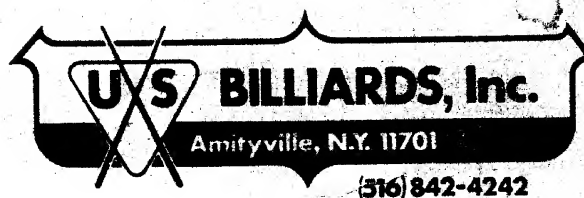


**technical manual for**

**QUASAR**



## STARTING OPERATIONS

- Open back door to extract power supply cable.
- Before connecting the game some inspections should be made. These visual inspections are important for the damages which might have been caused during transport.
  1. Check that all connectors are connected.
  2. Check that all mechanical parts are in correct position.
  3. Check that safety switch at the bottom back board works correctly and that is to say:  
When assembling back door and closing it slowly one should hear the microswitch contact shut off.
  4. Make sure that earth socket is connected.

## INSTALLATION AND MAINTENANCE

The CRT used in our games is like those employed on regular television sets, therefore, please handle with care so as not to damage it.

- Do not set up the game in open and very lighted areas, as the quality of image would be greatly damaged.
- Do not set up the game close to heating sources and keep it 10 cm. from the back wall.
- If, when game is on, no image appears on the screen, check power supply fuses and if connectors are properly connected.
- If the screen is lit up but there is no image, check that C.P.U. board connectors are properly connected.
- If the image slowly moves toward the side, it can be caused by a close magnet or by a transformer which might cause strong wavinesses.

If, the game is turned around itself on power on, it might happen that the image on the screen will change colour. This is caused by the earth magnetic field.

To have the right colours again, only turn off the game for 5 minutes and then turn it on again.

PLEASE DO NOT CHANGE THE IMMATRICULATION LABELS BOTH ON THE CABINET AND ON THE ELECTRONIC BOARDS TO AVOID DISCUSSIONS IN CASE OF SERVICING.

## VIDEO GAME "QUASAR" or "NOVA"

### DESCRIPTION OF THE GAME

The game consists in ending space missions by overcoming obstacles which appear from time to time, and avoiding enemies which attack player ship.

Each mission is divided in 4 phases (Phase 1,2,3,4)

Each phase is different both for the game and the scenery.

Each time a mission is finished, begins a new mission with greatest difficulties, and thus the player can test his skills forever.

The game can be for one or two players who will alternate each time a ship is hit.

Each player has 2 pushbuttons (or a small lever) to move the ship to the left and right hand side during the first phase and to rotate it during the second and fourth phase. There is a firing pushbutton and one to advance everywhere in the screen.

### PHASE 1

During the 1st phase the ship is at the bottom. Flying saucers appear from the top and advance toward the ship. Player has to fast eliminate them because at a given distance they fire missiles. Furthermore the ship slowly rises and risks to be hit from the bottom in case some flying saucers are able to pass below. For each flying saucer hit 20 points are awarded. The number of flying saucers is 8, during the second mission they will become 16.

### PHASE 2

During the 2nd. phase the ship can be moved all around the monitor with pushbuttons.

This ship can be therefore rotated around itself or can advance. Enemies during this phase are of two different kind and arrive at random to the left and right hand side.

The score (3000) is indicated at the top right hand side. It is the quantity of energy supply available and will decrease automatically each time the player fires a missile.

In case the energy supply exhausts itself before having eliminated all the enemies, player ship will explode and the game will start again the 2nd. phase. If, on the contrary, the player succeeds and eliminates all his enemies, the remaining energy supply will be summed up to the player score.

There are, during this phase, 8 enemies, in the 2nd. mission they will become 16 with power supply of 5000.

For each ship hit 30 points are awarded.

### PHASE 3

During the 3rd. phase there is at the top a big star ("QUASAR" or "NOVA") with an eye at the centre. This star sends a light beam to the player ship which is at the bottom.

The star and the light beam move to the left and right hand side and the player has to keep the ship within the light beam in order to be attracted toward the star avoiding the meteorites which he encounters during his trip.

When the eye of the star is hit the advancing speed increases.

If the ship leaves the light beam it will be automatically drawn back.

The light beam become thinner as time goes by. The star has therefore to be reached before the time exhausts itself, this has to be done in order to start the 4th phase.

If the light beam exhausts itself the ship will explode and the game will start at the 1st. phase, if, on the contrary, the ship is hit by a meteorite the same will explode and the game will start at the 3rd. phase.

### PHASE 4

During the 4th. phase the player ship is at the centre and is attacked by enemies appearing from everywhere which convey toward the centre. Player has to hit all enemies rotating around itself before they touch his ship.

The ship will explode if an enemy has reached it and the game will start from the beginning of the 4th. phase.

The ship movement is always toward the enemies, that is to say, every rotating movement made by the player with the ship is always in the direction of the enemies.

For each enemy shot 100 points are awarded.

The number of missions brought to an end is indicated with a asterisk over corresponding player score.

Game is over when all available ships are finished.

Extended play can be programmed (1 extra ship) at 5500 points or 7500 points or 9500 points.

Free play can be programmed only on random high score in one of the 4 range of scores which are:

10.000 + 11.500. or 12.500 + 14.000. or 15.000 + 16.500. or 17.500 + 19.000.

# SWITCHES

## ADJUSTMENT

SWITCH 1 «3M»									
	1	2	3	4	5	6	7	8	
Coin mechanism 1			ON ON						2 coins 1 play
			OFF ON						1 coin 1 play
			ON OFF						1 coin 2 plays
			OFF OFF						1 coin 3 plays
Coin mechanism 2	ON ON								1 coin 1 play
	OFF ON								1 coin 2 plays
	ON OFF								1 coin 3 plays
	OFF OFF								1 coin 5 plays
N° Rockets					ON ON				3 rockets
					OFF ON				4 rockets
					ON OFF				5 rockets
					OFF OFF				6 rockets
SERVICE							ON		Normal game
							OFF		Free game
								ON	"Test" collis excl.
								OFF	"Game" collis incl.

SWITCH 2 «3N»									
	1	2	3	4	5	6	7	8	
High score (H.S.)	ON	X	X						Normal "HS"
	OFF	OFF	ON						Low "HS" 10000-11500
	OFF	ON	OFF						Med. low "HS" 12500-14000
	OFF	OFF	OFF						Med. high "HS" 15000-16500
	OFF	ON	ON						High "HS" 17500-19000
Game difficulties				ON ON					Easy game
				OFF ON					Medium game
				ON OFF					Difficult game
				OFF OFF					Very difficult game
Extended play						ON ON			No extended
						OFF ON			5500 points 1rocket
						ON OFF			7500 points 1rocket
						OFF OFF			9500 points 1rocket
OPTIONAL								ON	Rocket leaves the screen
								OFF	Rocket stops at sides

