
ROUTINE MAINTENANCE TESTS
T1 DIGITAL LINE
DIGITAL TRANSMISSION SYSTEMS

This section provides a maintenance procedure for testing the narrowband noise on an active fault-locate facility equipped with the 1114- or 1115-type fault-locate filters.

The reasons for reissuing this section are to provide the T1 Digital Transmission System with a narrowband noise test for an active fault-locate facility and to delete the following routine maintenance tests. These tests are now contained in Section 365-800-002 (TOP) with the exception of the order-wire test which is no longer a routine requirement.

- (1) T1 Error Test
- (2) Passive Fault-Locate Line Test
- (3) Power Loop Test
- (4) Order-Wire Test.

Since this is a general revision no revisions arrows have been used to denote significant changes. Equipment Test Lists are affected.

To perform the routine maintenance test in this section, either the J98725AD fault-line test set (FLTS) or the J98710F fault-locating set (FLS) with J94003A or C noise measuring set (NMS) can be used in conjunction with the J98725AJ fault line powering module (FLPM). The test set and FLPM are connected to the fault-locate facility as shown in Fig. 1 (FLTS) or Fig. 2 (FLS). The FLPM initially monitors the fault-locate (FL) line to determine if it is already in use from another office. If the FL line is not busy or if foreign voltage is not present, the line is connected through to the FLTS or FLS.

The FLPM supplies the 118 volts that powers the 1114- or 1115-type fault-locate filters attached to the FL pair at the repeater locations. Reversing the polarity of the voltage on the tip and ring of the FL pair turns the single input 1114-type filter on or off or selects one of the two inputs of the 1115-type filter.

The 1114- and 1115-type fault-locate filters are active, narrow bandpass filters available at each of the twelve fault locate frequencies. The filters are coded A through M which corresponds to twelve basic frequencies in the 0.8- to 3-kHz audio band. Their input is connected to a separate fault-locate output on the T1 line repeaters and their output is bridged onto the FL line. When activated the filter extracts from the digital output of the repeater the signal (discrete frequency or tone) transmitted over the maintenance line (ML) by the FLTS or FLS. The signal is returned on the FL line through the FLPM to the FLTS or NMS (if a FLS is used) where the noise level on the signal is measured and recorded (on Form E-6880, Fig. 3). These measurements are made to ensure

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that the noise level is within limits and that maintenance facilities are operational and will be reliable for use in troubleshooting.

The loop resistance test which is normally performed when testing a fault-locate facility equipped with passive type filters is not performed when testing a facility equipped with active type filters.

APPARATUS:

3—P3BH Cord

1—J98725AJ Fault Line Powering Module (FLPM, Section 103-494-109)

1—J98725AD T1C/T1 Fault Locate Test Set (FLTS, Section 103-494-106)

Note: If the FLTS is not available the following will be required.

1—J98710F Fault-Locating Set (FLS, Section 103-494-100)

1—J94003A or C (3A or 3C) Noise Measuring Set (NMS, Section 103-611-100 or 103-611-101)

1—3P13A Cord for 3A NMS (double jack input)

1—3P17A Cord for 3C NMS

STEP

PROCEDURE

Note: In the following test the test signal will be sent over an idle ML. The test signal must not be sent over an in-service line.

- 1 If the J98710F FLS is being used proceed to Step 17. If the J98725AD FLTS is being used continue with Step 2.

A. Test Using J98725AD FLTS with J98725AJ FLPM (Fig. 1)

- 2 Connect the FLPM power cord to a 120-volt ac receptacle.
- 3 Connect the FLTS power cord to the -48V jack on the FLPM.
- 4 Connect a P3BH cord from the RCV FL LINE jack on the FLTS to the FL LINE OUT jack on the FLPM.
- 5 Connect a P3BH cord from the GEN MON jack on the FLTS to the maintenance line IN jack on the DSX-1 or the appropriate BR IN jack on the office repeater bay (ORB).

Note: The GEN MON jack output is the proper signal level for the ML input through the bridging repeater.

STEP

PROCEDURE

- 6 Connect a P3BH cord from the FAULT LINE jack on the FLPM to the appropriate FL jack on the ORB or DSX-1.
- 7 Set the switches on the FLPM as follows:

SWITCH	POSITION
ON/OFF FAULT LINE POWERING POLARITY	ON 118V (NOTE)

Note: Polarity assignment for Step 8 can be obtained from the Initial Fault Lines Tests Form E-6988 (formerly Form E-6900).

