

## DATA SET 301B-TYPE TRANSMITTER-RECEIVER INSTALLATION AND CONNECTIONS

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### 1. GENERAL

**1.01** This section contains information concerning the installation and connection of Data Set (DS) 301B-type and data auxiliary equipment.

**1.02** This section is reissued to rate the following equipment Additions and Maintenance (A&M) only:

- DS 301B2
- Data Auxiliary Set (DAS) 806B5
- DAS 803A2
- 14A2 Data Unit (DU).

**1.03** The 10A2 DU in DAS 806B5 is rated Manufacture Discontinued (MD) and can be replaced with a 10A3 DU with the B option installed.

**1.04** The DAS 803A1 is also rated MD along with DS 301B1.

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

### 2. INSTALLATION

**2.01** The DS 301B2 (A&M) is designed for mounting on a shelf or table. The only difference between DS 301B1 (MD) and DS 301B2 is that DS 301B2 insures the proper transmission of idle code 10-00 when the data set is used as a regenerator.

DAS 806B5 (A&M) can be mounted in a KS-20018-L6 cabinet in close proximity to DS 301B. DAS 806B5 can also be mounted on a 23- or 25-inch relay rack with DS 301B resting on a KS-20130-L6 shelf. DAS 806B5 and DS 301B must be mounted in such a manner that connection by a 3-foot pendant cable is possible.

**2.02** Locate the data set or DAS 806B5 within range of the interface cable from the business machine. This cable should not exceed 50 feet in length. The location must permit the data set power cord to reach its receptacle without the use of an extension cord.

**2.03** The customer must furnish a 3-wire ac outlet that is not under control of a switch. This is important as the line repeaters require signal power for regulation; therefore, the data set must be energized continuously. The outlet must accept a plug having two parallel blades and a U-shaped grounding pin.



*To avoid the possibility of data errors due to a potential difference between data set ground and business machine ground, the outlet for the data set power cord should be served from the same ac distribution panel as the outlet for the business machine. If they are not served from the same panel, the data set ground and the business machine ground must be bonded together. The method of providing this bond should be in accordance with local practice.*

**2.04** Locate DAS 803A2 in a position convenient to the customer. A 10-foot W9A cord is furnished as part of the data set for connections between the data set and data auxiliary set.

**Note:** If it is not convenient to connect the W9A cord directly to the data auxiliary set, extend the leads by means of SK station wires. Join the wires to the cord at a 44A

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connecting block. All shields must be connected together.

**2.05** The facilities between the exchange cable entrance and the data auxiliary set must meet the transmission requirements specified in the section entitled Toll Systems A2 (40.8-Kilobit), Data Transmission System, General Description (314-605-100). These facilities should be installed and tested in accordance with standard BSPs.

**2.06** Verify with the local test center that the loop facilities have been tested and meet transmission requirements specified in Section 314-605-100.

**2.07** The data set is designed to operate correctly with the ambient temperature ranging from 40 to 120°F. To insure reliable operation, the data set should not be installed in an area where it would be subjected to a relative humidity higher than 90 percent.

**2.08** At the time of installation, make end-to-end test as described in the section entitled Data Set 301B-Type, Transmitter-Receiver, Test Procedures (593-011-500) covering test requirements.

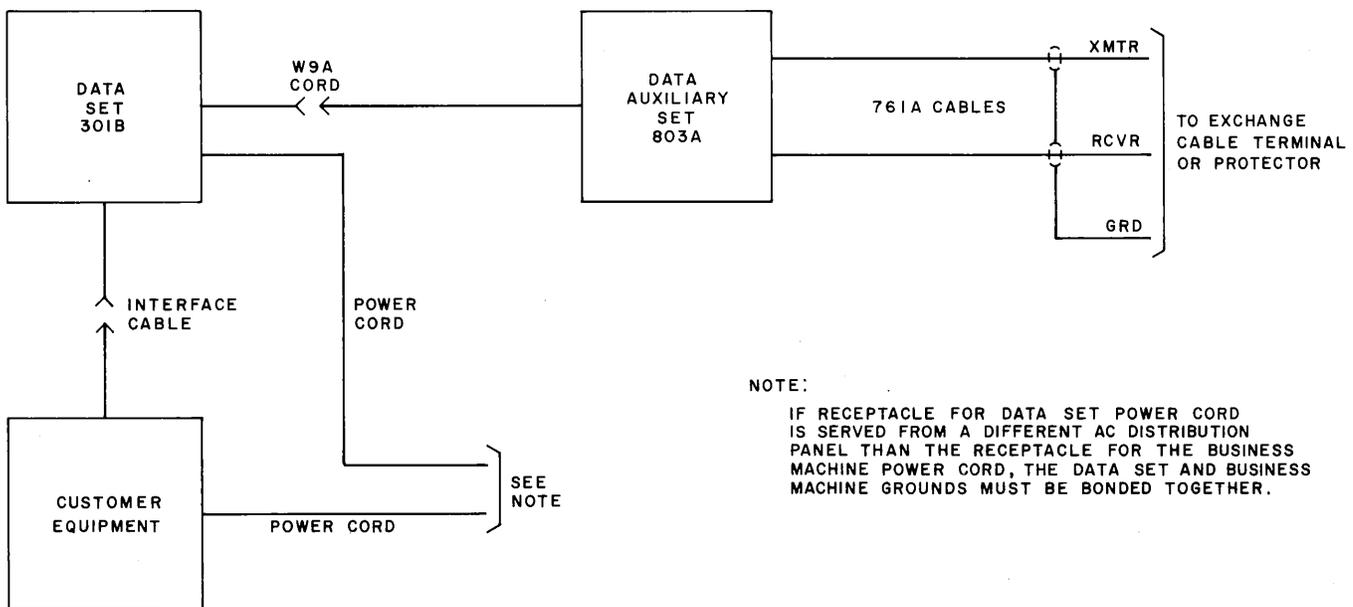


*Take proper steps to insure that customer is not billed for calls made in connection with installation and testing. See the section entitled **Crediting Charges on Test Calls (010-250-001)**.*

