

TA201C DATA MODEM TEST USING EXTERNAL TEST EQUIPMENT

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1. GENERAL

A. Introduction

1.01 This section contains procedures required to test a RIXON® TA201C Data Modem using a Data Transmission Test Set (DTS). The section is also designed to test portions of the data modem and data installation not tested by self-diagnostics or installation tests. The tests listed in this section should be performed after self-diagnostics and installation tests have been completed.

1.02 Whenever this section is reissued, the reason will be listed in this paragraph. Please refer to this paragraph when working with any section above the Issue 1 level.

B. Pre-Test Checks

1.03 Before performing the following tests, verify that:

- The data modem options have been correctly selected and noted for the service application.
- The telephone portion of the installation has been tested by the local telephone company and meets the standard DC talk, signaling, and supervision requirements.
- The transmission loop (telephone line from data modem location to nearest central office) has been tested by the local telephone company and meets requirements for data modem operation over a switched network.

C. Required Equipment

1.04 The following equipment is required to test the TA201C using listed procedures:

- Data terminal interface cable used to connect data modem to data terminal.
- Sierra 1914C Data Test Set.
- Rixon's Data Test Center (RDTC) must be available as a remote site.
- A 565, 2565, or AE186 telephone.

**R
E
A
D**

Connect test equipment and set controls only as specified in the following procedures. Doing otherwise may damage the data modem and test equipment.

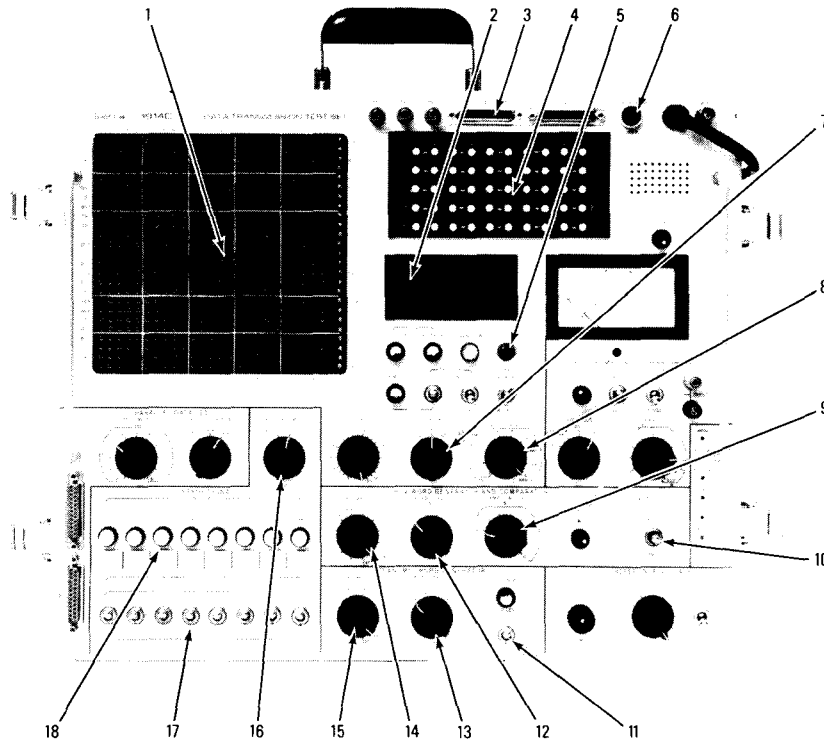
D. Control Locations

1.05 Figure 5-1 shows location of controls used during the test and Table 5-A lists the controls.

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Fig. 5-1. Sierra 1914C Data Transmission Test Set

E. General Setup

1.06 Chart 1 is a general setup of the 1914C DTS, which is used for most of the tests performed in this section. Reference to this setup as a whole or in part will be made throughout the tests.

2. ANALOG LOOPBACK ERROR RATE TEST (TWO- OR FOUR-WIRE)

2.01 This test checks both the data modem and data terminal. To perform the analog loopback error rate test, follow Chart 2 procedure.

