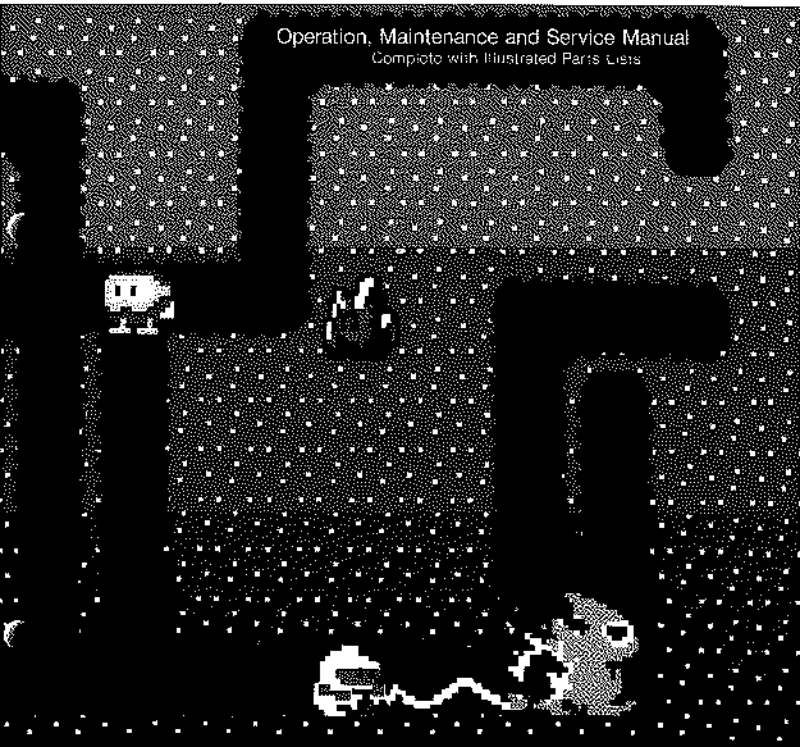
TM-203
2nd printing

DIG DUG™

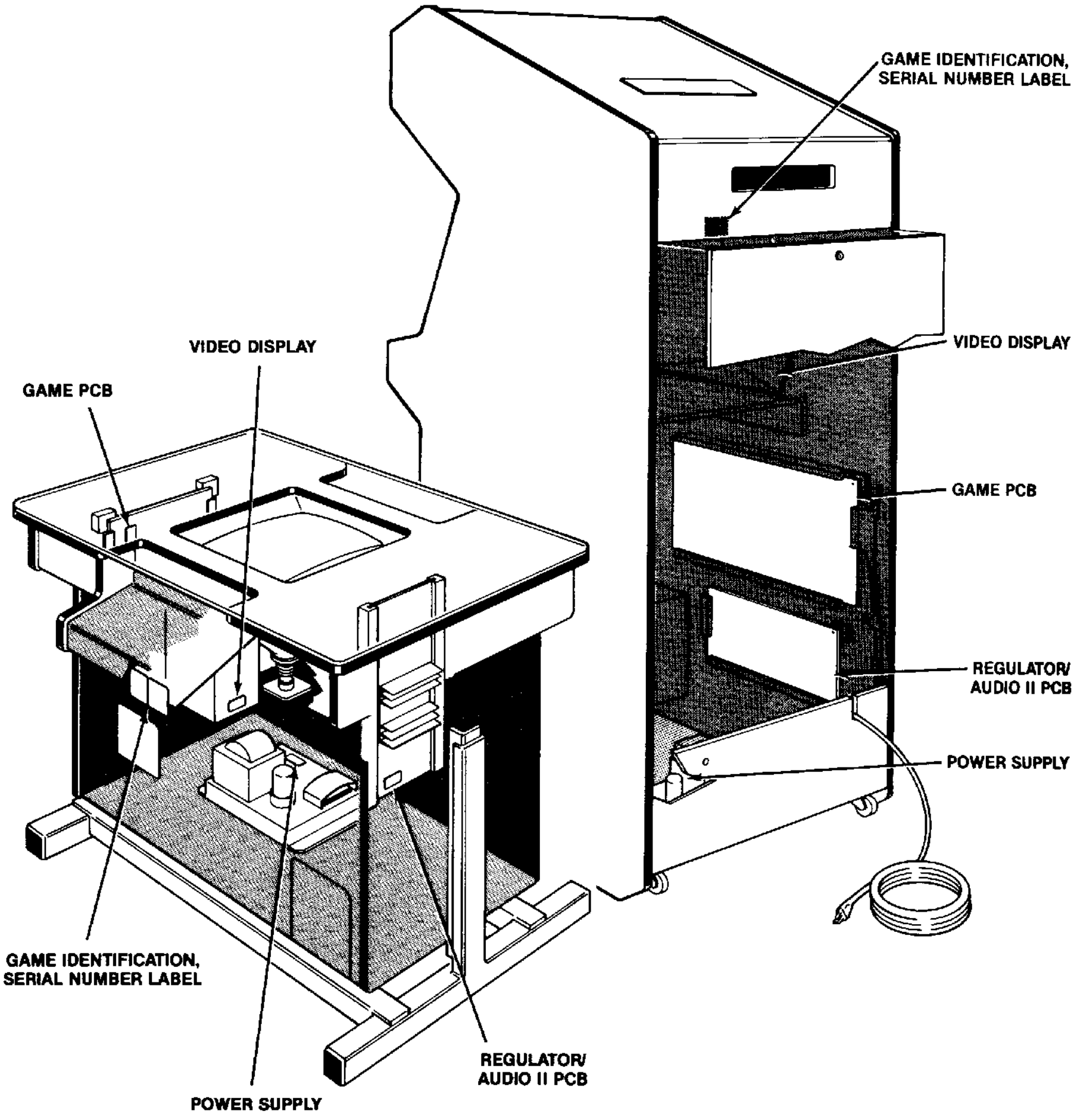
Operation, Maintenance and Service Manual

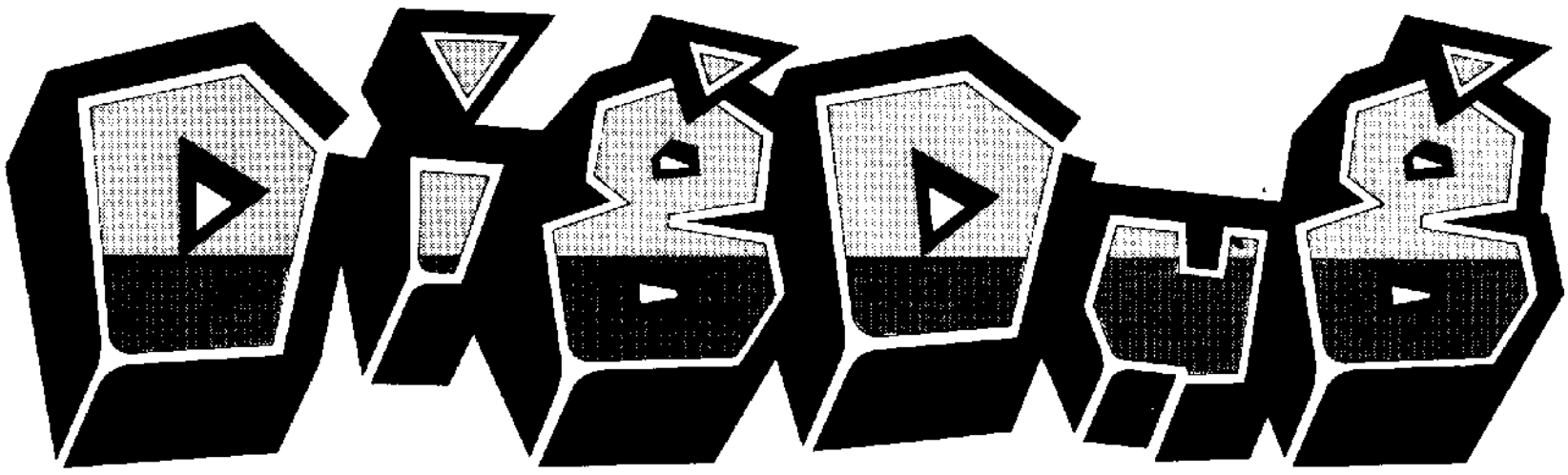
Complete with Illustrated Parts Lists



GAME SERIAL NUMBER LOCATION

Your game's serial number is stamped on a label on the outside back of the game. The same number is also on the chassis of the video display, power supply, Regulator/Audio II PCB, and the Game PCB. Please mention this number when calling your distributor for service.





Operation, Maintenance and Service Manual

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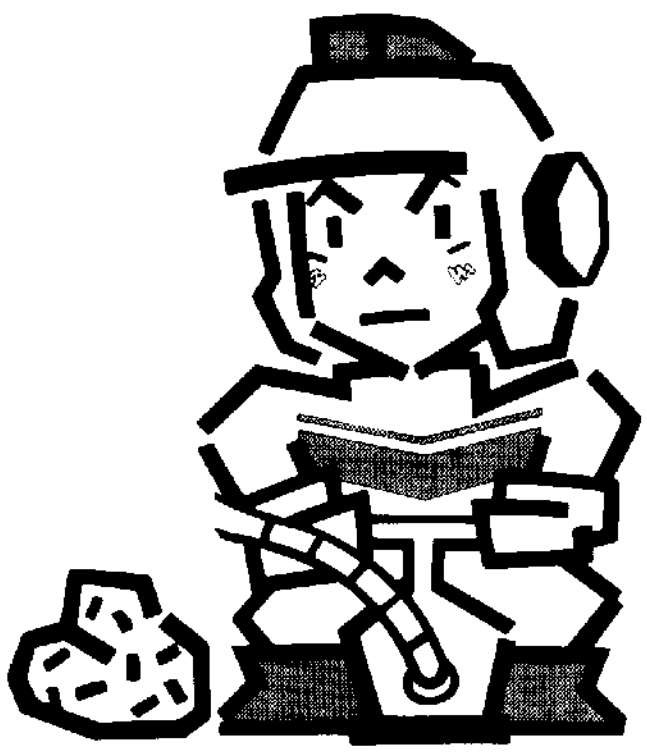

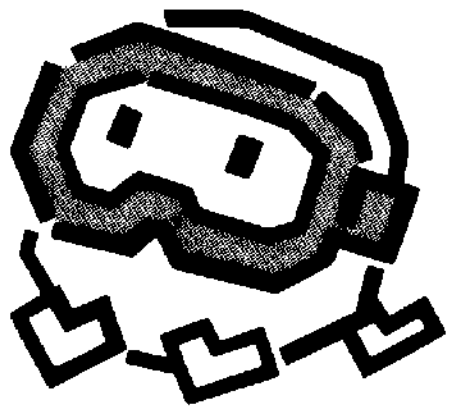

Engineered and Designed by NAMCO, LTD.
Manufactured under license by ATARI, INC.

Published by:
ATARI INC.
790 Sycamore Drive
P.O. Box 906
Milpitas, California 95035

Lithographed in the U.S.A. **4L**

INTERFERENCE

to licensed communications services is not permitted by the FCC (Federal Communications Commission)

If you suspect interference from an ATARI game at your location, check the following:

- All grounds (green wires) in the game are properly connected as shown in the game wiring diagram, and
- The game's power cord is properly plugged into a **grounded** 3-wire outlet.

If you are unable to solve the interference problem, please contact:

ATARI Customer Service
(800) 526-3849
or
(800) 538-1611

Notice Regarding Non-ATARI Parts

WARNING

Use of non-ATARI parts or modifications of your ATARI game circuitry may adversely affect the safety of your game, and may cause injury to you and your players.

The warranty printed on the inside back cover of this manual may be voided, if you do any of the following:

- you substitute non-ATARI parts in your coin-operated game, or
- you modify or alter any circuits in your ATARI game by using kits or parts **not** supplied by Atari.

Not only may the use of any non-ATARI parts void your warranty, but any such alteration may also adversely affect the safety of your game and may cause injury to you and your players.

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NOTE

If reading through this manual does not lead to solving a certain maintenance problem, call TELEHELP® at the Atari Customer Service office in your geographical area, as shown below.

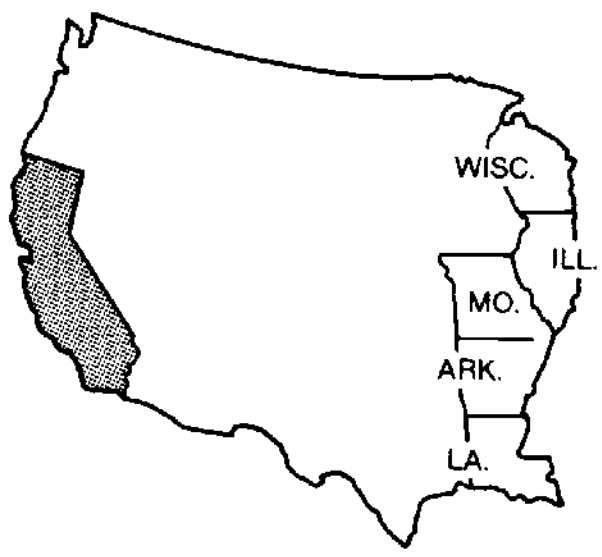
WEST and CENTRAL U.S.A.

Service only

Atari, Inc.
California Customer Service Office
1105 N. Fair Oaks Avenue
P. O. Box 427, Sunnyvale, CA 94086
Telex 17-1103
(Monday–Friday, 7:30–4:00 pm Pacific Time)

☎ From California, Alaska, or Hawaii
(408) 745-2900

☎ Service from anywhere in the area shown in white
toll-free **(800) 538-1611**



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Service only

Atari, Inc.
New Jersey Customer Service Office
12A World's Fair Drive, Somerset, NJ 08873
Telex 37-9347
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☎ From New Jersey
(201) 469-5993

☎ From anywhere else in this area
toll-free **(800) 526-3849**

EUROPE

Service only

Atari Ireland Limited
European Customer Service Office
Tipperary Town, Ireland
Telex 28165
(Monday–Friday, 9:00–6:00 pm GMT)

☎ **062-52155**

Set-Up Procedures

How to Use This Manual

This manual, written for game operators and service technicians, describes the Dig Dug™ game.

The manual contains information about *all* Dig Dug cabinets. Whenever information is unique to the Upright cabinet, this symbol appears:

Whenever information is unique to the Cabaret™ cabinet, this symbol appears:

Whenever information is unique to the Cocktail cabinet, this symbol appears:

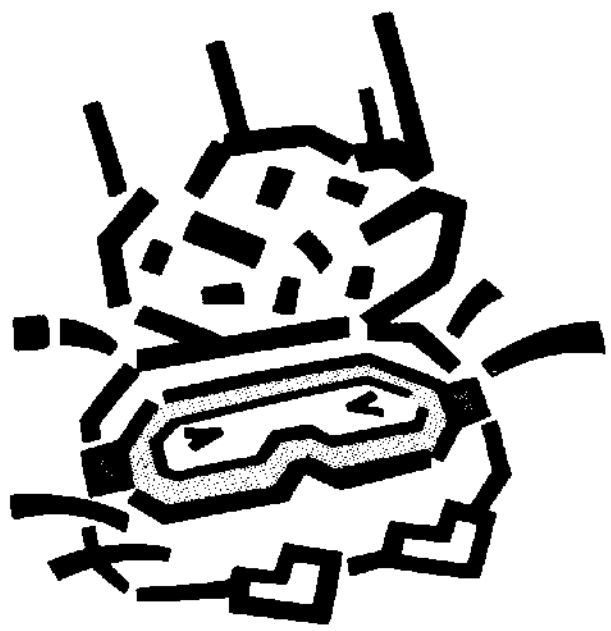
Chapter One includes new features, game set-up, option switch settings, self-test procedures and game play.