**3. CONNECTIONS**

**3.01** Refer to Fig. 1 and 2 for the block diagrams of a typical installation using DS 301B.

**3.02** The use of DS 301B-type as a signal regenerator in one side of a balanced 4-wire facility requires certain interface connections. These connections can be made on jack J3 (Fig. 3) or on jack J4 (Fig. 4). These interconnection arrangements should be used only when regeneration is to be accomplished within the same data set. Two such arrangements will be required for a full-duplex 4-wire repeater. As an option, signal regeneration in a full-duplex 4-wire facility may be accomplished by interconnecting the two physically separated 301B-type sets (Fig. 5). This option is designed for use between privately owned lines and Bell System wideband data channels. The interface connections required for this option must utilize coaxial cable properly terminated with Burndy connectors which mate with jack J3. The length of the coaxial cable should not exceed 50 feet.



**Fig. 1—Data Set 301B Equipped With Data Auxiliary Set 803A**

NOTES:

1. IF RECEPTACLE FOR DATA SET POWER CORD IS SERVED FROM A DIFFERENT AC DISTRIBUTION PANEL THAN THE RECEPTACLE FOR THE BUSINESS MACHINE POWER CORD, THE DATA SET AND BUSINESS MACHINE GROUNDS MUST BE BONDED TOGETHER.
2. WHEN DAS 804M IS PROVIDED FOR OPERATION WITH A 4-WIRE SWITCHED VOICEBAND LINE, AN M25E CORD IS USED FOR INTERCONNECTION. IN 2- OR 4-WIRE PRIVATE LINE VOICE COORDINATION INSTALLATION, A D6AA CORD IS USED TO CONNECT DAS 806B5 TO THE PRIVATE LINE.

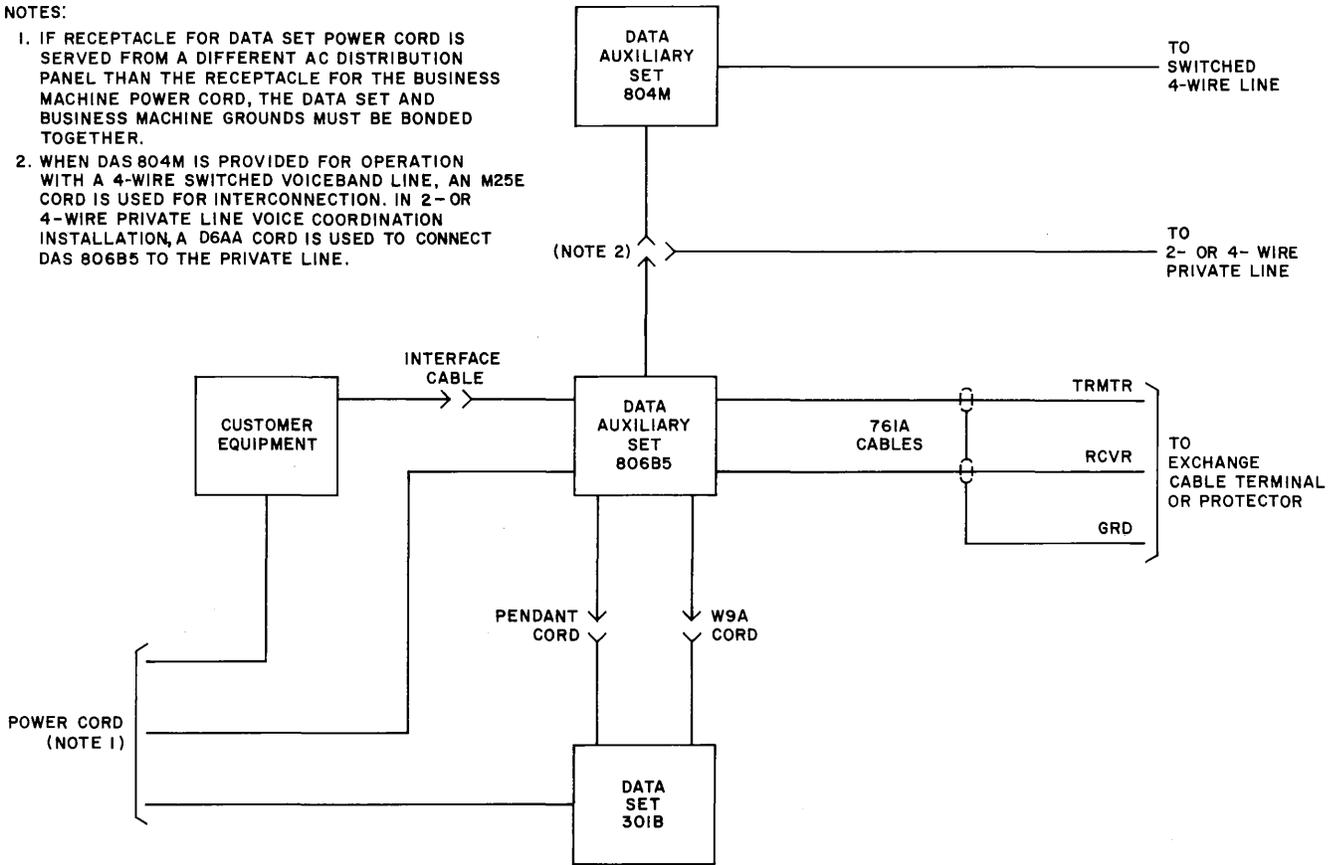
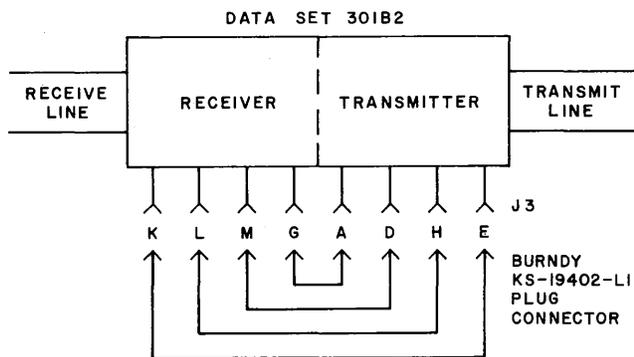


