FLIPPER GOTTLIEB-VIFICO

INSTRUCCIONES GENERALES

INDICE:

1º Instalación y puesta en marcha
2º Test de comprobación
3º Programación de la máquina
4º Teoría de funcionamiento y esquema de bloques
5º Autoporcentaje
6º Esquemas generales (Práctico, eléctrico y relación componentes)

- Placa Pop bumper (A8)
- Placa Piggy Back (A1)
- Placa CPU (A1)
- Placa driver (A3)
- Placa transistores auxiliar (A16)
- Placa resistencias (A13)
- Placa diodos (A7)
- Placa diodos conmutación (A19)
- Auxiliar alimentación y amplificación (A5)
- Auxiliar de sonido (A20)
- Generadora de sonidos (A6)
- Placa secuencia automática 10 lámparas (A11)
- Placa display (A4)
- Placa Reset (A24)
- Placa fuente alimentación (A2)
- Cableado cabina y cabezal.

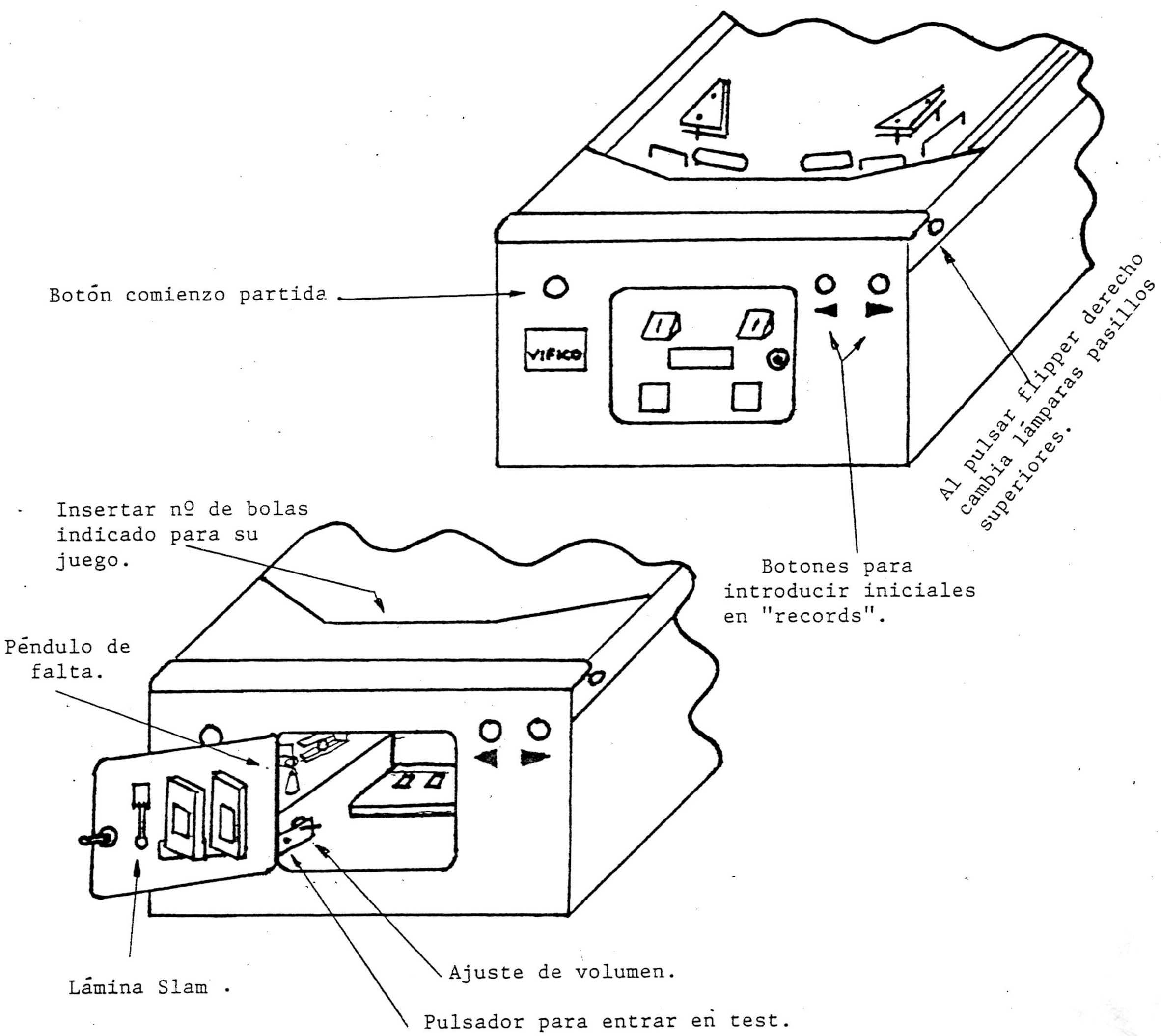
ANEXO A LAS INSTRUCCIONES GENERALES ENCONTRARÁ:

- Tabla de programación
- Desarrollo del juego
- Partes del tablero y distribución de solenoides, lámparas y láminas.
- Cableado del tablero.

Adaptado por: A J P C	DEPARTAMENTO TECNICO
F. LOPEZ	27-06-89

1º INSTALACION Y PUESTA EN MARCHA

- Atención éste equipo debe ser instalado a una toma de red que disponga de conexión a tierra.
- Una vez atornilladas las patas y la cabeza. Inserte el número de bolas - indicado para su juego.
- Conecte la máquina a la red, al accionar el interruptor inmediatamente se encienden las lámparas fijas el tubo fluorescente y ventilador transcurrido 1 segundo se enciende el display , suben bancadas y se encienden lámparas - controladas. Quedando la máquina a la espera de depositarle monedas.



2º TEST DE COMPROBACIÓN

- La máquina posee un sistema de autotest, para acceder a él, pulse el botón de test que se encuentra a la izquierda una vez abierta la puerta de monederos. El test no entra si se está jugando una partida.
- El test se divide en dos partes:

1º) - Test estadístico

2º) - Auto test técnico

En el test estadístico mediante pulsaciones sucesivas nos aparecen los siguientes mensajes (en inglés):

Pulsado por 1ª vez nos presenta:

TEST MODE

Pulsaciones siguientes:

1.- Monedas introducidas en monedero izquierdo.
2.- Monedero central (no usado).
3.- Monedas introducidas en monedero derecho.
4.- Total partidas.
5.- Total partidas gratis.
6.- Porcentaje partidas gratis.
7.- Total bolas extra.
8.- Total faltas.
9.- Total especial.
10.- Máxima duración de una partida hasta la fecha.
11.- 1º record (Pulsando botón comienzo partida borra anterior
12.- 2º record record y al seguir pulsando incrementamos en 100.000 puntos
13.- 3º record sucesivamente el record hasta dejarlo en el que interese).
14.- Record máximo conseguido hasta la fecha.
15.- Tiempo medio duración partida. (Pulsando en éste paso botón comienzo partida queda borrada memoria estadística)

- - - - - -

TEST TÉCNICO

16.- Test de lámparas (pulsando sucesivamente el botón de iniciales izquierdo, se pasa de una lámpara a otra).

17.- Test de solenoides y relés (Pulsando el botón de iniciales izquierdo, nos detenemos en el solenoide que interese probar).

18.- Test de contactos:

- El display debe indicarnos que todos están abiertos (All switches open) si alguno estuviera cerrado saldría el número de referencia en el display, asímismo, si queremos probar que cierran pulsar los que interesen. (cuidado de quitar las bolas para no confundir el estado cerrado de láminas del cargabolas).

19.- Ajuste de interruptores de programación:

- Nos dice en hexadecimal los parámetros en que se encuentra la máquina. (Ver tabla aparte para modificar lo que interese).

20.- Test de display:

- Sucesivamente nos prueba todos los dígitos y segmentos.

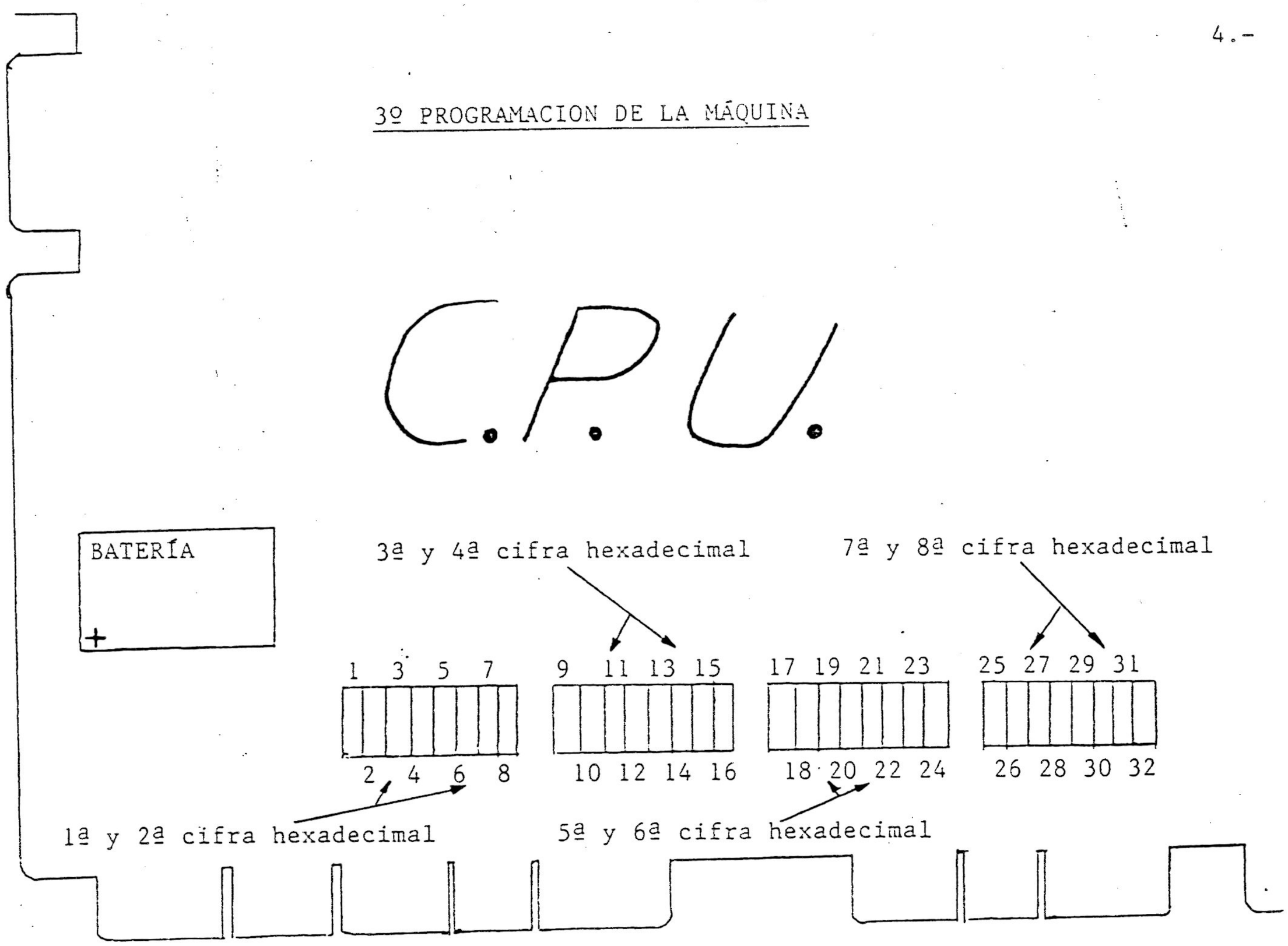
21.- Test de memoria del programa:

- La máquina nos da un mensaje de "O.K." si las memorias están correctas al mismo tiempo nos enseña el "Check sum" o código identificador de la memoria.

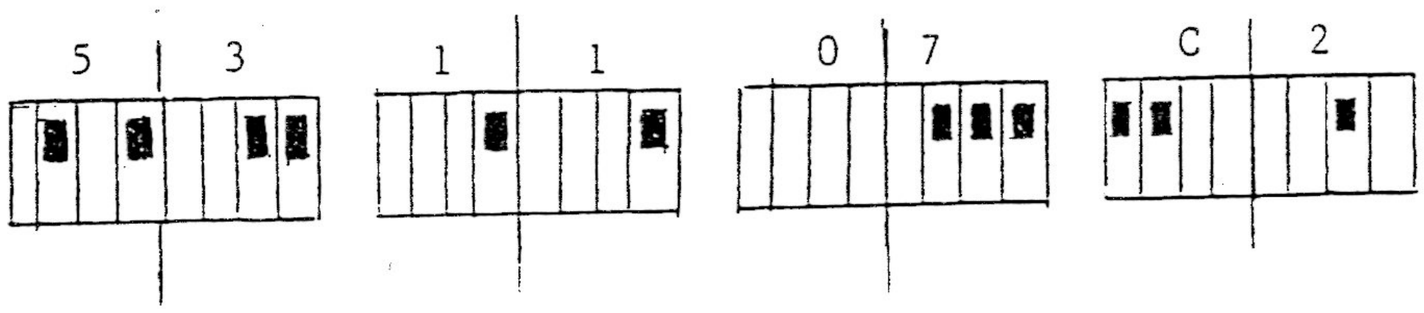
Para salir de test abrir el slam,una o dos veces, o apagar y encender la máquina. Puede acceder directamente al test técnico, obviando el estadístico si una vez - está leyendo en display "Test Mode" pulsa el botón comienzo partida.

- - - - - -

3º PROGRAMACION DE LA MÁQUINA



Ejemplo: 53 11 07 C2



Ver anexo para programar según - interése.

Tabla conversión hexadecimal a binario.

HEX	BINARIO
0	0 0 0 0
1	0 0 0 1
2	0 0 1 0
3	0 0 1 1
4	0 1 0 0
5	0 1 0 1
6	0 1 1 0
7	0 1 1 1
8	1 0 0 0
9	1 0 0 1
A	1 0 1 0
B	1 0 1 1
C	1 1 0 0
D	1 1 0 1
E	1 1 1 0
F	1 1 1 1

4º TEORÍA DE FUNCIONAMIENTO

La máquina dispone de varias tarjetas fundamentales:

- C.P.U.

  Es el cerebro de la máquina controla todo el juego (se distingue porque lleva los interruptores de programa). Es esencial que tenga 5'10V en el conector de 4 pines cercano a la batería (A1 J1)

- PLACA FUENTE ALIMENTACIÓN

  Regula la tensión de 5 Volts. para la CPU y otras placas, ajuste en caso necesario con su potenciómetro. (Se distingue por su gran refrigerador negro)

- PLACA DRIVER

  Mediante las pequeñas señales de control de la CPU ataca con la potencia necesaria bobinas y lámparas del tablero funciona con 5 V+. (Se distingue por sus hileras de transistores)

- PLACA GENERADORA SONIDO

  Almacena los sonidos que mediante un código la CPU extrae según se desarrolla el juego. (Se distingue por llevar un diodo Led que luce intermitente si su funcionamiento es correcto) Funciona con +5V +12V y -12V.

- PLACA DISPLAY

  Presenta al jugador las puntuaciones y va mostrando los pasos del test. Funciona con +5, 6'3V , 32V

- AMPLIFICADOR SONIDO

  (Contiene rectificador +/- 12V de la generadora sonidos) Amplifica el sonido que recibe de la generadora.

- PLACA RESET (Inicializa la CPU)

- PLACA SECUENCIA AUTOMATICA DE 10 LAMPARAS

  Funciona mediante +5V que son mandados por la CPU.

- POTENCIA DE BUMPER

  (Independiente de la CPU, controla el paso de corriente a bumper)

- AUXILIAR DE TRANSISTORES

  (Se añade a la driver en los elementos que requieren más potencia)

- DIODOS

  (Forman la matriz de contactos)

- RESISTENCIAS

  (Limitan tensión según requieran elementos del juego)