- 8 Set the POLARITY switch for the first sequence of A through M fault locate filters installed in the sections to be tested.

Note: The polarity of the voltage applied to the line determines which of the two inputs of the 1115-type dual-input filter is activated and whether or not a 1114-type single-input filter is activated.

- 9 Set the switches on the FLTS as follows:

SWITCH	POSITION
FUNCTION PULSE DENSITY RECEIVER SENSITIVITY CLOCK RATE FILTER	BI-POLAR SIGNAL 11 REF -80 T1 Same as the code letter of the filter in the first section (Note)

Note: The filter and repeater codes can be obtained from the T-Carrier Span Line Record Card, Form E-4941.

- 10 Momentarily depress the ACTIVATE switch on the FLPM. The READY LED should light.

Note: If the BUSY LED lights the FL line has foreign voltage on it or is being used at the other end.

- 11 Read the FLTS meter and record the reading under BIPOLAR on Form E-6880 (Fig. 3).

Requirement: -90 dBm or less

STEP	PROCEDURE
	Note 1: -92 dBm is less than -90 dBm.
	Note 2: A line needing maintenance but still usable for fault locating may have a noise level greater than -90 dBm but at least 16 dBm lower than the tone level recorded on Form E-6988.
	Note 3: A widely varying noise is indicative of an oscillating repeater.
12	Rotate the FILTER switch to succeeding positions and record the meter reading as in Step 11.
	Requirement: -90 dBm or less at each position.
13	If the requirement of Step 11 or 12 is not met, refer to Section 365-227-500 or Section 365-800-003 (TOP).
14	Set the POLARITY switch on the FLPM for the next sequence of 1114-type filters or the second input for the 1115-type filters.
15	Repeat Steps 10 through 14 to test remaining sections.
16	Disconnect test equipment; testing is complete.
	B. Test Using J98710F FLS with J98725AJ FLPM (Fig. 2)
17	Connect the FLPM power cord to a 120-volt ac receptable.
18	Connect the FLS power cord to the -48V jack on the FLPM.
19	Connect a P3BH cord from the FAULT LOC LINE jack on the FLS to the FL LINE OUT on the FLPM.
20	Connect a P3BH cord from the TEST jack on the FLS to the ML IN jack on the DSX-1 or the BR IN jack on the office repeater bay (ORB).
	Note: The TEST jack output is the proper signal level for the ML input through the bridging repeater.
21	Connect a P3BH cord from the FAULT LINE jack on the FLPM to the appropriate FL jack on the ORB or DSX-1.
22	Connect a 3P13A cord (3A NMS) or a 3P17A (3C NMS) from the DET jack on the FLS to the IN jack on the NMS.
23	Set the switches on the FLPM as follows:

STEP	PROCEDURE
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SWITCH	POSITION
ON/OFF FAULT LINE POWERING POLARITY	ON 118V (NOTE)

Note: Polarity assignment for Step 24 can be obtained from the Initial Lines Test Form E-6988 (formerly Form E-6900).

- 24 Set the POLARITY switch for the first sequence of A through M fault-locate filters installed in the sections to be tested.

Note: The polarity of the voltage applied to the line determines which of the two inputs of the 1115-type dual-input filter is activated and whether or not a 1114-type single-input filter is activated.

- 25 Set the switches on the FLS as follows:

SWITCH	POSITION
FUNCTION switch REF ADJ control MEAS ADJ control PULSE PERIOD Switch 598 FILTER Switch	MEAS 1 1/3 Clockwise rotation (Note 1) Fully clockwise REF
PATTERN dial	Same as the code letter of the filter in the first section (Note 2) Same as the 598-type filter (Note 3)

Note 1: Setting the REF ADJ to a one-third clockwise rotation will eliminate the need to increase the dB_{rn} setting on the NMS during test.

Note 2: The filter and repeater codes can be obtained from the T-Carrier Span Line Record Card, Form E-4941.

Note 3: The 1114A through M and 1115A through M filters correspond to the 598A through M filters.

