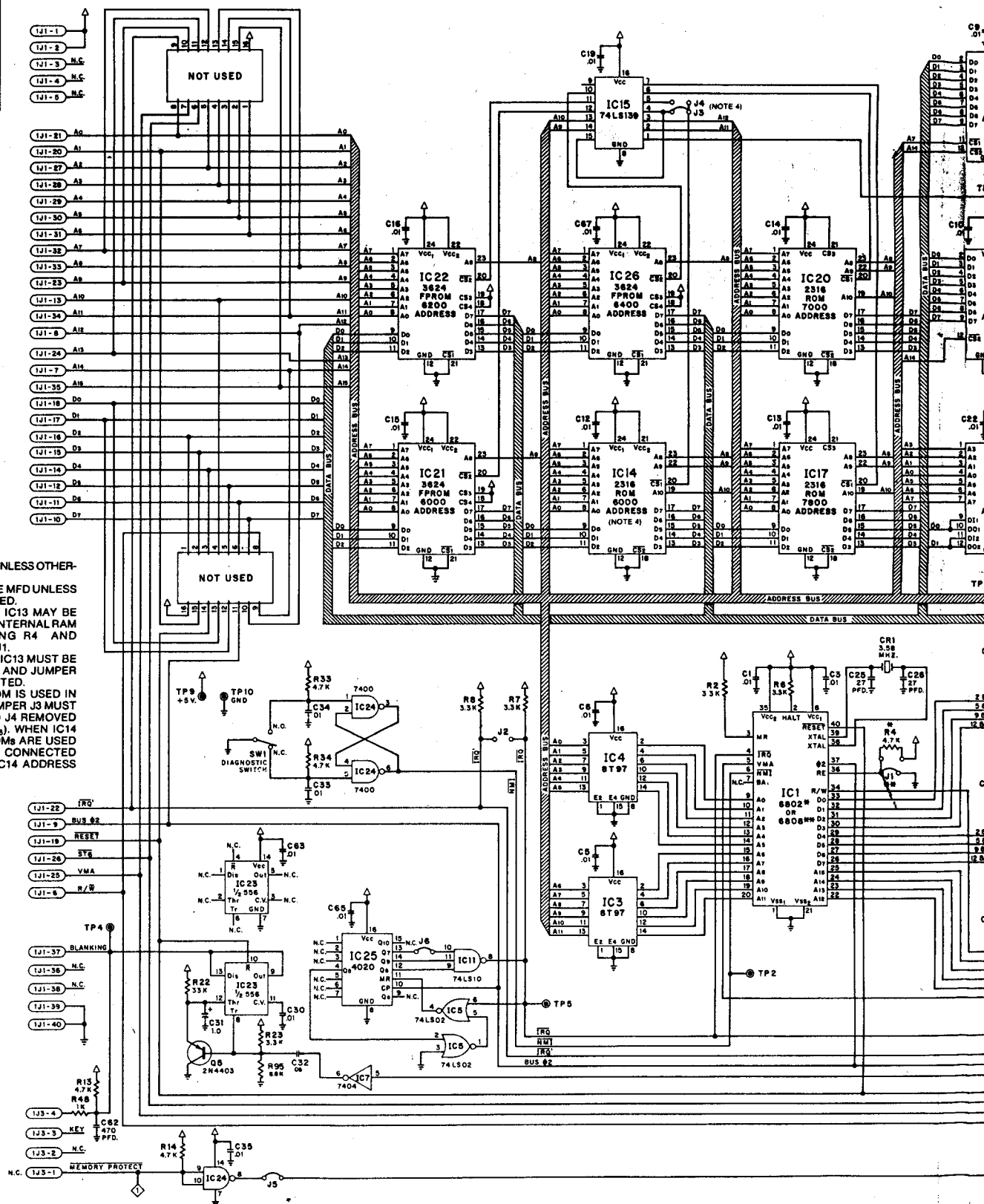


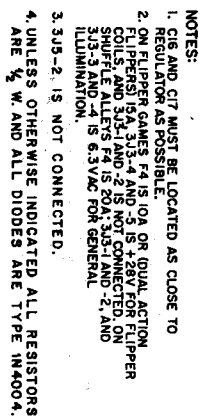
REVISION LETTER	REVISION
1J1-1	
1J1-2	
1J1-3	
1J1-4	
1J1-5	
1J1-6	

