

SERVICE MANUAL

centuri™

Manual No.375-10-0100

VANGUARD®

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# VANGUARD

CENTURI, INC.  
245 W. 74TH PLACE  
HIALEAH, FLA. 33014  
TEL. #(305) 558-5200

CUSTOMER SERVICE:  
TEL. #(305) 558-5200 (IN FLORIDA)  
TEL. #(800) 327-7710 (OUTSIDE FLORIDA)

VANGUARD  
TABLE OF CONTENTS

<u>I. INTRODUCTION:</u>	<u>PAGE NO.</u>
USER INFORMATION.....	1
GAME DESCRIPTION (FIGURE 1).....	2
GAME DESCRIPTION PARTS LIST FOR FIGURE 1.....	3
GAME SUMMARY.....	4,5
<u>II. SPECIFICATIONS:</u>	
INSTALLATION.....	6
ELECTRICAL REQUIREMENTS.....	6
110/220 VAC CONVERSION REQUIREMENTS.....	7
<u>III. OPERATION:</u>	
GAME INSTRUCTIONS.....	8
GAME POINT SCORING.....	8
OPERATIONAL OPTIONAL SWITCH SETTINGS.....	9
ROUTINE MAINTENANCE AND SERVICE.....	10
<u>IV. GENERAL:</u>	
CABINET CROSSECTION (FIGURE 4).....	11
CABINET CROSSECTION PARTS LIST FOR FIG. 4.....	12
FRONT PLATE EXPLODED VIEW (FIGURE 5).....	13
FRONT PLATE EXPLODED VIEW PARTS LIST FOR FIG. 5.....	14
COIN DOOR EXPLODED VIEW OF OPERATING MECHANISMS (FIGURE 6).....	15
COIN DOOR EXPLODED VIEW PARTS LIST FOR FIG. 6.....	16
COIN DOOR EXPLODED VIEW (FIGURE 7).....	17
COIN DOOR EXPLODED VIEW PARTS LIST FOR FIG. 7.....	18
CONTROL PANEL PARTS LIST FOR FIG. 2.....	19
8 POSITION JOYSTICK PARTS LIST FOR FIG. 3.....	20
SHINDENGEN POWER SUPPLY PARTS LIST.....	21,22
SK-4 (375-17-0100) PARTS LIST.....	23,24
SK-5 (375-17-0200) PARTS LIST.....	25
SK-6 (375-17-0300) PARTS LSIT.....	26
<u>V. DRAWINGS &amp; SCHEMATICS:</u>	
SK-6 SCHEMATIC (375-17-0300).....	27
CONTROL PANEL EXPLODED VIEW (FIGURE 2).....	28
8 POSITION JOYSTICK EXPLODED VIEW (FIGURE 3).....	29

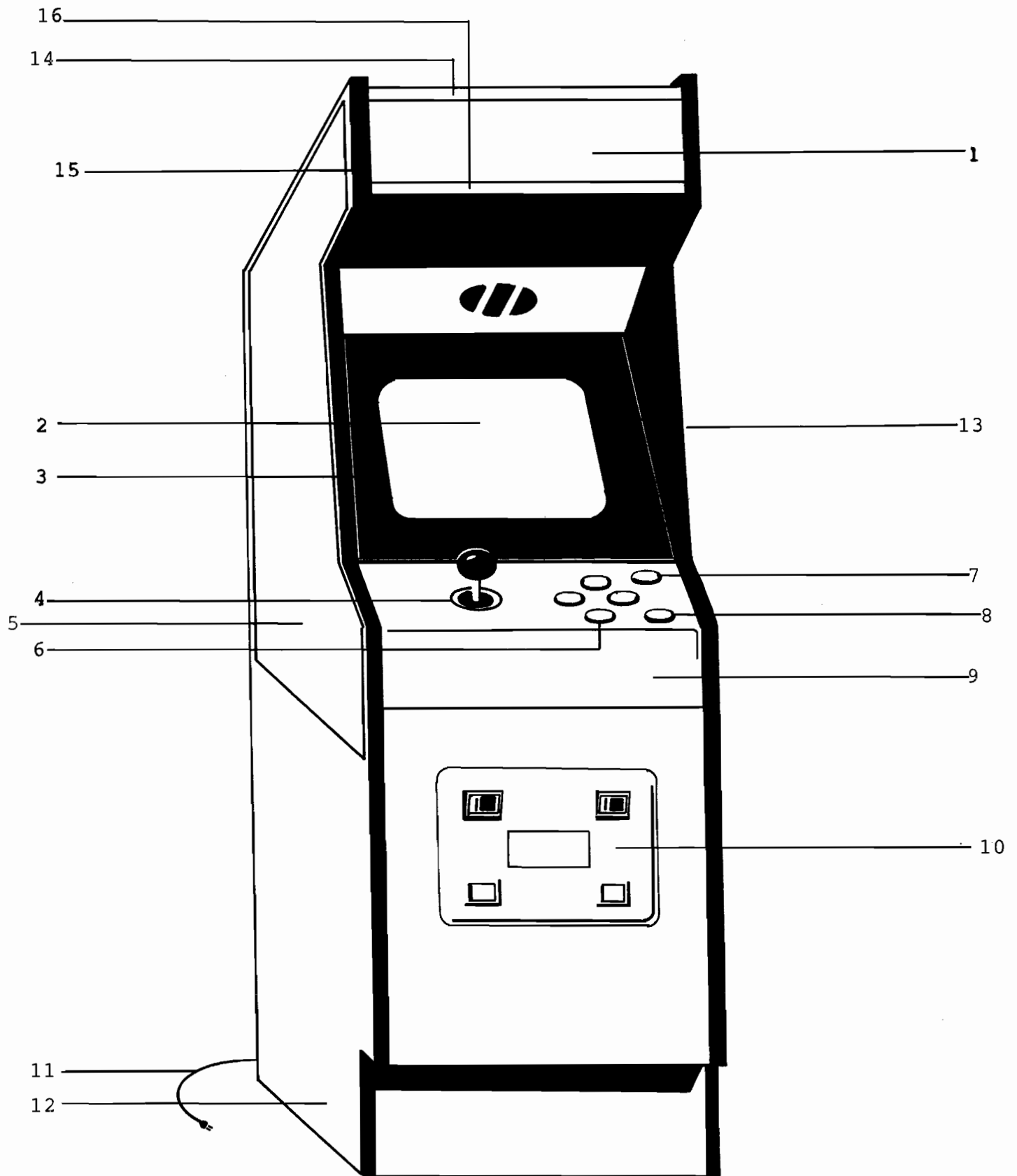
VANGUARD  
TABLE OF CONTENTS (CONT'D)

<u>V. DRAWINGS AND SCHEMATICS:</u>	<u>PAGE NO.</u>
SHINDENGEN POWER SUPPLY SCHEMATIC (363-17-0300).....	30
VANGUARD CIRCUIT MEMORY MAP (375-17-0400).....	31
SK-4 SCHEMATIC (375-17-0100).....	32,33,34
SK-5 SCHEMATIC (375-17-0200).....	35
110/220 VAC POWER INTERCONNECT DIA. (FIGURE 8).....	36
CONTROL PANEL HARNESS DIA. (375-10-0500).....	37
MONITOR SIGNAL HARNESS (375-12-0200).....	38
C.P.U. HARNESS INTERCONNECT DIA. (375-10-0400).....	39

USER INFORMATION - F.C.C.

WARNING:

THIS EQUIPMENT GENERATES, USES AND CAN RADIATE RADIO FREQUENCY ENERGY AND IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTIONS MANUAL, MAY CAUSE INTERFERENCE TO RADIO COMMUNICATIONS. AS TEMPORARILY PERMITTED BY REGULATION, IT HAS NOT BEEN TESTED FOR COMPLIANCE PURSUANT TO SUBPART J OF PART 15 OF F.C.C. RULES, WHICH ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST SUCH INTERFERENCE. OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE INTERFERENCE IN WHICH CASE THE USER AT HIS OWN EXPENSE WILL BE REQUIRED TO TAKE WHATEVER MEASURES MAY BE REQUIRED TO CORRECT THE INTERFERENCE.



**(FIG, 1) CABINET**

CABINET  
(FIGURE 1)  
PARTS LIST

<u>NO.</u>	<u>CENTURI P/N:</u>	<u>DESCRIPTION:</u>
1.	375-06-0100	MARQUEE PANEL, SILK SCREENED
2.	361-04-1000	VIEWING GLASS
3.	375-06-0500	SILK SCREENED MONITOR OVERLAY
4.	50130070	JOYSTICK, 8 POSITION
5.	375-06-0200	LEFT HAND SIDE DECAL
6.	-----	FIRE BUTTONS
7.	-----	ONE PLAYER START BUTTON
8.	-----	TWO PLAYER START BUTTON
9.	375-14-0100	CONTROL DECK WIRED ASSEMBLY
10.	360-14-0700	COINCO COIN DOOR (MODIFIED)
11.	361-12-0900A	A.C. LINE CORD HARNESS
12.	375-01-0900	WOOD CABINET ASSEMBLY
13.	375-06-0300	RIGHT HAND SIDE DECAL
14.	343-03-0200	MARQUEE TOP HOLD DOWN BRACKET
15.	361-10-0200	VINYL TRIM, 7 1/2" LONG
16.	361-03-0100	MARQUEE BOTTOM HOLD DOWN BRACKET

## VANGUARD

VANGUARD is the newest addition in the line of Centuri video games. With its many colorful visual effects and unusual audio effects, this game is sure to be a challenge to even the most experienced player.

In this game there are twelve tunnels (rounds) to accomplish, with eight stages of play in the first tunnel, each varying in the remaining eleven tunnels.

A tunnel barometer found in the upper right corner of the viewing glass indicates which tunnel of play your spaceship is in. It also points out the exact position of your spaceship in each tunnel of play.

The first stage in tunnel one begins with a commanding voice bidding, "BON VOYAGE" to the spaceship. The ship journeys through a tunnel bordered with mountains of cubes, hued in blue and green. A short distance into the tunnel, the spaceship encounters the enemy Harley (50 Points) and Mist (70 Points). The spaceship must protect itself by firing upon the enemy with its four-directional missiles. When the spaceship passes through an Energy Zone, it becomes "energized", enabling it to crash into enemy rockets and missiles, and bordering mountains without destroying itself.

When the ship has successfully completed its journey through this zone, it proceeds to meet the challenges of stage II.

In this second stage of play, the spaceship travels upward through the Rainbow Zone, a tunnel edged with a rocky canyon of blue and white. Here it must defend itself against Helm (80 Points), a hazy white enemy ship, while travelling clear of destructive obstacles.

When the spaceship has completed its journey through this zone, it enters the unknown dimensions of the Stick Zone.

In this third stage of play, the spaceship continues its journey through the Stick Zone, a tunnel bordered with bright colored mountains, peaked in sticks of orange and green. A short distance into this tunnel, the spaceship again encounters the enemy Harley (50 Points) and Mist (70 Points). Successfully defending itself against these enemy ships, the spaceship proceeds into the rocky dimensions of stage IV.

In this stage, the spaceship descends through a second Rainbow Zone. Here it encounters the hazy pink enemy, Ammo (120 Points). Safely completing the distance of this Rainbow Zone, the spaceship enters the challenges of the Stripe Zone.

In this fifth stage of play, the spaceship must maneuver around mountains of stripes, bordered with a city of enemy bases and barriers.



These bases (100-400 Points) and barriers (800 Points), must be destroyed upon approach or the spaceship will explode upon contact. The spaceship must also dodge the path of Garime (100-400 Points), an enemy whose tentacles reel in and out waiting to destroy the passing spaceship.

When the end of the Stripe Zone is reached, the spaceship then ascends through another Rainbow Zone, encountering once again the enemy Helm (80 Points). This completes the spaceship's journey through stage VI.

Stage VII brings the spaceship into the dimensions of the Bleak Zone. Here a tunnel, bordered by tufts of finger-shaped obstacles, sweeps the spaceship upward where it first encounters the enemy Kemlus (100-400 Points), a laughing snake enemy. The spaceship may dock in the direct center of this enemy three times without being destroyed. With each successful dock a bonus of 1,090 Points is awarded.

Further into the Bleak Zone, the spaceship encounters a meteor-like enemy Romeda (100 Points). This enemy falls down through the tunnel in an attempt to crash into the spaceship and destroy it. Safely defeating the enemy of the Bleak Zone, the spaceship continues its journey to its final destination, stage VIII.

In this stage, the spaceship enters the Dock Zone, a tunnel outlined in silver and ruled by the enemy Gond (1,000-8,000 Points). When the spaceship has successfully attacked and destroyed this ruling enemy, a commanding voice shouts, "CONGRATULATIONS", while bursts of crystal light flash across the screen to designate a successful completion of the mission and the start of a new round.

## INSTALLATION

Your game was shipped from the factory in ready-to-play condition. A brief inspection is suggested before the machine is removed from the carton. If there is damage to the shipping carton, contact the freight carrier for claim purposes. External damage could indicate possible damage to the cabinet and/or electronics components.

After the carton has been satisfactorily inspected, remove the machine from the shipping carton.

Examine the interior of the game for disconnected wires, cables, or harnesses. Make sure the electronic devices are securely mounted in their sockets, etc. Record the game serial number since it will be required for reference and servicing.

## ELECTRICAL REQUIREMENTS

Unless otherwise specified, this game is set to operate at 110 Volts A.C. See Figure-8- and 110/220 VAC conversion instructions.

Power Supply Chassis schematic information and parts list are included in this manual.