Chapter Two details troubleshooting procedures.

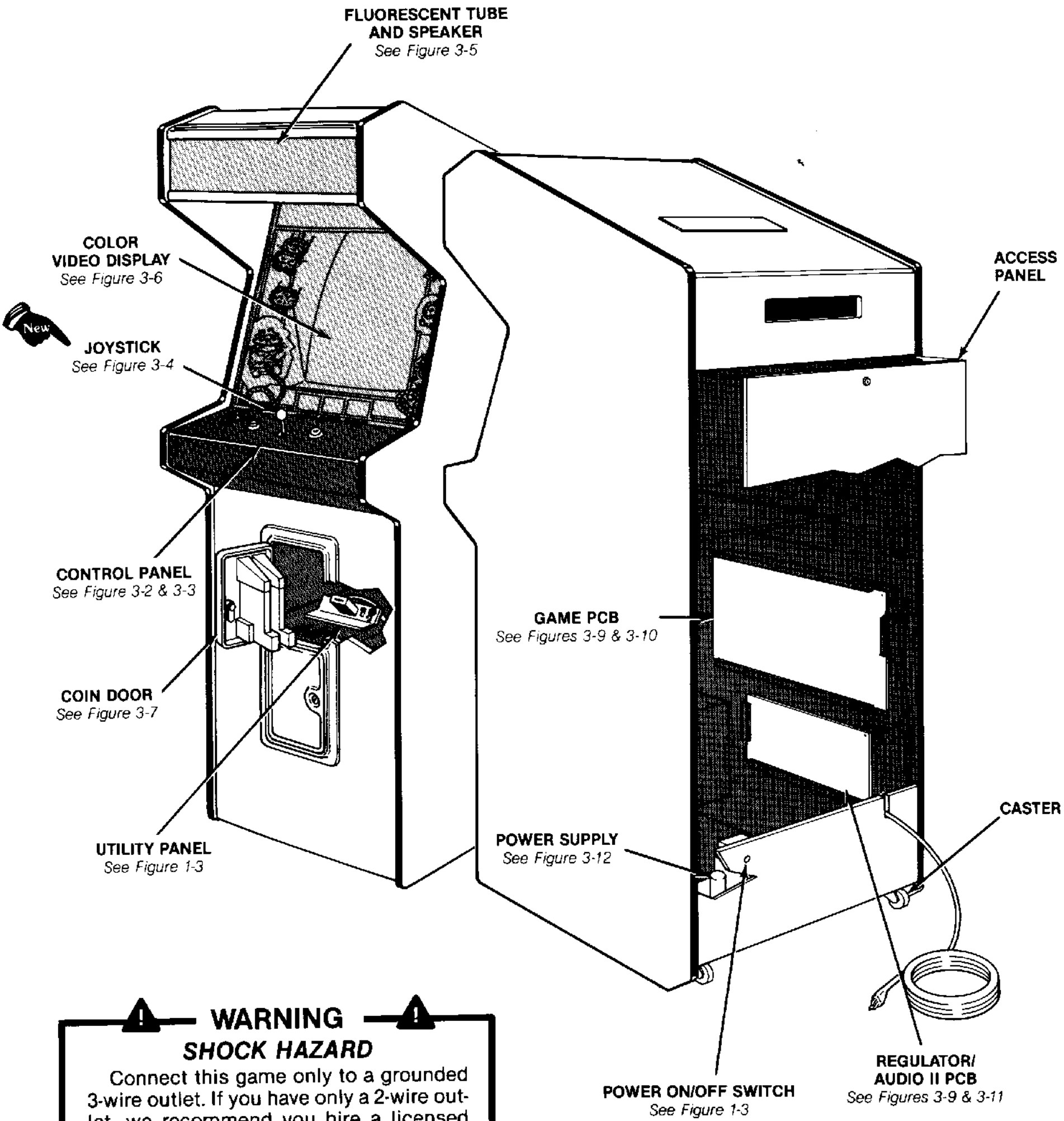
Chapter Three contains maintenance, repair and parts information.

In addition, schematic diagrams of the game circuitry are included with this manual.

Figures 1-1 and 3-1 illustrate the game cabinet. Italicized lettering on these figures refers you to other places in the manual for information about specific cabinet parts.



Chapter 1



WARNING

SHOCK HAZARD

Connect this game only to a grounded 3-wire outlet. If you have only a 2-wire outlet, we recommend you hire a licensed electrician to install a grounded outlet. **Players may receive an electric shock** if this game is not properly grounded!

Figure 1-1 Game Overview
Upright Cabinet

A. New Features

The Dig Dug™ game has two new features. Even if you're familiar with ATARI® games, you should note these important differences:

- **Joystick Control.** This new four-position control is made of steel and molded plastic. It has few parts, which makes servicing easier. The leaf switches snap in and out for easy replacement. The rubber bellows is designed for a quick return to center.
- **Game Sounds.** There are 21 different game sounds. In addition, a special option switch setting lets you hear sounds used during game play, but turns off attraction-mode sounds.

New features, as well as all other major parts in the game, are illustrated in Figure 1-1. Throughout this manual, wherever one of these new features is mentioned, you will see this symbol:

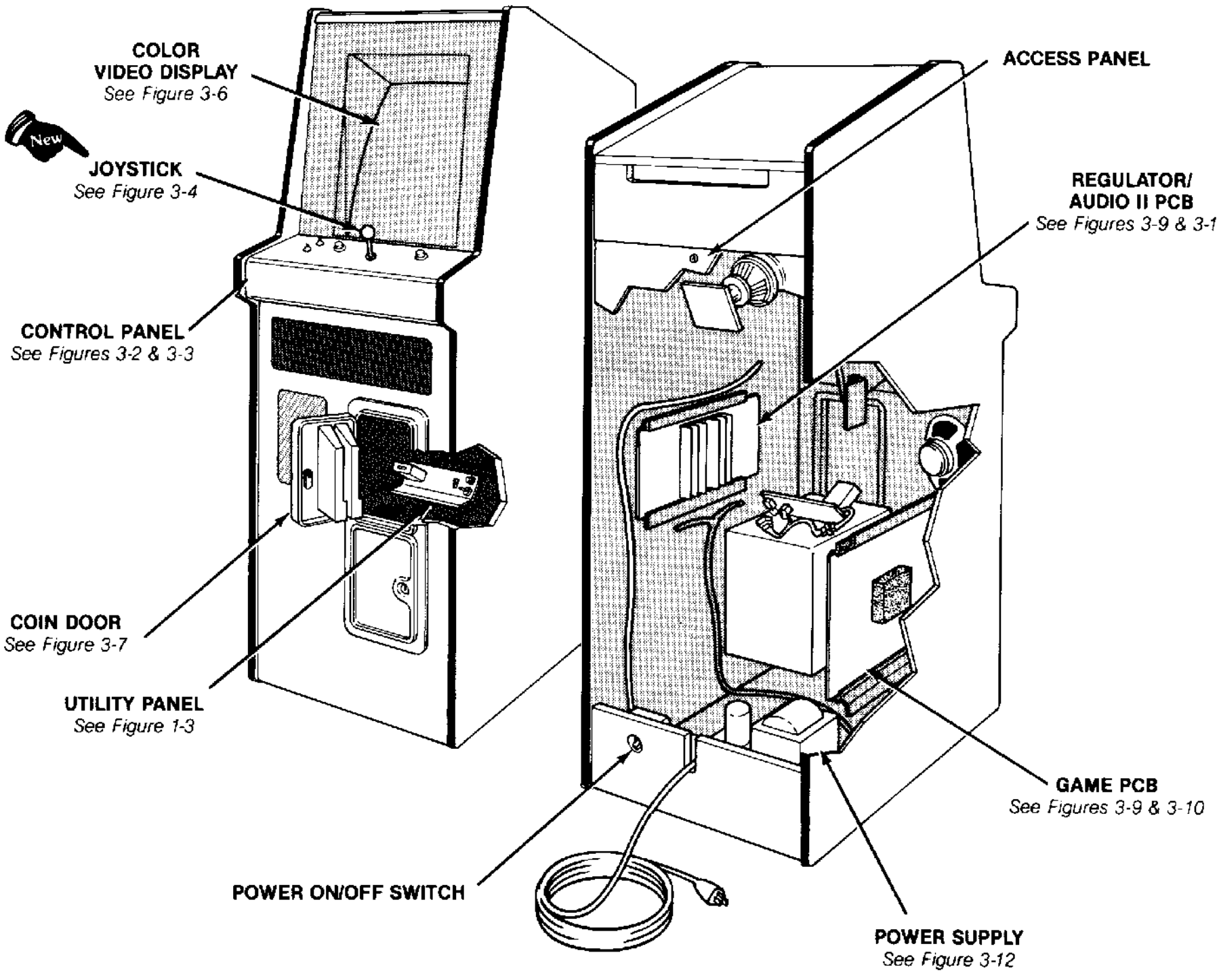


Figure 1–1 Game Overview, continued
Cabaret™ Cabinet

B. Opening the Cocktail Cabinet

1. Opening the Table Top

- To open the game cabinet, unlock and open the two key locks at one end of the game cabinet, located immediately below the table top (see *Figure 1-1).*
- Carefully lift the table top until the support arm locks into place. **Do not jam the table top at the end of its upward swing.**

2. Access Panel

- To open the access panel, lift out the steel security bar that secures the panel to the cabinet wall.
- The access panel near the bottom of the cabinet will then come out *(See Figure 3-1).*

3. Closing the Table Top

- To close the cabinet, stand opposite the hinged end of the cabinet and grasp the table top with your right hand.
- With your left hand, press the button at the middle of the support arm and push the button out toward the left.
- **Gently** lower the table top to the closed position.
- Lock both key locks.

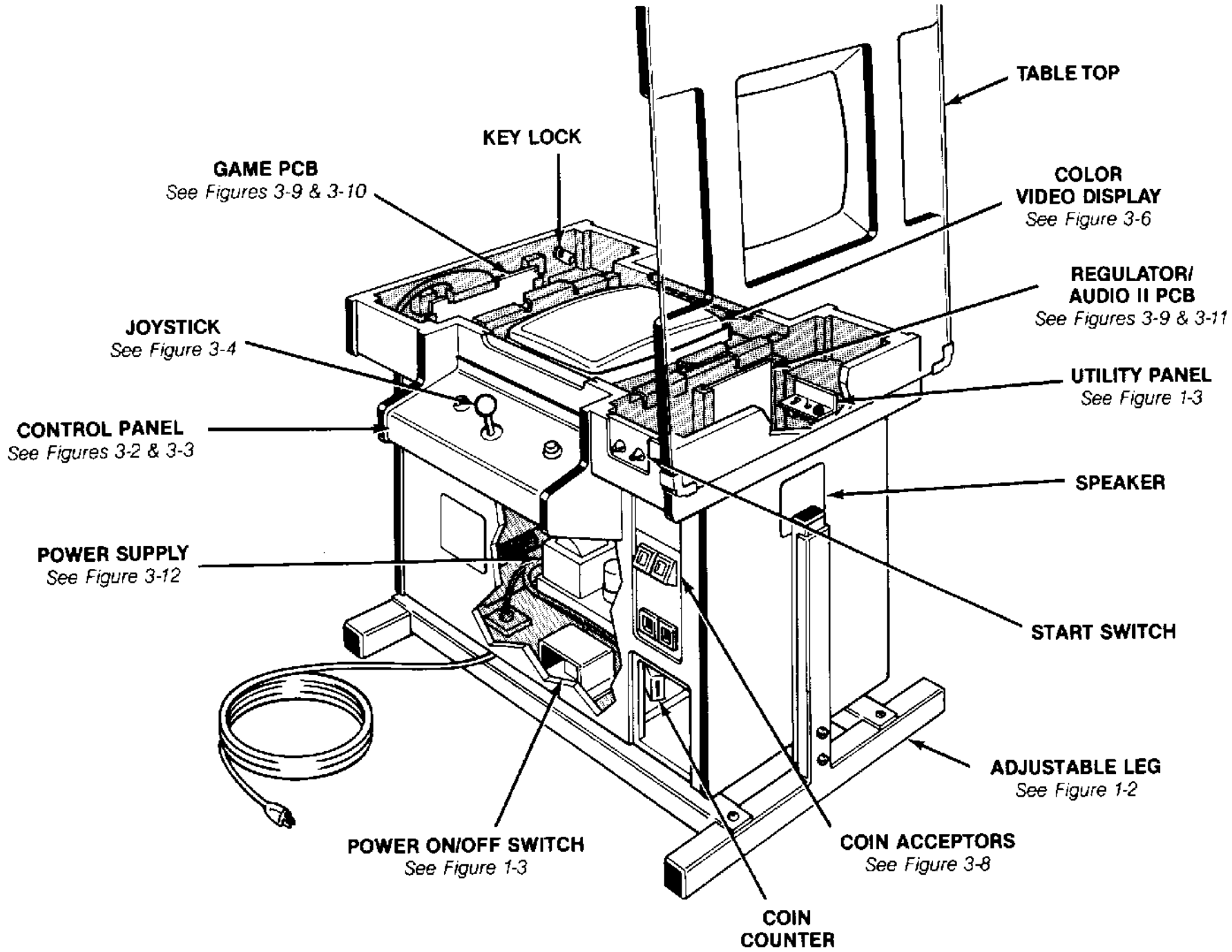


Figure 1-1 Game Overview, continued
Cocktail Cabinet

C. Game Inspection

Please inspect your game carefully to insure that it was delivered to you in good condition.

NOTE

Do not plug the game in yet!

1. Examine the exterior of the game cabinet for dents, chips, or broken parts.
2. Remove the screws that were used as extra security to seal the rear access panel (*Upright* and *Cabaret* cabinets). Unlock and open this panel or the *Cocktail* table top, and the coin door; inspect the interior of the game as follows:

- Check that all plug-in connectors (on the game harness) are firmly seated. Replug any connectors found unplugged. **Don't force connectors together.** The connectors are keyed so they only go on in the proper orientation. **A reversed edge connector will damage a PCB** and will void your warranty.
- Check that all plug-in integrated circuits on the PCBs are firmly seated in their sockets.
- Remove the tie-wrap that holds the coiled power cord on the inside cabinet wall (*Upright* and *Cabaret* cabinets). Check the power cord for any cuts or dents in the insulation. Place the square black plastic strain-relief plate in the wood slot at the bottom of the rear panel opening.

⚠ WARNING ⚠

To avoid electrical shock, do not touch internal parts of the display with your hands or with metal objects held in your hands!

- Note the game's serial number. On *Upright* and *Cabaret* cabinets, it is printed on a label on the back of the cabinet. On the *Cocktail* cabinet, the label is located on the start switch side of the cabinet. Verify that the same serial number is also on the Dig Dug game PCB, Regulator/Audio II PCB, power supply and video display. A drawing of the serial-numbered components is on the inside front cover of this manual. Please mention this number whenever you call your distributor for service.
- Check major subassemblies, such as the power supply, control panel and video display, for secure mounting.