NOTES:

1. ALL RESISTORS 1/4W UNLESS OTHERWISE INDICATED.
2. ALL CAPACITORS ARE MFD UNLESS OTHERWISE INDICATED.
3. *WITH 6802 FOR IC1, IC13 MAY BE REMOVED AND MPU INTERNAL RAM ENABLED BY ADDING R4 AND REMOVING JUMPER J1.
**WITH 6808 FOR IC1, IC13 MUST BE USED, R4 NOT USED, AND JUMPER J1 MUST BE CONNECTED.
4. WHEN IC14 GAME ROM IS USED IN PLACE OF PROMs JUMPER J3 MUST BE CONNECTED AND J4 REMOVED (IC14 ADDRESS 6000₁₆). WHEN IC14 GAME ROM AND PROMs ARE USED JUMPER J4 MUST BE CONNECTED AND J3 REMOVED (IC14 ADDRESS 6800₁₆).



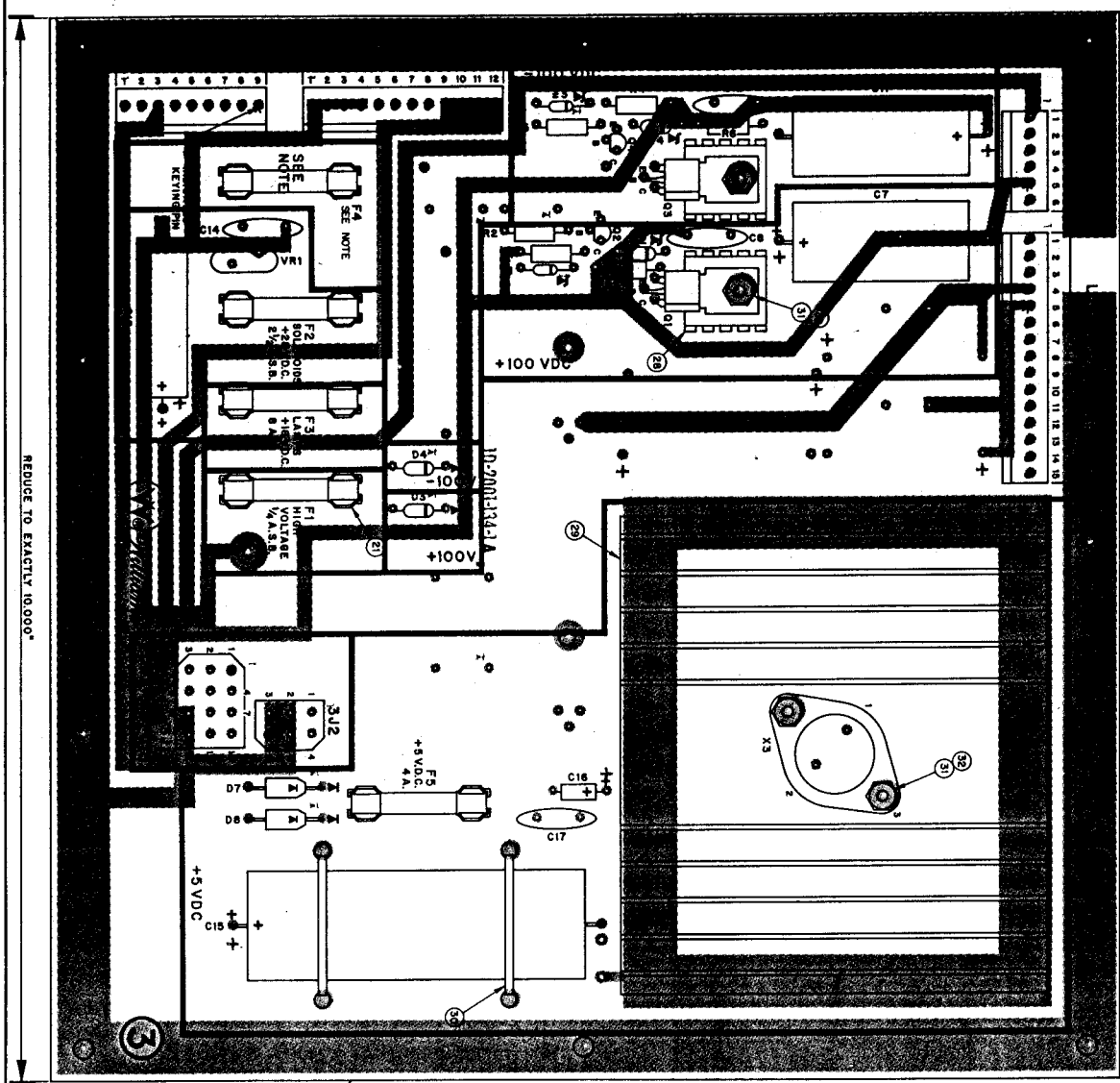
13



A	REDRAWN WAS D SIZE. P4 AND NOTES 2,3,4 ADDED	5-9-79
REVISION LETTER	REVISION	BY

TOLERANCES		DIM.		ASSEMBLED ON	
UNLESS OTHERWISE SPECIFIED					
FRACTIONAL	DECIMAL	HOLE DIA.		HOLE DIA.	
1/16"	0.0625"	1/8"		1/8"	
1/32"	0.03125"	1/16"		1/16"	
1/64"	0.015625"	1/32"		1/32"	
1/128"	0.0078125"	1/64"		1/64"	
1/256"	0.00390625"	1/128"		1/128"	
1/512"	0.001953125"	1/256"		1/256"	
1/1024"	0.0009765625"	1/512"		1/512"	
1/2048"	0.00048828125"	1/1024"		1/1024"	
1/4096"	0.000244140625"	1/2048"		1/2048"	
1/8192"	0.0001220703125"	1/4096"		1/4096"	
1/16384"	0.00006103515625"	1/8192"		1/8192"	
1/32768"	0.000030517578125"	1/16384"		1/16384"	
1/65536"	0.0000152587890625"	1/32768"		1/32768"	
1/131072"	0.00000762939453125"	1/65536"		1/65536"	
1/262144"	0.000003814697265625"	1/131072"		1/131072"	
1/524288"	0.0000019073486328125"	1/262144"		1/262144"	
1/1048576"	0.00000095367431640625"	1/524288"		1/524288"	
1/2097152"	0.000000476837158203125"	1/1048576"		1/1048576"	
1/4194304"	0.0000002384185791015625"	1/2097152"		1/2097152"	
1/8388608"	0.00000011920928955078125"	1/4194304"		1/4194304"	
1/16777216"	0.000000059604644775390625"	1/8388608"		1/8388608"	
1/33554432"	0.0000000298023223876953125"	1/16777216"		1/16777216"	