FIGURE -1-

110/220 VAC CONVERSION INSTRUCTIONS

This video game has a harness configuration that allows the machine to be operated from either a 110 VAC or 220 VAC, 50 or 60 Hz power source. All games shipped from Centuri, Inc., are in the 110 VAC configuration. To change to the 220 VAC configuration perform the following:

- FIRST: Unplug the machine from the wall outlet to completely eliminate shock hazards.
- SECOND: Remove the single 3 AMP slow-blow fuse in the A.C. Distribution Bracket, and install two(2) 1.5 AMP slow-blow fuses. Now cut the #18 AWG. white jumper wire at both ends of the fuse holder and replace the cover.
- THIRD: Locate the "orange" jumper plug marked 110 VAC on the game power transformer, on the floor of the machine. Unplug the "orange" jumper, and plug in the "red" jumper plug marked 220 VAC.

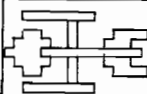
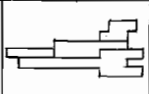
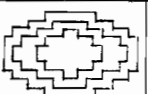
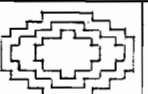


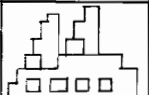
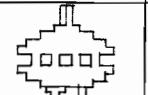

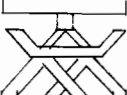




To change back to 110 VAC, replace the components changed in Steps above.

- \*NOTE: The common side of the A.C. Line must not be fused in the 110 VAC configuration - Replace the #18 AWG., white jumper wire.

VANGUARD  
GAME INSTRUCTIONS

1. INSERT COIN(S).
2. SELECT 1 OR 2 PLAYER BUTTON.
3. USE THE JOYSTICK TO GUIDE YOUR SPACESHIP WITHIN THE TUNNEL BOUNDARIES WHILE AVOIDING OBSTACLES AND ENEMY MISSILES.
4. USE THE DIRECTIONAL FIRE BUTTONS TO DESTROY ATTACKING ENEMY.
5. ENTER THE ENERGY ZONE TO PROTECT YOUR SHIP AGAINST ATTACKING ENEMY AND OBSTACLES. SCORE POINTS BY CRASHING INTO ENEMY ROCKETS AND BASES.
6. UPON REACHING YOUR DESTINATION, MYSTERY CITY, SCORE A MYSTERY BONUS WHEN YOU HAVE SUCCESSFULLY ATTACKED THE GOND.
7. EARN EXTRA BONUS SHIPS AT 10,000 AND 50,000 POINTS.

**SCORE**

				
<b>MIST</b> 70	<b>HARLEY</b> 50	<b>HELM</b> 80	<b>AMNO</b> 120	
				
<b>BASE I</b> 100~400	<b>BASE II</b> 100~400	<b>BASE III</b> 100 400	<b>GARINE</b> 100~400	<b>BARRIER</b> 800
				
<b>KEMLUS</b> 100~400	<b>ROMEDA</b> 100	<b>GOND</b> 1000~8000	<b>POWER UP</b>	

OPERATOR OPTIONAL SWITCH SETTINGS

The option switches are located on the SK-5 board. The option switches and audio control can be reached through the back of the machine.

OPTIONAL SWITCH SETTINGS

SWITCH 1: OFF- MUST REMAIN OFF FOR UPRIGHT CABINET  
ON- UPRIGHT CABINET SWITCH

SWITCH 2: FACTORY SETTING; REMAINS IN OFF POSITION

SWITCH 3: FACTORY SETTING; REMAINS IN OFF POSITION

SWITCH 4: FACTORY SETTING; REMAINS IN OFF POSITION

Switches 5 and 6 control the number of times the player may have his spaceship destroyed before the game is over. The following truth table lists these switch settings:

<u>SWITCH 5</u>	<u>SWITCH 6</u>	<u>NUMBER OF SPACESHIPS</u>
OFF	OFF	3
ON	OFF	4
OFF	ON	5

SWITCH 7: OFF- 25¢ PER GAME  
ON- 50¢ PER GAME

SWITCH 8: NON-FUNCTIONAL

## ROUTINE MAINTENANCE & SERVICE

Because of the solid state electronic circuitry, this machine should require very little maintenance and only occasional adjustments. However, it is necessary to take measures to insure this.

The volume control is located on the bottom side of the printed circuit board farthest from the side of the cabinet, and can be accessed through the rear door.

The video monitor has been properly adjusted before shipping. Occasionally minor adjustments are necessary. See monitor specifications and schematics for technical information. Adjustment controls for the monitor are located at the rear of the monitor.

This machine should be serviced only by a qualified technician.

Do not make any adjustments on this machine while the power is on.

For service information, contact:

CENTURI, INC.

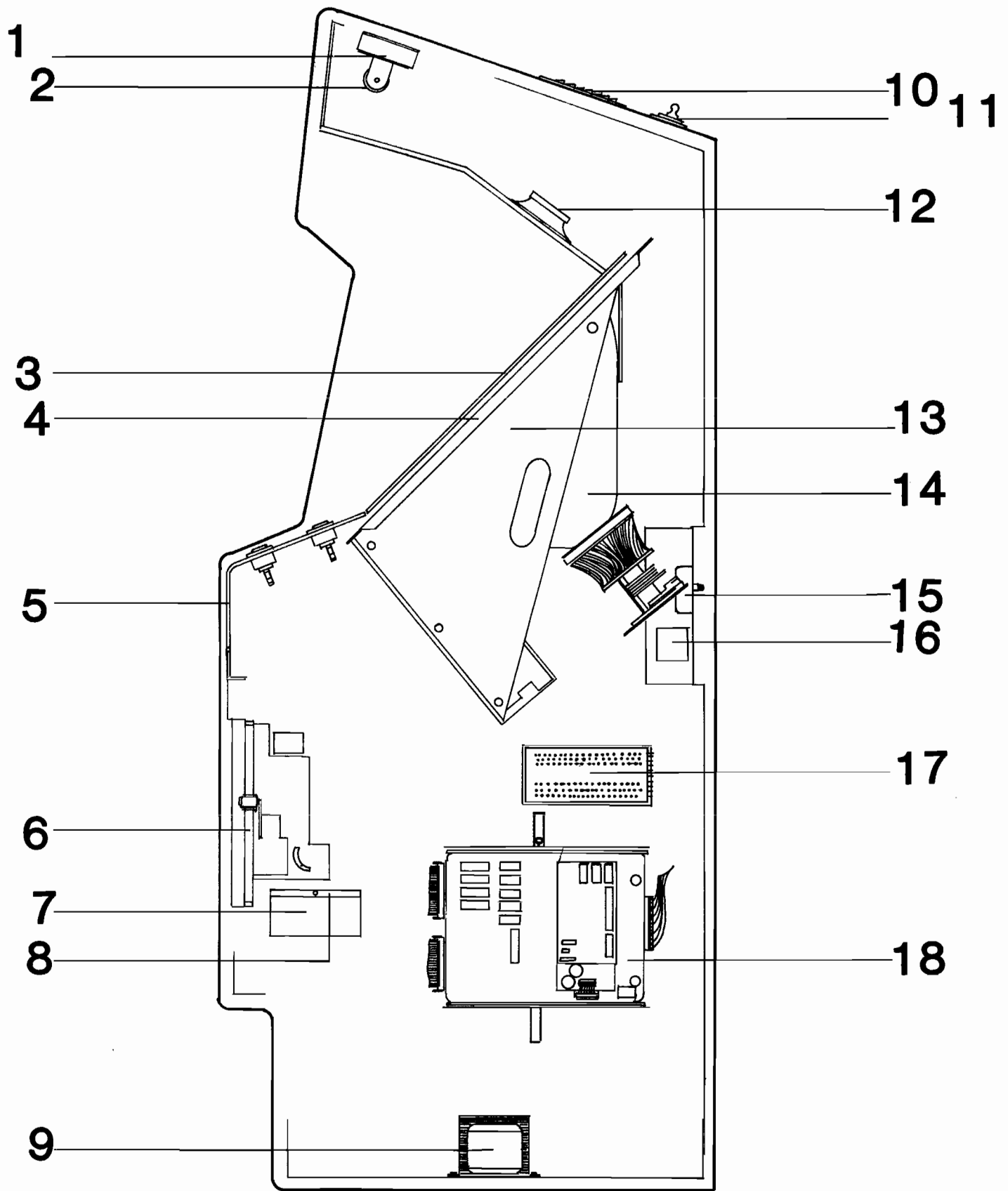
Customer Service Department

#800-327-7710(Outside the state of Florida)

#305-556-5888(In Florida)

## POWER SUPPLY

The computer Board in this game operates most efficiently and reliably when the power supply is set so that the voltage on the board is 5.0 Volts,  $\pm 0.1$  Volts. To check this, place a meter across 5 Volts and ground at the edge connector. If necessary, adjust the screwdriver control on the power supply so the meter reads between 4.9 and 5.1 Volts.



**(FIG,4) CABINET CROSSECTION.**

CABINET CROSSECTION

(FIGURE 4)

PARTS LIST

<u>NO.</u>	<u>CENTURI P/N:</u>	<u>DESCRIPTION:</u>
1.	361-14-0300A	FLOURESCENT LAMP & WIRED ASS'Y.
2.	50180031	G.E. 15 WATT FLOURESCENT LAMP
3.	361-04-1000	VIEWING GLASS
4.	375-06-0500	SILK SCREENED MONITOR OVERLAY
5.	375-14-0100	CONTROL DECK WIRED ASS'Y.
6.	360-14-0700	COINCO COIN DOOR (MODIFIED)
7.	276-01-44	CASH BOX WELDED ASS'Y.
8.	360-03-1200A	CASH BOX COVER
9.	361-14-0200A	ISOLATION TRANSFORMER WIRED ASS'Y.
10.	322-03-1300	LOUVRE PLATE
11.	343-08-1400	HANDLE, PULL
12.	50200011	SPEAKER, 5" ROUND, 8 OHM, 8 WATT
13.	50250021	WELLS-GARDNER COLOR MONITOR, 19"
14.	-----	C.R.T. ONLY- 19" COLOR
15.	50130045	INTERLOCK SWITCH
16.	50340001	LINE FILTER
17.	50350001	POWER SUPPLY, SWITCHING REGULATOR
18.	375-10-0200A	P.C. BOARDS ASS'Y., MODIFIED



## 2800-0 FRONT PLATE EXPLODED VIEW 25¢ COIN

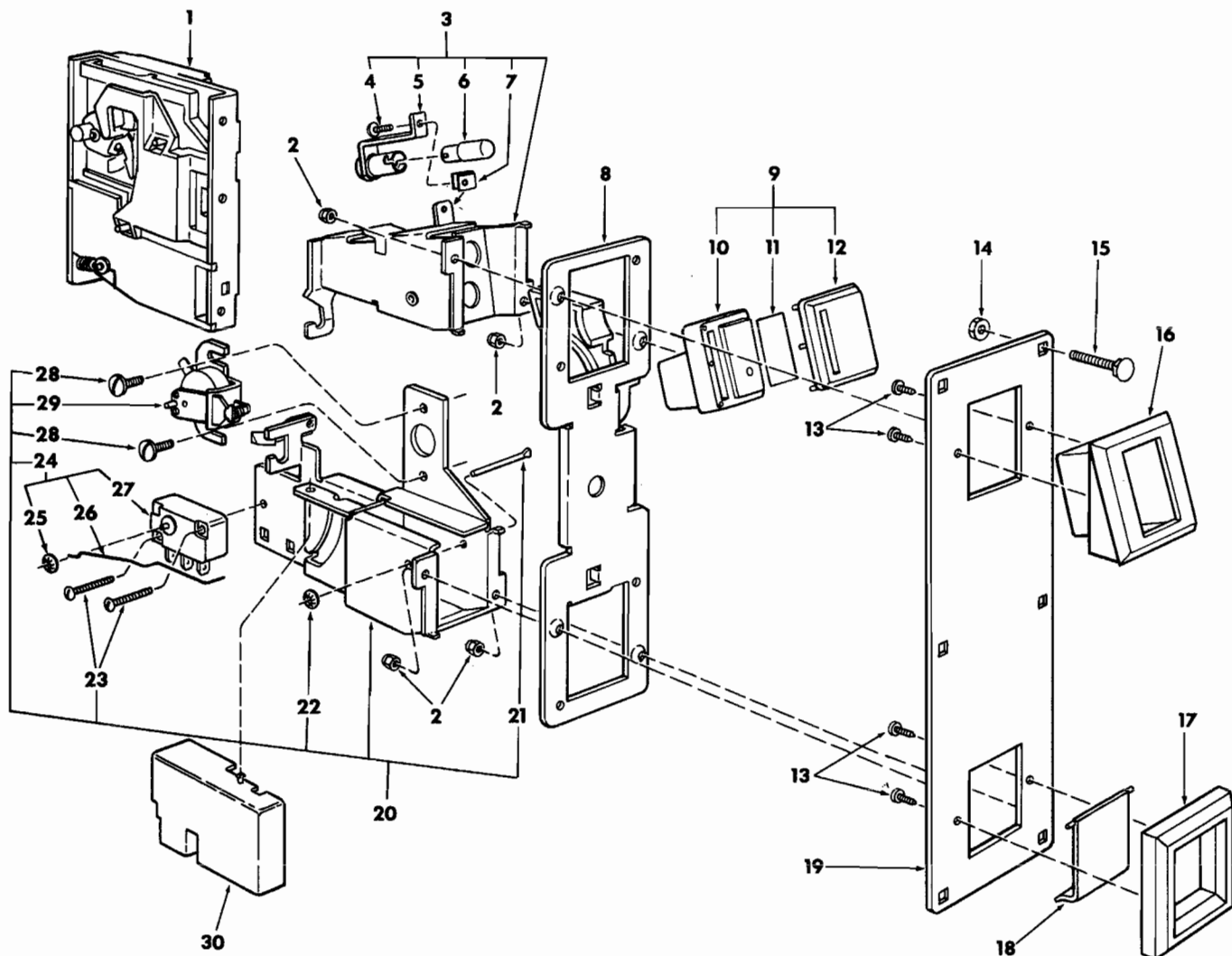


FIGURE 5

Index No.	Part No.	Description	Index No.	Part No.	Description
1	5301-10	25¢ Coin Acceptor	16	904588	Coin Inlet Housing
2	400-4	#4-40 Self Locking Nut	17	904590	Coin Return Cover
3	404351	Coin Inlet Chute Assembly	18	904599	Coin Return Door
4	110-4-6	4 x 3/8 Screw	19	404463	Frontplate Assembly, 3-1/8" x 9-1/4"
5	904717	Lamp Socket	20	404350	Coin Return Chute Assembly
6	904716	#47 Lamp (6.3 Volt)	21	905115	Bar
7	904712	Fastener	22	904936	Keeper
8	404464	Inner Panel/Lever Assembly	23	100-4-12	4-40 x 3/4 Screw
9	404348	Coin Return Button Assembly	24	404353	Switch & Wire Assembly
10	904591	Coin Return Button	25	900651	Retainer
11	904703	25¢ Price Decal	26	904710-1	Switch Wire-Silver
12	904589-2	Reject Cover Button (25¢)	27	904845	Switch
13	345-4-5	#4 x 5/16 Pan Head Screw	28	100-6-3	6-32 x 3/16 Screw
14	406-10	#10-24 Hex Nut (Mounting Hardware)	29	404354	12 Volt Crem Assembly
15	905022	#10-24 x 1-1/8 Carriage Bolt (Mounting Hardware)	30	904762	Switch Cover