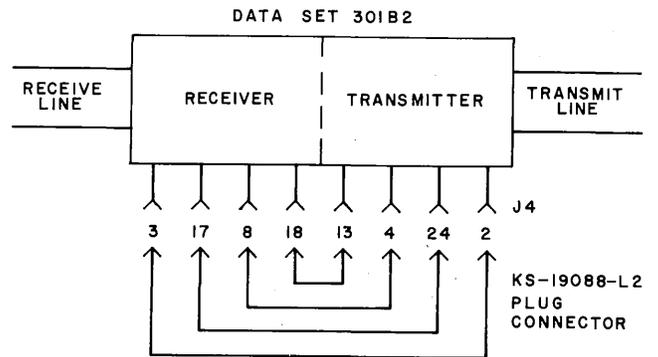
Fig. 2—Data Set 301B Equipped With Data Auxiliary Set 806B5



- A=DIBIT CLOCK TRANSMIT EXTERNAL (DCTE)
- D=SEND REQUEST (SR)
- E=SEND DATA (SD)
- G=DIBIT CLOCK RECEIVE (DCR)
- H=SERIAL CLOCK TRANSMIT EXTERNAL (SCTE)
- K=RECEIVE DATA (RD)
- L=SERIAL CLOCK RECEIVE (SCR)
- M=CARRIER ON-OFF (COO)

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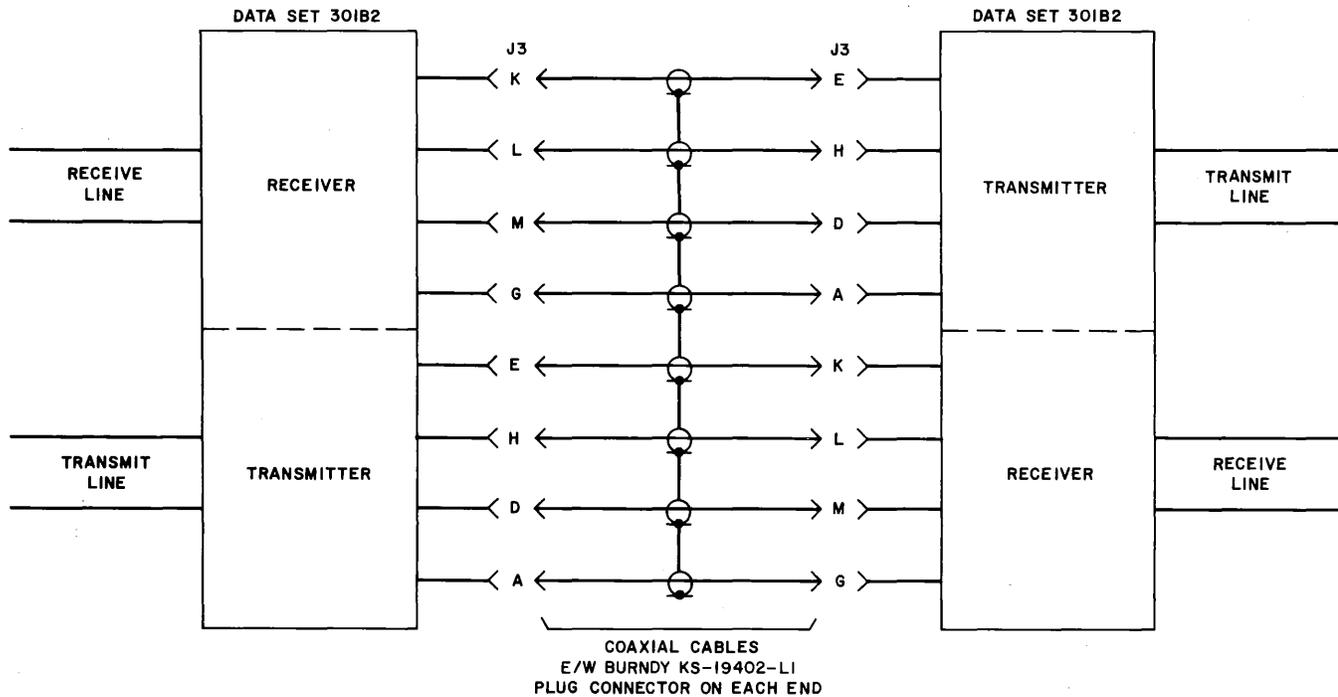
Fig. 3—Jack J3



