2.5 Texas Instruments 990/10A Processor Board

2.5.1 Introduction

The Texas Instruments 990/10A board contains the TMS9900 microprocessor and with associated input/output controllers, up to 2MB of Dynamic Random Access Memory (DRAM). It provides the central processing for the TAS system.

2.5.2 Description and Operation

Refer to MODEL 990/10A, Computer Maintenance Manual General Description.

2.5.3 Indications, Switches and Links

(1) Indications

The edge of the 990/10A board contains a row of LEDs which indicates fault conditions. The LED indications and associated faults are listed below:

MAJFAULT	Illuminates on power up. Extinguished if no major fault exists within the microprocessor - ROM core. Should always be illuminated on power up. If LED fails to extinguish the other error indicators may be inhibited.
FAULT	Indicates self-test, loader or operating system fault. Software set.
MER	Indicates a double-bit memory error since last reset to memory error log. If illuminated, memory indicators are unreliable.
CER	Indicates a single-bit memory error since last reset to memory error log. If CER is illuminated but not MER, then ROW and BIT in ERROR LEDs pinpoint the memory integrated circuit causing the error.
ROW	The two ROW LEDs indicate, in binary, the logical row of memory chips that contain the error. The leftmost LED is the most significant bit.

BIT IN ERROR Five error bits binary encode the memory integrated circuit contained within the row designated by the ROW LED.

If a successful self test has been carried out, all LEDs will be extinguished.

NOTE: Older version 990/10A boards do not have the ROW and BIT-IN-ERROR LED diagnostic facility.

Refer to Fig. 1 for LED locations.

(2) Switches

Two DIL switches, one 8-way and one 4-way, are mounted on the card.

Refer to Fig. 1 for location and setting of switches.

NOTE: The normal setting of the switches is shown.

(3) Links

Refer to Fig. 1 for location and fitting of links.

For further information concerning indications, switches and jumpers refer to MODEL 990/10A, Computer Maintenance Manual General Description.

2.5.4 Input/Output Connections

Four input/output connectors are mounted on the board. Refer to Fig. 1 for connector location.

(1) Plug P1 80-Way Edge Connector

Pin Number	Slot 1 Signal	In/Out	
1,2	GND	-	
3,4	+5 MAIN	I	
5,6	NO CONNECT	-	(+12V MEMORY)
7,8	+5 MEMORY	I	
9,10	NO CONNECT	-	(-5V MEMORY)
11	TLREAD	I/O	
12	GND	-	
13	TLPRES-	I	
14	TLIORES-	O	470 OHM PULL-UP
15	GND	-	
16	TLPFWP-	I	
17	GND	-	
18	CRUBITOUT	O	
19	GND	-	
20	TLTM-	I/O	
21	GND	-	
22	STORECLK-	O	
23	MODSEL0-	O	
24	GND	-	
25	TLGO-	I/O	
26	GND	-	
27	TLDAT12-	I/O	
28	TLDAT13-	I/O	
29	120HZ	I	
30	TLDAT14-	I/O	
31	TLDAT15-	I/O	
32	CRUBIT13	O	
33	NO CONNECT	-	
34	CRUBIT15	O	
35	MODSEL1-	O	
36	CRUBIT12	O	
37	MODSEL2-	O	
38	CRUBIT14	O	
39,40	NO CONNECT	-	(+12V MAIN)
41,42	NO CONNECT	-	(-12V MAIN)
43	MODSEL3-	O	
44	MODSEL4-	O	
45	MODSEL5-	O	
46	MODSEL6-	O	
47	MODSEL7-	O	
48	MODSEL8-	O	
49	MODSEL9-	O	
50	CRUBIT7	O	

(1) Plug P1 80-Way Edge Connector

Pin Number	Slot 1 Signal	In/Out	
51	MODSEL10-	O	
52	CRUBIT6	O	
53	MODSEL11-	O	
54	CRUBIT5	O	
55	TLMER-	I/O	
56	CRUBIT4	O	
57	GND	-	
58	TLAV	I	
59	GND	-	
60	CRUBITIN	I	470 OHM PULL-UP IN SLOT 1
61	MODSEL12-	O	
62	CRUBIT8	O	
63	TLWAIT-	I	
64	CURBIT9	O	
65	NO CONNECT	-	
66	INTP1A-	O	HOST INTERRUPT
67	MODSEL13-	O	
68	CRUBIT10	O	
69	MODSEL14-	O	
70	CRUBIT11	O	
71	TLAK-	I/O	
72	GND	-	
73	NO CONNECT	-	
74	CBTEST	-	GND IN CHASSIS
75	NO CONNECT	-	
76	MODSEL15-	O	
77,78	+5 MAIN	I	
79,80	GND	-	

