

WIDEBAND DATA STATION USING DATA SET 306 POINT-TO-POINT, LIMITED DISTANCE INSTALLATION AND CONNECTIONS

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1. GENERAL

1.01 This section is issued to provide information concerning the installation and connection of Data Set (DS) 306 and associated equipment in a wideband data station.

1.02 For general installation and connection information, refer to the section entitled Data Sets, General Installation and Connection Information (590-010-200).

1.03 Figure 1 shows the front view of a wideband data station using DS 306A-L1/2, in a KS-20018-L3 cabinet, and Data Auxiliary Set (DAS) 804A-type. Also shown mounted in the cabinet is the T1 line terminating unit (LTU) and associated KS-15620-L14 power supply which are part of the T1 line. Figure 2 identifies the cords, connectors, and equipment in the rear view of the arrangement of Fig. 1. The business machine interface connector, J10, on the rear of DS 306A-type is a 34-pin Winchester MRA-34-S-SFC-J.

2. INSTALLATION

2.01 Data Set 306A-type has two configurations:

- (a) DS 306A-L1—Consists of 33A1 Data Unit (DU), 41A2 power unit, 840129985 cord assembly, and a P3BG cord. The intended application for this configuration is in the wideband data test bay. Information concerning the

installation and connection of DS 306A-L1 is covered in Engineering Letter (EL) 1232.

- (b) DS 306A-L1/2—Consists of 32A1 DU (series 2 or higher), 33A1 DU, 41A2 power unit, 840129977 cable assembly, 840129985 cord assembly, and a P3BG cord. This configuration is used in wideband data station arrangements normally located at the customer's premises.

2.02 Only a 32A1 DU of series 2 or higher may be used in DS 306A-L1/2.

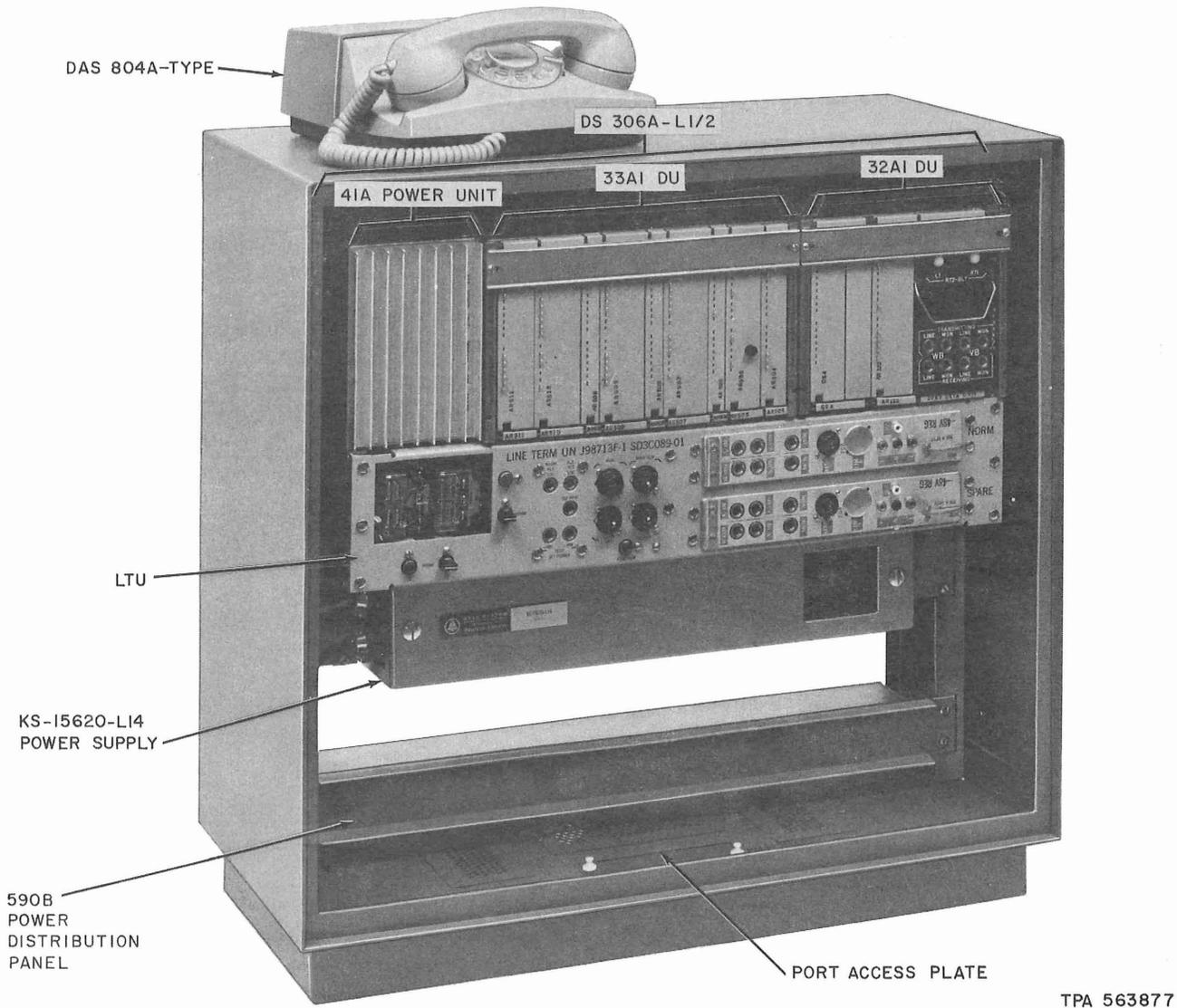
2.03 The DS 306A-L1/2 can be used in the following station arrangements:

- (a) The data set is used with a telephone set or DAS 804A-type functioning as a typical telephone set.
- (b) The data set is used with DAS 804A-type providing limited control.
- (c) The data set is used with DAS 804A-type control providing DATA-PHONE® features.

