PLANTRONICS DS151A
*ComSet** MODEM
INSTALLATION/OPERATION

1. GENERAL

1.01 This section is a cover sheet for the Plantronics/ComSet Modem DS151A Installation and Operation Manual 09073-00.

1.02 The *ComSet* DS151A-1M-1C Modem is a multiple mounting equipped with a cover. It may be placed on a table or shelf, mounted in a 19-inch rack or cabinet. It comes equipped with a power supply board and one modem channel board. Slots will accept seven more modem channel boards (a total of eight channel boards per mounting).

Note: Space is also provided to store an extender board.

1.03 Each modem channel board connects one telephone line with one computer port through an E1A interface. The channel board provides unattended answering. It accepts "*Touch-Tone*®" signals from the line and converts them to 300 baud frequency shift keyed (FSK) ASCII signals. These are presented to the computer port and, when desired, can be transmitted back on the line to the visual data terminal. This echoplexing can be done either by the modem channel board or by the customer's computer. As transmission is half-duplex, the operator cannot send another character until the echoplexed character is received by the visual data terminal.

2. USOC CODE/CUSTOMER OPTIONS

ComSet Modem (USOC DM8++)

A. 1. Echoplex
   2. No Echoplex

B. 3. 300 Baud
   4. 150 Baud/110 Baud (See Note 1.)

C. 5. Even Parity
   6. Odd Parity

D. 7. EOT (##) Not transmitted to computer (immediate disconnects)
   8. EOT (##) Transmitted to computer

E. 9. CB lead is true "Clear to Send"
   10. CB lead goes on when both CC and CD leads are on (See Note 2.)

F. 11. Auto time-out set at 10 seconds
   12. Auto time-out variable 8 to 50 seconds (See Note 3.)

Notes:

1. 110 or 150 baud is entered in remarks.

2. Modem functions as RS-232-C but gives appearance of CB=CC to accommodate some computers.

3. Desired variable automatic time-out from 8 to 50 seconds is entered in remarks.

3. ORDERING–SERVICE/RETURNS

3.01 Factory repair service is provided by Plantronics on a repair and return basis.

3.02 All purchasing and returns is handled by Western Electric (WE).

3.03 Order Wording

(Qty) Modem, ComSet, Plantronics, DS151A-1M-1C

Maintenance Spares

(Qty) Board, Channel, Modem, Plantronics, 09092-00

(Qty) Assembly, Supply, Power, Modem, Plantronics, 09093-00

Tool

(Qty) Board, Extender, Plantronics, 09094-00

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Attachment:
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PLANTRONICS/ComSet™ MODEM DS151A

INSTALLATION AND OPERATION MANUAL

PLANTRONICS, INC. . 385 Reed Street . Santa Clara, California .
95050 . (408) 249-1160 . Telex 34-5555

CONTENTS

FIGURES

TABLES

1. GENERAL

1.01 This manual describes the Plantronics/ComSet Modem Model DS151A (figure 1-1), and includes procedures for installation and on-site testing. Full technical discussions and maintenance procedures are in the Plantronics/ComSet Model DS151A Maintenance Manual 09072-00. For detailed information on connection to and operation with the communications network and the DTE (data terminal equipment), refer to Plantronics/ComSet System Description and Interface Specification 09069-00.

1.02 The Plantronics/ComSet modem is designed as the interface between the communications network and the data terminal equipment (DTE) in a data communications system using dial-up, primarily, or private line networks. The modem receives dual-tone multifrequency (DTMF) signals from a remote terminal, transmits frequency-shift keying (FSK) signals back to the remote terminals, and transfers data between itself and the DTE according to EIA Standard RS-232-C.

2. PHYSICAL DESCRIPTION

2.01 The DS151A modem consists of a modem shelf (07750-00) and up to 10 plug-in circuit cards. The shelf mounts in a standard 19-inch rack or cabinet. The shelf can also be installed on a table, shelf, or other horizontal surface. Overall dimensions are 19 inches wide by 5-1/4 inches high by 20-3/4 inches deep; maximum weight is about 20 pounds (see figure 1-1). For a stand-alone type installation, an optional cover kit (09095-00) is available.

2.02 Plug-in circuit cards (figure 2-1) are as follows:

(a) One modem channel board (09092-00) for each communications channel up to a maximum of eight

(b) One power supply board (09093-00)