1/67108864"	0.00000001490116119384765625"	1/33554432"		1/33554432"	
1/134217728"	0.000000007450580596923828125"	1/67108864"		1/67108864"	
1/268435456"	0.0000000037252902984619140625"	1/134217728"		1/134217728"	
1/536870912"	0.00000000186264514923095703125"	1/268435456"		1/268435456"	
1/1073741824"	0.000000000931322574615478515625"	1/536870912"		1/536870912"	
1/2147483648"	0.0000000004656612873077392578125"	1/1073741824"		1/1073741824"	
1/4294967296"	0.00000000023283064365386962890625"	1/2147483648"		1/2147483648"	
1/8589934592"	0.000000000116415321826934814453125"	1/4294967296"		1/4294967296"	
1/17179869184"	0.0000000000582076609134674071875"	1/8589934592"		1/8589934592"	
1/34359738368"	0.00000000002910383045673370359375"	1/17179869184"		1/17179869184"	
1/68719476736"	0.000000000014551915228366851796875"	1/34359738368"		1/34359738368"	
1/137438953472"	0.0000000000072759576141834258984375"	1/68719476736"		1/68719476736"	
1/274877906944"	0.00000000000363797880709171294921875"	1/137438953472"		1/137438953472"	
1/549755813888"	0.000000000001818989403545856474609375"	1/274877906944"		1/274877906944"	
1/1099511627776"	0.0000000000009094947017729282373046875"	1/549755813888"		1/549755813888"	
1/2199023255552"	0.00000000000045474735088646411865234375"	1/1099511627776"		1/1099511627776"	
1/4398046511104"	0.000000000000227373675443232059326171875"	1/2199023255552"		1/2199023255552"	
1/8796093022208"	0.0000000000001136868377216160296630859375"	1/4398046511104"		1/4398046511104"	
1/17592186044416"	0.00000000000005684341886080801483154296875"	1/8796093022208"		1/8796093022208"	
1/35184372088832"	0.000000000000028421709430404007415771484375"	1/17592186044416"		1/17592186044416"	
1/70368744177664"	0.0000000000000142108547152020037078857421875"	1/35184372088832"		1/35	