2800-0 FRONT PLATE EXPLODED VIEW

(FIGURE 5)

PARTS LIST

<u>NO.</u>	<u>CENTURI P/N:</u>	<u>MANUFACTURING P/N:</u>	<u>DESCRIPTION:</u>
1.	50270144	5031-10	25¢ COIN ACCEPTOR
5.	50270169	904717	LAMP SOCKET
6.	50270170	904716	#47 LAMP (6.3 VOLT)
8.	50270172	404464	INNER PANEL/LEVER ASS'Y.
10.	50270145	904591	COIN RETURN BUTTON
11.	50270146	904703	25¢ PRICE DECAL
12.	50270147	904589-2	REJECT COVER BUTTON (25¢)
16.	50270149	904588	COIN INLET HOUSING
17.	50270157	904590	COIN RETURN BEZEL
18.	50270150	904599	COIN RETURN DOOR
19.	50270173	404463	FRONTPLATE ASS'Y. (3 <sup>1</sup> / <sub>8</sub> "x9 <sup>1</sup> / <sub>4</sub> ")
21.	50270168	905115	BAR
25.	50270141	900651	RETAINER
26.	50270142	904710-1	SWITCH-WIRE, SILVER
27.	50130061	904845	SWITCH
29.	50270165	404354	12 VOLT C.R.E.M. ASS'Y.
30.	50270164	904762	SWITCH COVER

## 2800 SERIES COIN DOOR EXPLODED VIEW

25¢ U.S. COIN

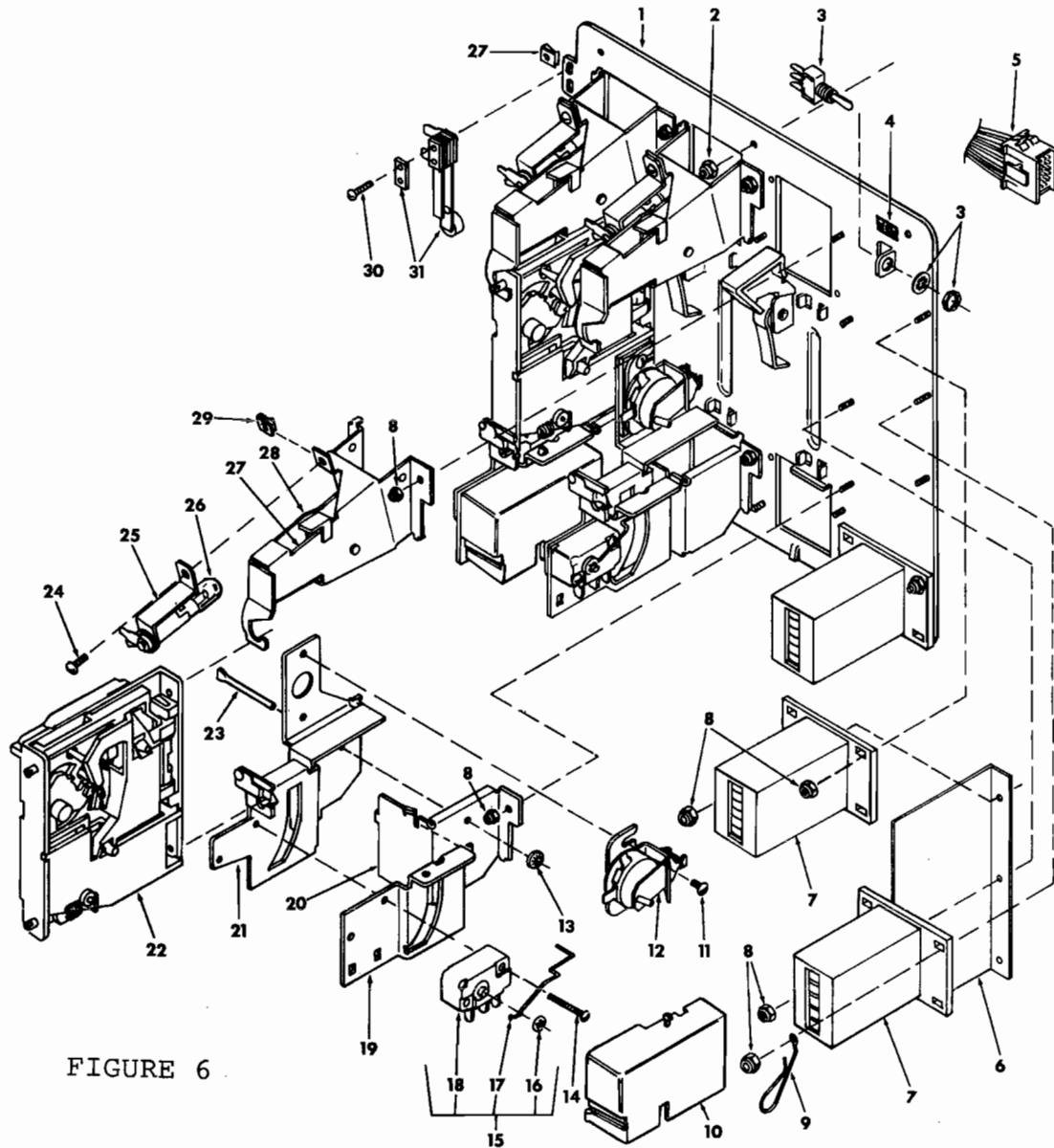


FIGURE 6

Index No.	Part No.	Description	Index No.	Part No.	Description
1	404429	Inner Panel With Levers Sub-Assembly	17	904710-1	Silver Switch Wire — for U.S. 25¢ Coin
2	400-8	Nut	18	904845	Switch
3	904782	Toggle Switch	19	904701	Coin Chute
4	904706	Test Switch Decal	20	904598	Coin Return Box
5		Custom Harness Assembly	21	404428	Switch and C.R.E.M. Coil Bracket Assembly
6	904822	Insulation	22	5301-10	25¢ Acceptor
7	404352	Coin Counter Assembly (6 Volt D.C.)	23	905115	Bar
8	400-4	Nut	24	110-4-6	Screw
9	904722	Wire Key Holder	25	904717	Miniature Bayonet-Base Lamp Socket
10	904762	Switch Cover	26	904716	#47 Lamp (6.3 Volt)
11	100-6-3	Screw	27	404418	Coin Inlet Chute Sub-Assembly
12	404354	C.R.E.M. Coil Assembly. 12 Volts D.C.	28	904594	Right Half of Coin Inlet Chute
13	904936	Keeper	29	904712	"U"-Type Fastener
14	100-4-12	Screw	30	116-4-8	Screw
15	404353	Coin Switch Assembly for U.S. 25¢ Coin	31	904704	Slam Switch Assembly
16	900651	Retainer			

2800 SERIES COIN DOOR EXPLODED VIEW

25¢ U.S. COIN

(FIGURE 6)

PARTS LIST

<u>NO.</u>	<u>CENTURI P/N:</u>	<u>MANUFACTURING P/N:</u>	<u>DESCRIPTION:</u>
1.	50270160	404429	INNER PANEL w/LEVERS SUBASS'Y.
3.	50130062	904782	TOGGLE SWITCH
4.	50270161	904706	TEST SWITCH DECAL
5.	364-62-1000A	-----	CUSTOM HARNESS ASS'Y.
6.	50270162	904822	INSULATION
7.	50270140	404352	COIN COUNTER ASS'Y.
9.	50270163	904722	WIRE KEY HOLDER
10.	50270164	904762	SWITCH COVER
12.	50270165	404354	C.R.E.M. COIL ASS'Y. (12 VOLT D.C.)
17.	50270142	904710-1	SILVER SWITCH WIRE- FOR 25¢ U.S. COIN
18.	50130061	904845	SWITCH
19.	50270143	904701	COIN CHUTE
20.	50270166	904598	COIN RETURN BOX
21.	50270167	404428	SWITCH & C.R.E.M. COIL BRACKET ASS'Y.
22.	50270144	5301-10	25¢ ACCEPTOR
23.	50270168	905115	BAR.
25.	50270169	904717	MINIATURE BAYONET-BASE LAMP SOCKET
26.	50270170	904716	#47 LAMP (6.3 VOLTS)
27.	50270171	404418	COIN INLET CHUTE-SUBASS'Y.
31.	50130063	904707	SLAM SWITCH ASSEMBLY

**2800 SERIES COIN DOOR EXPLODED VIEW**  
**25¢ U.S. COIN**

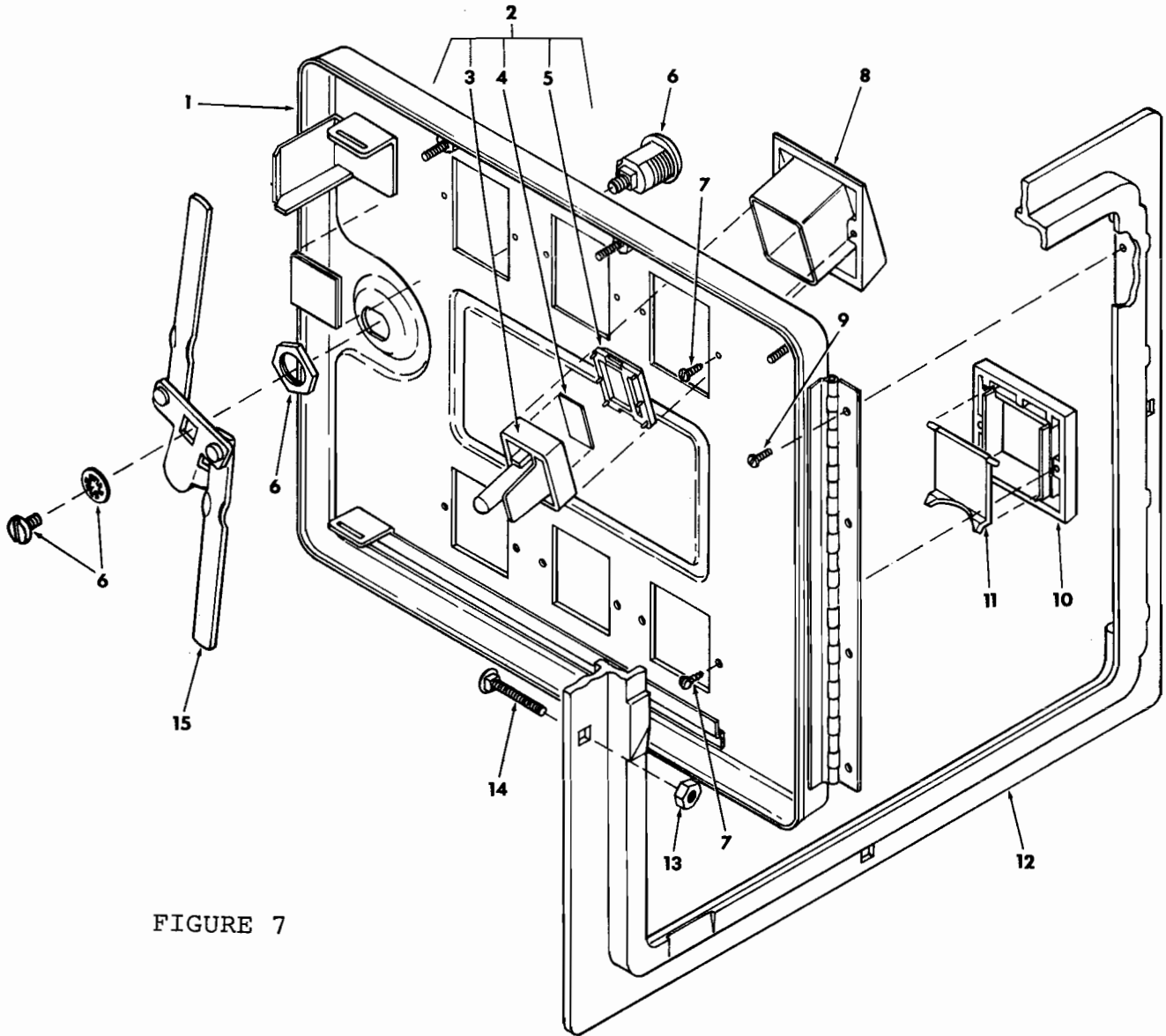


FIGURE 7

Index No.	Part No.	Description	Index No.	Part No.	Description
1	404341	Coin Door Only (2 Coin)	7	345-4-5	Screw
	404341-1	Coin Door Only (3 Coin)	8	904588	Coin Button Housing
2	404348-1	Coin Return Button Assembly for U.S. 25¢ Coin	9	325-4-4	Screw
3	904591	Coin Return Button	10	904590	Coin Return Bezel
4	904703	U.S. 25¢ Price Decal	11	904599	Coin Return Cover
5	904589-2	Coin Return Button Cover for U.S. 25¢ Coin	12	904581	Coin Door Frame, 11-5/8" x 13-3/8" Mounts in a 10-3/8" x 12-3/16" Opening
6	904707-1	Lock Assembly	13	406-416	Hex Nut
			14	904734	Carriage Bolt
			15	404357	Locking Arm Assembly

