INSTALLATION

507A AND 507B PBX

CONTENTS

1. GENERAL

1.01 This section covers a method for installing the 507A and 507B PBX.

1.02 This section is reissued for the following reasons:

(a) To include information on the new switchboards with die-cast aluminum chassis.

(b) To show the termination of even count cable in cross-connecting terminals.

(c) To add tables showing the connections for terminating cable in the 507A and 507B PBX.

(d) To include additional information on supplying power to the PBX.

(e) To include information for fusing battery feeders when the CO or building battery fuses are inaccessible.

Since this reissue covers a general revision arrows ordinarily used to indicate changes have been omitted.

2. APPARATUS

2.01 ***Tools*** normally used for PBX installations.

2.02 ***Materials*** required for protecting the customer's premises or the equipment during installation.

3. PREPARATION FOR INSTALLATION

Locating PBX

3.01 In general, both PBX are designed to be mounted on top of a piece of office furniture, such as a desk or table, without being fastened down.

3.02 Select a location for the PBX acceptable to the customer and with the following reservations:

(a) Avoid locations where moisture, excessive dust, corrosive fumes, etc., are present.

(b) Avoid locations where excessive vibration, due to machinery or any other cause, may affect the operation of the equipment.

(c) Avoid locations where natural or artificial light will make it difficult for the attendant to see the signals.

(d) Avoid locations on metal-topped desks or tables, or where the PBX is likely to be moved into contact with locally grounded metal structures, such as pipes, window frames, etc.

Locating Cross-Connecting Terminal

3.03 Terminals equipped with connecting blocks may be used to terminate the cable from the PBX.

Note: Some companies order the switchboard from the local distributing house equipped with a cable of a predetermined length and a terminal box in accordance with ED-65894-01 or ED-66097-01.

3.04 Select a location which will be satisfactory to the customer or building management.

3.05 Place the terminal in an accessible location where good lighting and safe working space exists, and where the cover of the box can be fully opened.

3.06 Avoid locating the terminal near a window where the box may become wet or in locations where it may become excessively dirty.

3.07 Locations near electrical circuits, switches, doors, hoists, etc., should be avoided.

Cabling and Wiring

3.08 Discuss with the customer the proposed route and methods of attaching cables and wiring to building walls, baseboards, etc.

3.09 Permission should be obtained from the property owner or his agent when it is necessary to make attachments to surfaces such as wood panel, glazed tile, marble, etc.

3.10 When conduit for installation is to be provided, close cooperation is required with the customer or his agent in order that conduits of suitable size and location will be installed.

4. INSTALLATION

Unpacking and Placing PBX

4.01 Care should be exercised when handling the PBX to prevent personal injury and damage to the PBX. The PBX is packed in a cardboard carton that is especially designed to prevent damage to the PBX.

Note: These cartons, whenever available, should be re-used to pack the PBX when returning it to the distributing house or storeroom.

4.02 Spread any available protective material. Remove the PBX from the shipping carton and place it on the material. Remove the four screws from the wooden base plate which is secured to the PBX.

4.03 Place the PBX on the desk, table or other location selected.

Placing Cross-Connecting Terminal

4.04 Install cross-connecting terminal box and place connecting block and adapter in terminal. See Figs. 1, 2, and 3 for typical arrangement.

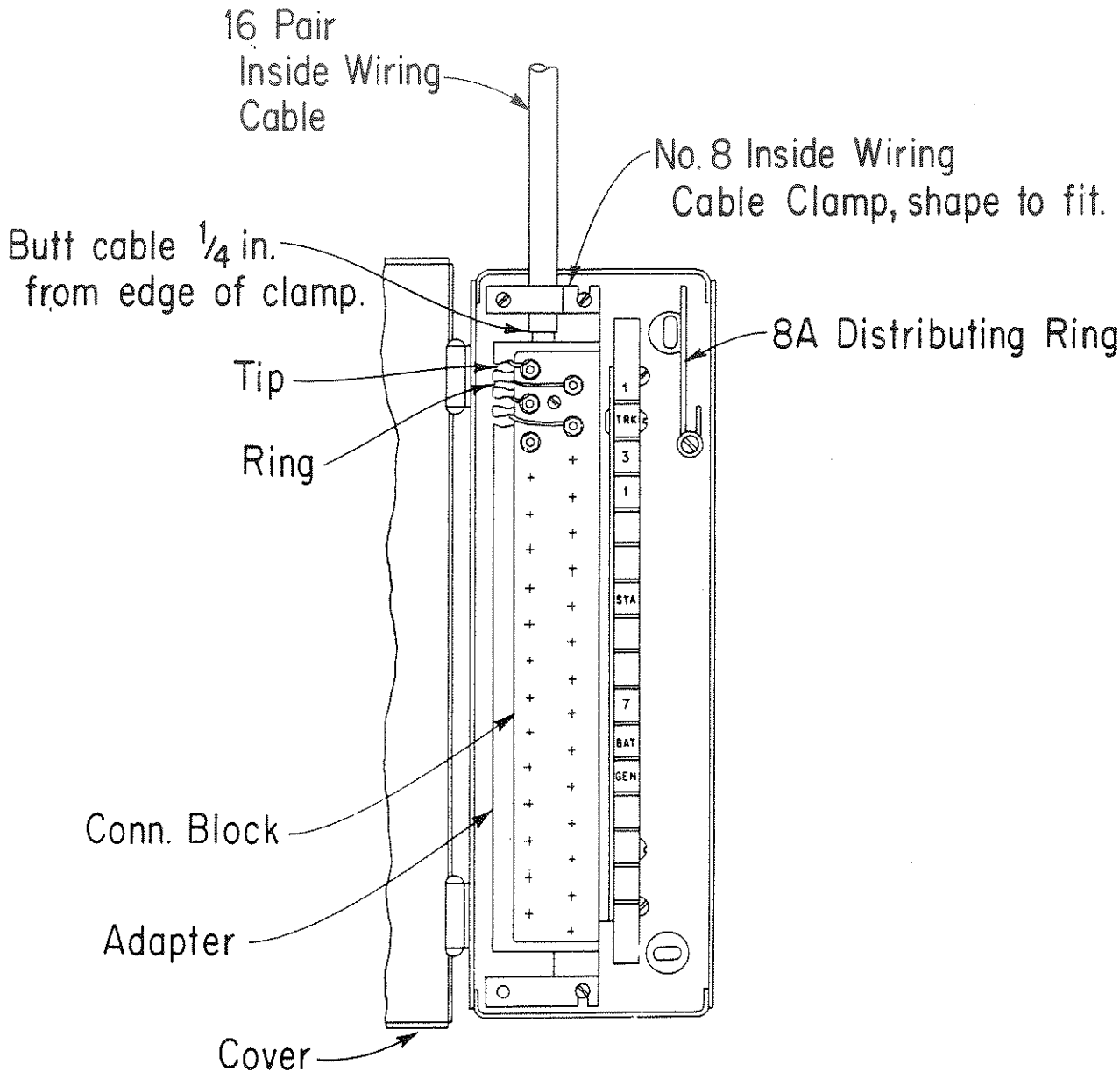


Fig. 1 — Typical Arrangement for 507A PBX with Prefabricated Sheet Metal or Die-Cast Aluminum Chassis

