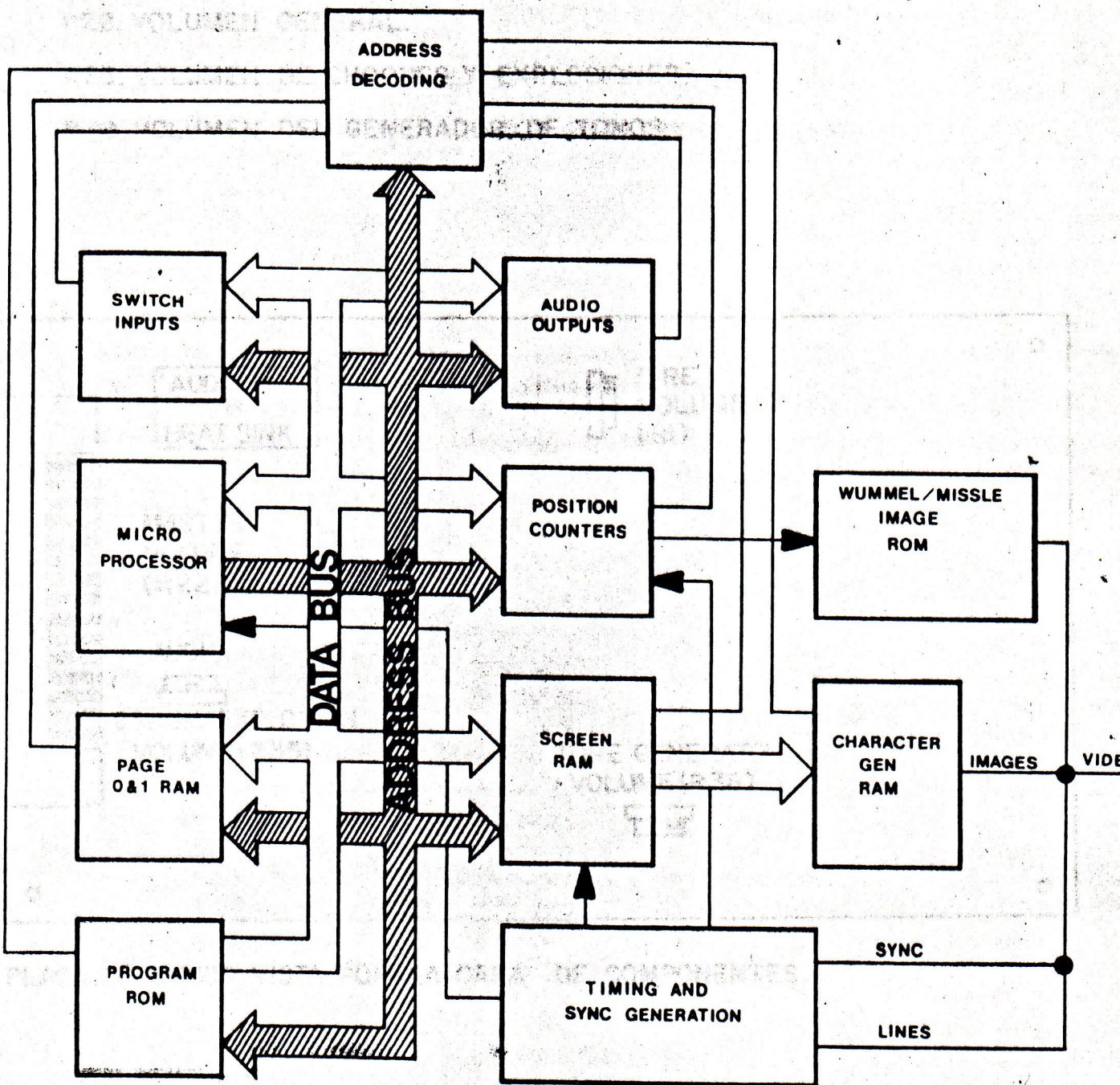
RECREATIVOS FRANCO, S.A.

SPACE TAR

Alfonso Gómez, 6
tel. 754 20 39
telex 4



LOGIC BOARD BLOCK DIAGRAM

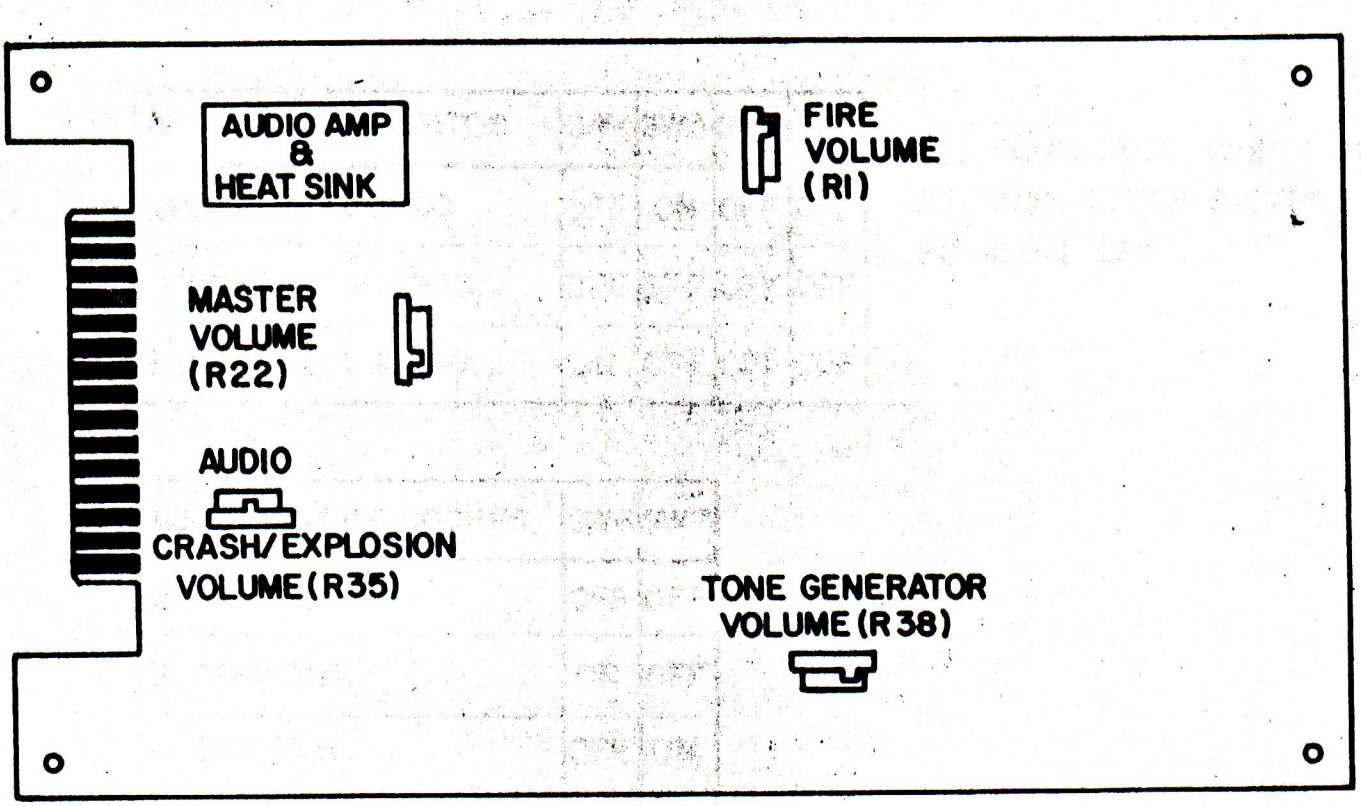
AJUSTES DE SONIDOS

R1. VOLUMEN DE DISPAROS.

R22. VOLUMEN GENERAL.

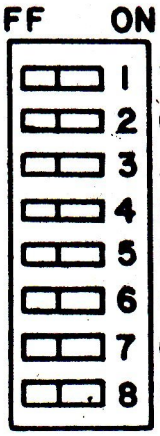
R35. VOLUMEN DE CHOQUES Y EXPLOSIONES.

R38. VOLUMEN DEL GENERADOR DE TONOS.



PLACA DE SONIDO VISTA POR LA CARA DE COMPONENTES.

CONTACTOS DE AJUSTE LOCALIZADOS EN (A-16) DE LA PLACA DE C.P.U.