D. Game Installation

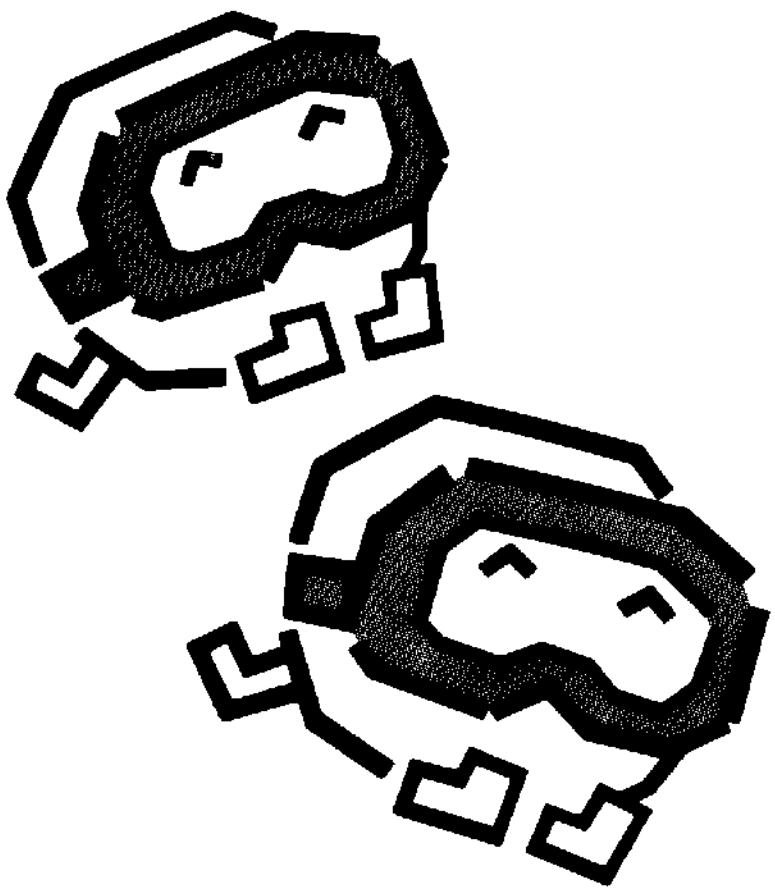
1. Installation Requirements

Power	175 watts
Temperature	0 to 38°C (32 to 100°F)
Humidity	Not over 95% relative
	Upright Cabinet
Space Required	64 × 79 cm (25⅜ × 31 in.)
Game Height	174 cm (68¾ in.)
	Cabaret Cabinet
Space Required	52 × 78¾ cm (20½ × 31 in.)
Game Height	153¾ cm (60½ in.)
	Cocktail Cabinet
Space Required	62¼ × 82½ cm (24½ × 32½ in.)
Game Height	65 × 101 cm (25¾ × 39¾ in.)

2. Voltage Selection

The power supply used in this game operates on the line voltage of almost any country in the world. The power supply may have three different voltage selection plugs: 100 VAC (violet wire color), 220 VAC (blue wire color), and 240 VAC (brown wire color).

Before plugging in your game, check your line voltage. Then check the wire color on the voltage selection plug that is plugged into your power supply. Make sure the voltage selection plug is correct for your location's line voltage (see *Figure 3-12).*



E. Cocktail Table Legs

This cocktail-table cabinet may be adjusted to four heights—65, 70, 76 or 101 cm (25¾, 27⅞, 30 or 39¾ inches). To adjust the table height, refer to Figure 1-2.

NOTE

To ensure cabinet strength, you **must** use two screws when attaching each table leg. Using only one screw may result in damage to the cabinet wall when you move the cabinet across the floor.

- **Remove or empty the coin box to prevent loose coins from sliding out of the box and into the game cabinet.**
- **Lay the table on end as shown. Place a support (the coin box, books or tool box) under the recessed side of the cabinet.**
- **Remove the two Allen-head screws on each leg. Grasp the legs and slide them into the desired position. Then replace the screws.**

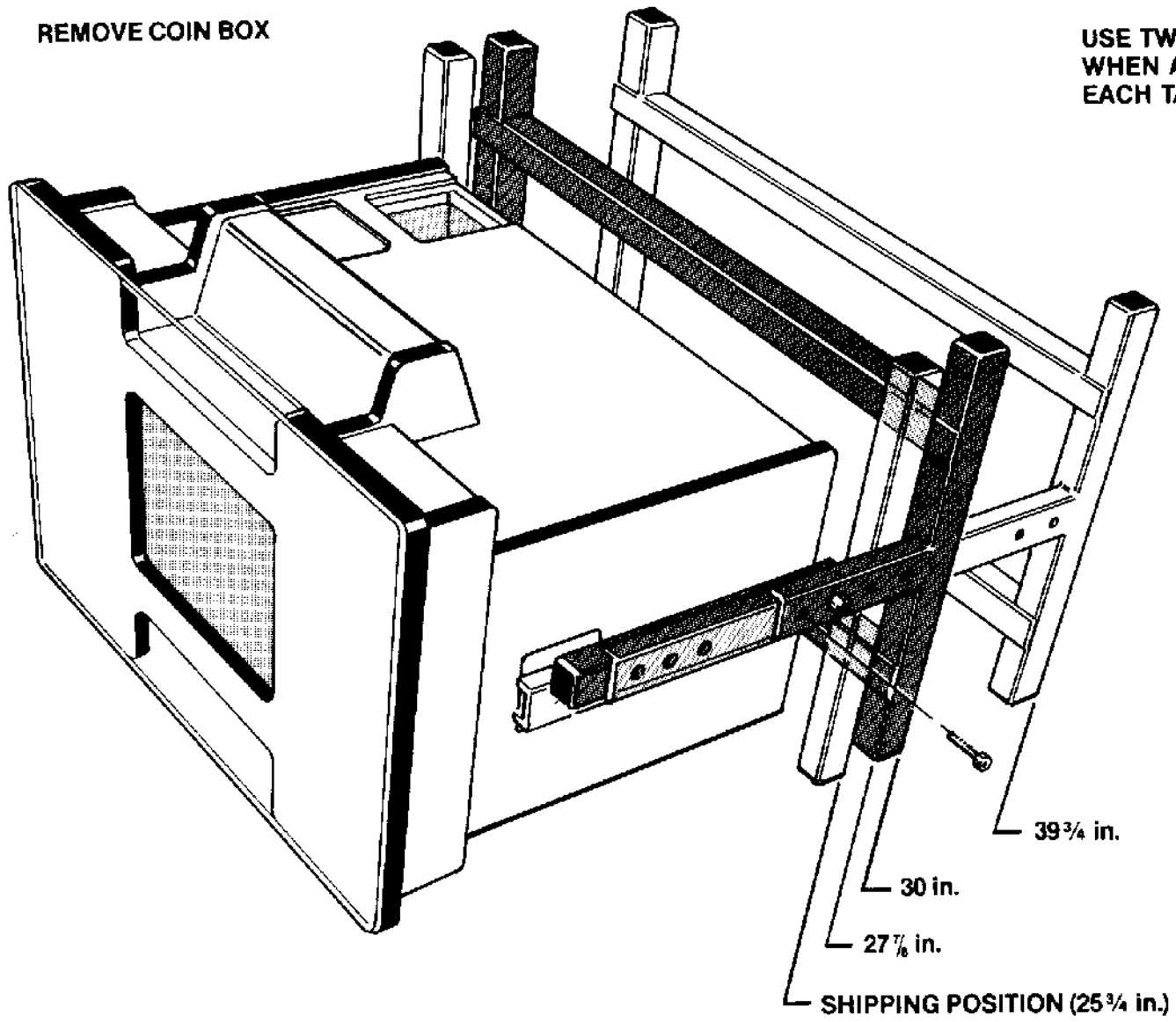


Figure 1-2 Adjusting the Table Legs

F. Switch Locations

1. On/Off Switch

The *Upright* and *Cabaret* cabinet on/off switch is located on the back of the cabinet, lower left side. The *Cocktail* cabinet on/off switch is located on the bottom of the cabinet (see *Figure 1-3*).

2. Utility Panel Switches

For *Upright* and *Cabaret* cabinets, the utility panel includes the volume control, self-test and coin switches, and coin counter. The coin switch is used to credit the game without tripping the coin counter. These switches are located inside the upper coin door (see *Figure 1-3*).

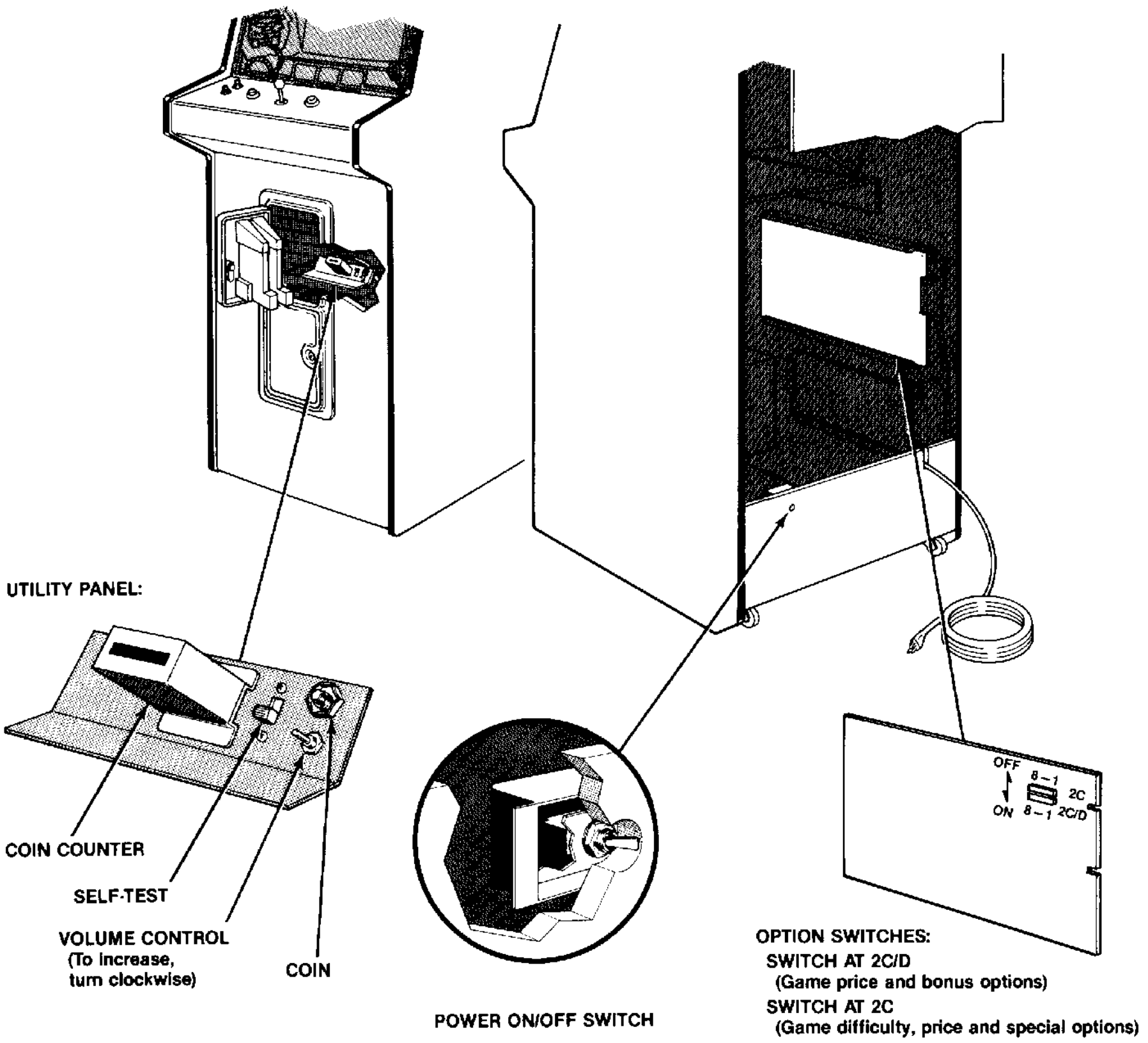


Figure 1-3 Game Switch Locations
Upright and Cabaret Cabinets

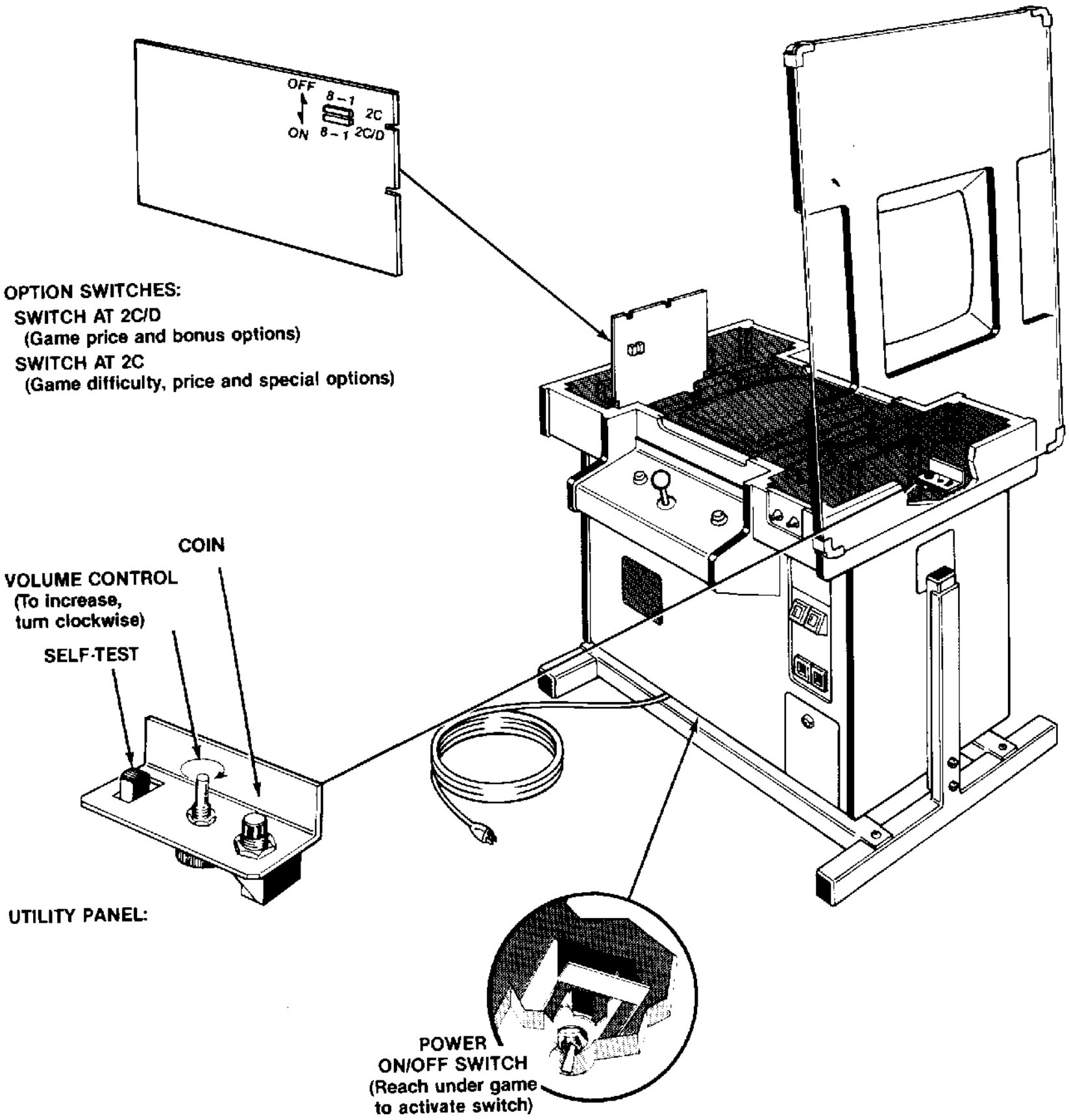


Figure 1-3 Game Switch Locations, continued
Cocktail Cabinet

For the *Cocktail* cabinet, the utility panel includes the volume control, self-test and the coin switches. These switches are located under the table top. To locate the coin counter, remove the coin box (see *Figure 3-1*).

