

5100AM TRANSACTION TELEPHONE SET BASE WITH 220- OR 2220-TYPE HAND TELEPHONE SET

1. GENERAL

1.01 This section contains identification, installation, connection, and maintenance information for the Transaction II telephone set which consists of a 5100AM base, faceplate and a 220- or 2220-type hand telephone set. For detailed information on components, refer to CD- and SD-69926-01.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 For use behind a key system, A and A1 leads are provided by the black (BK) and yellow (Y) leads, respectively, in the mounting cord. If common audible ringing is to be provided, a separate ringer is required.

1.04 For additional information on the Transaction telephone system, refer to Technical Reference, PUB 41804, titled "Switched Network Transaction Telephone System Interfacing With Audio Response Units."

2. IDENTIFICATION

2.01 The 5100AM Transaction telephone set base, equipped with a 220- or 2220-type hand telephone set (Fig. 1) provides the standard features of a single line rotary or TOUCH-TONE® telephone set.

Note: If the customer elects to have the dial of the hand telephone set made inoperable (as covered by 3.33) then it can only provide incoming service and card dialer service.

It can also automatically dial and electronically transmit information read from a magnetic stripe on a credit card, or keyed on a 15-button manual entry pad (Fig. 1), to a data center for immediate credit authorization, check verification, or inventory control. In addition, it is possible for a transaction to be accomplished in a hands-free mode.

2.02 *Design Features:*

- Modular type
- Magnetic stripe card reader (ABA Track 2)
- Automatic dialer
- Click-disc type 15-button manual entry pad
- Operating instruction lamps (light emitting diodes [LED])
- Hands-free operation
- Electronic switchhook and call progress sounder
- Volume control for call progress sounder
- Green/yellow approval or referral lamps (LED)
- Data receiver and an 8-digit alpha/numeric display.

2.03 *Optional Features:*

- TT/DP (TOUCH-TONE/DIAL PULSE) option allows use of button pad and card reader into a rotary or a TOUCH-TONE dial office
- 15-button manual entry pad may be locked inoperable for outgoing calls
- TOUCH-TONE signal output level of set from button pad or card operation may be changed to compensate for loop loss
- An auxiliary manual entry pad (5000A-50 dial) may be connected to allow use of a Personal Identification Number (PIN).

NOTICE

Not for use or disclosure outside the
Bell System except under written agreement

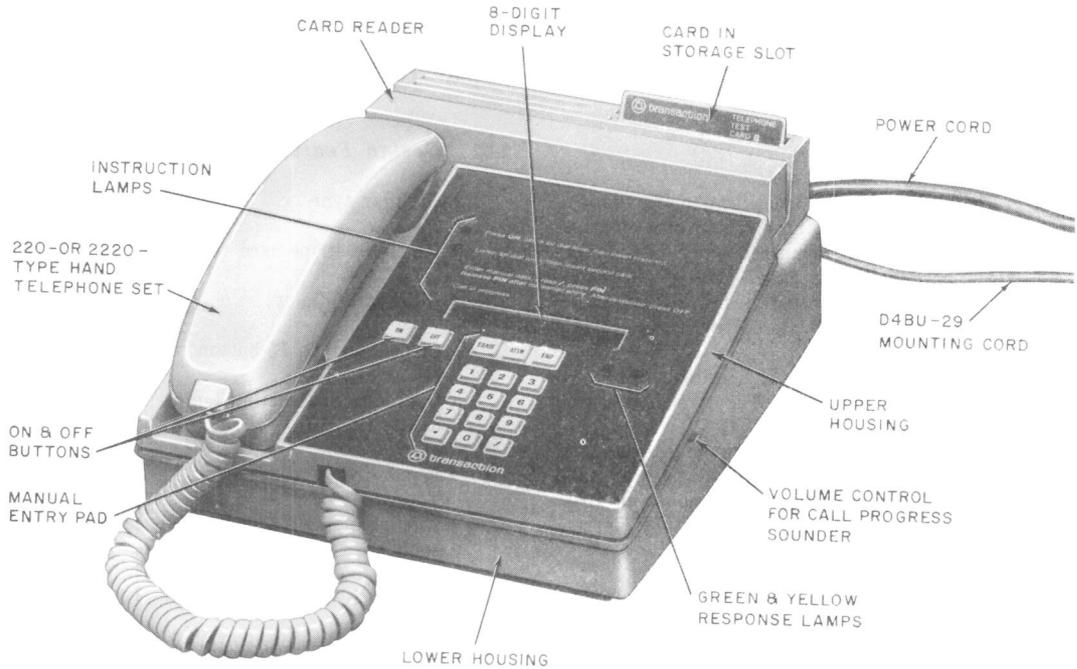


Fig. 1—5100AM Transaction II Telephone Set Base Equipped With 220- or 2220-Type Hand Telephone Set

2.04 The 5100AM Transaction II telephone set base is available in Ivory (-50) only. These bases will be shipped with a disposable protective faceplate, so it is necessary to order the proper faceplate separately (Table A).

2.05 Ordering Guide:

(a) The 5100AM Transaction II telephone set base consists of all the necessary circuitry including power unit and card reader and should be ordered as:

- Base, Telephone Set, 5100AM (includes the following):
 - Cord, Handset, H4DU-50
 - Cord, Mounting, D4BU-29 (7 foot provided, 14- or 25-foot available)
 - Adapter, 227A (for handset cord)

840996003 Test Card B (additional cards may be ordered)

Subscriber Instruction Booklet (SIB-2482C)

(b) One of the following is also required and must be ordered separately:

- Set, Telephone, Hand, 220A-50 (Rotary dial)
- Set, Telephone, Hand, 2220B-50 (TOUCH-TONE dial)

(c) If the auxiliary manual entry pad is to be used, it will be necessary to order the D-180687 Kit of Parts (which includes the 5000A-50 dial) and also an appropriate faceplate (Table A).

