

## JACKS FOR REGISTERED DATA EQUIPMENT SINGLE AND MULTILINE INSTALLATIONS

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**1. GENERAL**

**1.01** This section contains information on jacks for registered data sets or registered protective circuitry to be provided under the Federal Communications Commission (FCC) Registration Program. The jacks described herein are for use with data equipment registered as fixed loss loop (FLL) type, programmable type or equipment with an output not to exceed -9 dBm.

The FCC Registration Program requires that telephone-company provided or customer-provided data equipment be connected to the switched telecommunications network by means of a standard

jack and plug with the jack to be installed by the telephone company (telco).

The FCC Registration Program rules do not permit data jacks behind PBXs or key telephone systems. Registered data sets with an output not exceeding -9 dBm may be connected using voice jacks in these situations.

**1.02** This section is reissued for the following reasons.

- To incorporate information on the 97A3 data mounting.
- To indicate 97A1 data mounting is rated Manufactured Discontinued (MD).
- To make changes in Fig. 13 and 14.
- To update Table C.
- To make other minor deletions and changes.

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

**1.03** The fixed loss loop type of data equipment must transmit at an output level of -4 dBm and a pad will be included in the data jack so that the total of loop loss plus pad loss will range between 8 and 9 dB. The programmed type of data equipment will adjust the output level in accordance with a programming resistor in the data jack. Both types of registered data equipment, when used with the appropriate data jacks, result in signal levels no greater than -12 dBm at the serving central office. A third type of registered data equipment must transmit at a non-adjustable level not to exceed -9 dBm for use on voice loops via a standard miniature voice jack. Since the mean attenuation of business loops is on the order of 3 dB, the -12 dBm objective will be met at

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Bell System except under written agreement

the central office. Registered data equipment with this fixed output level of  $-9$  dBm may be used with either type of data jack and all of the 6- and 8-position miniature voice jacks to be provided under the registration program. The miniature voice jacks are described in the 463-400-ZZZ series of Bell System Practices.

**1.04** In addition to providing the physical interface to the switched network, the 97-type connecting blocks provide the following:

- Physical termination of the line
- Miniature keyed 8-position jack
- Programming resistor.

The 97A-type connecting block also provides a fixed loss loop pad and a switch to allow the user to select operation with either fixed loop loss or programmed data equipment.

## 2. IDENTIFICATION

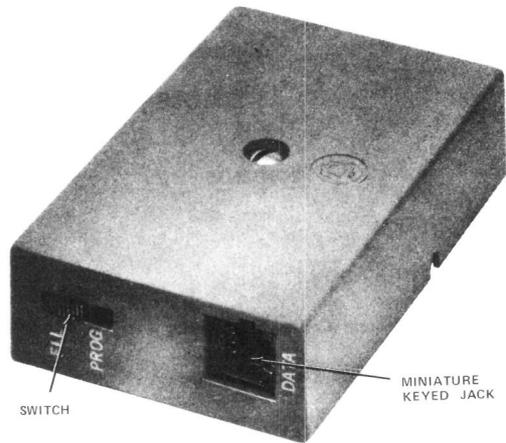
### A. 97-Type Connecting Blocks

**2.01** The 97A-type, and 97B connecting blocks provide a means for connecting registered data equipment to the switched network. The 97A-type (Fig. 1) is for use with data equipment registered as either fixed loss loop type or programmed and is also referred to as the universal data jack. The 97B (Fig. 2) connecting block is for use with data equipment registered as programmed and is also referred to as the programmed data jack.

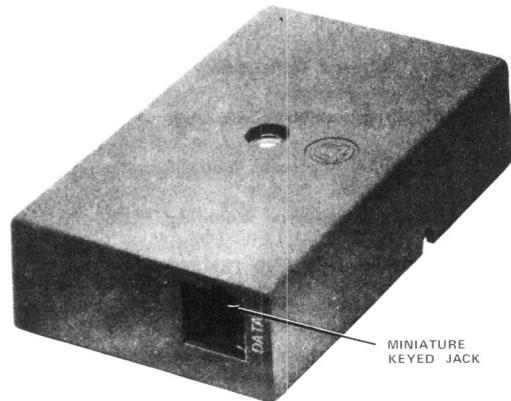
**2.02** The 97A-type and 97B connecting blocks are for use with single line installations.

**2.03** The 97A-type and 97B connecting blocks measure 3.9 inches long by 1 inch high by 2.4 inches wide.

**2.04** The 97A-type and 97B connecting blocks have a pair of screw terminals for the telephone line tip and ring leads. They also have a second pair of screw terminals for auxiliary telephone connections, such as mode indication, from an exclusion key-type telephone set. The mode indication function indicates to the customer's registered data equipment whether the telephone line is in the voice or data mode. As an alternative,



**Fig. 1—97A-Type Connecting Block**



**Fig. 2—97B Connecting Block**

if the customer chooses, the mode indication function can indicate operation of the switchhook contacts only.

**2.05** The 97A-type and 97B connecting blocks are equipped with an 8-position miniature jack which is specially keyed for use with data equipment. The jack also accepts the miniature nonkeyed 6-position standard telephone plug.

**Note:** Starting third quarter 1977, the 97A-type and 97B connecting blocks are shipped with a sliding door which cover the jack opening to keep out dust and dirt, etc. The door is spring-loaded and automatically closes unless a plug is inserted.

**2.06** When the 97A-type connecting block is provided, the associated switch must be in the correct position to ensure proper operation. Should the switch be in the programmed position with fixed loss loop data equipment, the data signal will not reach the line. Should the customer attempt to connect fixed loss loop type data equipment through a programmed data jack, the signal will not reach the line. If the switch on the 97A-type (universal) data jack is in the fixed loss loop position with programmable data equipment, the data signal may have an additional loss of up to 3 dB due to the bridged open circuit impedance of the pad.

**2.07** The 97A-type connecting block is available in nine versions coded 97A1 through 97A9, with each code having the appropriate pad and programming resistor for a particular loop loss. The last digit of the code represents the loss of the loop rounded up to the next whole dB. The resulting loop loss is between 8 and 9 dB, as illustrated in Fig. 3. The 97B connecting block is shipped with a complete set of programming resistors.

#### **B. 97A-Type Data Mounting**

**2.08** The 97A1 (MD) data mounting (Fig. 4) is a multiple mounting for up to eight D97A-type circuit packs connected via 910B connectors that are mounted on a printed wiring board backplane. One 50-position connector mounted on the backplane provides means for connecting registered data equipment. The other 50-position connector is for the connection of telephone line facilities.

**2.09** The 97A3 data mounting (Fig. 5) replaces and is similar to the 97A1. The 97A3 data mounting is equipped with a 2-foot cable assembly and clamp instead of the telephone interface connector mounted on the backplane as on the 97A1.

**2.10** The overall dimensions of the 97A1 (MD) and 97A3 data mounting are 5 inches long, 1.85 inches high, and 5 inches deep.

**2.11** A gray plastic cover and base pan (D-180935 mounting kit) may be used to house a 97A-type data mounting to facilitate wall mounting (Fig. 6). The cover has eight slots which allows the D97A-type circuit pack switches to protrude and a writing surface under each switch position to write in telephone line number and loop loss. The switches provide a means for selection of operation with either fixed loss loop or programmed data equipment. A fully equipped 97A-type data mounting in a D-180935 mounting kit weighs approximately 3 pounds.

**2.12** A bracket and a clamp, to lock connecting cables to the 97A-type data mounting, are provided as part of the 97A-type data mounting. An adhesive pad (842309643) to allow mounting to a metal wall without drilling, is provided as part of the D-180935 mounting kit.

**2.13** The 97A-type data mounting has been designed for both 19- and 23-inch rack mounting as well as wall mounting. In a 19-inch rack, a number 842310781 2-inch mounting plate accommodates three 97A-type data mountings providing up to 24 lines. A 23-inch rack application requires the use of a number 842310773 2-inch mounting plate which holds four 97A-type data mountings providing up to 32 lines.