3. Option Switches

Option switches, for all game cabinets, are located on the game PCB as follows:

- Game price and bonus options are at PCB location 2C/D.
- Game difficulty, price and special options are at PCB location 2C.

G. Option Switch Settings

Tables 1-1 and 1-2 detail game options and their settings. Options are preset at the factory and shown by the **$** symbols. However, you may change the settings to suit your individual needs.

Table 1-1 Game Price and Bonus Option Settings

The 8-toggle switch at location 2C/D is accessible when the Dig Dug™ game PCB is mounted in place. To change switch settings, set the self-test switch to *on*. Verify the changes on the self-test screen. Then turn the self-test switch to *off*.

A "coin" is defined as 25¢, 1DM or 1Fr. If you have a 2DM/1DM or 2Fr/1Fr coin door with two coin counters, set switch 8 at PCB location 2C to *off*. Then different denominations are counted on the two coin counters.

Settings of 8-Toggle Switch on Dig Dug PCB *(at 2C/D)*								Option	
8	7	6	5	4	3	2	1		
On	On							1 Dig Dug life	
On	Off							2 Dig Dug lives	
Off	On							3 Dig Dug lives **$**	
Off	Off							5 Dig Dug lives	
								Bonus lives awarded at the following point values:	
								With 1, 2 or 3 Dig Dug lives	With 5 Dig Dug lives
		On	On	On				No Bonus	No Bonus
		Off	On	On				First at 10,000, second at 40,000, and every 40,000 **$**	First at 20,000, second at 60,000, and every 60,000
		On	Off	On				First at 10,000, second at 50,000, and every 50,000	First at 30,000, second at 80,000, and every 80,000
		Off	Off	On				First at 20,000, second at 60,000, and every 60,000	First at 20,000, second at 50,000
		On	On	Off				First at 20,000, second at 70,000, and every 70,000	First at 20,000, second at 60,000
		Off	On	Off				First at 10,000, second at 40,000	First at 30,000, second at 70,000
		On	Off	Off				First at 20,000, second at 60,000	First at 20,000
		Off	Off	Off				First at 10,000	First at 30,000
								Right coin mech—coin doors with 1 or 2 coin counters*	
					On	On	On	1 coin for 7 credits	
					Off	On	On	1 coin for 6 credits	
					On	Off	On	1 coin for 3 credits	
					Off	Off	On	1 coin for 2 credits	
					On	On	Off	1 coin for 1 credit **$**	
					Off	On	Off	2 coins for 3 credits	
					On	Off	Off	2 coins for 1 credit	
					Off	Off	Off	3 coins for 1 credit	

***$** Manufacturer's suggested settings*

** See Table 1-2 for left coin mechanism.*

Table 1-2 Game Difficulty, Price and Special Options

The table below contains the switch settings for options relating to game difficulty, price and special options. The switches, on the game PCB at location 2C, are accessible when the PCB is mounted in place.

A special option allows for continuation of game play. If a player is at a more advanced round when his game ends, he has 16 seconds to begin the next game at the same round. Another special option allows you to freeze the game action.

Settings of 8-Toggle Switch on Dig Dug PCB *(at 2C)*								
8	7	6	5	4	3	2	1	Option
On								One coin counter **$**
Off								Two coin counters*
	On	On						A—Easy game difficulty
	On	Off						B—Medium game difficulty **$**
	Off	On						C—Hard game difficulty
	Off	Off						D—Expert game difficulty
			On					Continuation of game play **$**
			Off					No continuation of game play
				On				Attract Mode sound **$**
				Off				No Attract Mode sound
					Off			Normal game action **$**
					On			Freeze game action
								Left coin mech—coin doors with 2 coin counters
						On	On	1 coin for 1 credit **$**
						On	Off	1 coin for 2 credits
						Off	On	2 coins for 1 credit
						Off	Off	2 coins for 3 credits

$ *Manufacturer's recommended settings*

** Coin doors with different denominations and two coin counters.*

H. Self-Test Procedure

This game will test itself and provide data to show that the game's circuitry and controls are operating properly. The data is provided on the video display and speaker. No additional equipment is necessary.

We suggest you perform the self-test procedure when you first set up the game, any time you collect money from the game, when you change game options, or when you suspect game failure.

Refer to Figure 1-3 for the location of the self-test switch and option switches. To perform the self-test, set the self-test switch to *on*. After about eight seconds the self-test screen will be displayed.

To see game statistics, press the utility coin switch. To reset the high score table, simultaneously push and hold the pump and utility coin switches for 10 seconds. To end the self-test, set the self-test switch to *off*.

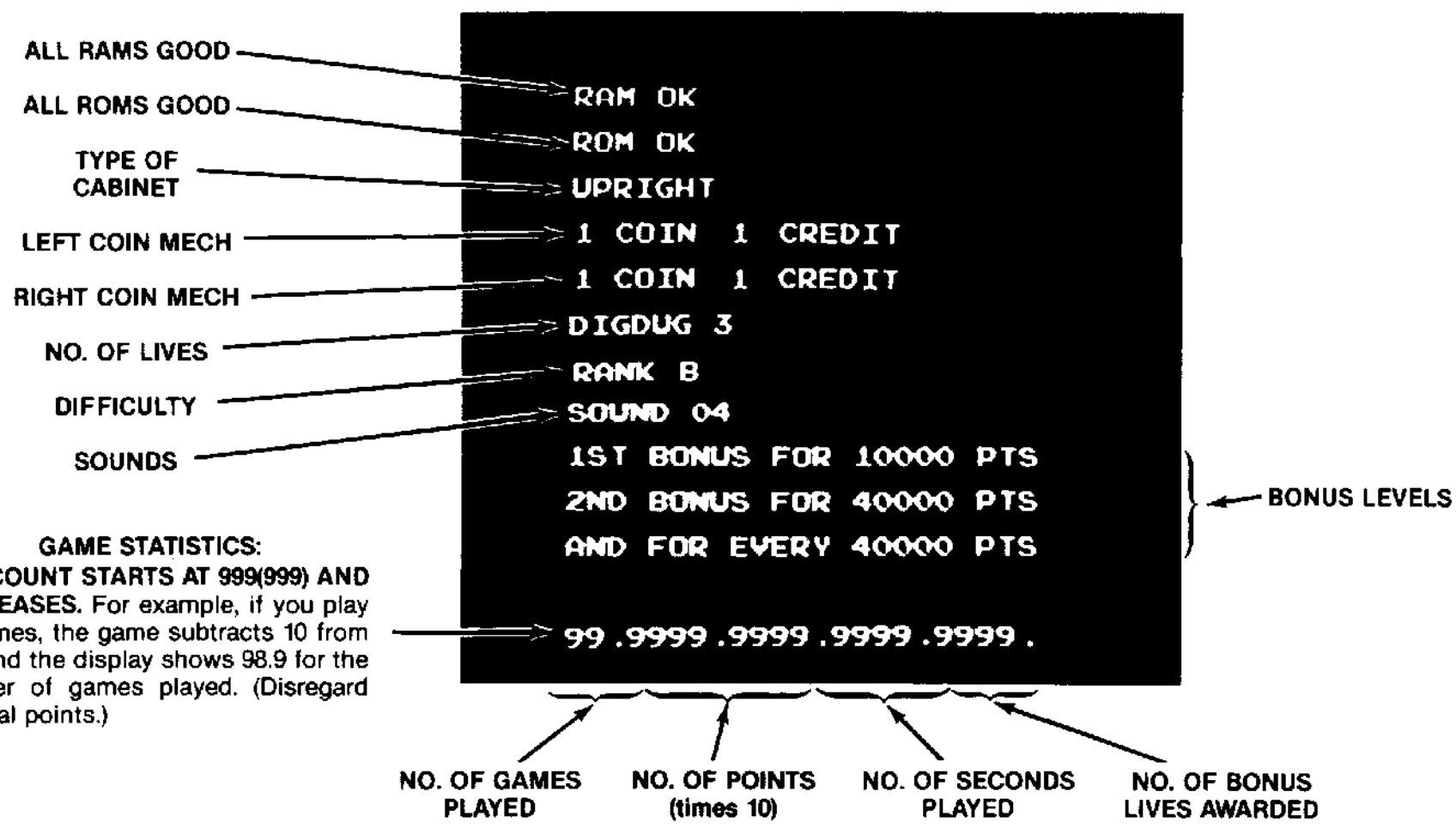
The complete self-test procedure is explained in *Chapter 2, Self-Test Procedure.* If any part of the test described in Figure 1-4 fails, refer to Chapter 2.

Figure 1-4 Self-Test Procedure

Instruction	Test Passes
1. Set the self-test switch to *on* (see Figure 1-3).	Patterns appear on the screen. After about 8 seconds, the screen displays the picture below. The RAMs, ROMs and other chips are tested. If the picture is different from the picture below, refer to *Chapter 2, Self-Test Procedure.*
2. Activate any control panel switch.	Game sounds are produced, from *SOUND 00* through *SOUND 20.* Activating any control panel switch produces a new sound. Test *all* switches this way. If test fails, refer to *Chapter 2, Self-Test Procedure.*

Game sounds:

SOUND 00 Credit issued
SOUND 01 Start of game
SOUND 02 Indication of highest score
SOUND 03 Game over
SOUND 04 Monster attacking Dig Dug
SOUND 05 Dig Dug dies
SOUND 06 Monster escaping
SOUND 07 Bonus Dig Dug awarded
SOUND 08 End of wave
SOUND 09 Monster speeding up
SOUND 10 Monster crushed by rock
SOUND 11 Monster bursting
SOUND 12 Rock hitting ground
SOUND 13 Rock falling
SOUND 14 Dragon spitting fire
SOUND 15 Dig Dug throwing harpoon
SOUND 16 Dig Dug pumping up monster
SOUND 17 Dig Dug walking
SOUND 18 Monster moving
SOUND 19 Dig Dug capturing vegetable
SOUND 20 Enter initials into high score table



GAME STATISTICS:
THE COUNT STARTS AT 999(999) AND DECREASES. For example, if you play 10 games, the game subtracts 10 from 99.9 and the display shows 98.9 for the number of games played. (Disregard decimal points.)

I. Game Play

The Dig Dug™ game is a one- or two-player game with a color raster-scan video display. The screen shows a cutaway view of the land, most of which is below ground. The player controls the Dig Dug character who travels through and digs tunnels in the dirt. The object is for Dig Dug to destroy monsters by pumping them up or dropping rocks on them and to capture vegetables.

The third picture simulates game play. Dig Dug walks through underground tunnels. Monsters chase him and he periodically pumps them up or drops rocks on them. This picture ends when Dig Dug is destroyed.

1. Attract Mode

The attract mode begins when power is applied to the game, after a play or high-score mode, or after self-test. This mode is continuous and stops only when a credit is entered, or when in self-test. This mode may last for about one minute and fifteen seconds. In the attract mode, the screen displays one of four possible pictures.

In the first picture, Dig Dug enters the screen from the top right and walks across the surface. He digs a tunnel into the ground and begins to dig around the words *DIG DUG*. Meanwhile, monsters escort the word *ATARI* across the top of the screen. When Dig Dug digs entirely around the words *DIG DUG*, these words, *ATARI* and the monsters fall down to a new position on the screen. Everything in the picture rolls up except the words *DIG DUG*.

In the second picture, game characters appear on the screen. Dig Dug is between FYGAR, the fire-breathing dragon, and POOKA, the fat monster. First, Dig Dug pumps up POOKA until he explodes and disappears, and *200-500* (points) appears in his place. Then, Dig Dug pumps up FYGAR until he explodes and disappears, and *200-1000* appears in his place.

The third picture simulates game play. Dig Dug walks through underground tunnels. Monsters chase him and he periodically pumps them up or drops rocks on them. This picture ends when Dig Dug is destroyed.

The fourth picture shows the high-score table. The top five scores, round played and matching initials appear on the screen.

During the attract mode, the high score and score(s) for one or both players appear at the top of the screen. Credits or number of Dig Dug lives and the round number appear at the bottom of the screen. This mode ends when coins are inserted and accepted for game play.

2. Ready-to-Play Mode

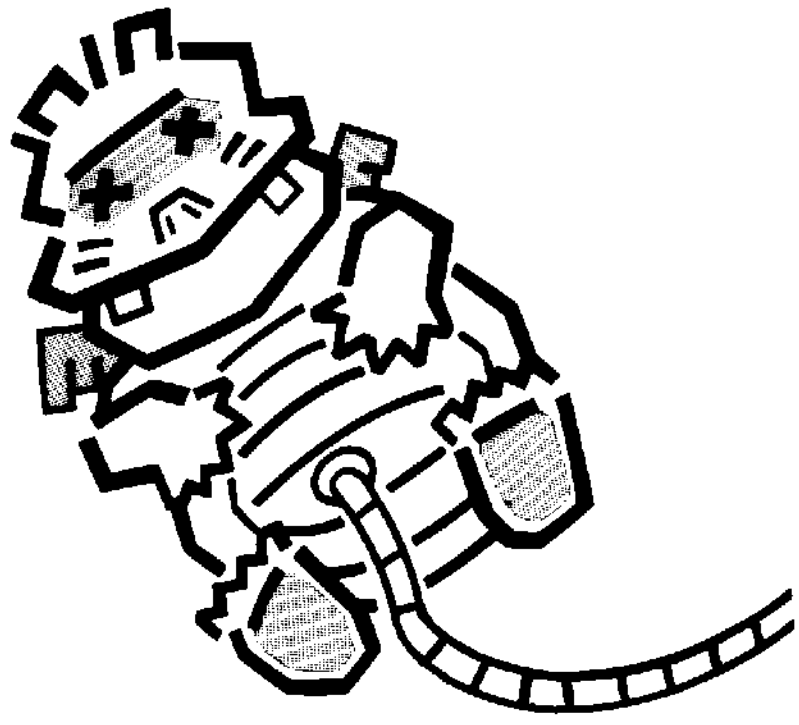
During this mode, the high score and score(s) for one or both players appear at the top of the screen. The words *PUSH START BUTTON, 1 PLAYER ONLY or 1 OR 2 PLAYERS* and bonus life information appear in the center of the screen. ATARI copyright, credits and the round number appear near the bottom of the screen. This mode ends when a player pushes the start button.

3. Play Mode

This mode begins when Dig Dug enters the screen from the top right and walks across the surface. He digs down to the center of the screen. The words *PLAYER 1 READY* or *PLAYER 2 READY* appear on the screen. Also, high score and score(s) for one or both players appears at the top of the screen. The number of Dig Dug lives and the round number appear at the bottom of the screen.

Game play takes place on a cutaway section of the land. The characters are Dig Dug and two monsters, one of which is a fire-breathing dragon. The underground area is divided into four different colored layers of dirt. Rocks are scattered in the dirt. The sky is at the top of the screen.

