TM 11-5895-931-14 & P

TECHNICAL MANUAL

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOLS LISTS (INCLUDING DEPOT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS) FOR FACILITIES IN PLACE PATCH AND TEST FACILITY BAILEY'S CROSSROADS, VIRGINIA

HEADQUARTERS, DEPARTMENT OF THE ARMY

September 1978

WARNING

HIGH VOLTAGE

Be careful when working on the ac line connections. Serious injury or death may result from contact with these terminals.

TECHNICAL MANUAL

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HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON DC, *25 September 1978*

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REPORTING OF ERRORS

You can improve this manual by recommending improvements using DA Form 2028-2 located in the back of the manual. Simply tear out the self-addressed form, fill it out as shown on the sample, fold it where shown, and drop it in the mail.

If there are no blank DA Form 2028-2 in the back of your manual, use the standard DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forward to the Commander, US Army Communications and Electronics Material Readiness Command, ATTN: DRSEL-MA-Q, Fort Monmouth, NJ 07703.

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

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

a. This manual describes the Patch and Test Facility t Bailey's Crossroads, Virginia, and provides instruc- ons for operating and maintaining the facility equip- ent. A components of end item list (app B), a main- nance allocation chart (app D), and a repair parts list pp E) are included in the manual.

b. Throughout this manual references are made to ther publications that cover equipment in the facility. complete listing of applicable publications is pro- ded in appendix A.

c. All fold-out illustrations are located in the rear of e manual.

1-2. Indexes of Equipment Publications.

a. DA Pam 310-4. Refer to the latest issue of DA m 310-4 to determine whether there are new edi- ns, changes, or additional publications pertaining to e equipment.

b. DA Pam 310-7. Refer to DA Pam 310-7 to termine whether there are modification work orders WO's) pertaining to the equipment.

1-3. Forms and Records

a. Reports of Maintenance and Unsatisfactory uipment. Use equipment forms and records in ac- rdance with instructions in TM 38-750.

b. Station Operation and Maintenance. Use forms and records in accordance with instructions in the sta- tion Standard Operating Procedures (SOP).

c. Plant-in-Place Records. Changes, corrections and updating of Plant-in-Place Records (para 3-3) should be reported to US Army Communications Electronics Engineering Installation Agency (CEE-SWSR), Fort Huachuca, Arizona 85613.

1-4. Reporting Equipment Improvement Recommendations (EIR).

EIR's will be prepared using DA Form 2407, Maintenance Request. Instructions for preparing EIR's are provided in TM 38-750, The Army Maintenance Management System. EIR's should be mailed directly to: Commander, US Army Communications and Elec- tronics Material Readiness Command, ATTN: DRSEL-MA-Q, Fort Monmouth, NJ 07703. A reply will be furnished directly to you.

1-5. Administrative. Storage.

The exact procedure in repacking for limited storage depends on the materials available and the conditions under which the equipment is to be stored.

1-6. Destruction to Prevent Enemy Use.

Refer to TM 750-244-2 for demolition procedures for electronic equipment.

Section II. DESCRIPTION AND DATA

1-7. Purpose and Use.

he patch and test facility (PTF) provides a centralized int, which is part of the Automated Telecommunica- ns Center (ATCC) System at Bailey's Crossroads, rginia, for the termination and interconnection of lies to and from the center. Additionally, the PTF ntains equipment which provides access to the com- nications lines, transmission security, and ncomponent testing.

1-8. Tabulated Data.

NOTE

See individual technical manuals (app A) for technical characteristics of installed compo- nents of the PTF.

Circuits (full duplex)	Number	Speed
DCS Autodin (Mode 1)	2 cir	4800 bps
Remote Terminals (NG Bureau DPI)	1 cir	9600 bps

Patching Facilities (full duplex)	Number
2-wire jack appearances	
VF	96
DC High Level	96 trans, 96 rec
DC Low Level	96 trans, 96 Rec/Key
12-wire jack appearances	10
COMSEC Facilities	115-12 (5 operation, 7 spare)

AC Power:	
Red and black	120/208 vac, (three) 3 phase, 60 Hz (supplied from separate power panels)

DC Power Supplies 48 VDC (Dual)	Uses Alarm panel and high level signalling.
Red/Black Isolation	Modulated light sources and photosensitive receivers.
Alarms (Audible alarm and alarm panel lights)	**Condition**
Isolator	Loss of power, door open, high temp (130°).
DC power supplies	Loss of 48 volt power.

1-9. **Description of Patch and Test Facility, General.**

The Patch and Test Facility (PTF) is part of the Automated Telecommunications Center (ATCC) System, Bailey's Crossroads, Virginia. The PTF is installed with the Automated Multimedia Exchange (AMMEX) which it serves. The PTF equipment is arranged in three rows in the COMSEC equipment vault (figure FO 1-1) using standard cabinets which accept 19 inch rack mounted equipment/components and provide housing for cable distribution frames. Cable ducts for carrying signal and power cables between the cabinets are installed overhead above the cabinet rows. Conduits from the cable ducts bring the cables and power into the rear of the cabinets. In addition, a large conduit is connected from the signal entrance box to the cable duct to carry the entrance signal cable. Power for operating the cabinet components is taken from duplex outlets installed in the rear of the cabinets. The COMSEC equipment keys in the vault are part of special circuits not covered in this manual.

1-10. **Row 1 Equipment Bays (Figure 1-2).**

The Row 1 equipment bays constitute the black side of the signal lines.

a. Western Union Bay. A Western Union Modem is installed in bay 1.2 (bay 1.1 has been deleted). The cabinet is connected to the overhead cable duct by conduits which carry signal cables and black power. The signal cable terminates at the VF entrance frame in bay 1.3. The modem is furnished and maintained by the contractor.

b. Bays 1.3 and 1.4 (Figure 1-2). Bays 1.3 and 1.4 are available for future expansion.

c. Modem Bay 1.5 (Figure 1-10). Bay 1.5 contains a Bell Telephone 9600 Modem, a Bell Channel Interface, and a Vanstron Data Set Adapter. Signal cables from the cable ducts are terminated on blocks and cross connected to cables connected to the rear of the modem. The modem is furnished and maintained by the contractor.

d. Black Distribution Frame (DF) Cabinet Bay 1.6 (Figure 1-10). The black DF cabinet contains cable terminating blocks mounted on a metal frame. The cable blocks are used to terminate and cross-connect signal cables on the black side of the signal path through the PTF.

e. Black Patch Bay 1.7 (Figure 1-11). The black patch bay contains six patch panels and a pull-out writing shelf. Three patch panels are multi-circuit or 12-wire types. Each multi-circuit panel handles 16 each 12-wire circuits which are normalled through, from, and to cable connectors on the panel rear. Two patch panels are of the 2-wire type containing 24 each normalled through circuits which are used for low level dc patching (black). The lower patch panel is used for miscellaneous 2-wire connections and has facilities for 48 patch connections. All connections to the patch panels are made at the rear of the bay (Figure 1-12).

f. Test Bay 1.8 (Figure 1-2). Test bay equipments consist of four panels of test equipment, one MISC patch panel and a pull out shelf. The MISC patch panel terminates test equipment connections (Figure 1-9). Test equipment power input connections are made at the cabinet rear along with signal and cable connections for the patching module (Figures 1-9 and 1-10).

g. VF Entrance Frame and Patch Bay 1.9 (Figures 1-2 and 1-9). Bay 1.9 contains a dual speaker panel, four 2-wire patch modules, an intercom handset and cable terminating blocks. Each 2W audio patch module has the capability for 24 2-wire normalled through circuits. Connections are made from the rear of the patching modules to the cable terminating blocks (Figure 1-7). The main signal cable from the signal entrance panel is connected to the terminating blocks.

h. Miscellaneous Equipment Bay 1.10 (Figures 1-2 and 1-9). Bay 1.10 contains an audible indicator, an alarm panel, intercom, two high-level dc patch panels, a pull-out shelf and a 48 vdc power supply. All wiring connections are made at the rear of the components (Figure 1-9).

1-11. **Row 2 Equipment Bays (Figures 1-2A, 1-2B, and 1-2C).**

The Row 2 equipment bays constitute the black side of the signal lines.

a. Red Patch Bay (Secure) 2.1 (Figure 1-10). The red patch bay (Secure) contains six patch panels and a pull-out writing shelf. Three patch panels are multi-circuit or 12-wire types. Each multi-circuit panel handles 16 each 12-wire circuits which are normalled through, from, and to cable connectors on the panel rear. Two patch panels are of the 2-wire type containing 24 each normalled through circuits which are used for low level dc patching (red). The lower patch panel is used for miscellaneous 2-wire connections and has facilities for 48 patch connections. All connections to the patch panels are made at the rear of the bay (Figure 1-12).

b. Red Distribution Frame (DF) Cabinet Bay 2.2 (Figure 1-10). The red DF cabinet contains cable terminating blocks mounted on a metal frame. The cable blocks are used to terminate and cross-connect signal

cables on the red side of the signal path through the PTF.

c. Red Patch Bay (Nonsecure) 2.3 (Figure 1-18). Bay 2.3 contains an audible indicator, alarm panel, six patch panels, pull-out shelf, and a 48 vdc power supply. The six patch panels are identical to those located in the red patch bay (Secure) 2.1. All connections are made at the rear of the bay (Figure 1-20).

d. Red/Black Isolator Cabinets Bay 2.4 (Figure 1-21). Two separate side-by-side cabinets, using special radio frequency (rf) door seals and a series of clamps around the edges to hold the doors tightly closed, are used to house the red/black isolator circuitry. Black and red signals and power are connected through conduits from the overhead cable ducts into the cabinets. The left cabinet contains the black signals; the right cabinet the red signals. Connection of signals between the cabinets is made through common wall bushings that carry fiberglass light pipes between light transmitting and receiving modules installed in each cabinet. The doors are wired so that the opening of one causes an alarm to sound and an indicator to illuminate on the respective (red or black) alarm panel (Figures 1-18 and 1-3).

1-12. Row 3 Equipment Bays (Figure 1-22).

The Row 3 equipment bays consist of four bays. Two bays contain COMSEC equipment and two bays are available for future use.

a. Bays 3.1 and 3.2 are available for future use and are located adjacent to the two COMSEC equipment bays.

b. COMSEC Equipment Bays 3.3 and 3.4 (Figure 1-22). Two identical racks are used to mount two sets of communication security (COMSEC) equipment. Each rack has a Western Union junction box (J Box) installed above the COMSEC equipment. Signal wiring and cabling on the rear of the equipment is carried through conduit or ducts for shielding purposes.

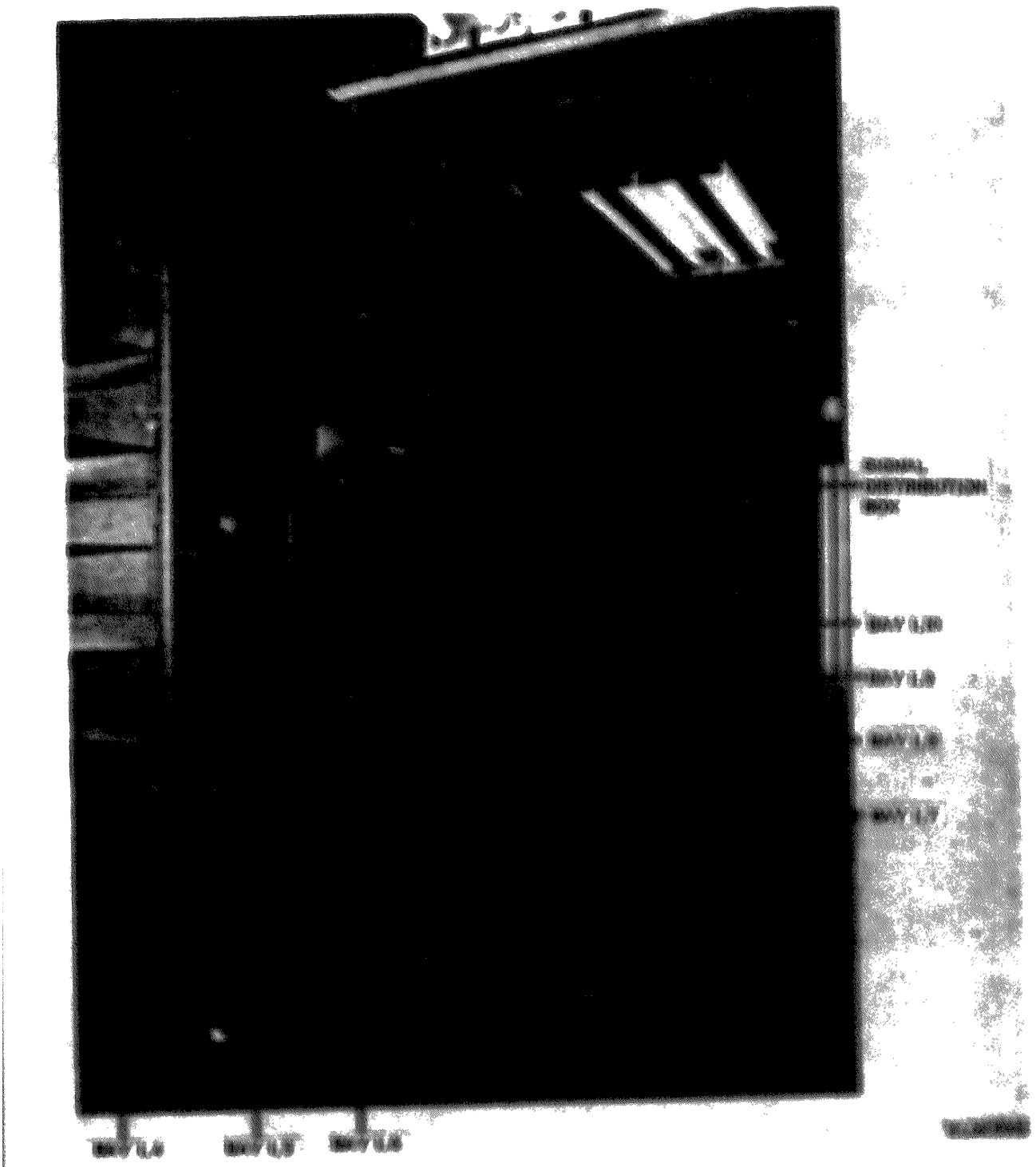


Figure 1-2.

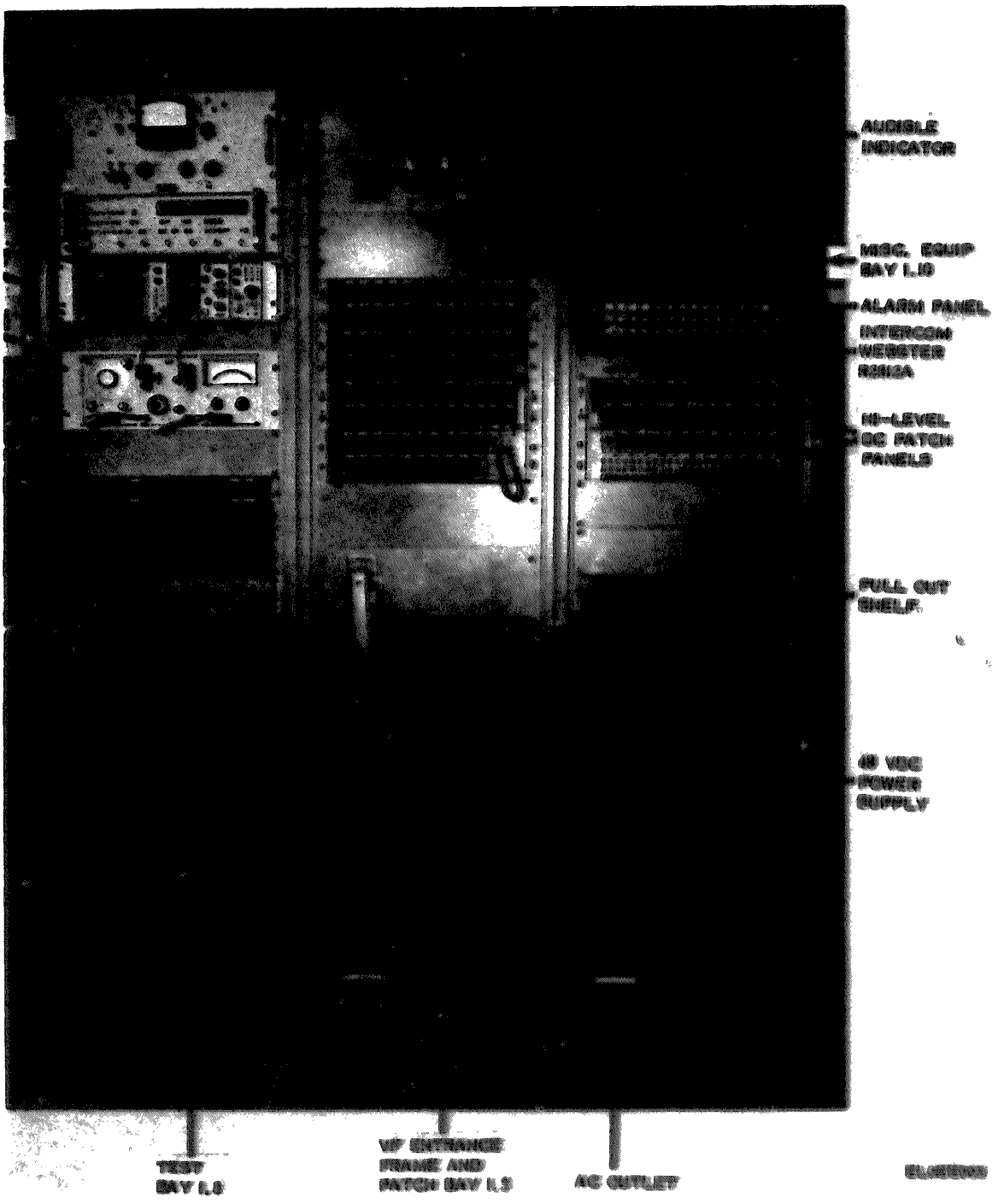


Figure 1-3. Equipment bays I_8, I Panel I_10, front views

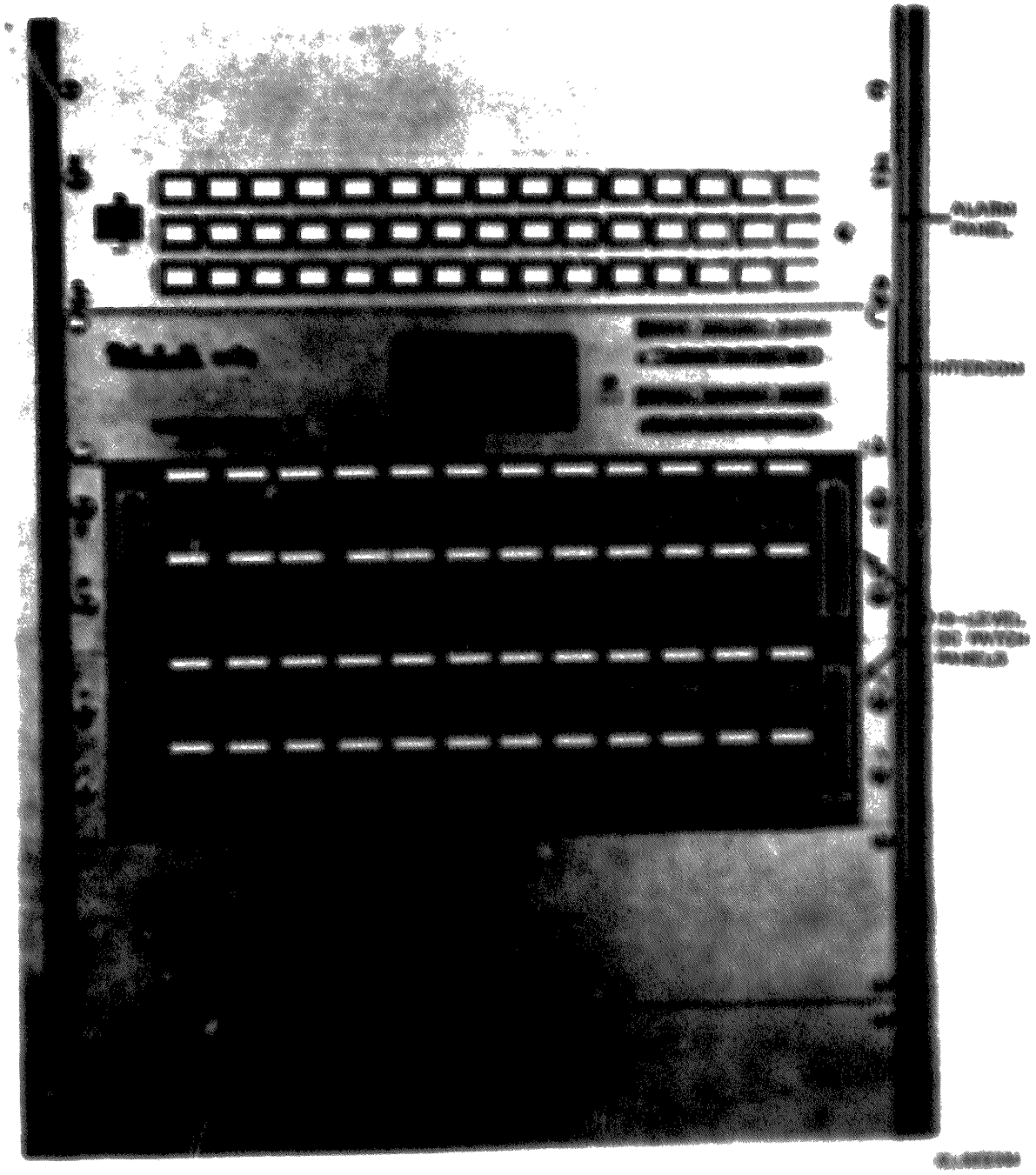


Figure 1-4.

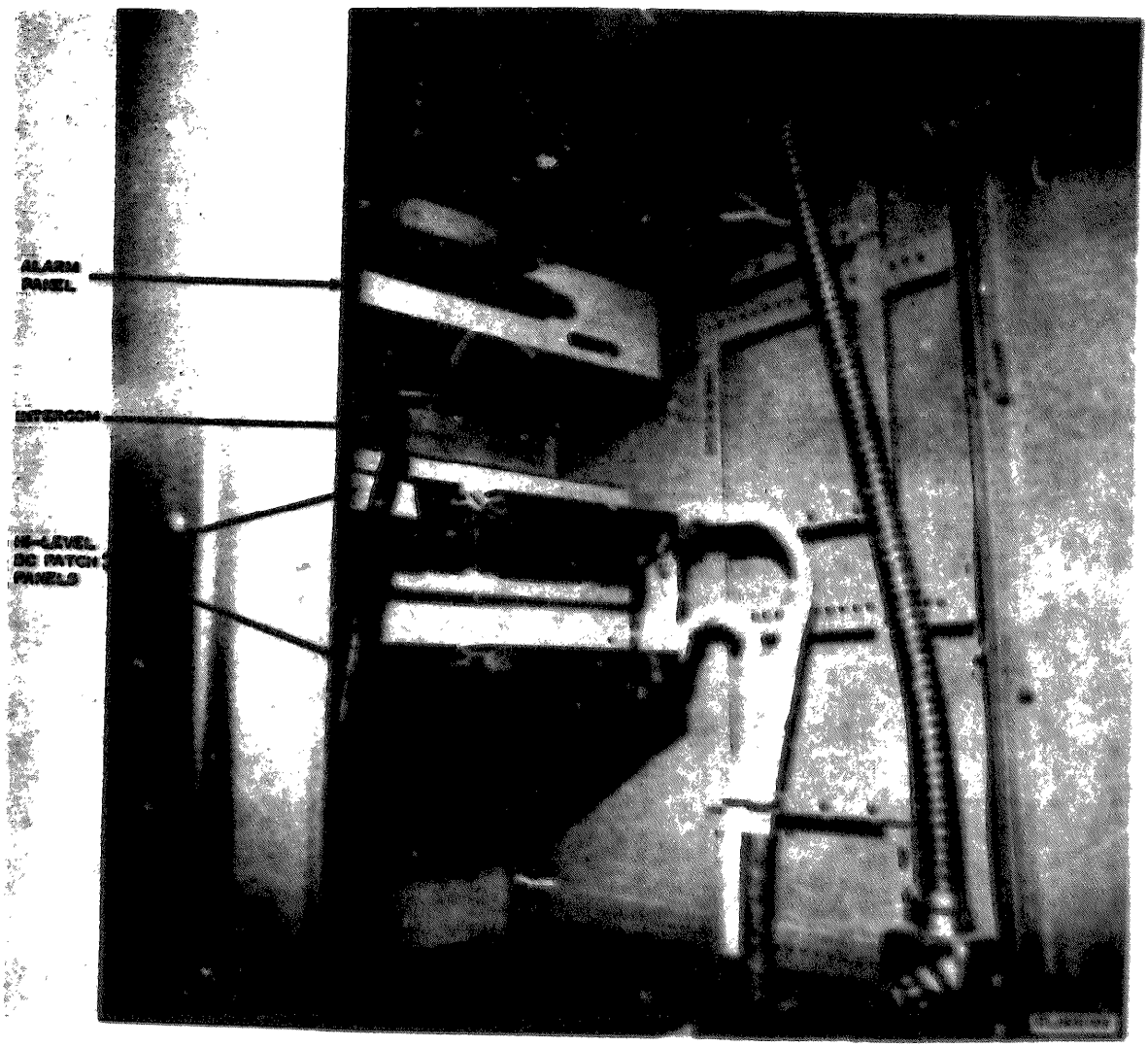


Figure 1-5. Miscellaneous equipment bay 1 (3), partial rear view

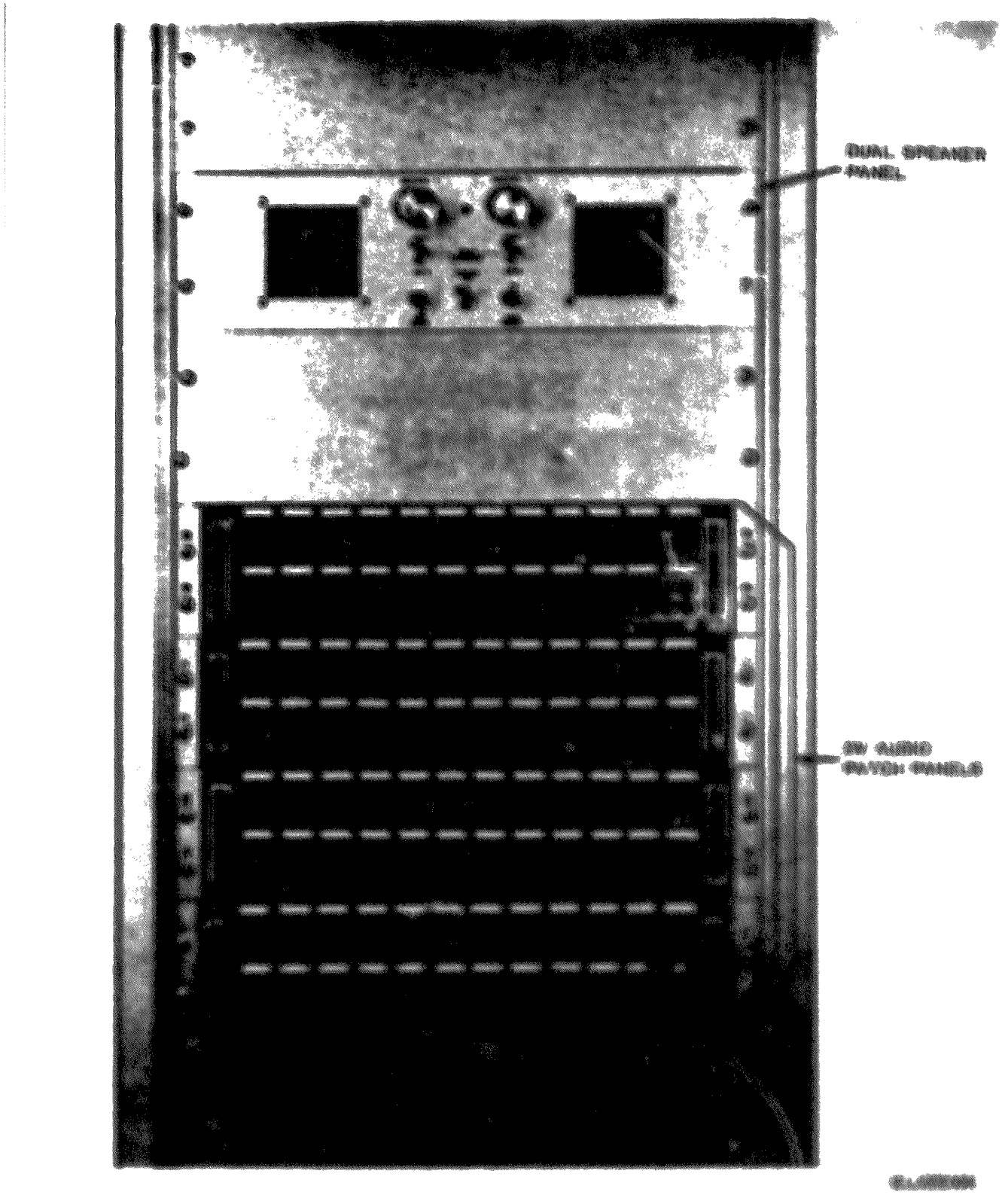


Figure 1-6.