- 2 = SEND DATA (SD)
- 3 = RECEIVE DATA (RD)
- 4 = SEND REQUEST (SR)
- 8 = CARRIER ON-OFF (COO)
- 13 = DIBIT CLOCK TRANSMIT EXTERNAL (DCTE)
- 17 = SERIAL CLOCK RECEIVE (SCR)
- 18 = DIBIT CLOCK RECEIVE (DCR)
- 24 = SERIAL CLOCK TRANSMIT EXTERNAL (SCTE)

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Fig. 4—Jack J4



**Fig. 5—Signal Regeneration Connection**

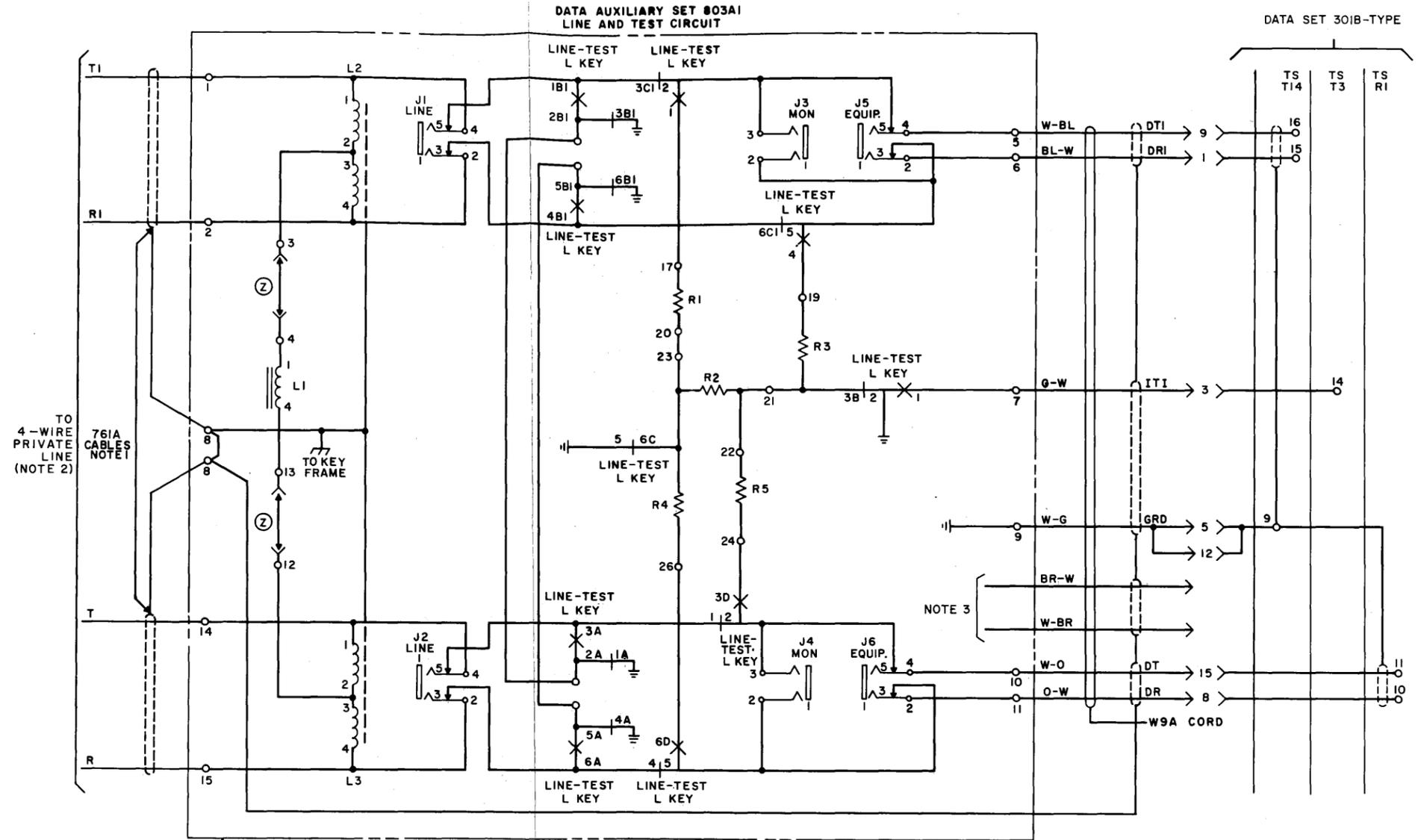
**3.03** Figures 6, 7, and 8 show connections at DAS 806B5. Figure 9 shows connections at DAS 806B5 with the 10A3 DU used in place of the 10A2 DU. Figure 10 shows the 14A2 DU which connects to the 10A2 DU in Fig. 8 or to the 10A3 DU in Fig. 9.◀

**3.04** Connect all shields together and ground at cable terminal or protector.

**3.05** Connections for DS 301B-type wiring options are given in Table A. Connections for wiring options on DAS 803A line and test circuit are given in Table B. Connections for wiring options on DAS 806B5 are given in Table C. DS 301B must be wired for external sync option Y when used with DAS 806B5. This allows the DAS 806B5 to provide external sync for remote test and internal or external sync for customer's use as required. Option F in DAS 806B5 provides a permanent Send Request (SR) condition and should be included on

the circuit layout card only if required by the customer. If option F is not installed and tests are to be made with a 901, 902, or 903 Data Test Set, option F must be wired in temporarily. These options should be specified on the service order. Screw terminals are provided for these connections.