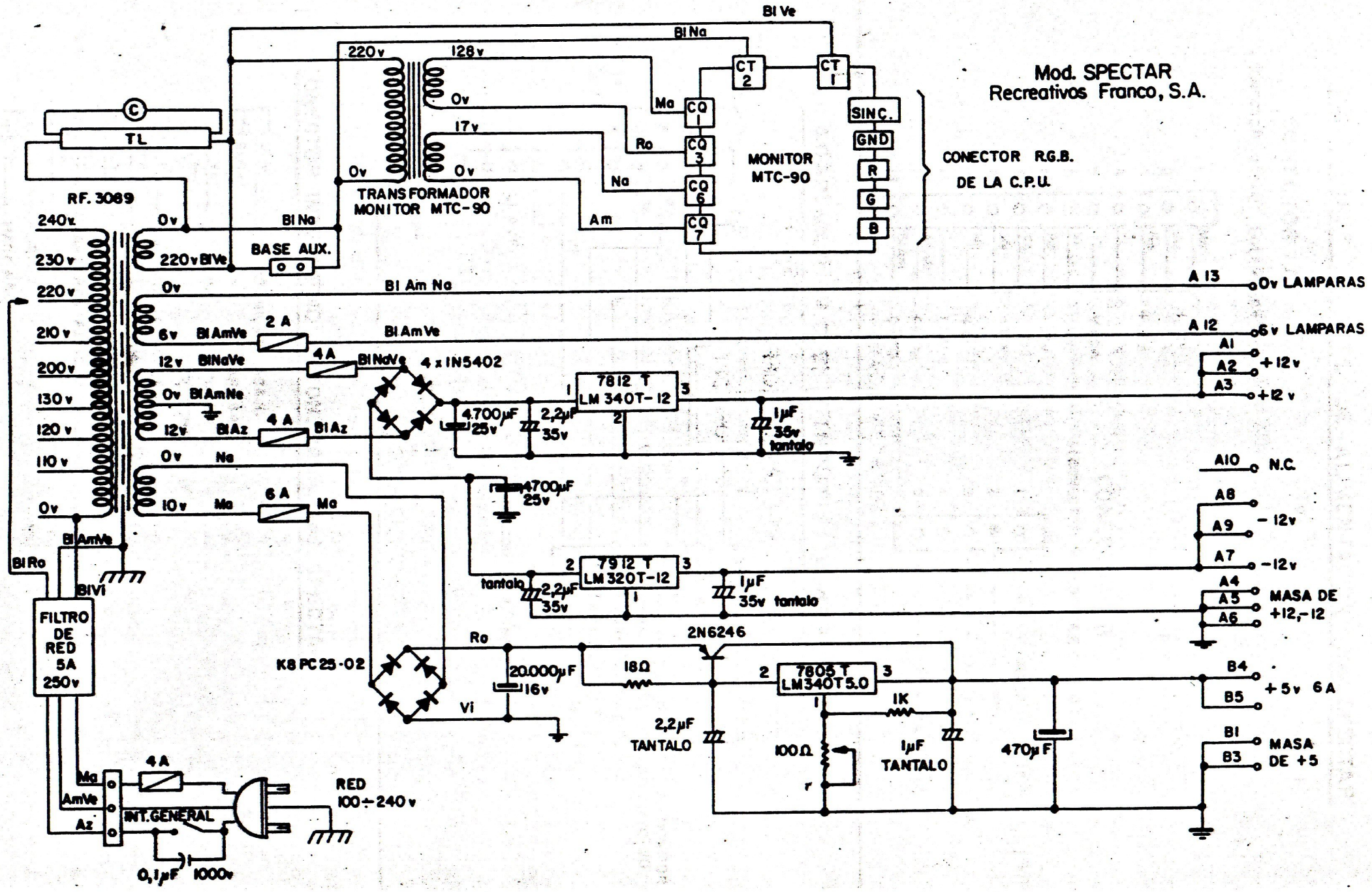
AJUSTE DE CREDITOS	SW4	SW5	SW2	SW8
1 MONEDA 1 JUEGO	OFF	ON	OFF	OFF
1 MONEDA 2 JUEGOS	OFF	OFF	OFF	OFF
2 MONEDAS 1 JUEGO	ON	OFF	OFF	OFF

(LOS CONTACTOS SW2 Y SW8 DEBERAN ESTAR SIEMPRE EN POSICION OFF).

AJUSTE Nº DE COCHES	SW6	SW7
2 COCHES	OFF	OFF
3 COCHES	ON	OFF
4 COCHES	OFF	ON
5 COCHES	ON	ON

AJUSTE DE RECORD	SW3
PARTIDA GRATIS	ON
1 COCHE MAS	OFF

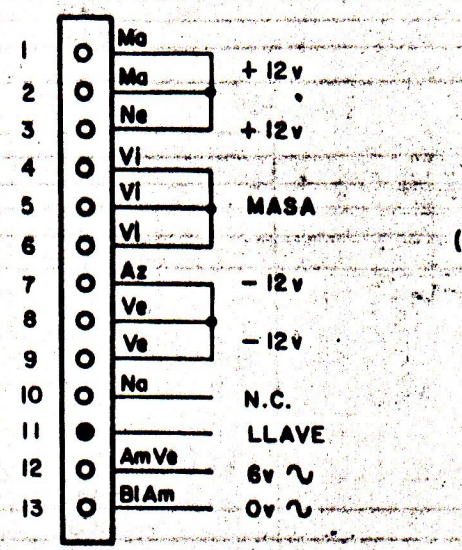
AJUSTE TIPO DE JUEGO	SW1
CAMPOS DE JUEGO ALEATORIOS	ON
CAMPOS DE JUEGO SECUENCIALES	OFF


Mod. SPECTAR
Recreativos Franco, S.A.
Bl Ve
Bl Na
220v
128v
0v
17v
0v
TRANSFORMADOR
MONITOR MTC-90
CT 2
CT 1
Ma
Ro
Na
Am
CQ 1
CQ 3
CQ 6
CQ 7
MONITOR
MTC-90
SINC.
GND
R
G
B
CONECTOR R.G.B.
DE LA C.P.U.
C
TL
RF. 3089
240v
230v
220v
210v
200v
130v
120v
110v
0v
0v
220v Bl Ve
Bl Na
BASE AUX.
Bl Am Na
A 13
0v LAMPARAS
6v Bl Am Ve
2 A
Bl Am Ve
A 12
6v LAMPARAS
12v Bl Na Ve
4A
Bl Na Ve
4 x IN5402
A1
A2
A3
+12v
+12v
0v Bl Am Ne
12v Bl Az
4 A
Bl Az
7812 T
LM 340T-12
4.700µF 25v
2,2µF 35v
1µF 35v tantalo
0v Na
10v Ma
6 A
Ma
4700µF 25v
A10
N.C.
A8
A9
A7
-12v
-12v
Bl Am Ve
Bl Ro
Bl Vi
FILTRO DE RED 5A 250v
7912 T
LM 320T-12
tantalo
2,2µF 35v
1µF 35v tantalo
A4
A5
A6
MASA DE +12,-12
K8PC25-02
Ro
Vi
20.000µF 16v
2N6246
18Ω
7805 T
LM340T5.0
2,2µF TANTALO
100Ω
1K
1µF TANTALO
470µF
B4
B5
+5v 6A
B1
B3
MASA DE +5
Ma
Am Ve
Az
4A
INT. GENERAL
RED
100÷240v
0,1µF 1000v

CONECTORES FUENTE DE ALIMENTACION Mod.SPECTAR

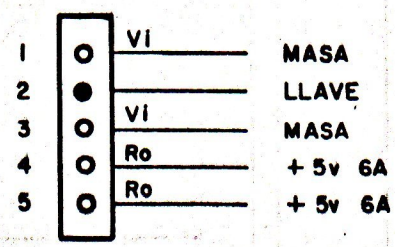
CONECTOR A

(CONECTOR MACHO MOLEX 5,04)

