407C MULTIPLE DATA STATION

INSTALLATION AND CONNECTIONS

1. GENERAL

1.01 This section provides installation and connection procedures to be followed when installing the 407C multiple data station. Installation information is also provided on the CALL DIRECTOR®, key-type telephone set, 801-type automatic calling unit (ACU), and 2B or 3A automatic call distributor (ACD) which may be associated with the data station. Information concerning associated customer-provided equipment (CPE), data terminal equipment, or related services is **not** included.

1.02 This section is reissued to show data set (DS) 407C-L1, series 1 rated manufacture discontinued (MD) and to show DS 407C-L1, series 2 as the replacement. DS 407C-L1, series 2 provides four additional end-of-message (EOM) characters, which are customer options.

1.03 The 407C multiple data station consists of DSs 407C-L1, 57-type data mounting(s) (four data sets per data mounting), and a KS-20018-L20 cabinet (Fig. 1 and 2). Both of the 57-type data mountings (Fig. 3 and 4) contain a 229A power unit (Fig. 5), but only the 57A1 contains a test

unit. One 229A power unit will supply power to one data mounting or a maximum of four data sets. The test unit consists of the 51A-type and 47A-type data units. The DS 407Cs are receivers of TOUCH-TONE® signals used primarily in TOUCH-TONE inquire/FSK (frequency shift keyed) data response systems.

1.04 The 407C multiple data station is housed in a KS-20018-L20 cabinet. *The use of any other cabinet is not recommended because of thermal limitations.* The KS-20018-L20 cabinet can house one 57A-type and one 57B-type data mounting, with a maximum of eight data sets. A blower is provided in the bottom of the cabinet (Fig. 1), while an 81A (thermal) detector must be installed in the top of the cabinet (Fig. 1 and 6) to protect the data sets from operation above their maximum temperature limit. The 81A detector must be ordered separately. The detector will shut off all power in the cabinet, except for audible and visual alarms, when the temperature in the cabinet reaches 57° Celsius (135°F). All power is restored automatically when the cabinet temperature drops to 47° Celsius (118°F). Installations requiring more than eight data sets (16 lines) require additional KS-20018-L20 cabinets.

1.05 Plugs and cables for connecting CPE to the data sets are provided by the customer and should not exceed 50 feet in length. Cables for connecting the multiple data station to transmission line facilities must be terminated at the data mounting end in a 50-pin connector, such as the one on the A25D-type connector cable.

1.06 The multiple data station may be installed in any location that is convenient for the customer, within 16 meters (50 ft) of the CPE. It is desirable to mount the station adjacent to or within view of the CPE. This will allow visual monitoring of the status light emitting diodes (LEDs) on the data sets while operating or testing the CPE. Verify that the location selected by the

81A DETECTOR

57B1
DATA
MOUNTING

DATA SETS
407C—L1

KS—20018—L20
CABINET

57A1
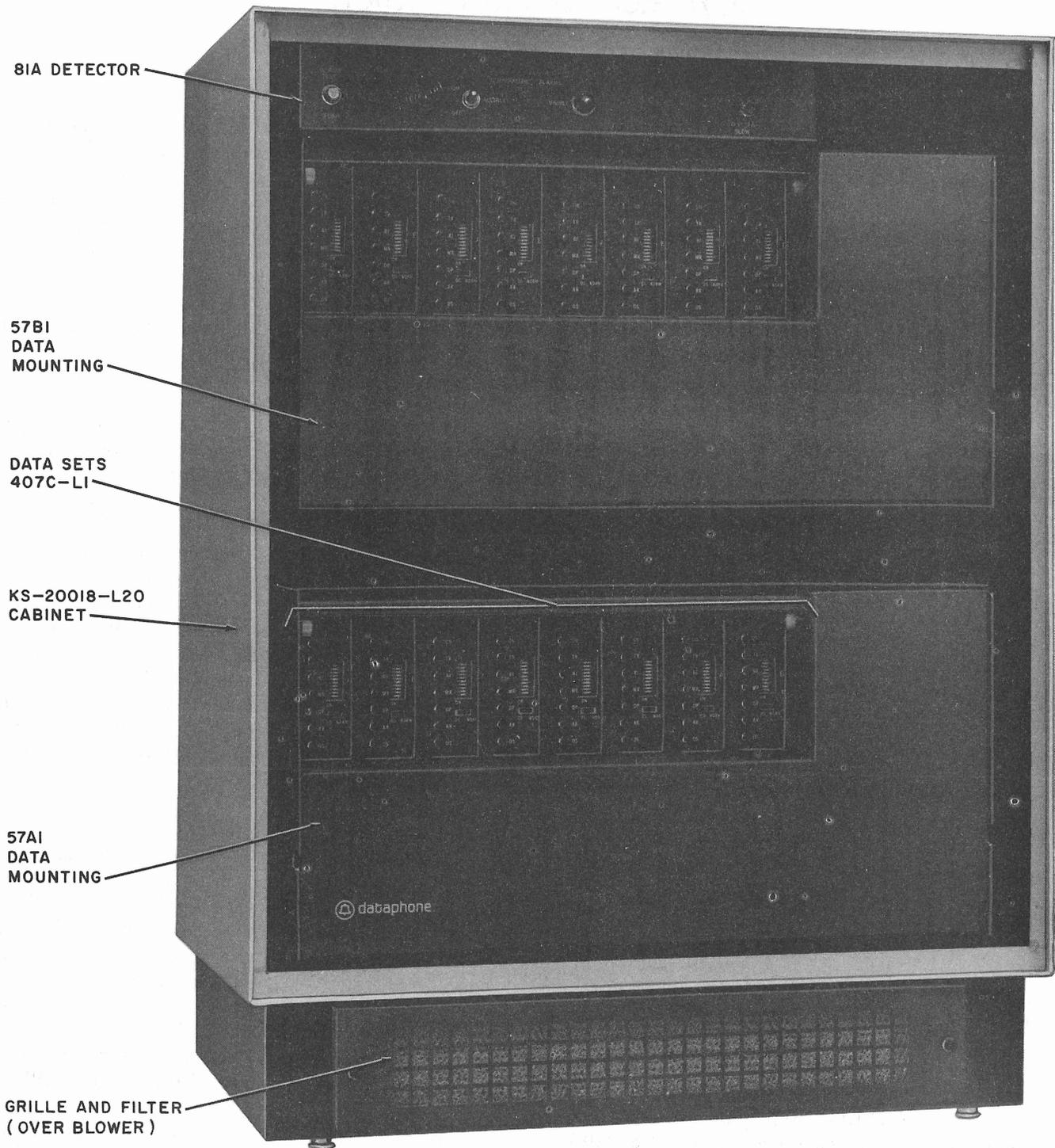DATA
MOUNTING

GRILLE AND FILTER
(OVER BLOWER)