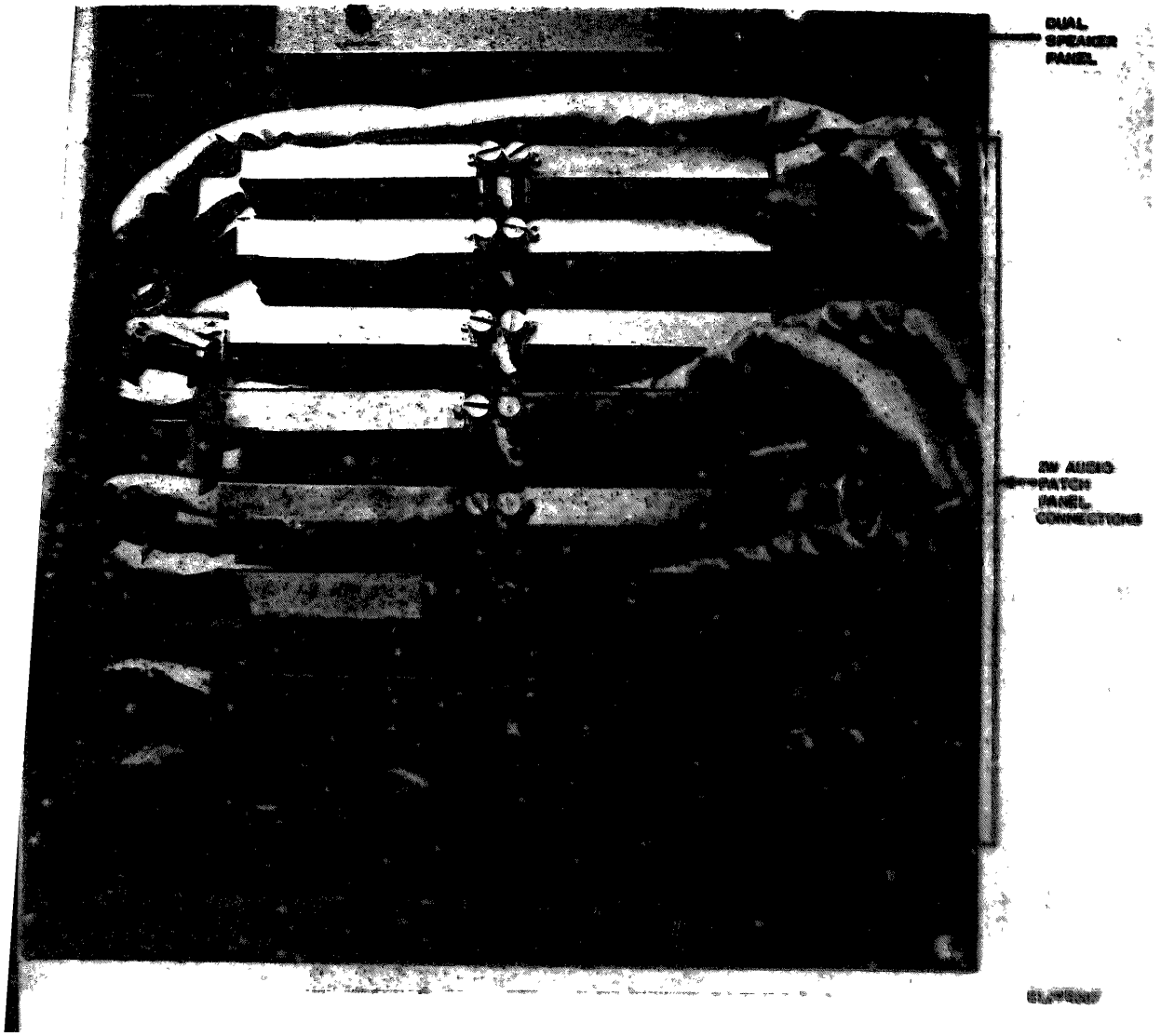


Figure 1-7. *VF entrance frame and patch bay 1.3 partial rear view.*

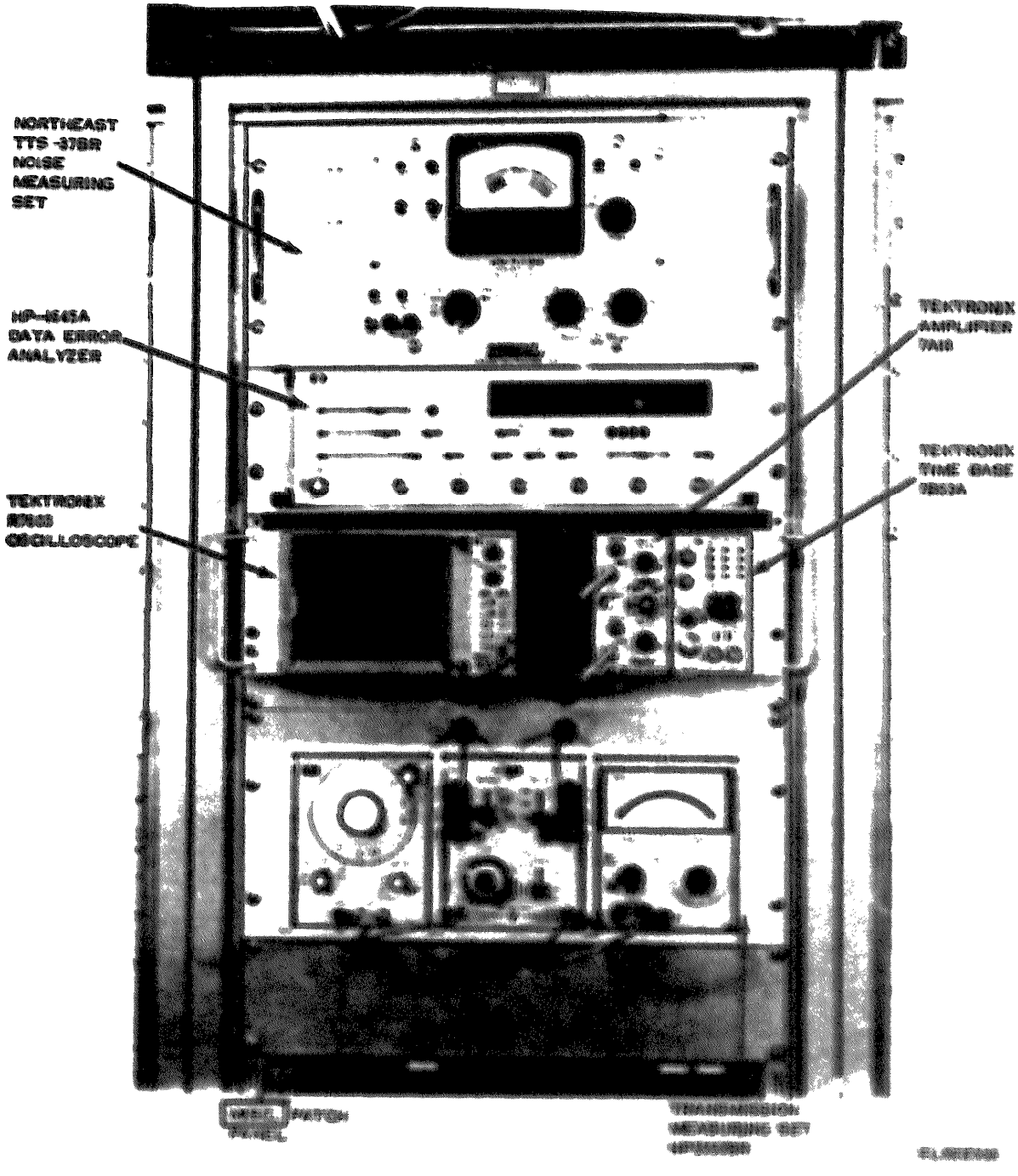

NORTHEAST
TTS -378R
NOISE
MEASURING
SET
HP-
DATA ERROR
ANALYZER
TEKTRONIX
AMPLIFIER
TEKTRONIX
TIME BASE
TEKTRONIX
OSCILLOSCOPE

Figure 1-8.

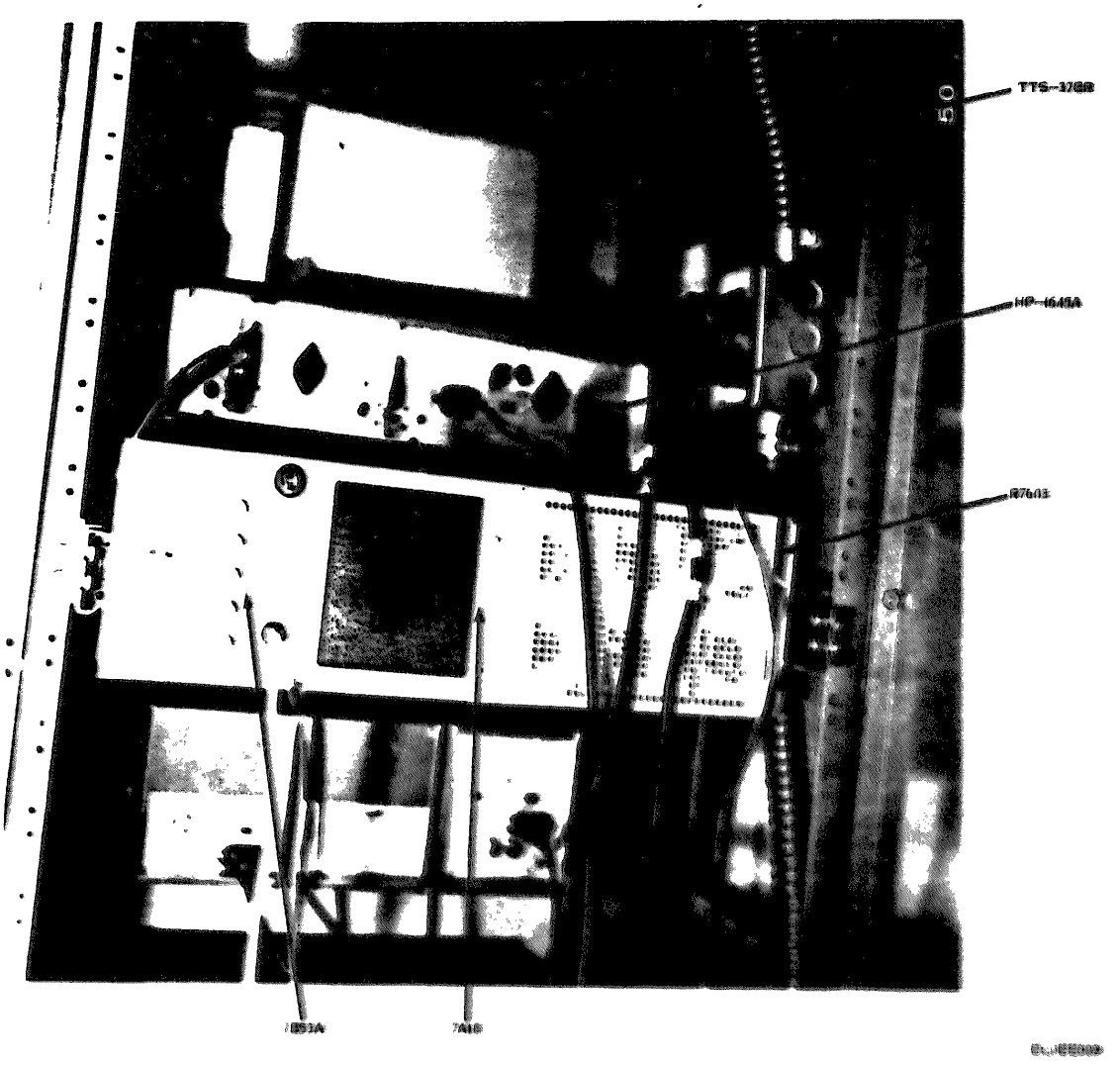


Figure 1-9.

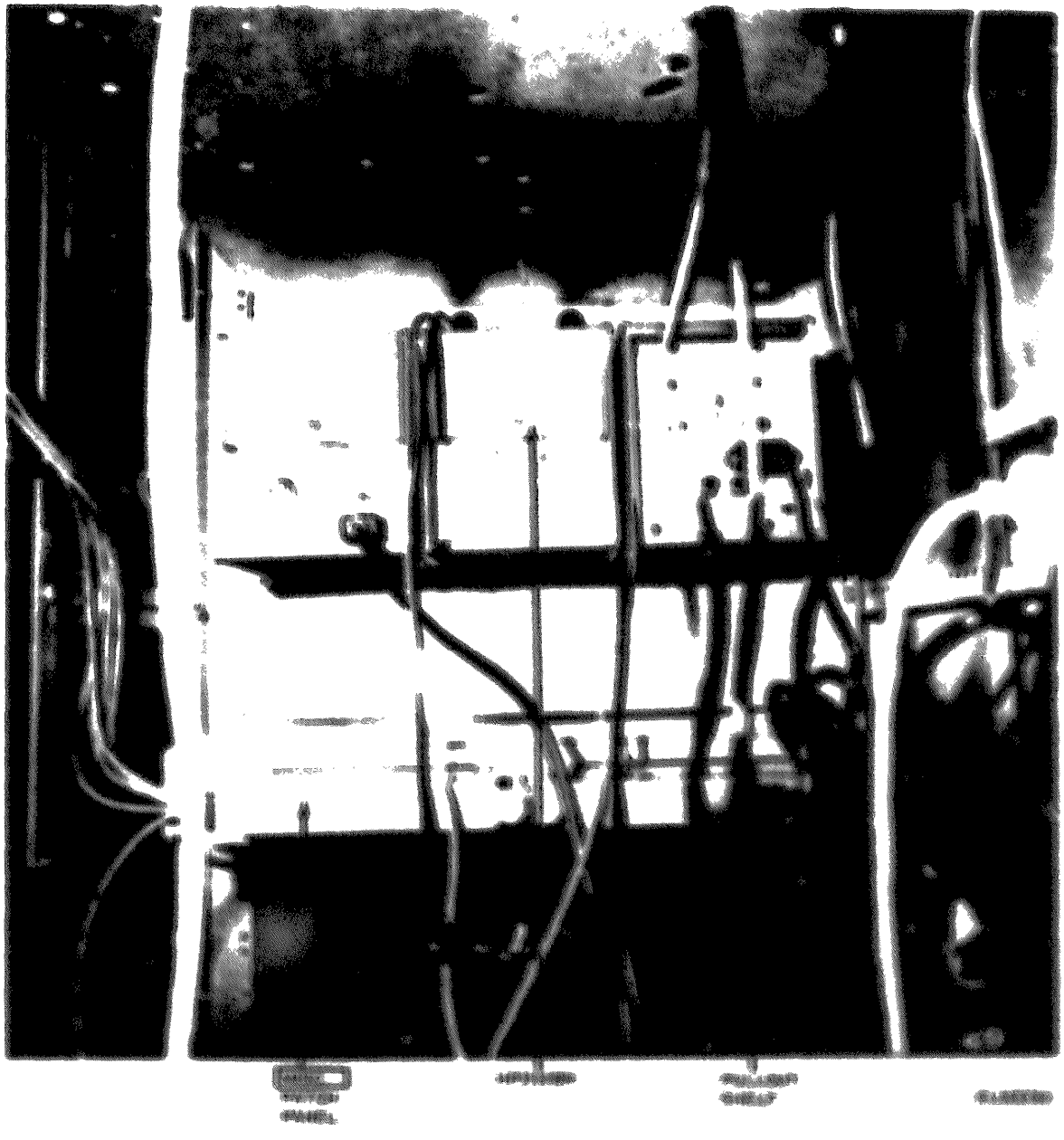


Figure 1-10.

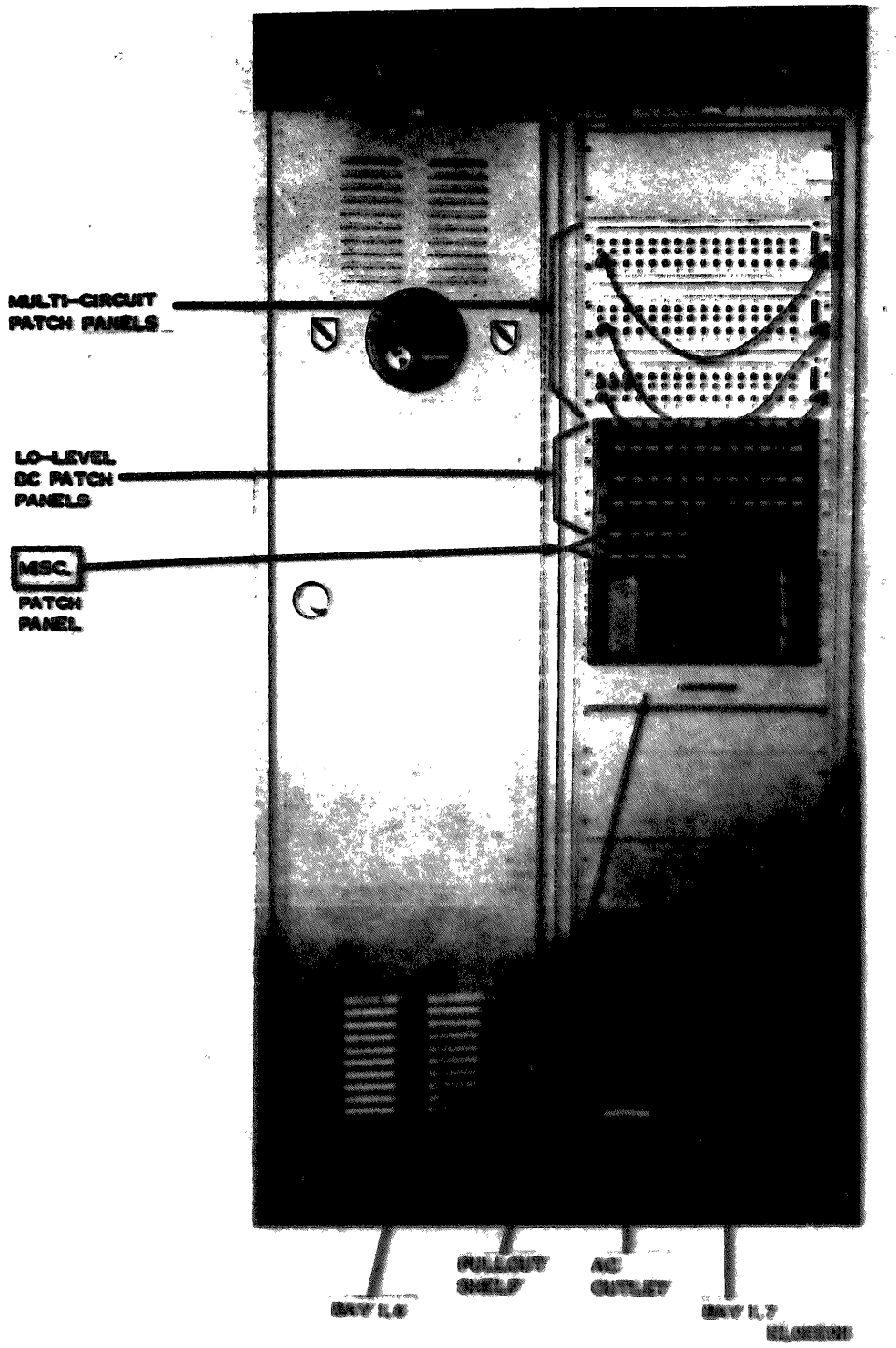

MULTI-CIRCUIT PATCH PANELS
LO-LEVEL DC PATCH PANELS
MSC. PATCH PANEL
PULLOUT SHELF
AC OUTLET

Figure 1-11.

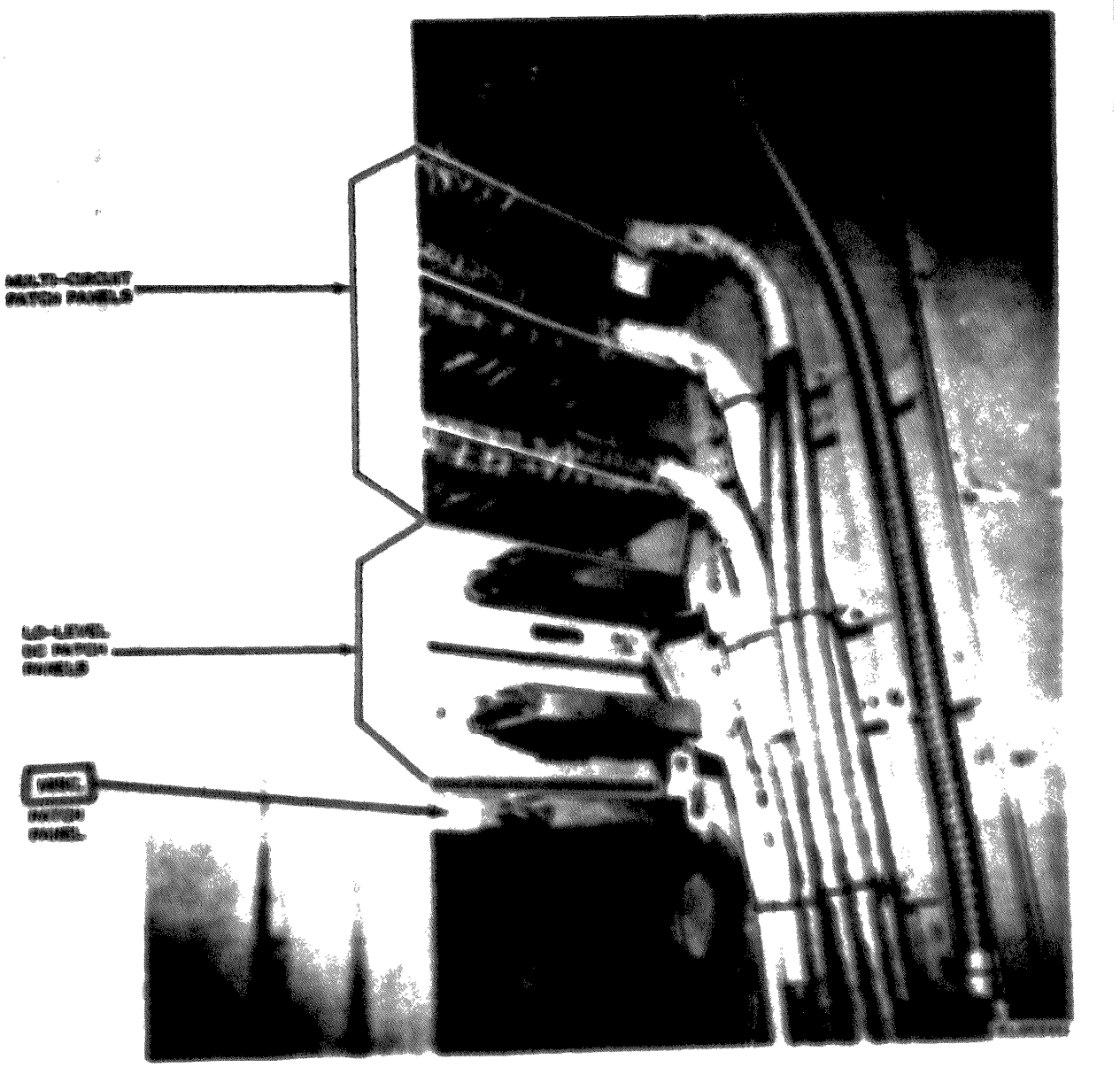


Figure 1-12

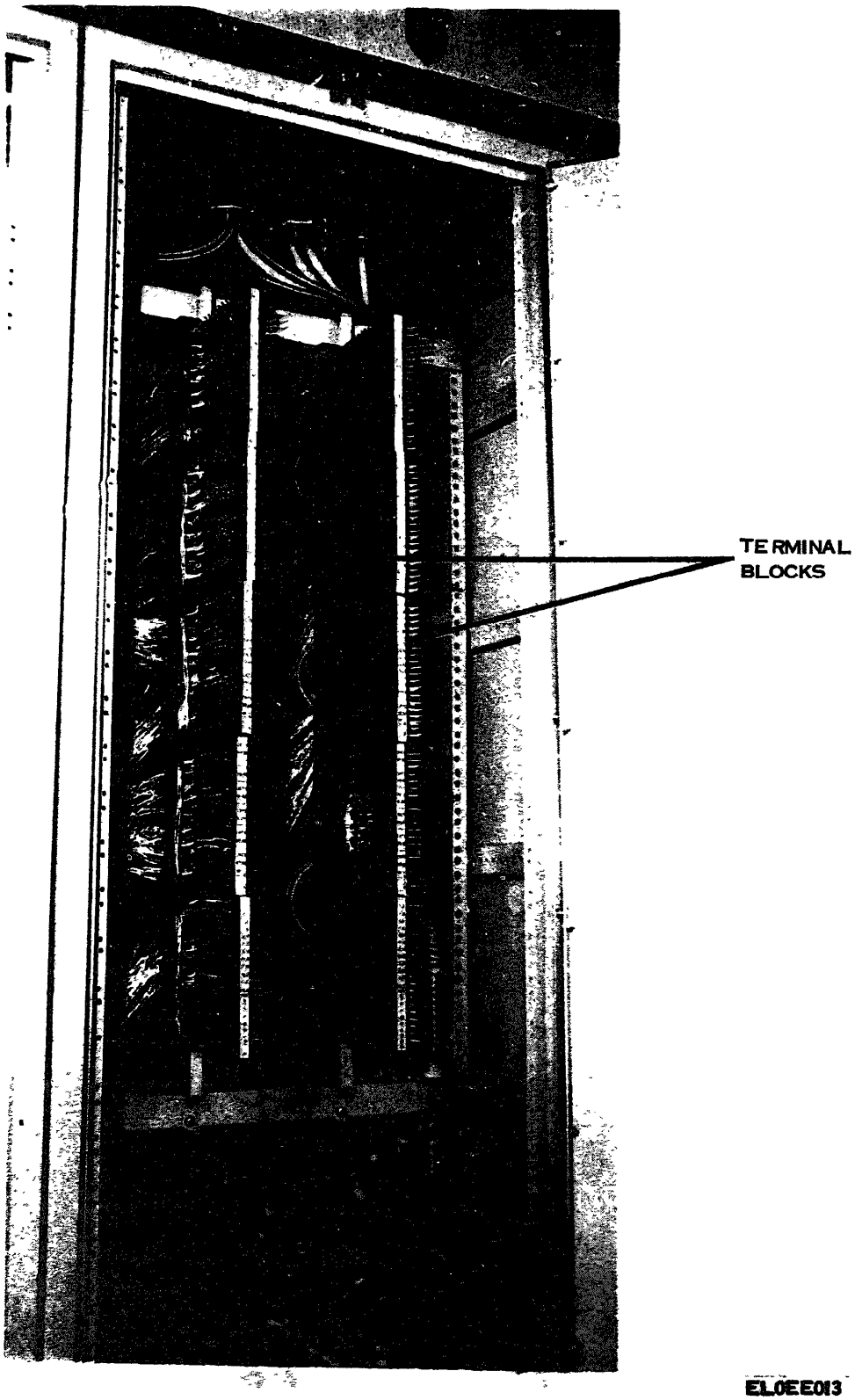


Figure 1-13. Black IDF bay 16, front view.

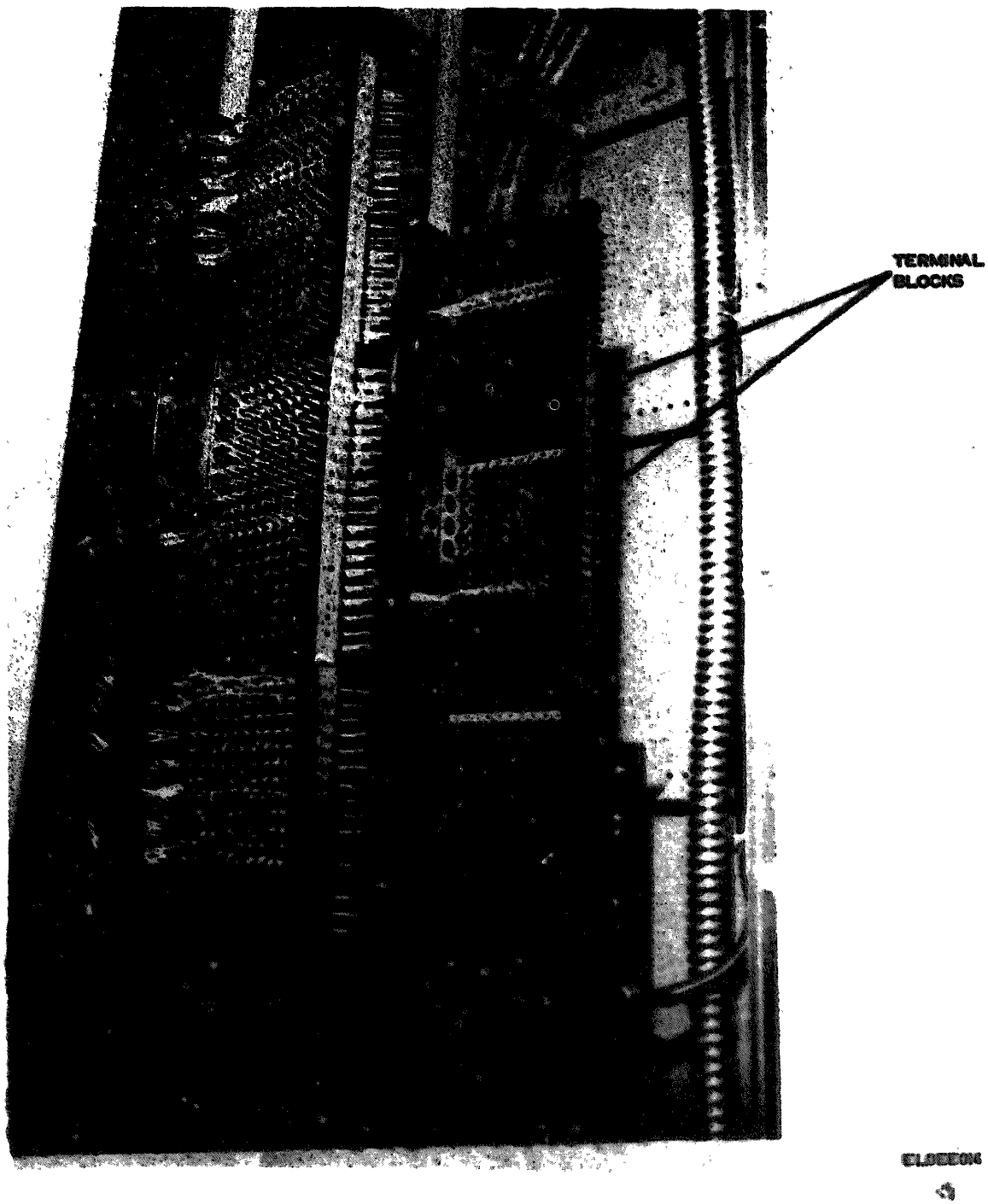


Figure 1-14. Black IDF bay 16, rear view.

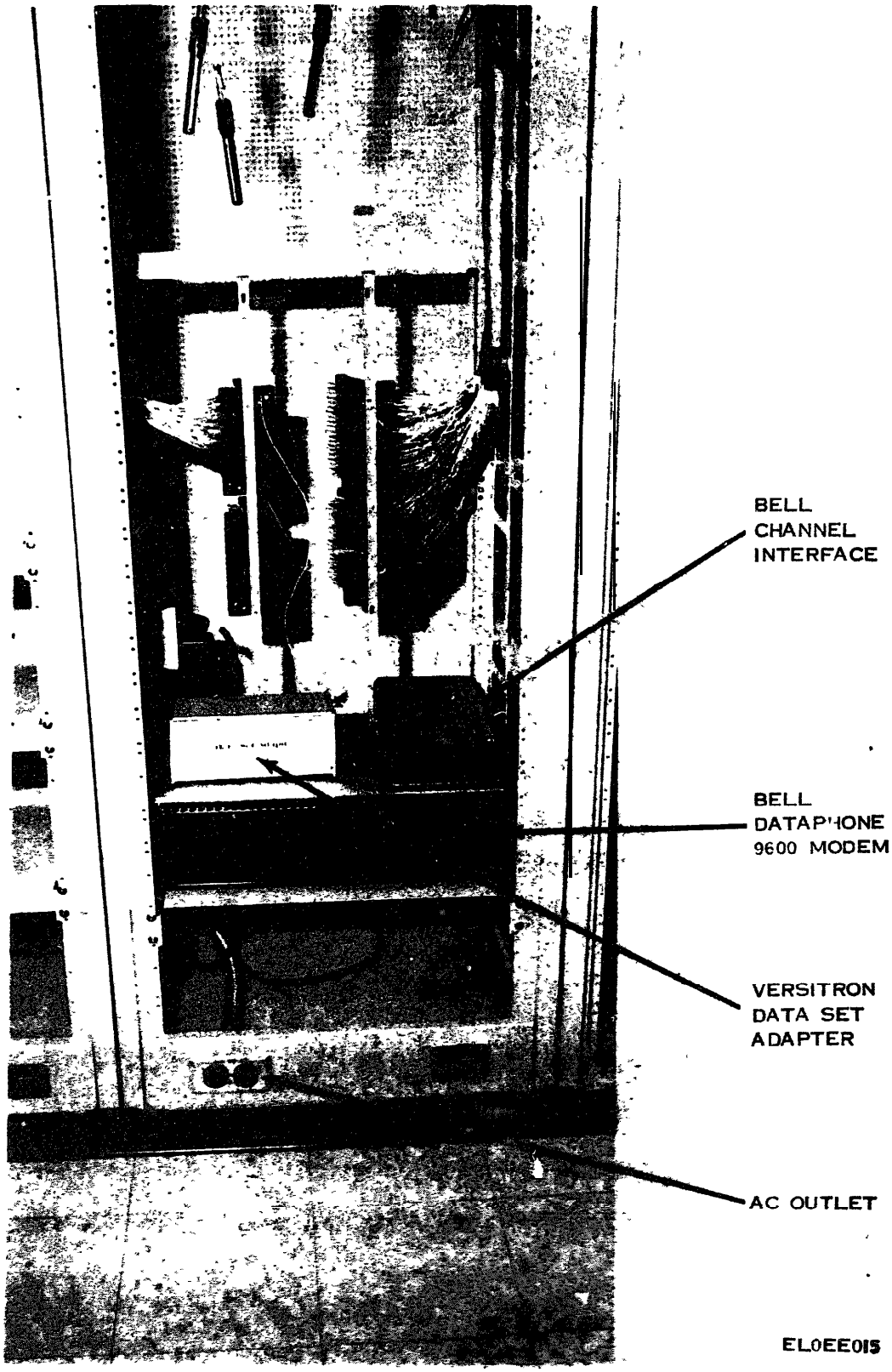


Figure 1-15. Modem bay 15, lower front view.