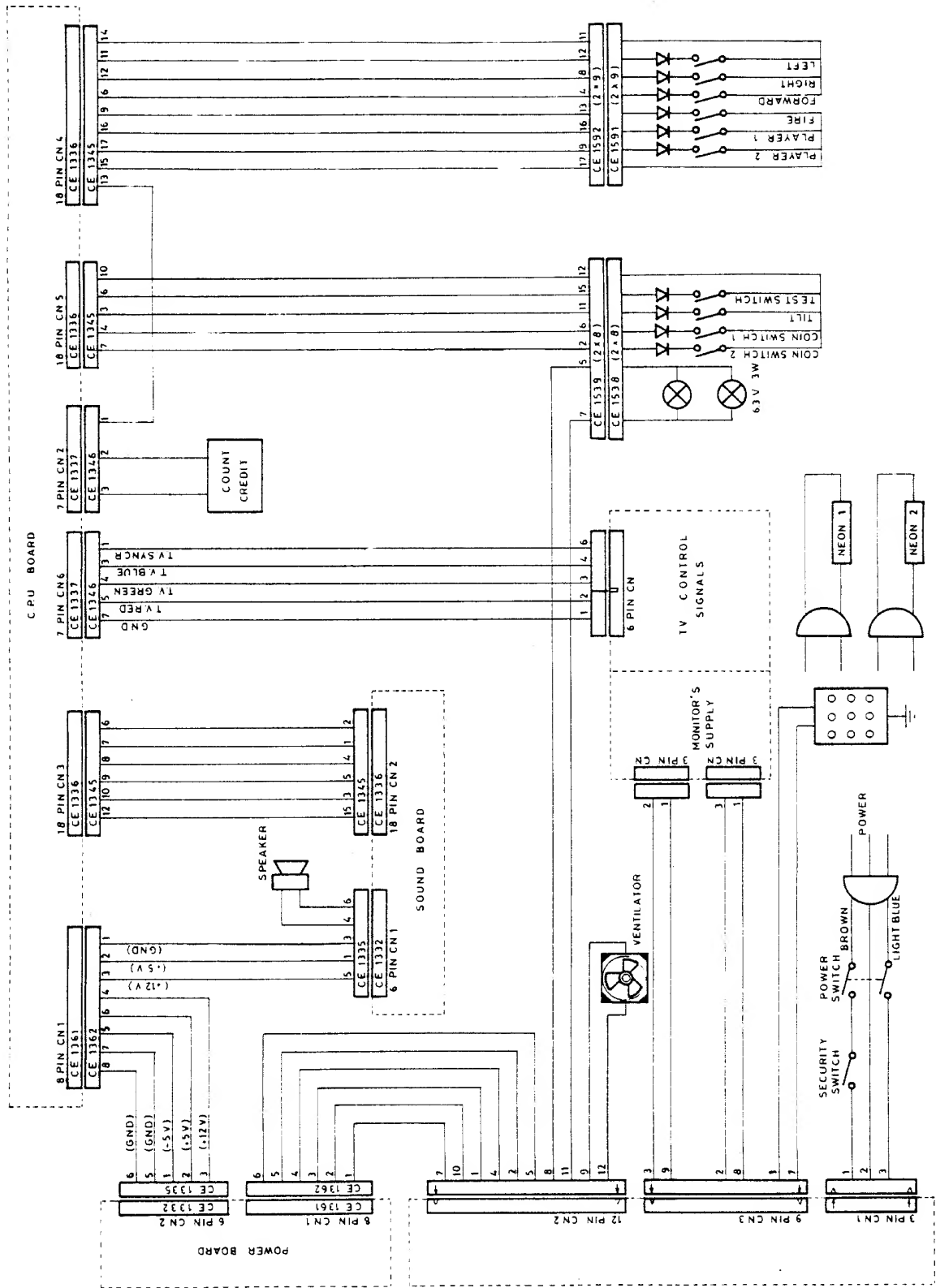
Note : X = ON or OFF condition is the same

SOUND SWITCH				
1	2	3	4	
ON				Test
OFF		ON	OFF	Quasar Sound

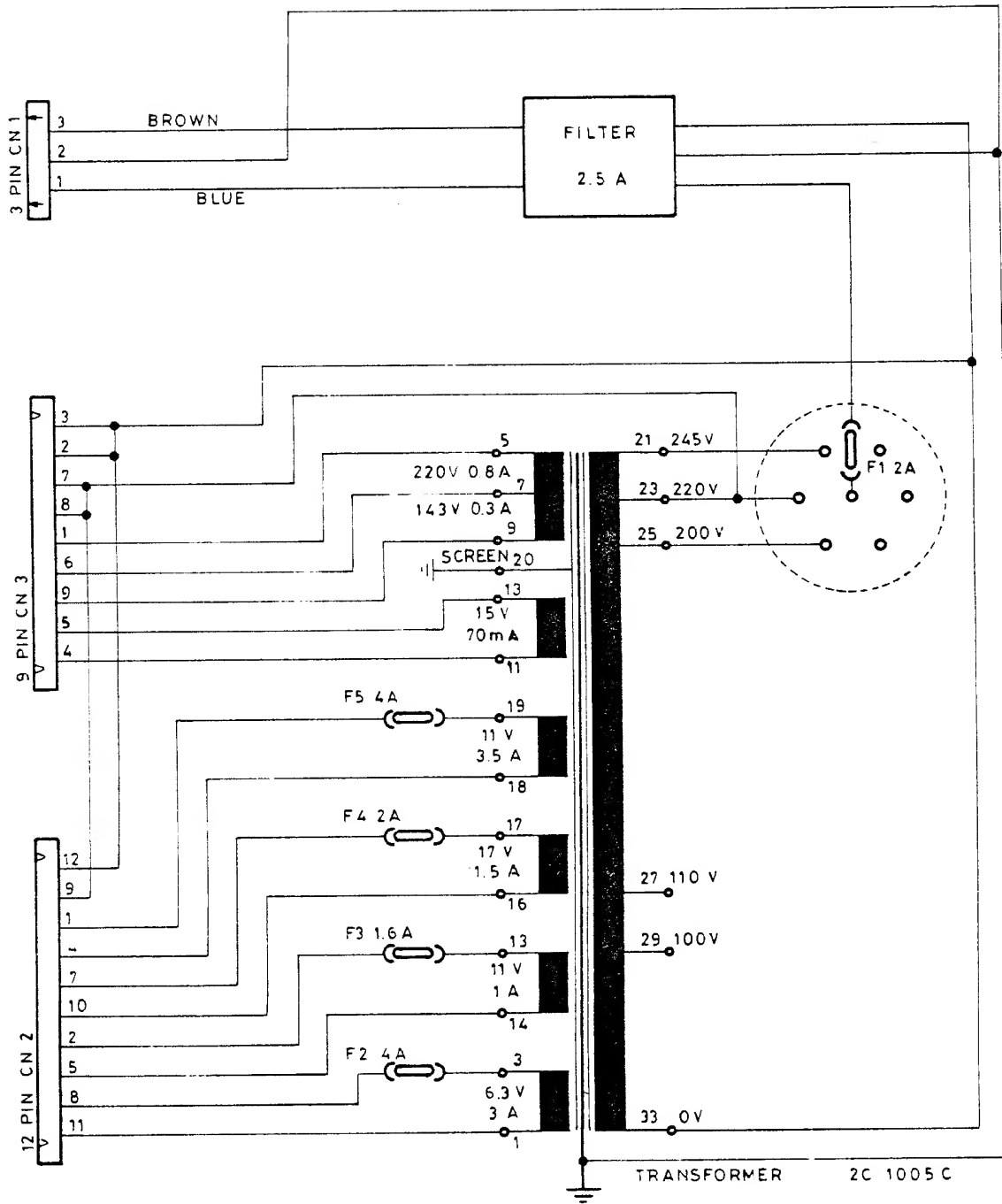
Notes:

