

# Challenger

## SERVICE MANUAL

MANUAL NO.  
374-10-0100

**centuri**  
inc.

# **CHALLENGER**

CENTURI, INC.  
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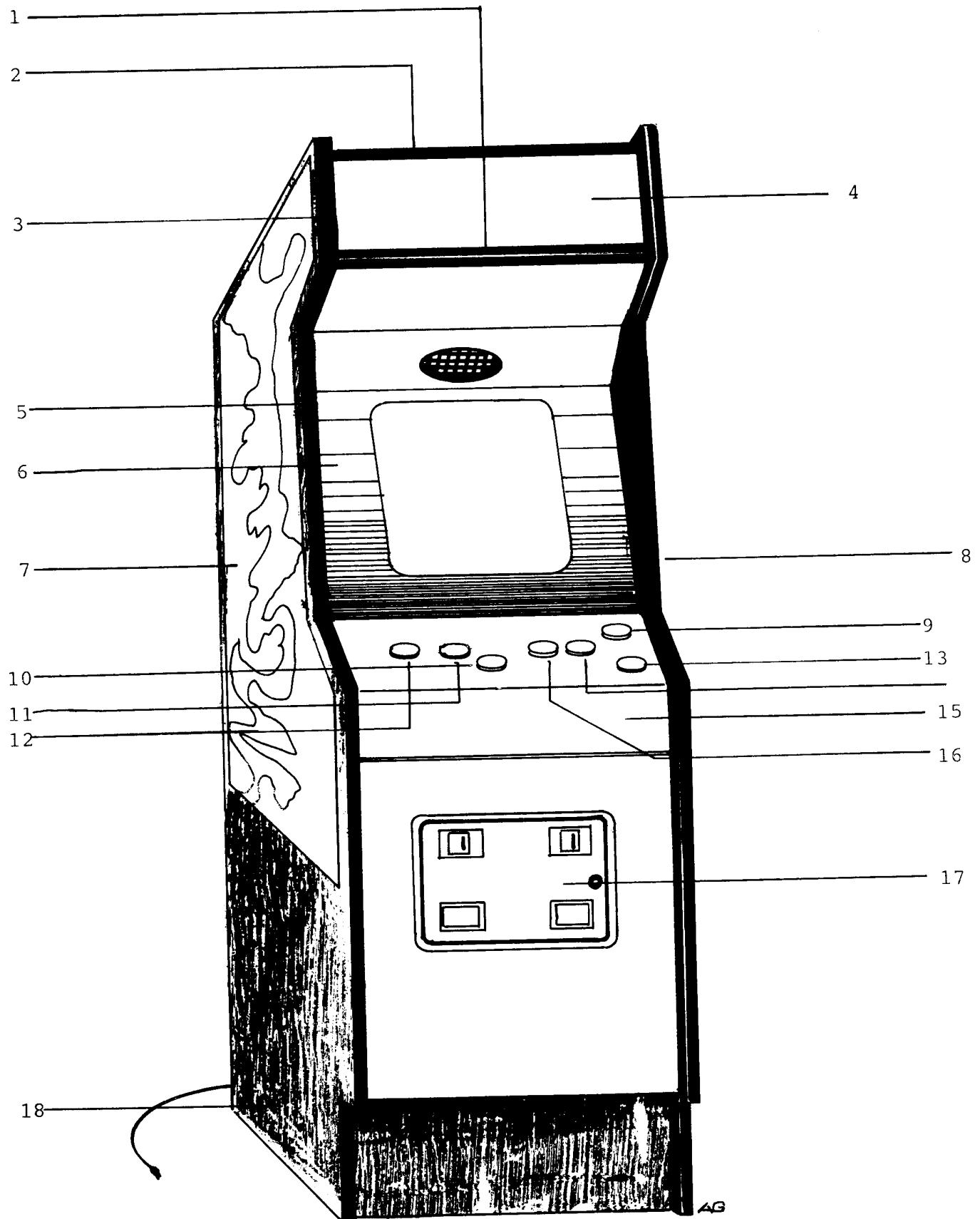
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**CHALLENGER UPRIGHT**  
**(figure 1)**

CABINET  
(FIGURE 1)  
PARTS LIST

NO.	CENTURI P/N:	DESCRIPTION:
1.	361-06-0100	MARQUEE BOTTOM HOLD DOWN BRKT.
2.	343-03-0200	MARQUEE TOP HOLD DOWN BRKT.
3.	361-10-0200	VINYL TRIM, 7 1/4" LONG
4.	374-06-0100	SILK SCREENED MARQUEE PANEL
5.	374-06-0500	SILK SCREENED MONITOR OVERLAY
6.	361-04-1000	VIEWING GLASS
7.	374-06-0200	LEFT HAND SIDE DECAL
8.	374-06-0300	RIGHT HAND SIDE DECAL
9.	-----	ONE PLAYER BUTTON
10.	-----	WARP BUTTON
11.	-----	LEFT MOTION BUTTON
12.	-----	RIGHT MOTION BUTTON
13.	-----	TWO PLAYER BUTTON
14.	-----	FIRE BUTTON
15.	374-14-0100	CONTROL DECK WIRED ASS'Y.
16.	-----	SUPER BOMB BUTTON
17.	374-10-0400	COINCO COIN DOOR (MODIFIED)
18.	361-12-0900A	A.C. LINE CORD HARNESS

## CHALLENGER

CHALLENGER is the newest video game to be introduced by Centuri. With its vivid colors and lively setting, it is sure to lure the most ardent player into game action.

The game consists of sixteen sectors (rounds) of play. Sector one begins with Large Energy Rings floating randomly across the screen. The Spaceship must avoid colliding with the Rings, or it will explode into a starburst of brilliant colors. The Spaceship dodges the Energy Rings by moving right or left across the playfield, while bursting them with the Spaceship's 3-directional guns. Bursting the Large Rings (100 points), breaks them into Medium Rings. Bursting the Medium Rings (200 points), breaks them into Small Rings. Bursting the Small Rings (400 points), causes them to disintegrate.

The Spaceship is further protected by a feature called a "Warp" button. By depressing this button, the Spaceship will relocate from the top or bottom of the screen to the opposite side.

If the Spaceship is in ultimate danger of being destroyed, releasing its Super Bomb will wipe out all the objects on the playfield, and add the point value of the objects to your score. Use of the Super Bomb is lost, if the ship is destroyed first. Only one Super Bomb is awarded per Spaceship.

At any time, a colorful Space Bogey resembling a Worm may appear on screen and proceed to chase the Spaceship. If the Worm is destroyed by Spaceship fire, or dodged successfully for several seconds, a "clang" is heard and the Worm (500 points) wriggles off the screen in a bright red hue of embarrassment. If the Spaceship is caught by the Worm, a bell is sounded, and the astronaut is chased out of his ship in pursuit of safety.

At random time intervals a Bonus Bug will walk across the playfield, stop, and count down a Bonus Number. This number is equal to 100 times its value. To receive this Bonus, the Spaceship must link with the nose of the Bonus Bug.

When the Spaceship has survived 50 Seconds of playing time, it now enters the challenges of the next sector.

The remaining 15 sectors are played in the same manner as Sector one. The differences include that each succeeding sector increases in difficulty. The Energy Rings increase in number and move faster across the screen making them harder to dodge. Also there are several Space Bogeys introduced in the first 8 sectors. They also increase in number with advancement through each sector. Some of the Space Bogeys resemble Comets whizzing through space. Others resemble Spaceships from other worlds. Each Space Bogey (500 points), is an assemblage of bright colors, and when destroyed, burst with a "clang" into a spray of bright light.

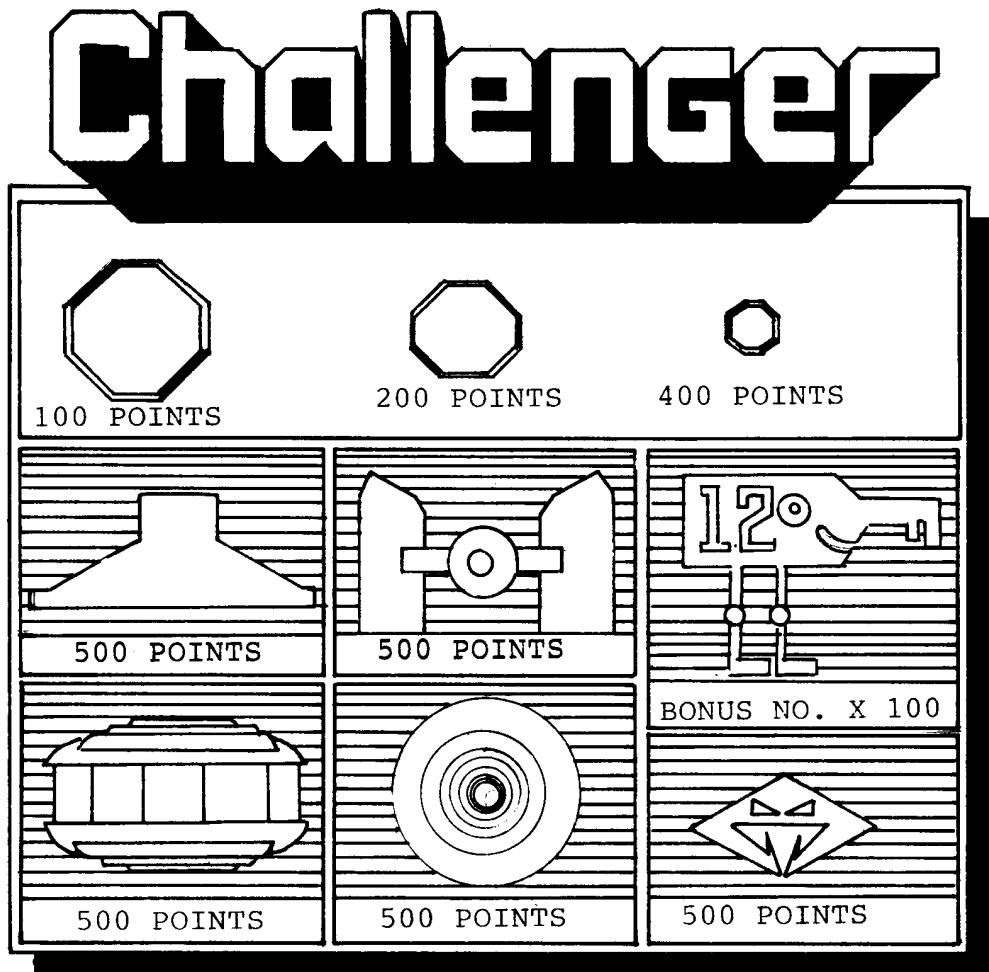
Sectors 4, 8, 12, and 16, are alike as follows. A few seconds after the Energy Rings are broken into smaller pieces, they are pulled into a Black Hole in the center of the screen. While swirling across the game area, the condensed Rings expand and shatter into fragments which must be destroyed before they absorb the Spaceship.

When Sector 16 has been accomplished, it will return to Sector 9.

When Bonus levels are achieved, an additional Ship will be added to your game.

## CHALLENGER INSTRUCTIONS

1. BURST ENERGY RINGS TO SCORE AND INCREASE BONUS LEVELS.  
LARGE RINGS - 100 POINTS  
MEDIUM RINGS - 200 POINTS  
SMALL RINGS - 400 POINTS
2. AFTER ALL THE SMALL RINGS ARE HIT, ADVANCE TO THE NEXT SECTOR.
3. IN EACH SECTOR, SPACE BOGEYS APPEAR AND SCORE 500 POINTS WHEN HIT.
4. WHEN THE BONUS BUG WALKS ACROSS THE PLAYFIELD AND STOPS, BONUS POINTS ARE COUNTED DOWN. TO COLLECT THE BONUS, LINK THE SHIP WITH NOSE OF THE BUG.
5. PRESSING THE WARP BUTTON IMMEDIATELY RELOCATES THE SHIP FROM THE TOP OR BOTTOM OF THE PLAYFIELD TO THE OPPOSITE SIDE.
6. THE SUPER BOMB BUTTON DESTROYS ALL OBJECTS ON THE PLAYFIELD SCREEN AND AWARDS TOTAL POINT VALUE TO YOUR SCORE.
7. ONE SUPER BOMB IS AWARDED PER SHIP. USE OF IT WILL BE LOST IF THE SHIP IS DESTROYED FIRST.
8. GAME IS OVER WHEN ALL THE SHIPS HAVE BEEN DESTROYED.



### OPTIONAL SWITCH SETTINGS

The optional switch settings for the game are found on the C.P.U. Board. They will aid you in your game selection format.

Dip Switch A controls the number of coins per game, and also the the number of ships allotted per game. The following settings can also be found described on mode 6 of the self diagnostic test modes. (See System Diagnostics section for further explanation.)

#### DIP SWITCH A

Switches 1 and 2, of this switch, control the number of coins per game:

<u>SWITCH 1</u>	<u>SWITCH 2</u>	<u>COINS PER GAME</u>
Off	Off	1 Coin per game
On	Off	2 Coins per 1 game <u>or</u>
		3 Coins per 2 games
Off	On	2 Coins per game
On	On	Free Play

Switches 3 through 6 are factory settings. They are to remain in the OFF position.

Switches 7 & 8 control the number of ships allotted per game:

<u>SWITCH 7</u>	<u>SWITCH 8</u>	<u>NO. OF SHIPS PER GAME</u>
Off	Off	3
On	Off	4
Off	On	5
On	On	6

Dip Switch B controls the number of points at which a Bonus Ship is awarded, as well as some factory settings also described on mode six of the self diagnostic test modes.

#### DIP SWITCH B

Switches 1 through 3 control the Bonus Ship for different point levels.

<u>SWITCH 1</u>	<u>SWITCH 2</u>	<u>SWITCH 3</u>	<u>BONUS SHIP AWARDED AT</u>
On	On	On	30,000 Points
Off	Off	Off	40,000 Points
On	Off	Off	50,000 Points
Off	On	Off	60,000 Points
On	On	Off	70,000 Points
Off	Off	On	80,000 Points
On	Off	On	90,000 Points

Switches 4 & 5 are factory settings and remain in the OFF position. Switches 6 & 7 are factory settings which remain in the ON position. Switch 8 - OFF for the upright game; ON for the Cocktail Table.

## SYSTEMS DIAGNOSTICS

Programmed into the Challenger game is a feature called "Systems Diagnostics". This is a series of system level (game level as opposed to circuit level) tests which are used to aid a service operator in checking-out or setting-up a game on site. Regardless of the state of the game or position of the operator switch settings, entry into the test modes is possible as long as the power is on in the game. This is accomplished by depressing the test switch located on the inside of the coin door. By pressing this switch down, a momentary action results which advances you through the selection of test modes. By pressing the switch up, it is now placed in a detent position. This position is used in performing special tests within some of the modes. To exit from the test modes, activate the coin-switch or slam-switch, upon which the game automatically returns to the attract mode. Please note that test mode 7 is used to test the coin switches and exit from it can only be accomplished by stepping to another test mode or interrupting the power with the switch in a neutral position.

The test modes are numbered 0 through 9, with Mode 0 displaying the "diagnostic menu". This is merely the Table of Contents of all of the test modes. The following is a brief description of each of the nine mode selections:

### COLOR FIELDS (Mode 1)

This test is comprised of a built-in, color bar generator. It is used to properly set-up the color monitor for color purity, static and dynamic convergence, and white balance. When Mode 1 is first entered the screen is all black with "TEST NO. 1 COLOR FIELDS" inscribed across the top. When the test switch is placed in a detent position (upward), the screen will automatically sequence cyclically through the 8 color fields (solid color rasters) of RED, GREEN, YELLOW(RED & GREEN), BLUE, MAGENTA(RED & BLUE), CYAN(GREEN & BLUE), WHITE(ALL ON), BLACK(ALL OFF). Any of these color fields can be selected by returning the test switch to a neutral position.

