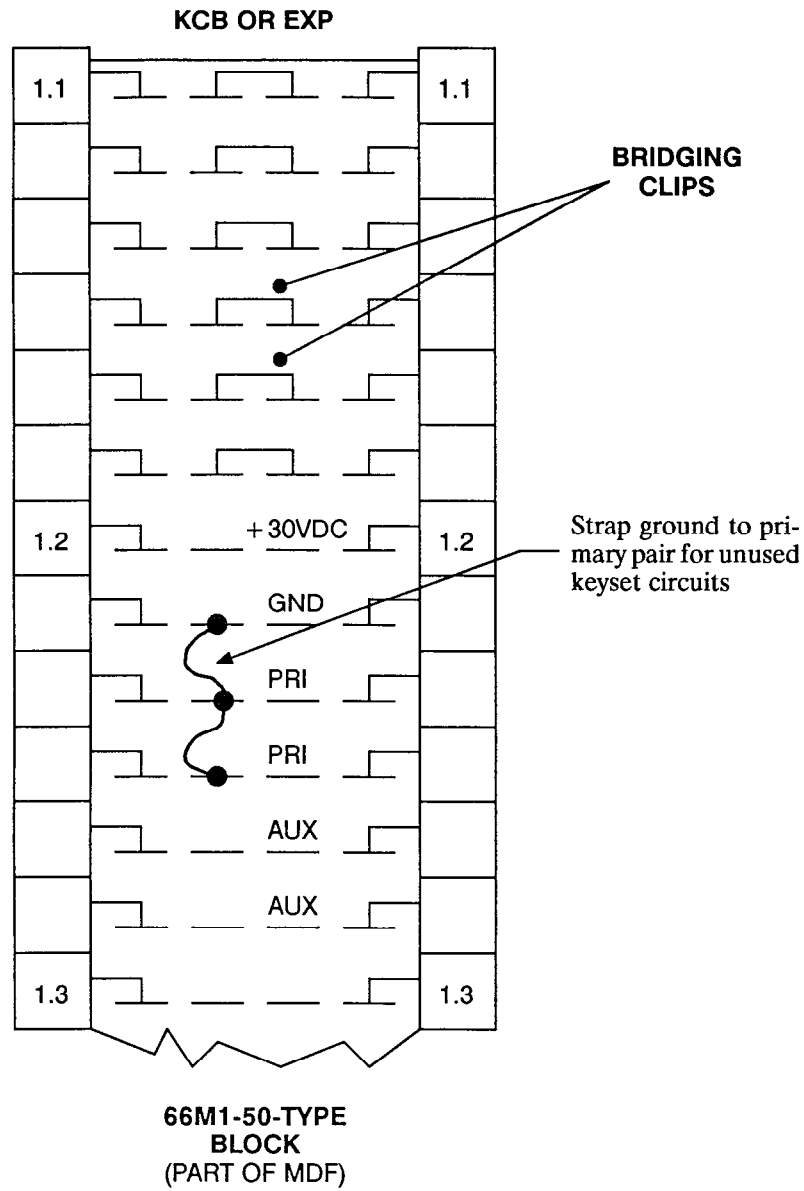
FIGURE 3–8. STN BLOCK TERMINATIONS FOR SECONDARY VOICE PATH KEYSETS

AMPHENOL	CABLE PAIR			KCB OR EXP
26	W	-	BL	CKT 1 + 30VDC
1	BL	-	W	CKT 1 GND
27	W	-	O	CKT 1 PRIMARY PATH
2	O	-	W	CKT 1 PRIMARY PATH
28	W	-	G	NOT USED
3	G	-	W	NOT USED
29	W	-	BR	NOT USED
4	BR	-	W	NOT USED
30	W	-	S	CKT 1 SECONDARY PATH
5	S	-	W	CKT 1 SECONDARY PATH
31	R	-	BL	NOT USED
6	BL	-	R	NOT USED
32	R	-	O	CKT 3 + 30VDC
7	O	-	R	CKT 3 GND
33	R	-	G	CKT 3 PRIMARY PATH
8	G	-	R	CKT 3 PRIMARY PATH
34	R	-	BR	NOT USED
9	BR	-	R	NOT USED
35	R	-	S	NOT USED
10	S	-	R	NOT USED
36	BK	-	BL	CKT 3 SECONDARY PATH
11	BL	-	BK	CKT 3 SECONDARY PATH
37	BK	-	O	NOT USED
12	O	-	BK	NOT USED
38	BK	-	G	CKT 5 + 30VDC
13	G	-	BK	CKT 5 GND
39	BK	-	BR	CKT 5 PRIMARY PATH
14	BR	-	BK	CKT 5 PRIMARY PATH
40	BK	-	S	NOT USED
15	S	-	BK	NOT USED
41	Y	-	BL	NOT USED
16	BL	-	Y	NOT USED
42	Y	-	O	CKT 5 SECONDARY PATH
17	O	-	Y	CKT 5 SECONDARY PATH
43	Y	-	G	NOT USED
18	G	-	Y	NOT USED
44	Y	-	BR	CKT 7 + 30VDC
19	BR	-	Y	CKT 7 GND
45	Y	-	S	CKT 7 PRIMARY PATH
20	S	-	Y	CKT 7 PRIMARY PATH
46	V	-	BL	NOT USED
21	BL	-	V	NOT USED
47	V	-	O	NOT USED
22	O	-	V	NOT USED
48	V	-	G	CKT 7 SECONDARY PATH
23	G	-	V	CKT 7 SECONDARY PATH
49	V	-	BR	NOT USED
24	BR	-	V	NOT USED
50	V	-	S	NOT USED
25	S	-	V	NOT USED

NOTE: For proper keyset operation, all three pairs (power/ground, primary, and secondary) are required.

E.   STATION LOOP RESISTANCE TEST

4.19 Perform the loop resistance test for each station cable individually.

(1)   Ensure that bridging clips have not been installed on the STN blocks and that the station instrument is not connected to the modular jack assembly.

(2)   Place a short across the RED and GREEN wires on the modular jack assembly.

(3)   At the MDF, measure the resistance across the WHITE/BLUE and BLUE/WHITE wires on the right side of the STN block. The reading should not exceed the following limits (for 24AWG wire) listed in the table below (ohm values are the loop measurements; feet/meter values are the maximum one-way measurements from the KSU).

NOTE: Excessive and/or improperly made connections increase the resistance of a cable, which reduces the allowable cable run length.

(4)   Remove the short after the test is complete.

(5)   Repeat this test for each station cable.

(6)   Install bridging clips on the STN blocks to complete the cable connections.

NOTE: Do *not* install bridging clips on unused keyset circuits that have been terminated to ground (as shown in Figure 3–6 on page 3–13). For secondary voice path-equipped circuits, refer to Figure 3–7 on page 3–15 for proper bridging clip locations. Also, do *not* install bridging clips on the APM ground pairs (see Figure 3–4 on page 3–11).

TYPE OF INSTRUMENT	LOOP LIMITS
24-Line Keysets (standard or display)	65 ohms/1260 ft. (384 m.)
24-Line Keysets with Data Port Modules	50 ohms/970 ft. (295 m.)
12-Line Keysets	65 ohms/1260 ft. (384 m.)
DSS/BLF Units	65 ohms/1260 ft. (384 m.)
SLIs (AC or DC)	450 ohms/8750 ft. (2667 m.)
Single-Line DTMF Sets (AC or DC)	175 ohms/3400 ft. (1036 m.)
Playback Devices (AC or DC)	175 ohms/3400 ft. (1036 m.)

F. CONNECTING OPTIONAL OFF-PREMISES STATIONS

4.20 To connect off-premises single-line stations to the system, use AC ringer-equipped SLIs or single-line DTMF sets.

4.21 Off-premises stations require an external High Voltage Ringing Adapter (HVRA) Unit, a 48VDC power supply, a ring generator, a 66M1-50-type terminal block, and cabling. (Refer to page 2-14 for equipment requirements.)

4.22 The HVRA Unit provides isolation from the telephone company OPX line(s) and converts the DC ringing used in the system to the AC ringing used by the off-premises stations. Each HVRA Unit allows two off-premises stations to access the single-line features. Multiple HVRA Units may be installed, if desired.

4.23 As many as six off-premises stations can connected to each APM. Each off-premises station circuit on the APM must have the AC/DC strap set for DC ringing to allow an external HVRA to be installed. (NOTE: AC ringing will damage the HVRA.) Set the strap for each off-premises station circuit in the DC position before installing the APM. (Figure 3-18 on page 3-36 shows the circuit straps.)

NOTE: The FCC requires that an *external* HVRA Unit be installed when connecting an off-premises station. The APM onboard HVRA (AC setting) may not be used.

4.24 In certain off-premises applications, voice volume levels may not be acceptable. This degradation in voice volume is due to the natural voice frequency range limitations of the telephone company or customer-provided line. To increase the voice frequency range, installation of a 2-wire, negative impedance repeater unit is recommended. (Refer to page 2-14 for recommendations and specifications.)

4.25 The repeater unit is installed at the MDF between the HVRA Unit and the cabling to the off-premises single-line station. For proper installation with the GMX-48 System, the following are connected to the appropriate "pins" on the repeater unit (refer to the manufacturer's instructions for proper pin locations): -Battery (-24 to -56VDC), Ground, System Tip, System Ring, OPX Tip, and OPX Ring.

Information on operating and adjusting the repeater unit is included with the product.

4.26 Install the off-premises stations as follows (refer to Figure 3-9 on page 3-20):

(1) Mount the HVRA Unit(s) on the MDF backboard.

   a. Disassemble the HVRA Unit by removing the four base screws.

   b. Insert two mounting screws through the holes in the top of the HVRA Unit and screw the HVRA Unit top to the MDF backboard. (Some units do not have these holes and drilling is required.)

   c. Reassemble the HVRA Unit on the MDF backboard.

(2) Mount a 66M1-50-type terminal block on the MDF backboard near the HVRA Unit.

(3) Connect the HVRA Unit to the MDF backboard as follows:

   a. Using enough 25-pair cable to run from the HVRA Unit to the MDF location, attach a 50-pin female amphenol-type connector to one end of the cable. Label the connector "HVRA".

   b. Terminate the other end of the 25-pair cable on the *left* side of the HVRA block.

   c. Attach the connector on the cable to the male connector on the HVRA Unit.

(4) Mount the power supply and ring generator on the MDF backboard.

(5) Connect the power supply and ring generator to the *right* side of the HVRA connecting block. Refer to Figure 3-9 on page 3-20.

(6) Attach a length of 10AWG wire to the -48VDC return terminal (+ side) on the power supply. Connect the other end to the grounding terminal on the MDF backboard (refer to Figure 3-9, and see the grounding requirements on page 3-26).

(7) Use cross-connect cable(s) to connect the APM block to the HVRA block as follows:

a. Terminate one end of the cross-connect cable on the *right* side of the APM block on the pins associated with the off-premises station's circuit.

b. Terminate the other end of the cross-connect cable on the *right* side of the HVRA block on the W/BL or R/BL pairs (depending on the HVRA circuit being used).

NOTE: Be sure tip and ring connections are made as shown in Figure 3–9. Reversing tip and ring on the APM block causes the off-premises station to ring continuously.

(8) Terminate the telephone company OPX line(s) or customer-provided line(s) on the *right* side of the HVRA block.

NOTE: Be sure that tip and ring connections are made as shown in Figure 3–9. Reversing tip and ring on the OPX line inhibits the station from ringing.

(9) Install bridging clips on the HVRA and APM blocks to complete the connection.

FIGURE 3-9. HVRA CONNECTION TO THE MDF
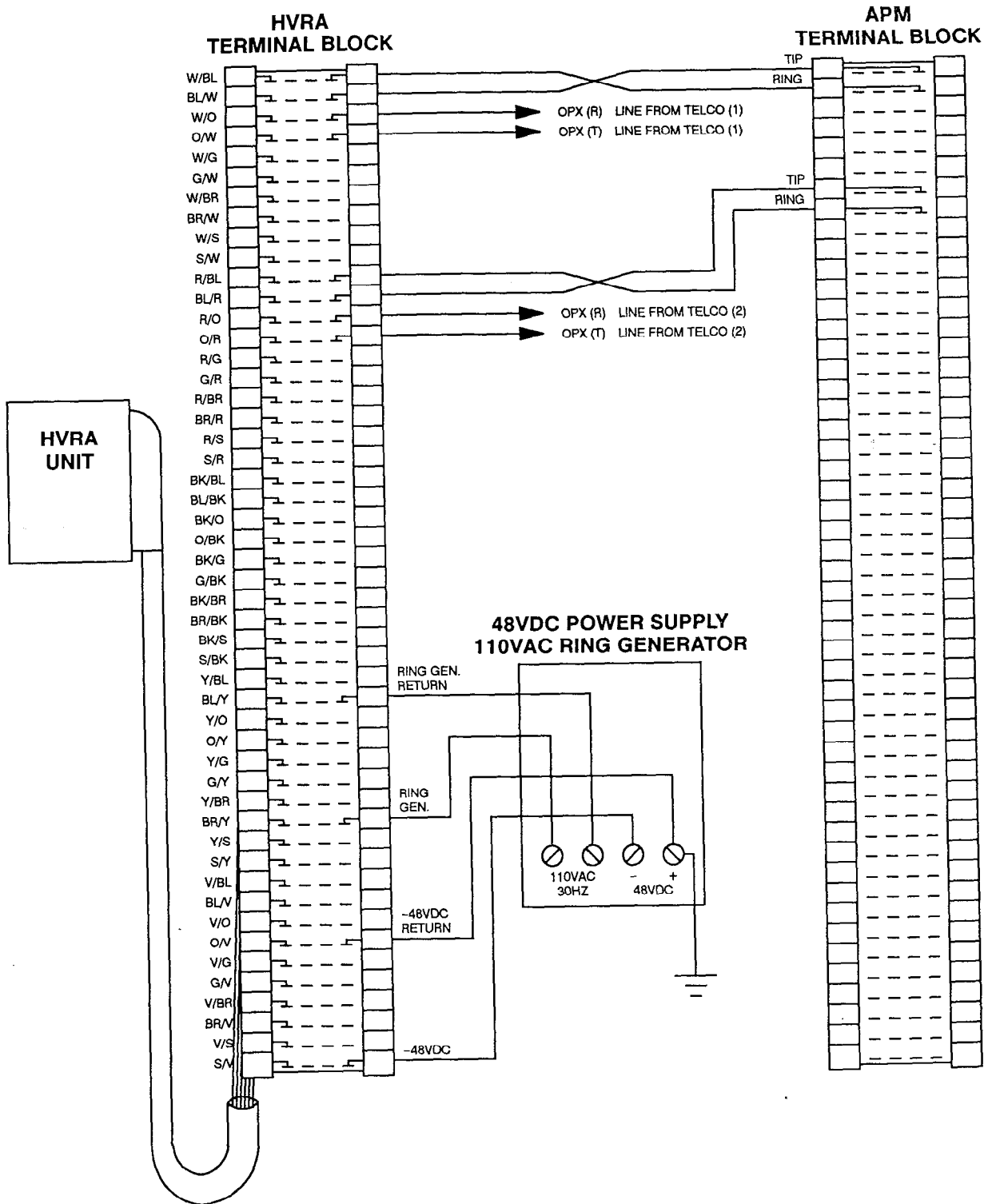
5. TERMINATING C.O. LINES AT THE MDF

5.1 The installation procedure used to terminate C.O. lines at the MDF is dependent on the type of termination used by the telephone company and how close it is to the MDF. The C.O. lines may be terminated on RJ-type jacks or on an RJ-type block.

5.2 Follow one of the three C.O. termination methods (A, B, or C) outlined on the following pages.

IMPORTANT NOTES:

- The first C.O. jack on the KSU Control Board (KCB) connects lines 1 and 2, while the second C.O. jack connects lines 3 and 4. The first C.O. jack on the first Expansion Module (EXP) connects lines 5 and 6, while the second C.O. jack connects lines 7 and 8. The first C.O. jack on the second EXP connects lines 9 and 10, and so on. Lines are normally connected in this sequence. For example, if three lines are installed, lines 1 and 2 would terminate on the first C.O. jack, and line 3 would terminate on the second C.O. jack.

- For additional lightning protection, install gas discharge tubes with silicon avalanche suppressors to ground on each C.O. and OPX line. This must be done external to the system. Each gas discharge tube is installed directly between the telephone company termination and the C.O. modular jack assemblies mounted next to the KSU. This protection should give energy absorption and filter low-level surge potentials on the C.O./OPX lines. If C.O. termination method A (direct KSU connection) is used, gas discharge tubes cannot be installed; use method B instead. Also, in areas with frequent occurrences of lightning, it is recommended that the cable between the telephone company termination and the gas discharge tubes be at least 75 feet long (the cable may be coiled up if desired).

A. C.O. LINES TERMINATED ON RJ-TYPE JACKS NEAR THE MDF

5.3 Before using this procedure, read the *IMPORTANT NOTES* following paragraph 5.2. Plug one end of a two-pair mod-to-mod line cord into each telephone company RJ-type jack. The other end will *later* be plugged into a C.O. jack on the KSU.

B. C.O. LINES TERMINATED ON RJ-TYPE JACKS AWAY FROM THE MDF

5.4 Before using this procedure, read the *IMPORTANT NOTES* following paragraph 5.2. Also, refer to Figure 3-10 on the next page for a diagram of the complete layout.

(1) Mount one four-conductor modular jack assembly next to each telephone company RJ-type jack.

(2) For each modular jack assembly mounted in step 1, also mount a corresponding four-conductor modular jack assembly on the MDF backboard.

(3) To connect the modular jack assemblies mounted in steps 1 and 2:

    a. Run two-pair cable between the corresponding modular jack assemblies.

    b. Wire each end of the two-pair cables onto their respective modular jack assemblies. Refer to Figure 3-11 on the next page for a diagram of the wiring.

(4) Plug one end of a two-pair mod-to-mod line cord into each RJ-type jack and plug the other end into the corresponding modular jack assembly beside it.

(5) At the MDF backboard, plug one end of a two-pair mod-to-mod line cord into each modular jack assembly. The other end will *later* be plugged into a C.O. jack on the KSU.

FIGURE 3-10.   C.O. LINE TERMINATIONS FROM RJ-TYPE JACKS
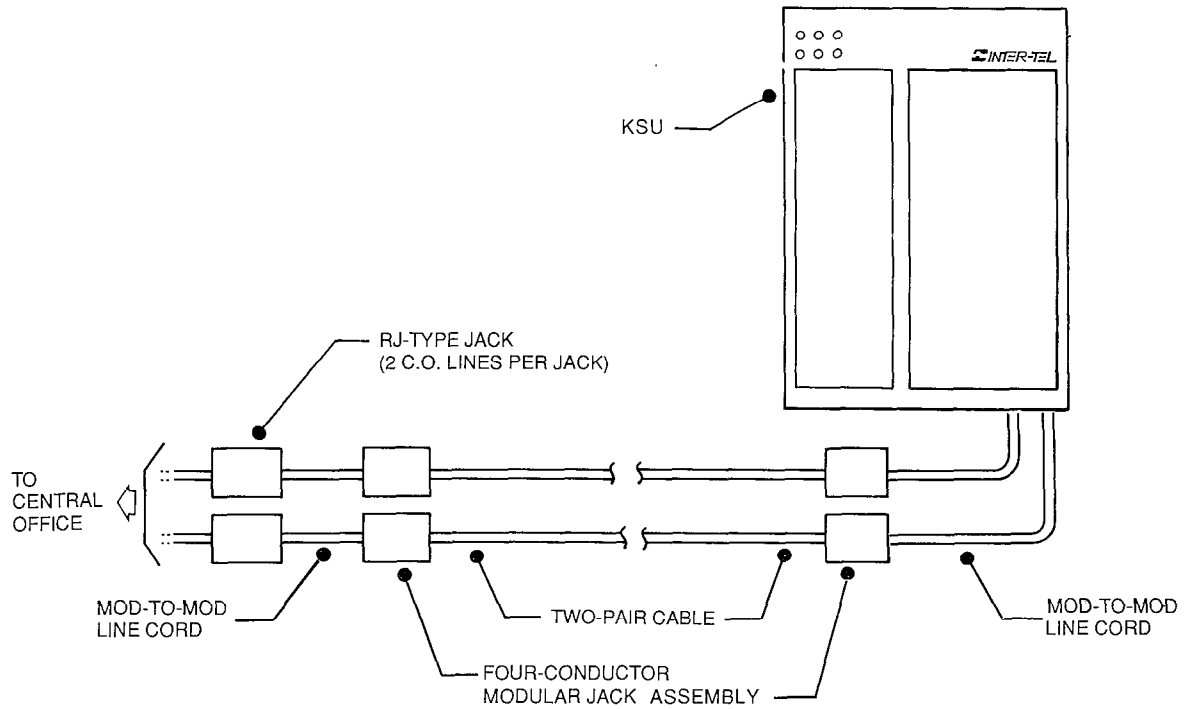
FIGURE 3-11.   MODULAR JACK ASSEMBLY WIRING FOR C.O. LINES
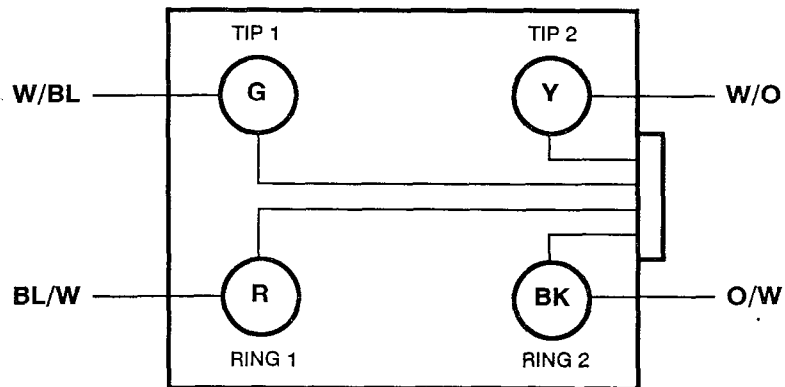
C. C.O. LINES TERMINATED ON AN RJ-TYPE BLOCK

5.5 Before using this procedure, read the *IMPOR-TANT NOTES* on page 3-21. Also, refer to Figure 3-12 below for a diagram of the complete layout.

(1) Mount a C.O. block (66M1-50-type connecting block) on the MDF backboard.

(2) For every two C.O. lines, mount a four-conductor modular jack assembly on the MDF backboard near the KSU. The modular jack assemblies should be positioned between the C.O. block (mounted in step 1) and the KSU.

(3) For each modular jack assembly (mounted in step 2), connect two-pair cable (or cross-connect cable) from it to the C.O. block as follows:

   a. Terminate one end of a two-pair cable on each modular jack assembly. Refer to Figure 3-11 on the previous page.

   b. Terminate the other end of the two-pair cable on the *right* side of the C.O. block,

with C.O. line 1 tip and ring first, then C.O. line 2 tip and ring, and so on.

(4) Plug one end of a two-pair mod-to-mod line cord into each modular jack assembly (mounted in step 2). The other end will *later* be plugged into a C.O. jack on the KSU.

(5) To interface between the C.O. block and the telephone company RJ-type block:

   a. Run a 25-pair cable between the C.O. block and the RJ-type block.

   b. Terminate the MDF end of the 25-pair cable on the *left* side of the C.O. block. Install bridging clips to complete the connections.

   c. On the other end of the 25-pair cable, attach a 50-pin male amphenol-type connector.

   d. Plug the male connector into the female connector on the RJ-type block.

FIGURE 3-12. C.O. LINE TERMINATIONS FROM AN RJ-TYPE BLOCK
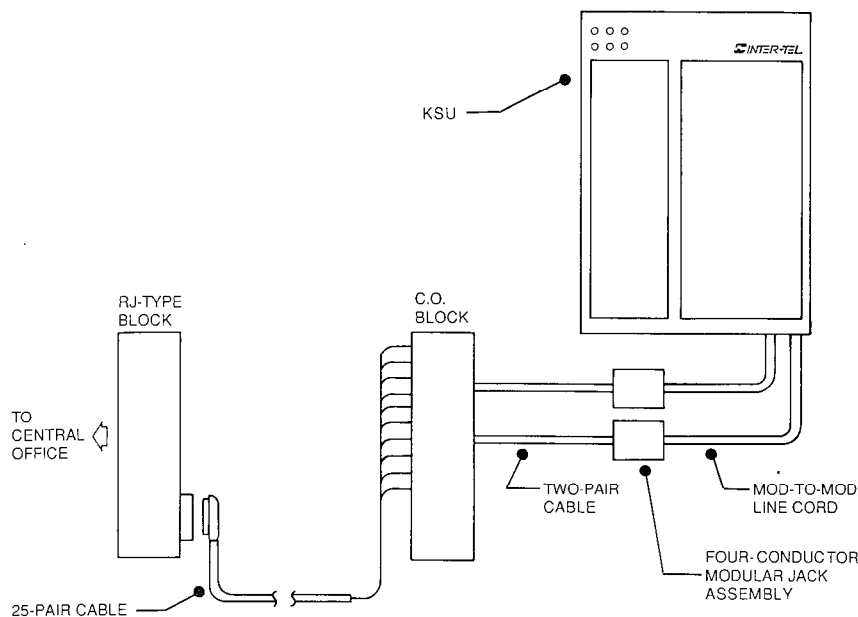
6. KEY SERVICE UNIT (KSU) INSTALLATION

A. UNPACK THE EQUIPMENT

6.1 Unpack and inspect the KSU equipment following these guidelines.

(1) Check the KSU components against the packing slip and inspect them for damage. If any equipment is missing or damaged, contact your supplier immediately.

(2) Check the KSU Control Board (KCB), Expansion Modules (EXPs), and Accessory Port Modules (APMs) as follows:

NOTE: The KCB, EXPs, and APMs contain static-sensitive components. They should be handled by the edges only. (For additional precautionary information, see the CAUTION on page 3–29.)

a. Check each unit to ensure there is no shipping foam or tape attached.

b. Inspect each unit for shorted components.

c. Return all units to their protective bags until they are ready to be installed.

```
CAUTION

To prevent damage, the KSU Control Board,
Expansion Modules, and Accessory Port Mod-
ules must always be transported or shipped as
individually packaged units. Do not transport or
ship an assembled KSU; such action will void the
warranty. Also, while the KSU Control Board
is out of service, make sure that the database
back-up battery strap (JMP 1) is in the B posi-
tion (upper two pins) to preserve the battery
charge.
```

B. INSTALL THE KSU AND POWER SUPPLY

6.2 The KSU and the power supply are mounted on the MDF backboard as outlined in the following steps. For a drawing of a suggested layout, refer to Figure 3–13 on the next page.

NOTE: To also install the battery back-up unit (part no. 662.0110) designed specifically for use with this system, refer to the installation instructions included with the unit.

(1) The distance between the two mounting holes on the back of the KSU is 10⅝ inches (27 centimeters). Use this measurement to mark the location of the mounting screw holes on the MDF backboard.

(2) Drive a ¾-inch #12 pan head screw into the center of each KSU mounting hole marking, allowing the heads of the screws to protrude slightly.

(3) Hang the KSU on its screws. If necessary, adjust the screws to ensure that the KSU is held firmly in place.

(4) To further secure the KSU to the MDF backboard, drive a ¾-inch #10 pan head screw into the hole on the metal tab that extends out the bottom of the KSU.

(5) Position the power supply at least 4 inches to one side of the location where the KSU will be mounted. (There must be sufficient air circulation around both units. DO NOT place the power supply below the KSU.)

(6) Mark the positions of the mounting screw holes. Set the power supply aside.

(7) Drive a screw into the center of each power supply mounting hole marking, allowing the heads of the screws to protrude slightly. (Use screws of sufficient strength to support the power supply. Some power supplies have mounting screw specifications on the label.)

(8) Hang the power supply on its screws. If necessary, adjust the screws to ensure that the power supply is held securely in place.

(9) DO NOT plug in the DC power cable or the AC power cord until the power supply electrical test has been performed (as outlined on page 3–27).

FIGURE 3-13.   KSU AND POWER SUPPLY LAYOUT
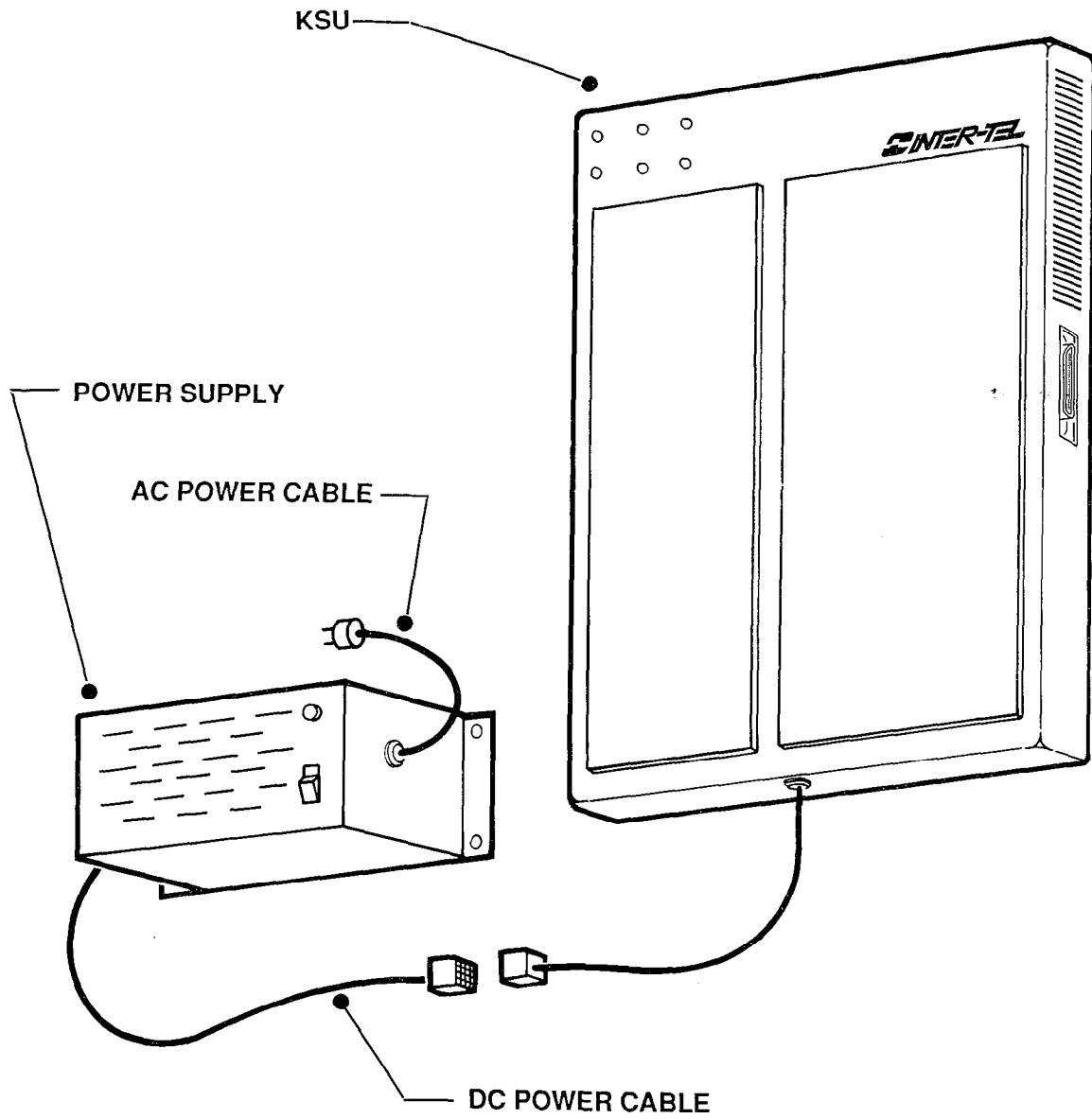
Grounding Requirements

6.3 The KSU must be properly grounded to an earth ground point. A copper, cold water pipe is usually a good ground point; however, a properly installed ground rod is more effective.

NOTE: According to UL 1459, "an insulated grounding conductor that is not smaller in size and equivalent in insulation material and thickness to the grounded and ungrounded branch-circuit supply conductors, except that it is green with or without one or more yellow stripes, is to be installed as part of the circuit that supplies the product or system." Also, "the attachment-plug receptacles in the vicinity of the product or system are all to be of a grounding type, and the grounding conductors serving these receptacles are to be connected to earth ground at the service equipment."

6.4 The grounding wire should be 10AWG or larger and should not exceed 25 feet (7.5 meters) to help provide RFI/EMI protection or 10 feet (3 meters) to help provide RFI/EMI and lightning protection.

6.5 To ground the system (see Figure 3–14 below):

(1) Ensure that the power supply is not plugged into the AC outlet.

(2) Mount a grounding terminal on the MDF backboard and connect it to:

a. An earth ground.

b. The ground lug on the bottom of the KSU.

c. Each HVRA power supply, if used.

d. Battery compartments, if used.

6.6 If AC power-related problems appear on the system, one of the following three methods can be used to test the ground.

● Use a digital multimeter to measure the difference of potential between the KSU ground point and the power neutral, and between the KSU ground point and the third wire ground. If the voltage measurement exceeds 0.5V, noise may develop on the system. If this occurs, call an electrician.

● Use a Megger to test the ground point. (A Megger should be available through the local power company.) The reading should be 5 ohms or less.

● Unplug the AC power cord from the outlet and insert a ground isolation plug into the outlet. Plug the AC power cord into the ground isolation plug. If the problem ceases, call an electrician. When finished, remove the ground isolation plug to restore ground protection.

FIGURE 3–14. KSU GROUNDING
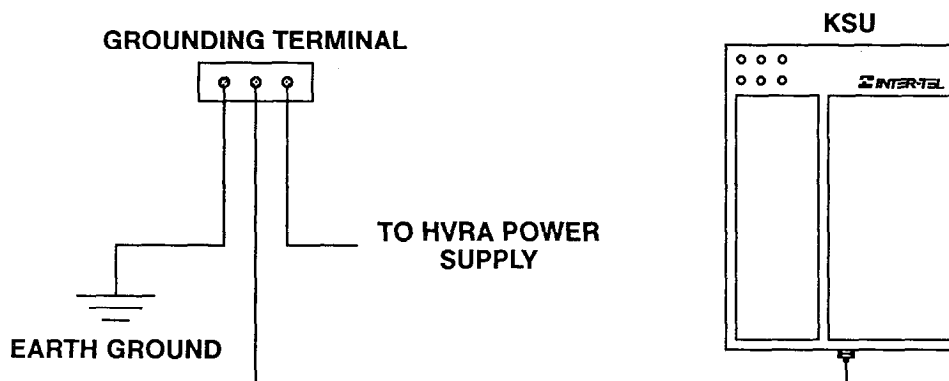
Voltage Surge/Spike Protection

6.7 To reduce the effects of AC voltage surges and spikes that may cause system malfunctions, false logic, and/or damage to the electronic components, it is recommended that a surge/spike protector be installed. Check the manufacturer's specifications to ensure that the device meets the following requirements:

- Clamp voltage transients at 300VDC within 5 nanoseconds when exposed to waveforms as described in the ANSI/IEEE Standard C62.41-1980 (IEEE 587).

- Reduce RFI/EMI noise by at least 20dB at frequencies between 5kHz and 30MHz.

Power Supply Electrical Test

6.8 Perform the following electrical check on the power supply.

(1) Ensure that the power supply DC power cable is *not* connected to the KSU, the AC power cord is not plugged in, and the AC POWER switch on the power supply is OFF.

(2) Plug the AC power cord into a 105-125VAC, 57-63Hz, 15A, single-phase commercial power source.

   NOTE: This *MUST* be an isolated, dedicated circuit. *DO NOT* use an extension cord when installing the power supply and do not plug any other equipment into the same AC outlet.

(3) Turn ON the AC POWER switch.

(4) Referring to Figure 3-15 on the next page, measure the indicated voltages on the front side of the power supply DC power cable connector. A digital voltmeter of $\pm 0.5\%$ accuracy is required. If voltage measurements are not within the specified limits (excepting the note below), *DO NOT PROCEED;* contact Inter-Tel Customer Support.

   NOTE: Since there is no "load" on the power supply when performing this test, the actual voltage measurements may be lower than the tolerances provided in Figure 3-15. If this is the case, continue with the installation and check the voltages again (using the test points provided on the KSU Control Board) after keysets have been installed. For the two larger power supplies, at least four keysets must be installed to provide an adequate testing load. For the smallest power supply, at least two keysets must be installed to provide an adequate testing load.

(5) If the voltages are within the specified limits (or perhaps lower as explained in the note above), turn OFF the AC POWER switch.

(6) Connect the power supply DC power cable to the power supply connector on the bottom of the KSU.

FIGURE 3-15. DC POWER CABLE CONNECTOR PINOUT AND VOLTAGE TEST POINT LOCATIONS

FRONT VIEW

(LOOKING INTO CONNECTOR PINS
ON THE END OF THE CABLE)

+30VDC	+5VDC RETURN (GROUND)		+5VDC
TP1	TP7		TP6
+30VDC RETURN (GROUND)	SENSE GROUND	SENSE	+12VDC
TP2			TP3
±12VDC RETURN (GROUND)	+30VDC	+30VDC RETURN (GROUND)	-12VDC
TP5			TP4

TP1 TO TP2   +30 ±2.0VDC (+28VDC TO +32VDC)

TP3 TO TP5   +12.5 ±0.6VDC (+11.9VDC TO +13.1VDC)

TP4 TO TP5   -12 ±1.2VDC (-10.8VDC TO -13.2VDC)

TP6 TO TP7   +5.1 ±0.1VDC (+5.0VDC TO +5.2VDC)
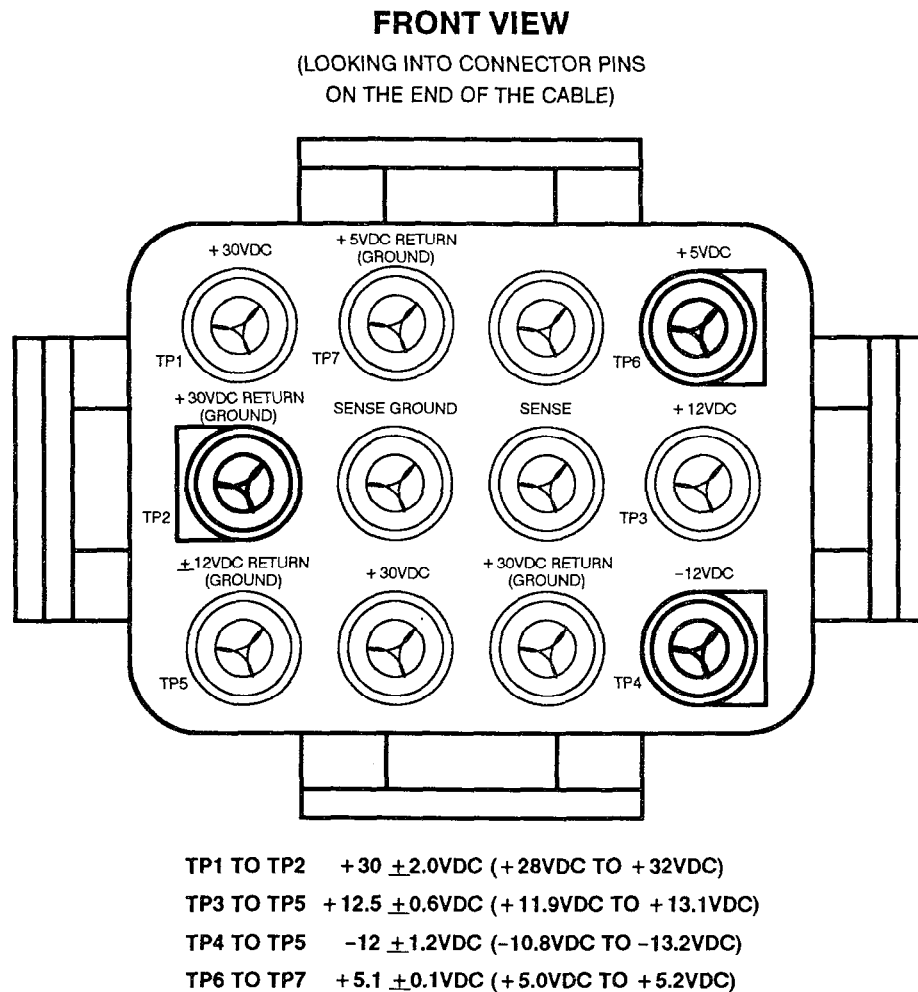
NOTE: Without a sufficient "load" on the power supply, the actual voltage measurements may fall outside the range of tolerances provided above. If the voltage measurements are high, *DO NOT PROCEED*; contact Inter-Tel Customer Support. If the voltage measurements are low, continue with the installation and check the voltages again (using the test points provided on the KSU Control Board) after station instruments have been installed. For the two larger power supplies, at least four keysets must be installed to provide an adequate testing load. For the smallest power supply, at least two keysets must be installed to provide an adequate testing load.

C. KSU CONTROL BOARD CONFIGURATION

6.9 Before installing any Expansion Modules (EXPs) or Accessory Port Modules (APMs), perform the following operations to the KSU Control Board (KCB). Refer to Figure 3–16 on page 3–31 for a drawing of the KCB and its attached Memory (MEM) Board.

CAUTION

The modules and components are static sensitive. Handle these units by the edges only and keep replacement components in their protective case until they are to be installed. Do not bend or touch the pins of the components or subject them to a static charge. When working with the units, use an anti-static wrist strap and place the units on an anti-static work surface. Any static charge (no matter how small the charge) must be discharged from the body before touching the modules or components. *The warranty for this equipment does not cover damage caused by static or mishandling. Modules or components damaged in such a manner will not be replaced.*

---

(1) To expose the KCB and its attached MEM Board, remove the screws to the two plates covering the front of the KSU and set the plates aside. (When removing the plates, be careful not to bend the pins that hold the tops of the cover plates in place.)

(2) The MEM Board is shipped with the KF-rated *Basic* or the MF-rated *Intermediate* or *Advanced* software already installed. Check the part numbers on the labels of the software components — ROMs 1-4 (or 5) and U30. They should all have the same part number.

   NOTE: To install APMs, an Extended MEM Board with *Advanced* software (part no. 662.2101) or an Extended MEM Board with *Intermediate* software (part no. 662.2103) is required.

(3) Check that all components and integrated circuits are seated securely in their sockets and that no pins are bent. Also, make sure that all connectors and stand-offs are properly aligned and seated.

   NOTE: If the components on the MEM Board are not properly seated and/or if the MEM Board itself is not properly seated, the RUN LED may flash when the KSU is turned on and the KSU will not operate properly.

(4) If connecting an external music source, place the music-on-hold (MOH) ON/OFF strap in the ON position (over the left two pins) to enable music, or place the strap in the OFF position (right two pins) to disable music. If enabled, outside callers will hear music when placed on hold. If disabled, outside callers will not hear music when placed on hold.

   NOTE: If a music source is connected, the position of the MOH strap will not affect the ability of keyset users to receive background music. Also, regardless of the strap location, internal station users will hear music when placed on hold by another station or when camped on.

(5) If music-on-hold is enabled, set the MOH HI/LO strap in the desired position. For a lower MOH volume level, set the strap in the LO position (over the left two pins). For a higher MOH volume level, set the strap in the HI position (over the right two pins).

(6) Place the back-up battery (JMP 1) strap in the A position (over the bottom two pins) to enable database back-up battery. If the strap is placed in the B position (upper two pins), the BATT OFF LED lights when the AC power is on.

   NOTE: The BATT OFF LED will not light if the strap is missing.

(7) If attaching an SMDR/SAR output device or a programming terminal, set the RS-232-C baud rate DIP switches to the desired baud rate.

   NOTE: Only one switch should be ON (in the down position) at a time. The other three switches must be off. Having all the switches off or having more than one switch on at a time will cause data errors to occur and stations may not operate.

(8) Check the station fuse on the bottom edge of the KSU Control Board. This should be a 2A, 250V, AGC 2 (fast-acting) fuse.

(9) If any of the odd-numbered station circuits are installed with secondary voice paths (refer to page 3–14), set the associated secondary voice path strap on the KSU Control Board in the OHVA position (over pins A and B). If the circuit does not have a secondary voice path, ensure that the strap is in the NORM position (over pins B and C).

(10) Turn ON the AC POWER switch and observe the LEDs on the front of the KSU for the following indications. If they are incorrect, check the system voltages as outlined in step 11 and then contact Inter-Tel Customer Support.

NAME	CORRECT INDICATION
RUN	Lit (Green)
CO BUSY	Off (Red)
IC BUSY	Off (Red)
MINOR ALARM	Off* (Red)
D-BASE ERROR	Off* (Red)
BATT OFF	Off (Red)

* When a new system is installed, the D-BASE ERROR LED remains lit until the system database has been initialized or programmed. The MINOR ALARM LED may also be lit and can later be cleared from an attendant station using the Clear System Alarm feature code (019).

(11) Measure the following system voltages. A digital voltmeter of ±0.5% accuracy is required. Place the "common" voltmeter probe on the ground point (TP0) and place the other probe on the desired voltage test point. (Refer to Figure 3–16 on the next page for system voltage test point locations.)

TEST POINTS	VOLTAGE
TP 1 to TP 0	+5.1 ±0.1VDC
TP 2 to TP 0	–12.0 ±1.2VDC
TP 3 to TP 0	+30.0 ±2.0VDC
TP 4 to TP 0	+12.5 ±0.6VDC

NOTE: Without any keysets installed, the actual voltage measurements may be lower than the tolerances provided above. If this is the case, continue with the installation and check the voltages again after station instruments have been installed. For the two larger power supplies, at least four keysets must be installed to provide an adequate testing load. For the smallest power supply, at least two keysets must be installed to provide an adequate testing load.

(12) If the voltages are within tolerance (or perhaps lower as explained in the preceding note), proceed to step 13. If the voltages are out of tolerance:

a. Turn OFF the AC POWER switch.

b. Check the KCB and its attached MEM Board for shorted components.

c. Turn ON the AC POWER switch and check the voltages again.

d. If still out of tolerance, turn OFF the AC POWER switch and contact Inter-Tel Customer Support for assistance.

(13) While pressing the battery check button (SW1) on the MEM Board, measure the database back-up battery voltage. Place the "common" voltmeter probe on battery test point TP1 (–) and the other probe on battery test point TP2 (+). If the voltage is not greater than 2.5VDC, return the KSU for repair. (Refer to Figure 3–16 on the next page for back-up battery voltage test point locations.)

NOTE: This procedure may be performed with the KSU power on or off.

(14) Turn OFF the AC POWER switch.

(15) An optional SMDR/SAR output device, a programming terminal, or an auto-answer modem may be connected to the RS-232-C port at any time. Refer to page 2–16 for RS-232-C pin connections, and refer to page 3–48 for installation instructions.

(16) *If any EXPs or APMs are to be installed,* proceed with the instructions on page 3–32.

If no EXPs or APMs are to be installed, proceed to page 3–37.

FIGURE 3-16. KSU CONTROL BOARD (KCB)
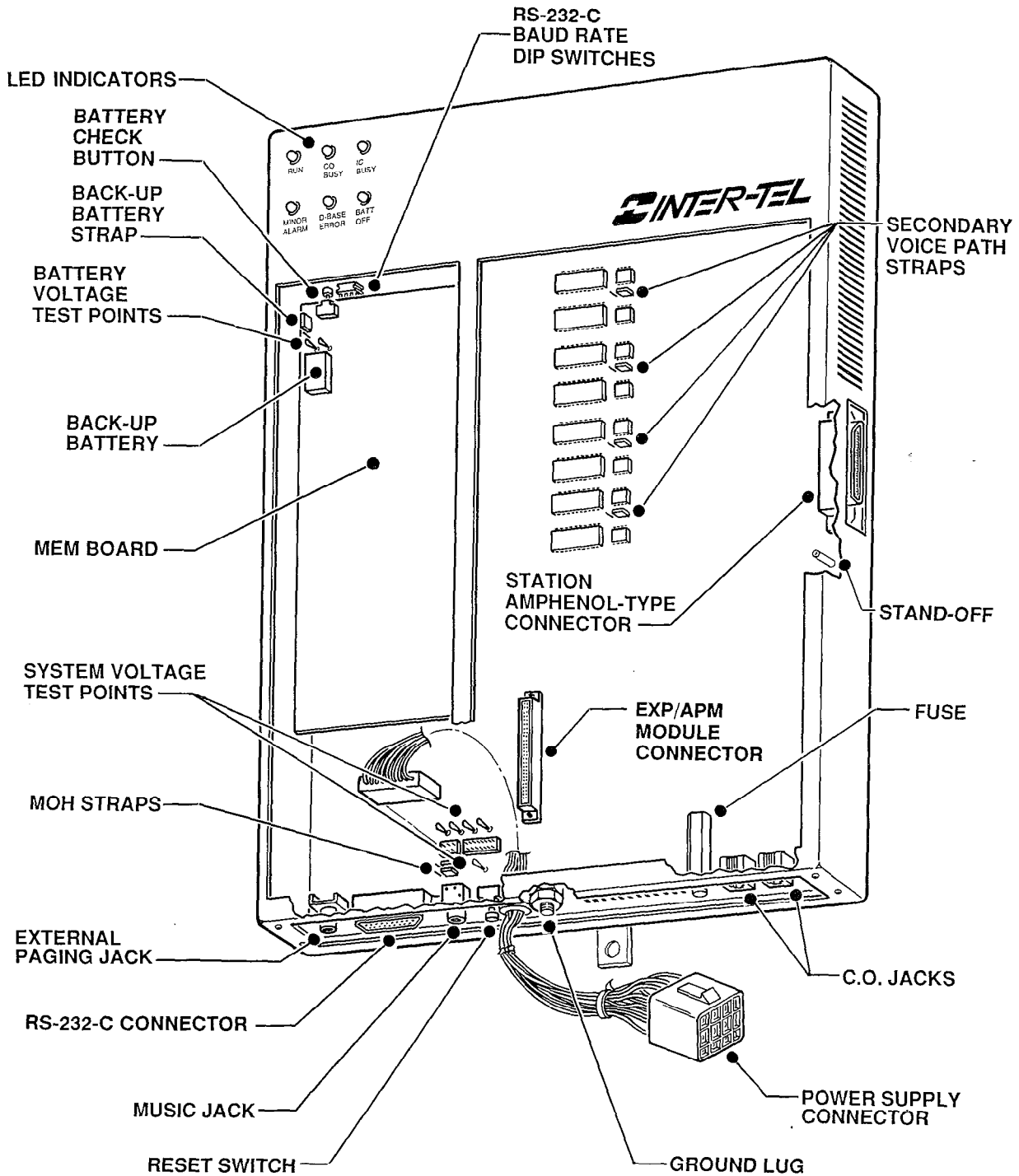
D. EXPANSION MODULE (EXP) INSTALLATION

6.10 Install each EXP as described below. Refer to Figure 3-17 on the next page for an illustration.

(1) *Make sure the AC POWER switch is turned OFF. Installing an EXP with the power on may damage the EXP and the KSU.*

(2) Install the EXPs one at a time.

(3) With the component side facing out, carefully slide the EXP into place. Make sure that the connector on the back of the EXP is securely seated on the corresponding connector beneath it.

CAUTION

If any of the connector pins are bent while attempting installation, the Expansion Module (and any modules that are installed on top of it) will not operate properly.

---

(4) Check the station fuse on the bottom edge of the EXP. This should be a 2A, 250V, AGC 2 (fast-acting) fuse.

(5) Set the address selection switches that are used to indicate the position of the EXP in relation to the KSU. *These switches must be set correctly in order for the system to operate properly.* Outlined below are the switch settings for each possible EXP location. To aid in proper installation, these settings are also silkscreened directly on the EXP.

	SWITCH		
	B3	B2	B1
1st EXP	0	0	1
2nd EXP	0	1	0
3rd EXP	0	1	1
4th EXP	1	0	0
5th EXP	1	0	1

(6) If any of the odd-numbered station circuits for this module are installed with secondary voice paths (refer to page 3-14), set the associated secondary voice path strap on the EXP in the OHVA position (over pins A and B). If the circuit does not have a secondary voice path, en-

sure that the strap is in the NORM position (over pins B and C).

(7) Turn ON the AC POWER switch and measure the following system voltages on the KSU Control Board. A digital voltmeter of $\pm 0.5\%$ accuracy is required. Place the "common" voltmeter probe on the ground point (TP0) and place the other probe on the desired system voltage test point. (Refer to Figure 3-16 on the previous page for system voltage test point locations.)

TEST POINTS	VOLTAGE
TP 1 to TP 0	$+5.1 \pm 0.1$VDC
TP 2 to TP 0	-12.0 ± 1.2VDC
TP 3 to TP 0	$+30.0 \pm 2.0$VDC
TP 4 to TP 0	$+12.5 \pm 0.6$VDC

NOTE: Without any keysets installed, the actual voltage measurements may be lower than the tolerances provided above. If this is the case, continue with the installation and check the voltages again after keysets have been installed. For the two larger power supplies, at least four keysets must be installed to provide an adequate testing load. For the smallest power supply, at least two keysets must be installed to provide an adequate testing load.

(8) If the voltages are within tolerance (or perhaps lower as explained in the preceding note), skip to step 9. If the voltages are out of tolerance:

a. Turn OFF the AC POWER switch.

b. Remove the EXP and check for shorted components and/or bent connector pins.

c. Replace the EXP, turn ON the AC POWER switch, and check the voltages. If out of tolerance, try another EXP. If the voltages are still out of tolerance with the new EXP, contact Customer Support for assistance.

(9) Along the bottom edge of the EXP, insert screws into the two tabs that extend into the module below.

(10) Repeat steps 1 through 9 for each additional EXP. After each EXP is installed, insert screws into the two tabs (along the top edge of the module) that extend into the module underneath.

FIGURE 3-17.   EXPANSION MODULE (EXP)

COVER PLATE

EXPANSION MODULE

SECONDARY VOICE
PATH STRAPS

EXPANSION MODULE
ADDRESS SELECTION
CHART

STAND-OFFS

B3 B2 B1
SW1

ADDRESS
SELECTION
SWITCHES

FUSE

STAND-OFF

EXPANSION
MODULE
CONNECTOR

C.O. LINE
JACKS

KSU
CONTROL
BOARD

EXP/APM
MODULE
CONNECTOR
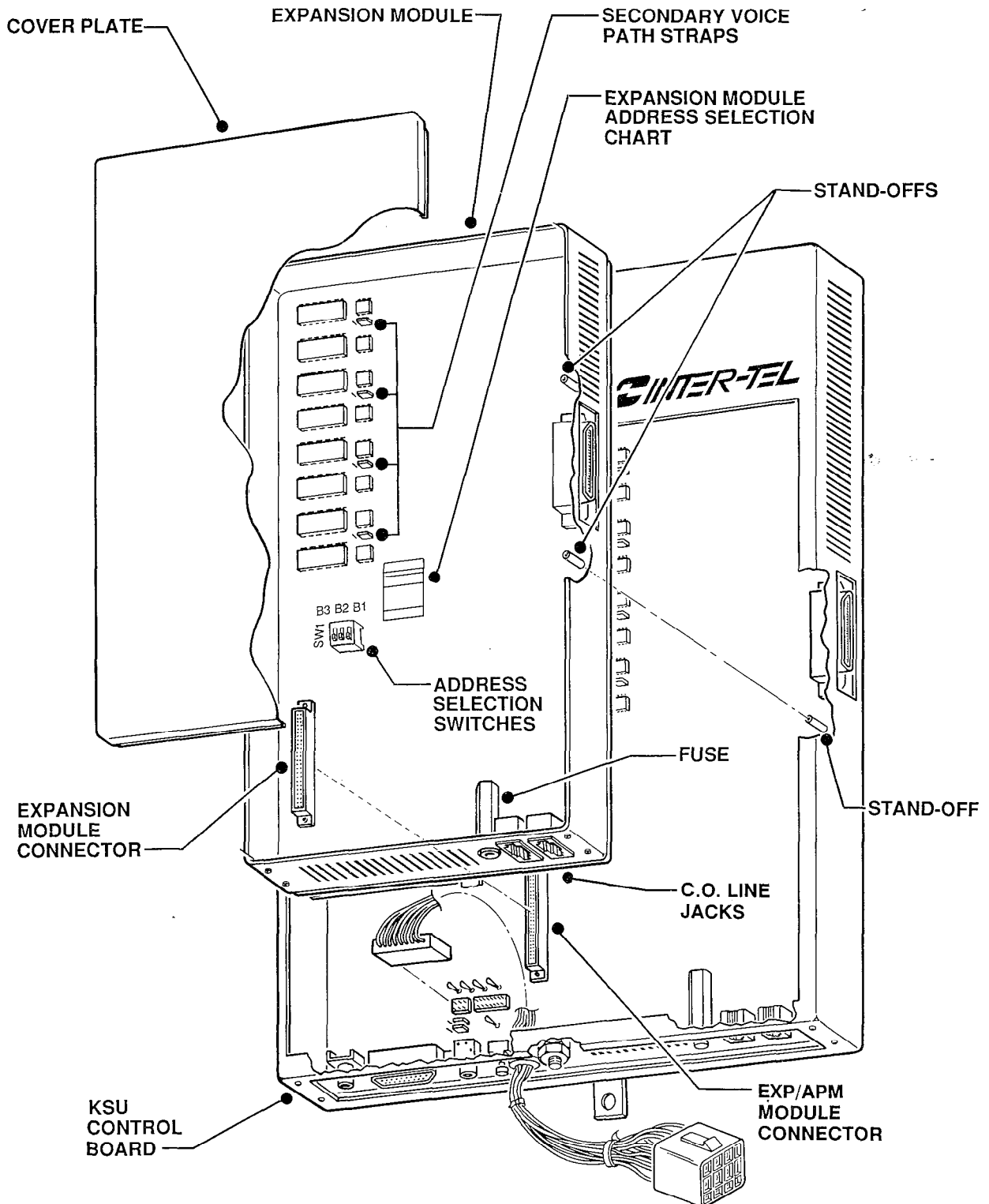
E. ACCESSORY PORT MODULE (APM) INSTALLATION

6.11 Install each APM as described below. Refer to Figure 3-18 on page 3-36 for an illustration of the APM.

NOTE: To install APMs, an Extended MEM Board with *Advanced* software (part no. 662.2101) or an Extended MEM Board with *Intermediate* software (part no. 662.2103) is required.

(1) *Make sure the AC POWER switch is turned OFF. Installing an APM with the power on may damage the APM and the KSU.*

(2) Install the APMs one at a time.

(3) With the component side facing out, carefully slide the APM into place. Make sure that the connector on the back of the APM is securely seated on the corresponding connector beneath it.

CAUTION

If any of the connector pins are bent while attempting installation, the APM (and any modules that are installed on top of it) will not operate properly.

---

(4) Check the station fuse on the bottom edge of the APM. This should be a 2A, 250V, AGC 2 (fast-acting) fuse.

(5) Set the address selection strap, which is used to indicate the position of the APM in relation to the KSU, as outlined below (see Figure 3-18). To aid in proper installation, the strap settings are also silkscreened directly on the APM.

If this is the first APM installed, place the strap in the A position (over the lower two pins).

If this is the second APM installed, place the strap in the B position (over the upper two pins).

(6) For each APM circuit, place the AC/DC strap in the proper position for the type of station instrument being installed. (If installing off-premises stations, refer to page 3-18 before installing the APMs.)

For AC-ringing instruments, place the associated strap in the AC position (over the top two pins).

For DC-ringing instruments, place the associated strap in the DC position (over the bottom two pins).

(7) Turn ON the AC POWER switch and measure the following system voltages on the KSU Control Board. A digital voltmeter of $\pm 0.5\%$ accuracy is required. Place the "common" voltmeter probe on the ground point (TP0) and place the other probe on the desired system voltage test point. (Refer to Figure 3-16 on page 3-31 for system voltage test point locations.)

TEST POINTS	VOLTAGE
TP 1 to TP 0	+5.1 ±0.1VDC
TP 2 to TP 0	-12.0 ±1.2VDC
TP 3 to TP 0	+30.0 ±2.0VDC
TP 4 to TP 0	+12.5 ±0.6VDC

NOTE: Without any keysets installed, the actual voltage measurements may be lower than the tolerances provided above. If this is the case, continue with the installation and check the voltages again after station instruments have been installed. For the two larger power supplies, at least four keysets must be installed to provide an adequate testing load. For the smallest power supply, at least two keysets must be installed to provide an adequate testing load.

(8) If the voltages are within tolerance (or perhaps lower as explained in the preceding note), proceed to step 9. If the voltages are out of tolerance:

a. Turn OFF the AC POWER switch.

b. Remove the APM and check for shorted components and/or bent connector pins.

c. Replace the APM, turn ON the AC POW-
ER switch, and check the voltages. If out of
tolerance, try another APM. If the voltages
are still out of tolerance with the new
APM, contact Inter-Tel Customer Support
for assistance.

(9) Turn OFF the AC POWER switch.

(10) Along the bottom edge of the APM, insert
screws into the two tabs that extend into the
module below.

(11) Repeat steps 1 through 10 for the second
APM, if used. If a second module is installed,
insert screws into the two tabs (along the top
edge of the module) that extend into the mod-
ule underneath.

(12) An optional SMDR/SAR output device, a pro-
gramming terminal, or an auto-answer modem
may be connected to the RS-232-C ports on
the APMs at any time. Refer to page 2–16 for
RS-232-C pin connections, and refer to page
3–48 for installation instructions.

FIGURE 3–18.   ACCESSORY PORT MODULE (APM)
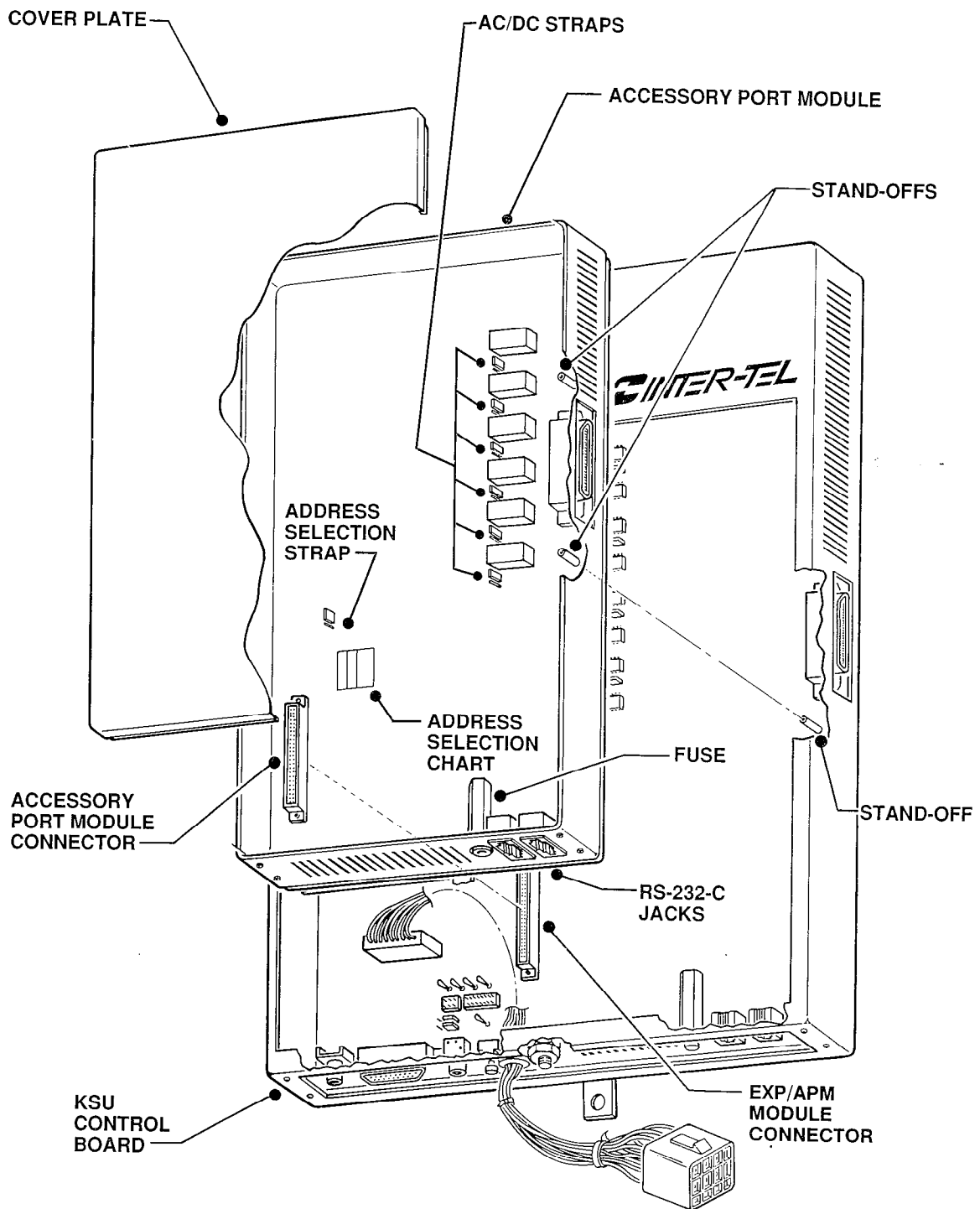
F. PERFORM THE NETWORK SELF TEST

NOTE: The network self test function is available only in the *Intermediate* and *Advanced* software packages. Also, an APM is required to perform all tests other than the system board status test.

6.12 After the last module is installed, the network self test for the full system should be performed. The self test function tests the voice channels and switching matrices of the system. The test should performed for every new installation, whenever a new board or module is installed, and whenever a voice channel problem arises.

6.13 Refer to PROGRAMMING, page 5-5, for information on setting up the KSU for programming. Then, see page 5-128 for details on performing the network self test. Perform the full system test (menu selection [G] on the self test menu). If any board or module fails the test, it must be replaced.

G. COMPLETING THE KSU INSTALLATION

6.14 Complete the KSU installation as follows:

(1) Ensure that the AC POWER switch is OFF.

(2) Slide the KSU cover plates into place and replace the screws.

(3) Connect each labeled station female amphenol-type connector to the 50-pin male connector on the corresponding KCB, EXP, or APM.

(4) Connect each mod-to-mod C.O. line cord to the associated C.O. jack on the KCB or EXP.

(5) Turn ON the AC POWER switch.

7. STATION INSTALLATION

7.1 Keysets and DSS/BLF Units are connected to the KSU Control Board (KCB) and Expansion Modules (EXPs). Single-line devices (such as SLIs, single-line DTMF sets, playback devices, voice mail units, facsimile machines, etc.) are connected to Accessory Port Modules (APMs).

CAUTION

Connecting a station instrument to the wrong type of module can damage the instrument and the module.

A. KEYSET INSTALLATION

7.2 Before installing keysets, unpack each one and check for damage. If items are damaged or missing, contact your supplier. Each keyset should have the following:

- Baseplate
- Extra key caps
- One six-foot, three-pair line cord
- One handset
- One four-conductor coiled handset cord
- Slide-out directory card

Liquid Crystal Display (LCD) Installation

7.3 To convert a standard 24-line keyset to a display keyset, install an LCD Kit (part number 828.1052) as follows:

(1) Unpack the LCD Kit. There should be a clear plastic display window, an LCD unit, a ribbon cable, and two small Phillips-head screws.

(2) Remove the keyset baseplate by pressing on the top edge of the baseplate to release the tab and by pulling the plate off.

(3) Remove the line cord and handset cord from the keyset. Then, loosen the four screws on the bottom of the keyset (enough so that the keyset can be opened).

(4) Carefully open the keyset to expose the back of the keyboard that has the LCD connector. (Refer to Figure 3-19 on the next page.)

(5) Remove the cover from the display opening in the top housing of the keyset by releasing the tabs from the inside of the housing and pushing out the cover.

(6) From the front of the keyset, insert one end of the clear plastic window in the display opening, with the painted side of the brown edging facing the inside of the keyset. Then, slightly bend the window, insert the other end into the opening, and ease the window into place.

(7) Remove the covering from the LCD and install as follows:

a. Insert one end of the ribbon cable (printed side down) into the black connector on the LCD unit. Ensure that the metal strips on the ribbon cable make contact with the metal tabs in the black connector.

b. With the LCD facing up, insert the other end of the ribbon cable into the black connector on the back of the keyboard. (Refer to Figure 3-19 on the next page.)

c. Position the LCD on the plastic window so that the screw holes in the LCD unit and in the keyset housing are aligned. Install the screws to hold the LCD in place.

(8) Reassemble the keyset.

FIGURE 3–19. KEYSET LCD INSTALLATION

DISPLAY
WINDOW

LCD
CONNECTOR

RIBBON
CABLE

LCD UNIT
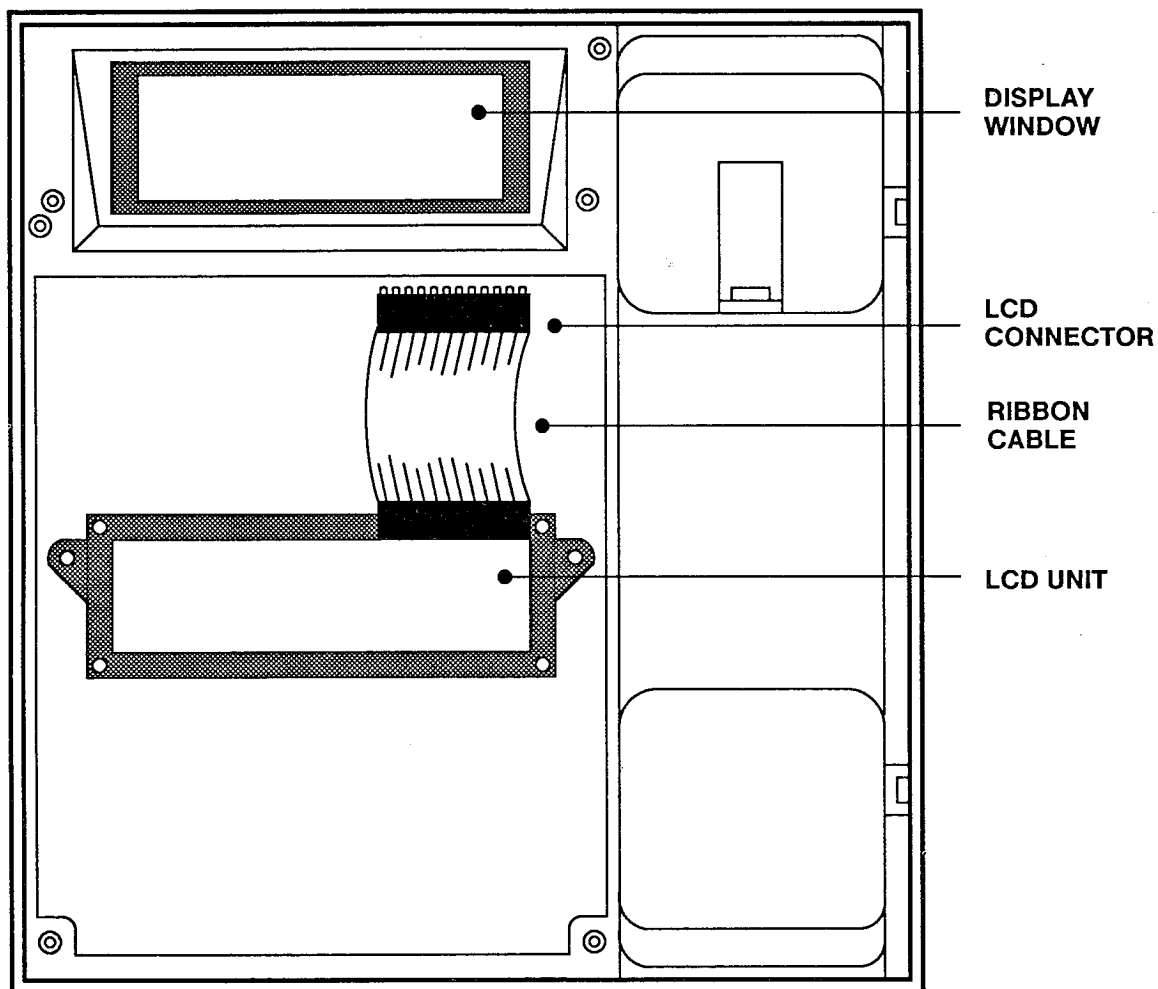
Keyset Installation

7.4 Install all keysets as follows:

(1) Before mounting the modular jack assembly and connecting the keyset, measure the voltage on the RED terminal of the modular jack assembly with respect to the GREEN terminal. (The "common" probe of the voltmeter is placed on the GREEN terminal.) It must measure +30VDC ($\pm$2.0VDC). If –30VDC is measured, check the cabling for a reversed pair.

```
┌─────────────────────────────────────────┐
│                CAUTION                   │
│                                          │
│ If the power pair (W/BL, BL/W) is re-    │
│ versed, installing a keyset will open    │
│ the fuse on the KSU Control Board or     │
│ Expansion Module. This affects operation │
│ of all keysets and DSS/BLF Units         │
│ connected to the board or module.        │
└─────────────────────────────────────────┘
```

(2) Mount the modular jack assembly on the wall.

(3) Attach the coiled handset cord to the handset and to the handset jack on the right side on the bottom of the keyset. Place the handset on hook.

(4) Plug one end of the line cord into the wall-mounted modular jack assembly. Plug the other end into the jack labeled KSU near the upper-left corner on the bottom of the keyset.

NOTE: To aid in installation and troubleshooting, display keysets show their station circuit number, intercom (extension) number, and assigned user name for five seconds when power is turned on and the line cord is first plugged in. This display also appears whenever the line cord is removed and replaced while power is on, after a system reset, and after a system initialization using selection [K] in database programming. The station identification displays for five seconds, then the keyset changes to the appropriate display, depending on its current status.

(5) If installing a display keyset with a potentiometer located underneath the extension number plate on the face of the keyset, adjust the LCD contrast. Turn the potentiometer to lighten or darken the display.

(6) Perform the keyset self-test:

a. While pressing the asterisk (*) and pound (#) keys, unplug and replace the keyset line cord.

b. Release the keys. The keyset rings momentarily. (Display keysets show KTS SELF-TEST HOOKSWITCH.)

c. Lift and replace the handset to test the hookswitch. The LED-equipped keys light and the keyset rings momentarily. (Display keysets show KTS SELF-TEST LEDS.) If any of the LEDs do not light, return the keyset for repair.

d. Lift and replace the handset. The keyset rings momentarily and all of the LEDs go out. (Display keysets show KTS SELF-TEST KEYS.)

e. Press keys in the following order. A progress tone is heard and the keyset rings momentarily if the key is functioning properly. If the signals are not heard, the key was either pressed out of order or is faulty. Return the keyset for repair if any key is faulty.

24-Line Keysets:

1. The C.O. line keys in order: 1-24.

2. Feature keys in this order: HOLD, XFR, CNF, ANS, FLASH, DATA, REDL, SYS SPD, QUE, PAGE, SPKR, IC, MUTE, FWD, DND, MSG, BGND MUSIC, and SPCL.

3. Keypad keys in the following order: 1-9, *, 0, and #.

4. Speed-dial keys in this order: 1, 6, 2, 7, 3, 8, 4, 9, 5, and 0.

12-Line Keysets:

1. The speed-dial keys in order: 1-8.

2. C.O. line keys in order: 1-12.

3. Feature keys in this order: CNF, SPKR, IC, OVER, HOLD, and XFR.

4. Keypad keys in the following order: 1-9, *, 0, and #.

5. Feature keys in this order: FWD, DND, MSG, and SPCL.

f. After all the keys have been tested, it takes about ten seconds for the keyset to return to normal operation. (Display keysets show KTS SELF-TEST DONE for about five seconds. Then, the keyset's identification, as described in the NOTE to step 4 on the previous page, displays for about five seconds.)

g. Replace the keyset if faulty.

(7) The keyset ring tone can be changed by performing the steps described in the FEATURES section on page 4-39.

Wall Mounting Keysets

7.5 To mount the keyset on a wall:

(1) Remove the keyset baseplate by pressing on the top edge of the baseplate to release the tab and by pulling the plate off. Set the keyset aside.

(2) Rotate the baseplate so that the mounting holes are at the top and position the plate in the desired location on the wall.

(3) Mark the location of the keyset mounting holes on the wall. Set the baseplate aside.

(4) Drive a screw into the center of each mounting hole marking. Allow the head of the screw to protrude approximately ¼ inch.

(5) Replace the baseplate on the keyset with the mounting holes at the top. Then, position the mounting holes of the baseplate over the screws and slide the keyset into position on the wall.

Headsets

7.6 Refer to SPECIFICATIONS, page 2-12, for headset requirements. To attach a headset to a keyset:

(1) Remove the coiled handset cord from the handset jack on the base of the keyset. Leave the handset in the cradle.

(2) Insert the headset modular plug into the jack. Plug in the headset power source, if used.

(3) If the headset has an on/off switch, turn on the headset.

(4) On the keyset, press the SPCL key and enter the headset enable feature code (default value is 315).

(5) *To disable the headset,* press SPCL and enter the headset disable feature code (default value is 316). Then unplug the headset and reconnect the handset.

Handset Amplifiers

7.7 Users may wish to have a handset amplifier installed. Typically, the amplifier is an external unit that is placed between the keyset and the handset (refer to page 2-12 for specifications).

7.8 To install such an amplifier:

(1) Unplug the coiled handset cord from the keyset.

(2) Plug the coiled handset cord into the amplifier jack labeled HANDSET.

(3) Plug the amplifier line cord (coming from the jack labeled TELEPHONE) into the keyset handset jack.

(4) Plug the amplifier power supply cord into an AC outlet.

(5) Turn on the amplifier.

(6) The handset volume can be increased or decreased, using the thumbwheel located on the amplifier. Verify that the amplifier is functioning correctly by placing a call and adjusting the volume from low to high.

Data Port Module

7.9 24-line keysets may be equipped with optional Data Port Modules (part number 828.1094). The Data Port Module contains a four-conductor modular jack that can be used to connect *either* a data device (such as a personal computer with a direct-connect modem) *or* an LRA and an external signalling device (such as a loud bell, horn, flashing light, etc.) to the keyset.

7.10 Install the Data Port Module as outlined below. For a diagram, see Figure 3–20 on the next page.

(1) Remove the keyset baseplate by pressing on the top edge of the baseplate to release the tab, and by pulling the plate off.

(2) Unplug the line cord from its modular jack.

(3) Remove the 10-pin shorting plug located on the keyset control board.

   NOTE: The back cover of the keyset does not need to be removed in order to reach the shorting plug.

(4) Save the shorting plug by taping it to the bottom cover of the keyset or to the inside of the baseplate. The plug must be replaced if the Data Port Module is later removed.

(5) Align the Data Port Module over the appropriate screw holes (see Figure 3–20) on the back cover of the keyset and insert the screws (do not over tighten).

(6) Plug the Data Port Module cable into the pins on the KSU Control Board where the shorting plug was previously located. Make sure the cable connector is securely seated.

(7) Place straps SP1, SP2, SP3, and SP4 on the Data Port Module in the appropriate positions. Depending on how the Data Port Module will be used, refer to one of the three possible settings outlined in Figure 3–20.

(8) *If connecting a modem-equipped data device,* refer to paragraphs 7.11 through 7.13.

   If connecting a loud ringing adapter and an external signalling device, refer to paragraphs 7.14 through 7.16.

7.11 To Connect A Modem-Equipped Data Device: The optional Data Port Module can be used to connect a data device (such as a personal computer) equipped with a direct-connection modem to a 24-line keyset. The data device can be used with the keyset to communicate with remote data equipment over C.O. lines or intercom channels. The data device's modem must be externally powered (or capable of operating on 20mA of loop current) and have an RJ11 C.O. line interface.

7.12 The data device can be activated using the keyset or an auto-dial modem. It is disconnected when one of the following occurs: when the modem attached to the keyset disconnects from the call, when the called modem disconnects from the call, or when the data connection is transferred to the keyset's primary voice path and the call is disconnected. (For complete details on using an attached data device, either with or without a secondary voice path installed, refer to page 4–90 in FEATURES.)

7.13 Install the data device as follows:

(1) Insert the modem line cord (which would normally be connected to a C.O. jack) into the modular jack on the keyset's Data Port Module.

(2) Ensure that the straps on the Data Port Module are set to the proper *data device* positions (either *with* a secondary voice path or *without* a secondary voice path). Refer to Figure 3–20 on the next page.

(3) Plug the keyset line cord into the keyset's modular jack and reattach the baseplate.

FIGURE 3-20.   KEYSET DATA PORT MODULE INSTALLATION
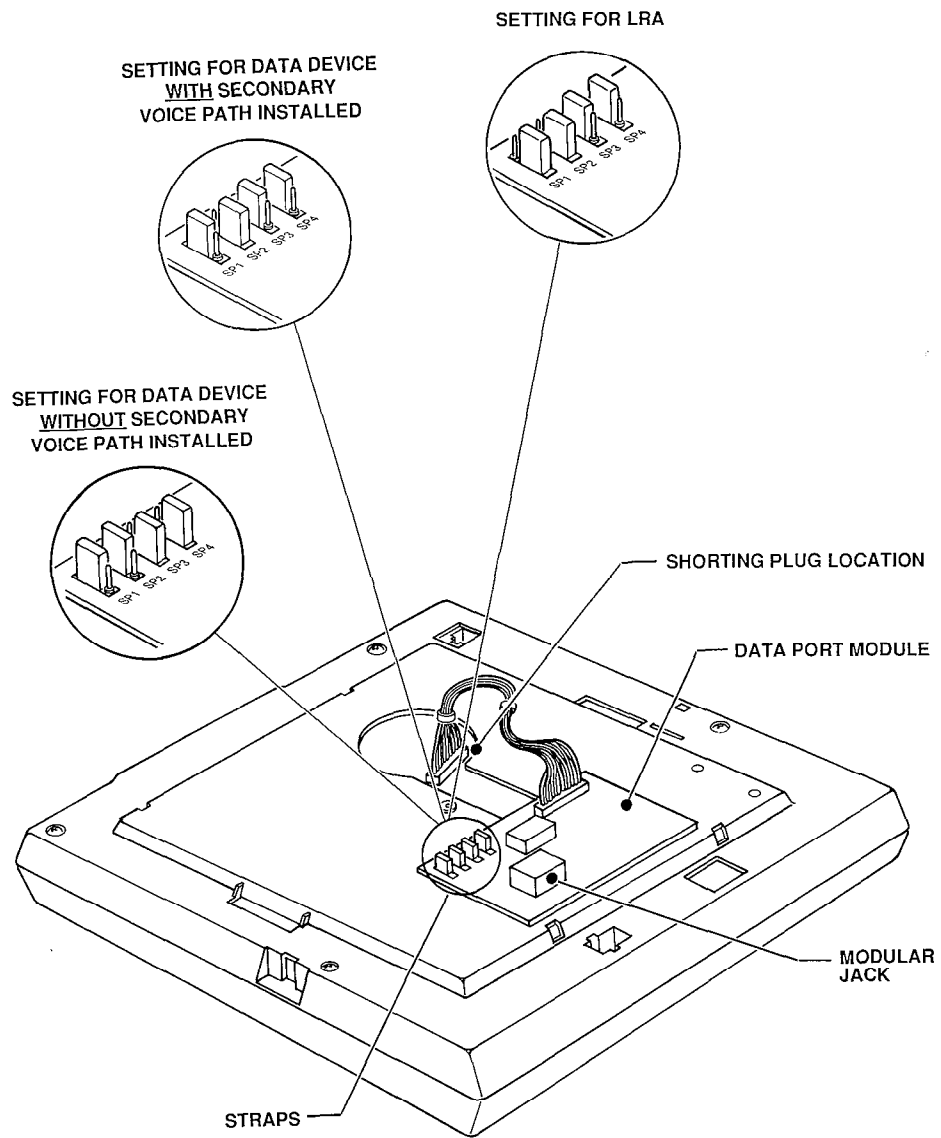
7.14 To Connect A Loud Ringing Adapter (LRA):
The optional Data Port Module can be used to connect external signalling equipment such as loud bells, horns, flashing lights, etc. to a 24-line keyset. This application is useful in areas where the normal ring tone of the keyset cannot be heard, such as warehouses and loading docks. The signalling device follows the normal ringing patterns of the keyset.

NOTE: Since handsfree intercom calls may be difficult to hear in noisy areas, keysets with LRAs installed should be programmed for handsfree disable so that users are alerted to incoming intercom calls by continuous double ring tones. (Refer to FEATURES, page 4-45.)

7.15 An electromechanical LRA device is placed between the keyset Data Port Module and the external signalling equipment to provide the necessary interface relay. Refer to page 2-12 for LRA device specifications and recommendations. A diagram of a typical set-up is shown in Figure 3-21 below.

7.16 Install the LRA as follows:

(1) Using 24AWG wire, connect the LRA device input (coil circuit) to the RED and GREEN

wires on a modular jack assembly. Some devices require that polarity be observed between the LRA input and the modular jack.

NOTE: In order for the LRA device to operate properly, the maximum resistance from the modular jack to the LRA should be kept under 100 ohms.

(2) Attach a mod-to-mod line cord to the modular jack assembly and to the modular jack on the keyset's Data Port Module.

(3) Ensure that the straps on the Data Port Module are set in the proper *LRA* positions. Refer to Figure 3-20 on the previous page.

(4) Connect the LRA device output (contacts) to the signalling device according to the manufacturer's instructions. Use the appropriate gauge wire for handling the current/voltage rating of the signalling device.

(5) Plug the keyset line cord into the modular jack on the back of the keyset and reattach the baseplate.

FIGURE 3-21. LRA SET-UP
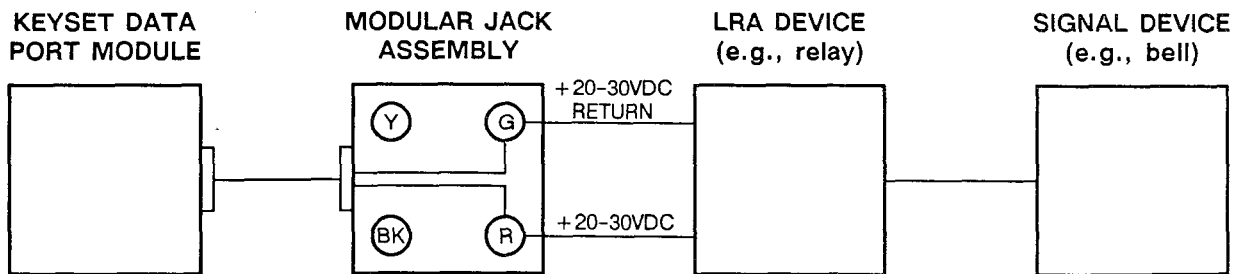
NOTE: Each time the keyset rings, the Data Port Module provides 20-26mA of loop current to the LRA. This causes the LRA contacts to close and activates the signalling device. The LRA is not affected by the ring tone or the ringer volume of the keyset. The LRA must be capable of operating on 20mA current (approximately 20VDC).

B. DIRECT STATION SELECTION/BUSY LAMP FIELD (DSS/BLF) UNIT INSTALLATION

7.17 Up to five DSS/BLF Units can be installed on the system. If desired, all five units may be on the KSU Control Board or on the same Expansion Module. Each unit has 60 keys for directly accessing up to 48 intercom numbers and up to 5 hunt group numbers.

7.18 As with keysets, DSS/BLF Units require three-pair cabling. After they are installed, the DSS/BLF Units must be assigned in database programming to be used along with designated keysets.

7.19 Unpack and inspect the DSS/BLF Units before installing them. Each DSS/BLF Unit is shipped with a 7-foot line cord.

7.20 For each DSS/BLF Unit:

(1) Before connecting the DSS/BLF Unit to the KSU, measure the voltage on the RED terminal of the modular jack assembly with respect to the GREEN terminal. (The "common" probe of the voltmeter is placed on the GREEN terminal.) It must measure +30VDC ($\pm$2.0VDC). If –30VDC is measured, check the cabling for a reversed pair.

```
                    CAUTION

 If the power pair (W/BL, BL/W) is reversed, in-
 stalling a DSS/BLF Unit will open the fuse on
 the KSU Control Board or Expansion Module.
 This affects operation of all keysets and DSS/
 BLF Units connected to the board or module.
```

(2) Mount the modular jack assembly on the wall.

(3) Perform the DSS/BLF Unit self-test:

a. Disassemble the DSS/BLF Unit by removing the four screws on the bottom of the unit.

b. Locate the four DIP switches in the lower-right corner of the unit's control board.

c. Set DIP switch 1 to the TEST (closed) position. Reassemble the unit without replacing the screws.

d. Plug one end of the line cord into the modular jack assembly and plug the other end into the KSU jack on the bottom of the DSS/BLF Unit. The system automatically tests the unit's processor.

NOTE: If the test fails, you will not be able to continue to the next step; the unit will ignore all input. Remove and replace the line cord. If the test fails again, replace the DSS/BLF Unit.

e. Test the keys by pressing them one at a time, starting with the key in the upper-left corner and continuing from the top to the bottom of each column. As each key is pressed, the LED lights and remains lit. If an LED does not light, either the key was pressed out of order, the key is faulty, or the LED is faulty; the DSS/BLF Unit must be replaced.

f. Open the DSS/BLF Unit again and return DIP switch 1 to the RUN (open) position.

NOTE: The other three DIP switches (2–4) are not used.

g. Reassemble the DSS/BLF Unit and replace the screws.

C. SINGLE-LINE SET AND PLAYBACK DEVICE INSTALLATION

Single-Line Sets

7.21 The types of single-line sets listed below can be used on the GMX-48 System. They are connected to Accessory Port Modules (APMs). If the single-line set has an AC ringer, the strap on the corresponding APM circuit must be placed in the AC position (unless the single-line set is an off-premises station connected through an HVRA Unit, in which case the APM strap must be set in the DC position). If a single-line set has a DC ringer, the strap must be in the DC position. Refer to Figure 3-18 on page 3-36 for strap settings.

7.22 Single-Line Instrument (SLI): An internal strap can be moved to set the ringer for AC or DC. (An AC ringer is required if the single-line set is used as an off-premises station.) Be sure the strap is set correctly for the installation; incorrect installation will cause damage to the set.

7.23 Industry-standard single-line DTMF set: If single-line DTMF sets are used as off-premises stations, they must be equipped with AC ringers. When used on premises, single-line DTMF sets may have AC or DC ringers.

Playback Devices

7.24 Playback devices can be used in place of single-line sets on APM circuits. These devices answer an incoming call, play a recorded message, and automatically disconnect from the call. They are installed like single-line sets, using the same cabling and modular jack assemblies.

7.25 If the playback device responds to AC ring signals, the APM circuit must be strapped for AC ringing; if the device responds to DC ring signals, the strap must be set for DC ringing. (Refer to Figure Figure 3-18 on page 3-36.) A playback device uses the intercom number that is associated with its STN circuit.

7.26 With the *Advanced* software package, playback devices may be used with hunt groups to speed call processing. Hunt groups can have two types of special stations: announcement stations and overflow stations. Either type of station can be equipped with a station instrument that operates as a regular station or with a playback device that answers the call, then disconnects to transfer the call back to the hunt group. Refer to FEATURES, page 4-17, for more information.

7.27 With the *Advanced* software package, playback devices may also be used in conjunction with the automated attendant feature. In this situation, the playback device answers the call and plays a prerecorded message. After the message, the caller is disconnected from the automated attendant and hears three quick tones followed by silence. The caller may then dial an intercom number or a hunt group pilot number. Refer to FEATURES, page 4-13, for more information.

Installation

7.28 Inspect the SLIs before installing them. If any parts are damaged, contact Customer Service. To install a single-line set or a playback device:

(1) *If installing an SLI:*

    a. Remove the baseplate and open the phone to expose the control board.

    b. Place the AC/DC strap in the desired position. (Refer to Figure 3-22 on the following page.)

    c. Reassemble the phone.

(2) Before connecting the single-line set or playback device to the KSU, measure the voltage on the RED terminal of the modular jack assembly with respect to the GREEN terminal. (The common probe of the voltmeter is placed on the GREEN terminal.) It must measure −30 (±2VDC). If +30VDC is measured, check the cabling for a reversed pair.

(3) Mount the modular jack assembly on the wall.

(4) Plug one end of the line cord into the modular jack assembly and the other end into the jack on the single-line set or playback device.

(5) To wall mount an SLI, refer to the instructions given for wall mounting the keysets on page 3-41.

FIGURE 3-22. SINGLE-LINE INSTRUMENT (SLI) CONTROL BOARD

AC/DC RINGER STRAP

AC   DC
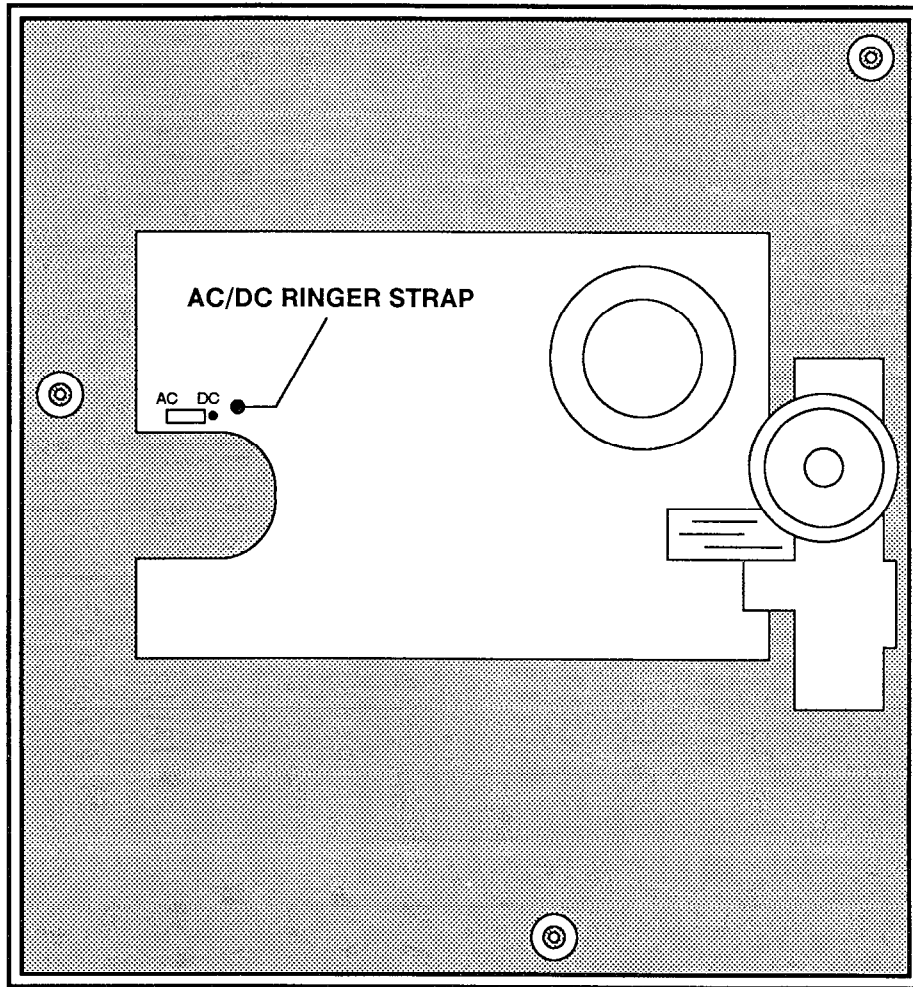
8. AUTO-ANSWER MODEM INSTALLATION

8.1 Remote programming of the system requires installation of a customer-provided auto-answer modem. The modem is connected to an RS-232-C port on the KSU and directly to an APM circuit or a dedicated C.O. line. Refer to page 2–16 for RS-232-C pinout and modem specifications.