REVISION
REVISED AND REISSUED R. 001 7-14-73



BILL OF MATERIAL

ITEM NO.	PART NO.	DESCRIPTION	QTY
1	10-1001-14	BASE PC BOARD	1
2	5A-1004	3 AMP 5 VOLT POSITIVE VOLTAGE	1
3	5A-1007	100-100 AMP TRANSISTOR	1
4	5A-1005	IMPEDANCE MATCH TRANSISTOR	1
5	5A-1008	500-500 AMP TRANSISTOR	1
6	5A-1006	IMPEDANCE MATCH TRANSISTOR	1
7	5A-1004	100-100 AMP TRANSISTOR	1
8	5A-1004	100-100 AMP TRANSISTOR	1
9	5A-1004	100-100 AMP TRANSISTOR	1
10	5A-1004	100-100 AMP TRANSISTOR	1
11	5A-1004	100-100 AMP TRANSISTOR	1
12	5A-1004	100-100 AMP TRANSISTOR	1
13	5A-1004	100-100 AMP TRANSISTOR	1
14	5A-1004	100-100 AMP TRANSISTOR	1
15	5A-1004	100-100 AMP TRANSISTOR	1
16	5A-1004	100-100 AMP TRANSISTOR	1
17	5A-1004	100-100 AMP TRANSISTOR	1
18	5A-1004	100-100 AMP TRANSISTOR	1
19	5A-1004	100-100 AMP TRANSISTOR	1
20	5A-1004	100-100 AMP TRANSISTOR	1
21	5A-1004	100-100 AMP TRANSISTOR	1
22	5A-1004	100-100 AMP TRANSISTOR	1
23	5A-1004	100-100 AMP TRANSISTOR	1
24	5A-1004	100-100 AMP TRANSISTOR	1
25	5A-1004	100-100 AMP TRANSISTOR	1
26	5A-1004	100-100 AMP TRANSISTOR	1
27	5A-1004	100-100 AMP TRANSISTOR	1
28	5A-1004	100-100 AMP TRANSISTOR	1
29	5A-1004	100-100 AMP TRANSISTOR	1
30	5A-1004	100-100 AMP TRANSISTOR	1
31	5A-1004	100-100 AMP TRANSISTOR	1
32	5A-1004	100-100 AMP TRANSISTOR	1
33	5A-1004	100-100 AMP TRANSISTOR	1
34	5A-1004	100-100 AMP TRANSISTOR	1
35	5A-1004	100-100 AMP TRANSISTOR	1
36	5A-1004	100-100 AMP TRANSISTOR	1
37	5A-1004	100-100 AMP TRANSISTOR	1

NOTE:
F4 IS FLIPPER FUSE ON FLIPPER
GAMES AND GENERAL ILLUMINATION
ON SHUFFLE ALLEYS.