- 1) Switch 2 is not used
- 2) Do Not use other combination

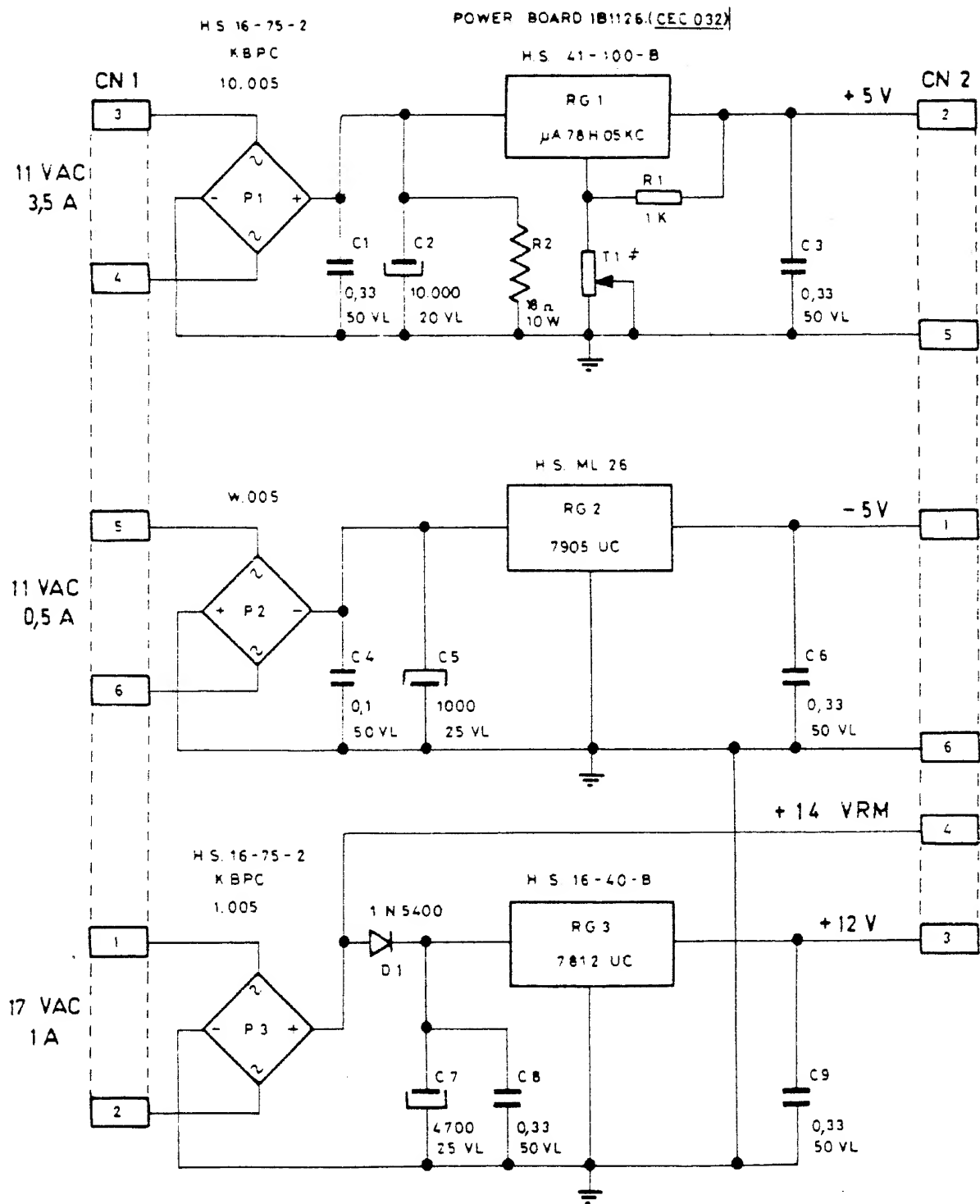
# WIRING DIAGRAM FOR QUASAR



# POWER TRANSFORMER FOR QUASAR

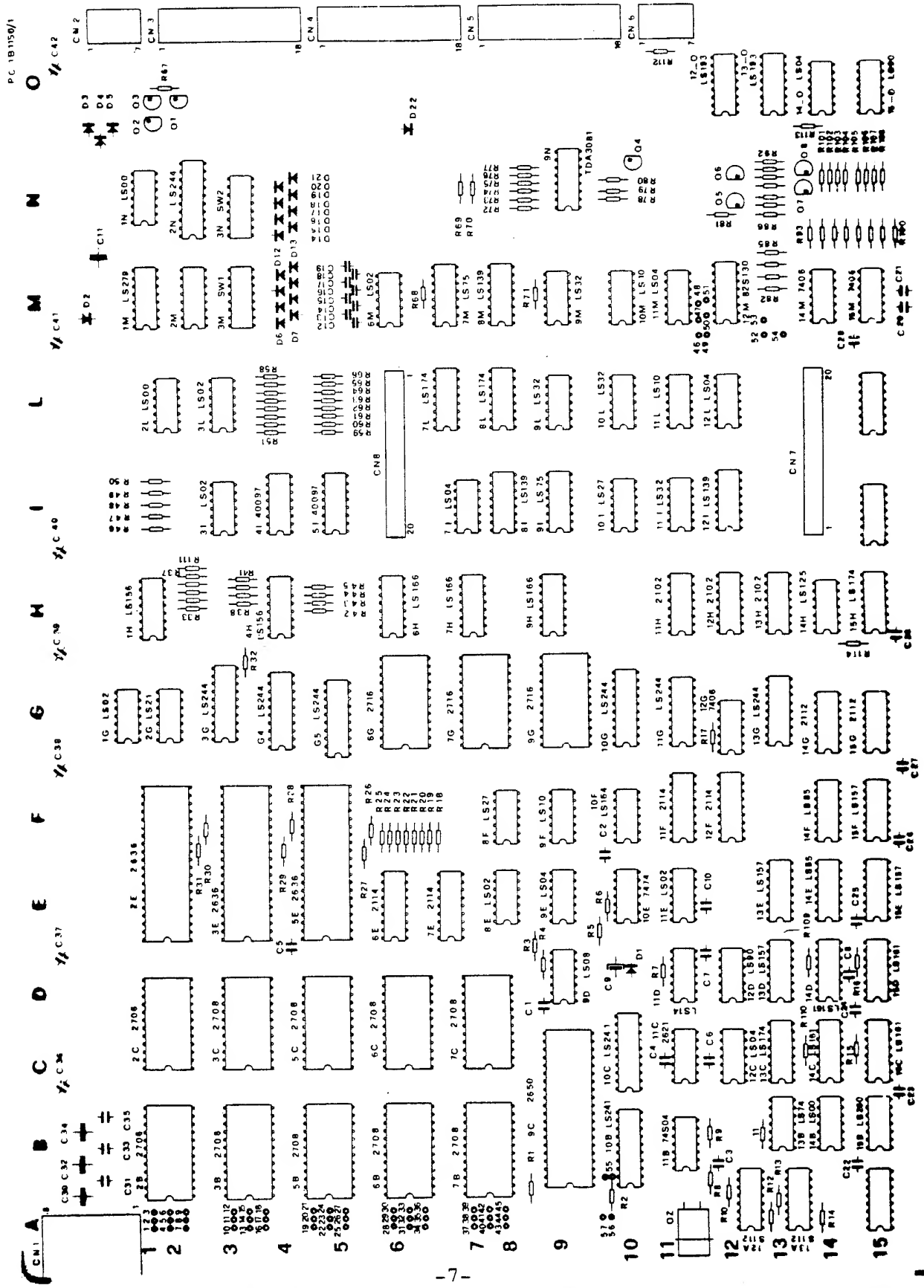


# POWER SUPPLY FOR QUASAR

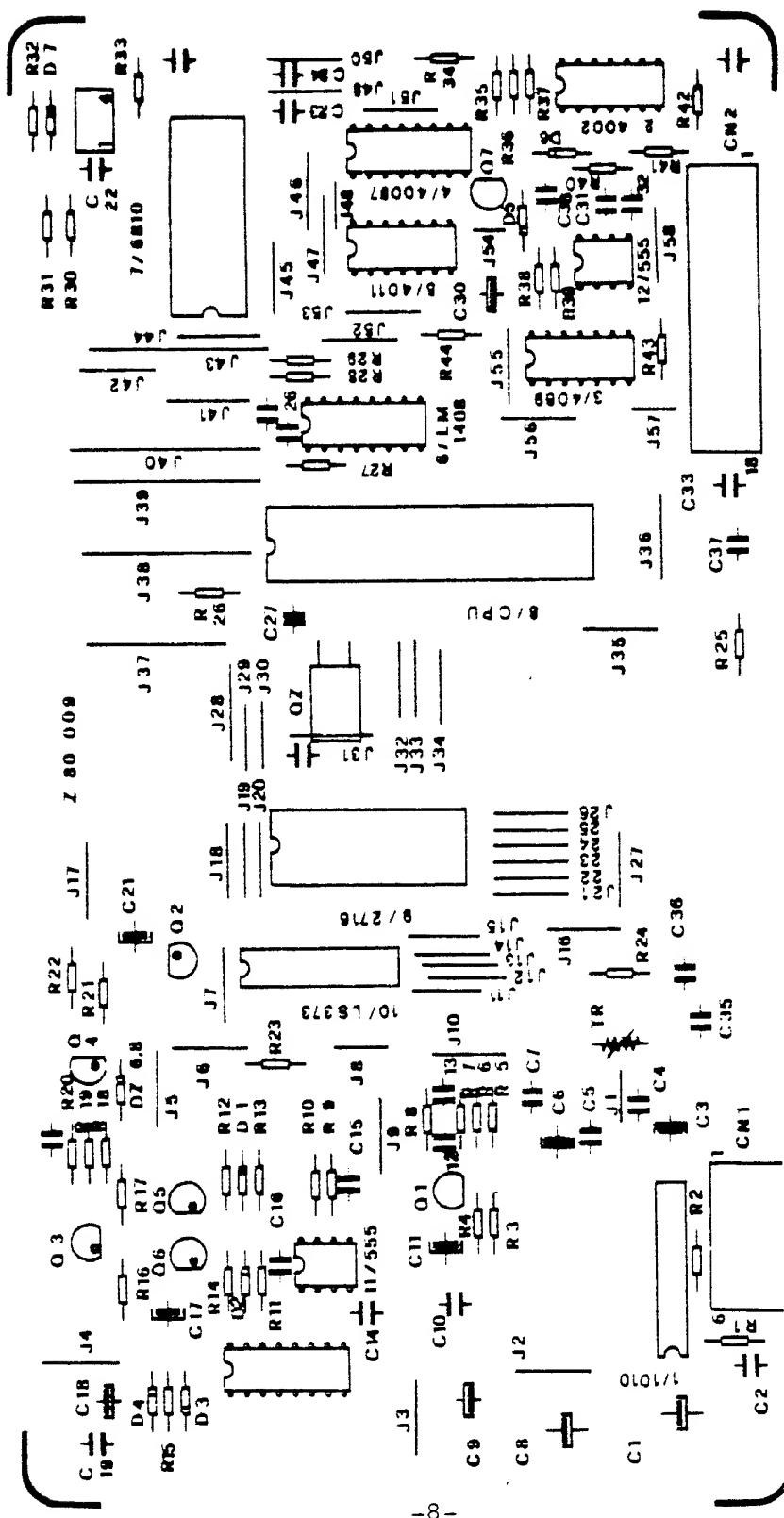


± 47 Ω TRIMMER or 22 Ω 1/4 W 5% RESISTOR

# MAIN LOGIC BOARD PARTS LAYOUT DIAGRAM - QUASAR

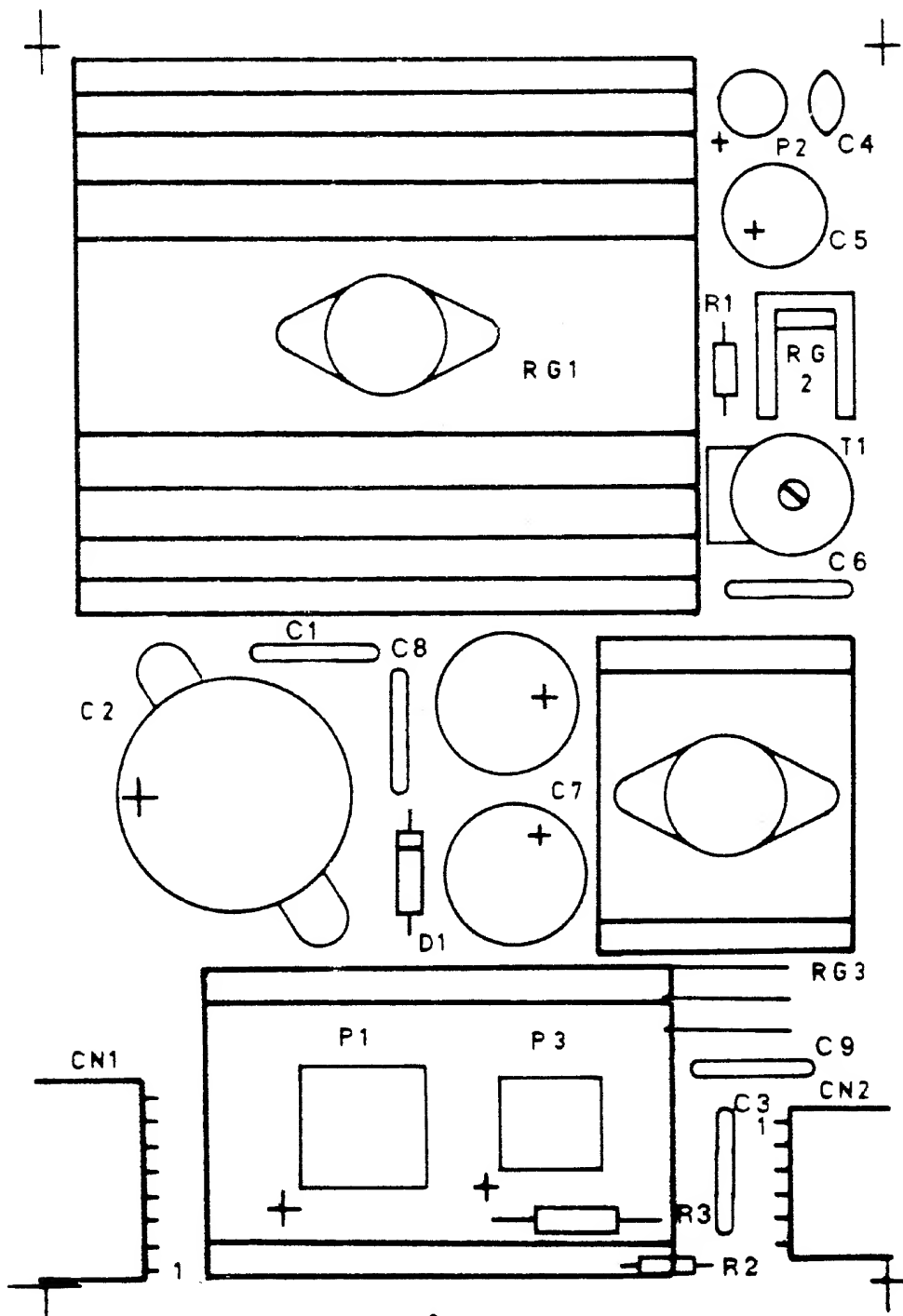


AUDIO BOARD FOR QUASAR





## POWER SUPPLY PARTS LAYOUT DIAGRAM - QUASAR



## PARTS LISTING - QUASAR

<u>Part #</u>	<u>Description</u>
521	Coin Chute (25¢)
335	Dutch Cash Door, Frame with Cash Box
338	Cash Box Only for Dutch Cash Door
7002	Leg Leveler - each
11700	Back Service Door
11701	Speaker Grill - 6"x9"
11702	TV Monitor Cardboard Mask
11703	TV Monitor Cardboard Side Panel - Right
11704	TV Monitor Cardboard Side Panel - Left
11705	Plastic Header Screened
11706	Instruction Decal
11707	Front Plastic Window - 23-1/2x17-1/2x3/16
11708	Frame for Front Plastic Window
11709	Decal, Side - Right
11710	Decal, Side - Left
11711	Instruction Manual
11712	Schematic Booklet

