5100BM TRANSACTION TELEPHONE SET BASE WITH 220- OR 2220-TYPE HAND TELEPHONE SET— USED WITH OR WITHOUT 5000A OR 5000A2 PRINTER IDENTIFICATION, INSTALLATION, CONNECTIONS, TESTING, AND MAINTENANCE

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1. GENERAL

1.01 This section contains information for the transaction telephone set which consists of a 5100BM base, faceplate, and a 220- or 2220-type hand telephone set. For detailed information on components, refer to CD- and SD-69926-01. It also contains installation, connection, testing, and maintenance information on the 5000A or 5000A2 printer when used with the 5100BM transaction telephone set. The printers are covered by CD- and SD-69949-01.

1.02 This section is reissued to:

- Update information for Federal Communications Commission (FCC) registered sets and add new figures.

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," and PUB 41805, titled "Switched Network Transaction Telephone System Interfacing With FSK System Transmission Control Units".

2. IDENTIFICATION

2.01 The 5100BM 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 paragraph 4.31) then it can only provide incoming 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
- An auxiliary manual entry pad (5000A-50, 5000C-50, or 5000E-50 dial), which will be referred to as Personal Identification Number (PIN) pad, may be connected to allow use of a PIN
- A 5000A or 5000A2 printer may be connected to provide printed response from the data center
- The one-number option can be set to restrict normal transactions to a single data center. (This option can be defeated by interrupting power between transactions.)

Note: This is an FCC registered set. There are no option adjustments for TOUCH-TONE signal output level. Option plugs for E27-E35 have been removed as well as the shorting plugs on the control board. The output level is set at the factory and cannot be changed.

2.04 The 5100BM transaction 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 (Tables A and B).

2.05 ***Ordering Guide***

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

- Base, Telephone Set, 5100BM (includes the following):
- Cord, Handset, H4DU-50
- Cord, Mounting, D4BU-29 (7-foot provided, 14- or 25-foot available)
- Adapter, 227A or D (for H4DU handset cord)
- 840996003 Test Card B (additional cards may be ordered)
- How To Operate Manual.

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

- Set, Telephone, Hand, 220C-50, 220AL-50, or 220AM-50 (Rotary dial)
- Set, Telephone, Hand, 2220BM-50 or 2220C-50 (TOUCH-TONE dial)

(c) If the PIN pad is to be used, it will be necessary to order the appropriate D-kit of parts (Table D) and also an appropriate faceplate (Tables A and B).

(d) If the 5000A or 5000A2 printer is to be used, it will be necessary to order it separately.

Note: The printer will be shipped with the following items:

- Housing Spacer—to be used when 5100BM set is placed on top of printer
- Cord, M14H—to interconnect with 5100BM set (3-foot provided, 10-foot available)
- 841941214 Test Card D
- Cord, Power, KS-14532L30, 6-foot long.

Note: Power cords are available in other lengths with a ***right angle*** plug as follows:

- 824013262 (P-40J326), 1-1/2 foot
- 824013270 (P-40J327), 2-foot

- 824013288 (P-40J328), 4-foot
- 824013296 (P-40J329), 6-foot
- 824010995 (P-40J099), 12-foot.

(e) D-180844 Kit of Parts (printer ribbon), ordered separately.

3. INSTALLATION

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

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

3.02 Connect appropriate TRIMLINE® handset (rotary or TOUCH-TONE dial) to the 5100BM set base using the handset cord and adapter if required. (A 616P jack is provided on the front of the base.)

3.03 Insure that there is an available 117-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 install 138-type faceplate, proceed as follows:

(1) Remove disposable faceplate. If faceplate is aluminum foil, peel off and discard. If faceplate is aluminized cardboard lift 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 upper tabs into housing and slightly bowing the faceplate enough to insert lower tabs into slots of housing.

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

3.05 It is recommended that at this time the set be opened (paragraph 3.06) and all option plugs on main printed wiring board (PWB), control board, and the data receiver board checked to insure that they are in their ***when shipped positions as shown by Fig. 3 and 4 or Table C. Check wiring terminations and if any loose connections are found, reterminate per Fig. 19 and 20.***

3.06 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. 5).

(3) Lay the upper housing and chassis to the right, as shown in Fig. 6, without disconnecting any cables.

(4) To reassemble, reverse procedure.

3.07 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.

To avoid unnecessary opening and closing of the set, it is important that the installer be aware, at this time, of what external optional features are to be provided. Internal connections must be made for either the printer or the PIN pad, but certain sequential procedures must be followed. If a printer is to be provided but no PIN pad, the M14H printer interconnect cord should be connected to the 5100BM set at this time [paragraph 3.18(1)]. The printer end of the M14H cord should NOT be connected.

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

PRELIMINARY TEST PROCEDURE

3.09 Place upper housing and chassis back onto the lower housing. With handset on-hook, plug in power cord and then go off-hook momentarily to reset the 5100BM set.

> ***Note:*** If no lamps light when handset is taken off-hook, either ac receptacle is defective or fuses may be open. If fuses are suspected, refer to Part 5 Maintenance (paragraph 5.02).

3.10 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 5100BM 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.

OPTIONS

3.11 If the service order does not call for the implementation of any options (Dial Pulse, Lockout, one-number option, disconnection of the ringer, or provision for PIN pad and/or printer) at this time, reassemble set and proceed to paragraph 3.13.

The service order must specify that each option is or is not required. If the service order does not so specify, the sales representative should be contacted.

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

3.12 If the service order specifies that any of the options, Dial Pulse, Lockout, or one-number option, be activated, or that ringer be disconnected, access the main PWB (paragraph 3.06) and proceed as follows:

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

(1) Place TT/DP option plug for DP per Table C.

(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 C.

(5) Place upper housing and chassis back onto lower housing and reconnect ac power cord.

(6) Test lockout by going off-hook and depressing any numeric button on manual entry pad to verify absence of dial pulse 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 C.

(2) Place upper housing and chassis back onto lower housing and reconnect ac power cord.

(3) Test lockout by going off-hook and depressing any numeric button on manual entry pad to verify absence of TOUCH-TONE frequency signals.

(d) If the one-number option is specified, set switch number 4 to the ON position (Fig. 3), and insure that the lockout option plug is in Locked Out position per Table C.

Note: For the ***ON*** position, depress the end of the rocker switch nearest the number 4.

(e) 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) Place upper housing and chassis back onto lower housing and reconnect ac power cord.

INSTALLATION TEST PROCEDURES

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

3.14 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.

3.15 Before connecting either a PIN pad or a printer (if they are to be provided), proceed to Part 4 and complete the appropriate Remote Test Procedures.

PIN PAD

3.16 If the PIN pad (Fig. 7) is to be used, it should be installed at this time. Refer to Fig 8 and Table D for proper D-kit of parts and install as follows:

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

(2) Install the mounting plate and enabling key (Fig. 9) as follows:

(a) Remove screw holding static arrester spring (Fig. 9) 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 two (2) screws.

(c) Insert the 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 two (2) screws provided.

(3) Install new 138D-type faceplate.

(4) Open the set (paragraph 3.06); 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 adjunct cord entrance hole in the base pan, (Fig. 5). 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 enabling key.

(c) Connect the black (BK) spade-tipped mounting cord conductor to terminal E8A on the main PWB. [Some sets have a black lead connected to E8A. This must remain. Connect (BK) mounting cord lead to same terminal.]

(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 (Fig. 3) using a D-161488 connector. Insulate the connection.

Note: In later production model 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 slate (S) mounting cord conductor to the spade-tipped (S) lead from terminal Y1 on the control board (Fig. 4) 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 directly to terminal Y1.

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

If a printer is to be provided and the M14H printer interconnect cord has not been connected to the 5100BM set it should be connected at this time [paragraph 3.18(1)].

(6) Place upper housing and chassis back onto lower housing. Invert set and tighten captive screws holding the upper and lower housing together.

(7) Place jacketed portion of mounting cord(s) under strain relief as shown in Fig. 5.

(8) Refer to paragraphs 4.14 through 4.17 for testing procedures.

5000A OR 5000A2 PRINTER

Before connecting a printer, a visual inspection should be made and certain preliminary procedures followed to prepare the printer for operation.

3.17 Proceed with the inspection and procedures as follows:

(1) Examine the printer for any physical damage.

(2) Remove the back cover by releasing the four (4) cover mounting screws (Fig. 10).

(3) Remove the printer housing by.

(a) Carefully lay printer on its side and release the four recessed captive housing mounting screws.

(b) Set printer upright and lift housing straight up to slide housing off circuit board.

(4) Visually inspect the printer for damage and check to see that ribbon is correctly positioned around guide posts and into the guide path (Fig. 11 and 12).

(5) Manually move the spool ratchet (located between the ribbon spools, Fig. 12) toward spool A.

(6) Turn spool six (6) or seven (7) rotations to take up slack and pull ribbon around the reinking rollers for better operation.

Note: The spool ratchet must remain positioned away from the spool being turned.

(7) Replacing printer housing (not back cover), tighten screws and proceed with installation.

Note: To replace the printer housing, face the rear of the printer. Place the circuit board and metal board in the housing guide slots. Carefully slide down on housing until properly seated.

3.18 To install a printer with 5100BM set located on printer (Fig. 13 or 14) proceed as follows:

(1) Open the 5100BM set (paragraph 3.06) and feed the end of the M14H connecting cord not equipped with a cord stay hook, through the adjunct cord entrance hole in the base pan (Fig. 5). Plug the cord into the connector on the data receiver board (Fig. 6). This connector is keyed and should not be forced. Dress slack from M14H cord and place cord under strain relief (Fig. 5). Reassemble the 5100BM set.

(2) Remove the insert from the top edge of the back cover by pulling it at a right angle to the cover. Remove retaining screw from rear of printer (above cord spools) and store insert by placing retaining screw through hole in center slot of insert and fasten in place as shown in Fig. 10.