1. CONNECT RED (R) GREEN (G) YELLOW (Y), AND BLACK (BK) CONDUCTORS OF STATION WIRE ALONG WITH (R), (G), (Y), AND (BK) JACK LEADS OF 625C TO TERMINALS R, G, Y, AND B, RESPECTIVELY, OF 42A CONNECTING BLOCK
2. PLACE 625C ONTO 42A AND SECURE
3. PLUG ONE END OF D4BU CORD INTO JACK OF 625C AND OTHER END INTO JACK IN BASE OF TELEPHONE SET

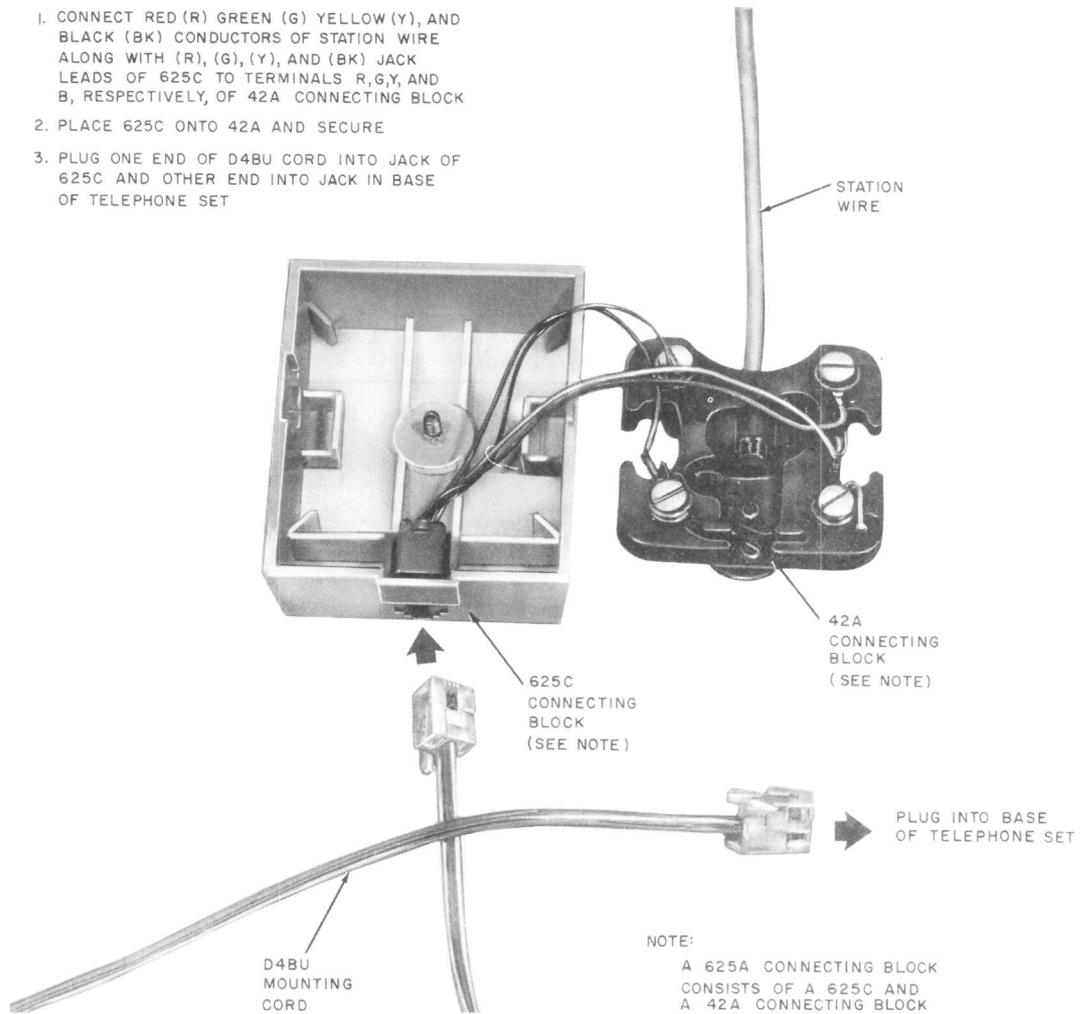


Fig. 2—Installation of 625A Connecting Block

3. INSTALLATION

modular connecting blocks or adapters, refer to Section 503-100-100.

3.01 Terminate the local loop into a connecting block suitable for the D4BU-29 mounting cord, but do not connect the mounting cord at this time. The use of a 625-type connecting block (Fig. 2) is recommended. For information on other

Warning: Any magnetic stripe card may have its encoding destroyed if the card is carried or stored near a magnet or magnetized object.

TABLE A
TRANSACTION II
FACEPLATE ORDERING GUIDE

TEL SET	FACEPLATE CODE NUMBER	LETTERING	INTENDED USE
5100AM Tel Set Base	138C1-*	Blank	Without Auxiliary Manual Entry Pad
	138C5-*	Standard Instructions	
	138D1-*	Blank	With Auxiliary Manual Entry Pad
	138D6-*	Standard Instructions	

* Add appropriate color suffix from Table B

TABLE B
COLOR ORDERING GUIDE (SEE NOTE)

HAND TEL SET		FACEPLATES	
SUFFIX	COLOR	SUFFIX	COLOR
-50	Ivory	-100	Avocado
		-108	Teak
		-109	Walnut
		-111	Gold
		-112	Orange
		-113	Brown
		-114	Red
		-115	Blue
		-118	Black

Note: The 5100AM telephone set base is available in Ivory only and the hand telephone set should also be Ivory. The faceplate must be ordered separately.