### METAL PARTS

11763	Control Panel complete with buttons
11713	Control Panel with graphics without buttons
11762	Graphics alone for Control Panel
11714	California Switch Bracket
11715	PC Board perforated metal screen
11716	Plastic Header Holding Spring
11717	Rear Monitor Support Strap
11718	Rear Monitor Plate

### TRIM

11719	Black T-Moulding for one side - 128"
11720	Aluminum Trim - 24"
11721	Black T-Moulding - 24"

### LOCKS

1486	Random Lock with Key & Hardware
1487	#1150 Lock with Key & Hardware

### INSTRUCTIONS & LABELS

2949	"Caution High Voltage"
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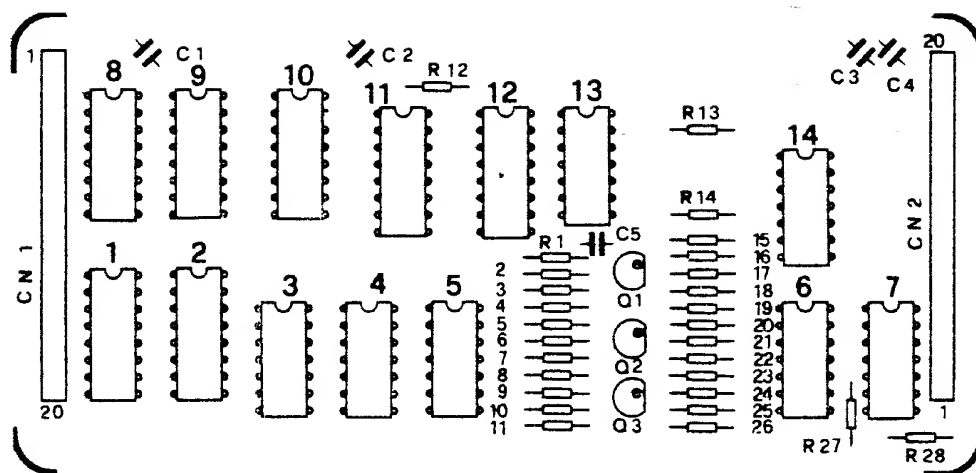
## PARTS LIST - QUASAR (continued)

### ELECTRICAL PARTS

11722	Complete Game Board
11723	Complete Audio Board
11724	Bulb for Coin Chute - 63V
11725	Red Push Button Assembly (Fire)
11726	White Push Button Assembly (Player 1, Player 2)
11727	Green Push Button Assembly (Aim)
11728	Leaf Switch For Push Buttons & Holder Assembly
11729	Holder for Push Buttons
11730	Color Monitor
11731	Speaker - 6"x9"
11732	Power Supply Complete
11733	P1, 50V, 10 Amp Bridge (KBPC 10-005)
11734	P2, 50V, 1 Amp Bridge (W-005)
11735	P3, 50V, 3 Amp Bridge (KBPC 1-005)
11736	RG1, +5V, 5 Amp Regulator (MA 78H05KC)
11737	RG2, -5V, 1 Amp Regulator (MA 7905UC)
11738	RG3, +12V, 1 Amp Regulator (MA 7812UC)
11739	D1, IN 5400 Diode
11740	C1,2,3,6,8,9 - .33MF 50V Cap
11741	C2-10000MF 16V CAP
11742	C4-.1MF 50V CAP
11743	C5-100MF 25V CAP
11744	C7-2200MF 25V CAP
11745	R1-1K $\frac{1}{4}$ W
11746	R2-18 Ohm 20W
11747	T1-470 Ohm 1 Turn Vertical Trimmer (22 Ohm $\frac{1}{4}$ Watt)
11748	Transformer Group Complete
11749	110 or 220 Multitap Transformer - 2C 1005C
11750	110 to 220 Step Up Transformer - 130 VA
11751	Line Filter SIEMENS B81931-B-B1
11752	F1 Line Adjuster with 4A Fuse (Special Small Size)
11753	Fuses F2 4A
11754	Fuses F3 1.6A
11755	Fuses F4 2A
11756	Fuses F5 4A
11757	Fan - 220V B7240
11758	AC on Power Switch A4425
11759	California Switch - B5050
11760	Wiring Harness Complete
10110	Fluorescent Fixture
10111	Fluorescent Bulb
2356	6 Volt DC Counter
10529	Triple Outlet

### HARDWARE

11761	Pal Nut for Push Button Switch
1296	3/18-16 T-Nut Pronged (for Leg Leveler)



Auxiliary Board on Game Mother Board for Quasar

	col 7							col 8
write 0	switch	tilt	shoot 1	shoot 2	get 2	get 1	play 2	play 1
row 0	collaud							

	col 7							col 8
write 0	count	forward	forward	left 1	left 2	right 1	right 2	tavolino
row 1	enable	1	2					

row 0 - row 1 - sw 1 - sw 2 = ext read

	page 0		page 1		page 2
1FFF	user ram	3FFF	user ram	5FFF	user ram
1C00	write 0 - background	3C00	write 0 - background	5C00	write 0 - background
	write 1 - colour		write 1 - colour		write 1 - colour
	write 2 - effect		write 2 - effect		write 2 - effect
	write 3 - port blank		write 3 - port blank		write 3 - port blank
1800		3800		5800	
1700	pvi 3	3700	pvi 3	5700	pvi 3
1600	pvi 2	3600	pvi 2	5600	pvi 2
1500	pvi 1	3500	pvi 1	5500	pvi 1
1400	shell	3400	shell	5400	shell
	program		program		program
	from k0		from k5		from k10
	to k4		to k9		to k14
0000		2000		4000	

	sw 1-0						sw 1-1
write 0A	not	credit	laser	laser	get 1	get 1	get 2
sw 1	collis.						

0 - no 0 - norm. 00 - 2 00 - 2c 1pl 00 - 2c 1pl  
 01 - 4 01 - 1c 1pl 01 - 1c 1pl  
 1 - yes 1 - credit 10 - 5 10 - 1c 2pl 10 - 1c 2pl  
 11 - 6 11 - 1c 5pl 11 - 1c 5pl

	sw 2-0						sw 2-1
write 0B		ext.	ext.	diff.	diff.	high	high
sw 2		play	play			score	score

