

DATA AUXILIARY SET 828C INSTALLATION AND CONNECTIONS

	CONTENTS	PAGE
1.	GENERAL	1
2.	SPECIAL TOOLS AND APPARATUS	2
3.	INSTALLATION	2
	A. Installation of Wall-Mounted Unit (DAS 828C-L1A)	2
	B. Installation of Rack-Mounted Unit (DAS 828C-L1)	13
4.	CONNECTIONS	13
	A. Option Connections	13
	B. Loop-Back Connections	13
	C. Power Connections	14
	D. Connecting Cords to Telephone Set and Data Set	14
	E. Additional Station Lines	15
	F. Key Telephone Set	15
5.	INSTALLATION TESTING	15
6.	REFERENCES	16

1. GENERAL

1.01 This section contains information and instructions for the installation and connection of data auxiliary set (DAS) 828C. This section does not cover the installation of any other equipment that is used in conjunction with the DAS.

1.02 This section is reissued to:

- Include a method of providing 2-line direct distance dialing (DDD) backup to private line data sets that are not sufficiently sensitive

for DDD receive levels. Data sets such as 208A and 201C possess this characteristic.

- Show data set 202R wiring which has been revised to provide a better means of interconnecting to DAS 828-type.
- Add instructions concerning the second line button when 2-wire data set backup is provided.

1.03 The DAS 828C is primarily for use in providing switched network backup capability to a 4-wire private line (PL) voicegrade data channel where a DAS 828A is used to terminate the PL channel. The DAS 828C may also be used to provide backup capability to a 4-wire PL that is not equipped with DAS 828A, or to simply provide a 4-wire channel over the switched network where a PL is not involved.

1.04 The DAS 828C is designed for use with 2-wire and 4-wire telephone company-provided data sets.

1.05 The DAS 828C is available under two list codes, as follows:

- DAS 828C-L1 (rack-mounted)
- DAS 828C-L1A (wall-mounted).

1.06 The DAS 828C-L1 consists of two separate units: the repeat coil and ring-up relay assembly and the transfer, control, and signaling assembly. These units are assembled on hanger bars and plug together to form a single prewired and tested package. The DAS 828C-L1 is also suitable for mounting on 19-inch or 23-inch relay racks, 31B or 16C apparatus mountings, and various equipment cabinets.

1.07 The DAS 828C is not a complete functional unit. An 89-type plug-in resistor must be specified to meet the circuit requirement in the transmit line. Information for verifying the proper value resistor is given in Part 5 of this section.

SECTION 598-080-201

A key telephone set is required for controlling DAS 828C. The 568HAA-3 telephone set is supplied with DAS 828A-L1/2 at stations arranged for full data/alternate voice (FDA) and DDD backup, and can also be used with DAS 828C. For stations not arranged for alternate voice, such as full data (FD), but requiring DDD backup capability, a 565HK key telephone set is required and must be ordered separately. Both telephone sets will require wiring changes as given in Part 4 of this section. In addition, a power supply is required.

2. SPECIAL TOOLS AND APPARATUS

2.01 The following test equipment is required for installation testing of DAS 828C when installed with a 227D amplifier:

- One voiceband transmission test set, TTS-4 or equivalent, with bridging measurement capacity.
- One 2W6A patch cord or equivalent (310 plug on one end and clip leads on the other end).

No special tools or test equipment is required to install DAS 828C without a 227D amplifier.

3. INSTALLATION

3.01 A front view of a data-only station arrangement and installation with DDD backup is shown in Fig. 1. This consists of DAS 828A-L1 and 828C-L1 mounted together on a 16C apparatus mounting. This arrangement, together with a 565HK telephone set (not shown), the proper plug-ins, and power supplies, make up a complete arrangement for one 4-wire PL circuit with DDD backup.

3.02 A block diagram of the data-only station arrangement with DDD backup is shown in Fig. 2.

3.03 A rear view of the data-only station arrangement and installation with DDD backup and the 565HK telephone set is shown in Fig. 3. The 565HK telephone set must be ordered separately. Also shown are the associated 66-type terminal blocks, plug, and connectors. Instructions for attaching external wiring to the 66-type terminal blocks are given in Section 461-604-100.

3.04 A block diagram showing the connections for 4-wire DDD backup service with alternate data/voice on the 4-wire PL is shown in Fig. 4. Apparatus required for this arrangement is shown in Fig. 5.

3.05 Data sets designed for PL use only, such as data set 208A or 201C, can be provided with 2-line DDD backup using DAS 828 and a 227D amplifier. The 227D amplifier increases the DDD receive level to nearly coincide with the PL receive level.

A. Installation of Wall-Mounted Unit (DAS 828C-L1A)

3.06 The procedure for a wall-mounted installation is as follows:

- (1) Mount the 177A backboard to the wall using instructions given in Section 463-130-100.

Note: The 31B apparatus mounting can be arranged to open either from the left or the right.

- (2) If DAS 828C is associated with DAS 828A-L1/2, connect per Fig. 4. Modify the telephone set per Fig. 6A.

Note: Verify that the RING key is converted to nonlocking (signaling) operation.

- (3) If DAS 828C is associated with DAS 828A-L1, connect per Fig. 2. Modify the telephone set wiring as shown in Fig. 6A and, if the data set is 2-wire, modify the telephone set wiring per Fig. 6B.

- (4) If DAS 828C is associated with a PL data set, such as data set 208A or 201C, that is not compatible with the switched network and 2-line DDD backup is desired, a 227D amplifier must be used. The additional parts required to mount the 227D amplifier with DAS 828C are listed below.

Quantity	Item
1	Mounting shelf, J98615AF-1, L-1B
1	Mounting plate (locally fabricated per Fig. 7)
4	Screw, P-44L168