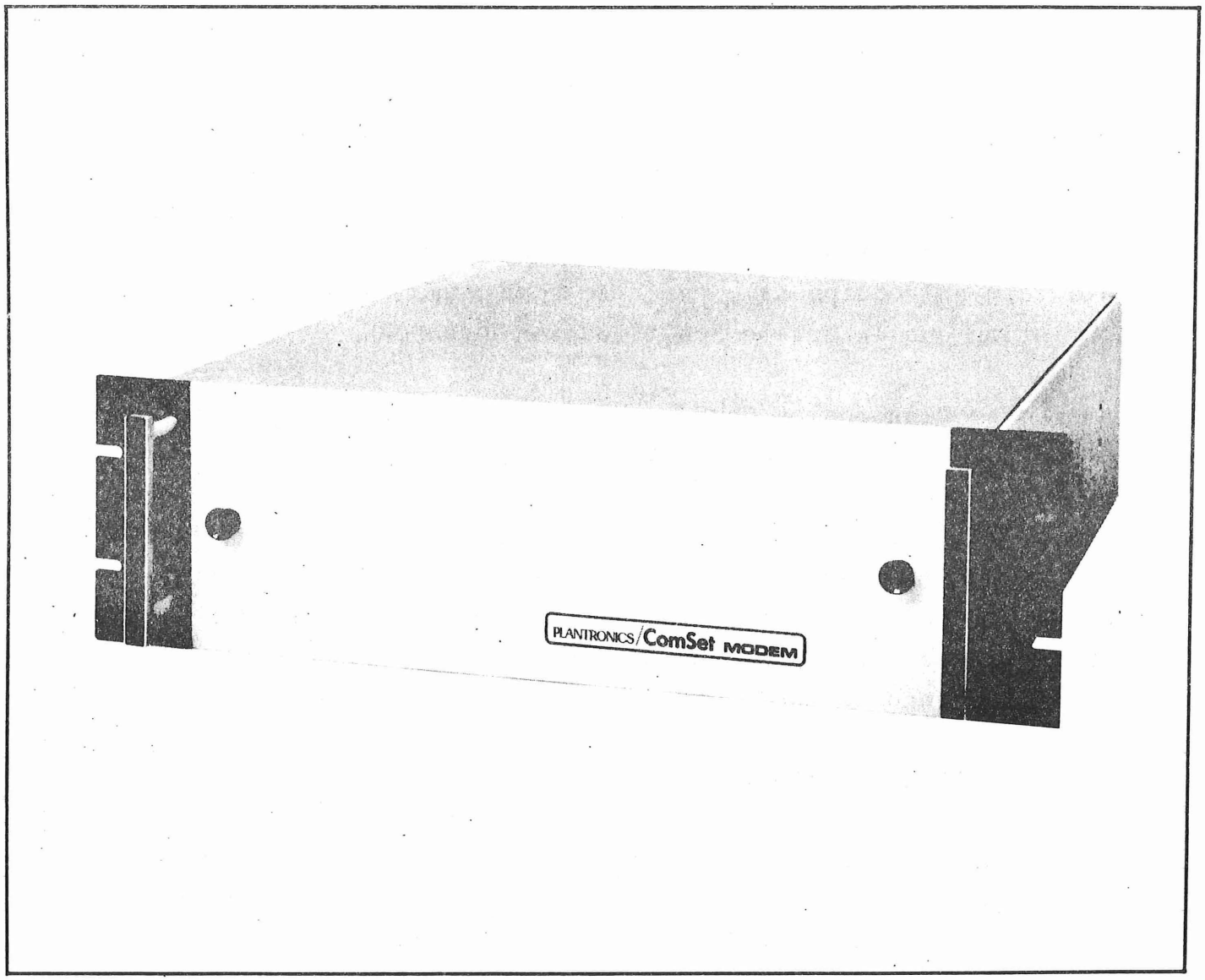


Figure 1-1. Plantronics/ComSet Modem DS151A

(c) One optional extender board (09094-00) used for test purposes

2.03 Each channel card has the following LED indicators (reading top to bottom):

A Presence of low DTMF frequency
B Presence of high DTMF frequency
CD Data terminal ready
CC Data set ready

2.04 The rear panel (figure 2-2) has receptacles for connection to the DTE along with direct connection to the incoming telephone lines or through type CBS Data Access Arrangements (DAA). See Section 4, Installation.

3. SITE REQUIREMENTS

3.01 The following facilities are required where the modem will be installed:

(a) Access to the communications network

(b) Access to the DTE via a maximum of 50 feet of cable

(c) Mounting space on a 19-inch rack or cabinet or on a horizontal surface

(d) Three-wire 117 V, 60-Hz power receptacle within reach of the 8-foot power cord on the modem shelf.

(e) Access to the DAA via a maximum of 25 feet of cable, when used.

