

**TECHNICAL MANUAL**

**OPERATOR'S AND ORGANIZATIONAL**

**MAINTENANCE MANUAL**

**FOR**

**SWITCHBOARD, TELEPHONE**

**SB-3614 (V)/TT**

**(NSN 5805-01-032-1694)**

This copy is a reprint which includes current  
pages from Changes 1.

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**HEADQUARTERS, DEPARTMENT OF THE ARMY**  
**AUGUST 1977**

TECHNICAL MANUAL }  
 No. 11-5805-695-12 }

HEADQUARTERS  
 DEPARTMENT OF THE ARMY  
 WASHINGTON, DC, 29 August 1977

**OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL  
 FOR**

**SWITCHBOARD, TELEPHONE SB-3614(V)/TT  
 (NSN 5805-01-032-1694)**

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## CHAPTER 1

### INTRODUCTION

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#### Section I. GENERAL

##### 1-1. Scope

a. This manual describes the SB-3614(V)/TT Telephone Switchboard (figure 1-1) and all equipment that comprises each unit. It contains information for installation, operation, and maintenance. Manuals that contain information for associated equipment are listed in appendix A.

b. The maintenance allocation chart is in appendix C. Repair parts and special tools are listed in TM 11-5805-695-20P.

##### 1-2. Indexes of Publications

a. *DA Pam 310-4*. Refer to the latest issue of

DA Pam 310-4 to determine whether there are new editions, changes or additional publications pertaining to the equipment.

b. *DA Pam 310-7*. Refer to DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

##### 1-3. Forms and Records

a. *Reports of Maintenance and Unsatisfactory Equipment*. Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38-750 (United States Army)

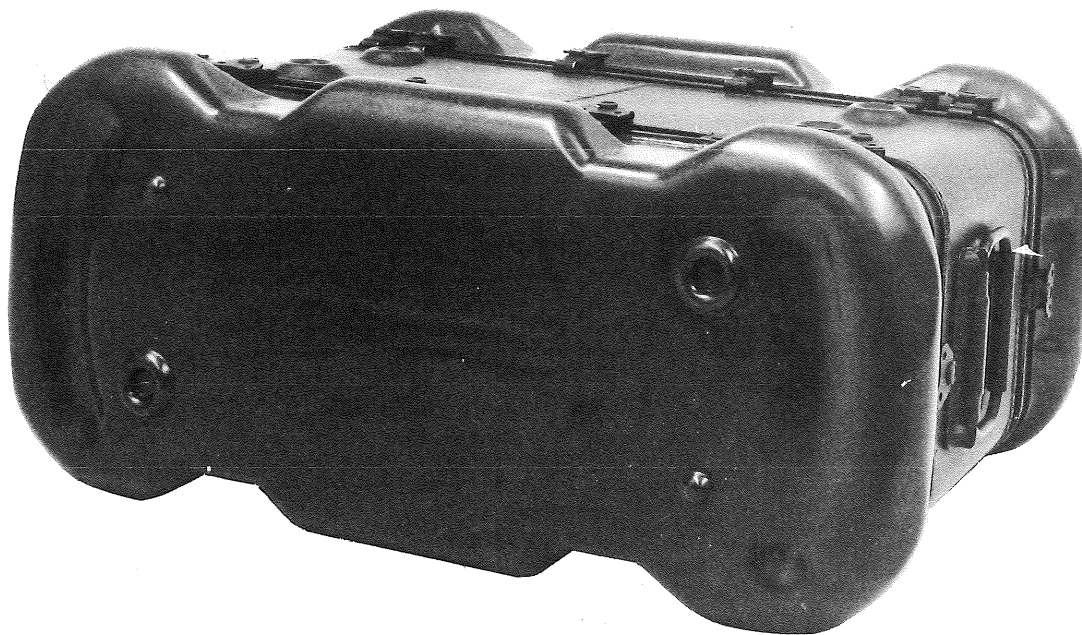


Figure 1-1. Switchboard, Telephone, SB-3614(V)/TT.

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and current directives (United States Marine Corps).

b. *Report of Packaging and Handling Deficiencies.* Fill out and forward DD Form 6 (Packaging Improvement Report) as prescribed in AR 700-58/NAVSUPINST 4030.29/AFR 71-13/MCO P4030.29A and DLAR 4145.8.

c. *Discrepancy in Shipment Report (DISREP) (SF 361).* Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33B/AFR 75-18/MCO P4610.19C and DLAR 4500.15.

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

If your equipment needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL-ME-MQ, Fort Monmouth, New Jersey 07703. We'll send you a reply.

**1-5. Equipment Serviceability Criteria (ESC)**

(Not applicable).

Table 1-1. *Semiautomatic Switchboard (30 Terminations)*

Item	Description	Part number	Quantity
1	Case	755090A0697	1
2	Front cover	755090A0473	1
3	Rear cover	755090A0484	1
4	Terminal box assembly	755090A0667	1
5	Power Supply	755090A0700	1
		755090A0500	1
6	Headset	H-182( )/PT	1
7	Power cable assembly	655090A0474	2
8	Cable assembly	755090A0408	1
9	Ground rod cable	755090A0671	1
10	Ground rod	5975-00-187-5304	0
		(not furnished)	
11	Type I termination PCB*	755090A0372	Up to 15 maximum total, as required
12	Type II termination PCB	755090A0399	
13	Matrix link/test tone PCB	755090A0388	1
14	P+/P- driver PCB	755090A0301	2
15	Analog gate PCB	755090A0337	2
16	Main timer PCB	755090A0365	1
17	Processor PCB	755090A0383	1
18	Random access memory PCB	755090A0305	1
19	Read only memory PCB	755090A0351	1
20	Interface PCB	755090A0332	1
21	Crosspoint PCB	755090A0325	4

\*Printed circuit board.

**1-6. Destruction of Army Electronics Materiel.**

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

**1-7. Administrative Storage**

Refer to the unpacking and checking paragraphs and repack the equipment for storage utilizing the same materials and inspection.

**1-8. Items Comprising an Operable Equipment.**

a. *Semiautomatic Switchboard (30 Terminations).* The items comprising a 30-termination semiautomatic switchboard are given in table 1-1.

Table 1-2. *Automatic Switchboard (30 Terminations)*

Item	Description	Part number	Quantity
1	Case, equipment	755090A0697	1
2	Front cover	755090A0473	1
3	Rear cover	755090A0484	1
4	Terminal box assembly	755090A0667	1
5	Power supply	755090A0700	1
6	Headset	H-182( )/PT	1
7	Power cable assembly	755090A0474	2
8	Cable assembly	755090A0408	1
9	Ground rod cable	755090A0671	1
10	Ground rod	5975-00-187-5304	0
		(not furnished)	
11	Type I termination PCB	755090A0372	Up to 15 maximum total, as required. (Type III is restricted to 9 maximum.)
12	Type II termination PCB	755090A0399	
13	Type III termination PCB	755090A0315	
14	Matrix link PCB	755090A0388	1
15	P+/P- driver PCB	755090A0301	2
16	Analog gate PCB	755090A0337	3
17	Main timer PCB	755090A0365	1
18	Processor PCB	755090A0383	1
19	Random access memory PCB	755090A0305	1
20	Read only memory PCB	755090A0351	1
21	Interface PCB	755090A0332	1
22	Crosspoint PCB	755090A0325	4
23	DTMF receiver PCB*	755090A0320	3
24	Tone generator PCB	755090A0310	1
25	Elect. alterable NVM-A PCB	755090A0378	1
26	Elect. alterable NVM-B PCB	755090A0393	1

\*Required only if switchboard interfaces with DTMF subsets or 4-wire trunks.

b. *Semiautomatic Switchboard (60 Terminations)*. Two sets of equipment listed in table 1-1 plus four additional crosspoint cards are required for 60-termination semiautomatic switchboard. Item 19 (table 1-1) is not required for slave switchboard.

c. *Semiautomatic Switchboard (90 Terminations)*. Three sets of equipment listed in table 1-1 plus four additional crosspoint cards are required for the 90-termination semiautomatic switchboard. Item 19 (table 1-1) is not required for slave switchboards.

d. *Automatic Switchboard (30 Terminations)*.

The items comprising a 30-termination automatic switchboard are given in table 1-2.

e. *Automatic Switchboard (60 Terminations)*. Two sets of equipment listed in table 1-2 plus four additional crosspoint cards are required for the 60-termination automatic switchboard. Item 20 (table 1-2) is not required for slave switchboards.

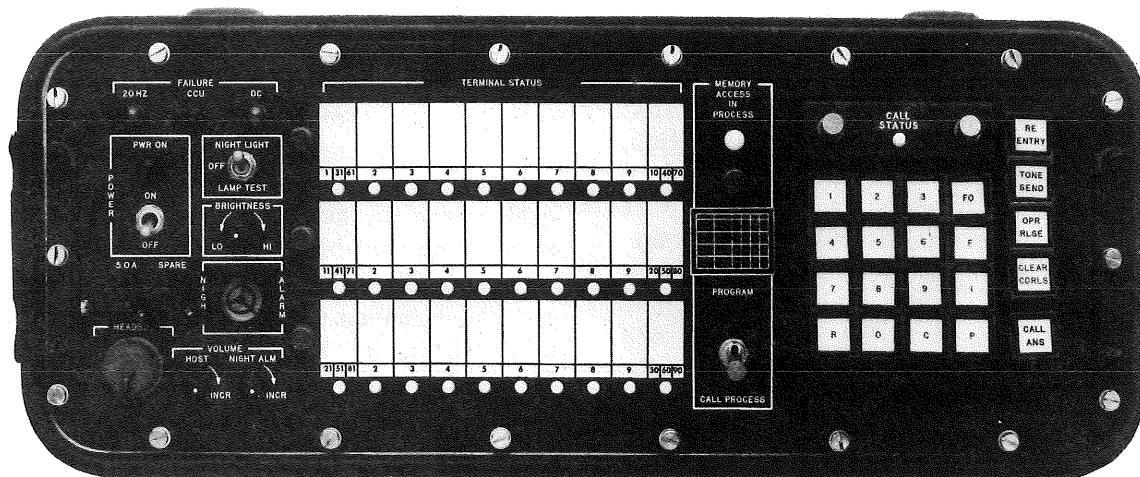
f. *Automatic Switchboard (90 Terminations)*. Three sets of equipment listed in table 1-2 plus four additional crosspoint cards are required for the 90-termination automatic switchboard. Item 20 (table 1-2) is not required for slave switchboards.

## Section II. DESCRIPTION AND DATA

### 1-9. Purpose and Use

a. The SB-3614(V)/TT (figures 1-1 and 1-2) is a tactical, ruggedized, 30-terminal automatic switchboard. It provides rapid, cordless service to 2-wire common battery signaling (CBS) lines, 20-Hz ringdown (RD) lines or trunks, common bat-

tery dial pulse or DTMF lines, and 4-wire tone signaling trunks. The basic switchboard may be operated as a 30-terminal single switchboard or may be connected with additional switchboards to form a 60- or 90-line system. The operator monitors, answers, initiates, and extends calls



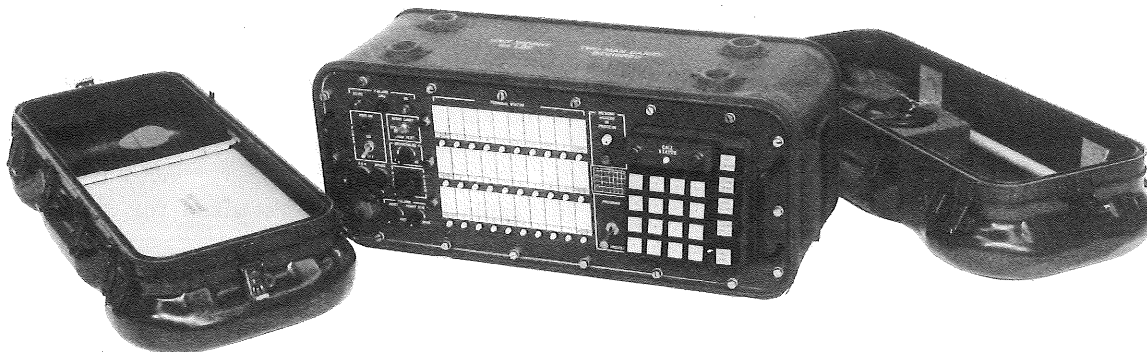
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Figure 1-2. Front Panel.

through actuation of a four-by-four pushbutton keysender and other functional pushbuttons. Any connection can be broken down manually, through operation intervention and action, or automatically, through a subscriber going to an onhook condition.

b. Up to 18 of the terminals may be connected as 4-wire DTMF tone signaling terminals or trunks. (See example in figure 1-11).

c. The SB-3614(V)/TT provides fully automatic operation with DTMF touch tone subsets and 2- and 4-wire automatic trunks. It also provides limited automatic operation with rotary dial pulse subsets. In the case of common battery signaling or ringdown line and trunk, the SB-3614(V)/TT provides call extension service via the operator.



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*Figure 1-3. Case and Covers.*

### 1-10. Equipment Description

a. The switchboard (figure 1-3), with its front and rear covers in their transit configuration, contains, in addition to the switchboard itself, an operator's headset, a terminal box for field wire WD-1/TT connection, an SB-3614(V)TT interconnection cable for operation in a stacked configuration, two battery cables, and a ground cable. Accessory Maintenance Kit, Telephone MK-1823 (V)/TT (figure 1-10) is available for storage for 15 additional printed circuit boards, additional light bulbs and fuses (running spares), and a card extractor.

b. Cover attachment and gasket compression are accomplished by engagement of cam-action latches. Prior to removal of covers, the pressure

relief valve located on the side of the case must be depressed. Space in the front cover is used to store the operator's headset, while space in the rear cover is used to store the interconnection and power cables, the ground rod, and the ground cable. Each of these items is installed in foamed depressions and held in place with straps.

c. The SB-3614(V)/TT front panel (figure 1-4) is attached to the case with thumbscrews located along its periphery and is removed with the aid of a handle on each side. When the panel is unfastened, the hinge mechanism allows the panel to swing upward and lock in the position shown in figure 1-5, thus permitting continued system operation.

d. Panel controls and indicators are located

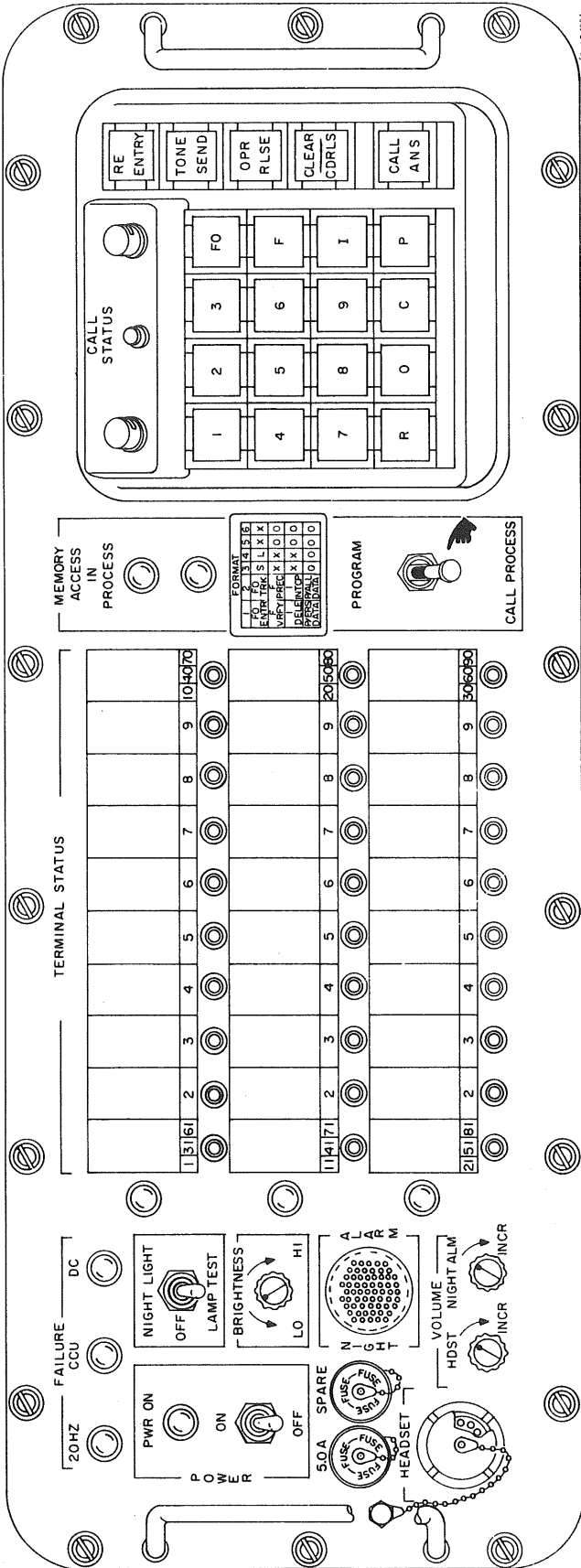
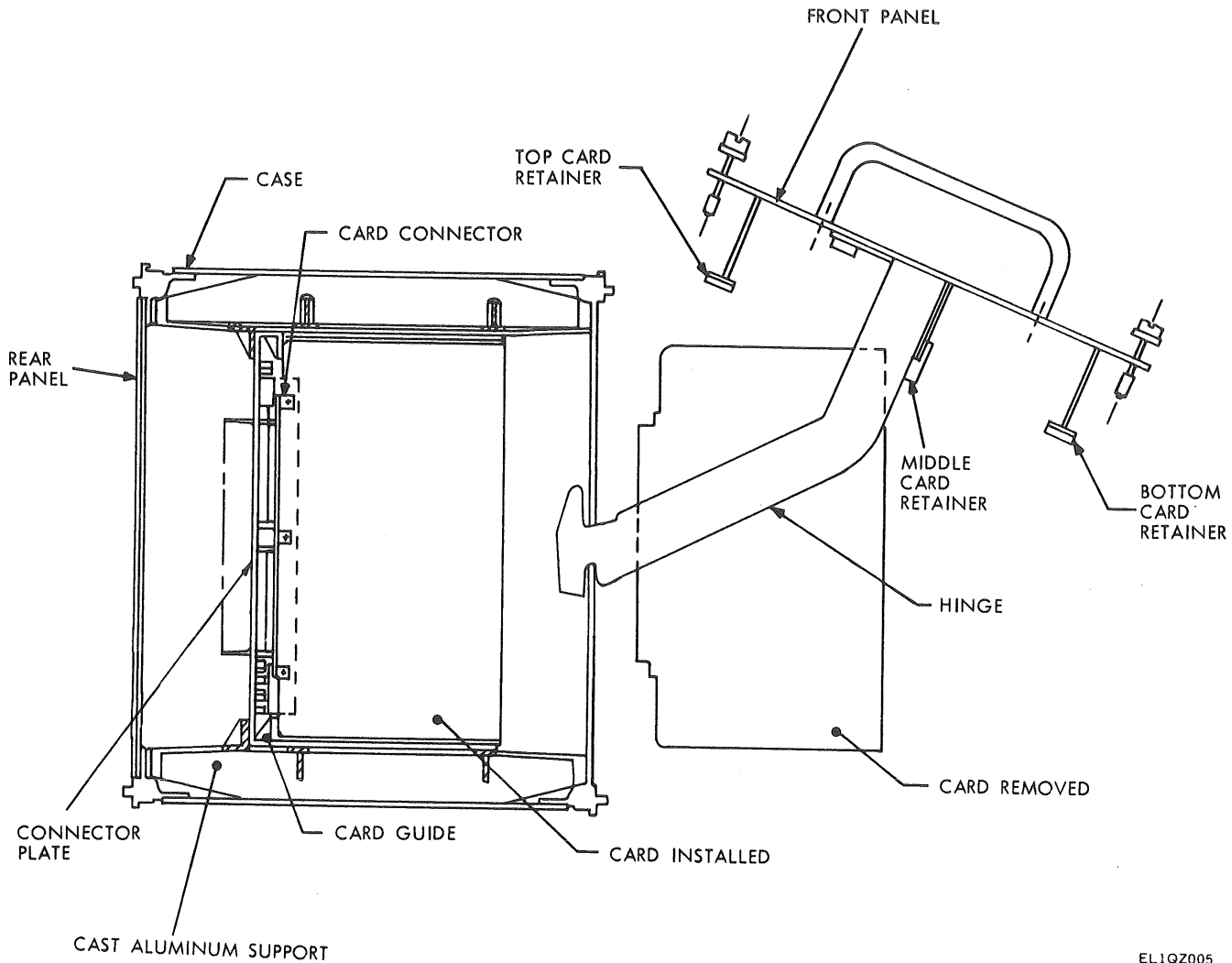


Figure 1-4. Front Panel Controls.





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Figure 1-5. Front Panel, Open—Cross Section.

such that set-up and other seldom-used items are located on the left side, terminal status items in the center, and operator's keyset and associated items on the right side.

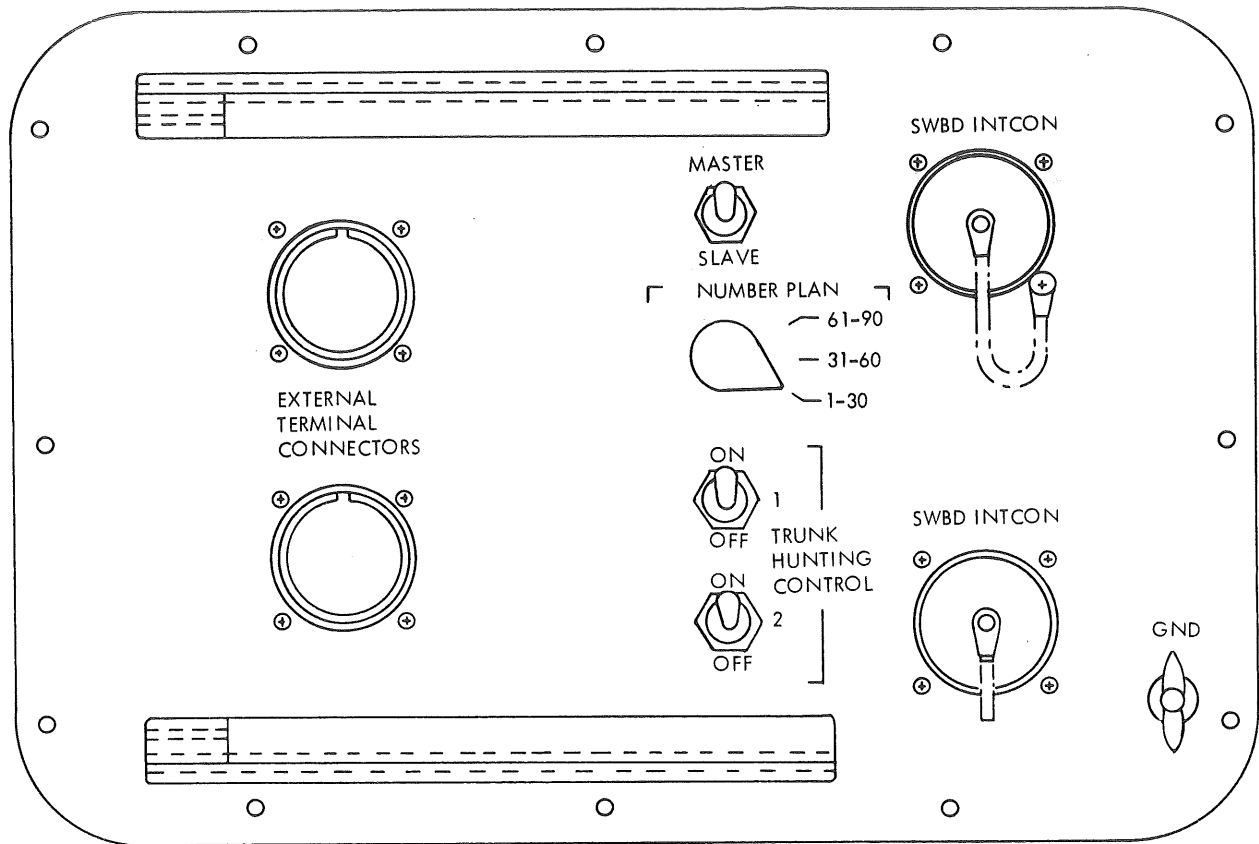
e. The left side of the panel contains failure indicators for the 20-Hz ring generator, common control unit (CCU) and DC power source, power on/off switch and status indicator, switch for night light illumination and lamp test, fuse and spare fuseholder, headset connector, night alarm, and volume controls for the headset and night alarm.

f. The center of the panel contains the terminal status lamps and their associated marking strips. The lamps are arranged in three rows of ten and are correspondingly marked 1 to 30 with provision for alternate marking of 30 to 60 or 60 to 90. Night lights are located on the left side of each marking strip.

g. The nonvolatile memory access controls are located to the right of the terminal status lamps. Access to the memory is controlled by a lever-locking toggle switch that prevents accidental switch activation. Memory access is acknowledged by illumination of a lamp. Once the memory is accessed, the program can be initiated using the format provided on the attached plate.

h. The four-by-four keysender is located on the right side of the panel and is slanted for ease of operation. Adjacent to the keyset matrix are the operator function controls, night lights and indicators.

i. The rear panel-mounted components shown in figure 1-6 include two connectors (SWBD INT-CON) for switchboard expansion, two connectors (EXTERNAL TERMINAL CONNECTORS) for



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Figure 1-6. Rear Panel.

the terminal box, a MASTER/SLAVE toggle switch, two trunk hunting toggle switches (TRUNK HUNTING CONTROL), and a rotary NUMBER PLAN switch. The panel also contains two slides for mounting the terminal box.