(2) Plug P2 80-Way Edge Connector

Pin Number	Slot 1 Signal	In/Out
1,2	GND	-
3,4	+5 MAIN	I
5	TLAG (OUT)	O
6	TLAG (IN)	I
7	GND	-
8	TLADR14-	I/O
9	TLADR15-	I/O
10	TLADR10-	I/O
11	RLADR12-	I/O
12	TLADR11-	I/O
13	MODSEL23-	O
14	NOT USED	-

(2) Plug P2 80-Way Edge Connector

Pin Number	Slot 1 Signal	In/Out	
15	TLADR13-	I/O	
16	MODSEL22-	O	
17	TLADR08-	I/O	
18	MODSEL21-	O	
19	TLADR09-	I/O	
20	TLDAT11-	I/O	
21	TLDAT08-	I/O	
22	MODSEL20-	O	
23	TLDAT10-	I/O	
24	INT3-	I	470 OHM PULL-UP
25	TLADR18-	I/O	
26	TLHOLD-	I/O	
27	TLADR17	I/O	
28	RESTART-	I	
29	TLADR16-	I/O	
30	GND	-	
31	TLADR19-	I/O	
32	MODSEL19-	O	
33	TLDAT09-	I/O	
34	MODSEL18-	O	
35	TLDAT02-	I/O	
36	MODSEL17-	O	
37	TLDAT03-	I/O	
38	MODSEL16-	O	
39,40	+12 MAIN	I	
41,42	-12 MAIN	I	
43	TLDAT06-	I/O	
44	TLADR01-	I/O	
45	TLDAT07-	I/O	
46	INT4-	I/O	470 OHM PULL-UP
47	TLADR06-	I/O	
48	INT5-	I	470 OHM PULL-UP
49	TLADR07-	I/O	
50	INT6-	I	470 OHM PULL-UP
51	TLADR02-	I/O	
52	INT7-	I	470 OHM PULL-UP
53	TLADR03-	I/O	
54	INT8-	I	470 OHM PULL-UP
55	TLADR00-	I/O	
56	INT9-	I	470 OHM PULL-UP
57	TLADR04-	I/O	
58	INT10-	I	470 OHM PULL-UP
59	TLADR05-	I/O	
60	NOT USED	-	
61	TLDAT04-	I/O	
62	INT11-	I	470 OHM PULL-UP

(2) Plug P2 80-Way Edge Connector

Pin Number	Slot 1 Signal	In/Out	
63	TLDAT05-	I/O	
64	INT12-	I	470 OHM PULL-UP
65	INT13-	I	470 OHM PULL-UP
66	INT14-	I	470 OHM PULL-UP
67	TLDAT00-	I/O	
68	INT15-	I	470 OHM PULL-UP
69	TLDAT01-	I/O	
70	NOT USED	-	
71,72	NOT USED	-	(-5V MEMORY)
73,74	+5 MEMORY	I	
75,76	NOT USED	-	(+12V MEMORY)
77,78	+5 MAIN	I	
79,80	GND	-	

(3) Plug P3 18-Way Connector
(Asynchronous Communications Port EIA)

Pin Number	Signal	In/Out
1	XMTD	O
2	RCVD	I
3	RTS	O
4	CTS	I
5	DSR	I
6	DCD	I
7	NOT USED	
8	NOT USED	
9	NOT USED	
10	NOT USED	
11	NOT USED	
12	DTR	O
13	RIND	I
14	NOT USED	
15	ALB	O
16	OND	
17	NOT USED	
18	NOT USED	

(4) Plug P4 20-Way Connector (Front Panel Interface)