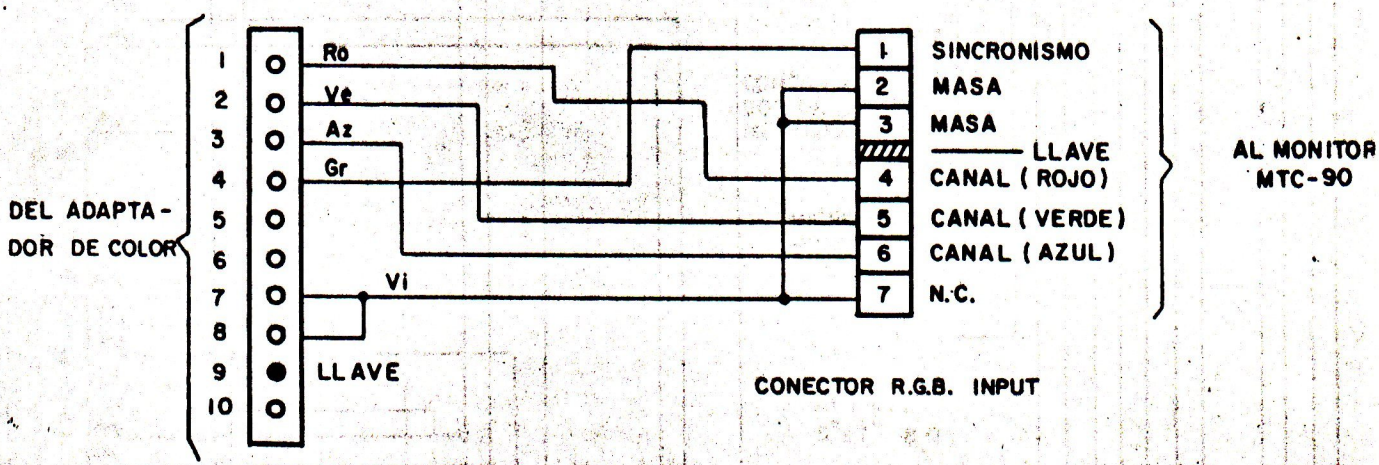


CONECTOR B

(CONECTOR MACHO MOLEX 5,04)



