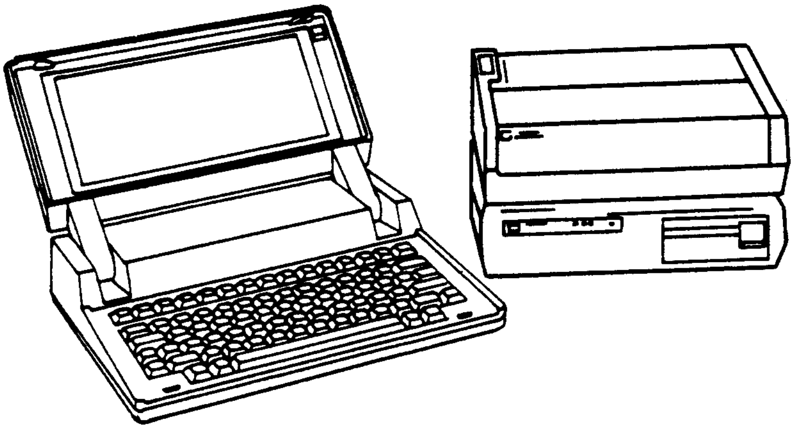
OPERATOR'S AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)



BASIC GENERATION UNIT
AN/GYK-33
(NSN 5895-01-260-4545)(EIC:N/A)

INCLUDING

PORTABLE COMPUTER (HP MODEL 111)
CP-1836/G,
(NSN 5895-01-254-6699)(EIC:N/A)

DISK DRIVE (HP MODEL 9114B)
RD-592/G,
(NSN 5895-01-254-6700)(EIC:N/A)

THINKJET PRINTER (HP MODEL 2225B)
(NSN 7025-01-199-8707)(EIC:N/A)

Approved for public release; distribution is unlimited.

HEADQUARTERS, DEPARTMENT OF THE ARMY
1 AUGUST 1992

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PMCS
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(RPSTL)
APPENDIX F-1

5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK.

1 DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL.

2 IF POSSIBLE, TURN OFF THE ELECTRICAL POWER.

3 IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A DRY WOODEN POLE OR A DRY ROPE OR SOME OTHER INSULATING MATERIAL.

4 SEND FOR HELP AS SOON AS POSSIBLE.

5 AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION.

FOR ARTIFICIAL RESPIRATION, REFER TO FM 21-11.

WARNING

HIGH VOLTAGE

is used In the operation of this equipment.

DEATH ON CONTACT

may result if personnel fail to observe safety precautions.

Never work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who is competent in administering first aid. When technicians are aided by operators, they must be warned about dangerous areas.

Be careful not to contact high-voltage connections of 115 volt ac input connections when installing or operating this equipment.

Whenever the nature of the operation permits, keep one hand away from the equipment to reduce the hazard of current flowing through vital organs of the body.

WARNING: Do not be misled by the term "low voltage." Potentials as low as 50 volts may cause death under adverse conditions.

For Artificial Respiration, refer to FM 21-11.

WARNING

Do not incinerate or mutilate the battery pack. The battery pack may release toxic materials or burst under extreme heat. Do not connect together or otherwise short circuit the battery pack terminals. The battery pack may melt or cause serious bums.

Use only HP battery packs with your printer. Use only HP rechargers with your battery pack.

The ink in the print head catridge contains diethylene glycol which is HARMFUL IF SWALLOWED. Keep new or used cartridges OUT OF THE REACH OF CHILDREN.

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*** TM 11-5895-1412-12&P**

TECHNICAL MANUAL
NO. 11-5895-1412-12&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 1 August 1992

OPERATOR'S AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)

BASIC GENERATION UNIT
AN/GYK-33
(NSN 5895-01-260-4545)(EIC:N/A)

INCLUDING

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Approved for public release; distribution is unlimited.

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-LC-LM-LT Fort Monmouth, New Jersey 07703-5007.

In either case, a reply will be furnished direct to you.

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*This manual supersedes TM 11-5895-1412-12&P, dated 1 May 1989.

This manual is an authentication of the manufacturer's commercial manuals which has been found to cover the data required to operate and maintain this equipment. The format has been structured in accordance with military specifications and also to consider levels of maintenance.

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HOW TO USE YOUR MANUAL

This manual is a quick reference book to tell you how to get your system operating and how to operate it in various modes.

Major topics are listed in the blocks on the front page together with the page number where the information can be found. Secondary topics are also enclosed in blocks throughout the manual sometimes continuing on following pages.

There will be occasions during the BECS operation when data in the Appendices will be required. Utilize those procedures when required and then return to the next consecutive operational procedure where you left off.

Additional topics can be located by consulting the table of contents near the front of the manual or at the beginning of each chapter, or by scanning through the index in the rear of the manual.

Primary performance steps, when subdivision is necessary, use letters A, B, C, etc. Secondary steps use bullets or alpha-numeric notation. IMPORTANT: Control and switch settings are printed with a picture of the switch in reference blocks similar in shape as on the hardware.

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CHAPTER 1

INTRODUCTION

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SECTION 1. GENERAL INFORMATION

Subject Page

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SCOPE

This manual provides operating and unit maintenance instructions, including repair parts for the Basic Generating Unit (BGU) of the Battlefield Electronic CEOI System (BECS). The BGU consists of a Hewlett-Packard (HP) 110 Portable-Plus computer, a HP 2225B ThinkJet printer, and a HP 9114B disc drive. These devices are used with a BECS Program disc, and other data discs to create and distribute information.

This manual is designed to be used with the BGU. You should become familiar with the PORTABLE PLUS OWNER'S DOCUMENTATION binder included with each computer and then read this User's Guide before attempting to use the BGU. Keep in mind this User's Guide is a manual for the BECS Program disc and contains only the essential information about the use of the software.

CONSOLIDATED INDEX OF ARMY PUBLICATIONS AND BLANK FORMS

Refer to the latest issue of DA Pam 25-30 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

MAINTENANCE FORMS, RECORDS, AND REPORTS I

Reports of Maintenance and Unsatisfactory Equipment. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, as contained in Maintenance Management Update.

b. Reporting of Item and Packaing Discretpancies. Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/SECNAVINST 4355.18/AFR 400-54/MCO 4430.3J.

C. Transportation Discrepancy Report (TDR) (SF 361). Fill out and forward Transportation Discrepancy Report (TDR) (SF 361) as prescribed In AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

DESTRUCTION OF ARMY ELECTRONIC MATERIEL TO PREVENT ENEMY USE

Destruction of Army electronic materiel to prevent enemy use shall be in accordance with TM 750-244-2.

PREPARATION FOR ADMINISTRATIVE STORAGE OR SHIPMENT

Administrative storage of equipment issued to and used by Army activities will have preventive maintenance performed in accordance with the PMCS charts before storing. When removing the equipment from administrative storage, perform PMCS.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your BGU needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don’t like about your equipment. Let us know why you don’t like the design. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to: Commander, US Army Communication-Electronics Command and Fort Monmouth, ATTN: AMSEL-ED-PH-D, Fort Monmouth, New Jersey 07703-5000. He’ll send you a reply.

REFERENCE INFORMATION

Nomenclature Cross-Reference List.

This list contains common names used throughout this manual in place of official nomenclature.

Common Name	Official Nomenclature
Basic Generation Unit	Computer Set, General Information Data, AN/GYK-33
Portable Computer	Computer, Desk Top, CP-1836/G
Disc Drive	Recorder, Reproducer, RD-592/G
Printer (ThinkJet Printer)	Printer, HP-2225B

LIST OF ABBREVIATIONS

Printed here is a list of abbreviations used in this manual. Become familiar with them as they will be used often during operation of the BGU and the BECS software.

ABBREVIATION	TERM
AASLT	Air Assault
ABRT	Abort (discontinue)
AC	Alternating Current
ADA	Air Defense Artillery
AFLD	Airfield
AJ	Antijam
AJ/ALT	Antijam/alternate
ALO	Air Liaison Officer
ALT	Alternate
AM	Amplitude Modulation
AMB	Ambulance
AMBL	Air Mobile
APPLIC	Application
AR	Armor
ARFOR	Army Forces
ARNG	Army National Guard
ARTY	Artillery
AT	Antitank
ATC	Air Traffic Control
ATH	Attack Helicopter
AUD/FILL	Audio/fill data connector on RT
AVN	Aviation
AVN BN (C)	Aviation Battalion - Combat
BN	Battalion
BECS	Battlefield Electronic CEOI System
BGU	Basic Generation Unit
BPS	Bits Per Second

ABBREVIATION	TERM
BRG	Bridge
BDE	Brigade
BAME	Brigade Air Management Element
BEW	Brigade Early Warning
CAV	Cavalry
CEN	Center
CML	Chemical
CBR	Chemical, Biological, and Radiological
CA	Civil Affairs
CLR	Clearing
C&J	Collection & Jamming
CBT	Combat
CAB	Combat Aviation Battalion/Brigade
CAG	Combat Aviation Group
CEWI	Combat Electronic Warfare and Intelligence
CEOI	Communications-Electronics Operations-Instructions
CEV	Combat Engineer Vehicle
CMD	Command
C/F	Command Fire
CO	Company
C	Countersign
C/S	Countersign and Sign

REFERENCE INFORMATION (CONT'D)

ABBREVIATION	TERM
CHAR	Character
COMSEC	Communications Security
CPU	Central Processing Unit
D	Downward
DCC	Data Corn Configuration
DTD	Data Transfer Device
DESC	Descriptor
DOS	Disk Operating System
DSR	Digital Standard Runoff
DAME	Division Air Management Element
DARTY	Division Artillery
DIVARTY	Division Artillery
DEW	Division Early Warning
DMMC	Division Material Management Center
DISCOM	Division Support Command
EW	Electronic Warfare
ECCM	Electronic Counter Counter-measures
EDISC	Electronic Disc
ERF	Electronic Remote Fill
EN	Engineer
EPROM	Erasable Programmable Read-only Memory
EOD	Explosive Ordnance Disposal
EXEC	Execute
F	Find
FA	Field Artillery
FD	Fire Direction
FLT	Flight
FCC	Flight Coordination Center
FOC	Flight Operations Center
FWD	Forward
FAAR	Forward Area Alerting Radar
FAARP	Forward Area Armament and Refueling Point
FH	Frequency Hopping
FM	Frequency Modulation
FREQ	Frequency
GSR	Ground Surveillance Radar
GP	Group

ABBREVIATION	TERM
HQ	Headquarters
HHB	Headquarters and Headquarters Battery
HHC	Headquarters and Headquarters Company
HHD	Headquarters and Headquarters Detachment
HHT	Headquarters and Headquarters Troop
HVY	Heavy
HPAD	Helicopter Landing Pad
HF	High Frequency
HLD	Hold*Load (H*LD)
IN	Infantry
INT	Intelligence
ID	Identification
IL	Interface Loop
INI	Item Number Identifier
INIT	Initial
INS	Insert
1/0	Input/Output
LCD	Liquid-Crystal Display
LD	Load
LED	Light Emitting Diode
LF	Low Frequency
M	Memo
MS-DOS	MicroSoft Disc Operating System
MAN	Manual
MHz	MegaHertz
MNT	Maintenance
MMC	Material Management Center
MI	Military Intelligence
MP	Military Police
MORT	Mortar
MLRS	Multiple Launcher Rocket System
NBC	Nuclear, Biological, and Chemical
N	Net
N	No
NIL	No
ONL	Organizational Net Listing

REFERENCE INFORMATION (CONT'D)

ABBREVIATION	TERM
0/I	Operations and Intelligence
OPS	Operation(s)
OPFOR	Opposition Forces
P(PYRO;	Pyrotechnic
PAM	Personal Applications Manager
PMCS	Preventive Maintenance Checks and Services
PREV	Previous
PRI	Primary
PSYOPS	Psychological Operations
QM	Quartermaster
RAM	Random Access Memory
ROM	Read Only Memory
RDR	Radar
RATT	Radio-teletype
RWI	Radio Wire Integration
REGT	Regiment
RT	Receiver Transmitter
RTS	Retransmission
S(SUFX)	Suffix
SFL	Sequential Frequency List
SHFT	Shift
SCT	scout

ABBREVIATION	TERM
SOI	Signal Operation Instructions
STATS	Statistics
STO	stow
SSB	Single Side Band
SQDN	Squadron
SVY	Survey
SUF/EXP	Suffix/Expander
TACP	Tactical Air Control Party
TOC	Tactical Operations Center
TF	Task Force
TAB	Target Acquisition Battery
TRANS	Transportation
UHF	Ultra High Frequency
VHF	Very High Frequency
WPNS	Weapons
XFER	Transfer
Y	Yes
z	Zone

REFERENCE INFORMATION (CONT'D)

GLOSSARY OF SYSTEM TERMS

ABORT (ABRT) - A command that discontinues or exits.

ADDRESS - A number that identifies the exact location to which your computer can send data or from which your computer receives data.

BACKUP - A backup is a duplicate copy of a disk made in case the original disk is lost or damaged.

BATTERY AMPHOUR - A rating of how much energy a battery can deliver before its immediate useful life is finished.

BOOTING - Booting up your computer puts it in a ready-to-run condition. The computer literally "pulls itself up by it's bootstraps" and gets ready to go. (Booting loads the operating system and utilities.)

BYTE - A byte is used to represent one character, such as a single letter, number, or other symbol.

CABLE - Cables provide the connection between computers and peripherals (printers and disk drives, etc.). The cable used in this manual is the HP-IL (Hewlett-Packard Interface Loop).

CALL SIGNS - A sign used in conjunction with the current time period and net name.

CHANNEL - A circuit in which a frequency and/or a hopset can be loaded and stored.

COMMAND - A sequence of characters that causes an operation to occur. Commands generally start with a name that identifies an executable file, such as a program or utility, and may include parameters.

CONFIGURATION - Configuration is a way to let your computer know which disk drive it is talking to, where the disk drive is on the bus, and which drive you want the computer to access.

CREATE - Can be used when no information exists in a given file or when the information that does exist is out of date and can be written over. When the CREATE option is chosen, the following prompt will appear: This will destroy current information. Are you sure? Y/N?

CURRENT LINE - The line on the screen that contains the cursor.

CURSOR - The flashing indicator that shows where the next character will be typed or changed.

CUE - Used to contact an FH radio net.

DEFAULT - The action or value automatically invoked by the computer unless you specify otherwise.

REFERENCE INFORMATION (CONT'D)

DIRECTORY - The table of contents for the files stored on a disk.

DISK - A circular plate of magnetically-coated material used to store computer information. HP's 3 l/2-inch flexible disk is enclosed in a plastic jacket.

DISK DRIVE - A device that allows a computer to read data that is stored on a disk or write data on a disk.

EDITING KEYS - Any keys on the keyboard that can be used for updating information on the screen by deleting, clearing and inserting characters. Keys used for moving the cursor, rolling the screen and moving the display pointer are also considered editing keys.

EXECUTE (EXEC) - A command that allows the operator to indicate when input on the keyboard is finished.

FH FREQUENCY DATA - Frequency data that RT operates on during frequency hopping; includes lockout sets and hopsets.

FILE - A part of memory or a storage medium that is uniquely identified by its file name. A file is treated by the operating system and application programs as a separate unit of information that can be manipulated independently of other files. Files can contain data or programs or both.

FILE NAME - A sequence of 1 to 8 characters used to identify a particular file.

FORMATTING - The process by which a disk is prepared to receive and store data. Also known as "indicating". First the disk drive checks the disk for any damaged areas in which data cannot be stored. Second, the disk drive sets up storage areas on the disk. Finally, the disk drive sets up a directory on the disk.

FREQUENCY ASSIGNMENT - A designated frequency for operation as assigned by the net controller.

FUNCTION KEYS (also called SOFT KEYS) - The eight keys labeled fl through f8 on the top row of the keyboard. Functions assigned to these keys often change when a new screen is displayed. Function-key labels appear in the right blocks on the screen corresponds to the position of the function keys on the keyboard.

HARDWARE - The physical parts of the computer system: the computer and the peripheral devices.

HEAD - The part of the disk drive that reads data form your disk and writes data onto your disk.

HOPSET - Data that determines which frequencies will be used during FH; used by all radios in a net for net communication.

HEWLETT-PACKARD (HP) - Manufacturer of BGU and peripherals.

REFERENCE INFORMATION (CONT'D)

HEWLETT-PACKARD INTERFACE LOOP (HP-IL) - The HP-IL is a connector that allows the computer and the peripherals to communicate. The personal computer, disk drive, and printer are connected to one another by means of cables in a loop configuration.

INITIALIZING - Process by which a disk is prepared to receive and store data. See formatting.

INSERT (INS) -A command that allows characters to be inserted into text during the entry period.

INTERFACE - The link between the computer and another piece of equipment. It can be equipment or programs and is designed to communicate information from one system of computing devices or programs to another. It makes communications possible between the computer and its peripherals.

INTERLEAVE - Interleaving a disk is a method of alternately numbering sectors on the disk to improve data acquisition efficiency.

KEYBOARD - The 75 keys attach to the front of the personal computer.

KBYTES - A unit of measurement for memory storage. One kbyte is equal to 1,024 bytes (or 1,024 characters). Also called "K" or "kilobyte."

LCD (Liquid Crystal Display) - The personal computer's screen.

LOAD - To read programs into a computer.

LOCKOUT SET - Data which prevents transmission/reception on particular frequencies.

MEMORY - The size of the computer's brain. Memory is the combination of hardware and/or disks on which data is stored.

MENU - The displayed list of options available, such as Suffixes, Expanders or Frequencies and Callsigns.

MFM - Modified Frequency Modulation (MFM) is a method for storing data on disks.

MODIFY - Used when the information already contained in a file must be changed, added to, deleted from or altered in some way. This option allows all items not deliberately altered to be retained in the file.

PAM PAUSE - A time certain prompts are displayed (from .065 seconds) when both the SHFT and TIME keys are held down.

PERIPHERALS - Devices, such as the Hewlett-Packard Think Jet printer and the Hewlett-Packard 9114 disk drive, which are connected directly to the Hewlett-Packard HP-111 personal computer. They are external to and controlled by the computer. Peripherals are so called because they are not part of the computer.

REFERENCE INFORMATION (CONT'D)

PRESET FREQUENCY - The frequency loaded into a present channel.

PROGRAM - A set of instructions or steps telling the computer how to handle a problem or task.

REVERSE VIDEO - The letters and numbers appear in grey on a black background.

SCREEN - The LIQUID CRYSTAL DISPLAY (LCD) on which user input is shown and on which messages appear.

SOFTWARE - A computer program or set of programs.

TIME OF DAY (TOD) - TOD is used for timing FH operations. NCS is the timekeeper for the clocks.

TRANSEC VARIABLE - Electronic control data required for FH operation. All SINCGARS Radios in the same net must contain the same TRANSEC variable.

UTILITY - A utility is a program that performs a task required by most users. For example, most users need-to make copies of disks. Therefore, the copy utility is a program that tells the computer how to copy disks.

WRITE PROTECT - A method of protecting disk information from being erased or overwritten.

REFERENCE INFORMATION (CONT'D)

GLOSSARY OF COMSEC AND CEOI TERMS

ALTERNATE NET - The net used when the primary net communications cannot be maintained due to jamming or interference.

AUTHENTICATION - A security measure designed to protect a communications system against acceptance of a fraudulent transmission or simulation by establishing the validity of a transmission, message or originator.

AUTHENTICATION SYSTEM - Authentication systems are provided to prevent unauthorized stations from entering friendly radio nets. There are two methods of authentication: challenge and reply and transmission authentication.

BATTLEFIELD ELECTRONIC CEOI SYSTEM (BECS) - System includes the BGU and its peripherals. The purpose of BECS is to eliminate NSA-produced paper CEOI systems, to reduce response time and to increase user's flexibility.

BASIC GENERATION UNIT (BGU) - The personal computer (Hewlett-Packard HP-110/111) component of BECS, plus the peripheral devices: the disk drive and printer.

CALL SIGN - A three-character combination of letter-number-letter used to identify a command, activity unit or element in establishing and maintaining communications.

CALL SIGN SHARING - Allows different nets to be assigned the same call signs for each time period.

CLASS - A grouping of up to 20 zones. The total frequency requirement for a class equals the number of nets in the largest zone. Nets selected for a reuse plan are grouped into zones and classes.

COMMUNICATIONS-ELECTRONICS (CE) - Embraces the design, development, installation, operation, and maintenance of electronics and electromechanical systems associated with the collecting, transmitting, storing, processing, recording, and displaying of data and information associated with all forms of military communications.

COMMUNICATIONS-ELECTRONICS OPERATION INSTRUCTIONS (CEOI) - A series of orders issued for technical control and coordination of the Communications Electronics operations of a command or activity. It provides guidance needed to insure the speed, simplicity, and security of communications. The CEOI normally contains call sign assignments, frequency assignments, suffixes, signs and countersigns, pyrotechnic and smoke signals, and complete supplemental instructions.

COMMUNICATIONS SECURITY (COMSEC) - Measures taken to prevent unauthorized persons from gaining information of value from your communication. COMSEC includes: (l)crypto-security; and (2)transmission security; and (3)emission security; and (4)physical security of communications security materials and information.

REFERENCE INFORMATION (CONT'D)

COSITE PLAN - Provides frequency separation from 0.5 to 5 MHz so that nets in close proximity can communicate simultaneously without mutual interference.

CUE FREQUENCY - A frequency used to bring a user into a net. The frequency is in the range of 30.000 MHz to 87.975 MHZ and is divisible by .025 MHz.

DATA TRANSFER DEVICE (DTD) - A small hand-held computer which will be used for the storage and transfer of BGU-generated items; callsigns, frequency assignments, SINCGARS TRANSEC variables, suffixes and expanders, signs and countersigns, and pyrotechnics, smoke signals, call words, and COMSEC keys.

EXPANDER - Used with a call sign suffix to identify a sub-element of the position, mission or function identified by the suffix.

FREQUENCY - The number of reoccurrences of a periodic phenomenon in a unit of time. In specifying electrical frequency, the unit of time is the second, the frequency is expressed in hertz (Hz) (meaning cycles per second). Radio frequencies are normally expressed in kilohertz (KHz) at and below 999 kilohertz, and in megahertz (MHz) above this frequency.

FREQUENCY ASSIGNMENT - A designated radio frequency for use by a specific radio net during a certain period of time.

FREQUENCY RESTRICTION - partially restricts the use of an available frequency. Designated within the BGU by the letters A-P.

FREQUENCY SHARING - Allows different nets to be assigned the same frequency for each time period.

HERTZ - A unit of frequency equivalent to one cycle per second.

HF - High-frequency (2.000-30.000 megahertz).

HOPSET - A set of frequencies that a frequency-hopping radio uses when in the frequency-hopping mode.

ITEM NUMBER IDENTIFIERS - an aid that provides a rapid and general means of station identity.

LF - Low-frequency (0.0001- 1.9999 megahertz).

MANUAL FREQUENCY - A frequency used for filling a radio remotely. The frequency is in the range of 30.000 MHz to 87.975 MHZ and is divisible by .025 MHz.

MEGAHERTZ (MHz) - A unit of frequency equal to 1,000,000 hertz (cycles per second).

NATIONAL SECURITY AGENCY (NSA) - The agency, functioning under the Department of Defense, which monitors the entire United States SIGINT (Signals Intelligence) collection and processing effort. NSA is responsible for research and development efforts and initial production procurement of BECS.

REFERENCE INFORMATION (CONT'D)

NET - An organization of stations capable of direct communications with each other using a common frequency or channel.

NET CALL SIGN -A call sign which represents all stations within a net.

NET CONTROL STATION (NCS) - A station designated to control traffic and enforce circuit discipline with a given net.

NET RESTRICTION - A frequency restriction placed on a-net. Up to eight restrictions may be applied to a given net. The restrictions are designated by a letter code in the range A-P. Each letter identifies the explanation of how the net is restricted.

PRIMARY NET - The net used under normal operating conditions.

PYROTECHNICS - Ammunition containing chemicals that produce a smoke or brilliant light in burning, used for signaling or for lighting up an area at night.

RETRANSMISSION - Employment of a radio communication set for the purpose of rebroadcasting a message on a different frequency simultaneously with the original broadcast by means of an electrically operated linkage device between the receiver and transmission of the net.

RETRANS NET - The net assigned to a retrans (radio relay) operation.

SIGNAL OPERATION INSTRUCTIONS (S0I) - A series of orders issued for technical control and coordination of the Signal operations of a command or activity. It provides guidance needed to insure the speed, simplicity and security of communications. The SOI normally contains call sign assignments, frequency assignments, suffixes, signs and countersigns, pyrotechnic and smoke signals and complete supplemental instructions. See CEOI description.

SUFFIX - A two-digit number (01 through 99) used in conjunction with a tactical organization's call sign to indicate a specific position, mission or function. Suffixes may be further expanded by letters to identify a sub-element of the position, mission, or function identified by the suffix.

SINCGARS - Single Channel Ground and Airborne Radio System.

TIME PERIOD - That length of time during which a specific call sign, suffix and frequency is used.

TRANSEC KEY(S) - A set of bits that, when properly loaded into the SINCGARS radio, provides the hopping sequence through the frequency hopset that the radio uses in the frequency-hopping mode.

UHF - Ultra High Frequency (225.00-400.00 megahertz).

VHF-AM - Very High Frequency-Amplitude Modulation (108.00-150.00 megahertz).

VHF-FM - Very High Frequency-Frequency Modulation (30.000-87.975 megahertz).

REFERENCE INFORMATION (CONT'D)

ZONE - A grouping of nets in which an assigned frequency may not be repeated within that group for the same time period.

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Section II. EQUIPMENT DESCRIPTION

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EQUIPMENT PURPOSE, CAPABILITIES AND FEATURES

PURPOSE

The BGU is an automated management system designed to meet a critical requirement for a decentralized and automated system to generate print, store, and electronically transfer both single channel and frequency hopping CEOI information. BGU will generate and load frequency hopping information for radios and the Transmission Security (TRANSEC) Key (TSK) for ECCM protection. The BGU is intended to be more responsive to rapidly changing and highly mobile battlefield conditions as an integral subsystem of SINCGARS, High Frequency (HF), Very High Frequency (VHF) AM/FM, and Ultra High Frequency (UHF) radio systems.

CAPABILITIES AND FEATURES

The BGU is able to electronically transfer and receive data from another BGU or DTD .

The BGU os also capable of generating, processing, displaying, printing, and storing SOI/CEOI information (e.g., net descriptions, call signs, frequencies (including al 1 four bands: HF, VHF-AM, VHF-FM, UHF), suffixes and expanders, sign/countersign, smoke and pyrotechnics), and frequency hopping information for SINCGARS and other radio system (e.g., Net IDs Manual frequencies, CUE frequencies, and hopset information), and electronic transfer of information and loading of ECCM fill devices, DTDs, and frequency hopping radios. The BGU will also generate, store, and distribute the TRANSEC Keys. The BECS will generate current single channel CEOI and provide password protection.

EQUIPMENT DATA

WEIGHTS AND MEASURES

The overall dimensions are in inches; weights are in pounds. Dimensions are maximums; weights are approximate.

Components	Length	Width	Depth	Weight
Portable Computer	9 3/4"	12 5/8″	3 "	9 lbs 5 oz
Printer	8 "	11 1/4″	3 1/2	5 lbs 11 OZ
Disc drive	8 "	11 1/2″	3 "	5 lbs 9 OZ

Batteries
  Computer and Disc Drive six volt lead/acid gel with recharger
  Printer Nickel cadmium battery pack with recharger
Cable (HP-IL) 1 meter (3 required)

Transit cases	Individual	System
Height:	10 pounds 4 ounces	32 pounds 4 ounces
Width:	18 1/4″	39"
Depth:	8 3/4″	13"
Length:	14 3/4″	21"

Individual transit cases, although the same physical dimension, will have styrofoam cutouts unique to peripherals.

CHARACTERISTICS

- Displays: All LCD visual displays are clear and legible in almost all lighting conditions.
- Computer: 16 bit 8086 Microprocessor 1024 bytes of ROM/RAM (total) 80 characters X25 line tinted liquid crystal display; enhanced HP keyboard.
- Printer: Dot Matrix - 150 characters per second;
- Size and weight: The BGU consists of three small lightweight compact devices that can be carried by the user and can be assembled for use within a few short moments.
- Continuous printing over 1 and 1/2 hours or 200 pages before recharging; Readily accessible controls.
- Disc Drive: Double sided 3 1/2″ microfloppy disc media, 710 kilobytes formatted memory capacity; 6 kbytes per sec transfer rate; 497 milliseconds access time.
- Storage: The portable computer, disc drive, and the printer can be stored in the transit cases. Exposed parts are reasonably protected. (Refer to “Transporting the BGU” for more details)
- Battery life expectancy: At average use life expectancy of the BGU batteries is approximately 2 years.
- Battery use: portable computer - 40 minutes - continuous read and write operation. Disc drive - 5 hours of continuous use, or 12 to 16 hours of intermittent use, or 20 hours of standby operation.
- Recharging approximately 11 hours required to fully recharge the batteries, depending upon use.
- Self test: the printer can perform a one page self test. The disc drive also has a power-on self test that lasts from 6 to 11 seconds and is monitored by a “fault” light during the test cycle.

- Dc duty cycle:

  Computer: 8 hours of continuous use without charging battery. Longer for intermittent use.

  Disc drive: 5 hours of continuous use without charging battery. Longer for intermittent use cycles.

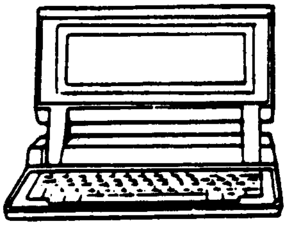
  Printer: 4 hours of continuous use without charging battery. Longer for intermittent use cycles.

- Prints stored data on continuous form tractor pad or 8 1/2″ x 11" friction fed paper.

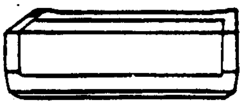
- Operates under all climatic conditions.

DESCRIPTION OF MAJOR COMPONENTS

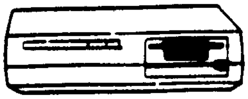
The Basic Generation Unit (BGU) consists of three components:



a portable computer,



a printer,



and a disc drive.

The Portable Plus personal computer hereinafter referred to as the portable computer is a battery powered desk-top computer used to generate SOI/CEOI and SINCGARS information. The top flips up to reveal a screen and a full size “QWERTY” (typewriter-style) keyboard. The keyboard contains eight variable-function soft keys (f1-f8) located along the top row of the keyboard. These keys drive separate menu options appearing on the screen. Arrows keys move the cursor to a desired location. The portable computer provides two external connectors for Input/output (1/0) operations or a loop Interface. The computer is powered by a sealed rechargeable 6-volt lead-acid battery and can be used while the battery is being recharged by the ac adapter.

The ThinkJet printer is used to make printed copies of work done on the personal computer. Use HP ThinkJet paper provided; and, be sure to allow for additional space near the printer for paper storage. The ink jet print head cartridge contains ink to print approximately 500 pages. The cartridge is completely disposable and easy to replace. In addition, the ThinkJet printer uses the Interface Loop (HP-IL) to communicate with the computer and the disc drive.

The 9114 Disc Drive is a battery operated electronic storage device used to:

(1) Load program and data information,

(2) Transfer data from discs into the portable computer,

(3) Store information from the portable computer discs.

Each unit is powered by rechargeable battery packs. The batteries for the disc drive and the printer are replaceable; the battery for the computer is not user serviceable. Each should be operated with HP step-down AC adapters whenever possible to maintain a maximum charge. The computer can operate for about 8 hours without recharging, the disc drive for about 5 hours, and the printer for about 4 hours.

DIFFERENCE BETWEEN MODELS

Only one model exists at the time of this printing.

PERFORMANCE DATA

- Equipment lifespan: The BGU having reasonable ruggedized construction is capable of repeated performance over a span of approximately two to four years depending upon hours to use, care taken during use, transportation, and storage.

- Mission lifespan: Internal batteries will provide approximately 8 hours of mission life before recharging is necessary.

- Data protection: Stored data is provided protection by means of a non-volatile memory.

- Screen display: A visual LCD display is provided.

- Mission essential accomplishment: Normal mission essentiality presents no problem except for the disc drive.

- Operating temperature range: The BECS will operate satisfactorily in the nominal temperature range from -30 to +52 degrees centigrade.

- Main Menu: The main menu contains over eleven different programs.

- Modes of operation: Transmit; transmit FH; Local Transmit; remote transmit; receive; receive FH; local receive; remote receive; store; test internally (BIT); search; scrolling and zeroing

Section III. Technical Principles of Operation of BECS Components

PORTABLE COMPUTER CP-1836/G (HP MODEL 110)

The Portable Computer CP-1836/G is a battery-powered computer with a full-sized keyboard and a liquid-crystal display (LCD). The display shows 25 80-character lines of alphanumeric information, or 480-by-200 dots of graphics. The display viewing angle can be adjusted by tilting the hinged top case. The portable computer can be used at a fixed work station, or can be carried to practically any location. A typical work station might require space for peripheral devices, such as a disc drive and a printer. A power outlet is need for recharging the computer's battery, and for recharging or plugging in peripheral devices.

For portable use, the computer can be used almost anywhere, since it contains its own battery power. The computer is powered by a sealed rechargeable 6-volt lead-acid battery. Battery-powered peripheral devices can also be used. Peripheral devices are installed by connecting them to one of the two input/output (1/0) receptacles, at the back of the computer.

- Peripheral devices are connected in series between the computer's IN and OUT receptacles using interface cables. Cables are keyed to ensure correct polarity.
- One RS-232C compatible serial device can be connected to the serial interface receptacle using a serial interface cable.

The portable computer uses software for configuring its settings, rather than using hardware (such as switch settings). The computer's System memory/Electronic disc consists of 512K bytes of random-access memory (RAM), 1024K bytes of read-only memory (ROM); and 8k bytes (expandable to 16K) of configuration EPROM (erasable, programmable read-only memory) containing specialized system information. The partition of system memory and electronic disc is configurable.

Built-in diagnostic tests verify proper operation of the computer's basic functions. For a good unit, all tests will indicate "ok". An error message or failure code indicates that a test didn't pass and that service is required.

Installation isn't required to operate the portable computer. If the computer's battery is sufficiently charged (battery charge shows in the main PAM screen), the unit is ready to operate as a stand-alone computer. If the battery is insufficiently charged, the recharger is connected to the computer and the computer can be used while its battery is recharging. Recharging time is 10 hours if the computer is turned off, and 18 hours if the computer is turned on.

DISC DRIVE RD-592/G (HP MODEL 91146)

The Disc Drive RD-592/G is a battery operated electronic storage device. Data and programs from the computer are stored on a removable flexible disc used with the disc drive. The disc drive uses a 3 l/2-inch disc providing as much as 710 thousand characters of storage capacity. The disc is similar to a phonograph record that stores programs and data instead of music. The disc is called a flexible or micro-flexible disc or media. Data is stored on both sides of the disc, and thus the name double-sided disc.

The disc drive reads and writes data to and from the disc using a window space which exposes the disc. This window is covered by a metal shutter. The shutter helps protect the disc surface from particles and accidental fingerprints. The disc drive is equipped with a shutter opener. This means that when the disc is placed in the drive, the shutter is automatically opened exposing the disc surfaces.

The power light on the front panel flashes whenever it's time to charge the battery. When there is a low battery indication, the battery provides a reserve operating time of about five minutes, or a standby time of about thirty minutes. After the battery voltage drops below a minimum, the drive will not respond to read or write operations. This is to protect the stored data.

The adapter/recharger can be connected to the disc drive at any time. The disc drive can be used while the battery pack is charging. In fact, it is recommended that the adapter/recharger be used whenever possible, even when the battery is fully charged.

A power-on self-test is performed automatically when the disc drive is turned on. The fault light is the self-test indication. This light is on when self-test is in operation. The self-test takes approximately 6 (or 11) seconds after which the fault light goes out. If the fault light stays on after the normal testing time, an error within the disc drive has been detected.

The read/write heads of the disc drive touch the disc. As a result, the flexible disc media does wear. Through a feature called Media Monitor, the disc drive automatically monitors the cumulative use of each individual disc. When the usage of a disc is approaching a level at which there is a risk of loss of data through normal disc wear, the disc access light on the front panel blinks and a clicking sound is heard.

THINKJET PRINTER (HP MODEL 22256)

The ThinkJet Printer (HP-2225B) is a battery powered, lightweight page printer which can be easily transported anywhere. This printer is small and has a print rate of 150 characters per second (cps). The printer is powered by a rechargeable 6.5V nickel cadmium (NiCad) battery. The printer also has a low battery indication; printer stops operating at 6.2V.

A major feature of the ThinkJet printer is the quietness of its ink jet printing. The ink jet print head cartridge contains ink to print approximately 500 pages. The cartridge is completely disposable and easy to replace. Normal line length is 80 characters, with a paper width of 8.65" and a paper length of 11". The printer can use either single sheet paper (ink jet recommended), or Z-fold pin feed paper.

The ThinkJet printer is capable of printing in two modes, text mode and graphics mode. In text mode, the printer interprets each data byte it receives from the computer as an ASCII character. It then looks that character up in its internal character table and prints the dot pattern which it finds. In graphics mode, however, the data received from the" computer directly specifies the dot pattern which is to be printed.

CHAPTER 2

OPERATING INSTRUCTIONS

Page

Description and Use of Operator’s Controls 2-1
Operating Procedures 2-8
Operation Under Usual Conditions 2-6
Operation Under Unusual Conditions 2-116

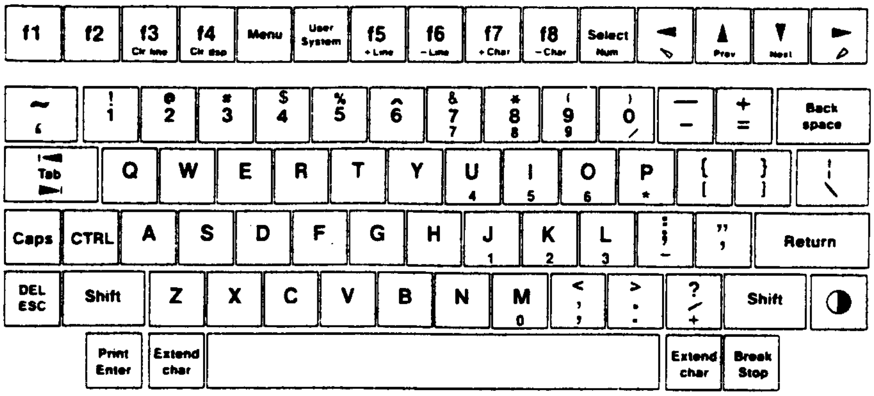
Section I. DESCRIPTION AND USE OF OPERATOR’S CONTROLS

HARDWARE

As the operator of BGU you will be working with the following controls

COMPUTER

The keys on the computer keyboard are shown below: To turn the computer on, press any key. It may be necessary to press the contrast key ◑ also. A PAM display will appear on the LCD. Pressing f8 turns off the computer. The computer uses SOFTWARE for configuring its settings, rather than hardware (such as switch settings).


f1
f2
f3
Clr line
f4
Clr eop
Menu
User System
f5
+Line
f6
-Line
f7
+Char
f8
-Char
Select
Num
Prev
Next
Back space
Tab
Q W E R T Y U I O P
Caps
CTRL
A S D F G H J K L
Return
DEL ESC
Shift
Z X C V B N M
Shift
Print Enter
Extend char
Extend char
Break Stop

Keyboard Layout

To adjust the contrast of the display press ◑ or press Shift and ◑. Pess several times for greater contrast.

To reset the system press and hold ◑ For 15 seconds. Do this only when instructed to do so. This affects active operations but does not affect stored files.

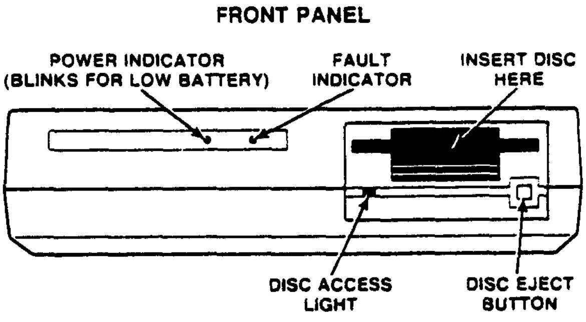
To change the time or date settings, press **f3** (Time & Date) in the main PAM From the time and date menu, use the tab or cursor keys to select the fields to edit, and use the “Next Choice” **NEXT** and "Previous choice" **PREV** function keys to select the desired choice. Press the **f8** (Exit) function key to return to the main PAM screen.

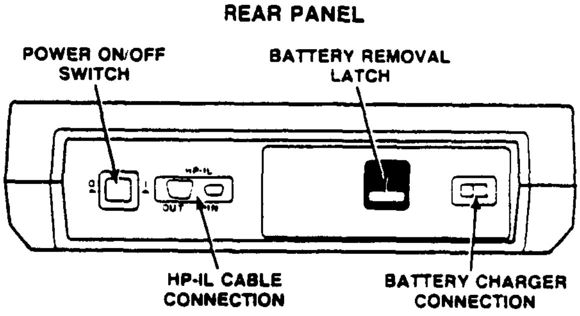
The system configuration defines memory allocation, timeout operation, and display options; and selects a peripheral conmtunlcations interface device. To change the system configuration, press **f6** (System Config) in the main PAM screen. From the system configuration menu, use the tab or cursor keys to select the fields to edit, and use the "Next Choice" and "Previous Choice" function keys to select the desired choice. Use the f8 (Exit) function key to return to the main PAM screen.

The datacom configuration defines interaction between the computer and 1/0 devices. The datacom configuration also defines baud rate, word length, number of stop bits, and parity. To change the datacom configuration, press the f5 (Datacom Config) function key in the main PAM screen. From the datacom configuration menu, use the tab or cursor keys to select the fields to edit, and use the "Next Choice" and "Previous Choice" function keys to select the desired choice. Use the f8 (Exit) function key to return to the main PAM screen.

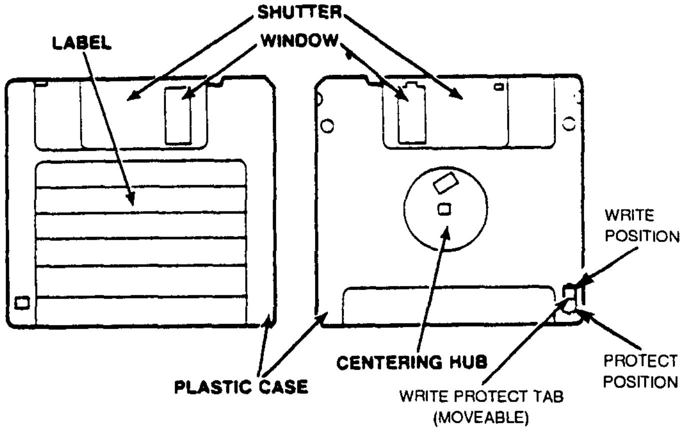
DISC DRIVE

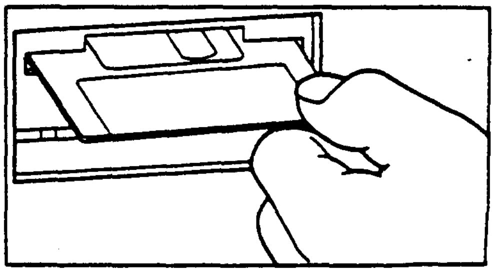
The disc drsive controls and connections are shown here. The power on/off rocker switch is labeled 0 on one side (for off) and 1 on the other side (for on). The DISC EJECTION button is the only other manual control necessary to operate the drive. Insertion of the disc when the disc drive is properly connected opens the shutter, centers the hub, and completes the read and write actions.


FRONT PANEL
POWER INDICATOR (BLINKS FOR LOW BATTERY)
FAULT INDICATOR
INSERT DISC HERE
DISC ACCESS LIGHT
DISC EJECT BUTTON


REAR PANEL
POWER ON/OFF SWITCH
BATTERY REMOVAL LATCH
HP-IL
OUT
IN
HP-IL CABLE CONNECTION
BATTERY CHARGER CONNECTION

The flexible disc that is inserted in the disc drive slot stores programs and data. Become familar with parts of the flexible disc by reviewing the following drawing.


SHUTTER
LABEL
WINDOW
WRITE POSITION
CENTERING HUB
PROTECT POSITION
PLASTIC CASE
WRITE PROTECT TAB (MOVEABLE)



Proper loading of the flexible disc

FLEXIBLE DISC USAGE AND HANDLING

The disc is similar to a phonograph record that stores programs and data instead of music. The 3 l/2-inch flexible disc is enclosed in a plastic jacket and is maintenance free. The disc is called a flexible or mirco-flexible disc or media. Data is stored on both sides of the disc, and thus the name double-sided disc is applied. Due to the hard case and automatic shutter the micro flexible disc is safer and more reliable than the larger flexible discs on the market. Here are some DOs and DON'Ts for the handling of your discs.

Do

Back Up Discs Frequently

There is always a chance of losing data when mass storage devices are accessed. Causes of loss of data include programming bugs, operator errors, power failures, and hardware failures. Data may also be lost due to flexible disc contamination or wear. One protection against data loss is frequent backup of your files onto other discs. Store discs upright in a dust free container. The box in which the discs are shipped, or a similar container, is a good choice.

Operate your system in a relatively clean environment

Airborne contaminants and particles accidently dropped onto the disc will cause your disc to wear prematurely and may cause unrealizable data storage and retrieval operations. Some of the most common contaminants are DUST, SMOKE, ASHES, ERASER CRUMBS, and BREADCRUMBS. NEVER ATTEMPT TO BLOW SMALL PARTICLES FROM THE DISC. Chemical vapors may also cause premature disc wear.

Maintain proper temperature and humidity

The proper operating range is 10°C (50°F) to 40°C (104°F) and 20% to 80% relative humidity. While temperature can be controlled, it may be necessary to make special provisions to keep the humidity in the proper range. Although the disc will continue to operate outside the normal humidity range, it will wear more quickly and will have a higher error rate.

Avoid magnetic fields

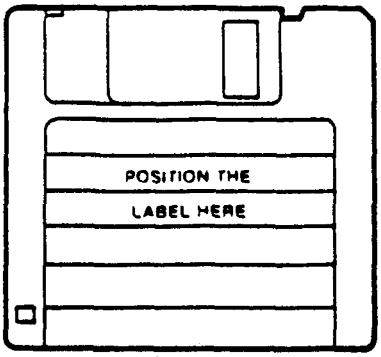
The data is stored on the disc magnetically, and can be erased by an external magnetic field. Avoid placing a disc near power transformers, magnets, large disc memories, motors or CRTs (Cathode Ray Tube).

Do not touch the surface of the disc

The thickness of a fingerprint is enough to lift the head off the disc and cause errors. The oils in a fingerprint also collect dust which can cause the disc to wear faster.

LABELING THE FLEXIBLE DISC

When you receive your disc drive and discs, you also receive a packet of labels. Note that the labels come in a variety of colors. Position the label on the disc so that the colored portion of the label is folded over the lower edge of the disc.



Positioning of the label on the disc

You can establish a color-coded system for cataloging your discs. For example, discs containing memos may be labeled in red while discs containing personnel files can have blue labels. Store your discs upright in a container so that the colored edge of the labels are visible. You may use the colors to select the category of discs you desire, and then read the labels to select the specific disc needed.

LIFE EXPECTANCY OF A FLEXIBLE DISC

The read/write heads of the disc drive touch the disc. As a result, the flexible disc media does wear. The Media Monitor indication helps assure reliable operation.

MEDIA MONITOR

Through a feature called Media Monitor, your disc drive automatically monitors the cumulative use of each individual disc. When the usage of a disc is approaching a level at which there is a risk of loss of data through normal disc wear, the disc access light on the front panel blinks and a clicking sound is heard. Once this point has been reached in the life span of a disc, read and write commands are still performed by the computer. However, after a command has been performed, the disc drive immediately resumes the warning indication.

When the Media Monitor warning occurs, immediately copy your disc. If you continue to use this disc, the disc drive will eventually automatically write protect the disc. After that time, you will only be able to read data from the disc or copy the disc.

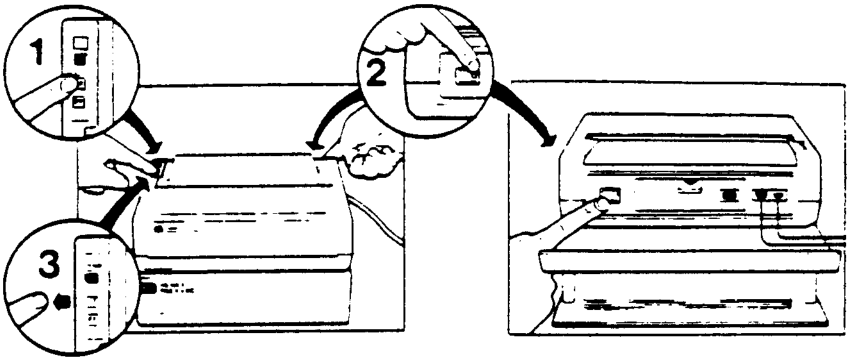
WRITE PROTECT ERROR ON INITIALIZATION

A motor speed check is performed when a disc is inserted into the drive. If the motor speed is on either side of the tolerance allowed, a Write Protect Error is generated and the disc cannot be initialized or used. If your drive is operating properly, this indication is one of a defective disc. ‘Discard the disc.

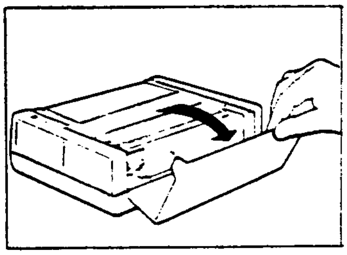
PRINTER

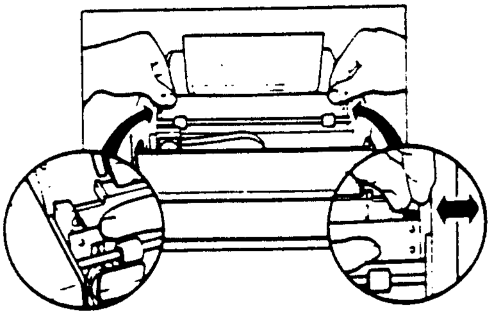
The controls and actions necessary to operate the printer are these:

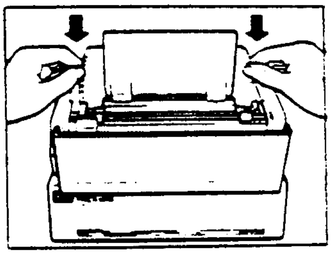
The on/off switch on the printer is identical to the on/off switch on the disc drive and is lacated on the rear of the printer next to the battery compartment



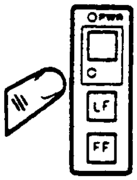
The red power light indicates power is available to operate the printer. A blinking power light indicates the battery requires recharging. During printing in this condition the power light will go off and will start blinking again after printing is completed. Recharge battery soon. Loading paper into the printer will cause the continuously lit-yellow indicator to blink. Pressing the blue button will cause the print head to move and the yellow light to turnoff. Lift the front cover to gain access to the print head and paper feed rolls.

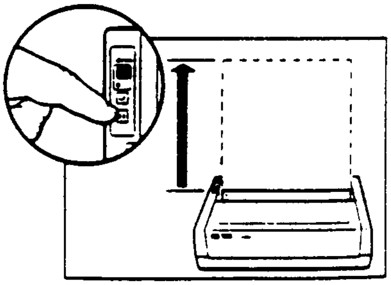


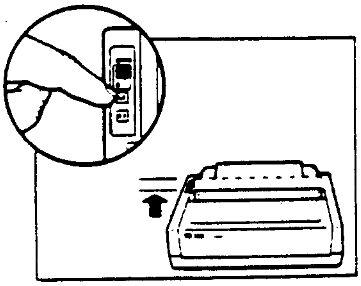




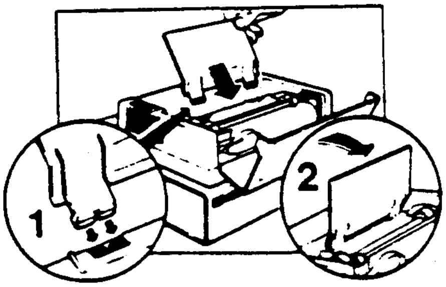
press the FF or LF button according to the type of paper being used; fan fold or single Pressing the FF button causes the paper to advance one full sheet. pressin9 the LF (line feed) button causes the paper to advance one line.

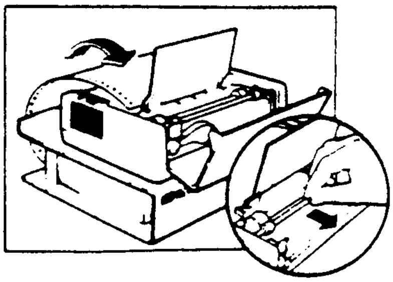


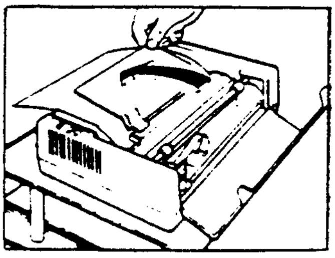




A two position removable flap can be inserted to guide and fan fold paper either-way, forward of the printer or to the rear; or to hold single-sheet paper in a-viewing position.







Section II. OPERATION UNDER USUAL CONDITIONS

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Connections For Operation 2-6
Making Connections 2-6
Required Devices and Peripherals 2-6
Turning On/Off Devices 2-7

REQUIRED DEVICES AND PERIPHERALS

- Computer
- Disc Drive
- Printer
- AC Rechargers
- Battery Packs
- Loop and Interface Cables
- Paper
- Jet Ink
- Flexible Disc

MAKING CONNECTIONS

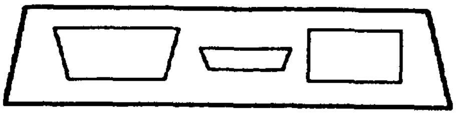
The following will help determine how devices should be connected.

CONNECTIONS FOR OPERATION

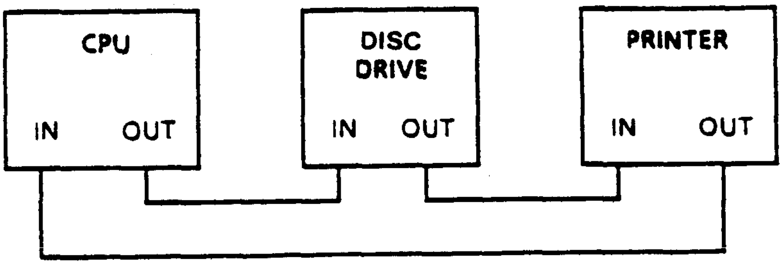
Each device comes with a Interface Loop (IL) cable and has IN and OUT interface ports on the back panel as shown below.

The ports have the following uses going from left to right:

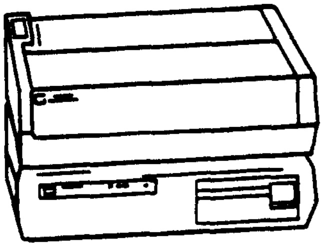
OUTPUT (large end of the HP-IL cable)
INPUT (small end of the HP-IL cable)
POWER (port for AC adapter)

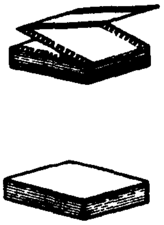


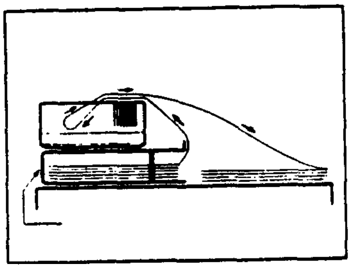
Use the HP-IL cables to connect the system components, as shown below. It Is Important that all components be connected by two cables.



The printer may be positioned on the disc drive during operation however allow a place for tractor type paper If being used.







OPERATION OF AUXILARY EQUIPMENT

CONNECTIONS FOR LOADING DTD AND ECCM FILL DEVICE

For connecting the BGU to the DTD and MX-10579 or MX-18290 use an ECCM interface cable. The ECCM interface cable has a 9-pin RS-232 connector on one end and a circular 6-pin connector plug on the other.

TURNING ON/OFF DEVICES

computer -ON: Push the Contrast key
OFF: Push key f8
Both must be done at the PAM level.

Printer - ON: Push the switch on the back panel to the “l” position.
OFF: Push the switch on the back panel to the “O” position.

Disc Drive - ON: Push the switch on the back panel to the “l” position.
OFF: Push the switch on the back panel to the “O” position.

To conserve power, the display automatically turns off after about five minutes of idleness when the AC Adapter/Recharger is not connected. The time limit is adjustable as part of the System Configuration.

Screen contrast is controlled from the keyboard with the contrast key marked by the half-darkened circle located on the lower right side of the keyboard.

LIGHTEN: Hold the SHIFT key and press the contrast key◑.
DARKEN : Press the contrast key.

CAUTION

D0 NOT HOLD THE CONTRAST BUTTON DOWN FOR LONGER THAN FIVE SECONDS AT A TIME, OR THE BGJ PROGRAM WILL EXIT. THE DISPLAY WILL GO BLANK AND WILL RETURN SHOWING THE PERSONAL APPLICATIONS MANAGER (PAM) MENU . ALL WORK NOT STORED IN A FILE HILL BE LOST.

Section III. OPERATING PROCEDURES

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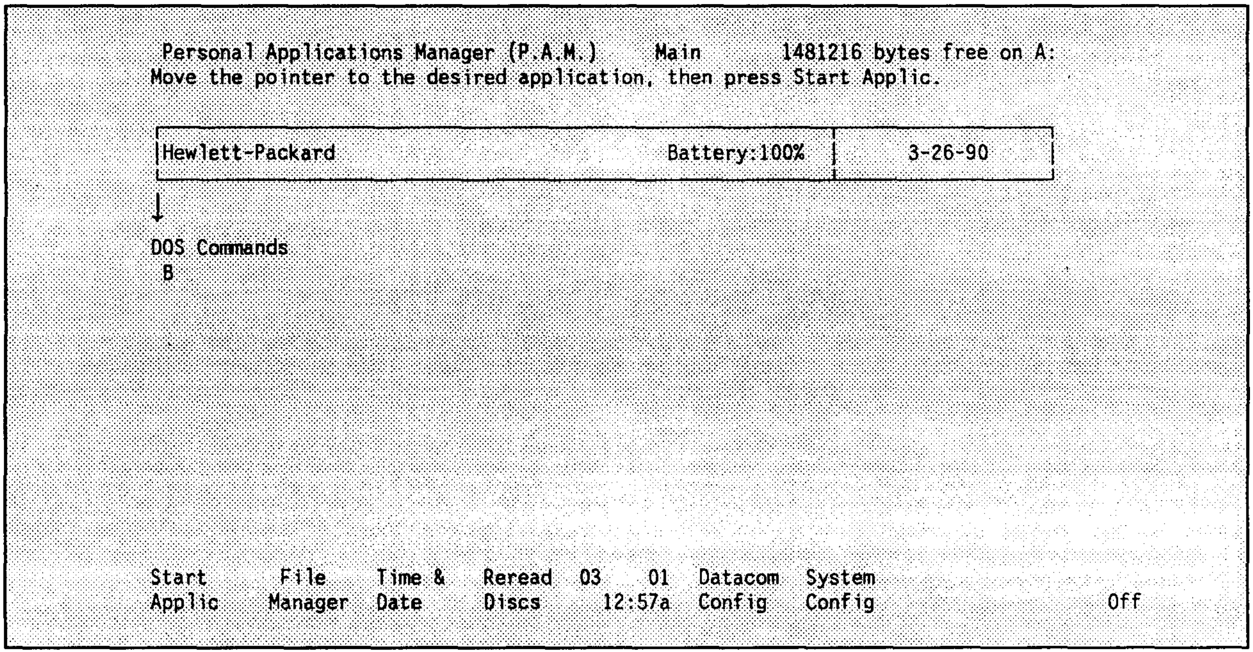
Entering System Configuration 2-8
Entering Datacom Configuration 2-9
Laserjet Configuration and Connection 2-10
Connecting the Laserjet 2-10
    Serial Port Connection 2-10
    Entering System Configuration 2-11
    Entering Datacom Configuration 2-11

It is essential that correct system configuration information is loaded into the BGU prior to operation of any input functions. System configuration determines how the read/write memory is divided between the system and disk drive; how the automatic timeout works (when the recharger is not connected); what the cursor looks like; how characters look on the screen display; what happens when a key is pressed; and how the computer communicates with system components.

ENTERING SYSTEM CONFIGURATION

From the Personal Applications Manager (PAM) menu shown in Figure 2-1, press <f6>.

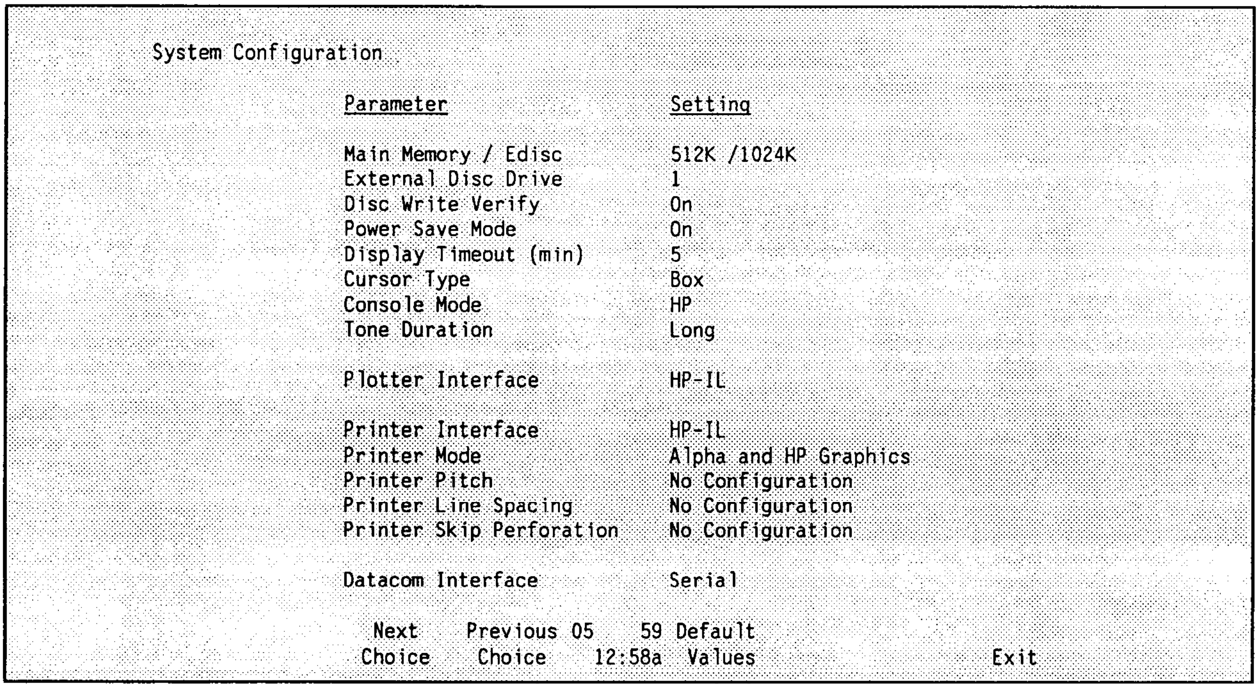


```
 Personal Applications Manager (P.A.M.)     Main      1481216 bytes free on A:
Move the pointer to the desired application, then press Start Applic.

|Hewlett-Packard                           Battery:100%  |      3-26-90      |

↓
DOS Commands
 B

Start      File     Time &   Reread  03    01  Datacom  System
Applic    Manager  Date     Discs     12:57a  Config   Config                 Off
```

Figure 2-1

If a disk is present in the disk drive, this screen may look different.

The System configuration screen is displayed as shown in Figure 2-2.



```
System Configuration

                 Parameter                 Setting

                 Main Memory / Edisc       512K /1024K
                 External Disc Drive       1
                 Disc Write Verify         On
                 Power Save Mode           On
                 Display Timeout (min)     5
                 Cursor Type               Box
                 Console Mode              HP
                 Tone Duration             Long

                 Plotter Interface         HP-IL

                 Printer Interface         HP-IL
                 Printer Mode              Alpha and HP Graphics
                 Printer Pitch             No Configuration
                 Printer Line Spacing      No Configuration
                 Printer Skip Perforation  No Configuration

                 Datacom Interface         Serial
```

Figure 2-2 (f6)

To change or set values, use the function keys:

f3 - allows you to select the Next Choice at the cursor position.
f4 - allows you to select the Previous Choice at the cursor position.
f5 - allows you to select the Default Values.
f8 - EXIT to the PAM menu.

The system configuration should be checked before beginning any session and any time that Drive A is reformatted.

Notice the f6 in parenthesis following the figure caption. These hints appear throughout this document to show the keystroke(s) leading up to the screen from the PAM menu. From the PAM menu you must move the arrow over the block and press the <f1> key or <RETURN>.

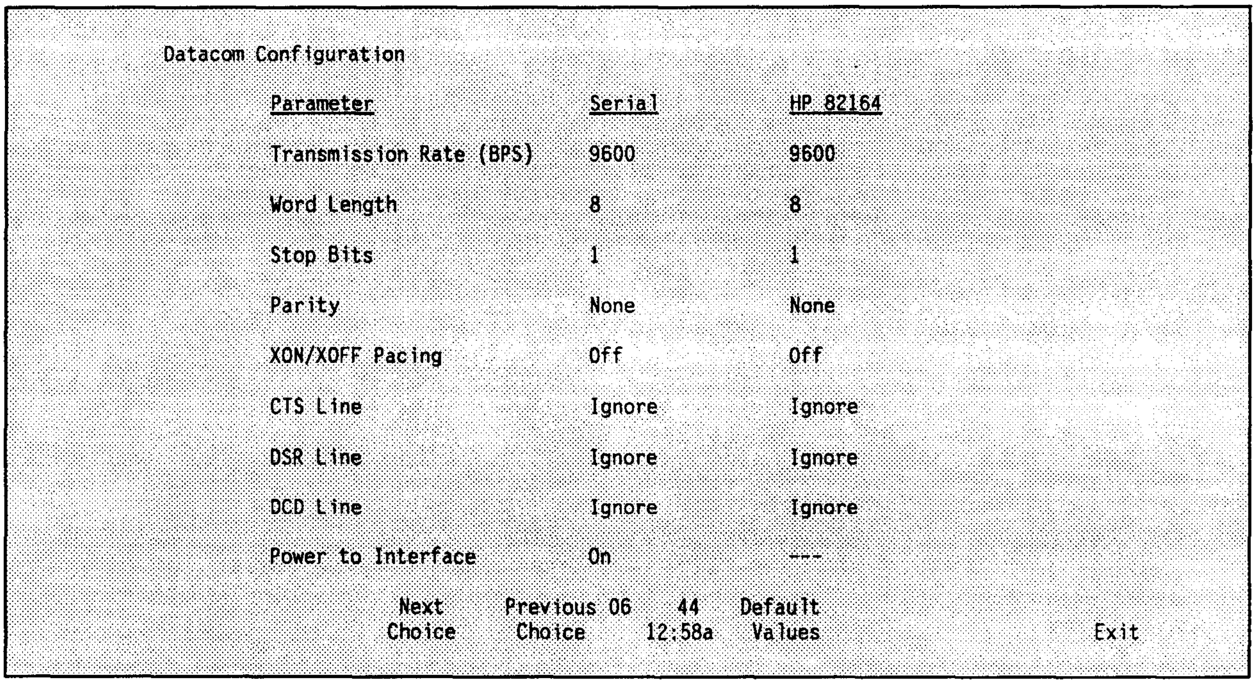
Press the down arrow key five times to select “Cursor Type " in Figure 2-2. Press <f3> or <f4> and notice the setting column toggles between “Box” and “Underscore”. Press <f3> or <f4> to set the cursor type to “Box”.

Using the arrow keys, change the configuration to match the settings in Figure 2-2. Press <f8> to save the settings and return to the PAM menu. The system is now configured to use the serial port for printing.

ENTERING DATACOM CONFIGURATION

Datacom configuration must be set for system components to link-up and exchange data. The datacom configuration should be done after the system configuration or else the changes are not recorded. From PAM menu shown in

Figure 2-1, press <f5> Datacom Config. The Datacom Configuration screen is displayed as shown in Figure 2-3.



Datacom Configuration

Parameter	Serial	HP 82164
Transmission Rate (BPS)	9600	9600
Word Length	8	8
Stop Bits	1	1
Parity	None	None
XON/XOFF Pacing	Off	Off
CTS Line	Ignore	Ignore
DSR Line	Ignore	Ignore
DCD Line	Ignore	Ignore
Power to Interface	On	---

Figure 2-3 (f5)

To change or set values, use the function keys:

f3 - allows you to select the Next Choice at the cursor position.
f4 - allows you to select the Previous Choice at the cursor position.
f5 - allows you to select the Default Values.
f8 - EXIT to the PAM menu.

Use the arrow keys to go from line to line and set values shown in Figure 2-3.

Press <f8> to save the settings and return to PAM.

LASERJET CONFIGURATION AND CONNECTION

CONNECTING THE LASERJET

This section identifies the procedures for interfacing a HP LaserJet printer to the computer. You can configure the computer's 9 pin connector to act as a serial interface or to act as a HP 82164a HP-IL/RS-232 Interface. The LaserJet printer can be configured to accept data from the computer using both modes. See the following subsections for details.

A. SERIAL PORT CONNECTION

To connect the LaserJet directly to the serial port, use the HP 92221P Printer Cable. Serial communication port technical information is shown in Table 2-1. Plug the 9-pin end of the HP 92221P Printer Cable into the serial port on the back of the computer. Connect the 25-pin end of the cable into the back of the printer. Turn on the computer and the printer.

Signals		9-Pin		25-Pin	Signals	
RS-232-C	V.24	(Male)		(Male)	RS-232-C	V.24
(CD) DTR	108/2	1	→	6	DSR (CC)	107
(BA) TxD	103	2	→	3	RxD (BB)	104
(BB) RxD	104	3	←	2	TxD (BA)	103
(CA) RTS	105	4	→	8	DCD (CF)	109
(CB) CTS	106	5	←			
(CC) DSR	107	6	←	20	DTR (CD)	108/2
(AB) GND	102	7	↔	7	GND (AB)	102
(CF) DCD	109	8	←	4	RTS (CA)	105
(NOT USED)		9	→	5	CTS (CB)	106
		SHELL	↔ SHIELD	SHELL		
			→ DRAIN	1		

TABLE 2-1 (92221P) BGU to LaserJet pin out

B. ENTERING SYSTEM CONFIGURATION

From the Personal Applications Manager (PAM) menu shown in Figure 2-1, press <f6>. If a disk is-present in the disk-drive, this screen may look different. Notice the f6 in parenthesis following the figure caption. These hints appear throughout this document to show the keystroke(s) leading up to the screen from the PAM menu.

If connecting to the LaserJet through the HP 82164A interface, set the *Printer Interface* parameter to HP 82164A instead of Serial.

C. ENTERING DATACOM CONFIGURATION

Datacom configuration must be set for system components to link-up and exchange data. Use the arrow keys to move from line-to-line (see Fiqure 2-31. Use the serial column when connecting the LaserJet to the serial port. Use ‘ the HP 82164A column when using the HP 82 164A interface. The computer is now ready to print to the LaserJet.

NOTE: Refer to Appendix L for Print Menu and Configuration Menu.

SOFTWARE

Page

Loading the BGU Program 2-12
SOI/CEOI Menu 2-12
Load From Disk 2-13
Save To Disk 2-14
Zeroize Computer 2-15
DOS Commands 2-15
Conv Database 2-15
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Xfer SOI/CEOI. . . . . , ...2-16
Gen Callsigns. 2-17
Gen Suf/Exp. 2-17
Gen Sign/Cntr. 2-17
Gen Frequency. 2-17
Gen Sincgars 2-17
Gen Smoke/Pyro 2-17
Format C Drive 2-17

LOADING THE BGU PROGRAM

1. Ensure all of the components are properly connected as specified in Section II, page 2-6.
2. Ensure the configurations are properly set as specified in Entering System Configuration, page 2-8.
3. Remove the transit disk from the disk drive if one is present.
4. Insert the BECS Version I Program disk into the disk drive.
5. Press <f4> Reread Disks. The PAM menu then displays the screen shown in Figure 2-4.
6. Move the cursor arrow using the arrow keys to “SOI/CEOI MENU” and press <f1> Start Applic or the <RETURN> key. The screen then displays,

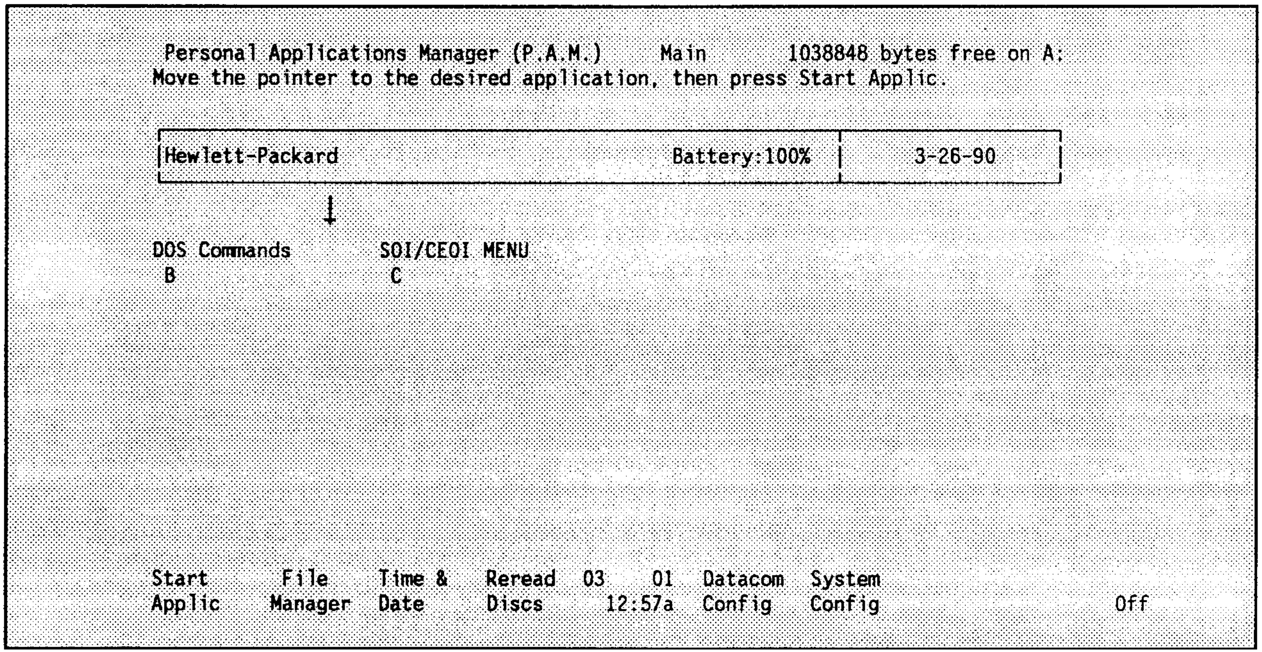
Loading “SOI/CEOI MENU”

When the SOI menu is finished loading, the screen shown in Figure 2-5 is displayed.

NOTE:
You need a blank formatted floppy disk to save the database. This disk is referred to as the data disk. (See Format C Drive, page 2-17 for the procedures to format a disk.)

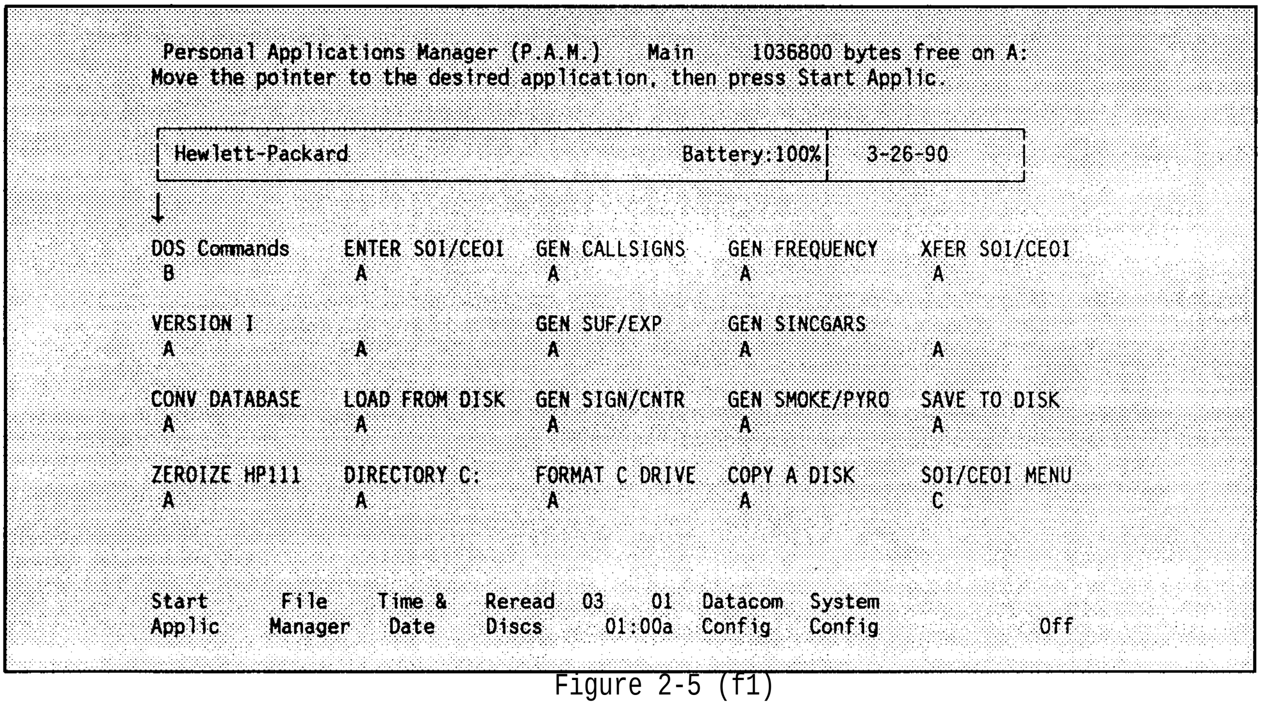
SOI/CEOI MENU

This PAM selection creates the BGU PAM menu. Use this option if the PAM menu does not have all of the necessary selections.



```
 Personal Applications Manager (P.A.M.)     Main      1038848 bytes free on A:
Move the pointer to the desired application, then press Start Applic.

|Hewlett-Packard                                    Battery:100%  |     3-26-90    |

DOS Commands        SOI/CEOI MENU
 B                   C

Start     File     Time &   Reread  03    01  Datacom  System
Applic    Manager  Date     Discs     12:57a  Config   Config                 Off
```

Figure 2-4 (f4)



```
 Personal Applications Manager (P.A.M.)    Main     1036800 bytes free on A:
Move the pointer to the desired application, then press Start Applic.

| Hewlett-Packard                                    Battery:100%|   3-26-90     |

DOS Commands     ENTER SOI/CEOI   GEN CALLSIGNS    GEN FREQUENCY    XFER SOI/CEOI
 B                A                A                A                A

VERSION I                         GEN SUF/EXP      GEN SINCGARS
 A                A                A                A                A

CONV DATABASE    LOAD FROM DISK   GEN SIGN/CNTR    GEN SMOKE/PYRO   SAVE TO DISK
 A                A                A                A                A

ZEROIZE HP111    DIRECTORY C:     FORMAT C DRIVE   COPY A DISK      SOI/CEOI MENU
 A                A                A                A                C

Start     File     Time &   Reread  03    01  Datacom  System
Applic    Manager   Date    Discs     01:00a  Config   Config            Off
```

Figure 2-5 (f1)

LOAD FROM DISK

This PAM selection loads previously created data disks using the external disk drive. Use this option to recall information from data disks.

Once this option is selected, the screen displays:

Loading “LOAD FROM DISK”

followed by:

"REMOVE PROGRAM DISK FROM DRIVE C
INSERT DATA DISK INTO DRIVE C"

Insert the data disk and press any key. A listing of the loaded files is shown and then the computer screen displays:

"REMOVED DATADISK FROM DRIVE C
INSERT PROGRAM DISK INTO DRIVE C"

Insert program disk and hit any key. The PAM menu comes to the screen.

SAVE TO DISK

This PAM selection stores all BGU data to a data disk. THE DATA DISK MUST BE PROPERLY FORMATTED BEFORE ATTEMPTING TO STORE DATA. (See Format C Drive, page 2-17 for the procedures to format a disk.) Use this option at the end of each session to store all the data entered. Data created from a session is not stored until this option is used.

Once this option is selected, the screen displays:

Loading "SAVE TO DISK"

followed by:

"REMOVE PROGRAM DISK FROM DRIVE C
INSERT DATA DISK INTO DRIVE C"

Insert the data disk and press any key. A file listing of all files stored is displayed, followed by:

"REMOVE DATA DISK FROM DRIVE C
INSERT PROGRAM DISK INTO DRIVE C"

Insert the program disk and press any key. The PAM menu comes to the screen and data is stored. Label each data disk before it is stored.

Note: The disk's label should contain the following:

1. A summary of the SOI/CEOI data contained on the disk
2. The hopset filename (if any)
3. The TRANSEC Key pair name (i.e. TSK #1)
4. The level at which all data was generated
5. The date of generation or effective date or both

ZEROIZE THE COMPUTER

This PAM selection deletes all data that is stored inside of the computer unit. Use this selection at the end of each session after storing data.

Once Zeroize is selected, the screen displays:

Loading "ZEROIZE HP111"

The zeroization takes approximately 15 minutes to complete.

IMPORTANT: *If the zeroize feature cannot be initiated due to the CPU unit needing maintenance, perform the following passive zeroization before beginning maintenance actions.*

1. *Remove the battery cover on the CPU.*
2. *Note three small pins located on the bottom of the back of the battery near the middle.*
3. *Note the connector over the left and middle pins.*
4. *Remove the connector.*
5. *Replace the connector, covering them middle and right pins.*

This process disconnects the battery backup to the unit. Refer to the PORTABLE PLUS OWNER'S DOCUMENTATION and Appendix F of this document regarding the connection of the battery and additional information.

The first time the machine is turned on after a zeroization, the operator is presented the following message:

WARNING: Memory Lost! Press [f1] to reformat drive A: (destroying data) or press the space bar to continue without reformatting (data errors on A: may result).

Press <fl> and continue with normal operations.

ZEROIZATION RESETS THE SYSTEM'S CONFIGURATIONS. VERIFY YOUR DATA CONFIGURATION AND YOUR SYSTEM CONFIGURATION AFTER A ZEROIZE IS PERFORMED. (Entering System Configuration and Entering DATACOM Configuration, page 2-8 & 9.)

DOS COMMANDS

This PAM selection gives you access to MS-DOS commands. Use this option to perform any DOS operating system commands. (See Appendix K.)

CONV DATABASE

This PAM selection converts the database created using Version F software to the format needed by Version H. If you have a valid Version G database, there is no need to convert the database.

Once this option is selected, the following message is displayed:

Loading "CONV DATABASE"

--then--

"This program will convert a database created using version F to the format needed by versions G and H. If you-have a database that was created using version G, it does not need to be converted. The REUSE file of the old database will be destroyed. Do you wish to continue (Y/N)?"

Respond "no" and the program returns to the PAM menu. Respond "yes" and the following message appears:

"Converting DATABASE..."

followed by:

"DATABASE has been converted

Press the spacebar to continue".

Pressing the spacebar returns you to the PAM menu.

VERSION I

This PAM selection displays the most current version of BECS software loaded on the BGU. Once this option is selected, the following message is displayed:

Loading "VERSION I"

followed by:

```
"ECHO OFF

            THIS IS VERSION I
                 OF THE
 BATTLEFIELD ELECTRONIC CEOI SYSTEM (BECS)
  BASIC GENERATION UNIT (BGU) SOFTWARE
              KAFB-106 VER I

Strike a key when ready..."
```

Strike any key and the program returns to the PAM menu.

XFER SOI/CEOI

This PAM selection allows you to use the OUTPUT component of the BGU software. Use this option to display-completed SOI to the screen (see Display, page 2-89), print packages of SOI data (see Print, page 2-93), output data to be used for merging (see Diskette, Merge, page 2-98), load a ECCM fill device (see ECCM, page 2-102).

This PAM selection allows yo to generate five time periods worth of call signs for the nets that require them (see Gen Call Signs, page 2-69).

GEN SUF/EXP

This PAM selection allows you to generate five time periods worth of suffixes and expanders (see Gen Suf/Exp, page 2-78).

GEN SIGN/CNTR

This PAM selection allows you to generate or select five time periods of sign/countersign pairs (see Gen Sign/Cntr, page 2-79).

GEN FREQUENCY

Use this PAM selection to generate five time periods worth of frequency data for the nets that require them (see Gen Frequency, page 2-69).

GEN SINCGARS

Use this PAM selection to generate SINCGARS data for the nets that require them (see Gen SINCGARS, page 2-73).

GEN SMOKE/PYRO

Use this PAM selection to select five time periods worth of smoke/pyrotechnic information (see Gen Smoke/Pyre, page 2-84).

FORMAT C DRIVE

This PAM selection is used to format a disk in the external C drive. Once this option is selected, the following messages are displayed:

Loading “FORMAT C DRIVE.”

followed by

“Remove program disk from drive C: and insert the disk you wish to format
Press any key to begin formatting”

Insert the disk, press any key and the disk is formatted. When formatting is finished the following message is displayed:

“Volume label (11 characters, RETURN for none)?”

If desired, type in the volume label and press <RETURN>. Otherwise, press <RETURN>. The total disk space and space available on the disk is displayed on the screen followed by the message:

“Format another (Y/N)?”

Type “Y” and the following message is displayed:

“Press any key to begin formatting”.

Insert a disk and press any key to format the disk.

Type “N” and the following message is displayed:

Remove formatted disk and re-insert the program disk
Strike a key when ready . ..”

Press any key and the PAM Menu returns.

HOW TO USE THE HP-111 SECURE FEATURE

The SECURE feature can help protect against unauthorized use of the computer. Use the following procedures:

1. Before turning off the computer, type “secure” followed by a blank and the password you want.
2. Press RETURN to turn off the computer.
3. The next time the computer is turned back on, the following prompt will appear: “Secure:”. If the password is typed correctly the PAM menu will be shown. Otherwise the computer will turn off. (See the Portable PLUS Owner’s Documentation for further details.)

BECS SOI/CEOI FLOW DIAGRAM

Refer to Appendix M for BECS SOI/CEOI flow diagram.