2800 SERIES COIN DOOR EXPLODED VIEW

25¢ U.S. COIN

(FIGURE 7)

PARTS LIST

<u>NO.</u>	<u>CENTURI P/N:</u>	<u>MANUFACTURING P/N:</u>	<u>DESCRIPTION:</u>
1.	50270152	404341	COIN DOOR ONLY (2 COIN)
2.	50270158	404348-1	COIN DOOR BUTTON ASS'Y. FOR U.S. 25¢ COIN
3.	50270145	904591	COIN RETURN BUTTON
4.	50270146	904703	U.S. 25¢ PRICE DECAL
5.	50270147	904589-2	COIN RETURN BUTTON COVER
6.	50270148	904707-1	LOCK ASSEMBLY w/KEYS
8.	50270149	904588	COIN BUTTON HOUSING (INLET HOUSING)
10.	50270157	904590	COIN RETURN BEZEL
11.	50270150	904599	COIN RETURN COVER
12.	50270151	904581	COIN DOOR FRAME (11 5/8"x13 3/8")
15.	50270159	404357	LOCKING ARM ASSEMBLY

EXPLODED VIEW OF THE CONTROL PANEL

(FIGURE 2)

PARTS LIST

<u>NO.</u>	<u>CENTURI P/N:</u>	<u>DESCRIPTION:</u>
1, 10, 11.	50270174	KNOB & SHAFT ASS'Y. w/ACTUATOR & E RING
2.	50130048 50130049	WHITE BUTTON ASSEMBLY RED BUTTON ASSEMBLY
3.	375-06-0400	CONTROL PANEL OVERLAY
4.	375-03-0300A	CONTROL PANEL (SHEET METAL)
5.	50270175	PLASTIC WASHER, 2" DIA.
6.	361-10-0600D	HINGE, CONTROL DECK
7.	10111006	#10-24x3/4" CARRIAGE BOLT, BLK. OXIDE
8.	50270177	TOP PLATE FOR 8 POSITION JOYSTICK
9.	50130050	PAL NUT
12.	10150007	#10-24 KEP NUT

8 POSITION JOYSTICK ASSEMBLY- (WICO)

(FIGURE 3)

PARTS LIST

<u>NO.</u>	<u>CENTURI P/N:</u>	<u>MANUFACTURING P/N:</u>	<u>DESCRIPTION:</u>	<u>USAGE:</u>
1.	50270174	151419-01	KNOB & SHAFT ASS'Y. w/ACTUATOR & E RING	1
2.	50270175	15950401	PLASTIC WASHER, 2"DIAM.	1
3.	50270176	15954101	TOP PLATE FOR 8 POSITION JOYSTICK	1
4.	50270177	15950501	BOTTOM WASHER	2
5.	50270178	15952301	DIAFRAGM	1
6.	50270179	15954201	SWITCH MOUNTING PLATE	1
7.	50270181	15108401	MOLDED BLADE SWITCH	4
8.	50270180	15954501	ACTUATOR GUARD	4
9.	50270182	15950601	SWITCH MOUNTING BRKT.	4



PARTS LIST - SHINDENGEN POWER SUPPLY

<u>SYMBOL:</u>	<u>DESCRIPTION:</u>	<u>USAGE:</u>
T1	TRANSFORMER, SINGLE PHASE, 2A VA	1
L1	CHOKING COIL, 1.6mH, 1.5A	1
L2, L4	CHOKING COIL, SF-T8-50S-03	2
L3	CHOKING COIL, SF-HP-2A-03	1
D1	DIODE, V19G	1
D2	DIODE, V06C	1
D3, D6	DIODE, 1S1588	2
D4	DIODE, S15S3	1
D5, D7	DIODE, 5CH1M	2
D12, D13	DIODE, F113B	2
D14	DIODE, F113B	1
RF1	DIODE, S4VB40 (BRIDGE TYPE)	1
Q1	TRANSISTOR, 2SC2504	1
Q2	TRANSISTOR, 2SD467(B)	1
Q3	TRANSISTOR, 2SC460(B)	1
Q4	TRANSISTOR, 2SA673(B)	1
IC1	INTEGRATED CIRCUIT, RM723DC or HA17723G-02	1
PC1	PHOTO COUPLER, PS2001	1
R1	RESISTOR, 2 WATT, 18 OHM	1
R8, R9	RESISTOR, 2 WATT, 47K OHM	2
R3, 1-4	RESISTOR, 2 WATT, 15 OHM	4
R4	RESISTOR, 1 WATT, 56 OHM	1
R12	RESISTOR, 1 WATT, 100 OHM	1
R28	RESISTOR, 1 WATT, 470 OHM	1
R7	RESISTOR, 1 WATT, 0.56 OHM	1
R26	RESISTOR, 1 WATT, 0.82 OHM	1
R23	RESISTOR, 1/4 WATT, 22 OHM	1
R10	RESISTOR, 1/4 WATT, 33 OHM	1
R27	RESISTOR, 1/4 WATT, 68 OHM	1
R2	RESISTOR, 1/4 WATT, 330-470 OHM	1
R22	RESISTOR, 1/4 WATT, 220 OHM	1
R21	RESISTOR, 1/4 WATT, 270 OHM	1
R6	RESISTOR, 1/4 WATT, 330 OHM	1
R11	RESISTOR, 1/4 WATT, 68 OHM	1
R20	RESISTOR, 1/4 WATT, 470 OHM	1
R17	RESISTOR, 1/4 WATT, 680 OHM	1
R19	RESISTOR, 1/4 WATT, 800 OHM	1
R18	RESISTOR, 1/4 WATT, 1.2K OHM	1
R5	RESISTOR, 1/4 WATT, 10K OHM	1
R16	RESISTOR, 1/4 WATT, 220K OHM	1
R29	RESISTOR, 3 WATT, 27 OHM	1
R39	RESISTOR, 1/4 WATT, 4.7K OHM	1
R38	RESISTOR, 1/4 WATT, 5.6K OHM	1
R24	RESISTOR, 1/4 WATT, 330 OHM	1
R25	RESISTOR, 1/4 WATT, 150 OHM	1
RV1	VARIABLE RESISTOR, RJ-6P501	1

PARTS LIST - SHINDENGEN POWER SUPPLY

<u>SYMBOL:</u>	<u>DESCRIPTION:</u>	<u>USAGE:</u>
C1, C2	CAPACITOR, ECK-DAL102E	2
C3-1,-2	CAPACITOR, 160VSN100	2
C9, C10	CAPACITOR, SM10VB-2200	2
C11, C23	CAPACITOR, SM10VB-2200	2
C12, C13, C15	CAPACITOR, SL25VB-10	3
C27	CAPACITOR, SL25VB-10	1
C18, C19, C20	CAPACITOR, SM35VB-1000	3
C26	CAPACITOR, SM35VB-1000	1
C21, C22, C25	CAPACITOR, SM16VB-1000	3
C5	CAPACITOR, DMY21H472K	1
C6	CAPACITOR, DMY21H104K	1
C14, C16	CAPACITOR, DMY21H222K	2
C4	CAPACITOR, CM20XC511K5	1
C8	CAPACITOR, MDD22G473K	1
C5-2	CAPACITOR, DMY21H222K	1
F1, F2	ENCLOSED TYPE FUSE, 3A	2

SK-4  
PARTS LIST

<u>NO.</u>	<u>PART NUMBER</u>	<u>DESCRIPTION:</u>	<u>USAGE:</u>
1.	50010169	74LS154 I.C.	1
2.	50010022	74LS86 I.C.	1
3.	50010273	74LS244 I.C.	4
4.	50010005	74LS04 I.C.	4
5.	50010221	74LS163 I.C.	1
6.	50010019	74LS74 I.C.	2
7.	50010007	74LS10 I.C.	1
8.	50010004	74LS02 I.C.	1
9.	50010141	74LS125 I.C.	1
10.	50010197	74LS05	1
11.	50010002	74LS00 I.C.	2
12.	50010193	74LS155 I.C.	1
13.	50010261	74LS273 I.C.	4
14.	50010315	74LS240 I.C.	3
15.	50010105	74LS32	1
16.	50010204	74LS393 I.C.	3
17.	50010012	74LS30 I.C.	1
18.	50010035	74LS161 I.C.	4
19.	50010279	LM3900 I.C.	1
20.	50010254	LM324	1
21.	50010314	2732 I.C.	8
22.	50010317	4118 I.C.	1
23.	50010172	6502 I.C.	1
24.	50010001	555 I.C.	1
25.	50010147	74121 I.C.	1
26.	50010043	556 I.C.	1
27.	50010266	14066 I.C.	3
28.	50010171	2716 I.C.	2
29.	50010198	76477 I.C.	2
30.	50100014	IN914	4
31.	50020121	1815 TRANSISTOR	1
32.	50070012	11.289 MHZ CRYSTAL	1
33.	50010321	3713 AUDIO AMP	1
34.	50060040	1,000mfd, 25V., ELECTROLYTIC RADIAL CAPACITOR	3
35.	50060069	100mfd, 25V., ELECTROLYTIC RADIAL CAPACITOR	1
36.	50060189	47mfd, 25V., ELECTROLYTIC RADIAL CAPACITOR	1
37.	50040186	.033mfd, 50V., MYLAR CAPACITOR	1
38.	50040174	0.1mfd, 25V., MYLAR CAPACITOR	1
39.	50040001	0.1mfd, 25V., DISC CERAMIC CAPACITOR	47
40.	50040027	.01mfd, 16V., DISC CERAMIC CAPACITOR	4
41.	50040011	.001mfd, 15V., DISC CERAMIC CAPACITOR	6
42.	50040170	220pf, 50V., DISC CERAMIC CAPACITOR	2
43.	50040120	.0022mfd, 25V., DISC CERAMIC CAPACITOR	1
44.	50060165	10mfd, 25V., DIPPED TANTALUM CAPACITOR	2
45.	50060202	.22mfd, 25V., DIPPED TANTALUM CAPACITOR	2
46.	50060163	1mfd, 25V., DIPPED TANTALUM CAPACITOR	3
47.	50060203	.22mfd, 35V., DIPPED TANTALUM CAPACITOR	2
48.	50060167	.1mfd, 35V., DIPPED TANTALUM CAPACITOR	1
49.	50040127	4.7mfd, 25V., DIPPED TANTALUM CAPACITOR	1
50.	50030001	2.2K, 1/4W., 5% RESISTOR	9

SK-4  
PARTS LIST

<u>NO.</u>	<u>PART NUMBER</u>	<u>DESCRIPTION:</u>	<u>USAGE:</u>
51.	50030151	22K OHM, 1/4W., 5% RESISTOR	6
52.	50030150	47K OHM, 1/4W., 5% RESISTOR	5
53.	50030007	100K OHM, 1/4W., 5% RESISTOR	2
54.	50030011	220 OHM, 1/4W., 5% RESISTOR	3
55.	50030185	1.8K OHM, 1/4W., 5% RESISTOR	1
56.	50030162	560 OHM, 1/4W., 5% RESISTOR	1
57.	50030010	470 OHM, 1/4W., 5% RESISTOR	16
58.	50030051	1K OHM, 1/4W., 5% RESISTOR	5
59.	50030315	18K OHM, 1/4W., 5% RESISTOR	1
60.	50030256	100 OHM, 1/4W., 5% RESISTOR	2
61.	50030086	33K OHM, 1/4W., 5% RESISTOR	9
62.	50030104	470K OHM, 1/4W., 5% RESISTOR	6
63.	50030092	1M OHM, 1/4W., 5% RESISTOR	4
64.	50030159	1.5M OHM, 1/4W., 5% RESISTOR	3
65.	50030147	6.8K OHM, 1/4W., 5% RESISTOR	1
66.	50030063	10K OHM, 1/4W., 5% RESISTOR	12
67.	50030155	150K OHM, 1/4W., 5% RESISTOR	3
68.	50030146	15K OHM, 1/4W., 5% RSISTOR	1
69.	50030006	4.7K OHM, 1/4W., 5% RESISTOR	2
70.	50030197	5.1K OHM, 1/4W., 5% RESISTOR	7
71.	50030316	1K PCB TRIMMER POTENTIOMETER	1
72.	50150317	20-PIN RIGHT ANGLE PCB HEADER	1
73.	50150256	50-PIN RIGHT ANGLE PCB HEADER	2
74.	50360006	9-PIN RESISTOR PACK(S.I.P.), 1K OHM	2
75.	10010003	RD/PH/MS #4-40 x 3/8"	1
76.	10130001	HEX NUT #4-40	1
77.	50150061	24-PIN SOLDER TRAIL SOCKET, LOW PROF.	11
78.	50150060	40-PIN SOLDER TRAIL SOCKET, LOW PROF.	1
79.	375-08-0500	HEAT SINK	1