(3) Turn printer onto either side. Connect the M14H cord from the 5100BM set by plugging the keyed connector into the bottom of the printer and secure the strain relief using the screw provided (Fig. 15).

(4) Connect end of printer power cord into recessed power receptacle in the bottom of the printer (Fig. 15) and place printer upright.

(5) Place the housing spacer, provided with the printer, onto the printer (Fig. 10), and place the 5100BM set on top of the spacer.

(6) Plug 5100BM power cord into printer receptacle and wind the M14H cord and 5100BM power cord around the cord storage spools at the rear of the printer (Fig. 16).

(7) Dress cord(s) through the slots provided in rear of printer and replace cover.

(8) Remove shipping paper taped to printer platen.

(9) Connect the 5100BM set to the telephone line. With handset on-hook, plug in power cord and then go off-hook momentarily to reset the 5100BM set.

3.19 If the 5100BM set is to be placed adjacent to the printer, install the printer as follows:

(1) Install the M14H cord between the 5100BM set and the printer, and connect the printer power cord [paragraphs 3.18 (1), (3), and (4)].

(2) The power cord from the 5100BM set may be connected to the power receptacle inside the printer, or the two power cords may be run to separate ac receptacles.

(3) If the 5100BM set power cord is connected to the printer receptacle, dress it through slot provided in rear of printer and replace the back cover.

(4) Remove shipping paper taped to printer platen.

(5) Connect the 5100BM set to the telephone line. With handset on-hook, plug in power cord(s) and then go off-hook momentarily to reset the 5100BM set.

Note: When installed in this manner, the housing spacer (provided with the printer) will not be used.

3.20 Remote testing procedures must now be repeated to test operation of the printer. If the one-number option is not specified, refer to paragraphs 4.18 through 4.23. If the one-number option is specified, refer to paragraphs 4.24 through 4.26.

4. TESTING

The 5100BM set should be tested before connecting any adjuncts such as the PIN pad and/or the printer. If more than one adjunct is being provided test the PIN pad before connecting the printer. This will enable the installer to recognize a defective or nonworking component. After becoming familiar with the appropriate test procedure, the condensed format of the corresponding Step, Action, Verification tests, at the end of this part are more convenient to follow. These tests are designed to be used as follows:

(a) ***Without one-number option:***

5100BM set TEST A

5100BM set with PIN pad TEST A and C

5100BM set with printer TESTS A and E

5100BM set with PIN pad and printer TESTS A, C, and E

(b) ***With one-number option:***

5100BM set TEST B

5100BM set with PIN pad TESTS B and D

5100BM set with printer TESTS B and F

5100BM set with PIN pad and printer TESTS B, D, and F

REMOTE TEST PROCEDURES

In the following tests there should not be over a 20-second delay between steps or the test line may interpret this as an error. If an interrupted tone (1/2 second on, 1/2 second off), lasting about 5 seconds, is heard at any time, an error is indicated. The Local 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.

REMOTE TEST PROCEDURE WITHOUT ONE-NUMBER OPTION (TEST A)

4.01 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 Local 1A Transaction Telephone Test Line Station (TTTLS) using the TRIMLINE handset.

4.02 When the call is completed to the Local TTTLS, it will respond with a 3-second answer tone which will be heard on the TRIMLINE handset. After the answer tone has terminated, test card B 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.

4.03 Key in digits by depressing buttons on the manual entry pad, in sequence, 1 through 9, o, 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 keyed and the display will clear when transmission is completed.

4.04 The green response lamp will then flash and the display shall be filled with 8s.

4.05 Press the ERASE button. The display should fill with decimal points, and the green response lamp will continue to flash.

4.06 Key in 1, 2, 3, END. The display should erase and the yellow lamp should light within 10 seconds. If the yellow lamp does not light and the display shows E-0-0, reenter 1, 2, 3, END. You have 7 seconds, after E-0-0 is displayed to do this. The yellow lamp should light within 10 seconds.

4.07 After yellow lamp lights, press ATTN. A 3-second response is heard and the Local TTTLS will disconnect. Place handset on-hook. The yellow lamp may be extinguished by momentarily going off-hook.

REMOTE TEST PROCEDURE WITH ONE-NUMBER OPTION AND KEYBOARD LOCKOUT (TEST B)

4.08 Disconnect the ac power cord and then reconnect it. The display will show ***diAL Cd*** and the yellow response lamp will be blinking.

4.09 Go off-hook by lifting the handset and pass test card B through the reader once. The yellow response lamp will now be on without blinking.

4.10 Dial the number of the Local TTTLS, (see Note after paragraph 4.01), using manual entry pad. (As the Local TTTLS is being dialed, the numbers dialed will appear on the display from the right side and the ***diAL Cd*** will move off the display to the left.) Press END button. The display will clear; the yellow response lamp will go out, and the first and fourth instruction lamps are lighted. (The fourth instruction lamp will remain lighted as long as the set is off-hook.)

> ***Note:*** If the Local TTTLS is dialed (paragraph 4.10) through a rotary office (DP option provided), digits must be dialed slowly so as to allow all pulses of each digit to be outpulsed before depressing the next digit.

4.11 When the call is completed to the Local TTTLS it will respond with a 3-second answer tone which will be heard on the TRIMLINE handset. After the answer tone has terminated, press ATTN once. The first instruction lamp will extinguish and the second instruction lamp will be lighted.

4.12 Pass test card B through the reader once. The instruction lamps should sequence—the third instruction lamp should be lighted and the second instruction lamp should extinguish.

4.13 Follow the procedures of paragraphs 4.03 through 4.07, but at the conclusion of paragraph 4.07, interrupt the ac power to clear the one-number memory. If the customer dialing card is available, the one-number should be loaded with the correct dialing card before leaving. This may be done as follows:

(1) When ac power is interrupted, display will show ***diAL Cd.***

(2) Pass dialing card through reader.

(3) Press END button.

(4) Go off-hook momentarily to reset 5100BM set.

PIN PAD (TESTS C OR D)

4.14 To test the PIN 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 PIN pad. Depress PIN key again and observe that both LEDs are extinguished.

4.15 If the one-number option is not selected, repeat paragraphs 4.01 and 4.02 (Test C). If the one-number option is selected, repeat paragraphs 4.08 through 4.12 (Test D).

4.16 Press the PIN key to enable the pad. Key in by depressing, in sequence, digits 1 through 9, o, and 0 on the PIN pad. Depress / (slash) on the 5100BM base manual entry pad and then depress END on the PIN pad. The third instruction lamp shall be extinguished.

> ***Note:*** Each entry from either the PIN pad or the 5100BM base manual entry pad, while the PIN pad is activated, will cause the letter ***P*** to appear on the display.

4.17 The green response lamp shall flash and the display shall be filled with 8s. Depress the PIN key and observe that the LEDs (on both the PIN pad and the 5100BM base) shall be extinguished. Go on-hook with the hand telephone set.

REMOTE TEST PROCEDURE FOR 5000A OR 5000A2 PRINTER—WITHOUT ONE-NUMBER OPTION (TEST E)

> ***Note:*** Have an 8-1/2 by 11 inch sheet of paper available before beginning test but do not insert it into the printer.

> ***Note:*** This installation test procedure is slightly different than the customer's test procedures. Follow these instructions rather than the instructions on the back of the test card.

4.18 Repeat test procedures for 5100BM transaction telephone set per paragraphs 4.01 through 4.05.

4.19 Key in 1, 2, 3, END. The display should erase and the green lamp will go out. If the display shows E-0-0, reenter 1, 2, 3, END within 7 seconds.

4.20 Approximately 10 seconds after the green lamp goes out, the display will show ***PAPEr.*** Insert the 8-1/2 by 11 inch sheet of paper into the printer (Fig. 13).

> ***Note:*** Paper may be inserted from the front or from the right side. Position paper so that back of paper is against the paper guide and the left side lines up with the paper guide line on the shroud.

4.21 The display will show ***PUSH End.*** Press END button.

4.22 When the END button is pressed, the yellow lamp will light and the printer will print the test message shown by Fig. 17.

4.23 After the printing stops, but before removing the paper, press ATTN. The yellow lamp will go out, a 3-second response tone is heard and the TTTLS will disconnect. The paper may be withdrawn from any direction. If the paper is still clamped, press the reset button (Fig. 13 or 14) and remove the paper. If a 5000A2 printer is used, hold button and paper will feed automatically.

> ***Note:*** During printing the display may show E-0-1; this indicates a printer malfunction or that the paper is not positioned correctly. Repeat the test. If the condition continues, refer to the maintenance section for possible causes.

REMOTE TEST PROCEDURE FOR 5000A OR 5000A2 PRINTER—WITH ONE-NUMBER OPTION (TEST F)

> ***Note:*** Have an 8-1/2 by 11 inch sheet of paper available before beginning test but do not insert it into the printer.

> ***Note:*** This installation test procedure is slightly different than the customer's test procedures. Follow these instructions rather

than the instructions on the back of the test card.

4.24 Repeat one-number option test procedures for 5100BM transaction telephone set per paragraphs 4.08 through 4.12, and then paragraphs 4.03 through 4.05.

4.25 Repeat paragraphs 4.19 through 4.23 from the printer test procedure without the one-number option.

4.26 At the conclusion of the test, interrupt the ac power to clear the one-number memory. If the customer dialing card is available, the one-number memory should be loaded with the correct dialing card before leaving. This may be done as follows:

(1) When ac power is interrupted, display will show ***diAL Cd.***

(2) Pass dialing card through reader.

(3) Press END button.

(4) Go off-hook momentarily to reset 5100BM set.

FINAL TEST

4.27 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.

> ***Note:*** If no printer has been installed, leave test card B. If a printer has been provided, leave test card D which is provided with the printer. Both test cards have the same data on their magnetic stripes, only the testing instructions on the cards are different. If test card D is being provided, the validity of the card should be checked by the procedure given in paragraph 3.10 using test card D instead of test card B.

