

Figure 8.1 The CAT Box Control Panel

CAT Box Cheat Sheet

CAT Box Pin Out

1	GROUND
2	GROUND
3	GROUND
4	GROUND
5	GROUND
6	CBCLK DIS*
7	ABUS 10
8	ABUS 11
9	ABUS 8
10	ABUS 9
11	ABUS 6
12	ABUS 7
13	ABUS 4
14	ABUS 5
15	ABUS 2
16	ABUS 3
17	ABUS 0
18	ABUS 1
19	ABUS 14
20	ABUS 15
21	ABUS 12
22	ABUS 13
23	DBUS 6
24	DBUS 7
25	DBUS 4
26	DBUS 4
27	DBUS 2
28	DBUS 3
29	DBUS 0
30	DBUS 1
31	GAME ϕ_2
32	GAME R/W
33	GAME VMAA
34	NOT USED
35	GAME
36	GAME BAA
37	NOT USED
38	NOT USED
39	NOT USED
40	NOT USED
41	NOT USED
42	NOT USED
43	NOT USED
44	NOT USED
45	NOT USED
46	NOT USED
47	NOT USED
48	NOT USED
49	NOT USED
50	NOT USED

Self-Test Procedure

For more information see the CAT Box Manual, Section 7.

INSTRUCTION	IF TEST PASSES
POWER and TESTER SELF-TEST to ON. Press TESTER RESET.	UNSTABLE SIGNATURE, LOOPING and COMPARE ERROR LEDs and all display segments light.
Press DATA SET.	COMPARE ERROR, LOOPING and UNSTABLE LEDs and all display segments are not lighted.
Press DATA SET.	Each display digit, COMPARE ERROR, LOOPING and UNSTABLE SIGNATURE LEDs light one at a time.
Press DATA SET.	Each display segment lights one at a time. UNSTABLE SIGNATURE lights with segment g. COMPARE ERROR lights with decimal point segment. LOOPING lights with segment f.
Press DATA SET. Set each switch to a different position.	A 7. is displayed. The 7. changes to E, or vice versa, with each new position of switch.

Hexadecimal Conversion Chart

DECIMAL	BINARY	HEXADECIMAL
0	0000	0
1	0001	1
2	0010	2
3	0011	3
4	0100	
5	0101	5
6	0110	6
7	0111	7
8	1000	8
9	1001	9
10	1010	A
11	1011	B
12	1100	C
13	1101	D
14	1110	E
15	1111	F

* When connected to an Atari game PCB edge connector, disables the CAT Box internal clock. Thus, the game clock is the CAT Box clock.

Δ 6800 microprocessor-based circuits only.

Control Panel Description

For more detailed information, see the CAT Box Manual, Section 8.

READ/WRITE CONTROL Section

$\overline{R/W}$ MODE: permits read or write operations
(OFF): key in address
PULSE: continuous read or write operation
 $\overline{R/W}$: reads to or writes from circuit under test
ERROR DATA DISPLAY: data read differs from data comparing to
GAME: DATA display data is from data bus
TESTER: DATA display data was written to circuit under test
BYTES: selects number of bytes you write to or read from circuit under test
DBUS SOURCE: lets you select data when writing to circuit under test, or data compared to when reading from circuit under test
DATA: data written to circuit under test
ADDR, ADDR: data from ADDRESS/SIGNATURE display is written to RAM of circuit under test
COMPARE ERROR LED: lights when data read differs from data compared to

SIG ANALYSIS CONTROL Section

START, STOP, CLOCK: up—chooses rising edge of signal
down—chooses falling edge of signal
UNSTABLE SIGNATURE LED: lights when there is a failure
GATE LED: lights when signatures are being taken from circuit under test

TESTER CONTROL Section

ADDRESS/SIGNATURE Display: indicates address CAT Box writes to or reads, or indicates signatures
DATA Display: displays data
ADDRESS INCR: increments display address by one address
DATA SET: clears DATA display, enter new byte of data with keypad
KEYPAD: press to enter address or data
LOOPING LED: lights when CAT Box is performing a continuous operation
TESTER MODE: activates either Read/Write or Signature Analysis section of the CAT Box
NO CLOCK LED: lights when no clock coming from circuit under test
TESTER RESET: microcomputer of CAT Box goes to start of its program
TESTER SELF-TEST: causes CAT Box to enter self-test program
LOOPING LED: lights when CAT Box is performing a continuous operation

DATA PROBE Section

DATA: with logic probe, determines logic state of signal or probes circuits for signatures
PULSE MODE: UNLATCHED detects repetitive signal, LATCHED detects one-shot signal, RESET clears pulse LED

