

B1 DATA CARRIER TERMINAL
DEMODULATOR, TROUBLE TIMER, AND DEMULTIPLEXER
TESTS AND TROUBLE LOCATION

1. GENERAL

1.01 This section is associated with Section 314-016-550, B1 Data Carrier Terminal — Tests and Trouble Location — General. Each section refers to one class of trouble condition as determined by the 20A toll testboard.

2. PURPOSE

2.01 This section tabulates a series of tests designed to isolate a trouble condition of the demodulator, trouble timer, or the demultiplexer. It is to be used when the 20A toll testboard attendant has verified that the input signal to the affected unit is within limits, and that no major alarm condition exists in the associated carrier supply unit. Before beginning the test, all *E, M, B1-B2* leads associated with the affected unit should be blocked at the 20A toll testboard by placing a ground on the corresponding six SIG L jack sleeves and inserting make-busy plugs in the six MB jacks.

3. APPARATUS

908A Logic Circuit Test Set (J79908A)

Hewlett-Packard 403A AC Transistor Voltmeter (TVM)

1 W1AW test cord or 8 clip leads (for grounding test points)

4. PROCEDURE

4.01 The 908A logic circuit test set specified in the Apparatus paragraph of this section has been designed specifically for use on the B1 data carrier terminal. The 908A operates on 12 volts derived from the +12 volt supply of the B1 terminal. A single lead with a clip suitable for attaching to the test points of the B1

terminal circuit packages is provided for the input. An 11-position rotary switch selects the desired function. Frequency is measured with the rotary switch set to one of four positions, depending on the frequency to be measured. Maximum accuracy is obtained when using the scale setting which gives the highest reading on the meter (nearest to full scale). To measure bias with the 908A meter, the rotary switch is set to either BIAS(+) or BIAS(-) to provide a positive reading on the meter.

4.02 If the trouble is associated with a particular channel, replace the CP18 which is associated with the affected channel, and attempt to return the unit to service. There are six CP18s in each supervisory tray, and channel one is associated with the CP18 which is adjacent to CP17. If this procedure does not clear the trouble, then recourse to the more detailed procedures should be taken.

4.03 The detailed trouble shooting procedure to be followed is presented in a tabular form. Upon learning of a trouble existing in a supervisory signaling circuit the repairman should utilize the indicated testing apparatus with proper settings, insert the special circuit preparations, and verify that his readings agree with the indicated test result. In the event that the test result is not correct, the repairman should take the indicated action. If that action requires replacement of a circuit package, the test which located the defective package should be repeated to verify that the trouble has been cleared.

4.04 Once a trouble is cleared, the test procedure should be continued to clear troubles in circuits that protect service, but would not show up readily since these circuits are not normally active. The trouble timer is an example of such a circuit.

4.05 In some cases the detailed test procedures indicate that if a signal is not present on an output, it is not being generated and that the circuit package failing to generate the signal should be replaced. Should such a replacement not correct a trouble, an effort should be made to determine if the trouble is external to the circuit package. Wire leads, connectors, power, and signal sources should be investigated rather than resorting to continued attempts to

replace the circuit package. *Wear on circuit packages and connectors should be avoided whenever possible.*

4.06 Test point E, found on CP18 just below the knob, carries the transient voltage produced by opening the E lead to a trunk relay winding. This test point should not be touched, especially when removing the cord, in order to prevent surprise shocks.

4.07 DEMODULATOR TESTS

TEST NUMBER	CIRCUIT PACKAGE	TEST POINT	TESTING APPARATUS	SETTINGS OR INSTRUCTIONS	SPECIAL CIRCUIT PREPARATION	TEST RESULT SHOULD BE	ACTION FOR INCORRECT TEST RESULT
1	CP11	None	None	None	Operate test key to TST; ground test point DG	Trouble lamp remains ON when test key is thrown to TST. If trouble lamp was not ON at start, proceed to next step	If trouble lamp goes out and stays out, replace Line Circuit (SD-73019-01) and/or SUPV filter (620B) and/or CP11
2	CP5	BO	908A	50 CPS — DF	Do not change	47.8 ±2	Replace CP11 and/or trouble shoot multiplexer and modulator (see Section 314-018-550)
3	CP5	SO	908A	500 CPS — AF	Do not change	35 ±2	Trouble is in multiplexer and/or modulator, (see Section 314-018-550)
4	CP6	SI (GRD)	908A	500 CPS — AF	Do not change	35 ±2	Replace CP6 and/or CP7
			TVM	-10 db		-27 ±3 db	
5	CP7	CL	908A	TRL(+)	Do not change	Lamp OFF	Replace CP7
6	CP8	DO	908A	500 CPS — AF	Do not change	5 ±2	Replace CP8
7	CP6	BI	908A	50 CPS — DF	Do not change	47.8 ±2	Replace CP6 and/or CP8
8	CP6	BI	908A	BIAS +,-	Do not change	≤ 5%	Replace CP8 if BIAS control cannot be adjusted below 5%

