DATA SET 201C-L1D
TRANSMITTER-RECEIVER
DESCRIPTION AND OPERATION

CONTENTS PAGE

1. GENERAL

1.01 This section contains the physical and functional description and operating procedures for data set (DS) 201D-L1D.

1.02 Whenever this section is reissued, the reason for reissue will be contained in this paragraph.

1.03 The DS 201C-L1D (Fig. 1) is a synchronous, serial binary transmitter-receiver that operates at 2400 bps over 2- or 4-wire private lines. This set replaces DS 201C-L1 optioned for private line service. Data set 201C-L1D is designated for private line service and cannot be optioned for switched network operation.

1.04 The DS 201C-L1D is line signal compatible with and can be interchanged for DS 201C-L1 in private line applications.

1.05 The DS 201C-L1D may be used with the following auxiliary apparatus:

- DAS 829-type to provide a standard termination and switched network backup for 4-wire private lines with data only or alternate data/voice.
- DAS 828A-type to provide a standard termination for 4-wire private lines with data only or alternate data/voice.

1.06 The following is a technical specification summary for DS 201C-L1D:

Operation: Synchronous, binary, serial

Fig. 1—Data Set 201C-L1D/2/4/5

Modulation: Differential 4-phase shift keying (PSK)

Data Rate: 2400 bps

Interface Voltages: Per Electronic Industries Association (EIA) RS-232-C

Transmitter Timing: Internal or external

Line Requirements: 2- or 4-wire private line series 2000- or 3002-type (basic) channel.

Operating Modes:

- On 2-wire private line, simplex (1-way) or half-duplex (2-way nonsimultaneous)
- On 4-wire private line, simplex, half-duplex, or duplex (2-way simultaneous)

Power Requirements: 105 to 129 volts, 8 watts maximum, at 57 to 63 Hz

Ambient Temperature Range: +40 to +120°F

Relative Humidity Range: 20 to 95 percent

Dimensions: Width 10.5 inches, height 4.3 inches, depth 14 inches

Weight: 12 pounds

Customer-Provided Equipment: Must be supplied with an interface cord terminated in a Cinch or Cannon DB-19604-432 plug wired in accordance with Table A. This interface cord should not exceed 50 feet in length.

TABLE A

CUSTOMER INTERFACE

PIN NO.	FUNCTION	DATA SET MNEMONIC	EIA DESIGNATION (RS-232-C)
2	Transmitted Data	SD	BA
3	Received Data	RD	BB
4	Request to Send	RS	CA
5	Clear to Send	CS	CB
6	Data Set Ready	DSR	CC
7	Signal Ground	SG	AB
8	Received Line Signal Detector	CO	CF
9	Test Voltage	+12V	—
10	Test Voltage	−12V	—
14	New Sync	NS (Non-EIA)	—
15	Transmitter Signal Element Timing	SCT	DB
16	Dibit Clock Transmitter	DCT (Non-EIA)	—
17	Receiver Signal Element Timing	SCR	DD
18	Dibit Clock Receiver* or	DCR (Non-EIA)	—
	Local Analog Loopback Test†	LL (Non-EIA)	—
19	Test Voltage	+5V (Non-EIA)	—
20	Data Terminal Ready	DTR	CD
24	Transmitter Signal Element Timing (External)	SCTE	DA

* Option YT

† Option YS

2. PHYSICAL DESCRIPTION

2.01 List code designations corresponding to the physical configurations of DS 201C-L1D are as follows:

- L1D—Consists of the basic data set that is composed of two circuit packs (Fig. 2) interconnected by a flexible cable.
- L2—Consists of the 100A power unit (Fig. 2) that provides +12, -12, and +5 volts.
- L4—Consists of the stand-alone enclosure and the P3BJ or KS-14532-L24 power cord. The enclosure (Fig. 1) is composed of front and rear molded black plastic covers mounted on an extruded aluminum housing. The housing has a brushed finish. The enclosure and the power cord are also orderable as a 50A1 data mounting.
- L5—Consists of the M8K telephone line interface cord.

2.02 The orderable list codes are as follows:

- 201C—L1D/2/5 for multiple data set installations
- 201C—L1D/2/4/5 for single stand-alone data set installations

2.03 Eight status indicators (Fig. 3) are provided on the data set to monitor the power unit, certain interface leads, and the test switches. These status indicators consist of light emitting diodes (LEDs) that illuminate translucent designations on the data set front cover. These designations identify the functions being monitored. The