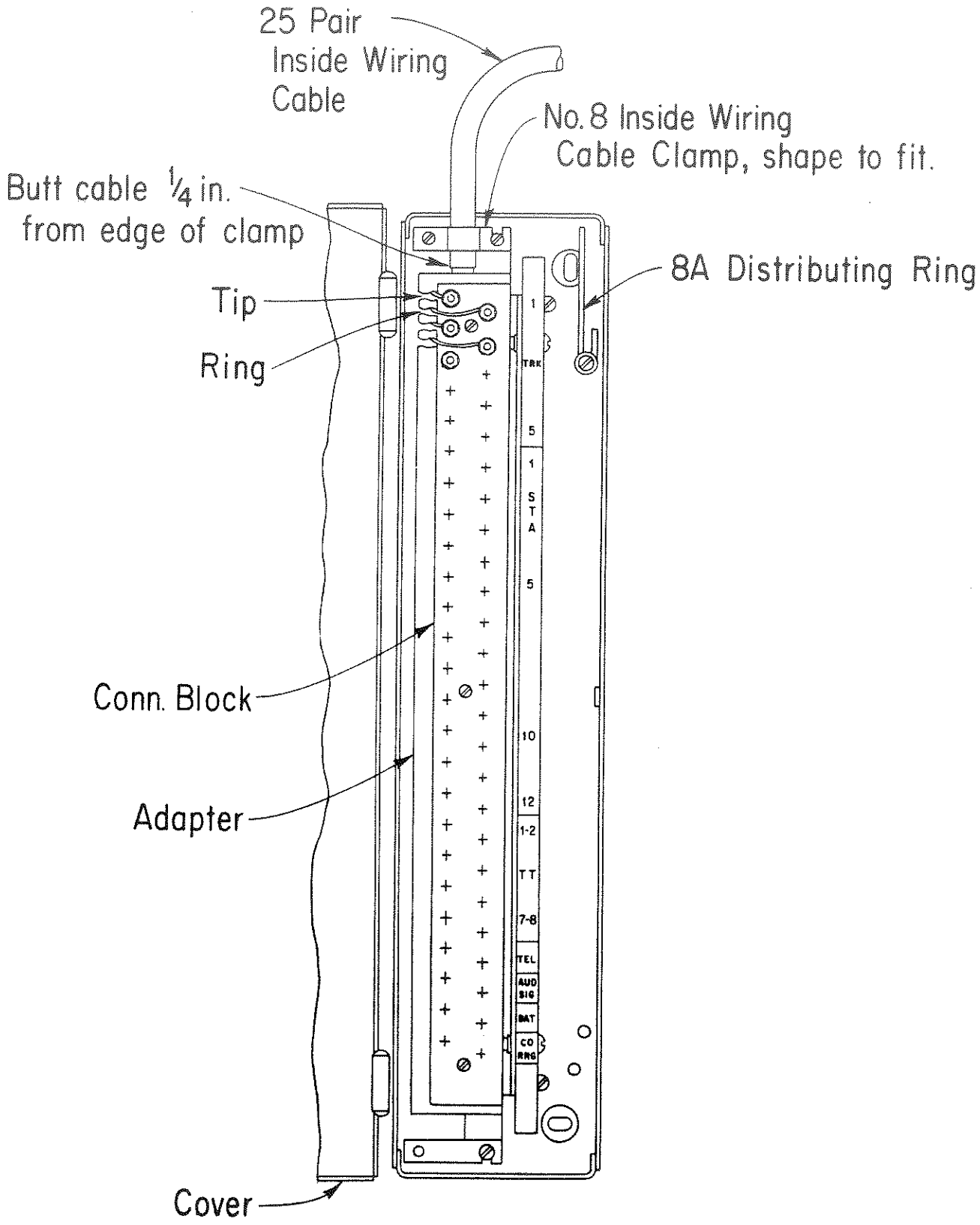


Fig. 2 — Typical Arrangement for 507B PBX with Prefabricated Sheet Metal or Die-Cast Chassis Using 25-Pair Cable