8.2 When the programmer accesses the modem, the modem automatically sends modem tone. The programmer may then log on to the system and perform any necessary programming functions. When finished, the programmer hangs up and the modem is disconnected. The modem is installed as follows:

(1) *To connect the modem to an APM circuit:*

    a. For modems that respond to AC ringing, set the strap on the APM to the AC ringer setting. Or, if the modem responds to DC ringing, set the strap to the DC ringer setting. (Refer to Figure 3–18 on page 3–36 for strap locations.)

    b. Run station cabling as you would for a single-line set. The modular jack assembly should be close to the KSU to allow the modem to be connected to an RS-232-C port.

    c. Connect the modem line cord (with RJ11 connector) to the modular jack assembly.

    To connect the modem to a C.O. line: Terminate tip and ring from an available (or switchable) C.O. line onto a four-conductor modular jack assembly. Then, connect one end of a mod-to-mod line cord to the modem RJ11 connector and connect the other end to the modular jack assembly.

(2) Match the baud rate of the modem to that of the desired RS-232-C port. Refer to page 2–16 for the proper baud rate settings.

(3) Plug in the modem's AC power cord and turn on the AC power to both the modem and the system *before* connecting the modem RS-232-C cable to the KSU. This prevents electrical surges from being transmitted by the interface.

(4) Carefully connect the modem RS-232-C cable to the desired RS-232-C connector on the KCB or APM.

    NOTE: The modem must be configured for connection to a computer interface. For details, refer to the manual that accompanies the modem.

(5) Test the modem installation by placing a call to the modem's assigned telephone number. When answered, the modem should send modem tone.

9. SMDR/SAR OUTPUT DEVICE INSTALLATION

9.1 The output device(s) for the station message detail recording (SMDR) and system activity report (SAR) features must meet the requirements and match the RS-232-C pinout described in SPECIFICATIONS on page 2–16. The cable(s) between the device(s) and the KSU must not be longer than 50 feet (15 meters).

9.2 To connect an output device to the KSU:

(1) Match the baud rates on the output device and the port to which it will be attached (KCB or APM). Refer to page 2–16 for the proper baud rate settings.

(2) Turn on the AC power to both the device and the system *before* connecting the RS-232-C cable to the KSU. This prevents any electrical surges from being transmitted by the interface.

(3) Carefully connect the RS-232-C interface cable from the device to the appropriate RS-232-C connector (KCB or APM) on the KSU.

(4) To set the parameters for the SMDR and SAR outputs, refer to PROGRAMMING.

10. EXTERNAL MUSIC SOURCE INSTALLATION

10.1 A jack on the bottom edge of the KSU is the input for an optional external music source (radio, tape player, etc.). For more information, see SPECIFICATIONS, page 2-7.

NOTE: In some circumstances, there may be broadcast restrictions associated with the music. Check with the music's original distributor and/or the radio station for copyright and broadcast restrictions concerning background music and music-on-hold.

10.2 If using a radio as the music source, place it 5 to 10 feet away from the KSU to avoid RFI generated by the KSU. If the radio is placed more than 10 feet away from the KSU, use twisted pair cable. For better reception, a radio with an external antenna is recommended.

10.3 To install the external music source:

(1) On the KSU Control Board:

EITHER, place the music-on-hold (MOH) ON/OFF strap in the ON position (over the left two pins) to enable music. When C.O. calls are placed on hold, the caller hears music.

OR, place the music-on-hold (MOH) ON/OFF strap in the OFF position (over the right two pins) to disable music. When C.O. calls are placed on hold, the caller does not hear music.

NOTE: If an external music source is connected, the position of the music-on-hold strap will not affect the ability of keyset users to receive background music. Also, regardless of the strap location, internal station users will hear music when placed on hold by another station or when camped on.

(2) If music-on-hold is enabled, set the MOH HI/LO strap in the desired position. For a lower MOH volume level, set the strap in the LO position (over the left two pins). For a higher MOH volume level, set the strap in the HI position (over the right two pins).

(3) Attach an ⅛-inch, two-conductor, mini-phone plug to one end of a 5- to 10-foot (1.5- to 3.0-meter) length of coaxial cable. Or, if the radio is placed more than ten feet away from the KSU, use twisted pair cable.

(4) **EITHER,** connect the other end of the cable to the speaker output terminals of the music source.

OR, if the music source has an earphone jack, attach an ⅛-inch mini-phone plug (or other specified connector) to the other end of the cable, and plug it into the earphone jack on the music source.

NOTE: If the earphone jack is "padded" so that the optimal volume level cannot be reached, the first procedure above (beginning with EITHER) may be more effective.

(5) Plug in the AC power cord for the music source. *DO NOT* use the outlet that is being used for the KSU. Turn on the AC power to the music source.

(6) Insert the ⅛-inch mini-phone plug into the jack labeled MUSIC on the bottom of the KSU.

(7) From a keyset:

EITHER, select a C.O line and dial the telephone number of one of the other lines to call back into the system. Put the call on hold to hear the music.

OR, place an intercom call to another station. Put the call on hold to hear the music.

(8) While listening to music-on-hold, adjust the volume on the music source to a level within the range of the automatic gain control circuit (slightly past the point where the volume level no longer increases). The optimal input level is 0.775VRMS (0dB).

11. EXTERNAL PAGING EQUIPMENT INSTALLATION

11.1 A jack on bottom edge of the KSU is the output for the optional external paging equipment. For more information, see SPECIFICATIONS, page 2-7.

11.2 Install the external paging equipment as follows:

(1) Cut a length of coaxial cable to run from the amplifier to the KSU.

(2) Attach an RCA-type phono plug to one end of the cable.

(3) Connect the other end of the cable to the amplifier high-impedance input according the manufacturer's instructions.

(4) Connect the paging speaker(s) to the amplifier using speaker cable.

(5) Plug in the amplifier's AC power cord. *DO NOT* use the outlet for the KSU.

(6) Insert the RCA-type phono plug into the jack labeled EXT PAGE on the bottom of the KSU.

(7) Set the amplifier volume control to the lowest setting and turn on the amplifier.

(8) From a station location, make a page by lifting the handset, pressing the PAGE key (or dialing 7 — the default page feature code), and dialing a zone code that includes the external paging zone (zone 1 by default). Adjust the amplifier to the desired level while placing the page.

NOTE: If background music to external paging speakers is enabled, the volume of background music at keyset stations may be lowered.

12. POST-INSTALLATION CHECKLIST

12.1 To ensure that the system has been installed properly, review the installation outline on page 3-3. Then, review the items on the following list as a final check.

— KSU, MDF, and station locations and cable runs meet environmental requirements, and cable lengths are within loop limits.

— Bridging clips are installed where required on all MDF blocks.

— Gas discharge tubes with silicon avalanche suppressors are installed on the C.O. and the OPX lines for lightning protection. Also, if extra protection is desired, the cable between the telephone company RJ-type block (or RJ-type jacks) and the gas discharge tubes is at least 75 feet long.

— If off-premises stations are used, HVRA Units, power supplies, ring generators, OPX or customer-provided lines, and OPX repeaters (if needed) are connected at the MDF.

— The KSU, HVRA(s), and 48VDC power supply(s) are attached to an approved earth ground.

— The KSU power supply is plugged into an isolated, dedicated AC outlet, and no other equipment has been plugged into the same outlet. An extension cord was *not* used. A voltage surge/spike protector is installed to reduce the effects of AC voltage surges and spikes that can cause system malfunctions, false logic, and/or damage to the electronic components.

— Power supply and database back-up battery voltages are in tolerance. The battery strap (JMP 1) in the KSU is placed in the A position (over the lower two pins).

— Amphenol-type connectors and station instrument line cords are all connected securely. All keyset, DSS/BLF Unit, single-line set, and playback device stations are working properly.

— All optional equipment is properly installed and working correctly (for example, printer has paper and ribbon, radio is tuned to a station, auto-answer modem connected to the RS-232-C port is hooked up and working properly, etc).

— C.O. dial tone is present and calls can be placed and received using all lines. (Refer to FEATURES and PROGRAMMING for initializing the system and for programming outgoing access, allowed answer, and ring in.)

— After programming the system, the database is backed up using a reliable storage device. (Refer to the PROGRAMMING section for details.)

FEATURES

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1. INTRODUCTION

1.1 The system, in addition to its sleek, modular appearance and easy installation and programming, provides over 120 user-friendly features. To describe the system features, this portion of the manual has been divided into the following sections:

- **Accessing the Features:** This section contains a list of the feature codes and their definitions.

- **System Organization:** This section describes possible attendant arrangements, automated attendants, tenant groups and hunt groups.

- **Central Office (C.O.) Line Features:** This section explains the C.O. line functions and programmable features, including: dual-tone multi-frequency (DTMF) or dial-pulse signalling; outgoing access, allowed-answer, and ring-in assignments; day and night mode of operation; C.O. line and station toll restriction; auto line and line group assignments; automatic route selection (ARS); direct inward system access (DISA); and line maintenance.

- **Station Instruments:** This section describes the station instruments of the GMX-48 System. Available station instruments include keysets, single-line sets, and Direct Station Selection/ Busy Lamp Field (DSS/BLF) Units.

- **General Station Features:** Several sections explain the use of the system's intercom call features, outside call features, and special features for both keysets and single-line sets.

- **Attendant Features:** This section explains the special attendant-only features and the use of the DSS/BLF Unit.

- **Record Keeping and Maintenance Features:** For record keeping purposes, the GMX-48 System offers station message detail recording (SMDR) and system activity report (SAR) features. The system error reporting feature provides self-diagnostic information to make the system easier to service.

2. ACCESSING THE FEATURES

A. FEATURE CODES

2.1 Each of the station features is assigned a feature code. Using the station's keypad, these codes are entered to access C.O. lines, process calls, and use special features. Complete explanations of the features and instructions for using them are covered later in this section of the manual.

2.2 The codes shown on the following pages are the values that are assigned when the system is initialized. If desired, they can be changed in database programming to any one- to three-digit value.

<table>
<tr><td>CAUTION</td></tr>
<tr><td>Changing a feature code may affect the accessibility of other feature codes. See PROGRAMMING, page 5–33, for details.</td></tr>
</table>

B. FEATURE KEYS

2.3 Keysets and Single-Line Instruments (SLIs) have feature keys that allow one-key dialing of feature codes. The 24-line keysets have eight fixed-function feature keys and ten user-programmable feature keys. The 12-line keysets have six fixed-function and three programmable feature keys. All four SLI feature keys are user-programmable.

C. SPCL AND FLASH KEYS

2.4 In some instances, feature codes are entered immediately after lifting the handset or pressing the SPKR key. Other times, the user must signal the system by pressing a designated key before entering the feature code. Keyset users signal the system by pressing the SPCL key. SLI users press the FLASH key, and single-line DTMF set users perform a hookflash (press and release the hookswitch quickly). If the user does not enter a code or begin dialing before the dial initiation timer expires, the system sends reorder tones.

D.   C.O. LINE ACCESS CODES

2.5   The feature codes used to access C.O. lines are listed below. If a default feature key may be used in place of a code, it is indicated at the end of the explanation.

FEATURE NAME	CODE	DEFINITION
Automatic Line Selection	89	Answers the call that has been ringing or holding the longest at that station. Refer to page 4–29 for the priority list. Or, if no call is ringing or holding, the highest-numbered available auto line is selected for an outgoing call. (Keysets use line keys and the ANS key)
Automatic Route Selection (ARS)	80	Allows the system to select the desired route for placing a call. Special route groups are programmed for calls within the local area code, calls outside the local area code, operator-assisted calls, and operator-assisted and direct-dialed international calls. (SLIs use the OUT key)
Select Line Group 1–8	81–87, and 9	Selects an available line from a programmed group of lines.

E.   GENERAL FEATURE CODES

2.6   The following pages list the general feature codes. Most of them can be used at any station; however, some codes are for keysets only and/or require a display and some require a Data Port Module (optional on 24-line keysets; not available on 12-line keysets). If a default feature key may be used in place of a code, it is indicated at the end of the explanation. Refer to pages 4–36 and 4–37 for a complete listing of the default feature keys.

FEATURE NAME	CODE	DEFINITION
Automatic Intercom Access Cancel Automatic Intercom Access	362 363	*(Keysets only)* Allows the user to determine how ringing intercom calls will be answered: simply by lifting the handset (automatic access), or by lifting the handset and pressing the IC key.
Automatic Line Access Cancel Automatic Line Access	360 361	*(Keysets only)* Allows the user to determine how ringing outside calls will be answered: simply by lifting the handset (automatic access), or by lifting the handset and pressing a line key or the ANS key.
Automatic Line Answer	350	Station users with allowed answer can pick up lines that are ringing into the system, but are not actually ringing at the stations themselves. This feature does not pick up transferred calls or recalls that are ringing at the station. (Keysets use line keys)
Background Music On/Off	313	*(Keysets only)* Turns background music heard through the keyset speaker on and off. (BGND MUSIC key)

FEATURE NAME	CODE	DEFINITION
Call Forward:		
Call Forward All Calls	355	Immediately forwards all calls to another station or to an outside telephone number. (Keysets use the FWD key)
Call Forward If Busy	357	Immediately forwards all calls to another station or to an outside telephone number when the station is in use. (The keyset FWD key may be reprogrammed with this feature code.)
Call Forward If No Answer	356	Forwards all calls to another station or to an outside telephone number if not answered within a predetermined time. (The keyset FWD key may be reprogrammed with this feature code.)
Call Forward If No Answer or Busy	358	Forwards all calls to another station or to an outside telephone number if not answered within a predetermined amount of time, or immediately if the station is in use. (The keyset FWD key may be reprogrammed with this feature code.)
CO Call Forward All Calls	351	Immediately forwards incoming CO calls to another station or to an outside telephone number. (The keyset FWD key may be reprogrammed to use this feature code.)
CO Call Forward If No Answer	352	Forwards incoming CO calls to another station or to an outside telephone number if not answered within a predetermined time. (The keyset FWD key may be reprogrammed to use this feature code.)
CO Call Forward If Busy	353	Immediately forwards incoming CO calls to another station or to an outside telephone number when the station is in use. (The keyset FWD key may be reprogrammed to use this feature code.)
CO Call Forward If No Answer or Busy	354	Forwards incoming CO calls to another station or to an outside telephone number if not answered within a predetermined amount of time, or immediately if the station is in use. (The keyset FWD key may be reprogrammed to use this feature code.)
Cancel Any Call Forward	359	Cancels any call forward request. (Keysets use the FWD key)
Call Splitting	337	*(Single-line sets only)* Allows the single-line station user to return to calls on individual hold, in the order they were placed on hold.
Cancel Misc. Operations	395	This single feature code cancels do-not-disturb, hunt group remove, page remove, call forwarding, disable handsfree, background music, and queue requests for the station.

FEATURE NAME	CODE	DEFINITION
Conference	5	Connects from three to five parties in a conference. A conference consists of a station and 2–4 other parties which can be outside callers or stations. (Keysets use the CNF key)
Data	340	*(24-Line Keysets with Data Port Module only)* Allows operation of a data device attached to a 24-line keyset. (DATA key)
Default Volumes	394	*(Keysets with audio integrated modules only)* Sets the volume levels on the audio integrated module keyset to the defined default values. *These keysets are not presently available.*
Directories:		
System Directory	307	*(Display Keysets only)* If the system is using *Advanced* or *Intermediate* software, allows display keyset users to search for system intercom numbers and user names. The number can then be dialed, if desired.
C.O. Directory	308	*(Display Keysets only)* If the system is using *Advanced* or *Intermediate* software, allows display keyset users to search for system and/or tenant specific speed-dial numbers and names. The number can then be dialed, if desired.
Display Date and Time	300	*(Display Keysets only)* Displays the system date and time, user name, and intercom number during a call or when other displays are shown.
Do-Not-Disturb	370	Halts all intercom calls, transferred calls, and
Cancel Do-Not-Disturb	371	pages to the station. The cancel code returns the
Do-Not-Disturb On/Off	372	station to normal operation. The on/off code can be used to turn the feature on or off. (Keysets use the DND key)
Feature Key Default	325	Keysets and SLIs have user-programmable
Feature Key Programming	327	feature keys that can be set to access feature codes.
Feature Key Display	326	The keys can be set to the defined default values or they can be programmed individually. Display keyset users can view feature key assignments.
Handsfree Disable	310	*(Keysets only)* Disables/enables the keyset's
Handsfree Enable	311	handsfree intercom answering. Incoming intercom calls ring as private calls if handsfree answering is disabled.
Headset Enable	315	*(Keysets only)* The enable code signals the
Headset Disable	316	system that a headset has been connected to the keyset. The disable code returns the keyset to normal operation.

FEATURE NAME	CODE	DEFINITION
Hold:		
Individual Hold	336	Places a call on hold so that it can be directly accessed only at that station or accessed through a reverse transfer from any other station. (HOLD key)
System Hold	335	*(Keysets only)* Places an outside call on system hold. It can be picked up directly at any station that has allowed answer, ring in, or outgoing access to the line. (Cannot be used on intercom calls. If used on conference calls, the system places the parties on individual hold. Cannot be used by 12-line keyset users on out-of-range lines.)
Hookflash	330	Sends a timed hookflash over the C.O. line while on an outside call.
Hunt Group Remove	322	Removes the station from the hunt group or
Hunt Group Replace	323	places it in again. Does not affect non-hunt group calls.
Message	365	Leaves a message at a called station or the called station's message center. Depending on how the message was left, the called station user can pick up the message from his/her message center or from the station that left the message. (Keysets use the MSG key)
Cancel Message	366	Allows the user to cancel a message that was left at another station.
Cancel Current Message	379	Cancels a message that is waiting at the station without requiring the user to respond to it. (Keysets use the asterisk key.)
Microphone Mute On/Off	314	*(Keysets only)* Turns the microphone on or off during a call. If off (muted), the station user can hear the other party, but the party cannot hear the station user. (MUTE key)
Monitor Data Port	341	*(24-Line Keysets with Data Port Module only)* Allows monitoring of a data call through a 24-line keyset's handset. (Requires a Data Port Module and a modem-equipped data device.)
Optional Account Code	390	Allows the station user to enter an optional account code for SMDR during an outside call.
Page	7	When followed by a paging zone code, it allows announcements to be made through keyset speakers and/or external paging speakers. (Keysets use the PAGE key)

FEATURE NAME	CODE	DEFINITION
Page Remove	332	*(Keysets only)* Halts pages through the keyset
Page Replace	333	speaker or allows them to be received again.
Private Call	369	Allows users to invoke call privacy on an outside call when privacy release is enabled system wide.
Program Redial Mode —		*(Keysets only)* Programs the keyset redial mode
Last Number Dialed	320	to store either the last outside telephone number
Program Redial Mode —		dialed or the last outside telephone number
Last Number Saved	321	saved.
Queue Request	6	Requests an automatic callback when a busy line
Cancel Queue Request	376	or station becomes available. The cancel code terminates a queue request. (Keysets use the QUE key)
Redial	380	Redials the last outside telephone number dialed or saved at the station (up to 32 digits). Also used to save numbers at keysets programmed for last number saved. (REDL key)
Reminder Message	305	*(Keysets only)* Sets or cancels a reminder
Cancel Reminder Message	306	message that signals the station at a specific time.
Reverse Transfer (Call Pick-Up)	4	Picks up a call ringing or holding at another station. Also used for the group call pick-up feature to pick up calls that are ringing at a hunt group pilot number or hunt group station.
Ring Intercom Always	367	Programs the station to always place private
Cancel Ring Intercom Always	368	(non-handsfree) intercom calls. The cancel code allows the station to again place handsfree calls to keysets.
Select Ring Tone	328	*(Keysets only)* Selects the type of ringing alert tone that will be heard from the keyset.
Speakerphone On/Off	312	*(Keysets only)* Turns the keyset speakerphone on or off for on-hook dialing, conversation, and monitoring. (SPKR key)
Station Monitoring	396	*(Keysets only)* Allows a designated hunt group supervisor to monitor the outside calls of anyone in the associated hunt group.
Station Key Default	329	*(Keysets only)* Keysets can have station keys if there are unused line keys. These keys can be used for accessing intercom numbers or feature codes (as determined in database programming). This feature code returns the keys to the database default values.

FEATURE NAME	CODE	DEFINITION
Station Speed Dial Program Station Speed Dial	382 383	Dials/programs one of the 10 station speed-dial telephone numbers when followed by a location code (0-9). (Keysets use the SPD/BLF keys and SLIs use the STN SPD key)
System Speed Dial	381	Dials one of the 100 system or tenant-specific speed-dial telephone numbers when followed by a location code (00-99). Also used for reviewing system or tenant-specific speed-dial numbers at stations and for programming at the designated keyset. (Keysets use the SYS SPD key)
Transfer CO Call	345	Transfers an outside call to another station or to an outside telephone number. (Keysets use the XFR key)
Transfer Intercom Call	346	Transfers an intercom call to another station or to an outside telephone number.
Transfer CO/IC to Hold	347	Transfers a call to another station and places it on individual hold so that it does not ring or send call waiting signals while holding. (Keysets may use XFR and HOLD keys on outside calls)
Voice Computer Access	281-295	These codes can be assigned to feature keys or station keys to provide one-key access to voice computer hunt groups. They are associated with pilot numbers 236-250 respectively.

F. ATTENDANT FEATURE CODES

2.7 The following feature codes may be used only at designated attendant stations. Non-attendant station users hear reorder tones if they attempt to use these feature codes.

FEATURE NAME	CODE	DEFINITION
Attendant SAR	025	Generates a station activity report (SAR).
Clear System Alarm	019	Cancels a system alarm display.
Night Ring On/Off	010	Places system in night mode or cancels night mode. While in night mode, the night SCOS, outgoing access, ring-in and allowed-answer assignments are used.
Paging Speaker Music On/Off	018	Turns background music on or off to the external paging speaker(s).
Program Lines Out of Service	030	Removes lines from service (unequips them in programming) to allow service personnel to test and perform maintenance.
Program Lines In Service	031	Returns the lines to service that have been unequipped using the program lines out of service code described above.

FEATURE NAME	CODE	DEFINITION
Program Stations for Night Ring	011	Reprograms the database night lists for ring in and allowed answer for each station.
Program Station Data	022	Reprograms specific station data, including user name, tenant group, secretarial intercept, and serving attendant.
Program System Do-Not-Disturb Messages	024	Reprograms up to 19 of the 20 stored system do-not-disturb messages.
Program System Reminder Messages	023	Reprograms any or all of the 20 stored system reminder messages.
Program System Speed Dial	020	Programs tenant-specific or system-wide speed-dial numbers when followed by location codes (00–99). (Also accessed by the SYS SPD key and/or feature code 381.)
Set Time of Day	021	Programs system time, date, and day of week.

G. INTERCOM NUMBERS

2.8 Intercom numbers are recognized as feature codes by the system. When the system is initialized, the intercom numbers are assigned as follows:

Attendant	0
Stations	100–159
Hunt groups	231–250

3. SYSTEM ORGANIZATION

3.1 The GMX-48 System is designed to allow organization of the stations into groups. The following system features divide the system into manageable units for easier call processing and record keeping.

A. FLEXIBLE ATTENDANT ARRANGEMENTS

3.2 Attendants provide the following services for the stations they serve:

- Accessed by dialing "0"
- Central operators for incoming calls (if programmed for ring in)
- Message centers (if programmed)
- Recall stations for unanswered calls
- Receive and clear displayed system alarms (unless the system has been programmed to send them only to the primary attendant)
- Program specific station information
- Program system do-not-disturb messages
- Program system reminder messages
- Program all system speed-dial numbers including tenant-specific numbers. This ability can also be assigned to a non-attendant keyset.
- Place the system in night mode or day mode
- Set the system time of day, date, and day of week
- Program stations' allowed-answer and ring-in assignments for night mode
- Place lines out of service for maintenance purposes, and return them to service.
- Generate system activity report (SAR)
- Turn background music on or off for the external paging speakers

3.3 In addition to the capabilities listed above, one attendant can be designated as the primary attendant who can receive unsupervised C.O. recalls.

3.4 All attendant stations should be equipped with display keysets to show system alarms and recall sources. If desired, each attendant's keyset can also be used with a DSS/BLF Unit for one-key intercom access to all stations and for constant station/hunt group status indication.

No-Attendant Operation

3.5 The system will function without an attendant, but attendant features such as night mode, attendant recall, dial-zero access, and system/station programming cannot be used. A display keyset station must be programmed as the system alarm station to receive system alarm messages and unsupervised C.O. recalls. C.O. lines are programmed to ring in at any or all stations.

One-Attendant Operation

3.6 One attendant (generally designated as the primary attendant) has control of all the attendant features listed in paragraphs 3.2 and 3.3. All lines (except private lines) are usually programmed to ring in at this attendant's station.

Multiple-Attendant Operation

3.7 The system can be assigned as many attendants as needed (up to 48). C.O. lines are usually programmed to ring at any or all attendant stations. One attendant can be designated as the primary attendant. With this arrangement, the primary attendant can serve as the only system alarm station, or every attendant can receive alarm messages.

Night Mode Station

3.8 A programming option can be enabled that automatically places the system into night mode whenever the primary attendant station (or other designated station) is out of service due to a keyset failure or in the event that the keyset is unplugged. When the station is returned to service, an attendant must manually place the system back into day mode; the system will not cancel night mode automatically. When the system is initialized, this option is enabled and associated with station circuit 1.1 (the primary attendant).

B. AUTOMATED ATTENDANT

NOTE: This feature is available only in the *Advanced* software package and requires an APM.

3.9 The automated attendant is a programmable feature that can be used to provide some of the services normally handled by an attendant. It allows an outside party to dial into the system and automatically access (or be transferred to) an automated attendant station, which is generally a playback device with a prerecorded message. After hearing the message, the caller is disconnected from the automated attendant and hears three tones (followed by silence). The caller may then directly dial a station intercom number or hunt group pilot number.

3.10 Single-line circuits can be designated as automated attendant stations in database programming and can be assigned direct ring in for specific C.O. lines. The number of automated attendant stations is limited to the number of available single-line circuits. Keyset circuits cannot be programmed as automated attendant stations.

NOTE: Due to the natural characteristics of the C.O. line, the volume level of DTMF tones transmitted over the line may be substantially reduced before reaching the GMX-48 System. This natural degradation in tone volume may adversely affect the reliability of the automated attendant feature. Other factors which can affect automated attendant performance are C.O. line noise, the quality of the playback device, and the quality and strength of the DTMF tones generated by the off-premises phone itself.

Automated Attendant Applications

3.11 There are a number of different uses for this feature. For example, direct ring-in calls to a busy attendant could be forwarded to an automated attendant (using one of the forwarding features). Another option is to have calls ring in directly to an automated attendant when the system is in day and/or night mode. Or, a group of automated attendants could be assigned to one hunt group. In this situation, a call would ring in or be transferred to the hunt group pilot number where it would circulate until an available automated attendant answered the call.

3.12 Another possibility is to assign an automated attendant as an announcement or overflow station in an existing hunt group. Unlike standard announcement or overflow stations, the caller hears three tones (and then silence) after being disconnected and can dial another intercom number.

NOTE: If this option is used, the programmer must answer "NO" to the "IS THE ANNOUNCEMENT/ OVERFLOW STATION A PLAYBACK DEVICE?" prompt in program [E] hunt groups, as described on page 5-75 IN PROGRAMMING. If the prompt is answered "YES," the announcement or overflow feature will override the automated attendant feature. Refer to page 4-18 for more information about overflow and announcement stations.

Automated Attendant Call Processing

3.13 When a station receives a call that has been routed through the automated attendant, the call rings as a transferred call. The outside caller hears music until the call is answered or disconnected. If the called station is forwarded, the call follows the programmed forward. If the called station is busy or does not answer, the call is transferred to the automated attendant's designated recall station after the appropriate transfer timer expires. (If the designated recall station does not answer the call, it is disconnected after the abandoned recall timer expires. If the automated attendant does not have a designated recall station, the call transfers to the called party's attendant after the appropriate transfer timer expires.)

3.14 When a hunt group pilot number receives a call that has been routed through the automated attendant, the call rings as a direct ring in call and circulates according to how the hunt group is programmed (i.e., linear, distributed, or all ring). Refer to page 4-17 for more information on hunt group calls.

3.15 The caller cannot access C.O. lines or any other feature through the automated attendant station. An attempt to do so automatically transfers the call to the automated attendant's attendant.

NOTE: If the automated attendant does not have an assigned attendant, calls normally routed to the automated attendant's attendant will instead go to the primary attendant or designated system alarm station.

3.16 To avoid possible camp-on tone interruptions during calls, it is recommended that camp-on tones be disallowed for the automated attendant.

3.17 Intercom calls to an automated attendant are handled the same as normal intercom calls. After hearing the message, the caller is disconnected and hears intercom dial tone. Intercom callers cannot use automated attendant features.

Playback Devices As Automated Attendants

3.18 Playback devices are generally used at the automated attendant(s). When an outside call rings in or is transferred to an automated attendant, the playback device plays a message (giving dialing instructions) and then disconnects from the call. The caller hears three tones (followed by silence). If using a DTMF telephone, the caller can dial a station intercom number or hunt group pilot number to access the desired station or hunt group, or dial "0" for the automated attendant's attendant. If an invalid number is dialed or the DTMF decoders are busy, the call is immediately transferred to the automated attendant's attendant. If using a rotary telephone or unsure of the intercom number, the caller can wait on the line for the automated attendant's attendant to be called after the SL dial initiation timer expires.

3.19 Playback device installation is described on page 3-46 in INSTALLATION. C.O. line ring-in programming is described on page 5-49 in PROGRAMMING. C.O. lines should not be programmed to ring in to multiple playback devices. Use the call forwarding or hunt group feature if multiple playback devices are to be used.

Dialing During Recording

3.20 A database option allows the programmer to determine if the system will accept a caller's DTMF tones (dialed intercom or hunt group pilot numbers) while the automated attendant is giving dialing instructions (rather than having to wait until three tones are heard after the automated attendant hangs up). If the option is enabled, callers who know the intercom or pilot number station they wish to call can dial the number any time after the automated attendant answers the call.

NOTE: The reliability of allowing callers to dial during the instructions may be affected by the voice characteristics of the person giving the instructions, the quality of the playback device, the C.O. line noise levels, the DTMF tone levels, etc. If frequent problems occur, this option should be disabled.

3.21 The single-line circuit that is designated as an automated attendant can be programmed as having an associated DTMF port, which allows it to be connected to an Automated Attendant Adapter. The adapter uses the automated attendant circuit and one other single-line circuit to permit DTMF tones to be sent to the KSU while voice transmission is being sent to the automated attendant. This application is necessary when using some digital voice recorders.

Automated Attendant Do-Not-Disturb Breakthrough

3.22 Direct ring-in calls are not blocked by do-not-disturb; they ring at the called station. However, the database contains an option that allows or disallows automated attendant (and DISA) calls to break through do-not-disturb on a station-by-station basis. If do-not-disturb breakthrough is disallowed, calls through the automated attendant to a station in do-not-disturb are immediately sent to the automated attendant's designated recall station (or, if one does not exist, the called party's attendant). If do-not-disturb breakthrough is allowed, the call rings at the station and, if unanswered, is transferred to the automated attendant's designated recall station after the appropriate transfer timer expires.

Digit Translation

3.23 As described on the previous pages, the automated attendant feature allows outside callers to access the system and directly dial intercom numbers or hunt group pilot numbers. To simplify this process and to help prevent the system from having problems recognizing digits (due to C.O line noise levels, DTMF tone levels, etc.) or to restrict callers to specific intercom numbers, a feature called digit translation may be used. Digit translation allows callers to dial a single digit to access a designated intercom number or hunt group pilot number. Up to ten digit translation storage locations (0-9) are available in database programming (refer to PROGRAMMING, page 5-49).

3.24 To use digit translation, the programmer enters an intercom number or hunt group pilot number in the desired translation location (0–9). A caller accessing the system through the automated attendant can then dial the single-digit location number to reach the designated intercom number or hunt group pilot number. For example, if the pilot number for a customer support group was entered in translation location number 3, the automated attendant's message might say: "Dial 3 for customer support." This is easier than dialing a three-digit number, leaves less room for user error, and helps to prevent the system from making digit recognition errors.

3.25 To allow callers to dial zero for the attendant or dial station intercom numbers, it is recommended that translation location numbers 0 and 1 be left blank. For example, if location 1 is assigned pilot number 231, any automated attendant caller attempting to dial a station intercom number that begins with one (100–159) will instead be transferred to 231.

C. TENANT GROUPS

3.26 Tenant service allows the customized distribution of C.O. lines among multiple users sharing a common Key Service Unit (KSU). Assigning groups of stations to different tenant groups can be useful for comparing the number and estimated cost of calls that each tenant group makes and receives. See SAR, page 4-104, for details.

3.27 This form of partitioning is ideal in instances where several small businesses or departments within a larger company wish to operate as separate identities for such purposes as account billing or budgeting.

3.28 Four tenant groups can be established in the system. Each station must be assigned to one (and only one) tenant group. When the system is initialized, all stations are in tenant group 1. Stations are assigned to soft key groups to determine which C.O. lines can be accessed by the line keys. All stations within a single tenant group are not required to be in the same soft key group.

3.29 Traffic (communication) between tenant groups can be allowed or denied in database programming. If cross-tenant conversations are denied, a station (including the attendant) can only call other stations within its tenant group and calls cannot be transferred or forwarded between tenant groups. Therefore, if cross-tenant traffic is denied, each tenant group should be assigned its own attendant.

3.30 In database programming, each system speed-dial number can be programmed for use by stations in a single tenant group or by all stations in the system. The attendants can program the tenant-specific and system-wide speed-dial numbers.

3.31 A programming option can be enabled that allows voice mail stations to access stations that are not part of the same tenant group when cross-tenant traffic is denied. If this option is not enabled, and cross-tenant traffic is denied, the voice mail stations have the same limitations as any other station.

D. HUNT GROUPS

3.32 The hunt group feature permits calls to be placed to a group of stations and to be automatically transferred to an available station within the group. Stations in these groups are accessed by dialing a special intercom number called a pilot number (initialized as 231–250). Individual stations within hunt groups can also be accessed using their assigned intercom numbers.

3.33 There are two types of hunt groups: station and voice mail/voice computer.

- **Station hunt groups (hunt groups 1–5):** Up to five station hunt groups can be programmed in the database (hunt group 1 can have up to 60 stations, while hunt groups 2 through 5 can have up to 20 stations each).

- **Voice mail/voice computer hunt groups (hunt groups 6–20):** Up to 15 voice mail/voice computer hunt groups can be programmed that contain single-line circuits which are connected to voice mail. Groups 6–10 can include as many as 16 voice mail circuits each, and groups 11–20 can have up to 8 circuits each. These hunt groups can be assigned special dial rules that signal the voice mail unit to perform such tasks as dialing a voice mail access number or the called station's mailbox number (refer to page 4–22 for more information on voice mail groups).

  NOTE: The voice mail computer group feature is available only in the *Advanced* software package and requires an APM.

Station Hunt Group Call Distribution

3.34 When an intercom or outside call is transferred or rings in to the pilot number, it either rings at all stations in the hunt group (all ring) or circulates through the hunt group in linear or distributed order until answered, as described below.

- **All-ring:** Incoming calls ring simultaneously at all stations in the hunt group. If any stations are busy, the call camps on and sends call waiting signals to those stations.

- **Linear order:** Incoming calls always start circulating by ringing at the first station on the list stored in the database. If that station is busy, or if there is no answer before the no answer advance timer ex-

pires, the call goes to the next station on the list. When the system reaches the end of the list, it returns to the beginning of the list.

- **Distributed order:** To even out the call load, distributed order shifts the starting point of each call. When a station user receives a call, the next station on the list receives the next incoming call. If a station is busy, or if there is no answer before the no answer advance timer expires, the call goes to the next station on the list. When the system reaches the end of the list, it returns to the beginning of the list.

3.35 The order in which hunt group stations receive circulating, incoming calls (intercom, transferred, direct ring-in, and DISA calls) is determined by a list stored in the database. A station can appear in a single list more than once and it can appear in multiple hunt group lists, if desired.

Station Hunt Group Call Processing

3.36 Hunt group stations receive the following indications when a call is ringing in:

- If an outside call is ringing, each of the hunt group stations in an all-ring hunt group, or the designated station in a linear or distributed hunt group, the associated line key will flash to indicate a ringing call until the call is answered.

- If all stations are busy, an intercom or outside call will camp on and cause the system to send camp-on tones and display messages to all stations in the hunt group. If an outside call is ringing, all of the hunt group stations will have the associated line key flashing to indicate a ringing call. As soon as one station is available, the camp-on tone and message end, and the available station receives intercom or C.O. ringing (the line key stops flashing at all other stations). Camped-on calls follow the recall route as described on page 4–19.

- If *every* station in a linear or distributed hunt group, or *any* station in an all-ring hunt group, is in do-not-disturb, has hunt group remove enabled, or is forwarded, an incoming call will flash on the associated line key until the call is answered or the caller hangs up.

- If an out-of-range C.O. line (lines 13–24 on a 12-line keyset) rings in or is transferred to a busy hunt group, all stations in the group receive a call waiting message and a camp-on tone. The line key flashes at those stations with an associated line key. At 12-line keyset stations with the OVER key enabled, the OVER key does not flash until the user ends the current call. Then the key flashes at that station. If a user presses the OVER key before hanging up (before the OVER key starts flashing), reorder tones are heard.

3.37   A C.O. line can be programmed to ring in directly to one or more intercom numbers or to a single pilot number. If assigned to a pilot number, ring in for the line cannot be assigned to any other pilot or intercom number.

3.38   Stations within the hunt group can receive direct C.O. ring-in, intercom, forwarded, or transferred calls to their individual intercom numbers without affecting other stations in the hunt group.

3.39   Hunt group programming affects the call forwarding feature in several ways:

- If a station in a linear or distributed hunt group is in call forward mode, the station will not receive hunt group calls. However, if a station in an all-ring hunt group is in call forward mode, the line key will flash to indicate a ringing hunt group call (but the station will not ring).

- If an announcement station or overflow station has call forwarding enabled, hunt group calls will not follow the forward, but will remain at the station. (An exception to this occurs when hunt groups are programmed with multiple announcement stations; refer to PROGRAMMING, page 5-75.)

- Stations can forward calls to a hunt group's pilot number.

- Hunt group members should not be assigned secretarial intercepts; such an assignment would have the effect of permanently removing them from the hunt group.

3.40   If cross-tenant traffic is denied, hunt group stations not in the same tenant group as an intercom caller do not receive the incoming intercom call.

3.41   If an outside call rings in or is transferred to a pilot number that does not have hunt group station assignments, the call is sent to the primary attendant (or the system alarm station if there is no primary attendant). If a station user attempts to transfer an intercom call to an invalid pilot number, the call is placed on transfer hold; the intercom call can be reaccessed so that the transfer can be attempted again using a valid number.

3.42   When a DISA call or a call routed through the automated attendant rings at a hunt group member's station, it is displayed as a direct ring-in call.

3.43   Hunt groups can be assigned as message centers for individual stations.

Announcement And Overflow Stations

3.44   Two types of special stations can be programmed to help calls circulate through the hunt group more efficiently: hunt group announcement stations and hunt group overflow stations. (Announcement stations are not available in *Intermediate* software.)

3.45   Announcement and overflow stations are not included in the hunt group list; they are individual stations that receive unanswered calls when all of the hunt group stations are unavailable. Announcement and overflow stations can be assigned to separate stations or they can be the same station. Also, each of the up to five hunt groups can have the same announcement and overflow stations or they can be assigned different stations.

3.46   **Announcement Stations:** When a C.O. call *rings in directly* to a hunt group (not transferred), it rings at all stations or circulates in linear or distributed order until it is answered or the announcement timer expires. If the timer expires, the unanswered call is sent to one of up to three designated announcement stations (outside of the hunt group). An announcement station can be a playback device that answers the call, plays a message, and then disconnects from the call to transfer it back to the hunt group. Or, the announcement station can be a station or hunt group where a user greets the caller and, if desired, may return the call to the hunt group using the call transfer feature. If the announcement station is an automated attendant, the caller hears three tones (and then silence) after the message and can dial

another intercom number, rather than being returned to the hunt group. Each direct ring-in call will transfer to the announcement station(s) only once.

3.47 To handle heavy incoming traffic, each hunt group can be programmed with up to three announcement stations. With multiple announcement stations, an unanswered call is sent to the first announcement station on the list (after the announcement timer expires). If the first announcement station is unavailable (no answer or busy), the call is forwarded to the second announcement station, and so on. Once the call reaches the last announcement station on the list, it remains there until the forward no answer timer expires. It then forwards to the first announcement station on the list and starts the process over again, continuing until the call is answered or the caller hangs up.

NOTE: If a keyset or single-line set (rather than a playback device) is part of a multiple announcement station list, all calls to the station are processed according to the programmed forward condition. The station user cannot cancel or reprogram the forward unless the station is removed from the multiple announcement station list in database programming.

3.48 Overflow Stations: When a C.O. call is *transferred or recalling* to a hunt group, it rings at all stations or circulates in linear or distributed order until it is answered or the overflow timer expires. If unanswered when the timer expires, the call is sent to an overflow station. The overflow station can be another hunt group (*Advanced* and *Basic* software packages only), a station not in the group, or a playback device. If it is a playback device, the programmer can determine the number of times (up to 25) that the call will be allowed to transfer back to the hunt group and then return to the overflow station. (After the determined number of returns, the call becomes a recall.) If the overflow station is another hunt group or a station, the call can only be sent to the overflow once, unless the user transfers it back using the call transfer feature.

Unanswered Station Hunt Group Calls

3.49 The path that an unanswered hunt group call follows is determined by the configuration of the hunt group, as outlined in the following paragraphs. Note that intercom calls (direct or transferred) will not

transfer to the announcement or overflow stations, and transferred intercom calls will not recall.

● **Direct ring-in outside calls:**

— *With a playback device announcement station.* If a direct ring-in call remains unanswered when the hunt group announcement timer expires, the call is sent to an announcement station playback device. After the message is played and the playback device disconnects from the call, the call is automatically transferred back to the hunt group. (In distributed hunt groups, the call begins circulating at the station that appears on the list after the last station that rang before the call was sent to the announcement station. In linear hunt groups, it begins circulating at the first station on the list. In all-ring hunt groups, the call rings at all available stations.) If the call remains unanswered, it then transfers to the overflow station (refer to the transferred call recall information below) or, if there is no overflow station, it recalls the primary attendant or system alarm station.

— *With a non-playback announcement station.* When an unanswered direct ring-in call is sent to a non-playback announcement station (after the hunt group announcement timer expires), the call remains at the announcement station until it is answered or the caller hangs up. After the announcement station user answers, the call is processed as a normal C.O. call (if desired, the call can be manually transferred back to the hunt group using the call transfer feature).

— *Without an announcement station.* A direct ring-in call rings at or circulates through the hunt group until answered or the caller hangs up; it is not sent to the overflow station, nor does it recall the primary attendant or system alarm station.

● **Transferred outside calls or calls recalling the hunt group:**

— *With a playback device overflow station.* If a transferred C.O. call remains unanswered when the hunt group overflow timer expires, the call is sent to an overflow station playback device. After the message is played and the playback device disconnects from the call, it is automatically transferred back to the hunt

group the programmed number of times. (In distributed hunt groups, the call begins circulating at the station that appears on the list after the last station that rang before the call was sent to the overflow station. In linear hunt groups, it begins circulating at the first station on the list. In all-ring hunt groups, the call rings at all available stations.) If the call remains unanswered after returning to the overflow station for the last time, the call returns to the hunt group until the overflow timer expires, and then recalls the original transferring station.

NOTE: If the transfer came from the announcement station or an automated attendant, the call recalls the primary attendant or system alarm station.

— *With a non-playback overflow station.* When an unanswered transferred C.O. call is sent to a non-playback overflow station, the call remains at the overflow station until it is answered or until the recall timer expires; it then recalls the transferring station. If the call still remains unanswered, it recalls the transferring station's attendant.

NOTE: If the transfer came from the announcement station, the call recalls the primary attendant or system alarm station.

— *Without an overflow station.* An unanswered call circulates until the hunt group overflow timer expires and then returns to the original transferring station. If the call still remains unanswered, it recalls the transferring station's attendant.

● To avoid the recall timers:

— A hunt group can be assigned as its own overflow station (if using the *Advanced* software package). The call will circulate through the hunt group until it is answered or the caller hangs up.

Hunt Group Remove/Replace And Do-Not-Disturb

3.50 Hunt group members can temporarily halt hunt group calls to their station by entering the hunt group remove feature code as described below. Also, the do-not-disturb feature can be used to block all in-coming hunt group calls to a station. Announcement stations and overflow stations cannot block hunt group calls using the do-not-disturb or hunt group remove features.

3.51 When the hunt group remove feature is enabled, the user will not hear ringing or receive the camp-on message display for calls to the hunt group unless it is in an all-ring hunt group. In linear and distributed hunt groups, the line key flashes only if all other hunt group members are unavailable — busy, in do-not-disturb, with calls forwarded, or with hunt group remove enabled. (The station continues to receive calls placed to its intercom number.) All-ring hunt group stations will have flashing line keys, but no display, while in hunt group remove mode or do-not-disturb. Hunt group overflow and announcement stations cannot block hunt group calls.

3.52 *TO REMOVE OR REPLACE THE STATION'S HUNT GROUP CALLS:*

(1) **Keyset:** While on or off hook, press SPCL.

   Single-Line Set: Lift the handset.

(2) Enter the hunt group remove feature code (322) to halt hunt group calls or enter the hunt group replace feature code (323) to return the station to its hunt group(s).

(3) *If off hook,* hang up.

Station Call Monitoring

3.53 This feature allows hunt group supervisors to monitor the outside calls of anyone in a specified station hunt group. It can be useful in training or in evaluating the performance of hunt group members. (Voice mail/voice computer hunt groups cannot have supervisor stations.)

NOTE: As a courtesy, hunt group members should be notified in advance that their calls may be monitored. In *Advanced* and *Intermediate* software (with an APM), an option can be enabled that periodically sends a tone to the station being monitored whenever the hunt group supervisor is listening to a call. How often the monitoring tone is heard is controlled by a programmable timer. (Note that call monitoring may be illegal in some locations. It is up to the end user to ensure that use of this feature is in compliance with local laws.)

3.54 In database programming, each hunt group can have one keyset user assigned as the hunt group supervisor. This can be any keyset user, even if it is not a member of the hunt group. If the supervisor is a member of the hunt group, the hunt group remove/replace feature can be used at any time without affecting the station monitor ability. If desired, one keyset can be assigned as the supervisor of multiple hunt groups.

3.55 To monitor a hunt group member's call, the supervisor enters the station call monitoring feature code and dials the desired intercom number. The supervisor is connected to the ongoing call and can hear both parties, but cannot be heard by either one. If using a display keyset, the top line of the supervisor's display shows the hunt group member's intercom number (or user name) and line number (or line identification). The bottom line of the supervisor's display shows the hunt group member's call cost information (just as it is on the hunt group member's display). If the monitored call is terminated, transferred, or placed on hold by the hunt group member, the monitor function is terminated.

3.56 In the associated hunt group, the supervisor may monitor any active CO-to-intercom call (both hunting and non-hunting), including incoming, outgoing, and DISA-to-intercom calls. Conference calls and calls that do not involve hunt group members cannot be monitored. Also, if privacy release is enabled system wide and another keyset user joins an ongoing CO-to-intercom call that is being monitored (i.e., joins it by lifting the handset and pressing the busy line key), the call monitoring function is terminated.

3.57 If the supervisor attempts to monitor a station that is already being monitored or one that is not on an active CO-to-intercom call, the system sends reorder tones and allows the supervisor to dial another intercom number. If the supervisor attempts to monitor a station that is not in the hunt group or an idle station in the hunt group, the system sends reorder tones and cancels the monitor feature.

3.58 *TO MONITOR A HUNT GROUP CALL (DESIGNATED SUPERVISOR ONLY):*

(1) **EITHER,** while on hook, press SPCL and enter the station call monitoring feature code (396). You hear a confirmation tone and the SPKR key lights.

OR, while off hook, enter the station call monitoring feature code (396). You hear a confirmation tone.

(2) Dial the intercom number (or press the lit speed-dial or DSS/BLF key) of the station to be monitored. You are automatically connected to the call and the display shows the intercom identification, line identification, and the monitored station's call cost information. The MUTE key lights.

(3) **EITHER,** monitor another hunt group member's call by pressing SPCL, entering the station call monitoring feature code (396), and dialing the intercom number (or pressing the speed-dial key). Or, if using a DSS/BLF Unit, simply press another hunt group member's DSS/BLF key.

OR, terminate the monitor feature. *If off hook,* hang up. *If on hook,* press the SPKR key.

OR, place or receive a call by pressing the IC key or a line key (or the ANS key).

OR, access another feature by pressing the SPCL key and entering the desired feature code.

E. VOICE MAIL/VOICE COMPUTER HUNT GROUPS

NOTE: The voice mail computer group feature is available only in the *Advanced* software package and requires an APM.

3.59 If desired, single- or multi-port voice mail systems can be connected to APM circuits on the GMX-48 System. Calls can be received as direct ring-in (outside or intercom), forwards, or transfers from stations, automated attendants, secretarial intercepts, or message centers. After a message is recorded by the voice mail unit, a message waiting indication is left at the appropriate station location, and the message can easily be retrieved by the user.

3.60 The separate voice mail ports on a multi-port unit can be placed in a hunt group. Incoming calls to the voice mail unit can then be sent to a single intercom number where they can be processed even if one port is busy or out of service.

3.61 Up to 15 voice mail/voice computer hunt groups can be programmed that contain voice mail ports. As many as 16 voice mail ports can be assigned to hunt groups 6–10 and up to 8 ports can be assigned to groups 11–20.

3.62 The order in which the voice mail ports receive incoming calls (intercom, transferred, direct ring-in, and DISA calls) is determined by a list stored in the database. A port can appear in a single list more than once and it can appear in multiple lists, if desired.

3.63 If a call is not answered by the first port on the list before the no answer advance timer expires, the call is sent to the next port on the list. If the call remains unanswered when the return timer expires, it will recall the transferring station (if the call was transferred to the voice mail group) or to the primary attendant.

Recalls

3.64 A recall destination is assigned to voice computer hunt groups. The recall destination can be a station or another hunt group. If a call is transferred by the voice computer, and the recall timer expires, the call is sent to the designated recall destination. If there is no recall destination, the call recalls the primary attendant.

Voice Computer Dial Rules

3.65 The GMX-48 System has the ability to support voice mail *computers* which are special voice mail units that can process codes for communicating detailed information about the status, origin, and destination of the call between the computer and the GMX-48 System, and can dial feature codes. Refer to the manual provided with your voice computer to determine if dial rules should be used and which dial rules are most suited to your specific voice computer. You can use the preset dial rules or send specific digits by programming custom dial rules. (For example, a dial rule can be used for dialing "365" which is the message feature code.) The preset dial rules and the codes that they send are as follows.

3.66 Dial rule 1 — Originating extension: Dials the intercom number of the individual who initiated the call. For example, if extension 200 called a voice computer hunt group that used dial rule 1, the system would send "200" to the voice mail unit. This is a general purpose dial rule; it can be used for things such as automatically accessing the caller's mailbox, etc.

3.67 Dial rule 2 — Controlling extension: This dial rule is meant for use with voice computer conference features *not yet developed*. It dials the intercom number of the station user that brought the voice computer into the conference. For example, if extension 200 is talking to extension 201 and extension 200 brings a voice computer hunt group that uses dial rule 2 into the call using the conference feature, the system would send "200" to the voice computer. The call could then be recorded in mailbox number 200 so that it can be replayed and/or transcribed later.

3.68 Dial rule 3 — Destination extension: This dial rule has two purposes: (1) It dials the extension of the station that is forwarded to the voice computer hunt group. For example, if extension 201 calls extension 202 and extension 202 forwards the call to extension 200 who forwards the call to a voice computer hunt that uses dial rule 3, the system would send "200" to the voice mail unit whenever a call was forwarded through the chain. This dial rule is useful for installations in which only a few extensions in a building have mailboxes. Assuming that only an extension that had a voice mailbox would forward to a voice computer, the system should dial the extension that would most likely have a voice mailbox. (2) It dials the intercom number of a station when a call is transferred to the

voice mail unit. For example, if extension 100 transferred a call to a voice computer hunt group that used dial rule 3 and entered "200" in response to the system-generated prompt, the system would dial "200" when it transferred the call to the voice computer.

3.69 Dial rule 4 — Original destination extension: This dial rule dials the original destination of the call. For example: If extension 200 dials a voice computer hunt group that uses dial rule 4, the system would not dial anything for this dial rule because there was not a "destination." However, if extension 201 dialed extension 200, which was forwarded to extension 202 which was forwarded to a voice computer hunt group that used dial rule 4, the system would dial "200." Similarly, if extension 100 transferred a call to a voice computer hunt group that used dial rule 4 and entered "200" in response to the system-generated prompt, the system would dial "200" when it transferred the call to the voice computer.

3.70 Dial rule 5 — Originating extension's secretarial intercept: This dial rule dials the secretarial intercept of the station that initiated the call. For example, if extension 201 had extension 200 programmed as its secretarial intercept and extension 201 called a voice computer hunt group that used dial rule 5, the system would send "200" to the voice mail unit. This dial rule is meant to be used with features such as dictation equipment that allows users to record a message and have it automatically sent to his or her secretary's mailbox.

3.71 Dial rule 6 — Other extension: This dial rule is meant for conferencing features not implemented at this time. It is the opposite of dial rule 2. Where dial rule 2 would dial the intercom number of the station that brought the voice computer hunt group into the conference, this dial rule will dial the other intercom number that is involved in conference. This dial rule is meant to be used only during two-party calls. It is useful for features such as a "wake-up message" in which an operator in a hotel would receive a call from someone wanting a wake-up call. The operator could then invoke the "wake-up" feature and enter a time for the other person while in a conference on a call.

3.72 Dial rule 7 — Hunt group number: This dial rule tells the voice computer which hunt group it serves (as an announcement or overflow station). For

example, if a call overflows from hunt group 1 into a voice computer hunt group that uses dial rule 7, the system will send "01" to the voice computer. This dial rule is meant to be used for the voice computer performing announcement or overflow functions for one or more hunt groups.

3.73 Dial rule 8 — Tenant group number: This dial rule tells the voice computer which tenant group the originating extension is in. For example, if extension 200 is in tenant group 1 and it calls a voice computer hunt group that uses dial rule 8, the system will send "1" to the voice computer.

3.74 Dial rule 9 — Department number: This dial rule tells the voice computer which department the originating extension is in. For example, if extension 200 is in department number 1 and it calls a voice computer hunt group that uses dial rule 9, the system will send "1" to the voice computer. This dial rule can be used in conjunction with dial rule 8.

3.75 Dial rule 10 — Day/night flag: This dial rule will dial a "1" if the originating extension's tenant group is in day mode. Otherwise, it will dial "0." This dial rule is useful for determining when the system is in night mode and indicating that the attendant station is therefore unavailable.

3.76 Dial rule 11 — Account code: This dial rule will dial the account code, if any, that was previously assigned to a call.

3.77 Dial rule 12 — Call type: This dial rule will identify the type of call. If the call is an intercom call, the system will dial a "1" for this dial rule. Otherwise, this dial rule will dial a "2."

3.78 Dial rule 13 — Hunt group queue position: This dial rule will identify the queue position the call was in (first, second, third...) while waiting for the hunt group. For example, if there was one other call ahead of this call when it overflowed to a voice computer hunt group that uses dial rule 13, the system would dial "2" for this dial rule. This dial rule is designed for future features such as hunt group overflow processing in which the recording tells the caller, "There are five calls ahead of your call." **NOTE:** This is not useful for the current method of processing hunt group calls since the call loses its position in the hunt group when it is sent to the overflow station.

3.79 Dial rule 14 — Hunt group overflow count: This dial rule will dial the number of times that the call has been sent to the overflow station. If a call overflows to a voice computer hunt group with dial rule 15, the system will dial "1" the first time, "2" the second time, etc. This is useful for features such as hunt group overflow processing in which the voice computer plays different messages or performs different types of processing depending upon the number of times a caller receives an overflow message.

3.80 Dial rule 15 — Dial recall extension: This dial rule dials the intercom number of the station that received a transfer recall. The basic operation is the same as dial rule 4, except that this rule is intended for entering the voice mail system through a recall and dial rule 4 is for entry through direct dialing. It is useful for automated attendant applications to make the call transfer appear supervised.

DIAL RULE		IC-TO-VOICE COMPUTER CALL	C.O.-TO-VOICE COMPUTER CALL
1	Originating extension	Originating station's intercom number	No code sent
2	Controlling extension	Originating station's intercom number	No code sent
3	Destination extension	Intercom number of last non-voice mail station to forward the call if a chain of stations is forwarded to voice mail or voice mail transfer mailbox number	Intercom number of last non-voice mail station to forward the call if a chain of stations is forwarded to voice mail or voice mail transfer mailbox number
4	Original destination extension	Intercom number of the first non-voice mail station to forward the call if a chain of stations is forwarded to voice mail	Intercom number of the first non-voice mail station to forward the call if a chain of stations is forwarded to voice mail
5	Secretarial intercept	Intercom number of the originating station's secretarial intercept station or the originating station if there is no intercept.	No code sent
6	Other extension/ Controlling extension	Originating station's intercom number	No code sent
7	Hunt group number	Receiving hunt groups or voice mail group number	Receiving hunt group or voice mail group number
8	Tenant group number	Originating station's tenant group number	No code sent
9	Department number *(Not used on the GMX-48 System)*	No code sent	No code sent
10	Day/night flag	If system is in day mode = 1 If system is in night mode = 0	If system is in day mode = 1 If system is in night mode = 0
11	Account code	No code sent	Account code, if entered
12	Call type	Intercom call: code = 1	Outside call: code = 2
13	Hunt group queue position	No code sent	Number of calls waiting ahead of this call for the hunt group
14	Hunt group overflow count	No code sent	The number of times this call has been sent through the hunt group
15	Dial recall extension	Intercom number of the station that received a transferred call which recalls. This applies even if the receiving station is forwarded; it uses the intercom number that was dialed to make the transfer, not the final destination.	No code sent

4. C.O. LINE FEATURES

4.1 The GMX-48 System can contain up to 24 C.O. lines. This section explains the C.O. line functions and programmable features.

NOTE: While this system is designed to be reasonably secure against C.O. line misuse by outside callers, there is no implied warranty that it is invulnerable to unauthorized intrusions. If the central office does not provide supervision and disconnect the call when one party hangs up, it is possible for a caller to remain connected to a C.O. line circuit. If this happens, and the caller begins dialing, the call could be placed through the system and would then be billed to the system's owner. The system cannot check this type of call for toll restriction and may not register the call in SMDR. This problem could arise when a call is connected to a station, or when it is forwarded or transferred to the public network.

A. DUAL-TONE MULTI-FREQUENCY (DTMF) OR DIAL-PULSE SIGNALLING

4.2 C.O. lines can be designated for DTMF or dial-pulse signalling through database programming (see PROGRAMMING, page 5-36).

4.3 A digital code is generated by the keysets and decoded by the KSU to be sent as either a DTMF or a dial-pulse signal depending on the line designation. While using a dial-pulse line, a keyset user can switch to DTMF dialing simply by pressing the pound (#) or asterisk (*) key. After pressing the pound or asterisk key, any digits that follow for that call are sent out as DTMF. (This is useful when calling computerized services that require a DTMF telephone, such as automated banking.) Single-line sets should use only DTMF lines.

B. OUTGOING-ACCESS, ALLOWED-ANSWER, AND RING-IN ASSIGNMENTS

4.4 Each C.O. line has programmed lists of stations for outgoing-access, allowed-answer, and ring-in assignments:

- **Outgoing-access** assignment for a particular line permits the station user to place calls using that line.

- **Allowed-answer** assignment for a particular line permits the user to answer incoming calls on that line. Although the call can be answered, it does not ring at the user's station. On keysets, the line key flashes to indicate an incoming call.

- **Ring-in** assignment for a particular line permits the station user to receive direct ring-in calls on that line. The station rings and, on keysets, the line key flashes. Allowed answer for the line is automatically assigned to a station with ring in.

4.5 When keyset stations have at least one of these three assignments, the associated line keys show the status of their lines.

4.6 Stations that do not appear on any of the C.O. line lists cannot place or directly receive outside calls; they are limited to intercom calls, conferences, transferred calls, and retrieving calls on system hold.

4.7 A private line can be established by programming outgoing-access, ring-in, and allowed-answer assignments for the line to only one station.

C. DAY AND NIGHT MODES

4.8 There are separate lists in the database for station toll restrictions, outgoing access, allowed-answer, and ring-in assignments for day and night modes. While the system is in day mode, calls ring in to stations on the day lists and can also be answered by stations on the allowed-answer and outgoing access day lists. When an attendant places the system in night mode, the system uses the night lists.

4.9 The database night mode lists for allowed answer and ring in can be reprogrammed from any attendant's keyset for any of the C.O. lines and stations. Refer to page 4-95.

4.10 There is no attendant recall during night mode. A call will recall the station that transferred it or put it on hold and will ring there until the recall and abandoned recall timers expire; then the system will disconnect the call.

D. C.O. LINE RESTRICTION AND STATION TOLL RESTRICTION

4.11 C.O. lines and stations can be toll restricted using several methods. Lines can be "subject to toll

restriction" or "unrestricted." They can also be identified to allow equal access dialing and/or to absorb digits. Stations can be toll restricted using a combination of eight station class of service (SCOS) restrictions and/or they can be restricted from accessing specific lines. Each of the C.O. line and station restrictions is described separately in the following paragraphs. SCOS can be programmed differently for day and night modes, on a station-by-station basis.

Line Restriction

4.12 C.O. line access is programmed on a station-by-station basis. Each individual station can be allowed access to or denied access to each individual C.O. line separately for day and night modes. In addition, each C.O. line can also be designated as "subject to toll restriction" or "unrestricted" in database programming. (All lines are subject to toll restriction when the system is initialized.) When a station user selects a line that is designated as subject to toll restriction, the system checks the database for that station's SCOS. When an unrestricted C.O. line is chosen, the station's SCOS is not checked nor is dialing required to hold the line.

4.13 Lines are often programmed as unrestricted to allow station users to have access to reduced-cost long distance carriers, or to use ringdown lines, dictaphones, voice mail systems, and other auxiliary equipment. When the installer is programming unrestricted lines, one of four call cost factors can be selected to designate calls as free, local, 10-digit toll, or operator/ international. The selected call cost is then used for all calls that are placed using that line.

Line Exemption From ARS Only

4.14 The line may be designated as "exempt from automatic route selection (ARS) only." (ARS is described in detail on page 4–30.) This allows users with SCOS 6 (ARS Only) to directly access specified C.O. lines by pressing the appropriate line keys (or the ANS key) or by entering the appropriate line access feature code. This feature is required if C.O. lines are connected to auxiliary equipment, such as voice mail, dictation, or ring-down equipment. When such lines are designated as exempt from ARS Only, stations with SCOS 6 and allowed access can use the special facilities.

4.15 Designating a line as exempt from ARS Only also allows ARS-Only stations to use the call forward to the public network feature. To do this, the line(s) must be assigned to a line group so that stations can enter a line group access code when programming the call forward number. For call forwarding and line group access purposes, all lines in the line group must be exempt from ARS Only; if not, an attempt to access the line(s) results in reorder tones.

4.16 The default assignment for all C.O. lines is "not" exempt from ARS Only. When a line is not exempt, all stations with SCOS 6 are denied direct access to the line.

Absorbed Digits

4.17 Restricted lines can be programmed to "absorb" or ignore the first digit(s) dialed so that only the remaining digits are checked for toll restriction and call cost purposes. There are two applications for this feature: PBX installations and installations in areas where part of the local office code is absorbed.

4.18 When a GMX-48 System is installed behind a PBX, users must dial special PBX codes to access the C.O. lines. Without absorbed digits, the lines must be unrestricted and the PBX performs the toll restriction and call cost functions. However, with absorbed digits, the GMX-48 System absorbs the PBX line access codes, checks the remaining digits for toll restriction, and calculates call cost.

4.19 When a number is dialed that does not match one of the absorbed digit strings (up to eight strings, with a maximum of eight digits in each string), it is considered an internal PBX call, toll restriction is passed, and the call is designated as a free call (000) in the SMDR report. When redialing or using call forward, the system automatically inserts a short pause after the PBX access code. (The PBX access code is entered as part of the call forward number.) When speed dialing, the speed-dial number must include the PBX access code and a pause before the telephone number.

4.20 In some rural areas, specific digits (dialed as all or part of the local exchange) are absorbed by the central office, thus reducing the number of digits required to dial local calls. To determine if a central office absorbs digits, contact the telephone company.

4.21 If the system is not programmed to recognize the absorbed digits, two problems may arise. One problem is that a telephone number of less than seven digits that is dialed at toll-restricted stations is not recognized as a valid telephone number and the call is dropped. The other problem is that toll restriction can be defeated by dialing the absorbed digits before dialing a toll number. However, when programmed to recognize a single string of absorbed digits (with up to eight digits in the string), the system checks the remaining digits for toll restriction and processes numbers with less than seven digits as local calls (except 411 calls, which are considered seven-digit toll calls). If the first non-absorbed digit is "1" or "0", SCOS 1, 2, and/or 8 are enforced immediately (see station class of service, beginning with paragraph 4.25). Absorbed digits appear in the SMDR record when dialed if they are not repeatable or suppressed.

4.22 Absorbed-digit designations are programmed on a line-by-line basis. No lines are designated for absorbed digits when the system is initialized. Refer to page 5-39 in PROGRAMMING for more information.

Equal Access

4.23 With equal access, the customer must choose a primary long distance carrier. This is the carrier that will automatically be accessed when the user dials a long distance telephone number. Customers may also select a secondary carrier or use several secondary carriers. These secondary carriers are accessed by dialing the equal access prefix (10) and a three-digit code assigned to the desired carrier (XXX) before dialing the telephone number. When using a secondary carrier, the telephone number is dialed as usual after the equal access code — including the toll field (1, 0, or 01) and the area code, if needed.

4.24 A restricted C.O. line that does not have equal access designation prevents the system from providing accurate toll restriction and call cost information when "10XXX" is dialed on that line. When programmed for equal access, the system ignores the "10XXX" and checks the remaining digits for toll restriction. Equal access designation is programmed on a line-by-line basis. All lines are designated for equal access when the system is initialized. To limit access to specific secondary carriers, the stations can be restricted to using ARS only (refer to paragraph 4.14).

Station Class of Service (SCOS)

4.25 SCOS is programmed on a station-by-station basis and each station can have different restrictions for day and night modes. A station can be completely unrestricted (SCOS 0) or can have any combination of the following restrictions.

> **CAUTION**
>
> REGARDING EMERGENCY NUMBERS
>
> In areas where the emergency number is 1911, be sure that toll-restricted stations have SCOS 8 (Enable ALD) and that 911 is in the allowed long distance number list. Otherwise, toll-restricted users may not be able to find a station that is permitted to dial "1+" numbers. Note that 911 is allowed at every station regardless of toll restriction, but 1911 requires this special programming.

4.26 SCOS 1 — **Operator restriction:** Calls that begin with a "0" are restricted. This also restricts international calls.

NOTE: If this restriction is not set, and a user dials "0" as the first digit when placing a call, only SCOS 3 is checked; no other toll restriction is checked.

4.27 SCOS 2 — **Toll access restriction:** This restricts calls that begin with "1" unless they are on the allowed long distance number list and the station has SCOS 8.

4.28 SCOS 3 — **International call restriction:** Calls that begin with "01" are restricted.

NOTE: If international calls are allowed (SCOS 1 and SCOS 3 are not set) and the user dials "01" as the first digits when placing a call, no other toll restriction is checked.

4.29 SCOS 4 — **Eight-digit call restriction:** Calls are not permitted if they are over seven digits in length, unless they are in the allowed long distance number list and the station has SCOS 8. Users with this SCOS must dial a valid telephone number before the appropriate interdigit timer expires, otherwise the connection will be dropped and the user will hear reorder tones.

4.30 SCOS 5 — Area/office code restriction: Area codes can be designated as restricted or allowed. Restricting an area code prevents users from placing calls to all office codes within that area code. Allowing an area code (other than the local area code) allows users to place calls to all office codes within that area code. Office codes within the local area code can be allowed or restricted on an individual basis.

4.31 SCOS 6 — ARS Only: Calls can only be placed using the automatic route selection (ARS) feature when this restriction is assigned. (ARS is described in detail on page 4-30.) The user will hear reorder tones when attempting to place a call using any other method. A restricted user can still access individual lines if the lines are designated as "exempt from ARS Only" (as described on page 4-26), or were transferred, were placed on hold, or are recalling or ringing. Line restriction also determines which lines can be accessed by the station. Because stations with this SCOS can use only ARS, they cannot forward calls to outside telephone numbers (unless they are using a line group containing only lines designated as exempt from ARS Only).

4.32 SCOS 7 — Alternate carrier number restriction: Calls can not be placed to any of the numbers on the alternate carrier number list if the station is given this restriction. (For example, to restrict 411 at certain stations, enter the number in the alternate carrier list and give the stations SCOS 7.) There can be up to 20 alternate carrier numbers with up to 10 digits each. The numbers should not contain the toll field. An "X" in a number represents any digit 0-9. A plus (+) in the number restricts any number that begins with the designated sequence (for example, 976+ restricts any number that begins with 976).

NOTE: Allowed long distance numbers override alternate carrier number restrictions. Also, numbers are only restricted if they **exactly match** the number on the alternate carrier list. For this reason, alternate carrier numbers should have a " + " added to the end of the number to prevent user from bypassing toll restriction by dialing extra digits after dialing the restricted number.

4.33 SCOS 8 — Allowed long distance number: Stations with this SCOS are allowed access to numbers in the allowed long distance number list. There can be up to 20 numbers of up to 10 digits each. Calls placed to these numbers are not subject to SCOS restrictions 2 and 4-7. Operator-assisted and international calls (SCOS 1 and 3) are not checked against this list. An "X" in the number represents any digit 0-9; for example, XXX-555-1212 allows users to dial directory information using any area code. A plus (+) in the number allows any number that begins with the designated sequence (for example, 800+ allows any 800 number to be dialed). The numbers should not include the toll field.

4.34 SCOS can be programmed to be associated with account codes. This permits a user to place a call from any station using his account code and his usual SCOS. When the account code is entered, the system checks the associated station and applies its SCOS to the call being made. When the call is completed, the programmed SCOS for the station goes back into effect.

4.35 System speed-dial numbers can be programmed to bypass SCOS restrictions on a system-wide basis. If the option is not enabled, all system speed-dial numbers are subject to toll restriction.

E. LINE GROUP ASSIGNMENTS AND AUTOMATIC LINE ANSWER/SELECT

4.36 For easy access to available C.O. lines, the system can include line groups and auto lines.

*   Line group feature codes are used to select a line in one of the programmed line groups. There can be up to eight line groups. In the *Basic* software, each line group can have one line. In the *Intermediate* and *Advanced* software, each line group can have up to the maximum number of equipped lines. For example, all local lines could be in one group, while another group contains WATS lines that are used for long distance calling. Lines can be included in more than one group. Line group feature codes are necessary when forwarding calls to outside telephone numbers.

*   Auto lines are incoming or outgoing lines that are accessed by entering the automatic line select feature code (89) or by pressing the ANS key. Refer to paragraph 4.38 below. In the *Basic* software, there can be one auto line. In the *Intermediate* and *Advanced* software, up to the maximum number of equipped lines can be designated as auto lines.

4.37 Automatic Line Answer: If a station is programmed with allowed-answer assignment only, direct ring-in calls can be answered by entering the automatic line answer feature code (350) or pressing the flashing line key.

4.38 Automatic Line Select: For calls that are ringing or holding at the station, the user may enter the automatic line select feature code (89) or press the ANS key. When more than one call is ringing or holding, the following priority list determines which call is answered first:

*   Ringing outside calls (ring ins, recalls, callbacks, or transfers) are answered in the order they were received.

*   Then calls on individual hold are answered (not calls on system hold, conference hold, or being transferred). Calls are picked up in the order they were placed on hold.

*   If no calls are ringing or holding, an available outgoing auto line is selected.

F. AUTOMATIC ROUTE SELECTION (ARS)

NOTE: This feature is available only in the *Advanced* software package.

4.39 ARS is a money-saving feature that allows the system to be programmed to select the desired route for placing outgoing calls. It can be used for placing outgoing calls or transferring calls to outside telephone numbers, but cannot be used for forwarding calls to outside telephone numbers. Stations can be programmed to only use ARS for placing outgoing calls (refer to page 4–28).

4.40 When ARS is selected, the user dials the number (including the area code, if needed), and the system does the following:

- **Checks the area code and/or office code:** ARS has eight groups of lines that are used for routing calls according to the type of call being placed.

  - *Route group 1* is used for local calls. ARS routes seven- and eight-digit numbers through this route group if the office code is included in the list for this route group. When fewer than seven digits are dialed (for example, 911 and 1411) the call is placed using this route group.

  - *Route groups 2 and 3* are used for seven- and eight-digit calls within the local area code. These route groups would include lists of office codes that were not included in route group 1.

  - *Route groups 4 and 5* are used for 10- and 11-digit calls (calls outside the local area code). Each route group has a separate list of area codes that it serves.

- *Route group 6* is used for operator-assisted calls which begin with 0 (but not 01 or 011).

- *Route group 7* is for operator-assisted international calls which begin with 01.

- *Route group 8* is used for direct dialing international calls which begin with 011.

- **Selects a line:** Each route group contains up to 24 lines each. The system selects an available line.

- **Adds or deletes digits according to the route group chosen:** Each route group has a programmed set of dial rules that tell the system what to dial. (The system can have up to 10 dial rules — seven of which are programmable. Each route group can use 1–10 dial rules.) For example, if the selected route group requires that the number contain "1," but no area code, the dial rules include the "1" and drop the area code.

- **Checks for toll and line restrictions:** Once the number has all of the necessary digits added or deleted, the system checks the SCOS and line restrictions for the station to determine whether the call is allowed. If allowed, the system continues to the next step. If not allowed, the user hears reorder tones and the call is dropped without being dialed.

- **Dials the modified telephone number:** If the number is allowed, the system seizes the selected line, waits for the dial tone wait timer to expire, and then dials. The user hears a single progress tone and outside dial tone. If the system DTMF tones are not muted the user also hears the dialing sequence while the call is being placed.

G. DIRECT INWARD SYSTEM ACCESS (DISA)

NOTE: This feature is available only in the *Advanced* software package and requires an APM.

4.41 DISA is a programmable feature that allows an outside party to dial into the system from an external DTMF telephone and then access the following system resources: intercom numbers for placing calls to stations; line groups or auto lines for placing outgoing calls; and hunt group pilot numbers.

4.42 Toll restriction is not checked on DISA calls when an outgoing line is accessed. DISA users cannot use ARS, access individual C.O. lines, or make pages. Even when privacy release is enabled system wide, keyset users may not access ongoing DISA-to-intercom calls by pressing the busy line key.

4.43 Any of the equipped lines can be programmed to receive incoming DISA calls in day and/or night mode. When not in use for DISA, the line can be used by system users for placing outgoing calls (unless the line is designated as "incoming-only"). Stations cannot be programmed for ring-in or answer assignments for DISA lines.

NOTE: Due to the natural characteristics of a C.O. line, the volume level of DTMF tones transmitted over the line may be substantially reduced before reaching the GMX-48 System. This natural degradation in tone volume may adversely affect the reliability of the DISA feature. Other factors which can affect DISA performance are C.O. line noise and the quality and strength of the DTMF tones generated by the off-premises phone itself.

4.44 When a DISA user calls a station intercom number, the call rings as a direct ring-in call. The DISA caller hears music (if enabled) until the call is answered or disconnected, even if the called station is busy or in do-not-disturb. If the called station is forwarded, the call follows the programmed forward.

4.45 When a DISA caller accesses an outside line, the unsupervised CO timer is activated. When the timer expires, both parties hear a burst of dial tone. Either party may reset the timer by pressing any DTMF key. If the timer is not reset, the call recalls the attendant. If the attendant does not answer the

recall before the recall and abandoned recall timers expire, the call is disconnected.

NOTE: There may be some reduction in voice volume when a DISA caller accesses an outside line.

4.46 When a hunt group pilot number receives a call through DISA, the call rings or circulates according to how the hunt group is programmed (i.e., linear, distributed, or all ring). The call is displayed as a direct ring-in call. Refer to page 4-17 for more information on hunt group calls.

DISA Do-Not-Disturb Breakthrough

4.47 Under normal circumstances, direct ring-in calls are not blocked by do-not-disturb. However, the database contains an option that allows or disallows do-not-disturb breakthrough on a station-by-station basis. If do-not-disturb breakthrough is disallowed, DISA calls to a station in do-not-disturb are immediately sent to the station's attendant. If the attendant does not answer the call, it is disconnected after the abandoned recall timer expires.

Security Codes

4.48 DISA lines can be assigned four-digit security codes that are required to access intercom numbers and/or the C.O. lines. The installer can program separate codes for each DISA line to be used during day and/or night modes.

NOTE: While DISA is designed to be reasonably secure against misuse by outside callers, there is no implied warranty that it is invulnerable to unauthorized intrusions. The installer and owner of the system should ensure that proper security measures have been taken to prevent outside callers from accessing and misusing outgoing lines for unauthorized calls.

Using DISA

4.49 Incoming DISA calls are not answered unless the necessary resources (a DTMF decoder and a voice channel) are available.

4.50 If you hear a busy signal followed by music, the C.O. line you tried to access is busy. You have camped on and will be connected to the desired line as soon as it is available.

4.51 If you call an intercom number, you will hear music until the appropriate transfer timer expires;

then if your call is not answered it recalls the called station's attendant.

4.52 If you enter an invalid feature code, or intercom number, or dialed an invalid number, you hear reorder tones and then three tones (followed by silence). You may try again. If you dial a valid hunt group pilot number that has no members assigned to it, the call automatically rings at the primary attendant station (or the system alarm station) until the appropriate transfer and abandoned recall timers expire. If the attendant does not answer before the abandoned recall timer expires, the call is disconnected. If you enter an invalid security code, you hear reorder tones and the call is disconnected.

4.53 *TO USE DISA IF A SECURITY CODE IS NOT RE-QUIRED:*

(1) From a DTMF telephone, dial the telephone number of the DISA line.

(2) When the call is answered by the system and you hear three tones, do one of the following:

    a. *For placing an outside call:* Dial the automatic line select (89) or select line group (81-87, or 9) feature code. You then hear outside dial tone and can place your call.

    b. *For placing an intercom call:* Dial an intercom number or a hunt group pilot number (if calling the attendant, dial the intercom number, not "0"). You hear music until the call is answered.

4.54 *TO USE DISA IF A SECURITY CODE IS REQUIRED FOR INTERCOM AND C.O. LINE ACCESS:*

(1) From a DTMF telephone, dial the number of the DISA line.

(2) When the call is answered by the system and you hear a single progress tone, enter the appropriate (day or night) DISA security code. (If an invalid security code is entered, you hear reorder tones; the call is dropped.)

(3) When you hear three tones, do one of the following:

    a. *For placing an outside call:* Dial the automatic line select (89) or select line group (81-87, or 9) feature code. You hear outside dial tone; place your call.

    b. *For placing an intercom call:* Dial an intercom number or hunt group pilot number. (If calling the attendant, dial the intercom number, not "0".) You hear music until the call is answered.

4.55 *TO USE DISA IF A SECURITY CODE IS REQUIRED FOR C.O. LINE ACCESS:*

(1) From a DTMF telephone, dial the telephone number of the DISA line.

(2) When the system answers the call and you hear three tones, do one of the following:

EITHER, dial an intercom number or hunt group pilot number (if calling the attendant, dial the intercom number, not "0"). You hear music until the call is answered.

OR, dial a C.O. access code (89, 81-87, or 9). When you hear a single progress tone, enter the appropriate (day or night) DISA security code. You hear outside dial tone when the system recognizes the security code and if the line is available.

H.   C.O. LINE MAINTENANCE

4.56   Attendants can place individual lines out of service by entering a feature code. This unequips the line, but does not prevent the central office from sending signals on the line. To outside callers, the line will appear to be functioning and they will hear ringing. However, station users will not hear ringing or see a flashing line key and cannot access the line for receiving or placing calls until the attendant places the line back into service by entering another feature code or the line is returned to service through the database.

NOTE: If the line that is placed out of service is part of a telco rotary hunt, the central office will detect that line as being available and will not bypass it for incoming calls.

4.57   The advantage of using this feature is that instead of unequipping the line in the database, all programming for the line is preserved. The line returns to complete functionality as soon as it is returned to service, with no additional programming required. Note that because the line is temporarily unequipped, no programming changes can be made for that line until it is returned to service.

5. STATION INSTRUMENTS

5.1 To allow system flexibility and cost efficiency, a variety of station instruments can be used on the GMX-48 System. They are:

- 24-Line Keysets — display and standard
- 12-Line Keysets — standard only
- Single-Line Sets — Single-Line Instruments (SLIs) and industry-standard, single-line DTMF sets
- Direct Station Selection/Busy Lamp Field (DSS/BLF) Units

5.2 Station instrument configuration depends on the combination of Expansion Modules and Accessory Port Modules installed. Expansion Modules can be used to add up to eight keysets or DSS/BLF Units each, and Accessory Port Modules can be used to add up to six single-line devices each. There can be as many as 48 keysets (with no single-line devices), or up to 12 single-line devices (with 32 keysets).

A. KEYSETS

5.3 Keysets are available in standard or display models. The only physical difference is a liquid crystal display (LCD) on the display keyset. Keyset design features are described in the following paragraphs.

Handsfree Speakerphone

5.4 Each keyset has a built-in, integrated speakerphone that allows handsfree operation on outside (C.O.) calls and inside (intercom) calls.

NOTE: On certain handsfree-to-handsfree intercom calls, voice volume levels may cause feedback to occur. If this happens, one station user should pick up the handset.

5.5 All keyset stations allow the user to dial while on hook. In addition, the keyset speaker is used to broadcast pages and may provide background music (provided an external music source is connected to the KSU).

5.6 A programming option can be enabled that disables the speakerphone. This prevents a station from using the speakerphone on outgoing intercom or any outside calls. If enabled, the speakerphone can still

be used for receiving handsfree intercom calls, but the user must lift the handset to speak when placing intercom calls and when placing or receiving outside calls. The MUTE key is always lit when the speaker is activated. Call monitoring and on-hook dialing are not affected.

Optional Liquid Crystal Display (LCD)

5.7 Standard keysets can be converted to display keysets by installing LCD Units. Installation instructions are on page 3–38 in the INSTALLATION section. The LCD Unit has two 16-character display lines. When the keyset is not in use, the LCD shows the date and the time of day (and, if enabled, the station intercom number and user name). Other displays include: reminder messages, do-not-disturb messages, numbers dialed, call sources, elapsed time of calls, current call costs, error messages, station status, programming messages, etc. The displayed information is described throughout the instructions in this section of the manual.

Keyset Identification Displayed

5.8 When a display keyset is idle, the intercom number and assigned user name appear on the top line of the display, and the date and time appear on the bottom line. Through database programming, installers can program the system to show date and time only (see PROGRAMMING, page 5–49), unless the user presses the SPCL key and enters the display date and time feature code (300).

Date, Time, User Name, And Intercom Number Display

5.9 When a display keyset is idle, the date and time (and, if enabled, user name and intercom number) are displayed. While on an outside call, in do-not-disturb, or unconditionally forwarded, certain other displays are shown. In these circumstances, use the following procedure to redisplay the date, time, name, and number for five seconds.

5.10 *TO DISPLAY THE DATE, TIME, USER NAME, AND INTERCOM NUMBER:*

Press the SPCL key and enter the display date and time feature code (300). The date, time, user name, and intercom number are displayed for five seconds.

Circuit Number On Power-Up

5.11 To aid in installation and troubleshooting procedures, display keysets show their station identification for five seconds when power is turned on and the keyset line cord is first plugged in. The intercom number and assigned user name appear on the top line of the display, and the circuit number appears on the bottom line. This display also appears whenever the line cord is removed and replaced while power is on, after a system reset, or after a system initialization using selection [K] in database programming. After the five-second identification display, the keyset changes to the appropriate display for the current status.

C.O. Line Keys

5.12 The line keys provide direct access to the C.O. lines. Each line key is equipped with a light-emitting diode (LED) that indicates the status of the line. (The ANS and OVER keys are sometimes used to access C.O. lines.) Line keys are associated with specific C.O. Line circuit numbers.

5.13 Unused line keys can be designated as fixed-function feature keys by assigning feature codes, or they can be designated as user-programmable "station keys" for up to four "soft key groups." Keysets are assigned to the soft key groups to determine the functions of the unused line keys. Refer to page 4-41 for further information. Also see page 5-49 in PROGRAMMING.

Automatic Out-Of-Range Line Selection And The OVER Key

5.14 When 12-line keysets are used on a system that has more than 12 C.O. lines), incoming calls on the out-of-range lines may be accessed by pressing the ANS key (or by entering the automatic line selection feature code — 89). Pressing the ANS key answers the call that has been ringing or holding the longest at that keyset. If no call is ringing or holding, the highest-numbered available auto line is selected for an outgoing call.

5.15 In addition to the automatic line selection feature, the database contains a station option that allows line key 12 on all keysets to be designated as the automatic "out-of-range" line selection key. This out-of-range line selection key is called the OVER key.

5.16 Although the OVER key works much like the ANS key, the advantage of the OVER key is that it has an LED to indicate the status of ringing or holding calls on the out-of-range lines. Also, when the OVER option is enabled, the keyset user will receive call waiting indications when more than one out-of-range line is ringing or holding. Unlike the ANS key, the OVER key cannot be used to access out-of-range lines for placing outgoing calls.

5.17 When multiple out-of-range lines are ringing or holding, the priority list below determines which call is answered first. When the first call on the list is answered, the second call will camp on and send call waiting signals. Also, the OVER key will flash to indicate the status of the waiting call (ringing or holding).

- Ringing outside calls (ring ins, recalls, callbacks, or transfers) are answered in the order they were received.

- Then calls on individual hold are answered (not calls on system hold, conference hold, or being transferred). Calls are picked up in the order they were placed on hold.

5.18 An exception to the OVER key showing the status of the waiting call occurs when the current call is in the process of being transferred to another station or to the public network. While the call is being transferred, the OVER key will flutter to indicate that the line is in a "transfer hold" condition. The OVER key will flutter until the transfer is either completed or aborted.

NOTE: To complete the transfer of an out-of-range C.O. line, the user must hang up, press another line key, or press the IC key. Pressing the OVER key will abort the transfer and reconnect the current call.

5.19 Out-of-range lines that are ringing in to the system will not flash on the OVER key if the station is programmed with outgoing-access or allowed-answer only. Station users must be assigned ring-in in order for the OVER key to show the status of the line.

5.20 Calls accessed by the OVER key cannot be placed on system hold. Also, out-of-range lines that are placed on system hold by another keyset cannot be accessed using the OVER key.

5.21 If a 24-line keyset is installed, and the automatic out-of-range line selection feature is enabled, line key 12 will act as the OVER key. However, line keys 13–24 can still be used for direct access to those lines.

User-Programmable Speed-Dial (SPD/BLF) Keys with Busy Lamp Field

5.22 The keysets have SPD/BLF keys that are used for storing and speed dialing up to 10 intercom and 10 outside telephone numbers. The 12-line keysets have eight SPD/BLF keys (the other two speed-dial numbers are stored using location codes), and 24-line keysets have 10 SPD/BLF keys. The keys have LEDs that form a busy lamp field to indicate the status of the 10 stations that are accessed using the keys.

Feature Keys And Station Keys

5.23 There are 18 feature keys on the 24-line keysets and nine feature keys on the 12-line keysets. These feature keys provide one-key dialing of feature codes. Eight of the keys on the 24-line keysets and six keys on the 12-line keyset have fixed functions. Nine feature keys on the 24-line keyset and two keys on the 12-line keyset are user-programmable keys that can be programmed by the keyset user to access any of the feature codes (except call splitting [337] which is a single-line feature). There is a programmable FWD key on both 12- and 24-line keysets that can be programmed with any of the call forward feature codes. For feature key locations, refer to the illustrations at the end of the SPECIFICATIONS section.

5.24 Unused line keys can be assigned feature codes and can be used as fixed-function keys, or they can be made into user-programmable "station keys" for up to four "soft key groups." Refer to page 4-41 for further information. The default values of the station keys are assigned for each of the soft key groups in database programming. Refer to page 5-49 in PROGRAMMING. Station users can then re-program the station keys to access feature codes or intercom numbers. If programmed with a feature code that utilizes the lamp (such as message or call forward), the lamp will show the current status of the feature as described in paragraph 5.30. (For the do-not-disturb feature, use the on/off feature code for proper lamp operation.) If the key is given an intercom number, the

lamp will provide status of the associated station as do the SPD/BLF or DSS/BLF keys.

FWD Key

5.25 The FWD key on the keyset can also be programmed. It can be changed to access any of the call forwarding feature codes (351-358) so that users have easy access to the forwarding option they use most frequently.

Feature Key Initialized Values

5.26 The initialized values of the 24-line keyset's 10 user-programmable keys are as follows. Feature code descriptions start on page 4-5.

KEY	FUNCTION
HOLD	Individual hold (336).
XFR	Transfer C.O. call (345) also used for reverse transfer.
ANS	Automatic line selection (89).
FLASH	C.O. hookflash (330).
REDL	Redial (380). When the system is initialized, the mode of the redial feature code is last outside number dialed (320). Users may reprogram the mode to last outside number saved (321).
SYS SPD	System speed dial (381).
QUE	Busy line/station callback (queue) request (6) also used to cancel a queue.
PAGE	Page (7).
FWD	Call forward all calls (355). This feature key may be reprogrammed with any of the call forward feature codes (however, other feature codes may not be used). Pressing a lit FWD key has the same effect as the cancel any call forward feature code (359).
BGND MUSIC	Background music on/off (313).

5.27 The features accessed by the 24-line keyset's eight fixed-function keys are shown below.

KEY	FUNCTION
CNF	Conference (5).
DATA	Data (340).
SPKR	Speakerphone on/off (312).
IC	Selects an intercom channel or picks up a holding or camped-on intercom call.
MUTE	Microphone mute on/off (314).
DND	Do-not-disturb on/off (372).
MSG	Leave message (365); also used for retrieving and viewing messages when the flashing MSG key is pressed.
SPCL	Signals the system to expect a feature code.

5.28 The initialized values of the 12-line keyset's three user-programmable keys are listed below. Feature code descriptions start on page 4–5.

KEY	FUNCTION
HOLD	Individual hold (336).
XFR	Transfer C.O. call (345) also used for reverse transfer.
FWD	Call forward all calls (355). This feature key may be reprogrammed with any of the call forward feature codes (however, other feature codes may not be used). Pressing a lit FWD key has the same effect as the cancel any call forward feature code (359).

5.29 The features accessed by the 12-line keyset's six fixed-function keys are shown below.

KEY	FUNCTION
CNF	Conference (5).
SPKR	Speakerphone on/off (312).
IC	Selects an intercom channel or picks up a holding or camped-on intercom call.
DND	Do-not-disturb on/off (372).
MSG	Leave message (365) also used for retrieving and viewing messages when the flashing MSG key is pressed.
SPCL	Signals the system to expect a feature code.

Keyset Light-Emitting Diode (LED) Indications

5.30 The keyset line keys, speed-dial (SPD/BLF) keys, and some of the feature keys contain light-emitting diodes (LEDs). The LED flash rates, shown on the next page, indicate the status of the stations, lines, and features. The rates are shown in interruptions per minute (IPM).

5.31 A programming option can be enabled that will change the system hold flash rate to a continuous 960IPM to differentiate it from the 60/960IPM flutter used for individual hold. If the option is not enabled, both hold types use the 60/960IPM flutter.

	STEADY 0 IPM	SLOW 30 IPM	MEDIUM 120 IPM	FAST 240 IPM	FLUTTER 60/960 IPM
DATA		Data call is being monitored			Data call is in progress; continuous = data device is off hook
IC			Recalling intercom call is camped on	Intercom call is camped on	Intercom call is on hold
SPKR	Speakerphone is on or ready for use				
CNF		Conference is in progress	Conference is recalling station		Initiator left conference in progress; or conf. party is on conference wait hold
MUTE	Microphone is muted				
FWD	Calls are being forwarded				
MSG			Message is waiting		
DND	Your station is in do-not-disturb				
SPD/BLF	Station is busy or un-plugged	Station is in do-not-disturb		Station has a call ringing in	Continuous = station left off hook
CO LINE	Line is in use at another station or unplugged	Line is in use at your station	Line is recalling from hold or transfer	Ring in, call waiting, or busy line callback	Line is on hold Continuous = Optional system hold flash
OVER		Out-of-range line is in use at your station	Out-of-range line is recalling from hold or transfer	Ring in, call waiting, or busy line callback	Out-of-range line is on individual hold at your station

Volume Controls

5.32 Speaker volume and ring tone volume are controlled by two thumbwheels on the right-hand side of the keyset.

Selectable Ring Tone

5.33 Keyset users can select the type of ringing alert tone to be heard at their respective keysets. This is useful in open office settings where phones are close together and it is difficult to tell which one is ringing. Eight distinctive ring tones are available.

5.34 *TO CHANGE KEYSET RING TONE:*

(1) While on hook, press SPCL and enter the select ring tone feature code (328). (Displays SELECT RING TONE.)

(2) **EITHER,** Enter a number 1–8 for the desired ring tone.

OR, Press the asterisk (*) key or the pound (#) key to scroll through the tones.

OR, Enter 0 or 9 to repeat the previously selected tone.

(3) Lift and replace the handset, or allow the long interdigit timer to expire. The last tone selected will now be heard when the keyset rings.

Connecting A Headset

5.35 For convenience, a headset can be used at any keyset station. The SPKR key is used to connect and disconnect calls when the headset is attached.

5.36 *TO CONNECT A HEADSET:*

(1) Disconnect the handset by unplugging the coiled handset cord from the base of the keyset. Leave the handset in the cradle.

(2) Insert the headset plug into the vacant handset jack.

(3) Press the SPCL key and enter the headset enable feature code (315).

5.37 *TO DISCONNECT THE HEADSET:*

(1) Disconnect the headset by unplugging the headset cord from the base of the keyset.

(2) Plug the coiled handset cord into the base of the keyset.

(3) While on hook, press the SPCL key and enter the headset disable feature code (316).

B. SINGLE-LINE SETS

5.38 If using *Advanced* or *Intermediate* software, up to two Accessory Port Modules (APMs) can be installed on the system. Each provides up to six single-line circuits that can be used for installing single-line sets, FAX machines, voice mail units, off-premises stations, or playback devices. (Playback devices can be used only with *Advanced* software.)