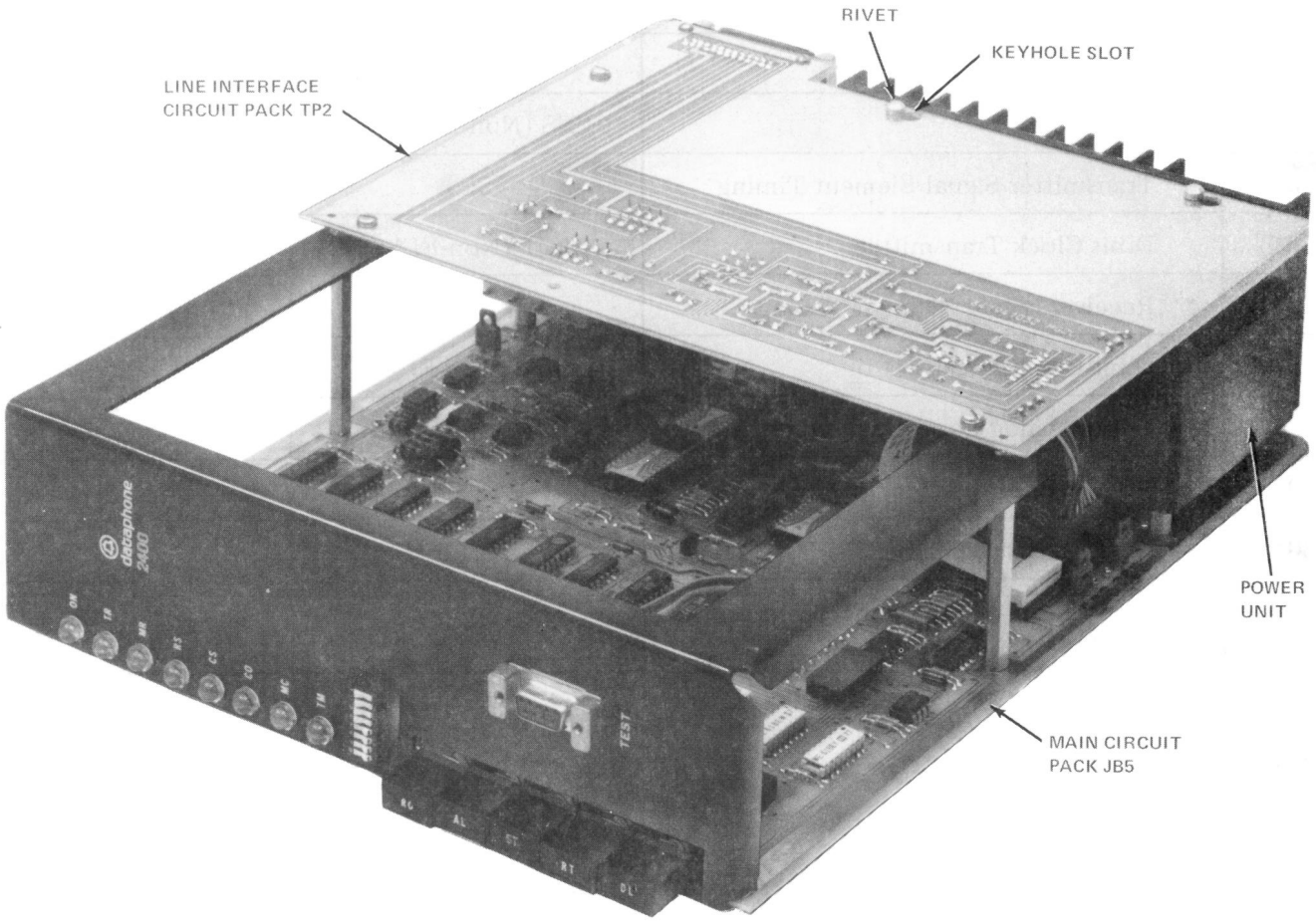

Fig. 2—DS 201C-L1D/2/5—Internal View

indicators and their functions during normal operation are as follows:

- ***ON:*** Lighted when power is supplied to the data set.
- ***TR (Terminal Ready):*** Lighted when the data terminal ready (CD) lead is ***on***.
- ***MR (Modem Ready):*** Lighted when the data set ready (CC) lead is ***on***.
- ***RS (Request to Send):*** Lighted when the request-to-send (CA) lead is ***on***.
- ***CS (Clear to Send):*** Lighted when the clear-to-send (CB) lead is ***on***.
- ***CO (Carrier On):*** Lighted when the received line signal detector (CF) lead is ***on***.
- ***MC (Modem Check):*** Lighted when the receiver signal element timing (DD) lead is ***off***. During self-test operation, also lighted when errors occur in the received data.
- ***TM (Test Mode):*** Lighted when one or more of the AL, ST, RT, and DL test switches are depressed.

2.04 Five pushbutton switches, accessible through the front cover, provide self-test operation of the data set. These test switches are the