Fig. 1—Front View of 407C Multiple Data Station With Plastic Front Cover Removed

6-FOOT POWER CORD
CONNECTOR FROM
229A POWER UNIT
IN 57AI DATA
MOUNTING

CONNECTING
BLOCKS FOR
INTERCONNECTING
57BI DATA
MOUNTING TO 57AI
DATA MOUNTING
FOR TEST PURPOSES

IO—FOOT II7 VAC
POWER CORD

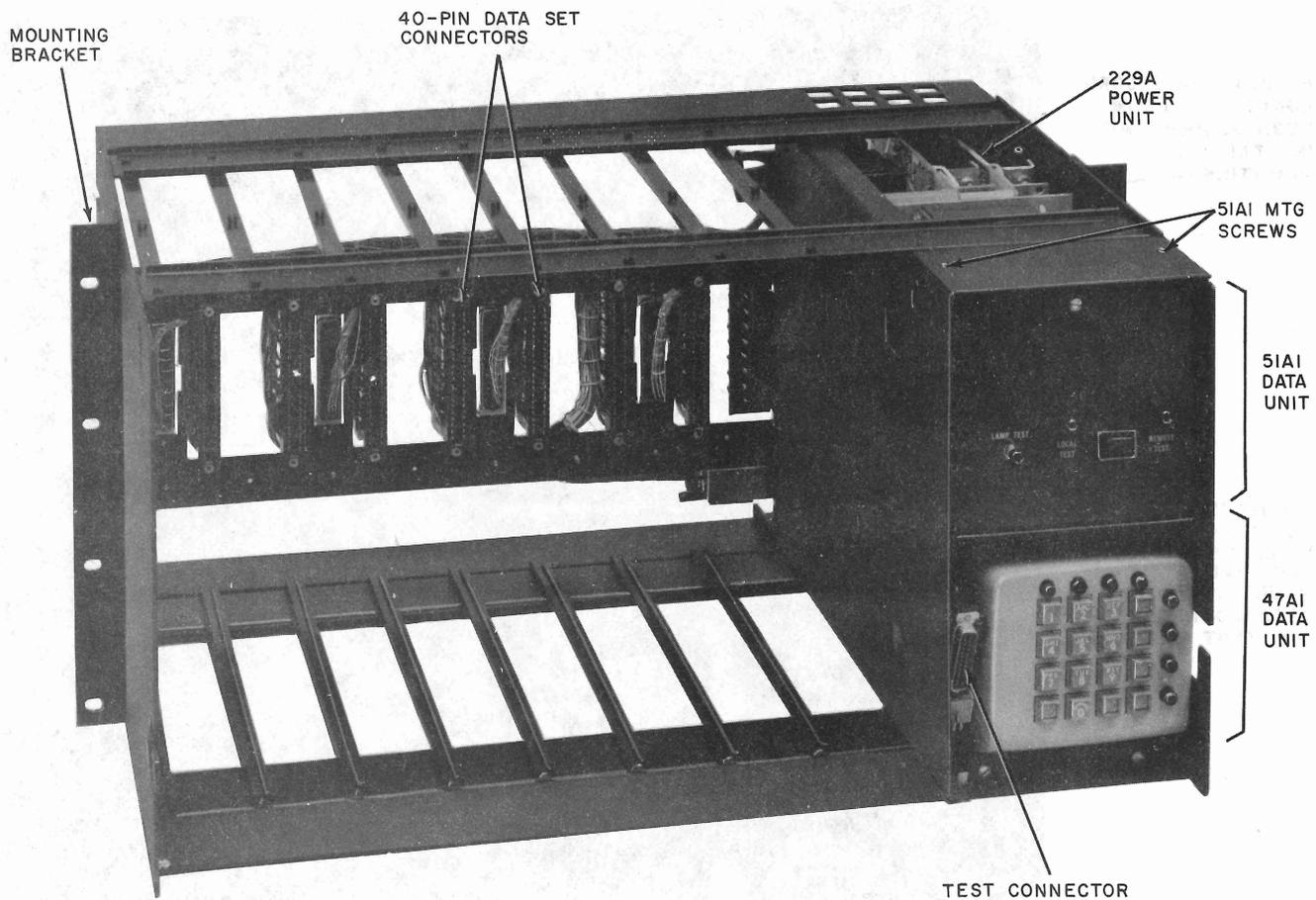**Fig. 2—Rear View of 407C Multiple Data Station With Grille Removed**

Fig. 3—57A-Type Data Mounting With Front Cover Removed

customer for the installation is adequate for maintenance and that the customer-provided ac power outlet is **not** controlled by a switch. The ac power outlet must be within 2 meters (6 ft) of the equipment cabinet. For additional information on installation planning, refer to the section entitled Data Sets—Multiple Installation Information (590-010-201).

1.07 Reference directions (left, right, front, or rear) on the data mounting are in respect to facing the front of the apparatus.

1.08 When test or demonstration calls are made, refer to the section entitled Crediting Charges on Test Calls (010-250-001) for the proper procedure for crediting charges.

1.09 Ensure that the data loops have been tested and meet requirements for TYPE I

DATAPHONE® lines as outlined in the section entitled Data Systems—DATAPHONE Service on Direct Distance Dialing Network—Test Requirements for Subscriber, Foreign Exchange, and Remote Exchange Lines (314-205-501) or basic private lines as outlined in the section entitled Voice Bandwidth Private Line Data Circuits—Tests and Requirements (314-410-500).

1.10 It is recommended that the cabinet(s) for the data station be installed on a table top, desk or other suitable surface approximately 28 to 32 inches above floor level. *In any event, the 57A-type data mounting must be mounted in the bottom of the cabinet, whether one or two data mountings are used, to afford proper cooling.*

1.11 Data sets, data units, and power units found to be defective should be returned to a
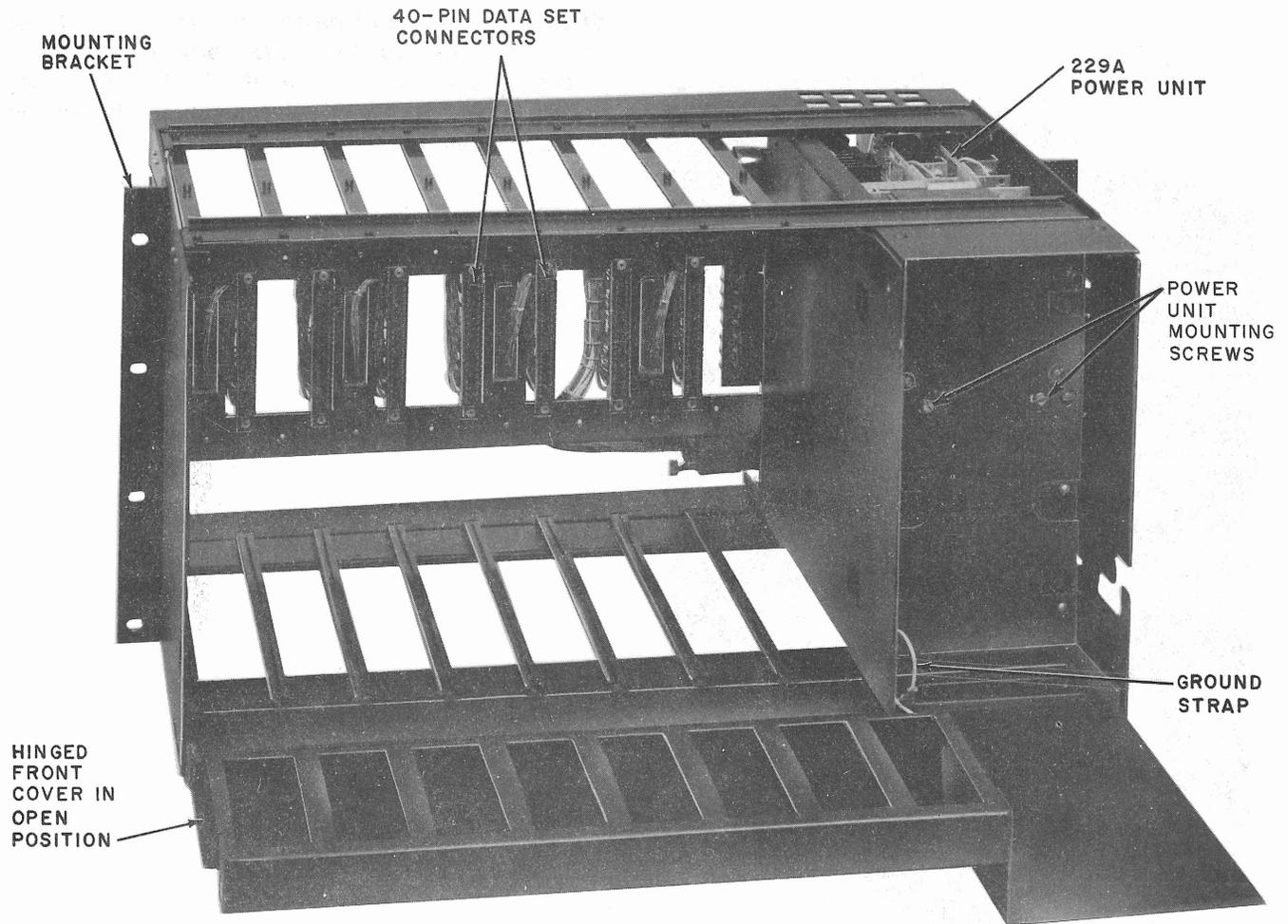
Fig. 4—57B-Type Data Mounting With Front Cover Open

Western Electric Company distributing house for repair. Sets should be tagged to indicate the nature of the trouble. *No attempt should be made to repair DS 407C in the field.*

2. SPECIAL TOOLS

2.01 In addition to the standard installation tools, installation of the data mountings will require the following special tool.

- TH-10 Hold-E-Zee® Screw-holding screwdriver, (Mfg by Upson Tools, Inc) or equivalent screw-holding screwdriver with 25 cm (10-in.) blade.

3. OPTIONS

3.01 Options for 407C multiple data station vary with application. Thirteen of the twenty-two telephone company (telco) options are installed on the circuit packs by means of Cambion shorting plugs which fit into numbered jacks on DS 407C-L1. Seven telco options are implemented by backplane wiring. Two telco options are implemented by means of a strap on the 229A power unit. Customer options on DS 407C-L1 are made by means of two groups of ten switches each on the front panel of the data set, providing a total of forty customer options, each of which applies to both lines. Installation of options should be made in accordance with the service order or the circuit layout record card. There are no options associated with the data units. *Install telco options in DS*