3.02 Connect the TRIMLINE® handset to the 5100AM telephone set base using the handset cord and adapter. (A 616P jack is provided on the front of the base.)

3.03 Insure that there is an available 110-volt, 3-wire AC receptacle, not controlled by a switch, within reach of the 6-foot power cord.



A 3-wire outlet is required for safety and proper operation of the set. Third conductor must be grounded. If third wire is not provided and grounded, the resistance of the set to electrostatic damage is lowered and the probability of failure is greatly increased.

3.04 To intall 138-type faceplate, proceed as follows:

- (1) Remove disposable faceplate by lifting at the midpoints of the left and right edges. When faceplate is bowed slightly, the locking tabs at top and bottom will release.
- (2) Install new faceplate by inserting bottom tab into housing and slightly bowing the faceplate enough to insert upper tabs into slots of housing.

Note: If auxiliary manual entry pad is to be installed, do not install faceplate at this time.

TRANSMISSION MEASUREMENTS (INSERTION LOSS)

3.05 The signal output level of the TOUCH-TONE frequencies transmitted by the Transaction II set must be adjusted to match the loop being used. Make a loop insertion loss measurement using a 23D Transmission Measuring Set, or the equivalent, and a 900 ohm termination. Dial the milliwatt supply (1000 Hz) of the serving central office, read and record the loss of the loop.

3.06 It is recommended that at this time the set should be opened up (3.07) and all option plugs on main printed wiring board (PWB) and control board checked to insure that they are in their "when shipped" positions as shown by Tables C and D or Fig. 4 and 5. Check wiring terminations and if any loose connections are found, reterminate per Fig. 11.

3.07 To open set in order to access option plugs and/or terminals proceed as follows:

- (1) Disconnect power plug from AC outlet, if connected.
- (2) Invert set and loosen the two captive screws holding the upper housing and chassis (Fig. 3).
- (3) Lay the upper housing and chassis to the right, as shown by Fig. 6, without disconnecting any cables.
- (4) To reassemble, reverse procedure.

3.08 Set the TOUCH-TONE signal output level for the actual measured loss of the loop (3.05) as follows:

- (1) Place the options on their proper positions. See Fig. 4 and Table C.
- (2) If the loss of the loop is 3.9 dB, or less, resistors R2 and R3 on the control board should be placed in the circuit. This is done by moving the option pins from B-C to A-B as shown by Fig. 5.
- (3) If loss of loop exceeds 12 dB the quality of the service may be impaired. Defer, according to local procedures, until an acceptable loop is made available.

3.09 Connect the set to the telephone line by inserting the mounting cord into the connecting block.

3.10 Remove the gum-backed "OPTIONS" sticker which is packed with the base and attach it to the bottom of the base near the front. If the service order does not call for the implementation of any options (Dial Pulse, Lockout, or disconnection of the ringer) at this time, reassemble set and proceed to 3.12.

Note: If the order calls for making dial of hand telephone set inoperable, do not disable dial until all testing is completed.

OPTIONS

3.11 If the service order specifies that the Dial Pulse and/or Lockout options be activated, or that ringer be disconnected, access the main PWB (3.07) and proceed as follows:

(a) If both Dial Pulse and Lockout options are called for:

- (1) Place TT/DP option plug for DP per Table D.
- (2) Place upper housing and chassis back on set and reconnect AC power cord.
- (3) Go off-hook and, using manual entry pad, dial any test number and verify that the call is completed. This tests the dial pulse feature.
- (4) Disconnect power cord, lay upper housing and chassis aside, and move Lockout option plug to lockout position per Table D.
- (5) Reassemble set and reconnect AC power cord.
- (6) Test lockout by going off-hook and depressing any button on manual entry pad to verify absence of TOUCH-TONE frequency signals.

(b) If only Dial Pulse option is specified:

- (1) Proceed as in (a) Steps (1), (2), (3) and (5).

(c) If only Lockout option is specified:

- (1) Move Lockout option plug per Table D.
- (2) Reassemble set and reconnect AC power cord.
- (3) Test lockout by going off-hook and depressing any button on manual entry pad to verify absence of TOUCH-TONE frequency signals.

TABLE C
ADJUSTMENT OF TOUCH-TONE OUTPUT LEVEL (NOTE)

LOOP LOSS IN DBs	OPTION PLUG POSITIONS ON MAIN PWB			WIRING ON CONTROL BOARD				NOMINAL OUTPUT LEVEL IN DBM
				RESISTOR - R2 ‡		RESISTOR - R3 ‡		
	R-34	R-35	R-36	REMOVE FROM	CONNECT TO	REMOVE FROM	CONNECT TO	
0 to 1.9*	E33-E34	E31-E32	E23-E29	B-C†	A-B	B-C†	A-B	-13.5
2.0 to 3.9*	E34-E35	E30-E31	E23-E29	B-C†	A-B	B-C†	A-B	-11.5
4.0 to 5.9	E34-E35†	E30-E31†	E27-E28†	-	-	-	-	- 9.5
6.0 to 7.9	E34-E35	E30-E31	E28-E29	-	-	-	-	- 7.5
8.0 to 10.4	E34-E35	E31-E32	E27-E28	-	-	-	-	- 5.5
10.5 to 12	E34-E35	E31-E32	E28-E29	-	-	-	-	- 3.0

* If loop loss is 3.9 dB or less, resistors R2 and R3 should be connected into the circuit as shown.

† Plug positions when shipped from factory.

‡ Designations are not on board, see Fig. 5.

Note: See Fig. 4 for location of option plugs on main PWB.
See Fig. 5 for location of wiring option on control board.