3. END-TO-END ERROR RATE TEST (TWO- OR FOUR-WIRE)

3.01 The procedure provided in Chart 3 checks both the data modem and the data lines. It also checks a far-end data modem. The Chart 3 procedure is for two-wire (half-duplex) operation. If four-wire (full-duplex) service is employed, the transmitting and receiving end-to-end test can be performed simultaneously by ensuring DTS S4 is ON at both ends.

TABLE 5-A	
1914C DTS CONTROLS, INDICATORS, AND CONNECTORS	
FIG. 5-1 REF. NO.	DEVICE
1	Program matrix.
2	Counter display.
3	Connector A.
4	Interface selection switches.
5	RESET pushbutton.
6	POWER switch and lamp.
7	TEST SET MODE switch.
8	COUNTER switch.
9	Receive SAMPLE WIDTH switch.
10	WORD SYNC switch.
11	SIG LEV switch.
12	Receive WORD LENGTH switch.
13	Transmit WORD LENGTH switch.
14	Receive BIT RATE switch.
15	Transmit BIT RATE switch.
16	INTERFACE MODE switch.
17	CONTROL SIGNAL switches S1 through S8.
18	CONTROL SIGNAL lamps DS1 through DS8.

4. DIGITAL LOOPBACK ERROR RATE TEST (FOUR-WIRE)

4.01 Chart 4 provides an alternate test for checking both the data modem and data lines. This test also checks a far-end data modem.

5. REMOTE ERROR RATE TEST (TWO-WIRE DDD)

5.01 The data modem and data lines are checked during the Chart 5 procedure. It is only used for data modems in switched network configurations. The data modem is remotely tested by RIXON Data Test Center (RDTC). No other test equipment is required. Before calling RDTC obtain the following information from the data modem rear panel nameplate.

- Data modem model number
- Data modem part number
- Data modem serial number

6. REFERENCES

6.01 The following publications provide additional information for standalone and multiple installations using a TA201C Data Modem.

SECTION	TITLE
5214-100	TA201C Data Modem Description and Operation
5214-200	TA201C Data Modem Installation and Connection
5214-300	TA201C Data Modem Self-Diagnostics
5225	TA201C Users Manual
5219	TA201C Maintenance Manual

CHART 1

1914C DTS TEST SETUP

STEP	ACTION	VERIFICATION
1	At DTS, ensure POWER switch is off.	DTS POWER indicator OFF.
2	At data modem, ensure ON Lamp is off.	
3	Disconnect data modem cable from CUST INT connector at business machine, and reconnect cable to Connector A of DTS.	Fig. 5-1, Ref. No. 3.
4	Place all 1914C DTS program pins in matrix STG positions and program matrix by placing one red program pin at each matrix position specified below: Horizontal row / Vertical row 1 / GRD 2 / SD 2 / DS2 3 / RD 3 / DS3 4 / DS4 4 / S4 5 / DS5 6 / DS6 7 / GRD 8 / DS8 15 / SCT 17 / SCR 20 / DS7 20 / S7	Fig. 5-1, Ref. No. 1.
5	Ensure all interface selector switches are pushed in.	Fig. 5-1, Ref. No. 4.
6	Set TEST SET MODE switch to SER.	Fig. 5-1, Ref. No. 7.
7	Set Counter switch to BIT ERRORS.	Fig. 5-1, Ref. No. 8.
8	Set Receive SAMPLE WIDTH switch to 0.5 μ sec.	Fig. 5-1, Ref. No. 9.

CHART 1 (Cont)

1914C DTS TEST SETUP

STEP	ACTION	VERIFICATION
9	Set WORD SYNC switch to OFF.	Fig. 5-1, Ref. No. 10.
10	Set Transmit SIG LEV switch to $\pm 4V$.	Fig. 5-1, Ref. No. 11.
11	Set Receive WORD LENGTH switch to 63.	Fig. 5-1, Ref. No. 12.
12	Set Transmit WORD LENGTH switch to 63.	Fig. 5-1, Ref. No. 13.
13	Set Receive BIT RATE switch to EXT + .	Fig. 5-1, Ref. No. 14.
14	Set Transmit BIT RATE switch to EXT + .	Fig. 5-1, Ref. No. 15.
15	Set INTERFACE MODE switch to VOLTAGE.	Fig. 5-1, Ref. No. 16.
16	Set CONTROL SIGNAL switches S4 and S6 to OFF. Set S7 to ON.	Fig. 5-1, Ref. No. 17.
17	Lamps DS2 through DS8 provide interface lead indications from data modem as follows: DS2 Transmitted Data DS3 Received Data DS4 Request To Send DS5 Clear To Send DS6 Data Set Ready DS7 Data Terminal Ready DS8 Carrier Detect	Fig. 5-1, Ref. No. 18.