2.04 The DAS 804A1, A3, A5, or A7 may be used with the station arrangement. The DASs 804A1 and A3, which are rated Manufacture Discontinued, are replaced with DASs 804A5 and A7, respectively. If DAS 804A1 or A3 is to be used with the station arrangement, a 185A protection network must be connected between terminals 44 and 46 on the 3A1 DU located in DAS 804A1 and A3.

2.05 The line terminating unit (LTU) and associated power supply (KS-15620-L14) are used with DS 306A-L1/2 on T1 line installations and can be installed in the same cabinet with the data set, or they can be separated from the data set by up to 750 feet.

2.06 The DS 306A-type may be installed in a Bell System-provided cabinet (KS-20018-type) or



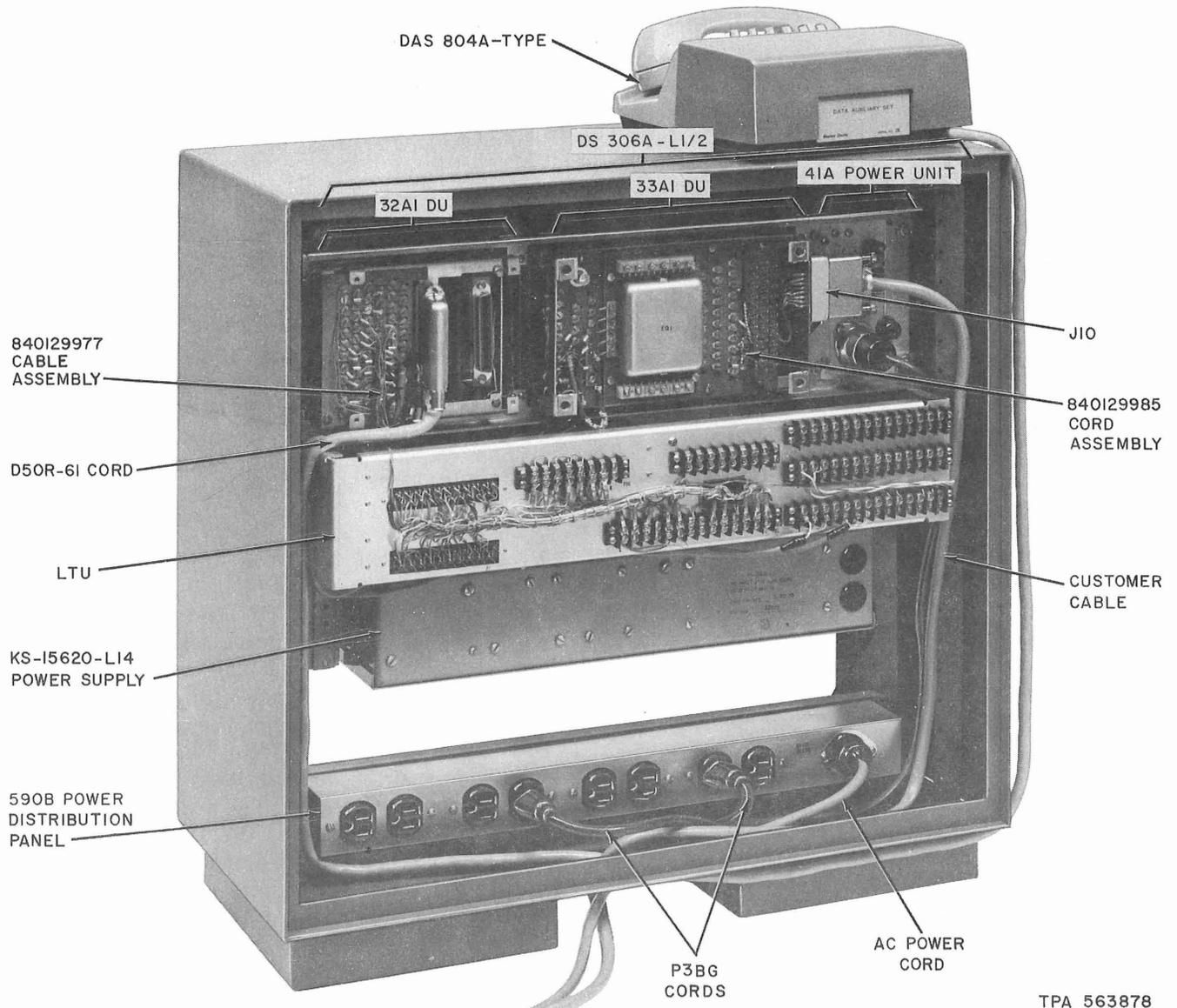
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Fig. 1—Front View of Station Arrangement Using DS 306A-L1/2 With LTU and Associated Power Supply Mounted in Data Station Cabinet

23-inch relay rack of No. 5 crossbar-type or bulb angle-type. The size of the cabinet needed for installing DS 306A-type will depend upon whether or not the LTU and associated power supply are being installed in the cabinet. Cabinet KS-20018-L1 will accommodate DS 306A-type only. Cabinet KS-20018-L3 will accommodate DS 306A-type, the LTU and associated power supply, and a 590B power distribution panel. If DS 306A-type is going to be installed in a cabinet, refer to the section entitled Data Sets, Multiple Installation Information

(590-010-201) for additional cabinet sizes and installation information.