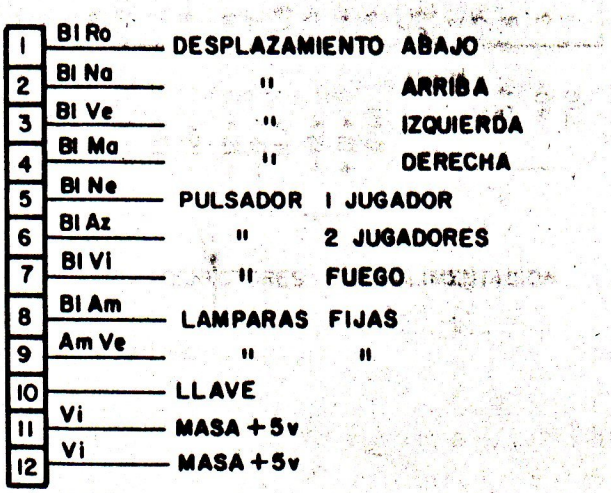
ADAPTADOR R.G.B. INPUT Mod.SPECTAR

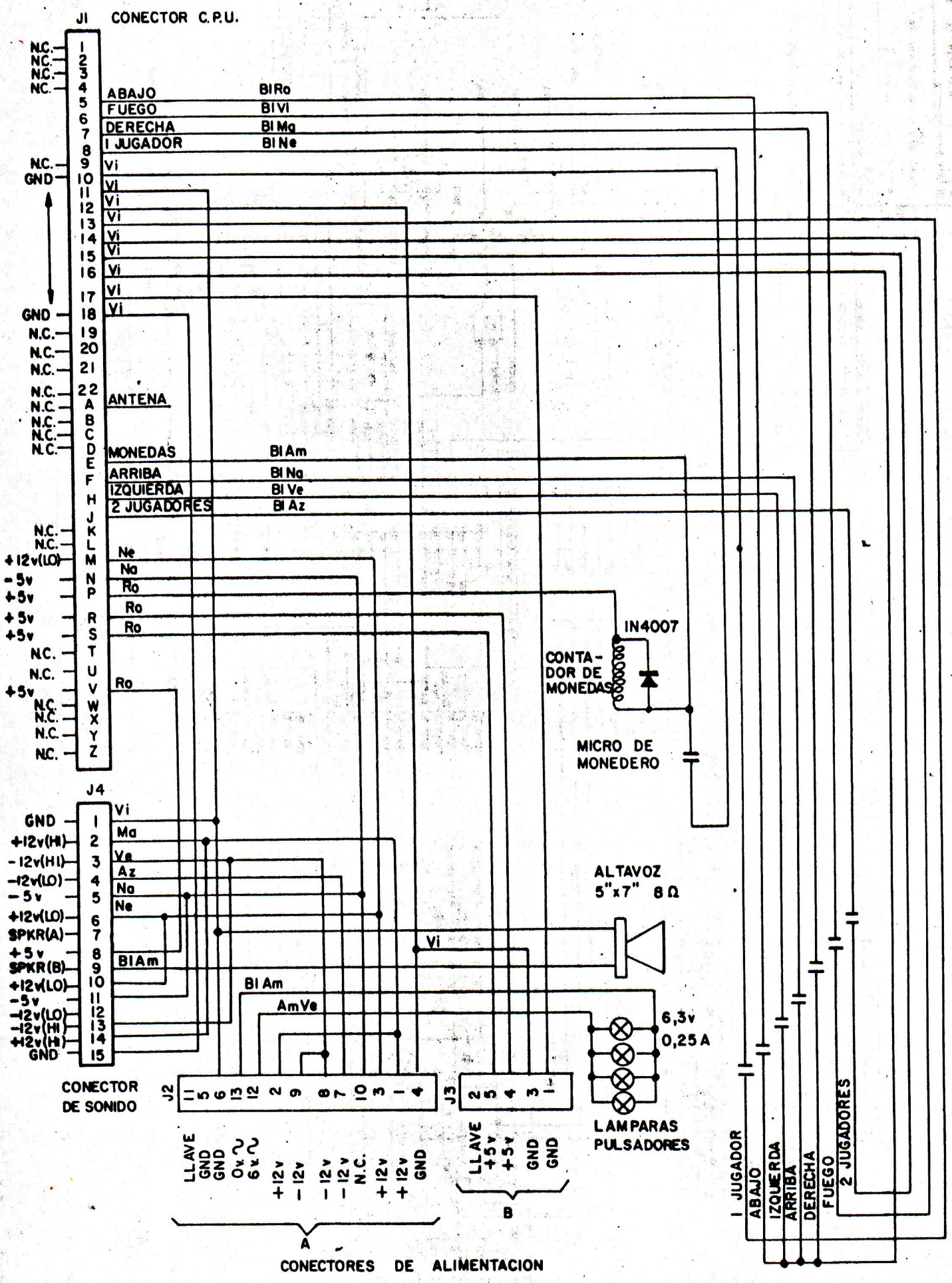


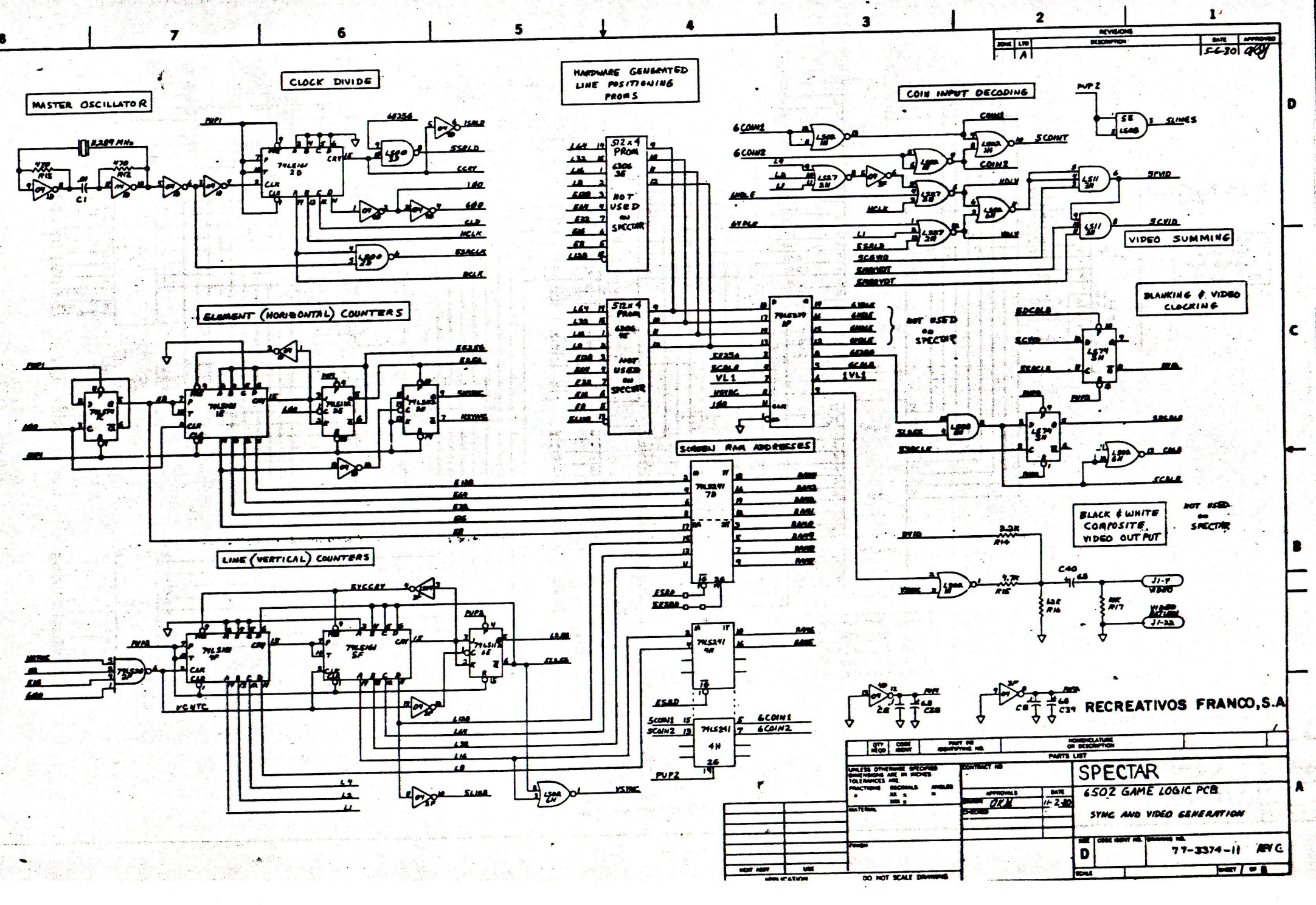
CONECTOR HEMBRA MOLEX 5.04

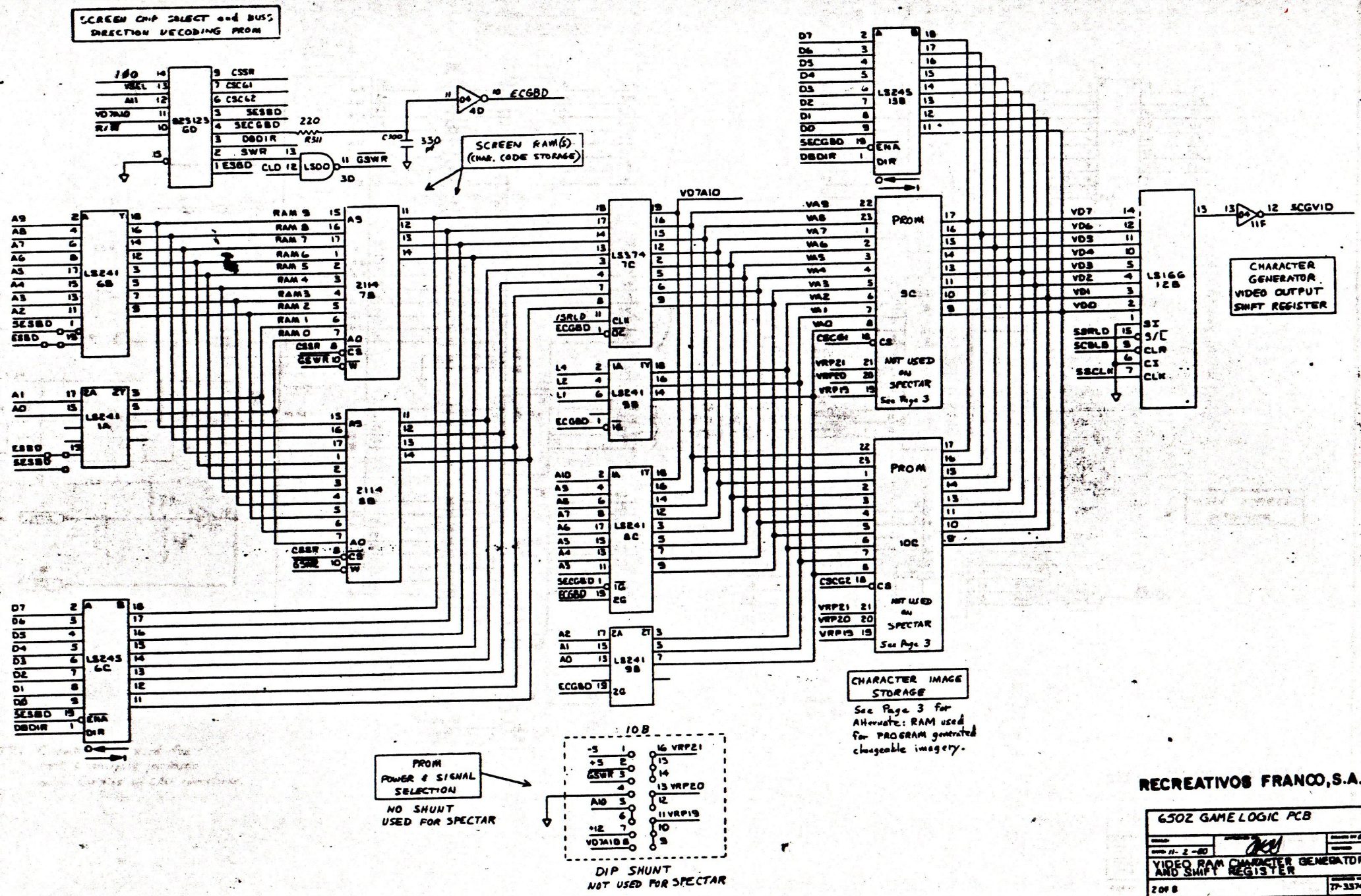
CONECTOR R.G.B. INPUT

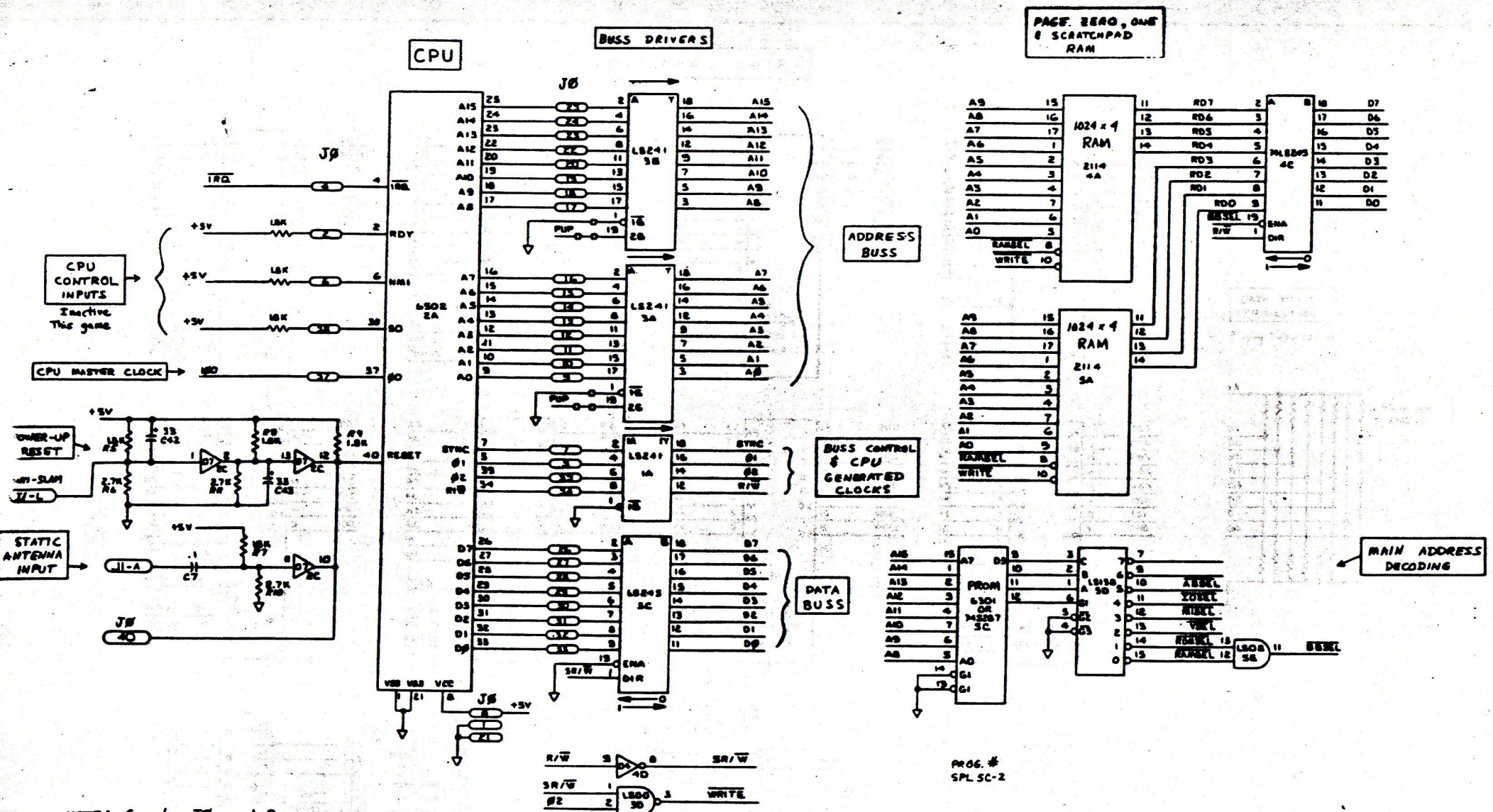
CONECTOR INTERMEDIO BOTONERA Mod. SPECTAR