*j.* The SB-3614(V)/TT electrical components are mounted and interconnected on printed circuit board assemblies. All components, including the 76-pin connector, are mounted on the same side of the board with leads protruding through plated holes. The boards are conformal-coated with a polyurethane compound to provide protection against moisture, dust, and other contaminants.

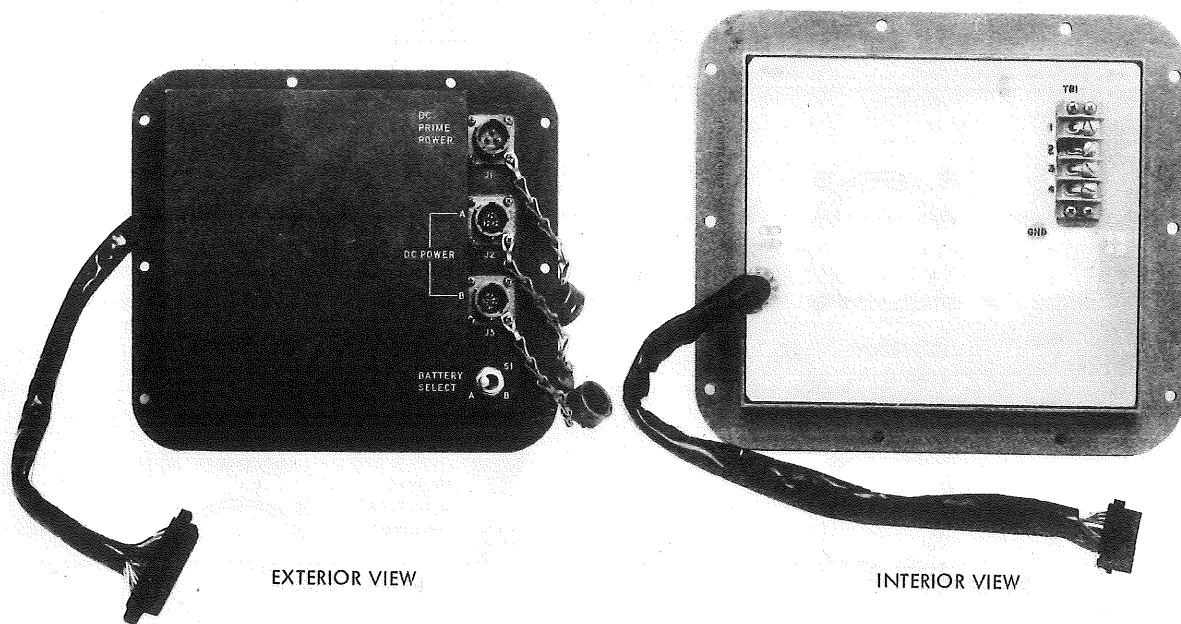
*k.* The power supply (figure 1-7) is mounted on the rear flange of the SB-3614(V)/TT case adjacent to the rear panel. There are three input power connectors located on the external surface, one for prime power and two for battery power. A battery select toggle switch enables switching between batteries. The internal face of the supply contains a connector into the switchboard.

*l.* The terminal box (figure 1-8) is used to connect the individual field telephone wires to

the SB-3614(V)/TT. It contains 100 insulated binding posts for telephone wire connection, high voltage surge arrestors to protect the switchboard and operating personnel, ground lug, and cables to connect the terminal box to the switchboard.

*m.* The terminal box (figure 1-9) can be mounted to the rear panel in either of two positions. In the storage position, the terminal box is retracted to allow attachment of the rear cover. In the operate position the terminal box is extended to the top edge of the box. In the operational position the box is displaced to the side; thus the rear panel switches and SB-3614(V)/TT interconnect connectors are uncovered.

*n.* The interior of the MK-1823(V)/TT is constructed of closed-cell urethane foam which has slots for 15 printed circuit cards and a card extractor. Running spares are packaged in a section as shown in figure 1-10. The case has a pressure relief valve to relieve differential pressure between the inside and the outside of the case. The valve must be depressed prior to opening.

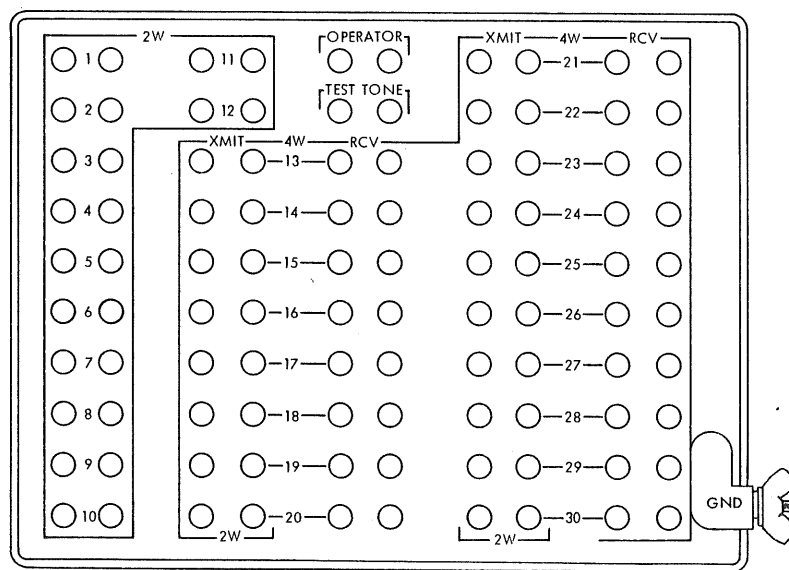


EXTERIOR VIEW

INTERIOR VIEW

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Figure 1-7. Power Supply.



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Figure 1-8. Terminal Panel, Front View.

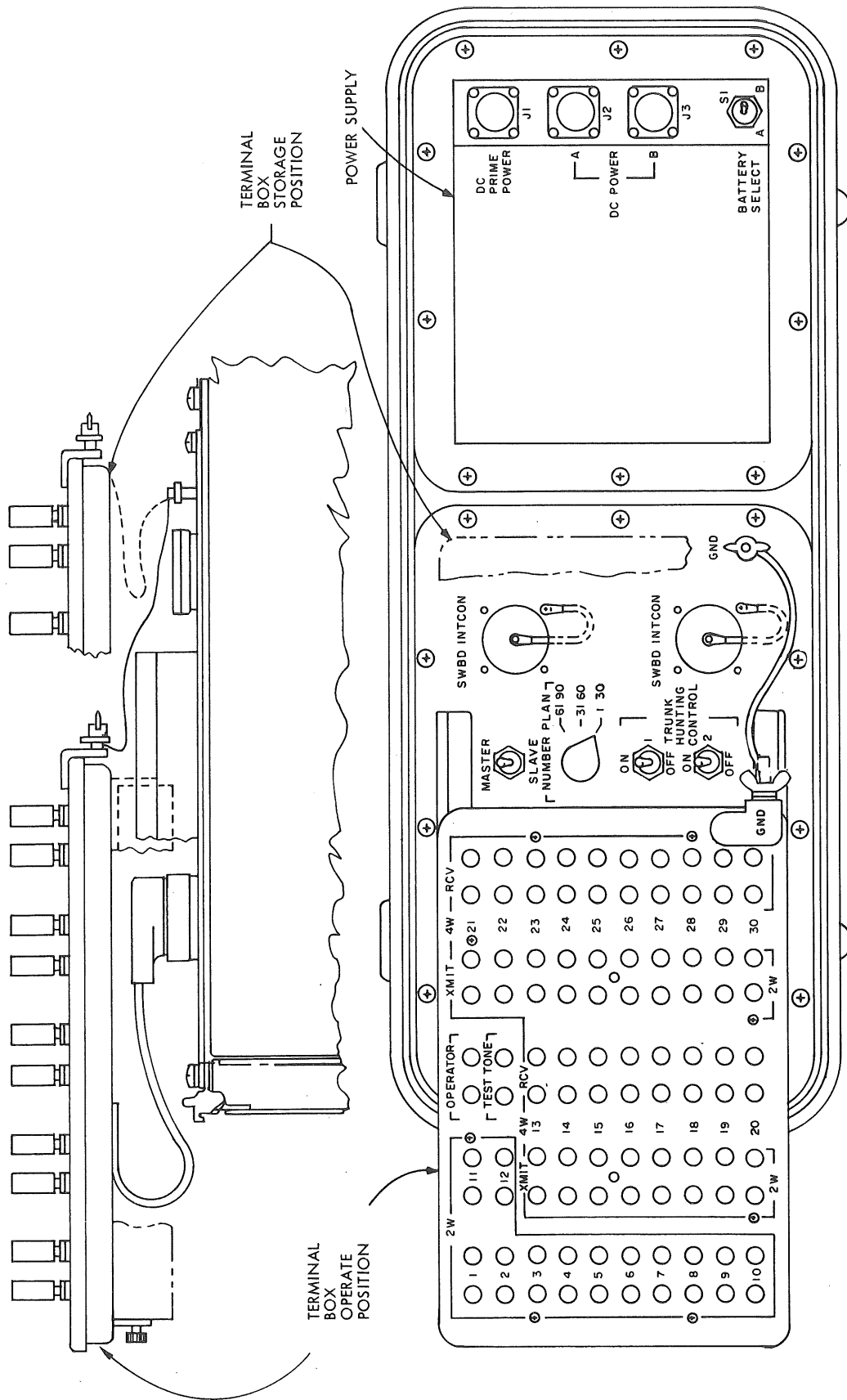
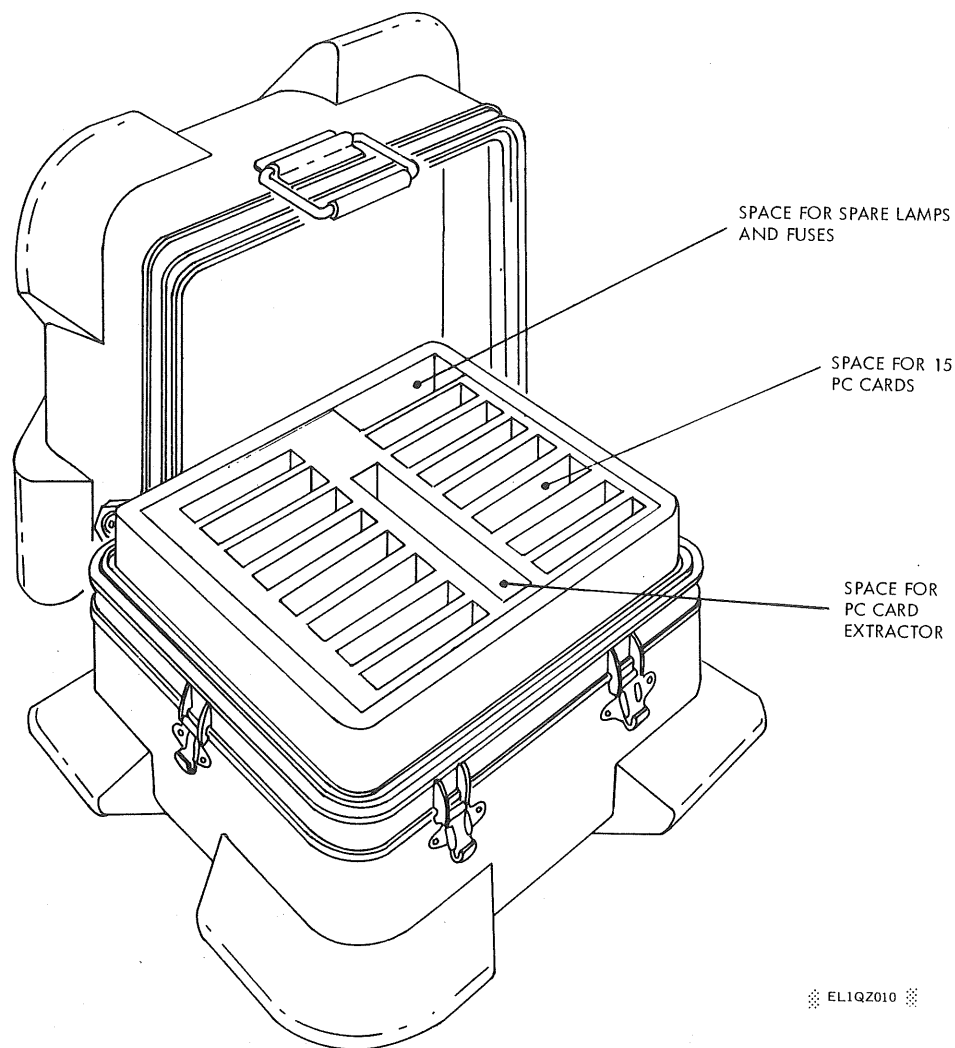


Figure 1-9. Terminal Box Storage and Operate Positions.



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Figure 1-10. Spare Parts Case (Accessory Maintenance Kit, Telephone MK-1823(V)/TT).

### 1-11. Differences Between Models

a. Refer to paragraph 1-8, Items Comprising an Operable Equipment.

b. There are three types of termination PCB cards:

(1) Type I for 2-wire CBS and ringdown subsets and 2-wire trunks.

(2) Type II for common battery dial pulse and common battery DTMF subsets.

(3) Type III for 4-wire trunk operation (for automatic switchboard only).

c. The SB-3614(V)/TT accepts a total of 15 termination cards as shown in figure 2-4. All termination card slots accept type I and type II.

In addition, a predesignated set of nine card slots also accept type III 4-wire trunk cards.

d. The PCB complement of the SB-3614(V)/TT may be regarded as dividing into three sets of cards: termination, basic set, and automatic capability. The card nest is wired to accept all cards. The basic set PCB's, plus mixed termination PCB's, enable the semiautomatic mode, and addition of the automatic capability PCB's enables the automatic mode.

(1) Breakdown of the PCB cards required for the semiautomatic mode as given in table 1-1.

(2) Breakdown of the PCB cards required for the automatic mode is given in table 1-2.

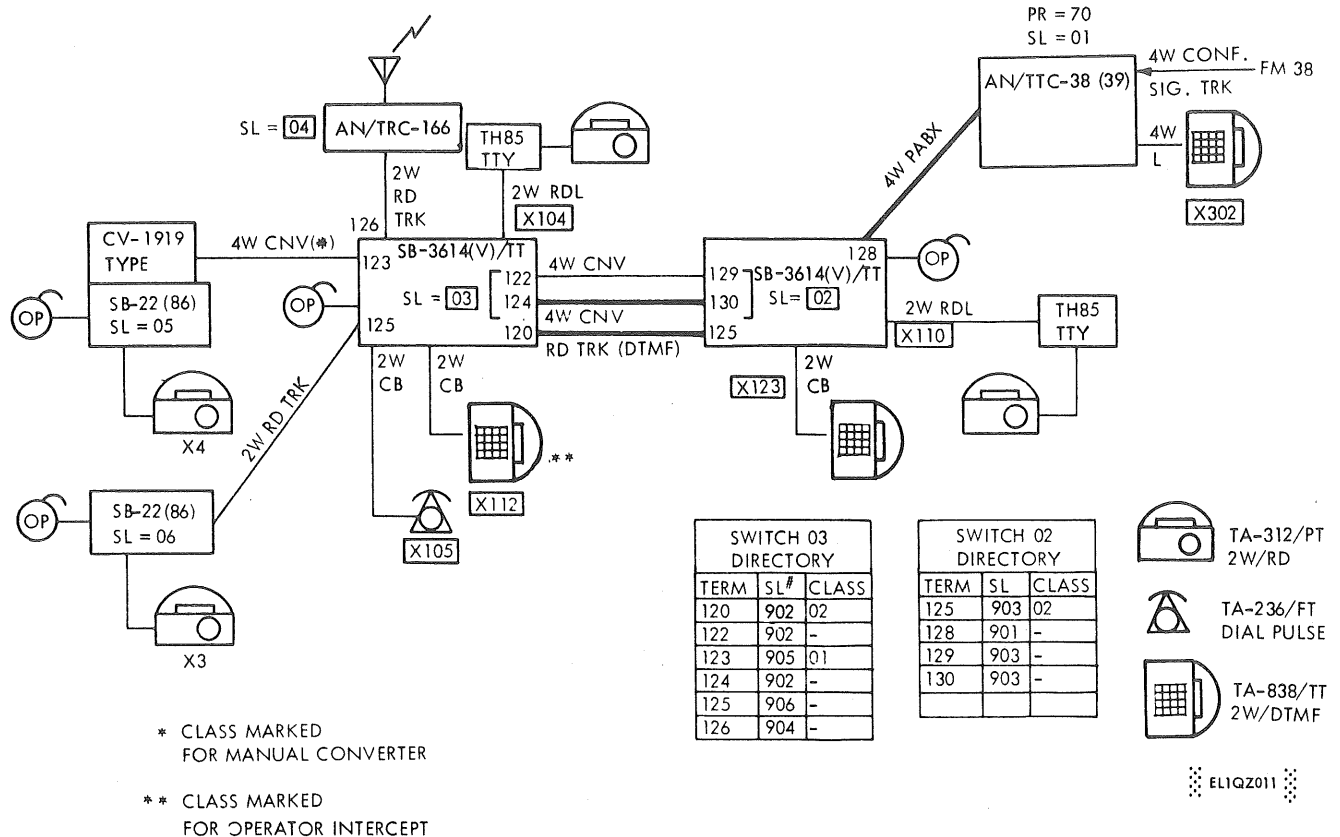


Figure 1-11. Typical Operating Application of SB-3614(V)/TT.

**1-12. System Application**

The SB-3614(V)/TT Telephone Switchboard is capable of interfacing with various compatible equipments. Figure 1-11 shows a comprehensive operating configuration. Refer to paragraph 2-2 for a listing of all compatible equipment and to appendix A for references to pertinent technical data.

**1-13. Tabulated Data**

Miscellaneous data is tabulated in tables 1-3 through 1-8.

1. Table 1-3, SB 3614(V)/TT Characteristics.
2. Table 1-4, Switchboard Originated Signals (4-wire).
3. Table 1-5, Switchboard Received Signals (4-wire).
4. Table 1-6, Switchboard Originated Signals (2-wire).
5. Table 1-7, Switchboard Received Signals (2-wire).
6. Table 1-8, Size, Weight, and Density of Switchboard Units.

Table 1-3. SB-3614(V)/TT Characteristics

Power requirements	24 vdc prime power, 5 amp (max) Ripple Below 500 Hz <0.5 Vpp Above 500 Hz <0.3 Vpp
Environmental characteristics	
Temperature (operating)	-25°F to +130°F (with sum loading)
Temperature (nonoperating)	-65°F to +165°F
Humidity	0 to 100%
Altitude (operating)	Sea level to 10,000 feet
Altitude (nonoperating)	Sea level to 50,000 feet
Terminals	30 in each SB-3614(V)/TT 60 or 90 in expanded mode
Simultaneous conversations	15 for one SB-3614(V)/TT 30 for expanded operation

Table 1-3. SB-3614(V)/TT Characteristics—Continued

Subscriber services	Two precedence levels Preemption (DTMF subsets) Direct outward digiting (DTMF subsets) Operator recall Trunk hunting Off-hook warning
Transmission characteristics	
Terminal impedance	600 ohms $\pm$ 10% with phase angle 0° to 10° from 300 Hz to 3500 Hz
Frequency response	Relative to 1 kHz insertion loss, $\pm$ 1dB from 0.5 to 3.5 kHz; -1, +3 dB from 0.3 to 0.5 kHz; +1, -2 dB from 3.5 to 108 kHz
Longitudinal balance	Greater than 40 dB from 0.3 to 3.5 kHz
Harmonic distortion	Greater than 30 dB from 0.3 to 3.5 kHz
Insertion loss	Less than 3.5 db at 1 kHz for 2-wire path
Noise level	Less than 22 dB rnc
Impulse noise	Less than -40 dBm0 for pulses greater than 1 microsecond
Voice frequency crosstalk	Isolation of greater than 60 dB from 0.3 to 3.5 kHz
Broadband frequency crosstalk	Greater than 55 dB from 3.5 to 108 kHz
20-Hz crosstalk	Less than 45 dB rnc
Envelope delay	Less than 100 microseconds—0.6 to 0.8 kHz Less than 50 microseconds—0.8 to 3.5 kHz Less than 10 microseconds—3.5 to 108 kHz
Absolute delay	Less than 300 microseconds
Conference circuit	Insertion loss: 2-party $\leq$ 3 dB $\pm$ 1 dB 5-party $\leq$ 13 dB 10-party $\leq$ 20 dB
Output variation (from terminal to terminal) 4-wire	Output variation from any one line/trunk to any other is less than 0.5 dB
Return loss	Greater than 25 dB—300 to 3500 Hz
Terminal impedance	600 ohms $\pm$ 10% with phase angle 0° to 10° from 300 Hz to 3500 Hz
Insertion loss	Less than 6.0 dB at 1 kHz for 4W-to-2W path or 2W-to-4W path
Frequency response	Relative to 1 kHz insertion loss, + 1 dB, -3 dB from 300 to 500 Hz; $\pm$ 1 dB from 500 to 3500 Hz
Switchboard originated signals (4-wire)	See table 1-4
Switchboard received signals (4-wire)	See table 1-5
Switchboard originated signals (2-wire)	See table 1-6
Switchboard received signals (2-wire)	See table 1-7
Operating configurations	
30-termination switchboard (semi-automatic operation)	Quantity Description 1 SB-3614(V)/TT basic switchboard 15 { Type I termination PCB total { Type II termination PCB
30-termination switchboard (automatic operation)	1 SB-3614(V)/TT basic switchboard 1 Automatic kit 15 { Type I termination PCB total { Type II termination PCB Type III termination PCB
60-termination switchboard (semi-automatic operation)	2 SB-3614(V)/TT basic switchboard
60-termination switchboard (automatic operation)	30 { Type I termination PCB total { Type II termination PCB 2 SB-3614(V)/TT basic switchboard 2 Automatic kit
90-termination switchboard (semi-automatic operation)	30 { Type I termination PCB total { Type II termination PCB Type III termination PCB 3 SB-3614(V)/TT basic switchboard
90-termination switchboard (automatic operation)	45 { Type I termination PCB total { Type II termination PCB 3 SB-3614(V)/TT basic switchboard 3 Automatic kit
	45 { Type I termination PCB total { Type II termination PCB Type III termination PCB See table 1-8
Size, weight, and density	

Table 1-4. Switchboard Originated Signals (4-wire)