5.39 There are two types of single-line sets: Single-Line Instruments (SLIs) and industry-standard single-line DTMF sets.

Single-Line Instrument (SLI)

5.40 The SLI has four user-programmable feature keys for one-key dialing of feature codes and a FLASH key that sends a timed hookflash to signal the system before a feature code is entered. The default values of the feature keys are defined in database programming (refer to PROGRAMMING, page 5-49, for details) and the keys can be programmed by the user (refer to page 4-41). They can be assigned any of the general feature codes or C.O. line access codes listed on pages 4-5 through 4-10 (except keyset-only and attendant codes). When the system is initialized, the feature codes assigned to the keys are as follows.

KEY	FUNCTION
STN SPD	Station speed dial (382)
REDL	Redial (380)
ARS	Automatic route selection (80)
HOLD	Individual hold (336).

Industry-Standard Single-Line DTMF Set (2500 Set)

5.41 Single-line DTMF set users access the features by hookflashing (pressing and releasing the hookswitch quickly) and entering feature codes.

Off-Premises Stations

5.42 SLIs or industry-standard single-line sets can be used as off-premises stations. They are placed in a remote location and are connected to the system through a telephone company OPX line or a customer-provided line. Refer to INSTALLATION, page 3-18 for specifications and installation procedures.

5.43 Off-premises station users access the features by hookflashing (pressing and releasing the hookswitch quickly) and entering feature codes.

C. DIRECT STATION SELECTION/BUSY LAMP FIELD (DSS/BLF) UNITS

5.44 There can be a maximum of five DSS/BLF Units in the system. DSS/BLF Units are programmed to be used with specific keysets, but are not physically attached to the keysets. Each unit requires separate cabling and a separate keyset circuit. For each DSS/BLF Unit installed, one fewer keyset can be installed.

5.45 Each DSS/BLF Unit provides one-key access to up to 60 numbers. These numbers are programmed in the database on a system-wide basis. The numbers can be either station intercom numbers or hunt/voice mail group pilot numbers.

5.46 Together, the lamps in the keys create a busy lamp field that indicates the status of each station or hunt group assigned to the keys. The LED indicator in the key is solidly lit when the associated station is busy, flashes slowly when the station is in do-not-disturb, flashes fast when the station has a call ringing in, or flutters continuously if the station is causing a STATION OFF-HOOK system alarm. If assigned to a hunt group, the LED indicator is solidly lit when all stations in the hunt group are unavailable (busy, forwarded, in do-not-disturb, or removed from the hunt group) and it flashes fast when a call is camped on to a hunt group.

6. USER-PROGRAMMABLE FEATURE AND STATION KEYS

6.1 There are essentially four types of feature keys:

- **Fixed-function feature keys:** The feature codes accessed by these keys are preset and cannot be changed by the programmer or the users.

- **User-programmable feature keys:** The default values for these keys are assigned on a system-wide basis in the database (see PROGRAMMING, page 5-49). Users can then customize their stations by re-programming the keys to access the desired feature codes, as described below. Default values of the programmable keyset feature keys are shown on page 4-36. These keys can be programmed to access any of the general feature codes (except call splitting — 337, which is a single-line feature code). The keyset FWD key can be programmed with any of the eight call forwarding feature codes. Default values of the SLI programmable keys are shown on page 4-40. These keys can be programmed to access any of the general feature codes except keyset-only or attendant-only codes.

- **Unused line keys assigned as fixed-function keys:** Any unused line keys can be assigned feature codes in database programming. This makes them fixed-function keys that cannot be changed by the users.

- **Station keys:** Unused line keys can also be designated as "station keys." These user-programmable keys are assigned default values in the database for up to four "soft key groups." Keysets are then assigned to the soft key groups as desired. (Refer to PROGRAMMING, page 5-49, for details.) Because the keys are user-programmable, they can be re-programmed to access the desired feature codes as described below. SLIs cannot have station keys because they do not have line keys.

6.2 *TO DISPLAY THE CURRENT FEATURE OR STATION KEY ENTRIES ON A DISPLAY KEYSET:*

(1) While on hook, press the SPCL key and enter the feature key display feature code (326). (Display shows DISPLAY FEATURE KEY PROGRAMMING.)

(2) Press the feature or station key(s) to be displayed. (Display shows the current feature assigned, as the keys are pressed.)

6.3 *TO RETURN THE FEATURE KEYS TO DEFAULTS:*

Keyset: While on or off hook, press the SPCL key and enter the feature key default feature code (325). *If off hook,* hang up.

Single-Line Set: Lift the handset, enter the feature key default feature code (325), and hang up.

6.4 *TO RETURN THE KEYSET STATION KEYS TO DEFAULTS:*

While on or off hook, press the SPCL key and enter the default station keys feature code (329). *If off hook,* hang up.

6.5 *TO PROGRAM THE FEATURE OR STATION KEYS:*

(1) **Keyset:** While on hook, press the SPCL key and enter the feature key programming feature code (327). (Display shows NOW PROGRAMMING FEATURE KEY.)

Single-Line Set: Lift the handset and enter the feature key programming feature code (327).

(2) Press the desired feature or station key. (Display shows the feature currently assigned to the key.)

(3) Enter the feature code to be stored under that key. Keyset users hear a single progress tone when the programming is completed; single-line sets return to intercom dial tone. (Display shows the newly programmed feature.) An invalid code causes repeating reorder tones and does not change the feature code assigned to the key. (Display shows ERROR! FEATURE CODE INVALID.)

NOTE: If you do not enter a feature code, the programming mode times out when the long interdigit timer expires and you hear reorder tones; the feature code assigned to the key remains unchanged.

(4) **Keyset:** Wait for the display to return to date and time, or lift and replace the handset. To program other keys, repeat the procedure.

Single-Line Set: Hang up or program other keys by repeating the procedure.

7. AUTOMATIC CALL ACCESS (KEYSETS ONLY)

7.1 This feature allows a keyset user to determine the way in which incoming calls are answered. Feature codes are entered by the users to select the type of call access. The four variations are as follows:

- The user hears intercom dial tone when the handset is lifted and must press a line key (or the ANS or OVER key) or the IC key to access an incoming call.

- The user can answer ringing intercom calls by simply lifting the handset, but outside calls must be answered by pressing a line key or the ANS or OVER key. (When the system is initialized, all keysets have this type of call access.)

- The user can answer ringing outside calls by lifting the handset, but ringing intercom calls must be answered by pressing the IC key.

- The user can answer any ringing call by lifting the handset. If no call is ringing, the user hears intercom dial tone when the handset is lifted. (This option is the way single-line sets work.)

NOTE: In any of the above variations, keyset users may still receive handsfree intercom calls (if enabled).

7.2 The selected options determine how all types of ringing intercom or outside calls (direct calls, transferred calls, recalls, etc.) are answered. If more than one call is ringing at the station, the first call received is the first answered.

7.3 When programmed for automatic C.O. line access, a station user with allowed answer, but without ring in, for a C.O. line must always press a line, ANS, or OVER key (or press SPCL and enter the automatic line answer feature code — 350) to answer a non-ringing call. Transferred ringing calls and recalls can be answered by lifting the handset.

7.4 Camped-on calls cannot be answered by simply lifting the handset or pressing the SPKR key. For example, a station is programmed to automatically answer ringing outside calls, but requires pressing the IC key to answer ringing intercom calls. If a private intercom call rings in and is immediately followed by an outside call ringing in, the display shows the intercom call message and the outside call camps on. The intercom call also camps on when the handset is lifted. The user can then choose between the camped on calls by pressing either the IC key or the line, ANS, or OVER key.

7.5 The automatic call access options can be programmed at keyset stations only. Single-line sets are already designed to automatically answer ringing intercom and outside calls by lifting the handset. This cannot be changed.

7.6 *TO PROGRAM OUTSIDE CALL ACCESS:*

(1) While on hook, press the SPCL key.

(2) Select the option:

    a. *If you wish to automatically answer ringing outside calls by lifting the handset,* enter the automatic line access feature code (360). You hear a progress tone.

    b. *If you wish to access outside calls by pressing the line, ANS, or OVER key,* enter the cancel automatic line access feature code (361). You hear a progress tone.

7.7 *TO PROGRAM INTERCOM CALL ACCESS:*

(1) While on hook, press the SPCL key.

(2) Select the option:

    a. *If you wish to automatically answer ringing intercom calls by lifting the handset,* enter the automatic intercom access feature code (362). You hear a progress tone.

    b. *If you wish to access ringing intercom calls by pressing the IC key,* enter the cancel automatic intercom access feature code (363). You hear a progress tone.

8. MUSIC-ON-HOLD AND BACKGROUND MUSIC

8.1 The system can be equipped with a customer-provided external music source for calls on hold and calls waiting, as well as for background music on keysets.

8.2 The music-on-hold feature not only makes the wait as pleasant as possible, but it assures the holding party that the call is still connected.

8.3 Music can also be heard on keyset speakers by using the background music feature code. Attendants can enable background music for the optional external paging speakers by entering a feature code (see page 4-101). Background music and intercom music-on-hold are interrupted for internal and external pages. Music over keyset speakers is also interrupted by calls, programming, and ringing at the station.

8.4 *TO TURN KEYSET BACKGROUND MUSIC ON OR OFF:*

> While on or off hook, press the BGND MUSIC key (or press the SPCL key and enter the background music on/off feature code — 313). *If off hook,* hang up.

8.5 The optional external music source is a customer-provided radio, tape player, or other device connected through a jack on the KSU. If an external source is connected, music-on-hold (MOH) is enabled by placing the MOH ON/OFF strap on the KSU in the ON position. It can be disabled by placing the strap in the OFF position. If disabled, background music can still be heard through keyset and paging speakers, and all internal callers will hear music when placed on hold or camped on. The volume of the music-on-hold may also be adjusted by placing the MOH HI/LO strap in the desired position.

NOTE: In some circumstances, there may be broadcast restrictions associated with the music. Check with the music's original distributor and/or the radio station for copyright and broadcast restrictions concerning background music and music-on-hold.

8.6 Throughout the instructions in this section of the manual, the term "music" refers to the selected music-on-hold option: music or silence.

NOTE: If background music to external paging speakers is enabled, the volume of background music at keyset stations is lowered.

9. SIGNALS AND TONES

9.1 There are several distinct signals and tones on the GMX-48 System as shown in the tables below.
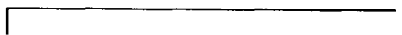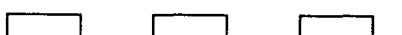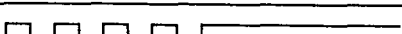
A. RING SIGNALS

9.2 The signals and tones generated by the ringer or keyset speaker are as follows.

TYPE OF CALL	SIGNAL	
Outside call	Single long tone every 6 seconds	
Intercom call or off-hook voice announce call	Two short tones and a pause (repeats for private calls)	
Queue callback	Three short tones and a long pause (repeating)	
Recall from transfer or hold	Four short tones and a long pause (repeating)	
Reminder message	Eight short tones	

B. CALL PROCESSING SIGNALS

9.3 The following signals and tones are heard through the handset or keyset speaker.

SIGNAL		ACTION
Intercom dial tone		Handset lifted or SPKR or IC key pressed.
Double tones (called station receives the same signal)		Intercom call — repeats for private call or call to non-handsfree station; one double tone for handsfree call.
Intercom busy signal — slow repeating tones (until camp on)		Called station or selected line is busy.
Four fast tones and a pause (repeating)		Called station is in do-not-disturb.
Reorder tone — fast tones (may be four tones or continuous)		Number or feature code was not accepted, number did not pass toll restriction, or dialing timer expired.
System busy signal — reorder tones followed by music		All resources are busy, station is camped on.
Single progress tone		Feature procedure completed, or something needs to be entered.
Camp-on tone — single tone every 15 seconds (programmable)		Another station has camped on to your station.
Message waiting tone — Six tones followed by intercom dial tone after lifting the handset or hookflashing		A message is waiting at your single-line station.
Consultation hold tones — four fast tones		User just placed a call on consultation hold.

NOTE FOR SINGLE·LINE SET USERS: When the procedures in this manual tell you to hookflash, quickly press and release the hookswitch. If you press the hookswitch to hang up, hold it down until the SL hookflash maximum timer expires (default value is 0.7 seconds); otherwise, the system recognizes it as a hookflash. If using a Single-Line Instrument (SLI), use the FLASH key to perform a hookflash.

10. INTERCOM CALLS

10.1 The intercom can be used to place station-to-station calls that can be answered handsfree. Or, it can be used to place private (non-handsfree) calls. A station user that reaches a busy station can camp on, request a callback (queue), leave a message, or use the off-hook voice announce feature (if enabled). Other features that apply to both outside and intercom calls, as described later in this section of the manual, include placing calls on hold, call waiting, call transfer, reverse transfer, and call forwarding.

A. PROGRAMMING FOR PRIVATE INTERCOM CALLS

10.2 A station user can place private (non-handsfree) intercom calls by pressing the pound (#) key before dialing the intercom number. Or, the station can be programmed to always send and/or receive private calls using one of the following methods.

Ring Intercom Always

10.3 Always place private calls by programming the station with the ring intercom always feature code as described below. While this feature is enabled, the called party hears repeating double tones and must

lift the handset (or press the SPKR key or IC key) to answer.

10.4 TO PROGRAM THE STATION TO ALWAYS PLACE PRIVATE INTERCOM CALLS (RING INTERCOM ALWAYS):

> **Keyset:** While on hook, press the SPCL key and enter the ring intercom always feature code (367).

> **Single·Line Set:** Lift the handset. Enter the ring intercom always feature code (367) and hang up.

10.5 TO CANCEL RING INTERCOM ALWAYS:

> **Keyset:** While on hook, press the SPCL key and enter the cancel ring intercom always feature code (368).

> **Single·Line Set:** Lift the handset. Enter the cancel ring intercom always feature code (368) and hang up.

Keyset Handsfree Enable/Disable

10.6 Always receive private (non-handsfree) calls by disabling the keyset handsfree answering feature using the disable handsfree feature code. The keyset user hears repeating double tones when receiving an intercom call and must lift the handset (or press the SPKR and/or IC key) to answer while this feature is enabled.

10.7 TO PROGRAM THE STATION TO ALWAYS RECEIVE PRIVATE INTERCOM CALLS (KEYSETS ONLY):

> While on hook, press the SPCL key and enter the disable handsfree feature code (310).

10.8 TO RESTORE THE HANDSFREE ANSWERING FEATURE:

> While on hook, press the SPCL key and enter the enable handsfree feature code (311).

B.   STATION-TO-STATION CALLING

Receiving Intercom Calls

10.9 *TO RECEIVE A HANDSFREE INTERCOM CALL ON A KEYSET:*

> When you hear a double tone and a call announcement, and the SPKR key is lit, respond handsfree or lift the handset. (Display identifies the source of the call for 10 seconds with INTERCOM CALL FROM XXX.)

10.10 *TO RECEIVE A PRIVATE CALL ON A KEYSET:*

> When you hear repeating double tones, lift the handset, or press the SPKR or IC key to respond handsfree. (Display identifies the source of the call with INTERCOM CALL FROM XXX.)

10.11 *TO RECEIVE AN INTERCOM CALL ON A SINGLE-LINE SET:*

> When you hear repeating double tones, lift the handset.

10.12 *TO RECEIVE A TRANSFERRED-TO-HOLD INTERCOM CALL:*

If you hear a page announcing that an intercom call is holding at your station:

> **Keyset:** When the IC key is fluttering, lift the handset and press the IC key. Or, while on hook, press the IC key to speak handsfree. You are connected to the caller.

> **Single-Line Set:** Lift the handset and press the HOLD key or enter the individual hold feature code (336). You are connected to the caller.

Placing Intercom Calls

NOTE: When placing an intercom call, begin dialing before the dial initiation timer expires. If the timer expires, the system drops the connection and sends repeating reorder tones. This prevents an intercom channel from being tied up accidentally.

10.13   *TO PLACE AN INTERCOM CALL:*

(1)   **Keyset:**

> **EITHER,** lift the handset.

> **OR,** while on hook, press the SPKR key or the IC key. The SPKR key lights.

Single-Line Set: Lift the handset. (If the DTMF decoders, tone generators, or intercom paths are busy, a single-line set user hears silence and camps on. When all necessary resources are available, the user hears intercom dial tone.)

(2)   *If you want to place a private (non-handsfree) call to a keyset,* press the pound (#) key.

(3)   Dial an intercom number. The number can be "0" for the attendant, a station intercom number, or a hunt group pilot number. (Display shows number dialed.) If you dial too slowly, the interdigit timer may expire and you will hear repeating reorder tones.

a.   *If calling a handsfree keyset station,* speak after you hear a double tone.

b.   *If calling a single-line station, a hunt group, or a keyset with handsfree disabled,* you hear repeating double tones until the call is answered.

c.   *If placing a private call,* you hear repeating double tones until the call is answered.

d.   *If you dial an invalid number,* you hear repeating reorder tones.

e.   *If the called station is busy,* you have the following options:

1.   Hang up and try later. Or, *if dialing handsfree (keysets only),* press the SPKR key to disconnect.

2.   Do not hang up, your call camps on. When the called station is available, a private call is placed. Refer to paragraph 10.14 for details.

3.   Request a busy station callback (queue). This is similar to camping on except that you hang up and wait for the busy station to be available. For more information, refer to paragraph 10.17.

f. *If you hear four fast tones and a pause — repeating,* the station is in do-not-disturb. You can use the busy station callback feature.

g. *If the called station is busy, in do-not-disturb, or there is no answer,* you can leave a message with the station itself or with the station's message center. For details, refer to page 4–48.

h. *If the called station is a busy 24-line keyset (and if all the necessary conditions for OHVA are enabled),* you can announce the call using the off-hook voice announce feature. For a complete explanation of this feature, refer to page 4–51.

C. INTERCOM CAMP ON AND BUSY STATION CALLBACK (QUEUE)

Camp On

10.14 When a station user calls a busy station or hunt group, the system sends a busy signal. The caller can wait off hook to camp on (after the camp-on timer expires) and hear music while waiting until the called station is available. The system periodically sends call waiting signals to the busy station(s). Up to 47 stations can camp on to the same intercom number.

10.15 If a called station enables do-not-disturb while an intercom call is camped on, the caller is removed from the camped on state and receives do-not-disturb indications (see paragraph 15.4 on page 4–60). Intercom callers cannot camp on to a station that is in do-not-disturb.

10.16 *TO CAMP ON TO AN INTERCOM NUMBER:*

If you hear a busy signal when calling an intercom number and wish to camp on, do not hang up. You hear music (if enabled) while camped on. When the station is available, a private call

is automatically placed and you hear repeating double tones until the call is answered.·

Busy Station Callback (Queue)

10.17 When the called station is busy or in do-not-disturb, the caller can request a callback (queue) and hang up until the station is available. This can be done before or after the call camps on. Each station can have only one active queue request at a time.

10.18 Queue callbacks must be answered before the queue callback timer expires. If a callback is not answered, the queue is canceled. If the station is busy when called back, the queue request is placed behind any other waiting queue requests.

10.19 *TO QUEUE A STATION:*

(1) **Keyset:** If you hear a busy signal or do-not-disturb signal (four fast tones and a pause, repeating) when calling an intercom number, press the QUE key (or press SPCL and enter the queue request feature code — 6) and hang up.

Single-Line Set: If you hear a busy signal or do-not-disturb signal when calling an intercom number, press the FLASH key (hookflash), enter the queue request feature code (6), and hang up.

(2) When the queued station is available, you hear three tones and a long pause, repeating. (Display shows XXX IS NOW AVAILABLE.) Lift the handset. A private call is automatically placed to the queued station.

10.20 *TO CANCEL A QUEUE REQUEST (BEFORE THE QUEUED STATION BECOMES AVAILABLE):*

Keyset: While on hook, press the QUE key (or press the SPCL key and enter the cancel queue request feature code — 376).

Single-Line Set: Lift the handset, enter the cancel queue request feature code (376), and hang up.

11. INTER-STATION MESSAGES

11.1 If a station is busy, there is no answer, or it is in do-not-disturb, intercom callers may leave a message waiting indication. There are two message options:

- **Have the user return your call.** When the station user responds to the message, a call is automatically placed to your station.

- **Leave a message with the station user's message center.** When the station user responds to the message, a call is automatically placed to his or her message center.

11.2 To signal that a message is waiting, a called keyset's MSG key flashes and the display shows the message source. For single-line sets, a system programming option can be enabled that sends message waiting tones when the user lifts the handset or presses the hookswitch.

11.3 Any station or hunt group can be designated as the message center for any other station or group of stations. However, a station cannot be programmed as its own message center. When the system is initialized, circuit 1.1 (the primary attendant) is the message center for all stations, except itself.

11.4 If the designated message center is a voice mail system, the voice mail system is called after the message (at message center) timer expires. When the voice mail system answers the call, the called station user's "mail box" is automatically dialed. The caller can then leave a message in the mail box. If a display keyset is called, display shows MESSAGE RECEIVED FROM [Voice Mail].

11.5 Each station user can leave message waiting indications at more than one station, but only one per station. A station can receive up to 47 messages, and there can be a maximum of 126 waiting messages in the system.

11.6 On display keysets, the messages can be viewed in the order they were received and answered as desired.

A. LEAVING MESSAGES

11.7 *TO LEAVE A MESSAGE WAITING INDICATION:*

(1) When calling a station, if you hear a busy signal, do-not-disturb signal (repeating signal of four fast tones and a pause), or the call is not answered:

Keyset: Press the MSG key.

Single-Line Set: Press the FLASH key (hookflash) and enter the message feature code (365).

(2) *To have the called party call you:* Hang up or press a line key or the IC key to disconnect before the message (at message center) timer expires.

To leave the message with the called party's message center: Do not hang up. When the message (at message center) timer expires, a private call is automatically placed to the called party's message center. Leave your message with the message center and hang up. If the message center does not answer the call (that is placed after the timer expires), the message at the called station still processes the message as coming from the message center.

NOTE: If the station you are calling does not have a designated message center or if the station happens to be your message center, you will hear dial tone immediately after pressing the MSG key. The message indication is left at the called station and display keysets will show MESSAGE RECEIVED FROM [*your station*].

Canceling A Message Waiting Indication That You Left

11.8 Occasionally, you may wish to cancel a message that you left before the station user responds to the message. If the message was left with the station's message center, you cannot cancel it from your station; it can only be canceled from the message center station.

11.9 *TO CANCEL A MESSAGE YOU LEFT:*

(1) At your station, lift the handset and dial the intercom number (or press the SPD/BLF key) of the station with the message.

(2) Press the SPCL key (FLASH on single-line sets) and enter the message cancel feature code (366). You hear intercom dial tone (even if a message was not present at the called station).

B. RESPONDING TO MESSAGES

Answering Messages

11.10 *TO ANSWER MESSAGES AT A KEYSET:*

(1) If your MSG key is flashing (display shows MESSAGE RECEIVED FROM XXX), lift the handset and press the MSG key. Depending on how the message was left, an intercom call is placed to either the station that left the message or your message center.

NOTE: If, after pressing the flashing MSG key, the called station does not answer a private call, is busy, or is in do-not-disturb, your message key continues to flash (if you hang up, the display indicates a waiting message). The message waiting indications are canceled only when you are actually connected with the called station.

(2) If the MSG key continues to flash, there is another message (display shows the next message). Repeat step 1.

11.11 *TO ANSWER MESSAGES AT A SINGLE-LINE SET:*

(1) If you hear message waiting tones (six tones) after lifting the handset or hookflashing, press the FLASH (hookflash) and enter the message feature code (365). Depending on how the message was left, an intercom call is placed to either the station that left the message or your message center.

NOTE: If the called station does not answer, is busy, or is in do-not-disturb, you may hang up. When the handset is lifted again you will hear message waiting tones. The message waiting indications are canceled only when you have actually connected with the called station.

(2) If you hear message waiting tones after hookflashing or when the handset is lifted again, there is another message waiting. Repeat step 1.

Canceling A Waiting Message

11.12 *TO CANCEL A MESSAGE WITHOUT ANSWERING AT A KEYSET:*

(1) If the MSG key is flashing (display shows message source), remain on hook and press the asterisk (*) key. Or, press SPCL and enter the cancel current message feature code (379). The message is canceled.

(2) If the MSG key continues to flash, there is another message (display shows the next message). Either respond to the message or cancel it.

11.13 *TO CANCEL A MESSAGE WITHOUT ANSWERING AT A SINGLE-LINE SET:*

(1) If you receive message waiting tones, press FLASH (hookflash) and enter the cancel current message feature code (379). The message is canceled.

(2) If you hear message waiting tones after hookflashing or when the handset is lifted again, there is another message. Either respond to it or cancel it.

Viewing Waiting Messages

11.14 *TO VIEW RECEIVED MESSAGES AT A DISPLAY KEYSET:*

(1) If your MSG key is flashing, one or more messages are waiting. While on hook, press the MSG key repeatedly to view waiting messages.

(2) *If desired,* you can answer or cancel a message while it is displayed.

Alternate Message Source

NOTE: This feature is available only in the *Advanced* and *Intermediate* software packages.

11.15 An "alternate message source" feature was developed to enable a voice mail system to leave messages through a station or hunt group that is designated as its alternate message source. When a message is left on the voice mail system for a station user that has an assigned mailbox, the voice mail unit automatically dials the message feature code (365) and then dials the intercom number of the called station. The called station receives message waiting indications. If it is a display keyset, the display shows MESSAGE RECEIVED FROM [alternate message source] rather than from the voice mail circuit. An actual intercom call has not been placed; only the message waiting indications are affected. When the called station user retrieves the message an intercom call is placed to the alternate message source.

11.16 Two possible applications for this feature are: routing messages through a COU circuit to allow keysets to use DTMF tones to retrieve messages and routing messages through a hunt group to make efficient use of voice mail resources. These applications are described below.

11.17 **Routing messages through a COU circuit:** To achieve this function, an unused single-line circuit is programmed as the alternate message source for the voice mail station circuits and is then programmed to automatically forward all calls to a COU circuit that is connected to the voice mail unit. When a user responds to a message from the voice mail unit, the call is automatically forwarded to the COU circuit. This leaves the voice mail single-line circuit available to receive messages while the COU circuit is in use.

11.18 **Routing messages through a hunt group:** To make efficient use of multi-port voice mail units, the ports could be placed in a voice mail hunt group which might be named "V-Mail" and the voice mail hunt group's pilot number would be assigned as the alternate message source. When a user responded to a message from "V-Mail," the call would be sent to the pilot number and circulate until it located an available voice mail port.

12. OFF-HOOK VOICE ANNOUNCE (OHVA)

12.1 When a called 24-line keyset is busy, the caller can use the off-hook voice announce (OHVA) feature (if enabled). This feature allows an intercom caller (either single-line or keyset) to establish voice contact with a 24-line keyset user, even though the user already has a call in progress on the handset. The called keyset user can then talk freely on either connection, using the handset for the original call or the speakerphone for the OHVA intercom call.

12.2 The OHVA feature requires special installation and programming (refer to INSTALLATION, page 3–14, and PROGRAMMING, page 5–49, for complete details). When the system is initialized, this feature is disabled. Once the OHVA feature is enabled system wide (and the appropriate installation procedures have been performed), each individual 24-line keyset can be allowed or disallowed from *placing* and/or *receiving* OHVA calls. Also, each 24-line keyset without a secondary voice path, 12-line keyset, and single-line set can be allowed or disallowed from *placing* OHVA calls. (Single-line sets and 12-line keysets cannot receive OHVA calls because they do not have secondary voice path circuitry.)

12.3 For example, you may want to allow all attendants to place, but not receive, OHVA calls, while all other stations are allowed to receive, but not place, OHVA calls. Any combination is available through system and station programming.

12.4 OHVA calls cannot be processed if the secondary voice path or the speakerphone of the called 24-line keyset is not available. This occurs when the keyset has a different OHVA call in progress, has an active data call in progress, is on an active handsfree intercom or outside call, has handsfree disabled, has a headset enabled, or is in do-not-disturb. Also, OHVA calls are not possible if the caller is placing a forced private intercom call.

12.5 *TO PLACE AN OFF-HOOK VOICE ANNOUNCE CALL:*

(1) When an intercom call is placed to a busy 24-line keyset, do not hang up. You hear busy signals until the camp-on timer and the OHVA screening timer expire. (If you hear music after the camp-on timer expires, conditions for an OHVA call were not met and you are camped-on. See paragraph 10.14.)

(2) When the OHVA screening timer expires (and if the keyset's secondary voice path is available), you are automatically connected to the called party's speakerphone.

12.6 *TO PLACE AN IMMEDIATE OFF-HOOK VOICE ANNOUNCE CALL (KEYSETS EQUIPPED WITH DSS/BLF UNITS ONLY):*

NOTE: This method can only be used if the database has been programmed to allow keysets with attached DSS/BLF Units to bypass the camp-on and OHVA screening timers. See page 5–24 in PROGRAMMING.

(1) When an intercom call is placed (using the DSS/BLF key) to a busy 24-line keyset, do not hang up.

(2) Press the DSS/BLF key for that keyset again. If the keyset's secondary voice path is available, you are immediately connected and may speak.

12.7 *TO RECEIVE AN OFF-HOOK VOICE ANNOUNCE CALL (OHVA-EQUIPPED 24-LINE KEYSETS ONLY):*

(1) While on a call using the handset, you hear a camp-on tone (display shows CALL ANNOUNCE FROM XXX). Do nothing. When the OHVA screening timer expires, you hear a double tone (display shows INTERCOM CALL FROM XXX). You are connected with the intercom caller via the speakerphone. Your original call remains connected on the handset.

(2) **To terminate the OHVA call:** Press the lit SPKR key or have the OHVA caller hang up. If you terminate the original call by hanging up the handset, you remain connected to the OHVA call in the handsfree intercom mode.

12.8 *TO BLOCK AN OFF-HOOK VOICE ANNOUNCE CALL (OHVA-EQUIPPED 24-LINE KEYSETS ONLY):*

(1) While on a call using the handset, you hear a camp-on tone (display shows CALL ANNOUNCE FROM XXX). To cause the intercom call to camp on, press the SPKR or DND key. The IC key flashes.

(2) *If you wish to send do-not-disturb signals to the camped-on call,* press the DND key two more times if the DND key was used in step 1, or press the DND key once if the SPKR key was used in step 1.

13. OUTSIDE CALLS

13.1 When a line is selected for receiving or placing an outside call, a voice channel is seized and cannot be used by any other station (unless privacy release is enabled or the conferencing feature is used). If the desired line is busy, the station user can camp on or request a callback (queue).

13.2 Other features that apply to both outside and intercom calls are discussed later in this section of the manual. They include placing calls on hold, call waiting, call transfer, reverse transfer, conferencing, and call forwarding. Refer to page 4–25 for an explanation of outgoing-access, allowed-answer, and ring-in assignments. Refer to page 4–29 for an explanation of line groups, auto lines, and the use of the automatic line answer and automatic line select feature codes. Refer to page 4–35 for an explanation of using the OVER key on 12-line keysets to access calls on out-of-range lines.

A. PLACING AND RECEIVING OUTSIDE CALLS

Placing Outside Calls

13.3 *TO PLACE AN OUTSIDE CALL:*

NOTE: When placing a call, begin dialing before the dial initiation timer expires. If the timer expires, the system drops the line connection and sends repeating reorder tones. This prevents a line from being tied up accidentally.

(1) Lift the handset. (Keyset users, see paragraph 13.7 for on-hook dialing instructions.)

(2) Select an outgoing line, using one of the methods below. The associated line key or the OVER key flashes slowly.

> NOTE: You must have outgoing access to a line to seize it.

> **Keyset:**

> EITHER, press a line key for direct access.

> OR, enter the automatic line select feature code (89) or, if auto lines have been pro-

grammed, press the ANS key. If no call is ringing or holding, the system selects the highest-numbered available auto line.

> OR, enter a select line group feature code (81–87, or 9). This selects a line in the chosen line group.

> OR, refer to the automatic route selection procedure on the next page.

> **Single-Line Set:**

> EITHER, enter the automatic line selection feature code (89).

> OR, enter a select line group feature code (81–87, or 9).

> OR, refer to the automatic route selection procedure on the next page.

(3) You hear one of the following signals:

- *Outside dial tone:* Go to the next step. The associated line key (if one exists) flashes slowly. *If SCOS is associated with account codes (system-wide option), and you wish to use your usual SCOS while at another station,* press SPCL and enter the optional account code feature code (390), then enter your account code.

- *Single progress tone:* Enter a forced account code. The display shows ACCT#. You hear a single progress tone and then outside dial tone when the code is accepted. The associated line key or the OVER key flashes slowly. *If SCOS is associated with account codes (system-wide option),* your usual SCOS is now in effect. Go to the next step.

- *Repeating reorder tones:* You are restricted from the line chosen; choose another line. Or, you are restricted to using ARS only; try again using ARS (refer to the procedure on the next page).

- *Busy signal:* The chosen line is busy. Camp on, use the busy line callback (queue) feature, or select another line.

(4) Manually dial, speed dial, or redial the desired telephone number. (Display shows the numbers dialed. When the valid call timer expires, the display shows the elapsed time and call cost.) If you hear repeating reorder tones, you dialed a restricted number. If you dial too slowly and the interdigit timer expires, the call may be dropped, and you will hear repeating reorder tones.

13.4 *TO PLACE A CALL USING AUTOMATIC ROUTE SELECTION:*

(1) Lift the handset.

(2) **Keyset:** Enter the automatic route selection feature code (80). You hear a single progress tone.

Single-Line Set: Press the ARS key or enter the automatic route selection feature code (80). You hear a single progress tone.

NOTE: If required, enter a forced account code. (Display shows ACCT#.) You hear a progress tone when the code is accepted. *If SCOS is associated with account codes (system-wide option),* your usual SCOS is now in effect. Go to the next step.

(3) Dial the telephone number. Use the MUTE key to backspace if you make a mistake. Include the area code, if needed. *If desired,* press the pound (#) or asterisk (*) key after dialing to immediately proceed; otherwise there may be a slight delay. You hear one of the following signals.

NOTE: When dialing 911 or 1911 emergency numbers, always press # or * after dialing so that the call is processed as quickly as possible.

a. *Single progress tone (followed by dial tone and digits being dialed if digits are not muted):* Your call is being placed. The associated line key or the OVER key flashes slowly on keysets.

b. *Single progress tone followed by busy signals, then music:* All of the lines in the selected route group are busy. Do one of the following:

EITHER, continue to wait off hook. When the system accesses a line, you hear dial tone (and possibly digits being dialed). The associated line key or the OVER key flashes slowly on keysets.

OR, request a busy line callback. The system places your station in a queue for an available line in the selected route group. When you hear repeating callback signals of three tones and a long pause (and the display shows LINE XX IS NOW AVAILABLE), lift the handset; keyset users must also press the fast flashing line or OVER key (or the ANS key). You hear dial tone and possibly digits being dialed. The associated line key or the OVER key flashes slowly on keysets.

c. *Repeating reorder tones:* You are restricted from the number dialed or the line selected.

Receiving Outside Calls

13.5 *TO RECEIVE AN OUTSIDE CALL:*

Keyset:

(1) When one of the following occurs, lift the handset:

- *You hear repeating long tones and a line key is flashing at the fast rate:* A call is ringing in. (Display shows CALL RINGING IN ON LINE XX.)

- *You hear an intercom call or page announcing a call and a line key is flashing at the fast rate:* A call has been transferred to your station. (Display shows LINE XX TRANSFER FROM XXX.)

- *A line key is flashing at the fast rate (there is no ring signal at your station), and you have allowed answer for the line:* You may hear ringing on another keyset. The ANS key cannot be used to answer these calls. Press the fast-flashing line key as described below or enter the automatic line answer feature code [350].

(2) Press the fast-flashing line or OVER key, or press the ANS key. The line or OVER key flashes slowly during the call.

Single-Line Set:

If you hear a page announcing a transfer and/or repeating long tones, a call is ringing in. Lift the handset; you are connected to the caller.

If you hear a call ringing in on another station and you have allowed answer, lift the handset and enter the automatic line answer feature code (350). You are connected to the lowest-numbered ringing line for which you have allowed answer.

13.6 *TO RECEIVE A CALL THAT WAS TRANSFERRED TO HOLD:*

If you hear a page announcing that an outside call is holding at your station (a line key is fluttering):

Keyset: Lift the handset and press the fluttering line or OVER key, or press the ANS key. You are connected to the caller.

Single-Line Set: Lift the handset and press the HOLD key or enter the individual hold feature code (336). You are connected to the caller.

B. KEYSET ON-HOOK DIALING AND MONITORING

13.7 A keyset user can dial numbers while on hook, monitor the call (listen to a recorded message, wait for the call to be answered, or wait on hold), and then speak handsfree when answered.

13.8 *TO DIAL ON HOOK:*

(1) While on hook, press an available line key, or, if auto lines are programmed, press the ANS key. Or, press SPCL and enter the ARS feature code (80), or enter a line group select feature code (81-87, or 9). The SPKR key lights, you hear outside dial tone, and the associated line key or the OVER key flashes slowly.

(2) Begin dialing the telephone number before the line pre-select timer expires. Then press the pound (#) or asterisk (*) key or wait for the

short interdigit timer to expire to signal the system to begin sending the dialed digits. (Display shows number dialed; after the valid call timer expires, it shows elapsed time and call cost.)

(3) **EITHER,** speak handsfree when the party answers.

OR, lift the handset and speak. The SPKR key goes off. You may later transfer back to the speakerphone by pressing the SPKR key and hanging up.

(4) **To terminate the call:** *If on hook,* disconnect by pressing the SPKR key. *If off hook,* hang up.

13.9 *TO USE ON-HOOK MONITOR:*

(1) While on a call, press the SPKR key and hang up. *If you do not want to be heard,* press the MUTE key. You can hear the other party (if the microphone is muted, you cannot be heard). The SPKR key is lit (and the MUTE key is lit if the microphone was muted).

(2) **To return to the conversation:** You may lift the handset or speak handsfree. (If the microphone was muted, press the lit MUTE key to speak. The MUTE key goes off.)

C. C.O. LINE CAMP ON AND BUSY LINE CALLBACK (QUEUE)

Camp On

13.10 When a station user attempts to access a busy outgoing line, the system sends a busy signal. The station user can wait off hook to camp on until the line is available.

13.11 *TO CAMP ON TO AN OUTGOING LINE:*

(1) When you hear a busy signal after selecting an outgoing line, do not hang up. You camp on and hear music until the line is available.

(2) When you hear a single progress tone and outside dial tone, dial the desired telephone number. The associated line key (if one exists) flashes slowly.

Busy Line Callback (Queue)

13.12 If you attempt to access a busy outgoing line and hear a busy signal or if you camp on, you can request a callback (queue) and hang up until the system signals your station that the line is available. Each station can wait in only one queue at a time. If a second request is made, the first request is canceled and replaced by the second.

13.13 Queue callbacks must be answered before the queue callback timer expires. If a callback is not answered, the queue is canceled. If the station is busy when the queued line becomes available, the queue request is placed at the end of the queue list for that line and the line is made available to the next queued station.

13.14 *TO QUEUE A BUSY OUTGOING LINE:*

(1) **Keyset:** If you hear a busy signal when selecting a line or if you are camped on, press the QUE key (or press the SPCL key and enter the queue request feature code — 6) and hang up.

Single-Line Set: If you hear a busy signal when selecting a line or if you are camped on, press the FLASH key (hookflash) and enter the queue request feature code (6). Then hang up.

(2) Your station rings (three tones and a long pause, repeating) when the queued line is available. (Display shows LINE XX IS NOW AVAILABLE.)

(3) **Keyset:** Lift the handset, press the fast-flashing line key or the ANS key, and dial the desired telephone number (unless the number was originally dialed using ARS and it is dialed automatically). The associated line key or the OVER key flashes slowly.

Single-Line Set: Lift the handset and dial the desired number (unless the number was originally dialed using ARS and it is dialed automatically). If all DTMF decoders are busy when your station is called back, the system sends repeating reorder tones instead of dial tone and the queue is canceled.

13.15 *TO CANCEL A QUEUE:*

Keyset: While on hook, press the QUE key (or press the SPCL key and enter the cancel queue request feature code — 376).

Single-Line Set: Lift the handset, enter the cancel queue request feature code (376), and hang up.

D. ACCOUNT CODES

13.16 There are three types of account codes in the GMX-48 System. All account codes are assigned the same character length (4–8 characters) in database programming. The three types are as follows:

● **Standard account codes** automatically appear in the SMDR report (if programmed) to identify the station that answered or initiated the call. Up to 32 standard account codes can be defined for the system. Stations can then be assigned one of the 32 account codes during station programming.

● **Forced account codes** are programmed on a station-by-station basis. If required, a forced account code must be entered before the station user is given access to a selected outgoing line (refer to paragraph 13.3 for procedures). Up to 120 forced account codes can be assigned in the database programming. The account code entered by the station user must match any one of the programmed forced account codes before line access is granted. The forced account code appears in the SMDR account code field.

● **Optional account codes** are used to identify calls to and from customers for billing purposes. They can be entered at any time during a call. These user-defined codes are not pre-programmed, but must be the same length as the standard and forced account codes. If entered, optional account codes are printed in the SAR and the SMDR report for that call in place of standard or forced codes that may have been used.

13.17 Forced and optional account codes can be programmed to be associated with station class of service (SCOS). This permits a user to place a call from any station using his account code and his usual SCOS. When the account code is entered, either as a forced account code (as described in paragraph 13.3)

or as an optional account code (using the procedure on the next page), the system checks the associated SCOS and applies it to the call being made. When the call is completed, the programmed SCOS for the station goes back into effect.

13.18 *TO ENTER AN OPTIONAL ACCOUNT CODE WHILE ON AN OUTSIDE CALL:*

(1) **Keyset:** Press the SPCL key and enter the optional account code feature code (390). (Display shows ACCT#.) The outside party does not hear you enter the code.

Single-Line Set: Press the FLASH key and enter the optional account code feature code

(390). The call is placed on hold while the account code is being entered.

(2) Enter the account code using the keypad; keyset users may press a SPD/BLF key to enter an account code number that has been stored in an outside speed-dial number location. (Display shows numbers.) You hear a single progress tone when the code is accepted. Single-line users are reconnected when the system accepts the account code. (If an account code is entered that has fewer than the programmed number of digits, single-line users will return to the call after the short interdigit timer expires.)

14. PLACING CALLS ON HOLD

14.1 There are several ways to place intercom and outside calls on hold. The party on hold hears music.

- **Individual hold** places the call on hold at only one station. It can then be picked up directly at that station or it can be picked up at another station using the reverse transfer feature.

- **System hold** places the call on hold at all stations. It can then be picked up directly at any keyset station that shows a fluttering line key for the call. (Single-line set users cannot place calls on system hold or pick up calls already on system hold.) Users with 12-line keysets cannot place calls on out-of-range lines (13–24) on system hold. Also, calls on out-of-range lines that are placed on system hold by 24-line keyset users cannot be picked up by 12-line keyset users. Intercom calls cannot be placed on system hold. If this feature code is used on conference calls, the callers are placed on individual hold.

- **Consultation hold** allows a single-line set user to pause during a call, use other system features, and then return to the caller by pressing the FLASH key (hookflashing). If a single-line set user attempts to hang up after placing a call on consultation hold, the call immediately recalls the station.

- **Call splitting** allows a station user to place two or more calls on individual hold and then easily split between the calls.

- **Skate-to-hold,** if enabled in the database, allows keyset users to place calls on individual hold when another line key or the IC key is pressed during a call (instead of pressing the HOLD key). The system is initialized to disconnect calls when another key is pressed (skate-to-disconnect).

14.2 If an outside call remains on hold until the hold timer expires, it recalls the station. If it is still unanswered when the recall timer expires, it recalls the station's attendant. If the attendant does not answer the recall before the abandoned recall timer expires, the call is disconnected by the system. (If the station does not have an attendant, or the system is in night mode, the call recalls the station that placed it on hold

until the abandoned recall timer expires and the call is disconnected.) Intercom calls that are placed on hold do not recall the attendant.

NOTE: Keyset users can avoid the hold timer by muting the microphone during a call instead of placing the call on hold (if this is done, the caller will not hear music-on-hold and the call will not recall the station).

14.3 A programming option can be enabled that will change the system hold flash rate to a continuous 960IPM to differentiate it from the 60/960IPM flutter used for individual hold. If the option is not enabled, both hold types use the 60/960IPM flutter.

A. INDIVIDUAL HOLD

14.4 *TO PLACE AN INTERCOM OR OUTSIDE CALL ON INDIVIDUAL HOLD:*

(1) While on the call:

Keyset: Press the HOLD key (or press the SPCL key and enter the individual hold feature code — 336). You hear intercom dial tone and the line, OVER, or IC key flutters.
NOTE: If the system is programmed with the skate-to-hold option, pressing another line key or the IC key will place the call on individual hold.

SLI: Press the FLASH key. Then press the HOLD key or enter the individual hold feature code (336). You hear intercom dial tone.

Other Single-Line Set: Hookflash and enter the individual hold feature code (336). You hear intercom dial tone.

(2) Hang up or place another call.

14.5 *TO RETURN TO THE CALLER ON INDIVIDUAL HOLD:*

Keyset: Lift the handset. Press the fluttering IC key for intercom calls. Or, press the fluttering line or OVER key (or the ANS key) for outside calls.

Single-Line Set: Lift the handset. Then press the HOLD key or enter the individual hold feature code (336).

B. SYSTEM HOLD

NOTE: Intercom calls cannot be placed on system hold. If you attempt to do so, you will hear reorder tones. Users with 12-line keysets cannot place calls on out-of-range lines on system hold. Also, if an out-of-range C.O. line is placed on system hold, the call can only be picked up at keysets that have a fluttering line key for the call. The ANS and OVER keys cannot be used to access an out-of-range line that is on system hold. (Single-line set users cannot place calls on system hold or pick up calls already on system hold.)

14.6 *TO PLACE AN OUTSIDE CALL ON SYSTEM HOLD (KEYSETS ONLY):*

(1) While on a call, press the SPCL key and enter the system hold feature code (335). You hear intercom dial tone and the associated line key flutters on all keysets.

(2) Hang up or place another call.

14.7 *TO ACCESS A CALL ON SYSTEM HOLD:*

At any keyset that shows a fluttering line key for the call, lift the handset and press the fluttering line key.

C. CONSULTATION HOLD

14.8 *TO USE CONSULTATION HOLD (SINGLE-LINE SETS ONLY):*

(1) While on a call, press the FLASH key (hookflash) to place the call on consultation hold. You hear two short tones followed by dial tone.

(2) You can call another station or enter a feature code. If you attempt to access an outgoing C.O. line, you will hear reorder tones.

NOTE: If you hang up while the call is on consultation hold, the call will immediately recall your station. If you hang up after dialing an intercom number, the call will transfer to that station.

(3) Return to the caller on hold by pressing the FLASH key (hookflashing).

D. CALL SPLITTING

14.9 *KEYSET CALL SPLITTING:*

(1) When two or more calls are on hold, access the first call on hold by pressing the fluttering line, OVER, or IC key.

(2) *If the system is programmed to place calls on hold when another line key or the IC key is pressed (skate to hold),* skip this step. Place the call back on hold by pressing the HOLD key (or pressing the SPCL key and entering the individual hold feature code — 336). You hear intercom dial tone and the key flutters again.

(3) Access the next call by pressing another fluttering line key or the IC key.

14.10 *SINGLE-LINE SET CALL SPLITTING:*

(1) Place one or more calls on hold: For each call, press the FLASH key (hookflash) and then press the HOLD key or enter the individual hold feature code (336). While on the last call, go to the next step.

(2) While on the last call, when you are ready to split between calls on hold, press the FLASH key (hookflash) and enter the call splitting feature code (337). That call is placed on hold and you are connected to the first call that was placed on hold in step 1.

(3) Press the FLASH key (hookflash) and enter the call splitting feature code (337) every time you wish to be connected to the next holding call. The current call returns to the end of the list.

(4) Hang up to disconnect the current call and cancel call splitting. You can then place or receive calls or return to any remaining calls on hold by lifting the handset and pressing the HOLD key (or entering the individual hold feature code — 336).

E. HOLD RECALL

14.11 *TO ANSWER A HOLD RECALL:*

If you hear four tones and a pause — repeating (display shows HOLD RECALL FROM XXX or LINE XX RECALL FROM XXX):

> **Keyset:** Lift the handset. Intercom calls are immediately connected. For outside calls, press the medium-flashing line or OVER key, or the ANS key.

> **Single-Line Set:** Lift the handset. You are connected.

F. MICROPHONE MUTE

14.12 Whether handsfree or using the handset, you can temporarily turn off your microphone while on a call. The call is still connected; you can hear the other party, but they cannot hear you. Since the call is not placed on hold, no timer is activated. The MUTE key is lit when the microphone is muted; the light will go off when you press the MUTE key to re-enable the microphone.

14.13 *MUTING THE KEYSET MICROPHONE:*

(1) To temporarily turn off your microphone while on a call, press the MUTE key (or enter the microphone mute on/off feature code — 314). The MUTE key is lit. *If off hook,* do not hang up (unless you press the SPKR key first).

(2) Press the lit MUTE key to turn the microphone on (or enter the microphone mute on/off feature code — 314). The MUTE key goes off.

15. CALL WAITING

15.1 While a station is in use, incoming intercom and outside calls camp on until the busy station is available. The busy party hears a single camp-on tone every 15 seconds (unless the camp-on tone timer is changed or camp-on tones have been disabled).

15.2 *TO RESPOND TO A WAITING CALL USING A KEY-SET:*

If, while on a call, you hear a single camp-on tone and see the IC key or a line key flashing fast, you have a call waiting. (Display shows CALL RINGING IN ON LINE XX or INTERCOM CALL FROM XXX or XXX TRANSFER FROM XXX or XXX RECALL FROM XXX each time you hear the tone.) Do one of the following:

(1) **EITHER,** end the current call and hang up. A waiting outside call rings as an incoming call; an intercom call rings as a private call. Answer as usual.

    OR, place the current call on hold by pressing the HOLD key (or pressing the SPCL key and entering the individual hold feature code — 336). The line, OVER, or IC key flutters (unless an intercom call is camped on; the IC key flashes fast until the camped on call is picked up, then the IC key flutters). Access the waiting call by pressing the flashing line or IC key.

(2) **To return to the holding call:** Press the fluttering line or IC key.

15.3 *TO RESPOND TO A CALL WAITING USING A SINGLE-LINE SET:*

When you hear a single camp-on tone every 15 seconds while you are on a call, another call is waiting. Do one of the following:

(1) **EITHER,** end the current call and hang up: The call rings at your station. Lift the handset.

    OR, place the current call on hold: Press the FLASH key (hookflashing). Then press the HOLD key or enter the individual hold feature code (336). You are connected with the waiting caller.

(2) **To return to the first call on hold:**

    EITHER, hang up to disconnect from the current call and return to the holding call by pressing the HOLD key or entering the individual hold feature code (336).

    OR, place the current call on hold and connect with the original call: Press the FLASH key (hookflashing). Then press the HOLD key or enter the individual hold feature code (336), twice.

15.4 *TO MOVE A CAMPED-ON INTERCOM CALL TO DO-NOT-DISTURB:*

While on a call, you hear call waiting signals:

    Keyset: Press the DND key. The DND key lights. The intercom caller is no longer camped on and receives do-not-disturb indications.

    Single-Line Set: Press the FLASH key (hookflash) and enter the do-not-disturb feature code (370). The intercom caller is no longer camped on and receives do-not-disturb indications. Press the FLASH key (hookflash) again to return to the current call.

    NOTE: The station is now in the do-not-disturb mode. If you wish to remove it from DND, press the DND key again or press FLASH and enter the cancel DND feature code again (371).

16. CALL TRANSFER

16.1 There are several feature codes for transferring intercom and outside calls to other stations or to outside telephone numbers. The call transfer options are:

● **Transfer C.O. call:** You can transfer outside calls to another station or to an outside telephone number.

● **Transfer intercom call:** Intercom calls can be transferred to another station or to an outside telephone number.

● **Transfer to hold:** Either intercom or outside calls can be transferred to another station and placed on hold using this feature. You cannot transfer calls to hold at hunt groups or voice mail stations.

16.2 In addition, transfer-to-park locations can be set up by the installer. Calls can be transferred to these locations and then reverse transferred by any station user. A transfer-to-park location is an intercom number that is "equipped" during database programming, but it is not assigned to any station instrument and it does not require a station circuit. However, if all available station circuits are equipped, you cannot assign a transfer-to-park location.

A. TRANSFER TO AN INTERCOM NUMBER

16.3 *TO TRANSFER A CALL TO AN INTERCOM NUMBER:*

(1) **Keyset:**

If on an outside call, press the XFR key (or press the SPCL key and enter the transfer C.O. call feature code — 345). You hear intercom dial tone.

If on an intercom call, press the SPCL key and enter the transfer intercom call feature code (346). You hear intercom dial tone.

Single-Line Set: While on a call, press the FLASH key (hookflash). You hear two short tones followed by intercom dial tone.

(2) Dial the desired intercom number or press a SPD/BLF key. The number can be a station in-

tercom number, a voice mail intercom number, "0" for the attendant, a hunt group pilot number, or a transfer-to-park location number.

a. **Transfer to voice mail or transfer to a station that is forwarded to voice mail:** *If transferring to the voice mail unit or to a station that is forwarded to voice mail,* you hear a single tone and the system waits for you to enter the mailbox number (display shows ENTER VOICE MAILBOX #).

If you do not enter a mailbox number before you hang up, the caller will be connected to the voice mail unit and must enter the mailbox number after listening to the introductory voice prompts.

If the system is checking for a valid mailbox number and you enter a valid mailbox number, the transfer is completed to voice mail (display shows CALL TRANSFERRED TO VOICE MAIL).

If the system is checking for a valid mailbox number and the number you entered is invalid, you hear reorder tones (display shows INVALID MAILBOX NUMBER ENTERED) and you must enter the correct number.

If the system is not checking for a valid mailbox number, enter the desired mailbox number and hang up.

b. **Transfer to a hunt group:** The transfer is completed automatically. Hang up.

c. **Transfer-to-park:** If transferring to the transfer-to-park location, hang up to complete the transfer, or transfer the call to hold as described in the second part of step 4. Then page the desired party and announce the call. The party must reverse transfer the call. Note that if the call is not answered, it will recall your station if transferred directly or will recall the called transfer-to-park location's attendant if transferred to hold.

(3) *If desired,* wait for an answer and announce the call. One of the following occurs:

  a. *If the call is accepted,* go to the next step.

  b. *If the call is refused,* return to the caller:

   Keyset: Press the fluttering line key for an outside call; for an intercom call, press the XFR key twice (or press the SPCL key once and enter the transfer intercom call feature code [346] twice).

   Single-Line Set: Press the FLASH key (hookflash).

  c. *If the station is busy or there is no answer:*

   EITHER, return to the caller as described above.

   OR, try another station. Press the XFR key (or press the SPCL key and enter the transfer C.O. feature code — 345, or the transfer intercom feature code — 346) and dial another intercom number.

   OR, complete the next step. Then page the party to announce the transfer.

(4) **EITHER,** hang up, press another line key, or press the IC key to complete the transfer. The call will ring at the station. (Receiving station's display shows XXX TRANSFER FROM XXX or LINE XX TRANSFER FROM XXX.) If the station is busy, the call camps on and sends call waiting signals.

   OR, FOR KEYSETS ONLY, press the HOLD key (or press the SPCL key and enter the individual hold feature code — 336) to place the call on hold at the called station. The call will not ring or send call waiting signals until the hold timer expires.

B. TRANSFER TO HOLD

16.4 A call transferred to hold at a station does not ring or send a display message while holding. After the hold timer expires, the station rings or sends call waiting signals. Also, calls transferred to hold do not recall the transferring party; they recall the receiving party's attendant if unanswered after the hold and transfer recall timers expire. Besides the procedure listed below, keyset users have an alternative method for transferring calls to hold; refer to the second half of step 4 in the preceding column.

16.5 *TO TRANSFER A CALL TO HOLD:*

(1) **Keyset:** While on a call, press the SPCL key and enter the transfer CO/IC to hold feature code (347).

   Single-Line Set: While on a call, press the FLASH key (hookflash) and enter the transfer CO/IC to hold feature code (347).

(2) Dial the desired intercom number.

(3) *If desired,* wait for an answer and announce the call.

(4) Hang up to complete the transfer.

16.6 *TO PICK UP A CALL THAT WAS TRANSFERRED TO HOLD AT YOUR STATION:*

   Keyset: When your IC key or a line or OVER key is fluttering, lift the handset and press the fluttering key (or the ANS key for an outside call). You are connected to the caller.

   Single-Line Set: Lift the handset and press the HOLD key or enter the individual hold feature code (336). You are connected to the caller.

C. TRANSFER RECALLS

16.7 If an outside call is transferred to another station and is not answered before the transfer-available or transfer-busy timer expires (and if it was not transferred to hold), the call recalls the transferring station and rings until the recall timer expires. If still unanswered after the recall timer expires, it recalls the transferring party's attendant. If the attendant does not answer a recall before the abandoned recall timer expires, the call is disconnected by the system. If the transferring station has no attendant, the call remains at the transferring station until the recall and abandoned recall timers expire. Transferred intercom calls will not recall the transferring station or the attendant.

16.8 *TO ANSWER A TRANSFER RECALL:*

> **Keyset:** If you hear four tones and a pause — repeating (display shows LINE XX RECALL FROM XXX), lift the handset. Press the medium-flashing line or OVER key, or the ANS key.

> **Single-Line Set:** If you hear four tones and a pause — repeating, lift the handset. You are immediately connected.

D. TRANSFER TO AN OUTSIDE NUMBER

NOTE: There may be some reduction in voice volume when an outside call is transferred to an outside telephone number.

16.9 The duration of an outside call that is transferred to outside telephone numbers is limited by the unsupervised C.O. timer. If using *Basic* software (or *Intermediate* or *Advanced* software without an APM), the call recalls the primary attendant or system alarm station when the timer (and the abandoned recall timer) expires. If using *Intermediate or Advanced* software and an APM is installed, the outside parties hear a burst of dial tone when the timer expires. They may then press any DTMF key (before the dial initiation — SL set timer expires) to reset the timer. If the timer is not reset, the unsupervised call recalls the primary attendant or alarm station. If the attendant does not answer the recall before the abandoned recall timer expires, the call is disconnected by the system.

NOTE: While this system is designed to be reasonably secure against C.O. line misuse by outside callers, there is no implied warranty that it is invulnerable to unauthorized intrusions. If the central office does not provide supervision and disconnect the call when one party hangs up, it is possible for a caller to remain connected to a C.O. line circuit. If this happens, and the caller begins dialing, the call could be placed through the system and would then be billed to the system's owner. The system cannot check this type of call for toll restriction and may not register the call in SMDR. This problem could arise when a call is connected to a station, or when it is forwarded or transferred to the public network.

16.10 *TO TRANSFER A CALL TO AN OUTSIDE TELEPHONE NUMBER:*

(1) **Keyset:**

> *While on an outside call,* press the XFR key (or press the SPCL key and enter the transfer C.O. call feature code — 345).

> *While on an intercom call,* press the SPCL key and enter the transfer intercom call feature code (346).

> **Single-Line Set:** While on a call, press the FLASH key (hookflash) and enter the transfer C.O. call feature code (345) or the transfer intercom call feature code (346).

(2) Select an outgoing line, and continue to the next step. *If you hear a busy signal,* select another line or camp on and wait for the line. Or, return to the caller as follows:

> **Keyset:** Press the fluttering line key for an outside call; for an intercom call, press the XFR key twice (or press the SPCL key once and enter the transfer call code [345] twice).

> **Single-Line Set:** Press the FLASH key (hookflash).

(3) Dial the desired telephone number.

(4) One of the following occurs:

> a. *If answered,* announce the call. Hang up, press another line key, or press the IC key to complete the transfer. If transferring an

outside call, the callers remain connected until the unsupervised C.O. timer expires. If using *Basic* software (or *Intermediate* or *Advanced* software without an APM), the call recalls the primary attendant or system alarm station when the timer (and the abandoned recall timer) expires. If using *Intermediate* or *Advanced* software and an APM is installed, the timer can be reset by one of the outside callers by pressing any DTMF key. If the timer is not reset, the call recalls the primary attendant or the system alarm station.

b. *If the number is busy or there is no answer,* return to the caller as described in step 2.

c. *If you hear repeating reorder tones,* you dialed a restricted telephone number. Return to the caller as described in step 2.

(5) *If you hear a repeating signal of four tones and a pause immediately after hanging up,* all resources are busy and the transfer did not go through. The party waiting to be transferred is on individual hold at your station and the receiving party recalls your station immediately. (Display shows LINE XX RECALL FROM XXX.) Do the following:

Keyset:

a. Lift the handset and press the medium-flashing line or OVER key, or the ANS key to speak to the party waiting to receive the transfer.

b. **EITHER,** hang up to attempt the transfer again.

   OR, disconnect from that party by pressing the XFR key (or pressing the SPCL key and entering the transfer C.O. call feature code — 345). Then press the fluttering or flashing line or OVER key, or XFR key to connect to the party that is waiting to be transferred.

Single-Line Set:

a. Lift the handset to speak to the party waiting to be transferred.

b. Hang up to disconnect from the party waiting to be transferred. The recalling call (the party waiting to receive the transfer) rings. Lift the handset again, you are connected with the party that was waiting to receive the transfer.

17. REVERSE TRANSFER AND GROUP CALL PICK-UP

17.1 Calls ringing or recalling at a station, a hunt group, or a transfer-to-park location can be picked up at any other station, using these features. Calls on hold can also be picked up from stations and from transfer-to-park locations.

NOTE: When reverse transferring a direct ring-in call, the line or OVER key will continue to flash at the ringing station until the call is answered. However, when using group call pick-up, the call is accessible only at the reverse transferring station.

Reverse Transfer

17.2 If more than one call is ringing or holding at a station, a priority list determines which call is reverse transferred. Calls are selected in the following order, and if more than one call of the same type is at the station, the calls are picked up in the order they were received:

1. Outside calls
   a. direct ring-in
   b. transfer and camped-on
   c. recall
   d. call on individual hold
2. Intercom calls
   a. ringing (ring-in, transfer, or recall)
   b. holding

Group Call Pick-Up

17.3 A call ringing in to a hunt group or one of its stations can be picked up at any other station. Users can enter the reverse transfer feature code (4) and dial a hunt group's pilot number to pick up a call that is ringing in to the hunt group's pilot number or to any station within that hunt group.

17.4 The following priority list is used for determining which call is picked up. The system follows the hunt group list (always beginning with the first station on the list) to check each station in the hunt group

and then the overflow station for one type of call at a time. If there is more than one call of the same.type at the selected station, the call that was received by the station first is picked up. Camped-on calls, holding calls, and queue callbacks cannot be picked up.

1. Ringing outside calls
   a. direct ring-in
   b. transfer
   c. recall
2. Intercom call (ringing, transfer, or recall)

17.5 *TO REVERSE TRANSFER A CALL FROM A STATION, HUNT GROUP, OR THE TRANSFER-TO-PARK LOCATION:*

(1) Lift the handset and enter the reverse transfer (call pick-up) feature code (4). You hear a progress tone.

(2) Dial the intercom number of the station where the call is ringing or holding.

(3) **Keyset:** *If the system is not programmed for direct connection of reverse transferred calls,* press the flashing line, OVER, or IC key for a ringing call, or press the fluttering line or IC key for a call on hold. (For outside calls that are ringing or holding, the ANS key may be used instead.)

Single-Line Set: You are automatically connected to the caller.

17.6 *TO REVERSE TRANSFER (PICK UP) A CALL USING THE XFR KEY (KEYSETS ONLY):*

(1) To pick up a call that is ringing or holding at another station, lift the handset and dial the intercom number of the station where the call is ringing or holding.

(2) Press the XFR key (or press SPCL and enter the transfer C.O. call feature code — 345).

(3) Press the flashing or fluttering line, OVER, or IC key if the system is not programmed to automatically connect reverse transferred calls. (For outside calls that are ringing or holding, the ANS key may be used instead.)

18. CALL PRIVACY AND PRIVACY RELEASE

18.1   Call privacy restricts speech channel access to one station at a time. When a C.O. line or intercom channel is selected, no other station user can gain access to the line or channel. However, access to, and control of, a line or channel can be passed to another station using the conference or transfer features.

18.2   In addition, the database contains an installer-programmable option that allows call privacy on all lines or allows keyset users to join ongoing calls on busy lines (see PROGRAMMING, page 5-24). When the system is initialized, calls on all lines are private and any user attempting to access a busy line will hear busy tones.

18.3   When privacy release is enabled, any keyset user may join any ongoing C.O. call by lifting the handset (or pressing the SPKR key) and pressing the busy line key — even if the station does not have outgoing-access, ring-in, or allowed-answer privileges for that line. Exceptions to this are established conference calls, data calls, calls on individual hold, DISA calls, and calls forced private by the user. If a keyset user presses the busy line key while on hook, the station will camp on to the line; pressing the line key again will allow the user to join the call.

18.4   If desired, as many as four intercom parties can participate in a call on one line. (There may be some reduction in voice volume on multi-party calls.) When a station user hangs up, only that user is disconnected; all other parties remain connected. While a multi-party call is in progress, the inside parties cannot dial numbers, enter hookflashes, or use the call transfer features. To queue or camp on to a busy line (rather than join the conversation), the keyset user must remain on hook and press the busy line key.

18.5   Even when privacy release is enabled system wide, an individual station user can restore call privacy during an outside call by entering the private call feature code or by placing the station in do-not-disturb. The call then cannot be joined by other people unless the conferencing feature is used. If the call is transferred or placed on system hold, the privacy restore feature is canceled. Privacy is retained if the call is put on individual hold.

18.6   *TO RESTORE PRIVACY ON A NON-PRIVATE LINE:*

> **Keyset:** While on an outside call, press the SPCL key and enter the private call feature code (369), or place the station in do-not-disturb by pressing the DND key.

> **Single-Line:** While on an outside call, press the FLASH key (hookflash) and enter the private call feature code (369), or place the station in do-not-disturb by entering the do-not-disturb feature code (370).

19. CONFERENCE CALLS

19.1 Station users can establish a three- to five-party conference without operator assistance. A station user can initiate one conference at a time and the system can maintain up to eight simultaneous conference calls. In addition to the initiating station, the conference can include any combination of intercom and/or outside calls. The initiating station is considered one of the conferencing parties.

19.2 If a conference is terminated using the hold feature, the remaining callers hear music while they are waiting. The station user must return to the callers one at a time. If the hold timer expires, the calls on hold recall the station that placed them on hold in the order they were placed. If still unanswered after the recall timer expires, they recall the station's attendant.

19.3 While a conference call is in progress, the inside parties cannot dial numbers, enter hookflashes, or use the call transfer features. Also, if an inside party exits the conference, any remaining inside parties may not use the conference or hold features to exit or terminate the conference.

19.4 Unlike the call privacy release option where station users can join an ongoing call by lifting the handset and pressing a busy line key, station users attempting to join an ongoing conference call by pressing a busy line key will hear busy tones, but may camp on to the line if desired.

NOTE: Conferencing is *not* amplified. During a multiple-party call, some reduction in voice volume may be noticed.

A. PLACING A CONFERENCE CALL

19.5 *TO PLACE A CONFERENCE CALL:*

(1) **Keyset:** While on a call, press the CNF key. The party is on conference wait hold (hears music) and the CNF key flutters. The line key is lit.

Single-Line Set: While on a call, press the FLASH key (hookflash) and enter the conference feature code (5). The party is on conference wait hold (hears music).

NOTE: If you hear a busy signal followed by music, all conference resources are busy. Do one of the following:

EITHER, wait off hook until you hear intercom dial tone before placing the second call.

OR, return to the call as follows.

> **Keyset:** Press the CNF key.

> **Single-Line Set:** Press FLASH (hookflash) and press HOLD (or enter the individual hold feature code — 336).

(2) Place intercom or outside calls to (or access existing calls with) the other parties to be included in the conference and place them on conference wait hold as described in step 1.

If the conference is to consist of five parties, the conference is connected automatically when the CNF key is pressed or the conference feature code is entered to connect the fifth party. (Display shows the intercom or line identification of each party connected in the conference.)

If the conference is to consist of fewer than five parties:

> **Keyset:** When all desired parties are on conference wait hold, press the CNF key again. All parties are connected. (Display shows the intercom number or line identification of each party connected in the conference.) The CNF key flashes slowly; line keys are lit.

> **Single-Line Set:** When all parties are on conference wait hold, press the FLASH key (hookflash) and enter the conference feature code (5). All parties are connected.

B. ADDING PARTIES TO A CONFERENCE

NOTE: Only one party in the conference can perform this procedure at a time. This procedure cannot be performed if five parties are already in the conference.

19.6 *TO ADD PARTIES TO AN EXISTING CONFERENCE (ANY INSIDE PARTY):*

Keyset:

(1) During the conference, press the CNF key. The other parties remain connected. The CNF key flutters and the line keys remain lit to indicate the outside calls that are in the conference. However, if a station remains connected in the conference, the IC key does not light to indicate that a station is involved.

(2) Place an intercom or outside call to (or access an existing call with) the other party to be included in the conference and press the CNF key.

If a total of five parties are involved, all of them are connected in a conference.

If four or fewer parties are involved:

EITHER, press the CNF key again to connect all four parties in a conference.

OR, to add a fifth party repeat step 1 again.

Single-Line Set:

(1) During the conference, press the FLASH key (hookflash). The other parties remain connected.

(2) Place an intercom or outside call to (or access an existing call with) the other party to be included in the conference. Press the FLASH key (hookflash) and enter the conference feature code (5).

If a total of five parties are involved, all of them are connected in a conference.

If four or fewer parties are involved:

EITHER, press the FLASH key (hookflash) and enter the conference feature

code (5) again to connect all four parties in a conference.

OR, to add a fifth party repeat step 1 again.

C. EXITING A CONFERENCE

19.7 There are several options for leaving the conference:

● End the conference by hanging up. The other parties remain connected as long as one is a station (inside party). If there are no stations remaining, the conference is disconnected.

● Place all parties on individual hold (refer to paragraph 19.8). The conference is terminated. You must return to the callers one at a time. To re-establish the conference, repeat the procedures in paragraph 19.5.

NOTE: If you attempt to place a conference call on system hold, all parties will be placed on individual hold.

● Leave the conference and allow the outside parties to remain connected (refer to paragraph 19.9). You can return to the conference at any time. To add parties to an existing conference, see paragraph 19.6.

19.8 *TO PLACE THE OTHER PARTIES ON HOLD:*

(1) **Keyset:** During a conference call, press the HOLD key (or press the SPCL key and enter the individual hold feature code — 336). The conference is terminated; the IC and/or line keys flutter and the CNF key goes off. The parties hear music while waiting.

Single-Line Sets: During a conference call, press the FLASH key (hookflash) and then press the HOLD key (or enter the individual hold feature code — 336). The conference is terminated and the parties hear music while waiting.

(2) Return to the parties one at a time:

Keyset: Access one party by pressing the fluttering line, OVER, or IC key. Then you can place it on hold, disconnect it, or re-establish the conference (following the procedures in paragraph 19.5). Repeat this step to access additional parties.

Single-Line Set: Access one party by pressing the FLASH (hookflash) key and then pressing the HOLD key (or entering the individual hold feature code — 336). Then you can place it on hold, disconnect it, or re-establish the conference (following the procedures in paragraph 19.5). Repeat this step to access additional parties.

19.9 *TO EXIT THE CONFERENCE AND LEAVE THE OTHER PARTIES CONNECTED (ANY INSIDE PARTY):*

Keyset:

(1)   During the conference, press the CNF key and hang up. The CNF key flutters and the line keys remain lit to indicate the outside calls that remain in the conference. However, if a station remains connected in the conference, the IC key does not light to indicate that a station is involved.

(2)   **To return to the conference:** Lift the handset and press the CNF key again.

NOTE: If all remaining parties are outside parties the unsupervised conference timer limits the length of the conference as follows:

If using *Basic* software (or *Intermediate* or *Advanced* software without an APM), the conference recalls the primary attendant or system alarm station when the timer (and the abandoned recall timer) expires.

If using *Intermediate* or *Advanced* software and an APM is installed, one of the parties may reset the timer by pressing any DTMF key. If the timer is not reset, the parties recall your station. You hear recall tones (four tones and a pause) and the CNF key flashes at the medium rate (display shows CONFERENCE HOLD RECALL). Press the CNF key to return to the conference. If the recall is not answered before the recall and abandoned recall timers expire, the conference will be disconnected; it will not recall the attendant.

Single-Line Set:

(1)   During the conference, press the FLASH key (hookflash) and hang up.

(2)   **To return to the conference:** Lift the handset and enter the conference feature code (5).

NOTE: If the unsupervised conference timer expires while you are out of the conference, one of the outside parties may reset the timer by pressing any DTMF key. If the timer is not reset, the parties recall your station. You hear recall tones (four tones and a pause). Lift the handset to answer the recall. If the recall is not answered before the recall and abandoned recall timers expire, the conference will be disconnected; it will not recall the attendant.

20. SECRETARIAL INTERCEPT

20.1   Stations can be programmed to have all incoming calls automatically forwarded to a secretarial intercept station (refer to PROGRAMMING, page 5-49). When the station is busy, calls are forwarded immediately. When there is no answer, calls forward after the forward no answer timer expires. Secretarial intercept stations can be assigned their own intercept station to provide back-up when the original secretarial intercept station is busy (as long as the assignments do not cause a call to circulate through a "loop"). Hunt group members should not be assigned secretarial intercepts; such an assignment has the effect of removing them from the hunt group.

20.2   Stations that are programmed to route their calls to a secretarial intercept station do not receive handsfree intercom calls; all calls ring as private calls.

21. CALL FORWARDING

21.1 With call forwarding, a station user can route incoming calls to another station, to a hunt group, or to an outside telephone number (if programmed for forwarding to the public network and allowed by toll and line restrictions). Station users can determine whether intercom and outside calls or just outside calls will be forwarded when placing the station into call forward mode. Special feature codes are used for forwarding all calls and for outside calls only. Keyset users can also choose to forward only intercom calls.

21.2 The four forwarding conditions are shown below. Separate feature codes have been assigned for forwarding all calls and forwarding only outside calls.

- **Forward all calls:** All incoming calls are immediately forwarded.

- **Forward if no answer:** Incoming calls are forwarded if they are not answered before the forward no answer timer expires.

- **Forward if busy:** Incoming calls are immediately forwarded if the station is busy.

- **Forward if no answer or busy:** Incoming calls are forwarded if the station is busy or if calls are not answered before the forward no answer timer expires.

21.3 All station users can use the eight forwarding feature codes to select the types of calls they want forwarded (all calls or outside calls only). In addition, keyset users can enter one of the feature codes that forwards all calls (355–358) and then terminate the programming sequence either by pressing the IC key to forward only intercom calls, or by pressing any line key to forward only outside calls. Single-line set users cannot choose to forward only intercom calls, as they are limited to using the "all" or "outside only" forwarding features codes.

21.4 When an outside call is being transferred to a station that is set to forward outside calls, the intercom call from the transferring party also forwards to allow the transferring party to announce the call. If the station is set to forward only intercom calls, the intercom call from the transferring party will not forward because it is associated with the transferred outside call.

21.5 If forward all calls is enabled, display keysets show the call forwarding status and destination until the request is canceled. If one of the conditional forwards is enabled (no answer, busy, or no answer/busy), display keysets show the forward status for five seconds and then return to normal. If the station receiving the forward is a display keyset, it shows XXX FORWARD FROM XXX for each forwarded call received.

21.6 The call forwarding feature can be allowed or disallowed on a station-by-station basis in the database. Also, permission to forward calls to the public network can be allowed or denied for each station that has call forwarding permission.

21.7 Station users can chain forwards from station to station providing the forwards do not form a loop. The conditional forward features (if busy, if no answer, if busy/no answer) may form a loop that the system cannot detect until a call is placed to one of the stations. For example, if two station users forward their calls to each other using the forward if busy feature, the system accepts the requests. However, if a call rings in while both stations are busy, the forwards create an illegal loop. The call camps on to the called station.

21.8 If more than one station has ring in for a C.O. line, direct ring-in calls on that line will forward to intercom numbers, but not outside numbers. The display of the keyset receiving the forwarded call will show it as a direct ring-in call, not as a forwarded call, and the line key flashes to show ring in. The keyset that is being forwarded also shows the call as a direct ring-in call and the line key flashes.

21.9 Calls cannot be forwarded to restricted outside telephone numbers or stations in do-not-disturb. If the station that is programmed to receive the forwarded calls is later placed in do-not-disturb, intercom callers will see the do-not-disturb display, but the call will be forwarded.

21.10 If a station is in do-not-disturb and call forward is programmed, intercom callers will see the do-not-disturb display set at the forwarded station, but the call is forwarded.

21.11 If a station in a linear or distributed hunt group is in call forward mode, the station will not receive hunt group calls. However, if a station in an all-ring hunt group is in call forward mode, the line key will flash to indicate a ringing hunt group call (but the station will not ring).

21.12 Call forwarding overrides any secretarial intercept assignment.

21.13 When a station that is forwarded to another station receives a message waiting indication, the message indication stays at that station; the message waiting indication does not appear at the station that is receiving the forwarded calls.

21.14 Queue callbacks and recalls do not forward, except that a recall at the attendant's station will forward to another station.

FWD Key

21.15 Keyset users may program their FWD key with any of the forwarding feature codes. In the default configuration, the FWD key is programmed to forward all calls.

21.16 A keyset's FWD key is lit when the station is programmed for call forwarding. When the lit key is pressed, the user has the option of canceling or changing the forward destination.

NOTE: If the FWD key is programmed with a feature code that forwards outside calls only, the user cannot use the IC key to terminate programming and thus include intercom calls.

Forwarding To An Outside Number

21.17 When programming a station for call forward to an outside telephone number, a select line group feature code is programmed before the telephone number. If the station is called while the selected line group is busy, the caller will hear continuous busy signals and the forward will not go through. The caller cannot camp on, queue, or leave a message and must hang up and try again. If another user transfers a call to a station that is forwarded to an outside number, the transferring party must wait for a line to be seized and the complete number to be dialed before hanging up. Failure to wait for the connection to be completed

will result in the call immediately recalling the transferring station.

21.18 A line must be exempt from ARS Only to allow ARS-Only stations to use it for the call forward to the public network feature. To do this, the line(s) must be assigned to a line group so that stations can enter a line group access code when programming the call forward number. For call forwarding and line group access purposes, all lines in the line group must be exempt from ARS Only; if not, an attempt to access the line(s) results in reorder tones.

21.19 The forwarding station's, not the caller's, line and toll restrictions are checked when the call is forwarded to an outside number.

NOTE: While this system is designed to be reasonably secure against C.O. line misuse by outside callers, there is no implied warranty that it is invulnerable to unauthorized intrusions. If the central office does not provide supervision and disconnect the call when one party hangs up, it is possible for a caller to remain connected to a C.O. line circuit. If this happens, and the caller begins dialing, the call could be placed through the system and would then be billed to the system's owner. The system cannot check this type of call for toll restriction and may not register the call in SMDR. This problem could arise when a call is connected to a station, or when it is forwarded or transferred to the public network.

21.20 If using a PBX line to forward to an outside telephone number, a PBX access code is entered after the select line group feature code and before the telephone number. Then, when a call is forwarded, the system automatically pauses for the duration of the pause digit timer before dialing the rest of the number. When other special digits are required, the user can insert a pause (short medium or long). And, if the system is programmed to allow hookflashes in speed-dial numbers the user may also enter a hookflash in the number.

21.21 When an outside call is forwarded to an outside number, the unsupervised C.O. timer is activated. If using *Basic* software (or *Intermediate* or *Advanced* software without an APM), the unsupervised call recalls the primary attendant or system alarm station when the timer (and the abandoned recall timer) expires. If using *Intermediate* or *Advanced* software and an APM is installed, both parties hear a burst of

intercom dial tone when the timer expires. Either party can reset the timer by pressing any DTMF key before the SL dial initiation timer expires. If the unsupervised C.O. timer is not reset, the call recalls the attendant. If the attendant does not answer the recall before the abandoned recall timer expires, the call is disconnected.

NOTE: There *may* be some reduction in voice volume when an outside call is forwarded to an outside telephone number.

Forwarding Calls To An Intercom Or Outside Number

21.22 *TO FORWARD CALLS:*

(1) **Keyset:**

EITHER, while on or off hook, press the FWD key to forward calls (except queue callbacks and recalls) according to how the FWD key is programmed. If on hook, the SPKR key is lit. (Display shows PROGRAM FORWARD.)

OR, while on or off hook, press the SPCL key and enter one of the following feature codes. If on hook, the SPKR key is lit. (Display shows PROGRAM FORWARD.)

- Call forward all calls (355)
- Call forward if no answer (356)
- Call forward if busy (357)
- Call forward if no answer or busy (358)
- CO forward all calls (351)
- CO Call forward if no answer (352)
- CO Call forward if busy (353)
- CO Call forward if no answer/busy (354)

Single-Line Set: Lift the handset and enter one of the feature codes listed above.

(2) **EITHER,** dial the intercom number of the station to receive the calls or "0" for the attendant. (Or, keysets only, press the MSG key to forward calls to the assigned message center.) If you dialed an invalid intercom number, your display shows FORWARD TO INVALID NUMBER and you hear reorder tones.

OR, dial a select line group feature code (81–87, 89, or 9), the PBX access code (if using

a PBX line), and the desired outside telephone number. **To include pauses or hookflashes in the number:** Press the SPCL key once for a short pause (S), twice for a medium pause (M), and three times for a long pause (L). If hookflash programming is enabled, press the SPCL key once for a hookflash (F), twice for a short pause (S), and three times for a medium pause (M).

If you hear repeating reorder tones, you entered an invalid line group feature code or dialed a restricted number and must start over. (Display shows FORWARD TO RESTRICTED LINE.)

NOTE: If a PBX access code was entered, the system automatically pauses for the duration of the pause digit timer before dialing the rest of the number. (Display shows an "S" to indicate a short pause.)

(3) **Keyset:** *If off hook,* hang up. *If on hook,* press SPKR.

OR, *If you entered 355, 356, 357, or 358 in the first step:*

To forward only CO calls: Press any line key or the ANS key.

To forward only IC calls: Press the IC key.

After using either method, you hear a progress tone and the FWD key is lit (display shows FWD [condition] TO XXX). If you attempted to forward calls to a station that is unconditionally forwarded to your station, your display shows SYSTEM DETECTED FORWARD LOOP and you hear reorder tones.

Single-Line Set: Hang up.

21.23 *TO CANCEL ANY CALL FORWARD REQUEST:*

Keyset: Press the lit FWD key (the key goes off). *If on hook,* press the lit SPKR key (the key goes off). *If off hook,* hang up. You hear a progress tone. (Display shows CANCEL ANY CALL FORWARD.)

Single-Line Set: Lift the handset, enter the cancel any call forward feature code (359), and hang up.

Forwarding To the Message Center

21.24 Keyset users have a simple method for forwarding calls to the their designated message center. The user presses the FWD key and then the MSG key. Calls forwarded through the keyset are then sent to the keyset's designated message center.

21.25 *TO QUICKLY FORWARD CALLS TO YOUR MESSAGE CENTER (KEYSETS ONLY):*

> While on or off hook, press the FWD key and then the MSG key. (Display shows FWD [condition] TO XXX). *If on hook,* press the lit SPKR key (the key goes off). *If off hook,* hang up.

Forwarding To Voice Mail

21.26 If the station is forwarded to the voice mail unit or if the message center is a voice mail system, the keyset user's intercom number (which is usually the mailbox number) is automatically dialed when the voice mail unit answers the forwarded call. In fact, whenever any station (keyset or single-line) is forwarded to a designated voice mail system, the station's intercom number is automatically dialed when the voice mail unit answers the forwarded call.

NOTE: If a C.O. line is assigned direct ring in to multiple stations, and if any of the stations are forwarded to a voice mail system, incoming calls will not be forwarded to the voice mail unit.

22. SPEED DIALING

22.1 Three GMX-48 features provide speed-dialing. They are as follows:

- **System Speed Dialing:** Up to 100, 32-digit system or tenant-specific speed-dial numbers can be stored in system memory.

- **Station Speed Dialing:** Single-line set users can store up to 10, 16-digit outside numbers using speed-dial location codes (0–9). Using the ten speed-dial (SPD/BLF) keys, keyset users can store 10 outside telephone numbers (up to 16 digits each) and 10 intercom numbers (up to four digits each).

- **Intercom and Outside (C.O.) System Directory:** *(Intermediate and Advanced software only)* The intercom directory enables display keyset users to "look up" intercom extension numbers and user names. The outside (C.O.) directory enables display keyset users to "look up" system speed-dial numbers and associated names.

A. SYSTEM SPEED DIALING

22.2 Speed dialing allows station users to dial stored telephone numbers quickly. Up to 100, 32-digit system or tenant-specific speed-dial numbers can be stored in system memory. Through database programming (but not through attendant programming), each individual number can be designated as available to all stations or available only to stations within a certain tenant group. If desired, an identifying name can also be stored with each speed-dial number. (See also the C.O. Directory feature on page 4-80.)

22.3 To keep system speed-dial numbers confidential, a valid range of locations 10–99 can be programmed as non-display numbers (see PROGRAMMING, page 5-20). Locations 00–09 are always displayed. Non-display numbers can be used by any station user (as long as the number is assigned to the user's tenant group or available to all stations in the system), but can only be displayed on the programming station's keyset. (At keysets, non-display numbers cannot be redialed or saved as station speed-dial numbers.)

NOTE: Non-display numbers will appear in the SMDR report.

22.4 System speed-dial numbers are subject to toll restriction unless a programmable option has been enabled that allows any station to dial any system speed-dial number regardless of that station's SCOS.

22.5 The system speed-dial numbers are stored using location codes (00–99). When dialed, the numbers appear on a display keyset unless they have been programmed as non-display numbers. Display keyset users can also view system speed-dial numbers and names that are available to their tenant group without dialing. When viewing non-display numbers only the name is displayed.

22.6 The system speed-dial numbers and names are protected by the database back-up battery and will not be erased in the event of a power failure.

Programming System Speed-Dial Numbers

22.7 The system speed-dial numbers and names are programmed by the installer or at any attendant station. However, attendants can only program or view numbers that are used system wide or in their particular tenant group. In addition to the attendant stations, one display keyset can be designated as the system speed-dial programming station, which can program or view all system speed-dial numbers and all tenant-specific speed-dial numbers. When the system is initialized, the primary attendant station is the designated system speed-dial programming station.

22.8 The system speed-dial numbers can contain up to 32 digits each and can include hookflashes and/or short, medium, or long pauses for dialing a series of numbers. For example, the speed-dial number can contain an SCC local number, a pause, an access code, and the telephone number. PBX access codes, followed by a pause, may be included in speed-dial numbers. When programming speed-dial numbers, each hookflash and each single, double, or triple pause is considered one digit. However, when the number is actually speed dialed, each double pause counts as two digits and each triple pause counts as three digits. (Therefore, some of the digits may be lost if the number is extremely long and contains double or triple pauses.) The lengths of the hookflash and the pause are determined by the programmable "pause digit" and "CO hookflash" timers.

22.9 To program system speed-dial numbers, use one of the following methods:

- Use the keypad to manually dial the number. If you make a mistake, press the MUTE key to backspace.

- Press the REDL key to enter the last number dialed or saved at the station (up to 32 digits).

- Press one of the SPD/BLF keys on the keyset to enter the outside telephone number (up to 16 digits) programmed under that key.

22.10 If *Intermediate* or *Advanced* software is installed, to program speed-dial names, keypad keys are used to enter the desired letters, numbers, and punctuation. The number of times a key is pressed determines which character is entered. For example, 77776444844 would enter "SMITH". When adjoining characters are located under the same key, press the FWD key once to advance to the next character. For example, 5666 FWD 66337777 would enter "JONES." Refer to the chart below to program speed-dial names. (Note that letters correspond to the letters printed on the keypad keys.)

KEY	NUMBER OF TIMES KEY IS PRESSED				
	1	2	3	4	5
1	.	—	,	&	1
2	A	B	C	>	2
3	D	E	F	/	3
4	G	H	I	"	4
5	J	K	L	[	5
6	M	N	O	]	6
7	P	Q	R	S	7
8	T	U	V	;	8
9	W	X	Y	Z	9
0	'	%	=	?	0

NOTE: The character values for key number "1" in the chart are different than those found for custom programming do-not-disturb messages (see page 4-86). This is due to the loss of the pound (#) key and asterisk (*) key character values. Intercom directory, C.O. directory, and system speed-dial programming all use the chart above.

22.11 *TO PROGRAM OR CHANGE SYSTEM SPEED-DIAL NUMBERS AND NAMES (ATTENDANTS AND THE DESIGNATED SYSTEM SPEED-DIAL PROGRAMMING KEYSET ONLY):*

NOTE: If you make a mistake, use the MUTE key to backspace. Or, lift and replace the handset (the name and number in memory remain unchanged); then start over.

(1) While on hook, press the SYS SPD key (or press SPCL and enter the program system speed-dial feature code — 020). (Display shows PROGRAM SYSTEM SPEED DIAL.)

(2) Enter the speed-dial location code (00-99). (The MSG key is lit and the display shows the name and number or, if one does not exist, NO OUTSIDE #.) *If using Basic software,* skip to step 4. *If using Intermediate or Advanced software,* go to the next step. If you do not continue to the next step, the display times out after the long interdigit timer expires and you must start over.

(3) **EITHER,** enter or change the name for the speed-dial number using your keypad. Refer to the chart. If necessary, use the MUTE key to back up and erase existing characters. Press the MSG key (it will go out and the cursor will move to the top line).

   OR, *if the existing name is correct,* or you do not wish to program a name, press the MSG key (it will go out and the cursor will move to the top line). Proceed to the next step.

(4) Enter or change the number (up to 32 digits) to be stored using the keypad, one of the SPD/BLF keys, or the REDL key. *If necessary,* use the MUTE key to back up and erase existing numbers. (Display shows the number as it is entered.) **To include pauses or hookflashes in the number:** Press the SPCL key once for a short pause (S), twice for a medium pause (M), and three times for a long pause (L). If hookflash programming is enabled, press the SPCL key once for a hookflash (F), twice for a short pause (S), and three times for a medium pause (M). You may not exceed 32 digits.

(5) Press any line key to save the number. You hear a single progress tone when the number is

accepted. (Display shows PROGRAM SYS-
TEM SPEED DIAL.)

(6) **EITHER,** repeat steps 2 through 5 for each
number to be entered or changed.

OR, wait for the display to return to the date
and time (after the long interdigit timer ex-
pires) or lift and replace the handset.

22.12 *TO ERASE SYSTEM SPEED-DIAL NAMES AND/OR
NUMBERS (ATTENDANTS AND THE DESIGNATED SYSTEM
SPEED-DIAL PROGRAMMING KEYSET ONLY):*

(1) While on hook, press the SYS SPD key (or
press SPCL and enter the program system
speed-dial feature code — 020). (Display
shows PROGRAM SYSTEM SPEED DIAL.)

(2) Enter the speed-dial location code (00–99).
(The MSG key is lit and the display shows the
name and number.)

(3) *If using Intermediate or Advanced software and
you wish to erase the name,* press the MUTE key
repeatedly until the name is erased. Press any
line key. You hear a single progress tone when
accepted.

(4) *If you wish to erase the number,* press the MSG
key, then press the MUTE key repeatedly un-
til the number is erased. Press any line key.
You hear a single progress tone when ac-
cepted.

(5) **EITHER,** repeat steps 2 through 4 for each
number to be erased.

OR, wait for the display to return to the date
and time (after the long interdigit timer ex-
pires) or lift and replace the handset.

Viewing System Speed·Dial Numbers

22.13 *TO VIEW SYSTEM SPEED-DIAL NUMBERS AND
NAMES AT ATTENDANT STATIONS AND THE DESIGNATED
SPEED-DIAL PROGRAMMING STATION:*

NOTE: If you make a mistake, lift and replace the
handset; then start over.

(1) While on hook, press the SYS SPD key (or
press SPCL and enter the system-speed dial
feature code — 381). (Display shows PRO-
GRAM SYSTEM SPEED DIAL.)

(2) Enter the desired location code (00–99). (The
display shows the programmed name and
number.)

(3) Wait for the display to return to the date and
time (after the long interdigit timer expires) or
lift and replace the handset. Then repeat the
procedure for each number to be viewed.

22.14 *TO VIEW SYSTEM SPEED-DIAL NUMBERS AND
NAMES AT ANY DISPLAY KEYSET:*

(1) While on hook, press the SYS SPD key (or
press SPCL and enter the system speed-dial
feature code — 381). (Display shows RE-
VIEW SYSTEM SPEED DIAL.)

(2) Enter the desired location code (00–99).
(Display shows the programmed name and
number. Or, if it is a non-display number, the
display shows the name and NON DISPLAY
#.)

(3) Wait for the display to return to the date and
time (after the long interdigit timer expires) or
lift and replace the handset. Then repeat the
procedure for each number to be viewed.

Dialing System Speed-Dial Numbers

22.15   *TO DIAL SYSTEM SPEED-DIAL NUMBERS:*

(1)   Lift the handset and select an outgoing line.

(2)   **Keyset:** Press the SYS SPD key (or press SPCL and enter the system speed-dial feature code — 381).

Single-Line Set: Press the FLASH key (hook-flash) and enter the system speed-dial feature code (381).

(3)   Enter the location code (00–99) for the desired number. The number is automatically dialed. (Display shows the number dialed unless it is a non-display number.) If you hear reorder tones, your station is restricted from dialing the selected number.

B. STATION SPEED DIALING

22.16 For convenience, each station user can program individual speed-dial numbers. Single-line set users can store up to 10, 16-digit outside numbers using speed-dial location codes (0–9). Using the speed-dial (SPD/BLF) keys and/or location codes, 12-line and 24-line keyset users can store 10 outside telephone numbers (up to 16 digits each) and 10 intercom numbers (up to four digits each; see paragraph 22.18 below). The 12-line keysets have eight SPD/BLF keys and 24-line keysets have 10 SPD/BLF keys. Together, the lamps in the keyset SPD/BLF keys create a busy lamp field that indicates the status of the stations programmed under the keys. Intercom numbers can be either station intercom numbers or hunt group pilot numbers.

Programming Station Speed-Dial Numbers

22.17 When entering the outside telephone numbers, use one of the following methods:

● Use the keypad to manually dial the number.

● On a keyset, press the REDL key to enter the last number (up to the first 16 digits) dialed or saved at the station.

● On a keyset, press the SYS SPD key and enter the system speed-dial location code (00–99) to store one of the system speed-dial numbers in a station speed-dial location. (If the number is over 16 digits, only the first 16 digits are stored.) Non-display system speed-dial numbers cannot be stored in keyset station speed-dial locations.

22.18 A station intercom number can be preceded with a pound (#) to always speed dial private intercom calls to the station. Or, a "4" may be entered before a station intercom number or hunt group pilot number to quickly reverse transfer (pick up) calls from that station or hunt group. If either of these options is used, normal handsfree intercom calls cannot be placed using that station speed-dial location or SPD/BLF key. Also, when an intercom number is preceded by a "4", the SPD/BLF key will not show the station's status.