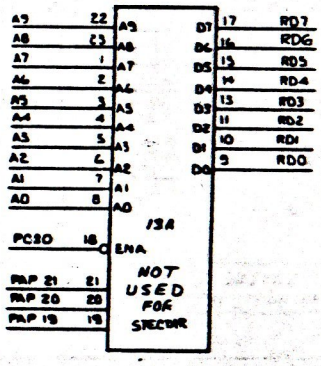

J1 CONECTOR C.P.U.
N.C.
GND
ABAJO
FUEGO
DERECHA
1 JUGADOR
BlRo
BlVi
BlMg
BlNe
Vi
ANTENA
MONEDAS
ARRIBA
IZQUIERDA
2 JUGADORES
BlAm
BlNg
BlVe
BlAz
+12v(LO)
-5v
+5v
Ne
Na
Ro
IN4007
CONTA-DOR DE MONEDAS
MICRO DE MONEDERO
J4
+12v(HI)
-12v(HI)
-12v(LO)
SPKR(A)
SPKR(B)
Ma
Ve
Az
AmVe
ALTAVOZ 5"x7" 8Ω
6,3v 0,25A
CONECTOR DE SONIDO
J2
J3
LLAVE
GND
0v
6v
+12v
-12v
N.C.
LAMPARAS PULSADORES
A
B
CONECTORES DE ALIMENTACION
1 JUGADOR
ABAJO
IZQUIERDA
ARRIBA
DERECHA
FUEGO
2 JUGADORES
CONEXIONADO GENERAL
SPECTAR

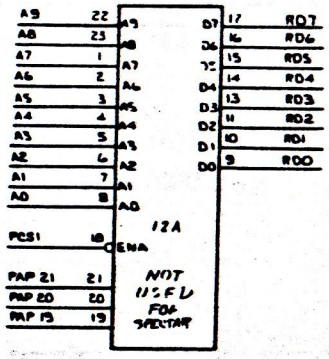

MASTER OSCILLATOR
8.389 MHz
CLOCK DIVIDE
HARDWARE GENERATED LINE POSITIONING PROMS
512 x 4 PROM
NOT USED on SPECTAR
COIN INPUT DECODING
VIDEO SUMMING
BLANKING & VIDEO CLOCKING
ELEMENT (HORIZONTAL) COUNTERS
SCREEN RAM ADDRESSES
LINE (VERTICAL) COUNTERS
BLACK & WHITE COMPOSITE VIDEO OUTPUT
RECREATIVOS FRANCO, S.A.
SPECTAR
6502 GAME LOGIC PCB
SYNC AND VIDEO GENERATION
77-3374-11
REV C
PARTS LIST
DO NOT SCALE DRAWING

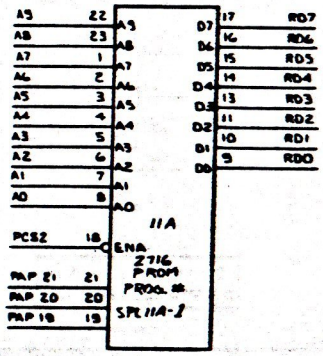

SCREEN CHIP SELECT and BUSS DIRECTION DECODING PROM
SCREEN RAM(S) (CHAR. CODE STORAGE)
CHARACTER GENERATOR VIDEO OUTPUT SHIFT REGISTER
CHARACTER IMAGE STORAGE
See Page 3 for Alternate: RAM used for PROGRAM generated changeable imagery.
PROM POWER & SIGNAL SELECTION
NO SHUNT USED FOR SPECTAR
DIP SHUNT NOT USED FOR SPECTAR
RECREATIVOS FRANCO, S.A.
6502 GAME LOGIC PCB
VIDEO RAM CHARACTER GENERATOR AND SHIFT REGISTER
20 of 8
27-3374-11

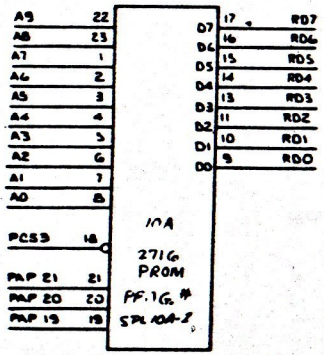

CPU
BUSS DRIVERS
PAGE ZERO, ONE & SCRATCHPAD RAM
JØ
IRQ
+5V
RDY
NMI
SO
CPU CONTROL INPUTS
Inactive This game
CPU MASTER CLOCK
Ø2O
37
ØO
RESET
6502 2A
LS241 3B
LS241 3A
LS241 4A
LS245 3C
ADDRESS BUSS
BUSS CONTROL & CPU GENERATED CLOCKS
DATA BUSS
1024 x 4 RAM 2114 4A
1024 x 4 RAM 2114 5A
74LS295 4C
PROM 6301 OR 74S287 5C
LS138 3D
LS08 5B
MAIN ADDRESS DECODING
POWER-UP RESET
ANTI-SLAM
STATIC ANTENNA INPUT
R/W
SR/W
Ø2
WRITE
NOTE: Connector JØ used for test & analysis purposes only. Contains all CPU connections.
PROG. # SPL SC-2
RECREATIVOS FRANCO, S.A.
4
6502 GAME LOGIC PCB
RESET: CPU: PROGRAM RAM BUS ARCHITECTURE
4 OF 8
77-5370-10