Function	Frequency (Hz)	Frequency tolerance	Send signal level	Duration	Remarks
Digit 1	697/1209	± 1.5%	Decibel referred to 1 milliwatt -7 dBm ± 2 dB single tone level	Operator/DTMF subscriber controlled	Operator/DTMF subscriber originated
2	697/1336				
3	697/1477				
4	770/1209				
5	770/1336				
6	770/1477				
7	852/1209				
8	852/1336				
9	852/1477				
0	941/1336				
Recall & line priority	941/1209	± 1.5%	- 7 dBm ± 2 dB	Continuous until interdigit is detected	Remains on until released by AN/TTC-38 if AN/TTC-38 forwards a disallowed tone burst sequence
Conference	941/1477				
Restart	852/1209				
Seize to tone signaling trunk	2250	± 1.5%	- 7 dBm ± 2 dB	Continuous maximum (max) of 2.5 ± 0.5 second(s) or 475 ± 50 milliseconds (ms) after seize acknowledge (sz ack)	
Wait-in-queue	500	± 2.5%	- 14 dBm ± 2 dB	Continuous 2 s on } 2 s off } nominal 2 s on } until operator answers	Automatic
Ringback	500	± 2.5%	- 14 dBm ± 2 dB	Single sequence 2 s on } 2 s off } nominal 2 s on }	Automatic
Preempt	1000	± 2.5%	- 14 dBm ± 2 dB	Single burst 0.25 s on } 0.25 s off } nominal 0.25 s on }	Automatic
Dial tone	500	± 2.5%	- 14 dBm ± 2 dB	Continuous (7.5 s max)	Terminated by first digit
Sz ack, release acknowledge (rl ack)	570	± 1.5%	- 7 dBm ± 2 dB	Until seize/release stops + 250 ms minimum (min)	Inhibited after maximum below 2.5 ± 0.5 s for sz ack, 1.5 + 0.5 s for rl ack
Release to tone signaling trunk	2600	± 1.5%	- 7 dBm ± 2 dB	Continuous	Max of 3.5 ± 0.5 s or until tripped
Test Tone	1050	± 2.5%	- 4 dBm ± 0.5 dB	Continuous	Automatic
Priority (P)*	941/1633	± 1.5%	- 7 dBm ± 2 dB single-tone level	Operator controlled	Operator originated
Immediate (I)	852/1633				
Flash (F)	770/1633				
Flash Override (FO)	697/1633				
Busy	500	± 10%	- 14 dBm ± 2 dB	Continuous interrupted sequence 0.5 s on } 0.5 s off } nominal	Automatic
Error	1000	± 10%	- 14 dBm ± 2 dB	Continuous Interrupted sequence 0.25 s on } 0.25 s off } nominal	Automatic

\* Priority calls into AN/TTC-38 by:

- R1 = Priority
- R2 = Immediate
- R3 = Flash
- R4 = Flash override



Table 1-5. Switchboard Received Signals (4-wire)

Function	Frequency (Hz)	Frequency tolerance	Received signal level	Duration	Remarks
sz ack	570	± 1.3%	0 dBm to - 20 dBm	Continuous	Until seize, release plus 250 ms or up to 3 s timeout 1. Until sz ack or 2 s for converter trunk timeout 2. Until restart or 10 s for three-digit tone-burst trunk timeout
rl ack					
Seize	2250	± 1.3%	0 dBm to - 20 dBm	Continuous	
Release	2600	± 1.3%	0 dBm to - 20 dBm	Continuous	Until rl ack or 2 s timeout on converter tone trunks and 3 s timeout on three-digit tone burst trunks
Digit 1	697/1209	± 1.5%	0 dBm to - 20 dBm	Automatic office/DTMF subscriber controlled	Automatic office/DTMF subscriber originated
2	697/1336				
3	697/1477				
4	770/1209				
5	770/1336				
6	770/1477				
7	852/1209				
8	852/1336				
9	852/1477				
0	941/1336				
(Priority) Interdigit	941/1209 941/1633	± 1.3%	0 dBm to - 20 dBm	Continuous	Until end of restart or 3 s timeout
The operation of the switchboard system shall be compatible with the following service signals which may be present during a connection to an automatic switchboard.					
Ringback	425	± 2.0%	- 10 dBm max	Continuous sequence 2 s on 2 s off	3 min max
Dial tone	425	± 1.3%	- 10 dBm max	Continuous (10 s max)	Shut off by first digit
Busy	425	± 1.3%	- 10 dBm max	Continuous sequence 1/4 s on 1/4 s off	10 s timeout or shut off by release
Preempt Error	475/425	± 1.3%	- 10 dBm max	2 s ± 1/4 s	1/8 s 425 1/8 s 1050
	425/1050	± 1.3%	- 10 dBm max	Continuous	
Wait-in-queue	425	± 1.3%	- 10 dBm max	3 min or until answered	2 s on 4 s off 50 ms on 50 ms off
Answer	2600	± 1.3%	- 5 dBm max	275 ± 50 ms burst before connection	Indicates, to subscriber, connection to an automatic switchboard
Test	1050	± 2.5%	- 3.5 dBm max	Continuous	Manual patch initiation at automatic switchboard
The following signals may be present during a connection to an automatic switchboard. They are not required for control functions or service indications at the switchboard system.					
Conference	941/1477	± 1.3%	- 5 dBm max	Subscriber controlled	

Table 1-6. Switchboard Originated Signals (2-wire)

Function	Frequency (Hz)	Frequency tolerance	Send signal level	Send sequence	Remarks
Ring to CBS ring-down line	20	± 10%	90 Vrms ± 10%	2 s on } 2 s off } nominal	Automatic
Ring to CB dial DTMF	20	± 10%	90 Vrms ± 10%	2 s on } 2 s off } nominal for 16 s	Automatic
Seize & release from ring-down line	20			Continuous burst	Subscriber controlled
Trunk signal	20	± 10%	90 Vrms ± 10%	2 s ± 10% burst	Automatic
Ringback	500	± 2.5%	- 14 dBm + 6 dB - 3 dB	Synchronous with line or trunk ring	Automatic
Dial tone	500	± 2.5%	- 14 dBm + 6 dB - 3 dB	Continuous until 1st digit or 7.5 ± 1/2 s for DTMF subscribers	Automatic
Wait-in-queue	500	± 2.5%	- 14 dBm + 6 dB - 3 dB	2 s on } 2 s off } nominal 2 s on } until operator answers	Automatic
Preempt	1000	± 2.5%	- 14 dBm ± 2 dB	Single sequence 0.25 s on } 0.25 s off } nominal 0.25 s on }	Automatic
Test tone	1050	± 2.5%	0 dBm ± 0.5 dB	Continuous	Automatic
Busy tone	500	± 10%	- 14 dBm + 2 dB	Continuous 1/2 s on 1/2 s off	Automatic
Off-hook warning to CBS, DP or DTMF CB lines	3125	± 2.5%	Greater than 3.5 dBm	Continuous interrupted sequence 0.5 s on } 0.5 s off } nominal	Automatic
Error	1000	± 10%	- 14 dBm ± 2 dB	Continuous interrupted sequence 0.25 s on } 0.25 s off } nominal	Automatic

Table 1-7. Switchboard Received Signals (2-wire)

Function	Frequency (Hz)	Frequency tolerance	Received signal level	Duration	Remarks
Digit 1	697/1209	± 1.3%	0 to - 20 dBm per single tone	DTMF subscriber controlled	DTMF subscriber initiated
2	697/1336				
3	697/1477				
4	770/1209				
5	770/1336				
6	770/1477				
7	852/1209				
8	852/1336				
9	852/1477				
0	941/1336				
Priority (R)	941/1209	± 1.3%	0 to - 20 dBm per single tone	DTMF subscriber controlled	DTMF subscriber initiated
Priority (P)	941/1633				
Seize & release from ring-down line	20	16-25 Hz	12 Vrms, min	Continuous burst	Subscriber controlled
Trunk signal	20	16-25 Hz	12 Vrms, min	2 s ± 10% burst	Automatic
Dial pulse	Nominal make-break 60/40 ms	N/A	N/A	Subscriber controller	Subscriber initiated

Table 1-8. Size, Weight, and Density of Switchboard Units

	Switchboard		Transit case	
	Stowed	Operating	Full	Empty
Size (inches)				
Length	24.5	22.5	14.0	14.0
Depth	17.5	12.0	14.0	14.0
Height	10.5	9.25	8.0	8.0
Weight (lb.)				
Case and covers	17.88	7.69	7.50	7.50
PC cards	13.80	13.80	4.52	—
Front panel	7.00	7.00	—	—
Rear panel	2.28	2.28	—	—
Power supply	5.10	5.10	—	—
Structure	8.93	8.93	—	—
Cables	1.76	—	—	—
Headset	1.68	—	—	—
Terminal box	4.41	4.22	—	—
Total	62.84	49.02	12.02	7.50
Density (lb./ft. <sup>3</sup> )	24.12	33.92	13.24	8.26

## CHAPTER 2

## SERVICE UPON RECEIPT AND INSTALLATION

## Section I. SYSTEM PLANNING

**2-1. General**

This chapter contains information for installation of the SB-3614(V)/TT Telephone Switchboard for a 30-terminal application. In addition, information for installation of up to three SB-3614(V)/TT switchboards for 60 and 90 terminal applications is included. Refer to paragraph 2-3 for specific installation instructions.

**2-2. Compatible Interface Equipment**

Following is a list of equipment which may interface with the SB-3614(V)/TT.

1. TA-312/PT subset in CBS or RD
2. SB-22 switchboard as RD trunk
3. SB-86 switchboard as RD trunk
4. SB-3082 switchboard as RD trunk or 4-wire tone signaling converter trunk
5. CV-425/U signal converter as RD line or 4-wire tone signaling trunk
6. AN/TRC-166 terminal, telephone as RD line
7. AN/MRC-134 terminal, telephone as RD line
8. AN/MRC-135 terminal, telephone as RD line
9. TH-85/GCC terminal, telephone as RD line
10. AN/TTC-25 switchboard as 4-wire tone signaling PABX trunk
11. AN/TTC-38 switchboard as 4-wire tone signaling PABX trunk
12. AN/TTC-39 switchboard as 4-wire tone signaling PABX trunk
13. TA-236/FT subset, CB dial
14. TA-838/TT subset, CB DTMF (2-wire)
15. CV-1918 converter as 4-wire tone signaling trunk
16. CV-1919 converter as 4-wire tone signaling trunk
17. CV-1548 ( )/G Converter as 2-wire RD trunk

**2-3. Wiring Plan**

Each installation requires an SB-3614(V)/TT wiring plan which contains information that is peculiar to the particular switchboard. This information will be supplied in a tabular form similar to table 2-1. It is required for each original installation of a switchboard(s) and for the addition of new subscribers or trunks to an existing switchboard(s).

*a. Description.* The wiring plan defines the functional interface between the SB-3614(V)/TT and the lines and trunks. It also describes configuration of the termination PCB set, selection of mode and precedence (when memory is not used), set-up of rear panel controls and switchboard interconnections, arrangement of terminals on the terminal panel, and terminal panel connections.

*b. Interfaces.* Six types of interfaces are possible with the SB-3614(V)/TT: 2-wire RD line/trunk, 2-wire CBS line, 2-wire dial pulse line, 2-wire DTMF line, 4-wire PABX trunk, and 4-wire converter trunk. The switches on the rear panel are positioned, as appropriate, to operate an SB-3614(V)/TT as a 30-line switch or, in expanded configurations, as 60 or 90 line switches. The two trunk hunting switches are positioned to enable or disable a trunk group within the switchboard. Trunk hunting is provided for two groups of four terminals each.

*c. Type I Terminal Cards.* The paths for 2-wire ringdown line/trunk or CBS line are completed by connecting the lines to any of the pairs of 2-wire terminals (No. 1 through No. 12) or to the transmit pairs of the 4-wire terminals (No. 13 through No. 30) of the termination panel. The mode switch on the type I PCB card is set to the ringdown line/trunk or CBS position. The precedence switch is set to routine or priority as required. If the unassigned position is desired, this position is set using the precedence switch and not the mode switch.

*d. Type II Terminal Cards.* The paths for a 2-

Table 2-1. Terminal Card Installation and Switch Settings

Type of terminal (paragraph 2-2)	Terminal number (table 3-7)	2-wire terminal connections (paragraph 3-2)		4-wire terminal connections (paragraph 3-2)				Terminal card type (paragraph 2-3)	Terminal card locations (table 3-7)	Mode of service to be selected (paragraph 3-2)	precedence to be selected (paragraph 3-2)	Terminal card switch settings (paragraph 3-2, figure 3-1)				Trunk group switch settings (para. 3-2, figure 1-6)	Number plan switch (paragraph 3-2, figure 1-6)
		T	R	XMIT	T	R	RCV					S1	S2	S3	S4		
TA-312/PT telephone subset,	1-30,	✓	✓	N/A	N/A	N/A	N/A	I	XA4, XA24, XA7, XA26, XA9, XA29, XA13, XA31, XA15, XA35, XA18, XA37, XA20, XA40, XA42.	CBS line, RD line, RD trunk, Unassigned.	Routine, Priority.	L, C, R.	L, C, R.	L, C, R.	S1-ON/OFF, S2-ON/OFF.	1-30, 31-60, 61-90.	
	31-60,																
2-wire Ring down trunk.	61-90.																
TA-236/FT telephone subset,	1-30,	✓	✓	N/A	N/A	N/A	N/A	II	XA4, XA24, XA7, XA26, XA9, XA29, XA13, XA31, XA15, XA35, XA18, XA37, XA20, XA40, XA42.	Dial pulse, DTMF, Unassigned.	Routine, Priority. (Assigned by software)	L, C, R.	L, C, R.	N/A	S1-ON/OFF, S2-ON/OFF. (Used for trunk hunting)	1-30, 31-60, 61-90.	
	31-60,																
TA-838/TT telephone subset.	61-90.																
4-wire converter trunk,	13-30,	N/A	N/A	✓	✓	✓	✓	III	A20, A40, A24, A42, A26, A29, A31, A35, A37.	PABX trunk, Converter trunk, Unassigned.	Routine, Priority. (Assigned by software)	L, C, R.	L, C, R.	N/A	N/A	1-30, 31-60, 61-90.	
	43-60,																
4-wire PABX trunk.	73-90.																

wire dial pulse line or a 2-wire DTMF line are completed by connecting the lines to any of the pairs of 2-wire terminals (No. 1 through No. 12) or to the transmit pairs of the 4-wire terminals (No. 13 through No. 30) of the termination panel. The mode switches on the type II common battery dial pulse or DTMF PCB card are set to determine dial pulse, DTMF operation or the unassigned position. No precedence switch is available and the choice between routine or priority assignment is under software control.

*e. Type III Terminal Cards.* The paths for 4-wire PABX trunks and 4-wire converter trunks are completed by connecting the lines to any of the sets of 4-wire terminals (No. 13 through No. 30) of the termination panel. The mode switches on the type III 4-wire tone signaling trunk PCB card are set to determine PABX trunk, converter trunk operation or the unassigned position.

### 2-4. Programming Memory

The programmable memory must contain certain data which is peculiar to each particular installation. This data assignment is entered via the keysender with the PROGRAM/CALL PROCESS switch in the PROGRAM mode. Subsequent changes or additions to terminal assignments must be made in the same manner. Table 2-2 summarizes the various operations associated and lists the appropriate formats. Definitions and detailed procedures for each operation are listed below.

*a. Definitions.* Definitions for assignments which can be made in the programmable memory are:

(1) *Trunk Group.* Trunk group assigns a switch locator number to a trunk hunting group. Each switchboard can accommodate trunk hunting groups which include from 1 to 30 2-wire trunks and from 1 to 18 4-wire trunks with a maximum of 30 total.

(2) *Trunk Terminal.* Trunk terminal assigns a specific wired trunk as part of a trunk hunting group.

(3) *Precedence.* Precedence is a means of assigning a priority classmark to a specific wired line terminal. This classmark applies to CBS, RD and CB lines only.

(4) *Intercept.* Intercept on a terminal causes all calls destined for that specific terminal to be routed to the operator.

(5) *Special Classmarks.* Special classmarks are used to identify unique trunk terminal designations in memory (EANVM) as follows.

Table 2-2. Privilege Assignment Formats

Operation	Input Format
Assign	
Trunk group	FO, FO, SL, 00
Trunk terminal	FO, FO, SL, XX
Precedence	FO, F, XX, 00
Intercept	FO, I, XX, 00
Special classmarks	FO, P, XX, NN
Verify	
Trunk group	F, FO, SL, 00
Trunk terminal	F, FO, SL, XX
Precedence	F, F, XX, 00
Intercept	F, I, XX, 00
Special classmarks	F, P, XX, NN
Delete	
Trunk group	I, FO, SL, 00
Trunk terminal	I, FO, SL, XX
Precedence	I, F, XX, 00
Intercept	I, I, XX, 00
Special classmarks	I, P, XX, NN
Erase	
All trunk groups	P, FO, 00, 00
All precedence	P, F, 00, 00
All intercept	P, I, 00, 00
All memory	P, P, 00, 00

Note: SL = Switch locator  
 XX = Terminal number  
 NN = Special classmark (01, 02, 03)

(a) RD trunk terminals (Type I terminal cards) are classmarked 02 when designating a DTMF automatic ringdown trunk and classmarked 03 when designating a 20-Hz/DTMF applique trunk.

(b) Four-wire trunk terminals (Type III terminal cards with mode switch set to converter) are classmarked 01 when designating a manual, 4-wire converter trunk.

*b. Data Entering Procedure.* The memory is programmed per the procedure given below.

1. The operator places the PROGRAM/CALL PROCESS toggle switch in the PROGRAM mode.

2. CLEAR CDRLS illuminates.

3. The operator keys in data, via the four-by-four keysender, using the following six-digit format:

FO	FO	S	L	0	0
(Enter)	(Trunk Group)				
FO	FO	S	L	X	X
(Enter)	(Trunk)				
FO	F	X	X	0	0
(Enter)	(Precedence)				
FO	I	X	X	0	0
(Enter)	(Intercept)				
FO	P	X	X	N	N
(Enter)	(Special Classmark)				

4. Upon keying of the first digit, the MEMORY ACCESS IN PROCESS (MAP) lamp indicator illuminates. If an error is made during the key sequence, MAP flashes and the operator hears an error tone. Entry may be cleared by depressing the CLEAR CDRLS pushbutton.

5. Upon successful keying of data, MAP extinguishes.

6. If a trunk group has already been entered or if a trunk already exists in another trunk group, the operator will receive busy tone.

7. If a trunk is assigned to a nonexistent trunk group, the operator will receive error tone.

8. If a terminal greater than 90 is assigned to a trunk group; if intercept or precedence is assigned to a trunk; or if a special classmark is assigned to a line, the operator will receive error tone and the MAP indicator flashes.

9. The operator may clear any of the erroneous entries listed in 6, 7, or 8 above by depressing the CLEAR CDRLS pushbutton.

10. The operator places the PROGRAM/CALL PROCESS toggle switch in the CALL PROCESS mode.

**NOTE**

If the operator neglects to return this switch to the CALL PROCESS mode, he is unable to initiate calls via the key-sender, and he may cause unwanted changes to memory.

11. CLEAR CDRLS extinguishes.

*c. Data Verification Procedure.* The following procedure allows verification of data which has been previously entered in memory.

1. The operator places the PROGRAM/CALL PROCESS toggle switch in the PROGRAM mode.

2. CLEAR CDRLS illuminates.

3. The operator keys in data, via the four-by-four keysender, using the following six-digit format:

F	FO	S	L	0	0
(Verify)	(Trunk Group)				
F	FO	S	L	X	X
(Verify)	(trunk)				
F	F	X	X	0	0
(Verify)	(Precedence)				
F	I	X	X	0	0
(Verify)	(Intercept)				
F	P	X	X	N	N
(Verify)	(Special Classmark)				

4. Upon keying of the first digit, MAP illuminates. If an error is made during the keying sequence, MAP flashes and the operator hears an

error tone. Entry may be cleared by depressing the CLEAR CDRLS pushbutton.

5. Upon successful keying of data, MAP extinguishes.

6. If the data to be verified has already been entered into the electrically alterable nonvolatile memory (EANVM), a busy tone is returned to the operator. If the data to be verified has not been entered into the EANVM, an error tone is returned to the operator.

7. An error tone or busy tone is cleared by depressing the CLEAR CDRLS pushbutton.

8. Another verification can then be made, if required.

9. The operator places the PROGRAM/CALL PROCESS toggle switch in the CALL PROCESS mode.

10. CLEAR CDRLS extinguishes.

*d. Data Deletion Procedure.* Data which has been previously entered into memory can be deleted as follows:

1. The operator places the PROGRAM/CALL PROCESS toggle switch in the PROGRAM mode.

2. CLEAR CDRLS illuminates.

3. The operator keys in data, via the four-by-four keysender, using the following six-digit format:

I	FO	S	L	0	0
(Delete)	(Trunk Group)				
I	FO	S	L	X	X
(Delete)	(Trunk)				
I	F	X	X	0	0
(Delete)	(Precedence)				
I	I	X	X	0	0
(Delete)	(Intercept)				
I	P	X	X	N	N
(Delete)	(Special Classmark)				

4. Upon keying of the first digit, MAP illuminates. If an error is made during the keying sequence, MAP flashes and the operator hears an error tone. Entry may be cleared by depressing the CLEAR CDRLS pushbutton.

5. Upon successful keying of data, MAP extinguishes.

6. Another deletion can then be made, if required.

7. The operator places the PROGRAM/CALL PROCESS toggle switch in the CALL PROCESS mode.

8. CLEAR CDRLS extinguishes.

*e. Data Erasing Procedure.* This procedure removes from memory blocks of data which have been previously entered.

1. The operator places the PROGRAM/CALL PROCESS toggle switch in the PROGRAM mode.
2. CLEAR CDRLS illuminates.
3. The operator keys in data, via the four-by-four keysender, using the following six-digit format:

P	FO	0	0	0	0
(Erase)	(Trunk Group)				
P	F	0	0	0	0
(Erase)	(Precedence)				
P	I	0	0	0	0
(Erase)	(Intercept)				
P	P	0	0	0	0
(Erase)	(EANVM)				

4. Upon keying of the first digit, MAP illuminates steady and the "P" key flashes. If an error is made during the keying sequence, MAP flashes, the "P" key extinguishes, and the operator hears an error tone. Entry may be cleared by depressing the CLEAR CDRLS pushbutton.

5. Upon successful keying of data, MAP and the "P" key extinguish.

6. Other erasures can then be made, if required.

7. The operator places the PROGRAM/CALL PROCESS toggle switch in the CALL PROCESS mode.

8. CLEAR CDRLS extinguishes.

### Section II. SITE AND SHELTER REQUIREMENTS

There are no special planning requirements. Installation planning consists of locating the switch-

board in a dry, level position that will allow the operator to perform his functions.

### Section III. SERVICE UPON RECEIPT OF MATERIAL

#### 2-5. Unpacking.

The SB-3614(V)/TT is packed in a double wall corrugated carton surrounded by precut, medium durometer, open cell polyurethane cushioning. (See figure 2-1). No special unpacking instructions are required.

listing in the operator's manual and the packing slip to see if the shipment is complete. Report all discrepancies in accordance with paragraph 1-3. The equipment should be placed in service even though a minor assembly or part that does not affect proper functioning is missing.

#### 2-6. Checking Unpacked Equipment

1. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 6 (paragraph 1-3).

3. Check to see whether the equipment has been modified. (Equipment which has been modified will have the MWO number on the front panel near the nomenclature plate.) Check also to see whether all currently applicable MWO's have been applied. (Current MWO's applicable to the equipment are listed in DA Pam 310-7.)

2. Check the equipment against the component

4. For dimensions, weights, and volumes of packaged items, see SB 700-20.



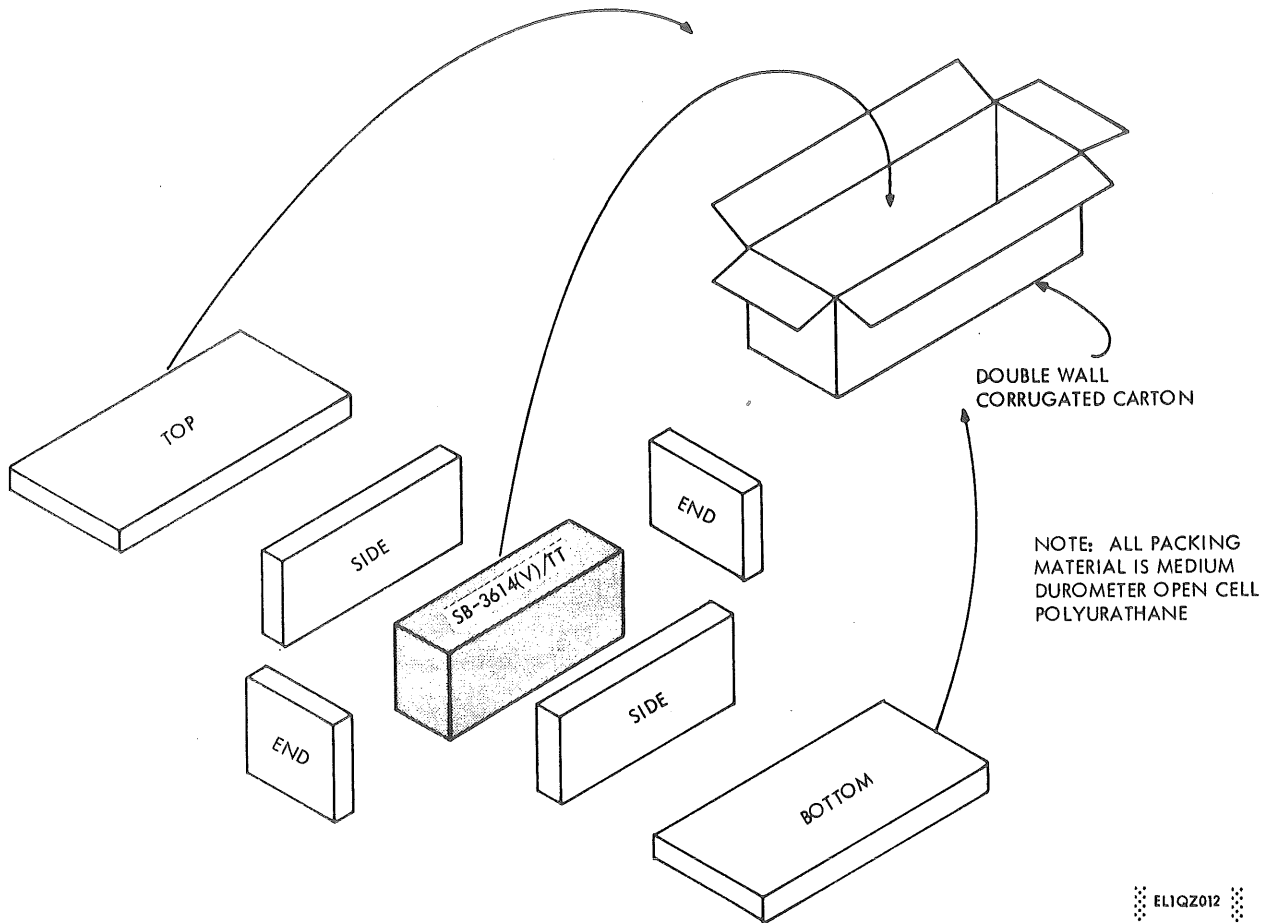


Figure 2-1. Packing Diagram

## Section IV. INSTALLATION INSTRUCTIONS

### 2-7. Tools and Materials Required for Installation

Tools and materials required for the installation of the SB-3614(V)/TT are given in table 2-3.