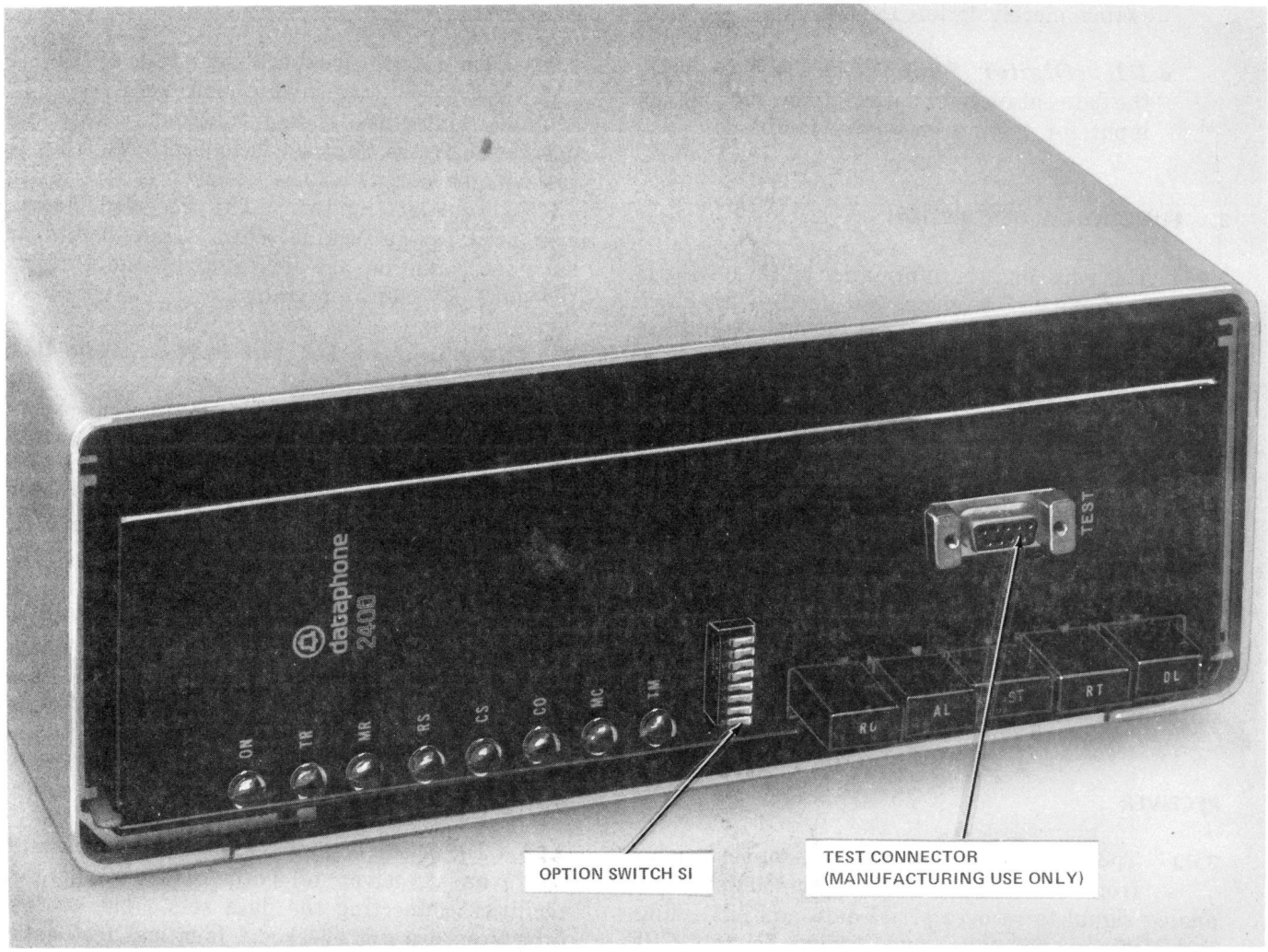

Fig. 3—DS 201C-L1D/2/4/5—Front Cover Removed

push-to-operate and push-to-release type. The switches and their functions are as follows:

- ***RO (Receive Only):*** Conditions the data set to function as a receiver in an end-to-end self test on 2-wire facilities.
- ***AL (Analog Loopback):*** Loops back the data set transmitter output to the receiver input through an internal attenuator.
- ***ST (Self Test):*** Conditions the data set for self-test operation using an internal data generator and comparator.
- ***RT (Receiver Test):*** When used in conjunction with the AL switch, this switch conditions the data set for the local loopback receiver margin test. Used alone, the RT switch merely lights the TR lamp.
- ***DL (Digital Loopback):*** Loops back the data set receiver output to the transmitter input for testing on 4-wire facilities.

3. FUNCTIONAL DESCRIPTION

3.01 This part contains information on DS 201C-L1D transmitter, receiver, test modes, interface leads, and options. Refer to Fig. 4 for a simplified block diagram of DS 201C-L1D.

TRANSMITTER

3.02 The transmitter accepts serial binary data at 2400 bps in synchronism with positive transitions of a 2400-Hz clock provided either by the data set or by the customer-provided equipment (CPE). The transmitter groups the digital data into symbols of two bits each (dibits) and encodes this data in a differential 4-phase modulated signal suitable for transmission on switched network lines.

RECEIVER

3.03 The receiver accepts the transmitted signal from the telephone line, demodulates the analog signal to recover serial data and bit timing, and delivers the data and timing to the CPE through the Electronics Industries Associated (EIA) interface.

TEST MODES

3.04 Data set 201C-L1D provides four test modes for use by the customer or a telephone company (telco) employee: analog loopback test, analog loopback self test, digital loopback self test, and end-to-end self test.

A. Analog Loopback Test

3.05 The analog loopback test checks the data set transmitter and receiver and the customer interface. The data set is internally disconnected from the line interface and the transmitter output is looped back to the receiver input. The CPE transmits data and tests the customer interface by examining transmitter and receiver output signals at the CPE.

B. Analog Loopback Self Test

3.06 The analog loopback self test checks the data set transmitter and receiver. The customer interface is not checked. Test data generated by the data set is looped back from the transmitter output to the receiver input through an internal attenuator. The received data is compared to the original data. Data errors and data set condition are indicated by the status of the data set indicator lamps.