4.28 This completes the test procedures. Write the telephone number of the Local TTTLS on the appropriate test card for customer's future reference and give test card to customer along with the How To Operate Manual. Explain to the customer the use of the test card per the How To Operate Manual.

DIAL RESTRICTION OF HAND TELEPHONE SET

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

4.30 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 paragraph 4.31.

4.31 To restrict the dial in a 220A (MD), 220AM, or 220AL 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 two screws located under retainer. This will release the cover from the handset.

(4) Place a strap between the pulsing contacts as shown in Fig. 18. The dial will remain in the handset.

> ***Note:*** If a 220C hand telephone set is provided, place the strap between screw terminals 1 and 2 located on the flexible circuit board.

(5) Reassemble handset and reconnect handset cord.

4.32 Outgoing calls may now be made only by using a dialing card, if keyboard lockout option was specified (paragraph 3.12).

TEST A (SEE NOTE)

5100BM WITHOUT ONE-NUMBER OPTION

STEP	ACTION	VERIFICATION
1	Go off-hook with handset.	Dial tone heard 1st and 4th instruction lamps light
2	Dial local TTTLS, using handset.	3-second answer tone heard
3	Pass test card B thru reader.	1st lamp out—2nd lamp lights
4	Pass test card B thru reader a second time.	2nd lamp out—3rd lamp lights
5	Key 1 thru 9, o, 0, /, and END.	3rd lamp out Digits appear on display as keyed Set transmitting buffered data Display clears when transmission stops Display fills with 8s Green lamp flashing
6	Press ERASE.	Display shows decimal points Green lamp flashing
7	Key 1, 2, 3, END. If display shows "E-0-0" reenter 1, 2, 3, END.	Display clears Yellow lamp lights (within 10 seconds)
8	Press ATTN.	Yellow lamp out 3-second tone heard Local TTTLS will disconnect
9	Go on-hook.	4th lamp goes out.

Note: For more detailed information, see paragraphs 4.01 through 4.07.

TEST B (SEE NOTE)

5100BM WITH ONE-NUMBER OPTION

STEP	ACTION	VERIFICATION
1	Disconnect ac power cord.	
2	Reconnect ac power cord.	Display shows "diAL Cd" Yellow lamp flashing
3	Go off-hook with handset.	Dial tone heard
4	Pass test card B thru reader.	Yellow lamp lights
5	Dial Local TTTLS, using manual entry pad.	Digits appear on display as dialed— "diAL Cd" moves off display to left
6	Press END button.	Display clears Yellow lamp goes out 1st and 4th instruction lamps light 3-second answer tone heard
7	Press ATTN.	1st lamp out—2nd lamp lights
8	Pass test card B thru reader.	2nd lamp out—3rd lamp lights
9	Key 1 thru 9, o, 0, /, and END.	3rd lamp out Digit appears on display as keyed Set is transmitting buffered data Display clears when transmission stops Display fills with 8s Green lamp flashing
10	Press ERASE button.	Display shows decimal points Green lamp flashing
11	Key 1, 2, 3, END.	Display clears—Green lamp out Yellow lamp lights
12	Press ATTN.	Yellow lamp goes out 3-second tone heard Local TTTLS disconnects
13	Go on-hook.	4th lamp goes out.

Note: For more detailed information, see paragraphs 4.08 through 4.13.

TEST C (SEE NOTE)

PIN PAD WHEN CONNECTED TO 5100BM SET—WITHOUT ONE-NUMBER OPTION

STEP	ACTION	VERIFICATION
1	Press PIN key on 5100BM.	LEDs light on PIN key and on PIN pad
2	Press PIN key again.	LEDs are extinguished
3	Go off-hook with handset.	Dial tone is heard 1st and 4th instruction lamps light
4	Dial Local TTTLS, using handset.	3-second answer tone heard
5	Pass test card B thru reader.	1st lamp out—2nd lamp lights
6	Pass test card B thru reader a second time.	2nd lamp out—3rd lamp lights
7	Press PIN key.	LEDs light on key and on PIN pad
8	Key 1 through 9, o, and 0 using PIN pad. Press / (slash) on 5100BM set. Press END on PIN pad.	Each entry appears on display as a letter "P" Set transmitting buffered data Display clears when transmission stops 3rd lamp goes out Display fills with 8s Green lamp flashing
9	Press PIN key.	LEDs are extinguished
10	Go on-hook.	4th lamp goes out Display shows 8s—Green lamp flashing
11	Go off-hook momentarily.	Display clears.

Note: For more detailed information, see paragraphs 4.14 through 4.17.

TEST D (SEE NOTE)

PIN PAD WHEN CONNECTED TO 5100BM SET—WITH ONE-NUMBER OPTION

STEP	ACTION	VERIFICATION
1	Press PIN key on 5100BM.	LEDs light on PIN key and on PIN pad
2	Press PIN key again.	LEDs are extinguished
3	Disconnect ac power cord.	
4	Reconnect ac power cord.	Display shows "diAL Cd" Yellow lamp flashing
5	Go off-hook.	Dial tone heard
6	Pass test card B thru reader.	Yellow lamp lights
7	Dial Local TTTLS, using manual entry pad.	Digits appear on display as dialed— "diAL Cd" moves off display to left
8	Press END button.	Display clears Yellow lamp goes out 1st and 4th instruction lamps light 3-second answer tone heard
9	Press ATTN.	1st lamp out—2nd lamp lights
10	Pass test card B thru reader.	2nd lamp out—3rd lamp lights
11	Press PIN key.	LEDs light on key and on PIN pad
12	Key 1 through 9, o, and 0 using PIN pad. Press / (slash) on 5100BM set. Press END on PIN pad.	Each entry appears on display as a letter "P" Set transmitting buffered data Display clears when transmission stops 3rd lamp goes out Display fills with 8s Green lamp flashing
13	Press PIN key.	LEDs are extinguished
14	Go on-hook.	4th lamp goes out Display shows 8s,—Green lamps flashing
15	Go off-hook momentarily.	Display clears.

Note: For more detailed information, see paragraphs 4.14 through 4.17.

TEST E (SEE NOTE)

5000A OR 5000A2 PRINTER WHEN CONNECTED TO 5100BM SET—WITHOUT ONE-NUMBER OPTION

STEP	ACTION	VERIFICATION
1	Go off-hook.	Dial tone is heard 1st and 4th instruction lamps light
2	Dial Local TTTLS using handset.	Local TTTLS answers with 3-second tone
3	Pass test card B thru reader.	1st lamp goes out—2nd lamp lights
4	Pass test card B thru reader.	2nd lamp goes out—3rd lamp lights
5	(Using manual entry pad) key 1 thru 9, o, 0, /, and END.	Set transmit buffered data 3rd lamp goes out Digits appear on display as keyed Display will clear—within 10 seconds— Display fills with 8s Green lamp flashing
6	Press ERASE.	Display shows decimal points Green lamp flashing
7	Key 1, 2, 3, END. If display shows "E-0-0" reenter 1, 2, 3, END.	Display clears Green lamp out— Approximately 10 seconds— Display shows "PAPEr"
8	Insert paper.	Display shows "PUSH End"
9	Press END.	Yellow lamp lights Printer prints test message Printer stops
10	Press ATTN.	Yellow lamp out 3-second tone heard Local TTTLS will disconnect
11	Go on-hook.	4th lamp goes out.
12	Withdraw paper. If clamped, press RESET button.	

Note: For more detailed information, see paragraphs 4.18 through 4.23.

TEST F (SEE NOTE)

5000A OR 5000A2 PRINTER WHEN CONNECTED TO 5100BM SET—WITH ONE-NUMBER OPTION

STEP	ACTION	VERIFICATION
1	Disconnect ac power cord.	
2	Reconnect ac power cord.	Display shows "diAL Cd" Yellow lamp flashing
3	Go off-hook.	Dial tone heard
4	Pass test card B thru reader.	Yellow lamp is on
5	Dial Local TTTLS, using manual entry pad.	Digits appear on display as dialed— "diAL Cd" moves off display to left—
6	Press END.	Display clears Yellow lamp is out 1st and 4th instruction lamps light 3-second answer tone heard
7	Press ATTN.	1st lamp out—2nd lamp lights
8	Pass test card B thru reader.	2nd lamp out—3rd lamp lights
9	Key 1 thru 9, o, 0, /, and END on manual entry pad.	3rd lamp out Digits appear on display as keyed Set transmitting buffered data Display clears when transmission stops Display fills with 8s Green lamp flashing
10	Press ERASE.	Display shows decimal points Green lamp flashing
11	Key 1, 2, 3, END. If display shows "E-0-0," reenter 1, 2, 3, END.	Display clears Green lamp out— After approximately 10 seconds— Display shows "PAPEr"
12	Insert paper.	Display shows "PUSH End"
13	Press END.	Yellow lamp lights Printer prints test message Printer stops
14	Press ATTN.	Yellow lamp out 3-second tone heard— Local TTTLS disconnects
15	Go on-hook.	4th lamp out.

STEP	ACTION	VERIFICATION
16	Withdraw paper.	

Note: For more detailed information, see paragraphs 4.24 through 4.26.

5. MAINTENANCE

5.01 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 (paragraph 4.31), the set cannot 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.

5.02 There are two fuses, (F1 for +5 volt and F2 for -12 volt circuitry) housed in plastic ***in-line*** holders and located at the left rear corner of the main PWB. These are Bussman MDL 2-ampere fuses and may be obtained locally. If a fuse failure is suspected, the fuses may be removed (access per paragraph 3.06), and checked visually or observe the following indications.

(1) If fuse F1 is open.

(a) Depressing the ON button will not simulate 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.

Warning: For continued protection against fire hazard, replace fuses only with 2 amp SLO-BLO (bus MDL) or equivalent.

5.03 For maintenance checks due to reported or indicated trouble conditions, refer to the appropriate test procedure(s) in Part 4. This should help to isolate the trouble to the 5100BM set (including PIN pad, provided), or the printer and/or their associated components.