- - - - - -

THEORY OF OPERATION

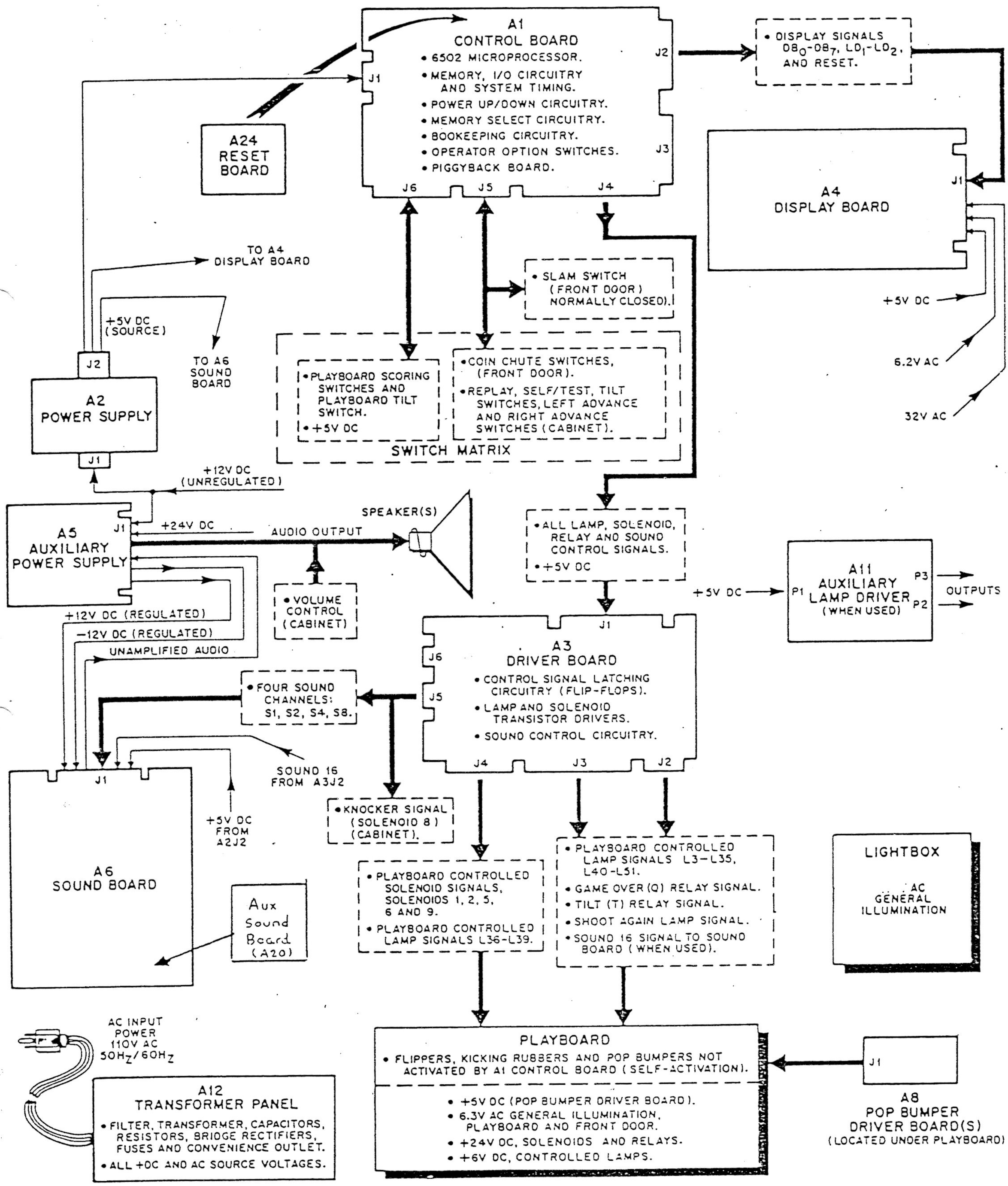


FIGURE I. SYSTEM 80B BLOCK DIAGRAM

5º AUTOPORCENTAJE

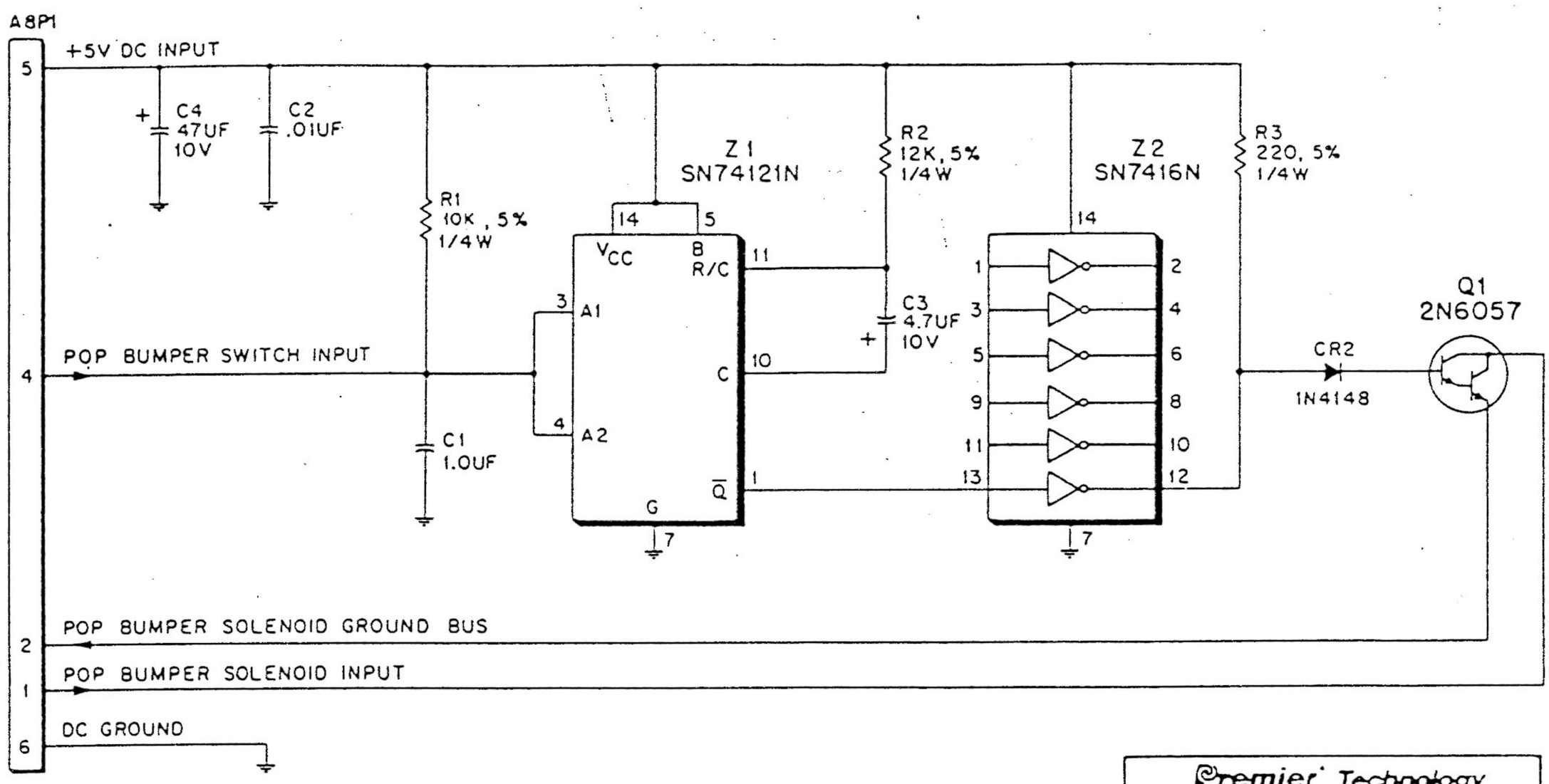
La C.P.U. dispone de un sistema que regula el número de partidas gratis que da la máquina , por ejemplo en el paso nº6 vemos que el display presenta lo siguiente:

Replay autoporcentaje	
Actual 23	Setting 25

Esto nos dice que la máquina está programada para dar 25 partidas de cada 100, gratis, y lo hace bajando o subiendo su record inicial según una estadística que la CPU va sacando a medida que se juega. Sacando una media de puntuación sobre la experiencia de los jugadores.

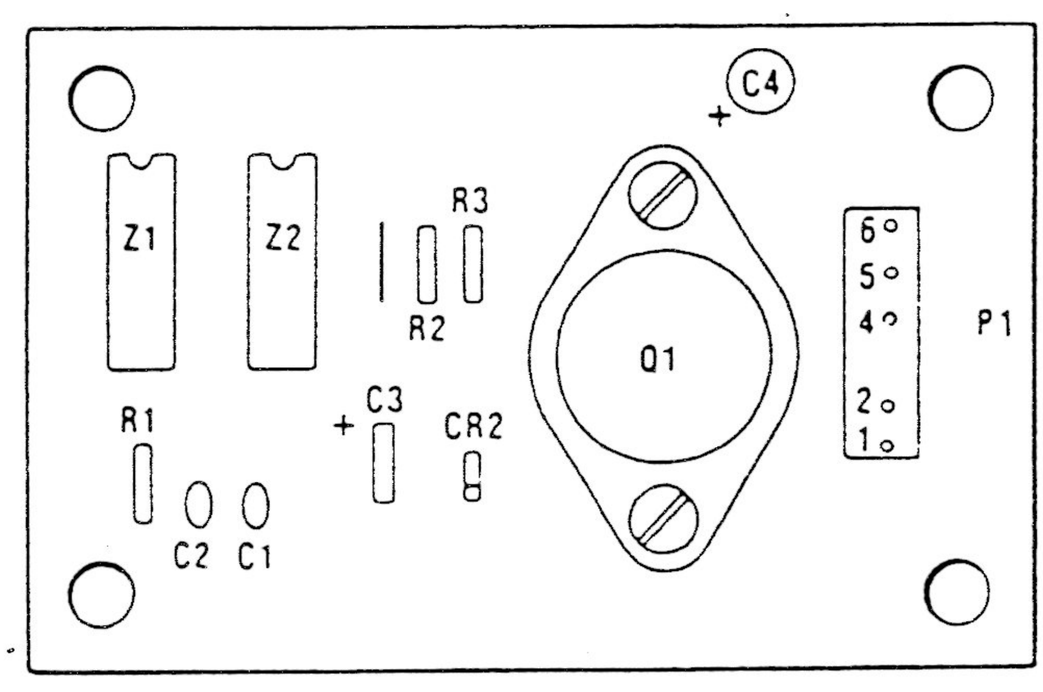
Despues de 10.000 jugadas el valor de, total jugadas, jugadas gratis y tiempo son puestos a cero.
Pulse el botón de comienzo partidas encontrándose en el paso 6 del test, y pondrá a cero el porcentaje. Sucesivas pulsaciones incrementan el porcentaje en unidades. Hasta dejarlo en el deseado.

- - - - - -



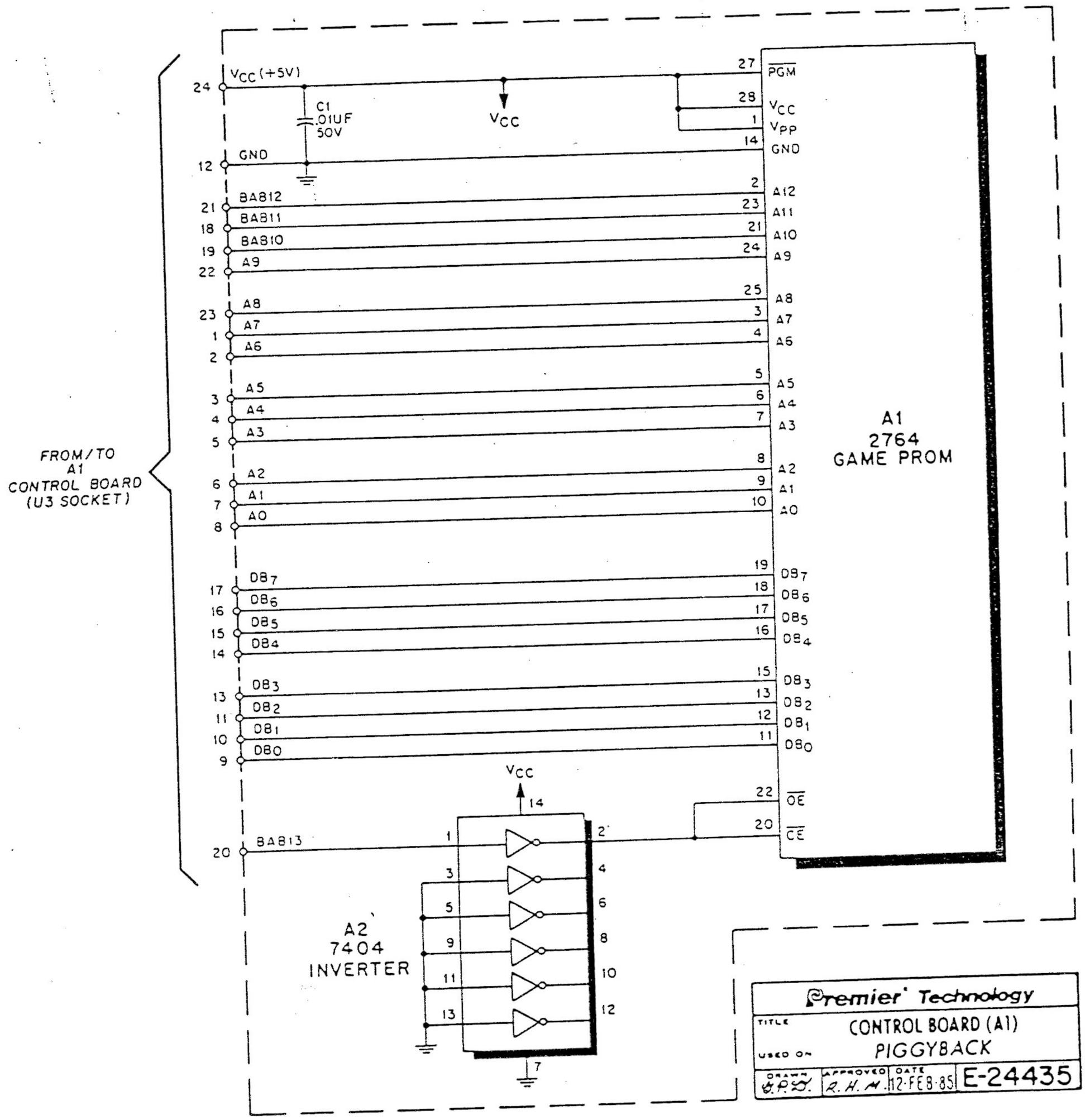
Premier Technology			
TITLE POP BUMPER DRIVER BOARD (A8)			
USED ON			
DRAWN	APPROVED	DATE	D-20923

POP BUMPER DRIVER BOARD (A8) COMPONENT LOCATION

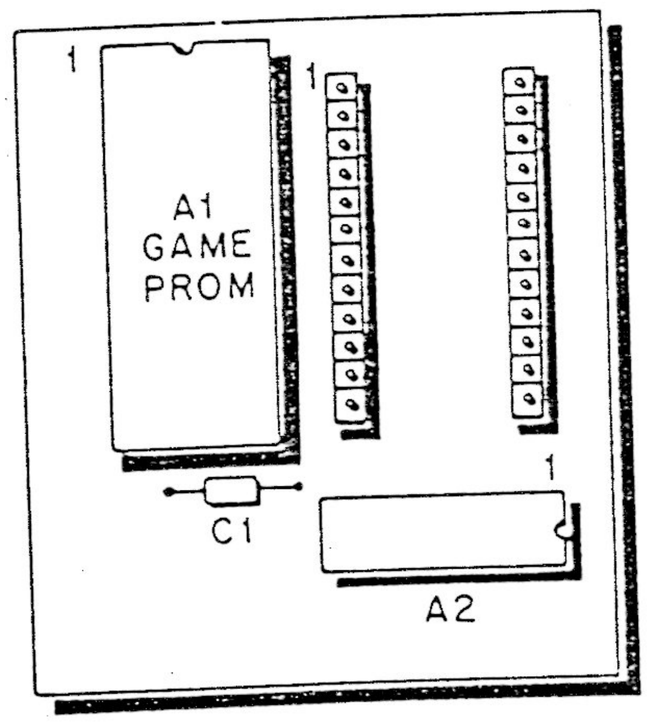


POP BUMPER DRIVER BOARD (A8) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	POP BUMPER DRIVER BOARD	A-19741
C1	Capacitor, 1 UF, 50V, Non-Polarized	XO-294
C2	Capacitor, .01 UF, 100V	XO-202
C3	Capacitor, 4.7 UF, 10%, 10V Tantalum, Axial	XO-226
C4	Capacitor, 47 UF, 10V	XO-227
CR2	Diode 1N4148	XO-261
P1	Connector	XO-879
R1	Resistor, 10K ohm, 1/4W, 5%	XO-18
R2	Resistor, 12K ohm, 1/4W, 5%	XO-9
R3	Resistor, 220 ohm, 1/4W, 5%	XO-21
Q1	Transistor, Darlington 2N6057	XO-311
Z1	IC SN74121N	XO-417
Z2	IC SN7416N	XO-405



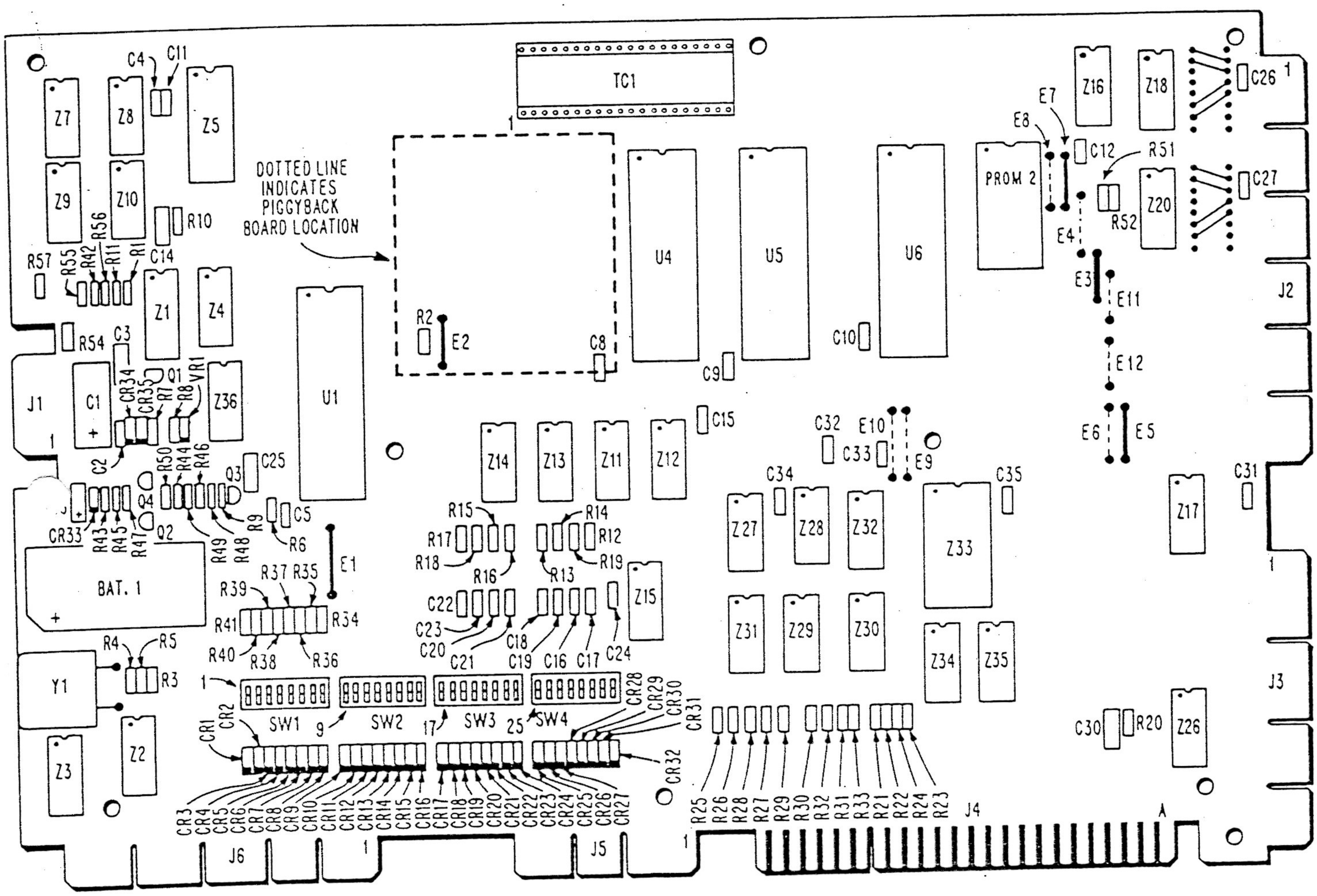
CONTROL BOARD (A1), PIGGYBACK COMPONENT LOCATION



CONTROL BOARD (A1), PIGGYBACK PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	Control Board (A1), Piggyback	MA689
A1	Game Prom, 2764	XO-489
A2	IC, 7404 Inverter	XO-402
C1	Capacitor, .01UF, +80% -20%, 50V	XO-229
	Socket, 28 Pin	XO-536