C. Digital Loopback Self Test (4-Wire Private Line)

3.07 The digital loopback self test checks the transmitter and receiver of both data sets and the facilities connecting the data sets. The customer interfaces are not checked. Test data generated and transmitted by the near-end data set is looped back from the receiver output to the transmitter input of the far-end data set and retransmitted. This data is received by the near-end data set and compared to the original data. Data errors and data set condition are indicated by the status of the indicator lamps on the near-end data sets.

D. End-to-End Self Test

3.08 The end-to-end self test checks the transmitter and receiver of both data sets and the facilities connecting the data sets. The customer interfaces are not checked. Identical test data is generated by both data sets, transmitted by one of the data sets, and compared to the data generated

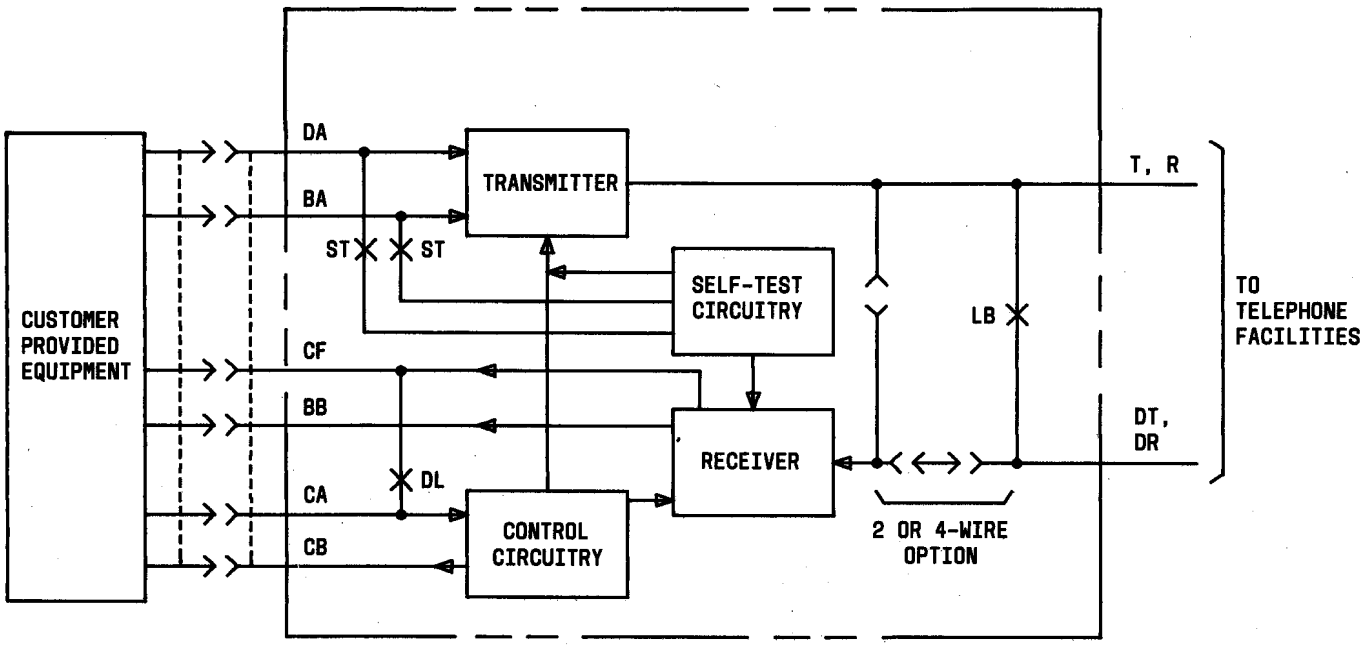

Fig. 4—DS 201C-L1D—Simplified Block Diagram

by the receiving data set. Data errors and data set condition are indicated by the status of the indicator lamps on the data sets. This test is performed with either 2- or 4-wire facilities. In the 2-wire test the transmitter and receiver sections are tested separately. In the 4-wire test both sections are tested simultaneously.

3.09 When DS 201C-L1D is used as an extension of a DS 209A-L1 multiplex system, refer to Section 592-032-100 for more information. Procedures used at the serving test center (STC) to maintain this system are contained in Section 666-511-504.

3.10 When DS 201C-L1D is used as a subrate off-net extension of the digital data system (DDS), refer to Section 314-919-100 for more information. Procedures used at the hub office STC to maintain the analog portion of this system are contained in Section 666-511-501.

3.11 The digital loopback self test cannot be performed from a remote extension (with options as installed) in toward DS 201C-L1D collocated with DS 209A-L1 or a hub office of the DDS. If the internal timing option is temporarily installed at the remote extension, this test can be performed.

INTERFACE

A. Customer Interface

3.12 The customer interface is accessible through the CUST INT connector at the rear of the data set (Fig. 5). The connector pin numbers and the corresponding lead designations are shown in Table A. A detailed description of these leads is contained in the following paragraphs:

3.13 ***Transmitted Data (BA)—Pin 2:*** Mark and space signals generated by the CPE are delivered to the data set on this lead. The data set samples the signals on this lead during the negative transition of the transmitter signal element timing (DB) signal or the clock signal provided by the CPE for externally timed data sets. The CPE must be arranged to transmit data on this lead only when an ***on*** condition is present on both the clear-to-send (CB) and data set ready (CC) leads.