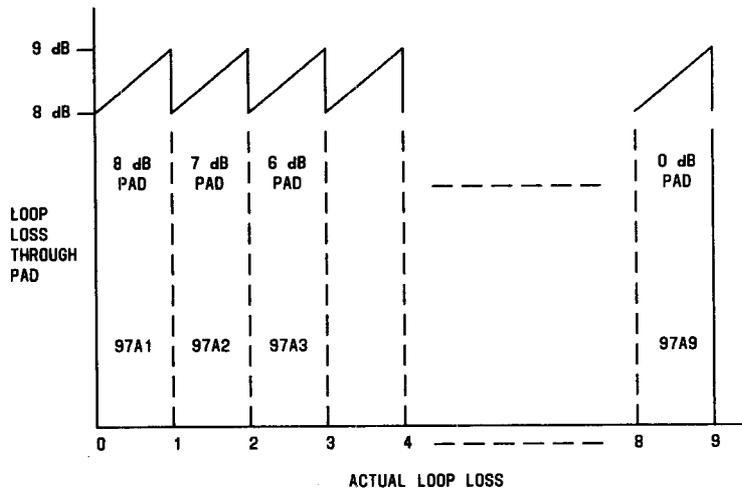
**2.14** The 97A-type data mounting was designed to serve the same purpose as the 97A-type and 97B connecting block, except the 97A-type data mounting has these advantages:

- Is more compact
- Provides a more attractive multiline arrangement.

#### **C. D97A-Type Circuit Pack**

**2.15** The D97A-type circuit pack (Fig. 7) is electrically equivalent to the 97A-type connecting block, except for the absence of the 8-position miniature jack, provides a fixed loss loop pad and a switch to allow the user to select operation with either fixed loss loop or programmed data equipment.

**2.16** The D97A-type circuit pack is available in nine versions, coded D97A1 through D97A9, with each code having the appropriate pad and programming resistor for a particular loop loss



1. DIAL C.O. MILLIWATT SUPPLY.
2. MEASURE INCOMING SIGNAL LEVEL.
3. ROUND UPWARD TO NEXT WHOLE NUMBER.
4. USE THAT CODE OF 97A.

EXAMPLE: 2.2dB = 97A3

Fig. 3—Determining Correct 97A-Type Connecting Block

(Table A). The last digit of the code represents the loss of the loop rounded up to the next whole dB. The resulting loop loss (loop plus pad) is between 8 and 9 dB.

#### D. Summary of USOC Designations

**2.17** The data jacks have been assigned USOC designations in the RJ family. The remaining characters identify a specific interface and physical arrangement. An arrangement can be provided to interconnect a data jack and an exclusion key telephone set. Each of the data jacks and the telephone arrangement is described in the following paragraphs.

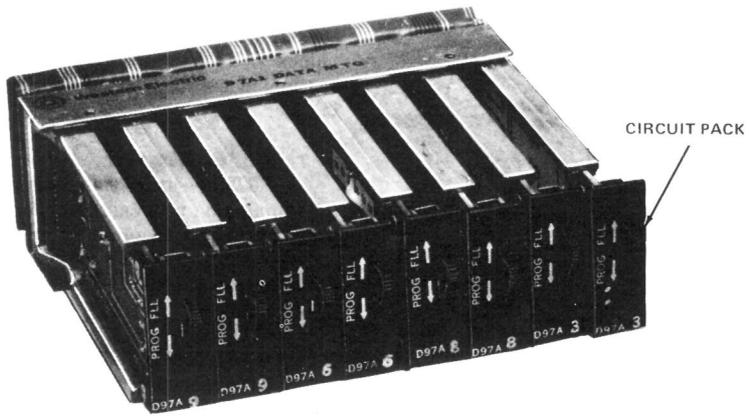
**2.18 USOC RJ41S:** RJ41S is the universal data jack (requires the 97A-type connecting block) for single-line applications of both fixed loss loop and programmed data equipment. The jack is an 8-position miniature keyed jack and is shown schematically in Fig. 8.

**2.19 USOC RJ45S:** RJ45S is the programmed data jack (requires the 97B connecting block) for single-line applications of the programmable type data equipment only. The jack is an 8-position miniature keyed jack and is shown schematically in Fig. 9.

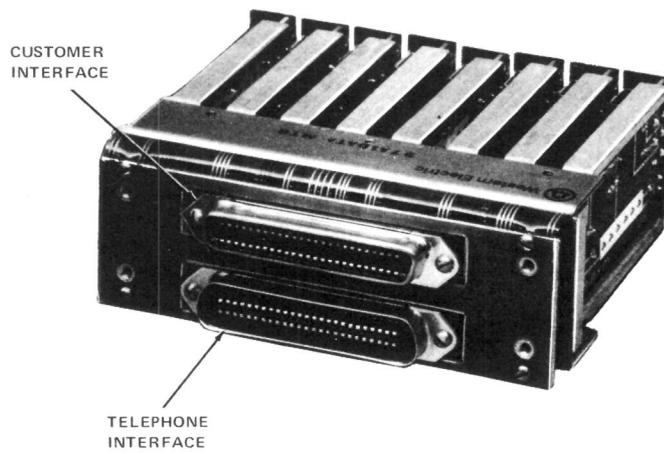
**2.20 USOC RJ16X:** This arrangement in connection with a series jack such as RJ36X provides "mode indication" leads (MI and MIC) for data sets using the "permissive" mode of transmission (shown schematically in Fig. 10). This is a miniature 6-position connector.

**2.21 USOC RJ41M:** RJ41M is the multiple mounting arrangement equipped with up to eight universal data jacks. This USOC is implemented with the 103A apparatus mounting (RJM2X) and the appropriate number of 97A-type connecting blocks (RJ41S). A 103A apparatus mounting accommodates up to 16 single universal data jacks.

**2.22 USOC RJ45M:** RJ45M is the multiple mounting arrangement equipped with up to



A. D97A CIRCUIT PACK VIEW



B. INTERFACE VIEW

Fig. 4—97A1 Data Mounting

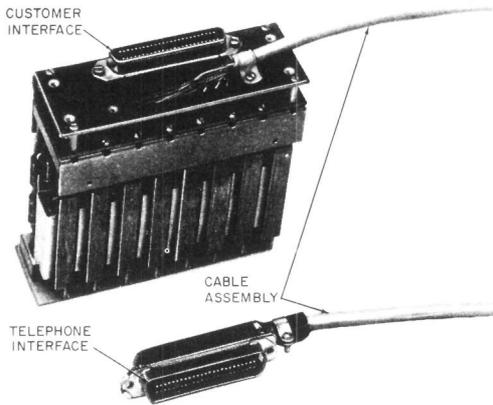


Fig. 5—97A3 Data Mounting

eight programmed data jacks. This USOC is implemented with a 103A apparatus mounting (RJM2X) and the appropriate number of 97B connecting blocks (RJ45S). A 103A apparatus mounting accommodates up to 16 single programmed data jacks.

**2.23 USOC RJ26X:** As an interim arrangement, RJ26X is implemented with the M48A-87 cord for combining up to eight single-line universal data jacks into one 50-position miniature ribbon connector. RJ26X can also be implemented with the new 97A3 data mounting. In this case, the following USOCs would apply:

**USOC RJ26X:** Multiple line universal data jack for up to 8 lines—common equipment (97A3 data mounting). The connector that the data equipment connects to is shown schematically in Fig. 11. The pin assignment