CONTROL BOARD (A1) COMPONENT LOCATION



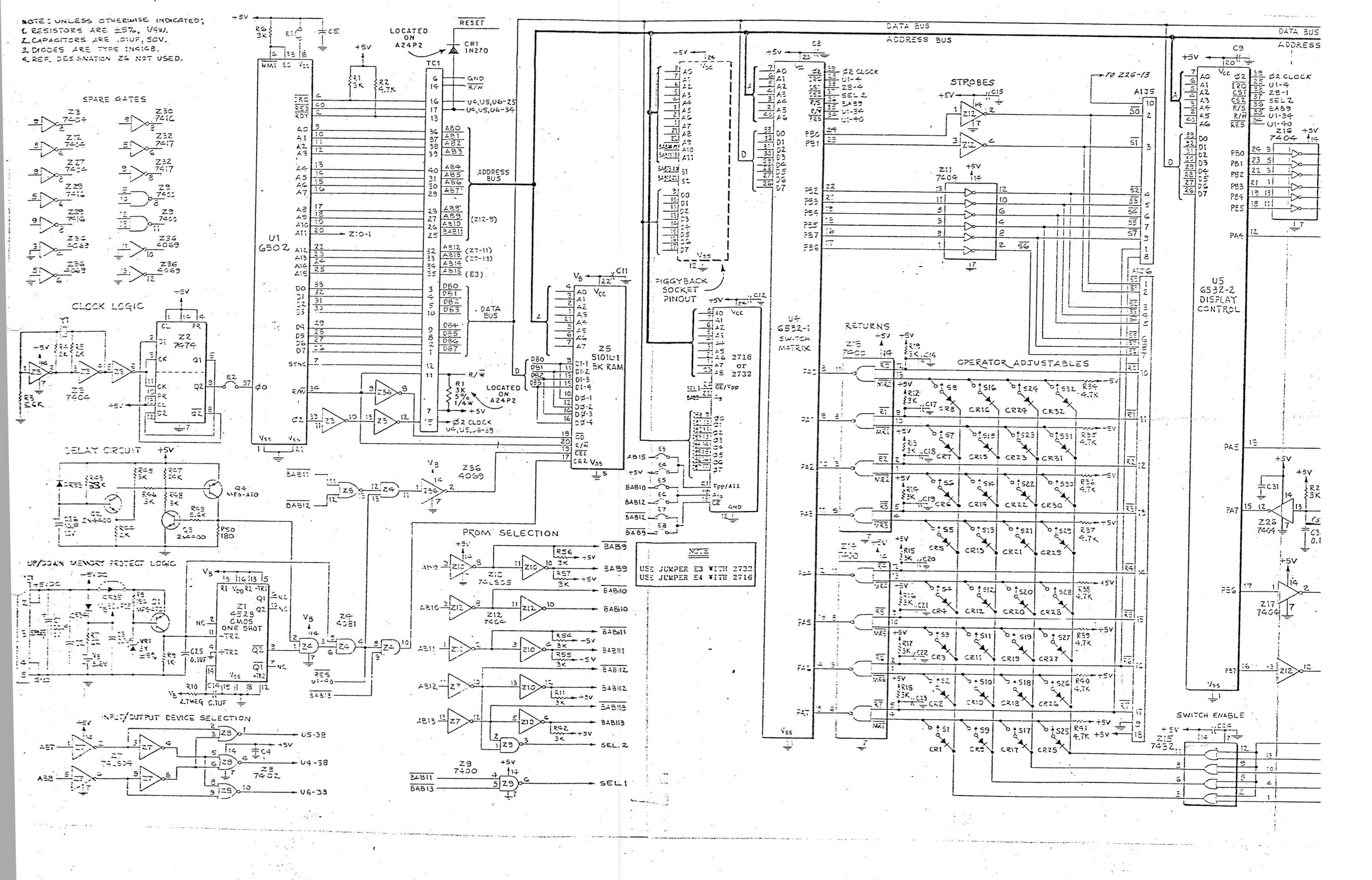
CONTROL BOARD (A1) PARTS LIST

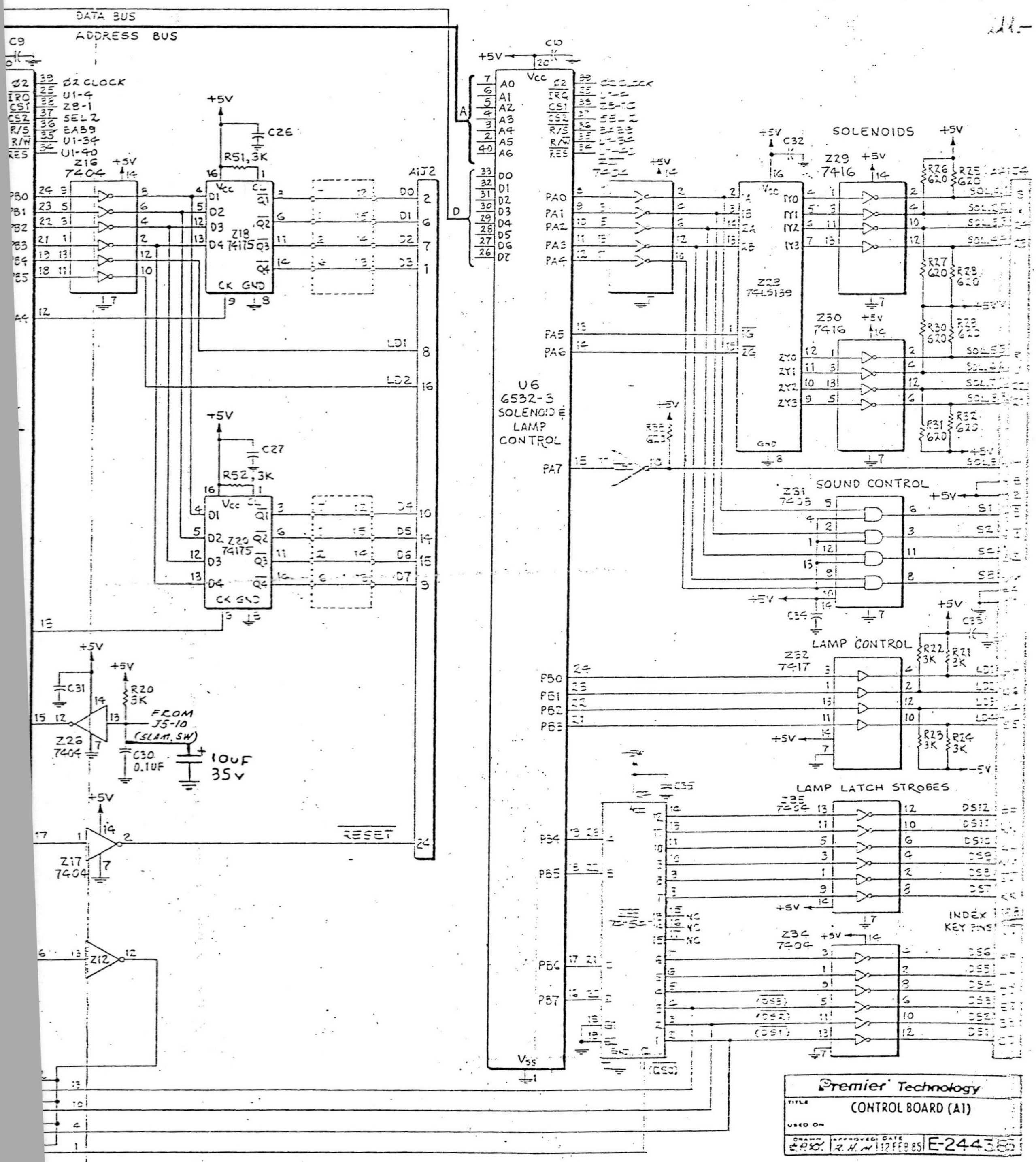
REFERENCE	DESCRIPTION	PART NUMBER
	CONTROL BOARD	MA-1133
Bat 1	Battery-3.6V NI-CAD	XO-458
C1	Capacitor. 100 mfd, 10V	XO-211
C2, C4, C5, C8-C12, C15-C24, C26, C27, C31-C35	Capacitor. .01 mfd, 50V	XO-229
C3. C14. C25. C30	Capacitor. .1 mfd. 50V	XO-230
C36	10 mfd, 10V. TNT-AX CAP	XO-209
CR1-CR35	Diode. GP IN4148	XO-261
Q1. Q4	Transistor-PNP MPS-A70	XO-309
Q2. Q3	Transistor. NPN (Motorola) 2N4400	XO-313
R1, R6 R11-R24 R42, R45, R46, R48, R51, R52, R54-R57	Resistor. 3.0K ohm. 5%. ¼W	XO-23
R2. R34-R41	Resistor. 4.7K ohm. 5%. ¼W	XO-7
R3. R43. R49	Resistor. 5.6K ohm. 5%. ¼W	XO-19
R4. R5. R44	Resistor. 2.0K ohm. 5%. ¼W	XO-14
R7	Resistor. 62 ohm. 5%. ¼W	XO-3
R8. R50	Resistor. 180 ohm. 5%. ¼W	XO-24
R9	Resistor. 1K ohm. 5%. ¼W	XO-5
R10	Resistor. 2.7M ohm. 5%. ¼W	XO-13
R25-R33	Resistor. 620 ohm. 5%. ¼W	XO-4

REFERENCE	DESCRIPTION	PART NUMBER
R47	Resistor. 24K ohm. 5%. ¼W	XO-10
SW1-SW4	Dip Switch 1008-692	XO-505
TC1	Socket. 40 Pin 640379-3	XO-530
U1	CPU R6502P	XO-360
U4. U5. U6	PRIOT R6532P	XO-361
VR1	Diode-3.0V. 5% IN5225B or IN5987B	XO-269
Y1	Crystal. 3.579545 MHZ	XO-456
Z1	IC-Cmos-Dual 1 Shot SCL45288E	XO-414
Z2	IC-Dual Flip Flop SN7474N	XO-423
Z3. Z11. Z12. Z16. Z17. Z26. Z27. Z34. Z35	IC-Hex Inverter SN7404N	XO-402
Z4	IC-Cmos-Quad 2 Input "And" SCL40818E	XO-401
Z5	IC-Static Ram SS101-L	XO-356
Z7	IC-Hex Inverter SN74LS04N	XO-418
Z8	IC-2 Input "Nor" SN7402N	XO-421
Z9. Z13. Z14	IC-2 Input "Nand" SN7400N	XO-420
Z10	IC-Open Collector Inverter SN74LS05N	XO-411
Z15	IC-2 Input "Or" SN7432N	XO-407
Z18. Z20	IC-"D" Flip Flop SN74175N	XO-410
Z33	IC-4-16 Decoder SN74154N	XO-409
Z28	IC-2 to 4 Decoder SN74LS139N	XO-419
Z29. Z30	IC-Hex Inverter—OC/HV SN7416N	XO-405
Z31	IC-2 Input "And" SN7408N	XO-404
Z32	IC-Hex Buffer—OC SN7417N	XO-406
Z36	IC-Cmos SCL40698	XO-424
	Socket 24 Pin 640361-3	XO-529

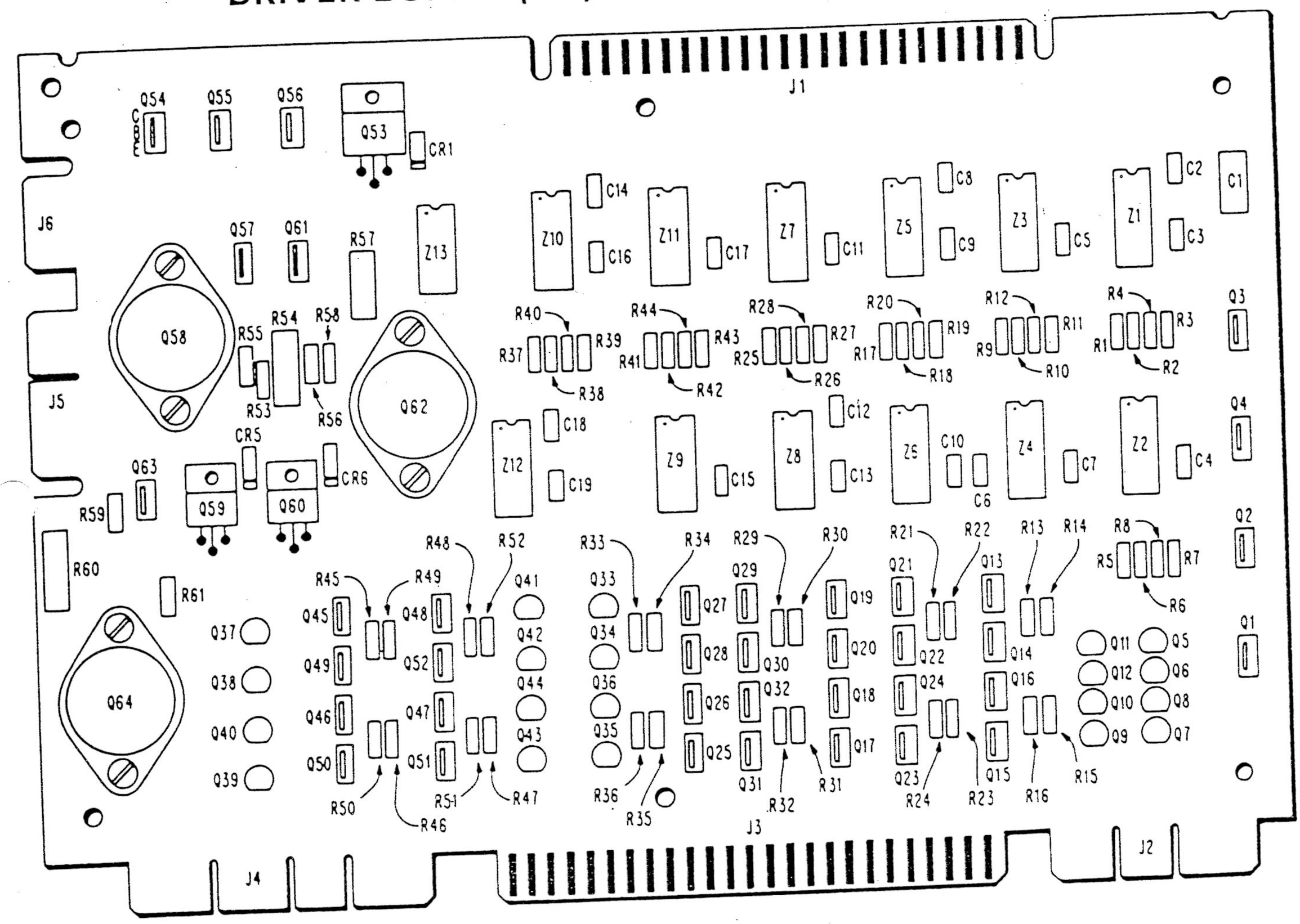
CONTROL BOARD (A1),PIGGYBACK MA689

NOTE: UNLESS OTHERWISE INDICATED;
1. RESISTORS ARE ±5%, 1/4W.
2. CAPACITORS ARE .01UF, 50V.
3. DIODES ARE TYPE 1N4148.
4. REF. DESIGNATION Z6 NOT USED.




DATA BUS
ADDRESS BUS
Ø2 CLOCK
U1-4
Z8-1
SEL 2
BA59
U1-34
U1-40
Z16 7404
Z18 74175
Z20 74175
AIJ2
LD1
LD2
RESET
U6 6532-3 SOLENOID & LAMP CONTROL
SOLENOIDS
Z29 7416
Z30 7416
Z23 74LS139
SOUND CONTROL
Z31 7405
LAMP CONTROL
Z32 7417
LAMP LATCH STROBES
Z35 7404
Z34 7404
INDEX KEY PINS
FROM J5-10 (SLAM SW)
10uF 35v
Premier Technology
CONTROL BOARD (A1)
E-24436

DRIVER BOARD (A3) COMPONENT LOCATION

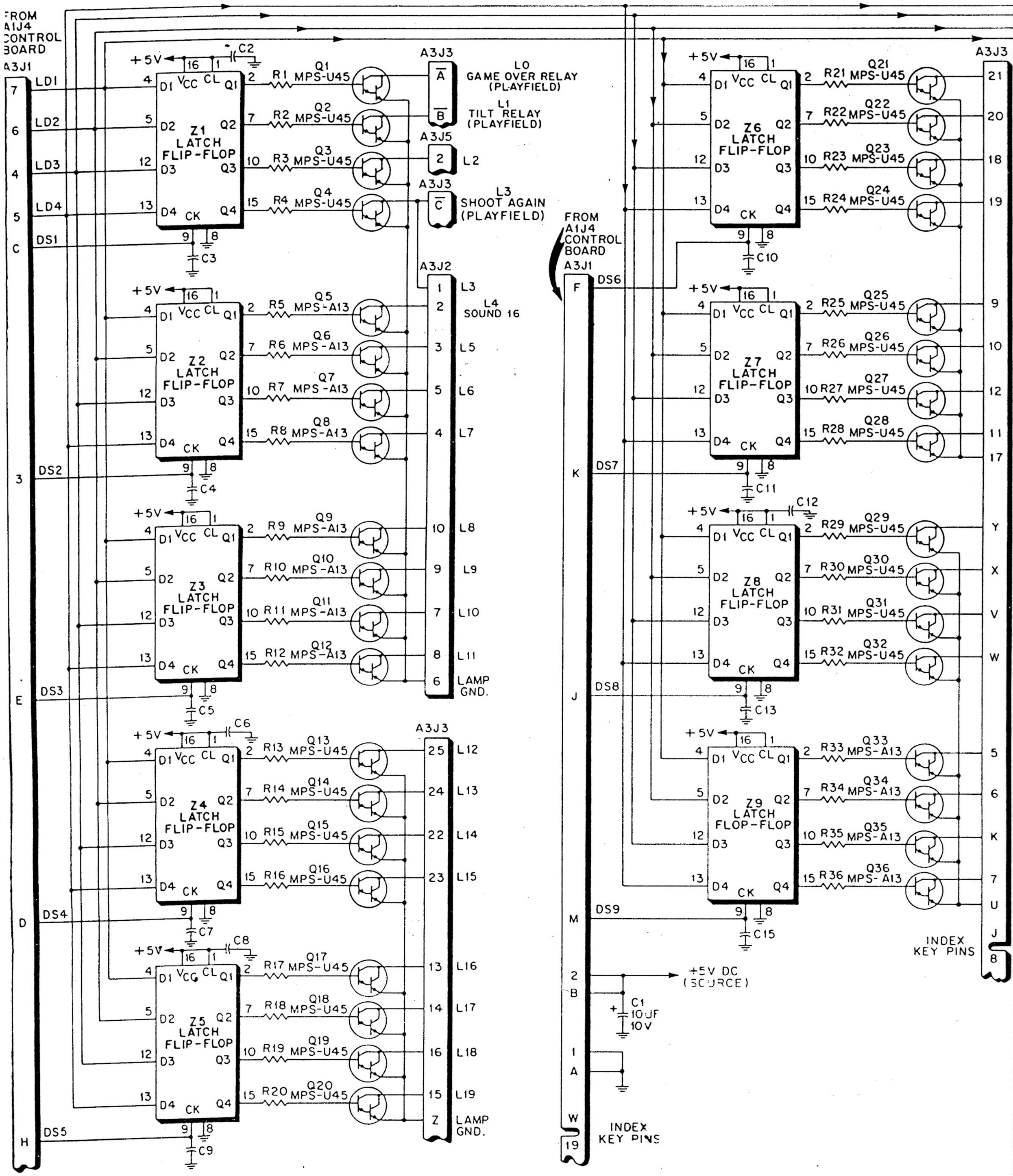


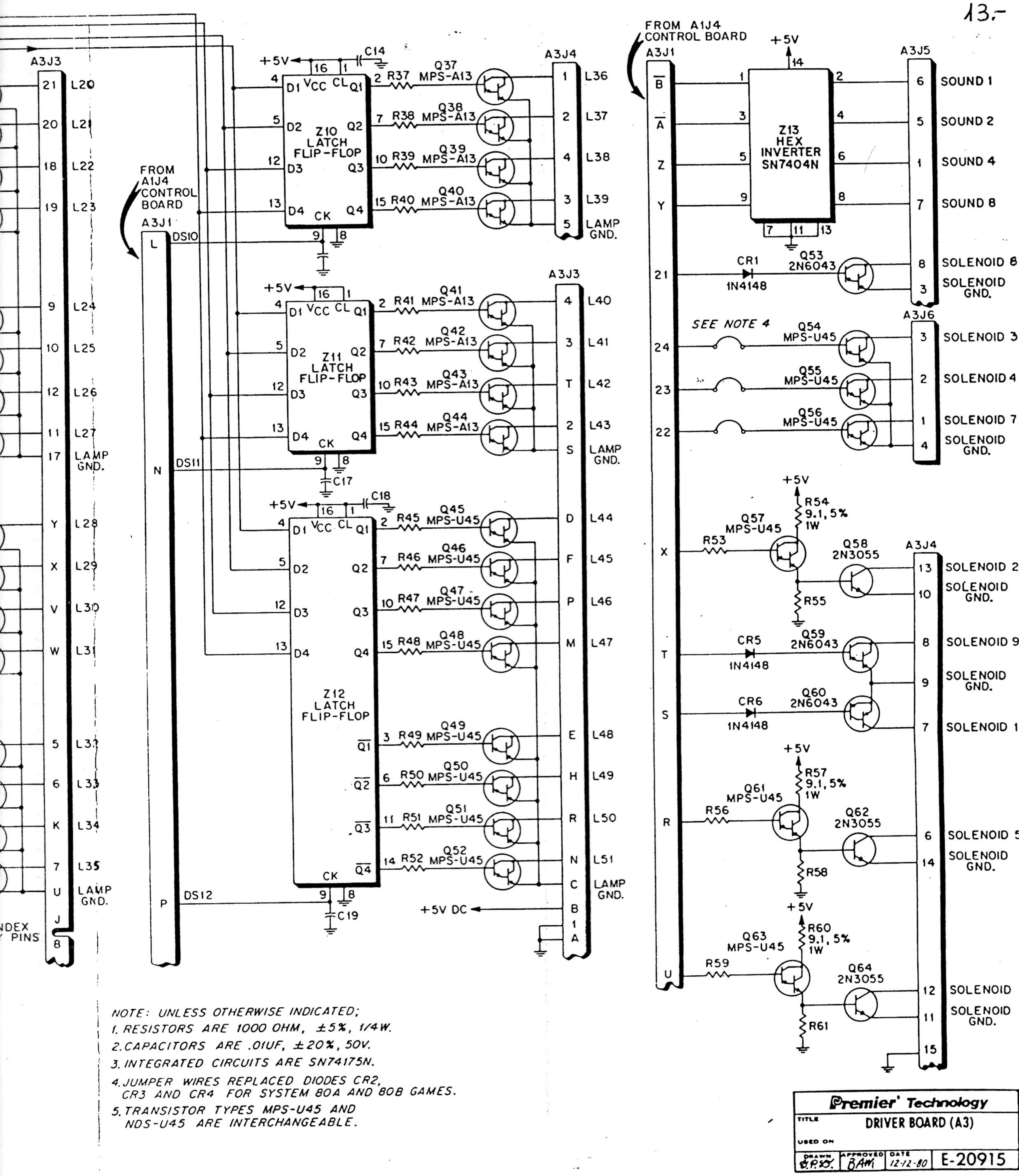
DRIVER BOARD (A3) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	DRIVER BOARD	MA-295
C1	Capacitor, 10 mfd, 10V Tantalum	XO-209
C2-C19	Capacitor, .01 mfd, 50V Ceramic	XO-229
CR1-CR6	Diode—Silicon 1N4148	XO-261
R1-R53, R61, R55, R56, R58, R59	Resistor 10k ohm, 5% ¼W	XO-5
R54, R57, R60	Resistor 91 ohm, 5% 1W	XO-158
Q1-Q4, Q13-Q32, Q45-Q52, Q54-Q57, Q61, Q63	Transistor NPN Darlington MPS-U45	XO-306
Q5-Q12, Q33-Q44	Transistor NPN Darlington MPS-A13	XO-304
Q53, Q59, Q60	Transistor NPN Darlington 2N6043	XO-303
Q58, Q62, Q64	Transistor NPN 2N3055	XO-301
Z1-Z12	IC-Quad D Latch Flip Flop SN74175N	XO-410
Z13	IC-Hex Inverter SN7404N	XO-402
	Insulator-Thermalloy 43-034	XO-512