2.07 Before attempting to install the LTU in the data station cabinet, attach the side mounting brackets (provided loose with the LTU). Use the set of four threaded holes located nearer the rear of the LTU chassis. If the wrong set of mounting holes is used, the rear cabinet cover may short out the terminals on the rear of the LTU. The KS-15620-L14 power supply, used with the LTU,



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Fig. 2—Rear View of Wideband Data Station Arrangement Using DS 306A-L1/2 With LTU and Associated Power Supply Mounted in Data Station Cabinet

requires two adapter brackets (P-426535 adapters) before it can be mounted in the data station cabinet or relay rack.

2.08 The DS 306A-type should be installed within range of the interface cable supplied by the customer. This cable should not exceed 100 feet in length.

2.09 If the circuit packs have to be inserted in the data set when it is installed, refer to Fig. 3 for proper location of the circuit packs.

2.10 The DAS 804A-type, optional with DS 306A-L1/2, is of the desk-top type telephone apparatus and is not to be mounted in the cabinet. It may be placed on top of the cabinet or at any other convenient location up to 75 feet away from the data station if a B25A extension cable is used. The B25A extension cables are available in 5-, 15-, 30-, and 60-foot lengths.

2.11 The customer must furnish a 3-wire outlet that supplies a nominal 117 volts at 50 to 60 Hz. The outlet must accept a plug equipped

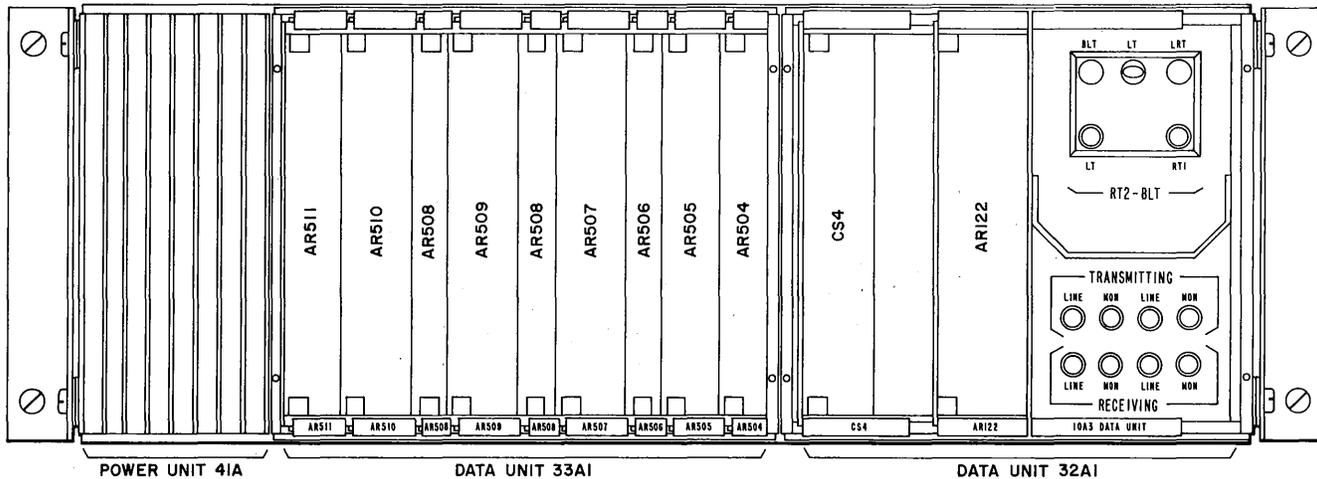


Fig. 3—Circuit Pack Location in Data Set 306A-L1/2

with two parallel blades and a U-shaped grounding pin. This outlet is not to be under the control of a switch. The customer should be instructed that once power is applied to DS 306A-type, it should not be removed because a lack of line signal from DS 306A may cause the T1 line to go into a trouble state.

2.12 To minimize inductive interference to the data signal on the telephone (data) lines, the lines should not be carried in the same run as cable between the data station and the customer's business machine or lines carrying dc teletypewriter services.

2.13 The cabinet housing DS 306A should be installed in a manner to permit easy access to both the front and rear of the set after the covers have been removed.

2.14 The telephone lines from the data station should be brought out to a connecting block located near the installation and then routed to the building entrance or outside connecting block.