10 CAT Box PCB Assemblies

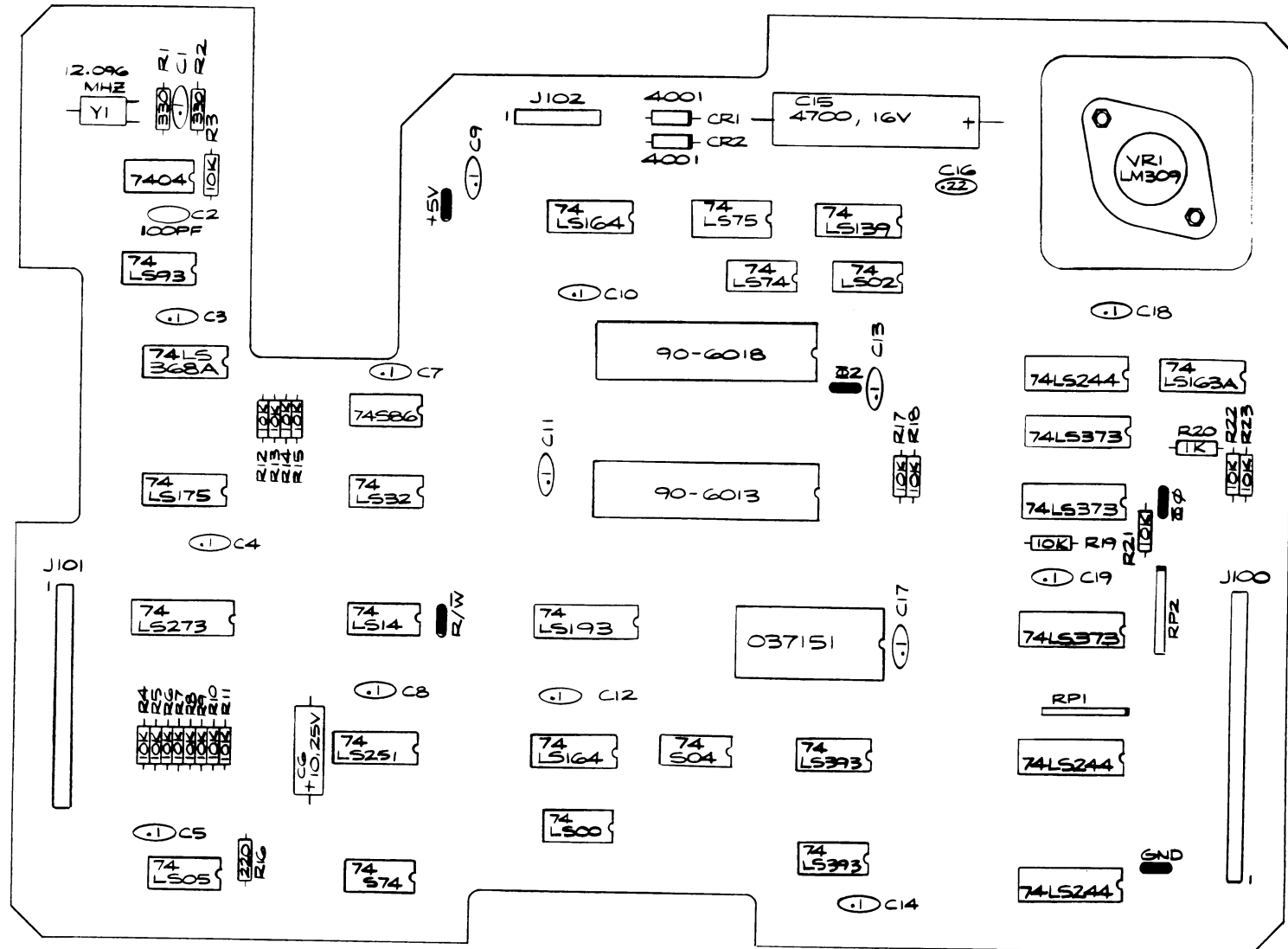
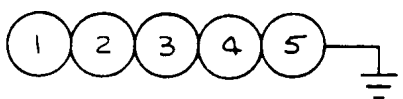
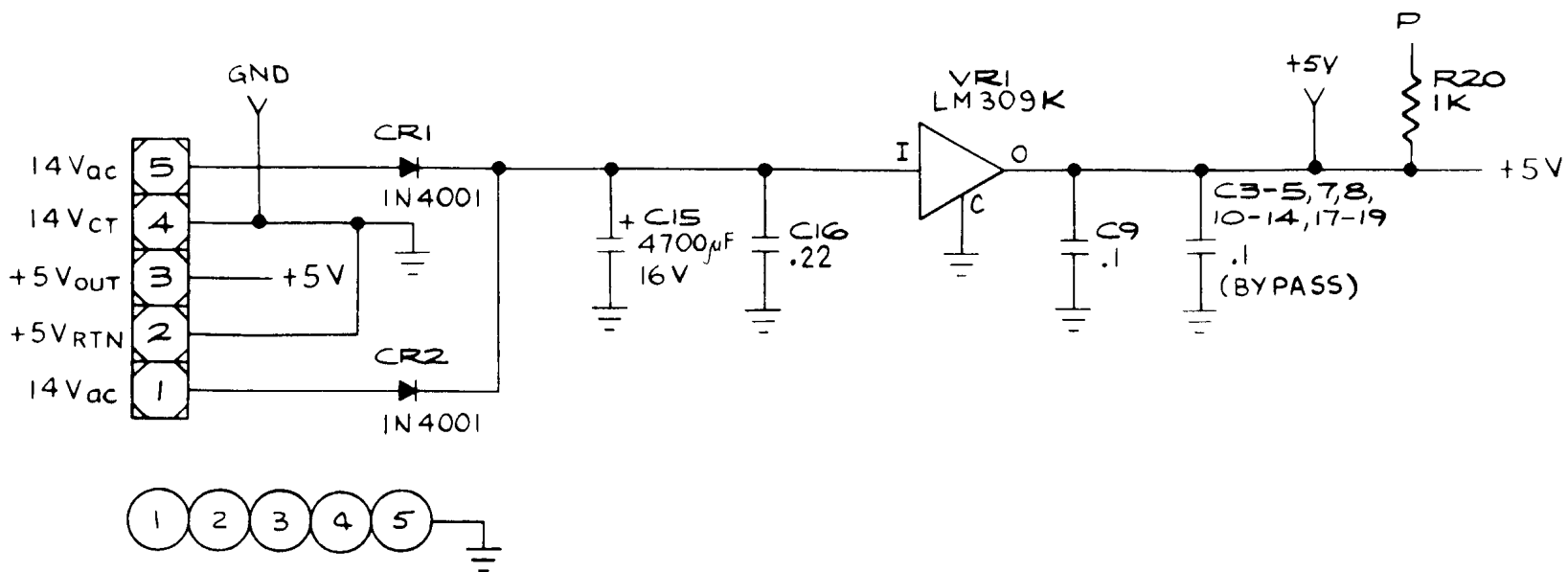


Figure 10.1 CAT Box Logic Board Assembly Parts List




Part No.	Description (Reference Designations and Locations in Bold)
19-007	10K Resistor Network (RP1, 2)
24-160478	4700 μ f Electrolytic Fixed Axial-Lead 16V Capacitor (C15)
24-250106	10 μ f Aluminum Electrolytic Fixed Axial-Lead 25V Capacitor (C6)
27-250104	.1 μ f Ceramic-Disc Radial-Lead 25V Capacitor (C1)
29-088	.1 μ f Ceramic-Disc Radial-Lead 25V Capacitor (C3-5, 7-14, 17-19)
31-1N4001	Type-1N4001 50V Switching Diode (CR1, 2)
37-LM309K	Type-LM309K Voltage Regulator (VR1)
37-7404	Type-7404 Hex Inverter, Integrated Circuit (H1)
37-74LS00	Type-74LS00 Quad 2-Input Nand Gate, Integrated Circuit (A3)
37-74LS02	Type-74LS02 Quad 2-Input Positive Nor Gate, Integrated Circuit (E/F5)
37-74LS14	Type-74LS14 Hex Inverter, Integrated Circuit (C2)
37-74LS32	Type-74LS32 Quad 2-Input Or Gate, Integrated Circuit (D2)
37-74LS74	Type-74LS74 Dual 'D' J-K Flip-Flop, Integrated Circuit (E/F4)
37-74LS75	Type-74LS75 Dual 2-Bit Latch, Integrated Circuit (F4)
37-74LS93	Type-74LS93 4-Bit Binary Ripple Counter, Integrated Circuit (F1)
37-74LS139	Type-74LS139 Dual 1-of-4 Decoder/Demultiplexer, Integrated Circuit (F5)
37-74LS163A	Type-74LS163A 4-Bit Binary Counter, Integrated Circuit (E7)
37-74LS164	Type-74LS164 8-Bit Shift Register, Integrated Circuit (B3, F3)
37-74LS175	Type-74LS175 Quad 'D' Flip-Flop, Integrated Circuit (D1)
37-74LS193	Type-74LS193 4-Bit Up/Down Counter, Integrated Circuit (C3)
37-74LS244	Type-74LS244 3-State Octal Buffer, Integrated Circuit (A6, B6, E6)
37-74LS251	Type-74LS251 8-Input Multiplexer, Integrated Circuit (B2)
37-74LS273	Type-74LS273 Octal 'D' Flip-Flop, Integrated Circuit (C1)
37-74LS373	Type-74LS373 3-State Octal Latch, Integrated Circuit (C6, D6, D/E6)
37-74LS393	Type-74LS393 Dual 4-Bit Binary Ripple Counter, Integrated Circuit (A5, B5)
37-74S04	Type-74S04 Hex Inverter, Integrated Circuit (B4)
37-74S74	Type-74S74 Dual 'D' Flip-Flop, Integrated Circuit (A2)
78-06005	Heat Sink
78-16005	Thermally Conductive Compound
79-42C24	24-Pin Medium-Insertion-Force Integrated Circuit Socket (C5)
79-42C40	40-Pin Medium-Insertion-Force Integrated Circuit Socket (D4, E4)
79-58096	5-Pin Connector (J102)
90-102	12.096, \pm .005%, Crystal (Y1)
90-6013	Type-6502A Microprocessor, Integrated Circuit (D4)
90-6018	Type-6532A RAM I/O Timer, Integrated Circuit (E4)
020670-01	Test Point
037151-01	Read-Only Memory, 2Kx8 (C5)
110000-102	1K Ohm, \pm 5%, 1/4 W Resistor (R20)
110000-103	10K Ohm, \pm 5%, 1/4 W Resistor (R3-15, 17-19, 21-23)
110000-221	220 Ohm, \pm 5%, 1/4 W Resistor (R16)
110000-331	330 Ohm, \pm 5%, 1/4 W Resistor (R1, 2)
122004-224	.22 μ f Ceramic-Disc Radial-Lead 25V Capacitor (C16)
128002-101	100 pf Radial-Lead Epoxy-Dipped 100V Mica Capacitor (C2)
137002-001	Type-74S86 Quad 2-Input Exclusive OR Gate, Integrated Circuit (E2)
137167-001	Type-74LS05 Open Collector Hex Inverter, Integrated Circuit (A1)
137168-001	Type-74LS368A Hex Inverter Buffer, Integrated Circuit (E1)
179021-040	40-Pin Connector (J101)
179022-050	50-Pin Connector (J100)