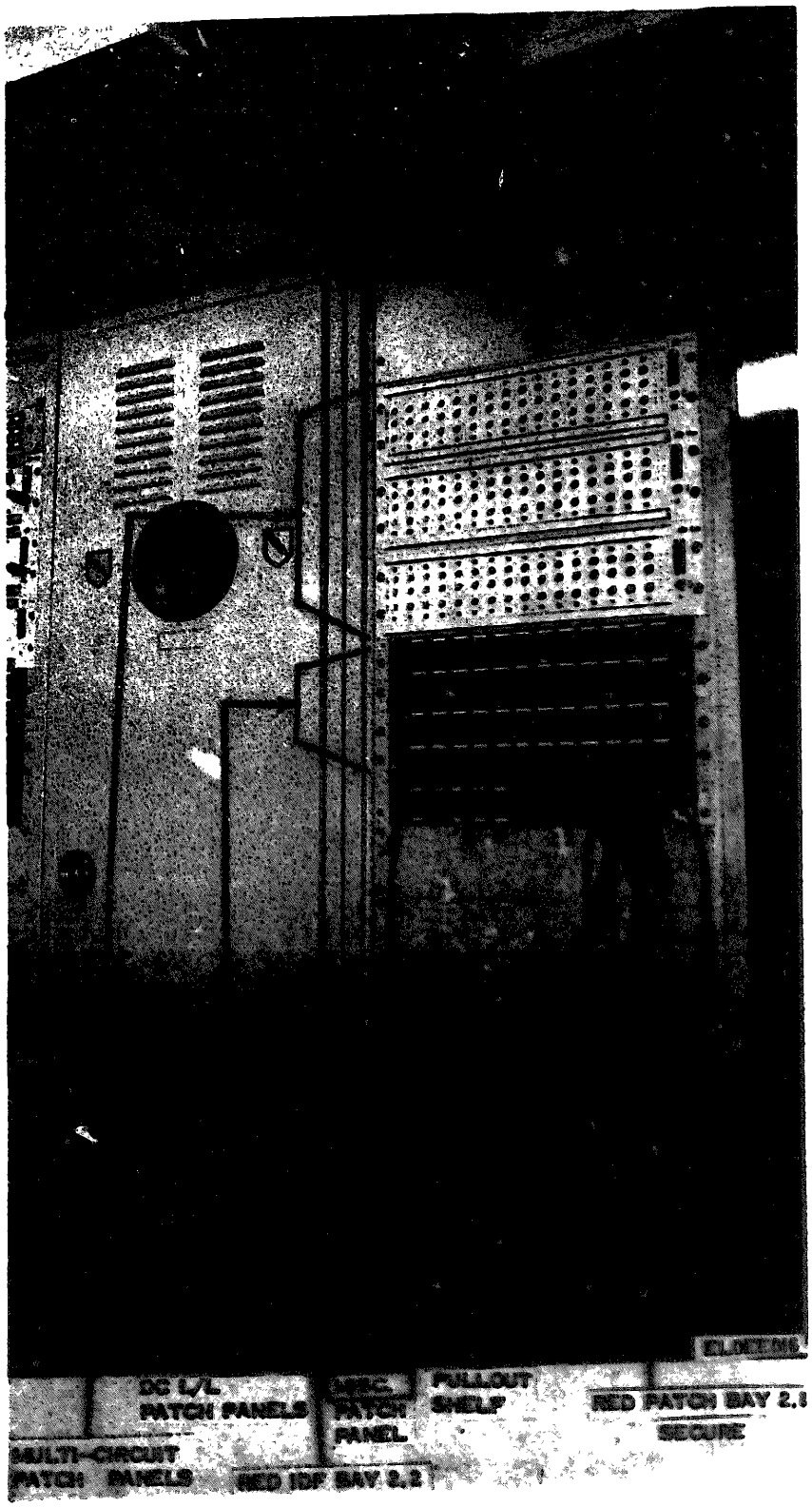


Figure 1-16. Red patch (secure) bay 2.1 and Red IDF bay 2.2, front view

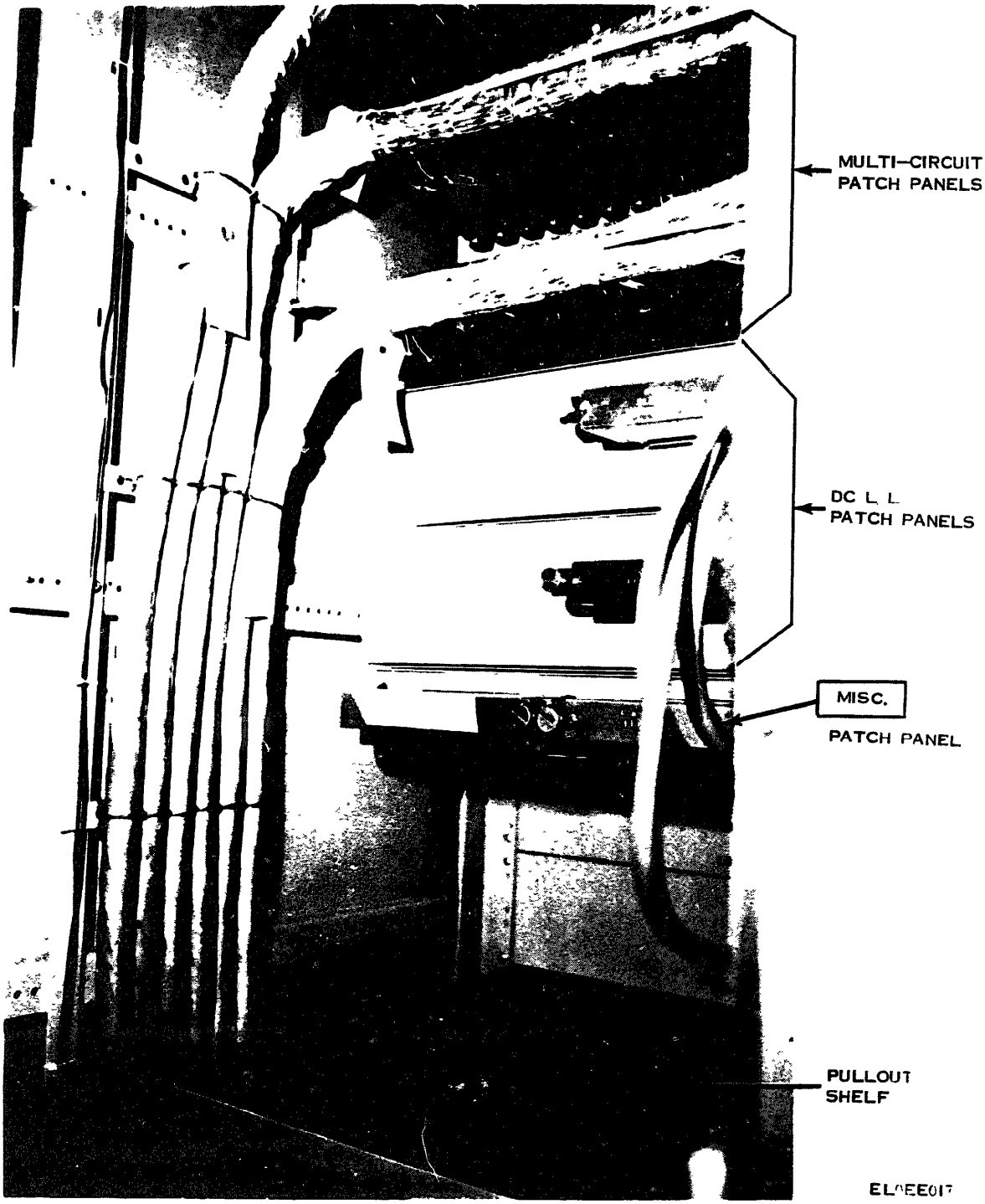


Figure 1-17 Red patch (secure) bay 2.1, rear view.

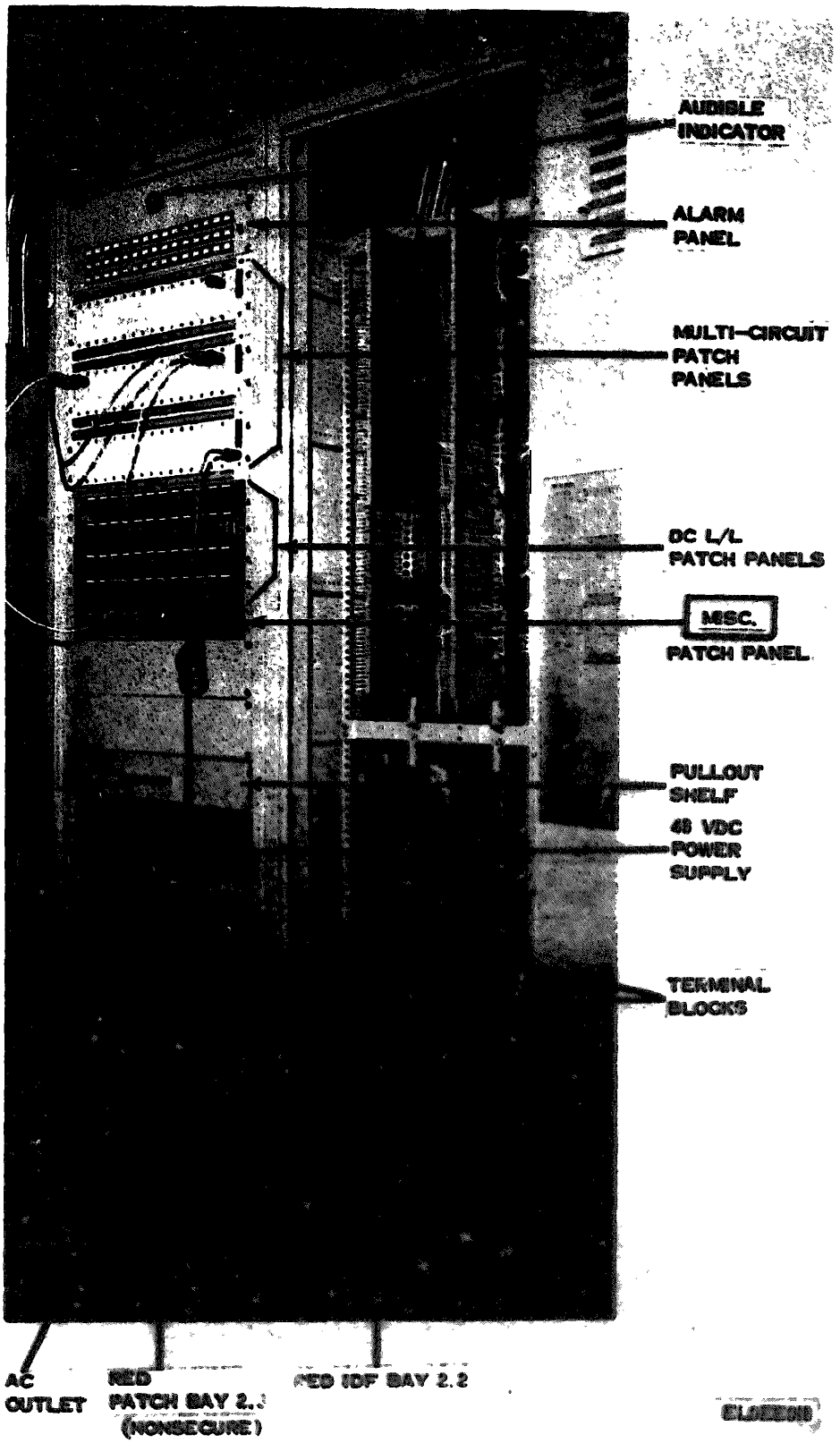


Figure 1-18 Red IDF bay 2.2, and red patch (nonsecure) bay 2.3

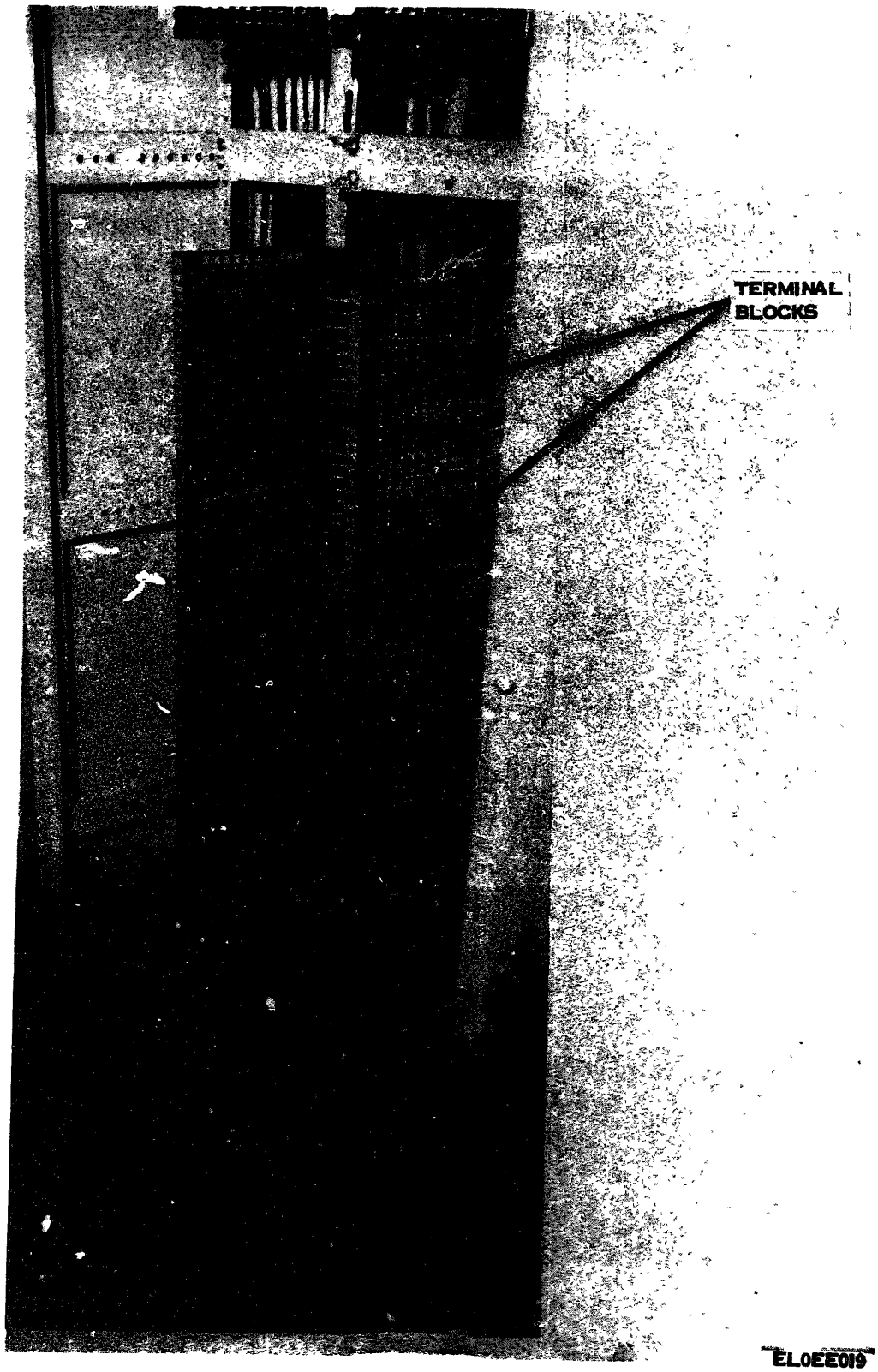


Figure 1-19. Red IDF bay 2.2, rear view.

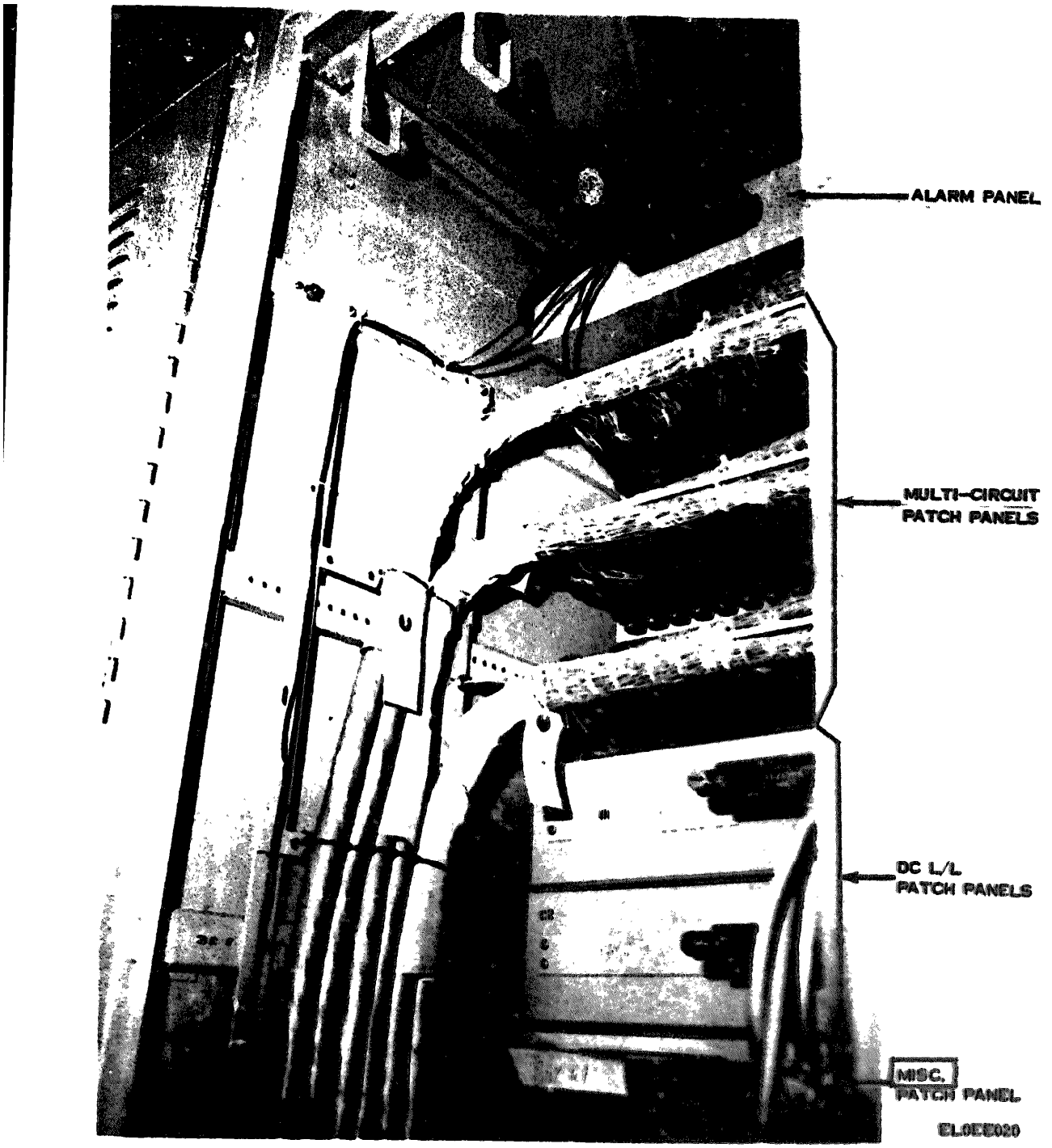


Figure 1-20. Red patch (nonsecure) bay 2.3, rear view.

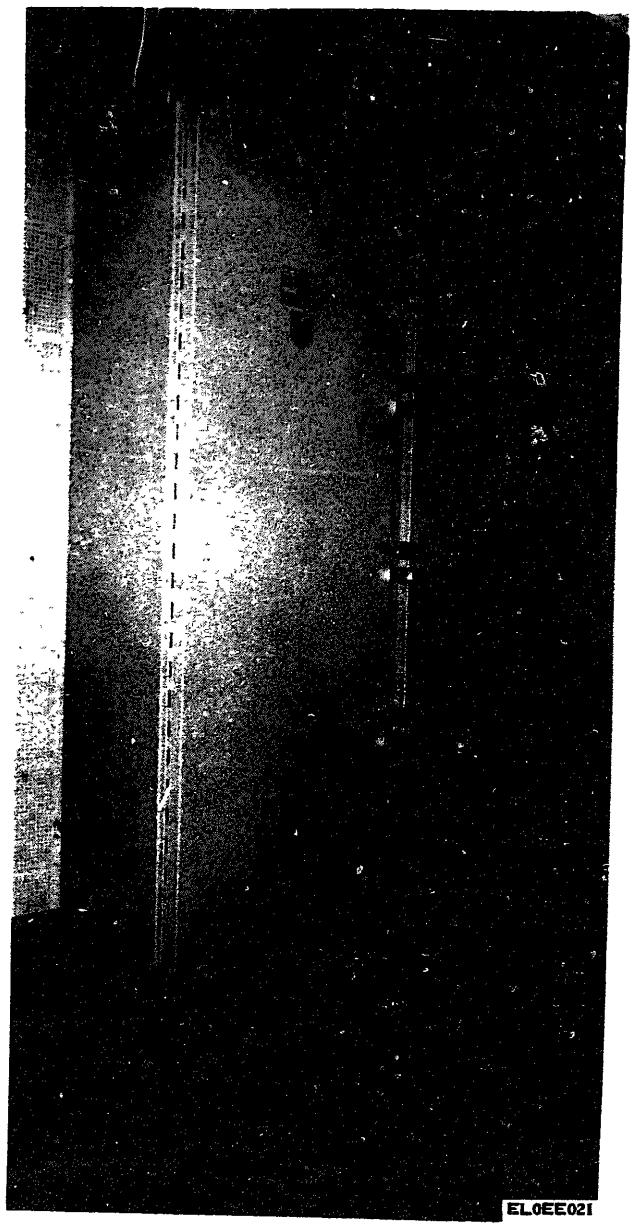


Figure 1-21 Red-black isolators bay 2.4, front view.

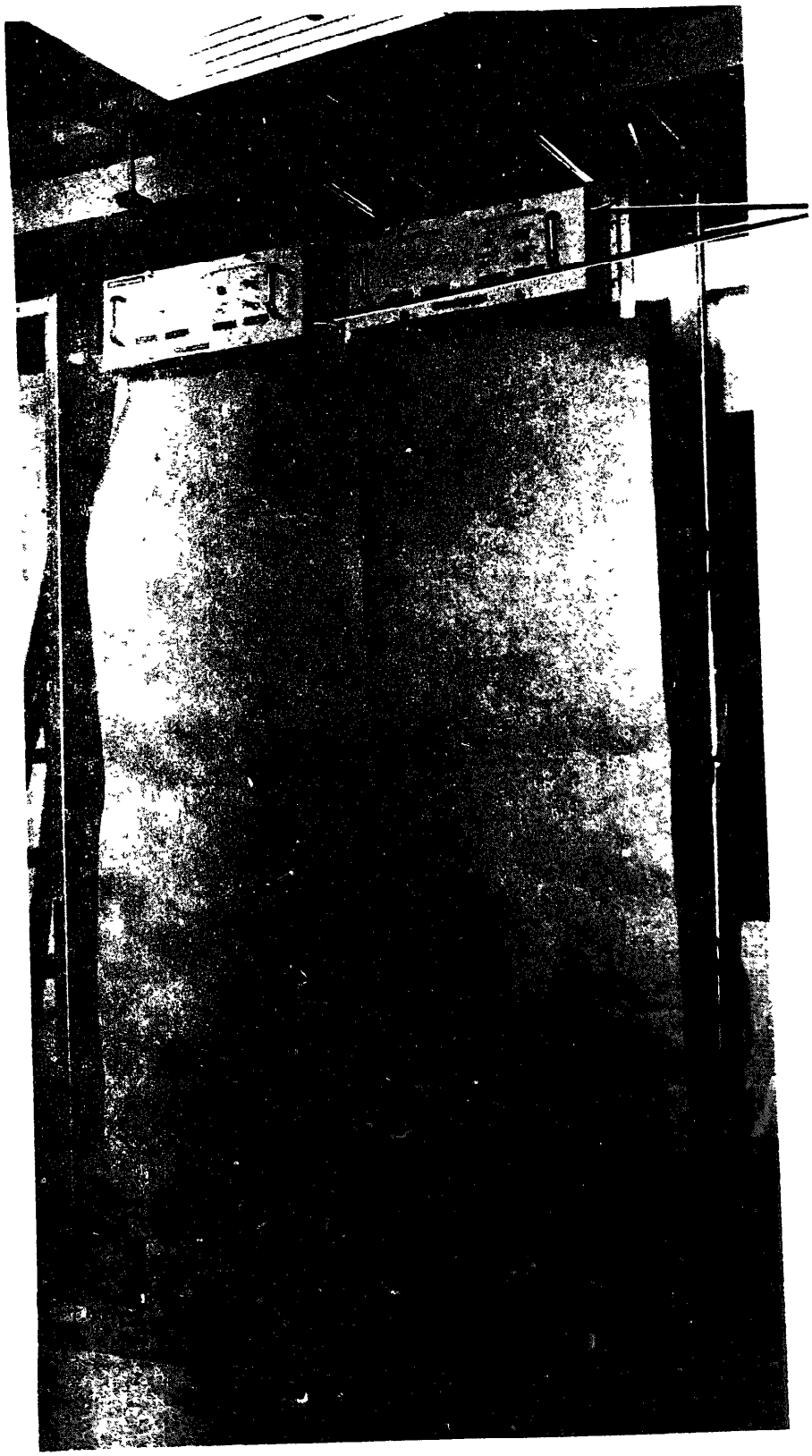


Figure 1-22 Comsec equipment boxes 3 and 3 1

Figure 1-23. Black power distribution box.

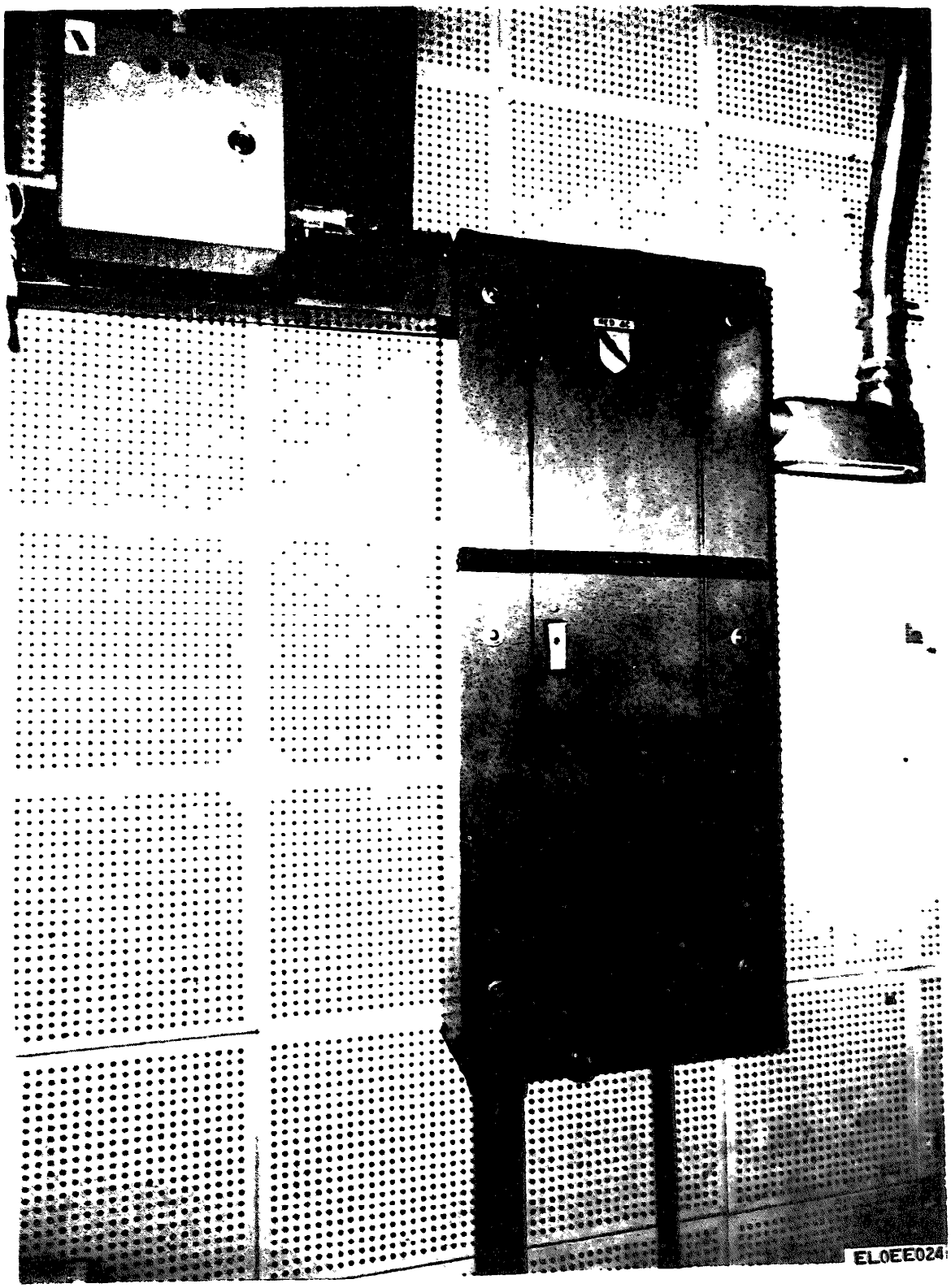


Figure 1-24 Red power distribution box

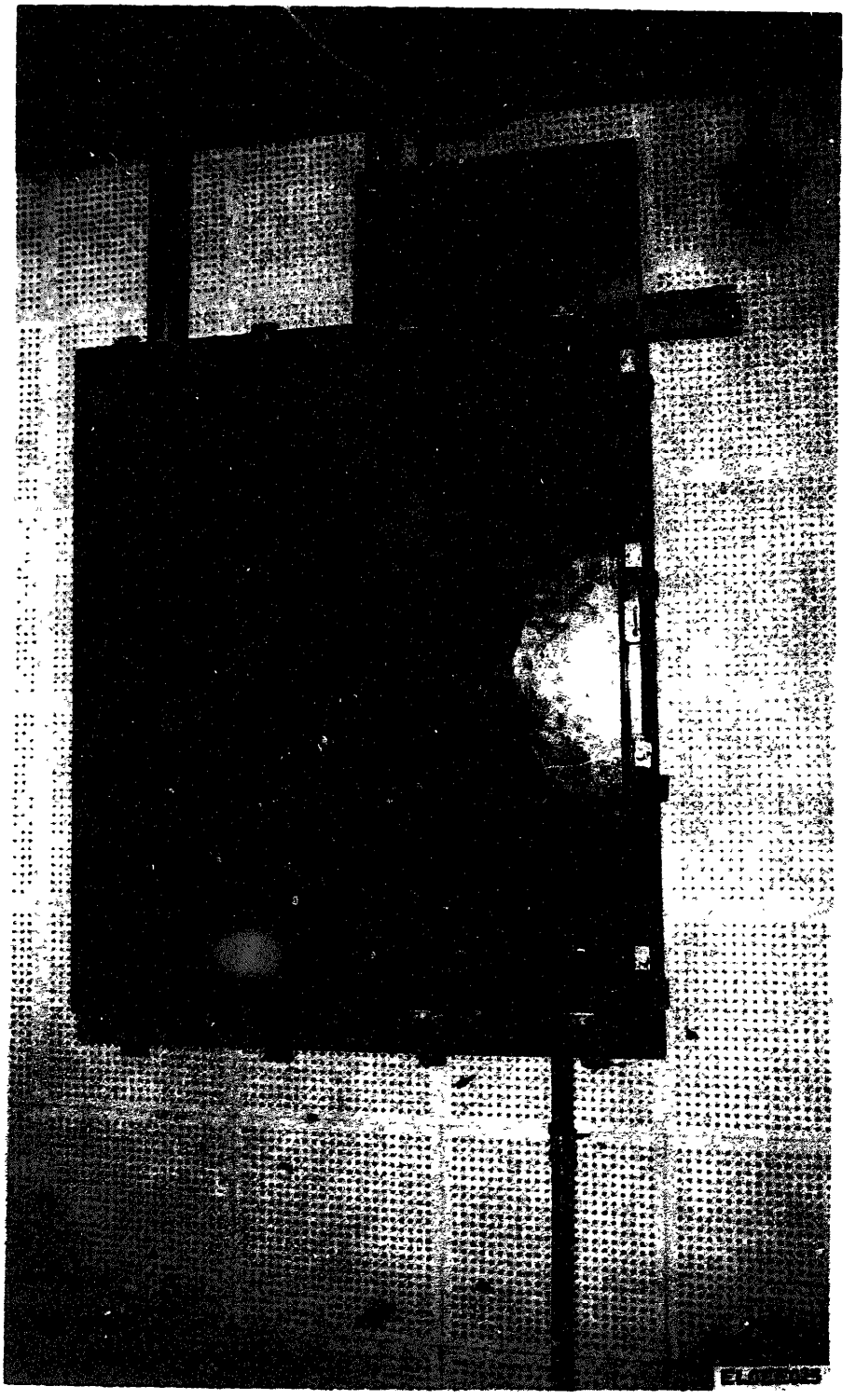


Figure 1-25. Signal entrance box.