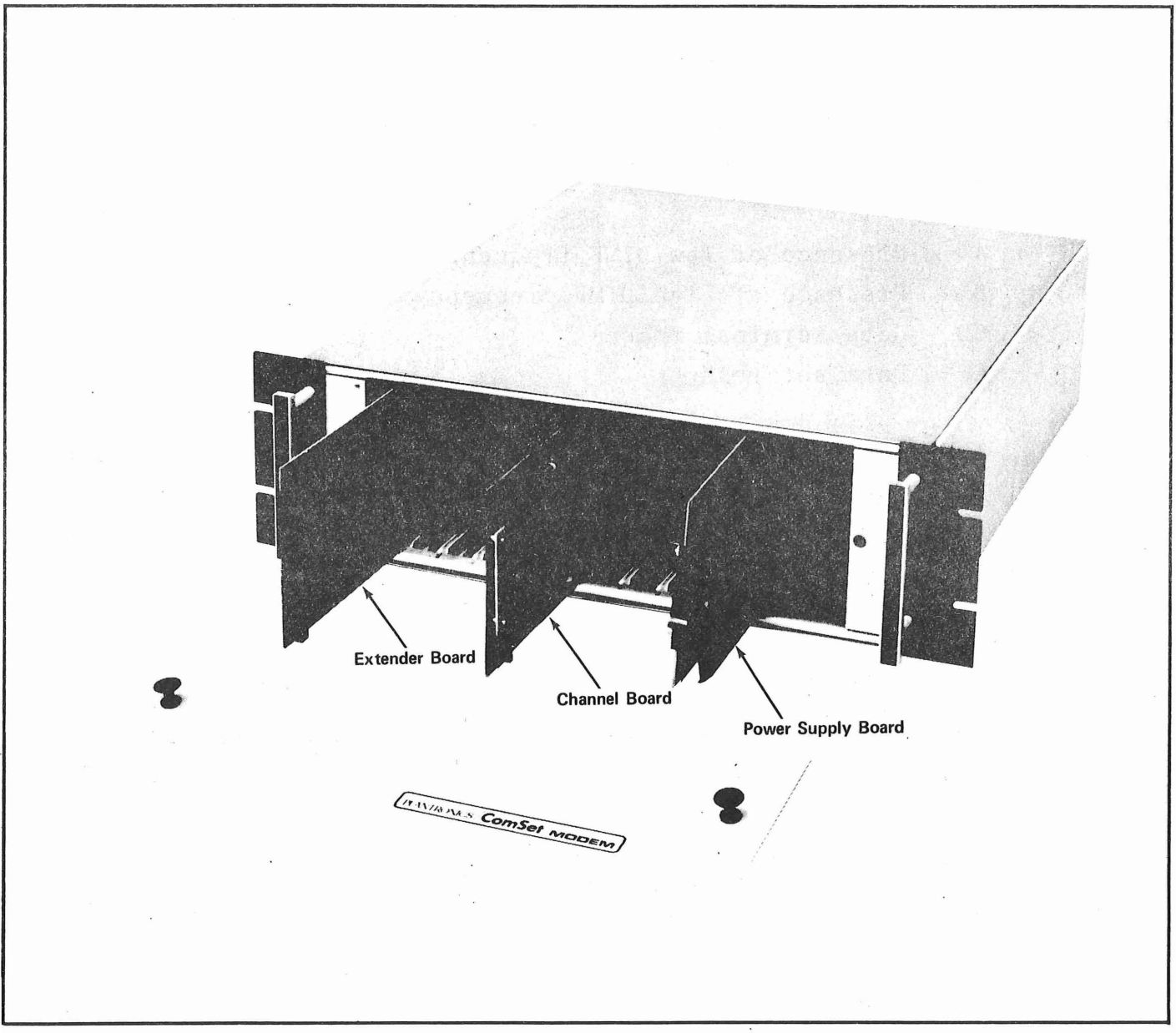


Figure 2-1. Modem with Front Panel Removed

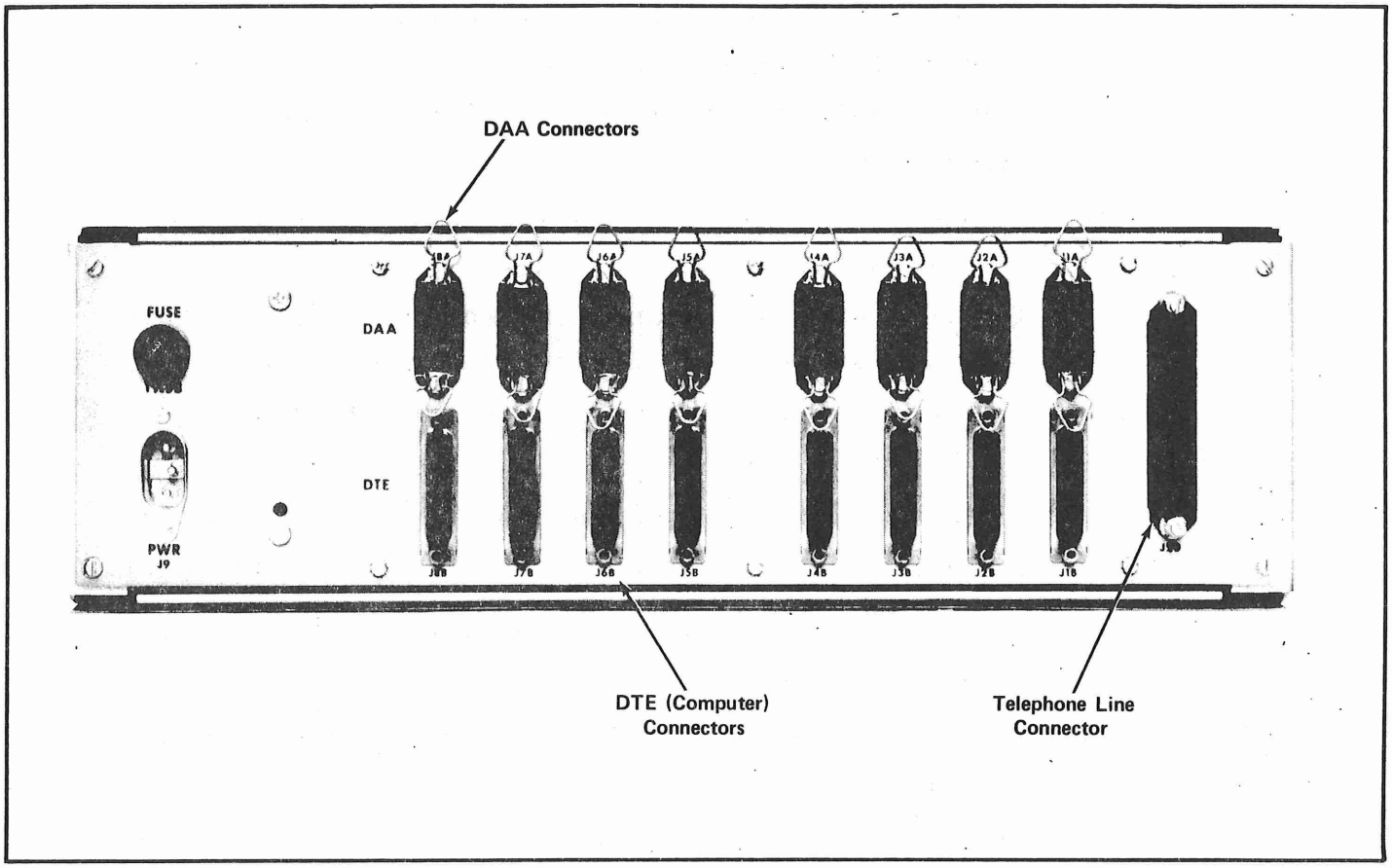


Figure 2-2. Modem Rear Panel

4. INSTALLATION PROCEDURES

4.01 Mount and assemble the equipment as follows:

(a) For rack or cabinet installation, bolt the front panel flanges onto the rack verticals.

(b) For tabletop mounting, the optional cover kit (09095-00) is recommended to improve the appearance.