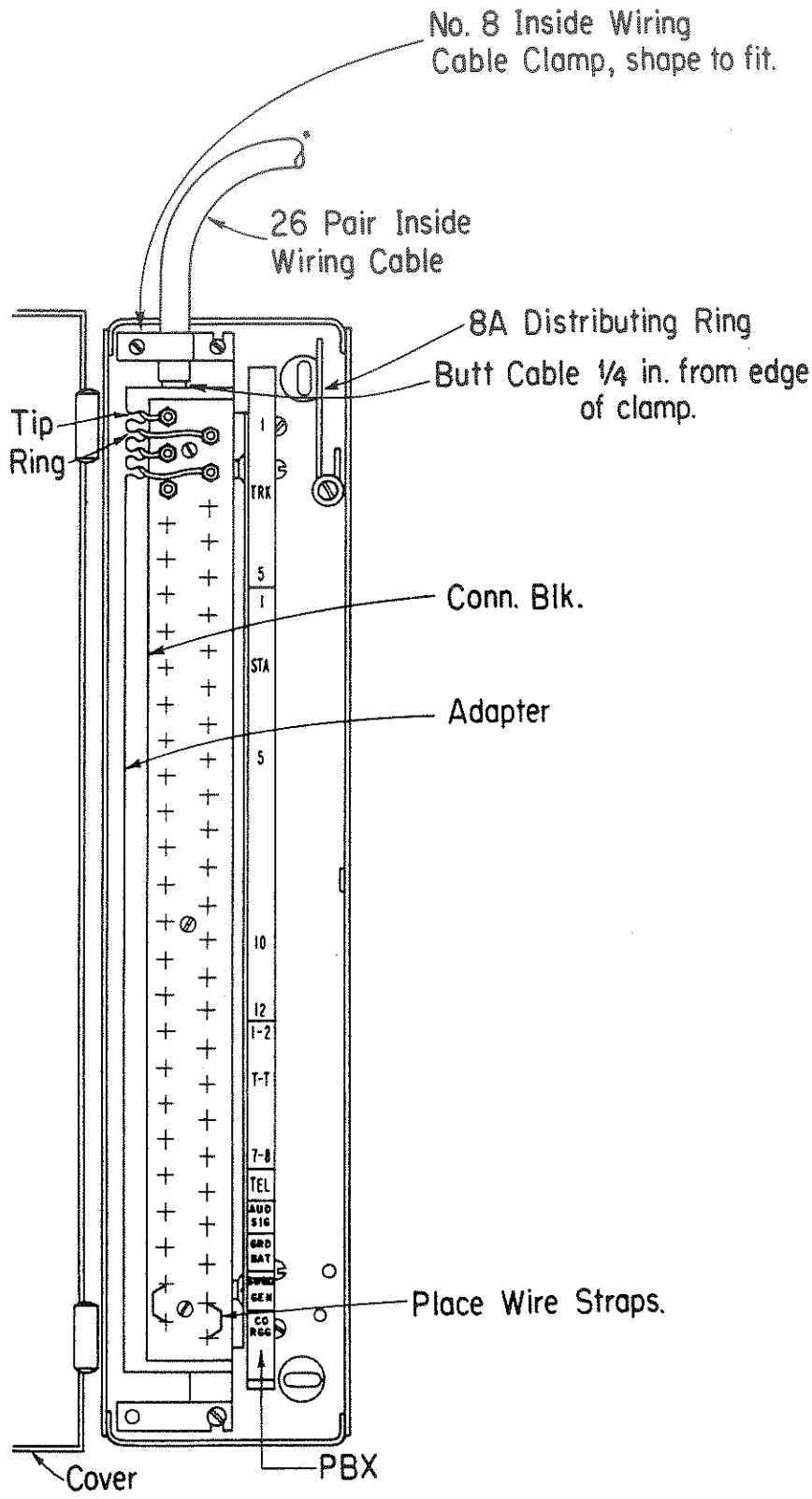


Fig. 3 — Typical Arrangement for 507B PBX with Prefabricated Sheet Metal Chassis Using 26-Pair Cable (Manufacture Discontinued)

Cabling and Wiring

4.05 Run and fasten the cable in accordance with instructions as covered in the Bell System Practices.

4.06 Strip the end of the cable to be placed in the cross-connecting terminal and butt as shown in Figs. 1, 2, and 3.

4.07 Fan out and connect the cable to the connecting block pair-to-pair. (Pair 1 of cable to pair 1 of connecting block, etc.)

Lettering and Numbering

4.08 Letter and number fanning strips, using 3/16-inch rubber stamps, as shown in Figs. 1, 2, and 3. When connecting blocks are used which have the ring terminal positiond above and to the right of the tip terminal, transpose the designations for single leads.

Terminating Cable in PBX

4.09 To remove the cover of the PBX, pull up the plug-in designation strip holder and loosen the two hold-down screws located under the strip.

4.10 Remove the cover by lifting the front end high enough to clear the keys and pushing gently toward the rear to disengage the back catches. The finish of the cover should not be marred. Place it where it will be protected during the installation.

4.11 Loosen the two "turn-spring" screws located on the front of the chassis.

4.12 ***To raise*** the keyshelf of the PBX, approaching it from the front, place the fingers of the left hand in the hand hole in the front of the chassis. Take a firm grip and raise the keyshelf. Do not release the grasp until the keyshelf is safely locked in position and the movable end of the right-hand supplementary keyshelf brace is placed between the side flange of the base casting and the reinforcing rib which holds the right rubber switchboard foot.

Note: When the PBX is approached from the rear, the position of right and left hand as described in 4.12 is reversed.

4.13 The first 507-type PBX to be manufactured were not provided with a supplementary keyshelf brace on the right side of the chassis. If the PBX is not equipped with a brace, a P-31A294 brace should be installed in the field. Drill a hole in the chassis and install the required parts. The location and size of this hole and the assembly of parts are shown in Fig. 4. The material to modify one switchboard is as follows:

1 — P-31A294 Brace

1 — P-31A293 Shoulder Screw

1 — P-220756 Hex Nut

1 — P-423636 Washer

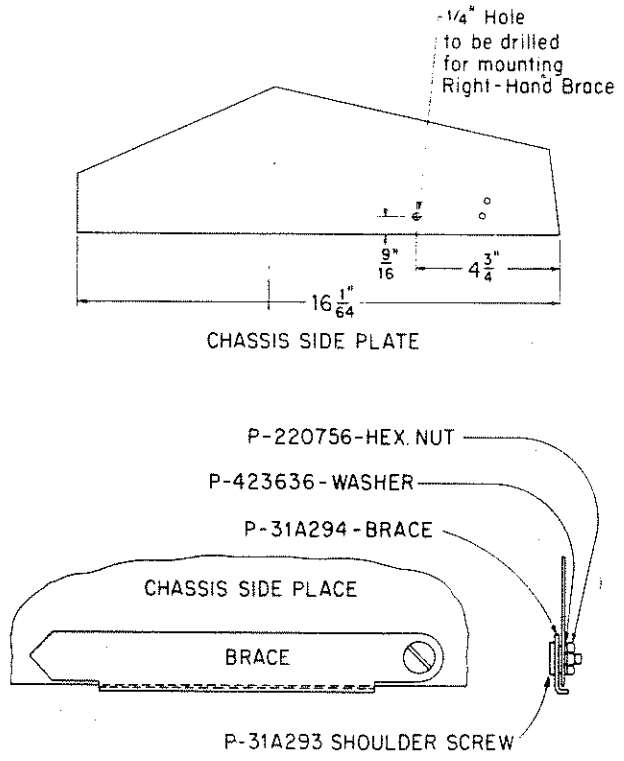
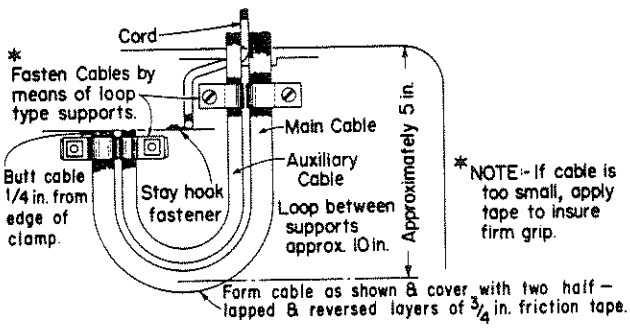