CHART 2

ANALOG LOOPBACK ERROR RATE TEST (TWO- OR FOUR-WIRE)

STEP	ACTION	VERIFICATION
1	Perform setup as described in Chart 1.	
2	Connect data modem ac power and press AL switch.	Data modem ON and TM lamps light.
3	At DTS press POWER switch and set S4 to ON.	DTS POWER lamp lights.
4	Press and release WORD SYNC switch to MAN position.	Counter stops.
5	Press and release RESET pushbutton.	Counter indicates 00.
6	Allow error rate to run for 5 min.	Counter should stay at 00.
7	To return data modem to normal operation press to release data modem AL pushbutton and DTS POWER pushbutton.	Data modem TM lamp and DTS POWER lamp goes out.
8	Disconnect ac power from data modem.	Data modem ON lamp goes out.
9	If other tests must be performed, continue with other tests; otherwise, reconnect data modem to data terminal and restore ac power.	

CHART 3

END-TO-END ERROR RATE TEST (TWO- OR FOUR-WIRE)

STEP	ACTION	VERIFICATION
1	Perform setup as described in Chart 1. Call far-end site and ensure same procedure is done.	
2	If testing two-wire, set S4 to ON at transmitting end, and OFF at receiving end. If testing four-wire, set S4 to ON at both ends.	
3	Press and release DTS POWER switch; at data modem connect ac power.	DTS POWER and data modem ON lamps light.
4	Press and release WORD SYNC switch to MAN position.	Counter stops.
5	Press and release RESET pushbutton.	Counter indicates 00.
6	At receiving end of two-wire configuration, press and release WORD SYNC switch to MAN after DS4 lamp lights, then press and release RESET pushbutton.	Counter stops, then indicates 00 after reset.
7	Record errors during one minute intervals for several minutes, resetting counter at end of each error run.	
8	Disregard error run with most errors and check error rate.	Should be less than 10 errors per minute.
9	To return data modem to normal operation, press and release DTS POWER pushbutton. Disconnect ac power from data modem.	DTS POWER and data set ON lamp goes out.
10	If more tests need to be performed, continue with other tests, otherwise reconnect data modem to data terminal and restore ac power.	