(c) Remove front panel by pulling out the two snap connectors.

(d) Verify that power supply board is seated in slot 10 (see figure 2-1). When viewed from the front of the shelf, the slots are numbered left to right, 1 through 10.

(e) Insert individual channel boards, as required, in any of the slots 2 through 9 (see figure 2-1).

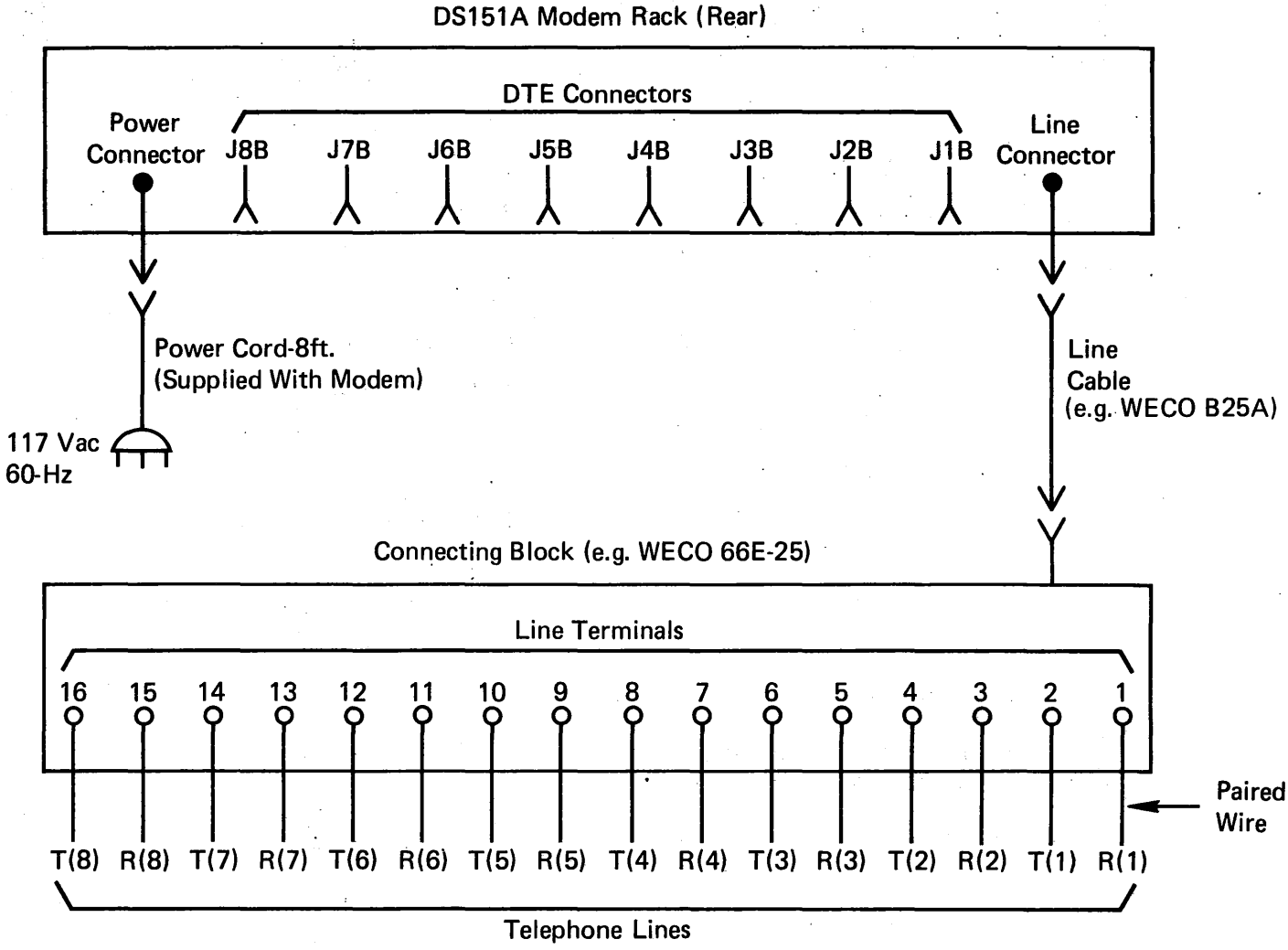
(f) Insert extender board (if purchased) in slot 1 (see figure 2-1).