The player controls Dig Dug. He moves through horizontal and vertical tunnels. When Dig Dug digs new tunnels he moves slowly. When he is on the surface or in an existing tunnel, he moves faster. The object of the game is for Dig Dug to destroy all the monsters and go to the next round.



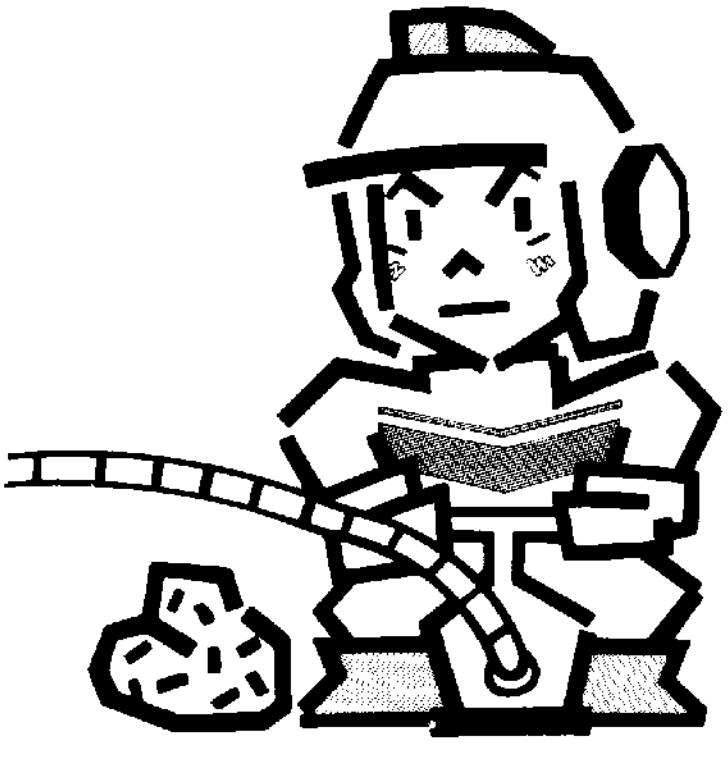
Monsters are trapped in caves. A monster may get out of a cave two ways. Dig Dug may dig him out. Then, the monster chases Dig Dug. The monster may also get out of the cave by turning into a ghost. As a ghost, he cannot be destroyed. The ghost does not travel in the tunnels. He travels through the dirt, and can travel diagonally. However, he reappears as the monster when he goes into a tunnel.

The monster moves faster than Dig Dug in vertical tunnels and slower on the surface. He destroys Dig Dug by catching him. In addition, the dragon destroys Dig Dug by breathing fire on him. The dragon only breathes fire horizontally. The fire can penetrate the dirt.

Dig Dug destroys the monsters by pumping them up until they burst, or by causing rocks to drop on them. To pump up and destroy a monster, the player presses and holds down the pump button. It is possible to stun a monster for a few seconds by pressing the pump button once or twice. While a monster is stunned, Dig Dug may pass over him without being destroyed. If two monsters are very close together, only one may be stunned. The other will catch and destroy Dig Dug.

Dig Dug must dig tunnels under the rocks to get them to drop. A rock may fall in a vertical or a horizontal tunnel. A rock also goes through a thin layer of dirt from one tunnel to the next. In a vertical tunnel, Dig Dug may stay directly under a rock and it will not drop. However, in a horizontal tunnel, Dig Dug must move out from under a rock right away, or he will be crushed.

After two rocks are dropped, a vegetable (worth extra points) appears in a tunnel in the center of the screen. A player has 10 seconds to capture (touch) the vegetable or it will disappear. There is only one vegetable per round.



The game progresses by rounds. Round 1 starts with four monsters and three rocks. The vegetable is a carrot. One flower on the surface (top right of the screen) represents Round 1. Two flowers represent Round 2, etc. As the rounds progress, the monsters move a little faster, and are better at avoiding falling rocks. In each round, the last monster tries to escape. If he is not caught by Dig Dug, he exits on the surface (top left).

The game ends when all of the Dig Dug lives are used up. A player may continue to play at the same round (level) by following instructions on the screen. He has 16 seconds to insert a coin(s). Then he must push and hold the pump and start buttons at the same time.

4. High Score Mode

This mode begins when a player has one of the five top scores. A player enters his initials in the center of the screen. The initials are then transferred to the table. To reset the high-score table, set the self-test switch to *on*. Simultaneously push and hold the pump and utility coin switches for 10 seconds. Then set the self-test switch to *off*.

5. Hints for Game Play

- Get many monsters to follow you. Then dig a long vertical tunnel up to a rock. Drop the rock by digging right or left.
- Dig Dug may take extra time to turn. It is better to start turning early than to wait until the last second.
- Destroy monsters at bottom dirt level for more points.
- Use PUMP to stun monsters. Then you may escape or walk through them.
- Don't stop next to dragon when he is in a cave. His fire can go through a thin layer of dirt and destroy you.
- A vegetable appears after two rocks have been dropped. So be sure to drop two rocks in each round.

Table 1-3 Dig Dug™ Scoring

Bursting Monsters

Dirt Layer	POOKA	FYGAR*
1	200	400
2	300	600
3	400	800
4	500	1000

** Worth ½ amount vertically*

Dropping Rocks

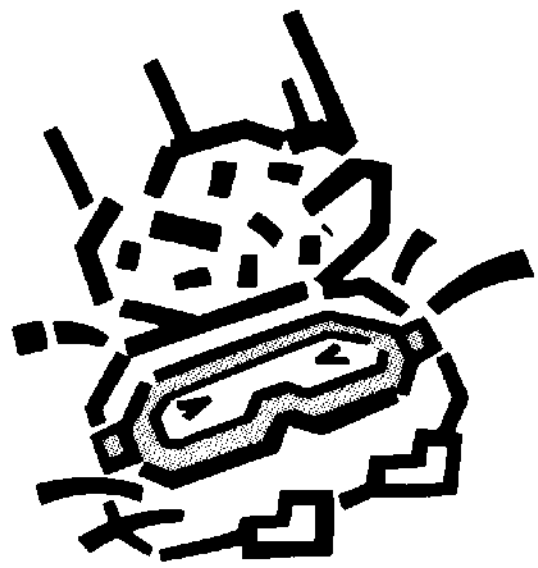
Monsters Destroyed	Points
1	1000
2	2500
3	4000
4	6000
5	8000
6	10,000
7	12,000
8	15,000

Vegetables

Round	Vegetable	Points for Capture
1	Carrot	400
2	Rutabaga	600
3	Mushroom	800
4	Cucumber	1000
5	Cucumber	1000
6	Eggplant	2000
7	Eggplant	2000
8	Bell Pepper	3000
9	Bell Pepper	3000
10	Tomato	4000
11	Tomato	4000
12	Onion	5000
13	Onion	5000
14	Watermelon	6000
15	Watermelon	6000
16	Galaxian	7000
17	Galaxian	7000
18 and above	Pineapple	8000

Digging a new tunnel is worth 10 points per ⅝ inch (1.61 cm).

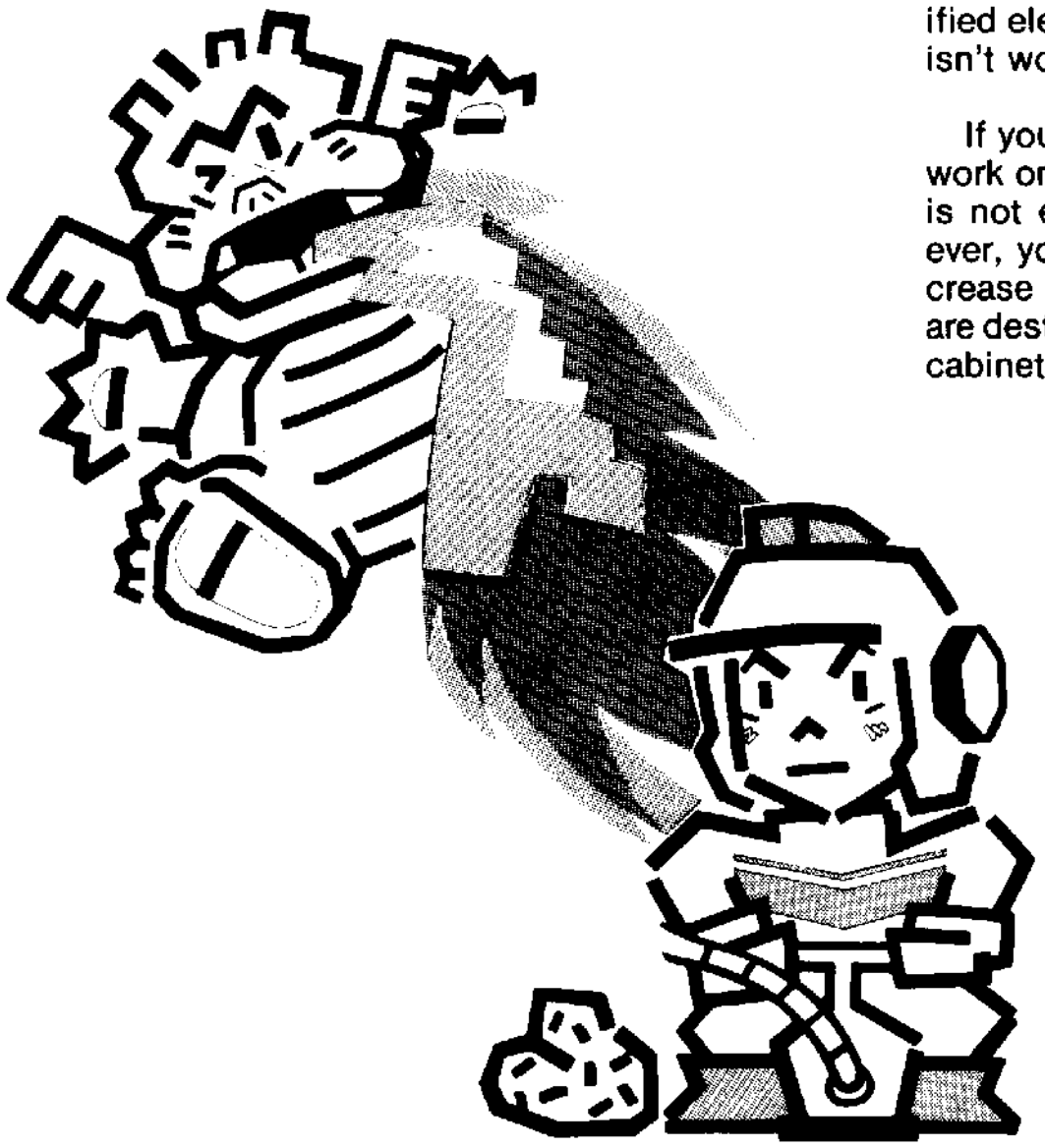
Troubleshooting



A. Introduction

This game tests itself when the self-test switch is set to the *on* position. If there is a failure, the game produces audiovisual aids to help you isolate the failing portion of the game. The self-test procedure included in Chapter 1 is to help you decide if the game is or isn't working properly. The expanded procedures in this chapter are included to help the qualified electronic technician determine why the game isn't working properly.

If you are not a qualified technician, do not try to work on the game circuitry or video display. True, it is not earning money when it doesn't work. However, your investment in this game may greatly increase if either the video display and/or game PCB are destroyed while you are working inside the game cabinet. Be assured, it isn't worth it.



Chapter 2

B. Comments on Troubleshooting

When troubleshooting, first determine the symptom(s) of the failure. After determining the symptom, look over the wiring diagram and determine what assemblies could cause the failure. Could it be caused by the power supply, Regulator/Audio II PCB, or the video display?

The next step is to check all harness wires and connectors to the suspected failing assembly. If you find no harness or connector problem, substitute an assembly known to be good for the suspected failing assembly. If the game functions properly, you have successfully isolated the failure. If it doesn't, repeat the procedure with another assembly.

When you have isolated the failing assembly, you must troubleshoot that assembly and make the necessary repairs. If the display is failing, we suggest that a qualified video display technician handle the troubleshooting and repair. If the power supply or Regulator/Audio II PCB is failing, troubleshooting and repair is relatively simple, as these assemblies are not too complicated. If the game PCB is failing, troubleshooting and repair will greatly depend on your understanding of the operation of this PCB.

To effectively troubleshoot problems of the game PCB, it is necessary for you, the technician, to become familiar with the PCB's hardware. The diagrams in the schematic package (included with the game) show the functions of the circuitry. Again, while troubleshooting this PCB, first determine the symptom of the failure, then locate the suspected area on the schematic diagram.

C. Self-Test Procedure

To enter Self-Test, set the self-test switch to the *on* position. Patterns appear on the screen. After about 8 seconds, the self-test screen is displayed (see *Figure 2-1*). See *Chapter 1, Section H, Self-Test Procedure* for a complete description of this part of the self-test.

NOTE

This procedure does not test the coin door lockout coils. If the self-test passes, but the lockout coils do not energize when the self-test switch is set to *off*, suspect the lockout coil wiring, coin door harness, game PCB harness, or driver Q5 and related circuitry of the game PCB.