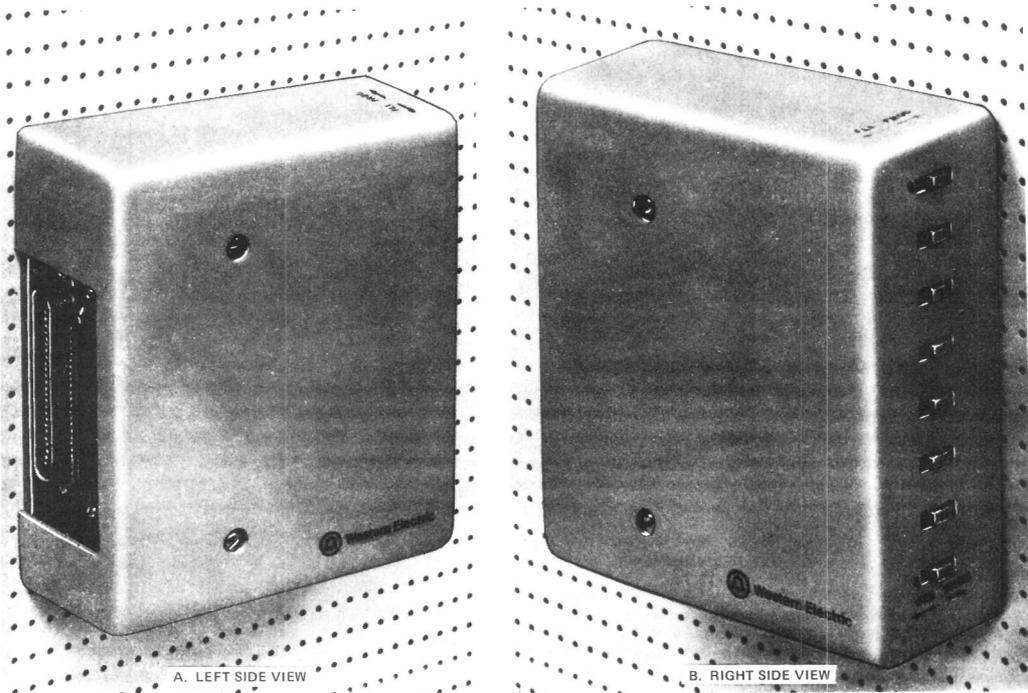
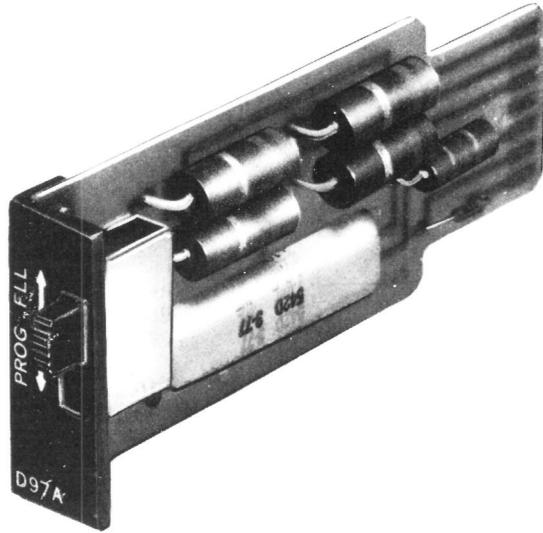
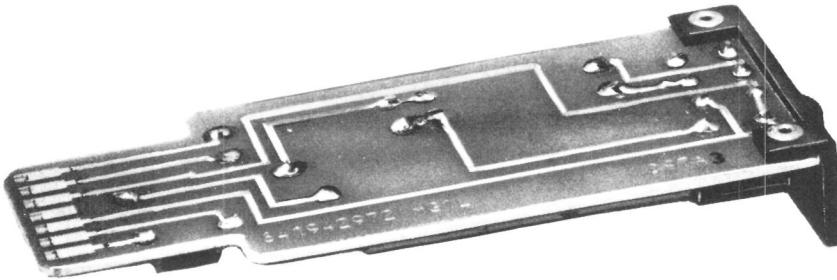


Fig. 6—97A1 Data Mounting E/W Eight D97A-Type Circuit Packs Installed in a D-180935 Mounting Kit



A. FRONT VIEW



B. BACK VIEW

Fig. 7—D97A-Type Circuit Pack

TABLE A

**PAD AND PROGRAMMING RESISTOR  
CODE LISTINGS FOR PARTICULAR LOOP LOSS  
OF D97A-TYPE CIRCUIT PACKS**

CODE	LOOP LOSS IN dB
D97A1	0.0-1.0
D97A2	1.1-2.0
D97A3	2.1-3.0
D97A4	3.1-4.0
D97A5	4.1-5.0
D97A6	5.1-6.0
D97A7	6.1-7.0
D97A8	7.1-8.0
D97A9	8.1-9.0

for the connector that the telephone facilities connect to is shown in Table B.

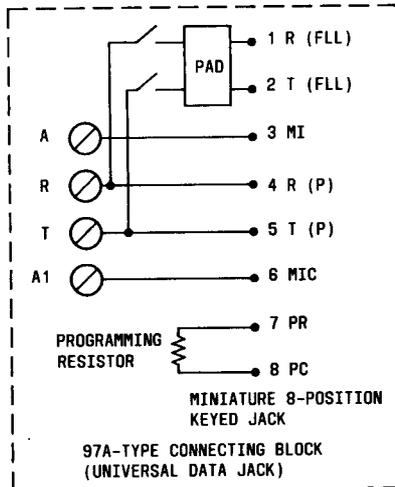
**USOC RJ26S:** Line circuits for use with RJ26X on a per line basis (D97A-type circuit pack).

**USOC RJM3X:** Wall mounting arrangement for use with an 8-line multiple data jack (D-180935 mounting kit).

**USOC RJM4X:** Rack mounting for use with multiple line data jack (19- or 23-inch rack mounting).

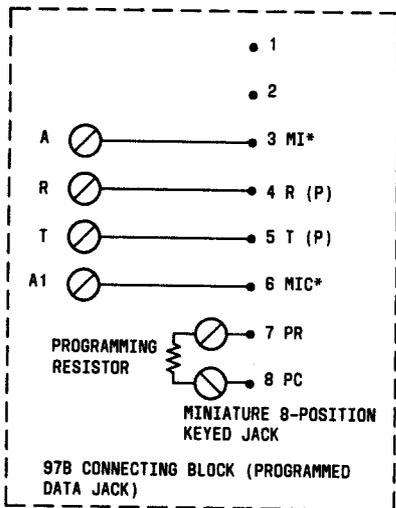
**2.24 USOC RJ27X:** As an interim arrangement, RJ27X is implemented with the M48A-87 cord for combining up to eight programmed data jacks (97B connecting blocks) into one 50-position miniature ribbon connector.

**2.25 USOC RJ36X:** RJ36X is a miniature 8-position series jack (635-type connecting block) shown schematically in Fig. 12.



LOOP LOSS IN dB	SELECT
0.0-1.0	97A1
1.1-2.0	97A2
2.1-3.0	97A3
3.1-4.0	97A4
4.1-5.0	97A5
5.1-6.0	97A6
6.1-7.0	97A7
7.1-8.0	97A8
8.1-9.0	97A9

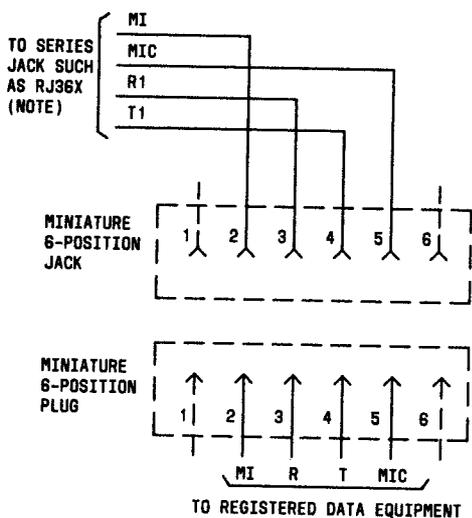
Fig. 8—USOC RJ415, Schematic



LOOP LOSS IN dB	PROGRAMMING RESISTOR VALUE (OHMS)	RESISTOR MARKING
0.0-1.0	NONE	NONE
1.1-2.0	19,800	19K8
2.1-3.0	9,200	9K20
3.1-4.0	5,490	5K49
4.1-5.0	3,610	3K61
5.1-6.0	2,520	2K52
6.1-7.0	1,780	1K78
7.1-8.0	1,240	1K24
8.1-9.0	866	866R

\*MI IS LABELLED "A" AND MIC IS LABELLED "A1" ON CONNECTING BLOCK.

Fig. 9—USOC RJ45S, Schematic



NOTE:  
MI AND MIC LEADS ARE TYPICALLY WIRED TO AN RJ36X SERIES JACK WHICH CAN BE USED TO CONNECT AN EXCLUSION KEY TELEPHONE SET AHEAD OF THE DATA EQUIPMENT.

Fig. 10—Connections for USOC RJ16X

**2.26 USOC RJM2X:** RJM2X is implemented with the 103A apparatus mounting for up to sixteen 97A-type and 97B connecting blocks.

**2.27 USOC RJA5X:** RJA5X is implemented with a M48A-87 adapter cord with a 50-position miniature ribbon connector attached.

**2.28** A summary of the USOCs for registered data equipment jacks is presented in Table C.

**2.29 USOC RTC:** This is the USOC for the 503CM or 2503CM telephone set which provides exclusion key transfer of the line to either the telephone set or the data equipment and provides a mode indication to the data equipment. The set is connected by means of a D8AA-87 cord which plugs into a miniature 8-position series jack (635-type connecting block, USOC RJ36X) and which connects to the data jack as shown in Fig. 13 for the 503CM telephone set or Fig. 14 for the 2503CM telephone set.