CHART 4

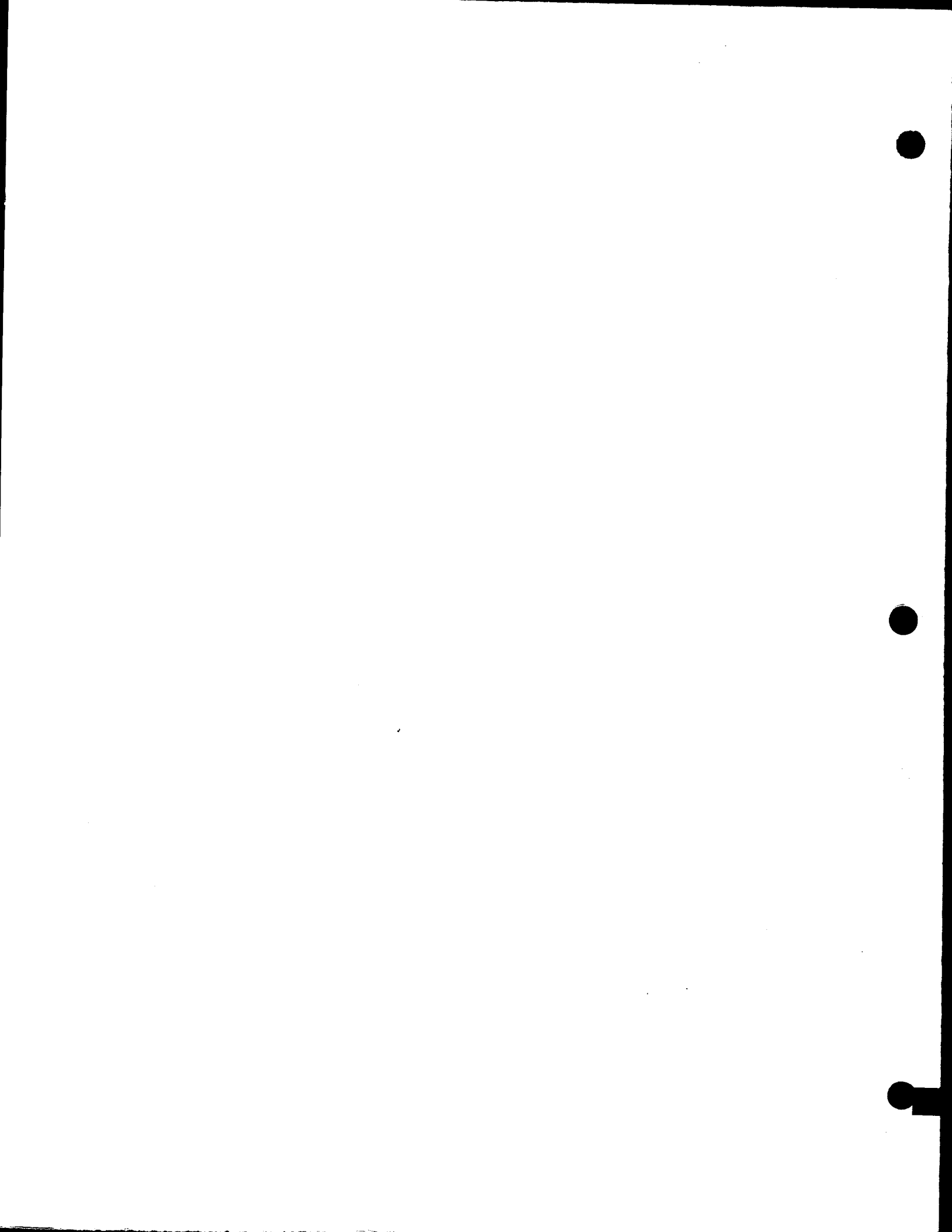
DIGITAL LOOPBACK ERROR RATE TEST (FOUR-WIRE)