Pin Number	Signal	In/Out
1	GND	
2	STORECLK-	O
3	GND	
4	GND	
5	RESTART-	I
6	FAULTED-	O
7	CRUBITIN	I
8	NOT USED	
9	+5V	O
10	+5V	O
11	IDELLED-	O
12	RUN-	O
13	POWERLED-	O
14	MODSEL-	O
15	CRUBITOUT	O
16	CRUBIT15	O
17	GND	
18	CRUBIT14	O
19	CRUBIT12	O
20	CRUBIT13	O

SWITCHES, LEDS, CONNECTORS AND LINKS SETTINGS AND LOCATIONS

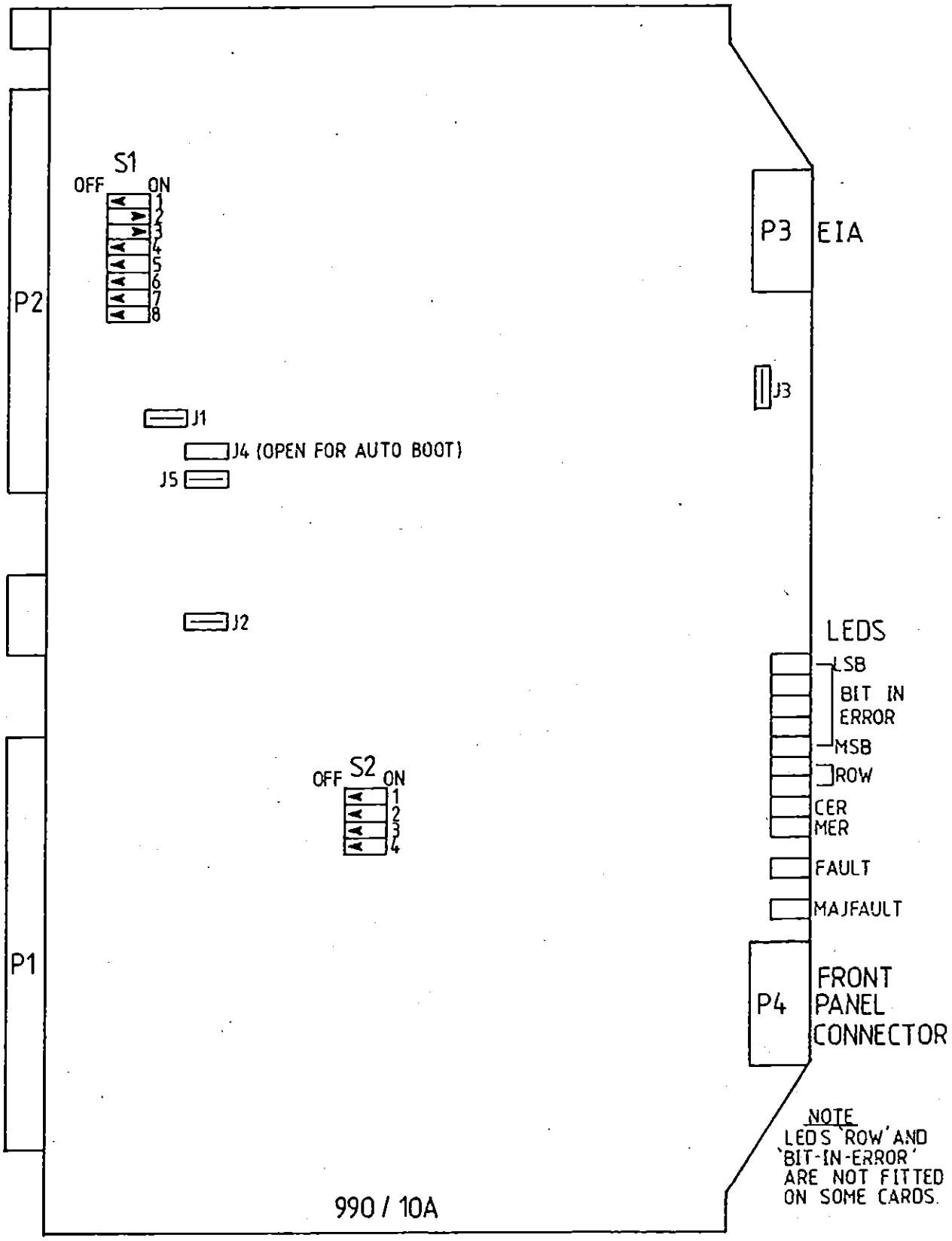

FIG .1