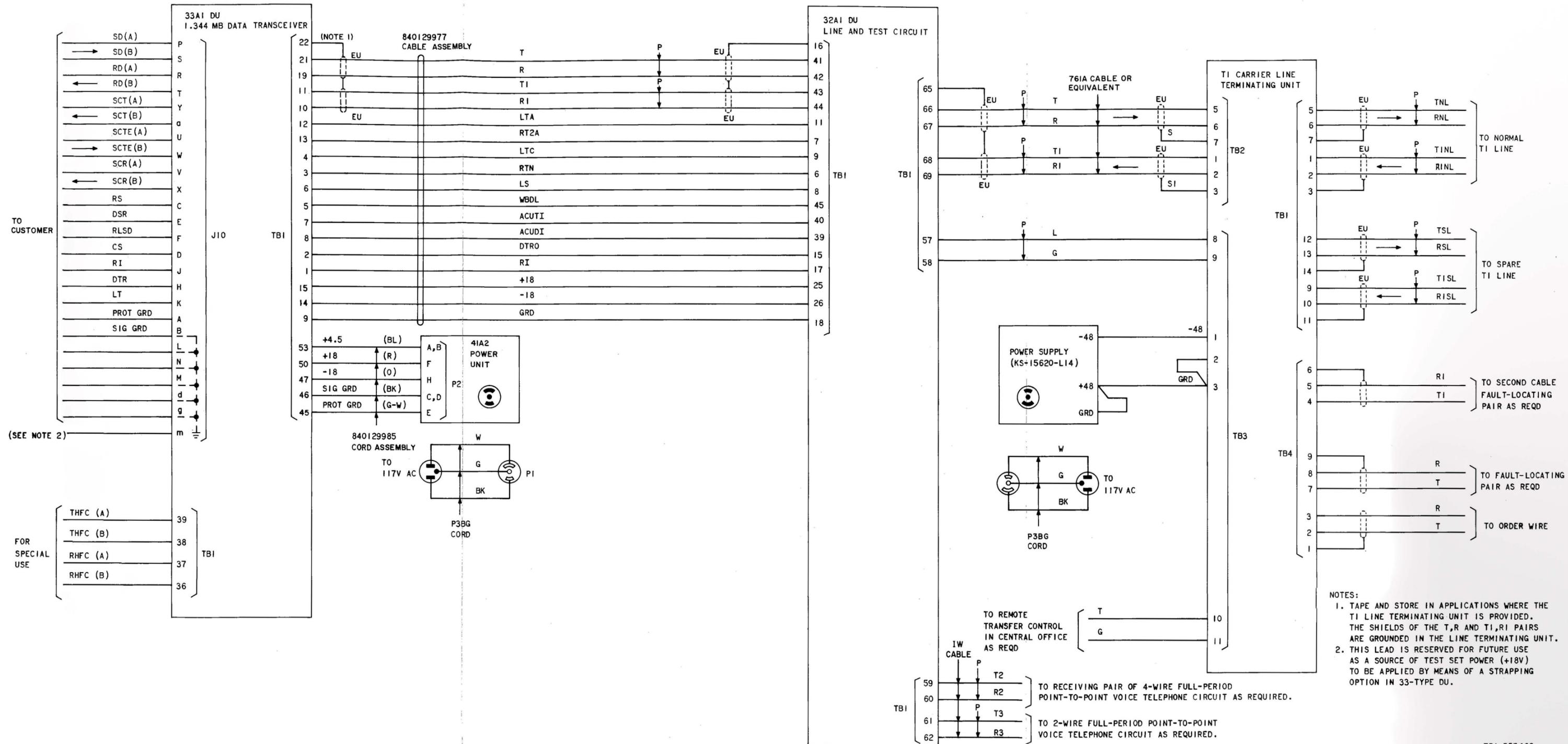
2.15 The private line terminal used with DAS 804A-type should not be mounted in the data station cabinet unless all of the relays in the private line terminal are equipped with protection networks.

3. CONNECTIONS

3.01 The connection of DS 306A-L1/2 (32A1 DU, 33A1 DU, 840129977 cable assembly, 840129985 cord assembly, P3BG cords, and 41A2 power unit), LTU, and KS-15620-L14 power supply is shown in Fig. 4. In this configuration, the test tone detector circuitry of the 32A1 DU must be bridged across the receive pair of the associated telephone line to permit remote testing. The test tone detector circuitry is bridged across the T2, R2 leads when the telephone line is 4-wire and across the T3, R3 leads when the telephone line is 2-wire. Figure 5 shows the connection of DS 306A-L1/2, LTU, KS-15620-L14 power supply, and DAS 804A-type. In this case, the remote test tone path is provided via the required connections to the appropriate private line terminal arrangement.

3.02 All connections to DS 306A are made from the rear of the data set. The power cord from the 41A2 power unit is 10 feet long and is plugged into one of the outlets on the distribution panel when the panel is provided. The distribution panel is located in the bottom of the cabinet. The cord from the distribution panel plugs into the customer-provided ac outlet. If a 590B distribution panel is not used, the power cord from the 41A2 power unit must be plugged into the customer-provided outlet.

3.03 An access port is provided in the bottom of the KS-20018-type data station cabinet to permit the introduction of cords and leads which



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Fig. 4—Connection Diagram of Data Set 306A-L1/2 and LTU

are to be connected to the apparatus mounted in the cabinet. The port is covered by an access plate. To install cords through the access port, remove the plate, rotate it 180 degrees, and place the cords through the port. With the plate in the rotated position, snap the access plate to the cabinet.

3.04 The terminal protection plates on the rear of the 32A1 DU and 33A1 DU must be removed before connections can be made on the rear screw-down terminals. Figure 6 identifies terminal boards on the rear of DS 306A-L1/2 for connection purposes.