4.08 DEMULTIPLEXER TESTS (CLOCK AND STEERING MEMORY)

TEST NUMBER	CIRCUIT PACKAGE	TEST POINT	TESTING APPARATUS	SETTINGS OR INSTRUCTIONS	SPECIAL CIRCUIT PREPARATION	TEST RESULT SHOULD BE	ACTION FOR INCORRECT TEST RESULT
1	CP12	3820	908A	5000 CPS — DF	Retain test key in TST position, and ground on test point DG	38 ±2	Trouble shoot carrier supply and/or 3820 lead on pin 3, TS(C)
2	CP12	G	908A	TRL(+)	Do not change	908A lamp flashes	Ground test point G and utilize the starred (**) test results
				50 CPS — DF		10 ±2	
3	CP12	$\overline{C1}$	908A	5000 CPS — DF	Do not change	**19 ±2	Replace CP12
						17 ±2	
4	CP15	$\overline{C5}$	908A	500 CPS — DF	Do not change	**19 ±2	Replace CP15
						17 ±2	
5	CP16	$\overline{C6}$	908A	500 CPS — DF	Do not change	**9.5 ±2	Replace CP16
						8.5 ±2	
6	CP16	DA	908A	50 CPS — DF	Retain previous preparations and ground test point G	48 ±2	Replace CP16
7	CP16	DB	908A	50 CPS — DF	Do not change	24 ±2	Replace CP16
8	CP16	DC	908A	50 CPS — DF	Do not change	12 ±2	Replace CP16

4.09 DEMULTIPLEXER TESTS (SYNC RECOVERY)

TEST NUMBER	CIRCUIT PACKAGE	TEST POINT	TESTING APPARATUS	SETTINGS OR INSTRUCTIONS	SPECIAL CIRCUIT PREPARATION	TEST RESULT SHOULD BE	ACTION FOR INCORRECT TEST RESULT
1	CP13	P	908A	BIAS(-)	Retain test key in TST position, and grounds on test points DG and G	44 ±3	Replace CP13
2	CP12	FP	908A	BIAS(-)	Do not change	44 ±3	Replace CP13
3	CP13	T	908A	BIAS(-)	Do not change	39 ±3	Replace CP13
4	CP14	T̄	908A	BIAS(+)	Do not change	39 ±3	Replace CP13
5	CP13	FD	908A	TRL(+)	Do not change	Off	Replace CP14 then CP13 (in that order)
				MP(+)		No repetitive flashing	
6	CP13	FE	908A	TRL(+)	Do not change	Off	Replace CP14 then CP13 (in that order)
				MP(+)		No repetitive flashing	
7	CP13	FD	908A	MP(+)	Retain test key in TST position, remove ground from test point G, place grounds on test points FG, FP, T, K, and DG	Continuous ON or very rapidly flashing lamp	Replace CP14 then CP13 (in that order)
8	CP13	FE	908A	MP(+)	Do not change	Continuous ON or very rapidly flashing lamp	Replace CP14 then CP13 (in that order)

4.09 DEMULTIPLEXER TESTS (SYNC RECOVERY) (Cont)

TEST NUMBER	CIRCUIT PACKAGE	TEST POINT	TESTING APPARATUS	SETTINGS OR INSTRUCTIONS	SPECIAL CIRCUIT PREPARATION	TEST RESULT SHOULD BE	ACTION FOR INCORRECT TEST RESULT
9	CP13	H	908A	50 CPS — DF	Retain test key in TST position; and grounds on test points DG, K, and G; remove grounds from test points FG, FP, and T	6 ±2	Replace CP13
10	CP14	FT or FU (only one)	908A	50 CPS — DF	Do not change	6 ±2	Replace CP14
11	CP12	FC	908A	50 CPS — DF	Do not change	6 ±2	Replace CP14
12	CP12	FG	908A	50 CPS — DF	Do not change	6 ±2	Replace CP14
13	CP12	G	908A	50 CPS — DF	Do not change except place grounds on test points DG and KS; remove ground on test point G	11 ±2	Replace CP12
14	CP12	KS	908A	MP(+)	Do not change except remove ground on test point KS	No flashing	Replace CP12
15	CP12	\bar{K}	908A	TRL(+)	Do not change except remove ground on test point K	Lamp OFF	Replace CP12
16	CP12	\bar{K}	908A	TRL(+)	Do not change except ground test point H	Lamp ON	Replace CP12