5.04 Field maintenance of the 5100BM 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. 19 and 20).

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

(e) Replacement of D4BU-29 mounting cord.

(f) Replacement of TRIMLINE handset.

(g) Replacement of auxiliary manual entry pad.

5.05 Field repairs on the 5100BM 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.

5.06 Field repairs on the printer shall not be attempted except for ribbon replacement (paragraph 5.10). Return defective printer to Western Electric Service Center in accordance with local procedures.

5.07 Paper problems with the printer should be treated as follows:

(a) If paper is jammed or can not be removed easily.

(1) Push RESET button (5000A printer) or RESET and FORM FEEDOUT BUTTON on 5000A2 printer.

(2) Try to remove paper.

(3) If paper can not be removed, replace printer.

(b) If paper is ***lost*** in printer:

(1) Try to push paper out using another sheet of paper.

(2) Replace printer.

Do not attempt to remove paper from printer by forcing metal tools or hard objects through the paper slot as this may damage the printing mechanism.

5.08 Some printer related problems may be indicated by ***E-0-1*** being displayed on the 5100BM set. These are—

(a) Paper not registering properly causing paper sensor switch to open before printing is completed.

(b) Defective M14H interconnect cord or improper engagement of M14H with connector in 5100BM set or in printer.

(c) Malfunction in printer.

(d) Defective or faulty output from 5100BM set.

(e) Errors in text transmitted from data center to set.

5.09 Repeated occurrences of the following symptoms indicate a printer malfunction and/or a need for printer replacement.

(a) Light printing on original (top) copy.

(b) Occasional missing dots in character is acceptable.

(c) Characters printed over one another.

(d) Line feed (paper advance) is nonuniform, skewed (successive lines not parallel), or no line feed at all.

(e) Printer functions without paper present.

(f) Extreme nonuniformity in character width or spacing between characters, (some nonuniformity in the first 5 characters of the printed line is normal).

(g) Printer fails to print last character(s) on line, and stops leaving paper still clamped.

(h) Paper jammed in printer (see paragraph 5.07).

5.10 To replace a printer ribbon (Fig. 11 and 12) by adding (D-180844 Kit of Parts), ordered separately.

(1) Disconnect the printer from ac power source.

(2) If the 5100BM set is located on the printer (Fig. 13 or 14), it must be removed, but it should not be necessary to disconnect the power or mounting cord.

(3) Remove back cover by releasing the four cover mounting screws (Fig. 10).

(4) Remove the upper housing by—

(a) Carefully laying printer on its side and releasing the four recessed captive housing mounting screws.

(b) Set printer upright and lift housing straight up to slide housing off circuit board.

(5) Remove the plastic shroud (5000A2 printer) only, by loosening the two back wing nuts and removing the single front screw.

(6) Carefully remove ribbon guard by inserting a screwdriver at top of guard and pry outward.

Note: Insure that the ribbon guard is not bent in removal or bottom of guard will interfere with ribbon when it is reinstalled.

(7) Remove plastic spool cover (Fig. 11), and retain for later use.

(8) Remove the two ribbon spools, ribbon, and two inking rollers and discard them.

(9) From the D-180844 Kit of Parts, installed new spools, ribbon, and reinking rollers per the diagram on the ribbon guard or (Fig. 12). Insure that—

(a) Ribbon comes off spool as shown in diagram or figure.

(b) Ribbon passes around inking rollers, through the small guide posts, around corner rollers, over 45-degree guide posts and into guide path.

(c) Ribbon is not twisted under print head.

(10) Tighten ribbon by winding on ***free*** turning spool, turn approximately four (4) full turns.

(11) Carefully replace the ribbon guard (refer to Note, Step 6) and replace spool cover retained in Step 7.

(12) Replace the shroud (5000A2 only), upper housing, and cover.

Note: To replace the upper housing, turn rear of printer facing you and carefully slide housing down with the edges of the printed board in slots of housing and metal board in rear right-hand slot.

5.11 ▶Card read head problems can be resolved by cleaning the read head monthly. Cleaning of the read head can be accomplished by applying a commercial head cleaner, either by swab or specialty cleaning card. Clean read heads as follows:

(a) Apply cleaning agent to swab or spongy strip of cleaning card.

(b) Pass over read head 10 to 15 times.

(c) After a few seconds, the card reader may be used.◀

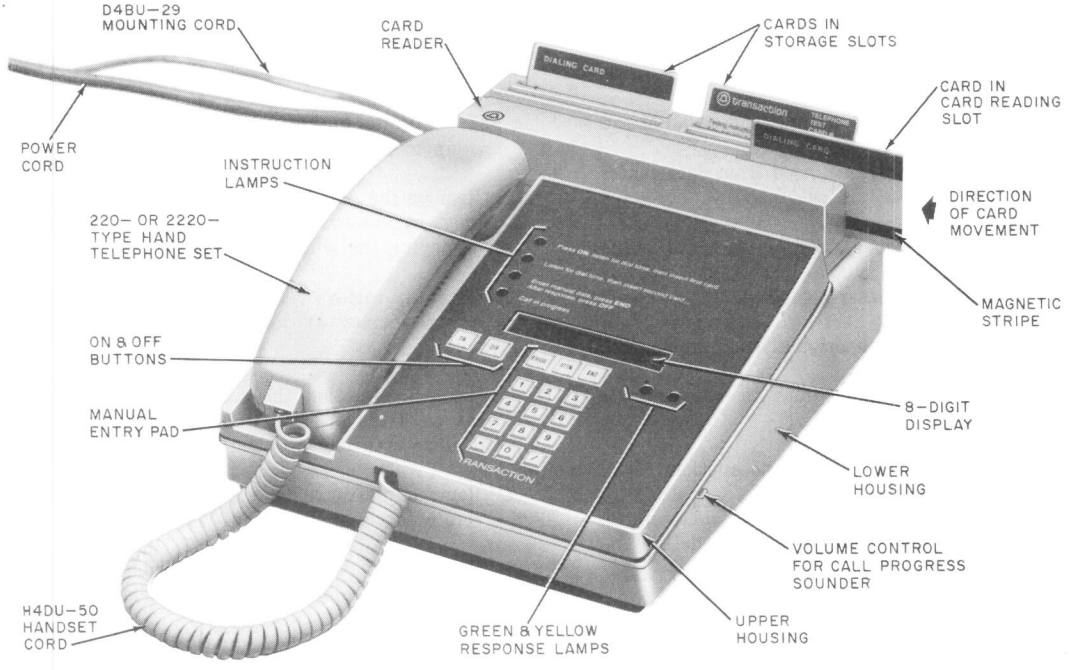


Fig. 1—5100BM Transaction Telephone Set Base Equipped With 220- or 2220-Type Hand Telephone Set

TABLE A
5100BM TELEPHONE SET
FACEPLATE ORDERING GUIDE

TEL SET	FACEPLATE CODE NUMBER	LETTERING	INTENDED USE
5100BM Tel Set Base	138C1-*	Blank	Without PIN Pad
	138C5-*	Standard Instructions	
	138D1-*	Blank	With PIN 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 5100BM telephone set base is available in Ivory only and the hand telephone set should also be Ivory. The faceplate must be ordered separately.