ENTER SOI/CEOI

INTRODUCTION 2-21
INITIAL MENU 2-22
NET & FREQUENCY INFO MENU . . . 2-23
MASTER NET LIST --MATRIX . . . 2-24
  SEARCH 2-28
  SAVE 2-28
  COPY LINE 2-28
  FIND LINE 2-28
  FIND BLANK . . . 2-29
  PREVIOUS MENU 2-29
FREQUENCY LIST & RESTRICTIONS . . . 2-29
  SAVE FREQS . . . 2-32
  SEARCH 2-32
  REPEAT 2-32
  SORT 2-32
  STATS 2-32
  RANGE. 2-33
  PREVIOUS MENU . . 2-33
  EXIT FREQS . . . 2-33
 NET GROUPS 2-33
  SEARCH 2-34
  SAVE.......... 2-34
  ALL NETS ASSIGNED . . 2-36
  DISPLAY GROUP . . . 2-36
    PREVIOUS GROUP . . 2-37
    NEXT GROUP . . 2-37
    FIND GROUP . . 2-37
    SAVE . . 2-37
    NEW GROUP.... 2-37
    FIND NET # . . 2-38
COSITE PLAN 2-38
  INSERT GROUP 2-40
  FIND GROUP 2-40
  SAVE GROUP......... 2-40
  DELETE GROUP......... 2-40
  DELETE NET........ 2-41
SHARING FOR CALL SIGNS . . 2-41
  NEXT GROUP........ 2-43
  PREVIOUS GROUP...... 2-43
  FIND GROUP 2-43
  NEW GROUP 2-43
  SAVE 2-43
SHARING PLAN FOR FREQUENCIES . . 2-44
  NEXT GROUP . . 2-46
  PREVIOUS GROUP........ 2-46
  FIND GROUP 2-46
  NEW GROUP 2-46
  SAVE 2-46
SPECIAL NETS PLAN 2-46
  FIND NET 2-48
  SAVE NETS 2-48

SUFFIXES 2-48
    SEARCH 2-49
    SAVE 2-50
    COPY LINE 2-50
    FIND LINE 2-50
    FIND BLANK 2-50
    REPEAT LINE 2-50
EXPANDERS 2-50
    SEARCH 2-52
    SAVE 2-52
    COPY LINE 2-52
    FIND LINE # 2-52
    FIND BLANK 2-52
    REPEAT LINE 2-52
MERGE 2-52
    MERGE SUFFIXES AND EXPANDER INFORMATION 2-53
    MERGE SIGN AND COUNTERSIGN 2-54
    MERGE SMOKE AND PYROTECHNICS 2-54
    MERGE SINCGARS INFORMATION 2-55
    MERGE NET LIST, CALL SIGNS AND
      FREQUENCIES INFORMATION 2-55
    MERGE ALL OF THE ABOVE 2-56
SINCGARS FREQUENCY RESOURCES 2-56
    ENTER/MODIFY FREQ RESOURCE 2-57
    HELP SCREEN 2-59
    LIST ENTRY 2-59
COPY FREQUENCY RESOURCE 2-60
MERGE FREQUENCY RESOURCE 2-60
DELETE FREQUENCY RESOURCE 2-62
PRINT FREQUENCY RESOURCE 2-62

ENTER SOI/CEOI

INTRODUCTION

This PAM selection gives you access to the INPUT component of the BGU software. Use this selection to create and modify information regarding net structures (see Master Net List--Matrix, page 2-24), available frequencies (see Frequency List & Restrictions, page 2-29), net groups (see Net Groups, page 2-33), cositing (see Cosite Plan, page 2-38), call sign sharing (see Sharing Plan for Call Signs, page 2-41), frequency sharing (see Sharing Plan for Frequencies, page 2-44), special net planning (see Special Nets Plan, page 2-46), suffix descriptors (see Suffixes, page 2-48), expander descriptors (see Expanders, page 2-50), merging (see Merge, page 2-52) and SINCGARS frequency resources (see SINCGARS Frequency Resources, page2-56).

This chapter discusses the ENTER SOI/CEOI procedures in detail. It shows how to enter into the BGU the SOI data created in Appendix G. The example database used in the manual comes from the SOI developed in Appendix G. The data is complete and generates actual SOI information.

At the end of the chapter is a quick reference table. The table contains definitions for the data elements to be entered into the BGU in this chapter.

ENTER SOI MAIN MENU

To select ENTER SOI/CEOI from the PAM menu shown in Figure 2-6, use the arrow keys to position the small arrow over the “ENTER SOI/CEOI” PAM selection and press <RETURN> or <fl>.

The screen clears and then displays the following:

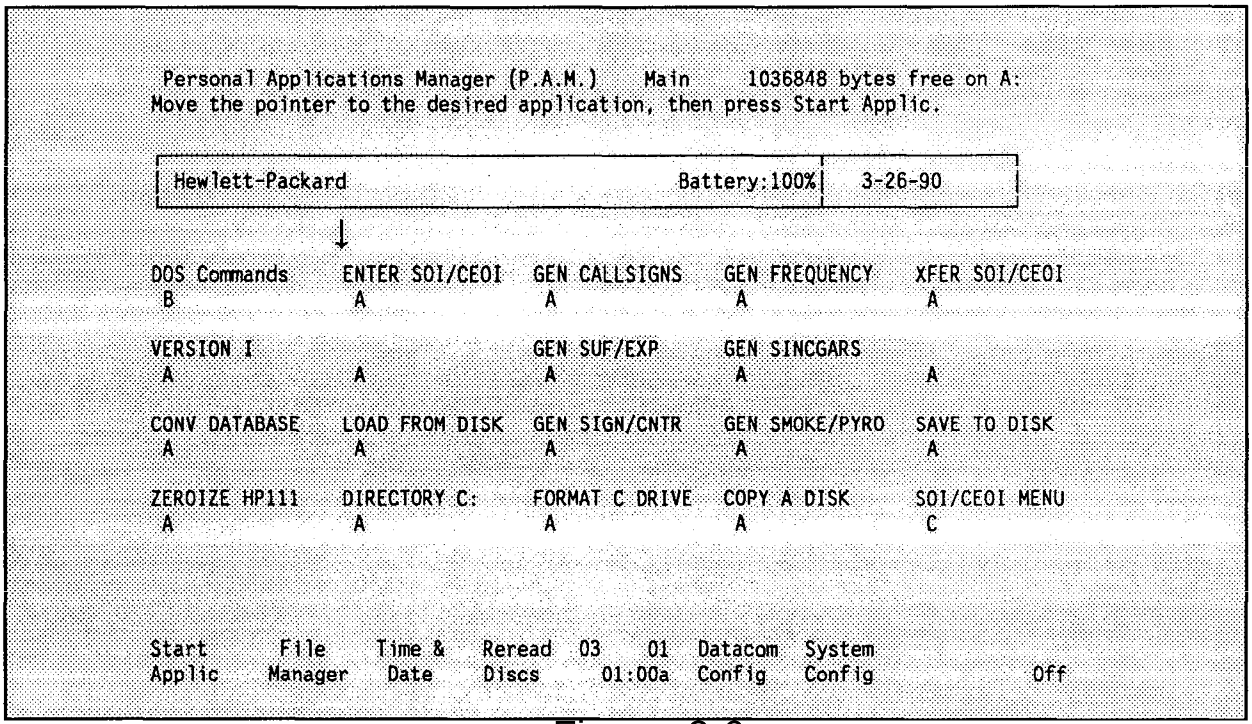
Loading “ENTER SOI/CEOI”.

When, the screen clears again, the Input Options menu is displayed. This menu is shown in Figure 2-7.

The key sequence used to get to this menu from the BECS PAM Menu is shown in parenthesis.

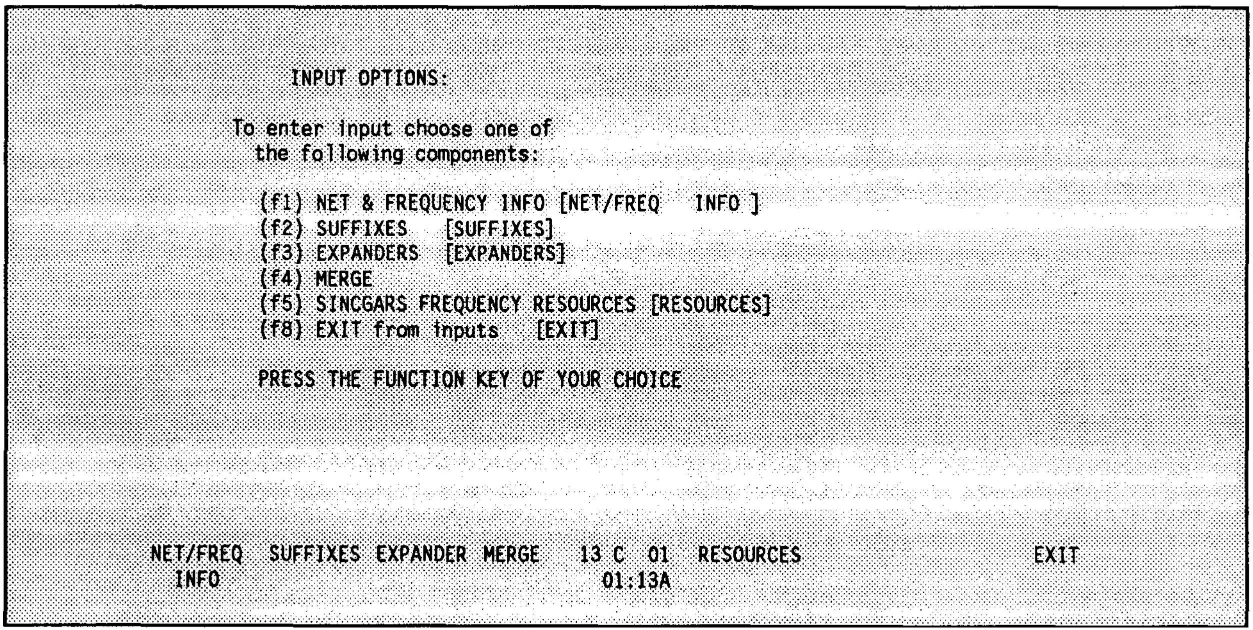
All menu selections are made by pressing the function keys on the HP-111. There are six (6) choices from this menu.

f1 - allows you to enter net and frequency information. This choice is covered in Net & Frequency Info Menu, page 2-23.
f2 - allows you to enter suffix data. This choice is covered in Suffixes, page 2-48.
f3 - allows you to enter expander data. This choice is covered in Expanders, page 2-50.
f4 - allows you to merge data that has previously been output to a disk and the current data base. This choice is covered in Merge, page 2-52.



```
 Personal Applications Manager (P.A.M.)    Main     1036848 bytes free on A:
Move the pointer to the desired application, then press Start Applic.

| Hewlett-Packard                                  Battery:100%|  3-26-90      |

                ↓
DOS Commands    ENTER SOI/CEOI  GEN CALLSIGNS   GEN FREQUENCY   XFER SOI/CEOI
 B               A               A               A               A

VERSION I                       GEN SUF/EXP     GEN SINCGARS
 A               A               A               A               A

CONV DATABASE   LOAD FROM DISK  GEN SIGN/CNTR   GEN SMOKE/PYRO  SAVE TO DISK
 A               A               A               A               A

ZEROIZE HP111   DIRECTORY C:    FORMAT C DRIVE  COPY A DISK     SOI/CEOI MENU
 A               A               A               A               C



Start      File     Time &   Reread  03    01  Datacom  System
Applic    Manager    Date    Discs     01:00a  Config   Config             Off
```

Figure 2-6



```
            INPUT OPTIONS:

       To enter input choose one of
         the following components:

         (f1) NET & FREQUENCY INFO [NET/FREQ   INFO ]
         (f2) SUFFIXES   [SUFFIXES]
         (f3) EXPANDERS  [EXPANDERS]
         (f4) MERGE
         (f5) SINCGARS FREQUENCY RESOURCES [RESOURCES]
         (f8) EXIT from inputs   [EXIT]

         PRESS THE FUNCTION KEY OF YOUR CHOICE




NET/FREQ  SUFFIXES EXPANDER MERGE   13 C  01  RESOURCES                  EXIT
  INFO                                01:13A
```

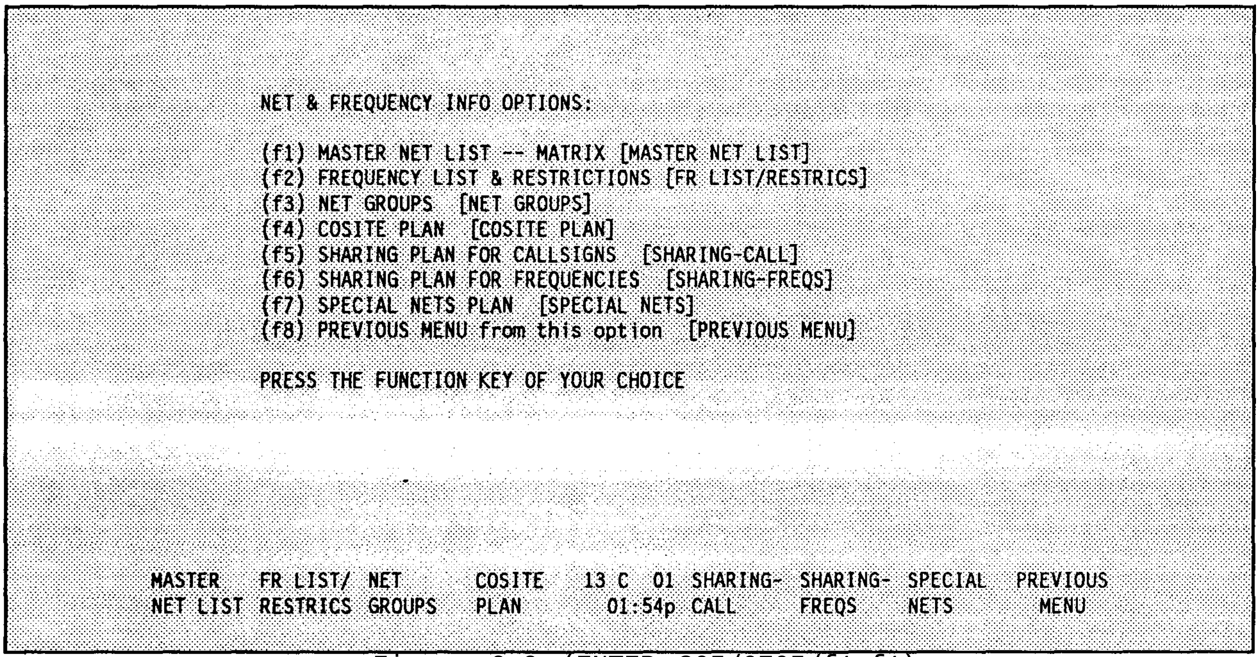
Figure 2-7 (ENTER SOI/CEOI/F1

f5 - allows you to enter SINCGARS frequency data. This choice is covered in SINCGARS Frequency Resources, page 2-56.

f8 - allows you to exit from the ENTER SOI/CEOI main menu and return to the BECS PAM Menu.

NET & FREQUENCY INFO MENU

The NET & FREQUENCY INFO menu is displayed by pressing <f1> from the Input Option menu shown in Figure 2-7. The NET & FREQUENCY INFO options menu in Figure 2-8 is displayed.



```
NET & FREQUENCY INFO OPTIONS:

(f1) MASTER NET LIST -- MATRIX [MASTER NET LIST]
(f2) FREQUENCY LIST & RESTRICTIONS [FR LIST/RESTRICS]
(f3) NET GROUPS  [NET GROUPS]
(f4) COSITE PLAN  [COSITE PLAN]
(f5) SHARING PLAN FOR CALLSIGNS  [SHARING-CALL]
(f6) SHARING PLAN FOR FREQUENCIES  [SHARING-FREQS]
(f7) SPECIAL NETS PLAN  [SPECIAL NETS]
(f8) PREVIOUS MENU from this option  [PREVIOUS MENU]

PRESS THE FUNCTION KEY OF YOUR CHOICE

MASTER   FR LIST/ NET     COSITE   13 C  01 SHARING- SHARING- SPECIAL  PREVIOUS
NET LIST RESTRICS GROUPS  PLAN        01:54p CALL     FREQS    NETS       MENU
```

Figure 2-8 (ENTER SOI/CEOI/f1,f1)

These selections allow you to enter information about the SOI/CEOI net frequencies.

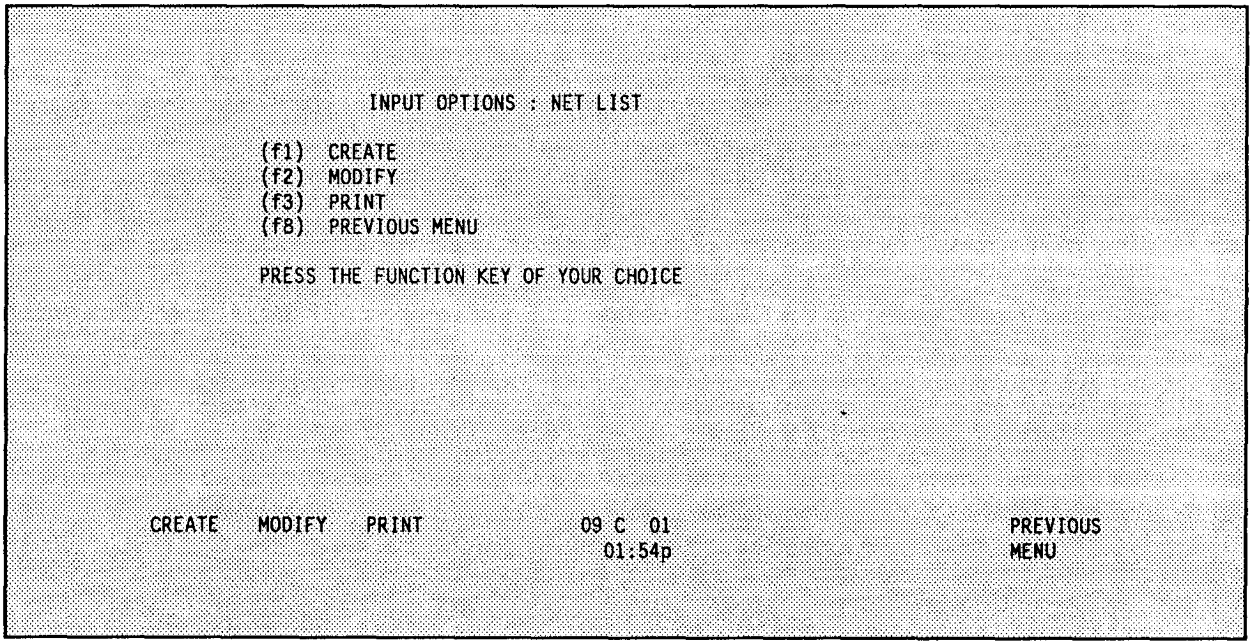
f1 - allows you to enter data related to the individual nets. This menu selection is discussed in Master Net List--Matrix, page 2-24.
f2 - allows you to enter data concerning the frequency list and restrictions. This choice is discussed in Frequency List & Restrictions, page 2-29.
f3 - allows you to enter net group data. Net group data entry is discussed in Net Groups, page 2-33.
f4 - allows you to enter cosite information. This selection is discussed in Cosite Plan, page 2-38.
f5 - allows you to enter a sharing plan for the call signs. This is discussed further in Sharing Plan For Call Signs, page 2-41.
f6 - allows you to enter a sharing plan for frequencies. This is discussed further in Sharing Plan For Frequencies, page 2-44.
f7 - allows you to enter a special net plan. This is discussed further in Special Nets Plan, page 2-46.
f8 - allows you to return to the previous menu.

MASTER NET LIST--MATRIX

After selecting <f1> from Figure 2-8, the BGU displays the following question:

Does the Net List have merged Corps information in it (Y/N)?

Type "Y" if the database contains merged information and "N" if it does not. Next, the BGU displays the screen shown in Figure 2-9.



INPUT OPTIONS : NET LIST

(f1) CREATE
(f2) MODIFY
(f3) PRINT
(f8) PREVIOUS MENU

PRESS THE FUNCTION KEY OF YOUR CHOICE

Figure 2-9 (ENTER SOI/CEOI/f1, f1, f1)

f1 - allows you to create a new net list.
f2 - allows you to modify an existing net list.
f3 - allows you to print information about the net list.
f8 - allows you to return to the previous menu.

After selecting <f1> from Figure 2-9, you are warned that selecting the create option destroys existing information in the BGU. Choosing "Y" allows you to continue and "N" returns you to the screen shown in Figure 2-9.

Selecting <f3> from Figure 2-9 allows you to print information about the net list. Figure 2-10 shows how the print screen appears on the BGU.

f1 - allows you to print ALL NET NAMES.
f2 - allows you to print SOME NET NAMES. Prompts you to enter the selected nets.
f3 - allows you to print ALL NET INFO.
f4 - allows you to print SOME NET INFO. Prompts you to enter the selected nets.

By pressing <f2> from Figure 2-9, you can modify existing information which has been loaded into the BGU. An example of the screen used for data entry is shown in Figure 2-11. The data shown is an example; your data is different.

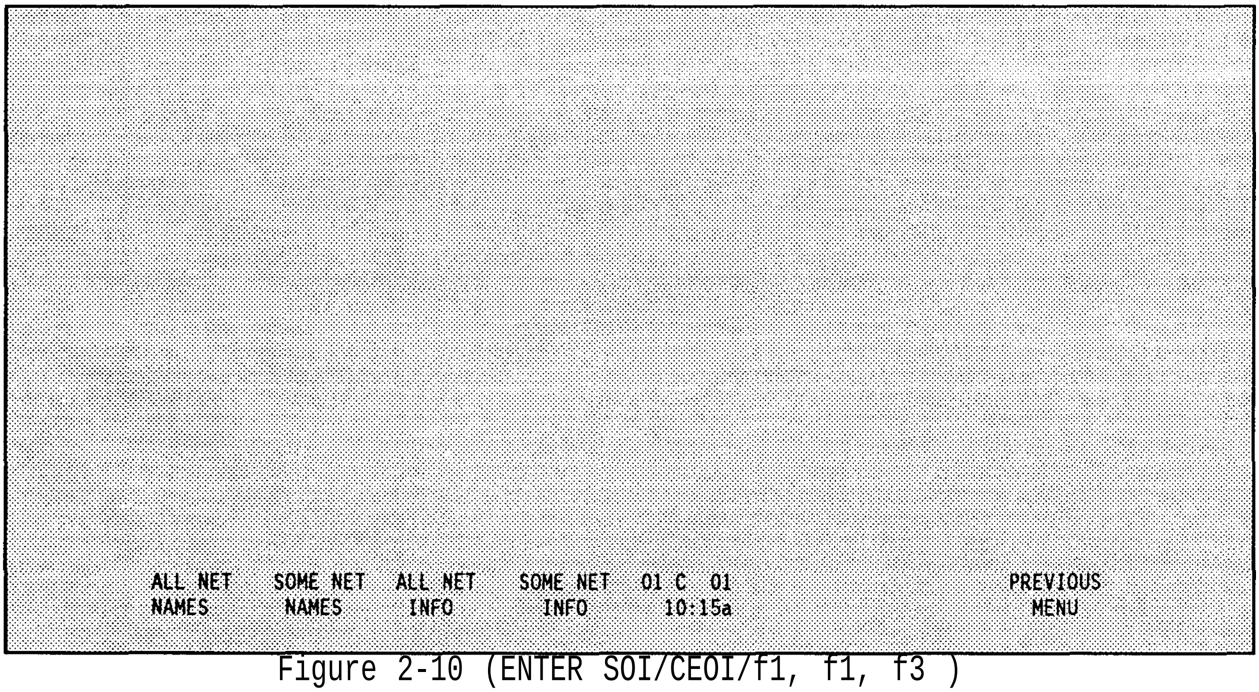
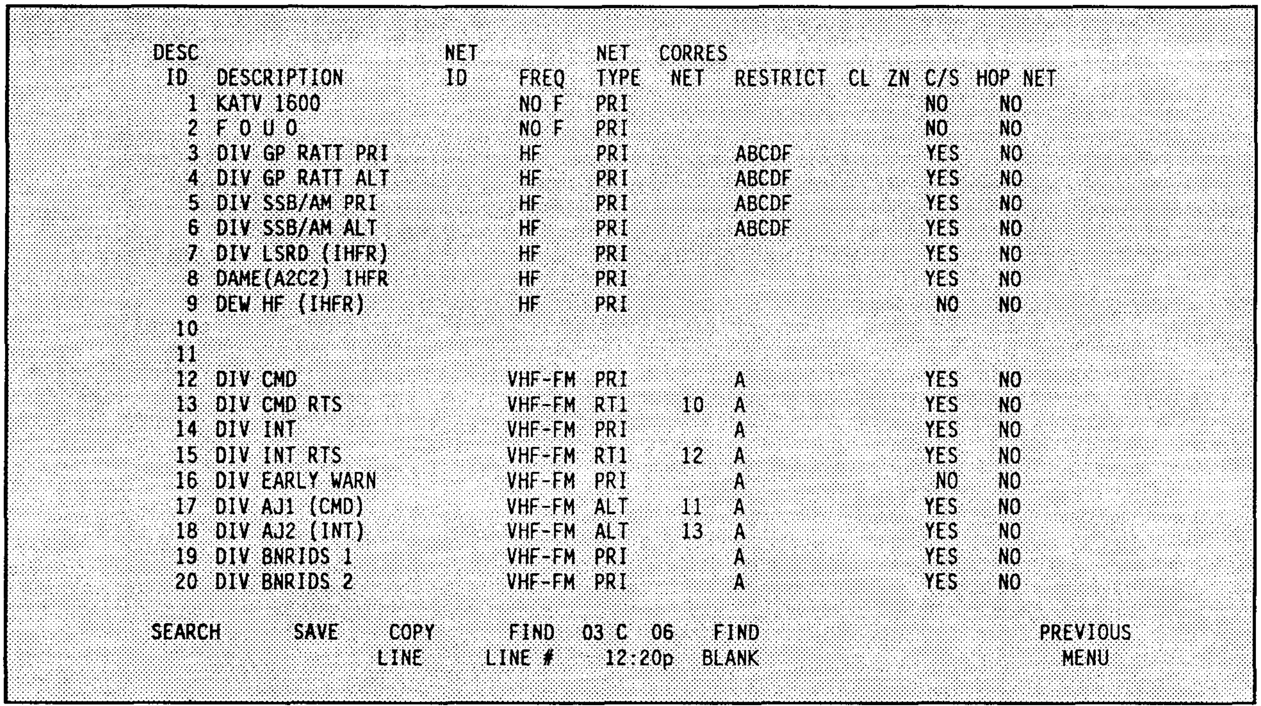

ALL NET NAMES
SOME NET NAMES
ALL NET INFO
SOME NET INFO
01 C 01
10:15a
PREVIOUS MENU

Figure 2-10 (ENTER SOI/CEOI/f1, f1, f3)



```
DESC                      NET          NET   CORRES
 ID  DESCRIPTION          ID     FREQ  TYPE   NET   RESTRICT  CL  ZN C/S  HOP NET
  1  KATV 1600                   NO F  PRI                            NO    NO
  2  F O U O                     NO F  PRI                            NO    NO
  3  DIV GP RATT PRI             HF    PRI          ABCDF             YES   NO
  4  DIV GP RATT ALT             HF    PRI          ABCDF             YES   NO
  5  DIV SSB/AM PRI              HF    PRI          ABCDF             YES   NO
  6  DIV SSB/AM ALT              HF    PRI          ABCDF             YES   NO
  7  DIV LSRD (IHFR)             HF    PRI                            YES   NO
  8  DAME(A2C2) IHFR             HF    PRI                            YES   NO
  9  DEW HF (IHFR)               HF    PRI                             NO   NO
 10
 11
 12  DIV CMD                    VHF-FM PRI          A                 YES   NO
 13  DIV CMD RTS                VHF-FM RT1     10   A                 YES   NO
 14  DIV INT                    VHF-FM PRI          A                 YES   NO
 15  DIV INT RTS                VHF-FM RT1     12   A                 YES   NO
 16  DIV EARLY WARN             VHF-FM PRI          A                  NO   NO
 17  DIV AJ1 (CMD)              VHF-FM ALT     11   A                 YES   NO
 18  DIV AJ2 (INT)              VHF-FM ALT     13   A                 YES   NO
 19  DIV BNRIDS 1               VHF-FM PRI          A                 YES   NO
 20  DIV BNRIDS 2               VHF-FM PRI          A                 YES   NO
```

SEARCH
SAVE
COPY LINE
FIND LINE #
03 C 06
12:20p
FIND BLANK
PREVIOUS MENU

Figure 2-11 (ENTER SOI/CEOI/f1 ,f1 ,f2)

The Master Net List Matrix is used to enter: Net Description, Net ID, Frequency Type, Net Type, Corresponding Net, Restrictions, Class, Zone, Call Signs and Hopset Requirements.

Enter all necessary information into the matrix. Use the <TAB> key to move between columns on the same line. Use a <SHIFT> and <TAB> combination to move backwards between the columns. Use the <RETURN> key to move to the next line.

Arrow keys can be used to move between lines within columns. Some columns use the function keys to make selections; therefore, the function key selections may change depending on which column the cursor is in.

DESC ID is the first column of the matrix. The numbers increase in sequential order as you proceed down the list. This number is used as the reference number for each of the nets when entering Net Groups (see Net Groups, page 2-33), Cosite Groups (see Cosite Plan, page 2-38), Call Sign Sharing Plan (see Sharing Plan For Call Signs, page 2-41), Frequency Sharing Plan (see Sharing Plan For Frequencies, page 2-44) and Special Nets (see Special Nets Plan, page 2-46) .

This column is fixed and cannot be edited by you. If you do not want to use a DESC ID, the row should be left blank such as rows ten (10) and eleven (11) in Figure 2-11. It is recommended that 2 blank lines be inserted approximately every 20 nets or between commands. This is done because an insert line capability does not exist.

Enter into the DESCRIPTION column the descriptors for the nets to be included into the completed SOI. Up to 1500 net names (1-1200 = DIV, 1201-1500 = CORPS), each up to 16 characters long may be entered. The following characters may be used as part of the net names: letters A - Z, digits O - 9, &, (,), - and/.

The cursor must be in this column to return to the previous menu <f8>. The cursor can be placed into this column by hitting the <RETURN> key from any column

Enter into the NET ID column the three digit number (000-999) to be used as a NET ID with SINCGARS radios. The NET ID number is used in the SINCGARS radios as an identifier. If a net ID number is entered, then the HOPNET should be yes.

Enter into the FREQ column the frequency band to be used by the net. Enter either a fixed frequency or use the appropriate frequency range if the net is to have randomly generated frequency information. The function key selections change when the cursor is placed in this column.

To select a frequency range use the following function keys:

(f1) LF
(f2) HF
(f3) VHF-FM
(f4) VHF-AM
(f5) UHF
(f6) EXTRA
(f7) NO FREQ NEEDED

Frequency ranges are as follows:

LF	0.0001-1.9999 Mhz
	2.0000-29.9999 MHz
VF-FM	30.000-87.975 MHz
VHF-AM	108.000-149.999 MHz
UHF	225.000-399.999 MHz
EXTRA	0.0001-9999.99 MHz (includes those frequencies not in other ranges)

Frequencies less than 30 MHz are rounded to the fourth digit after the decimal point.

Frequencies equal to or greater than 30 MHz are rounded to the third digit after the decimal point.

Rounding up occurs for values of six or greater in the extra digit.

IF A NET IS NOT ASSIGNED ANY FREQUENCY INFORMATION, IT IS ASSUMED THAT NO FREQUENCY IS NEEDED.

Enter into the NET TYPE column the net type. The types include PRI (primary), ALT (alternate) and RTS (retransmission). The default type is PRI.

The function key selections change when the cursor is placed in this column. To select a net type use the following function keys:

(f1) PRIMARY NET
(f2) ALTERNATE NET
(f3) RETRANS NET #1
(f4) RETRANS NET #2
(f5) RETRANS NET #3
(f6) RETRANS NET #4
(f7) RETRANS NET #5
(f8) RETRANS NET #6

A PRIMARY NET is used under normal mode operating conditions. An ALTERNATE NET is used when the PRIMARY net communications cannot be maintained due to jamming or interference. A RETRANS NET is assigned to a retrans (radio relay) operation. If anything other than PRI is used as a net type, a corresponding net must be given. There is a 10 MHz separation between a RETRANS net and its corresponding net as well as the alternate net.

The CORRESPONDING NET item is used only if the net is an ALTERNATE or RETRANS net type. The net number used refers to the DESC ID of the PRImary net to which it corresponds.

Enter into the RESTRICTIONS column the frequency restrictions that have been placed on the net. Up to eight restrictions may be applied to a given net. The restrictions are entered using the letters in the range A-P. Each letter identifies the explanation of how the frequency is to be restricted. For example, “A” may indicate the frequency cannot be used in a given geographical area. Do not use commas between restrictions. Nets that have a fixed frequency requirement should not receive any restrictions.

Enter into the CL column the class the net may be assigned to as part of a reuse plan. A class is a grouping of up to 20 zones. The total frequency requirement for a class equals the number of nets in the largest zone. The class may be a number 1-10.

Enter into the ZN column the zone the net may be assigned to as part of a reuse plan. A zone is a group of nets in which an assigned frequency cannot be repeated within that group for the same time period. Each zone can contain 200 nets. The zone may be a number 1-20.

Enter into the C/S column whether or not the net is to receive a call sign. A call sign s a three-character combination of letter-number-letter used to identify a command, activity unit or element in establishing and maintaining communicant ens. The default is "yes". Type "Y" for yes and "N" for no.

Enter into the HOP NET column whether or not the net uses frequency hopping radios. A freaquency hopping radio is a radio in which the operating frequencies "hop" around. The frequencies do not stay fixed-at one-point. The default is "no". Type "Y" for yes and "N" for no. If yes is entered, then a net ID should have been entered in the NET ID column.

A. SEARCH

Use this option to look for a particular net. Once this option has been selected, indicate which direction to search.

U - searches upward from current cursor position to the top of the net group list.
D - searches downward from current cursor position to the bottom of the net group) list.
A - searches from the top to the bottom of the net group list.
R - searches for the next occurrence of the string previously entered, when there is more than one occurrence of the same string.

Select the desired direction and enter the string to find. If the string is found, it is displayed at the top of the screen.

B. SAVE

Use this option to save any changes or additions to the Master Net List located inside of the computer. The information is not permanently saved until a SAVE TO DISK is performed.

C. COPY LINE

Use this option to duplicate a certain Net to the line where the cursor is presently blinking. Once this option has been selected, enter the line number to be copied.

D. FIND LINE

Use this option to go to a desired line number. Once this option is selected, enter the desired line number. The selected line number is displayed at the top of the screen.

E. FIND BLANK

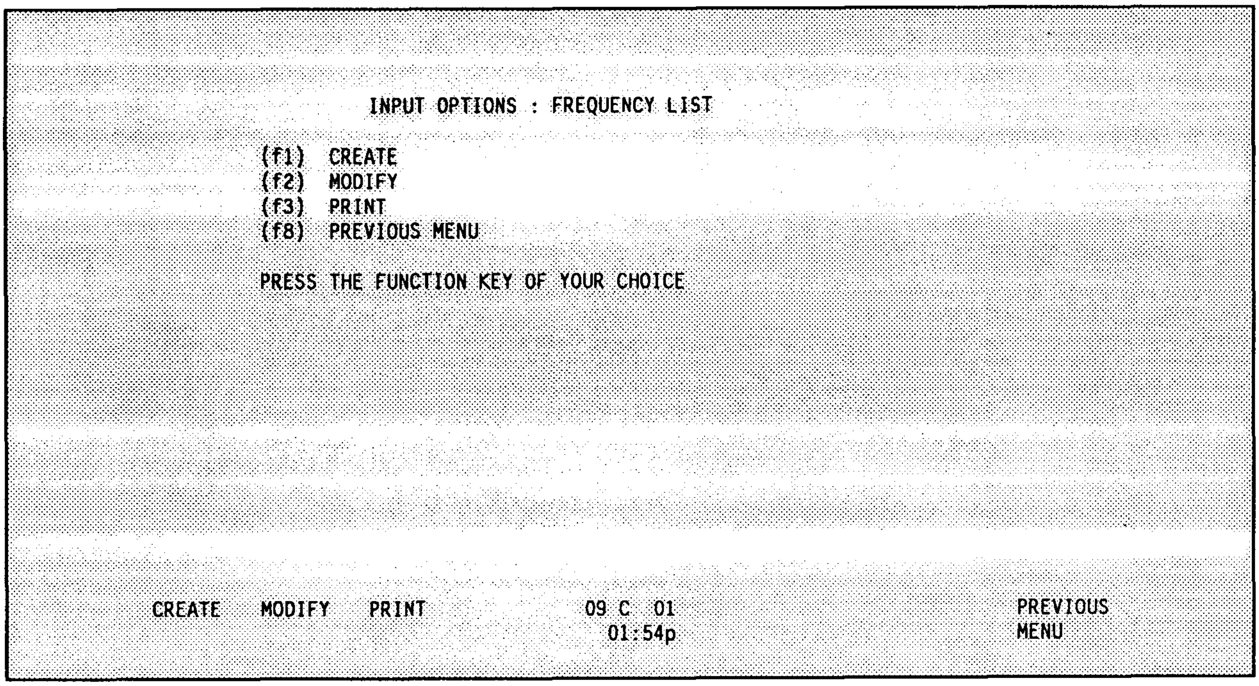
Use this option to locate the first blank line in the matrix. Once this option is selected, the line is displayed at the top of the screen.

F. PREVIOUS MENU

Use this option to return to input options menu (Figure 2-9).

FREQUENCY LIST & RESTRICTIONS

The Frequency List & Restrictions selection is used to enter the frequencies available for use within each band. After selecting <f2> from the screen shown in Figure 2-8 in Net & Frequency Info Menu, page 2-23, the screen shown in Figure 2-12 is displayed.



```
                    INPUT OPTIONS : FREQUENCY LIST

              (f1)  CREATE
              (f2)  MODIFY
              (f3)  PRINT
              (f8)  PREVIOUS MENU

              PRESS THE FUNCTION KEY OF YOUR CHOICE









       CREATE   MODIFY   PRINT          09 C  01                      PREVIOUS
                                          01:54p                      MENU
```

Figure 2-12 (ENTER SOI/CEOI/f1, f1, f2)

f1 - allows you to create a new frequency list.
f2 - allows you to modify an existing frequency list.
f3 - allows you to print information about the frequency list.
f8 - allows you to return to the previous menu.

If you select <f1> and a frequency list already exists, then you are warned that creating a new frequency list destroys the existing data. Selecting "N" returns you to the previous menu. Selecting "Y" allows you to enter a new frequency list.

Selecting <f3> from Figure 2-12 allows you to print information about the frequencies. Figure 2-13 shows how the print screen appears on the BGU.

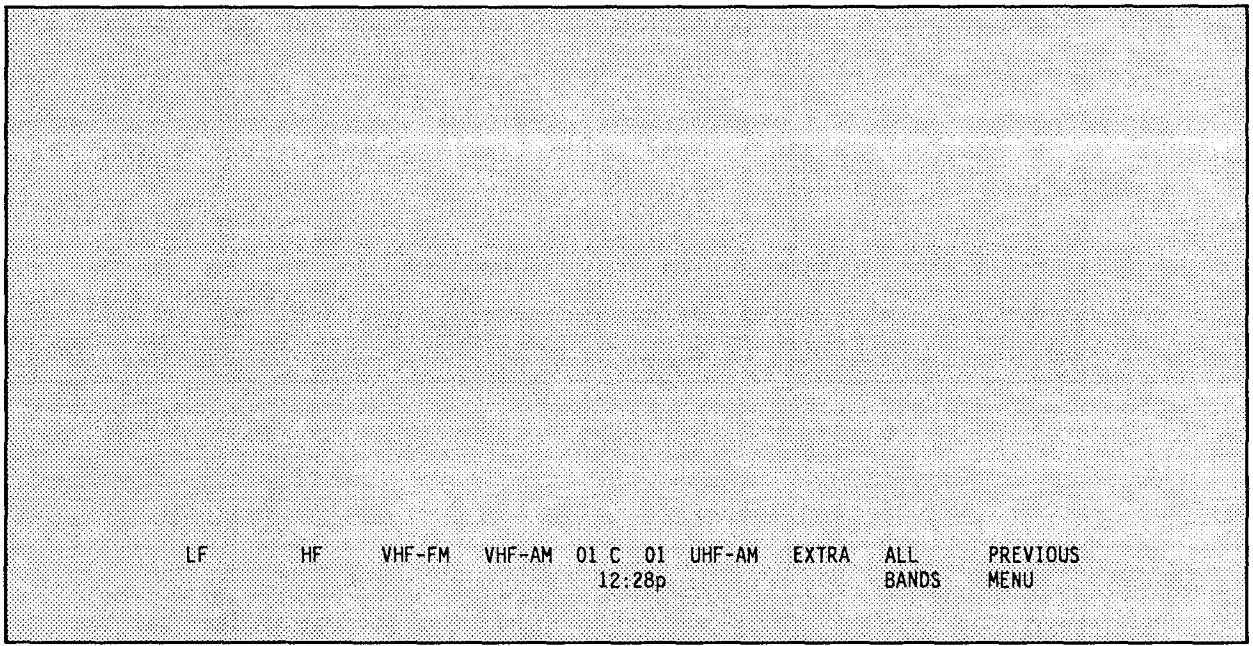


Figure 2-13 (ENTER SOI/CEOI/f1, f1, f2, f3)

f 1 - allows you to print the LF band.
f 2 - allows you to print the HF band.
f 3 - allows you to print the VHF-FM band.
f 4 - allows you to print the VHF-AM band.
f 5 - allows you to print the UHF-AM band.
f 6 - allows you to print the EXTRA band.
f 7 - allows you to print ALL BANDS.
f 8 - allows you to return to the previous menu.

In all cases frequency band statistics and a frequency list are printed when a function key is selected.

If <f2> is selected, then the screen is displayed as shown in Figure 2-14.

f1 - allows you to modify frequencies in the LF band.
f2 - allows you to modify frequencies in the HF band.
f3 - allows you to modify frequencies in the VHF-FM band.
f4 - allows you to modify frequencies in the VHF-AM band.
f5 - allows you to modify frequencies in the UHF band.
f6 - allows you to modify frequencies in the EXTRA band.
f8 - allows You to return to the previous menu.

Figure 2-15 shows how the data for frequencies and restrictions is entered into the database for the HF band. “

Enter the allocated frequencies for the band selected--one per line. Use the <TAB> key to move between the FREQUENCY and RESTRICTION columns. Up to 16 restrictions may be applied to each frequency. The restrictions are entered using the letters in the range A-P. Do not use commas between restrictions.

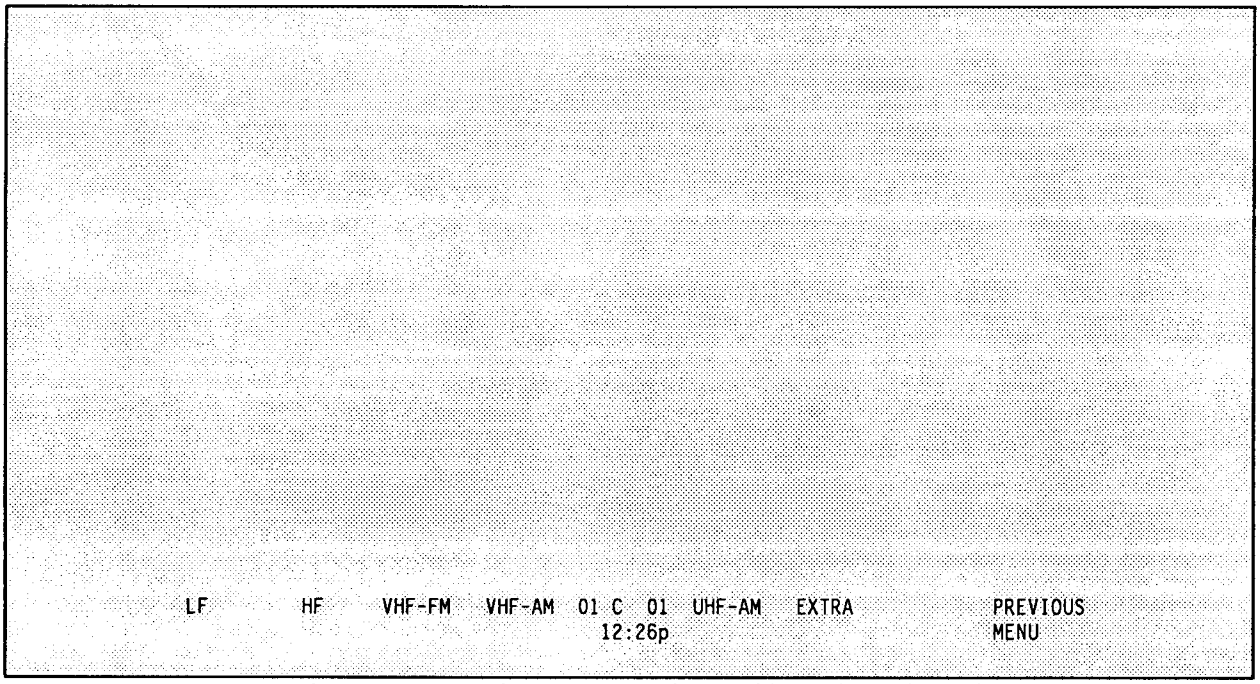
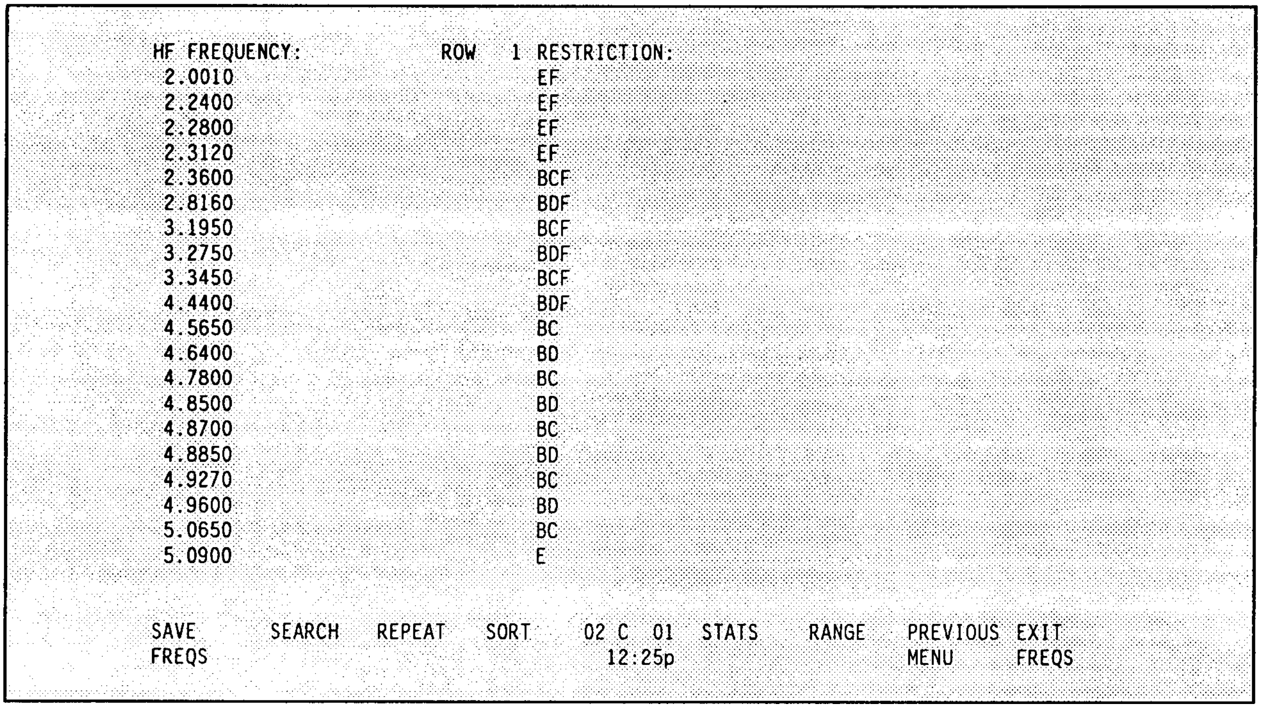

LF
HF
VHF-FM
VHF-AM
01 C 01
12:26p
UHF-AM
EXTRA
PREVIOUS
MENU

Figure 2-14 (ENTER SOI/CEOI/f1, f1, f2, f2



```
HF FREQUENCY:           ROW   1 RESTRICTION:
 2.0010                       EF
 2.2400                       EF
 2.2800                       EF
 2.3120                       EF
 2.3600                       BCF
 2.8160                       BDF
 3.1950                       BCF
 3.2750                       BDF
 3.3450                       BCF
 4.4400                       BDF
 4.5650                       BC
 4.6400                       BD
 4.7800                       BC
 4.8500                       BD
 4.8700                       BC
 4.8850                       BD
 4.9270                       BC
 4.9600                       BD
 5.0650                       BC
 5.0900                       E
```

SAVE
FREQS
SEARCH
REPEAT
SORT
02 C 01
12:25p
STATS
RANGE
PREVIOUS
MENU
EXIT
FREQS

Figure 2-15 (ENTER SOI/CEOI/f1, f1, f2, HF)

Each frequency category accepts entries only in the proper range (see Master Net List-- Matrix, pages 2-24 and G-20), except for EXTRA which accepts entries in the range from 0.0001-9999.99 MHz. If a mistake is made in entering a frequency, use the <BACKSPACE> or arrow key to go to the beginning of the column and retype the entry. The cursor types over old text.

The remainder of this Section explains the editing options shown in Figure 2-15.

A. SAVE FREQS

Use this option to save any changes or additions to the frequency file located inside of the computer. The information is not permanently saved until a **SAVE TO DISK** is performed.

B. SEARCH

Use this option to look for a particular frequency. Once this option has been selected, indicate which frequency to find. If the frequency is found, it is brought to the top of the screen.

C. REPEAT

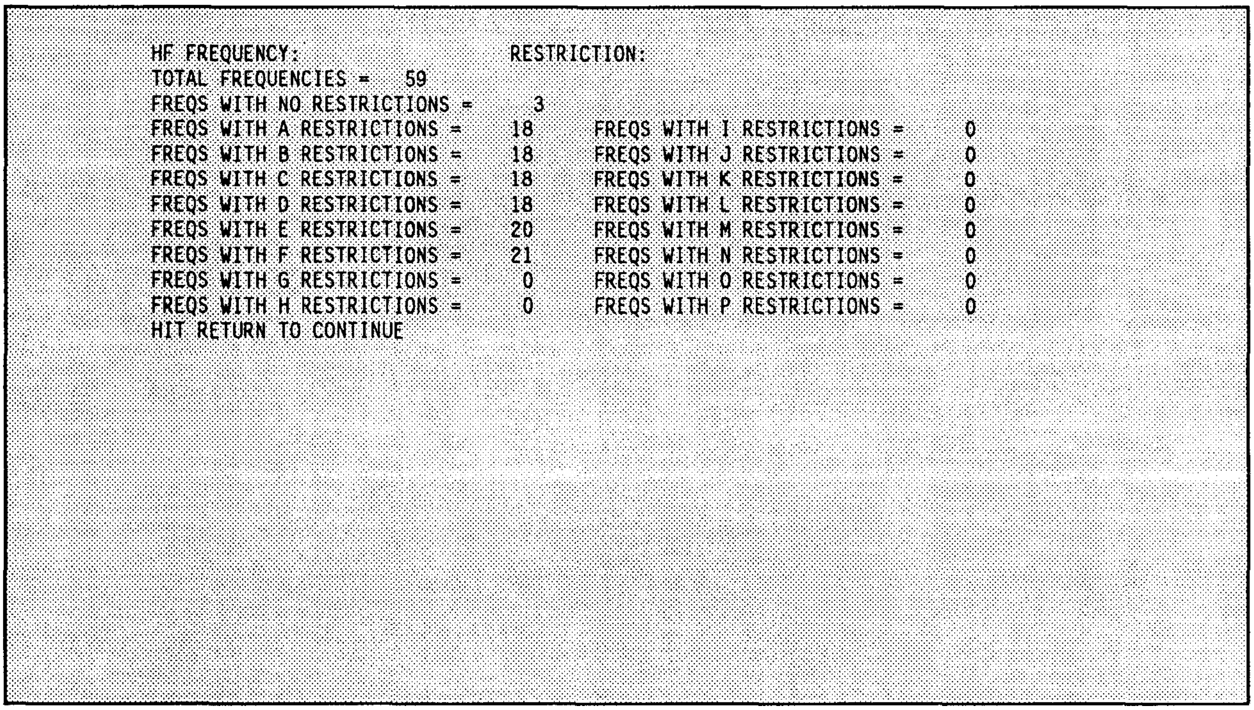
Use this option to duplicate the frequency where the cursor is presently blinking on the next line.

D. SORT

Use this option to sort the displayed frequencies into ascending numerical order.

E. STATS

Use this option to view the restriction statistics for the band. Once this option is selected, the screen displays the data shown in Figure 2-16.



```
HF FREQUENCY:                RESTRICTION:
TOTAL FREQUENCIES =   59
FREQS WITH NO RESTRICTIONS =     3
FREQS WITH A RESTRICTIONS =    18     FREQS WITH I RESTRICTIONS =     0
FREQS WITH B RESTRICTIONS =    18     FREQS WITH J RESTRICTIONS =     0
FREQS WITH C RESTRICTIONS =    18     FREQS WITH K RESTRICTIONS =     0
FREQS WITH D RESTRICTIONS =    18     FREQS WITH L RESTRICTIONS =     0
FREQS WITH E RESTRICTIONS =    20     FREQS WITH M RESTRICTIONS =     0
FREQS WITH F RESTRICTIONS =    21     FREQS WITH N RESTRICTIONS =     0
FREQS WITH G RESTRICTIONS =     0     FREQS WITH O RESTRICTIONS =     0
FREQS WITH H RESTRICTIONS =     0     FREQS WITH P RESTRICTIONS =     0
HIT RETURN TO CONTINUE
```

Figure 2-16 (ENTER SOI/CEOI/f1, f1, f2, f2, f2, f5)

F. RANGE

Use this option to enter a uniformly incremented range of frequencies. For example, all of the frequencies between 35.000 and 40.000 MHz separated by 0.500 MHz increments.

Choosing <f6> RANGE causes the following prompts to appear:

```
ENTER START OF RANGE:
ENTER END OF RANGE:
ENTER INCREMENT (IN MHz):
```

Enter the information and hit <RETURN> after answering each question.

G. PREVIOUS MENU

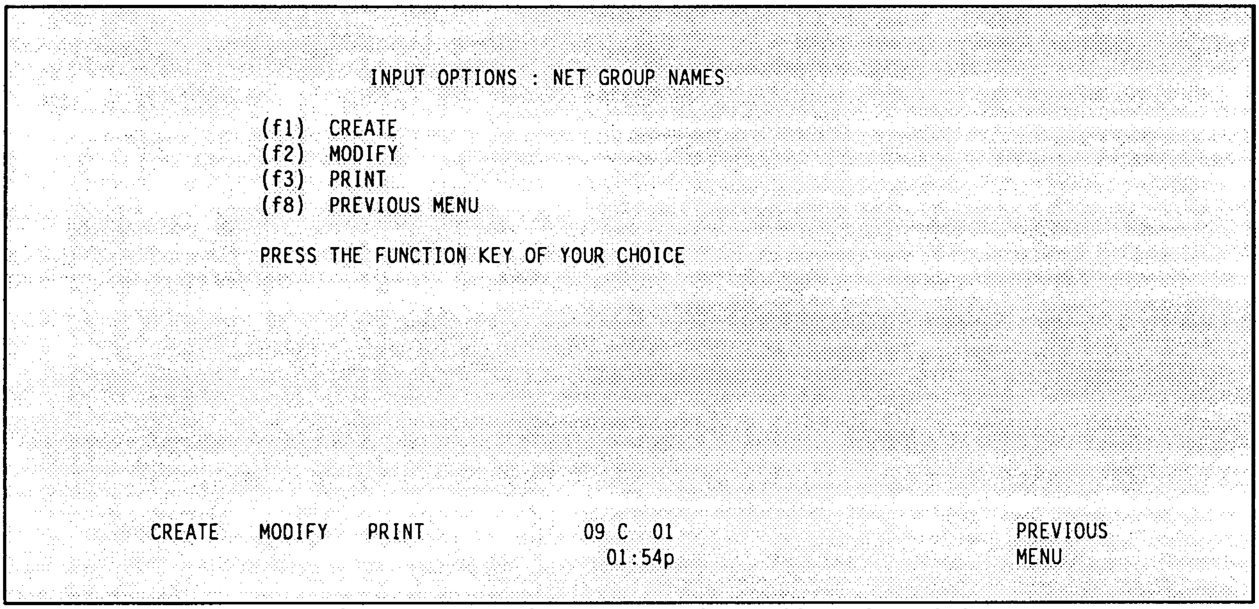
Use this option to return to the frequency band selection menu. (See Frequency List & Restrictions, page 2-23)

H. EXIT FREQS

Use this option to exit the frequency list option.

NET GROUPS

This section shows you how to enter the net groups which correspond to extract sheets. The Net Groups area is used to create a maximum 150 groupings of nets which correspond to extract sheets. Up to 36 nets can be entered into each blank. After selecting <f3> from Figure 2-8 in Net & Frequency Info Menu, page 2-23, the screen shown in Figure 2-17 is displayed.



```
                    INPUT OPTIONS : NET GROUP NAMES

              (f1)  CREATE
              (f2)  MODIFY
              (f3)  PRINT
              (f8)  PREVIOUS MENU

              PRESS THE FUNCTION KEY OF YOUR CHOICE



        CREATE   MODIFY   PRINT         09 C  01                    PREVIOUS
                                          01:54p                    MENU
```

Figure 2-17 (ENTER SOI/CEOI/f1, f1, f3)

f1 - allows you to create new net groups.
f2 - allows you to modify existing net groups.
f3 - allows you to print information about net groups.
f8 - allows you to return to the previous menu.

After selecting <f1> from Figure 2-17, you are warned that selecting the create option destroys existing information in the BGU. Choosing "Y" allows you to continue and "N" returns you to the screen shown in Figure 2-17.

Selecting <f3> from Figure 2-17 allows you to print information about the net groups. Figure 2-18 shows how the print screen appears on the BGU.

f1 - allows you to print some net groups. You are prompted to enter the selected net groups.
f2 - allows you to print all the net groups.
f3 - allows you to print all the net group names.
f8 - allows you to return to the previous menu.

In all cases, use <f7> function key to pause the printer or function key <f8> to stop the printer.

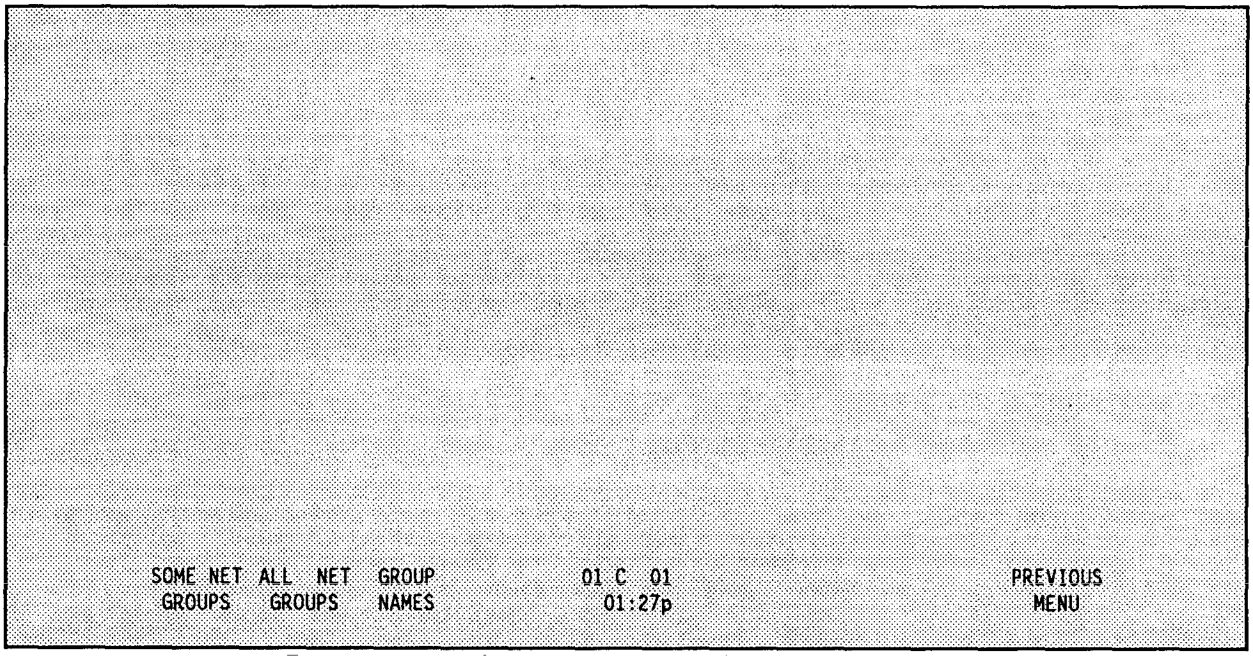


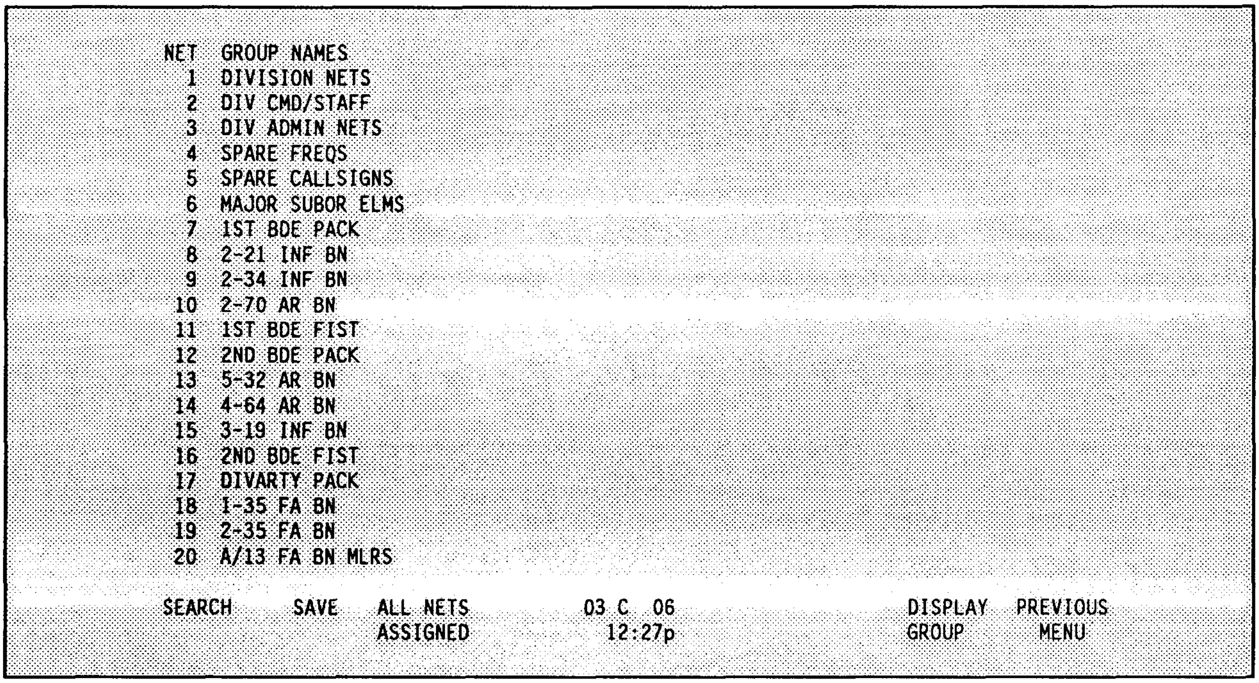
Figure 2-18 (ENTER S0I/CE0I/f1, f3, f3)

Selecting <f2> from Figure 2-17, displays the screen shown in Figure 2-19 which shows the net group names for the current database. Again, the data shown here is an example; your data is different.

The remainder of this section explains the options used to edit net group information.

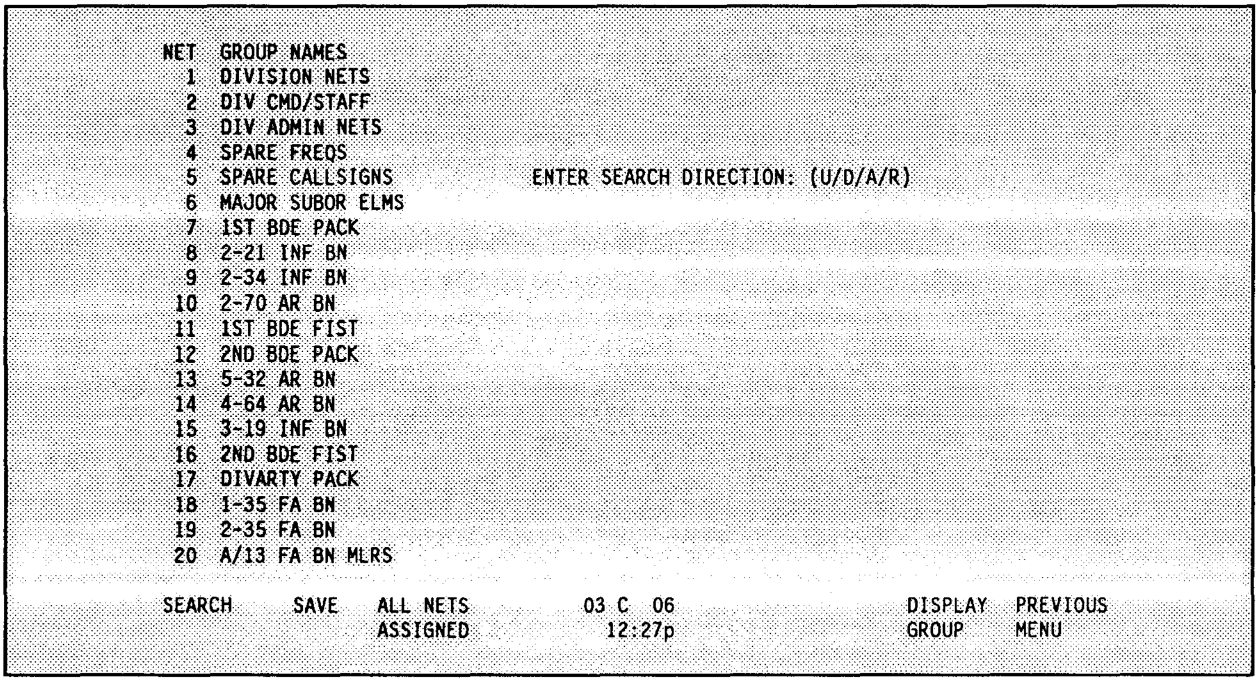
A. SEARCH

Use this option to search for a particular net group. Once this option is selected, enter the direction as shown in Figure 2-20.



```
NET  GROUP NAMES
  1  DIVISION NETS
  2  DIV CMD/STAFF
  3  DIV ADMIN NETS
  4  SPARE FREQS
  5  SPARE CALLSIGNS
  6  MAJOR SUBOR ELMS
  7  1ST BDE PACK
  8  2-21 INF BN
  9  2-34 INF BN
 10  2-70 AR BN
 11  1ST BDE FIST
 12  2ND BDE PACK
 13  5-32 AR BN
 14  4-64 AR BN
 15  3-19 INF BN
 16  2ND BDE FIST
 17  DIVARTY PACK
 18  1-35 FA BN
 19  2-35 FA BN
 20  A/13 FA BN MLRS

SEARCH    SAVE   ALL NETS        03 C  06                DISPLAY  PREVIOUS
                 ASSIGNED          12:27p                GROUP      MENU
```

Figure 2-19 (ENTER SOI/CEOI/f1, f1, f3, f2)



```
NET  GROUP NAMES
  1  DIVISION NETS
  2  DIV CMD/STAFF
  3  DIV ADMIN NETS
  4  SPARE FREQS
  5  SPARE CALLSIGNS          ENTER SEARCH DIRECTION: (U/D/A/R)
  6  MAJOR SUBOR ELMS
  7  1ST BDE PACK
  8  2-21 INF BN
  9  2-34 INF BN
 10  2-70 AR BN
 11  1ST BDE FIST
 12  2ND BDE PACK
 13  5-32 AR BN
 14  4-64 AR BN
 15  3-19 INF BN
 16  2ND BDE FIST
 17  DIVARTY PACK
 18  1-35 FA BN
 19  2-35 FA BN
 20  A/13 FA BN MLRS

SEARCH    SAVE   ALL NETS        03 C  06                DISPLAY  PREVIOUS
                 ASSIGNED          12:27p                GROUP    MENU
```

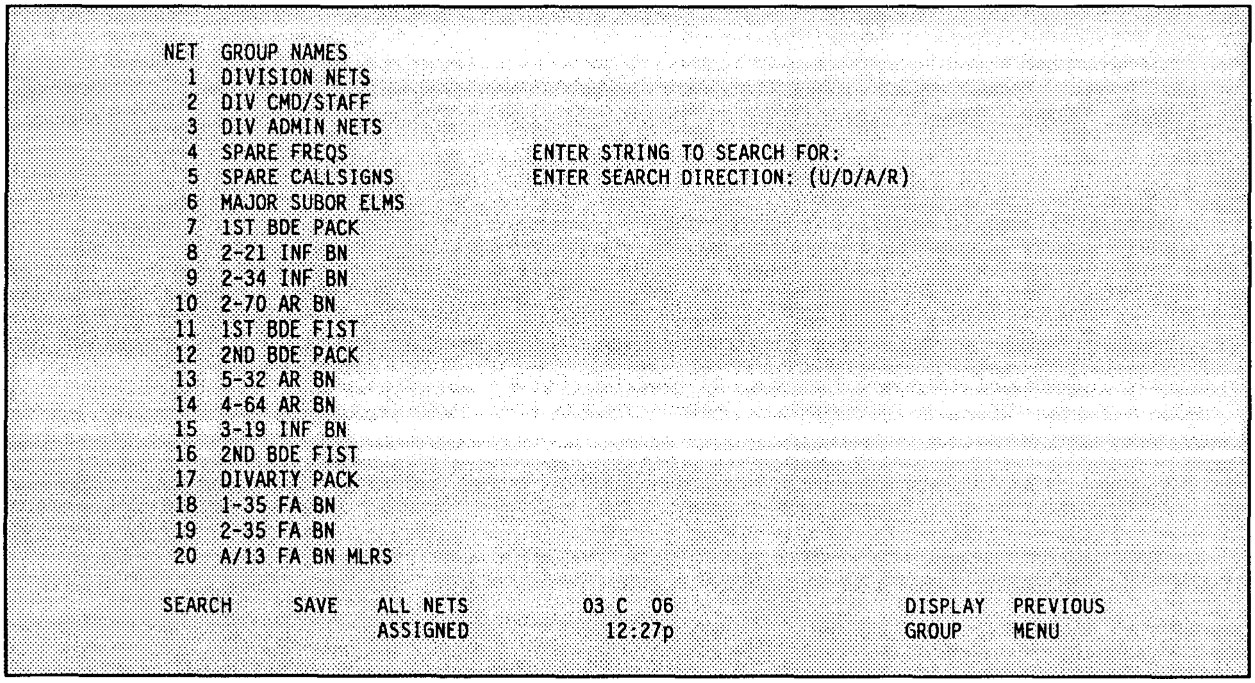
Figure 2-20 (ENTER SOI/CEOI/f1, f1, f3, f2, f1)

U - searches upward from current cursor position to the top of the net group list.

D - searches downward from current cursor position to the bottom of the net group list.

A - searches from the top to the bottom of the net group list.

R - searches for the next occurrence of the string previously entered, when there is more than one occurrence of the same string.



```
NET  GROUP NAMES
  1  DIVISION NETS
  2  DIV CMD/STAFF
  3  DIV ADMIN NETS
  4  SPARE FREQS               ENTER STRING TO SEARCH FOR:
  5  SPARE CALLSIGNS           ENTER SEARCH DIRECTION: (U/D/A/R)
  6  MAJOR SUBOR ELMS
  7  1ST BDE PACK
  8  2-21 INF BN
  9  2-34 INF BN
 10  2-70 AR BN
 11  1ST BDE FIST
 12  2ND BDE PACK
 13  5-32 AR BN
 14  4-64 AR BN
 15  3-19 INF BN
 16  2ND BDE FIST
 17  DIVARTY PACK
 18  1-35 FA BN
 19  2-35 FA BN
 20  A/13 FA BN MLRS

SEARCH    SAVE   ALL NETS        03 C  06              DISPLAY  PREVIOUS
                 ASSIGNED         12:27p               GROUP    MENU
```

Figure 2-21 (ENTER SOI/CEOI/f1, f1, f3, f2, f1, D)

Next, enter the string to be searched for after the second prompt as shown in Figure 2-21.

B. SAVE

Use this option to save changes or additions made to the list of net groups names located inside of the computer. The information is not permanently saved until a SAVE TO DISK is performed.

C. ALL NETS ASSIGNED

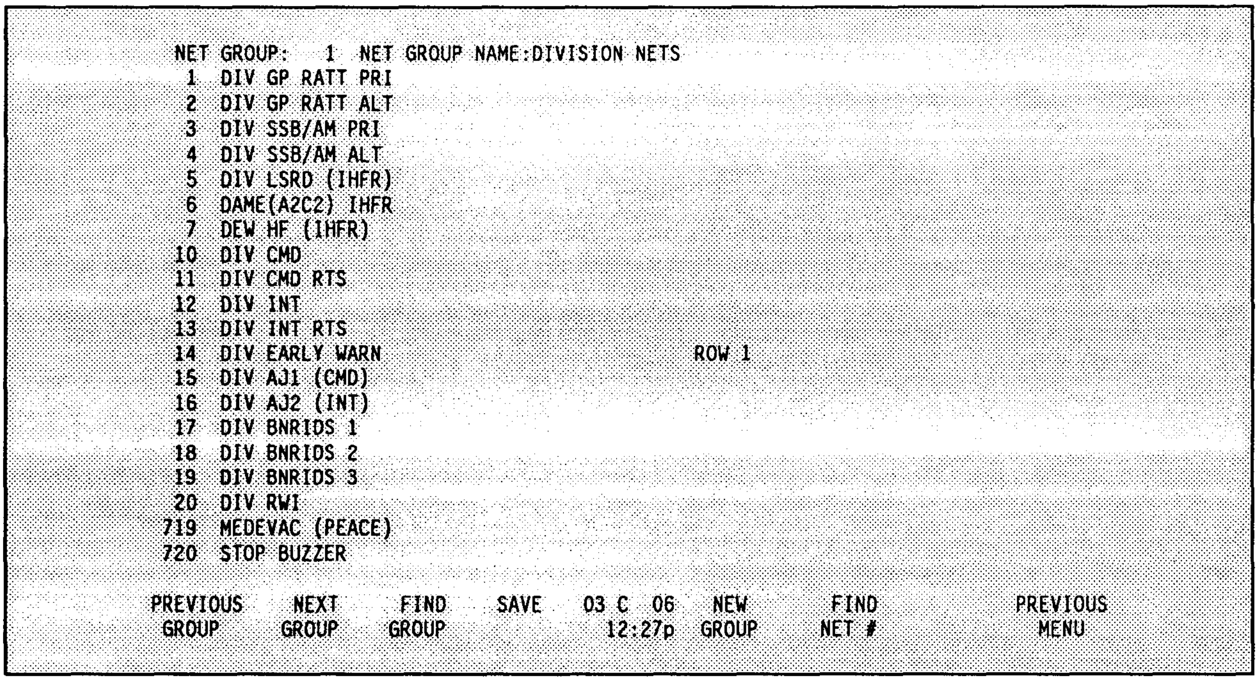
Use this option to check which nets have not been assigned to any net group. If there are any nets which are not assigned, the option is available to receive a printed list of the unassigned nets.

D. DISPLAY GROUP

Use this option to enter and view the contents of each net group. Once this option is selected, an area appears for entering up to 36 nets. An example of a typical screen format is shown in Figure 2-22.

To enter a net, type the DESC ID number for the net as assigned in the Master Net List Matrix (see Master Net List--Matrix, pages 2-23 and 2-25). As each DESC ID number is entered, the computer automatically displays the full descriptor associated with the net on the screen.

The remainder of this section describes the function key selections for Figure 2-22.



```
      NET GROUP:   1  NET GROUP NAME:DIVISION NETS
        1  DIV GP RATT PRI
        2  DIV GP RATT ALT
        3  DIV SSB/AM PRI
        4  DIV SSB/AM ALT
        5  DIV LSRD (IHFR)
        6  DAME(A2C2) IHFR
        7  DEW HF (IHFR)
       10  DIV CMD
       11  DIV CMD RTS
       12  DIV INT
       13  DIV INT RTS
       14  DIV EARLY WARN                           ROW 1
       15  DIV AJ1 (CMD)
       16  DIV AJ2 (INT)
       17  DIV BNRIDS 1
       18  DIV BNRIDS 2
       19  DIV BNRIDS 3
       20  DIV RWI
      719  MEDEVAC (PEACE)
      720  STOP BUZZER

  PREVIOUS    NEXT    FIND    SAVE   03 C  06   NEW      FIND            PREVIOUS
   GROUP     GROUP   GROUP             12:27p  GROUP     NET #             MENU
```

Figure 2-22 (ENTER SOI/CEOI/f1, f1, f3, f2, f7)

1. PREVIOUS GROUP

Use this option to go to the net group located before the current net group in the list of assigned net groups.

2. NEXT GROUP

Use this option to go to the net group located after the current net group in the list of assigned net groups.

3. FIND GROUP

Use this option to find a particular net group. Once this option has been selected, enter the net group number to find.

4. SAVE

Use this option to save changes or additions made to the current net group located inside of the computer. The information is not permanently saved until a SAVE TO DISK is performed.

5. NEW GROUP

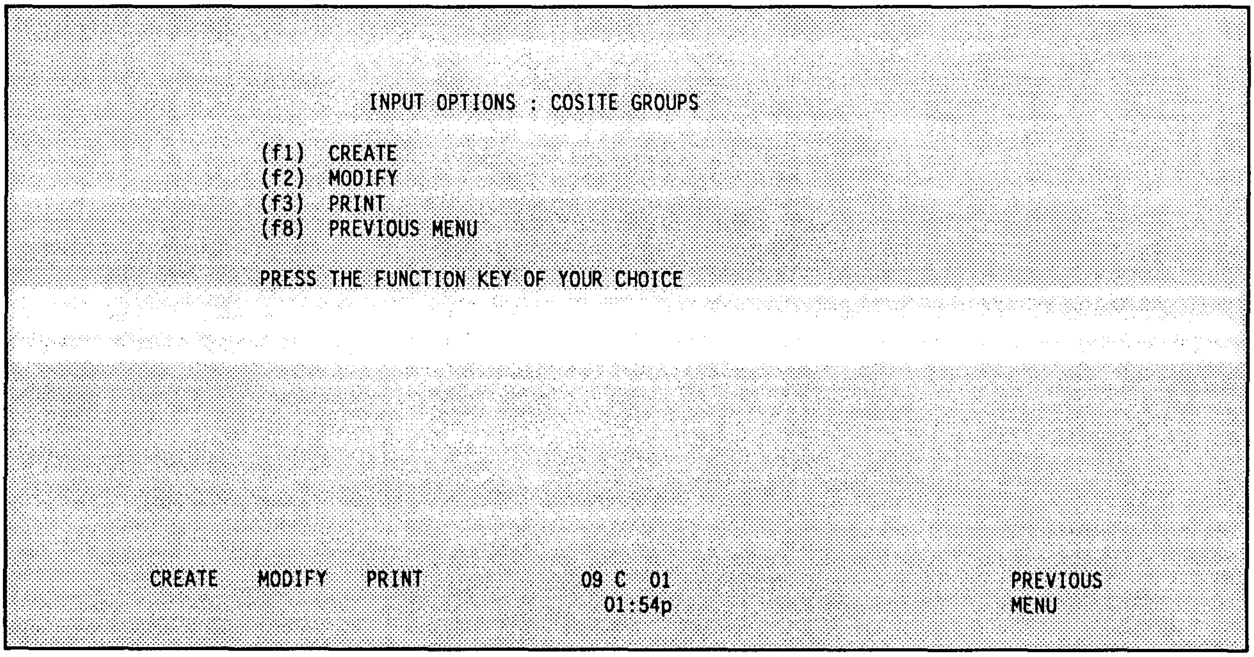
Use this option to create a new group from this level of the program. Once this option is selected, the next available net group is brought to the top of the screen. (See Net Groups, page 2-33)

6. FIND NET #

Use this option to find a particular net within the current group. Once this option is selected, enter the DESC ID number associated with the net.

COSITE PLAN

The Cosite Plan area is used to implement a cositing plan of nets. A Cosite Plan provides frequency separation from 0.5 to 5 Mhz. This separation allows nets in close proximity to communicate simultaneously without mutual interference. Up to 50 cosite groups may be created. Each group can contain up to 12 nets (1 base and 11 others). One frequency separation is selected for all 50 groups. After selecting <f4> from Figure 2-8 in Net & Frequency Info Options Menu, page 2-23, the screen shown in Figure 2-23 is displayed.



```
                    INPUT OPTIONS : COSITE GROUPS

              (f1)  CREATE
              (f2)  MODIFY
              (f3)  PRINT
              (f8)  PREVIOUS MENU

              PRESS THE FUNCTION KEY OF YOUR CHOICE




        CREATE   MODIFY   PRINT          09 C  01                    PREVIOUS
                                           01:54p                    MENU
```

Figure 2-23 (ENTER SOI/CEOI/f1, f1, f4)

f1 - allows you to create new cosite groups.
f2 - allows you to modify existing cosite groups.
f3 - allows you to print information about cosite groups.
f8 - allows you to return to the previous menu.

After selecting <f1> from Figure 2-23, you are warned that selecting the create option destroys existing information in the BGU. Choosing “Y” allows you to continue and “N” returns you to the screen shown in Figure 2-23.

Selecting <f3> from Figure 2-23 allows you to print information about the cosite plan. Figure 2-24 shows how the print screen appears on the BGU.

f1 - allows you to print all of the cosite plan.
f2 - allows you to print some of the cosite plan.

Selecting <f2> from Figure 2-23 allows you to modify existing cosite groups.

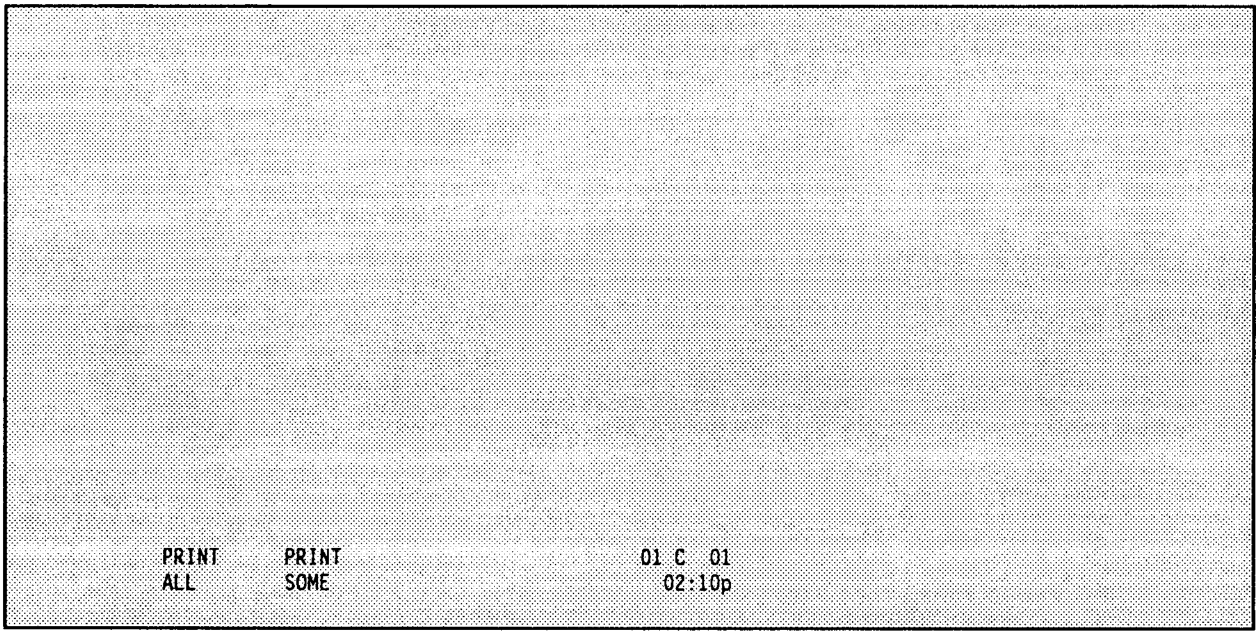
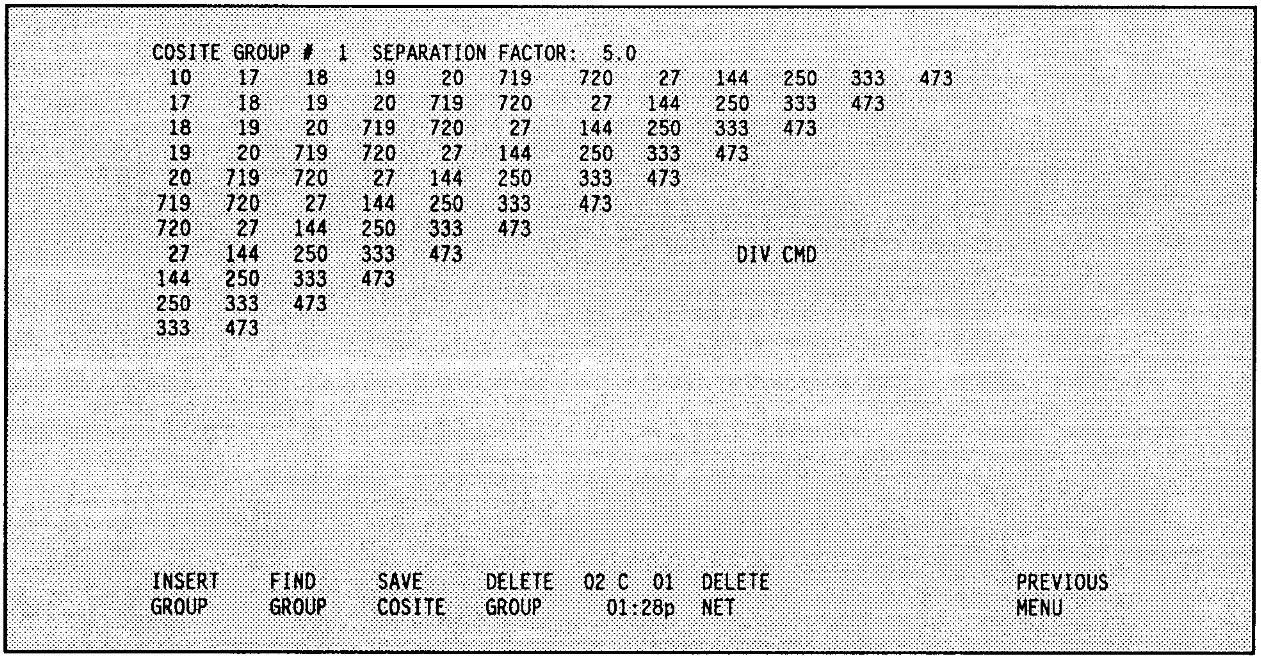

PRINT
ALL
PRINT
SOME
01 C 01
02:10p

Figure 2-24 (ENTER SOI/CEOI/f1, f1, f4, f3)

Once <f2> is selected, provide a separation factor for the cosite plan. Enter the desired separation factor in the range 0.5-5.0 MHz. The separation factor must be divisible by 0.5 MHz. Next, a screen with a triangular arrangement of columns for entering cositing information appears. Up to 50 cosite groups may be created. An example of this screen is shown in Figure 2-25.



```
COSITE GROUP # 1  SEPARATION FACTOR:  5.0
 10   17   18   19   20  719  720   27  144  250  333  473
 17   18   19   20  719  720   27  144  250  333  473
 18   19   20  719  720   27  144  250  333  473
 19   20  719  720   27  144  250  333  473
 20  719  720   27  144  250  333  473
719  720   27  144  250  333  473
720   27  144  250  333  473
 27  144  250  333  473                   DIV CMD
144  250  333  473
250  333  473
333  473
```

INSERT
GROUP
FIND
GROUP
SAVE
COSITE
DELETE
GROUP
02 C 01
01:28p
DELETE
NET
PREVIOUS
MENU

Figure 2-25 (ENTER SOI/CEOI/f1, f1, f4, f2)

Nets are entered using the net's DESC ID number. The first column is used for base nets. The remaining spaces on the same line are used for the nets to be separated from the base net. The nets entered for separation have their assigned frequencies separated from the base net by the separation factor. This separation does not cause a separation between the nets listed to the right of the base net. To create a further separation among the nets listed, use each separated net as a base net for the remaining nets.