407C-L1 as applicable before installing the data sets in the data mounting. Telco plug-type options which apply to DS 407C are illustrated in Fig. 7 and 8; plug, strap, and backplane wiring options are listed in Table A.
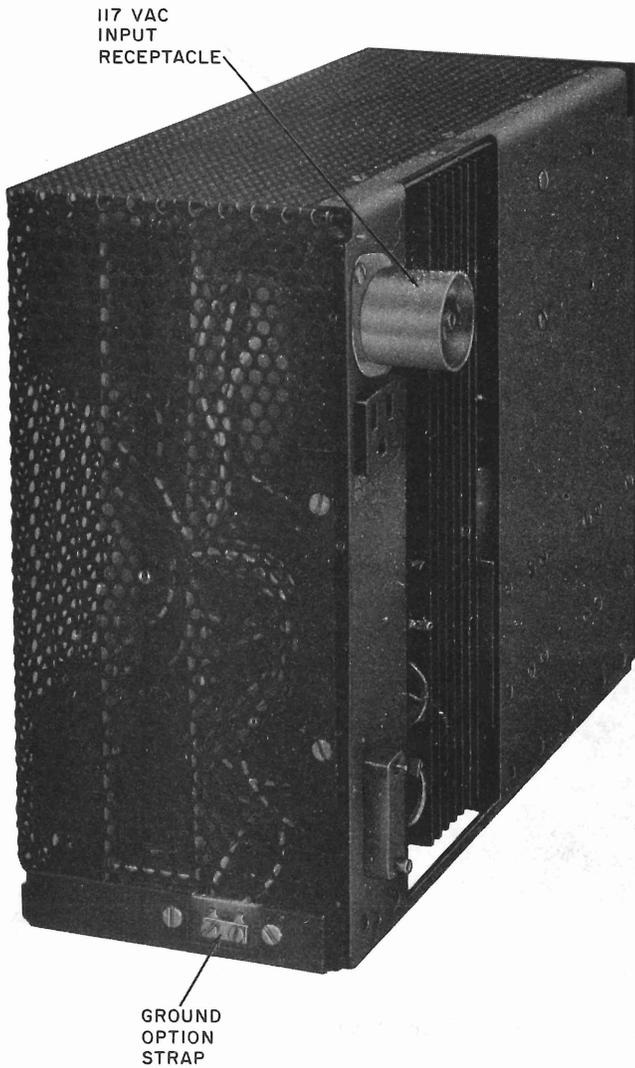
II7 VAC
INPUT
RECEPTACLE

GROUND
OPTION
STRAP

Fig. 5—229A Power Unit

ALARM
TEST
SWITCH

CONNECTOR FOR
CUSTOMER POWER

AUDIBLE
ALARM

AUDIBLE ALARM
CUT-OFF SWITCH

VISUAL
ALARM

10 AMPERE
SLOW-BLOW
FUSE

229A POWER UNIT
CONNECTOR

BLOWER
CONNECTOR
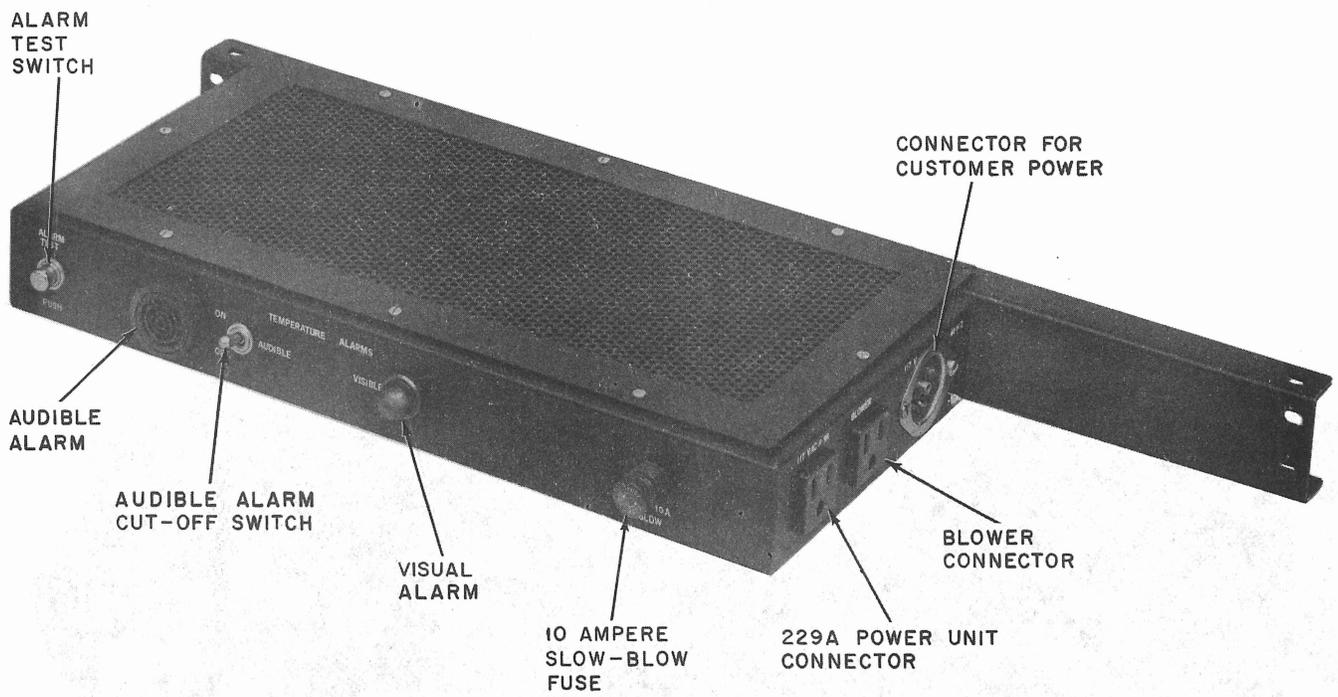
Fig. 6—81A Detector Removed From Cabinet

OPTION T, U, OR V
(T SHOWN)

OPTION A OR B
(A SHOWN)

OPTION C OR D
(C SHOWN)

OPTION I OR J
(I SHOWN)

OPTION E OR F
(E SHOWN)
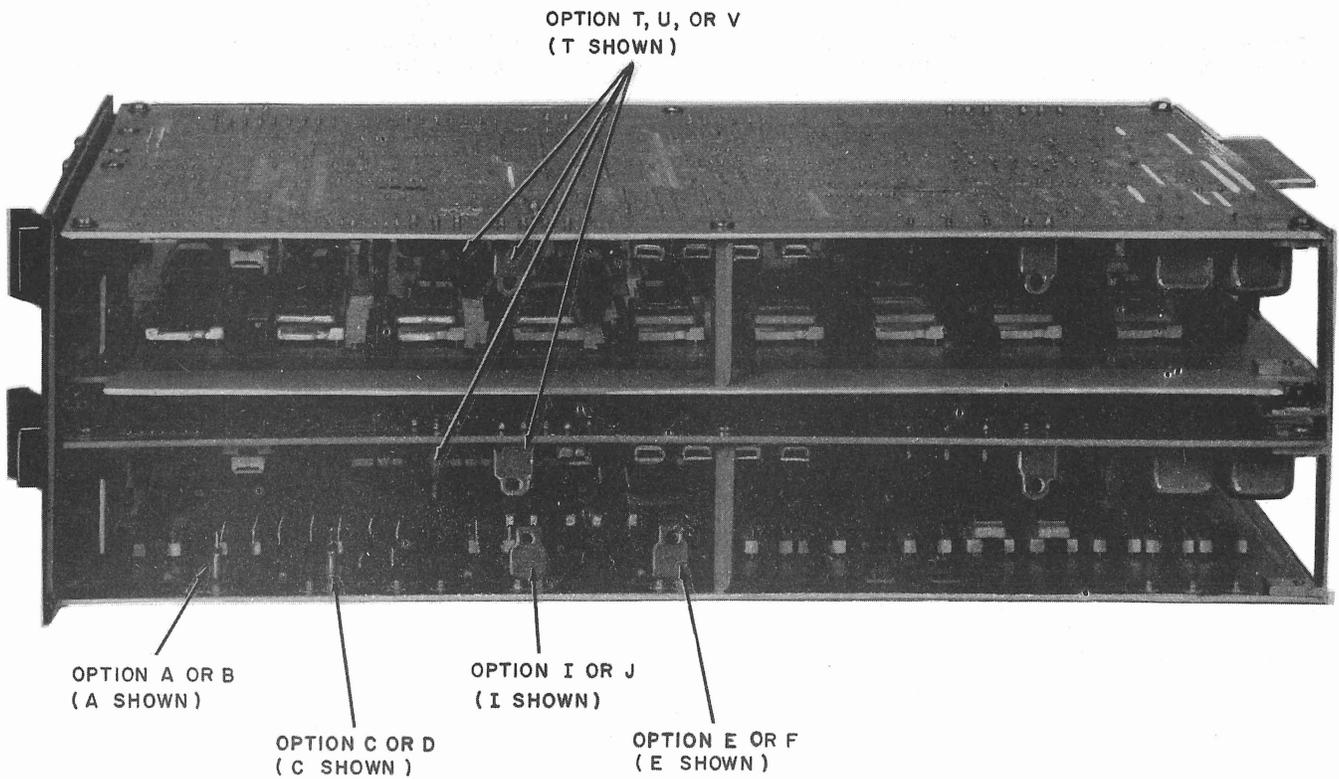
Fig. 7—Top View of DS 407C Showing Telco Option Plugs

OPTION G OR H
(G SHOWN)

OPTION E OR F
(E SHOWN)

OPTION A OR B
(A SHOWN)