**E. Associated Telephone Arrangement**

**2.30** A telephone set can be connected to the data line and used for voice or call origination and answering. The telephone line is connected

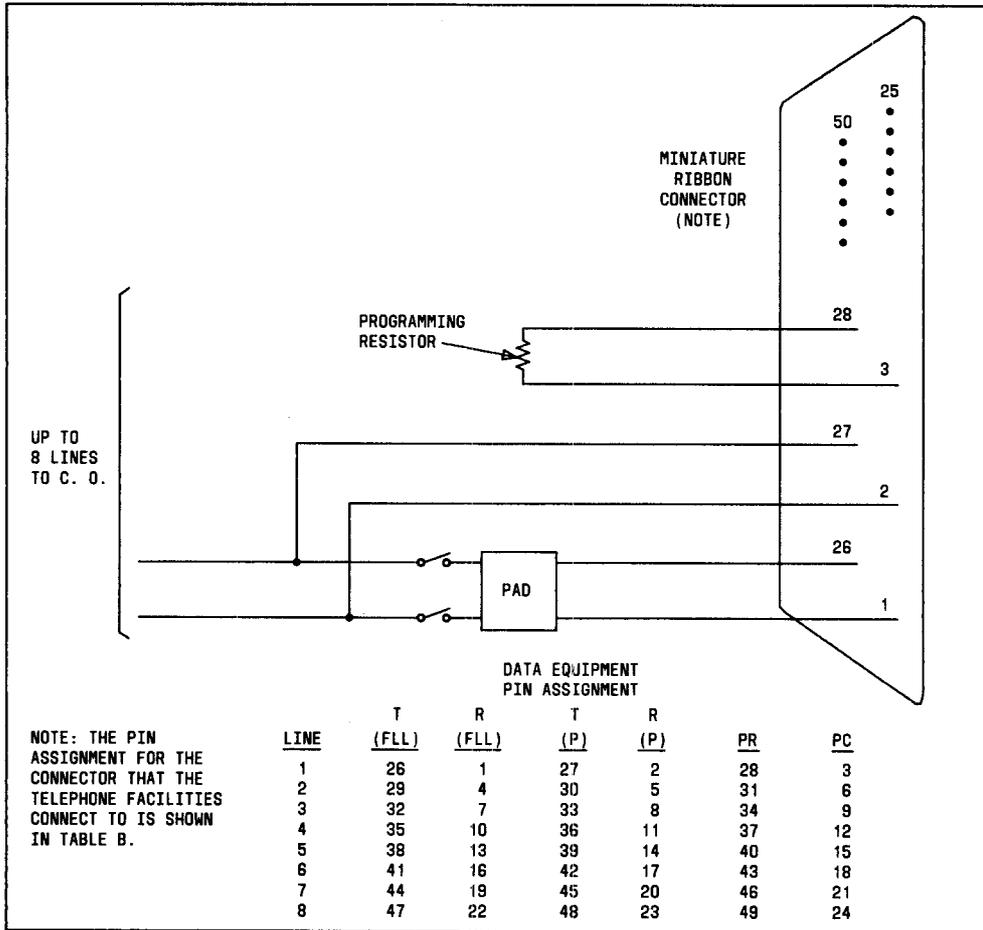


Fig. 11—USOC RJ26X, Schematic

to either the telephone set or the data equipment under control of the exclusion key. With this arrangement, an indication of the voice mode can be given to the customer through the mode indication positions of the data jack. As an alternative, the mode indication pins can provide an indication of the operation of switchhook contacts. The customer must specify whether the telephone set or the data equipment controls the line. The customer must also specify whether or not aural monitoring is desired. Refer to Table D for items requiring a

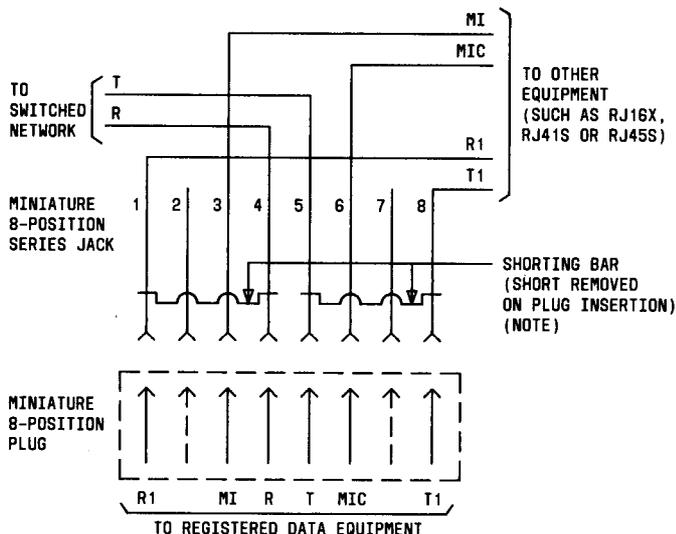
customer decision. With aural monitoring, the 503CM or 2503CM telephone set can monitor the line (on a high impedance basis) while the data equipment is in the data mode.

2.31 Refer to Fig. 13 or 14 for wiring and connection diagrams for the telephone set. With wiring option B (Fig. 13 or 14) the telephone handset is lifted from the switchhook and the exclusion key lifted for the voice mode. This is usually described as "data equipment controls the

TABLE B

PIN ASSIGNMENT CONNECTING THE EIGHT CENTRAL OFFICE LINES TO 97A-TYPE DATA MOUNTING

LINE NO.	PIN ASSIGNMENT OF:	
	97A1 DATA MOUNTING W/O M16M CORD	97A1 DATA MOUNTING E/W M16M CORD AND 97A3 DATA MOUNTING
1	24-49	1-26
2	21-46	2-27
3	18-43	3-28
4	15-40	4-29
5	12-37	5-30
6	9-34	6-31
7	6-31	7-32
8	3-28	8-33



NOTE: THE DIFFERENCE BETWEEN THE 635A AND 635B ARE

1. THE 635A REMOVES THE SHORT ON INSERTION OF A 6- OR 8-POSITION PLUG.
2. THE 635B PROVIDES A BRIDGED CONNECTION WITH A 6-POSITION PLUG AND A SERIES CONNECTION WITH AN 8-POSITION PLUG.

Fig. 12—Connections for USOC RJ36X

TABLE C

STANDARD CONFIGURATIONS FOR CONNECTION  
TO THE SWITCHED TELEPHONE NETWORK

USOC	PLUG/JACK	DESCRIPTION	METHOD OF IMPLEMENTATION
RJ41S	Miniature 8-position keyed	Single line universal data jack for fixed loss loop or programmable data equipment.	97A-type connecting block.
RJ45S	Miniature 8-position keyed	Single line programmed data jack for programmable data equipment.	97B connecting block.
RJ41M	Up to eight miniature 8-position keyed	Multiple mounting arrangement and up to eight single line universal data jacks.	103A apparatus mounting (RJM2X) and the appropriate number of 97A-type connecting blocks (RJ41S). The 103A apparatus mounting will hold up to 16 single line data jacks.
RJ45M	Up to eight miniature 8-position keyed	Multiple mounting arrangement and up to eight single line programmed data jacks.	103A apparatus mounting (RJM2X) and the appropriate number of 97B connecting blocks (RJ45S). The 103A apparatus mounting will hold up to 16 single line data jacks.
RJ26X* (interim)	50-position miniature ribbon connector	Adapter cord which provides miniature ribbon connectors and up to eight single line universal data jacks.	M48A-87 adapter cord (RJA5X) and up to eight 97A-type connecting blocks (RJ41S). The 97A connecting blocks may be wall mounted or they may be housed in a 103A apparatus mounting (RJM2X) at added cost. The 103A will hold up to sixteen 97As.
RJ26X† (new) consists of:			
RJ26X	50-position miniature ribbon connector	Multiple line universal data jack for up to eight lines — common equipment.	97A3 data mounting.
RJ26S		Line circuits for use with RJ26X on a per line basis.	D97A-type circuit pack.
RJM3X		Wall mounting arrangement for use with an 8-line multiple data jack.	D-180935 mounting kit (includes plastic cover and base pan with mounting screws and adhesive pad).
RJM4X		Rack mounting for use with multiple line data jacks.	842310781 mounting plate — 19 inch, 842310773 mounting plate — 23 inch.

TABLE C (Contd)

STANDARD CONFIGURATIONS FOR CONNECTION  
TO THE SWITCHED TELEPHONE NETWORK

USOC	PLUG/JACK	DESCRIPTION	METHOD OF IMPLEMENTATION
RJ27X (interim)	50-position miniature ribbon connector	Adapter cord which provides 50-position miniature ribbon connector and up to eight single line programmed data jacks.	M48A-87 adapter cord (RJA5X) and up to eight 97B connecting blocks (RJ45S). The 97B connecting blocks may be wall mounted or they may be housed in a 103A apparatus mounting (RJM2X) at added cost. The 103A will hold up to sixteen 97Bs.
RJ36X	Miniature 8-position unkeyed	Series jack to connect 503CM or 2503CM exclusion key telephone set ahead of jack provided for data equipment..	635-type connecting block.
RJ16X	Miniature 6-position	Voice jack with connection to RJ36X series jack.	625-type connecting block.