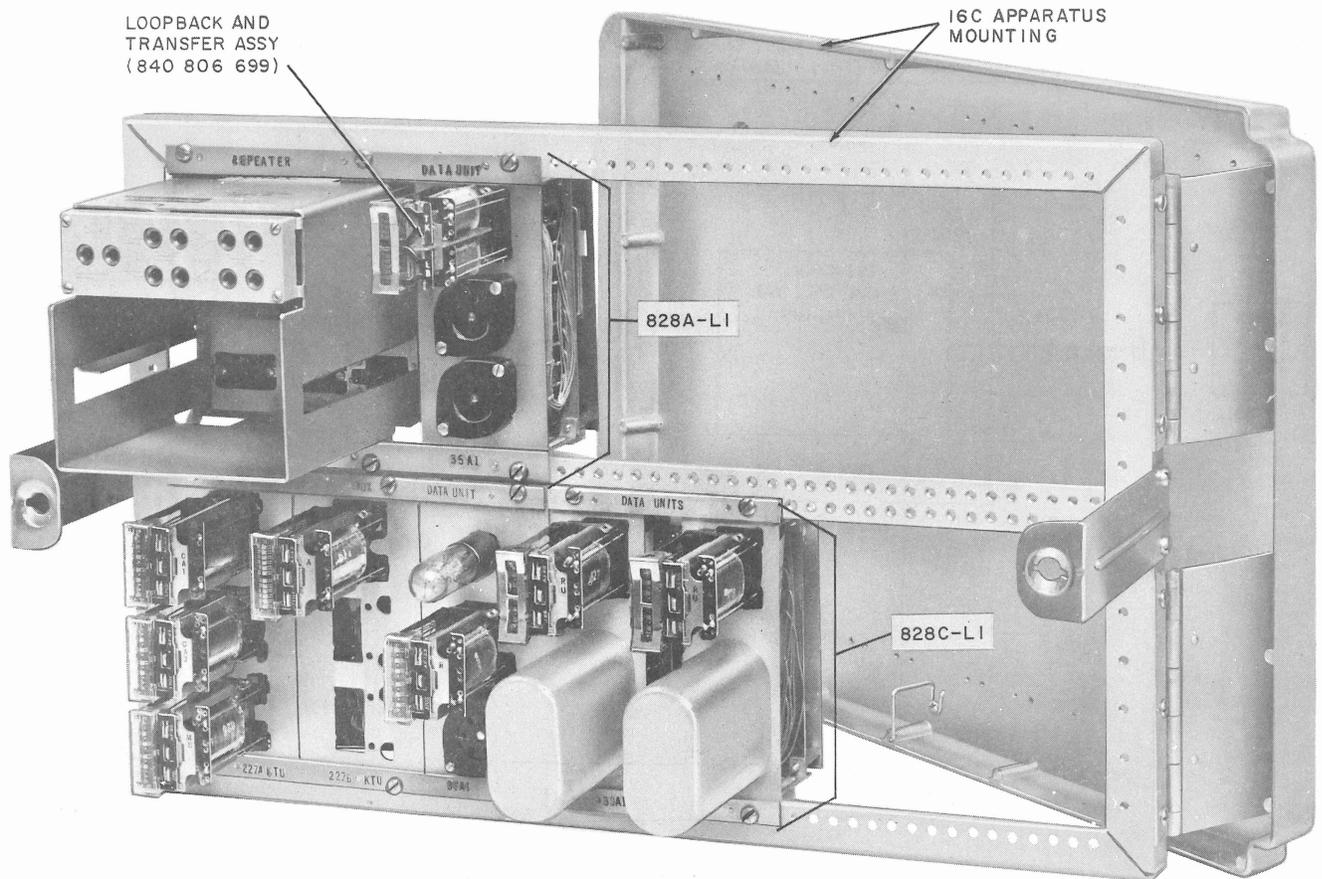


Fig. 1—Front View of Data-Only Station Arrangement with DDD Backup

- 4 Screw, 6-32 \times 1/4
 4 Nut, 6-32.

Fabricate the mounting plate as shown in Fig. 7. Mount the 227D amplifier as shown in Fig. 8. Connect the 227D amplifier as shown in Fig. 9. Set the 227D amplifier for zero gain until installation tests are completed.⚡

- (5) Install the required option wiring as specified on the service order to terminals on TB1, TB2, or TB3. Refer to Fig. 10 for details.
 (6) If specified on the service order, connect the loop-back circuit for local operation as

shown in Fig. 11. The 348-ohm resistor must be supplied locally.

- (7) Connect the power supply leads to terminals 3, 4, 31, and 32 of TB1 as shown in Fig. 12. Insulate the leads on terminals 31 and 32 with SSM-type insulators.
 (8) Install options as required in the Bell System data set.
 (9) Connect the data set to DAS 828C using the plug-in cable to DATA plug P1, or connect to terminals on TB3.