NOTE:

1. *JUMPER WIRES REPLACED DIODES CR2, CR3 AND CR4 FOR SYSTEM 80A AND 80B GAMES.*
2. *TRANSISTOR TYPES MPS-U45 AND NSD-U45 ARE INTERCHANGEABLE.*


FROM A1J4 CONTROL BOARD
A3J1
LD1
LD2
LD3
LD4
DS1
DS2
DS3
DS4
DS5
DS6
DS7
DS8
DS9
+5V
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C15
Z1 LATCH FLIP-FLOP
Z2 LATCH FLIP-FLOP
Z3 LATCH FLIP-FLOP
Z4 LATCH FLIP-FLOP
Z5 LATCH FLIP-FLOP
Z6 LATCH FLIP-FLOP
Z7 LATCH FLIP-FLOP
Z8 LATCH FLIP-FLOP
Z9 LATCH FLOP-FLOP
Q1 MPS-U45
Q2 MPS-U45
Q3 MPS-U45
Q4 MPS-U45
Q5 MPS-A13
Q6 MPS-A13
Q7 MPS-A13
Q8 MPS-A13
Q9 MPS-A13
Q10 MPS-A13
Q11 MPS-A13
Q12 MPS-A13
Q13 MPS-U45
Q14 MPS-U45
Q15 MPS-U45
Q16 MPS-U45
Q17 MPS-U45
Q18 MPS-U45
Q19 MPS-U45
Q20 MPS-U45
Q21 MPS-U45
Q22 MPS-U45
Q23 MPS-U45
Q24 MPS-U45
Q25 MPS-U45
Q26 MPS-U45
Q27 MPS-U45
Q28 MPS-U45
Q29 MPS-U45
Q30 MPS-U45
Q31 MPS-U45
Q32 MPS-U45
Q33 MPS-A13
Q34 MPS-A13
Q35 MPS-A13
Q36 MPS-A13
A3J3
L0 GAME OVER RELAY (PLAYFIELD)
L1 TILT RELAY (PLAYFIELD)
A3J5
L2
L3 SHOOT AGAIN (PLAYFIELD)
A3J2
L4 SOUND 16
L5
L6
L7
L8
L9
L10
L11
LAMP GND.
L12
L13
L14
L15
L16
L17
L18
L19
LAMP GND.
FROM A1J4 CONTROL BOARD
A3J1
INDEX KEY PINS
+5V DC (SOURCE)
C1 10UF 10V
INDEX KEY PINS

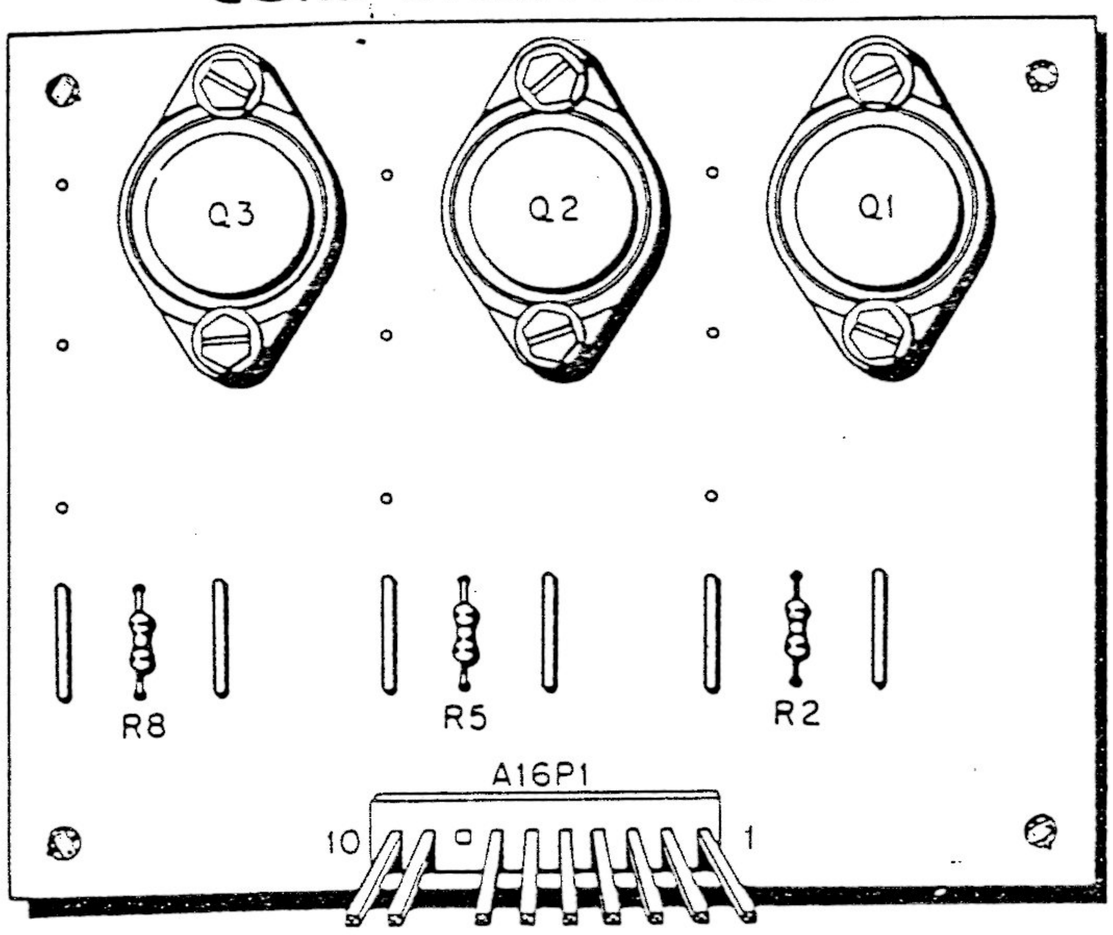


NOTE: UNLESS OTHERWISE INDICATED;

1. *RESISTORS ARE 1000 OHM, ±5%, 1/4W.*
2. *CAPACITORS ARE .01UF, ±20%, 50V.*
3. *INTEGRATED CIRCUITS ARE SN74175N.*
4. *JUMPER WIRES REPLACED DIODES CR2, CR3 AND CR4 FOR SYSTEM 80A AND 80B GAMES.*
5. *TRANSISTOR TYPES MPS-U45 AND NDS-U45 ARE INTERCHANGEABLE.*

Premier' Technology			
TITLE	DRIVER BOARD (A3)		
USED ON			
DRAWN	APPROVED	DATE	E-20915
	BAM	12-12-80	

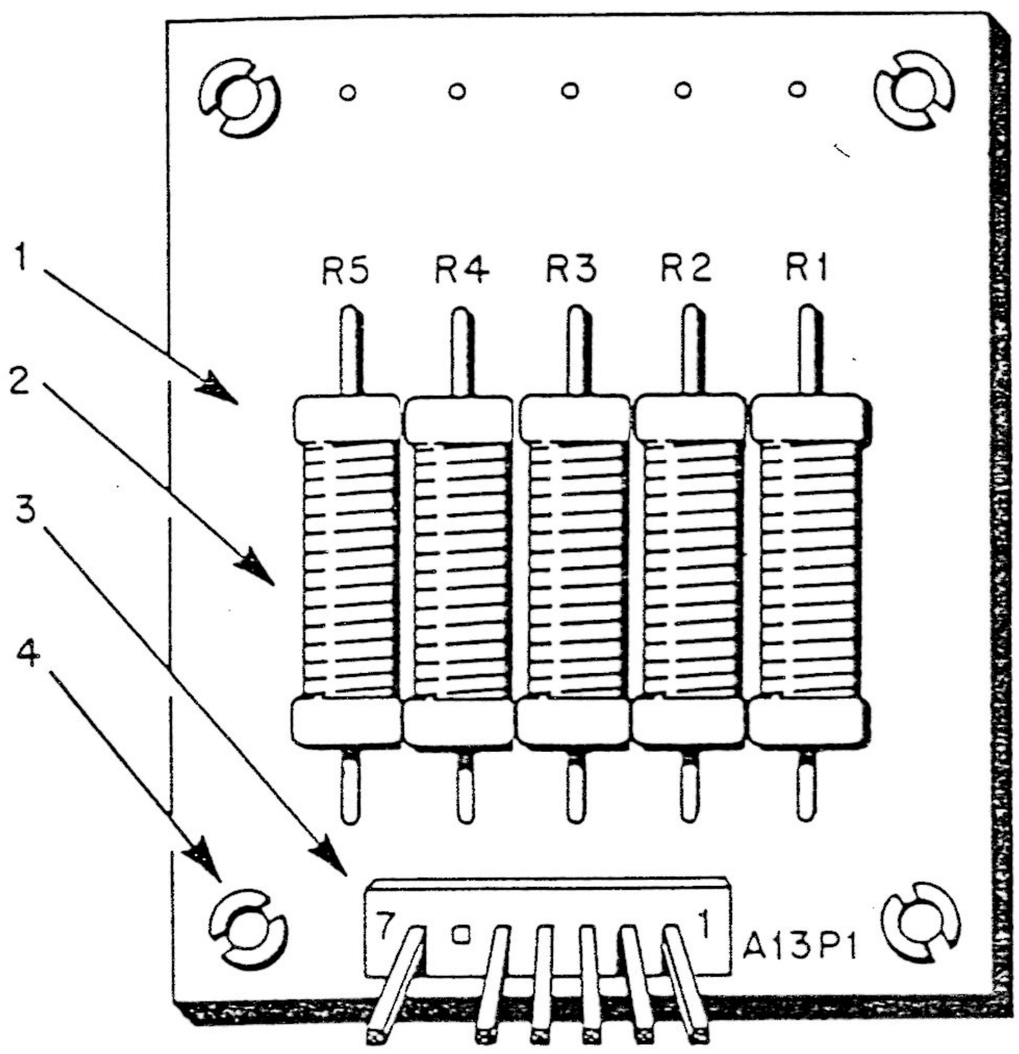
TRANSISTOR DRIVER BOARD (A16) COMPONENT LOCATION



TRANSISTOR DRIVER BOARD (A16) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	Transistor Driver Board Assembly (2A16)	MA-1013
Q1-Q3	Transistor, MJ2955	XO-799
R2,R5,R8	Resistor, 4.7K Ohm, 5%, 1/4W	XO-7
P1	10 Position Connector	XO-879
	Circuit Board Support (4)	MP-40

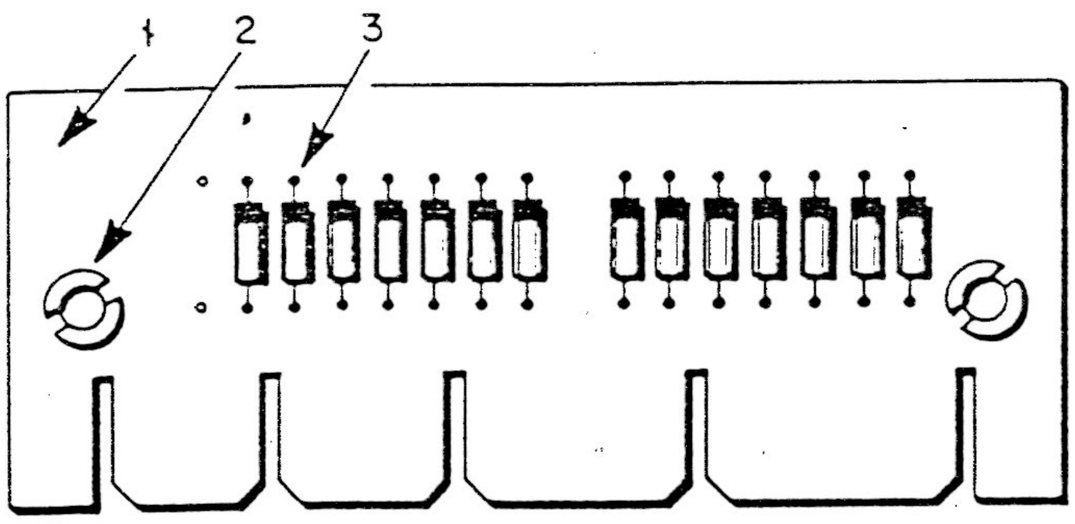
RESISTOR BOARD (A13)



RESISTOR BOARD (A13) PARTS LIST

ITEM	DESCRIPTION	PART NO.
1	Resistor Board Assembly (A13)	MA-1123
2	Resistor, 4 Ohn, 7W, 5%, WW (5)	XO-878
3	7 Position Connector (A13P1)	XO-879
4	Spacer (4)	23984

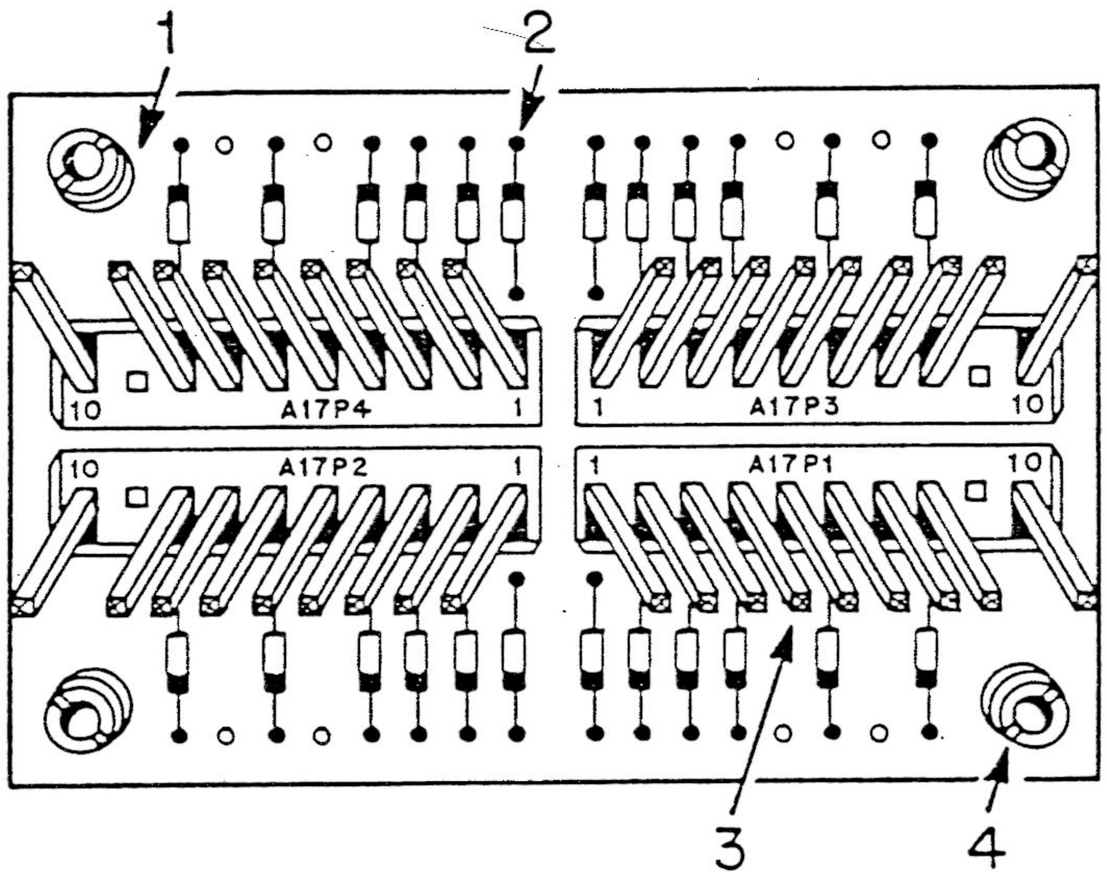
DIODE BOARD (A7)



DIODE BOARD (A7) PARTS LIST

ITEM	DESCRIPTION	PART NO.
1	Diode Board Assembly (A7)	26091
2	Spacer (2)	23984
3	Diode, 1N270 (14)	XO-265

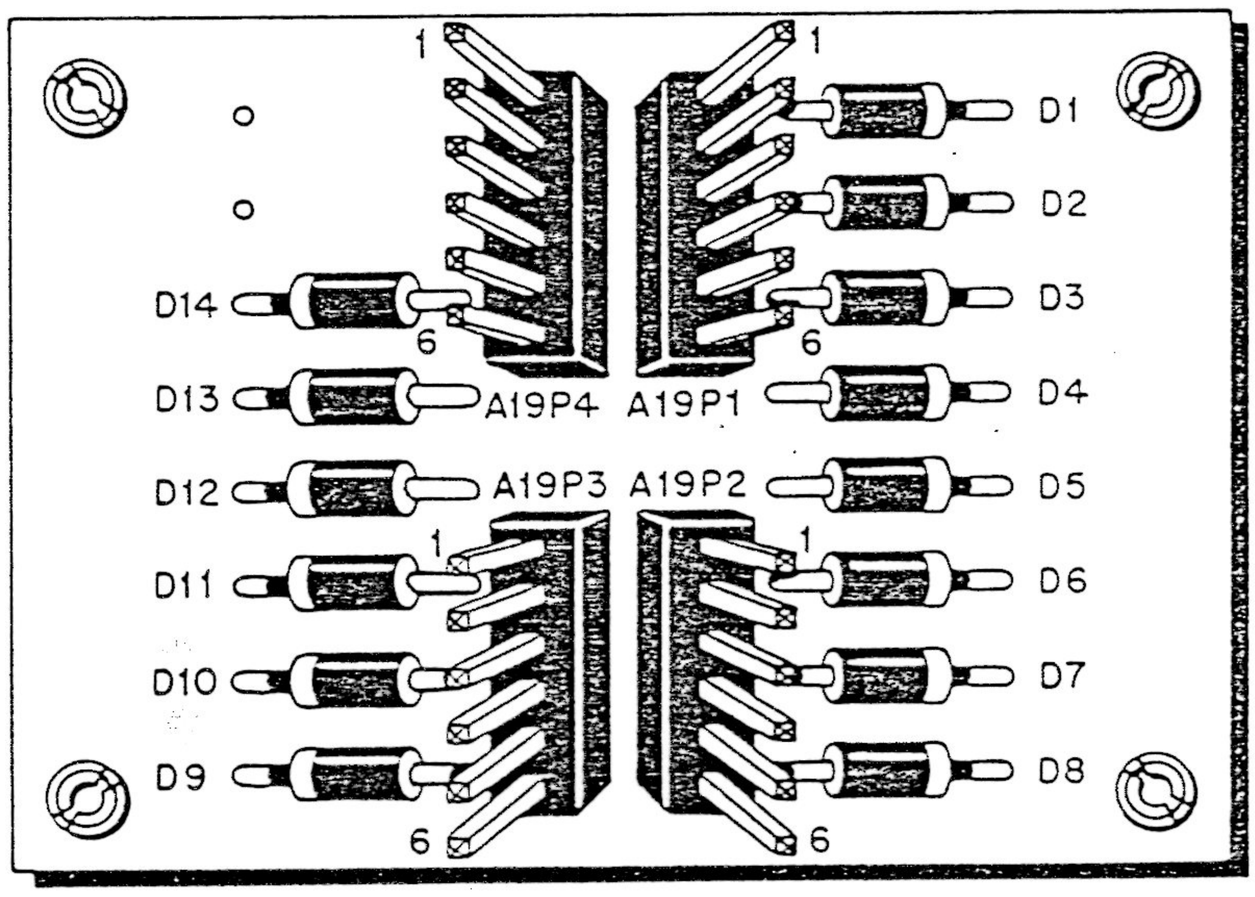
DIODE BOARD (A17)