### 2-8. Assembly of Equipment

1. Depress the pressure relief valve.
2. Remove the front and rear covers of the transit case. Turn each cam-action latch  $\frac{1}{4}$  turn counterclockwise.
3. Unscrew the two retaining screws and reposition the terminal box from the transport position to the operate position as shown in figure 1-9.
4. Place the SB-3614(V)/TT on a dry, level surface which will allow the operator sufficient access to perform his functions.
5. In expanded mode configurations, when two or three switchboards are stacked, care must be taken to provide a level surface for mechanical stability.

### 2-9. Connect Earth Ground

Earth ground is made by driving the ground stake into the ground and attaching a ground cable between the stake and the rear panel and terminal box by means of wing nuts (refer to figure 2-2). If two or more switchboards are interconnected, a ground stake and a ground cable for each switchboards must be installed. See figure 2-2 for appropriate connections. (The ground stake and ground cable are stored in the rear cover of the SB-3614(V)/TT. Refer to figure 3-3.)

### 2-10. Two-wire Terminal Connections

Two-wire terminal connections are made to hole-in-head connectors located on the terminal panel. Connector pairs, designated 2W, are located in two groups: terminals 1 through 12 and 13 through 30. Refer to figure 1-8, paragraph 3-2, and table 2-1. The following procedure is per-

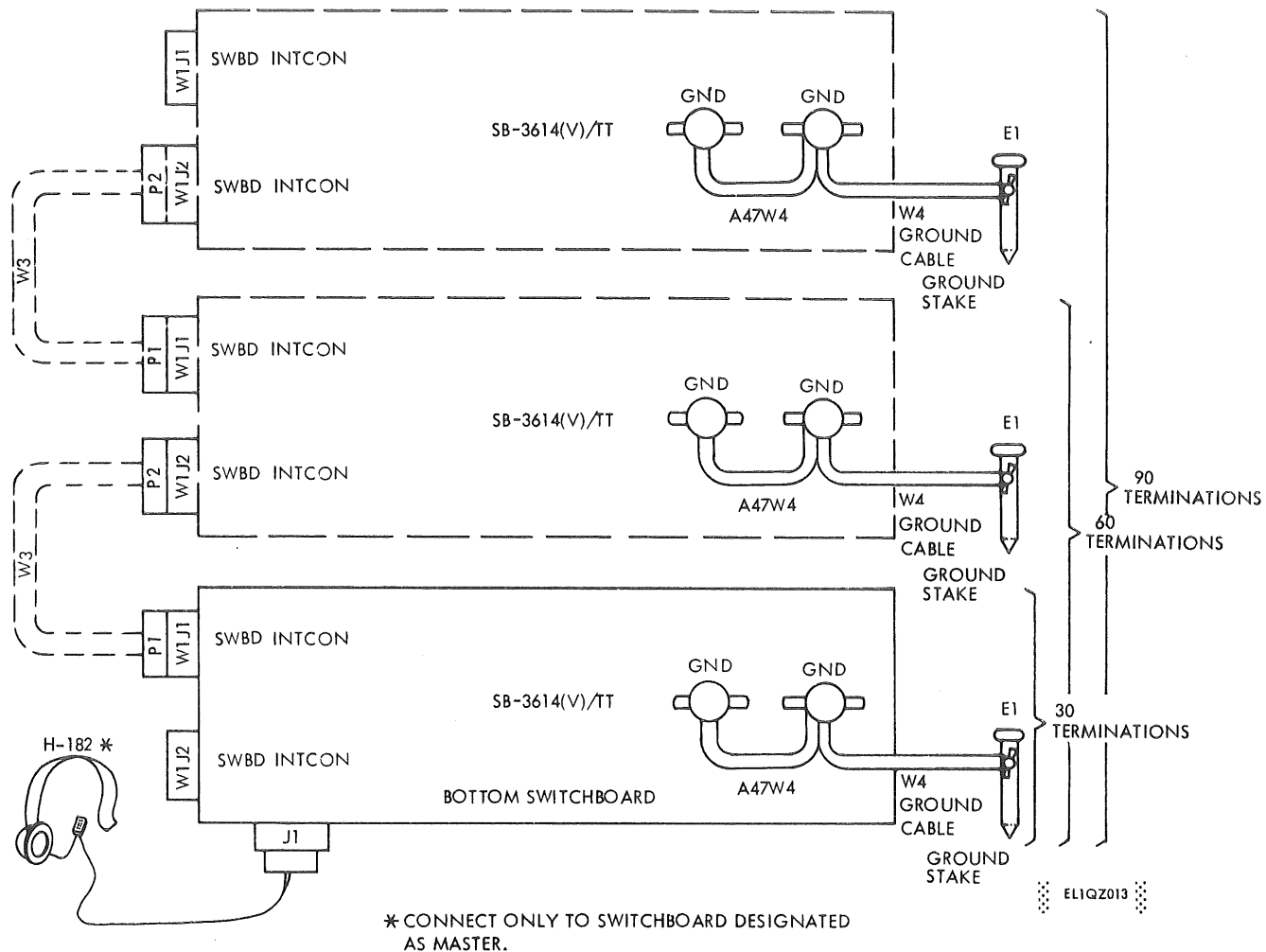


Figure 2-2. Stacked Switchboards—Interconnection Diagram

formed by the wireman, in accordance with the wiring plan, when installing the switchboard(s) or adding a new subscriber/trunk to an existing system.

1. Strip field wire pairs 3/8 inch for each subscriber line/trunk.
2. Press one hole-in-head connector, insert the stripped standard field wire, and release the connector.
3. Ensure that the connector is closed on bare wire and that the field wire will not slip out.
4. Perform steps 2. and 3. for the remaining connector for that terminal.
5. Perform steps 2. through 4. for all 2-wire connections.

### 2-11. Four-wire Terminal Connections

Four-wire terminal connections are made to terminals located on hole-in-head connectors 13 through 30 located on the terminal panel. Refer to figure 1-8, paragraph 3-2, and table 2-1. The following procedure is performed by the wireman, in accordance with the wiring plan, when installing the switchboard(s) or adding a new subscriber/trunk to an existing system.

1. Strip 3/8 inch of insulation from transmit field wire pair end.
2. Press one XMIT hold-in-head connector and insert one strand of wire.
3. Press the remaining XMIT hole-in-head con-

Table 2-3. Tools and Materials Required for Installation

Item	Purpose	Applicable publication
Tool kit AN/USM-15	Stripping of WD-1/TT	TM 11-5805-695-20P
Wiring Plan	Wiring information, PC card locations, and preset switching settings	
Data assignment	Programming information	

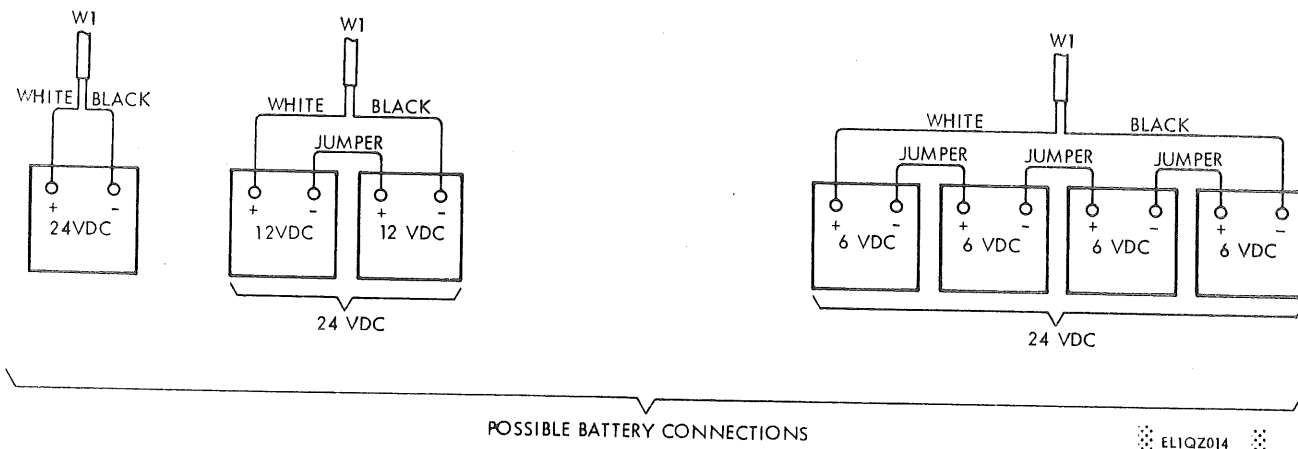
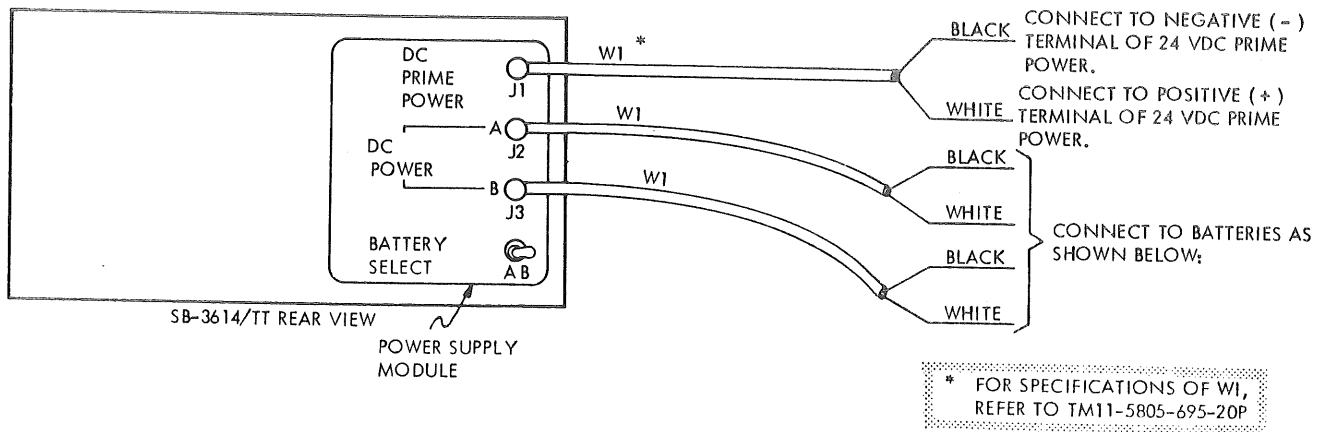


Figure 2-3. Power Connections

- connector and insert the other transmit wire. Release the connector on the wire.
4. Perform steps 2. and 3. for each receive wire using the hole-in-head connectors marked RCV for the same terminal.
  5. Ensure that all 4-wire connections will not slip out.
  6. Connect each 4-wire terminal using steps 2 and 5.

**2-12. Connect Headset**

Remove headset H-182 from the storage position in the front cover and connect it to the front panel HEADSET connector. In stacked configurations, a headset can be installed in the HEADSET connector of any switchboard; however, only the switchboard designated Master will have functioning controls and indicators.

**2-13. Connect Power**

Each SB-3614(V)/TT switchboard requires an external source of 24 vdc power. Connectors for three independent power sources are provided; a prime power connection for generator or power supply

and two external batteries. See paragraph 3-2 and figure 2-3. Only one of these sources is required for operation. All three input connectors are identical as are the two power cables stored in the rear cover. In a garrison situation connect the prime power (b below) and one battery (a below). In a field installation, connect both batteries (a below). When only a single 24 Vdc source is available, connect that voltage source (either prime power or battery) to connector J2. (c below). Under no condition should a battery be connected to the DC prime power input (J1). Some installations may require all three power connections, in which case an additional power cable must be supplied. (Refer to RPSTL in TM 11-5805-695-20P for cable nomenclature.)

a. Battery Connections. Refer to figure 2-3.

**WARNING**  
DANGEROUS CHEMICALS ARE USED IN NICKEL-CADMIUM BATTERIES

The electrolyte used in nickel-cadmium batteries contains potassium hydroxide (KOH), which is a caustic chemical agent. Serious and deep burns of body tissue will result if the electrolyte comes in

contact with the eyes or any part of the body. Use rubber gloves, rubber apron, and protective goggles when handling the electrolyte. If accidental contact with the electrolyte is made, use ONLY clean clear water and immediately (seconds count) flush contaminated areas. Continue flushing with large quantities of clean clear water for at least 15 minutes. Seek medical attention without delay.

#### EXPLOSIVE GASES ARE GENERATED BY NICKEL-CADMIUM BATTERIES

Hydrogen and oxygen gases are generated in explosive proportions while the nickel-cadmium battery is being charged. Charge the nickel-cadmium battery in a well-ventilated area to reduce concentrations of explosive gases. Turn off the battery charger before connecting or disconnecting the nickel-cadmium battery to prevent arcing. Do not use matches or an open flame in the charging area. Arcs, flames, or sparks in the charging area will ignite the gases and cause an explosion. The battery box cover must be removed and the battery case vent plug (if any) must be open when charging.

#### DO NOT MIX SULPHURIC ACID AND KOH

The electrolyte used in nickel-cadmium batteries reacts violently to the sulphuric acid in the more common lead-acid types of batteries. DO NOT add sulphuric acid electrolyte to the battery; the mixing of the acid and KOH electrolytes will cause a violent reaction which could result in the splattering of the mixture into the eyes and onto the skin.

#### CAUTION

To prevent damage to equipment, do not connect batteries to DC PRIME POWER connector J1.

1. Check that the POWER switch is in the OFF position.
2. Remove W1 cable(s), stored in the rear cover, and connect P1 to J2 and/or J3 of SB-3614(V)/TT, as required.
3. Connect battery end of W1 to battery terminals. White wire is connected to the positive (+) terminal and black wire to the negative (-)

terminal. Refer to applicable battery references listed in appendix A.

4. Connect jumper wire(s) between batteries if required as shown in figure 2-3. Use wire no smaller than AWG 10.

5. Set the BATTERY SELECT switch to the appropriate position (A for J2 and B for J3).

#### b. Prime Power Connection.

1. Check the POWER switch is in the OFF position.

2. Remove W1 cable, stored in the rear cover, and connect P1 to J1 of the SB-3614(V)/TT.

3. Connect the black and white wires to an appropriate source of 24 vdc prime power. White wire is connected to the positive (+) terminal and black wire to the negative (-) terminal.

#### c. Single Source Connection.

1. Ensure the POWER switch is in the OFF position.

2. Remove W1 cable, stored in the rear cover, and connect P1 to J2 of the SB-3614(V)/TT.

3. Connect the black and white wires to the 24 vdc source (prime power or battery). White wire is connected to the positive (+) terminal and black wire to the negative (-) terminal.

#### 2-14. Interconnections

In stacked configurations only, connect cable W3 between switchboards. This cable is stored in the rear cover (figure 3-3). Install W3 as shown in the cabling diagram, figure 2-2 being careful to connect P2 to upper switchboard.

#### 2-15. Installation of Plug-in Items

1. Remove front panel by loosening the 18-thumb-screws located along its periphery and then swinging the panel upward to the lock position. Refer to figure 1-5.

2. Install type I, II, and III terminal cards into appropriate slots. Refer to figure 2-4 to locate cards, figure 3-1 to identify cards and table 2-1 to determine applicable card types.

3. Install all other circuit cards into their appropriate slots in accordance with figure 2-4.

4. Set the mode and precedence switches on the terminal cards as required by the wiring plan. Refer to paragraph 3-2, figure 3-1 for switch positions and locations. Refer to table 2-1 for terminal card and terminal designations.

5. Release the front panel from the lock position and tighten the 18 thumbscrews.

\* THESE PC CARDS ARE USED ONLY IN THE AUTOMATIC CONFIGURATION

‡ TYPE I TERMINATION PCB (755090A0372)

‡ TYPE II TERMINATION PCB (755090A0399)

‡ TYPE III TERMINATION PCB (755090A0315)

*	DTMF REC 1	755090A0320	A1
	SPARE		A2
	MATRIX LINK	755090A0388	A3
‡	TERMINAL 1 - 2		A4
	CROSS POINT 1	755090A0325	A5
	CROSS POINT 2	755090A0325	A6
‡	TERMINAL 3 - 4		A7
	CROSS POINT 3	755090A0325	A8
‡	TERMINAL 5 - 6		A9
	CROSS POINT 4	755090A0325	A10
*	DTMF REC 2	755090A0320	A11
	P+/P-	755090A0301	A12
‡	TERMINAL 7 - 8		A13
	SPARE		A14
‡	TERMINAL 9 - 10		A15
	P+/P-	755090A0301	A16
*	CROSS POINT 5	755090A0325	A17
‡	TERMINAL 11 - 12		A18
	ANALOG GATE 1	755090A0337	A19
‡	TERMINAL 13 - 14		A20
	ANALOG GATE 2	755090A0337	A21
*	DTMF REC 3	755090A0320	A22
*	ANALOG GATE 3	755090A0337	A23
‡	TERMINAL 15 - 16		A24
*	CROSS POINT 6	755090A0325	A25
‡	TERMINAL 17 - 18		A26
*	CROSS POINT 7	755090A0325	A27
*	DIGITAL TONE GEN	755090A0310	A28
‡	TERMINAL 19 - 20		A29
*	CROSS POINT 8	755090A0325	A30
‡	TERMINAL 21 - 22		A31
	(ROM 2- FOR FUTURE EXPANSION)	755090A0351	A32
	MAIN TIMER	755090A0365	A33
*	ELEC ALT NVM A	755090A0378	A34
‡	TERMINAL 23 - 24		A35
*	ELEC ALT NVM B	755090A0393	A36
‡	TERMINAL 25 - 26		A37
	PROCESSOR	755090A0383	A38
	ROM 1	755090A0351	A39
‡	TERMINAL 27 - 28		A40
	UNIFIED INTERFACE	755090A0332	A41
‡	TERMINAL 29 - 30		A42
	RAM	755090A0305	A43

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Figure 2-4. Circuit Card Locations.

**Section V. PRELIMINARY ADJUSTMENT OF EQUIPMENT**

**2-16. Installation of Trunk Directory and Special Classmarks**

1. Perform preliminary starting procedure in accordance with paragraph 3-3.
2. Perform initial adjustments in accordance with paragraph 3-4.

3. Perform turn-on procedure in accordance with paragraph 3-5.

4. Program the required terminal assignment data into memory, and verify in accordance with paragraph 2-4. This procedure contains instructions for initializing the memory with the trunk directory and special classmark information as designated in the wiring plan.

### 2-17. Selection of Trunk Hunting Control Switches

Turn the two TRUNK HUNTING CONTROL switches to the appropriate settings as required in the wiring plan. Refer to table 2-1.

### 2-18. Selection of Numbering Plan.

The number plan switch must be turned to the appropriate position in accordance with the wiring plan (table 2-1) and numbering designations. (Refer to figure 1-6 and paragraph 3-2). Duplicate number plans must not be selected for stacked configurations.

### 2-19. Selection of MASTER/SLAVE Designation (paragraph 3-2 and figure 1-6)

a. In a single SB-3614(V)/TT configuration, the MASTER/SLAVE toggle switch, on the rear panel, must be placed in the MASTER position.

b. In stacked configurations, the MASTER

SLAVE toggle switches are placed in the appropriate positions as designated in the wiring plan.

#### NOTE

In stacked configurations, only *one* MASTER/SLAVE toggle switch must be placed in the MASTER position.

### 2-20. Test Calls

1. Set SB-3614(V)/TT front panel POWER switch to ON position.

2. Observe that SB-3614(V)/TT FAILURE lamps do not light. If any FAILURE lamp lights, set POWER switch to OFF and refer to paragraphs 2-10 through 2-20 to check correct installation. If installation is correct refer unit to organizational maintenance for troubleshooting.

3. Place test calls to all installed terminals to check system operation. Refer to paragraph 3-5 for call processing procedures.

#### NOTE

Momentary flash of the CCU FAILURE lamp during power turn-on is normal.



## CHAPTER 3

### OPERATING INSTRUCTIONS

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#### Section I. CONTROLS AND INDICATORS

##### 3-1. Damage from Improper Settings.

There are no controls or combinations of controls which can cause damage to the equipment or create a condition hazardous to operating personnel. Improper operation, however, is likely to cause interruption of service.

##### 3-2. Controls, Indicators, and Connectors.

*a. Front Panel.* Controls and indicators have been positioned on the front panel and are categorized in three groups: power and alarm group, common function control group, and terminal status group (see figure 1-4).

(1) *Power and Alarm Group.* See table 3-1 for power and alarm group controls, indicators, and connectors.

(2) *Common Function Control Group.* See table 3-2 for common function control group controls and indicators.

(3) *Terminal Status Group.* See table 3-3 for terminal status group indicators.

*b. Rear Panel.* (figure 1-6).

##### CAUTION

Controls and connectors on the rear panel are used by the installer when the switchboard is originally installed or when changes are made in the installation.

See table 3-4 for rear panel controls and connectors.

*c. Terminal Panel.* (figure 1-8).

##### CAUTION

Terminals on the terminal panel are used by the installer when the switchboard is originally installed or when changes are made in the installation.

See table 3-5 for terminal panel terminals.

*d. Power Supply.* (figure 1-7).

##### NOTE

Connections are made to prime power and batteries by the installer during in-

stallation or at other times when service is required. Battery power is switched by the operator as required during normal operation.

See table 3-6 for power supply connectors and switches.

*e. Type I Terminal Card Switches.* (figure 3-1).

##### CAUTION

Terminal card switches are preset during installation by the installer or at other times when changes are made. There is no need for the operator to manipulate these switches.

See table 3-7 for terminal card and terminal locations and figure 3-1 and table 3-8 for type I terminal card switch locations and switch descriptions.

*f. Type II Terminal Card Switches.* (figure 3-1).

##### CAUTION

Terminal card switches are preset during installation by the installer or at other times when changes are made. There is no need for the operator to manipulate these switches.

See table 3-7 for terminal card and terminal locations and figure 3-1 and table 3-9 for type II terminal card switch locations and switch descriptions.

*g. Type III Terminal Card Switches.* (figure 3-1).

##### CAUTION

Terminal card switches are preset during installation by the installer or at other times when changes are made. There is no need for the operator to manipulate these switches.

See table 3-7 for terminal card and terminal locations and figure 3-1 and table 3-10 for type III terminal card switch locations and switch descriptions.