### COLOR GRIDS (MODE 2)

This test displays crosshatch patterns. As in Mode 1, the switch in a detent position can be used to select any of the eight colors. The color grids fill the total image display on the monitor screen, so that size and position adjustments of the grid relate directly to the game image. These grids should be periodically used to check the monitor set-up for IMAGE SIZE, POSITION, SYNCHRONIZATION, LINEARITY, PINCUSHIONING, COLOR CONVERGENCE, COLOR BALANCE. Image focus and brightness should be a final adjustment made on-site to the game, while in play.

### CONTINUOUS VIDEO CLEAR (MODE 3)

The function of this test is to provide repetitive clear and write signals, so that the functions can be observed with synchronous test equipment such as oscilloscopes. When Mode 3 is entered, the

screen will go solid blue with "TEST NO. 3 CONT". VIDEO CLEAR" displayed across the top in black. After a 2 second delay, the screen will begin flashing, indicating that repetitive "clear to blue" signals are being processed.

CONTINUOUS VIDEO WRITE  
(MODE 4)

When the test in this mode is entered, the monitor screen will be cleared to all black and "TEST NO. 4 CONT. VIDEO WRITE" will be displayed across the top of the screen in white. After a 2 second delay, a white diagonal line will appear from the upper-left to the lower-right screen. Although not apparent to the viewer, this line is being constantly redrawn to force the video X-Y write counters to cycle through binary up-counts.

Since the video RAMS are being continuously accessed, errors from defective or marginal RAMS will appear as spurious dots on the screen, and when errors are observed, the next test mode can then be entered to determine which RAMS are generating the erroneous dots.

VIDEO RAM LOCATOR  
(MODE 5)

Mode 5 is a unique diagnostic aid that uses the video display as well as the hardware configuration of the video computer to isolate problems down to chip level. There are 48 video RAM chips which are socketed and arranged in three groups of 16, corresponding to the 3 primary colors: Red, Green, and Blue. Whenever one of these chips is defective, spurious dots will appear on the screen.

For this test, vertical, white lines are spaced across the screen, and 3 pairs of letter-numbers appear in the middle of the screen. These pairs are "road-map" locators corresponding to the physical location of the 3 specific RAM chips on the video board. The locators are displayed in Blue, Green, and Red, and correspond to the 3 RAMS which generate the vertical white lines. If any of the white lines overlaps a noise dot, the locator indicates which chip generated that dot.

By moving the test switch up and then back to neutral immediately, the next set of RAMS is selected. The vertical lines appear wider since a second set of lines is drawn adjacent to the first set, and the RAM locators change to indicate the new set of RAMS which generate the new lines. Once again, if these white lines overlap a noise dot, then the locator will tell you which chip is generating that dot.

Activating the test switch to the detent position (upward), then back again to neutral can be repeated 16 times total. This process continues adding white lines to the screen until the entire image area is covered with white lines. It is helpful to experiment with this test by removing one of the RAM chips and find its location by using the video locator.

DIP SWITCHES  
(MODE 6)

Test Mode 6 serves a dual, first by checking the proper operation of the option DIP switches(A & B), and second by displaying all the possible switch options. The DIP switch positions are numbered and followed by the word OFF in Red. When a switch is turned ON, it will be written in Green, following the switch number. The best way

to verify proper operation of the DIP switches is as follows:

1. Turn all switches OFF.
2. Confirm all 16 OFF is displayed.
3. Turn all odd-numbered switched ON.
4. Confirm alternating ON-OFF is displayed.
5. Turn all remaining switches ON.
6. Confirm all 16 ON is displayed.
7. Turn all odd-numbered switches OFF.
8. Confirm alternating OFF-ON is displayed.
9. Turn all switches OFF.
10. Confirm return to all 16 OFF.

For various selections of the switch options, see the OPTIONAL SWITCH SETTINGS section of this manual.

COIN & START SWITCHES  
(MODE 7)

In this display, as in the previous test, the switches are numbered and followed by word OFF (in Red) or ON (in Green) when the switch is activated. There is also an additional column labeled LOCATOR, which provides the information concerning the connection of each switch to its harness. FOR EXAMPLE ONLY: If the SLAM switch locator is A30J1-4, this means that this switch is wired to Pin 4 of Connector J1 on assembly A30. When the SLAM switch is activated, the display should show COIN-DOOR switch number 3 ON. If it doesn't connect a jumper from the common of the connector to Pin 4. If the display shows ON, the problem is external to the computer system.

Each of the switches listed in this test display should be manually activated to verify proper electrical connections. However, most of these switches are critical switches, and the only true test of total operational performance is by actual use in a game environment. FOR EXAMPLE, multiple coins should be inserted in the coin-slot with the verification of proper tracking of the coins all the way to cash box, through proper credit accumulation and coin counting. Note that the SELECT TEST switch cannot be directly tested in this mode since its activation will sequence to the next test mode.

PLAYER SWITCHES  
(MODE 8)

The display format for this test is identical to test 7, except that it displays the player 1 and player 2 control switches. This test is also used to isolate problems, but performance testing must be obtained by operating the switches while playing an actual game.

AUDIO COMPUTER  
(MODE 9)

This test lists all the 15 sounds in the Challenger game. By putting the switch in the detent position (up), a sequence of sound effects will be heard. If the proper response is received by the Game Computer, the test will display OK in Green after the sound number. If not, it will write NO in Red. Either response indicates that the request was made. Thus this test provides a check on the Game-to Audio Computer link, when the sound system is not working or not properly connected.

## 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-2- and 110/220 VAC conversion instructions.

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

## 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 labeled, and located in the middle of the cabinet, and can be accessed through the rear cabinet 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 on the rear of the monitor.

This machine should be serviced only by a qualified technician.

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

For service information, contact the Customer Service Department. The number and information is located on the first page of this manual.

### 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 the 5 Volts and ground at the edge of the connector. If necessary, adjust the screwdriver control on the power supply so the meter reads between 4.9 and 5.1 Volts.

## 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.

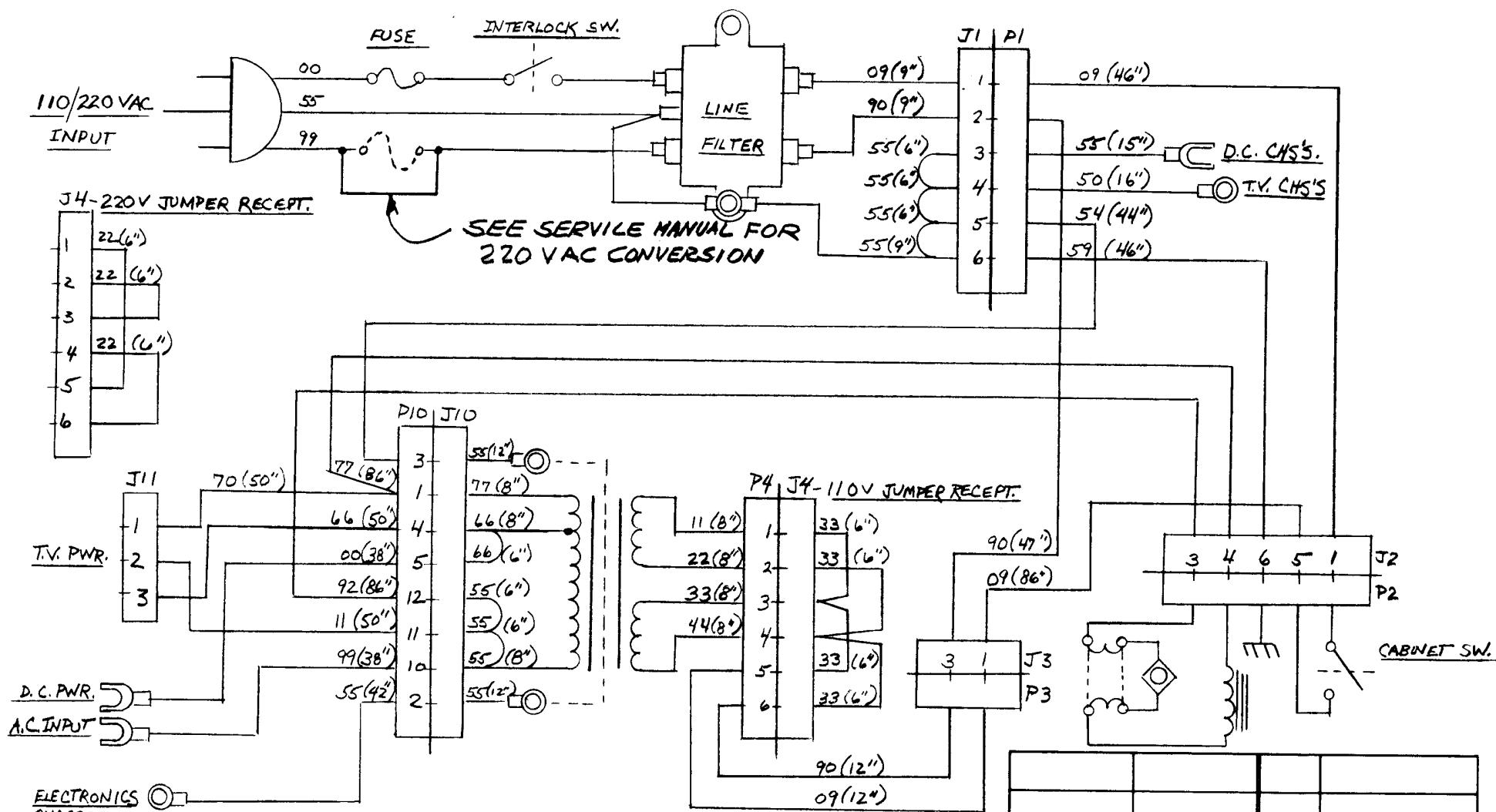
To change back to 110 VAC, replace the components changed in Steps above.

\*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.

(SEE ALSO FIG. 2, 110/220 POWER INTERCONNECT DIAGRAM, #370-10-040C

ENTIAL  
INT THE

FIGURE 2



REV. LET.	ECN NO.	REVISION	BY	TOLERANCES	centur <sup>inc.</sup>				HIALEAH, FLORIDA 33014
				Unless Otherwise Specified					
				FRACTIONS $\pm 1/32$					
				DECIMALS 2 PL $\pm .015$					
				DECIMALS 3 PL $\pm .005$					
				HOLES $\pm .003$					
				ANGLES $\pm 1/2^\circ$					
				SHT. MET BENDS $\pm 2^\circ$					
					110/220V POWER INTERCONNECT DIAGS				
					NAME				
					MATL'S.				HEAT TREAT. FINISH
					DWN. ANG'D	DATE	SCALE	PART NO.	
					VAP	5-8-81		370-10-0400	REV. A