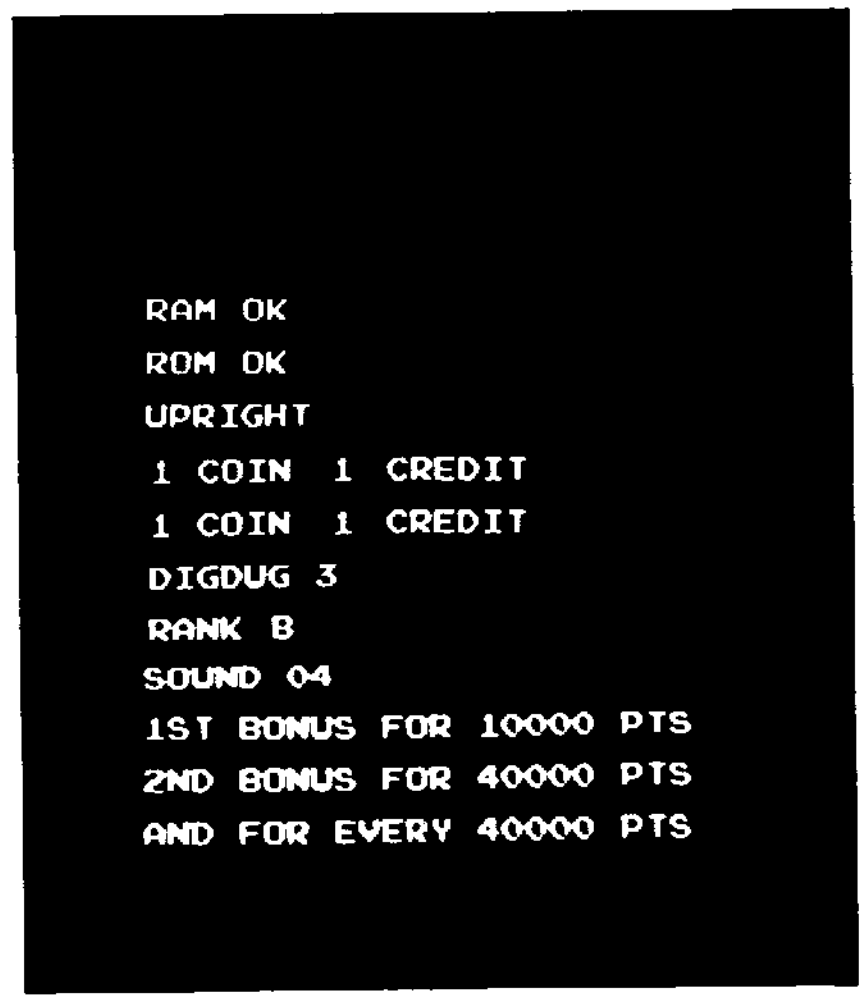


Figure 2-1 Self-Test Screen 1 Test Passes

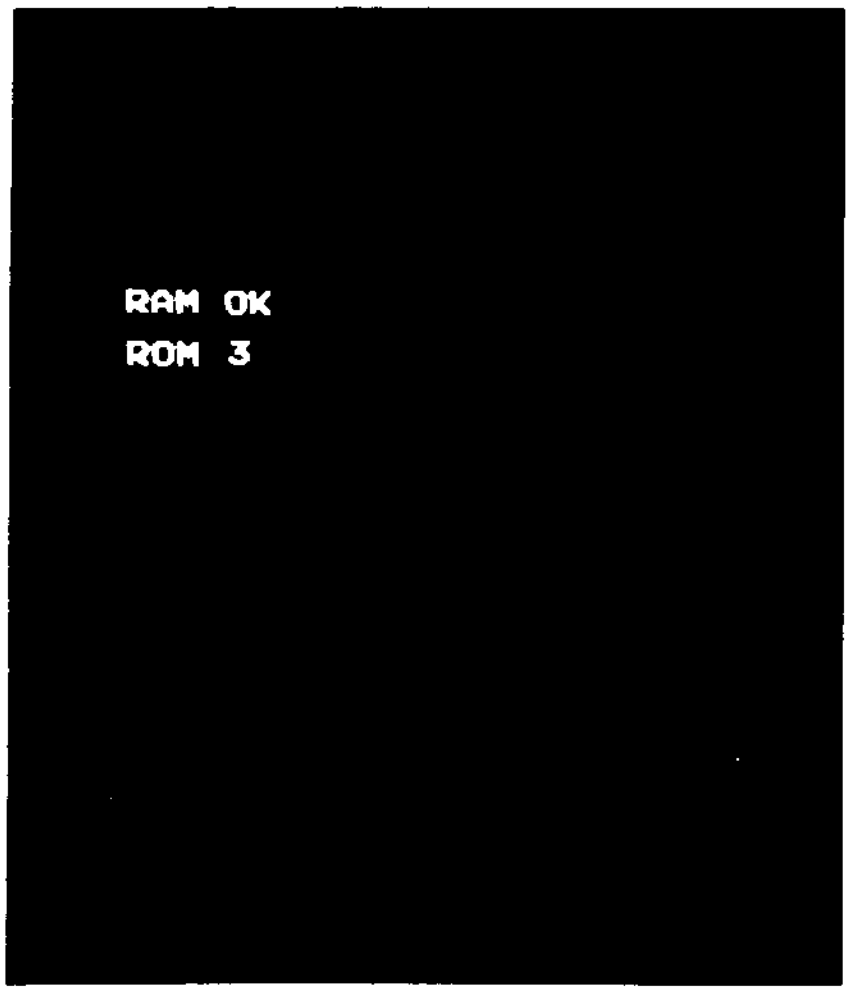
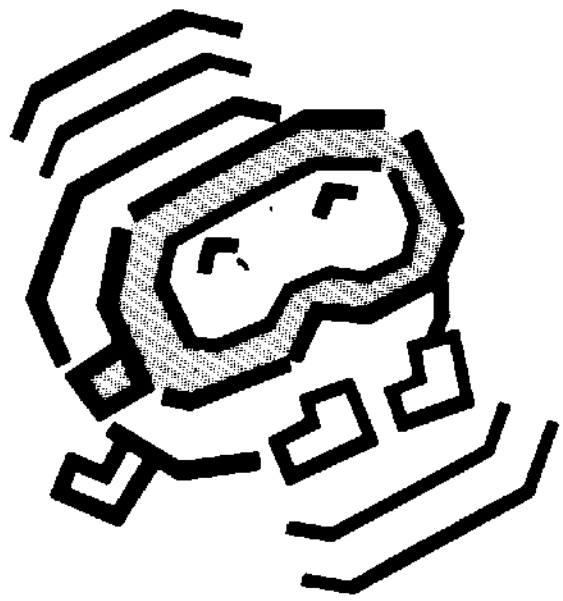


Figure 2-2 Self-Test Screen 1 Test Fails



To go to screen 2, set the self-test switch to *off* and immediately to *on* again.

SCREEN 2:

A white crosshatch pattern appears on the screen (see *Figure 2-3*). Use this pattern for convergence (see the raster-scan video display manual).

SCREEN 1:

RAM FAILURE is indicated by the word RAM and a pair of alphanumeric characters displayed at the top of the screen. The following table lists the bad RAM chip and its location.

Screen Display	Bad RAM chip location on game PCB
RAM 0L	9M
RAM 0H	9M
RAM 1L	9M
RAM 1H	9M
RAM 2L	9E
RAM 2H	9J/K
RAM 3L	9H/J
RAM 3H	9H
RAM 4L	9F/G
RAM 4H	9G/H

ROM FAILURE is indicated by the word ROM and a number displayed at the top of the screen. The following table lists the bad ROM chip and its location.

Screen Display	Bad ROM chip location on game PCB
ROM 1	6L
ROM 2	6M
ROM 3	6N/P
ROM 4	6R
ROM 5	6C
ROM 6	6D
ROM 7	5L

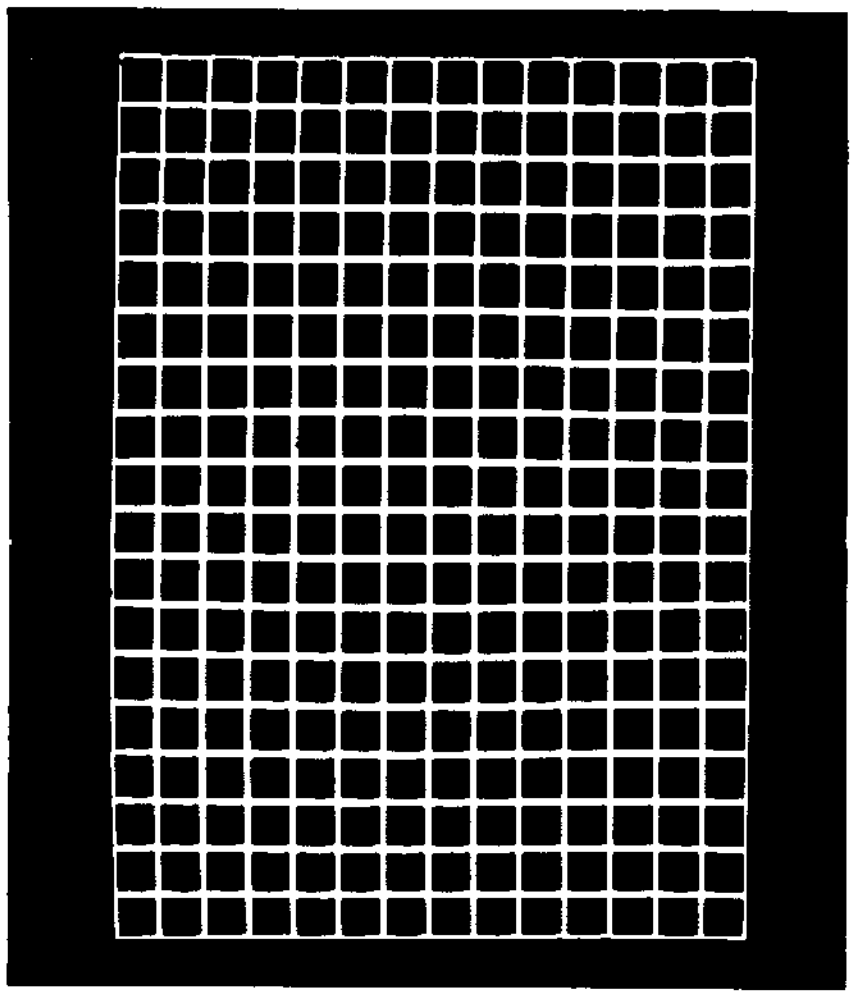
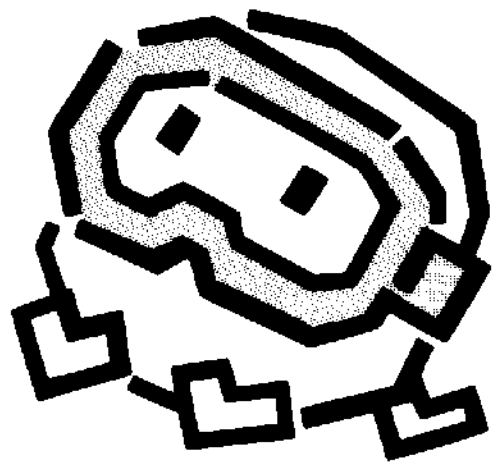
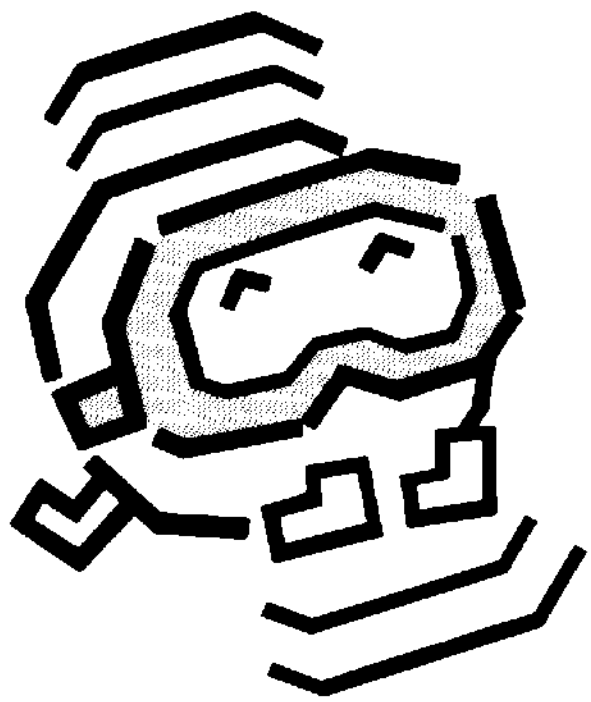


Figure 2-3 Self-Test Screen 2

Maintenance, Repair and Parts



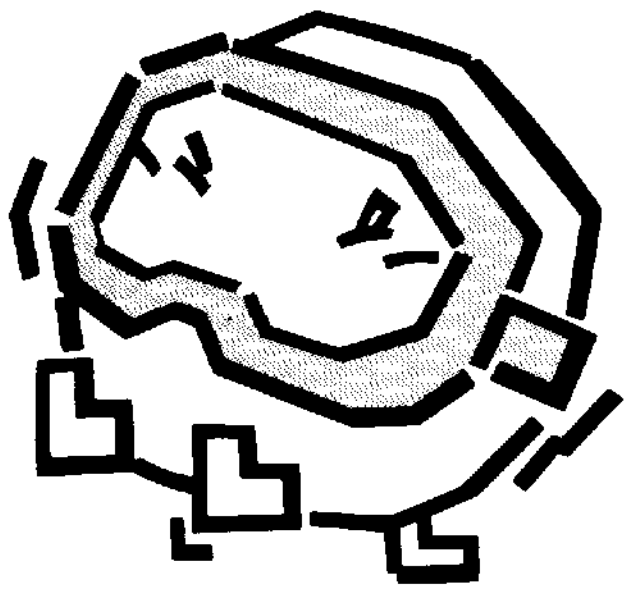


In addition to maintenance and repair information, this chapter provides the necessary information for you to order parts for your Dig Dug game. Please note that **common hardware has been deleted** from most of the parts lists. This includes screws, nuts, washers, bolts, etc.

The parts lists are arranged in alphanumeric order. For example, all "A-" prefix numbers come first. Following this are numbers in sequence evaluated up to the hyphen, namely 00- thru 99-, then 000598-thru approximately 190000-.

When ordering parts, please give the part number, part name, applicable figure number of this manual, and serial number of your game. This will help to avoid confusion and mistakes in your order. We hope the results will be less downtime and more profit from your game.

Atari Customer Service numbers are listed in the front of this manual for your convenience.