22.19 Station users can also program pauses and/or hookflashes into the stored outside telephone numbers. For example, the number can contain an SCC

local number, a pause, and an access code. If the system is installed behind a PBX, speed-dial numbers may contain the PBX access code if it is followed by a pause. When programming speed-dial numbers, each hookflash and each single, double, or triple pause is considered one digit. However, when the number is actually speed dialed, each double pause counts as two digits and each triple pause counts as three digits. (Therefore, some of the digits may be lost if the number is extremely long and contains double or triple pauses.) The durations of the hookflash and the pause are determined by the programmable "pause digit" and "CO hookflash" timers.

22.20 The station speed-dial numbers are stored in the system memory and protected by the database back-up battery. They will not be erased by unplugging the station instrument or by a power failure.

22.21 *TO PROGRAM STATION SPEED-DIAL NUMBERS USING A KEYSET:*

NOTE: If you make a mistake, lift and replace the handset; then start over. The number in memory remains unchanged. Or, use the MUTE key to backspace.

(1) While on hook, press the SPD/BLF key to be programmed. (Display shows PROGRAM STATION SPEED DIAL # and the key number.)

(2) Dial the intercom number (up to four digits) or telephone number (up to 16 digits) to be stored. (Display shows the number.) **To include pauses in an outside telephone number:** Press the SPCL key once for a short pause (S), twice for a medium pause (M), and three times for a long pause (L). If hookflash programming is enabled, press the SPCL key once for a hookflash (F), twice for a short pause (S), and three times for a medium pause (M). You may not exceed 16 digits. Do not program hookflashes or pauses in intercom numbers, or you will receive reorder tones when trying to dial them.

(3) **EITHER**, press the IC key if an intercom number was stored.

OR, press any line key if a telephone number was stored.

You hear a single progress tone when the system has accepted the number. (Display shows both numbers stored under the key.)

(4) Lift and replace the handset (or wait 5 seconds for the display to return to the date and time). Repeat the steps for each additional number to be stored.

22.22 *TO PROGRAM STATION SPEED-DIAL NUMBERS USING A SINGLE-LINE SET:*

NOTE: Up to 10 outside telephone numbers can be stored using speed-dial location codes (0–9). If you make a mistake, hang up and start over.

(1) Lift the handset and enter the program station speed-dial feature code (383).

(2) Dial the speed-dial location code (0–9).

(3) Dial the telephone number (up to 16 digits) to be stored and hang up. **To include pauses or hookflashes in the number:** Press the FLASH (hookflash) key once for a short pause (S), twice for a medium pause (M), and three times for a long pause (L). If hookflash programming is enabled, press the FLASH (hookflash) key once for a hookflash (F), twice for a short pause (S), and three times for a medium pause (M). Each pause or hookflash counts as one digit. Wait 2 seconds after pressing the FLASH key before pressing it again; the system only recognizes one FLASH every 2 seconds.

(4) Repeat the complete procedure for each number to be stored.

22.23 *ERASE A STATION SPEED-DIAL NUMBER:*

Repeat the programming procedures, but do not dial a number (skip step 3).

Viewing Station Speed-Dial Numbers

22.24 *TO VIEW THE STORED NUMBERS (ON A DISPLAY KEYSET):*

(1) While on hook, press the desired SPD/BLF key twice. (Display shows the currently stored numbers.)

(2) *If desired,* press other SPD/BLF keys once to view their numbers. (If the date and time displays, the program has timed out; repeat step 1.)

Dialing Station Speed-Dial Numbers

22.25 *TO DIAL A STATION SPEED-DIAL NUMBER:*

(1) Lift the handset.

(2) *If placing an outside call,* select an outgoing line. *If placing an intercom call,* skip this step.

(3) **Keysets:** Press the SPD/BLF key of the desired number. The number is dialed. (Display shows the number.)

Single-Line Set: Press the FLASH key (hookflash), and then press the STN SPD key or enter the station speed-dial feature code (382). Then dial the location code (0–9). The number is dialed.

23. INTERCOM AND C.O. DIRECTORY (KEYSETS ONLY)

NOTE: This feature is available only in the *Intermediate* and *Advanced* software packages.

23.1 The intercom directory enables display keyset users to "look up" intercom extension numbers and user names. The C.O. directory enables display keyset users to "look up" system speed-dial numbers and associated names. The intercom directory is automatically updated whenever user names and/or intercom number information is reprogrammed. The C.O. directory is updated whenever a system speed-dial number or name is reprogrammed.

23.2 Once the desired intercom number/name or system speed-dial number/name has been selected, the user may automatically dial the number, store the number in a station speed-dial location, select a different number/name, terminate the directory routine, or switch to the other directory. A directory search can be performed when a call is waiting on conference or transfer hold at the station, if necessary.

23.3 To use the directory, enter a letter, a string of letters, or a valid intercom number. If searching for a name, the full name need not be entered. The system will find the closest match and show the number and its associated name on the keyset display. Or, use the asterisk (*) or pound (#) keys to scroll backward or forward alphabetically through the stored list of names. (It is not possible to scroll through the intercom numbers.)

23.4 Keypad keys are used to enter the desired letters, numbers, and punctuation. The station user can switch between numeric and alphanumeric modes. (Numeric mode = MSG key unlit; alphanumeric mode = MSG key lit.) In alphanumeric mode, the number of times a key is pressed determines which character is entered. For example, 77776444844

would enter "SMITH". When adjoining characters are located under the same key, press the FWD key once to advance to the next character. For example, 5666 FWD 66337777 would enter "JONES." Refer to the chart below to program messages in alphanumeric mode. The letters correspond to the letters printed on the keypad keys.

| KEY | NUMBER OF TIMES KEY IS PRESSED | | | | |
	1	2	3	4	5
1	.	—	,	&	1
2	A	B	C	>	2
3	D	E	F	/	3
4	G	H	I	"	4
5	J	K	L	[	5
6	M	N	O	]	6
7	P	Q	R	S	7
8	T	U	V	;	8
9	W	X	Y	Z	9
0	'	%	=	?	0

NOTE: The character values for key number "1" in the chart are different than those found for custom programming do-not-disturb messages (see page 4-86). This is due to the loss of the pound (#) key and asterisk (*) key character values. Intercom directory, C.O. directory, and system speed-dial programming all use the chart above.

A. INTERCOM DIRECTORY

23.5 *TO PERFORM AN INTERCOM DIRECTORY SEARCH:*

(1) While on or off hook, press SPCL and enter the intercom directory feature code (307). The MSG key lights (and the SPKR key lights if on hook) and the display shows INTERCOM NAME: on the top line, while the cursor is located on the bottom line.

(2) Enter up to seven alpha and/or numeric characters for the intercom number or user name. If searching for a name, the whole name does not have to be entered. You may switch between modes by pressing the MSG key (lit = alphanumeric, unlit = numeric).

   a. *In numeric mode (MSG key unlit):* Press the keypad keys to enter a valid intercom number. Press the MUTE key to backspace, if necessary.

   b. *In alphanumeric mode (MSG key lit):* Press the keypad keys to enter the desired characters. Refer to the chart on the previous page. Press the FWD key once to advance or twice to leave a space. Press the MUTE key to backspace.

(3) *If desired*, press the pound (#) key to scroll forward alphabetically through the directory or press the asterisk (*) key to scroll backward. If this method is used, skip the next step.

(4) Press either the pound (#) or asterisk (*) key to signal the system to begin the search. The closest match will be displayed on your keyset. (If you entered an invalid intercom number, you will hear reorder tones. Repeat step 2.)

(5) *If desired,* store the selected intercom number in a station speed-dial location by pressing the desired SPD/BLF key. You hear confirmation tone when the number is accepted.

(6) **EITHER,** automatically dial the intercom number selected by pressing the IC key. (If an intercom call is camped on and the IC key is lit, pressing the IC key accesses the waiting call and terminates the directory feature.)

   OR, search for a different intercom number by repeating steps 2 through 4.

   OR, terminate the directory routine. *If off hook,* hang up. *If on hook,* press the SPKR key.

   OR, switch to the C.O. directory by pressing a non-flashing line key or the ANS key. (C.O. directory instructions are given below.)

NOTE: If a call is ringing in or holding on the selected line, pressing the flashing line or ANS key will answer the call and terminate the directory function.

B. C.O. DIRECTORY

23.6 *TO PERFORM A C.O. DIRECTORY SEARCH:*

(1) While on or off hook, press SPCL and enter the C.O. directory feature code (308). The MSG key lights (and the SPKR key lights if on hook) and the display shows OUTSIDE NAME: on the top line, while the cursor is located on the bottom line.

(2) Enter alphanumeric characters (up to 16) for the speed-dial name. You do not have to enter the whole name. Press the keypad keys to enter the desired characters. Refer to the chart on the previous page. Press the FWD key once to advance or twice to leave a space. Press the MUTE key to backspace.

(3) *If desired,* press the pound (#) key to scroll forward alphabetically through the directory or press the asterisk (*) key to scroll backward. If this method is used, skip the next step.

(4) Press either the pound (#) or asterisk (*) key to signal the system to begin searching. The closest match will be displayed on your keyset. If you selected a non-display number, NON DISPLAY # will appear on the top line and the name (if assigned) will appear on the bottom line; the number is not displayed.

(5) *If desired,* store the selected system speed-dial number in a station speed-dial location by pressing the desired SPD/BLF key. You hear a confirmation tone when the number is accepted.

   NOTE: If the system speed-dial number is longer than 16 digits, only the first 16 digits will be stored in the station speed-dial location. Also, if the number is a non-display number, it cannot be stored.

(6) **EITHER,** automatically dial the speed-dial number selected by pressing a line key. Lift the handset when the call is answered, if on hook.

(If a call is ringing in or holding on the selected line, pressing the flashing line or ANS key will answer the call and terminate the directory function.)

OR, search for a different system speed-dial number by repeating steps 2 through 4.

OR, terminate the directory routine by hanging up or, if on hook, pressing the SPKR key.

OR, switch to the intercom directory by pressing the IC key. (Intercom directory instructions are given on page 4-80.)

NOTE: If an intercom call is camped on and the IC key is flashing, pressing the IC key accesses the waiting call and terminates the directory feature.

24. HOUSE PHONE

24.1 This feature provides users with the ability to place a pre-designated intercom or outside call simply by lifting the handset (or pressing the SPKR key) on a designated house phone. There are several applications for this feature, such as:

- **Courtesy paging phone:** Visitors hear pages instructing them to pick up the house phone (such as the "courtesy paging phone" used in airport terminals). When they lift the handset, they are connected to a station user who can give them a message or connect them to a call.

- **Emergency phone:** The house phone can be programmed to automatically place a call to an emergency number (such as 911). This could save time in an emergency.

- **Service phone:** Customers can use the house phone(s) to place orders or receive special services from the lobby. For example, the house phone would automatically dial the intercom number of a service representative (or hunt group number of the service department).

- **Intercom network:** House phones could be placed in specific locations throughout a building (such as examination rooms in a doctor's office) and could be programmed to access a specific station or group of stations (such as a nurses' station).

24.2 Any station may be designated as a house phone in database programming (see PROGRAM-MING, page 5–49). However, a single-line set is preferred for ease of use. The number dialed by the house phone is determined by the station's speed-dial programming. The number programmed in C.O. station speed-dial location 1 is automatically dialed during day mode, and the number in C.O. location 2 is dialed during night mode. This number can be either an intercom number or an outside telephone number. If it is an outside number, it must be preceded with a select line group feature code (and a pause if necessary). Other station information (such as user name, intercom number, SCOS, etc.) for the house phone is programmed as usual.

24.3 If the house phone is a keyset, the intercom or outside telephone number must be programmed in the station's "outside number" speed-dial location, and not the "intercom number" location. If no speed-dial numbers are programmed or if the speed-dial number is erased, the user hears dial tone when the handset is lifted or the SPKR key is pressed and may dial any intercom number or place an outside call.

24.4 Once a station is designated as a house phone, the speed-dial number must be programmed on hook or through the database because lifting the handset causes the number to be dialed.

24.5 Incoming calls take precedence over outgoing calls. If using a single-line set or a keyset programmed for automatic C.O. access (see page 4–42), any ringing call is automatically answered when the handset is lifted or the SPKR key is pressed.

25. REDIALING

25.1 The redial feature stores a telephone number dialed manually or speed dialed at the station (up to 32 digits). If the station user reaches a busy number or is disconnected, or if there is no answer, the number can be redialed easily.

25.2 Only one telephone number can be stored in redial memory at one time. With keysets, this number can be stored in one of two ways, depending on keyset programming.

- **Last number dialed:** The last number manually dialed or speed dialed is automatically stored. It changes every time the user dials a telephone number. The number is redialed using the procedure in paragraph 25.8. This is the default value of the redial feature and the REDL key.

- **Last number saved:** The last number dialed is manually stored by the keyset user. Dialing other numbers does not change the number saved. It only changes when a new number is saved, using the procedure in paragraph 25.7. The number is redialed using the procedure in paragraph 25.8. This is programmed with the last number saved feature code.

25.3 There are three feature codes that affect the redial feature. The redial feature code (380) performs the redial function (on keysets and SLIs the code is under the REDL key). The program redial mode feature codes (320 and 321) determine the mode of the redial feature code for keysets (last number dialed or last number saved). The SLI REDL key mode cannot be changed; it is always last number dialed.

25.4 System speed-dial numbers cannot be redialed at keyset stations if they have been programmed as non-display numbers.

25.5 If the system is installed behind a PBX, the redial feature remembers the PBX access code and automatically inserts a pause after the code when it is redialed.

25.6 *TO PROGRAM THE KEYSET REDIAL MODE:*

NOTE: When initialized, the keyset redial mode is programmed for last number redial (320).

(1) While on hook, press the SPCL key.

(2) Enter the feature code to program last number dialed (320) or last number saved (321) redial mode.

25.7 *TO SAVE A NUMBER ON A KEYSET PROGRAMMED FOR LAST NUMBER SAVED (321):*

NOTE: The saved number is replaced each time you repeat this procedure.

(1) When you wish to save an outside telephone number, hang up to disconnect the call.

(2) Remain on hook and press the REDL key (or press SPCL and enter the redial feature code — 380).

(3) **To redial the number:** Use the procedure in the next paragraph.

25.8 *TO REDIAL A NUMBER:*

(1) Lift the handset and select an outgoing line.

(2) **Keyset:** Press the REDL key (or press SPCL and enter the redial feature code — 380). The number is dialed and displayed.

 SLI: Press the FLASH key and press the REDL key or enter the redial feature code (380). The number is dialed.

 Single-Line Set: Hookflash and enter the redial feature code (380). The number is dialed.

26. PAGING

26.1 The paging feature allows announcements to be made through keyset internal speakers. Optional paging equipment (an amplifier and paging speakers) may also be installed to provide paging for an external area, such as a warehouse or loading dock.

26.2 The installer can place keysets and/or the external paging speaker network in up to six paging zones. When the system is initialized, all keysets and the external paging speaker network are assigned to paging zone 1 to provide an all-page zone. Keysets and the external paging speaker network can be assigned to any, all, or none of the paging zones, as desired.

26.3 Pages are not heard if the keyset has been removed from paging, is in do-not-disturb, is ringing, or is in use. Also, keyset background music and internal music-on-hold are interrupted for pages (even if the keyset is not in the selected page zone).

26.4 *TO MAKE A PAGE:*

(1) Lift the handset.

(2) **Keyset:** Press the PAGE key (or enter the page feature code — 7).

   Single-Line Set: Enter the page feature code (7).

(3) Enter the zone code (1–6) for the desired zone.

(4) After the single progress tone, make your page before the paging timer expires. If you hear reorder tones, there are no stations in the selected page zone; all stations in the zone have enabled the page remove feature, are busy, or are in do-not-disturb; the necessary system resources are busy; or the paging system is being used by another station. Users cannot camp on to or queue the paging system.

(5) Hang up.

27. REMOVE FROM PAGING

27.1 A keyset user can remove the keyset from its assigned page zone(s) or allow it to receive pages again by placing it back in the zone(s) using these feature codes.

27.2 *TO HALT OR ENABLE ZONE PAGES:*

(1) While on or off hook, press SPCL.

(2) Enter the page remove feature code (332) to prevent the keyset from receiving pages or enter the page replace feature code (333) to allow the keyset to receive pages. You hear a progress tone.

(3) *If off hook,* hang up.

28. DO-NOT-DISTURB

28.1 Placing a station in do-not-disturb halts all pages, incoming intercom calls, camped-on calls, and calls transferred to that station. Queue callbacks, recalls, and direct ring-in calls are not blocked. Another user calling the station while it is in do-not-disturb hears a repeating signal of four fast tones and a pause; the user cannot camp on, but can queue or leave a message at the station.

28.2 If desired, individual stations can be prevented from using do-not-disturb by disabling the do-not-disturb option in the database (see PROGRAMMING, page 5-24.) Another option concerns do-not-disturb breakthrough. Normally, calls to a station through DISA or the automated attendant are not blocked by placing the station in do-not-disturb. If desired, individual stations can be set prevent these calls from breaking through do-not-disturb (see PROGRAMMING, page 5-49) and send the calls immediately to the attendant when the station is in do-not-disturb.

28.3 If a station in a linear or distributed hunt group is in do-not-disturb, calls to the user's hunt group do not cause the keyset to ring, but the line or IC key will flash if all other stations in the hunt group are busy, forwarded, have hunt group remove enabled, or are in do-not-disturb. Stations in all-ring hunt groups that are in do-not-disturb, will show ring flash, but will not ring when receiving a hunt group call. Hunt group announcement stations and overflow stations cannot block hunt group calls by using do-not-disturb.

28.4 When a station is placed in do-not-disturb, the user may select one of 20 system-stored messages (unless do-not-disturb is enabled while the user is on a call, in which case message 1 is automatically selected). An attendant can reprogram messages 02-20 with another message, up to 16 characters long. When a station in do-not-disturb is called by a display keyset user, the caller sees the selected message. Initialized messages are programmed as follows:

01 - DO-NOT-DISTURB	11 - OUT OF OFFICE
02 - IN MEETING UNTIL	12 - OUT UNTIL
03 - IN MEETING	13 - WITH A CLIENT
04 - ON VACATION 'TIL	14 - WITH A GUEST
05 - ON VACATION	15 - WITH A PATIENT
06 - CALL ME AT	16 - UNAVAILABLE
07 - AT THE DOCTOR	17 - IN CONFERENCE
08 - ON A TRIP	18 - AWAY FROM DESK
09 - ON BREAK	19 - GONE HOME
10 - OUT OF TOWN 'TIL	20 - OUT TO LUNCH

28.5 The second line of the message can be customized with a numeric/alphanumeric message of up to 16 characters. The customized message is entered as described in the following paragraphs.

28.6 When programming a customized do-not-disturb message, the station is automatically in numeric mode. The keypad keys are used to enter numbers 0-9, the pound (#) key is used for entering a hyphen (-), and the asterisk (*) key is used for entering a colon (:). For example, 1*00 would enter "1:00" in numeric mode.

28.7 Keyset users can enter alphanumeric mode by pressing the MSG key (the key lights). Keypad keys are used to enter the desired letters, numbers, and punctuation. The number of times a key is pressed determines which character is entered. For example, 33377744432999 would enter "FRIDAY". When adjoining characters are located under the same key, press the FWD key once to advance to the next character. For example, 6 FWD 666 FWD 6632999 would enter "MONDAY". Refer to the chart below to program messages in alphanumeric mode. (Note that letters correspond to the letters printed on the keypad keys.)

| KEY | NUMBER OF TIMES KEY IS PRESSED | | | | |
	1	2	3	4	5
1	@	+	&	<	1
2	A	B	C	>	2
3	D	E	F	/	3
4	G	H	I	"	4
5	J	K	L	[	5
6	M	N	O	]	6
7	P	Q	R	S	7
8	T	U	V	;	8
9	W	X	Y	Z	9
0	'	%	=	?	0
*	*	!	$	(	:
#	#	,	.	)	—

28.8 When using either mode, keyset users may use the SPD/BLF keys (digits stored in the outside number location) and/or the REDL key to enter stored numbers or messages. Speed-dial numbers can be chained together when entering messages that require more that 16 digits. When programming a message in speed-dial memory, use the SPCL key in place of the FWD key to advance or insert spaces.

28.9 *TO ENABLE DO-NOT-DISTURB:*

(1) **Keyset:** While on hook, press the DND key. The DND key lights. (Display shows SELECT DND MESSAGE.)

Single-Line Set: Lift the handset and enter the do-not-disturb feature code (370).

(2) **EITHER,** select message 01 (DO-NOT-DIS-TURB):

Keyset: Press the SPKR key or allow the programming mode to time out.

Single-Line Set: Hang up, press the FLASH key, or allow the programming mode to time out.

OR, select any of the 20 pre-programmed messages by entering the desired number (01–20). (Messages are listed on the previous page.) Keyset users may scroll through the messages by pressing the pound (#) key to go forward or the asterisk (*) key to go backward (the display shows the selected message). If you enter an invalid message number, you will hear reorder tones and may try again.

(3) **EITHER,** terminate programming.

Keyset: Press the SPKR key, lift and replace the handset, or allow the programming mode to time out.

Single-Line Set: Hang up, press the FLASH key, or allow the programming mode to time out.

OR, customize the second line of the message using any combination of the following methods:

a. *Remain in numeric mode:* Press the keypad keys to enter the desired number. Use the pound key (#) for a hyphen (-) and the asterisk key (*) for a colon (:). Keyset users can press the FWD key once to leave a space, or press the MUTE key to backspace.

b. *Change to alphanumeric mode (keyset only):* Press the MSG key (the key lights), then enter the desired characters. Refer to the chart on the preceding page. Keyset users can press the FWD key once to advance or twice to leave a space, or press the MUTE key to backspace.

c. *Use speed-dial and/or redial numbers (keysets only):* In either numeric or alphanumeric mode, press one of the SPD/BLF keys, and/or press the REDL key to enter the stored characters. You may chain numbers together.

(4) Terminate programming.

Keyset: Press the SPKR key, lift and replace the handset, or allow the programming mode to time out. (Display shows selected message. Date and time appear on the second line if there is no customized message.)

Single-Line Set: Hang up, press the FLASH key, or allow the programming mode to time out.

28.10 *TO CANCEL DO-NOT-DISTURB:*

Keyset: While on hook, press the lit DND key. The key goes off and the display returns to date and time.

Single-Line Set: Lift the handset, enter the cancel do-not-disturb feature code (371), and hang up.

28.11 *TO MOVE A CAMPED-ON INTERCOM CALL TO DO-NOT-DISTURB:*

If, while on a call, you hear call waiting signals and you wish to let the caller know you do not want to be disturbed:

(1)   **Keyset:** Press the DND key. The key lights. The intercom caller is no longer camped on and receives do-not-disturb indications.

   Single-Line Set: *(This procedure will interrupt your call in progress.)* Press the FLASH key (hookflash) and enter the do-not-disturb feature code (370). The intercom caller is no longer camped on and receives do-not-disturb indications. Press the FLASH key (hookflash) again to return to the current call.

(2)   After completing the call, your station will remain in do-not-disturb until you use the canceling procedure in paragraph 28.10.

29. CANCEL MISCELLANEOUS OPERATIONS

29.1   A station user can cancel do-not-disturb, disable handsfree, call forward requests, a queue request, page remove, hunt group remove, and background music all at once by entering a single feature code.

29.2   *TO CANCEL MISCELLANEOUS OPERATIONS:*

   Keyset: While on or off hook, press the SPCL key and enter the cancel miscellaneous operations feature code (395). *If off hook,* hang up.

   Single-Line Set: Lift the handset, enter the cancel miscellaneous operations feature code (395), and hang up.

30. HOOKFLASH

30.1   If the system is installed behind a PBX, station users may be required to hookflash to access PBX system resources. Or, a hookflash may be required to access certain telephone company features, such as call waiting. The duration of the hookflash can be changed by reprogramming the C.O. hookflash timer (default value is 600ms).

NOTE: The SLI FLASH key does not generate a hookflash over C.O. lines. You must use this procedure.

30.2   *TO SEND A TIMED HOOKFLASH WHILE ON AN OUTSIDE LINE:*

   Keyset: Press the SPCL key and enter the hookflash feature code (330).

   Single-Line Set: Press the FLASH key (hookflash) and enter the hookflash feature code (330).

31. REMINDER MESSAGES (KEYSETS ONLY)

31.1 Reminder messages are set, like an alarm clock, to signal a keyset station at a specified time. The user can select the message and time up to 24 hours in advance. Twenty different reminder messages are available. These messages can be reprogrammed by the installer or any attendant.

31.2 At the programmed time, the reminder message signals the station with eight short tones. A display keyset shows the message until it is canceled; a non-display keyset receives tones only. If the station is busy, the user still hears the tones and the message displays for 10 seconds during the call, then the display returns after the user hangs up. (Reminder displays interrupt, but do not affect, programming.) Up to 120 reminder messages can be requested per system.

31.3 Messages can be changed by the installer or any attendant, if desired. They are limited to 16 characters. The initialized values are:

01 MEETING	11 CALL ENGINEERING
02 STAFF MEETING	12 CALL MARKETING
03 SALES MEETING	13 CALL ACCOUNTING
04 CANCEL MEETING	14 CANCEL DND
05 APPOINTMENT	15 CANCEL CALL FWD
06 PLACE CALL	16 TAKE MEDICATION
07 CALL CLIENT	17 MAKE RESERVATION
08 CALL CUSTOMER	18 REVIEW SCHEDULE
09 CALL HOME	19 LUNCH
10 CALL CORPORATE	20 REMINDER

31.4 *TO REQUEST REMINDER MESSAGES:*

NOTE: Lift and replace the handset to stop the process without selecting a message.

(1) While on hook, press the SPCL key.

(2) Enter the reminder message feature code (305). (Display shows PROGRAM REMINDER MESSAGE.)

(3) **EITHER,** enter the two-digit message code (01–20). (Display shows selected message.)

OR, view the available messages by pressing the pound (#) key to scroll forward or pressing the asterisk (*) key to scroll backward. Each message displays for the length of the reminder message scroll delay timer before another can be selected.

(4) While the desired message is displayed, enter the time that you wish to receive the message:

a. Enter the hour and minutes (e.g., 900 for 9:00).

b. Press the asterisk (*) key for AM or the pound (#) key for PM. You hear a progress tone when it is accepted.

NOTE: If an invalid time is entered, you hear reorder tones and the message request is canceled. (Display shows ERROR! INVALID TIME ENTERED.)

31.5 *TO RECEIVE A REMINDER MESSAGE:*

At the selected time, you hear eight short tones and the message displays.

(1) *If your station is idle,* go to the next step.

If you are on a call, the message will display for 10 seconds. After you hang up, the reminder message returns and must be cleared. Go to the next step.

If you are programming your keyset, the programming function is interrupted, but not canceled. The message will display for 10 seconds. After programming is completed, the reminder message will return and must be cleared. Go to the next step.

(2) **To clear the message:** Remain on hook and press the asterisk (*) key.

31.6 *TO CANCEL ALL OF YOUR REMINDER MESSAGE REQUESTS:*

While on hook, press the SPCL key and enter the cancel reminder message feature code (306). You cannot view or cancel individual messages.

32. DATA DEVICE ATTACHMENTS (24-LINE KEYSETS ONLY)

32.1 A customer-provided, modem-equipped data device (such as a data terminal or a personal computer) may be attached to any 24-line keyset that has an optional Data Port Module installed. The 12-line keysets cannot have data device attachments.

NOTE: Because incoming calls must be transferred to the data path by pressing the DATA key, auto-answer modems cannot be used to answer data calls to a keyset.

32.2 Data calls can be placed to an intercom or outside number using the keyset or a keyboard attached to the data device. If using a keyboard, the C.O. line or intercom channel is automatically connected to the data device when it comes off hook. If using the keyset to place the call, the keyset user presses the DATA key to connect the C.O. line or intercom channel to the data device. By entering a feature code, data calls may be monitored through the handset without interfering with the data transmission (the microphone is muted).

32.3 If a secondary voice path is installed, data calls are transmitted over the keyset's secondary voice path. This leaves the primary voice path available for normal keyset operation. Receiving off-hook voice announce (OHVA) calls is not possible since they use the secondary voice path. If there is not a secondary voice path, the keyset cannot receive calls when the data device is in use.

32.4 The modem-equipped data device is connected to the keyset by plugging the data device's line cord (normally intended for connection to a standard C.O. line) into the modular jack on the keyset's optional Data Port Module.

32.5 *TO ACCESS A REMOTE DATA DEVICE USING A C.O. LINE:*

(1) **EITHER,** lift the handset.

OR, while on hook, press the SPKR key.

(2) Select an outside line and dial the telephone number of the data device to be accessed. The line key flashes and the display shows the call cost and elapsed time of the call.

(3) When you hear modem tone, press the DATA key. The line key is solidly lit. *If using the speakerphone,* the SPKR key goes off, the DATA key flutters, and the display returns to date and time. *If using the handset,* the DATA key flashes slowly.

(4) *If using the handset,* hang up. The line key remains lit, the DATA key flutters, and the display returns to date and time.

(5) Operate the data device according to the manufacturer's instructions.

For keysets with a secondary voice path: If you wish to return the data call to the primary voice path, press the DATA key. The line key remains lit and the call cost and elapsed time are displayed.

For keysets without a secondary voice path: If you wish to disconnect the data call and talk over the handset or speakerphone, press the DATA key.

32.6 *TO ACCESS A REMOTE DATA DEVICE USING AN INTERCOM CHANNEL:*

(1) **EITHER,** lift the handset.

OR, while on hook, press the SPKR key.

(2) Dial the intercom number of the data device to be accessed.

(3) Notify the receiving party that you wish to connect the data device. When the called party activates the remote data device by pressing the DATA key, you hear modem tone. Or, if the intercom number accesses an auto-answer modem connected to a single-line circuit, you will hear modem tone immediately.

NOTE: If the receiving party wishes to transfer the call to another party, the transfer must be completed before the caller completes the next step.

(4) Press your DATA key. If using the speakerphone, the SPKR key goes off and the DATA key flutters. If using the handset, the DATA key flashes slowly.

(5) *If using the handset,* hang up. The DATA key flutters.

(6) Operate the data device according to the manufacturer's instructions.

32.7 *TO ACCESS A REMOTE DATA DEVICE WHILE ON A CALL:*

(1) When you hear modem tone, press the DATA key. (If on an outside call, the line key is solidly lit). If using the speakerphone, the SPKR key goes off and the DATA key flutters (and, if on an outside call, the display returns to date and time). If using the handset, the DATA key flashes slowly.

(2) *If using the handset,* hang up. (If on an outside call, the line key is solidly lit). The DATA key flutters (and, if on an outside call, the display returns to date and time).

(3) Operate the data device according to the manufacturer's instructions.

32.8 *TO ACCESS A REMOTE DATA DEVICE USING AN AT-TACHED MODEM-EQUIPPED DATA DEVICE:*

(1) Following the procedures of your data device's communications software, instruct the device to dial an intercom number or a line access code and a telephone number of the data device to be accessed. The call will be processed as though dialed from the keyset and will be automatically connected when answered. The DATA key is lit until dialing is completed, then it flutters. If the resources are busy, the data device will not camp on, but will receive continuous busy tones.

(2) Operate the data device according to the manufacturer's instructions.

NOTE: You cannot access system features (other than intercom and line access) by entering feature codes through the data device keyboard.

32.9 *TO MONITOR A DATA CALL IN PROGRESS:*

(1) *With a secondary voice path installed:* While a data transmission is active, lift the handset, press SPCL, and enter the data port monitor feature code (341). DATA key flashes slowly. (If connected to an outside line, the line key remains lit and the display shows the call cost and elapsed time of the call.)

Without a secondary voice path installed: While a data transmission is active, lift the handset. DATA key flashes slowly. (If connected to an outside line, the line key remains lit and the display shows the call cost and elapsed time of the call.)

(2) You may listen to the data call without interfering with the data transmission (the handset microphone is muted). Hang up to discontinue monitoring the data transmission; the data call is still in progress and the DATA key flutters.

32.10 *TO TERMINATE THE DATA DEVICE CONNECTION:*

EITHER, using the appropriate commands for the data device, instruct it to disconnect from the call.

OR, while on or off hook:

a. Press the lit DATA key. The DATA key goes off. *If desired,* speak to the party at the site of the remote data device. This can only be done if the modem at the site of the remote data device can be turned off without dropping the C.O. line.

b. **To disconnect:** *If off hook,* hang up. *If on hook,* press the SPKR key.

33. ATTENDANT FEATURES

33.1 This section describes the attendant-only features including the functions of the Direct Station Selection/Busy Lamp Field (DSS/BLF) Unit.

33.2 All attendant stations must be equipped with a keyset and should be equipped with a display in order to identify ring-in and recall sources. Also, for increased call-processing capabilities, attendant stations are generally equipped with optional DSS/BLF Units. Single-line sets cannot be used as attendant stations.

33.3 Each DSS/BLF Unit provides one-key access for up to 60 numbers (station intercom numbers and/or hunt group or voice computer group pilot numbers). Together, the lamps in the keys create a busy lamp field that indicates the status of each station or hunt group assigned to the keys. The LED indicator in the key is solidly lit when the associated station is busy, flashes slowly when the station is in do-not-disturb, flashes fast when the station has a call ringing in, or flutters continuously if the station is causing a STATION OFF-HOOK system alarm. If assigned to a hunt group, the LED indicator is solidly lit when all stations in the hunt group are unavailable (busy, forwarded, in do-not-disturb, or removed from the hunt group) and it flashes fast when a call is camped on to a hunt group.

NOTE: Keyset stations do not have to be assigned as attendant stations in order to use a DSS/BLF Unit. However, all keysets with DSS/BLF Units must be identified in database programming (see PROGRAMMING, page 5-71).

A. USING THE DSS/BLF UNIT

33.4 *PLACING AN INTERCOM CALL USING A DSS/BLF UNIT:*

(1) Lift the handset or press the SPKR key.

(2) *If you wish to place a private call to a keyset,* press the pound (#) key.

(3) Press the desired DSS/BLF key.

> *If calling a keyset with handsfree answering enabled,* you are immediately connected.

If placing a private call, calling a hunt group, calling a single-line set, or calling a keyset with the handsfree feature disabled, you hear repeating double tones until the call is answered.

(4) If the system is enabled for immediate DSS/BLF Unit off-hook voice announce, do not hang up when calling a busy keyset. Press the DSS/BLF key again. If the keyset's secondary voice path is available, you are immediately connected for an off-hook voice announce call and may speak. (For more information concerning the off-hook voice announce feature, refer to page 4-51.)

33.5 *TRANSFERRING CALLS:*

(1) *While on an outside call,* press the desired DSS/BLF key (or press the XFR key and dial a station intercom number, a hunt group pilot number, a voice mail intercom number, or a transfer-to-park location number). The call is placed on hold.

While on an intercom call, press the SPCL key and enter the transfer intercom call feature code (346). Then press the desired DSS/BLF key (or dial a station intercom number, a hunt group pilot number, or a transfer-to-park location number).

a. **Transfer to voice mail or transfer to a station forwarded to voice mail:** *If transferring to a voice mail unit or a station that is forwarded to voice mail,* you hear a single tone and the system waits for you to enter the mailbox number (display shows ENTER VOICE MAILBOX #).

> *If you do not enter a mailbox number before you hang up,* the caller will be connected to the voice mail unit and must enter the mailbox number after listening to the introductory voice prompts.

> *If the system is checking for a valid mailbox number and you enter a valid mailbox number,* the transfer is completed to voice mail (display shows CALL TRANSFERRED TO VOICE MAIL).

If the system is checking for a valid mailbox number and the number you entered is invalid, you hear reorder tones (display shows INVALID MAILBOX NUMBER ENTERED) and you must enter the correct number.

If the system is not checking for a valid mailbox number, hang up to complete the transfer (display shows CALL TRANSFERRED TO VOICE MAIL).

b. **Transfer to a hunt group:** The transfer is completed automatically. Hang up.

c. **Transfer-to-park:** If transferring to the transfer-to-park location, hang up to complete the transfer, or transfer the call to hold as described in the second part of step 4. Then page the desired party and announce the call. The party must reverse transfer the call. Note that if the call is not answered, it will recall your station if transferred directly or will recall the called transfer-to-park location's attendant if transferred to hold.

(2) **EITHER,** hang up, press another line key, or press the IC key to complete the transfer. If the station you transferred the call to is busy, the call camps on. If the call is not answered before the transfer timer expires, the call returns to the station's attendant and rings until answered or the abandoned recall timer expires.

OR, wait for an answer and announce the call. One of the following will occur:

a. *If there is no answer or if the call is refused:*

EITHER, return to the caller by pressing the fluttering line key for outside calls or

pressing the XFR key twice for intercom calls.

OR, transfer the call to another station by pressing another DSS/BLF key or pressing the XFR key and dialing an intercom number. (Or, you may transfer to an outside number by pressing the XFR key, selecting a line, and dialing a telephone number.)

b. *If the call is accepted,* hang up to complete the transfer. The call rings at the station.

c. *If the called party requests that the call be placed on hold,* press the HOLD key and hang up. If the transferred call is unanswered when the hold timer expires, it will recall the station until the transfer timer expires, and then recall the attendant.

33.6 *TO REVERSE TRANSFER (PICK UP) A CALL RINGING OR HOLDING AT ANOTHER STATION:*

(1) Lift the handset or press the SPKR key.

(2) **EITHER,** press the DSS/BLF key of the station where the call is ringing or holding and then press the XFR key.

OR, enter the reverse transfer feature code (4) and then press the DSS/BLF key of the station where the call is ringing.

(3) Press the line or IC key if the system is not programmed to automatically connect reverse transfers. The key is fluttering if the call was on hold or flashing if the call was ringing.

B. ATTENDANT RECALL

33.7 When a call is placed on hold or is transferred from one station to another, certain system timers limit the amount of time the call may remain unattended. After that time, the call recalls the station that transferred it or placed it on hold. If the call remains unanswered at the station until the recall timer expires, it recalls the station's attendant. If the attendant station is busy, the call camps on and the display shows the source of the recall. If the call is not answered before the abandoned recall timer expires, the system disconnects the call.

33.8 If a station user transfers or forwards an outside call to an outside telephone number, the call is limited by the unsupervised C.O. timer. If using *Basic* software (or *Intermediate* or *Advanced* software without an APM), the call recalls the primary attendant or system alarm station when the timer (and the abandoned recall timer) expires. If using *Intermediate* or *Advanced* with an APM installed, the parties will hear a warning tone when the unsupervised C.O. timer expires. Either party can then reset the timer by pressing any DTMF key before the SL dial initiation timer expires. If the unsupervised C.O. timer is not reset, the call recalls the primary attendant station (or the system alarm station) and causes the CNF key to flash. (Display shows UNSUPERVISED CO RECALL.) This serves two purposes:

- It allows the attendant to monitor the length of CO-to-CO calls. When the call recalls, the attendant can disconnect it or allow it to continue.

- If the callers hang up before the attendant receives the recall, the system may not have disconnected the lines because a C.O. disconnect was not received from the central office. The attendant must disconnect the call.

33.9 A recall signals the attendant's station with a display message, a recall ring signal (four tones and a pause, repeating), and a medium-flashing line key. If there is no attendant, or if the system is in night mode, the call recalls the station that transferred the call or placed it on hold until the abandoned recall timer expires; then the call is disconnected.

33.10 If the attendant has calls forwarded, recalls from stations follow internal call forward requests. Recalls do not forward to outside telephone numbers, but recall the attendant's station until they are answered or the abandoned recall timer expires. Placing the attendant's station in do-not-disturb does not block recalls or direct ring-in calls.

33.11 *TO ANSWER A HOLD OR TRANSFER RECALL FROM AN OUTSIDE CALL:*

(1) When you see a hold or transfer recall display (HOLD RECALL FROM XXX or LINE XX RECALL FROM XXX) and hear a recall ring signal (four tones and a pause, repeating), lift the handset or press the SPKR key.

(2) Press the medium-flashing line key or press the ANS key. If more than one line is recalling, pressing the ANS key accesses the outside call indicated on the display.

33.12 *TO ANSWER A HOLD RECALL FROM AN INTERCOM CALL:*

When you see a hold or transfer recall display (HOLD RECALL FROM XXX) and hear a recall ring signal (four tones and a pause, repeating):

> **EITHER,** lift the handset or press the SPKR key, then press the IC key.
>
> **OR,** for quick handsfree operation, simply press the IC key.
>
> **NOTE:** If you are busy when the call recalls, it camps on. The IC key flashes at the medium rate, but you do not hear recall ring signals.

33.13 *TO ANSWER AN UNSUPERVISED C.O. RECALL:*

(1) When you see the unsupervised C.O recall display (UNSUPERVISED CO RECALL), hear a recall ring signal (four tones and a pause, repeating), and see the CNF key flashing at the medium rate, lift the handset and press the CNF key to connect with both lines. The CNF key flashes slowly and the display shows CONFERENCE WITH LINE XX LINE XX.

(2) Check to see if the line is still being used.

(3) *If the parties are still talking,* press the CNF key again and hang up to return the parties to their conversation. The CNF key flutters. You can enter the conference at any time by pressing the fluttering CNF key. When the unsupervised conference timer expires, the conference recalls your station again.

If the parties have hung up, hang up to disconnect the call.

C. PROGRAMMING STATIONS FOR NIGHT RING

33.14 Any attendant station can use the following procedure to change the database ring-in and allowed-answer night lists for stations. The night list takes effect when the system is placed in night mode. Any line can be assigned to ring in or to be answered on any station. However, you cannot add or delete lines from a station's list; you must reprogram all lines for the station. An attendant cannot change ring-in assignments for hunt groups.

33.15 To use this procedure, the system must be in the day mode.

33.16 *TO PROGRAM STATIONS FOR NIGHT RING:*

NOTE: If you make a mistake, lift and replace the handset and start over. An error while pressing keys terminates the program and displays the NIGHT RING LIST UNCHANGED message. Start over.

(1) While on hook, press the SPCL key.

(2) Enter the program stations for night ring feature code (011). You hear a single progress tone. (Display shows PROGRAM NIGHT RING FOR EXT #.)

(3) Enter the intercom number or press the DSS/BLF key of the station to be programmed; do not use a keyset SPD/BLF key. You hear another progress tone. (Display shows ENTER (A)NSWER OR (R)ING-IN.)

(4) **EITHER**, press R (the digit 7 key) on the keypad if the calls are to ring in to the station. The station is automatically given allowed answer.

OR, press A (the digit 2 key) on the keypad if the station is to have allowed answer but no

ringing for the line(s). When calls ring in to the system, the station user may answer them (the line keys will flash on keysets).

(5) When the display shows NOW PROGRAMMING XXX, designate the line number(s) by pressing the line keys. If no line keys are pressed, the lines previously selected for this station will be erased.

(6) Press the asterisk (*) key. You hear a single progress tone. (Display momentarily shows NIGHT RING SET FOR XXX.)

(7) Repeat the procedure for each station to be changed.

D. PLACING THE SYSTEM IN NIGHT OR DAY MODE

33.17 Any attendant can place the system in night mode. This changes the station SCOS, outgoing access, allowed-answer and ring-in assignments to the night lists. There is no attendant recall during night mode. Hold and transfer recalls ring at the station that transferred them or placed them on hold. If a recall is not answered before the abandoned recall timer expires, the call is disconnected.

NOTE: This procedure must be performed to return the system to day mode if the night mode station has been out of service. Refer to page 4-12 for details.

33.18 *TO TURN NIGHT MODE ON OR OFF:*

While on hook, press the SPCL key and enter the night ring on/off feature code (010). You hear a single progress tone. (If putting the system in night mode, all attendant stations display SYSTEM IS NOW IN NIGHT RING.)

E. PROGRAMMING SPECIFIC STATION INFORMATION

33.19 Due to employee movement, change of status, turnover, etc., certain specific station information, such as user name, tenant group number, secretarial intercept, and serving attendant may need to be changed. This can be done from any attendant station. When programming numbers, the attendant's station is automatically in numeric mode; when programming the user name, the station is automatically in alphanumeric mode. Press the MSG key to switch between alphanumeric and numeric mode.

33.20 In numeric mode, the keypad keys are used to enter numbers 0–9, the pound (#) key is used for entering a hyphen (-), and the asterisk (*) key is used for entering a colon (:). For example, 1*00 would enter "1:00" in numeric mode.

33.21 In alphanumeric mode, keypad keys are used to enter the desired letters, numbers, and punctuation. The number of times a key is pressed determines which character is entered. For example, 533266 would enter "JEAN". When adjoining characters are located under the same key, press the FWD key once to advance to the next character. For example, 66 FWD 6667776 would enter "NORM". Refer to the chart below to program information in alphanumeric mode. (Note that the letters correspond to the letters printed on the keypad keys.)

KEY	NUMBER OF TIMES KEY IS PRESSED				
	1	2	3	4	5
1	@	+	&	<	1
2	A	B	C	>	2
3	D	E	F	/	3
4	G	H	I	"	4
5	J	K	L	[	5
6	M	N	O	]	6
7	P	Q	R	S	7
8	T	U	V	;	8
9	W	X	Y	Z	9
0	'	%	=	?	0
*	*	!	$	(	:
#	#	,	.	)	—

33.22 *TO PROGRAM SPECIFIC STATION INFORMATION:*

(1) While on hook, press the SPCL key and enter the program station data feature code (022). (Display shows PROGRAMMING EXT:.)

(2) Enter the intercom number (do not use the DSS/BLF key) of the station that is to be reprogrammed and press SPCL. You will hear a confirmation tone and the display shows USERNAME: EXT XXX (or the user name if it exists).

(3) **EITHER,** enter a new user name using one of the following methods:

   a. *Alphanumeric mode (MSG key lit):* Press the keypad keys to enter the desired characters. Refer to the chart. You may press the FWD key once to advance or twice to leave a space. Press the MUTE key to backspace.

   b. *Numeric mode (MSG key unlit):* Press the keypad keys to enter the desired number. Use the pound key (#) for a hyphen (-) and the asterisk key (*) for a colon (:). Press the FWD key once to leave a space, or press the MUTE key to backspace.

   OR, erase the current name by repeatedly pressing the MUTE key until the lower portion of the display shows NONE. (If the name is erased, the intercom number of the station will appear on keyset displays in place of a name. If a blank space is programmed, nothing will appear to identify a call from this station.)

   OR, to leave the information the same, proceed to the next step.

(4) Press the SPCL key to update the database and advance to the next prompt. You will hear a confirmation tone and the display shows TENANT XX (and, if programmed, the tenant group name will display on the second line).

(5) **EITHER,** enter a new tenant group number by pressing the pound (#) key to scroll forward through the list or the asterisk (*) key to scroll backward.

   OR, to leave the information the same, proceed to the next step.

(6) Press the SPCL key to update the database and advance to the next prompt. You will hear a confirmation tone and the display shows SECRETARY: EXT XXX (or NONE).

(7) **EITHER,** enter the new secretarial intercept number using the keypad (it is automatically in the numeric mode).

OR, erase the current secretarial intercept by repeatedly pressing the MUTE key until the lower portion of the display shows NONE.

OR, to leave the information the same, proceed to the next step.

(8) Press the SPCL key to update the database and advance to the next prompt. You will hear a confirmation tone and the display shows ATTENDANT: EXT XXX (or NONE).

NOTE: This display will not appear if the station being programmed is an attendant.

(9) **EITHER,** enter a new serving attendant number using the keypad (it is automatically in the numeric mode). If you enter an intercom number of a non-attendant station, you will hear reorder tones and may try again.

OR, erase the current attendant by repeatedly pressing the MUTE key until the lower portion of the display shows NONE.

OR, to leave the information the same, proceed to the next step.

(10) Press the SPCL key to update the database and advance to the next prompt. You will hear a confirmation tone and the display shows "PROGRAMMING EXT.".

(11) **EITHER,** repeat the process with another intercom number.

OR, terminate the programming sequence by lifting and replacing the handset or allowing the timer to expire. The display will return to date and time.

F. PROGRAMMING SYSTEM REMINDER MESSAGES

33.23 The stored system reminder messages can be changed from any attendant's keyset. (See page 4-89 for information concerning their use.) When the system is initialized, the 20 reminder messages listed below are programmed. Attendants can delete them or change them to any other value (up to 16 characters).

01 MEETING	11 CALL ENGINEERING
02 STAFF MEETING	12 CALL MARKETING
03 SALES MEETING	13 CALL ACCOUNTING
04 CANCEL MEETING	14 CANCEL DND
05 APPOINTMENT	15 CANCEL CALL FWD
06 PLACE CALL	16 TAKE MEDICATION
07 CALL CLIENT	17 MAKE RESERVATION
08 CALL CUSTOMER	18 REVIEW SCHEDULE
09 CALL HOME	19 LUNCH
10 CALL CORPORATE	20 REMINDER

33.24 When programming, the attendant's station is automatically in alphanumeric mode. Press the MSG key to switch between alphanumeric and numeric mode.

33.25 In numeric mode, the keypad keys are used to enter numbers 0–9, the pound (#) key is used for entering a hyphen (-), and the asterisk (*) key is used for entering a colon (:). For example, 1*00 would enter "1:00" in numeric mode.

33.26 In alphanumeric mode, keypad keys are used to enter the desired letters, numbers, and punctuation. The number of times a key is pressed determines which character is entered. For example, 33377744432999 would enter "FRIDAY". When adjoining characters are located under the same key, press the FWD key once to advance to the next character. For example, 6 FWD 666 FWD 6632999 would enter "MONDAY". Refer to the chart below to program information in alphanumeric mode. (Note that the letters correspond to the letters printed on the keypad keys.)

| | NUMBER OF TIMES KEY IS PRESSED | | | | |
KEY	1	2	3	4	5
1	@	+	&	<	1
2	A	B	C	>	2
3	D	E	F	/	3
4	G	H	I	"	4
5	J	K	L	[	5
6	M	N	O	]	6
7	P	Q	R	S	7
8	T	U	V	;	8
9	W	X	Y	Z	9
0	'	%	=	?	0
*	*	!	$	(	:
#	#	,	.	)	—

33.27 *TO PROGRAM A REMINDER MESSAGE:*

NOTE: Lift and replace the handset to stop the process without selecting a message.

(1) While on hook, press the SPCL key and enter the program system reminder messages feature code (023). Display shows PROGRAM REMINDER MESSAGE.

(2) **EITHER,** enter the two-digit message code (01-20). Display shows selected message.

OR, view the available messages by pressing the pound (#) key to scroll forward or pressing the asterisk (*) key to scroll backward. Each message displays for the length of the reminder message scroll delay timer before another can be selected.

(3) **EITHER,** enter a new message using one of the following methods:

   a. *Alphanumeric mode (MSG key lit):* Press the keypad keys to enter the desired characters. Refer to the chart. You may press the FWD key once to advance or twice to leave a space. Press the MUTE key to backspace.

   b. *Numeric mode (MSG key unlit):* Press the keypad keys to enter the desired number. Use the pound key (#) for hyphen (-) and

the asterisk key (*) for colon (:). Press the FWD key once to leave a space, or press the MUTE key to backspace.

OR, to erase the current message, press the MUTE key repeatedly until the display shows NONE. (If the message is erased, a blank will appear on keyset displays in place of a message. Do not program the word "NONE," because that would be the message to appear.)

OR, to leave the message the same, lift and replace the handset. (You will exit the pro-

gramming sequence and your display will return to date and time.)

(4) Press the SPCL key to update the database. You will hear a confirmation tone and the display shows PROGRAM REMINDER MESSAGE.

(5) **EITHER,** repeat steps 2 through 4.

OR, terminate the programming sequence by lifting and replacing the handset, allowing the timer to expire, or pressing the SPKR key, IC key, or one of the line keys. (Display returns to date and time.)

G. PROGRAMMING SYSTEM DO-NOT-DISTURB MESSAGES

33.28 The stored system do-not-disturb messages can be changed from any attendant station. (See page 4–86 for information concerning their use.) When the system is initialized, the 20 do-not-disturb messages listed below are programmed. Attendants can delete or change messages 02–20 to any other desired value (up to 16 characters). Message number 01 (DO-NOT-DISTURB) cannot be changed.

01 DO-NOT-DISTURB	11 OUT OF OFFICE
02 IN MEETING UNTIL	12 OUT UNTIL
03 IN MEETING	13 WITH A CLIENT
04 ON VACATION 'TIL	14 WITH A GUEST
05 ON VACATION	15 WITH A PATIENT
06 CALL ME AT	16 UNAVAILABLE
07 AT THE DOCTOR	17 IN CONFERENCE
08 ON A TRIP	18 AWAY FROM DESK
09 ON BREAK	19 GONE HOME
10 OUT OF TOWN 'TIL	20 OUT TO LUNCH

33.29 When programming, the attendant's keyset is automatically in alphanumeric mode. Press the MSG key to switch between alphanumeric and numeric mode.

33.30 In numeric mode, the keypad keys are used to enter numbers 0–9, the pound (#) key is used for entering a hyphen (-), and the asterisk (*) key is used for entering a colon (:). For example, 1*00 would enter "1:00" in numeric mode.

33.31 In alphanumeric mode, keypad keys are used to enter the desired letters, numbers, and punctuation. The number of times a key is pressed determines which character is entered. For example, 33377744432999 would enter "FRIDAY". When adjoining characters are located under the same key, press the FWD key once to advance to the next character. For example, 6 FWD 666 FWD 6632999 would enter "MONDAY". Refer to the following chart to program information in alphanumeric mode. (Note that the letters correspond to the letters printed on the keypad keys.)

KEY	NUMBER OF TIMES KEY IS PRESSED				
	1	2	3	4	5
1	@	+	&	<	1
2	A	B	C	>	2
3	D	E	F	/	3
4	G	H	I	"	4
5	J	K	L	[	5
6	M	N	O	]	6
7	P	Q	R	S	7
8	T	U	V	;	8
9	W	X	Y	Z	9
0	'	%	=	?	0
*	*	!	$	(	:
#	#	,	.	)	—

33.32 *TO PROGRAM A DO-NOT-DISTURB MESSAGE:*

NOTE: If you make a mistake while programming, lift and replace the handset to stop the process without selecting a message. Then, start over.

(1) While on hook, press the SPCL key and enter the program system do-not-disturb messages feature code (024). (Display shows PROGRAM DND MESSAGE.)

(2) **EITHER,** enter the two-digit message code (02–20). (Display shows selected message.)

OR, view the available messages by pressing the pound (#) key to scroll forward or pressing the asterisk (*) key to scroll backward. Each message displays for the length of the reminder message scroll delay timer before another can be selected.

NOTE: DND message number 01 (DO-NOT-DISTURB) cannot be changed.

(3) **EITHER,** enter a new message using one of the following methods:

a. *Alphanumeric mode (MSG key lit):* Press the keypad keys to enter the desired characters. Refer to the chart above. You may press the FWD key once to advance or twice to leave a space. Press the MUTE key to backspace.

b. *Numeric mode (MSG key unlit):* Press the keypad keys to enter the desired number. Use the pound key (#) for a hyphen (-) and the asterisk key (*) for a colon (:). Press the FWD key once to leave a space, or press the MUTE key to backspace.

OR, to erase the current message, press the MUTE key repeatedly until the display shows NONE. (If the message is erased, a blank will appear on keyset displays in place of a message. Do not program the word "NONE," because that would be the message to appear.)

OR, to leave the message the same, lift and replace the handset. (You will exit the programming sequence and your display returns to normal.)

(4) Press the SPCL key to update the database. You will hear a confirmation tone and the display shows PROGRAM DND MESSAGE.

(5) EITHER, repeat steps 2 through 4.

OR, terminate the programming sequence by lifting and replacing the handset, allowing the timer to expire, or pressing the SPKR, IC, or one of the line keys. (Display will return to normal.)

H. PAGING SPEAKER BACKGROUND MUSIC

33.33   Any attendant can turn background music on and/or off for the external paging speakers. Music to speakers is interrupted by pages.

33.34   *TO TURN BACKGROUND MUSIC ON OR OFF:*

While on hook, press the SPCL key and enter the paging speaker background music feature code (018). You hear a progress tone.

NOTE: If background music to external paging speakers is enabled, the volume of background music at keyset stations may be lowered.

I.   SETTING TIME OF DAY AND DATE

33.35   Occasionally, the system time or date needs to be reset (for example, for daylight-saving time). Any attendant can change the date and time message that appears on all display keysets and in the SAR and the SMDR reports.

33.36   *TO SET THE TIME OF DAY AND DATE:*

NOTE: If you make a mistake, lift and replace the handset, then start over. If an invalid date or time is entered, the keyset displays ERROR! INVALID TME/DTE ENTERED; you must start over.

(1)   While on hook, press the SPCL key and enter the set time of day feature code (021). (Display shows SET TIME OF DAY.)

(2)   Use the keypad keys to enter the time in hours and minutes. Then press the asterisk (*) key for AM or the pound (#) key for PM. For example, enter 900* for 9:00AM or 230# for 2:30PM. (Display shows SET DATE MM-DD-YYYY.)

(3)   Use the keypad keys to enter the month, day, and year. For example, press 01011990 for January-01-1990. You may backspace to correct entries by pressing the MUTE key. (When finished, display shows SET DAY OF WEEK SUN.)

(4)   Select the day of week by scrolling through the selections. Press the pound (#) key to go forward or the asterisk (*) key to go backward. When the desired day is displayed, press the SPKR key to terminate programming. You hear a progress tone and may check the date and time of day on the display.

J. SYSTEM ALARM REPORTING

33.37 The system's alarm reporting feature detects equipment failures, determines the impact, and classifies the problem as a major or minor alarm. Minor alarms are indicated on the primary attendant's station display (or the system alarm station's display) and can be programmed to appear on all attendants' keysets. Both major and minor alarms are printed in the SMDR printout. Major alarm messages appear on all display keysets.

33.38 The first four minor alarms indicate problems that can be corrected without calling service personnel. All other minor alarms require attention from service personnel. Refer to page 6–2 in TROUBLE-SHOOTING for a listing of the possible alarms and their meanings.

33.39 *TO RESPOND TO A MINOR SYSTEM ALARM FROM ANY ALARM DISPLAY STATION:*

(1) When a minor alarm indication appears (WARNING! SYSTEM ALARM #XX), write down the alarm number, alarm message, date, and time.

(2) While on hook, clear the message displayed by pressing the SPCL key and entering the clear system alarm feature code (019).

(3) *If the alarm message is #5 or #10 or higher,* contact service personnel.

If the alarm message is #01–04, correct the problem:

a. *#01 STATION OFF-HOOK:* A station remained off hook and inactive until the inactivity alarm timer expired. The SMDR indicates which station is off hook. The station's key on DSS/BLF Units and on other stations' SPD/BLF keypads flutters continuously. Locate the station and replace the handset in the cradle.

   NOTE: Calls being transmitted over the secondary voice path are not affected or interrupted by an off-hook alarm condition.

b. *#02, #03, or #4 PRINTER TIMEOUT:* The indicated printer is not functioning properly. Check that the cable and the power cord are connected and that it has paper and ribbon.

33.40 A major alarm message, WARNING! MAJOR ALARM, appears on all display keysets in the event of a processor board failure. The warning might also appear on a single keyset if the keyset is defective. Major alarms require immediate attention from service personnel.

K.   TAKING A LINE OUT OF SERVICE FOR MAINTENANCE

33.41   Attendants can take individual lines out of service by entering a feature code. This unequips the line, but does not prevent the central office from sending signals on the line. To outside callers, the line will appear to be functioning and they will hear ringing. However, users will not hear ringing or see a flashing line key and cannot access the line for receiving or placing calls until the attendant places the line back into service by entering another feature code.

NOTE: If the line that is taken out of service is part of a telco rotary hunt, the central office will detect that line as being available and will not bypass it for incoming calls.

33.42   The advantage of using this feature instead of unequipping the line in the database, is that all programming for the line is preserved and the line returns to complete functionality, with no additional programming required, as soon as it is returned to service. Note that because the line is temporarily unequipped, no programming changes can be made for that line until it is returned to service.

33.43   *TO TAKE A LINE OUT OF SERVICE FOR MAINTE-NANCE:*

(1)   While on hook, press SPCL and enter the program line out of service feature code (030). (The display shows PROGRAM LINES OUT OF SERVICE.)

(2)   Press the line key(s) associated with the circuit(s) you wish to unequip. You hear a progress tone as each key is pressed. If a line is already out of service, you will hear reorder tones and may press another line key, if desired.

NOTE: Taking a line out of service drops any calls in progress on the associated line.

(3)   Lift and replace the handset or allow the long interdigit timer to expire.

33.44   *TO PLACE A LINE IN SERVICE AGAIN:*

(1)   While on hook, press SPCL and enter the program line in service feature code (031). (The display shows PROGRAM LINES IN SERVICE.)

(2)   Press the associated line key(s) of the line(s) to be placed back in service. You hear a progress tone as each key is pressed. If a line is already in service, you will hear reorder tones and may press another line key, if desired.

(3)   Lift and replace the handset or allow the long interdigit timer to expire.

L.   GENERATING A SYSTEM ACTIVITY REPORT

33.45   If automatic system activity reports are enabled, an attendant can generate a system activity report at any time, even if daily, weekly, or monthly reports are programmed. The SAR report is printed as described on the next page.

33.46   *TO GENERATE A SYSTEM ACTIVITY REPORT:*

While on hook, press SPCL and enter the attendant SAR feature code (025). The report begins printing via the port designated in the database.

34. RECORD KEEPING AND MAINTENANCE FEATURES

A. CALL COST ACCOUNTING

34.1 The call cost accounting feature estimates the cost of outgoing and incoming calls, displays it on the keysets, and prints it in the SAR and/or the SMDR reports. The cost is based on the telephone number dialed, the elapsed time of the call, the day of the week, and the time of day. A table in the database supplies the rates for toll calls and local calls, including evening and weekend rate changes. The equation for calculating call cost is: *Daytime Rate X Evening or Night & Weekend Multiplier X Connect Time.*

34.2 The evening or night/weekend multiplier adjusts the daytime per-minute call cost for evening (5:00 PM to 10:59 PM) and night/weekend (11:00 PM to 7:59 AM and weekends) rates. For example, the evening call cost multiplier is 0.65 if calls are 35% less expensive after 5:00 PM.

NOTE: The GMX-48 System's call cost accounting feature is intended to provide a *cost estimate* that is applied to the various classes of calls. Due to the wide variation in charges among network carriers, the system's call cost calculation cannot be used as a prediction of actual charges. This feature can only be used to *estimate* call cost as a management tool.

34.3 Incoming calls can have a call cost set for accounting or billing purposes. If a line is not subject to toll restriction, calls placed on that line will follow the cost factor set during C.O. line programming. If call cost is set to zero, call cost will not display during the call and the SMDR printout shows $00.00.

B. SYSTEM ACTIVITY REPORT (SAR)

NOTE: This feature is available only in the *Advanced* software package.

34.4 The system activity report (SAR) provides management and accounting records that can be used to analyze system traffic and employee productivity.

34.5 This data can be recorded on a customer-provided printer or alternate device, such as a magnetic tape or floppy disk. The device is connected to the RS-232-C port on either the KSU or an APM and must have a cable no longer than 50 feet (15 me-

ters). It can be the same device used for the SMDR report. If so, the SMDR information is buffered (at least 10 calls) while the system activity report prints.

34.6 System activity reports can be automatically generated daily, weekly, or monthly. They can also be generated on demand by using the attendant SAR feature code or through the programming terminal (refer to page 5-114 in PROGRAMMING).

34.7 SAR includes the following information:

- **System Activity:** The report shows the number of incoming and outgoing calls, transfers and recalls, average answer time, number of unanswered calls, average ring time (unanswered), total and average duration of incoming and outgoing calls, and total and average cost of incoming and outgoing calls.

- **Configuration summary:** The number of Expansion Modules and Accessory Port Modules is shown as well as the number of incoming, outgoing, and in/out lines.

- **Tenant Activity:** Information for each tenant group includes the number of stations; the tenant name, and the number; duration, and cost of incoming and outgoing calls.

- **Station Activity:** Number, duration, and cost of incoming and outgoing calls are listed in numerical order by station circuit number for all stations in the system. Reports also include station circuit numbers, intercom numbers, user names, and device type (or "unequipped").

- **C.O. Line Activity:** C.O. line circuit number, line identification, and line type are shown for all lines. The report also includes number of incoming and outgoing calls, average answer time, number of unanswered calls, and average ring time for unanswered calls as well as total and average duration and cost of incoming and outgoing calls.

34.8 When programming the output, the installer can choose to clear the SAR information after each report or let it remain in the memory to be accumulated and included in all later reports. This gives the customer the option of having limited or comprehensive SAR reports.

34.9 The SAR output is printed in the format shown in the following figure. All reports are 80 characters wide. The number of days included in each report is set during programming.

FIGURE 4-1. SYSTEM ACTIVITY REPORT (SAR) FORMAT

```
******************************************************************************

                         System Activity Report

          Data Collection Period Began      00:00 SUN-1-JAN-1990
                                    Ended    12:00 SUN-1-JAN-1990

******************************************************************************

                         System Activity Summary

               Total Number of Calls                 X,XXX,XXX
                  Incoming Calls                        XXX,XXX
                  Outgoing Calls                        XXX,XXX
                  XFRs/Recalls                          XXX,XXX
                  Avg. Ans. Time                        H:MM:SS
                  Unanswered Calls                       XX,XXX
                     Avg. Ring Time                     H:MM:SS

               Total Duration of Calls             H,HHH:MM:SS
                  Incoming Calls                     HHH:MM:SS
                     Average                           H:MM:SS
                  Outgoing Calls                     HHH:MM:SS
                     Average                           H:MM:SS

               Total Cost of Calls                  $X,XXX.XX
                  Incoming Calls                      $XXX.XX
                     Average                            $XX.XX
                  Outgoing Calls                      $XXX.XX
                     Average                            $XX.XX

******************************************************************************

                         Configuration Summary

          Expansion Modules                              X
          Accessory Port Modules                         X
          Number of CO Lines                            XX
             — Incoming-Only CO Lines                     X
             — Outgoing-Only CO Lines                     X
             — Incoming/Outgoing CO Lines                 X

******************************************************************************
```

FIGURE 4–1. SYSTEM ACTIVITY REPORT (SAR) FORMAT (CONT'D)

Tenant Activity Summary

Number of Stations
Tenant 1 "[tenant name]"   XX

	Tenant 1	Tenant 2	Tenant 3	Tenant 4
Total Number of Calls	XX	XX	XX	XX
Incoming Calls	XX	XX	XX	XX
Outgoing Calls	XX	XX	XX	XX

	Tenant 1	Tenant 2	Tenant 3	Tenant 4
Total Duration of Calls	X:XX:XX	X:XX:XX	X:XX:XX	X:XX:XX
Incoming Calls	X:XX:XX	X:XX:XX	X:XX:XX	X:XX:XX
Average	X:XX:XX	X:XX:XX	X:XX:XX	X:XX:XX
Outgoing Calls	X:XX:XX	X:XX:XX	X:XX:XX	X:XX:XX
Average	X:XX:XX	X:XX:XX	X:XX:XX	X:XX:XX

	Tenant 1	Tenant 2	Tenant 3	Tenant 4
Total Cost of Calls	$XX.XX	$XX.XX	$XX.XX	$XX.XX
Incoming Calls	$XX.XX	$XX.XX	$XX.XX	$XX.XX
Average	$XX.XX	$XX.XX	$XX.XX	$XX.XX
Outgoing Calls	$XX.XX	$XX.XX	$XX.XX	$XX.XX
Average	$XX.XX	$XX.XX	$XX.XX	$XX.XX

****

Station Activity Report
Stations Listed By Circuit Number

1. Station Circuit XX.Y EXXX [user name]   (type of station)
       Total Number of Calls   X,XXX,XXX
           Incoming Calls   XXX,XXX
           Outgoing Calls   XXX,XXX

       Total Duration of Calls   H,HHH:MM:SS
           Incoming Calls   HHH:MM:SS
               Average   H:MM:SS
           Outgoing Calls   HHH:MM:SS
               Average   H:MM:SS

       Total Cost of Calls $X,XXX.XX
           Incoming Calls $XXX.XX
               Average $XX.XX
           Outgoing Calls $XXX.XX
               Average $XX.XX

(Information repeats for each station circuit)

****

FIGURE 4-1. SYSTEM ACTIVITY REPORT (SAR) FORMAT (CONT'D)

```
                        CO Line Activity Report
                     CO Lines Listed By Circuit Number

    1. CO Circuit X.Y
          Line Type - Incoming/Outgoing
          Total Number of Calls                   X,XXX,XXX
             Incoming Calls                          XXX,XXX
             Outgoing Calls                          XXX,XXX
             Avg. Ans. Time                          X:XX:XX
             Unanswered Calls                              X
                Avg. Ring Time                       X:XX:XX

          Total Duration of Calls                 H,HHH:MM:SS
             Incoming Calls                         HHH:MM:SS
                Average                              H:MM:SS
             Outgoing Calls                         HHH:MM:SS
                Average                              H:MM:SS

          Total Cost of Calls                      $X,XXX.XX
             Incoming Calls                          $XXX.XX
                Average                               $XX.XX
             Outgoing Calls                          $XXX.XX
                Average                               $XX.XX

    (Information repeats for each C.O. line circuit)
```

****

C. STATION MESSAGE DETAIL RECORDING (SMDR)

34.10 Station message detail recording (SMDR) is a system feature that provides a detailed record of outgoing calls and can include incoming calls. An outgoing call lasting longer than the programmed valid call timer is recorded; however, if the call was transferred to a station or placed on hold, the valid call timer is not checked and the call is recorded. The valid call timer does not affect incoming calls; if the option to record incoming calls is selected in the database, all incoming calls are listed.

34.11 Station call data can be recorded on a customer-provided printer or an alternate device, such as a magnetic tape or floppy disk. This output device is connected to the RS-232-C port on either the KSU or an APM and must have a cable no longer than 50 feet (15 meters). It can be the same device used for SAR. If so, the SMDR information is buffered (at least 10 calls) while the SAR report prints.

34.12 Selectable SMDR options can include any combination of the following:

- Incoming calls
- Outgoing non-toll local calls (including "free" calls on unrestricted lines and internal PBX calls)
- Outgoing toll calls (7-digit, 10-digit, operator-assisted, or international calls)
- DISA calls
- Conference calls
- System ring-in messages that show how long calls ring before being answered

34.13 C.O. line noise levels, DTMF tone levels, etc., can affect the of reliability of DISA calls to outside telephone numbers. As a result, the central office does not always recognize all of the digits dialed. To help counteract this effect, the programmer can determine whether digits dialed on DISA-to-CO calls will appear in the SMDR printout. Suppressing outgoing DISA digits enables the system to send DTMF tones to the central office at a higher level.

34.14 The programmer can determine whether absorbed digits and toll field digits appear in the SMDR printout. As an example, assume the following number was dialed: 89 (PBX code) – 10XXX – 1 (toll fields) – 602 (area code) – 961-9000 (seven-digit number). The PBX absorbed digits can be suppressed so that only 10XXX1-602-961-9000 appears. Or, all but the first digit in each toll field can be suppressed to print 89-11-602-961-9000. The PBX digits and the toll fields can all be suppressed to show 11-602-961-9000.

34.15 The programmer can determine which equipped station(s) will be included in the report by listing the desired stations. In addition, there are options that can be selected for listing all DISA calls, conference calls, and/or ring-in diagnostics. If these call types are selected, the record will show the station that is involved in the call, even if the station does not appear on the "stations to be included" list.

34.16 The SMDR output report is printed in either narrow or wide format, as shown on the following pages. The wide format requires an 80-character output device and the narrow a 64-character device. A page heading (with the day of the week, date, month, year and column headings) is generated at midnight, when the clock cycles from 2359 to 0000 hours (international time).

FIGURE 4–2. SMDR REPORT FORMAT

Wide Format (80-character):

TYP	EXT	USRNAME	LN	DIALED DIGITS	START	ELPST	COST	ACCT CODE
XXX	XXX	AAAAAAA	XX	XX..............XX	HH:MM	HH:MM	$XX.XX	XXXXXXXX

TYP Call type abbreviations for:

- Incoming calls (IN)
- Outgoing local calls (LOC)
- Outgoing "free" calls (000)
- Seven-digit outgoing toll calls (T7)
- Ten-digit outgoing toll calls (T10)
- Operator-assisted/international calls (TOI)
- DISA calls (DSA) and Conference calls (CNF)
- Ring in (blank field)

EXT The intercom number (XXX) of the last station to handle the call. For a CO-to-CO call, this field shows the second line involved (LXX). For a ring-in record, it shows the intercom number of the station that answered, or it shows *** if the call was unanswered.

USRNAME User's name as programmed. This field is blank if no user name is programmed.

LN The C.O. line number used (XX). This is the default C.O. line number given to the line (i.e., C.O. line 1.1 is line 1), regardless of tenant line key programming.

DIALED DIGITS Up to 32 digits of the telephone number dialed, including hyphens between the toll field, area code, office code, etc. An asterisk (*) at the end of the dialed digits field indicates that either there was a long enough break in loop current to disconnect the call (the IC-CO disconnect or CO-CO disconnect timer expired), or the outside party hung up before the station user hung up. Some digits may be suppressed (see the previous page for an explanation). "RING" appears for a ring-in record. If the first digit in a 32-digit number is "1," only 31 digits will be printed.

START Time the call was placed or answered is shown in 24-hour time (00:00 - 23:59) rounded up to the nearest minute.

ELPST Call length from the beginning of the call until disconnect. Elapsed time is rounded up to the nearest minute to show hours and minutes. For ring-in records, S = XXX indicates the ring-in time in seconds.

COST Approximate cost of the call (XXX.XX), based on the database information, rounded to the nearest cent.

ACCT CODE A standard, forced, or optional account code (4-8 digits). An optional account code overrides installer-programmed standard or forced account codes. The field is blank if no account code was used.

FIGURE 4-2. SMDR REPORT FORMAT (CONT'D)

Narrow Format (64-character):

STN	NUMBER DIALED	DUR	TIME	LN	ACCOUNT
XXX	XX............................XX	XXX	XXXX	XX	XXXXXXXX

STN The intercom number (XXX) of the last station to handle the call. Two lines are printed for CO-to-CO calls, each showing a line number in this field. For ring-in records, this field shows the intercom number of the station that answered the call, or *** if the call was unanswered.

NUMBER DIALED The first 24 digits of the telephone number dialed. An asterisk (*) at the end of the dialed digits column indicates that either there was a long enough break in the loop current to disconnect the call (the IC-CO disconnect or CO-CO disconnect timer expired), or the outside party hung up before the station user hung up. Some digits may be suppressed (see page 4-108 for an explanation). "RING" appears here for ring-in records.

DUR Call length from the end of the valid call timer until disconnect. Elapsed time is shown in minutes, rounded up to the nearest minute, for up to 255 minutes (anything over 255 appears as ***). For a ring-in message, the field shows XX:XX, which indicates the number of minutes and seconds that passed before the call was answered.

TIME Time the call was placed or answered. Time is shown in 24-hour international time (0000 - 2359) rounded up to the nearest minute.

LN The number of the C.O. line used. This is the default C.O. line number given to the line (i.e., C.O. line 1.1 is line 1), regardless of line key programming.

ACCOUNT A standard, forced, or optional account code (4-8 digits). An optional account code overrides installer-programmed standard or forced account codes. The field is blank if no account was used.

D. SYSTEM ERROR REPORTING

34.17 The system has a self-diagnostic feature that checks for minor and major faults within the central and peripheral equipment. When a failure is detected, the software determines the impact of the problem and classifies it as a major or minor alarm. A major alarm requires immediate attention from service personnel; the system is not operable. A minor alarm can be as simple as a loose printer cable or power cord, or the printer running out of paper or ribbon.

34.18 A minor alarm sends a message to the system attendant(s) programmed to receive alarms and to either the KSU or an APM RS-232-C port. Both minor and major alarms are recorded through the RS-232-C ports (if the ports are functional). A fault history report is available on demand to service personnel through the programming terminal (however, minor alarms #1–#4 do not appear in the history report).

34.19 Minor alarm messages print in the format shown below. The message indicates the time the error was detected, the type and number of the alarm, and an explanation of the error.

00:00 + + + MINOR ALARM #XX [32-character message]
*00:00 * * * [Field Service Diagnostics message]*
00:00 – – – [Engineering Diagnostics message]

34.20 User-serviceable minor alarms are:

- **#1 EXT XXX — STATION OFF-HOOK:** A station remained off hook and inactive until the inactivity alarm timer expired. Replace the handset in its cradle at the station indicated.

- **#2 SMDR PRINTER TIMEOUT, #3 ERROR PRINTER TIMEOUT, or #4 SAR PRINTER TIMEOUT:** The printer possibly has a loose cable or power cord, or it has run out of ribbon or paper.

34.21 All other minor alarms, which require attention from service personnel, field service diagnostics, and engineering diagnostics are explained in TROUBLESHOOTING.

34.22 A major alarm occurs when a problem has caused the processor board to malfunction. The message appears on all display keysets and, if functional, at both RS-232-C ports.

E. POWER FAILURE CAPABILITIES

34.23 The KSU board contains a lithium battery that protects the customer's database memory in the event of a power failure. The back-up battery strap (JMP 1) on the MEM board must be placed in the A position (over the lower two pins) to activate the battery. (Refer to page 3–24 in INSTALLATION.)

34.24 A programming option can be enabled that automatically places the system into night mode whenever the primary attendant station (or other designated station) is out of service due to a keyset failure or in the event that the keyset is unplugged. When the station is returned to service, an attendant must manually place the system back into day mode; the system will not cancel night mode automatically. When the system is initialized, this option is enabled and associated with station circuit 1.1 (the primary attendant).

PROGRAMMING

CONTENTS   PAGE

1. INTRODUCTION

1.1 This section of the manual explains how to initialize and program the system. Initializing the system sets the default values for each of the programmable features. These values have been carefully selected to make the programmer's task easier. The system is fully functional when initialized and only requires programming to meet the customer's special needs.

A. INITIALIZED VALUES

1.2 The initialized values of the features are specified in each of the programs outlined throughout this section of the manual. They are also specified on the program planning sheets beginning on page 5–133. A summary of the initialized system values is as follows:

Programming

- Passwords are not required to access the database programs.

- Menus appear only when a new menu is selected.

- Errors cause the terminal's bell to signal the user.

Attendant

- There is one attendant for all stations (circuit 1.1). This station serves as the primary attendant, system alarm station, day/night mode toggle station, and message center for all stations. It is the system speed-dial programming station, and it can be used to place the system in night mode. The circuit is equipped and configured for a keyset.

- Circuit 1.1 receives ring-in and can answer all lines during day mode and night mode.

Stations

- Station circuits 1.1-6.8 are *configured* for keysets, but only 1.1 is *equipped* until station instruments are installed and station cables are connected.

- Stations are not toll restricted.

- All stations can answer all C.O. lines when the system is in night mode. Users have outgoing access on all lines.

- Intercom numbers are assigned in order beginning with circuit 1.1 and intercom number 100. In *Basic* software, the highest-numbered circuit is 6.8 (intercom number 147). In *Advanced* and *Intermediate* software circuit numbers can be as high as 8.6 (intercom number 159) if APMs are installed.

- All stations are assigned to tenant group 1.

- All keysets and the optional external paging equipment are in paging zone 1. Paging zones 2–6 are cleared.

- Camp-on tones are heard at all stations.

- Station monitoring tones are not enabled.

- No headsets are equipped.

- Audible message indications for single-line sets are not enabled.

- No user names are assigned.

- There are no DSS/BLF stations, house phones, or secretarial intercepts assigned.

- Off-hook voice announce is not enabled.

- Keyset LCD identification is enabled full-time.

- All stations have do-not-disturb, call forward, and forward to the public network capability.

- All stations have C.O. reseize disabled.

C.O. Lines

- All C.O. lines are equipped and programmed for DTMF signaling.

- No lines are designated for DISA use. (*Advanced* software and an APM is required for the DISA feature.)

- All lines are incoming/outgoing lines.

- No lines have C.O. line identification.

- Lines are assigned to the keyset line keys in numerical order, beginning with circuit 1.1 (line key 1) and continuing through circuit 6.4 (line key 24).

- System-wide C.O. line privacy is enabled.

- All lines are subject to toll restriction. None are exempt from ARS Only. (ARS is available in *Advanced* software only.) All lines accept equal access dialing. None have absorbed digits.

- No lines are associated with hunt groups.

- All lines are assigned to ARS route groups 1, 4, 6, 7, and 8. (ARS is available in *Advanced* software only.)

- With *Basic* software, only C.O. line circuit 1.1 is assigned to line group 8; no other lines are assigned to a line group. With *Advanced* or *Intermediate* software, all lines are in line group 8.

- No auto lines are assigned.

Toll Restriction

- Area and office codes do not overlap. All area codes and office codes are restricted.

- The allowed long distance numbers are 800-XXX-XXXX and 911. There are no alternate carrier numbers.

Automatic Route Selection (ARS)

- Route groups are programmed to handle local, national, operator-assisted, and international calls. (ARS is available in *Advanced* software only.)

SMDR, SAR and Error Reporting

- Station message detail recording (SMDR) is active and sent to the primary port. It is set for the wide format. Reports include incoming, local, toll, DISA, and conference calls as well as ring-in diagnostics and system faults. All stations are included. No digits are suppressed.

- Error reports (system alarms and field service diagnostics) are active.

- Station activity report (SAR) is activated by the attendant. It is assigned to the primary (motherboard) port. (SAR is available in *Advanced* software only.)

Miscellaneous

- The system is in day mode.

- No system or station speed-dial numbers are programmed. None of the system speed-dial locations are identified as non-display numbers or tenant-specific numbers. Speed-dial DTMF tones are muted.

- System speed dial numbers are subject to toll restriction.

- No account codes are assigned. Account code default length is four digits. Account codes are not associated with SCOS.

- Individual hold and system hold are indicated with the same flash rate (60/960 IPM flutter).

- No hunt groups, voice computer groups, hunt group supervisors, or hunt group announcement or overflow stations are assigned.

- The system is programmed to disconnect calls (not place them on hold) when a user presses another line key during a call.

- Cross-tenant intercom traffic is allowed.

- System alarms are sent to all attendants.

- Reverse transfers to keyset stations are not connected immediately; the user must press the flashing line or IC key.

B. PLAN THE PROGRAMMING SESSION

1.3 Determine the features that need to be programmed to meet the customer's needs by referring to the specific programs and program planning sheets. For example, if the customer wants to use the hunt group feature, refer to the programming information on page 5-75 and the program planning sheet on page 5-156.

1.4 Because it is usually not necessary to reprogram the entire database, the programs have been divided to allow programming of specific information without sorting through other programming areas. Note that some programs allow entering of information for one C.O. line or station while others allow batch loading of information. Select the program that best suits the task.

C. SYSTEM SET-UP FOR PROGRAMMING

KSU Set-Up

1.5 DIP switches in the KSU are used to set the baud rate for the programming terminal connection. The possible baud rate settings are: 300, 1200, 2400, and 4800. (Refer to page 2-16 in SPECIFICATIONS for switch locations.)

NOTE: Only one switch should be ON (down position) at a time. The other three switches must be OFF. Having more than one switch on at a time will cause data errors to occur and stations may not operate.

1.6 When the system is initialized, the KSU RS-232-C connectors (primary and accessory ports) are enabled for "software handshaking." Most programming terminals and output devices are designed for software handshaking, which is the use of "X-ON" and "X-OFF" characters to indicate readiness to send or receive data. Refer to the terminal's owner's guide to determine if the device uses X-ON/X-OFF characters.

1.7 If the device does not use X-ON/X-OFF characters, "hardware" handshaking may be enabled (see page 5-24). When enabled for hardware handshaking, signals are sent over the RS-232-C pins to indicate readiness to send or receive data. Refer to page 2-16 in SPECIFICATIONS for additional information concerning pin signals and functions.

1.8 APMs have RS-232-C ports that can be used for connecting a programming terminal. The APM ports are set to 1200 baud and cannot be changed. However, X-ON/X-OFF handshaking can be enabled.

The Programming Terminal

1.9 An input/output device is required, such as a CRT terminal with an attached keyboard or a printer with an attached keyboard. The device can be connected to the KSU for on-site programming, or it can be used with a specially installed auto-answer modem arrangement for remote programming. Refer to SPECIFICATIONS, page 2-16, for programming terminal requirements and refer to INSTALLA-TION, page 3-48, for auto-answer modem installation instructions.

1.10 To connect the terminal to the KSU for on-site programming:

(1) Match the baud rates of the terminal and the KSU. (APMs can only be set to 1200 baud.)

(2) To help prevent electrical surges from damaging the KSU, turn on the terminal and the KSU before connecting the terminal cable to the KSU.

(3) Connect the RS-232-C connector from the terminal to the RS-232-C connector on the KSU or APM.

(4) To sign on and begin programming, press the RETURN or the ENTER key on the keyboard.

1.11 To connect the terminal for remote programming:

(1) Set the terminal baud rate to 300, 1200, 2400, or 4800 baud to match the baud rate of the KSU and the auto-answer modem. (If connected to an APM, the modem will be set at 1200 baud.)

NOTE: Due to characteristics of the modem and/or the C.O. line connection, there may be difficulty with transmissions at certain baud rates.

(2) **EITHER,** place a call to the modem's assigned telephone number.

OR, place a C.O. call to the modem from a keyset that is equipped with a data terminal.

(3) When modem tone is heard, activate the programming modem according to the manufacturer's instructions. If using a keyset with an attached data device, refer to page 4-90 in FEATURES.

(4) To sign on and begin programming, press the RETURN or ENTER key on the keyboard.

1.12 *If programming the database for the first time, initialize the system (refer to page 5-104 for procedures).*

NOTE: Initialization or reset of the system will drop all calls in progress, including the modem connection.

D.   OPERATING THE TERMINAL

Character Case

1.13   The system recognizes both upper- and lower-case characters. Use either case or a combination.

Carriage Return < CR >

1.14   The system begins processing commands after the RETURN or ENTER key has been pressed. This allows the programmer to edit a command before entering it. The instructions in this section use the < CR > symbol to represent the RETURN or ENTER key.

1.15   Default values appear in parentheses ( ) in many of the prompts. If the default value is the desired value, press < CR > to continue to the next prompt.

Editing

1.16   To correct mistakes made while entering information, back up and make corrections using one of the following methods:

● Press the DELETE or RUB OUT key. The characters appear in reverse order on the terminal as they are deleted.

● Press the BACKSPACE key to back up and type over the original entry.

1.17   If the entry becomes unreadable because of the corrections, do one of the following:

● Redisplay the entry without the corrections by pressing the CONTROL and R keys at the same time.

● Delete the entire line without entering it and display a blank line by pressing the ESCAPE key, or the backslash (\) key, or the CONTROL and X keys, or the CONTROL and U keys. The prompt does not appear on the new line.

Yes or No Responses

1.18   You may respond to "Yes or No" questions by entering Y for yes or N for no.

Circuit and Intercom Numbers

1.19   Circuit numbers are expressed as X.Y, with X representing the station or C.O. circuit location in the KSU and Y representing the actual circuit number on the KSU control board (KCB) or expansion module (EXP). For example, the eighth station circuit on the KCB is station circuit 1.8. If two EXPs are installed, the fourth station circuit on the second EXP is station circuit 3.4. If all five EXPs are installed, the second C.O. circuit on the fifth EXP is C.O. circuit 6.2. Station circuits on the KCB and EXPs range from 1.1 to 6.8. With *Advanced* and *Intermediate* software, the first Accessory Port Module (APM) installed adds station circuits 7.1–7.6 and the second APM adds station circuits 8.1–8.6. C.O. circuits (on the KCB and EXPs) range from 1.1 to 6.4.

1.20   Stations can also be identified by their intercom (extension) numbers. To use these numbers, enter EXXX (or if the procedures specify, XXX may be entered). The XXX represents the one- to three-digit intercom number assigned to the station.

1.21   When prompts show the current value as a circuit number, enter E to show the associated intercom number. To display circuit numbers when intercom numbers are shown, enter C.

Number Ranges

1.22   Some program prompts request a range of numbers. When the prompt asks for a range, use a hyphen (–) between two numbers. For example, to indicate a range including all numbers from 1.1 to 1.6, enter 1.1–1.6. A single entry, ALL, and NONE are also valid responses to a range prompt.

1.23   If the item entered is too large, too small, or an unexpected value, an error message appears on the terminal.

1.24   A range of intercom numbers is translated into circuit numbers by the system. Therefore, be careful when using intercom numbers in ranges; the first circuit number must be lower than the second. For example, if circuit 1.1 is assigned intercom number 101, and circuit 1.2 is assigned intercom 100, entering E100–E101 would cause an error, because the circuit numbers (1.2–1.1) are not in proper numerical order.

1.25 Do not mix circuit numbers with intercom numbers within ranges. An entry of 1.1–1.6, E100–E110, or E100–110 is allowed, but E100–1.6 is not allowed and causes an error message.

Number Lists

1.26 Some prompts ask for a list of numbers. When creating a list, enter one of the following:

• Single item(s). If more than one item is listed, separate them with commas (1.1, 1.6, 1.2). (They do not have to be in numerical order.)

• Ranges of numbers, using hyphens (1.4–1.6, 1.1–1.2). (The first value in each range must be lower than the second value in that range. Lists of ranges, separated by commas, do not have to be in order.)

• Any combination of single items and ranges (1.6, 1.2–1.5, 2.6, 1.1).

• ALL and NONE can be used in response to a list prompt.

1.27 If one entry in a list is an invalid item, that item is not accepted by the system and an error message is printed. However, other items in the list are sometimes accepted if they are valid; to be certain, the entries should be rechecked.

NOTE: When entering a list, note that the system has an 80-character buffer. You must press <CR> before the buffer is full; the system will not recognize (or echo) any characters entered after the buffer limit is reached.

Signing Off And Delayed Reset

1.28 When ready to end the programming session, return to the applications program menu and sign off by entering a period (.) and <CR>.

NOTE: When finished programming, be sure to answer yes to PERFORM UPDATE TO SYSTEM DATABASE (Y OR N) if you wish to save the changes that were made.

1.29 If any changes were made to C.O. line, station, DSS/BLF, hunt group, or tenant group assignments,

the system prints the following message at the end of the programming session:

WARNING: THE DATABASE HAS BEEN CHANGED IN A MANNER THAT MAY CAUSE FAULTY BEHAVIOR UNLESS THE SYSTEM IS RESET.

PERFORM A SYSTEM RESET NOW (Y or N)?

1.30 Enter a Y and <CR> to reset the system to ensure that C.O. line and station information is processed correctly. Or enter N <CR> to program a delayed reset. If you enter N, the next prompt is:

SCHEDULE A DELAYED SYSTEM RESET (Y OR N)?

NOTE: If a delayed reset is pending, you will be given the opportunity to reschedule the delayed reset.

1.31 If you enter N, the system will not reset. However, it should be reset as soon as possible to ensure proper system operation. If you answer Y, the prompts continue as follows to allow you to set the time of the reset. Enter the desired time for the reset in 24-hour international time (i.e., 1PM = 13:00).

DELAYED RESET TIME (HH:MM):

PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)?

1.32 When you enter Y and perform the update to the system database, the delayed reset is acknowledged (DELAYED RESET SCHEDULED FOR XX:XX) and will occur at the set time unless changed. If a call or programming session is in progress at the set time, the system will not reset until the call or programming is completed (the system attempts the reset at one-minute intervals).

1.33 To change the delayed reset time, sign in by pressing the RETURN or ENTER key, then use the System Initialization and Reset program (refer to page 5-104 for procedures).

NOTE: A system reset drops all calls in progress and erases any buffered SMDR or SAR information that was waiting to print.

2. MENUS

2.1 Programs are selected through a series of menus. Each menu leads to more specific menus and/or to the data input prompts. When a menu prompt is displayed, select one of the options shown in the menu:

- Enter the letter (shown in the menu) of the desired program.

- Enter a period (.) to exit the menu and back up to the previous menu. If desired, multiple periods may be entered to back up further than one menu level. (Entering a period at the applications program menu prompt ends the programming session.)

- Enter a question mark (?) to redisplay the menu. (This is useful when the menus are programmed to display only on command. Refer to page 5–119 for more information.)

2.2 The first menu shown after signing on is the applications program menu. It introduces the five major programming sections: database programming, SMDR and error programming, call cost programming, menu displays, and on-line monitor. The applications program menu for the *Advanced* and *Intermediate* software appears as shown below:

INTER-TEL/GMX-48 KEY TELEPHONE SYSTEM
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ALL RIGHTS RESERVED
PART NUMBER [version part number]

APPLICATIONS PROGRAM MENU

[A] DATABASE PROGRAMMING
[B] SMDR AND ERROR PROGRAMMING
[C] SAR PROGRAMMING
[D] MENU DISPLAYS
[E] ON–LINE MONITOR
[F] SELF TEST

. EXIT

2.3 If using *Basic* software, the menu appears as shown below:

APPLICATIONS PROGRAM MENU

[A] DATABASE PROGRAMMING
[B] SMDR AND ERROR PROGRAMMING
[C] CALL COST PROGRAMMING
[D] MENU DISPLAYS
[E] ON–LINE MONITOR

. EXIT

2.4 The database programming menu offers programs for system-wide features as well as the specific C.O. line and station features. It is reached by entering A at the applications program menu prompt (APPLICATION:). The database programming menu appears as shown below:

DATABASE PROGRAMMING

[A] GENERAL SYSTEM DATA
[B] EXTENSIONS AND FEATURE ACCESS CODES
[C] CO LINES
[D] STATION/DSS DATA
[E] HUNT GROUPS AND VOICE COMPUTER
    GROUPS *(voice computer groups are not available in
    Basic software)*
[F] TENANTS, ATTENDANTS, AND
    SECRETARIAL INTERCEPTS
[G] PAGE ZONES
[H] TOLL RESTRICTION
[I] AUTOMATIC ROUTE SELECTION
[J] DATABASE SAVE/RESTORE
[K] SYSTEM INITIALIZATION AND RESET

? DISPLAY MENU
. EXIT

NOTE: Choices [J] and [K] appear only when the unrestricted password is used or when no password is required. For more information about passwords, refer to page 5–30. Choice [I] is not available with the *Basic* software package.

2.5 The SMDR and error programming menu presents the programs used for defining station message detail recording (SMDR) reports and system error reports. Enter B from the applications program menu to access the SMDR and error programming menu. It appears as shown below:

SMDR AND ERROR PROGRAMMING

[A] SMDR OUTPUT
[B] SMDR REPORTS
[C] ERROR OUTPUT
[D] ERROR REPORTS
[E] ON–LINE ERROR REPORTS
[F] SMDR AND ERROR PASSWORD

? DISPLAY MENU
. EXIT

2.6 If using *Advanced* or *Intermediate* software, the system activity report (SAR) programming menu displays the programs used in *Advanced* software for scheduled report generation. In *Advanced* and *Intermediate* software it is used for assigning the SAR password and call cost factors. It is accessed by entering C from the applications program menu. The menu appears as shown below:

SYSTEM ACTIVITY REPORT (SAR)

[A] AUTOMATIC SAR REPORTS
[B] ON-LINE SAR REPORTS
[C] SAR PASSWORD
[D] CALL COST FACTORS

? DISPLAY MENU
. EXIT

2.7 If using *Basic* software, the call cost programming menu displays the programs used for assigning the call cost password and call cost factors. It is accessed by entering C from the applications program menu. The menu appears as shown below:

CALL COST PROGRAMMING

[A] CALL COST PASSWORD
[B] CALL COST FACTORS

? DISPLAY MENU
. EXIT

2.8 Selection [D] MENU DISPLAYS (from the applications program menu) determines how often the programming menus are displayed. Refer to page 5-119 for more information.