# 2800-0 FRONT PLATE EXPLODED VIEW

25¢ COIN

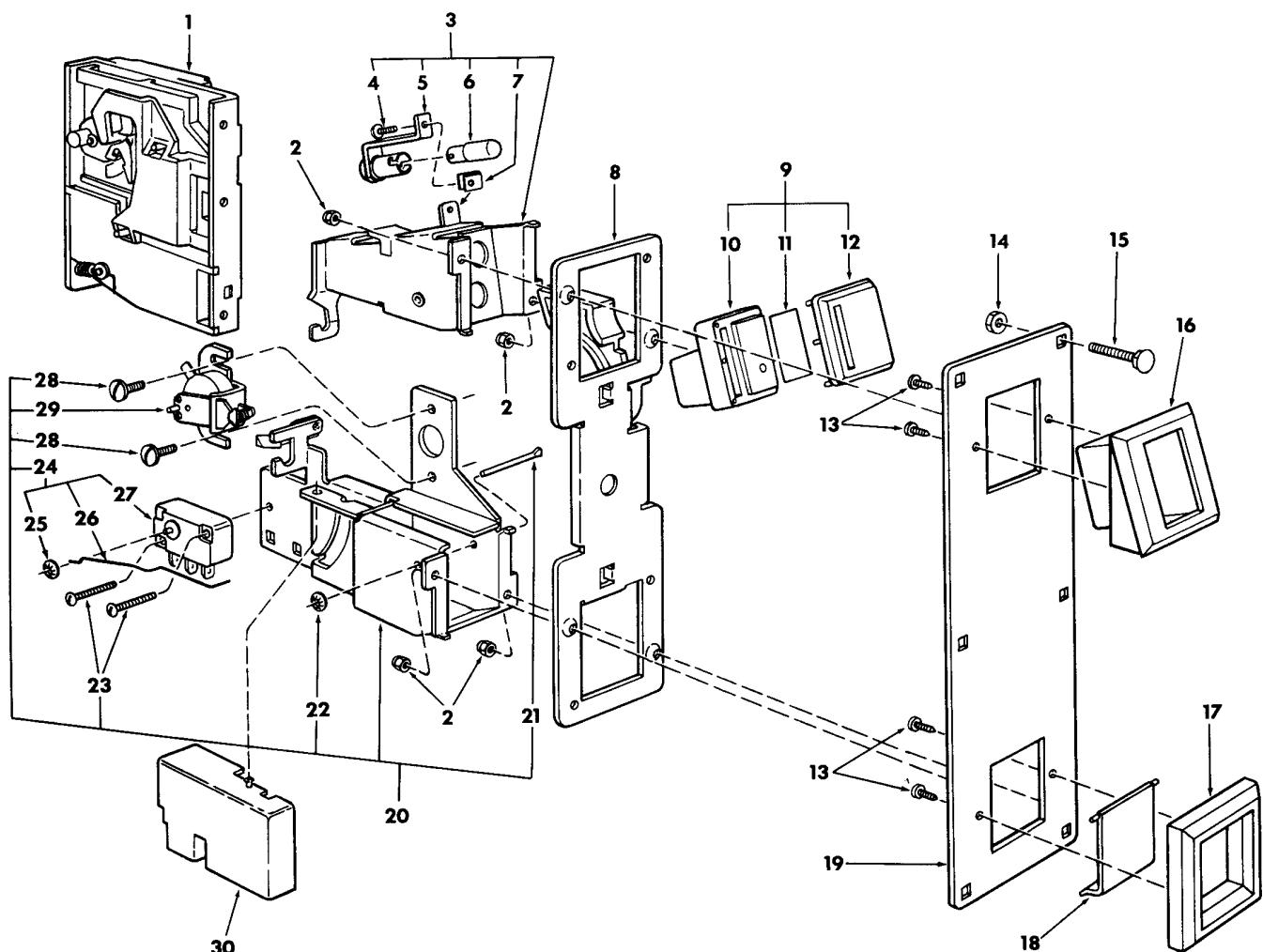


FIGURE 5

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**

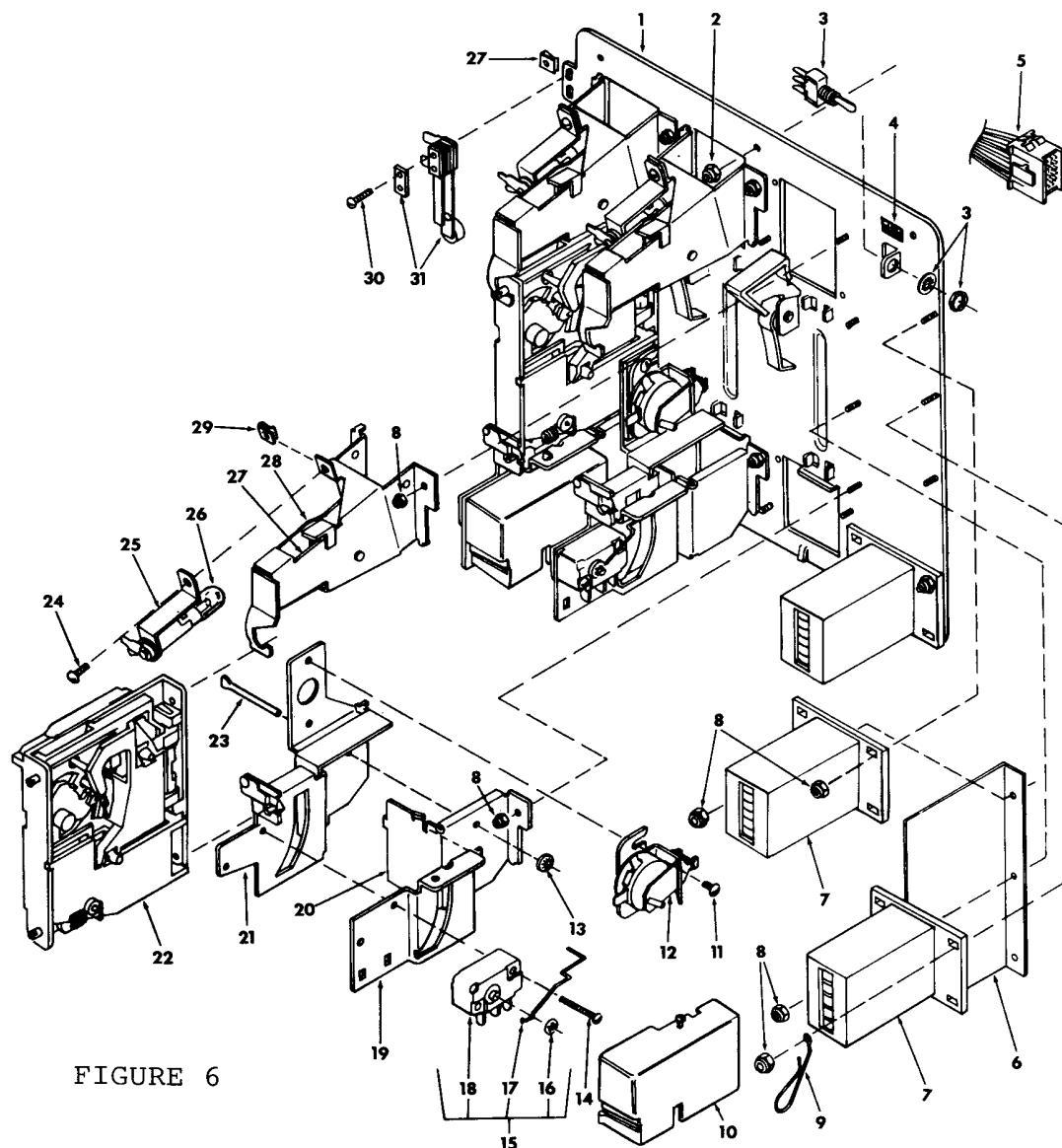


FIGURE 6

<b>Index No.</b>	<b>Part No.</b>	<b>Description</b>	<b>Index No.</b>	<b>Part No.</b>	<b>Description</b>
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	904822	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

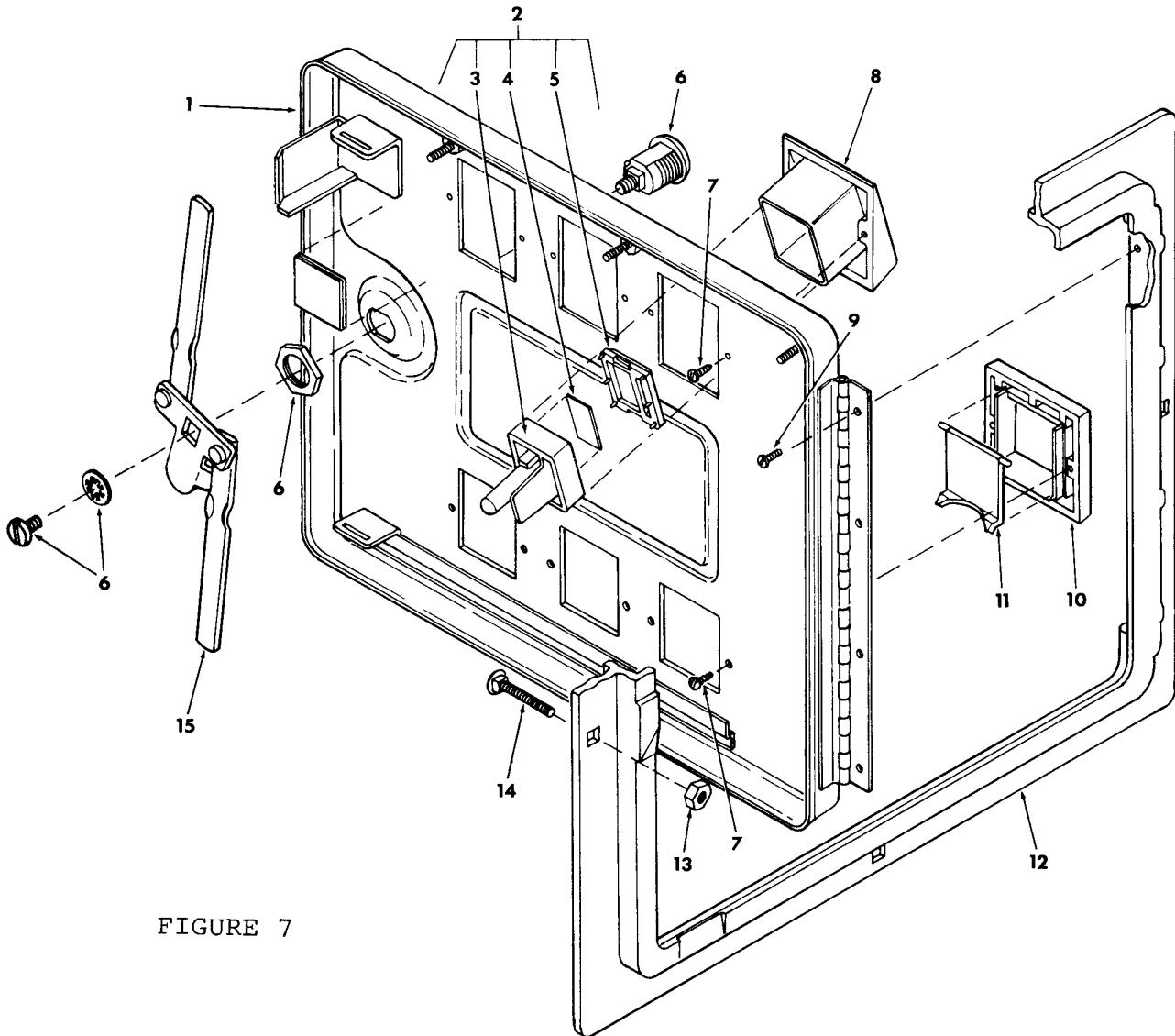


FIGURE 7

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" x 13 3/8")
15.	50270159	404357	LOCKING ARM ASSEMBLY

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

PERIPHERAL INTERFACE BOARD A-30

NO.	PART NUMBER:	DESCRIPTION:	USAGE:
1.	50020005	MPS 6531 NPN SIGNAL TRANSISTOR	1
2.	50020065	TIP 120 NPN POWER TRANSISTOR	1
3.	50030014	270 OHM, 1/4W., 5% RESISTOR	2
4.	50030097	2.7K OHM, 1/4W., 5% RESISTOR	1
5.	50040010	0.1mfd, 16V., CERAMIC DISC CAPACITOR	2
6.	50060055	100mfd, 16V., ELECTROLYTIC CAPACITOR	1
7.	50230001	3 AG., 1 AMP, NORMAL BLOW FUSE	1
8.	50230014	3 AG., P.C MOUNT FUSE CLIP	2
9.	50150313	4 CKT., P.C. WAFER, MOLEX	1
10.	50150310	10 CKT., P.C. WAFER, MOLEX	1
11.	50150312	9 CKT., P.C. WAFER, MOLEX	3
12.	50150177	20 PIN FLAT CABLE HEADER, STRAIGHT w/EJECTOR	1
13.	50100007	1N40001 SILICON 1AMP DIODE	1
14.	50100014	1N914 SIGNAL DIODE	32
15.	50210197	P.C. BOARD, A-30	1

VIDEO INTERFACE BOARD A-20

NO.	PART NUMBER:	DESCRIPTION:	USAGE:
1.	50010002LS	74LS00 I.C.	2
2.	50010004LS	74LS02 I.C.	2
3.	50010005LS	74LS04 I.C.	3
4.	50010007LS	74LS10 I.C.	2
5.	50010008LS	74LS20 I.C.	2
6.	50010019LS	74LS74 I.C.	6
7.	50010024LS	74LS93 I.C.	4
8.	50010028LS	74LS153 I.C.	5
9.	50010045LS	74LS157 I.C.	2
10.	50010059LS	74LS165 I.C.	6
11.	50010105LS	74LS32 I.C.	1
12.	50010194LS	74LS191 I.C.	5
13.	50010014	7442 I.C.	3
14.	50010191	MK4027-4, 350ns I.C.	48
15.	50030051	1K OHM, 1/4W., 5% RESISTOR	3
16.	50030095	330 OHM, 1/4W., 5% RESISTOR	2
17.	50030206	180 OHM, 1/4W., 5% RESISTOR	3
18.	50040010	.1mfd, 16V., CERAMIC DISC CAPACITOR	33
19.	50040027	.01mfd, 16V., CERAMIC DISC CAPACITOR	1
20.	50040053	100pf, 25V., CERAMIC DISC CAPACITOR	10
21.	50060055	100mfd, 16V., AXIAL ELECTROLYTIC CAPACITOR	3
22.	50040066	470pf, 16V., CERAMIC DISC CAPACITOR	4
23.	50150111	16 PIN SOLDER TRAIL SOCKET, LOW PROF.	48
24.	50150178	26 PIN FLAT CABLE P.C.B. HEAD w/EJECTOR	1
25.	50150310	10 CKT., P.C. WAFER, MOLEX	1
26.	50150314	12 CKT., P.C. WAFER, MOLEX	1
27.	50070009	11.6688 MH <sub>Z</sub> CRYSTAL	1
28.	50210195	VIDEO INTERFACE BOARD	1

AUDIO COMPUTER BOARD A-25

NO.	PART NUMBER:	DESCRIPTION:	USAGE:
1.	50010004LS	74LS02 I.C.	1
2.	50010005LS	74LS04 I.C.	1
3.	50010014LS	74LS42 I.C.	1
4.	50010019LS	74LS74 I.C.	1
5.	50010172	6502 I.C., C.P.U.	1
6.	50010177	AY3-8910 I.C.	1
7.	50010171	2716 I.C., EPROM	1
8.	50010206	6532 I.C.	1
9.	50010054	LM380N I.C.	1
10.	50030010	470 OHM, 1/4W., 5% RESISTOR	2
11.	50030146	15K, 1/4W., 5% RESISTOR	2
12.	50030112	3.3K, 1/4W., 5% RESISTOR	3
13.	50030092	1 MEG., 1/4W., 5% RESISTOR	1
14.	50030051	1K, 1/4W., 5% RESISTOR	2
15.	50030154	2.7 OHM, 1/4W., 5% RESISTOR	1
16.	50030150	47K, 1/4W., 5% RESISTOR	1
17.	50030063	10K, 1/4W., 5% RESISTOR	1
18.	50040010	0.1mfd, 16V., CERAMIC DISC CAPACITOR	16
19.	50040011	.001mfd, 16V., CERAMIC DISC CAPACITOR	1
20.	50040056	.05mfd, 16V., CERAMIC DISC CAPACITOR	1
21.	50040085	22pfd, 16V., CERAMIC DISC CAPACITOR	1
22.	50060060	10mfd, 16V., AXIAL ELECTROLYTIC CAPACITOR	1
23.	50060055	100mfd, 16V., AXIAL ELECTROLYTIC CAPACITOR	3
24.	50060090	2.2mfd, 16V., AXIAL ELECTROLYTIC CAPACITOR	1
25.	50060058	2200mfd, 16V., ELECTROLYTIC CAPACITOR	1
26.	50130034	8 POSITION DIP SWITCH (SPST)	2
27.	50150061	24 PIN SOLDER TRAIL SOCKET, LOW PROF.	1
28.	50150060	40 PIN SOLDER TRAIL SOCKET, LOW PROF.	3
29.	50150179	34 PIN FLAT CABLE HEADER w/EJECTOR	1
30.	50230001	3 AG., 1 AMP FUSE, NORMAL BLOW	1
31.	50230014	3 AG., MOUNT FUSE CLIP	2
32.	50150311	3 CKT., P.C. WAFER, MOLEX	1
33.	50150310	10 CKT., P.C. WAFER, MOLEX	1
34.	50070005	3.579 MH <sub>Z</sub> CRYSTAL	1
35.	50090015	14 PIN DIP HEAT SINK, V7-1, STAVER	1
36.	50120005	100K, 1/4W., TRIMMER POT	1
37.	50210196	AUDIO COMPUTER BOARD, A-25	1

MICRO COMPUTER BOARD, REV. CPARTS LIST

<u>NO.</u>	<u>PART NUMBER</u>	<u>DESCRIPTION:</u>	<u>USAGE:</u>
1.	50010002LS	74LS00 I.C.	1
2.	50010005LS	74LS04 I.C.	4
3.	50010019LS	74LS74 I.C.	2
4.	50010273LS	74LS244 I.C.	2
5.	50010195LS	74LS367 I.C.	1
6.	50010248LS	74LS138 I.C.	2
7.	50010045LS	74LS157 I.C.	1
8.	50010035LS	74LS161 I.C.	1
9.	50010172	6502 I.C., CPU	1
10.	50010173	6522 I.C.	3
11.	50010322	2532 I.C., EPROM 500ns or LESS	6
12.	50030007	100K., 1/4W., 5% RESISTOR	1
13.	50030010	470 OHM, 1/4W., 5% RESISTOR	2
14.	50030063	10K., 1/4W., 5% RESISTOR	3
15.	50030112	3.3K, 1/4W., 5% RESISTOR	3
16.	50040010	.1mfd., 16V., CERAMIC DISC CAPACITOR	14
17.	50040011	.001mfd., 16V., CERAMIC DISC CAPACITOR	9
18.	50040056	.05mfd., 16V., CERAMIC DISC CAPACITOR	1
19.	50060055	100mfd., 16V., AXIAL ELECTROLYTIC CAPACITOR	1
20.	50060124	1.0mfd., 16V., AXIAL ELECTROLYTIC CAPACITOR	1
21.	50070005	3.579MH <sub>Z</sub> , CRYSTAL w/LEAD WIRES	1
22.	50130034	8 POSITION DIP SWITCH (SPDT)	3
23.	50150061	24 PIN SOLDER TRAIL SOCKET, LOW PROF.	8
24.	50150060	40 PIN SOLDER TRAIL SOCKET, LOW PROF.	4
25.	50150112	18 PIN SOLDER TRAIL SOCKET, LOW PROF.	4
26.	50100014	1N914 SIGNAL DIODE	1
27.	50150177	20 PIN FLAT CABLE w/EJECTOR	1
28.	50150178	26 PIN FLAT CABLE w/EJECTOR	1
29.	50150179	34 PIN FLAT CABLE w/EJECTOR	1
30.	50150310	10CKT. P.C. WAFER, MOLEX	1
31.	50010310	2114 RAM	2
32.	50210194C	MICRO COMPUTER BOARD, REV. C	1
33.	374-10-0300	EPROM LABELS	6

## CONTROL PANEL

ITEM	QTY	PART N°	DESCRIPTION
10	8	10150007	#10-24 KEPS NUT
9	1	10110022	#10-24x3/4 CARRIAGE BOLT BLACK OXIDE
8	7	50130049	RED BUTTON ASSY
7	7	50130050	PAL NUT
6	7	50130047	SWITCH & BRACKET
5	1	361-10-0600	HINGE CONTROL DECK
4	6	10110029	#10-24x1/2 CARRIAGE BOLT, BLACK OXIDE
3	1	374-03-0100	CONTROL PANEL
2	1	374-06-0400	CONTROL PANEL OVERLAY
1	4	50130048	WHITE BUTTON ASSY
			BILL OF MATERIALS