Fig. 8—Bottom View of DS 407C Showing Telco Option Plugs
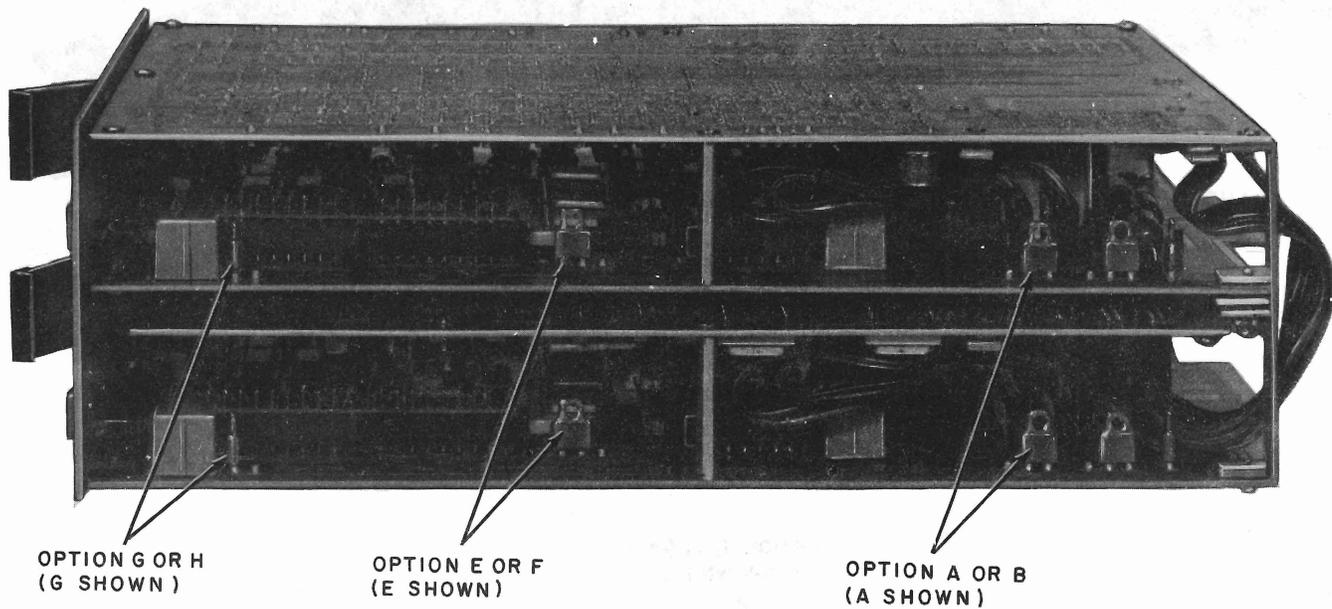
Note: Some options are interdependent; the data sets will not function properly if improper option combinations are selected.

Telco Option Descriptions

3.02 The following describes the telco options:

(a) *Option A*—This option provides switched telecommunications network operation.

(b) *Option B*—This option provides private line (PL) operation. When this option is installed, the line control circuit of the data set is slaved to the customer's equipment such that the data set is placed on-line via the data terminal ready (DTR) customer interface lead.

(c) *Option C*—This option is provided when there is an automatic call distributor (ACD) associated with the data station.

(d) *Option D*—This option is provided when a CALL DIRECTOR or key telephone is associated with the data station. When referral is not provided, this option is used.

(e) *Option E*—This option provides a serial customer interface per Electronic Industries Association (EIA) Standard RS-232-C. With this option, options G and I must be selected.

(f) *Option F*—This option provides a parallel customer interface.

(g) *Option G*—This option provides a voltage interface per EIA Standard RS-232-C. When this option is selected, customer option BH must also be selected.

(h) *Option H*—This option provides a contact *equivalent* interface when option F is selected. When option H is selected, customer options AP and BG must also be selected.

(i) *Option I*—This option enables terminal initiated referral, ▶computer down,◀ and automatic disconnect.

(j) *Option J*—This option disables option I.

(k) *Option K*—This option provides for "computer-down" detection by means of a customer-actuated switch. It is implemented by backplane wiring. ▶This switch must be provided locally and installed separately.◀

(l) *Option L*—This option provides for "computer down" detection by means of all DTR leads being in the *off* condition simultaneously. *It is provided unless disabled by backplane wiring.*

(m) *Option M*—This option provides for "computer down" detection either by customer-actuated switch or by all DTR leads being *off*. It is implemented by backplane wiring. [See (k).]

(n) *Option N*—"Computer down" detection not used. This option is implemented by backplane wiring.

(o) *Option O*—This option provides out-of-service wiring by means of a tip-to-ring short.

(p) *Option P*—This option provides out-of-service wiring by means of a third wire (sleeve) ground.

(q) *Option Q*—This option provides out-of-service wiring by means of a short on a separate pair.

(r) *Option R*—This option provides a connection from frame ground to signal ground on the 229A power unit.

(s) *Option S*—This option removes connection between frame ground and signal ground on the 229A power unit.

(t) *Option T*—This option provides a -4 dBm transmit level.

(u) *Option U*—This option provides a -8 dBm transmit level.

(v) *Option V*—This option provides a -13 dBm transmit level.

TABLE A

TELCO OPTIONS

OPTION			STRAPPING				REMARKS
FEATURE	SELECTION	DESIG	ON BOTH LINE CONTROL BOARDS	ON TOUCH-TONE DETECTOR BOARD	ON TERMINAL BLOCK TB1	ON 229A POWER UNIT	REMARKS
Type of Operation	Switched Network	A	E20-E21	E10-E11	—	—	
	Private Line	B	E19-E20	E10-E12	—	—	
Used With ACD	Yes	C	—	E7-E8	—	—	
	No	D	—	E7-E9	—	—	
Interface Mode	Serial	E	E13-E14	E1-E2	—	—	If option E is installed, options G and I must also be installed.
	Parallel	F[1]	E14-E15	E2-E3	—	—	
Interface Type [2]	EIA Voltage	G	E16-E17	—	—	—	If option E is selected, option G must also be selected.[1]
	Contact Equivalent	H	E17-E18	—	—	—	
Call Control Code Detector	Enable	I	—	E4-E5	—	—	Option I enables terminal initiated referral, computer down, and automatic disconnect features of DS 407C if option F is used. If option E is installed, option I must also be installed.
	Disable	J	—	E5-E6	—	—	
Computer Down Detection	Switch	K	—	—	7-SG; 6-SWITCH[3]	SG-SWITCH[3] SG-TB1-7	These options are implemented by backplane wiring. Note: TB1 connecting blocks of all 57-type data mountings must be multipled.
	All DTR OFF	L	—	—	—	—	
	Switch or All DTR OFF	M	—	—	6-SWITCH[3]	SG-SWITCH[3]	
	Not Used	N	—	—	7-SG	SG-TB1-7	

TABLE A (Contd)

TELCO OPTIONS

FEATURE	OPTION SELECTION	DESIG	STRAPPING ON BOTH LINE CONTROL BOARDS	ON TOUCH-TONE DETECTOR BOARD	ON TERMINAL BLOCK TB1	ON 229A POWER UNIT	REMARKS
Out-of-Service Wiring	Tip-Ring Short	O	—	—	—	—	OS1-T OS2-R (in J9 and J10)
	Third Wire Ground	P	—	—	—	—	OS1-FG OS2-third wire (in J10)
	Separate Pair Short	Q	—	—	—	—	OS1 OS2 OS pair (in J10)
Grounding	Frame Ground Connected to Signal Ground	R	—	—	—	SG-FG SHORT	Option R connects strap on power unit.
	Frame Ground and Signal Ground Not Connected	S	—	—	—	SG-FG OPEN[4]	Option S removes strap on power unit.
Transmit Level	−4 dBm	T	E1-E3; E5-E6	—	—	—	Sets transmit level to produce −12 dBm at serving CO.
	−8 dBm	U	E2-E3; E6-E7	—	—	—	
	−13 dBm	V	E3-E4; E7-E8	—	—	—	

Note 1: Switch must be operated.

Note 2: If option G is selected, customer option BH must also be selected; if option H is selected, customer options AP and RG must also be selected.

Note 3: SWITCH is a single-pole single-throw make contact provided locally and installed separately.

Note 4: SG paralleled to all data mountings.

Customer Option Descriptions

3.03 Customer options are summarized in Table B and described in the following paragraphs:

(a) **Option AA**—This option causes the data set to disconnect the line when a TOUCH-TONE * # * is received from a remote terminal. Available with parallel or serial interface (option F or E).

(b) **Option AB**—This option disables * # * line disconnect (option AA).

(c) **Option AC**—This option places data set out of service if DTR is *off* more than 200 ms. Available with parallel or serial interface (option F or E).

(d) **Option AD**—This option disables option AC.

(e) **Option AE**—This option places data set out of service whenever OS lead is *on.* Available with parallel or serial interface (option F or E).

(f) **Option AF**—This option disables option AE.

(g) **Option AG**—This option will cause the data set to initiate a referral to an attendant on receipt of a TOUCH-TONE * * when computer is operative ("up"). Available with parallel or serial interface (option F or E).

(h) **Option AH**—This option disables option AG.

(i) **Option AI**—This option will cause the data set to initiate a referral to an attendant on receipt of a TOUCH-TONE * * when computer is inoperative ("down"). Available with parallel or serial interface (option F or E).