2.9 The on-line monitor menu allows trained personnel to view and change system memory control blocks on the central processing unit (CPU) in the KSU. This program is used by specially-trained programmers for diagnostic purposes. When you enter E from the applications program menu, the on-line monitor menu appears as follows:

ON-LINE MONITOR

[A] CPU ON-LINE MONITOR
[B] CPU ACTIVITY MONITOR

? DISPLAY MENU
. EXIT

[MONITOR]:

2.10 If using *Intermediate* or *Advanced* software and an APM is installed, the network self test can be used to test the voice channels and switching matrices of the GMX-48 System. It should be used for every new installation, whenever a board is changed, and when a voice channel problem arises. After entering F from the applications program menu, the network self test menu appears as shown below (after a warning message and a prompt to continue):

NETWORK SELF TEST
[A] SYSTEM BOARD STATUS
[B] INDIVIDUAL CPU (MOTHER) BOARD
[C] INDIVIDUAL EXP MODULE
[D] ALL EXP MODULES
[E] INDIVIDUAL ACCESSORY PORT MODULE
[F] ALL ACCESSORY PORT MODULES
[G] FULL SYSTEM
[H] PASSWORD
[I] EXIT

SELECT TEST:

3. ADVANCED PROGRAMMING TECHNIQUES

3.1 The experienced programmer may wish to move from program to program without using the menus. To directly access programs, enter one of the abbreviated commands listed on the following page.

3.2 All of the abbreviated commands must be preceded by a slash (/) or a double slash (//).

3.3 A single slash before the command signals the terminal to return to the menu prompt for that command's section (database programming, SMDR and error programming, or SAR/call cost programming) after the program is finished. For example, enter /STN from the C.O. lines menu prompt to access the specific station information program. When the program is finished, the terminal returns to the database programming menu prompt ([ ]:).

3.4 A double slash before the command signals the system to return to the menu prompt that was being viewed when the command was entered. For example, the programmer may wish to exit the C.O. lines menu in order to change a station's user name and then return to the C.O. lines menu. Enter //STN to access the specific station information program. When finished with the STN program, the terminal returns to the C.O. lines menu prompt ([C]:).

3.5 From the database programming menu prompt (selection [A] from the applications menu), any of these commands can be used:

MENU LEVEL	COMMAND
[A] DATABASE PROGRAMMING	
[A] General System Data	
[AA] Date and Time	DATE
[AB] Timer Values	TIMR
[AC] System Speed Dial	SPDI
[AD] Account Codes	ACCT
[AE] Reminder Messages	MESS
[AF] Miscellaneous System Data	MISC
[AG] DND Messages	DNDM
[AH] Passwords	PASS
[B] Extensions and Feature Access Code	CODE
[C] CO Lines	
[CA] CO Line Equipment Status	EQU
[CB] CO Line Groups	LGRP
[CC] Specific CO Line Information	LINE
[CD] Auto and Line Key Assignments	AUTO
[CE] Access, Answer, and Ring In	
[CEA] Assign Common Station Lists to CO Lines	COMM
[CEB] Assign Common Outgoing-Access Lists	ACC
[CEC] Assign Common Allowed-Answer and Ring-in Lists	ANS
[D] Station/DSS Data	
[DA] Station Data	
[DAA] Specific Station Information	STN
[DAB] Extension and Username Assignments	NAME
[DAC] Soft Feature Key Default Values	SOFT
[DAD] Copy Station Information	COPY
[DAE] Assign Common SCOS to Stations	CCOS
[DAF] Assign Common CO Line Lists to Stations	SCOM
[DAG] Assign Common Page Zones to Keysets	PCOM
[DAH] Miscellaneous Station Features	SMSC
[DAI] AIM Keyset Volume Default Values	VOL
[DB] DSS/BLF Data	
[DBA] DSS/BLF Identification	DSS
[DBB] DSS/BLF Key Assignments	DKEY
[DC] Station Report	SREP
[E] Hunt Groups and Voice Computer Groups	HUNT
[F] Tenants, Attendants, and Secretarial Intercepts	
[FA] Tenant Group Assignments	TNT
[FB] Attendants	ATT
[FC] Secretarial Intercepts	SEC
[FD] Message Centers	MSG
[FE] Special Purpose Stations	SPCL
[G] Page Zones	PAGE

MENU LEVEL	COMMAND
[H] Toll Restriction	
[HA] SCOS Information	SCOS
[HB] Overlapping Area/Office Codes	OVER
[HC] Area/Office Codes Allowed/ Restricted	AREA
[HD] Area/Office Code Reports	AREP
[HE] Alternate Carriers	ALT
[HF] Allowed Long Distance	ALD
[I] Automatic Route Selection	
[IA] ARS Route Groups	ROUT
[IB] ARS Dial Rules	RULE
[J] Database Save/Restore	SAVE
[K] System Initialization and Reset	INIT

3.6 From the SMDR and error programming menu prompt (selection [B] from the applications menu), the following commands can be used:

MENU LEVEL	COMMAND
[B] SMDR AND ERROR PROGRAMMING	
[A] SMDR Output	OUTR
[B] SMDR Reports	SMDR
[C] Error Output	OUTE
[D] Error Reports	ERR
[E] On-Line Error Reports	OLER
[F] SMDR and Error Password	PASS

3.7 *If using Advanced or Intermediate software:* From the SAR programming menu prompt (selection [C] from the applications menu), the following commands access the programs:
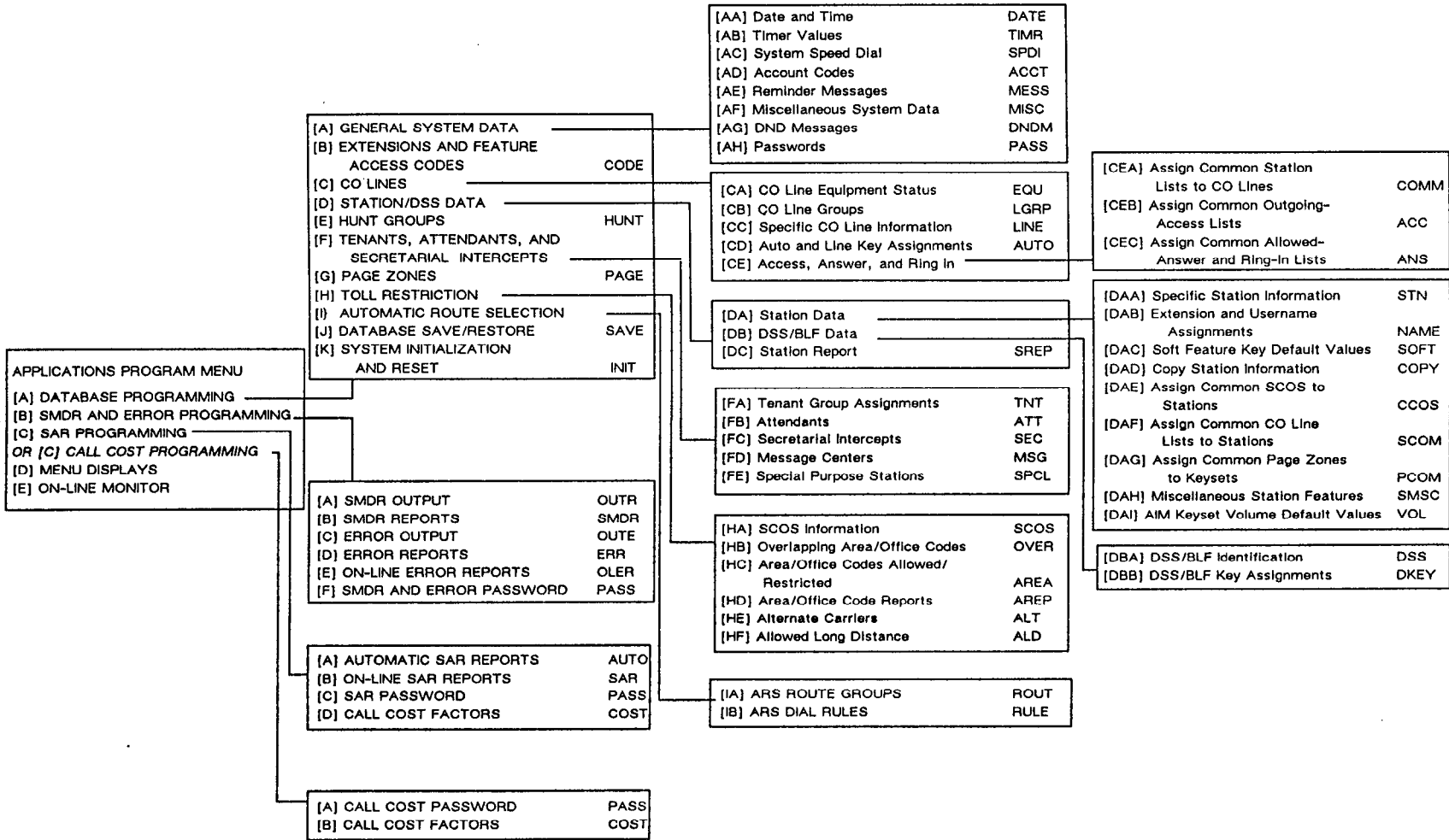
MENU LEVEL	COMMAND
[C] SYSTEM ACTIVITY REPORT (SAR)	
[A] Automatic SAR reports	AUTO
[B] On-Line SAR Reports	SAR
[C] SAR Password	PASS
[D] Call Cost Factors	COST

3.8 *If using Basic software:* From the call cost programming menu prompt (selection [C] from the applications menu), the following commands access the programs:

MENU LEVEL	COMMAND
[C] CALL COST PROGRAMMING	
[A] Call Cost Password	PASS
[B] Call Cost Factors	COST

3.9 From any of the main menu prompts shown on this page, enter /EXIT to return to the applications program menu.

3.10 To better understand how the programs listed on this page are related, refer to the flow chart on the following page.

[AA] Date and Time	DATE
[AB] Timer Values	TIMR
[AC] System Speed Dial	SPDI
[AD] Account Codes	ACCT
[AE] Reminder Messages	MESS
[AF] Miscellaneous System Data	MISC
[AG] DND Messages	DNDM
[AH] Passwords	PASS

[A] GENERAL SYSTEM DATA	
[B] EXTENSIONS AND FEATURE	
ACCESS CODES	CODE
[C] CO LINES	
[D] STATION/DSS DATA	
[E] HUNT GROUPS	HUNT
[F] TENANTS, ATTENDANTS, AND	
SECRETARIAL INTERCEPTS	
[G] PAGE ZONES	PAGE
[H] TOLL RESTRICTION	
[I] AUTOMATIC ROUTE SELECTION	
[J] DATABASE SAVE/RESTORE	SAVE
[K] SYSTEM INITIALIZATION	
AND RESET	INIT

[CA] CO Line Equipment Status	EQU
[CB] CO Line Groups	LGRP
[CC] Specific CO Line Information	LINE
[CD] Auto and Line Key Assignments	AUTO
[CE] Access, Answer, and Ring In	

[CEA] Assign Common Station	
Lists to CO Lines	COMM
[CEB] Assign Common Outgoing-	
Access Lists	ACC
[CEC] Assign Common Allowed-	
Answer and Ring-In Lists	ANS

[DA] Station Data	
[DB] DSS/BLF Data	
[DC] Station Report	SREP

[DAA] Specific Station Information	STN
[DAB] Extension and Username	
Assignments	NAME
[DAC] Soft Feature Key Default Values	SOFT
[DAD] Copy Station Information	COPY
[DAE] Assign Common SCOS to	
Stations	CCOS
[DAF] Assign Common CO Line	
Lists to Stations	SCOM
[DAG] Assign Common Page Zones	
to Keysets	PCOM
[DAH] Miscellaneous Station Features	SMSC
[DAI] AIM Keyset Volume Default Values	VOL

APPLICATIONS PROGRAM MENU

[A] DATABASE PROGRAMMING	
[B] SMDR AND ERROR PROGRAMMING	
[C] SAR PROGRAMMING	
OR [C] CALL COST PROGRAMMING	
[D] MENU DISPLAYS	
[E] ON-LINE MONITOR	

[FA] Tenant Group Assignments	TNT
[FB] Attendants	ATT
[FC] Secretarial Intercepts	SEC
[FD] Message Centers	MSG
[FE] Special Purpose Stations	SPCL

| [DBA] DSS/BLF Identification | DSS |
| [DBB] DSS/BLF Key Assignments | DKEY |

[A] SMDR OUTPUT	OUTR
[B] SMDR REPORTS	SMDR
[C] ERROR OUTPUT	OUTE
[D] ERROR REPORTS	ERR
[E] ON-LINE ERROR REPORTS	OLER
[F] SMDR AND ERROR PASSWORD	PASS

[HA] SCOS Information	SCOS
[HB] Overlapping Area/Office Codes	OVER
[HC] Area/Office Codes Allowed/	
Restricted	AREA
[HD] Area/Office Code Reports	AREP
[HE] Alternate Carriers	ALT
[HF] Allowed Long Distance	ALD

[A] AUTOMATIC SAR REPORTS	AUTO
[B] ON-LINE SAR REPORTS	SAR
[C] SAR PASSWORD	PASS
[D] CALL COST FACTORS	COST

| [IA] ARS ROUTE GROUPS | ROUT |
| [IB] ARS DIAL RULES | RULE |

| [A] CALL COST PASSWORD | PASS |
| [B] CALL COST FACTORS | COST |

4. [A] GENERAL SYSTEM DATA

4.1 Choose option A from the database programming menu to program general system data. The menu appears as shown below:

[A] GENERAL SYSTEM DATA
   [A] DATE AND TIME
   [B] TIMER VALUES
   [C] SYSTEM SPEED DIAL
   [D] ACCOUNT CODES
   [E] REMINDER MESSAGES
   [F] MISCELLANEOUS SYSTEM DATA
   [G] DND MESSAGES
   [H] PASSWORDS
[A]:

NOTE: Selection [H] PASSWORDS does not appear unless the unrestricted password was entered or no password is required.

A. [AA] DATE AND TIME (/DATE)

4.2 Enter A from the general system data menu or /DATE from the database programming menu to set the system date and time. After new information is entered, the terminal redisplays the entry for verification. If it is correct, enter < CR >. If not, enter the correct information.

PROMPT	VALID ENTRY
SYSTEM DATE (MON–1–FEB–1990):	**EITHER,** enter the current day, date, month, and year as shown in the prompt (DAY–DD–MMM–YYYY) and < CR >.
	OR, change only the day, date, month, or year by performing one of the following:
	• Change only the day of the week by entering a three-letter abbreviation (SUN, MON, TUE, WED, THU, FRI, or SAT) and < CR >.
	• Change only the date by entering a hyphen (–), one or two-digits for the date (1–31), and < CR >.
	• Change only the month using two hyphens (– –), then a three-letter abbreviation (JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC), and < CR >.
	• Change only the year by entering three hyphens (– – –), four digits for the year, and < CR >.
	• Enter any combination of these entries, separated by a hyphen for each field, followed by < CR >. Examples: –14– –1988 to change date and year or – –JAN–1988 to change month and year.

PROMPT	VALID ENTRY
SYSTEM TIME (XX:XX):	**EITHER,** enter the hour and the minutes in 24-hour international time (midnight is 00:00; noon is 12:00) and < CR >. **OR,** change only the hour or minutes using one of the following methods: ● Enter two digits (00–23) and < CR > to change the hour. ● Change the minutes by entering a colon (:), two digits (00–59), and < CR >.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged. Return to the general system data menu prompt ([A]:).

B.   [AB] TIMER VALUES (/TIMR)

4.3 There are programmable timers that control various system functions. In this programming task, the programmer can change any or all of them. To reach this program, enter B from the general system data menu or enter AB or /TIMR from the database programming menu.

4.4 The timers and their initialized values, programmable ranges, and purposes are listed below and

on the following pages. The default values have been carefully selected to ensure proper system operation under most circumstances. Determine which timers, if any, need to be changed. If a value is entered that is out of range, the terminal prints an error message. Refer to the program planning sheet in Figure 5-1 on page 5-133.

4.5 Several timers are programmed on a hunt group-by-hunt group basis. Refer to page 5-75.

TIMER	VALUE	DEFAULT RANGE	PURPOSE
CO-CO Disconnect	35/100	2–250	A call is disconnected by the system if it detects loss of loop current (lasting longer than this timer) during CO-to-CO calls.
IC-CO Disconnect	60/100	2–250	A call is disconnected by the system if it detects loss of loop current (lasting longer than this timer) during station-to-CO calls.
DTMF Digit Duration/Pause	6/100	2–60	Adjusts the duration and pause of DTMF tones sent by the system. Both the tone and the pause will use the assigned duration (for example, a 6/100 second tone has a 6/100 second pause).
CO Hookflash	60/100	2–250	Adjusts the duration of the timed hookflash that is sent over the C.O. line by the system when the hookflash feature code is used. (Does not affect ESLI FLASH key.)
Dialing Wait After Connect	15/10	10–250	The length of time the system waits for C.O. dial tone before dialing or checking the line for a disconnect.
Dialing Wait After Hookflash	30/10	1–250	Delays dialing after a hookflash to allow the system hardware to recover.
Inter-Ring Silence	60/10	1–250	Indicates the duration of the silence between rings on an incoming C.O. call to determine if the line has stopped ringing prior to being seized. In most areas, C.O. ring pattern is 2 seconds on/4 seconds off. Check with the local telephone company for the ring pattern in your area.

NOTE: This timer must always be set higher than the amount of time the central office ring signal is off.

TIMER	VALUE	DEFAULT RANGE	PURPOSE
Keyset Hookswitch Debounce	10/10	1–50	After detecting a valid hookswitch toggle, the length of time the system will ignore subsequent hookswitch toggles. Prevents a keyset user from accidentally disconnecting a call if the hookswitch is pressed twice when a call is answered or when the user switches from using the handset to using the speakerphone.
Off-Line After Disconnect	10/10	10–250	The length of time the system waits after disconnect before checking for loop current. Used only after the C.O. line has been disconnected in response to the IC-CO disconnect timer.
Reminder Message Scroll Delay	5/10	0–50	Minimum amount of time a message remains on the display when scrolling through the reminder and do-not-disturb messages.
SL Hookflash Minimum	2/10	1–10	The minimum length of time a single-line set user must press the hookswitch for the system to recognize a hookflash. *(Not available in Basic software)*
SL Hookflash Maximum	7/10	2–20	The maximum amount of time a single-line set user can press the hookswitch before the system disconnects calls. *(Not available in Basic software)*
Voice Mail/Computer Dialing Delay	5/10	0–100	The length of time the system will wait before sending digits to the voice mail/computer port when a call is being transferred or forwarded to the port. This prevents the caller from missing a portion of the message before the connection is complete. *(Not available in Basic software)*
Camp-On	3 sec.	0–255	Length of time a caller hears busy tone before camping on.
Camp-On Tone	15 sec.	5–255	Length of time between camp-on tones.
CO Re-Seize	3 sec.	1–15	This timer has two functions: (1) It prevents the system from reseizing a C.O. line until the timer expires. This prevents a keyset user from accidentally disconnecting a call when a line key is pressed twice or another line key is bumped while the user is answering or returning to a call. NOTE: A programmable station option can be set to prevent users from reseizing a C.O. line. If selected, the station user cannot reseize a line until it is disconnected by replacing the handset, pressing the SPKR key, or pressing another line key. (2) When a user reseizes a line, this timer is started to determine the length of time the system will hold the line open to allow the central office to drop and reconnect the line.

TIMER	VALUE	DEFAULT RANGE	PURPOSE
Data Port Wait	30 sec.	1–255	Length of time the system will wait for the data device to go off hook after pressing the DATA key to transfer an outside or intercom call to the data port.
Dial Tone Wait	2 sec.	1–50	When processing an ARS call, the system waits for this length of time before dialing to allow the central office time to send dial tone. *(Not available in Basic software and not used in Intermediate software)*
Dial Initiation — Keyset	15 sec.	5–30	Limits time keyset can remain off hook without dialing before the system sends reorder tones.
Dial Initiation — SL Set	10 sec.	5–30	Limits time single-line set user can remain off hook without dialing before the system sends reorder tones. *(Not available in Basic software)*
Disconnect Wait After Dialing	20 sec.	2–30	Length of time the system waits after dialing an outside telephone number before checking the line for disconnect.
Forward No Answer	15 sec.	3–255	Length of time a call waits at an unavailable station before being forwarded.
Hold	60 sec.	10–255	Limits time a call remains on hold before recalling the station.
Inactivity Alarm	60 sec.	10–255	Limits the time a station can remain off hook and inactive (after first receiving reorder tones) before registering a system alarm.
Interdigit (Long)	15 sec.	2–255	Determines end of dialing. Short timer is used after a valid number has been dialed. Long timer is used until digits form a valid number.
Interdigit (Short)	4 sec.	2–30	
Line Pre-Select	5 sec.	2–255	To pre-select a line, the keyset user presses a line key while on hook. This limits the time the keyset can hold a line before dialing.
Message (At Message Center)	5 sec.	1–255	Length of time a caller waits after pressing the MSG key before being connected to the called party's message center.
OHVA Screening	5 sec.	0–255	After the camp-on timer expires, length of time before an OHVA call can be completed.
Paging	15 sec.	0–255	Limits duration of page.
Pause Digit	3 sec.	1–5	Length of timed pauses used in system and station speed-dial telephone numbers and in ARS dial rules.

TIMER	VALUE	DEFAULT RANGE	PURPOSE
Queue Callback	15 sec.	10-255	Time allowed for a station to respond to a queue callback before the queue is cancelled.
Recall	60 sec.	10-255	Length of time a hold or transfer recall rings at a station before recalling that station's attendant. If the station receiving the recall has no attendant, the call remains at the station until the abandoned recall timer expires.
Station Monitoring Tone	15 sec.	5-255	Length of time between tones heard by station users when a hunt group supervisor is monitoring a calls. *(Not available in Basic software)*
Transfer — Available	20 sec.	10-255	Limits time a transferred call rings unanswered before it recalls the transferring station.
Transfer — Busy	24 sec.	10-255	Limits time a transferred call waits at a busy station before recalling the transferring station.
Valid Call	15 sec.	0-60	Minimum duration of an outgoing call before it is recorded in SMDR. Calls placed on hold or transferred are not subject to this timer.
Abandoned Recall	10 min.	1-255	After a call has recalled to the last possible station, it will recall until this timer expires. If it remains unanswered, the system will disconnect the call.
Unsupervised Conference	5 min.	1-255	Limits time an unsupervised conference call with two or more outside parties remains connected before recalling the station.
Unsupervised CO	5 min.	1-255	Limits duration of CO-to-CO DISA calls or outside calls transferred or forwarded to outside telephone numbers before recalling the primary attendant (or system alarm station).

NOTE: With *Advanced* and *Intermediate* software and an APM, when the unsupervised conference or unsupervised CO timers expire, the outside parties hear a burst of dial tone. If desired, they can reset the timer by pressing any DTMF key before the SL dial initiation timer expires. This allows them to continue the conversation and temporarily avoid recall.

4.6 If a value is entered that is out of range, the terminal prints an error message. The prompts begin with the timers that are programmed in *hundredths* of a second, as shown below. End each entry with <CR>.

PROMPT	VALID ENTRY
TIMER VALUES IN HUNDREDTHS OF SECONDS	
CO-CO DISCONNECT (35):	2-250
IC-CO DISCONNECT (60):	2-250
DTMF DIGIT DURATION/PAUSE (6):	2-60
CO HOOKFLASH (60):	2-250

PROMPT	VALID ENTRY
REVIEW SAME TIMERS AGAIN (N)	Enter Y < CR > to repeat the timers shown above or enter N < CR > to continue with the timers that are programmed in *tenths* of seconds.
TIMER VALUES IN TENTHS OF SECONDS	
DIALING WAIT AFTER CONNECT (15):	10–250
DIALING WAIT AFTER HOOKFLASH (30):	1–250
INTER-RING SILENCE (60):	1–250
KEYSET HOOKSWITCH DEBOUNCE (10):	1–50
OFF-LINE AFTER DISCONNECT (10):	10–250
REMINDER MESSAGE SCROLL DELAY (5):	0–50
SL HOOKFLASH MINIMUM (2):	1–10 *(Not available in Basic software)*
SL HOOKFLASH MAXIMUM (7):	2–20 *(Not available in Basic software)*
VOICE MAIL/COMPUTER DIALING DELAY (5):	0–100 *(Not available in Basic software)*
REVIEW SAME TIMERS AGAIN (N)	Enter Y < CR > to return to the DIALING WAIT AFTER CONNECT prompt. Or, enter N < CR > to continue with the timers that are programmed in *seconds*.
TIMER VALUES IN SECONDS	
CAMP-ON (3):	0–255
CAMP-ON TONE (15):	5–255
CO RE-SEIZE (3):	1–15
DATA PORT WAIT (30):	1–255
DIAL TONE WAIT (2):	1–50 *(Not available in Basic software)*
DIAL INITIATION — KEYSET (15):	5–30
DIAL INITIATION — SL SET (10):	5–30 *(Not available in Basic software)*
DISCONNECT WAIT AFTER DIALING (20):	2–30
FORWARD NO ANSWER (15):	3–255
HOLD (60):	10–255
INACTIVITY ALARM (60):	10–255
INTERDIGIT (LONG) (15):	2–255
INTERDIGIT (SHORT) (4):	2–30
LINE PRE-SELECT (5):	2–255
MESSAGE (AT MESSAGE CENTER) (5):	1–255
OFF-HOOK VOICE ANNOUNCE SCREENING (5):	0–255
PAGING (15):	0–255
PAUSE DIGIT (3):	1–5
QUEUE CALLBACK (15):	10–255
RECALL (60):	10–255

PROMPT	VALID ENTRY
STATION MONITORING TONE (15):	5–255 *(Not available in Basic software)*
TRANSFER — AVAILABLE (20):	10–255
TRANSFER — BUSY (24):	10–255
VALID CALL (15):	0–60
REVIEW SAME TIMERS AGAIN (N)	Enter Y < CR > to return to the CAMP-ON prompt. Or, enter N < CR > to continue with the timers that are programmed in *minutes*.
TIMER VALUES IN MINUTES	
ABANDONED RECALL (10):	1–255
UNSUPERVISED CONFERENCE (5):	1–255
UNSUPERVISED CO (5):	1–255
REVIEW SAME TIMERS AGAIN (N)	Enter Y < CR > to return to the ABANDONED RECALL prompt. Or, enter N < CR > to exit the program.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

C. [AC] SYSTEM SPEED DIAL (/SPDI)

4.7 To prepare for programming the system speed-dial information, determine the following information. (If desired, use the program planning sheet in Figure 5-2 on page 5-134.)

- **System speed-dial programming station:** Determine the circuit or intercom number of the keyset station that will be allowed to program all system speed-dial numbers, including all tenant-specific numbers.

- **Display speed-dial numbers:** Determine a range of system speed-dial number locations 0 to (9-99), which may be viewed on display keysets. (Locations 0-9 are always displayed.) Any location number not included in this range is confidential. Non-display numbers do not appear on display keysets when dialed and cannot be redialed. Non-display numbers will appear in the SMDR when dialed.

- **Speed-dial numbers and names:** List up to 100 system speed-dial numbers. If using *Advanced* or *Intermediate* software, also list their associated names. Names can include up to 16 characters. (These names are used with the C.O. Directory feature.) Numbers can include up to 32 digits and can include timed pauses and/or hookflashes. Timed pauses and/or hookflashes are used when entering a series of numbers, such as access codes, security codes, and telephone numbers, for spe-

cialized common carrier (SCC) dialing. To include a pause in the number, enter the letter P for a short pause, PP for a medium pause, or PPP for a long pause. The pause length represented by the P is determined in program [AB] (timer values). If the hookflash option is enabled, enter an F (flash) for a hookflash. Each pause and/or hookflash (P, PP, PPP, or F) is considered one of the 32 digits. However, when the number is actually speed dialed, each double pause counts as two digits and each triple pause counts as three digits. Therefore, some of the digits may be lost if the number is extremely long and contains double or triple pauses.

- **Tenant group number:** Determine which system speed-dial numbers may be used only by the members of a specific tenant group. If desired, a single tenant group number (1-4) may be entered for each individual system speed-dial number. Tenant-specific numbers cannot be viewed or dialed by station users not in the designated tenant group. If no tenant group number is entered, the system speed-dial number is available to all system users.

4.8 Enter C from the general system data menu or enter AC or /SPDI from the database programming menu to access the system speed-dial program. The prompts appear as shown below; end entries with <CR>.

PROMPT	VALID ENTRY
SYSTEM SPEED DIAL PROGRAMMING STATION (1.1):	Enter the circuit (X.Y) or intercom (EXXX) number of the station that can be used for entering or changing all system speed-dial numbers.
DISPLAY ALL SYSTEM SPEED DIAL NUMBERS (Y):	Y- All system speed-dial numbers appear when dialed at display keysets. Advance to the RANGE OF SPEED DIAL NUMBERS prompt. N- Advance to the next prompt.
DISPLAY SYSTEM SPEED DIAL NUMBERS 0 TO (99):	Complete the range of system speed-dial numbers (9-99) that will be allowed to appear on display keysets when dialed. Any number not included in this range is a non-display number. Numbers 0-9 are always displayed.

PROMPT	VALID ENTRY
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
RANGE OF SPEED DIAL NUMBERS TO BE REVIEWED (NONE):	Enter a range of speed-dial location codes (0–99). ALL is a valid entry (however, only 20 speed-dial numbers will be viewed or reviewed at a time before the REVIEW SAME SPEED DIAL NUMBERS AGAIN prompt appears). Enter NONE to return to the general system data menu prompt ([A]:).
00 ( ): *SPEED DIAL NAME ( ):* TENANT GROUP NUMBER (NONE): ... 20 ( ): *SPEED DIAL NAME ( ):* TENANT GROUP NUMBER (NONE):	As each location code prompt appears, enter the speed-dial number (up to 32 digits including pauses and/or hookflashes). If using *Advanced* or *Intermediate* software, you can enter a speed-dial name (up to 16 characters). After pressing < CR >, the prompt requests a tenant group number. If desired, enter a single tenant group number (1–4). Or, if the number is to be available to all station users, enter NONE. **NOTE:** To erase an existing name or number without entering a new one, enter < at the number prompt.
REVIEW SAME SPEED DIAL NUMBERS AGAIN (N)?	Y– Return to the first speed-dial number of the selected range. N– Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged. If more than 20 numbers were entered at the RANGE prompt, the system continues to the next 20 speed-dial numbers. If not, the following prompt appears.
REVIEW ADDITIONAL SPEED DIAL NUMBERS (N)?	Y– Return to the RANGE OF SPEED DIAL NUMBERS prompt. N– Return to the general system data menu prompt ([A]:).

D. [AD] ACCOUNT CODES (/ACCT)

4.9 Enter D from the general system data menu or enter AD or /ACCT from the database programming menu to define up to 32 standard account codes and up to 120 forced account codes, using this program. (For more information regarding account codes, refer to page 4-55 in FEATURES.) These codes can then be assigned to specific stations in program [D] (Station/DSS Data).

4.10 If the "Account Code Class of Service" system-wide flag is enabled in program [AF] miscellaneous system data (refer to page 5-24), forced account codes 1-60 are assigned to specific circuit numbers. Forced account code 0 and forced account codes 61-119 are general-use account codes.

4.11 To plan the account code programming, determine the length for all account codes (4-8 digits). Then list the standard account codes (numbered 0-31) and the forced account codes (numbered 0-119). The program planning sheet in Figure 5-3 on page 5-136 may be helpful.

4.12 The terminal first displays the warning shown below. It is followed by the prompts. End each entry with < CR >.

WARNING: CHANGING THE ACCOUNT CODE LENGTH ERASES ALL PREVIOUSLY DEFINED STANDARD AND FORCED ACCOUNT CODES.

PROMPT	VALID ENTRY
ACCOUNT CODE LENGTHS (4):	To leave it unchanged, enter < CR > only. Entering a number (4–8) changes the length of all codes and erases any previously programmed codes.
RANGE OF STANDARD ACCOUNT CODES TO BE REVIEWED (NONE):	Enter a range of standard account codes (0–31) to be programmed or viewed. ALL is a valid entry. Enter NONE to advance to the RANGE OF FORCED ACCOUNT CODES prompt.
0 ( ): ... 31 ( ):	As each standard account code number appears, enter the four- to eight-digit code. Or, enter < to erase the current code without entering a new code.
REVIEW SAME STANDARD ACCOUNT CODES AGAIN (N)?	Y– Return to the first standard account code in the previously entered range. N– Continue to the next prompt.
REVIEW ADDITIONAL STANDARD ACCOUNT CODES (N):	Y– Return to the RANGE OF STANDARD ACCOUNT CODES prompt. N– Continue to the next prompt.
RANGE OF FORCED ACCOUNT CODES TO BE REVIEWED (NONE)?	Enter a range of forced account code numbers (0–119) to be programmed or viewed. ALL is a valid entry. Enter NONE to return to the general system data menu prompt ([A]:).

PROMPT	VALID ENTRY
0 ( ): 1 *[ASSOC STN 1.1]* ( ): ... 47 *[ASSOC STN 6.7]* ( ): 48 *[ASSOC STN 6.8]* ( ): ... 60 *[ASSOC STN 8.6]* ( ): 61 ( ): ... 119 ( ):	As each forced account code number appears, enter the four- to eight-digit code. Or, enter < to erase the current code without entering a new code. *Note that if the "Account Code Class of Service" system-wide flag is enabled in program [AF], account codes are assigned to specific circuit numbers (shown in brackets). If using Basic software, the associated stations end with circuit 6.8 (account code index 48). In Advanced and Intermediate software, associated stations continue to 8.6 (account code index 60).*
REVIEW SAME FORCED ACCOUNT CODES AGAIN (N)?	Y- Return to the first forced account code of the previously selected range. N- Continue to the next prompt.
REVIEW ADDITIONAL FORCED ACCOUNT CODES (N)?	Y- Return to the RANGE OF FORCED ACCOUNT CODES prompt. N- Return to the general system data menu prompt ([A]:).
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

E.   [AE] REMINDER MESSAGES (/MESS)

4.13   Enter E from the general system data menu or enter AE or /MESS from the database programming menu to define any or all of the 20 reminder message displays. (For more information regarding reminder messages, refer to page 4-89 in FEATURES.) Refer to the program planning sheet in Figure 5-4 on page 5-137.

PROMPT	VALID ENTRY
MESSAGE 1 (MEETING): MESSAGE 2 (STAFF MEETING): ... MESSAGE 19 (LUNCH): MESSAGE 20 (REMINDER):	Enter any 16-character message or < to erase the current message without entering a new one. End each entry with < CR > or just press < CR > to advance to the next line without changing the current message.
REVIEW REMINDER MESSAGES AGAIN (N)	Y- The messages display again. N- Return to the general system data menu prompt ([A]:).
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

F. [AF] MISCELLANEOUS SYSTEM DATA (/MISC)

4.14 Various system parameters are set using this programming task. Select F from the general system data menu or enter AF or /MISC from the database programming menu.

4.15 To prepare for this program, determine the following information. If desired, use the program planning sheet in Figure 5-5 on page 5-138.

- **Primary attendant or system alarm station:** Record the circuit or intercom number of the primary attendant station. The station must first be programmed as an attendant in program [FB] (attendants). If there will not be a primary attendant, select a display keyset station to receive system alarm messages.

- **Broadcasting alarms:** Determine whether system alarms display on all attendant stations or only at the primary attendant (or system alarm) station.

- **Day/Night Mode Toggle Station:** A keyset station (usually the primary attendant) can be designated to automatically place the system in night mode whenever this station is out of service due to keyset failure or in the event that the keyset is unplugged. When the station is placed back in service, an attendant must manually place the system back in day mode; the system will not cancel night mode automatically. When the system is initialized, this option is assigned to station circuit 1.1 (the primary attendant). **NOTE:** If the system is programmed for "no-attendant" operation, do not assign a night mode toggle station.

- **Cross-tenant traffic:** Determine whether stations that are in different tenant groups will be allowed to place intercom calls, forward intercom calls, or transfer intercom or C.O. calls to one another. Intercom calls placed to a hunt group are routed only to the hunt group stations that are in the same tenant group as the caller. Outside calls that are transferred to the hunt group are routed to all stations in the group. Recalls are not blocked, even if the attendant is not in the hunt groups' tenant group. If using *Advanced* or *Intermediate* software and cross-tenant traffic is denied, the system will allow you to determine whether voice

mail/voice computer ports are also denied cross-tenant access or if they are able to place calls to any station.

- **System-wide options:** The following options can be enabled or disabled on a system-wide basis:

  — *Account code class of service:* Forced and optional account codes can be programmed to be associated with station class of service (SCOS). This permits a user to place a call from any station using his account code and his usual SCOS. When the account code is entered, the system checks the *associated station's* SCOS and applies it to the call being made. When the call is completed, the programmed SCOS for the station goes back into effect.

  — *Audible message indication for SL sets:* If this option is enabled, single-line set users will hear a signal after lifting the handset or pressing the hookswitch whenever a message is waiting at the station. *(Not available in Basic software)*

  — *Dialing during automated attendant recording:* If using *Advanced* software, determine whether callers to an automated attendant will be allowed to dial DTMF digits while the automated attendant is giving dialing instructions. If enabled, this option allows callers (who know the intercom number of the person they wish to speak to) to dial before the end of the message.

    NOTE: The reliability of allowing callers to dial during the instructions may be affected by the voice characteristics of the person giving the instructions, the quality of the playback device, the C.O. line noise levels, the DTMF tone levels, etc. If frequent problems occur, this option should be disabled.

  — *C.O. line privacy release:* Determine whether users will be allowed to join ongoing C.O. calls (privacy release is enabled) or if C.O. calls will be limited to one station unless the conference feature is used (privacy release disabled).

  — *Speed-dial DTMF tones:* Determine whether DTMF tones will be heard when numbers

are speed dialed (via ARS, redial, station speed dial, system speed dial, etc.), or if they will be muted.

— *Hardware handshake settings:* Determine whether the RS-232-C connectors on the KSU and/or Accessory Port Modules should be set for "hardware" or "software" handshaking. Refer to page 2–16 in SPECIFICATIONS for details.

— *Speed-dial programming hookflash:* Determine whether hookflashes can be entered as part of speed-dial numbers and ARS dial rules.

— *Keyset LCD identification:* Determine whether the keyset identification display (user name and extension number) should appear on display keysets always (enabled) or only on keyset power up (disabled).

— *Off-hook voice announce:* Determine whether the off-hook voice announce (OHVA) feature will be enabled system-wide, and if so, whether DSS-equipped keysets will have immediate off-hook voice announce capability.

— *Override SCOS with speed-dial numbers:* If enabled, this option allows users to dial speed-dial numbers regardless of SCOS. If disabled, system speed-dial numbers are subject to toll restriction.

— *Reverse transfer:* Determine whether reverse-transferred calls are connected to keysets automatically, or if the user must press the flashing line key or the IC key to be connected. Single-line sets are always automatically connected to reverse-transferred calls.

— *System hold flash rate:* This option can be enabled to change the system hold flash rate to a continuous 960IPM to differentiate it from the 60/960IPM flutter used for individual hold. If the option is not enabled, both hold types use the 60/960IPM flutter.

— *System "skate" type:* Determine whether the system will place a call on hold when a keyset user presses another line key or the IC key while on a call (skate-to-hold) or will drop the call when another line key or the IC key is pressed (skate-to-disconnect). Skate-to-hold does not affect the procedure for reseizing a line.

— *Station monitoring periodic tones:* This option can be enabled to periodically send a tone to a station that is being monitored by a hunt group supervisor. *(Not available in Basic software. APM required.)*

— *Voice mailbox number validation:* This feature affects calls transferred to a voice mail unit. If all mailbox numbers match intercom numbers, the option should be enabled to allow the system to check that the mailbox number entered by the transferring party is valid. If there are mailbox numbers that do not match an intercom number, there is no need to validate mailbox numbers and this option should be disabled. In the default state, this is set to not validate numbers. *(Not available in Basic software)*

4.16   The miscellaneous system data prompts begin on the following page. End each entry with < CR >.

PROMPT	VALID ENTRY
PRIMARY ATTENDANT STATION (1.1):	If desired, enter the circuit (X.Y) or intercom (EXXX) number of the primary attendant station. Or, enter NONE if there is no primary attendant.
SYSTEM ALARM STATION (1.1):	*This prompt appears only if NONE was entered above.* If a primary attendant has not been assigned, enter the circuit (X.Y) or intercom (EXXX) number of the keyset station to receive system alarm messages.
BROADCAST ALARMS TO ALL ATTENDANTS (Y):	Y– System alarms display on all attendants' keysets. N– Only the primary attendant (or system alarm station) is notified in the event of a system alarm.
DAY/NIGHT MODE TOGGLE STATION (1.1):	If desired, enter the circuit (X.Y) or intercom (EXXX) number of the keyset station that will cause the system to be placed into night mode if this station is out of service. NONE is a valid entry.
ALLOW CROSS-TENANT IC TRAFFIC (Y):	Y– Members of different tenant groups are allowed to place calls to one another. Advance to the ENABLE SYSTEM WIDE prompt. N– No calls are allowed between tenant groups. Continue to the next prompt.
ALLOW CROSS-TENANT VOICE MAIL/COMPUTER TRAFFIC (Y):	*This prompt does not appear in Basic software.* Y– Voice mail/computer station may place calls to any stations. N– Voice mail/computer stations may place calls only to stations within their tenant group.
ENABLE SYSTEM-WIDE: ACCOUNT CODE CLASS OF SERVICE (N):	Y– Forced account codes are associated with SCOS for specific stations. N– Account codes will not change the SCOS for the call when entered.
AUDIBLE MESSAGE INDICATION FOR SL SETS (N):	*This prompt does not appear in Basic software.* Y– The system will send a signal if a message is waiting at a single-line set. N– The system will not send special tones to notify a single-line set user when a message is waiting.
AUTOMATED ATTENDANT CALL DIALING DURING RECORDING (N):	*This prompt does not appear in Basic software and is not used in Intermediate software.* Y– The system will recognize digits dialed during the automated attendant's dialing instructions. N– The system will ignore digits dialed during the automated attendant's dialing instructions.

PROMPT	VALID ENTRY
CO LINE PRIVACY RELEASE (N):	Y- Keyset users may join calls in progress by pressing the lit line key, unless the station involved in the call is on a conference call, or has entered the private call or do-not-disturb feature code while on the call.
	N- Use of a C.O. line is limited to one station at a time, unless the conference feature is used.
DTMF TONES DURING SPEED DIALING (N):	Y- DTMF tones are heard when a number is speed dialed.
	N- DTMF tones are not heard by the user when a number is speed dialed.
HARDWARE HANDSHAKE FOR PRIMARY PORT (N):	Y- The CPU port will be enabled for hardware and software handshaking.
	N- The CPU port will be enabled for software handshaking only.
HARDWARE HANDSHAKE FOR ACCESSORY PORT A (N): HARDWARE HANDSHAKE FOR ACCESSORY PORT B (N):	*These prompts do not appear in Basic software.* Y- The indicated APM port will be enabled for hardware and software handshaking.
	N- The indicated APM port will be enabled for software handshaking only.
HOOKFLASH PROGRAMMING IN SPEED DIAL NUMBERS (Y):	Y- When programming system or station speed-dial numbers from a keyset, pressing the SPCL key once enters a hookflash, twice enters a short pause, and three times enters a medium pause. When programming from a terminal, the programmer can enter F for a hookflash, P for a short pause, PP for a medium pause, and PPP for a long pause.
	N- When programming system or station speed-dial numbers from a keyset, pressing the SPCL key once enters a short pause, twice enters a medium pause, and three times enters a long pause. When using a terminal, the programmer can enter P for a short pause, PP for a medium pause, and PPP for a long pause.
LCD IDENTIFICATION FOR KEYSET FULL-TIME (N):	Y- The top line of each display keyset will show the user name and intercom number when the keyset is in the idle state.
	N- Only date and time will show when a display keyset is in the idle state.
OFF-HOOK VOICE ANNOUNCE (N):	Y- Enables system-wide OHVA.
	N- OHVA calls are not allowed. Advance to the OVERRIDE SCOS WITH SYSTEM SPEED DIAL NUMBERS prompt.

PROMPT	VALID ENTRY
IMMEDIATE DSS OFF-HOOK VOICE ANNOUNCE (Y):	*This prompt appears only if the OHVA feature is enabled.* Y– DSS stations can make immediate OHVA calls without waiting for the OHVA screening timer to expire. N– DSS stations do not have special priority when making OHVA calls.
OVERRIDE SCOS WITH SYSTEM SPEED DIAL NUMBERS (N):	Y– System speed dial numbers can be dialed from any station regardless of SCOS. N– System speed dial numbers are subject to toll restriction.
REVERSE TRANSFER IMMEDIATE CONNECTION (N):	Y– Reverse transfers are automatically connected. N– After reverse transfers, the keyset user must press the flashing line key or the IC key to be connected.
S-HOLD DIFFERENT FLASH RATE (N):	Y– System hold will be indicated by a 960 IPM flash rate and individual hold will be indicated by a 60/960 IPM flutter. N– Both types of hold will use the 60/960 IPM flash rate.
SKATE-TO-HOLD (N):	Y– The current call is placed on hold when the keyset user presses another line key or the IC key. N– The current call is disconnected when another line key or the IC key is pressed.
STATION MONITORING PERIODIC TONES (N):	*This prompt does not appear in Basic software.* Y– Station users will hear a tone periodically while a call is being monitored by the hunt group supervisor if an APM is installed. N– Station monitoring is not indicated to the party being monitored in any way.
VOICE MAILBOX NUMBER VALIDATION (N):	*This prompt does not appear in Basic software.* Y– When a call is transferred to a voice mail unit, the system will check that the mailbox number entered by the transferring party corresponds to a valid intercom number. N– Mailbox numbers are not validated.
REVIEW MISC SYSTEM DATA (N)?	Y– Return to the PRIMARY ATTENDANT prompt. N– Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

G.   [AG] DND MESSAGES (/DNDM)

4.17   Select program G from the general system data menu or enter AG or /DNDM from the database program-ming menu to define any or all of the do-not-disturb message displays (2–20). (For more information regarding do-not-disturb messages, refer to page 4–86 in FEATURES.) Refer to the program planning sheet in Figure 5–6 on page 5–139. The prompts appear as shown below. End each entry with < CR >.

PROMPT	VALID ENTRY
MESSAGE 1 (DO-NOT-DISTURB) MESSAGE 2 (IN MEETING UNTIL): ... MESSAGE 19 (GONE HOME): MESSAGE 20 (OUT TO LUNCH):	Message 1 cannot be changed. Messages 2–20 can be changed to any 16-character message or erased by entering <.
REVIEW DND MESSAGES AGAIN (N)?	Y– Return to message 2. N– Return to the menu prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

H. [AH] PASSWORDS (/PASS)

4.18 The database programming, SMDR and error programming, SAR/call cost programming, and on-line monitor menus each can be assigned passwords that limit access.

4.19 The database programming menu can have up to three passwords; each specifies a different level of access:

- **Database inspection level** allows any portion of the database to be viewed, except the save/restore, initialization, or password programs. It does not allow changes to be made in the database.

- **Database modification level** allows changes in the database to be made and saved. But, it does not allow access to the save/restore, initialization, or password programs.

- **Database unrestricted level** allows the programmer to make changes, save or load information, initialize the system, and access the password programs.

4.20 If an inspection and/or modification password is assigned, an unrestricted password *must* also be assigned to ensure adequate security. If an unrestricted password is not assigned, a simple < CR > allows access to the save/restore, initialization, and password programs, thus defeating the purpose of password security.

4.21 The SMDR and error programming, SAR/call cost programming, on-line monitor, and self test each have one password (unrestricted level).

4.22 If a password is required for entry to a programming area, the terminal displays PASSWORD:. If an invalid password is entered, the system returns to the applications menu prompt and prints an error message. For security, the passwords do not appear on the terminal when typed.

4.23 A password can be up to eight characters long. To allow immediate access to every program, no passwords are set during initialization. If desired, record the passwords on the program planning sheet in Figure 5-6 on page 5-139.

4.24 To establish, change, or remove passwords, enter H from the general system data menu or enter AH or /PASS from the database programming menu. The prompts for the database programming menu password appear first. End each entry with < CR >.

4.25 If a password is created and later designated as *not required*, it remains in the system memory. If it is later designated as *required* and a *new* password is not created, the original password is reassigned.

PROMPT	VALID ENTRY
REQUIRE A PASSWORD FOR DATABASE PROGRAMMING (N):	N– Advance to the SMDR password prompts. Y– Continue to the next prompt.
CHANGE INSPECTION PASSWORD (N)?	N– Advance to the CHANGE MODIFICATION PASSWORD prompt. Y– Continue to the next prompt.
ENTER NEW PASSWORD:	Enter up to eight characters.
ENTER NEW PASSWORD AGAIN:	Repeat the same characters. If the two entries do not match, an error message appears; return to the ENTER NEW PASSWORD prompt.
CHANGE MODIFICATION PASSWORD (N)?	N– Advance to the CHANGE UNRESTRICTED PASSWORD prompt. Y– Continue to the next prompt.
ENTER NEW PASSWORD:	Enter up to eight characters.
ENTER NEW PASSWORD AGAIN:	Repeat the same characters. If the two entries do not match, an error message appears; return to the ENTER NEW PASSWORD prompt.

PROMPT	VALID ENTRY
CHANGE UNRESTRICTED PASSWORD (N)?	N– Advance to the SMDR password prompts. Y– Continue to the next prompt.
ENTER NEW PASSWORD:	Enter up to eight characters.
ENTER NEW PASSWORD AGAIN:	Repeat the same characters. If the two entries do not match, an error message appears; return to the ENTER NEW PASSWORD prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
REQUIRE A PASSWORD FOR SMDR AND ERROR (N):	N– Advance to the REQUIRE A PASSWORD FOR SAR *(OR CALL COST)* prompt. Y– Continue to the next prompt.
CHANGE SMDR AND ERROR PASSWORD (N)?	N– Advance to the REQUIRE A PASSWORD FOR SAR *(OR CALL COST)* prompt. Y– Continue to the next prompt.
ENTER NEW PASSWORD:	Enter up to eight characters.
ENTER NEW PASSWORD AGAIN:	Repeat the same characters. If the two entries do not match, an error message appears; return to the ENTER NEW PASSWORD prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
REQUIRE A PASSWORD FOR SAR (N): *(OR, REQUIRE A PASSWORD FOR CALL COST)*	*If using Basic software, these prompts will ask for a Call Cost password instead of SAR.* N– Advance to the REQUIRE A PASSWORD FOR ON–LINE MONITOR prompt. Y– Continue to the next prompt.
CHANGE SAR PASSWORD (N)? *(OR, CHANGE CALL COST PASSWORD)*	N– Advance to the REQUIRE A PASSWORD FOR ON–LINE MONITOR prompt. Y– Continue to the next prompt.
ENTER NEW PASSWORD:	Enter up to eight characters.
ENTER NEW PASSWORD AGAIN:	Repeat the same characters. If the two entries do not match, an error message appears; return to the ENTER NEW PASSWORD prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

PROMPT	VALID ENTRY
REQUIRE A PASSWORD FOR ON-LINE MONITOR (N):	N– Advance to the REQUIRE A PASSWORD FOR NETWORK SELF TEST prompt. Y– Continue to the next prompt.
CHANGE ON-LINE MONITOR PASSWORD (N)?	N– Advance to the REQUIRE A PASSWORD FOR NETWORK SELF TEST prompt. Y– Continue to the next prompt.
ENTER NEW PASSWORD:	Enter up to eight characters.
ENTER NEW PASSWORD AGAIN:	Repeat the same characters. If the two entries do not match, an error message appears; return to the ENTER NEW PASSWORD prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
REQUIRE A PASSWORD FOR NETWORK SELF TEST (N):	*The network self test prompts do not appear in Basic software.* N– Return to the general system data menu prompt ([A]:). Y– Continue to the next prompt.
CHANGE NETWORK SELF TEST PASSWORD (N)?	N– Return to the general system data menu prompt ([A]:). Y– Continue to the next prompt.
ENTER NEW PASSWORD:	Enter up to eight characters.
ENTER NEW PASSWORD AGAIN:	Repeat the same characters. If the two entries do not match, an error message appears; return to the ENTER NEW PASSWORD prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged. The terminal then returns to the general system data menu prompt ([A]:).

5. [B] EXTENSIONS (INTERCOM NUMBERS) AND FEATURE ACCESS CODES (/CODE)

5.1 To reprogram intercom numbers or feature codes, enter B or /CODE from the database programming menu prompt. Prompts are shown below only for a few extension (intercom) numbers and feature codes. To prepare for programming, make a list of feature codes, intercom numbers, and pilot numbers and check to be sure they do not overlap. The program planning sheet in Figure 5-7, starting on page 5-140, lists the default values of all the extension codes, hunt group codes, C.O. line access codes, and feature codes.

5.2 The feature codes and intercom numbers are preset to carefully selected default values. Changing the codes or numbers can cause existing assignments to be erased. For example, if 300, 305, and 306 are assigned as feature codes and you attempt to assign 30 as another feature code, 30 would not be accepted, because 3 and 0 make up part of existing codes. The terminal prints the error message shown below. If desired, enter Y < CR > to save 30 and erase feature codes 300, 305, and 306.

```
*** AMBIGUOUS ASSIGNMENT(S) ***
E300
E305
E306
OVERRIDE CONFLICT (N)?
```

5.3 Feature code prompts appear in numerical order, according to their default values. Changing the code for a feature does not change the order in which the prompts appear. The prompts begin with intercom number assignments. End each entry with < CR >.

PROMPT	VALID ENTRY
RANGE OF STATIONS TO BE REVIEWED (NONE):	Enter a range of circuit numbers of the stations to be viewed or assigned new intercom numbers. ALL is a valid entry. Enter NONE to advance to the RANGE OF HUNT GROUPS prompt.
KEYSET 1.1 (E100): ... KEYSET 6.8 (E147) ... SL SET 8.6 (E159):	Enter an intercom number (XXX or EXXX) to change the number assigned to the circuit. Circuit numbers 1.1–6.8 are on the KSU and EXP boards. Single-line circuits 7.1–7.6 are on the first APM and 8.1–8.6 are on the second APM. *(Circuits 7.1–8.6 are not available in Basic software.)*
REVIEW SAME STATIONS AGAIN (N)?	Y– Return to the first station selected. N– Continue to the next prompt.
REVIEW ADDITIONAL STATIONS (N)?	Y– Return to the RANGE OF STATIONS prompt. N– Continue to the next prompt.
RANGE OF HUNT GROUPS TO BE REVIEWED (NONE):	Enter a range of hunt group numbers (1–5) to be assigned pilot numbers. ALL is a valid entry. Enter NONE to advance to the REVIEW FEATURES prompt if using *Basic* software, or the RANGE OF VOICE COMPUTER HUNT GROUPS prompt if using *Advanced* or *Intermediate* software.
HUNT GROUP 1 (E231): ... HUNT GROUP 5 (E235):	Enter new pilot numbers (XXX or EXXX) for the hunt groups, if desired. Be careful not to use numbers that you wish to use as intercom numbers or feature codes.
REVIEW SAME HUNT GROUPS AGAIN (N)?	Y– Return to the first hunt group in the selected range. N– Continue to the next prompt.

PROMPT	VALID ENTRY
REVIEW ADDITIONAL HUNT GROUPS (N)?	Y- Return to the RANGE OF HUNT GROUPS prompt. N- Continue to the next prompt.
RANGE OF VOICE COMPUTER GROUPS TO BE REVIEWED (NONE):	*Voice computer prompts appear only in Intermediate and Advanced software.* Enter a range of voice computer hunt group numbers (6-20) to be assigned pilot numbers. ALL is a valid entry. Enter NONE to advance to the REVIEW FEATURES prompt.
VOICE COMPUTER GROUP 6 (E236): ... VOICE COMPUTER GROUP 20 (E250):	*This prompt is not used in Intermediate software.* Enter new pilot numbers (XXX or EXXX) for the voice computer hunt groups, if desired. Be careful not to use numbers that you wish to assign as intercom numbers or feature codes.
REVIEW SAME VOICE COMPUTER GROUPS AGAIN (N)?	Y- Return to the first voice computer hunt group in the selected range. N- Continue to the next prompt.
REVIEW ADDITIONAL VOICE COMPUTER GROUPS (N)?	Y- Return to the RANGE OF VOICE COMPUTER GROUPS prompt. N- Continue to the next prompt.
REVIEW FEATURES (N)?	Y- Continue to the next prompt. N- Advance to the REVIEW EXTENSION ASSIGNMENTS AGAIN prompt.
REVIEW CO LINE ACCESS FEATURE CODES (N)?	*This prompt does not appear in Basic software.* Y- Continue to the next prompt. N- Advance to the REVIEW NON-ATTENDANT ONLY FEATURE CODES prompt.
CO LINE ACCESS: AUTOMATIC ROUTE SELECTION (E80): *(Not in Basic software)* CO LINE ACCESS: SELECT LINE GROUP 1 (E81): ... CO LINE ACCESS: AUTOMATIC LINE SELECTION (E89)	Enter a new 1-3 digit code for each line access code or NONE if the feature will not be used. Do not use numbers that you wish to assign as intercom numbers or feature codes.
REVIEW NON-ATTENDANT ONLY FEATURE CODES (N)?	*This prompt does not appear in Basic software.* Y- Continue to the next prompt. N- Advance to the REVIEW ATTENDANT ONLY FEATURE CODES prompt.
FEATURE: DISPLAY DATE AND TIME (E300): ... FEATURE: PAGE (E7)	Enter a 1-3 digit code for each feature or NONE if the feature is not used. Do not use numbers that are reserved as intercom numbers or feature codes.
REVIEW ATTENDANT ONLY FEATURE CODES (N)?	*This prompt does not appear in Basic software.* Y- Continue to the next prompt. N- Advance to the REVIEW FEATURES AGAIN prompt.

PROMPT	VALID ENTRY
FEATURE: NIGHT RING ON/OFF (E010): ... FEATURE: PROGRAM LINES IN SERVICE (E031)	Enter a 1–3 digit code for each feature or NONE if the feature will not be used. Be careful not to use numbers that you have used as intercom numbers or feature codes.
REVIEW FEATURES AGAIN (N)?	Y– Return to the CO LINE ACCESS prompt. N– Continue to the next prompt.
REVIEW EXTENSION ASSIGNMENTS AGAIN (N)?	Y– Return to the RANGE OF STATIONS TO BE REVIEWED prompt. N– Exit to the database programming prompt ([ ]:).
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

6. [C] C.O. LINES

6.1 The programs reached through menu [C] C.O. Lines (selection C from the database programming menu) establish equipped C.O. lines, C.O. line groups, outgoing-access lists, allowed-answer lists, and ring-in lists.

6.2 The menu appears as shown below:

```
[C] CO LINES
    [A] CO LINE EQUIPMENT STATUS
    [B] CO LINE GROUPS
    [C] SPECIFIC CO LINE INFORMATION
    [D] AUTO AND LINE KEY ASSIGNMENTS
    [E] ACCESS, ANSWER, AND RING-IN
```

6.3 Certain types of C.O. information can be entered in more than one program. For example, lists of stations with outgoing-access, allowed-answer, and ring-in can be assigned individually to each C.O. line (using program [CC] Specific C.O. Line Information) or they can be assigned to a group of C.O. lines (using program [CE] Access, Answer, And Ring-In). The exact method and order of programming used depends on the customer's specific needs and the programmer's preference.

6.4 Before using these programs, look through *all* of the information on pages 5–36 to 5–48. Then, using the program planning sheet in Figure 5–8, starting on page 5–143, make lists of the following information.

- Circuit numbers of equipped C.O. lines.

- Line identifications (up to seven characters).

- Circuit numbers of lines to be used for DISA in day and night modes, and security codes, if desired. *(Advanced software only, requires an APM)*

- Circuit numbers of incoming-only and/or outgoing-only C.O. lines.

- Circuit numbers of lines that require dial pulse signaling.

- Circuit numbers of lines that will be subject to toll restriction, exempt from ARS Only *(Advanced software only)*, lines that will be programmed to absorb digits for PABX or local lines (and their absorbed digit strings), and lines that will be used for equal access dialing.

- Call cost types for unrestricted lines.

- Circuit numbers of auto line(s). In the *Basic* software there can be only one auto line. *Advanced* software allows as many equipped lines as desired to be designated as auto lines.

- Circuit numbers of line(s) for each line group. In the *Basic* software there can be only one line in each line group. *Advanced* software allows all equipped lines to be assigned to a single line group. A line can be in more than one line group.

- Hunt group ring-in assignments.

- Outgoing-access, allowed-answer, and ring-in assignments for the stations (separate lists for day and night modes).

- Line key assignments for up to four soft key groups. The soft keys can be assigned C.O. circuit numbers, feature codes, or station key numbers.

A. [CA] C.O. LINE EQUIPMENT STATUS (/EQU)

6.5 Select option A from the C.O. lines menu or enter CA or /EQU from the database programming menu to batch load information for several C.O. lines. The program planning sheet for this program is located in Figure 5–8 on page 5–143.

6.6 The prompts begin on the following page. After each list of circuit numbers is entered, the terminal redisplays the entry. Press < CR > if the information is correct. If not, enter new information.

6.7 When a list is displayed, items can be added to it by entering a plus (+) before the information. For example, the list reads 1.1–1.3, 2.1. To add 1.4 and 2.2–2.4, enter + 1.4, 2.2–2.4. To subtract items from the list, enter a minus (–) as the first character. Do not attempt to add and subtract items in the same entry.

NOTE: Lines that have been placed out of service for maintenance cannot be programmed until they are returned to service.

PROMPT	VALID ENTRY
LIST OF EQUIPPED CO LINES (ALL):	Enter the circuit numbers of the C.O. lines to be equipped. ALL or NONE are valid entries.
LIST OF DAY DISA CO LINES (NONE):	*This prompt appears only in Advanced software.* Enter the circuit numbers of lines to be used for DISA access while the system is in day mode. ALL or NONE are valid entries.
LIST OF NIGHT DISA CO LINES (NONE):	*This prompt appears only in Advanced software.* Enter the circuit numbers of lines to be used for DISA access while the system is in night mode. ALL or NONE are valid entries.
LIST OF INCOMING-ONLY CO LINES (NONE):	Enter circuit numbers of lines to be used for incoming calls only. ALL or NONE are valid entries. Changing this list also changes the outgoing-access list in [DAA].
LIST OF OUTGOING-ONLY CO LINES (NONE):	Enter circuit numbers of lines to be used for outgoing calls only. Changing this list also changes the allowed-answer and ring-in lists in [DAA].
LIST OF PULSE-DIALING CO LINES (NONE):	Enter circuit numbers of lines that use dial-pulse signaling. ALL or NONE are valid entries.
LIST OF CO LINES SUBJECT TO TOLL RESTRICT (ALL):	Enter circuit numbers of lines that will be subject to toll restriction. Station class of service (SCOS) is checked only if the line is restricted. ALL or NONE are valid entries.
LIST OF CO LINES EXEMPT FROM ARS ONLY (NONE):	*This prompt does not appear in Basic software and is not used in Intermediate software.* Enter circuit numbers of lines that can be accessed directly by stations with SCOS 6 (ARS Only) and allowed access.
REVIEW CO LINE STATUS AGAIN (N)?	Y– Return to LIST OF EQUIPPED CO LINES prompt. N– Return to the C.O. lines menu prompt ([C]:).
LINE KEY ASSIGNMENT FOR CO LINE X.Y SOFT KEY GROUP X LINE KEY NUMBER(S) AVAILABLE ( ):	*This prompt appears only if a line is changed from unequipped to equipped status. They show the available soft key assignments.* Enter the desired line key number from the list shown, or < CR > to select the lowest available line key. This prompt repeats for each of the soft key groups.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

B.   [CB] C.O. LINE GROUPS (/LGRP)

6.8   A line group is accessed for placing outgoing calls by entering one of the select line group feature codes at a station. To define the eight line groups, enter B from the C.O. lines menu or enter CB or /LGRP from the database programming menu. Prepare to use this program by making a list of the C.O. line circuit numbers to be used for each line group (refer to Figure 5-8 on page 5-144 for a program planning sheet). A line can be in more than one line group or in none.

6.9   When a list of C.O. lines is entered, the terminal redisplays the entry for verification. If the entry is correct, press < CR >. If not, enter the correct information. The prompts appear as follows. End each entry with < CR >.

PROMPT	VALID ENTRY
RANGE OF LINE GROUPS TO BE REVIEWED (ALL):	Enter a range of line group numbers (1–8) to be programmed. Enter NONE to return to the C.O. lines menu prompt ([C]:) or enter ALL to view all line groups.
LINE GROUP X LIST OF CO LINES (NONE):	Enter the circuit number(s) of the line(s) to be assigned to the line group. (If using *Basic* software, you can enter only one circuit number per line group.) This prompt repeats for each of the line groups in the selected range.
REVIEW SAME LINE GROUPS AGAIN (N)?	Y– Return to the first line group selected. N– Continue to the next prompt.
REVIEW ADDITIONAL LINE GROUPS (N)?	Y– Return to the RANGE OF LINE GROUPS prompt. N– Return to the C.O. lines menu prompt ([C]:).
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

C. [CC] SPECIFIC C.O. LINE INFORMATION (/LINE)

6.10 To assign C.O. line features on a line-by-line basis, enter C from the C.O. lines menu or enter CC or /LINE from the database programming menu. Before using this program, determine the following information for each equipped C.O. line circuit. (The program planning sheet in Figure 5-8, page 5-145, may be helpful.)

- **C.O. lines equipped:** List all equipped C.O. lines.

- **C.O. line identification:** An identifier of up to seven characters can be programmed for each line.

- **DISA access:** Each line can be programmed as a day and/or night DISA line. In addition, each DISA line can be assigned a four-digit security code to limit system access and/or access to the C.O. lines. Separate security codes can be assigned for day and night modes. *(Advanced software only, requires an APM)*

- **Dial-pulse signaling:** Determine if each line uses dial-pulse signaling.

- **Toll restriction:** If the line is not subject to toll restrict, the station class of service (SCOS) is not checked when the line is used. For unrestricted lines, determine the call cost rate to be used for calls placed on the C.O. line. Restricted lines can be designated as equal access lines and can be programmed to absorb digits for PABX installations and installations in areas where the first digit(s) of the office code are absorbed.

- **ARS Only restriction:** *(Advanced software only)* Each line can be exempt from, or subject to, the ARS only restriction. If exempt from ARS only, stations with SCOS 6 (ARS Only) and the proper access can directly access the lines. If subject to ARS Only, stations with SCOS 6 can access the line only if is part of an ARS route group.

- **Outgoing access, allowed-answer, and ring-in assignments:** Prepare lists of stations that have outgoing access, ring-in, and/or allowed-answer assignments for day and night modes. List hunt group ring-in assignments, if used.

6.11 When the prompt asks for a list, the terminal redisplays the entry for verification. Enter < CR > if it is correct. If not, enter the correct information.

6.12 When a list is displayed, items can be added by entering a plus (+) before the information. For example, the list reads 1.1-1.3, 2.1. To add 1.4 and 2.2-2.4, enter +1.4, 2.2-2.4. To subtract items from the list, enter a minus (-) as the first character. Do not attempt to add and subtract items in the same entry.

PROMPT	VALID ENTRY
RANGE OF CO LINES TO BE REVIEWED (ALL):	Enter a range of circuit numbers of the C.O. lines to be reviewed or programmed. Enter ALL to view all lines or enter NONE to return to the C.O. lines menu prompt ([C]:).
CO LINE X.Y	
EQUIPPED (Y):	Y- A C.O. line is connected to this circuit. N- Circuit is unequipped. Advance to the REVIEW SAME CO LINE AGAIN prompt.
CO LINE ID ( ):	If desired, enter a name for the C.O. line up to seven characters long (e.g., WATS 1, LOCAL 3, etc.) or enter < to erase the current name. (If no entry is made, LINE XX appears on keyset displays.) If using *Basic* or *Intermediate* software, skip to the INCOMING-ONLY LINE prompt; the DISA prompts appear only in *Advanced* software. NOTE: Programming names for all of the C.O. lines may cause the system to process calls more slowly than usual.

PROMPT	VALID ENTRY
DAY DISA LINE (N):	Y- This line is used for DISA access during day mode. Continue to the next prompt.
	N- This line is not available for DISA use during day mode. Advance to the NIGHT DISA LINE prompts.
SECURITY CODE OPTION N = NONE REQUIRED C = CO ONLY I = IC AND CO SECURITY CODE OPTION (N):	N- No DISA security code is required. Advance to the NIGHT DISA LINE prompt. C- A security code will be required to access C.O. lines when using DISA. I- A security code is required to access any system resource. **NOTE:** Changing the security code option erases previously programmed security code.
SECURITY CODE ( ):	*This prompt appears if C or I is entered above.* Enter the four-digit day DISA security code, if desired. If a new security code is not entered, the security code option returns to N (NONE REQUIRED). However, if a security code already exists and a new one is not entered, the existing security code will remain.
NIGHT DISA LINE (N):	Y- This line is used for DISA access during night mode. Continue to the next prompt. N- This line is not available for DISA use during night mode. Advance to the INCOMING-ONLY LINE prompt.
SECURITY CODE OPTION N = NONE REQUIRED C = CO ONLY I = IC AND CO SECURITY CODE OPTION (N):	N- No DISA security code is required. Advance to the PULSE-DIALING LINE prompt. C- A security code will be required to access C.O. lines when using DISA. I- A security code is required to access any system resource. **NOTE:** Changing the security code option erases previously programmed security code.
SECURITY CODE ( ):	*This prompt appears if C or I is entered above.* Enter the four-digit night DISA security code, if desired. If a new code is not entered, the security code option returns to N (NONE REQUIRED). However, if a security code already exists and a new one is not entered, the existing security code will remain.
INCOMING-ONLY LINE (N) OUTGOING-ONLY LINE (N)	*These are assigned in program [CA] (C.O. line equipment status); they are shown here for reference only.*
PULSE-DIALING LINE (N):	Y- The line uses dial-pulse signaling. N- This is a DTMF line.

PROMPT	VALID ENTRY
SUBJECT TO TOLL RESTRICT (Y):	Y– Station class of service (SCOS) is checked when this line is used. Advance to the next prompt. N– Toll restriction is not checked when this line is used. Advance to the CALL COST TYPE prompt.
EQUAL ACCESS (Y):	Y– Users will be allowed to dial 10XXX to reach long distance carriers using this line. N– This line will not be used for equal access dialing.
DOES THIS LINE ABSORB DIGITS (N):	Y– This is a PBX or local C.O. line that requires digits to be absorbed in order to provide toll restriction. Advance to the next prompt. N– If using *Advanced* or *Intermediate* software, advance to the EXEMPT FROM ARS ONLY prompt. If using *Basic* software, advance to the AUTO LINE prompt.

REASON FOR ABSORBING DIGITS
  P = PBX LINE
  L = LOCAL CO LINE
REASON FOR ABSORBING DIGITS (P):
	P– The system is installed behind a PBX.
	L– The system is installed in an area where the central office absorbs the first digit(s).

ABSORBED DIGIT STRINGS 1. ( ): ... 8. ( ):	Enter the digit string(s) that will be used on this line, up to eight digits. An "X" may be used in the number to represent any digit 0–9. For example, 8X allows 80–89. *If L is chosen in the previous prompt, only one prompt will appear.*
REVIEW ABSORBED DIGIT STRINGS AGAIN (N)?	Y– Return to the ABSORBED DIGIT STRINGS prompt. N– If the line is not a PBX line, advance to the next prompt. If it is a PBX line, advance to the EXEMPT FROM ARS ONLY prompt.
ARE THE ABSORBED DIGITS REPEATABLE (N):	*This prompt does not appear for PBX lines.* Y– The digit string is absorbed when it is dialed more than once. Advance to the EXEMPT FROM ARS ONLY prompt. N– The digit string is processed as part of the telephone number if dialed a second time. Advance to the EXEMPT FROM ARS ONLY prompt.

PROMPT	VALID ENTRY

CALL COST TYPE
  F = FREE (000)
  L = LOCAL (LOC)
  T = TEN-DIGIT TOLL (T10)
  O = OPERATOR/INTERNATIONAL (TOI)
CALL COST TYPE (F):
	This prompt appears only for lines that are not subject to toll restriction.
	
	F– Because this line is unrestricted, the call cost will be 000.
	
	L– Local call cost calculations will be used for this line.
	
	T– 10-digit call cost calculations will be used.
	
	O– Operator/international rates will be used for call cost.

EXEMPT FROM ARS ONLY (N):	*This prompt does not appear in Basic software and is not used in Intermediate software.* Y– This line can be accessed directly by stations with SCOS 6 (ARS Only) and allowed access. N– This line can only by accessed by ARS-Only stations with allowed access if the line is part of a facility group.
AUTO LINE (N)	*This is assigned in program [CD] (auto and line key assignments); it is shown here for reference only.*
LINE GROUPS ( ):	*In Basic software, this prompt appears for reference only and the line group number(s) cannot be changed.* Enter the line group number(s) in which this line is included.

HUNT GROUP RING-IN EXTENSION
  DAY MODE (NONE) :
  NIGHT MODE (NONE) :
	This prompt does not appear for outgoing-only lines.
	
	If the line rings in to a hunt group, enter the pilot number (EXXX) of the hunt group or the hunt group number (1–20) for day mode and/or night mode. ALL or NONE are valid entries.
	
	NOTE: Lines that ring in to any hunt group cannot be assigned to ring in to any other hunt group or to a station.

STATIONS WITH OUTGOING-ACCESS
  DAY LIST (ALL) :
  NIGHT LIST (ALL) :
	Enter circuit (X.Y) or intercom (EXXX) numbers of stations with access to this line for placing outside calls during day or night mode. ALL or NONE are valid entries.

STATIONS WITH ALLOWED-ANSWER
  DAY LIST (1.1) :
  NIGHT LIST (ALL) :
	Enter circuit (X.Y) or intercom (EXXX) numbers of stations that can answer these lines during day or night mode (keyset line keys flash, but there is no ring-in tone). ALL or NONE are valid entries.
	
	NOTE: This data cannot be modified for outgoing-only or hunt group ring-in lines using this program.

PROMPT	VALID ENTRY

STATIONS WITH RING-IN
   DAY LIST (1.1) :
   NIGHT LIST (1.1) :
	Enter circuit (X.Y) or intercom (EXXX) numbers of stations that have ring-in for this line during day or night mode (stations receive ring signals and have flashing line keys). ALL or NONE are valid entries. These stations have allowed-answer assignment.
	
	NOTE: This data cannot be modified for outgoing-only or hunt group ring-in lines using this program.

REVIEW SAME CO LINE AGAIN (N)?	**Y**– Return to the EQUIPPED prompt for this line. **N**– Continue to the next prompt.
LINE KEY ASSIGNMENT FOR CO LINE X.Y **SOFT KEY GROUP X** LINE KEY NUMBER(S) AVAILABLE (X):	*This prompt appears only if a line is changed from unequipped to equipped status. It shows the available line key assignments.* Enter the desired line key number from the list shown, or < CR > to select the lowest available line key. The prompt repeats for each of the four soft key groups.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
REVIEW ADDITIONAL CO LINES (N)?	**Y**– Return to the RANGE OF CO LINES prompt. **N**– Return to the C.O. lines menu prompt ([C]:).

D. [CD] AUTO AND LINE KEY ASSIGNMENTS (/AUTO)

6.13 This program designates the auto lines and assigns the default soft keys for up to four soft key groups. Keysets are then assigned to the soft key groups as desired. To reach this program, enter D from the C.O. lines menu or enter CD or /AUTO from the database programming menu. (Refer to the program planning sheet in Figure 5-8, page 5-146, and to the description in FEATURES on page 4-41.) For each soft key group, the keys can be assigned the following functions:

- **Line keys:** A line key allows direct access to a C.O. line and the lamp shows the line's status.

- **Feature keys:** Any unused line keys can be assigned feature codes. This makes them fixed-function keys that cannot be changed by the users.

- **Station keys:** Unused line keys can also be designated as "station keys." These user-program-

mable keys are assigned default values. Because the keys are user-programmable, they can be reprogrammed by the user.

NOTE: If assigning the do-not-disturb feature to a key, use the do-not-disturb on/off feature code (372) to allow proper lamp function.

6.14 When the prompt asks for a list, the terminal redisplays the entries for verification. Enter < CR > if the list is correct. If not, enter the correct information. When a list is displayed, items can be added by entering a plus (+) before the information. For example, the list reads 1.1–1.3, 2.1. To add 1.4 and 2.2–2.4, enter + 1.4, 2.2–2.4. Stations cannot be directly deleted from the soft key group in the LIST OF STATIONS prompt. Stations are removed from a soft key group only by assigning them to another group. To subtract stations from the LIST OF AUTO LINES prompt, you can enter a minus (–) as the first character. Do not attempt to add and subtract items in the same entry. End all entries with < CR >.

PROMPT	VALID ENTRY
LIST OF AUTO LINES (NONE): *or AUTO CO LINE NUMBER (NONE):*	Enter circuit numbers for the auto line(s). In the *Basic* software there can be only one auto line. *Advanced* and *Intermediate* software allow any equipped line to be designated as an auto line.
RANGE OF SOFT KEY GROUPS TO BE REVIEWED (NONE):	Enter a range of soft key group numbers (1–4). ALL is a valid entry. Enter NONE to return to the C.O. lines menu prompt ([C]:).
KEY ASSIGNMENT REFERENCE CHART FEATURE KEY = FEATURE CODE STATION KEY = ST1, ST2, ... ST16 CO LINE KEY = CIRCUIT #	*This chart shows the available options for key assignments. The soft keys are labeled 1–24 on 24-line keysets and 1–12 on 12-line keysets. They can be designated as feature keys, station keys, or line keys in [DAE] (soft feature key default values) on page 5–65.*

SOFT KEY GROUP X
    KEY 1 (1.1):
    ...
    KEY 24 (6.4):
	To create a fixed FEATURE key: Enter the desired feature code.
	 To create a programmable STATION key: Enter ST followed by the desired station key number (1–16).
	 To create a LINE key: Enter the circuit number of the desired line.
	 To disable the key: Enter NONE.

LIST OF STATIONS (ALL):	Enter the circuit numbers of the keysets that will use the defaults assigned to this soft key group.
REVIEW SOFT KEY GROUP AGAIN (N)?	Y– Return to the SOFT KEY GROUP X prompt. N– Continue to the next soft key group or, if all groups have been programmed, continue to the next prompt.

PROMPT	VALID ENTRY
REVIEW ADDITIONAL SOFT KEY GROUPS (N)?	Y– Return to the RANGE OF SOFT KEY GROUPS prompt. N– Continue to the next prompt.
CO LINES(S) X.Y WILL BE UNEQUIPPED IF NOT ASSIGNED A LINE KEY UNEQUIP THE CO LINE(S) (N):	**NOTE:** All *equipped* lines *must* be assigned to a line key in each of the four soft key groups. If they are not, this message appears. Y– The indicated lines are unequipped. Return to the C.O. lines menu prompt ([C]:). N– Return to the LIST OF AUTO LINES prompt; then review the soft key groups and reassign the line to a line key.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

E.   [CE] ACCESS, ANSWER, AND RING-IN

6.15   Common outgoing-access, allowed-answer, and ring-in lists for the C.O. lines are assigned in the programs accessed through this menu. Enter E from the C.O. lines menu or CE from the database programming menu to access the following menu:

[CE] ACCESS, ANSWER, AND RING-IN
   [A]   ASSIGN COMMON STATION LISTS TO
   CO LINES
   [B]   ASSIGN COMMON OUTGOING-
   ACCESS LISTS
   [C]   ASSIGN COMMON ALLOWED-
   ANSWER AND RING-IN LISTS

6.16   In all of the programs accessed through this menu, the prompts ask for a list of C.O. line circuit numbers. When a list is entered, the terminal redisplays the entry for verification. Enter < CR > if the list is correct. If not, enter the correct information.

6.17   Items can be added to or subtracted from lists by entering a plus (+) or minus (–) before the information. For example, the list reads 1.1–1.3, 1.6. To add 1.4–1.5 and 2.1, enter + 1.4–1.5, 2.1. To subtract items from the list, enter a minus (–) before the numbers. For example, to subtract 1.3–1.4, enter –1.3–1.4. Do not attempt to add and subtract items in the same entry.

NOTE: These programs cannot be used for reviewing the current assignments. The prompts show NONE

until new information is entered, even if assignments have been made for those lines.

6.18   To prepare to use these programs, list the circuit numbers of the stations that have the same C.O. line outgoing-access, allowed-answer, and/or ring-in assignments. Information may be entered either using the list of common C.O. lines or using the lists of common stations. (Refer to the program planning sheet in Figure 5-8, page 5-147.)

+---+
| **CAUTION** |
| |
| These programs are total replacement pro- |
| grams. If the prompts are not answered care- |
| fully, previously entered data from other pro-|
| grams may be overwritten. |
+---+

[CEA] Assign Common Station Lists to CO Lines (/COMM)

6.19   Enter A from the access, answer, and ring-in menu, enter EA from the C.O. lines menu, or enter CEA or /COMM from the database programming menu to reach this program. It is used to batch load lists of stations for outgoing-access, allowed-answer, and ring-in assignments for the same C.O. lines. (Refer to the program planning sheet in Figure 5-8, page 5-147.)

6.20   The prompts appear in the order shown below. End each entry with < CR >.

PROMPT	VALID ENTRY
LIST OF CO LINES WITH COMMON ACCESS, ANSWER, AND RING-IN LISTS (NONE):	Enter circuit numbers of lines that have the same access, answer, and/or ring-in lists. ALL is a valid entry. Enter NONE to return to the access, answer, and ring-in menu prompt ([CE]:).

STATIONS WITH OUTGOING-ACCESS
  DAY LIST (NONE):
  NIGHT LIST (NONE):
	Enter circuit (X.Y) or intercom (EXXX) numbers of stations that can access these lines for placing outgoing calls during day and night modes. ALL or NONE are valid entries.

STATIONS WITH ALLOWED-ANSWER
  DAY LIST (NONE):
  NIGHT LIST (NONE):
	Enter circuit (X.Y) or intercom (EXXX) numbers of stations that can answer these lines during day and night modes. ALL and NONE are valid entries.

PROMPT	VALID ENTRY
STATIONS WITH RING-IN DAY LIST (NONE): NIGHT LIST (NONE):	Enter circuit (X.Y) or intercom (EXXX) numbers of stations that have ring-in during day/night mode. ALL or NONE are valid entries.
REVIEW ASSIGNMENTS AGAIN (N)?	Y– Return to the LIST OF CO LINES prompt. N– Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
MAKE ADDITIONAL ASSIGNMENTS (N)?	Y– Return to the LIST OF CO LINES prompt. N– Return to the access, answer, and ring-in menu prompt ([CE]:).

[CEB] Assign Common Outgoing-Access Lists (/ACC)

6.21 To reach this program, enter B from the access, answer, and ring-in menu, EB from the C.O. lines menu, or enter CEB or /ACC from the database programming menu. It is used to batch load lists of stations with outgoing access for the same lines. (Refer to Figure 5–8, page 5–147, for a program planning sheet.)

PROMPT	VALID ENTRY
LIST OF CO LINES WITH COMMON OUTGOING-ACCESS LISTS (NONE):	Enter circuit numbers of lines that have the same outgoing access lists. ALL is a valid entry. Enter NONE to return to the access, answer, and ring-in menu prompt ([CE]:).
STATIONS WITH OUTGOING-ACCESS DAY LIST (NONE): NIGHT LIST (NONE):	Enter circuit (X.Y) or intercom (EXXX) numbers of stations that can access these lines for placing outgoing calls during day and night modes. ALL is a valid entry.
REVIEW ASSIGNMENTS AGAIN (N)?	Y– Return to the LIST OF CO LINES prompt. N– Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
MAKE ADDITIONAL ASSIGNMENTS (N)?	Y– Return to the LIST OF CO LINES prompt. N– Return to the access, answer, and ring-in menu prompt ([CE]:).

[CEC] Assign Common Allowed-Answer and Ring-in Lists (/ANS)

6.22   This program assigns lists of stations that are allowed to answer and/or have ring in for groups of C.O. lines. It can be reached by entering C from the access, answer, and ring-in menu, EC from the C.O. lines menu, or enter CEC or /ANS from the database programming menu. (Refer to Figure 5-8, page 5-148, for a program planning sheet.)

PROMPT	VALID ENTRY
LIST OF CO LINES WITH COMMON ALLOWED-ANSWER AND RING-IN LISTS (NONE):	Enter circuit numbers of lines that can be answered or ring in at the same stations. ALL is a valid entry. Enter NONE to return to the access, answer, and ring-in menu prompt ([CE]:).

STATIONS WITH ALLOWED-ANSWER
  DAY LIST (NONE):
  NIGHT LIST (NONE):
	Enter circuit (X.Y) or intercom (EXXX) numbers of stations that can answer these lines during day/night mode. ALL or NONE are valid entries. (Keysets have flashing lines keys, but no ring-in tones.)

STATIONS WITH RING-IN
  DAY LIST (NONE):
  NIGHT LIST (NONE):
	Enter circuit (X.Y) or intercom (EXXX) numbers of stations that have ring-in for these lines during day and/or night mode. ALL or NONE are valid entries. (Keysets have both flashing line keys and ring-in tones.)

REVIEW ASSIGNMENTS AGAIN (N)?	Y- Return to the LIST OF CO LINES prompt. N- Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
MAKE ADDITIONAL ASSIGNMENTS (N)?	Y- Return to the LIST OF CO LINES prompt. N- Return to the access, answer, and ring-in menu prompt ([CE]:).

7. [D] STATION/DSS DATA

7.1 Selecting D from the database programming menu allows the programmer to review and set the features for each station. The station/DSS data menu appears as shown below:

```
[D] STATION/DSS DATA
    [A] STATION DATA
    [B] DSS/BLF DATA
    [C] STATION REPORT
```

7.2 In all of the programs accessed through this menu, the prompts ask for lists. When a list is entered, the terminal redisplays the entry for verification. Enter < CR > if the list is correct. If it is not correct, enter the correct information.

7.3 Items can be added to or subtracted from lists by entering a plus (+) or minus (–) before the information. For example, the list reads 1.1–1.3, 1.6. To add 1.4–1.5 and 2.1, enter +1.4–1.5, 2.1. To subtract 1.2–1.3, enter –1.2–1.3. Do not attempt to add and subtract items in the same entry.

7.4 Certain types of station information can be entered in more than one program. For example, station class of service (SCOS) can assigned individually to each station (using program [DAA] Specific Station Information) or it can be assigned to a group of stations (using program [DAF] Assign Common SCOS To Stations). The exact method and order of programming used depends on the customer's specific needs and the programmer's preference.

7.5 Before using the programs outlined in this section, look through *all* of the information on pages 5–49 to 5–70. Then, using the program planning sheet in Figure 5–9, starting on page 5–149, make lists of the necessary information.

A. [DA] STATION DATA

7.6 The station data program menu is reached by entering A from the station/DSS data menu or DA from the database programming menu. The menu appears as follows.

```
[DA] STATION DATA
    [A] SPECIFIC STATION INFORMATION
    [B] EXTENSION AND USERNAME
        ASSIGNMENTS
    [C] SOFT FEATURE KEY DEFAULT
        VALUES
    [D] COPY STATION INFORMATION
    [E] ASSIGN COMMON SCOS TO
        STATIONS
    [F] ASSIGN COMMON CO LINE LISTS TO
        STATIONS
    [G] ASSIGN COMMON PAGE ZONES TO
        KEYSETS
    [H] MISCELLANEOUS STATION
        FEATURES
    [I] KEYSET VOLUME DEFAULT VALUES
```

7.7 The programs that are accessed through this menu are used to enter specific information about individual stations or groups of stations. To prepare to use these programs, determine the following information for each station. (The program planning sheet in Figure 5–9, starting on page 5–149, may be helpful.)

- **Circuit number:** Circuit numbers are assigned to stations according to their position in relation to the KSU and according to their specific location on the KSU control board or expansion module. For example, the first (top) station circuit on the second expansion module is circuit 3.1).

- **Extension number:** When the system is initialized, extension (intercom) numbers are assigned to the circuits in numerical order ranging from circuit 1.1/intercom number 100 to circuit number 8.6/intercom number 159. The intercom number list in Figure 5–7, page 5–140, may be helpful.

- **User's name:** Names can be up to seven characters long. These names will appear on idle display keysets (if the option is enabled), in the intercom directory, on displays when receiving intercom calls, and in the SAR and SMDR records.

- **Tenant group numbers and names:** Tenant group numbers range from 1–4. (Refer to FEATURES, page 4–16, for more information.) Tenant groups are given names in program [FA] (tenant group assignments).

- **Station class of service (SCOS):** Refer to the FEATURES section, page 4-27, for a full explanation of the SCOS designations.

- **Secretarial intercept station:** Determine the circuit number of a station that will receive calls when the station (that is being assigned a secretarial intercept) is busy or does not answer.

- **Attendant station:** Determine the circuit number of the station that serves as the attendant for this station.

- **Message center:** Stations can be assigned a message center that will receive messages after the message (at message center) timer expires. See FEATURES, page 4-48.

- **Alternate message source:** *(Advanced and Intermediate software only and requires an APM)* An "alternate message source" feature was developed to enable a voice mail system to leave messages through a station or hunt group that is designated as its alternate message source. Alternate message sources can only be assigned to single-line circuits.

- **Account code type:** The station can be assigned a standard or forced account code, or neither. If it is a standard code, indicate the code index (0-31). Refer to the FEATURES section, page 4-55, for more information.

- **Automated attendant and designated recall station:** *(Advanced software only and requires an APM)* Single-line stations can be designated as automated attendants that answer incoming C.O. calls, play a recorded message (or give information), and disconnect to allow the caller to dial an intercom number or hunt group pilot number. If desired, the automated attendant can be assigned a designated recall station.

  NOTE: Also, due to the natural characteristics of the C.O. line, the volume level of DTMF tones transmitted over the line may be substantially reduced before reaching the GMX-48 System. This natural degradation in tone volume may adversely affect the reliability of the automated attendant feature. Other factors which can affect automated

attendant performance are C.O. line noise, the quality of the playback device, and the quality and strength of the DTMF tones generated by the off-premises phone itself.

- **Digit translation:** *(Advanced software only and requires an APM)* As described above, the automated attendant allows callers to dial intercom numbers or hunt group pilot numbers. To simplify this process and prevent the system from having digit recognition problems, digit translation may be used to allow callers to dial a single digit to access a designated intercom number or hunt group pilot number. Up to ten digit translation storage locations (0-9) are available.

- **Automated attendant and DISA do-not-disturb breakthrough:** *(Advanced software only and requires an APM)* Determine whether calls through DISA and the automated attendant will be allowed to ring at the station if it is in do-not-disturb. If disallowed, such calls will immediately transfer to the appropriate recall destination.

- **Camp-on tones:** Camp-on tones (that signal a call waiting) may be disabled for any station.

- **C.O. reseize:** Determine which stations will be allowed to reseize a C.O. line without first disconnecting the call by hanging up or pressing another line key.

- **Do-not-disturb:** Determine which stations will be allowed to use the do-not-disturb feature.

- **FAX port and FAX message center:** *(Advanced and Intermediate software only and requires an APM)* A facsimile machine may be connected to an unused single-line circuit to provide a message waiting interface. The single-line circuit is designated as a FAX port and a keyset station is designated as the FAX message center. Then, whenever a FAX is received, the keyset user receives message waiting indications from the FAX circuit.

- **Forwarding and forward to the public network:** Determine which stations will be permitted to use the call forwarding feature. And, among those that can use forwarding, determine which will be permitted to forward calls off premises to the public network.

- **House phone:** The station can be designated as a house phone that automatically dials a predetermined number when the handset is lifted. The assigned day number is dialed when the system is in day mode and the assigned night number is dialed when the system is in night mode. The day/night house phone numbers can also be programmed using the house phone station speed-dial locations. See FEATURES, page 4–83, for more information.

- **Off-premises extensions:** *(Advanced and Intermediate software only and requires an APM)* Single-line sets that will be used as off-premises stations can have their ring cadence modified to allow the central office to recognize all GMX-48 System ring signals.

- **Voice mail station:** *(Advanced and Intermediate software only and requires an APM)* If using an optional voice mail system, the single-line circuit connected to the voice mail unit must be designated as a voice mail station. This designation allows the voice mail unit to leave message waiting indications at stations. Stations assigned to voice mail/computer hunt groups are automatically designated as voice mail stations and cannot be changed until the station is removed from the voice mail/computer group.

- **DTMF feedback enabled:** *(Advanced and Intermediate software only and requires an APM)* When a station is designated as a voice mail station, you can determine whether progress tones are sent to the voice mail unit.

- **Off-hook voice announce (OHVA) options:** Keysets with secondary voice path capability can be enabled to place and/or receive OHVA calls. Other stations can be enabled to place OHVA calls.

- **Out-of-range line (OVER) key number:** Determine which line key (if any) will be designated as the OVER key (automatic out-of-range line selection key) for the selected stations. The OVER key will show the status of the out-of-range lines and may be used to access incoming calls on those lines.

- **Secondary voice path:** Determine the 24-line keysets that have secondary voice path capability. See INSTALLATION, page 3–14.

- **Speakerphone:** Determine which speakerphone-equipped keysets will be permitted to place hands-free intercom and outside calls.

- **C.O. line lists:** Make lists of the C.O. lines that the station can access for outgoing calls. Also list lines that do not ring at the station but can be answered (line keys flash) and lines that ring in at the station (line keys flash and ringing is heard). Make separate lists for day and night modes.

- **Soft key group:** Determine which of the four soft key groups each station will be assigned to. The soft key group determines the default values of the user-programmable feature keys, the station keys, and the FWD key.

- **Hunt groups and voice mail/computer groups:** Determine which stations will be included in hunt groups. If using *Advanced* software, also determine which voice mail ports will be included in voice mail/computer groups. Stations assigned to voice mail/computer hunt groups are automatically designated as voice mail stations and cannot be changed until they are removed from the voice mail/computer hunt group.

- **Paging zones:** Determine the page zone(s) (1–6) that the keysets are to be listed in, if any.

- **DSS/BLF station:** If a DSS/BLF Unit will be associated with a keyset, indicate its circuit number for reference.

[DAA] Specific Station Information (/STN)

7.8 To define the characteristics of each station individually, enter A from the station data menu, AA from the station/DSS data menu, or enter DAA or /STN from the database programming menu. This program may also be used for reviewing the features after they have been programmed.

7.9 Once the features included in this program have been assigned to one station, they can be copied to other stations using program [DAD] (copy station information). DSS/BLF Units are not included in this program.