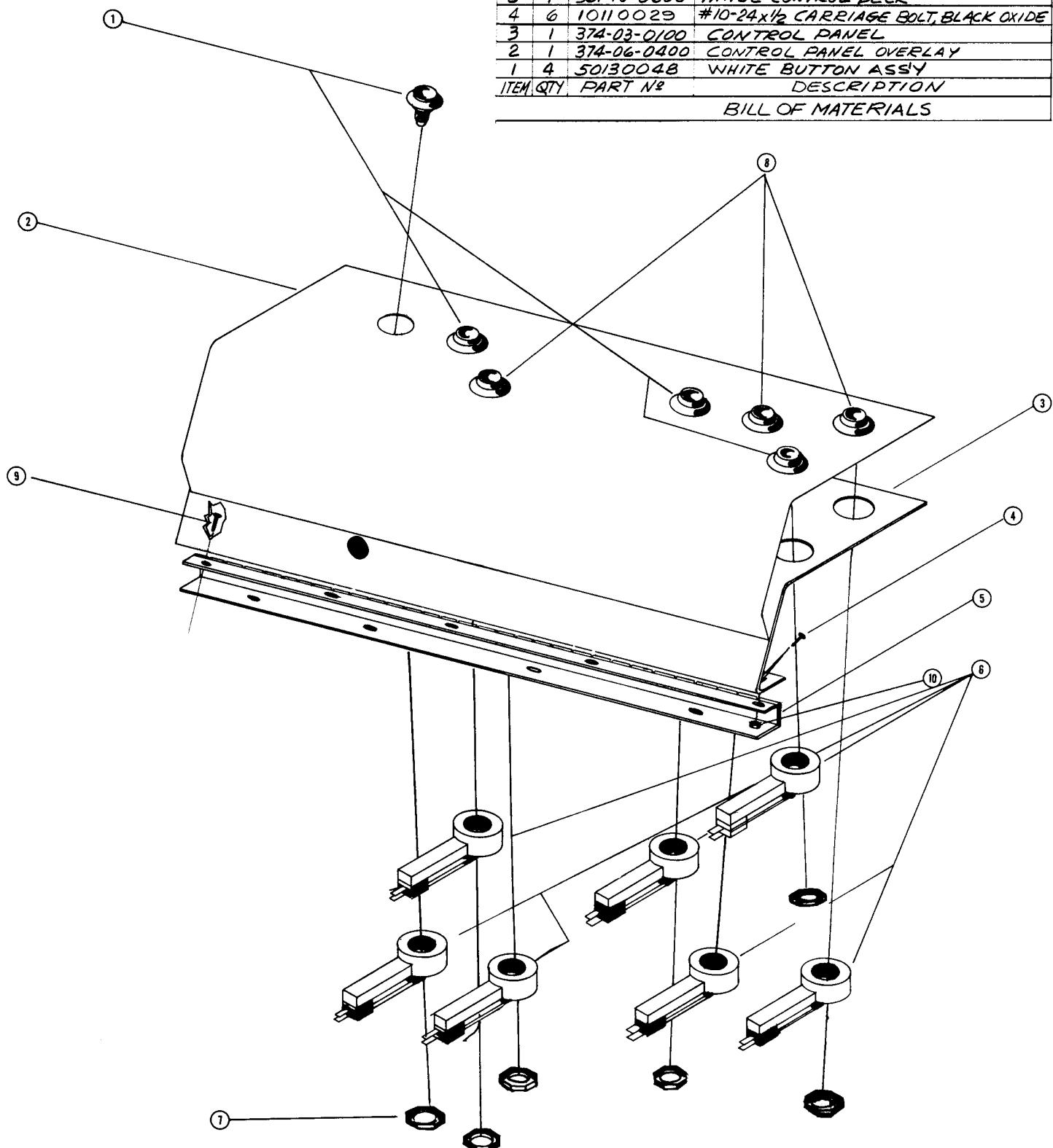
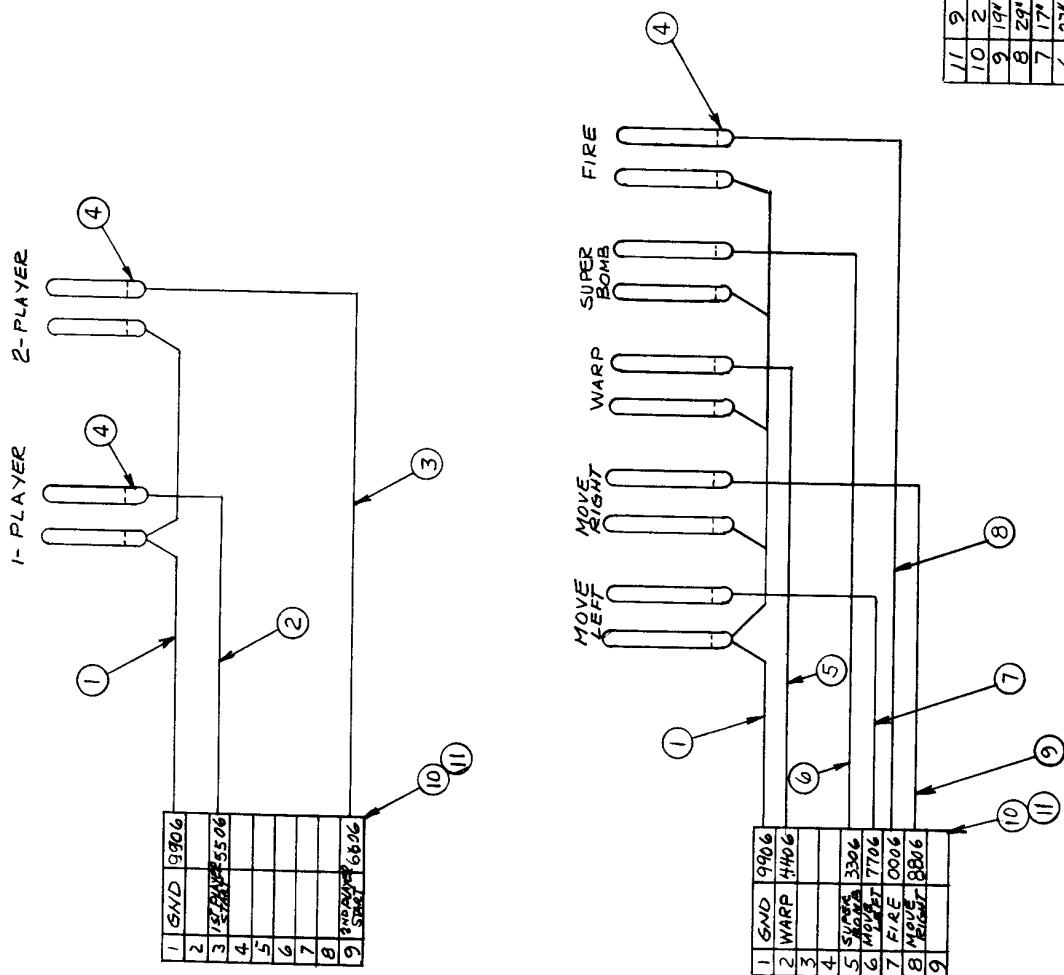
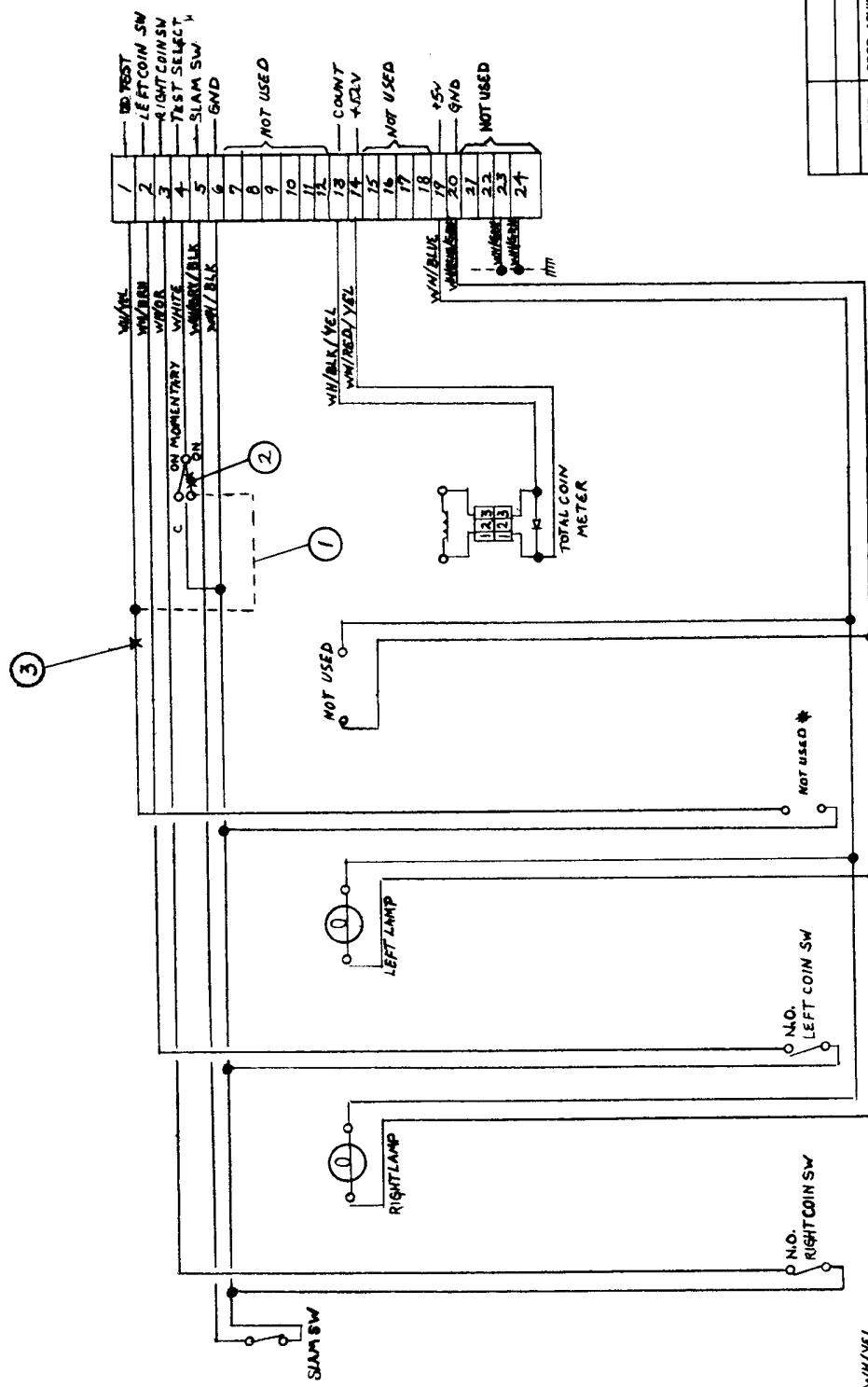


FIG. 3



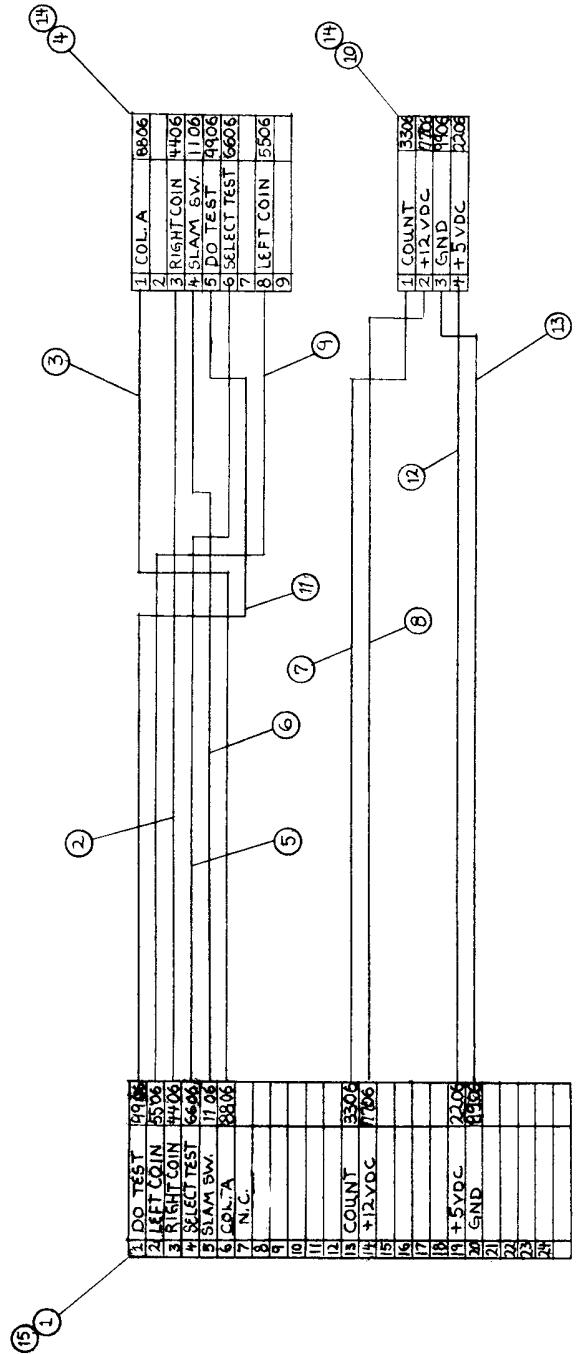
BILL OF MATERIALS			
ITEM	QTY	APPROD.	ASSEMBLY NO.
NAME	CONTR.	PROD. CITY	NAME
FRACTIONS	1/32		WHALEAN, FLORIDA 33914
DECIMALS 2 PL.	.010		
DECIMALS 4 PL.	.0000		
HOLDS	-	-	MATERIAL:
REV. ECRN	1/2	DRAW. DATE	PART NO.
NO.		BY	374-12-0700 REV.
SAT. MTR. BDR.	2		374-12-0700



NOTE:  
 (1) INDICATES V/H/YEL  
 WIRE CONN. TO ON SIDE  
 OF TEST SW.  
 (2) INDICATES CUT ON  
 WHITE WIRE TO ON SIDE  
 OF TEST SW.  
 (3) INDICATES CUT AND REMOVAL  
 OF WH/YEL WIRE FROM POINT  
 X TO NOT USED \*

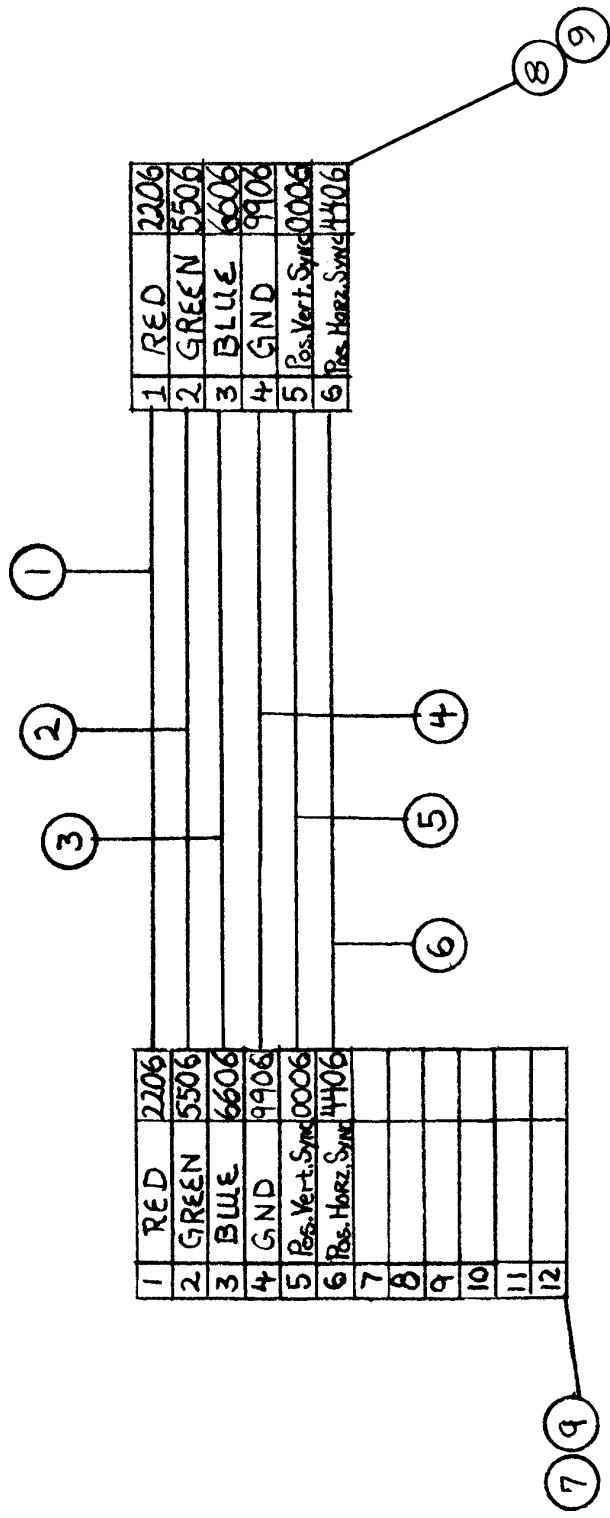
CIRCUIT			
AC. AMPD	PROD. AMPD	QTY.	ASSEMBLY NO.
			HIALEAH, FLORIDA 33014
			NAME: GAMMA II COIN DOOR MOD/F/CD
			DATE: 7-60-14-070D HEAT TREAT. FINISH
			PART NO. 374-10-0400 REV. B
			374-10-0400 REV. B
			DATE: 7-60-14-070D HEAT TREAT. FINISH
			PART NO. 374-10-0400 REV. B
			374-10-0400 REV. B