TABLE D
PLACEMENT OF OPTION PLUGS (SEE NOTE)

OPTION	PLUG POSITION	RESULT
Key Pad Lock out	E42-E43*	Not locked (can dial out from key pad)
	E43-E44	Locked (cannot dial out from key pad)
TT/DP Dialing	E21-E22*	Key pad dials in TT frequencies
	E22-E23	Key pad sends out dial pulses
Power Up Reset	E39-E40*	Resets terminal to ON-HOOK condition following commercial power failure.

* Option plug positions when shipped.

Note: See Fig. 4 for location of option plugs.

(d) To disconnect P2B ringer:

(1) Remove red (R) and black (BK) ringer leads from terminal P1 and T, respectively, on control board, insulate and store.

(2) Reassemble set and reconnect AC power cord.

Note: Indicate on the sticker on the base of the set any options that are implemented.

3.12 With handset on-hook, plug in power cord and then go off-hook momentarily to reset Transaction II telephone set.

Note: If no lamps light when handset is taken off hook, either AC receptacle is defective

INSTALLATION TEST PROCEDURES

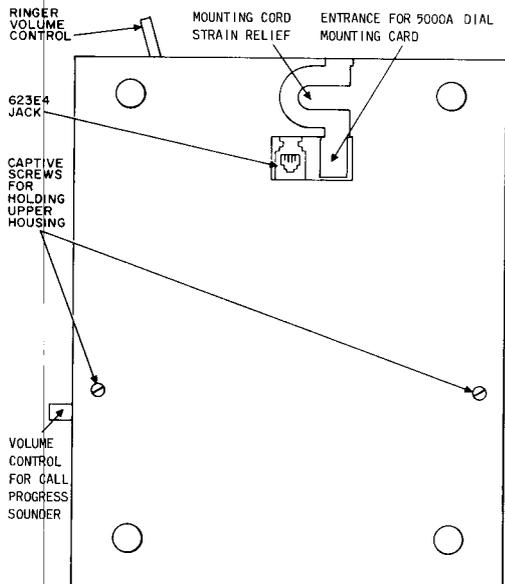


Fig. 3—Bottom of 5100AM Transaction II Telephone Base Showing Upper Housing Screws and Mounting Cord Jack

or fuses may be open. If fuses are suspected, refer to 4.02 in Maintenance section.

PRELIMINARY TEST PROCEDURE

3.13 Go off-hook by lifting handset; first and fourth instruction lamps will light. Replace the handset; both lamps will extinguish. Press the ON button; both lamps will light again. Run test card B (card is packed with the 5100AM base) through the card reader from right to left. Card must be held with the magnetic stripe down and to the front and must be moved through the slot smoothly and without hesitation. First instruction lamp should go out and second instruction lamp should light. Correct operation of these lamps indicates that the test card is properly coded and the card reader is good. If the card is not read correctly the first lamp will blink and the card reading procedure should be repeated. Press the OFF button; both lamps will extinguish.

3.14 Using the TRIMLINE handset, perform the normal tests, including ringback, for a rotary or TOUCH-TONE telephone set (as applicable) according to local procedures.

3.15 Depress ON button (listen to dial tone), and check operation of call progress tone sounder volume control (Fig. 1). Adjust volume control to acceptable level and depress OFF button.

REMOTE TEST PROCEDURE



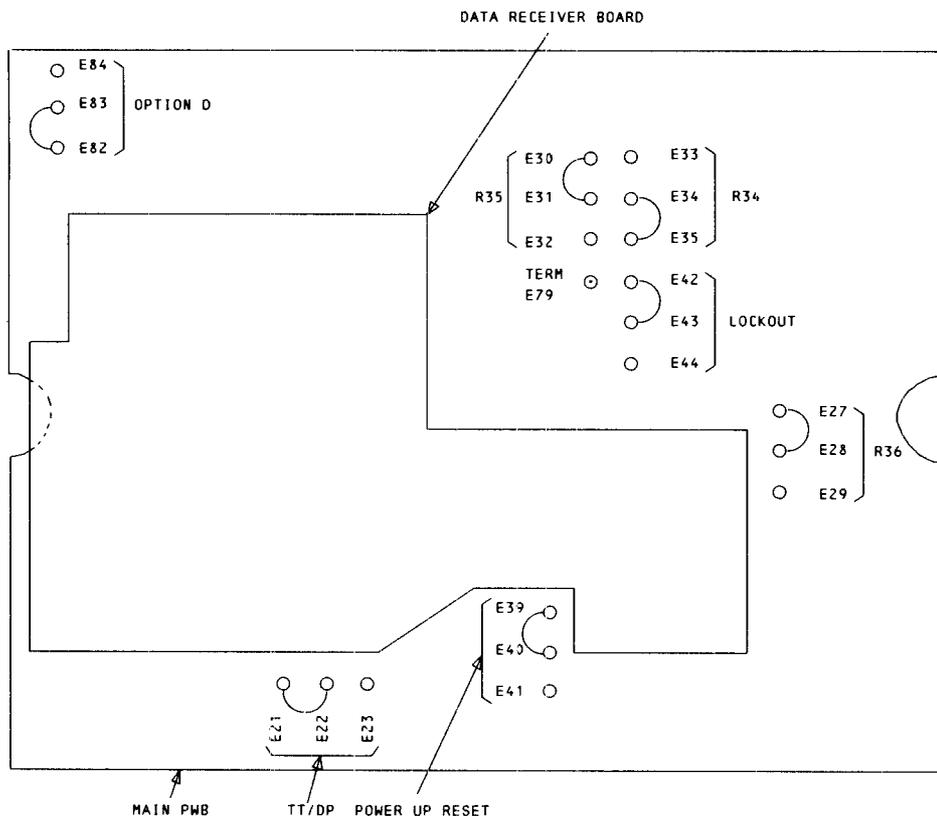
In the following tests there must not be over a 10-second delay between steps or the test line will interpret this as an error.