(g) Plug in power cord and check that power lamp on supply board is lighted.

(h) Replace front panel. Lock in place by pushing in the two snap connectors.

4.02 Attach the DTE cables to the appropriate DTE channel receptacle, Cinch type DB-19604-43 or equivalent (see table 4-1). Make sure both screws are tightened for proper seating. As described in Plantronics ComSet System Description and Interface Specification 09069-00, the proper mating plug is a Cinch DB-19604-00 or equivalent. A description of the pin assignments and function is given in table 4-2.

Table 4-1. DS151A Modem Interconnect Diagram.



Modem Line Connector Pair Assignments:

Modem Channel Number*		1	2	3	4	5	6	7	8
Pin Number	(T)	1	2	3	4	5	6	7	8
	(R)	26	27	28	29	30	31	32	33

*Channel Number (Or Position) 8 Is The One Nearest The Power Supply Board.

Table 4-2. DTE (Computer) Pin Assignment

PIN	CIRCUIT	I/O[1]	FUNCTION
1	AA	---	Protective Ground
2	BA	I	Transmitted Data
3	BB	O	Received Data
4	CA	I	Request to Send
5	CB	O	Clear to Send
6[2]	CC	O	Data Set Ready
7	AB	---	Signal Ground
8[2]	CF	O	Carrier Detector
18	EPX[3]	I	Echoplex
20	CD	I	Data Terminal Ready
22	CE	O	Ring Indicator
25	LTV	---	Loop Test Voltage (+12 V)

[1] Input or Output with respect to the modem.

[2] CF is supplied by internal strapping of pin 8 to CC, pin 6, to simulate carrier to the computer.

[3] See table 4-4.

Table 4-3. DAA Connector Pin (or Terminal) Assignment

ComSet Modem Connector Pins	DAA CBS Terminal	I/O[1]	Function
9	DT	I/O	Data Tip
10	DR	I/O	Data Ring
7	OH	O	Off-Hook
5	DA	O	Data Access
8	RI	I	Ring Indicator
4	SG	---	Signal Ground
6	CCT	I	Cut Through

[1] Input or Output with respect to the modem.

4.03 Direct connection is made to the communications line by attaching the cable from the incoming lines to the telephone line connector (see table 4-1). This connector is a 25-pair AMP Champ 229974-1 or equivalent and mates with an AMP Champ 2-552001-1 or equivalent (not provided by Plantronics). Pair assignments are listed in table 4-1.

4.04 If access to the communications network is to be through a CBS-type DAA, then a DAA cable (optional purchasable item number 07751-00) should be connected to each of the DAA connectors for the appropriate channels used (see figure 2-2). The DAA receptacle is an Amphenol type 57-30140 or equivalent and mates with an Amphenol type 57-30140 or equivalent. A description of pin assignments, function, and operation is given in table 4-3. If other than a Plantronics DAA cable is used then an 1800-ohm, 1/8 watt or better, carbon resistor should be strapped across the DT and DR terminals of the DAA.

4.05 Optional operating modes are selected for each channel by setting switches on the channel board. Refer to table 4-4, figures 4-1 and 4-2. Removal of the channel board from the shelf is required for setting most options.

5. ON-SITE TESTING

5.01 Three methods of testing the DS151A modem are given below. Before testing begins, there must be assurance that the communications channel is within performance specifications and that the DTE interface, if used in the test, is functioning properly.

