

2.6 POST INSTALLATION CHECK

2.6.1 Introduction

The paragraphs that follow give post installation test procedures for the TDR-94/94D Transponder. These procedures are used to:

- a. Make sure that the system operates correctly.
- b. Operate the system with a systematic routine to show defective LRUs.

If there is an equipment malfunction or failure, examine the installation and equipment wire harness for possible causes of the equipment failure. Chapter 11 of AC 43.13-1A has guidelines to use when you do an inspection of the installation and wire harness of electrical equipment. This data is also included in the Installation Practices Manual (CPN 523-0775254).

When you do fault isolation to find a defective LRU, the procedure usually assumes that the equipment can operate some, but not fully. Thus, when you have a system that does not operate at all, it is usually necessary to remove the equipment from the aircraft to do fault isolation procedures on a test bench. A bench test analysis will give more data to help isolate the defective equipment.

2.6.2 TDR-94/94D Mode S Transponder Equipment System Maintenance

2.6.2.1 Introduction

The post installation test procedure in this manual uses an IFR ATC-601 Mode S Transponder Ramp Test Set to do a test of the TDR-94/94D transponder system. An equivalent ramp test set can be used if it can do all of the necessary tests correctly.

If an alternative ramp test set is used, the operator must change the test procedure as necessary to make sure that the tests operate correctly.

2.6.2.2 Self-Test

- a. Close the necessary circuit breakers to apply power to the TDR-94/94D transponder system.
- b. Set the CTL-92 mode selector switch to the STBY position. If the installation is a dual system, set the CTL-92 1/2 switch to the 1 position.
- c. Set the CTL-92 mode selector switch to the ON position and push the TEST button.
- d. If a diagnostic code shows on the CTL-92 display, refer to Table 2-13 to find the SUSPECT LRU. Remove the SUSPECT LRU to do fault isolation on the test bench.
- e. If the installation is a dual system, set the CTL-92 1/2 switch to the 2 position and do steps c. and d. again.

2.6.2.3 Diagnostic Display

Caution

The diagnostic routines are part of the transponder self-test function. During the diagnostic routines you must monitor the indicators and related equipments for the correct self-test results. If there are incorrect self-test results, start the diagnostic routine to find more data about the unsatisfactory self-test result.

To start a full self-test diagnostic routine of the TDR-94/94D, push the TEST button on the CTL-92/92A Transponder control. Refer to Table 2-13 for list of diagnostic codes.

Table 2-13. TDR-94/94D CSDB Diagnostic Codes.

DIAGNOSTIC CODE	DESCRIPTION	STATUS		SUSPECT LRU
		STBY	F/W (1)	
00	No fault found			
10	Power supply diagnostics	No	No	TDR
11	+5 V dc	Yes	Yes	TDR
12	+70 V dc	No	No	TDR
13	+35 V dc	No	No	TDR
14	LVPS	No	No	TDR

Table 2-13. TDR-94/94D CSDB Diagnostic Codes.

DIAGNOSTIC CODE	DESCRIPTION	STATUS		SUSPECT LRU
		STBY	F/W (1)	
20	Transmitter/modulator diagnostics	No	No	TDR
21	Final stage, over current	Yes	Yes	TDR
22	Top antenna low power output	No	No	TDR
23	Bottom antenna low power output	No	No	TDR
24	Transmitter over temperature	No	No	TDR
30	Synthesizer diagnostics	No	No	TDR
31	Synthesizer lock detect	No	No	TDR
32	Synthesizer low power detect	No	No	TDR
40	Receiver/IF diagnostics	No	No	TDR
41 (3)	Top receiver channel	No	No	TDR
42 (3)	Bottom receiver channel	No	No	TDR
43	Top DPSK demodulator	No	No	TDR
44	Bottom DPSK demodulator	No	No	TDR
50	Program memory (ROM) diagnostics	Yes	Yes	TDR
51	High-byte ROM	Yes	Yes	TDR
52	Low-byte ROM	Yes	Yes	TDR
53	Both ROM chips	Yes	Yes	TDR
60	Volatile memory (RAM) diagnostics	Yes	Yes	TDR
61	High-byte RAM	Yes	Yes	TDR
62	Low-byte RAM	Yes	Yes	TDR
63	Both RAM chips	Yes	Yes	TDR
64	Cache RAM	Yes	Yes	TDR
65	Cache RAM and high-byte RAM	Yes	Yes	TDR
66	Cache RAM and low-byte RAM	Yes	Yes	TDR
67	Cache RAM and both RAM chips	Yes	Yes	TDR
68	Dual port RAM	Yes	Yes	TDR
70	Nonvolatile memory (NVRAM) diagnostics	No	No	TDR
80	Serial input control bus diagnostics	Yes	No	CTL/TDR
81	ARINC 429 control UART	Yes	No	TDR
82	ARINC 429 control port A inactive	Yes	No	CTL
83	ARINC 429 control port B inactive	Yes	No	CTL
84	ARINC 429 control port C inactive	Yes	No	CTL
85	CSDB control input port A inactive	Yes	No	CTL
86	(Not Assigned)			
87	AIS/ADS UART Failure	No	No	TDR
88	GPS UART Failure	No	No	TDR
89	FMS/IRS UART Failure	No	No	TDR
90	Serial altitude input diagnostics	No	No	ALT/TDR
91	ARINC 429/575 Altitude UART	No	No	TDR
92	ARINC 429/575 input port A inactive	No	No	ALT
93	ARINC 429/575 input port B inactive	No	No	ALT
94	CSDB altitude input port A inactive	No	No	ALT
95	CSDB altitude input port B inactive	No	No	ALT
99	No data received from TDR-94/94D	(2)	(2)	CLT/TDR
A0	ADLP communication diagnostics	No	No	ADLP/TDR
A1	ADLP comm A/B UART	No	No	TDR
A2	ADLP comm A/B bus inactive	No	No	ADLP
A3	ADLP comm C/D UART	No	No	TDR
A4	ADLP comm C/D bus inactive	No	No	ADLP
b0	TCAS communication diagnostics	No	No	TCAS/TDR