SECTION 598-080-201

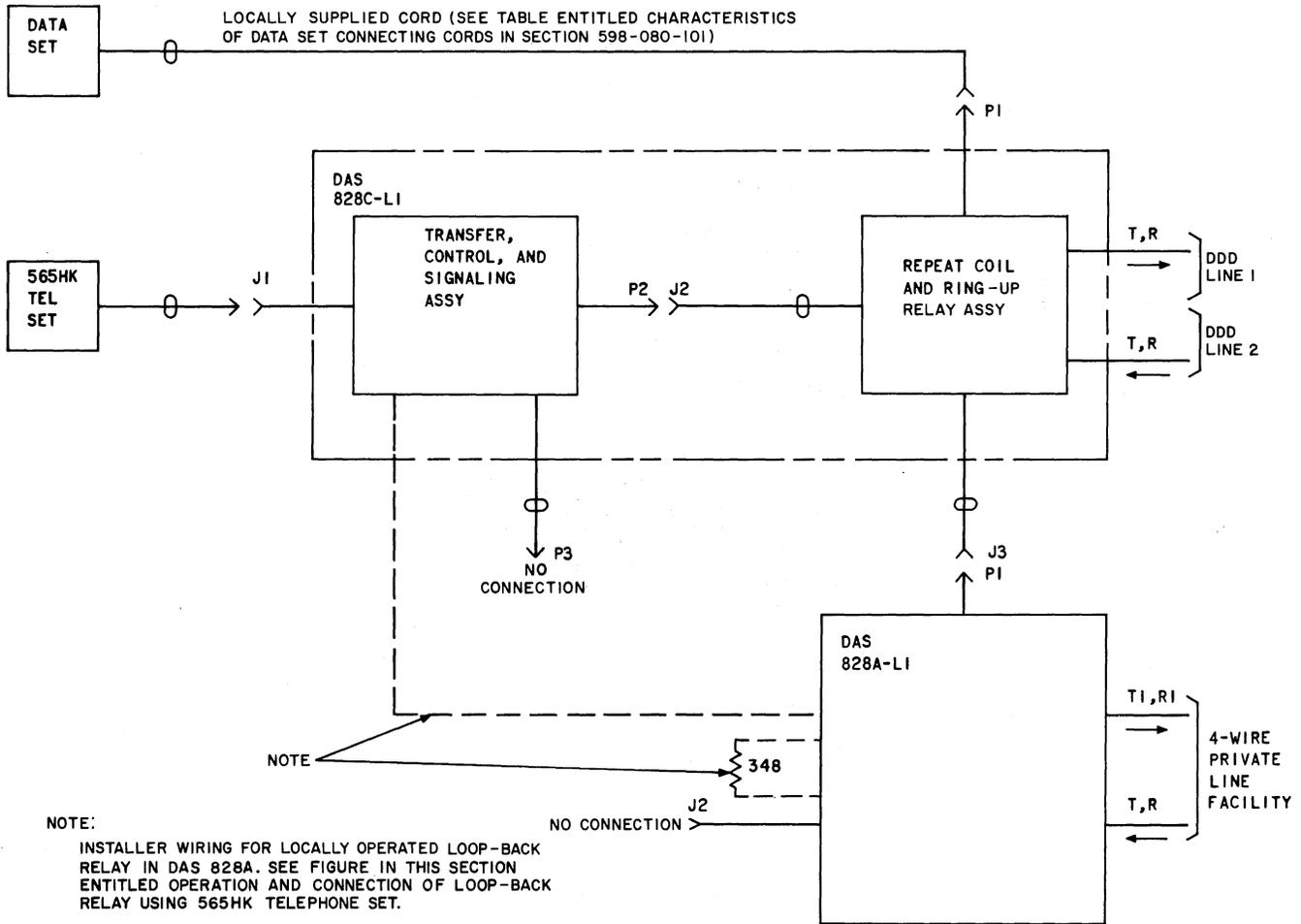


Fig. 2—Circuit Arrangement for DDD Backup of 4-Wire Private Line Without Alternate Voice Transmission