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

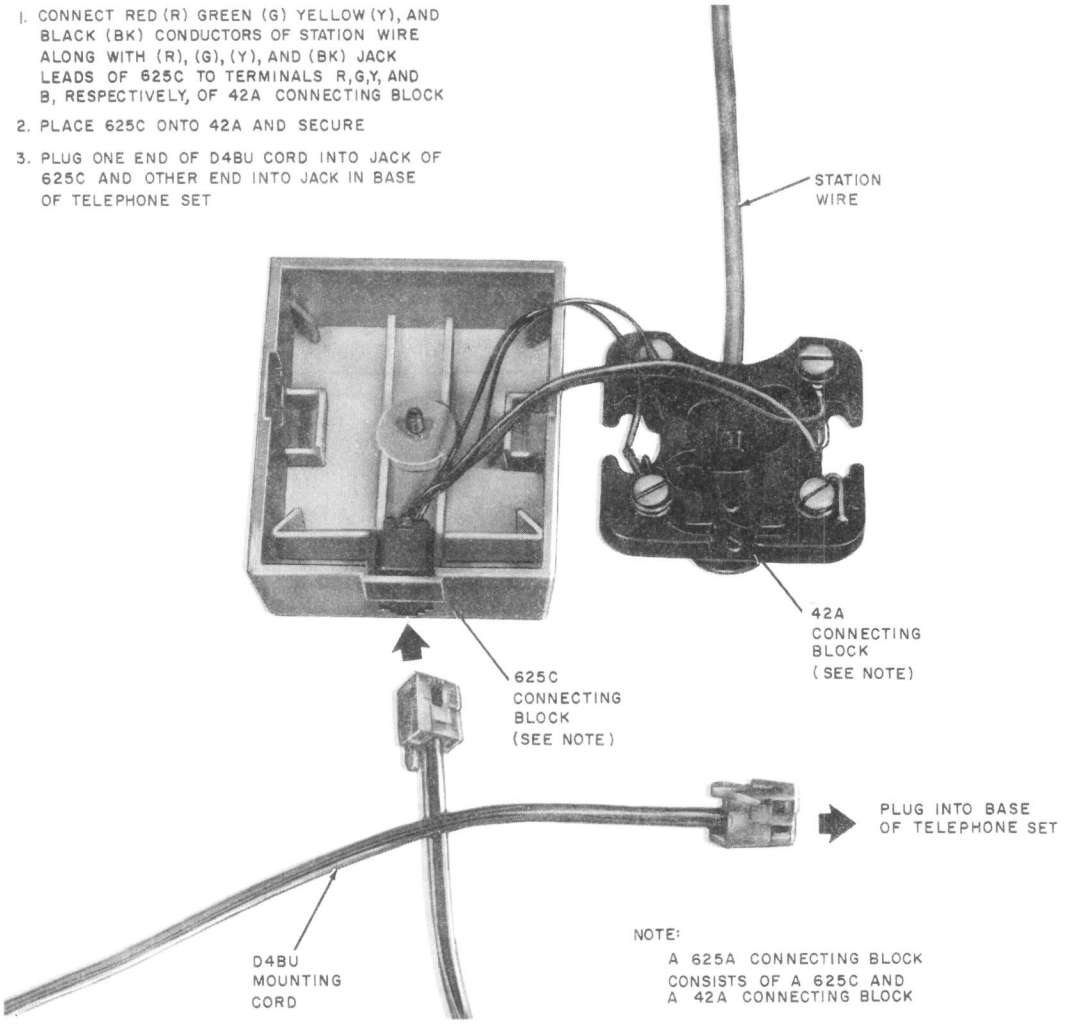


Fig. 2—Installation of 625A Connecting Block

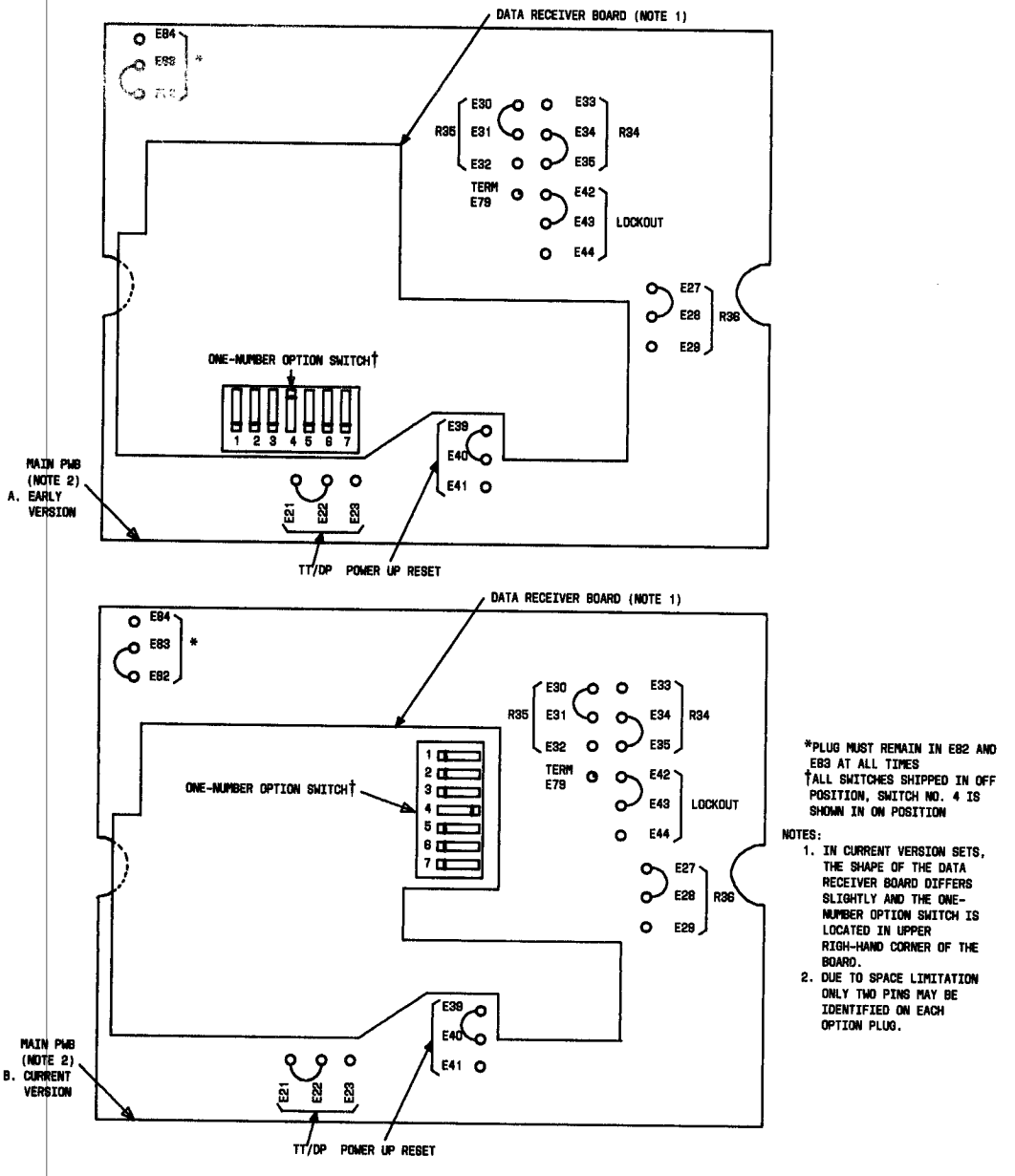


Fig. 3—Main PWB and Data Receiver Board Showing Option Plugs and One-Number Option Switch Locations on Early Version and FCC Registered Sets (Sheet 1 of 2)

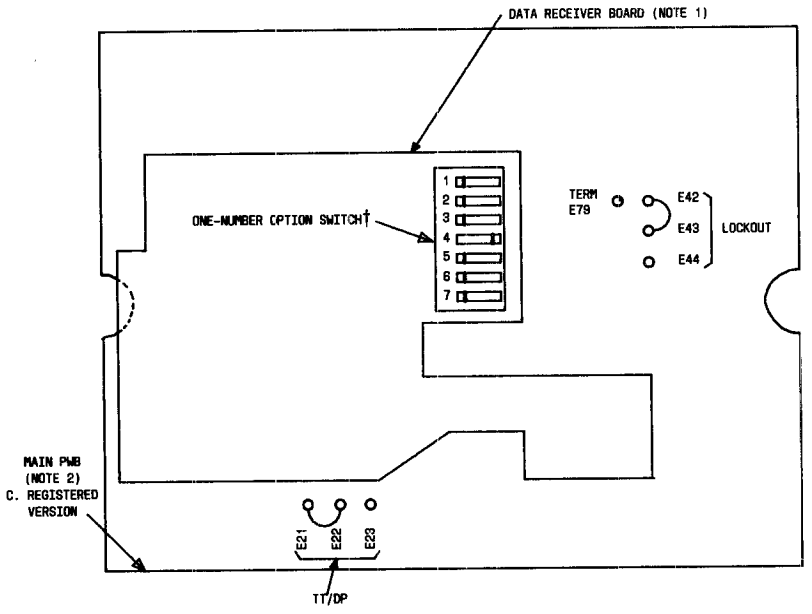


Fig. 3—Main PWB and Data Receiver Board Showing Option Plugs and One-Number Option Switch Locations on Early Version and FCC Registered Sets (Sheet 2 of 2)

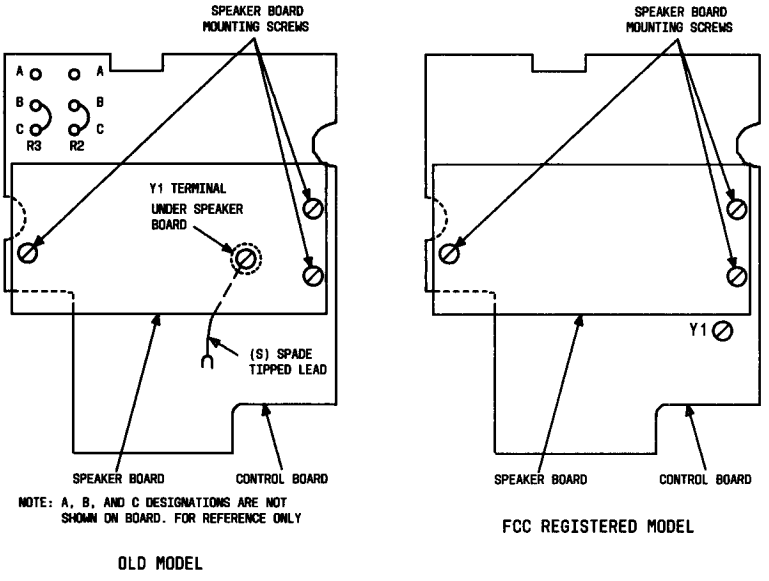


Fig. 4—Control Board and Speaker Board Showing Location of R2 and R3 Option Plugs and Terminal Y1

TABLE C

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
One-Number Option	Switch #4 OFF*	Does not restrict routine transactions to a single data center
	Switch #4 ON	Restricts routine transaction to a single data center

* Option plug positions when shipped.

Note: See Fig. 3 for location of option plugs or switch.