REFERENCE DESIG

HIGHEST	NOT USED
R23	
C19	
CR2	
VRI	
RP2	

NOTES:

1.  = J102, 5 PIN
2.  = J100, 50 PIN
3.  = J101, 40 PIN

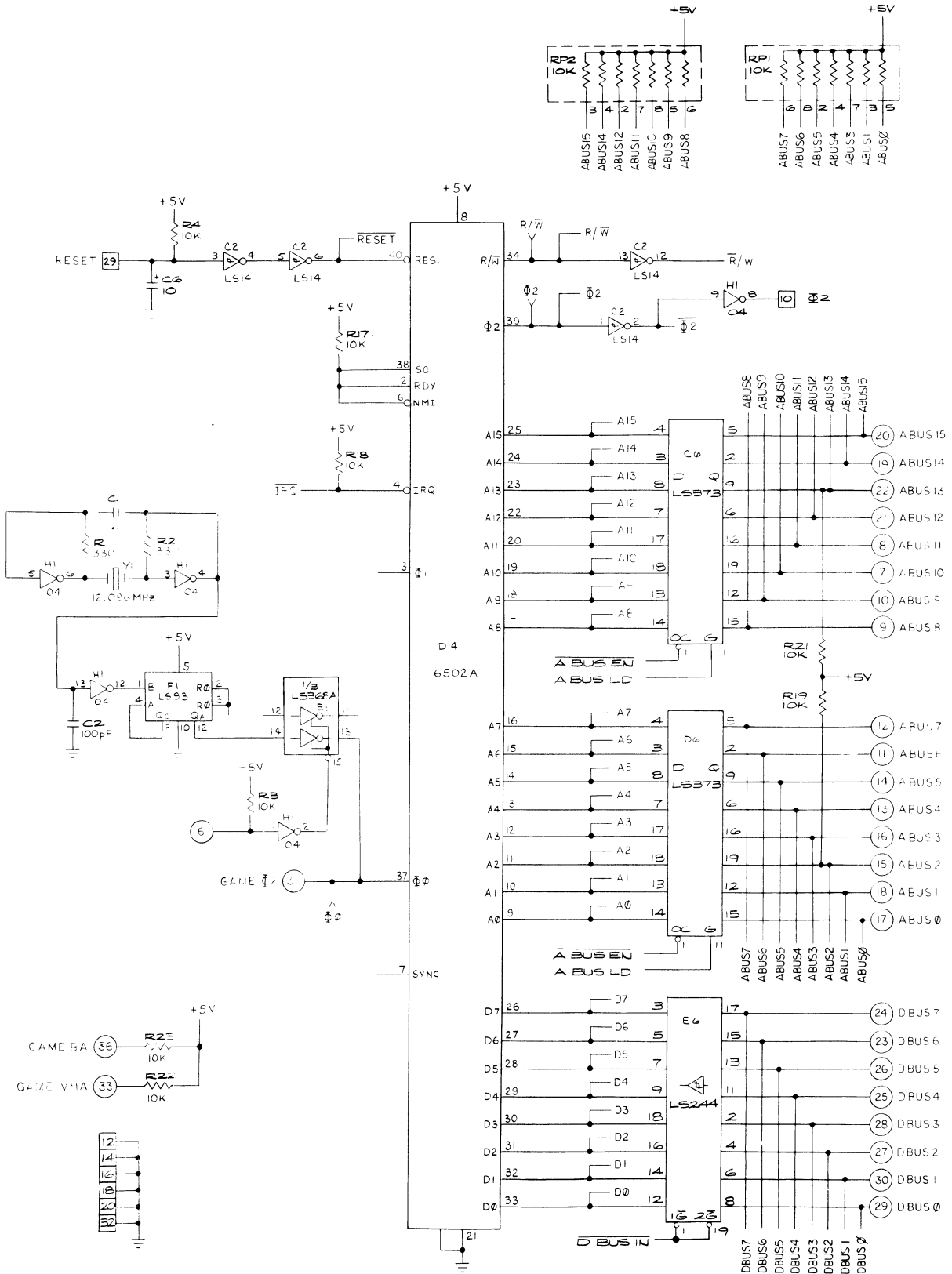
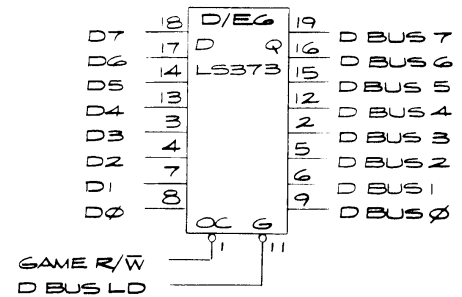
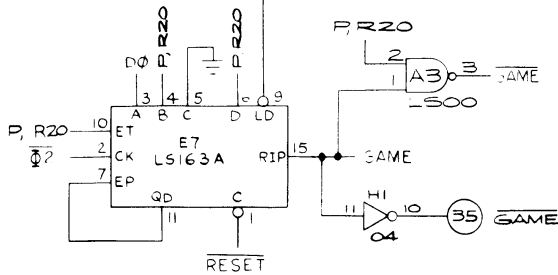
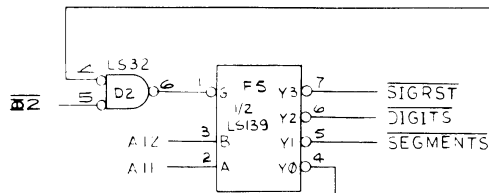
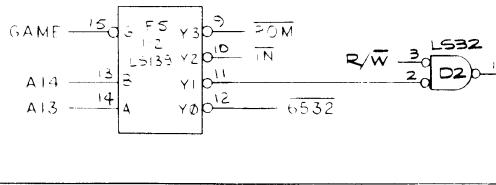
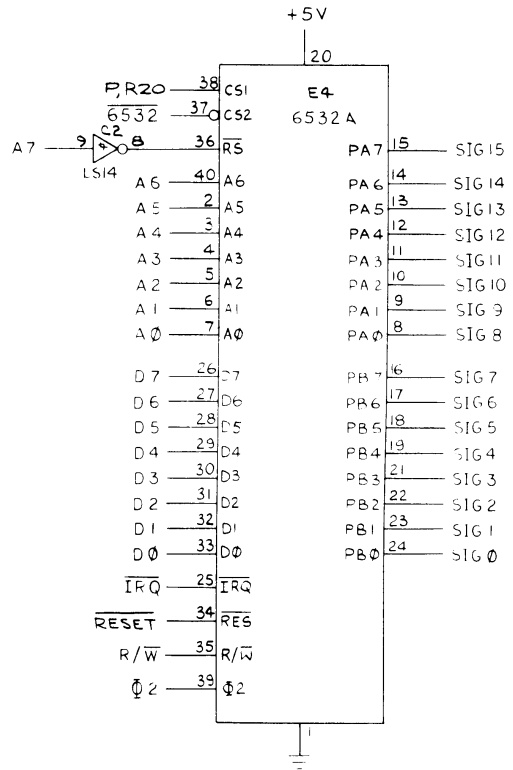
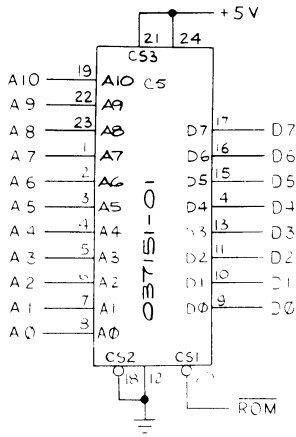
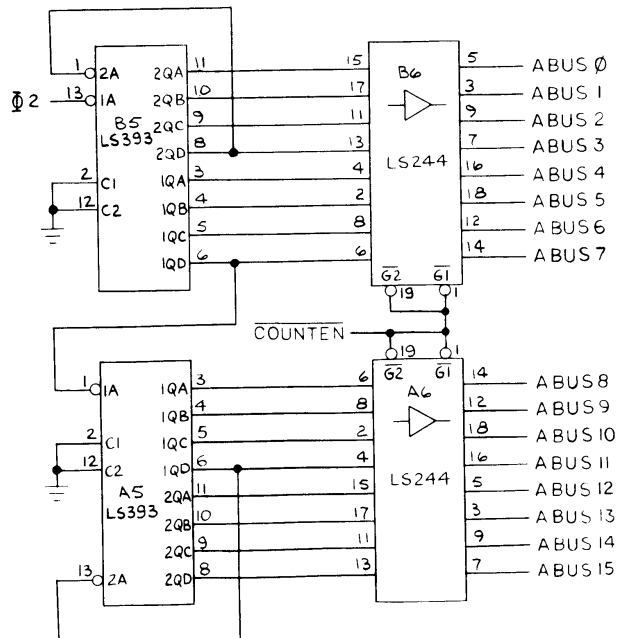