- (1) INDICATES V/H/YEL  
 WIRE CONN. TO ON SIDE  
 OF TEST SW.
- (2) INDICATES CUT ON  
 WHITE WIRE TO ON SIDE  
 OF TEST SW.
- (3) INDICATES CUT AND REMOVAL  
 OF WH/YEL WIRE FROM POINT  
 X TO NOT USED \*



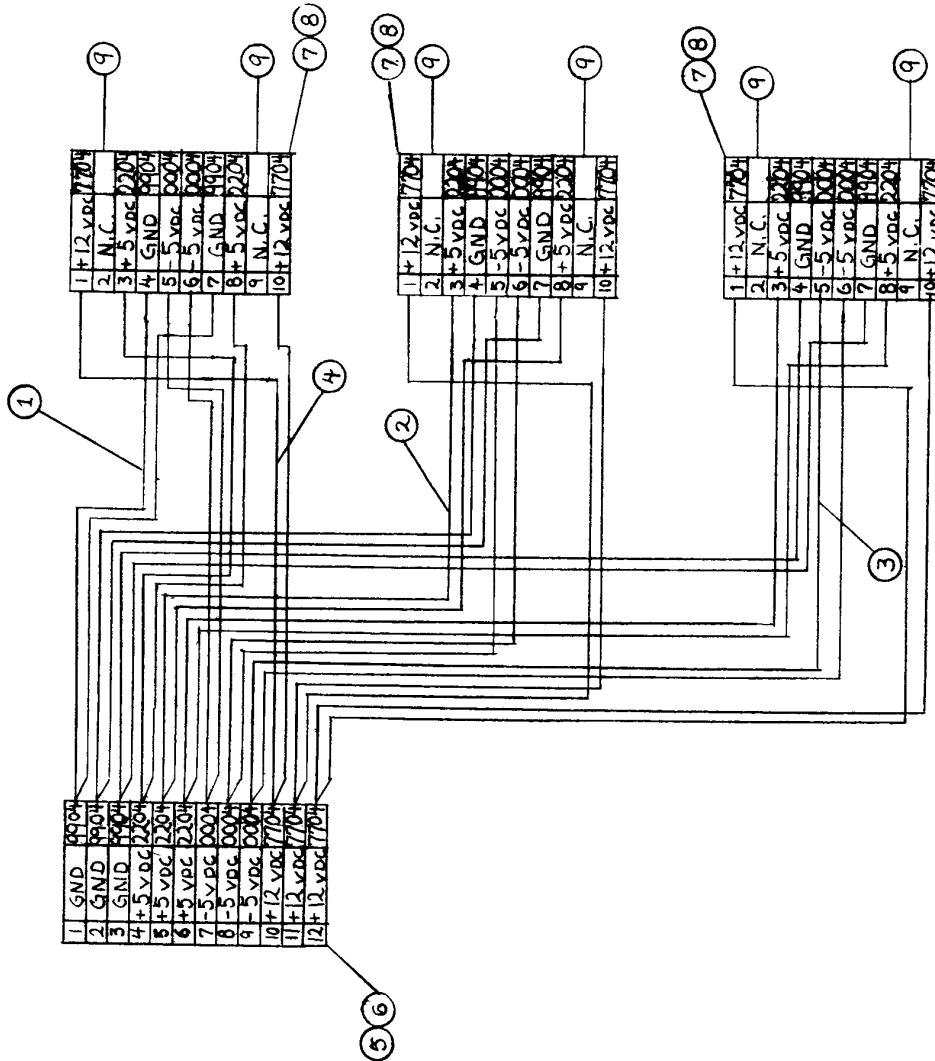
ITEM	QNTY	PART NO.	DESCRIPTION
1	1	50150269	AMP FEMALE PINS
2	10	50150274	CRIMP TERMINAL, CHAIN (MOLEX)
3	13	50172006	BLACK WIRE
4	12	50172006	RED WIRE
5	11	50150269	WHITE WIRE HOUSING (MOLEX)
6	10	50150270	CKT FEMALE HOUSING (MOLEX)
7	6	50150270	GREEN WIRE
8	3	50172006	VIOLET WIRE
9	7	50173306	ORANGE WIRE
10	6	50174006	BROWN WIRE
11	5	50176006	BLUE WIRE
12	4	50150309	GCKT FEMALE HOUSING (MOLEX)
13	3	50177006	GRAY WIRE
14	2	50177006	YELLOW WIRE
15	1	50150268	24 PIN AMP RECEP'T/CASE

REV.	ECN	REVISION	REV.	ECN	REVISION	TOLERANCES
PRINTED CIRCUIT BOARD						NAME
						COIN DOOR HARNESS
						DATE
						MANUFACTURER
						HOLE
						ASSEMBLY NO.
						ITEM NO.
						QUANTITY
						PROD. APPROV'D
						QC APPROV'D
						NAME
						MAIL TO
						FLORIDA 33144



NOTE: ALL WIRE IS # 22 AWG

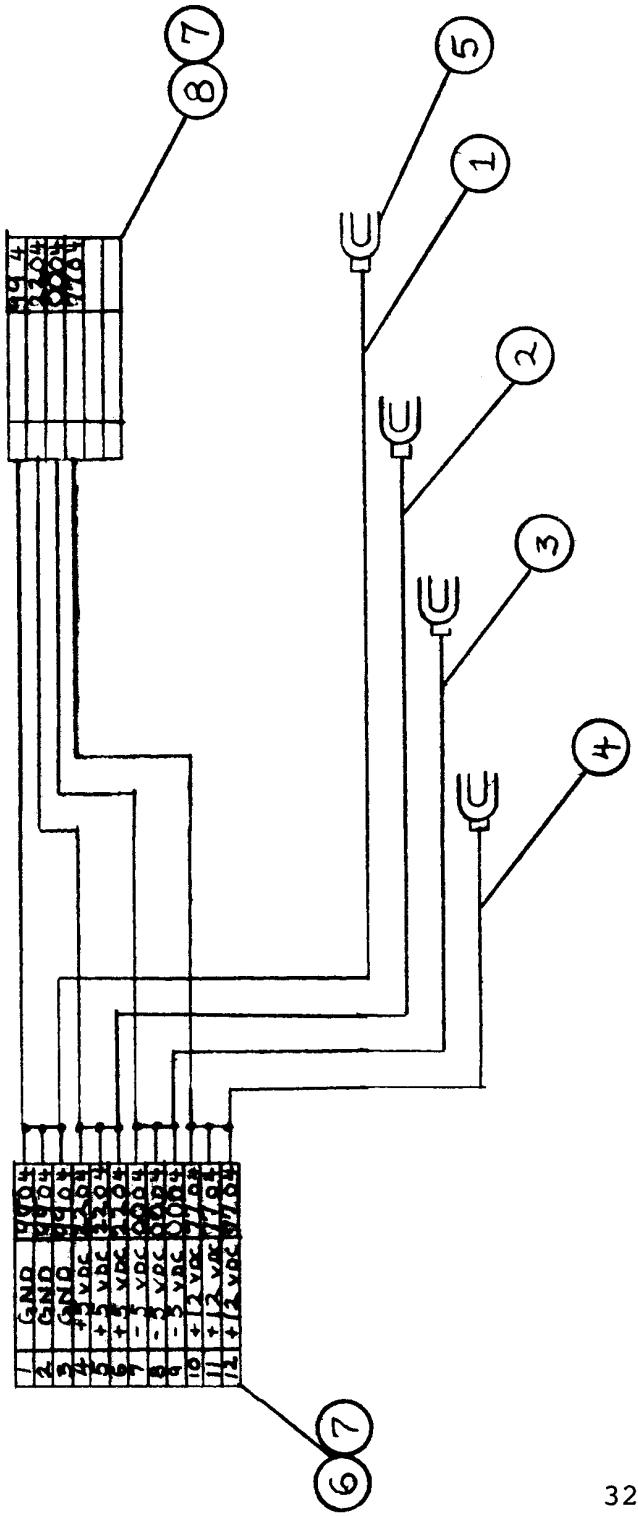
ITEM		QTY		DESCRIPTION		TOLERANCES		CONTINENTAL INC.		HIALEAH, FLORIDA 33014	
				Unless Otherwise Specified							
FRACTIONS		±	1/32	NAME							
DECIMALS 2 PL		±	.015	ELECTRO HOME WELL GARDNER MONITOR SIGNAL HARNESS							
DECIMALS 3 PL		±	.005	FINISH							
HOLES		+	.003	MATERIALS							
ANGLES		-	.001	HEAT TREAT.							
SHT. MET. BENDS		±	1/2"								
REV. LET.	ECN. NO.	REVISION	BY	DRAWN BY	DATE	SCALE	PART NO.	REV.			
A.F. 17899A		JAB	JULY 10-1	.81	2	374-12-0300					
1	1	12	50150274 CRIMP TERMINALS MOLEX								
2	1	1	50150303 6 CKT. HOUSING MOLEX								
3	1	1	50150272 12 CKT. HOUSING MOLEX								
4	1	34	50174406 YELLOW WIRE # 22 AWG								
5	1	34	" 50170006 WHITE WIRE # 22 AWG								
6	1	34	" 50179906 BLACK WIRE # 22 AWG								
7	1	34	" 50176606 BLUE WIRE # 22 AWG								
8	1	34	" 50175506 GREEN WIRE # 22 AWG								
9	1	34	" 50172206 RED WIRE # 22 AWG								



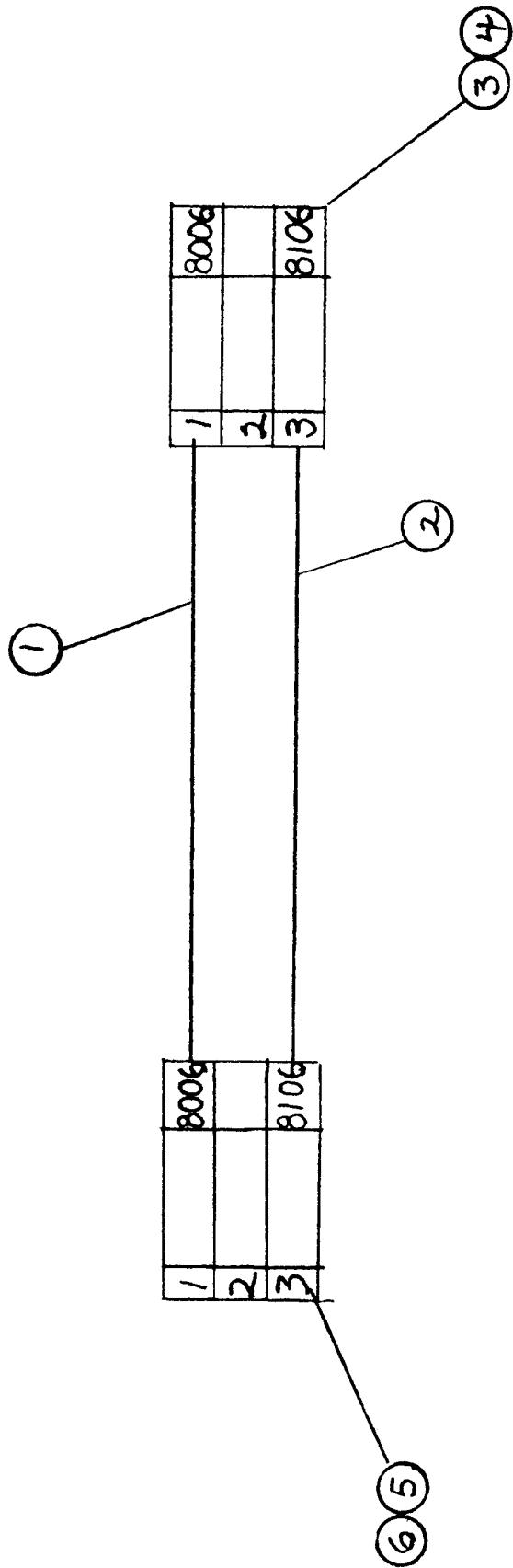
ITEM	QTY	PART NO.	DESCRIPTION
9	6	501502273	MOLIX POLARIZING KEY
8	24	501502274	CRIMP TERMINALS MOLIX CHAIN
7	3	50150227	ID CAT. FEMALE HOUSING HOUSE
6	12	501502277	MALE PLUG MOLIX REEL
5	1	501502621	12 PIN MOLIX PLUG
4	104	50177204	VIOLET WIRE
3	104	50178904	WHITE WIRE
2	104	50172804	RED WIRE
1	104	50179304	BLACK WIRE

NOTE: ALL WIRE IS #18 AWG

AC. APVD	PROD. APVD	QTY.	1	374-01-0200
				ASSEMBLY NO
				HIALEAH, FLORIDA 33014
TOLERANCES Unless Otherwise Specified		NAME		
FRACTIONS		D.C.B. POWER HARNESS		
DECIMALS 2 PL		HEAT TREAT.		
DECIMALS 3 PL		FINISH		
HOLE S.				
ANGLES				
REV. LET.	ECN NO.	REVISION	BY	