7.10 The prompts for this program appear as shown on the following page. End each entry with < CR >.

PROMPT	VALID ENTRY
RANGE OF STATIONS TO BE REVIEWED (ALL)?	Enter a range of circuit (X.Y) or intercom (EXXX) numbers of the stations to be programmed. Enter NONE to return to the station/DSS data menu prompt ([DA]:) or enter ALL to view all stations.
KEYSET X.Y (ATTENDANT) or SL SET X.Y	**NOTE:** (ATTENDANT), (SYSTEM ALARM STATION), or (PRIMARY ATTENDANT) appears only if the station was previously designated as an attendant or alarm station.
EQUIPPED (N):	Y– Continue to the next prompt. N– Go to the REVIEW STATION AGAIN prompt.
EXTENSION (EXXX)	*This is assigned in program [B] (extensions and feature codes) or [DAB] (extensions and user names). It appears here for reference only.*
USERNAME ( ):	Enter < to erase the existing name or enter a name of up to seven characters.
TENANT GROUP NAME " "	*This is assigned in program [FA] (tenant group assignments). It is shown here for reference only.*
TENANT GROUP NUMBER (1):	Enter a tenant group number (1–4).
DAY SCOS (0) REVIEW DAY SCOS STATUS (N):	*Displays current assignments for day mode.* N– No changes are required. Go to the NIGHT SCOS prompt. Y– Continue to the next prompt. The following prompts assign SCOS. For more toll restriction information, refer to program [H] (toll restriction) on page 5–89.
(0) UNRESTRICTED (Y):	Y– This station is not toll-restricted. Advance to the NIGHT SCOS prompt. N– Continue to the next prompt.
RESTRICTED (1) OPERATOR ACCESS (N):	Y– Restricts calls that begin with 0 (zero). N– Calls that begin with 0 (zero) are not restricted.
(2) TOLL ACCESS (N):	Y– Restricts calls that begin with 1. N– Toll calls are not restricted.
(3) INTERNATIONAL (N):	Y– International calls, which begin with 01, are restricted. N– International calls are not restricted.
(4) EIGHT DIGIT (N):	Y– Numbers with eight digits or more are restricted. N– Numbers over seven digits are not restricted.

PROMPT	VALID ENTRY
(5) AREA/OFFICE CODE (N):	Y– Local and long distance calls are limited to the allowed area/office code lists. N– Area/office code lists are not checked when a call is placed.
(6) ARS ONLY (N):	*This prompt does not appear in Basic software and is not used in Intermediate software.* Y– Outgoing calls must be placed using the ARS feature. N– The station is not restricted to using ARS for placing outgoing calls.
(7) ALTERNATE CARRIER (N):	Y– Numbers in the alternate carrier list cannot be dialed. N– The alternate carrier number list is not checked when a call is placed.
(8) ENABLE ALD (N):	Y– Calls are permitted to the allowed long distance numbers, regardless of other toll restrictions. N– The allowed long distance number list is not checked when a call is placed.
NIGHT SCOS (0) REVIEW NIGHT SCOS STATUS (N):	*Displays current night mode assignments.* N– No changes are required. Go to the SECRETARIAL INTERCEPT prompt. Y– Continue to the next prompt. The following prompts assign night mode SCOS. For more toll restriction information, refer to program [H] (toll restriction) on page 5-89.
(0) UNRESTRICTED (Y): RESTRICTED (1) OPERATOR ACCESS (N): (2) TOLL ACCESS (N): (3) INTERNATIONAL (N): (4) EIGHT DIGIT (N): (5) AREA/OFFICE CODE (N): (6) ARS ONLY (N): (7) ALTERNATE CARRIER (N): (8) ENABLE ALD (N): USER GROUP NUMBER (1):	Enter Y or N for each SCOS as described for day mode SCOS. *The ARS Only prompt does not appear in Basic software and is not used in Intermediate software.*
SECRETARIAL INTERCEPT (NONE):	Enter the circuit (X.Y) or intercom (EXXX) number of the station (in the same tenant group if cross-tenant traffic is denied) that will receive calls when this station is busy or does not answer. Or, enter NONE if a secretarial intercept is not used.

PROMPT	VALID ENTRY
ATTENDANT (1.1):	Enter the circuit (X.Y) or intercom (EXXX) number of a programmed attendant station that will be this station's attendant (they must be in the same tenant group if cross-tenant traffic is denied). Enter NONE if an attendant is not used. *This prompt does not appear when programming an attendant's station.*
MESSAGE CENTER (1.1):	Enter the circuit (X.Y) or intercom (EXXX) number of the station that will receive messages that are left for this station. NONE is a valid entry.
ALTERNATE MESSAGE SOURCE (NONE):	*This prompt appears only in Advanced and Intermediate software and only when programming a single-line circuit.* Enter the circuit (X.Y) or intercom (EXXX) number of the station that will serve as the alternate message source for this circuit.
REVIEW STATION FEATURES (N)?	Y– Continue to the next prompt. N– Advance to the REVIEW CO LINE LISTS prompt.
ACCOUNT CODE TYPE S = STANDARD (AUTOMATIC) F = FORCED (REQUIRED) N = NEITHER ACCOUNT CODE TYPE (N):	S– An account code is entered in the SMDR and SAR reports automatically when this station is used to place a C.O. call. F– Station user is forced to enter an account code before placing an outside call. It appears in the SMDR reports. N– Account code does not appear in SMDR unless an optional account code is entered.
ACCOUNT CODE INDEX (0):	*This prompt appears only if S was selected above.* Enter an account code index (0–31). For more information, see program [AD] (account codes) on page 5–22 and see FEATURES, page 4–55.
AUTOMATED ATTENDANT (N):	*The automated attendant, recall destination, and digit translation prompts appear only when you are using Advanced software and programming a single-line station.* Y– This station is used as an automated attendant. N– This station is not used as an automated attendant. Advance to the HOUSE PHONE prompt.
DTMF PORT (NONE):	If the automated attendant is connected to the system using the Automated Attendant Adapter (AAA) unit, enter the circuit (X.Y) number of the DTMF port that is associated with this automated attendant circuit. NONE is a valid entry.

PROMPT	VALID ENTRY
RECALL DESTINATION (NONE):	*This prompt appears only if Y was selected at the automated attendant prompt.* Enter the circuit (X.Y) or intercom (EXXX) number of the station that will receive recalls from stations that are called through the automated attendant.
REVIEW DIGIT TRANSLATION (N):	*This prompt appears only if Y was selected at the AUTOMATED ATTENDANT prompt.* Y– Continue to the next prompt. N– Advance to the AUTOMATED ATTENDANT/ DISA DND OVERRIDE prompt.
1 ( ): 2 ( ): 3 ( ): ... 9 ( ): 0 ( ):	Enter station intercom numbers or hunt group pilot numbers in the desired digit translation locations. Enter < if you wish to erase the existing number.
AUTOMATED ATTENDANT/DISA DND BREAKTHROUGH ENABLED (Y):	*This prompt does not appear in Basic software and is not used in Intermediate software.* Y– Calls to this station through DISA or the automated attendant will ring in if the station is in do-not-disturb. N– Calls to this station through DISA or the automated attendant will ring at the station's attendant if the station is in do-not-disturb.
CAMP-ON TONES DISABLED (N):	Y– The user will not hear camp-on tones. N– The user will hear camp on tones when there is a call waiting.
CO RESEIZE ENABLED (N):	*This prompt appears for keysets only.* Y– This keyset user may reseize a C.O. line on which they have an active call simply by pressing the busy C.O. key. N– This keyset user may not reseize a C.O. line on which they have an active call by pressing the busy C.O. key.
DND ENABLED (Y):	Y– This station is allowed to use the do-not-disturb feature. N– This station is not allowed to use the do-not-disturb feature.

PROGRAMMING

PROMPT	VALID ENTRY

FAX PORT (N):

This prompt appears only when using Advanced or Intermediate software and when programming a single-line circuit.

Y– This circuit has a facsimile machine connected. Continue with the next prompt.

N– This circuit does not have a facsimile machine connected. Advance to the FWD ENABLED prompt.

FAX MESSAGE CENTER (NONE):

This prompt appears only if Y was selected above. Enter the circuit (X.Y) or intercom (EXXX) number of the keyset that will receive message waiting indications from the FAX port.

FWD ENABLED (Y):

Y– This station is allowed to use the call forwarding feature.

N– This station is not allowed to use the call forwarding feature.

FPN ENABLED (Y):

This prompt appears only if FWD is enabled above.

Y– This station is allowed to use the forward to the public network (off-premises forward) feature.

N– This station cannot use the forward to the public network feature.

HOUSE PHONE (N):

Y– This station is used as a house phone. Advance to the next prompt.

N– This station is not used as a house phone. Skip the DAY NUMBER and NIGHT NUMBER prompts.

DAY NUMBER ( ):
NIGHT NUMBER ( ):

These prompts appear only if Y was selected above. Enter the house phone number that is dialed when the system is in day mode and enter the house phone number that is dialed when the system is in night mode.

OVERFLOW LINE KEY NUMBER (NONE):

This prompt appears for keysets only. Enter the line key number that will be used as the OVER key.

OFF-HOOK VOICE ANNOUNCE TRANSMIT ENABLED (Y):

This prompt appears only if the system OHVA feature is enabled in program [AF] (miscellaneous system data).

Y– When this station places a call to a busy 12-line or 24-line keyset, the user may place OHVA calls over the called keyset's secondary voice path.

N– This station cannot place OHVA calls.

PROMPT	VALID ENTRY
SECONDARY VOICE PATH KEYSET (N):	*This prompt appears for keysets only.*
	Y– This is a 24-line keyset that has a secondary voice path installed. (Refer to INSTALLATION, page 3–14.)
	N– This keyset does not have a secondary voice path installed. Advance to the SPEAKER-PHONE ENABLED prompt.
OFF-HOOK VOICE ANNOUNCE RECEIVE ENABLED (N):	*This prompt appears for keysets only and only if the system OHVA feature is enabled and you answered Y to the previous prompt.*
	Y– The keyset can receive OHVA calls when its secondary voice path is available.
	N– The keyset cannot receive OHVA calls.
SPEAKERPHONE ENABLED (Y):	*This prompt appears for keysets only.*
	Y– This station is allowed to use the handsfree feature when placing and receiving calls.
	N– This station is not allowed to use the handsfree feature on outgoing calls.
OFF-PREMISES EXTENSION (N):	*This prompt appears only if you are using Advanced or Intermediate software and programming a single-line station.*
	Y– The station is used at an off-premises location. The ring cadence for the station is modified to allow the local telephone company to recognize all GMX-48 System ring signals.
	N– The station is not used at an off-premises location. The ring cadence is not changed.
VOICE MAIL/COMPUTER STATION (N):	*This prompt appears only if you are using Advanced or Intermediate software and programming a single-line station. If the station is already part of a voice mail/computer hunt group, this prompt will be set to "Y" and cannot be changed until the station is removed from the voice mail/computer group.*
	Y– This station is used as a voice mail station.
	N– This station is not used as a voice mail station.
DTMF FEEDBACK ENABLED (PROGRESS TONES DISABLED):	*This prompt appears only if Y was entered in the prompt above.*
	Y– The system sends DTMF signals to the voice mail port to indicate the status of the call being attempted.
	N– Progress tones are sent as usual.
REVIEW CO LINE LISTS (N):	Y– Continue to the next prompt.
	N– Skip the next three prompts.

PROMPT	VALID ENTRY
LIST OF CO LINES THAT CAN BE ACCESSED FOR OUTGOING CALLS DAY LIST (ALL): NIGHT LIST (ALL):	Enter circuit numbers of lines that can be used for placing outgoing calls during day and night modes. Do not include incoming-only lines. ALL or NONE are valid entries.
LIST OF CO LINES THAT CAN BE ANSWERED DAY LIST (NONE): NIGHT LIST (ALL):	Enter circuit numbers of lines that can be answered at this station during day and night modes. ALL or NONE are valid entries. Do not include outgoing-only lines.
LIST OF CO LINES THAT RING-IN DAY LIST (NONE): NIGHT LIST (NONE):	Enter circuit numbers of lines that ring in on this station during day/night mode. ALL or NONE are valid entries. When ring in is assigned, the station is automatically assigned allowed-answer. Do not include outgoing-only lines.
SOFT KEY GROUP (1):	*This prompt appears for keysets only.* Enter the desired soft key group number (1-4).
HUNT GROUPS (NONE)	*This is assigned in [E] (hunt groups). It is shown here for reference only.*
PAGE ZONES (1):	*This prompt appears for keysets only.* List of page zones (1-6), if any, the keyset is located in.
DSS/BLF ASSOCIATED ( )	*This appears only if the station has been programmed to be used with a DSS/BLF Unit in program [DBA] (DSS/BLF identification). It is shown here for reference only.*
REVIEW STATION AGAIN (N)?	Y– Return to EQUIPPED prompt. N– Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged. After all stations have been reviewed, continue to the next prompt.
REVIEW ADDITIONAL STATIONS (N)?	Y– Return to the RANGE OF STATIONS prompt. N– Return to the station data menu prompt ([DA]:).

[DAB] Extension (Intercom Number) and Username Assignments (/NAME)

7.11 To use this program, enter B from the station data menu, AB from the station/DSS data menu, or enter DAB or /NAME from the database programming menu. This program is used for assigning user names and intercom numbers for individual stations. Refer to paragraph 5.2 on page 5-33 for information on ambiguous intercom number assignments. The prompts appear as shown below. End each entry with < CR >.

PROMPT	VALID ENTRY
LIST OF STATIONS TO BE REVIEWED (NONE):	Enter a list of up to eight circuit (X.Y) numbers of the stations to be programmed or reviewed.
KEYSET X.Y (EXXX): or SL SET X.Y (EXXX):	Enter an intercom number (EXXX).
USERNAME ( ):	Enter < to erase the existing name or enter a name with up to seven characters.
REVIEW SAME STATIONS AGAIN (N)?	Y– Return to the KEYSET or SL prompt.
	N– Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
REVIEW ADDITIONAL EXTENSIONS AND USERNAMES (N)?	Y– Return to the LIST OF STATIONS prompt.
	N– Return to the station data menu prompt ([DA]:).

[DAC] Soft Feature Key Default Values (/SOFT)

7.12 Enter C from the station data menu, AC from the station/DSS data menu, or enter DAC or /SOFT from the database programming menu to set the default value of the user-programmable keyset feature keys and station keys. The programmer can then reset all stations to the new default values, or leave them unchanged so the default values will be set only if the station users enter the feature key default feature code (325). Refer to Figure 5-9 on page 5-151 for a program planning sheet.

7.13 The current feature name and feature code are shown in the prompt for each key. Whenever a new code is entered, the name and feature code are redisplayed for verification. If the entry is correct, press < CR >; if not, enter a new feature code.

PROMPT	VALID ENTRY
REVIEW SL SET SOFT FEATURE KEYS (N):	*This prompt does not appear in Basic software. If using Basic, advance to the REVIEW 24-LINE KEYSET SOFT FEATURE KEYS prompt.* Y– Continue to the next prompt. N– Advance to the REVIEW 24-LINE KEYSET SOFT FEATURE KEYS prompt.

KEY A "FEATURE: STATION SPEED DIAL"
  FEATURE CODE (E382) :
KEY B "FEATURE: REDIAL"
  FEATURE CODE (E380) :
KEY C "CO LINE ACCESS: AUTOMATIC
ROUTE SELECTION"
  FEATURE CODE (E80) :
KEY D "FEATURE: INDIVIDUAL HOLD"
  FEATURE CODE (E336) :
KEY E "FEATURE: SYSTEM SPEED DIAL"
  FEATURE CODE (E381) :
KEY F "FEATURE: PROGRAM STATION
SPEED DIAL"
  FEATURE CODE (E383) :
KEY G "FEATURE: QUEUE REQUEST"
  FEATURE CODE (E6) :
KEY H "FEATURE: CONFERENCE"
  FEATURE CODE (E5) :
KEY I "FEATURE: MESSAGE"
  FEATURE CODE (E365) :
	Enter the desired feature code. Key A is the top key, B is the second, etc. *Keys E–I are for future use.*

LIST OF SL SETS TO UPDATE (NONE):	Enter the list of single-line stations to be updated to the new default values as soon as the PERFORM SYSTEM UPDATE prompt is answered. Any single-line station not included in the list will be set to the new default values if the station user enters the feature key default feature code (325).
REVIEW SL SET FEATURES AGAIN (N)?	Y– Return to the KEY A prompt. N– Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

PROMPT	VALID ENTRY
REVIEW 24-LINE KEYSET SOFT FEATURE KEYS (N):	Y– Continue to the next prompt. N– Advance to the REVIEW 24-LINE AIM KEYSET SOFT FEATURE KEYS prompt.
KEY A "FEATURE: INDIVIDUAL HOLD" FEATURE CODE (E336) : KEY B "FEATURE: TRANSFER CO CALL" FEATURE CODE (E345) : KEY C "CO LINE ACCESS: AUTOMATIC LINE SELECTION" FEATURE CODE (E89) : KEY D "FEATURE: HOOKFLASH" FEATURE CODE (E330) : KEY E "FEATURE: REDIAL" FEATURE CODE (E380) : KEY F "FEATURE: SYSTEM SPEED DIAL" FEATURE CODE (E381) : KEY G "FEATURE: QUEUE REQUEST" FEATURE CODE (E6) : KEY H "FEATURE: PAGE" FEATURE CODE (E7) : KEY I "FEATURE: BACKGROUND MUSIC ON/OFF" FEATURE CODE (E313) :	Enter any feature code. The 24-line keyset feature keys appear as shown in the figure below:
LIST OF 24-LINE KEYSETS TO UPDATE (NONE):	Enter the list of 24-line keyset stations to be updated to the new default values as soon as the PERFORM SYSTEM UPDATE prompt is answered. Any 24-line keyset station not included in the list will be set to the new default values if the station user enters the feature key default feature code (325).
REVIEW 24-LINE KEYSET FEATURES AGAIN (N)?	Y– Return to the KEY A prompt. N– Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y <CR> to save the changes or N <CR> to leave the database unchanged.
REVIEW 24-LINE AIM KEYSET SOFT FEATURE KEYS (N):	Y– Continue to the next prompt. N– Advance to the REVIEW 12-LINE KEYSET SOFT FEATURE KEYS prompt. *The 24-line AIM keyset is not presently available.*
KEY A "FEATURE: REDIAL" FEATURE CODE (E380) : ... KEY I "FEATURE: HOOKFLASH" FEATURE CODE (E330) : LIST OF 24-LINE AIM KEYSETS TO UPDATE (NONE):	
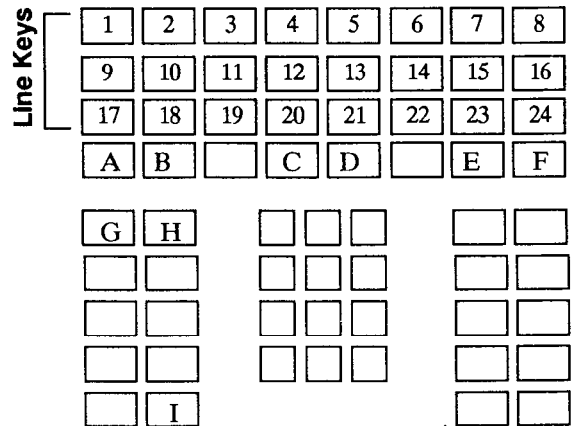
PROMPT	VALID ENTRY
REVIEW 24-LINE AIM KEYSET FEATURES AGAIN (N)?	Y– Return to the KEY A prompt. N– Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
REVIEW 12-LINE KEYSET SOFT FEATURE KEYS (N):	Y– Continue to the next prompt. N– Advance to the REVIEW 8/12-LINE AIM KEYSET SOFT FEATURE KEYS prompt.
KEY A "FEATURE: INDIVIDUAL HOLD" FEATURE CODE (E336) : KEY B "FEATURE: TRANSFER CO CALL" FEATURE CODE (E345) :	Enter any feature code. The 12-line keyset feature keys appear as shown in the figure below:

Line Keys
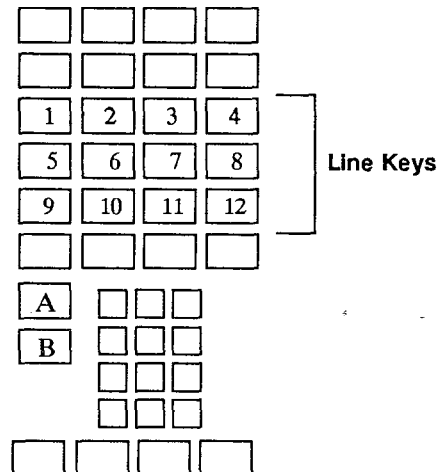
PROMPT	VALID ENTRY
LIST OF 12-LINE KEYSETS TO UPDATE (NONE):	Enter the list of 12-line keyset stations to be updated to the new default values as soon as the PERFORM SYSTEM UPDATE prompt is answered. Any 12-line keyset not included in the list will be set to the new default values if the station user enters the feature key default feature code (325).
REVIEW 12-LINE KEYSET FEATURES AGAIN (N)?	Y– Return to the keyset KEY A prompt. N– Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
REVIEW 8/12-LINE AIM KEYSET SOFT FEATURE KEYS (N):	Y– Continue to the next prompt. N– Advance to the REVIEW STATION KEYS prompt.
KEY A "FEATURE: INDIVIDUAL HOLD" FEATURE CODE (E336) : ... KEY E "FEATURE: REDIAL" FEATURE CODE (E380) : LIST OF 8/12-LINE AIM KEYSETS TO UPDATE (NONE):	*The 8-line and 12-line AIM keysets are not presently available.*

PROMPT	VALID ENTRY
REVIEW 8/12-LINE AIM KEYSET FEATURES AGAIN (N)?	Y- Return to the KEY A prompt. N- Continue to the next prompt.
REVIEW STATION KEYS (N):	Y- Continue to the next prompt. N- Advance to the REVIEW SYSTEM-WIDE KEYSET FWD KEY DEFAULT prompt.
STATION KEY X FEATURE CODE (NONE) :	Enter the desired feature code or intercom number for each station key. Entering a feature code creates a feature key and entering an intercom number creates a DSS/BLF key.
LIST OF KEYSETS TO UPDATE (NONE):	Enter the list keyset stations to be updated to the new default values as soon as the PERFORM SYSTEM UPDATE prompt is answered. Any keyset station not included in the list will be set to the new default values if the station user enters the station key default feature code (329).
REVIEW KEYSET STATION KEYS AGAIN (N)?	Y- Return to the STATION KEY X prompt. N- Continue to the next prompt.
REVIEW SYSTEM-WIDE KEYSET FWD KEY DEFAULT (N):	Y- Continue to the next prompt. N- Advance to the REVIEW SOFT KEY DEFAULTS AGAIN prompt.
SYSTEM-WIDE FWD KEY FEATURE FWD KEY "FEATURE: CALL FORWARD ALL CALLS" FEATURE CODE (E355) :	Enter the desired call forwarding feature code that will be the default for all keysets in the system.
LIST OF KEYSETS TO UPDATE (NONE):	Enter the list keyset stations to be updated to the new default value as soon as the PERFORM SYSTEM UPDATE prompt is answered. Any keyset station not included in the list will be set to the new default value if the station user enters the feature key default feature code (325).
REVIEW SYSTEM-WIDE FWD KEY FEATURE AGAIN (N)?	Y- Return to the SYSTEM-WIDE KEYSET FWD KEY DEFAULT prompt. N- Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
REVIEW SOFT KEY DEFAULTS AGAIN (N):	Y- Return to the first prompt. N- Return to the station/DSS data menu prompt ([DA]).

[DAD] Copy Station Information (/COPY)

7.14 Station information can be copied to several stations using this program. (User names, extension numbers, hunt groups, and DSS/BLF Unit assignments are not copied.) Copying information to an ex-

isting station replaces that station's current features.

7.15 To reach this program, enter D from the station data menu, AD from the station/DSS data menu, or enter DAD or /COPY from the database programming menu. A program planning sheet is located in Figure 5-9 on page 5-152.

PROMPT	VALID ENTRY
STATION TO BE COPIED (NONE):	Enter the circuit number (X.Y) or intercom number (EXXX) of the station that has the information to be copied. Enter NONE to return to the station data menu prompt ([DA]:).
REVIEW STATION INFORMATION (N)?	N– Continue to the LIST OF STATIONS TO COPY TO prompt. Y– Review station parameters to be copied.

KEYSET X.Y
 	
  EQUIPPED (Y)
  TENANT GROUP NAME " "
  TENANT GROUP NUMBER (1):
 	
  ...
  PAGE ZONES (1):
	Valid responses are the same as in program [DAA] (specific station information) on page 5-51.

REVIEW STATION COPY AGAIN (N)?	Y– Review the station features again. N– Continue to the next prompt.
LIST OF STATIONS TO COPY INFORMATION TO (NONE):	Enter circuit (X.Y) or intercom (EXXX) numbers of stations to receive the information. ALL is a valid entry. Enter NONE to stop the procedure without copying information.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
COPY ADDITIONAL STATIONS (N)?	Y– Return to the STATION TO BE COPIED prompt. N– Return to the station data menu prompt ([DA]:).

[DAE] Assign Common SCOS to Stations (/CCOS)

7.16 Station class of service (SCOS) is assigned to multiple stations using this program. It is accessed by entering E from the station data menu, AE from the station/DSS data menu, or enter DAE or /CCOS from the database programming menu. A program planning sheet is located in Figure 5-9 on page 5-153.

7.17 This program cannot be used to review current assignments. The prompts show default values until new SCOS information is entered for the list of stations. After each list is entered, the terminal redisplays the entry for verification. If the list is correct, press < CR >. If not, enter the correct information. The prompts appear as shown below. End each entry with < CR >.

PROMPT	VALID ENTRY
LIST OF STATIONS WITH COMMON DAY SCOS (NONE):	Enter circuit (X.Y) or intercom (EXXX) numbers of stations with the same SCOS for day mode. ALL is a valid entry. Enter NONE to return to the station data menu prompt ([DA]:).
(0) UNRESTRICTED (Y):	Y– Advance to the REVIEW ASSIGNMENTS AGAIN prompt. N– Continue to the next prompt.

RESTRICTED
  (1) OPERATOR ACCESS (N):
  (2) TOLL ACCESS (N):
  (3) INTERNATIONAL (N):
  (4) EIGHT DIGIT (N):
  (5) AREA/OFFICE CODE (N):
  (6) ARS ONLY (N):
  (7) ALTERNATE CARRIER (N):
  (8) ENABLE ALD (N):
	Respond with Y or N as in program [DAA] (specific station information), page 5-51.
	The ARS only prompt does not appear in Basic software and is not used in Intermediate software.

REVIEW ASSIGNMENTS AGAIN (N)?	Y– Return to the LIST OF STATIONS prompt. N– Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
LIST OF STATIONS WITH COMMON NIGHT SCOS (NONE):	Enter circuit (X.Y) or intercom (EXXX) numbers of stations with the same SCOS for night mode. ALL is a valid entry. Enter NONE to return to the MAKE ADDITIONAL ASSIGNMENTS prompt.
(0) UNRESTRICTED (Y):	Y– Advance to the REVIEW ASSIGNMENTS AGAIN prompt. N– Continue to the next prompt.

PROGRAMMING

PROMPT	VALID ENTRY
RESTRICTED (1) OPERATOR ACCESS (N): (2) TOLL ACCESS (N): (3) INTERNATIONAL (N): (4) EIGHT DIGIT (N): (5) AREA/OFFICE CODE (N): (6) ARS ONLY (N): (7) ALTERNATE CARRIER (N): (8) ENABLE ALD (N):	Respond with Y or N as in program [DAA] (specific station information), page 5-51. *The ARS only prompt does not appear in Basic software and is not used in Intermediate software.*
REVIEW ASSIGNMENTS AGAIN (N)?	Y- Return to the LIST OF STATIONS prompt. N- Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
MAKE ADDITIONAL ASSIGNMENTS (N)?	N- Return to the station data menu prompt ([DA]:). Y- Return to the LIST OF STATIONS WITH COMMON DAY SCOS prompt.

[DAF] Assign Common CO Line Lists to Stations (/SCOM)

7.18   Enter F from the station data menu, AF from the station/DSS data menu, or enter DAF or /SCOM from the database programming menu to batch load C.O. line information to multiple stations. A program planning sheet is located in Figure 5-9 on page 5-153.

7.19   This program cannot be used to review the current assignments. The prompts show default values until new C.O. information is entered for the list of stations. Whenever the prompt asks for a list, entries redisplay for verification after they are entered. If the information is correct, press < CR >. If not, enter the correct information. The prompts appear as shown on below. End each entry with < CR >.

PROMPT	VALID ENTRY
LIST OF STATIONS WITH COMMON CO LINE LISTS (NONE):	Enter circuit (X.Y) or intercom (EXXX) numbers of stations with allowed-answer, ring-in, and outgoing-access assignments for the same C.O. lines. ALL is a valid entry. Enter NONE to return to the station data menu prompt ([DA]:).

LIST OF CO LINES THAT CAN BE ACCESSED FOR OUTGOING CALLS
    DAY LIST (NONE):
    NIGHT LIST (NONE):
LIST OF CO LINES THAT CAN BE ANSWERED
    DAY LIST (NONE):
    NIGHT LIST (NONE):
LIST OF CO LINES THAT RING-IN
    DAY LIST (NONE):
    NIGHT LIST (NONE):
	Enter a list of C.O. line circuit numbers (X.Y) for each prompt. ALL or NONE are valid entries.

REVIEW ASSIGNMENT (N)?	Y– Return to the LIST OF STATIONS prompt. N– Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
MAKE ADDITIONAL ASSIGNMENTS (N)?	Y– Return to the LIST OF STATIONS prompt. N– Return to the station data menu prompt ([DA]:).

[DAG] Assign Common Page Zones to Keysets (/PCOM)

7.20 Select option G from the station data menu, select AG from the station/DSS data menu, or enter DAG or /PCOM from the database programming menu to assign the same page zone list to multiple stations. A program planning sheet is located in Figure 5-9 on page 5-153.

7.21 This program cannot be used to review the current assignments. The prompts show default values until new page zones are programmed for the list of stations. Whenever the prompt asks for a list, entries redisplay for verification after they are entered. If the information is correct, press < CR >. If not, enter the correct information. The prompts appear as shown below. End each entry with < CR >.

PROMPT	VALID ENTRY
LIST OF KEYSETS WITH COMMON PAGE ZONES (NONE):	Enter a list of circuit (X.Y) or intercom (EXXX) numbers of keysets in the same page zone(s). ALL is a valid entry. Enter NONE to return to the station data menu prompt ([DA]:).
LIST OF PAGE ZONES TO BE ASSIGNED (NONE):	Enter page zone number(s) 1-6 for the keysets.
REVIEW ASSIGNMENTS AGAIN (N)?	Y- Return to the LIST OF KEYSETS prompt. N- Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
MAKE ADDITIONAL ASSIGNMENTS (N)?	Y- Return to the LIST OF KEYSETS prompt. N- Return to the station data menu prompt ([DA]:).

[DAH] Miscellaneous Station Features (/SMSC)

7.22 Select option H from the station data menu, select AH from the station/DSS data menu, or enter DAH or /SMSC from the database programming menu to assign miscellaneous station features to multiple stations. (A program planning sheet is located in Figure 5-9 on page 5-154.) Whenever the prompt asks for a list, entries redisplay for verification after they are entered. If the information is correct, press < CR >. If not, enter the correct information. The prompts appear as shown below. End each entry with < CR >.

PROMPT	VALID ENTRY

LIST OF STATIONS WITH:
    AUTOMATIC ANSWER ON CO CALLS ( ):
    AUTOMATIC ANSWER ON IC CALLS ( ):
    CO RESEIZE ENABLED ( ):
    DISA AUTOMATED ATTENDANT DND
        OVERRIDE ENABLED ( ):
    DND ENABLED ( ):
    FWD ENABLED ( );
    FPN ENABLED ( ):
    HANDSFREE ENABLED ( ):
    SECONDARY VOICE PATH KEYSETS ( ):
    OHVA TRANSMIT ENABLED ( ):
    OHVA RECEIVE ENABLED ( ):
    REDIAL MODE — LAST NUMBER
        DIALED ( ):
    RING INTERCOM ALWAYS ENABLED ( ):
	The current lists are displayed. For each prompt, enter a list of station circuit (X.Y) or intercom (EXXX) numbers of stations with each of the indicated features. *The OHVA prompts appear only if off-hook voice announce is enabled in [AF] (miscellaneous system information). The DISA/ Automated Attendant DND Override prompt does not appear in Basic software and is not used in Intermediate software.*

REVIEW ASSIGNMENTS AGAIN (N)?	Y– Return to the LIST OF STATIONS WITH HANDSFREE ENABLED prompt. N– Return to the station data menu prompt ([DA]:).
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

PROGRAMMING

[DAI] Keyset Volume Default Settings (/VOL)

NOTE: This program is used to set the default volume settings on the audio interface module (AIM) keyset. At the date of this publication, the AIM keyset was still in development. When the keyset is available, a complete feature description and detailed instructions on using the keyset will be available.

7.23 Select option I from the station data menu, select AI from the station/DSS data menu, or enter DAI or /VOL from the database programming menu to assign the AIM keyset volume default settings. If not, enter the correct information. The prompts appear as shown below.

PROMPT	VALID ENTRY
HANDSET IC VOICE LEVEL (4): SPEAKERPHONE IC VOICE LEVEL (3): HANDSET CO VOICE LEVEL (5): SPEAKERPHONE CO VOICE LEVEL (5): BACKGROUND MUSIC LEVEL (2): ALERTING TONE LEVEL (4): HANDSET PROGRESS TONE LEVEL (5): SPEAKERPHONE PROGRESS TONE LEVEL (3): REVIEW DEFAULT VOLUME LEVELS AGAIN (N) ? PERFORM UPDATE TO SYSTEM DATABASE (Y OR N) ASSIGN DEFAULT VOLUME LEVELS TO ALL KEYSETS (N) ? PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*To be provided when the AIM keyset is available.*

B. [DB] DSS/BLF DAT

7.24   Information relate(
entered using the progra
from the station/DSS data
tabase programming ment
appears as shown below:

[DB] DSS/BLF DATA
    [A] DSS/BLF IDENT
    [B] DSS/BLF KEY A

PROMPT

[DBB] DSS/BLF Key Assignments (/DKEY)

7.26 Enter B from the DSS/BLF data menu, BB from the station/DSS data menu, or enter DBB or /DKEY from the database programming menu to assign or review system-wide DSS/BLF key assignments. Station intercom numbers (E100–E159) and hunt group numbers (H1–H5 or E231–E235) can ap-

pear under the DSS/BLF keys. In the *Advanced* and *Intermediate* software, voice mail/computer hunt groups (H6–H20 or E236–E250) can appear under DSS/BLF keys. A program planning sheet is located in Figure 5-9 on page 5-155.

7.27 The prompts appear in the order shown below. End each entry with < CR >.

PROMPT	VALID ENTRY
REVIEW DSS/BLF KEY ASSIGNMENT (N)?	Y– Continue to the next prompt. N– Return to the DSS/BLF data menu prompt ([DB]:).
DSS/BLF COLUMN 1 ROW 1 (1.1): DSS/BLF COLUMN 1 ROW 2 (1.2): ... DSS/BLF COLUMN 6 ROW 10 (8.6):	Enter the desired numbers or NONE. Enter E < CR > to display the intercom number of the station, if desired.
REVIEW DSS/BLF KEY ASSIGNMENTS AGAIN (N)?	Y– Return to COLUMN 1 ROW 1. N– Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

C. [DC] STATION REPORT (/SREP)

7.28 This program is used to generate a report for any range of stations in the system. The information includes the station's circuit number, intercom (extension) number, user name, type of equipment, attendant circuit number, secretarial intercept circuit number, tenant group number, and related DSS/BLF Unit circuit number. To reach this program, enter C

from the station/DSS data menu or enter DC or /SREP from the database programming menu.

7.29 An unequipped station shows the circuit number only. A DSS/BLF Unit shows the circuit number and related keyset station. Attendants have an asterisk in place of the attendant station number. The prompts for this program are shown below. End each entry with < CR >.

PROMPT	VALID ENTRY

STATION REPORT OUTPUT PORT
  P = PRIMARY
  A = ACCESSORY PORT 1
  B = ACCESSORY PORT 2
STATION REPORT OUTPUT PORT (P):
	This prompt does not appear in Basic software. Choose the output port to which the terminal will be attached. Enter P for the KSU port or enter A or B for the desired accessory module port.

BREAK AFTER EACH CIRCUIT CARD (N)?	Y– The station report pauses after each circuit board (the KSU and each expansion module or APM) and prints CONTINUE (Y). N– All circuit boards (the KSU and expansion modules) are grouped together in the report without breaks.
RANGE OF STATIONS TO BE REPORTED (ALL):	Enter the range of circuit (X.Y) or intercom (EXXX) numbers of the stations to appear in the report. ALL is a valid entry. Enter NONE to return to the station/DSS data menu prompt ([D]:). *The device attached to the output port displays the information in the format shown below. If the information scrolls across the terminal screen too quickly, press CONTROL S to stop the output and CONTROL Q to continue.*

STATION REPORT   SUN–1–JAN–1987   HH:MM

STA	EXT	USERNAME	EQ	ATT	SEC	TENANT	REL STA
1.1	E100	AL	KEY+	*		1	1.2
1.2			DSS				1.1
...							
8.6	E159	BETTY	KEY	1.1	1.1	2	

NOTE: The plus (+) after the KEY abbreviation indicates that a headset is enabled on that station. The asterisk (*) in the ATT column indicates that the station is an attendant.

CONTINUE (Y)	*This prompt appears after each board is printed if a break between circuit cards was programmed.* Enter Y < CR > to continue the report or N < CR > to continue to the next prompt. When the report is finished, go to the next prompt.

PROMPT	VALID ENTRY
REVIEW SAME STATION REPORTS AGAIN (N)?	Y- The terminal prints the report again, from the beginning.
	N- Continue to the next prompt.
REVIEW ADDITIONAL STATION REPORTS (N)?	Y- Return to the BREAK AFTER EACH CIRCUIT CARD prompt.
	N- Return to the station/DSS data menu prompt ([D]:).

8. [E] HUNT GROUPS AND VOICE COMPUTER GROUPS (/HUNT)

NOTE: The use of playback devices and voice computer groups are available only in the *Advanced* software package. The use of announcement stations is available only in *Basic* and *Advanced* software.

8.1 Select E or enter /HUNT from the database programming menu to assign stations for up to five hunt groups. In *Advanced* software, it is also used to assign voice mail stations for up to 15 voice mail/voice computer hunt groups. Voice mail/voice computer hunt groups can be assigned special dial rules that signal the voice computer unit to perform such tasks as dialing the voice mail access number or the called station's mailbox number.

Station Hunt Groups

8.2 Each station hunt group can be assigned a name of up of to seven characters that will be shown on display keysets to identify the source of a transferred call or recall from the hunt group.

8.3 Before using the program, prepare a list of the hunt groups and the stations to be included in them. Depending on the option selected, the stations receive calls at the same time or in the order in which they appear on the programmed list. If desired, a station can appear more than once in a hunt group list. A station can also be in more than one hunt group. Refer to Figure 5-10, page 5-156, for a program planning sheet that lists hunt groups.

8.4 This program also determines whether the calls are sent to the stations in all-ring, linear, or distributed order. All-ring order means that the call rings at all stations in the hunt group simultaneously. Linear order means that the call is sent to the first station on the list and moves down the list until it reaches an available station. With distributed order, the call is sent to the station that appears on the list after the last station to receive a call.

8.5 Because linear and distributed lists must be entered in a specific order, the entire list should be re-entered to make changes. Stations cannot be subtracted from the list. However, stations may be added to the list (+ X.Y), but they will be placed at the **end** of the list. After each list is entered, the terminal redisplays the entry for verification. If the list is correct, press < CR >. If not, enter the correct information.

8.6 A station hunt group can have an overflow station and/or up to three announcement stations (announcement stations are not available in *Intermediate* software). If a call is transferred to the hunt group and is not answered before the hunt group overflow timer expires, the call automatically transfers to the overflow station. If a call rings in directly to the hunt group and is not answered before the hunt group announcement timer expires, the call automatically transfers to the announcement station(s), if enabled. Record the overflow and announcement stations' circuit or intercom numbers (or hunt group pilot number) on the program planning sheet in Figure 5-10, page 5-156. Do not include these stations in the hunt group distribution list. Also, if the overflow station is a playback device (*Advanced* software only), record the number of times (count) a call will be allowed to return to the playback device before recalling (0-25). Refer to FEATURES, page 4-18, for a full explanation of overflow and announcement stations.

8.7 Three timers are programmed on a hunt group-by-hunt group basis that affect station hunt group operation: no answer advance timer, announcement timer, and overflow timer.

- **No answer advance:** Determines the amount of time a call will ring at a hunt group station (unanswered) before advancing to the next station on the list. The default value is 18 seconds. It can be programmed for 3-255 seconds.

- **Announcement:** This determines the amount of time a direct ring-in call will remain unanswered before it is sent to the hunt group's announcement station(s). The default value is 18 seconds. It can be programmed for 0-255 seconds. *(This is not available in Intermediate software.)*

- **Overflow:** This determines the amount of time a transferred outside call will circulate through the hunt group (unanswered) before being sent to the hunt group's overflow station. The default value is 72 seconds. It can be programmed for 10-255 seconds.

8.8 Each station hunt group can have one keyset assigned as a hunt group supervisor. The assigned supervisor has the option of using the station monitor feature code to monitor an active outside call of any station in the hunt group. Refer to page 4-20 in FEATURES for more information.

Voice Mail/Voice Computer Hunt Groups

NOTE: Voice mail/computer hunt groups are available only in the *Advanced* software package.

8.9 Each voice mail/computer group can be assigned a name of up to seven characters that will be shown on display keysets to identify the source of a transferred call or recall from the voice mail/computer group.

8.10 Before using the program, prepare a list of the voice mail/computer groups and the stations to be included in them. The stations receive calls in the order in which they appear on the programmed list. If desired, a station can appear more than once in a voice mail/computer group list. A station can also be in more than one voice mail/computer group. Refer to Figure 5-10, page 5-156, for a program planning sheet that lists voice mail/computer groups.

8.11 Two timers are programmed that affect voice mail/computer group operation: no answer advance timer and return timer.

● **No answer advance:** Determines the amount of time a call will ring at a voice mail/computer group station (unanswered) before advancing to the next station on the list.

● **Return:** This determines the amount of time a call will circulate through a voice mail/computer group (unanswered) before being returned to the station that transferred it to the group or to the primary attendant.

8.12 If the group is designated as a *voice mail/voice computer* group, whenever a call is transferred to the group, a single tone will prompt the user to also enter the desired mailbox number. If the single-line circuits in this group are designated as automated attendants, the voice computer cannot dial any feature codes. It can only dial an intercom number after a hookflash.

8.13 A recall destination is assigned to voice computer hunt groups. The recall destination can be a station or another hunt group. If a call is transferred out of the hunt group, or placed on hold in the hunt group, and the recall timer expires, the call is sent to the designated recall station.

8.14 The system can support voice computers that can process codes that give detailed information about the status, origin, and destination of the call, and can dial feature codes. The dial rules and the codes that they send are as follows. Refer to page 4-22 in FEATURES for full descriptions of the dial rules.

	DIAL RULE	IC-TO-VOICE COMPUTER CALL	CO-TO-VOICE COMPUTER CALL
1	Originating extension	Originating station's intercom number	No code sent
2	Controlling extension	Originating station's intercom number	No code sent
3	Destination extension	Intercom number of last non-voice mail station to forward the call if a chain of stations is forwarded to voice mail or voice mail transfer mailbox number	Intercom number of last non-voice mail station to forward the call if a chain of stations is forwarded to voice mail or voice mail transfer mailbox number
4	Original destination extension	Intercom number of the first non-voice mail station to forward the call if a chain of stations is forwarded to voice mail	Intercom number of the first non-voice mail station to forward the call if a chain of stations is forwarded to voice mail
5	Secretarial intercept	Intercom number of the originating station's secretarial intercept station or the originating station if there is no intercept.	No code sent
6	Other extension/ Controlling extension	Originating station's intercom number	No code sent
7	Hunt group number	Receiving hunt groups or voice mail group number	Receiving hunt group or voice mail group number
8	Tenant group number	Originating station's tenant group number	No code sent

DIAL RULE		IC-TO-VOICE COMPUTER CALL	CO-TO-VOICE COMPUTER CALL
9	Department number (*Not used on GMX-48*)	No code sent	No code sent
10	Day/night flag	If system is in day mode = 1 If system is in night mode = 0	If system is in day mode = 1 If system is in night mode = 0
11	Account code	No code sent	Account code, if entered
12	Call type	Intercom call code = 1	Outside call code = 2
13	Hunt group queue position	No code sent	Number of calls waiting ahead of this call for the hunt group
14	Hunt group overflow count	No code sent	The number of times this call has been sent through the hunt group
15	Dial recall extension	Intercom number of the station that received a transferred call which recalls. This applies even if the receiving station is forwarded; the intercom number that was dialed to make the transfer, not the final destination, is used.	No code sent

PROMPT	VALID ENTRY
RANGE OF HUNT GROUPS TO BE REVIEWED (NONE):	Enter a range of hunt group numbers (1–5) to be reviewed or programmed. ALL is a valid entry. Enter NONE to return to the database programming menu prompt ([ ]:) if using *Intermediate* or *Basic* software, or to the RANGE OF VOICE COMPUTER HUNT GROUPS prompt is using *Advanced* software.
HUNT GROUP X — PILOT EXTENSION EXXX	*The current assignment is shown for reference only. Pilot numbers are assigned in program [B] (extensions and feature access codes).*
HUNT GROUP NAME ( ):	Enter a name of up to seven characters or < to erase the existing name.
ORDERED LIST OF STATIONS ( ):	Enter circuit (X.Y) or intercom (EXXX) numbers of stations to be included in the hunt group (if the hunting method is to be linear or distributed, enter the numbers in the order they are to be accessed). There can be up to 60 stations in hunt group 1, and 20 stations in groups 2–5. All is a valid entry; if used, all stations are listed in numerical order by circuit number.
HUNTING METHOD L = LINEAR HUNTING D = DISTRIBUTED HUNTING A = ALL-RING HUNTING HUNTING METHOD (L) :	L– Calls ring in at the first available station on the list. D– Calls ring in at the next available station on the list after the last station to answer a call. A– Calls ring simultaneously at all available hunt group stations.
NO ANSWER ADVANCE TIMER (18 SECONDS):	Enter the amount of time (3–255 seconds) that a call can ring at one station (unanswered) before advancing to the next station on the list.

PROMPT	VALID ENTRY
HUNT GROUP ANNOUNCEMENT STATION(S) (NONE):	*This prompt does not appear in Intermediate software.* Enter up to three circuit (X.Y) or intercom numbers (EXXX) in the order they are to be accessed. Or, enter a hunt group pilot number (EXXX) or number (H1–H5 in *Basic* software, H1–H20 in *Advanced* software). If you enter NONE, go to the OVERFLOW prompt.
IS THE ANNOUNCEMENT STATION A PLAYBACK DEVICE (N):	*This prompt appears in the Advanced software only.* Y– Whether the station (or the group of stations) is equipped with a playback device or a station instrument, calls sent here from the hunt group will return to the hunt group whenever this station answers and then disconnects. N– It is equipped with a station instrument that operates as a regular station.
ANNOUNCEMENT TIMER (18 SECONDS):	*This prompt does not appear in Intermediate software.* Enter the amount of time (0–255 seconds) that a call will ring (unanswered) before being sent to the announcement station.
OVERFLOW STATION (NONE):	Enter a circuit (X.Y) or intercom number (EXXX). Or, enter a hunt group pilot number (EXXX) or number (H1–H5 in *Basic* and *Intermediate* software, H1–H20 in *Advanced* software). If you enter NONE, advance to the OVERFLOW TIMER prompt.
IS THE OVERFLOW A PLAYBACK DEVICE (N):	*This prompt appears in the Advanced software only.* Y– Whether the overflow station is equipped with a playback device or a station instrument, calls that overflowed from the hunt group will return to the hunt group whenever this station answers and then disconnects. N– It is equipped with a station instrument that operates as a regular station.
OVERFLOW COUNT (0):	*This prompt appears if you answered Y to the overflow playback device prompt.* Enter the number of times (0–25) calls will be allowed to return to the playback device before recalling.
OVERFLOW TIMER (72 SECONDS):	Enter the amount of time (10–255 seconds that a call will circulate through the hunt group (unanswered) before being sent to the overflow station.
HUNT GROUP SUPERVISOR (NONE):	Enter the circuit (X.Y) or intercom (EXXX) number of the keyset station that can monitor calls in this hunt group. Or, enter NONE to continue.
REVIEW SAME HUNT GROUP AGAIN (N)?	Y– Return to the HUNT GROUP X prompt. N– Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

PROMPT	VALID ENTRY
REVIEW ADDITIONAL HUNT GROUPS (N)?	Y– Return to the RANGE OF HUNT GROUPS prompt. N– Advance to the next prompt if using *Advanced* software. If using *Basic* or *Intermediate* software, you return to the database programming menu prompt ([ ]:).
RANGE OF VOICE COMPUTER GROUPS TO BE REVIEWED (NONE):	*The voice computer prompts are used in Advanced software only.* Enter a range of voice computer group numbers (6–20) to be reviewed or programmed. ALL is a valid entry. Enter NONE to return to the database programming menu prompt ([ ]:).
VOICE COMPUTER GROUP X — PILOT EXTENSION EXXX	*The current assignment is shown for reference only. Pilot numbers are assigned in program [B] (extensions and feature access codes).*
VOICE COMPUTER GROUP NAME ( ):	Enter a name of up to seven characters or < to erase the existing name.
ORDERED LIST OF STATIONS ( ):	Enter circuit (X.Y) or intercom (EXXX) numbers of voice mail stations to be included in the voice computer group. There can be up to 16 voice-mail/voice computer stations in hunt groups 6–10, and up to 8 voice mail/voice computer stations in groups 11–20. These stations will automatically be designated as voice mail stations as described on page 5-51.
NO ANSWER ADVANCE TIMER (18 SECONDS):	Enter the amount of time (3–255 seconds) that a call can ring at one station (unanswered) before advancing to the next station on the list.
RETURN TIMER (72 SECONDS):	Enter the amount of time (10–255 seconds) a call will circulate through the voice computer group (unanswered) before being returned to the station that transferred it to the group or to the primary attendant.
IS THIS A VOICE MAIL/VOICE COMPUTER GROUP (N):	Y– The single-line station circuits in this group are connected to voice mail computers. When a call is transferred to the group, a single tone will prompt the user to also enter the desired mailbox number. Advance to the RECALL DESTINATION prompt. N– The circuits are not connected to voice mail computers.

PROMPT	VALID ENTRY
IS THIS AN AUTOMATED ATTENDANT VOICE COMPUTER GROUP (N):	*This prompt appears only if you answer N to the previous prompt.* Y– The single-line circuits in this group are designated as automated attendants. The voice computer(s) cannot dial any feature codes. It can only dial an intercom number after a hookflash. N– The circuits are not automated attendants.
RECALL DESTINATION ( ):	Enter the circuit (X.Y) or intercom (EXXX) number of the station or hunt group that will receive recalls for this voice computer hunt group.
DIAL RULES ( ): ? 1 – Dial Originating Extension 2 – Dial Controlling Extension 3 – Dial Destination Extension 4 – Dial ORIGINAL Destination Extension 5 – Dial Secretarial Intercept Extension 6 – Dial Other Station's Extension 7 – Dial Hunt Group Number 8 – Dial Associated Tenant Group Number 9 – Dial Associated Department Number 10 – Dial Associated Day/Night Code 11 – Dial Associated Account Code 12 – Dial Call Type (IC/CO) 13 – Dial Hunt Group Queue Position 14 – Dial Hunt Group Overflow Count 15 – Dial Recall Extension	Enter any combination of the following in the order they will be used, separating each with commas, or enter NONE to clear all dial rules. *Specific digits:* If the voice computer must dial specific digits, such a a message feature code, enter those digits surrounded by quotes (e.g., "365"). *Preset dial rules:* Select one of the preset dial rules shown on page 5-76. (To display them enter ? as shown.) *Dial rule 9 is not used in the GMX-48 System.* **EXAMPLE:** To dial the message feature code, followed by the destination station's number, enter: "365", 3.
REVIEW SAME VOICE COMPUTER GROUP AGAIN (N)?	Y– Return to the VOICE COMPUTER GROUP X prompt. N– Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
REVIEW ADDITIONAL VOICE COMPUTER GROUPS (N)?	Y– Return to the RANGE OF VOICE COMPUTER GROUPS prompt. N– Return to the database programming menu prompt ([ ]:).

9. [F] TENANTS, ATTENDANTS, AND SECRETARIAL INTERCEPTS

9.1 To define departments, attendants, secretarial intercepts, message centers, and special purpose stations, select F from the database programming menu. The following menu appears:

[F] TENANTS, ATTENDANTS, AND SECRE-
TARIAL INTERCEPTS
   [A] TENANT GROUP ASSIGNMENTS
   [B] ATTENDANTS
   [C] SECRETARIAL INTERCEPTS
   [D] MESSAGE CENTERS
   [E] SPECIAL PURPOSE STATIONS

A. [FA] TENANT GROUP ASSIGNMENTS (/TNT)

9.2 Select A from the menu shown above or enter FA or /TNT from the database programming menu to program tenant groups. There can be up to four tenant groups. When the system is initialized, all stations are placed in tenant group 1.

9.3 To prepare to use this program, make a list of the stations to be assigned to each of the four tenant groups. All stations must be assigned to a tenant group. If desired, give each tenant group a name of up to 20 characters. Refer to the program planning sheet in Figure 5-11 on page 5-158, if desired.

9.4 Whenever the prompt asks for a list, the entries redisplay for verification. If the information is correct, press < CR >. If not, enter the correct information.

PROMPT	VALID ENTRY
RANGE OF TENANT GROUPS TO BE REVIEWED (NONE):	Enter a range of tenant group numbers (1-4) to be programmed. ALL is a valid entry. Or, enter NONE to return to the tenants, attendants, and secretarial intercepts menu prompt ([F]:).
TENANT GROUP X NAME ( ):	Enter a tenant group name of up 20 characters.
LIST OF STATIONS ( ):	Enter circuit (X.Y) or intercom (EXXX) numbers of stations to be included in the tenant group. ALL and NONE are valid entries.
REVIEW SAME TENANT GROUP AGAIN (N)?	Y– Return to the TENANT GROUP X NAME prompt. N– Continue to the next prompt or tenant group.
REVIEW ADDITIONAL TENANT GROUPS (N)?	Y– Return to the RANGE OF TENANT GROUPS prompt. N– Return to the tenants, attendants, and secretarial intercepts menu prompt ([F]:).
If all stations in the system were not assigned to a tenant group, the following message appears:	Answer Y and make sure all stations are assigned to a tenant group.
ALL STATIONS MUST BE ASSIGNED LIST OF STATIONS NOT ASSIGNED TO A TENANT GROUP (X.Y–X.Y)	
RANGE OF TENANT GROUPS TO BE REVIEWED (NONE):	
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

B.   [FB] ATTENDANTS (/ATT)

9.5   To program the attendant stations, enter B from the tenants, attendants, and secretarial intercepts menu or enter FB or /ATT from the database programming menu.

9.6   To prepare to use this program, make a list of the attendant stations. Then list the stations each attendant serves. If desired, indicate a primary attendant that receives unanswered recalls. If a station is assigned to more than one attendant, only the last assignment is valid. (When making the list, refer to the program planning sheet in Figure 5-11 on page 5-158.)

9.7   When the system is initialized, station 1.1 is the primary attendant that serves all other stations. No secondary attendants are initialized. The primary attendant assignment cannot be deleted until it has been redefined in program [AF] (misc. system data), page 5-24.

9.8   Whenever the prompt asks for a list, entries redisplay for verification after they are entered. If the information is correct press < CR >. If not, enter the correct information. The prompts appear as shown below. End each entry with < CR >.

PROMPT	VALID ENTRY
RANGE OF ATTENDANTS TO BE REVIEWED (ALL):	Enter a range of station circuit numbers that contains attendants. Enter a circuit number that is not an attendant or NONE to advance to the MAKE ADDITIONAL ATTENDANTS prompt.
ATTENDANT STATION X.Y	This appears for previously programmed attendant stations.
LIST OF STATIONS SERVED ( ):	Enter circuit (X.Y) or intercom (EXXX) numbers of stations served by this attendant. Or, enter NONE to delete the stations served. An attendant may not serve another attendant.

If an attendant station (other than the primary attendant) is not given any stations to serve, the terminal prints the following message.

*** NO STATIONS SERVED *** KEEP THIS KEYSET AS AN ATTENDANT (Y):	Enter < CR > to keep the station as an attendant or N < CR > to remove the attendant designation.
REVIEW SAME ATTENDANT AGAIN (N)?	Y- Return to the LIST OF STATIONS SERVED prompt. N- Return to the LIST OF STATIONS SERVED prompt to review the next attendant station. Or, if all attendant stations listed have been reviewed, continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
MAKE ADDITIONAL ATTENDANTS (N)?	Y- Continue to the next prompt. N- Advance to the REVIEW ADDITIONAL ATTENDANTS prompt.

PROMPT	VALID ENTRY
ATTENDANT STATION (NONE):	Enter the circuit (X.Y) or intercom (EXXX) number of the station to be designated as an attendant. This must be a keyset and should have a display. If the station is already an attendant, an error message is printed; enter a valid number.
LIST OF STATIONS SERVED (NONE):	Enter circuit (X.Y) or intercom (EXXX) numbers of stations served by this attendant. Return to the REVIEW SAME ATTENDANT AGAIN prompt, or if all attendants have been programmed, continue to the next prompt.
REVIEW ADDITIONAL ATTENDANTS (N)?	Y- Return to the RANGE OF ATTENDANTS prompt. N- Return to the tenants, attendants, and secretarial intercepts menu prompt ([F]:).

C. [FC] SECRETARIAL INTERCEPTS (/SEC)

9.9 This program is used to assign secretarial intercept stations that receive calls when the stations they serve are busy or do not answer. Enter C from the tenants, attendants, and secretarial intercepts menu or enter FC or /SEC from the database programming menu.

9.10 Before programming, make a list of the secretarial intercept stations (circuit or intercom numbers) and the stations they serve. (Refer to the program planning sheet in Figure 5-11, page 5-159, when making the list.)

9.11 When a list is entered, the terminal redisplays it for verification. If the list is correct, enter < CR >. If not, enter the correct information. The prompts appear in the order shown below. End each entry with < CR >.

PROMPT	VALID ENTRY
RANGE OF SECRETARIAL INTERCEPTS TO BE REVIEWED (ALL) :	Enter a range of station circuit (X.Y) or intercom (EXXX) numbers that contains secretarial intercept stations. Enter NONE to advance to the MAKE ADDITIONAL SECRETARIAL INTERCEPTS prompt.
SECRETARIAL INTERCEPT STATION X.Y LIST OF STATIONS SERVED ( ):	This prompt appears for secretarial intercept stations that were previously programmed. Enter a new list of circuit (X.Y) or intercom (EXXX) numbers to change the stations served by this secretarial intercept station. ALL or NONE are valid entries. Entering NONE removes the secretarial intercept assignment.
REVIEW SAME SECRETARIAL INTERCEPT AGAIN (N)?	Y– Return to the SECRETARIAL INTERCEPT STATION prompt.
	N– Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
MAKE ADDITIONAL SECRETARIAL INTERCEPT (N)?	Y– Continue to the next prompt.
	N– Advance to the REVIEW ADDITIONAL SECRETARIAL INTERCEPTS prompt.
SECRETARIAL INTERCEPT STATION (NONE):	Enter the circuit (X.Y) or intercom (EXXX) number of the secretarial intercept station.
LIST OF STATIONS SERVED (NONE):	Enter the circuit (X.Y) or intercom (EXXX) numbers of stations served by this secretarial intercept station. ALL is a valid entry. Return to the REVIEW SAME SECRETARIAL INTERCEPT STATION AGAIN prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
REVIEW ADDITIONAL SECRETARIAL INTERCEPTS (N)?	Y– Return to the RANGE OF STATIONS prompt.
	N– Return to the tenants, attendants, and secretarial intercepts menu prompt ([F]:).

D. [FD] MESSAGE CENTERS (/MSG)

9.12 This program is used to assign message centers to keysets. Station users can then leave messages at keyset stations or the keyset stations' assigned message centers. Each station can have only one message center. Refer to FEATURES, page 4-48, for details. Enter D from the tenants, attendants, and secretarial intercepts menu or enter FD or /MSG from the database programming menu.

9.13 Before programming, make a list of the message center stations (circuit or intercom numbers) or hunt groups (1-20) and the stations they serve. (Refer to the program planning sheet in Figure 5-11, page 5-159, when making the list.)

9.14 When a list is entered, the terminal redisplays it for verification. If the list is correct, enter < CR >. If not, enter the correct information. The prompts appear in the order shown below. End each entry with < CR >.

PROMPT	VALID ENTRY
RANGE OF MESSAGE CENTER STATIONS TO BE REVIEWED (ALL):	Enter a range of station circuit (X.Y) or intercom (EXXX) numbers that includes a message center. ALL and NONE are valid entries. If there are no message centers is the selected range, the next prompt is RANGE OF MESSAGE CENTER HUNT GROUPS TO BE REVIEWED.
MESSAGE CENTER STATION X.Y LIST OF STATIONS SERVED ( ):	If desired, change the stations served by entering a list of circuit (X.Y) or intercom (EXXX) numbers. ALL and NONE are valid entries. If NONE is entered, the message center assignment is removed.
REVIEW SAME MESSAGE CENTER AGAIN (N)?	Y- Return to the MESSAGE CENTER STATION X.Y prompt. N- Advance to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
RANGE OF MESSAGE CENTER HUNT GROUPS TO BE REVIEWED (ALL):	Enter a range of hunt group numbers that includes a message center hunt group. ALL and NONE are valid entries. If there are no message centers in the selected range, the next prompt is MAKE ADDITIONAL MESSAGE CENTERS.
MESSAGE CENTER HUNT GROUP X LIST OF STATIONS SERVED ( ):	If desired, change the stations served by entering a list of circuit (X.Y) or intercom (EXXX) numbers.
REVIEW SAME MESSAGE CENTER AGAIN (N)?	Y- Return to the MESSAGE CENTER HUNT GROUP X.Y prompt. N- Advance to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
MAKE ADDITIONAL MESSAGE CENTERS (N)?	Y- Advance to the next prompt. N- Advance to the REVIEW ADDITIONAL MESSAGE CENTERS prompt.

PROMPT	VALID ENTRY
MESSAGE CENTER STATION OR HUNT GROUP (NONE):	Enter the circuit (X.Y) or intercom (EXXX) number of the message center station. If you enter NONE, advance to the REVIEW ADDITIONAL MESSAGE CENTERS prompt.
LIST OF STATIONS SERVED (NONE):	Enter a list of circuit (X.Y) or intercom (EXXX) numbers of stations that will be served by the message center station or hunt group.
REVIEW SAME MESSAGE CENTER AGAIN (N)?	Y– Return to the MESSAGE CENTER STATION OR HUNT GROUP prompt. N– Advance to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
MAKE ADDITIONAL MESSAGE CENTERS (N)?	Y– Return to the MESSAGE CENTER STATION (NONE) prompt. N– Advance to the next prompt.
REVIEW ADDITIONAL MESSAGE CENTERS (N)?	Y– Return to the RANGE OF MESSAGE CENTER STATIONS prompt. N– Exit to the tenants, attendant, and secretarial intercepts menu prompt ([F]:).

E. [FE] SPECIAL PURPOSE STATIONS (/SPCL)

9.15 This program is used to quickly assign automated attendants, FAX ports, house phones, and voice mail/computer ports. Enter E from the tenants, attendants, and secretarial intercepts menu or enter FE or /SPCL from the database programming menu.

9.16 Before programming, make a list (circuit or intercom numbers) of house phones to be assigned. (Refer to the program planning sheet in Figure 5–11, page 5–159.)

9.17 When a list is entered, the terminal redisplays it for verification. If the list is correct, enter < CR >. If not, enter the correct information. The prompts appear as shown below.

PROMPT	VALID ENTRY

LIST OF:
  AUTOMATED ATTENDANTS (NONE):
  FAX PORTS (NONE):
  HOUSE PHONES (NONE):
  VOICE MAIL/COMPUTER PORTS (NONE):
	Enter the circuit (X.Y) or intercom (EXXX) numbers of the special purpose stations. ALL or NONE are valid entries. Only single-line circuits can be assigned as automated attendants, FAX ports, and voice mail/computer ports. A circuit cannot be *both* an automated attendant and a voice mail/computer port. *The automated attendant prompt does not appear in Intermediate software. Only the house phones prompt appears in Basic software.*

REVIEW ASSIGNMENTS AGAIN (N)?	Y– Return to the LIST OF HOUSE PHONES prompt. N– Exit to the tenants, attendant, and secretarial intercepts menu prompt ([E]:).
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

10. [G] PAGE ZONES (/PAGE)

10.1 To define the internal page zones, enter G or /PAGE from the database programming menu. To prepare to use this program, make a list of the keysets and/or the external paging network that are included in up to six paging zones. Keysets and the external paging network can be in more than one page zone. (Refer to the program planning sheet in Figure 5-12, page 5-160, when making the list.)

10.2 When the system is initialized, all keysets and the optional external paging network (connected to the paging port on the KSU) are assigned to page zone 1.

10.3 When a list is entered, it is redisplayed for verification. If the list is correct, enter < CR >. If not, enter the correct information. The prompts appear in the order shown below. End each entry with < CR >.

PROMPT	VALID ENTRY
RANGE OF PAGE ZONES TO BE REVIEWED (ALL) :	Enter a range of page zone numbers (1–6). Enter NONE to return to the database programming menu prompt ([ ]:).
PAGE ZONE X LIST OF KEYSETS ( ) :	Enter circuit (X.Y) or intercom (EXXX) numbers of keysets in this page zone. ALL or NONE are valid entries.
EXTERNAL PAGING ( ) :	Y– The external paging network is included in this paging zone. N– The external paging network is not in this zone.
REVIEW SAME PAGE ZONES AGAIN (N)?	Y– Return to the first selected page zone. N– Continue to the next prompt.
REVIEW ADDITIONAL PAGE ZONES (N)?	Y– Return to the RANGE OF PAGE ZONES prompt. N– Return to the database programming menu prompt ([ ]:).
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

11. [H] TOLL RESTRICTION

11.1 Select H from the database programming menu to access the toll restriction menu. It appears as shown below:

[H] TOLL RESTRICTION
    [A] SCOS INFORMATION
    [B] OVERLAPPING AREA/OFFICE CODES
    [C] AREA/OFFICE CODES ALLOWED/
        RESTRICTED
    [D] AREA/OFFICE CODE REPORTS
    [E] ALTERNATE CARRIERS
    [F] ALLOWED LONG DISTANCE

11.2 To plan the toll restriction information before programming, make lists of the following items. (Refer to Figure 5-13, pages to 5-161, for a program planning sheet.)

● **Station class of service (SCOS) designations:** (Refer to the FEATURES section, page 4-27, for an explanation of the restrictions.) List all unrestricted stations and those that are affected by each of the following restrictions for day and night modes:

  — Operator access

  — Toll call access

  — International call access

  — Eight-digit call access

  — Area/office code restriction

  — ARS Only *(Advanced software only)*

  — Alternate carrier restriction

  — Allowed long distance number access

● **Area/office codes:** List the area codes that are allowed and the area codes that are restricted. Also, list the office codes within the local area code that are allowed and restricted. If an area code is restricted, all office codes within the area code are restricted.

● **Alternate Carrier Numbers:** List up to 20 local access numbers (up to 10 digits each, do not include the toll field) for alternate carriers that will not be accessible from restricted stations.

● **Allowed Long Distance Numbers:** List up to 20 long distance numbers (up to 10 digits each, do not include the toll field) that are not subject to toll restriction.

A. [HA] SCOS INFORMATION (/SCOS)

11.3 Enter A from the toll restriction menu or enter HA or /SCOS from the database programming menu to batch load the SCOS information. SCOS restrictions can be set for individual stations using program [DAA] (specific station information) on page 5-51.

11.4 Respond to each prompt with circuit (X.Y) or intercom (EXXX) numbers of stations to be added to the lists. After any changes are made, the list is redisplayed for verification. Press < CR > if the list is correct or enter new information. The prompts appear as shown on the next page. End each entry with < CR >.

PROMPT	VALID ENTRY

DAY SCOS INFORMATION

(0) LIST OF UNRESTRICTED STATIONS (ALL)
:

RESTRICTED
 (1) OPERATOR ACCESS
      LIST OF STATIONS (NONE):
 (2) TOLL ACCESS
      LIST OF STATIONS (NONE):
 (3) INTERNATIONAL
      LIST OF STATIONS (NONE):
 (4) EIGHT DIGIT
      LIST OF STATIONS (NONE):
 (5) AREA/OFFICE CODE
      LIST OF STATIONS (NONE):
 (6) ARS ONLY (NONE):
      LIST OF STATIONS (NONE:
 (7) ALTERNATE CARRIER
      LIST OF STATIONS (NONE):
 (8) ENABLE ALD
      LIST OF STATIONS (NONE):

Respond to each prompt with circuit (X.Y) or intercom (EXXX) numbers of stations to be added to the lists. After any changes are made, the list is redisplayed for verification. Press < CR > if the list is correct or enter new information. End each entry with < CR >.

NOTE: Stations cannot be directly deleted in the LIST OF UNRESTRICTED STATIONS prompt. Stations are removed from unrestricted status only by giving them restrictions in the remaining prompts. Stations may have multiple restrictions assigned to them. To return a station to unrestricted status, add it back in the first prompt. *The ARS only prompt does not appear in Basic software and is not used in Intermediate software.*

REVIEW DAY SCOS DATA AGAIN (N)

Enter Y < CR > to return to the LIST OF UNRESTRICTED STATIONS prompt, or N < CR > to continue.

PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)

This prompt appears only if new information was entered. Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

NIGHT SCOS INFORMATION

(0) LIST OF UNRESTRICTED STATIONS (ALL)
:

RESTRICTED
 (1) OPERATOR ACCESS
      LIST OF STATIONS (NONE):
 (2) TOLL ACCESS
      LIST OF STATIONS (NONE):
 (3) INTERNATIONAL
      LIST OF STATIONS (NONE):
 (4) EIGHT DIGIT
      LIST OF STATIONS (NONE):
 (5) AREA/OFFICE CODE
      LIST OF STATIONS (NONE):
 (6) ARS ONLY (NONE):
      LIST OF STATIONS (NONE):
 (7) ALTERNATE CARRIER
      LIST OF STATIONS (NONE):
 (8) ENABLE ALD
      LIST OF STATIONS (NONE):

Respond to each prompt with circuit (X.Y) or intercom (EXXX) numbers of stations to be added to the lists. After any changes are made, the list is redisplayed for verification. Press < CR > if the list is correct or enter new information. End each entry with < CR >.

NOTE: Stations cannot be directly deleted in the LIST OF UNRESTRICTED STATIONS prompt. Stations are removed from unrestricted status only by giving them restrictions in the remaining prompts. Stations may have multiple restrictions assigned to them. To return a station to unrestricted status, add it back in the first prompt. *The ARS only prompt does not appear in Basic software and is not used in Intermediate software.*

REVIEW NIGHT SCOS DATA AGAIN (N)

Enter Y < CR > to return to the LIST OF UNRESTRICTED STATIONS prompt, or N < CR > to continue.

**B. [HB] OVERLAPPING AREA/OFFICE
     CODES (/OVER)**

11.5 This program is used to designate whether or not the system is being programmed in an area where some of the area codes and office codes overlap. For example, 901 is an area code in Tennessee and is an office code in the 818 area code in the Los Angeles area. This program is reached by entering B from the toll restriction menu or enter HB or /OVER from the database programming menu.

PROMPT	VALID ENTRY
DO OFFICE AND AREA CODES OVERLAP (N):	N– The system is not in an area where some of the office codes have the same digits as the area codes. Return to the toll restriction menu prompt ([H]:). Y– The system is in an area where some of the office codes have the same digits as the area codes. Return to the toll restriction menu prompt ([H]:).
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged. Return to the toll restriction menu prompt ([H]:) without changing the database.

C. [HC] AREA/OFFICE CODES ALLOWED/RESTRICTED (/AREA)

11.6 This program is used to specify the area codes and office codes to which calls are allowed or restricted for those users assigned with SCOS 5 (allowed area/office codes). It is reached by entering C from the toll restriction menu or HC or /AREA from the database programming menu. Refer to Figure 5-13, page 5-163, for a program planning sheet.

11.7 Area/office code programming also affects call cost designation for the SMDR feature. When a 7-digit number is dialed from a station without SCOS 5, the system checks the office code against the area/office code tables. If the office code is allowed, the call is recorded as a local call (LOC). If it is restricted, the call is recorded as a seven-digit toll call (T7).

11.8 When the lists of area or office codes are entered, the terminal redisplays the entry for verification. If the list is correct, press < CR >. If not, enter the correct information. An error message (*** INVALID AREA/OFFICE CODE SPECIFICATION ***) appears if an invalid area code is entered. In the North American Numbering Plan, area codes that do not overlap office codes take the form NPA and office codes take the form NAA where:

N = Digits 2-9   P = Digits 0 or 1   A = Digits 0-9

NOTE: "X11" area codes are invalid and will be ignored or will cause an error message when entered.

11.9 The area/office code prompts appear as shown below. End each entry with < CR >.

PROMPT	VALID ENTRY
LOCAL AREA CODE ( ):	Enter the three-digit area code of the system's location. (An error message appears if one is not entered or if an invalid code is entered; enter a valid code.)
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
INITIALIZE ALL AREA CODES TO SAME ALLOWED/RESTRICTED STATUS (N)?	Y- Continue to the next prompt. N- Advance to the REVIEW AREA CODES INDIVIDUALLY prompt.

INITIAL ALLOWED/RESTRICTED STATUS OF ALL AREA CODES
   A = ALLOWED
   R = RESTRICTED
INITIAL ALLOWED/RESTRICTED STATUS OF ALL AREA CODES (A):
	A- All area codes are allowed until they are reprogrammed.
	R- All codes are restricted until they are reprogrammed.

LIST OF AREA CODES TO BE RESTRICTED (or ALLOWED) (NONE):	List of exceptions to the value assigned above. ALL is a valid entry. This prompt does not show the current status of the area codes.
REVIEW AREA CODES INDIVIDUALLY (N)?	Y- Continue to the next prompt. N- Advance to the LIST OF ADDITIONAL AREA CODES TO BE RESTRICTED prompt.
RANGE OF AREA CODES TO BE REVIEWED (NONE) :	Enter an area code, ALL, or a range of area codes to be reviewed or programmed. Enter NONE to advance to the LIST OF ADDITIONAL AREA CODES TO BE RESTRICTED prompt.

PROMPT	VALID ENTRY
XXX (R) :	A– The area code is allowed. R– The area code is restricted.
After all area codes have been reviewed, the prompts continue as follows:	
REVIEW SAME AREA CODES AGAIN (N)?	This prompt appears only if a range of area codes was previously reviewed. Y– Return to the first area code selected. N– Continue to the next prompt.
LIST OF ADDITIONAL AREA CODES TO BE RESTRICTED ( ): LIST OF ADDITIONAL AREA CODES TO BE ALLOWED ( ):	List of exceptions or additions to the value assigned above. ALL is a valid entry. These prompts do not show the current status of the area codes.
REVIEW ADDITIONAL AREA CODES (N)?	Y– Return to the RANGE OF AREA CODES prompt. N– If the local area code is allowed, continue to the next prompt. If not, return to the toll restriction menu prompt ([H]:).
OFFICE CODES FOR AREA CODE [local area code]	
INITIALIZE ALL OFFICE CODES TO SAME ALLOWED/RESTRICTED STATUS (N)?	Y– Continue to the next prompt. N– Advance to the REVIEW OFFICE CODES INDIVIDUALLY prompt.
INITIAL ALLOWED/RESTRICTED STATUS OF ALL OFFICE CODES A = ALLOWED R = RESTRICTED INITIAL ALLOWED/RESTRICTED STATUS OF ALL OFFICE CODES (A):	A– All office codes are allowed until they are reprogrammed. R– All office codes are restricted until they are reprogrammed.
LIST OF OFFICE CODES TO BE RESTRICTED (or ALLOWED) (NONE):	List of exceptions to the value assigned above.
REVIEW OFFICE CODES INDIVIDUALLY (N)?	Y– Continue to the next prompt. N– Advance to the LIST OF ADDITIONAL OFFICE CODES TO BE RESTRICTED prompt.
RANGE OF OFFICE CODES TO BE REVIEWED (NONE) :	Enter a range of office codes to be reviewed or programmed. Enter NONE to advance to the LIST OF ADDITIONAL OFFICE CODES TO BE RESTRICTED prompt.
XXX (R) :	A– The office code is allowed. R– The office code is restricted.
REVIEW SAME OFFICE CODES AGAIN (N)?	Y– Return to the first office code selected. N– Continue to the next prompt.

PROMPT	VALID ENTRY
LIST OF ADDITIONAL OFFICE CODES TO BE RESTRICTED ( ): LIST OF ADDITIONAL OFFICE CODES TO BE ALLOWED ( ):	List of exceptions or additions to the value assigned above. ALL is a valid entry. This prompt does not show the current status of the office codes.
REVIEW ADDITIONAL OFFICE CODES (N)?	Y– Return to the RANGE OF OFFICE CODES prompt. N– Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

D. [HD] AREA/OFFICE CODE REPORTS (/AREP)

11.10   Select D from the toll restriction menu or enter HD or /AREP from the database programming menu to print summary reports of area code and office code assignments. The prompts appear as shown below. End each entry with < CR >.

PROMPT	VALID ENTRY

REPORT OUTPUT PORT
  P = PRIMARY
  A = ACCESSORY PORT A
  B = ACCESSORY PORT B
REPORT OUTPUT PORT (P):
	This prompt does not appear in Basic software. Choose the output port to which the printer will be attached. Enter P for the KSU port or enter A or B for the desired APM port. The report appears in the following format.

AREA/OFFICE CODE TABLE REPORT DAY–DD–MM–YY   HH:MM *(shows current date and time)*

  LIST OF ALLOWED AREA CODES ( )
  LIST OF RESTRICTED AREA CODES ( )

  OFFICE CODE TABLE FOR AREA CODE   XXX

    LIST OF ALLOWED OFFICE CODES ( )
    LIST OF RESTRICTED OFFICE CODES( )

E. [HE] ALTERNATE CARRIERS (/ALT)

11.11   To program the alternate carrier local access numbers that *cannot* be dialed from stations with SCOS 7 (alternate carrier), enter E from the toll restriction menu or HE or /ALT from the database programming menu. Refer to Figure 5–13, on page 5–164, for a program planning sheet.

11.12   The alternate carrier access numbers are the telephone numbers that a station user dials to access specialized common carriers. The numbers can contain up to 10 digits each. You may use X in the number to indicate any digit 0–9. A plus (+) can be inserted at the end of any number to indicate that any digits can be dialed after the indicated digits are dialed. For example, 976+ restricts the user from dialing 976 numbers.

NOTE: Alternate carrier numbers are only restricted if they **exactly match** the number on the alternate carrier list. For this reason, alternate carrier numbers should have a " + " added to the end of the number to prevent users from bypassing toll restriction by dialing extra digits after dialing the restricted number.

11.13   The prompts appear in the order shown below. End each entry with < CR >.

PROMPT	VALID ENTRY
1 ( ): ... 20 ( ):	Enter up to 10 digits per number (including X or +) or < to erase the current number. Do not include the toll field (1, 0, or 10XXX).
REVIEW ALTERNATE CARRIER NUMBERS AGAIN (N)?	Y– Return to number 1. N– Return to the toll restriction menu prompt ([H]:).
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

F.   [HF] ALLOWED LONG DISTANCE (/ALD)

11.14   This program defines the allowed long distance numbers for stations assigned with SCOS 8 (enable ALD). It is reached by entering F from the toll restriction menu or HF or /ALD from the database programming menu. Refer to Figure 5-13, on page 5-164, for a program planning sheet.

11.15   The allowed long distance numbers can have up to 10 digits each including the following:

- An X to indicate any digit 0-9. For example, XXX5551212 allows the user to dial directory assistance for any area code.

- A plus (+) at the end of any number to indicate that any digits can be dialed after the indicated digits are dialed. For example, 800+ allows any number beginning with 800.

NOTE: Even if 0+ numbers are included in the allowed long distance number list, they cannot be dialed by a station with SCOS 1.

11.16   The prompts below show the initialized values of the allowed long distance numbers. End each entry with < CR >.

> **CAUTION REGARDING EMERGENCY NUMBERS:** In areas where the emergency number is 1911, be sure that toll-restricted stations have SCOS 8 (Enable ALD) and that 911 is in the allowed long distance number list. Otherwise, toll-restricted users may not be able to find a station that is permitted to dial "1+" numbers. Note that 911 is allowed at all stations regardless of SCOS, but 1911 requires this special programming.

PROMPT	VALID ENTRY
1 (800XXXXXXX): 2 (911): ... 20 ( ):	Enter up to 10 digits including X or +, if desired. Do not include the toll field (1 or 10XXX). **NOTE:** Even if "0+" numbers are included in the allowed long distance number list, they cannot be dialed by a station with SCOS 1.
REVIEW ALLOWED LONG DISTANCE NUMBERS AGAIN (N)?	Y- Return to number 1. N- Return to the toll restriction menu prompt ([H]:).
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

12. [I] AUTOMATIC ROUTE SELECTION

NOTE: This feature is available only in the *Advanced* software package.

12.1 The automatic route selection (ARS) menu is used to enter data for the route groups and dial rules. Enter I from the database programming menu to view the following menu:

[I] AUTOMATIC ROUTE SELECTION
    [IA] ARS ROUTE GROUPS
    [IB] ARS DIAL RULES

12.2 To prepare to program ARS, refer to page 4–30 in the FEATURES section. Then, determine the necessary information listed on following pages. (Refer to Figure 5–14, page 5–165, for a program planning sheet).

- **Route groups:** ARS has eight groups of lines that are used for routing calls according to the type of call being placed.

  - *Route group 1* is used for local calls. ARS routes seven- and eight-digit numbers through this route group if the dialed office code is included in the list for this route group. When fewer than seven digits are dialed (for example, 911 and 1411) the call is placed using this route group.

  - *Route groups 2 and 3* are used for seven- and eight-digit calls within the local area code. These route groups would include lists of office codes that were not included in route group 1. They are intended for toll calls within the local area code, to other office codes.

  - *Route groups 4 and 5* are used for 10- and 11-digit calls (calls outside the local area code). Each route group has a separate list of area codes that it serves.

  - *Route group 6* is the operator-assisted route group. Calls that begin with 0 (but not 01 or 011) are routed through this group.

  - *Route group 7* is the operator-assisted international route group. Calls that begin with 01 are routed through this group.

  - *Route group 8* is the direct dialing international route group. Calls that begin with 011 are routed through this group.

- **Dial rules:** If the lines in the route groups require special digits (for example, equal access 10XXX codes) up to 10 dial rules can be programmed. There are three permanently programmed rules in the database, they are:

  - *Echo toll field:* When ARS is selected, the user dials the number as if a direct dial line was being used, including 1 and the area code if necessary. If ARS selects a line that requires a 1, its route group must have this dial rule programmed to tell the system to echo (send) the the 1.

    NOTE: It may be desirable to program dial rule number four to add a 1, even though dial rule number one can be used to echo the toll field. This allows users to dial without knowing whether the 1 is required. If 1 is needed, the dial rules tell the system to add it. Users only have to remember to dial the area code when placing a call outside the local area code. If dial rule number four is programmed as described, use it in place of dial rule number one.

  - *Echo area code:* The system includes the area code in the number if this dial rule is programmed for the route group. If this dial rule is not programmed, the system drops the area code from the dialed number.

  - *Echo local address or country code and national number:* All route groups must have this dial rule. It tells the system to send the telephone number that the user has dialed.

- **Assign the dial rules to the route groups:** List the dial rules for the route groups in the order they are to be used. For example, to list dial rule 4 (add the 1, as described in the note above), then dial rule 2 (echo the area code), then dial rule 3 (echo the digits dialed); enter 4, 2, 3.

A. [IA] ARS ROUTE GROUPS (/ROUT)

12.3 This program identifies the lines and area codes or office codes associated with each of the route groups. It is reached by entering A from the automatic route selection menu or IA or /ROUT from the database programming menu. Refer to the program planning sheets (Figure 5-14, page 5-165).

12.4 When entering an area or office code, an X can be included in the number to indicate any digit between 0 and 9. For example, enter 22X to indicate 220-229.

12.5 Items can be added to or subtracted from lists by entering a plus (+) or minus (–) before the information. For example, the list reads 220-229. To add 230 and 235-237, enter +230,235-237. To subtract 221, enter –221. Do not attempt to add and subtract items in the same entry.

12.6 When a list of lines, area codes, or office codes is entered, the terminal redisplays the entry for verification. If the list is correct, enter <CR>. If not, enter the correct information.

PROMPT	VALID ENTRY
RANGE OF ROUTE GROUPS TO BE REVIEWED (ALL):	Enter a range of route group numbers (1-8) to be programmed or reviewed. ALL is a valid entry. Enter NONE to return to the ARS menu prompt ([I]:).
ROUTE GROUP 1 (LOCAL: XXX-XXXX) NOTE: 911 AND 1-411 CALLS ARE ROUTED THROUGH THIS GROUP. —NORMALLY USED FOR LOCAL CALLS—	*Route group 1 is used for calls within the local area code.*
LIST OF INCLUDED OFFICE CODES (200-999):	Enter the office codes, within the local area code, for which this route group will be used.
LIST OF CO LINES (ALL):	Enter the circuit numbers of the lines that will be used for calls to the office codes listed above.
DIALING RULES (1,3):	List the dial rules *in the order they are to be used* for this route group.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y <CR> to save the changes or N <CR> to leave the database unchanged.
ROUTE GROUP 2 (INTRA-AREA CODE #1: XXX-XXXX)	*Route group 2 is used for seven- or eight-digit calls within the local area code.*
LIST OF INCLUDED OFFICE CODES ( ):	Enter the office codes, within the local area code, for which this route group will be used.
LIST OF CO LINES (NONE):	Enter the circuit numbers of the lines that will be used for calls to the office codes listed above.
DIALING RULES ( ):	List the dial rules *in the order they are to be used* for this route group.

PROMPT	VALID ENTRY
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
ROUTE GROUP 3 (INTRA-AREA CODE #2: XXX–XXXX)	*Route group 3 is used for seven- or eight-digit calls within the local area code.*
LIST OF INCLUDED OFFICE CODES ( ):	Enter the office codes, within the local area code, for which this route group will be used.
LIST OF CO LINES (NONE):	Enter the circuit numbers of the lines that will be used for calls to the office codes listed above.
DIALING RULES ( ):	List the dial rules *in the order they are to be used* for this route group.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
ROUTE GROUP 4 (NATIONAL #1: XXX–XXX–XXXX)	*Route group 4 is used for calls outside the local area code.*
LIST OF INCLUDED AREA CODES (200–919):	Enter the area codes for which this route group will be used.
LIST OF CO LINES (ALL):	Enter the circuit numbers of the lines that will be used for calls to the area codes listed above.
DIALING RULES (1,2,3):	List the dial rules *in the order they are to be used* for this route group.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
ROUTE GROUP 5 (NATIONAL #2: XXX–XXX–XXXX)	*Route group 5 is used for calls outside the local area code.*
LIST OF INCLUDED AREA CODES ( ):	Enter the area codes for which this route group will be used.
LIST OF CO LINES (NONE):	Enter the circuit numbers of the lines that will be used for calls to the area codes listed above.
DIALING RULES ( ):	List the dial rules *in the order they are to be used* for this route group.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
ROUTE GROUP 6 (OPERATOR-ASSISTED: 0+)	*Route group 6 is used for operator assisted calls, except international calls.*

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PROMPT	VALID ENTRY
LIST OF CO LINES (ALL):	Enter the circuit numbers of the lines that will be used for operator-assisted calls.
DIALING RULES (1,2,3):	List the dial rules *in the order they are to be used* for this route group.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
ROUTE GROUP 7 (OPERATOR-ASSISTED INTERNATIONAL: 01 +)	*Route group 7 is used for operator-assisted international calls.*
LIST OF CO LINES (ALL):	Enter the circuit numbers of the lines that will be used for operator-assisted international calls.
DIALING RULES (1,3):	List the dial rules *in the order they are to be used* for this route group.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
ROUTE GROUP 8 (STATION–TO–STATION INTERNATIONAL: 011 +)	*Route group 8 is used for direct-dialed international calls.*
LIST OF CO LINES (ALL):	Enter the circuit numbers of the lines that will be used for station-to-station international calls.
DIALING RULES (1,3):	List the dial rules *in the order they are to be used* for this route group.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
REVIEW SAME ROUTE GROUPS AGAIN (N)?	Y– Return to the first route group in the selected range. N– Continue to the next prompt.
REVIEW ADDITIONAL ROUTE GROUPS (N)?	Y– Return to the RANGE OF ROUTE GROUPS TO BE REVIEWED prompt. N– Return to the automatic route selection menu prompt ([I]).

B.   [IB] ARS DIAL RULES (/RULE)

12.7   The system dials the number according to the dial rules assigned to the route group. If the dial rules do not tell the system to echo digits that are dialed (rules 1-3), they are deleted. To program the digits that are added to the dialed number when the route group is selected (rules 4-10), select B from the automatic route selection menu or IB or /RULE from the database programming menu. The first three rules are preset; rules 4-10 are programmable.

12.8   Each dial rule can contain up to 16 digits including 0-9, #, *, and timed pauses and/or hookflashes. To program pauses, enter P for a short pause, PP for a medium pause, and PPP for a long pause. The length of the pause (P) is determined by the programmable pause timer. If hookflash programming is enabled (in miscellaneous system data [AF]), you can enter an F (Flash) for a hookflash, P for a short pause, or PP for a medium pause. The length of the hookflash is determined by the programmable CO hookflash timer. Each pause or hookflash (P, PP, PPP, or F) is considered one digit. The prompts appear as shown below. End each entry with < CR >.

NOTE: When dialing an ARS number, the system only sends out a total of 48 digits. For this reason, the complete ARS number (including the telephone number and any assigned dial rules) should be kept under 48 digits.

PROMPT	VALID ENTRY
DIAL RULE 1. ECHO TOLL FIELD (1, 0, 01, OR 011) DIAL RULE 2. ECHO AREA CODE DIAL RULE 3. ECHO LOCAL ADDRESS OR COUNTRY CODE AND NATIONAL NUMBER	*The first three dial rules are shown for reference only. They cannot be changed.*
DIAL RULE 4 ( ): ... DIAL RULE 10 ( ):	Enter up to 16 digits. Include pauses and/or hookflashes (P, PP, PPP, or F), if necessary.
REVIEW DIAL RULES AGAIN (N)?	Y– Return to ADD RULE 4. N– Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
RANGE OF ROUTE GROUPS TO BE REVIEWED (ALL) :	Enter a range of route group numbers (1-8). Enter NONE to return to the automatic route selection menu prompt ([I]:).
ROUTE GROUP X DIALING RULES ( ) :	Enter a list of dial rules (1-8) that are to be used with this route group. Separate the numbers with commas. List them in the exact order that the number should be dialed (i.e., toll field, area code, local address). The entry redisplays for verification. Enter < CR > if it is correct or enter new information if it is incorrect.
REVIEW SAME ROUTE GROUPS AGAIN (N)?	Y– Return to the first route group selected. N– Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.
REVIEW ADDITIONAL ROUTE GROUPS (N)?	Y– Return to the RANGE OF ROUTE GROUPS prompt. N– Return to the automatic route selection menu prompt ([I]:).

13. [J] DATABASE SAVE/RESTORE (/SAVE)

13.1 This program allows an unrestricted programmer to save and/or load the database using an external storage device such as a personal computer. (Refer to SPECIFICATIONS, page 2-17, for information concerning the external storage device.)

NOTE: To store the entire system database, approximately 100K bytes of memory are required.

13.2 To reach this program, enter J or /SAVE from the database programming menu. The prompts appear as follows.

PROMPT	VALID ENTRY

SELECT DEVICE PORT
  P = PRIMARY
  A = ACCESSORY PORT 1
  B = ACCESSORY PORT 2
SELECT DEVICE PORT (P/A/B):
	This prompt does not appear in Basic software. Choose the output port to which the storage device will be attached. Enter P for the KSU port or enter A or B for the desired APM port.

DELAY VALUE (DEFAULT = 10 SECONDS):	*This prompt appears only if the port is connected to the terminal you are using.* Set the delay to a value between 1 and 255 seconds to allow time to prepare the terminal to send or receive the information. Make sure that the baud rates of the selected RS-232-C port and the storage device are the same.
ECHO ENABLE (N)?	Y– The data appears in Motorola-S format on the terminal. N– The data is not displayed. NOTE: Some data devices do not operate properly when echo is enabled. Unless otherwise instructed, it is recommended that echo not be enabled.

SELECT DEVICE HANDLER
  D = CPU/DISK DEVICE
  T = TECHTRAN DATACASSETTE
DEVICE HANDLER (D/T)?
	Select the type of storage device that will send or receive the data.

SELECT FILE TRANSFER PROTOCOL
  Y = ENABLE
  N = DISABLE
ACK/NAK (DEFAULT = DISABLE)?
	If CPU/DISK DEVICE was selected, this prompt appears and allows you to determine the transfer protocol. The ACK/NAK file transfer protocol provides a method of validating each line of the database as it is transferred from one device to the other. As each line is transferred, the value that was received is compared with the value that was sent. If the two values match, the ACK character is transmitted to the sending device and the next line is sent. If the values do not match, the NAK character is transmitted to the sending device and the same line is sent again.

SELECT SAVE/RESTORE OPERATION
  S = SAVE
  R = RESTORE
OPERATION (R/S)?
	S– Information is sent from the system to the storage device.
	
	R– Information is transferred from the storage device to the system.

13.3 The terminal then prints one the following sets of instructions for beginning the save/restore function:

If a delay time is set:

> THE DELAY OPERATION IS NOW IN EFFECT.
> PROCEED WITH ANY RE-CABLING (ETC.) AS
> NECESSARY. THE SPECIFIED OPERATION
> WILL START WHEN THE DELAY TIMER
> EXPIRES.

If another port is selected and a delay time is not set:

> ESTABLISH ANY NECESSARY COMMUNICATION WITH THE
> HOST/DEVICE, THEN TYPE CONTROL-P WHEN READY TO
> PROCEED.

13.4 When the selected operation is successfully completed, the following message appears:

*** REQUESTED DATABASE OPERATION HAS SUCCESSFULLY COMPLETED ***

13.5 *If using the restore function,* the PERFORM A SYSTEM RESET NOW (Y or N) message is printed when the programmer attempts to exit the system after the database has been loaded. Enter Y < CR > to reset the system.

14. [K] SYSTEM INITIALIZATION AND RESET (/INIT)

14.1 This program allows an unrestricted programmer to reset the database or return it to the default configuration. It is used when the system is first installed or when the KSU has been replaced. To access this program, enter K or /INIT from the database programming menu. The prompts are preceded with a warning:

WARNING: THIS TASK WILL END THE PROGRAMMING SESSION AND TERMINATE ALL CALLS IN PROGRESS AS PART OF THE INITIALIZATION PROCESS.