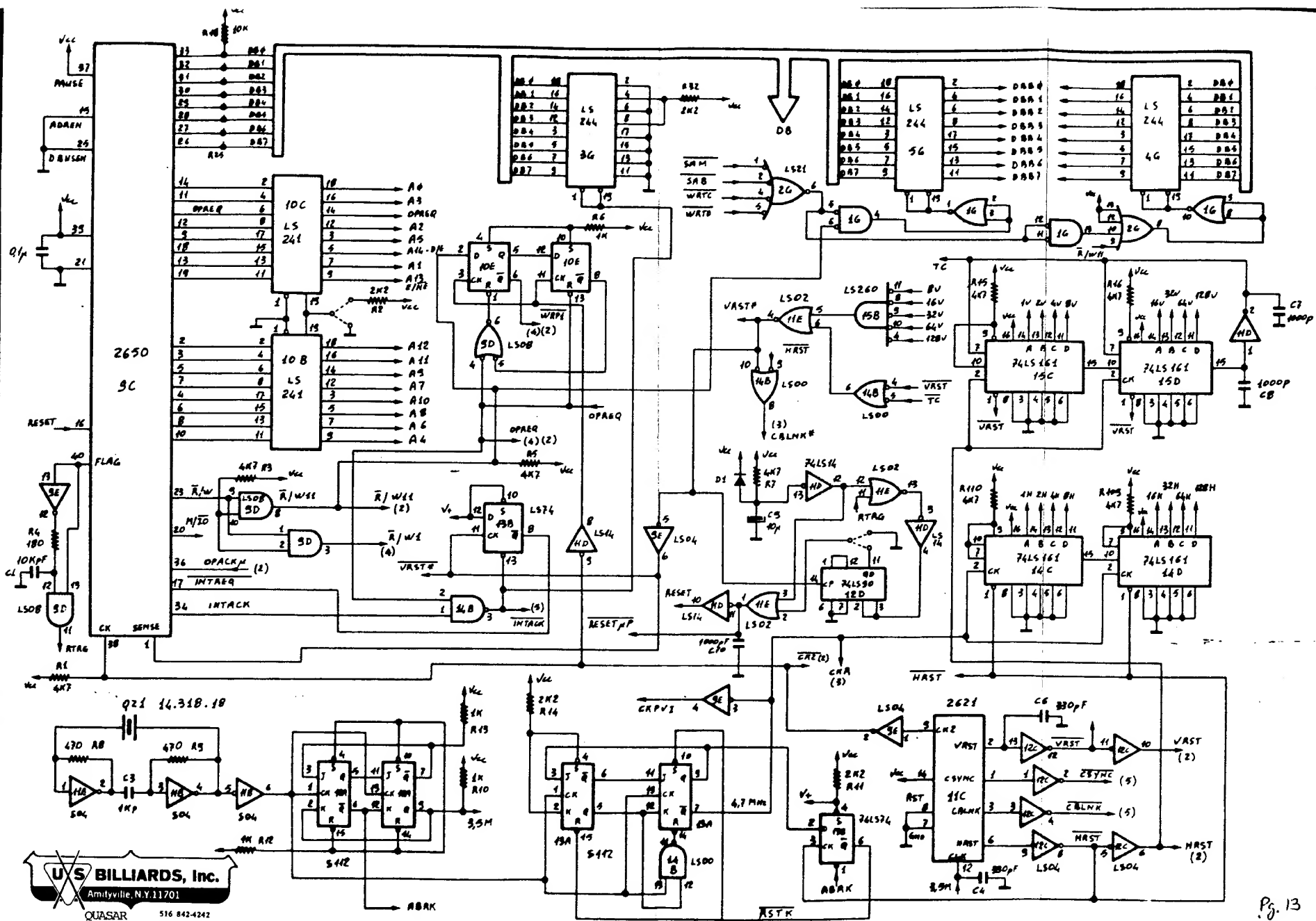
00 - no 00 - easy 00 - low 0 - norm.  
 01 - 2500 01 - medium 01 - medium low 1 - random  
 10 - 3500 10 - difficult 10 - medium high  
 11 - 5500 11 - most difficult 11 - high

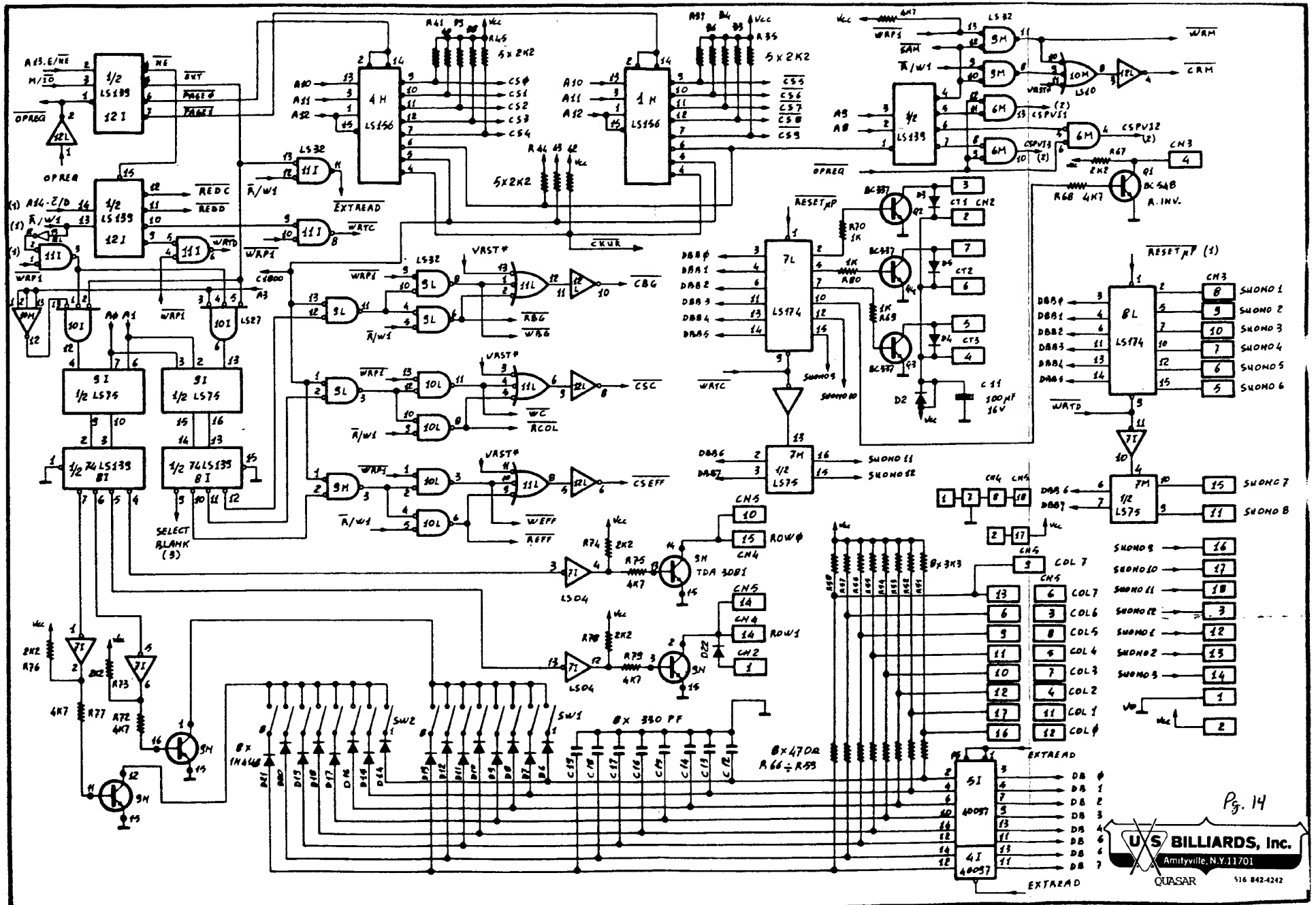
	db 7						db 0
wrtc						count.	count.
						english	bonus
							credit