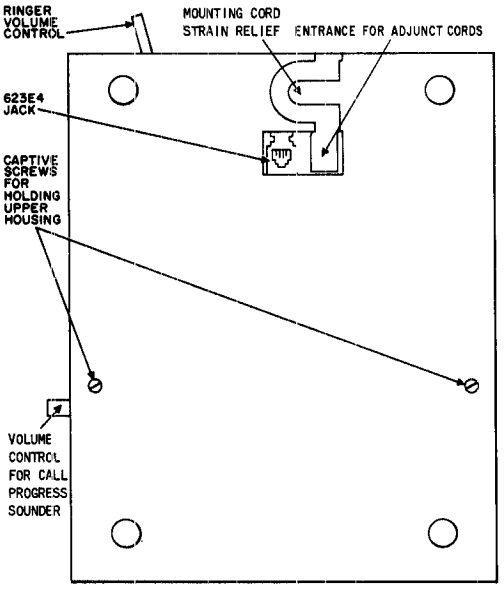


Fig. 5—Bottom of 5100BM Tranaction Telephone Set Base Showing Upper Housing Screws and Mounting Cord Jack

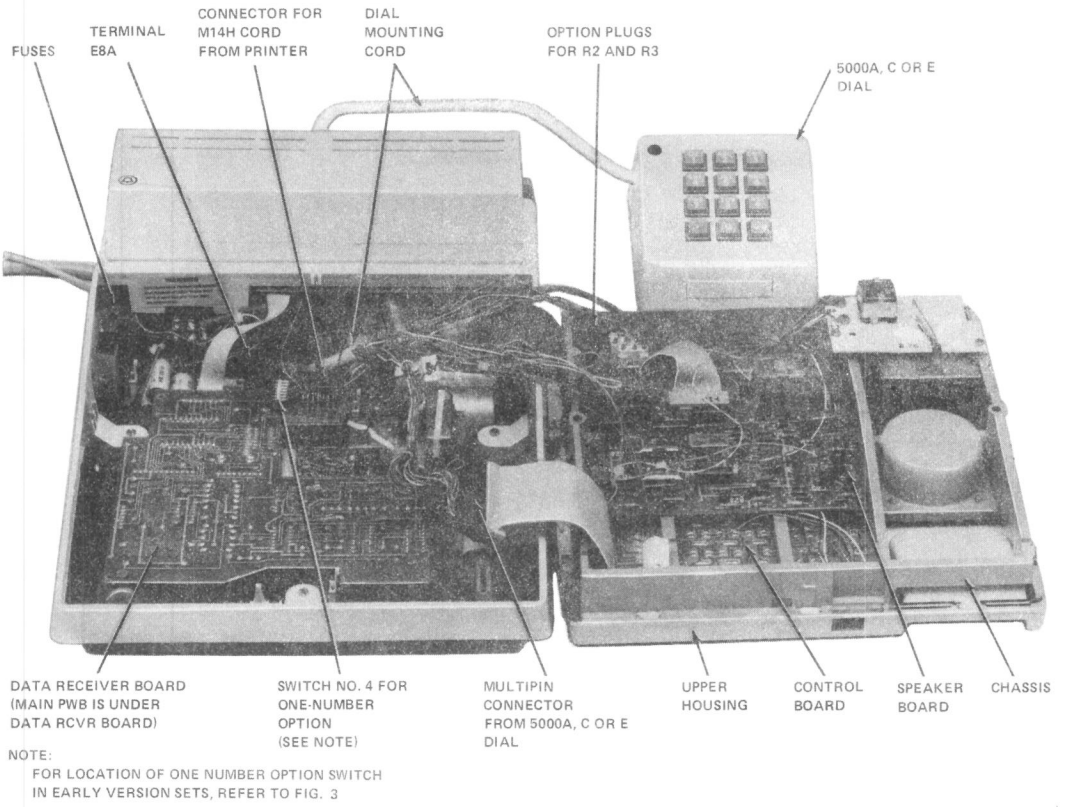


Fig. 6—5100BM Transaction Telephone Set Base With Upper Housing and Chassis Laid Aside, PIN Pad and Printer Connected

Fig. 7—5100BM Transaction Telephone Set With PIN Pad Installed

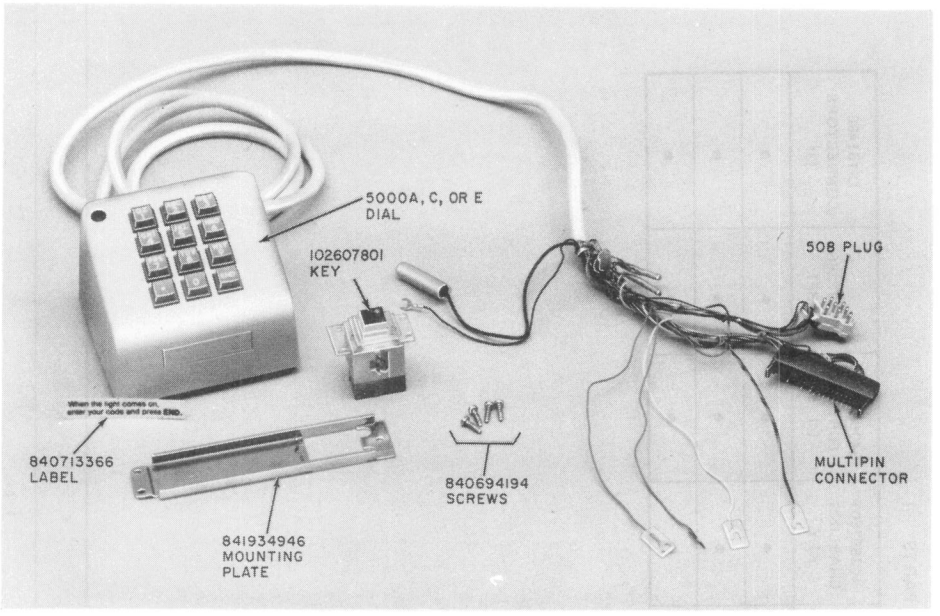


Fig. 8—PIN Pad D-Kit of Parts

TABLE D

PIN PAD D-KITS OF PARTS

KIT OF PARTS	5000A-50 DIAL 5 FT CORD	5000C-50 DIAL 10 FT CORD	5000E-50 DIAL * 20 FT CORD	841934946 MTG PLATE	102607801 ENABLING KEY	840694194 SCREWS (4)	840713366 LABEL	D-161488 CONNECTORS (2)
D-180687	•			•	•	•	•	•
D-180813		•		•	•	•	•	•
D-180820			•	•	•	•	•	•

* Includes Installation Instructions

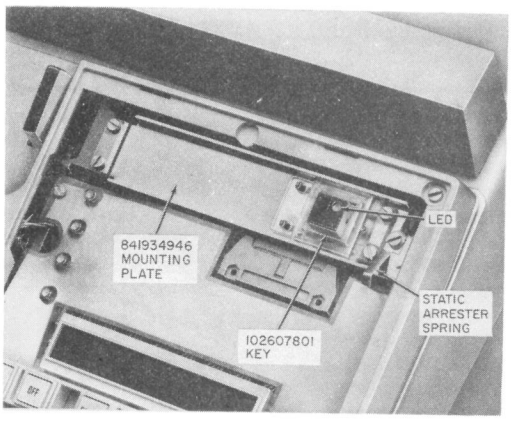


Fig. 9—5100BM With Faceplate Removed Showing Mounting Plate and 102607801 Key Installed