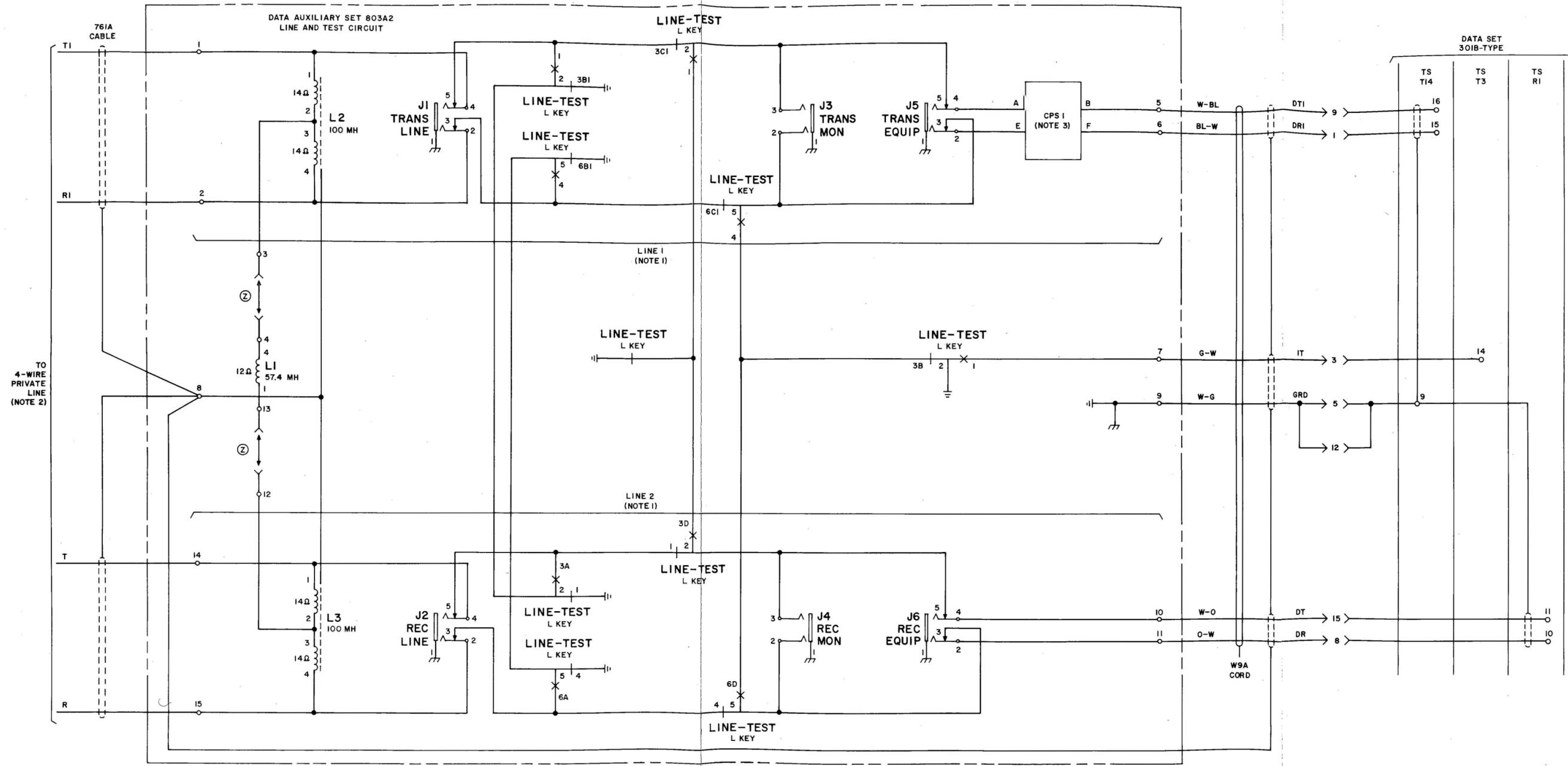
**3.06** To furnish DAS 806B5 with the 2800-Hz signal for remote test, a connection must be made to the voice coordination circuit. Terminal strip TB2, accessible from the rear of DAS 806B5, is provided for this purpose. A 2-wire private line should be bridged across terminals 3 and 4 of TB2 and option W provided. A 4-wire private line should be bridged across terminals 1, 2, 3, and 4 of TB2, and wiring option V should be connected as shown in Table C. When using 4-wire switched voice circuits, option H is provided to connect the voice circuits from DAS 804M to DAS 806B5 through connector J5. When DAS 804M-type is not provided, option E must be installed in the 806B5.



- NOTES:
1. CONNECT ALL SHIELDS TO APPROVED GROUND AT POINT OF CONNECTION WITH ENTRANCE WIRE OR CABLE.
  2. IF SHIELDED WIRE IS NOT USED FOR 4-WIRE LINE, CONNECT TERMINAL 8 TO 9. IF SHIELDED WIRE IS USED FOR 4-WIRE LINE, NO CONNECTION IS MADE FROM 8 TO 9.
  3. INSULATE AND STORE THESE LEADS.