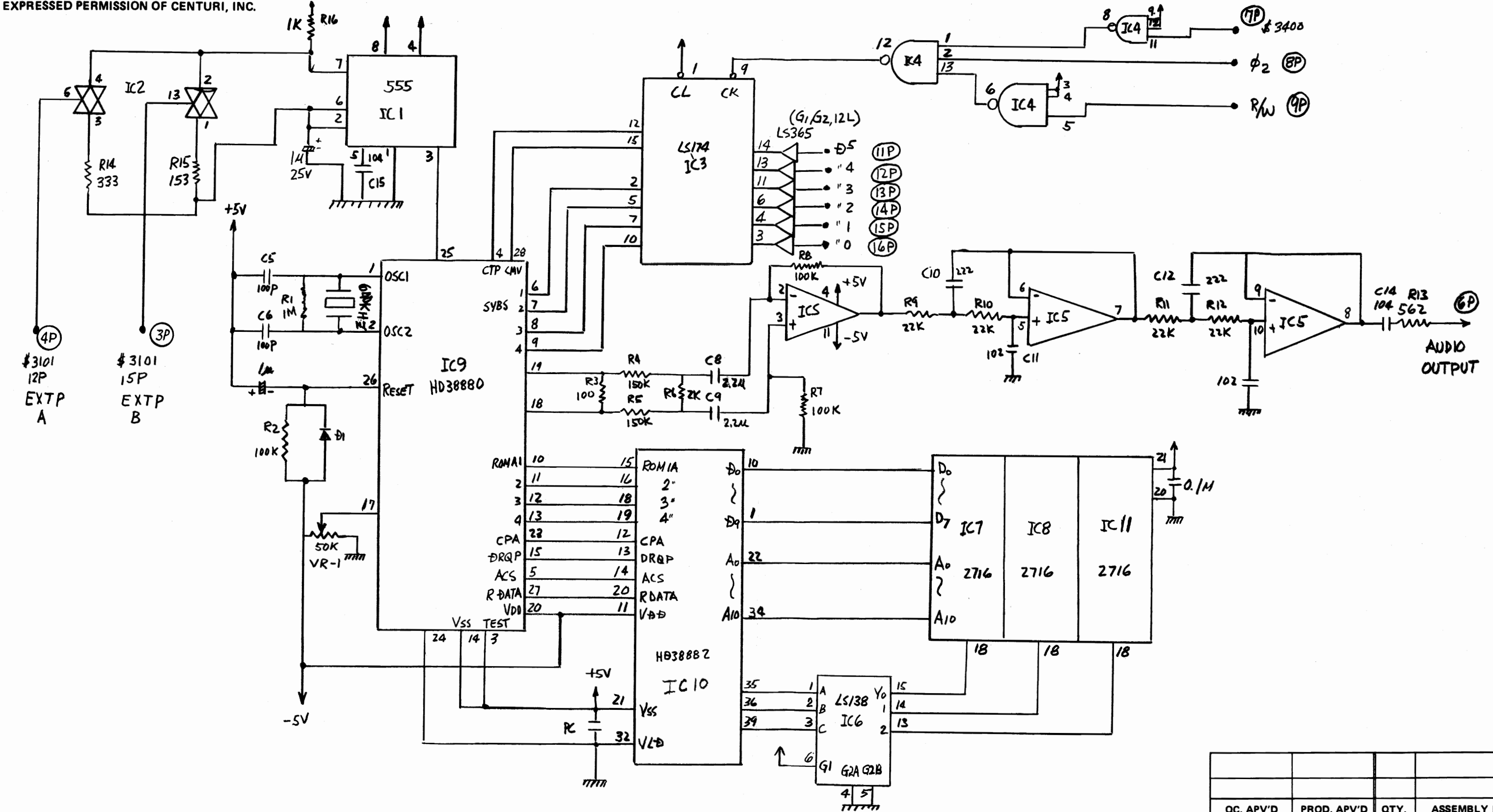
SK-5  
PARTS LIST

<u>NO.</u>	<u>PART NUMBER</u>	<u>DESCRIPTION:</u>	<u>USAGE:</u>
1.	50010019	74LS74 I.C.	1
2.	50010262	74LS283 I.C.	5
3.	50010022	74LS86 I.C.	4
4.	50010005	74LS04 I.C.	2
5.	50010232	74LS288 I.C.	2
6.	50010045	74LS157 I.C.	11
7.	50010197	74LS05 I.C.	1
8.	50010030	74LS174 I.C.	5
9.	50010248	74LS138 I.C.	2
10.	50010007	74LS10 I.C.	4
11.	50010273	74LS244 I.C.	10
12.	50010105	74LS32 I.C.	1
13.	50010252	74LS374 I.C.	6
14.	50010096	74LS08 I.C.	2
15.	50010029	74LS166 I.C.	4
16.	50010026	74LS107 I.C.	1
17.	50010002	74LS00 I.C.	1
18.	50010004	74LS02 I.C.	1
19.	50010275	74LS136 I.C.	1
20.	50010093	74LS151 I.C.	2
21.	50010141	74LS125 I.C.	1
22.	50010315	74LS240 I.C.	1
23.	50010316	46505 I.C.	1
24.	50010171	2716 I.C.	2
25.	50010317	2128 I.C.	2
26.	50010310	2114 I.C.	6
27.	50040001	0.1 MFD, 25V., DISC CERAMIC CAPACITOR	27
28.	50030010	470 OHM, ¼W., 5% RESISTOR	9
29.	50030011	220 OHM, ¼W., 5% RESISTOR	6
30.	50030051	1K OHM, ¼W., 5% RESISTOR	7
31.	50030256	100 OHM, ¼W., 5% RESISTOR	1
32.	50360006	9-PIN RESISTOR PACK (S.I.P.), 1K OHM	1
33.	50130034	8-POSITION DIP SWITCH	1
34.	50150256	50-PIN RIGHT ANGLE PCB HEADER	2
35.	50150060	40-PIN SOLDER TRAIL SOCKET, LOW PROF.	1
36.	50150061	24-PIN SOLDER TRAIL SOCKET, LOW PROF.	4
37.	50150112	18-PIN SOLDER TRAIL SOCKET, LOW PROF.	6
38.	50150111	16-PIN SOLDER TRAIL SOCKET, LOW PROF.	2

SK-6  
PARTS LIST

<u>NO.</u>	<u>PART NUMBER</u>	<u>DESCRIPTION:</u>	<u>USAGE:</u>
1.	50010248	74LS138 I.C.	1
2.	50010007	74LS10 I.C.	1
3.	50010030	74LS174 I.C.	1
4.	50010283	74LS365 I.C.	1
5.	50010171	2716 I.C.	3
6.	50010318	38882 I.C.	1
7.	50010319	38880 I.C.	1
8.	50010254	LM324 I.C.	1
9.	50010266	14066 I.C.	1
10.	50010320	17555 I.C.	1
11.	50040001	0.1mfd, 25V., DISC CERAMIC CAPACITOR	15
12.	50060007	470mfd, 16V., ELECTROLYTIC RADIAL CAPACITOR	2
13.	50040053	100pf, 25V., DISC CERAMIC CAPACITOR	2
14.	50040011	.001mfd, 15V., DISC CERAMIC CAPACITOR	2
15.	50040120	.0022mfd, 25V., DISC CERAMIC CAPACITOR	2
16.	50060163	1mfd, 25V., DIPPED TANTALUM CAPACITOR	2
17.	50060193	2.2mfd, 25V., DIPPED TANTALUM CAPACITOR	2
18.	50100014	IN914	1
19.	50030146	15K OHM, ¼W., 5% RESISTOR	1
20.	50030086	33K OHM, ¼W., 5% RESISTOR	2
22.	50030155	150K OHM, ¼W., 5% RESISTOR	2
23.	50030001	2.2K OHM, ¼W., 5% RESISTOR	1
24.	50030007	100K OHM, ¼W., 5% RESISTOR	3
25.	50030151	22K OHM, ¼W., 5% RESISTOR	4
26.	50030149	5.6K OHM, ¼W., 5% RESISTOR	1
27.	50030256	100 OHM, ¼W., 5% RESISTOR	1
28.	50030092	1M OHM, ¼W., 5% RESISTOR	1
29.	50150317	20-PIN RIGHT ANGLE PCB HEADER	1
30.	50150315	MOUNTED PCB BEAD PIN	1
31.	50150061	24-PIN SOLDER TRAIL SOCKET, LOW PROF.	3
32.	50150062	28-PIN SOLDER TRAIL SOCKET, LOW PROF.	1
33.	50150316	42-PIN SOLDER TRAIL SOCKET, LOW PROF.	1
34.	50070017	640KH <sub>2</sub> CRYSTAL	1

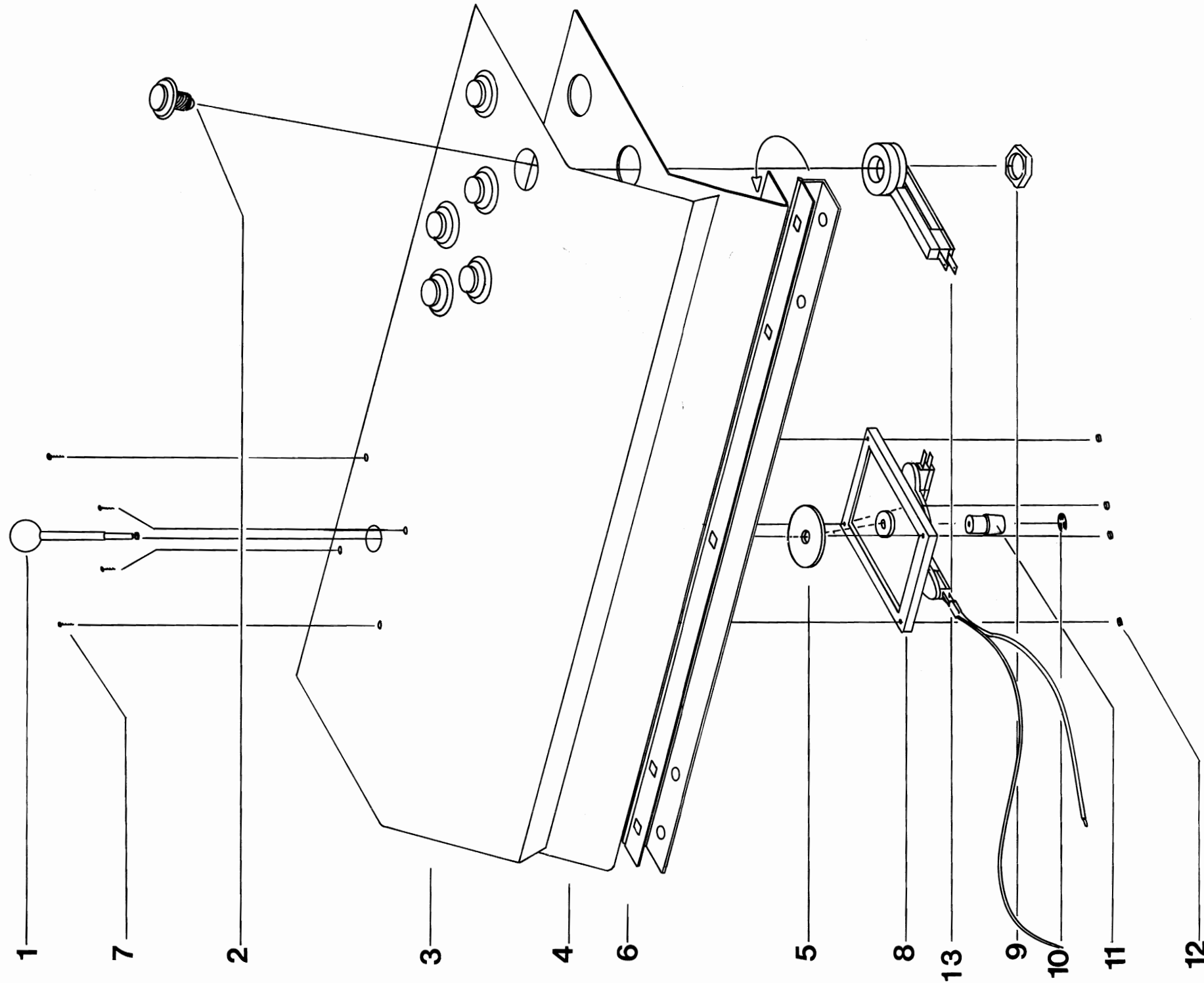
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QC. APV'D	PROD. APV'D	QTY.	ASSEMBLY NO

REV. LET.	ECN NO.	REVISION	BY	TOLERANCES		centuri inc.		HIALEAH, FLORIDA 33014			
				Unless Otherwise Specified		NAME					
				FRACTIONS	± 1/32	SK-6 (VOICE)					
				DECIMALS 2 PL	± .015	MATL'S.					
				DECIMALS 3 PL	± .005	HEAT TREAT.		FINISH			
				HOLES	+ .003	DWN.	APP'D.	DATE	SCALE	PART NO.	REV.
				ANGLES	- .001	AAN		7-31-81		375-17-0300	
				SHT. MET BENDS	± 2'						

AF 17899B



(FIG.2) EXPLODED VIEW OF CONTROL PANEL.