Note: To remove the rear cover plate on the 33A1 DU, turn the screws holding the plate 1/4 turn counterclockwise and remove the plate.

3.05 The cable from DS 306A-type to the business machine is provided by the customer and should be 24 gauge multiple twisted pair cable.

3.06 The customer interface leads can be monitored on the terminals on TB2 located on the rear of the 33A1 DU near the interface connector, J10.

3.07 A list of the options and option strappings for the 33A1 DU, 32A1 DU, and DAS 804A-type is given in Tables A, B, and C, respectively, for the three different station arrangements. The service order should list all options that are to be strapped into the data set. For a more detailed description of the options in DS 306A-type, refer to the section entitled Wideband Data Station Using Data Set 306, Point-to-Point, Limited Distance, Description and Operation (593-801-100).

Note: Options wired into DS 306A-type and associated apparatus should be recorded on the label placed in the data station cabinet. This will aid in identifying options and changes on subsequent repair visits.

3.08 In order to help make connections and option strappings, terminal board identification in DAS 804A-type is shown in Fig. 7.

3.09 The DAS 804A-type is equipped with a D50R-61 mounting cord that is equipped with a KS-16699-L1 plug. Access for the cord to the data set is through the port in the base of the cabinet. The KS-16699-L1 plug mates with connector J5 on the rear of the 32A1 DU. If a B25A extension cord is used with DAS 804A-type, one end of the

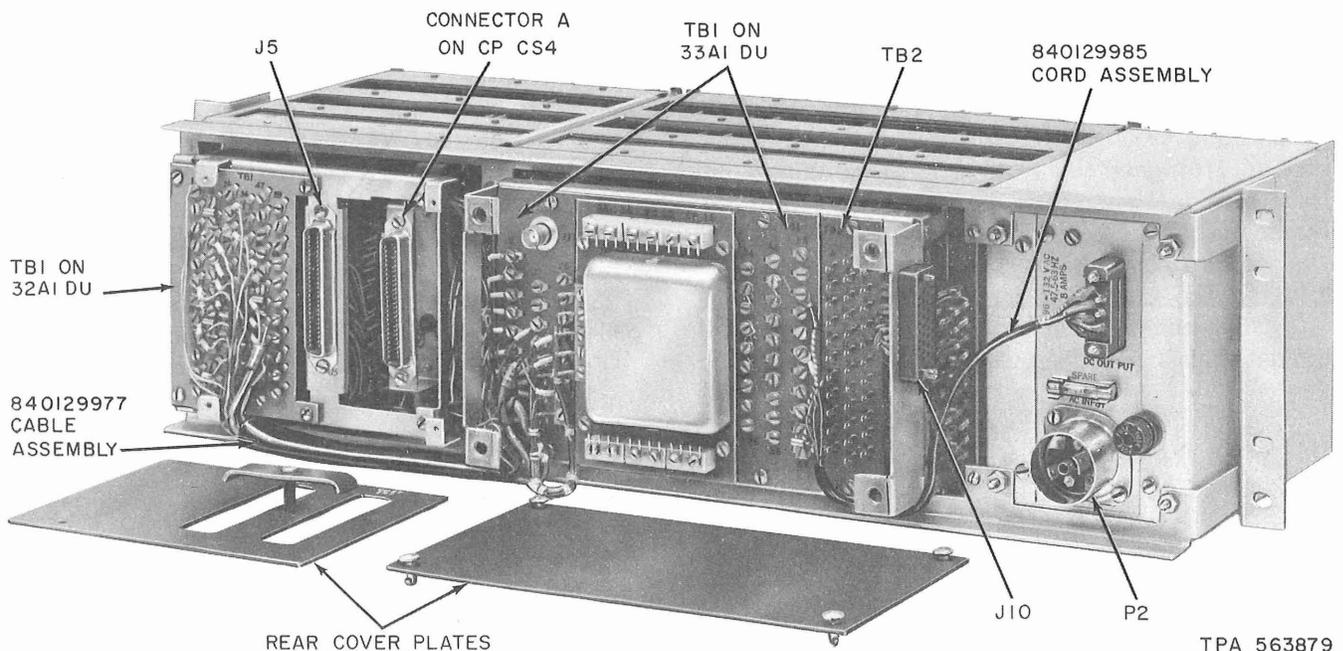


Fig. 6—Terminal Board and Connector Identification on the Rear of Data Set 306A-L1/2

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cord connects to the D50R-61 cord and the other end plugs into connector J5 on the rear of the 32A1 DU.

3.10 The DAS 804A-type contains a 589AA key unit with six illuminating keys that provide the control functions shown on the key labels in Fig. 8. Several designation strips are provided with DAS 804A-type, but the one used for DATA-PHONE 50 and 460.8 data on PICTUREPHONE can be adapted by merely typing in RING in the blank space. The key marked WB CHAN should be blocked by inserting blocking ring P-12A858. The TEST and AUTO keys should be made locking by installing a P-12A892 screw, and the lamp under the DATA key should be removed if DAS 804A-type control provides DATA-PHONE features. For additional information concerning DAS 804A-type, refer to the section entitled Data Auxiliary Set 804A-Type, Description and Operation (598-030-100).