FEATURE OR OPTION	APP OR WRG	PROVIDE		STRAP	
		QUANTITY	FROM	TO	
SEALING CURRENT PATH	Z	AS REQ	3	4	
			12	13	

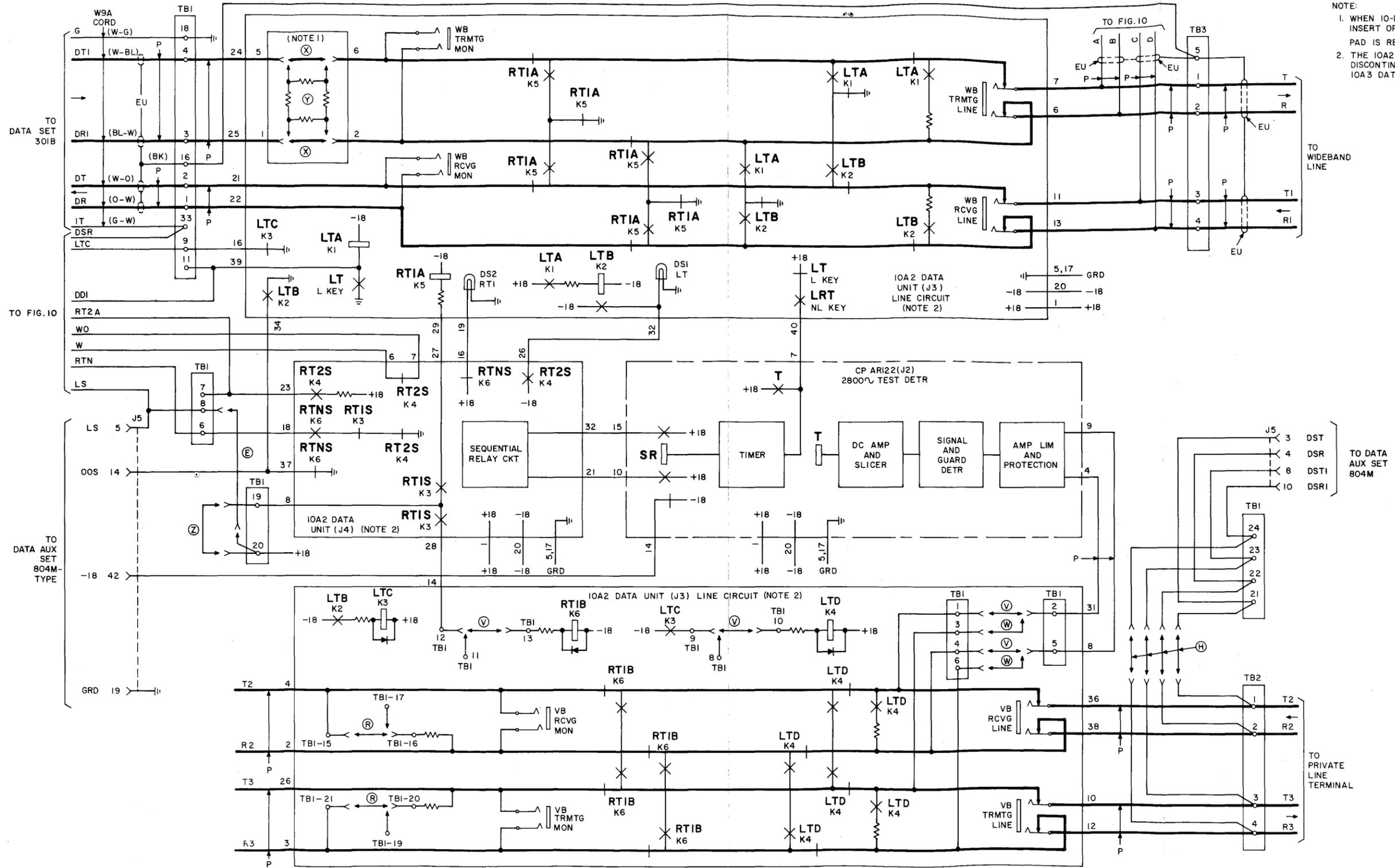
Fig. 6—Connections to Data Auxiliary Set 803A1 (MD)



- NOTES:
1. LINE 1 WIRING SHALL BE SEGREGATED FROM LINE 2 WIRING.
  2. IF SHIELDED WIRE IS NOT USED FOR 4-WIRE PRIVATE LINE, CONNECT TERMINAL 8 TO 9. IF SHIELDED WIRE IS USED FOR 4-WIRE PRIVATE LINE, NO CONNECTION IS MADE FROM 8 TO 9.
  3. WHEN 10-DB ATTENUATOR PAD IS REQUIRED, INSERT CPS 1 TO INDICATE OPTION Y. WHEN 0-DB ATTENUATOR PAD IS REQUIRED, INSERT CPS 1 TO INDICATE OPTION X.

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Fig. 7—Connections to Data Auxiliary Set 803A2 (A&M)



- NOTE:
1. WHEN 10-DB ATTENUATOR PAD IS REQUIRED, INSERT OPTION (Y); WHEN 0-DB ATTENUATOR PAD IS REQUIRED, INSERT OPTION (X).
  2. THE 10A2 DATA UNIT IS RATED MANUFACTURE DISCONTINUED AND IS REPLACED WITH THE 10A3 DATA UNIT.