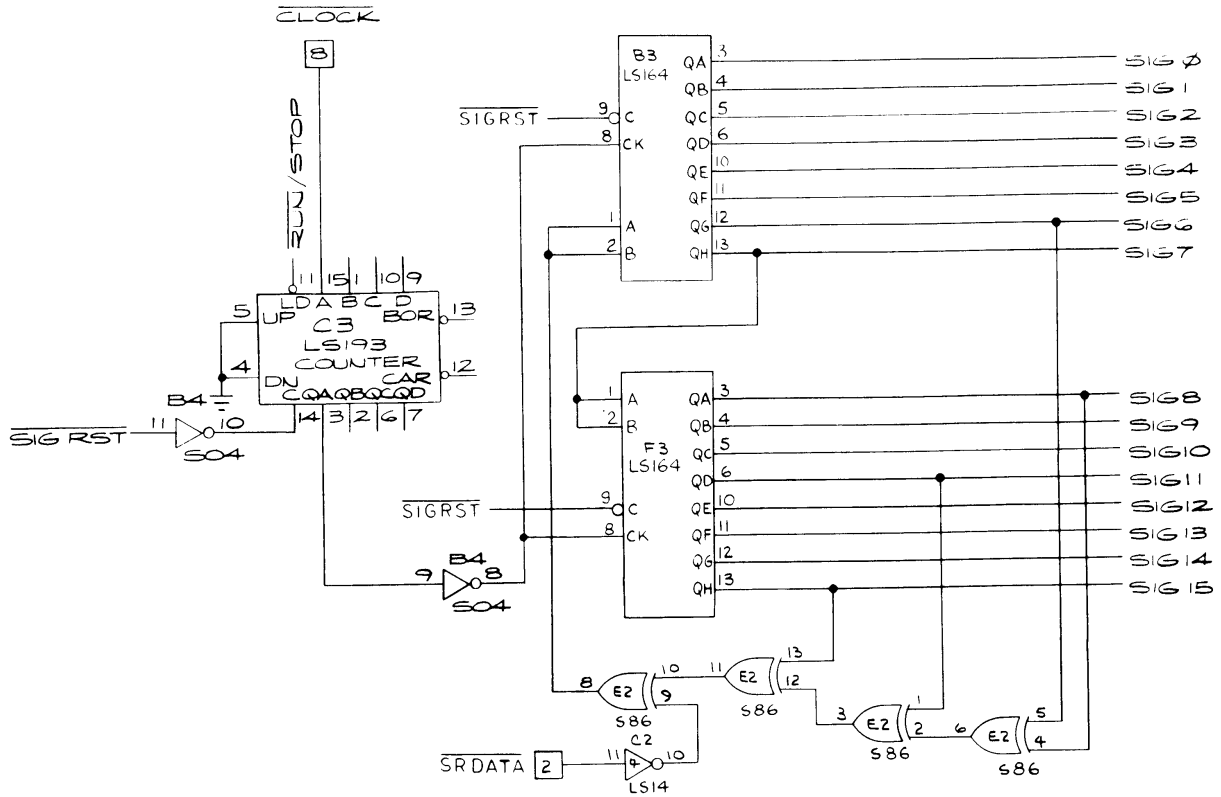
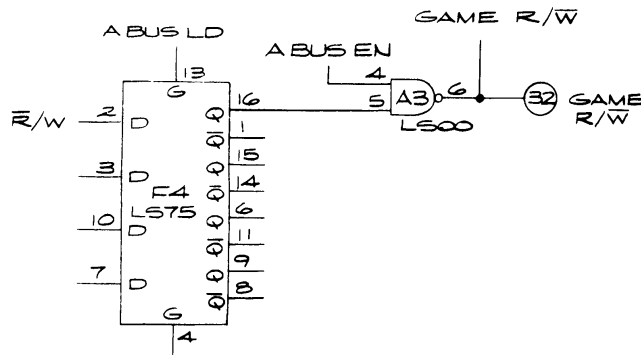
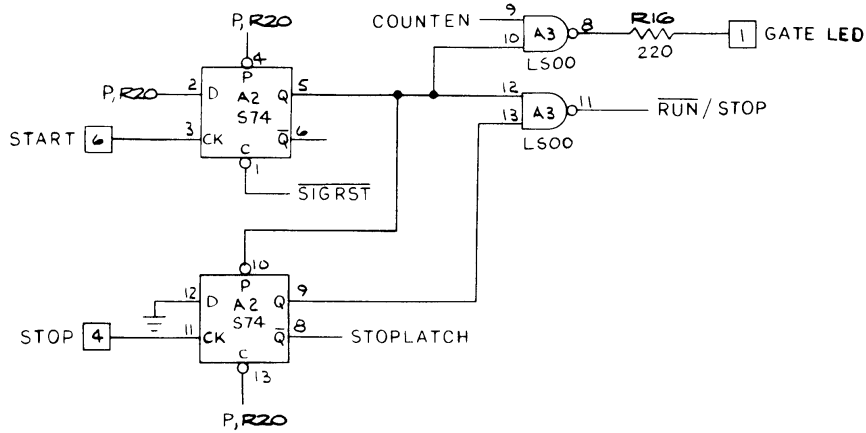
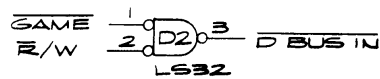
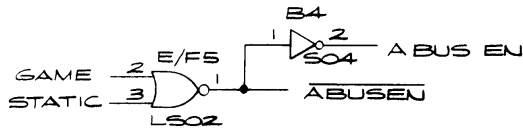
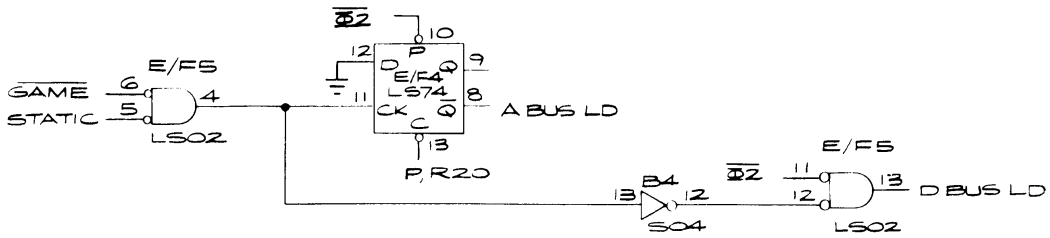
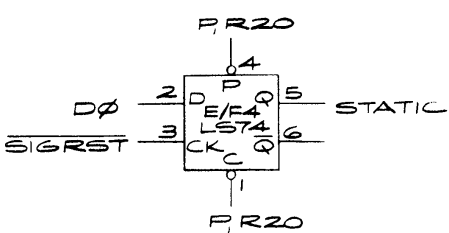
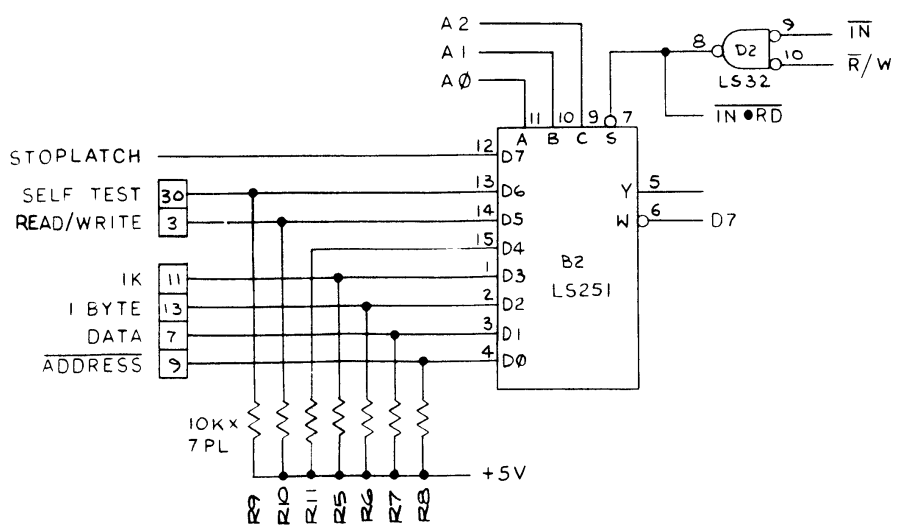
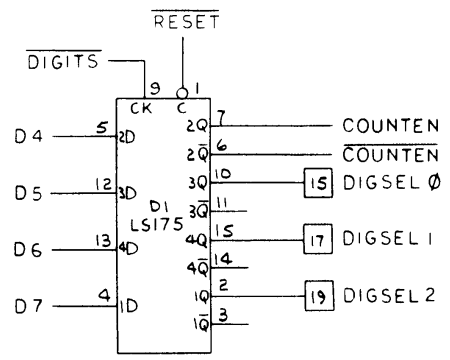
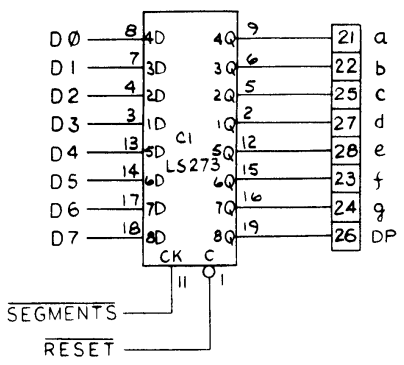
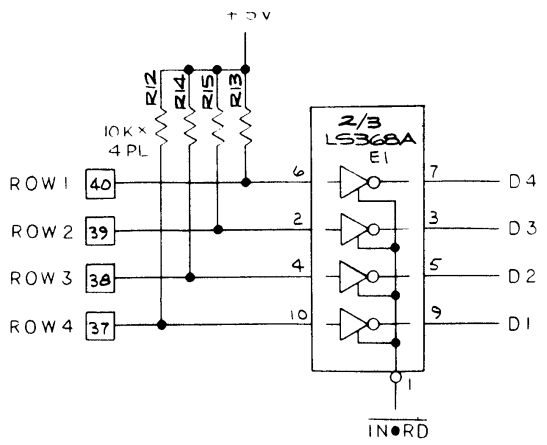
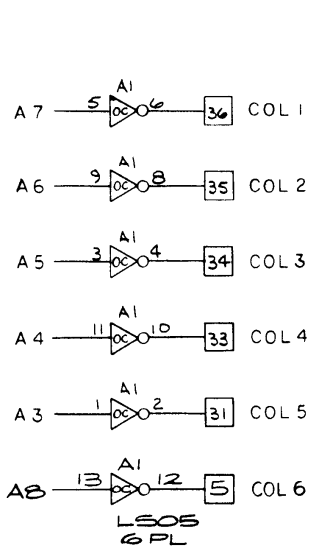