PROMPT	VALID ENTRY
SYSTEM INITIALIZATION OPTION I = INITIALIZE TO SYSTEM DEFAULT VALUES R = SYSTEM RESET D = SCHEDULE A DELAYED RESET C = CANCEL A DELAYED RESET SYSTEM INITIALIZATION OPTION (R):	I– Initializing the database returns system information to default values. Advance to the PRESERVE SELECTED DATA prompt. R– A reset of the system does not change the database, but drops all calls in progress and erases the SMDR buffer. Advance to the PERFORM UPDATE TO SYSTEM prompt shown on the next page. NOTE: Besides dropping all C.O. and intercom calls in progress (including the modem, if in use) and erasing the SMDR buffer, a reset also cancels background music, queue requests, inter-station messages, reminder messages, and redial memory. Other miscellaneous items, such as programmed forwards, do-not-disturb messages, day/night mode operation, redial mode, etc., are preserved. D– To schedule a delayed reset, continue to the next prompt. C– A previously scheduled reset is cancelled. Advance to the PERFORM UPDATE TO SYSTEM prompt shown on the next page.
DELAYED RESET TIME (HH:MM):	Enter a time in 24-hour international format (i.e., 13:00 = 1:00PM). The time entered is redisplayed. Press < CR > to accept that time or enter a new time to change it. When the time has been accepted, continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to cancel the request.
DELAYED RESET SCHEDULED FOR XX:XX	The terminal returns to the database programming menu prompt ([ ]:).
PRESERVE SELECTED DATA (N):	N– All data is returned to the default values. Advance to the PERFORM UPDATE TO SYSTEM prompt. Y– Continue to the next prompt to select specific data to be saved.

PROMPT	VALID ENTRY
	For the following PRESERVE prompts, enter Y <CR> to save the information or N <CR> to return the information to default values:
PRESERVE SYSTEM TIMERS (N):	All system timers.
PRESERVE SYSTEM SPEED DIAL (N):	All system speed-dial numbers (including non-display and tenant-specific designations).
	NOTE: This does not preserve the system speed-dial programming station assignment.
PRESERVE ACCOUNT CODES (N):	All standard and forced account codes.
PRESERVE EXTENSION AND FEATURE CODE ASSIGNMENTS (N):	All intercom numbers and feature codes.
PRESERVE STATION INFORMATION (N):	User names, station speed-dial numbers, programmable feature keys, SCOS, secretarial intercept, attendants, call forward requests, and account code indexes.
PRESERVE TOLL-RESTRICT TABLES (N):	Overlapping area/office code designation, allowed/restricted area and office codes, local area code, alternate carrier numbers, and allowed long distance numbers.
PRESERVE AUTOMATIC ROUTE SELECTION TABLES (N):	*This prompt does not appear in Basic software.* Automatic route selection programming information.
PRESERVE REPORT PROGRAMMING (N):	SMDR reports, SAR/call cost information, tenant names, and error reports.
REVIEW SELECTED DATA AGAIN (N)?	Y- Return to the PRESERVE SYSTEM TIMERS prompt.
	N- Continue to the next prompt.
PERFORM UPDATE TO DATABASE (Y OR N)?	Y- Complete the selected function (initialize or reset).
	N- Return to the database programming menu prompt ([ ]:) without affecting the system.
MAJOR RESET	This appears if you initialized or reset the system.

15. SMDR AND ERROR PROGRAMMING

15.1 To program the station message detail recording (SMDR) and error message output, select B from the applications program menu. This program sets the parameters for the SMDR and error output. Use the SMDR program planning sheet in Figure 5-15 on page 5-167.

15.2 If a password is required for access to the SMDR and error programming menu, the PASSWORD: prompt is displayed. If an incorrect password is entered, the terminal returns to the applications program menu.

A. [A] SMDR OUTPUT (/OUTR)

15.4 To activate or halt the output port for SMDR, enter A or /OUTR from the SMDR and error pro-

15.3 The SMDR produces a record of calls and their costs as well as system error messages. Report format and error messages are discussed in the FEATURES section, starting on page 4-108. The menu appears as shown below:

SMDR AND ERROR PROGRAMMING

[A] SMDR OUTPUT
[B] SMDR REPORTS
[C] ERROR OUTPUT
[D] ERROR REPORTS
[E] ON-LINE ERROR REPORTS
[F] SMDR AND ERROR PASSWORD

? DISPLAY MENU
. EXIT

gramming menu. The following prompt is displayed. Halting the SMDR output places the information (at least 10 calls) in a buffer that is printed when the SMDR resumes operation.

PROMPT	VALID ENTRY
SMDR OUTPUT ACTIVE (Y):	Y- Activate the SMDR output.
	N- Halt the SMDR output.

SMDR OUTPUT PORT
  P = PRIMARY
  A = ACCESSORY PORT 1
  B = ACCESSORY PORT 2
SMDR OUTPUT PORT (P):
	This prompt does not appear in Basic software. Choose the output port to which the SMDR device will be attached. Enter P for the KSU port or enter A or B for the desired APM port.

PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged. Return to the SMDR and error programming menu prompt ([ ]:).

B. [B] SMDR REPORTS (/SMDR)

15.5 To determine the information that is included in the SMDR report, select B or /SMDR from the SMDR and error programming menu.

15.6 To program the SMDR report contents, enter Y or N to any or all of the following options. End all entries with <CR>.

PROMPT	VALID ENTRY
RECORD ALL INCOMING CALLS (Y):	Records all incoming calls.
RECORD ALL LOCAL CALLS (Y):	Records all local, non-toll calls that are longer than the valid call timer.
RECORD ALL TOLL CALLS (Y):	Records all toll calls that are longer than the valid call timer. Toll calls include calls that begin with 1 or 0, are longer than seven digits, or contain a restricted office code.
RECORD ALL DISA CALLS (Y):	*This prompt does not appear in Basic software and is not used in Intermediate software.* All calls made using DISA are recorded, even DISA calls placed to stations not listed in the SMDR LIST OF STATIONS prompt below.
RECORD ALL CONFERENCE CALLS (Y):	All conference calls that involve an outgoing line are recorded, even conference calls involving stations not listed in the SMDR LIST OF STATIONS prompt below.
RECORD ALL RING-IN DIAGNOSTICS (Y):	A ring-in message is recorded for every incoming call (whether answered or unanswered) to indicate how long it rang. All incoming calls are recorded, even those involving stations not listed in the SMDR LIST OF STATIONS prompt below.
SUPPRESS ALL OUTGOING DISA DIGITS (N):	*This prompt does not appear in Basic software and is not used in Intermediate software.* Y- DISA-to-outside call digit will not appear in the report. N- All digits dialed to place an outgoing call via DISA appear in the report.
SUPPRESS ALL ABSORBED DIGITS (N):	Y- Absorbed digits (on local or PBX lines) will not appear in the report. N- Absorbed digits appear in the report. **NOTE:** If absorbed digits are repeatable on a local line, the absorbed digits will not appear in the SMDR report.
SUPPRESS ALL BUT THE FIRST TOLL DIGIT (N):	Y- Only the first digit of the toll field(s) will appear in the number dialed field (i.e., if "10XXX-1-..." was dialed, only "11" would appear). N- The entire toll field will appear in the report.

PROMPT	VALID ENTRY
SMDR LIST OF STATIONS (ALL):	Enter the extension (EXXX) or circuit (X.Y) number(s) of the station(s) that will appear in the report. ALL and NONE are valid entries.
SMDR FORMAT W = WIDE N = NARROW SMDR FORMAT (W):	W- Selects the 80-character report format. N- Selects the 64-character report format. (Refer to FEATURES, pages 4-109 and 4-110, for examples.)
REVIEW SMDR AGAIN (N)?	Y- Return to the RECORD ALL INCOMING CALLS prompt. N- Return to the SMDR and error programming menu prompt ([ ]:).
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

C.   [C] ERROR OUTPUT (/OUTE)

15.7   Select C or /OUTE from the SMDR and error programming menu to determine the output type for the system error reports. The programmer can halt the error output so that messages are only printed when service personnel request them. Or, the programmer can choose to have continuous output for a complete record of all errors. At least 20 error messages are held in a buffer. These messages are printed as soon as the output is activated again.

15.8   If, when activating error message output, SMDR is active, error messages appear within the SMDR report and call information is buffered while the message prints.

PROMPT	VALID ENTRY
ERROR MESSAGE OUTPUT ACTIVE (Y):	N- Halt the error message output. Y- Restore the error message output.
ERROR OUTPUT PORT P = PRIMARY A = ACCESSORY PORT 1 B = ACCESSORY PORT 2 ERROR OUTPUT PORT (P):	*This prompt does not appear in Basic software.* Choose the output port to which the error recording device will be attached. Enter P for the KSU port or enter A or B for the desired APM port.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged. Return to the SMDR and error programming menu prompt ([ ]:).

D.   [D] ERROR REPORTS (/ERR)

15.9   This program determines the types of error messages to be included in the error report. It can be reached by entering D or /ERR from the SMDR and error programming menu. You may wish to use the program planning sheet in Figure 5–15 on page 5–167.

15.10   When the system is initialized, error mes- sages for all alarms and for all field service diagnostics are enabled, and error messages for all engineering diagnostics are disabled.

NOTE: Do not enable error reports for engineering diagnostics unless requested to do so by authorized service personnel.

15.11   The prompts are as follows. Enter Y < CR > to include the information or N < CR > to exclude it.

PROMPT	VALID ENTRY
REPORT ALL ALARMS [+ + +] (Y):	An error message is recorded for all minor and major system alarms. (Refer to FEATURES, page 4–111, and TROUBLESHOOTING, page 6–4, for more information concerning system alarm reporting.)
REPORT ALL FIELD SERVICE DIAGNOSTICS [***] (Y):	An error message is recorded for all field service diagnostics. A customer service representative should be contacted if any of these error messages are printed. Refer to TROUBLESHOOTING, page 6–5, for a listing of field service diagnostics.
REPORT ALL ENGINEERING DIAGNOSTICS [- - -] (N):	An error message is recorded when the software detects an inconsistent or illogical condition in the dynamic database, when the operating system detects an error in the non-operating system software on the same circuit board, and if the operating system detects an inconsistency or error condition in its own data structures. These error messages are for engineering use only.
REVIEW ERROR MESSAGES AGAIN (N)	Y– Return to the REPORT ALL ALARMS prompt. N– Continue to the next prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged. Return to the SMDR and error programming menu prompt ([ ]:).

E. [E] ON–LINE ERROR REPORTS (/OLER)

15.12 A report of at least 20 error messages can be requested at any time using this program. Refer to the previous page for an explanation of the types of messages. To reach this program, enter E or /OLER from the SMDR and error programming menu.

PROMPT	VALID ENTRY
ERROR OUTPUT PORT P = PRIMARY A = ACCESSORY PORT 1 B = ACCESSORY PORT 2 ERROR OUTPUT PORT (P):	*This prompt does not appear in Basic software.* Choose the output port to which the error report recording device will be attached. Enter P for the KSU port or enter A or B for the desired APM port.
BEGIN ERROR REPORT (Y)?:	Y– Error report prints in the format shown below. N– Advance to the REVIEW SAME ERROR REPORTS AGAIN prompt without printing the report.
Day–XX–Month–19XX HH:MM [Error Message]	*The report includes the date and time of the error and the error code/message.*
REVIEW SAME ERROR REPORTS AGAIN (N)?	Y– Return to the first prompt. N– Continue to the next prompt.
CLEAR THE ERROR MESSAGE QUEUE NOW (N):	Y– Clear the error report data. N– Save the messages in the system memory.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged. Return to the SMDR and error programming menu prompt ([ ]:).

F. [F] SMDR AND ERROR PASSWORD (/PASS)

15.13 This program gives the option of requiring a password for access to the SMDR and error programming menu. To access this program, enter F or /PASS from the SMDR and error programming menu. This password can also be programmed using the [AH] (passwords) program.

15.14 If Y < CR > is entered after the REQUIRE PASSWORD prompt, the CHANGE and ENTER prompts also appear. If N < CR > is entered, the terminal returns to the SMDR and error programming menu prompt ([ ]:). The passwords must be typed twice because they do not appear on the screen and cannot be verified before being entered. The prompts appear as shown below. End all entries with < CR >.

PROMPT	VALID ENTRY
REQUIRE A PASSWORD FOR SMDR AND ERROR (N) :	Y– Continue to the next prompt. N– Return to the SMDR and error programming menu prompt ([ ]:).
CHANGE SMDR AND ERROR PASSWORD (N)?	Y– Continue to the next prompt. N– Advance to the PERFORM UPDATE TO SYSTEM DATABASE prompt.
ENTER NEW PASSWORD :	Enter the password (up to eight characters).
ENTER NEW PASSWORD AGAIN :	Enter the same characters. If they do not match the first entry, an error message appears; return to the ENTER NEW PASSWORD prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged. Return to the SMDR and error programming menu prompt ([ ]:).

16. STATION ACTIVITY REPORTS (SAR)

NOTE: This menu appears only in the *Advanced* and *Intermediate* software package. If using *Basic* software, refer to page 5-117 for the call cost programming menu.

16.1 The SAR feature produces a record of call costs that can be used as a management tool. Refer to FEATURES, page 4-104, for details on SAR reports. To program the SAR information, select C from the applications program menu. You may wish to use the program planning sheet in Figure 5-15 on page 5-167.

16.2 If a password is required for access to the SAR program, the PASSWORD: prompt appears. The password can be up to eight characters long. An incorrect password causes the system to return to the applications program menu.

16.3 After a correct password has been entered, the SAR menu appears as follows.

STATION ACTIVITY REPORT (SAR)
[A] AUTOMATIC SAR REPORTS
[B] ON-LINE SAR REPORTS
[C] SAR PASSWORD
[D] CALL COST FACTORS
? DISPLAY MENU
. EXIT

16.4 Because the SAR feature is available only in the *Advanced* software package, selections [A] and [B] are not available in *Intermediate* software.

A. [A] AUTOMATIC SAR REPORTS (/AUTO)

16.5 This program appears only in *Advanced* software only. This program establishes the frequency, format, and output port for the automatic SAR reports. It is reached by entering A or /AUTO from the SAR programming menu. The prompts and valid entries are as follows. End each entry with < CR >.

PROMPT	VALID ENTRY
ENABLE AUTOMATIC SAR REPORT GENERATION (Y) :	Y- An SAR output device is connected to the system.
	N- No output device is connected for SAR. Advance to the STATION/CO LINE DATA WAS LAST CLEARED prompt.

REPORTING INTERVAL
  D = DAILY
  W = WEEKLY
  M = MONTHLY
  A = ATTENDANT
REPORTING INTERVAL (A):
	D- Reports print daily. Go to the GENERATE DAILY REPORTS ON prompt.

	W- Reports print weekly. Go to the DAY OF WEEK prompt.
	M- Reports print monthly. Continue to the next prompt.
	A- Reports are printed only when the attendant enters the SAR feature code (025). Advance to the SAR OUTPUT PORT prompt.
DAY OF MONTH (1):	If monthly, select the day of the month on which reports are to be generated. Advance to the TIME-OF-DAY prompt.
	NOTE: If the date does not occur within the month (e.g., 30 is not in February), the report is not generated. For end-of-the-month reports, select a time of 00:00 on the first day of the month.
DAY OF WEEK (SUN):	If weekly, enter a three-letter abbreviation for the day of the week that reports are to be generated (SUN, MON, TUE, WED, THU, FRI, SAT). Advance to the TIME-OF-DAY prompt.

PROMPT	VALID ENTRY
GENERATE DAILY REPORTS ON: 　SUNDAY (Y): 　MONDAY (Y): 　TUESDAY (Y): 　WEDNESDAY (Y): 　THURSDAY (Y): 　FRIDAY (Y): 　SATURDAY (Y):	If daily, enter Y or N for each day of the week, as desired.
TIME-OF-DAY FOR AUTOMATIC REPORTS (00:00):	Select the time of day that reports are generated. Input hours and minutes in 24-hour international time.
SAR OUTPUT PORT 　P = PRIMARY 　A = ACCESSORY PORT 1 　B = ACCESSORY PORT 2 SAR OUTPUT PORT (P) :	Choose the output port to which the SAR recording device will be attached. Enter P for the KSU port or enter A or B for the desired APM port.
CLEAR THE STATION/CO LINE DATA FOLLOWING REPORT (N):	Y–All stored cumulative station data will be cleared after the report is printed. N– Later reports will include data from previous printouts.
STATION/CO LINE DATA WAS LAST CLEARED Day–XX–Month–19XX HH:MM CLEAR THE STATION/CO LINE DATA NOW (N):	Y–All stored cumulative station data is cleared. N– Later reports will include data from previous printouts. **NOTE:** Answer Y when the system is first installed to set the date for the first report.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

B. [B] ON–LINE SAR REPORTS (/SAR)

16.6 This program appears only in *Advanced* software only. This program generates an on-line SAR report. It is reached by entering B or /SAR from the SAR programming menu. The format settings temporarily change the SAR output without affecting the automatic SAR reports. The prompts appear as shown below. End each entry with < CR >.

PROMPT	VALID ENTRY

SAR OUTPUT PORT
  P = PRIMARY
  A = ACCESSORY PORT 1
  B = ACCESSORY PORT 2
SAR OUTPUT PORT (P) :
	Choose the output port to which the SAR recording device will be attached. Enter P for the KSU port or enter A or B for the desired APM port.

BEGIN SAR REPORTING (Y):	Y– Ensure that the output port is ready. Then enter < CR >. The report is sent to the output port. N– Return to the SAR programming menu prompt ([]:). No report is generated.
GENERATE ANOTHER REPORT (N):	Y– Return to the SAR OUTPUT PORT prompt. N– Return to the SAR programming menu prompt ([]:).
STATION/CO LINE DATA WAS LAST CLEARED Day–XX–Month–19XX HH:MM CLEAR THE STATION/CO LINE DATA NOW (N):	Y–All stored cumulative station data is cleared. N– Later reports will include data from previous printouts. **NOTE:** Answer Y when the system is first installed to set the date for the first report.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

C. [C] SAR PASSWORD (/PASS)

16.7 This program gives the option of requiring a password to access the SAR programming menu. It is accessed by entering A or /PASS from the SAR programming menu. This password can also be programmed using database program [AH] (passwords) shown on page 5-30.

16.8 If a password is created and later designated as *not required*, it remains in the system memory. If it is later designated as *required* and a *new* password is not created, the original password is reassigned.

16.9 The passwords must be typed twice because they do not appear on the screen and cannot be verified before being entered. The prompts appear as shown below. End each entry with < CR >.

PROMPT	VALID ENTRY
REQUIRE A PASSWORD FOR SAR (N):	Y– Continue to the next prompt.
	N– Return to the SAR programming menu prompt ([ ]:).
CHANGE SAR PASSWORD (N)?	Y– Continue to the next prompt.
	N– Advance to the PERFORM UPDATE TO SYSTEM DATABASE prompt.
ENTER NEW PASSWORD :	Enter the password (up to eight characters).
ENTER NEW PASSWORD AGAIN :	Enter the same characters. If the two entries do not match, an error message appears; return to the ENTER NEW PASSWORD prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged. Return to the SAR programming menu prompt ([ ]:).

D. [D] CALL COST FACTORS (/COST)

16.10 This program establishes the variables used in calculating the call cost portion of the SAR and SMDR reports. Call cost information is also shown on display keysets. To access it, enter D or /COST from the SAR programming menu. Refer to Figure 5-15 on page 5-167 for a program planning sheet.

16.11 Before using this program, determine the daytime rates (in dollars per minute) for the following types of calls. Use several telephone bills from months with typical usage to calculate the average cost per minute of each type of call. Record the charges in dollars and cents from 00.00 to 99.99. You may need to adjust the calculations later to more accurately estimate actual call costs. (This program is to be used as an estimate only; refer to page 4-104 in FEATURES for more information.)

- Local calls

- Seven-digit toll calls

- Ten-digit toll calls

- Operator-assisted and international calls

- Incoming calls

16.12 Then, determine the discount rates for night/ weekend and evening calls. Record these as decimal factors. For example, an evening discount rate of 35% would have a factor of 0.65 times the day rate. The allowed range is between 0.00 and 1.99. The prompts appear as shown below. End each entry with < CR >.

PROMPT	VALID ENTRY
LOCAL AREA CODE ( )	Enter the three-digit area code. An error message appears if you enter an invalid area code or no area code.

DAYTIME RATES IN DOLLARS PER MINUTE
   LOCAL CALL (0.05) :
   7-DIGIT TOLL CALL (0.20) :
   10-DIGIT TOLL CALL (0.50) :
   OPERATOR/INTERNATIONAL
   CALL (1.00) :
   INCOMING CALL (0.00) :
	Enter the per-minute cost in dollars and cents for calls placed during the day. The range is 0.00 to 99.99.

MULTIPLICATIVE FACTORS
 	
   EVENING (0.65) :
   NIGHT AND WEEKEND (0.40) :
	Enter the number that, when multiplied by the above rates, produces the evening and night rates for calls. The range is 0.00 to 1.99.

REVIEW CALL COST AGAIN (N)?	Y– Return to the LOCAL AREA CODE prompt. N– Return to the SAR programming menu prompt ([ ]:).
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged. Return to the SAR programming menu prompt ([ ]).

17. CALL COST PROGRAMMING

NOTE: This menu appears only in the *Basic* software package. If using *Advanced* or *Intermediate* software, refer to page 5-112 for the SAR programming menu.

17.1 Call cost programming establishes the variables used in calculating the call cost portion of the SMDR reports. Call cost information is also shown on display keysets. To program the call cost information, enter C from the applications program menu. You may wish to use the program planning sheet in Figure 5-15 on page 5-167.

17.2 If a password is required for access to the call cost program, the PASSWORD: prompt appears. The password can be up to eight characters long. An incorrect password causes the system to return to the applications program menu.

17.3 After a correct password has been entered, the call cost programming menu appears as follows.

CALL COST PROGRAMMING

    [A] CALL COST PASSWORD
    [B] CALL COST FACTORS
    ? DISPLAY MENU
    . EXIT

A. [A] CALL COST PASSWORD (/PASS)

17.4 This program gives the option of requiring a password to access the call cost programming menu. It is accessed by entering A or /PASS from the call cost programming menu. This password can also be programmed using database program [AH] (passwords) shown on page 5-30.

17.5 If a password is created and later designated as *not required*, it remains in the system memory. If it is later designated as *required* and a *new* password is not created, the original password is reassigned.

17.6 The passwords must be typed twice because they do not appear on the screen and cannot be verified before being entered. The prompts appear as shown below. End each entry with < CR >.

PROMPT	VALID ENTRY
REQUIRE A PASSWORD FOR CALL COST (N):	Y- Continue to the next prompt. N- Return to the call cost programming menu prompt ([ ]:).
CHANGE CALL COST PASSWORD (N)?	Y- Continue to the next prompt. N- Advance to the PERFORM UPDATE TO SYSTEM DATABASE prompt.
ENTER NEW PASSWORD :	Enter the password (up to eight characters).
ENTER NEW PASSWORD AGAIN :	Enter the same characters. If the two entries do not match, an error message appears; return to the ENTER NEW PASSWORD prompt.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged. Return to the call cost programming menu prompt ([ ]:).

B.   [B] CALL COST FACTORS (/COST)

17.7   This program establishes the variables used in calculating the call cost portion SMDR reports. Call cost information is also shown on display keysets. To access it, enter B or /COST from the call cost programming menu. Refer to Figure 5-15 on page 5-167 for a program planning sheet.

17.8   Before using this program, determine the daytime rates (in dollars per minute) for the following types of calls. Use several telephone bills from months with typical usage to calculate the average cost per minute of each type of call. Record the charges in dollars and cents from 00.00 to 99.99. You may need to adjust the calculations later to more accurately estimate actual call costs. (This program is to be used as an estimate only; refer to page 4-104 in FEATURES for more information.)

- Local calls

- Seven-digit toll calls

- Ten-digit toll calls

- Operator-assisted and international calls

- Incoming calls

17.9   Then, determine the discount rates for night/ weekend and evening calls. Record these as decimal factors. For example, an evening discount rate of 35% would have a factor of 0.65 times the day rate. The allowed range is between 0.00 and 1.99. The prompts appear as shown below. End each entry with < CR >.

PROMPT	VALID ENTRY
LOCAL AREA CODE ( )	Enter the three-digit area code. An error message appears if you enter an invalid area code or no area code.
DAYTIME RATES IN DOLLARS PER MINUTE LOCAL CALL (0.05) : 7-DIGIT TOLL CALL (0.20) : 10-DIGIT TOLL CALL (0.50) : OPERATOR/INTERNATIONAL CALL (1.00) : INCOMING CALL (0.00) :	Enter the per-minute cost in dollars and cents for calls placed during the day. The range is 0.00 to 99.99.
MULTIPLICATIVE FACTORS EVENING (0.65) : NIGHT AND WEEKEND (0.40) :	Enter the number that, when multiplied by the above rates, produces the evening and night rates for calls. The range is 0.00 to 1.99.
REVIEW CALL COST AGAIN (N)?	Y- Return to the LOCAL AREA CODE prompt. N- Return to the call cost programming menu prompt ([ ]:).
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged. Return to the SAR programming menu prompt ([ ]).

18. MENU DISPLAYS

18.1 For convenience, the programmer can set the system to display menus as desired (always, at change of menu, or on request). To determine when the current menu is displayed, select D from the applications program menu. The prompts appear as shown below. End each entry with < CR >.

PROMPT	VALID ENTRY

DISPLAY CURRENT MENU
  A = ALWAYS
  C = CHANGE OF MENU
  R = REQUEST ONLY
DISPLAY CURRENT MENU (C):
	A– The current menu displays whenever a menu prompt appears.
	C– The current menu displays only when an item in a new menu is selected.
	R– The menu displays only when a question mark (?) is entered at a menu prompt.

RING BELL ON PROGRAMMING ERROR MESSAGES (Y):	Y– While programming, all error messages are accompanied by a bell sound from the terminal. N– Error messages appear without a bell sound from the terminal. *The terminal returns to the applications program menu.*

19. ON–LINE MONITOR

19.1 The on-line monitor program is used to display and change the system memory. Because it requires a knowledge of hexidecimal and binary mathematics, it is intended only for use by an advanced installer or engineer for debugging and maintaining the system. It is not intended for untrained personnel.

19.2 The on-line monitor menu is accessed by entering E from the applications program menu prompt. It includes the following:

```
ON–LINE MONITOR
    [A] CPU ON–LINE MONITOR
    [B] CPU ACTIVITY MONITOR
    ?  DISPLAY MENU
    .  EXIT

[MONITOR]:
```

A.   [A] CPU ON–LINE MONITOR

19.3 The on-line monitor program follows the format described below. When you first select [A] the following warning appears:

WARNING: THE ON–LINE MONITOR SHOULD BE USED ONLY BY TRAINED PERSONNEL. CHANGING VALUES COULD RESULT IN A MAJOR SYSTEM FAILURE.

19.4 A summary of the commands available can be viewed using the HELP directory. The help directory is displayed any time the user enters either a question mark (?) or HELP in response the command level prompt (MEM >). The *Advanced* and *Intermediate* software help directories show the following commands. The *Basic* software help directory appears in the same format, but does not include all of the commands shown here.

ON–LINE MONITOR HELP FACILITY			
C	CHANGE MEMORY <B, W, L>	NS	FIND NEXT MATCHING STRING
C+	ADD TO MEMORY START address	PE	PEEK INTO MEMORY <B, W, L>
ERRH	TOGGLE ERROR HALT BIT	PO	POKE INTO MEMORY <B, W, L>
ERRP	TOGGLE ERROR PRINT BIT	POST	POST A MESSAGE TO A TASK
EXIT	EXIT THE ROUTINE	SDOF	DISABLE SYSTEM DIAGNOSTICS
EXT	CONVERT EXTENSION TO TYPE/NUM	SDON	ENABLE SYSTEM DIAGNOSTICS
F	FIND MEMORY <B, W, L>	SEND	SEND A MESSAGE
DNRT	TOGGLE CPU/APP MESSAGE ENABLE	STR	FIND STRING IN MEMORY
FRZ	FREEZE RTT POLLING	UDOF	DISABLE USER DIAGNOSTICS
HELP	PRINT HELP DIRECTORY	UDON	ENABLE USER DIAGNOSTICS
I	INITIALIZE MEMORY <B, W, L>	UFRZ	UN-FREEZE RTT POLLING
M	MEMORY DUMP <B, W, L>	*	MULTIPLY W/ACCUMULATOR
UPRT	TOGGLE RTT MESSAGE ENABLE	+	ADDITION W/ACCUMULATOR
MV	MOVE MEMORY BLOCK <B, W, L>	.	EXIT THE ROUTINE
M+	ADD TO MEMORY START address	?	PRINT HELP DIRECTORY

19.5   After the help menu has been displayed, the terminal sends the message TYPE A PERIOD TO TERMINATE HELP, ANY OTHER TO CONTINUE. If you continue, the following menu appears.

FORMATTED CONTROL BLOCKS			
CFCB	PRINT DYNAMIC CNF-CCB	KCBD	PRINT DYNAMIC KEYSET CB
COCB	PRINT DYNAMIC CO-CCB	KCBS	PRINT STATIC KEYSET CB
DCBD	PRINT DYNAMIC DSS CB	LCBD	PRINT DYNAMIC CO-LCB
DCBS	PRINT STATIC DSS CB	LCBS	PRINT STATIC CO-LCB
DDBF	PRINT DIALED DIGIT BUFFER	SCBD	PRINT DYNAMIC SL-CB
ICCB	PRINT DYNAMIC IC-CCB	SCBS	PRINT STATIC SL-CB

19.6   The terminal sends the message TYPE A PERIOD TO TERMINATE HELP, ANY OTHER TO CONTINUE. If you continue, the following menus appear.

RESOURCE MANAGER ROUTINES			
CCB	CALL CONTROL BLOCK BIT LIST	DTMF	DTMF BIT LIST AND MAP
CNF	CNF CONTROL BLOCK BIT LIST	ICQ	IC CALL CONTROL BLOCK QUE
COQ	CALL CONTROL BLOCK QUEUE	SPQ	SMDR WAIT QUEUE
DB	DIALED-DIGIT BUFFER BIT LIST	TONE	TONE BIT LIST AND MAP
DBQ	DIALED-DIGIT BUFFER QUEUE	VC	VOICE CHANNEL BIT LIST
DIAG	TOGGLE CP DIAGNOSTICS BIT	ICVC	IC VOICE CHANNEL COUNTER

ADDITIONAL ROUTINES			
BELL	RING BELL ON ERROR MESSAGES	CPMH	CP MESSAGE HISTORY QUEUE
CPFR	FREEZE CP MESSAGE QUEUE	CPUF	UNFREEZE CP MESSAGE QUEUE
RHST	DUMP RESET HISTORY	CPF?	CP MESSAGE QUEUE FROZEN?
CPDS	CP HIST FROM CURRENT MSG	CPDH	DUMP CP MESSAGE HISTORY
CODS	CO HISTORY FROM CURRENT MSG	CODH	DUMP CO MESSAGE HISTORY
AUX	DUMP X AUX INFO RECORDS	AUXD	DUMP AUXILIARY HISTORY
PC	PC PEEK < B,W,L >	PCM	PC DUMP MEMORY
PCDH	DUMP CP MESSAGE HISTORY	PCDA	PC DUMP AUX HISTORY
PORT	ORIGINATING FWDS IDENTIFICATION	UDDG	UP/DOWN DIAG TOGGLE

19.7   To exit the on-line monitor program and return to the [MONITOR]: prompt, enter EXIT, QUIT, or a period (.) at any command level prompt.

19.8   The first group of commands shown in the HELP menu are used to find, change, and initialize the system memory blocks, as described on the following pages.

Find Memory

19.9 The find (F) function allows the user to locate all instances of a specified KEY (ANDed with the optional mask) in a given range of memory. The command is in the following format:

F[B/W/L] START STOP KEY [MASK]

19.10 The following parameters can be specified:

- The memory range can be specified as START and STOP address, or as a START address followed by the number of locations to be searched.

- The number of locations to be searched depend on the mode (byte, word, or longword).

- The substring must start on a word boundary.

- Values taken from memory are ANDed with the mask value before they are compared to the input value for the KEY. When only the first three parameters are input, the default value of the mask is $FFFFFFFF, specifying an exact match between the memory values and the KEY.

19.11 For example, the command FL C000 30 FE00 locates the next $30 (hex) longwords beginning at location $C000 for the longword value $0000FE00.

19.12 When a match is found, the entire line (or lines) containing the matched substring is displayed and the memory repeat address is set to the base of the line. When multiple locations match the input KEY, the entire line is printed and the system continues to display matching information until a full page has been displayed on the screen. The system then waits for either a period (.) to terminate the find command, or any other character to continue searching until the range has been exhausted or another full page has been displayed (in which case the system waits again).

Find String in Memory

19.13 The find string (STR) command allows the programmer to search through an area of memory for the given literal string. The command uses the following format:

STR START STOP literal string

19.14 Three parameters are required for the STR command:

- The START address of the search.

- Either the STOP address or the range of words that are to be searched.

- The final parameter that specifies the literal string to find. The string and the memory are converted to upper case letters before the comparisons are made.

19.15 If a match is not found, a message is displayed. Or, when a match is found, the lines that contain the substring are displayed and the memory repeat mode is enabled for the next line. When the command prompt displays, either inspect the memory that follows the string by pressing the carriage return <CR> key, or search for another instance of the string by typing NS at the MEM> prompt. The search is picked up from the point where it left off and searches the remainder of the requested range.

Memory Dump

19.16 The memory dump (M) command allows the programmer to display an area of memory in one of three formats. Word format (default value) is displayed when an M or MW is followed by the optional START and STOP parameters. Byte format is requested by entering MB. Longword format is used when ML is entered.

19.17 The memory dump (M) command uses the following format:

M[B/W/L] [[START] [STOP]]

19.18 The START and STOP addresses follow the format command to determine the beginning and end of the selected memory block. For example:

- ML C000, 4 or ML C000 4 — A new START address is specified for the START parameter, followed by the number (interpreted as a hexidecimal value) of memory longwords to display.

- ML ,4 — Use the current value for the memory START address and display the next 4 longwords of memory. When no starting address is specified, the current value of the memory dump START variable is used. (To add to the START address for the memory dump processor, use the M+ command.)

- M — Sixteen lines of word-formatted memory are displayed using the current value for START as the START address.

NOTE: Either a comma (,) or space can be used to separate the parameters.

19.19 The memory dump pauses between pages. Enter one of the following characters:

- An "at" sign (@) — The current value for the memory START variable is set to the base address of the top of the current page. This allows the programmer to read a large area of memory and mark an area for the default START address to begin the next use of the memory dump command.

- A comma (,) — The current screen of data is re-displayed. This allows the programmer to observe data as it is changed by some other task.

- A period (.) — The memory dump command is terminated. The memory START variable is unaffected.

- A circumflex (^) or asterisk (*) — The previous screen of data is displayed. This allows the programmer to back up. The back-up can extend beyond the memory START address.

- Any other character — The next screen of data is displayed. Pages of memory are displayed until this mode is terminated with either a period (.) or @, or the end of the range is reached.

19.20 After an area of memory is displayed, successive lines of memory can be viewed by pressing the carriage return <CR> in response to the command prompt (MEM >).

Change Memory

19.21 The change memory (C) command allows the programmer to change a byte, word, or longword in memory. The command is entered in the following format:

C[B/W/L] [START]

19.22 The START address for the change command is optional; one of the following can be used: Use word format (default value) by entering C or CW (with or without a starting address), specify byte format by entering CB, or select longword format using CL.

19.23 To terminate the change mode, enter one of the following characters followed by a carriage return <CR>.

- An "at" sign (@) — The START address can be changed at any time by simply entering a new START address when the change command is entered or by using the @ terminator while in change mode. When the @ terminator is used, the change mode START parameter is set to the address currently displayed on the terminal.

- A comma (,) — The same line is re-displayed on the terminal.

- A period (.) — Return to the command prompt for the on-line monitor.

- A circumflex (^) or asterisk (*) — The previous line of memory is displayed at the terminal.

- A <CR> — Continue to the next line of memory.

Add To Memory START address

19.24 The M+ and C+ commands add an offset to the current memory or change START address to determine the starting address of a field within a data structure. (They do not change the current START address.) They are used in the following format:

M+ ADDEND or C+ ADDEND

19.25 Once the field address has been computed, full lines of memory can be viewed by pressing the carriage return <CR> key.

19.26 Depending on whether the M+ or C+ is used, after the computed address is displayed (RESULT = XXXXXX) the system is put into memory display mode or change mode (auto repeat is enabled).

Initialize Memory

19.27 The initialize memory (I) command allows the programmer to initialize a range of memory bytes, words, or longwords to any desired value. The command uses the following format:

I[B/W/L] START STOP KEY.

19.28 The parameters for the initialize command are similar to the find command in that the range is given by a START and STOP address or a START address followed by the amount of memory to initialize.

19.29 For example, the command I 15000 A 11 causes the 10 words starting at location $15000 to be initialized to 0011.

Move Memory Block

19.30 The move memory (MV) command allows the programmer to move a block of memory to another location. Enter the command in the following format:

MV[B/W/L] START STOP DESTINATION

19.31 The same parameters used for the find command are needed to move the blocks. When MV is used without a size qualifier, the default value is word. To specify byte, word, or longword, use MVB, MVW, or MVL, respectively.

19.32 No provision is made for overlapping buffers. Therefore, depending on the degree of overlap and the direction of the move, the resulting buffer may not be what was expected.

Toggle Error Halt/Error Print Bits

19.33 The ERRH/ERRP commands are used to turn on and off the call processing error display. When the ERRP bit is set and a call processing error occurs, the error messages are posted for the call processing error print task.

Enable/Disable System Diagnostics

19.34 The SDON/SDOF commands are used to enable and disable the reporting of system diagnostic messages to the primary port. SDOF disables error messages and SDON enables error messages.

Enable/Disable User Diagnostics

19.35 The UDON/UDOF commands are used to enable and disable the printout of user diagnostic messages to the primary port. UDOF disables error messages and UDON enables error messages.

Toggle Message Enable Bit

19.36 The DNRT command toggles the message enable bit. When this bit is set (1), all messages are displayed at the primary port. When this bit is cleared, the messages are not displayed.

Toggle RTT Message Enable Bit

19.37 The UPRT command is used to toggle the RTT message enable bit. When this bit is set, messages are displayed at the primary port. When the message bit is cleared, no message is displayed.

Send A Message

19.38 Entering the SEND command allows the programmer to send messages (entered from the keyboard). After each message is sent, the message processor prompts the user for another message. This mode can be terminated by entering a period (.) in response to the prompt MESSAGE:.

```
                 CAUTION

 Message validity is NOT verified before being
 sent. It is therefore the responsibility of the user
 to send proper messages.
```

Post A Message To A Task

19.39 Entering the POST command allows the programmer to post messages (entered from the keyboard).

Freeze RTT Polling

19.40 The FRZ/UFRZ commands are used to enable and disable the keyset polling. The FRZ command causes the CPU to stop polling the keysets for data. In this mode, the rest of the system continues to function as normal. The UFRZ command re-enables the polling function so that the entire system functions normally.

Multiply With Accumulator

19.41 The multiply command (*) uses the following format:

* [P1], P2

19.42 It requires up to two parameters. The first parameter represents the accumulator value and is optional for this command. If missing, the multiplicand is the value for the accumulator. For example, *,12 is interpreted correctly as 12 times the accumulator value. However, * 12 is interpreted as 12 times the constant value.

19.43 All inputs are interpreted as hexidecimal values. The unary operators + and – are allowed:

Addition With Accumulator

19.44 The add command (+) requires uses the following format:

+ [P1], P2

It requires up to two parameters. The first parameter represents the primary addend and is optional for this command. If missing, the primary addend is taken from the accumulator for the add instruction. This allows results to accumulate over several additions. The second parameter specifies the secondary addend and is also optional. If the secondary addend is omitted, the constant value is used in its place.

NOTE: When the primary addend is missing, the user must precede the second parameter with a comma or it is taken as a new value for the accumulator. For example, +,12 is interpreted correctly as the accumulator plus 12. However, + 12 is interpreted as 12 plus the constant value.

19.45 All inputs are interpreted as hexidecimal values. The unary operators + and – are allowed.

Memory Read/Write Commands

19.46 The PE/PO commands allow the programmer to inspect or change a byte, word, or longword in memory. They use the following format:

PE [B/W/L] [START] or PO [B/W/L] [START]

19.47 The START address for the peek and poke commands are optional and default to the last START address specified for the command. The default size of the commands is word. Choose one of the following, if desired: Enter POB or PEB for byte, enter POW or PEW for word, or enter POL or PEL for longword.

19.48 The terminators are the same for the memory change (M) command.

Convert Extension Number to Type and Logical Number

19.49 The EXT command allows the programmer to enter the extension (intercom) number of a station. The terminal then displays the type of station instrument and the hex value of the control block associated with the extension number. Enter the command in the following format:

EXT EXXX (extension number)

Formatted Control Blocks

19.50 The formatted control block commands can be used to display the blocks of system data. The control blocks are displayed with the data on the right half of the screen and a brief description on the left half of the screen. The fields are separated by a colon.

19.51 The base address of the control block is output as a 32-bit hexidecimal value on the first line of the display. The remaining fields of the control block are output using hexidecimal, binary, ASCII, or DTMF binary-coded decimal (DTMF BCD) values.

19.52 The hexidecimal values begin with a dollar sign ($) and can be represented as byte, word, 3-byte, or longword fields. Individual fields that contain more than one value are separated by blank spaces and as many fields as possible are put on the same line. A new line for the same field starts with a colon in the middle of the page or screen.

19.53 All binary fields are broken into byte quantities and begin with a percent sign (%). As many values as will fit in the right half of the page/screen are output with blank spaces inserted to separate the fields.

19.54 ASCII fields are displayed without spaces. As many characters as will fit on a line are output before a new line is started.

19.55 DTMF BCD values are represented according to the following table. These values are printed as a single field with no intervening spaces.

```
DTMF BCD  1 2 3 4 5 6 7 8 9 A B C D E F
                                        INTERPRETATION
DISPLAY VALUE  1 2 3 4 5 6 7 8 9 0 # * S M L
                                          │  └─────── long pause
                                          └───────── medium pause
                                        └─────────── short pause
```

Resource Manager Routines

19.56 The commands listed under resource manager routines in the HELP menu are used to specify the resource list to be inspected. After the source is specified, the programmer can view and/or change (using the change memory command) the contents of the resource displayed.

NOTE: The resource manager routines can change values that can cause a major system failure.

B. [B] CPU ACTIVITY MONITOR

19.57 This program is intended for use by trained engineers to monitor the activity of the central processing unit (CPU) in the KSU. The activity monitor produces a graph that shows the amount of useful work being performed by the CPU. Useful work includes executing call processing code, applications code, or operating system code. The graph appears in the following format:

BUSY DATA COUNT:

xxx%   xxx%   xxxxx: ******...****

xxx%   xxx%   xxxxx: ******...****

xxx%   xxx%   xxxxx: ******...****

19.58 The first column (BUSY) indicates the total percentage of time that the CPU was busy during the time the graph was being generated. For example, if a new graph is generated every 3 seconds and the percentage is 50%, the CPU was busy for 1.5 seconds (.5 x 3).

19.59 The second column (DATA) indicates the percentage of time the CPU was waiting for hardware communication (this is wasted time because the CPU is not performing useful work while waiting). Under normal operating conditions this percentage should be zero. If it is not, subtract this number from the BUSY percentage to determine the actual useful system busy time.

19.60 The third column (COUNT) indicates the number of bytes of data the CPU generated to the keysets during the measured time interval.

19.61 The fourth column is a graphic representation of the first two columns. An asterisk (*) appears for each two percent of BUSY time and a hyphen (–) for each two percent of DATA time.

19.62 As an example, the graph below shows 56% BUSY time and 22% DATA time, which is represented in the graph as 34% actual useful system busy time (17 asterisks = 34%; 11 hyphens = 22%):

BUSY DATA COUNT:
56% 22%   15623:****************----------

19.63 To reach the program, enter B from the on-line monitor menu. The prompts are as shown below.

PROMPT	VALID ENTRY
WINDOW SIZE (28):	The window size is the amount of time it takes for the APP activity to be measured and each graph to be produced. The default window size is 28 units. Since each unit is 1/28 of a second, this produces one graph every second. (A window size of 56 units would produce a graph every two seconds.) Enter a window size between 1 and 65,535. However, it is not recommended to use a window size of less than 28.
SCREEN SIZE (1):	The screen size determines the number of graphs printed at one time. The default value is one (1). If the screen size is changed to three (3), the system will wait until three graphs have accumulated before printing them. Enter a screen size between 1 and 22.
OUTPUT PORT P = PRIMARY A = ACCESSORY PORT 1 B = ACCESSORY PORT 2 OUTPUT PORT (P) :	*This prompt does not appear in Basic software.* Choose the output port to which the printer or terminal will be attached. Enter P for the KSU port or enter A or B for the desired APM port. The graph automatically begins printing. To terminate the output at any time, press any key on the terminal to return to the on-line monitor menu prompt ([MONITOR]).

20. SELF TEST

NOTE: This program appears in the *Intermediate* and *Advanced* software packages only.

20.1 This programming function is reached by entering F from the applications program menu. A password may be assigned to limit access to trained users. The network self test function tests the voice channels and switching matrices of the system. It should be used for every new installation, whenever a module is changed, and if a voice channel problem arises.

20.2 When the self test menu option is selected, the following warning appears:

**WARNING: IN ORDER TO PERFORM THE SELF TEST, THE ENTIRE SYSTEM WILL BE HALTED. WHEN YOU BEGIN TESTING, ALL CALLS IN PROGRESS WILL BE TERMINATED AND NO FURTHER CALLS WILL BE HANDLED BY THE SYSTEM UNTIL THE TESTING IS COMPLETE. WHEN TESTING IS COMPLETE, A RESET WILL TAKE PLACE.
DO YOU WANT TO BEGIN TESTING? (Y):**

20.3 If the system is in use, alert the users before beginning the test. When ready, enter < CR >. Or, enter N < CR > to return to the applications programming menu.

20.4 There are several tests available as shown in the menu below. Each is described separately in this section. All tests, except system board status, require an APM to run.

[A] SYSTEM BOARD STATUS
[B] INDIVIDUAL CPU (MOTHER) BOARD
[C] INDIVIDUAL EXP MODULE
[D] ALL EXP MODULES
[E] INDIVIDUAL ACCESSORY PORT MODULE
[F] ALL ACCESSORY PORT MODULES
[G] FULL SYSTEM
[H] PASSWORD
[I] EXIT
SELECT TEST:

20.5 Each of the test programs show the connections that pass (indicated by a "P") and fail (indicated by an "F"). Failures can be caused by faulty chips, boards, or module connections, or they can be caused by stations and C.O. lines that cannot be connected due to system board configuration (refer to SPECIFICATIONS, page 2-8, for an explanation of proper

Expansion Module and Accessory Port Module installation).

A. [A] SYSTEM BOARD STATUS

20.6 Selection A from the menu allows the programmer to view the current configuration of modules in the the system.

20.7 The test results appear as shown below:

```
***  SYSTEM BOARD STATUS
MOB  EXP Modules  APM
 1   1 2 3 4 5    1 2
 M   E E E - -    A -
```

```
Select Test:
```
The sample indicates that the motherboard, three EXP Modules, and one APM are installed. The dashes indicate empty slots.

B. [B] INDIVIDUAL CPU (MOTHER) BOARD

20.8 This tests the components on the KSU motherboard including the DTMF transmitter, DTMF receivers, tone generators, internal paging amplification circuitry, external paging circuitry, C.O. line circuitry, and station circuitry. It *must* be run before any other test on a newly initialized system. It performs a "stuck closed" and a "stuck open" test on each connection.

20.9 The first prompt allows you to select the output port for the test results. Enter P for the KSU port, or A or B for an APM port.

NETWORK SELF TEST OUTPUT PORT
  P = PRIMARY
  A = ACCESSORY PORT 1
  B = ACCESSORY PORT 2
NETWORK SELF TEST OUTPUT PORT (P):

20.10 If the selected port is in use or the APM is not installed, the next prompt is REQUESTED OUTPUT PORT IS BUSY. WAIT FOR THE PORT TO BE AVAILABLE (Y). If you press RETURN, the output is buffered until the port is available and then prints. To cancel the output, press N and RETURN.

20.11 The test results are printed as shown on the next page. A failure in the test would be indicated by an "F" in place of a "P" and the word "FAIL" at the end of the line. If the DTMF tests fail, a message appears (*** DTMF TEST FAILURE — NO FURTHER TESTING) and the system will not permit any more tests to be run. Replace the KSU.

*** Network Self Test Mother Board

```
                             System Channels
                                 1                   2
                 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2
                 -----------------------------------------------
DTMF XMT #X
DTMF RCV #X
  Stuck Closed Test   P P P P P P P P P P P P P P P P P P P P P P  PASS
  Stuck Open Test     P P P P P P P P P P P P P P P P P P P P P P  PASS
                      # * 0 9 8 7 6 5 4 3 2 1
  Digit Test          P P P P P P P P P P P P                      PASS


                             System Channels
                                 1                   2
                 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2
                 -----------------------------------------------
DTMF XMT #X
DTMF RCV #X
  Stuck Closed Test   P P P P P P P P P P P P P P P P P P P P P P  PASS
  Stuck Open Test     P P P P P P P P P P P P P P P P P P P P P P  PASS
                      # * 0 9 8 7 6 5 4 3 2 1
  Digit Test          P P P P P P P P P P P P                      PASS


                             System Channels
                                 1                   2
                 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2
                 -----------------------------------------------
Internal Paging Input
  Stuck Closed Test   P P P P P P P P P P P P P P P P P P P P P P  PASS
  Stuck Open Test     P P P P P P P P P P P P P P P P P P P P P P  PASS
External Paging Input
  Stuck Closed Test   P P P P P P P P P P P P P P P P P P P P P P  PASS
  Stuck Open Test     P P P P P P P P P P P P P P P P P P P P P P  PASS
CO Line #01
  Stuck Closed Test   P P P P P P P P P P P P P P P P P P P P P P  PASS
  Stuck Open Test     P P P P P P P P P P P P P P P P P P P P P P  PASS
...
CO Line #04
  Stuck Closed Test   P P P P P P P P P P P P P P P P P P P P P P  PASS
  Stuck Open Test     P P P P P P P P P P P P P P P P P P P P P P  PASS
Station #01
  Stuck Closed Test   P P P P P P P P P P P P P P P P P P P P P P  PASS
  Stuck Open Test     P P P P P P P P P P P P P P P P P P P P P P  PASS
...
Station #08
  Stuck Closed Test   P P P P P P P P P P P P P P P P P P P P P P  PASS
  Stuck Open Test     P P P P P P P P P P P P P P P P P P P P P P  PASS
```

C. [C] INDIVIDUAL EXP MODULE

20.12   This test allows you to check the station connections on a specific EXP module.

20.13   Before running this test, the test for the CPU (Motherboard) must be completed first. If not, the test shows: *** TEST MOTHERBOARD **** DO YOU WANT TO CONTINUE WITH THE TEST? (Y). Enter N and then complete the CPU test first.

20.14   If the CPU has been tested, but the DTMF part of the test did not pass completely, an error message occurs (*** DTMF TEST FAILURE — NO FURTHER TESTING) and the network self test menu returns. The KSU must be replaced and retested before attempting to test any modules.

20.15   The test is preceded by the following prompt: ENTER EXP MODULE # (1–5). Enter the desired number. If an invalid number is entered, an error message appears (*** INVALID EXP MODULE NUMBER ***) and the prompt repeats.

20.16   The next prompt allows you to select the output port for the test results. Enter P for the KSU port, or A or B for an APM port.

NETWORK SELF TEST OUTPUT PORT
  P = PRIMARY
  A = ACCESSORY PORT 1
  B = ACCESSORY PORT 2
NETWORK SELF TEST OUTPUT PORT (P):

20.17   If the selected port is in use or the APM is not installed, the next prompt is REQUESTED OUTPUT PORT IS BUSY. WAIT FOR THE PORT TO BE AVAILABLE (Y). If you press RETURN, the output is buffered until the port is available and then prints. To cancel the output, press N and RETURN.

20.18   If the selected module has not been installed, an error message (*** NETWORK TEST EXP MODULE #XX — NOT PRESENT) appears and the self test menu returns.

20.19   The test results are printed as shown below. A failure in the test would be indicated by an "F" in place of a "P" and the word "FAIL" at the end of the line.

D. [D] ALL EXP MODULES

20.20   This test checks and prints results for all EXP Modules installed. The prompts and results are identical to the individual EXP Module test, except that they repeat until all modules are tested.

```
                          System Channels
                          1                     2
                 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2
                 ------------------------------------------------
Station #XX
   Stuck Closed Test   P P P P P P P P P P P P P P P P P P P P P P  PASS
   Stuck Open Test     P P P P P P P P P P P P P P P P P P P P P P  PASS
...
Station #XX
   Stuck Closed Test   P P P P P P P P P P P P P P P P P P P P P P  PASS
   Stuck Open Test     P P P P P P P P P P P P P P P P P P P P P P  PASS

Select Test :
```

E. [E] INDIVIDUAL ACCESSORY PORT MODULES

20.21 This test checks the station and C.O. line connections on an individual APM.

20.22 Before running this test, the test for the CPU (Motherboard) must be completed first. If not, the test shows: *** TEST MOTHERBOARD **** DO YOU WANT TO CONTINUE WITH THE TEST? (Y). Enter N and then complete the CPU test first.

20.23 If the CPU has been tested, but the DTMF part of the test did not pass completely, an error message occurs (*** DTMF TEST FAILURE — NO FURTHER TESTING) and the network self test menu returns. The KSU must be replaced and retested before attempting to test any modules.

20.24 The test is preceded by the following prompt: ENTER ACCESSORY PORT MODULE # (1-2). Enter the desired number. If an invalid number is entered, an error message appears (*** INVALID ACCESSORY PORT MODULE NUMBER ***) and the prompt repeats.

20.25 The next prompt allows you to select the output port for the test results. Enter P for the KSU port, or A or B for an APM port.

NETWORK SELF TEST OUTPUT PORT
  P = PRIMARY
  A = ACCESSORY PORT 1
  B = ACCESSORY PORT 2
NETWORK SELF TEST OUTPUT PORT (P):

20.26 If the selected port is in use or the APM is not installed, the next prompt is REQUESTED OUTPUT PORT IS BUSY. WAIT FOR THE PORT TO BE AVAILABLE (Y). If you press RETURN, the output is buffered until the port is available and then prints. To cancel the output, press N and RETURN.

20.27 If the APM select for the report has not been installed, an error message (*** NETWORK TEST ACCESSORY PORT MODULE #XX — NOT PRESENT) appears and the self test menu returns.

20.28 The report appears as shown below. A failure in the test would be indicated by an "F" in place of the "P" and the word "FAIL" at the end of the line.

```
                            System Channels
                          1                    2
                1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2
                ------------------------------------------------
Station #XX
   Stuck Closed Test    P P P P P P P P P P P P P P P P P P P P P P  PASS
   Stuck Open Test      P P P P P P P P P P P P P P P P P P P P P P  PASS
...
Station #XX
   Stuck Closed Test    P P P P P P P P P P P P P P P P P P P P P P  PASS
   Stuck Open Test      P P P P P P P P P P P P P P P P P P P P P P  PASS

Select Test :
```

F.   [F] ALL ACCESSORY PORT MODULES

20.29   This test checks and prints results for both APMs. The prompts and results are identical to the individual APM test, except that both APMs are tested.

G.   [G] FULL SYSTEM

20.30   This test checks the CPU and all modules. Test results appear as shown for each of these tests on the previous pages.

H.   [H] PASSWORD

20.31   Selection H from the menu allows you to assign a password that limits access to the network self test program. (A password for the network self test can also be assigned or removed from program [AH] Passwords; see page 5-30.) If a password is required, the terminal displays "PASSWORD:" whenever someone attempts to access the network self test program. If an invalid entry is entered, the system returns to the applications menu prompt and prints an error message. For security, the password does not appear on the terminal when typed.

20.32   A password can be up to eight characters long. To allow immediate access to the network self test program, no password is assigned during initialization.

NOTE: If a password is created and later designated as *not* required, it remains in the system memory. If it is later designated as required and a *new* password is not created, the original password is assigned.

20.33   The password programming prompts are shown below.

I.   [I] EXIT

20.34   To exit from the network self test menu, enter I, period (.), CONTROL-Y, or CONTROL-C. When the exit command is received the following message appears and the system is reset (the programmed database is left unchanged).

RESET WILL NOW TAKE PLACE

20.35   After the reset, the system returns to normal operation.

PROMPT	VALID ENTRY
REQUIRE A PASSWORD FOR NETWORK SELF TEST (N):	N– Return to the self test menu prompt ([ ]:). Y– Continue to the next prompt.
CHANGE NETWORK SELF TEST PASSWORD (N)?	N– Return to the self test menu prompt ([ ]:). Y– Continue to the next prompt.
ENTER NEW PASSWORD:	Enter up to eight characters.
ENTER NEW PASSWORD AGAIN:	Repeat the same characters. If the two entries do not match, an error message appears; retype the password.
PERFORM UPDATE TO SYSTEM DATABASE (Y OR N)	*This prompt appears only if new information was entered.* Enter Y < CR > to save the changes or N < CR > to leave the database unchanged.

FIGURE 5-1. SYSTEM TIMER PROGRAM PLANNING SHEET

[AB] TIMER VALUES (TIMR): List new values if different than default values.

	RANGE	DEFAULT VALUE	NEW VALUE
Programmed in hundredths of a second:			
CO-CO DISCONNECT	2-250	35	_____
IC-CO DISCONNECT	2-250	60	_____
DTMF DIGIT DURATION/PAUSE	2-60	6	_____
CO HOOKFLASH	2-250	60	_____
Programmed in tenths of seconds:			
DIALING WAIT AFTER CONNECT	10-250	15	_____
DIALING WAIT AFTER HOOKFLASH	1-250	30	_____
INTER-RING SILENCE	1-250	60	_____
KEYSET HOOKSWITCH DEBOUNCE	1-50	10	_____
OFF-LINE AFTER DISCONNECT	10-250	10	_____
REMINDER MESSAGE SCROLL DELAY	0-50	5	_____
*SL HOOKFLASH MINIMUM	1-10	2	_____
*SL HOOKFLASH MAXIMUM	2-20	7	_____
*VOICE MAIL/COMPUTER DIALING DELAY	0-100	5	_____
Programmed in seconds:			
CAMP-ON	0-255	3	_____
CAMP-ON TONE	5-255	15	_____
CO RE-SEIZE	1-15	3	_____
DATA PORT WAIT	1-255	30	_____
DIAL TONE WAIT	1-50	2	_____
DIAL INITIATION — KEYSET	5-30	15	_____
*DIAL INITIATION — SL SET	5-30	10	_____
DISCONNECT WAIT AFTER DIALING	2-30	20	_____
FORWARD NO ANSWER	3-255	15	_____
HOLD	10-255	60	_____
INACTIVITY ALARM	10-255	60	_____
INTERDIGIT (LONG)	2-255	15	_____
INTERDIGIT (SHORT)	2-30	4	_____
LINE PRE-SELECT	2-255	5	_____
MESSAGE (AT MESSAGE CENTER)	1-255	5	_____
OFF-HOOK VOICE ANNOUNCE SCREENING	0-255	5	_____
PAGING	0-255	15	_____
PAUSE DIGIT	1-5	3	_____
QUEUE CALLBACK	10-255	15	_____
RECALL	10-255	60	_____
*STATION MONITORING TONE	5-255	15	_____
TRANSFER-AVAILABLE	10-255	20	_____
TRANSFER-BUSY	10-255	24	_____
VALID CALL	0-60	15	_____
Programmed in minutes:			
ABANDONED RECALL	1-255	10	_____
UNSUPERVISED CONFERENCE	1-255	5	_____
UNSUPERVISED CO	1-255	5	_____

*Not available in *Basic* software.

FIGURE 5–2. SPEED-DIAL PROGRAM PLANNING SHEET

[AC] SYSTEM SPEED-DIAL (SPDI):

System speed-dial programming station: _____   Display system numbers from 00 – ___ (09–99)

	SPEED-DIAL NUMBER	NAME	TENANT GROUP #
00			
01			
02			
03			
04			
05			
06			
07			
08			
09			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			
42			
43			
44			
45			
46			

FIGURE 5-2.   SPEED-DIAL PROGRAM PLANNING SHEET (CONT'D)

47 _____ _____ _____

48 _____ _____ _____

49 _____ _____ _____

50 _____ _____ _____

51 _____ _____ _____

52 _____ _____ _____

53 _____ _____ _____

54 _____ _____ _____

55 _____ _____ _____

56 _____ _____ _____

57 _____ _____ _____

58 _____ _____ _____

59 _____ _____ _____

60 _____ _____ _____

61 _____ _____ _____

62 _____ _____ _____

63 _____ _____ _____

64 _____ _____ _____

65 _____ _____ _____

66 _____ _____ _____

67 _____ _____ _____

68 _____ _____ _____

69 _____ _____ _____

70 _____ _____ _____

71 _____ _____ _____

72 _____ _____ _____

73 _____ _____ _____

74 _____ _____ _____

75 _____ _____ _____

76 _____ _____ _____

77 _____ _____ _____

78 _____ _____ _____

79 _____ _____ _____

80 _____ _____ _____

81 _____ _____ _____

82 _____ _____ _____

83 _____ _____ _____

84 _____ _____ _____

85 _____ _____ _____

86 _____ _____ _____

87 _____ _____ _____

88 _____ _____ _____

89 _____ _____ _____

90 _____ _____ _____

91 _____ _____ _____

92 _____ _____ _____

93 _____ _____ _____

94 _____ _____ _____

95 _____ _____ _____

96 _____ _____ _____

97 _____ _____ _____

98 _____ _____ _____

99 _____ _____ _____

FIGURE 5-3.   ACCOUNT CODE PROGRAM PLANNING SHEET

[AD] ACCOUNT CODES (ACCT):

Length of all account codes is _____ (4-8) digits.

STANDARD ACCOUNT CODES:

0 _____	7 _____	14 _____	21 _____	28 _____
1 _____	8 _____	15 _____	22 _____	29 _____
2 _____	9 _____	16 _____	23 _____	30 _____
3 _____	10 _____	17 _____	24 _____	31 _____
4 _____	11 _____	18 _____	25 _____	
5 _____	12 _____	19 _____	26 _____	
6 _____	13 _____	20 _____	27 _____	

FORCED ACCOUNT CODES:

0 _____	24 [3.8] _____	48 [6.8] _____	72 _____	96 _____
1 [1.1] _____	25 [4.1] _____	49 [7.1] _____	73 _____	97 _____
2 [1.2] _____	26 [4.2] _____	50 [7.2] _____	74 _____	98 _____
3 [1.3] _____	27 [4.3] _____	51 [7.3] _____	75 _____	99 _____
4 [1.4] _____	28 [4.4] _____	52 [7.4] _____	76 _____	100 _____
5 [1.5] _____	29 [4.5] _____	53 [7.5] _____	77 _____	101 _____
6 [1.6] _____	30 [4.6] _____	54 [7.6] _____	78 _____	102 _____
7 [1.7] _____	31 [4.7] _____	55 [8.1] _____	79 _____	103 _____
8 [1.8] _____	32 [4.8] _____	56 [8.2] _____	80 _____	104 _____
9 [2.1] _____	33 [5.1] _____	57 [8.3] _____	81 _____	105 _____
10 [2.2] _____	34 [5.2] _____	58 [8.4] _____	82 _____	106 _____
11 [2.3] _____	35 [5.3] _____	59 [8.5] _____	83 _____	107 _____
12 [2.4] _____	36 [5.4] _____	60 [8.6] _____	84 _____	108 _____
13 [2.5] _____	37 [5.5] _____	61 _____	85 _____	109 _____
14 [2.6] _____	38 [5.6] _____	62 _____	86 _____	110 _____
15 [2.7] _____	39 [5.7] _____	63 _____	87 _____	111 _____
16 [2.8] _____	40 [5.8] _____	64 _____	88 _____	112 _____
17 [3.1] _____	41 [6.1] _____	65 _____	89 _____	113 _____
18 [3.2] _____	42 [6.2] _____	66 _____	90 _____	114 _____
19 [3.3] _____	43 [6.3] _____	67 _____	91 _____	115 _____
20 [3.4] _____	44 [6.4] _____	68 _____	92 _____	116 _____
21 [3.5] _____	45 [6.5] _____	69 _____	93 _____	117 _____
22 [3.6] _____	46 [6.6] _____	70 _____	94 _____	118 _____
23 [3.7] _____	47 [6.7] _____	71 _____	95 _____	119 _____

FIGURE 5–4. REMINDER MESSAGE PROGRAM PLANNING SHEET

[AE] REMINDER MESSAGES (MESS):

DEFAULT MESSAGE   **NEW MESSAGE**

MESSAGE 1 (MEETING):   _____

MESSAGE 2 (STAFF MEETING):   _____

MESSAGE 3 (SALES MEETING):   _____

MESSAGE 4 (CANCEL MEETING):   _____

MESSAGE 5 (APPOINTMENT):   _____

MESSAGE 6 (PLACE CALL):   _____

MESSAGE 7 (CALL CLIENT):   _____

MESSAGE 8 (CALL CUSTOMER):   _____

MESSAGE 9 (CALL HOME):   _____

MESSAGE 10 (CALL CORPORATE):   _____

MESSAGE 11 (CALL ENGINEERING):   _____

MESSAGE 12 (CALL MARKETING):   _____

MESSAGE 13 (CALL ACCOUNTING):   _____

MESSAGE 14 (CANCEL DND):   _____

MESSAGE 15 (CANCEL CALL FWD):   _____

MESSAGE 16 (TAKE MEDICATION):   _____

MESSAGE 17 (MAKE RESERVATION):   _____

MESSAGE 18 (REVIEW SCHEDULE):   _____

MESSAGE 19 (LUNCH):   _____

MESSAGE 20 (REMINDER):   _____

FIGURE 5-5. MISC. SYSTEM DATA PROGRAM PLANNING SHEET

[AF] MISC. SYSTEM DATA (MISC): Circle one choice for each question.

Primary Attendant/System Alarm Station is: _____

Broadcast Alarms to All Attendants   Y *or* N

Day/Night Mode Toggle Station is: _____

Allow Cross-Tenant Traffic: Y *or* N

*Allow Cross-Tenant Voice Mail/Computer Traffic: Y *or* N

ENABLE SYSTEM WIDE:

Account Code Class of Service:	Y *or* N
*Audible Message Indication for SL Sets:	Y *or* N
**Automated Attendant Dial During Recording:	Y *or* N
C.O. Line Privacy Release:	Y *or* N
DTMF Tones During Speed Dialing:	Y *or* N
Hardware Handshake for Primary Port:	Y *or* N
*Hardware Handshake for Accessory Port A:	Y *or* N
*Hardware Handshake for Accessory Port B:	Y *or* N
Hookflash Programming in Speed Dial Numbers:	Y *or* N
LCD Identification for Keyset Full-Time:	Y *or* N
Off-Hook Voice Announce:	Y *or* N
Immediate DSS Off-Hook Announce:	Y *or* N
Override SCOS with System Speed Dial Numbers:	Y *or* N
Reverse Transfer Immediate Connection:	Y *or* N
System Hold Different Flash Rate:	Y *or* N
Skate-to-Hold:	Y *or* N
*Station Monitoring Periodic Tones:	Y *or* N
*Voice Mailbox Number Validation:	Y *or* N

*Not available in *Basic* software.

**Not available in *Basic* software and not used in *Intermediate* software.

FIGURE 5–6.   DND MESSAGE AND PASSWORD PROGRAM PLANNING SHEET

[AG] DND MESSAGES (DNDM):

DEFAULT MESSAGE	NEW MESSAGE
MESSAGE 1 (DO-NOT-DISTURB)	(THIS MESSAGE CANNOT BE CHANGED)
MESSAGE 2 (IN MEETING UNTIL)	_____
MESSAGE 3 (IN MEETING)	_____
MESSAGE 4 (ON VACATION 'TIL)	_____
MESSAGE 5 (ON VACATION)	_____
MESSAGE 6 (CALL ME AT)	_____
MESSAGE 7 (AT THE DOCTOR)	_____
MESSAGE 8 (ON A TRIP)	_____
MESSAGE 9 (ON BREAK)	_____
MESSAGE 10 (OUT OF TOWN 'TIL)	_____
MESSAGE 11 (OUT OF OFFICE)	_____
MESSAGE 12 (OUT UNTIL)	_____
MESSAGE 13 (WITH A CLIENT)	_____
MESSAGE 14 (WITH A GUEST)	_____
MESSAGE 15 (WITH A PATIENT)	_____
MESSAGE 16 (UNAVAILABLE)	_____
MESSAGE 17 (IN CONFERENCE)	_____
MESSAGE 18 (AWAY FROM DESK)	_____
MESSAGE 19 (GONE HOME)	_____
MESSAGE 20 (OUT TO LUNCH)	_____

[AH] PASSWORDS (PASS):

Database Inspection: _____

Database Modification: _____

Database Unrestricted: _____

SMDR/Error: _____

SAR *(Adv. and Int. software):*_____

Call Cost *(Basic software)*:   _____

On-Line Monitor: _____

Self Test: _____

FIGURE 5-7. INTERCOM NUMBER AND FEATURE CODE PROGRAM PLANNING SHEET

[B] EXTENSIONS AND FEATURE ACCESS CODES (CODE):

STATION CIRCUIT	DEFAULT EXT.	NEW EXT.	STATION CIRCUIT	DEFAULT EXT.	NEW EXT.	STATION CIRCUIT	DEFAULT EXT.	NEW EXT.
1.1	(100)	___	3.5	(120)	___	6.1	(140)	___
1.2	(101)	___	3.6	(121)	___	6.2	(141)	___
1.3	(102)	___	3.7	(122)	___	6.3	(142)	___
1.4	(103)	___	3.8	(123)	___	6.4	(143)	___
1.5	(104)	___	4.1	(124)	___	6.5	(144)	___
1.6	(105)	___	4.2	(125)	___	6.6	(145)	___
1.7	(106)	___	4.3	(126)	___	6.7	(146)	___
1.8	(107)	___	4.4	(127)	___	6.8	(147)	___
2.1	(108)	___	4.5	(128)	___	7.1	(148)	___
2.2	(109)	___	4.6	(129)	___	7.2	(149)	___
2.3	(110)	___	4.7	(130)	___	7.3	(150)	___
2.4	(111)	___	4.8	(131)	___	7.4	(151)	___
2.5	(112)	___	5.1	(132)	___	7.5	(152)	___
2.6	(113)	___	5.2	(133)	___	7.6	(153)	___
2.7	(114)	___	5.3	(134)	___	8.1	(154)	___
2.8	(115)	___	5.4	(135)	___	8.2	(155)	___
3.1	(116)	___	5.5	(136)	___	8.3	(156)	___
3.2	(117)	___	5.6	(137)	___	8.4	(157)	___
3.3	(118)	___	5.7	(138)	___	8.5	(158)	___
3.4	(119)	___	5.8	(139)	___	8.6	(159)	___

HUNT GROUP/VOICE MAIL GROUP CODES

1 (231) ___
2 (232) ___
3 (233) ___
4 (234) ___
5 (235) ___
6 (236) ___
7 (237) ___
8 (238) ___
9 (239) ___
10 (240) ___
11 (241) ___
12 (242) ___
13 (243) ___
14 (244) ___
15 (245) ___
16 (246) ___

17 (247) ___
18 (248) ___
19 (249) ___
20 (250) ___

CO LINE ACCESS CODES

Automatic Route Selection (80) ___
Select Line Group 1 (81) ___
Select Line Group 2 (82) ___
Select Line Group 3 (83) ___
Select Line Group 4 (84) ___
Select Line Group 5 (85) ___
Select Line Group 6 (86) ___
Select Line Group 7 (87) ___
Select Line Group 8 (9) ___
Automatic Line Selection (89) ___

FIGURE 5–7. INTERCOM NUMBER AND FEATURE CODE PROGRAM PLANNING SHEET (CONT'D)

GENERAL STATION FEATURE CODES

___ Display Date and Time (300)

___ Program Reminder Message (305)

___ Cancel Reminder Message (306)

___ System Directory (307)*

___ CO Directory (308)*

___ Disable Handsfree (310)

___ Enable Handsfree (311)

___ Speakerphone On/Off (312)

___ Background Music On/Off (313)

___ Microphone—Mute On/Off (314)

___ Enable Headset (315)

___ Disable Headset (316)

___ Program Redial Mode—Last Number Dialed (320)

___ Program Redial Mode—Last Number Saved (321)

___ Hunt Group Remove (322)

___ Hunt Group Replace (323)

___ Default Opt. Feat. Keys (325)

___ Display Opt. Feat. Key (326)

___ Program Opt. Feat. Key (327)

___ Select Ring Tone (328)

___ Default Station Keys (329)

___ Hookflash (330)

___ Page Remove (332)

___ Page Replace (333)

___ System Hold (335)

___ Individual Hold (336)

___ Call Splitting (337)

___ Data (340)

___ Monitor Data Port (341)

___ Transfer CO Call (345)

___ Transfer Intercom Call (346)

___ Transfer CO/IC to Hold (347)

___ Automatic Line Answer (350)

___ CO Call Forward Unconditional (351)

___ CO Call Forward If No Answer (352)

___ CO Call Forward If Busy (353)

___ CO Call Forward If No Answer/Busy (354)

___ Call Forward All Calls (355)

___ Call Forward No Answer (356)

___ Call Forward If Busy (357)

___ Call Forward If No Answer or Busy (358)

___ Cancel Any Call Forward (359)

___ Automatic Line Access (360)

___ Cancel Automatic Line Access (361)

___ Automatic Intercom Access (362)

___ Cancel Automatic Intercom Access (363)

___ Message (365)

___ Cancel Message (366)

___ Ring Intercom Always (367)

___ Cancel Ring IC Always (368)

___ Private Call (369)

___ Do-Not-Disturb (370)

___ Cancel Do-Not-Disturb (371)

___ DND Mode On/Off (372)

___ Cancel Queue Request (376)

___ Cancel Current Message (379)

___ Redial (380)

___ System Speed Dial (381)

___ Station Speed Dial (382)

___ Program Station Speed Dial (383)

___ Optional Account Code (390)

___ Default Volumes (394)

___ Cancel Misc. Operations (395)

___ Station Monitoring (396)

___ Voice Computer Feature #1 (281)*

___ Voice Computer Feature #2 (282)*

___ Voice Computer Feature #3 (283)*

___ Voice Computer Feature #4 (284)*

___ Voice Computer Feature #5 (285)*

___ Voice Computer Feature #6 (286)*

___ Voice Computer Feature #7 (287)*

*Not available in *Basic* software.

FIGURE 5–7. INTERCOM NUMBER AND FEATURE CODE PROGRAM PLANNING SHEET (CONT'D)

___ Voice Computer Feature #8 (288)*

___ Voice Computer Feature #9 (289)*

___ Voice Computer Feature #10 (290)*

___ Voice Computer Feature #11 (291)*

___ Voice Computer Feature #12 (292)*

___ Voice Computer Feature #13 (293)*

___ Voice Computer Feature #14 (294)*

___ Voice Computer Feature #15 (295)*

___ Reverse Transfer (4)

___ Conference (5)

___ Queue Request (6)

___ Page (7)

ATTENDANT FEATURE CODES

___ Night Ring On/Off (010)

___ Programming Night Ring (011)

___ Paging Speaker Music On/Off (018)

___ Clear System Alarm (019)

___ Program System Speed Dial (020)

___ Set Time of Day (021)

___ Program Station Data (022)

___ Program System Reminder Messages (023)

___ Program System DND Messages (024)

___ Attendant SAR (025)*

___ Program Lines Out of Service (030)

___ Program Lines In Service (031)

*Not available in *Basic* software.

FIGURE 5-8. C.O. LINE PROGRAM PLANNING SHEET

[CA] C.O. LINE EQUIPMENT STATUS (EQU): List C.O. circuit numbers for each feature.

List of equipped lines:_____

_____

List of day DISA lines *(Advanced software only)*:_____

_____

List of night DISA lines *(Advanced software only)*:_____

_____

List of incoming-only lines:_____

_____

List of outgoing-only lines:_____

_____

List of pulse-dialing lines:_____

_____

List of lines subject to toll restrict:_____

_____

List of lines exempt from ARS Only *(Advanced software only)*:_____

_____

Line keys by soft key group: refer to the charts on pages.

FIGURE 5-8.   C.O. LINE PROGRAM PLANNING SHEET (CONT'D)

[CB] C.O. LINE GROUPS (LGRP):

C.O. CIRCUIT NUMBERS

Line group 1: _____

_____

Line group 2: _____

_____

Line group 3: _____

_____

Line group 4: _____

_____

Line group 5: _____

_____

Line group 6: _____

_____

Line group 7: _____

_____

Line group 8: _____

_____

FIGURE 5-8. C.O. LINE PROGRAM PLANNING SHEET (CONT'D)

C.O. Circuit Number of line				
Equipped Y/N				
C.O. Line ID (up to 7 characters)				
Day DISA 4-Digit Code (N/C/I)*				
Night DISA 4-Digit Code (N/C/I)*				
In/Out Only (reference only)				
Pulse-Dialing Line Y/N				
Subject to Toll Restrict Y/N				
Call Cost Type F/L/T/O				
Equal Access Y/N				
Absorb Digits Y/N				
PBX or Local P/L				
Digit String 1				
Digit String 2				
Digit String 3				
Digit String 4				
Digit String 5				
Digit String 6				
Digit String 7				
Digit String 8				
Repeatable Y/N				
Exempt from ARS Only Y/N				
Auto Line (reference only)				
Line Groups (1-8)				
Hunt Group Ring In Day				
Night				
Stations with Outgoing Access Day				
Night				
Stations with Allowed Answer Day				
Night				
Stations with Ring In Day				
Night				
Line Key Assignment for Soft Key Group 1				
for Soft Key Group 2				
for Soft Key Group 3				
for Soft Key Group 4				

* N = None Required, C = C.O. Only, I = Intercom and C.O.

FIGURE 5-8. C.O. LINE PROGRAM PLANNING SHEET (CONT'D)

[CD] AUTO AND LINE KEY ASSIGNMENTS (AUTO):

Auto line circuit number(s):_____

_____

Enter the feature code, station key number, or C.O. line circuit assigned to each soft key:

SOFT KEY NUMBER	SOFT KEY GROUP 1	2	3	4
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

SOFT KEY NUMBER	SOFT KEY GROUP 1	2	3	4
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				

Stations in soft key group 1: _____

_____

_____

Stations in soft key group 2: _____

_____

_____

Stations in soft key group 3: _____

_____

_____

Stations in soft key group 4: _____

_____

_____

FIGURE 5-8.   C.O. LINE PROGRAM PLANNING SHEET (CONT'D)

[CEA] ASSIGN COMMON STATION LISTS TO CO LINES (COMM):

C.O. lines with common access, answer, and ring-in assignments: _____

_____

_____

Stations with outgoing access:

Day: _____

_____

Night: _____

_____

Stations with allowed answer:

Day: _____

_____

Night: _____

_____

Stations with ring in:

Day: _____

_____

Night: _____

_____

[CEB] ASSIGN COMMON OUTGOING-ACCESS LISTS (ACC):

C.O. lines with common outgoing-access assignment: _____

_____

_____

Stations with outgoing access:

Day: _____

_____

Night: _____

_____

FIGURE 5-8.   C.O. LINE PROGRAM PLANNING SHEET (CONT'D)

[CEC] ASSIGN COMMON ALLOWED-ANSWER AND RING IN LISTS (ANS):

C.O. lines with common allowed-answer, and ring-in assignments: _____

_____

_____

Stations with allowed answer:

Day: _____

_____

Night: _____

_____

Stations with ring in:

Day: _____

_____

Night: _____

_____

FIGURE 5-9.   STATION/DSS PROGRAM PLANNING SHEET

[DAA] SPECIFIC STATION DATA (STN):

Station Circuit Number to be Programmed				
Equipped Y/N				
Ext. Number *(reference only)*				
User Name (up to 7 characters)				
Tenant Number/Name				
Day SCOS:				
0 Unrestricted Y/N				
1 Operator Access Y/N				
2 Toll Access Y/N				
3 International Y/N				
4 Eight Digit Y/N				
5 Area/Office Code Y/N				
6 ARS Only				
7 Alternate Carrier Y/N				
8 Enable ALD Y/N				
Night SCOS:				
0 Unrestricted Y/N				
1 Operator Access Y/N				
2 Toll Access Y/N				
3 International Y/N				
4 Eight Digit Y/N				
5 Area/Office Code Y/N				
6 ARS Only				
7 Alternate Carrier Y/N				
8 Enable ALD Y/N				
Secretarial Intercept				
Attendant				
Message Center				
Alternate Message Source *(SL)*				
Account Code Type S/F/N				
Index				
Automated Attendant Y/N *(SL)*				
DTMF Port Y/N				
Recall Destination				
Digit Translation Y/N				
Location 1				
Location 2				
Location 3				
Location 4				

Continued on the next page.

FIGURE 5–9.   STATION/DSS PROGRAM PLANNING SHEET (CONT'D)

Station Circuit Number *(cont.)*				
Location 5				
Location 6				
Location 7				
Location 8				
Location 9				
Location 0				
Allow DND Breakthrough Y/N				
Disable Camp-on Tones Y/N				
C.O. Reseize Enabled Y/N				
DND Enable Y/N				
Fax Port Y/N *(SL)*				
Fax Message Center				
Forward Enabled Y/N				
Fwd to Public Network Y/N				
House Phone Y/N				
Day Number				
Night Number				
OVER Key Line Key Number *(K)*				
OHVA Transmit Enabled Y/N				
Secondary Voice Path Y/N *(K)*				
OHVA Receive Enabled Y/N *(K)*				
Speakerphone enabled Y/N *(K)*				
Off-Premises Extension Y/N *(SL)*				
Voice Mail Y/N *(SL)*				
DTMF Feedback Y/N				
Outgoing Access Day Lines				
Night Lines				
Allowed Answer Day Lines				
Night Lines				
Ring In Day Lines				
Night Lines				
Soft Key Group (1–4) *(K)*				
Hunt Groups *(reference only)*				
Page Zone List (1–6) *(K)*				
DSS/BLF *(reference only)*				

FIGURE 5-9. STATION/DSS PROGRAM PLANNING SHEET (CONT'D)

[DAC] SOFT FEATURE KEY DEFAULT VALUES (SOFT):

Single-Line Set: *(Not available in Basic software)*

	DEFAULT FEATURE	NEW FEATURE
Key A	Station Speed Dial (E382)	
Key B	Redial (E380)	
Key C	Automatic Route Selection (E80)	
Key D	Individual Hold (E336)	

(Keys E-I are for future use.)

24-Line Keyset:

	DEFAULT FEATURE	NEW FEATURE
Key A	Individual Hold (E336)	
Key B	Transfer CO Call (E345)	
Key C	Automatic Line Selection (E89)	
Key D	Hookflash (E330)	
Key E	Redial (E380)	
Key F	System Speed Dial (E381)	
Key G	Queue Request (E6)	
Key H	Page (E7)	
Key I	Background Music On/Off (E313)	

12-Line Keyset:

	DEFAULT FEATURE	NEW FEATURE
Key A	Individual Hold (E336)	
Key B	Transfer CO Call (E345)	

Station Keys: (No default values are initialized.)

	NEW FEATURE		NEW FEATURE
ST1		ST9	
ST2		ST10	
ST3		ST11	
ST4		ST12	
ST5		ST13	
ST6		ST14	
ST7		ST15	
ST8		ST16	

System-Wide Keyset FWD Key:

	DEFAULT FEATURE	NEW FEATURE
Key FWD	Call Forward All Calls (E355)	

FIGURE 5-9.   STATION/DSS PROGRAM PLANNING SHEET (CONT'D)

[DAD] COPY STATION INFORMATION (COPY):

<u>COPY STATION DATA FROM:</u>   <u>COPY DATA TO:</u>

Circuit # _____   Circuits _____

_____

Circuit # _____   Circuits _____

_____

Circuit # _____   Circuits _____

_____

Circuit # _____   Circuits _____

_____

Circuit # _____   Circuits _____

_____

Circuit # _____   Circuits _____

_____

Circuit # _____   Circuits _____

_____

Circuit # _____   Circuits _____

_____

FIGURE 5–9. STATION/DSS PROGRAM PLANNING SHEET (CONT'D)

[DAE] COMMON SCOS ASSIGNMENTS:

LIST OF STATIONS WITH COMMON DAY SCOS

SCOS IN COMMON

LIST OF STATIONS WITH COMMON NIGHT SCOS

SCOS IN COMMON

[DAF] COMMON C.O. LINE ASSIGNMENTS (SCOM):

STATIONS WITH COMMON C.O. LINE LISTS

C.O. CIRCUIT NUMBERS

Outgoing/Day: _____

Outgoing/Night: _____

Answer/Day: _____

Answer/Night: _____

Ring In/Day: _____

Ring In/Night: _____

[DAG] COMMON PAGE ZONE ASSIGNMENTS (PCOM):

KEYSETS WITH COMMON PAGE ZONES

PAGE ZONES TO BE ASSIGNED

FIGURE 5-9. STATION/DSS PROGRAM PLANNING SHEET (CONT'D)

[DAH] MISCELLANEOUS STATION INFORMATION (SMSC):

STATIONS WITH:

Automatic Answer on C.O. Calls _____

_____

Automatic Answer on Intercom Calls _____

_____

C.O. Reseize Enabled _____

_____

DISA/AA DND Override Enabled *(Advanced software only)*_____

_____

Do-Not-Disturb Enabled _____

_____

Forward Enabled _____

_____

Foward to the Public Network Enabled _____

_____

Handsfree Enabled _____

_____

Secondary Voice Path Keysets _____

_____

OHVA Transmit Enabled _____

_____

OHVA Receive Enabled _____

_____

Redial Mode — Last Number Dialed _____

_____

Ring Intercom Always Enabled _____

_____

FIGURE 5-9. STATION/DSS PROGRAM PLANNING SHEET (CONT'D)

[DBA] DSS/BLF IDENTIFICATION (DSS):

	DSS/BLF CIRCUIT NO.	ASSOCIATED KEYSET STATION CIRCUIT NO.
DSS/BLF 1		
DSS/BLF 2		
DSS/BLF 3		
DSS/BLF 4		
DSS/BLF 5		

[DBB] DSS/BLF KEY ASSIGNMENTS (DKEY): Enter the station intercom number or hunt group pilot number associated with each key.

Row	Column 1	2	3	4	5	6
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

FIGURE 5–10.   HUNT GROUP PROGRAM PLANNING SHEET

[E] HUNT GROUPS (HUNT):

NO.	PILOT#	NAME	METHOD	N/A TIME	ANN. STN/TYPE	ANN TIME	OVER STN/TYPE	COUNT	OVER TIME	SUPERVISOR
1										
Stations:										
2										
Stations:										
3										
Stations:										
4										
Stations:										
5										
Stations:										

Voice Mail/Voice Computer Groups:

NO.	PILOT#	NAME	N/A TIME	RETURN TIME	COMPUTER?	AA GROUP?	RECALL DEST	DIAL RULES
6								
Stations:								
7								
Stations:								
8								
Stations:								
9								
Stations:								
10								
Stations:								

FIGURE 5-10. HUNT GROUPS (CONT'D)

Voice Mail/Voice Computer Groups:

NO.	PILOT#	NAME	N/A TIME	RETURN TIME	COMPUTER?	AA GROUP?	RECALL DEST	DIAL RULES
11								
Stations:								
12								
Stations:								
13								
Stations:								
14								
Stations:								
15								
Stations:								
16								
Stations:								
17								
Stations:								
18								
Stations:								
19								
Stations:								
20								
Stations:								

FIGURE 5-11. TENANT/ATTENDANT/SECRETARIAL INTERCEPT PROGRAM PLANNING SHEET

[FA] TENANT GROUP ASSIGNMENTS (TNT):

Tenant group 1 name (up to 20 characters): _____

List of stations: _____

_____

_____

Tenant group 2 name (up to 20 characters): _____

List of stations: _____

_____

_____

Tenant group 3 name (up to 20 characters): _____

List of stations: _____

_____

_____

Tenant group 4 name (up to 20 characters): _____

List of stations: _____

_____

_____

[FB] ATTENDANTS (ATT):

NOTE: There may be more than five attendants; however, there may be only five DSS/BLF stations.

CIRCUIT NUMBER	ASSOCIATED DSS CIRCUIT	STATIONS SERVED
P* _____	_____	_____
2 _____	_____	_____
3 _____	_____	_____
4 _____	_____	_____
5 _____	_____	_____

* P = Primary Attendant or system alarm station

FIGURE 5-11. TENANT/ATTENDANT/SECRETARIAL INTERCEPT PROGRAM
PLANNING SHEET (CONT'D)

[FC] SECRETARIAL INTERCEPTS (SEC):

SEC. INT.   STATIONS SERVED

_____   _____

_____   _____

_____   _____

_____   _____

_____   _____

[FD] MESSAGE CENTERS (MCTR or MSG):

MESSAGE
CENTER   STATIONS SERVED

_____   _____

_____   _____

_____   _____

_____   _____

_____   _____

_____   _____

_____   _____

_____   _____

_____   _____

_____   _____

_____   _____

[FE] SPECIAL PURPOSE STATIONS (SPCL):

Automated Attendants *(Advanced software only)*: _____

FAX Ports *(Not available in Basic software)*:_____

House Phones: _____

Voice Mail/Computer Ports *(Not available in Basic software)*: _____

FIGURE 5-12.   PAGE ZONE PROGRAM PLANNING SHEET

[G] PAGE ZONES (PAGE): Enter intercom or circuit numbers for all keysets to be included in each zone. Also determine whether the optional external paging equipment is to be included in each zone.

Page Zone 1: _____

_____

_____ External Paging Y/N ____

Page Zone 2: _____

_____

_____ External Paging Y/N ____

Page Zone 3: _____

_____

_____ External Paging Y/N ____

Page Zone 4: _____

_____

_____ External Paging Y/N ____

Page Zone 5: _____

_____

_____ External Paging Y/N ____

Page Zone 6: _____

_____

_____ External Paging Y/N ____

FIGURE 5–13. TOLL RESTRICTION PROGRAM PLANNING SHEET

[HA] SCOS INFORMATION (SCOS):

DAY SCOS:

List of Unrestricted Stations _____

_____

Lists of Stations with Restrictions:

1 Operator Access _____

_____

2 Toll Call Access _____

_____

3 International Call Access _____

_____

4 Eight-Digit Call Access _____

_____

5 Area/Office Code Restrict _____

_____

6 ARS Only *(Advanced software only)* _____

_____

7 Alternate Carrier Access _____

_____

8 Enable ALD Number Access _____

_____

FIGURE 5-13. TOLL RESTRICTION PROGRAM PLANNING SHEET (CONT'D)

NIGHT SCOS:

List of Unrestricted Stations _____

_____

Lists of Stations with Restrictions:

1 Operator Access _____

_____

2 Toll Call Access _____

_____

3 International Call Access _____

_____

4 Eight-Digit Call Access _____

_____

5 Area/Office Code Restrict _____

_____

6 ARS Only *(Advanced software only)* _____

_____

7 Alternate Carrier Access _____

_____

8 Enable ALD Number Access _____

_____

[HB] OVERLAPPING AREA/OFFICE CODES (OVER):

Do office and area codes overlap?   Y *or* N

FIGURE 5–13.   TOLL RESTRICTION PROGRAM PLANNING SHEET (CONT'D)

[HC] AREA/OFFICE CODES ALLOWED/RESTRICTED (AREA)

Local Area Code: _____

Allowed Area Codes: _____

_____

_____

Restricted Area Codes: _____

_____

_____

Allowed Office Codes (within the local area code): _____

_____

_____

Restricted Office Codes (within the local area code): _____

_____

FIGURE 5-13. TOLL RESTRICTION PROGRAM PLANNING SHEET (CONT'D)

[HE] ALTERNATE CARRIERS (ALT): Enter numbers up to 10 digits each, do not include toll field.

1 _____	11 _____
2 _____	12 _____
3 _____	13 _____
4 _____	14 _____
5 _____	15 _____
6 _____	16 _____
7 _____	17 _____
8 _____	18 _____
9 _____	19 _____
10 _____	20 _____

[HF] ALLOWED LONG DISTANCE (ALD): Enter numbers up to 10 digits each, do not include toll field.

1 _____	11 _____
2 _____	12 _____
3 _____	13 _____
4 _____	14 _____
5 _____	15 _____
6 _____	16 _____
7 _____	17 _____
8 _____	18 _____
9 _____	19 _____
10 _____	20 _____

FIGURE 5-14. AUTOMATIC ROUTE SELECTION

[IA] ARS ROUTE GROUPS (/ROUT): *Available in Advanced software only.*

Route Group 1 (Local: XXX–XXXX):

Included office codes: _____

_____

List of C.O. lines: _____

_____

Dialing rules: _____

Route Group 2 (Intra-Area Code #1: XXX–XXXX):

Included office codes: _____

_____

List of C.O. lines: _____

_____

Dialing rules: _____

Route Group 3 (Intra-Area Code #2: XXX–XXXX):

Included office codes: _____

_____

List of C.O. lines: _____

_____

Dialing rules: _____

Route Group 4 (National #1: XXX–XXX–XXXX):

Included area codes: _____

_____

List of C.O. lines: _____

_____

Dialing rules: _____

FIGURE 5-14. AUTOMATIC ROUTE SELECTION (CONT'D)

Route Group 5 (National #2: XXX–XXX–XXXX):

Included office codes: _____

_____

List of C.O. lines: _____

_____

Dialing rules: _____

Route Group 6 (Operator Assisted: 0+):

List of C.O. lines: _____

_____

Dialing rules: _____

Route Group 7 (Operator-Assisted International: 01+):

List of C.O. lines: _____

_____

Dialing rules: _____

Route Group 8 (Station-to-Station International: 011+):

List of C.O. lines: _____

_____

Dialing rules: _____

[IB] ARS DIAL RULES (/RULE)

Rule 1   Echo toll field (1, 0, 01, or 011)
Rule 2   Echo area code
Rule 3   Echo local address or country code and national number
Rule 4   _____
Rule 5   _____
Rule 6   _____
Rule 7   _____
Rule 8   _____
Rule 9   _____
Rule 10   _____

FIGURE 5-15. SMDR/ERROR REPORT/SAR
PROGRAM PLANNING SHEET

SMDR REPORTS:

Output port	Primary *or* A *or* B

Calls to be recorded in reports:

All Incoming Calls?	Y *or* N
All Local Calls?	Y *or* N
All Toll Calls?	Y *or* N
All DISA Calls?	Y *or* N
All Conference Calls?	Y *or* N
All Ring-In Diagnostics?	Y *or* N
Suppress all outgoing DISA digits?	Y *or* N
Suppress all absorbed digits?	Y *or* N
Suppress all but the first toll digit?	Y *or* N

List of stations to be included: _____

_____

_____

_____

_____

Format: Wide *or* Narrow

ERROR REPORTS:

Output port	Primary *or* A *or* B
Report all alarms [+ + +] ?	Y *or* N
Report all field service diagnostics [***] ?	Y *or* N
Report all engineering diagnostics [---] ?	Y *or* N

STATION ACTIVITY REPORT: *(Advanced software only)*

Reporting interval:

____ Daily —	Time of day:_____
____ Weekly —	Day of week: _____
	Time of day: _____
____ Monthly —	Day of month: _____
	Time of day: _____

___ Attendant

CALL COST FACTORS:

Local Area Code: _____

Daytime rates in dollars per minute:

Local Call (0.05):	_____
7-Digit Toll (0.20):	_____
10-Digit Toll (0.50):	_____
Op/Internat (1.00):	_____
Incoming Call (0.00):	_____

Multiplicative factors:

Evening (0.65):	_____
Night/Weekend (0.40):	_____

TROUBLESHOOTING

CONTENTS   PAGE

1. INTRODUCTION

1.1 This section describes the troubleshooting procedures to follow in the event of a system or station instrument malfunction. System repair is limited to replacing parts — for example, KSU Control Board (KCB), Expansion Modules (EXPs), Accessory Port Modules (APMs), power supply, keysets, etc.