Use the <TAB> (next column) and <SHIFT>-<TAB> (previous column) keys to move the cursor between the columns of data.

For example, to fully separate the nets with DESC IDs of 1-5 enter the following:

1 2 3 4 5
2 3 4 5
3 4 5
4 5

A partially separated cosite group may look like the following:

1 2 3 4 5
2 3 4 5

Each cosite group s automatically named by the BGU. The name is the net description of the DESC ID located in the first column of the first line for the cosite group.

Refer to SOI/CEOI raining information on the details of cosite planning in Appendix G.

The remainder of this section describes the options given by the function keys.

A. INSERT GROUP

Use this option to create a new cosite group. Once this option is selected, the new net group assumes the number of the group currently being displayed. The net number for the current group and higher group numbers is increased by one. For example, if a new group is added when group 3 is being displayed; group 3 becomes group 4; group 4 becomes group 5; and the new group becomes group 3.

B. FIND GROUP

Use this option to find a particular cosite group. Once this option is selected, indicate the cosite group number to find.

C. SAVE GROUP

Use this option to save changes or additions made to cosite group information located inside of the computer. The information is not permanently saved until a SAVE TO DISK is performed.

D. DELETE GROUP

Use this option to delete a cosite group. The group currently displayed on the screen-is the group that is deleted-when this option is selected. When a group is deleted, all remaining group numbers are decreased by a count of one.

For example, if group #3 is deleted, group #4 now becomes group #3; group #5 is now group #4; etc.

Select this option and the following message is displayed:

"COSITE GROUP WILL **BE DELETED. ARE YOU SURE (Y/N)?"**

Type "N" and the current cosite group returns to the screen. Type "Y" and the next cosite group is displayed on the screen with the current cosite group number.

E. DELETE NET

Use this option to delete a net number from the cosite group. Move the cursor over the net number to be deleted and press <f5>. This deletes the net number from the screen but not from memory. When **<TAB>, <SHIFT>-<TAB>, <RETURN>,** the up arrow or the down arrow is pressed, the net number is deleted from each line of the cosite group, in memory as well as on the screen. The remaining net numbers shift left on the screen to fill in the empty positions.

This function can also be executed by pressing EXTEN/CHAR> along with <f3>.

SHARING PLAN FOR CALL SIGNS

All nets within the same call sign share group are assigned the same call sign for each time period. Use the nets DESC ID to enter a net and the corresponding net descriptor is automatically displayed. Up to 99 sharing groups may be entered. There is no limit to the number of nets within a group.

After selecting <f5> from Figure 2-8 in Net & Frequency Info Options Menu, the screen shown in Figure 2-26 is displayed.

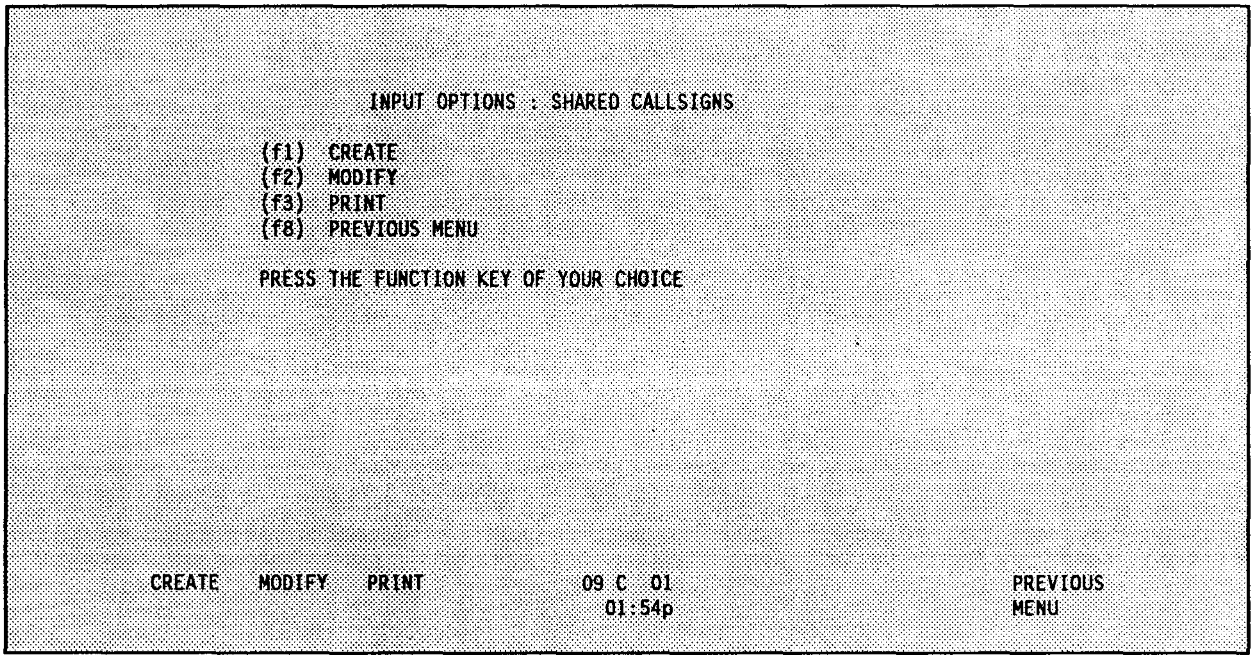
All nets within the same call sign share group are assigned the same call sign for each time period.

f1 - allows you to create a new sharing call sign plan.
f2 - allows you to modify an existing sharing call sign plan.
f3 - allows you to print information about shared call signs.
f8 - allows you to return to the previous menu.

After selecting <f1> from Figure 2-26, you are warned that selecting the create option destroys existing information in the BGU. Choosing "Y" allows you to continue and "N" returns you to the screen shown in Figure 2-26.

Selecting <f3> from Figure 2-26 allows you to print information about the sharing plan for call signs. Figure 2-27 shows how the print screen appears on the BGU.

f1 - allows you to print all groups sharing call signs.
f2 - allows you to print one group sharing call signs. You are prompted to enter the group number.


INPUT OPTIONS : SHARED CALLSIGNS

(f1) CREATE
(f2) MODIFY
(f3) PRINT
(f8) PREVIOUS MENU

PRESS THE FUNCTION KEY OF YOUR CHOICE

CREATE
MODIFY
PRINT
09 C 01
01:54p
PREVIOUS MENU

Figure 2-26 (ENTER SOI/CEOI/f1, f1, f5)

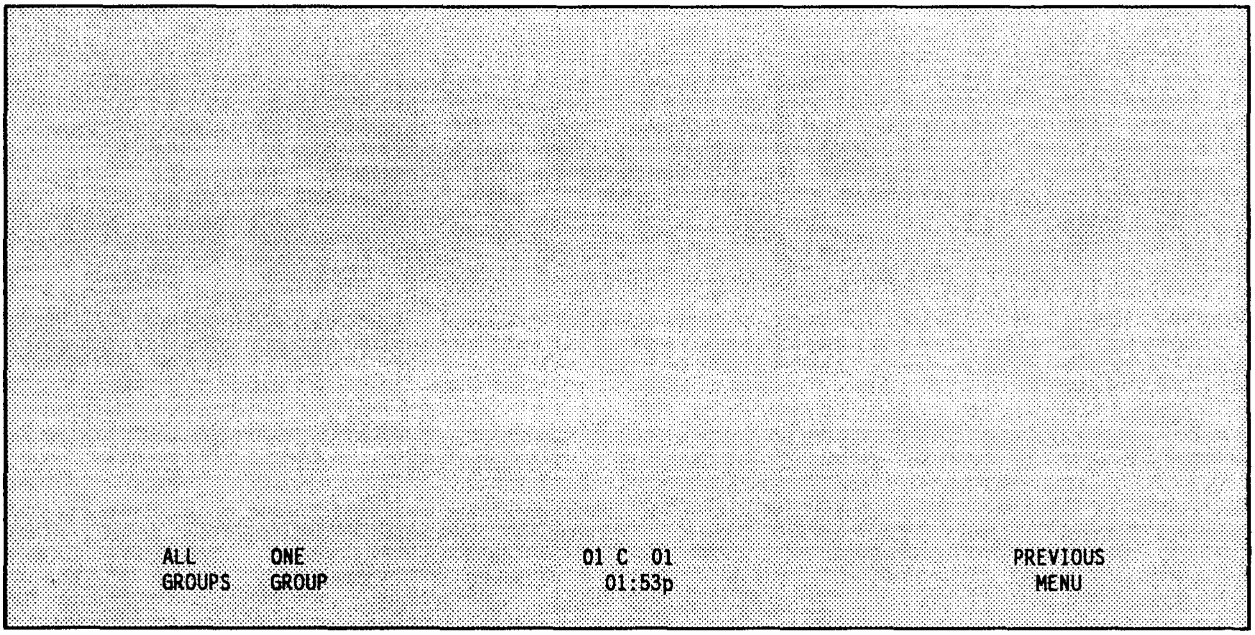
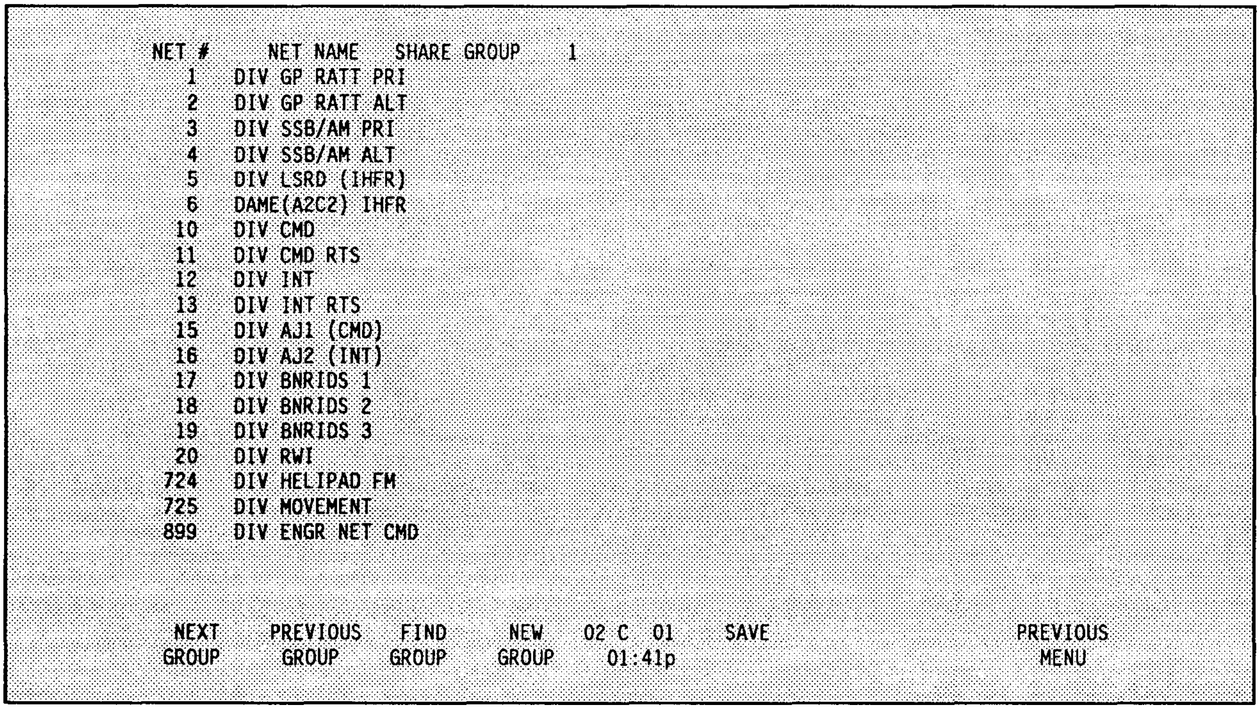

ALL GROUPS
ONE GROUP
01 C 01
01:53p
PREVIOUS MENU

Figure 2-27 (ENTER SOI/CEOI/f1, f1, f5, f3)

Once <f2> is selected from Figure 2-26, you are given an area for entering nets into call sign sharing groups. This screen is shown in Figure 2-28.

Use the nets DESC ID to enter a net and the corresponding net descriptor is automatically displayed. Up to 50 sharing groups may be entered.

The remainder of this section describes the function key options for editing the shared call sign plan.



```
NET #     NET NAME   SHARE GROUP    1
   1   DIV GP RATT PRI
   2   DIV GP RATT ALT
   3   DIV SSB/AM PRI
   4   DIV SSB/AM ALT
   5   DIV LSRD (IHFR)
   6   DAME(A2C2) IHFR
  10   DIV CMD
  11   DIV CMD RTS
  12   DIV INT
  13   DIV INT RTS
  15   DIV AJ1 (CMD)
  16   DIV AJ2 (INT)
  17   DIV BNRIDS 1
  18   DIV BNRIDS 2
  19   DIV BNRIDS 3
  20   DIV RWI
 724   DIV HELIPAD FM
 725   DIV MOVEMENT
 899   DIV ENGR NET CMD
```

Figure 2-28 (ENTER SOI/CEOI/f1, f1, f5, f2)

A. NEXT GROUP

Use this option to display the share group located after the current share group in the list of share groups.

B. PREVIOUS GROUP

Use this option to display the share group located before the current share group in the list of share groups.

C. FIND GROUP

Use this option to find a particular share group. Once this option is selected, indicate the share group number to be found.

D. NEW GROUP

Use this option to create a new call sign share group. Once this option is selected, the next open share group appears.

E. SAVE

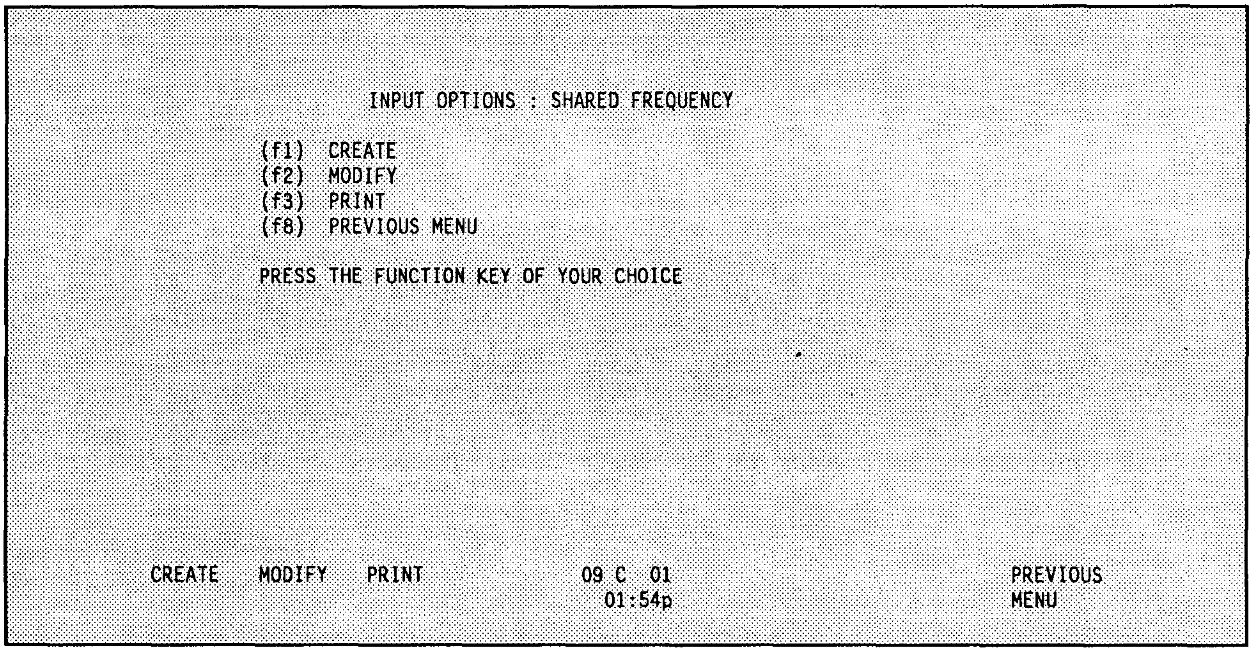
Use this option to save changes or additions made to the call sign sharing groups information located inside of the computer. The information is not permanently saved until a SAVE TO DISK is performed.

SHARING PLAN FOR FREQUENCIES

All nets within the same frequency share group are assigned the same frequency for each time period. Use the nets DESC ID to enter a net and the corresponding net descriptor is automatically displayed. Up to 99 sharing groups may be entered. There is no limit to the number of nets within a group.

After selecting <f6> from Figure 2-8 in Net & Frequency Info Options Menu, the screen shown in Figure 2-29 is displayed.

All nets within the same frequency share group are assigned the same frequency for each time period. Refer to SOI/CEOI training information for the details on frequency sharing.


INPUT OPTIONS : SHARED FREQUENCY

(f1) CREATE
(f2) MODIFY
(f3) PRINT
(f8) PREVIOUS MENU

PRESS THE FUNCTION KEY OF YOUR CHOICE

Figure 2-29 (ENTER SOI/CEOI/f1, f1, f6)

f1 - allows you to create a new sharing plan.
f2 - allows you to modify an existing sharing plan.
f3 - allows you to print information about the current sharing plan.
f8 - allows you to return to the previous menu.

After selecting <f1> from Figure 2-29, you are warned that selecting the create option destroys existing information in the BGU. Choosing “Y” allows you to continue and “N” returns you to the screen shown in Figure 2-29.

Selecting <f3> from Figure 2-29 allows you to print information about the sharing plan for frequencies. Figure 2-30 shows how the print screen appears on the BGU.

Once <f2> is selected from Figure 2-29, an area appears for entering nets into frequency sharing groups as shown in Figure 2-31.

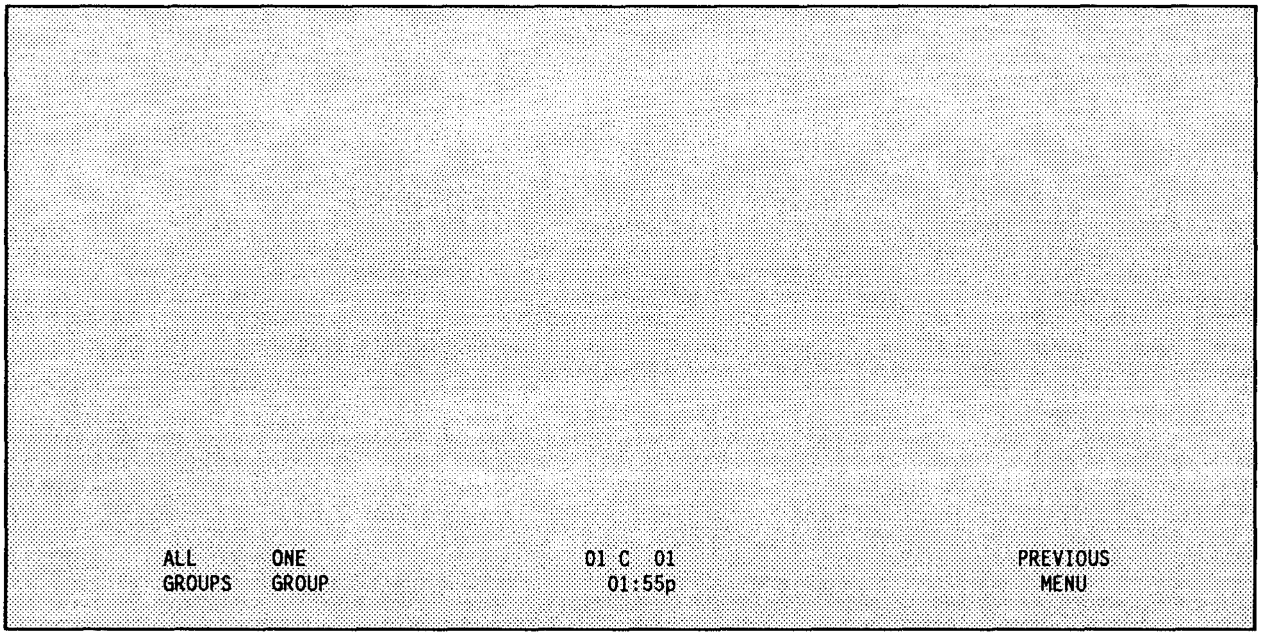
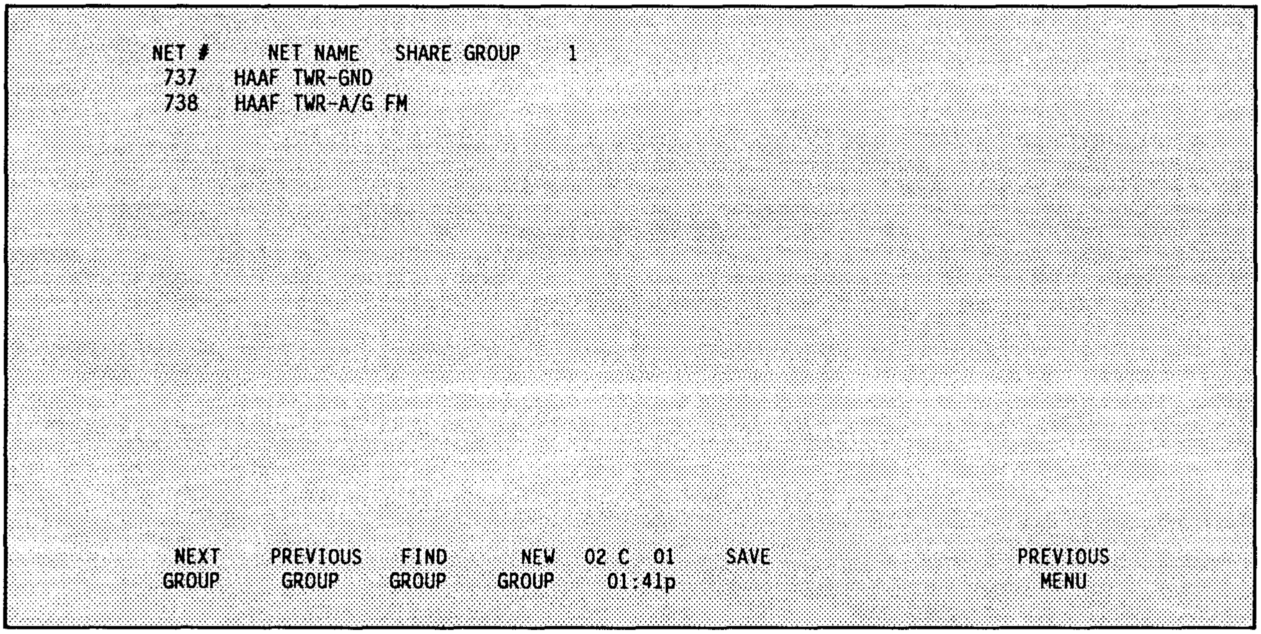

ALL GROUPS
ONE GROUP
01 C 01
01:55p
PREVIOUS MENU

Figure 2-30 (ENTER SOI/CEOI/f1, f1, f6, f3)

Use the nets DESC ID to enter a net and the corresponding net descriptor is automatically displayed. Up to 99 sharing groups may be entered.



```
NET #     NET NAME   SHARE GROUP    1
 737   HAAF TWR-GND
 738   HAAF TWR-A/G FM
```

NEXT GROUP
PREVIOUS GROUP
FIND GROUP
NEW GROUP
02 C 01
01:41p
SAVE
PREVIOUS MENU

Figure 2-31 (ENTER SOI/CEOI/f1, f1, f6, f2)

Use the nets DESC ID to enter a net and the corresponding net descriptor is automatically displayed.

The remainder of this section explains the function key options shown in Figure 2-31.

A. NEXT GROUP

Use this option to go to the share group located after the current share group in the list of share groups.

B. PREVIOUS GROUP

Use this option to go to the share group located before the current share group in the list of share groups.

C. FIND GROUP

Use this option to find a particular share group. Once this option is selected, the next open share group appears.

D. NEW GROUP

Use this option to insert a new group.

E. SAVE

Use this option to save changes or additions made to the frequency sharing groups information located inside of the computer. The information is not permanently saved until a SAVE TO DISK is performed.

SPECIAL NETS PLAN

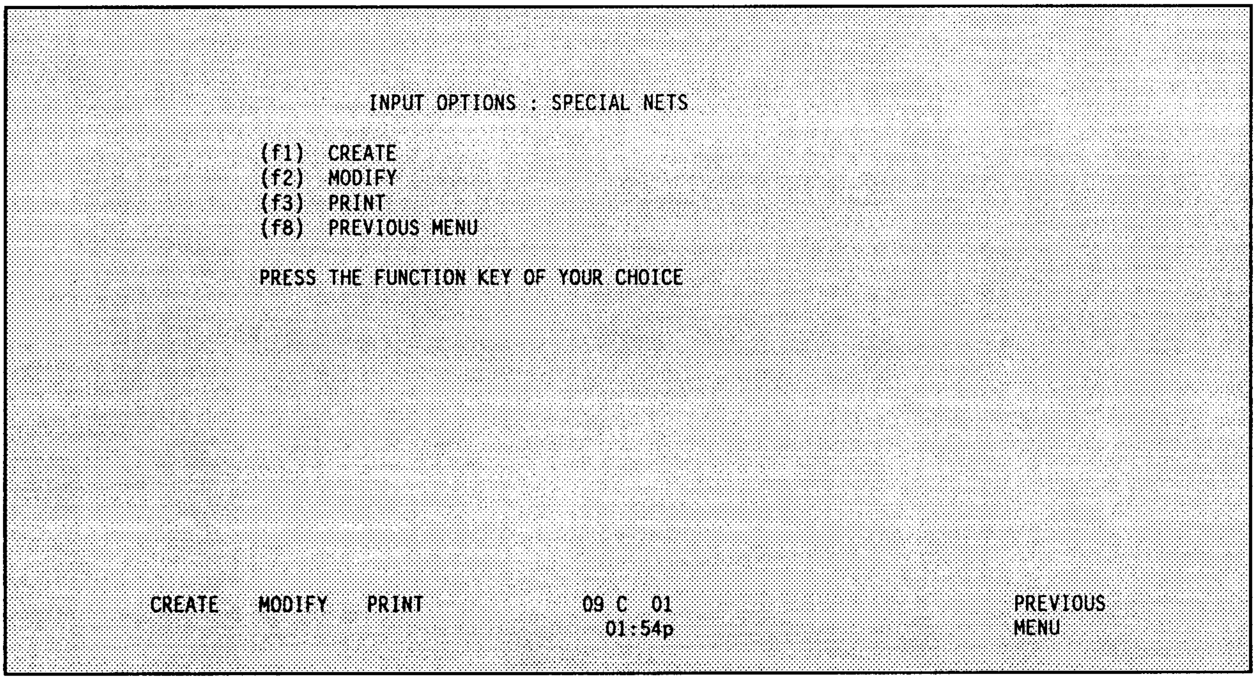
Use this option to implement a special nets plan. A special nets plan allows you to specify a cosite separation between pairs of nets which is greater than what can be accomplished via cosite planning, Up to 50 net pairs can be entered into the special nets plan (only one plan can be created). The separation factor may be in the range 1-15 MHz. Each net pair can have a different separation. The separation factor must be evenly divisible by 0.5 MHz .

After selecting <f7> from Figure 2-8 in Net & Frequency Options Info, the screen shown in Figure 2-32 is displayed.

f1 - allows you to create a new special net plan.
f2 - allows you to modify an existing special net plan.
f3 - allows you to print information about the current special net plan.
f8 - allows you to return to the previous menu.

After selecting <f1> from Figure 2-32, you are warned that selecting the create option destroys existing information in the BGU. Choosing “Y” allows you to continue and “N” returns you to the screen shown in Figure 2-32.

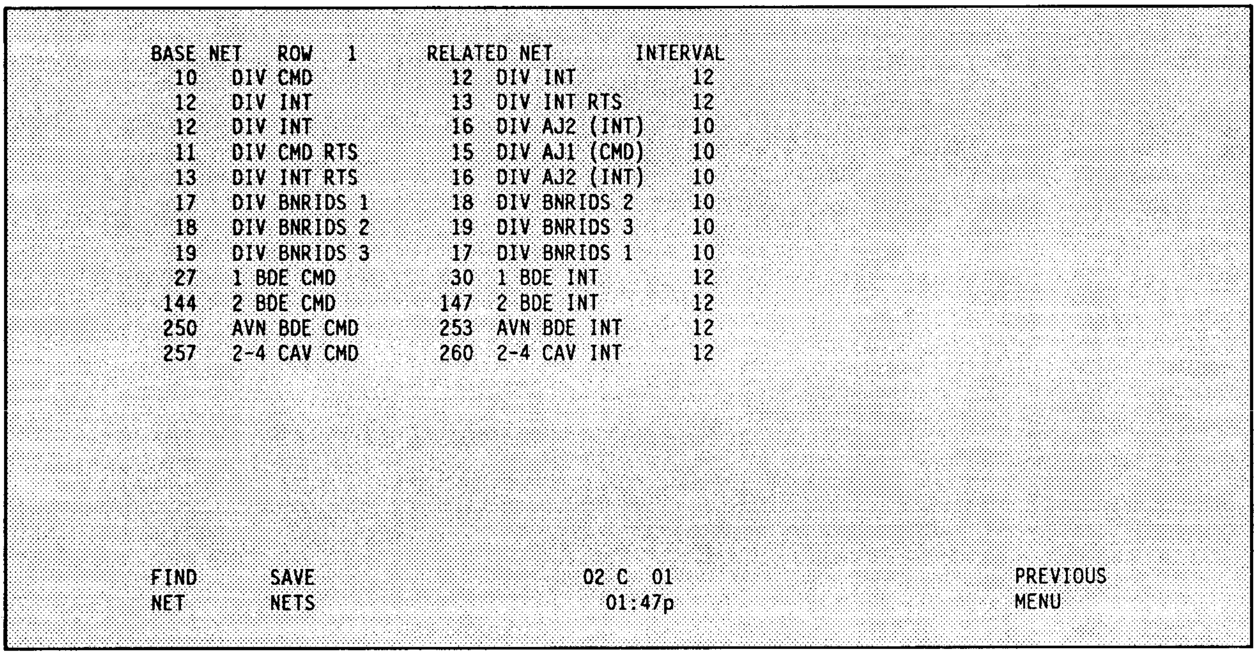
Selecting <f3> from Figure 2-32 allows you to print information about the special nets plan. After selecting <f3>, the BGU prints the entire special net plan.



```
                    INPUT OPTIONS : SPECIAL NETS

              (f1)  CREATE
              (f2)  MODIFY
              (f3)  PRINT
              (f8)  PREVIOUS MENU

              PRESS THE FUNCTION KEY OF YOUR CHOICE











      CREATE   MODIFY   PRINT        09 C  01                    PREVIOUS
                                       01:54p                    MENU
```

Figure 2-32 (ENTER SOI/CEOI/f1, f1, f7)

Selecting <f2> from Figure 2-32 allows you to modify an existing special nets plan. Once <f2> option is selected from Figure 2-32, you are presented with the following screen shown in Figure 2-33.



```
      BASE NET   ROW   1      RELATED NET       INTERVAL
        10   DIV CMD            12  DIV INT         12
        12   DIV INT            13  DIV INT RTS     12
        12   DIV INT            16  DIV AJ2 (INT)   10
        11   DIV CMD RTS        15  DIV AJ1 (CMD)   10
        13   DIV INT RTS        16  DIV AJ2 (INT)   10
        17   DIV BNRIDS 1       18  DIV BNRIDS 2    10
        18   DIV BNRIDS 2       19  DIV BNRIDS 3    10
        19   DIV BNRIDS 3       17  DIV BNRIDS 1    10
        27   1 BDE CMD          30  1 BDE INT       12
       144   2 BDE CMD         147  2 BDE INT       12
       250   AVN BDE CMD       253  AVN BDE INT     12
       257   2-4 CAV CMD       260  2-4 CAV INT     12









      FIND      SAVE                 02 C  01                    PREVIOUS
      NET       NETS                   01:47p                    MENU
```

Figure 2-33 (ENTER SOI/CEOI/f1, f1, f7, f2)

Enter the base net and the related net using DESC IDs and a separation factor. The separation factor may be in the range 1-15 MHz and evenly divisible by 0.5 MHz .

The remainder of this section will explain the function key options given in Figure 2-33. Different separations can be applied to each net pair; 1 - 5 MHz should be used in a cosite plan if possible.

A. FIND NET

Use this option to find a particular net within the special nets plan. Once this option is selected, indicate the number of the net to be found.

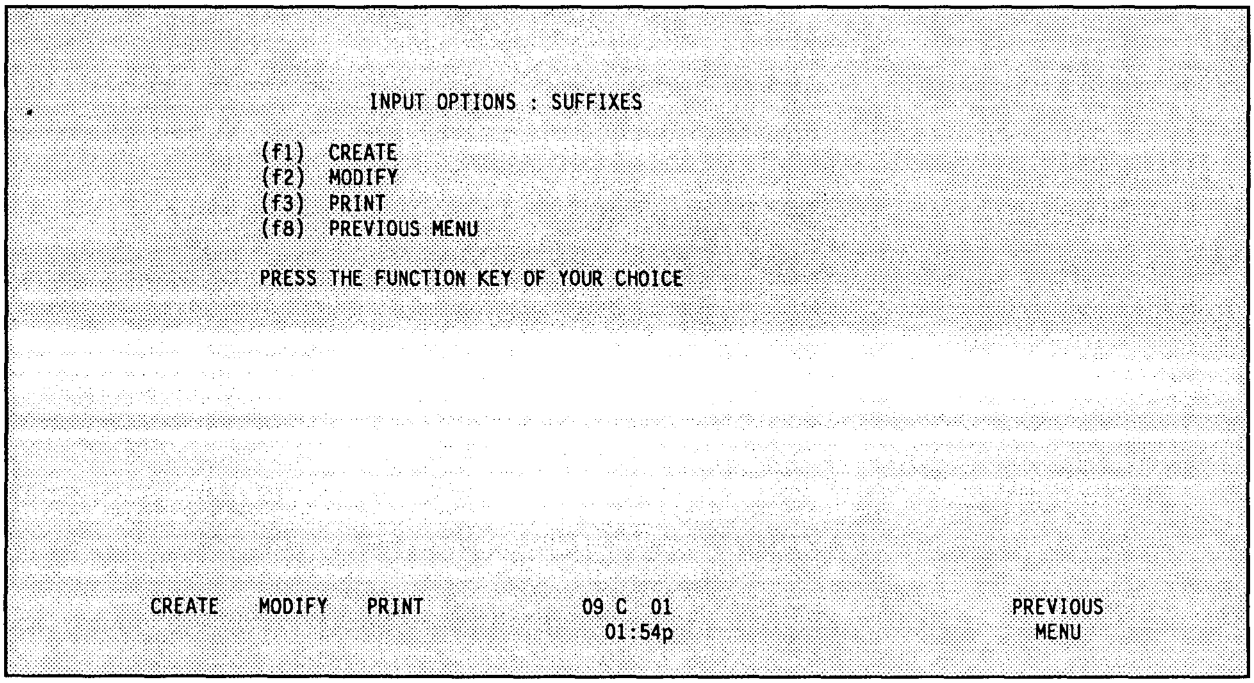
B, SAVE NETS

Use this option to save changes and additions made to the special nets plan located inside of the computer. The information is not permanently saved until a **SAVE TO DISK** is performed.

SUFFIXES

This section shows how to enter the suffix descriptors to be assigned random suffixes. A suffix is a two number combination associated with the descriptor entered. A maximum of 99 suffix descriptors can be entered. Each descriptor can be up to **20** alpha/numeric characters long.

After selecting <f2> from Figure 2-7 in Enter SOI Main Menu, and Figure 2-8, Input Options, page 2-23, the screen shown in Figure 2-34 is displayed.



INPUT OPTIONS : SUFFIXES

(f1) CREATE
(f2) MODIFY
(f3) PRINT
(f8) PREVIOUS MENU

PRESS THE FUNCTION KEY OF YOUR CHOICE

CREATE MODIFY PRINT 09 C 01 01:54p PREVIOUS MENU

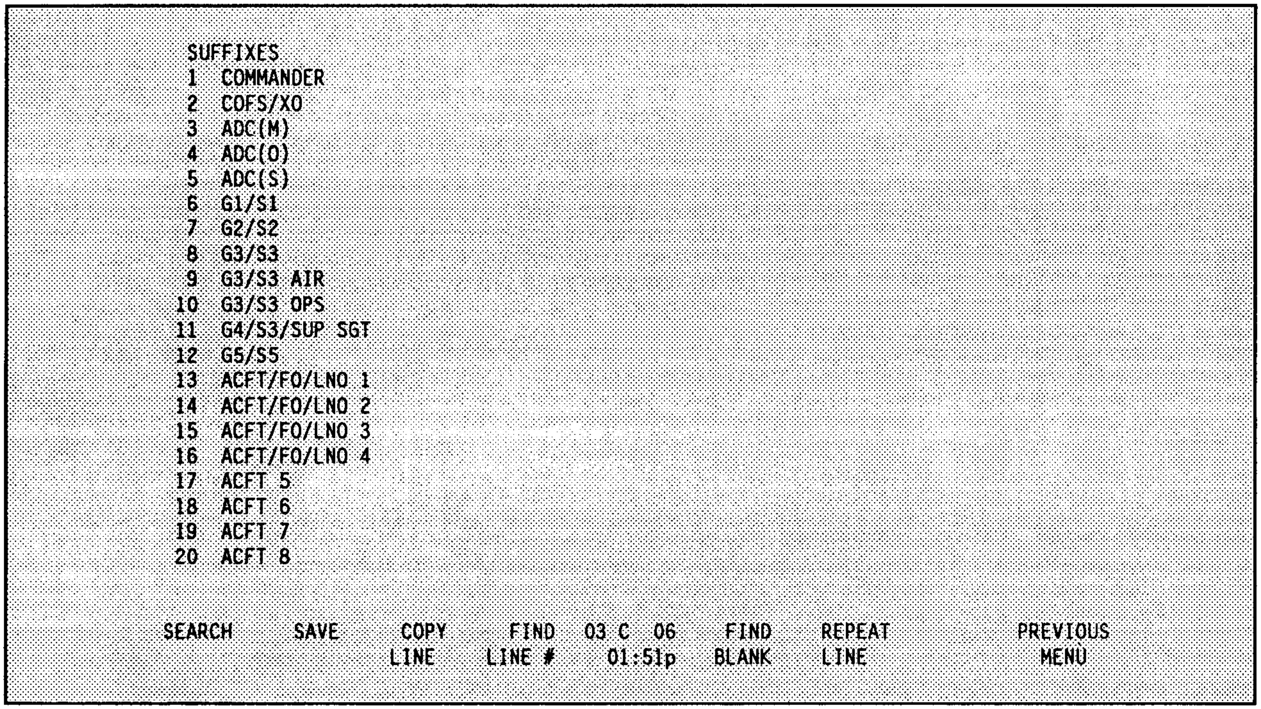
Figure 2-34 (ENTER SOI/CEOI/f1, f2)

f1 - allows you to create a new suffixes.
f2 - allows you to modify an existing suffixes.
f3 - allows you to print information about the current suffixes.
f8 - allows you to return to the previous menu.

After selecting <f1> from Figure 2-34, you are warned that selecting the create option destroys existing information in the BGU. Choosing "Y" allows you to continue and "N" returns you to the screen shown in Figure 2-34.

Selecting <f3> from Figure 2-34 allows you to print information about the suffixes. After selecting <f3>, the BGU prints a list of the current suffixes.

Selecting <f2> from Figure 2-34 allows you to modify existing suffix data. Once this option is selected, you may enter up to 99 suffix descriptors. An example of this screen is shown in Figure 2-35.



```
SUFFIXES
 1  COMMANDER
 2  COFS/XO
 3  ADC(M)
 4  ADC(O)
 5  ADC(S)
 6  G1/S1
 7  G2/S2
 8  G3/S3
 9  G3/S3 AIR
10  G3/S3 OPS
11  G4/S3/SUP SGT
12  G5/S5
13  ACFT/FO/LNO 1
14  ACFT/FO/LNO 2
15  ACFT/FO/LNO 3
16  ACFT/FO/LNO 4
17  ACFT 5
18  ACFT 6
19  ACFT 7
20  ACFT 8
```

Figure 2-35 (ENTER SOI/CEOI/F1, F2, F2)

The remainder of this section explains the function key options shown in Figure 2-35.

A. SEARCH

Use this option to search for a particular suffix descriptor. Once this option is selected, two prompts appear:

"ENTER SEARCH DIRECTION: U/D/A/R)"

U - searches upward from current cursor position to the top of the suffix descriptor list.

D - searches downward from current cursor position to the bottom of the suffix descriptor list.

A - searches from the top to the bottom of the suffix descriptor list.

R - searches for the next occurrence of the string previously entered when there is more than one occurrence of the same string.

Next,

"ENTER STRING TO SEARCH FOR"

is displayed above the previous prompt. Respond to both questions.

B. SAVE

Use this option to save changes and additions made to the suffix list inside of the computer. The information is not permanently saved until a SAVE TO DISK is performed.

C. COPY LINE

Once this option is selected, indicate the line number of the suffix descriptor to copy to the line where the cursor is presently located.

D. FIND LINE

Use this option to go to a particular line number. Once this option is selected, indicate to which line number to go.

E. FIND BLANK

Use this option to go to the next available blank line in the suffix list.

F. REPEAT LINE

Use this option to repeat the line on which the cursor is presently located to the following line.

EXPANDERS

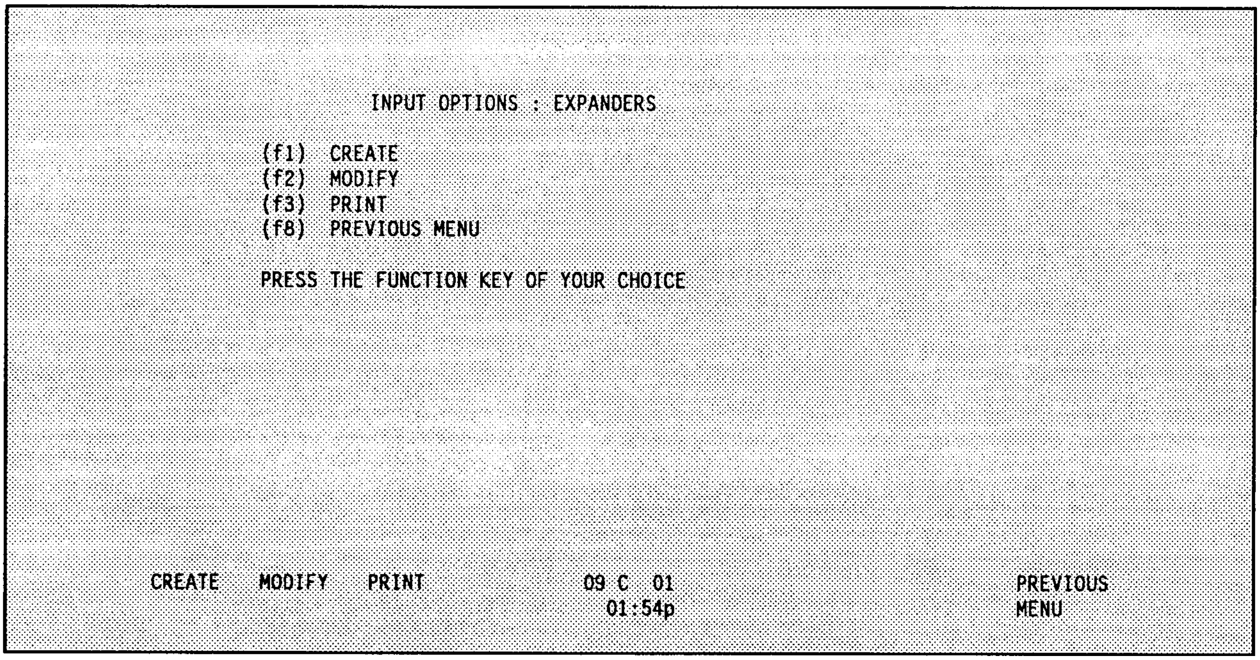
This section shows how to enter the expander descriptors to be assigned random expanders. An expander is a single letter associated with the descriptor entered. A maximum of 20 expander descriptors can be entered. Each descriptor can be up to 20 alpha/numeric characters long.

Use this option to enter the expander descriptors to be assigned random expanders. An expander suffix is a single letter used with a call sign suffix to identify a sub-element of the position, mission or function identified by the suffix. After selecting <f3> from Figure 2-7 in Enter SOI Main Menu, Input Options, Figure 2-8 page 2-23, the screen shown in Figure 2-36 is displayed.

f1 - allows you to create a new expander plan.
f2 - allows you to modify an existing expander plan.
f3 - allows you to print information about the current expander plan.
f8 - allows you to return to the previous menu.

After selecting <fl> from Figure 2-36, you are warned that selecting the create option destroys existing information in the BGU. Choosing "Y" allows You to continue and "N" returns you to the screen shown in Figure 2-36.

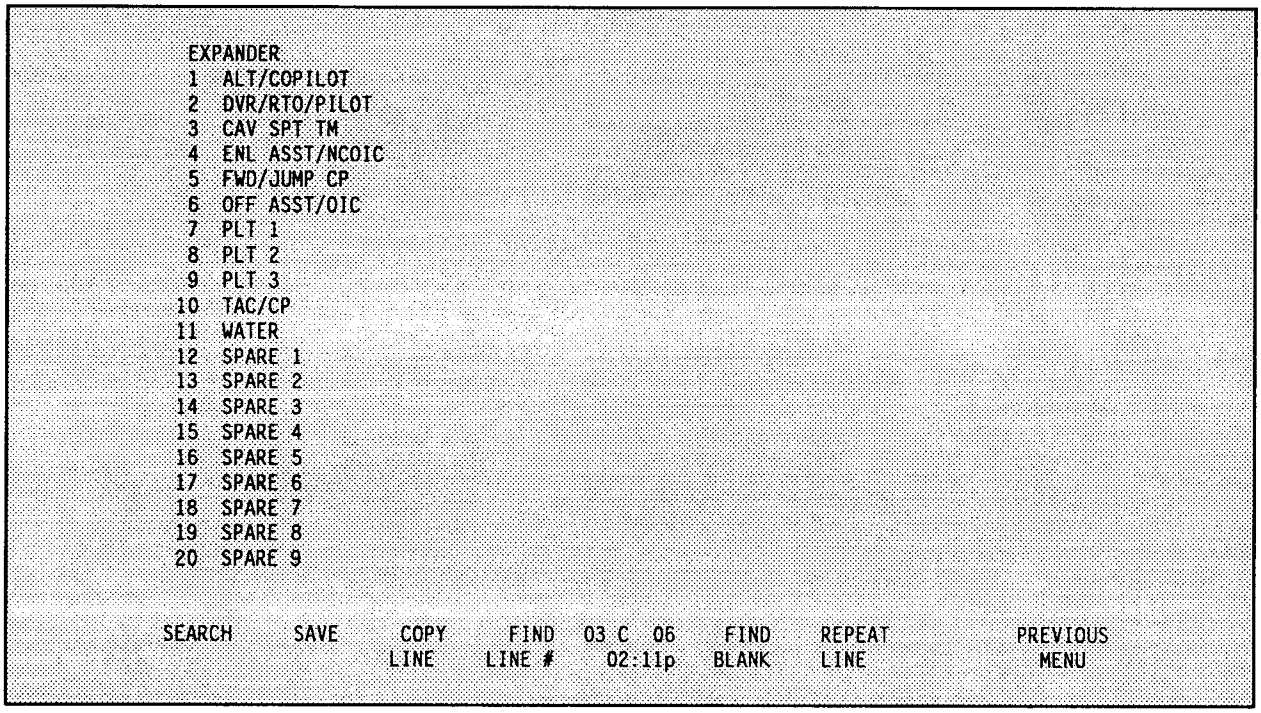
Selecting <f3> from the options screen allows you to print information about the expanders. After selecting <f3>, the BGU prints a list of the current expanders.



```
                    INPUT OPTIONS : EXPANDERS

               (f1)  CREATE
               (f2)  MODIFY
               (f3)  PRINT
               (f8)  PREVIOUS MENU

               PRESS THE FUNCTION KEY OF YOUR CHOICE









   CREATE   MODIFY   PRINT            09 C  01                      PREVIOUS
                                        01:54p                      MENU
```

Figure 2-36 (ENTER SOI/CEOI/f1, f3)

Selecting <f2> from Figure 2-36 allows you to modify existing expander data. Once this option is selected, up to 20 expander descriptors may be entered. An example of this screen is shown in Figure 2-37.



```
    EXPANDER
     1  ALT/COPILOT
     2  DVR/RTO/PILOT
     3  CAV SPT TM
     4  ENL ASST/NCOIC
     5  FWD/JUMP CP
     6  OFF ASST/OIC
     7  PLT 1
     8  PLT 2
     9  PLT 3
    10  TAC/CP
    11  WATER
    12  SPARE 1
    13  SPARE 2
    14  SPARE 3
    15  SPARE 4
    16  SPARE 5
    17  SPARE 6
    18  SPARE 7
    19  SPARE 8
    20  SPARE 9

   SEARCH    SAVE    COPY    FIND   03 C  06   FIND   REPEAT        PREVIOUS
                     LINE   LINE #   02:11p   BLANK   LINE            MENU
```

Figure 2-37 (ENTER SOI/CEOI/f1, f3, f2)

The remainder of this section explains the function key options shown in Figure 2-37.

A. SEARCH

Use this option to search for a particular descriptor. Once this option is selected, respond to the following prompts:

"ENTER SEARCH DIRECTION: (U/D/A/R)"

U - searches upward from current cursor position to the top of the expander descriptor list.
D - searches downward from current cursor position to the bottom of the expander descriptor list.
A - searches from the top to the bottom of the expander descriptor list.
R - searches for the next occurrence of the string previously entered when there is more than one occurrence of the same string

Next,

"ENTER STRING TO SEARCH FOR"

is displayed above the previous prompt. Respond to both prompts.

B. SAVE

Use this option to save changes and additions made to the exrpander list located inside of the computer. The" information is not permanently-saved until a **SAVE** TO **DISK** is performed.

C. COPY LINE

Once this option is selected, give the line number to copy from to the line where the cursor is presently located.

D. FIND LINE

Use this option to go to a particular line number. Once this option is selected, indicate which line number to find.

E. FIND BLANK

Use this option to go to the next available blank line in the expander list.

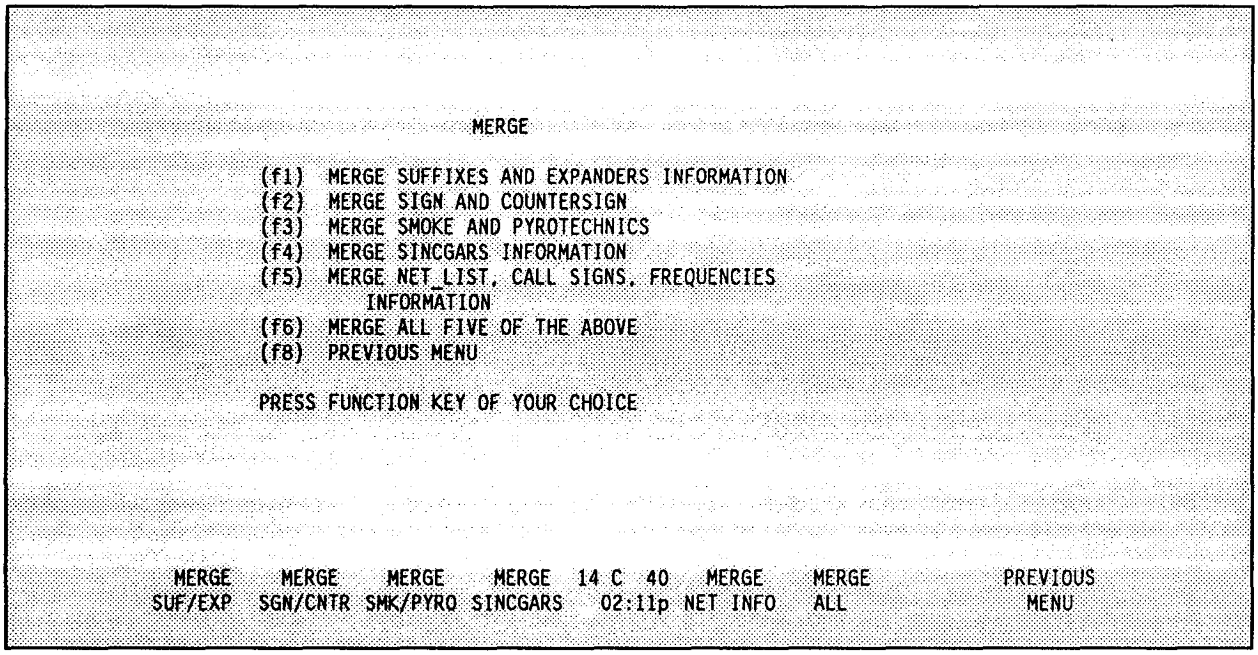
F. REPEAT LINE

Use this option to repeat the line on which the cursor is presently located to the following line.

MERGE

Use this option to perform the input portion of a merge operation. An input merge operation takes data that has previously been output to a disk (see Diskette Merge, page 2-98) and places it into the current database. See Appendix G for more details.

After selecting <f4> from Figure 2-7 in SOI Main Menu, and Figure 2-8, Input Option, page 2-23, the BGU displays the screen shown in Figure 2-38.



```
                     MERGE

     (f1)  MERGE SUFFIXES AND EXPANDERS INFORMATION
     (f2)  MERGE SIGN AND COUNTERSIGN
     (f3)  MERGE SMOKE AND PYROTECHNICS
     (f4)  MERGE SINCGARS INFORMATION
     (f5)  MERGE NET_LIST, CALL SIGNS, FREQUENCIES
              INFORMATION
     (f6)  MERGE ALL FIVE OF THE ABOVE
     (f8)  PREVIOUS MENU

     PRESS FUNCTION KEY OF YOUR CHOICE




  MERGE    MERGE     MERGE    MERGE   14 C  40   MERGE    MERGE         PREVIOUS
SUF/EXP  SGN/CNTR  SMK/PYRO SINCGARS   02:11p NET INFO   ALL              MENU
```

Figure 2-38 (ENTER SOI/CEOI/F1, F4)

The remainder of this section explains the function key options shown in Figure 2-38.

A. MERGE SUFFIXES AND EXPANDERS INFORMATION

Use this option to merge suffix and expander information from the Corps disk containing the data to the existing database in the BGU. When selected, the following message appears:

“INSERT THE DISK RECEIVED FROM CORPS CONTAINING THE BECS MERGED DATA”.

“HIT RETURN TO CONTINUE”

Insert the data disk containing the previously merged data (see Diskette Merge, page 2-98) and press <RETURN>. The screen flashes the following message:

“CHECKING FILES ON DRIVE C“,

If the files are found, the screen flashes the following message:

“WAIT - PROCESSING”

and returns to the MERGE menu. If the files are not found, the screen displays the following message:

“THEM MERGE5 (SUFFIX) FILE DOES NOT EXIST
THE MERGE6 (EXPANDER) FILE DOES NOT EXIST”

followed by:

“HIT RETURN TO CONTINUE”.

Press **<RETURN>** and the MERGE menu returns.

B. MERGE SIGN AND COUNTERSIGN

Use this option to merge sign and countersign information from a disk containing the data. When selected, the following message appears:

"INSERT THE DISK RECEIVED FROM CORPS CONTAINING THE **BECS MERGED DATA".**

"HIT RETURN TO CONTINUE"

Insert the data disk containing the previously merged data (see Diskette Merge, pages 2-98 and 2-99) and press <RETURN>. The screen flashes the following message:

"CHECKING FILES ON DRIVE C".

If the file is found, the screen flashes the following message:

"WAIT - PROCESSING"

and returns to the MERGE menu. If the file is not found, the screen displays the following message:

"THE MERGE9 (SIGN/CNTR) FILE DOES NOT EXIST"

followed by:

"HIT RETURN TO CONTINUE".

Press **<RETURN>** and the MERGE menu returns.

C. **MERGE SMOKE** AND PYROTECHNICS

Use this option to merge smoke and pyrotechnics information from a disk containing the data. When selected, the following message appears:

"INSERT THE DISK RECEIVED FROM CORPS CONTAINING THE BECS MERGED DATA".

"HIT RETURN TO CONTINUE"

Insert the data disk containing the previously merged data (see Diskette Merge, ' page 2-98) and press <RETURN>. The screen flashes the following message:

"CHECKING FILES ON DRIVE C".

If the file is found, the screen flashes the following message:

"WAIT - PROCESSING"

and returns to the MERGE menu. If the file is not found, the screen displays the following message:

"THE MERGE8 (SMOKE/PYRO) FILE DOES NOT EXIST" followed by:

“HIT RETURN TO CONTINUE”.

Press <RETURN> and the MERGE menu returns.

D. MERGE SINCGARS INFORMATION

Use this option to merge SINCGARS information from a disk containing the data. When selected, the following message appears:

“INSERT THE DISK RECEIVED FROM CORPS CONTAINING THE BECS MERGED DATA”.

“HIT RETURN TO CONTINUE”

Insert the data disk containing the previously merged data (see Diskette Merge, pages 2-98 and 2-99) and press <RETURN>. The screen flashes the following message:

“WAIT... PROCESSING”.

Next, the screen displays the following message:

“Enter hopset extension: HOPSET.XX”

Enter the two digit extension and press <RETURN>.

The following messages are displayed.

```
“Copying MERGE10 to A:HOPSET.xx”
      “1 file(s) copied”

“Copy completed successfully”

“Copying HERGE11 to A:TSK.DAT”
      “1 file(s) copied”

“Copy completed successfully”

“Press any key to continue”
```

If the merged Corps files are not found, the BGU returns you to the MERGE menu shown in Figure 2-38.

E. MERGE NET LIST, CALL SIGNS AND FREQUENCIES INFORMATION

Use this option to merge net list, call signs and frequencies information from a disk containing the data. When selected, the following message appears:

“INSERT THE DISK RECEIVED FROM CORPS CONTAINING THE BECS MERGED DATA”.

“HIT RETURN TO CONTINUE”

Insert the data disk containing the previously merged data (see Diskette Merge, pages 2-98 and 2-99) and press <RETURN>. The screen flashes the following message:

"CHECKING FILES ON DRIVE C".

If the files are found, the screen flashes the following message:

"WAIT - PROCESSING"

A list of the net numbers, the old values (net names) and new values (net names) are printed and then the BGU returns to the MERGE menu. If the files are not found, the screen displays the following message:

"THE MERGE1 (NET_ID) FILE DOES NOT EXIST"
"THE MERGE4 (FREQ_GEN) FILE DOES NOT EXIST"
"THE MERGE3 (CALSIGN) FILE DOES NOT EXIST"
"THE MERGE2 (ALLNAMES) FILE DOES NOT EXIST"

followed by:

"HIT RETURN TO CONTINUE".

Press **<RETURN>** and the MERGE menu returns.

F. MERGE ALL OF THE ABOVE

Use this option to merge all BECS data from a merge disk. When selected, the following message appears.

"INSERT THE DISK RECEIVED FROM CORPS CONTAINING THE BECS MERGED DATA".

"HIT RETURN TO CONTINUE"

Insert the disk containing the previously merged data (see Diskette Merge, pages 2-98 and 2-99) and press **<RETURN>.** The screen flashes the following message:

"CHECKING FILES ON DRIVE C"

If the files are found, the screen flashes the following message:

"WAIT - PROCESSING"

Al is of the net numbers, the old values (net names) and new values (net names) are printed. Next, you are prompted to enter the hopset extension as in D. Merge SINCGARS Information, page 2-55. The remainder of the messages shown in D. Merge SINCGARS Information, page 2-55 follow. After the SINCGARS data is merged, the BGU returns to the MERGE menu.

SINCGARS FREQUENCY RESOURCES

Use this option to create, modify and manipulate the frequency resources for the ICOM and Non-ICOM SINCGARS radios. Up to 20 frequency resources can be contained in a frequency resource data file.

After selecting <f5> form the screen shown in Figure 2-7 in SOI Main Menu, Input Options, page 2-22, you are prompted with the following question.

> “The A:RESOURCE.DAT file does not exist”
> “Do you wish to create it (Y/N)?”

If entering a new set of resources, the program indicates that the file does not exist and asks if it should be created. Type “Y” to create the file and the frequency resources entered are saved in that file. If you do not want to create the file, type “N” and the BGU will return to Figure 2-7 in SOI Main Menu, Input Options, Figure 2-8, page 2-22.

Next, the screen shown in Figure 2-39 will be displayed.

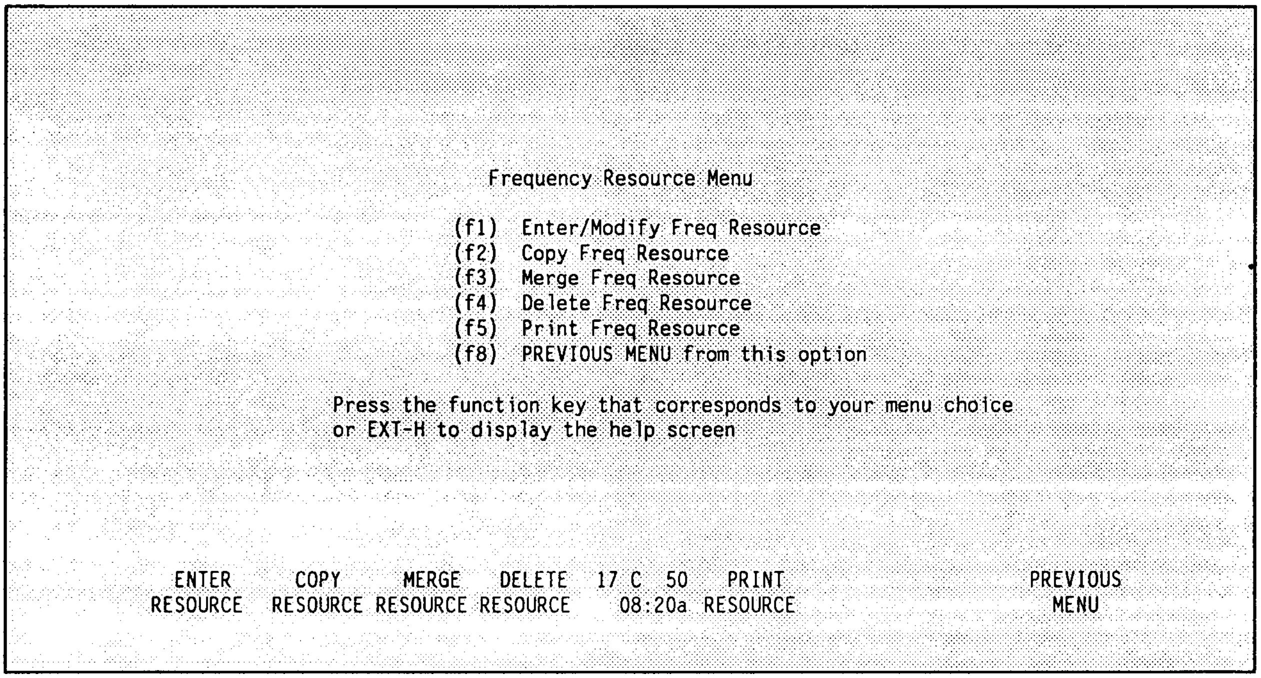

Frequency Resource Menu
(f1) Enter/Modify Freq Resource
(f2) Copy Freq Resource
(f3) Merge Freq Resource
(f4) Delete Freq Resource
(f5) Print Freq Resource
(f8) PREVIOUS MENU from this option
Press the function key that corresponds to your menu choice
or EXT-H to display the help screen
ENTER RESOURCE
COPY RESOURCE
MERGE RESOURCE
DELETE RESOURCE
17 C 50
08:20a
PRINT RESOURCE
PREVIOUS MENU

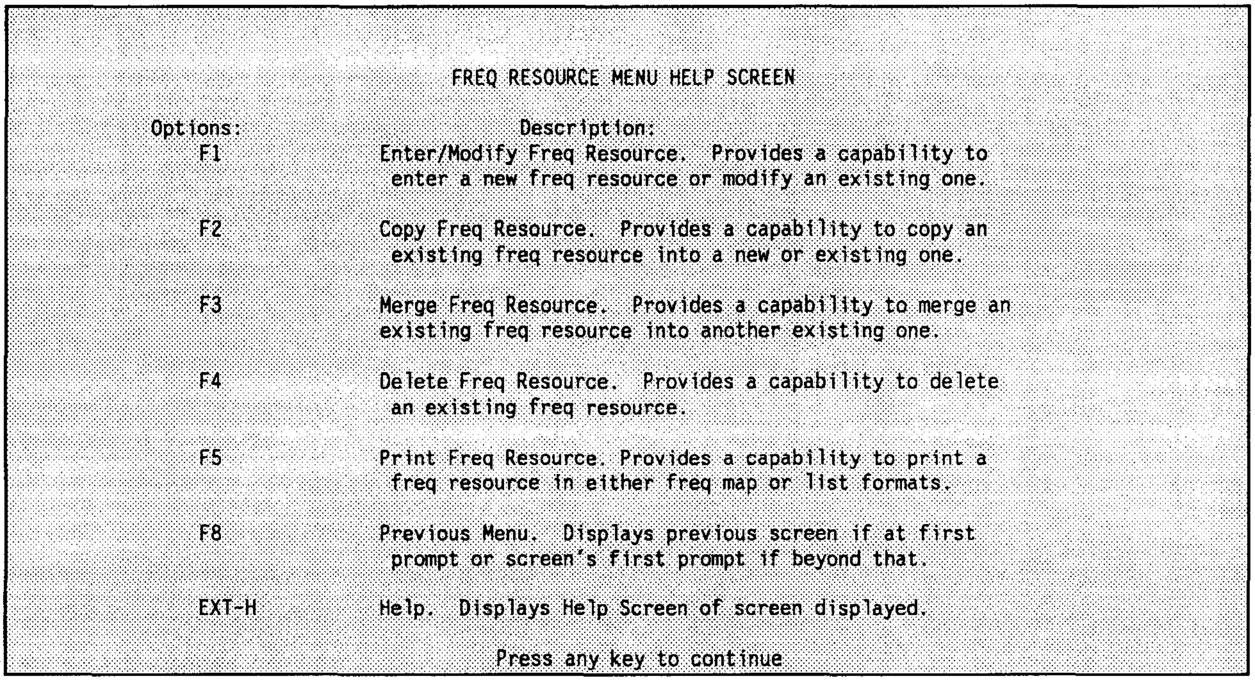
Figure 2-39 (ENTER SOI/CEOI/f1 f5)

For a general description of the function keys, press <EXT>-<H> and the help screen shown in Figure 2-40 is displayed. The function keys shown in Figure 2-39 are described in more detail in the remainder of this section.

ENTER/MODIFY FREQ RESOURCE

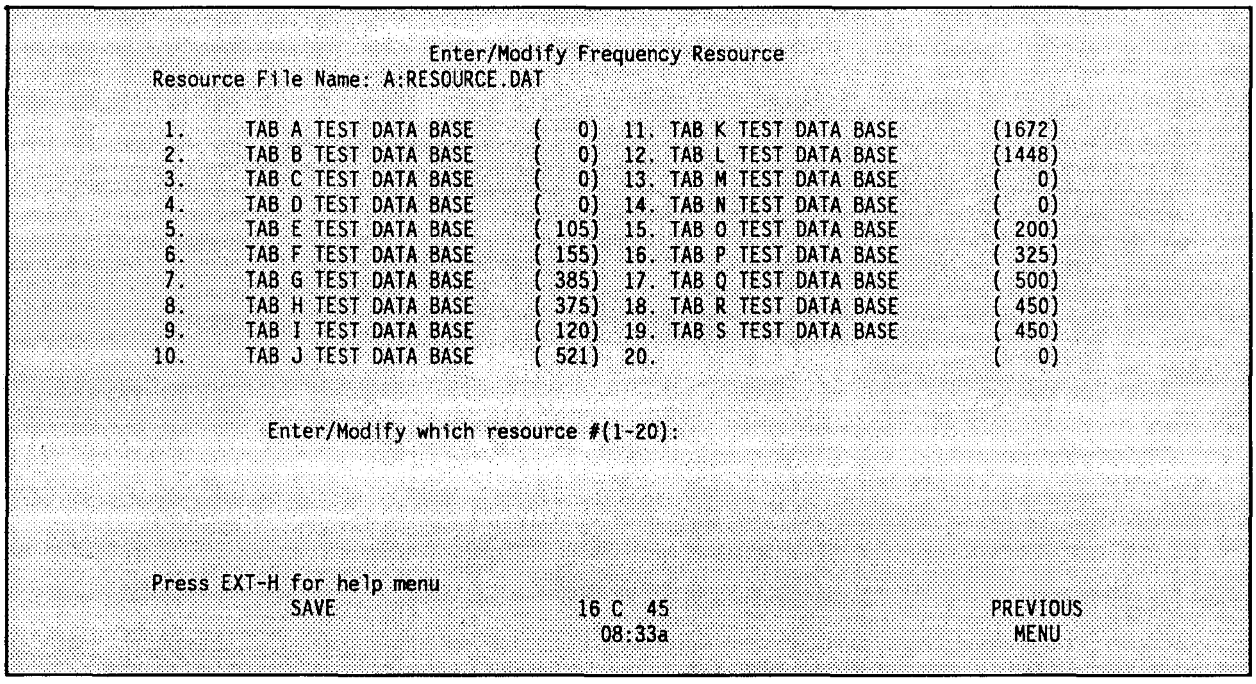
Use this option to Enter/Modify frequency resources in a frequency resource data file. Frequencies between 30.000 and 87.975 MHz, inclusive, can be entered in either a Map or List format.

Select this option and a list of resources saved in the resource data file is displayed as shown in Figure 2-41.



```
                         FREQ RESOURCE MENU HELP SCREEN

      Options:                      Description:
          F1            Enter/Modify Freq Resource.  Provides a capability to
                         enter a new freq resource or modify an existing one.

          F2            Copy Freq Resource.  Provides a capability to copy an
                         existing freq resource into a new or existing one.

          F3            Merge Freq Resource.  Provides a capability to merge an
                        existing freq resource into another existing one.

          F4            Delete Freq Resource.  Provides a capability to delete
                         an existing freq resource.

          F5            Print Freq Resource. Provides a capability to print a
                         freq resource in either freq map or list formats.

          F8            Previous Menu.  Displays previous screen if at first
                         prompt or screen's first prompt if beyond that.

          EXT-H         Help.  Displays Help Screen of screen displayed.

                                Press any key to continue
```

Figure 2-40 HELP SCREEN for Figure 2-39



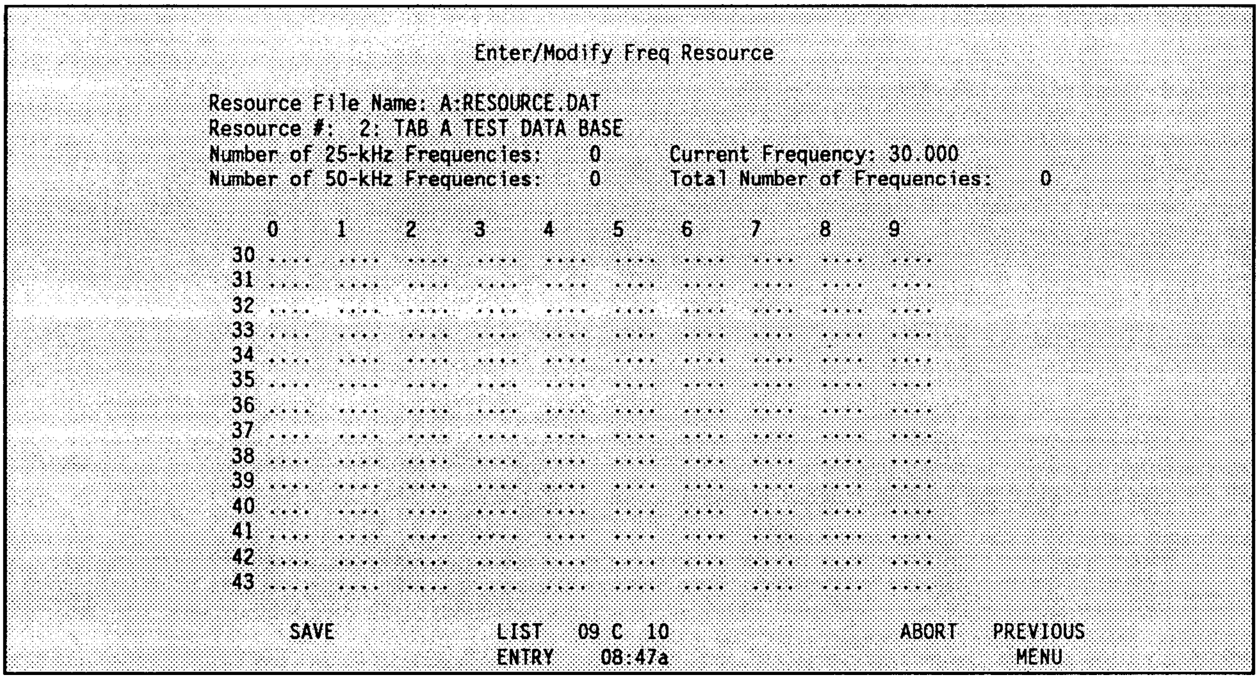
```
                           Enter/Modify Frequency Resource
      Resource File Name: A:RESOURCE.DAT

       1.     TAB A TEST DATA BASE     (   0)  11. TAB K TEST DATA BASE        (1672)
       2.     TAB B TEST DATA BASE     (   0)  12. TAB L TEST DATA BASE        (1448)
       3.     TAB C TEST DATA BASE     (   0)  13. TAB M TEST DATA BASE        (   0)
       4.     TAB D TEST DATA BASE     (   0)  14. TAB N TEST DATA BASE        (   0)
       5.     TAB E TEST DATA BASE     ( 105)  15. TAB O TEST DATA BASE        ( 200)
       6.     TAB F TEST DATA BASE     ( 155)  16. TAB P TEST DATA BASE        ( 325)
       7.     TAB G TEST DATA BASE     ( 385)  17. TAB Q TEST DATA BASE        ( 500)
       8.     TAB H TEST DATA BASE     ( 375)  18. TAB R TEST DATA BASE        ( 450)
       9.     TAB I TEST DATA BASE     ( 120)  19. TAB S TEST DATA BASE        ( 450)
      10.     TAB J TEST DATA BASE     ( 521)  20.                             (   0)

              Enter/Modify which resource #(1-20):




      Press EXT-H for help menu
            SAVE                 16 C  45                              PREVIOUS
                                  08:33a                                 MENU
```

Figure 2-41 (ENTER SOI/CEOI/f1, f5, f1)

A frequency resource description is shown with the total number of frequencies in the resource shown in parentheses." A blank resource description indicates no frequency resource is saved at that location. A zero within the parenthesis indicates no frequencies are entered in the resource.

Enter the number for the desired resource to enter/modify. Enter anew resource description and press <RETURN> or press <RETURN> to use the default description.

Enter a resource description and the Map Entry screen shown in Figure 2-42 is displayed. Ensure that the filename, resource description and resource number are correct. To enter a frequency into the resource using the map entry, move the cursor over the dot for the frequency that is to be added. Press the <+> key to enter the frequency into the resource. The dot is replaced by an asterisk to indicate the frequency is entered. To delete a frequency, move the cursor over the asterisk for the frequency to be deleted and press <->. To enter or delete a line of frequencies, use the left bracket ([) and the right bracket (]) keys respectively. If either of these keys are pressed, frequencies are added or deleted from the current cursor position to the end of line.



```
                          Enter/Modify Freq Resource

          Resource File Name: A:RESOURCE.DAT
          Resource #:  2: TAB A TEST DATA BASE
          Number of 25-kHz Frequencies:    0     Current Frequency: 30.000
          Number of 50-kHz Frequencies:    0     Total Number of Frequencies:    0

              0     1     2     3     4     5     6     7     8     9
           30 ....  ....  ....  ....  ....  ....  ....  ....  ....  ....
           31 ....  ....  ....  ....  ....  ....  ....  ....  ....  ....
           32 ....  ....  ....  ....  ....  ....  ....  ....  ....  ....
           33 ....  ....  ....  ....  ....  ....  ....  ....  ....  ....
           34 ....  ....  ....  ....  ....  ....  ....  ....  ....  ....
           35 ....  ....  ....  ....  ....  ....  ....  ....  ....  ....
           36 ....  ....  ....  ....  ....  ....  ....  ....  ....  ....
           37 ....  ....  ....  ....  ....  ....  ....  ....  ....  ....
           38 ....  ....  ....  ....  ....  ....  ....  ....  ....  ....
           39 ....  ....  ....  ....  ....  ....  ....  ....  ....  ....
           40 ....  ....  ....  ....  ....  ....  ....  ....  ....  ....
           41 ....  ....  ....  ....  ....  ....  ....  ....  ....  ....
           42 ....  ....  ....  ....  ....  ....  ....  ....  ....  ....
           43 ....  ....  ....  ....  ....  ....  ....  ....  ....  ....

             SAVE            LIST   09 C  10                ABORT   PREVIOUS
                             ENTRY    08:47a                          MENU
```

Figure 2-42 (ENTER SOI/CEOI/f1, f5, f1 RESOURCE DESCRIPTION)

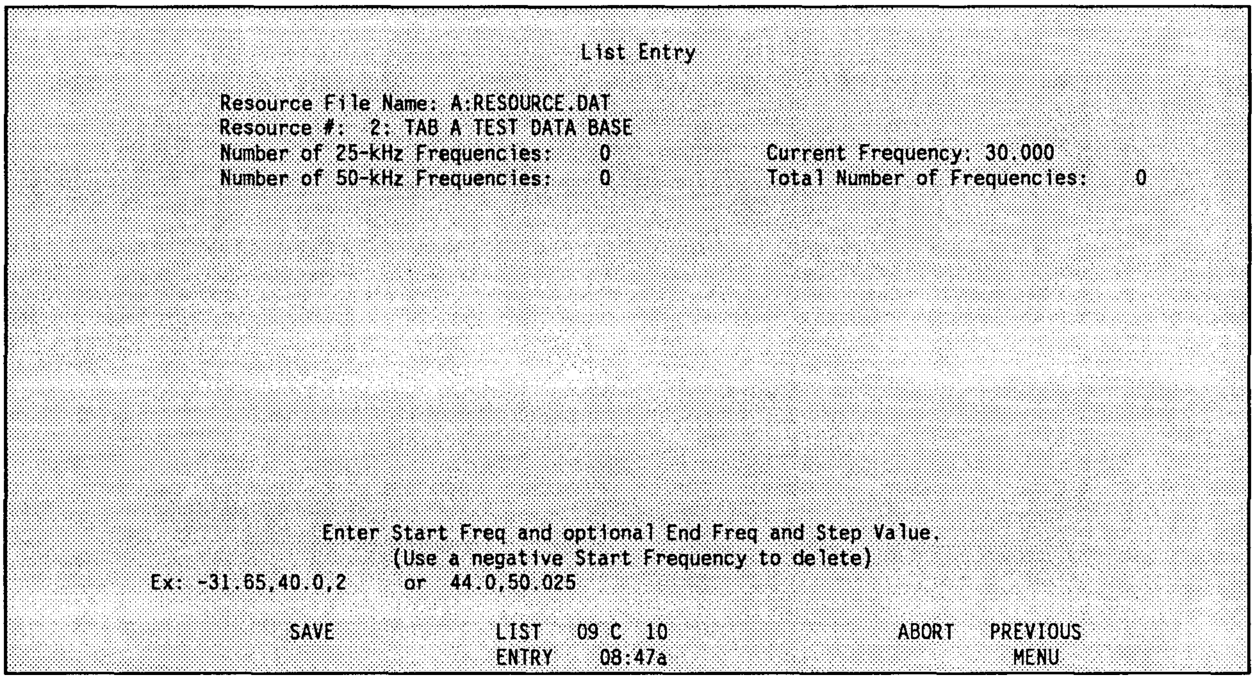
A. HELP SCREEN (EXT-H)

The help screen for the Map Entry Screen is available (although not indicated on the screen) by pressing <EXT>-<H>. Select the help screen and a description of how to move the cursor and how to add/delete frequencies in the map is displayed. In addition, the help screen describes the function keys.

B. LIST ENTRY

Use this option to enter frequency resource data in a list format as shown in Figure 2-43.

The frequencies can be entered as single entries or as a range of frequencies. To enter a range of frequencies, type in the start frequency, end frequency, and step value. Each entry must be separated by a comma. To delete frequencies, use a negative value for the start frequency. The step value may be either in the form of a frequency increment or number of 25-kHz increments. For example, the entry 31.000,40.000,2 enters frequencies from 31.000 MHz to 40.000 Mhz in 50.0 kHz increments (the-entry 31.000,40.000,0.05 enters the same frequencies).



```
                           List Entry

        Resource File Name: A:RESOURCE.DAT
        Resource #:  2: TAB A TEST DATA BASE
        Number of 25-kHz Frequencies:    0          Current Frequency: 30.000
        Number of 50-kHz Frequencies:    0          Total Number of Frequencies:    0




            Enter Start Freq and optional End Freq and Step Value.
               (Use a negative Start Frequency to delete)
     Ex: -31.65,40.0,2     or  44.0,50.025

           SAVE          LIST   09 C  10                ABORT   PREVIOUS
                         ENTRY    08:47a                          MENU
```

Figure 2-43 (ENTER SOI/CEOI/f1 f5, f1 RESOURCE DESCRIPTION, f4)

Note: Use the optional End Freq and Step Value only to enter a range of frequencies.

Use the help screen for additional information on how to move the cursor and enter data.

COPY FREQ RESOURCE

Use this option to copy one frequency resource to another.

Select this option and a list of resource descriptions is displayed as shown in Figure 2-44.

At the prompt, enter the number for the resource to copy from and press <RETURN>. At the next prompt, enter the destination resource number of the copy and then enter the new frequency resource description (defaults to resource being copied). The description is listed at the destination resource number.

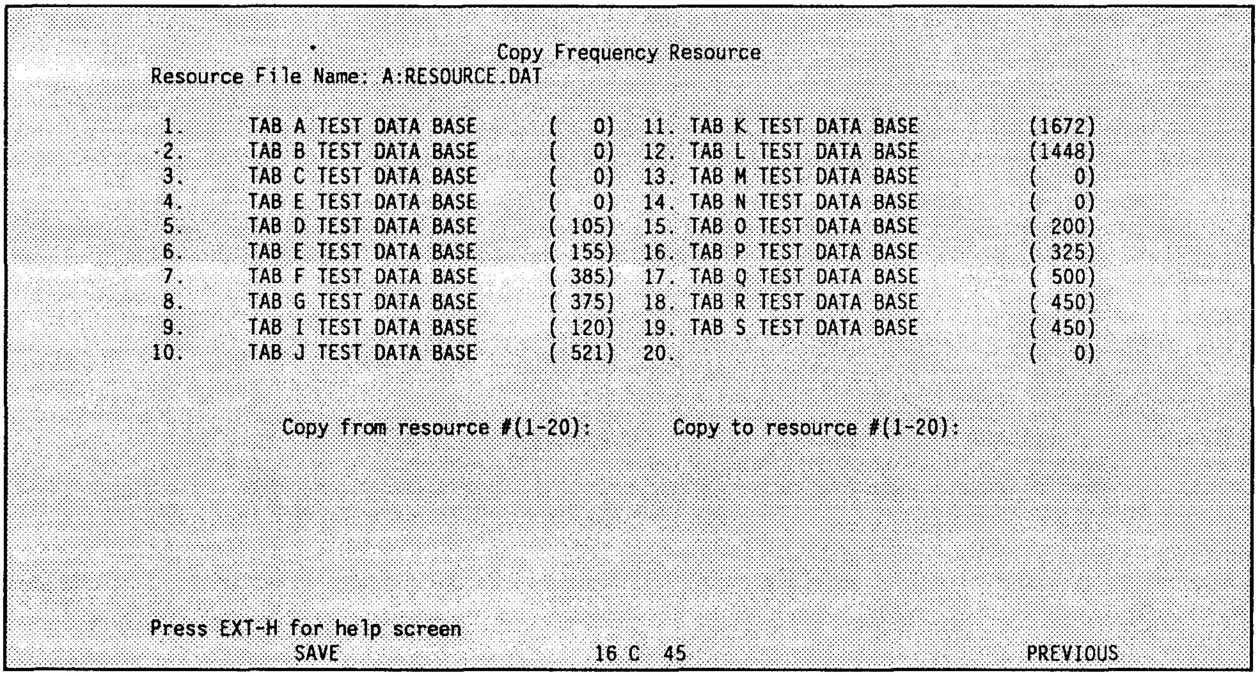
Use the help screen for additional options descriptions.