WILLIAMS ELECTRONICS, INC.
1301 N. CALIFORNIA CHICAGO, ILL. 60618
POWER SUPPLY BOARD ASSEMBLY
PART NO. D-7999
REV. 001 7-14-73
DOCUMENT 91

NO. REV. LETTER	REVISION
D	REVISED AND REGRAPHED DRAWING DWS TO CONFORM TO AIRWORK NO. 18-00000-AN LATEST ISSUE NO. 6 R. 04V, 1-8-74
E	ITEM NO. 5, MACH. P. NO. WAS 1N5901. P. C. 11 4470 R. 04V, 1-31-79

DISPLAY
BLANKING

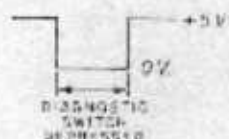
MEM. PROTECT &
DIAGNOSTIC SW.

INDICATES DISPLAY
KEYING FIN. BCU OUTPUTS

MASTER

TP1 +12V. UNREG.

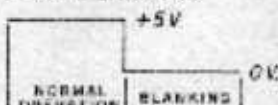
TP2 NM1



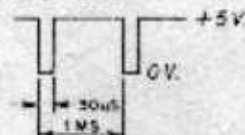
TP3 MEMORY
PROTECT



TP4 BLANKING



TP5 $\overline{\text{IRQ}}$



TP6 BUS $\Phi 2$



TP7 CMOS
RAM B+

POWER ON 4.3V
POWER OFF 3.9V.