2. TROUBLESHOOTING CHECKLIST

2.1 To save time, perform the troubleshooting procedures in the following order:

(1) Check for proper light-emitting diode (LED) indications on the KSU (refer to Figure 6-1 on the next page).

(2) Check the alarm message and field service diagnostic output (refer to pages 6-4 to 6-7).

(3) Isolate the problem and refer to the appropriate troubleshooting chart (refer to page 6-8).

(4) Reset the system through database programming (see page 5-104).

NOTE: Throughout the TROUBLESHOOTING section of the manual, there are numerous references to replacing the KSU Control Board (KCB) and returning it for repair. In these cases, the term "KCB" refers to both the KCB and its attached MEM board. The two boards are treated as one unit. *However, if possible, try to isolate the problem to either the KCB or the MEM board, and replace only the defective part.*

3. LIGHT-EMITTING DIODE (LED) INDICATIONS

3.1 LEDs on the front of the KSU indicate specific functions. (Refer to Figure 6-1 on the next page.) If the RUN LED is flashing (or if referred to this page to isolate a problem), follow these procedures to check the system voltages:

CAUTION

Always turn OFF the AC POWER before removing or inserting any module.

---

(1) Turn OFF the AC power.

(2) Remove any EXPs or APMs and open both covers on the KCB unit. Check to make sure that the MEM board is properly attached to the KCB and that all components on the KCB and on the MEM board are properly seated.

(3) Wait 10 seconds and turn ON the AC power.

(4) If the RUN LED is still flashing (or if the problem still persists), measure the following system voltages using the test points located on the KCB. A digital voltmeter of $\pm 0.5\%$ accuracy is required. Place the "common" voltmeter probe on the ground point (TP0) and place the other probe on each of the voltage test points. (Refer to Figure 3-16 on page 3-31 for voltage test point locations.)

TEST POINTS	VOLTAGE
TP 1 to TP 0	+5.1 $\pm$0.1VDC
TP 2 to TP 0	-12.0 $\pm$1.2VDC
TP 3 to TP 0	+30.0 $\pm$2.0VDC
TP 4 to TP 0	+12.5 $\pm$0.6VDC

(5) Perform *one* of the following steps:

a. If the system voltages are incorrect, or if they are correct and the RUN LED is *still* flashing, contact Customer Support for assistance.

b. If the system voltages are correct and the RUN LED is *not* flashing, yet the problem still persists, replace the KCB.

CAUTION

To prevent damage, the KCB, EXPs, and APMs must always be transported or shipped as individually packaged units. *Do not transport or ship an assembled KSU; such action will void the warranty.* Also, before removing the KCB, use the save/restore program to save the customer's database (see page 5-102 in PROGRAMMING). It can then be restored (loaded) into a new KCB, if necessary. Make sure the database back-up battery on the new KCB has a charge of at least 2.5VDC (see page 3-30 in INSTALLATION).

FIGURE 6-1. LIGHT-EMITTING DIODE (LED) INDICATIONS

LED	DESCRIPTION
RUN	Lit when the KSU is functioning normally. Flashes when the KSU is not operating properly.
CO BUSY	Lit when there is a C.O. call in progress.
IC BUSY	Lit when there is an intercom call in progress.
MINOR ALARM	Lit when a minor alarm has occurred. The light goes out when the alarm message is cleared (as described in FEATURES, page 4-102).
D-BASE ERROR	Lit when a database error has caused the system to return to default values. When the system is first installed, the LED will remain lit until the database is initialized.
BATT OFF	Lit when the battery strap (BBU) on the MEM Board is placed in the OFF position (over the lower two pins). Will not light if the battery strap is not attached to any pins.

4. ALARM MESSAGES AND FIELD SERVICE DIAGNOSTICS

4.1 Alarm messages can be programmed to appear on display keysets, in the SMDR printout, or as a separate error printout. When listed in a printout, alarm messages are preceded by + + + and the time of day when the alarm occurred.

4.2 Minor alarm messages can be programmed to appear on all attendant stations' displays or on the primary attendant's display only. If there are no attendants, the messages will appear on a designated system alarm station's display. Refer to PROGRAMMING, page 5-24, for designating which attendants or which station will receive minor alarm messages. Major alarm messages will appear on all display keysets, regardless of programming.

4.3 Possible alarm messages and the associated troubleshooting procedures are outlined in the following sections.

A. MINOR ALARMS THAT ARE USER CORRECTABLE

(1) **#01 EXT XXX — Station Off-Hook:** A station is off hook and idle. (The DSS/BLF key for the station will be fluttering continuously.) Hang up the handset at the station.

(2) **#02 SMDR Print Timeout, #03 Error Print Timeout, and #04 SAR Print Timeout:** The indicated printer is not working properly (the cable may be loose or the printer may be out of paper or ribbon).

B. MINOR ALARMS REQUIRING ATTENTION FROM SERVICE PERSONNEL

NOTE: Before replacing the KCB, use the save/restore program to save the customer's database (see page 5-102 in PROGRAMMING). It can then be restored (loaded) into a new KCB, if necessary. Make sure the database back-up battery in the new KCB has a charge of at least 2.5VDC (see page 3-30 in INSTALLATION).

(1) **#10 EXT XXX — Excessive Data Errors:** Check the operation of the indicated keyset. The error may be caused by a defective keyset (perform keyset self-test), defective wiring (check wiring), defective station cable, or a defective KCB or EXP.

(2) **#11 Write Protect Circuit Fail:** The circuitry that prevents the software from accidentally writing to the database is no longer functioning. Replace the KCB and return it for repair.

(3) **#13 Primary Port — No Txt Int.:** The RS-232-C port has no transmit interrupt function. Replace the KCB and return it for repair.

(4) **#14 Primary Port — No Clock:** There is a problem with the clock in the KSU. Replace the KCB and return it for repair.

(5) **#15 Watchdog Interrupt Inop.:** The watchdog interrupt function is inoperative. It will not be able to detect a loop and allow the system to recover. Replace the KCB and return it for repair.

(6) **#16 Background Detected Timer Fail:** The interval timer is defective. Replace the KCB and return it for repair.

(7) **#17 Watchdog Timeout in Minor Init:** The watchdog function has timed out during an attempted initialization. Replace the KCB and return it for repair.

(8) **#20 Database Error:** This message usually appears when the system AC power is turned on for the very first time. Check that the battery strap (JMP 1) on the MEM board is placed in the A position (over the lower two pins). If the battery strap is correct, perform a system initialization through the programming terminal. If the D-BASE ERROR LED on the KSU remains lit after the initialization, replace the KCB and return it for repair. To clear the alarm display at the attendant's station(s), press SPCL and enter 019.

(9) **#21 EXT XXX-Excessive Hardware Failures:** Replace or repair the indicated station's cabling and/or replace the station instrument, EXP, APM, or KCB.

(10) **#22 Accessory Port A — No Txt Int.:** The APM RS-232-C port has no transmit interrupt function. Replace the APM and return it for repair.

(11) **#23 Accessory Port A — No Clock:** There is a problem with the clock on the APM. Replace the APM and return it for repair.

(12) **#22 Accessory Port B — No Txt Int.:** The APM RS-232-C port has no transmit interrupt function. Replace the APM and return it for repair.

(13) **#23 Accessory Port B — No Clock:** There is a problem with the clock on the APM. Replace the APM and return it for repair.

C. MAJOR ALARMS THAT REQUIRE IMMEDIATE ATTENTION

4.4 If a major alarm is detected by the system, the RUN LED begins flashing. When a major alarm occurs, do the following:

(1) Attempt to reset the system by using the reset switch on the bottom of the KSU or by using the programming terminal (refer to PROGRAMMING, page 5–104). If the system does not recover from the alarm, continue to the next step.

(2) Turn OFF the AC POWER for at least ten seconds and then turn it ON again.

(3) If the system still does not recover from the alarm, check the system voltages as outlined on page 6–2. If it is determined that the KCB is faulty, return it for repair and include any indicated error messages in the problem description. The possible messages include the following:

> Scratch RAM Failure
> Database RAM Failure
> ROM Failure
> Interval Timer Failure
> Task Initialization Table Error
> User Initialization Failure
> User Failure in Exception Processing
> CPU Interrupt Level 5 Stuck True
> CPU Interrupt Level 7 Stuck True
> Operating System Initialization Failure

NOTE: When returning a faulty KCB, EXP, or APM, indicate all applicable error messages on the material return authorization (MRA) tag. For more information on returning equipment, see page 6–41.

D. FIELD SERVICE DIAGNOSTICS

4.5 Field service diagnostics can be programmed to appear in the SMDR printout or as a separate error printout. When listed in a printout, field service diagnostics are preceded by *** and the time of day when the error message occurred. Possible field service diagnostics and the associated troubleshooting procedures are as follows:

(1) **Device Change Failed: X.Y — Device Remains [Keyset, SL Set, or DSS/BLF]:** The system has detected the presence of a device on a circuit that is equipped for a different type of device. Either change the type of device or properly re-equip the circuit through database programming.

(2) **?? XX or Board: ?? XX:** This indicates a software problem in error handling. Contact Customer Support and report the error message and the circumstances under which it occurred.

(3) **Board: Type Number — Inserted, Passed Init:** This indicates successful detection and initialization of the board. No action is necessary.

(4) **Board: Type Number — Removed:** This indicates removal of the board. No action is necessary.

(5) **STNA: X.Y [K/D1]:** The system has detected or received an error from a KCB or EXP device (keyset or DSS/BLF Unit). The possible accompanying error messages are:

a. *RTT Detected Transmission Error:* The system has detected a transmission error from a keyset or DSS/BLF Unit. This message may occur when the line cord is removed from a keyset or DSS/BLF Unit and when the 25-pair cable is removed from the KCB or an EXP. In these cases, no action is required. However, if the error message occurs repeatedly for a station circuit or a group of station circuits for which the line cord(s) or the station cable is not being removed, all station cabling and wiring should be checked. If the problem persists, replace the station instrument, the KCB, and/or the EXP and return for repair.

b. *?? $XX:* The system has detected an invalid data byte from a keyset or DSS/BLF Unit. This message may occur when the line cord is removed from a keyset or DSS/BLF Unit and when the 25-pair cable is removed from the KCB or an EXP. In these cases, no action is required. However, if the error occurs repeatedly for a station circuit or a group of station circuits for which the line cord or the station cable is not being removed, all station cabling and wiring should be checked. If the problem persists, replace the station instrument, the KCB, and/or the EXP and return for repair.

c. *RTT Detected No-Response Error:* The system has detected a lack of response from a keyset or DSS/BLF Unit. This message generally indicates a hardware problem. Check all station cabling and wiring. If the problem persists, replace the station instrument, the KCB, and/or the EXP and return for repair.

d. *Reconfigure Request:* The system has detected a temporary transmission problem from a keyset or DSS/BLF Unit. If this error message occurs only intermittently, no action is necessary. However, if the error occurs repeatedly for a station circuit or a group of station circuits, check all station cabling and wiring. If the problem persists, replace the station instrument, the KCB, and/or the EXP and return for repair.

e. *Spurious Reset:* The indicated device has undergone a reset. The reset may have been caused by electrostatic shock or electromagnetic interference in the vicinity of the station instrument. If this error message occurs only intermittently, no action is necessary. However, if the error occurs repeatedly for a station circuit or a group of station circuits, check all station cabling and wiring. If the problem persists, replace the station instrument, the KCB, and/or the EXP and return for repair.

f. *RTT Detected ACIA Hardware Error:* The system has detected a faulty KCB or EXP circuit. Replace the faulty KCB or EXP and return it for repair.

g. *Inconsistency Error:* The system has detected inconsistent communication between the KSU and the KCB/EXP device. If this error message occurs only intermittently, no action is necessary. However, if the error occurs repeatedly for a circuit or a group of station circuits, check all station cabling and wiring. If the problem persists, replace the station instrument, the KCB, and/or the EXP and return for repair.

h. *Peripheral Detected Xmit Error:* The KCB/EXP station instrument has detected a transmission error from the KSU. If this error message occurs only intermittently, no action is necessary. However, if the error occurs repeatedly for a station circuit or a group of station circuits, check all station cabling and wiring. If the problem persists, replace the station instrument, the KCB, and/or the EXP and return for repair.

i. *Peripheral Output Queue Overflow:* This indicates that the station user is pushing the keys on the station instrument at an unreasonably fast rate. If this error message occurs only intermittently, no action is necessary. However, if the error occurs repeatedly, the station user should be instructed to avoid pushing the station instrument keys so rapidly.

j. The following errors indicate a problem with the device attached to the KCB or EXP. When these errors occur, replace the faulty device and return it for repair.

Peripheral Watchdog Timeout
Peripheral Trap Error
Peripheral Timer Error
Peripheral SWI Error
Peripheral TDRE Error

k. *VX* — This message may appear when a station device is connected to the KCB or an EXP and when the system is powered up. The message indicates the station version number sent to the KSU. If the message reads "V0", no action is necessary. If the message reads anything other than "V0", the station device is not functioning properly and must be replaced.

(6) The following messages indicate minor software errors. Although they detect inconsistent operation, they generally do not warrant a system reset. If any of these messages should occur, note the circumstances under which they occurred and contact Customer Support.

Invalid Input > Keyset: XX State: XXX Input: XX

Invalid Input > Keyset: XX State: XXX Timer No.: XX

Invalid Input > SL Set: XX State: XXX Input: XX

Invalid Input > SL Set: XX State: XXX Timer No.: XX

Invalid Input > Line: XX State: XXX Input: XX

Invalid Input > Line: XX State: XXX Timer No.: XX

Cancel Timer Not Found = $XX Device = $XXXX

Invalid Error Message: Task

(7) **Single User Abort: Device Type = TTTTT Device Number = $XX:** This message indicates that a minor software reset has occurred concerning the indicated device. Note the circumstances under which the message occurred and contact Customer Support.

(8) **Last CP/CO History Freeze and Last CP/CO History Un-Freeze:** By themselves, these messages do not indicate any errors. They are printed to indicate when the last freeze and unfreeze of the CP and CO history queues took place. They should be reported along with the accompanying error messages.

(9) **Failure to Reset after Volatile Data Change:** Indicates that the programmer did not reset the system after completing a programming session. The system must be reset to to avoid possible faulty behavior.

(10) **Delayed Reset Request After Volatile Data Change:** Indicates that the programmer requested a delayed system reset after completing a programming session. This message is logged to help explain any faulty system behavior after the programming session, but before the scheduled reset.

(11) **Time of Last History Clear:** Indicates the time and date that the error message history was cleared. No action is necessary.

(12) Any other error messages: Note the circumstances under which the message(s) occurred and contact Customer Support.

NOTE: When returning a faulty station instrument, EXP, APM, or KCB, indicate all applicable error messages on the material return authorization (MRA) tag. For more information on returning equipment, see page 6–41.

5. TROUBLESHOOTING CHARTS

5.1 The troubleshooting charts located on the following pages list symptoms, possible causes, and corrective actions for problems. Look up the problem in the appropriate chart and perform the corrective actions in the order given. The troubleshooting procedures for correcting equipment failures have been divided into five categories:

A. System
B. C.O. Lines
C. Features
D. Keysets
E. Single-Line Sets
F. DSS/BLF Units

A. SYSTEM

5.2 If the problem involves one of the following system features, refer to Figure 6-2 on pages 6-10 through 6-14.

- Repeated occurrence of dropped calls.
- Programming terminal will not communicate with the system.
- Auto-answer modem for remote programming is inoperative.
- DISA is inoperative.
- All keysets are inoperative.
- Unable to interface with a computer call-up device.
- No music-on-hold/background music.
- RFI/EMI present over conversations.

B. C.O. LINES

5.3 If the problem involves one of the following C.O. line symptoms, refer to Figure 6-3 on pages 6-15 through 6-20.

- C.O. line inoperative throughout the system.
- Cannot obtain C.O. dial tone.
- Cannot break C.O. dial tone.
- Cannot place an outgoing call.
- Calls are dropped during conversation or when answered.
- C.O. line cannot be reseized.
- Noise on C.O. line at all stations.
- C.O. line remains seized after the call is ended.

- Other station conversations can be heard on the C.O. line.

C. FEATURES

5.4 For problems involving the following features, refer to Figure 6-4 on pages 6-21 to 6-26.

- Feature does not appear to work properly.
- Cannot transfer C.O. or intercom calls.
- Cannot transfer incoming C.O. calls or place them on hold.
- Cannot initiate a conference.
- Cannot initiate a page.
- Cannot initiate a call forward.
- Calls do not follow requested forward.
- Redial feature is inoperative.
- Station is not receiving hunt group calls.
- Station is not receiving pages.
- Call privacy release is inoperative.
- House phone is inoperative.
- Station cannot be placed in do-not-disturb.
- Automated attendant is inoperative.
- Voice mail/computer hunt groups not functioning properly.
- SMDA reports not generated automatically and/ or they cannot be generated on request using the attendant feature code

D. KEYSETS

5.5 If problems involve keysets or their optional equipment, refer to Figure 6-5 on pages 6-27 through 6-33.

- Keyset is inoperative.
- A group of eight keysets is inoperative.
- LCD is inoperative.
- Headset is inoperative.
- Keyset squeals when placing and/or receiving calls.
- Data noise when the keyset is off hook.
- Cannot obtain intercom dial tone.
- Cannot break intercom dial tone.
- Cannot place an intercom call.
- Cannot break C.O. dial tone.
- Data device not operating properly.
- LRA not operating properly.
- Cannot receive off-hook voice announce calls.
- Cannot place off-hook voice announce calls.

E. SINGLE-LINE SETS

5.6 The following problems are discussed in Figure 6–6 on pages 6–34 through 6–37.

- Single-line set is inoperative.
- A group of six single-line sets is inoperative.
- Cannot obtain intercom dial tone.
- Cannot place an intercom call.
- Cannot break C.O. dial tone.
- Cannot place off-hook voice announce calls.

- Single-line sets not receiving message waiting indications.

F. DSS/BLF UNITS

5.7 For DSS/BLF Unit problems, refer to Figure 6–7 on pages 6–38 and 6–39.

- DSS/BLF Unit is inoperative.
- Incorrect LED indications.
- Calls are transferred to the wrong station.
- Cannot place immediate off-hook voice announce calls.

FIGURE 6–2. SYSTEM TROUBLESHOOTING CHART

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Repeated occurrence of dropped calls	AC line is not isolated and dedicated	Have isolated, dedicated line installed. Refer to page 3–3 in INSTALLATION for details.
	Defective power supply	Refer to INSTALLATION, page 3–27, to perform the power supply electrical test. Replace the power supply if faulty.
	KSU located near a strong magnetic field or other potential source of interference (copy machines, power transformer, etc.)	Relocate the KSU a minimum of 20 feet from any equipment that is a potential source of interference.
	IC-CO/CO-CO disconnect timer(s) need(s) adjustment	See *dialed digits* field in SMDR, page 4–109. Set timer(s) to a higher value. Refer to PROGRAMMING, page 5–14.
	Inter-ring silence timer value is set too sensitive	Ensure timer value is set longer than the C.O. ring "off" time. See PROGRAMMING, page 5–14.
	Defective KCB	Refer to page 6–2 to test the system voltages. Replace the control board if faulty.

NOTE: The central office must provide a minimum of 20mA loop current.

Programming terminal will not communicate with the system. The terminal has a good cable and functions correctly when used for other purposes.	Baud rates of the terminal and the KSU are not the same and/or the communication parameters are not compatible	Refer to page 2–16 for proper settings and complete specifications.
	Defective power supply or cable	Check the –12VDC and + 12VDC test points on the KCB (refer to page 6–2).
	Defective KCB	Refer to page 6–2 to test the system voltages. Replace the control board if faulty.
	Terminal is a TI Silent 700 model	See SPECIFICATIONS, page 2–16, for modification.

FIGURE 6-2. SYSTEM TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Auto-answer modem for remote programming inoperative	Baud rate does not match RS-232-C port and/or the communication parameters are not compatible	Refer to page 2-16 for proper settings and complete specifications.
	Defective cable	Replace the cable.
	Defective modem	Refer to the manual included with the modem.
	Improper installation	Refer to INSTALLATION, page 3-48, for correct procedures.
	APM circuit not equipped	Equip APM circuit. Refer to PROGRAMMING, page 5-49.
	Defective C.O. line from central office	At the C.O. block, remove the bridging clips for the line. On the telco side of the block, use a test set to verify the C.O. line connection. Also, move the C.O. line to a different C.O. circuit. If the problem follows the line, contact the telephone company.
	Defective C.O. circuit	Replace defective KCB or EXP.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.

FIGURE 6–2. SYSTEM TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
DISA inoperative	User error	Refer to the FEATURES, page 4–31, for correct procedures. (DISA is available only in the *Advanced* software package.)
	Telephone not compatible	User must dial in from a DTMF telephone.
	Programming error	Ensure that the DISA line is identified correctly as a day or night DISA line. Refer to PROGRAMMING, page 5–39.
	Defective system channel or switching matrix	Perform network self test. Refer to PROGRAMMING, page 5–128.
	Defective KCB, EXP, or APM	Refer to page 6–2 to test the system voltages. Replace the board(s) if faulty.

NOTE: Due to the natural characteristics of the C.O. line, the volume level of DTMF tones transmitted over the line may be substantially reduced before reaching the GMX-48 System. This natural degradation in tone volume may adversely affect the reliability of the DISA feature. Other factors which can affect DISA performance are C.O. line noise and the quality and strength of the DTMF tones generated by the off-premises phone itself.

All keysets in the system are inoperative. No LED indication when a line key is pressed. +30 ±2.0VDC measurement (as described on page 6–2) is not present.	Open or loose connection in the cable between the power supply and the KSU, or a defective cable	Turn off the AC power. Check to see that DC power cable is properly connected. Repair or replace the power supply, the cable, and/or the KCB if the connection is faulty.
	Circuit breaker on power supply has been tripped.	Reset the circuit breaker.
	Defective power supply or connector	Use a voltmeter to check the +30VDC voltage at the power supply DC connector. (See INSTALLATION, page 3-27, for proper procedures.) If the voltage is not +30 ±2.0VDC, replace the power supply and/or the cable.
	Defective EXP	Remove all EXPs. Replace the EXPs one at a time and check the system voltages on the KCB (refer to page 6–2), until the defective EXP is isolated. Replace the faulty module.
	Defective KCB	Refer to page 6–2 to test the system voltages. Replace the KCB if faulty.

FIGURE 6-2.   SYSTEM TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Unable to interface with computer call-up device (banking machine, answering machine, auto dialer, etc.)	Equipment being called is defective	Ensure that the called equipment is functioning correctly.
	DTMF digit duration/ pause specifications of called equipment is incompatible with GMX-48 System	Check with the equipment manufacturer for DTMF digit duration/pause specifications. Adjust DTMF digit duration/pause timer. (Refer to page 5-14 in PROGRAMMING.) Default value is 6/100 second.
	C.O. line is designated for dial-pulse signaling	User may signal the system to send DTMF tones (see page 4-25).
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.
No music-on-hold/background music (external music source connected)	External music source turned off or inoperative	Check the external music source for proper operation. Optimal input level is .775VRMS (0dB). Refer to INSTALLATION, page 3-49.
	MOH strap not in proper position (no MOH, but background music is operative)	Move music-on-hold strap (MOH) on the KCB to the ON position (over the left two pins).
	Defective cable between music source and KSU	Repair or replace the cable. Check that the proper connector was used. Refer to SPECIFICATIONS, page 2-7.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.

FIGURE 6–2. SYSTEM TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
RFI/EMI present over conversations	AC power source or grounding incorrect	Verify that the AC circuit is isolated and dedicated (see page 3–3) and check for proper grounding (see page 3–26).
	Grounding point is source of RFI/EMI	While the system is running on AC power, temporarily remove the grounding wire to determine if it is the source of the RFI EMI. See page 3–26 for proper grounding requirements.
	AC power source is causing RFI/EMI	If an external battery back-up power source is installed, switch system operation to battery back-up power by unplugging the power source's AC power cord (with grounding wire connected to KSU). If RFI/EMI stops, the AC power source is the cause. Install an RFI/EMI filter or equivalent on the AC outlet.

NOTE: For further assistance, contact Customer Support with the following information:

1. Modulation — AM, FM, or other
2. Frequency of the interfering station (in Hz)
3. Broadcast power
4. Distance between KSU and broadcast antenna
5. When RFI is heard:
   - Outside call — inside party only
   - Outside call — outside party only
   - Outside call — both parties
   - Intercom call — one or both parties
6. Type of instrument(s) on which RFI is heard
   - 24-line keyset(s)
   - 12-line keyset(s)
   - Single-line sets.

FIGURE 6-3.   C.O. LINE TROUBLESHOOTING CHART

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
C.O. line inoperative throughout the system	Defective C.O. line from central office	At the C.O. block, remove the bridging clips for the line. On the telco side of the block, use a test set to verify the C.O. line connection. Also, move the C.O. line to a different C.O. circuit. If the problem follows the line, contact the telephone company.
	Line is dedicated to a secondary carrier requiring an access code	Verify the type of C.O. line. Instruct users to dial access code, if necessary.
	Defective cabling or miswired C.O. modular jack assembly	Using a test set, ensure presence and correct location of the C.O. line at the associated C.O. modular jack assembly.
	Programming error	Ensure that the line is equipped and stations have been given access to it. Refer to page 5-39 in PROGRAMMING.
	Line has been taken out of service by the attendant	Place the line back in service. Refer to FEATURES, page 4-103.
	Defective system channel or switching matrix	Perform network self test. Refer to PROGRAMMING, page 5-128.
	Defective C.O. circuit	Replace defective KCB or EXP.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.

FIGURE 6-3. C.O. LINE TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Cannot obtain C.O. dial tone	If reorder tone is heard, programming error	Ensure that keyset has outgoing access. Refer error to page 5-39 in PROGRAMMING.
		Ensure that the keyset is not programmed for ARS only. Refer to pages 5-49 and 5-97 in PROGRAMMING.
		Ensure line is equipped. Refer to page 5-39 in PROGRAMMING.
	If progress tone is heard, user error	System is programmed to expect a forced account code. Refer to PROGRAMMING, page 5-22 and 5-49.
	Defective system channel or switching matrix	Perform network self test. Refer to PROGRAMMING, page 5-128.
	Defective C.O. circuit	Replace defective KCB or EXP.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.
Cannot break C.O. dial tone	C.O. circuit is programmed for wrong signaling type	Check that C.O. line and C.O. circuit use same type signaling (DTMF or dial-pulse). See PROGRAMMING, page 5-39.
	Timer error	If line is DTMF, the DTMF digit duration/pause timer setting may not be compatible with the line. See PROGRAMMING, page 5-14.
	Defective system channel or switching matrix	Perform network self test. Refer to PROGRAMMING, page 5-128.
	Defective C.O. circuit	Replace defective KCB or EXP.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.

NOTE: See also keyset problems on page 6-30.

FIGURE 6-3.   C.O. LINE TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Cannot place an outgoing call. C.O. dial tone is present. Intercom works.	Programming error	Check station class of service (SCOS). See PROGRAMMING, page 5-49. Check that equal access and absorbed digit programming for the line are correct. See PROGRAMMING, page 5-39.
	Defective C.O. line from central office	At the C.O. block, remove the bridging clips for the line. On the telco side of the block, use a test set to verify the C.O. line connection. Also, move the C.O. line to a different C.O. circuit. If the problem follows the line, contact the telephone company.
	Defective station instrument	Replace the station instrument and/or perform the keyset self-test in INSTALLATION, page 3-40.
	Defective system channel or switching matrix	Perform network self test. Refer to PROGRAMMING, page 5-128.
	Defective C.O. circuit	Replace defective KCB or EXP.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.

FIGURE 6-3. C.O. LINE TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Outside calls dropped during conversation or upon answering C.O. line	User error (line key being pressed after initial connection is made)	Instruct users not to press the line key while on a call. Or, if necessary, set the C.O. reseize timer to a higher value. Default value is 3 seconds. See page 5-14 in PROGRAMMING. Or, program the station to disallow C.O. reseize. See PROGRAMMING, page 5-49.
	Defective C.O. line from central office	At the C.O. block, remove the bridging clips for the line. On the telco side of the block, use a test set to verify the C.O. line connection. Also, move the C.O. line to a different C.O. circuit. If the problem follows the line, contact the telephone company.
	Insufficient loop current supplied by central office	Central office must supply 20mA minimum loop current.
	IC-CO disconnect timer value is set too sensitive	Ensure timer value is long enough to ignore normal interruptions in C.O. loop current. Default value is 0.6 seconds. See page 5-14.
	Inter-ring silence timer value is set too sensitive	Ensure timer value is set longer than the C.O. ring "off" time. Refer to PROGRAMMING, page 5-14.
	Defective system channel or switching matrix	Perform network self test. Refer to PROGRAMMING, page 5-128.
	Defective C.O. circuit	Replace defective KCB or EXP.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.
C.O. line cannot be reseized	C.O. reseize feature is disabled	Check specific station programming as described on page 5-49 in PROGRAMMING. If the C.O. reseize option has been disabled, the user cannot reseize a line until it has been disconnected.
	C.O. reseize timer is set too high	Set the timer to a lower timer value. Default value is 3 seconds. See page 5-14 in PROGRAMMING.

FIGURE 6–3. C.O. LINE TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Noise on C.O. line at all stations	Defective C.O. line	At the C.O. block, remove the bridging clips for the line. On the telco side of the block, use a test set to verify the C.O. line connection. Also, move the C.O. line to a different C.O. circuit. If the problem follows the line, contact the telephone company.
	Defective C.O. circuit	Replace defective KCB or EXP.
	Defective power supply	Refer to INSTALLATION, page 3–27, to perform the power supply electrical test. Replace the power supply if faulty.
	Defective KCB	Refer to page 6–2 to test the system voltages. Replace the control board if faulty.
C.O. line remains seized after a call has been ended	Characteristic of some ESS central offices	Central office must provide disconnect signal.
	IC-CO or CO-CO disconnect timer value set too long	Central office disconnect signal was not detected by IC-CO or CO-CO disconnect timer. Default value of the IC CO timer is 0.6 seconds; the CO-CO timer is 0.35 seconds. See page 5–14.
	Defective C.O. line	At the C.O. block, remove the bridging clips for the line. On the telco side of the block, use a test set to verify the C.O. line connection. Also, move the C.O. line to a different C.O. circuit. If the problem follows the line, contact the telephone company.
	Defective C.O. circuit	Replace defective KCB or EXP.
	Defective KCB	Refer to page 6–2 to test the system voltages. Replace the control board if faulty.

FIGURE 6-3. C.O. LINE TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Other station conversations can be heard on the C.O. line (cross-talk)	Defective C.O. line(s)	Isolate the line(s) with cross-talk by removing the bridging clips from the C.O. block. On the telco side of the block, attach a test set to each line and check for cross-talk. If present, contact the phone company.
	Defective system channel or switching matrix	Perform network self test. Refer to PROGRAMMING, page 5-128.
	Defective EXP	Remove all EXPs. Replace the EXPs one at a time and check the system voltages on the KCB (refer to page 6-2), until the defective EXP is isolated. Replace the faulty module.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.

FIGURE 6-4. FEATURE TROUBLESHOOTING CHART

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Feature does not work properly	User error	Refer to FEATURES for procedures. Also, ensure that the feature is available on the software package installed.
	Programming error	Check feature code programming. Refer to PROGRAMMING, page 5-33. Also, check user-programmable feature key programming. Refer to FEATURES, page 4-41, and PROGRAMMING, page 5-60.
	Defective station instrument	Replace the station instrument and/or perform the keyset self-test as described in INSTALLATION, page 3-40.
	Defective station circuit	Replace defective KCB, EXP, or APM.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.
Cannot transfer C.O. or intercom calls to other stations	User error	Refer to FEATURES, page 4-61, for procedures.
	Called station is in do-not-disturb	A station in do-not-disturb cannot receive transferred calls.
	Call transferred to an illegal intercom number	Use only valid intercom numbers.
	Called station is in a different tenant group and cross-tenant traffic is denied	To allow such transfers (if desired), place the two stations in the same tenant group or allow cross-tenant traffic. See PROGRAMMING, page 5-24.
	Defective station instrument	Replace the station instrument and/or perform the keyset self-test as described in INSTALLATION, page 3-40.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.

FIGURE 6–4. FEATURE TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Cannot transfer incoming C.O. calls or place them on hold	User error	Refer to FEATURES for procedures.
	Inter-ring silence timer is set too sensitive	Ensure timer value is set longer than the C.O. ring off time. Refer to PROGRAM MING, page 5–14.
	User error (line key being pressed after initial connection is made)	Set the C.O. reseize timer to a higher value. Default value is 3 seconds. See page 5–14 in PROGRAMMING. Or, program the station to disallow C.O. reseize. See PROGRAMMING, page 5–49.
	Programming error	Check user-programmable feature key programming. Refer to FEATURES, page 4–41.
Cannot initiate a conference	User error	Refer to FEATURES, page 4–67, for correct procedures.
	System capacity exceeded	Refer to the maximum system capacities on page 1–6 in OVERVIEW.
	Defective station instrument	Replace the station instrument and/or perform the keyset self-test as described in INSTALLATION, page 3–40.
	Defective station circuit	Replace defective KCB, EXP, or APM.
	Defective KCB	Refer to page 6–2 to test the system voltages. Replace the control board if faulty.

FIGURE 6–4.   FEATURE TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Cannot initiate an internal page	User error	Refer to FEATURES, page 4–85, for correct procedures.
	All stations in the paging zone are busy, or an intercom and/or paging channel is not available	Reorder tone is heard. Wait several seconds and then attempt to place the page again. Paging requires an intercom or paging channel.
	All stations in the paging zone are in do-not-disturb	Reorder tone is heard if all stations in the zone are in DND and if external paging for the zone is disabled.
	No stations are programmed to receive pages	Reorder tone is heard. Check paging assignment. Refer to page 5–88 in PROGRAMMING.
	Defective station instrument	Replace the station instrument and/or perform the keyset self-test as described in INSTALLATION, page 3–40.
	Defective system channel or switching matrix	Perform network self test. Refer to PROGRAMMING, page 5–128.
	Defective KCB	Refer to page 6–2 to test the system voltages. Replace the control board if faulty.
Cannot initiate a call forward	User error	Refer to FEATURES, page 4–70, for correct procedures.
	User attempting illegal forward	Stations are not allowed to set call forward if it forms an unconditional loop, the receiving station is in do-not-disturb, or an invalid intercom number is dialed. SCOS and outgoing access are checked when a call is forwarded to an outside telephone number. Also, ARS cannot be used to forward to an outside number.
	Defective station instrument	Replace the station instrument and/or perform the keyset self-test as described in INSTALLATION, page 3–40.
	Defective KCB	Refer to page 6–2 to test the system voltages. Replace the control board if faulty.

TROUBLESHOOTING

FIGURE 6–4. FEATURE TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Calls will not forward	User error	The FWD key is lit when the station has been placed in call forward. Refer to FEATURES, page 4–70, for procedures.
	Illegal forward	Conditional forwards (i.e., if busy, if un-answered) may form an undetected loop. If a call forward request forms a conditional loop, the call returns to the first station.
	Defective station circuit	Replace defective KCB, EXP, or APM.
	Defective KCB	Refer to page 6–2 to test the system voltages. Replace the control board if faulty.
Last number redial feature inoperative	User error	Refer to FEATURES, page 4–84, for procedures. Keyset may be programmed for last number saved.
	System speed-dial number identified as non-display	A system speed-dial number identified as non-display cannot be redialed.
	Defective station instrument	Replace the station instrument and/or perform the keyset self-test as described in INSTALLATION, page 3–40.
	Defective KCB	Refer to page 6–2 to test the system voltages. Replace the control board if faulty.
Station not receiving hunt group calls	User error	Hunt group calls may have been halted using the hunt group remove feature code (see page 4–20 in FEATURES). Or, the station may be in do-not-disturb or call forward.
	Programming error	Check hunt group programming. Refer to page 5–75 in PROGRAMMING.

FIGURE 6–4. FEATURE TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Station is not receiving pages	User error	Pages may have been halted using the page remove feature code (see page 4–85 in FEATURES). Or, the station may be in do-not-disturb.
	Programming error	Check page zone programming for the station. See PROGRAMMING, page 5–88.
Call privacy release inoperative	User error	Keyset user must lift the handset or press the SPKR key before pressing the busy line key.
	Call is forced private	Refer to page 4–66 in FEATURES for information on call privacy and privacy release.
	Programming error	Verify that system-wide privacy release option is enabled (PROGRAMMING, page 5–24) and that the keyset has allowed access to the line (PROGRAMMING, page 5–39).
House phone is not working properly or is inoperative	User error	Incoming calls take precedence over outgoing calls. Refer to FEATURES, page 4–83.
	Programming error (database)	Ensure that the station is designated as a house phone. Refer to page 5–49 in PROGRAMMING. Also, make sure the station has been assigned the proper SCOS and line access. See page 5–49 in PROGRAMMING.
	Programming error (database or speed-dial)	Ensure that the correct numbers are in appropriate day number and night number (speed-dial) locations. Refer to page 4–83 in FEATURES.
Station cannot be placed in do-not-disturb	User error	Refer to page 4–86 in FEATURES for correct procedures.
	Programming error	Station is programmed to disallow do-not-disturb. See PROGRAMMING, page 5–49.
	Defective keyset	Perform the keyset self-test as described in INSTALLATION, page 3–40. Replace the keyset if faulty.

FIGURE 6-4. FEATURE TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Automated attendant inoperative	User error	A DTMF phone is required. Refer to FEATURES, page 4-13.
	DTMF decoder unavailable	If a DTMF decoder is not available, the caller is transferred to the automated attendant's attendant.
	Programming error	Automated attendant station(s) must be designated in the database. Refer to PROGRAMMING, pages 5-49 and 5-87.
	Defective playback device	Replace the playback device.

NOTE: Due to the natural characteristics of the C.O. line, the volume level of DTMF tones transmitted over the line may be substantially reduced before reaching the GMX-48 System. This natural degradation in tone volume may adversely affect the reliability of the automated attendant feature. Other factors which can affect automated attendant performance are C.O. line noise, the quality of the playback device, and the quality and strength of the DTMF tones generated by the off-premises phone itself.

Voice mail/computer hunt groups not functioning properly	Incorrect voice mail/ computer installation	Refer to the installation instructions included included with the unit to verify the wiring interface and installation.
	Voice computer dial rules programming error	Refer to FEATURES, page 4-22, and to PROGRAMMING, page 5-75.
	DTMF feedback enabled	Some voice mail units require DTMF feedback from the KSU to indicate the status of the call being attempted. For other voice mail units, DTMF feedback may cause problems and should be disabled.

SMDA reports not generated automatically and/or they cannot be generated using the attendant feature code	Programming error	Automatic SMDA report generation must be be enabled. Also, the reports can be set to be generated daily, weekly, monthly, or by the attendant only. See PROGRAMMING, page 5-112.
	User error	For correct procedures on using the attendant feature code for SMDA report generation, refer to page 4-103 in FEATURES.

FIGURE 6-5.   KEYSET TROUBLESHOOTING CHART

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Keyset inoperative. LED indication present while any key with an LED is held down. Reorder tone is heard when key is pressed.	Programming error (circuit not equipped; display shows STN CIRCUIT IS UN-EQUIPPED)	Equip the circuit. Refer to PROGRAMMING, page 5-49.
	Programming error (circuit identified as DSS/BLF; no reorder tone is heard)	Identify the circuit for keyset use. Refer to page 5-49 in PROGRAMMING.
	Defective cabling or connections	Ensure that all cables are correctly connected to the modular jack as shown in Figure 3-1 on page 3-7 in INSTALLATION. Check for loose or open connections in the station cabling and the line cord.
	Defective keyset	Perform the keyset self-test as described in INSTALLATION, page 3-40, and replace the keyset if faulty.
	Defective station circuit	Replace defective KCB or EXP.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.
Keyset inoperative. No LED indication when any key is pressed. No audio is present.	System lockout caused by excessive data errors (displays SYSTEM LOCKOUT)	Remove and replace the line cord to reset the keyset.
	Defective keyset	Perform the keyset self-test as described in INSTALLATION, page 3-40, and replace the keyset if faulty.
	Defective cabling or connections	Ensure that 30VDC is present at the modular jack and polarity is correct. Check for loose or open connections in the station cabling and the line cord. Refer to Figure 3-1 on page 3-7 in INSTALLATION.
	Defective station circuit	Replace defective KCB or EXP.

FIGURE 6-5.   KEYSET TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
A group of 8 keysets inoperative. No LED indication when a line key is held down. All affected keysets are located on the KCB or on EXP.	Defective fuse on the associated KCB or EXP	Turn off the AC power, remove the fuse, and use an ohmmeter to check the fuse; replace if faulty.
	Defective KCB or EXP	Replace defective KCB or EXP.
	Defective station amphenol connector or cable	Remove cable from board. Using an ohmmeter, verify the pinout of the cable. (Refer to Figure 3-15 on page 3-28 in INSTALLATION.) Ensure that 30VDC is present at the modular jack and polarity is correct. Check for loose or open connections in the station cabling and the line cord.
LCD inoperative. Otherwise, keyset functions normally.	Defective LCD Unit or LCD ribbon cable.	Replace the LCD Unit or ribbon cable. Refer to page 3-38 in INSTALLATION.
	Improper installation	Refer to INSTALLATION, page 3-38.
	Defective ribbon cable connector	Replace the keyset.
Optional headset inoperative	User error	Ensure the enable headset feature code (315) was entered. Check feature code programming to see if code was changed. Refer to page 5-33 in PROGRAMMING.
	Incorrect or defective headset	Ensure the headset contains a dynamic microphone, or a carbon microphone and an external AC power source. Replace headset if necessary.
	Defective keyset	Try another keyset.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.

FIGURE 6-5. KEYSET TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Keyset squeals on outside calls or when receiving a handsfree intercom call from a single-line station (feedback)	Speaker volume is too loud	Reduce feedback by lowering speaker volume using keyset volume controls.
	Poor acoustics	Poor acoustics can cause poor quality on handsfree calls. Try placing a private call.

NOTE: A two- to four-wire converter is used during communication between keysets and single-line stations. Reflection is a normal characteristic of these converters. Feedback on intercom calls is eliminated when the single-line station user places a private intercom call by pressing the pound (#) key before dialing the intercom number or by entering the ring intercom always feature code (367).

Data noise in any off-hook condition	Defective cabling or connections	Check for loose or open connections, or crossed wires.
	Station cable exposed to interference	Ensure proper station cable runs. Refer to INSTALLATION, page 3-6.
	Defective keyset	Try another keyset.
	Defective station circuit	Replace defective KCB or EXP.

Cannot obtain intercom dial tone. No tone heard; C.O. line works.	Defective keyset	Perform the keyset self-test as described in INSTALLATION, page 3-40, and replace the keyset if faulty.
	Defective station circuit	Replace defective KCB or EXP.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.

Cannot break intercom dial tone	Defective keyset	Perform the keyset self-test as described in INSTALLATION, page 3-40, and replace the keyset if faulty.
	Defective station circuit	Replace defective KCB or EXP.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.

FIGURE 6–5. KEYSET TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Cannot place intercom call. Intercom dial tone is present, but reorder tone is heard when call is is attempted.	User error	Illegal dialing sequence used. Try again, using proper dialing sequence. See FEATURES, page 4–46.
	Defective keyset	Perform the keyset self-test as described INSTALLATION, page 3–40, and replace the keyset if faulty.
	Defective station circuit	Replace defective KCB or EXP.
	Defective KCB	Refer to page 6–2 to test the system voltages. Replace the control board if faulty.
Cannot break C.O. dial tone	Defective keyset	Perform the keyset self-test as described in INSTALLATION, page 3–40, and replace the keyset if faulty.
	Defective system channel or switching matrix	Perform network self test. Refer to PROGRAMMING, page 5–128.
	Defective C.O. or station circuit	Replace defective KCB or EXP.
	Defective KCB	Refer to page 6–2 to test the system voltages. Replace the control board if faulty.

NOTE: See also C.O. line problems on page 6–16.

FIGURE 6–5.   KEYSET TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Data device (connected to 24-line keyset) not operating properly	User error	Refer to manufacturer's operating instructions.
	Secondary voice path busy (if installed)	The keyset will not transmit data calls when the secondary voice path or speakerphone are in use. Refer to page 4–90 in FEATURES.
	Problem with data device	Disconnect data device and check operation according to the manufacturer's instructions.
	Data Port Module not installed properly or defective	Check Data Port Module installation and strap settings. Refer to INSTALLATION, page 3–42. Replace if defective.
	Defective keyset	Try another keyset.
	Defective station circuit	Replace defective KCB or EXP.
	Defective KCB	Refer to page 6–2 to test the system voltages. Replace the control board if faulty.
LRA device connected to keyset not operating properly	Problem with LRA device	Disconnect LRA device and check operation according to the manufacturer's instructions.
	Data Port Module not installed properly or defective	Check Data Port Module installation and strap settings. Refer to INSTALLATION, page 3–42. Replace if defective.
	Defective keyset	Try another keyset.
	Defective KCB	Refer to page 6–2 to test the system voltages. Replace the control board if faulty.

FIGURE 6-5.   KEYSET TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Cannot receive off-hook voice announce calls	Programming error	Ensure that the system option for off-hook voice announce is enabled (PROGRAMMING, page 5-24), that the called keyset is programmed to receive OHVA calls, and that the calling keyset is programmed to transmit OHVA calls (PROGRAMMING, page 5-49).
	Installation	The keyset must have a secondary voice path installed. Refer to INSTALLATION, pages 3-14 to 3-16, for details.
	Secondary voice path busy	The keyset will not receive off-hook voice announce calls when the secondary voice path or speakerphone are in use. Refer to FEATURES, page 4-51.
	Defective keyset	Perform the keyset self-test as described in INSTALLATION, page 3-40, and replace the keyset if faulty.
	Defective station circuit	Replace defective KCB or EXP.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.

FIGURE 6-5. KEYSET TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Cannot place off-hook voice announce calls	Programming error	Ensure that the system option for off-hook voice announce is enabled (PROGRAMMING, page 5-24), that the called keyset is programmed to receive OHVA calls, and that the calling keyset is programmed to transmit OHVA calls (PROGRAMMING, page 5-49).
	User error	The called station is a 12-line keyset or a single-line set (they cannot receive OHVA calls) or it is a 24-line keyset that is programmed not to receive OHVA calls. Or, the called keyset user may have blocked the OHVA call. Refer to page 4-51 in FEATURES for more information.
	Defective keyset	Perform the keyset self-test as described in INSTALLATION, page 3-40, and replace the keyset if faulty.
	Defective station circuit	Replace defective KCB or EXP.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.

FIGURE 6-6. SINGLE-LINE SET TROUBLESHOOTING CHART

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Single-line set completely inoperative.	APM and/or proper software not installed	An APM and Intermediate or Advanced software are required for single-line set capability.
	Defective set	Replace the single-line set.
	Defective cabling	Check amphenol connector and station cabling. Refer to INSTALLATION, page 3-9.
	Defective APM	Replace the associated APM.
Single-line set inoperative. Talk battery present.	Programming error	Ensure the circuit has been equipped. Refer to PROGRAMMING, page 5-49.
	Defective set	Replace the single-line set.
	Defective system channel or switching matrix	Perform network self test. Refer to PROGRAMMING, page 5-128.
	Defective APM	Replace the associated APM.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.
Single-line set inoperative. Calls ring in. Talk battery is present.	Defective set	Replace the single-line set.
	Defective APM	Replace the associated APM.
A group of six single-line sets inoperative. All are on the same APM.	Loose amphenol connector	Ensure connector is securely attached to the APM.
	Defective APM	Replace the associated APM.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.

FIGURE 6-6. SINGLE-LINE SET TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Single-line set will not ring for C.O. or intercom calls. Talk battery is present. Calls can be placed.	APM or single-line set ring straps not set for correct ringing	Set the associated strap for the correct ringer (AC or DC). Refer to INSTAL-LATION, pages 3–34 and 3–46.
	If set for DC ringing, APM fuse may be defective	Replace APM fuse. Refer to page 2–9 in SPECIFICATIONS.
	Defective ring generator and/or improper cabling	If using an AC ringer, you must install a ring generator on the APM that has proper REN for the stations it supports. Check the ring generator cabling. Refer to page 2–14 in SPECIFICATIONS.
	Defective set	Replace the set.
	Defective APM	Replace the associated APM.
	Defective KCB	Refer to page 6–2 to test the system voltages. Replace the control board if faulty.
Ring trip is not provided to a group of six single-line sets. Outgoing calls are not affected.	–48VDC absent from APM	Defective connection or incorrect installation of –48VDC on the APM. Using a voltmeter, measure the –48VDC (V/BR pair) at the APM block. Refer to INSTALLA-TION, pages 3–8 to 3–12.
	Defective cabling	Using a voltmeter, measure the –48VDC input at the amphenol connector (pins 49 and 24). Refer to Figure 3–5 on page 3–12 in INSTALLATION.
	Defective APM	Replace the associated APM.

FIGURE 6-6. SINGLE-LINE SET TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
A group of AC ringer-equipped single-line sets will not ring for C.O. or intercom calls. Talk battery is present. Calls can be placed. All stations are on the same APM.	Ringer generator not attached to APM	Defective connection or incorrect installation of ring generator to APM. Using a voltmeter, measure the ring generator input (V/S pair) at the APM block. Refer to INSTALLATION, pages 3-8 to 3-12.
	Defective cabling or miswired amphenol connector on the APM	Using a voltmeter, measure the ring generator input on the associated amphenol connector (pins 50 and 25). Refer to Figure 3-5 on page 3-12 in INSTALLATION.
	Defective APM	Replace the associated APM.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.
No AC ringer-equipped single-line set will ring for C.O. or intercom calls. Talk battery present. Calls can be placed.	Defective ring generator	Ring generator connected to a APM must be 110VAC, 30Hz. Use a voltmeter to measure the output. It must have the proper REN to ring the stations it supports. See SPECIFICATIONS, page 2-14.
	Defective cabling or miswired amphenol connector on all APMs	Using a voltmeter, measure the ring generator input on all amphenol connectors (pins 50 and 25). Refer to Figure 3-5 on page 3-12 in INSTALLATION.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.
Cannot obtain intercom dial tone. No sound is heard.	Either a DTMF decoder, voice channel, or tone generator is not available	Single-line station user will hear silence when any of the necessary resources are not available. User may camp on.
	Defective set	Replace the single-line set.
	Defective APM	Replace the associated APM.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.

FIGURE 6-6. SINGLE-LINE SET TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Cannot place intercom call. Dial tone present, but reorder tone heard.	User error	Try the call again. User may have dialed an invalid number.
	Defective set	Replace the single-line set.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.
Cannot break C.O. dial tone	Defective set	Replace the single-line set.
	Defective APM	Replace the associated APM.
Cannot place off-hook voice announce calls	Programming error	Ensure that the system option for off-hook voice announce is enabled (PROGRAMMING, page 5-24) and that the station is programmed to transmit (page 5-49).
	User error	Called station is a 12-line keyset or a single-line set.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.
Single-line sets not receiving message waiting indications	Programming error	Message waiting indication option must be enabled in the database. Refer to page 5-24 in PROGRAMMING.

FIGURE 6-7. DSS/BLF UNIT TROUBLESHOOTING CHART

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
DSS/BLF inoperative. No LED indication present while key is pressed.	Defective cabling	Ensure 30VDC present at the DSS/BLF modular jack and polarity is correct. Check for loose or open connections. Refer to Figure 3-1 on page 3-7 in INSTALLATION.
	Defective DSS/BLF Unit	Replace the DSS/BLF Unit.
	Defective station fuse	Replace the fuse if faulty.
	Defective station circuit	Replace defective KCB or EXP.
DSS/BLF inoperative. LED indication present while key is pressed.	Programming error	Circuit is identified for keyset use. Refer to page 5-49 in PROGRAMMING. Circuit must be equipped for DSS/BLF Unit use.
	Defective DSS/BLF Unit	Replace the DSS/BLF Unit.
	Defective station circuit	Replace defective KCB or EXP.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.
DSS/BLF LED indications incorrect	Cable exposed to interference	Refer to INSTALLATION, page 3-6, for correct cabling procedures.
	Programming error	Check DSS key assignment in PROGRAMMING, page 5-72.
	Defective DSS/BLF Unit	Replace the DSS/BLF Unit.
	Defective KCB	Refer to page 6-2 to test the system voltages. Replace the control board if faulty.
Calls are transferred to the wrong station	User error	Refer to FEATURES, pages 4-61 and 4-92, for procedures.
	Programming error	Check DSS/BLF key assignments. Refer to PROGRAMMING, page 5-72.

FIGURE 6–7. DSS/BLF UNIT TROUBLESHOOTING CHART (CONT'D)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Cannot place immediate off-hook voice announce calls (using the DSS/BLF key)	Programming error	Ensure that the system option for off-hook voice announce is enabled, that the immediate off-hook voice announce option is enabled, that the DSS/BLF station is programmed to transmit, and that the called keyset is programmed to receive. Refer to pages 5–24 and 5–49 in PROGRAMMING.
	User error	The called station is a 12-line keyset or a single-line set (they cannot receive OHVA calls) or is a 24-line keyset that is programmed not to receive OHVA calls. Or, the called keyset user may have blocked the OHVA call. Refer to page 4–51 in FEATURES for more information.
	Defective keyset	Perform the keyset self-test as described in INSTALLATION, page 3–40, and replace the keyset if faulty.
	Defective DSS/BLF Unit	Perform the DSS self-test (see INSTALLATION, page 3–45) and replace the DSS/BLF Unit if faulty.
	Defective station circuit	Replace defective KCB or EXP.
	Defective KCB	Refer to page 6–2 to test the system voltages. Replace the control board if faulty.

6. CUSTOMER SUPPORT

A. TECHNICAL SUPPORT

6.1 If problems persist when installing or servicing Inter-Tel equipment, *certified technicians* may contact Inter-Tel's Customer Support Department for assistance. They can be reached from 7:00 AM to 5:00 PM Mountain Standard Time at 602-961-9000 or 1-800-669-5858.

B. EMERGENCY ASSISTANCE

6.2 After office hours and on weekends, call 602-961-0277 and leave your message with the voice mail service. A Customer Support Product Specialist will return your call as soon as possible, usually within an hour. Please remember that this is an emergency number for *critical system problems only*. Sales questions, equipment orders, etc., can only be handled during normal business hours.

C. INTER-TEL SYSTEMS INFORMATION SERVICE (ISIS)

6.3 ISIS is available to distributors 24 hours a day, seven days per week. Following the instructions given in ISIS, you can access tech tips, application notes, and technical training schedules. You may access ISIS for as long as you like; however, if you go four minutes without responding to a prompt, the call will automatically be disconnected.

6.4 To access ISIS, you will need a terminal and a modem with the following characteristics:

- Bell 103 or 212 standard modem or equivalent.

- 0-300 or 1200 baud rate.

- Full-duplex communication capability (parity is not checked).

6.5 *TO ACCESS ISIS:*

(1) Dial 602-961-1825.

(2) When you hear the modem tone, activate your modem according to the manufacturer's instructions.

(3) Press the RETURN key repeatedly until the terminal responds with USERNAME.

(4) Enter ISIS and press RETURN.

(5) Your terminal will print ENTER ACCESS CODE.

(6) Enter 150377 and press RETURN.

(7) Your terminal will print ENTER DISTRIBUTOR CODE.

(8) Enter your distributor code (Inter-Tel account number as it appears on your monthly invoice) and press RETURN.

(9) Your terminal will print WELCOME TO ISIS, followed by a series of menus that will guide you to the information you need.

(10) When you are finished, select EXIT ISIS from the main menu and terminate your call according to the instructions for your modem.

NOTE: If you have any problems, please exit ISIS and report the problem to Customer Support between 7:00 AM and 5:00 PM (MST).

7. DEFECTIVE UNIT RETURN POLICY

> **IMPORTANT**
>
> For complete information on returning equipment, refer to the *current* Inter-Tel Incorporated Material Return Policy (document part number 835.1065). This document includes specific information on the following subjects: warranty, procedures to follow when returning equipment, equipment damaged in shipment, insurance, repair policy, and advance replacement policy.

7.1 *TO RETURN A DEFECTIVE UNIT FOR REPAIR:*

(1) Obtain an MRA number from Inter-Tel's Order Processing Department. Write the MRA number and ATTN: MRA on the outside of each carton being returned. *INTER-TEL DOES NOT ACCEPT EQUIPMENT IF THE MRA NUMBER IS NOT ON THE CARTON.*

(2) On the repair tag, identify the unit by the equipment name, part number, and serial number. (Repair tags are available from Inter-Tel.)

(3) Describe the defect in detail and, if applicable, the circuit number related to the defect. Include applicable alarm messages and/or field service diagnostics, if possible. Document the estimated length of time the part had been in service prior to the failure. *ALL EQUIPMENT RETURNED FOR REPAIR MUST BE TAGGED WITH COMPLETE-DETAILED INFORMATION REGARDING THE DEFECT OR IDENTIFICATION OF THE PROBLEM.*

(4) Attach the upper portion of the repair tag to the defective equipment. Retain the bottom portion for your files.

(5) Properly package the equipment for shipping (i.e., return in original package or equivalent). *WARRANTY MAY BE VOIDED IF EQUIPMENT IS IMPROPERLY PACKAGED.*

> **CAUTION**
>
> To prevent damage, the KCB, EXPs, and APMs must always be transported or shipped as individually packaged units. *Do not transport or ship an assembled KSU; such action will void the warranty.* Also, while the KCB is out of service, make sure that the database back-up battery strap (JMP 1) is in the B position (upper two pins) to preserve the battery charge.

REPLACEMENT PARTS

CONTENTS   *PAGE*

1. INTRODUCTION

1.1 This section provides the information necessary to order replacement parts for the GMX-48 System.

2. ORDERING PROCEDURE

2.1 When ordering equipment for the GMX-48 System it is necessary to provide the following information to your order processing clerk:

- Company name
- Purchase order number
- Required date of shipment
- Part number(s) of equipment ordered
- Quantity required

3. REPLACEMENT PARTS LIST

3.1 Figure 7–1 on the next page lists authorized parts available for replacement on the GMX-48 System.

4. RECOMMENDED SPARE PARTS

4.1 *It is mandatory that spare parts be kept on hand to ensure the best possible customer service.*

4.2 Figure 7–2 on page 7–3 lists the quantities of spare parts recommended to adequately maintain and service ten GMX-48 Systems.

FIGURE 7-1. REPLACEMENT PARTS

<u>**DESCRIPTION**</u>   <u>**PART NUMBER**</u>

Station Instruments

24-Line Standard Keyset 662.3000
24-Line Display Keyset 662.3100
12-Line (non-display) Keyset 662.3200
DSS/BLF Unit 662.3300
Single-Line Instrument (SLI) 662.4100

KSU and Power Supply

KSU Control Board without MEM Board 662.1100
KSU Control Board with Standard MEM Board
    and Basic Software 662.1000
Standard MEM Board with Basic Software 662.2100
Extended MEM Board with Intermediate Software 662.2103
Extended MEM Board with Advanced Software 662.2101
Expansion Module 662.1200
Accessory Port Module 662.1500
Power Supply — Large* 662.0100
Power Supply — Medium* 662.0200
Power Supply — Small* 662.0600
Battery Back-Up Unit 662.0110

* Refer to SPECIFICATIONS, page 2-6, for size recommendations.

Software

MF-rated, Advanced 827.6005
MF-rated, Intermediate 827.6006
KF-rated, Basic 827.6007

Miscellaneous Equipment

HVRA Assembly Kit 680.73
Keyset Data Port Module Kit 828.1094
Keyset LCD Kit 828.1052
Voice Mail Unit (contact Customer Support for a list of available models)

Manuals

Installation & Field Maintenance Manual 662.8001
Owner's Guide 662.8002
Keyset User Guide 662.8003
Single-Line Set User Guide 662.8009
Keyset Quick Reference Guide 662.8004
SLI Quick Reference Guide 662.8008
DSS/BLF Quick Reference Guide 662.8007

FIGURE 7–2.   RECOMMENDED SPARE PARTS

PART NUMBER	DESCRIPTION	QUANTITY
662.1100	KSU Control Board without MEM Board	1
662.2100	Standard MEM Board with Basic Software	1
662.2103	Extended MEM Board with Intermediate Software	1
662.2101	Extended MEM Board with Advanced Software	1
662.1200	Expansion Module	1
662.1500	Accessory Port Module	1
662.0100	Power Supply — Large	1
662.0110	Battery Back-Up Unit	1
662.3000	24-Line Standard Keyset	5
662.3200	12-Line Keyset	5
662.4100	Single-Line Instrument	4
662.3300	DSS/BLF Unit	1
828.1052	Keyset LCD Kit	5
828.1094	Keyset Data Port Module Kit	1
680.73	HVRA Assembly Kit	1

NOTES

DEFAULT FEATURE CODES

INTER-TEL®

Notice to Service Personnel: Certification is Required.

Certification is required before installing or servicing the GMX-48 System. Certification entitles personnel to technical support through Inter-Tel's toll-free number and to informational updates. To become certified, personnel must successfully complete the *GMX-48 System Correspondence Course* which is available through equipment suppliers (part number 835.1096).

GMX-48

INSTALLATION AND FIELD MAINTENANCE MANUAL

Part No. 662.8001   Issue 2, May 1990

INTER-TEL

INTER-TEL/DVK SUPPLEMENT

TO ISSUE 2 OF THE GMX-48 INSTALLATION AND FIELD MAINTENANCE MANUAL

NOTICE

This *Inter-Tel/DVK Supplement* to Issue 2 of the *GMX-48 Installation and Field Maintenance Manual* is released by INTER-TEL, INCORPORATED as a guide for service personnel. When used in conjunction with the manual, this supplement provides information necessary to properly install, program, operate, and maintain the system.

The contents of this supplement, which reflect current INTER-TEL standards, are subject to revision or change without notice. If necessary, changes will be documented in succeeding issues of the supplement.

If additional information is required, please contact:

Customer Support Department
INTER-TEL, INCORPORATED
6505 W. Chandler Blvd.
Chandler, AZ 85226
(602) 961-9000

INTER-TEL/DVK SUPPLEMENT TO THE GMX-48 MANUAL

1. OVERVIEW

Use this *Inter-Tel/DVK Supplement* in conjunction with Issue 2 of the *GMX-48 Installation and Field Maintenance Manual*. Except for the differences noted in this supplement, the Inter-Tel/DVK station instruments install and operate the same as those outlined in the manual.

1.1 In addition to the station instruments described in the manual, the new digital Inter-Tel/DVK station instruments can also be used on the GMX-48 System.

NOTE: In order for the Inter-Tel/DVK station instruments to operate properly, the system must be installed with one of the new software packages described in the Issue 2 manual (software part numbers 827.6005, 827.6006, and 827.6007).

1.2 The Inter-Tel/DVK station instruments include:

- Inter-Tel/DVK 24-Line Standard Keysets (part no. 662.3800)
- Inter-Tel/DVK 24-Line Display Keysets (part no. 662.3400)
- Inter-Tel/DVK 12-Line Standard Keysets (part no. 662.4000)
- Inter-Tel/DVK 12-Line Display Keysets (part no. 662.3900)
- Inter-Tel/DVK 8-Line Standard Keysets (part no. 662.3500)
- Inter-Tel/DVK 8-Line Display Keysets (part no. 662.3600)
- Inter-Tel/DVK Direct Station Selection/Busy Lamp Field (DSS/BLF) Units (part no. 662.3700)

1.3 Inter-Tel/DVK keysets, which come equipped with audio integrated module (AIM) circuitry, allow the user to individually control voice and tone volume levels for intercom calls, outside calls, background music, etc. In the PROGRAMMING section of the GMX-48 manual, the Inter-Tel/DVK keysets are referred to as AIM keysets, which was the developmental name at the time the manual was published.

2. SPECIFICATIONS

A. KEYSETS

2.1 A built-in, integrated speakerphone is standard in all Inter-Tel/DVK keysets. For illustrations of the keysets, refer to Figures 4 through 6 on pages 10 through 12. Inter-Tel/DVK keyset dimensions are:

IT/DVK 24-LINE KTS	IT/DVK 12-/8-LINE KTS
Height 3.8 in. (9.7 cm.)	Height 3.8 in. (9.7 cm.)
Width 9.2 in. (16.5 cm.)	Width 7.0 in. (17.8 cm.)
Length 9.5 in. (24.1 cm.)	Length 9.5 in. (24.1 cm.)
Weight 2.8 lb. (1.3 kg.)	Weight 2.5 lb. (1.1 kg.)

2.2 Like the GMX 24-line keyset, all Inter-Tel/DVK keysets can be equipped with secondary voice paths (to *receive* OHVA calls and/or to use the *simultaneous* voice/data communication feature). Refer to pages 3–14 and 5–49 in the GMX-48 manual for special installation and programming information.

Liquid Crystal Display (LCD) Unit

2.3 All standard Inter-Tel/DVK keysets (24-line, 12-line, and 8-line) can be converted to display sets by installing a liquid crystal display (LCD) unit as outlined in the manual on page 3–38. Inter-Tel/DVK 24-line keysets use the *large* LCD Kit (part no. 828.1168). Inter-Tel/DVK 12-line and 8-line keysets use the *small* LCD Kit (part no. 828.1166).

Data Port Modules

2.4 All Inter-Tel/DVK keysets may be equipped with optional Data Port Modules (part no. 828.1094) for connecting either a data device or a loud ringing adapter (LRA) and an external signalling device. Refer to page 3–42 in the GMX-48 manual for installation instructions.

B. DIRECT STATION SELECTION/BUSY LAMP FIELD (DSS/BLF) UNITS

2.5 The Inter-Tel/DVK DSS/BLF Unit is similar in design and function to the GMX DSS/BLF Unit described in the manual.

2.6 For a drawing of the Inter-Tel/DVK DSS/BLF Unit, refer to Figure 7 on page 13. The unit's dimensions are:

Height	3.8 in.	(9.7 cm.)
Width	7.0 in.	(17.8 cm.)
Length	9.5 in.	(24.1 cm.)
Weight	2.5 lb.	(1.1 kg.)

3. INSTALLATION

3.1 The installation instructions in this supplement contain information that differs from the GMX-48 manual or is not covered in the manual. For complete installation information, use the manual along with this supplement.

3.2 When performing the loop resistance test as outlined on page 3-17 in the GMX-48 manual, use the following loop limit values for Inter-Tel DVK station instruments:

Inter-Tel/DVK Keysets (standard and display)	82 ohms/1595 ft. (455 m.)
Inter-Tel/DVK Keysets with Data Port Modules	66 ohms/1280 ft. (390 m.)
Inter-Tel/DVK DSS/BLF Units	65 ohms/1260 ft. (354 m.)

A. KEYSET INSTALLATION

3.3 Before performing the installation instructions outlined in this section, refer to the information in the GMX-48 manual beginning on page 3-38.

Inter-Tel/DVK Keyset Installation

3.4 Install Inter-Tel DVK 24-line, 12-line, and 8-line standard and display keysets as follows:

(1) Before mounting the modular jack assembly and connecting the keyset, measure the voltage on the RED terminal of the modular jack assembly with respect to the GREEN terminal. (The "common" probe of the voltmeter is placed on the GREEN terminal.) It must measure +30VDC (±2.0VDC). If −30VDC is measured, check the cabling for a reversed pair.

```
                 CAUTION
If the power pair (W/BL, BL/W) is reversed, in-
stalling a keyset will open the fuse on the KSU
Control Board or Expansion Module. This af-
fects operation of all keysets and DSS BLF
Units connected to the board or module.
```

(2) Mount the modular jack assembly on the wall.

(3) Remove the baseplate.

(4) Attach the coiled handset cord to the handset and to the handset jack on the right side on the bottom of the keyset.

(5) Place the handset on hook.

(6) Plug one end of the line cord into the wall-mounted modular jack assembly. Plug the other end into the jack near the upper-left corner on the bottom of the keyset.

NOTE: To aid in installation and troubleshooting, display keysets show their station circuit number, intercom (extension) number, and assigned user name for five seconds when power is turned on and the line cord is first plugged in. This display also appears whenever the line cord is removed and replaced while power is on, after a system reset, and after a system initialization using selection [K] in database programming. The station identification displays for five seconds, then the keyset changes to the appropriate display, depending on its current status.

(7) Perform the keyset self-test:

a. While pressing the asterisk (*) and pound (#) keys, unplug and replace the keyset line cord.

b. Release the keys. The keyset rings momentarily. (Display keysets show a dark display — all pixels lit.)

c. Lift and replace the handset. The keyset rings momentarily. (Display keysets show a blank display — no pixels lit.)

d. Lift and replace the handset. The keyset rings momentarily and all LED-equipped keys light. (Display keysets show KTS SELF-TEST LED MATRIX.) If any of the LEDs do not light, return the keyset for repair.

e. Lift and replace the handset. The keyset rings momentarily and all of the LEDs go out. (Display keysets show KTS SELF-TEST KEY MATRIX.)

f. One at a time, press each of the keys on the keyset in any order. A progress tone (or a DTMF tone for keypad keys) is heard if the key is functioning properly. If the signals are not heard, the key is faulty. Return the keyset for repair if any key is faulty.

g. Lift and replace the handset. The audio integrated module tones are broadcast over the speakerphone speaker. (Display keysets show KTS SELF-TEST AIM TONES.)

h. Lift and replace the handset. Audio integrated module tones of various volume levels, from softest to loudest, are broadcast over the speakerphone speaker. (Display keysets show KTS SELF-TEST AIM TONE VOLUME.)

i. Lift and replace the handset. Tones of various volume levels, from softest to loudest, are broadcast over the speakerphone speaker. (Display keysets show KTS SELF-TEST AIM SPK VOLUME.)

j. Lift the handset, then press and release the hookswitch. Tones of various volume levels, from softest to loudest, are broadcast over the handset receiver. (Display keysets show KTS SELF-TEST AIM HS VOLUME.)

k. Press and release the hookswitch. A continuous tone is broadcast over the handset receiver using the primary voice path circuitry. (Display keysets show KTS SELF-TEST AIM XMT/RCV PRI.)

l. Press and release the hookswitch. A continuous tone is broadcast over the handset receiver using the secondary voice path circuitry. (Display keysets show KTS SELF-TEST AIM XMT/RCV SEC.)

m. Press and release the hookswitch. The handset transmitter is connected to the handset receiver via the primary voice path circuitry. (Display keysets show KTS SELF-TEST HOT HANDSET PRI.)

n. While speaking into the handset transmitter, determine that sidetone is being received over the handset receiver.

o. Press and release the hookswitch. The handset transmitter is connected to the handset receiver via the secondary voice path circuitry. (Display keysets show KTS SELF-TEST HOT HANDSET SEC.)

p. While speaking into the handset transmitter, determine that sidetone is being received over the handset receiver.

q. Press and release the hookswitch. The speakerphone microphone is connected to the handset receiver. (Display keysets show KTS SELF-TEST SPKRPHONE MIC.)

r. While speaking into the speakerphone microphone (or rubbing a finger over the opening to the microphone), determine that the sound is being broadcast over the handset receiver.

s. Place the handset back on hook. The keyset rings momentarily. It then takes about ten seconds for the keyset to return to normal operation. (Display keysets show KTS SELF-TEST COMPLETED! for about five seconds. Then, the keyset's identification, as described in the NOTE to step 6, displays for about five seconds.)

t. Replace the keyset if faulty.

(8) Replace the baseplate.

(9) The keyset ring tone can be changed by performing the steps described in the FEATURES section on page 4-39.

B. DIRECT STATION SELECTION/BUSY LAMP FIELD (DSS/BLF) UNIT INSTALLATION

3.5 Before performing the installation instructions outlined in this section. refer to the information in the GMX-48 manual beginning on page 3–45.

3.6 To install Inter-Tel/DVK DSS/BLF Units, follow these steps:

(1) Before connecting the DSS/BLF Unit to the KSU, measure the voltage on the RED terminal of the modular jack assembly with respect to the GREEN terminal. (The "common" probe of the voltmeter is placed on the GREEN terminal.) It must measure +30VDC (±2.0VDC). If –30VDC is measured, check the cabling for a reversed pair.

CAUTION

If the power pair (W/BL, BL/W) is reversed, installing a DSS/BLF Unit will open the fuse on the KSU Control Board or Expansion Module. This affects operation of all keysets and DSS/BLF Units connected to the board or module.

---

(2) Mount the modular jack assembly on the wall.

(3) Remove the four screws on the bottom of the DSS/BLF Unit and remove the bottom cover.

(4) Locate the strap (J2) in the lower-right corner of the control board (see Figure 1 on page 6) and ensure that it is in the DSS1 position (over the right two pins).

(5) Perform the DSS/BLF Unit self-test:

   a. Plug one end of the line cord into the modular jack on the unit's control board.

   b. While holding down keys 100 and 110 (default), plug the other end of the line cord into the modular jack assembly. All the keys should light up. If an LED does not light. remove and replace the line cord while holding down keys 100 and 110 (default). If the test fails again. replace the DSS/BLF Unit.

   c. Press each key individually (in any order) to remove the lit status. When finished. all keys should be unlit. If an LED does not go out, remove and replace the line cord and repeat steps b and c. If the test fails again. replace the DSS/BLF Unit. After all the keys have been tested. it takes approximately 10 seconds for the DSS BLF Unit to return to normal operation.

   d. Re-assemble the DSS/BLF Unit.

FIGURE 1.   INTER-TEL/DVK DSS/BLF UNIT CONTROL BOARD

DSS CONFIGURATION STRAP

J2

DSS2 DSS1
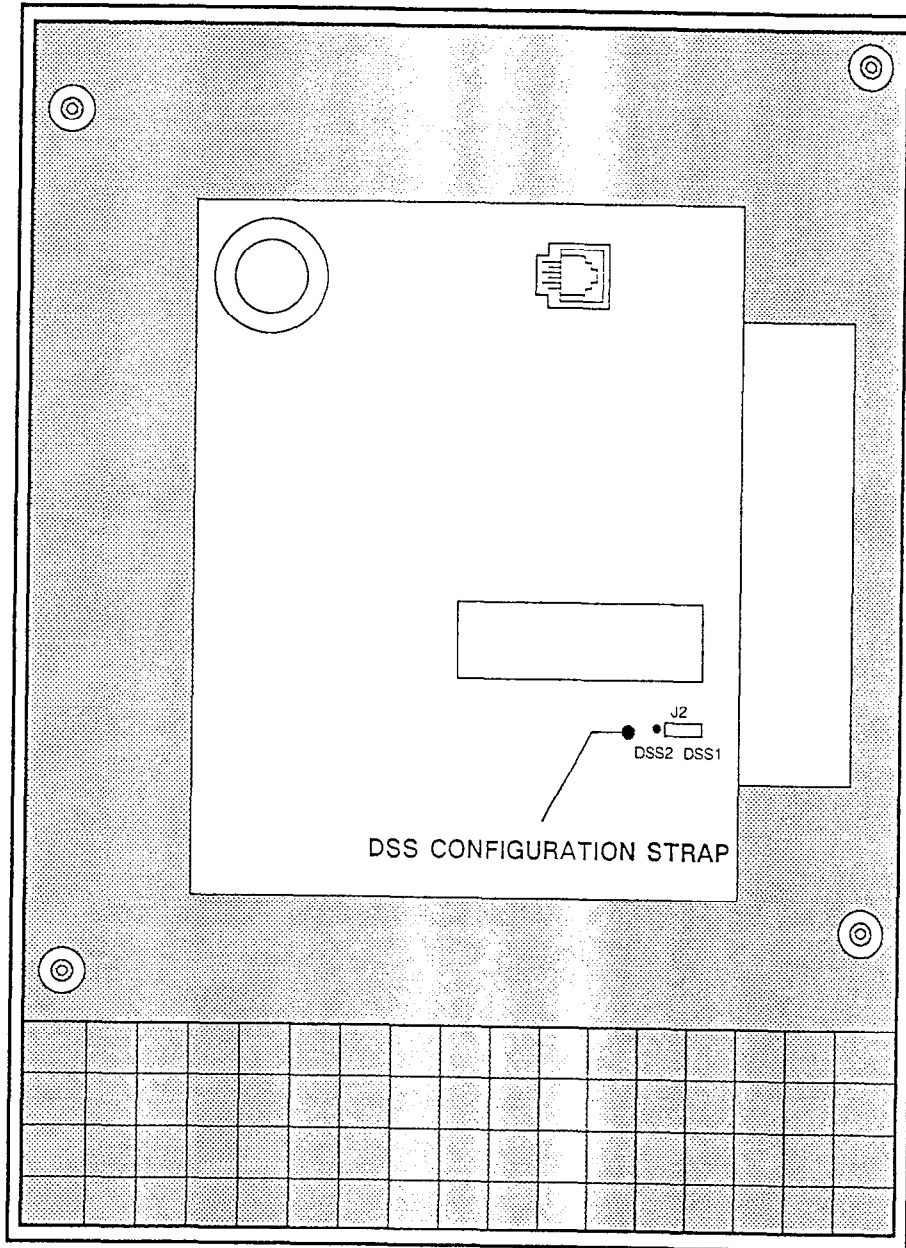
4. FEATURES

4.1 Except for the differences noted in this supplement. the Inter-Tel/DVK stations instruments function exactly the same as the station instruments described in the manual. All keyset and DSS BLF Unit feature instructions in the manual also apply to the Inter-Tel/DVK station instruments.

Volume Controls

4.2 On Inter-Tel/DVK keysets, handset volume. speakerphone volume. ring tone volume. etc. are controlled by pressing volume control feature keys (VOL UP and VOL DN) as described below.

4.3 *TO CHANGE VOLUME LEVELS ON AN INTER-TEL DVK KEYSET:*

(1) While performing or listening to any of the following eight functions, press the VOL UP (volume up) key to raise the volume or press the VOL DN (volume down) key to lower the volume. A confirmation tone indicates that you have reached the highest or lowest possible volume. Display keysets show the level as it is raised or lowered.

   a. *To change handset intercom voice volume.* press the desired key while on an off-hook (handset) intercom call.

   b. *To change handsfree intercom voice volume (which includes paging volume).* press the desired key while on an on-hook (speakerphone) intercom call or while listening to a page.

   c. *To change handset outside call voice volume.* press the desired key while on an off-hook (handset) outside call.

   d. *To change handsfree outside call voice volume,* press the desired key while on an on-hook (speakerphone) outside call.

   e. *To change background music volume.* press the desired key while listening to background music through the keyset speaker.

   f. *To change ringing alert tone volume.* press the desired key while the keyset is ringing. Or, while on hook. press both keys at the same time to hear the currently programmed volume, then press the desired key to adjust the volume up or down.

      NOTE: The selected ringing alert tone volume is automatically saved.

   g. *To change handset progress tone volume.* press the desired key while listening to intercom dial tone through the handset.

   h. *To change speakerphone progress tone volume,* press the desired key while listening to intercom dial tone through the speakerphone.

(2) **To save the new volume level, if desired:** Press the VOL UP and VOL DN keys at the same time. If this step is not performed. the keyset will retain the previous saved volume level for that function (except for the ringing alert tone volume, which is automatically saved at the most current volume level).

4.4 *TO RETURN AN INTER-TEL/DVK KEYSET TO THE DEFAULT VOLUME LEVELS:*

   While on or off hook, press the SPCL key and enter the default volume feature code (394).

Off-Hook Voice Announce

4.5 If the off-hook voice announce (OHVA) feature is enabled system-wide (and the proper secondary voice path installation has been performed). each Inter-Tel/DVK keyset can be enabled to *receive* OHVA calls. Refer to pages 3-14 and 5-49 in the GMX-48 manual for special installation and programming information.

5. PROGRAMMING

5.1   To reprogram the default values of the user-programmable feature keys on the Inter-Tel DVK keysets, refer to program [DAC] Soft Feature Key Default Values (/SOFT) as outlined on page 5–60 in the manual. A program planning sheet for the Inter-Tel/DVK keysets is provided in Figure 2 below.

FIGURE 2.   STATION PROGRAM PLANNING SHEET

[DAC] SOFT FEATURE KEY DEFAULT VALUES (/SOFT):

Inter-Tel/DVK 24-Line Keysets:

	DEFAULT VALUE	NEW VALUE
Key A	Redial (E380)	_____
Key B	System Speed Dial (E381)	_____
Key C	Individual Hold (E336)	_____
Key D	Transfer CO Call (E345)	_____
Key E	Page (E7)	_____
Key F	Queue Request (E6)	_____
Key G	Background Music On/Off (E313)	_____
Key H	Automatic Line Selection (E89)	_____
Key I	Hookflash (E330)	_____
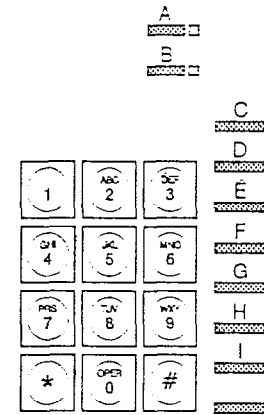
Inter-Tel/DVK 12-Line Keysets:

	DEFAULT VALUE	NEW VALUE
Key A	Individual Hold (E336)	_____
Key B	Transfer CO Call (E345)	_____
Key C	Page (E7)	_____
Key D	Queue Request (E6)	_____
Key E	Redial (E380)	_____
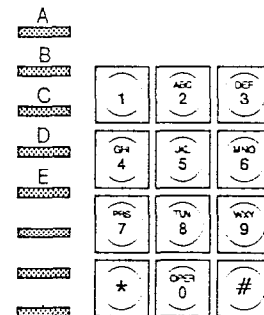
Inter-Tel/DVK 8-Line Keysets:

	DEFAULT VALUE	NEW VALUE
Key A	Individual Hold (E336)	_____
Key B	Transfer CO Call (E345)	_____
Key C	Page (E7)	_____
Key D	Queue Request (E6)	_____
Key E	Redial (E380)	_____

5.2 To reprogram the default volume levels for the Inter-Tel/DVK keysets, refer to program [DAI] Keyset Volume Default Settings (/VOL) as outlined on page 5-70 in the manual. A new program planning sheet is provided in Figure 3 below.

FIGURE 3. STATION PROGRAM PLANNING SHEET

[DAI] INTER-TEL/DVK KEYSET VOLUME DEFAULT VOLUMES (VOL):

	RANGE	DEFAULT	NEW SETTING
Handset IC Voice Level	1-13	4	_____
Speakerphone IC Voice Level	1-16	3	_____
Handset CO Voice Level	1-13	5	_____
Speakerphone CO Voice Level	1-16	5	_____
Background Music Level	1-16	2	_____
Alerting Tone Level	1-13	4	_____
Handset Progress Tone Level	1-13	5	_____
Speakerphone Progress Tone Level	1-13	3	_____

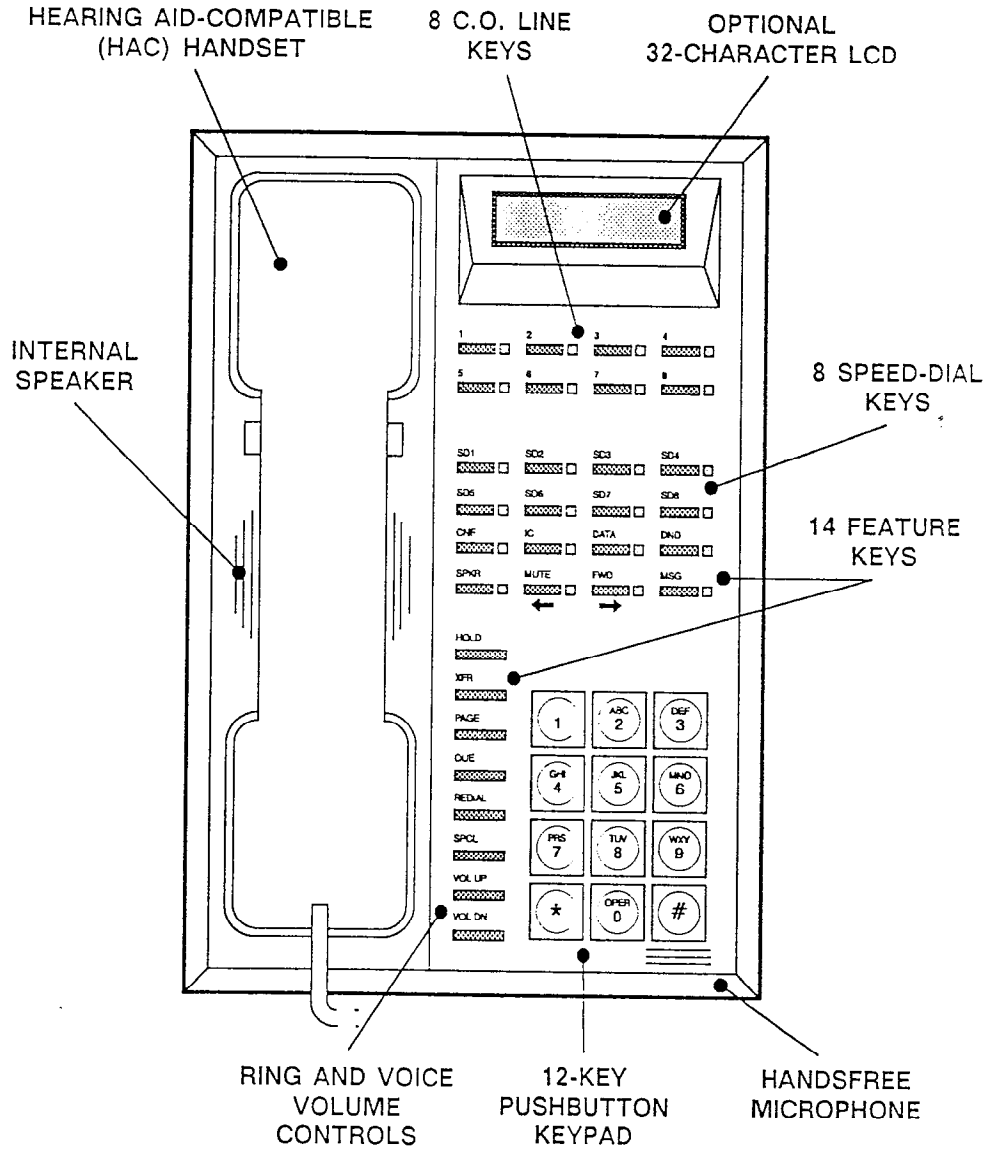## FIGURE 4.   INTER-TEL/DVK 24-LINE KEYSET
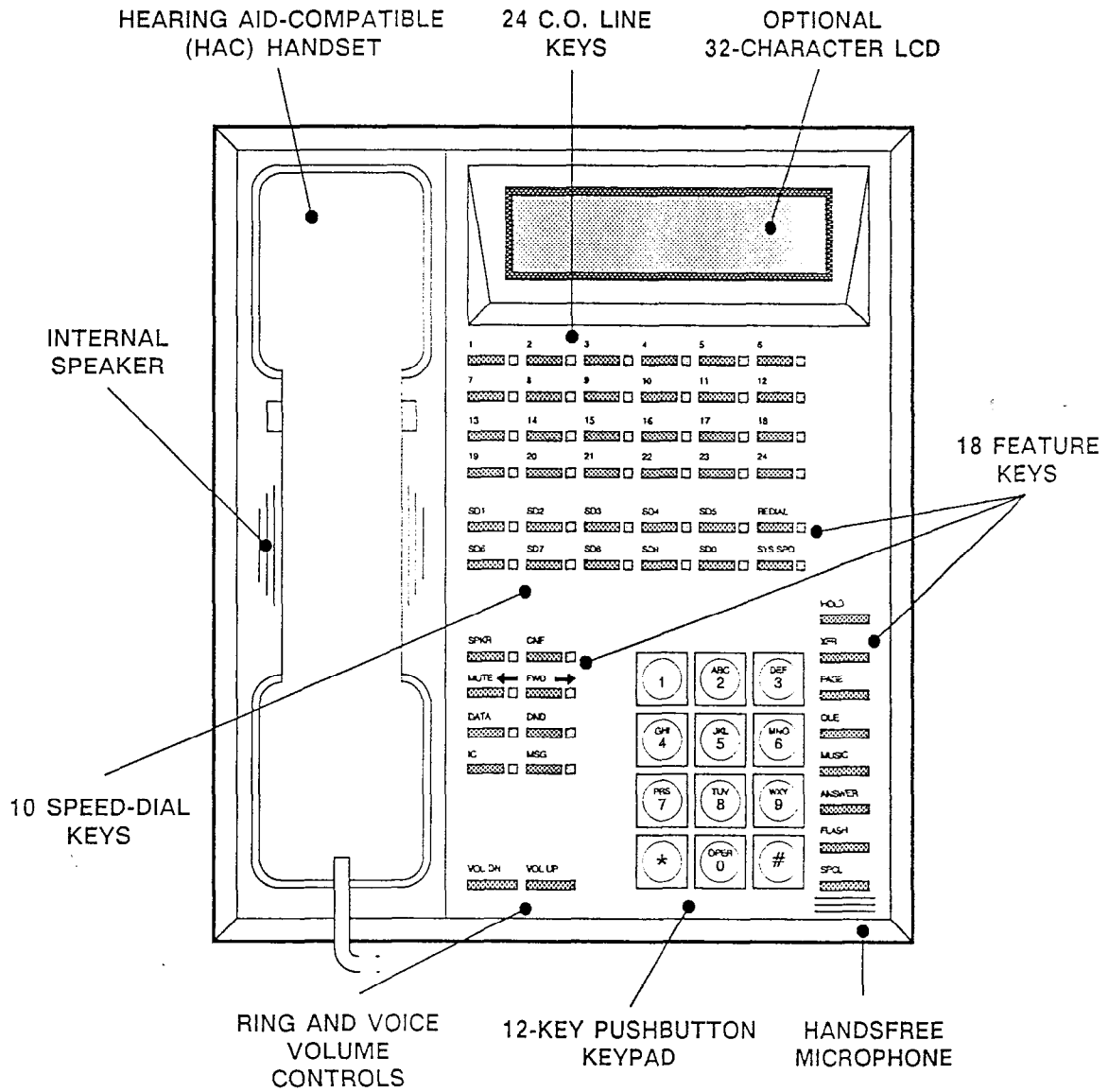
NOTE: The keys are shown as they appear in the default configuration.

FIGURE 5.   INTER-TEL/DVK 12-LINE KEYSET
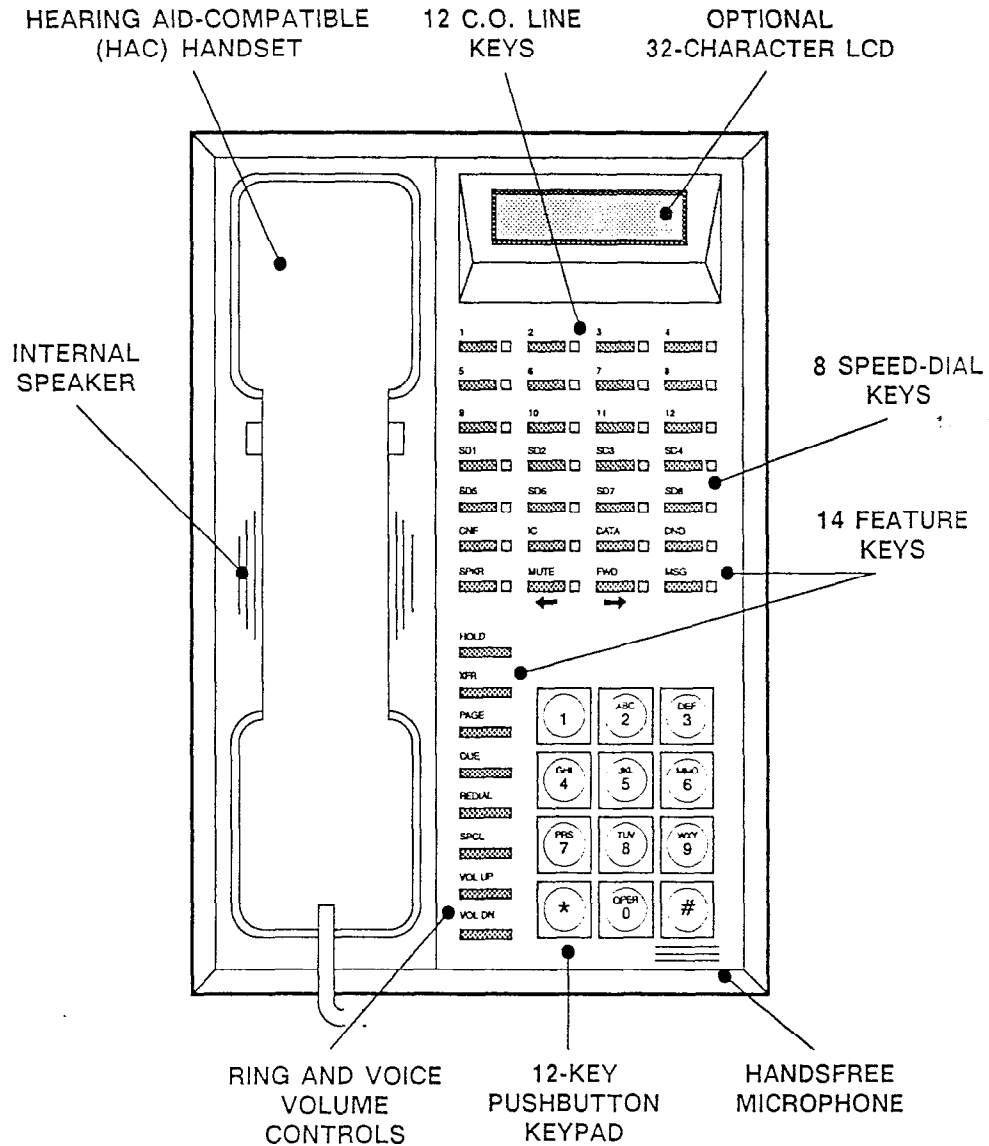
NOTE: The keys are shown as they appear in the default configuration.

FIGURE 6.   INTER-TEL/DVK 8-LINE KEYSET

NOTE: The keys are shown as they appear in the default configuration.

FIGURE 7.   INTER-TEL/DVK DIRECT STATION SELECTION/BUSY LAMP FIELD (DSS/BLF) UNIT

60 DSS/BLF KEYS