\*RJ26X (interim) is the original implementation of the 50-position connector.

†RJ26X (new) provides those features in a self-contained arrangement.

line" because, until the telephone set exclusion key is lifted, the data equipment has control over incoming and outgoing calls, as it is directly connected to the line. Operation of the telephone set can be inverted by reversing the exclusion key wiring (Fig. 13 or 14, wiring option A), so that the telephone set controls the line and the exclusion key must be operated to allow data equipment connection to the line. With aural monitoring (wiring option C), the telephone handset is bridged on the line on a high impedance basis whenever the handset is off-hook and the exclusion key is in the data position. With wiring option E, the mode indication function indicates to the data equipment that the handset is off-hook through the MI and MIC leads.

- 2.32** When customers request a telephone set as an adjunct to the data jack, an exclusion

key telephone set (503CM or 2503CM or equivalent) is recommended.

**2.33** An exclusion key telephone set (RTC) is recommended when customers request a telephone set ahead of a data jack. This is because room noise and switchhook operation can cause data errors if an ordinary bridged telephone set is used. Also, calls can be dropped if the transfer between talk and data modes are not carefully coordinated.

**2.34** Requests for regular bridged telephone sets should not be denied if the customer is aware of the possible problems, and feels that the telephone set will be used properly. The telephone set should be located not more than 6 feet from the data equipment to minimize data transmission errors and false disconnects.

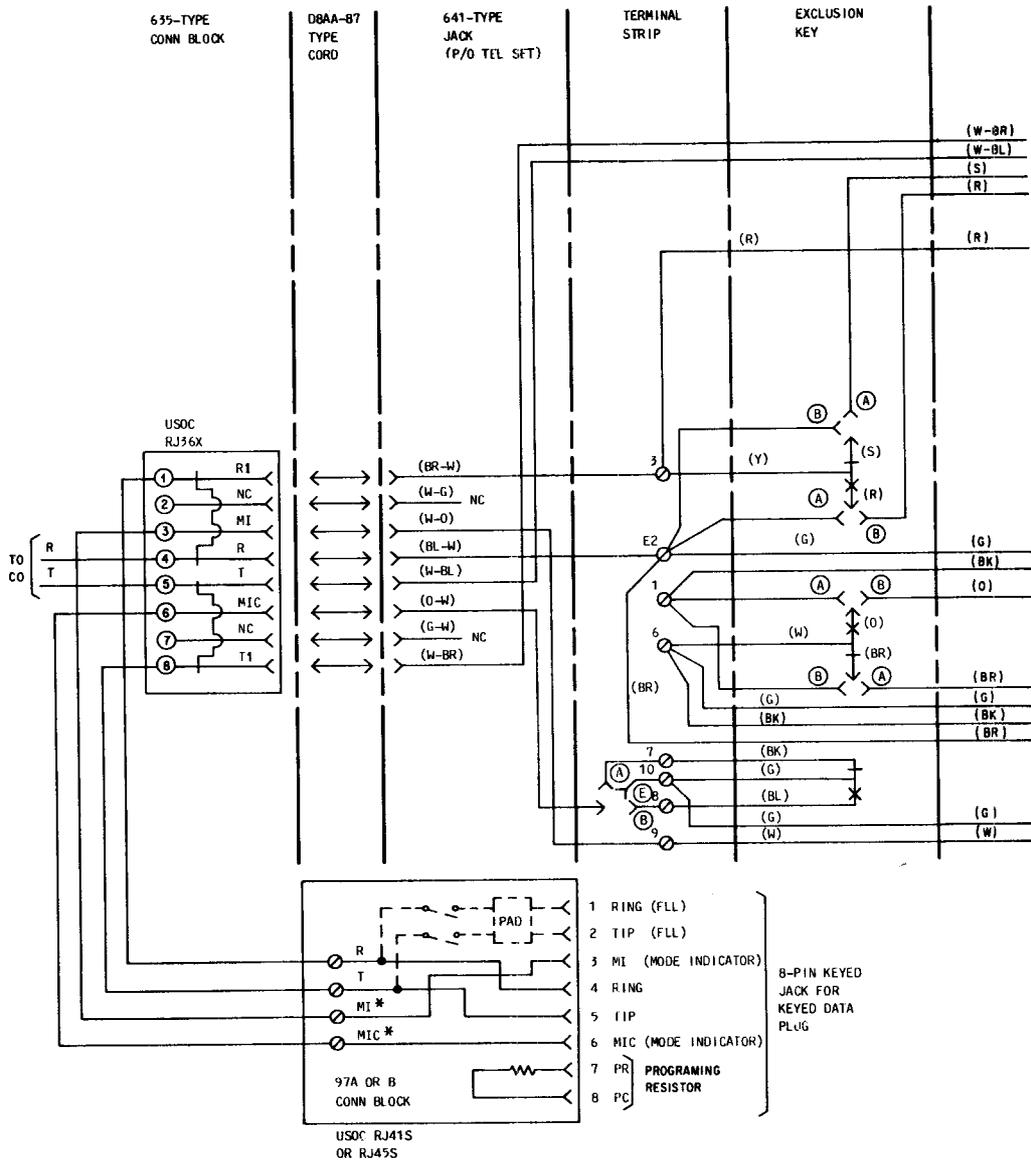
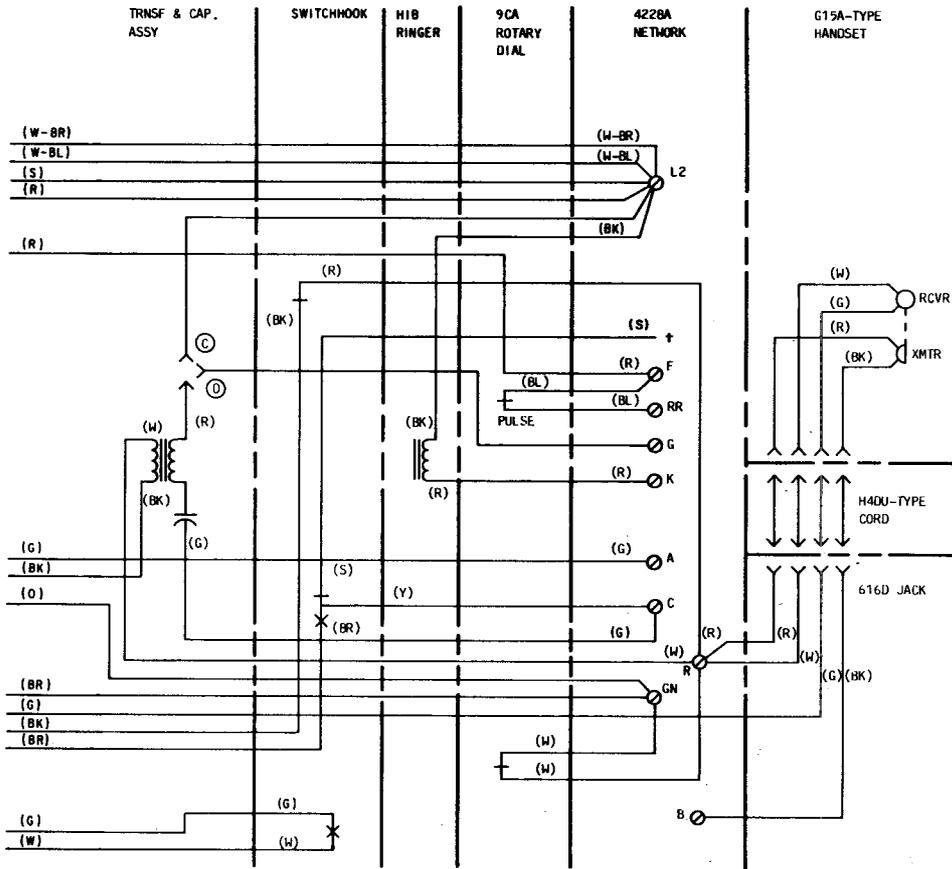


Fig. 13—503CM Telephone Set—Registration Jack Connections (Sheet 1 of 2)



NOTE:  
VOICE MODE INDICATION  
IS THE ABSENCE OF  
WIRING OPTION E.