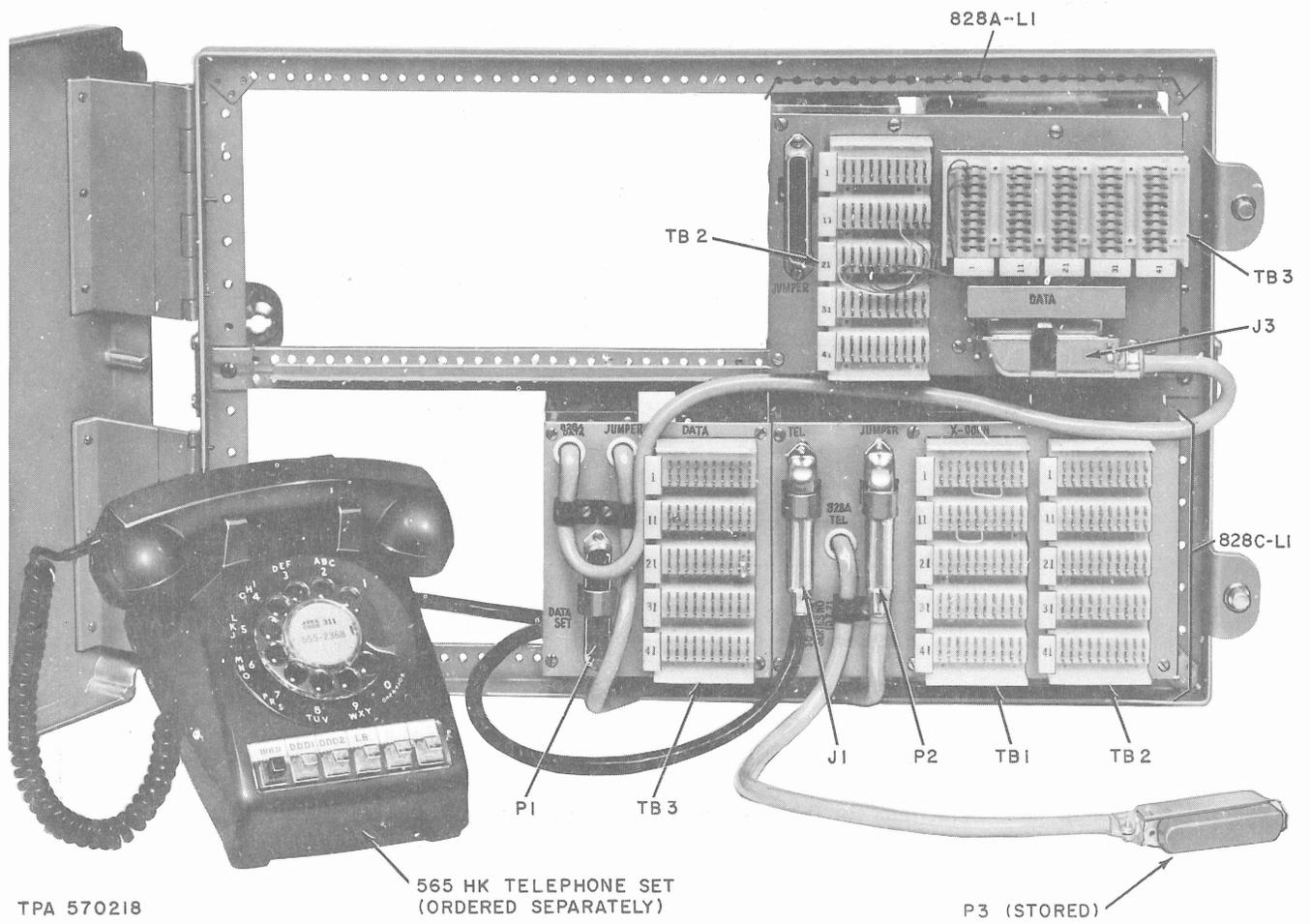


Fig. 3—Rear View of Data-Only Station Arrangement With DDD Backup

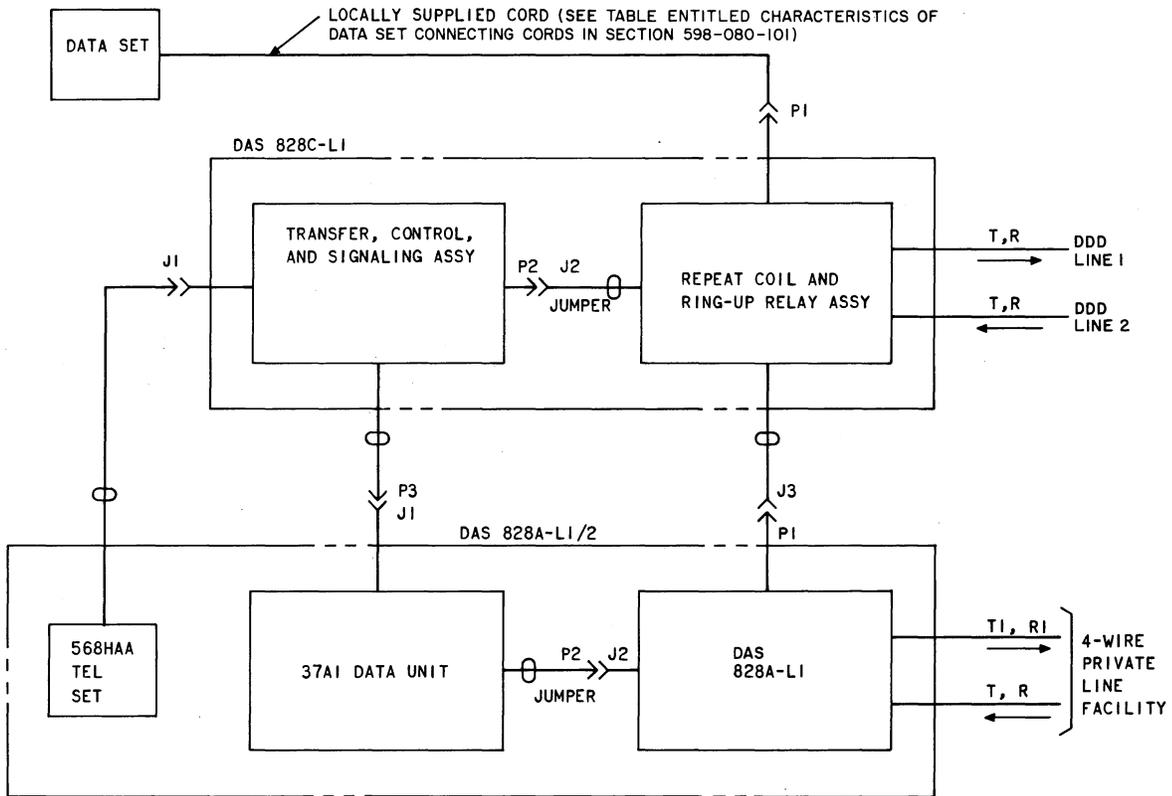


Fig. 4—Connections for DDD Backup for Alternate Data/Voice on Private Line

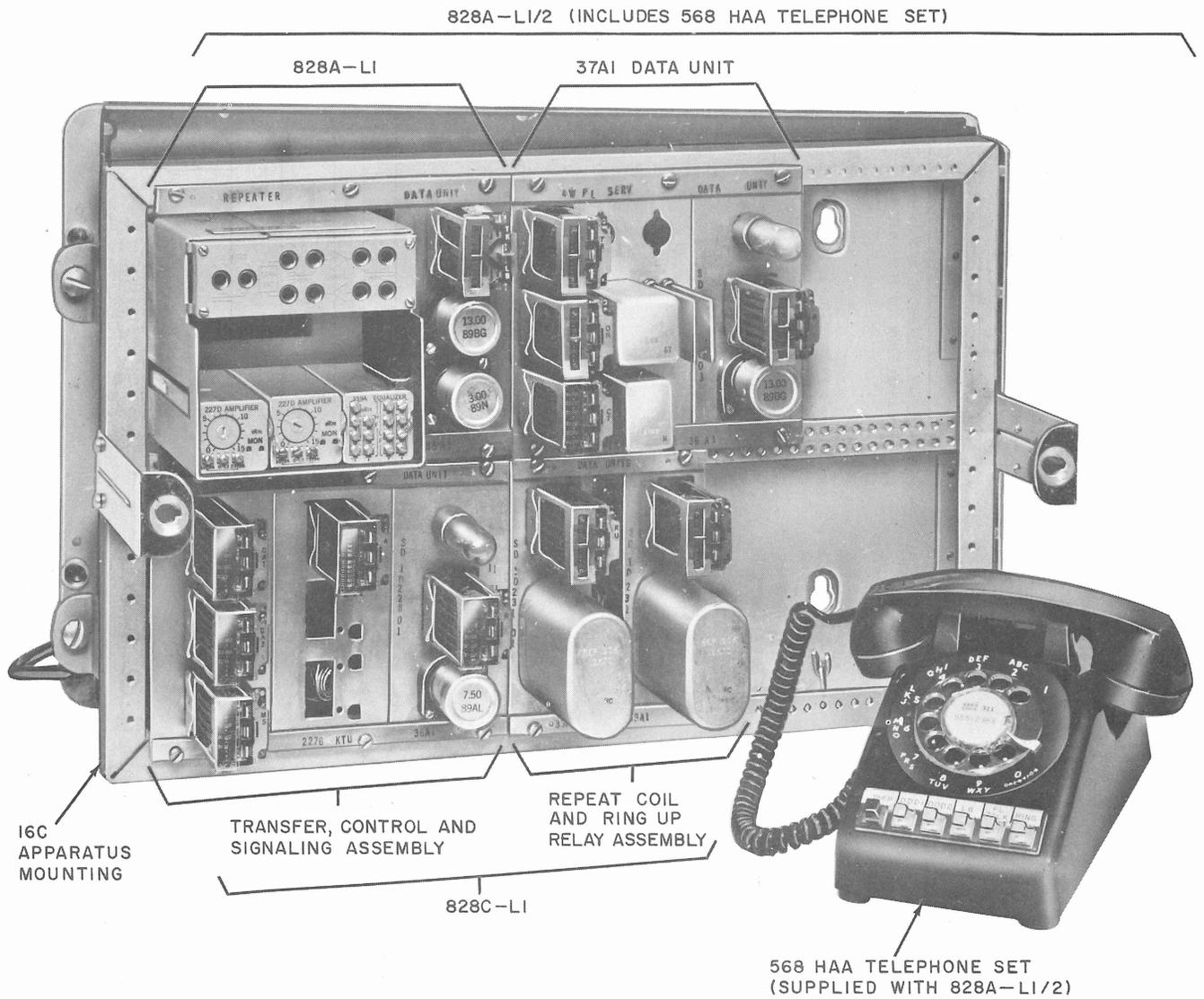
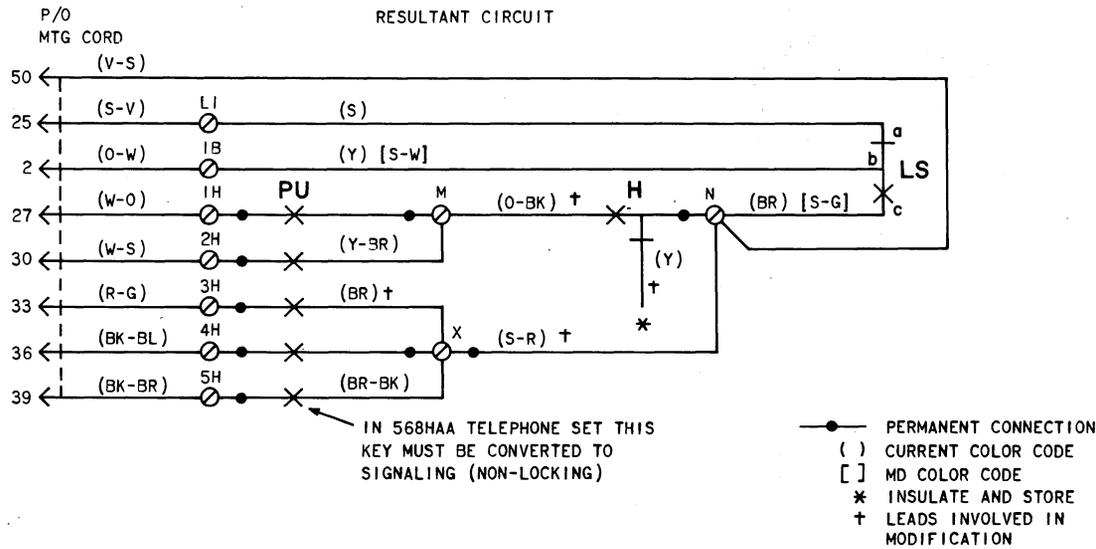