				QC. APV'D				PROD. APV'D				QTY.				ASSEMBLY NO							
												<b>TOLERANCES</b> Unless Otherwise Specified FRACTIONS ± 1/32 DECIMALS 2 PL ± .015 DECIMALS 3 PL ± .005 HOLES + .003 - .001 ANGLES ± 1/2° SHT. MET BENDS ± 2°											
												<b>centuri</b> HIALEAH, FLORIDA 33014											
												NAME MATL'S. HEAT TREAT. FINISH DWN. APP'D. DATE SCALE PART NO. REV.											
REV. LET.	ECN NO.	REVISION		BY																			

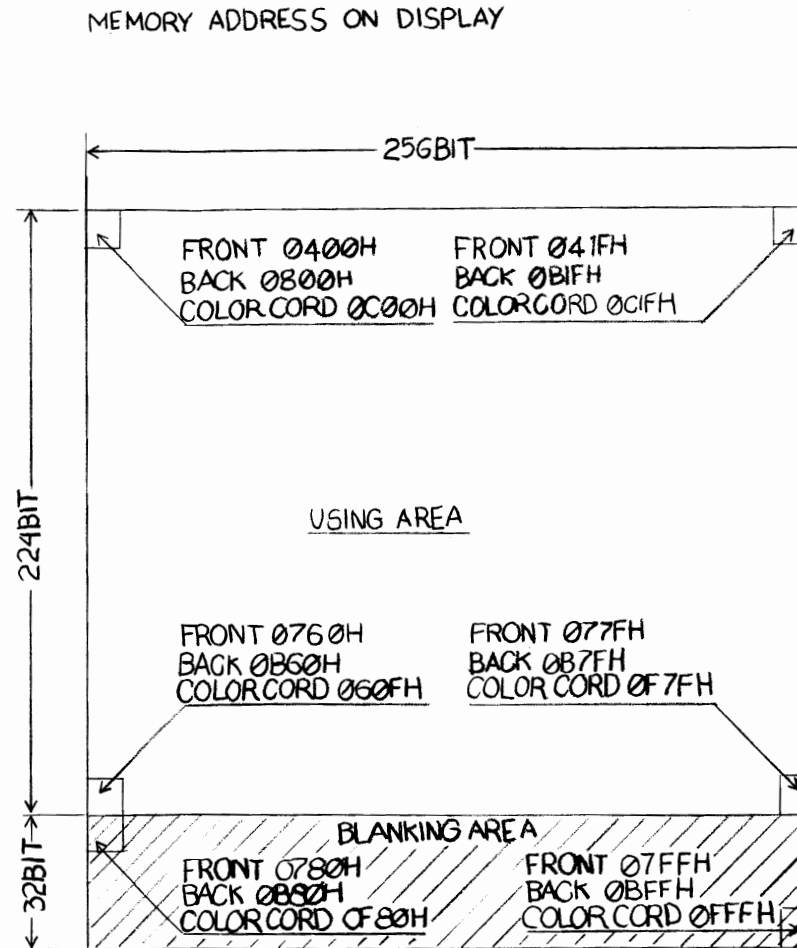






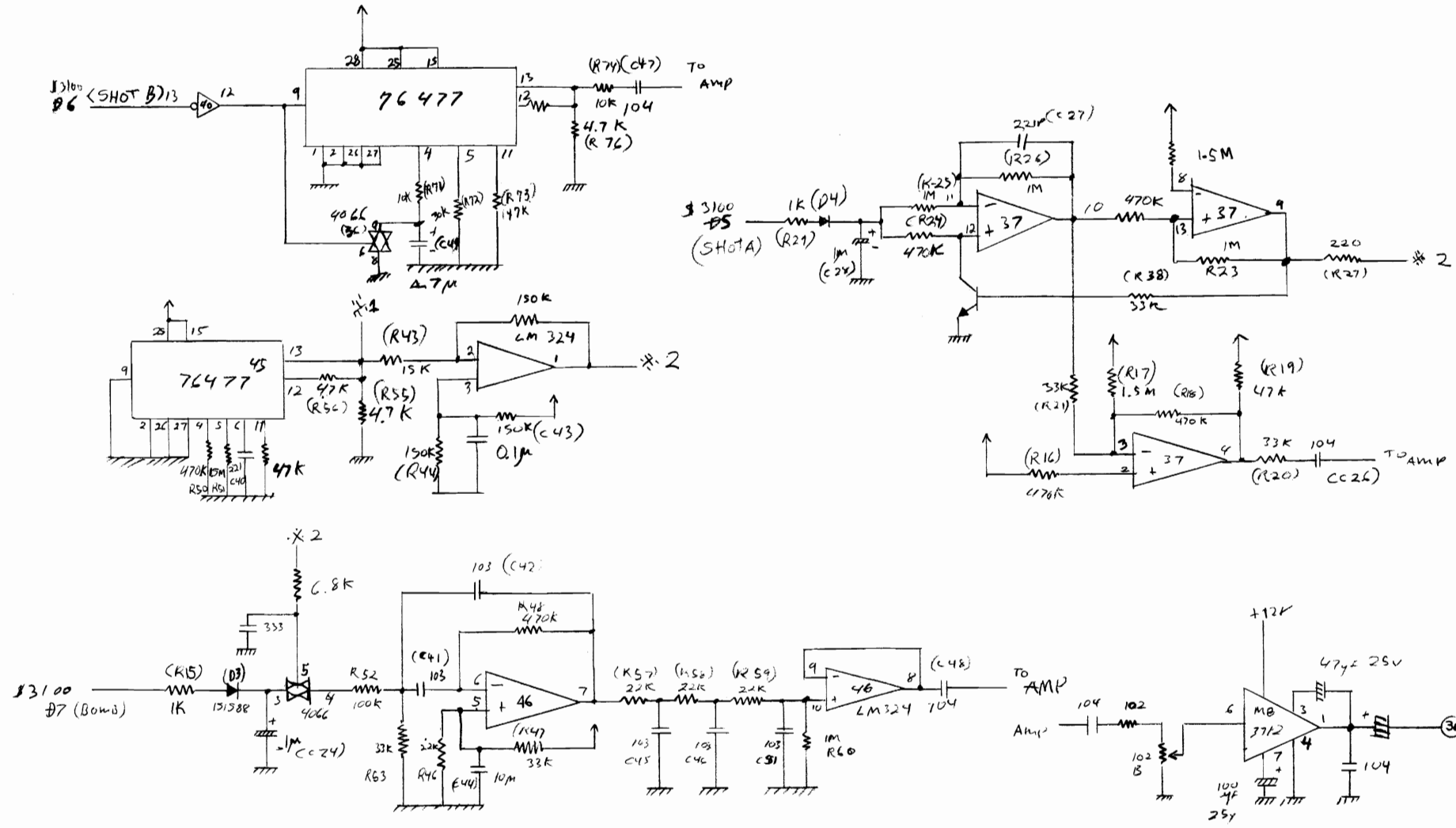
## VANGUARD CIRCUIT MEMORY MAP

ADDRESS		IC
0000H~ 03FFH	WORKING RAM	4118 X 1
0400H~ 07FFH	FRONT V-RAM	2114 X 2
0800H~ 0BFFH	BACK V-RAM	2114 X 2
0C00H~ 0FFFH	COLOR V-RAM	2114 X 2
1000H~ 1FFFH	FRONT CHARACTOR RAM	2128 X 2
2000H~ 2FFFH	BLANK	
3000H~ 3001H	CRTC	6505 X 1
3100H~ 34FFH	I/O PORT	
3500H~ 3FFFH	BLANK	
4000H~ BFFFH	ROM	2732 X 8
F000H~ FFF9H	BLANK	
FFFAH~ FFFFH	BECTLE	6502 X 1



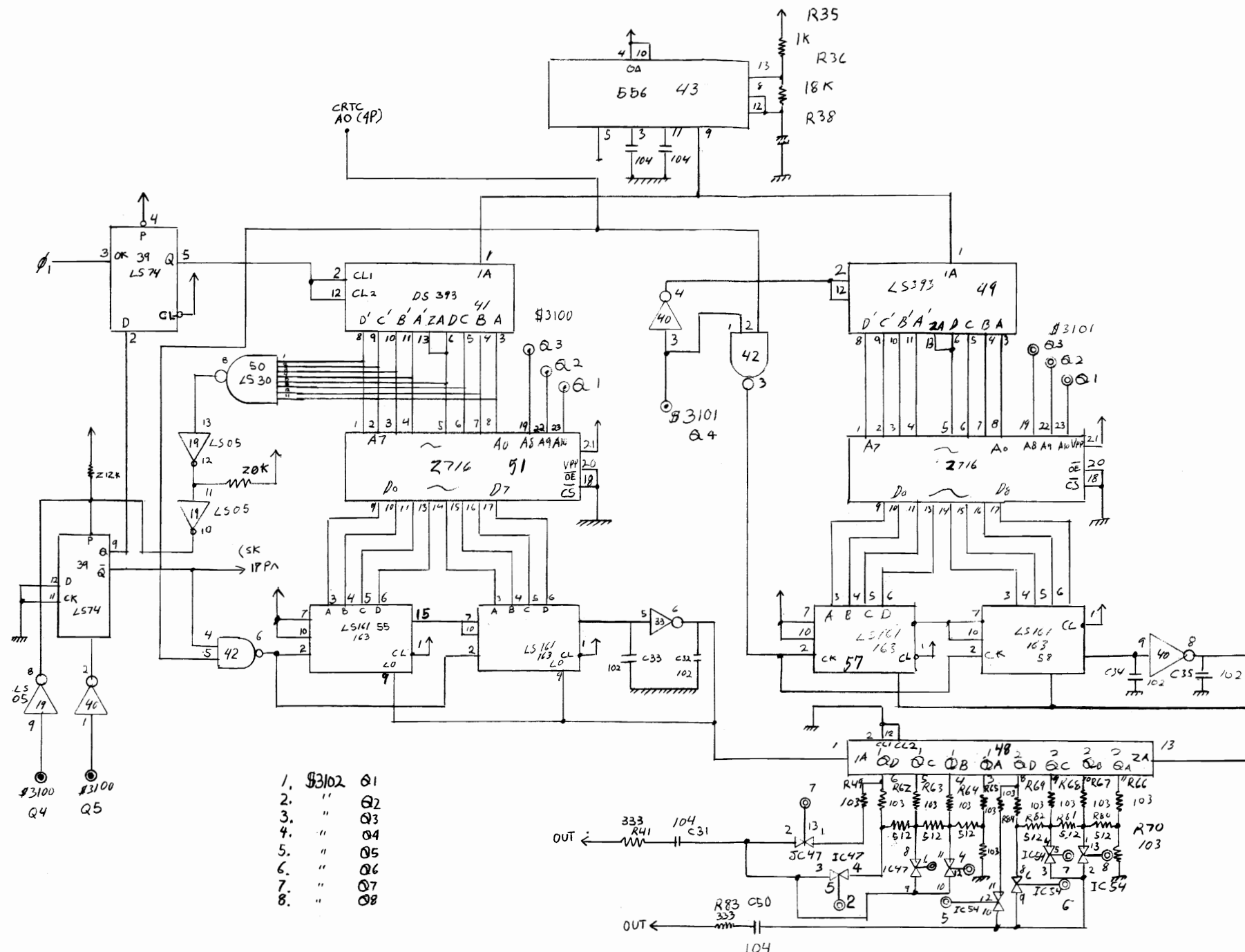
REV. LET.	ECN NO.	REVISION	BY	TOLERANCES	centuri	HIALEAH, FLORIDA 33014
				Unless Otherwise Specified	NAME VANGUARD CIRCUIT MEMORY MAP	
				FRACTIONS ± 1/32	MATERIALS HEAT TREAT. FINISH	
				DECIMALS 2 PL ± .015	DWN. APP'D. DATE SCALE PART NO. REV.	
				DECIMALS 3 PL ± .006	ALBERTO 8-4-81 375-17-0400	
				HOLES + .003		
				ANGLES ± 1/2°		
				SHT. MET BENDS ± 2°		