Fig. 4 — Installation and Assembly of Supplementary Keyshelf Brace for 507-type PBX Not Provided with Two Keyshelf Braces

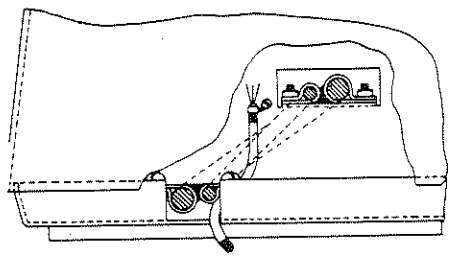
4.14 *To Lower:* Place the fingers of the right hand in the hand hole and take a firm grip. Place the fingers of the left hand on the pawl of the keyshelf brace. Raise the keyshelf slightly and at the same time raise the pawl. Lower the keyshelf. Do not release the right hand until the keyshelf is safely resting on the base.

Note: Raising the keyshelf slightly to release the pawl on the left-hand brace will automatically release the right-hand supplementary brace.

4.15 Strip, butt, and tape cable and arrange in PBX. See Fig. 5. Leave sufficient slack in cable to allow for movement of the PBX when it is placed on a desk, table or other moveable support.



TOP VIEW
Right Rear Section 507A or 507B P.B.X.



REAR VIEW

Fig. 5 — Typical Cabling and Cording Arrangement for 507-type PBX with Prefabricated Sheet Metal or Die-Cast Aluminum Chassis

4.16 Connect cable to terminal strips in PBX as follows:

(a) For 507A PBX with prefabricated sheet metal or die-cast aluminum chassis use Table A.

(b) For 507B PBX with prefabricated sheet metal chassis use Table B.

(c) For 507B PBX with die-cast aluminum chassis use Table C.

Note: The column in the tables headed "Terminal Box Desig" shows the stenciling as it should appear on the fanning strip in the cross-connecting terminal and has been included in the tables for reference.

Caution: Do not connect battery or ringing feeders through to the PBX until the work operations covered in 4.39 and 4.40 are completed.

TABLE A

Terminations for 507A PBX Prefabricated Sheet Metal and Die-Cast Aluminum Chassis

TS IN REAR OF PBX			CABLE	TERMINAL BOX
DESIG	STRIP	PCHG	PAIR	DESIG
TRK 1-3	T	1-3	1T-3T	1 TRK 3
	R	1-3	1R-3R	
STA 1-7	T	4-11	4T-10T	1 STA 7
	R	4-11	4R-10R	
GRD B	M M	11 10	11T 11R	BAT
G ±	M M	6 8	12T 12R	GEN

4.17 *PBX Frame Ground:* A ground strap is provided on the underside of the keyshelf from terminal No. 11 of the miscellaneous (TT) terminal strip to the frame of the keyshelf. This strap was omitted from earlier manufacture of the PBX. Check and, if found to be omitted, provide this strap. Solder the connections.

Attendant's Telephone Equipment

4.18 *Telephone Set Without Switching Keys in the Base:* Modify the telephone set and ringer per SD-65680-01.

4.19 Enter the cord from the telephone set through the hole in the rear of the PBX and fasten the stay hook to the stay hook fastener, as shown in Fig. 5. Fan the cord conductors and terminate as indicated by the circuit drawings.

TABLE B

Terminations for 507B PBX Prefabricated Sheet Metal Chassis

TS IN REAR OF PBX			CABLE	TERMINAL BOX	NOTES
DESIG	STRIP	PCHG	PAIR	DESIG	
TRK 1-5	T1	1-5	1T-5T	1 TRK 5	
	R1	1-5	1R-5R		
STA 1-6	T1	6-11	6T-11T	1 STA 12	
	R1	6-11	6R-11R		
STA 7-12	T2	1-6	12T-17T		
	R2	1-6	12R-17R		
	TT	1-8	18T-21T	1-2 TT 7-8	1
			18R-21R		
TEL	T2	T	22T	TEL	
	R2	R	22R		
B1	M	1	23T	AUD	
R—	M	2	23R	SIG	
GRD	M	11	24T	BAT	
B	M	10	24R		
G	M	6	25T	CO	2
±	M	8	25R	RRG	

SUPPLEMENT					
	M	7	25T	SWBD	1
	M	3	25R	GEN	
G	M	6	26T	CO	
±	M	8	26R	RRG	

Notes:

1. No designation on terminal strip.
2. For 507B PBX which have been installed using 26-pair cable see the SUPPLEMENT for terminations of 25th and 26th pairs.

TABLE C

Terminations for 507B PBX Die-Cast Aluminum Chassis

TS IN REAR OF PBX			CABLE	TERMINAL BOX	NOTES
DESIG	STRIP	PCHG	PAIR	DESIG	
TRK 1-5	T	1-5	1T-5T	1 TRK 5	
	R	1-5	1R-5R		
STA 1-12	T	7-12	6T-17T	1 STA 12	
	R	7-12	6R-17R		
	TT	1-8	18T-21T	1-2 TT 7-8	1
			18R-21R		
TEL	T	T	22T	TEL	
	R	R	22R		
B1	M	1	23T	AUD	
R	M	2	23R	SIG	
GRD	M	11	24T	BAT	
B	M	10	24R		
G	M	6	25T	CO	
±	M	8	25R	RRG	

Note:

1. No designation on terminal strip.

4.20 *Key Telephone Set with Buzzer Cutoff and Automatic Restoration:* Modify the telephone and connect in accordance with SD-65736-01.

4.21 *Key Telephone Set with 6 Pickup Keys:* Modify the telephone set and connect in accordance with SD-65680-01.

Note: In certain cases it is necessary to connect a circuit of the key telephone set to the inner springs of the attendant key (A position) of the PBX. To facilitate this connection provide straps in the PBX as follows:

(a) Place a wire from the ring inner spring of the attendant key (A position) to punching 9 on the M terminal strip.