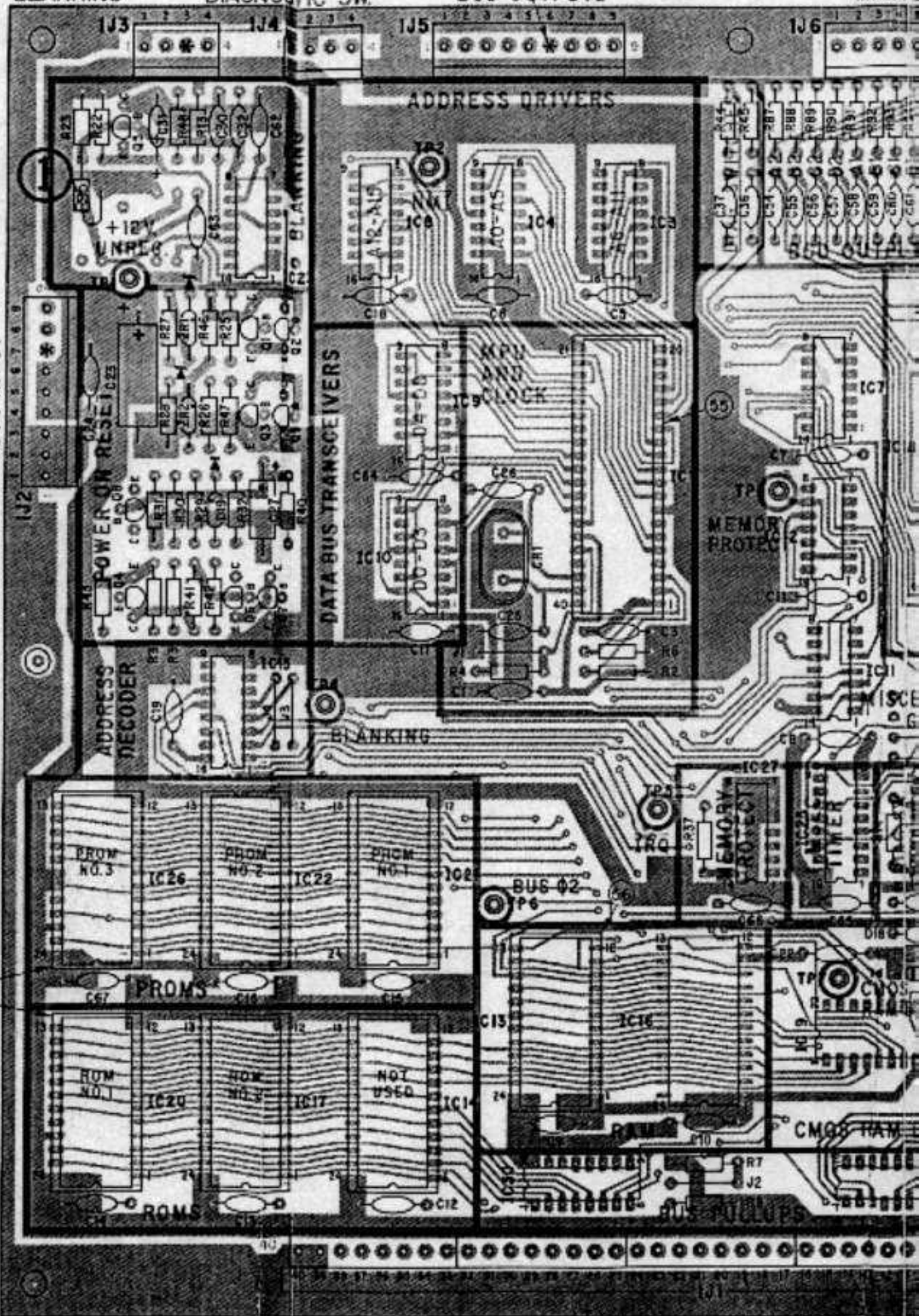
TP8 RESET



TP9 +5V

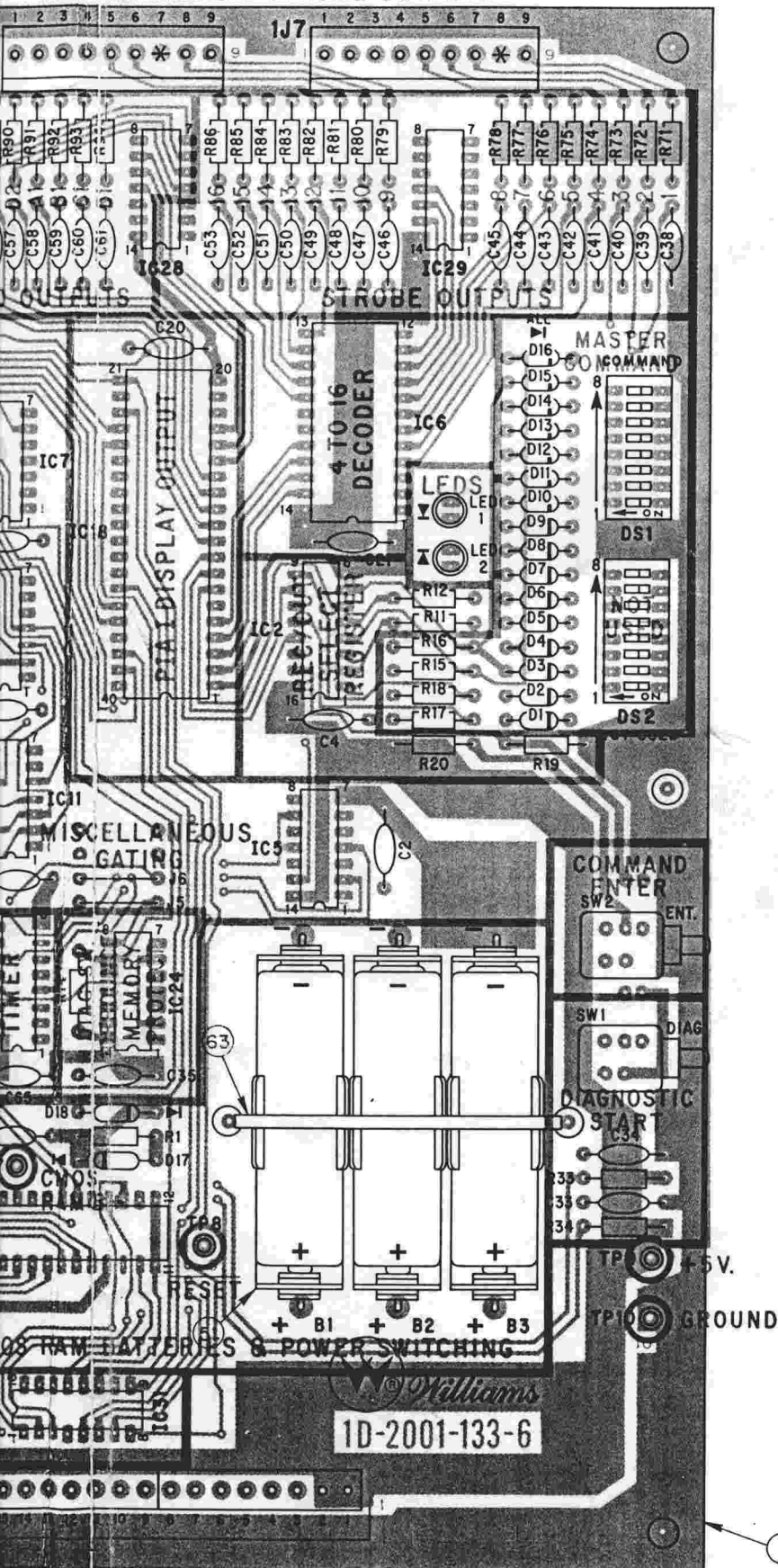
TP10 GND

LOGIC POWER
BUS INPUT



INTERBOARD CONNECTOR

MASTER DISPLAY STROBE OUTPUTS



BILL OF MATERIAL

ITEM NO.	PART NO.	PART DESIGNATION	DESCRIPTION	REQ'D NO.
1	1B-2001-133-6		BARE P.C. BOARD	1
2	5A-8990	IC2, IC9, IC10	8T28 QUAD BUFFER/RECEIVER	3
3	5A-8989	IC3, IC4, IC8	8T97 HEX. TS BUFFER	3
4	5A-9010	IC6	74154 4 TO 16 DECODER	1
5	5A-9013	IC7	7404 HEX. INVERTER	1
6	5A-9235	IC11	74LS10 TRIPLE 3 INPUT NAND	1
7	5A-8973	IC12	7408 QUAD AND	1
8	5A-9011	IC13, IC16	MC6810 RAM	2
9	5A-9246	IC15	74LS139 DUAL 2 TO 4 LINE DECODER	1
10	5A-9017	IC17	ROM 2K X 8 LOWER	1
11	5A-8972	IC18	MC6820 PIA	1
12	5A-9017	IC19	CMOS RAM 5101	1
13	5A-9017	IC20	ROM 2K X 8 UPPER	1
14	5C-9002	IC23	MC3456/556 DUAL TIMER	1
15	5A-9073	IC24	7400 QUAD 2 INPUT NAND	1
16	5A-9236	IC25	4020 CMOS 14 BIT COUNTER	1
17	5A-9237	IC27	4071 CMOS QUAD 2 INPUT NOR	1
18	5A-9247	IC5	74LS02 QUAD 2 INPUT NOR GATE	1
19	5A-9238	IC28, IC29	13 DIP RESISTOR/PACK, 4.7K OHM	2
20	5A-9239	IC30, IC31	15 DIP RESISTOR/PACK, 4.7K OHM	2
21	5B-9025	DS1, DS2	8 STN. DIP SWITCH	2
22	5A-9018	ZR1	1N5996 ZENER DIODE	1