Table 2-13. TDR-94/94D CSDB Diagnostic Codes.

DIAGNOSTIC CODE	DESCRIPTION	STATUS		SUSPECT LRU
		STBY	F/W (1)	
b1	TCAS UART	No	No	TDR
b2	TCAS system failure	No	No	TCAS
b3	TCAS bus inactive	No	No	TCAS
b4 (2)	TCAS protocol error	No	No	TCAS/TDR
C0	Squitter diagnostics	No	Yes	TDR
C1 (TDR-94D only)	Top channel squitter	No	Yes	TDR
C2 (TDR-94D only)	Bottom channel squitter	No	Yes	TDR
D0 (TDR-94D only)	Diversity diagnostic	No	Yes	TDR
E0	Message processor diagnostics	No	No	TDR
E1 (TDR-94D only)	Top channel message processor, soft failure	No	No	TDR
E2	Bottom channel message processor, soft failure	No	No	TDR
E3	Top channel hard message processor, hard failure	Yes	Yes	TDR
E4	Bottom channel hard message processor, hard failure	Yes	Yes	TDR
F0	Configuration diagnostics	No	No	WIRING
F1	Mode S discrete address changed	No	No	WIRING
F2	TCAS selection changed	No	No	WIRING
F3	Altitude units selection changed	No	No	WIRING
F4	Max airspeed program selects changed	No	No	WIRING
F5	Port selects changed	No	No	WIRING
F6	SDI selects changed	No	No	WIRING
F7	Single antenna selection changed	No	No	WIRING
F8	ADLP selection changed	No	No	WIRING
F9-FE	(Not assigned)			
FF	Unacceptable Mode S address selected (all address lines identical)	Yes	Yes	WIRING

Note

(1) F/W (Fail/Warn) refers to:
a. TDR-94/94D fault monitor discrete output, P1-31, set to high level,
b. TDR-94/94D CSDB data word label 1F, byte-1, bit-7 set to logic 0, and
c. TDR-94/94D ARINC 429 SSM and other data bits related to diagnostics set to the appropriate fault level.

(2) Fault code 99 is generated by the CTL-92T and indicates the CTL-92T is not receiving data from the selected TDR-94/94D.

(3) These diagnostic codes can appear on an intermittent basis and not indicate an actual failure. Consider these codes to indicate a failure only if reported on a continual basis.

2.6.2.4 Ramp Tester Selection and Use

The TDR-94/94D post installation test procedure in this manual uses an IFR ATC-601 ramp test set. You can use an equivalent test set if you are sure that the alternative test set can do the transponder tests in the list on the subsequent page.

Most transponder ramp test sets have two modes of operation; broadcast mode and direct connection. In broadcast mode, the ramp test set transmits and receives the RF signals through the transponder an-

tenna. This mode does a test of the full transponder system.

In direct connection mode, the ramp test set connects directly to the antenna connector on the rear of the transponder (the antenna is disconnected). The antenna system is isolated from the transponder transmitter/receiver. If a transponder has low power output or low sensitivity during a test when you use broadcast mode, do the test again in direct connection mode. If the low power output or low sensitivity condition goes away in direct connection mode, the antenna system is most likely the problem. If you