4.10 DEMULTIPLEXER (E LEAD DESAMPLING, STEERING, AND MEMORY)

TEST NUMBER	CIRCUIT PACKAGE	TEST POINT	TESTING APPARATUS	SETTINGS OR INSTRUCTIONS	SPECIAL CIRCUIT PREPARATION	TEST RESULT SHOULD BE	ACTION FOR INCORRECT TEST RESULT
1	CP6	BI	908A	50 CPS — DF	Operate test key to TST position; ground test point DG; test point H should not be grounded	47.8 ±2	Trouble shoot modulator (see Section 314-018-550) and/or CP6, CP7, and CP8
2	CP17	SP	908A	500 CPS — DF	Do not change except ground test point G	9.5 ±2	Replace CP17
3	CP17	RESET	908A	50 CPS — DF	Do not change	47.8 ±2	Replace CP17
4	CP17	SET	908A	50 CPS — DF	Do not change	47.8 ±2	Replace CP17
5	CP18	SR	908A	50 CPS — DF	Do not change except remove ground on test point G	6 ±2	Replace CP18
6	CP18	RR	908A	50 CPS — DF	Do not change	6 ±2	Replace CP18
7	CP18	CE	908A	TRL(-)	Do not change	Lamp flashes	Replace CP18 — and/or trouble shoot Channel Circuit (see Section 314-017-550)
8	CP18	ET	908A	BUFFER	Do not change	Lamp flashes	Replace CP18
9	CP11	EG	908A	BUFFER	Do not change except remove ground from test point DG and ground CM1, CM2, CM3, CM4, CM5, and CM6 sequentially; remove ground from each before proceeding to next CM test point	Lamp should go ON for each CM test point grounded	Replace the CP18 associated with a grounded CM lead not lighting the 908A lamp

4.11 TROUBLE TIMER

TEST NUMBER	CIRCUIT PACKAGE	TEST POINT	TESTING APPARATUS	SETTINGS OR INSTRUCTIONS	SPECIAL CIRCUIT PREPARATION	TEST RESULT SHOULD BE	ACTION FOR INCORRECT TEST RESULT
1	CP10	\overline{LU}	908A	TRL(+)	Place test key in TST position and ground test point DG	Lamp OFF	Trouble shoot de-multiplexer
2	CP10	SET	908A	50 CPS — DF	Do not change	41 \pm 3	Trouble shoot de-multiplexer
3	CP10	RESET	908A	50 CPS — DF	Do not change	41 \pm 3	Trouble shoot de-multiplexer
4	CP10	\overline{NP}	908A	TRL(+)	Do not change	Lamp ON	Replace CP10
5	CP10	NP	908A	TRL(+)	Do not change	Lamp OFF	Replace CP10
6	CP10	ST	908A	MP(+)	Do not change	Lamp flashes	Trouble shoot de-multiplexer and/or replace CP10
				50 CPS — DF		5 \pm 2	
7	CP10	RT	908A	MP(+)	Do not change	Lamp flashes	Trouble shoot de-multiplexer and/or replace CP10
				50 CPS — DF		5 \pm 2	
8	CP11	LB	908A	TRL(+)	Do not change	Lamp flashes	Replace CP10
9	CP10	NP	908A	TRL(+)	Do not change except ground test points SET and RESET on CP10	Lamp ON	Replace CP10
10	CP9	TM and TC	908A	MP(+)	Do not change	Lamp flashes at about 2 to 3 second intervals	Replace CP9
11	CP11	LA	908A	TRL(+)	Do not change	Lamp ON	Replace CP10

4.11 TROUBLE TIMER (Cont)

TEST NUMBER	CIRCUIT PACKAGE	TEST POINT	TESTING APPARATUS	SETTINGS OR INSTRUCTIONS	SPECIAL CIRCUIT PREPARATION	TEST RESULT SHOULD BE	ACTION FOR INCORRECT TEST RESULT
12	CP11	LA	908A	TRL(+)	Do not change except remove ground from test point SET, leaving ground on test point RESET	Option Z* Lamp goes off immediately Option Y* Lamp goes off after approximately 2.8 seconds	Replace CP10 (option Z and option Y are interchangeable, but if CP10 is Group 2, CP4 should be also)
13	CP11	LA	908A	TRL(+)	Do not change except ground test point SET briefly (ie, less than one second) while leaving ground on test point RESET	The 908A lamp should not come on but the lamp on CP11 should be ON while the test point is grounded	Replace CP10
14	CP11	MU	908A	TRL(+)	Do not change except remove grounds on test points SET and RESET	Lamp ON	Replace CP11
15	CP11	EG	908A	BUFFER	While observing lamp, remove ground from test point DG and return test key to NORM position	Lamp OFF	Replace CP11
16	CP9	BC	908A	BUFFER	Ground test points LA and LB; observe lamp as test key is moved from NORM to TST position	Lamp goes OFF in TST position	Replace CP11

* Option Z is being tested if CP10 is ED-73071-30, Group 1. Option Y is being tested if CP10 is ED-73071-30, Group 2.

5. LIST OF DRAWINGS AND SECTIONS FOR REFERENCE

TITLE	NO.
Data Systems — Central Office — B1 Data Carrier Terminal — Supervisory Signaling Circuit	SD-73017-01
Data Systems — Central Office — 908A Logic Circuit Test Set	SD-73021-01
908A Logic Circuit Test Set — Description and Operation	Section 100-171-101
20A WADS Toll Testboard — Description and Operation	Section 314-016-160