23	5A-9240	ZR2	1N5990 ZENER DIODE	1
24	5A-8919	D1 THRU D17, D19	1N4148 DIODE, SILICON	19
25	5C-8938	D1, D2, D3, D6 THRU D9	2N4401 TRANSISTOR	9
26	5C-9016	D4, D5	2N4403 TRANSISTOR	2
27	5A-9020	CR1	CRYSTAL, 3.58 MHZ	1
28	5B-8984	R20, R25, R26, R48, R71 THRU R94	RESISTOR, FC, 1K OHM 10% 1/4 W	28
29	5B-8983	R2, R6, R7, R8, R23, R30	RESISTOR, FC, 3.3K OHM 10% 1/4 W	6
30	5B-8991	R4, R13 THRU R19, R33, R34, R41	RESISTOR, FC, 4.7K OHM 10% 1/4 W	11
31	5A-9033	R1	RESISTOR, FC, 680 OHM 5% 1/4 W	1
32	5B-9036	R11, R12, R42	RESISTOR, FC, 100 OHM 10% 1/4 W	3
33	5B-9113	R22, R40	RESISTOR, FC, 33K OHM 5% 1/4 W	2
34	5B-9034	R27, R28,	RESISTOR, FC, 10K OHM 10% 1/4 W	2
35	5A-9241	R29, R38, R46, R47	RESISTOR, FC, 22K OHM 10% 1/4 W	4
36	5A-8998	R31	RESISTOR, FC, 2.2K OHM 10% 1/4 W	1
37	5A-9039	R32	RESISTOR, FC, 10 OHM 10% 1/4 W	1
38	5A-9242	R37	RESISTOR, FC, 300K OHM 10% 1/4 W	1
39	5A-8997	R39, R43	RESISTOR, FC, 2.7K OHM 10% 1/4 W	2
40	5B-9083	R44, R45	RESISTOR, FC, 470 OHM 10% 1/4 W	2
41	5A-8980	C1, THRU C21, C30, C33 THRU C37, C63 THRU C67	CAPACITOR, CERAMIC, .01 MFD. 50V.	30
42	5A-8986	C23	CAPACITOR, ELECT., 100 MFD. 10V.	1
43	5A-8996	C22, C24	CAPACITOR, CERAMIC, .1 MFD. 50V.	2