- 26 Set the switches on the NMS as follows:

STEP

PROCEDURE

SWITCH	POSITION
FUNCTION switch 497A network DBRN switch	BRDG 3 KC FLAT For on-scale reading

- 27 Momentarily depress the ACTIVATE switch on the FLPM. The READY LED should light.

Note: If the BUSY LED lights the FL line has foreign voltage on it or is being used at the other end.

- 28 Tune the PATTERN dial on the FLS for peak response on the NMS and read the meter indication. Use the monitoring headphone to verify the presence of the FL tones and to identify interfering noise. Plug the headphone into the MON AC jack on the NMS.

Note: To ensure that the set is tuned for peak response, tune the PATTERN dial for a peak indication of the NMS while the FUNCTION switch is set to REF and the 598 FILTER switch is set to agree with the code of the filter to be fault located. Slight re-peaking of the FLS may be necessary when reading the actual repeater location.

- 29 Set the FUNCTION switch on the FLS to BIPOLAR.

- 30 Read the NMS meter and record the reading under BIPOLAR on Form E-6880 (Fig. 3).

Requirement: 0 dBrn or less

Note 1: -2 dBrn is less than 0 dBrn.

Note 2: A line needing maintenance but still usable for fault locating may have a noise level greater than 0 dBrn but at least 10 dB lower than the tone level recorded on Form E-6988.

Note 3: A widely varying reading usually indicates an oscillating repeater.

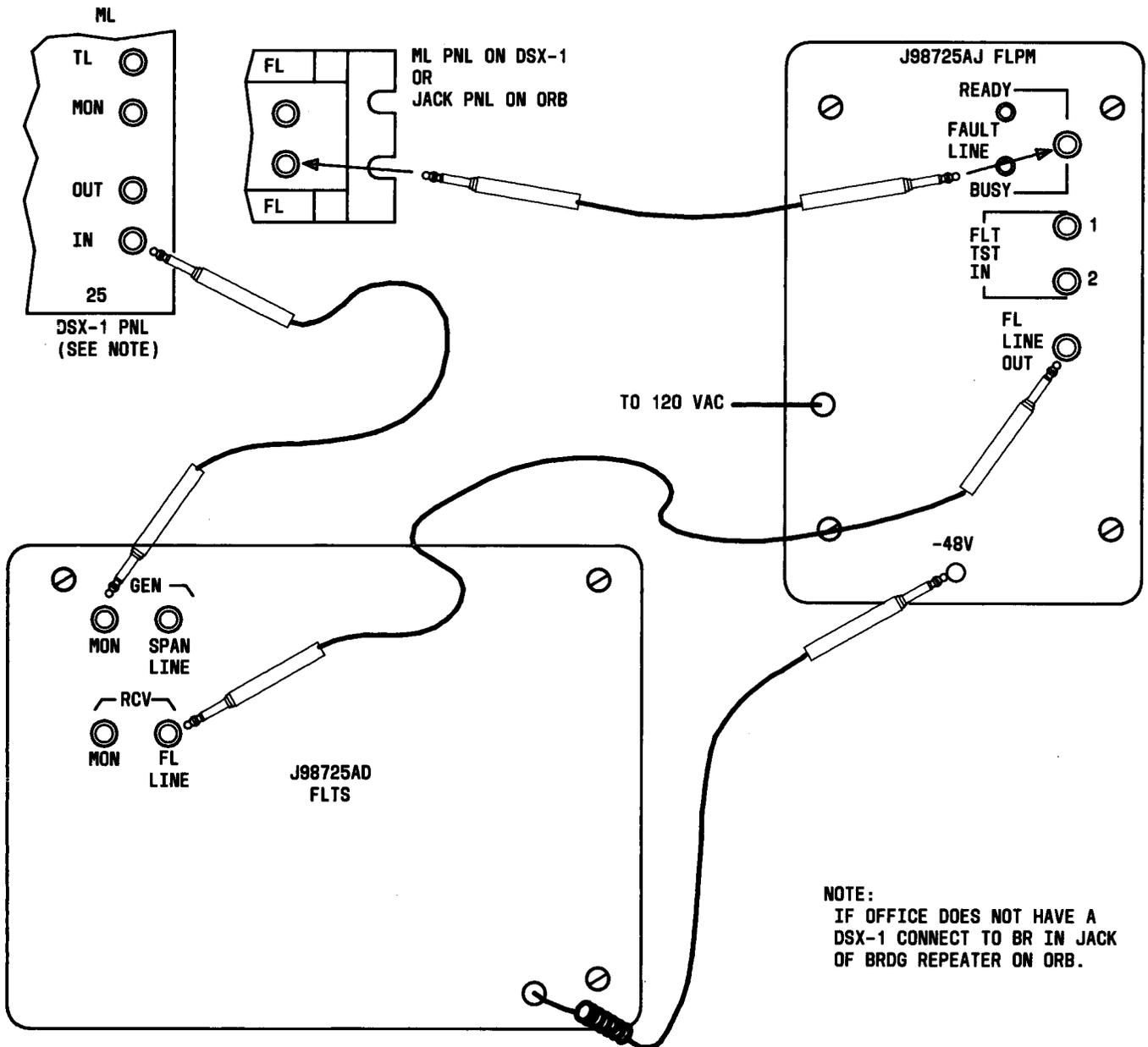
- 31 Repeat measurement procedure by rotating the FILTER switch to succeeding positions and repeating Steps 28 and 30.