Figure 11.1 Logic Board, continued









MEMORY MAP

HEXA- DECIMAL ADDRESS	R/W	DATA								FUNCTION
		D7	D6	D5	D4	D3	D2	D1	D0	
0000-0007F	R/W	D	D	D	D	D	D	D	D	6532 (Timer, Signature)
0800-00FF	R/W	D	D	D	D	D	D	D	D	6532 (RAM)
2000	W								D	Game/Box Counter
2B00	W	D	D	D	D	D	D	D	D	Segment Select
3000	W	D	D	D						Digit Select
3000	W				D					1 = Sig. An. Enabled
3800	W									Sig. An. Reset
4000	R	D								1 = Address
4001	R	D								1 = Data
4002	R	D								1 = 1 Byte
4003	R	D								1 = 1K Byte
4004	R	D								Spare Input
4005	R	D								0 = Write 1 = Read
4006	R	D								1 = Self Test
4007	R	D								0 = Sig. An. Done
4008	R				D					1 = Game 0 = Tester
4008	R					D				1 = Address Incr.
4008	R						D			1 = Data Set
4008	R							D		1 = Sig. An. 0 = R/W
4010	R				D	D	D	D		3, 7, B, F
4020	R				D	D	D	D		2, 6, A, E
4040	R				D	D	D	D		1, 5, 9, D
4080	R				D	D	D	D		0, 4, 8, C
4100	R						D			1 = Static
4100	R							D		1 = Pulse
6000-67FF	R	D	D	D	D	D	D	D	D	Program ROM (2K)