3.14 ***Received Data (BB)—Pin 3:*** Mark and space signals generated by the data set in response to data signals received from the distant-end data set are delivered to the CPE on this lead. The data signals are clocked to the CPE and the CPE is timed to sample the data during the negative transitions of the receiver

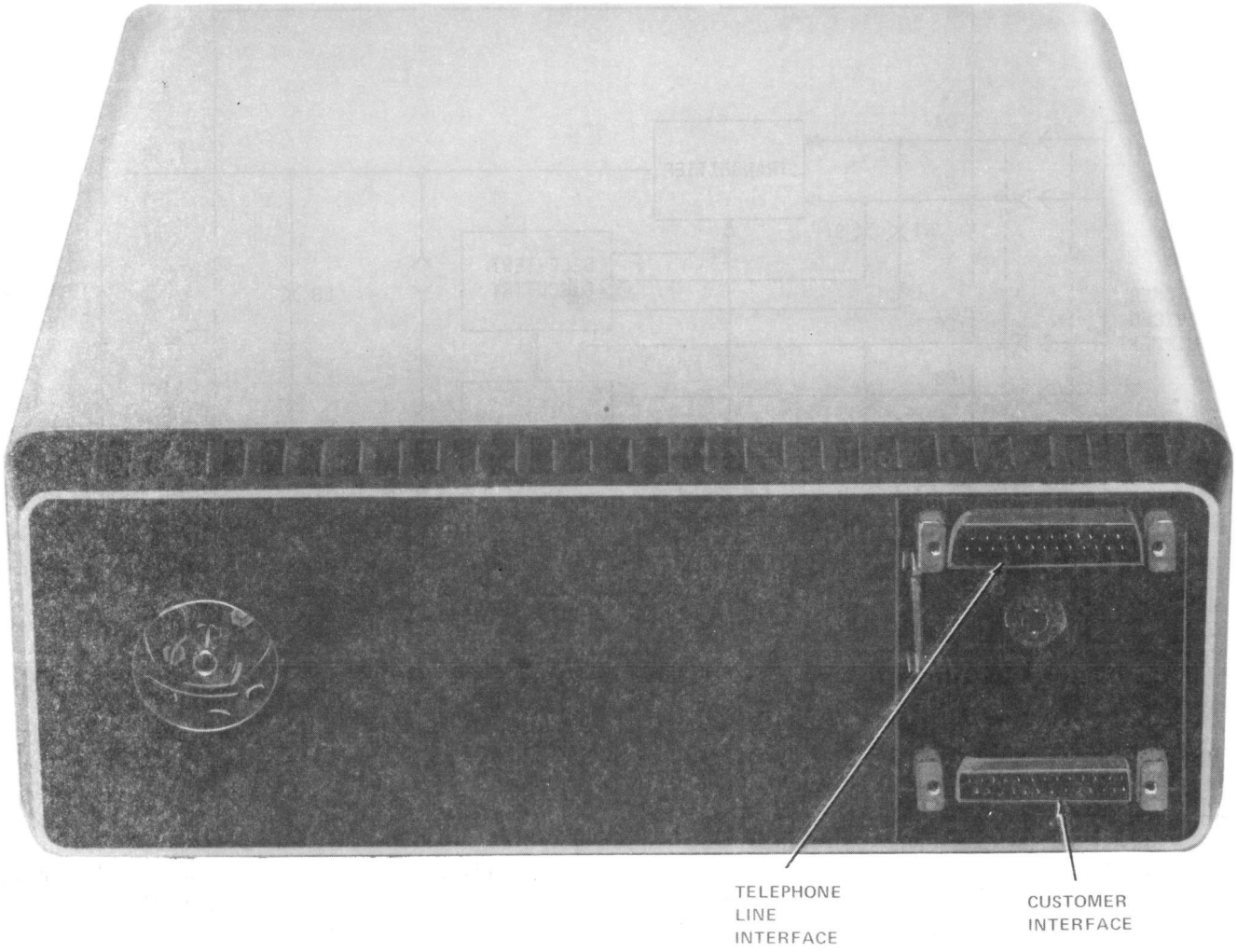

Fig. 5—DS 201C-L1D/2/4/5—Rear View

signal element timing (DD) signals. An ***off*** condition on the received line signal detector (CF) lead causes the received data lead to be clamped in the mark condition. In 2-wire service, an ***on*** condition on the request-to-send (CA) lead causes the received data lead to be clamped in the mark condition. In DL mode the received data lead is clamped in the marked condition.