MERGE FREQ RESOURCE

Use this option to merge a number of resources into one resource.

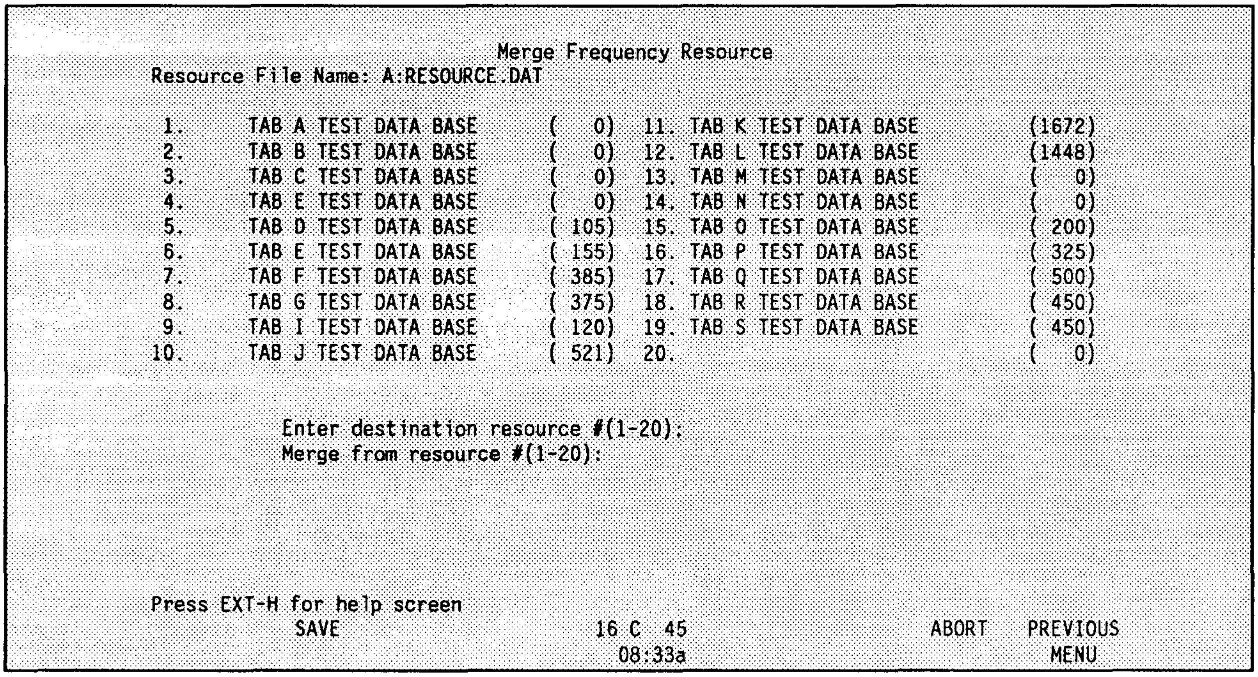
Select this option and a list of resource descriptions is distplayed as shown in Figure 2-45. “

Enter the destination resource number at the prompt and press <RETURN>. Indicate whether the destination should be zeroized. Type “Y” to zeroize the resource or type “N” to not zeroize the resource and press <RETURN>. Next, enter the



```
                         Copy Frequency Resource
Resource File Name: A:RESOURCE.DAT

 1.     TAB A TEST DATA BASE     (   0)  11. TAB K TEST DATA BASE        (1672)
 2.     TAB B TEST DATA BASE     (   0)  12. TAB L TEST DATA BASE        (1448)
 3.     TAB C TEST DATA BASE     (   0)  13. TAB M TEST DATA BASE        (   0)
 4.     TAB E TEST DATA BASE     (   0)  14. TAB N TEST DATA BASE        (   0)
 5.     TAB D TEST DATA BASE     ( 105)  15. TAB O TEST DATA BASE        ( 200)
 6.     TAB E TEST DATA BASE     ( 155)  16. TAB P TEST DATA BASE        ( 325)
 7.     TAB F TEST DATA BASE     ( 385)  17. TAB Q TEST DATA BASE        ( 500)
 8.     TAB G TEST DATA BASE     ( 375)  18. TAB R TEST DATA BASE        ( 450)
 9.     TAB I TEST DATA BASE     ( 120)  19. TAB S TEST DATA BASE        ( 450)
10.     TAB J TEST DATA BASE     ( 521)  20.                             (   0)


         Copy from resource #(1-20):      Copy to resource #(1-20):






Press EXT-H for help screen
      SAVE                   16 C  45                                 PREVIOUS
```

Figure 2-44 (ENTER SOI/CEOI/f1, f5, f2)



```
                         Merge Frequency Resource
Resource File Name: A:RESOURCE.DAT

 1.     TAB A TEST DATA BASE     (   0)  11. TAB K TEST DATA BASE        (1672)
 2.     TAB B TEST DATA BASE     (   0)  12. TAB L TEST DATA BASE        (1448)
 3.     TAB C TEST DATA BASE     (   0)  13. TAB M TEST DATA BASE        (   0)
 4.     TAB E TEST DATA BASE     (   0)  14. TAB N TEST DATA BASE        (   0)
 5.     TAB D TEST DATA BASE     ( 105)  15. TAB O TEST DATA BASE        ( 200)
 6.     TAB E TEST DATA BASE     ( 155)  16. TAB P TEST DATA BASE        ( 325)
 7.     TAB F TEST DATA BASE     ( 385)  17. TAB Q TEST DATA BASE        ( 500)
 8.     TAB G TEST DATA BASE     ( 375)  18. TAB R TEST DATA BASE        ( 450)
 9.     TAB I TEST DATA BASE     ( 120)  19. TAB S TEST DATA BASE        ( 450)
10.     TAB J TEST DATA BASE     ( 521)  20.                             (   0)


         Enter destination resource #(1-20):
         Merge from resource #(1-20):





Press EXT-H for help screen
      SAVE                   16 C  45                       ABORT    PREVIOUS
                              08:33a                                   MENU
```

Figure 2-45 (ENTER SOI/CEOI/f1 f5, f3)

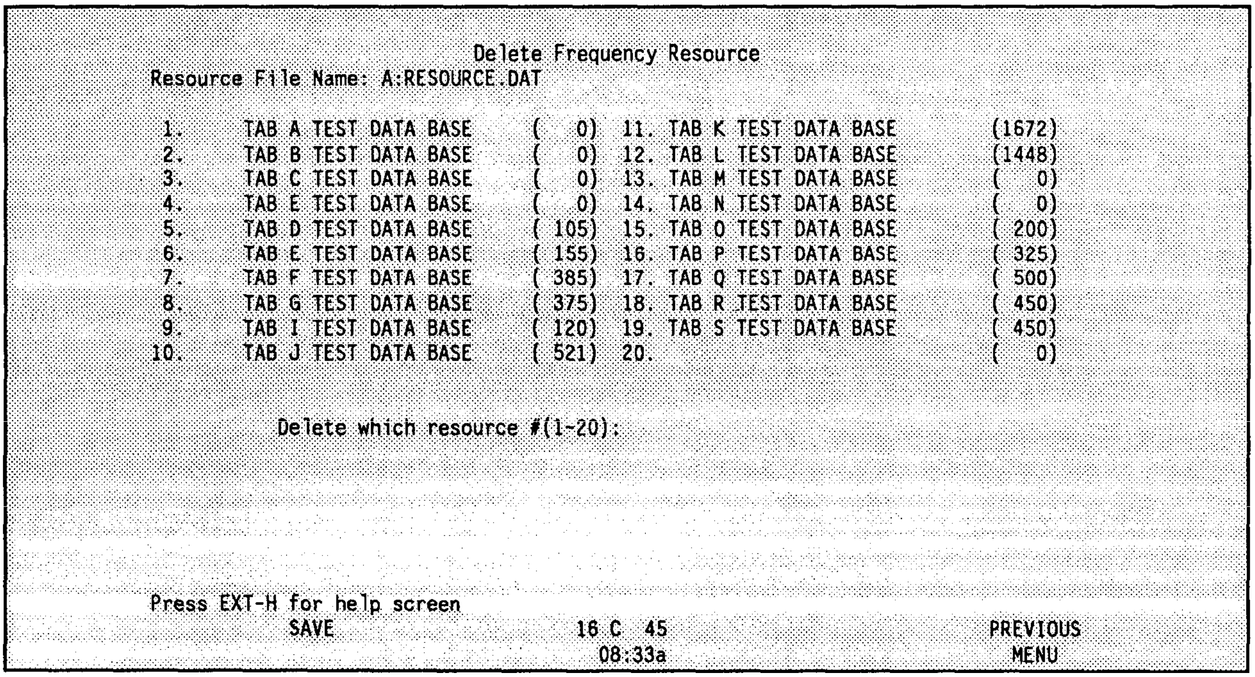
resource(s) to be merged. After entering all the desired merge resources, press <RETURN> at the source prompt and the prompt for entering the resource description is displayed. Enter a new resource description and press <RETURN> or press <RETURN> to use the default description. The description is listed at the destination resource number.

Use the help screen for option descriptions and an explanation of default resource descriptions.

DELETE FREQ RESOURCE

Use this option to delete a resource from the data file.

Select this option and a list of resource descriptions is displayed as shown in Figure 2-46.



```
                             Delete Frequency Resource
       Resource File Name: A:RESOURCE.DAT

         1.     TAB A TEST DATA BASE     (   0)  11. TAB K TEST DATA BASE        (1672)
         2.     TAB B TEST DATA BASE     (   0)  12. TAB L TEST DATA BASE        (1448)
         3.     TAB C TEST DATA BASE     (   0)  13. TAB M TEST DATA BASE        (   0)
         4.     TAB E TEST DATA BASE     (   0)  14. TAB N TEST DATA BASE        (   0)
         5.     TAB D TEST DATA BASE     ( 105)  15. TAB O TEST DATA BASE        ( 200)
         6.     TAB E TEST DATA BASE     ( 155)  16. TAB P TEST DATA BASE        ( 325)
         7.     TAB F TEST DATA BASE     ( 385)  17. TAB Q TEST DATA BASE        ( 500)
         8.     TAB G TEST DATA BASE     ( 375)  18. TAB R TEST DATA BASE        ( 450)
         9.     TAB I TEST DATA BASE     ( 120)  19. TAB S TEST DATA BASE        ( 450)
        10.     TAB J TEST DATA BASE     ( 521)  20.                             (   0)


                  Delete which resource #(1-20):






       Press EXT-H for help screen
                  SAVE                   16 C  45                              PREVIOUS
                                          08:33a                                 MENU
```

Figure 2-46 (ENTER SOI/CEOI/f1, f5, f4)

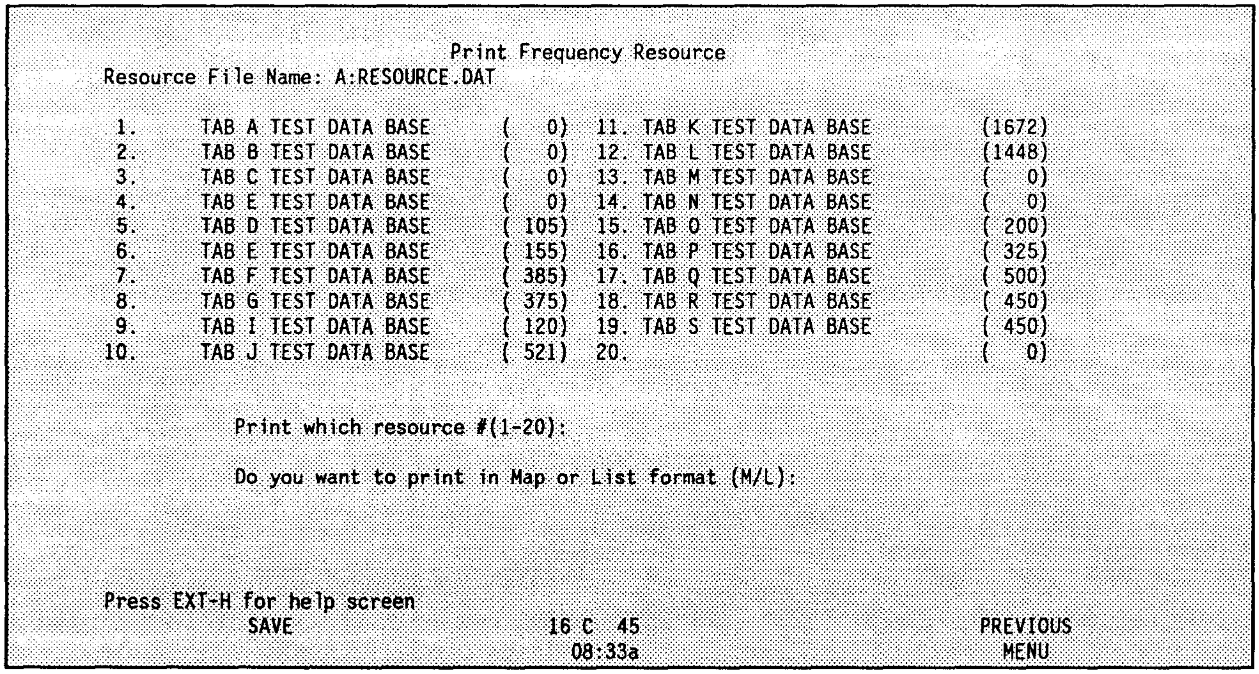
Enter the number for the resource to be deleted. and press <RETURN>. Type “Y” to confirm the deletion or type “N” to cancel the deletion. If the deletion is confirmed, the resource description is removed from the list.

NOTE: None of the previously detailed resource data file edits (Enter Modify Freq, List Entry, Copy Freq, Delete Freq) are saved until the save function is used for that screen. Or when returning to the Input Options Screen, you are prompted as to whether to save the file. Respond “yes” to save the changes made.

PRINT FREQ RESOURCE

Use this option to print a resource in either the Map or List format.

Select this option and a list of resource descriptions is displayed as shown in Figure 2-47.



```
                               Print Frequency Resource
 Resource File Name: A:RESOURCE.DAT

  1.     TAB A TEST DATA BASE     (   0)  11. TAB K TEST DATA BASE         (1672)
  2.     TAB B TEST DATA BASE     (   0)  12. TAB L TEST DATA BASE         (1448)
  3.     TAB C TEST DATA BASE     (   0)  13. TAB M TEST DATA BASE         (   0)
  4.     TAB E TEST DATA BASE     (   0)  14. TAB N TEST DATA BASE         (   0)
  5.     TAB D TEST DATA BASE     ( 105)  15. TAB O TEST DATA BASE         ( 200)
  6.     TAB E TEST DATA BASE     ( 155)  16. TAB P TEST DATA BASE         ( 325)
  7.     TAB F TEST DATA BASE     ( 385)  17. TAB Q TEST DATA BASE         ( 500)
  8.     TAB G TEST DATA BASE     ( 375)  18. TAB R TEST DATA BASE         ( 450)
  9.     TAB I TEST DATA BASE     ( 120)  19. TAB S TEST DATA BASE         ( 450)
 10.     TAB J TEST DATA BASE     ( 521)  20.                              (   0)


             Print which resource #(1-20):

             Do you want to print in Map or List format (M/L):




 Press EXT-H for help screen
         SAVE                    16 C  45                              PREVIOUS
                                  08:33a                                 MENU
```

Figure 2-47 (ENTER SOI/CEOI/f1, f5, f5)

Enter the number of the resource to be printed and press **<RETURN>.** Type “M” to choose the Map format or type “L” to choose the List format and press **<RETURN>**.

QUICK REFERENCE TABLE
DATA ELEMENT DEFINITIONS

DESCRIPTION	QUANTITY	TYPE OR FORMAT	RANGE OR SIZE
DESCRIPTION ID	1500 PER SET OF 5 TIME PERIODS	NUMERIC	1-1500
NET DESCRIPTION	1500 PER SET OF 5 TIME PERIODS	ALPHANUMERIC	16 CHARACTERS
NET ID	1 PER NET DESCRIPTION	NUMERIC	000-999
FREQUENCY RESTRICTION	16 PER FREQUENCY	ALPHABETIC	A-P
NET RESTRICTION	8 PER NET	ALPHABETIC	A-P
CLASS	10 PER SET OF 5 TIME PERIODS	NUMERIC	1-10
ZONE	20 PER CLASS	NUMERIC	1-20
ZONE NET	200 PER ZONE	NUMERIC	1-4000
SIGN/COUNTERSIGN	20 - 1500 WORDS	ALPHANUMERIC	3 - 9 CHARACTERS
CALL SIGN	1 PER NET NAME PER TIME PERIOD	LETTER/NUMBER/LETTER	A-Z/0-9/A-Z
NET GROUP	150 PER SET OF 5 TIME PERIODS	NUMERIC	1-150
NET GROUP NAME	1 PER NET GROUP	ALPHANUMERIC	16 CHARACTERS
NET GROUP NET	36 PER NET GROUP	NUMERIC	1-1500
COSITE GROUP	50 PER SET OF 5 TIME PERIODS	NUMERIC	1-50
COSITE GROUP NET	12 PER COSITE GROUP	NUMERIC	1-600
CALL SIGN SHARE GROUP	99 PER SET OF FIVE TIME PERIODS	NUMERIC	1-99
CALL SIGN SHARE GROUP NET	1500 PER GROUP	NUMERIC	1-1500
FREQUENCY SHARE GROUP	99 PER SET OF FIVE TIME PERIODS	NUMERIC	1-99
FREQUENCY SHARE GROUP NET	1500 PER GROUP	NUMERIC	1-1500

TABLE 2-2

QUICK REFERENCE TABLE
DATA ELEMENT DEFINITIONS

DESCRIPTION	QUANTITY	TYPE OR FORMAT	RANGE OR SIZE
SPECIAL NETS PLAN	1 PLAN PER SET OF 5 TIME PERIODS		
SPECIAL NETS PLAN NET	50 PAIRS PER PLAN	NUMERIC	1-1500
SUFFIXES	99	NUMERIC	01-99
SUFFIX DESCRIPTION	1 PER SUFFIX	ALPHANUMERIC	16 CHARACTERS
EXPANDERS	20	ALPHABETIC	A-Z
EXPANDER DESCRIPTION	1 PER EXPANDER	ALPHANUMERIC	16 CHARACTERS
FREQUENCY RESOURCE	20 PER DATA FILE	FILE	1-20
FREQUENCY RESOURCE DESCRIPTION	1 PER FREQENCY RESOURCE	ALPHANUMERIC	28 CHARACTERS
TRANSEC KEY	20 PAIRS PER DATA FILE	FILE	1-20
TRANSEC KEY DESCRIPTION	1 PER TRANSEC KEY PAIR	ALPHANUMERIC	32 CHARACTERS

TABLE 2-2

GENERATION

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        Clear. 2-82
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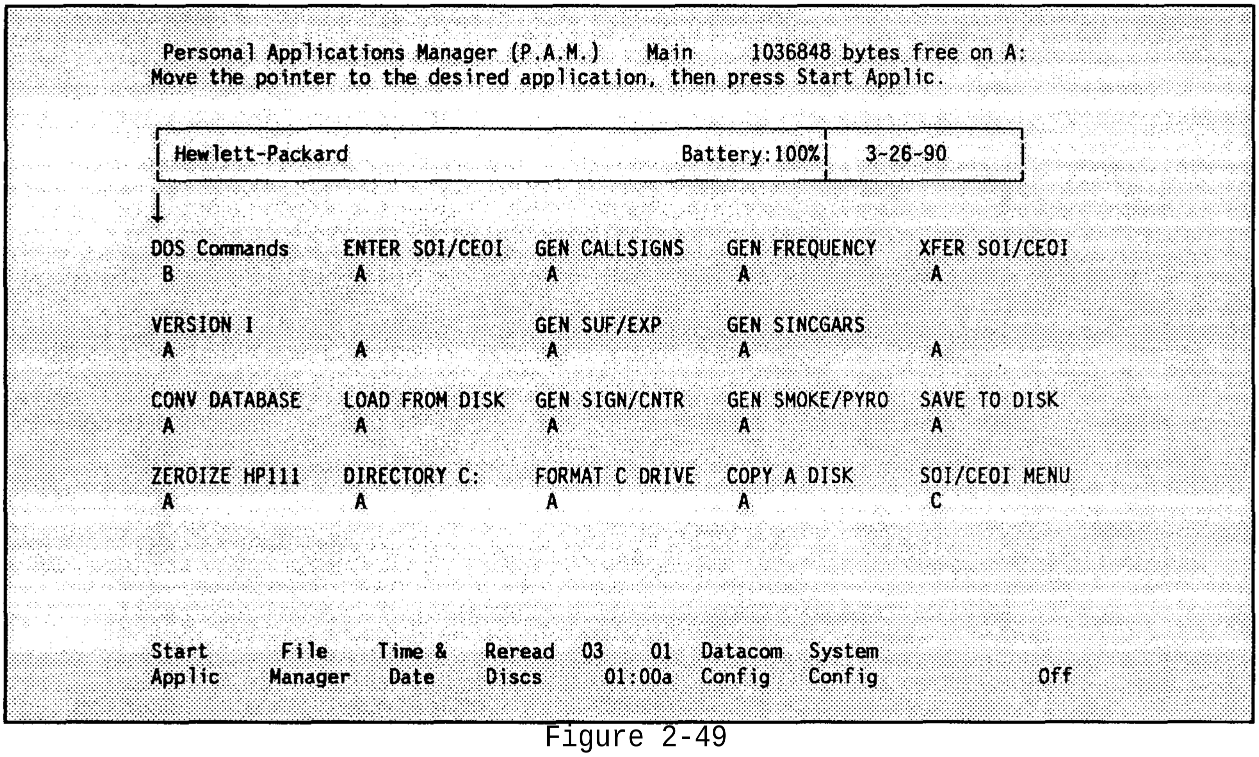
INTRODUCTION

This chapter describes the various PAM selections used to generate random SOI data. Use this chapter to learn how to generate call signs (see Gen Call Signs, page 2-69), frequency information (see Gen Frequency, page 2-69), SINCGARS information (see Gen SINCGARS, page 2-73), suffixes and expanders (see Gen Suf/Exp, page 2-78), signs and countersigns (see Gen Sign/Cntr, page 2-79) and smoke and pyrotechnic information (see Gen Smoke/Pyre, page 2-84).

Generation of random data is divided between six different generation routines. This separation allows for flexibility in generation since generated data is not always needed for each section.

An initialization vector, supplied by NSA, is required for random SOI data generation. A new vector is required for each complete set of SOI generation. It is a violation of doctrine to use one initialization vector for multiple SOI data generations.

The generation routines are called from the BECS PAM Menu shown in Figure 2-48.



```
 Personal Applications Manager (P.A.M.)   Main    1036848 bytes free on A:
Move the pointer to the desired application, then press Start Applic.

| Hewlett-Packard                               Battery:100%|  3-26-90   |
↓
DOS Commands    ENTER SOI/CEOI  GEN CALLSIGNS   GEN FREQUENCY   XFER SOI/CEOI
 B               A               A               A               A

VERSION I                       GEN SUF/EXP     GEN SINCGARS
 A               A               A               A               A

CONV DATABASE   LOAD FROM DISK  GEN SIGN/CNTR   GEN SMOKE/PYRO  SAVE TO DISK
 A               A               A               A               A

ZEROIZE HP111   DIRECTORY C:    FORMAT C DRIVE  COPY A DISK     SOI/CEOI MENU
 A               A               A               A               C

Start     File    Time &  Reread  03    01  Datacom  System
Applic   Manager   Date   Discs    01:00a   Config   Config            Off
```

Figure 2-49

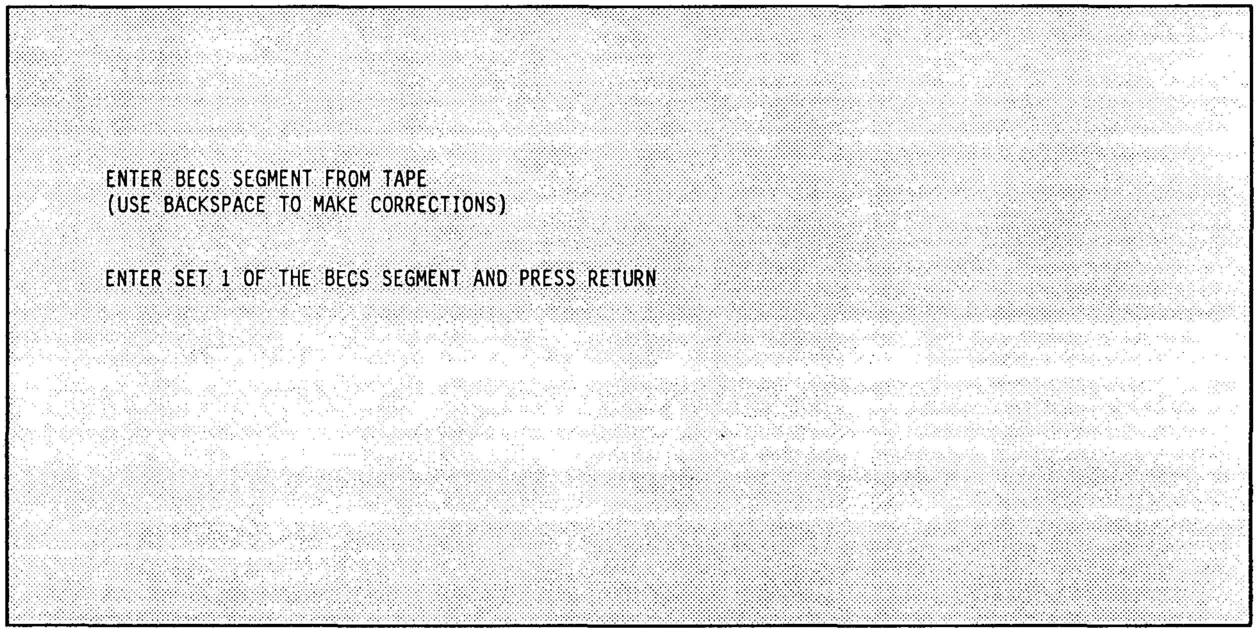
To initiate a generation routine, move the arrow cursor to the name of the desired routine and press either <f1>, START APPLIC or <RETURN>.

After selecting any of the generation routines, confirm if this is a merged data base. <u>Do not perform a generation of data that has been passed from</u>

Corps via a merge. If a generation is performed on merged data, the merged data is lost. Refer to Merge, pages 2-52 to 2-56 in the previous ENTER SOI/CEOI chapter for more information.

The first time a generation routine is selected during a session, you are prompted to enter a 32 character vector. Use an available BECS BGU initialization vector.

Enter the vector in four groups of eight characters each. These groupings should match those of the printed tape. The screen in Figure 2-49 shows the prompt to follow.



```
ENTER BECS SEGMENT FROM TAPE
(USE BACKSPACE TO MAKE CORRECTIONS)


ENTER SET 1 OF THE BECS SEGMENT AND PRESS RETURN
```

Figure 2-49 (Any Generate)

Enter a vector only once during a session. For example, if a vector is entered when generating frequencies, there is no prompt for a new vector when generating call signs.

ZEROIZE THE HP AT THE END OF EACH SESSION. USE A DIFFERENT VECTOR FOR EACH NEW SESSION.

CAUTION:

Paper must be in the printer and the printer must be turned on before generating SOI/CEOI. Ensure sufficient paper is available; if the printer runs out of paper, generation will stop and time is lost.

GEN CALL SIGNS

Use this PAM selection to generate five time periods worth of call signs for the nets that require them. Once this option is selected, the screen displays:

Loading "GEN CALLSIGNS"

If you did not create a shared call signs file while in ENTER SOI/CEOI, the following message is displayed,

"YOU HAVE NOT CREATED A SHARED CALL SIGN FILE.
DO YOU WANT TO CONTINUE PROCESSING (Y/N)?"

Type "N" to return to the PAM menu and select the ENTER SOI/CEOI option to create the files. Type "Y" and the BGU asks,

"Is this a merged corps database (Y/N)?"

This question is to remind you not to generate call signs for a database that contains merged data. After responding to the question, a message on the screen and a printout indicate which time period is being generated. A generation of a typical size data base should take about 2 to 3 minutes.

If you did create a shared call signs file while in ENTER SOI/CEOI, the BGU asks:

"Is this a merged corps database (Y/N)?"

Respond to the question. If a previously generated call sign file exists (not from a merged database), the following prompt appears:

"YOU ALREADY HAVE A GENERATED CALLSIGN FILE, DO YOU WANT TO USE THE GENERATED CALLSIGNS IN THE FILE AS PART OF YOUR NEW FILE? (Y/N)"

If you want all of the previously generated call signs are to be used again without regeneration, respond "yes".

A message on the screen and a printout indicate which time period is being generated. A generation of a typical size data base should take about 2 to 3 minutes.

GEN FREQUENCY

Use this PAM selection to generate five time periods worth of frequency data for the nets that require them. Once this option is selected, the screen displays:

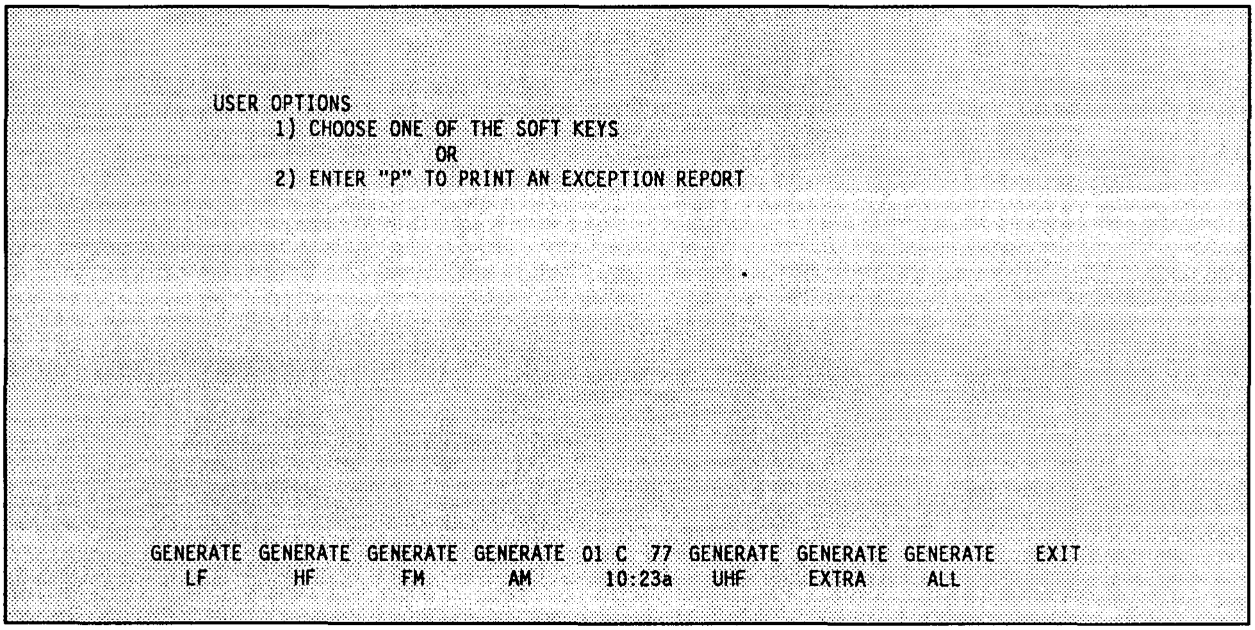
Loading "GEN FREQUENCY"

"Reading files...
Press any key to continue"

If the necessary files do not exist, the following message is displayed:

```
THERE IS NO COSITE PLAN
THERE IS NO REUSE PLAN
THERE IS NO SHARED LIST
THERE IS NO SPECIAL NETS
GO BACK TO INPUTS AND RE-CREATE THE FREQUENCY LIST.
GO BACK TO INPUTS AND RE-CREATE THE NET GROUPS INFORMATION.
```

The PAM menu returns.
If the files do exist, press any key and the screen shown in Figure 2-50 is displayed.



```
USER OPTIONS
    1) CHOOSE ONE OF THE SOFT KEYS
                 OR
    2) ENTER "P" TO PRINT AN EXCEPTION REPORT
```

Figure 2-50 (GEN FREQUENCY/f1)

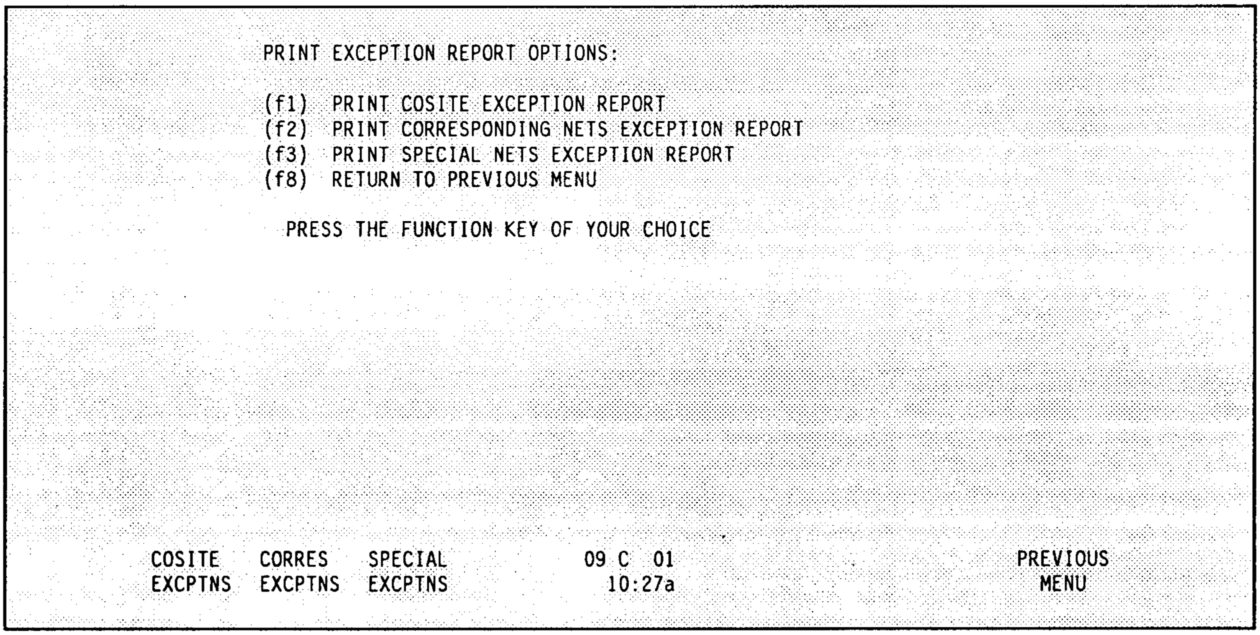
f1 - allows you to generate frequencies for the LF band.
f2 - allows you to generate frequencies for the HF band.
f3 - allows you to generate frequencies for the FM band.
f4 - allows you to generate frequencies for the AM band.
f5 - allows you to generate frequencies for the UHF band.
f6 - allows you to generate frequencies for the EXTRA band.
f7 - allows you to generate frequencies for ALL bands.
f8 - allows you to EXIT frequency generation.

The remainder of this section describes the user options shown in Figure 2-50.

A. EXCEPTION REPORTS

Having selected “P” causes the screen to be displayed as shown in Figure 2-51.

f1 - allows you to print a cosite exception report.
f2 - allows you to print a corresponding nets exception report.
f3 - allows you to print a special nets exception report.
f8 - allows you to return to the previous menu.



PRINT EXCEPTION REPORT OPTIONS:

(f1) PRINT COSITE EXCEPTION REPORT
(f2) PRINT CORRESPONDING NETS EXCEPTION REPORT
(f3) PRINT SPECIAL NETS EXCEPTION REPORT
(f8) RETURN TO PREVIOUS MENU

PRESS THE FUNCTION KEY OF YOUR CHOICE

Figure 2-51 (GEN FREQUENCY/f1, P)

The reports only have meaning after a frequency generation has been completed. Each report describes the resulting separation factors obtained for a given type of request.

B. FREQUENCY GENERATION

Choose the band to generate by pressing one of the function keys shown in Figure 2-50.

CAUTION:

If you are generating frequency bands individually, then the “EXTRA” band must be generated last.

If a generated frequencies file already exists, then the following prompt appears:

“DO YOU WANT TO USE PREVIOUSLY GENERATED FREQUENCIES AS PART OF THE CURRENT GENERATION? (Y/N)”

If the response is “yes”, then freqenci es are not generated for the nets that already have frequency assignments.′

Next, the BGU asks,

“IS THIS A MERGED DATABASE (Y/N)?”

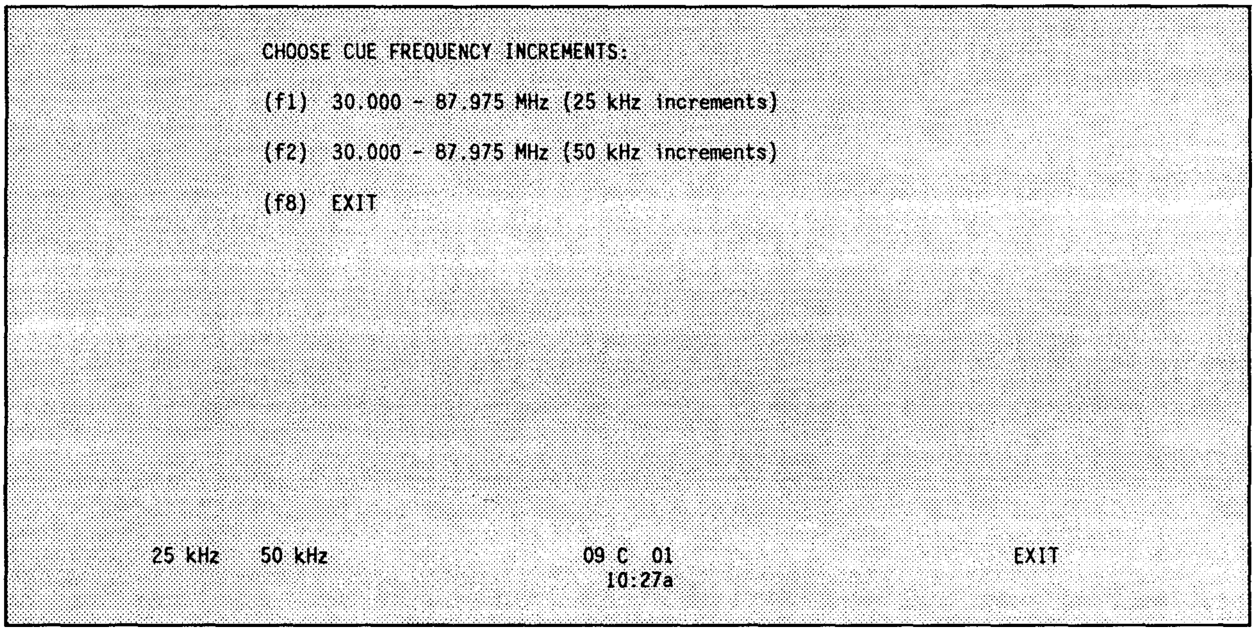
Respond with “Y” or “N” to the question.

If you selected the “Generate FM” option (<f3>), the following message is displayed:

> “You now have the option of limiting CUE frequencies to under 75.950 MHz. This will give you a frequency range of 30.000 to 75.950 MHz in 50 kHz increments and will allow a radio such as the VRC-12 to communicate with SINCGARS radio. If you choose NOT to limit CUE frequencies, you will be given the choice of using either 25 or 50 kHz increments over the entire range of VHF-FM frequencies.
>
> Do you wish to limit CUE frequencies to under 75.950 MHz (Y/N)?”

Answer the question by typing “Y” and generation begins.

Answer the question by typing “N” and the screen shown in Figure 2-52 is displayed.



```
CHOOSE CUE FREQUENCY INCREMENTS:

(f1)  30.000 - 87.975 MHz (25 kHz increments)

(f2)  30.000 - 87.975 MHz (50 kHz increments)

(f8)  EXIT
```

Figure 2-52 (GEN FREQUENCY/f1, f3, “N”)

(f1) -	allows you to choose VHF-FM frequency generation in 25 kHz increments.
(f2) -	allows you to choose VHF-FM frequency generation in 50 kHz increments.

Select <f1> or <f2> and frequency generation begins.

Once frequency generation has begun, the screen displays the following message until the generation is complete:

“GENERATING FREQUENCY ASSIGNMENTS”

When generation is complete, the band generation selection menu returns to the screen and another band may be selected to generate; if not, exit frequency generation by pressing <f8>. A generation of all of the frequency bands takes anywhere between five minutes to five hours depending upon the size of the database, the complexity of the cosite plan and the amount of available frequencies.

GEN SINCGARS

Use this PAM selection to generate SINCGARS data for the nets that require them. Once this option is selected, the screen displays:

Loading "GEN SINCGARS"

Next, the SINCGARS Master Menu is displayed as shown in Figure 2-53

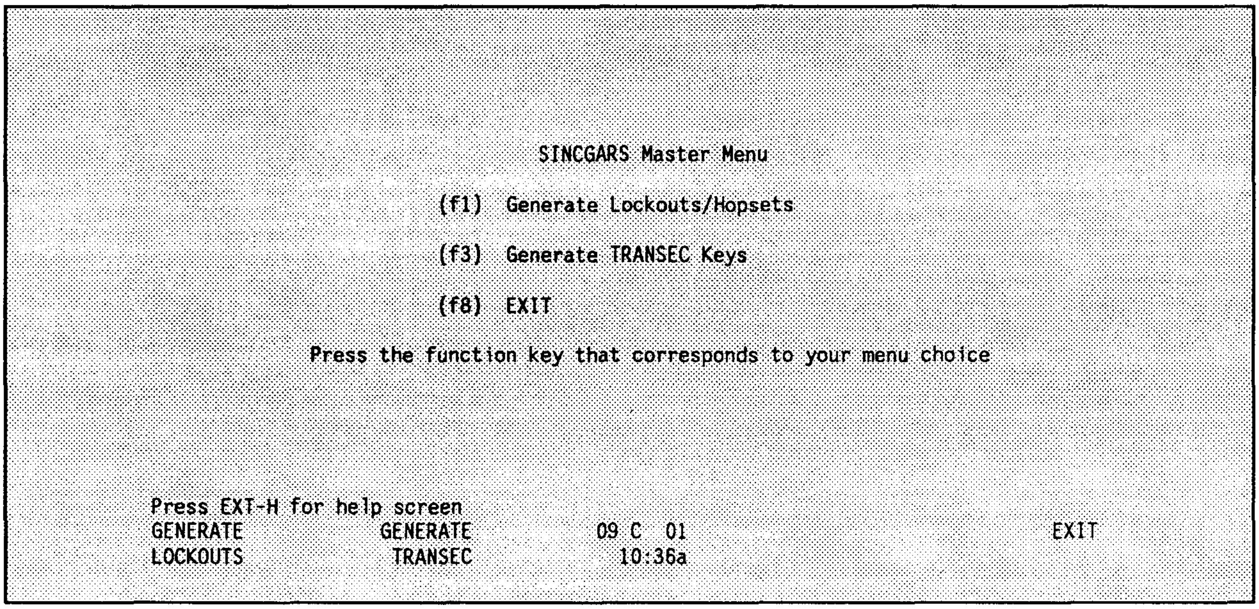

SINCGARS Master Menu
(f1) Generate Lockouts/Hopsets
(f3) Generate TRANSEC Keys
(f8) EXIT
Press the function key that corresponds to your menu choice
Press EXT-H for help screen
GENERATE LOCKOUTS
GENERATE TRANSEC
09 C 01
10:36a
EXIT

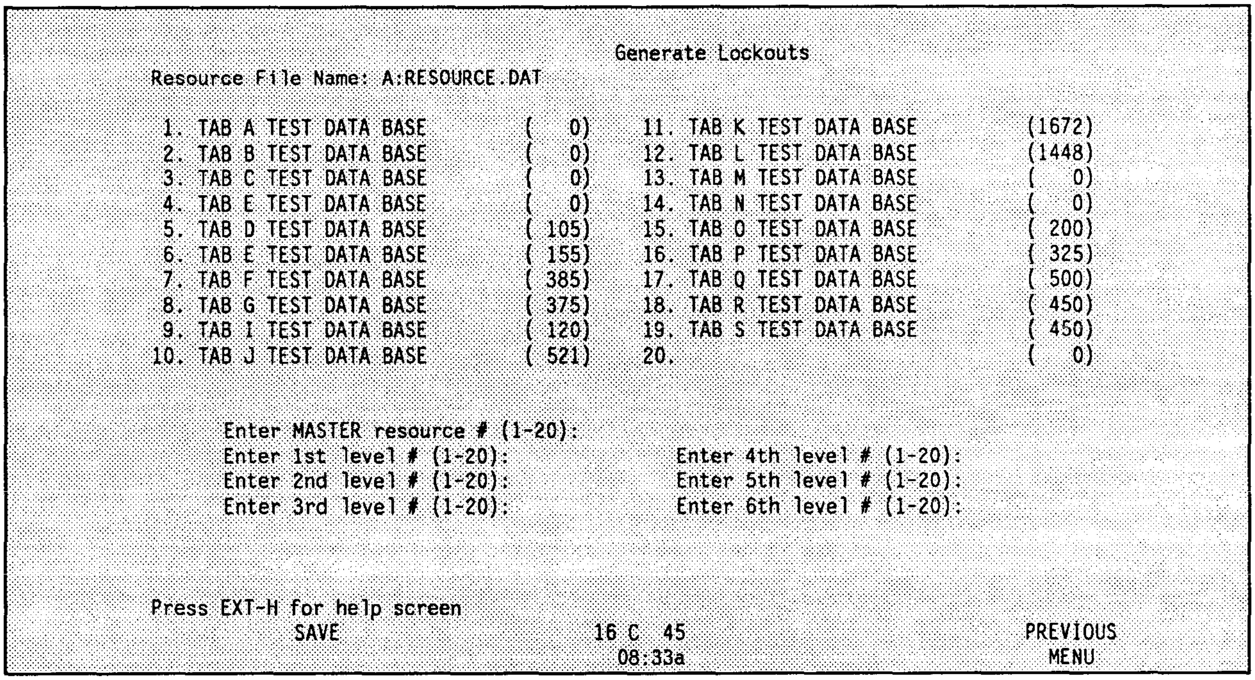
Figure 2-53 (GEN SINCGARS/f1)

Choose the portion of SINCGARS data desired to generate or select the help screen for a description of the function keys.

A. Generate Lockouts/Hopsets

Use this option to generate the frequency lockouts / hopsets for a frequency resource.

Select this option and the list of resources is displayed as shown in Figure 2-54. The RESOURCE.DAT file must be created before attempting to generate lockouts/hopsets. If the RESOURCE.DAT file does not exist, then the BGU warns you and allows you to return to the Master Menu where you can exit. Then enter the Master resource (optional) and the first through sixth level resources. Leave blank, by pressing the <RETURN> key, the levels where no generation is needed. Use the help screen for a description of entries and function keys.



```
                              Generate Lockouts
     Resource File Name: A:RESOURCE.DAT

      1. TAB A TEST DATA BASE      (   0)   11. TAB K TEST DATA BASE       (1672)
      2. TAB B TEST DATA BASE      (   0)   12. TAB L TEST DATA BASE       (1448)
      3. TAB C TEST DATA BASE      (   0)   13. TAB M TEST DATA BASE       (   0)
      4. TAB E TEST DATA BASE      (   0)   14. TAB N TEST DATA BASE       (   0)
      5. TAB D TEST DATA BASE      ( 105)   15. TAB O TEST DATA BASE       ( 200)
      6. TAB E TEST DATA BASE      ( 155)   16. TAB P TEST DATA BASE       ( 325)
      7. TAB F TEST DATA BASE      ( 385)   17. TAB Q TEST DATA BASE       ( 500)
      8. TAB G TEST DATA BASE      ( 375)   18. TAB R TEST DATA BASE       ( 450)
      9. TAB I TEST DATA BASE      ( 120)   19. TAB S TEST DATA BASE       ( 450)
     10. TAB J TEST DATA BASE      ( 521)   20.                            (   0)


          Enter MASTER resource # (1-20):
          Enter 1st level # (1-20):           Enter 4th level # (1-20):
          Enter 2nd level # (1-20):           Enter 5th level # (1-20):
          Enter 3rd level # (1-20):           Enter 6th level # (1-20):



     Press EXT-H for help screen
           SAVE                  16 C  45                          PREVIOUS
                                  08:33a                             MENU
```

Figure 2-54 (GEN SINCGARS/f1, f1)

Enter the resources for generation and the following message is slowly displayed:

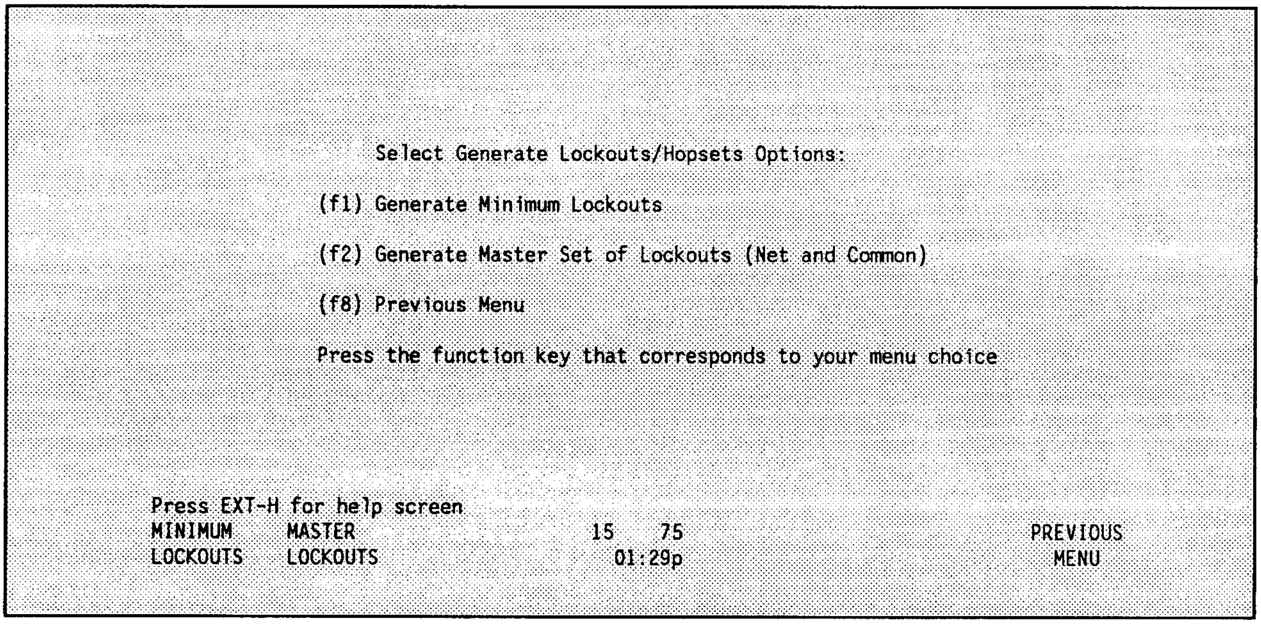
```
*************************** Working ***************************
                    Processing Master Resource
                     Processing Resource One
                                ●
                                ●
                                ●
                     Processing Resource Six
```

Then, the screen shown in Figure 2-55 is displayed.

<f1> provides the capability to generate a hopset with the minimum number of lockouts (using the Net Definition plus L7 and/or L8 if possible). <f2> provides the capability to generate a multi-level set of hopsets, (e.g., Theater/Corps/Division), using Net Definition and Common Lockouts.

Select <f1> or <f2> and you are prompted to enter a 2-digit tag number as shown in Figure 2-56.

The 2-digit tag number is used to identify the specific lockout/hopset generation. When loading the radio, this tag number is displayed. Enter the desired number and the word “Working” will appear on the screen while the generation is in progress. Then the program displays the Lockout Menu shown in Figure 2-57. Use the help screen for function key descriptions. Options <f2> and <f3> are debugging tools and are not discussed in this manual.



Select Generate Lockouts/Hopsets Options:

(f1) Generate Minimum Lockouts

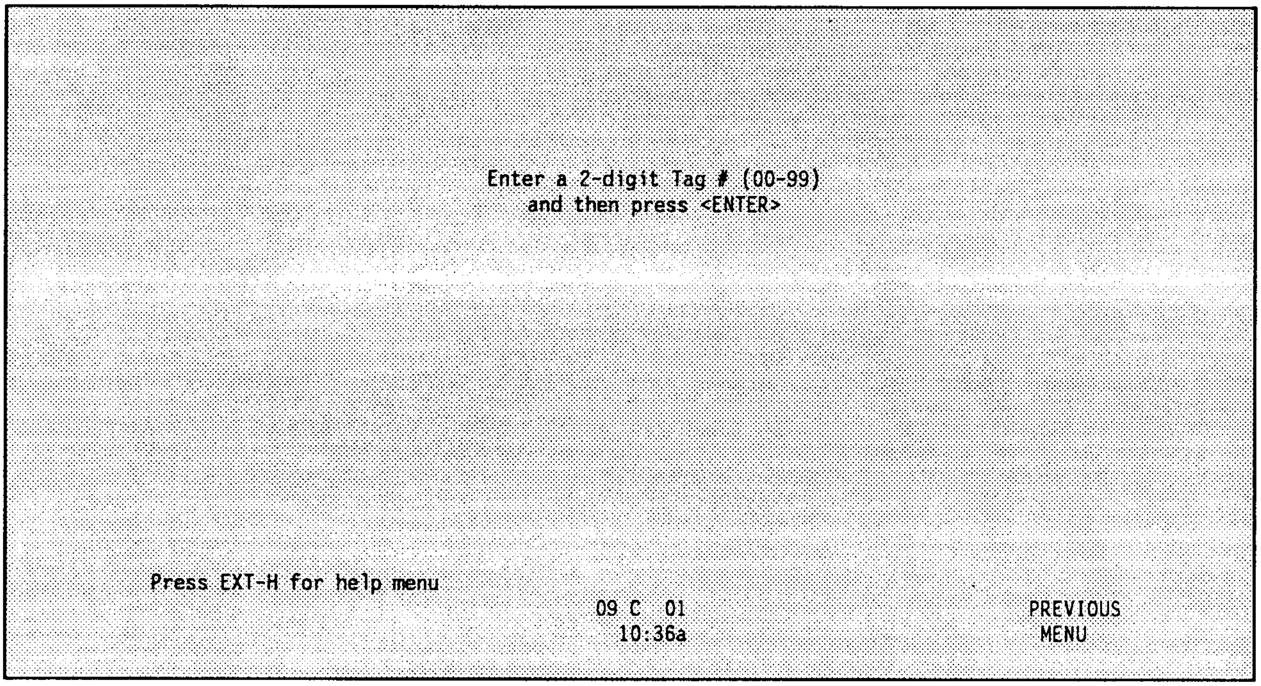
(f2) Generate Master Set of Lockouts (Net and Common)

(f8) Previous Menu

Press the function key that corresponds to your menu choice

```
Press EXT-H for help screen
MINIMUM     MASTER                    15    75                          PREVIOUS
LOCKOUTS    LOCKOUTS                   01:29p                             MENU
```

Figure 2-55 (GEN SINCGARS/f1, f1, ENTER RESOURCES)



Enter a 2-digit Tag # (00-99)
and then press <ENTER>

```
Press EXT-H for help menu
                                      09 C  01                          PREVIOUS
                                        10:36a                            MENU
```

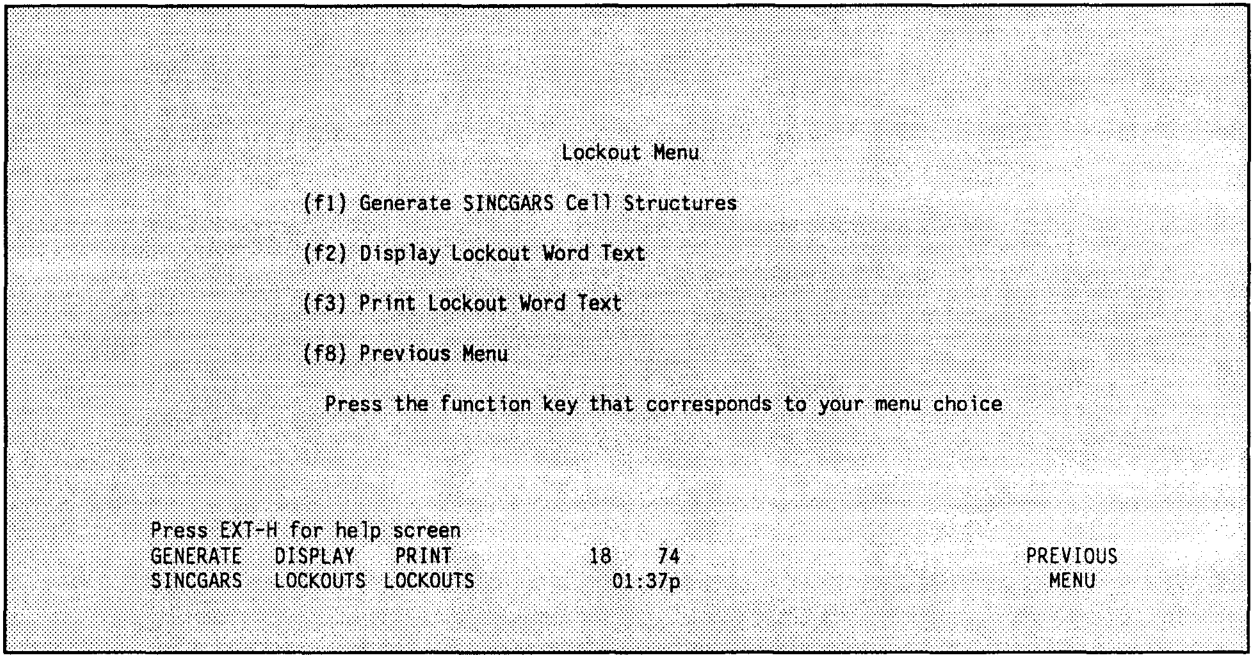
Figure 2-56(GEN SINCGARS/f1, f1, ENTER RESOURCES, f1 or f2)

1. Generate SINCGARS Cell Structures

Use this option to fill Net Definition and Common Lockout Cells with the generated lockouts.

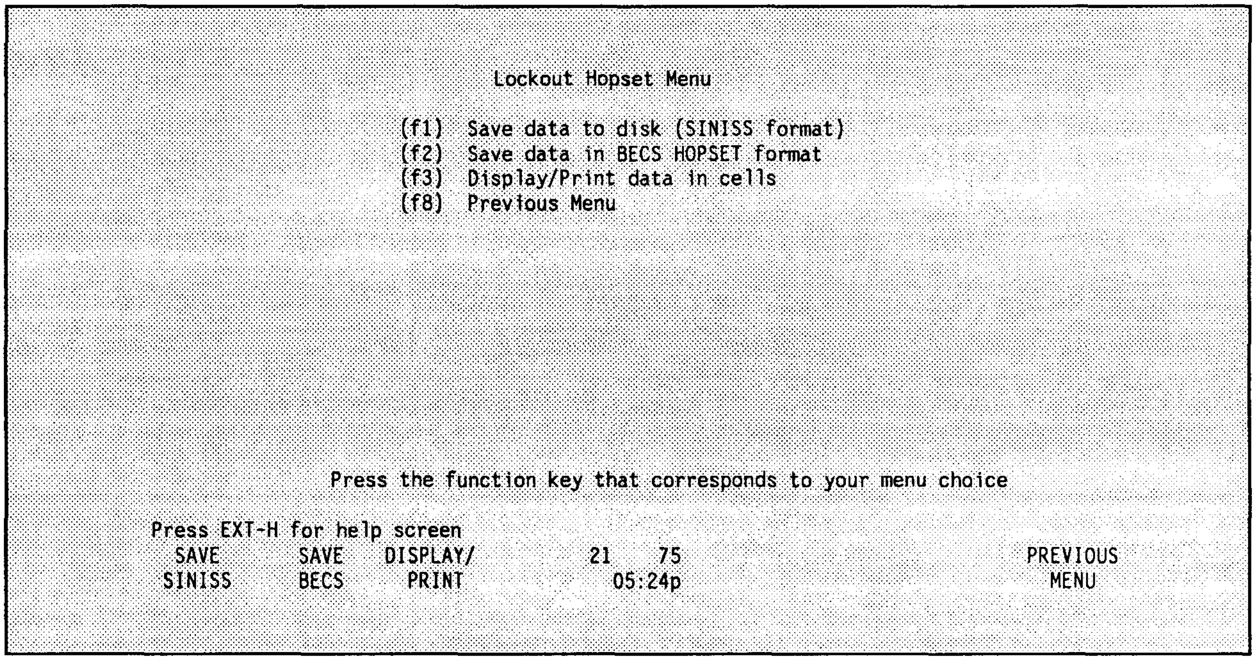
Select the Generate SINCGARS Cell Structures option and the Lockout Hopset Menu shown in Figure 2-58 is displayed.

If Generate Minimum Lockouts is selected from Figure 2-55 and more lockout words are required than available in the Net Definition and



```
                         Lockout Menu

               (f1) Generate SINCGARS Cell Structures

               (f2) Display Lockout Word Text

               (f3) Print Lockout Word Text

               (f8) Previous Menu

                 Press the function key that corresponds to your menu choice


Press EXT-H for help screen
GENERATE   DISPLAY    PRINT            18    74                            PREVIOUS
SINCGARS   LOCKOUTS  LOCKOUTS            01:37p                              MENU
```

Figure 2-57 (GEN SINCGARS/f1, f1, ENTER RESOURCE, f1 or f2)



```
                      Lockout Hopset Menu

                    (f1)  Save data to disk (SINISS format)
                    (f2)  Save data in BECS HOPSET format
                    (f3)  Display/Print data in cells
                    (f8)  Previous Menu



                 Press the function key that corresponds to your menu choice

Press EXT-H for help screen
  SAVE       SAVE    DISPLAY/          21    75                            PREVIOUS
 SINISS      BECS      PRINT             05:24p                              MENU
```

Figure 2-58 (GEN SINCGARS/f1, f1, ENTER RESOURCES. f1 or f2, f1)

Common Lockouts L7 and L8, a minimum lockout failure occurs after selecting cell structure generation. Go back and select the Generate Master Set of Lockouts option. If a lockout failure occurs after selecting the Master Set of Lockouts, the following options are available:

1. Select different resources to generate lockouts.

2. Return to Enter/Modify Frequency Resource and selectively reduce the frequency resource.

Choose the desired option (Generate Minimum Lockouts or Generate Master Set of Lockouts) and attempt to generate the SINCGARS cell structures.

Use the help screen for function key descriptions. Option <f3> is a debugging tool and is not discussed in this manual.

(a) Save data to disk **(SINISS** format)

Use this option to save a generated hopset to disk in the **SINISS** format.

Select this option and enter the filename (defaults to A:HOPSET.##, where ## is the 2-digit tag number entered earlier) that the generated cells are to be stored in and press <RETURN>. The words “Saving File” are displayed and the Lockout Hopset Menu returns.

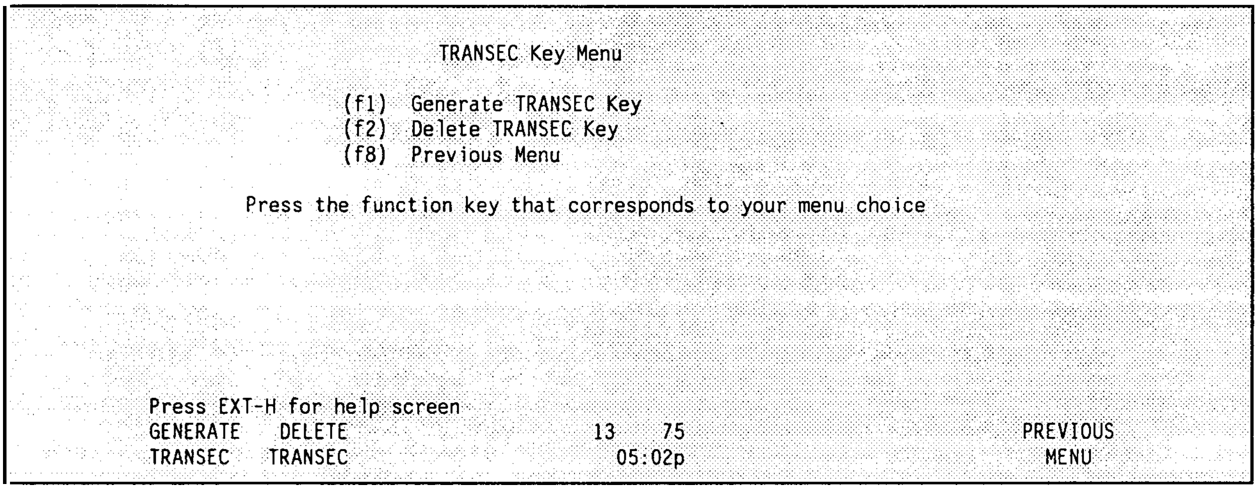
(b) Save data in **BECS HOPSET** format

Use this option to save generated hopset to disk in the BECS format to either the A: or C: drives. Hopset data must be saved in this format to transfer to the Data Transfer Device (DTD) AN/CYZ-10.

B. Generate **TRANSEC Keys**

Use this option to generate the operational and spare TRANSEC Keys for the SINCGARS radio.

Select this option and the TRANSEC Key Menu shown in Figure 2-59 is displayed. Use the help screen for option descriptions.



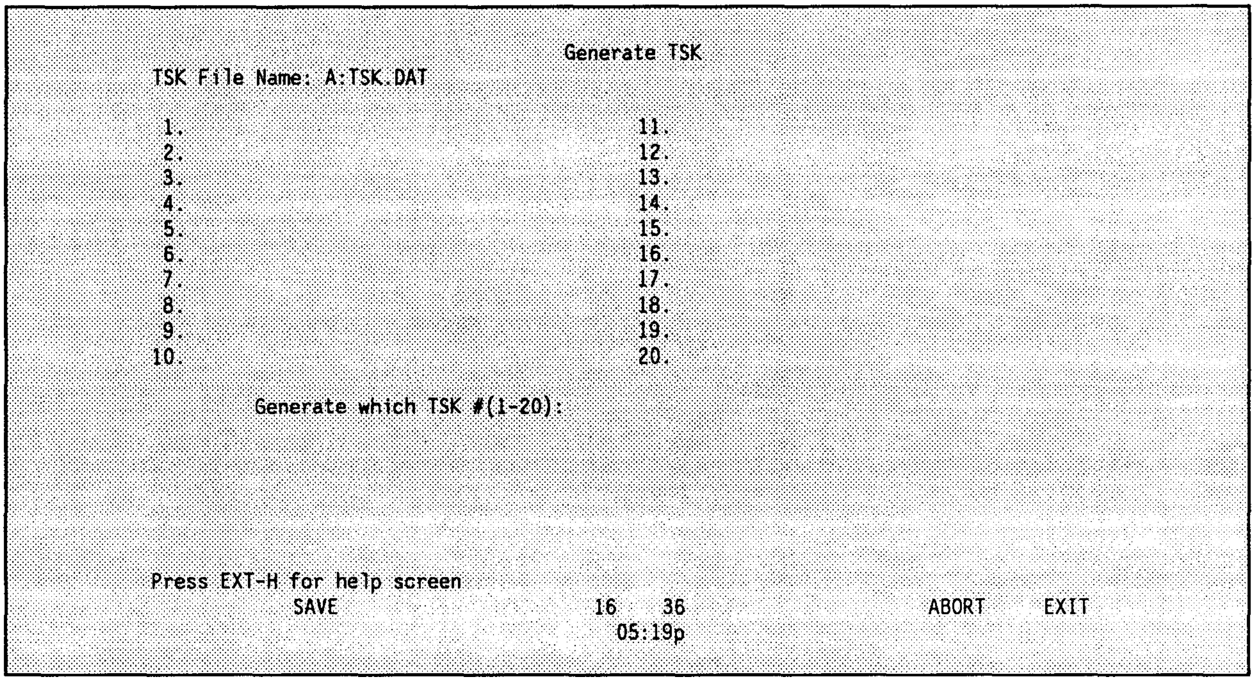
```
                         TRANSEC Key Menu

                    (f1)  Generate TRANSEC Key
                    (f2)  Delete TRANSEC Key
                    (f8)  Previous Menu

            Press the function key that corresponds to your menu choice




     Press EXT-H for help screen
     GENERATE   DELETE             13   75                   PREVIOUS
     TRANSEC    TRANSEC              05:02p                    MENU
```

Figure 2-59 (GEN SINCGARS/f1, f3)

1. Generate TRANSEC Key

Use this option to generate TRANSEC Keys for loading ICOM and Non-ICOM devices. A pair of TRANSEC Keys, one operational and one spare, are generated each time.

Select this option and the screen shown in Figure 2-60 is displayed.



```
                              Generate TSK
TSK File Name: A:TSK.DAT

 1.                                11.
 2.                                12.
 3.                                13.
 4.                                14.
 5.                                15.
 6.                                16.
 7.                                17.
 8.                                18.
 9.                                19.
10.                                20.

        Generate which TSK #(1-20):




Press EXT-H for help screen
            SAVE                 16   36                ABORT    EXIT
                                   05:19p
```

Figure 2-60 (GEN SINCGARS/f1, f3, f1)

At the prompt, type the desired number and press **<RETURN>.** Enter a TRANSEC Key description and press **<RETURN>** or press **<RETURN>** to use the default description. Enter the name and the words "Generating TSK" flash on the screen. The "Generate which TSK #(1-20)" prompt returns. Use the same procedure to generate additional TRANSEC Keys.

NOTE :

When exiting the Generate TRANSEC Key option back to the SINCGARS menu, you are prompted as to whether to save the file. Respond "yes" to save the changes made.

2. Delete TRANSEC Key

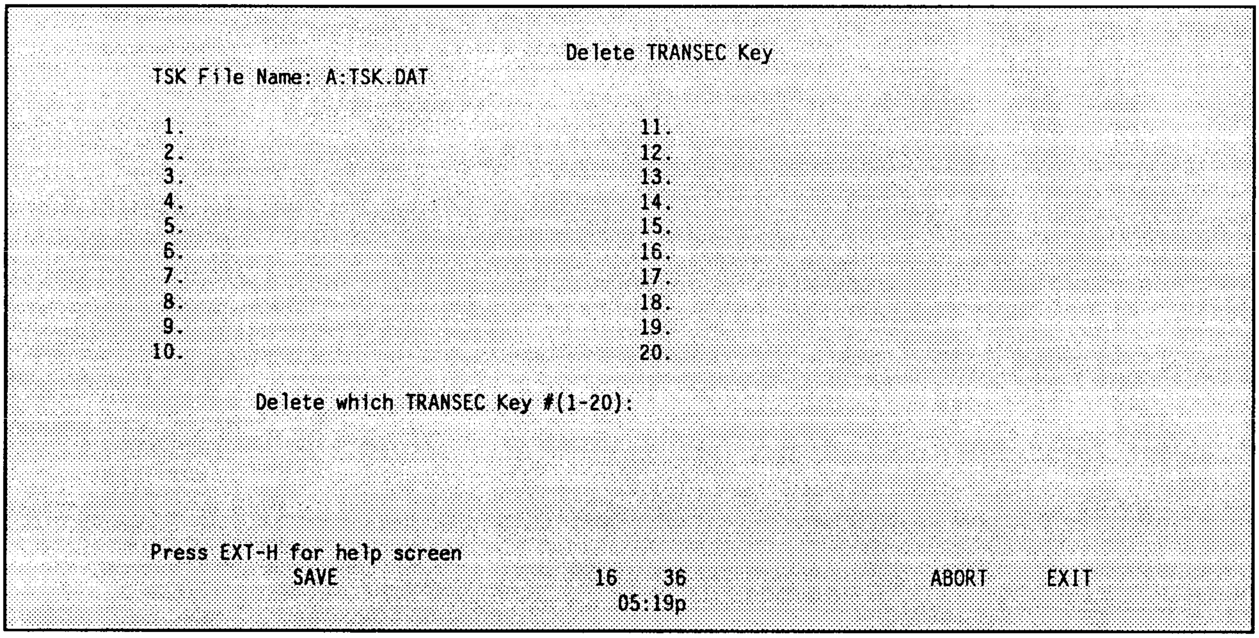
Use this option to delete a TRANSEC Key from the data file.

Select this option and the screen shown in Figure 2-61 is displayed. Enter the number of the TRANSEC Key to be deleted and press <RETURN>. Type "Y" to confirm or type "N" to cancel the deletion and press **<RETURN>.**

GEN SUF/EXP

Use this PAM selection to generate five time periods worth of suffixes and expanders. Once this option is selected, the screen displays:

Loading "GEN SUF/EXP"



```
                                      Delete TRANSEC Key
       TSK File Name: A:TSK.DAT

        1.                                11.
        2.                                12.
        3.                                13.
        4.                                14.
        5.                                15.
        6.                                16.
        7.                                17.
        8.                                18.
        9.                                19.
       10.                                20.

            Delete which TRANSEC Key #(1-20):




       Press EXT-H for help screen
              SAVE                     16   36                   ABORT    EXIT
                                          05:19p
```

Figure 2-61 (GEN SINCGARS?f1, f3, f2)

If the necessary files do not exist, the following message is displayed:

THE SUFFIX FILE DOES NOT EXIST
USE INPUT - CREATE OPTION
THE EXPANDER FILE DOES NOT EXIST
USE INPUT - CREATE OPTION

PRESS <RETURN> TO EXIT

Press <RETURN> and the PAM menu returns. Select the ENTER SOI/CEOI option to create the files.

If the files do exist, the screen displays a message showing the progress of the generation. Once generation is complete, the PAM menu returns. A generation should take only a few minutes.

GEN SIGN/CNTR

Use this PAM selection to generate five time periods of sign/countersign pairs. This section of SOI database generation has been changed since revision F. Once this option is selected, the screen displays:

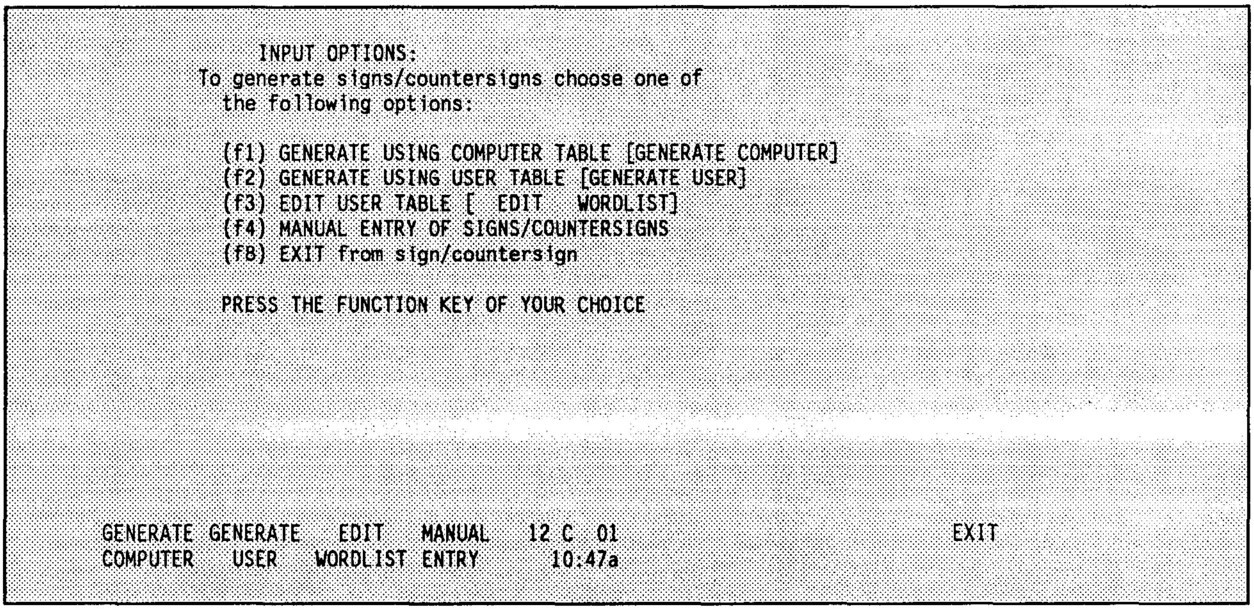
Loading “GEN SIGN/CNTR”

Next, the BGU asks,

“Is this a merged corps database (Y/N)?”

Respond with “Y” or “N” to the question.

Next, the BGU displays the screen shown in Figure 2-62.



```
     INPUT OPTIONS:
To generate signs/countersigns choose one of
  the following options:

  (f1) GENERATE USING COMPUTER TABLE [GENERATE COMPUTER]
  (f2) GENERATE USING USER TABLE [GENERATE USER]
  (f3) EDIT USER TABLE [  EDIT   WORDLIST]
  (f4) MANUAL ENTRY OF SIGNS/COUNTERSIGNS
  (f8) EXIT from sign/countersign

  PRESS THE FUNCTION KEY OF YOUR CHOICE
```

Figure 2-62 (GEN SIGN/CNTR/f1)

f1 - allows you to generate sign/countersign data us ing the table of words supplied with the system software.
f2 - allows you to generate sign/countersign data us ing the table of user-supplied words.
f3 - allows you to edit the user table of words.
f4 - allows you to manually enter signs/countersigns for each time period.
f8 - allows you to exit from sign/countersign generation.

After selecting <f1> from Figure 2-62, the BGU starts the generation of sign/countersign data and displays the following message after the completion of each time period.

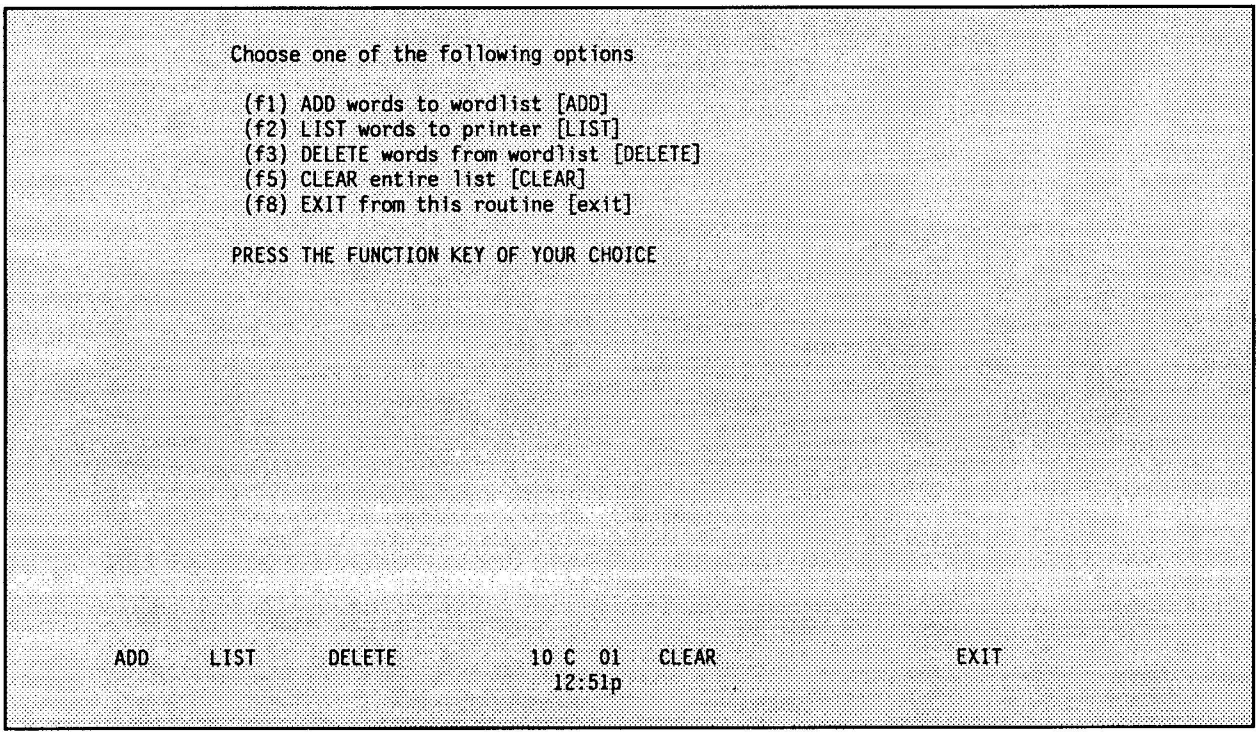
SIGN/COUNTERSIGN GENERATION COMPLETE
FILE IS BEING SAVED

After the completion of all five time periods, hit any key to continue.

Selecting <f2> from Figure 2-62 causes the BGU to display the same messages that are displayed when selecting <f1>. The only difference is that the BGU uses the user's table to generate the sign/countersign information. If there are not enough words in the user's wordlist, the BGU does not complete the generation and displays a message telling you how many words must be included in the wordlist for a successful generation.

A. EDIT USER TABLE

Selecting <f3> from Figure 2-62 allows you to edit the user table. After selecting <f3>, the screen shown in Figure 2-63 is displayed.



Choose one of the following options

(f1) ADD words to wordlist [ADD]
(f2) LIST words to printer [LIST]
(f3) DELETE words from wordlist [DELETE]
(f5) CLEAR entire list [CLEAR]
(f8) EXIT from this routine [exit]

PRESS THE FUNCTION KEY OF YOUR CHOICE

Figure 2-63 (GEN SIGN/CNTR/f1, f3)

f1 - allows you to ADD words to the current wordlist.
f2 - allows you to LIST all the words in the current wordlist to the printer.
f3 - allows you to DELETE words from the current wordlist.
f5 - allows you to CLEAR the entire current wordlist.
f8 - allows you to EXIT from the edit wordlist mode and return to the previous menu.

The remainder of this section describes the options shown in Figure 2-63.

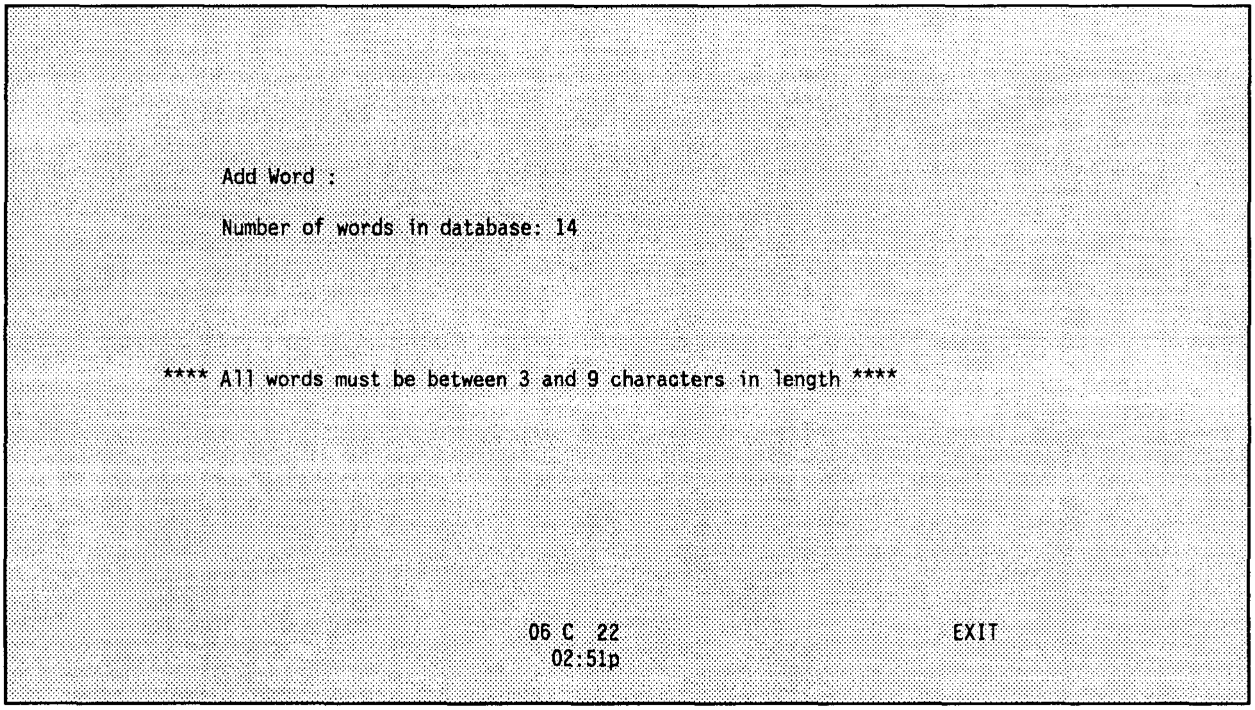
1. ADD

Selecting **<f1>** from Figure 2-63 allows you to add words to the wordlist. After selecting **<f1>,** the screen shown in Figure 2-64 is displayed.

To add a word, type in the word at the prompt and hit <RETURN>. This screen automatically updates the total word count. All words must be between three and nine characters in length and can be alpha characters (A-Z), numeric characters (0-9), - (dash), _ (underscore), / (slash), or ‘ (apostrophe).

NOTE:

The User Table must contain a minimum of 20 words and can contain a maximum of 1500 words.



```
        Add Word :

        Number of words in database: 14



    **** All words must be between 3 and 9 characters in length ****




                              06 C  22                    EXIT
                                02:51p
```

Figure 2-64 (GEN SING/CNTR/f1, f3, f1)

2. LIST

This option allows you to print all the words in the wordlist. After selecting <f2>, the words in the wordlist are printed. The words are numbered for user convenience.

3. DELETE

This option allows you to delete words in the user's wordlist. After selecting <f3>, the screen shown in Figure 2-65 is displayed.

To delete a word, type in the word at the prompt and hit RETURN. This screen automatically updates the total word count.