Figure 10.2 Switch Board Layout

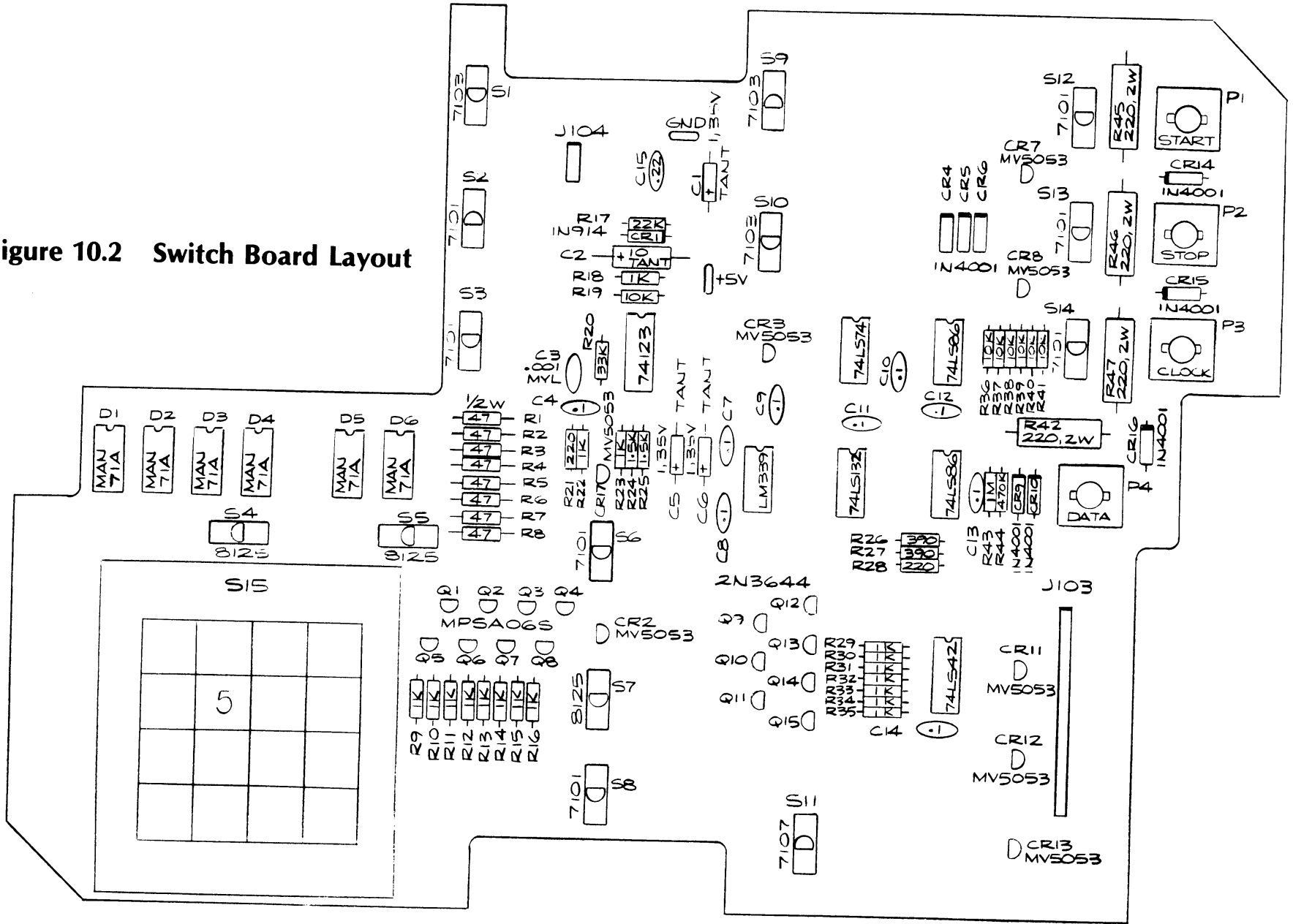


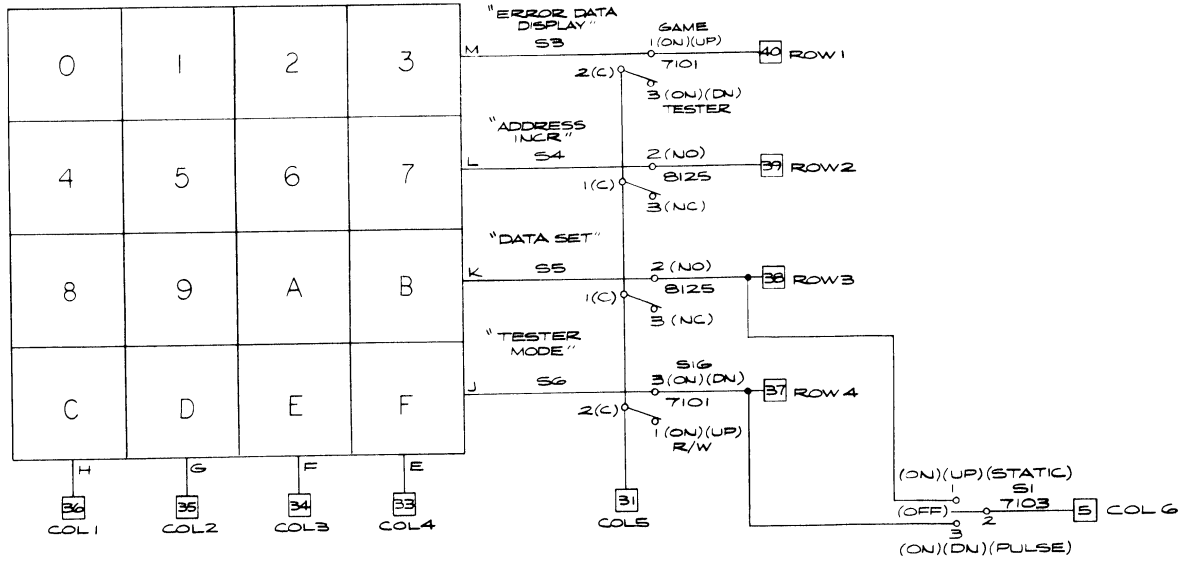
Figure 10.2 CAT Box Switch Board Assembly Parts List

<i>Part No.</i>	<i>Description (Reference Designations and Locations in Bold)</i>
13-5221	220 Ohm, $\pm 5\%$, 2W Resistor (R42, 45-47)
21-101102	.001 μf Mylar Fixed Radial-Lead 100V Capacitor (C3)
29-006	1 μf Tantalum Radial-Lead 35V Capacitor (C1, 5, 6)
29-046	10 μf Tantalum Axial-Lead 20V Capacitor (C2)
29-088	.1 μf Ceramic-Disc, Radial-Lead 25V Capacitor (C4, 7-14)
31-1N914	Type-1N914 75V Switching Diode (CR1)
31-1N4001	Type-1N4001 75V Switching Diode (CR4-6, 9, 10, 14-16)
33-2N3644	Type-2N3644 PNP Silicon Transistor (Q9-15)
34-MPSA06S	Type-MPSA06S NPN Silicon Transistor (Q1-8)
37-LM339	Type-LM339 Quad Comparator, Integrated Circuit (A4)
37-74LS42	Type-74LS42 BCD-To-Decimal Decoder, Integrated Circuit (A7)
37-74LS74	Type-74LS74 Dual "D" Flip-Flop, Integrated Circuit (A2)
37-74LS86	Type-74LS86 Quad 2-Input Exclusive-Or Gate, Integrated Circuit (A3, 6)
37-74LS132	Type-74LS132 Quad 2-Input Nand Schmitt Trigger, Integrated Circuit (A5)
38-MAN71A	Type-MAN71A LED (D1-6)
38-MV5053	Type-MV5053 LED (CR2, 3, 7, 8, 11-13, 17)
61-011C	SPDT Toggle Switch (S2, 3, 6, 8, 12-14)
79-42114	14-Pin Integrated Circuit Socket (D1-6)
020670-01	Test Point
110000-102	1K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R9-16, 18, 22, 23, 29-35)
110000-103	10K Ohm $\pm 5\%$, $\frac{1}{4}$ W Resistor (R19, 36-41)
110000-105	1 MegOhm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R43)
110000-152	1.5K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R24, 25)
110000-221	220 Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R21, 28)
110000-223	22K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R17)
110000-333	33 Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R20)
110000-391	390 Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R26, 27)
110000-474	470K Ohm, $\pm 5\%$, $\frac{1}{4}$ W Resistor (R44)
110001-470	47 Ohm, $\pm 5\%$, $\frac{1}{2}$ W Resistor (R1-8)
122004-224	.22 μf Ceramic-Disc 25V Radial-Lead Capacitor (C15)
137166-001	Type-74123 Dual Retriggerable Monostable Multivibrator, Integrated Circuit (A1)
160006-001	4 x 4 Keyboard (S15)
160007-001	SPDT Toggle Switch (S1, 9, 10)
160008-001	SPDT Toggle Switch (S11)
160009-001	SPST Push-Button Switch (S4, 5, 7)
178020-312	LED Support (CR2, 3, 7, 8, 11-13, 17)
179013-001	BNC Receptacle (P1-4)
179020-040	40-Pin Connector (J103)
179024-003	3-Pin Connector (J104)