\* MI IS LABELLED "A" ON 97-TYPE  
CONNECTING BLOCKS AND MIC IS  
LABELLED "A1"  
† INSULATED AND STORED

OPTIONS:

- (A) TELEPHONE SET CONTROLS LINE
- (B) DATA SET CONTROLS LINE
- (C) AURAL MONITORING PROVIDED
- (D) NO AURAL MONITORING PROVIDED
- (E) SWITCHHOOK INDICATION E SUPERSEDES  
A AND B ON TERMINAL STRIP WHEN  
BOTH A AND E OR B AND E ARE TO  
BE USED.

Fig. 13—503CM Telephone Set—Registration Jack Connections (Sheet 2 of 2)

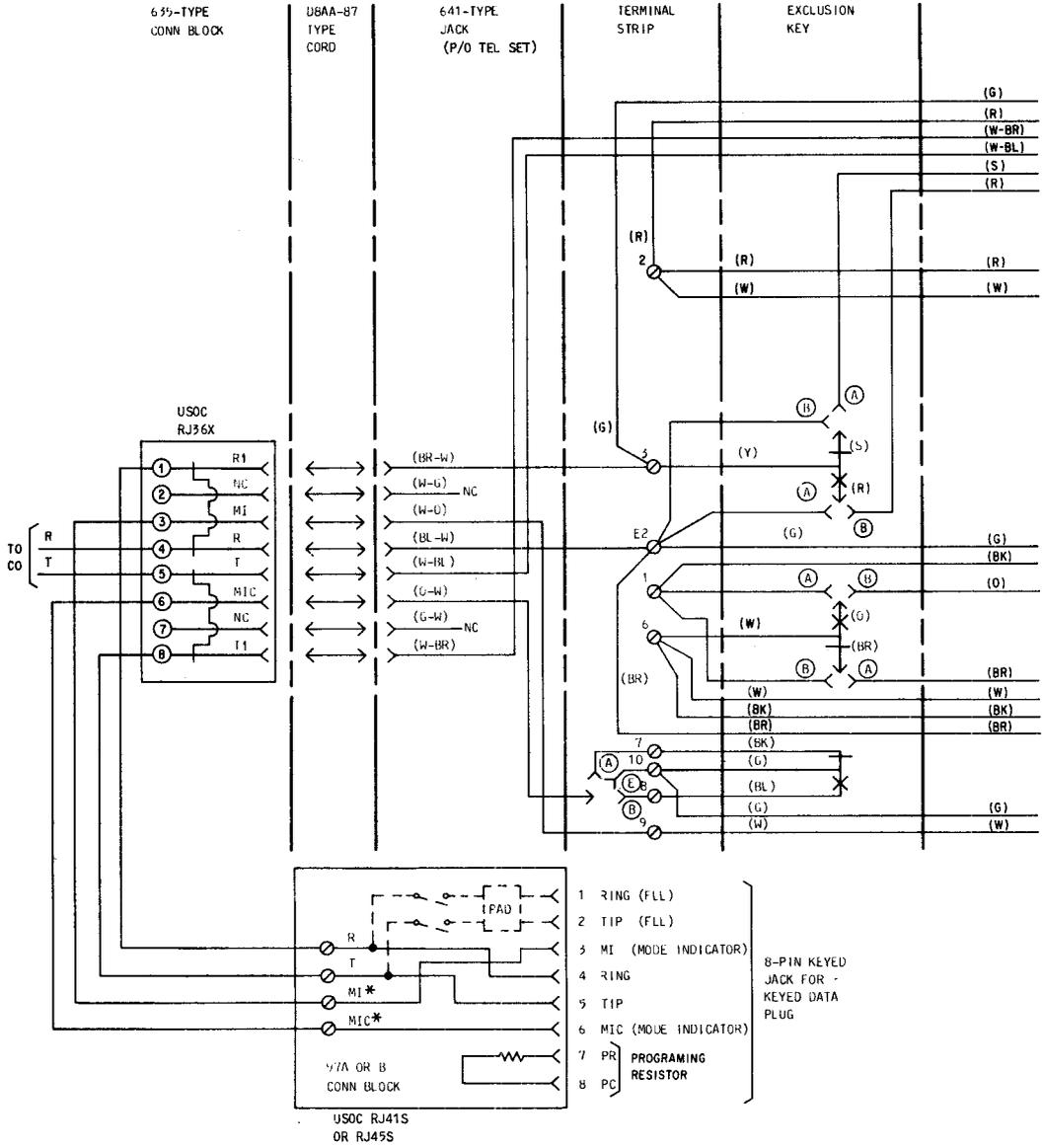
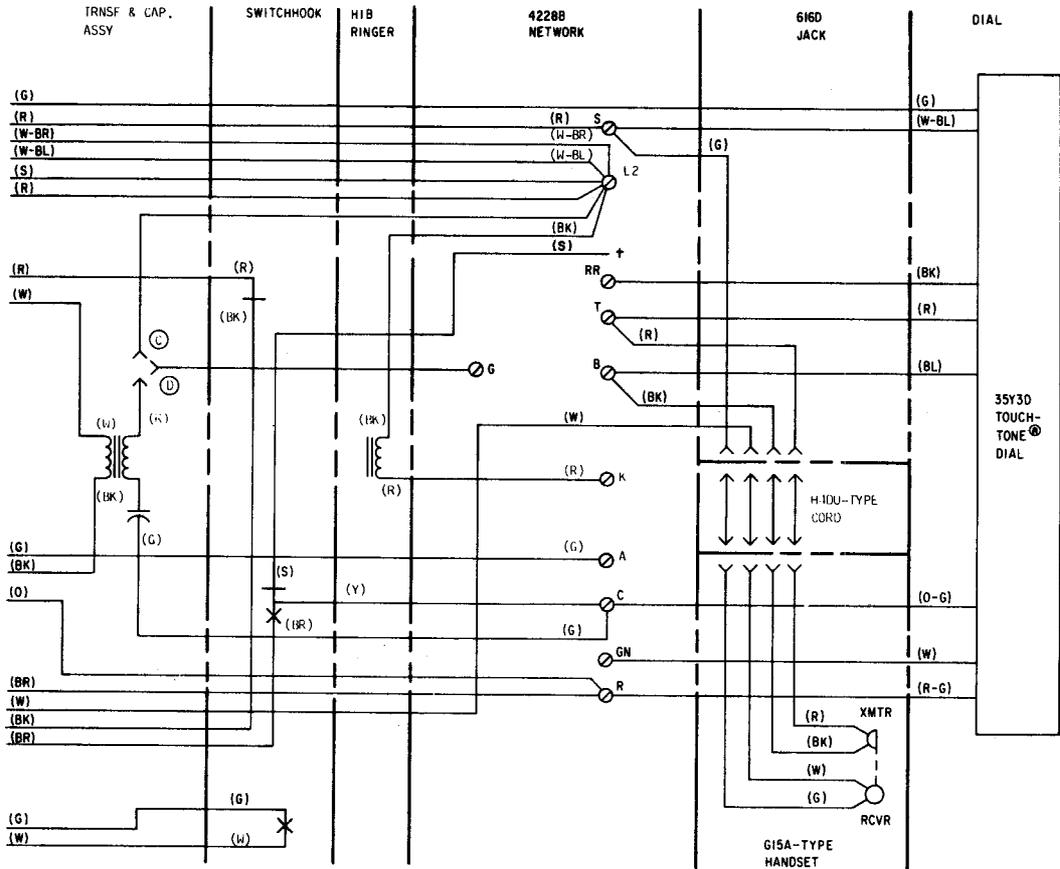


Fig. 14—2503CM Telephone Set—Registration Jack Connections (Sheet 1 of 2)



NOTE:  
VOICE MODE INDICATION IS  
THE ABSENCE OF WIRING  
OPTION E.

\* MI IS LABELLED "A" ON 97-TYPE  
CONNECTING BLOCKS AND MIC IS  
LABELLED "A1"  
† INSULATED AND STORED

OPTIONS:

- (A) TELEPHONE SET CONTROLS LINE
- (B) DATA SET CONTROLS LINE
- (C) AURAL MONITORING PROVIDED
- (D) NO AURAL MONITORING PROVIDED
- (E) SWITCHHOOK INDICATION E SUPERSEDES  
A AND B ON TERMINAL STRIP WHEN BOTH  
A AND E OR B AND E ARE TO BE USED.