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QC. APV'D	PROD. APV'D	QTY.	ASSEMBLY NO
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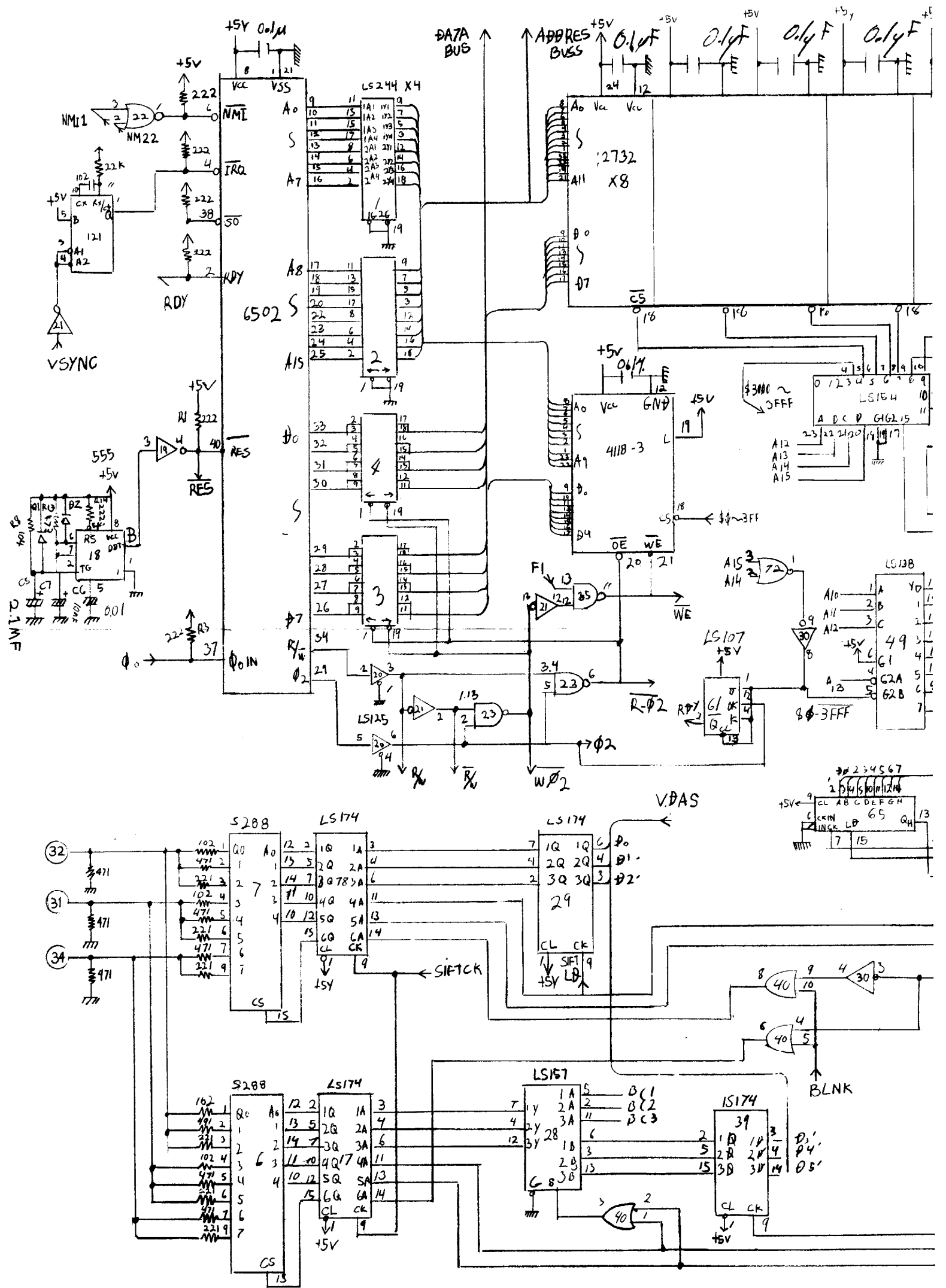
REV. LET.	ECN NO.	REVISION	BY	TOLERANCES	NAME	DATE	SCALE	PART NO.	REV.
				Unless Otherwise Specified	SK-4 VANGUARD Sound	8-4-81		375-17-0100	
				FRACTIONS ± 1/32					
				DECIMALS 2 PL ± .015					
				DECIMALS 3 PL ± .005					
				HOLES ± .003					
				ANGLES ± 1/2°					
				SHT. MET BENDS ± 2°					

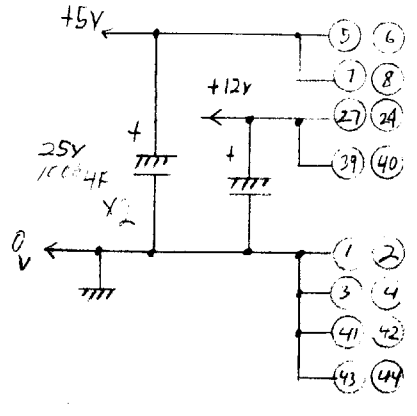
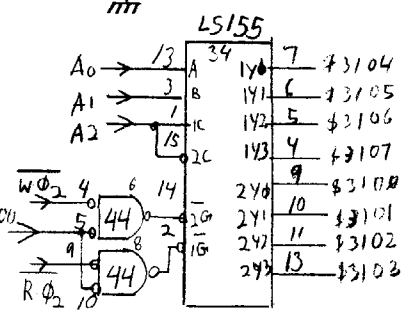
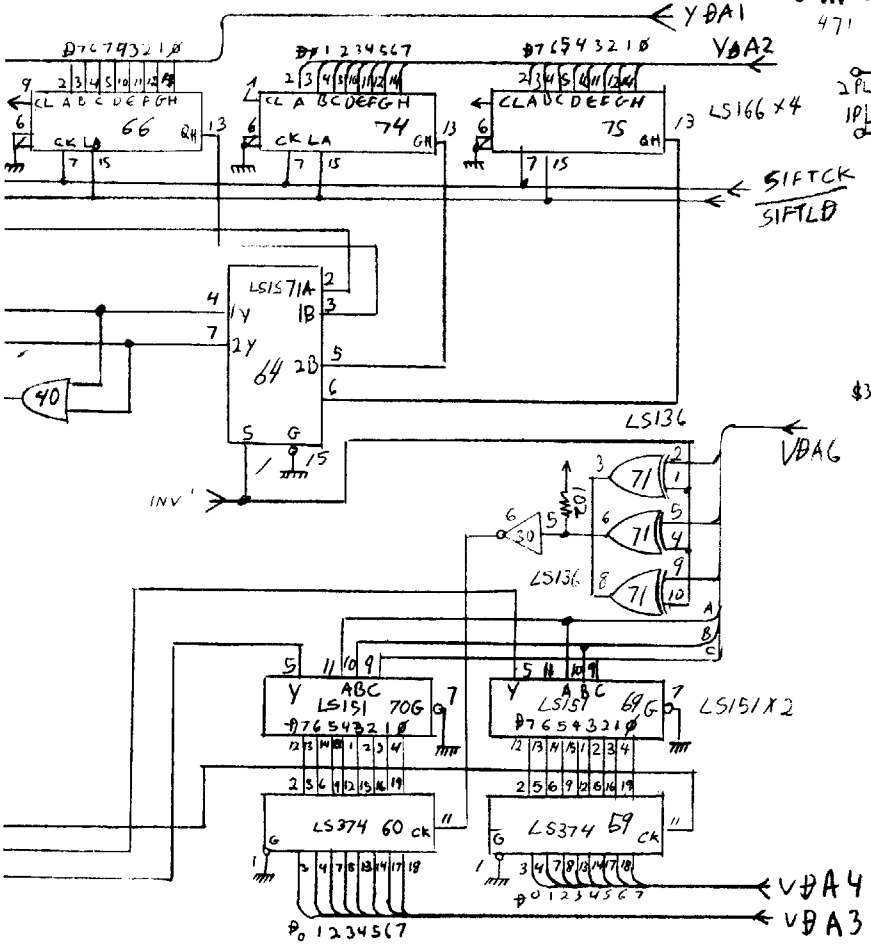
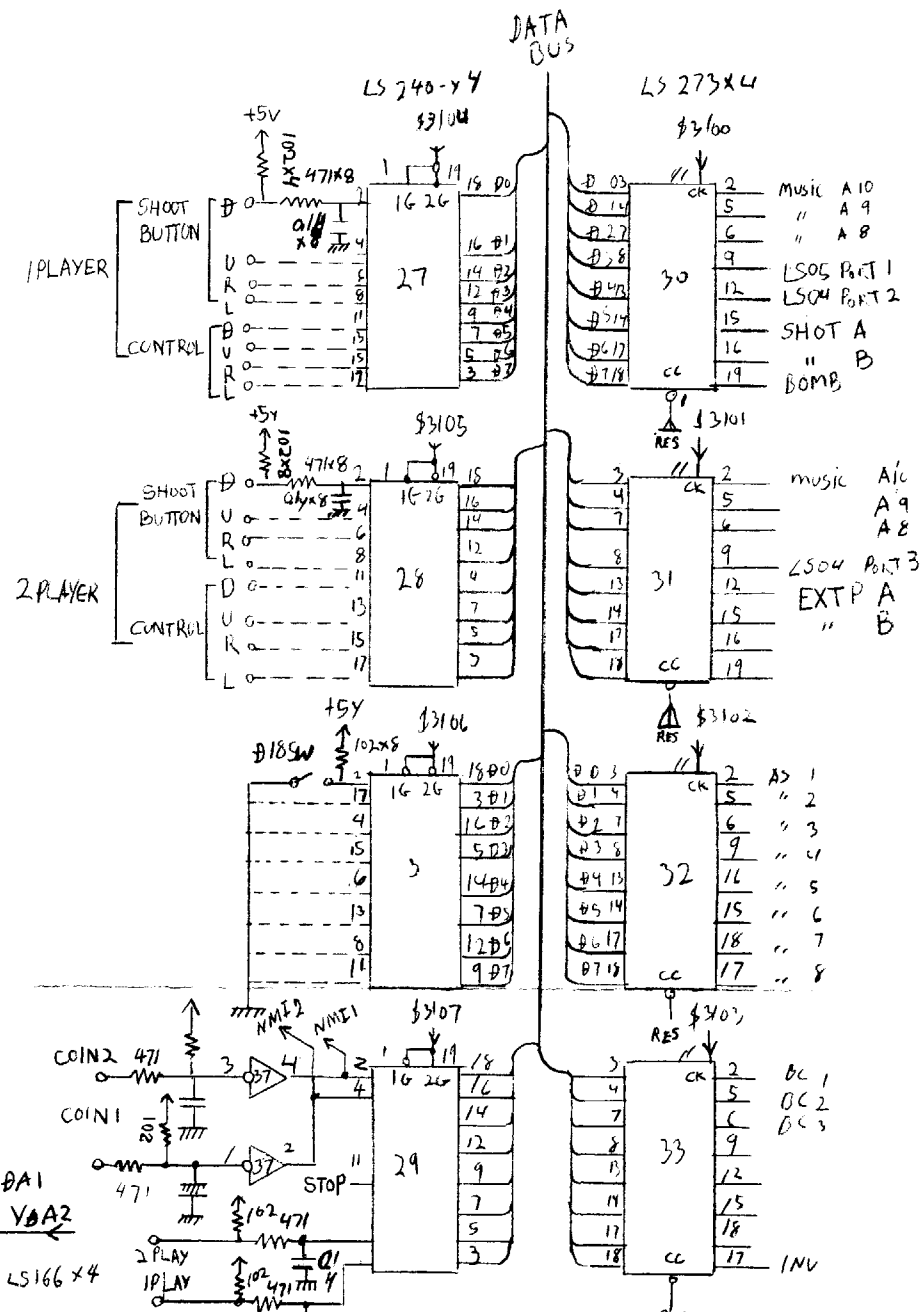
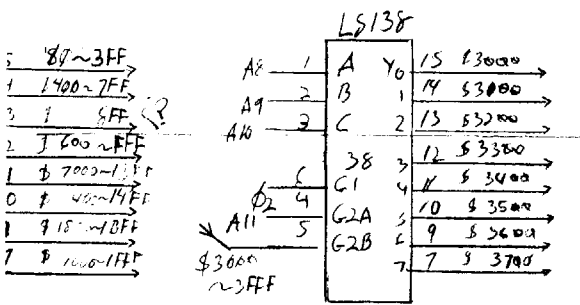
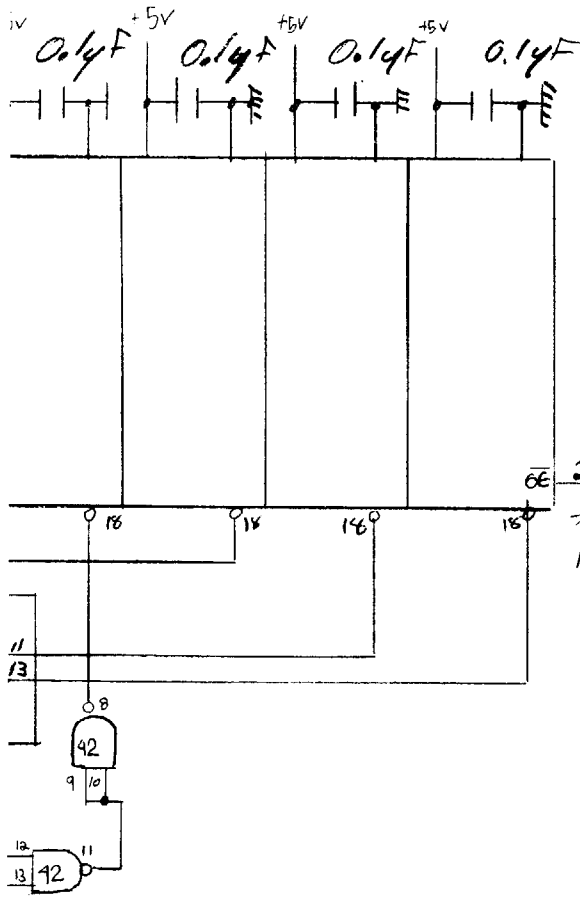