Fig. 8—Connections to Data Auxiliary Set 806B5 Using 10A2 Data Unit

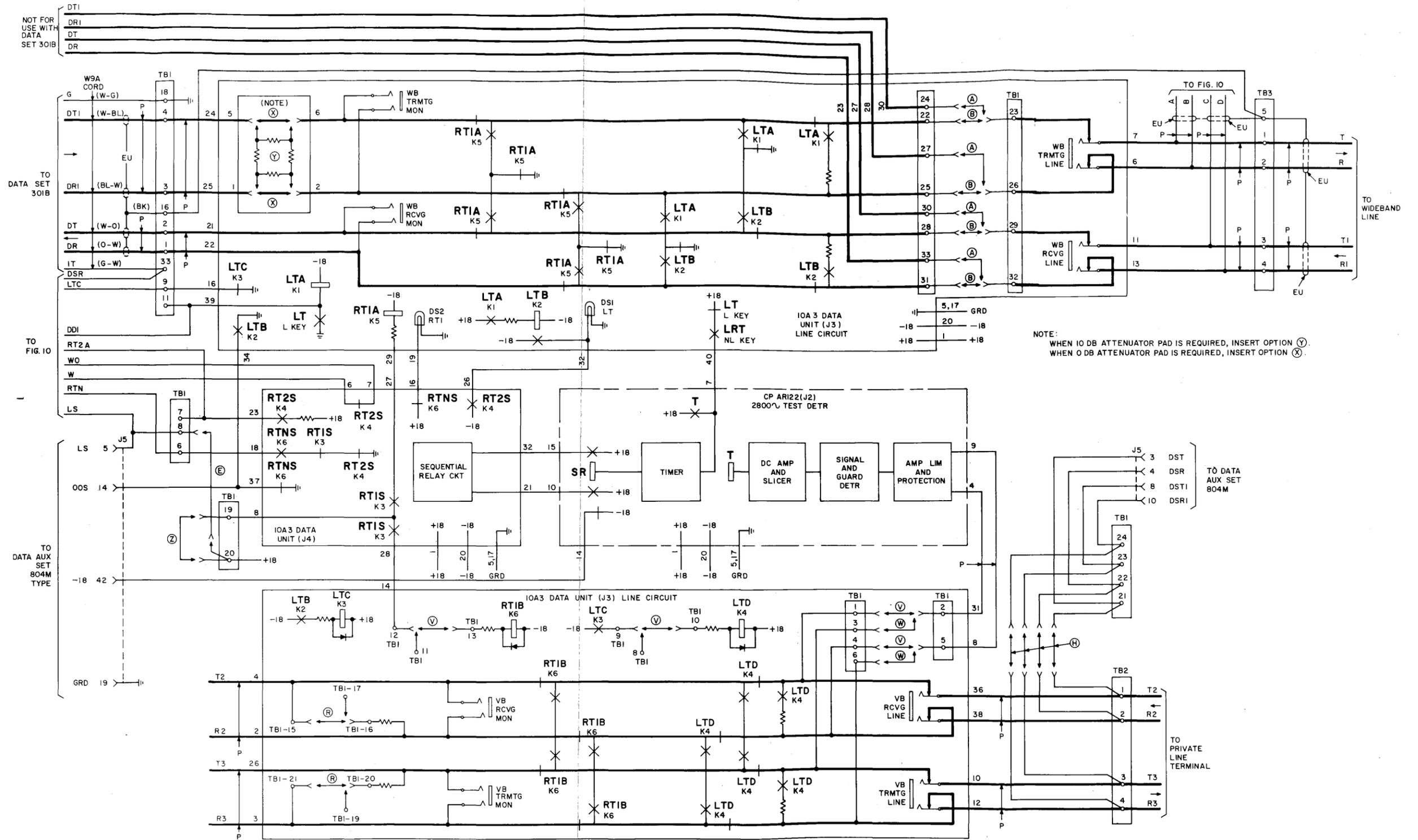


Fig. 9—Connections to Data Auxiliary Set 806B5 Using 10A3 Data Unit

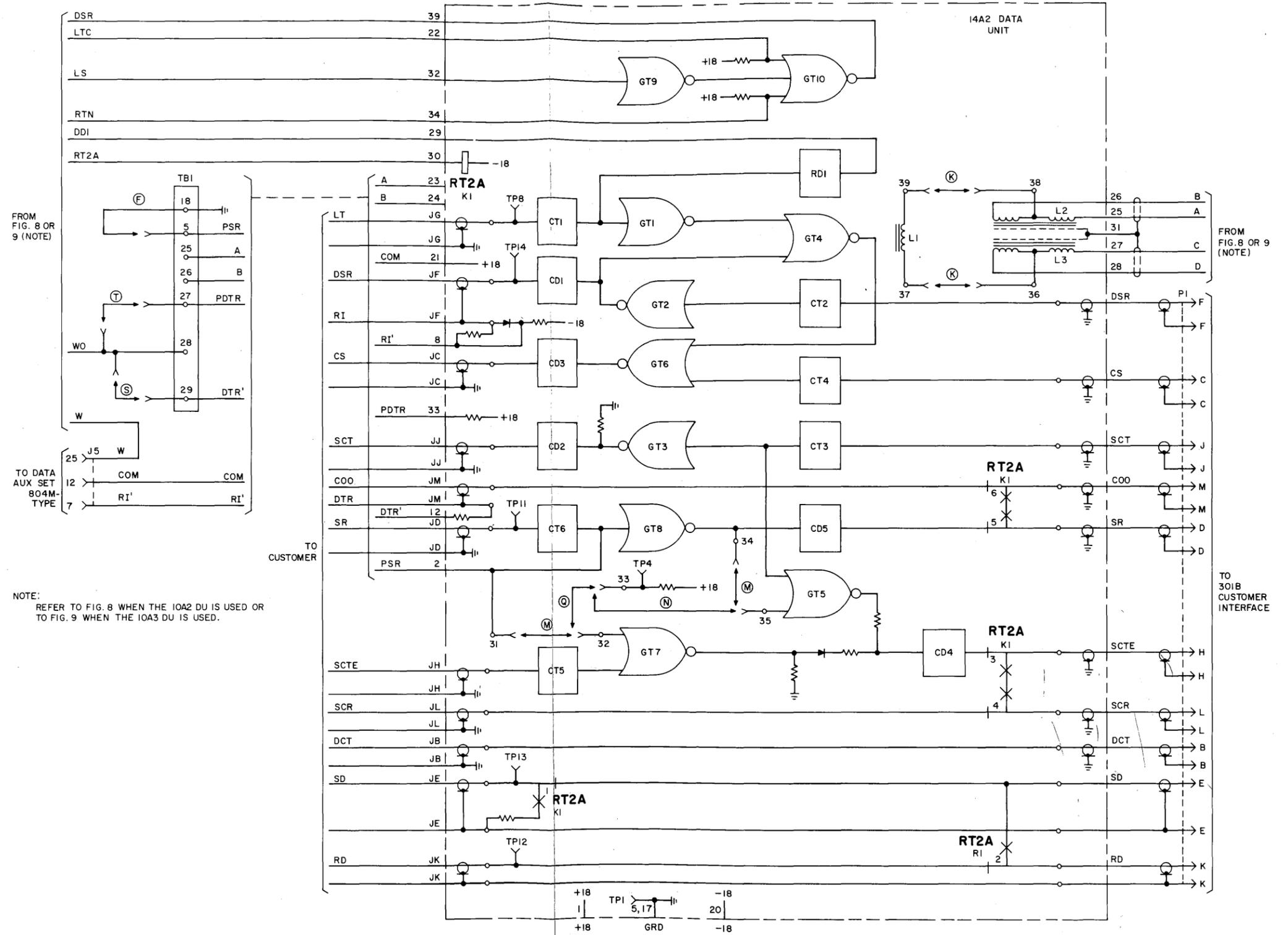


Fig. 10—Connections to the 14A2 Data Unit in Data Auxiliary Set 806B5

**TABLE A**  
**OPTIONS FOR DATA SET 301B-TYPE**

FEATURE	OPTION	STRAP CONNECTION	PRINTED BOARD ASSEMBLY	PROVIDE AS REQUIRED
External Transmitter Timing (Clock in Business Machine)	Y	A to E B to D	Serial Clock Interface T1	1 Per Set
Internal Transmitter Timing (Clock in Data Set)	Z	A to B C to E		
Receive Level	X (+10 to -20 dBm)	1 to 4	AGC, Amplifier, and Carrier Detector R1	1 Per Set
	W (-5 to -35 dBm)	1 to 3		
	V (-20 to -50 dBm)	1 to 2		

**TABLE B**  
**OPTIONS FOR DATA AUXILIARY SET 803A LINE AND TEST CIRCUIT**

FEATURE	OPTION	STRAP CONNECTION	LOCATION	PROVIDE AS REQUIRED
Sealing Current Path	Z	3 to 4 12 to 13	Connecting Block	1 Per Set
Wideband Transmit Line Pad 803A2 (Only)	0 dB	Plug-In Card		1 Per Set
	10 dB			

**TABLE C**  
**OPTIONS FOR DATA AUXILIARY SET 806B5**

FEATURE		OPTION	STRAP CONNECTION	LOCATION	PROVIDE AS REQUIRED	
Sealing current required		K	38 to 39 36 to 37	14A2 Data Unit	1 Per Set	
External transmitter timing with switch to internal transmitter timing when SR control signal is "OFF"		M	31 to 32 34 to 35	14A2 Data Unit	1 Per Set	