(b) Place a wire from the tip inner spring of the attendant key (A position) to punching 9 on the TT terminal strip.

(c) Solder all connections.

(d) Place a tag on the fanning strips opposite punching 9 indicating that this work has been done.

4.22 *Head Telephone Set:* When a head telephone set is required a dial mounting, dial, telephone jacks, buzzer or ringer, key telephone units, and a 105-type apparatus box for mounting the key telephone units must be ordered. Install in accordance with SD-65736-01.

Designation Strip

4.23 Have the central office trunk numbers, tie trunk number, and station line numbers as indicated on the service order, typed on the designation strip. Any names, if indicated by the customer, should be typed on the designation strip.

4.24 Attach the designation strip to the designation strip holder and place on the PBX.

Miscellaneous Equipment

(A) *Off-Premises Station Lines*

4.25 Station line No. 7 in the 507A PBX and station line No. 12 in the 507B PBX are equipped with line relays for use with off-premises station lines. Where more than one line relay is required, additional line relays installed externally in a 105-type apparatus box and wired to the appropriate line circuits may be provided.

(B) *Tie Trunks*

4.26 Station line No. 1 in the 507A and 507B PBX has terminal and wiring arrangements which facilitate the connection and installation of automatic and ringdown tie trunks. When a tie trunk is to be provided, remove straps on the equipment (under) side of terminal strip TT per SD-65680-01.

Note: To avoid future station line transfers, do not use these circuits unless a tie trunk or long line relay is to be provided or no other station line circuits are available.

4.27 To restore line No. 1 in the 507A and 507B PBX for station use when tie trunks are disconnected, place and terminate straps on the cable (upper) side between the punchings on the "TT" terminal strip in accordance with the circuit drawings. Do not replace them as originally installed on the equipment (under) side.

Note: In the 507-type PBX with die-cast aluminum chassis, each terminal of the terminal strips is provided with an auxiliary terminal for variable strapping as shown in Fig. 6.

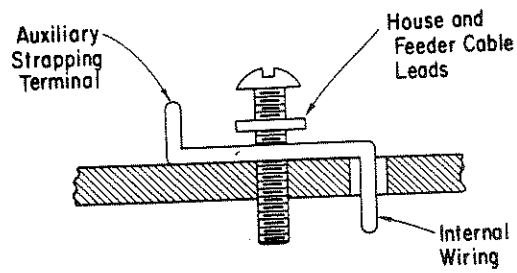


Fig. 6 — Section of Terminal Strip from 507-type PBX with Die-Cast Aluminum Chassis

4.28 Additional tie trunks may be terminated on any station key or trunk key location. Modify the keys per SD-65736-01.

4.29 When it is necessary to terminate a tie trunk in a trunk key location, the trunk key shall be replaced with a station key modified per SD-65736-01.

Note: It will also be necessary to relocate electrically the supervisory signal circuit per SD-65736-01.

4.30 The 2-way ringdown tie trunk is housed in an externally mounted 105-type apparatus box.

4.31 The 2-way automatic tie trunk is housed in two 105-type apparatus boxes externally mounted one above the other.

(C) ***Hand Generator and Audible Auxiliary Signal***

4.32 When a hand generator is to be provided as the main source of ringing current, use a dc buzzer, instead of the ringer in the attendant telephone set, as the audible auxiliary signal.

4.33 When a hand generator is to be provided as the emergency source of ringing current, use a dc buzzer as an emergency audible auxiliary signal if required by local instructions.

4.34 Mount the 105-type apparatus box housing the hand generator and the dc buzzer in a suitable location acceptable to the customer.

Note: The hand generator and dc buzzer unit is arranged for right- or left-hand mounting.

4.35 Run and fasten wiring between the 105-type apparatus box and the PBX.

4.36 Terminate the conductors in accordance with SD-65680-01.

Power Supply

4.37 The type of power plant or power supply used will depend upon local instructions. Table D lists the sources from which power may be obtained.

TABLE D

BATTERY		GENERATOR		NOTES
TYPE	DESCRIPTION	TYPE	DESCRIPTION	
101A	Battery Reserve	107-Type	Freq. Gen.	1
101G	Batteryless	KS-5585	Static Gen.	
101J	Batteryless			
Central Office	Supplied over cable pairs	Central Office	Supplied over cable pairs	2
Building Battery	Supplied over local cable pairs			

Notes:

1. Do not use a 107-type frequency generator with the PBX if tie trunks are to be provided.
2. When battery and ground are supplied from the central office over cable pairs, to minimize noise effects on PBX stations and to prevent possible electrolysis damage to sheath cables or underground pipes, use a metallic return for any grounds. A ground-return feeder arrangement should not be used unless authorized by specific local instructions. If battery and ground are supplied from a building battery, a cable sheath return ground may be used with grounded building battery feeders.

4.38 *Fusing Battery Feeders:* The CO battery or building battery fuses, as normally provided, are sufficient for fusing the battery feeders. Where these fuses are not readily accessible at all times, additional fuses as per Fig. 7 should be provided and mounted on a 21A key telephone unit housed in a 105-type apparatus box.

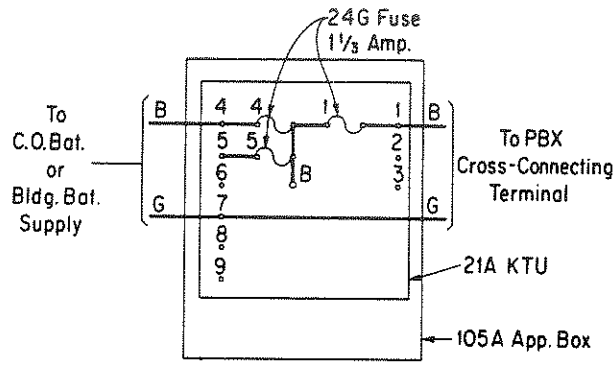


Fig. 7 — Fusing for 507-type PBX When CO or Building Battery Fuses Are Inaccessible

4.39 *Strapping Battery Feeders at Terminal:* When more than one cable pair is used for battery supply, strap all the tip sides of the same group for ground and all the ring sides of the same group for battery at the terminal.

4.40 *Checking Battery and Ringing Feeders:* Check the battery feeders and ringing feeders for correct polarity before connecting them through to the PBX.