CHAPTER 2

FACILITY CIRCUIT DESCRIPTION

2-1. General.

This chapter provided an introduction to the circuits and signals that are handled by the PTF. The inroduction is made on a block diagram and circuit diagram level. Circuit details and possible cable routings m shown in figures FO 2-1 and 2-2. Detailed functioning of the individual items of equipment represented by the block in the block diagram is described in separate manuals (app A).

2-2. Center Description.

a. The PTF facility described in this manual is part of the Automated Telecommunications Center (ATCC) System at Bailey's Crossroad, Virginia. The center is a Defense Communication System (DCS) Automatic Digital Network (AUTODIN) tributary center, part of a worldwide system of tributaries interconnected through 10 overseas Automatic Switching Centers (ASC) and 9 commercially leased CONUS ASC's, which route narrative and data traffic between tributaries. Each ASC essentially functions to receive, store, and forward messages between tributaries and ASC's but also performs other functions in connection with the traffic it handles. The other functions concern message handling to include error correction, proper and timely delivery, message security, etc., which are not relevant to the tributary operation. The ASC, in addition to containing the message handling mud processing equipment, includes equipments which interface with different types of equipment utilized at the tributary centers and which transmit and receive the digital message on the voice frequency communications channels between centers.

b. The Bailey's Crossroads ATCC can be separated into four functional sections: The Patch and Test Facility (PTF); the Automated Multimedia Exchange (AMME); direct interface circuits; and a system of remote terminals.

(1) PTF. The patch and test portion of the center **is used to monitor all communication lines for the center. It contains equipment for monitoring, measuring, and testing, those lines. It also contains equipment for processing the signals received from and transmitted to the ASC's, the remote terminals, and the AMME.**

(2) *AMME*. The AMME performs a function similar to the ASC as it is a store and forward facility between AUTODIN direct interface circuits and the remote terminals. As with ASC's, AMME performs other functions in connection with the transmission of data and message traffic. The AMME contains equipment to record traffic; switch traffic to proper remote terminal; provide AUTODIN routing symbols on outgoing messages; and perform other message handling *functions*. The AMMe equipment is leased and maintained by private contractor.

(3) *Direct* interface circuits. Direct interface circuits are either secure or nonsecure. The primary equipment configuration used between the PTF and direct interface circuits is Magnetic Tape Units (MTU's). A direct interface circuit may have any combination of a line printer, Visual Display Unit (VDU), and a Magnetic Tape Unit (MTU).

(4) Remote terminals. several different equipment configurations are used between the **PTF and the** remote terminals. A remote terminal may have any combination of a card reader, a card punch, **a line** printer, and a Visual Display Unit (VDU), and **a Mag**netic Tape Unit (MTU).

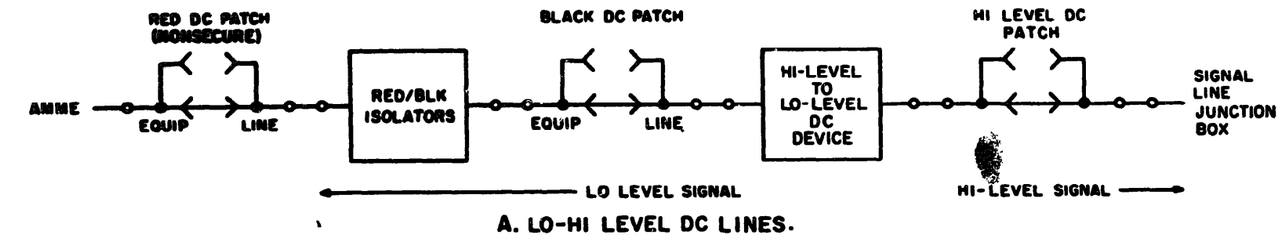
2-3. Facility Signal Block Diagram.

a. Center Signal Routing. **The signal flow for received and transmitted traffic to the telecommunications center passes through the PTF. The received signal flow from the ASC enters the center at the PTF, is processed, and is routed to AMME. From AMME the signal path to the intended remote terminal is again routed through the PTF. A transmitted signal from a remote terminal follows the reverse path of a received signal, from the remote terminal through the PTF, to AMME, back through the PTF, and then to the ASC.**

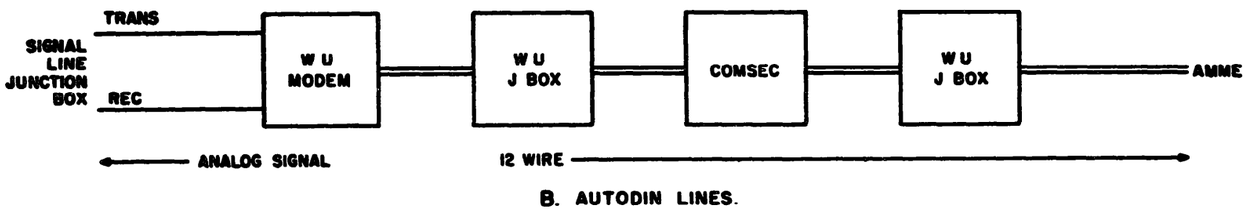
b. ASC Signal. **The signal received from, and also transmitted to the ASC, is a data message which has been encoded for message security and changed to an analog signal for transmittal on the voice frequency lines between centers. On the block diagram (fig. FO 2–1) the two ASC lines are shown entering the PTF at the VF entrance frame.**

(1) The ASC signal to and from the AMME passes through several significant blocks. The blocks represent equipments which either modify the signal, such as the WU modem or COMSEC blocks, or provide access to the signal for testing, such as the patch panel blocks.

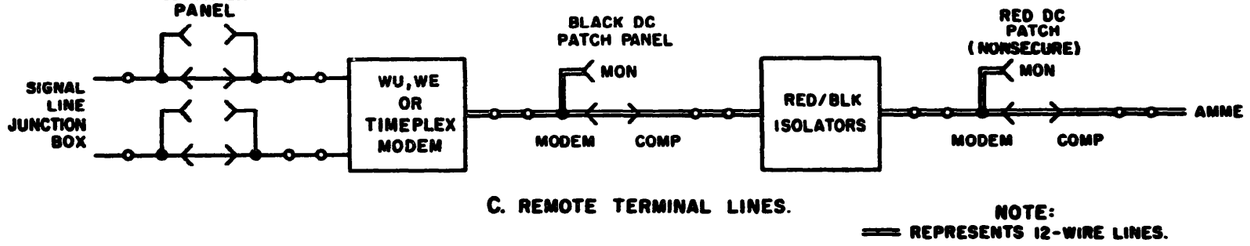
(2) The Western Union (WU) Modulator-Demodulator (modem) requires four wires input on the ASC side of the equipment (full duplex) and twelve



A. LO-HI LEVEL DC LINES.



B. AUTODIN LINES.



C. REMOTE TERMINAL LINES.

NOTE:
═══ REPRESENTS 12-WIRE LINES.

Figure 2-2. Typical Circuit configurations.

wires output on the AMME side of the equipment.

(a) The signal on the ASC side of the WU modem is a carrier or tone at 1800 Hz. The carrier is frequency modulated (FM) at the digital rate (2400 bits/second) with the date (message) information. The WU modem converts the signal received from the ASC to a digital, direct current signal, for use by the AMME and converts the digital signal originating in the AMME to the VF signal transmitted to the ASC.

(b) Between the AMME and the WU modem, the signal flow contains control signals and clock signals as well as data (message information) which is being received from or transmitted to the ASC. The control signals are dc levels between the AMME and the modem which allows the AMM to control the modem. The clock signals are used to synchronize the AMME and the modem.

(3) The communication Security (COMSEC) block provide for security of the data (message) transmitted by encoding them automatically. Received data, which has been encoded at the ASC, is decoded automatically in the equipment represented by the COMSEC block. The COMSEC equipment provides a dividing point between red and black signal lines.

c. Remote Terminal Signal. The signal flow between the AMME and the remote terminals is more complex than the signal between the AMME and the ASC as more circuits are involved. In general, however, the signal processing is, on most cases the same. The remote terminals lines are shown entering the PTF.

Following the circuits from the AMME the PTF, several significant blocks are encountered. The most significant block is the modem which transposes the dc digital signal, used in the AMME, into the analog frequency signal which is used on the voice frequency transmission lines to the individual remote terminals. The second most significant block is the Red/Black Isolator which electrically separates the red signal wiring from the black signal wiring. Other block remaining are the patch panel blocks and the VF entrance frame.

2-4. Circuit configurations.

The circuits that pass through the PTE can be placed in three general categories: the transmit only teletype *lines (A, fig. 2-2),* the AUTTODIN lines (B, fig. 2-2), *and the lines to the remote terminals (C, fig. 2-2). The simplified diagram (fig. 2-2) shows the three* configurations and symbols that represent the major equipment blocks and interface connections.

a. Transmit Only. The transmit *only lines handle* low level teletype signals which originate in the AMME, as shown on the left hand side of the diagram. Moving across the diagram from left to right, the line encounters the red dc patch as shown by the symbol for 2 normal through and 2 monitor jacks. (The circle symbols on the line represent terminals in the Distribution Frame to which the wire pairs are connected). The Red/Black Isolators, which provide isolation of the red signal wiring from the black signal wiring; the black dc patch; the hi-level to lo-level dc device which changes the low level signals used by AMME to high level signals sent to the teletypewriter terminals: and the high level dc patch panel.

b. AUTODIN Lines. The AUTODIN lines handle the two AUTODIN duplex lines that travel through the PTF. Shown on the left hand side of the diagram is the station entrance at the signal line filter and two sets of panel jacks at the VF patch panel. Following the signal through to the AMME there is the WU modem block, the black dc patch panel, the WU junction box, and the *red dc patch. The WU modem functions to* modulate the AMME signal for transmission to the ASC and demodulate the signal from the ASC. The signal between modem and AMME is carried on 12 wires and require a special 12 wire patch panel. Six wire are used for each direction of signal flow. The WU junction box is the entrance point to the COMSEC devices, it also provides for switching in spare COMSEC units and testing by connecting the transmit and received lines together (back to back testing).

c. Remote Terminal Lines. The remote terminal lines are configured similar to the AUTODIN lines in that the are duplex and use a modem. Following the lines from the left hand side of C, figure 2-2, there is the signal line filter panel, the VF patch panel, Timeplex modem, the black dc patch panel, the Red/Black Isolators, and the red dc patch panel. The Timeplex modem performs the same function as the WU modem; it modulates the signal for transmission on voice frequency lines and demodulates the VF line signal for use by AMME. The Red/Black Isolators provide a means of isolating the red signal wiring from the black signal wiring as previously explained.

CHAPTER 3

PATCH AND TEST *FACILITY OPERATIONS*

Section I. PRACTICES AND METHODS

3-1. General.

This chapter identifies and establishes responsibilities and procedures which will contribute to successful PTF operation and maintenance. PTF' personnel should become familiar with procedure in this chapter and with the circuits of the PTF and its equipment.

3-2. Duties of PTF Personnel.

The basic duty of PTF personnel is to maintain proper communication and, when necessary, locate a defective communication circuit. These functions require a knowledge of the circuit status at all times. The basic requirements can be further divided into individual duties below:

a. Perform quality control checks and test on circuits and equipment in the PTF.

b. Provide assistance to the ASC's in the checking of circuits.

c. Substitute modems or channels to isolate circuit and equipment faults.

d. Answer fault alarms and restore communications.

e. Perform the required administration and record keeping.

f. Troubleshooting station equipment.

g. Maintain records (para 3-3).

h. Notify qualified maintenance personnel for repair of station equipment.

3-3. Maintenance of Records.

Maintenance of records ensures that all the PTF technical data (technical manuals, as built drawings, circuit drawings, circuit and switch markings) is up to date and complete. PTF records are divided into the following categories:

a. Plant-in-Place Records. Plant-in-place records are those engineering drawings and cable run lists which show what, where, and how site electronic equipment is installed. These records also show planning for future changes and are essential to site operation.

(1) Plant-in-place records (sometimes called "As builts") are prepared by the engineering/installation agency which is responsible for the original design of the PTF. The plant-in-place records are first developed as part of the engineering effort prior to the construction update of a communication site or station. After the work on site is completed, the plant-in-place records document the installation and become the basis of any new additions or station update planning.

(2) Plant-in-place records are wed by the electronic maintenance personnel maintenance data. Plant-in-place records must show all circuit and wiring connections in the telecommunication center. Copies of the original drawings am retained at the telecommunication site for use an a guide in troubleshooting and fault location.

(3) Prior to site construction, small errors may creep into the plant-in-place records as they are being produced. These errors become obvious during the installation process as equipments are installed and connected. Corrections to the plant-in-place records must be made on prints by installation personnel and sent to the engineer/installation agency for correction of the originals. Corrected prints should be returned to the telecommunication site for use in troubleshooting, circuit and wiring tracing, etc. Although the corrections are made by the installation personnel, electronic maintenance personnel have the responsibility to ensure that all corrections are completely accurate and portray the equipment as installed.

(4) The importance of accurate and complete plant-in-place records cannot be over emphasized. They are needed to document the site equipment and circuits and to provide information for updating, modernizing or expanding the site at some future date. Plant-in-place records are to be used by the electronic maintenance personnel for circuit tracing and troubleshooting. If circuit tracing or troubleshooting is effected in an effort to restore communications, an incorrect diagram can add hours to the communications down time. Simple fault location may become a long drawnout procedure due to a faulty drawing. Plant-in-place records must be accurate and complete.

b. Equipment Manuals. The equipment manuals which come under the heading of station records are commercial or military and cover the various items of station equipment. These items of equipment are either mounted in a rack or are whole equipment racks. They are generally not built by the installation/engineeing agency but procured as a commercial item. A list of military and commercial equipment manuals appears in appendix A.

c. Reference Publications. Reference publications **which should be included in the station records are those manuals, documents and other data which provide background, standards, or testing information. A** list of this type of document appears in appendix A.

d. Locally Prepared Data. Locally prepared operator data, which should be included as part of station operator records, are patch **panel labels, labels on the power distribution boxes denoting circuit breaker application, simplified patching diagrams placed on patch bays, and operator trouble logs. In general, any instruction** or **aid to operation and troubleshooting of the equipment must be considered part of the station records.**

Section II. PATCHING OPERATIONS

3-4. Patching, General.

a. The communication lines or paths that run through the PTF are provided with patch panels which are wiredbetween equipments and at the line entrance and exit points. The patch panels are equipped with jacks that allow for either a parallel circuit connection for monitoring or **a series connection which breaks the line and connects it to the patchcord when it is inserted. The series jacks** on the patch panels are used for testing and **rearranging circuit paths for troubleshooting and temporary restoration of communications.**

b. Patching requires knowledge of the circuits and equipments, a skilled technique that comes from practice, and attention to specific precautions to be successful.

(1) ***Circuit Knowledge. Knowledge*** **of the circuits and the type of signals they handle is** ***essential*** **for proper patching. Like signals (dc to dc, vf to vf, multichannel to multichannel, etc.) have to be patched to like signals. Signal paths must be maintained; e.g., the** ***output*** **from one piece of equipment must go into the** ***input*** **of the equipment being patched into.**

(2) Operational Spares. Operational spare circuits **and equipment must be maintained. Standby equip ment maintained in these spare circuits are to be used when patching around a defective item.**

(3) Precautions. **Patches should not be made without thought to the interruption of traffic. Always know what is on the circuit to be interrupted. When possible, coordinate with others affected so that when circuits have to be patched traffic is not on the line.**

(4) Technique. **Develop the habit of rechecking your cord and plug positions just prior to completing the patch. Set the patch up with the cable plugs loosely set into the patch jacks. Recheck the signal flow prior to plugging in the idle section; then plug in idle section fully; finally, complete the patch by setting in (or throwing) the plugs to the active line section simultaneously.**

(5) Prohibitions. **Although the PTF was designed to minimize the chances that red and black circuits may be patched together. operators should be especially alert to this possibility. Bed circuits must not be patched directly to black circuits. The electrical isolation of circuits** provided by the **red/black isolator cabinets must not be defeated.**

3-5. Patching for Equipment Substitution.

Typical patch cord connectors are illustrated for patching in substitute equipments. The patching diagrams are explained below:

a. Isolator Substitution **(fig.** ***3-1).*** **Isolator substitution involves the multicircuit (12-wire) patch cords. In this case, it is assumed that operational spares for the isolators are connected to circuit 19. On the black patch panel, the MODEM jack of circuit 2 is connected to the COMP jack of circuit 19. On the other side of the isolator cabinet, at the red dc patch panel, the MODEM jack of circuit 19 is connected to the COMP jack of circuit number 2 to complete the patch.**

b. Hi-level to Lo-Level/DC Device Substitution (fig. **3-2). This patch is presented schematically to better explain the principle involved in patching. The defective hi-level to lo-level dc device appears on the upper 2-wire line. Patch cords are connected to divert the signal (transmit only) from the upper 2-wire line to the spare hi-level to lo-level dc device on the lower line and then back to the upper 2-wire output line.**

3-6. Patching for Fault Location.

Patching for fault location includes loopback by use of special test cords and plugs and use of the data error analyzer for troubleshooting.

a. ***Loopback.*** **Loopback is a method for connecting the transmitting lines of a communication device to its received lines. The purpose of the loopback is so that a standard, or test message, may be sent from and to the communication device for comparison of the transmitted to the received message for testing purposes. At the PTF. a request for a loopback comes from either the AMME or a remote terminal. Two special loopback cables and one special plug are provided at the PTF. The use of the cables and plug is illustrated in figure 3-3.**

(1) ***Black*** **Test** ***Patch Cord. The*** **black test cord is identified by the plug ends. One end has 3 pins and the other has 9 pins. It is used for looping back the AMME signal as shown in B, figure 3-3.**

(2) ***Red Test Patch Cord. The*** **red test cord is identified by the plug ends. One end has 3 pins and the**

other has 5 pins. It is wed in amjunction with the red test plug for looping back a secure remote terminal line as shown in C, figure 3-3.

(3) *Red Test Plug*. The red rest plug is used to loop back a remote terminal signal as shown in C and D, figure 3-3.

b. Data Error Analyzer Patching. When the data error analyzer is used for troubleshooting as described in chapter 4, it is connected and patched into the system as shown in figure 3-4. This arrangement may or may not be practical depending on the length of the patch cords.

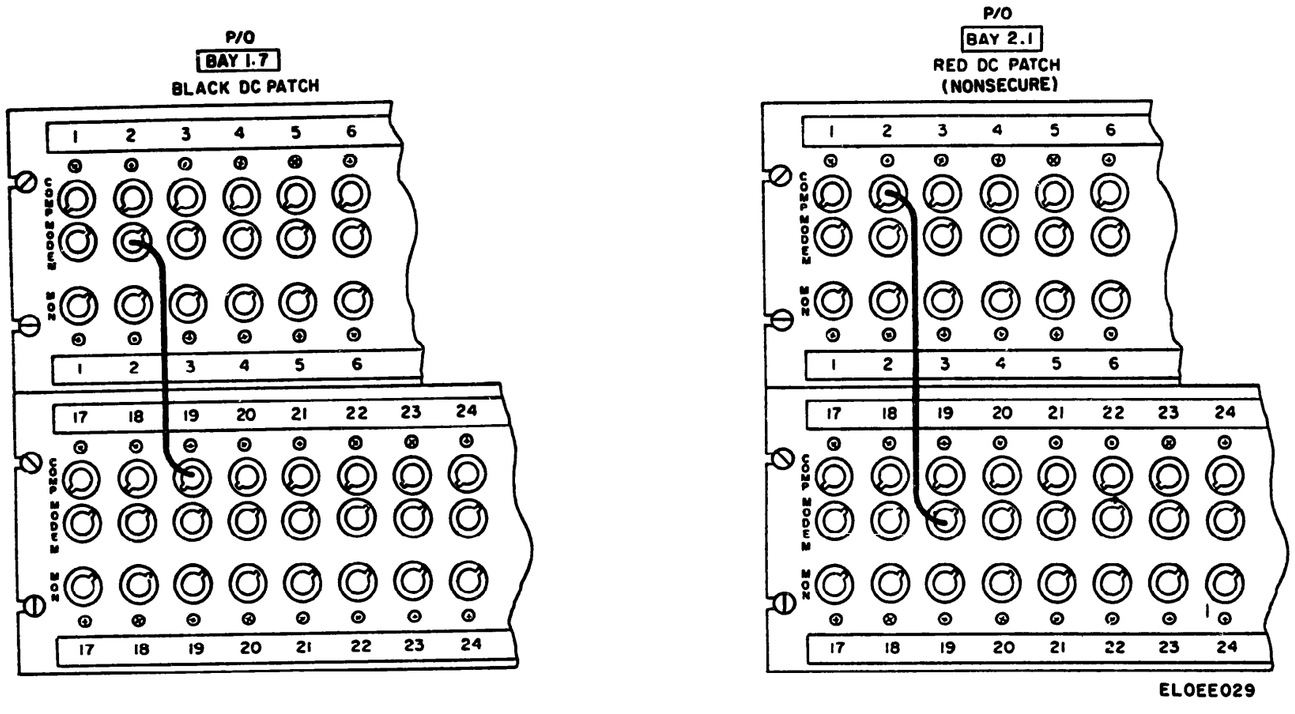
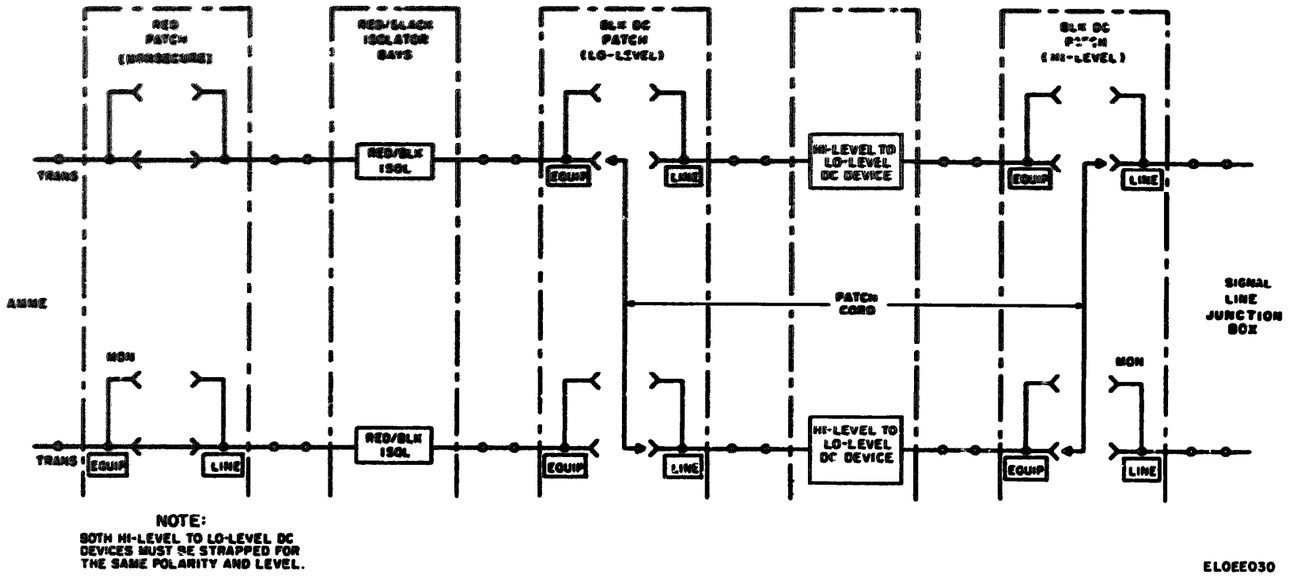


Figure 3-1 Patching for isolator Substitution



NOTE:
BOTH HI-LEVEL TO LO-LEVEL DC DEVICES MUST BE STRAPPED FOR THE SAME POLARITY AND LEVEL.

ELOEE030

Figure 3-2. Patching for Hi-level Lo-level Dc Device Substitution.

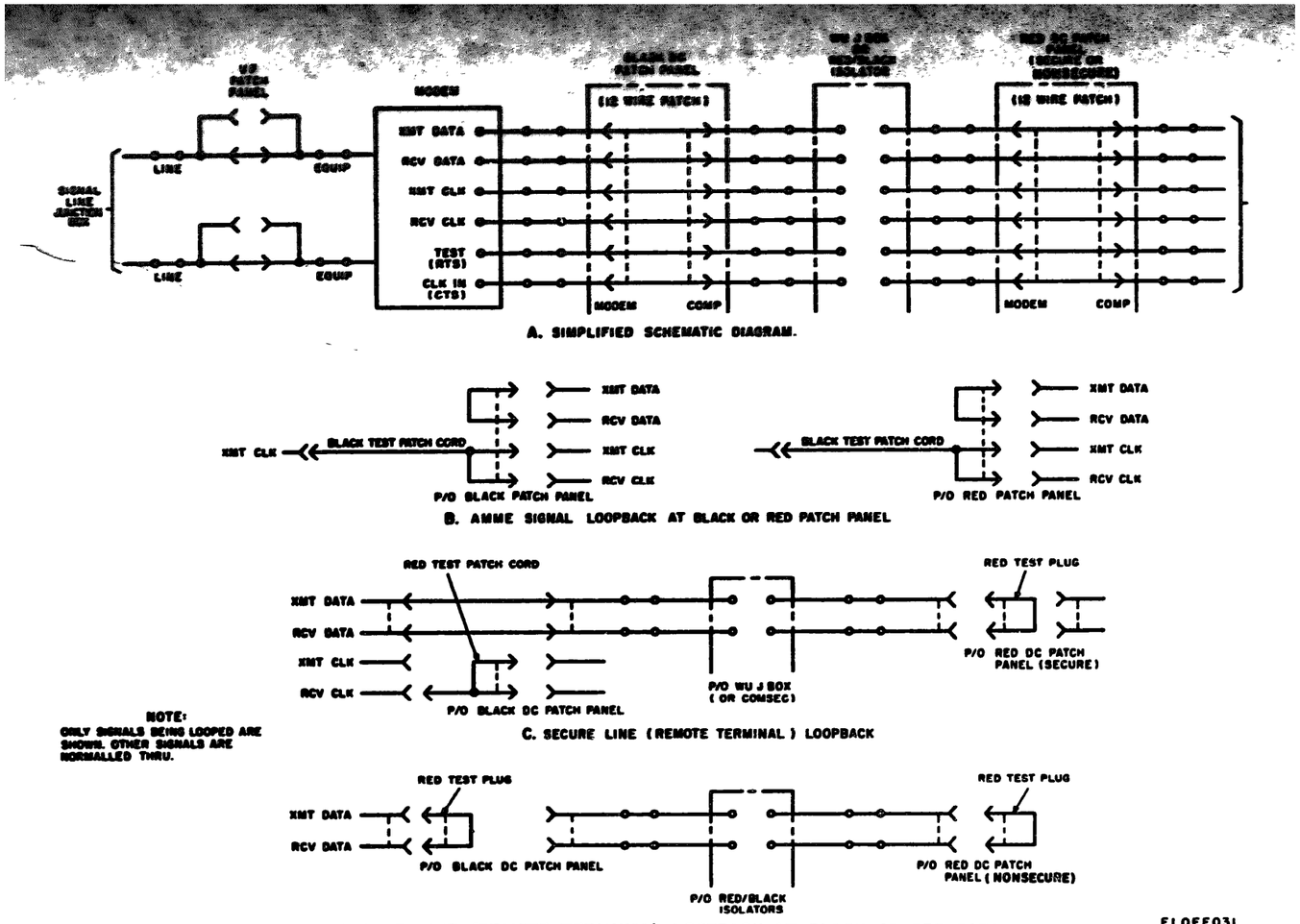


Figure 3-3. Test Plug and Teat Cord Use, Simplified Schematic Diagram.

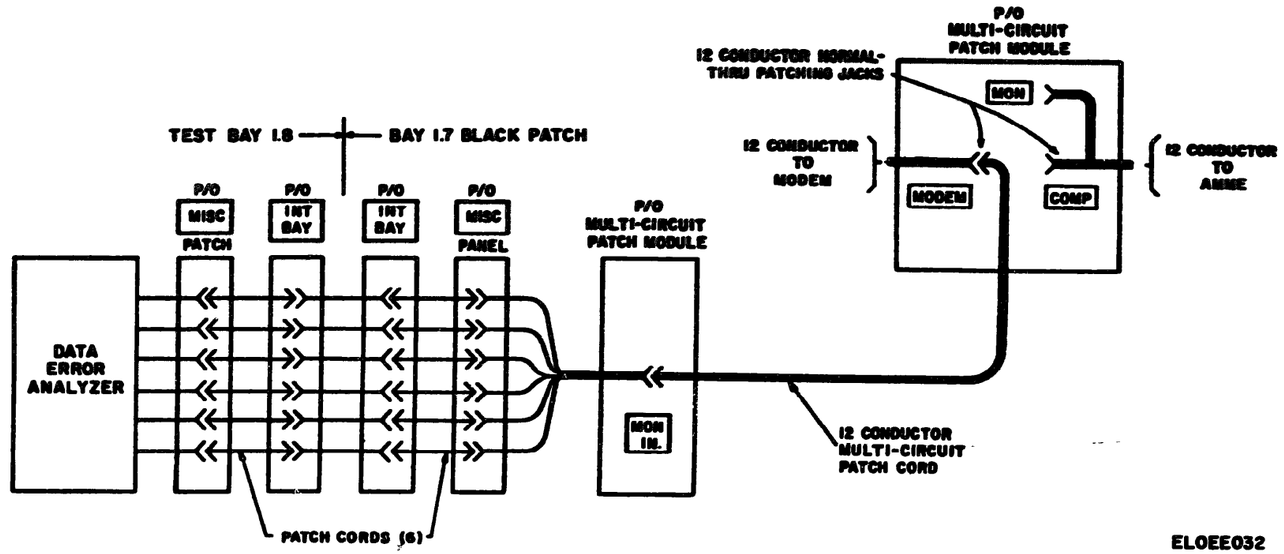


Figure 3-4. Typical Data Error Analyzer Patching Arrangement

CHAPTER 4

MAINTENANCE

Section I. GENERAL

4-1. Scope of Maintenance

NOTE

Daily checks must be performed by the PTF operator. All other checks will be performed by base electronic repair personnel.