(j) **Option AJ**—This option disables option AI.

(k) **Option AK0**—This is one of ▶eight◀ options which select end-of-message (EOM) characters given to the computer after all control sequences. This option provides *no* EOM characters. ▶The end-of-block (EOB) character expected from the computer is DC3 or ENQ.◀ Available with serial interface only (option E).

(l) **Option AL0**—This is one of ▶eight◀ options which select EOM characters given to the computer after all control sequences. This option provides the EOM character *CR.* ▶The EOB character expected from the computer is DC3 or ENQ.◀ Available with serial interface only (option E).

(m) **Option AM0**—This is one of ▶eight◀ options which select EOM characters given to the computer after all control sequences. This option provides the EOM characters *CR LF DC3.* ▶The EOB character expected from the computer is DC3 or ENQ.◀ Available with serial interface only (option E).

(n) **Option AN0**—This is one of ▶eight◀ options which select EOM characters given to the computer after all control sequences. This option provides the EOM character *DC3.* ▶The EOB character expected from the computer is DC3 or ENQ.◀ Available with serial interface only (option E).

(o) ▶**Option AK1**—This is one of eight options which select EOM characters given to the computer after all control sequences. This option provides the EOM character ETX. The EOB character expected from the computer is DC3 or ENQ. Available with serial interface only (option E).◀

(p) ▶**Option AL1**—This is one of eight options which select EOM characters given to the computer after all control sequences. This option provides the EOM character EOT. The EOB character expected from the computer is DC3 or ENQ. Available with serial interface only (option E).◀

(q) ▶**Option AM1**—This is one of eight options which select EOM characters given to the computer after all control sequences. This option provides the EOM character ETX. The EOB character expected from the computer is DC3, ENQ, or ETX. Available with serial interface only (option E).◀

(r) ▶**Option AN1**—This is one of eight options which select EOM characters given to the computer after all control sequences. This option provides the EOM character EOT. The EOB character expected from the computer is DC3,

TABLE B

CUSTOMER OPTIONS

OPTION				REMARKS
FEATURE	AVAIL*	SWITCH SELECTION	DESIG	
# Line Disconnect	P or S	A1 ON	AA	Data set disconnects line when a TOUCH-TONE *#* is received with option AA. Option AB disables option AA.
		A1 OFF	AB	
OS Controlled by DTR	P or S	A2 ON	AC	Data set is out of service if DTR is *off* more than 200 ms with option AC. Option AD disables option AC.
		A2 OFF	AD	
OS Controlled by OS Lead	P or S	A3 ON	AE	Data set is out of service whenever OS lead is *on* with option AE. Option AF disables option AE.
		A3 OFF	AF	
Terminal Initiated Referral— Computer Up	P or S	A4 ON	AG	Data set will initiate a referral when computer is operative on receipt of a TOUCH-TONE ** with option AG.
		A4 OFF	AH	
Terminal Initiated Referral — Computer Down	P or S	A5 ON	AI	Data set will initiate a referral when computer is down on receipt of a TOUCH-TONE ** with option AI.
		A5 OFF	AJ	
End of Message 1 End of Message 2 End of Message 3	S	A6 OFF A6 ON A7 OFF A7 ON A8 OFF A8 ON		Selects end of message (EOM) characters given to computer after all control sequences and end of block (EOB) characters expected from computer. Selected as follows: A6 A7 A8 EOM EOB
			AK0	OFF OFF OFF None DC3 or ENQ
			AL0	ON OFF OFF CR DC3 or ENQ
			AM0	OFF ON OFF CR LF DC3 DC3 or ENQ
			AN0	ON ON OFF DC3 DC3 or ENQ
			AK1	OFF OFF ON ETX DC3 or ENQ
			AL1	OFF ON ON EOT DC3 or ENQ
			AM1	ON OFF ON ETX DC3, ENQ, or ETX
			AN1	ON ON ON EOT DC3, ENQ, or EOT
Binary Coded Matrix	P	A8 ON	AO	BCM output from data set (with options F, G, and BH only).
		A8 OFF	AP	2-out-of-8 output from data set, with option F only.

TABLE B (Contd)

CUSTOMER OPTIONS

OPTION				REMARKS
FEATURE	AVAIL*	SWITCH SELECTION	DESIG	
Speed Select 1	S	A9 ON	AQ	Data speed is 110 bps with option AQ. Data speed is 150 bps with option AR unless over-ridden by option BI.
		A9 OFF	AR	
Message Blocking	S	B1 ON	AS	Data set translates TOUCH-TONE ## into X EOM; computer must "block" outgoing messages by ending them with DC3 or with ENQ, option AS. If option AT is selected, switches B2 through B8 must be *off*.
		B1 OFF	AT	
STX/ETX Punctuation	S	B2 ON	AU	Data set will add ASCII characters STX and translate DC3 to ETX on all FSK messages, with options AU *and* AS. With option AV, DC3 will be transmitted.
		B2 OFF	AV	
Error Control	S	B3 ON	AW	Option AW (with option AS) provides data set compatibility with error control features of transaction telephone, as follows: (1) Adds STX, ETX, and LRC to all FSK messages. (2) On incoming messages, data set checks LRC and CCT, and notifies computer of validity of message: good, bad, or no check. (3) When FSK messages or timed answer-tones are sent out, a data set timer is set and computer is notified if anticipated response is not received in time. (4) Option AW is disabled if the leading TOUCH-TONE "b" is not received. Option AX disables option AW.
		B3 OFF	AX	
Positive Acknowledgment	S	B4 ON	AY	Option AY (with options AS and AW) provides an acknowledgment of receipt of a correct message within the time-out period by sending the ASCII sequence A EOM to the computer. Option AZ disables this feature.
		B4 OFF	AZ	
Data Flow Control Protocol	S	B5 ON	BA	Option BA (with option AS) allows data set to control flow of data across customer interface. Permits computer to put FSK on-line only when remote terminal is not transmitting and passes data to computer only when computer signifies it is ready.
		B5 OFF	BB	

TABLE B (Contd)

CUSTOMER OPTIONS

OPTION				REMARKS
FEATURE	AVAIL*	SWITCH SELECTION	DESIG	
Logon/Sign-on	S	B6 ON	BC	Option BC (with options AS and BA) allows transaction telephone to communicate with computers which require Logon characters. If option BE is also present, then option BD provides for a fixed sign-on in addition to a Logon.
		B6 OFF	BD	
Multiple Message Segments	S	B7 ON	BE	Option BE (with options AS and BA) permits data set "handshaking" required by certain computers which allow multiple-segmented messages. The type of "handshaking" depends on option BC or BD.
		B7 OFF	BF	
Closure Type/ EIA Voltage Interface	P	B8 ON	BG	Contact equivalent or closure type
		B8 OFF	BH	EIA voltage; option BH must be used with telco option G. This option is required whenever option E or AO is used. Option BG must be used with telco options F and H and option AP only.
Speed Select 2	S	B9 ON	BI	Option BI (with option AR) provides data speed of 300 bps. Options BI and AQ cannot be used together.
		B9 OFF	BJ	

* P denotes parallel interface; S denotes serial interface.

Note: Switches A10 and B10 unassigned.

ENQ, or EOT. Available with serial interface only (option E).◀

(s) **Option AO**—This option provides a binary coded matrix (BCM) output from the data set. Available with parallel interface and EIA voltage interface only (options F and G). (See Table F for BCM code.)

(t) **Option AP**—This option provides a 2-out-of-8 output from the data set. Available with parallel interface only (option F). (See figure entitled **TOUCH-TONE Dial Frequency Assignments** in Section 594-800-102.)

(u) **Option AQ**—This option provides a data speed of 110 bps. Available with serial interface only (option E).

(v) **Option AR**—This option provides a data speed of 150 bps unless overridden by option BI. Available with serial interface only (option E).

(w) **Option AS**—This option causes the data set to translate an incoming TOUCH-TONE ## into X EOM; the computer must then "block" messages by ending them with DC3 ▶or ENQ.◀ Available with serial interface only (option E).

(x) **Option AT**—This option disables option AS. When this option is selected, customer option switches B2 through B8 must be *off.*

(y) **Option AU**—With this option **and** option AS, the data set will add ASCII character STX at the start of an FSK response message

and translate DC3 to ETX on all FSK response messages. Available with serial interface only (option E).

(z) *Option AV*—With this option, the data set will ♦not punctuate FSK messages as in (y). DC3 will be transmitted.◀

(aa) *Option AW*—This option, together with option AS, provides data set compatibility with the error control features of the transaction telephone, as follows:

(1) Adds STX, ETX, and LRC (start of text, end of text, and longitudinal redundancy check, respectively) to all FSK messages.

(2) On incoming messages, the data set checks LRC and CCT (character count), and notifies the computer of the validity of the message: good, bad, or no check.

(3) When FSK messages or timed answer-tones are sent out, a data set timer is actuated and the computer is notified if anticipated response is not received during the timed interval.

(4) This option is disabled if the first incoming TOUCH-TONE character is not a "b" (A$_2$ B$_4$).

(ab) *Option AX*—This option disables option AW.