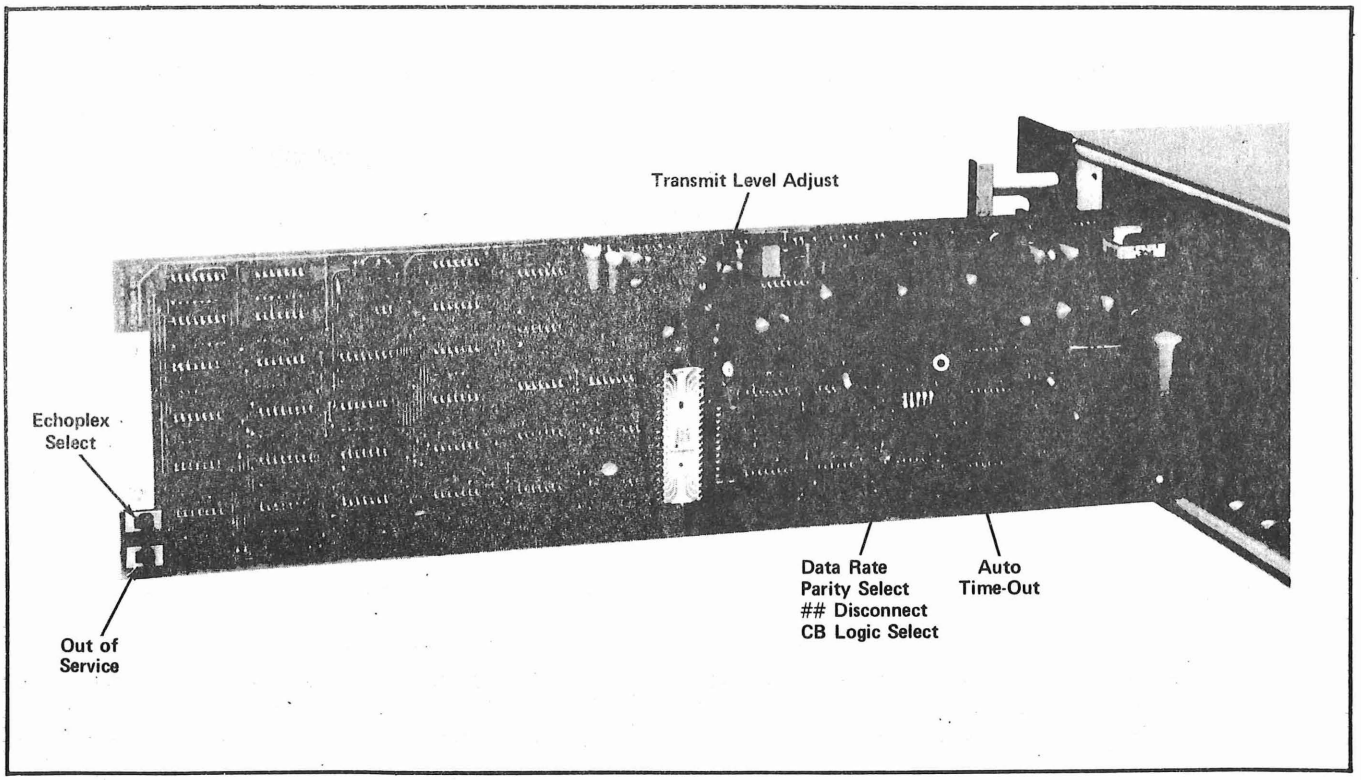
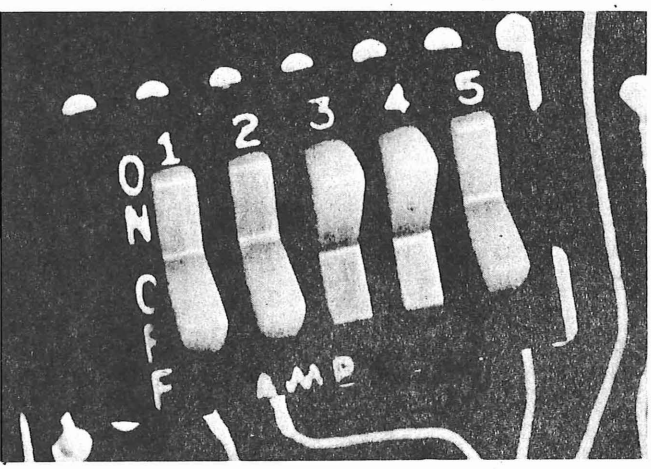
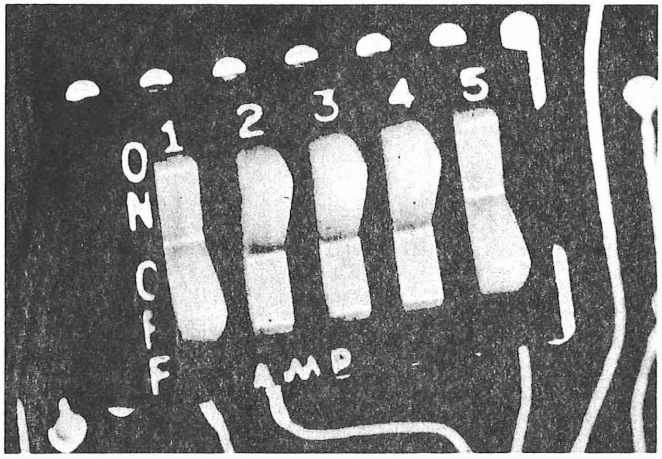