Maintenance for a PTF includes the following functions:

a. **Daily and weekly preventive maintenance checks and services (para 4-5).**

b. **Monthly preventive maintenance checks and services (para 4-6).**

c. **Quarterly preventive** ***maintenance checks and*** **services (para 4-7).**

d. **Cleaning (para 4-8).**

e. **Touchup painting (para 4-9).**

f. **Troubleshooting (para 4-10).**

4-2. Tools, Materials, and Test Equipment Required for Maintenance.

a. Tools. **Tool Kits, Electronic Equipment TK-100/G,** TK-101/G, and TK-**105/G.**

b. Materials.

(1) **Lint-free cloth.**

(2) **Brush (MIL-G-**7241).

(3) Distilled water.

(4) Lubricating oil, general purpose, preservative (PL Special) (NSN 9150-00-1P5-0629).

(5) Fine sandpaper, No. 000.

c. Test Equipment.

(1) All reck mounted test equipment listed in appendix B.

(2) Mulitmeter AN/USM-223, or equivalent.

Section II. PREVENTIVE MAINTENANCE PROCEDURES

4-3. Preventive Maintenance.

Preventive maintenance is the systematic care, inspection, and servicing of equipment to maintain it in serviceable condition and assure maximum operational capability. Preventive maintenance is the responsibility of PTF operating personnel (daily) and base electronic repair personnel (all other times).

a. Systematic Care. **The procedures given in paragraphs 4-4 through 4-7 cover routine systematic care and cleaning essential to proper upkeep and operation of the equipment.**

b. Preventive Maintenance Checks and Services. **The preventive maintenance checks and service charts (para 4-5 through 4-7) outline functions to be performed at specific intervals (para 4-4). These checks and services are to maintain equipment in good general (physical) condition and in good operating condition. To assist maintenance personnel in maintaining the equipment in peak condition, the charts indicate what to check, how to check, and the normal conditions. The** ***references*** **column lists the paragraphs or manuals that contain detailed repair or replacement procedures. If a defect is noted that cannot be remedied by the PTF maintenance personnel, refer to a higher category of maintenance or repair.**

4-4. Preventive Maintenance Checks and Service Periods.

Preventive maintenance checks and service of the PTF are required on a daily, weekly, monthly, and quarterly basis unless otherwise directed by the station commander.

a. Paragraph 4-6 specifies checks and service that must be accomplished weekly and under the special conditions listed below:

(1) When the equipment is initially installed.

(2) When the equipment is reinstalled after removal for any reason.

(3) At least once each month if the equipment is maintained in standby condition.

b. Paragraphs 4-6 and 4-7 specifies additional maintenance checks and services that be performed monthly and quarterly.

4-5. Daily and Weekly Preventive Maintenance Checks and Services Charts.

Perform the maintenance functions indicated in the **daily and weekly preventive maintenance checks and services charts below. Adjustment of the maintenance interval must be made to compensate for any unusual operating conditions.**

a. Patch and Test Facility (Daily)

Sequence No.	Item to be inspected	Procedure	References
	Alarm Lamps	**Press test button on alarm panels**	

b. Patch and Test Facility (Weekly).

Sequence No.	Item to be inspected	Procedure	References
1	Grounding System	**Verify that grounding system properly installed with good electrical throughout.**	**None**
2	Cables, wires, and cords.	**a. Remove dirt from cable insulation and connections. Tighten loose connections at all accessible connector and jacks.**	**a. Para 4-8**
		b. Check for cut insulation; remove all kinks and strains.	*b. None*
3	*Lighting System*	Report defective lamps to Post Electrician.	*None*
4	**Walls, ceilings, and floors**	*Report any discrepancies to Post Maintenance.*	*None*

***c. Equipment Racks, Equipment, and Power Distribution Panel* (Weekly).**

Sequence No.	Item to be inspected	*Procedure*	*Reference*
1	**Cleanliness**	Remove dirt, and other foreign matter from all exposed exterior surfaces.	Para 4-8
2	**Connectors**	Check cables and connectors for secure fit.	None
3	**Mounting**	Check to be sure that the units are securely mounted.	**None**
4	**Operation**	**During normal operation, observe that mechanical action of each** switch and control is smooth and free of binding.	**None**
5	**Lamps**	Check all indicating lamps. Replace defective lamps.	**None**

4-6. Monthly Preventive Maintenance Checks and Services charts.

Perform the maintenance functions indicated in the monthly preventive maintenance checks and services chart below once each month. A month is defined as approximately 30 calendar days. Adjustment of the maintenance interval must be made to compensate for ally unusual operating conditions. Equipment maintained in a standby condition must have monthly preventive checks and service. Equipment in limited storage requires services before operation but not daily and weekly preventive maintenance.

a. Patch and Test Facility (Monthly).

Sequence No.	Item to be inspected	Procedure	References
1	**Grounding System**	*Inspect station grounding system.*	**None**
2	**Moveable parts**	Check all hinges, latches and metal to metal moving parts as necessary. a. Clean and paint bare metal parts. *b.* Tighten loose screws, nuts, and bolts c. Lubricate. d. Clean all air filters	Para 4-8 and 4-9
3	Cables, wires, and cords	a. Tighten screws, clamps, and nuts that secure wires to terminals.	**a None**
		A Repair insulation cuts and abrasions with electrical insulation tape.	*b. None*
4	**Electrical system conduits and switching**	tighten loose screws, bolts and clips. Repair or replace defective switches, switchplates, outlets, and receptacles.	*NOM*
5	Equipment mountings	a. Tighten all loose bolts, nuts, screws, and clamps that secure equipment racks, frames, shelves, braces, and mounting hardware. Replace missing hardware.	*None*
		Replace missing hardware. *b.* **Check to see that equipment mounting racks, frames, shelves, braces, and clamps are not broken, or out of shape.**	**None**

b. Equipment (Monthly).
Perform periodic checks and services on each equipment in the facility (app.B).

4-7. Quarterly Preventive Maintenance Checks and Services Charts.

Quarterly preventive maintenance checks are required on the PTF. Periodic daily, weekly, and monthly services constitute a part of the quarterly preventive maintenance checks and services and must be performed concurrently. All deficiencies will be recorded and corrected.

a. Patch and Test Facility (Quarterly).

Sequence No.	Item to be inspected	Procedure	References
1	Publications	Check to see that all publications are complete, serviceable, and current.	None
2	Mounting	Verify that all bolts, nuts, and washers are correctly positioned and properly tightened. Check for cracked, bent, or broken brackets.	None

b. Equipment.

Sequence No.	Item to be inspected	Procedure	References
1	Completeness	See that equipment is complete.	App B
2	Preservation	Check all surfaces for evidence of fungus. Remove rust and corrosion and spot paint bare spots.	Para 4-8
3	Connections	Verify that plugs, sockets, and jacks are clean, intact, and not loose fitting.	None
4	Pluck-out items	Inspect clamps and seating of pluck-out items. Check for bent, or broken parts.	None
5	Knobs, dials, and switches	While making the operating checks, observe that the mechanical action of each knob, dial, and switch is smooth and free of external or internal binding.	None

4-8. Cleaning.

a Remove dust and loose dirt from exterior surfaces with a clean soft cloth.

WARNING

The fumes of TRICHUROEIMANE are toxic. Provide thorough ventilation whenever it is used; avoid prolonged or repeated breathing of vapor. Do not use near an open flame or hot surface; trichloroethane is nonflammable but heat converts the fumes to a highly toxic. phosgene gas. The inhalation of this gas could result in serious injury or death. Prolonged or repeated skin contact with trichloroethane can cause skin inflammation. When necessary, use gloves, sleeves, and aprons which the solvent cannot penetrate.

b. Remove grease, fungus, and ground-in dirt from the equipment; use a cloth dampened (not wet) with **trichloroethane**.

CAUTION

Do not press on the indicator face (glass) when cleaning; the indicator may be damaged*

c. Clean indicator glass; use a soft clean cloth. If difficulty in removing dirt occurs, dampen the cloth with water. Mild soap may be used to make cleaning more effective.

4-9. Touchup Painting Instructions.

a. When the finish on the exterior of the equipment has been scarred or damaged, corrosion may be prevented by touching up the metal surfaces as detailed below.

(1) Use No. 000 sandpaper to clean the surface down to the bare metal; obtain a bright clean finish.

(2) Sand the area down to solid paint and feather the painted edge that leads to exposed metal.

(3) Wipe the area clean and apply to metal surfaces one coat of zinc chromate metal primer (NSN 3010-00-835-2114) and two thin finish coats of enamel.

b. When a touchup paint job is necessary, apply paint with a small brush.

Section III. TROUBLESHOOTING

4-10. General

a. **Troubleshooting in the PTF involves determining** which item is defective and then locating the defect in the item or equipment unit. The first approach or step

is on a system basis, to find out what piece of equipment is faulty in a series of equipments that make up the communications chain. The active components of the communication chain are the AMME, Red/Black Isolators, Modem, communication lines, modem at the remote site, and the remote terminal equipment. A fault in any unit will degrade or interrupt communications.

b. The time required in the troubleshooting procedure depends on the complexity of the trouble. The simpler type troubles, such as a power supply failure, provide an alarm indication and can be located *immediately. Troubles that degrade the signal or in*crease received in a message required more time because the require the use of test equipment *and a test procedure.*

c. The repair of faulty equipment depends on maintenance concept for that item. For example, if the equipment is maintained by a contractor, PTF personnel must take the equipment out of service and notify the contractor. When the equipment is to be maintained by base electronic repair personnel at the PTF, the equipment must be taken out of service and repaired, using the troubleshooting procedure in the associated equipment manual (App A).

d. Troubleshooting procedures in this section cover the procedure used in locating a faulty equipment in the communication chain (para 4-11) and a troubleshooting chart for the alarm panel which does not have its own manual. The troubleshooting chart (para 4-14) will aid in locating the defective component of the alarm panel. All other equipment items have their own manuals, listed in appendix A, which contain troubleshooting data for the repair of the item.

4-11. Troubleshooting the Communication Channel.

a. The communication chain which connects the *AMME to the remote terminal* equipment *has several* functional areas that can degrade communications. The functional ares shown on the block diagram *figure 4-1.* The slow degradation of a communication signal is more of a problem to the person in care of repair than the complete failure of a single equipment. In the communication chain shown, a diagnostic program can be run on the AMME and the remote terminal equipment to determine if they are degrading the system. The transmission system represented by the modems and communication lines require a special piece of test equipment called a data error analyzer. It generates a know digital signal that can be transmitted to itself for the purpose of determining any errors created in the transmission, The number of errors is received by the data error analyzer, totalized by it, and the total gives an indication of the quality of the transmission medium or circuits being tested. A high number of errors represent the transmission through faulty circuits; a low number of errors recorded represent normal transmission.

b. Use of the data error analyzer in testing a typical communications system is shown in figure 4-1. In this case the data error analyzer is connected into the modem side of the black patch panel to supply signals to the modem, the communications lines, and the remote terminal modem. The lines looped back at the pints are shown separately, progressing from left to right on the diagram. At each loop back point, the data error analyzer is operated and the number of errors is noted. A significant increase in errors, caused by the addition of a loop back segment, pinpoints the cause of the trouble to that added segment. If the modems prove defective by this method, they should be replaced. If the communications lines prove defective, they should be reported to the maintenance personnel responsible for the communications lines.

4-12. Station Drawings.

In addition to this manual, a considerable amount of maintenance data is contained in the station drawings. Site personnel must become familiar with the information contained in them. Source of the information contained in the station drawings are as follows:

a. Cable runs (routing through cable ducts).
b. Cable pair color coding connections.
c. Cross-connection diagrams.
d. **Location** and stenciling of terminal blocks.

4-13. Use of Troubleshooting Charts.

Troubleshooting of this facility is based upon malfunctions that may occur during normal operation of the equipment in the system. When a trouble occurs, refer ***to the Trouble symptom*** column in the chart. Perform the checks and corrective measures indicated in the ***Check and corrective maintenance*** column to located and clear the trouble.

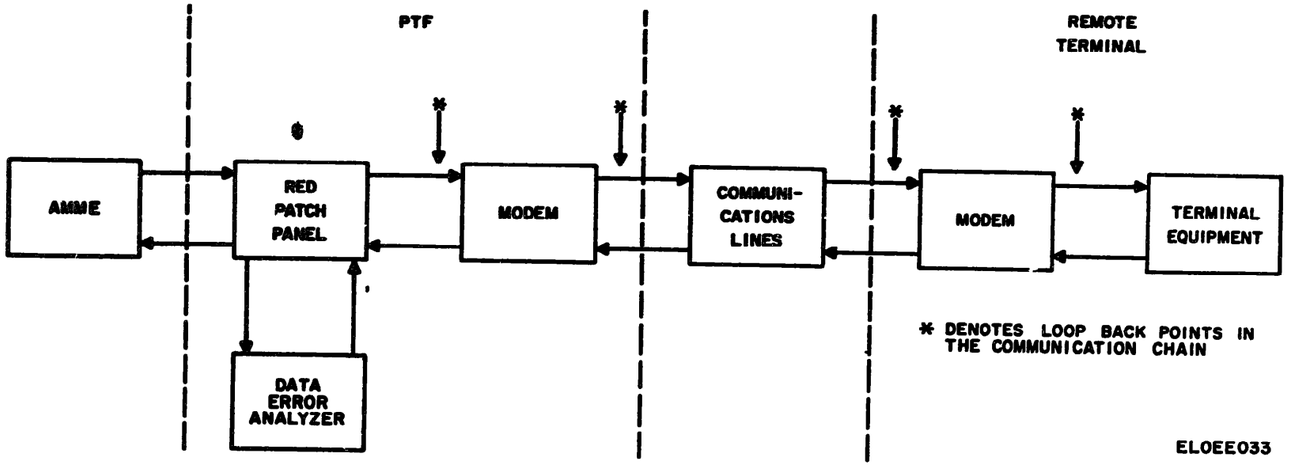


Figure 4-1. Troubleshooting the communications.

4-14. Troubleshooting Chart for Alarm Panel.

Item	Trouble symptom	Probable trouble	Check and corrective maintenance
1	No tone from audible indicator with an alarm panel light illuminated.	*a.* Tellite has been depressed, locking out audible tone.	*a.* Check for trouble as indicated by switch light.
		b. Ground from alarm panel not being extended to audible indicator.	*b.* Provide ground on audible indicator with jumper wire. If alarm does not sound, check for voltage at audible indicator. If voltage is present, audible indicator is defective. (1) If alarm sounds when ground is provided, trace circuit ground back to alarm panel. (2) If voltage is not found at alarm, trace voltage back to −48vdc power supply.
		c. Ground not being extended through alarm panel.	*c.* If no continuity exists to ground from alarm panel, remove alarm panel from rack to gain access to component parts. With top and bottom covers removed, make a continuity check, using Multimeter AN/USM-223 or equivalent, from pin number corresponding to the illuminated lamp to switch pins NC1 COM1. If continuity is obtained on COM1 but not NC1, this indicates a defective switch. Be sure that (+) lead of multimeter is connected to corresponding lead (1-45). This will forward bias diode in circuit, thus insuring a valid multimeter reading. If continuity is not obtained at either NC1 or COM1, check associated diode Refer to parts list, symbol CR1, parts location
2	Audible tone from alarm converter without any lamp indication on alarm panels	Defective lamp in switch	*a.* Depress switch SW1 All switches should glow red. Depress each switch SW2 Each switch should glow amber. If any switch fails to glow in either color, replace associated bulb. *b* If all switches fail to light, check circuit breaker located on front panel Reset if found deactivated.
3	Equipment is known to be in an alarm condition with no alarm indication given	Ground not being extended from equipment to alarm panel	*a* Remove connector from back of alarm panel, locate pin associated with equipment alarm and check for ground *b* If ground is found, internal wiring of alarm is defective *c* If no ground is found, trace circuit wiring back to IDF where ground originates Use station drawing showing the alarm wiring
4	Audible alarm interrupted only while switch is depressed	Switch is defective	Check the switch coil, remove panel from bay to gain access to component parts With top and bottom covers removed, a reading of approximately 340 ohms across pins 4 and 5 indicates a good coil; an open reading will require replacement of switch

CHAPTER 5

COMPONENT FUNCTIONING

5-1. General.

This chapter covers the functioning of items manufactured by Lexingtion-Blue Glass Army Depot and installed in PTF, These items do not have individual manuals but are covered in this manual and in the station drawings. The station drawings cover the complete schematic diagram and how the item is connected into the station. The parts for these depot manufactured items are listed in appendix E.

5-2. Patch Panels.

Four types of patch panels (fig. 5-1) are used in the PTF. The differences are based on the type of signals that the patch panel are designated to handle. Four different types of signals are involved in the PTF. These are the dc signals from the modem to the AMME, the audio signals (VF) which enter and leave the PTF, the low level teletypewriter signal transmitted between the hi-level to lo-level dc device and AMME (when used), and the high level signal output from the hi-level to lo-level dc device (when used). Each type signal has a special requirement and a special type of patch panel.

a. 12-Wire Patch Panel (A, Fig. 5-1. The 12-wire patch panel is required for the signal between the AMME and the modem. Of the 12 wires, six are required to carry transmitting data control signals, the remaining six carry the receiving data and control signals. A series of tree 12-wire jacks is used for each of 16 circuits available at the patch panel. There are two normal through and one monitor jack per circuit.

(1) Following the circuit path from the AMME to he modem through the patch panel, we have a separate 12 wire connector for the wires from the AMME, a normal through jack (marked COMP), another normal through jack (marked MODEM), to a separate connector for the 12 wires to the modem. A 12-wire jack, mar&d MON, is also connected to the circuit for monitoring purpose.

(2) During patching operations one end of a patch cord connected to the COMP jack breaks the through connection to the MODEM jack and puts the lines rom the AMME in series with the patch cord. The ther end of the patch cord transfers the wires to nother circuit which would be connected to the ODEM jack. The connection into the MODEM jack isconnects the through circuit connection and puts he patch cord in series connection to the modem.

b. 2-Wire Audio Patch Panel (B, fig. 5-1). The 2-wire audio patch panel is used in the VF entrance jack field. A module handles twenty-four 2-wire circuits using four Z-wire jacks arranged vertically for each 2-wire circuit. There are two normal through and two monitor jacks per Z-wire circuit. A duplex circuit uses two vertical jack sets, one for the transmit line and one for the receive line.

(1) A 2-wire line connected to pins 1 and 2 on C1, proceeds through the equipment as follows: from Cl to the LINE jack; from the LINE jack to C2 when it is looped around by P1; from C2 to the EQUIP jack; f m the EQUIP jack to the equipment side of the line at C1. TWO jacks, marked MON, are used for monitoring lines connected to the equipment and the line jacks.

(2) For patching, a Z-wire patch cord is used for each transmit and receive line. Connecting to the LINE jack, the patch cord is in series with the line side of the patch panel and the equipment side of the patch panel is disconnected by action of the LINE jack. To transfer the line to another circuit's equipment line, the second end of the patch cord is inserted into the EQUIP jack of that circuit. This action disconnects the line from the equipment in that circuit and completes thepatch.

c. Low-Levee Patch Panel (C!, fig. 5-1). The low-level patch panel is configured the same as the 2-wire audio patch panels. That is, there are two normal through and two monitor jacks per circuit and 24 circuits per panel.

(1) Between the line and the equipment, are the LINE normal through jack and the EQUIP normal through jack, Parallel connections provide both the LINE and EQUIP jacks with two monitor jacks marked LINE and EQUIP. Both monitor jacks are isolated by 15K resistors from the communication lines to reduce any possible loading by monitoring equip ment.

(2) Patching for this patch panel is the same as the Z-wire audio patch panel explained above. That is, a Z-wire patch cord is set into a normal through jack to break the communication line and divert it to a new path.

d. Hi-Level DC Patch Panels (D, fag. 5-1). The high level dc patch panel is used to patch the high level (120 vdc) teletype signals that are the output of the hi-level to lo-level dc device. The patch panel is configured similarly to the other Z-wire patch panels. That is, four vertical jacks per circuit, 24 circuits per panel.

(1) Following the line connections to the equipment connections on the diagram, an arrangement different from the ones previously encountered is found. One wire of each circuit pair is routed through a monitor jack before connecting to the normal through patch jacks. In this case each monitoring jack (MON) is connected in series with the line rather than as before, in parallel.

(2) The patching principal for this panel is the same as previously encountered. The patch cord, inserted into the normal through jack, breaks the circuit and the patch cord is used to divert the wires to another circuit number. Monitoring, however, is different because instead of a parallel connection, a series conection is used. The series connection provides a means of connecting a dc milliammeter in series with the line for measuring and setting the teletypewriter loop current.

5-3. Alarm Panel (Fig. FO 5-2).

The alarm panel operates as an indicator for equipment troubles and centralizes, within a single panel, alarm controls for up to 45 alarm circuits. Each alarm circuit condition is displayed by a red-lighted segment of the front panel which is also a switch used for removing the audio alarm.

a. The external circuits which are connected to the alarm panel provide a maximum of 45 inputs for alarms. Each alarm is activated by a ground input to pins 1 through 45 on the main connector. Pins 46 and 47 provide outputs (grounds) which cause the audible indicator to sound. Pins 53 through 56 on the main connector are tied to dc ground and pins 57 through 60 are tied to the negative 48 vdc power supply.

b. Internal circuits include 45 identical switches and components used for controlling the alarm and items common to all circuits such as power.

(1) Following au alarm ground, generated by the closing of an external alarm switch, through the main connector in 1 (left hand side of Figure FO 5-2), the following action occurs: diode CR1 or CR2 is forward biased; current flows through CR1, or CR2, indicating lamps L1 and L2, and voltage dropping resistor R1, from the negative power supply connected at pins 57 through 60 of the main connector. Indicating lamps L1 and L2 are part of switch SW2 and cause the associated segment on the front panel to light indicating au alarm condition.

(2) Following an alarm ground from the external alarm switch into pin 1 of the main connector, a second path can be traced. This path provides an interruptable output ground (at pin 46) which goes to the audible alarm. The other side of the audible alarm (not shown) is connected to the negative 48 vdc supply. The current path is from the negative 48 vdc supply to the audible alarm; to pin 46 on the alarm panel through the normally closed switch contact of SW2 through the forward biased diode CR2; to pin 1 on the main connector on the alarm panel.

(3) As the result of the alarm ground input to the alarm panel, the indicator lamps L1 and L2 light and the audible alarm sounds. The operator, responding to the alarm, presses the alarm switch (lighted panel segment) on the alarm panel front. This action silences the audible alarm and sets the alarm switch into the manual lock, or latch position.

(4) The electrical circuit set up when the operator presses the alarm switch energizes the coil in SW2. Current flow is routed through limiting resistor R2 through the coil of SW2, and through the forward biased diode CR2 to ground. This conditon holds the switch SW2 in the locked position until the alarm ground on the input to the alarm panel is removed by clearing the trouble which caused the alarm.

(5) Switch SW1, at tight side of from panel, is used to test the lamps of the alarm panel. When the switch is used, a ground is connected to the input of all 45 alarm switch circuits. Each circuits is similar to circuit #1 shown. A closed circuit provides a path for current flow from the negative 48 vdc power supply through resistor R1, Through lamps L1 and L2 through CR3 and closed switch SW1 to ground. Lamps will remain illuminated as long as switch SW1 remains pressed.

5-4. Power Circuits (figs. 5-5, 5-6, and 5-7)

Power for operation of the patch and test facility is provided as follows: alternating current (ac) is pm vided through power distribution boxes located in the PTF room (figs. 1-23 and 1-24); direct current (dc) i provided by the dc power supplies located in bay 1.10 (black dc, fig. 1-3) and bay 2.3 (red dc, fig. 1-18). Sche matic and wiring diagrams for power distribution area provided by figures 5-2 through 5-5.

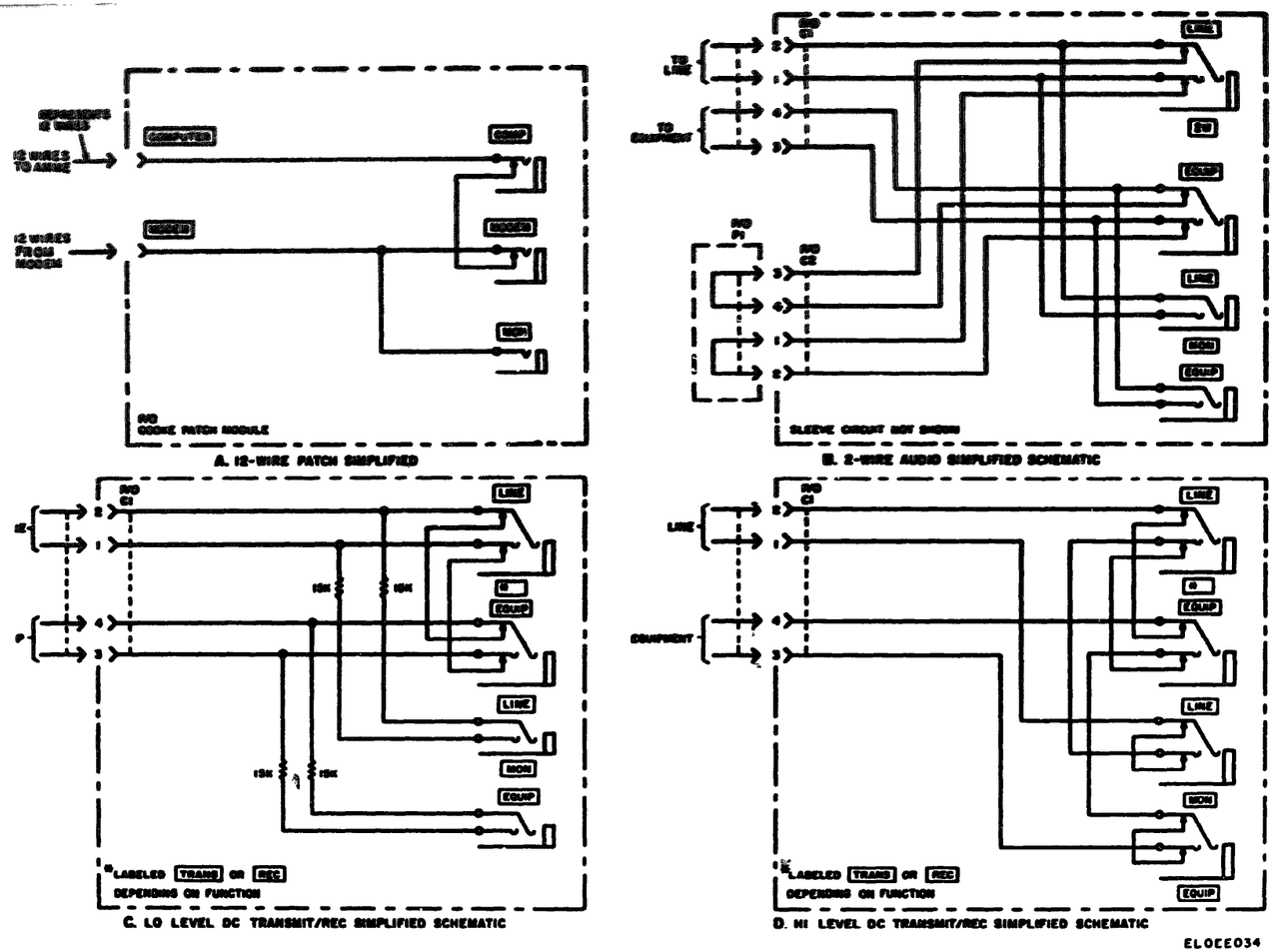


Figure 5-1. Patch panels, simplified schematics.

APPENDIX A

REFERENCES

The following publications contain information applicable to the maintenance of the Patch and Test Facility, Bailey's Crossroads, Virginia.

DA Pam 310-4	**Index of Technical Manuals, Technical Bulletins, Supply Manuals (Types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.**
DA Pam 310-7	**US Army Equipment Index of Modifications Work Orders.**
TB 43-0118	**Field Instructions for: Painting and Preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters.**
TB 43-180	**Calibration Requirements for the Maintenance of Army Materiel.**
TM 11-6625-602-12	**Organizational Maintenance Manual Including Repair Parts and Special Tool Lists: Test Set, Telephone AN/USM-181 and Hewlett-Packard Model 3550B.**
TM 11-6625-654-14	**Operator's, Organizational, Direct Support and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools List) for Multimeter AN/USM-223.**
TM 11-6625-2426-15	**Operator's, Organizational, Direct Support, General Support and Depot Maintenance Manual: Northeast Electronics Corporation Noise-Level-Vu Measuring Set Model TTS-37B.**
TM 11-6625-2658-14	**Operator's, Organizational, Direct Support, and General Support Maintenance Manual for Oscilloscope AN/USM-281C (NSN: 6625-00-106-9622).**
TM 38-750	**The Army Maintenance Management Systems (TAMMS).**
TM 750-244-2	**Procedures for Destruction of Electronics Materiel to Prevent Enemy Use.**

COMMERCIAL MANUALS

NOTE

The following commercial manuals may be procured from the associated contractor listed below.

Operating and Service Manual	Data Error Analyzer Model 1645A (P/N 01645-90905 Dated Oct 1976) Hewlett-Packard Company P. O. Box 301 Loveland, Colorado 80537
Operating Manual	Portable Test Set HP-3550B (P/N 03550-90005, dated Feb 73) Hewlett-Packard Company
Operating and Service Manual	Oscillator 204C/504D (P/N 00204-90003) Hewlett-Packard Company
Operating and Service Manual	Patch Panel 353A (P/N 00353-9003) Hewlett-Packard Company
Operating and Service Manual	AC Voltmeter 403B (P/N 00403-90013) Hewlett-Packard Company
Operators Instructional Manual	Oscilloscope 7603/R7603 (P/N 070-1310-00) Tektronix, Inc. P. O. Box 500 Beaverton, Oregon 97005
Operator's Instruction Manual	Type 7B53A/7B53AN Dual Time Base Plug-In (P/N 070-1252-00) Tektronix, Inc.
Special Instruction Manual	Type 7B53A/7B53AN Dual Time Base Plug-In (P/N 070-1342-00) Tektronix, Inc.
nstruction Manual	Type 7A18/7A18N Dual Trace Amplifier (P/N 070-1126-01) Tektronix, Inc.
Instruction Manual	Multicircuit Patch Panels, (P/N 153-004A(16)) Cooke Engineering Co. 900 Slaters Lane Alexandria, Virginia 22314

Technical Manual	**Dual Speaker Panel** **Engineered Devices Company, Inc.** **680 Bizzel Drive** **Lexington, KY 40504**
Operating Instructions	**Intercom. Teletalk. R2812A. Bulletin 211-45326-1** **Faraday, Inc.** **805 South Maumee St.** **Tecumseh, Michigan 49286**
Installation and Service Instructions	**Intercom, Teletalk, P2812A, Bulletin** 311-46170 **Faraday, Inc.**
Instruction Manual	**Model TTS-37BAQ, Noise-Level-VU Measuring** Set, (PM A0037-89-600, Issue 3, **dated Mar 75)** **Northeast Electronics Corporation** **P. O. Box 649** **Concord, New Hampshire 03301**
Instruction Manual	**Sola CVDC Power Supplies - Type Standard CVDC Regulated (-48 vdc 28-1561-2) (P/N 272-00416)** **Sola Electric Company, Division of Sola Basic Industries** **1717 Busse Road** **Elk Grove Village, Illinois 60007**
Technical Manual	**Digital Isolator Model R-205** **Versitron, Inc.** 6310 Chillum Place NW Washington, DC 2001
Technical Manual	Isolation Device Model R-202S. Versitron, Inc.
Technical Manual	Power supply Model P-12 (P/N 11857) Versitron, Inc.
Technical Manual	Series T Housing, Operation, Theory and Maintenance. (T612 BW) Versitron, Inc.
	DEFENSE COMMUNICATION AGENCY CIRCULARS
DCAC 310-50-3	Concept for Technical Control of the Defense Communication System.
DCAC 310-70-1	Vol I, DCS Technical Control Policy and Facilities; Vol II, DCS Technical Control Procedures; VOL IV, DCS Technical Control Glossary.
DCAC 370-D95-1	System Description DCS-AUTODIN
DCAC 330-175-1	DCS Engineering-Installation Standards Manual.
DCAC 300-175-9	DCS Operating-Maintenance Electrical Performance Standards.