4. CLEAR

This option allows you to clear the entire wordlist. After selecting <f5>, the following question is displayed,

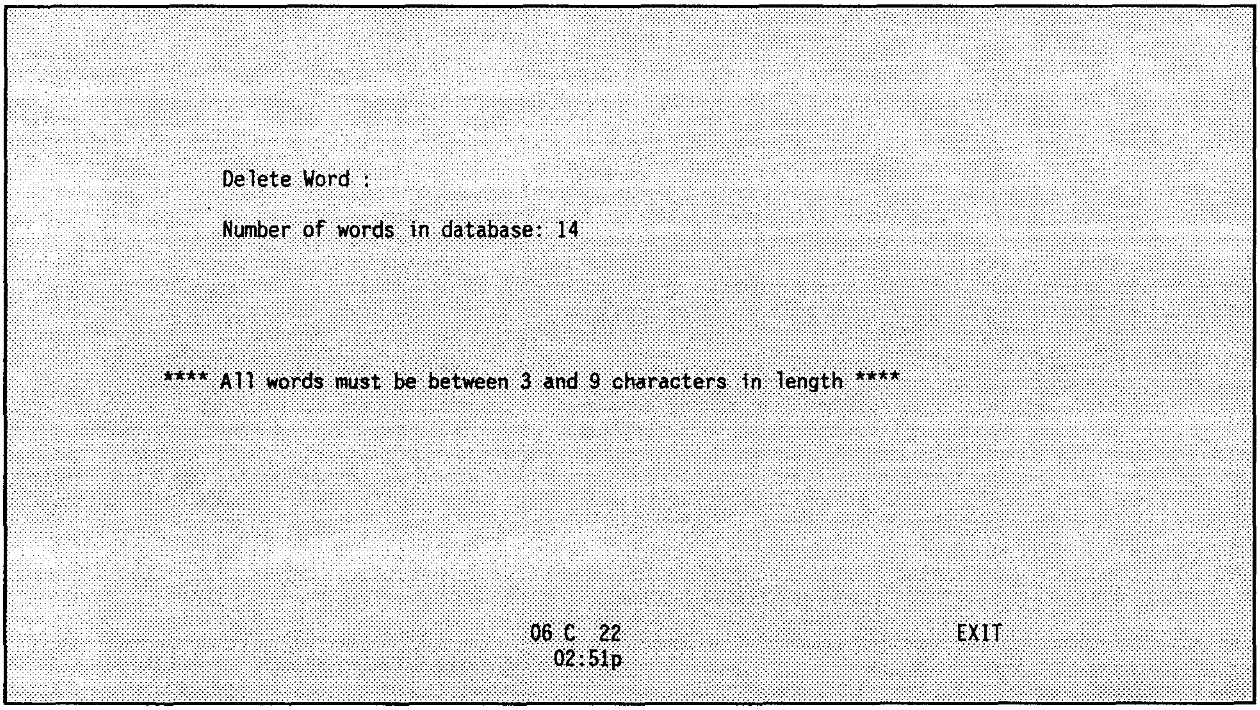
> "Are you sure you want to clear entire list(Y/N)?"

If you enter a "Y", the entire list is erased. If you enter a "N", the BGU returns to the screen shown in Figure 2-63.

B. MANUAL ENTRY OF SIGNS/COUNTERSIGNS

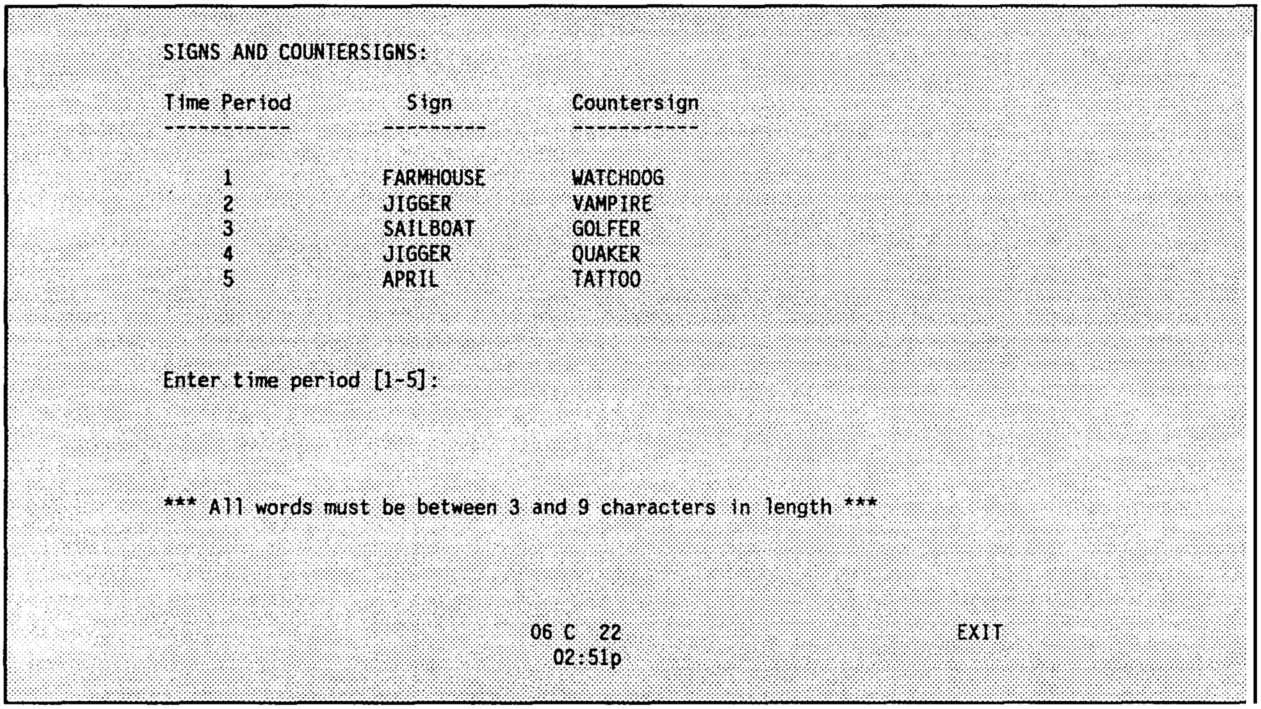
This option allows manual entry of signs and countersigns. You are allowed to change the sign/countersign pair for any of the five time periods.

Select this option and the screen shown in Figure 2-66 is displayed.



```
     Delete Word :

     Number of words in database: 14



**** All words must be between 3 and 9 characters in length ****





                         06 C  22                    EXIT
                          02:51p
```

Figure 2-65 (GEN SIGN/CNTR/f1, f3, f3)



```
SIGNS AND COUNTERSIGNS:

Time Period         Sign         Countersign
-----------       ---------      -----------

     1            FARMHOUSE      WATCHDOG
     2            JIGGER         VAMPIRE
     3            SAILBOAT       GOLFER
     4            JIGGER         QUAKER
     5            APRIL          TATTOO


Enter time period [1-5]:



*** All words must be between 3 and 9 characters in length ***



                         06 C  22                    EXIT
                          02:51p
```

Figure 2-66 (GEN SIGN/CNTR/f1, f4)

If the sign/countersign file does not exist upon selecting <f4>, a blank list is displayed. If you attempt to exit (<f8>) when at least one sign or countersign is left blank, you are warned that the signs/countersigns are not saved while the blank(s) exist and you are given the chance to modify the list or exit.

Enter the time period at the prompt shown in Figure 2-66 and you are prompted to enter a new sign. Press **<RETURN>** to enter the default sign or type a new sign and press **<RETURN>** to enter it. Next, you are prompted to enter a new countersign. Again, press <RETURN> to enter the default or type a new countersign and press <RETURN>. After signs/countersigns for all time periods have been entered, press <f8> to return to the INPUT OPTIONS menu (Figure 2-62).

GEN SMOKE/PYRO

Use this PAM selection to select five time periods worth of smoke/pyrotechnic information. The GEN SMOKE/PYRO option has changed since REV F. You must select how the data is paired; it is not done automatically by the system. Once this option is selected, the screen displays:

Loading **"GEN SMOKE/PYRO"**

Next, the BGU asks,

"Is this a merged corps database (Y/N)?"

Respond with "Y" or "N" to the question. Next, the screen shown in Figure 2-67 is displayed.

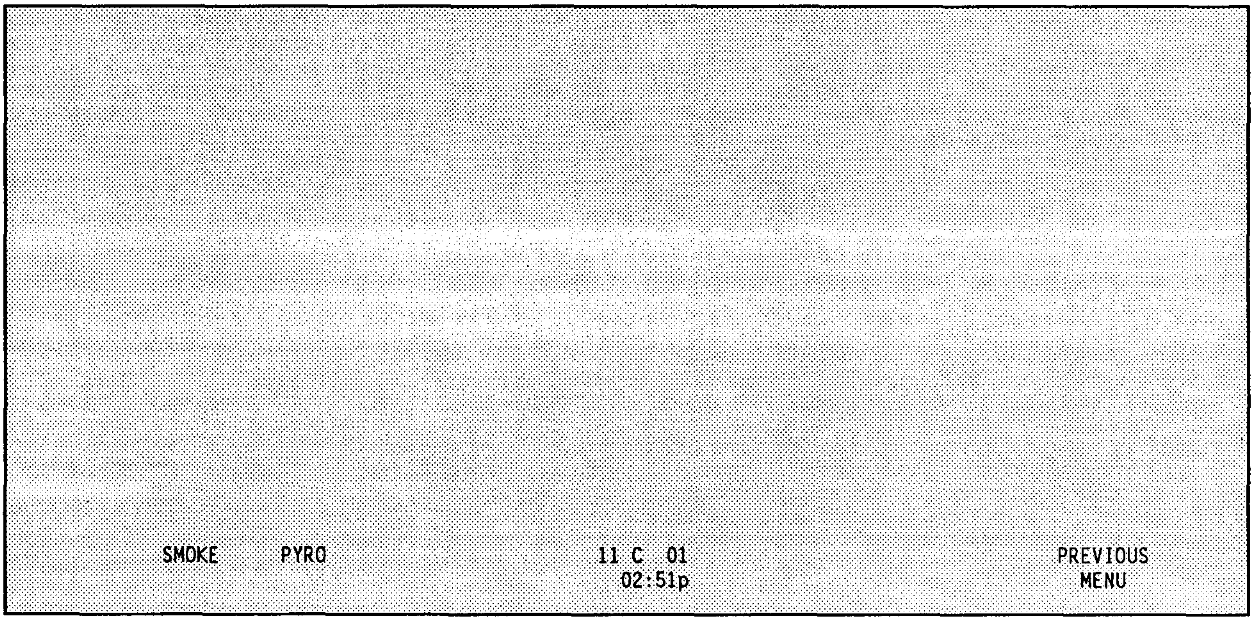
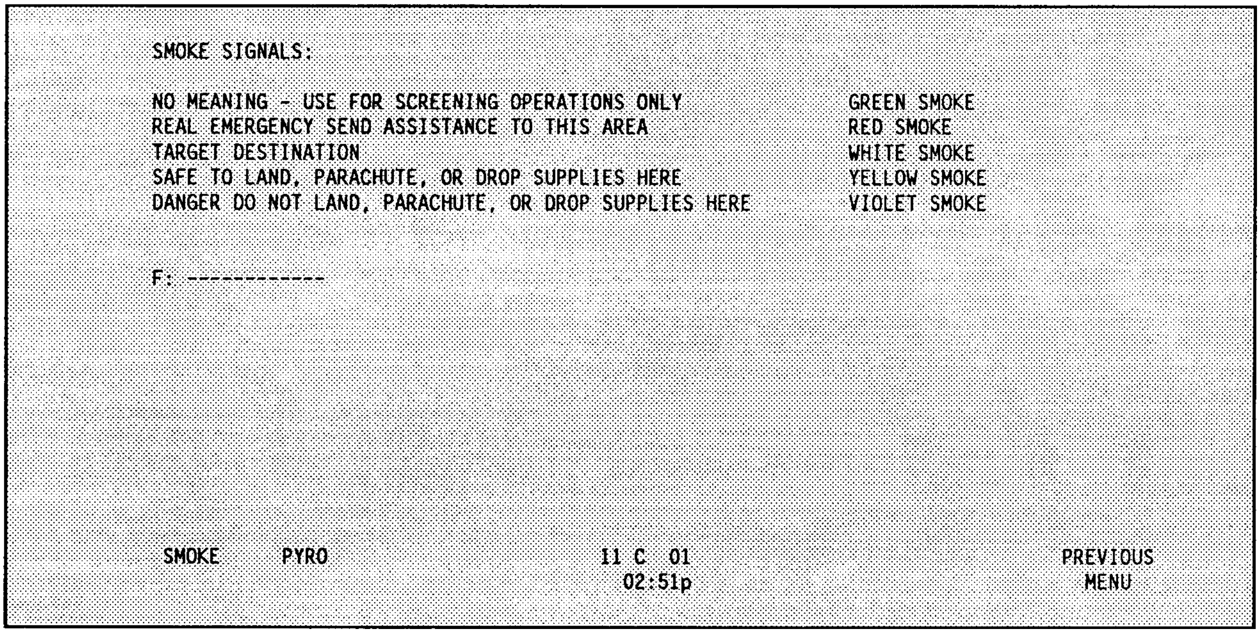


Figure 2-67 (GEN SMOKE/PYRO/f1)

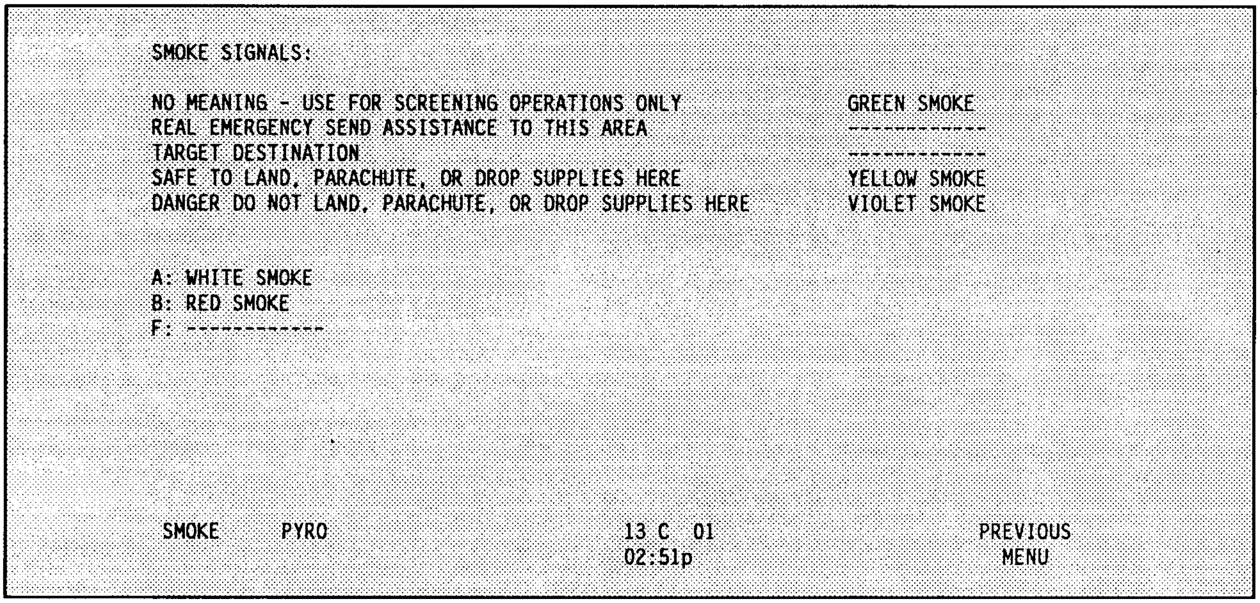
Press the <f1> key to modify the smoke information. After selecting <f1>, the screen shown in Figure 2-68 is displayed.

From this screen, you can select smoke information by switching the right column around. To swap the second and third smoke signals. You would first move the smoke signals" down below as shown in Figure 2-69 and then move the signals back in reversed order. The signals are moved by highlighting the entry and pressing the **<F>** key to select a blank for that spot. The signal moves down below.



```
SMOKE SIGNALS:

NO MEANING - USE FOR SCREENING OPERATIONS ONLY             GREEN SMOKE
REAL EMERGENCY SEND ASSISTANCE TO THIS AREA                RED SMOKE
TARGET DESTINATION                                         WHITE SMOKE
SAFE TO LAND, PARACHUTE, OR DROP SUPPLIES HERE             YELLOW SMOKE
DANGER DO NOT LAND, PARACHUTE, OR DROP SUPPLIES HERE       VIOLET SMOKE


F: ------------









 SMOKE     PYRO                     11 C  01                          PREVIOUS
                                     02:51p                             MENU
```

Figure 2-68 (GEN SMOKE/PYRO/fl, f1)

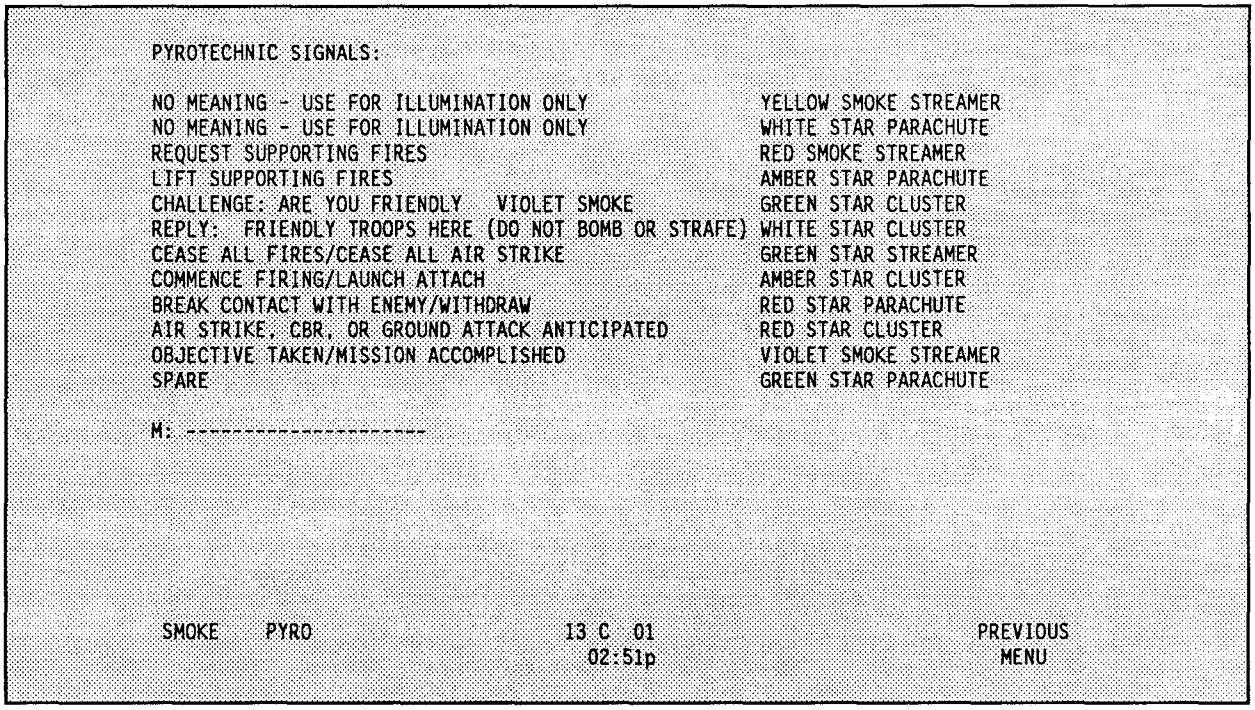


```
SMOKE SIGNALS:

NO MEANING - USE FOR SCREENING OPERATIONS ONLY             GREEN SMOKE
REAL EMERGENCY SEND ASSISTANCE TO THIS AREA                ------------
TARGET DESTINATION                                         ------------
SAFE TO LAND, PARACHUTE, OR DROP SUPPLIES HERE             YELLOW SMOKE
DANGER DO NOT LAND, PARACHUTE, OR DROP SUPPLIES HERE       VIOLET SMOKE


A: WHITE SMOKE
B: RED SMOKE
F: ------------







 SMOKE     PYRO                      13 C  01                     PREVIOUS
                                     02:51p                         MENU
```

Figure 2-69 (GEN SMOKE/PYRO/f1, **f1)**

The signals below can be moved back to the top by highlighting a blanked area with dashes and pressing the letter key that corresponds with the smoke signal . For example, to complete the swap in Figure 2-69 you would highlight the second dashed entry opposite “REAL EMERGENCY...”. Press the <A> key to move the WHITE SMOKE signal to the second position and highlight the third dashed position opposite “TARGET DESIGNATION”; press the <B> key to move the RED SMOKE signal to the third position in the right column. Follow this technique to select five time periods of smoke information for the database.

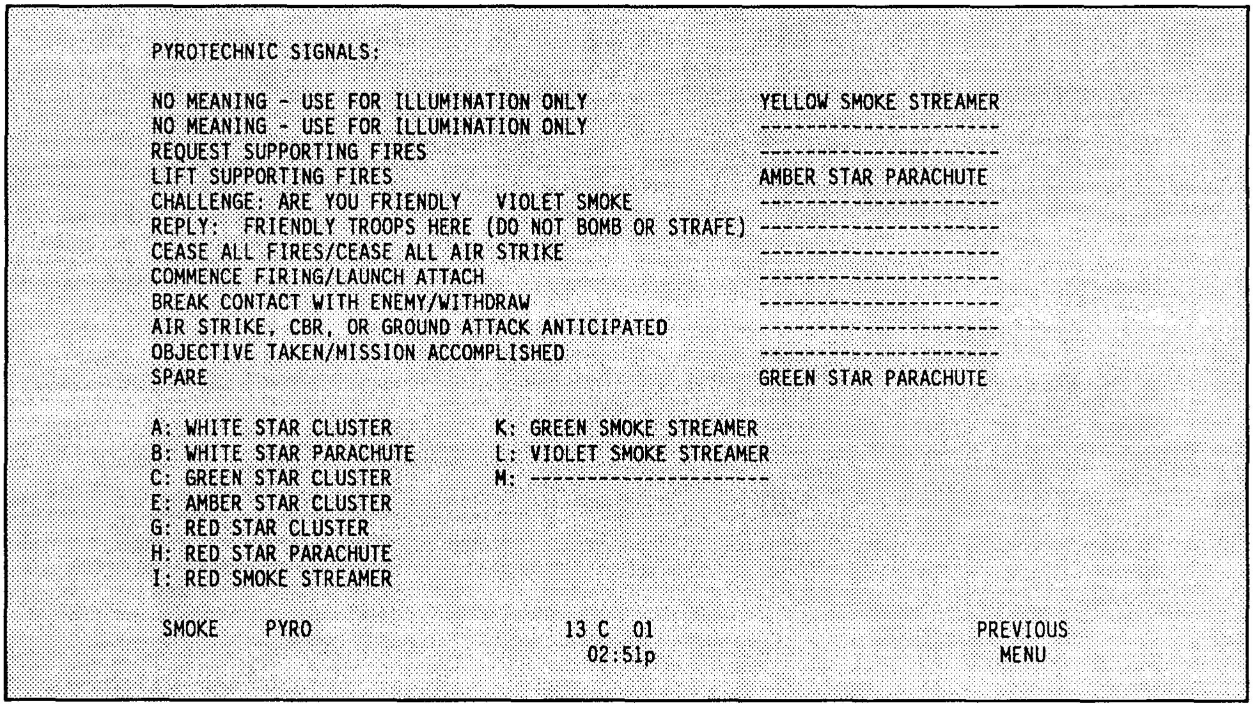
To select the pyrotechnic signals, press the <f2> function key to get to the screen shown in Figure 2-70.



```
PYROTECHNIC SIGNALS:

NO MEANING - USE FOR ILLUMINATION ONLY             YELLOW SMOKE STREAMER
NO MEANING - USE FOR ILLUMINATION ONLY             WHITE STAR PARACHUTE
REQUEST SUPPORTING FIRES                           RED SMOKE STREAMER
LIFT SUPPORTING FIRES                              AMBER STAR PARACHUTE
CHALLENGE: ARE YOU FRIENDLY   VIOLET SMOKE         GREEN STAR CLUSTER
REPLY:  FRIENDLY TROOPS HERE (DO NOT BOMB OR STRAFE) WHITE STAR CLUSTER
CEASE ALL FIRES/CEASE ALL AIR STRIKE               GREEN STAR STREAMER
COMMENCE FIRING/LAUNCH ATTACH                      AMBER STAR CLUSTER
BREAK CONTACT WITH ENEMY/WITHDRAW                  RED STAR PARACHUTE
AIR STRIKE, CBR, OR GROUND ATTACK ANTICIPATED      RED STAR CLUSTER
OBJECTIVE TAKEN/MISSION ACCOMPLISHED               VIOLET SMOKE STREAMER
SPARE                                              GREEN STAR PARACHUTE

M: --------------------




 SMOKE    PYRO                   13 C  01                          PREVIOUS
                                  02:51p                             MENU
```

Figure 2-70 (GEN SMOKE/PYRO/f1, f2)

You can select the pyrotechnic information by moving the selections in the right column to the intended meaning. Figure 2-71 shows a screen with some of the signals moved to the bottom temporarily in the reordering process.



```
PYROTECHNIC SIGNALS:

NO MEANING - USE FOR ILLUMINATION ONLY             YELLOW SMOKE STREAMER
NO MEANING - USE FOR ILLUMINATION ONLY             ---------------------
REQUEST SUPPORTING FIRES                           ---------------------
LIFT SUPPORTING FIRES                              AMBER STAR PARACHUTE
CHALLENGE: ARE YOU FRIENDLY   VIOLET SMOKE         ---------------------
REPLY:  FRIENDLY TROOPS HERE (DO NOT BOMB OR STRAFE) ---------------------
CEASE ALL FIRES/CEASE ALL AIR STRIKE               ---------------------
COMMENCE FIRING/LAUNCH ATTACH                      ---------------------
BREAK CONTACT WITH ENEMY/WITHDRAW                  ---------------------
AIR STRIKE, CBR, OR GROUND ATTACK ANTICIPATED      ---------------------
OBJECTIVE TAKEN/MISSION ACCOMPLISHED               ---------------------
SPARE                                              GREEN STAR PARACHUTE

A: WHITE STAR CLUSTER         K: GREEN SMOKE STREAMER
B: WHITE STAR PARACHUTE       L: VIOLET SMOKE STREAMER
C: GREEN STAR CLUSTER         M: --------------------
E: AMBER STAR CLUSTER
G: RED STAR CLUSTER
H: RED STAR PARACHUTE
I: RED SMOKE STREAMER

 SMOKE    PYRO                   13 C  01                          PREVIOUS
                                  02:51p                             MENU
```

Figure 2-71 (GEN SMOKE/PYRO/f1, f2)

The technique for moving the pyrotechnic signals is similar to the smoke signals previously described except you use the <M> key to highlight.

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SPARE TRANSEC 2-109
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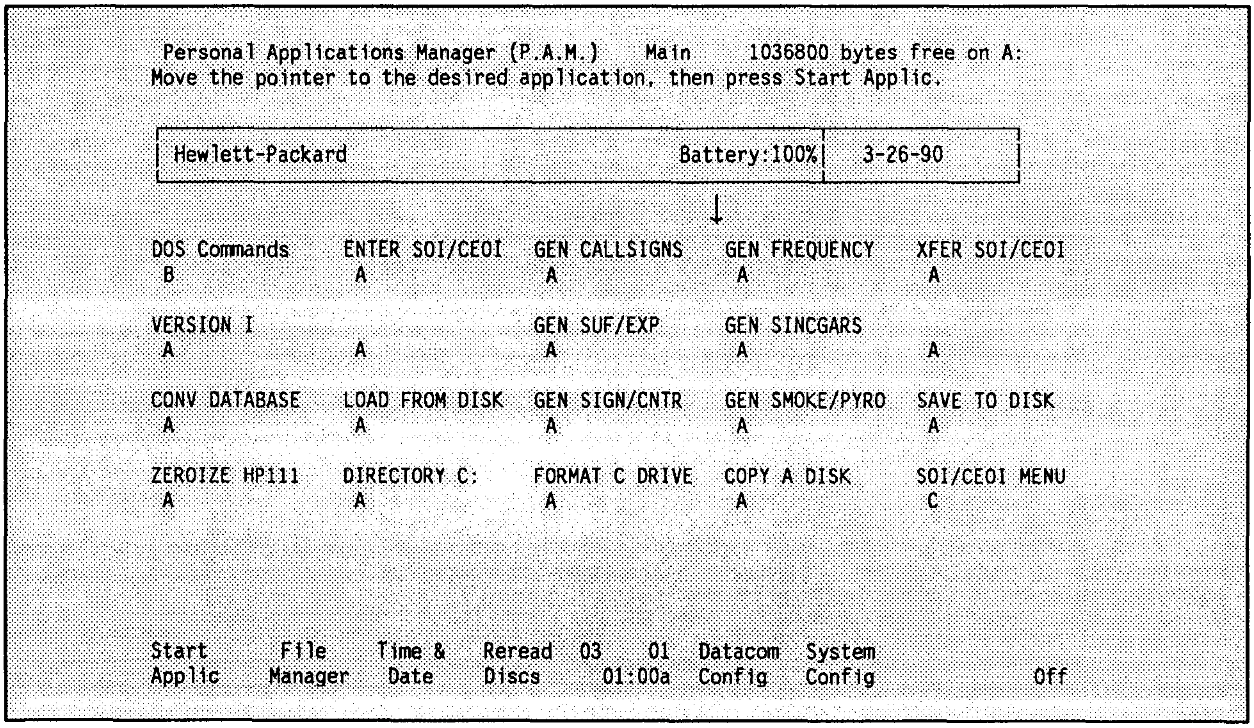
INTRODUCTION

This chapter describes how to use the OUTPUT component of the BGU software. Use this chapter to learn how to display completed SOI to the screen (see Display, page 2-87), print packages of SOI data (see Print, page 2-93), output data to be used for merging (see Diskette, Merge, page 2-98), load a ECCM fill device (see ECCM, page 2-102).

INITIAL MENU



Personal Applications Manager (P.A.M.) Main 1036800 bytes free on A:
Move the pointer to the desired application, then press Start Applic.

Hewlett-Packard
Battery:100%
3-26-90
DOS Commands B
ENTER SOI/CEOI A
GEN CALLSIGNS A
GEN FREQUENCY A
XFER SOI/CEOI A
VERSION I A
A
GEN SUF/EXP A
GEN SINCGARS A
A
CONV DATABASE A
LOAD FROM DISK A
GEN SIGN/CNTR A
GEN SMOKE/PYRO A
SAVE TO DISK A
ZEROIZE HP111 A
DIRECTORY C: A
FORMAT C DRIVE A
COPY A DISK A
SOI/CEOI MENU C
Start Applic
File Manager
Time & Date
Reread Discs
03 01 01:00a
Datacom Config
System Config
Off

Figure 2-72

To select XFER SOI/CEOI from the PAM Menu in Figure 2-72, position the small arrow over the “XFER SOI/CEOI” block and press <RETURN>. The screen displays:

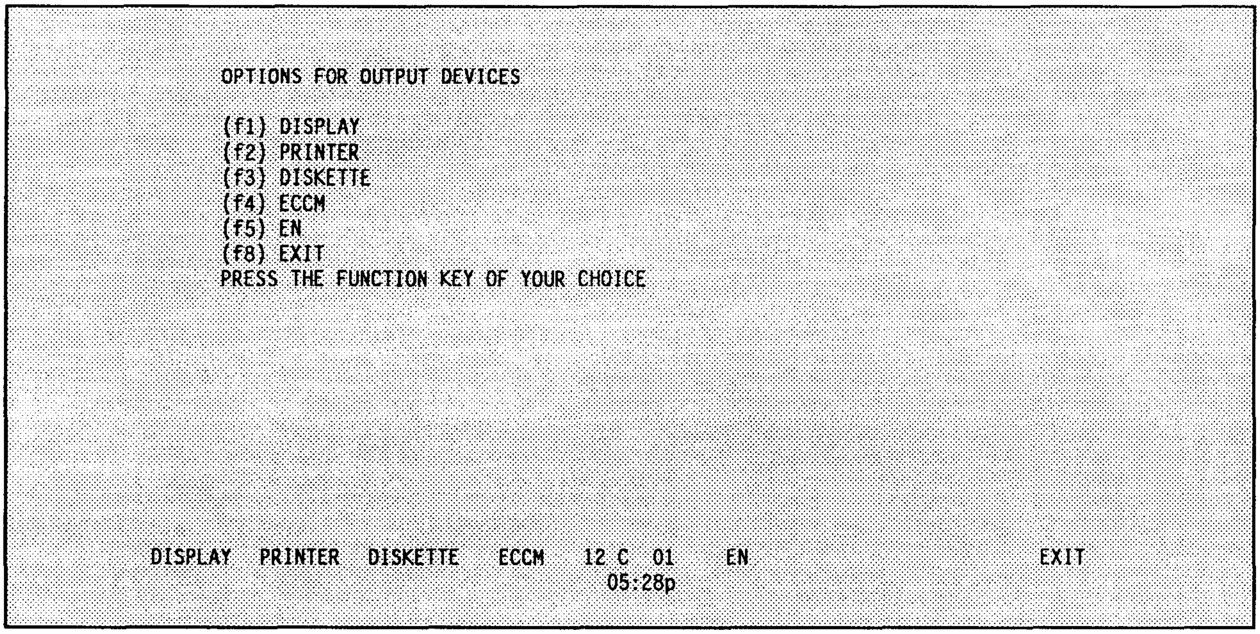
Loading “XFER SOI/CEOI”.

Next, the following message is displayed:

“Wait..obtaining the necessary files.
THE HOPSET FILE DOES NOT EXIST IN BECS FORMAT. IF
YOU WISH TO TRANSFER DATA TO AN EN. YOU MUST GO BACK
TO THE GENERATE SINCGARS PROGRAM AND SAVE THE HOPSET
IN BECS FORMAT. THE HOPSET FILE IN SINISS FORMAT CANNOT
BE USED FOR TRANSFER TO AN EN.

TO CONTINUE HIT ANY KEY

Hit any key and the screen shown in Figure 2-73 is displayed.



```
OPTIONS FOR OUTPUT DEVICES

(f1) DISPLAY
(f2) PRINTER
(f3) DISKETTE
(f4) ECCM
(f5) EN
(f8) EXIT
PRESS THE FUNCTION KEY OF YOUR CHOICE

DISPLAY  PRINTER  DISKETTE   ECCM   12 C  01   EN                     EXIT
                                     05:28p
```

Figure 2-73 (XFERSOI/CEOI/f1)

f1 - allows you to display the completed SOI/CEOI information.
f2 - allows you to print the completed SOI/CEOI information.
f3 - allows you to perform the output portion of a merged operation.
f4 - allows you to transfer SINCGARS data to a fill device.
f5 - allows you to transfer the database to the electronic notebook.
f8 - allows you to return to the previous menu.

The remainder of this section explains the options shown in Figure 2-73 and demonstrates how to transfer the example database information, entered and generated in prior sections of this manual, to the output devices indicated.

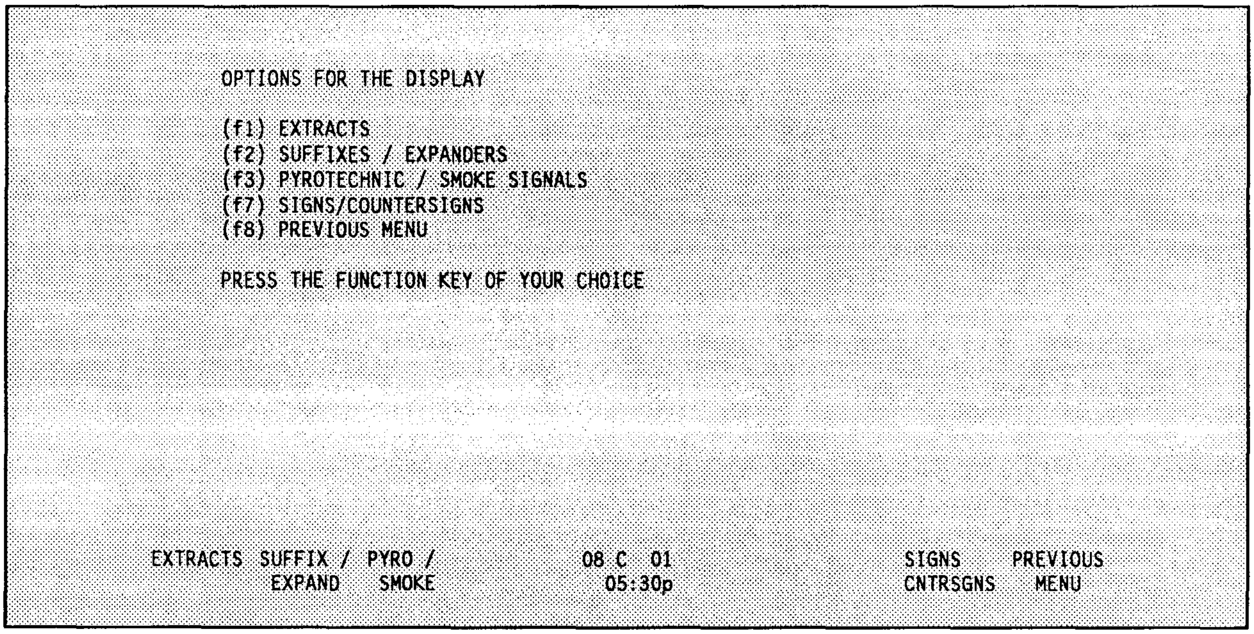
DISPLAY

Use this option to display to the screen completed SOI information. Once this option is selected, the screen is displayed as shown in Figure 2-74.

f1 - allows you to display the various extracts for five time periods.
f2 - allows you to display the suffixes and expanders for five time periods.
f3 - allows you to display the pyrotechnic and smoke signals for five time periods.
f7 - allows you to display the sign/countersigns assignments for five time periods.
f8 - allows you to return to the previous menu.

If a completed SOI generation has not been performed, only the options which have been generated are displayed.

The remainder of this section describes the function key choices shown in Figure 2-74.

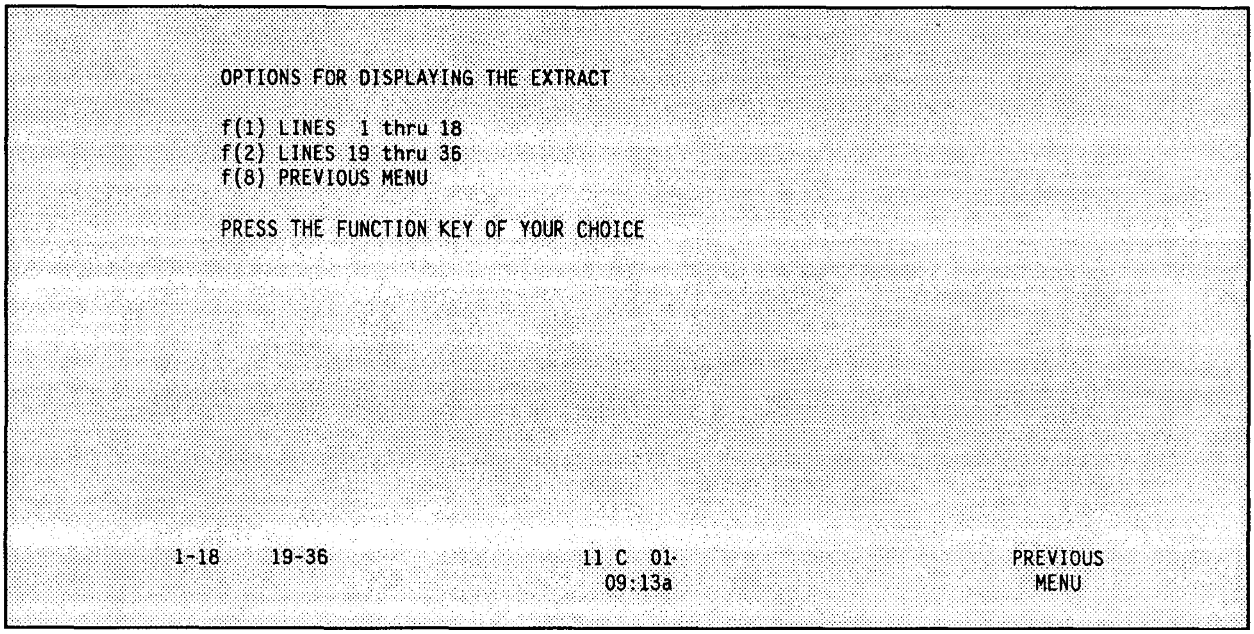


```
OPTIONS FOR THE DISPLAY

(f1) EXTRACTS
(f2) SUFFIXES / EXPANDERS
(f3) PYROTECHNIC / SMOKE SIGNALS
(f7) SIGNS/COUNTERSIGNS
(f8) PREVIOUS MENU

PRESS THE FUNCTION KEY OF YOUR CHOICE




EXTRACTS SUFFIX / PYRO /          08 C  01              SIGNS    PREVIOUS
          EXPAND   SMOKE            05:30p              CNTRSGNS   MENU
```

Figure 2-74 (XFER SOI/CEOI/f1, f1)

A. EXTRACTS

Use this option to display the various extracts for each of the five time periods. Once this option is selected, indicate which extract to display and which time period to display. Once these choices are made, the screen shown in Figure 2-75 appears.



```
OPTIONS FOR DISPLAYING THE EXTRACT

f(1) LINES  1 thru 18
f(2) LINES 19 thru 36
f(8) PREVIOUS MENU

PRESS THE FUNCTION KEY OF YOUR CHOICE




  1-18    19-36                  11 C  01                        PREVIOUS
                                   09:13a                          MENU
```

Figure 2-75 (XFER SOI/CEOI/f1, f1, f1)

f1 - allows you to display the information for the first 18 nets in the extract.
f2 - allows you to display the information for the last 18 nets in the extract.
f8 - allows you to return to the previous menu.

B. SUFFIXES/EXPANDERS

Use this option to display the suffixes and expanders for the five time periods. Once this option is selected, the following screen shown in Figure 2-76 appears.

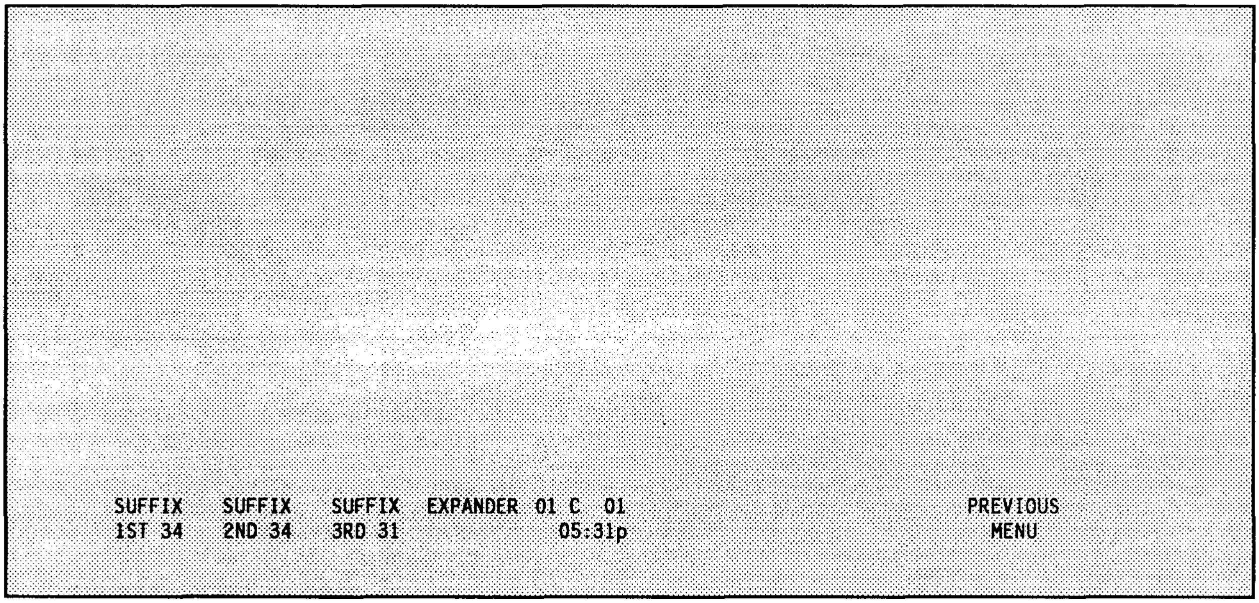


Figure 2-76 (XFERSOI/CEOI/f1, f1, f2)

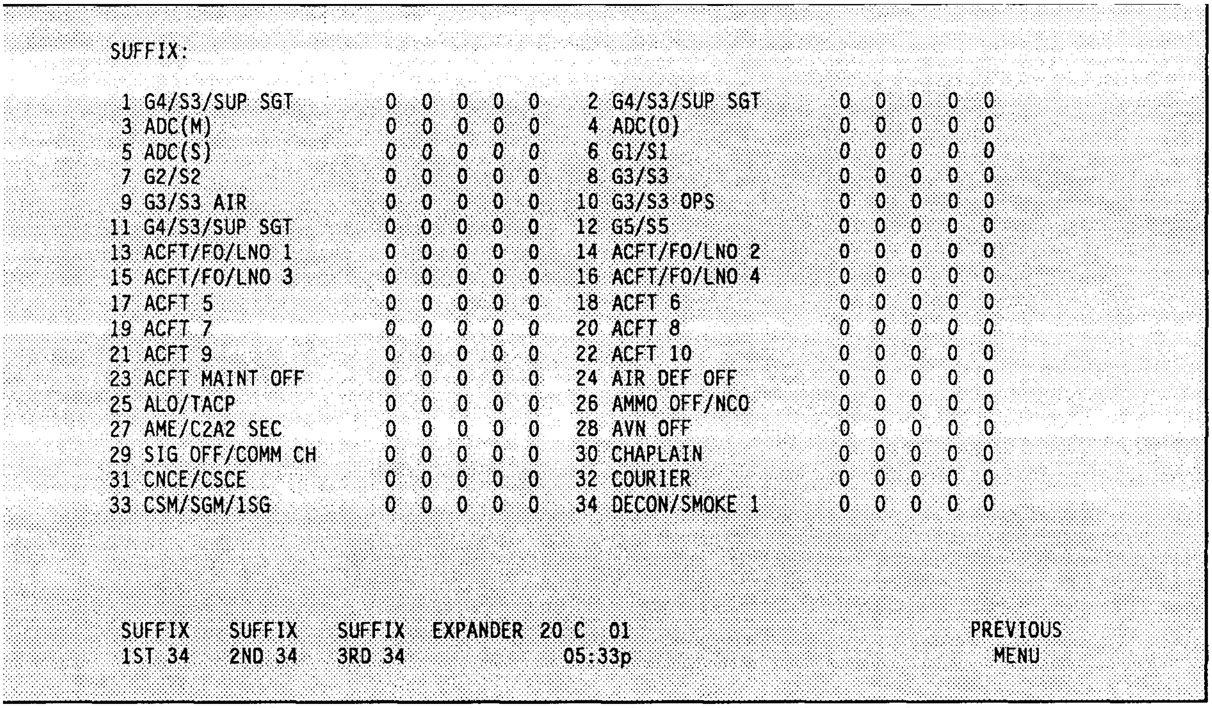
f1 - allows you to display the first 34 suffixes.
f2 - allows you to display the second 34 suffixes.
f3 - allows you to display the last 31 suffixes.
f4 - allows you to display the expanders.
f8 - allows you to return to the previous menu.

For example, pressing the <f1> key shows the first 34 suffixes as shown in Figure 2-77.

C. PYROTECHNIC/SMOKE SIGNALS

Use this option to display the pyrotechnic and smoke signals to be used for five time periods. Once <f3> is selected from Figure 2-74, you are given the screen shown in Figure 2-78.

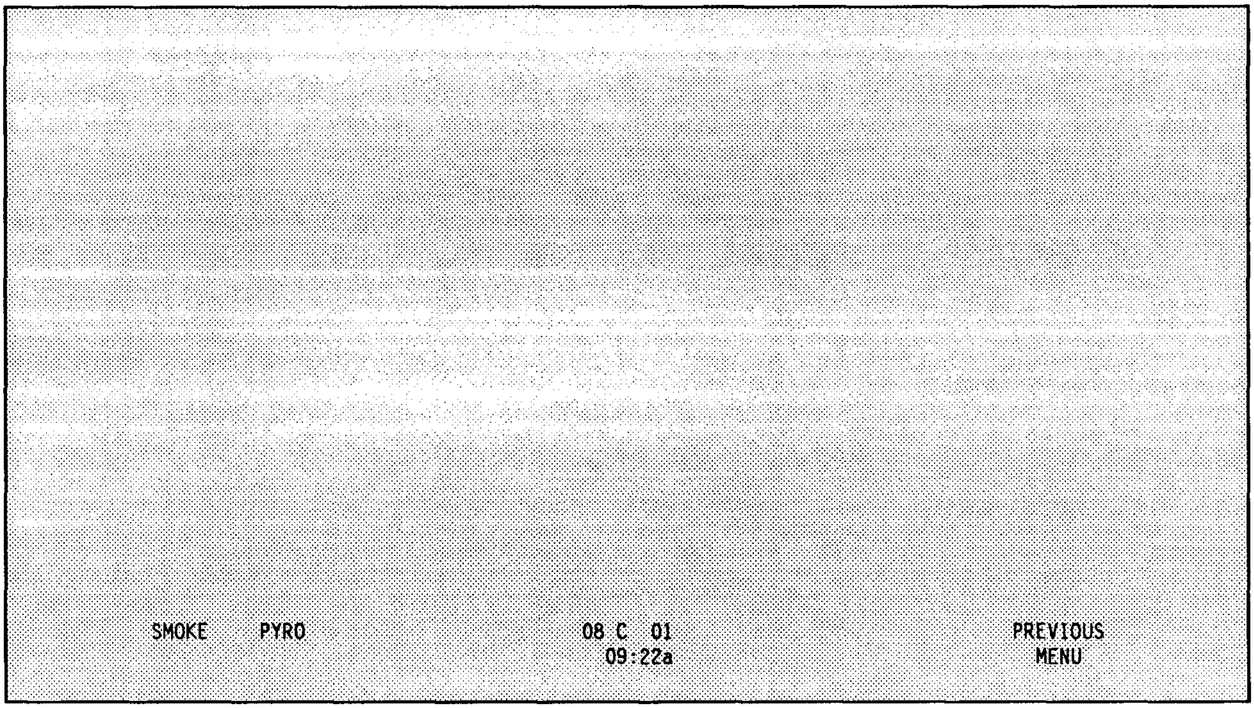
f1 - allows you to display the smoke signal assignments.
f2 - allows you to display the pyrotechnic signal assignments.
f8 - allows you to return to the previous menu.



```
SUFFIX:

 1 G4/S3/SUP SGT       0  0  0  0  0    2 G4/S3/SUP SGT      0  0  0  0  0
 3 ADC(M)              0  0  0  0  0    4 ADC(O)             0  0  0  0  0
 5 ADC(S)              0  0  0  0  0    6 G1/S1              0  0  0  0  0
 7 G2/S2               0  0  0  0  0    8 G3/S3              0  0  0  0  0
 9 G3/S3 AIR           0  0  0  0  0   10 G3/S3 OPS          0  0  0  0  0
11 G4/S3/SUP SGT       0  0  0  0  0   12 G5/S5              0  0  0  0  0
13 ACFT/FO/LNO 1       0  0  0  0  0   14 ACFT/FO/LNO 2      0  0  0  0  0
15 ACFT/FO/LNO 3       0  0  0  0  0   16 ACFT/FO/LNO 4      0  0  0  0  0
17 ACFT 5              0  0  0  0  0   18 ACFT 6             0  0  0  0  0
19 ACFT 7              0  0  0  0  0   20 ACFT 8             0  0  0  0  0
21 ACFT 9              0  0  0  0  0   22 ACFT 10            0  0  0  0  0
23 ACFT MAINT OFF      0  0  0  0  0   24 AIR DEF OFF        0  0  0  0  0
25 ALO/TACP            0  0  0  0  0   26 AMMO OFF/NCO       0  0  0  0  0
27 AME/C2A2 SEC        0  0  0  0  0   28 AVN OFF            0  0  0  0  0
29 SIG OFF/COMM CH     0  0  0  0  0   30 CHAPLAIN           0  0  0  0  0
31 CNCE/CSCE           0  0  0  0  0   32 COURIER            0  0  0  0  0
33 CSM/SGM/1SG         0  0  0  0  0   34 DECON/SMOKE 1      0  0  0  0  0
```

SUFFIX
1ST 34
SUFFIX
2ND 34
SUFFIX
3RD 34
EXPANDER 20 C 01
05:33p
PREVIOUS
MENU

Figure 2-77 (XFER SOI/CEOI/f1, f1, f3)



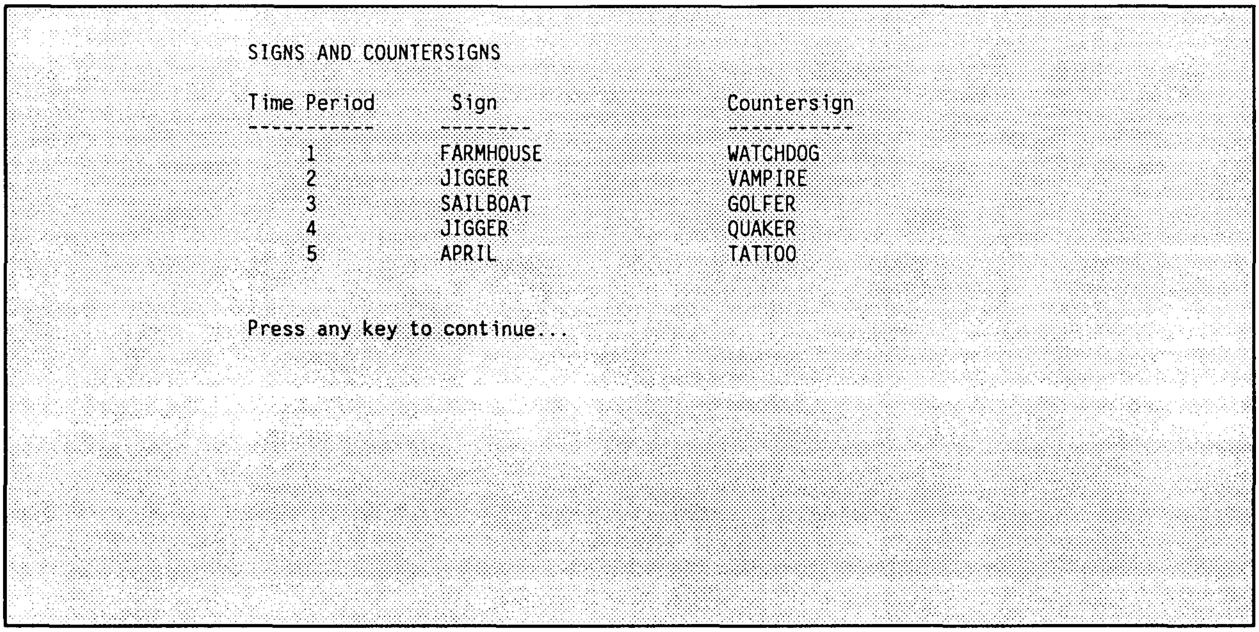
SMOKE
PYRO
08 C 01
09:22a
PREVIOUS
MENU

Figure 2-78 (XFER SOI/CEOI/f1, f1, f3)

D. SIGNS/COUNTERSIGNS

Use this option to display the signs/countersigns assignments for five time periods. Once <f7> is selected from Figure 2-74, the screen shown in Figure 2-79 is displayed.

Press any key and the display options return.



```
SIGNS AND COUNTERSIGNS

Time Period      Sign                Countersign
-----------     --------             -----------
     1          FARMHOUSE            WATCHDOG
     2          JIGGER               VAMPIRE
     3          SAILBOAT             GOLFER
     4          JIGGER               QUAKER
     5          APRIL                TATTOO


Press any key to continue...
```

Figure 2-79 (XFER SOI/CEOI/f1, f1, f7)

PRINTER

Use this option to print out the completed SOI information.

CAUTION:

Paper must be in the printer and printer must be turned on before printing any SOI/CEOI information.

Once this option is selected the screen shown in Figure 2-80 appears.

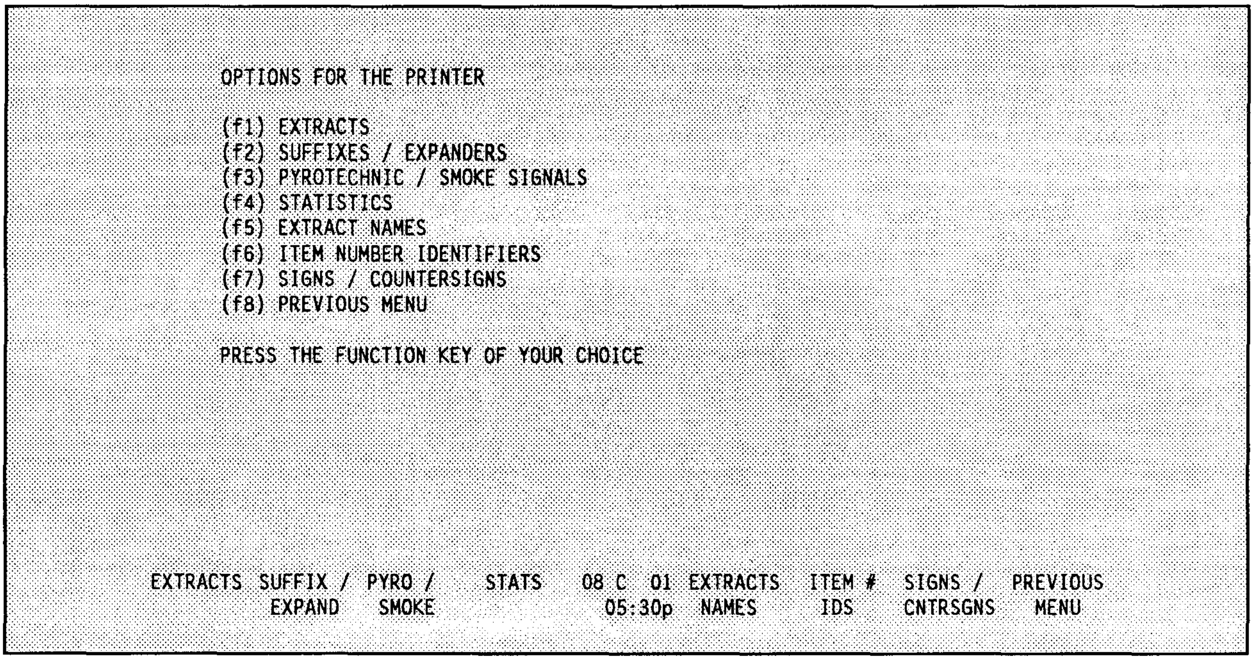
If a complete SOI generation has not been performed only the options which have been generated are displayed.

The remainder of this section explains the function key options shown in Figure 2-80.

A. EXTRACTS

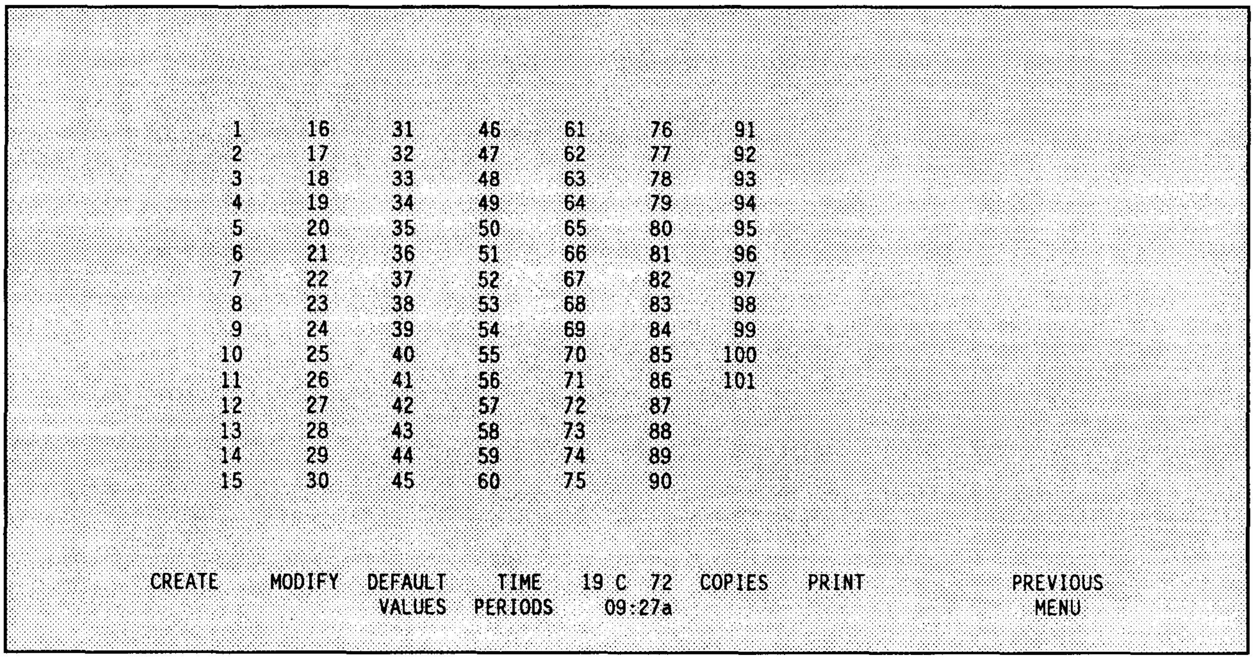
Use this option to print SOI extract packets. Once this option is selected. a screen with 10 columns as shown in Figure 2-81 appears. The data shown is a sample. Each column can contain 15 net group numbers, thus totaling 150 net groups. Not all columns are filled in Figure 2-81.

The remainder of this section explains the function key options shown in Figure 2-81.



```
OPTIONS FOR THE PRINTER

(f1) EXTRACTS
(f2) SUFFIXES / EXPANDERS
(f3) PYROTECHNIC / SMOKE SIGNALS
(f4) STATISTICS
(f5) EXTRACT NAMES
(f6) ITEM NUMBER IDENTIFIERS
(f7) SIGNS / COUNTERSIGNS
(f8) PREVIOUS MENU

PRESS THE FUNCTION KEY OF YOUR CHOICE




EXTRACTS  SUFFIX /  PYRO /    STATS   08 C  01  EXTRACTS  ITEM #  SIGNS /   PREVIOUS
          EXPAND    SMOKE                05:30p  NAMES     IDS    CNTRSGNS   MENU
```

Figure 2-80 (XFER SOI/CEOI/f1, f2)



```
 1    16    31    46    61    76    91
 2    17    32    47    62    77    92
 3    18    33    48    63    78    93
 4    19    34    49    64    79    94
 5    20    35    50    65    80    95
 6    21    36    51    66    81    96
 7    22    37    52    67    82    97
 8    23    38    53    68    83    98
 9    24    39    54    69    84    99
10    25    40    55    70    85   100
11    26    41    56    71    86   101
12    27    42    57    72    87
13    28    43    58    73    88
14    29    44    59    74    89
15    30    45    60    75    90


CREATE    MODIFY  DEFAULT    TIME    19 C  72  COPIES   PRINT              PREVIOUS
                  VALUES   PERIODS    09:27a                                 MENU
```

Figure 2-81)XFER SOI/CEOI/f1, f2, f1)

1. CREATE

Use this option to create a new list of net groups to be printed. Once this option is selected, the following question appears:

“This will destroy the current information. Are you sure?(Y/N)

Selecting “Y” destroys the current column information. Selecting “N” does not destroy the current column information and puts you in the screen shown in Figure 2-81 for editing.

Enter the group numbers one at a time starting in the first column and working first down and then across until all desired group numbers are entered. Use the arrow keys and the <RETURN> key to move up and down in a column. Use the <TAB> key to move to the next column to the right and the <SHIFT>-<TAB> combination to move to the next column to the left. Once all of the groups have been entered, use the <f8> PREVIOUS MENU key to save the list.

2. MODIFY

Use this option to modify the net group list that was previously saved. Enter any changes following the procedure in the previous paragraph (See 1. Create, page 2-94.

3. DEFAULT VALUES

Use this option to create a net group list of all net groups defined by you in ENTER SOI (See Net Groups, Input Options, page 2-33).

4. TIME PERIODS

Use this option to choose which time periods are to be printed. Once this option is selected, determine which time periods are to be printed. Use the function keys to make the time period selection. Make this selection before attempting to print.

5. COPIES

Use this option to choose how many copies are to be printed. Select how many copies are to be printed. Type in the number desired and press <RETURN>. Make this selection before attempting to print.

6. PRINT

Use this option to initiate the printing of extracts. Once this option is selected, the printing of extracts begins if all of the necessary information has been provided.

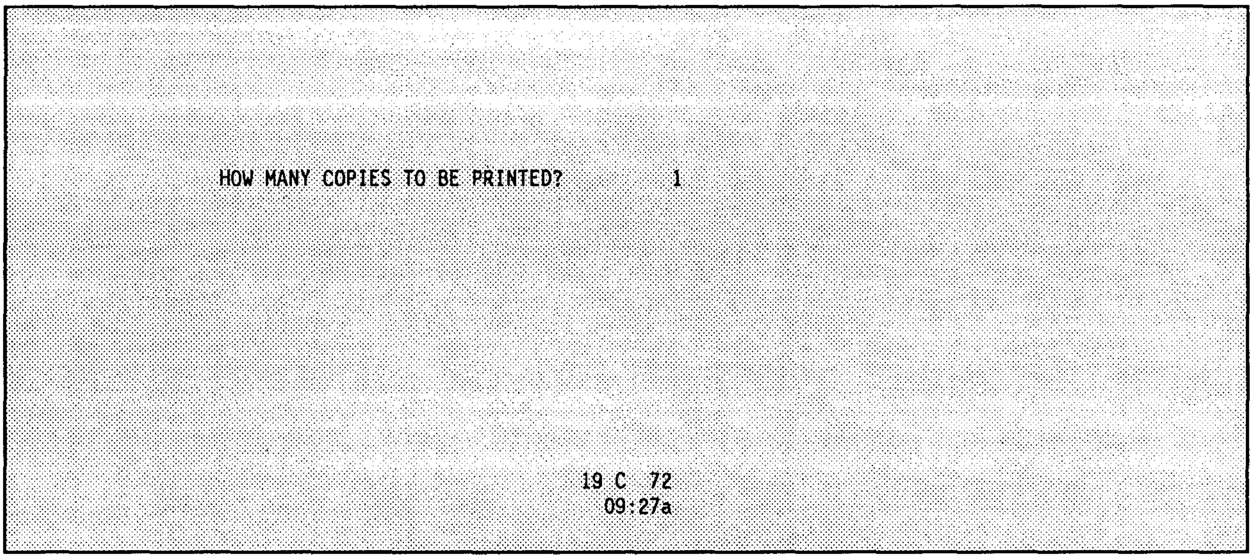
B. SUFFIXES/EXPANDERS

Use this option to print the suffixes and expanders for five time periods. Select how-many copies are to be printed. Enter the desired number and press <RETURN> and the screen shown in Figure 2-82 is displayed.

Press the soft key corresponding to the desired five time periods and the printout begins.

C. PYROTECHNIC/SMOKE SIGNALS

Use this option to print the smoke and pyrotechnic signal assignments for the five time periods. Select how many copies are to be printed. Enter the desired number and press <RETURN>.

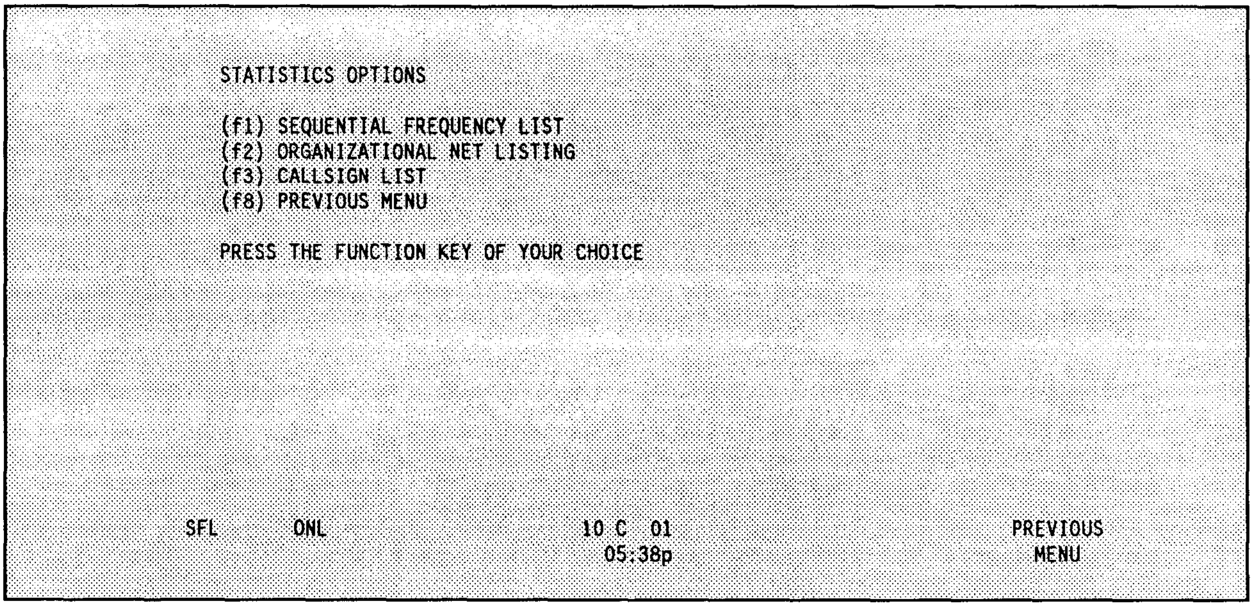


```
HOW MANY COPIES TO BE PRINTED?        1




                                  19 C  72
                                    09:27a
```

Figure 2-82 (XFER SOI/CEOI/f1, f2, f7)

D. STATISTICS

Use this option to print a sequential frequency list and a organizational net listing. Once this option is selected, then the screen shown in Figure 2-83 is displayed.

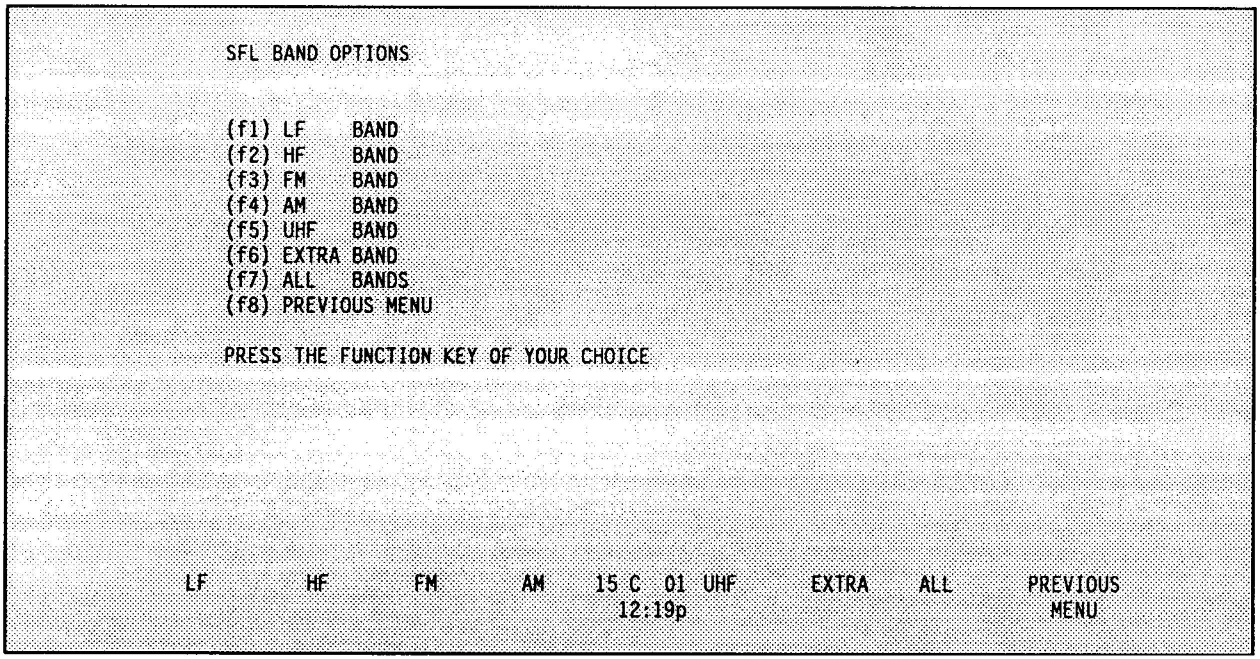


```
STATISTICS OPTIONS

(f1) SEQUENTIAL FREQUENCY LIST
(f2) ORGANIZATIONAL NET LISTING
(f3) CALLSIGN LIST
(f8) PREVIOUS MENU

PRESS THE FUNCTION KEY OF YOUR CHOICE




SFL     ONL                    10 C  01                           PREVIOUS
                                 05:38p                             MENU
```

Figure 2-83 (XFER SOI/COI/f1, f2, f4)

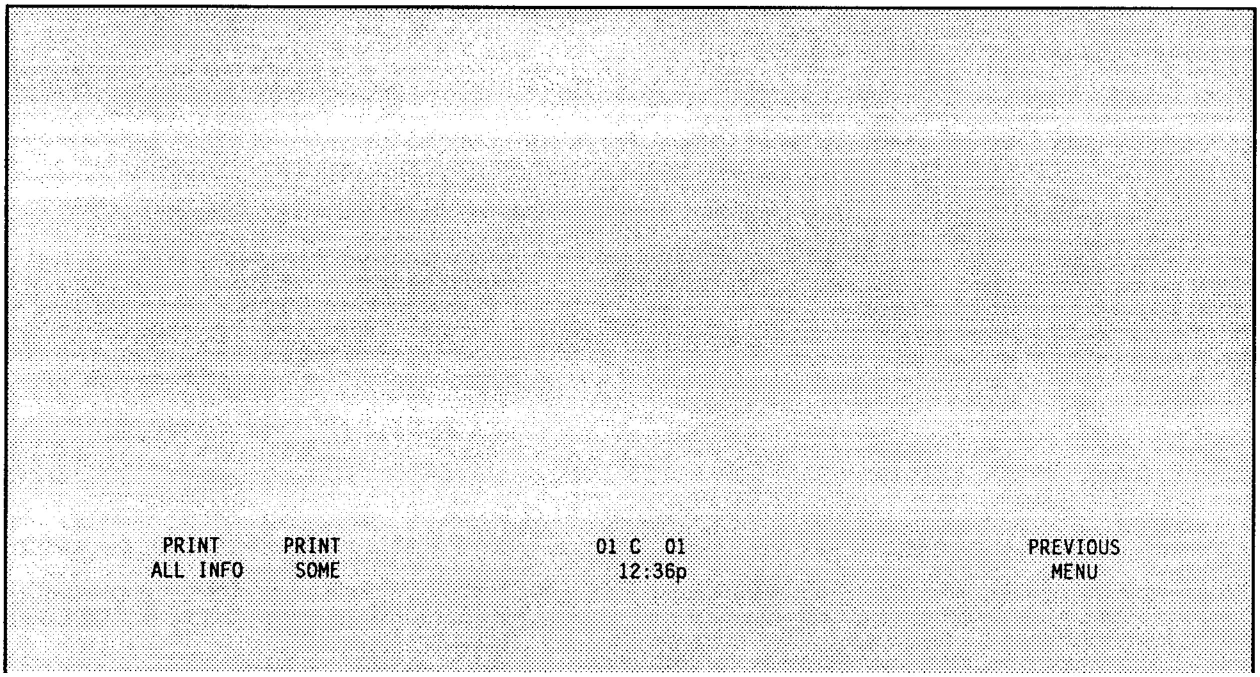
A sequential frequency list is a list of frequencies and the nets assigned to the frequencies for five time periods. After selecting <f1>, the BGU displays the SFL BAND OPTIONS as shown in Figure 2-84.

An organizational net listing is a list of all of the nets and the frequencies assigned to each net for five time periods. After selecting <f2>, the screen shown in Figure 2-85 is displayed.



```
          SFL BAND OPTIONS


          (f1) LF    BAND
          (f2) HF    BAND
          (f3) FM    BAND
          (f4) AM    BAND
          (f5) UHF   BAND
          (f6) EXTRA BAND
          (f7) ALL   BANDS
          (f8) PREVIOUS MENU

          PRESS THE FUNCTION KEY OF YOUR CHOICE








      LF       HF       FM       AM     15 C  01 UHF      EXTRA    ALL       PREVIOUS
                                           12:19p                              MENU
```

Figure 2-84 (XFER S0I/CE0I/f1, f2, f4, f1)



```
    PRINT     PRINT                        01 C  01                          PREVIOUS
   ALL INFO    SOME                          12:36p                            MENU
```

Figure 2-85 (XFER S0I/CE0I/f1, f2, f4, f2)

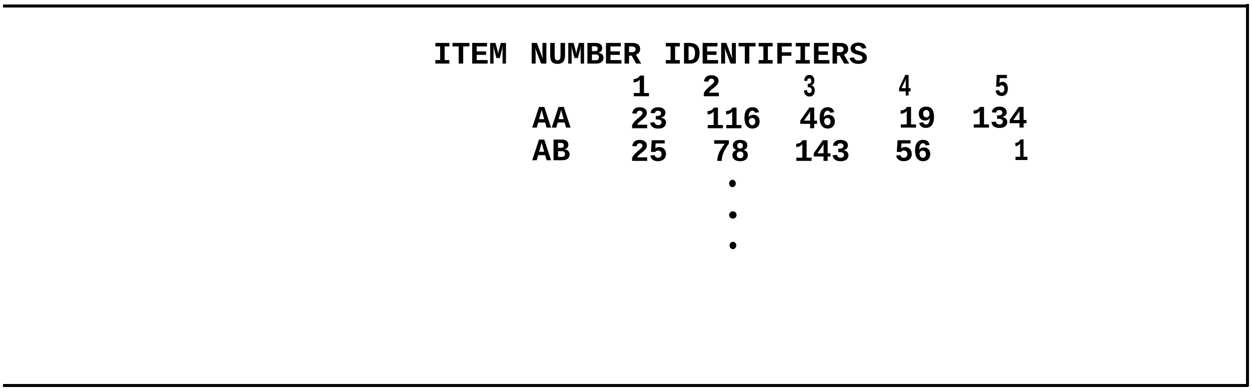
A callsign list is a list of all (or some) of the nets in the database and the call sign assigned to the net for time periods one through five.

E. EXTRACT NAMES

This option allows you to print all of the extract names. After selecting <f5>, enter the number of copies to be printed. Type in the number (five is the maximum) and hit <RETURN>. The BGU prints the data and returns to the screen shown in Figure 2-80 (Options for the Printer).

F. ITEM NUMBER IDENTIFIERS

This option allows you to print the Item Number Identifiers (INI). An INI is an aid that provides a rapid and general means of station identity. An example of an INI printout is shown in Figure 2-86.



ITEM NUMBER IDENTIFIERS

	1	2	3	4	5
AA	23	116	46	19	134
AB	25	78	143	56	1

•
•
•

Figure 2-86 Item Number Identifier (INI)

In the INI, the left margin is a two-letter column starting with “AA” and continuing in sequence. Adjacent to this list, the Net Group numbers (extracts) are in columns equating to five time periods. Net Control Stations (NCS) challenge unknown/out-of-net stations with the phrase “identify your station”. Respond with the two-letter INI (left column) which equates to your SOI item for that time period. The NCS will then use the INI table to determine the Net Group. The NCS will find the two-letter INI and read across the table to the correct time period and note the Net Group. The NCS will then find the extract that corresponds the Net Group. Note that all Net Groups should have their Net Group number in the title of the printed extract. (see Appendix G, Section VI, page G-32)

G. SIGNS / COUNTERSIGNS

Use this option to print the signs/countersigns assignments for the five time periods.

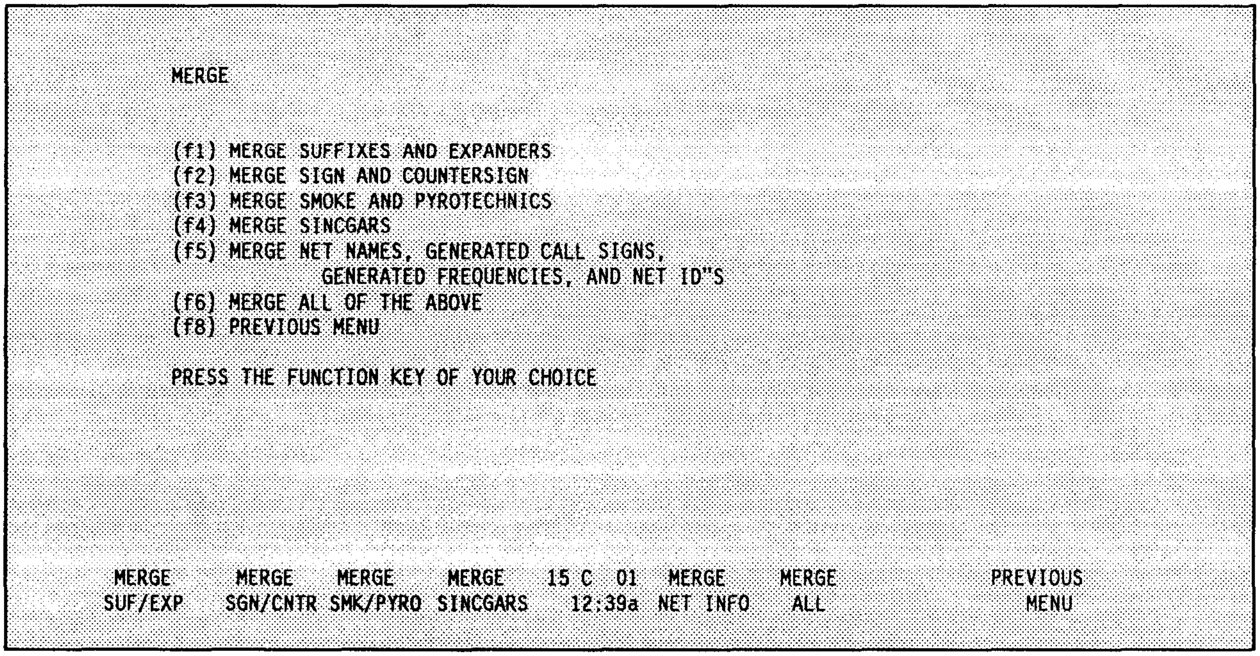
DISKETTE

Use this option to perform the output portion of a merged operation. An output merge operation takes data from the present database and outputs it to a disk in a special format to be used when doing the input (see Merge, pages 2-52 to 2-56) of a merge. Use a separate disk from the one used to store the database; make sure it has been formatted.

Once this option is entered, the following message is displayed.

> “INSERT THE DISK TO CONTAIN THE MERGE DATA THAT WILL”
> “BE PASSED FROM CORPS TO DIVISION”
>
> “HIT RETURN TO CONTINUE”

Next, the BGU displays the screen shown in Figure 2-87.



```
MERGE


(f1) MERGE SUFFIXES AND EXPANDERS
(f2) MERGE SIGN AND COUNTERSIGN
(f3) MERGE SMOKE AND PYROTECHNICS
(f4) MERGE SINCGARS
(f5) MERGE NET NAMES, GENERATED CALL SIGNS,
           GENERATED FREQUENCIES, AND NET ID"S
(f6) MERGE ALL OF THE ABOVE
(f8) PREVIOUS MENU

PRESS THE FUNCTION KEY OF YOUR CHOICE
```

Figure 2-87 (XFER S0I/CE0I/f1, f3)

Refer to later sections in this document under the same headings for details about each option. Insert the disk containing data and the program disk at the prompt.

A. MERGE SUFFIXES AND EXPANDERS

Use this option to output suffix and expander information to a disk for merging purposes. Select this option and the display flashes the following message:

“WAIT. ..PROCESSING” .

When processing is complete, the program returns to the MERGE menu.

B. MERGE SIGN AND COUNTERSIGN

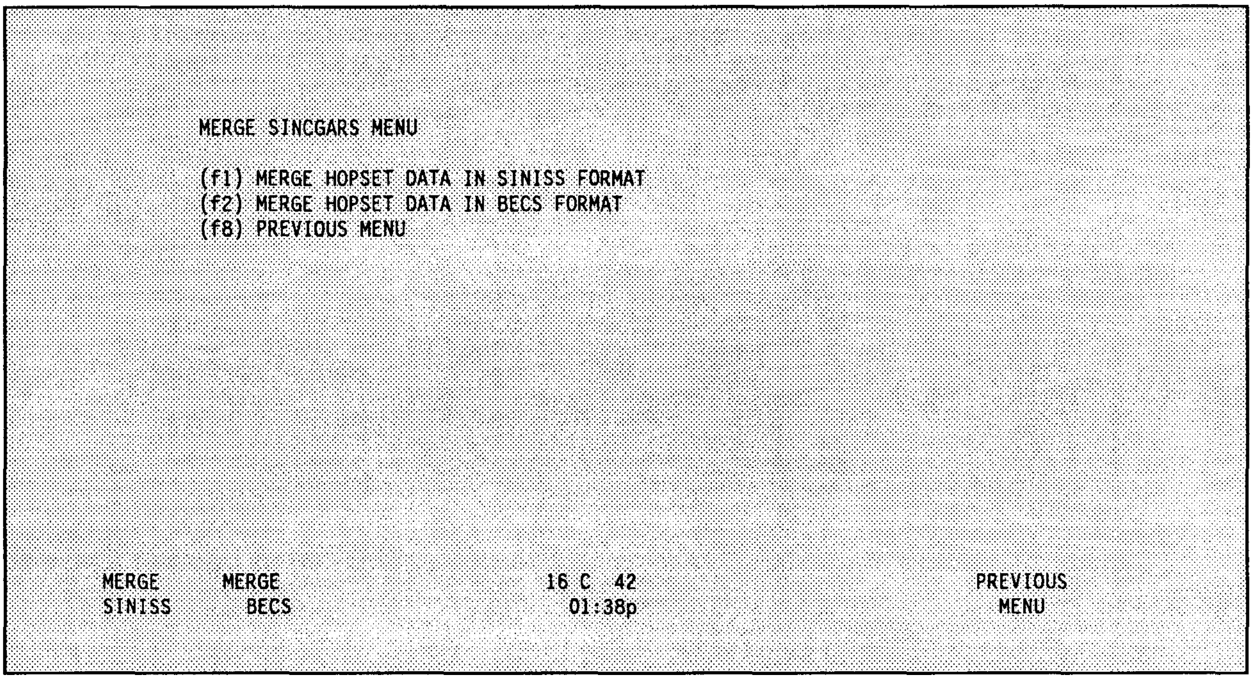
Use this option to output sign and countersign information to a disk for merging purposes. When processing is complete, the program returns to the MERGE menu.

C. MERGE SMOKE AND PYROTECHNICS

Use this option to output smoke and pyrotechnics information to a disk for merging purposes. When processing is complete, the program returns to the MERGE menu.

D. MERGE SINCGARS

Use this option to output SINCGARS information to a disk for merging purposes. Select this option and the screen Shown in Figure 2-88 is displayed.