DIODE BOARD (A17)

ITEM	DESCRIPTION	PART NO.
1	Diode Board Assembly (1A17)	MA-1165
2	Diode, 1N270 (24)	XO-265
3	10 Position Connector (4)	XO-879
4	Spacer (4)	23984

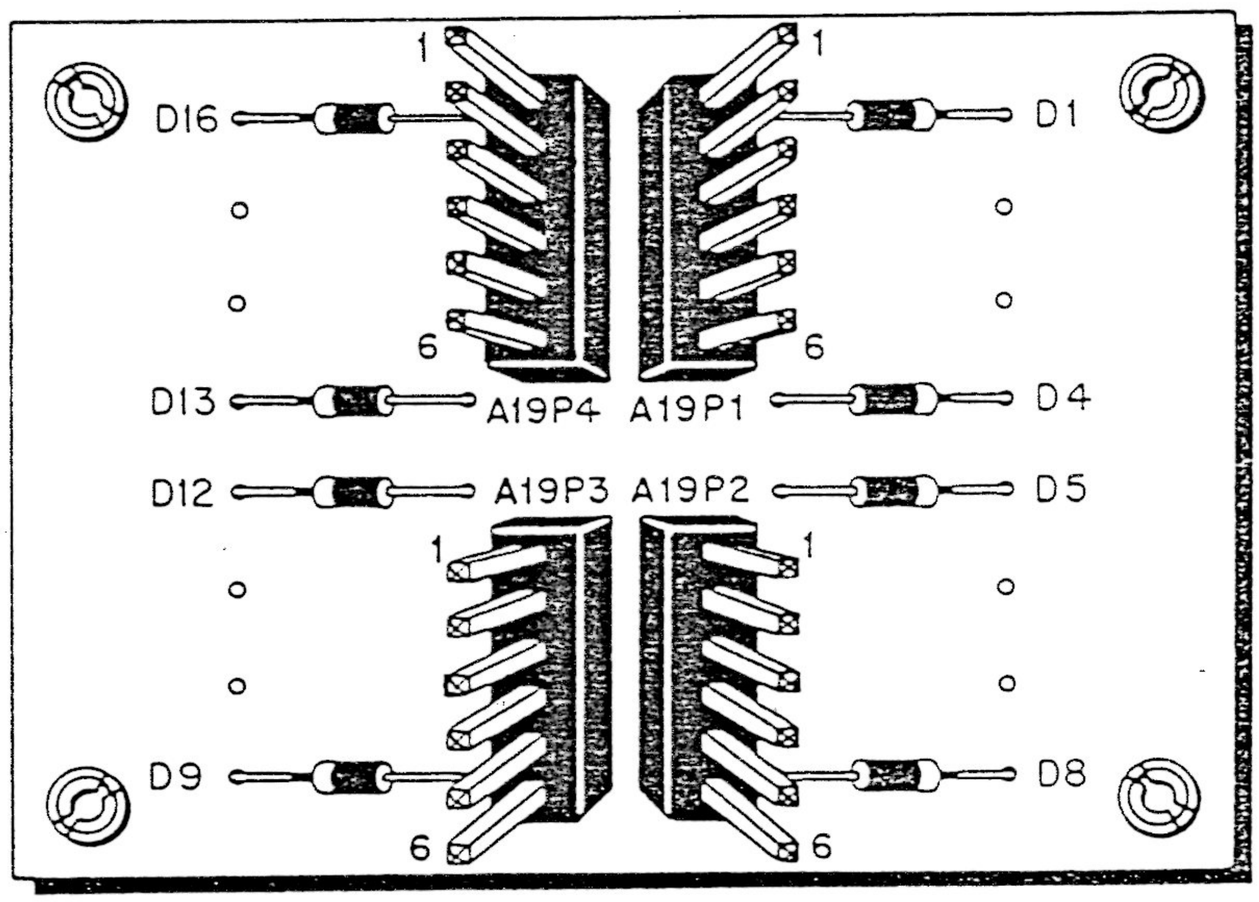
SWITCHING DIODE BOARD (A19)



SWITCHING DIODE BOARD (A19)

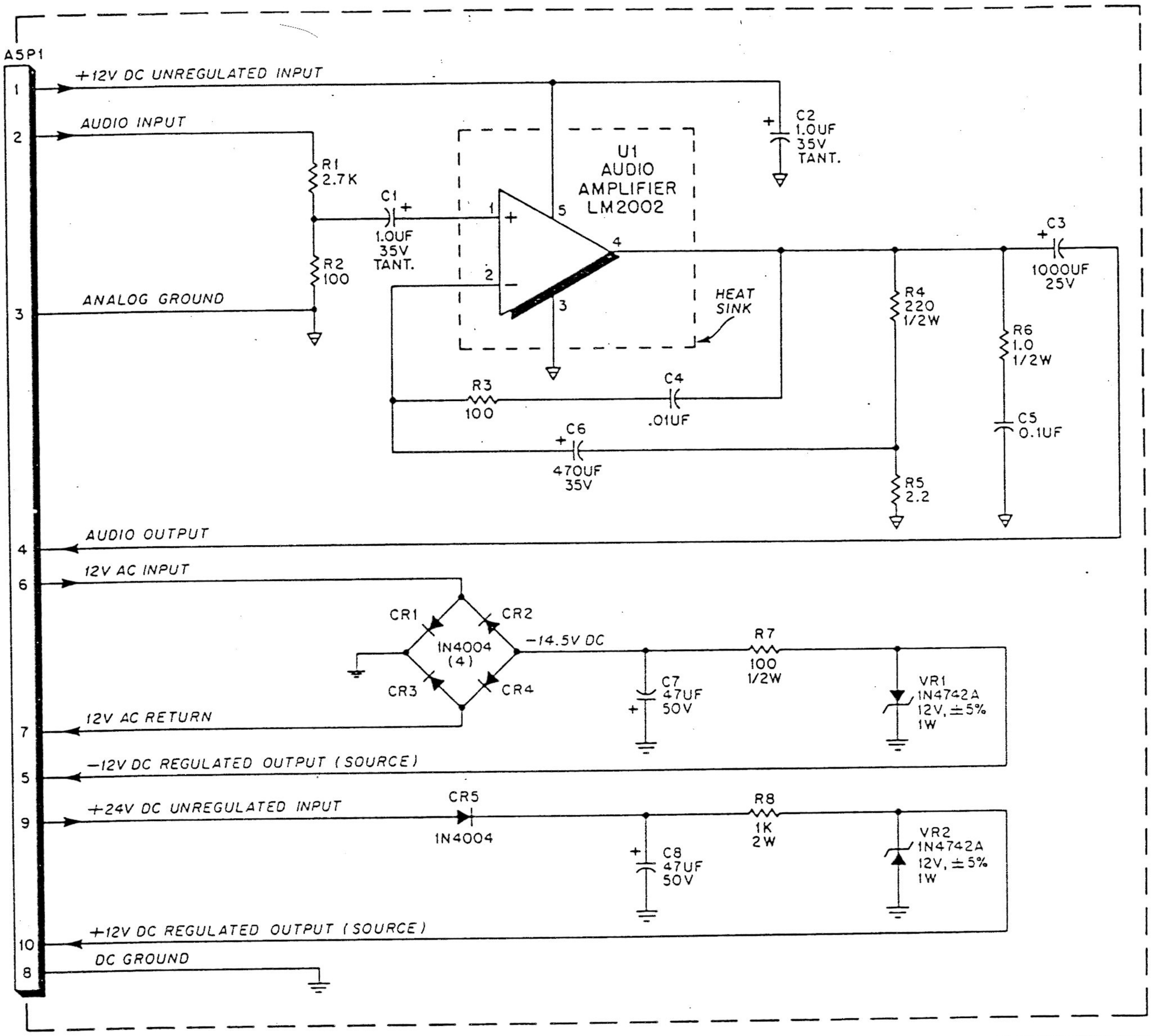
ITEM	DESCRIPTION	PART NO.
	Switching Diode Assembly (1A19)	MA-1122
D1-D14	Diode, 1N5401 (14)	XO-263
A19P1-A19P4	6 Position Connector (4)	XO-897
	Spacer (4)	23984

SWITCHING DIODE BOARD (A19)



SWITCHING DIODE BOARD (A19)

ITEM	DESCRIPTION	PART NO.
	Switching Diode Assembly (2A19)	MA-1168
D1-D16	Diode, 1N4004 (8)	XO-254
A19P1-A19P4	6 Position Connector (4)	XO-897
	Spacer (4)	23984



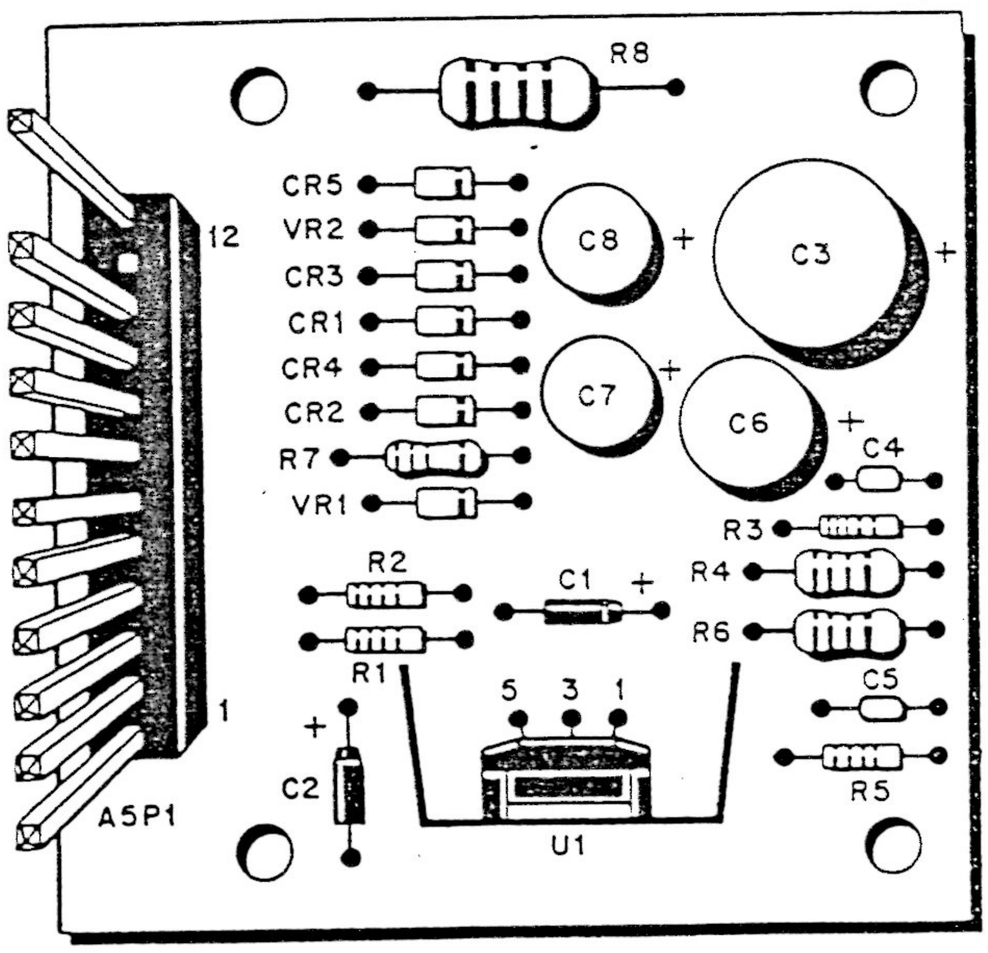
Premier Technology

TITLE AUXILIARY POWER SUPPLY (A5)

USED ON

DRAWN	APPROVED	DATE	
G.P.D.	R.H.	9-OCT-85	E-24715

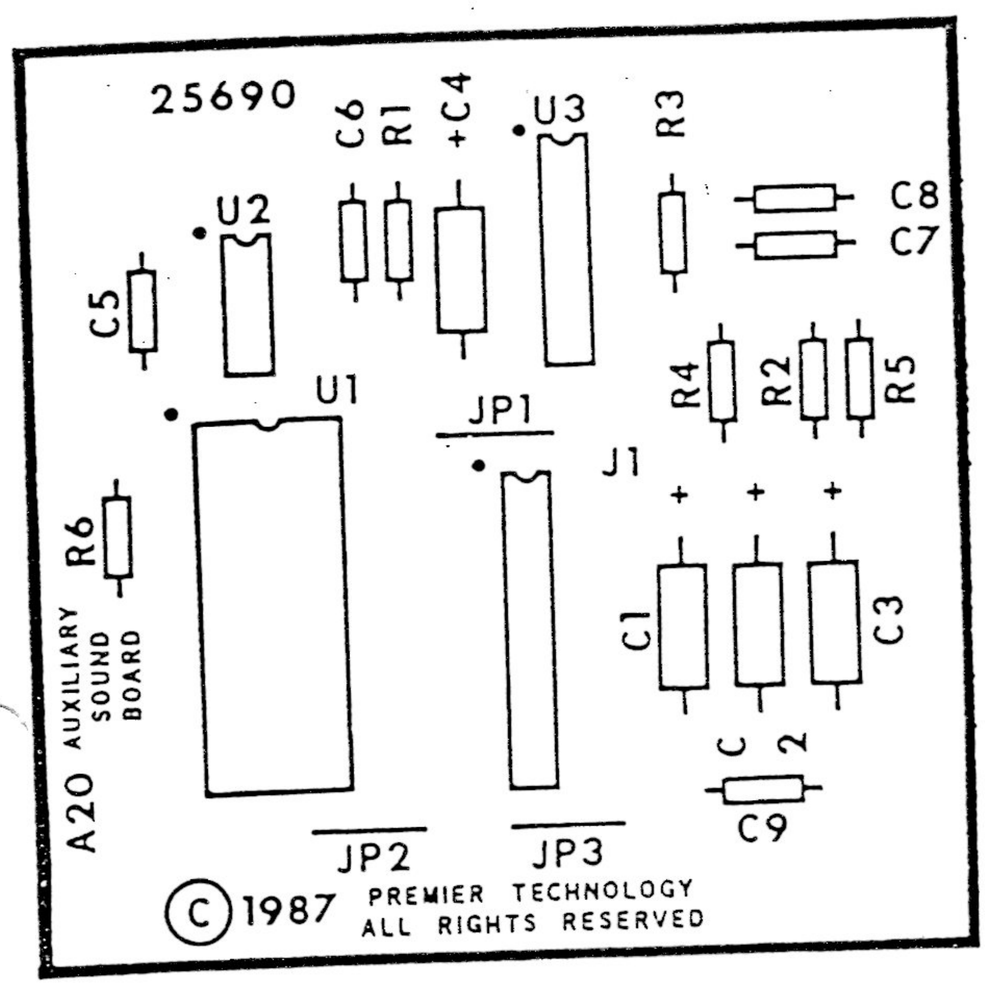
AUXILIARY POWER SUPPLY (A5) COMPONENT LOCATION



AUXILIARY POWER SUPPLY (A5) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	Auxiliary Power Supply	MA-1017
C1,C2	Capacitor, 1UF, 10%, 35V, TANT	XO-715
C3	Capacitor, 1000UF, 25V	XO-874
C4	Capacitor, .01UF, +80% -20%, 50V	XO-229
C5	Capacitor, 0.1UF, +80% -20%, 50V	XO-230
C6	Capacitor, 470UF, 35V	XO-284
C7,C8	Capacitor, 47UF, 50V	XO-210
CR1-CR5	Diode, 1N4004	XO-254
R1	Resistor, 2.7K Ohm, 5%, 1/4W	XO-6
R2,R3	Resistor, 100 Ohm, 5%, 1/4W	XO-28
R4	Resistor, 220 Ohm, 5%, 1/2W	XO-185
R5	Resistor, 2.2 Ohm, 5%, 1/4W	XO-595
R6	Resistor, 1 Ohm, 5%, 1/2W	XO-593
R7	Resistor, 100 Ohm, 5%, 1/2W	XO-52
R8	Resistor, 1K Ohm, 5%, 2W	XO-627
U1	Audio Amplifier, LM2002	XO-550
VR1,VR2	Diode, Zener, 1N4742A, 12V, ±5%, 1W	XO-257
	Heat Sink	XO-472
	12 Position Connector	XO-879

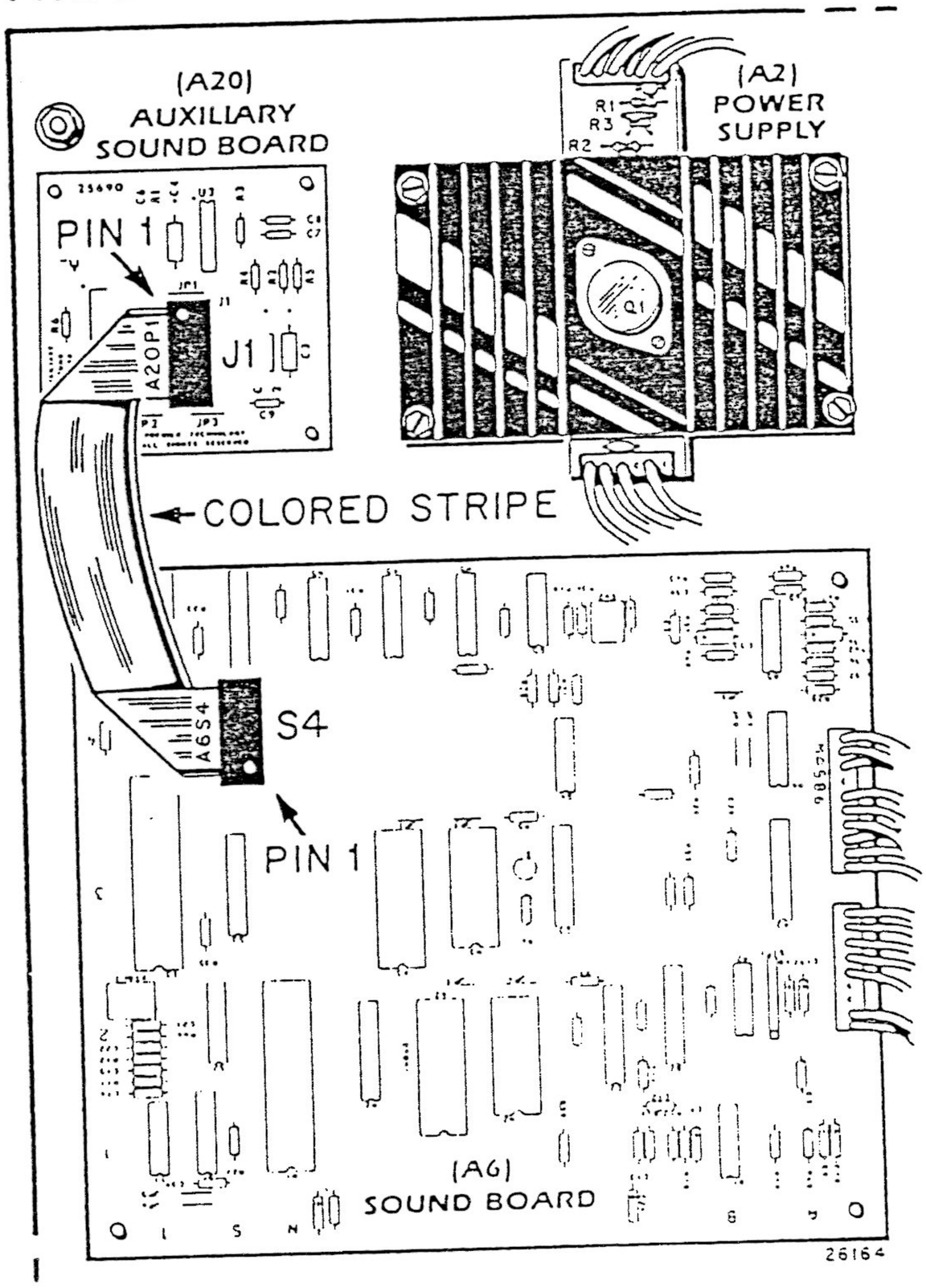
AUXILIARY SOUND BOARD (A20) COMPONENT LOCATION