APPENDIX B

COMPONENTS OF END ITEM LIST

Section I. INTRODUCTION

B-1. Scope.

This appendix lists integral components of the Patch and Test Facility, Bailey's Crossroads, Virginia, to help you inventory items required for safe and efficient operation.

B-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 Patch and Test Facility, Bailey's Crossroads, Virginia, and must accompany it whenever it is transferred or turned in.

b. Section III. Basic Issue Items. Not applicable.

B-3. Explanation of Columns.

a. Illustration. Not applicable.

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 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) is shown.

d. Location. Not applicable.

e. Usable on Code. Not applicable.

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 Date columns are for your use when you inventory the major item.

SECTION II INSTALL COMPONENTS OF END ITEM

(1) ILLUSTRATION (A) FIG NO.	(1) ILLUSTRATION (B) ITEM NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NUMBER (FSCM)	(4) LOCATION	(5) USABLE ON CODE	(6) QTY REQD	(7) QUANTITY RCVD	(7) QUANTITY DATE
			Row 1 EVALUATION					
			LEAD-D-54665					
			LISTENING UNION MODEM BAY 1.1			1		
			FUTURE BAY 1.2			1		
			FUTURE BAY 1.3			1		
			FUTURE BAY 1.4			1		
			MODEM BAY 1.5			1		
			LEAD-D-51715					
			CABINET CY-.3397/A (MOD) 21617			1		
			LEAD-D-51726					
			POWER SUPPLY 21617			1		
			LEAD-D-51715-1					
			MODEM 202MR 15422					
			TERMINAL BLOCK 81812			26		
			421C-10W					
			VISION DATA SET			1		
			BELL DATAPHONE 9600 MODEM			1		
			CALL CHANNEL INTERFACE			1		
			BLACK DISTRIBUTION FRAME BAY 1.6			1		
			LEAD-D-54671					
			CABINET ELECTRICAL CY-3397A (MOD) 21617			1		
			LEAD-D-51726					
			FRAME 21617			1		
			LEAD-D-51527					
			TERMINAL BLOCK 81812			20		
			421C					
			BLACK DC PANEL BAY 1.7 21617			1		
			-1713					
			CABINET, CY-3397A/G (MOD) 21617			1		
			1 LEAD-D-51726					
			BLACK PANEL, 3-1/2' 21617			1		
			1 LEAD-D-12360					
			MULTICIRCUIT PATCH PANEL 02002			3		
			1 153-004a-(16)					
			D. C. LOW LEVEL PATCH PANEL (MOD) 21617			1		
			1 LEAD-D-28973					
			D.C. LOW LEVEL PATCH PANEL (REC) 21617			1		
			1 LEAD-D-28972					

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(1) ILLUSTRATION (A) FIG NO.	(1) ILLUSTRATION (B) ITEM NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NUMBER (FSCM)	(4) LOCATION	(5) USABLE ON CODE	(6) QTY REQD	(7) QUANTITY RCVD	(7) QUANTITY DATE
			MISC PATCH PANEL 21617			1		
			LEAD-D-28567					
			BLANK PANEL 3-1/2" 21617			1		
			LEAD-C-12360					
		5975-00-122-2359	SHELF, WRITING (PAR METAL) 74156			1		
			SK-2419					
			BLANK PANELS (2-1/2", 4" & 21" 21617			3		
			LEAD-D-12360					
			TEST BAY 1.8 21617			1		
			LEAD-D-54670					
			CABINET, CY-3397A/G (MOD) 21617			1		
			LEAD-D-51726					
			BLANK PANEL 21617			4		
			LEAD-D-12360					
		6625-00-133-7496	NOISE MEASURING SET N.E.C. 06819			1		
			TTS-37HR					
			DATA ERROR ANALYZER 04404			1		
			HP-1645A					
		5975-00-122-2359	SHELF, WRITING (PAR METAL) 74156			1		
			SK-2419					
			TRANSMISSION MEASURING SET 04401			1		
			HP 3550BR					
			MISCILLANEOUS PATCH PANEL 21617			1		
			LEAD-D-28567					
			V.F. ENTRANCE FRAME & PATCH BAY 1.9					
			LEAD-D-54669					
			CABINET, CY-3397A/G (MOD) 21617			1		
			LEAD-D-51726					
			BLANK PANEL 4" 21617			1		
			LEAD-D-12360					
			DUAL SPEAKER PANEL 21617			1		
			LEAD-D-54669					
			2/W AUDIO PATCH PANEL 21617			4		
			LEAD-D-28563					
			HANDSET, WEBSTER 64294			1		
			H552-1					
			BLANK PANEL 21" 21617			2		
			LEAD-D-12360					
			AC OUTLET PANEL 21617			1		

(1) ILLUSTRATION (A) FIG NO.	(1) ILLUSTRATION (B) ITEM NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION / PART NUMBER	(FSCM)	(4) LOCATION	(5) USABLE ON CODE	(6) QTY REQD	(7) QUANTITY RCVD	(7) QUANTITY DATE
			MISCELLANEOUS EQUIP BAY 1.10						
			LEAD-D-51710						
			CABINET, CY-3397A/G (MOD)	21617			1		
			LEAD-D-51726						
		6360-00-102-4210	BLANK PANEL W/AUDIBLE INDICATOR	61294			1		
			MALLORY SC-628						
			MAJOR ALARM ASSY	21617			1		
			LEAD-D-33162						
			INTERCOM, WEBSTER	61294			1		
			R-2812A						
			H/L PATCH PANEL ASSY (XMIT) (DC)	21617			1		
			LEAD-D-28566						
			H/L PATCH PANEL ASSY (REC) (DC)	21617			1		
			LEAD-D-28565						
			BLANK PANEL, 21"	21617					
			LEAD-D-12360						
		5975-00-162-2359	SHELF, WIRING	74156			1		
			SK-2419						
			BLANK PANEL, 3"	21617			2		
			LEAD-D-12360-8						
			SHELF, POWER SUPPLY				1		
			28 VDC POWER SUPPLY	55814			1		
			28-1561-2						
			ROW 2 ELEVATION						
			LEAD-D-51729						
			RED DC PATCH BAY 2.1 (SECURE)						
			LEAD-C-51716						
			CABINET, CY-3397A/G (MOD)	21617			1		
			LEAD-D-51726						
			BLANK PANEL, 14"	21617			1		
			LEAD-D-12360						
			MULTICIRCUIT PATCH PANEL	02002			3		
			153-004-(16)						
			DC L/L W/O CK & LP (XMIT)	21617			1		
			LEAD-D-28973						
			DC L/L W/O CK & LP (REC)	21617			1		
			LEAD-D-28972						

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(1) ILLUSTRATION (A) FIG NO.	(1) ILLUSTRATION (B) ITEM NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION / PART NUMBER	(FSCM)	(4) LOCATION	(5) USABLE ON CODE	(6) QTY REQD	(7) QUANTITY RCVD	(7) QUANTITY DATE
			MISCELLANEOUS PATCH PANEL	21617			1		
			LEAD-D-28567						
			BLANK PANEL, 14"	21617			1		
			LEAD-D-12360						
		5875-0-162-2359	SHELF, WRITING	74156			1		
			SK2419						
			BLANK PANEL, 14" & 21"	21617			2		
			LEAD-D-12360						
			AC OUTLET PANEL	21617			1		
			LEAD-D-29094						
			MED DISTRIBUTION FRAME BAY 2.2						
			LEAD-D-51672						
			CABINET, CY-3397A/G (MOD)	21617			1		
			LEAD-D-51726						
			DOOR, CABINET	80363			1		
			SM-D-433907						
			FRAME	21617					
			LEAD-D-51532						
			TERMINAL BLOCK	21617			40		
			LEAD-D-51532-5						
			421C-10M						
			MED DC PATCH BAY 2.3						
			LEAD-C-51718						
			CABINET, CY-3397A/G (MOD)	21617			1		
			LEAT-D-51726						
			BLANK PANEL, 14"	21617			1		
			LEAD-D-12360						
			MULTICIRCUIT PATCH PANEL				3		
			153-00kA-(16)						
			DC L/L W/O CK & LP (XMIT)	21617			1		
			LEAD-D-28973						
			DC L/L W/O CK & LP (REC)	21617			1		
			LEAD-D-28972						
			MISCELLANEOUS PATCH PANEL	21617			1		
			LEAD-D-28567						
		6350-00-102-4210	ALARM PANEL W/AUDIBLE ALARM	64294			1		
			BC-628						
			BLANK PANEL, 6"	21617			1		
			LEAD-D-12360						
		5975-00-122-2359	SHELF, WRITING	74156			1		
			SK2419						

(3) ILLUSTRATION (A) FIG NO.	(3) ILLUSTRATION (B) ITEM NO.	(2) NATIONAL STOCK NUMBER	(1) DESCRIPTION PART NUMBER (FSCM)	(4) LOCATION	(5) USABLE ON CODE	(6) QTY REQD	(7) QUANTITY RCVD	(7) QUANTITY DATE
			BLANK PANEL, 4" 21617 LRAD-D-12360			1		
			28 VDC POWER SUPPLY 30A 21617 LRAD-D-281561-2			1		
			BLANK PANEL, 3-1/2" 21617 LRAD-D-12360			2		
			AC OUTLET PANEL 21617 LRAD-D-2909A			1		
			ALARM PANEL MAJOR 21617 LRAD-D-33162			1		
			CIRCUIT BOARD ASSEMBLY 21617 LRAD-D-33162 (48 VDC)			1		
			RED/BLACK ISOLATOR BAY 2-- LRAD-D-51673					
			HOUSING, ISOLATOR R-205 17297 P-12688			1		
			ISOLATOR, DIGITAL DATA & TIMING 17297 R-205			30		
		5805-00-009-3475	POWER SUPPLY 17297 P-12			60		
			BAY 3 ASSY 21617 LRAD-D-51969					
			FUTURE BAY 3.1 (RO-3A) 21617 LRAD-D-51969-1					
			CABINET, RELAY RO 197A/U 21617 LRAD-D-51969-2			1		
			FUTURE BAY 3.2 (RO-3A) 21617 LRAD-D-51969-3					
		5975-00-686-0806	CABINET, RELAY RO 197A/U 21617 LRAD-D-51969-2			1		
			CONSEC AUTODIN BAY 3.3 21617 (CIRCUIT #1 RO-13) LRAD-D-51969-4					
		5975-00-686-0206	CABINET, RELAY RO 197A/U 21617 LRAD-D-51969-2			1		
			CONSEC AUTODIN BAY 3.4 21617 (CIRCUIT #2 RO-13) LRAD-D-51969-5					
		5975-00-686-0206	CABINET, RELAY RO 197A/U 21617 LRAD-D-51969-2			1		

APPENDIX C

ADDITIONAL AUTHORIZATION

Section I. INTRODUCTION

C-1. Scope

This appendix lists additional items you are authorized for the support of the Patch and Test Facility, Bailey's Crossroads, Virginia.

C-2. General.

This list identifies items that do not have to accompany **the Patch and Test Facility, Bailey's Crossroads, Virginia, and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.**

C-3. Explanation of Listing.

National stock numbers, descriptions, and quantities. are provided to help you identify and request the additional items you require to support this equipment. If the item you require differs between serial numbers of the same model, effective serial numbers are shown in the last line of the description. If item required differs *for different models or this equipment,* the model is shown under the "Usable on" heading in description column.

APPENDIX C

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
			PATCH CORDS, PLUGS, AND MISC		
	#UPC-12-24	02002	PATCH CORD		9
	#UPC-12-48	02002	PATCH CORD		9
	LEAD-D-51561	21617	PATCH CORD, BLACK TEST		2
	LEAD-D-51561	21617	PATCH CORD, RED TEST		4
	DPP-DIB	02002	PLUG, RED TEST (COOK ENGINEERING CO)		4
5995-00-246-9786	ADC-PJ81	70674	PATCH CORD, 1 Ft. Lg.		20
5995-00-246-9791	ADC-PJ82	70674	PATCH CORD, 2 Ft. Lg.		20
5995-00-089-4500	ADC-PJ84	70674	PATCH CORD, 4 Ft. Lg.		20
5995-00-246-9792	ADC-PJ86	70674	PATCH CORD, 6 Ft. Lg.		20
	2806AT	64294	INTERCOM, DESK, EDLO, WEBSTER		2

APPENDIX D

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

D-1. General

This appendix provides a summary of the maintenance **operations for the Patch and Test** Facility, Bailey's **Crossroads, Virginia. It authorizes c**ategories of main**tenance for specific** m-a-i-m-- functions on repairable items and components and the tools and equipment **required to perform each function. This appendix may be used as aid in planning maintenance operations.**

B-2. Maintenance Functions.

Maintenance functions will be limited to and defined as follows:

a ***Inspect.*** To determine the **serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.**

b. Teat. **To verify serviceability and to detect incipent failure by measuring the mechanical 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 (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. **To maintain, within prescribed limits, by ringing into proper or exact position, or by setting he operating characteristics to the specified paramters.**

e. Align. To **adjust specified variable elements of an em 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 measering and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known acuracy, to detect and adjust any discrepancy in the acuracy of the instrument being compared.**

g. Install. **The act of emplacing, seating, or fixing to position an item, part, module (component or assembly in a manner to allow the proper functioning the equipment** or **system.**

h. ***Replace.*** **The act of substituting a serviceable like the part, subassembly, or module (component or assembly) for an unserviceable counterpart,**

Repair, The application of maintenance services (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, rivering, straightening, facing, remachining, or resurfacing) to restore servicability to an item by an item by correcting specific damage, ***fault, malfunction, or*** failure in a part, subassembly, module (component or assembly, end item, or system. This function does not include the trial and error **replacement of running spare type items such as fuses, lamps, or electron tubes.**

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 condi**tion.**

k. Rebuild. **Consists of those service/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 rebuilt operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifying Army equipments/components.**

D-3. Column Entries, Maintenance, Allocation Charts (Sect. II).

a. 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, sub assemblies, 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 "worktime" 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 or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate "worktime" figures will be shown for each category. The number of task-hours specified by the "worktime" 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 tasks 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.

D-4.. Tool and Test Equipment Requirements (Sect. III)

a. Tool or Test Equipment Reference Code. The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool or test equipment for the maintenance functions.

b. Maintenance Category. The codes in this column indicate the maintenance category allocated the tool or test equipment.

c. Nomenclature. This column lists the noun name and nomenclature of the tools and test equipment required to perform the maintenance functions.

d. National/NATO Stock Number. This column lists the National/NATO stock number of the specific tool or test equipment.

e. Tool Number. This column lists the manufacturer's part number of the tool followed by the Federal Supply Code for manufacturers (5-digit) in parentheses.

D-5. Remarks (Sect. IV).

a. Reference Code. This code refers to the appropriate item in section II, column 6.

b. Remarks. This column provides the required explanatory information necessary to clarify items appearing in section II.

APPENDIX D

SECTION II MAINTENANCE ALLOCATION CHART

FOR

PATCH AND TEST FACILITY

BAILEY'S CROSSROADS, VIRGINIA

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQPT.	(6) REMARKS
00	BAILEY'S CROSSROADS (VA.)	INSPECT		0.5					
	AUTOMATED COMMUNICATIONS CENTER	TEST[1]		1.0					
	PATCH & TEST FACILITY	TEST			2.0			1	
		SERVICE[2]		0.5					
		REPAIR[3]		2.5				4	
		REPAIR			6.0			1,2,3	
01	RACK: BAY 1.2	REPAIR[4]							
	(WESTERN UNION) ((P/N 13189-1A MOD 1))								
02	FUTURE EQUIPMENT BAY 1.3	INSPECT		0.5					
		TEST[1]		1.0					
		TEST			2.0			1	
		SERVICE		0.5					
		REPAIR[3]		2.5				4	
0201	CABINET, ELECTRICAL CY-597A/G (MOD)	REPAIR			5.0			1,2,3	
	(P/N LEAD-D-51726)								
03	FUTURE EQUIPMENT BAY 1.4	INSPECT		0.5					
		TEST[1]		1.0					
		TEST			2.0			1	
		SERVICE		0.5					
		REPAIR[3]		2.5				4	
0301	CABINET, ELECTRICAL CY-597A/G (MOD)	REPAIR			5.0			1,2,3	
	(P/N LEAD-C-51726)								

SECTION II MAINTENANCE ALLOCATION CHART

FOR

PATCH AND TEST FACILITY
BAILEY'S CROSSROADS, VIRGINIA

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQPT.	(6) REMARKS
04	FUTURE EQUIPMENT BAY 1.5	INSPECT		0.5					
	(P/N LMAD-C-51715)	TEST[1]		1.0					
		TEST			2.0			1	
		SERVICE		0.5					
		REPAIR[3]		2.5				4	
		REPAIR			5.0			1,2,3	
0401	CABINET, ELECTRICAL CY-597A/G (MDD)								
	(P/N LMAD-D-51726)								
0402	ADAPTER, DATA SET	REPLACE[5]							
	(VERITRON)								
0403	CHANNEL INTERFACE	REPLACE[5]							
	(BELL)								
0404	DATAPHONE MODEM 9600 BAUD	REPLACE[5]							
	(BELL)								
0405	MODEM DISTRIBUTION FRAME								
	(P/N LMAD-D-51767)								
05	BLACK DISTRIBUTION FRAME BAY 1.6	INSPECT		0.5					
	(P/N LMAD-D-51671)	TEST[1]		1.0					
		TEST			2.0			1	
		SERVICE		0.5					
		REPAIR[3] REPAIR		2.5	5.0			4 1,2,3	
0501	CABINET, ELECTRICAL CY-597A/G (MDD) (P/N LMAD-D-51726)								
0502	BLACK IDF TERMINAL BLOCK (P/N LMAD-D-51677)								
06	BLACK DC PATCH BAY 1.7	INSPECT		0.5					
	(P/N LMAD-D-51713)	TEST[1]		1.0					
		TEST			2.0			1	
		SERVICE		0.5					
		REPAIR[3]		2.5				4	
		REPAIR			5.0			1,2,3	
0601	CABINET, ELECTRICAL CY-597A/G (MDD)								
	(P/N LMAD-D-51726)								
0602	MULTICIRCUIT PATCH PANEL 1	REPLACE[3]			0.5			2,3	
	(CIRCUITS 1-16)	REPAIR			1.0			1,2,3	
	(P/N 153-00hA)								
0603	MULTICIRCUIT PATCH PANEL 2	REPLACE[3]			0.5			2,3	
	(CIRCUITS 17-32)	REPAIR			1.0			1,2,3	
	(P/N 153-00hA)								

SECTION II. MAINTENANCE ALLOCATION CHART-CONTINUED

FOR

PATCH AND TEST FACILITY
RADET'S GREENHAVEN, VIRGINIA

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQPT.	(6) REMARKS
0604	[illegible] PATCH PANEL 3 (CIRCUITS 33-48)	REPLACE[3]			0.5			2,3	
	(P/N 153-0010A)	REPAIR			1.0			1,2,3	
0605	L/L DC PATCH PANEL 1, w/o CK & LP, TRANSMIT	REPLACE[3]			0.5			2,3	
	(P/N LRAD-D-28972)	REPAIR			1.0			1,2,3	
0606	L/L DC PATCH PANEL 2, w/o CK & LP, RECEIVE	REPLACE[3]			0.5			2,3	
	(P/N LRAD-D-28972)	REPAIR			1.0			1,2,3	
0607	MISC PATCH PANEL	REPLACE[3]			0.5			2,3	
	(P/N LRAD-D-28987)	REPAIR			1.0			1,2,3	
07	TEST RAY 1.8	INSPECT		0.5					
	(P/N LRAD-D-51670)	TEST[1]		1.0					
		TEST			2.0			1	
		SERVICE		0.5					
		REPAIR[3]		2.5				4	
		REPAIR			5.0			1,2,3	
0701	CABINET, ELECTRICAL CY-5971A/G (MOD)								
	(P/N LRAD-D-51726)								
0702	NOISE MEASURING SET	REPLACE		0.5				4	
	(HEWLETT PACK CO., TYPE-3590)								
	FOR MAINTENANCE ALLOCATION,								
	SEE TM 11-6625-2626-15								
0703	DATA ERROR ANALYZER	REPLACE[5]		0.5				4	
	(HP-1645A)								
0704	OSCILLOSCOPE	REPLACE		0.5				4	
	(TEK R7603N-118)								
	FOR MAINTENANCE ALLOCATION,								
	SEE TM 11-6625-2658-14								
0705	TRANSMISSION MEASURING SET	REPLACE		0.5				4	
	(HP-3550B)								
	FOR MAINTENANCE ALLOCATION,								
	SEE TM 11-6625-602-15								
0705	MISC PATCH PANEL	REPLACE[3]			0.5			2,3	

FOR

PATCH AND TEST FACILITY
BAILEY'S CROSSROADS, VIRGINIA

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQPT.	(6) REMARKS
08	VF ENTRANCE FRAME & PATCH BAY 1-9	INSPECT		0.5					
	(P/N LEAD-D-51669)	TEST[2]		1.0					
		TEST			2.0			1	
		SERVICE		0.5					
		REPAIR[3]		2.5				4	
		REPAIR			5.0			1,2,3	
0801	CABINET, ELECTRICAL CY-597A/G (MOD) (P/N LEAD-D-51726)								
0802	VFEP TERMINAL BLOCK (P/N LEAD-D-51675)								
0803	DUAL SURFACE PANEL	TEST[6]							
	(SWITCHCRAFT SERVICE CO.)	REPLACE			0.5			2,3	
	(P/N LEAD-D-51675)	REPAIR[6]							
0804	2/W AUDIO PATCH PANEL 1	REPLACE[3]			0.5			2,3	
	(CIRCUITS 1-12)	REPAIR			1.0			1,2,3	
	(P/N LEAD-D-28563)								
0805	2/W AUDIO PATCH PANEL 2	REPLACE[3]			0.5			2,3	
	(CIRCUITS 13-24)	REPAIR			1.0			1,2,3	
	(P/N LEAD-D-28563)								
0806	2/W AUDIO PATCH PANEL 3	REPLACE[3]			0.5			2,3	
	(CIRCUITS 25-36)	REPAIR			1.0			1,2,3	
	(P/N LEAD-D-28563)								
0807	2/W AUDIO PATCH PANEL 4	REPLACE[2]			0.5			2,3	
	(CIRCUITS 37-48)	REPAIR			1.0			1,2,3	
	(P/N LEAD-D-28563)								
0808	INTERCOM HANDSET	TEST[6]							
	(WEBSTER ELECTRIC, H952-1)	REPLACE			0.5			2,3	
		REPAIR[6]							
09	MISC EQUIPMENT BAY 1-10	INSPECT		0.5					
	(P/N LEAD-D-51710)	TEST[1]		1.0					
		TEST			2.0			1	
		SERVICE		0.5					
		REPAIR[3]		2.5				4	
		REPAIR			5.0			1,2,3	
0901	CABINET, ELECTRICAL CY-597A/G (MOD) (P/N LEAD-D-51726)								

SECTION II MAINTENANCE ALLOCATION CHART-CONTINUED
FOR
PATCH AND TEST FACILITY
BAILEY'S CROSSROADS, VIRGINIA

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQPT.	(6) REMARKS
0902	BLANK PANEL WITH AUDIBLE INDICATOR	TEST			0.5			1	
	(EQUIVALENT SIGNAL SC-615)	REPLACE			0.3			2,3	
	(P/N LEAD-D-51710-2)	REPAIR			1.5			1,2,3	
0903	MAJOR ALARM PANEL	TEST			0.5			1	
	(P/N LEAD-D-33162)	REPLACE			0.3			2,3	
		REPAIR			1.5			1,2,3	
090301	CIRCUIT BOARD ASSEMBLY (-48 VDC)								
	(P/N LEAD-D-33164)								
0904	INTERCOM	TEST[6]							
	(WEBSTER TELETALK R-2812A)	REPLACE			0.5			?,3	
		REPAIR[6]							
0905	H/L DC PATCH PANEL, TRANSMIT	REPLACE[3]			0.5			2,3	
	(P/N LEAD-D-28565)	REPAIR			1.0			1,2,3	
0906	H/L DC PATCH PANEL, RECEIVE	REPLACE[3]			0.5			2,3	
	(P/N LEAD-D-28566)	REPAIR			1.0			1,2,3	
0907	-48 VDC CEMC POWER SUPPLY	TEST[6]							
	(SOLA TYPE 28-1561-2)	REPLACE			0.5			2	
		REPAIR[6]							
10	END DC PATCH BAY (SECURE) 2-1	INSPECT		0.5					
	(P/N LEAD-C-51716)	TEST[1]		1.0					
		TEST			2.0			1	
		SERVICE		0.5					
		REPAIR[3]		2.5				4	
		REPAIR			5.0			1,2,3	
1001	CABINET, ELECTRICAL CY-597A/G (MOD)								
	(P/N LEAD-D-51726)								
1002	MULTICIRCUIT PATCH PANEL 1	REPLACE[3]			0.5			2,3	
	(CIRCUITS 1-16)	REPAIR			1.0			1,2,3	
	(P/N 153-004A)								
1003	MULTICIRCUIT PATCH PANEL 2	REPLACE[3]			0.5			2,3	
	(CIRCUITS 17-32)	REPAIR			1.0			1,2,3	
	(P/N 153-004A)								
1004	MULTICIRCUIT PATCH PANEL 3	REPLACE[3]			0.5			2,3	
	(CIRCUITS 33-48)	REPAIR			1.0			1,2,3	
	(P/N 153-004A)								

SECTION II. MAINTENANCE ALLOCATION CHART

FOR

PATCH AND TEST FACILITY
BAILEY'S CROSSROADS, VIRGINIA

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQPT.	(6) REMARKS
1005	DC L/L PATCH PANEL W/O CK & LP, TRANSMIT	REPLACE[3]			0.5			2,3	
	(P/N LEAD-D-26971)	REPAIR			1.0			1,2,3	
1006	DC L/L PATCH PANEL W/O CK & LP, RECEIVE	REPLACE[3]			0.5			2,3	
	(P/N LEAD-D-26972)	REPAIR			1.0			1,2,3	
1007	MISC PATCH PANEL	REPLACE[3]			0.5			2,3	
	(P/N LEAD-D-26967)	REPAIR			1.0			1,2,3	
11	RED DISTRIBUTION FRAME BAY 2.2	INSPECT		0.5					
	(P/N LEAD-D-51672)	TEST[4]		1.0					
		TEST SERVICE		0.5	2.0			1	
		REPAIR[3] REPAIR		2.5	5.0			4 1,2,3	
1101	CABINET, ELECTRICAL CY-597A/G (P/N LEAD-D-51726)								
1102	RED IDF TERMINAL BLOCK (P/N LEAD-D-51679)								
12	RED DC PATCH BAY (NUMERICHE) 2.3	INSPECT		0.5					
	(P/N LEAD-D-51718)	TEST[4]		1.0					
		TEST			2.0			1	
		SERVICE		0.5					
		REPAIR[3]		2.5				4	
		REPAIR			5.0			1,2,3	
1201	CABINET, ELECTRICAL CY-597A/G								
	(P/N LEAD-D-51726)								
1202	BLANK PANEL W/AUDIBLE ALARM	TEST			0.5			1	
	(SONALERT SIGNAL SC-628)	REPLACE			0.3			2,3	
		REPAIR			1.5			1,2,3	
1203	MAJOR ALARM PANEL	TEST			0.5			1	
	(P/N LEAD-D-33162)	REPLACE			0.5			2,3	
		REPAIR			1.5			1,2,3	
120301	CIRCUIT BOARD ASSY (-48VDC)								
	(P/N LEAD-D-33164)								
1204	MULTICIRCUIT PATCH PANEL 1	REPLACE[3]			0.5			2,3	
	(CIRCUITS 1-16)	REPAIR			1.0			1,2,3	
	(P/N 153-001A)								
1204	MULTICIRCUIT PATCH PANEL 2	REPLACE[3]			0.5			2,3	
	(CIRCUITS 17-32)	REPAIR			1.0			1,2,3	
	(P/N 153-001A)								

SECTION II. MAINTENANCE ALLOCATION CHART

FOR

PATCH AND TEST FACILITY

BAILEY'S CROSSROADS, VIRGINIA

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQPT.	(6) REMARKS
1206	MULTICOUPLER PATCH PANEL 3	REPLACE[3]			0.5			2,3	
	(CONTROLS 33-48)	REPAIR			1.0			1,2,3	
	(P/N 153-0216)								
1207	DC L/L PATCH PANEL W/O CK & IP, TRANSMIT	REPLACE[3]			0.5			2,3	
	(P/N LEAD-D-28973)	REPAIR			1.0			1,2,3	
1208	DC L/L PATCH PANEL W/O CK & IP, RECEIVE	REPLACE[3]			0.5			2,3	
	(P/N LEAD-D-28972)	REPAIR			1.0			1,2,3	
1209	MISC PATCH PANEL	REPLACE[3]			0.5			2,3	
	(P/N LEAD-D-28967)	REPAIR			1.0			1,2,3	
1210	-48VDC POWER SUPPLY	TEST[6]							
	(SOLA ELECTRIC, 28-561-2)	REPLACE			0.5			2	
		REPAIR[6]							
13	RED/BLACK ISOLATOR BAYS 2,4	INSPECT		0.5					
	(P/N LEAD-C-52,673)	TEST[3]		1.0					
		TEST			2.0			1	
		SERVICE		0.5					
		REPAIR[3]		2.5				4	
		REPAIR			5.0			1,2,3	
1301	HOUSING (CABINET)								
	(T-612 EF)								
1302	ISOLATORS, DIGITAL DATA & TIMING,	TEST[6]							
	DUAL AND DUPLEX 26VDC	REPLACE			0.3			3	
	(VERSITRON R-205)	REPAIR[6]							
1303	POWER SUPPLY, ISOLATOR	TEST[6]							
	(VERSITRON P12)	REPLACE			0.5			3	
		REPAIR[6]							
14	FUTURE BAY 3.1	INSPECT		0.5					
	(RD-3A)	TEST[1]		1.0					
	(P/N LEAD-D-52,969-1)	TEST			2.0			1	
		SERVICE		0.5					
		REPAIR[3]		2.5				4	
		REPAIR			5.0			1,2,3	
1401	CABINET, ELECTRICAL								
	(RD-197A/U)								
	(P/N LEAD-D-52,969-2)								

SECTION II MAINTENANCE ALLOCATION CHART

FOR

PACKS AND TEST FACILITY
HALEY'S CROSSROADS, VIRGINIA

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQPT.	(6) REMARKS
15	FUTURE BAY 1.2	INSPECT		0.5					
	(RS-1)	TEST[1]		1.0					
	(P/N 1260-D-5969-1)	TEST			2.0			1	
		SERVICE		0.5					
		REPAIR[3]		2.5				4	
		REPAIR			5.0			1,2,3	
1501	CABINET, ELECTRICAL								
	(ED-1974/U)								
	(P/N 1260-D-5969-2)								
16	COMBAT ANTENNA BAY 3.3 (CIRCUIT #1)	INSPECT		0.5					
	RS-13 (2)	TEST[1]		1.0					
	(P/N 1260-D-5969-4)	TEST			2.0			1	
		SERVICE		0.5					
		REPAIR[3]		2.5				4	
		REPAIR			5.0			1,2,3	
601	CABINET, ELECTRICAL								
	(ED-1974/U)								
	(P/N 1260-D-5969-2)								
17	COMBAT ANTENNA BAY 3.4 (CIRCUIT #2)	INSPECT		0.5					
	RS-13 (2)	TEST[1]		1.0					
	(P/N 1260-D-5969-5)	TEST			2.0			1	
		SERVICE		0.5					
		REPAIR[3]		2.5				4	
		REPAIR			5.0			1,2,3	
1701	CABINET, ELECTRICAL								
	(ED-1974/U)								
	(P/N 1260-D-5969-2)								
18	TELEPHONE INTERCOM STATION	INSPECT		0.3					
	(HYDU-MINSHER "TELETALK" 2606)	TEST[6]							
		SERVICE		0.5					
		REPLACE			1.0			2,3	
		REPAIR[6]							

SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS
FOR
PATCH AND TEST FACILITY
BAILEY'S CROSSROADS, VIRGINIA

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE AN/TSM-83	NOMENCLATURE MIL. EQUIVALENT	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	F	MULTIMETER (AN/PSM-83)	MULTIMETER AN/USM-223	6625-00-999-7465	
2	F	TOOL KIT, ELEC EQUIP TK-100/G	TOOL KIT, ELEC EQUIP TK-100/G	5180-00-605-0079	
3	F	TOOL KIT, PHILCO-FORD 2490-5L8013-401	TOOL KIT, ELECTRONIC EQUIPMENT TK-105/G	6180-00-610-8177	
4	O	TOOL KIT, ELEC EQUIP TK-101/G	TOOL KIT, ELECTRONIC EQUIPMENT TK-101/G	5180-00-054-5178	

SECTION IV. REMARKS

REFERENCE CODE	REMARKS
1	Verify performance.
2	General cleaning.
3	Repair by replacement only when not repairable on-site at the DS level.
4	This item will be tested and repaired by Western Union.
5	This item will be tested and repaired by commercial contractor.
6	This item will be tested and repaired at Depot level and/or commercial contractor.