MERGE SINCGARS MENU

(f1) MERGE HOPSET DATA IN SINISS FORMAT
(f2) MERGE HOPSET DATA IN BECS FORMAT
(f8) PREVIOUS MENU

Figure 2-88 (XFER SOI/CEOI/f1, f3, f4)

1. MERGE HOPSET DATA IN SINISS FORMAT

To select this option, press <f1> from the screen shown in Figure 2-88. Next, the following prompt will appear.

> “Enter hopset extension: HOPSET.”

Enter the two digit extension and press return. Next, the screen shown in Figure 2-89 is displayed.

Enter the desired TRANSEC Key number and press <RETURN>. Enter the desired description, press <RETURN> and the following message is displayed:

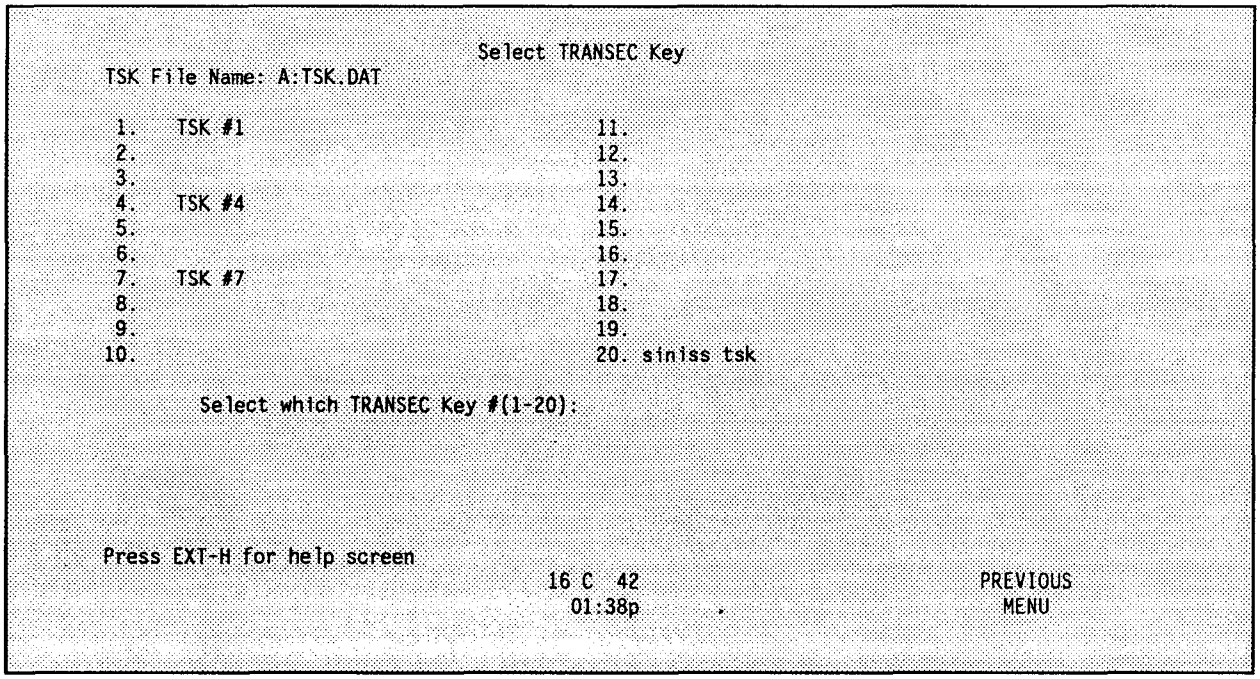
```
“Copying A:HOPSET.XX to C:MERGE10”
      “1 File(s) copied”

“Copy completed successfully”

“Writing TSK data to C:MERGE11"

“Merge Complete - press any key to continue”
```

2. MERGE HOPSET DATA IN BECS FORMAT

To select this option, press <f2> from the screen shown in Figure 2-88. The screen will flash:

> “WAIT... PROCESSING”

until completing the merge then returns to the screen shown in Figure 2-88.

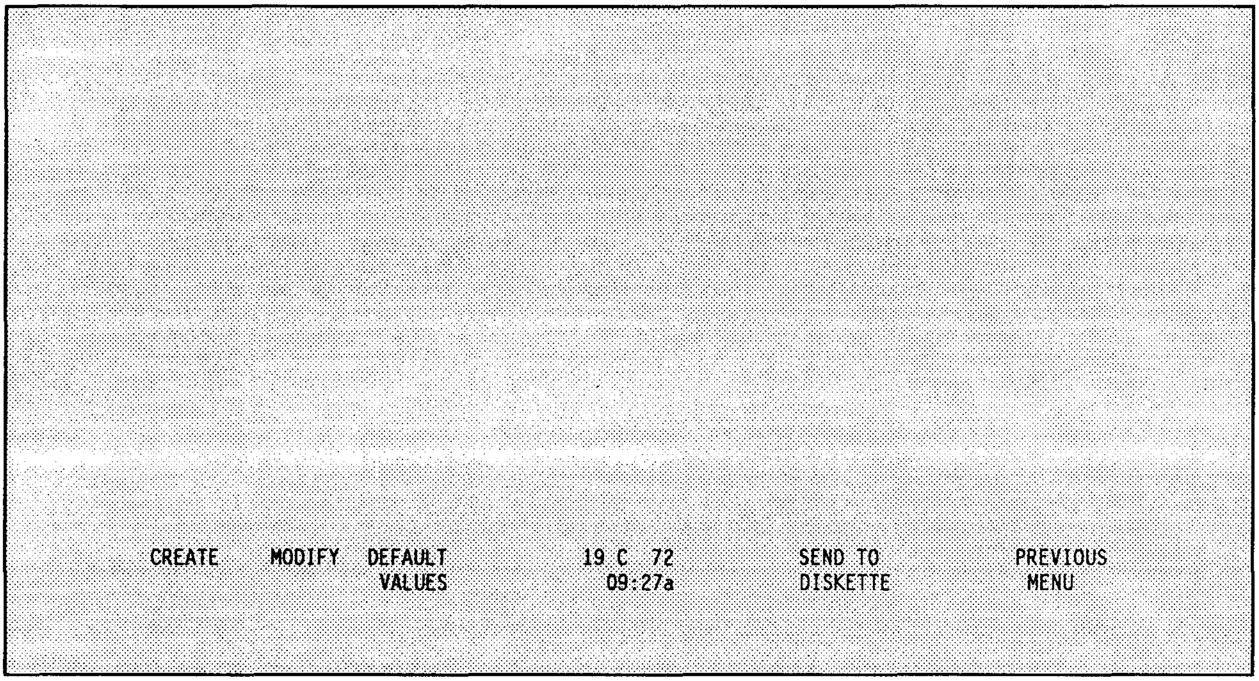


```
                        Select TRANSEC Key
TSK File Name: A:TSK.DAT

 1.   TSK #1                          11.
 2.                                   12.
 3.                                   13.
 4.   TSK #4                          14.
 5.                                   15.
 6.                                   16.
 7.   TSK #7                          17.
 8.                                   18.
 9.                                   19.
10.                                   20. siniss tsk

       Select which TRANSEC Key #(1-20):




Press EXT-H for help screen
                                16 C  42                     PREVIOUS
                                 01:38p     .                  MENU
```

Figure 2-89 (XFER S0I/CE0I/f1, f3, f4, f1)

E. MERGE NET NAMES, GENERATED CALL SIGNS, GENERATED FREQUENCIES AND NET ID'S

Use this option to output net list, call signs and frequencies information to a disk for merging purposes. Once this option is selected, a screen with 10 columns as shown in Figure 2-90 is displayed. The columns are highlighted on the BGU. The highlighting is not shown in Figure 2-90.



```
   CREATE    MODIFY  DEFAULT        19 C  72        SEND TO          PREVIOUS
                      VALUES         09:27a         DISKETTE           MENU
```

Figure 2-90 (XFER S0I/CE0I/f1, f3, f5)

f1 - allows you to create a new net group list.
f2 - allows you to modify an existing net group list.
f3 - allows you to enter all net groups.
f6 - allows you to copy net group data to disk.
f8 - allows you to return to the previous menu.

After selecting <f1> from Figure 2-90, you are warned that selecting the create option destroys existing information in the BGU. Choosing “Y” allows you to continue and “N” returns you to the screen shown in Figure 2-87. Choose “Y” and the cursor is placed in the top position in the first column and all options except <f8> go away. Type the first net group number (see pages 2-33 to 2-37) to be used in the merge. Press <RETURN> to enter the number and move the cursor to the next position. Enter the number of the remaining net group(s) you wish to use for the merge. A maximum of 150 net group numbers may be entered. After entering the desired net group number(s), press <f8> to return to the screen in Figure 2-90.

Selecting <f2> from Figure 2-90 allows you to modify an existing net group list. Press <RETURN> (or use the up and down arrow keys) to move the cursor to the position you want to modify. The net group name appears in the lower right corner of the screen. After modifying the desired net group number(s), press <f8> to return to the screen in Figure 2-90.

Selecting <f3> from the options screen in Figure 2-90 enters in the list all net groups from the current database.

Select <f6> and the following message is displayed:

“INSERT THE PROPER DATA DISK AND HIT RETURN TO CONTINUE”<

Insert the merge data disk and press <RETURN>. The screen flashes the following message:

“WAIT... PROCESSING”

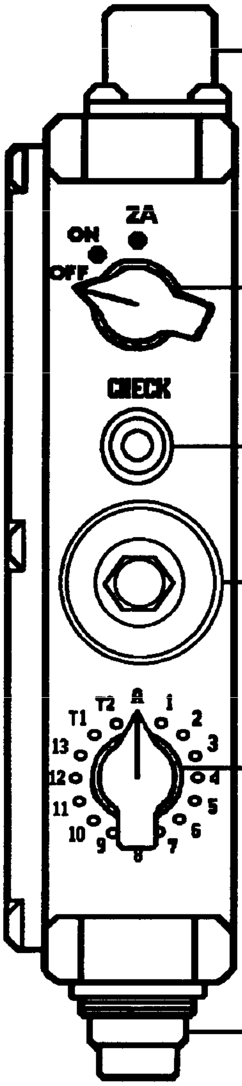
and returns to the merge menu.

F. MERGE ALL OF THE ABOVE

Use this option to output all BECS data to a disk for merging purposes. Select this option and the steps previously described in E. Merge Net Names, Generated Call Signs, Generated Frequencies and Net ID’s are performed. Next, the BGU steps you through the procedures to merge SINCGARS as previously described in D. Merge, SINCGARS, page 2-99. Finally, the BGU returns to the screen shown in Figure 2-87.

ECCM

Use this option to fill an ECCM fill device (MX-10579 or MX-18290) with SINCGARS frequency hopping information. The MX-10579 is used to load a Non-ICOM radio only. The MX-18290 is used to load either a Non-ICOM or an ICOM radio. The BGU program loads this data into the fill device through an ECCM interface cable. Make sure the ECCM fill device is turned off when connecting or disconnecting to the BGU or radio. The controls for a fill device are shown on the next page in Figure 2-91. (See Appendix H).



P1 CONNECTOR: Connects to a second fill device for fill device loading. Also can be used to load an rt if fill cable is not available.

FUNCTION SWITCH: Turns power on and off. Spring loaded "ZA" position zeroizes all data in fill device when initiate button is pressed.

CHECK LED: Blinks when data is transferred to rt. Also blinks if selector switch position has data in it and initiate button is pressed.

REQUEST (INITIATE) BUTTON: Used to (1) "ask for" data during fill device loading; (2) to check if select switch position has data in it; (3) to zeroize fill device.

FILL DATA SELECTOR SWITCH: Selects which hopset or lockout set will be stored or transferred. "A" position is used to transfer all data from one fill device to another. Positions 1-13 are for hopsets or lockout sets. Positions T1 and T2 are for TRANSEC Keys.

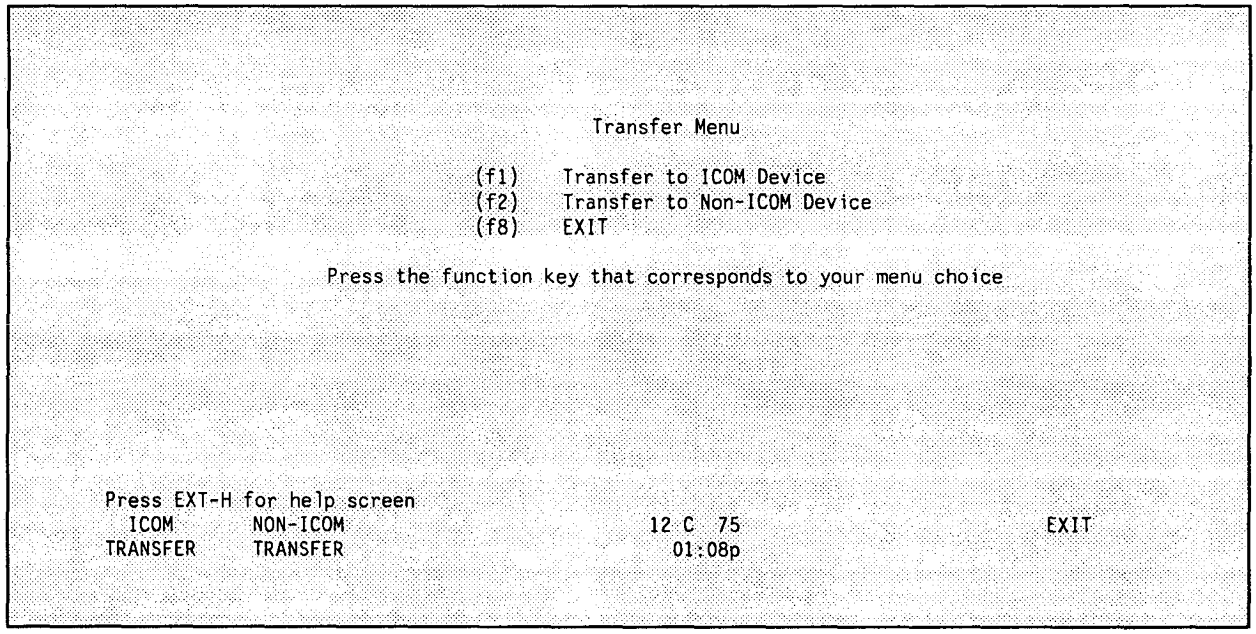
J1 CONNECTOR: Connects to the rt AUD/FILL connector by using a short cable. Also connects to BGUI RS-232 connector by using a short cable.

Figure 2-91

Zeroize the ECCM before transferring data from the BGU. To zeroize all locations in the ECCM, set the Selector switch to “A”, press and hold the REQUEST (Initiate) button and switch the Function switch to ZA then release.

After selecting <f4> from the screen shown in Figure 2-73, you are prompted to enter the hopset data filename extension (2-digit tag number). Enter the extension and press <RETURN>.

Next, the Transfer Menu screen shown in Figure 2-92 is displayed.



```
                              Transfer Menu

                         (f1)   Transfer to ICOM Device
                         (f2)   Transfer to Non-ICOM Device
                         (f8)   EXIT

               Press the function key that corresponds to your menu choice





   Press EXT-H for help screen
     ICOM       NON-ICOM                   12 C  75                     EXIT
   TRANSFER     TRANSFER                    01:08p
```

Figure 2-92 (XFER S0I/CE0I/f1, f4)

Use the help screen for descriptions of any function keys displayed on the screen.

Completely loading an ECCM fill device takes about three to four minutes if no mistakes are made.

CAUTION:

POWER TO INTERFACE must be turned on to communicate with the ECCM fill device (see Entering Datacom Information, pages 2-9 and 2-10). The fill device must be connected and turned on.

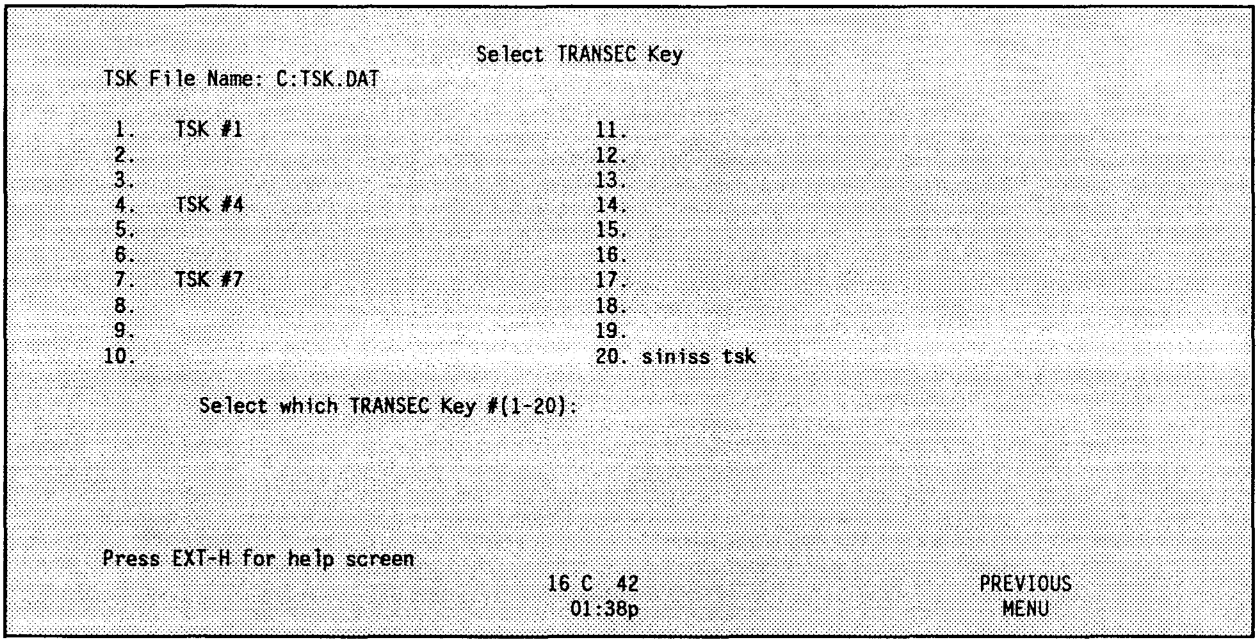
A. ICOM SINCGARS DATA TO MX-18290

Use this option to transfer ICOM SINCGARS data to MX-18290. See Appendix J.

Select <f1> from Figure 2-92 and the Select TRANSEC Key screen is displayed as shown in Figure 2-93.

NOTE:

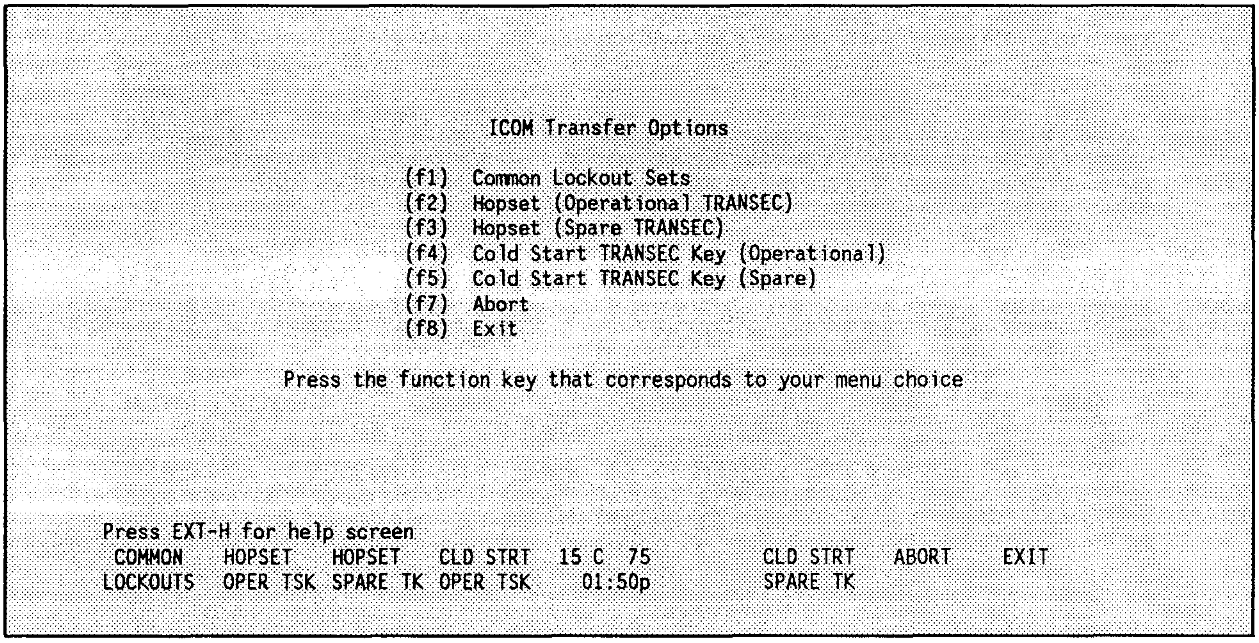
Each TRANSEC Key selected equals two TRANSECS, an operational and a spare, which are stored with ICOM and Non-ICOM parity.



```
                         Select TRANSEC Key
TSK File Name: C:TSK.DAT

 1.   TSK #1                         11.
 2.                                  12.
 3.                                  13.
 4.   TSK #4                         14.
 5.                                  15.
 6.                                  16.
 7.   TSK #7                         17.
 8.                                  18.
 9.                                  19.
10.                                  20. siniss tsk

        Select which TRANSEC Key #(1-20):




Press EXT-H for help screen
                                 16 C  42                            PREVIOUS
                                  01:38p                              MENU
```

Figure 2-93 (XFER SOI/CEOI/f1, f4, f1)

Enter the desired TRANSEC Key number, press <RETURN> and the ICOM Transfer Options screen shown in Figure 2-94 is displayed. Use the help screen for a description of the function keys.



```
                          ICOM Transfer Options

                     (f1)  Common Lockout Sets
                     (f2)  Hopset (Operational TRANSEC)
                     (f3)  Hopset (Spare TRANSEC)
                     (f4)  Cold Start TRANSEC Key (Operational)
                     (f5)  Cold Start TRANSEC Key (Spare)
                     (f7)  Abort
                     (f8)  Exit

               Press the function key that corresponds to your menu choice




Press EXT-H for help screen
 COMMON    HOPSET   HOPSET   CLD STRT  15 C  75        CLD STRT   ABORT    EXIT
LOCKOUTS  OPER TSK SPARE TK OPER TSK    01:50p         SPARE TK
```

Figure 2-94 (XFER SOI/CEOI/f1, f4, f1, Enter TRANSEC Key)

1. COMMON LOCKOUT SETS

Use this option to transfer the common lockout set(s) (L1-L6) of a generated hopset. If this option is selected and the hopset contains no common lockouts, it is indicated on the screen and the program returns to the ICOM Transfer Options Menu.

Select this option and the following message is displayed:

> "Press REQUEST on fill device to begin transfer of Common Lockout L#".

Set the ECCM fill device to the desired position (1-13) and press the REQUEST button on the ECCM fill device.

The following message appears:

> "Transfer Complete for Cell: #".

Watch for the green LED on the ECCM fill device to flash indicating a good fill. The flash should occur after a count of five. The common lockout number and ECCM fill device position will both increment. Only one location is stored in a position in the fill device.

Continue the process until all of the common lockouts have been loaded. At that time, the transfer options menu returns to the screen.

NOTE:

The number of common lockouts varies with different frequency resources.

2. HOPSET (OPERATIONAL TRANSEC)

Use this option to transfer the net lockout set(s) using the operational TRANSEC Key.

Select this option and enter the level number (1-6) to be transferred and the Net ID Group Number, O -9 (hundreds digit).

NOTE :

Though the Net ID Group Numbers have been established by doctrine, the program allows any Net ID Number to be used with any level of hopset.

Enter the numbers and the following message appears:

> "Press REQUEST on fill device to begin transfer of N#".

Set the ECCM fill device to the desired position (1-13) and press the REQUEST button on the ECCM fill device.

The following message appears:

> "Transfer Complete for Cell: #".

Watch for the green LED on the ECCM fill device to flash indicating a good fill. The flash should occur after a count of two.

Continue the process until all of the net lockouts required are loaded. If L7 and/or L8 are required, you are prompted to transfer them after the corresponding net lockout.

3. HOPSET (SPARE TRANSEC)

Using the same procedure as described in Hopset (Operational Transec), page 2-106, net lockout set(s) are transferred using a spare TRANSEC Key.

4. COLD START TRANSEC KEY (OPERATIONAL)

Use this option to transfer the cold start TRANSEC Key.

Select this option and the following message is displayed:

> **"Press REQUEST on fill device to** begin transfer **of Cold Start TSK".**

Set the ECCM fill device to the desired position (1-13) and press the REQUEST button on the ECCM fill device.

Watch for the green LED on the ECCM fill device to flash indicating a good fill. The flash should occur after a count of two.

5. COLD START TRANSEC KEY (SPARE)

Transfer the spare Cold Start TRANSEC Key as described in Cold Start Transec Key (Operational), page 2-107.

6. ABORT

Selecting this option during transfer returns you to the screen's first prompt. If you are at the screen's first prompt, Abort sends you back to the Transfer Menu (same as selecting <f8>).

B. NON-ICOM SINCGARS DATA TO MX-10579

Use this option to transfer Non-ICOM data into a MX-10579. See Appendix I.

Select this option and the Select TRANSEC Key screen is displayed as shown in Figure 2-93.

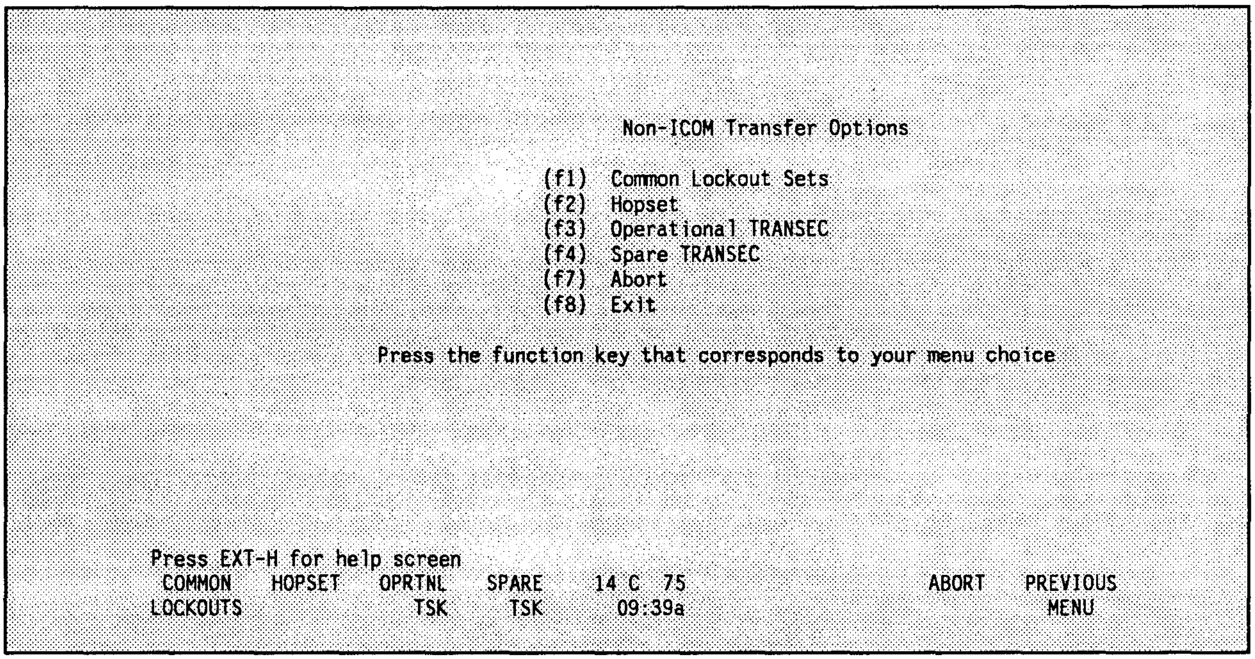
Enter the TRANSEC Key number and the Non-ICOM Transfer Options screen shown in Figure 2-95 is displayed. Use the help screen for function key descriptions.

1. COMMON **LOCKOUT SETS**

Use this option to transfer common lockout set(s) to the fill device (if required). If after selecting this option, and common lockouts (L1-L6) are not required, a message indicating that there are no common lockouts is displayed on the screen. The screen returns to the Non-ICOM Transfer options.

Select this option and the following message is displayed:

> **"Press REQUEST on fill** device to begin transfer of Common Lockout L#".



```
                         Non-ICOM Transfer Options

                    (f1)  Common Lockout Sets
                    (f2)  Hopset
                    (f3)  Operational TRANSEC
                    (f4)  Spare TRANSEC
                    (f7)  Abort
                    (f8)  Exit

          Press the function key that corresponds to your menu choice




Press EXT-H for help screen
 COMMON   HOPSET   OPRTNL   SPARE    14 C  75                  ABORT   PREVIOUS
LOCKOUTS              TSK     TSK     09:39a                             MENU
```

Figure 2-95 (XFER SOI/CEOI/f1, f4, f2)

Set the ECCM fill device to the desired position (1-13) and press the REQUEST button on the ECCM fill device.
The following message appears:

"Transfer Complete for Cell: #".

Watch for the red LED on the ECCM fill device to flash indicating a good fill. The flash should occur after a count of five. The common lockout number and ECCM fill device position both increment. Only one lockout is loaded into one position in the fill device.

Continue the process until all of the common lockouts are loaded. At that time, the transfer options menu returns to the screen.

NOTE:

The number of common lockouts varies with different frequency resources.

2. HOPSET

Use this option to transfer the net lockout set(s) to the fill device

Select this option and enter the level number (l-6) to be transferred (based on the hopset file selected) and the Net ID Group Number, O - 9 (hundreds digit).

NOTE:

Though the Net ID Group Numbers have been established by doctrine, the program allows any Net ID Number to be used with any level of hopset.

Enter the numbers and the following message appears:

> “Press REQUEST on fill device to begin transfer of N#.

Set the ECCM fill device to the desired position (1-13) and press the REQUEST button on the ECCM fill device.

The following message appears:

> “Transfer Complete for Cell: #“.

Watch for the red LED on the ECCM fill device to flash indicating a good fill. The flash should occur after a count of two.

Continue the process until all of the desired net lockouts are loaded. If L7 and/or L8 are required, you are prompted to transfer them after the corresponding net lockout.

3. OPERATIONAL TRANSEC

Use this option to transfer the operational TRANSEC Key to the fill device.

Select this option and the following message is displayed:

> “Press REQUEST on fill device to begin transfer of TRANSEC Key l“.

Set the ECCM fill device to the desired position (T1) and press the REQUEST button on the ECCM fill device.

Watch for the red LED on the ECCM fill device to flash indicating a good fill. The flash should occur after a count of two.

4. SPARE TRANSEC

Use this option to transfer the spare TRANSEC Key to the fill device.

Select this option and the following message is displayed:

> “Press REQUEST on fill device to begin transfer of TRANSEC Key 2“.

Set the ECCM fill device to the desired position (T2) and press the REQUEST button on the ECCM fill device.

Watch for the red LED on the ECCM fill device to flash indicating a good fill. The flash should occur after a count of two.

C. NON-ICOM SINCGARS DATA TO MX-18290

Use this option to transfer Non-ICOM SINCGARS data to a MX-18290. See Appendix I.

When transferring Non-ICOM SINCGARS data to a“MX-18290, the TRANSEC Keys are loaded using the Non-ICOM transfer options. The common lockout(s) and net lockout(s) are loaded using the ICOM transfer options.

To transfer Non-ICOM fill data to a MX-18290, select option <f2>, Transfer to Non-ICOM device, from the screen shown in Figure 2-92 (Transfer Menu). Select this option and the Select TRANSEC Key screen is displayed as shown in Figure 2-93.

Enter the TRANSEC Key number, press **<RETURN>** and the Non-ICOM Transfer Options screen shown in Figure 2-90 is displayed. Use the help screen for function key descriptions.

1. OPERATIONAL TRANSEC

Use option <f3> to transfer the operational TRANSEC Key.

Select this option and the following message is displayed:

> **“Press REQUEST on fill device to begin transfer of TRANSEC Key 1“.**

Set the ECCM fill device to the desired position (T1) and press the REQUEST button on the ECCM fill device.

Watch for the green LED on the ECCM fill device to flash indicating a successful fill. The flash should occur after a count of two.

2. SPARE TRANSEC

Use option <f4> to transfer the spare TRANSEC Key.

Select this option and the following message is displayed:

> **“Press REQUEST on fill device to begin transfer of TRANSEC Key 2".**

Set the ECCM fill device to the desired position (T2) and press the REQUEST button on the ECCM fill device.

Watch for the green LED on the ECCM fill device to flash indicating a successful fill. The flash should occur after a count of two.

3. COMMON LOCKOUT SETS

After loading the TRANSEC Keys (operational and spare), press <f8> two times to return to the Transfer Menu shown in Figure 2-92.

Next, select option <f1> and the Select TRANSEC Key screen is displayed as shown in Figure 2-93.

Select the same TRANSEC Key number that was selected before when transferring the TRANSEC Keys in 1. Operational Transec and 2. Spare Transec in previous paragraph. Press **<RETURN>** and the ICOM Transfer Options screen shown in Figure 2-94 is displayed. Use the help screen for a description of the function keys.

Use option <f1> to transfer the common lockout set(s) (L1-L6) of a generated hopset. If this option is selected and the hopset contains no common lockouts, it is indicated on the screen and the program returns to the ICOM Transfer Options Menu (Figure 2-94).

Select this option and the following message is displayed:

> “Press REQUEST on fill device to begin transfer of Common Lockout L#”.

Set the ECCM fill device to the desired position (1-13) and press the REQUEST button on the ECCM fill device.

The following message appears:

> “Transfer Complete for Cell: #“.

Watch for the green LED on the ECCM fill device to flash indicating a good fill. The flash should occur after a count of five. The common lockout number and ECCM fill device position will both increment.

Continue the process until all of the common lockouts have been loaded. At that time, the transfer options menu returns to the screen.

NOTE:

The number of common lockouts varies with different frequency resources.

4. HOPSET (OPERATIONAL TRANSEC)

Use option <f2> to transfer the net lockout set(s).

Select this option and enter the level number (1-6) to be transferred and the Net ID Group Number, O - 9 (hundreds digit).

NOTE:

Though the Net ID Group Numbers have been established by doctrine, the program allows any Net ID Number to be used with any level of hopset.

Enter the numbers and the following message appears:

> “Press REQUEST on fill device to begin transfer of N#”.

Set the ECCM fill device to the desired position (1-13) and press the REQUEST button on the ECCM fill device.

The following message appears:

> “Transfer Complete for Cell: #“.

Watch for the green LED on the ECCM fill device to flash indicating a good fill. The flash should occur after a count of two.

Continue the process until all of the net lockouts required are loaded. If L7 and/or L8 are required, you are prompted to transfer them after the corresponding net lockout.

5. HOPSET (SPARE TRANSEC)

Using the same procedure as described in 4. Hopset (Operational Transec), discussed above, net lockout set(s) are transferred using a spare TRANSEC Key.

ENDING A SESSION

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STORING ALL DATA

Return to the PAM menu. Move the cursor to the SAVE TO DISK box and press **<f1>** or **<RETURN>.** Once this option is selected, the following message is displayed:

Loading "SAVE TO DISK"

--then--

"ECHO OFF
REMOVE PROGRAM DISK FROM DRIVE C
INSERT DATA DISK INTO DRIVE C
Strike a key when ready..."

Insert the data disk and strike any key and the SOI data files are copied from the internal disk drive of the HP-111 to the data disk in the external disk drive. When the copy is complete, the following message is displayed:

"REMOVE DATA DISK FROM DRIVE C
INSERT PROGRAM DISK INTO DRIVE C
Strike a key when ready..."

Insert the program disk, strike a key and the PAM menu returns.

Note: The disk's label should contain the following:

1. A summary of the SOI/CEOI data contained on the disk
2. The hopset filename (if any)
3. The TRANSEC Key pair name (i.e. TSK #1)
4. The level at which all data was generated
5. The date of generation or effective date or both

ZEROIZING THE BGU

After storing all data, move the cursor arrow to the ZEROIZE HP111 box of the PAM menu and press <f1> or <RETURN>. The screen displays:

Loading "ZEROIZE HP111".

The process takes approximately 15 minutes to complete.

SECURING THE BGU

Upon initial receipt, the BGU is unclassified. After loading the BECS SECRET software, the BGU is classified SECRET and both hardware and software shall be protected in accordance with NACSI No. 4005. Upon completion of the BECS zeroization process, the BGU shall be controlled as an unclassified highly valued item in accordance with Service Regulations. In the event that the zeroization process is not initiated, interrupted or otherwise not completed, the BGU must be secured as SECRET CRYPTO material.

To prevent an unauthorized user from having access to the BGU, invoke the SECURE feature of the HP computer. See Secure Feature, page 2-18 for more details on the SECURE feature.

TRANSPORTING THE BGU

To transport the BGU, use the protective transport cases provided. The protective transit diskette must be inserted in the disk drive during BGU movement to prevent damage.

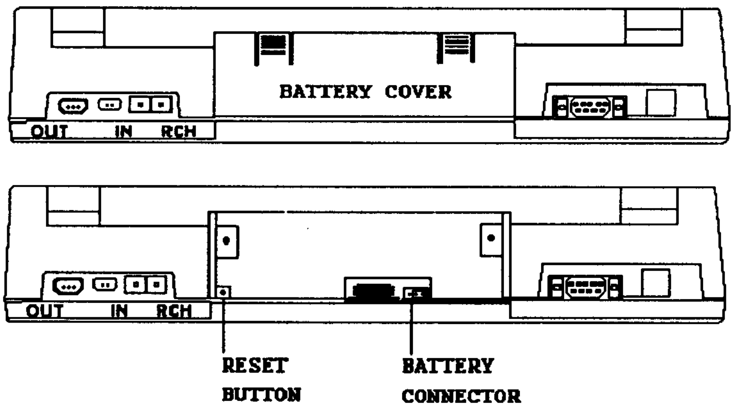
STORING THE BGU

To ensure the maximum possible charge retention during transit and storage, the battery is disconnected. To disconnect the battery, execute the following instructions to connect the battery:

1. Remove the battery cover from the back of the computer (see Figure 2-96) .
2. Remove the battery connector by pulling on the flexible tab protruding from the battery compartment.
3. Install the connector in the "OFF" position - on the rightmost two pins.
4. Replace the battery cover on the back of the computer.

NOTE:

The battery in the lap top discharge approximately one percent (1%) per day when the unit is not use. Hewlett Packard recommends the battery not be discharged below the forty percent (40%) level. This translates to 60 days of


BATTERY COVER
OUT
IN
RCH
OUT
IN
RCH
RESET BUTTON
BATTERY CONNECTOR

IF LEFTMOST TWO PINS ARE CONNECTED - BATTERY IS CONNECTED

IF RIGHTMOST TWO PINS ARE CONNECTED - BATTERY IS DISCONNECTED

PICTURE SHOWS BATTERY DISCONNECTED

Figure 2-96

inactivity or storage before the unit needs to be recharged. Failure to disconnect the battery for storage periods of greater than 60 days may permanently destroy the battery.

ADMINISTRATIVE STORAGE

Administrative storage of equipment issued to and used by Army activities shall be in accordance with TM 740-90-1.

WARNING

Do not incinerate or mutilate the battery pack.

(See WARNING in front of manual)

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

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OPERATION AT LOW TEMPERATURE

Extreme cold causes cables and wires to become hard, brittle, and difficult to handle. Be careful when handling and connecting the cables to the hardware. Be careful that kinks and unnecessary loops will not result in permanent damage. Keep snow or ice from entering areas around keyboard, printhead, paper feed or disc access slot.

OPERATION IN DESERT AND DUSTY AREAS

In hot, dry, sandy or dusty climates the connectors, receptacles and all slots or openings are subject to damage from wind blown sand, dust and dirt. Always cover any opening with any protective non conductive clean material or cloth when necessary. When not in use, store equipment in its protective cases.

OPERATION IN HOT MOIST OR WET CLIMATES.

In hot, moist or wet climates the equipment is subject to damage from moisture or fungi. Be extremely watchful for this condition. Wipe all moisture and fungi from exterior of the equipment with a lint free dry cloth. Keep equipment in the cases when not in use. Use or store in shelters or buildings when possible during very damp or rainy weather.

CHAPTER 3

MAINTENANCE

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Section 1. OPERATOR 'S MAINTENANCE

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OPERATOR'S MAINTENANCE

Your disc drive does not require regular maintenance. However, the performance and life of the disc drive and the flexible discs depend on how carefully they are handled. Be sure to follow the disc care and handling guidelines presented in Chapter 2.

LUBRICATION

No lubrication is required during operator maintenance.

TROUBLESHOOTING

This chapter is designed to give you some possible options should trouble arise while operating the BGU. This chapter is intended to grow as user feedback is recorded.

If trouble develops while operating the BGU, take the followinq steps where applicable to attempt to get out of trouble.

1. Check the part of chapter 2 of this manual for help relating to the activity you are performing.
2. Get a printout of what is occurring on the screen by turning on the printer and depressing the **SHIFT** and **PRINT** keys at the same time. Save this printout for use when reporting the incident.
3. Check other training material relating to the activity you are performing for help.
4. Check the HP Owner's Documentation for help.
5. If the problem still persists, write a complete description of the problem and what you are attempting to do.
6. Pass the problem description and the printout of the screen to your commanding officer.

7. RESET THE BGU BY PRESSING AND HOLDING THE CONTRAST KEY (THE KEY WITH THE CIRCLE ON IT LOCATED IN THE LOWER RIGHT SIDE OF THE KEYBOARD). Holding this key for more than a few seconds will cause the computer to break out of most situations. The computer is reset and the internal memory is erased. Do this operation only as a last resort.

1. SOME SIMPLE SITUATIONS:

1. Prbm: System will not turn on.
Soln: Check to see if all of the components are charged. Recharge any components that have less than a full charge. If problem persists, try replacement of the batteries.

CAUTION

The computer battery pack can not be serviced by the operator or by the unit maintenance personnel.
Do not attempt to remove the battery pack. DAMAGE to the computer may occur as the computer is never completely OFF.

2. Prbm: Battery light fading.
Soln: Replace and recharge the failing batteries.

3. Prbm: Disk error. Abort, Ignore, Retry?
Soln: Try Retry first. If this does not work, use Abort and then change disks.

4. Prbm: The software appears to hang up during generation of information or during a merge.
Soln: Check to see if the printer and the disk are working properly and are properly connected to the CPU.

2. EXPLANATION OF SOME WARNING MESSAGE WORDING:

ITEMS FILE - A data file containing generated Item Number Identifiers

FREQ_GEN - A data file containing generated frequency assignments

MERGE1(NET_ID) - A data file containing net group information to be merged

MERGE2(ALLNAMES) - A data file containing net names to be merged

MERGE3(CALSIGNS) - A data file containing call signs to be merged

MERGE4(FREQ_GEN) - A data file containing generated frequency information to be merged

MERGE5(SUFFIX) - A data file containing suffix information to be merged

MERGE6(EXPANDER) - A data file containing expander information to be merged

MERGE7(HOPSET) - A data file containing hopset data to be merged

MERGE8(OUT_MGS) - A data file containing signs and countersigns to be merged

MERGE9(OUT_WDS) - A data file containing smoke and pyrotechnic information to be merged

MERGE10(HOPSET.XX) - A data file containing generated SINCGARS hopset data to be merged

MERGE11(TSK.DAT) - A data file containing generated TRANSEC keys to be merged

SERIOUS DECODE PROBLEMS - Data that was entered or read from a file is corrupt. Try to re-enter the data.

RUNTIME FILE SYSTEM ERROR... - A serious error has occurred. Reset the system and begin your session again.

QUIT IN ROUTINE... -The software can go no further using the existing database. An assignment could not be made due to restrictions on the available choices. Review any additional messages for more information and check the database for accuracy.

3. RUNNING DIAGNOSTIC TESTS

If you suspect that your computer is not working correctly, you can determine if there is a problem by running the diagnostic test. These tests are built in to the computer. If the test generates a failure message, have your unit serviced by higher level of maintenance.

If your computer passes all of the tests, but still does not appear to be working properly, refer to the manuals shipped with the computer for operating information. If you still experience difficulty, contact your next higher level of maintenance.

CAUTION

> The contents of RAM memory, both Main memory and Edisc (drive A), may be altered when running the RAM test or during the RAM portion of the software/memory drawer test. Also, save the contents of the Edisc before running the system test, since this includes both the RAM test and the software/memory drawer test.

The display will not turn itself off when the diagnostics program is running. If you plan to run this program when you aren’t around, connect the recharger so the battery won’t run down.

The built-in test menu is displayed only on the screen. All other messages are directed to both the screen and (if connected) a Think-Jet printer. No other device can be configured to receive messages.

The RAM test and the RAM portion of the Software/Memory Drawer test each require about 5 minutes for each 128K of RAM checked.

- Turn the display off before starting the test. If the display is on, press OFF (f8) on the main PAM screen.
- With the display off, hold down the shift and extend char keys, then press f8 to start the diagnostic test. Hold the three keys down for about three seconds. The self-test menu is then displayed:

```
Built-in self-test:
f1:  System test          Shift fl:  RAM test*
f2 : LCD test             Shift f2:  Software/Memory drawer test *
f3 : Timer test           Shift f3:
f4 : RS-232 test          Shift f4:
f5 : HP-IL test           Shift f5:
f6 : Modem test           Shift f6:
f7 : ROM test             Shift f7:
                          Shift f8: Exit
```

* NOTE: The RAM test and RAM portion of the Software/Memory drawer test require approximately 5 minutes per 128K RAM checked.

If you plan to run the System test (f1) or the HP-IL test (f5), and no HP-IL peripherals are connected to your computer, connect an HP-IL cable from the OUT receptacle to the IN receptacle on the computer. Otherwise, you will get the message Broken Loop when the HP-IL test runs.

* NOTE: If the HP 82169A HP-IL/HP-IB Interface is on the loop, make sure that at least one peripheral device is configured as an HP-IB device (refer to HP manual page 6-15, “Specifying the System Configuration,” for information) before running the System or HP-IL tests. If no devices are configured as HP-IB when the HP 82169A interface is connected, the HP-IL test will not run correctly.

Press f1 to automatically run all of the tests, or press one of the other function keys to run a specific individual test.

If all parts passed the test, the message -ok is displayed briefly on the same line as the test message, then the test menu returns. If there is a failure, the failure message remains on the screen. Press any key to return to the test menu.

A failure message on the display indicates a part did not pass and service is required. On the service card in your support guide record the message, and the name of the test that generated it. Send the unit for service.

Press shift f8 from the self-test menu to exit from the diagnostics program and return to the main PAM screen.

4. WHAT EACH TEST DOES

System test (f1)

This test takes several minutes to run. It calls each of the individual test listed on the test menu, then returns to the menu after all of the tests are complete.

Because this includes RAM tests, information on the Edisc (drive A) will be lost. Refer to the preceding caution near the beginning of sub-paragraph 2.

LCD test (f2)

This test checks the LCD display controller registers and the LCD display memory. A variety of patterns are displayed on the screen while the LCD test is running.

Timer test (f3)

This test checks the operation of the internal timers and the built-in-time-of-day clock.

RS-232 test (f4)

This test checks the Internal registers of the RS-232 interface.

HP-IL test (f5)

This test checks the operation of the HP-IL controller, determines whether the loop is broken, and if it is not broken; displays the number of devices on the loop. All HP-IL peripherals must be turned on for this test to work.

The bad device message indicates that the HP-IL controller chip in the computer failed the test.

The broken loop message indicates that the loop is not continuous or that one of the devices on the loop is not turned on. To find out where the problem is, do the following:

- If no HP-IL peripherals are connected, refer to fourth step below. Verify that all devices on the loop are connected properly and turned on. (Refer to Section II page 2-6 for connecting Printers, Disc Drives, and Other Peripheral Devices, if you have questions about hooking up HP-IL peripherals.) Then run the test again.
- If the message still appears, remove one device from the loop and try again.
- Repeat step 2 until the bad device or cable is found, or until all devices have been removed from the loop.
- If you still get the Broken loop message, connect a cable from the HP-IL OUT connector on the Portable PLUS to the IN connector. Then try the test again.
- If the message still appears, connect a different cable and try the test once more.

  If the message appears again, the problem is internal to the computer and it requires repair.

Modem test (f6)

This test checks the built-in modem if one is present. The test first determines if the internal modem is installed and displays “Modem not installed” if no modem is installed. If the modem is present, it is tested.

ROM test (f7)

This test checks each internal ROM (drive B).

RAM test (shift f1)

This test checks the internal RAM. It takes about 5 minutes.

CAUTION

> This test erases information on the Edisc (drive A). Refer to Appendix K, ERASE (for any drive).

Software/MemoryDrawerTest (shift 2)

Checks for RAM (memory) and ROM (software modules) in both drawers.

CAUTION

> This test erases information on the Edisc (drive A). Refer to Appendix K, ERASE (for any drive).

When ROM is found, a message tells how many ROMs are installed and their locations, then the ROM test is performed.

When RAM is found, the number of bytes installed in the memory drawer is displayed and the RAM test is performed.

If neither RAM nor ROM is found, a message states this. If both are found, both tests are run.

The RAM test requires about 5 minutes for each 128K of RAM

The two drawer receptacles are called receptacle 1 and receptacle 2. The receptacle under Return is number 1 and the receptacle under Caps is number 2. Number 1 is checked first.

5. RESETTING YOUR COMPUTER

Under certain conditions your computer may get into a state where it will not respond to the keys you press. If you are sure that low battery voltage is not the cause (if you are not sure, refer to “Low Battery Safeguards,”) you should follow one or more of the steps in the following procedures:

- Reset the computer by pressing Shift CTRL Break. (Drives A and B are not affected by this reset, but user memory is, and any work not stored to Edisc or a flexible disc is lost.) If the main PAM screen appears, the computer has been reset, and you do not need to use any further steps.

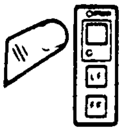
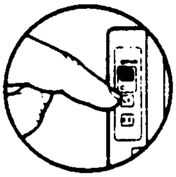
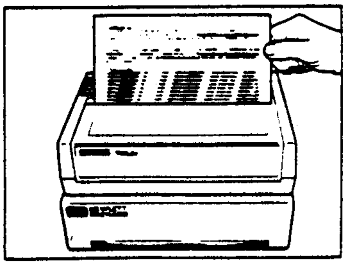
- If the main PAM screen did not appear when you performed step 1, press Shift CTRL Extend char Break. (This resetting method has the same effect on user memory as in step 1, above.) If the main PAM screen appears, the computer has been reset and you do not need to use any further steps.

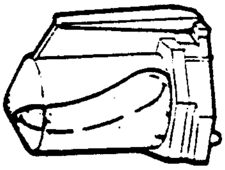
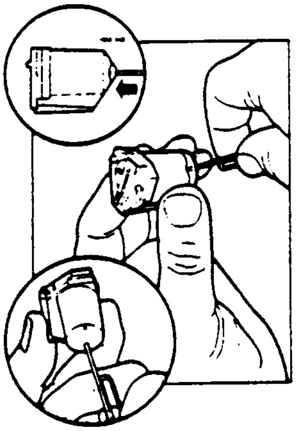
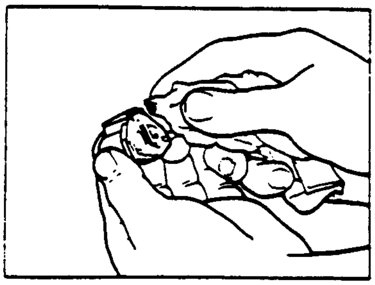
- If the main PAM screen did not appear when you performed step 2, turn off the computer by holding down the contrast key ◐. The display will darken to its maximum and then, after a few seconds, will turn off. Press the contrast key to turn the computer back on. This resetting method has the same effect on user memory as in step 1, above.

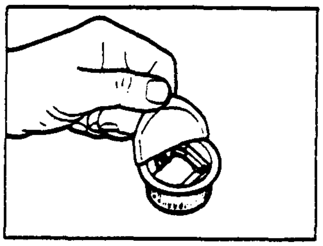
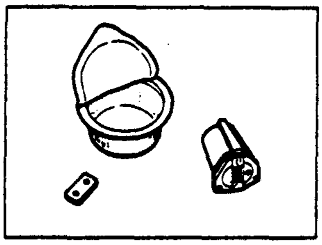
- If, after performing all of the preceding resets, there is still no response, have your unit serviced by higher maintenance levels. Take a picture of what is occuring on the screen by turning on the printer and depressing the SHIFT and PRINT keys at the same time. Save this printout for use when reporting the incident. Write a complete description of the problem and what you were attempting to do.

TROUBLESHOOTING THE PRINTER

Provided below is a list of the possible error conditions which may exist due to printer malfunction. In most Instances, performing the corrective action described will eliminate the problem. If the problem persists, however, the printer should be sent to higher level of maintenance for repair.

Error Condition	CorrectIon Action
1. Red power light "off" or flashing 	Ensure that the battery pack is installed correctly and the power switch is turned on. If the power light remains "off," the battery pack should be recharged. If the power light is blinking, the battery pack should be recharges.
2. Yellow attention light "on" continuously.	Load paper Into the printer. The attention light will begin blinking.
3. Yellow attention light blinking. 	Press the blue button. The print head carriage will move and the attention light will turn off. Remove any obstruction from around the print head carriage and push the blue button again. If the attention light continues blinking, the printer is signaling an error condition and should be sent to a higher level of maintenance for repair.
4. Printer does not respond to computer 	Make sure that the power light is "on" or blinking and the attention light is "off." If this is not the case, refer to Error Conditions 1 through 3 above. Verify that the printer is operational by running the self test as described in Operator's Section (Self Test). Verify that the HP-IL cables are properly connected. Then repair the procedure for assigning the printer as your system's print device. This procedures is explained for several different HP systems in the Appendices to this manual. Your computer may not be sending the printer a carriage return and line feed at the end of each line. In this case the printer will continue storing data because it never recognizes the end of the line.

	Use one of the automatic line termination escape sequences; ESC & k 0 G; ESC & k l G; ESC & k 2 G; or ESC & k 3 G, for the reset procedures.
5. Paper does not feed properly.	Remove the paper from the printer and discard any that is crumpled. If you are using fanfold paper, verify that it can travel freely without catching, and that the right side pinwheel is adjusted correctly for the width of your paper. Reload the paper and watch to see if it feeds properly. If not, higher level of maintenance may be required.
6. Print quality is poor  	If your print head stops printing after a few lines, it was probably jarred in shipment and needs to be activated. The bladder can be kneaded or made pliable by gently pushing a straightened paper clip through a hole on the rear side at a depth of about 1/8 inch, being careful not to puncture the bladder. Check that there is sufficient ink in the cartridge by viewing the bladder. If the bladder is collapsed, replace the cartridge. Check that the paper used is an ink jet paper. Gently wipe the face of the printer head using a tissue to remove any accumulated dust. If the print head cartridge has not been used for a prolonged period, moisten the tissue with water before wiping.
7. Dot rows are missing. 	Gently wipe the face of the print head using a tissue to remove any accumulated dust. If the print head cartridge has not been used for a prolonged period, moisten the tissue with water before wiping. Lightly wipe the electrical connector of the print head carriage using a cotton swab dipped in alcohol.

8. Carriage moves but printer does not print  	Check that there is sufficient ink in the cartridge by viewing the bladder. If the bladder is collapsed, replace the cartridge. Gently wipe the face of the print head using a tissue to remove any accumulated dust. If the print head cartridge has not been used for a prolonged period, moisten the tissue with water before wiping. Lightly wipe the electrical connector of the print head carriage using a cotton swab dipped In alcohol. If the problem continues, replace the print head cartridge.

TROUBLESHOOTING THE DISC DRIVE

1. If the disc access light begins blinking and the disc drive makes a clicking noise, the following should be done:

   The blinking of the disc access light and the clicking noise are a feature of your disc drive, called the Media Monitor. This warning Indicates that the disc currently In use in the blinking and clicking drive should be replaced. Immediately copy the worn disc and discard it.

2. If your disc drive does not pass the self-test, take the following actions:

   a. Turn off your disc drive. Then turn the disc drive back on; this repeats the self-test.

   b. If the Fault indication is still on, contact your next higher level of maintenance.

3. When trying to initialize the disc, an error stating that the disc is write protected. The following should be done:

   First, check to make sure that You are not using a disc that you have write protected or that has been automatically write protected by the Media Monitor.

   When a disc is Inserted to be initialized, the disc drive performs a motor speed check. If the motor speed is out of specification a write Protect Error is generated and the disc is not initialized. This Indicates a defective disc. Discard the disc.

Please note that if you receive a Write Protect Error on several discs in a row, your disc drive may not be operating properly. Contact you next higher level of maintenance.

4. When trying to store information on a disc, an error stating that the disc is write protected. Do the following:

   You are trying to store information on a disc that You have. reversed the write protect tab on the disc. If you wish to keep this disc write protected, insert another disc.

   Also, the disc may have been automatically write protected by the Media Monitor. If the Media Monitor warning is on, the disc should be copied and discarded.

5. If a message is received that says "Disc Not Present", "No Discs Were Found", "Not Ready Error, Reading Drive--", or Bad Unit Error, Reading Drive--", The following should be done:

   a. Be sure the disc drive is turned on.
   b. Check your cables to make sure they are secure.
   c. Be sure that you have a disc in the correct disc drive.
   d. Be sure that the disc has been initialized.
   e. If all this fails, you may have a bad disc. Try another disc.

6. If error message saying, "Disc or Data Error, Reading Drive" is received the following should be done:

   Your disc is probably worn or damaged. Try using other discs to see of you get the same message. If you receive the message on only one disc, copy the disc immediately and discard it. (Please note that if the disc is worn or damaged, the copy may not work.) If you receive the same message on several discs, contact your next higher level of maintenance.

7. Do the following if a message says, "Disc drive is empty, off, or undefined"?

   a. Be sure the disc drive is turned on.
   b. Be sure that you have a Disc in your disc drive.
   c. If all this fails, you may have a bad disc. Try another disc.

Your disc drive can be repaired only by a trained maintenance personnel. If you suspect that your disc drive is malfunctioning, contact your next higher level of maintenance.

REPAIR PARTS; SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); SUPPORT EQUIPMENT; AND MATERIALS

Refer to Appendix F for operator maintenance materials for the Basic Generation Unit (BGU). No special tools are required for operator maintenance.

REPAIR PARTS

There are no operator repair parts for the BGU.

MATERIALS

Materials required for performing operator's maintenance on the BGU are listed in appendix E, Expendable supplies and materials list.

PMCS

OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

INTRODUCTION

The Preventive Maintenance Checks and Services (PMCS) tables list the inspection and care of the BGU equipment required to keep it in good condition.

The interval column of the PMCS table indicates how often you will perform a certain check or service. The item to be inspected column lists what you will Inspect and service. The procedure column of the PMCS table explains how you will perform the check or service.

CAUTION

Do not try to clean a disc
The inside surface of the disc jacket is covered with a special material that cleans the disc as it rotates. Any other method of cleaning can cause solvent damage to the media or scratch the disc, causing loss of data. If a disc becomes dirty or scratched, immediately transfer the data to a new disc and dispose of the old disk.

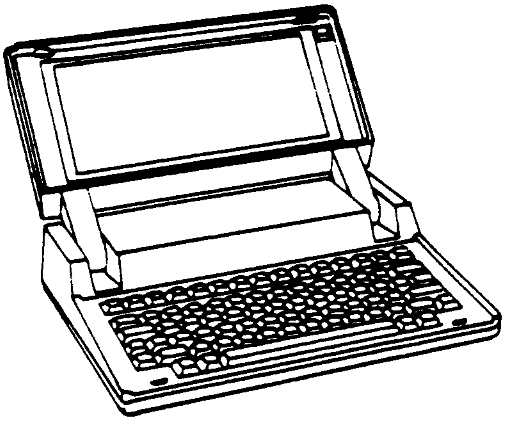
CAUTION

Erase disc before discarding.

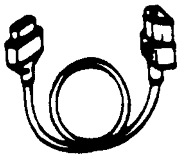
PMCS TABLE FOR PORTABLE COMPUTER

B-Before D-During A-After W-Weekly M-Monthly

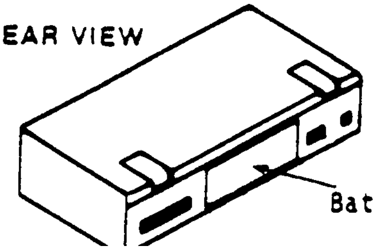
Item NO.	Interval B	D	A	W	M	Item to be Inspected	Procedure
1.	●					Computer	Check computer assembly for cracks, missing keys and screen visibility. Refer to higher maintenance as required.
2.	●					Cable	Check cable for cracked or worn insulation and bare wires. Refer to higher level of maintenance as required.
3.	●					Power strip	Check power strip for cracks or worn insulation or bare wires. Refer to higher level of maintenance as required.
4.	●					Battery door	Check battery door for cracks and proper seating. Do NOT remove door. Refer to higher level of maintenance as required.
5.	●					Recharger	Check recharger for cracks or worn insulation and bare wires. Refer to higher level of maintenance as required.

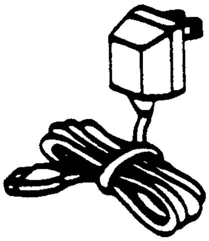


FRONT VIEW



REAR VIEW

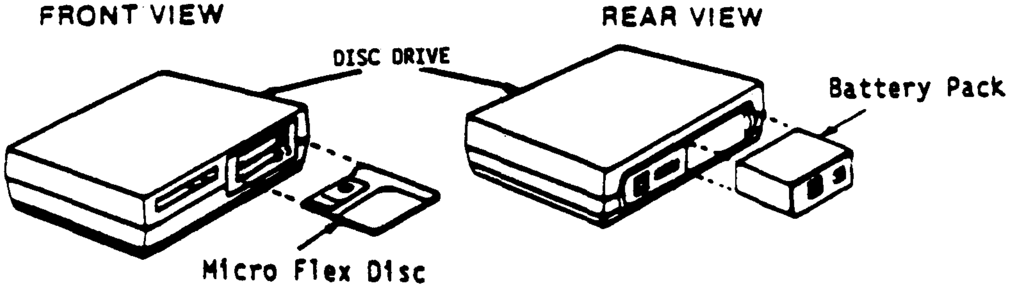


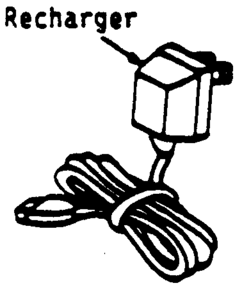


PMCS TABLE FOR THE DISC DRIVE

B-Before D-During A-After W-Weekly M-Monthly

Item NO.	Interval B	D	A	W	M	Item to be Inspected	Procedure
1.	●					Disc Drive Unit	Check disc drive unit for cracks, missing knobs/buttons. Refer to higher level of maintenance as required.
2.	●					Micro Flex Disc	Check micro flex disc for chips or cracks. Do not try to clean the disc and never touch the surface of the disc. Refer to higher level of maintenance as required.
3.	●					Recharger	Check recharger for cracks or worn insulation or bare wires. Refer to higher level of maintenance as required
4.	●					Battery Pack	Check battery pack for serviceability Refer to higher level of maintenance as required.

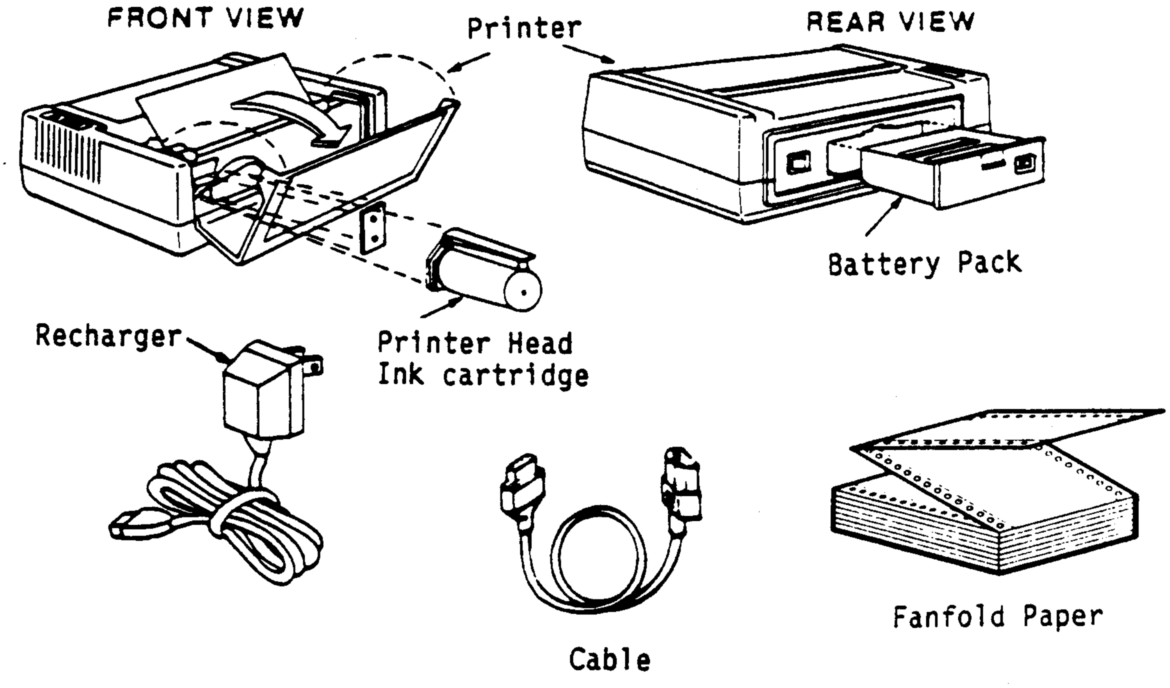




PMCS TABLE OF THE PRINTER

B-Before A-After M-Monthly
D-During W-Weekly

Item NO.	Interval B	D	A	W	M	Item to be Inspected	Procedure
1.	●					Printer	Check printer for cracks and missing switches. Refer to higher level of maintenance as required.
2.	●					Recharger	Check recharger for cracks or worn insulation and bare wires. Refer to higher level of maintenance as required.
3.	●					Battery Pack	Check Battery Pack for serviceability refer to higher maintenance required.
4.	●					Printer Head Ink cartridge	Check Printer Head Ink cartridge for ink level. Do not touch print head with your fingers. Refer to higher level of maintenance as required.
5.	●					Cable	Check cable for cracks or worn insulation and bare wires. Refer to higher level of maintenance as required.
6.	●					Paper	Check paper supply to insure there is enough paper to operate printer.


FRONT VIEW
Printer
REAR VIEW
Battery Pack
Recharger
Printer Head
Ink cartridge
Fanfold Paper
Cable

OPERATOR MAINTENANCE PROCEDURES

INITIAL SETUP

Tools	Material/Parts	Personnel Required
None	Brush Bristle (item 6 App. E) Brush Paint (item 7 App. E) Cheesecloth (item 8 App. E) Cleaning Compound (solvent) (item 9 App. E) Wiping Rags (item 10 App. E)	1

WARNING

Before cleaning the case, disconnect the charger and HP-IL cables. Make sure that any disc is removed from the drive.

CLEANING

The following procedures describe cleaning of BECS components. Refer to figure 3-1 on the following page for component identification.

CAUTION

Never turn the Disc drive off or remove the disc from the drive when the disc access light is on. Doing so can cause loss of data.

CAUTION

Chemical spray-on cleaners used for appliances and other household and Industrial applications may damage the case finish. Do not use detergents that contain ammonia, benzenes, chlorides, or abrasives.

- For computer (1) Disc Drive (4) and Printer (8) verify power is off.
- Remove all dirt, dust, grease or other debris from computer (1), Disc Drive (4), Printer (8), Cable (2), Cable (13), with a soft dampened cloth. Don't use an excessively wet cloth or allow water to get inside the computer. Don't use abrasive cleaners, especially on the display.
- When checking the Disc (6) for damage do not touch the surface of the disc and never try to clean a disc.
- Wipe the face of the printer head (10) with a very soft rag. Avoid touching the print head face with your fingers.
- Checking Battery Pack (5) and (9).

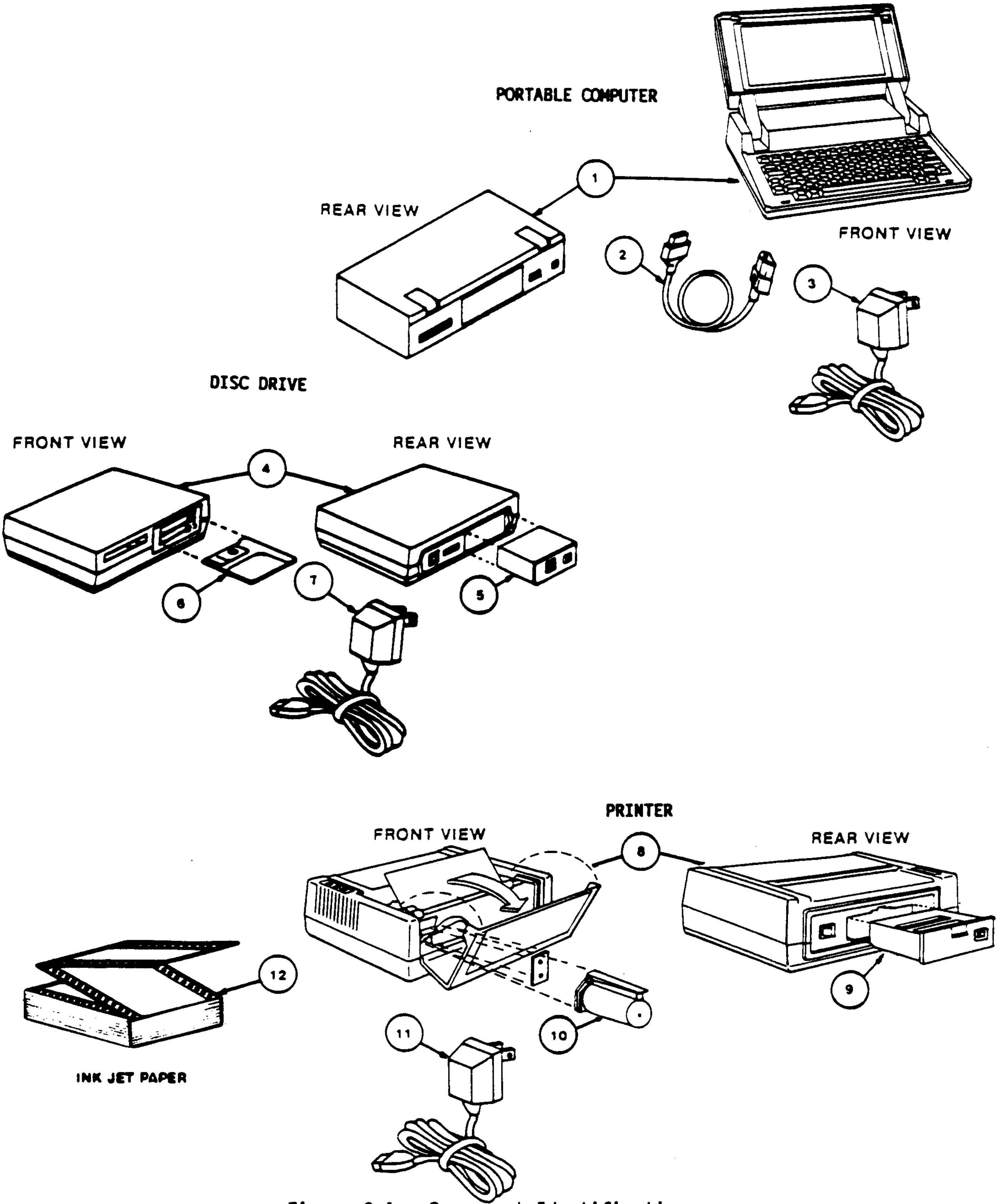

PORTABLE COMPUTER
REAR VIEW
1
FRONT VIEW
2
3
DISC DRIVE
FRONT VIEW
REAR VIEW
4
6
7
5
PRINTER
FRONT VIEW
8
REAR VIEW
12
9
11
10
INK JET PAPER

Figure 3-1. Component Identification

CAUTION

> The battery pack for the computer (1) can NOT be serviced or replaced by the user. Do not attempt to remove the battery pack--damage to the battery or the computer may occur.

Wipe off the battery pack (5) and (9) to insure that it is clean and dry.

- Remove all dirt, dust, grease or other debris when checking recharger for serviceability (3), (7), (11)

MAINTENANCE PROCEDURES

1. COMPUTER MAINTENANCE

The operator is not authorized to perform computer maintenance.

2. PRINTER MAINTENANCE

Printer Self Test

Think-Jet printers have two forms of self test; printing and non-printing. The non-printing self test checks the CPU, timers, internal and external RAM, and internal and external ROM. The test occurs when the power is switched on, or at the first part of the printing self test. The yellow attention light blinks twice during the non-printing self test.

If the printer fails the non-printing self test, the processor pins that control dot firing are used to report the part of the test that failed. Power to the print head is turned off at this point; dots are not actually fired.

The printing self test can be invoked in two ways. One way is to send an ESC z. All data in the buffer is printed, the non-printing self test is executed, and paper is advanced to the top of the form if it is not already there. Think-Jet printers execute the not-printers self test, and if the test is passed print a self test pattern.

The other way of invoking the printing self test is to press the line feed button or the form feed button while switching on power.

- Turn off the printer.
- Depress and hold the line feed button while turning the printer on.
- Release the line feed button to start the self test sequence which includes a set of printed examples.
- The self test may be terminated at any time by turning off the printer

The printing portion of the test is stopped if one of the following happens:

- The test fails because the carriage position is not known,
- A device clear command is received, in which case printing stores immediately and a device clear is executed, or
- The power is turned off.

The self test is suspended if the printer is out of paper, or, in the Model 2225B, the battery voltage is too low to run the motors. When either of these conditions is fixed the self test will resume.

The self-test-failed bit in the printer status byte is set only when the non-printing portion of the self test fails. (If the test failed because the carriage position cannot be determined, the carriage motion disabled bit is set. If the test is suspended because the printer is out of paper, the out of paper bit is set. If the test is suspended because the battery voltage is too, low, the low battery bit is set.)

2. Printer Resets

There are three different methods for returning your printer to its preset (default) print features. These are as follows:

- Simply turn the printer “off” and then “on.” All print features return to their default setting and top of form is set to the current line.

- Enter the escape sequence:

  ESC E

- This causes the printer to print whatever data is in the print buffer, set all changeable features to their default settings, and, if the paper is not at the top of form, execute a form feed.

  Send a device clear frame (DCF) to the printer. This reset causes the printer to stop printing (immediately), clear all remaining data in the print buffer, set all changeable features to their default setting, and execute a form feed if the paper is not at the top of the form.

In addition if the print head carriage jams or is moved manually while the printer is on, the printer will stop printing. In this event, the print buffer is emptied, all print features return to their default settings, and the attention light begins blinking.

Maintenance of the Printer Battery Pack and Recharger.

Under normal operating conditions, a fully charged battery pack is capable of the following:

- Continuous printing without using the recharger: over one and a half hours, or approximately 200 pages

- Storage: several weeks without recharging

- Not printing with power left on: five days

To maximize battery pack life, recharge the battery pack only when it is nearly discharged, as indicated by the printer power light. Approximately eleven hours is required to recharge a battery pack fully. The battery pack may be charged in or out of the printer.

WARNING

The 3 battery packs are not user serviceable. Do no Incinerate or mutilate a battery pack. The battery pack may release toxic materials or burst under extreme heat. Do not connect together or otherwise short circuit the battery pack terminals. The battery pack may melt or cause serious burns. Use only authorized battery packs with your printer. Use only authorized rechargers with your battery pack.

The red power light, located on the control panel, indicates the status of the printer's power source.

- The power light "on" indicates that power is available to operate the printer.
- A blinking power light indicates the battery pack should be recharged. During printing in this condition the power light is "off." When printing is completed, the power light will begin blinking again.

Maintenance of the Print Head Cartridge

The print head cartridge is durable, disposable, and easy to maintain. Observing a few simple rules of care should keep your print head trouble free.

- Avoid touching the print head face with your fingers.
- Periodically check the ink level of the print head cartridge. Hold the print head up and view the bladder inside. If the bladder is collapsed, then the ink supply is nearly depleted and the cartridge needs to be replaced.
- If the printer has not been used for a prolonged period of time, or if dust has accumulated on the print head face, you may need to gently wipe the face of the print head with a tissue to maintain best print quality. (See page 3-9 item number 6)
- Avoid allowing the print head face to come into prolonged contact with other materials. This may cause the ink to wick out of the print head.
- Use the print head cartridge prior to the month and year of expiration printed on the package.

WARNING

The ink in the print head cartridge contains diethylene glycol which is HARMFUL IF SWALLOWED. Keep new or used cartridges OUT OF REACH OF CHILDREN.

SECTION II. UNIT MAINTENANCE

Page

Lubrication 3-21
Troubleshooting 3-21
Repair Parts; Special Tools; Test Measurement, and
3-21
PMCS 3-22
Maintenance Procedures 3-22

LUBRICATION

No lubrication is required during organizational maintenance.

TROUBLESHOOTING

Introduction:

BGU Troubleshooting is performed using the appropriate tools and test equipment listed in the maintenance allocation chart for the Computer, Printer and Disc Drive. Upon completion of BGU troubleshooting the faulty unit is removed, if applicable, in accordance with maintenance instructions. The replacement unit is then installed. Upon installing a replacement unit the BGU performance test will be run to verify proper operation.

Perform the troubleshooting procedures in Operator's Maintenance

If the problem can not be resolved by instructions given there or by replacing parts authorized in the following repair parts list refer the problem to higher level of maintenance.

DO THIS OPERATION TO THE COUPUTER ONLY AS A LAST RESORT.

PRESS AND HOLD DOWN THE CONTRAST KEY (THE KEY WITH THE CIRCLE ON IT LOCATED IN THE LOWER RIGHT SIDE OF THE KEYBOARD). Holding this key for more than a few seconds will cause the computer to break out of most situations. The computer will be reset and the internal memory will be erased.

REPAIR PARTS; SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); SUPPORT EQUIPMENT AND MATERIALS

INTRODUCTION

This section lists test equipment and refers to list of repair parts, materials, special tools, TMDE and support equipment used in performing unit maintenance tasks on the BGU. For a list of special tools and support equipment used in unit maintenance refer to Appendix B Section III

MATERIALS

No materials are required for unit maintenance for the BGU.

REPAIR PARTS

The repair parts list for use in performing unit maintenance is contained in Appendix F.

PMCS

There are no unit level preventative maintenance checks and services. Refer to pages 3-12 through 3-15 for operator level preventative maintenance checks and services.

MAINTENANCE PROCEDURES

Unit maintenance will be accomplished by complying with the listing in the "O" column of the maintenance allocation chart. Run the self test and troubleshooting procedures in the operator's maintenance section. If the fault can not be detected replace the malfunctioning unit. Refer to Appendix F for parts listings.

APPENDIX A

REFERENCES

DA Pam 25-30	Consolidated Index of Army Publications and Blank Forms.
DA Pam 738-750	The Army Maintenance Management System (TAMMS).
SB 11-573	Painting and Preservation of Supplies Available for Field Use of Electronics Command Equipment.
TB 43-0118	Field Instructions for Painting and Preserving Communications-Electronics Equipment.
TM 22-6140-203-14-3	Operator’s, Organizational, Direct Support, and General Support and Maintenance Manual Nonaircraft Nickel-Cadmium Batteries.
TM 750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command).

LIST OF FIELD MANUALS

The following is a list of Field Manuals (FMs) that describe doctrine and who talks in what nets:

a.	FM 11-92 (HTF)	Combat Communications Within the Corps
b.	FM 11-50 (HTF)	Combat Communications Within the Division
c.	FM 11-32	Combat Radio Operations
d.	FM 24-1 (HTF)	Combat Communications
e.	FM 24-35	The SOI
f.	FM 24-2	Radio Frequency Management

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I INTRODUCTION

B-1. GENERAL.

This appendix provides a summary of maintenance operations for the Basic Generation Unit (BGU). This appendix provides a general explanation of all maintenance and repair functions authorized at specified maintenance categories.

b. The Maintenance Allocation Chart (MAC) in section II, III and IV designate overall authority and responsibility for the performance of maintenance functions on the identified end item of component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance levels.

c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. MAINTENANCE FUNCTIONS.

Maintenance functions will be limited to and defined as follows:

Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).

b. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

d. Adjust. To maintain or regulate, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is certified standard of know accuracy, to detect and adjust any discrepancy in the accuracy of the Instrument being compared.

Remove/Install. To remove and install the same Item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. “Replace” Is authorized by the MAC and is shown as the third position code of the SMR code.

i. Repair. The application of maintenance services (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in part, subassembly, module (component or assembly), end item, or system.

j. Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifying Army equipments/components.

B-3. COLUMN ENTRIES

Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists the functions to be performed on the item listed in column 2. When items are listed without maintenance functions, it is solely for purpose of having the group numbers in the MAC and RPSTL coincide.

d. Column 4, Maintenance Category. Column 4 specifies, by the listing of a “work time” figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number of complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate "work time" figures will be shown for each category. The number of task-hours specified by the "work time" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific task identified for the maintenance functions authorized in the maintenance allocation chart. Subcolumns of column 4 are as follows:

C - Operator/Crew
O - Organizational
F - Direct Support
H - General Support
D - Depot

e. Column 5, Tools and Equipment. Column 5 specifies by code, those common tool sets (not individual tools) and special tools, test, and support equipment required to perform the designated function.

f. Column 6, Remarks. Column 6 contains an alphabetic code which leads to the remark in section IV, Remarks, which is pertinent to the item opposite the particular code.

B-4. EXPLANATION OF COLUMNS IN TOOLAND TEST EQUIPMENT REQUIREMENTS, SECTION 111.

a. Column 1, Referenced Code. The tool and test equipment reference code correlates with a code used in the MAC, Section II.

b. Column 2, Maintenance Category. The lowest level of maintenance authorized to use the tool or test equipment.

c. Column 3, Nomenclature. Name or identification of the tool or test equipment.

d. Column 4, National Stock Number. The national stock number of the tool or test equipment.

e. Column 5, Tool Number. The manufacturer's part number.

B-5 . EXPLANATION OF COLUMNS IN REMARKS, SECTION IV.

a. Column 1, Reference Cards. The code recorded in column 6, Section II.

b. Column 2, Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

SECTION II

MAINTENANCE ALLOCATION CHART
FOR
BATTLEFIELD ELECTRONIC CEOI SYSTEM (BECS)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQUIP	(6) REMARKS
			C	O	F	H	D		
00	BASIC GENERATION UNIT (BGU) AN/GYK-33	SERVICE	.1						D
		TEST		.1					A
		REPAIR		.1					E, C
01	PORTABLE COMPUTER HP-110	REPLACE		.1					D
		REPAIR		.1					F
		REPAIR					1.0		B
02	DISK DRIVE HP-9114B	REPLACE	.1						D
		REPAIR	.1						F
		REPAIR					1.0		B
03	PRINTER HP-2225B	REPLACE	.1						D
		REPAIR	.1						F
		REPAIR					1.0		B
04	ECCM INTERFACE CABLE	TEST	.1						G
		REPLACE	.1				1.0		

SECTION III

TOOL AND TEST EQUIPMENT REQUIREMENTS

REFERENCE CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NSN	TOOL NUMBER
1	O,D	TOOL KIT	5180-00-064-5178	TK-101/G
2	O	MULTIMETER	6625-01-139-2512	AN/PSM-45
3	O	SERIAL SCREW DRIVER		8710-1699

SECTION IV
REMARKS

REFERENCE CODE	REMARKS
A	Self-Test Software is used to determine faults to the Line Replaceable Unit (LRU).
B	Return to Contractor (Hewlett Packard) for repair.
C	Repair by replacement of LRU/System transit case.
D	Charging the Battery of the Portable Computer, Disc Driver, and Printer. Routinely replenish the printers paper.
E	Repair by replacement of Portable Computer, Disc Driver, Printer and/or ECCM Interface Cable.
F	Repair by replacement of Disc Drive's/Printer's Battery, AC Adapter/Recharger, and/or Cables.
G	Perform continuity check.

APPENDIX C

COMPONENTS OF END ITEM LIST

Section I. INTRODUCTION

C-1. Scope

This appendix lists integral components of and basic issue Items for the Battlefield Electronic CEOI System (BECS) to help you inventory items required for safe and efficient operation.

C-2. General

This Components of End Item List is divided into the following sections:

a. Section II. Integral Components of the End Item. These items, when assembled, comprise the BECS and must accompany it whenever it is transferred or turned in. The illustrations will help you identify these items.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the BECS in operation, to operate it, and to perform emergency repairs. Although shipped separately packed they must accompany BECS during operation and whenever it is transferred between accountable officers. The illustrations will assist you with hard-to-identify items. This manual is your authority to requisition replacement BII, based on TOE/MTOE authorization of the end item.

C-3. Explanation of Columns

a. Illustration. This column is divided as follows:

(1) Figure number. Indicates the figure number of the illustration on which the item is shown.

(2) Item number. The number used to identify item called out in the illustration.

b. National Stock Number. Indicates the National stock number assigned to the item and which will be used for requisitioning.

c. Description. Indicates the Federal item name and, if required, a minimum description to identify the item. The part number (when applicable) indicates the primary number used by the manufacturer, which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items. Following the part number, the Federal Supply Code for Manufacturers (FSCM) (as applicable) is shown in parentheses.

d. Location. The physical location of each item listed is given in this column. The lists are designed to inventory all items in one area of the major item before moving on to an adjacent area.

e. Usable on Code “USABLE ON” codes are included to help you identify which component items are used on the different models.

f. Quantity Required (Qty Reqd). This column lists the quantity of each Item required for a complete major item.

g. Quantity. This column is left blank for use during an Inventory. Under the Rcvd column, list the quantity you actually receive on your major item. The Data columns are for your use when you inventory the major Item.