3.11 After DS 306A-type is installed and connected, the 944A equalizer on the rear of the 33A1 DU (Fig. 9) must be adjusted to compensate for the cable length between the 33A1 DU and the LTU. Tighten the screw terminals located at the top and bottom of the equalizer according to Table D for the length of cable between the 33A1 DU and the LTU. An 840129993 cable assembly is connected between the equalizer and TB1 on the 33A1 DU as shown in Fig. 10.

3.12 After all connections and strappings have been completed, confirm that the data set is operating properly by performing an installation test according to the section entitled Wideband Data Station Using Data Set 306, Point-to-Point, Limited Distance, Test Procedures (593-801-500).

3.13 If the data set is installed in a Bell System cabinet, replace both cabinet covers after the data set is confirmed to be operating properly.

Note: Once power is applied to DS 306A-type, it should not be removed unless the data set becomes defective or unless told to do so when performing a maintenance test.

4. REFERENCES

4.01 The CDs and SDs for the apparatus included in the wideband station using DS 306A-type are listed as follows:

SD- and CD-1D187-01—Data Set 306A-type

SD- and CD-1D237-01—Data Set 306A-type Application Schematic

SD- and CD-1D218-01—32A-type Data Unit

SD- and CD-1D196-01—33-type Data Unit

SD- and CD-1D041-01—Data Auxiliary Set 804A-type.

4.02 Additional information concerning DS 306A-type can be found in the following Bell System Practices:

SECTION	TITLE
593-801-100	Wideband Data Station Using Data Set 306, Point-to-Point, Limited Distance, Description and Operation
593-801-500	Wideband Data Station Using Data Set 306, Point-to-Point, Limited Distance, Test Procedures
598-030-100	Data Auxiliary Set 804A-Type, Description and Operation.

TABLE A
32A1 DATA UNIT OPTIONS

OPTION	FEATURE	CONNECTIONS	DATA SET 306A-L1/2		
			WITH TELEPHONE SET OR DAS 804A-TYPE FUNCTIONING AS TELEPHONE SET	WITH DAS 804A-TYPE PROVIDING LIMITED CONTROL	WITH DAS 804A-TYPE CONTROL PROVIDING DATA-PHONE FEATURES
A	Bypasses remote and local tests looping in data unit.	On TB1 of 10A3 DU, strap 23-24, 26-27, 29-30, and 32-33.	R	R	R
J*	Completes answer-back tone and voice-frequency data paths of an associated DAS 804A-type.	On TB1 of 32A1 DU, strap 30-31, 31-32, and 13-14.	O	R	R
S*	Makes DTR control dependent upon the option selected in 33A1 DU.	On TB1 of 32A1 DU, strap 28-29.	R	R	R
V*	Used when the voice-frequency circuit is 4-wire (see note).	On TB1 of 10A3 DU, strap 1-2, 4-5, 9-10, and 12-13. On TB1 of 32A1 DU, strap 31-32.	AR	AR	AR
W	Used when the voice-frequency circuit is 2-wire (see note).	On TB1 of 10A3 DU, strap 2-3 and 5-6.	AR	AR	AR
X*	Completes local test control path to LTU.	Plug in 0-dB pad.	R	R	R
ZB	Provides the path for the ACU TALK IND function when DAS 804A-type is used.	On TB1 of 32A1 DU, strap 52-53.	O	R	R
ZE	Terminates an associated DAS 804A-type operated to the data mode when a voiceband data set is not provided.	On CP CS4, strap 10-11 and 12-13.	O	R	R
ZF	Connects operating path to RVD relay to provide switching of the receive pair of a 4-wire full-period point-to-point voice coordination line to the telephone receiver of an associated DAS 804A-type operated to the talk mode.	On CP CS4, strap 14-15.	O	R†	R†
ZG	Provides a contact closure to operate an external looping relay when the data unit is placed in the local test mode. Used with option A.	On TB1 of 32A DU, strap 1-57 and 3-58.	R	R	R

Note: Option V should not be connected when option W is connected and vice versa.

* Factory-supplied options.

† This option required only when voice line is 4-wire; otherwise omit.

R — Required

O — Omit

AR — As required

TABLE B
33A1 DATA UNIT OPTIONS

OPTION	FEATURE	CONNECTIONS	DATA SET 306A-11/2		
			WITH TELEPHONE SET OR DAS 804A-TYPE FUNCTIONING AS TELEPHONE SET	WITH DAS 804A-TYPE PROVIDING LIMITED CONTROL	WITH DAS 804A-TYPE CONTROL PROVIDING DATA-PHONE FEATURES
G*†	Circuit ground connected to frame ground	Connect spade lug from terminal 5 on J1 under screw at lower right-hand corner on the rear of the nest.	R†	R†	R†
Q†	Permanent data terminal ready	On TB1, strap 43-44.	AR	AR	AR
R†	Permanent request-to-send	On TB1, strap 32-33.	AR	AR	AR
S*	Permanent line status	On TB1, strap 42-43.	R	R	O
W*	No Data Auxiliary Set 804A-type control — simulated answer	On TB1, strap 30-31.	R	O	O
Y*	No DAS 804A-type control — permanent off-hook	On TB1, strap 8-9.	R	O	O
X	Transmitting 1.544 Mb/s bipolar line interface — external clock	On CP AR511	AR	AR	AR
Z*	Transmitting 1.544 Mb/s bipolar line interface — internal clock	On CP AR511	AR	AR	AR
T	2-second billing delay	On TB1, strap 29-30.	O	O	O
N	One way, transmit only	On TB1, strap 33-34.	AR	AR	AR

Note: Option X should not be connected when option Z is connected and vice versa.