Chapter 3

A. Cabinet-Mounted Assemblies

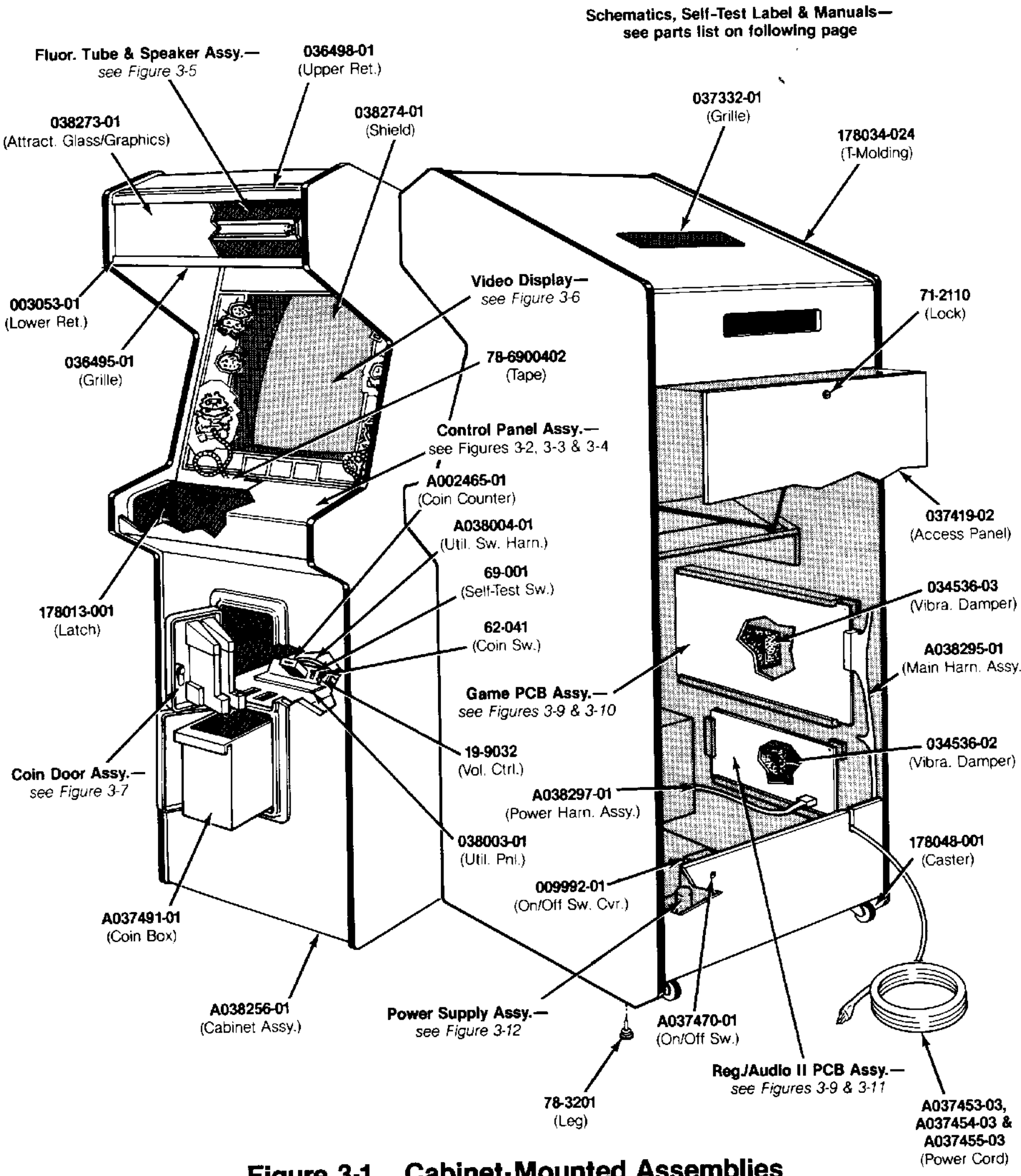


Figure 3-1 Cabinet-Mounted Assemblies Upright Cabinet

Figure 3-1 Cabinet-Mounted Assemblies, continued
Upright Cabinet Parts List

Part No.	*Description*
A002465-01	6V Coin Counter
A037453-03	Strain-Relief Power Cord *(U.S.)*
A037454-03	Strain-Relief Power Cord *(Austria, Belgium, Chile, Denmark, Finland, France, Germany, Greece, Indonesia, Italy, Netherlands, Norway, Spain, Sweden, and Uruguay)*
A037455-03	Strain-Relief Power Cord *(Australia and New Zealand)*
A037470-01	Power On/Off Switch and Mounting Plate Assembly
A037491-01	Coin Box
A038004-01	Utility-Switch Panel Harness Assembly
A038256-01	Cabinet Assembly *(includes legs and PCB retainers, but not the rear access panel)*
A038295-01	Main Harness Assembly
A038297-01	Power Harness Assembly
	The following four items are the technical information supplements to this game:
SP-203	Dig Dug™ Schematic Package
ST-203-01	Dig Dug Label with Self-Test Procedure and Option Switch Settings
TM-160	Service Manual for 19-Inch Electrohome Color Raster-Scan Display *(Substitute TM-201 when using part no. 92-055, Wells-Gardner 19-Inch Display)*
TM-203	Dig Dug Operation, Maintenance and Service Manual
19-9032	Volume Control
62-041	SPDT Momentary-Contact Pushbutton Utility Coin Switch with Black Cap
69-001	DPDT Self-Test Switch
71-2110	Panel Cartridge Lock Mechanism *(for rear access panel)*
78-3201	Cabinet-Leveling Leg
78-6900402	Vinyl Foam Single-Coated Adhesive Tape, ¼-Inch Wide × ⅛-Inch Thick *(72 in. required)*
003053-01	Lower Attraction Glass Retainer
009992-01	On/Off Switch Cover
034536-02	Foam Vibration Damper *(For Regulator/Audio II PCB)*
034536-03	Foam Vibration Damper *(For Dig Dug Game PCB)*
036495-01	Speaker Grille
036498-01	Upper Attraction Glass Retainer
036686-01	Card of Game Pricing Labels *(not shown in illustration)*
037419-02	Rear Access Panel *(does not include lock)*
037332-01	Ventilation Grille *(located on cabinet top)*
038003-01	Utility Switch Panel for Volume Control, Self-Test Switch, Coin Switch and Coin Counter
038273-01	Attraction Glass with Graphics
038274-01	Video Display Shield with Graphics
178013-001	Spring Draw Latch
178034-024	¾-Inch Black Plastic T-Molding
178048-001	2-Inch Rigid Caster

Schematics, Self-Test Label & Manuals—
see parts list on following page

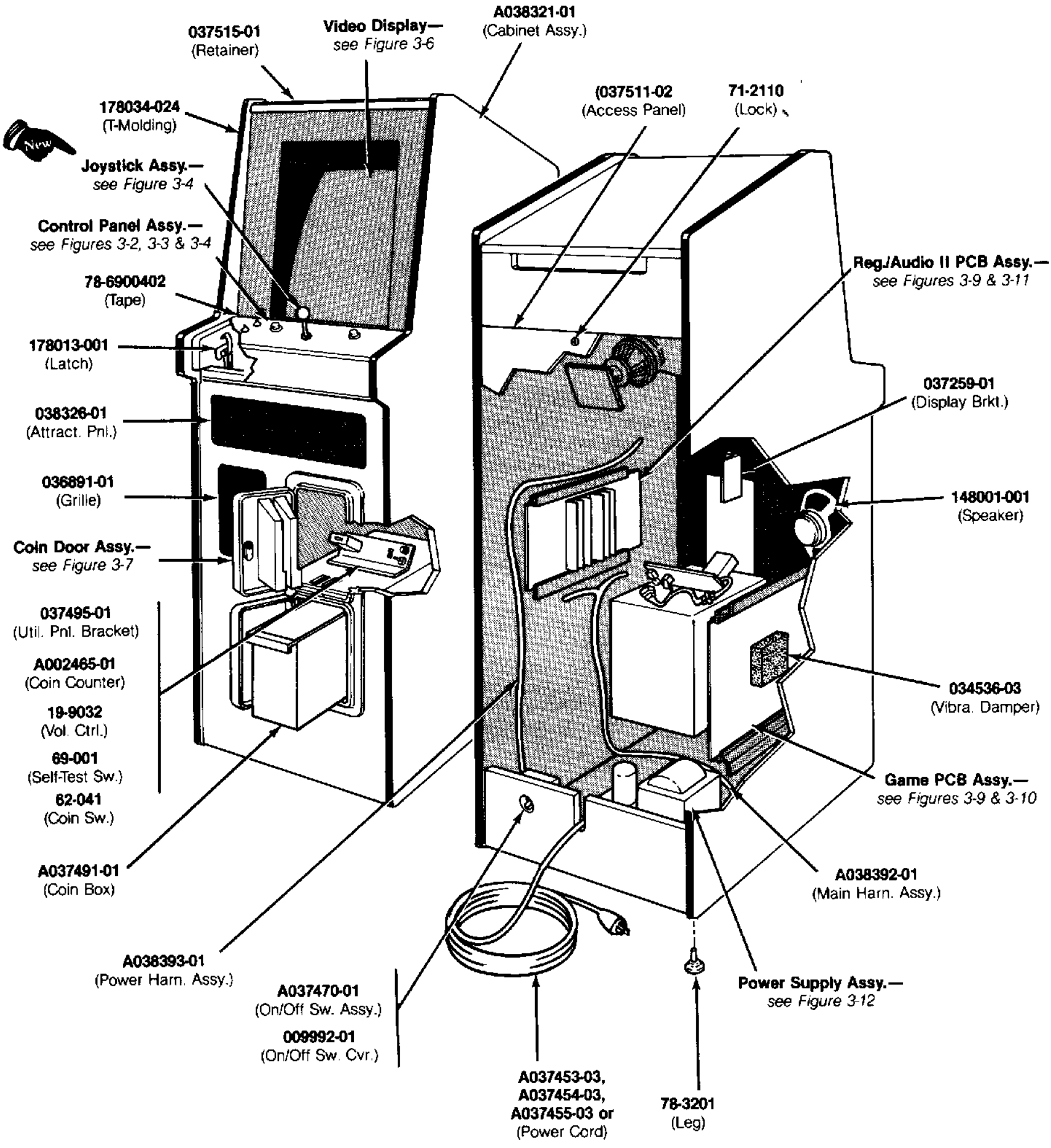


Figure 3-1 Cabinet-Mounted Assemblies, continued
Cabaret Cabinet

Figure 3-1 Cabinet-Mounted Assemblies, continued
Cabaret Cabinet Parts List

Part No.	*Description*
A002465-01	Coin Counter
A037453-03	Strain-Relief Power Cord *(U.S.)*
A037454-03	Strain-Relief Power Cord *(Austria, Belgium, Chile, Denmark, Finland, France, Germany, Greece, Indonesia, Italy, Netherlands, Norway, Spain, Sweden, and Uruguay)*
A037455-03	Strain-Relief Power Cord *(Australia and New Zealand)*
A037470-01	Power On/Off Switch and Mounting Plate Assembly
A037491-01	Coin Box
A038321-01	Cabinet Assembly *(includes PCB retainers and legs, but not rear access panel)*
A038392-01	Main Harness Assembly
A038393-01	Power Harness Assembly
	The following four items are the technical information supplements to this game:
SP-203	Dig Dug™ Schematic Package
ST-203-01	Dig Dug Label with Self-Test Procedure and Option Switch Settings
TM-160	Instruction and Service Manual for 19-Inch Electrohome Color Display *(Substitute TM-201 when using Wells-Gardner Display no. 92-055)*
TM-203	Dig Dug Operation, Maintenance and Service Manual
19-9032	Volume Control
69-001	DPDT Self-Test Switch
71-2110	Panel Cartridge Lock Mechanism *(for rear access panel)*
78-3201	Cabinet-Leveling Leg
78-6900402	Vinyl Foam Single-Coated Adhesive Tape, ¼-Inch wide × ⅛-Inch thick
009992-01	On/Off Switch Cover
034536-03	Foam Vibration Damper *(for both PCBs)*
036686-01	Card of Game Pricing Labels
036891-01	Speaker Grille
037495-01	Bracket for Volume Control, Self-Test Switch and Coin Counter(s)
037511-02	Rear Access Panel *(does not include lock)*
037515-01	Upper Display-Shield Retainer
037529-01	Display Bracket
038326-01	Attraction Panel with Graphics
038331-01	Side Panel Decal *(not shown in illustration)*
148001-001	6 × 9-Inch 4-Ohm 15W Oval High-Fidelity Speaker
178013-001	Spring Draw Latch
178034-024	Black Plastic T-Molding, ¾-Inch wide

