Williams®

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C8363 MASTER DISPLAY BOARD TROUBLESHOOTING PROCEDURES

INTRODUCTION

This section provides test procedures for the C8363 Master Display Board (7-digit). The procedures assume that the fault has been isolated to the Master Display or CPU Boards by substitution or disconnection of slave displays. Separate procedures are provided for the strobe circuits, the segment drivers, and the blanking circuit. Refer to the figure on the reverse side of this sheet.

SEGMENT DRIVER

Set the AUTO-UP/MANUAL-DOWN switch to MANUAL-DOWN and depress ADVANCE to enter the Display Digits Test (depress twice with green-labeled flipper ROMs and depress once with blue labeled flipper ROMs). Depress ADVANCE to step through all digits and compare the inputs to IC3 (A1-D1) and IC4 (A2-D2) and individual outputs of IC3 and IC4 (segments a-g) against the required signals as shown in the figure and the chart below.

With blue-labeled flipper ROMs, comma segments are produced. The A1-D1 and A2-D2 BCD signals produce segments for decimal numbers with the following levels:

BCD	0	1	2	3	4	5	6	7	8	9
A1(A2)	Low	High	Low	High	Low	High	Low	High	Low	High
B1(B2)	Low	Low	High	High	Low	Low	High	High	Low	Low
C1(C2)	Low	Low	Low	Low	High	High	High	High	Low	Low
D1(D2)	Low	Low	Low	Low	Low	Low	Low	Low	High	High

With a display of all 8's, all segments should be on. With a display of all 1's, only segments b and c should be on and segments a, d, e, f, and g can be checked for the off condition. Displaying all 2's allows a check of segment c for the off condition and displaying all 5's allows a check of segment b.

ADVANCE in manual to a display of all 8's and if any segment is out check corresponding IC1 and IC2 output for the correct voltages for the on condition (as shown in the figure). Next, ADVANCE in MANUAL to the all 1's display and check segments a, d, e, f, and g (if any are on) for the off condition; then ADVANCE to all 2's and check segment c (if on) for the off condition; finally, ADVANCE to all 5's and check segment b (if on) for the off condition.

STROBE DRIVERS

Use the Display Digits Test. Check the input, driver input, and strobe driver output for the waveform and/or voltages shown in the figure. Note that the dc voltages indicated in this diagram represent average values with the circuit activated 1/16 of the time and will vary depending on the test equipment used and the present load determined by the number of segments illuminated for the current digit displayed.

BLANKING CIRCUIT

The blanking circuit checks the BLANKING timer output from the CPU Board. If BLANKING goes low, the input (inverted by IC11) will inhibit the segment decoders IC3 and IC4. To check for proper blanking levels, depress the Diagnostic pushbutton on the CPU Board.

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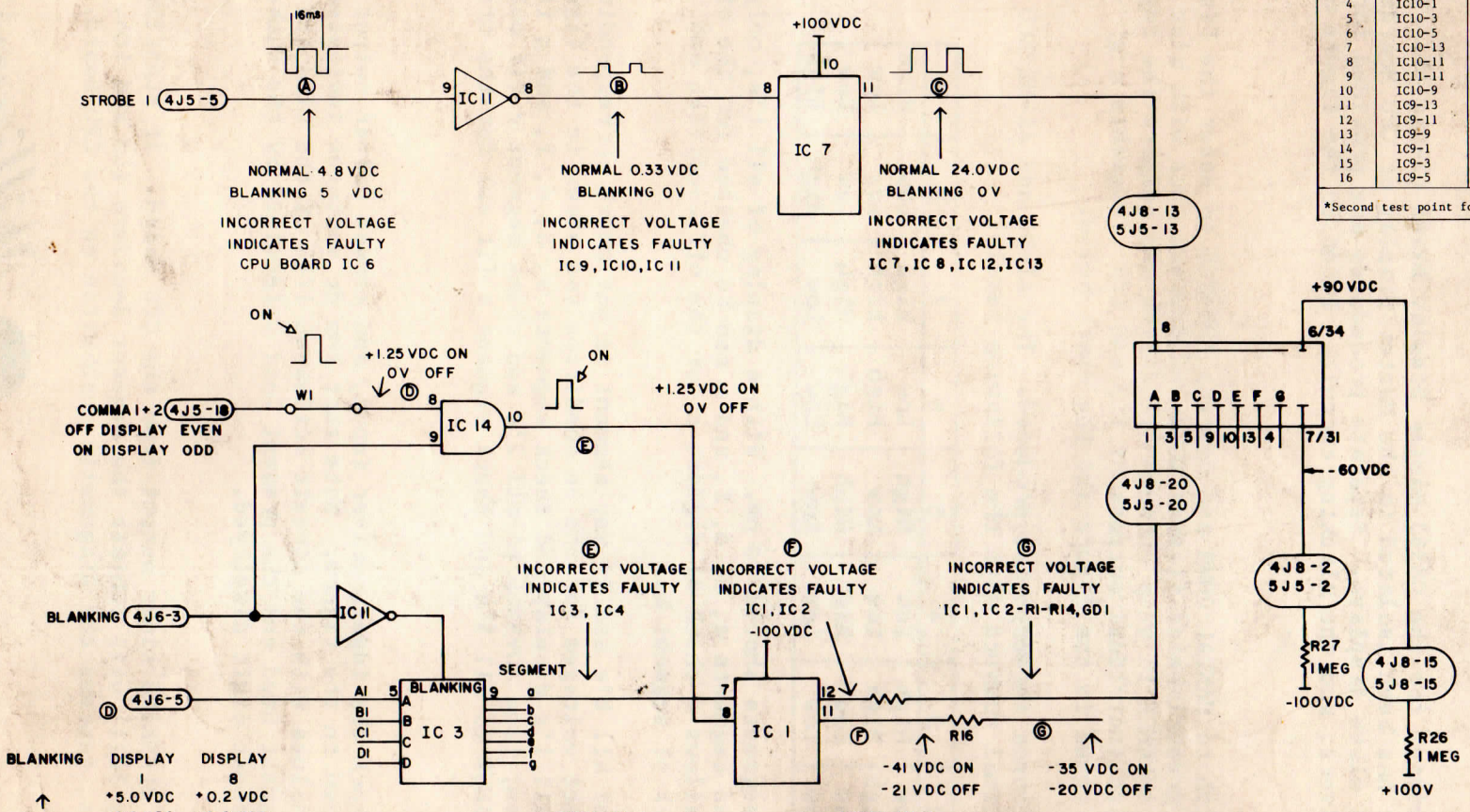