Fig. 5—Front View of DAS 828C-L1 and DAS 828A-L1/2 Shown With Plug-In Units



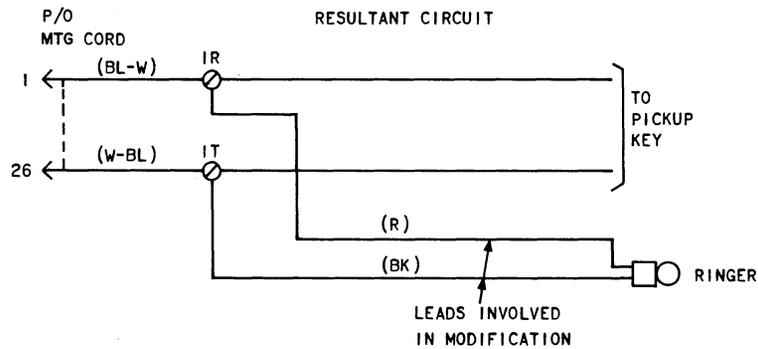
WIRING TABLE

636A KEY LEADS				
COLOR	BR	Y	O-BK	S-R
REMOVE FROM	M	M	INSULATED AND STORED*	M
CONNECT TO	X	INSULATE AND STORE	M	N

* IN 565HK TELEPHONE SET THIS LEAD IS STORED BY CONNECTION TO TERMINAL N.

H HOLD KEY
PU PICKUP KEY
LS LINE SWITCH

6A. FOR ALL APPLICATIONS

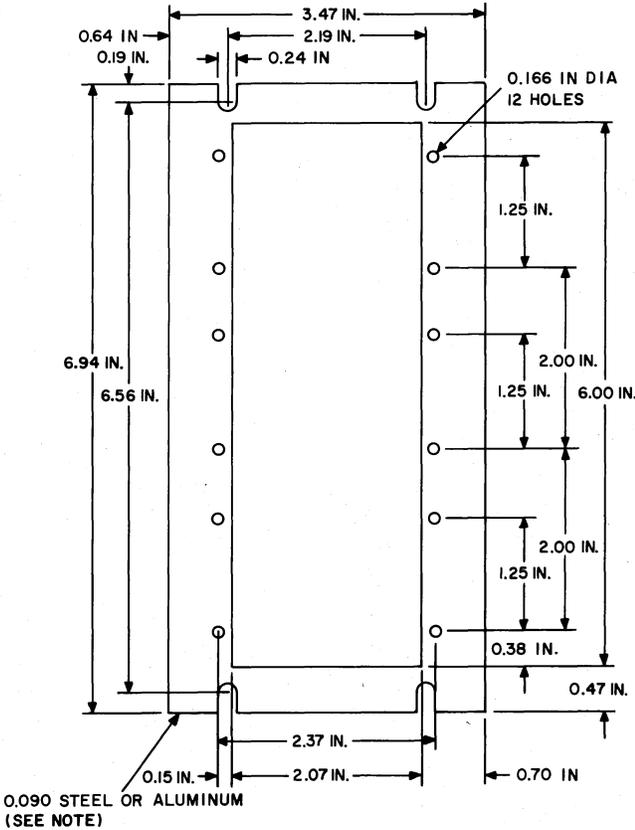


WIRING TABLE

636A KEY LEADS		
COLOR	R	BK
REMOVE FROM	RR	RT
CONNECT TO	IR	IT

6B. RINGER WIRING FOR PL DATA (NO PL VOICE) WITH 2-WIRE DATA SET

Fig. 6—Key Telephone Set Wiring for DAS 828C



NOTE:
228A KTU PANEL (P-12C391) MAY BE USED.
ADD 6.00 IN. X 2.07 IN. CUTOUT AND 12 HOLES.