APPENDIX E

ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST (INCLUDING DEPOT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS)

Section I. INTRODUCTION

E-1. Scope

This appendix lists repair parts required for performance of organizational, direct support, and general support maintenance of the Automated Telecommunications Center (ATCC) Patch and Test Facility (PTF) at Bailey's Crossroads, Virginia.

E-2. General

This Repair Parts and Special Tools List is divided into the following sections:

a. Section II. Repair Parts List. A list of repair parts authorized 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 numerical sequence.

b. *Section III. Special Tools List.* Not applicable.

c. *Section IV. National Stock Number and Part* Number Index. Not applicable.

E-3. Explanation of Columns.

a. Illustration. Not applicable.

b. Source, Maintenance, and Recoverability (SMR) codes.

(1) *Source Code. Source codes indicate the* manner of acquiring support items for maintenance, repair, or overhaul of end items. Source codes are entered in the first and second positions of the Uniform SMR Code format as follows:

Code	
PA	Item procured and stocked for anticipated or known usage
PD	Support item, excluding support equipment, procured for initial issue or outfitting and stocked only for subsequent or additional initial issue or outfittinga Not subject to automatic replenishment.
PF	Support equipment which will not be stocked but which will he centrally procured on demand.
XB	Item is not procured or stocked. If not available through salvage, requisition

NOTE

Cannibalization or salvage may be used as a source of supply for any items coded above except those coded XA and aircraft support items as restricted by AR 700-42.

(2) *Maintenance Code.* Maintenance codes are assigned to indicate the levels of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the Uniform SMR Code format as follows:

(a) The maintenance code entered in the third position will indicate the lowest maintenance level authorized to remove, replace, and use the support item. The maintenance code entered in the third position will indicate one of the **following levels of maintenance:**

Code	
F	The lowest maintenance level capable of complete repair of the support item is the direct support level.
H	The lowest maintenance level capable of complete repair of the support item is the general support level.

(b) The maintenance code entered in the **fourth position indicates whether the item is to he repaired and identifies the lowest maintenance level with the** capability to perform complete repair (i.e., all authorized maintenance functions). This position will contain one of the following maintenance codes:

Code	
F	The lowest maintenance level capable of complete repair of the support item is the direct support level.
H	The lowest maintenance level capable of complete repair of the support item is the general support level
Z	Nonreparable. No repair is authorized

(3) Recoverability Code. **Recoverability codes are assigned to support items to indicate the disposition action on unserviceable items. The recoverability axle is entered in the fifth position of the Uniform SMR Code format as follows:**

Recoverability Codes	*Definition*
Z	Nonreparable item When unserviceable, condemn and dispose at the level indicated in position 3
F	Reparable item When uneconomically reparable, condemn and dispose at the direct support level
H	Reparable item. When uneconomically reparable, condemn and dispose at the general support level
D	Reparable item When beyond lower level repair capability, return to depot Condemnation and disposal not authorized below depot level

c. National Stock Number. **Indicates the National stock number assigned to the item and will be used for requisitioning. 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 estab-**

lished and published, submit exception requisitions to: Commander, US Army Communications and Electronics Material Readiness Command, ATTN: DRSEL-MM, Fort Monmouth, New Jersey 07703 for the part required to support your equipment.

d. Part Number. 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 a stock-numbered item is requisitioned, the item received may have a different part number than the part being replaced.

e. Federal Supply Code for Manufacturer (FSCM). The FSCM is a 5-digit numeric code listed in SB 708-42 which is used to identify the manufacturer distributor, or Government agency, etc.

f. Description. Indicates the Federal item name and if required, a minimum description to identify the item. The physical security classification of the item is indicated by the parenthetical entry.

g. Unit of Measure (U/M). Indicates the standard of the basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation. When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

h. Quantity Incorporated in Unit. 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 no specific quantity is applicable.

SECTION II. REPAIR PARTS LIST

(1) ILLUSTRATION (A) FIG NO.	(1) ILLUSTRATION (B) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) UNIT OF MEAS	(8) QTY INC IN UNIT
						GROUP: 00 BAILEY'S CROSSROADS (VA) AUTOMATED COMMUNICATION CENTER (PATCH AND TEST FACILITY)		
				LEAD-D-13189-1AMOD	21617	MU MIDDN BAY 1.2	EA	1
				LEAD-D-13189-2AMOD	21617	FUTURE EQUIPMENT BAY	EA	3
				LEAD-D-51671	21617	BLACK DISTRIBUTION FRAME	EA	1
				LEAD-D-51713	21617	BLACK DC PATCH BAY	EA	1
				LEAD-D-51670	21617	TEST BAY	EA	1
				LEAD-D-51710	21617	MISC EQUIPMENT BAY	EA	1
				LEAD-D-51716	21617	RED DC PATCH BAY (SECURE)	EA	1
				LEAD-D-51718	21617	RED DC PATCH BAY (NONSECURE)	EA	1
				LEAD-D-51673	21617	RED/BLACK ISOLATOR BAYS	EA	2
				LEAD-D-51715A	21617	FUTURE BAY	EA	2
				LEAD-D-51715B	21617	CONSEC AUTODIN BAY 3.3	EA	1
				LEAD-D-51715C	21617	(CIRCUIT #1) KG-13		
				LEAD-D-51715D	21617	CONSEC AUTODIN BAY 3.4	EA	1
				LEAD-D-51715E	21617	(CIRCUIT #2) KG-13		
						GROUP: 0201 CABINET ELECTRICAL CY-597A/G (P/N LEAD-D-51726)		
		XBPZZ		LEAD-C-51539	21617	TOP COVER CY-597A/G	EA	1
		XBPZZ		LEAD-C-51540	21617	BOTTOM COVER CY-597A/G	EA	1
		XBPHD		SM-D-33907	21617	DOOR CABINET	EA	1
		PAFFF	6110-00-856-2410	SA-238/G	32757	SWITCH PANEL ASSY	EA	1
		PAFZZ		SMB-249225	80063	FUSE PLUG 15 AMP	EA	8
		PAFZZ	5930-00-989-6768	#1203	74345	SWITCH TOGGLE DPST	EA	1
		PAFZZ	5935-00-263-4003	#5242	27193	OUTLET CONVENIENCE DUPLEX	EA	1
		PAFZZ	5930-00-501-4859	756185	15605	SWITCH TOGGLE DPST	EA	1
		PAFZZ	5920-00-968-3238	11LT	71400	FUSEHOLDER (FOR 1 AMP GLASS FUSE)	EA	1
		PAFZZ	5920-00-403-8497	FMD3-1A	81349	FUSE 3 AG 1 AMP	EA	1
		XBPZZ		SA-238/GIA	32757	LAMP TROUBLE W/PROTECTOR & TERMINAL TUBE	EA	1
		XBPZZ		TYPE 4063	27193	RECEPTACLE (FOR 15 AMP PLUG FUSE)	EA	2

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(1) ILLUSTRATION (A) FIG NO.	(1) ILLUSTRATION (B) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION / USABLE ON CODE	(7) UNIT OF MEAS	(8) QTY INC IN UNIT
						GROUP: 0405		
						MODEM DISTRIBUTION FRAME (P/N LEAD-D-51747)		
		XBFZZ		LEAD-C-51544	21617	MOUNTING BRACKET	EA	4
		XBFZZ		4216-10W	81812	TERMINAL BLOCK 10 X 20 PINS (TRIMM CO)	EA	20
		XBFZZ		DNR-52A		ANCOR, ANGLE	EA	4
		XBFZZ		LEAD-C-51543	21617	TERMINAL BLOCK MTG BRACKET	EA	4
		XBFZZ		LEAD-C-51542	21617	MOUNTING BRACKET	EA	2
		PAFZZ	5305-00-989-6265	MS-35207-262	96906	SCREW, 10-32 UNF x 3/8 LG	EA	40
		XBFZZ		LEAD-D-51551	21617	CABINET, SUPPORT, CY-3397A/G	EA	4
		PAFZZ	5305-00-984-6208	MS35206-261	96906	SCREW 8-32 UNC x 3/8	EA	112
		PAFZZ	5310-00-877-5795	MS-21044-08	96906	NUT, SELF LOCKING	EA	112
		XBFZZ		LEAD-C-51545	21617	CABLE, LADDER	EA	2
		XBFZZ		LEAD-D-51546	21617	JUMPER, RING	EA	4
		XBFZZ		DR6176		STANDOFF 3/8 1-1/16 LG, 6-32THD (WILLIAMSON CO., OAKDALE, PA)	EA	4
		XBFZZ		ASTMB 187	88729	GROUND BUSS 1 x 1/4 x 12	EA	2
		PAFZZ	5310-00-877-5797	MS-21044-N3	96906	NUT SELF-LOCKING, 10-32 UNF	EA	40
						GROUP: 0502		
						BLACK IDF TERMINAL BLOCK ASSEMBLY (P/N LEAD-D-51677)		
		PFOOD		LEAD-D-51726	21617	TERMINAL BLOCK	EA	20
						GROUP: 0602		
						MULTICIRCUIT PATCH PANEL		
		PDFFD		153-004-A16	02002	MULTICIRCUIT DATA PATCHING	EA	3
		PAFZZ		205-208-1	03354	CONN ELECT: MALE 12 CONT	EA	16
		PAFZZ		205-207-1	03354	CONN ELECT FEMALE 12 CONT	EA	16
		PAFZZ		DYNA-PATCH DP12-2	02002	JACK PATCHING 12 CIR	EA	3
		PAFZZ		DP12-3	02002	JACK PATCHING 12 CIR	EA	1
		PAFZZ		DPP/6-24	02002	PATCH TEST CORD 16 CIR LOOP BACK	EA	4
		PAFZZ		DPP-12-24	02002	PATCH TEST CORD 12 CIRC LOOP	EA	4
		PAFZZ		DYNA PATCH 12 (48)	02002	PATCH TEST CORD ASS 48" LG	EA	9
		PAFZZ		DYNA PATCH 12 (36)	02002	PATCH TEST CORD ASS 36" LG	EA	9
		PAFZZ		DYNA PATCH 12 (24)	02002	PATCH TEST CORD ASS 24" LG	EA	9
		PAFZZ		016-8010-209	SELETRA	TEST POINTS	EA	12

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(1) ILLUSTRATION (A) FIG NO.	(1) ILLUSTRATION (B) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) UNIT OF MEAS	(8) QTY INC IN UNIT
						GROUP: 0605		
						L/L DC PATCH PANEL 1, TRANSMIT (P/N LBAD-D-28973)		
		PAFZZ	5935-00-547-7840	513938	44038	CONNECTOR (FRAME) 100 JACKS	EA	1
		PAFZZ	5905-00-799-2442	513936	44038	CONNECTOR (CABLE) 100 PINS	EA	1
		PAFZZ	5305-00-984-4988	MS-35206-228	96906	P.H.M.S. CAD PLATED 6-32 x 3/8	EA	96
		PAFZZ	5310-00-081-8087	MS21044-N06	96906	ELASTIC STOP NUT 6-32	EA	10
		XBFSH		LBAD-D-28993	21617	RESISTOR BOARD ASSY	EA	1
		PAHZZ	5905-00-195-6453	RC20GF562J	44655	RESISTOR 5.6k, 5%, 1/2W	EA	25
		XBFZZ		LBAD-C-28992	21617	RESISTOR BOARD MOUNTING BRACKET	EA	2
		PAFZZ	5305-00-833-8862	MS-18211-19C	96906	P.H.M.S. 4-40 x 5/16 NC(NYLON)	EA	22
		XDFZZ		MS-18211-8AF	96906	F.H.M.S. 10-32 x 18 NF (NYLON)	EA	6
		PAFZZ	5310-00-595-7203	MS-35338-.17	96906	LOCK WASHER #6	EA	96
		PAFZZ	5935-00-578-2701	240C	64959	JACK, TELEPHONE 240C	EA	48
		PAFZZ	5935-00-194-3079	239C	64959	JACK,TELEPHONE 239C	EA	48
		PAHZZ	5905-00-106-1273	RCR20G153JS	81349	RESISTOR, 15k OHMS 1/2 W 5%	EA	96
						GROUP: 0607		
						MISC PATCH PANEL (P/N LBAD-D-28567)		
		PAFZZ	5935-00-085-4730	512240	44038	CONNECTOR, 80 PIN (FRAME)	EA	1
		PAFZZ	5935-00-841-6421	512241	96906	CONNECTOR, 80 PIN (CABLE)	EA	1
		PAFZZ	5305-00-889-3000	MS-35206-230	96906	SCREW PAN.DASH H.D., 6-32 x 1/2 LG	EA	6
		PAFZZ	5310-00-081-8087	MS-21044-N06	96906	ELASTIC, STOP NUT, 6-32 NC	EA	6
		PAFZZ	5305-00-995-6653	MS35190-222	96906	SCREW,FLAT HEAD 4-40 NC x 5/16 LG	EA	4
		PAFZZ	5305-00-984-4988	MS-35206-228	96906	SCREW, R.P.H. 6-32 x 3/8 LG	EA	48
		PAFZZ	5305-00-984-7361	MS-35191-270	96906	SCREW, FLAT HEAD, 10-32NF x 3/8	EA	4
		PAFZZ	5310-00-209-1366	MS-35335-58	96906	WASHER, LOCK #6 (EXTERNAL TEETH)	EA	48
		XDFZZ		LBAD-D-285683	21617	SPACER, FIBER #2335	EA	4
		PAFZZ	5305-00-054-5657	MS-51957-17	96906	SCREW, R.H. 4-40 x 1/2 LG	EA	4
		PAFZZ	5805-00-877-2965	238A	64959	JACK, TELEPHONE 238 (KEY)	EA	48

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(1) ILLUSTRATION (A) FIG NO.	(1) ILLUSTRATION (B) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION / USABLE ON CODE	(7) UNIT OF MEAS	(8) QTY INC IN UNIT
						GROUP: 0803		
						DUAL SPEAKER PANEL (P/N LBAD-D-54675)		
		PFHZZ		178D-112	22231	PANEL, 4 IN VERTICAL	EA	1
		PFHZZ		180D-112	22231	PANEL, 15 IN VERTICAL	EA	1
		PFHZZ		112D-112	22231	HANDLE	EA	2
		PAHZZ		116D-112	22231	FUSE HOLDER	EA	1
		PAHZZ		118D-112	22231	FUSE (1 AMP FAST)	EA	1
		PAHZZ		120D-112	22231	TRANSFORMER, POWER	EA	1
		PAHZZ		122D-112	22231	TRANSFORMER, (MATCHING)	EA	2
		PAHZZ		124D-112	22231	TERMINAL (PRIMARY)	EA	2
		PAHZZ		126D-112	22231	TERMINAL (SECONDARY)	EA	1
		PAHZZ		130D-112	22231	SOCKET, TRANSFORMER	EA	2
		PAHZZ		132D-112	22231	SOCKET, MOUNT, TRANSFORMER	EA	2
		PAFZZ		136D-112	22231	POST, INPUT (DUAL)	EA	2
		PAFZZ		138D-112	22231	POWER CABLE (6 FT)	EA	1
		PAFZZ		140D-112	22231	POST, INPUT (SINGLE)	EA	2
		PAFZZ		142D-112	22231	CLAMP, POWER CABLE	EA	1
		PAFZZ		144D-112	22231	SWITCH, POWER	EA	1
		PAFZZ		156D-112	22231	JACK, INPUT (FOR W.E. 310 PLUG)	EA	2
		PAFZZ		158D-112	22231	KNOB, CONTROL	EA	4
		PAFZZ		160D-112	22231	SPEAKER	EA	2
		PAFZZ		162D-112	22231	GRILL, SPEAKER	EA	2
		PAFZZ		164D-112	22231	SWITCH, IMPEDANCE	EA	2
		PAFZZ		166D-112	22231	LIGHT, PILOT	EA	1
		PAFZZ		PCA-4-18A	22231	AMPLIFIER, 3 WATT	EA	2
		PAFZZ		DPC-H	22231	BOARD, PRINTED CIRCUIT	EA	1
		PAFZZ	5905-00-935-8/539	RCR20G202J	81349	RESISTOR, 2.2k OHM, 1/2W, PORM 5% (R-8. R-14)	EA	2
		PAFZZ		RV5LAYSD154A	81349	POTENTIOMETER, 150k OHM (R-1)(R-15)	EA	2
		PAFZZ		A158C	81349	TRANSISTOR (Q1)	EA	1
		PAFZZ	5910-00-111-4811	CK05BX103J	81349	CAPACITOR, .01UF (C-7)	EA	1
		PAFZZ		RC20GF472J	81349	RESISTOR: 4700 OHMS, 1/2W, 5% (R-4)	EA	1
		PAFZZ	5910-00-4515-7826	7G02332K0500D	56289	CAPACITOR· 0.22UF (C-1)	EA	1
		PAFZZ	5910-00-851-2095	150D226X9035R2	56289	CAPACITOR, ELECTRLYTIC: 220UF, 16 VDC (C-3)	EA	1
		PAFZZ		RCR20GF100J	81349	RESISTOR: 1 OHM 1/2W, PORM 5% (R-10, R-11)	EA	2
		PAFZZ		2N4107	81349	TRANSISTOR, (MATCHED) Q3, Q4	EA	2
		PAFZZ		8832001P/50E	34553	RESISTOR, THERMAL NTC-50	EA	1
		PAFZZ	5961-00-068-4708	5A4	81483	SEMICONDUCTOR DEVICE: (D-1)	EA	1
		PAFZZ	5910-00-893-6745	CKD5BX102K	81349	CAPACITOR: ELECTROLYTIC· 1000UF, 25VDC (C-4)	EA	1
		PAFZZ	5910-00-784-7714	CS13BC336K	81349	CAPACITOR: ELECTROLYTIC: 33UF, 16VDC (C-5, C-6)	EA	2

(1) ILLUSTRATION (A) FIG NO.	(1) ILLUSTRATION (B) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) UNIT OF MEAS	(8) QTY INC IN UNIT
		PAFZZ		RCR20GF473J	81349	RESISTOR: 47000 OHMS, 1/2W, PORM 5% (R-13)	EA	1
		PAFZZ		RCR20GF391J	81349	RESISTOR: 390 OHM, 1/2W, PORM (R-12)	EA	1
		PAFZZ		RCR20GF561J	81349	RESISTOR: 560 OHM, 1/2W, PORM (R-9)	EA	1
		PAFZZ		RCR20GF823J	81349	RESISTOR: 82000 OHM, 1/2W, PORM 10% (R-12)	EA	1
		PAFZZ		RC32GF820J	81349	RESISTOR: 82 OHM, 1W, PORM 10% (R-6)	EA	1
		PAFZZ		2N248	81349	TRANSISTOR: (Q2)	EA	1
		PAFZZ		RCR20GF100J	81349	RESISTOR: 10 OHM, 1/2W, PORM 10% (R-3)	EA	1
		PAFZZ	5910-00-995-1662	MLM	14655	CAPACITOR, ELECTROLYTIC- 250UF, 10VDC (C-2)	EA	1
		PAFZZ		RC20GF100KJ	81349	RESISTOR: 100000 OHM, 1/2W, PORM 5% (R-5)	EA	1
		PAFZZ		RC.OGF331J	81349	RESISTOR: 3300 OHMS, 1/2W, PORM 5% (R-7)	EA	1
						GROUP: 0804		
						2 WIRE AUDIO PATCH ASSY (P/N LEAD-D-28563)		
		PAFZZ	5935-00-084-4730	512240	44038	CONNECTOR 80 PIN (FRAME)	EA	4
		PAFZZ	5935-00-246-6421	512241	44038	CONNECTOR 80 PIN (CABLE)	EA	2
		PAFZZ	5310-00-081-8087	MS-21044-N06	96906	ELASTIC STOP NUT 6-32NC	EA	12
		PAFZZ	5305-00-889-3000	MS-35206-230	96906	P.H.M.S., CAD PLTED 6-32 x 1 1/2 NC	EA	12
		PAFZZ	5305-00-995-6653	MS-35190-222	96906	SCREW, FLAT HEAD 4-4 NC 5/16 LG	EA	4
		PAFZZ	5305-00-984-7361	MS-35181-270	96906	SCREW, FLAT HEAD 10-32 NF x 3/8 LG	EA	6
		PAFZZ	5305-00-828-9821	MS-24629-13	96906	SCREW, TAPPING PAN H.D. CAD PH 4-40 x 1/2	EA	4
		PAFZZ	5935-00-192-4805	280C	64959	JACK, TELEPHONE 280C	EA	48
		PAFZZ	5935-00-578-2647	241C	64959	JACK, TELEPHONE 241C	EA	48
		PAFZZ	5305-00-984-4988	MS-35206-228	96906	PHMS CAD PLTD, 6-32 x 3/8 NC	EA	96
		PAFZZ	5310-00-209-1366	MS-35335-58	96906	LOCK, WASHER #6, EXTERNAL TEETH	EA	96
						GROUP: 0903		
						MAJOR ALARM PANEL (P/N LEAD-D-33162)		
		PAFZZ	5305-00-889-3000	MS-35206-230	96906	SCREW, PAN HD. 6-32 x 1/2 LG	EA	31
		PAFZZ	5935-00-948-9096	513927	44038	CONNECTOR SERIES MTC TYPE D	EA	1
		PAFZZ	5935-00-948-9095	513925	44038	CONNECTOR	EA	1
		PAFZZ	5310-00-934-9747	MS-35649-262	96906	NUT, PLAIN, HEX, CAD PLTDL 6-32	EA	15
		PAFZZ	5310-00-045-4007	MS-35338-41	96906	WASHER, LOCK #6	EA	15
		PAFZZ	5305-00-059-4553	MS-35190-238	96906	SCREW FH 6-32 x 1/2 LG	EA	12
		XBFZZ		138127E	96182	SWITCH, PUSH BUTTON, UCINITE CO. NEWTONVILLE MASS	EA	1
		XBFZZ		90E A2C2-F3J1(R) L1 N1	96182	SWITCH, TELLITE, UCINITE	EA	45
		XBFZZ		117-210-101	79405	CIRCUIT BREAKER	EA	1
		XBPHH		LEAD-D-33175-GP-2	21617	CIRCUIT BOARD ASSY (-60VDC)	EA	3

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(1) ILLUSTRATION (A) FIG NO.	(1) ILLUSTRATION (B) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) UNIT OF MEAS	(8) QTY INC IN UNIT
						GROUP: 090301 CIRCUIT BOARD ASSY (60VDC) (P/N LEAD-D-33164)		
		XBHZZ		LEAD-D-33174	21617	PCB, MAJOR	EA	3
		PAHZZ	5961-00-068-4708	5A4	81483	DIODE	EA	135
		PAHZZ	5905-00-758-4724	4410	44655	RESISTOR, CARBON COMP. 470 OHMS, 2W, 5%	EA	90
						GROUP: 0905 H/L DC PATCH PANEL ASSY TRANSMIT (P/N LEAD-D-28565)		
		PAFZZ	5305-00-899-3000	MS-35206-230	96906	SCREW, PH. #0-32 x 1/2 LG STEEL	EA	12
		XBFZZ		MS-24627-10	96906	SCREW, F.H. #4-40 x 1/4 LG., SELF-TAPPING	EA	12
		PAFZZ	5305-00-054-5657	MS-21318-8	96906	SCREW DRIVE #2-3/16 LG	EA	8
		XBFZZ		MS-24629-13	96906	SCREW, F.H., #4-40 x 1/2 LG	EA	4
		XBFZZ		MS-28566-4	96906	SPACER, FIBER, #2335	EA	4
		PAFZZ	5305-00-984-7361	MS-35191-270	96906	SCREW, F.H., #10-32 x 3/8 LG	EA	6
		PAFZZ	5310-00-081-8087	MS-21044-N06	96906	ELASTIC STOP NUT #6-32	EA	7
		XBFZZ		MS-35190-222	96906	SCREW, F.H., #4-40 x 5/16 LG	EA	22
		PAFZZ	5310-00-209-1366	MS-35335-58	96906	LOCK WASHER, #6 EXT. TEETH	EA	96
		PAFZZ	5305-00-984-4988	MS-35206-228	96906	SCREW, R.H., #6-32 x 3/8 LG	EA	96
		PAFZZ	5935-00-194-3079	LEAD-D-28566-2	21617	JACK, 23PC	EA	48
		PAFZZ	5935-00-106-1273	LEAD-D-28566-1	21617	JACK, 24O-C	EA	48

APPENDIX F

OPERATION AND MAINTENANCE OF SOLA CVDC POWER SUPPLY TYPE 28-1561-2

F-1. General Description

The SOLA CVDC Power Supply Type 28–1561–2 is a regulated constant voltage power supply which is designed to furnish regulated dc voltage. Within the limits of the specifications, this regulated supply will deliver regulated voltage despite changes in input line voltage, line frequency, load impedance and temperature as described in the specification limits.

The power supply consists of a constant voltage transformer (described in greater detail under principles of operation), a rectifying means and a filter circuit. The transformer not only converts the incoming line voltage to the desired level, but also is the regulating means. The rectifiers, by use of conventional circuitry, convert the ac to dc. The filter circuit reduces the magnitude of the ripple to the desired specification level.

The output ripple at full load and nominal input voltage is less that 1% RMS. The nominal output voltage tolerance is ±1% at nominal input voltage and full load. The output voltage is regulated to ±1% over an input line variation of 100 to 130 volts RMS.

The power supply shall not be operated in an ambient of greater than 50°C or stored at a temperature greater than 85°C.

F-2. Principles of Operation (Figure F-1).

The heart of the regulator is the constant voltage transformer T1. The con&an&voltage transformer has a magnetic core structure different from convention transformers. It has a magnetic shunt with a fixed air gap interposed between the primary and secondary windings. The secondary winding is shunted by fixed ac capacitor Cl. Upon application of primary voltage, the secondary voltage increases to the point at which that portion of the magnetic core directly under the secondary winding approaches saturation due to the capacitative load connected across the secondary winding.

As the core approaches saturation, it cannot carry much additional magnetic flux, and the increase in secondary voltage is less than any proportional increase in primary voltage. Thus, a condition *of relative stabil*ity of secondary voltage is reached. Over the range of specified primary voltage. the core under the secondary winding is magnetically saturated, and the voltage of the secondary changes very little for this range of primary voltage. Due to the magnetic shunt between the primary and secondary windings, that part of the core under the primary is not saturated.

To equalized the small effect of increasing primary voltage on these secondary, a compensating coil is wound over the primary coil and is connected in series with the secondary load circuit, but out of phase with the secondary. Thus, when the primary voltage increases beyond the design voltage, the voltage in the compensating coil also increases, but since it is out of phase with the secondary voltage, it subtracts from the secondary voltage an amount equal to the slight increase induced in the secondary winding by the increase of primary voltage. Likewise, when the primary voltage decrease, the compensating coil voltage decreases in proportion to the primary voltage, and subtracts from the secondary voltage. The design is such that the vector sum of the compensating coil voltage and the secondary voltage is practically constant throughout the design range of input voltage.

When the power supply is overloaded in excess of its rated load, a point is reached where the output voltage drops to approximately zero. Due to the magnetic shunt in the transformer, its output current is limited. With excessive load current, the effect of the ac capacitor is lost; secondary flux opposes primary flux to demagnetize the secondary core leg, and the output voltage collapses, limiting short-circuit current to approximately 150 percent of full load.

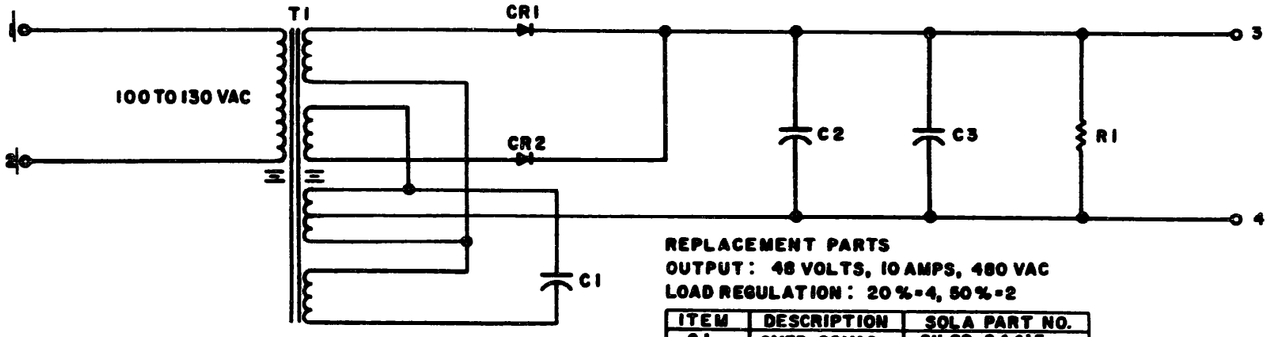
F-3. Maintenance

This regulated power supply is designed for continuous, unattended operation. Little or no maintenance is required. If due to a component failure maintenance is required, be sure to shut off line voltage prior to performing any repair operations. Discharge any residual charge on the dc filter capacitors by connecting a jumper across the output terminals or across the dc capacitor terminals, or allow at least one minute to elapse after shutting off line voltage to permit the capacitors to discharge. The energy stored in these capacitors could be harmful or fatal to personnel.

F-4. Circuit Analysis.