STROBE	TEST POINTS A	B	C*
1	IC11-9	IC11-8	IC7-11 (IC13-18)
2	IC11-5	IC11-6	IC13-16 (IC8-16)
3	IC11-3	IC11-4	IC13-17 (IC8-17)
4	IC10-1	IC10-2	IC13-15 (IC8-15)
5	IC10-3	IC10-4	IC13-14 (IC8-12)
6	IC10-5	IC10-6	IC13-13 (IC8-13)
7	IC10-13	IC10-12	IC13-12 (IC8-12)
8	IC10-11	IC10-10	IC13-11 (IC8-11)
9	IC11-11	IC11-10	IC8-18 (IC12-16)
10	IC10-9	IC10-8	IC12-17 (IC7-17)
11	IC9-13	IC9-12	IC12-18 (IC7-18)
12	IC9-11	IC9-10	IC12-15 (IC7-16)
13	IC9-9	IC9-8	IC12-14 (IC7-15)
14	IC9-1	IC9-2	IC12-13 (IC7-14)
15	IC9-3	IC9-4	IC12-12 (IC7-13)
16	IC9-5	IC9-6	IC12-11 (IC7-12)

*Second test point for Credit or Player 3 and Player 4.

BLANKING	DISPLAY 1	DISPLAY 8
↑	+5.0 VDC	+0.2 VDC
+5.2 VDC	+0.2 VDC	+0.2 VDC
	+0.2 VDC	+0.2 VDC
↓	+0.2 VDC	+5.0 VDC

INCORRECT VOLTAGE INDICATES FAULTY CPU BOARD IC18

SEGMENTS	DISPLAY 1 Ⓔ	Ⓕ	Ⓖ	DISPLAY 8 Ⓔ	Ⓕ	Ⓖ
a	0V	-21.0 VDC	-20.0 VDC	ALL	ALL	ALL
b	+5.0 VDC	-98.0 VDC	-52.0 VDC	+5.0 VDC	-97.0 VDC	-52.0 VDC
c	+5.0 VDC	-98.0 VDC	-52.0 VDC			
d	+0V	-21.0 VDC	-20.0 VDC			
e	+0V	-21.0 VDC	-20.0 VDC			
f	+0V	-21.0 VDC	-20.0 VDC			
g	+0V	-21.0 VDC	-20.0 VDC			

BCD FUNCTION	TEST POINT D	SEGMENT FUNCTION	TEST POINTS E	F	G
A1	IC3-5	a	IC3-9	IC1-12	R1 bottom
B1	IC3-3	b	IC3-10	IC1-13	R2 bottom
C1	IC3-2	c	IC3-11	IC1-14	R3 bottom
D1	IC3-4	d	IC3-12	IC1-15	R4 bottom
		e	IC3-13	IC1-16	R5 bottom
		f	IC3-15	IC1-18	R7 bottom
		g	IC3-14	IC1-17	R6 bottom
1-2 Comma	IC14-8	-	IC14-10	IC1-11	R16 bottom
A2	IC4-5	a'	IC4-9	IC2-11	R8 top
B2	IC4-3	b'	IC4-10	IC2-12	R9 top
C2	IC4-2	c'	IC4-11	IC2-13	R10 top
D2	IC4-4	d'	IC4-12	IC2-15	R11 top
		e'	IC4-13	IC2-16	R12 top
		f'	IC4-15	IC2-18	R13 top
		g'	IC4-14	IC2-17	R14 top
3-4 Comma	IC14-12	-	IC14-11	IC2-14	R15 top