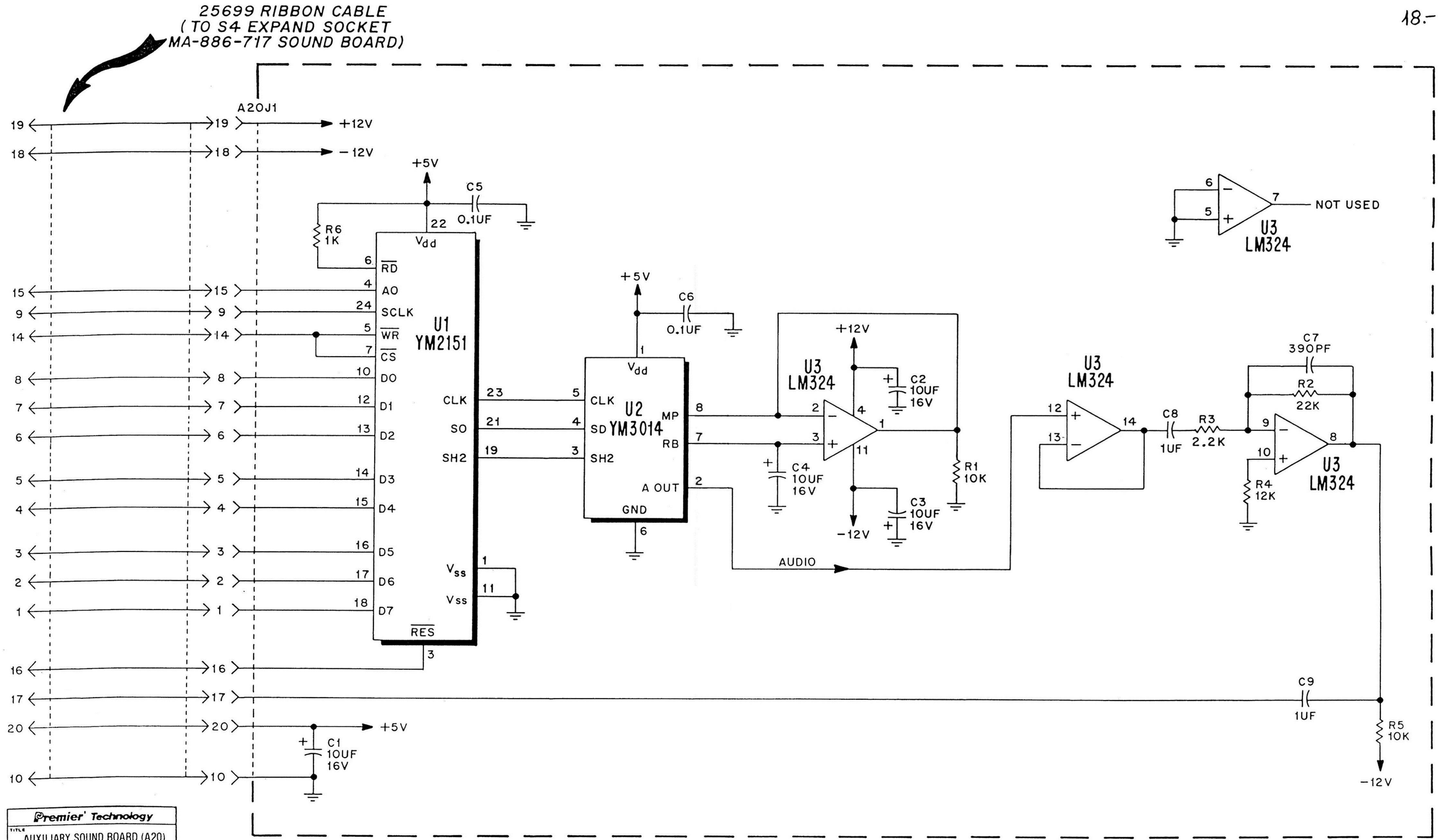


AUXILIARY SOUND BOARD (A20) PARTS LIST

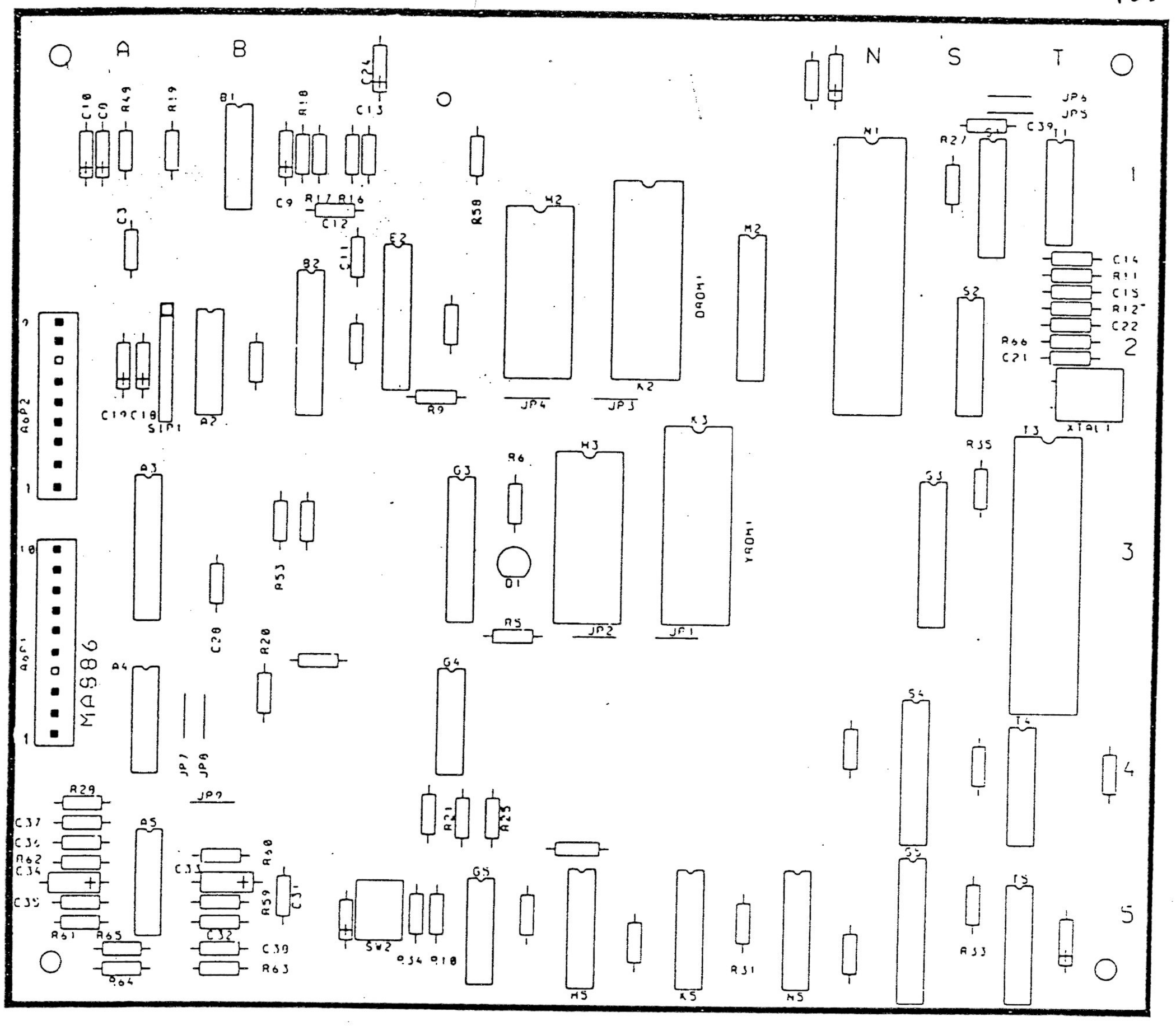
REFERENCE	DESCRIPTION	PART NUMBER
	AUXILIARY SOUND BOARD	MA-1033
C1-C4	CAPACITOR, 10UF, +80%-20%, 16V	XO-846
C5,C6	CAPACITOR, 0.1UF, +80%-20%	XO-230
C7	CAPACITOR, 390PF, 50V	XO-684
C8,C9	CAPACITOR, 1UF, 50V, NON-POLARIZED	XO-746
R1,R5	RESISTOR, 10K OHM, 5%, 1/4W	XO-18
R2	RESISTOR, 22K OHM, 5%, 1/4W	XO-42
R3	RESISTOR, 2.2K OHM, 5%, 1/4W	XO-27
R4	RESISTOR, 12K OHM, 5%, 1/4W	XO-9
R6	RESISTOR, 1K OHM, 5%, 1/4W	XO-5
U1	IC, SOUND CHIP, YM2151	XO-882
U2	IC, SERIAL DAC, YM3014	XO-883
U3	IC, QUAD AMP, LM324	XO-644
	JUMPER, 22 GAUGE (3)	XO-469
	SOCKET, 20 PIN DIP	XO-491
	SOCKET, 24 PIN DIP	XO-529
	RIBBON CABLE	25699

RIBBON CABLE ORIENTATION




25699 RIBBON CABLE
(TO S4 EXPAND SOCKET
MA-886-717 SOUND BOARD)
A20J1
+12V
-12V
+5V
C5
0.1UF
R6
1K
U1
YM2151
Vdd
RD
A0
SCLK
WR
CS
D0
D1
D2
D3
D4
D5
D6
D7
CLK
SO
SH2
Vss
RES
C6
0.1UF
U2
YM3014
SD
MP
RB
A OUT
GND
U3
LM324
C2
10UF
16V
C4
10UF
16V
C3
10UF
16V
R1
10K
AUDIO
NOT USED
C8
1UF
R3
2.2K
C7
390PF
R2
22K
R4
12K
C9
1UF
R5
10K
C1
10UF
16V
Premier' Technology
TITLE
AUXILIARY SOUND BOARD (A20)
USED ON
DRAWN
APPROVED
DATE
9-20-88
E-26145

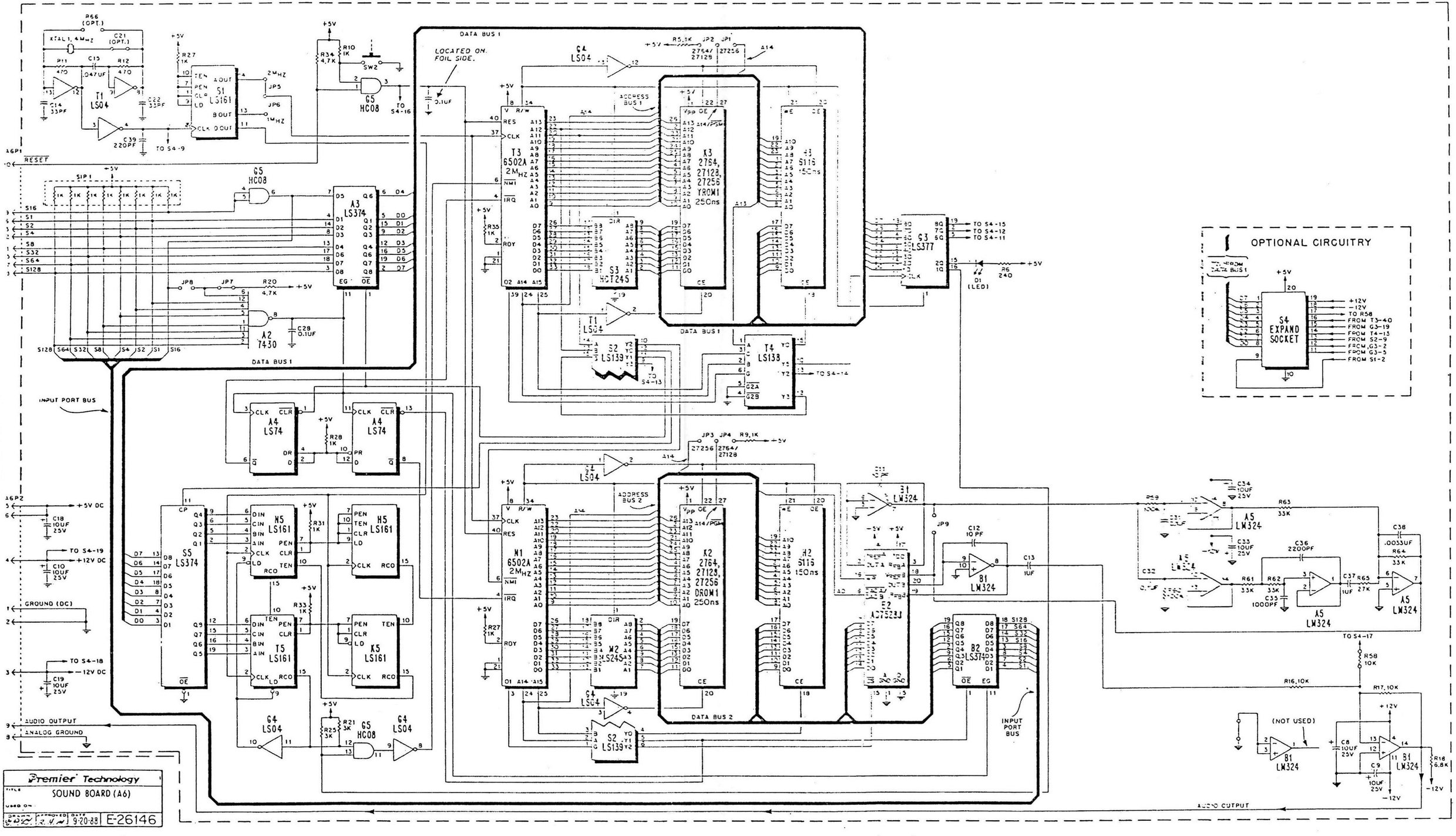
SOUND BOARD (A6) COMPONENT LOCATION

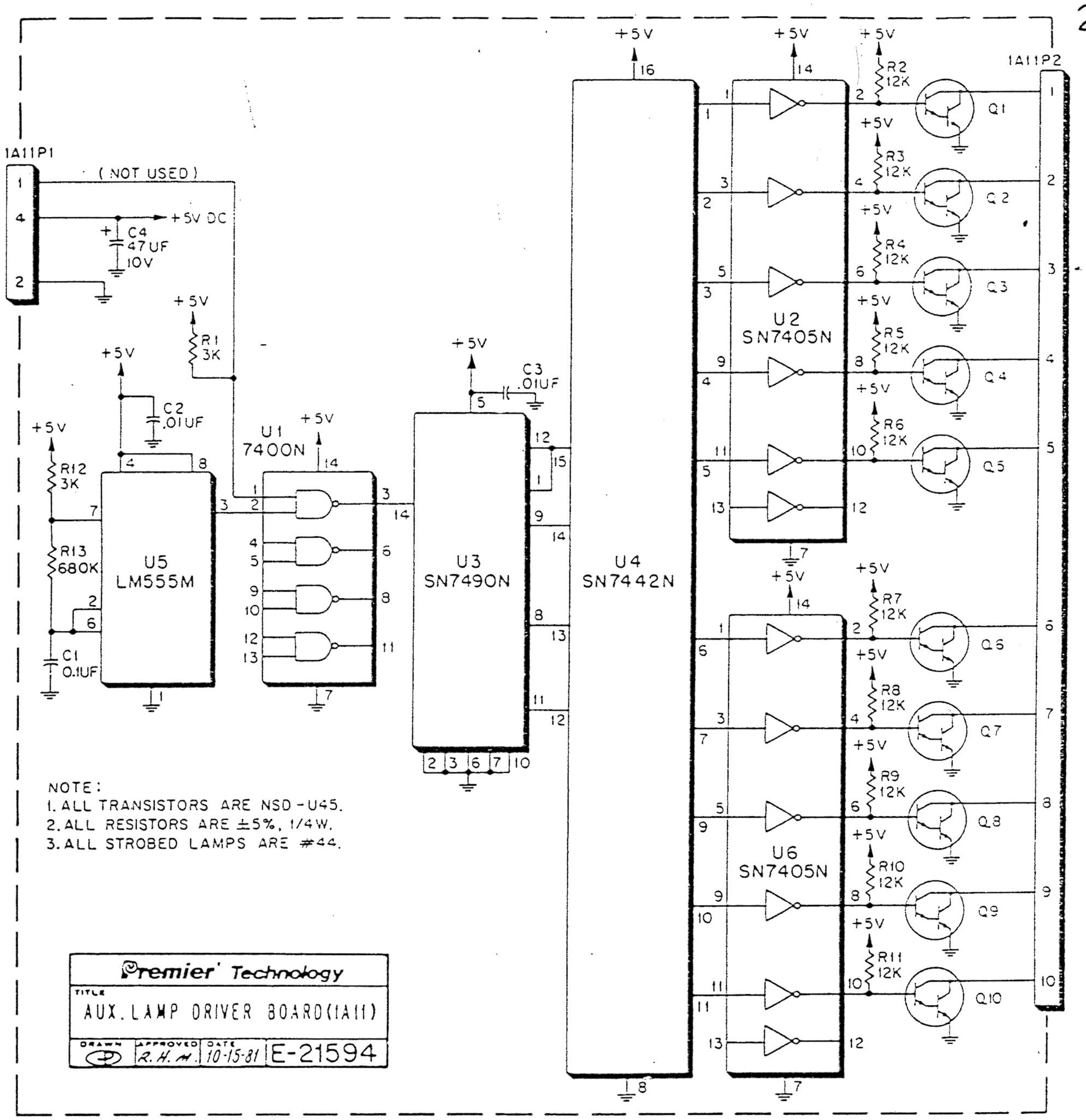


SOUND BOARD (A6) PARTS LIST

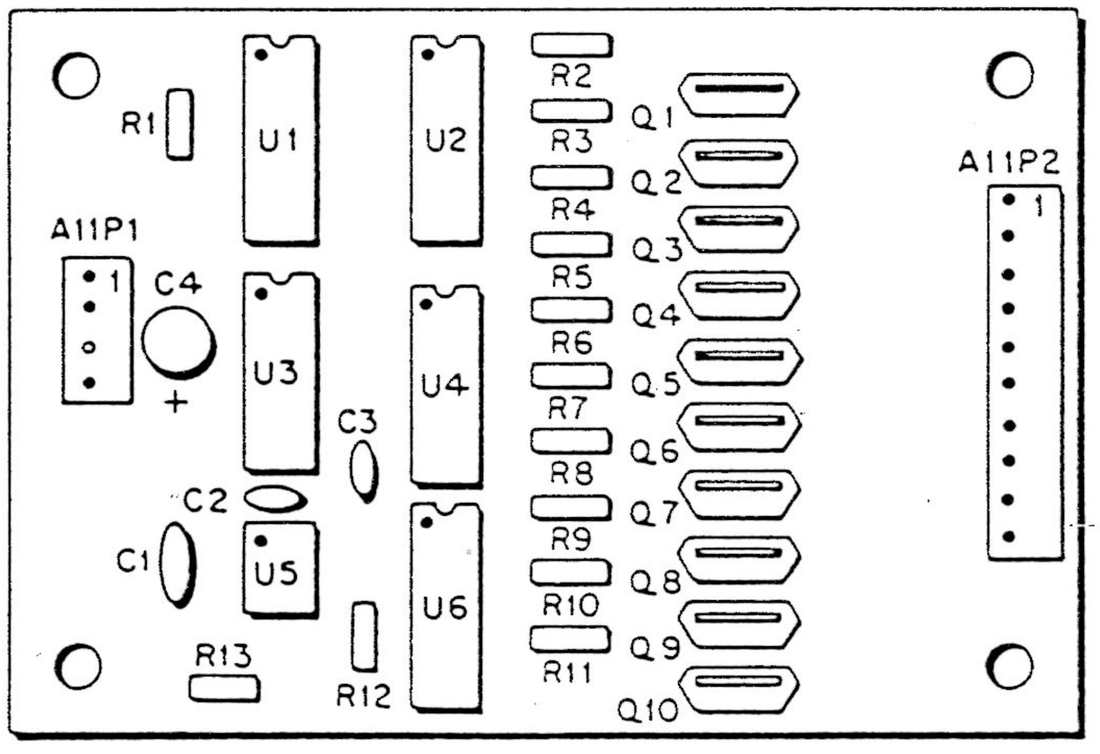
REFERENCE	DESCRIPTION	PART NUMBER
	Sound Board Assembly	MA-886-717
C13,C37	Capacitor, 1UF, 20%, 50V (Non-Polarized)	XO-746
C8,C9,C10 C18,C19,C24, C33,C34, AND THREE UNMARKED CAPACITORS	Capacitor, 10UF, 20%, 25V (Tantalum)	XO-127
C11,C12	Capacitor, 10PF,+80%-20%, 50V	XO-635
C14,C22	Capacitor, 33PF, 10%, 100V	XO-896
C15	Capacitor, .047UF, 20%, 50V	XO-638
C28 AND FOURTEEN UNMARKED CAPACITORS	Capacitor, 0.1UF, +80%-20%, 50V	XO-230
C31,C32	Capacitor, 0.1UF, 10%, 50V	XO-784
C35	Capacitor, 1000PF, 10%, 100V	XO-296
C36	Capacitor, 2200PF, 10%, 100V	XO-289
C38	Capacitor, .0033UF, 10%, 100V	XO-600
C39	Capacitor, 220PF, 10%, 100V	XO-694
D1	Diode, MV5752, (LED, Red)	XO-270
R5,R9,R10, R27,R28,R31, R33,R35	Resistor, 1K Ohm, 5%, 1/4W	XO-5
R6	Resistor, 240 Ohm, 5%, 1/4W	XO-173
R11,R12	Resistor, 470 Ohm, 5%, 1/4W	XO-35
R21,R25	Resistor, 3K Ohm, 5%, 1/4W	XO-23
R16,R17,R58	Resistor, 10K Ohm, 5%, 1/4W	XO-18
R18	Resistor, 6.8K Ohm, 5%, 1/4W	XO-8
R20,R34	Resistor, 4.7K Ohm, 5%, 1/4W	XO-7