Fig. 7—Mounting Plate for 227D Amplifier

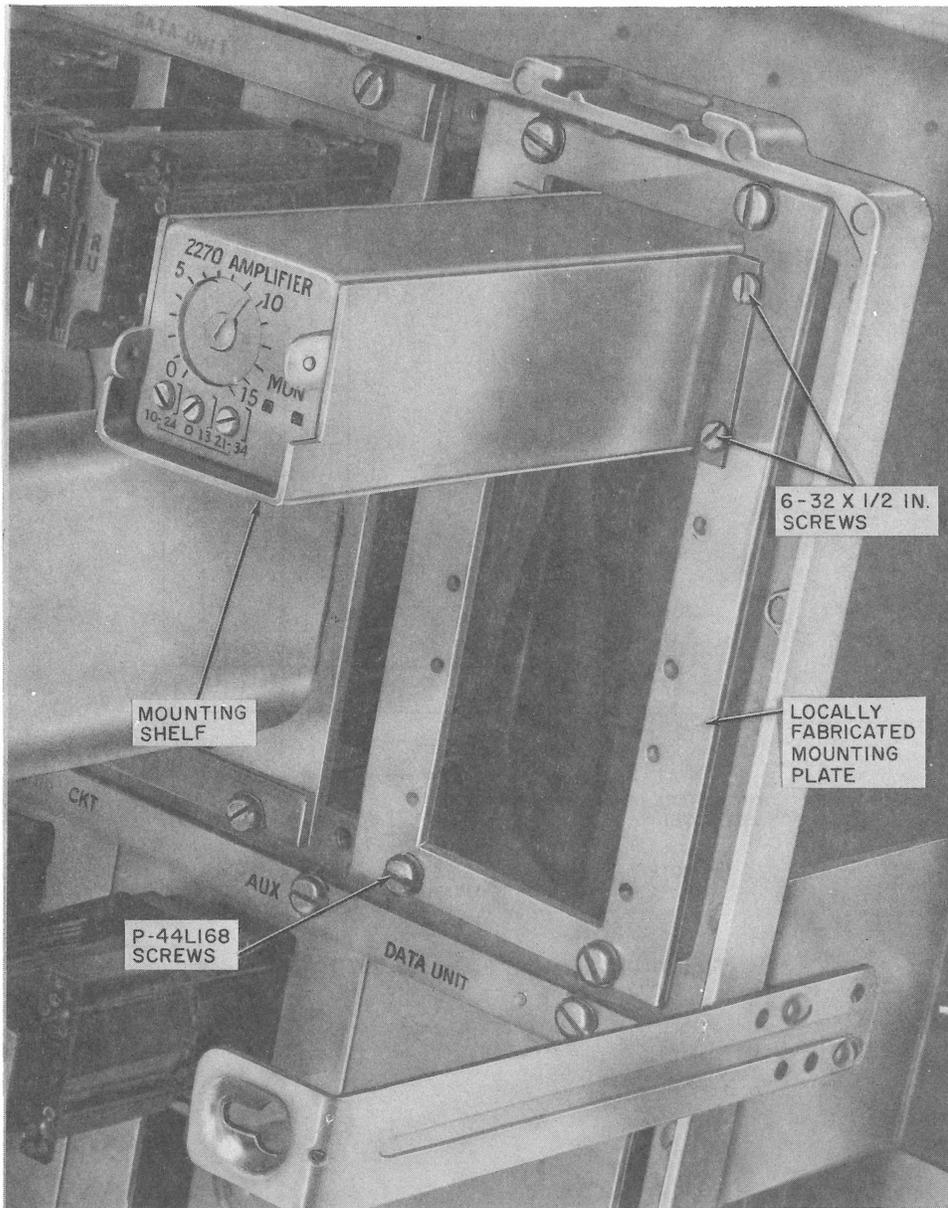


Fig. 8—▶Front View of Mounted 227D Amplifier◀

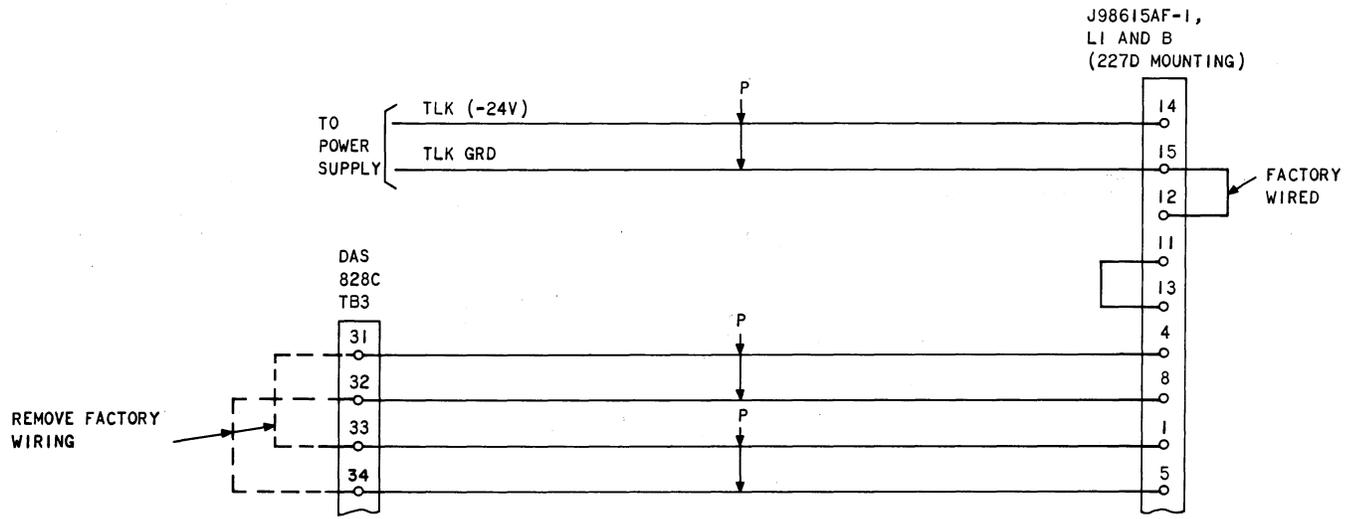
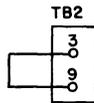
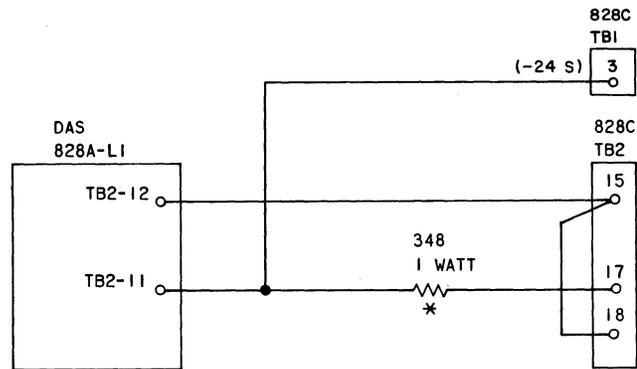
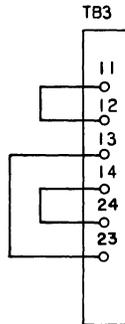


Fig. 9 → Wiring for 227D Amplifier ←

OPTION W, SINGLE LINE BACK UP



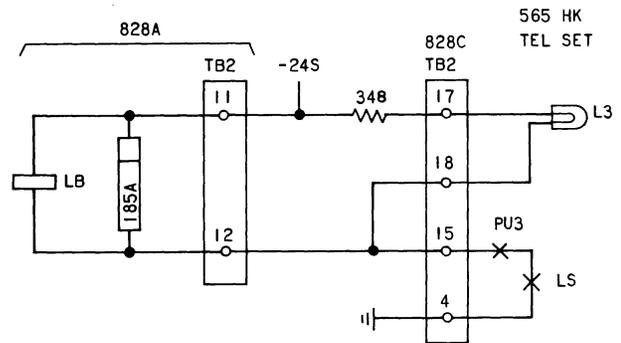
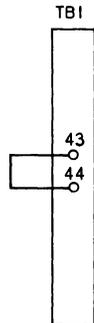
OPTION X, NOT-IN-DATA INDICATION CONTROLLED ONLY BY DAS 828C



* KS-13491, L3, OR OHMITE "LITTLE DEVIL", OR IRC GBT-1 (LOCALLY SUPPLIED)