3.15 ***Request to Send (CA)—Pin 4:*** With switched carrier operation, an ***on*** condition on this lead is an indication to the data set transmitter of the intent of the CPE to transmit data. After turning ***on*** this lead, the CPE should wait for an ***on*** condition on the clear-to-send (CB) lead before starting transmission. For a minimum variation in delay between the ***on*** conditions of CA and CB, the positive going transition of CA should coincide with a positive transition of the dibit clock transmitter (DCT) lead. When the CA lead is turned ***off*** at the end of a message, the data set transmitter remains on about 2 ms to allow the last bits of data to clear the transmitter. With continuous carrier operation, the transmitter is kept on at all times. The user may choose, however, to use the CA lead to control timing functions in the CPE that require the CB lead ***on*** condition. In this case, the data set provides an optional delay of 0 or 7.1 ms between an ***on*** condition of CA and an on condition of CB.

3.16 ***Clear to Send (CB)—Pin 5:*** Signals on this lead are generated by the data set to indicate whether or not the data set is ready

to transmit data. In switched carrier operation, CB is turned ***on*** in response to an ***on*** condition of the request-to-send (CA) lead from the CPE. The CA-CB delay is 148.3 ms for 2-wire private lines and 7.1 ms for 4-wire private lines. This delay allows the distant data set to get into synchronization. The ***on*** condition of the CB lead is an indication to the CPE that signals presented on the transmitted data (BA) lead will be transmitted to the communications channel. The ***off*** condition of this lead is an indication to the CPE that it should not transfer data on the BA lead. The ***off*** condition of CB will be maintained as long as CA is ***off.*** CB turns ***off*** when the CA is turned ***off*** so that another message can be initiated by turning CA ***on*** again. In continuous carrier operation, the data set provides an optional CA-CB delay of 0 or 7.1 ms.

3.17 ***Data Set Ready (CC)—Pin 6:*** Signals on this lead are generated by the data set to indicate to the CPE whether or not the data set is in the data mode. The ***on*** condition of this lead indicates that the local data set is capable of transmitting and receiving data signals and is not in the test mode or talk mode (if the data set is arranged for alternate voice service). The ***on*** condition of this lead alone should not be interpreted to mean that a communication channel has been established to a distant data station or should not be used to determine the status of any remote CPE. This lead is used in conjunction with request-to-send and clear-to-send leads when data is being transmitted.

3.18 ***Signal Ground (AB)—Pin 7:*** This lead establishes the common ground reference potential for all interface leads except protective (frame) ground (AA). This lead is normally connected to the protective ground lead to minimize the introduction of power line noise into electronic circuitry through the power transformer. Depending on local procedures and conditions, this connection to protective ground can be removed by the telco employee.

3.19 ***Received Line Signal Detector (CF)—Pin 8:*** The ***on*** condition of this lead indicates that the data carrier signal has been received for 5 ms or more. This lead will go ***off*** if the line signal disappears for more than 5 ms due to the end of transmission or to a transmission line interruption. This ***off*** condition causes the received data (BB) lead to be clamped to the mark condition and the receiver signal element timing (DD) and dibit clock receiver (DCR) leads to be clamped to the ***on*** condition. In 2-wire service, the CF lead is clamped ***off*** when request to send (CA) is ***on*** and for 100 ms after CA is turned ***off*** to prevent the receiver from responding to echoes on the line and processing the transmitted data (providing local copy). In the DL mode the CF lead is clamped in the mark condition.

3.20 ***Test Voltages (+12V, -12V)—Pins 9 and 10:*** These leads are connected to the power unit in the data set for use by telco personnel in data set testing. Pin 9 provides access to the +12 volt dc supply; pin 10 provides access to the -12 volt dc supply. The CPE must not be connected to these leads.

3.21 ***New Sync (NS—Non-EIA)—Pin 14:*** This lead may be used on an optional basis with a data set at the master station of a multistation private line network, such as in a polling operation, to ensure rapid resynchronization of the receiver on a sequence of messages from many different remote transmitters. This feature is necessary because the receiver clock maintains the timing information of the previous message for some interval after it has ended. This may interfere with resynchronization on receipt of the next message. The CPE can condition this lead to turn ***on*** for 1 ms or more to squelch the existing clock after the end of a message is received. At all other times the ***off*** condition should be applied by the CPE. When the new sync option is not used, the new sync lead is held ***off*** within the data set.

3.22 ***Transmitter Signal Element Timing (DB)—Pin 15:*** For internally timed data sets, 2400 Hz square-wave signals on this lead are used to provide the CPE with signal element timing information for the transmitted data (BA) lead. The DB signal is present at all times when power is applied to the data set. The first signal element of the transmitted data (BA) signal should be presented by the CPE on the positive (***off*** to ***on***) transition of DB which coincides with the ***off*** to ***on*** transition of the clear-to-send (CB) signal. (The clear-to-send signal turning ***on*** coincides with a positive transition of DB.) Transmitted data is sampled by the data set on negative transitions of DB. The DB lead provides a timing signal which is phase-locked to the transmitter signal element

timing (external) (DA) signal for data sets timed externally by the CPE.

3.23 ***Dibit Clock Transmitter (DCT—Non-EIA)—Pin 16:*** A square-wave signal at one-half the bit rate appears on this lead whenever power is applied to the data set. Positive and negative transitions of this signal coincide with positive and negative transitions of transmitter signal element timing (DB). The DCT lead indicates the rate at which phase changes are made in the transmitted signal. Two serial bits (dibit) from the CPE are used to determine a phase change by the data set modulator, and the grouping of bits is according to the transitions on this lead so that over one cycle of DCT, two serial bits from the CPE are encoded into one phase shift. If the minimum variation in delay between request to send (CA) ***on*** and clear to send (CB) ***on*** is desired, the positive transition of request to send from the CPE should coincide with a positive transition of DCT.