Note: If an interrupted (1/2 second on, 1/2 second off), lasting about 5 seconds, is heard at any time, an error is indicated. The 1A Transaction Telephone Test Line Station (TTTLS) will disconnect at the end of the interrupted tone. To retest, it will be necessary to redial the test line (3.16) through (3.22).

3.16 Go off-hook by lifting the handset, first and fourth instruction lamps are lighted and dial tone is heard. (The fourth instruction lamp will remain lighted as long as the set is off-hook.) Manually dial the number of the 1A Transaction Telephone Test Line Station (TTTLS) using the TRIMLINE handset.

3.17 When the call is completed to the TTTLS, it will respond with a 3-second answer tone which will be heard on the TRIMLINE handset. After the answer tone has terminated, the test card should be passed through the reader two (2) times. The instruction lamps should sequence—the second instruction lamp should light after the card is passed through the first time, and when the card has been passed through the second time, the third lamp will be lighted.

3.18 Key in digits by depressing buttons on the manual entry pad, *in sequence*, 1 through 9, ●, 0, /, and END. The third instruction lamp will now be extinguished. While you are doing this, the set will transmit the buffered data as TOUCH-TONE pulses. The digits keyed in will have appeared on the visual display as they are



NOTE: DUE TO SPACE LIMITATION ONLY TWO PINS MAY BE IDENTIFIED ON EACH OPTION PLUG

Fig. 4—Main PWB and Data Receiver Board Showing Option Plug Locations and Plug Positions as Shipped

keyed and the display will clear when transmission is completed.

3.19 The green (G) response lamp will then flash and the display shall be filled with 8's.

3.20 Press the ERASE button. The display should fill with decimal points, and the (G) response lamp will continue to flash.

3.21 Key in 1, 2, 3, END. The display should erase and the yellow (Y) lamp should light. If the (Y) lamp does not light and the display

shows E-0-0, reenter 1, 2, 3, END (you have 7 seconds to do this) and the (Y) lamp should light.

3.22 Press ATTN. A muted 3-second response is heard and the TTLS will disconnect. Place handset on-hook. The (Y) lamp may be extinguished by momentarily going off-hook.

AUXILIARY MANUAL ENTRY PAD

3.23 If the auxiliary manual entry pad is to be used, it should be installed at this time.

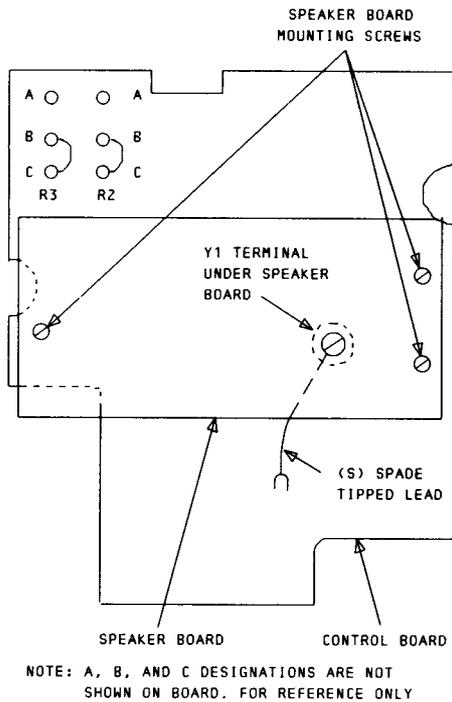


Fig. 5—Control Board and Speaker Board Showing Location of R2 and R3 Option Plugs and Terminal Y1

To install the D-180687 Kit of Parts (Fig. 7) which includes:

- 1 - 5000A-50 dial
- 1 - 841934946 mounting plate
- 1 - 651G key (push-to-lock, push-to-unlock)
- 4 - 840694194 screws
- 1 - 840713366 label
- 2 - D-161488 connectors (provided with kit of parts manufactured after 1st quarter of 1976).

- (1) Remove faceplate by lifting at the midpoints of the right and left edges. When faceplate

is bowed slightly, the locking tabs at top and bottom will release.

Note: An 138D-type faceplate (ordered separately, Table A) will also be required.

- (2) Install 841934946 mounting plate and 651G key (Fig. 8) as follows:

- (a) Remove screw holding static arrester spring (Fig. 8) and slide mounting plate under the spring. Replace the screw holding the spring and the associated lead. This should secure right side of mounting plate.

- (b) Secure left side of mounting plate with (2) 840694194 screws.

- (c) Insert 651G key with cut-out portion of key mounting to right and the two indexing or alignment holes over tabs on the mounting plate to the left.

- (d) Secure right side of key using the other (2) 840694194 screws provided.

- (3) Install new 138D-type faceplate.

- (4) Open the set (3.07); lay the upper housing and chassis to the right (Fig. 6).

- (5) Hold the lower housing up on its side and feed the mounting cord of the dial through the cord entrance hole in the base pan. Using Fig. 6, make connections as follows:

- (a) Plug multipin connector of mounting cord into connector on flex ribbon cable.

Note: A polarizing key in the female connector assures proper mating of connectors.

- (b) Connect 508 plug to 651G key.

- (c) Connect the black (BK) spade-tipped mounting cord conductor to terminal E8A on the main PWB.

- (d) Connect the spade-tipped blue-black (BL-BK) mounting cord conductor to the spade-tipped (BL-BK) lead from terminal E79 on the main PWB using a D-161488 connector. Insulate the connection.