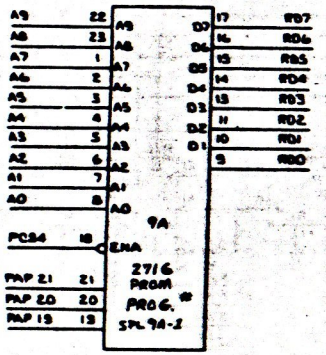
PROGRAM MEMORY

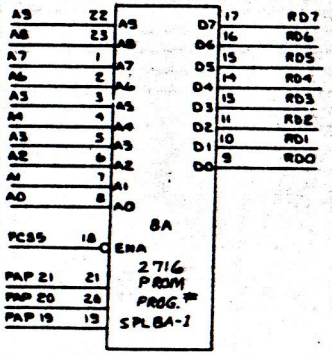


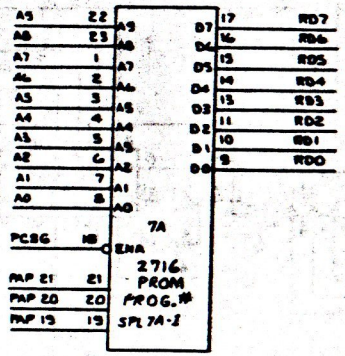


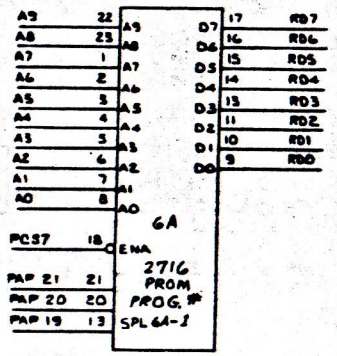






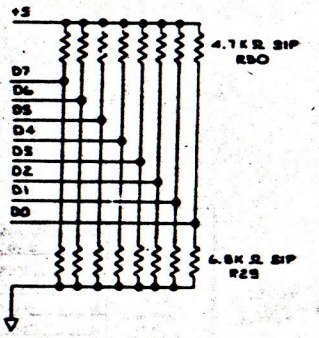


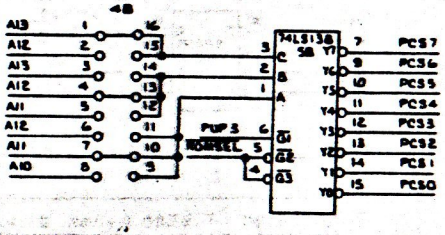




DATA BUSS TERMINATION

Ringing Suppression

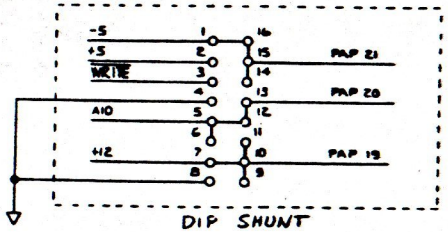




PROM ADDRESS SELECTION

Configuration shown For SPECTAR

11B



DIP SHUNT

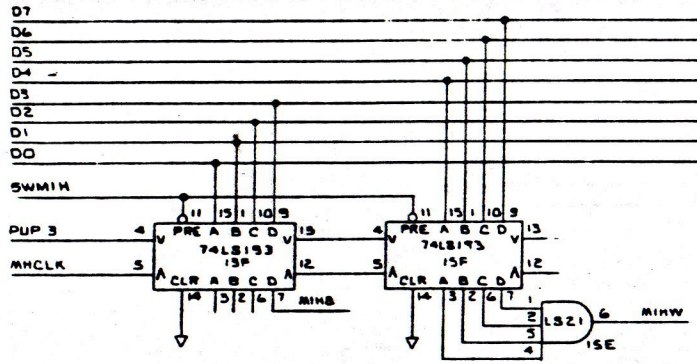
MEMORY DEVICE PERSONALITY SELECTION

Configuration shown For "3 VOLTAGE" 2716 EPROM

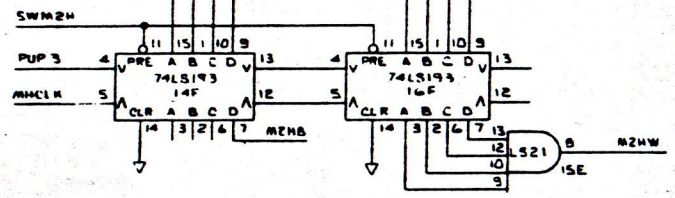
RECREATIVOS FRANCO, S.A.

5

DATE 11-2-80	GKA	C
6502 GAME LOGIC PCB CPU ROM		
5 OF 8		77-5576-00



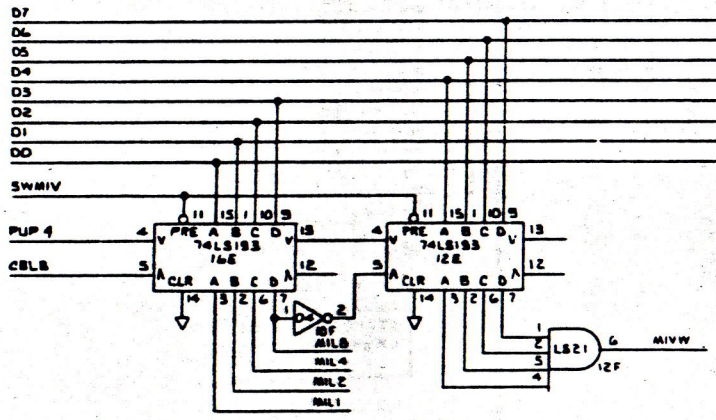
MOVING OBJECT 1
VERTICAL COUNTERS

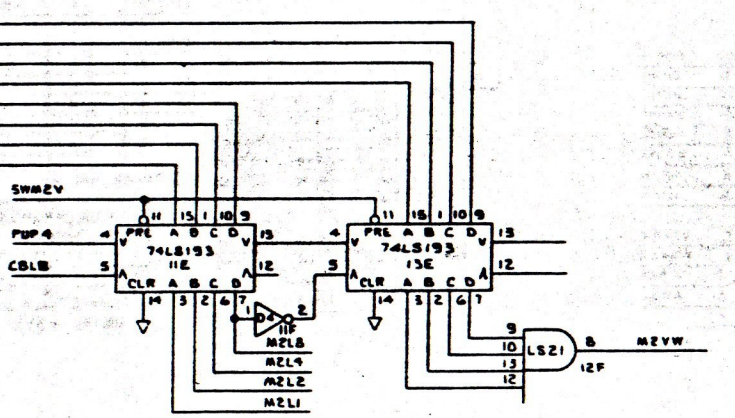


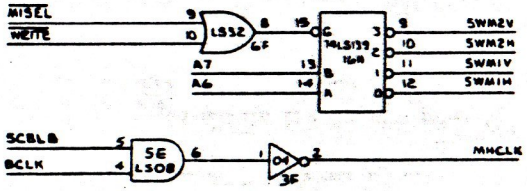
MOVING OBJECT 2
VERTICAL COUNTERS

NOTE : FOR SPECTAR ...

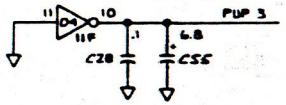
MOVING OBJECT 1 = PLAYER IMAGE (WUMMEL)
MOVING OBJECT 2 = MISSILE

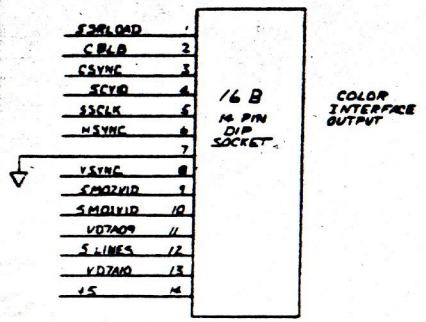






'WRITE MOVING OBJECT' DECODING





RECREATIVOS FRANCO, S.A.

6

6502 GAME LOGIC PCB

DATE 11-2-16 AKB REVISED C

COLOR INTERFACE OUTPUT AND MOVING OBJECT POSITION COUNTERS

6 OF 8 77-3526-11

MOVING OBJECTS MULTIPLEXING

MOVING OBJECTS IMAGE STORAGE

MOVING OBJECT 1 VIDEO OUTPUT SHIFT REGISTER

MOVING OBJECT 2 VIDEO OUTPUT SHIFT REGISTER

JUMPER USED ON SPECTAR

2708 PROM

11D

PROG # MCR 10-1

10P

DIP SHUNT

MEMORY DEVICE PERSONALITY SELECTION

Configuration shown is for "3 VOLTAGE" 2708 EPROM

MOVING OBJECTS SHIFT REGISTERS LOAD LOGIC

IMAGE SELECTION LOGIC

(Which Moving Object?)

NOT USED SPECTAR

32x8 PROM

14H

6331

PROG # 5YLM8-1

MOVING OBJECTS SHIFT REGISTERS CONTROL LOGIC

RECREATIVOS FRANCO, S.A.