3.24 ***Receiver Signal Element Timing (DD)—Pin 17:*** The square-wave signal on this lead at the nominal 2400 Hz rate is used to provide the CPE with receiver signal element timing information. The transition from ***on*** to ***off*** indicates the center of each signal element (bit) on the received data (BB) lead. The DD signal is provided when the received line signal detector (CF) lead is ***on***. If CF should go ***off***, DD is clamped to the mark (***off***) condition. In the DL mode the DD lead is clamped to the space condition.

3.25 ***Dibit Clock Receiver (DCR—Non-EIA) or Local Loopback Test (LL—Non-EIA)—Pin 18:*** The function of this customer interface lead is determined by the option chosen. Option YT is dibit clock receiver and option YS is local loopback test. With option YT installed the received dibit clock appears on pin 18. This is a 1200 Hz square-wave clock frequency which is used internally by the data set to synchronize the symbol decoding process in the receiver. DCR is clamped a positive voltage (space) when CO is off. With option YS installed pin 18 becomes an input which allows the customer to activate the analog loopback test through the customer interface.

3.26 ***Test Voltage (+5V)—Pin 19:*** This lead is connected to the power unit in the data set for use by telco personnel in data set testing.

3.27 ***Data Terminal Ready (CD)—Pin 20:*** This lead will function with either a contact closure interface or an EIA voltage interface. This provides the customer with a status indication of the signal on pin 20 via the TR lamp on the data set. The signal is not used by the data set.

3.28 ***Transmitter Signal Element Timing (External) (DA)—Pin 24:*** For externally timed data sets, this lead is used by the CPE to provide bit rate timing to the transmitter. The ***on*** to ***off*** transition of this lead indicates the center of each signal element on the transmitted data (BA) lead. The timing signal from the CPE must have a frequency of 2400 Hz ±0.005 percent with a peak individual distortion on negative transitions of not more than 0.5 percent. The transmitter signal element timing (DB) lead is phase-locked to this signal and the dibit clock transmitter (DCT) signal is derived from it. Signals should be available on this lead whenever the data set is in service.

B. Telephone Line Interface

3.29 The telephone line interface is accessible through an unlabeled connector at the rear of the data set (Fig. 5). The connector pin numbers and the corresponding lead designations are shown in Table B. A detailed description of these leads is contained in the following paragraphs:

3.30 ***Transmit and Receive (T, R, DT, DR)—Pins 7, 8, 9, and 10:*** For 2-wire service, data set and telephone set signals are transmitted and received through leads T (Pin 7) and R (pin 8). For 4-wire service, separate leads are used for transmitting and receiving. Leads T and R are used to transmit only and leads DT (pin 9) and DR (pin 10) are used to receive only.

3.31 ***Data Set Ready Control and Ground (TEK5, TEK6)—Pins 13 and 11:*** These leads are used by a channel interface unit (CIU) (DAS 828-type, DAS 829-type, or equivalent) to provide an indication to the CPE (on the data set ready lead) when the channel is in the loopback mode and not available for use.

OPTIONS

3.32 Data set 201C-L1D has features or options that may be requested by the user. A detailed description of these options is contained

TABLE B

TELEPHONE LINE INTERFACE

PIN NO.	DESIGNATION	FUNCTION
2	−12V	From power supply
3	+5V	From power supply
7	T	Telephone line tip — Transmit/Receive, 2-Wire — Transmit Only, 4-Wire
8	R	Telephone line ring — Transmit/Receive, 2-Wire — Transmit Only, 4-Wire
9	DT	Telephone line tip — Receive Only, 4-Wire
10	DR	Telephone line ring — Receive Only, 4-Wire
11	TEK6	Signal ground
13	TEK5	Data ready control from CIU* to data set
20	+12V	From power supply

* Channel interface unit (DAS 828-type, DAS 829-type, or equivalent).

in Section 592-029-220. A summary of the options is contained in Table C.

4. OPERATION

A. 4-Wire Private Line

4.01 Data set 201C-L1D is compatible with DAS 828-type and DAS 829-type channel interface units (CIUs). These CIUs provide a prewired and tested standard termination for a 4-wire private line voiceband channel with data only or data with alternate voice and/or switched network backup. For more information on the CIUs, refer to Part 5.

B. 2-Wire Private Line

4.02 Arrangements using DS 201C-L1D on a 2-wire private line must be locally engineered. The data set transmits at 0 dBm. The receive level should be a nominal -16 dBm. The DAS 828-type CIU can be used to terminate a 2-wire data set operating over a 4-wire line.