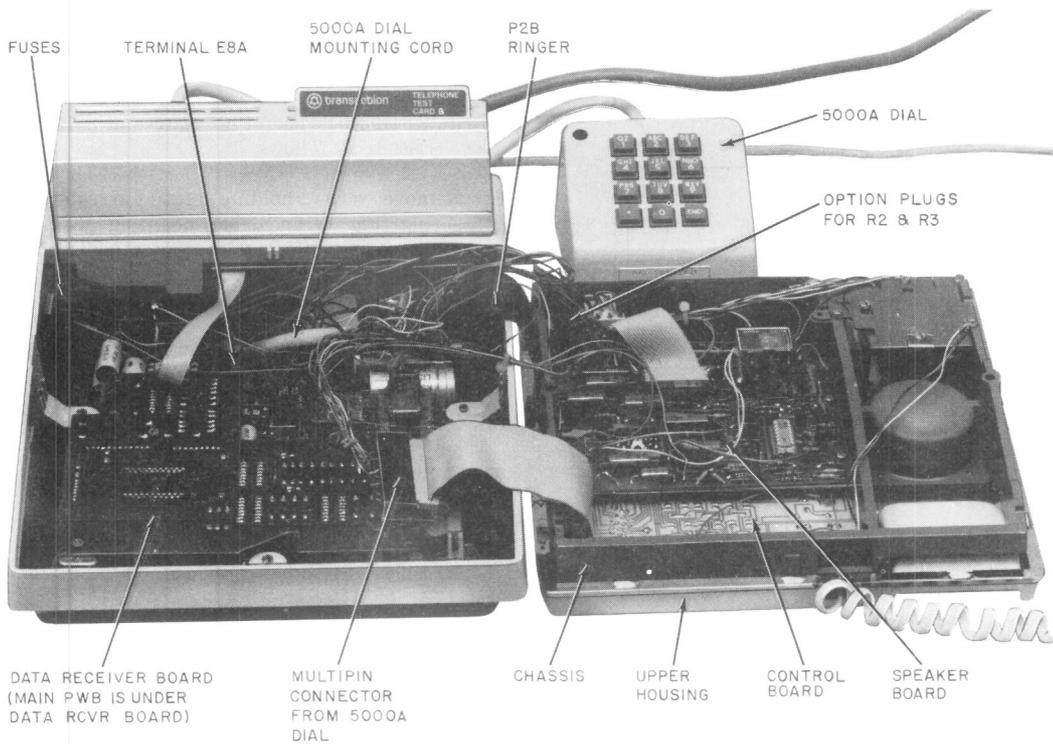


Fig. 6—5100AM Transaction II Telephone Set Base With Upper Housing and Chassis Laid Aside, 5000A Dial Connected

Note: In later production models there is a push-on terminal at E79 instead of a spade-tipped lead. Connect the (BL-BK) mounting cord conductor to this terminal.

(e) Connect the spade-tipped (S) mounting cord conductor to the spade-tipped (S) lead from terminal Y1 on the control board using a D-161488 connector. Insulate the connection.

Note: In later production models, terminal Y1 is accessible at the lower right corner of the control board. Connect the (S) mounting cord conductor to terminal Y1.

(f) Insulate and store any unused mounting cord leads.

(6) Pull slack out of mounting cord as upper housing and chassis are replaced. Invert set and tighten captive screws holding the upper and lower housing together.

(7) Place jacketed portion of mounting cord under strain relief as shown in Fig. 3.

3.24 To test the auxiliary manual entry pad, press the Personal Identification Number (PIN) key to enable the pad. Observe that both Light Emitting Diodes (LED) light, one on the PIN key and one on the 5000A-50 dial. Depress PIN key again and observe that both LED's are extinguished.

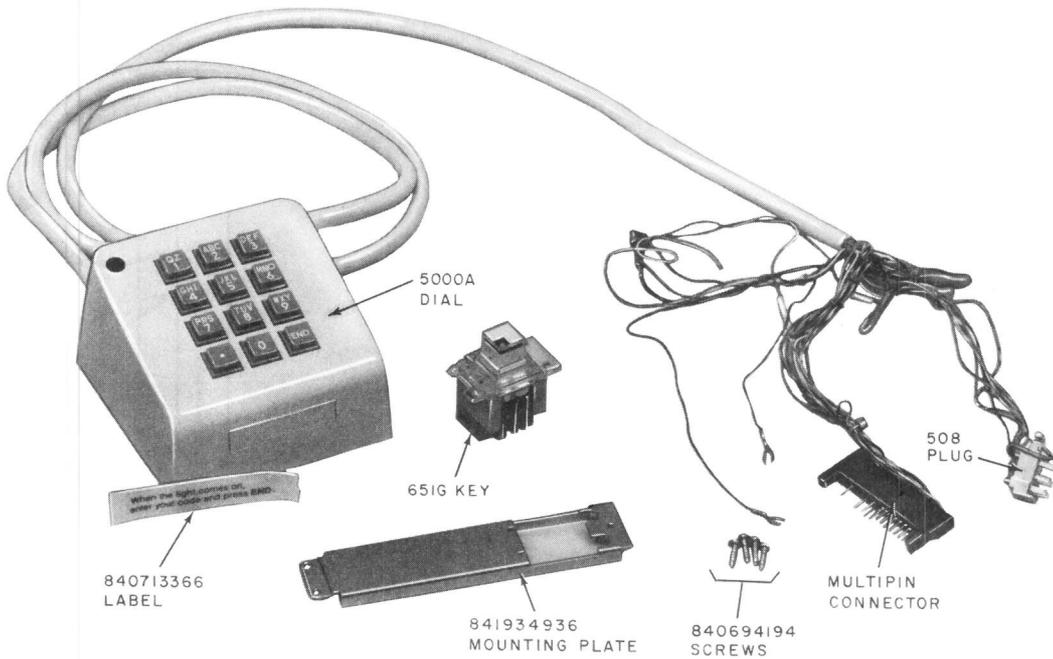


Fig. 7—D-180687 Kit of Parts

- 3.25** Repeat 3.16 and 3.17 and then press the PIN key to enable the pad.
- 3.26** Key in by depressing, *in sequence*, digits 1 through 9, ●, and 0 on the 5000A-50 dial. (None of the entries from the 5000A-50 dial should appear on the display.) Depress / (slash) on the 5100AM base and then depress END on the 5000A-50 dial. The third instruction lamp shall be extinguished.
- 3.27** The (G) response lamp shall flash and the display shall be filled with 8's. Depress the PIN key and observe that the LED's (on both the 5000A-50 dial and the 5100AM base) shall be extinguished. Hang up the hand telephone set.
- 3.28** Depress the PIN key and then the ON button. The first and fourth instruction lamps should light. Depress the END button on the manual entry pad of the 5100AM telephone set base and then depress the END button on the 5000A-50 dial. First instruction lamp is extinguished