44	5A-9169	C25, C26	CAPACITOR, CERAMIC, 27 PFD. 1K V.	2
45	5A-9243	C27	CAPACITOR, TANT., 10 MFD. 10V.	1
46	5A-9031	C31	CAPACITOR, TANT., 1 MFD. 25V.	1
47	5A-9030	C32	CAPACITOR, CERAMIC, .047 MFD 50V.	1
48	5A-9065	C38 THRU C62	CAPACITOR, CERAMIC, 470 PFD. 50V.	25
49	5A-9019	LED1, LED2	LED, RED	2
50	5A-9024	SW1, SW2	SWITCH, SPDT MOMENTARY	2
51	5A-9021		BATTERY HOLDER # 171	1
52	5A-9026	IJ1	HEADER 09-64-1083	5
53	5A-9028	IJ3, IJ4	HEADER 09-65-1041	2
54	5A-9027	IJ2, IJ5, IJ6, IJ7	HEADER 09-65-1091	4
55	5A-8985		40 PIN IC SOCKET	1
56	5A-9004		24 PIN IC SOCKET	7
57		J1 THRU J6	WIRE JUMPER 22 GAUGE WIRE WITH INSULATION	6
58		-TP1 THRU TP10	TERMINAL # 1502-1	10
59	5A-9250	IC1	MC6800 MICROPROCESSOR	1
60	5A-8967	IC14	GORGAR GAME ROM	1
61	5A-9015	IC21, IC22, IC26	PROM 512 X 8 7641/6341	3
62	5A-9022	B1, B2, B3	BATTERY, ALKALINE, 1.5 V.	3
63	3A-7520-1		TIE WRAP	1
64	5A-9266	D18	1N5817 DIODE	1
65	5A-9086	R95	RESISTOR, 6.8K OHM 10% 1/4 W	1

★ - WHEN USED, IC14 REPLACES IC21, IC22, AND IC26.

WILLIAMS ELECTRONICS, INC.

SUBSIDIARY OF XCOR CORPORATION

3401 N. CALIFORNIA CHICAGO, ILL. 60618 CORNELIA 7-2240

PART NAME				
CPU BOARD ASSEMBLY				
DWN.	DATE	APP'D.	SCALE	PART NO.
R. Gay	1-11-79		2=1	D-8161