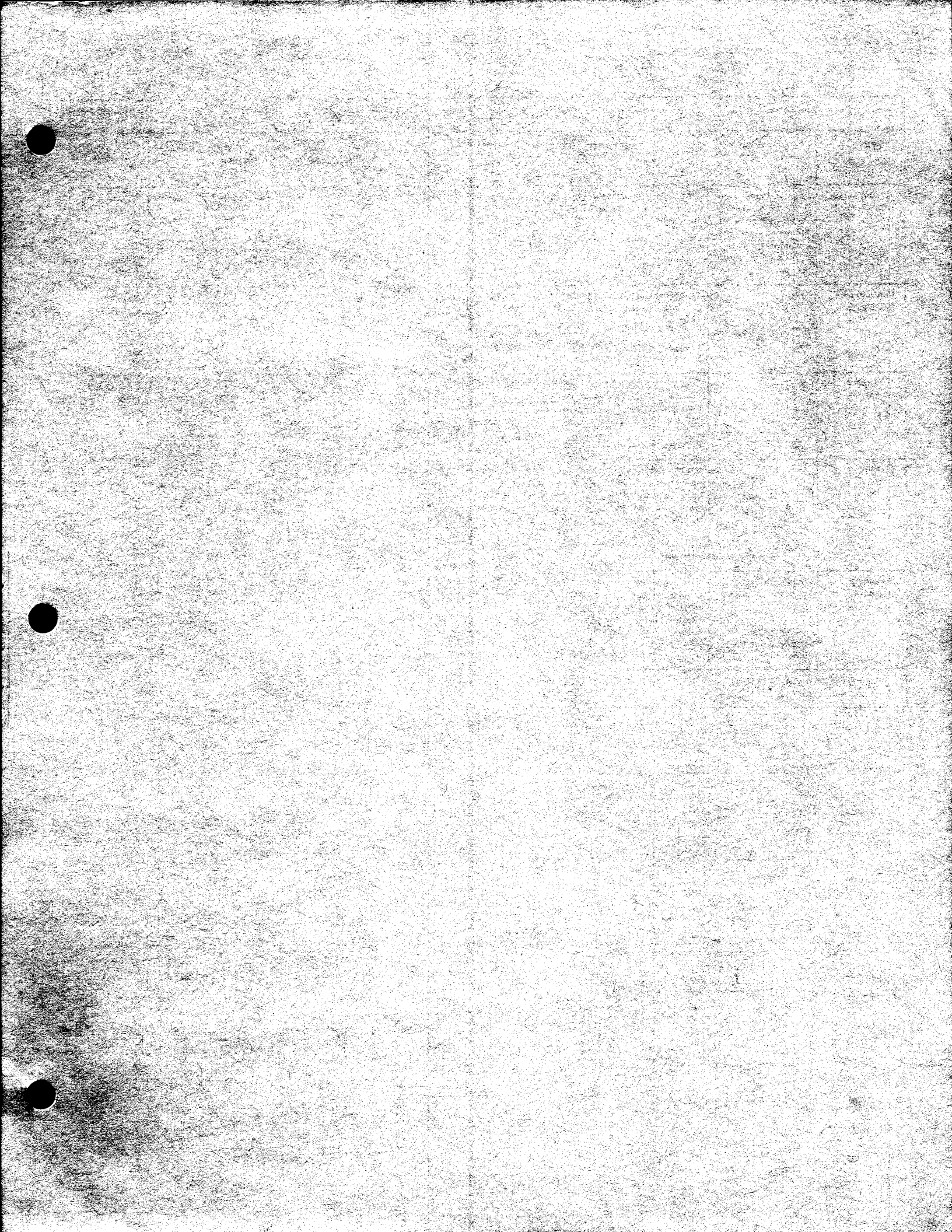
STEP	ACTION	VERIFICATION
1	Perform general setup as described in Chart 1. Ensure all switches on local data modem are in OUT (released) position.	
2	Call far-end site, have data modem DL switch pressed, and verify all other switches are in normal position.	Far-end site data modem TM lamp lights.
3	At DTS, set S4 to ON. Press and release POWER switch. Connect ac power to data modem.	DTS POWER and data modem ON lamps light.
4	Press and release WORD SYNC switch to MAN position.	COUNTER stop.
5	Press and release RESET pushbutton.	COUNTER indicates 00.
6	Record errors during 1 min. error run. Set S4 to OFF at end of error run.	
7	Set S4 to ON and repeat Steps 4, 5, and 6 several times. Disregard error run with most errors.	Should be less than 10 errors per minute.
8	To return data modem to normal operation press and release DTS POWER pushbutton. Disconnect ac power from data modem.	DTS POWER and data modem ON lamps go out.
9	Reconnect data modem to data terminal and restore ac power.	

CHART 5

REMOTE ERROR RATE TEST (TWO-WIRE DDD)

STEP	ACTION	VERIFICATION
1	Call RDTC and request remote test.	
2	At request of RDTC attendant, press data modem RT pushbutton.	Data modem TM lamp lights.
3	RDTC attendant indicates duration of test. At request of RDTC attendant press DATA pushbutton and place telephone handset on hook.	
4	RDTC begins remote test.	During test, data modem lamps RC, CS, and MC light and CO goes out for about 2 seconds; RS, CS and MC go out and CO lights for about 2 seconds. Changing lamp pattern continues during test.
5	At end of predetermined time RDTC terminates test.	Data modem lamps stop blinking.
6	Press lighted line key and lift telephone handset off hook to resume voice communication with RDTC and determine test results.	
7	Press (release) RT pushbutton.	Data modem TM lamp goes out.
	NOTE: <i>If RT pushbutton is not released, data modem cannot answer any incoming calls.</i>	
8	At request of RDTC terminate call in normal manner.	