Fig. 14—2503CM Telephone Set—Registration Jack Connections (Sheet 2 of 2)

TABLE D

CUSTOMER DECISION TABLE

DECISION		DESCRIPTION	OPTION*
I	1	Telephone Set Controls Line	A
	2	Data Set Controls Line†	B
II	3	Aural Monitoring Not Provided	D
	4	Aural Monitoring Provided†	C
III	5	TOUCH-TONE® Dial	—
	6	Rotary Dial	—
IV	7	Switchhook Indication Only	E
	8	Voice Mode Indication	B

\*Connections for listed options are shown in Fig. 13 and Fig. 14.

†Factory-furnished for telephone set.

### 3. INSTALLATION

**3.01** Prior to installing the data jack, ensure that the loop meets requirements specified in Section 314-205-501. The telco data sets operating at speeds higher than 300 bps require conditioned access lines. In addition, it is assumed that customers with data equipment operating at speeds higher than 300 bps will order data jacks and request conditioned access lines. The procedures described applies to data jacks installed on foreign exchange (FX) lines as well as regular switched network loops.

**Note:** The FX lines are normally designed to have a nominal 4.5 dB loss to the central office.

**3.02** Determine the loop loss as follows.

- (1) Dial the central office milliwatt supply or request the testboard, at the central office, to send a 1004-Hz tone at 0 dBm on the loop.
- (2) Use a transmission test set with a 900-ohm termination (TTS-4 or equivalent) to measure the level of the incoming signal. The numerical reading is equal to the loop loss in dB. (For

example, -6 dBm on the meter is equal to 6-dB loop loss.)

(3) When the measured loop loss is not a whole number, round off the fraction to the next higher whole number (for example, 5.4 dB becomes 6 dB).

(4) Record the loop loss (to the nearest tenth of a dB) and leave this information with the data jack.

#### A. Universal Data Jack

**3.03** When the loop loss has been determined, select the proper 97A-type connecting block as directed in the table in Fig. 8. Connect the 97A-type connecting block to the data line. Operate the switch to the position appropriate for the type of data equipment being connected. Instruct the customer as to the proper switch position and leave a copy of the How-to-Operate card (999-100-117).

#### B. Programmable Data Jack

**3.04** When the loop loss has been determined, select the proper programming resistor from those provided in the plastic bag, which corresponds to the loop loss, using the table in Fig. 9. Install this resistor between terminals PR and PC of the 97B connecting block. Store the bag of unused resistors under the circuit board of the connecting block or other convenient location. Connect the connecting block to the data line.

**Note 1:** A 97A-type connecting block can be used in an emergency if a 97B is not readily available.

**Note 2:** A chart similar to that shown in Fig. 9 is included in the plastic envelope which contains the programming resistors. Starting first quarter 1977, the chart was etched on the noncomponent side of the circuit board of the 97B connecting block instead of being shipped as a ship-loose item.

**3.05** Select a flat mounting surface and install the 97B connecting block using the two No. 6 pan-head wood/metal tapping screws or the double coated adhesive pad included as ship-loose items. The preferred mounting position is on a vertical surface with the jack opening to the lower left.

**3.06** Record loop loss (as measured in paragraph 3.02) and the telephone line number on the matte surface on the side of the cover above the jack opening of the 97B connecting block using a No. 2 lead pencil or a ball-point pen. All 97A-type and 97B connecting blocks manufactured starting in second quarter 1978 have an enlarged matte writing area. Designations LPL (loop loss) and TLN (telephone line number) are stamped on the surface for convenience.

### C. 103A Apparatus Mounting

**3.07** Where several 97A-type and 97B connecting blocks are to be installed in the same location, a 103A apparatus mounting may be used (Fig. 15).

**3.08** The 103A apparatus mounting provides a multiple arrangement for up to sixteen 97A-type and 97B connecting blocks. The 103A apparatus mounting can be mounted in any of the following configurations (Fig. 16).

(a) Wall-mounted with the rear of the unit against the wall.

(b) Rack-mounted in a 19-inch cabinet with the front of the unit flush with the mounting surface.

(c) Rack-mounted in a 19-inch cabinet with the front of the unit either 4.33 or 4.95 inches forward of the mounting surface.

(d) Rack-mounted in a 23-inch cabinet with the front of the unit 4.95 inches forward of the mounting surface.

**Note 1:** Each 103A apparatus mounting requires 6.0 inches (1/2 inch above and 1-3/4 inches below) to allow the cover to open properly.

**Note 2:** When installing 97A-type and 97B connecting blocks, leave about 6 inches slack in the wiring to allow the jack to be removed from the mounting without interrupting service.

**3.09** The M48A-87 cord (ordered separately) can be used to combine eight connecting blocks to one 50-position female miniature ribbon connector (Fig. 17). To attach the M48A-87 cord to the 103A cover, remove the nuts from the screws holding