- 1. #3102 Q1
- 2. " Q2
- 3. " Q3
- 4. " Q4
- 5. " Q5
- 6. " Q6
- 7. " Q7
- 8. " Q8

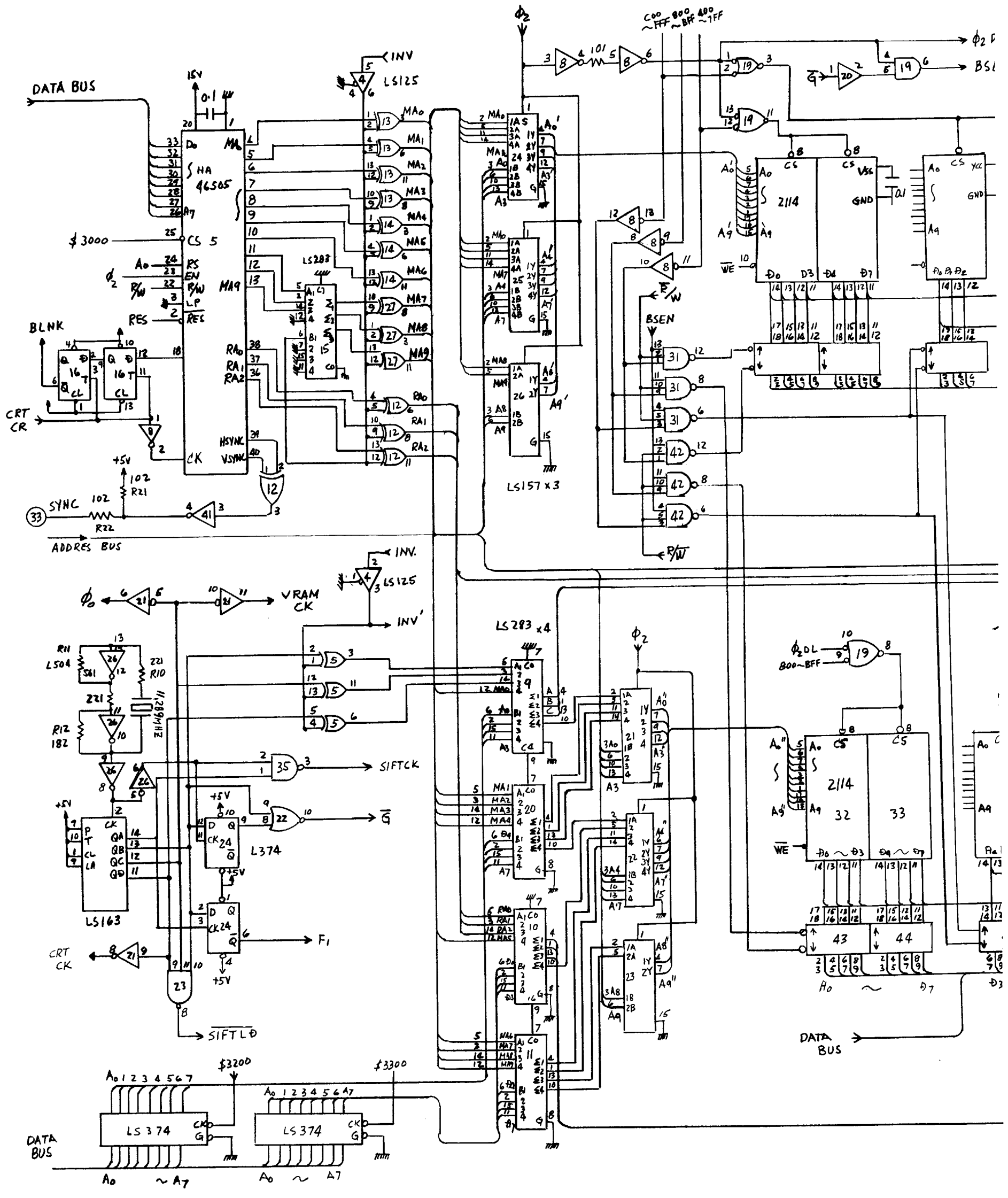
QC. APV'D	PROD. APV'D	QTY.	ASSEMBLY NO
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centuri				HIALEAH, FLORIDA 33014			
NAME		SK-4		PAGE 2			
MATL'S.		HEAT TREAT.		FINISH			
REV. LET.	ECN NO.	REVISION	BY	TOLERANCES Unless Otherwise Specified	DATE	SCALE	PART NO.
				FRACTIONS ± 1/32	8-4-81		375-17-0100
				DECIMALS 2 PL ± .015			
				DECIMALS 3 PL ± .005			
				HOLES + .003			
				ANGLES ± 1/2°			
				SHT. MET BENDS ± 2°			

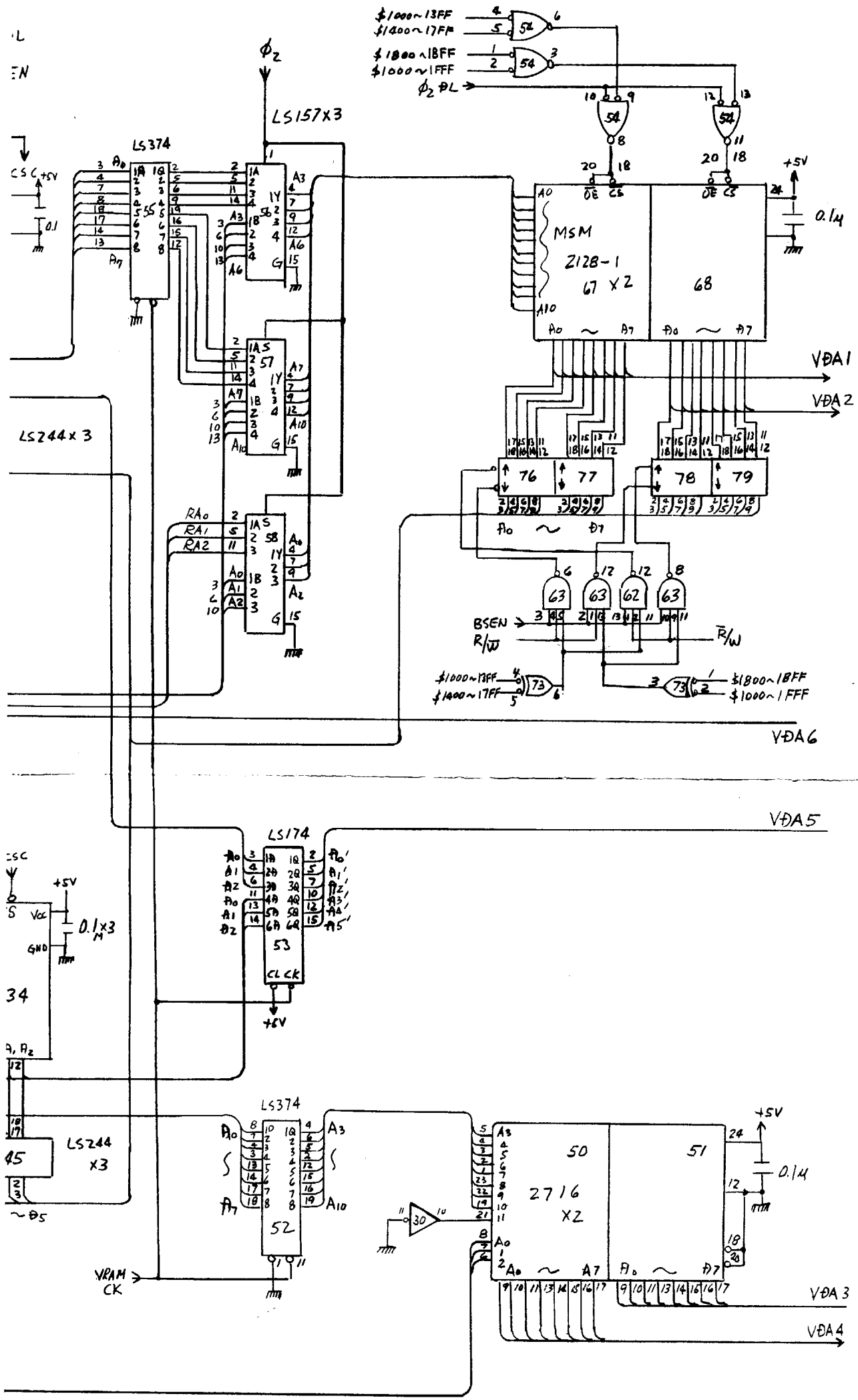




REV. LET.	ECN NO.	REVISION	BY	TOLERANCES	QC. APV'D	PROD. APV'D	QTY.	ASSEMBLY NO.
				Unless Otherwise Specified				
				FRACTIONS ± 1/32	<div style="text-align: center;">             HIALEAH, FLORIDA 33014         </div>			
				DECIMALS 2 PL ± .015				
				DECIMALS 3 PL ± .005				
				HOLES ± .003				
				ANGLES ± 1/2°				
				SHT. MET BENDS ± 2°	NAME SK-4 CPU PAGE 3 MATL'S. HEAT TREAT. FINISH DWN. APP'D. DATE 8-4-81 SCALE PART NO. 375-17-0100 REV.			







QC. APV'D	PROD. APV'D	QTY.	ASSEMBLY NO
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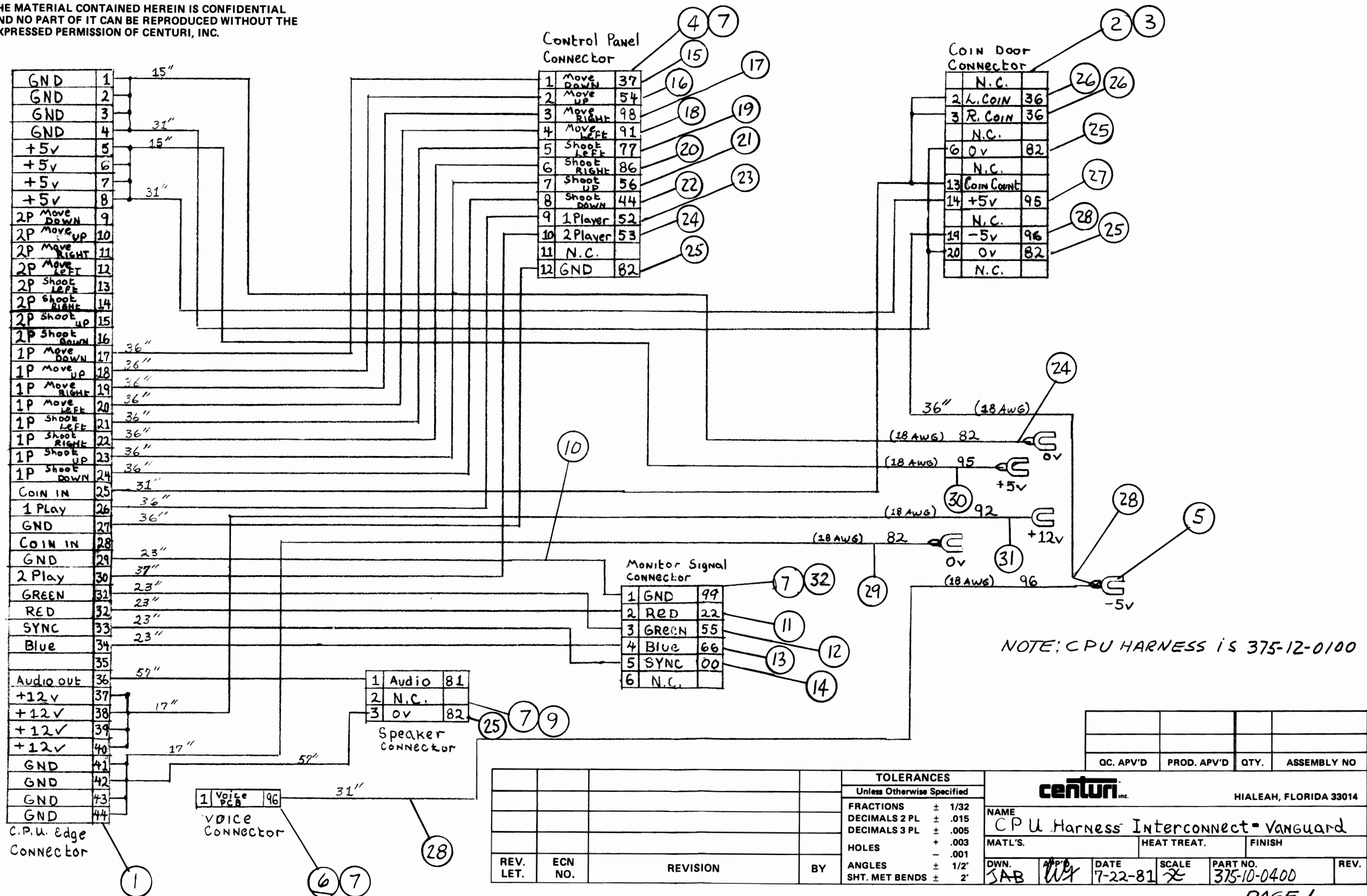
REV. LET.	ECN NO.	REVISION	BY	TOLERANCES	centur inc. HIALEAH, FLORIDA 33014					
				Unless Otherwise Specified	NAME SK-5					
				FRACTIONS ± 1/32	MATERIALS HEAT TREAT. FINISH					
				DECIMALS 2 PL ± .015	DWN. AAN	APP'D.	DATE 8-4-81	SCALE	PART NO. 375-17-0200	REV.
				DECIMALS 3 PL ± .005						
				HOLES ± .003						
				ANGLES ± 1/2°						
				SHT. MET BENDS ± 2°						







THE MATERIAL CONTAINED HEREIN IS CONFIDENTIAL AND NO PART OF IT CAN BE REPRODUCED WITHOUT THE EXPRESSED PERMISSION OF CENTURI, INC.



NOTE: CPU HARNESS IS 375-12-0100

QC. APV'D	PROD. APV'D	QTY.	ASSEMBLY NO
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REV. LET.	ECN NO.	REVISION	BY

<b>TOLERANCES</b>		<b>centuri inc.</b>		HIALEAH, FLORIDA 33014	
Unless Otherwise Specified				NAME	
FRACTIONS	±	1/32	CPU Harness Interconnect - Vanguard		
DECIMALS 2 PL	±	.015	MATL'S.		
DECIMALS 3 PL	±	.005	HEAT TREAT.		
HOLES	+	.003	FINISH		
	±	.001	DWN.	DATE	SCALE
ANGLES	-	1/2'	SAB	7-22-81	2
SHT. MET BENDS	±	2'	APP'D	PART NO.	REV.
			WY	375-10-0400	

AF 17899B



**245 West 74th Place Hialeah, Florida 33014**  
**Telephone 305-558-5200**  
**Telex: 803694 ANSB Centuri Cable: CENTURI**