(ac) *Option AY*—This option, together with options AS and AW, causes the data set to indicate receipt of a correct acknowledgment within the time-out period (mentioned under option AW) by sending the ASCII sequence A EOM to the computer. Available with serial interface only (option E).

(ad) *Option AZ*—This option disables option AY.

(ae) *Option BA*—This option, together with option AS, provides data flow control protocol by allowing the data set to control the flow of data across the customer interface and telephone line. This allows the computer and remote terminal to alternately use the line for transmitting. In addition, the data set will pass data to the computer only when the computer

signifies it is ready. Available with serial interface only (option E).

(af) *Option BB*—This option disables option BA.

(ag) *Option BC*—This option, together with option AS, allows transaction telephones to communicate with computers which require Logon characters. Available with serial interface only (option E).

(ah) *Option BD*—With option BF, this option disables option BC.

(ai) *Option BE*—This option, together with options AS and BA, permits data set "handshaking" required by certain computers which allow multiple-segmented messages. The type of "handshaking" depends on option BC or BD. Available with serial interface only (option E).

(aj) *Option BF*—This option disables option BE.

(ak) *Option BG*—This option, together with option H, provides a contact equivalent or closure-type interface with the computer. Available with parallel interface (option F) and 2-out-of-8 interface (option AP) only.

(al) *Option BH*—This option together with option G, provides an EIA voltage interface with the computer. This option must be used when option E (serial interface) or option AO (BCM interface) is selected.

(am) *Option BI*—This option, together with option AR, provides a data speed of 300 bps. Available with serial interface only (option E).

(an) *Option BJ*—This option disables option BI.

4. CUSTOMER INTERFACE INFORMATION

4.01 Either serial or parallel operation is provided in DS 407C by option. Interface lead functions and mnemonics for DS 407C operating in the serial mode are given in Table C.

4.02 Interface lead functions and mnemonics for parallel operation with 2-out-of-8 output are given in Table D. Interface lead functions and

TABLE C

CUSTOMER INTERFACE LEAD FUNCTIONS — SERIAL MODE

PIN NO.	FUNCTION	DATA SET MNEMONIC	EIA DESIGNATION (RS-232-C)
1	Frame Ground	FG	AA
2	Send Data	SD	BA
3	Receive Data	RD	BB
4	Request to Send (Not Used)	RS	CA
5	Clear to Send	CS	CB
6	Data Set Ready	DSR	CC
7	Signal Ground	SG	AB
8	Data Carrier Detector	DCD	CF
9	(Connected to 8)	—	—
10-13	Not Used	—	—
14	(Connected to 22)	—	—
15,16	Not Used	—	—
17	Voice Answer-Back A	VAA	Non-EIA
18	Voice Answer-Back B	VAB	Non-EIA
19	Not Used	—	—
20	Data Terminal Ready	DTR	CD
21	Not Used	—	—
22	Ring Indicator	RI	CE
23,24	Not Used	—	—
25	Out-of-Service	OS	Non-EIA

mnemonics for parallel operation with BCM output are given in Table E. The BCM code is given in Table F.

5. INSTALLATION AND CONNECTION PROCEDURE

5.01 The front cover of the 57-type data mounting is removable (by opening to a horizontal position and sliding the cover to the right to clear the stud and then to the left to remove the pivot pin from its mounting hole). A decal is attached to the inside cover of each of the 57-type data mountings, which provides the data set number, telephone number, and computer port number for each data set in the data mounting. Another decal is attached to the inside cover of the 57A-type data mounting, which provides local test information.

5.02 Perform the installation and connection procedure for the 407C multiple data station as follows:

STEP	PROCEDURE

Do not apply power to the cabinet or any of the related components of the data station until the complete station has been installed except for insertion of data sets. The data sets are to be installed one at a time and tested per Section 594-800-502 before the next data set is installed.

STEP	PROCEDURE

TABLE D

CUSTOMER INTERFACE LEAD FUNCTIONS — PARALLEL MODE
WITH 2-OUT-OF-8 OUTPUT

PIN NO.	FUNCTION	DATA SET MNEMONIC
1	Frame Ground	FG
2	One-Half of Voice Receive Pair	VRA
3	A-Group Frequency Identifier	A1
4	A-Group Frequency Identifier	A2
5	A-Group Frequency Identifier	A3
6	A-Group Frequency Identifier	A4
7	Not Used	—
8	One-Half of Voice Receive Pair	VRB
9	B-Group Frequency Identifier	B1
10	B-Group Frequency Identifier	B2
11	B-Group Frequency Identifier	B3
12	B-Group Frequency Identifier	B4
13	Not Used	—
14	Ring Indicator	RI
15	Attendant Request	AR
16	Data Present Indicator	DP
17	Voice Answer-Back A	VAA
18	Voice Answer-Back B	VAB
19	Data Mode Indicator	DM
20	Tone Answer-Back Control	TAB
21	Data Receiver Enable	DR
22	Data Terminal Ready	DTR
23	Data Set Ready	DSR
24	Signal Ground	SG
25	Out-of-Service	OS

1   Position the KS-20018-L20 cabinet near the customer-provided 60-Hz power outlet and CPE interface cords as described in paragraph 1.06.

2   Gain access to rear of cabinet. Install 81A detector in top of cabinet using four screws provided with detector. (Use top two mounting holes.)

Note: For ease of installation of the 57-type data mounting(s), the KS-20018-L20 cabinet may be placed *face* ♦*down*♦ during installation of the mounting(s).

STEP	PROCEDURE

TABLE E

CUSTOMER INTERFACE LEAD FUNCTIONS — PARALLEL MODE
WITH BCM OUTPUT

PIN NO.	FUNCTION	DATA SET MNEMONIC
1	Frame Ground	FG
2	One-half of Voice Receive Pair	VRA
3	Received Data 1	RD1
4	Received Data 2	RD2
5	Received Data 3	RD3
6	Received Data 4	RD4
7	Not Used	—
8	One-half of Voice Receive Pair	VRB
9—13	Not Used	—
14	Ring Indicator	RI
15	Attendant Request	AR
16	Data Present Indicator	DP
17	Voice Answer-Back A	VAA
18	Voice Answer-Back B	VAB
19	Data Mode Indicator	DM
20	Tone Answer-Back Control	TAB
21	Data Receiver Enable	DR
22	Data Terminal Ready	DTR
23	Data Set Ready	DSR
24	Signal Ground	SG
25	Out-of-Service	OS

3   Gain access to ▸back◂ of cabinet.

      Note: Eight No. 12 mounting screws are supplied with each 57-type data mounting.

4   Remove front cover of each 57-type data mounting to be installed.

5   Mount 57A-type data mounting at bottom of cabinet. If cabinet was placed face down, stand cabinet upright.

6   Remove 51A-type data unit by removing two screws in top of data unit and carefully pull forward to gain access to power supply mounting holes.

STEP	PROCEDURE

TABLE F

BCM CODE

SYMBOL	RECEIVE DATA LEADS			
	RD1	RD2	RD3	RD4
1	1	0	1	0
2	1	0	0	1
3	1	0	1	1
4	0	1	1	0
5	0	1	0	1
6	0	1	1	1
7	1	1	1	0
8	1	1	0	1
9	1	1	1	1
0	0	0	0	1
*	0	0	1	0
#	0	0	1	1
a	1	0	0	0
b	0	1	0	0
c	1	1	0	0
d	0	0	0	0

1 = MARK = — voltage
0 = SPACE = + voltage

7   Install 229A power unit from rear in the 57A-type data mounting and secure with two screws in front and one screw in side of power unit.

8   Replace 51A-type data unit and secure, using two screws removed in Step 6.

9   Store data unit cable along left side of power unit.

10   If more than four DS 407Cs are to be installed, mount a 57B-type data mounting above the 57A-type data mounting. Provide 2 to 2-1/2 inches between data mountings.