SECTION II. INTEGRAL COMPONENTS OF END ITEM

(1) ILLUSTRATION (A) FIG NO.	(B) ITEM NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NUMBER (FSCM)	(FSCM)	(4) LOCATION	(5) USABLE ON CODE	(6) QTY REQD	(7) QUANTITY RCVD	DATE
3-1	1	5895-01-254-6699	PORTABLE COMPUTER 110	51170	BGU	ALL	1		
3-1	2	6145-01-199-8679	CABLE,HP-IL 1 METER 82167B				2		
3-1	3	5950-01-167-3029	RECHARGER,110V,UNITED STATES 82059D				1		
3-1	4	5895-01-254-6700	DISC DRIVE UNIT 9114B	51170	DISC DRIVE UNIT		1		
3-1	7	5950-01-167-3029	RECHARGER,110V,UNITED STATES 82059D				1		
3-1	8	7025-01-199-8707	PRINTER 2225B	51170	PRINTER		1		
3-1	11	5950-01-199-8703	RECHARGER,110V,UNITED STATES 82059D	58229			1		

SECTION III. BASIC ISSUE ITEMS

(1) ILLUSTRATION (A) FIG NO.	(B) ITEM NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NUMBER	(FSCM)	(4) LOCATION	(5) USABLE ON CODE	(6) QTY REQD	(7) QUANTITY RCVD	DATE
3-1	3	5950-01-167-3029	RECHARGER,110V,UNITED STATES 82059D				1		
F-2	3	5895-01-254-6697	CASE SYSTEM 102516	29724			1		
3-1	7	5950-01-167-3029	RECHARGER,110V,UNITED STATES 82059D				1		
3-1	5	6135-01-269-3663	BATTERY PACK,DISC DRIVE 45711	60993			1		
3-1	6	7045-01-209-2193	MICRO FLEX DISC 92192A				1		
3-1	11	5950-01-167-3029	RECHARGER,110V,UNITED STATES 82059D	58229			1		
3-1	9	6135-01-202-5858	BATTERY PACK,PRINTER 82199A				1		
3-1	10	7430--1-199-8706	PRINTHEAD,INK CARTRIDGE 92261A				1		
F-4	4	5895-01-254-6698	CASE,COMPONENTS W/FOAM INSERT 102223-2	29724			1		
3-1	12	7530-01-200-9272	INK JET PAPER 92261M	51170			1		
			MANUFACTURER'S COMMERCIAL MANUALS						
			VERSION I SOFTWARE						

APPENDIX D

ADDITIONAL AUTHORIZATION LIST

Section I. INTRODUCTION

D-1. SCOPE.

This appendix lists additional items you are authorized for the support of the Battlefield Electronic CEOI System (BECS).

D-2. GENERAL.

This list identifies items that do not have to accompany the BECS and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOA, TDA, or JTA.

D-3. EXPLANATION OF LISTING.

National stock numbers, descriptions, and quantities are provided to help you identify the and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name under the type document (i.e., CTA, MTOE, TDA, or JTA) which authorizes the item(s) to you.

SECTION II. ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION PART NUMBER AND FSCM	USABLE ON CODE	(3) UNIT OF MEAS	(4) QTY AUTH
6135-01-269-3663	BATTERY PACK, DISK DRIVE		EA	1*
6135-01-201-5858	BATTERY PACK, PRINTER		EA	1*
7045-01-209-2193	DISC		EA	5*
7530-01-200-9272	PAPER,INKJET		EA	*
-	TECHNICAL MANUAL		EA	1
5950-01-167-3029	RECHARGER, 110V, UNITED STATES, 82059D		EA	1

* OR AS REQUIRED

APPENDIX E

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

El. Scope

This appendix lists expendable supplies and materials you will need to operate and maintain the Battlefield Electronic CEOI System (BECS). These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

E-2 . Explanation of Columns

Column 1 - Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g. “Use cleaning compound, item 9, App. E“).

b. Column 2 - Level. This column identifies the lowest level of maintenance that requires the listed Item.

O - Operator/Crew
C - Organizational Maintenance
F - Direct Support Maintenance
H - General Support Maintenance

c. Column 3 - National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column 4 - Description. Indicates the Federal Item name and, if required, a description to identify the Item. The last line for each item indicates the Dart number followed by the Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

Column 5 - Unit of Measure (U/M). Indicates the measure used n performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea. in, pr). If the unit of measure differs from the unit of Issue, requisition the lowest unit of issue that will satisfy your requirements.

SECTION II EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBERS	(4) DESCRIPTION PART NO. AND FSCM		(5) UNIT OF MEAS
1	0	6135-01-269-3663	BATTERY PACK 45711-60990	51170	EA
2	0	6135-01-201-5858	BATTERY PACK 88014B	51170	EA
3	0	7045-01-209-2193	MICRO FLEX DISC, DOUBLE SIDED (REFER TO CLASSIFIED INFORMATION. SEE SECURING THE BGU) 92192A	51170	EA
4	0	7430-01-199-8706	PRINTHEAD, INK CARTRIDGE 92261A	51170	EA
5	0	7530-01-200-9272	INK JET PAPER 92261N	51170	PK
6	0		BRUSH, BRISTLE, CLEANING		EA
7	0	8020-00-721-9657	BRUSH, PAINT	81848	EA
8	0	8305-00-267-3015	CHEESECLOTH	81348	YD
9	0	6850-00-105-3084	CLEANING COMPOUND		PINT
10	0	8305-00-222-2423	WIPING RAG		YD
11	0		PRINT HEAD, INK CARTRIDGE 51604A (PLAIN PAPER)	51170	EA

APPENDIX F

OPERATOR 'S AND UNIT MAINTENANCE MANUAL

REPAIR PARTS AND SPECIAL TOOLS LIST

		Page
Section I.	Introduction	F-1
II.	Repair Parts List	F-9
III.	Special Tools List (Not Applicable)	
IV.	National Stock Number and Part Number Index	F-19

SECTIOR I INTRODUCTION

F-1 . Scope

This manual lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of unit and maintenance of the BGU. It authorizes the requisitioning, issue, and disposition of spares, repair parts and special tools as indicated by the source, maintenance and recoverability (SMR) codes.

F-2 . General

This Repair Parts and Special Tools List is divided into the following sections:

a Section II Repair Parts List. A list of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending numeric sequence, with the parts in each group listed in ascending item number sequence. Figure numbers are listed directly beneath the group header. Bulk materials are listed in item name sequence. Repair parts kits are listed separately in their own functional group within Section II. Repair parts for reparable special tools are also listed in this section. Items listed are shown on the associated illustration(s)/figure(s).

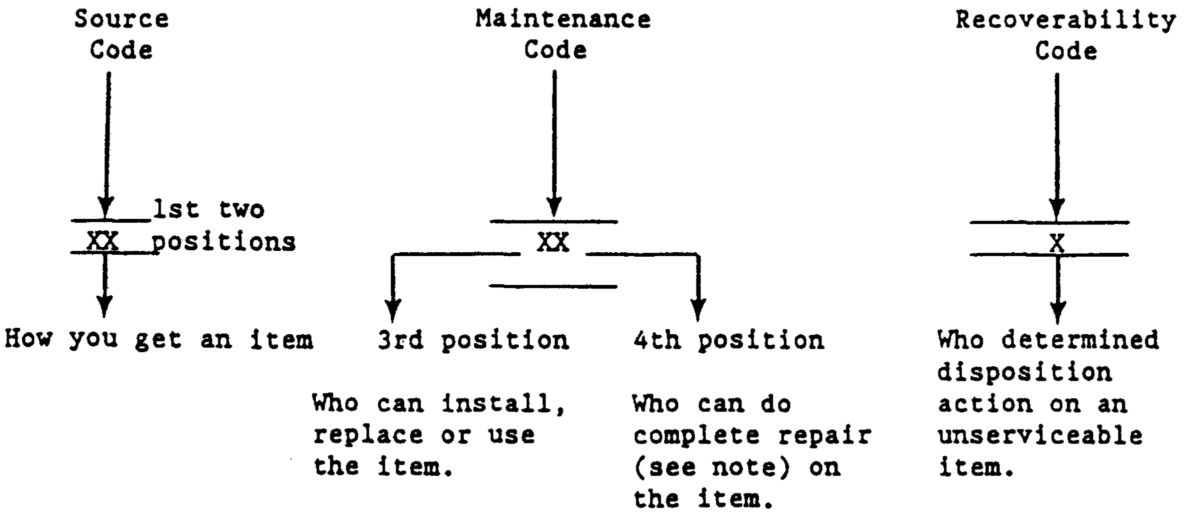
b. Section III. Special Tools List. Not Applicable

c. Section IV. National Stock Number and Part number index. A list, in National item identification number (NIIN) sequence, of all National stock numbered items appearing in the listing, followed by a list in alphanumeric sequence of all part numbers appearing in the listings. National stock numbers and part numbers are cross-referenced to each illustration figure and item number appearance.

F-3 . Explanation of Columns (Sections II and 111)

a. Item No. (Column (1)) indicates the number used to identify items called out in the illustration.

b. SMR Code (Column (2)). The source, maintenance, and recoverability (SMR) code is a five position code containing supply/requisitioning information, maintenance category authorization criteria, and disposition instructions, as shown in the following breakout:


Source Code
1st two positions
XX
How you get an item
Maintenance Code
XX
3rd position
Who can install, replace or use the item.
4th position
Who can do complete repair (see note) on the item.
Recoverability Code
X
Who determined disposition action on an unserviceable item.

NOTE

Complete Repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

(1) Source code. The source code tells you how to get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follows:

Code	Explanation
PA PB PC** PD PE PF PG	Stocked items; use the applicable NSN request/requisition items with these source codes. They are authorized to the category indicated by the code entered in the third position of the SMR code.

**NOTE

Items coded PC are subject to deterioration.

Code	Explanation
KD KF KB	Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance category indicated in the third position of the SMR code. The complete kit must be requisitioned and applied.
MO- (Made at org/) AVUM Level) MF- (Made at DS/ AVIM Level) MH- (Made at GS Level)	Items with these codes are not to be requested/requisitioned individually. They must be made from bulk material which is identified by the part number in the Description and Usable On Code (UOC) column and listed in the Bulk Material group of the repair parts list in this RPSTL.

Code	Explanation
ML- Made at Specialized Repair Activity (SRA) **MD- Made at Depot**	If the item is authorized to you by the third position code of the SMR code, but the source code indicates it is made at a higher category order the item from the higher category of maintenance.
AO- Assembled by org/AVUM category **AF- Assembled by DS/AVIM category** **AH- Assembled by GS category** **AL- Assembled by SRA** **AD- Assembled by Depot**	Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the category of maintenance indicated by the source code. If the third position code of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher category, order the item from the higher category of maintenance.

XA - Do not requisition an “XA” coded item. Order its next higher assembly.
XB - If an “XB” item is not available from salvage, order it using the FSCM and part number given.
xc - Installation drawing, diagram, instruction sheet, field service drawing, that is identified by manufacturers part number.
XD - Item is not stocked. Order an “XD” coded item through normal supply channels using the FSCM and part number given, if no NSN is available.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes, except for those source coded “XA” or those aircraft support items restricted by requirements of AR 750-1.

(2) Maintenancee code. Maintenance codes tell you the categyY of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the MR code as follows:

(a) The maintance code entered in the third position tells you the lowest maintenance category authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to one of the following categories of maintenance.

Code	Application/Explanation
C -	Crew or operator maintenance done within organizational or aviation unit maintenance.
O -	organizational or aviation unit category can remove, replace, and use the item.
F -	Direct support or aviation intermediate category can remove, replace, and use the item.

Code	Application/Explanation
H	General support category can remove, replace, and use the item.
L	Specialized repair activity can remove, replace, and use the item.
D	Depot category can remove, replace, and use the item.

(b) The maintenance code entered in the fourth position tells whether or not the item is to be repaired and identifies the lowest maintenance category with the capability to do complete repair (i.e., perform all authorized repair functions). This position will contain one of the following maintenance codes.

NOTE

> Some limited repair may be done on the item at a lower category of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.

Code	Application/Explanation
O	Organizational or aviation unit is the lowest category that can do complete repair of the item.
F	Direct support or aviation intermediate is the lowest category that can do complete repair of the item.
H	General support is the lowest category that can do complete repair of the item.
L	Specialized repair activity is the lowest category that can do complete repair of the item.
D	Depot is the lowest category that can do complete repair of the item.
z	Nonreparable. No repair is authorized.
B	No repair is authorized. (No parts or special tools are authorized for the maintenance of a “B” coded item.) However, the item may be reconditioned by adjusting, lubricating, etc., at the user category.

(3) Recoverability code. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the SMR code as follows:

Recoverability Code	Application/Explanation
z	Nonreparable item. When unserviceable, condemn and dispose of the item at the category of maintenance shown in the third position of SMR Code.
O	Reparable item. When uneconomically reparable, condemn and dispose of the item at organizational or aviation unit category.
F	Reparable item. When Uneconomically” reparable, condemn and dispose of the item at direct support or aviation intermediate category.
H	Reparable item. When uneconomically reparable, condemn and dispose of the item at general support category.
D	Reparable item. When beyond lower category repair capability, return to depot. Condemnation and disposal of item not authorized below depot category.

Recoverability Code   Application/Explanation

L - Reparable item. Condemnation and disposal not authorized below specialized repair activity (SRA).
A - Item requires special handling or condemnation procedures because of specific reasons (e.g., precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.

c. FSCM (column (3)). The Federal Supply Code for Manufacturer (FSCM) is a 5-digit numeric code which is used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

d. Part Number (column (4)). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

NOTE

When you use a NSN to requisition an item, the item you receive may have a different part number from the part ordered.

e. Description and Usable on Code (UOC) (Column (5)). This column includes the following information.

(1) The Federal item name and, when required, a minimum description to identify the item.

(2) The statement "END OF FIGURE" appears just below the last item description in Column (5) for a given figure in both sections II and III.

f. Qty (column (6)) Indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column in lieu of a quantity indicates that the quantity is variable and the quantity may vary from application to application.

F-4. Explanation of Columns (Section IV)

a. National Stock Number (NSN) Index.

(1) Stock number column. This column lists the NSN by National item identification number (NIIN) sequence. The NIIN consists of the last nine digits of the NSN. When using this column to locate an item, ignore the first four digits of the NSN. When requisitioning items use the complete NSN (13 digits).

(2) Fig.column. This column lists the number of the figure where the item is identified/located. The illustrations are in numerical sequence in sections II and III.

(3) Item column The item number identifies the item associated with the figure listed in the adjacent Fig. column. This item is also identified by the NSN listed on the same line.

12. Part Number index. Part numbers in this index are listed by part number in ascending alphameric sequence.

(1) FSCM column. This column lists Federal supply code for manufacturer (FSCM) .

(2) Part number column. This column indicates the part number assigned to the item.

(3) Stock number column. This column lists the National stock number for the associated part number and manufacturer identified in the part number and FSCM columns to the left.

(4) Fig. column. This column lists the number of the figure where the item is identified/located in sections II and III.

(5) Item column. The item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure-number column.

F-5 . Special Information

National stock numbers (NSN'S) that are missing from P source coded items have been applied for and will be added to this TM by future change/revision when they are entered in the Army Master Data File (AMDF). Until the NSN'S are established and published, submit exception requisitions to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-MM, Fort Monmouth, NJ 07703-5000 for the part required to support your equipment.

F-6 . How to Locate Repair Parts

a. When National stock number or part number is not known.

(1) First. Using the table of contents, determine the assembly group or subassembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and listings are divided into the same groups.

(2) Second. Find the figure covering the assembly group or subassembly group to which the item belongs.

(3) Third. Identify the item on the figure and note the item number.

(4) Fourth. Refer to the Repair Parts List for the figure to find the part number for the item number noted on the figure.

(5) Fifth. Refer to the Part Number Index to find the NSN, if assigned.

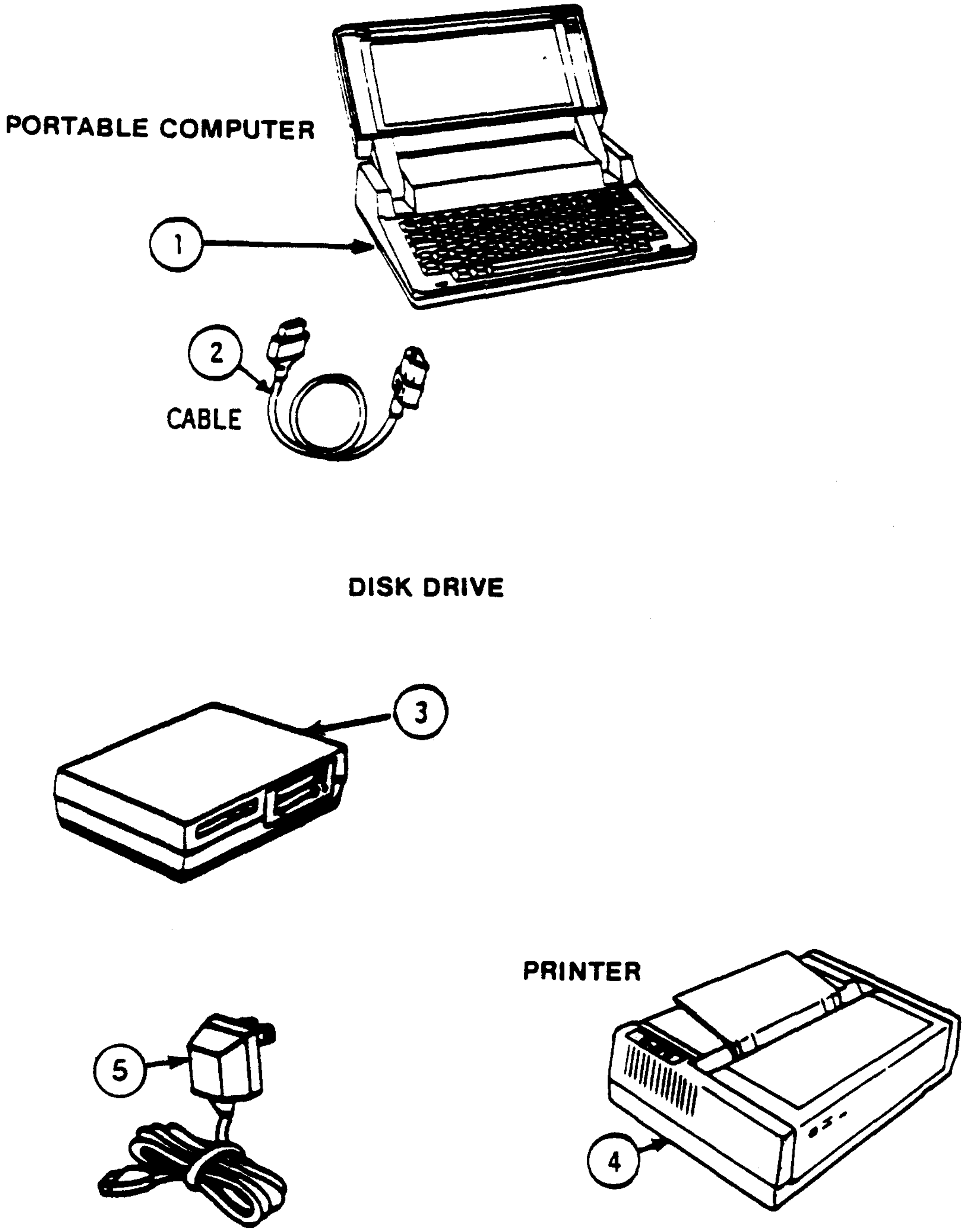
b. When National stock number or part number is known.

(1) First. Using the Index of National stock numbers and part numbers, find the pertinent National stock number or part number. The NSN index is in National item identification Number (NIIN) sequence (para 4a (1)). The part numbers in the part number index are listed in ascending alphameric sequence (para 4b). Both indexes cross-reference you to the illustration figure and item number of the item you are looking for.

(2) Second. After finding the figure and item number, verify that the item is the one you're looking for, then locate the item number in the repair parts list for the figure.

F-7. Abbreviation

Not applicable.


PORTABLE COMPUTER
1
2
CABLE
DISK DRIVE
3
PRINTER
5
4

CE2FI001

Figure F-1. Basic Generation Unit (BGU), AN/GYK-33

SECTION II. REPAIR LIST

(1) ITEM NO.	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE	(6) QTY
				GROUP: 00 BASIC GENERATION UNIT (BGU) AN/GYK-33 FIGURE F-1	
1	PAODA	51170	HP-110	PORTABLE COMPUTER	1
2	PAOZZ	51170	82167B	CABLE, HP-IL METER	3
3	PAODA	51170	HP-9114B	DISC DRIVE	1
4	PAODA	51170	HP-2225B	PRINTER	1
5	PADZZ	51170	82059D	RECHARGER, 110V, UNITED STATES	3
				END OF FIGURE	

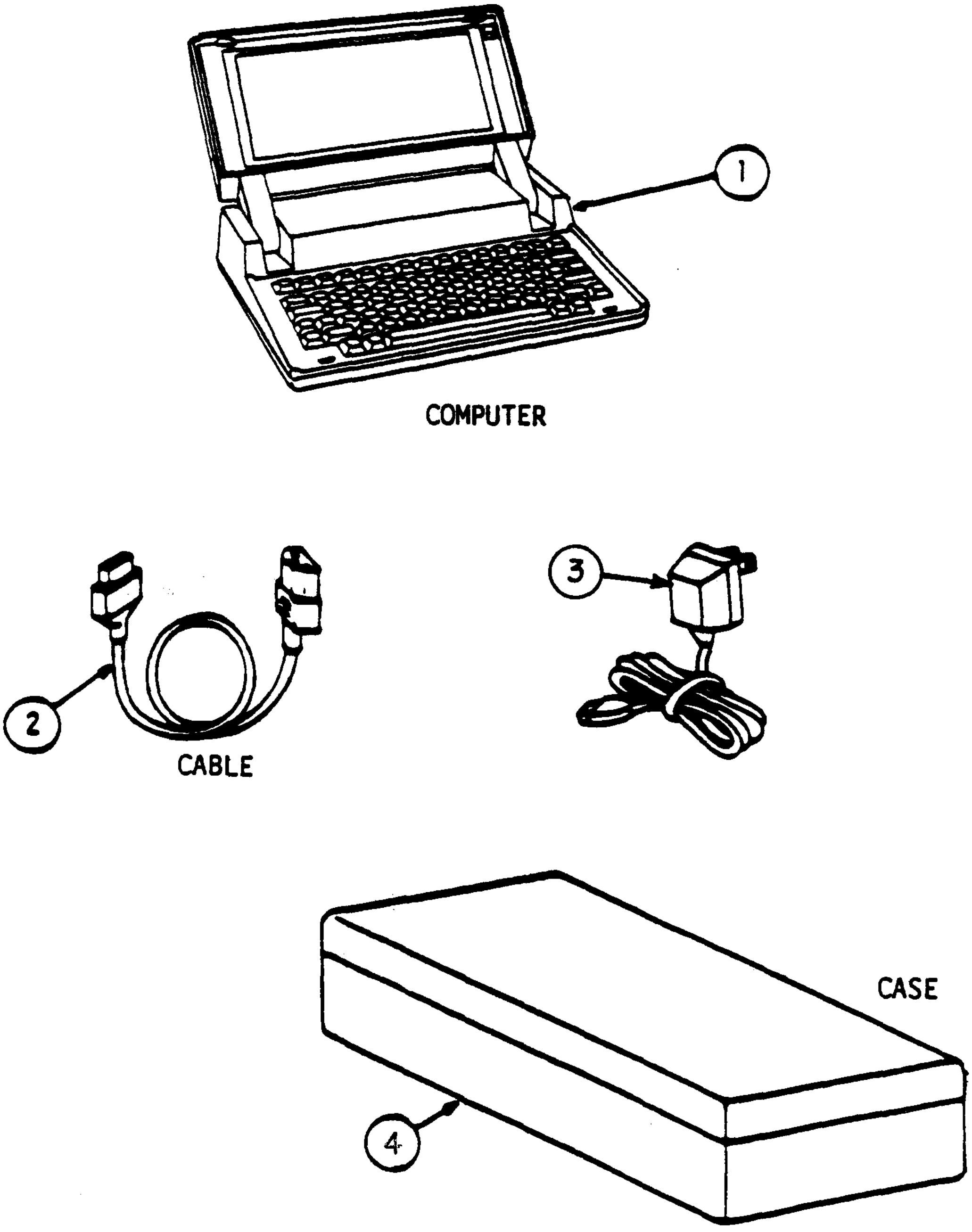

1
COMPUTER
2
CABLE
3
CASE
4
CE2FI002

Figure F-2.

SECTION II. REPAIR LIST

(1) ITEM NO.	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE	(6) QTY
				GROUP: 01 PORTABLE COMPUTER, HP-110 FIGURE F-2	
1	PAODA	51170	HP-110	PORTABLE COMPUTER	1
2	PAOZZ	51170	82167B	CABLE,HP-IL 1 METER	2
3	PAOZZ	51170	82059D	RECHARGER, 110V, UNITED STATES	1
4	PAODD	51770	102516	CASE SYSTEM W/FOAM INSERT	1
				END OF FIGURE	

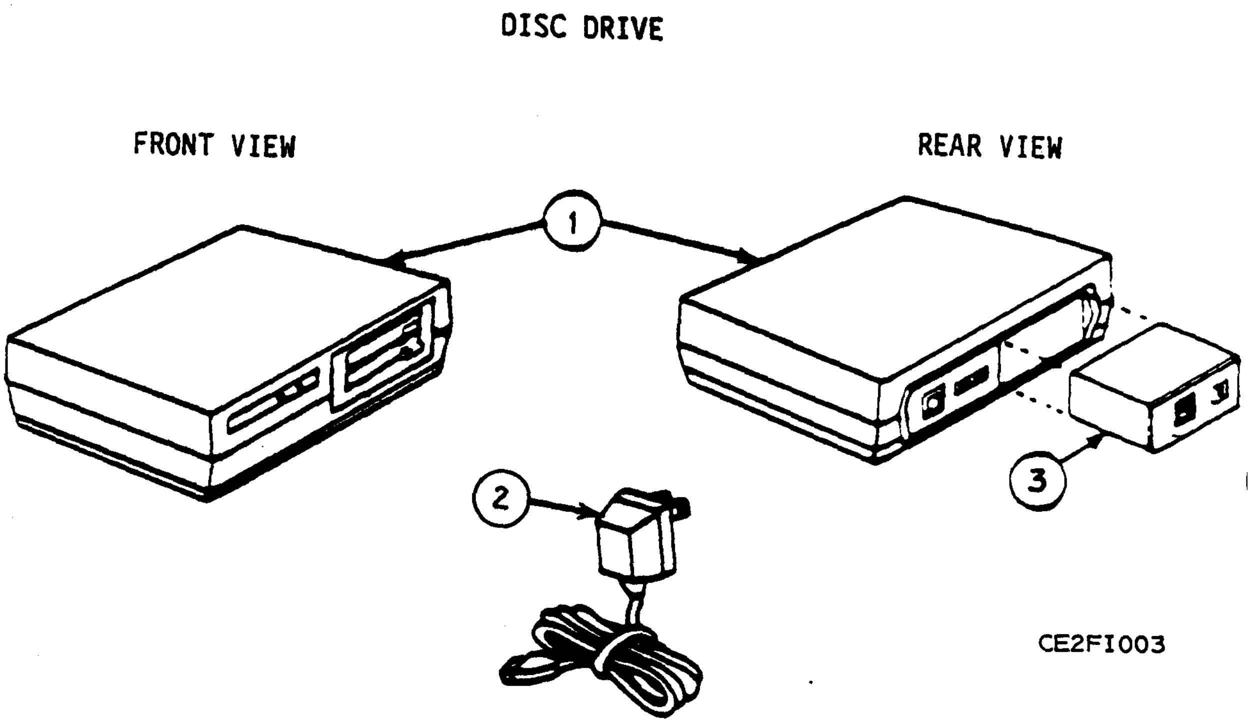

DISC DRIVE
FRONT VIEW
REAR VIEW
1
2
3
CE2FI003

Figure F-3. Disc Drive, HP-9114B

SECTION II. REPAIR LIST

(1) ITEM NO.	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE	(6) QTY
				GROUP: 02 DISC DRIVE, HP 9114B FIGURE F-3	
1	PAODA	51170	HP-9114B	DISC DRIVE	1
2	PAOZZ	51170	82059D	RECHARGER, 110V, UNITED STATES	1
3	PAOZA	51770	88014A	BATTERY PACK, DISC DRIVE	1

END OF FIGURE

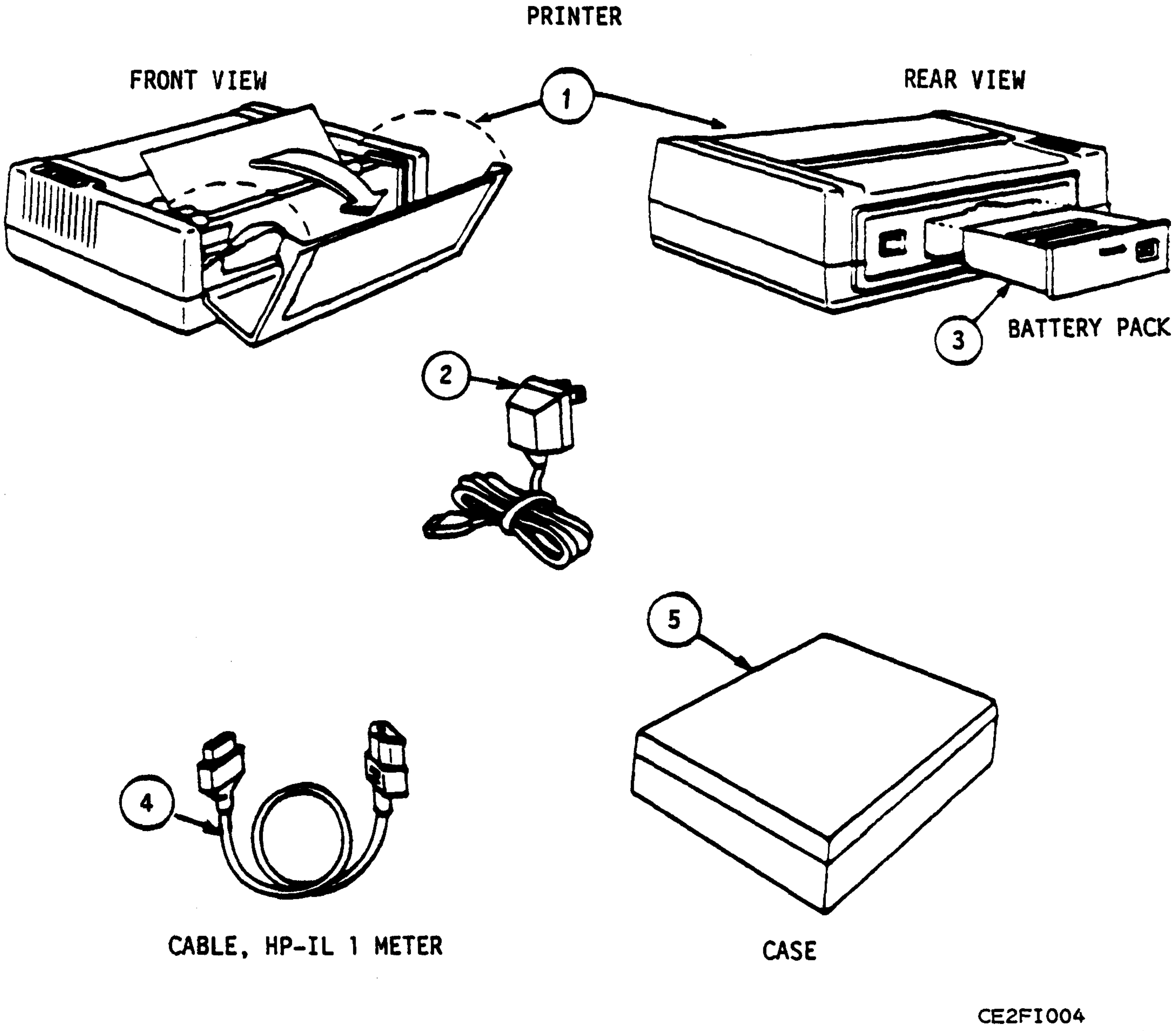

PRINTER
FRONT VIEW
REAR VIEW
1
3
BATTERY PACK
2
5
4
CABLE, HP-IL 1 METER
CASE
CE2FI004

Figure F-4. Printer, HP-2225B

SECTION II. REPAIR LIST

(1) ITEM NO.	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE	(6) QTY
				GROUP: 03 PRINTER, HP-2225B FIGURE F-4	
1	PAODA	51170	HP-2225B	PRINTER	1
2	PAOZZ	51170	82059D	RECHARGER, 110V, UNITED STATES	1
3	PAOZA	51170	82199A	BATTERY PACK, PRINTER	1
4	PAOZZ	51170	82167B	CABLE,HP-IL 1 METER	1
5	PAODD	51770	102223-2	CASE COMPONENTS W/FOAM INSERT	1
				END OF FIGURE	

SECTION II. REPAIR LIST

(1) ITEM NO.	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE	(6) QTY
				GROUP: 04 ECCM INTERFACE CABLE (NO PARTS AUTHORIZED)	2

SECTION III. SPECIAL TOOLS LIST

(NOT APPLICABLE)

SECTION IV. NATIONAL STOCK NUMBER AND PART NUMBER INDEX

TABLE F-2. NATIONAL STOCK NUMBER AND PART NUMBER IDEX

STOCK NUMBER	FIG. NO.	ITEM NO.	STOCK NUMBER	FIG. NO.	ITEM NO.
5895-01-254-6699	F-2	1			
5895-01-254-6700	F-3	1			
5895-01-254-6697	F-2	3			
5895-01-254-6698	F-4	4			
5950-01-167-3029	3-1	3			
6135-01-201-5858	F-4	2			
6135-01-269-3663	F-3	2			
6145-01-199-8679	F-2	2			
7025-01-199-8708	F-4	1			

TABLE F-3. NATIONAL STOCK NUMBER AND PART NUMBER INDEX (CONT'D)

PART NUMBER	FSCM	FIG. NO.	ITEM NO.	PART NUMBER	FSCM	FIG. NO.	ITEM NO.
2225B	51170	F-4	1				
9114B	51170	F-3	1				
110	51170	F-2	1				
82167A	51170	F-4	3				
82167B	51170	F-2	2				
45711-60993	51170	F-3	2				
82199A	51170	F-4	2				
102223-2	29724	F-4	3				
102516	29724	F-2	3				

APPENDIX G

SOI DEVELOPMENT

Section I INTRODUCTION

G-1 BECS SOI

The Signal Operation Instructions (S0I) is a series of orders issued for technical control and coordination of a command or activity (refer to Appendix A for a list of Field Manuals describing doctrine).

SOI provides the guidance needed to ensure the speed, simplicity and security of communications. SOI provides communications security by limiting and impairing enemy intelligence collection efforts. SOI is not designed to nor capable of providing security of message content.

G-2 PURPOSE OF BECS TO SOI

The BECS is designed to decentralize and automate SOI generation. Generating and distributing BECS SOI can be done with virtually no dependence on NSA. The BECS is capable of building a Brigade size SOI in 24 hours. NSA normally requires 60-90 days and a manual build normally requires 3-5 days to produce the same SOI. BECS can respond quickly to a compromise of SOI in the field or to rapidly changing force structures. BECS can regenerate frequencies and call signs in 2-3 hours (depending on data size). Reproduction and distribution could be done in 6-8 hours (depending on number of copies required). These system capabilities make BECS practical to use for building SOI for all units.

G-3 COMMAND LEVELS

The various levels of command have different responsibilities during SOI generation. The following shows a table of the Command levels, the media used to transfer data and the function of each level.

Command Levels	Media	Function
Theater	Disk	Generates pairs of operational TRANSEC keys every 30 days for ICOM & NON-ICOM SINCGARS radios. The J6 (C-E) generates the TRANSEC keys. Generates training TRANSEC keys every 90 days.
Corps	Disk	Generates the CUCP (sign/countersign, smoke/pyrotechnic signals, suffix/expander, hopsets and SOI) at Corps level. Receives TRANSEC keys from Theater
Division	Disk	Performs Division SOI generation. Receives TRANSEC keys, generated SOI merged from Corps, sign/countersign, smoke/pyro, suffixes/expanders and hopsets from Corps
Brigade	Disk	Receives the generated SOI and other data such as hopsets and TRANSEC keys from Division
Battalion	Paper & ECCM Fill Device	Receives the SOI information and other data such as hopsets and TRANSEC keys from Brigade.

In some situations Theater may. not be the highest level of command. In this case, the highest level of command (e.g. Corps) will generate TRANSEC keys

WARNING:

Every time the BECS has been zeroized, a new initialization vector must be used to generate additional SOIs.

G-4 DEVELOPMENT STEPS FOR BECS SOI

Although BECS automates the generation process, the C-E officer must design the SOI on paper first. The remainder of this appendix describes how to design SOI as well as how to fill out and use the worksheets.

The basic steps for designing and developing BECS SOI data are as follows:

1. Get data from MTOE (Modified Table of Organization and Equipment) which authorizes the use of personnel and equipment.
2. Determine the doctrine to be followed.
3. Determine what the commander desires.
4. Observe and identify the situation.
5. Restriction explanation worksheet.

6. Determine how many nets and frequencies are required. Use the current SOI as a starting point.
7. Master Net List (MNL).
8. Cosite worksheet.
9. Special Nets Plan.
10. Design SOI net groups.
11. Determine suffix and expander lists.
12. Determine share plan for frequencies.
13. Determine share plan for call signs.

Secton II FREQUENCIES

G-5 GENERAL INFORMATION

a. RADIO FREQUENCY SPECTRUM

Frequency Band	Frequency in MHz
Low Frequency (LF)	.0001 - 1.9999
High Frequency (HF)	2.0000 - 29.9999
VHF-FM	30.000 - 87.975
VHF-AM	108.0000 - 149.999
UHF	225.000 - 399.999
Extra	0.0001 - 9999.99

b. PROCEDURES

All frequency assignments are based on the authorized frequencies of the using organization. The available frequencies are listed in the current Radio Frequency Authorization (RFA). The initial step in preparing the net/frequency assignment plan is to identify the unit nets required for command and control of tactical operations. After all nets are identified, compare the resulting frequency requirements against the number of frequencies available. Spare frequencies are available for assignment in most SOI with their use being controlled by the major organizations (controlling authority) C-E officer. If your frequency allocation and assignments are inadequate, then additional frequencies must be requested through higher command or area frequency coordinator, or some nets will be required to share frequencies with other nets. Refer to FM 24-2 for procedures governing the requisition of frequencies.

c. FREQUENCY TYPES

1. FIXED FREQUENCY

Fixed frequencies are frequency values that are usually assigned to non-tactical nets. The frequency value is manually assigned and is unique to the specific net. The frequency value is non-changing for all time periods of the generation. For example, the MEDEVAC net may be assigned 34.000 MHz and will never change. Also, 34.000 MHz will not be assigned to another net. Fixed frequencies do not have any restrictions assigned and are used on single channel nets only.

2. RESTRICTED FREQUENCY

Restricted Frequencies are frequencies that can not be used by certain nets for various reasons (e.g. power, area restricted). The frequency value is assigned a letter restriction and if a net has the same restriction letter assigned to it, then the net will never be assigned the frequency value for any time period. Restricted frequencies can be either discrete or common user frequencies.

The BGU Frequency Assignment Program (BECS software) is designed to recognize up to 16 separate frequency restrictions (identified by a letter code) per frequency band. As each restriction is identified, assign it an appropriate letter code (A-P) and explanation sheet. Multiple frequencies can be assigned to a single frequency restriction letter.

The BECS software is designed to recognize up to 8 of the 16 separate net restrictions (identified by a letter code) per net. As each restriction is identified, assign it an appropriate letter code (A-P) and add the code and restriction description to an explanation sheet.

These same frequency restrictions will be used at a later time with specific radio nets on the master net list. When assigning frequencies, nets and frequencies with the same restriction letter code CANNOT be matched together. A “reverse logic” is used when assigning restrictions. For example, the letter “A” may be assigned to frequencies that will not be used to communicate with aircraft (frequency restriction). The letter “A” should then be assigned to nets that must communicate with aircraft (net restriction). Therefore “A” restricted frequencies will not be assigned nets that have been assigned the “A” restriction.

When a BECS Spectrum Manager receives the Radio Frequency Allocation (RFA), he is required to read and interpret it, extract both external and internal frequency restrictions, complete a restriction explanation sheet and compare frequency restrictions against nets when completing the master net list. Remember you have 16 restrictions per frequency band; the restrictions, letter coded (A-P), do not have to be the same for each band.

d. FREQUENCY ASSIGNMENTS

Ideally, frequencies are randomly assigned to nets designed to receive a changing frequency with each change in time period. However, because of special cases (e.g. MEDEVAC) and the lack of available frequencies and abundance of needed nets some nets must share frequencies or reuse frequencies. Also, some nets require frequency separation from other nets to

d. FREQUENCY ASSIGNMENTS (Continued)

prevent interference. The following section will describe the different types of assignments.

1. FREQUENCY ASSIGNMENT TYPES

A net may be sufficiently important to warrant a dedicated (sole user) frequency for its use. This frequency is unique to the organization and is only used by one net during any time period. Unlike a fixed frequency, the sole user frequency assigned to the net changes with each time period. This type of assignment is reserved for command and control nets.

When the number of nets requiring frequencies is greater than the number of available frequencies, frequency reuse (common user) becomes a necessary option. Reuse frequencies are frequencies that are reused (shared on a noninterference basis) by more than one net. Nets are selected for inclusion in a reuse plan on the basis of low operating power, geographic separation, terrain masking and other factors permitting the use of the same frequencies on a noninterference basis.

Another method of reducing the number of frequencies required is to share frequencies. A shared frequency is a frequency used by two or more nets. The sharing nets will receive the same frequency for a given time period. The frequency can be fixed or discrete. Typical nets using shared frequencies are survey nets and weather nets.

G-6 FREQUENCY RESTRICTIONS PRACTICAL EXAMPLES

The following practical exercise is designed to test your understanding of frequency restrictions. There are three suggestions provided. Exercises 1 and 2 provide an understanding of the reverse logic system applied to frequency restrictions. Exercise 3 requires interpretation of an HF and VHF-FM RFA, developing a frequency restriction explanation sheet and comparing frequency restrictions against specific radio nets.

In exercises 1 and 2, you are given radio nets and frequencies. With each radio net and frequency is an arbitrary restriction (A-P). You must determine which frequencies are assignable to which nets. Record your answers in the column titled “Assignable Frequencies for Net”.

In exercise 3, you are given a sample HF and VHF-FM RFA and radio nets for the 1-78th Infantry Battalion. After reviewing the RFAs, develop a restriction explanation sheet for both RFAs. Next, take the list identifying those radio nets which require restrictions and complete the two columns on your list of radio nets titled “RF BAND” and “Restrictions”.

EXERCISE NO. 1			
	NET DESCRIPTION	NET RESTRICTIONS	ASSIGNABLE FREQUENCIES FOR NET
1.	2 BDE CMD	A	
2.	1-78 IN CMD	B	
3.	2-78 IN CMD	C	
4.	2-62 AR CMD	D	
5.	3-62 AR CMD	E	
6.	2-40 FA CMD	F	
7.	2 FSB CMD	G	
8.	FWD COMMS/52 SIG	H	
9.	B/1-441 ADA CMD	I	
10.	B/52 EN CMD	J	
11.	2.52 CML	K	
12.	2/52 MP	L	

	RFA FREQUENCIES	RESTRICTIONS
1.	32.100	L
2.	33.350	K
3.	33.400	J
4.	41.250	I
5.	43.050	H
6.	44.000	G
7.	50.750	F
8.	55.550	E
9.	62.300	D
10.	62.350	C
11.	62.400	B
12.	66.950	A

EXERCISE NO. 2			
	NET DESCRIPTION	NET RESTRICTIONS	ASSIGNABLE FREQUENCIES FOR NET
1.	2 BDE CMD	A	
2.	1-78 IN CMD		
3.	2-78 IN CMD		
4.	2-62 AR CMD	AB	
5.	3-62 AR CMD		
6.	2-40 FA CMD	B	
7.	2 FSB CMD		
8.	FWD COMMS/52 SIG		
9.	B/1-441 ADA CMD		
10.	B/52 EN CMD	B	
11.	2.52 CML	BC	
12.	2/52 MP	ABC	

	RFA FREQUENCIES	RESTRICTIONS
1.	32.100	A
2.	33.350	
3.	33.400	
4.	41.250	B
5.	43.050	
6.	44.000	C
7.	50.750	
8.	55.550	D
9.	62.300	
10.	62.350	AD
11.	62.400	
12.	66.950	

EXERCISE NO. 3

RADIO FREQUENCY ALLOCATION

FREQUENCY	MAXIMUM	EMISSION	TRANSMITTING LOCATIONS
MHz	W35	30K00P3E	
30.050			
30.100			
30.150 **			
30.200			
30.250			
30.300			
30.350 ***			
30.400			
30.450			
30.500 **			
30.550			
32.050			
32.100			
32.150			
32.200			
32.250			
32.300			
32.350			
32.450			
32.550 ***			
32.600			
32.650			
32.700			
72.700 *			
74.950 *			

* These frequencies are not authorized for use by any element who communicates with an aviation unit.

** These frequencies are to be used on low power only.

*** These frequencies are not authorized for use in training area Tripoli.

EXERCISE NO. 3 (Cont)

LIST OF RADIO NETS

NET DESCRIPTION	RF BAND	RESTRICTIONS
1-78 IN CMD		
1-78 IN RTS		
1-78 IN INT		
1-78 IN AJ/ALT		
1-78 IN SSB (P)		
1-78 IN SSB (A)		
1-78 IN RATT (P)		
1-78 IN RATT (A)		
1-78 IN A/L		
A/1-78 IN CMD		
1/A/1-78		
2/A/1-78		
3/A/1-78		
B/1-78 IN CMD		
1/B/1-78		
2/B/1-78		
3/B/1-78		
C/1-78 IN CMD		
1/C/1-78 IN CMD		
2/C/1-78		
3/C/1-78		
D/1-78 IN CMD		
1/D/1-78		
2/D/1-78		
3/D/1-78		
E/1-78 IN CMD		
1/E/1-78		
2/E/1-78		
3/E/1-78		
DIV EARLY WARN		
MEDEVAC (WAR)		
MEDEVAC (PEACE)		

EXERCISE NO. 3 (Cent)

NETS REQUIRING RESTRICTIONS

HF RADIO NETS REQUIRING RESTRICTIONS
PRIMARY NETS
ALTERNATE NETS
RATT NETS
SSB-VOICE NETS

VHF-FM RADIO NETS REQUIRING RESTRICTIONS
AVIATION RESTRICTED NETS
1-78 IN CMD
1-78 IN RTS
1-78 IN INT
1-78 AJ/ALT
DIV EARLY WARN
MEDEVAC (WAR)
MEDEVAC (PEACE)

LOW POWER RESTRICTIONS
ALL PLATOONS

TRAINING AREA TRIPOLI RESTRICTIONS
1-78 IN CMD
1-78 IN RTS
A/1-78 IN CMD
1/A/1-78
2/A/1-78
3/A/1-78

G-7 REUSE PLAN

A reuse plan allows nets to reuse (share) frequencies (VHF-FM band only) with other nets. Nets which operate low power radios with short range communications requirements are the nucleus of a frequency reuse plan. Nets with long geographic separation or terrain masking are also considered for frequency reuse. This concept is best described by example. Suppose that there are three regions (zones) that are geographically separated from each other and each region contains three nets as shown in Table G-1.

Zone A	Zone B	Zone C
Net A1	Net B1	Net C1
Net A2	Net B2	Net C2
Net A3	Net B3	Net C3

TABLE G-1

If the nets in a zone can not interfere with nets in another zone, then only three frequencies are required to satisfy the nine nets. A net in the three zones can use the same frequency for one time period without causing problems. In the SOI generation process, the three nets in each zone are randomly assigned the same three frequencies.

For example, in time period 1, net A1, B1 and C1 may share the same frequency while net A2, B2 and C2 share a frequency and nets A3, B3 and C3 share a frequency. In time period No. 2, nets A1, B2 and C3 may share a frequency. Nets A2, B1 and C1 may share the same frequency and nets A3, B3 and C2 may share the same frequency.

In summary, the nets in Zones B and C can reuse the frequencies used in Zone A because the nets are geographically separated and can not interfere with each other.

a. NETS NOT ALLOWED IN REUSE

The following is a list of nets that should not be placed in reuse:

1. Command and retransmission (and corresponding) nets
2. Command and fire control nets (maneuver units)
3. Fire direction nets (DIVARTY/FA)
4. Any FM Aviation Net (CAV/ATK)
5. Any emergency net
6. Any spare net
7. Any AJ (Anti-jam) or ALT (Alternate) net.

b. NETS ALLOWED IN REUSE

The following is a list of nets that can be placed in reuse:

1. Company command nets without retransmission nets

b. NETS ALLOWED IN REUSE (Continued)

2. Air Defense Artillery (ADA) nets
3. Other combat support or combat service support command control nets.

c. CLASSES AND ZONES

Nets selected for reuse are grourped into “classes” and “zones”. A zone is a group of nets in which a freqency cannot be assigned to more than one net for the same time period. Classes are groups of zones. The total number of frequencies needed for a class equals the number of nets in the largest zone (frequencies reused between zones). An SOI database may contain a maximum of 10 classes and a maximum of 20 zones per class. A maximum of 200 nets can be in one zone.

d. REUSE “RULES OF THUMB”

The following is a list of the rules to design a reuse plan:

1. WARNING: Neither a RETRANS nor the CORRESPONDING net can be placed in a reuse plan. See section G-7.a.
2. All nets within the same class must have the same restriction(s).
3. The class with the largest number of restrictions should be class 1.
4. Frequencies are selected based on the restriction(s) assigned to the nets. If nets have NO restrictions, frequencies may be restricted but still assigned. Frequencies CANNOT include restriction(s) which are included in the net’s restriction(s).
5. The zone with the most nets determines the number of frequencies required to support the entire class.
    (a). Single channel nets require one frequency per net; therefore, if 20 nets is the maximum number in a zone, then 20 frequencies are required for the entire class.
    (b). Frequency hopping nets require two frequencies per net (manual and cue); therefore, if 20 nets is the maximum number in a zone, then 40 frequencies are required for the class for frequency hopping.
6. All zones within a class will “reuse” the same frequencies (Zone 1 uses the same frequencies as Zone 2, Zone 2 uses the same frequencies as Zone 3 and so on).
7. Reuse plan for most Army Divisions will contain one class with three to five zones
8. Elements that provide Direct Support (DS), i.e. field artillery and engineering must be placed in the same zone as the supported Brigade. (No two nets within the same zone are permitted to receive identical frequencies)
9. Elements that provide General Support (GS), i.e. chemical, cavalry, MI/CEWI, and Signal, should be placed in their own separate zone
10. When selecting nets for reuse, always start at the lowest possible echelon and work your way up.

e. OBTAINING SPARE FREQUENCIES

Spare frequencies are obtained from frequencies left over after the reuse assignment. The number of spare frequencies is calculated and entered on the reuse worksheet.

f. REUSE WITH FREQUENCY HOPPING NETS

If a net is to operate solely in the single channel mode, the frequency is assigned to the cue. If the net is to 0perate in the frequeny homing mode, the net is assigned a manual frequency in addition to the cue frequency. The cue and manual frequencies needed for a frequency hopping net can also be reused. However, if a frequency is assigned as a cue frequency it is not available for use as a manual frequency.

Because two frequencies are required for a frequency hopping net the number of frequencies used in a SINCGARS reuse plan is doubled. There is a maximum of 2320 frequencies in the FM band.

1. CUE FREQUENCY

The following is a list of characteristics of the cue frequency: (Terminology associated with the new SINCGARS radio, previously referred to as the single channel frequency)

- o Frequency in the range of 30.000 MHz to 87.975 MHz that is divisible by .025 MHz or 30.000 MHz to 75.950 MHz that is divisible by .050 MHz. The frequency limits and channelization are selected by the user. The selection is dependent on the radios being used. The VRC-12 radios are limited to 75.950 MHz and the CUE frequency must be a multiple of .050 MHz.
- o Bandwidth of 25 kHz
- o Single channel
- o Used to bring a user into a net

Example: VRC-12 series radios

2. MANUAL FREQUENCY

The following is a list of characteristics of the manual frequency: (associated only with SINCGARS)

- o Frequency in the range of 30.000 MHz to 87.975 MHz that is divisible by .025 MHz.
- o Bandwidth of 25 kHz
- o Single channel
- o Used for filling a radio remotely

Example: SINCGARS radio

g. FREQUENCY REUSE PLAN PRACTICAL EXAMPLE

You have been tasked to prepare a SOI for the 2D Brigade Task Force which has SINCGARS radios (2D BDE, 2-78 IN BN. 3-62 AR BN, and MEDEVAC (WAR)). The remaining units have VRC-12 Series radios (l-78 IN BN, 2-62 AR BN and all

g. FREQUENCY REUSE PLAN PRACTICAL EXAMPLE (Continued)

CS/CSS units supporting 2D BDE).

You need the following items to complete the exercise:

1. Radio Net Listing for the 2D Brigade Task Force
2. Authorized Frequency Listing
3. Blank Frequency Reuse Sheets
4. Frequency/Net Matrix

Develop a Frequency Reuse Plan, using single channel CUE frequencies (50 kHz) and a frequency hopping manual frequencies (25 kHz).

Review the following two reuse applications.

APPLICATIONS:

1. Complete the Radio Net Listing to include: RF Bands, User Definition (SU for sole user or CU for common user), Reuse Class/Zone and if net is a Frequency Hopping Net.

2. Complete the Frequency and Net Matrix by counting the number of frequencies by RF Band from the frequency list and by counting the number of nets in each band from the Radio Net Listing. Each Frequency Hop Net requires 2 frequencies (SU or CU).

NOTE:
If you have more nets than frequencies, then a reuse plan is required. If the frequencies equal or exceed the number of nets, then a reuse plan is not required.

3. Complete the Frequency Reuse Plan for the VHF-FM RF Band.

4. A/L, MORT, WPNS, and SCT Nets will be classified as Sole User Nets.

5. The 2D BDE will require one Reuse Class. The Zones will be made up by:

   (l). 1-78 IN BN is Zone 1.

   (2). 2-78 IN BN is Zone 2.

   (3). 2-62 AR BN is Zone 3.

   (4). 3-62 AR BN is Zone 4.

6. The following spares need to be planned for: RATT Spare 1 and SSB Spare 1.

7. MEDEVAC PEACE (34.000 MHz) and Range Control (37.900) are fixed frequencies.

PRACTICAL EXAMPLE

FREQUENCY REUSE PLAN

RADIO NET LISTING					
NET DESCRIPTION	RF BAND	USER DEF	CLASS	ZONE	HOP NET
2D BDE CMD	FM	SU	-	-	Y
2D BDE RTS					
2D BDE INTEL					
2D BDE AJ/ALT 1					
2D BDE AJ/ALT 2					
2D BDE A/L					
2D BDE NRI					
2D BDE CMD RATT (P)					
2D BDE CMD RATT (A)					
2D BDE CMD SSB (P)					
2D BDE CMD SSB (A)					
HHC/2D BDE					
1-78 IN BN CMD	FM	SU	-	-	N
1-78 IN BN RTS					
1-78 IN BN A/L					
1-78 IN AJ/ALT					
HHC/1-78 IN BN					
MORT/HHC/1-78 IN					
SCT/HHC/1-78 IN					
A/1-78 IN CMD					
1/A/1-78 CMD					
2/A/1-78 CMD					
3/A/1-78 CMD					
B/1-78 IN CMD					

PRACTICAL EXAMPLE

FREQUENCY REUSE PLAN

FREQUENCY AND NET MATRIX

	LF	HF	VHF-FM *	VHF-AM	UHF	EXTRA
NETS						
FREQUENCIES						

FREQUENCY REUSE PLAN

REUSE WORKSHEET FOR ________ BAND

TOTAL NO. NETS =	TOTAL NO. FREQUENCIES =
TOTAL NO. FIXED NETS =	FREQUENCIES REQUIRED = -
nets remaining =	frequencies remaining =
TOTAL NO. SOLE USER NETS = -	FREQUENCIES REQUIRED = -
nets remaining =	frequencies remaining =
TOTAL NO. NETS ALL SHARE GPS = -	FREQUENCIES REQUIRED = -
nets remaining =	frequencies remaining =
TOTAL NO. NETS CLASS 01 =	FREQUENCIES REQUIRED = -
nets remaining =	frequencies remaining =
TOTAL NO. NETS CLASS 02 =	FREQUENCIES REQUIRED = -
nets remaining =	frequencies remaining =
TOTAL NO. NETS CLASS 03 =	FREQUENCIES REQUIRED = -
nets remaining =	frequencies remaining =
TOTAL NO. NETS CLASS 04 =	FREQUENCIES REQUIRED = -
nets remaining =	frequencies remaining =
TOTAL NO. NETS CLASS 05 =	FREQUENCIES REQUIRED = -
nets remaining =	frequencies remaining =
TOTAL NO. NETS CLASS 06 =	FREQUENCIES REQUIRED = -
nets remaining =	frequencies remaining =
TOTAL NO. NETS CLASS 07 =	FREQUENCIES REQUIRED = -
nets remaining =	frequencies remaining =
TOTAL NO. NETS CLASS 08 =	FREQUENCIES REQUIRED = -
nets remaining =	frequencies remaining =
TOTAL NO. NETS CLASS 09 =	FREQUENCIES REQUIRED = -
nets remaining =	frequencies remaining =

TOTAL NO. NETS CLASS 10= - FREQUENCIES REQUIRED = -

nets remaining = ________ frequencies remaining = ________

NO. SPARE NETS TO BE ADDED ________

Fill in the chart with the number of nets in each zone for each class. At the end total up the total number of nets and frequencies required for each class.

CLASS	1	2	3	4	5	6	7	8	9	10
ZONE	---	---	---	---	---	---	---	---	---	---
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
TOTAL										
FREQ REQT										

PRACTICAL EXAMPLE

FREQUENCY REUSE PLAN

FREQUENCY LISTING

FREQUENCIES (MHz)					
3.4550 (AC)	31.300	40.200	46.550	65.750	80.025
4.7800 (AD)	32.750	40.250	46.600	65.800	80.050
5.3000 (AE)	33.000	40.275	46.625	68.100	80.075
8.2550 (BC)	33.750	40.300	46.650	68.500	80.100
10.3400 (BD)	34.000	40.600	46.675	68.850	81.100
13.2500 (BE)	34.425	40.750	46.700	71.250 (A)	81.125
	34.450	41.000	46.750	71.275	81.150
30.000	34.475	41.500	51.000	71.300 (A)	81.175
30.050	35.500	42.000	51.350	71.325	81.200
30.075	35.750	43.750	57.500	71.350 (A)	82.000
30.100	36.500	43.775	58.250	71.375	82.025
30.150	36.750	43.800	60.300	71.400 (A)	82.050
30.200	37.900	43.850	61.250	72.850 (A)	82.075
30.225	38.250	44.550	61.300	73.000 (A)	82.100
30.250	38.500	44.575	64.000	73.025	82.125
30.400	39.250	44.600	64.200	73.050 (A)	82.150
31.200	39.500	44.700	64.225	77.000	82.175
31.225	40.000	44.725	64.250	77.500	82.200
31.250	40.025	44.750	64.275	79.000	
31.275	40.050	46.500	64.300	80.000	

Section III MASTER NET LIST

The Master Net List is used to enter: Net Description, Net ID, Frequency Type, Net Type, Corresponding Net, Restrictions, Class, Zone, Call Signs and Hopnet requirements. A description of each of the Master Net List entries follows.

Net Description Number (NET DES NO.) is the first column of the matrix. The numbers increase in sequential order as you proceed down the list. This number is used as the reference number for each of the nets when entering Net Groups (see Section VI, Net Group Design), Cosite Groups (see Section IV, Cosite Plan), Call Sign Sharing Plan and Frequency Sharing Plan (see Section VIII, Frequency and Call Sign Sharing Plan) and Special Nets (see Section V, Special Nets Plan). Up to 1500 nets may be entered in the list with net numbers 1201 to 1500 used for corps merge on div or a lower subgeneration. The nets may be entered in command echelon (corps, division, BDE, etc.)

The NET DESCRIPTION column is used to enter the descriptors for the nets to be included into the completed SOI. The description is a unit description of the type of net i.e. 1st BDE CMD. Up to 1500 net names, each up to 16 characters long may be entered. The following characters may be used as part of the net names: letters A - Z, digits 0 - 9, &, (,), - and/. See List of Abbreviations, page 1-3 for a list of BECS abbreviations and terms. You should leave blank lines to allow for insertion of additional units if required. Also, adding spares to the list should be considered.

The NET ID NO. column is used to enter the three digit number (000-999) to be used as a NET ID with SINCGARS radio(s) (in frequency hopping mode). The NET ID number is used in the SINCGARS radios as an identifier. It designates the frequency within the hopset on which to start hopping. You should allow for spare NET IDs. NET IDs are reserved as follows:

1. 000-099 reserved for Theater/Joint Level
2. 100-299 reserved for Corps/Service Component Level
3. 300-999 reserved for Division and lower/Service Component Headquarters Level

The FREQ BAND column is used to enter the frequency band to be used by the net. Specify the band using LF, HF, FM, AM, UHF or EXTRA (see Section II, Frequencies, page G-5 and General Information, page G-3 for radio frequency spectrum). An entry of no frequency (NO F) is permissible. If a fixed frequency is required for the net, enter the frequency value in MHz. The fixed frequency value must also be entered into the correct band when in the frequency input section.

The NET TYPES column is used to enter one of the following net types:

1. Primary Net (PRI)
2. Alternate Net (ALT)
3. Retransmission Net RTS)

A PRIMARY net is used under normal mode operating conditions. An ALTERNATE net is used when the PRIMARY net communications cannot be maintained due to jamming or interference. A RETRANS net is assigned to a retransmission (radio relay) operation. An alternate net and a retransmission net normally corresponds to the command net. If anything other than PRI is used as a net type, a corresponding net must be given.

Up to 6 retransmissions (retrans #1 thru #6) per net can be entered with a 10 MHz separation from its corresponding net. Also, an alternate net will be separated from the corresponding net by 10MHz. The special net plan must be used to provide a 10MHz separation between a RETRANS net and an alternate net. If a retrans net or alternate net is used, identify the corresponding net number (1-1500). Do not use a retransmission net or corresponding primary in a reuse plan.

The CORRES NET NO. (corresponding net) column is used only if the net is an ALTERNATE or RETRANS net type. The net number used refers to the NET DES NO. of the PRImary net to which it corresponds.

The RESTRICTIONS column is used to enter the frequency restrictions that have been placed on the net. Up to eight of the 16 restrictions may be applied to a given net. The restrictions are entered using the letters in the range A-P. Each letter identifies the explanation of how the net is to be restricted. For example, “A” may indicate the net must communicate with aircraft.

In the CL column enter the class number the net may be assigned to as part of a reuse plan. A class is a grouping of up to 20 zones. The total frequency requirement for a class equals the number of nets in the largest zone. The class may be a number 1-10.

In the ZN column enter the zone number the net may be assigned to as part of a reuse plan. A zone is a group of nets in which an assigned frequency cannot be repeated within that group for the same time period. Each zone can contain 200 nets. The zone may be a number 1-20.

In the CALL SIGN column enter whether or not the net is to receive a call sign (enter “yes or “no”). A call sign is a three-character combination of letter-number-letter used to identify a command, activity unit or element in establishing and maintaining communications. All units and nets are to receive call signs with the exception of certain administrative nets i.e. range control or MEDEVAC.

In the HOP NET column enter whether or not the net uses frequency hopping radios (enter “yes or “no”). A frequency hopping radio is a radio in which the operating frequencies “hop” around. The frequencies do not stay fixed at one point. Entering a “yes” means that the net receives two frequencies, a cue and a manual. If a net is a hopping net then it receives a Net ID Number (000-999) .

In the C/S SHARE GROUP column indicate whether or not the net is to be part of a call sign share group. All nets within the same call sign share group are assigned the same call sign for each time period (HHC will not normally share). Each share group has a different number. If the net is to be part of a share group, enter in the column the share group number to which the net is to belong. Up to 99 groups may be entered.

In the FREQ SHARE GROUP column indicate whether or not the net is to be part of a frequency share group. All nets within the same frequency share group are assigned the same-frequency each time period. Each share group has a different number. If the net is to be part of a share group, enter in the column the share group number to which the net is to belong. Up to 99 groups may be entered.

G-8 2D BRIGADE MASTER NET LIST

Table **G-2** contains the master net list for the **2D** Brigade. Use this table to enter the master list data into the BGU.

NET DES NO.	NET DESCRIPTION	NET ID NO.	FREQ BAND	NET TYPE	CORRES NET NO.	RESTRICT	CL	ZN	CALL SIGN	HOP NET	C/S SHARE GROUP	FREQ SHARE GROUP	REMARKS
1	KATV 1600		NO F	PRI					NO	NO			
2	F O U O		NO F	PRI					NO	NO			
3													
4	2D BDE CMD	301	FM	PRI		A			YES	YES	1		
5	2D BDE RTS	302	FM	RT1	4	A			YES	YES	1		
6	2D BDE INTEL	303	FM	PRI					YES	YES	1		
7	2D BDE AJ/ALT 1	304	FM	PRI	4				YES	YES	1		
8	2D BDE AJ/ALT 2	305	FM	PRI	4				YES	YES	1		
9	2D BDE A/L	306	FM	PRI					YES	YES	1		
10	2D BDE NRI	307	FM	PRI					YES	YES	1		
11	2D BDE RATT (P)		HF	PRI		ACE			YES	NO	1		
12	2D BDE RATT (A)		HF	PRI		BCE			YES	NO	1		
13	2D BDE SSB (P)		HF	PRI		ADE			YES	NO	1		
14	2D BDE SSB (A)		HF	PRI		BDE			YES	NO	1		
15	HHC/2D BDE		NO F	PRI					YES	NO			
16													
17													
18													
19													
20	1-78 IN BN CMD	401	FM	PRI		A			YES	YES	2		
21	1-78 IN BN RTS	402	FM	RTS1	20	A			YES	YES	2		
22	1-78 IN BN A/L	403	FM	PRI					YES	YES	2		
23	1-78 IN AJ/ALT	404	FM	ALT	20				YES	YES	2		
24	HHC/1-78 IN BN		NO F	PRI					YES	NO			
25	MORT/HHC/1-78 IN	405	FM	PRI					YES	YES			

TABLE G-2

NET DES NO.	NET DESCRIPTION	NET ID NO.	FREQ BAND	NET TYPE	CORRES NET NO.	RESTRICT	CL	ZN	CALL SIGN	HOP NET	C/S SHARE GROUP	FREQ SHARE GROUP	REMARKS
26	SCT/HHC/1-78 IN	406	FM	PRI					YES	YES			
27	A/1-78 IN CMD	407	FM	PRI			1	1	YES	YES			
28	1/A/1-78 IN	408	FM	PRI			1	1	YES	YES			
29	2/A/1-78 IN	409	FM	PRI			1	1	YES	YES			
30	3/A/1-78 IN	410	FM	PRI			1	1	YES	YES			
31	B/1-78 IN CMD	411	FM	PRI			1	1	YES	YES			
32	1/B/1-78 IN	412	FM	PRI			1	1	YES	YES			
33	2/B/1-78 IN	413	FM	PRI			1	1	YES	YES			
34	3/B/1-78 IN	414	FM	PRI			1	1	YES	YES			
35	C/1-78 IN CMD	415	FM	PRI			1	1	YES	YES			
36	1/C/1-78 IN	416	FM	PRI			1	1	YES	YES			
37	2/C/1-78 IN	417	FM	PRI			1	1	YES	YES			
38	3/C/1-78 IN	418	FM	PRI			1	1	YES	YES			
39	D/1-78 IN CMD	419	FM	PRI			1	1	YES	YES			
40	1/D/1-78 IN	420	FM	PRI			1	1	YES	YES			
41	2/D/1-78 IN	421	FM	PRI			1	1	YES	YES			
42	3/D/1-78 IN	422	FM	PRI			1	1	YES	YES			
43	E/1-78 IN CMD	423	FM	PRI			1	1	YES	YES			
44	1/E/1-78 IN	424	FM	PRI			1	1	YES	YES			
45	2/E/1-78 IN	425	FM	PRI			1	1	YES	YES			
46	3/E/1-78 IN	426	FM	PRI			1	1	YES	YES			
47													
48													
49													
50	2-78 IN BN CMD		FM	PRI		A			YES	NO	3		

TABLE G-2

NET DES NO.	NET DESCRIPTION	NET ID NO.	FREQ BAND	NET TYPE	CORRES NET NO.	RESTRICT	CL	ZN	CALL SIGN	HOP NET	C/S SHARE GROUP	FREQ SHARE GROUP	REMARKS
51	2-78 IN BN RTS		FM	RT1	50	A			YES	NO	3		
52	2-78 IN BN A/L		FM	PRI					YES	NO	3		
53	2-78 IN AJ/ALT		FM	ALT	50				YES	NO	3		
54	HHC/2-78 IN BN		NO F	PRI					YES	NO			
55	MORT/HHC/2-78 IN		FM	PRI					YES	NO			
56	SCT/HHC/2-78 IN		FM	PRI					YES	NO			
57	A/2-78 IN CMD		FM	PRI			1	2	YES	NO			
58	1/A/2-78 IN		FM	PRI			1	2	YES	NO			
59	2/A/2-78 IN		FM	PRI			1	2	YES	NO			
60	3/A/2-78 IN		FM	PRI			1	2	YES	NO			
61	B/2-78 IN CMD		FM	PRI			1	2	YES	NO			
62	1/B/2-78 IN		FM	PRI			1	2	YES	NO			
63	2/B/2-78 IN		FM	PRI			1	2	YES	NO			
64	3/B/2-78 IN		FM	PRI			1	2	YES	NO			
65	C/2-78 IN CMD		FM	PRI			1	2	YES	NO			
66	1/C/2-78 IN		FM	PRI			1	2	YES	NO			
67	2/C/2-78 IN		FM	PRI			1	2	YES	NO			
68	3/C/2-78 IN		FM	PRI			1	2	YES	NO			
69	D/2-78 IN CMD		FM	PRI			1	2	YES	NO			
70	1/D/2-78 IN		FM	PRI			1	2	YES	NO			
71	2/D/2-78 IN		FM	PRI			1	2	YES	NO			
72	3/D/2-78 IN		FM	PRI			1	2	YES	NO			
73	E/2-78 IN CMD		FM	PRI			1	2	YES	NO			
74	1/E/2-78 IN		FM	PRI			1	2	YES	NO			
75	2/E/2-78 IN		FM	PRI			1	2	YES	NO			

TABLE G-2

NET DES NO.	NET DESCRIPTION	NET ID NO.	FREQ BAND	NET TYPE	CORRES NET NO.	RESTRICT	CL	ZN	CALL SIGN	HOP NET	C/S SHARE GROUP	FREQ SHARE GROUP	REMARKS
76	3/E/2-78 IN		FM	PRI			1	2	YES	NO			
77													
78													
79													
80	2-62 AR BN CMD		FM	PRI		A			YES	NO	4		
81	2-62 AR BN RTS		FM	RT1	80	A			YES	NO	4		
82	2-62 AR BN A/L		FM	PRI					YES	NO	4		
83	2-62 AR AJ/ALT		FM	ALT	80				YES	NO	4		
84	HHC/2-62 AR BN		NO F	PRI					YES	NO			
85	MORT/HHC/2-62 AR		FM	PRI					YES	NO			
86	SCT/HHC/2-62 AR		FM	PRI					YES	NO			
87	A/2-62 AR CMD		FM	PRI			1	3	YES	NO			
88	1/A/2-62 AR		FM	PRI			1	3	YES	NO			
89	2/A/2-62 AR		FM	PRI			1	3	YES	NO			
90	3/A/2-62 AR		FM	PRI			1	3	YES	NO			
91	B/2-62 AR CMD		FM	PRI			1	3	YES	NO			
92	1/B/2-62 AR		FM	PRI			1	3	YES	NO			
93	2/B/2-62 AR		FM	PRI			1	3	YES	NO			
94	3/B/2-62 AR		FM	PRI			1	3	YES	NO			
95	C/2-62 AR CMD		FM	PRI			1	3	YES	NO			
96	1/C/2-62 AR		FM	PRI			1	3	YES	NO			
97	2/C/2-62 AR		FM	PRI			1	3	YES	NO			
98	3/C/2-62 AR		FM	PRI			1	3	YES	NO			
99	D/2-62 AR CMD		FM	PRI			1	3	YES	NO			
100	1/D/2-62 AR		FM	PRI			1	3	YES	NO			

TABLE G-2

NET DES NO.	NET DESCRIPTION	NET ID NO.	FREQ BAND	NET TYPE	CORRES NET NO.	RESTRICT	CL	ZN	CALL SIGN	HOP NET	C/S SHARE GROUP	FREQ SHARE GROUP	REMARKS
101	2/D/2-62 AR		FM	PRI			1	3	YES	NO			
102	3/D/2-62 AR		FM	PRI			1	3	YES	NO			
103													
104													
105	3-62 AR BN CMD	501	FM	PRI		A			YES	YES	5		
106	3-62 AR BN RTS	502	FM	RT1	105	A			YES	YES	5		
107	3-62 AR BN A/L	503	FM	PRI					YES	YES	5		
108	3-62 AR AJ/ALT	504	FM	ALT	105				YES	YES	5		
109	HHC/3-62 AR BN		NO F	PRI					YES	NO			
110	MORT/HHC/3-62 AR	505	FM	PRI					YES	YES			
111	SCT/HHC/3-62 AR	506	FM	PRI					YES	YES			
112	A/3-62 AR CMD	507	FM	PRI			1	4	YES	YES			
113	1/A/3-62 AR	508	FM	PRI			1	4	YES	YES			
114	2/A/3-62 AR	509	FM	PRI			1	4	YES	YES			
115	3/A/3-62 AR	510	FM	PRI			1	4	YES	YES			
116	B/3-62 AR CMD	511	FM	PRI			1	4	YES	YES			
117	1/B/3-62 AR	512	FM	PRI			1	4	YES	YES			
118	2/B/3-62 AR	513	FM	PRI			1	4	YES	YES			
119	3/B/3-62 AR	514	FM	PRI			1	4	YES	YES			
120	C/3-62 AR CMD	515	FM	PRI			1	4	YES	YES			
121	1/C/3-62 AR	516	FM	PRI			1	4	YES	YES			
122	2/C/3-62 AR	517	FM	PRI			1	4	YES	YES			
123	3/C/3-62 AR	518	FM	PRI			1	4	YES	YES			
124	D/3-62 AR CMD	519	FM	PRI			1	4	YES	YES			
125	1/D/3-62 AR	520	FM	PRI			1	4	YES	YES			
126	2/D/3-62 AR	521	FM	PRI			1	4	YES	YES			

TABLE G-2

NET DES NO.	NET DESCRIPTION	NET ID NO.	FREQ BAND	NET TYPE	CORRES NET NO.	RESTRICT	CL	ZN	CALL SIGN	HOP NET	C/S SHARE GROUP	FREQ SHARE GROUP	REMARKS
127	3/D/3-62 AR	522	FM	PRI			1	4	YES	YES			
128													
129													
130													
131	MEDEVAC (WAR)		FM	PRI		A			YES	NO			
132	MEDEVAC (PEACE)		34.000	PRI					NO	NO			
133	RANGE CONTROL		37.900	PRI					NO	NO			
134													
135													
136													
137													
138	RATT SPARE		HF	PRI					YES	NO			
139	SSB SPARE		HF	PRI					YES	NO			
140													
141													
142													
143													
144													
145													
146													
147													
148													
149													
150													
546	SVC/1-40 FA		FM	PRI					YES	NO		1	
589	SVC/2-40 FA		FM	PRI					YES	NO		1	

TABLE G-2

Section IV COSITE PLAN

A cosite plan provides frequency separation from 0.5 to 5 MHz between nets. A cosite plan is used when operating more than one net within a communications van or close proximity to other nets or when mutual frequency interference may result between radios. A cosite plan allows these nets to communicate simultaneously without mutual interference.

A cosite plan provides separation for up to 50 cosite groups. Each gruop can contain up to 12 nets (1 base net and 11 others). One-frequency value of separation is selected for all 50 cosite groups.

The following items should be considered before constructing a cosite plan:

1. Determine whether enough frequencies are available for utilizing a cosite plan.
2. Determine whether cositing provides adequate frequency separation.
3. Determine whether the nets being considered for the cosite plan are also in a reuse plan.
4. Determine whether the cosite problem can be resolved by other means such as terrain masking, antenna remoting or use of low power.

If FM transmitters operating on different frequencies are situated in the same locale, it is not unusual for mutual interference problems to result. To effectively reduce these interference problems, the BECS software adheres to the following basic assignment standards:

1. Frequencies with an exact separation factor of 5.75 or 23.00 MHz to cosited nets.
2 Cosited nets are not assigned frequencies which are on the order of the second harmonic. For example, the frequency setting of 30.00, 32.65 and 35.00 will possibly interfere with a radio using 60.00, 65.30 and 70.00 MHz respectively.

To construct a cosite group, execute the following steps:

1. Identify the nets to be entered in the cosite group (12 max).
2. Identify the first base net and list the other nets.
3. Identify the second base net and list the other nets.
4. Continue the process until you reach one base net and one remaining net.

The cosite nets are entered into a triangular table as shown in Table G-3.

COSITE PLAN GROUP NO. 1			
1	2	3	4
2	3	4	
3	4		

TABLE G-3

Nets are entered using the net's DESC ID number. The first column is used for base nets. The remaining spaces on the same line are used for the nets to be separated from the base net. The nets entered for separation have their assigned frequencies separated from the base net by the separation factor. This separation does not cause a separation between the nets listed to the right of the base net. To create further separation among the nets listed, use each separated net as a base net for the remaining nets. For example, in Table G-3, nets 2, 3 and 4 are separated from net 1 by the given separation factor (line one). In line two, nets 3 and 4 are separated from net 2 by the same separation factor. In line three, net 4 is separated from net 3 by the same separation factor. Not all cosite groups have to be triangular in shape. It is valid for the group shown in Table G-3 to have only the first row, but net 2 would not be separated from 3 and 4 and net 3 would not be separated from 4.

G-9 PRACTICAL EXAMPLES

The cosite plan is an essential worksheet for the BECS spectrum manager. To develop the cosite worksheet, you need the Master Net List created earlier and a blank cosite table worksheet.

Section V SPECIAL NETS PLAN

Special nets plan is a modified cosite group and is normally applicable to all "RTS" and "AJ/ALT" nets. A special nets plan allows you to specify a cosite separation between pairs of nets which is greater or different than what can be accomplished via cosite planning.

Up to 50 net pairs can be entered into the special nets plan. (There is only one plan.) The nets are entered into a table as shown in Table G-4.

BASE NET NO.	BASE NET DESCRIPTION	REL NET NO.	NET DESCRIPTION	MHZ SEP
1	3D BDE CMD RTS	4	3D BDE AJ/ALT	15 MHz
15	3-77 IN BN CMD RTS	18	3-77 IN AJ/ALT	10 MHz
30	3-2 AR BN CMD RTS	33	3-2 AR AJ/ALT	8 MHz

TABLE G-4

Enter the base net and enter the related net to right of base net using DESC IDs. Enter a separation factor from 1-15 MHz which is evenly dividable by 0.5 MHz. There is no guarantee that the separation entered will be assigned. Each special net pair can have a different separation. After generation, you can check the exception report to see which pairs of nets, if any, could not be assigned the minimum separation.

NOTE:

Separations of 5 MHz or less can and should be done using cosite planning.

G-10 PRACTICAL EXAMPLE

Using the Master Net List and cosite plan, develop a special nets plan for the 2D Brigade.

Section VI NET GROUPS DESIGN

A nets group design is used to organize into operational groups the nets in the master nets file. Net groups are typically designed for the command and staff echelon and battalions or comparable elements. The net groups design also forms the basis for the generation of SOI extract pages by BECS.

Up to 150 net groups can be created. The nets are entered into a net group by using the DESC ID number. The ID numbers are entered into a table as shown in Table G-5.

GROUP NO. 3		
TITLE: NG003-3-2 AR BN		
50	65	
54	66	
55	67	51
56	68	52
57	69	53
58	70	20
59	71	22
60	72	131
61	73	132
62	74	133
63	75	1
64	76	2

TABLE G-5

Each net group is titled for identification (16 alpha/numeric characters). Each net group may contain up to 36 entries. The last two entry positions in the table are used for entering the edition number and classification (DESC IDs 1 and 2 in the 2D Brigade Master Net List). Also MEDEVAC(S) and RANGE CONTROL nets are entered in every net group.

NOTE:

> Net Groups (also referred to as extracts) may be selected for transfer to a lower echelon and may not include the entire set of Net Groups. The DTD and ECCM transfer process loses the identity of Net Groups due to the loss of sequence. For example, out of 150 Net Groups at Division, Net Groups l,3,5 and7 are selected for transfer to 1st Brigade. The transfer process changes the sequence number of the Net Groups at 1st Brigade to be Net Groups 1,2,3 and 4. Thus there is no common reference for the Net Groups between echelons. Therefore Net Group Names should have a Net Group Number as part of the name (by the originating echelon) (e.g., NGOO1-3-2 AR BN) in order to establish and maintain a common reference for Net Groups between echelons.

During call sign assignment, BECS attempts last-letter uniqueness unless the net is in a call sign share group or was previously assigned a call sign in a previous net group. Last-letter unique call signs only apply to the first 26 entries on the extract page, not the first 26 nets requiring last-letter unique call signs.

When entering net groups into BECS, an “ALL NETS ASSIGNED” option is available. This option creates a printed list of nets that have not been assigned to any net group.

G-n PRACTICAL EXAMPLE

SOI Net Groups must be developed for all units listed on the master net list. Use the master net list developed with SOI Net Groups for the 2D Brigade.

Section VII SUFFIX AND EXPANDER LISTS

A suffix is a two-digit number used in conjunction with a call sign to indicate a specific position, mission or function of a net.

An expander is a single letter used with a call sign/suffix to identify’s sub-element of the position, mission or function identified by the suffix.

The suffix and expander lists are not fixed lists common to all organizations, but vary according to the specific requirements of an organization, However, the same suffix and expander are used at all echelons of the using organization; e.g., a Division, by individuals/stations having like positions, functions or titles.

BECS randomly assigns suffixes and expanders simultaneously for each time period.

G-12 SUFFIX LIST

A suffix list can contain up to 99 (01-99) suffix descriptors. To create the list:

1. Identify all suffix requirements.
2 Develop 16 character alpha/numeric descriptions for each requirement.

Suffixes may have more than one meaning and are normally listed in alphabetical order or the most commonly used are listed first followed by the remainder in alphabetical order. The suffix numbers are assigned by BECS randomly for each time period. It is recommended that you plan for spares when creating the list.

A recommended suffix list is shown in Table G-6. This list is entered into the BGU later.

SUFFIX DESCRIPTORS			
01	COMMANDER	29	AIR DEF OFF
02	COFS/XO	30	ALO/TACP
03	G1/S1	31	AME
04	G2/S2	32	AMMO OFF
05	G2/S2 AIR	33	ATSE
06	G3/S3	34	AVLB
07	G3/S3 AIR	35	AVN OFF
08	G3/S3 OPS	36	CHAPLAIN
09	G4/S4/SUP SGT	37	CHEMICAL OFF
10	G5/S5	38	COMSEC OFF
11	C-E O/COMM CH	39	CSCE/CNCE
12	PLT/SEC/TM LDR	40	CSM/SGM/1SG
13	PLT/SEC/TM SGT	41	ENGR OFF
14	ADC (M)	42	EW OFF
15	ADC (S)	43	FAC/ACT
16	ACFT/FO 1	44	FARRP
17	ACFT/FO 2	45	FDC
18	ACFT/FO 3	46	FDO
19	ACFT/FO 4	47	FLT FOL
20	ACFT 5	48	FLT OPS
21	ACFT 6	49	FSCOORD
22	ACFT 7	50	FSE/FSO/FIST
23	ACFT 8	51	HELIPAD
24	ACFT 9	52	HQ COMDT
25	ACFT 10	53	IG
26	ACFT 11	54	INTL & SCTY OFF
27	ACFT 12	55	LN OFF 1
28	ACFT MAINT OFF	56	LN OFF 2

TABLE G-6

SUFFIX DESCRIPTORS			
57	LN OFF 3	79	TM/SQD/SEC/TK 6
58	LN OFF 4	80	TM/SQD/SEC/TK 7
59	MAINT OFF	81	TM/SQD/SEC/TK 8
60	MATERIAL OFF	82	TOC/CP/AADCP
61	MET/SWO	83	TRANS/MTR OFF
62	NAICO	84	VTR
63	NCS	85	SPARE 1
64	PMO	86	SPARE 2
65	RADAR	87	SPARE 3
66	RECOVERY VEH	88	SPARE 4
67	RTS/RWI STA	89	SPARE 5
68	SAFETY OFF	90	SPARE 6
69	SIGSEC	91	SPARE 7
70	SP WPNS OFF	92	SPARE 8
71	SURG/MED OFF/MED	93	SPARE 9
72	SURVEY OFF	94	SPARE 10
73	TARGET ACQ OFF	95	SPARE 11
74	TM/SQD/SEC/TK 1	96	SPARE 12
75	TM/SQD/SEC/TK 2	97	SPARE 13
76	TM/SQD/SEC/TK 3	98	SPARE 14
77	TM/SQD/SEC/TK 4	99	SPARE 15
78	TM/SQD/SEC/TK 5		

TABLE G-6

G-13 EXPANDER LIST

An expander list can contain up to 20 (generated as letters A-Z) expander descriptors. To create the list:

1. Identify all expander requirements.
2 Develop 16 character alpha/numeric descriptions for each requirement.

Expanders may have more than one meaning and are normally listed in alphabetical order or the most commonly used are listed first followed by the remainder in alphabetical order. It is recommended that you plan for spares when creating the list.

A recommended expander list is shown in Table G-7. This list is entered into the BGU later.

EXPANDERS			
1	ALTN/COPILOT	11	SPARE 1
2	DEPUTY/STAFF AST	12	SPARE 2
3	FIRE CON TM/REAR	13	SPARE 3
4	FORWARD	14	SPARE 4
5	JR AIDE/2ND/ENL	15	SPARE 5
6	MAIN	16	SPARE 6
7	SEC/TM LDR/OIC	17	SPARE 7
8	SEC/TM SGT/NCOIC	18	SPARE 8
9	RTO/DVR/PILOT	19	SPARE 9
10	SR AIDE/1ST/OFF	20	SPARE 10

TABLE G-7

Section VIII FREQUENCY AND CALL SIGN SHARING PLANS

G-14 FREQUENCY SHARING PLAN

All nets within the same frequency share group are assigned the same frequency for each time period.

NOTE:

Frequency assignment changes with each time period.

Use the nets DESC ID number to enter a net. Up to 99 sharing groups may be entered. There is no limit to the number of nets within a group.

Table G-8 shows a frequency share group plan.

Table G-8 shows a frequency share group plan.

SHARE GROUP NO. 1
1
2
18
47
TABLE G-8

G-15 CALL SIGN SHARING PLAN

All nets within the same call sign share group are assigned the same call sign for each time period.

NOTE:

Call sign assignment changes with each time period.

Use the nets DESC ID number to enter a net into the group. Up to 99 sharing groups may be entered. There is no limit to the number of nets within a group.

Table G-9 shows a call sign share group plan.