7

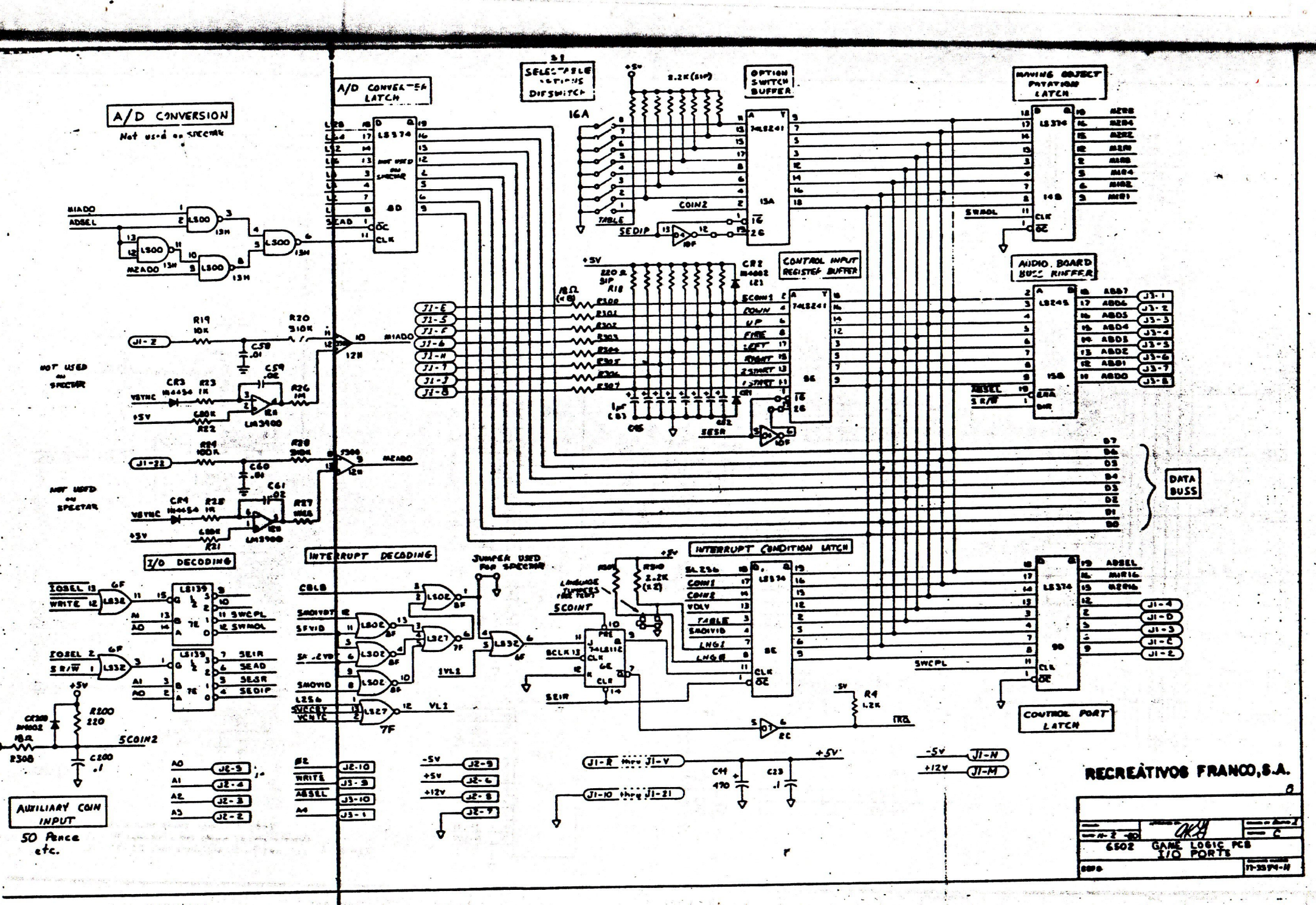
6502 GAME LOGIC PCB

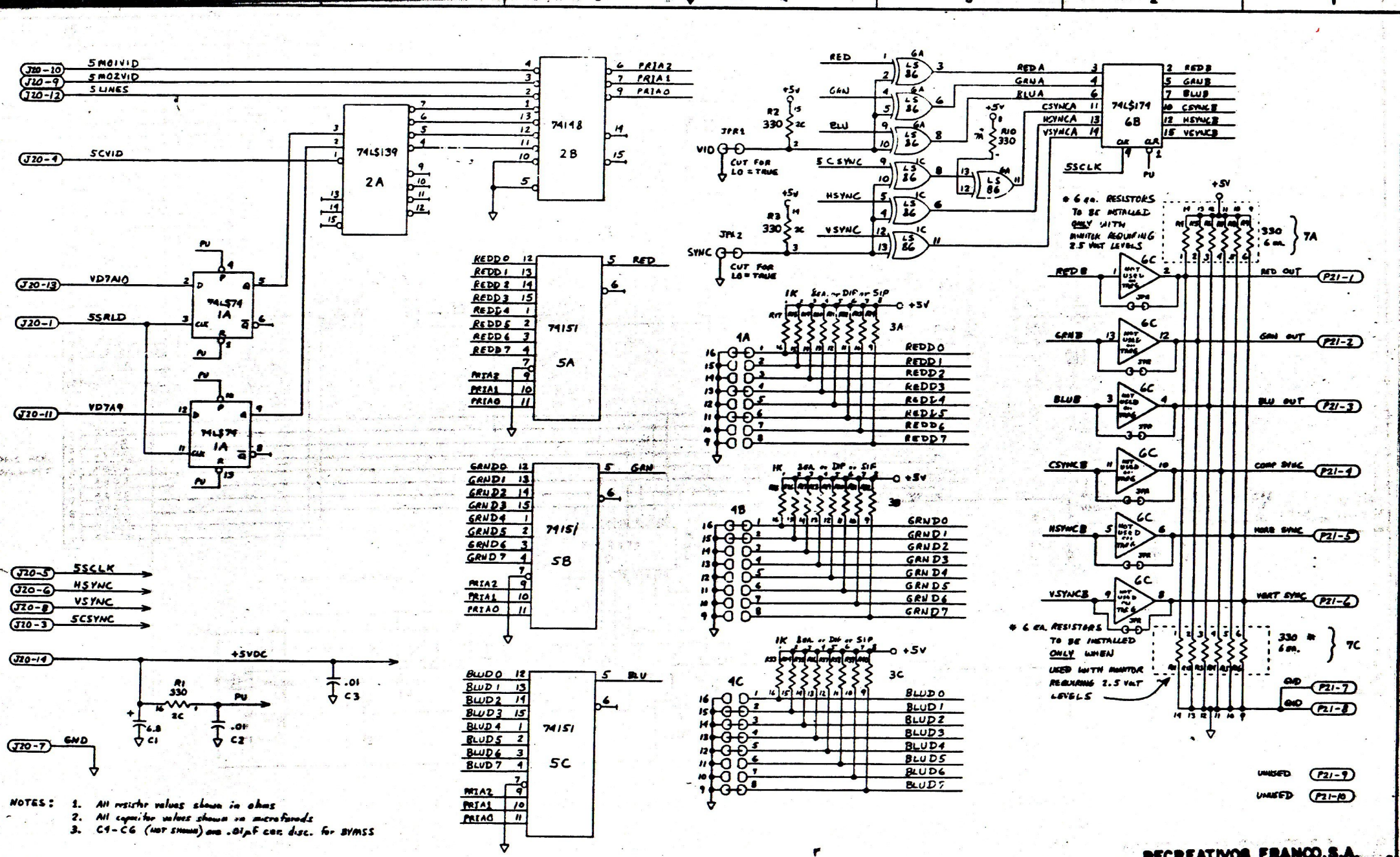
		SHEET C

MOVING OBJECT VIDEO GENERATION

7 OF 8

71-3196-01

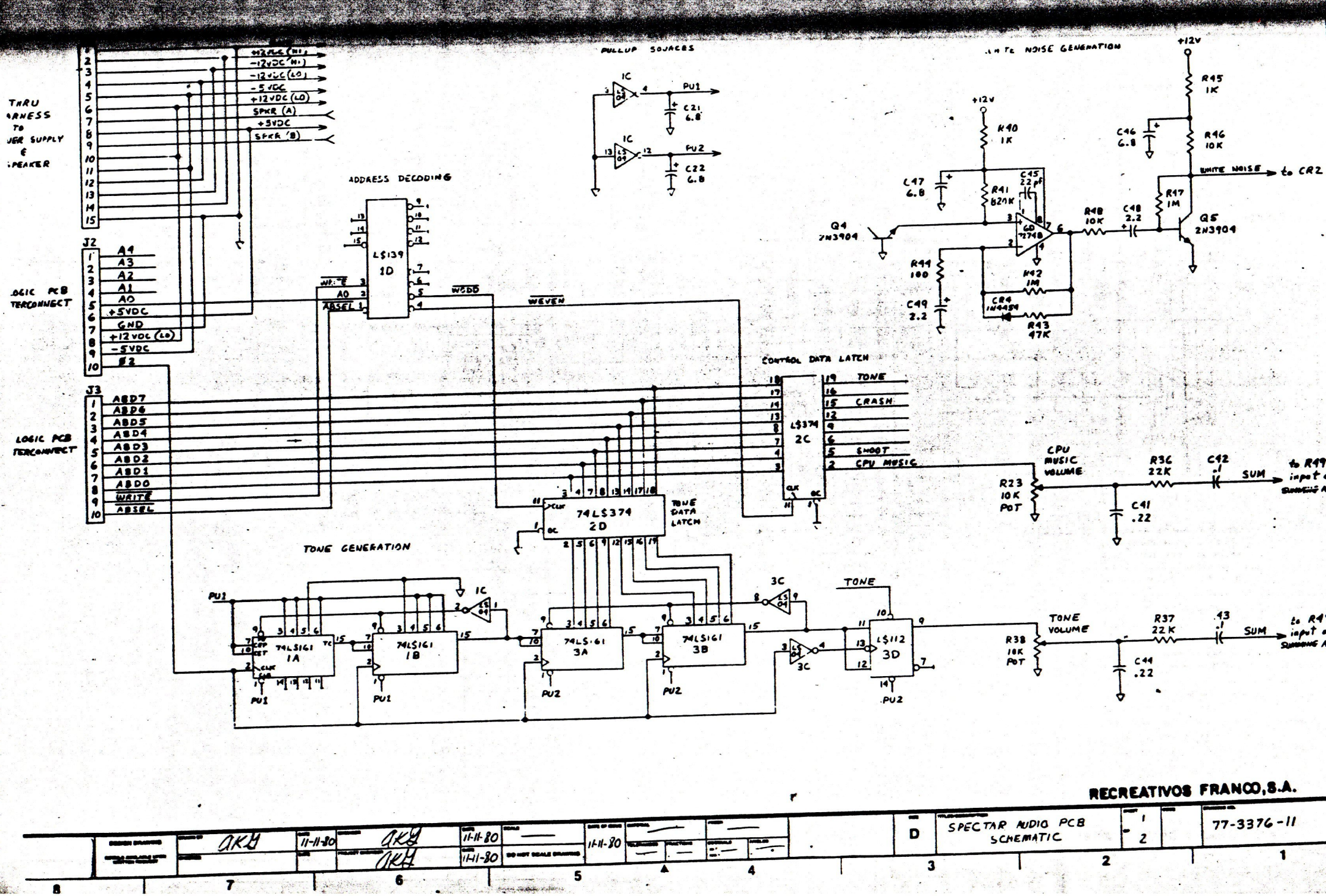

A/D CONVERSION
Not used on SPECTAR
A/D CONVERTER LATCH
LS374
8D
MIADO
ADSEL
MZADO
LS00
13M
HOT USED on SPECTAR
R19 10K
R20 510K
J1-Z
C58 .01
CR3 IN4454
R23 1K
C59 .02
VSYNC
+5V
R22 680K
R26 1M
LM3900
12H
MIADO
R24 100K
R28 390K
C60 .04
C61 .02
R27 100K
R21 680K
J1-22
MZADO
I/O DECODING
IOSEL
WRITE
R/W
LS32
LS139
7E
SWCPL
SWMOL
SEIR
SEAD
SESR
SEDIP
AUXILIARY COIN INPUT
50 Pence etc.
R200 220
CR200 IN4002
R208
C200 .1
5COIN2
INTERRUPT DECODING
CBLB
SAOVBT
SFVID
SAOVID
LZ56
SUCCBY
VCNTC
LS02
LS27
7F
8F
VL1
JUMPER USED FOR SPECTAR
SCOINT
BCLK
74LS112
6E
SEIR
INTERRUPT CONDITION LATCH
SA256
COIN1
COIN2
VOLV
TABLE
SAOVID
LNG1
LNGR
LS374
8E
SWCPL
R30 2.2K (x7)
R4 1.2K
IRQ
8C
8 SELECTABLE OPTIONS DIPSWITCH
16A
+5V
2.2K (8HP)
OPTION SWITCH BUFFER
74LS241
15A
COIN2
TABLE
SEDIP
10F
MOVING OBJECT PAYMENT LATCH
SWMOL
14B
CONTROL INPUT REGISTER BUFFER
CR2 IN4002
220 Ω SIP
R18
R100
R101
R302
R303
R304
R305
R306
R307
SCOIN1
COIN
UP
FIRE
LEFT
RIGHT
2START
1START
1uF
C65
C66
C62
SESR
9B
AUDIO BOARD BUSS INTERFACE
LS245
15B
ABD7
ABD6
ABD5
ABD4
ABD3
ABD2
ABD1
ABD0
RESET
S R/W
J3-1
J3-2
J3-3
J3-4
J3-5
J3-6
J3-7
J3-8
DATA BUSS
D7
D6
D5
D4
D3
D2
D1
D0
CONTROL PORT LATCH
LS374
9D
ADSEL
MIR16
MZR16
J1-4
J1-D
J1-3
J1-C