and second lamp is lighted. Depress OFF button and then the PIN key. All lamps should now be extinguished. This completes the testing procedure of the auxiliary manual entry pad.

3.29 If the customer has a dialing card, ask him to use his card and place a call to his data center to verify that he can reach it.

3.30 This completes the test procedures. Write the telephone number of the TTTLs on the test card for customer's future reference and give test card to customer along with the Subscriber Instruction Booklet. Explain to the customer the use of the test card per Subscriber Instruction Booklet.

DIAL RESTRICTION OF HAND TELEPHONE SET

3.31 Some customers may want the dial of the hand telephone set restricted from making outgoing calls. This feature is not recommended

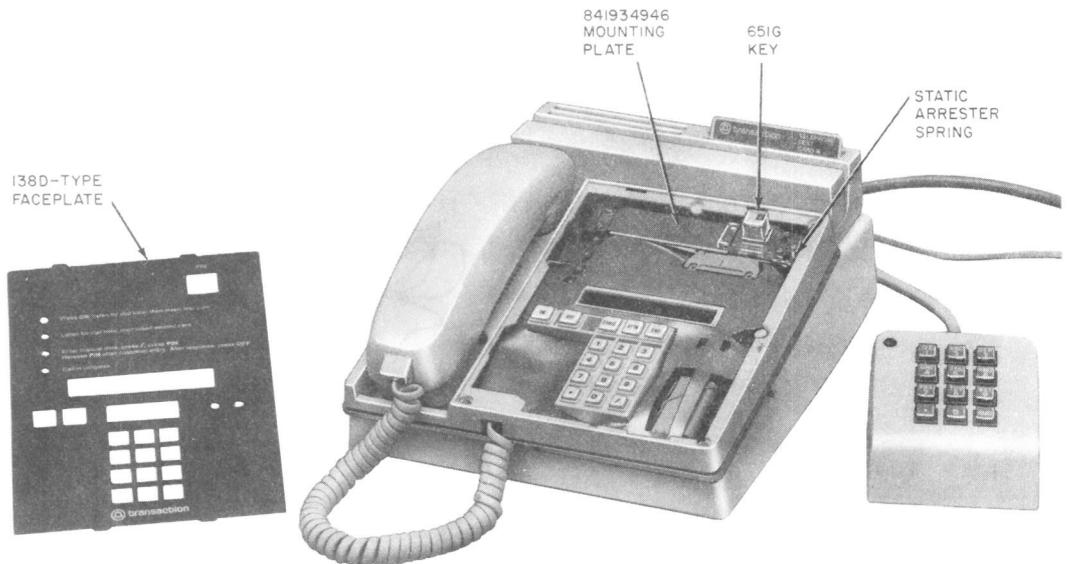


Fig. 8—5100AM Transaction II Telephone Set With Faceplate Removed for Installation of 651G Key

and will only be incorporated at the customer's insistence.

Note: If dial restriction is to be provided, all installation tests must be completed prior to making the modification.



If dial is restricted, the set can no longer be used as a normal telephone set since calls can only be initiated by a dialing card.

3.32 Only the 220-type hand telephone set may be restricted. If dial restriction is requested at a location that has been equipped for TOUCH-TONE service, the 2220-type hand telephone set should be replaced with a 220-type hand telephone set that has been modified per 3.33.

3.33 To restrict the dial in a 220-type hand telephone set, proceed as follows:

- (1) Remove handset cord from handset using KS-21107 releaser or equivalent.

- (2) Remove cover or number card retainer located just above dial using KS-21107 releaser or equivalent.

- (3) Remove light seal plate and the 2 screws located under retainer. This will release the cover from the handset.

- (4) Place a strap between the pulsing contacts as shown in Fig. 10. The dial will remain in the handset.

- (5) Reassemble handset and reconnect handset cord.

- (6) Note this modification on the option sticker.

3.34 Outgoing calls may now be made only by using a dialing card.

4. MAINTENANCE



Before attempting to make any maintenance tests, check option sticker under base of set, to see what options (3.11 or 3.33) may have been implemented



Fig. 9—Transaction II Telephone Set With 5000A Dial Installed

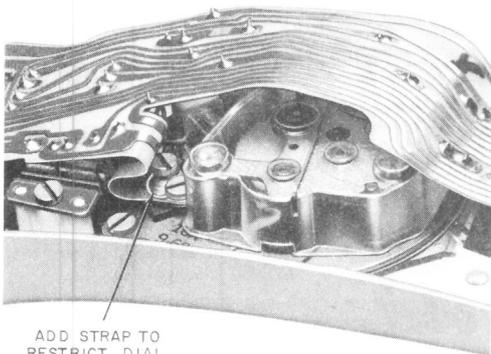


Fig. 10—Restricting Dial of 220A Hand Telephone Set

4.01 In case of commercial power failure, Transaction telephone sets can be used as standard telephone sets using the TRIMLINE handset. All

other functions of the Transaction telephone set are rendered inoperative by the loss of AC power.