4.41 *Connecting Battery and Ringing Supply:* Connect wiring from battery and generator sources in Cross-Connecting Terminal as shown in Fig. 1, 2, or 3 and per TABLE A, B, or C.

5. TESTS AND INSPECTIONS

5.01 Make the tests and inspections required as covered in Section 536-070-230.

CIRCUIT TESTS
507A AND 507B PBX

1. GENERAL

1.01 This section describes a method of testing the operating features of the No. 507A and No. 507B PBX switchboards.

1.02 This section is reissued to include testing information for attendants telephone set with buzzer cutoff and automatic restoration, operators head telephone set, and 2-way automatic tie trunk. Testing information for external trunk holding circuits formerly covered in this section has been deleted. Since this is a general revision arrows used to indicate changes have been omitted.

1.03 To avoid the effects of clicks when performing tests, the test receiver should be kept away from the ear.

1.04 The tests covered are:

(A) Ringing Supply

The features tested are:

(1) Presence of ringing supply.
(2) Ringing supply properly connected.
(3) Hand generator, when provided, delivers ringing current.

(B) Battery Supply

The features tested are:

(1) Presence of battery.
(2) Battery supply properly connected.

(C) C.O. Trunks

The features tested are:

(1) Tip and ring of trunks correctly terminated in the PBX.
(2) Holding on central office trunk connections.
(3) Talking against the hold bridge on trunk-station connections.
(4) Operation of the visual and audible signals on incoming trunk calls.
(5) Rering on the trunk against the hold bridge.

(D) Station Line Circuit

The features tested are:

(1) Operating circuit of the station line lamp.
(2) Contacts of the station key in the A, B, C, D, E and Ring positions.

(E) Supervisory Circuit

The features tested are:

(1) Supervisory relay.
(2) Supervisory lamp.

(F) Station Keys and Trunk Keys—Break Contacts

This test checks that the normally closed plunger spring contacts, of the station and trunk keys, break before the plunger spring makes with the normally open spring contacts.

(G) Attendants Telephone Equipment

The features tested are the operating circuits of the transmitter, receiver and dial, when the telephone set furnished, is a:

(1) Telephone set without pickup keys.
(2) Telephone set with pickup keys in the base.
(3) Telephone set with buzzer cutoff and automatic restoration.
(4) Operators head telephone set.

(H) Night Service Key, Buzzer Cutoff and Auxiliary Signal

The features tested are the operation of the:

(1) Night service key.
(2) Buzzer cutoff key.
(3) Auxiliary signal.

(I) Tie Trunks

The features tested are the signaling, talking and supervisory circuits of the:

(1) Ringdown tie trunks.
(2) Automatic tie trunks.

(J) Ground Connection to PBX Framework

This test checks that the framework and metal case of the PBX are grounded.

1.05 In making Tests (A), (B), (C), (D), (F), (G), (H), (I) and (J), it will be necessary to remove the cover of the PBX.

1.06 **Lettered Steps:** A letter a, b, c, etc, added to a step number in Part 3 of this section, indicates an action which may or may not be required depending on local conditions. The condition under which a lettered step or a series of lettered steps should be made is given in the ACTION column, and all steps governed by the same condition are designated by the same letter within a test. Where a condition does not apply, all steps designated by that letter should be omitted.

2. APPARATUS

Tests (A), (B), (C), (D), (F), (G), (H), (I) and (J).

2.01 No. 1011G Handset, equipped with a 2W37A Cord Assembly, consisting of a W2DB Cord, a No. 471A Jack and two KS-6780 Connecting Clips, or equivalent.

3. METHOD

STEP	ACTION	VERIFICATION
	(A) Ringing Supply	
1	Connect one clip of handset to terminal 6 of M terminal strip.	
2	Connect other clip of handset to terminal 2 of M terminal strip. **Note:** Steps 1 and 2 verify the presence of ringing supply and that resistance lamp is not shunted.	Ringing induction heard. Resistance lamp lights.
3	Disconnect clip from terminal 6, and connect to local ground. **Note:** Step 3 verifies that ringing supply is correctly connected to PBX.	Same as Step 2.
4	Disconnect handset.	

STEP	ACTION	VERIFICATION
5a	If hand generator is provided— Connect handset to terminals 3 and 7 of M terminal strip.	
6a	Momentarily hold ringing key operated while turning handle of hand generator.	Ringing current heard.
7a	Disconnect handset.	
	(B) Battery Supply	
1	Determine that ringing supply is properly connected.	
2	Connect one clip of handset to terminal 10 of M terminal strip.	
3	Momentarily touch other clip of handset to terminal 11 of M terminal strip. **Note:** Step 3 verifies the presence of battery.	Click heard in receiver.
4	Momentarily touch other clip of handset to terminal 6 of M terminal strip. **Note:** Step 4 verifies that battery supply is properly connected.	Same as Step 3.
5	Disconnect handset.	
	(C) C.O. Trunks	
1	Determine that battery supply is properly connected.	
2	Connect one clip of handset to terminal 11 of M terminal strip.	
3	Touch other clip of handset alternately to tip and ring terminal of trunk under test.	Louder click heard on ring terminal.
4	Repeat Step 2 for all trunks to be tested.	Same as Step 3.
5	Disconnect handset.	
6	Connect handset to terminals of idle station line.	Station line lamp lights.
7	Operate station key to idle position.	Station line lamp extinguished.
8	Operate idle trunk key to same position.	
9	Originate a call to local test desk.	
10	When testman answers— Advise that a talking and holding test is to be made on trunk under test.	Conversation is satisfactory.
11	Operate hold key of trunk under test.	Conversation is still satisfactory.
12	Operate handset key to monitor.	At PBX— Supervisory lamp lights. At test desk— No disconnect signal received.
13	Operate handset key to talk.	Supervisory lamp extinguished.
14	Request testman for successive ringbacks. **Note:** That night service key is normal and buzzer key is in the ON position.	
15	Restore trunk key and station key.	
16	Operate handset key to monitor.	When ringing current is applied— Trunk lamp lights. Audible signal sounds. **Note:** Signals lock in.
17	Restore hold key.	
18	Operate night service key.	Trunk lamp extinguished. Audible signal silenced.
19	Restore night service key.	
20	Operate trunk key to idle position.	When ringing current is again applied— Trunk lamp lights and signal sounds during ringing interval. **Note:** Signals do not lock in.
21	Restore trunk key to normal.	
22	Repeat Steps 8 through 21 for all trunks to be tested.	
23	Upon completion of test, release testman and restore equipment to normal.	