NOTE: ALL WIRE IS #18 AWG

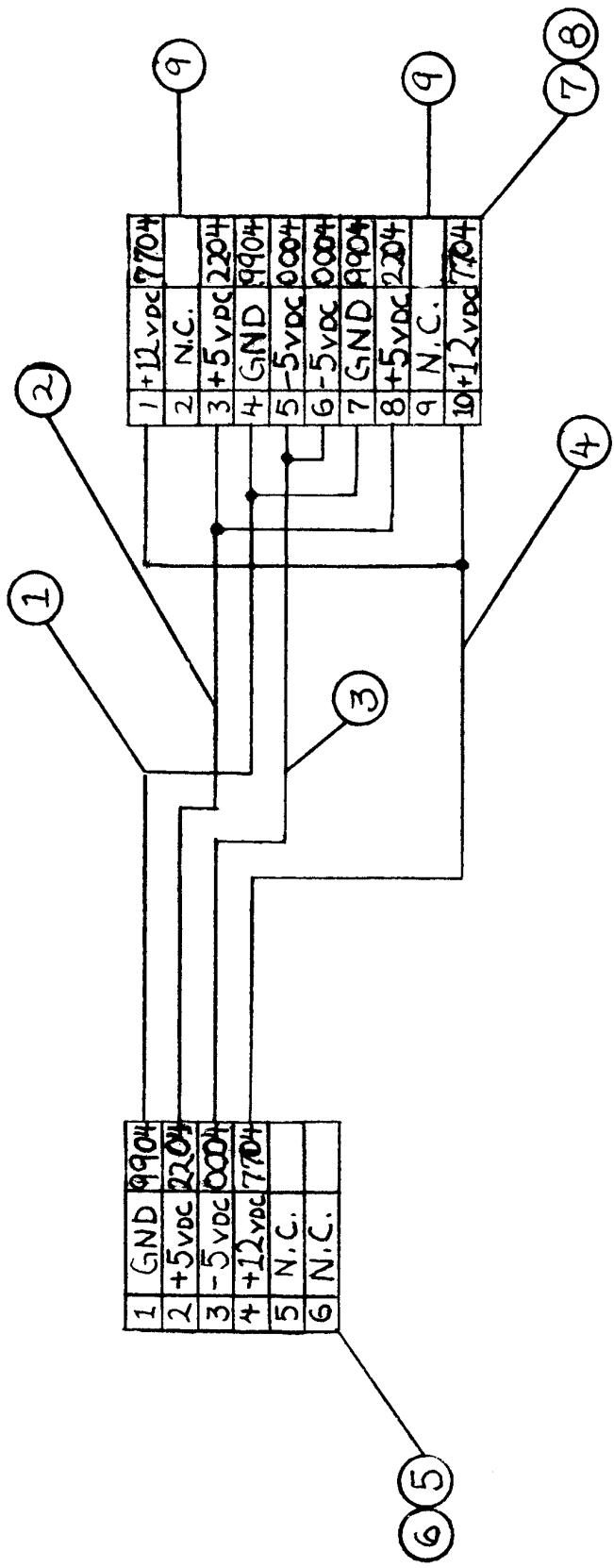


ITEM	QTY	PART NO.	DESCRIPTION	TOLERANCES		QC. APV'D	PROD. APV'D	QTY.	ASSEMBLY NO
				FRACTIONS	DECIMALS				
6	2	50/50228	Fe MALE PINS MOLEX, REEL	1/32	.015	NAME			
5	1	50/50231	3 PIN MOLEX RECEPTACLE	DECIMALS 2 PL	.015	SPEAKER OUTPUT HARNESS			
4	2	50/50274	CRIMP TERMINAL MOLEX	DECIMALS 3 PL	.005	MATL'S.	HEAT TREAT.	FINISH	
3	1	50/50301	3 PIN FEMALE HOUSING MOLEX	HOLDS	.003				
2	85	" 50/78106	GRAY Y BROWN STRIPE WIRE	ANGLES	-.001	DYN.			
1	85	50/78006	GRAY Y BLACK STRIPE WIRE	SHT. MET BENDS	± 1/2"	A-A'	8-27-81	SCALE	PART NO. 374-12-0400 REV. A

**contin** inc.

HIALEAH, FLORIDA 33014

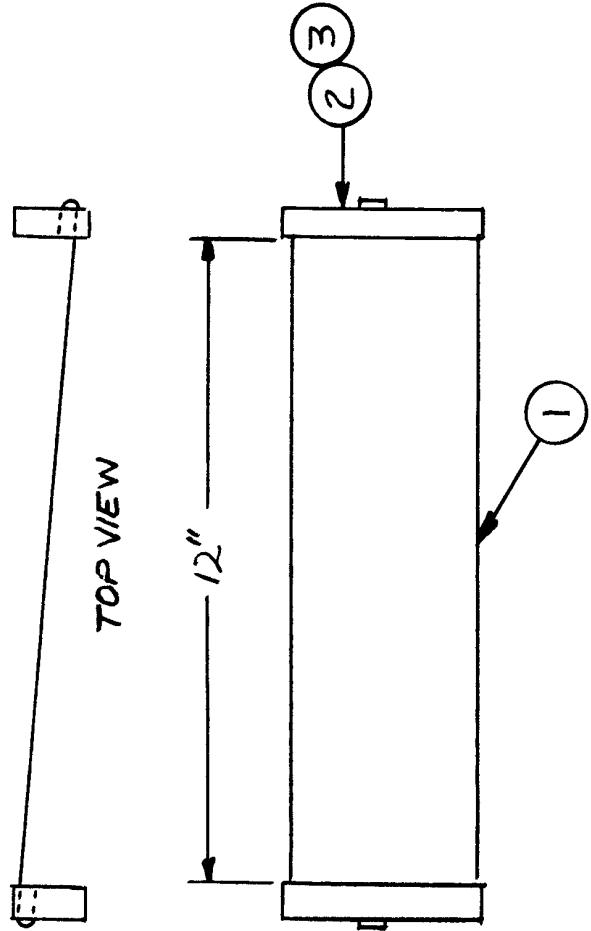
A E 17899A



QTY	PART NO.	DESCRIPTION	TOLERANCES		REV. LET.	ECN NO.	REVISION	BY	ANGLES SHT. MET. BENDS	DWN. SCALE	DATE	PART NO.	REV.	
			FRACTIONS	DECIMALS 2 PL	DECIMALS 3 PL									
9	2	50150273 MOLEX POLARIZING KEY	± 1/32	NAME										
8	8	50150274 CRIMP TERMINALS CHAIN	± .015	PERIPHERAL POWER HARNESS										
7	1	50150271 10 CKT. FEMALE HOUSING/MALE	± .005	HEAT TREAT.										
6	4	50150277 MALE PINS MOLEX REEL	± .003	MATERIALS.										
5	1	50150260 6 PIN MOLEX PLUG	- .001											
4	32"	50177704 VIOLET WIRE												
3	32"	50170004 WHITE WIRE												
2	32"	50172204 RED WIRE												
1	32"	50179904 BLACK WIRE												

**cont'd**

HIALEAH, FLORIDA 33014  
ASSEMBLY NO.

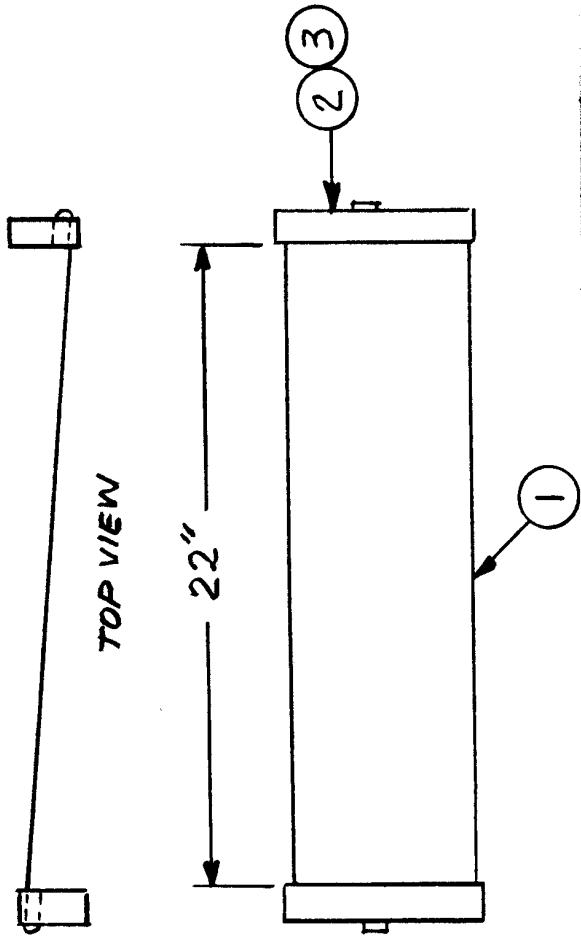


FRONT V/EW

3	2	50/50/48	34 PIN STRAIN RELIEF
2	2	50/50/24	34 PIN FLAT CABLE CONN.
1	16"	50/500/25	34 PIN FLAT CABLE
ITEM	QTY	PART NO	DESCRIPTION

BILL OF MATERIALS

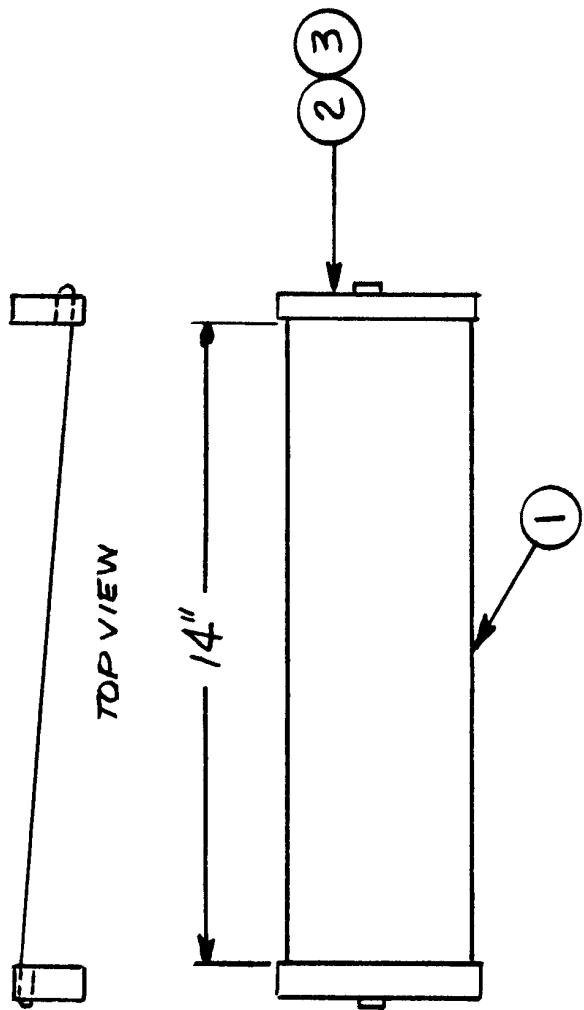
AC. APV'D	PROD. AV'D	QTY.	ASSEMBLY NO.
<b>cantron</b>			
MIALEAH, FLORIDA 33014			
TOLERANCES Unless Otherwise Specified			
FRACTIONS	± 1/32		NAME
DECIMALS 2 PL	± .015		AUDIO Bd. FLAT CABLE HARNESS
DECIMALS 3 PL	± .005		
HOLDS	+ .003	MATL'S.	HEAT TREAT.
ANGLES	- .001	DIM	FINISH
BY	1/2"	REV.	
ECN	SHT. MET BENDS	NO.	
LET.	REV.	LET.	REV.



3 2 50150146 20 PIN STRAIN RELIEF

ITEM	QTY	PART NO	DESCRIPTION
3	2	50150146	20 PIN STRAIN RELIEF
2	2	50150122	20 PIN FLAT CABLE conn.
1	22"	50170023	20 PIN FLAT CABLE