A. INSTALLER WIRING

OPTION Y, NOT-IN-DATA INDICATION DURING SET-UP OF CALL



B. OVERALL SCHEMATIC

OPTION Z, TERMINATE DATA SET IN IDLE STATE

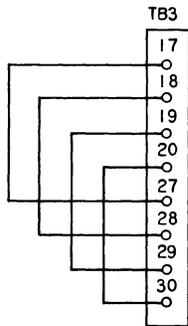
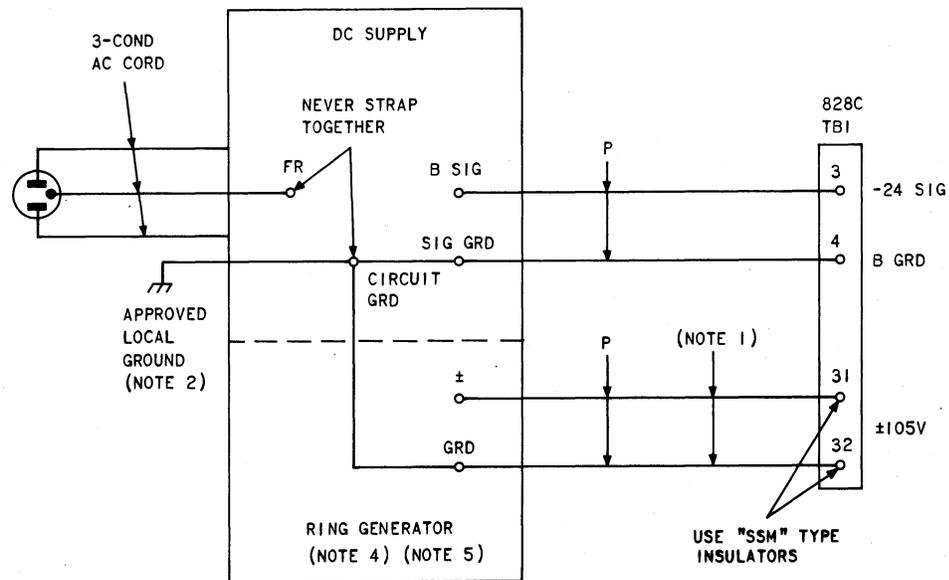


Fig. 11—Operation and Connection of Loop-Back Relay Using 565HK Telephone Set

Fig. 10—Option Wiring Connections



NOTES:

1. RUN RING GENERATOR LEADS SEPARATE FROM ALL OTHER LEADS.
2. CONNECT ALL GROUNDS EXCEPT FRAME (FR) GROUND TO LOCAL GROUND AS SHOWN TO MINIMIZE 20-HZ OR 30-HZ PICKUP.
3. STRAP POWER SUPPLY FOR 117 VOLTS AC INPUT (FACTORY SHIPPED).
4. RING GENERATOR MAY BE A SEPARATE SUPPLY.
5. RING GENERATOR NOT USED FOR BACKUP OF PL DATA (NO PL VOICE) WITH 2W DATA SET. SEE FIGURE 6B FOR TELEPHONE SET RINGER CONNECTION.

Fig. 12—Power Supply Connections to DAS 828C

(10) Install the incoming telephone lines as follows:

SWITCHED NETWORK		TB1
DDD1	T	11
	R	12
DDD2	T	21
	R	22

(11) Apply power and perform test referred to in 5.01.

B. Installation of Rack-Mounted Unit (DAS 828C-L1)

3.07 The procedure for a rack-mounted installation is as follows:

(1) Assemble and set up the relay rack and/or mounting bars.

(2) Mount DAS 828C to the relay rack mounting bars.

(3) Perform Steps 3.06(2) through (11) to complete the installation.

4. CONNECTIONS

A. Option Connections

4.01 Service options are shown in Fig. 10. The DAS 828C is factory-shipped without any options, ready for use with DAS 828A and any 4-wire data set, with the exception of data set 203-type which requires the use of option Y.

B. Loop-Back Connections

4.02 The loop-back relay in DAS 828A may be operated remotely or locally as required by

SECTION 598-080-201

the telephone company. The service order should specify whether local or remote operation is desired.

4.03 When the 565HK telephone set is used and local operation of the loop-back relay is required, one of the spare keys (PU3) on the 565HK telephone set is used. Figure 11 shows the installer wiring that provides for control of the loop-back relay by using the PU3 key contact in the telephone set. Figure 11 also gives the overall schematic that shows how the loop-back relay is operated and that LB lamp (L3) is lighted whenever the PU3 key is depressed with the handset off-hook.

C. Power Connections

4.04 The power supply for DAS 828C should be connected as shown in Fig. 12. The physical separation of the battery pair that leads from the pair carrying the ringing signal is recommended to prevent pickup of 20-Hz or 30-Hz ringing voltage.

4.05 When ringing voltage is used with DAS 828C, DAS 828C quick-connect TB1-31 and 32 terminals must be insulated with SSM-type insulators. Use two C clip terminal insulators or equivalent.

4.06 For PL data (FD) with 2-wire data sets, no ringing supply is required. The telephone set ringer can be connected directly to the T(1)-R(1) terminals in the key telephone set.

D. Connecting Cords to Telephone Set and Data Set

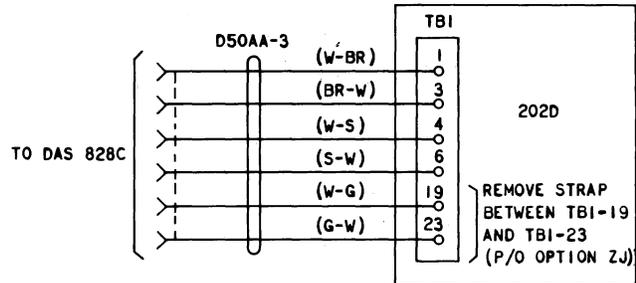
4.07 The DAS 828C can be located either close to or some distance away from the data set and key telephone set. The key telephone set cord is 5 feet in length, while the data set cord length varies, depending upon the cord selected. When the length of the data set and telephone set cords is not sufficient, standard A- and B-type connecting cables should be used. The cords to be used and connections at the data set are shown in Section 598-080-200.

Note: For 2-wire data sets 202D and 202R, use the wiring as shown in Fig. 13 of this section rather than that shown in Section 598-080-200.