11   If cabinet was turned face ♦down♦ for installation of 57B-type data mounting, place cabinet in upright position.

12   Install 229A power unit in 57B-type data mounting from rear of cabinet and secure.

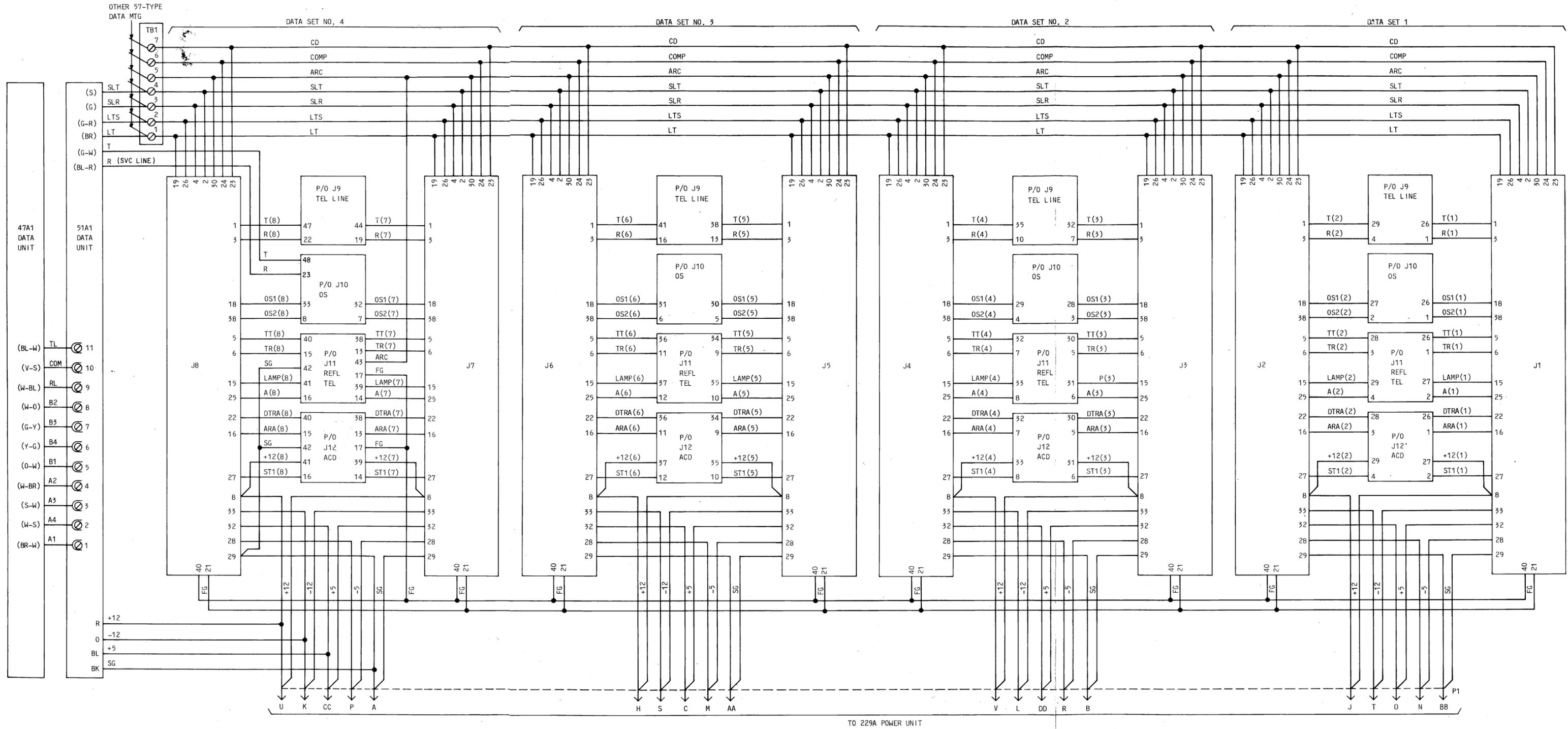| STEP	PROCEDURE
13	Connect a KS-14532-L24 6-foot power cable between the side of the bottom 229A power unit and the receptacle labeled "117 VAC/9A" on the 81A detector (Fig. 6). Connect blower cable to receptacle labeled BLOWER. Connect another KS-14532-L24 6-foot power cord from the upper power unit to the 117 Vac outlet in the lower power unit, if used.
14	Connect seven wires from TB1 of the 57B-type data mounting to TB1 of the 57A-type data mounting, terminal for terminal (ie, 1 to 1, 2 to 2, etc) per Fig. 9.
15	Verify that terminals SG and FG on 229A power unit are connected together (option R) per Fig. 5. If the service order or circuit layout record card requires that signal ground *not* be connected to frame ground (option S), remove the strap between SG and FG on 229A power unit per Fig. 5. Connect SG on 57A-type data mounting to SG on 57B-type data mounting.
16	Insert telephone connector plugs (A25D connector cable equipped with KS-16689-L3 plug) as required into J9, J10, J11, and J12 located on the rear of each 57-type data mounting. Route the A25D connector cables, as required, through the slot in the left side of the data mounting and out the bottom of the cabinet to the connecting block and terminate per Table G.
17	Connect service line to pins 48 and 23 of the A25D connector cable going to J10 of the 57A-type data mounting as shown in Fig. 9. *Note:* For private line systems (option B), connect tip and ring pairs *only* per Table G. The remainder of the arrangement is connected per customer requirement.
18	If a 2B or 3A ACD is specified on the service order or circuit layout record card it must be locally engineered.
19	Connect the central office telephone lines to the tip and ring pairs of the data sets at the connecting block per Table G.
20	Wire the out-of-service option (O, P, or Q) per local engineering or circuit layout record card in *one of the three ways* per Table A ▶and Fig. 10◀ for each data set in the 57-type data mounting. *Note:* The out-of-service option is only used in non-ACD switched network systems (telco options D and A, respectively).
21	Wire the computer down detection option (K, L, M, or N) as specified on the service order or circuit layout record card, in accordance with Table A.
22a	If key telephone sets, or CALL DIRECTORS are specified on the service order or circuit layout record card— Make connections from connecting block to CALL DIRECTORS or key telephone sets. Refer to Fig. 11 for a functional wiring arrangement from data set number 1 to the CALL DIRECTOR or key telephone set. Referral systems must be locally engineered.
22b	If an 801 ACU is used, install per Fig. 12 and local engineering information.

Fig. 9—57-Type Data Mounting and DS 407C—Interconnection Diagram

STEP	PROCEDURE

TABLE G

TELEPHONE INTERFACE CONNECTIONS FOR DS 407C-L1

DATA SET		J9 CABLE PAIRS		J10 CABLE PAIRS				J11 CABLE PAIRS				J12 CABLE PAIRS			
						SVC LINE									
NO.	LINE	TIP	RING	OS1	OS2	T	R	TT	TR	LAMP	A	DTRA	ARA	+12	ST1
1	A	26	1	26	1	48	23	26	1	27	2	26	1	27	2
	B	29	4	27	2	48	23	28	3	29	4	28	3	29	4
2	A	32	7	28	3	48	23	30	5	31	6	30	5	31	6
	B	35	10	29	4	48	23	32	7	33	8	32	7	33	8
3	A	38	13	30	5	48	23	34	9	35	10	34	9	35	10
	B	41	16	31	6	48	23	36	11	37	12	36	11	37	12
4	A	44	19	32	7	48	23	38	13	39	14	38	13	39	14
	B	47	22	33	8	48	23	40	15	41	16	40	15	41	16

23   If *multiple* KS-20018-L20 cabinets are used (more than eight data sets in the system) equip additional cabinet(s) per Steps 1 through 22. Multiple TB1 terminals 5, 6, and 7 of all cabinets. If option S is used, signal ground (SG) must be multipled.

24   Connect the 10-foot KS-14532-L16 power cord from the 81A detector to a 117-volt 60 ±0.1 Hz ac outlet that is not under control of a switch.

25   Verify that specified telco options are installed in all data sets.

26   Install first data set in position 1 and perform installation test per Section 594-800-502. After the first data set has passed test, install second data set in position 2 and test. Install remaining data sets one at a time in position sequence and test each data set as it is installed.