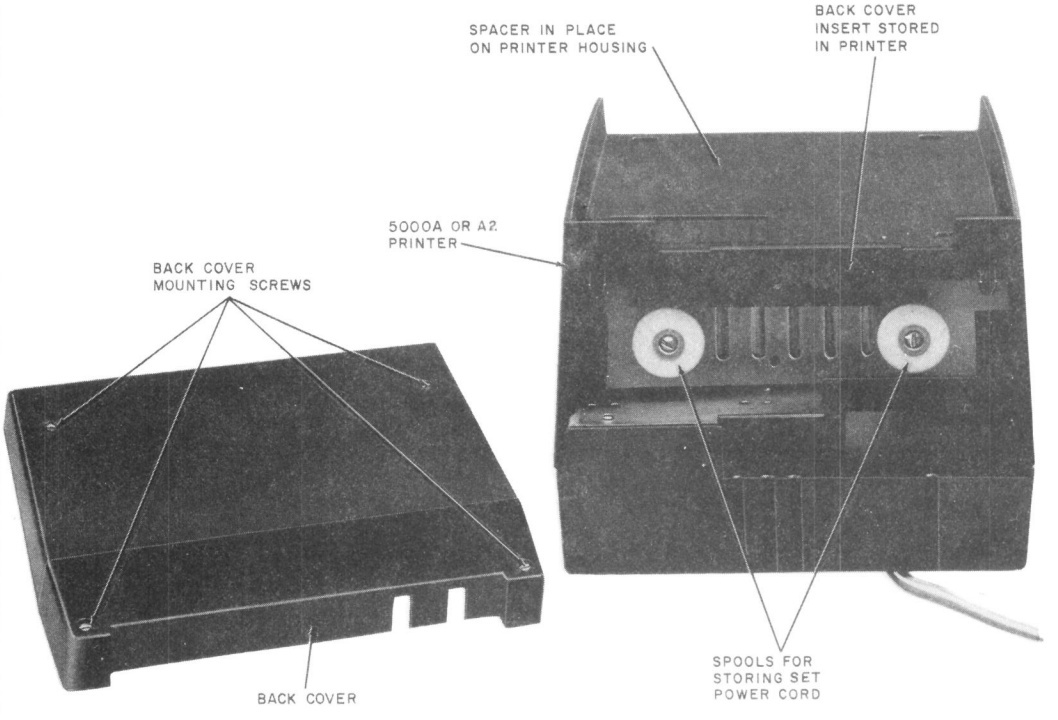


Fig. 10—5000A or 5000A2 Printer With Back Cover Removed

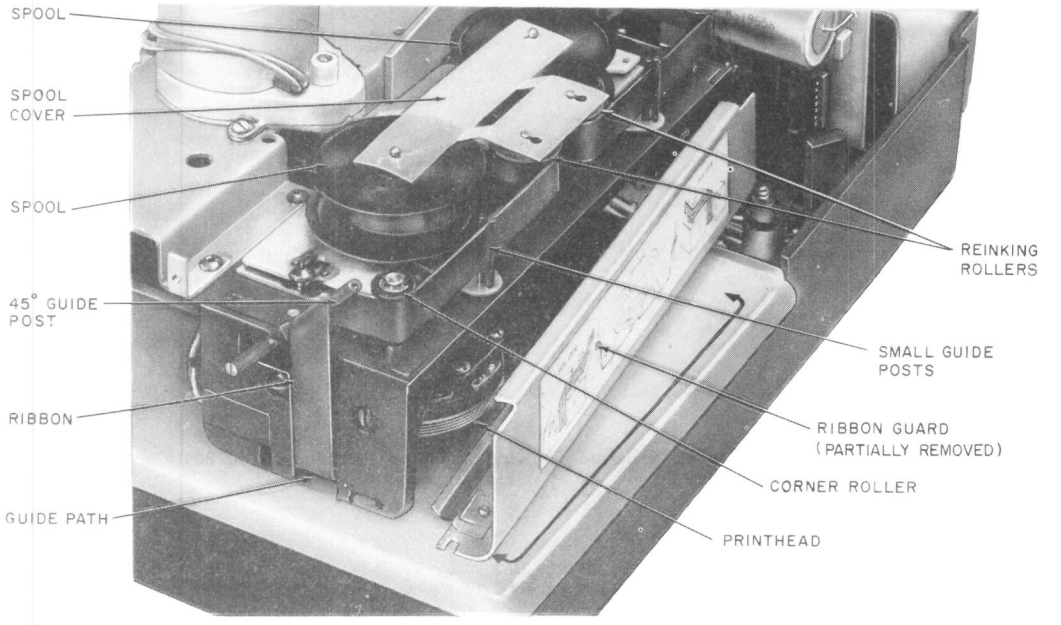


Fig. 11—Interior View of Printer With Housing Removed

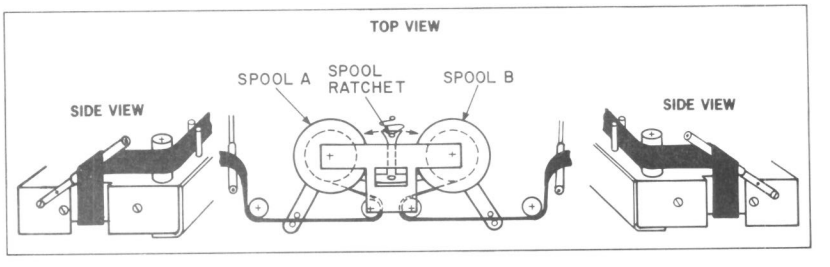


Fig. 12—5000A or 5000A2 Printer Ribbon Path

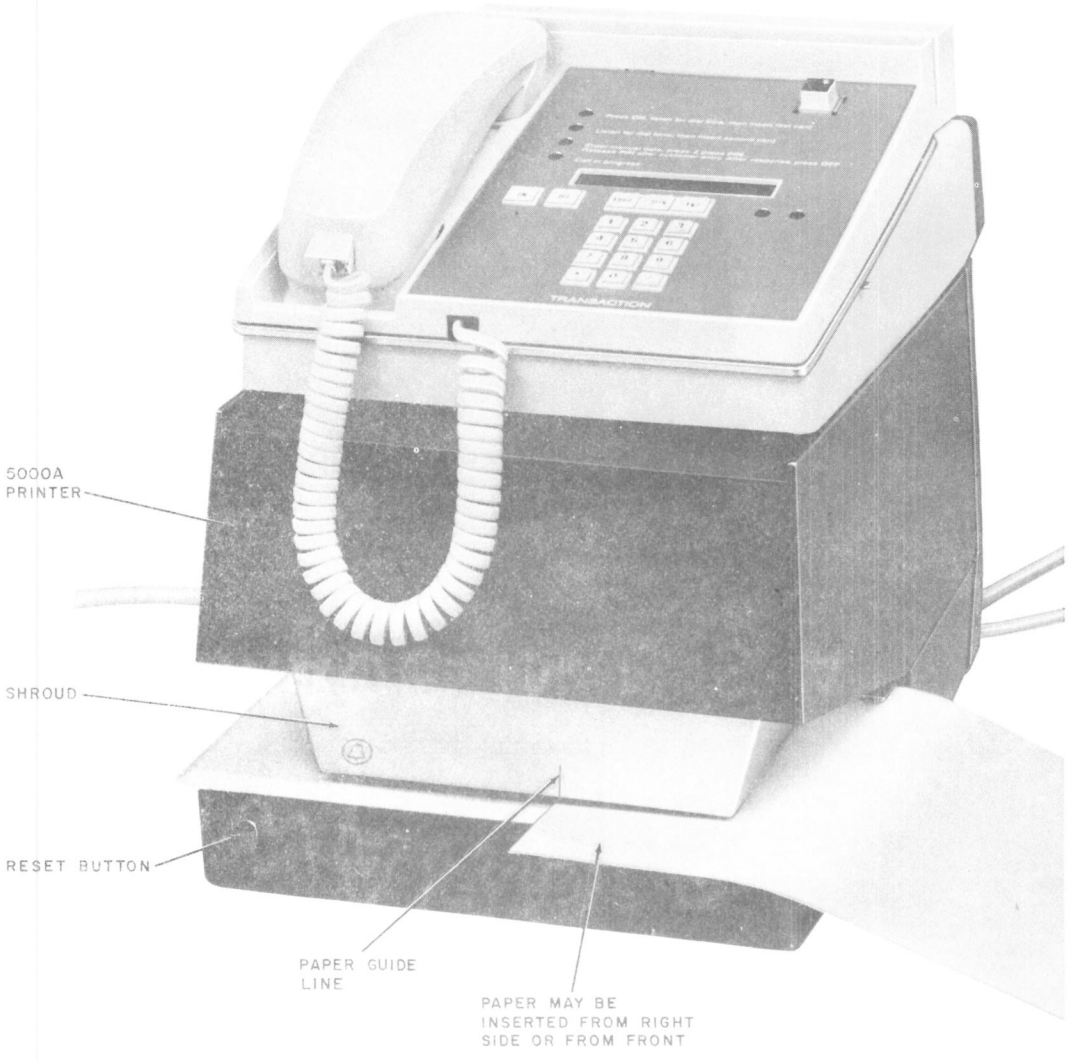


Fig. 13—5100BM Transaction Telephone Set Installed on 5000A Printer

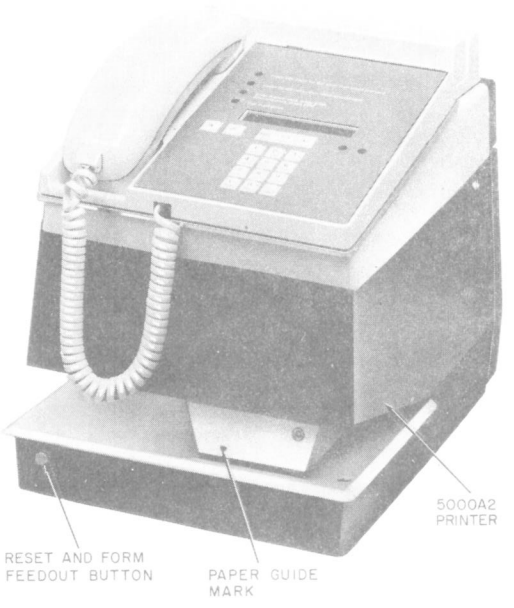


Fig. 14—5100BM Transaction Telephone Set Installed on 5000A2 Printer

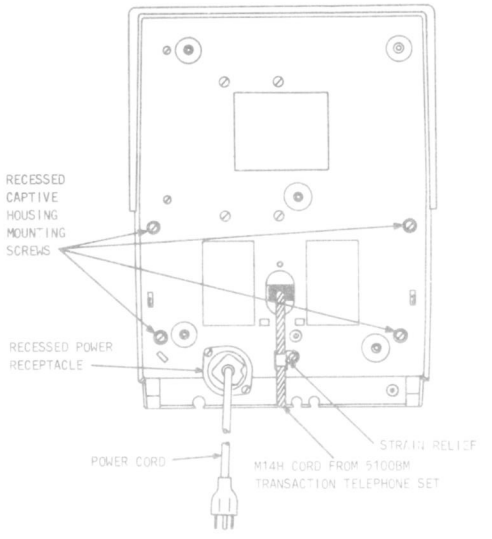


Fig. 15—Bottom View of Printer

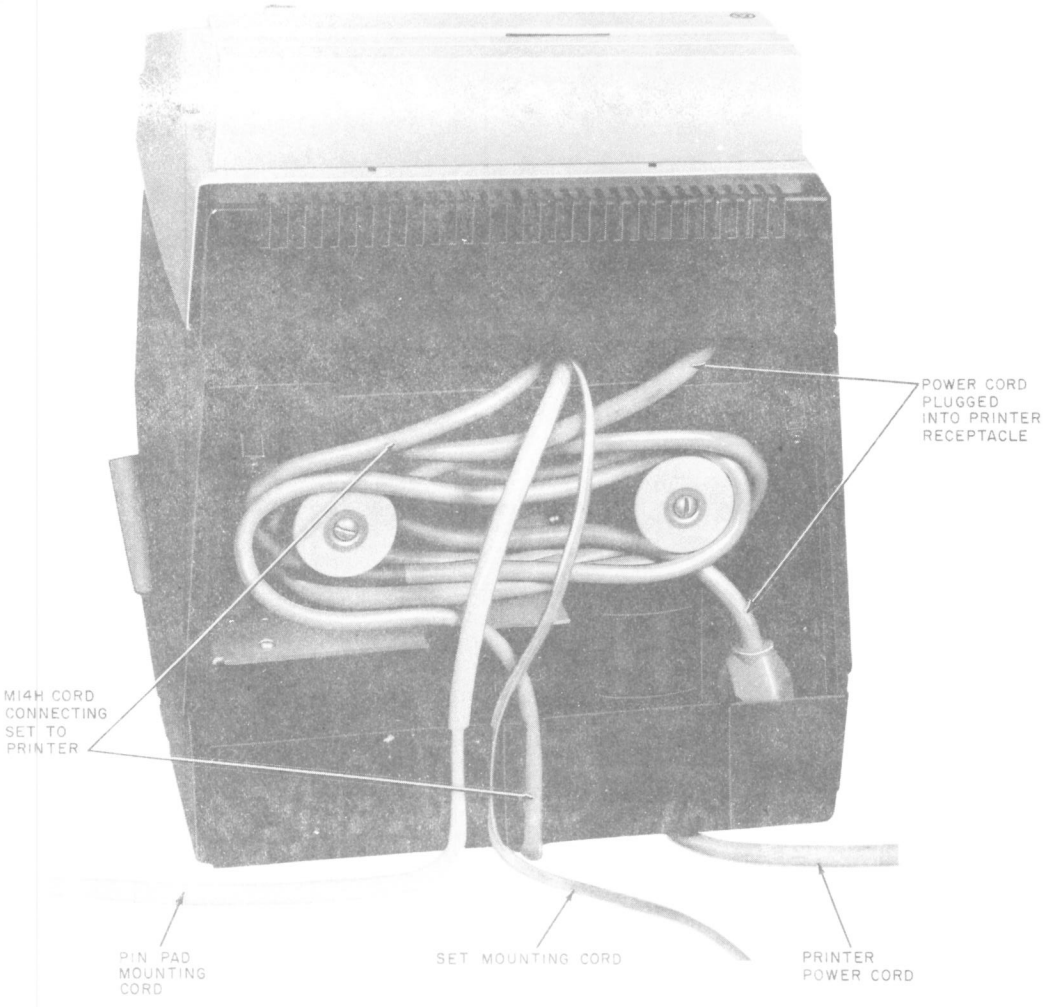
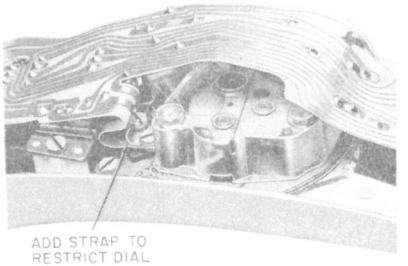