Table 3-1. Controls, Indicators, and Connectors—Front Panel Power and Alarm Group

Control, indicator or connector	Function
■ POWER ON/OFF (toggle switch) ■ POWER ON (indicator lamp)	Applies power to the power supply module. Indicates prime power is applied and all DC voltages are present at output of the power supply module.
20 HZ FAILURE (indicator lamp)	Indicates fuse is not blown. Indicates excessive load on 20-Hz ringer line. Occasional brief flashes are normal; however, indications in excess of two seconds are abnormal and maintenance is required.
DC FAILURE (indicator lamp)	Lights steady when any of the internal DC voltages has failed or is out of tolerance. Flashes when prime power battery voltage is too low for reliable switchboard operation.
CCU FAILURE (indicator lamp)	Lights when processor does not complete scanning cycle within approximately 1.2 seconds. Occasional and infrequent flashes are normal in extremely high traffic periods. NIGHT ALARM sounds simultaneously with illumination of CCU FAILURE lamp.
LAMP TEST/NIGHT LIGHT (three-position toggle switch)	OFF position—LAMP TEST and NIGHT LIGHTS off. (Indicators will operate in a normal manner.) NIGHT LIGHT—three lamps illuminate TERMINAL STATUS area, one light illuminates FORMAT plate and two lamps illuminate keysender. LAMP TEST—The following indicators illuminate: <ol style="list-style-type: none"> <li>1. 20 HZ FAILURE.</li> <li>2. CCU FAILURE.</li> <li>3. DC FAILURE.</li> <li>4. MEMORY ACCESS IN PROCESS.</li> <li>5. CALL STATUS.</li> <li>6. C (Keysender).</li> <li>7. P (Keysender).</li> <li>8. REENTRY.</li> <li>9. TONE SEND.</li> <li>10. CALL ANS.</li> <li>11. All TERMINAL STATUS lamps for which terminal cards have been installed.</li> </ol> NIGHT ALARM sounds steady.
BRIGHTNESS (rotary control)	Enables adjustment of intensities from minimum to maximum brightness for lamps listed above except the FAILURE lamps.
NIGHT ALARM (audible alarm)	Sounds 2900-Hz tone when CCU failure occurs. Sounds steady 2900-Hz tone when a routine call is in operator's queue. 2900-Hz tone is interrupted when priority call is in operator's queue.
NIGHT ALARM VOLUME (rotary control)	Adjusts volume of NIGHT ALARM from minimum to maximum level as indicated.
■ FUSE 5.0A	5-ampere slow blow fuse in power supply input power line for circuitry protection.
FUSE SPARE	Spare 5-ampere slow blow fuse located adjacent to active one.
HEADSET (connector)	Provides means of connecting operator's H-182 headset to SB-3614(V)/TT.
HEADSET VOLUME (rotary control)	Adjusts volume of sound in operator's headset from minimum to maximum level as indicated.

Table 3-2. Controls and Indicators—Front Panel Common Function Control Group

Control or indicator	Function
CALL ANSWER (momentary, illuminated pushbutton)	Illuminates steady when all calls in operator's queue are routine. Flashes when one or more calls in operator's queue are priority. (All incoming trunk calls are processed as priority.) Disconnects operator from previous call and connects him to first call in operator's queue.
REENTRY (momentary, illuminated pushbutton)	When depressed causes single party in communication with operator to be placed first in operator's queue. Operator becomes idle. Party is reconnected to the operator by depressing CALL ANS. Causes multiple party call in communication with operator to be marked for reentry. REENTRY will illuminate and operator becomes idle.
TONE SEND (momentary, illuminated pushbutton)	Depressing REENTRY, when illuminated, will connect operator to multiple party previously marked for reentry. Illuminates when operator is connected to a trunk requiring DTMF tones. When illuminated, depressing TONE SEND causes lamp to be extinguished, indicating keysender is no longer in tone send mode. (Required for calling local subscribers.)
OPR RLSE (operator release) (momentary pushbutton)	Depressing this pushbutton releases operator from any single or multiple party call and makes the operator idle.
CLEAR CDRLS (momentary pushbutton)	Program mode: (illuminated). Depressing switch clears previously entered data. Depressing switch after an erroneous six-digit entry clears entry and unlocks operator function buttons so that another entry can be made. Call processing mode: (not illuminated) If single party is connected to operator, depressing switch disconnects party from operator. If a two party call is connected to operator, depressing switch disconnects called party. If a conference is being established, depressing switch disconnects last conferee. If operator enters an established conference, depressing switch releases conferee selected by operator.
CALL STATUS (indicator lamp)	When not illuminated, indicates the operator is idle. When illuminated steady, indicates operator is connected to a routine party or a routinely marked call. When flashing, indicates operator is connected to priority party or priority marked call.
Keysender (four-by-four array of momentary pushbuttons—two illuminated)	Used to extend calls, establish priorities, and write into memory. C pushbutton illuminates after second conference call is initiated, indicating both conference links are busy. P pushbutton flashes when depressed in program mode, indicating erase of memory is being made.
MEMORY ACCESS IN PROCESS (indicator lamp)	Illuminates while memory is being updated. Refer to paragraph 2-4.
PROGRAM/CALL PROCESS (locking toggle switch)	When not illuminated, indicates switchboard is in operate mode. When in down position, normal switchboard call processing occurs. When in up position, memory update, erase or interrogation is possible. Normal call processing is also possible except for brief periods of update when writing into memory.
FORMAT (instruction table decal)	An instruction format table for memory keysender usage. Defines keys to be depressed for various memory update, erase or interrogation functions.



1 Perform lamp test and replace applicable lamp, if failed. Further repairs on front panel must be referred to intermediate level maintenance.

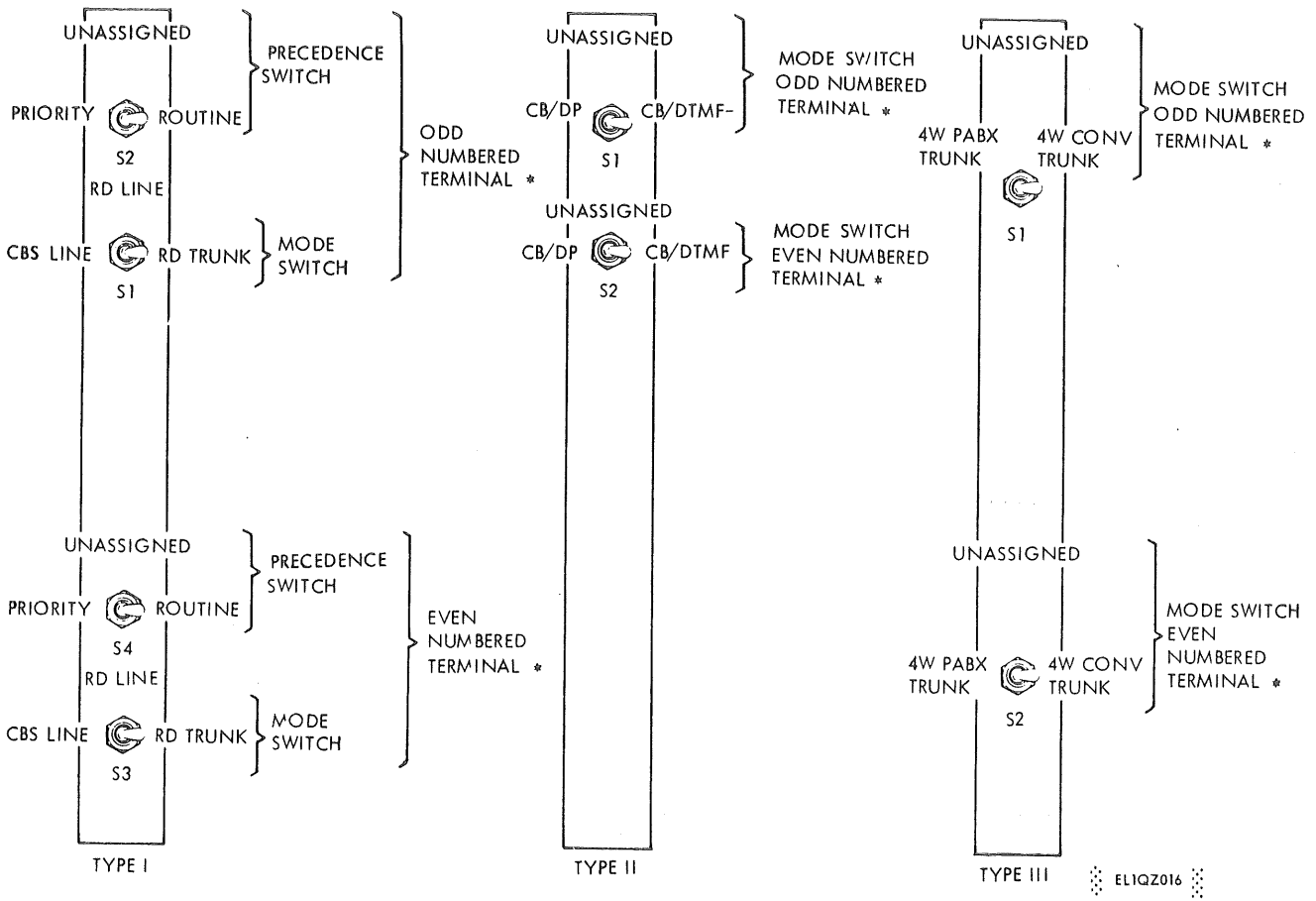
2 Only one terminal card will occupy the applicable card slot. (Refer to wiring plan and figure 2-4.)

3 If replacement of assemblies listed for a given failure does not eliminate problem, forward SB-3614/TT to intermediate level maintenance.

Failed Function		Failed Assembly		Type III terminal card (Note 2)	Type II terminal card (Note 2)	Type I terminal card (Note 2)	Cross point	Front panel (Note 1)	DTMF receiver	Power supply	P + / P -	ROM	Terminal box	Analog gate	Processor	EANVM A	Main timer	RAM	Digital tone generator	Rear panel	EANVM B	Unified interface	Matrix link	Internal wiring	External cable, W3			
Operator Observed Failures	Visual	Fail Lamps	20-HZ FAILURE							●							●					●		●				
			DC FAILURE								●														●	●		
			CCU FAILURE											●			●		●	●						●	●	
		Call Processing Lamps	CALL ANS																	●				●		●		
			RE-ENTRY																					●		●		
			TONE SEND																					●		●		
			CLEAR/CDRLS							●															●	●		
			CALL STATUS																	●	●				●	●		
			"C" key											●						●	●				●	●		
			TERMINAL STATUS (30)	●	●	●														●	●				●	●		
		Lamp(s) during lamp test								●															●	●		
		Night light(s)								●															●	●		
	"P" key											●							●				●	●				
	Memory access in process																						●	●				
	PWR ON								●															●	●			
	Audible	Tones	Ringback					●				●			●				●					●	●			
			Busy												●				●						●	●		
			Error												●				●						●	●		
			Off-hook warning													●				●						●	●	
			Preempt													●				●						●	●	
			DTMF													●					●					●	●	
			Test							●												●				●	●	
		Voice	Calling party													●		●							●	●		
			Called party						●				●				●								●	●		
			Sidetone																						●	●		
	Night alarm								●										●				●	●				
	Controls	Adjustments	BRIGHTNESS						●		●													●	●			
			NIGHT ALM VOLUME							●															●	●		
HDST VOLUME										●														●	●			
Call Processing Controls		CALL ANS							●														●	●				
		RE-ENTRY							●															●	●			
		TONE SEND							●															●	●			
		OPR RLSE							●															●	●			
CLEAR/CDRLS							●															●	●					

Fai
Operator Observed Failures Cont.
Subscriber Observed Failures

Figure FO-1. Equipment Versus Symptom Fault Location.



\* SEE TABLE 3-7

Figure 3-1. ① Terminal Card Switch Locations (Sheet 1 of 2)

I	LEFT	CTR	RIGHT	II	LEFT	CTR	RIGHT	III	LEFT	CTR	RIGHT
N	P	UNAS	R	N	DIAL	UNAS	DTMF	N	PABX	UNAS	CONV
	CBS	RDL	RDT		N+1	DIAL	UNAS		DTMF	N+1	PABX
N+1	P	UNAS	R	N+1		DIAL	UNAS	DTMF	N+1		PABX
	CBS	RDL	RDT		N+1	DIAL	UNAS	DTMF		N+1	PABX

THIS TERMINAL CARD SWITCH POSITION TABLE IS LOCATED ON INSIDE OF FRONT PANEL ON UPPER PC CARD RETAINER.

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Figure 3-1. ② Terminal Card Switch Locations (Sheet 2 of 2)

Table 3-3. Indicators—Front Panel Terminal Status Group

Indicator	Function
TERMINAL STATUS (indicator lamps)	30 lamps—one per terminal. Illuminates steady when terminal is dialing or is busy with another subscriber. Two-Hz flash rate indicates terminal is connected to operator. One half-Hz flash rate indicates terminal is waiting in the operator's queue.
TERMINAL STATUS (writing surface)	Permanent numbers (30 per terminal) indicate the terminal number for either the 30-, 60-, or 90-terminal configuration. Surface above permanent numbers is for writing optional terminal-peculiar information.

Table 3-4. Controls and Connectors—Rear Panel

Control or connector	Function
MASTER/SLAVE (toggle switch)	In single switchboard configuration, must be in MASTER position. In multiple switchboard configuration, MASTER position designates that the switchboard is used for control, call extension, etc. SLAVE position designates that the switchboard function is subordinated to the MASTER switchboard.
NUMBER PLAN (three-position rotary switch)	Used to select the number designated to terminals connected to the switchboard. In stacked configurations, each switchboard must have a different position for its NUMBER PLAN switch.
TRUNK HUNTING CONTROL 1	When ON, automatic trunk hunting will occur on trunks connected to terminals 23 through 26. When OFF, automatic trunk hunting on trunks connected to terminals connected to terminals 23 through 26 is disabled.
TRUNK HUNTING CONTROL 2	When ON, automatic trunk hunting will occur on trunks connected to terminals 27 through 30. When OFF, automatic trunk hunting on trunks connected to terminals 27 through 30 is disabled.
SWBD INTCON (upper connector)	Connector used to connect to switchboard above in stacked configurations.
SWBD INTCON (lower connector)	Connector used to connect to switchboard below in stacked configurations.
EXTERNAL TERMINAL CONNECTORS	Used to interface directly with terminals or to terminal panel for access to terminal lines through hole-in-head connectors.

Table 3-5. Terminals—Terminal Panel

Terminals	Function
2W (hole-in-head connectors)	A group of 12 terminal pairs to which 2-wire lines or trunks can be connected.
XMIT-4W-RCV (hole-in-head connectors)	A group of 18 4-wire terminal pairs to which 4-wire trunks can be connected. The group can be used for 2-wire lines or trunks when connected to the 2W pairs.
OPERATOR (hole-in-head connectors)	A pair of terminals to which an external telephone (e.g., TA-312/PT in LB position) can be connected for test purposes.
TEST TONE	A pair of terminals to which the 1050 Hz test tone can be connected for test purposes by keying N99 when operator is in idle state, where n = 1 to 6.
GND	Provides bonding ground connection from SB-3614(V)/TT to earth.

Table 3-6. Connectors and Switches—Power Supply

Connector or switch	Function
J1 (connector)	Input connector to which 24 vdc prime power is connected.
BATTERY POWER A and B (connectors)	Input connectors to which 24 vdc batteries are connected. Batteries A and B are designated for J2 and J3 respectively.
BATTERY SELECT A or B (switch)	Selects battery A or B as indicated.

Table 3-7. SB-3614(V)TT Terminal Card and Terminal Locations

Terminal numbers		Terminal card slot location
Odd	Even	
1	2	A4
3	4	A7
5	6	A9
7	8	A13
9	10	A15
11	12	A18
13	14	A20
15	16	A24
17	18	A26
19	20	A29
21	22	A31
23	24	A35
25	26	A37
27	28	A40
29	30	A42

Table 3-8. Switches—Type I Terminal Card Switches

Switch	Function
S1 (three-position toggle switch)	Odd numbered terminal designation: Left position selects the CBS line mode. Center position selects the RD line mode. Right position selects the RD trunk mode.
S2 (three-position toggle switch)	Odd numbered terminal designation: Left position selects priority precedence. Center position designates terminal is unassigned and considered out of service. Right position selects routine precedence.
S3 (three-position toggle switch)	Even numbered terminal designation: Left position selects CBS line mode. Center position selects the RD line mode. Right position selects the RD trunk mode.
S4 (three-position toggle switch)	Even numbered terminal designation: Left position selects precedence. Center position designates terminal is unassigned and considered out of service. Right position selects routine precedence.

Table 3-9. Switches—Type II Terminal Card Switches

Switch	Function
S1 (three-position toggle switch)	Odd numbered terminal designation: Left position selects CB dial pulse line mode. Center position designates terminal is unassigned and considered out of service. Right position selects CB DTMF line mode.
S2 (three-position toggle switch)	Even numbered terminal designation: Left position selects CB dial pulse line mode. Center position designates terminal is unassigned and considered out of service. Right position selects CB DTMF line mode.

Table 3-10. Switches—Type III Terminal Card Switches

Switch	Function
S1 (three-position toggle switch)	Odd numbered terminal designation: Left position selects 4-wire PABX trunk mode. Center position designates terminal is unassigned and considered out of service. Right position selects 4-wire converter trunk mode.
S2 (three-position toggle switch)	Even numbered terminal designation: Left position selects 4-wire PABX trunk mode. Center position designates terminal is unassigned and considered out of service. Right position selects 4-wire converter trunk mode.

Section II. OPERATION UNDER USUAL CONDITIONS

3-3. Preliminary Starting Procedure.

Before applying power to the SB-3614(V)/TT switchboard, it is necessary to establish certain initial control positions. The steps listed below apply to either a single or a multiple switchboard configuration. Refer to figure 1-4 and paragraph 3-2.

1. Turn POWER switch to OFF.
2. Turn NIGHT LIGHT/LAMP TEST switch to OFF.
3. Turn BRIGHTNESS control to mid-scale.
4. Turn HDST VOLUME control to mid-scale.
5. Turn NIGHT ALM control to mid-scale.
6. Check that the PROGRAM/CALL PROCESS switch is in the CALL PROCESS position.

3-4. Initial Adjustments.

1. Verify that 24 vdc prime or battery power is available at input connectors.
2. Check that 5.0-amp slow blow fuse is installed in fuseholder on front panel.
3. Check that H-182/PT headset is connected.

3-5. Operating Procedures.

NOTE

These procedures are used for both automatic and semiautomatic switchboards except where otherwise noted.

a. *Turn-on Procedure.* The turn-on procedure is given in table 3-11.

b. *Operator Call Processing.* Various functions which the operator can perform are:

1. Initiating local calls.
2. Initiating trunk calls.
3. Releasing calls with OPR RLSE pushbutton.
4. Releasing calls with CLEAR CDRLS pushbutton.
5. Releasing calls with CALL ANS pushbutton.
6. Answering incoming calls.
7. Extending calls.
8. Precedence extension and preemption.
9. Conference extension.

Table 3-11. Turn-on Procedure

Operation	Observation
Turn POWER switch to ON. (In expanded installations, the Slave switchboards must be turned on prior to the Master.)	POWER ON indicator is illuminated. No other indicator is illuminated. No tones are audible in headset.*
Turn NIGHT LIGHT/LAMP TEST switch to NIGHT LIGHT position.	Night lamps (6) will illuminate.
Turn NIGHT LIGHT/LAMP TEST switch to OFF position.	Night lights will extinguish.
Turn NIGHT LIGHT/LAMP TEST switch to LAMP TEST position and hold.	The following indicator lamps will illuminate: 1. 20 Hz FAILURE. 2. CCU FAILURE. 3. DC FAILURE. 4. MEMORY ACCESS IN PROCESS. 5. CALL STATUS. 6. C (keysender). 7. P (keysender). 8. REENTRY. 9. TONE SEND. 10. CALL ANS. 11. All TERMINAL STATUS lamps for which terminal cards have been installed.
Rotate NIGHT ALM control cw and ccw.	NIGHT ALARM sounds steady. Volume of NIGHT ALARM varies in accordance with NIGHT ALM control.
Rotate BRIGHTNESS control cw and ccw.	Observe that lamp intensity varies in accordance with BRIGHTNESS control, with the exception of three FAILURE lamps.
Release NIGHT LIGHT/LAMP TEST switch and return to OFF position.	Indicator lamps and night lights will extinguish and NIGHT ALARM becomes silent.

\* For operation of headset refer to TM 11-5965-283-15.



10. Reentry.
11. Call holding.
12. Call monitoring.
13. Reringing.
14. Test tone.
15. Call intercept.

Detailed operating procedures for each of these functions are described below.

(1) *Initiating Local Calls.* The following procedure assumes that the operator is initially in the idle state. There may, however, be calls awaiting service in the operator's queue.

1. Using the keysender, the operator keys the local subscriber three-digit directory number.

2. If the called subscriber is idle, (see steps 6, 7, or 8 if not idle) a ring signal is sent to the called subscriber and ringback to the operator. The called party TERMINAL STATUS indicator flashes ( $\frac{1}{4}$  second on;  $\frac{1}{4}$  second off). The CALL STATUS indicator illuminates (either steady or flashing).

3. The called party goes off hook.

4. Ring and ringback signals cease when an off-hook condition is detected.

5. The operator is connected to the called subscriber. Conversation can take place.

6. If the called subscriber is busy, the operator is connected to the called subscriber (and to whomever the called subscriber was connected to). The called TERMINAL STATUS indicator flashes ( $\frac{1}{4}$  second on;  $\frac{1}{4}$  second off). The CALL STATUS indicator illuminates (either steady or flashing).

7. If the operator keys an invalid or unassigned directory number, an error tone (paragraph 1-13) is sent by program to the operator.

8. If the called party (except ringdown subscriber) is off hook and not connected to anyone (idle busy), an off-hook warning tone (paragraph 1-13) is sent to the subscriber and operator. The subscriber TERMINAL STATUS indicator flashes ( $\frac{1}{4}$  second on;  $\frac{1}{4}$  second off). The CALL STATUS indicator illuminates (either steady or flashing).

9. If the called party is a ringdown subscriber and is idle busy, the call will proceed as in step 2.

#### NOTE

In steps 7 and 8, or if the operator keys an unwanted number, the operator may clear call by depressing CLEAR CDRLS pushbutton.

#### (2) *Initiating Trunk Calls*

(a) *Automatic Switchboards.* The following procedure assumes the operator is initially in the

idle state. There may, however, be calls awaiting service in the operator's queue.

1. Using the keysender, the operator keys N XX or NSL where:

N = any digit 1 to 6, XX = the two-digit trunk terminal number;

or

N = 9, SL = the two digit switchboard locator number (for trunk-hunting capability).

2. If an idle trunk is available, a dial tone is returned to the operator from the distant switchboard. The trunk TERMINAL STATUS indicator flashes ( $\frac{1}{4}$  second on;  $\frac{1}{4}$  second off), the CALL STATUS indicator illuminates (either steady or flashing), and the TONE SEND pushbutton illuminates when trunk requires DTMF tones. (Before local digiting TONE SEND must be depressed to exit the tone send mode).

3. If a trunk number is busy, the operator is connected to all parties on the trunk. The trunk TERMINAL STATUS indicator flashes ( $\frac{1}{4}$  second on;  $\frac{1}{4}$  second off) and the CALL STATUS indicator illuminates (either steady or flashing). If a trunk group is busy, busy tone is heard.

4. Upon receiving a dial tone, the operator keys in a distant switchboard subscriber number, which is forwarded to the distant switchboard. If the distant switchboard subscriber is busy, the distant switchboard releases back.

(b) *Semiautomatic Switchboards.* The following procedure assumes the operator is initially in the idle state. There may, however, be calls awaiting service in the operator's queue.

1. Using the keysender, the operator keys N XX where:

N = any digit 1 to 6, XX = the two-digit trunk terminal number.

2. If an idle trunk is available, a wait in queue tone is returned to the operator from the distant switchboard. The trunk TERMINAL STATUS indicator flashes ( $\frac{1}{4}$  second on;  $\frac{1}{4}$  second off), the CALL STATUS indicator illuminates (either steady or flashing).

3. If a trunk number is busy, the operator is connected to all parties on the trunk. The trunk TERMINAL STATUS indicator flashes ( $\frac{1}{4}$  second on;  $\frac{1}{4}$  second off) and the CALL STATUS indicator illuminates (either steady or flashing).

(3) *Releasing Calls with OPR RLSE Pushbutton.* This pushbutton allows the operator to be released from either a single or a multiple party call and to return to the idle state.

1. The operator depresses the OPR RLS pushbutton.

2. The operator is dropped from the call and placed in the idle state.

3. The CALL STATUS indicator extinguishes.

4. If the operator was connected to only one subscriber, that subscriber's TERMINAL STATUS indicator extinguishes, indicating that the subscriber has been released. If the operator was connected to a multiparty call, the TERMINAL STATUS indicator of the subscriber to whom the operator was connected illuminates steady, indicating that the subscriber is still connected to the multiparty call.