STEP	ACTION	VERIFICATION
	(D) Station Line Circuit	
1	Connect handset to terminals of idle station line.	Station line lamp lights.
2	Operate station key to position A.	Station line lamp extinguished. Supervisory lamp does not light. **Note:** Disregard momentary flicker of supervisory lamp.
3	Operate ringing key of station under test.	Ringing induction heard in receiver. **Note:** If subscriber should answer, advise him that line is being tested, and to disregard the ring.
4	Repeat Steps 2 and 3 for positions B, C, D and E of station keys under test.	Same as Steps 2 and 3.
5	Disconnect handset.	
6	Restore all keys to normal.	
	(E) Supervisory Circuit	
1	Operate idle station key to position A.	Supervisory lamp lights.
2	Restore station key.	Supervisory lamp extinguished.
3	Repeat Steps 1 and 2 for positions B, C, D and E.	Same as Steps 1 and 2.
	(F) Station Keys and Trunk Keys—Break Contacts	
1	Connect one clip of handset to terminal 11 of M terminal strip (ground).	
2	While tapping other clip of handset to ring terminal of idle station line—slowly operate station key toward position A.	Clicks heard in receiver. **Note:** A point will be reached where no clicks are heard in receiver.
3	Fully operate station key to position A.	Clicks heard in receiver.
4	Slowly operate trunk key toward position A.	Same as Step 2.
5	Fully operate trunk key to position A.	Same as Step 3.
6	Restore all keys.	
7	Repeat Steps 2 to 6 for positions B, C, D and E.	Same as Step 2.
8	Repeat Steps 2 to 7 for all station and trunk keys to be tested.	
9	Disconnect handset clip from terminal 11 and connect to terminal 10 (battery).	
10	Repeat Steps 2 to 7 testing tip terminal of idle station line.	Same as Steps 2 to 7.
11	Disconnect handset.	
	(G) Attendants Telephone Equipment	
1	Remove handset from switchhook.	
2	Operate attendant key to an idle position.	Sidetone heard in receiver.
3	Shake and gently twist cords.	No clicks or scratchy noise in receiver.
4a	If attendants set is an operators head telephone set— Repeat Steps 2 and 3.	Same as Steps 2 and 3.
5b	If attendants set is a telephone set with pickup keys in base— Depress last key on right.	
6b	Repeat Steps 1, 2 and 3.	Same as Steps 1, 2 and 3.
7c	If attendants set is equipped with dial— Operate key of idle trunk to same position as attendants key.	
8c	Dial test number.	Trunk lamp does not flash while dialing. No loud clicks heard while dialing.
9c	Restore trunk key to normal.	
10	Restore attendants key to normal.	
11d	If attendants set is equipped with buzzer cutoff and automatic restoration— Operate station key of idle line to idle position.	Audible signal sounds.
12d	Operate exclusion key in switchhook.	Audible signal silenced.
13d	Return handset to switchhook.	Audible signal sounds.

STEP	ACTION	VERIFICATION
14d	Restore station key to normal.	
15	Return handset to switchhook.	
	(H) Night Service Key, Buzzer Cutoff and Auxiliary Signal	
1	With buzzer key at ON, and night service key normal— Manually operate an L1 relay.	L1 relay locks operated. Trunk lamp lights. Audible signal sounds.
2	Operate buzzer key to OFF.	Audible signal silenced.
3	Operate buzzer key to ON.	Audible signal sounds.
4	Operate night service key.	L1 relay releases. Trunk lamp extinguished. Audible signal silenced.
5	Restore night key.	No visual or audible signal.
	(I) Tie Trunks	
1	Connect handset to terminals of idle station line.	
2	Operate station key of line selected in Step 1 to an idle position.	
3a	If tie trunk is ringdown type— Operate tie trunk key to same position as station key.	
4a	Momentarily operate tie trunk ringing key.	When distant PBX answers— Transmission is satisfactory.
5a	Request distant PBX to ringback on tie trunk.	
6a	Restore tie trunk key to normal.	When distant PBX rings on tie trunk— When nonlocked-in signals are provided— Tie trunk lamp lights and audible signal sounds during ringing interval. When locked-in signals are provided— Tie trunk lamp lights and audible signal sounds. Signals lock-in.
7a	Repeat Step 3a.	When locked-in signals are provided— Signals are retired.
8a	Repeat Step 5a.	When distant PBX rings on tie trunk— Tie trunk lamp lights and audible signal sounds during ringing interval.
9a	Restore tie trunk key to normal.	
10b	If tie trunk is automatic type— Operate tie trunk key to same position as station key.	Tie trunk lamp lights and audible signal sounds.
11b	When distant end answers— Request distant end to disconnect and originate a call on trunk under test.	Signals are retired. Transmission is satisfactory.
12b	Distant end disconnects from trunk.	Same as Step 10b.
13b	Restore trunk key to normal.	Signals are retired.
14b	Distant end originates call on trunk.	Same as Step 10b.
15b	Repeat Step 10b.	Signals are retired.
16b	Restore tie trunk key to normal.	
17	Restore station key to normal.	
18	Disconnect handset.	
	(J) Ground Connection to PBX Framework	
1	Connect one clip of handset to terminal 10 of M terminal strip (battery).	
2	Alternately touch other clip of handset to terminal 11 of M terminal strip (ground) and metal chassis of PBX.	Click heard in receiver is same.

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MANUAL PBX ACCESS LINE CIRCUIT SD-66918-01 FOR 507A AND 507B PBX SYSTEMS — IN-SERVICE TESTS

1. GENERAL

1.01 This section provides in-service test procedures for the access line circuit (line circuit) used at a 507A or 507B manual PBX when the PBX operates with a 4-wire switching center as used initially in AUTOVON. These tests enable a confidence check to be made of the line circuit by establishing voice connections with appropriate test equipment at the switching center. Proper operation of the line circuit is verified by observing lamps at the PBX and ***principal*** relay operation at the line circuit. Additional verification is obtained by satisfactory transmission between the line circuit under test and the 4-wire switching center.