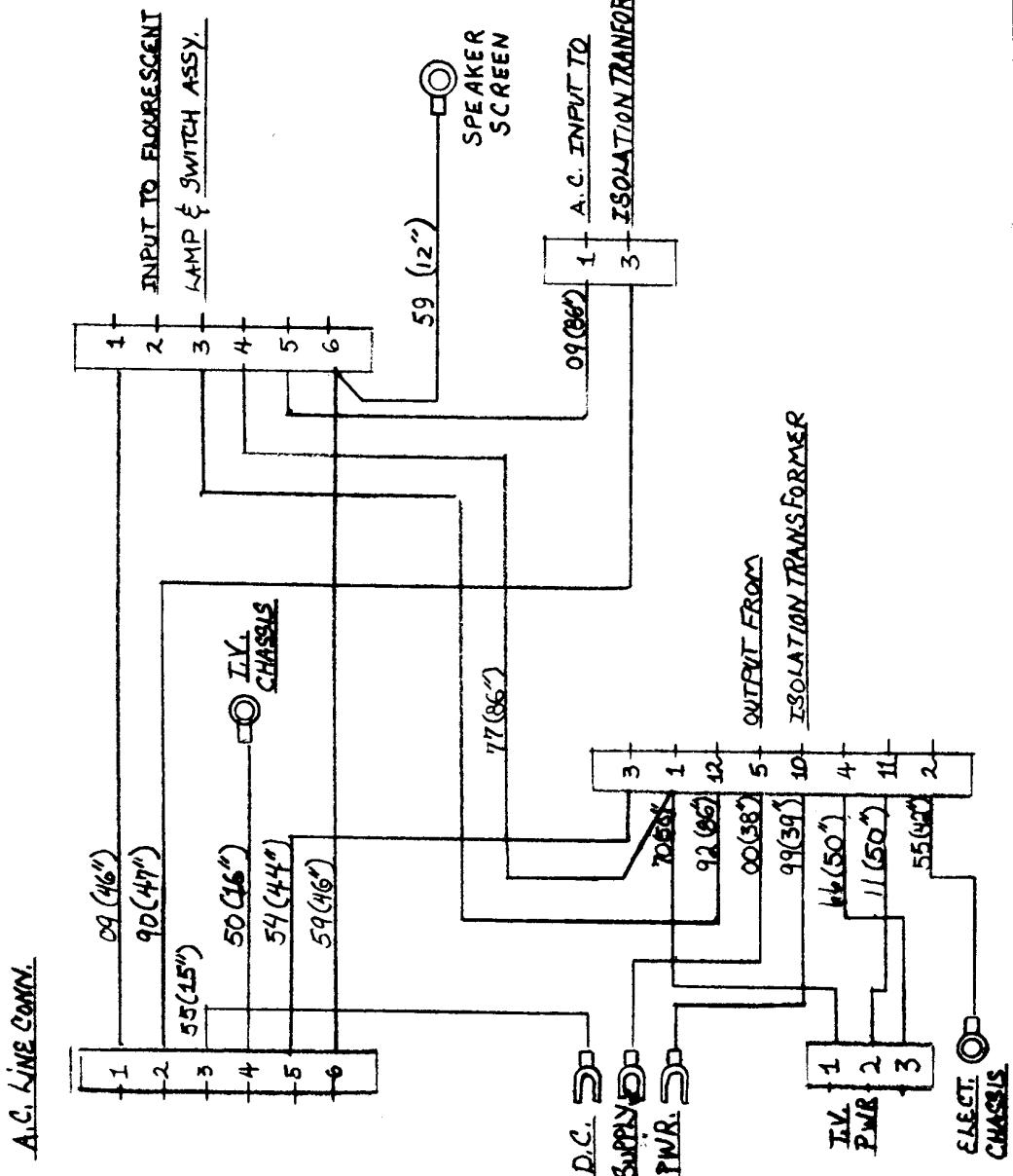
## BILL OF MATERIALS



FRONT VIEW

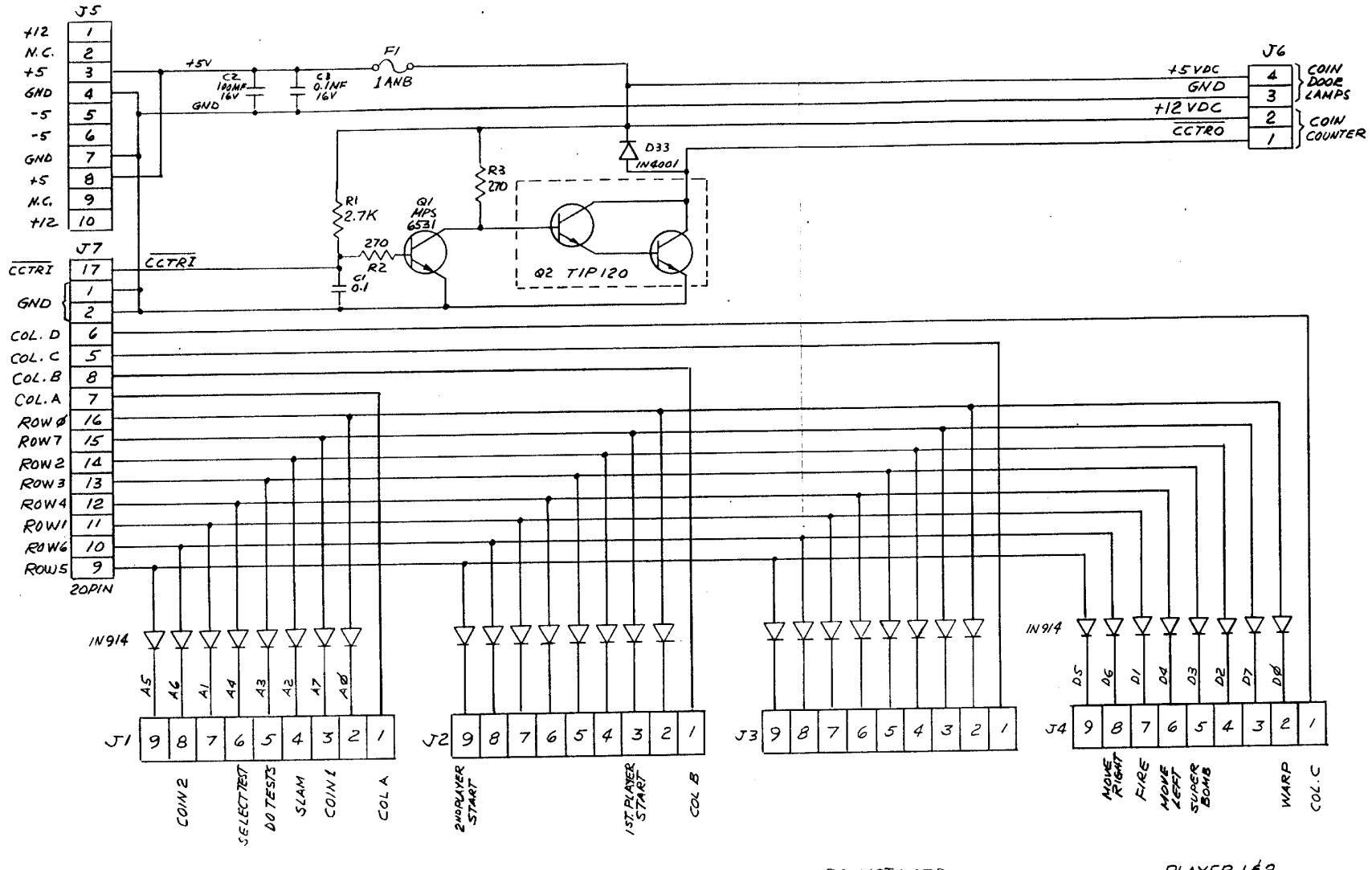
BILL OF MATERIALS			
ITEM	QTY	PART No	DESCRIPTION
3	2	50150147	26 PIN STRAIN RELIEF
2	2	50150123	26 PIN CONN
1	14"	50170024	26 COND. CABLE

## BILL OF MATERIALS



A.C. Line Conn.

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COIN DOOR  
SWITCHES

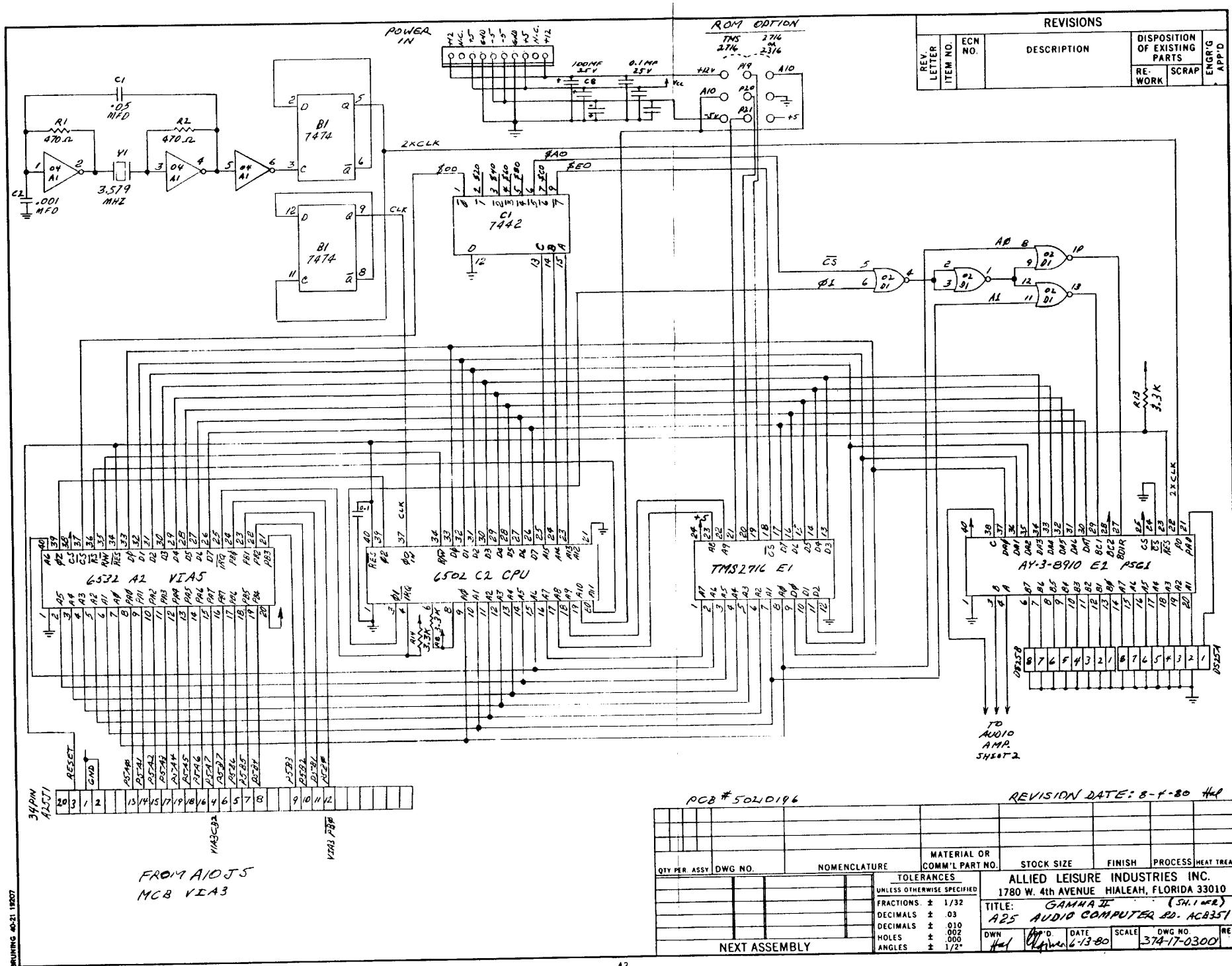
## GAME CONTROL SWITCHES

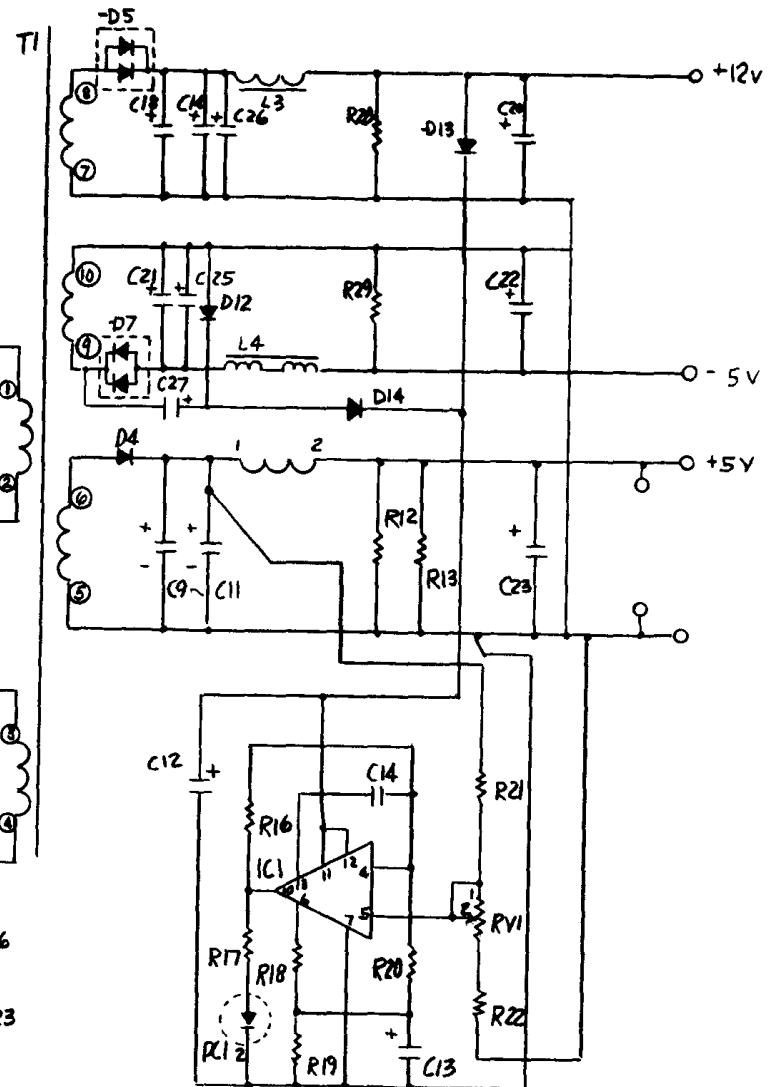
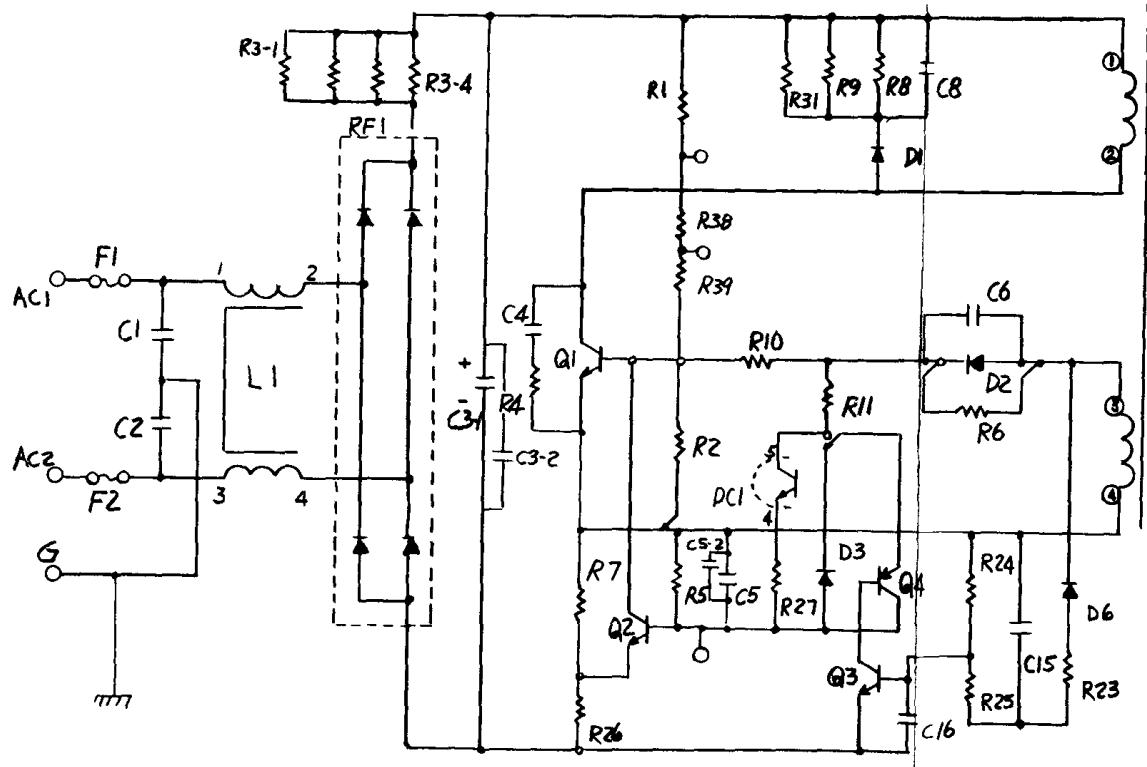
*DO NOT USED*

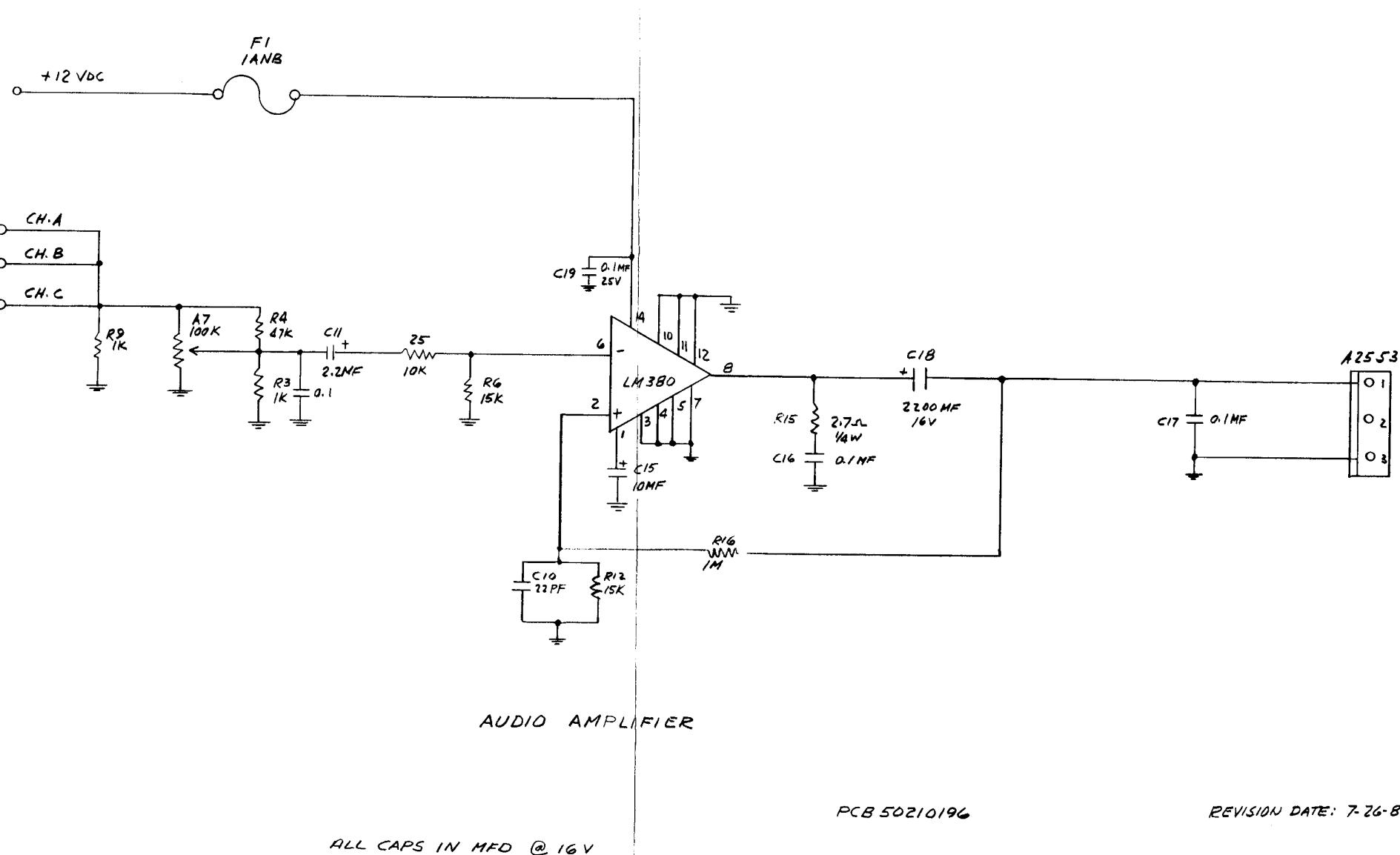
PLAYER 1 & 2  
SWITCHES

OC. APV'D	PROG. APV'D	QTY.	ASSEMBLY NO.
HIALEAH, FLORIDA 33014			
<i>IMA II PERIPHERAL INTERFACE Bd.</i>			
HEAT TREAT.		FINISH	
DATE 9-23-81	SCALE	PART NO. 342-17-0100	REV.