J1-2
AO
A1
A2
A3
J2-9
J2-4
J2-3
J2-2
WRITE
ADSEL
A4
J3-9
J3-10
J3-1
-5V
+5V
+12V
J2-9
J2-6
J2-8
J2-7
J1-R thru J1-V
J1-10 thru J1-21
C44 470
C23 .1
-5V
+12V
J1-N
J1-M
RECREATIVOS FRANCO, S.A.
6502 GAME LOGIC PCB I/O PORTS
11-13574-H



NOTES:
1. All resistor values shown in ohms
2. All capacitor values shown in microfarads
3. C1-C6 (not shown) are .01μF ceramic disc. for BYMSS

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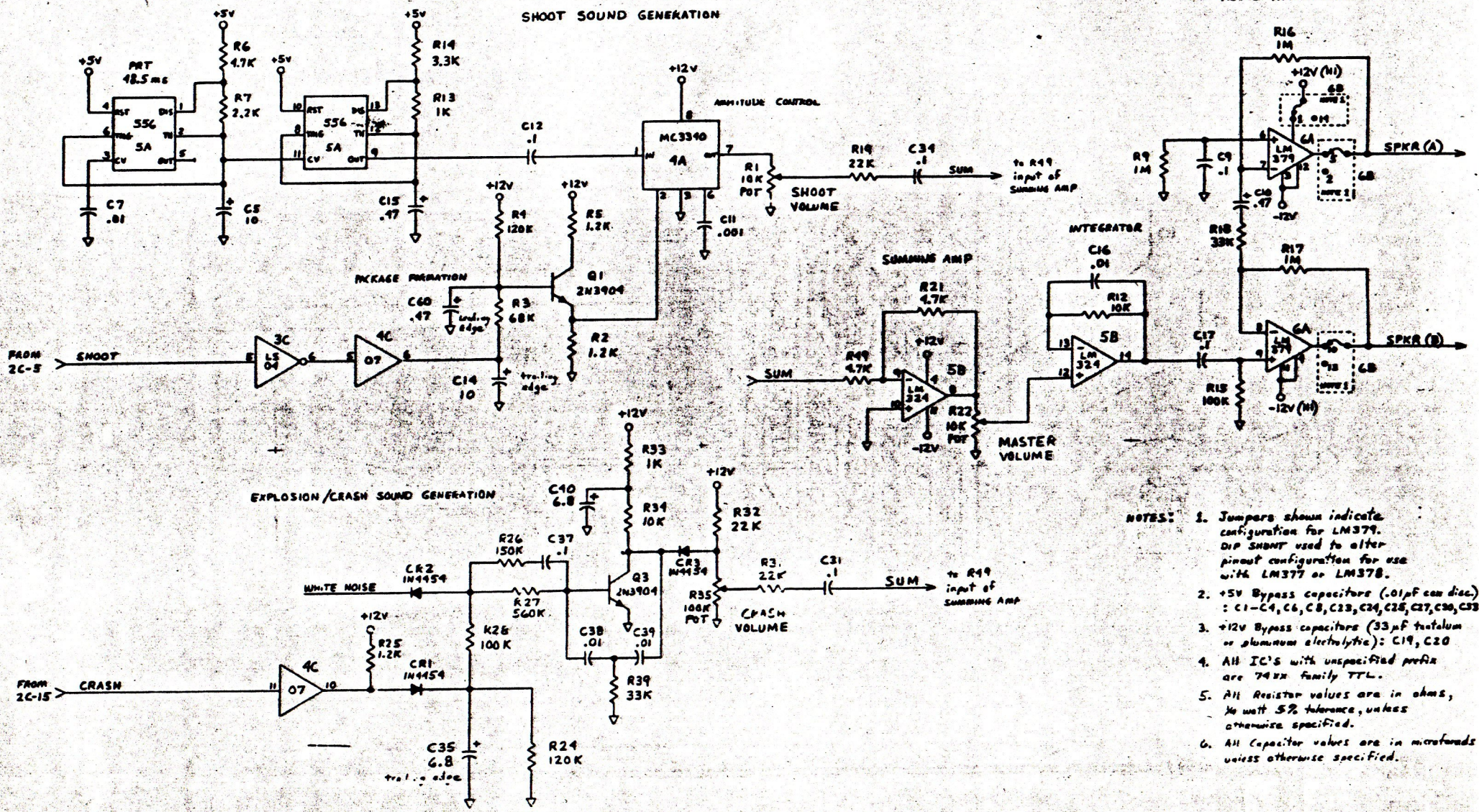
AKH 1127 VS	4-24-80	AKH REV B 11-17-80	4-24-80	1 OF 1		6502 Based VIDEO GAME		D	COLOR ADAPTER PCB		77-3373-11	B
8	7		6		5		4	3	2		1	



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		AKH	11-11-80	AKH	11-11-80		11-11-80				D	SPECTAR AUDIO PCB SCHEMATIC	1 / 2		77-3376-11	

8 7 6 5 4 3 2 1



NOTES:

1. Jumpers shown indicate configuration for LM379. DIP SHUNT used to alter pinout configuration for use with LM377 or LM378.
2. +5V Bypass capacitors (.01μF ceramic disc.): C1–C4, C6, C8, C23, C24, C25, C27, C30, C33.
3. +12V Bypass capacitors (33μF tantalum or aluminum electrolytic): C19, C20
4. All IC's with unspecified prefix are 74XX family TTL.
5. All Resistor values are in ohms, ¼ watt 5% tolerance, unless otherwise specified.
6. All Capacitor values are in microfarads unless otherwise specified.

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	JKL	11-11-80	TKG	11-11-80	—			D	SPECTAR AUDIO PCB SCHEMATIC	2 of 2	77-3376-11	A