> ***Note:*** The relays which are observed in these tests are not the only relays which may operate or release for a given functional operation. They are termed ***principal*** relays in these tests because their operation or release indicates receipt or transmission of principal signals by the equipment under test.

1.02 The tests provided in this section are as follows:

A. ***Outgoing Call (TOUCH-TONE Dial):*** This test checks the ability of the line circuit to function when a ROUTINE, TOUCH-TONE call is made toward the switching center.

B. ***Outgoing Call (Rotary Dial):*** This test checks the ability of the line circuit to function when a ROUTINE, rotary dial call is made toward the switching center.

C. ***ROUTINE Incoming Call:*** This test checks the ability of the line circuit to respond to steady off-hook signals from a switching center.

D. ***Precedence Incoming Call:*** This test checks the ability of the line circuit to respond to the special signaling used in Precedence calls.

E. ***Preemption of Existing Connection:*** This test checks the ability of the line circuit to receive a preempt on-hook signal and a distinctive disconnect tone.

F. ***Night and Through-Dial Operation:*** This test checks the operation of the line circuit when it is used for night and through-dial operation.

G. ***Connection of Central Office Trunk to 4-Wire Switching Center:*** This test checks the operation of the line circuit when the PBX is required to connect a central office trunk to an access line trunk.

1.03 These tests assume that the PBX and associated circuits, and the switching center are all operating properly. Obvious station defects such as broken wires, loose connections, etc. should be corrected prior to performing these tests. Tests of TOUCH-TONE keying, including precedence keying, may be performed by dialing a preselected number which connects the line circuit to a TOUCH-TONE and ringing test circuit at the 4-wire switching center.

**Reprinted to comply with modified final judgment.

2. METHOD

STEP	ACTION	VERIFICATION
	A. Outgoing Call (TOUCH-TONE Dial)	
1	At PBX — Take attendant telephone or extension telephone (whichever is equipped with TOUCH-TONE dial) off-hook and operate access line trunk key.	At PBX — Trunk lamp lights. At line circuit — D2, DP relays operate.
2	Dial 4-wire testboard using TOUCH-TONE dial.	At PBX — When testboard answers, trunk lamp extinguishes. At line circuit — When testboard answers, E relay operates.
3	Conduct talking test with 4-wire testboard.	At PBX — Conversation satisfactory.
4	Terminate call; restore PBX to normal.	Trunk lamp lights until testboard disconnects. At line circuit — D2, DP relays release; E relay releases when testboard disconnects.
	B. Outgoing Call (Rotary Dial)	
1	At PBX — Take attendant telephone or extension telephone (whichever is equipped with rotary dial) off-hook and operate access line trunk key.	At PBX — Trunk lamp lights. At line circuit — D2, DP relays operate.
2	Dial 4-wire testboard using rotary dial.	DP relay follows dial pulses. When testboard answers, E relay operates. At PBX — When testboard answers, trunk lamp extinguishes.
3	Conduct talking test.	Conversation satisfactory.
4	Terminate call; restore PBX to normal.	Trunk lamp lights until testboard disconnects. At line circuit — D2, DP relays release; E relay releases when testboard disconnects.
	C. ROUTINE Incoming Call	
1	At PBX — Contact 4-wire testboard and request that a ROUTINE call be placed to line circuit under test.	

STEP	ACTION	VERIFICATION
2	Ensure PBX is on-hook; await incoming call.	At line circuit — When ringing signal is received from testboard, E relay operates causing R relay to operate and release repeatedly at regular intervals. R relay operated provides ringing current to PBX and return of audible signaling to calling party. At PBX — When ringing signal is received, trunk lamp lights.
3	Operate access line trunk key and answer incoming call.	DP, D2 relays operate. At PBX — Trunk lamp extinguishes.
4	Conduct talking test.	Conversation satisfactory.
5	Terminate call; restore PBX to normal.	Trunk lamp lights until testboard disconnects. At line circuit — DP, D2 relays release; E relay releases when testboard disconnects.

D. Precedence Incoming Call

1	At PBX — Contact 4-wire testboard and request that a Precedence call be placed to line circuit under test.	
2	Ensure PBX is on-hook and await incoming call.	At PBX — When precedence signaling is applied, trunk lamp flashes. At line circuit — When precedence signaling is applied, E relay operates and releases repeatedly until call is answered. ***Note:*** For a Precedence call, E relay is operated for approximately 1.6 seconds and released for 0.345 second.
3	Operate access line trunk key and answer incoming call.	DP, D2 relays operate. At PBX — Trunk lamp extinguishes.
4	Terminate call; restore PBX to normal.	Trunk lamp lights until testboard disconnects. At line circuit — DP, D2 relays release; E relay releases when testboard disconnects.

STEP	ACTION	VERIFICATION
	E. Preemption of Existing Connection	
1	At PBX — Contact 4-wire testboard and request that preemption signal be applied toward line circuit under test.	At PBX — When preemption signal is applied: single flash of trunk lamp occurs, distinctive tone is audible in head/handset, 4-wire switching center disconnects. At line circuit — E relay releases for approximately 0.345 second, reoperates, then finally releases as switching center disconnects.
2	Restore PBX to normal.	
	F. Night and Through-Dial Operation	
1	At PBX — Operate night key, the access line trunk key, and a desired extension key.	
2	At desired extension — Go off-hook.	At line circuit — DP, D2 relays operate.
3	Go on-hook.	DP, D2 relays release.
4	At PBX — Contact 4-wire testboard and request that routine call be placed to line circuit under test.	At extension — When ringing current is applied, audible signaling occurs.
5	At extension — Answer call; conduct talking test.	Conversation satisfactory.
6	At extension — Go on-hook.	
7	At PBX — Restore PBX to normal.	
	G. Connection of Central Office Trunk to 4-Wire Switching Center	
1	At PBX — Operate central office trunk key and when dial tone is received, establish connection with central office testboard.	At PBX — Associated trunk lamp lights.
2	Place central office trunk on hold.	Trunk lamp extinguishes.
3	Operate access line trunk key and dial 4-wire testboard.	Access line trunk lamp lights.
4	Operate extension key and release central office trunk hold key and access line trunk key.	At line circuit — Relays A, A1 operate; relay E operates when 4-wire testboard answers.

STEP	ACTION	VERIFICATION
5	At PBX — Break into connection and verify proper operation.	At PBX — Conversation between 4-wire testboard and central office satisfactory.
6	Restore PBX to normal when test is complete.	