Transmitter timing	Internal	Q	32 to 33	14A2 Data Unit	1 Per Set	
	External	N	33 to 35			
Use when DAS 804M is provided		H	TB1 to TB2	Terminal boards TB1 and TB2 of DAS 806B5	1 Per Set	
			21			1
			22			2
			23			3
			24			4
Use when permanent "ON" send request is required		F	5 to 18	TB1 of DAS 806B5	1 Per Set	
Power for remote test		Z	19 to 20	TB1 of DAS 806B5	1 Per Set	
Data terminal ready signal provided by customer		S	28 to 29	TB1 of DAS 806B5	1 Per Set	
Wired data terminal ready		T	27 to 28	TB1 of DAS 806B5	1 Per Set	
Voiceband circuit	4-Wire	V	1 to 2, 9 to 10 4 to 5, 12 to 13	TB1 of 10A-type Data Unit	1 Per Set	
	2-Wire	W	2 to 3 5 to 6			
	—	—	Store strap 8 to 9, 11 to 12			
Required when DAS 804M is not provided		E	8 to 20	TB1 of DAS 806B5	1 Per Set	
No voice coordination required		R	15 to 16, 20 to 21	TB1 of 10A-type Data Unit	1 Per Set	
			Store strap 16 to 17, 19 to 20			
0-dB pad (used when connecting data set is of 303-type)		X	1 to 2, 5 to 6	10A-type Data Unit	1 Per Set	
10-dB pad (used when connecting data set is of 301B-type)		Y	Plug-in pad			
Wideband transmission path through the test relay contacts in 10A3 DU		B*	22 to 23, 25 to 26, 28 to 29, 31 to 32	TB1 of 10A3 Data Unit	1 Per Set	

\* Required when 10A3 Data Unit replaces the 10A2 Data Unit in Data Auxiliary Set 806B5.