REFERENCE	DESCRIPTION	PART NUMBER
R61,R62,R63, R64	Resistor, 33K Ohm, 5%, 1/4W	XO-43
R59,R60	Resistor, 100K Ohm, 5%, 1/4W	XO-45
R65	Resistor, 27K Ohm, 5%, 1/4W	XO-11
A2	IC, 7430, 8 Input NAND Gate	XO-643
A3,B2,S5	IC, 74LS374, Octal "D" Flip Flop	XO-96
A4	IC, 74LS74, Dual "D" Flip Flop	XO-434
A5,B1	IC, LM324, Quad Op-Amp	XO-644
E2	IC, AD7528J, Multiplier DAC	XO-647
G3,N4	IC, 74LS377, Octal "D" Flip Flop	XO-97
G4,T1	IC, 74LS04, Hex Inverter	XO-418
G5	IC, 74HC08, Quad 2 Input "AND" Gate	XO-872
H2,H3	IC, 6116P-3, 2K x 1 RAM	XO-193
H5,K5,N5	IC, 74LS161, Synchronous Presettable Binary Counter	XO-440
S1,T5		
K2,K3	IC, Specified Per Game	
M2	IC, 74LS245, Octal Bus Transceiver	XO-79
N1,T3	IC, 6502A, CPU	XO-893
S2	IC, 74LS139, Dual 1 of 4 Decoder	XO-419
S3	IC, 74HCT245, Octal Bus Transceiver	XO-891
T4	IC, 74LS138, 1 of 8 Decoder	XO-437
SIP 1	Resistor Pack 8 x 1K Ohm	XO-493
SW2	Switch, Pushbutton	XO-897
XTAL 1	Crystal, 4 MHZ	XO-366
AGP1,AGP2	Connector (2)	XO-879
	28 Pin Dip Socket (2)	XO-536
	Jumper, 22 Guage (7)	XO-469
	20 Pin Dip Socket	XO-491


DATA BUS 1
LOCATED ON FOIL SIDE.
ADDRESS BUS 1
ADDRESS BUS 2
INPUT PORT BUS
AUDIO OUTPUT
ANALOG GROUND
GROUND (DC)
RESET
OPTIONAL CIRCUITRY
S4 EXPAND SOCKET
(NOT USED)
Premier Technology
SOUND BOARD (A6)
9-20-88
E-26146



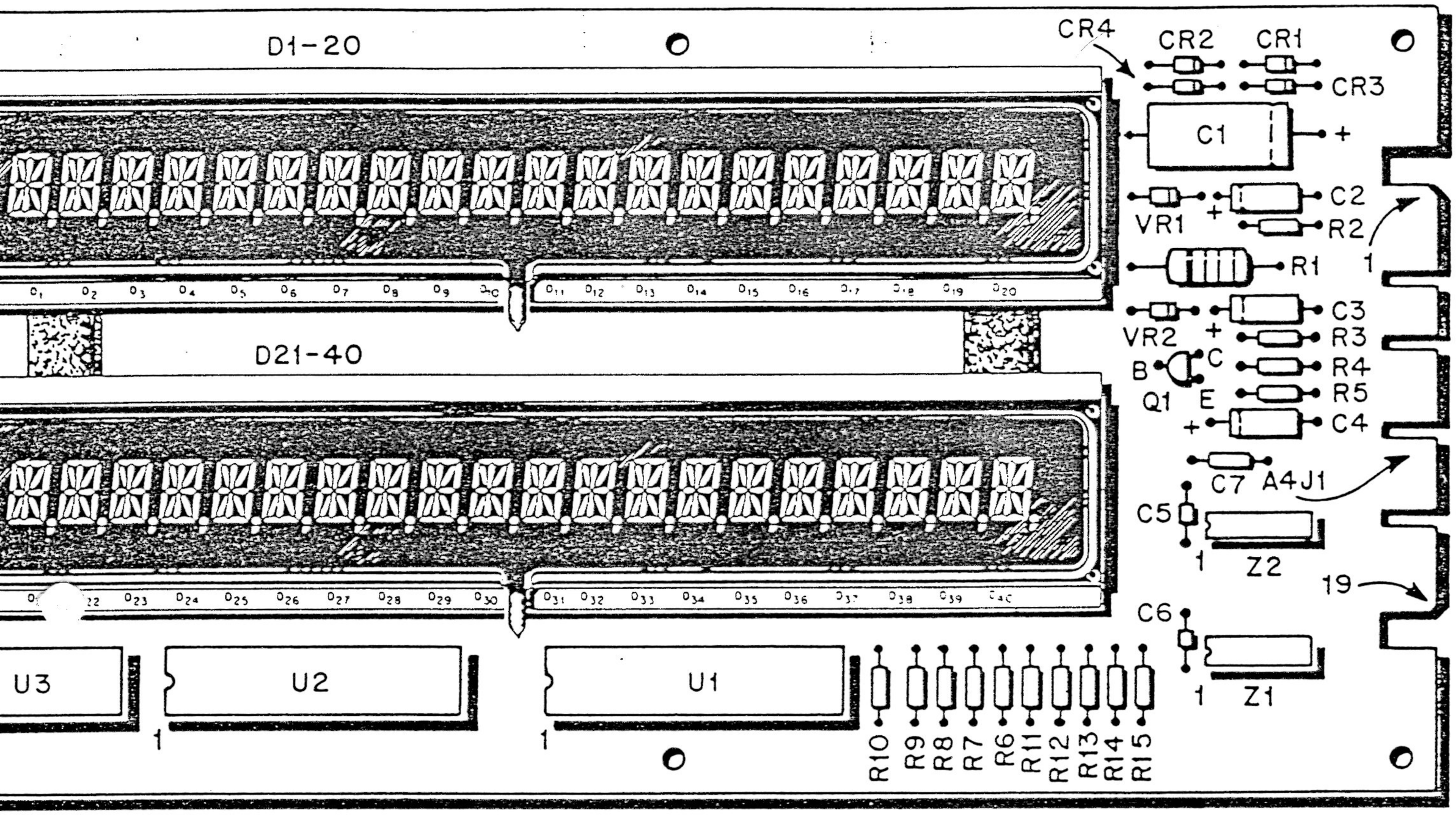
AUXILIARY LAMP DRIVER BOARD (A11) COMPONENT LOCATION



AUXILIARY LAMP DRIVER BOARD (A11) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	AUXILIARY LAMP DRIVER ASSEMBLY	MA-789
C1	CAPACITOR, .1 MFD, 100V CERAMIC RADIAL LEAD	XO-626
C2-C3	CAPACITOR, .01 MFD, 100V RADIAL LEAD	XO-202
C4	CAPACITOR, 47 MFD, 10V ELECTROLYTIC RADIAL LEAD	XO-227
Q1-Q10	TRANSISTOR, NSD-U45 NPN DARLINGTON	XO-146
R1,R12	RESISTOR, 3K OHM, 5%, 1/4 W	XO-23
R2-R11	RESISTOR, 12K OHM, 5%, 1/4W	XO-9
R13	RESISTOR, 680K OHM, 5%, 1/4W	XO-669
U1	I.C. 2-INPUT NAND, 7400	XO-420
U2,U6	I.C. INVERTER, 7405	XO-403
U3	I.C. DECADE COUNTER, 7490	XO-425
U4	I.C. DECODER, 7442	XO-426
U5	I.C. TIMER, NE555	XO-631
P2	10 POS. CONNECTOR	XO-879
P1	4 POS. CONNECTOR	XO-879

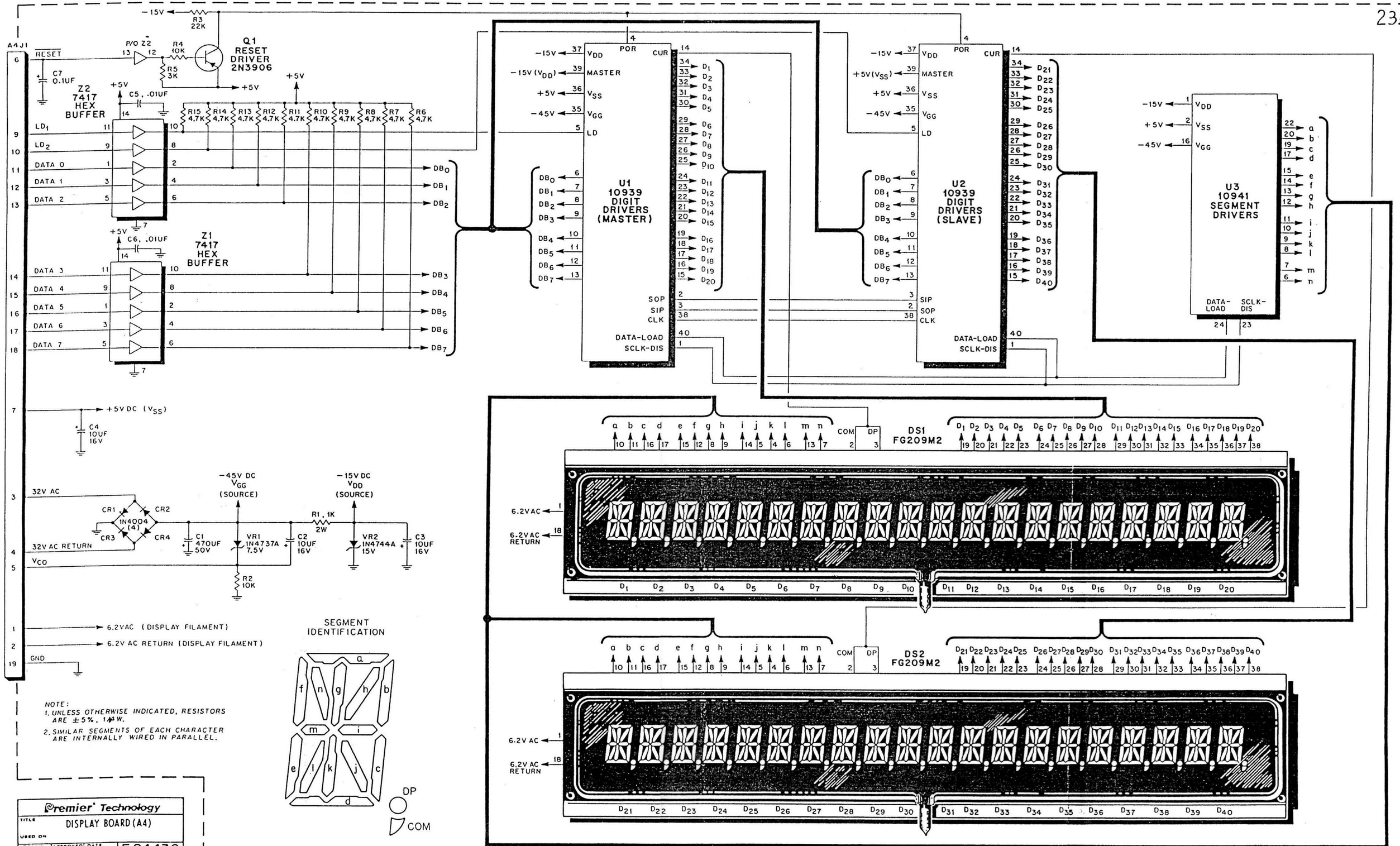
DISPLAY BOARD (A4) COMPONENT LOCATION

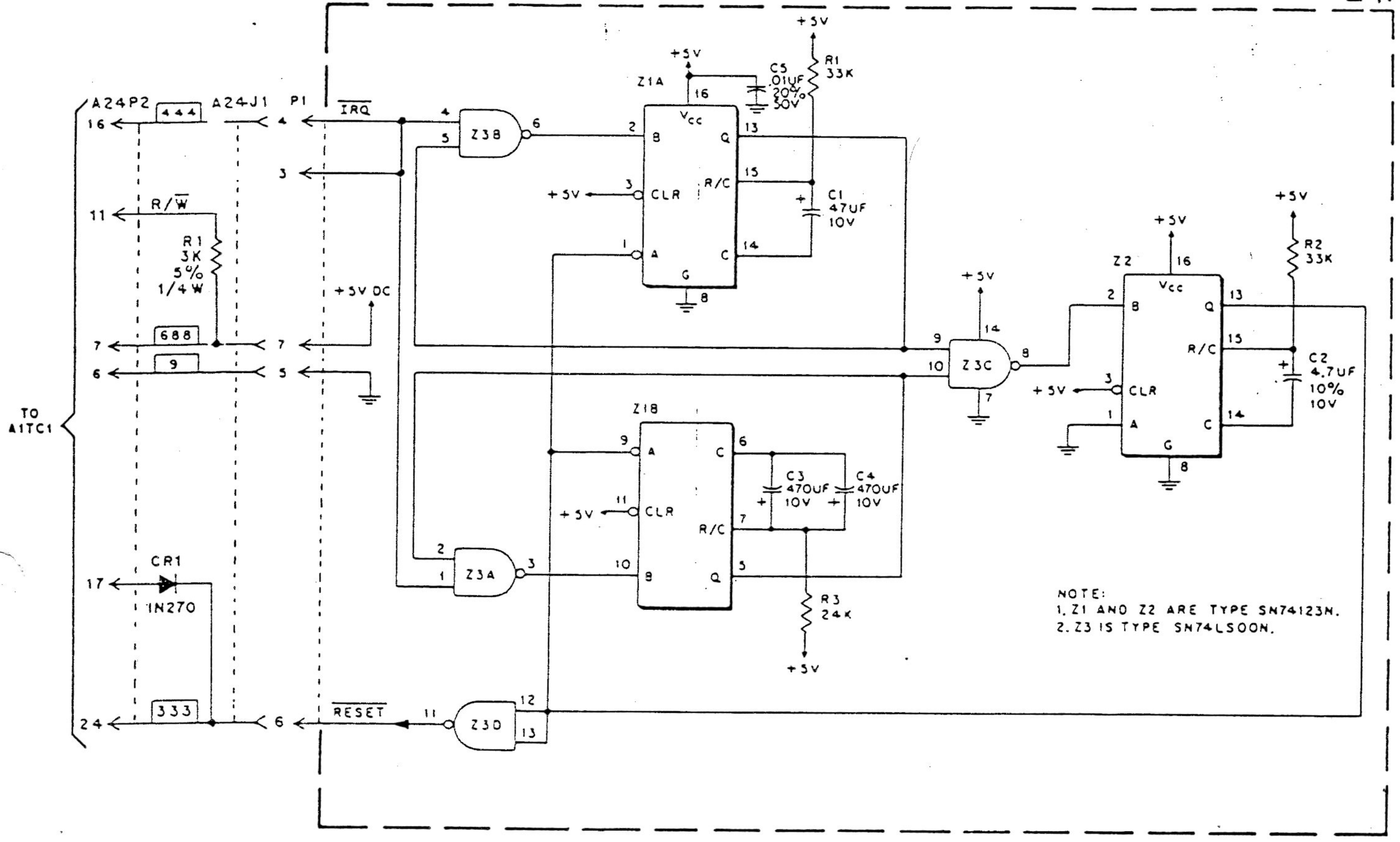


DISPLAY BOARD (A4) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	Display Board (A4)	MA644
C1	Capacitor, 470UF, 50V	XO-847
C2, C3, C4	Capacitor, 10UF, 16V	XO-846
C5, C6	Capacitor, .01UF, +80% -20%	XO-229
*C7	Capacitor, 0.1UF, 50V	XO-230
CR1-CR4	Diode, 1N4004	XO-254
DS1, DS2	Display, Alphanumeric	XO-840
Q1	Transistor, PNP, 2N3906	XO-588
R1	Resistor, 1K, 5%, 2W	XO-627
R2, R4	Resistor, 10K, 5%, 1/4W	XO-18
R3	Resistor, 22K, 5%, 1/4W	XO-42
R5	Resistor, 3K, 5%, 1/4W	XO-23
R6-R15	Resistor, 4.7K, 5%, 1/4W	XO-7
U1, U2	IC, Digit Drivers, 10939	XO-841
U3	IC, Segment Drivers, 10941	XO-842
VR1	Diode, Zener, 1N4737A, 7.5V	XO-844
VR2	Diode, Zener, 1N4744A, 15V	XO-843
Z1, Z2	IC, Hex Buffer, 7417	XO-406
	Tape, Vinyl Foam	24127-1

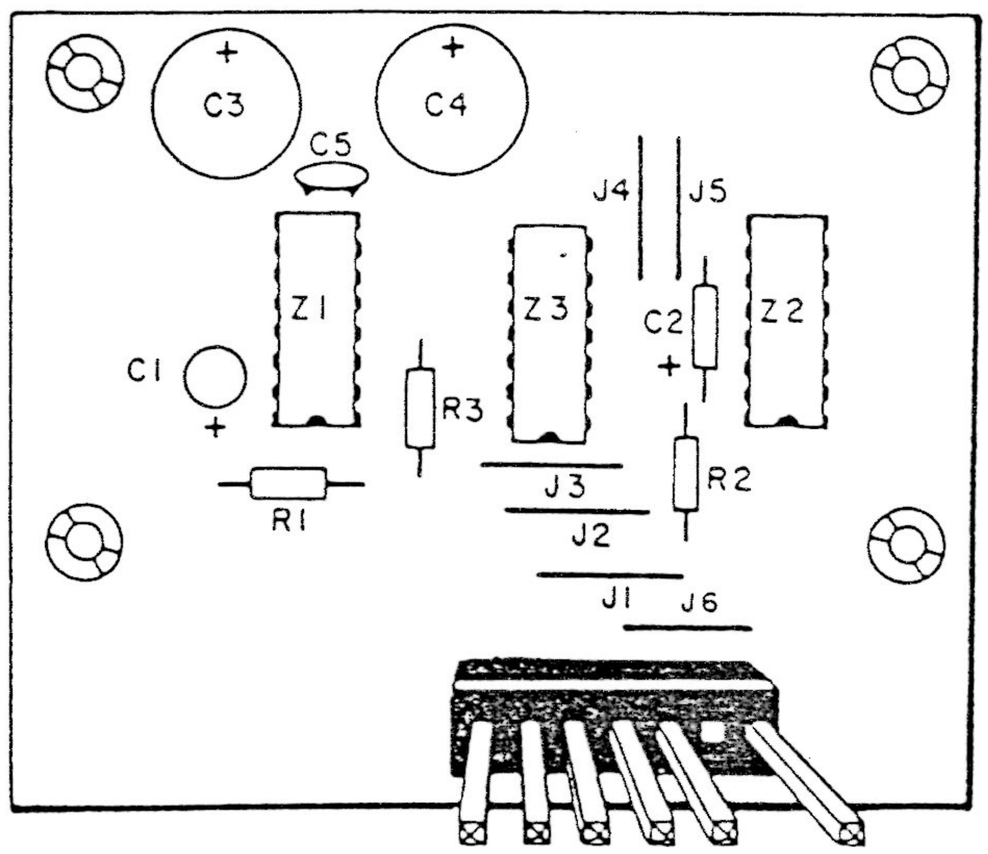
*C7 IS LOCATED ON THE NON-COMPONENT SIDE OF THE BOARD IN SOME CASES.