SHARE GROUP 1	SHARE GROUP 2
1	20
2	22
3	23
4	26
	27
	28
TABLE G-9	

Section IX MERGING SOI DATA FROM CORPS TO DIVISION

The following steps describe how to merge data between Echelons (Corps data to Division).

1. The Corps generates SOI data for all Corps level (e.g. Corps common) nets and the principle nets of each Division/Separate Brigade within the Corps and hopsets with appropriate TRANSEC key pairs (1 active, 1 backup) and optional hopset(s) as necessary.

2. Corps outputs the data which is to be merged with the Division to a diskette using the procedures shown in Transfer, page 2-98. For this discussion this disk will be referred to as Merge Disk C. The diskette label should say, “Corps merged database containing <list all data contained on the disk>”. Also, the label should contain the following information:

    1. Hopset filename (if any)
    2. TRANSEC Key Pair name (i.e. TSK#l)
    3. Level at which the hopset was generated
    4. Date generated or effective date

3. The diskette is then transferred to the Division.

4. At the Division, develop the Division database and remember to leave nets 1201-1500 blank. Use the SAVE TO DISK PAM selection to make a master backup of the data base developed at the Division level which we will call Database Disk A for this discussion. The disk label should say something similar to “Division Master Database containing <list all the data contained on the disk>”. Also, make a backup of the Division database which we will call Database Disk B. This disk should be labeled “Division Database Backup”. At this point, Database Disk A and Database Disk B are identical copies of the Division database. Merge Disk C contains the data being merged from the Corps.

5. At the Division, load the Division database into the BGU.

6. Use the procedures in Merge, etc., pages 2-53 through 2-56 to merge the data on the diskette supplied by the Corps into the Division database. Merge only the parts identified on the label of the diskette.

7. Make new net groups or add new merged nets to the Division net groups from the new data merged in from the Corps. Remember, the merged Corps nets will reside in net numbers 1201-1500.

8. At the Division, generate frequencies and call signs for the Division Database. While performing the frequency generation the BGU will prompt you with the following question:

    IS THIS A MERGED DATA BASE (Y/N)?

    Type a “Y” and press <RETURN>.

    While performing a call sign generation the BGU will prompt you with the following question:

    Is this a merged corps data base (Y/N)?

    Type a “Y” and press <RETURN>. Next, the following question will be displayed:

    YOU ALREADY HAVE A GENERATED CALL SIGN FILE, DO
    YOU WANT TO USE THE GENERATED CALL SIGNS IN THE
    CURRENT FILE AS PART OF YOUR NEW FILE (Y/N)?

Type a “Y” and press <RETURN>. Answering the two above questions this way will generate Division data without changing the merged Corps data.

9. Print the extracts needed at the Division level.

10. Save the new Division data base (with merged data) to the disk labeled “Division Database Backup” (Disk B). The diskette label should be changed to contain a title similar to the following:

    CORPS/DIVISION MERGED DATA BASE

    Also, the label should contain the following information:

    1. Hopset filename (if any)
    2. TRANSEC Key Pair name (i.e. TSK#l)
    3. Level at which the hopset was generated
    4. Date generated or effective date

    To review the contents of disks A, B and C:

    Database Disk A contains the Master Division Database.
    Merge Database Disk B contains Division data with the merged Corps data.
    Merge Disk C contains the data which was merged from the Corps.

NOTE:

Corps generates for use throughout the Corps:
signs/countersigns
smoke/pyrotechnic signals
suffixes
- expanders
item number identifiers
- TRANSEC Key Pairs & possibly hopsets (situation dependent)

Divisions/Separate Brigades do not generate these.

G-16 WORKSHEET APPENDIX

The following blank worksheets can be used to complete some suggested examples mentioned in this appendix.

FREQUENCY REUSE PLAN

RADIO NET LISTING					
NET DESCRIPTION	RF BAND	USER DEF	CLASS	ZONE	HOP NET

FREQUENCY REUSE PLAN

FREQUENCY AND NET MATRIX

	LF	HF	VHF-FM *	VHF-AM	UHF	EXTRA
NETS						
FREQUENCIES						

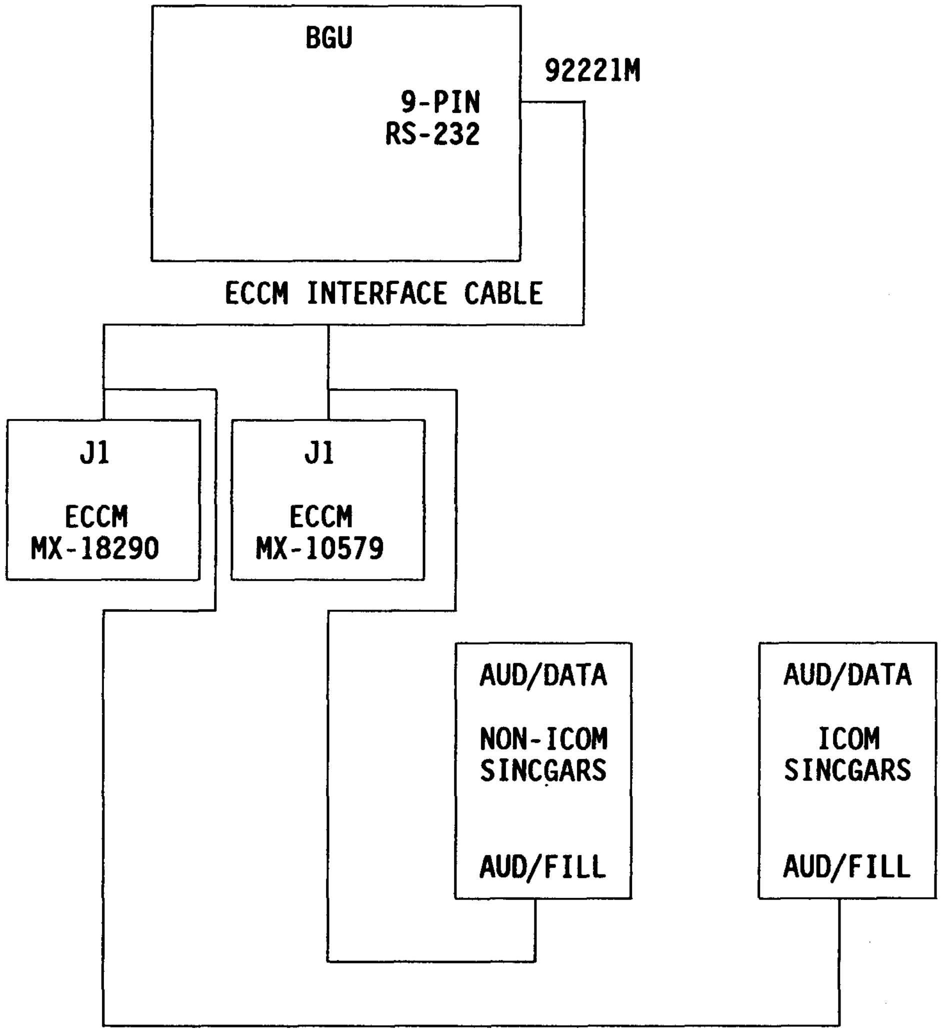
	LF	HF	VHF-FM *	VHF-AM	UHF	EXTRA
NETS						
FREQUENCIES						

	LF	HF	VHF-FM *	VHF-AM	UHF	EXTRA
NETS						
FREQUENCIES						

	LF	HF	VHF-FM *	VHF-AM	UHF	EXTRA
NETS						
FREQUENCIES						

APPENDIX H

TRANSFER CONNECTIONS


BGU
92221M
9-PIN
RS-232
ECCM INTERFACE CABLE
J1
ECCM
MX-18290
J1
ECCM
MX-10579
AUD/DATA
NON-ICOM
SINCGARS
AUD/FILL
AUD/DATA
ICOM
SINCGARS
AUD/FILL

APPENDIX I

NON-ICOM SINCGARS RADIO: HOPSET(S) LOADING PROCEDURES

PROCEDURE SUMMARY:

The following summarizes the frequency hopping operating procedures for a Non-ICOM radio. The radio controls are shown in Figure I-1.

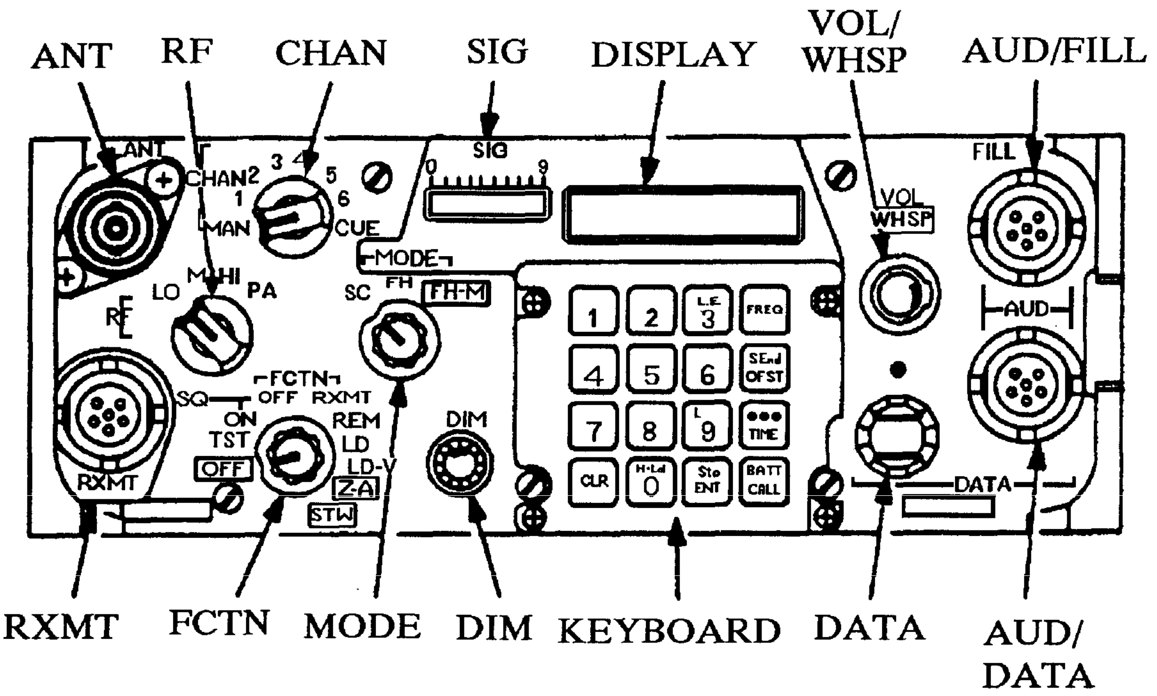

ANT
RF
CHAN
SIG
DISPLAY
VOL/
WHSP
AUD/FILL
CHAN
1
2
3
4
5
6
MAN
CUE
0
9
LO
M
HI
PA
RF
MODE
SC
FH
FH-M
FILL
VOL
WHSP
AUD
FCTN
SQ
OFF
RXMT
ON
TST
REM
LD
LD-V
Z-A
STW
OFF
DIM
1
2
L.E.
3
FREQ
4
5
6
SEnd
OFST
7
8
L
9
•••
TIME
CLR
H-Ld
0
Sto
ENT
BATT
CALL
DATA
RXMT
FCTN
MODE
DIM
KEYBOARD
DATA
AUD/
DATA

Figure I-1

1. Using BECS or SINISS, load the ECCM fill device (MX-10579 orMX-18290) with the common lockout(s), at least one net lockout set and at least one TRANSEC Key (Pages 2-107 and 2-109).

2. Turn on the power supply to the radio.

3. Set the FH Sync Time for the radio. Turn the function switch (FCTN) to the LOAD (LD) position. The MODE switch can be in either the single channel (SC) position or the frequency hopping (FH) position. PRESS THE **<•••/TIME>** button on the front panel keyboard. Press the clear (<CLR>) button and two lines appear on the LED display. Use the numeric keys to enter the two-digit day (last two digits of Julian date) (see Figure I-2 for Julian Date Calendar) and then press the store (<Sto/ENT>) button. To enter

JULIAN DATE CALENDAR (REGULAR YEAR)

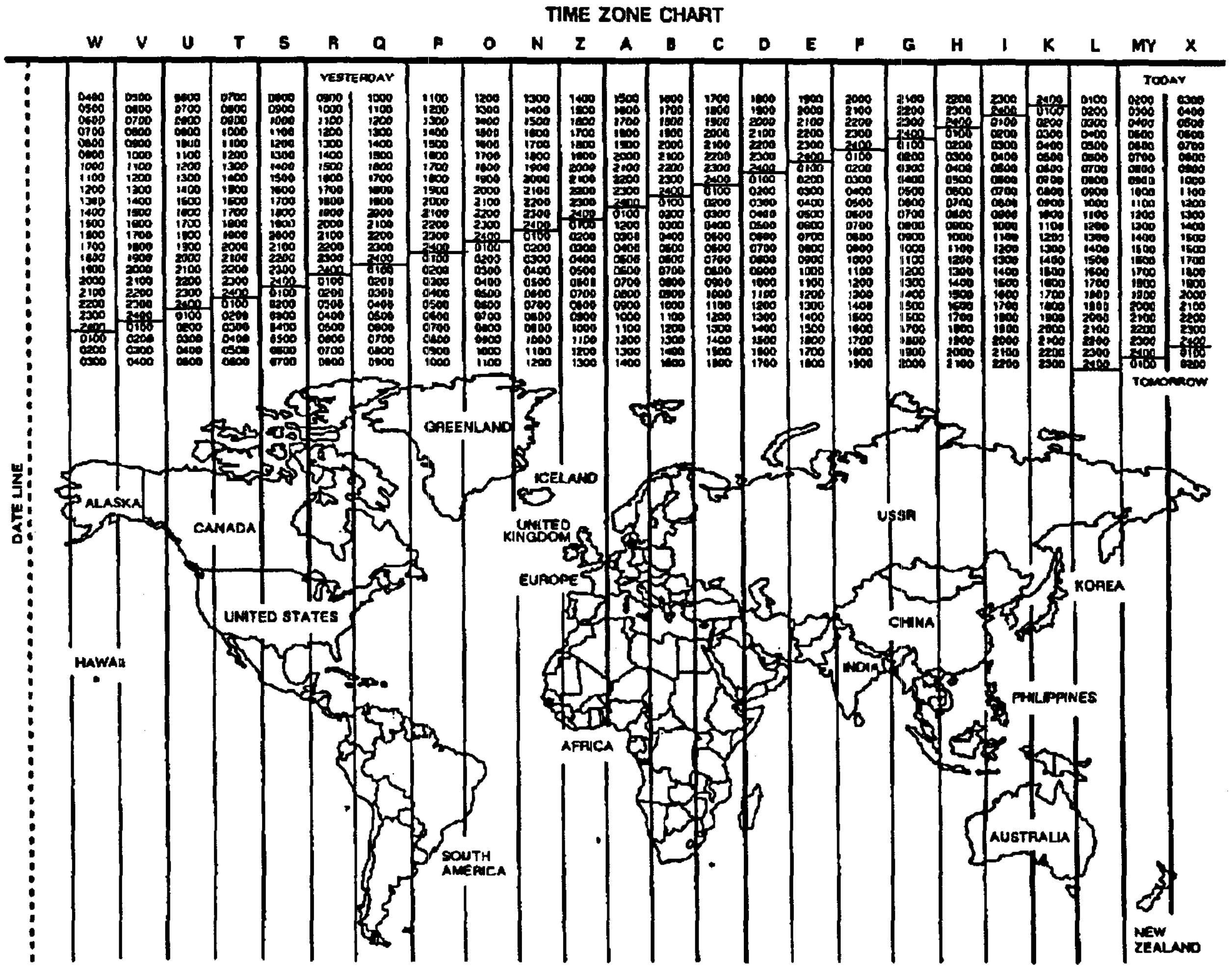
DAY/MO	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	01	32	60	91	21	52	82	13	44	74	05	35
2	02	33	61	92	22	53	83	14	45	75	06	36
3	03	34	62	93	23	54	84	15	46	76	07	37
4	04	35	63	94	24	55	85	16	47	77	08	38
5	05	36	64	95	25	56	86	17	48	78	09	39
6	06	37	65	96	26	57	87	18	49	79	10	40
7	07	38	66	97	27	58	88	19	50	80	11	41
8	08	39	67	98	28	59	89	20	51	81	12	42
9	09	40	68	99	29	60	90	21	52	82	13	43
10	10	41	69	00	30	61	91	22	53	83	14	44
11	11	42	70	01	31	62	92	23	54	84	15	45
12	12	43	71	02	32	63	93	24	55	85	16	46
13	13	44	72	03	33	64	94	25	56	86	17	47
14	14	45	73	04	34	65	95	26	57	87	18	48
15	15	46	74	05	35	66	96	27	58	88	19	49
16	16	47	75	06	36	67	97	28	59	89	20	50
17	17	48	76	07	37	68	98	29	60	90	21	51
18	18	49	77	08	38	69	99	30	61	91	22	52
19	19	50	78	09	39	70	00	31	62	92	23	53
20	20	51	79	10	40	71	01	32	63	93	24	54
21	21	52	80	11	41	72	02	33	64	94	25	55
22	22	53	81	12	42	73	03	34	65	95	26	56
23	23	54	82	13	43	74	04	35	66	96	27	57
24	24	55	83	14	44	75	05	36	67	97	28	58
25	25	56	84	15	45	76	06	37	68	98	29	59
26	26	57	85	16	46	77	07	38	69	99	30	60
27	27	58	86	17	47	78	08	39	70	00	31	61
28	28	59	87	18	48	79	09	40	71	01	32	62
29	29		88	19	49	80	10	41	72	02	33	63
30	30		89	20	50	81	11	42	73	03	34	64
31	31		90		51		12	43		04		65

Figure I-2

JULIAN DATE CALENDAR (LEAP YEAR)

DAY/MO	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	01	32	61	92	22	53	83	14	45	75	06	36
2	02	33	62	93	23	54	84	15	46	76	07	37
3	03	34	63	94	24	55	85	16	47	77	08	38
4	04	35	64	95	25	56	86	17	48	78	09	39
5	05	36	65	96	26	57	87	18	49	79	10	40
6	06	37	66	97	27	58	88	19	50	80	11	41
7	07	38	67	98	28	59	89	20	51	81	12	42
8	08	39	68	99	29	60	90	21	52	82	13	43
9	09	40	69	00	30	61	91	22	53	83	14	44
10	10	41	70	01	31	62	92	23	54	84	15	45
11	11	42	71	02	32	63	93	24	55	85	16	46
12	12	43	72	03	33	64	94	25	56	86	17	47
13	13	44	73	04	34	65	95	26	57	87	18	48
14	14	45	74	05	35	66	96	27	58	88	19	49
15	15	46	75	06	36	67	97	28	59	89	20	50
16	16	47	76	07	37	68	98	29	60	90	21	51
17	17	48	77	08	38	69	99	30	61	91	22	52
18	18	49	78	09	39	70	00	31	62	92	23	53
19	19	50	79	10	40	71	01	32	63	93	24	54
20	20	51	80	11	41	72	02	33	64	94	25	55
21	21	52	81	12	42	73	03	34	65	95	26	56
22	22	53	82	13	43	74	04	35	66	96	27	57
23	23	54	83	14	44	75	05	36	67	97	28	58
24	24	55	84	15	45	76	06	37	68	98	29	59
25	25	56	85	16	46	77	07	38	69	99	30	60
26	26	57	86	17	47	78	08	39	70	00	31	61
27	27	58	87	18	48	79	09	40	71	01	32	62
28	28	59	88	19	49	80	10	41	72	02	33	63
29	29	60	89	20	50	81	11	42	73	03	34	64
30	30		90	21	51	82	12	43	74	04	35	65
31	31		91		52		13	44		05		66

Figure I-2



TIME ZONE CHART

YESTERDAY

W	V	U	T	S	R	Q	P	O	N	Z	A	B	C	D	E	F	G	H	I	K	L	MY	X
0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300
0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400
0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500
0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600
0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700
0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800
1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900
1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000
1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100
1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200
1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300
1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400
1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500
1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600
1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700
1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800
2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900
2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100
2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200
2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100
0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200

TODAY

TOMORROW

Figure I-3

the time, press **<•••/TIME>.** Press <CLR> and four lines appear on the LED display. Enter the hour and minute (Zulu time) (see Figure I-3 for Zulu Time Chart). Press <Sto/ENT> at the exact time (resets seconds to zero).

Load the TRANSEC Key (TSK) into the radio. Turn the FCTN switch to load variable (LDV) and the MODE switch to FH. Set the CHAN switch to MAN. Using cable W-4, connect J1 of the ECCM fill device to the AUD/FILL port of the radio. Turn the fill device ON and set the FILL DATA SELECTOR SWITCH to T1 or T2. Press **<H•Ld/O>** on the radio keyboard and the TSK is automatically stored.

5. Load the common lockouts into the radio (if no lockouts exist, go to step 6). Turn the FCTN switch to LD and leave the MODE switch on FH. Turn the FILL DATA SELECTOR SWITCH on the fill device to the location corresponding to the first common lockout. Press **<H•Ld/O>** on the radio keyboard; the display indicates the lockout number and two-digit tag number. Press <Sto/ENT> to store the lockout in the radio. Repeat these steps for each of the remaining common lockouts, turning the FILL DATA SELECTOR SWITCH on the fill device to the location corresponding to each of the lockouts in turn.

6. Load the net lockouts into the radio. Leave the FCTN switch on LD and leave the MODE switch on FH. Turn the FILL DATA SELECTOR SWITCH on the fill device to the location corresponding to the net lockout to be loaded into the radio. Press **<H•Ld/O>** on the radio keyboard; the display indicates the net ID. To store the lockout in the radio, press <Sto/ENT> which causes the display to prompt for a channel number. Next, use the numeric keys to enter the channel number (1-6) that is used for this lockout. Repeat these steps for additional net lockouts to be loaded, using a different channel number for each.

7. The radio is loaded. Turn the channel selector (CHAN) to the channel number where the lockout from step 5 is loaded. The display indicates the net ID if the radio is properly loaded. If the radio is not properly loaded, the word "FILL" followed by the channel number appears on the LED display indicating the radio is looking for an additional fill.

8. Turn the FCTN switch to squelch on (SQ ON) or squelch off (SQ OFF). If another radio is loaded with the same information, the radios can communicate with each other. Once a radio is loaded, other radios can be loaded by Prforminq an ECCM Electronic Remote Fill (ERF).

DETAILED PROCEDURES:

The following describes the frequency hopping operating procedures for a Non-ICOM radio. The procedures are part of the Operator's Manual, TM 11-5820-890-10-3. Refer to the operator's manual for more details on radio procedures. The radio controls are shown in Figure I-1.

NET OPENING

A frequency-hopping (FH) radio net must be initially opened by NCS. It is extremely important that you listen to his instructions carefully. He guides you through the steps. If you lose contact during a procedure, see the section entitled LOST COMMUNICATION in this appendix (page 1-10). If you missed your primary net’s opening, cue NCS; then request an ERF.

Your rt needs special data to operate in a frequency hopping (FH) mode. Net opening is the procedure for loading this data.

There are two procedures for net opening: (1) cold start and (2) time hack. The NCS will tell you which one to use. Always do the pre-mission check before a mission.

PRE-MISSION CHECK

NOTE: If you do not perform the following steps, you risk radio failure during a mission.

- Make sure your radio is assembled correctly (refer to TM 11-5820-890-10-4).

- Make sure the PMCS is done on the following items (refer to TM 11-5820-890-10-3 for more information):
    1. Battery physical and electrical condition.
    2. Receiver-transmitter self-test.
    3. Transmitter.
    4. Mounting adapter and mounting base.
    5. Remote operation checks (control-monitor self-test, control-monitor rt function control).

- Make sure the routine checks are done on the following items (refer to TM 11-5820 -890-10-3 for more information):
    1. Antennas.
    2. Cables and cable connectors.
    3. Controls and switches.
    4. Mounting and assembly hardware.

- Make sure RF switch is set to authorized setting.

- Check battery life condition (refer to TM 11-5820-890-10-4).

- Load required data.

- Check required load. (Do you have the correct hopsets, lockout sets, TRANSEC variable, CUE frequency, and MAN frequency?)

- Stand by for net opening (the NCS contacts you). Make sure you can establish communication on each net you are operating in.

COLD START NET OPENING

NOTE: A cold start net opening should be used to initially open a net. It is used when all radios in a net ave the same TRANSEC variable, MAN frequency, CUE frequency and lockout set(s). The NCS will ERF (ECCM remote fill) needed hopset(s) to net member radios. FH sync time is automatically sent to the net member when ERF is sent.

a. Make sure that the following is loaded into your radio before operation.

   o TRANSEC variable.
   o Lockout set(s) if needed.
   o Frequency in MAN channel.
   o Frequency in CUE channel.

b. Set rt controls: FCTN to SQ ON, then to LD, MODE to FH and CHAN to MAN. Display shows “Cold”.

c. Monitor MAN channel and wait for the NCS to contact you. When contact is made, confirm communication and standby for ERF (the NCS tells you which channel to store hopset in.

d. The NCS transmits the hopset for FH sync time to your rt. The display shows the net identification (“HFxxx”) that was received (if you do not receive the ERFed hopset, monitor the MAN channel and wait; the NCS will come back for you).

e. Press <Sto/ENT> and enter the channel number for storing the hopset (channel number given to you in step c). Display shows “Fxxx” and a beep is heard. Acknowledge reception and storage of ERF.

f. On command, set CHAN to the channel where hopset is stored (step e). Confirm communication with NCS (if you do not receive the ERFed hopset, monitor the MAN channel and wait; the NCS will come back for you).

g" On command, set FCTN to SQ ON (or normal operating position).

NOTE: When shutting down, do not set FCTN to STW. Setting the FCTN to STW destroys the FH data in you rt. Set FCTN to OFF.

FH UPDATE USING ERF

This procedure is used to update hopsets and lockout sets. It is also used to add new sets. During an update, the net communicates on the FH channel it had been using.

NOTES:
- o The channel used for updating does not change until the updating is complete.
- o Lockout(s) are received first and hopset(s) are received second.
- o It is best to store a hopset in an empty-channel.

a. Set the FCTN to LD (all other controls remain the same as past communications).

b. The NCS will contact you and tell you in which channel data to store data. Acknowledge NCS call.

c. Stand by for NCS to transmit ERF to your rt.

d. Once ERF is received, press <Sto/ENT>. You must enter the number of the channel where hopset is to be stored immediately after pressing <Sto/ENT>. Acknowledge reception and storage of ERF.

e. On command, set CHAN to where hopset was stored (step d); then confirm communication with NCS.

f. Set <FCTN> to normal operating position.

LATE NET ENTRY

Two methods are used to join a net that is already operating. The FH data in your rt determines which method to use.

METHOD 1: RT LATE ENTRY. Using part 1 of this procedure is useful after net radios have been shut down (FCTN set to OFF) for less than 24 hours. Do part 2 only if traffic is heard during part 1.

RT LATE ENTRY PROCEDURE

PART 1 (PASSIVE)

a. Set controls: CHAN to channel having net's hopset, RF to lowest setting needed for good communication, FCTN to SQ ON and MODE to FH.

b. Press <FREQ>; then press <L.E./3>. Display shows "LFxxx".

c. Monitor the channel for two minutes; when a signal is received, late entry is canceled and "L" does not appear on the display.

PART 2 (ACTIVE)

d. Make sure that rt is in late entry mode: press <FREQ>; display shows "LFxxx".

e. Contact the net, making key-down time short; then wait 30 seconds between calls for a reply.

   o If no reply is received, repeat this step up to five times.
   o If contact still cannot be made do the cue and ERF procedure.

Method 2: Cue and ERF. This method should be used when one or both of the following conditions exist: (1) you missed your primary net's cold start and your rt needs FH data. (2) You need to be a member of more than one net. Use method 2 to join alternate nets after you have opened with your primary net.

CUE AND ERF PROCEDURE

a. Set controls: MODE to FH, CHAN to CUE, FCTN to LD, and RF to lowest setting needed for good communication (if you are using a KY-57, turn it off).

b. Load desired CUE frequency into CUE channel.

c. Set FCTN to SQ ON.

d. Key transmitter and call NCS.
   o If no reply, set RF to HI, VOL full right; then repeat this step several times.

e. Wait for a reply; then request a cold start.

CUE

CUE PROCEDURE

Cue is used when you need to contact a FH radio net when you are not an active member of that net. Cue can also be used if you are operating in a single channel net and wish to contact an FH net.

a. Set controls: MODE to SC, CHAN to CUE, FCTN to LD and RF to lowest setting needed for good communication. If you are using a KY-57, turn it off.

b. Load desired CUE frequently into CUE channel.

c. Set FCTN to SQ ON

d. Key transmitter and call NCS. If no reply, set RF to HI, VOL full right; then repeat this step several times.

e. Wait for reply

CHANGING HOPSET IDENTIFICATION (ID)

Changing FH hopset ID. When needed and authorized, the NCS can change from one FH hopset ID to another. Net members must also change hopset identification.

a. Set FCTN to LD.

b. Set MODE to FH-M

c. Set CHAN to channel where the hopset ID is stored that needs to be changed.

d. Press <FREQ>. Display shows old hopset ID.

e. Press <CLR>. Display shows that the last two digits have been cleared.

f. Enter next to last digit of new hopset ID.

g. Enter last digit of new hopset ID.

NOTES:
- o Make sure you have entered the correct numbers. If you made a mistake, communication will not be possible.
- o The old hopset ID is cleared at the completion of step h. If you need to restore the original hopset ID, press FREQ, CLR, and enter the last two digits of the original hopset ID.

h. Press <Sto/ENT> (display blinks and the new hopset ID is stored).

LOST COMMUNICATION

If you lose communication, do the following steps.

a. Set CHAN to channel where you last had communication.

b. Monitor channel (step a).

c. Wait for the NCS to contact you.

d. If you are unable to make contact after doing step c, do steps e and f.

e. Set KY-57 to OFF, rt FCTN to SQ OFF, rt CHAN to CUE, and rt VOL as needed.

f. Key transmitter and call NCS; then request a cold start.

TRANSEC VARIABLE LOADING (LOCAL FILL)

Only one TRANSEC variable is needed in your rt. It must be stored in the PM (permanent memory). A second TRANSEC variable may be loaded into HM (holding memory) and stored for use at a later time. The NCS may also remotely transmit the TRANSEC variable to your rt (refer to TM 11-5820-890-10-3).

a. Set rt FCTN to Z-A (do NOT do this step if there are presets in the rt that you want to save). Watch display. It must show “Good”.

b. Set rt FCTN to TST. Watch display. It must show “Good” at the end of test.

c. Set ECCM fill device function switch to OFF; then connect fill cable to rt connector AUD/FILL and to fill device connector J1.

d. Set rt controls: FCTN to LD/V. MODE to FH, and CHAN to MAN (or 1-6). Display shows “FILLt”.

e. Set ECCM fill device select switch to T1 or T2 (depending on which variable you wish to load).

f. Set ECCM fill device function to ON.

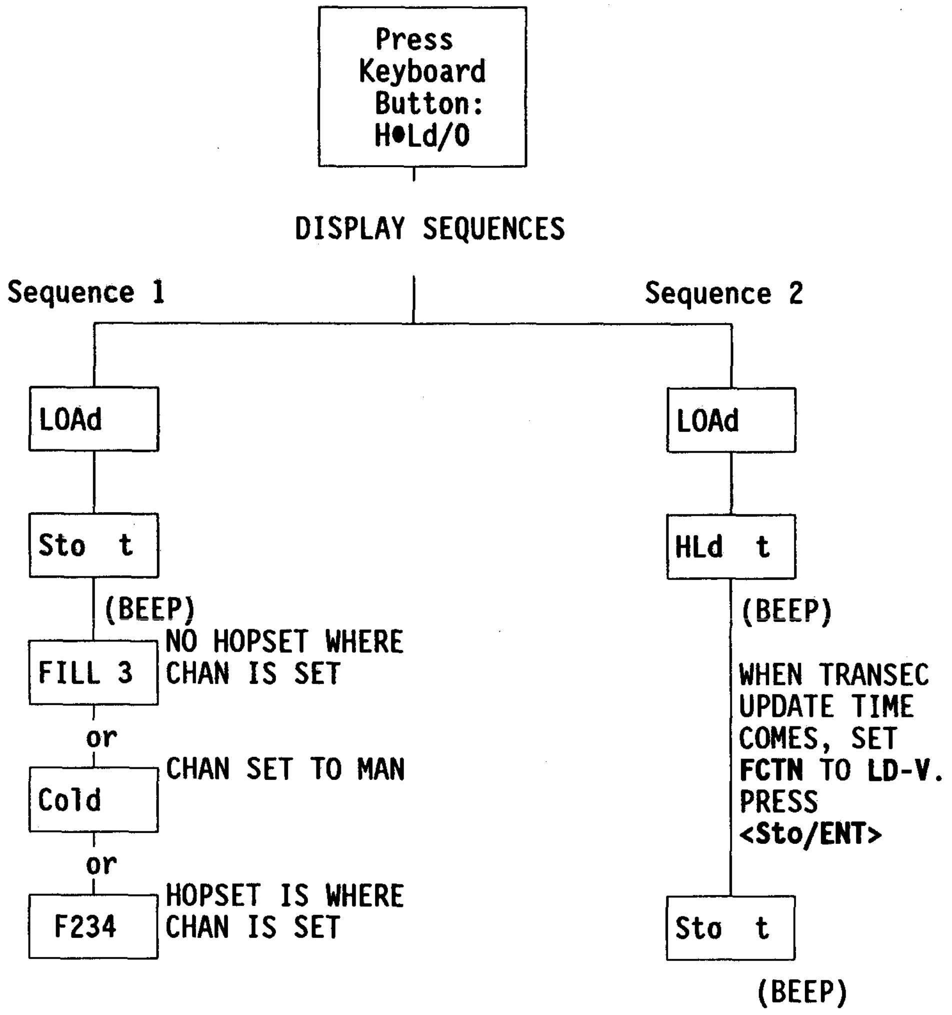
g. Press rt **<H•LD/O>.**

h. After TRANSEC variable is loaded, set ECCM fill device function switch to OFF before disconnecting fill cable.

DISPLAY SEQUENCE

SEQUENCE 1: Displays are shown when rt has been zeroized or if there is not already a TRANSEC variable loaded in rt.

SEQUENCE 2: Displays are shown when rt already has a working TRANSEC variable in it. When FCTN is at LD/V and <Sto/ENT> is pressed, the original variable is cleared (do not press <Sto/ENT> if you wish to save the original variable). If a display shows “bAd”, an alarm sounds. This indicates a bad fill. If fill is bad, press **<H•Ld/O>** and then press <Sto/ENT> again.


Press Keyboard Button: H•Ld/O
DISPLAY SEQUENCES
Sequence 1
Sequence 2
LOAd
Sto t
(BEEP)
FILL 3
NO HOPSET WHERE CHAN IS SET
or
Cold
CHAN SET TO MAN
or
F234
HOPSET IS WHERE CHAN IS SET
LOAd
HLd t
(BEEP)
WHEN TRANSEC UPDATE TIME COMES, SET FCTN TO LD-V. PRESS <Sto/ENT>
Sto t
(BEEP)

LOCKOUT SET LOADING (LOCAL FILL)

a. Make sure rt CHAN is not set to CUE.

b. Set ECCM fill device function switch to OFF; then connect fill cable to rt connector AUD/FILL and to fill device connector J1.

c. Set rt controls: FCTN to LD and MODE to FH.

d. Set ECCM fill device select switch to desired lockout set position.

e. Set ECCM fill device function to ON.

f. Press rt **<H•LD/O>** and after the beep press <Sto/ENT>

g. To load more lockouts, reset fill device select switch and repeat rt keyboard steps.

HOPSET LOADING (LOCAL FILL)

a. Make sure rt CHAN is not set to CUE.

b. Set ECCM fill device function switch to OFF; then connect fill cable to rt connector AUD/FILL and to fill device connector J1.

c. Set rt controls: FCTN to LD and MODE to FH.

d. Set ECCM fill device select switch to desired hopset position.

e. Set ECCM fill device function to ON.

f. Press rt **<H•LD/O>.** After the beep press <Sto/ENT> and <CHANNEL/NUMBER/(1-6)>.

g. To load more hopsets, reset fill device select switch and repeat rt keyboard steps. After all required hopsets, lockout sets and TRANSEC variables are loaded, turn off and disconnect fill device.

FH SYNC TIME [CHECKING AND SETTING]

The FH sync time clock in your rt is used to time FH operations. This clock stops running when FCTN has been set to OFF for more than 24 hours (if your rt has had the FCTN set to OFF for more than 24 hours, reset all FH sync time functions). The clock immediately stops running when FCTN is set to STW or Z-A. NEVER confuse FH sync time with wristwatch time.

CHECKING FH SYNC TIME

a. Set FCTN to SQ ON.

b. Press **<•••/TIME>** three times. Each press gives you a different display. The first press displays the days (last two digits of Julian date). The second press displays hours and minutes. The third press displays minutes and seconds.

SETTING FH SYNC TIME

If rt FCTN is set to Z-A, all time functions must be set manually or by ERF from NCS. To manually set all functions (days, hours, minutes), do the following steps:

o Obtain net’s time standard.

- o Set FCTN to LD.
- o Press **<•••/TIME>** once, <CLR>, enter numbers for new days (last two digits of Julian date) and press <Sto/ENT>.
- o Press **<•••/TIME>** twice, <CLR>, enter numbers for new hours and minutes and press <Sto/ENT>. When <Sto/ENT> is pressed, seconds are reset to 00 and the clock starts.

CLEARING A SINGLE FH SET

NOTE: You cannot clear the channel you are operating on.

a. Set rt controls: FCTN to LD and MODE to FH.

b. To clear hopset, press <CLR> and <CHANNEL/NUMBER/(1-6).

c. To clear lockout set, press <CLR>, <L/9>, and <NUMBER/(1st DIGIT OF SET)>.

d. Set rt switches to normal positions.

APPENDIX J
ICOM SINCGARS RADIO: HOPSET(S) LOADING PROCEDURES

PROCEDURE SUMMARY:

The following summarizes the frequency hopping operating procedures for an ICOM radio. The radio controls are shown in Figure J-1.

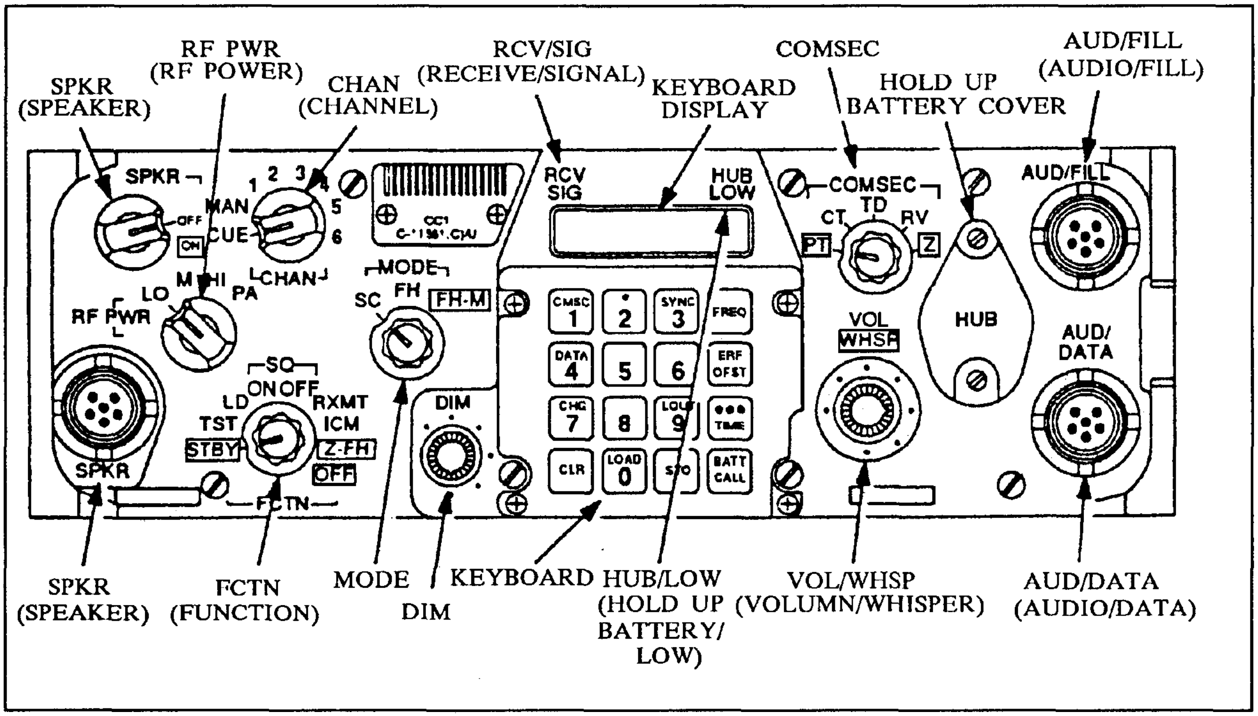

RF PWR
(RF POWER)
SPKR
(SPEAKER)
CHAN
(CHANNEL)
RCV/SIG
(RECEIVE/SIGNAL)
KEYBOARD
DISPLAY
COMSEC
HOLD UP
BATTERY COVER
AUD/FILL
(AUDIO/FILL)
SPKR
OFF
ON
1 2 3 4 5 6
MAN
CUE
CHAN
CC1
C-11561.C/U
RCV
SIG
HUB
LOW
COMSEC
CT TD RV
PT
Z
AUD/FILL
LO M HI PA
RF PWR
MODE
SC FH
FH-M
CMSC 1
2
SYNC 3
FREQ
DATA 4
5
6
ERF OFST
CHG 7
8
LOUT 9
●●● TIME
CLR
LOAD 0
STO
BATT CALL
VOL
WHSP
HUB
AUD/
DATA
SQ
ON OFF
LD
RXMT
TST
ICM
STBY
Z-FH
OFF
DIM
SPKR
FCTN
SPKR
(SPEAKER)
FCTN
(FUNCTION)
MODE
DIM
KEYBOARD
HUB/LOW
(HOLD UP
BATTERY/
LOW)
VOL/WHSP
(VOLUMN/WHISPER)
AUD/DATA
(AUDIO/DATA)

Figure J-1

1. Using BECS or SINISS, load the ECCM fill device (MX-18290) with the common lockout(s), at least one net lockout set, and at least one TRANSEC Key (Pages 2-104 through 2-107).

2. Turn on the power supply to the radio.

3. Set the FH Sync Time for the radio. Turn the function switch (FCTN) to the LOAD (LD) position. The MODE switch can be in either the single channel (SC) position or the frequency hopping (FH) position. Press the **<•••/TIME>** button on the front panel keyboard. Press the clear (<CLR>) button and two lines appear on the LED display. Use the numeric keys to enter the two-digit day and then press the store (<STO>) button. To enter the time, press **<•••/TIME>** two times. Press <CLR> and four lines appear on the LED display. Enter the hour and minute. Press <STO> at the exact time (resets seconds to zero).

4. Load the common lockouts into the radio (if no lockouts exist, go to step 5). Turn the FCTN switch to LD, the MODE switch on FH and make sure CHAN is set on MAN. Turn the FILL DATA SELECTOR SWITCH on the fill

device to the location corresponding to the first common lockout. Press <LOAD/0> on the radio keyboard; a beep is heard. Press <STO> to store the lockout in radio. The Display blinks and shows "STO1"followed by the first digit of the lockout number and a two-digit tag number. Repeat these steps for each of the remaining common lockouts, turning the FILL DATA SELECTOR SWITCH on the fill device to the location corresponding to each of the lockouts in turn.

5. Load the net lockouts into the radio. Leave the FCTN switch on LD, the MODE switch on FH and make sure CHAN is set on MAN. Turn the FILL DATA SELECTOR SWITCH on the fill device to the location corresponding to the net lockout to be loaded into the radio. Press <LOAD/0> on the radio keyboard; a beep is heard. To store the lockout in the radio, press <STO> which causes the display to prompt for a channel number. Next, use the numeric keys to enter the channel number (1-6) that is used for this lockout. Repeat these steps for additional net lockouts to be loaded, using a different channel number for each.

NOTE: TSK is loaded automatically with the Hopset in the ICOM radio.

6. The radio is loaded. Set FCTN to SQ ON, MODE to FH and turn the channel selector (CHAN) to the channel number where the hopset is loaded. Press <FREQ> several times. Watch display for lockout set numbers.

7. Turn the FCTN switch to sauelch on (SQ ON) or squelch off (S0 OFF). If another radio is loaded with the sarne-information, the radios can communicate with each other. Once a radio is loaded, other radios can be loaded by performing an ECCM remote fill (ERF).

DETAILED Procedures

The following procedures describe the frequency hopping operating procedures for an ICOM radio.. The procedures are part of the Operator's Manual, TM 11-5820-890-10-1. Refer to the operator's manual for more details on radio procedures. The radio controls are shown in Figure J-1.

PRE-MISSION CHECK

NOTE: If you do not perform the following steps, you risk radio failure during a mission.

0 Make sure your radio is assembled correctly (refer to TM 11-5820-890-10-1).

0 Make sure the PMCS is done on the following items (refer to TM 11-5820-890-10-1 for more information):

1. Battery physical and electrical condition.
2. Receiver-transmitter self-test.
3. Transmitter.
4. Mounting adapter and mounting base.
5. Remote operation checks (control-monitor self-test, control-monitor rt function control).
6. HUB electrical condition.

- Make sure the routine checks are done on the following items (refer to TM 11-5820-890-10-1 for more information):
  1. Antennas.
  2. Cables and cable connectors.
  3. Controls and switches.
  4. Mounting and assembly hardware.
- Check battery life condition (refer to TM 11-5820-890-10-1).
- If FCTN is at OFF, move it to STBY; then move it to SQ ON.
- Check required load. (Do you have the correct hopsets, lockout sets, COMSEC keys, cold start TSK, CUE frequency and MAN frequency?)
- Stand by for net opening (the NCS contacts you). Make sure you can establish communication on each net you are operating in.

NET OPENING

Your rt needs special data to operate in a frequency hopping (FH) mode. Net opening is the procedure for loading this data. Always keep in mind that your NCS directs net opening and that you must listen to his commands carefully. There are two procedures for net opening: (1) cold start net opening and (2) time hack net opening. The NCS will tell you which one to use. If Net is to be opened in CT, refer to the BASIC COMSEC PROCEDURES in this section (pages J-n to J-13.

COLD START NET OPENING

NOTE: The following steps are designed for net members. Detailed NCS procedures are provided in manual TM 11-5820-890-10-1 Chapter 4.

BEFORE OPERATION

a. Make sure that your rt has FH data loaded (the NCS has the same data loaded in his rt):

   - Cold start TSK in channel 1 or MAN channel (automatically loaded into MAN channel when hopset is loaded into channel 1).
   - Lockout set(s), if needed.
   - Hopset(s). If display shows “L7” or “L8”, you are missing mandatory lockout set(s)
   - MAN channel frequency.
   - CUE channel frequency.
   - Load TEK and KEK as required (BASIC COMSEC PROCEDURES). If COMSEC keys are required and MAN channel is being used, the COMSEC key used defaults to TEK in channel 5.

DURING OPERATION

b. Set FCTN to SQ ON, then to LD.

c. Set COMSEC to CT (if required).

d. Set CHAN to MAN and MODE to FH. Display shows “COLD”.

e. Wait for NCS to contact you and confirm communication (monitor the MAN channel).

f. Stand by for NCS to direct ERF (the NCS tells you in which channel to store hopset for FH sync time).

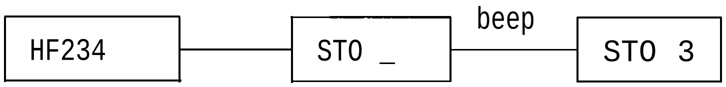
g. The NCS transmits the hopset for FH sync time to your rt. The display shows the hopset was received, “HFxxx”

o When hopset ERF is received, FH sync time and the hopset ID are received at the same time.

o If you do not receive the ERF, monitor the MAN channel and wait. The NCS comes back to you.

h. Press <STO> to store hopset for FH sync time.

i. Enter the number of the channel in which the set is to be stored (channel given to you in step f). Display changes as shown; beep is heard. Acknowledge ERF reception and storage of ERF.



ERF RECEIVED STO PRESSED NUMBER PRESSED; HOPSET STORED

j. On command, set CHAN to channel in which the hopset is stored (number entered in step i). Display shows “Fxxx”.

k. NCS contacts you to confirm communication on new hopset channel.
o If you are not able to establish contact with NCS, monitor the MAN channel and wait. The NCS comes back to you.

l. On command, set FCTN to SQ ON (or normal operating position).
o When shutting down, only set FCTN to STBY if you want to save FH data.

TIME HACK NET OPENING

NOTE: The following steps are designed for net members. Detailed NCS procedures are provided in manual TM 11-5820-890-10-1 Chapter 2 Section V. Remember, the NCS directs this procedure. Listen to his instructions carefully.

NOTE: Both NCS and net members must set FCTN to Z-FH before performing this procedure.

BEFORE OPERATION

a. Make sure that your rt has FH data loaded (the NCS has the same data loaded in his rt):

o Cold start TSK in channel 1 or MAN channel (automatically loaded into MAN channel when hopset is loaded into channel 1).

- Lockout set(s), if needed.
- Hopset(s). If display shows “L7” or “L8”, you are missing mandatory lockout set(s).
- MAN channel frequency.
- CUE channel frequency.
- Load TEK and KEK as required (see BASIC COMSEC PROCEDURES).

DURING OPERATION

b. Set CHAN to position where hopset is stored.

c. Set COMSEC to CT (if required).

d. Set FCTN to LD, MODE to FH.

e. Monitor CHAN position where hopset is stored and acknowledge communication;

f. On command, press **<•••/TIME>** two times (display shows “00 00”).

g. Press <CLR>.

h. Enter the numbers for new hours and minutes on the keyboard. Do not press <STO> until NCS gives command.

i. Stand by for NCS command to store hours and minutes.

j. On command, press <STO>. It is extremely important that you do not press <STO> until the NCS tells you to (you may lose net communication).

k. Set FCTN to SQ ON (or normal operating position).

l. Confirm communication with NCS.
   - If you cannot establish communication, monitor MAN channel and wait. The NCS comes back to you.

NOTE: When shutting down, only set FCTN to STBY if you want to save FH data.

FH UPDATE USING ERF

This procedure is used to update hopsets and lockout sets during net operations. It is also used to add new sets. During an update, the net communicates on the FH channel it has been using.

FH Update Procedure. The following steps are designed for net members. Detailed NCS procedures are provided in manual TM 11-5820-890-10-1.

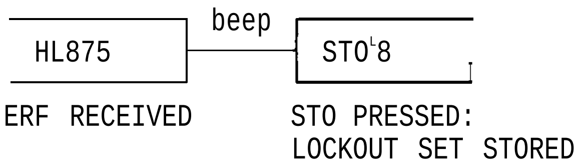
NOTE: Do not change the CHAN setting until all updating is complete.

a. Set FCTN to LD. Leave all other controls as they have been for past communications.

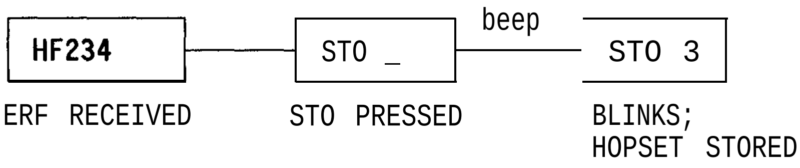
b. The NCS contacts you. Acknowledge call. NCS tells you which channel to store data in, and to confirm reception and storage of ERF after it is finished.

c. Stand by for update. NCS transmits lockout set(s) first, if needed; then hopset(s).

d. Store ERF:
   - Lockout set: Press <STO>. Display changes as shown.



   - Hopset: Press <STO>; then enter the channel number where it is to be stored (number given to you in step b). Display changes as shown.



e. Acknowledge when ERF is received and stored.

f. Set FCTN to normal operating position.

g. On command, set CHAN to where hopset is stored.
   - If FH update is being done in CT, you must scroll to net's operational TEK or have TEK loaded into channel selected for update.

   - If communication is not established, set CHAN to where you last had communication. The NCS contacts you.

CUE

Cue is used when you need to contact a FH radio net when you are not an active member of that net. Cue can be used if you have missed your primarv net's opening or if you need an ERF. Cue may also be used if you need to be a member of an alternate net or if you are operating a SC radio and wish to contact a FH net.

Cue procedure. If you are the NCS and need information about answering a cue signal, see Operator's Manual TM 11-5820-90-10-1. Refer to the local SOP for COMSEC procedures.

a. Set COMSEC to PT.

b. Set CHAN to CUE. Make sure channel is loaded (if it is not loaded, do the loading procedures from Operator's Manual TM 11-5820-890-10-1).

c. Set RF to HI
   - If you are using a long range rt, set RF to PA.

d. Adjust VOL as needed.

e. Key transmitter and call NCS. Repeat this step if necessary; wait 15 seconds between tries.

LATE NET ENTRY

Two methods are used to join a net that is already operating. The FH data in your rt determines which method to use. In either case, you must have the correct TSK for the net you need to join.

METHOD 1.

Part 1:

a. Set CHAN to channel having net's hopset.

b. Set other switches for normal FH operating positions.

c. Press <FREQ>.

d. Press <SYNC/3> (late entry).

e. Monitor the channel for at least 3 minutes.

f. Contact the net when traffic is heard. When a net signal is received, late entry is canceled; "L" does not appear on display when <FREQ> is pressed.
   o When traffic is heard, call the net.
   o If contact is not made, go on to part 2.

Part 2:

g. Attempt to contact net; making key-down time short.

h. Wait 60 seconds between each key-down for a replay.
   o If no traffic is heard, repeat steps g and h up to five times.
   o When traffic is heard, call the NCS.
   o If no contact is made after performing part 2, do the cue and ERF procedure (method 2).

CUE AND ERF PROCEDURE

Method 2: Cue and ERF procedure. This method should be used when one or both of the following conditions exist: (1) you missed your primary net's cold start and your rt needs FH data. (2) You need to be a member of more than one net. Use method 2 to join alternate nets after you have opened with your primary net or if FCTN-has been set to STBY arid no traffic is heard.

a. Set COMSEC to PT.

b. Set CHAN to CUE. Make sure channel is loaded (if it is not loaded, do the loading procedures from Operator's Manual TM 11-5820-890-10-1).

c. Set RF to HI
   o If you are using a long range rt, set RF to PA.

d. Adjust VOL as needed.

e. Key transmitter and call NCS. Repeat this step if necessary. Refer to local SOP for COMSEC procedures.

f. When a reply is heard, request a cold start ERF. The NCS directs you (same as cold start opening).

NOTE: If you are unable to communicate on new hopset, set CHAN to position where you last had communication; then wait for the NCS to contact you.

CHANGING HOPSET IDENTIFICATION (ID)

Changing FH hopset ID. When needed and authorized, the FH hopset ID can be changed. The following procedure is to be performed only at the direction of the NCS.

NOTE: When needed, it is possible to copy the hopset ID that is present in one channel into another channel: Set FCTN to LD, press <LOAD/0>, enter channel number where hopset is stored, press <STO>; then enter the channel number in which it is to be copied. If the hopset ID must be changed, perform the following procedure.

a. Set FCTN to LD.

b. Set MODE to FH-M

c. Set CHAN to channel where the hopset ID is stored that needs to be changed.

d. Press <FREQ>, Display shows old hopset ID.

e. Press <CLR>. Display shows that the last two digits have been cleared.

f. Enter next to last digit of new hopset ID.

g. Enter last digit of new hopset ID.

NOTE : 0 The old hopset ID is cleared at the completion of step h. If you need to restore the original hopset ID, press FREQ, CLR, and enter the last two digits of the original hopset ID.

h. Press <STO> (display blinks and the new hopset ID is stored).

LOST COMMUNICATION

What to Do When You Lose Communication. Perform the following steps if you cannot contact a net member or NCS.

a. Monitor channel (CHAN switch) where you last had communication.

b. Wait for the NCS to come back to you.
o If you are unable to make contact, do the cue procedures.

LOCKOUT SET LOADING (LOCAL FILL) Check the SOI for required lockout set(s).

a. Make sure that the ECCM fill device is loaded.
 o Check to see if the lockout set(s) have already been loaded in rt: Set rt FCTN to SQ ON, rt MODE to FH, CHAN to channel where hopset is stored; then press rt FREQ several times. Watch display for lockout set numbers.

b. Set ECCM fill device function switch to OFF.

c. Connect fill cable to rt connector AUD/FILL and to fill device connector J1.

d. Set rt controls: FCTN to LD and MODE to FH.

e. Make sure rt CHAN is not set to CUE.

f. Set ECCM fill device select switch to position containing the lockout set.

g. Set ECCM fill device function to ON.

h. Press rt <LOAD/0>. A beep is heard

i. Press <STO>. Display blinks and shows “STO^{L}” followed by the first digit of the lockout number.
 o If additional lockout sets are to be loaded, repeat steps a thru i for each.

j. Set ECCM fill device function switch to OFF.

k. Disconnect ECCM fill device from rt connectorAUD/FILL.

l. Set rt switches as needed for normal operation.

HOPSET LOADING (LOCAL FILL). Check the SOI for required lockout set(s).

a. Make sure that the ECCM fill device is loaded.

b. Set ECCM fill device function switch to OFF.

c. Connect fill cable to rt connector AUD/FILL and to fill device connector J1.

d. Set rt controls: FCTN to LD and MODE to FH.

e. Make sure rt CHAN is not set to CUE.

f. Set ECCM fill device select switch to position containing the hopset.

g. Set ECCM fill device function to ON.

h. Press <LOAD/0>. A beep is heard

i. Press <STO>. Display blinks and shows “STO_”.

j. Enter the number of the channel in which the hopset is to be stored (1-6). Display blinks and shows “STO” followed by the channel number in which the hopset is stored.
o If additional hopsets are to be loaded, repeat steps a thru j for each.

k. Set ECCM fill device function switch to OFF.

l. Disconnect ECCM fill device from rt connector AUD/FILL.

m. Set rt switches as needed for normal operation.

FH SYNC TIME (CHECKING AND SETTING)

The FH sync time clock in your rt is used to time FH operations. NEVER confuse FH sync time with the time of day. There are seven separate clocks inside the radio. There is a base clock and a clock for each CHAN setting (1-6). MAN and CUE settings display the base clock time. All clocks are set within an hour of the base clock time.

When time is first loaded into the radio (cold start ERF or manually), all seven clocks are set to the same time. When an ERF is received into a specific channel, the sender’s net time is also received and stored in the channel with the hopset (it must be within one hour of base clock time already within the radio). Whenever FH sync time is loaded using the keyboard, ALL of the clocks in the radio are reset to the base clock’s time. It is not possible to reset the net time for only one channel manually. This can only be done using ERF.

Updating the FH sync time is done automatically each time a message is received from the NCS. The NCS must be an active member of a FH radio net so that member’s radios are updated (NCS is the time standard for net). If you are a member of more than one net, it is important that you communicate with the NCS daily.

To find the time of a specific net (monitoring FH sync time of other nets), set the CHAN to the position where the net’s hopset is stored; then press **<•••/TIME>.** The display shows that net’s time. It is possible to check the time of a net while operating in a different net: Enter the number of the channel (1-6) on the keyboard while the time of your operating net is on display. The display changes to that net’S\s time.

During net operation the time might drift. It can drift as much as half a second if the FCTN is set to a normal operating position for up to 24 hours. It can drift up to 4 seconds if the FCTN has been set to STBY for up to 24 hours. If your radio drifts more than this, it should be turned in to maintenance. If the FCTN has been set to STBY for more than 24 hours, the radio clocks are automatically turned off. The amount of time that your radio clock drifts determines what type of operation is possible.

If your clock has drifted more than 59 minutes, it is possible to zeroize FH data (set FCTN to Z-FH), re-load data for cold start; then request a cold start.

CHECKING FH SYNC TIME

a. Set FCTN to SQ ON.

b. Press **<•••/TIME>** three times. Each press gives you a different display. The first press displays the days (last two digits of Julian date). The second press displays hours and minutes. The third press displays minutes and seconds.

SETTING FH SYNC TIME

If rt FCTN is set to Z-FH, all time functions must be set manually or by ERF; otherwise the clock does not start.

a. Obtain net's time standard; then set FCTN to LD.

b. Load and store days (last two digits of Julian date):

(1) Press **<•••/TIME>** (display shows current days).

(2) Press <CLR> (display shows two lines).

(3) Load new days (press number buttons for new days, display shows new days).

(4) Store new days (press <STO> button, display blinks and shows new days).

c. Load and store hours and minutes:

(1) Press **<•••/TIME>** twice (display shows current hours and minutes).

(2) Press <CLR> (display shows four lines).

(3) Load new hours and minutes (press number buttons for new hours and minutes). Display stays on for approximately 62 seconds or until <STO> is pressed in step 4.

(4) Store hours and minutes (press <STO> to store hours and minutes reset seconds; display blinks).

CLEARING A SINGLE FH SET

This procedure allows you to clear a single FH hopset or lockout set from your rt.

NOTE: You cannot clear the channel you are operating on.

a. Set rt controls: FCTN to LD and MODE to FH.

b. To clear hopset, press <CLR> and <CHANNEL/NUMBER/(1-6).

c. To clear lockout set, press <CLR>, <LOUT/9>and <NUMBER/(1st DIGIT OF SET)>.

d. Set rt switches to normal positions.

BASIC COMSEC PROCEDURES

SECURE COMMUNICATION. Secure operations may be done in SC or FH modes. Two radios having the same COMSEC key can communicate in cipher text by setting the

COMSEC switch to CT and selecting the same COMSEC key. A comsec key is a variable used to enable secure communications. Two types of COMSEC keys are used: (1) a traffic encryption key (TEK) may be loaded into channels 1, 2, 3, 4, or 5 and (2) a key encryption key (KEK) is loaded into channel 6. Have one or more TEK loaded into your rt before a mission if you need to handle secure traffic. You can then exchange secure voice and data with other RT-1523(C)/U having the same TEK or KEK. The rt CHAN switch selects a TEK or KEK. You can keep the same channel but change the TEK scrolling. You can communicate with other VHF FM radios which are equipped with a KY-57 COMSEC device.

LOADING COMSEC KEY (LOCAL FILL). Use the following to load the TEK into channel 1, 2, 3, 4 or 5. Use the same procedure to load the KEK into channel 6.

a. Turnoff fill device (KYK-13, KYX-15 or KOI-18); then connect the fill cable to rt AUD/FILL connector.

b. Set rt switches: FCTN to LD, COMSEC to CT.

NOTE: 0 If COMSEC alarm (beeping alarm) is heard, key handset twice for a minimum of 1/2 second each key. If a good COMSEC key is already in the radio, the alarm clears to no alarm. If the radio does not have a good COMSEC key, the alarm clears to a steady tone.

0 A COMSEC key can only be loaded when a steady tone is present at the handset. The steady tone clears to no alarm if fill procedure is successfully completed.

0 If the COMSEC alarm does not clear, set FCTN to STBY; then to TST. If TST results in a “FAIL5” display, there is a COMSEC failure. If “GOOD” is displayed, resume normal operation.

c. Set fill device controls (KYK-13 or KYX-15): Set MODE to ON; then select COMSEC key to be loaded.
0 If you are using fill device KOI-18, insert tape.

NOTE: If COMSEC keys are required and MAN channel is being used, the COMSEC key used defaults to the TEK in channel 5. If necessary, scroll to another channel containing a TEK and check its validity (refer to step b notes) before resuming operation.

d. Load variable:

KYK-13 or KYX-15

Press rt <LOAD/0>. Display flashes “LOAD” then “H TEK”.

Press <STO>; them enter the channel number where TEK is to be stored. Display blinks and two beeps are heard.

KOI - 18

Press rt <LOAD/0>. Display flashes “LOAD”. Pull tape through reader. Display shows “H TEK”.

Press <STO>; them enter the channel number where TEK is to be stored. Display blinks and two beeps are heard.

SCROLLING TEK. Use this procedure to change the TEK (you cannot scroll or change KEK in channel 6) and to keep the same SC frequency or FH net.

a. Set rt CHAN to 1, 2, 3, 4 or 5 (scrolling is not accepted in channel 6).

b Press <CMSC/1>. Display shows “TEK n“.

c. Press <CHG/7> to change TEK. Display shows new TEK.

d. Repeat step c until TEK you want is displayed.
o You must key handset to clear alarm.

APPENDIX K

DISK OPERATIONS (FORMAT, COPY, ERASE)

Before beginning any disk operations you must understand the location of your various disk drives. The HP system has three drives: two internal (A,B) and one external (C). Drive A holds the data you are working with <u>during a session</u>. Once you zeroize the computer, this drive is erased. Drive B holds operating system information. You should never have a need to use this drive. Drive C is the external drive into which 3-1/2″ disks are inserted. This drive is used to transfer data and programs between Drive A and storage disks.

All disk formatting, copying and erasing should be done via the DOS COMMANDS selection of the PAM (See Format C Drive, page 2-17). Once this option is selected, you should be given the following prompt:

```
[A:\]:
```

If there is a letter other than A in the prompt type the following: A: and press <RETURN>.

FORMAT

Before a disk can be used for information storage the disk must be formatted.

1. Type: format c: and press <RETURN>.
2. Insert the disk you want formatted into Drive C.
3. The write protect tab located in the upper corner of the disk should be slid so that the hole is covered (unprotected).
4. Press <RETURN>.

The process of formatting will begin and you will be notified when the process is complete. The entire process should take about five minutes.

COPY

The following tells you how to make a copy of a completed disk.

1. Type the following: diskcopy c: and press <RETURN>.
2. You will be instructed when to insert the source disk (the disk you are copying) and when to insert the target disk (the disk you are copying to).
3. You must alternately insert each disk until the copy is completed.

The entire process should take about 10 minutes.

ERASE

The following tells you how to completely erase a data disk.

1. Insert the disk you want erased into Drive C.
2. Type erase c:*.* and press <RETURN>.
3. You will be asked if you are sure that you want to erase the disk, respond “yes”.

The process should only take a few minutes.

WARNING: EVEN THOUGH A DISK HAS BEEN ERASED, IT MAY NEED TO BE TREATED AS CLASSIFIED MATERIAL IF IT HAS EVER CONTAINED CLASSIFIED DATA. CHECK WITH LOCAL

ACCOUNTING AND CONTROL PROCEDURES FOR PROPER DISPOSITION.

For information regarding copying individual files and erasing individual files consult the HP Owner's Documentation.

EXITING

To exit after completing your disk operations type: exit and press <RETURN>.

APPENDIX L
PRINT MENU AND CONFIGURATION MENU

PRINT MENU

Execute the following steps to select the print item values.

1. To enter the print menu, press <MENU> and the number of copies to be printed is displayed.
2. Press <+> or <-> to select the desired number of copies.
3. Press <ENTER/RESET MENU> to save your selection (an * appears in the display).
4. Press <MENU> and the manual feed item is displayed. When manual feed is "ON" paper is fed by hand into the printer.
5. Press <+> or <-> to select "OFF" for manual feed.
6. Press <ENTER/RESET MENU> to save your selection (an * appears in the display).
7. Press <MENU> and the font source is displayed.
8. Press <+> or <-> to select "I" (internal) for the font source.
9. Press <ENTER/RESET MENU> to save your selection (an * appears in the display).
10. Press <MENU> and the font number is displayed.
11. Press <+> or <-> to select "00" for the font number.
12. Press <ENTER/RESET MENU> to save your selection (an * appears in the display).
13. Press <MENU> and the number of form lines (lines-per-page) is displayed.
14. Press <+> or <-> to select "66" for the number of form lines.
15. Press <MENU> and "00 READY" is displayed.
16. Hold down <CONTINUE/RESET> until "00 RESET" is displayed. The printer automatically returns on-line.

CONFIGURATION MENU

Execute the following steps to select the configuration item values.

1. To enter the configuration menu, press and hold (about 5 seconds) <MENU> and the symbol set is displayed.

2 Press <+> or <-> to select “Roman-8” as the symbol set.

3. Press <ENTER/RESET MENU> to save your selection (an * appears in the display.

4. Press <MENU> and the auto continue state is displayed. When auto continue is “ON” most error messages on the display show for 10 seconds and then the “00 READY” message appears and the printer resumes printing.

5. Press <+> or <->, to select “ON” for auto continue.

6. Press <ENTER/RESET MENU> to save your selection (an * appears in the display.

7. Press <MENU> and the 1/0 configuration is displayed.

8. Press <+> or <-> to select “SERIAL” as the 1/0 configuration.

9. Press <ENTER/RESET MENU> to save your selection (an * appears in the display.

10. Press <MENU> and the baud rate is displayed.

11. Press <+> or <-> to select “9600” as the baud rate.

12. Press <ENTER/RESET MENU> to save your selection (an * appears in the display.

13. Press <MENU> and ROBUST XON is displayed.

14. Press <+> or <-> to select “ON” for ROBUST XON.

15. Press <ENTER/RESET MENU> to save your selection (an * appears in the display.

16. Press <MENU> and DTR POLARITY is displayed.

17. Press <+> or <-> to select “HI” for DTR POLARITY.

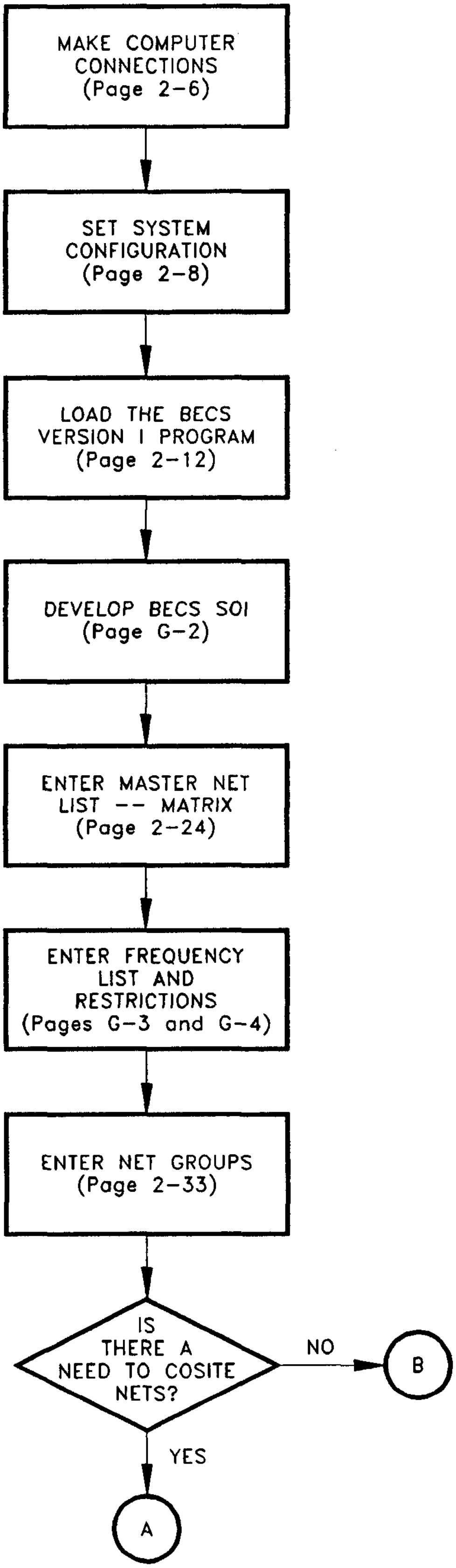
18. Press <ENTER/RESET MENU> to save your selection (an * appears in the display.

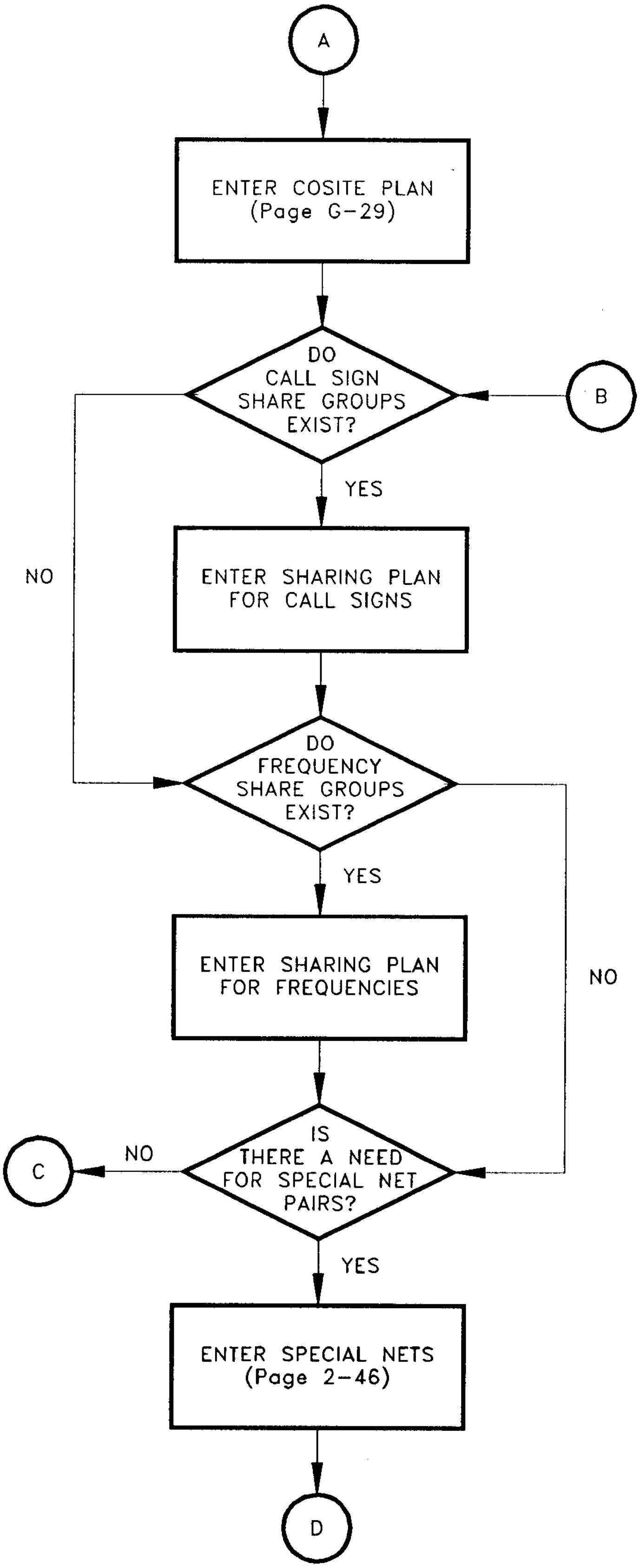
19. Press <MENU> and “00 READY” is displayed.

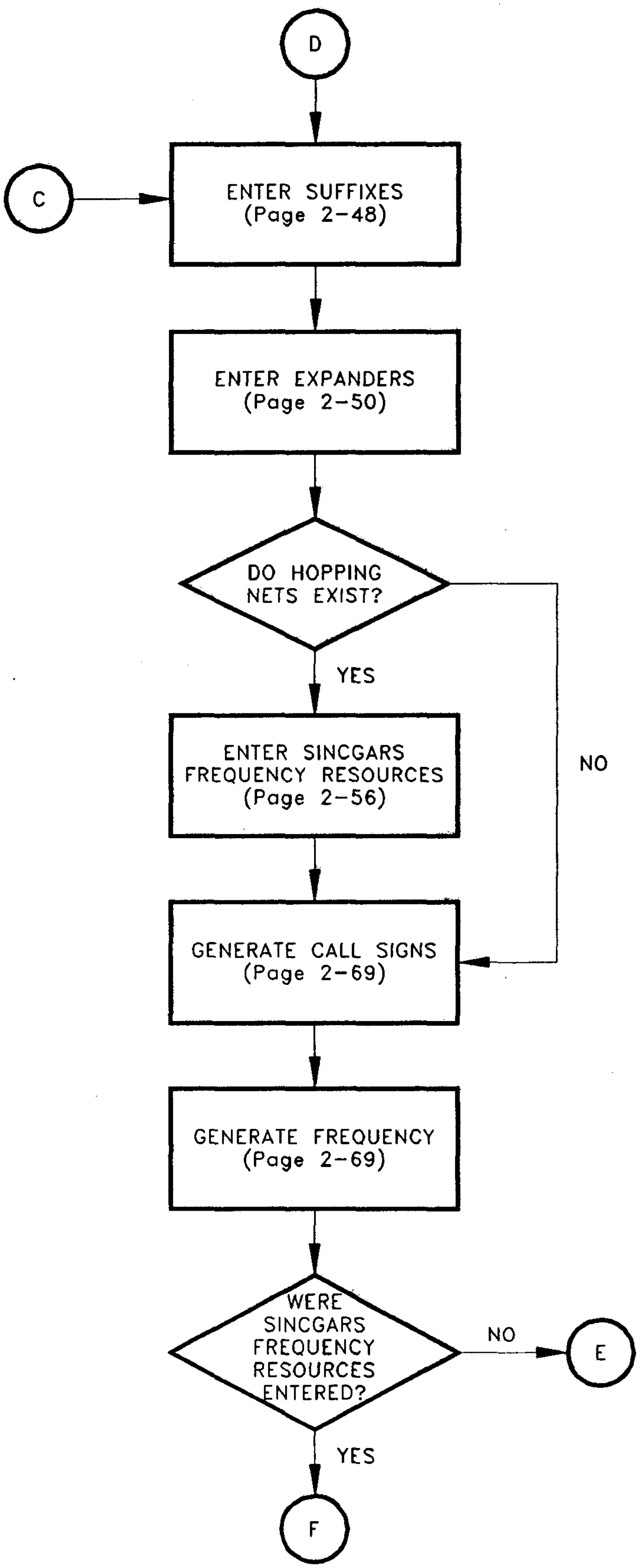
20. Hold down <CONTINUE/RESET> until “07 RESET” is displayed. The printer automatically returns on-line.

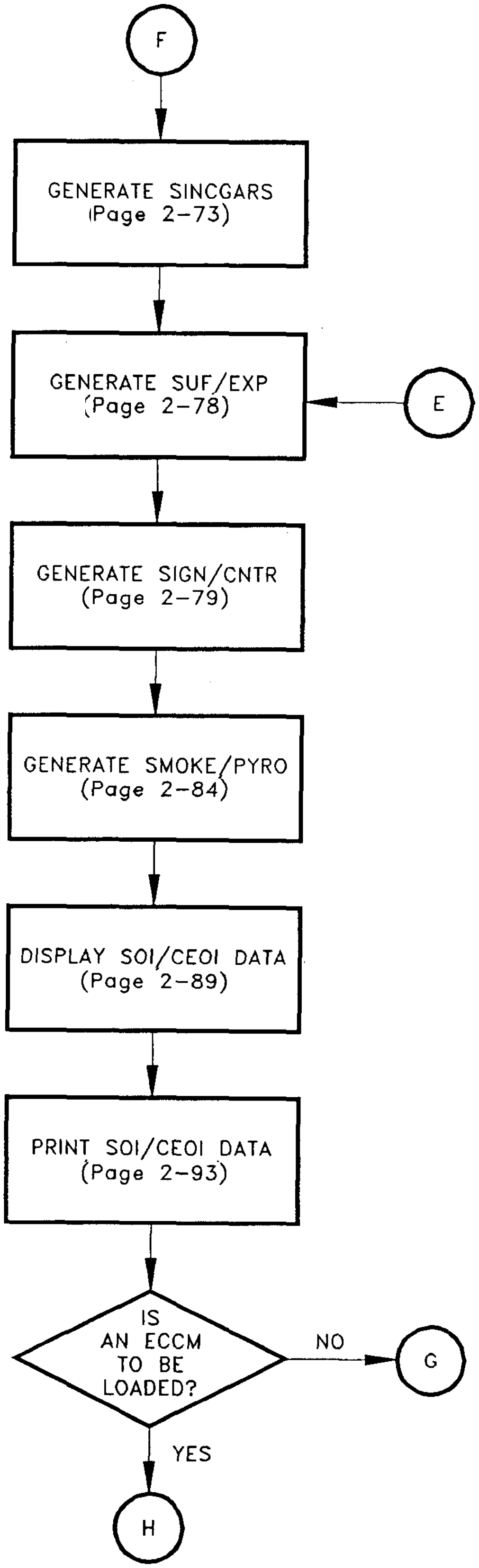
APPENDIX M
BECS SOI/CEOI FLOW DIAGRAM

The following pages show a flow diagram of the procedures for creating a database. Not all SOI/CEOI designs will exercise all options of the BECS software. For example”, if your SOI/CEOI design does not need a cosite plan, then the “ENTER COSITE PLAN” process is skipped. The User’s Guide section number describing each process is shown in parenthesis.


MAKE COMPUTER CONNECTIONS (Page 2-6)
SET SYSTEM CONFIGURATION (Page 2-8)
LOAD THE BECS VERSION I PROGRAM (Page 2-12)
DEVELOP BECS SOI (Page G-2)
ENTER MASTER NET LIST -- MATRIX (Page 2-24)
ENTER FREQUENCY LIST AND RESTRICTIONS (Pages G-3 and G-4)
ENTER NET GROUPS (Page 2-33)
IS THERE A NEED TO COSITE NETS?
NO
B
YES
A


A
ENTER COSITE PLAN (Page G-29)
DO CALL SIGN SHARE GROUPS EXIST?
B
YES
NO
ENTER SHARING PLAN FOR CALL SIGNS
DO FREQUENCY SHARE GROUPS EXIST?
YES
NO
ENTER SHARING PLAN FOR FREQUENCIES
IS THERE A NEED FOR SPECIAL NET PAIRS?
NO
C
YES
ENTER SPECIAL NETS (Page 2-46)
D


D
C
ENTER SUFFIXES
(Page 2-48)
ENTER EXPANDERS
(Page 2-50)
DO HOPPING NETS EXIST?
YES
NO
ENTER SINCGARS FREQUENCY RESOURCES
(Page 2-56)
GENERATE CALL SIGNS
(Page 2-69)
GENERATE FREQUENCY
(Page 2-69)
WERE SINCGARS FREQUENCY RESOURCES ENTERED?
NO
E
YES
F


F
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E
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GENERATE SMOKE/PYRO (Page 2-84)
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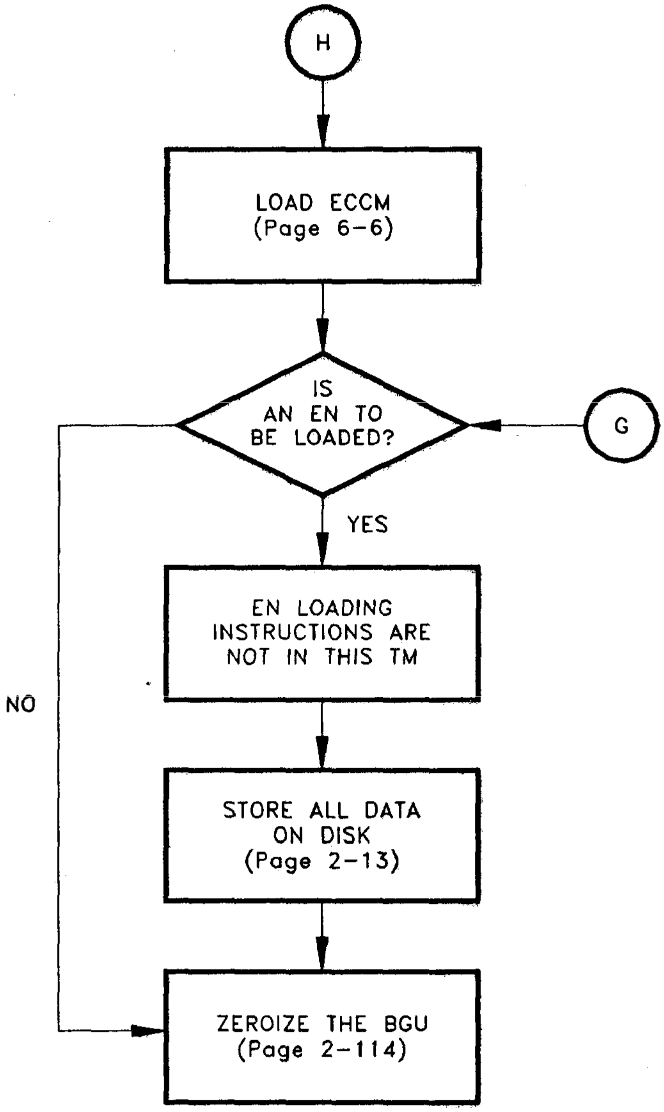
PRINT SOI/CEOI DATA (Page 2-93)
IS AN ECCM TO BE LOADED?
NO
G
YES
H


H
LOAD ECCM (Page 6-6)
IS AN EN TO BE LOADED?
G
YES
NO
EN LOADING INSTRUCTIONS ARE NOT IN THIS TM
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By Order of the Secretary of the Army:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff

Official:
Milton H. Hamilton

MILTON H. HAMILTON
Administrative Assistant to the
Secretary of the Army
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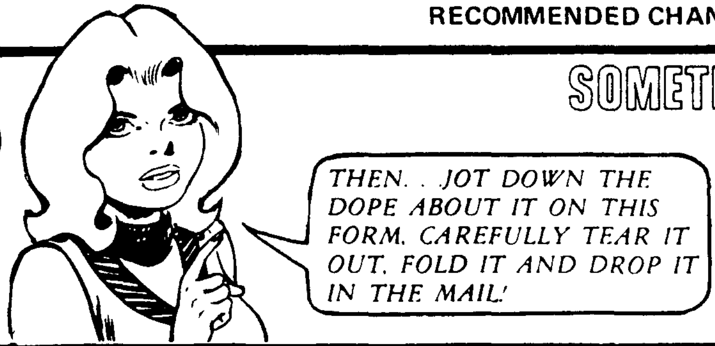
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10 July 1975

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 11-5840-340-12	23 Jan 74	Radar Set AN/PRC-76

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
2-25	2-28			Recommend that the installation antenna alignment procedure be changed throughout to specify a 2° IFF antenna lag rather than 1°. REASON: Experience has shown that with only a 1° lag, the antenna servo system is too sensitive to wind gusting in excess of 25 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 2° without degradation of operation.
3-10	3-3		3-1	Item 5, Function column. Change "2 db" to "3db." REASON: The adjustment procedure for the TRANS POWER FAULT indicator calls for a 3 db (500 watts) adjustment to light the TRANS POWER FAULT indicator.
5-6	5-8			Add new step f.1 to read, "Replace cover plate removed in step e.1, above." REASON: To replace the cover plate.
		F03		Zone C 3. On J1-2, change "+24 VDC to "+5 VDC." REASON: This is the output line of the 5 VDC power supply. +24 VDC is the input voltage.

SAMPLE

TEAR ALONG ATED LINE

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TEAR ALONG PERFORATED LINE

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

PIN: 066195