The chart below lists some possible malfunctions which may be encountered in the use of the supply and **their corresponding cause and remedy.**

Symptom	Probable trouble	Corrective action
Output voltage too high	a. Load current less than minimum rated load b. Line frequency too high	a. Correct load current b. Correct primary lines frequency
Output voltage too low	a. Load current greater than maximum rated load b. Line voltage too low c. Line frequency too low d. Defective dc filter capacitor e. Defective ac capacitor f. Defective rectifier	a Reduce load current b Increase primary voltage c. Correct primary power frequency d. Replace e. Replace f. Replace
No output voltage	a. Open connection b Open transformer winding	a. Check all connection and repair bad connections b. Replace transformer



ITEM	DESCRIPTION	SOLA PART NO.
C1	6MFD 66VAC	211-02-24415
C2,C3	23KMFD 55V	215-02-24864-05
CR1,CR2	IN3210	267-17206-03
T1		8-1628-1
R1	500Ω 20W	219-6992

Figure F-1. Sola CVDC Power **Supply,** *Type 28-1561-2.*

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

SOMETHING WRONG WITH THIS MANUAL?

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Commander
Stateside Army Depot
ATTN: AMSTA-US
Stateside, N.J. 07703

DATE 10 July 1975

PUBLICATION NUMBER	DATE	TITLE
TM 11-5840-340-12	23 Jan 74	Radar Set AN/TPC-76

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PAGE NO.	PARAGRAPH	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 [illegible] 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.

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER
SSG I. M. DeSpiritof 999-1776

SIGN HERE: SSG. I.M. DeSpiritof

DA FORM 1 AUG 74 2028-2

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HISA 1686-75

TEAR ALONG DOTTED LINE

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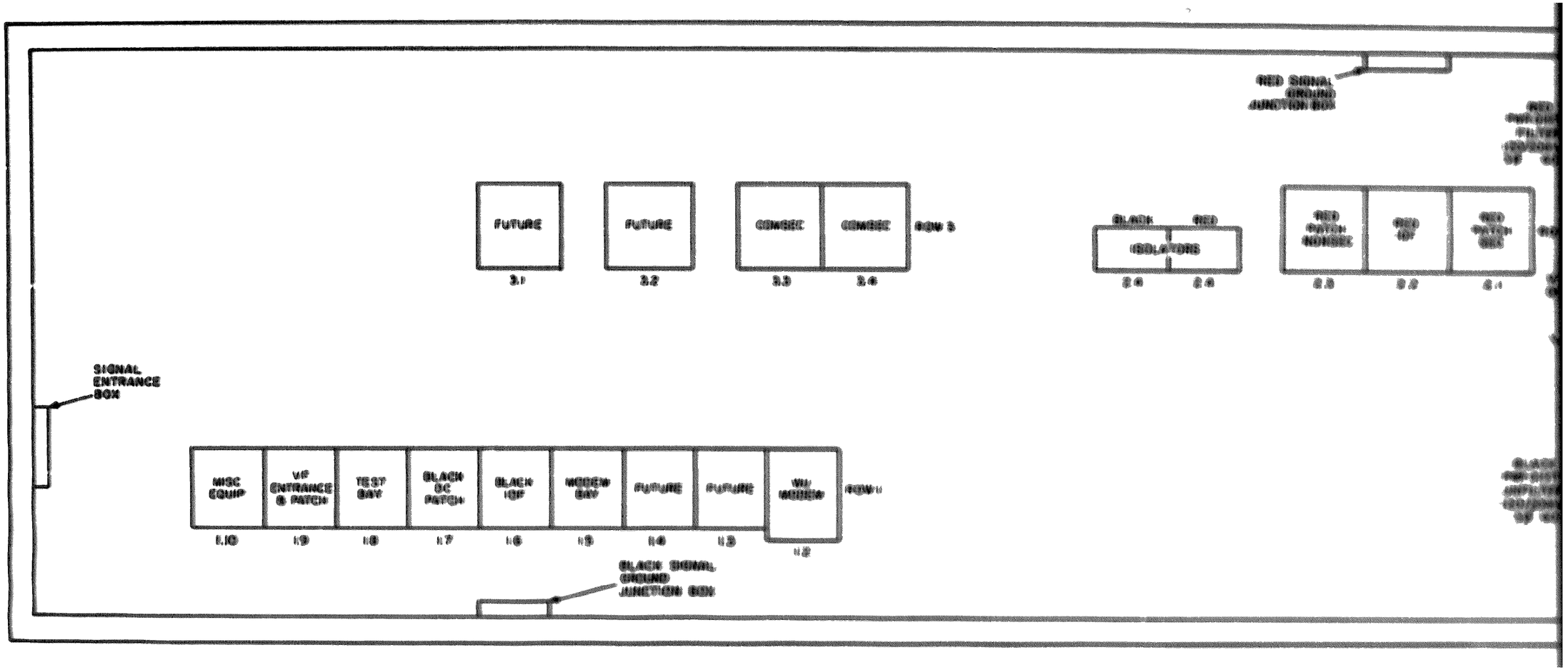
RED SIGNAL GROUND JUNCTION BOX
FUTURE
3.1
FUTURE
3.2
COMSEC
COMSEC
3.3
3.4
BLACK
RED
ISOLATORS
RED PATCH MONSEC
RED I/F
RED PATCH SEC
SIGNAL ENTRANCE BOX
MISC EQUIP
VF ENTRANCE & PATCH
TEST BAY
BLACK DC PATCH
BLACK I/F
MODEM BAY
FUTURE
FUTURE
WJ MODEM
BLACK SIGNAL GROUND JUNCTION BOX

Figure FO 1-1

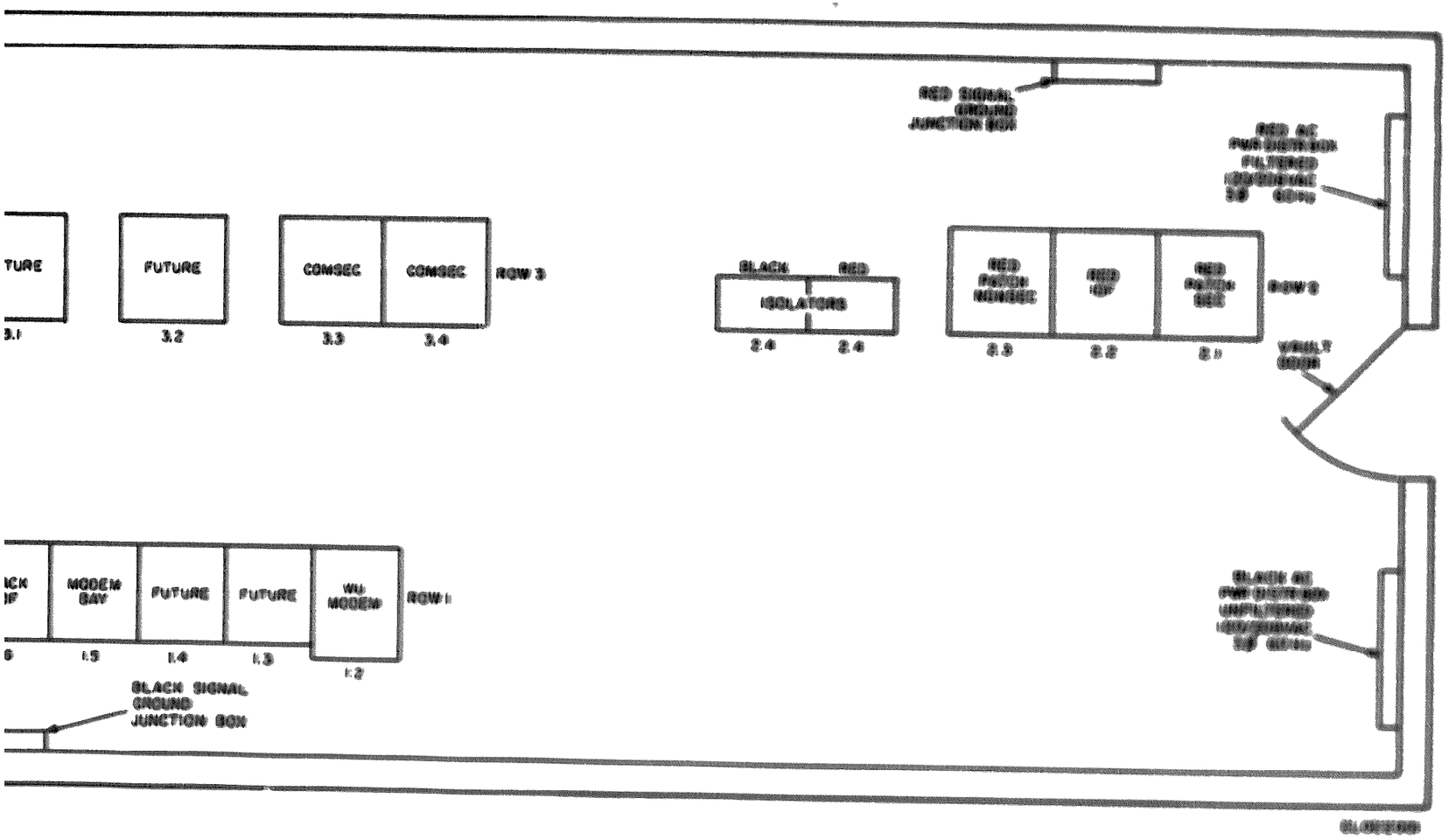

Figure FO 1-1 *Patch and Test Facility Equipment Floor Plan*

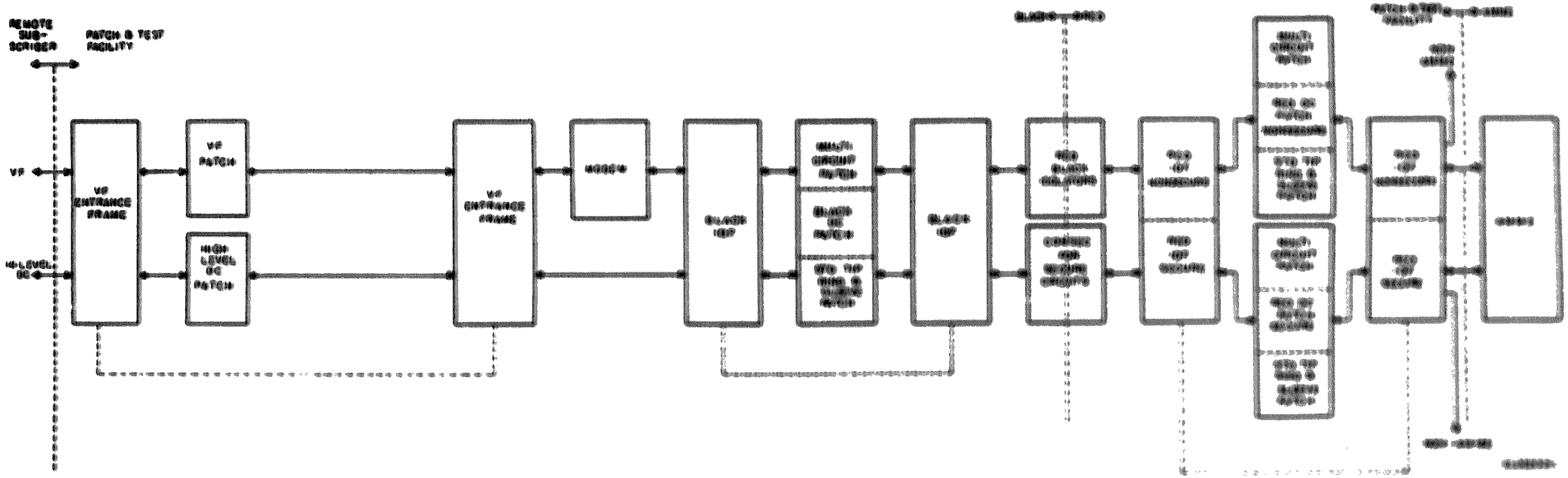
REMOTE SUB-SCRIBER
PATCH & TEST FACILITY
VF
VF ENTRANCE FRAME
VF PATCH
HIGH LEVEL DC PATCH
VF ENTRANCE FRAME

Figure FO 2-1.

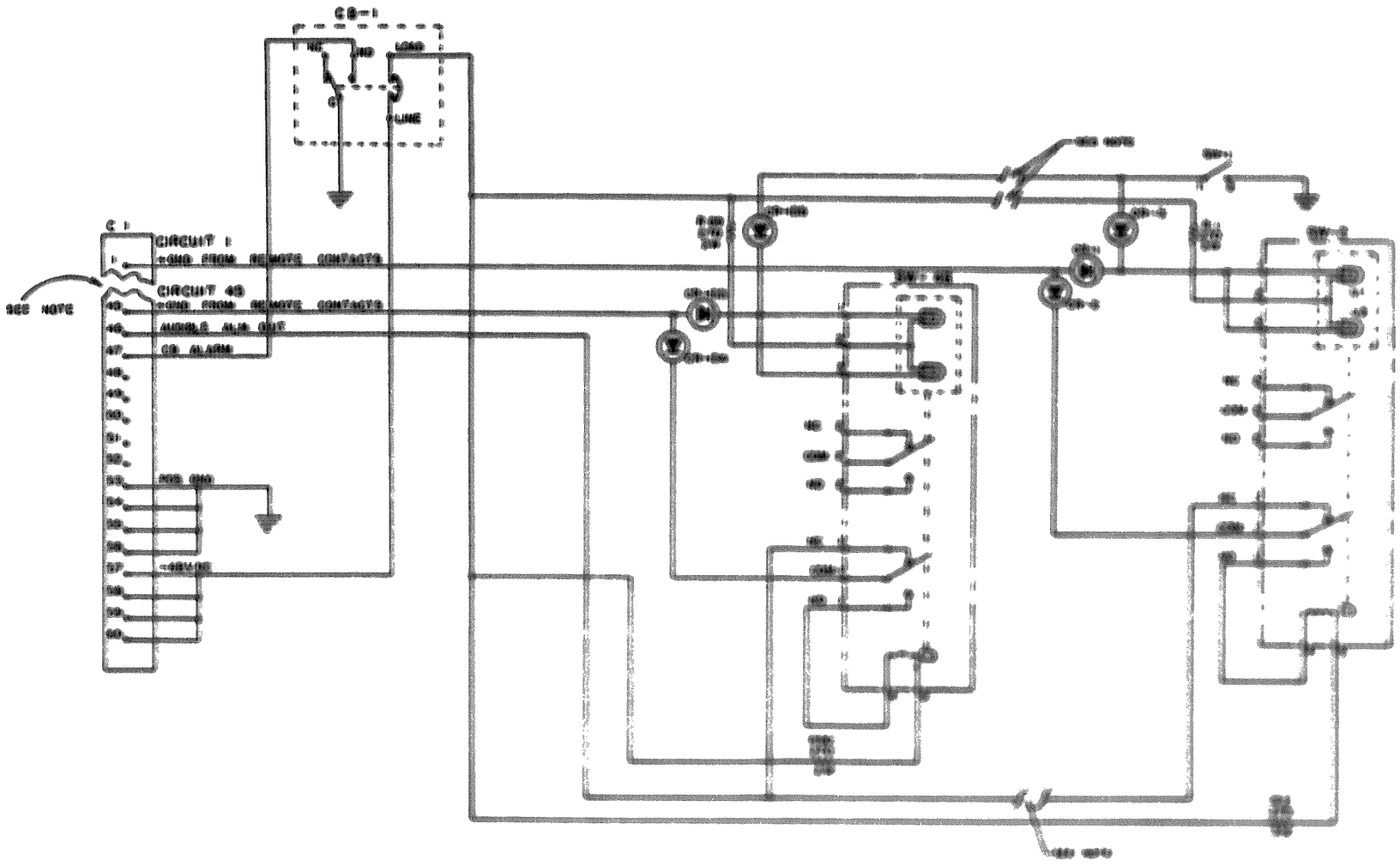
CB-1
LOAD
LINE
CIRCUIT 1
CIRCUIT 46
SEE NOTE
AUDIBLE ALM OUT
CB ALARM

Figure FO 5-2.

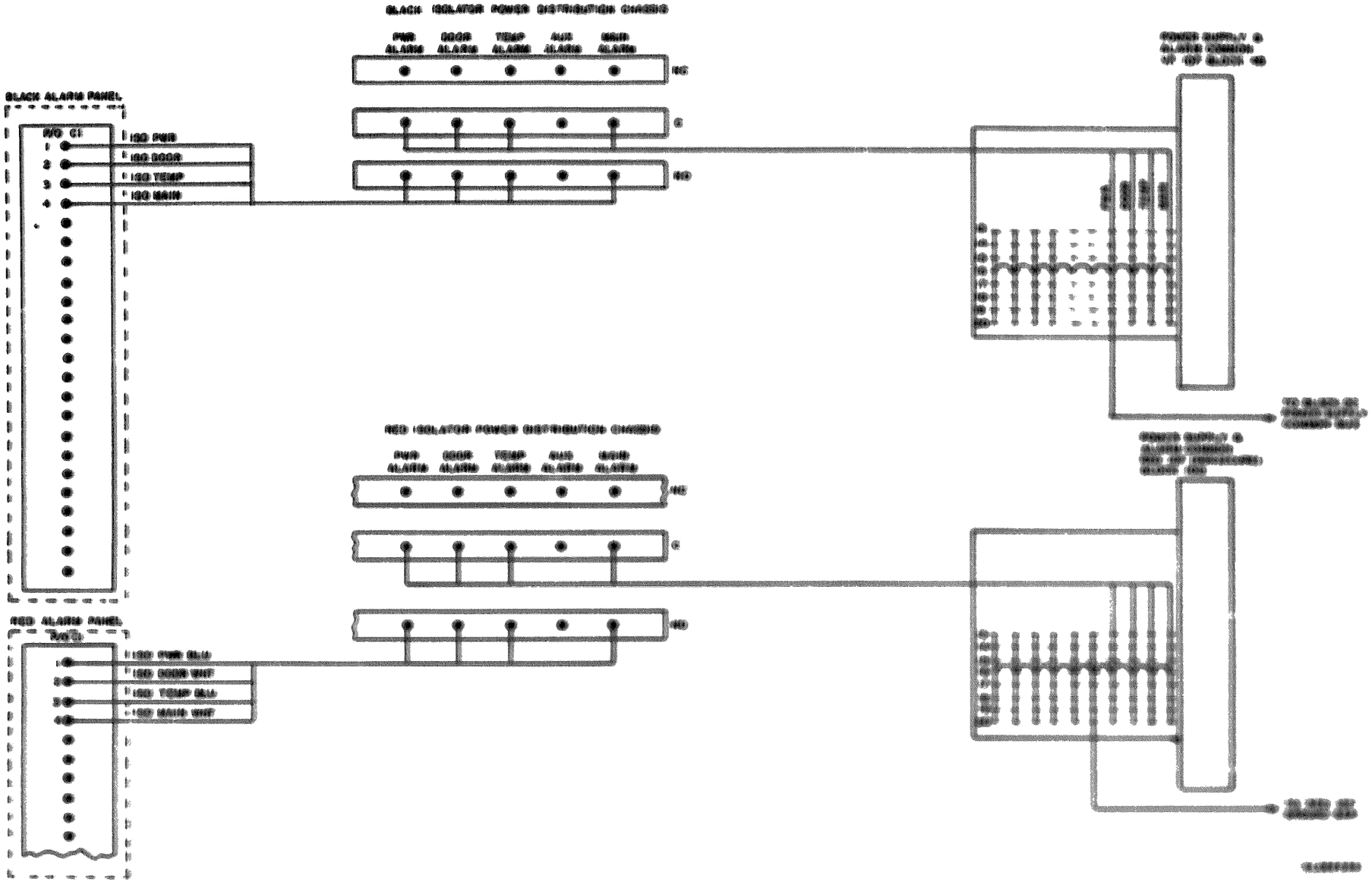

Figure FO 5-3 Alarm System Wiring Diagram

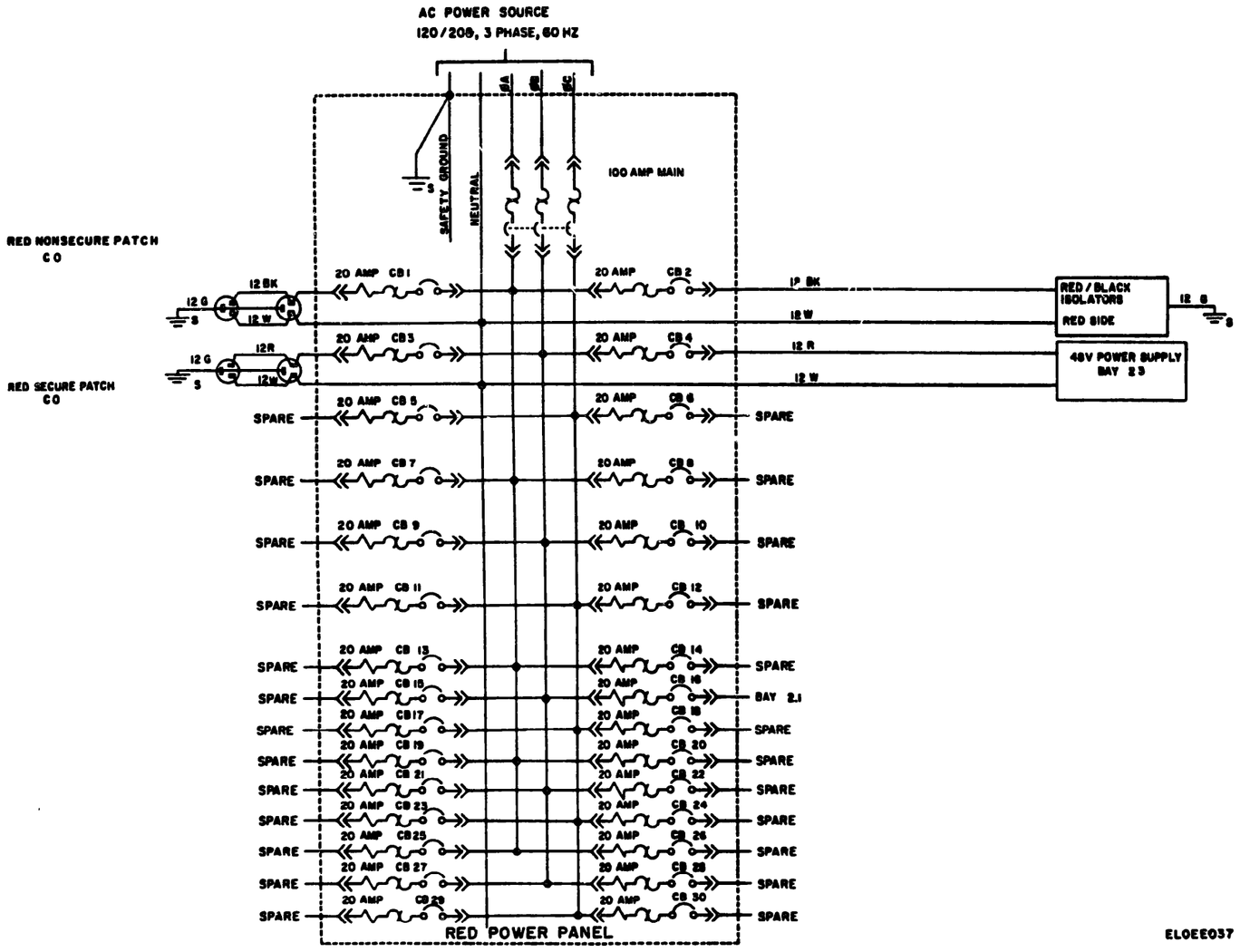

Figure FO 5-4. AD Power (Red) Distribution Diagram.

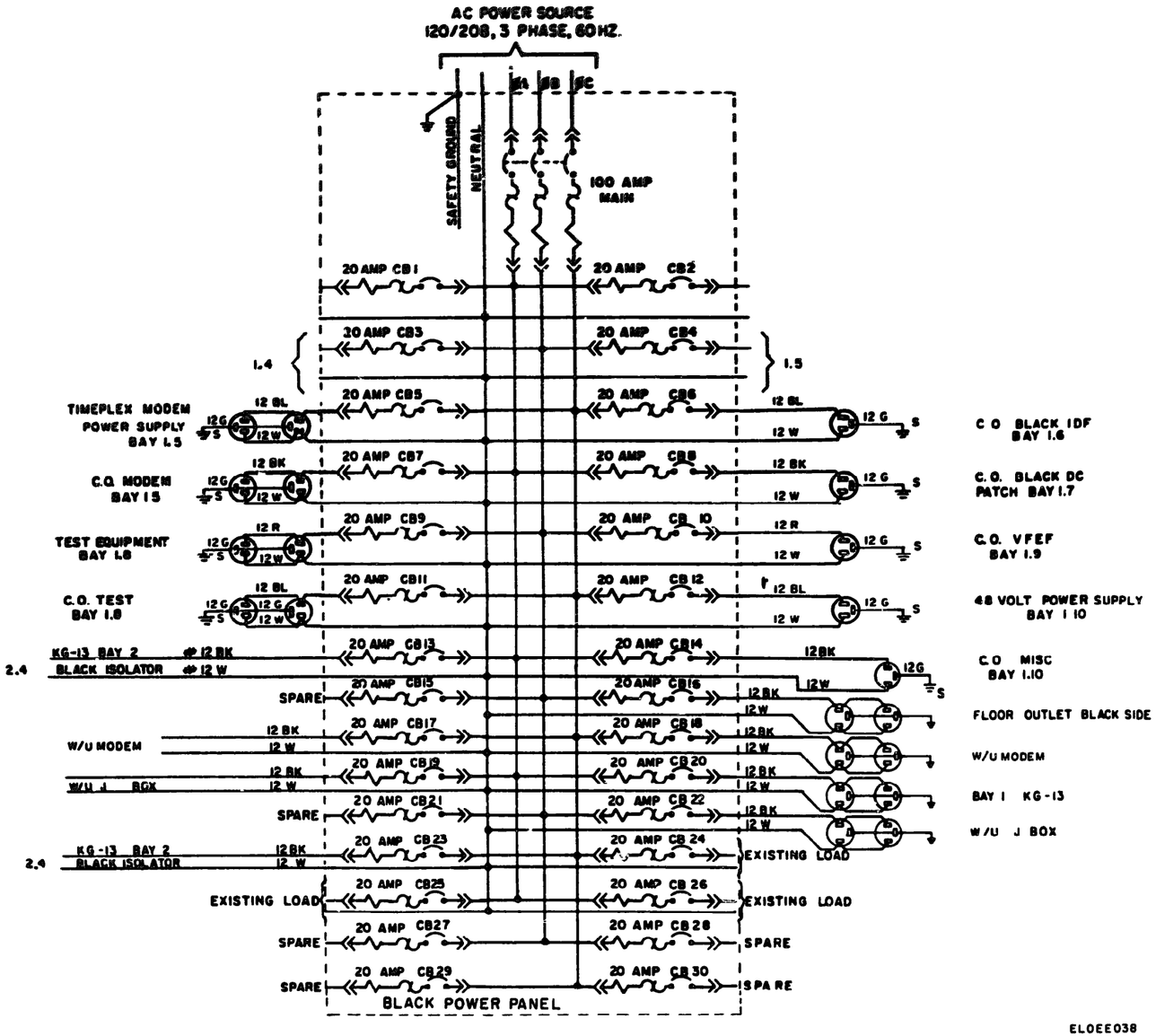

Figure FO 5-5 AC Power (Black) Distribution Diagram

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General, United States Army
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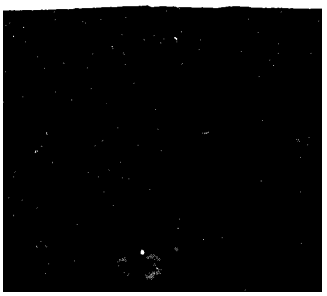

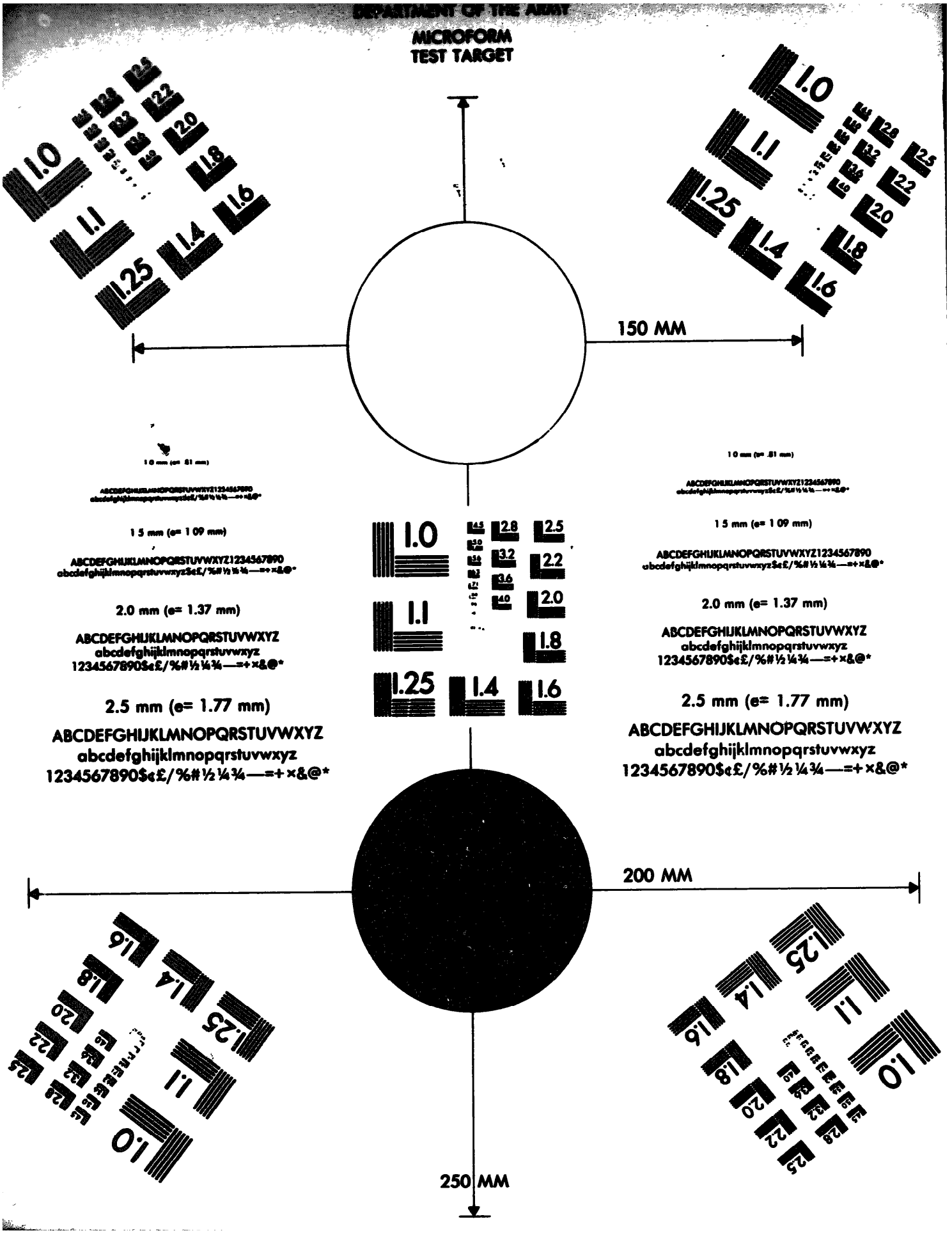
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MICROFORM
TEST TARGET
1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
150 MM
200 MM
250 MM
1.5 mm (e= 1.09 mm)
ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890
abcdefghijklmnopqrstuvwxyz$¢£/%#½¼¾—=+×&@*
2.0 mm (e= 1.37 mm)
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890$¢£/%#½¼¾—=+×&@*
2.5 mm (e= 1.77 mm)
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890$¢£/%#½¼¾—=+×&@*