Fig. 16—5100BM Set Shown Installed on Printer—Printer Cover Removed to Show Cord Storage

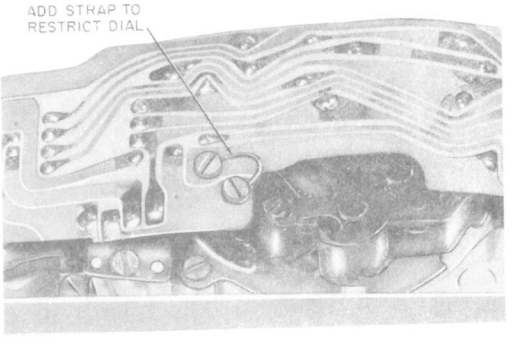
```
PRINTER TEST                1234567890
 A QUICK BROWN FOX JUMPED OVER THE LAZY
DOG'S BACK          1234567890abcd      1234567890


END TEST
```

Fig. 17—Test Message Printed by 5000A or 5000A2 Printer



A. 220A (MD), 220 AL (EARLY VERSION) AND 220 AM HAND TELEPHONE SETS



B. 220AL (CURRENT VERSION) HAND TELEPHONE SET

Fig. 18—Restricting Dial of 220A (MD), 220AM, or 220AL Hand Telephone Set

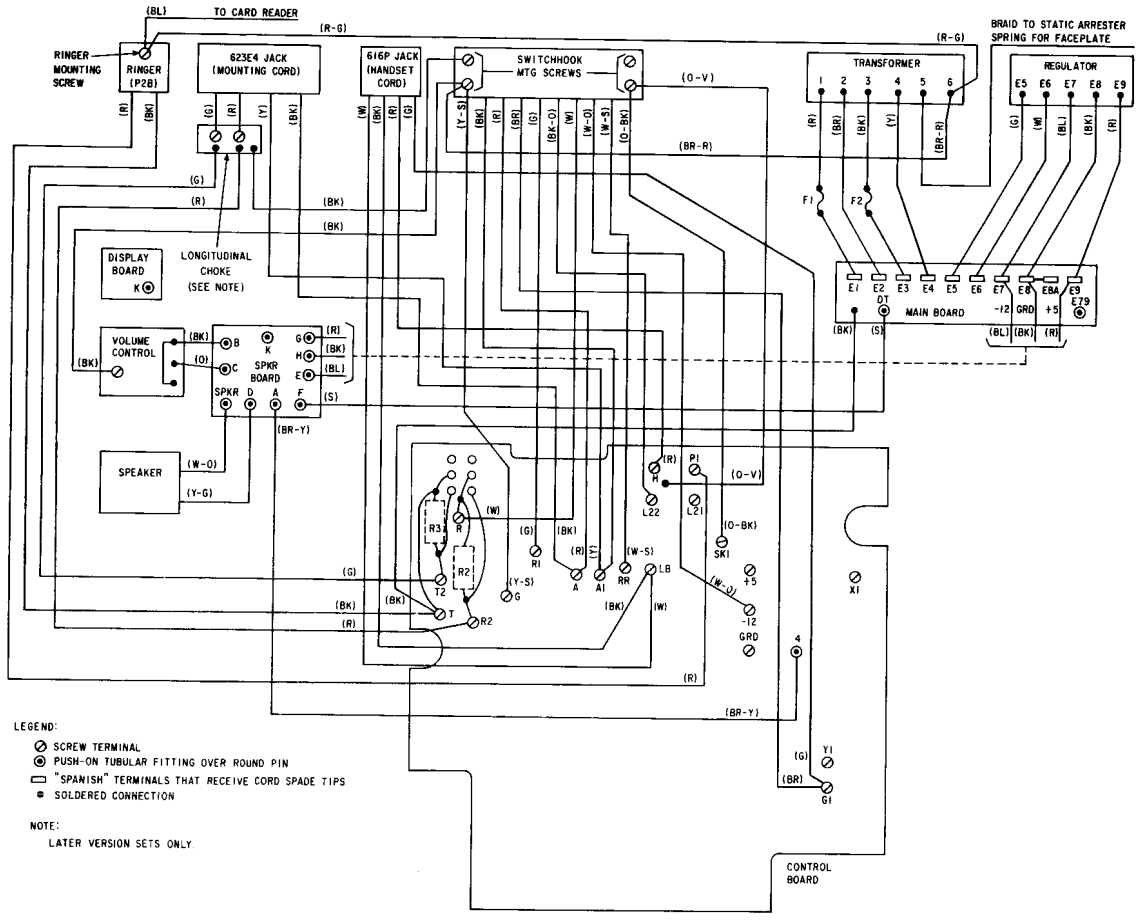


Fig. 19—Partial Schematic Showing Conductors Attached by Screws or Push-On Terminals (Early Version Sets)

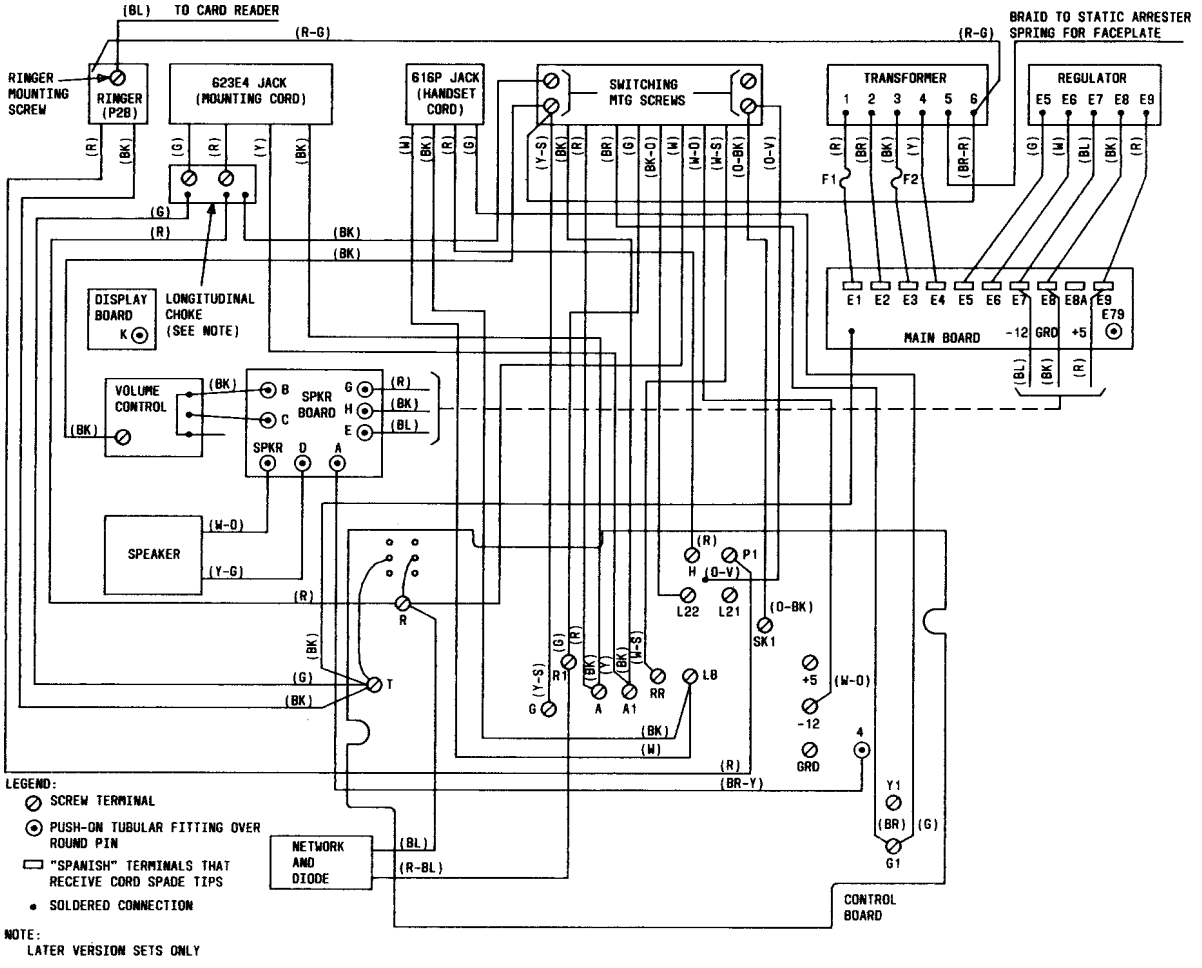


Fig. 20—Partial Schematic Showing Conductors Attached by Screws or Push-On Terminals (FCC Registered Sets)