(4) *Releasing Calls with CLEAR CDRLS Pushbutton.* In the call process mode, the CLEAR CDRLS pushbutton is provided to allow the operator to release the called subscriber (steady TERMINAL STATUS) while remaining connected to the calling (fast flashing TERMINAL STATUS) subscriber.

#### NOTE

Two exceptions are described in steps 4 and 5 below. The CLEAR CDRLS pushbutton is also used to clear a call to an invalid or unassigned directory number or to an unanswered, busy or off-hook called party.

1. The operator depresses the CLEAR CDRLS pushbutton.

2. If the operator is connected to a two-party call, the operator is released from the called party but is still connected to the calling party. If the operator is connected to a conference, the last conferee is released, but the operator is still connected to the calling and other conferees.

3. The CALL STATUS indicator remains illuminated (either flashing or steady), indicating that the operator is still connected to a party.

4. The TERMINAL STATUS indicator of the called party or last conferee (steady TERMINAL STATUS) extinguishes, indicating that the called party or last conferee has been released; but the TERMINAL STATUS indicator of the calling party remains flashing ( $\frac{1}{4}$  second on;  $\frac{1}{4}$  second off), indicating that the calling party is still connected to the operator.

5. If the operator is connected to only one party (fast flashing TERMINAL STATUS), the operator is returned to the idle state.

6. The CALL STATUS indicator extinguishes. The subscriber TERMINAL STATUS indicator extinguishes.

7. If the called party is invalid, unassigned, unanswered, busy or off hook, the operator may clear the call by depressing the CLEAR CDRLS pushbutton.

(5) *Releasing Calls with CALL ANS Pushbutton.* This pushbutton allows the operator to be released from either a single or a multiple party call and to be connected to the next call in the operator's queue. If no call exists in the queue, the operator will be placed in the idle state.

1. The operator depresses the CALL ANS pushbutton.

2. The operator is released from all parties to which he was connected.

3. If the operator was connected to only one party, that party's TERMINAL STATUS indicators extinguishes, indicating that the party has been released.

4. If the operator was connected to a multiparty call, the parties' TERMINAL STATUS indicators illuminate steady, indicating that they are still connected to each other.

5. If there was no party waiting in queue, the operator is in the idle state and the CALL STATUS indicator extinguishes.

6. If there was a party waiting in queue, the operator is connected to that party, the CALL STATUS indicator illuminates (either flashing or steady), and that party's TERMINAL STATUS indicator flashes ( $\frac{1}{4}$  second on;  $\frac{1}{4}$  second off). The party to which the operator was previously connected is released and the associated terminal status indicator is extinguished.

(6) *Answering Incoming Calls.* The following procedure assumes that the operator is initially in the idle state and that no calls are in the operator's queue awaiting service.

1. The program detects an operator service call.

2. The CALL ANS pushbutton illuminates either steady (routine) or flashing (priority), and the audible alarm sounds either continuous (routine) or interrupted (priority).

3. The TERMINAL STATUS indicator for the calling terminal flashes (1 second on; 1 second off), indicating that the terminal's call is in queue.

4. The operator depresses the CALL ANS pushbutton and is connected to the calling party. The calling TERMINAL STATUS indicator flashes ( $\frac{1}{4}$  second on;  $\frac{1}{4}$  second off), indicating that the operator is connected to the calling party.

5. The CALL STATUS indicator illuminates (either steady or flashing).

6. The CALL ANS pushbutton extinguishes and the audible alarm ceases.

#### NOTE

The operator's queue has the capacity of holding up to 15 calls. Calls are placed in queue with priority calls ahead of routine calls and are retrieved on a first-in-first-

out basis. If the queue is full, routine calls to the operator are returned a busy tone; priority calls preempt routine calls in queue or are returned a busy tone if there are no preemptable calls in queue.

(7) *Extending Calls.* This feature allows the operator to place a call for a subscriber connected to the operator position and, when the called party answers, to drop out of the call. The operator is assumed to be connected to a subscriber who wishes to call another party. Calls may or may not be waiting in queue.

1. The CALL STATUS indicator is illuminated (either steady or flashing) and the calling party TERMINAL STATUS indicator is flashing ( $\frac{1}{4}$  second on;  $\frac{1}{4}$  second off).

2. The operator keys the requested subscriber directory number via the keysender. (If the called party is a trunk, refer to paragraph (2) for details on initiating a trunk call.)

3. If the called terminal is idle, the operator and the calling party hear a ringback tone. The called TERMINAL STATUS indicator illuminates steady.

4. The called party goes off hook.

5. Ring and ringback signals cease when an off-hook condition is detected.

6. The operator and the called and calling parties are now connected, and conversation can take place.

7. The operator may drop out of the call by depressing either the OPR RLSE or the CALL ANS pushbutton.

#### NOTE

The operator may drop out of the call at any time after completing dialing and allow the calling subscriber to supervise the call to its completion.

8. The CALL STATUS indicator extinguishes, indicating that the operator is no longer connected to any parties.

9. If the called terminal is busy, the operator and the calling party hear a busy tone. The operator must clear the tone by depressing the CLEAR CDRLS pushbutton.

10. If the operator has made an error in keying the subscriber number, the operator and the calling party hear an error tone. The operator must clear the tone by depressing the CLEAR CDRLS pushbutton.

(8) *Precedence Extension and Preemption.* The following procedure allows the operator to grant, on a one time basis, a precedence to any line or trunk.

1. The operator answers an incoming call and receives a request for precedence extension.

2. The calling TERMINAL STATUS indicator

flashes ( $\frac{1}{4}$  second on;  $\frac{1}{4}$  off), indicating that the calling party is connected to the operator. The CALL STATUS indicator illuminates (either steady or flashing), indicating that the operator is connected to a party.

2. 1. If the called party is a line, proceed to step 3. If the call is to a semiautomatic switchboard proceed to step 8. If the call is to an automatic switchboard, proceed to step 14.

3. The operator, via the keysender, keys R or P followed by the line or trunk number. (If the operator keys P, the CALL STATUS indicator will flash.)

4. If the called subscriber is idle, ringback is returned to the operator and the calling party. When the called subscriber goes off hook, the operator and the called and calling parties are connected. The operator may release using standard procedures. In steps 4 and 6 above, when the called subscriber is connected to the call, the call is protected at priority level from all other calls.

5. If the called subscriber is busy and not preemptable, a busy tone is returned to the operator and the calling subscriber.

6. If the called subscriber is busy and preemptable, a preempt tone (paragraph 1-13) is returned to the operator and the calling, called, and preempted parties. The operator and the calling and called parties are then connected. The operator may release using standard procedures.

7. If the operator has made an error in keying the subscriber number, the operator and the calling party hear an error tone. The operator must clear the call by depressing the CLEAR CDRLS pushbutton.

8. The operator, via the keysender, keys R or P followed by NXX or NSL where:

N = any digit 1 to 6, XX = the two-digit trunk terminal number

or

N = 9, SL = the two-digit switchboard locator number (for trunk hunting capability).

9. If the called trunk is idle, wait-in-queue tone is returned to the operator and calling party from the distant switchboard until the call is serviced by the distant switchboard operator.

10. If the called trunk is busy and not preemptable a busy tone is returned to the operator and the calling party.

11. If the called trunk is busy and preemptable, a preempt tone is forwarded to the distant switchboard.

12. The preempted trunk is released and all parties on the trunk receive a busy signal.

13. The local switchboard reseizes the trunk and a wait-in-queue tone is returned from the distant switchboard to the calling party and the local operator. The calling party must now wait for the distant switchboard operator to service the call and the local operator may release using standard procedures.

14. The operator, via the keysender, keys R or P followed by NXX or NSL where:

N = any digit 1 to 6, XX = the two-digit trunk terminal number

or

N = 9, SL = the two-digit switchboard locator number (for trunk hunting capability).

15. If the called trunk is idle, dial tone is returned to the local operator and calling party. The calling party must now dial the subsequent digits to complete the call.

16. If the called trunk is busy, and not preemptable, a busy tone is returned to the calling party and local operator.

17. If the called trunk is busy and preemptable, a preempt tone is forwarded to the distant switchboard. The calling party, local operator and all parties on the preempted trunk hear the preempt tone.

18. The preempted trunk is released and reseized by the local switchboard and dial tone is forwarded from the distant switchboard to the calling party and local operator. From this point on, to the completion of call, the procedure is the same as that specified in paragraph (2) for initiating trunk calls.

(9) *Conference Extension.* The operator has the capability of initiating a conference of up to ten subscribers. The operator accomplishes this by calling all conferees and then releasing.

1. The operator answers incoming call and receives a request for conference.

2. The calling TERMINAL STATUS indicator flashes ( $\frac{1}{4}$  second on;  $\frac{1}{4}$  second off), indicating that the calling party is connected to the operator. The CALL STATUS indicator illuminates (either steady or flashing), indicating that the operator is connected to a party.

3. The operator, via the keysender, keys:

a. "C".

b. Conferee number.

4. If the called conferee is idle, ringback is returned to the operator and the calling subscriber. When the called conferee goes off hook, the operator and the calling and called parties are parties to the conference. If the idle subscriber does not go off hook, the operator can release him by depressing the CLEAR CDRLS pushbutton. If the called conferee is a trunk, refer to paragraph (2) for information on initiating trunk calls.

5. If the called conferee is busy, a busy tone is returned to the operator and the calling subscrib-



er. The entry may be cleared by depressing the CLEAR CDRLS pushbutton.

6. If the operator has keyed incorrectly, an error tone is returned to the operator and the calling subscriber. The entry may be cleared by depressing the CLEAR CDRLS pushbutton.

7. If the operator has not called the last conferee, steps 3b. through 6. are repeated.

8. If the operator has called the last conferee, the operator may drop out of the conference using standard release procedures. Upon reentry, the operator can add conferees by repeating steps 3b thru 6.

#### NOTE

Two individual conferences are possible in the SB-3614(V)/TT, each having the capacity of connecting up to ten parties. If the operator attempts to initiate a third conference, he receives an error tone. If the operator attempts to place more than ten parties on a conference link, he receives a busy tone. The two conferences links cannot be cascaded to provide for larger conferences. Upon initiating the second conference, the C key in the keysender will light indicating that both conference links are busy and no further conferences can be initiated.

(10) *Reentry*. This operation allows the operator to reenter a multiple party call at a later time. After marking a multiparty call for reentry, the operator can perform all of the standard functions except marking another multiparty call for reentry.

1. The operator is connected to a multiparty call.

2. The calling TERMINAL STATUS indicator is flashing ( $\frac{1}{4}$  second on;  $\frac{1}{4}$  second off), indicating that the calling party is connected to the operator. The CALL STATUS indicator illuminates (either steady or flashing), indicating that the operator is connected to a party.

3. The operator depresses the REENTRY pushbutton. The REENTRY pushbutton illuminates steady, the calling TERMINAL STATUS indicator illuminates steady, and the CALL STATUS indicator extinguishes.

4. The operator is now in the idle state and may perform standard functions except marking another multiparty call for reentry.

5. To reenter the multiparty call, the operator must be in the idle state. The operator depresses the REENTRY pushbutton and is connected to the multiparty call marked for reentry.

6. The REENTRY pushbutton extinguishes, the calling TERMINAL STATUS indicating flashes

( $\frac{1}{4}$  second on,  $\frac{1}{4}$  second off), and the CALL STATUS indicator illuminates (either steady or flashing).

7. The operator may drop out of the call by using the standard release procedure.

(11) *Call Holding*. Call holding allows the operator to place a subscriber, connected to the operator, on hold to be retrieved at a later time. After placing a call on hold, the operator can perform all of the standard functions except answering incoming calls in queue or placing another call on hold.

1. The operator is connected to a subscriber.

2. The subscriber's TERMINAL STATUS indicator is flashing ( $\frac{1}{4}$  second on,  $\frac{1}{4}$  second off), indicating that the subscriber is connected to the operator.

3. The CALL STATUS indicator is illuminated (either steady or flashing), indicating that the operator is connected to a party.

4. The operator depresses the REENTRY pushbutton.

5. The CALL ANS pushbutton flashes ( $\frac{1}{2}$  second on,  $\frac{1}{2}$  second off). The subscriber on hold has been placed at the head of the queue at a priority level.

6. The subscriber TERMINAL STATUS indicator flashes (1 second on, 1 second off) and NIGHT ALARM sounds interrupted, indicating that subscriber is in queue.

7. The CALL STATUS indicator extinguishes.

8. The operator is now in the idle state and may perform all standard functions except answering incoming calls in queue or placing another call on hold.

9. To retrieve the call on hold, the operator must be in the idle state and depress the CALL ANS pushbutton.

10. The operator is now connected to the subscriber placed on hold.

11. The CALL ANS pushbutton extinguishes.

12. The subscriber TERMINAL STATUS indicator flashes ( $\frac{1}{4}$  second on,  $\frac{1}{4}$  second off).

13. The CALL STATUS indicator flashes ( $\frac{1}{2}$  second on,  $\frac{1}{2}$  second off).

14. The operator may drop the call by using the standard release procedure.

(12) *Call Monitoring*. This allows the operator to enter an existing multiple party call.

1. A multiparty call is in process with the operator in the idle state.

2. The TERMINAL STATUS indicators of all parties connected are illuminated steady.

3. The CALL STATUS indicator is extinguished.

4. The operator, via the keysender, keys the subscriber number of one of the parties.

5. The operator and the called subscriber are connected (the operator is also connected to the multiparty call via the called party).

6. The called **TERMINAL STATUS** indicator is flashing ( $\frac{1}{4}$  second on,  $\frac{1}{4}$  second off), indicating that the called party is connected to the operator.

7. The **CALL STATUS** indicator illuminates (either steady or flashing).

(13) *Ringing.* This allows the operator to ring a subscriber repeatedly if desired.

1. The operator has keyed a subscriber number.

2. The operator hears a ringback tone.

3. The subscriber does not go off hook.

4. The operator may rering the subscriber by keying, via the keysender, the subscriber number again.

5. This may be repeated as often as the operator deems necessary.

(14) *Test Tone to Subscribers.* Test tone allows the operator to direct a 1050-Hz tone to any line for test purposes.

1. The operator is connected to a subscriber.

2. The operator, via the keysender, keys N99 where N is any digit 1 to 6.

3. A test tone is connected to the subscriber terminal.

4. To remove test tone, operator depresses **CLEAR CDRLS** pushbutton.

5. The operator may release using standard procedures.

(14.1) *Test Tone to Terminal Box.* Test tone may also be forwarded to the **TEST TONE** terminals on the terminal box for maintenance purposes.

1. The operator must be idle, not connected to any subscriber.

2. The operator, via the keysender, keys N99 where N is any digit 1 to 6.

3. Test tone is forwarded to the **TEST TONE** terminals on the terminal box.

4. To remove the test tone, the operator (when idle) keys N99.

(15) *Call Intercept* (automatic switchboards only). The following procedure assumes that a subscriber has keyed or dialed a terminal marked for intercept.

1. The **CALL ANS** pushbutton illuminates either steady (routine) or flashing (priority), and the audible alarm sounds either continuous (routine) or interrupted (priority).

2. The **TERMINAL STATUS** indicator for the calling terminal flashes (1 second on; 1 second off), indicating that the terminal's call is in queue.

3. The operator depresses the **CALL ANS** pushbutton and is connected to the calling party. The calling **TERMINAL STATUS** indicator flashes ( $\frac{1}{4}$  second on;  $\frac{1}{4}$  second off), indicating that the operator is connected to the calling party.

4. The **CALL STATUS** indicator illuminates (either steady or flashing).

5. The operator then extends or releases the call as required.

c. *Terminal Subset Call Processing.* The following procedures describe the actions performed at the terminal subsets for initiating calls. The SB-3614(V)/TT is capable of interfacing with 20-Hz ringdown, common battery supervised (CBS), common battery dial pulse, and common battery DTMF terminal subsets.

(1) *20-Hz Ringdown/CBS.* 20-Hz ringdown/CBS subscribers require operator assistance for all call extension capabilities.

(a) *Initiating Calls.*

1. A CBS subscriber goes off hook or a RD subscriber rings on.

2. Refer to table 3-12 for service tones and required actions.

3. When the RD/CBS subscriber goes on hook, the program senses 20-Hz (RD) or DC open (CBS) and marks the terminal idle.

(b) *Recalls to Operator.* When the subscriber is connected to another subscriber and requires operator intervention, it is not possible to contact the operator. Both parties must go on hook and one must call the operator as described above.

(2) *Common Battery DTMF.* (This procedure is applicable to automatic switchboards only.) Common battery DTMF subscribers are provided automatic call extension, precedence, and preemption capabilities for both local and trunk calls. Conferencing is provided via the operator position.

(a) *Initiating Calls.*

1. A CB DTMF subscriber goes off hook.

2. The program senses an off-hook condition (DC closure), assigns a DTMF receiver which sends a dial tone to the CB DTMF subscriber.

3. The CB DTMF subscriber may then key in either a three-digit directory number, or for priority, R or P plus a three-digit directory number (for either a local terminal or a trunk) via the DTMF keypad.

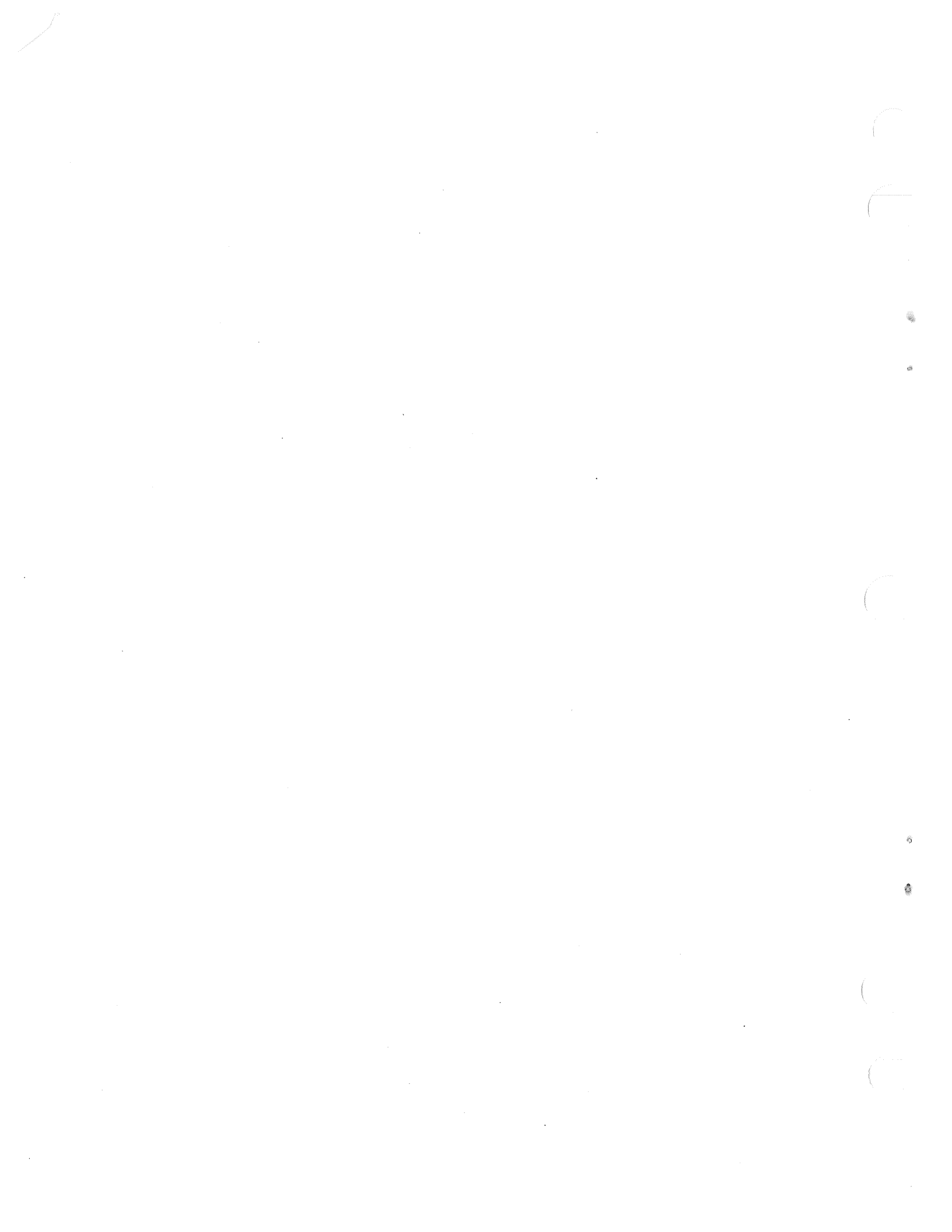
4. In the case of a trunk call, the subscriber may, upon receiving second dial tone, then key either a three-digit number or R or P plus a

three-digit number. The program verifies that the local DTMF subscriber is allowed to dial precedence. If not, an error tone will be returned to the local DTMF subscriber. The originating SB-3614(V)/TT is also responsible for ensuring that a valid precedence request by a DTMF subscriber for a DTMF trunk ("R" + 9SL) is followed by a precedence call to the distant switchboard. Consistency allows the call to be forwarded; inconsistency results in the release of the outgoing DTMF trunk and an error tone being returned to the local DTMF subscriber.

**NOTE**

The CB DTMF subscriber has approximately ten seconds to key in all digits in either step 3. or 4. A busy tone will be returned if all digits are not keyed within this time.





5. The CB DTMF subscriber has made a dialing error if he has keyed incorrectly (i.e., "R" when not classmarked for precedence; "C", etc).

6. Refer to table 3-12 for service tones and required actions.

7. If the CB DTMF subscriber has keyed a trunk group or trunk number, a busy tone (if a busy condition exists on all trunks), a dial tone (if the trunk is to an AN/TTC-38 or an SB-3614(V)/TT), or a wait-in-queue (if the trunk is to a CV-1919) is returned to the CB DTMF subscriber. (If the trunk is to an AN/TTC-38, the CB DTMF subscriber then dials the AN/TTC-38 subscriber directory number).

8. When the CB DTMF subscriber goes on hook, the program senses DC open and marks the terminal idle.

*(b) Recall to Operator.*

1. The CB DTMF subscriber is connected to another party (not the operator) and requires operator intervention.

2. The CB DTMF subscriber may recall the operator by tapping the hookswitch on the terminal subset.

3. The call is placed in the operator's queue at a level between routine and priority.

**NOTE**

Neither a wait-in-queue nor a busy tone is returned to the recalling party.

*(3) Common Battery Dial Pulse Subscribers.*

Common battery dial pulse subscribers are provided automatic call extension for local calls and manual trunks. Precedence, conferencing, and automatic trunk call extension (for automatic switchboards only) are provided via the SB-3614(V)/TT operator position.

*(a) Initiating Calls.*

1. A CB DP subscriber goes off hook.

2. The program senses an off-hook condition (DC closure) and returns a dial tone to the CB DP subscriber.

3. The CB DP subscriber may then dial a three-digit subscriber directory number.

4. The CB DP subscriber has made a dialing error if he has dialed incorrectly (i.e., automatic group or automatic trunk number, etc.). Subscriber receives wait-in-queue tone. Refer to table 3-12 for service tones and required action.

5. When the CB DP subscriber goes on hook, the program senses DC open and marks the terminal idle.

*(b) Recalls to Operator.*

1. The CB DP subscriber is connected to another party (not the operator) and requires operator intervention.

2. The CB DP subscriber may recall the operator by tapping the hookswitch on the terminal subset.

3. The call is placed in the operator's queue at a level between routine and priority.

**NOTE**

Neither a wait-in-queue nor a busy tone will be returned to the recalling party.

*d. Stopping Procedure for Standby.* This procedure is intended for use when the operator will not be present at the switchboard. The functions which the switchboard provides are listed below.

1. Depressing OPR RLSE releases the operator from the operator's queue and places the operator in the idle state.

2. 20-Hz ringdown and CBS subscribers cannot be serviced by the operator.

3. Common battery DTMF subscribers will have automatic call extension for both local and trunk calls and manual trunks.

4. Common battery dial pulse subscribers will have automatic call extension for local calls.

*e. Stopping Procedure for Shutdown.* To shutdown the SB-3614(V)/TT, turn the POWER ON/OFF switch to OFF.

**NOTE**

In expanded installations, the Slave switchboard POWER ON/OFF switches are turned to OFF.

Table 3-12. Service Tones—Subscriber Status

Service tone (paragraph 1-13)	Subscriber action required (call status)
Ringback	Wait for called party to answer call.
Wait-in-queue	Wait for operator to service call.
Busy	Terminate call-wait-call again.*
Error	Terminate call-check information-call again.
Off-hook warning	Place handset on hookswitch.
Preempt	Call has been preempted.
Preempt/ringback or wait-in-queue	Wait for called party to answer call.
Preempt/connected to party	Call is established.