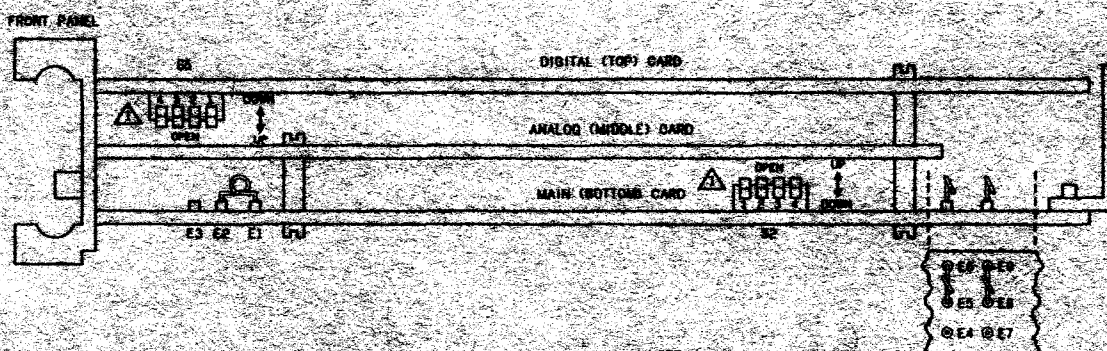
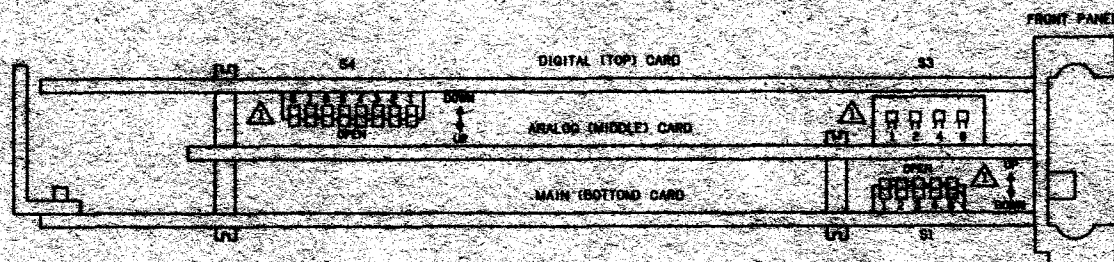


TA2010 TELEPHONE COMPANY SELECTED OPTIONS

FEATURE	OPTION	GENERAL DESCRIPTION	WESG DESIG		BASE SELECTION	SWITCH OR JUMPER POSITION	LOCATION
			DDO	PL			
Transect line signal level	Signal surge 0 to -10 dbm. Switch S2. Attenuates transect signal the sum total of all toggle switch positions.	0 db setting is recommended in private line installations using a DA6209 and in registered DDD installations.	**0dbm	*0dbm			S2 on analog (middle) card
Use with DAS 650/620 type	Yes	During facility loopback test, DA6209 indicates to the terminal that data modem is in not-in-data mode.	N/A	*Y		S1-3D	S1 on main (bottom) card
	No	Data Set Ready indication to terminal is controlled by the data modem.	N/A	*YJ		S1-3U	
4-Wire local analog line loopback (+16 dB)	In	Enables data modem to loop four-wire telephone line via a 16 db amplifier when in the analog loopback test mode. Recommended for four-wire private line installations.	N/A	-		S2-2D	S2 on main (bottom) card
	Out	Disables four-wire line loopback.	N/A	-		S2-2U	
Satellite option	In	Enables Request To Send signal at the called data modem for 275 ms after the end of answer tone. Delay interval allows echo suppressors which were disabled by conversion frequency to enable. Recommended in DDD satellite links.	**YD	N/A		S5-4D	S5 on digital (top) card
	Out	Request To Send signal at called data modem is not inhibited.	YR	N/A		S5-4U	
Grounding option	Signal ground connected to frame ground	Ties signal ground to the metal case (frame ground) of the data modem. Used to reduce longitudinal noise from the power line.	**YK	*YK		Screw switch closed	Screw switch on rear panel
	Signal ground not connected to frame ground	Isolates signal ground from frame ground.	YL	YL		Screw switch open	

* Factory setting for TA2010 L1/D.

** Factory setting for TA2010 L1/C1/D.



NOTE:
 SWITCHES MUST BE FULLY TO ONE SIDE OR THE OTHER. IN CENTER POSITION THE SWITCHES ARE NOT FUNCTIONAL.

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