Requirement: 0 dBrn or less at each position

- 32 If the requirement of Steps 30 or 31 is not met, refer to Section 365-227-500 or Section 365-800-002 (TOP).

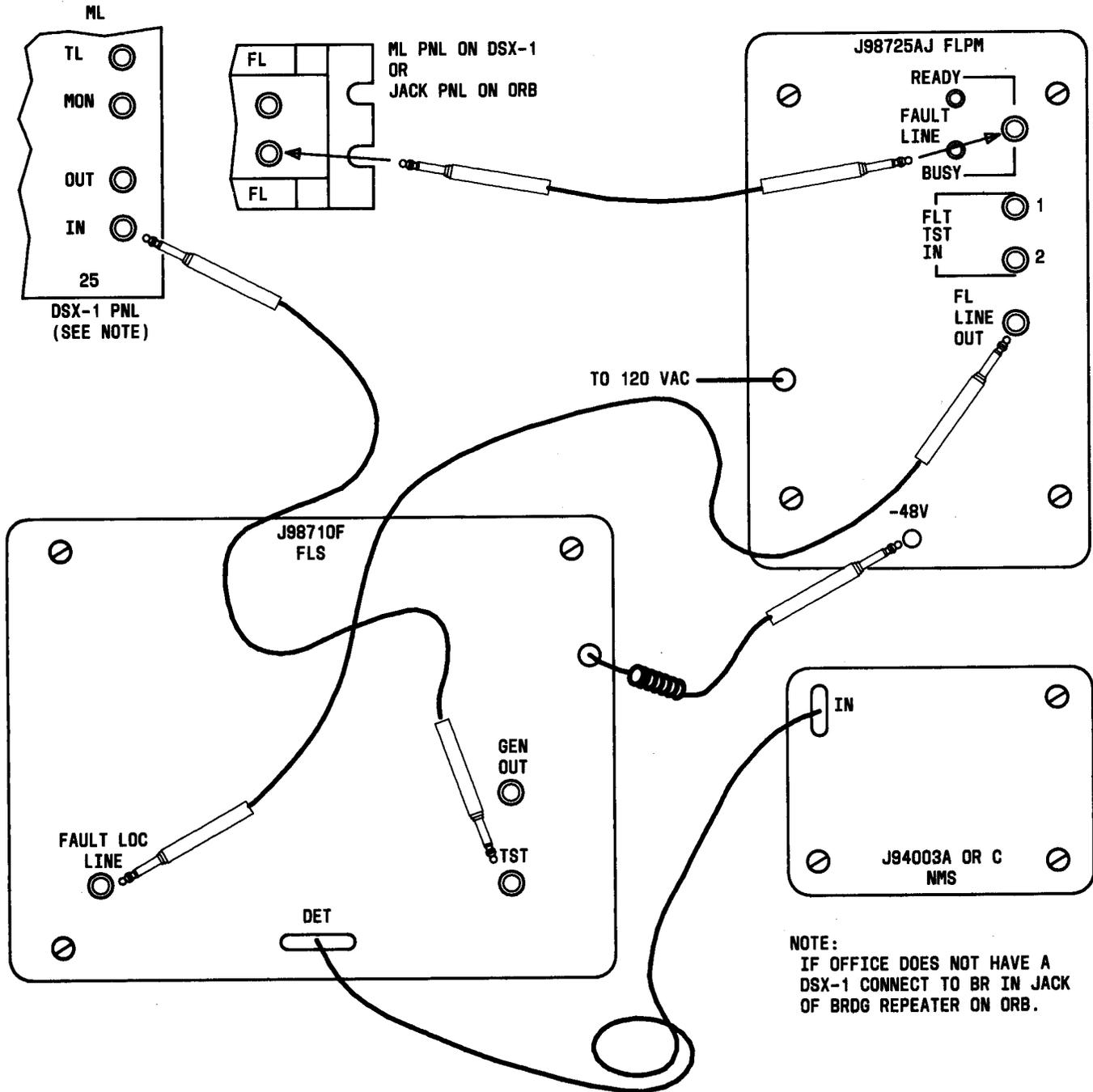
- 33 Set the POLARITY switch on the FLPM for the next sequence of 1114-type filters or the second input for the 1115-type filters (Form E-6988).