\* Ringback subscriber must turn handcrank and CBS and subscriber must go on hook.

## Section III. OPERATION UNDER UNUSUAL CONDITIONS

## 3-6. Operation Under Extreme Environmental Conditions

The SB-3614(V)/TT is capable of operating under extreme environmental conditions within its specifications as listed in paragraph 1-13. Certain precautions are necessary, however, as noted below.

*a. Cold Climates.* Extreme cold causes cables to become hard, brittle, and difficult to handle. Be careful when handling the cables and connecting them to the equipment, so that kinks and necessary loops will not result in permanent damage. Make sure that all connectors are free of frost, snow, and ice. Never drag or place an open connector in the snow. Keep cable caps on unused connectors.

*b. Hot Climates.* In hot, dry climates connectors and receptacles are subject to damage from dust and dirt. Never place an open connector on the ground. Keep cable caps on unused connectors.

*c. Warm, Damp Climates.* In warm, damp climates the equipment is subject to damage from moisture and fungi. Wipe all moisture and fungi from the equipment with a lint-free cloth. Keep cable caps on unused connectors.

## 3-7. Operation Under Emergency Conditions

Under emergency conditions some degradation or performance is tolerable. Table 3-13 lists performance to be expected for certain malfunctions. (Refer to paragraph 3-2a.)

Table 3-13. Emergency Conditions—Performance Degradation

Failure	Performance degradation
POWER ON lamp—failure	Full function can be obtained except for illumination of the POWER ON lamp.
DC FAILURE lamp—flashing	Indicates battery or prime power low voltage. Switch to alternate source. Refer to paragraph 2-13.
LAMP TEST—does not function	Does not degrade operational performance LAMP TEST.
NIGHT LIGHTS—do not operate	Does not degrade operational performance except for NIGHT LIGHTS. Flashlight can be used in emergency.
BRIGHTNESS Control—does not operate	Does not degrade operational performance. Operate with dimly lit indicators or use flashlight.
NIGHT ALARM—does not sound	Does not degrade operational performance. Observe CALL ANS pushbutton and CCU FAILURE lamp rather than relay on NIGHT ALARM.
NIGHT ALARM VOLUME—inoperative	Does not degrade operational performance. Low volume must be tolerated. High volume can be reduced by partially covering grille with tape.
HEADSET—inoperative	All functions requiring operator service are not possible. Ringdown and CB subscribers will have no service. DTMF subscribers can make local and trunk calls. Dial pulse subscribers can make local calls. If available, a TA-312/PT subset operating in LB mode can be substituted by connecting to OPERATOR terminals on terminal box at rear of switchboard.
HEADSET VOLUME—inoperative	All normal operational functions will be possible except that with high ambient noise, the operator may not be able to hear satisfactorily.
CALL ANS pushbutton—does not illuminate	In normal operation, the NIGHT ALARM sounds when the CALL ANS pushbutton illuminates. With the CALL ANS lamp inoperative the NIGHT ALARM will alert operator.
REENTRY lamp—does not illuminate	Operator must remember when REENTRY was depressed to mark a multiparty call for reentry.
DTMF tone—inoperative	All digiting requiring the missing digit will not be possible; however, other digiting will be unaffected.
CALL STATUS lamp—inoperative	The operator will be unable to tell, by observation, if he is connected to a routine or priority call. All other performance will be normal.
Keysender—digit inoperative	All digiting requiring the missing digit will not be possible; however, other digiting will be unaffected.
TERMINAL STATUS lamp(s)—inoperative	Operator will be unable to determine if terminal is busy to another subscriber, in the operator's queue or is connected to the operator. All other functions will be normal.

## Section IV. PREPARATION FOR MOVEMENT

**3-8. General**

The following procedure is used by the operator to disconnect, store loose hardware for, and assemble the SB-3614(V)/TT prior to movement.

**3-9. Movement Procedure**

a. Perform Stopping Procedure for Shutdown. Refer to paragraph 3-5e.

b. Disconnect W3 cable(s) from J1/J2 receptacle(s) and store in rear cover (expanded systems only). Refer to figures 3-3 and 2-2.

c. Disconnect H-182/PT headset and store in front cover. Refer to figures 3-2 and 2-2.

d. Remove W4 ground cable from GND terminal at rear panel and ground stake. Store in rear cover. Refer to figures 3-3 and 2-2.

e. Remove ground stake and store in rear cover. Refer to figures 3-3 and 2-2.

f. Remove all 2- and 4-wire terminal connections on terminal panel by depressing hole-in-head connector and removing wire.

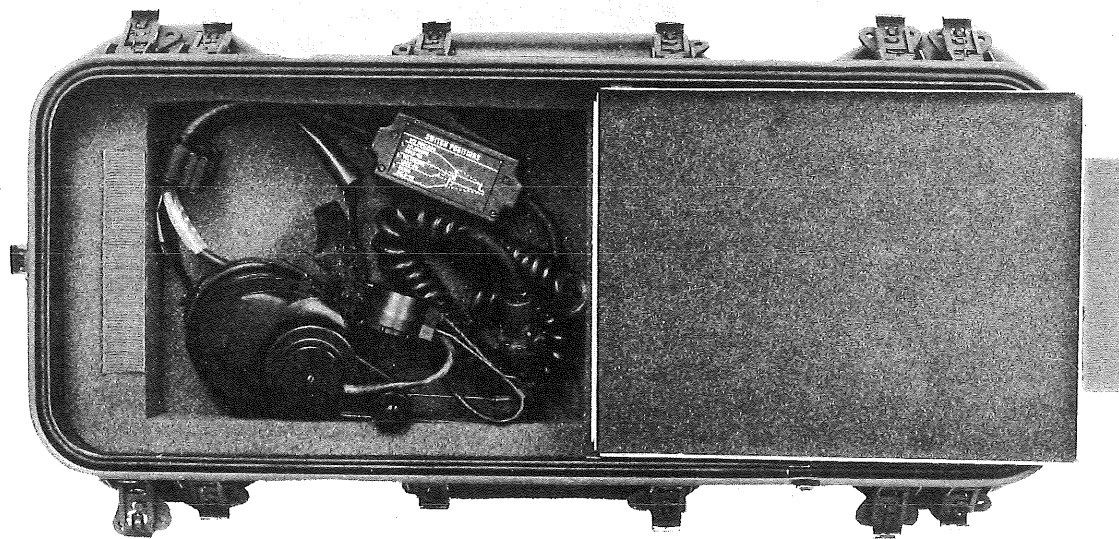
g. Reposition the terminal box to the storage position. Refer to figure 1-9.

h. Remove power cable(s) (W1) and store in rear cover. Refer to figure 3-3.

i. Clean all exterior surfaces in accordance with procedure described in paragraph 5-11.

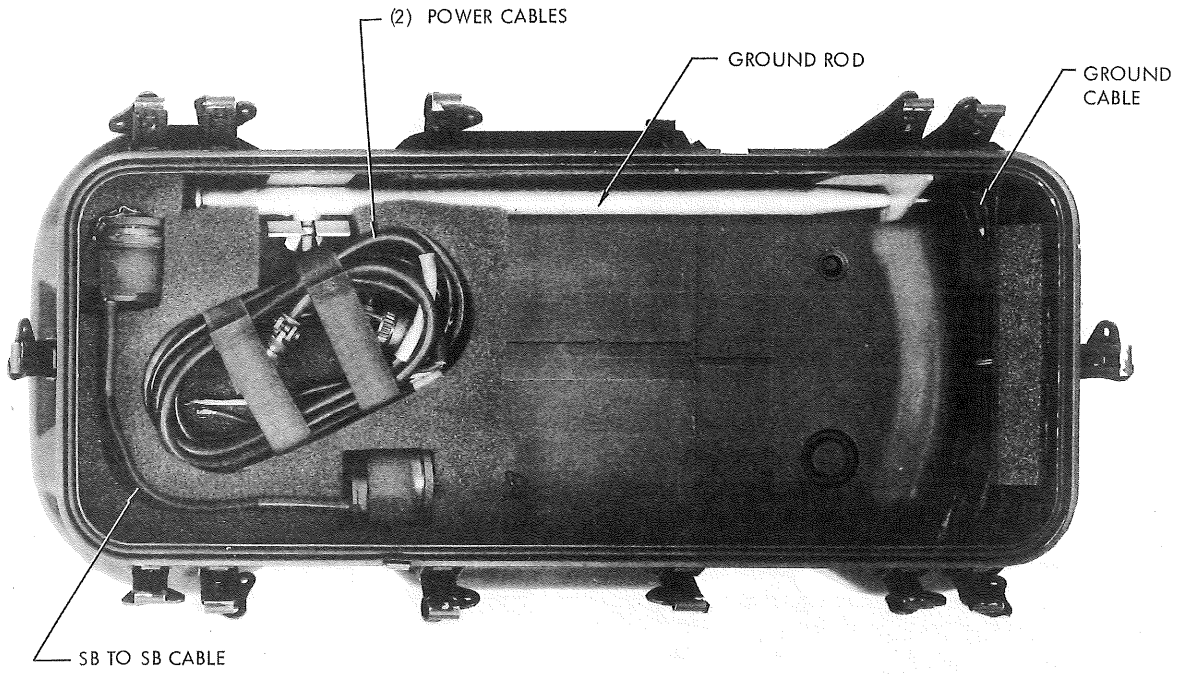
j. Observing keyways, attach front and rear covers to the SB-3614(V)/TT.

k. Pack switchboard in corrugated carton if applicable. Refer to paragraph 2-6 and figure 2-1.



EL1QZ0019

Figure 3-2. Front Cover, Headset Storage.



EL1QZ0018

*Figure 3-3. Rear Cover, Parts Storage.*

## CHAPTER 4

### OPERATOR/CREW MAINTENANCE INSTRUCTIONS

#### Section I. TOOLS AND EQUIPMENT

##### 4-1. Tools and Equipment

Tools and test equipment authorized for use by the operator are listed in the Maintenance Allocation Chart (appendix C).

##### 4-2. Repair Parts

Repair parts and accessories authorized for use by the operator are listed in the Repair Parts and Special Tools List (TM 11-5805-695-20P).

#### Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

##### 4-3. General.

*a. Scope.* To insure that the SB-3614(V)/TT Telephone Switchboard is always ready for operation, it should be systematically inspected for defects so that they may be corrected before they can result in serious damage or failure. The necessary preventive maintenance checks and services to be performed are listed and described in table 4-1. The sequence numbers indicate the order of minimum required inspection. Defects observed during normal operation of the switchboard (operator's instructions, paragraphs 3-6 and 3-7) should be noted for correction as soon as operation has ceased. Operation should be stopped immediately if a deficiency which could damage the equipment is noted during operation. All deficiencies, together with the corrective action taken, should be recorded as described in paragraph 1-3.

*b. Preventive Maintenance Checks and Services Periods.* Preventive maintenance checks and services for an operating SB-3614(V)/TT are required

daily. In addition, the daily checks and services should be performed under the following special conditions:

- (1) When the equipment is initially installed.
- (2) When the equipment is reinstalled after removal for any reason.
- (3) At least once each week if the equipment is maintained in a standby condition.

##### 4-4. Instructions for the Performance of Preventive Maintenance Checks and Service

Refer to table 4-1.

##### NOTE

If the SB-3614(V)/TT Telephone Switchboard must be kept in continuous operation, check and service only those items that can be serviced without disturbing operation; make complete checks and services when the equipment is shut down.

*Table 4-1. Operator's Daily Checks*

Sequence number	Item to be inspected	Procedure	References
1	Ground connection	Check that the grounding cable is clean and secure at the SB-3614(V)/TT and at the ground stake or other ground.	Paragraphs 3-2 and 2-9.
2	Cable connectors	Check that all connectors on rear panel and headset connector on front panel are secure.	Paragraph 3-2 and figures 2-2 and 2-3.
3	Terminal connections	Check that all field wire connections on terminal panel (rear of chassis) are secure.	Paragraph 3-2 and 2-10 and figure 1-8.
4	Fuse, Spare	Remove and inspect the spare fuse.	Paragraph 3-2 and figure 1-4.
5	POWER switch	Observe that the POWER switch is in the ON position.	Paragraph 3-2 and figure 1-4.

Table 4-1. Operator's Daily Checks—Continued

Sequence number	Item to be inspected	Procedure	References
6	Indicator lamps/BRIGHTNESS control	Depress LAMP TEST and observe that lamps illuminate and that intensity varies in accordance with BRIGHTNESS control.	Paragraph 3-2 and figure 1-4.
7	Night lamps/BRIGHTNESS control	Turn the NIGHT LAMP/LAMP TEST switch to the NIGHT LIGHT position. Observe that lamps illuminate and that intensity varies in accordance with BRIGHTNESS control.	Paragraph 3-2, figure 1-4.
8	PROGRAM/CALL PROCESS switch	Observe that the PROGRAM/CALL PROCESS switch is in the CALL PROCESS position.	Paragraph 3-2 and figure 1-4.
9	MASTER/SLAVE switch	Check that the MASTER/SLAVE switch is in the appropriate position.	Paragraph 3-2, figure 1-6, and table 2-1.
10	TRUNK HUNTING CONTROL switches, S1 and S2	Check that the TRUNK HUNTING CONTROL switches are in the appropriate position.	Paragraph 3-2, figure 1-6, and table 2-1.
11	NUMBER PLAN switch	Check that the NUMBER PLAN switch is in the appropriate position.	Paragraph 3-2, figure 1-6, and table 2-1.
12	VOLUME NIGHT ALARM	Request an incoming call and place the switchboard in the idle state. Observe NIGHT ALARM volume varies in accordance with VOLUME control.	Paragraph 3-2 and figure 1-4.
13	Voice path/ringback tone/ring	Initiate a call. Observe ringback tone and proper voice path and volume. Request verification of ring by subscriber.	Table 5-1.
14	Batteries	Inspect and service.	Appendix A.
15	VOLUME/HDST	Operator keys FO and receives error tone. Observe that error tone varies as HDST VOLUME is rotated.	Paragraph 3-2 and figure 1-4.
16	All exterior hardware	Inspect all exterior hardware to insure that it is secure. Verify that gaskets and "O" rings are compressed to prevent moisture leakage to interior.	

**Section III. TROUBLESHOOTING**

Refer to table 4-2 for operator's troubleshooting chart. Trouble that is beyond the scope of the operator shall be referred to organizational maintenance.

Table 4-2. Operator's Troubleshooting Chart

Malfunction	Probable cause	Corrective action
1. Switchboard inoperative	<ul style="list-style-type: none"> <li>a. Power switch OFF.</li> <li>b. Blown fuse.</li> <li>c. Loose or removed connector(s).</li> </ul>	<ul style="list-style-type: none"> <li>a. Turn POWER switch to ON.</li> <li>b. Replace blown fuse with SPARE (paragraph 4-7).</li> <li>c. Reconnect connector(s).</li> </ul>
2. POWER ON lamp does not light	<ul style="list-style-type: none"> <li>a. POWER switch OFF.</li> <li>b. Failed PWR ON lamp.</li> <li>c. BRIGHTNESS control set too low.</li> </ul>	<ul style="list-style-type: none"> <li>a. Turn POWER switch ON.</li> <li>b. Perform LAMP TEST and replace lamp if required (paragraph 4-4).</li> <li>c. Replace blown fuse with SPARE.</li> </ul>
3. Noise on telephone lines	<ul style="list-style-type: none"> <li>a. Loose ground connection.</li> <li>b. One side of transmission line grounded.</li> <li>c. Transmission lines in close proximity to power lines or power generators.</li> <li>d. Arrestor shorted.</li> </ul>	<ul style="list-style-type: none"> <li>a. Clean and restore ground connections (paragraph 4-4).</li> <li>b. Observe terminal box connections, in rear of switchboard, for obvious grounded connections.</li> <li>c. Check for transmission lines in close proximity to power lines or power generator and reroute to avoid these noise sources.</li> <li>d. Refer to organizational maintenance.</li> </ul>
4. Indicator lamp(s) not lit	<ul style="list-style-type: none"> <li>a. Burned out lamp.</li> <li>b. BRIGHTNESS control set too low.</li> </ul>	<ul style="list-style-type: none"> <li>Perform LAMP TEST and replace lamp(s) as required (paragraph 4-2).</li> </ul>
5. NIGHT ALM volume too low	VOLUME/NIGHT ALM control set too low.	Rotate VOLUME/NIGHT ALM cw to obtain volume, as desired.

Table 4-2. Operator's Troubleshooting Chart—Continued

Malfunction	Probable cause	Corrective action
6. Indicator/NIGHT LIGHT intensity too low	BRIGHTNESS control set too low.	Rotate BRIGHTNESS control cw to obtain lamp intensity as required.
7. DC FAILURE indicator lights steady	Failure of internal power supply.	Refer to organizational maintenance.
8. DC FAILURE indicator flashes	Battery voltage too low.	a. Switch to alternate battery (paragraph 3-2d). b. Replace battery (paragraph 2-13). c. Charge battery (appendix A).
9. CCU FAILURE indicator lights steady		Refer to organizational maintenance.
10. 20 Hz FAILURE indicator lights steady		Refer to organizational maintenance.

#### Section IV. MAINTENANCE OF SB-3614(V)/TT TELEPHONE SWITCHBOARD

4-5. This section contains unique procedures required for operator level maintenance

##### 4-6. Lamp Replacement

###### a. Pushbutton Indicators.

1. Remove the cap by gripping its two edges and pulling straight out from the panel.
2. Remove the lamp from the cap by gripping the lamp flange and pulling straight out.
3. Obtain the proper replacement lamp from the MK-1823(V)/TT.
4. Insert the replacement lamp and press the pushbutton cap into place.
5. Depress LAMP TEST to verify proper operation.

###### b. Panel Indicators and Night Lights.

1. Remove the lens from the front panel by unscrewing ccw.

2. Remove the lamp from the lens by gripping the lamp flange and pulling straight out.

3. Obtain the proper replacement lamp from the MK-1823(V)/TT.

4. Insert the replacement lamp and screw the lens into the panel.

5. Depress LAMP TEST to verify performance.

##### 4-7. Fuse Replacement

1. Remove the fuseholder from the front panel by rotating ccw,  $\frac{1}{4}$  turn.

2. Slide the fuse from the fuseholder and verify failure.

3. Remove SPARE fuse and install it in active fuseholder.

4. Reinstall both active and SPARE fuseholders into the front panel.





## CHAPTER 5

### ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

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#### Section I. TOOLS AND EQUIPMENT

##### 5-1. Repair Parts

Repair parts required for organizational maintenance of the SB-3614(V)/TT are contained in the Repair Parts and Special Tools List (RPSTL), which is included in TM 11-5805-695-20P.

##### 5-2. Special Tools

Special tools required for organizational maintenance of the SB-3614(V)/TT are contained in the Repair Parts and Special Tools List (RPSTL), which is included in TM 11-5805-695-20P.

#### Section II. REPAINTING AND REFINISHING INSTRUCTIONS

##### 5-3. Paints and Finishes

###### CAUTION

Before painting, carefully mask all unpainted and vented surfaces and nameplates, decals, MWO information, and other markings.

The case final paint film is smooth, semigloss enamel, green color number X24087 conforming to FED-STD-595 as listed in SB 11-573. Finish for hardware such as handles, hinges, screws, etc., is in accordance with MIL-F-14072.

##### 5-4. Painting Instructions

Refer to TB 746-10 for instructions on painting and preserving electronics equipment.

##### 5-5. Items Not to be Painted

1. Nonmetallic portion of front cover.
2. Nonmetallic portion of rear cover.
3. Rubber grips of carrying handles.
4. Interior surfaces of SB-3614(V)/TT.
5. Printed circuit card assemblies.
6. Pressure relief valve.
7. Metal surface beneath ground lug.

#### Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

##### 5-6. General.

*a. Scope.* To ensure that the SB-3614(V) /TT Telephone Swithboard is always ready for operation, it should be systematically inspected for defects so that they may be corrected before they can result in serious damage or failure. The necessary preventive maintenance checks and services to be performed are listed and described in table 5-1. The sequence numbers indicating the order of minimum required inspections. Sequence numbers 6 through 28 in table 5-1 reflect normal switchboard functions as observed by the operator; functions under abnormal conditions are described in detail in the operator's instructions, paragraphs 3-6 and 3-7. If deficiencies are noted by the operator during normal operation, the SB-3614(V)/TT should be referred to organizational level maintenance. If a defect which could damage

the switchboard is discovered during operation, operation should stop immediately. All deficiencies, together with the corrective action taken, should be recorded as described in paragraph 1-3.

###### *b. Maintenance Period.*

(1) Organizational preventive maintenance is performed monthly as specified by procedures provided in table 5-1.

(2) Defective items that cannot be corrected must be reported to higher category maintenance personnel. Records and reports of repairs and preventive maintenance must be made in accordance with procedures given in TM 38-750.

##### 5-7. Organizational Preventive Maintenance

Refer to table 5-1.

Table 5-1. Organizational Monthly Checks

## NOTE

If the SB-3414(V)/TT Telephone Switchboard must be kept in continuous operation, check and service only those items that can be serviced without disturbing operation; make complete checks and services when the equipment is shut down.

Sequence number	Item to be inspected	Procedure	References
1	Exterior surfaces	Inspect for chips and scratches in the paint.	Paragraph 5-4
2	Connectors	Inspect all external connectors to insure that they are secure. Inspect wires for loose or broken connections.	None
3	Hardware	Check, tighten, and replace as necessary.	None
4	Modification work orders	Check to see if any MWO's are required. Check to see if current MWO's have been applied and if MWO number is stamped as required.	DA Pam 310-7
5	Ground connection	Check that the grounding cable is clean and secure, both at the SB-3614(V)/TT and the ground stake or other ground.	Paragraphs 3-2 and 2-9
6	Local calls	Check that operator can initiate call to local subscriber (paragraph 3-5b).	Figure FO-1
7	Trunk calls	Check that operator can initiate a trunk call (paragraph 3-5b).	Figure FO-1
8	Operation of OPR RLSE pushbutton	Check that a call can be released by OPR RLSE pushbutton (paragraph 3-5b).	Figure FO-1
9	Operation of CLEAR CDRLS pushbutton	Check that a called party can be released by the CLEAR CDRLS pushbutton (paragraph 3-5b).	Figure FO-1
10	Operation of CALL ANS pushbutton	Check that a call can be released by the CALL ANS pushbutton (paragraph 3-5b).	Figure FO-1
11	Answering incoming calls	Check that incoming calls can be answered by the operator (paragraph 3-5b).	Figure FO-1
12	Call extension	Check that a subscriber, connected to the operator, can be connected to another subscriber or trunk (paragraph 3-5b).	Figure FO-1
13	Precedence extension	Check that the operator can grant precedence to a subscriber (paragraph 3-5b).	Figure FO-1
14	Conference calls	Check that the operator can establish a conference call (paragraph 3-5b).	Figure FO-1
15	Reentry	Check that the operator can reenter a multiparty call (paragraph 3-5b).	Figure FO-1
16	Call holding	Check that the operator has call holding capability (paragraph 3-5b).	Figure FO-1
17	Call monitoring	Check that the operator can monitor calls in process (paragraph 3-5b).	Figure FO-1
18	Reringing	Check that the operator can rering a subscriber more than once (paragraph 3-5b).	Figure FO-1
19	Test tone	Check that the operator can direct a test tone to a line (paragraph 3-5b).	Figure FO-1
20	Call intercept	Check that the operator has call intercept capability (paragraph 3-5b).	Figure FO-1
21	20-Hz RD subscriber call initiating	Check that a 20-Hz RD subscriber can initiate a call to the operator (paragraph 3-5c).	Figure FO-1
22	CB DTMF subscriber call initiating	Check that a DTMF subscriber can initiate a call (paragraph 3-5c).	Figure FO-1
23	CB DTMF subscriber recall	Check that a DTMF subscriber can recall the operator (paragraph 3-5c).	Figure FO-1
24	CB dial pulse subscriber call initiation	Check that a CB dial pulse subscriber can initiate a call (paragraph 3-5c).	Figure FO-1
25	CB dial pulse subscriber recall call	Check that a CB dial pulse subscriber can recall the operator (paragraph 3-5c).	Figure FO-1
26	Batteries	Inspect and service.	Appendix A
27	Headset	Inspect and service.	Appendix A
28	All exterior hardware	Inspect all exterior hardware to insure that it is secure. Verify that gaskets and "O" rings are compressed to prevent moisture leakage to interior.	