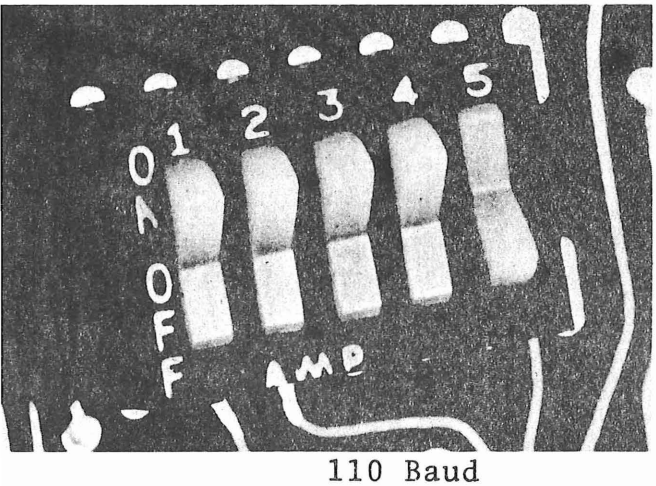
Figure 4-1. Modem Channel Board



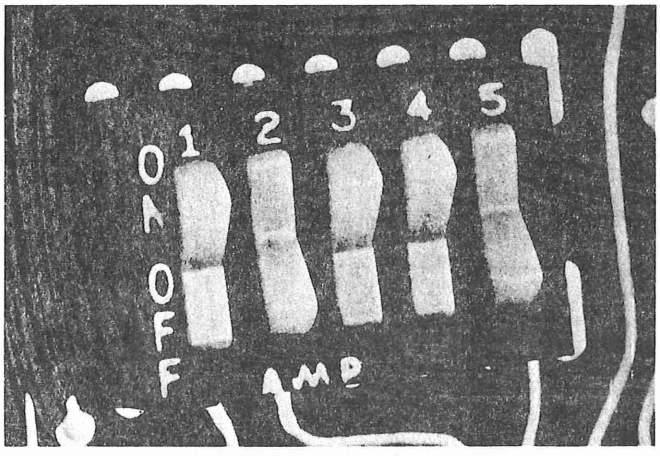
300 Baud



150 Baud



110 Baud



150 Baud

Figure 4-2. Data Rate Selection

Table 4-4. Channel Board Selectable Functions (See Plantronics/ComSet System Description and Interface Specification (09069-00) for further description of options.)

FUNCTION	SWITCH NUMBER	SWITCH POSITION	RESULTING CONDITION	COMMENT
Out of Service	S1	Dot Showing No Dot	Auto Answer	-Direct Connection or through DAA. -Appears Busy to Dial-up Line. Permanently ON to Private Line Circuit. (No Time-out in Effect)
Echoplex (EPX) Select	S2	Dot Showing No Dot	Auto Echoplex External Control	---------- -EIA Interchange Circuit EPX (Pin 18) can be used to control Echoplex. EPX "ON" - gives Echoplex. EPX "OFF" - No Echoplex
Data Rate	S3-1 and S3-2	Both ON One ON, One OFF Both OFF	300 Baud 150 Baud 110 Baud	-Factory Set Position. ---------- ----------
Parity Select	S3-3	OFF ON	Even Parity Odd Parity	-Factory Set Position. ----------
##Disconnect	S3-4	OFF ON	No Disconnect By Modem Immediate Disconnect	-EOT Transmitted to DTE. -No EOT Transmitted to DTE.
CB Logic Select	S3-5	ON OFF	CB=True "Clear to Send" CB Goes ON When Both CC & CD Are ON	-Per EIA RS-232-C. -Modem functions as RS-232-C but gives appearance of CB=CC to accommodate some computers.
Auto Time-Out	R56	Screw Adjustment	Continuously variable from 8 sec to 50 sec.	-Factory set at 10 sec (nominal). Clockwise rotation increases time-out delay. Approximately 10 sec per rotation. 4 turns maximum.
Transmit Level Adjust	R139	Screw Adjustment	Continuously variable -28 dBm to +5 dBm	-Factory set at -3 dBm nominal. Clockwise rotation increases gain.

5.02 Loopback Test. In this test, the incoming DTMF signal is decoded and looped back internally via the echoplex route. For the test, the communications channel must be connected to a Plantronics/ComSet data terminal, or an equivalent equipment capable of generating DTMF signals and receiving FSK data. Proceed as follows:

(a) Disconnect DTE interface cable.

(b) At the DTE connector install a jumper from pin 25 (LTV) to pin 20 (CD), or optionally pins 10 and 17 on the extender board if used. A 914B Data Test Set may be used to make these connections.

(c) Set channel board EPX switch S2 in automatic echoplex position.

(d) At the remote terminal, set up a connection to the modem; if dial-up service is used, dial the applicable number.

(e) From the remote terminal, transmit a DTMF signal and observe the returned FSK signal to confirm that it coincides with the proper DTMF/ASCII conversion (see table 2 of Plantronics/ComSet System Description and Interface Specification, 09069-00).

5.03 Modem Transmission and Interface Test. To test both the EIA interface and transmit branch of the modem, use a Western Electric 914B Data Transmission Test Set, or equivalent, and the procedures specified by the test equipment manufacturer.