STEP	PROCEDURE
34	Repeat Steps 27 through 32 to test the remaining sections.
35	Disconnect test equipment; testing is complete.



NOTE:
IF OFFICE DOES NOT HAVE A DSX-1 CONNECT TO BR IN JACK OF BRDG REPEATER ON ORB.

Fig. 1—Test Set Connection When Using J98725AD FLTS



NOTE:
IF OFFICE DOES NOT HAVE A
DSX-1 CONNECT TO BR IN JACK
OF BRDG REPEATER ON ORB.

Fig. 2—Test Set Connection When Using J98710F FLS

BSP 365-001 010		T CARRIER SPAN LINE TROUBLE REPORT		E-6880 (11-76)	
Serial NO.		Equipment Identification			
		Span Name		Bay	
System Identity				<input type="checkbox"/> New <input type="checkbox"/> Existing	
Reported		Ref. Serial No.		Received	
From	By			By	Date Time
Trouble Reported					
FAULT LOCATE INFORMATION					
System and Power-Mate Patched <input type="checkbox"/> Yes <input type="checkbox"/> No			Test Passed		Location of Trouble
			Yes	No	
Power Loop Test	Near End	Far End	<input type="checkbox"/>	<input type="checkbox"/>	Inside Central Office <input type="checkbox"/> Near <input type="checkbox"/> Far <input type="checkbox"/> Fault Line Problem
T Line Current	_____	_____			
Reg Voltage	_____	_____			
Line Voltage	_____	_____			
Preparation			<input type="checkbox"/>	<input type="checkbox"/>	Serial No. _____ <input type="checkbox"/> Trouble in Span Line Outside Central Office
Fault Line Resistance or Current					
Fault Line Noise			_____	_____	
Transmission Test (Record on Reverse)			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> No Trouble Found
Obscure Trouble Test (Record on Reverse)			<input type="checkbox"/>	<input type="checkbox"/>	
Other			<input type="checkbox"/>	<input type="checkbox"/>	
Tested		Referred		Ref. Serial No.	
By	Date Time	To	Date Time		
OUTSIDE PLANT INFORMATION				<input type="checkbox"/> 1 Cable <input type="checkbox"/> Bidirectional <input type="checkbox"/> 2 Cable <input type="checkbox"/> Unidirectional	
Cable No.	Case No.	Slot No.	Pair No. Side 1	Pair No. Side 2	
Direction in Trouble					
<input type="checkbox"/> Both <input type="checkbox"/> From _____ To _____					
Trouble Location				Filter Code	
<input type="checkbox"/> Problem With App. Case Filter At:					
Not Fault Located Due To:					
<input type="checkbox"/> Fault Line Problem <input type="checkbox"/> Power Loop Problem <input type="checkbox"/> Other					
Start Fault Isolation:					
<input type="checkbox"/> At _____ <input type="checkbox"/> Where Convenient					
Trouble Found And Location				Trouble Code	
System Made Regular				Notified	
By	Date Time	To	Date Time		

Fig. 3—T-Carrier Span Line Trouble Report Form E-6880 (Sheet 1 of 2)