A4J1
RESET
C7 0.1UF
P/O Z2
R4 10K
R5 3K
R3 22K
Q1 RESET DRIVER 2N3906
Z2 7417 HEX BUFFER
C5, .01UF
R15 4.7K R14 4.7K R13 4.7K R12 4.7K R11 4.7K R10 4.7K R9 4.7K R8 4.7K R7 4.7K R6 4.7K
LD1
LD2
DATA 0
DATA 1
DATA 2
DB0
DB1
DB2
Z1 7417 HEX BUFFER
C6, .01UF
DATA 3
DATA 4
DATA 5
DATA 6
DATA 7
DB3
DB4
DB5
DB6
DB7
+5V DC (VSS)
C4 10UF 16V
32V AC
CR1
CR2
CR3
CR4
1N4004 (4)
32V AC RETURN
VCO
C1 470UF 50V
-45V DC VGG (SOURCE)
VR1 1N4737A 7.5V
R2 10K
C2 10UF 16V
R1, 1K 2W
-15V DC VDD (SOURCE)
VR2 1N4744A 15V
C3 10UF 16V
6.2VAC (DISPLAY FILAMENT)
6.2V AC RETURN (DISPLAY FILAMENT)
GND
U1 10939 DIGIT DRIVERS (MASTER)
U2 10939 DIGIT DRIVERS (SLAVE)
U3 10941 SEGMENT DRIVERS
POR
CUR
MASTER
LD
SOP
SIP
CLK
DATA-LOAD
SCLK-DIS
-15V (VDD)
+5V (VSS)
-45V
DS1 FG209M2
DS2 FG209M2
COM
DP
6.2VAC
6.2VAC RETURN
6.2V AC
6.2V AC RETURN
SEGMENT IDENTIFICATION
NOTE:
1. UNLESS OTHERWISE INDICATED, RESISTORS ARE ±5%, 1/4W.
2. SIMILAR SEGMENTS OF EACH CHARACTER ARE INTERNALLY WIRED IN PARALLEL.
Premier Technology
TITLE DISPLAY BOARD (A4)
USED ON
DRAWN
APPROVED R.H.M.
DATE 12 FEB 85
E-24438



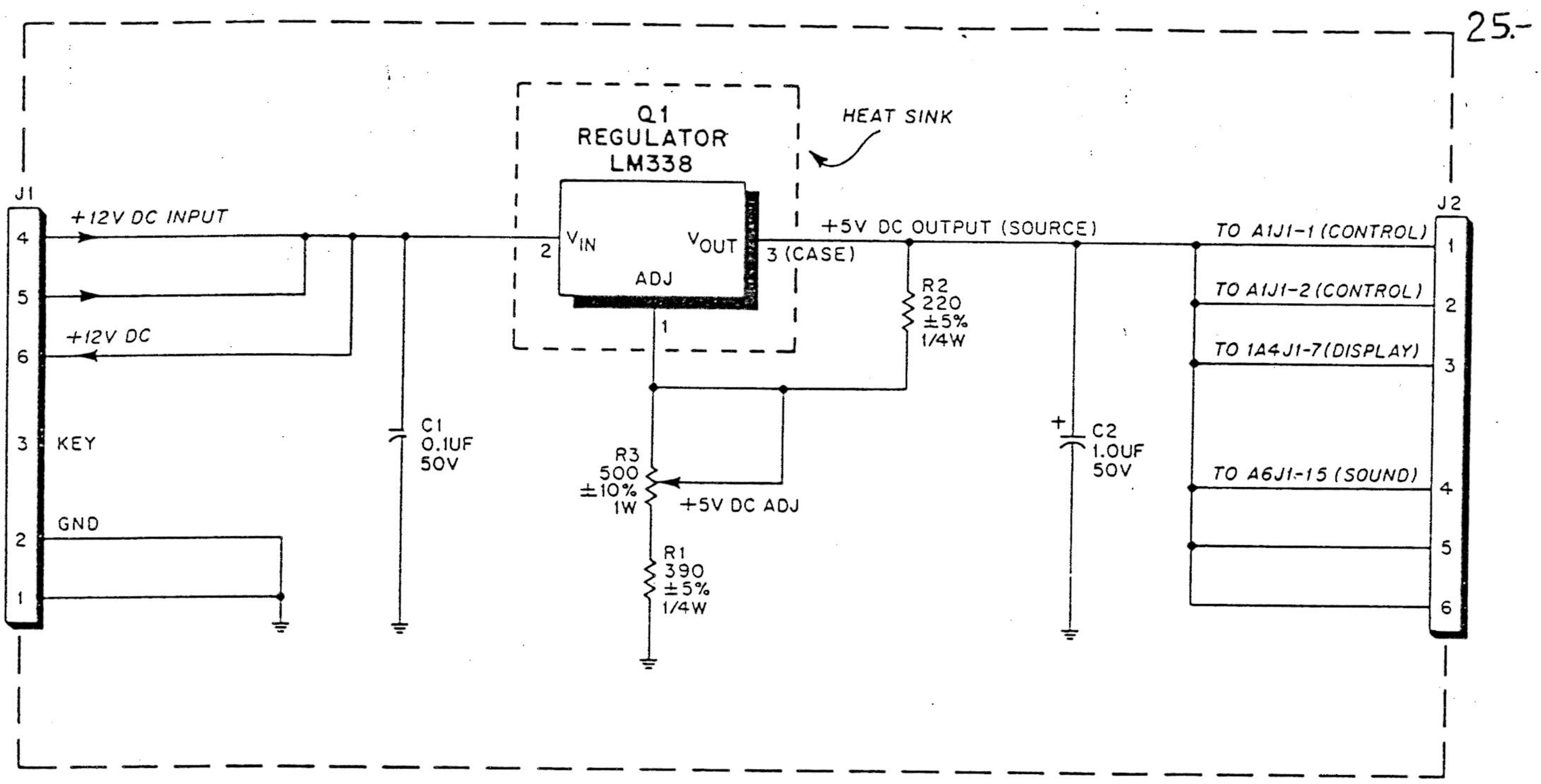
Premier Technology			
TITLE RESET CIRCUIT BOARD			
USED ON			
DRAWN G.P.S.	APPROVED BAM	DATE 6-AUG-87	C-21063

RESET BOARD (A24) COMPONENT LOCATION



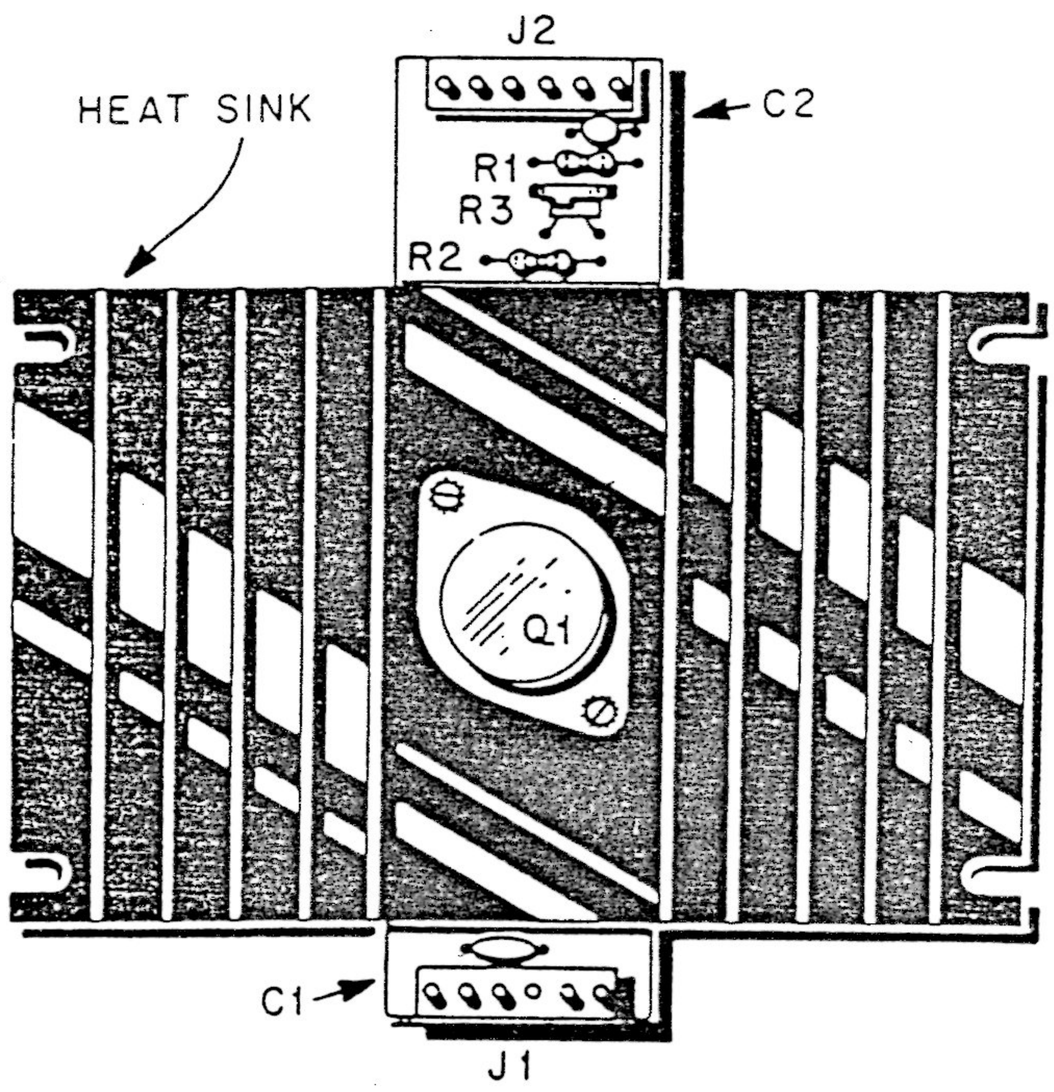
RESET BOARD (A24) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	Reset Board Assembly	MA-980
R1, R2	Resistor 33K Ohm, 5%, 1/4W	XO-43
R3	Resistor 24K Ohm, 5%, 1/4W	XO-10
C1	Capacitor 47UF, 10V	XO-227
C2	Capacitor 4.7UF, 10V	XO-226
C3, C4	Capacitor 470UF, 10V	XO-214
C5	Capacitor .01UF	XO-202
Z1, Z2	IC, 74123N	XO-398
Z3	IC, 74LS00N	XO-427
A24P2/ A24J2	Cable Assembly	MA-796
	7 Pin Connector	XO-879



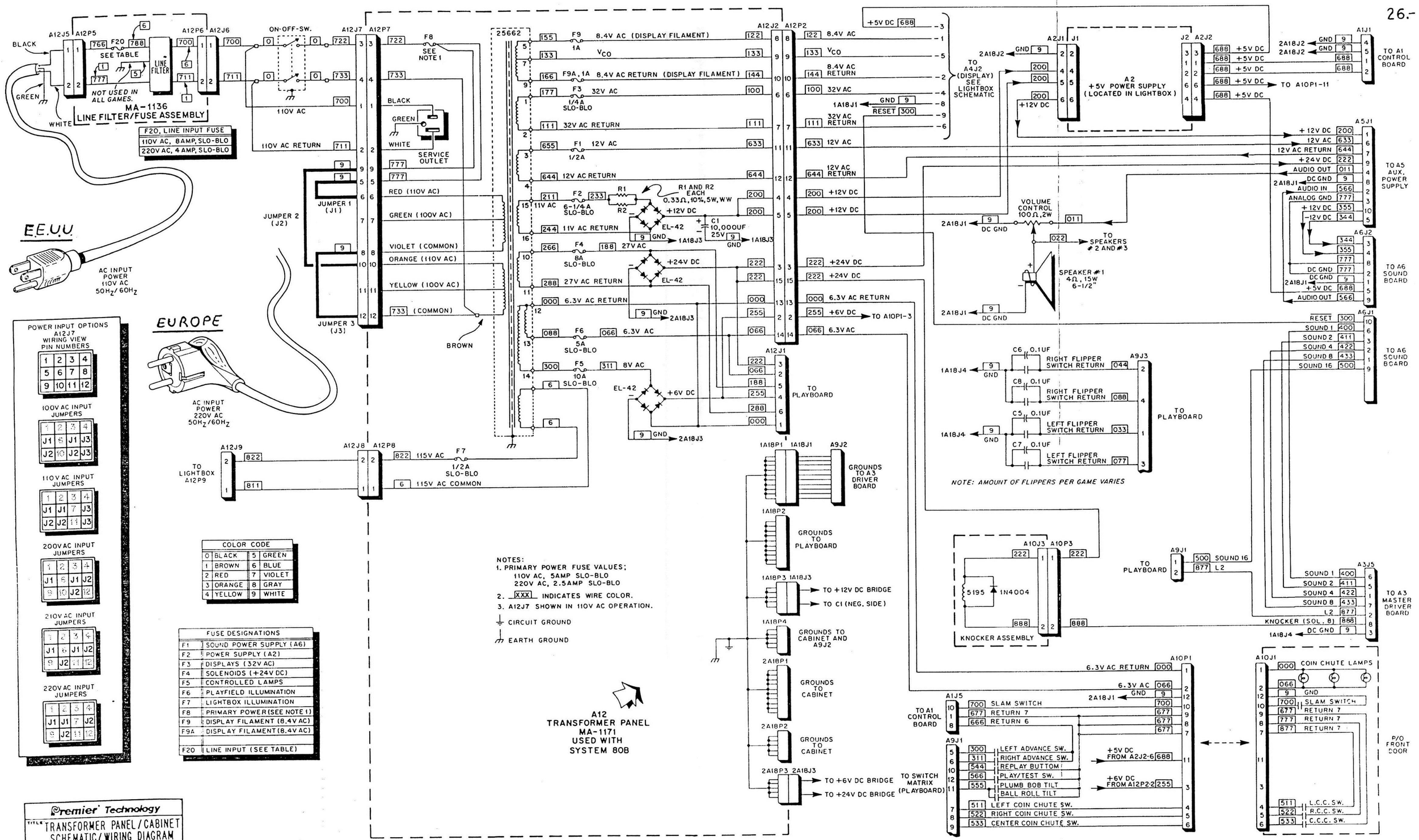
Premier' Technology			
TITLE POWER SUPPLY (A2)			
USED ON			
DRAWN	APPROVED	DATE	
	R.H.M.	12 FEB 85	E-24441

POWER SUPPLY (A2) COMPONENT LOCATION



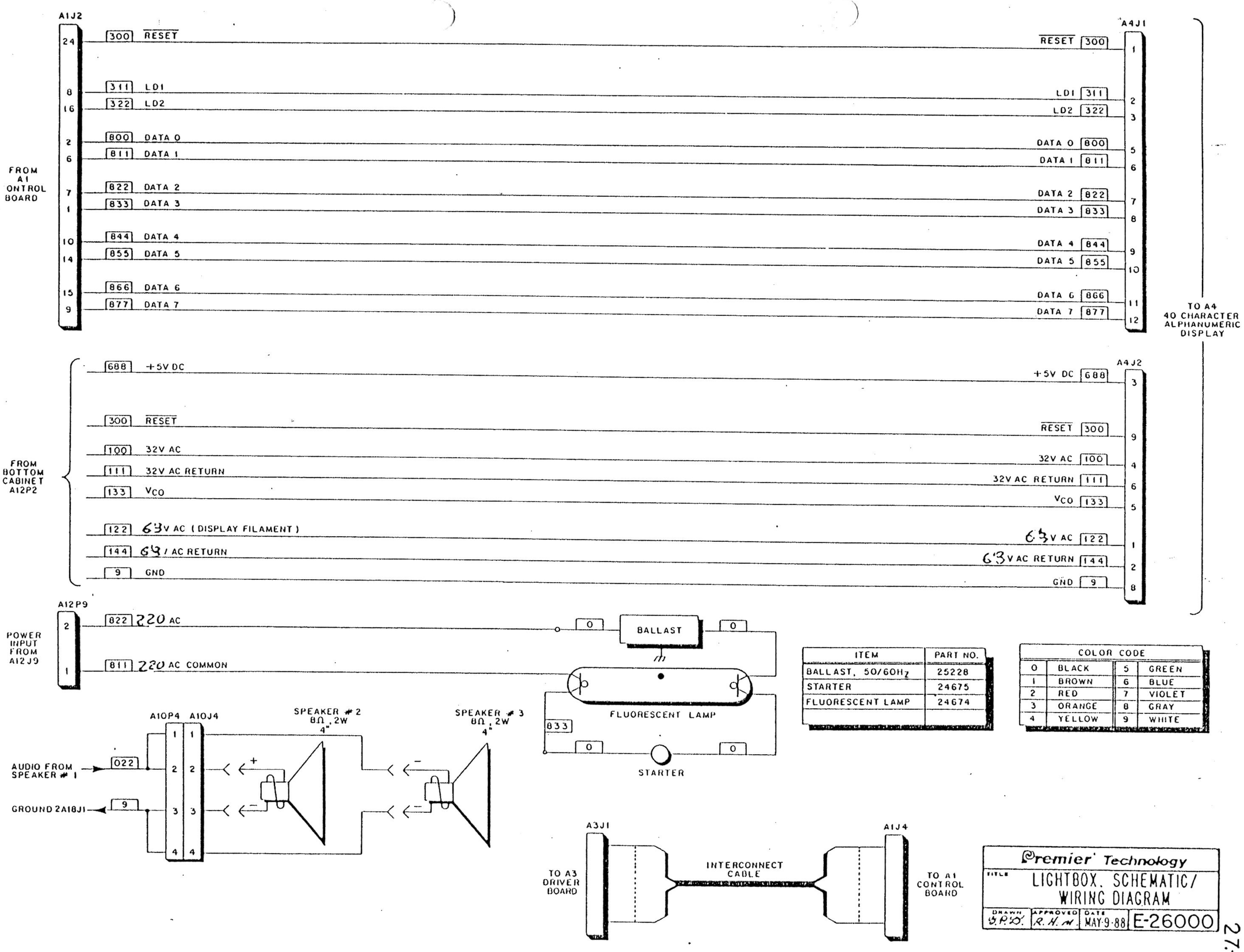
POWER SUPPLY (A2) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	Power Supply (A2)	MA-831
C1	Capacitor, 0.1UF, +80% -20%, 50V	XO-230
C2	Capacitor, 1UF, 10%, 50V	XO-217
J1, J2	Connector, 6 Pin	XO-879
Q1	Regulator, LM338, (5 Amp)	XO-839
R1	Resistor, 390 ohm, 5%, 1/4W	XO-845
R2	Resistor, 220 ohm, 5%, 1/4W	XO-21
R3	Resistor, (Pot) 500 ohm, 10%, 1W	XO-112
	Heat Sink	XO-534
	Insulator, (Regulator)	XO-522
	Insulator, (Regulator)	XO-523



COLOR CODE			
0	BLACK	5	GREEN
1	BROWN	6	BLUE
2	RED	7	VIOLET
3	ORANGE	8	GRAY
4	YELLOW	9	WHITE

FUSE DESIGNATIONS	
F1	SOUND POWER SUPPLY (A6)
F2	POWER SUPPLY (A2)
F3	DISPLAYS (32V AC)
F4	SOLENOIDS (+24V DC)
F5	CONTROLLED LAMPS
F6	PLAYFIELD ILLUMINATION
F7	LIGHTBOX ILLUMINATION
F8	PRIMARY POWER (SEE NOTE 1)
F9	DISPLAY FILAMENT (8.4V AC)
F9A	DISPLAY FILAMENT (8.4V AC)
F20	LINE INPUT (SEE TABLE)



ITEM	PART NO.
BALLAST, 50/60Hz	25228
STARTER	24675
FLUORESCENT LAMP	24674

COLOR CODE			
0	BLACK	5	GREEN
1	BROWN	6	BLUE
2	RED	7	VIOLET
3	ORANGE	8	GRAY
4	YELLOW	9	WHITE

Premier Technology

TITLE LIGHTBOX, SCHEMATIC/ WIRING DIAGRAM

DRAWN	APPROVED	DATE	
G.P.O.	R.H.M.	MAY·9·88	E-26000