5.04 System Test. The complete data system, including the DTE interface, can be tested by attempting to perform normal system operating procedures with a Plantronics/ComSet DTE Simulator TS170. As an alternative, the system can be tested by inserting a Pulsecom model 505-2 Data Interface Test Set, or equivlaent, between the modem and the DTE and performing the procedures outlined by the test equipment manufacturer.

6. SPECIFICATIONS

6.01 Input Signal From Remote Terminal

(a) Format: DTMF (2 of 7 A,B tones; 12 combinations)

(b) Allowable input levels: -40 dBm to 0 dBm

(c) Repetition rate: 10 characters/second maximum at 300 baud (one character/100 milliseconds)

(d) Input impedance: 900 ohms ±10%, ac coupled

(e) Dc loop resistance: 82 ohms at 120 mA maximum

(f) Character recognition time: 12 to 18 milliseconds

(g) Frequency (A or B) recognition bandwidth: ±2% nominal; ±3% maximum

(h) Allowable input amplitude difference: F_A-F_B=6 dB (nominal); F_A-F_B=12 dB (maximum)

(i) Disconnect Time-out: 8 to 50 seconds (continuously adjustable)

6.02 Output Signal to Remote Terminal

(a) Format: frequency-shift keying (FSK)

(b) FSK frequencies: 2025 Hz = Space
2225 Hz = Mark

(c) Signal stability: 2125 Hz ±1% center frequency
200 Hz ±2% modulation

(d) FSK signal levels: adjustable from -28 dBm to +5 dBm (factory set at -3 dBm (nominal))

(e) Output impedance: 900 ohms ±10%, ac coupled

(f) Dc loop resistance: 82 ohms at 120 mA maximum

(g) Data rate: 300 baud maximum as transmitted by DTE

(h) Echoplex data rate: 110, 150, or 300 baud (switch selectable)

6.03 Noise Performance

(a) Insensitive to power line noise at 60 Hz and related harmonics

(b) Insensitive to impulse noise from atmospheric static and switching transients found on unconditioned telephone lines

(c) Signal to in-band (2125 Hz ±400 Hz) non-coherent noise immunity: 6 dB (minimum)

(d) Signal to out-of-band (300 - 1740 Hz; 2600 Hz and up) noise immunity: -20 dB (minimum)

6.04 DTE Input/Output Signals

(a) Data format: eight-level serial ASCII code including odd or even parity (switch selectable) plus one start and one stop bits.

(b) Signal levels: EIA Standard RS-232-C compatible

(c) DTMF/ASCII character conversion:

DTMF	ASCII
0-9	0-9
*	CAN
#	CR
##	EOT

(d) Data rate: 110, 150, or 300 baud (switch selectable)

(e) Data transfer delay: Character output to DTE 30 to 40 ms after DTMF "OFF"

6.05 Power Requirements: 117 Vac ±10%, 60 Hz, 10 watts maximum

6.06 Physical Characteristics

(a) Shelf dimensions: 19 in. wide
5-1/4 in. high
20-3/4 in. deep

(b) Shelf weight: approximately 20 pounds fully loaded

(c) Shelf capacity: up to eight individual modem channels, one extender board, one power supply board

6.07 Operating Environment

(a) Temperature: $0^{o}C$ to $50^{o}C$ (operating)
$-10^{o}C$ to $65^{o}C$ (non-operating)

(b) Maximum relative humidity: 90% (no condensation)

(c) Altitude: 10,000 feet maximum

7. PLANTRONICS WARRANTY AND SERVICE POLICY

7.01 Warranty. Plantronics/ComSet products are guaranteed free from defects in workmanship and materials for a period of one (1) year from date of shipment. Excluded from this warranty are parts which are considered to be subject to wear and tear in normal usage, such as cords, cables, and all external decorative finishes.

7.02 Products returned for repair during the warranty period will be repaired at no charge, provided that the products have not, in the judgment of Plantronics, Inc., been subjected to improper installation, breakage, abuse, neglect or unauthorized repair attempt or alteration. Plantronics will prepay the return transportation by the most appropriate means of delivery. Products returned during the warranty period shall be subject to a handling charge if replacement of damaged items is necessary.

7.02 Factory Service. Factory repair service is provided by Plantronics for products that are out of warranty. This service is operated on a repair and return basis. Charges are based upon labor, material, and transportation costs. Equipment returned for repair will be inspected to determine the extent of damage and the cause of failure. This information will be compared with that provided by the customer for each returned item. Unless otherwise directed by the customer, Plantronics will then complete the repair and reconcile all discrepancies to the actual quantity and condition of the equipment received. Shipments to Plantronics shall be prepaid. Cost of return transportation will be included with the repair billing. Plantronics will select the most appropriate means of return shipment unless otherwise designated by the customer.

7.03 Plantronics will accept returned products, transportation prepaid to:

Plantronics, Inc.
Customer Service Department
345 Encinal Street
Santa Cruz, California 95060

7.04 The following information should be included with the returned units:

(a) Bill-to address

(b) Ship-to address

(c) Purchase order/control number

(d) Reason for return and serial number