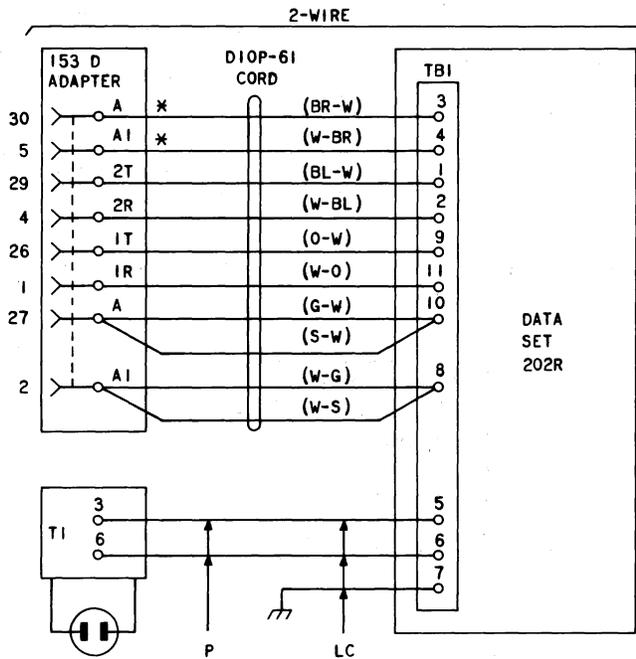
4.08 There are restrictions on the maximum allowable cable length. Control circuits in

the DAS or data set will not operate over excessively long cables due to the high cable pair resistance. The maximum cable lengths recommended for DAS 828C are given in Fig. 14.

4.09 When DAS 828C is used without DAS 828A, the distances shown in Fig. 14 apply from DAS 828C to the terminal equipment.



DATA SET 202D

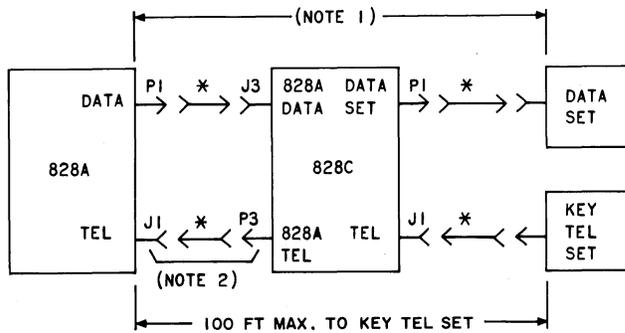


NOTE:
 TI IS KS-16886, L2 OR EQUIVALENT, AND IS SUPPLIED WITH 202R-L1/2.

* A, A1 PAIR ASSOCIATED WITH TERMINALS 30, 5 OF CONNECTOR MUST BE USED.

DATA SET 202R

Fig. 13—Two-Wire Data Set 202-Type Wiring



* B-TYPE CONNECTING CABLES (OR EQUIVALENT) AS REQUIRED

NOTES:

1. DISTANCE FROM 828C (OR 828A) TO DATA SET

DATA SET	MAXIMUM DISTANCE (FEET)
DATA SET 201	50
DATA SET 202D	500
DATA SET 202R	70
DATA SET 203	1400

2. THIS CONNECTION MADE ONLY WHERE PRIVATE LINE VOICE TRANSMISSION IS REQUIRED.

Fig. 14—Distance Limitations for DAS 828C

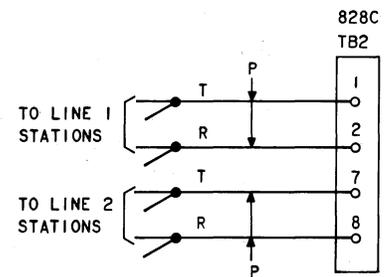
E. Additional Station Lines

4.10 When the switched network lines are not being used for data transmission, it is possible to use them for other applications. However, additional station sets should not be connected to these lines unless they are connected so they do not interfere with data transmission. The top part of Fig. 15 shows how to connect additional station sets to either or both lines. These additional stations are excluded from the line pairs whenever a data call is set up.

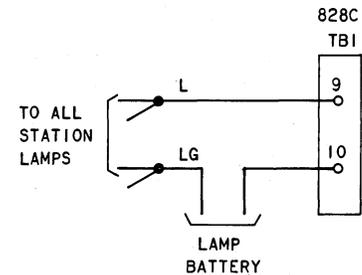
4.11 The bottom part of Fig. 15 shows the connections of a lamp associated with each added station. This provides an indication to the station set when it is cut off. As shown, all lamps are connected in parallel and powered from a locally provided supply.

F. Key Telephone Set

4.12 The factory wiring of either the 568HAA-3 or 565HK telephone set will require changes to adapt it for use with DAS 828C. These changes are shown in Fig. 6, which also shows the overall wiring of the modified telephone set. The wiring changes put a HOLD make contact in series with the PU1 and PU2 contacts. This allows the station



A. CONNECTION OF ADDITIONAL STATIONS ON DDD LINES



B. LAMP INDICATION FOR ADDED STATIONS

Fig. 15—Connection of Additional Stations on DDD Lines

operator to hold the dial-up lines. In addition, the PU3 through PU5 key contact wiring is changed so that the HOLD key is bypassed. In one application, the ringer wiring is also changed. For 2-wire data sets, the DDD2 button is not used. Block this button and remove its lamp.

5. INSTALLATION TESTING

5.01 After completing the installation procedure for the DAS, it must be tested as outlined in Section 598-080-501. These tests are required to ensure proper operation following installation.

5.02 After completing the installation tests, adjust the 227D amplifier as follows:

(1) Disconnect the data set from DAS 828C. Connect the REC 310 jack of the TTS-4 to TB3-9 and -10 of DAS 828C. Set the TTS-4 REC IMP to 600Ω.

(2) With handset off-hook, press the line 2 button and dial the directory number of the central office (CO) milliwatt supply. Once connected, press the HOLD key. Now adjust

the 227D amplifier so that the TTS-4 meter reads +3.7 dBm.

(3) Adjustment is now complete. Place the handset on-hook, disconnect the TTS-4, and reconnect the data set.¶

5.03 The 89-type resistor for the pad socket should be specified on the service order and may be verified by performing a path loss measurement to the CO. This pad is used to set the transmit signal level arriving at the CO. The plug-in 89-type resistor is selected by determining the loss from the CO to the line side of the pad. Once the loss is known, the pad value can be found by knowing what the data set transmit level is and what level is required at the CO.

5.04 Results of tests and values of transmission levels should be recorded for future use as bench mark measurements.

5.05 For wall-mounted installations, the 116A dust cover should be installed over the DAS after installation work and tests are completed.

CONTENTS

PAGE

6. REFERENCES

6.01 The following sections provide additional information for installing the DAS.

SECTION	TITLE
461-604-100	Connecting Blocks 66-Type—Tools, Terminating, Adapters, and Maintenance
463-140-100	Equipment Cabinets and Apparatus Mountings—Installation
590-010-200	Data Sets—General Installation and Connection Information
800-610-158	Packaged Electronic Products—Wiring, Cabling, Numbering, and Lettering