If dial of hand telephone set has been restricted (3.33), the set can not be used as a standard telephone set. The restricted handset may be unplugged and replaced for maintenance testing purposes. Be sure to reinstall customer's handset when testing is completed.

4.02 There are two fuses, (F1 for -12 volt and F2 for +5 volt circuitry) housed in plastic "in-line" holders and located at the left rear corner of the main PWB. If a fuse failure is suspected, the fuses may be removed (access per 3.06), and checked visually or observe the following indications:

- (1) If fuse F1 is open:
 - (a) Depressing the ON button will not take set off-hook, (no dial tone heard on call progress sounder).

(b) No TOUCH-TONE signals may be heard on handset when buttons are depressed on manual entry pad.

Note: If Lockout option has been activated this would be an inconclusive test.

(c) Lights on set may or may not be operable.

(2) If F2 fuse is open, there will be no lamps operable on set. These are Bussman MDL two (2) ampere fuses and may be obtained locally.

WARNING: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE FUSES ONLY WITH 2 AMP SLO-BLO (BUS MDL) OR EQUIVALENT.

4.03 Other field maintenance of the sets shall consist of the following:

- (a) Check for line continuity (dial tone).
- (b) Check for proper connection of cords and jacks.

(c) Check for loose wire or connections on main PWB or control board (Fig. 11).

(d) Replacement of H4DU-50 handset cord and/or 227A adapter.

(e) Replacement of D4BU-29 mounting cord.

(f) Replacement of TRIMLINE handset.

(g) Replacement of auxiliary manual entry pad.

4.04 If the loss of the loop changes due to cable activity, etc. and/or difficulty is encountered in communicating with the remote data center, the loop loss should be measured and the TOUCH-TONE signal output level adjusted per 3.08.

4.05 Field repairs on the 5100AM base shall not be attempted. Return defective base to Western Electric Service Center in accordance with local procedures. If base is being replaced, return disposable faceplate from new base with the used base.

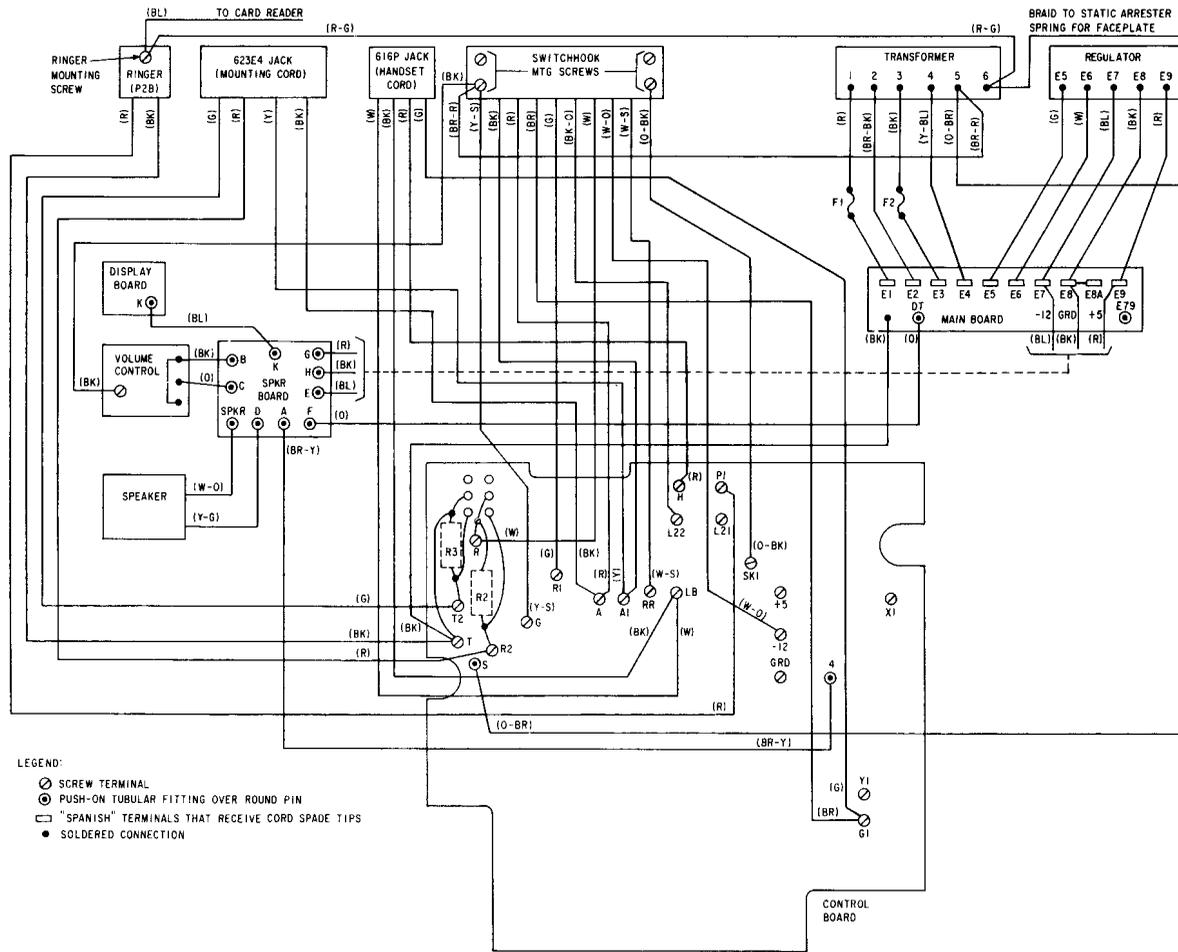


Fig. 11—Partial Schematic Showing Conductors Attached by Screws or Push-On Terminals