* Factory-supplied option.

† Can be removed to reduce ground noise problems.

‡ Customer control of DTR and RS functions is possible when the option straps are omitted.

R — Required

O — Omit

AR — As required

TABLE C
DATA AUXILIARY SET 804A-TYPE OPTIONS

OPTION	FEATURE	CONNECTIONS*	STATUS
B†	Provides automatic answer when used in conjunction with option G.	Move G-W lead from TB1-9 to TB1-3. Disconnect BL-Y mounting cord lead from TB1-9. Tape and store.	As required
F	402D Talk light option	Move G lead from TB1-18 to TB1-10.	Required
G†	Automatic answer key	Move BL lead from TB1-15 to TB1-9.	As required
H	Balanced pair	Move S lead from TB2-17 to TB2-18. Move BK lead from TB2-18 to TB2-1.	Required
J‡	Fixed 2-wire	Connect one W receiver wire to R of network. Connect other W receiver wire on GN of network (rotary dial). Connect other W receiver wire to G of network (TOUCH-TONE dial).	As required
M	Fixed 4-wire	Connect one W receiver wire to TB6-1. Connect other W receiver wire to TB6-3.	As required
N	Ring receive pair	Move W lead from A of network to TB1-8. Move G lead from TB2-19 to A of network. Move W lead from TB2-3 to TB2-8. Move BL lead from TB2-12 to TB2-2. Move O lead from TB2-15 to TB2-14. Untape stored O-W mounting cord lead and connect to TB1-6. Untape stored BL-BK mounting cord lead and connect to TB2-19. Untape stored BK-BL mounting cord lead and connect to TB2-3.	Required
V	600-Ohm line impedance	Move R-BL mounting cord lead from DU-16 to DU-35.	Required
X‡	Answertone power	Move BL lead from either TB2-9 or 10 to TB2-11.	As required§
Y		Move BL lead from either TB2-9 or 10 to TB2-11.	As required§
Z		Move BL lead from either TB2-10 or 11 to TB2-9.	As required§
ZA‡	+18 Volt data set power	Move G lead from DU-45 to DU-3. Move BK-S mounting cord lead from DU-11 to DU-41. Disconnect R-S mounting cord lead from DU-36; tape and store. Untape stored BL lead from DU-50 and connect to DU-5. Untape stored BL lead from DU-15 and connect to DU-53. Untape stored BK lead and connect to DU-36.	Required

TABLE C (Cont)

OPTION	FEATURE	CONNECTIONS*	STATUS
ZB‡	Rotary dial (11C apparatus unit)		Required in DAS 804A1 and A5¶
ZD	TOUCH-TONE® dial (11G apparatus unit)		Required in DAS 804A3 and A7¶
ZM‡	203 Compatibility OUT. Required to complete answerback tone path.	Move BL-R mounting cord lead from DU-54 to DU-55. Untape and connect the following: BL-W wire to DU-34 Y-S mounting cord lead to DU-18 G-Y mounting cord lead to DU-27 V-S mounting cord lead to DU-45.	Required

Note: Option M should not be connected when option J is connected and vice versa.

* The connections pertain to DAS 804A5 or A7, series 5. If any other DAS 804A-type is used, refer to Section 598-030-100 for connection information.

† Options B and G are both required for automatic answer.

‡ Factory-supplied options.

§ Use one of the three options (X, Y, or Z) that will allow the answertone to arrive at the serving central office closest to -12 dBm.

¶ If DAS 804A1 or A3 is used, connect a 185A network across terminals 44 and 46 on 3A1 Data Unit.