## Section IV. TROUBLESHOOTING

### 5-8. Scope

Locating defective parts is restricted to replaceable circuit cards, power supply, and indicator lamps. Isolation of the faulty part is accomplished by substituting a part known to be good and observing whether the fault symptom(s) has been eliminated.

### 5-9. Use of Troubleshooting Chart

a. Figure FO-1 lists along the horizontal axis, in descending order of reliability, all parts which are replaceable at the organizational level. Failed functions are listed on the vertical axis, and symptoms which are observable by the operator and/or subscriber are given.

b. When a failure is detected, the corresponding symptom is located on the vertical axis. The horizontal line indicates all parts or circuit boards that could cause the symptom; and these parts are replaced, one at a time, starting at the left side of the chart, until the fault is eliminated. When replacement of a part does not eliminate the symptom, the original must be reinstalled before the next part is replaced.

c. If, after replacement of all the parts listed for a given fault, the failure has not been eliminated, further maintenance shall be referred to intermediate level maintenance.

## Section V. MAINTENANCE OF SB-3614(V)/TT TELEPHONE SWITCHBOARD

### 5-10. General

This section contains unique replacement procedures required for organizational level maintenance.

### 5-11. Cleaning

#### WARNING

Adequate ventilation should be provided while using trichlorotrifluoroethane. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since trichlorotrifluoroethane dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

a. Use a dry, lint-free cloth or brush to remove dust or dirt. If necessary, moisten the cloth or brush with trichlorotrifluoroethane (NSN 6850-00-984-5853). After cleaning, wipe dry with a clean cloth.

#### WARNING

To be usable for cleaning, the compressed air source must limit the nozzle pressure to no more than 29 pounds per square inch gauge (PSIG). Goggles must be worn at all times while cleaning with compressed air.

b. Dry compressed air may be used to remove dirt and dust from inaccessible places.

### 5-12. Fuse Replacement

For fuse replacement procedure, refer to paragraph 4-7.

### 5-13. Cleaning Ground Connection

1. Remove ground strap from either the terminal box or ground stake, as required.

#### WARNING

Adequate ventilation should be provided while using trichlorotrifluoroethane. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since trichlorotrifluoroethane dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

2. Clean corrosion from terminal or strap with fine sandpaper. Wipe clean with trichlorotrifluoroethane.

3. Replace ground strap to terminal.

### 5-14. Lamp Replacement

For lamp replacement procedure, refer to paragraph 4-6.

### 5-15. Opening Front Panel

When a failure is isolated to a suspected circuit card, it is necessary to open the front panel for replacement of the card. The panel can remain in the "locked open" position for further service and observation of performance if required.

1. Using a suitable flathead screwdriver, unscrew the 18 captive screws which secure the front panel to the case (figure 1-5).
2. Pull out the front panel and swing it up slowly until it locks in the raised position.
3. It is possible to remove and insert circuit cards when the panel is in the "locked open" position.

### 5-16. Closing Front Panel

1. Verify that all circuit cards are inserted fully into their sockets.
2. Lift the front panel slightly from its "locked open" position and then allow it to slide down to the closed position (figure 1-5).
3. Secure the front panel to the chassis by tightening the 18 captive screws with a suitable flathead screwdriver.

### 5-17. Circuit Card Removal

1. Turn off power before removing any PC card or assembly.
2. Refer to figure 2-4 for circuit card locations.
3. Position the card extractor (figure 1-10) into the holes at the edges of the card to be removed.
4. Squeeze the card extractor slowly to remove the circuit card.

### 5-18. Circuit Card Installation

1. Refer to figure 2-4 for circuit card locations.
2. Position the circuit card to be installed on the appropriate guide slots. The components must be on the left side facing the chassis.
3. Slowly slide the card forward until the card connector is aligned with its mating receptacle.
4. Push the card in slowly until the connector is fully engaged.

### 5-19. Power Supply Removal

1. Set the POWER switch to OFF.
2. Disconnect the prime power cable and/or batteries from the power supply module (figure 1-7).
3. Fasten dust caps on respective connectors.
4. Using a suitable Philips screwdriver, remove the ten screws and washers which secure the power supply module to the rear panel.
5. Carefully pull out the module and place it face down.
6. Using a suitable Philips screwdriver, remove the two captive screws which secure connector PS1-P1 to the connector plate (A44-J4).
7. Remove connector PS1-P1 from A44-J4.
8. Remove A45W4 (three wires) from TB1 (PS1TB1-4, -3, -GND) of the power supply module by removing three screws with a suitable flathead screwdriver and replace the screws and washers in TB1.

### 5-20. Power Supply Installation

1. Place the power supply module to be installed face down in front of the rear panel.
2. Connect A45W4 to TB1 of the power supply module, as follows:
  - White—TB1-3
  - Black—TB1-4
  - Shield—TB1-GND
3. Insert connector PS1-P1 into connector plate A44-J4.
4. Using a suitable Philips screwdriver, tighten the two captive screws to secure PS1-P1.
5. Carefully insert the power supply module in place in the rear panel.
6. Using a suitable Philips screwdriver, secure the ten screws and washers which secure the power supply module to the rear panel.
7. Connect the prime power cable and/or battery cables as required (paragraph 2-13).
8. Set the BATTERY SELECT switch to the appropriate position (paragraph 2-13).

### 5-21. Battery Maintenance

Refer to appropriate TM in appendix A.

**5-22. Removal of Terminal Box**

1. Facing rear of SB-3614(V)/TT, disengage two locking screws, slide terminal box to left until it disengages from guides.
2. Disconnect P1W1 from W2J1 by rotating lock ring on P1W1 counterclockwise.
3. Disengage P1W2 from W3J1 by rotating lock ring on P1W2 counterclockwise.

**5-23. Installation of Terminal Box**

1. Connect P1W1 to W2J1 by rotating lock ring on P1W1 clockwise.
2. Connect P1W2 to W3J1 by rotating lock on P1W2 clockwise.
3. Engage terminal box on guides of SB-3614(V)/TT and slide into operating position and tighten the two locking screws.

**5-24. Water Leakage Check.**

This procedure should be performed to remove any water leakage that might have occurred whenever an unprotected SB-3614(V)/TT is exposed to a heavy rainfall.

1. Remove all power from the switchboard.
2. Open up the front panel of the switchboard as specified in paragraph 5-15.
3. Remove the printed circuit cards from card slots XA37 through XA43.
4. Raise the left side of the switchboard case to allow any water to flow down to the right side of the case.
5. Tip the case forward to allow the water to flow to the front corner of the case.
6. Using a sponge or other absorbent material, remove the accumulated water from the case.
7. Replace the printed circuit cards removed in step 3 and then close up the front panel.

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## APPENDIX A

## REFERENCES

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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	U.S. Army Equipment Index of Modification Work Orders.
SB 11-573	Painting and Preservation Supplies Available for Field Use for Electronics Command Equipment.
SB 700-20	Army Adopted/Other Items Selected for Authorization/List of Reportable Items.
TB 34-9-88	Telephone Set TA-43( )/PT, Telephone Set TA-312/PT, and Telephone Set TA-5003/U.
TB 43-0116	Identification of Radioactive Items in the Army Supply System.
TB 746-10	Field Instructions for Painting and Preserving Electronics Command Equipment.
TM 740-90-1	Administrative Storage of Equipment.
TM 11-468	Substation maintenance.
TM 11-2134	Manual Telephone Switchboard SB-86/P; Installation and Operation.
TM 11-5805-201-12	Operator and Organizational Maintenance Manual Including Repair Parts and Special Tool Lists: Telephone Set TA-312/PT.
TM 11-5805-247-12	Organizational Maintenance Manual (Including Repair Parts and Special Tool Lists): Converter, Telegraph-Telephone Signal TA-182/U.
TM 11-5805-262-12	Operator's and Organizational Maintenance Manual: Switchboards, Telephone, Manual SB-22/PT and SB-22A/PT.
TM 11-5805-386-12	Operator and Organizational Maintenance Manual Including Repair Parts and Special Tool Lists: Converter, Telephone Signal CV-1919/G.
TM 11-5805-471-12	Operator's and Organizational Maintenance Manual Including Repair Parts and Special Tools List: Switchboard, Telephone, Cordless, Manual SB-3082(V)1/GT and SB-3082(V)2/GT.
TM 11-5805-553-12	Operator and Organizational Maintenance Manual Including Repair Parts and Special Tool Lists: Converter, Telephone Signal CV-1918( )/G(V)1.
TM 11-5805-628-12	Operator's and Organizational Maintenance Manual: Automatic Telephone Central Offices AN/TTC-38(V)1 and AN/TTC-38(V)2.
TM 11-5805-650-12	Operator and Organizational Maintenance Manual Including Repair Parts and Special Tool Lists: Telephone Set TA-838/TT.
TM 11-5805-695-20P	Organizational Maintenance Repair Parts and Special Tools List: Switchboard, Telephone SB-3614(V)/TT.
TM 11-6140-203-15-1	Operator, Organizational, DS, GS, and Depot Maintenance Manual: Aircraft and Non-aircraft Nickel-Cadmium Batteries (General).
TM 11-6140-203-15-2	Operator's Organizational, DS, GS, and Depot Maintenance Manual Including Repair Parts and Special Tools Lists: Aircraft Nickel-Cadmium Batteries.
TM 11-6140-203-15-3	Operator, Organizational, DS, GS, and Depot Maintenance Manual Including Repair Parts and Special Tool Lists: Non-aircraft Nickel-Cadmium Batteries.



TM 11-5905-695-12

TM 38-750

TM 750-244-2

TM 11-5965-283-15

The Army Maintenance Management System (TAMMS).  
Procedures for Destruction of Electronics Material to Prevent  
Enemy Use (Electronics Command).  
Operator, Organizational, DS, GS, and Depot Maintenance Man-  
ual Including Repair Parts and Special Tools Lists: Headset  
Microphone H-182/PT.

## APPENDIX C

### MAINTENANCE ALLOCATION

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#### Section I. INTRODUCTION

##### C-1. General

This appendix provides a summary of the maintenance operations for the SB-3614. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

##### C-2. Maintenance Function

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. Test.* To verify serviceability and to detect incipient 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 operation 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 bringing into proper or exact position, or by setting the operating characteristics to the specified parameters.

*e. Align.* To adjust specified variable elements of an item to bring about optimum or desired performance.

*f. Calibrate.* To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust

any discrepancy in the accuracy of the instrument being compared.

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

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

*i. Repair.* The application of maintenance services (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in 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 condition.

*k. Rebuild.* Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifying Army equipments/components.

##### C-3. Column Entries

*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, subassemblies, and modules for which maintenance is authorized.

c. *Column 3, Maintenance Functions.* Column 3 lists the functions to be performed on the item listed in column 2. When items are listed without maintenance functions, it is solely for purpose of having the group numbers in the MAC and RPSTL coincide.

d. *Column 4, Maintenance Category.* Column 4 specifies, by the listing of a "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.

#### C-4. Tool and Test Equipment Requirements (Sec 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.

#### C-5. Remarks (Sec 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.

SECTION II MAINTENANCE ALLOCATION CHART  
FOR

SWITCHBOARD, TELEPHONE SB-3614(V)/TT

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQPT.	(6) REMARKS
			C	O	F	H	D		
00	SWITCHBOARD, AUTOMATIC SB-3614	Inspect		0.5				1,6	A B
		Test		1.0				1,6,27	
		Test			2.0			21,27	
		Test				4.0		1,2,3,6, 13,14,15, 19,21,27	
		Service Repair		0.5				1,6	C D
		Repair		2.0	4.0			1,6,27 21,27	
01	TERMINAL BOX ASSEMBLY, A47	Repair					1,2,3,6, 7,8,9,10, 13,14,15, 19,20,21, 26,27	E	
		Repair		0.5	1.0	2.0	1,2,27 1,2,19, 27		
02	PANEL ASSEMBLY, FRONT A45	Repair			1.0		1,2,27	F	
03	PANEL ASSEMBLY, REAR A46	Repair				0.5	1,2,27		
04	POWER SUPPLY PS1 (SCOTT 755090A0500)	Repair					2.0	G	
		Repair		0.5		3.0	1,2,22, 27		
0401	CIRCUIT CARD ASSEMBLY, LINE SENSE PS1A1	Replace					1	H	
		Repair				0.5	1,2,3, 12,20, 21,26,27		
0402	CIRCUIT CARD ASSEMBLY, MAIN OUTPUT PS1A2	Replace					28	I	
		Repair				0.5	1,2,3,5, 12,20,21, 26,27		
0403	CIRCUIT CARD ASSEMBLY, RING GENERATOR PS1A3	Replace					28	J	
		Repair				0.5	1,2,3,5, 12,20,21, 26,27		
0404	CIRCUIT CARD ASSEMBLY, FILTER PS1A4	Replace					28	K	
		Repair				0.5	1,2,3,5, 12,20,21, 26,27		
05	CONNECTOR PLATE ASSEMBLY A44	Replace					2.0	L	
06	CIRCUIT CARD, MATRIX LINK A3	Repair					4.0		
07	CIRCUIT CARD, P+/P - DRIVER A12, A16	Replace		0.5				1,6	M
		Repair					1.0	1,2,3,5, 16,17,18, 21	
08	CIRCUIT CARD, ANALOG GATE A19, A21, A23	Replace						1,6	N
		Repair		0.5			2.0	1,4,5	
08	CIRCUIT CARD, ANALOG GATE A19, A21, A23	Replace						1,6	O
		Repair					1.0	1,2,3,5, 16,17,18, 21	

SECTION II MAINTENANCE ALLOCATION CHART  
FOR  
SWITCHBOARD, TELEPHONE SB-3614(V)/TT

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQPT.	(6) REMARKS	
			C	O	F	H	D			
09	CIRCUIT CARD, MAIN TIMER A33	Replace Repair		0.5				2.0	1,6 1,4,5	
10	CIRCUIT CARD, PROCESSOR A38	Replace Repair		0.5				2.0	1,6 1,4,5	
11	CIRCUIT CARD, RAM A43	Replace Repair		0.5				2.0	1,6 1,4,5	
12	CIRCUIT CARD, ROM A32	Replace Repair		0.5				2.0	1,6 1,4,5	
13	CIRCUIT CARD, INTERFACE A41	Replace Repair		0.5				2.0	1,6 1,4,5	
14	CIRCUIT CARD, CROSS POINT A5, A6, A8, A10, A17 A25, A27, A30	Replace Repair		0.5				2.0	1,6 1,4,5	
15	CIRCUIT CARD, DIMP RCV A1, A11, A22	Replace Repair		0.5				2.0	1,6 1,4,5	
16	CIRCUIT CARD, TONE GENERATOR A28	Replace Repair		0.5			1.0 (L)		1,6 1,2,3,5, 16,17,18, 21	H J
17	CIRCUIT CARD, EAM A A34	Replace Repair		0.5				2.0	1,6 1,4,5	
18	CIRCUIT CARD, EAM B A36	Replace Repair		0.5				2.0	1,6 1,4,5	
19	CABLE ASSEMBLY, POWER, ELECTRICAL W1-W2	Repair			1.0				1,2,23, 27	
20	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL W3	Repair		1.0						
21	CIRCUIT CARD, TYPE I TERM, A4	Replace Repair		0.5				2.0	1,6 1,4,5	
22	CIRCUIT CARD, TYPE II TERM, A4	Replace Repair		0.5				2.0	1,6 1,4,5	
23	CIRCUIT CARD, TYPE II TERM, A4	Replace Repair		0.5				2.0	1,6 1,4,5	
24	ACCESSORY KIT MP12	Replace Repair		0.5 1.0					1	
25	ACCESSORY KIT MP13	Replace Repair		0.5 1.0					1	
26	POWER SUPPLY PS2 (KELTEC 755090A0700)	Replace Repair		0.5				3.0	1 1,2,3,12	I
2601	CIRCUIT CARD ASSEMBLY, REGULATOR (KELTEC 755090A0710-1)	Replace Repair					0.5	1.0	28 1,2,3,5, 12,20,21, 26,27	
2602	CIRCUIT CARD ASSEMBLY, CONVERTER (KELTEC 755090A0715-1)	Test Replace Repair					0.5 0.5	1.0	29 28 1,2,3,5, 12,20,21, 26,27	
2603	CIRCUIT CARD ASSEMBLY, RING GENERATOR (KELTEC 755090A0705-1)	Test Replace Repair					0.5 0.5	1.0	29 28 1,2,3,5, 12,20,21, 26,27	
2604	CIRCUIT CARD ASSEMBLY, INPUT CONTROL (KELTEC 755090A0725-1)	Test Replace Repair					0.5 0.5	1.0	29 28 1,2,3,5, 12,20,21, 26,27	

SECTION II MAINTENANCE ALLOCATION CHART  
FOR

SWITCHBOARD, TELEPHONE SB-3614(V)/TT

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQPT.	(6) REMARKS
			C	O	F	H	D		
2605	CIRCUIT CARD ASSEMBLY, OUTPUT CAP (KELTEC 755090A0731-1)	Test Replace Repair				0.5 0.5	1.0	29 28 1,2,3,5, 12,20,21, 26,27	
2606	CIRCUIT CARD ASSEMBLY, INPUT CAP	Test Replace Repair				0.5 0.5	1.0	29 28 1,2,3,5, 12,20,21, 26,27	

SECTION III TOOL AND TEST EQUIPMENT REQUIREMENTS  
FOR  
SWITCHBOARD, TELEPHONE SB-3614(V)/TT

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE ***	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	O,F,H,D	TOOL KIT, ELECTRONIC EQUIPMENT AN/USM-15 OR TOOL KIT, TK-101/G**	5180-00-567-2966 5180-00-064-5178	
2	F,H,D	MULTIMETER, DIGITAL AN/USM-341 OR MULTIMETER, DIGITAL AN/GSM-64**	6625-00-491-7752 6625-00-870-2264	
3	F,H,D	OSCILLOSCOPE AN/USM-338 OR OSCILLOSCOPE AN/USM-281C*	6625-00-204-1318 6625-00-106-9622	
4	D	AUTOMATIC PCB TESTER WITH TAPES TO TEST ALL PCBs, PRD ELECTRONICS CAST		
5	H,D	MAINTENANCE KIT, ELECTRONIC EQUIPMENT PRC-350-CH OR REPAIR KIT, PRINTED WIRING BOARD MK-772*	5180-00-339-3150 5999-00-757-7042	
6	O,F,H,D	PCB EXTRACTOR/INSERTER		
7	H,D	WIRE WRAP TOOL, GARDNER DENVER 14R2	5130-00-919-3486	
8	H,D	WIRE WRAP TOOL, GARDNER DENVER 500350	5130-00-731-5941	
9	H,D	WIRE WRAP TOOL, GARDNER DENVER 506445	5130-00-134-4570	
10	H,D	WIRE WRAP TOOL, GARDNER DENVER 5024485	5130-00-871-5882	
11	D	SWITCHBOARD TESTER		
12	H,D	SUPPLY MX-10059 ADAPTER, TEST, POWER	6625-01-063-0090	
13	H,D	TELEPHONE SET TA-312	5805-00-543-0012	
14	H,D	TELEPHONE SET TA-236	5805-00-503-2774	
15	H,D	TELEPHONE SET TA-838	5805-00-124-8678	
16	H	POWER SUPPLY, LAMDA LP 411A-FM OR POWER SUPPLY PP-3940A/G*	6625-00-604-1727	
17	H	FUNCTION GENERATOR, WAVETECH MODEL 110 OR GENERATOR, SIGNAL SG-299B* AND GENERATOR, SIGNAL AN/USM-127*	6625-00-808-5584 6625-00-783-5965	
18	H	MX-10058/TT, ADAPTER, TEST, PCB	6625-01-063-0091	
19	H	TEST SET, ELECTRIC SURGE ARRESTOR TS-3655/TT OR TEST SET, ELECTRIC SURGE ARRESTOR TS-3655A/TT*	5805-01-054-9114 5805-01-057-3972	
20	H	CURRENT PROBE, TEKTRONIX P6042 OR MILLIAMMETER, CLIP ON ME-488/U*	6625-00-816-9324	
21	H	POWER SUPPLY HP6291A OR POWER SUPPLY PP-3940A* (THREE REQUIRED PER SRA)	6625-00-604-1727	
22	H	ADAPTER, TEST, RING, ORVERLOAD MX-10067/TT	6625-01-063-0092	
23	H	CONNECTOR REPAIR TOOLS OR CRIMP TOOL MS27828* AND INSERTION TOOL MS24256A20* AND EXTRACTION TOOL MS24256R20*	5120-00-460-7601 5120-00-079-4598 5120-00-079-4601	
NOTE				
MAINTENANCE CATEGORIES F AND H ARE EQUIVALENT TO THE MARINE CORPS INTERMEDIATE SUPPORT (I).				

\* SEE FOOTNOTE AT END OF CHART

SECTION III TOOL AND TEST EQUIPMENT REQUIREMENTS  
FOR

SWITCHBOARD, TELEPHONE SB-3614(V)/TT

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	*** NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
24	H	CRIMP TOOL, AMP INC. 90222-2	5120-01-006-6068	
25	H	EXTRACTION TOOL, AMP INC. 91048-7		
26	H	DECADE BOX OR RESISTOR, DECADE ZM-57/U*	6625-00-935-1470	
27	O,F,H,D	MULTIMETER AN/USM-223*	6625-00-999-7465	
28	F,H,D	TOOL KIT TK-105/G*	5180-00-610-8177	
29	H,D	ADAPTER, TEST, LRU		

\* ARMY EQUIVALENT TEST EQUIPMENT

\*\* USE ME-498/U (6625-00-538-9794) AND  
ID-2101/U DISPLAY (6625-00-538-9758)  
WHEN AVAILABLE.

\*\*\* THE NATIONAL STOCK NUMBERS THAT  
ARE MISSING FROM THIS LIST HAVE  
BEEN REQUESTED AND WILL BE ADDED  
BY A CHANGE TO THE LIST UPON RECEIPT.



SECTION IV. REMARKS

REFERENCE CODE	REMARKS
A	Fault isolation to module or pcb using built in facilities, operational tests.
B	Continuity checks, fault isolation to panel-mounted piece parts.
C	By replacement of faulty pcbs, lamps, fuses, modules.
D	By replacement of panel-mounted piece parts, no wire wrap replacement. Repair of flex wire requires return to depot.
E	All repair except test and replacement of lightning arrestors.
F	Replacement of switches, lamp assemblies, sonalert, etc., by continuity isolation.
G	Replacement of Number Plan switch and toggle switch.
H	Repair by Army will be accomplished at selected repair activities.
I	Functionally interchangeable with Functional Group 04, Power Supply PS1.
J	(L) - Specialized repair activity.

## GLOSSARY

CB	Common Battery
CBS	Common Battery Supervised
CCU	Common Control Unit
CCW	Counterclockwise
CDRLS	Called Party Release (Pushbutton)
CNV	Converter
CW	Clockwise
DP	Dial Pulse
DTMF	Dual Tone Multi-Frequency
EANVM	Electrically Alterable Non-Volatile Memory
EANVM A	Electrically Alterable Non-Volatile Memory in Circuit Card Position A34
EANVM B	Electrically Alterable Non-Volatile Memory in Circuit Card Position A37
HDST	Headset
INTCON	Interconnect
Keysender	Operator's Keypad
MOS	Metal Oxide Semiconductor
MWO	Maintenance Work Order
NVM	Non-Volatile Memory
OPR RLSE	Operator Release Pushbutton
PABX	Private Automatic Branch Exchange
PC	Printed Circuit Card Assembly
RAM	Random Access Memory
RCV	Receive
RD	Ringdown
RDL	Ringdown Line
ROM	Read Only Memory
RL ACK	Release Acknowledge
SL	Switchboard Locater Number
SWBD	Switchboard
SZ ACK	Seize Acknowledge
TRK	Trunk
TTY	Teletype
4W CONV	Four-wire Converter Trunk
XMIT	Transmit



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PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.	
2-25	2-28			<p>Recommend that the installation antenna alignment procedure be changed throughout to specify a 2° IFF antenna lag rather than 1°.</p> <p>REASON: Experience has shown that with only a 1° lag, the antenna servo system is too sensitive to wind gusting in excess of 27 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.</p>
3-10	3-3		3-1	<p>Item 5, Function column. Change "2 db" to "3db."</p> <p>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.</p>
5-6	5-8			<p>Add new step f.1 to read, "Replace cover plate removed in step e.1, above."</p> <p>REASON: To replace the cover plate.</p>
		FO3		<p>Zone C 3. On J1-2, change "+24 VDC to "+5 VDC."</p> <p>REASON: This is the output line of the 5 VDC power supply. + 24 VDC is the input voltage.</p>

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For explanation of abbreviations used, see AR 310-50.







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