5. REFERENCES

5.01 Additional information concerning DS 201C-L1D and auxiliary apparatus is contained in the following publications:

SECTION	TITLE
314-205-501	Data Systems—DATA-PHONE® Service and Data Access Arrangements on Direct Distance Dialing Network—Test Requirements for Subscriber, Foreign Exchange, and Remote Exchange Lines
314-410-500	Voice Bandwidth Private Line Data Circuits—Tests and Requirements
314-919-100	Digital Data System—Subrate Off-Net Extension Arrangements—Description
502-500-120	Telephone Sets—540, 560, 1560, and 2560 Series—Common Installation and Maintenance Information
590-002-100	Data Services—2000 and 2400 BPS Provided by Data Set 201-Type—Reference Guide
590-010-200	Data Sets and Data Access Arrangements—General Installation and Connection Information
590-010-201	Data Sets—Multiple Installation Information
590-102-133	42A-Type Data Mounting—Identification
590-102-141	50A1 Data Mounting—Identification

SECTION	TITLE
592-029-150	Data Set 201C—Transmitter-Receiver—Supplementary Information
592-029-220	Data Set 201C-L1D—Transmitter-Receiver—Installation and Connections
592-029-520	Data Set 201C-L1D—Transmitter-Receiver—Test Procedures and Maintenance
592-032-100	Data Set 209A-L1—Transmitter-Receiver—Description and Operation
592-862-100	Data Station 201C—Description and Operation
592-862-200	Data Station 201C—Installation and Connections
598-080-100	Data Auxiliary Set 828A—Description and Operation
598-080-101	Data Auxiliary Set 828C—Description and Operation
598-080-200	Data Auxiliary Set 828A—Installation and Connections
598-080-201	Data Auxiliary Set 828C—Installation and Connections
598-080-500	Data Auxiliary Set 828A—Maintenance and Test Procedures
598-080-501	Data Auxiliary Set 828C—Maintenance and Test Procedures
598-082-100	Data Auxiliary Set 829-Type—Channel Interface Units—Voiceband Private Line Channels—Description
598-082-101	Data Auxiliary Set 829-Type—Supplementary Functions for Voiceband Private Line Channels—(Alternate Voice and Dial Backup)—Description
598-082-102	Data Auxiliary Set 829-Type—Multiple Channel Arrangements—(Switched Dial Backup)—Description
598-082-200	Data Auxiliary Set 829-Type—Channel Interface Units—Voiceband Private Line Channels—Installation and Connections
598-082-201	Data Auxiliary Set 829-Type—Supplementary Functions for Voiceband Private Line Channels—(Alternate Voice and Dial Backup)—Installation and Connections
598-082-202	Data Auxiliary Set 829-Type—Multiple Channel Arrangements—(Switched Dial Backup)—Installation and Connections
598-082-500	Data Auxiliary Set 829-Type—Channel Interface Units—Voiceband Private Line Channels—Maintenance and Test Procedures
598-082-501	Data Auxiliary Set 829-Type—Supplementary Functions for Voiceband Private Line Channels—(Alternate Voice and Dial Backup)—Test Procedures
598-082-502	Data Auxiliary Set 829-Type—Multiple Channel Arrangements—(Switched Dial Backup)—Test Procedures
666-511-501	Test of Data Services Provided by Data Set 201C From a Private Line Test Room
666-511-504	Test of Data Services Provided by Data Set 209A-L1 From a Private Line Test Room
999-100-138	Data Set 201C—How to Operate Manual

5.02 Detailed information concerning DS 201C-L1D is contained in Circuit Description (CD) and Schematic Drawing (SD) 1D290-01 entitled Data Systems Station—Data Set 201C-L1D.

TABLE C

DATA SET 201C-LID OPTIONS

FEATURE		OPTION	OPTION STRAP MAIN CKT JB5	SI SWITCH SETTING							
				1	2	3	4	5	6	7	8
New Sync	Not Used	YA*		O							
	Under Customer Control	YB		X							
Transmitter Timing	Internal	YC*			O	O					
	External	YD			X	O					
	Controlled by Receiver Bit Clock (Slave)	WI			X	X					
Use with DAS 828/829-Type	Yes	YI*	Install E5-E6								
	No	YJ	Install E4-E5								
Grounding Option	Signal Ground Connected to Frame Ground	YK*	Install E7-E8								
	Signal Ground not Connected to Frame Ground	YL	Install E8-E9								
Status of DSR During Local Analog Loopback	DSR On	YM									O
	DSR Off	YN*									X
Continuous Receiver Bit Clock	In	YO								O	
	Out	YP*								X	
Function of EIA Interface Pin 18	Initiates Local Analog Loopback	YS	Install E1-E2								
	Provides Receiver Symbol Clock	YT*	Install E2-E3								

FEATURE			OPTION	OPTION STRAP LINE INT. TP2	SI SWITCH SETTING							
					1	2	3	4	5	6	7	8
Type of Operation and Clear to Send Delay	4-Wire	Switched Carrier 7 MSEC Clear to Send Delay	XA*	Install E2-E3 Install E4-E6				O	X	X		
		Continuous Carrier 7 MSEC Clear to Send Delay	XB	Install E2-E3 Install E4-E6				O	O	X		
		Continuous Carrier 0 MSEC Clear to Send Delay	XC	Install E2-E3 Install E4-E6				X	O	X		
	2-Wire	Switched Carrier 150 MSEC Clear to Send Delay	XE	Install E1-E3 Install E5-E6				O	X	O		

* Factory-furnished option

X = Closed

O = Open