Figure 10.3 CAT Box Final Assembly Parts List A037162-01 A

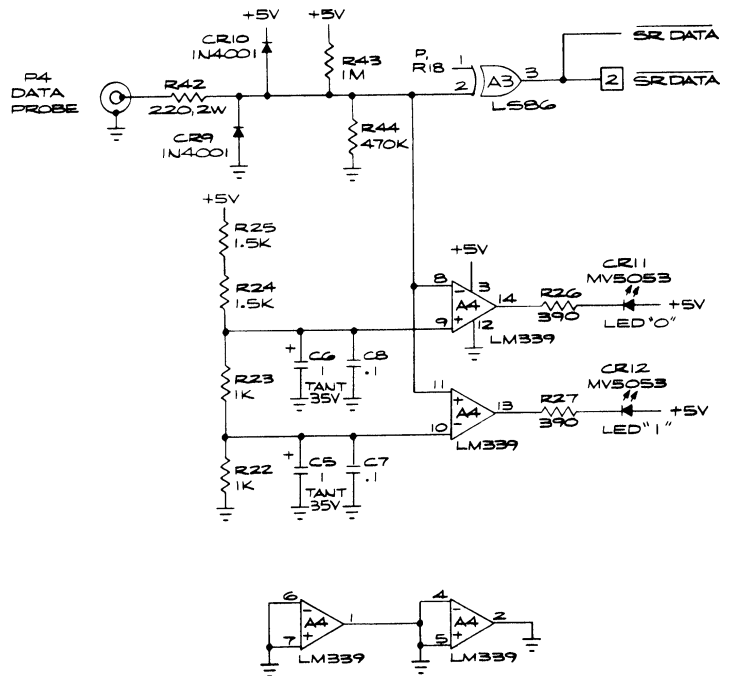
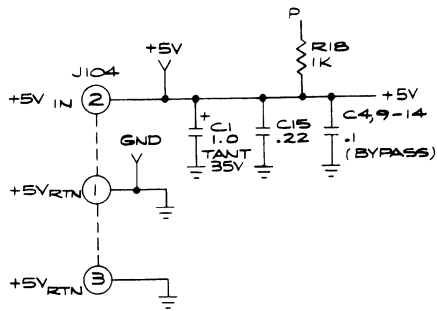
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A037102-01	Power Harness Assembly
A037103-01	40-Pin PCB Interconnect Assembly
A037104-01	50-Pin PCB Interconnect Assembly
CO-179	CAT Box Instruction Card <i>(Contains abbreviated instructions)</i>
TM-179	CAT Box Instruction and Service Manual
46-2010502	½ Amp. 250V, 3 AG Slow-Blow Glass Cartridge-Type Fuse
78-802001N	1 ¼-Inch Circuit-Board Support
79-4411001	Non-Indicating 3AG Cartridge-Type Fuse Post
021270-04	Red Display Overlay
036987-01	CAT Box Accessory Bag
037138-01	Control Panel with Graphics
150000-001	Power Cord
160010-001	SPDT On/Off Switch
178021-001	CAT Box Carrying Case
179025-001	Power Cord Receptacle
179040-224	Red Test Probe
179040-424	Yellow Test Probe
179040-524	Green Test Probe
179045-030	Pin Test Probe

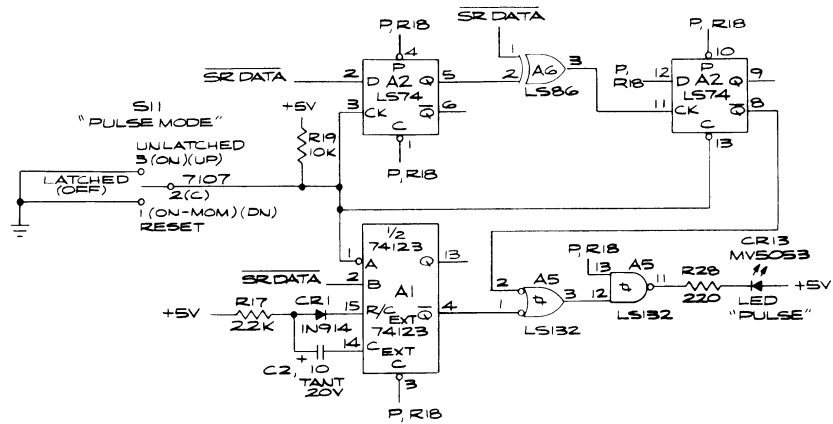
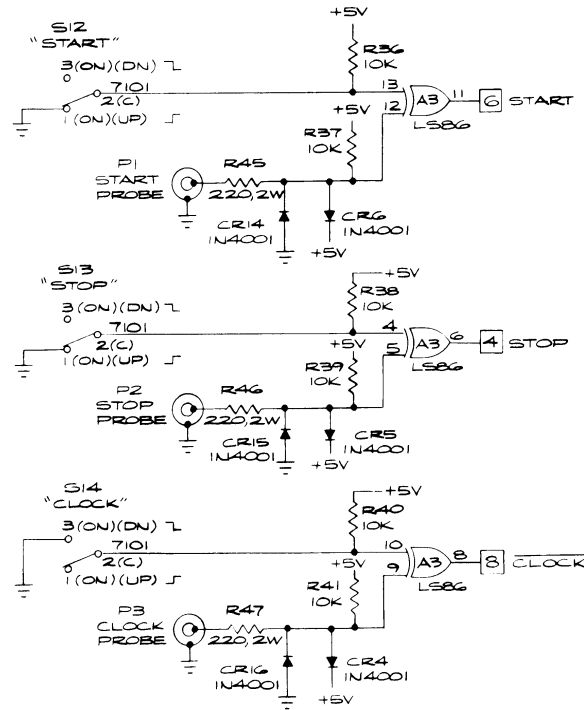
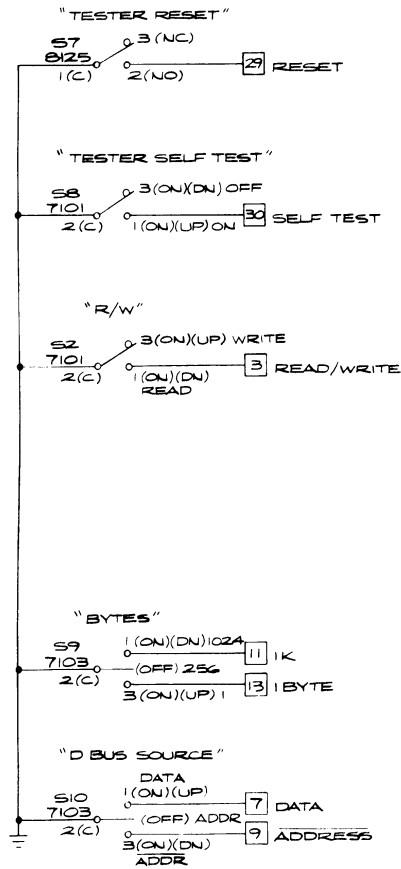
S15
16 POS KBD