27   After all data sets have been installed and passed installation test, install front covers on 57-type data mounting(s). Install all front and rear covers on cabinet(s).
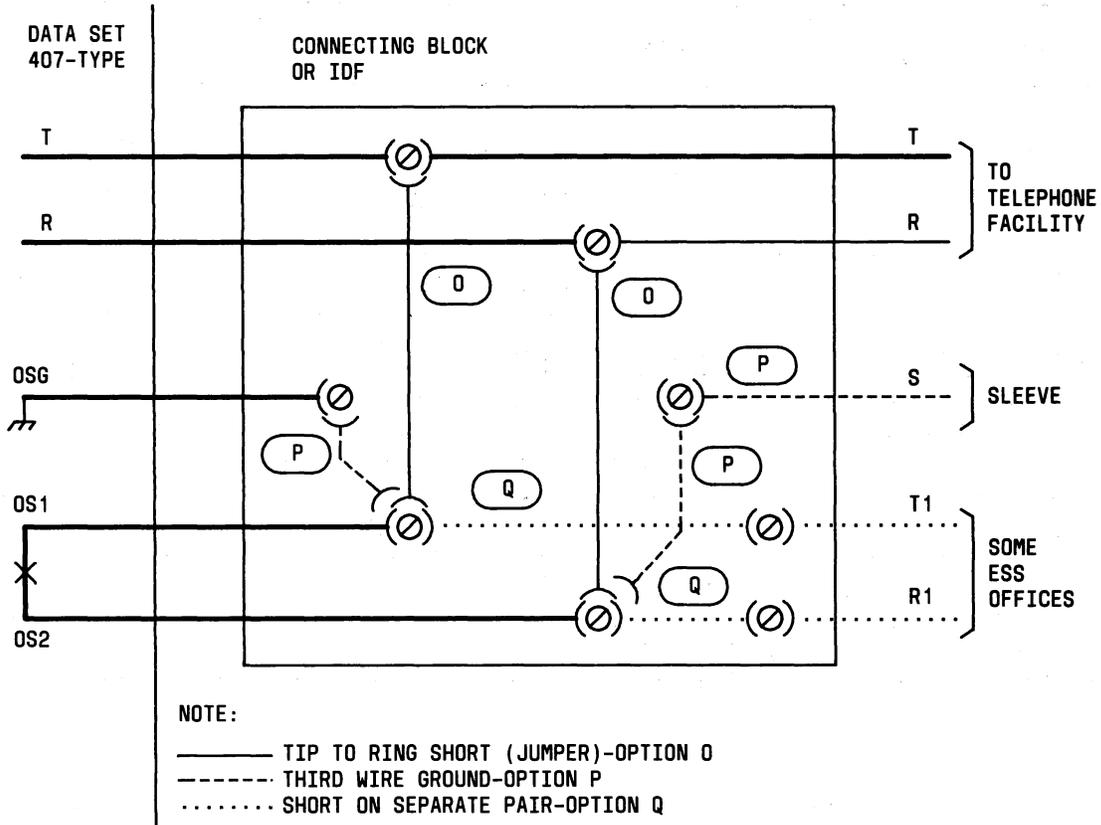
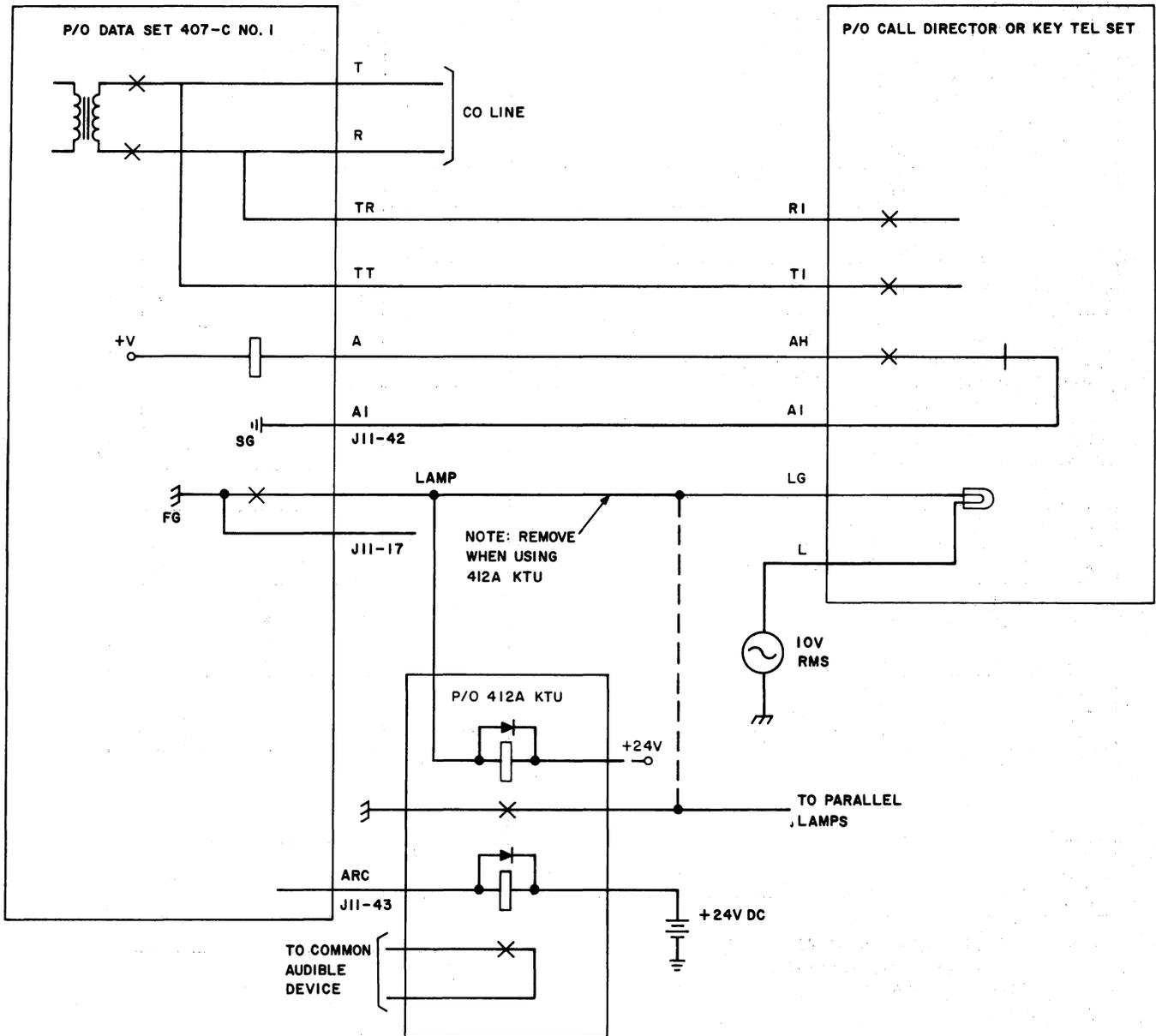Fig. 10—▶Out-of-Service Wiring Connections for One DS 407C-L1◀

Fig. 11—Functional Wiring Arrangement From DS 407C to CALL DIRECTOR or Key Telephone Set
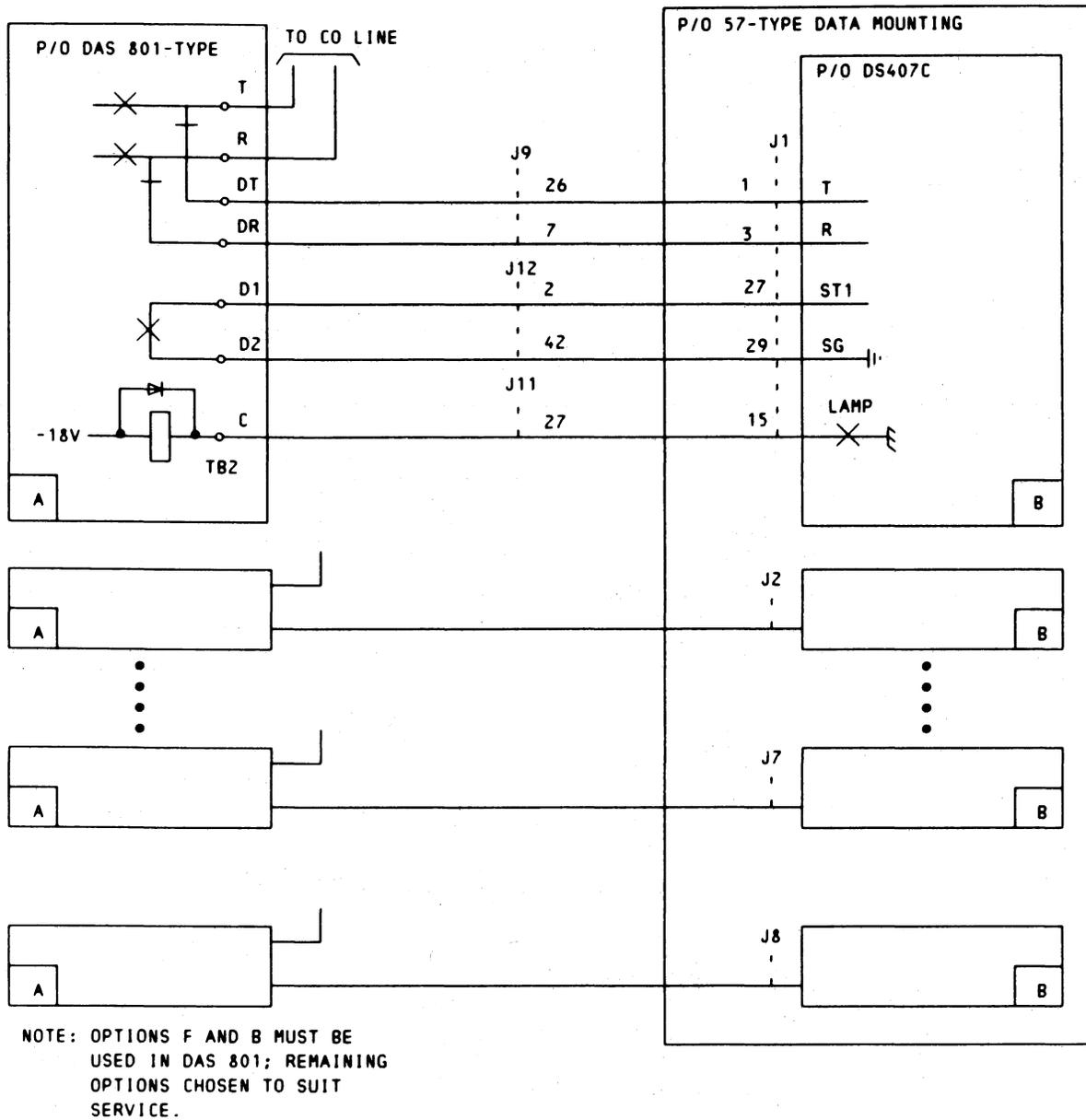
Fig. 12—Connections for Data Auxiliary Set 801-Type in 407C Multiple Data Station

NOTE: OPTIONS F AND B MUST BE
USED IN DAS 801; REMAINING
OPTIONS CHOSEN TO SUIT
SERVICE.