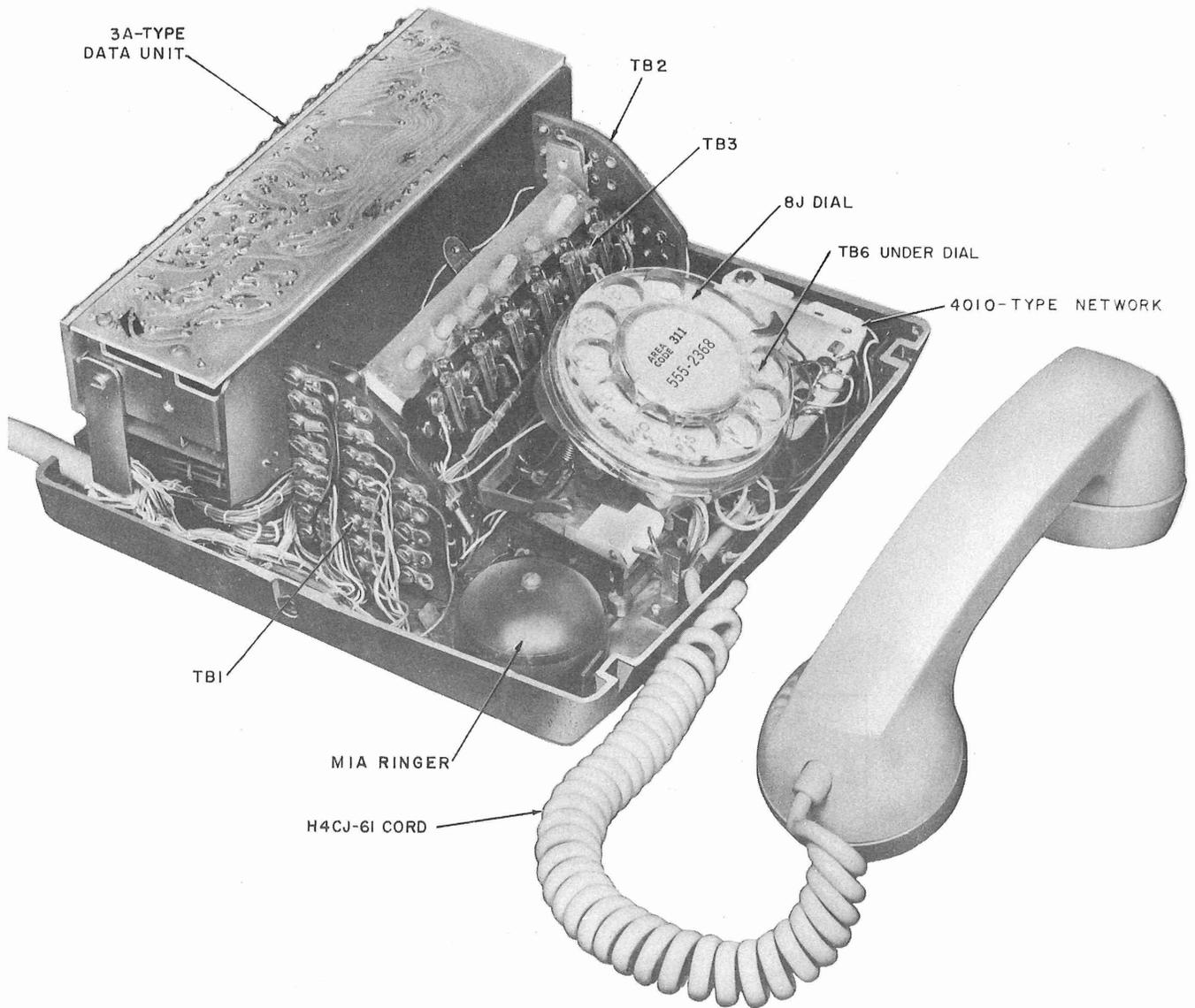
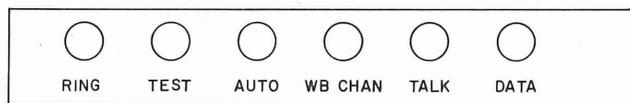


Fig. 7—Data Auxiliary Set 804A-Type Terminal Board Identification



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Fig. 8—Key Designations on Data Auxiliary Set 804A-Type When Used With Data Set 306A-L1/2

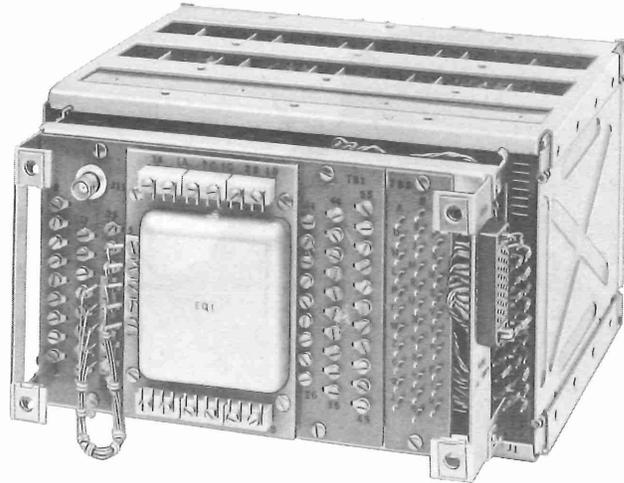


Fig. 9—Rear View of 33A1 Data Unit Showing 944A Equalizer

TABLE D

CABLE LENGTH IN FEET	SECTION	TIGHTEN SCREW TERMINALS
0 — 150	C	1C, 2C, 3C, 4C
150 — 450	B	1B, 2B, 3B, 4B
450 — 750	A	1A, 2A, 3A, 4A

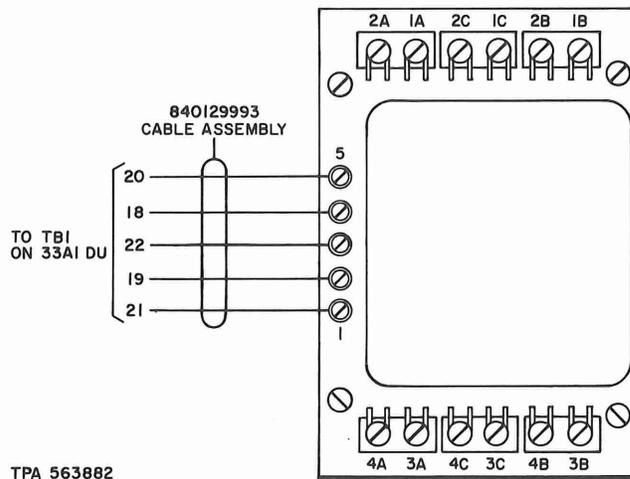


Fig. 10—Connection of 944A Equalizer