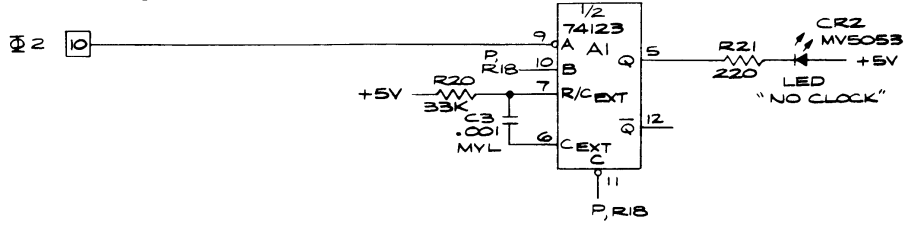
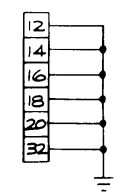
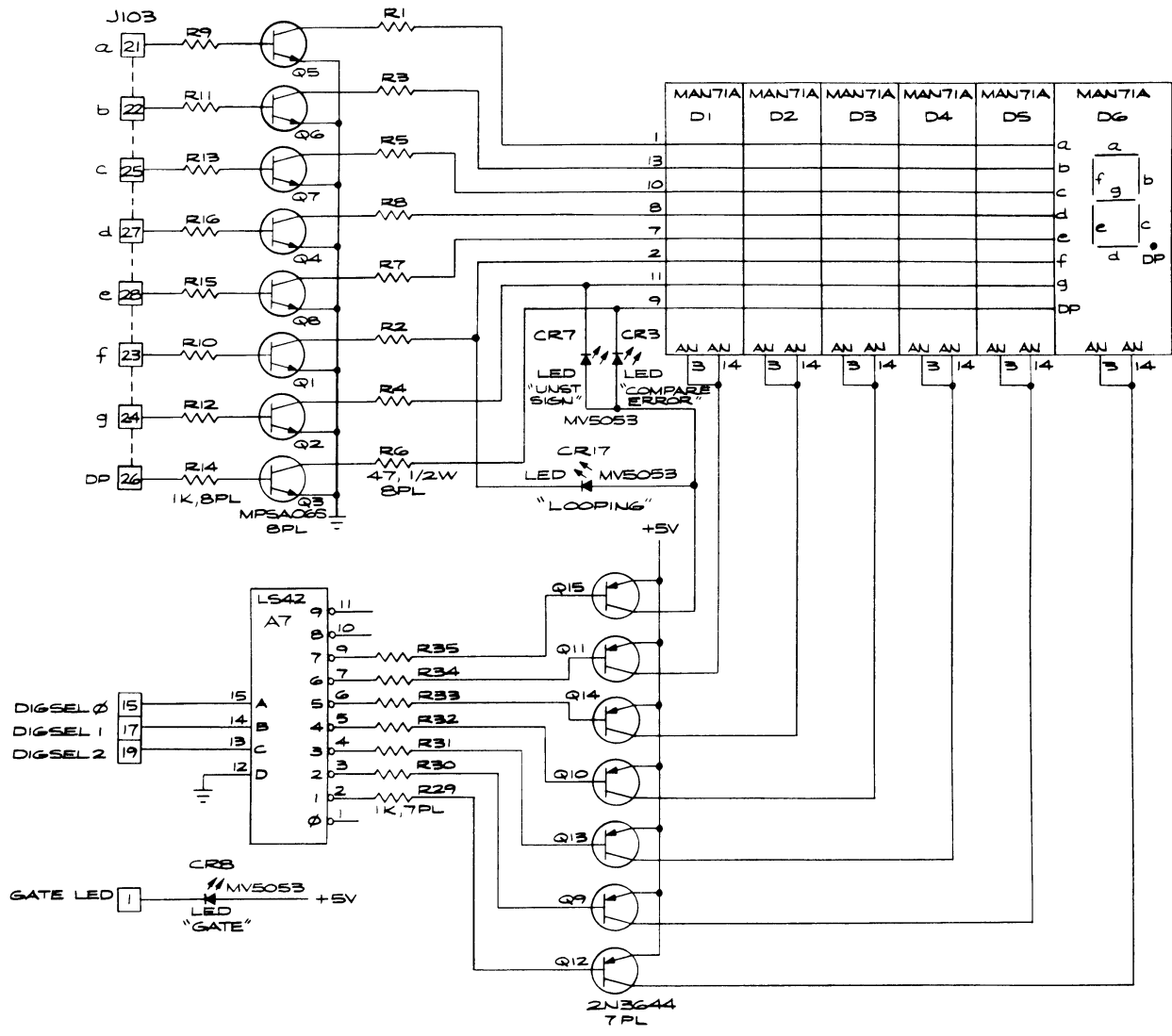


NOTES:

- 1. = J103, 40 PIN
- 2. = J104, 3 PIN







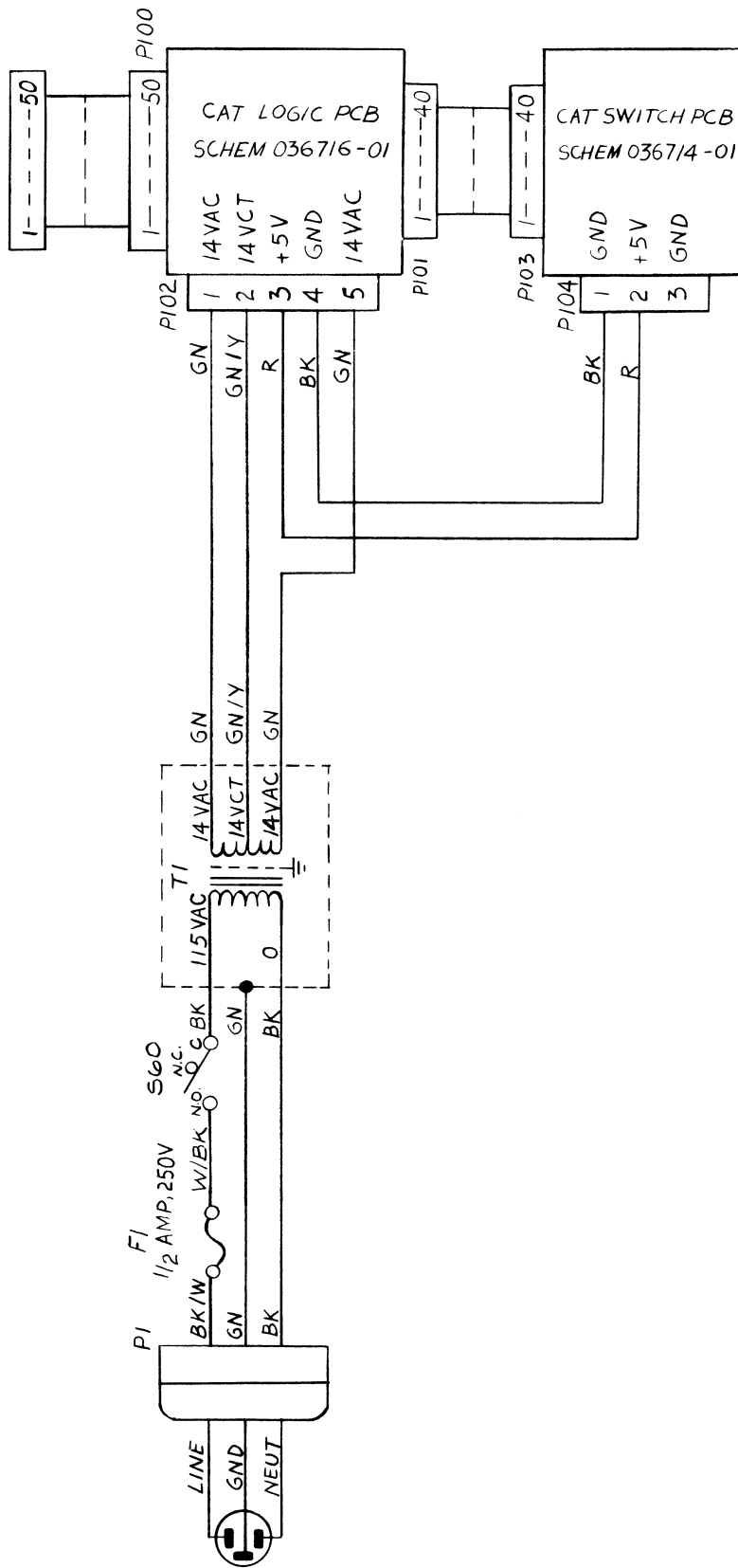


Figure 11.3 Wiring Diagram