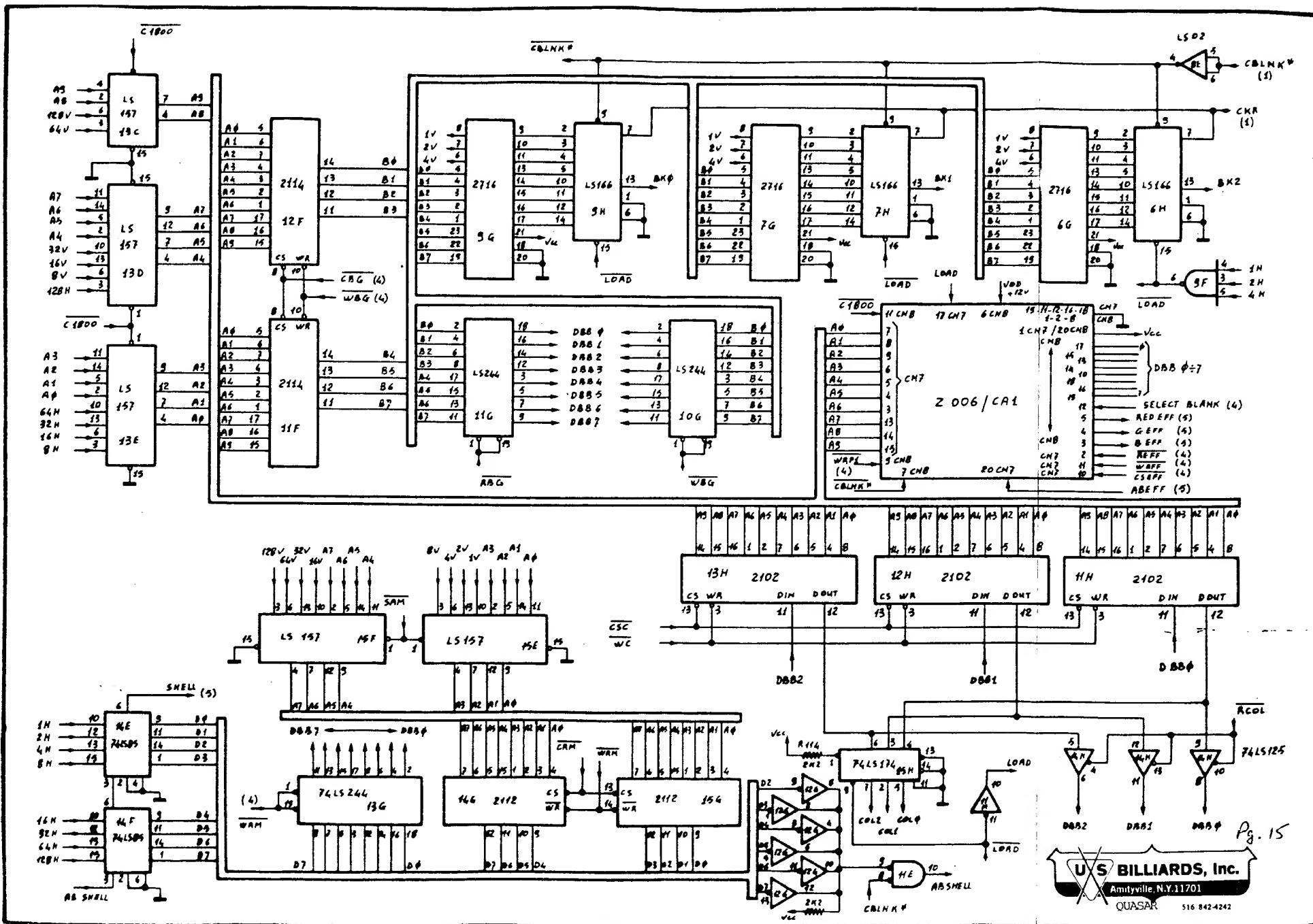
	db 7						db 0
wrt d				suono	suono	suono	suono
				invader	(D)	(C)	(B)
							(A)