			<b>TOLERANCES</b> Unless Otherwise Specified	
			FRACTIONS $\pm .1/32$	NAME <i>GAR</i>
			DECIMALS 2 PL $\pm .016$	MATERIAL
			DECIMALS 3 PL $\pm .006$	
			HOLDS $\pm .003$	
			ANGLES $\pm 1/2^{\circ}$	OWN <i>AAN</i>
			SHT. MET BENDS $\pm 2^{\circ}$	BY <i>BL</i>
REV. LET.	ECON NO.	REVISION	BY	







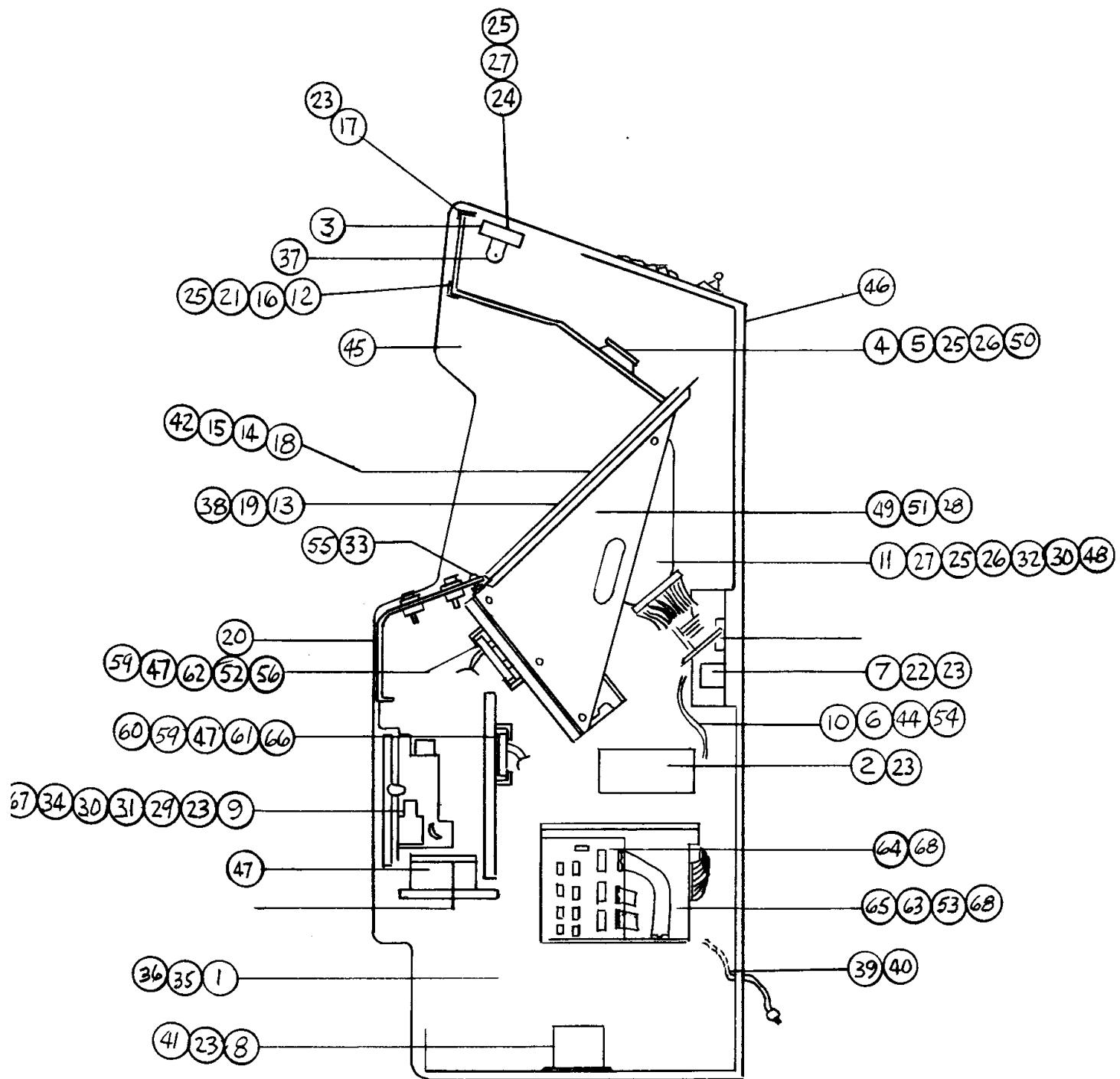
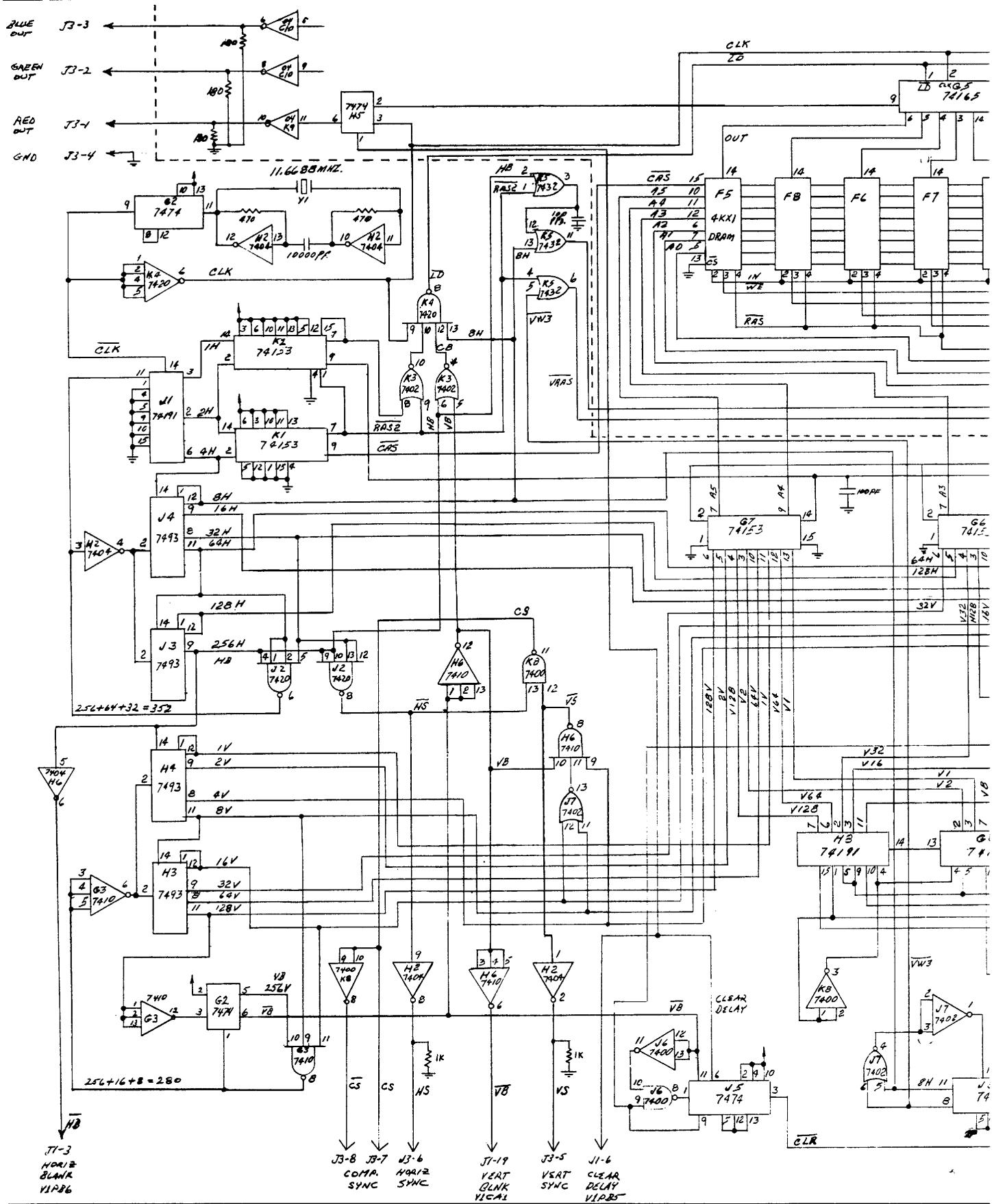
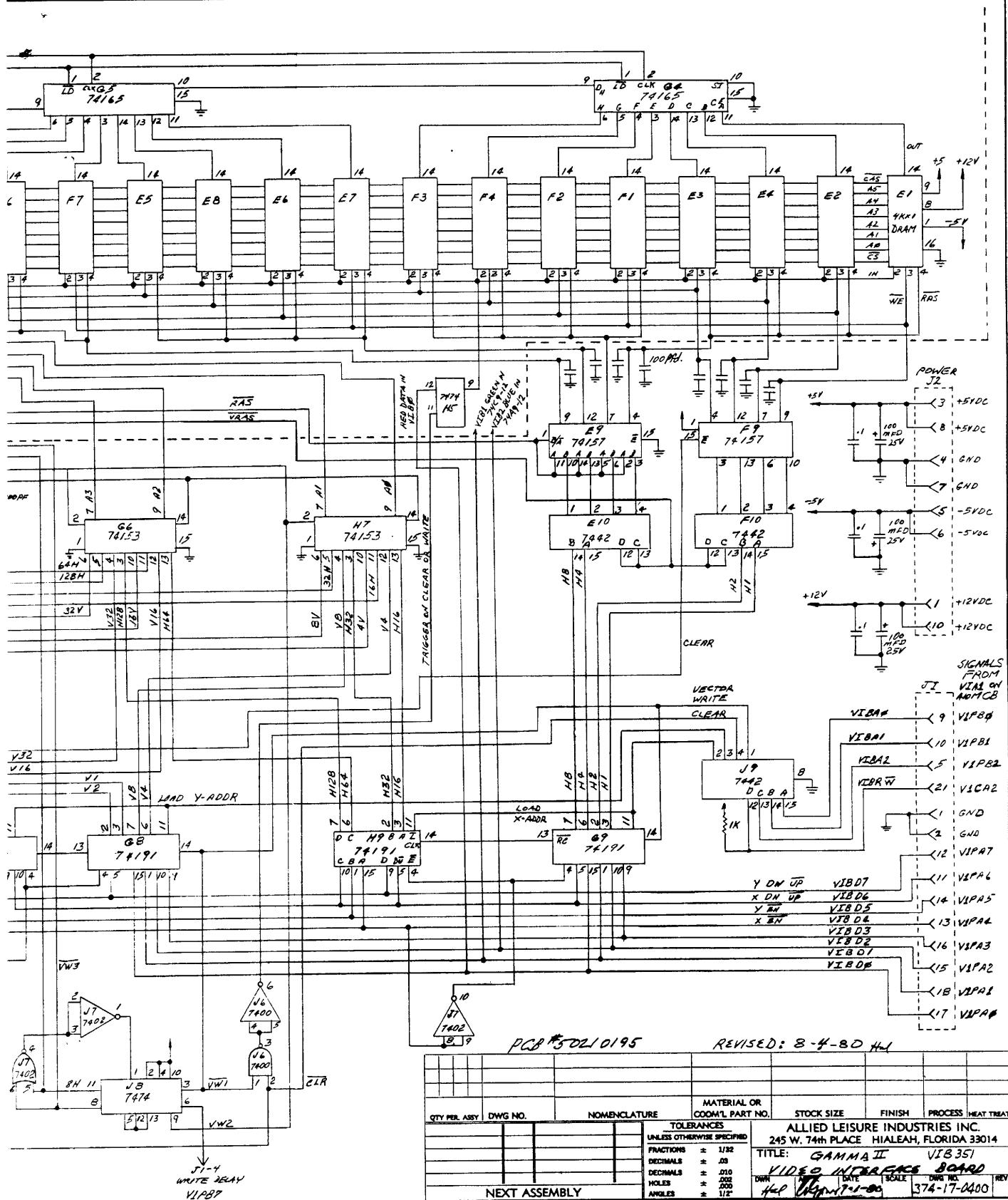
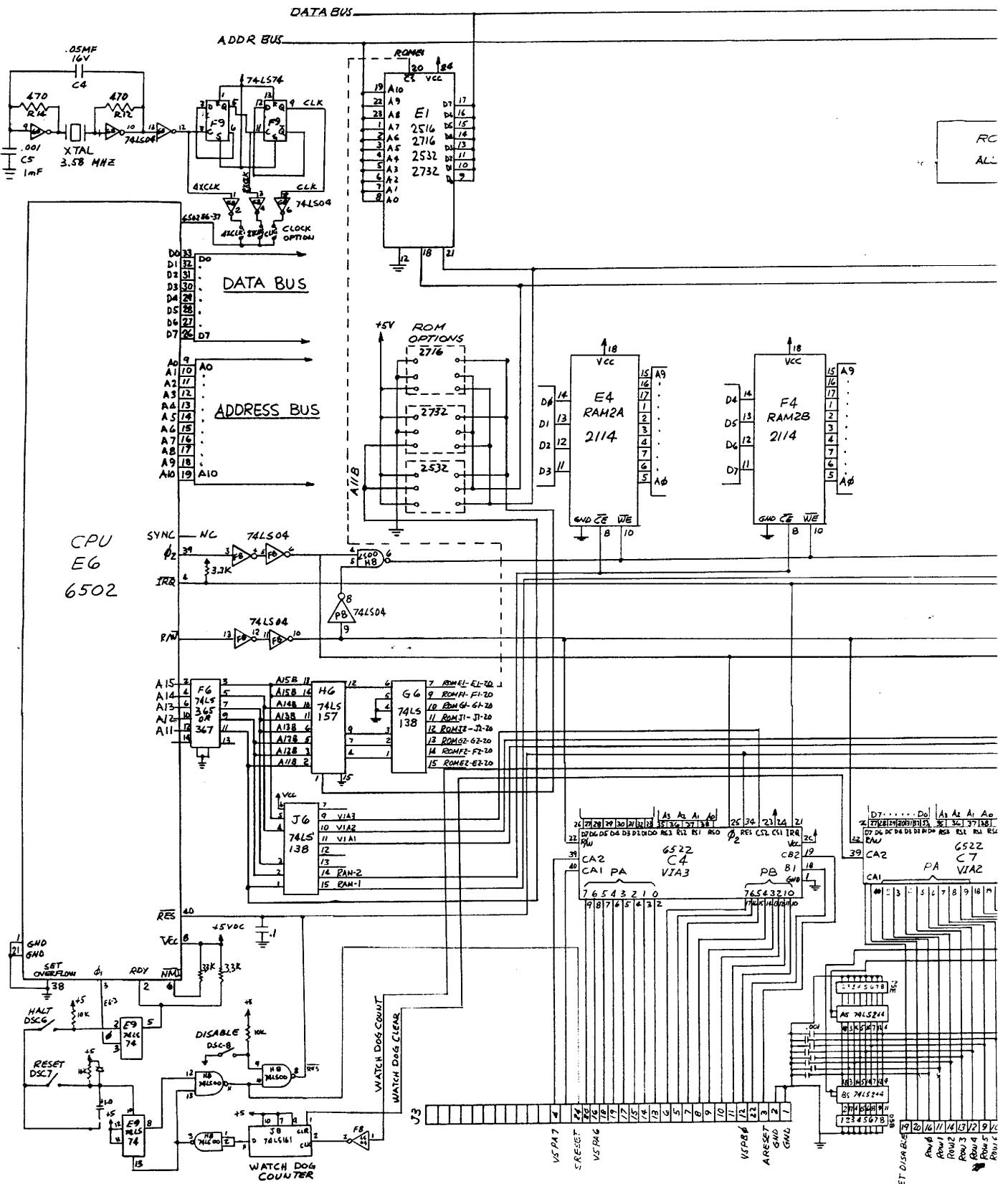


FIG. 4





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ROMS F1, G1, J1, J2, G2, F2 & E2  
ALL PINS SAME AS E1 EXCEPT PIN 20 ( $\bar{CS}$ )