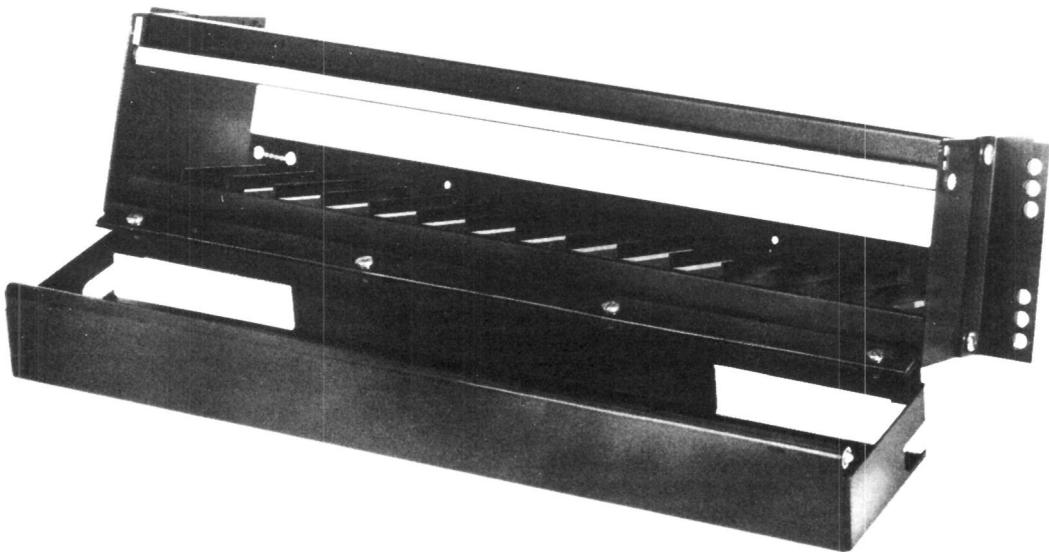


Fig. 15—103A Apparatus Mounting

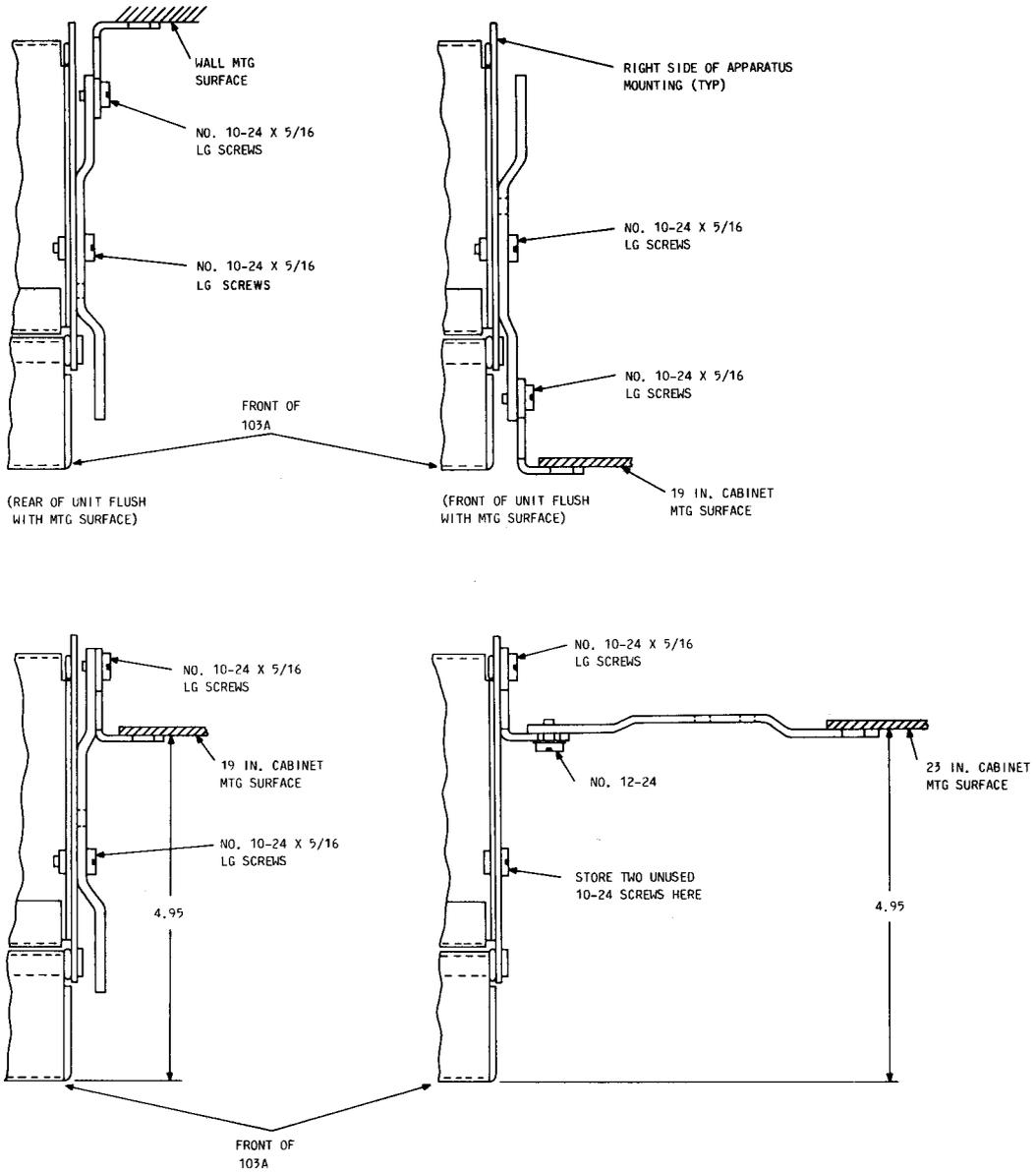


Fig. 16—103A Apparatus Mounting Brackets

the connector retainer bracket to the mounting bracket on the 103A apparatus mounting. Place the ribbon connector of the M48A-87 cord over the screw ends and replace the nut on the outer screw. The mounting screw toward the center of the cover threads into the connector body. (The nut may be discarded.) Clamp the retainer bracket between the connector and the mounting bracket on the 103A cover.



Fig. 17—M48A-87 Cord

3.10 Eight 97A-type or 97B connecting blocks may be wall-mounted using an M48A-87 cord to provide a 50-position interface.

3.11 A wall-mounted arrangement similar to that described in paragraph 3.10 but using an M48A-87 cord and a KS-20458,L14 cover to provide a 50-position interface is shown in Fig. 18.

#### D. Rack and Wall Mounting

3.12 The 97A1 and 97A3 data mounting have been designed for both 19- and 23-inch rack mounting as well as wall mounting. In a 19-inch rack, a number 842310781 2-inch mounting plate accommodates a total of three (3) data mountings or connecting blocks providing up to 24 lines. A 23-inch rack application requires the use of a number 842310773 2-inch mounting plate which holds a total of four data mountings or connecting blocks providing up to 32 lines.

3.13 A bracket and a clamp are available to lock connecting cables to the 97A1 and 97A3 data mounting, and an adhesive pad (842309643) is provided to allow mounting to a metal wall without drilling. These items are provided as part of the D-180935 mounting kit.

#### 4. MAINTENANCE AND TESTING

4.01 Maintenance of the data jack on the customer premises is limited to local tests, testing with the serving or test offices, or replacing a defective connecting block or data mounting.

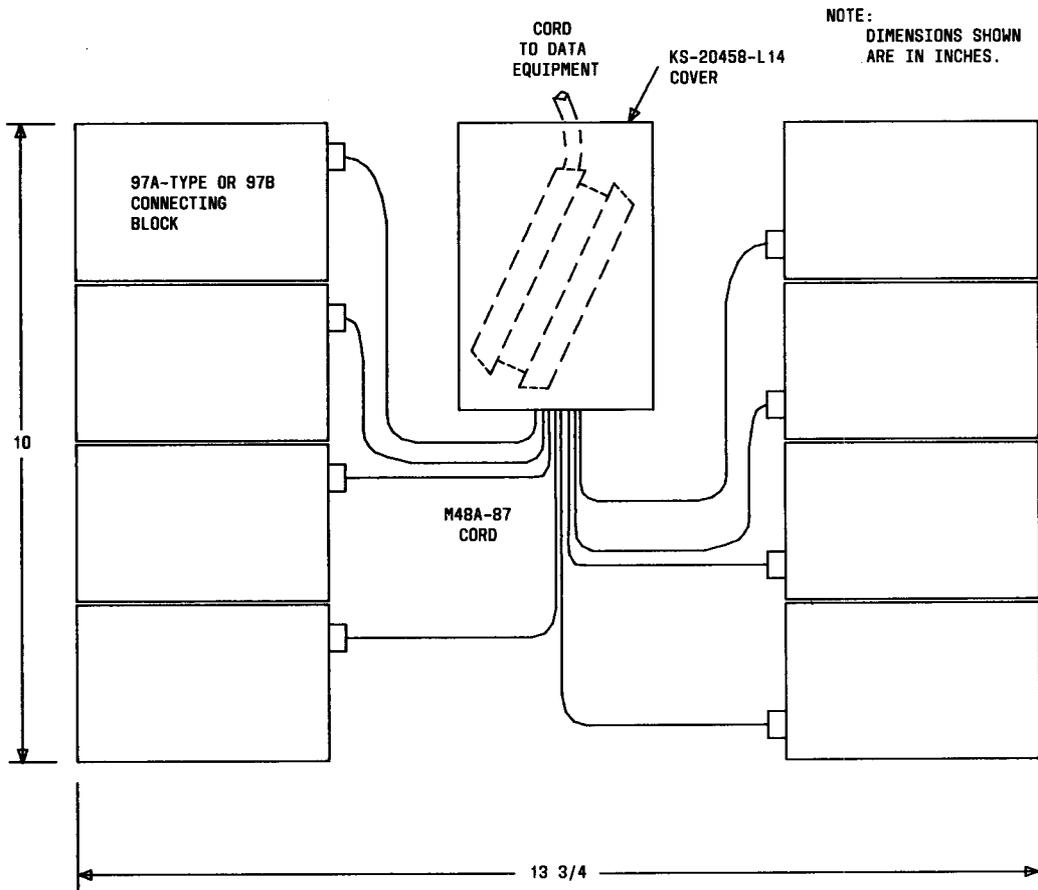
4.02 Repair forces should be familiar with the tariff provisions which generally provide for a "Maintenance of Service Charge" for each customer-requested repair visit to a data jack installation. When the customer requests such a repair visit and it is subsequently determined that the trouble is *not* in the telco facilities, advise the customer and notify the Plant Service Center to fill out Form E-5855 in conformance with the section entitled Maintenance of Service Charge on Service With Customer-Provided Equipment (CPE) (660-101-312).

4.03 The following test may be performed during repair visits to verify continuity of the data jack. Access to the positions of the 97A-type or 97B connecting block can be obtained by using an M8P-87 cord which terminates in a miniature 8-position keyed plug on one end and color-coded spade-tipped conductors on the other. The pin assignments and colors are as follows.

PIN	COLOR
1	Blue
2	Orange
3	Black
4	Red
5	Green
6	Yellow
7	Brown
8	Slate

(1) Verify continuity and ohmic value of the programming resistor with an ohmmeter via jack pins 7 and 8.

(2) Verify continuity through the 97A-type or 97B connecting blocks to the telephone line screw terminals (T and R) with an ohmmeter



**Fig. 18—Wall-Mounting Data Jacks and Adapter Cord**

via jack pins 4 and 5 for programmed data equipment. Level measurements of the milliwatt supply may be made via these pins also. (The switch on the 97A-type should be in the programmed position.) The data jack itself should introduce no loss.

(3) Verify continuity to the telephone line screw terminals (T and R) for fixed loss loop data equipment of 97A-types via jack pins 1 and 2. Level measurements of the milliwatt supply may be made via these pins also. (The switch on the data jack should be in the FLL position.)

The received level should be in a range between -8 and -9 dBm.

(4) If a 503CM or 2503CM telephone set is provided, verify the mode indication function via pins 3 and 6 with an ohmmeter. A short should appear when the line is in the voice mode and an open should appear when the line is in the data mode. If the "switchhook only" option has been provided in the telephone set, a short should appear on pins 3 and 6 whenever the handset is taken off-hook.