MEMORY MAP AND I/O MAP

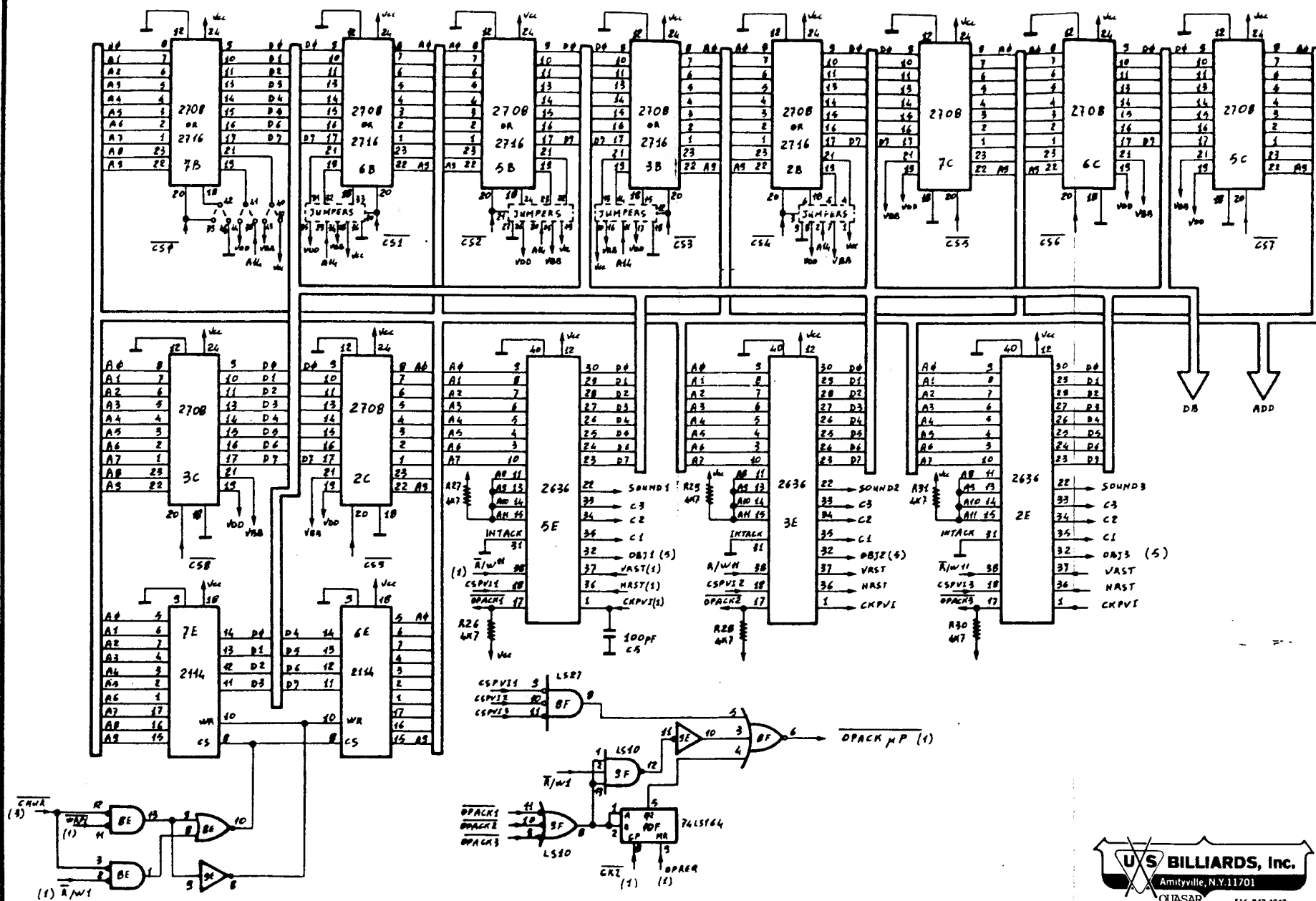


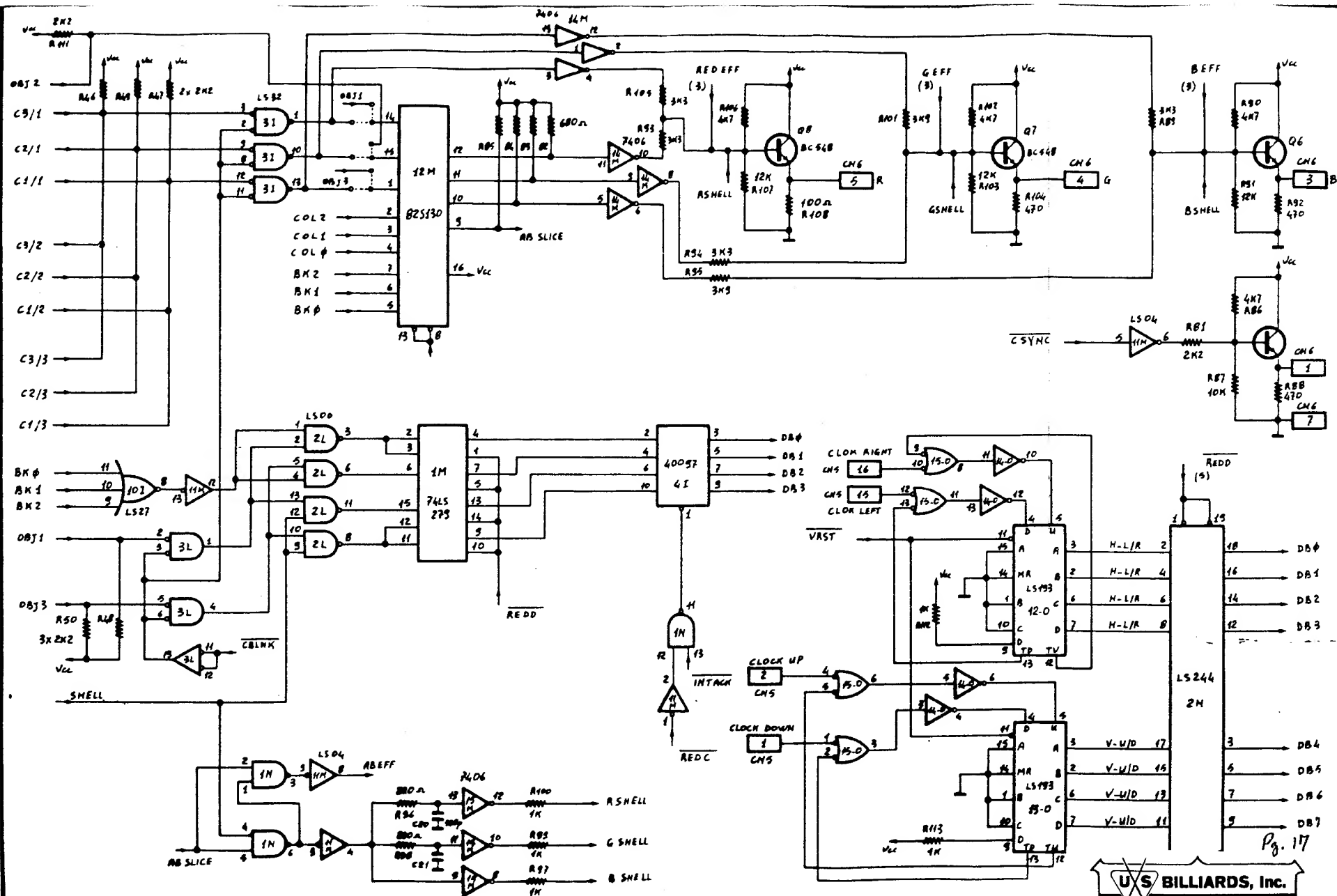


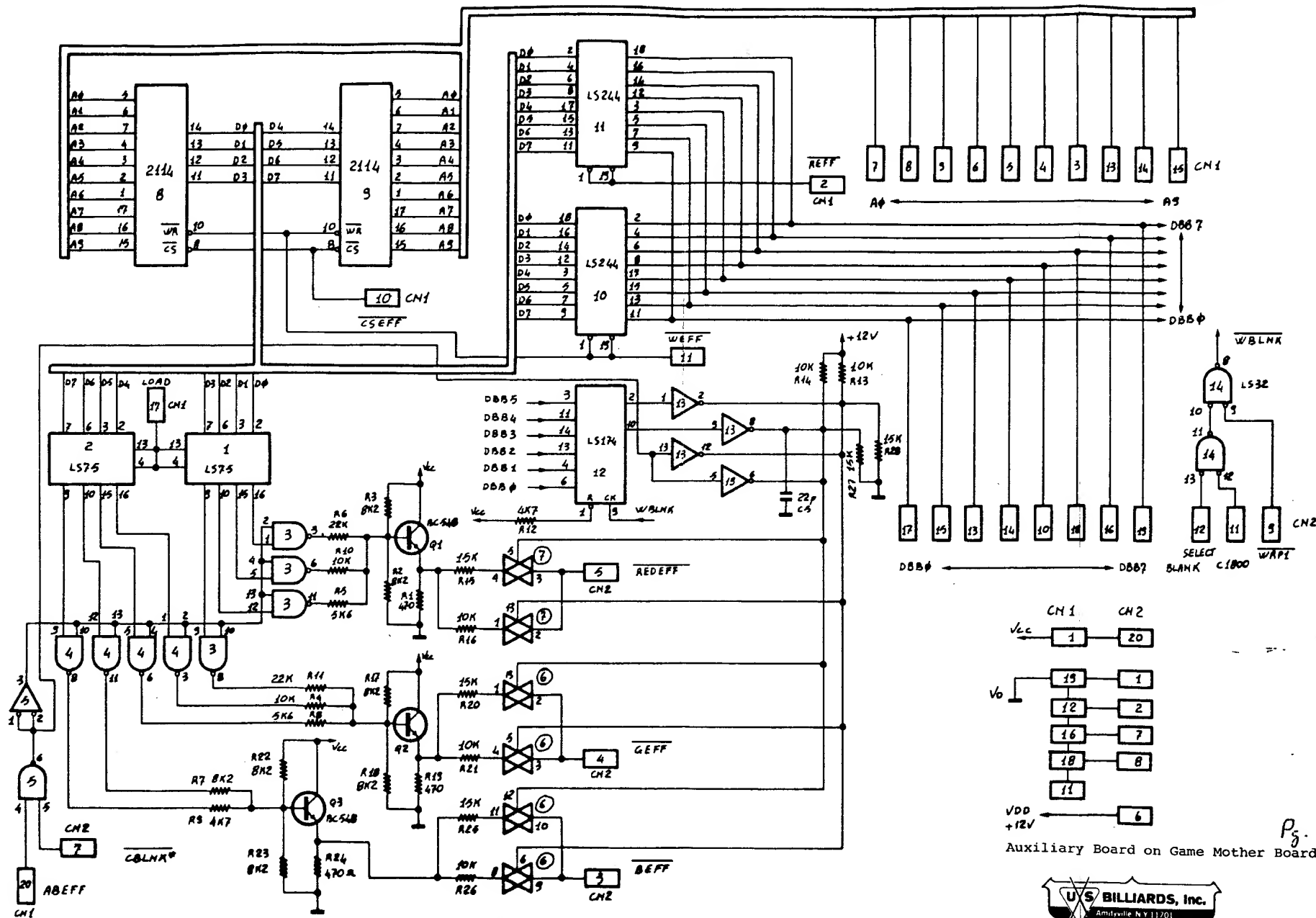












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Auxiliary Board on Game Mother Board