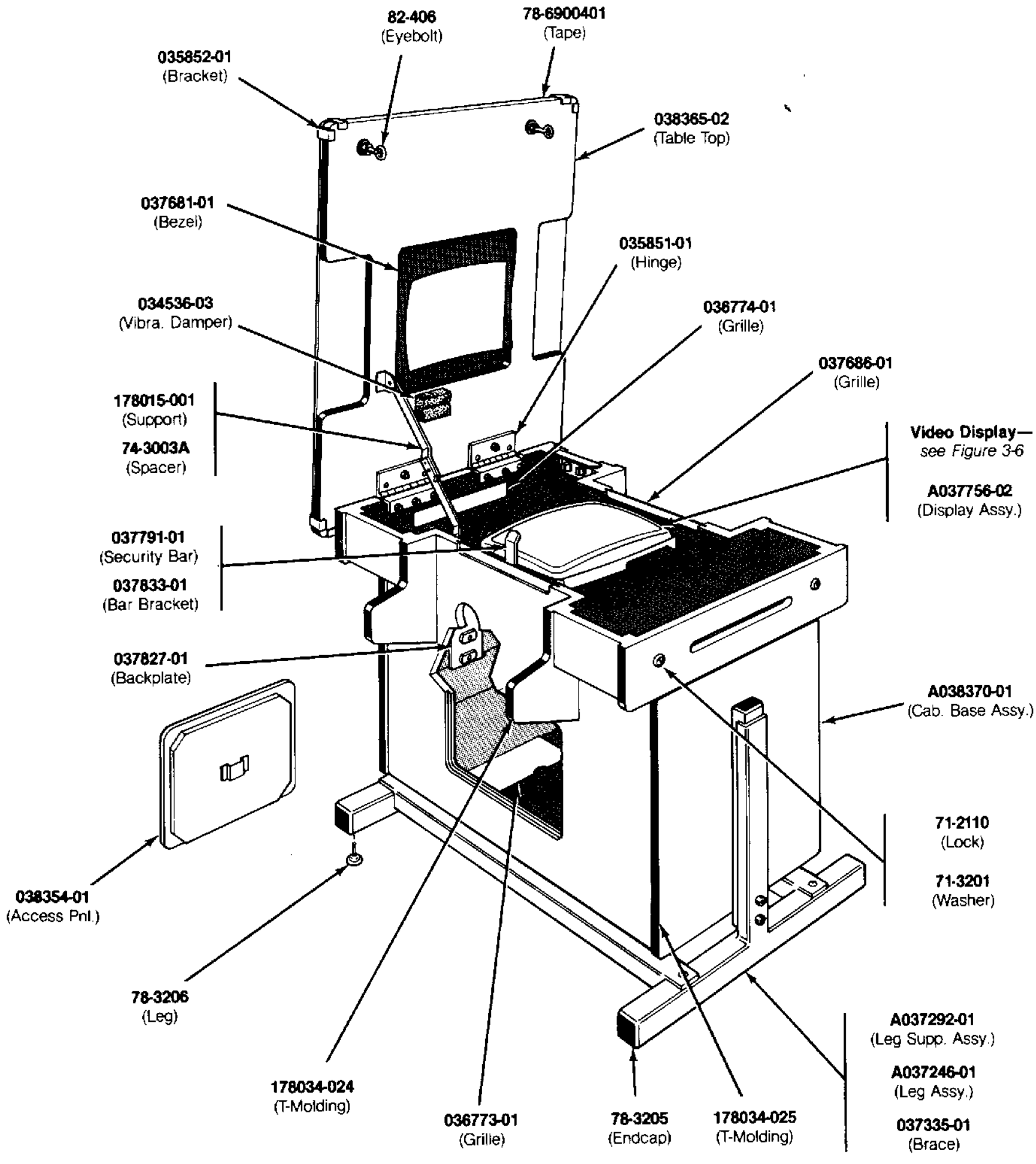


Figure 3-1 Cabinet-Mounted Assemblies, continued
Cocktail Cabinet

Schematics, Self-Test Label & Manuals—
see parts list on following page

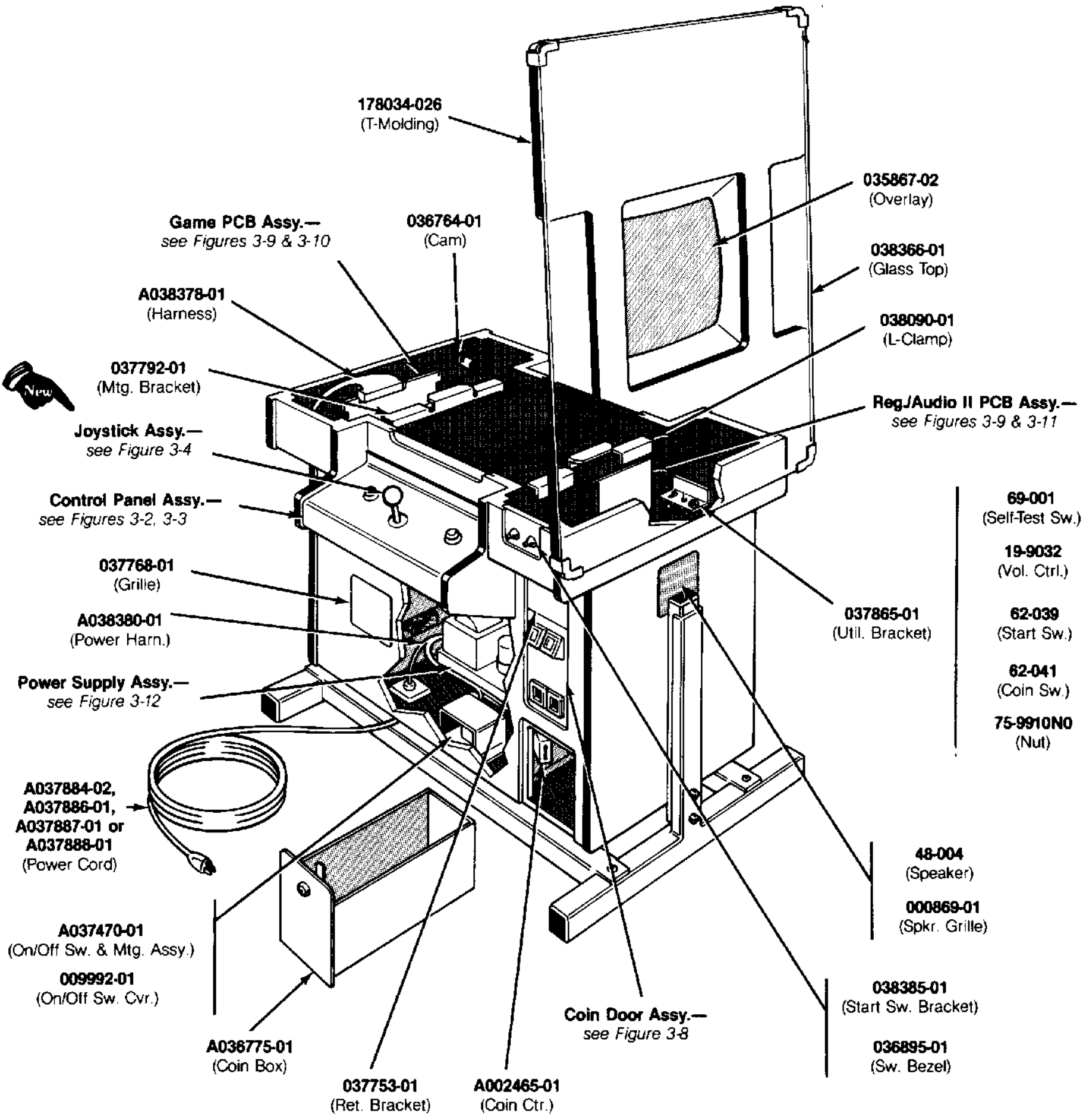


Figure 3-1 Cabinet-Mounted Assemblies, continued Cocktail Cabinet

Figure 3-1 Cabinet-Mounted Assemblies, continued
Cocktail Cabinet Parts List

Part No.	*Description*
A002465-01	Coin Counter
A005133-01	Cooling Fan *(optional equipment)*
A036775-01	Coin Box Assembly *(includes lock)*
A037246-01	Leg Assembly *(includes leg, 2 adjustable feet and 2 endcaps)*
A037292-01	Leg Support Assembly *(includes 2 panel nuts and endcap)*
A037470-01	On/Off Switch and Mounting Plate Assembly
A037756-02	14-Inch Color Video Display Assembly
A037884-02	Strain-Relief Power Cord *(United Kingdom, Ireland, Lebanon, Saudi Arabia, India, Hong Kong, Singapore, Egypt, Nigeria, Republic of South Africa, Zimbabwe)*
A037886-01	Strain-Relief Power Cord *(U.S.)*
A037887-01	Strain-Relief Power Cord *(Austria, Belgium, Chile, Denmark, Finland, France, Germany, Greece, Indonesia, Italy, Netherlands, Norway, Spain, Sweden, and Uruguay)*
A037888-01	Strain-Relief Power Cord *(Australia and New Zealand)*
A038370-01	Cabinet Base Assembly *(includes grilles, PCB retainers, leg backplate and hinges)*
A038378-01	Main Harness Assembly
A038380-01	Power Harness Assembly
	The following four items are the technical information supplements to this game:
SP-203	Dig Dug™ Schematic Package
ST-203-02	Dig Dug/Cocktail Label with Self-Test Procedure and Option Switch Settings
TM-187	Service Manual for 14-Inch Electrohome Color Raster-Scan Monitor
TM-203	Dig Dug Operation, Maintenance and Service Manual
19-9032	50-Ohm, 12½W Wire-Wound Rheostat *(for volume control)*
48-004	8-Ohm, 5W 5-Inch Round High-Fidelity Speaker
62-039	Momentary-Contact SPDT Light-Emitting-Diode Switch with Red Cap
62-041	SPDT Momentary-Contact Pushbutton Utility Coin Switch with Black Cap
69-001	DPDT Self-Test Switch
71-2110	Panel Cartridge Lock Mechanism *(for table top)*
71-3201	Anchor Washer for Table Top Locks
74-3003A	#10 × 3/16-Inch-Long Aluminum Tubular Spacer *(for table top support)*
75-9910N0	#5/8-11 Steel Stamped Nut *(for utility coin switch)*
78-3205	Square Black Endcap for Leg Assembly
78-3206	Cabinet-Leveling Leg
78-6900401	Vinyl Foam Single-Coated Adhesive Tape, ¼-Inch wide × 1/16-Inch thick
82-406	#¼-20 × 2-Inch-Long Eyebolt, with ¾-Inch Threads
000869-01	Speaker Grille
009992-01	On/Off Switch Cover
034536-03	Foam Vibration Damper
035851-01	Table Top Hinge
035852-01	Corner Bracket for Table Top
035867-02	Smoke-Color Acrylic Display Overlay
036764-01	Hook-Type Cam for Lock
036773-01	Cabinet Base Grille
036774-01	Upper End-Panel Grille
036895-01	Black Molded Switch Bezel
037335-01	Leg Brace
037681-01	Cardboard Display Bezel
037686-01	Slip-In Cabinet Grille *(above control panel)*
037753-01	Coin Acceptor Retaining Bracket
037768-01	Fan Grille *(fan is optional—see part no. A005133-01)*

[Continued on next page]

Figure 3-1 Cabinet-Mounted Assemblies, continued Parts List

Part No.	*Description*
037791-01	Security Bar
037792-01	Display Mounting Bracket
037827-01	Backplate for Attaching Leg
037833-01	Security Bar Bracket
037865-01	Bracket for Volume Control, Self-Test and Utility Coin Switches
038090-01	Video Display L-Clamp
038354-01	Service Panel
038365-02	Wood Table Top
038366-01	Tempered-Glass Table Top with Graphics
038385-01	Start Switch Mounting Bracket
178015-001	Hinged Table Top Support
178034-024	¾-Inch Black Plastic T-Molding *(for center cabinet base)*
178034-025	$^{25}/_{32}$-Inch Black Plastic T-Molding *(for cabinet ends)*
178034-026	$^{13}/_{16}$-Inch Black Pastic T-Molding *(for table top)*

B. The Control Panel

WARNING

Prior to removing or repairing any switch on the control panel, **unplug the game.**

To Open the Control Panel

Upright and Cabaret Cabinets:

1. Open the coin door. Reach up through the opening and release the spring-draw latches. They are on the cabinet side walls at each end of the control panel.
2. Lift up on the control panel at the top edge, and tilt it toward you. The display shield has foam tape applied to it to cushion the shield and prevent liquids from entering the cabinet interior. Make sure this tape is in good condition.

Cocktail Cabinet:

3. Remove the two sets of button-head screws and lock washers at the top edge of the control panel. Then, tilt the control panel toward you.

Leaf Switch Repair:

- Adjust the leaf switches for a narrow gap. When a switch button is depressed, the resulting wiping action of the cross-bar contacts provides a self-cleaning feature. **Don't burnish the contacts.** To clean them, use electrical contact cleaner.
- To replace a leaf switch, remove the screw with a Phillips-head screwdriver.
- To replace the switch button, turn the stamped nut with a wrench in a counterclockwise direction, as seen from the inside of the control panel. The ring on the outside of the control panel should not spin, due to its design.
- Reinstall the switch. Reconnect the harness wires as shown in the *Schematic Package, Game Wiring Diagram*. Make certain the right colors go to the right tabs on the switch.

LED Start-Switch Replacement:

The LED switches have a very low failure rate. If a switch should ever be suspect, first test it using the directions that follow.

To Test LED Switch:

- Remove the wires from the suspected switch.
- Attach the leads of an ohmmeter to normally open and common contacts.
- Check contacts (push and release the switch button) for closed and open continuity.
- If the contacts do not operate sharply or always remain closed or open, then replace the LED switch.

To Replace LED Switch:

- Remove all wires from the faulty switch.
- Turn the switch counterclockwise while holding the black cone-shaped bushing on the outside of the control panel.
- Install a new switch using the reverse procedure.
- Reconnect the harness wires as shown.

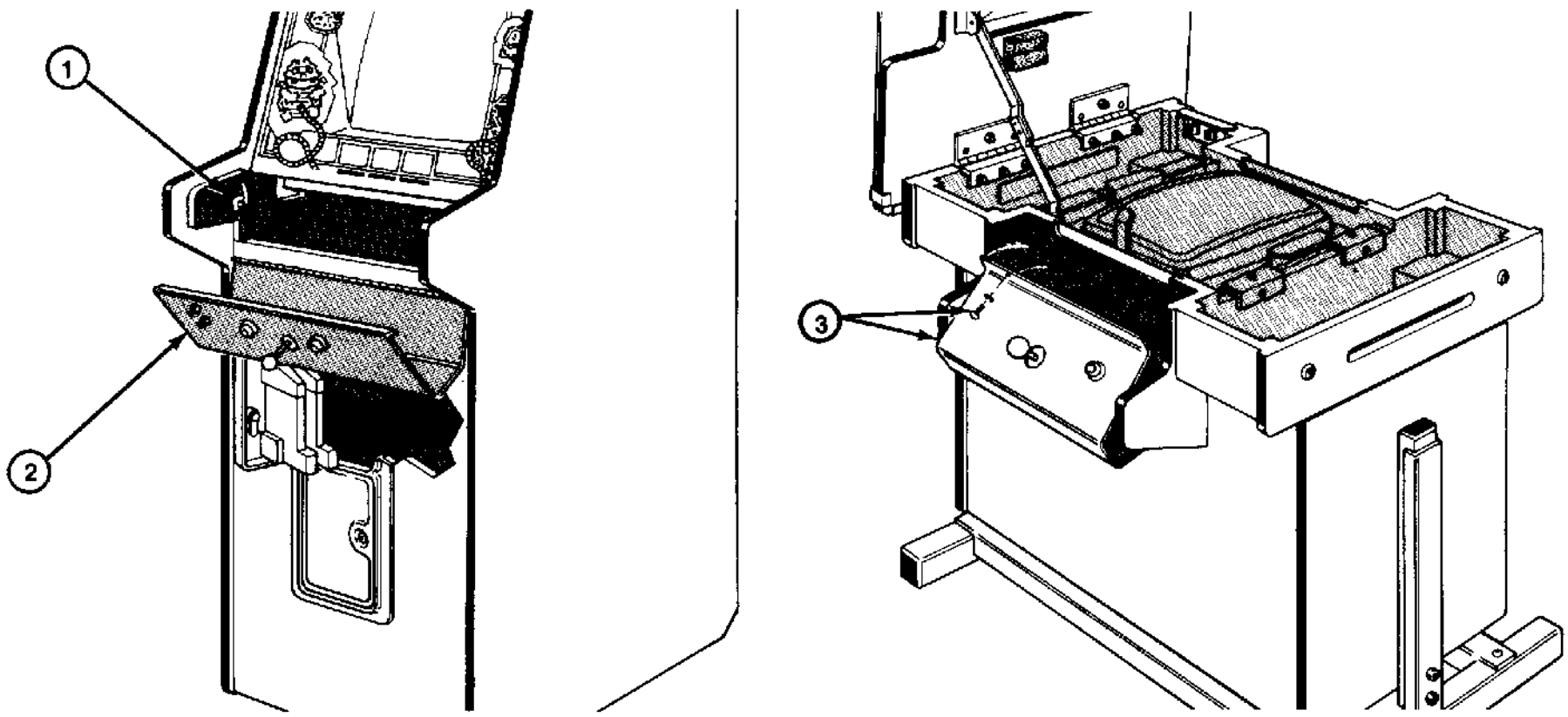
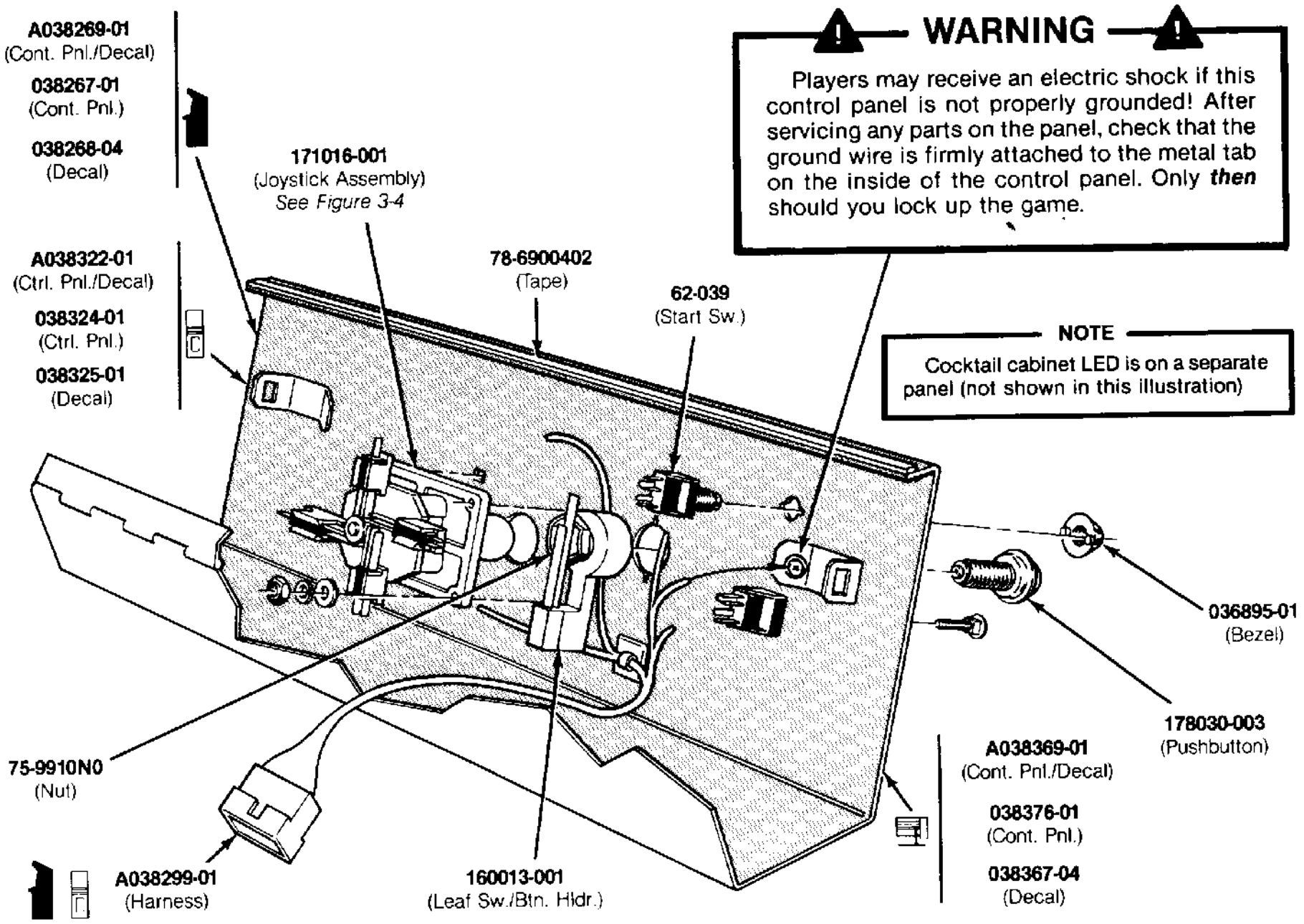
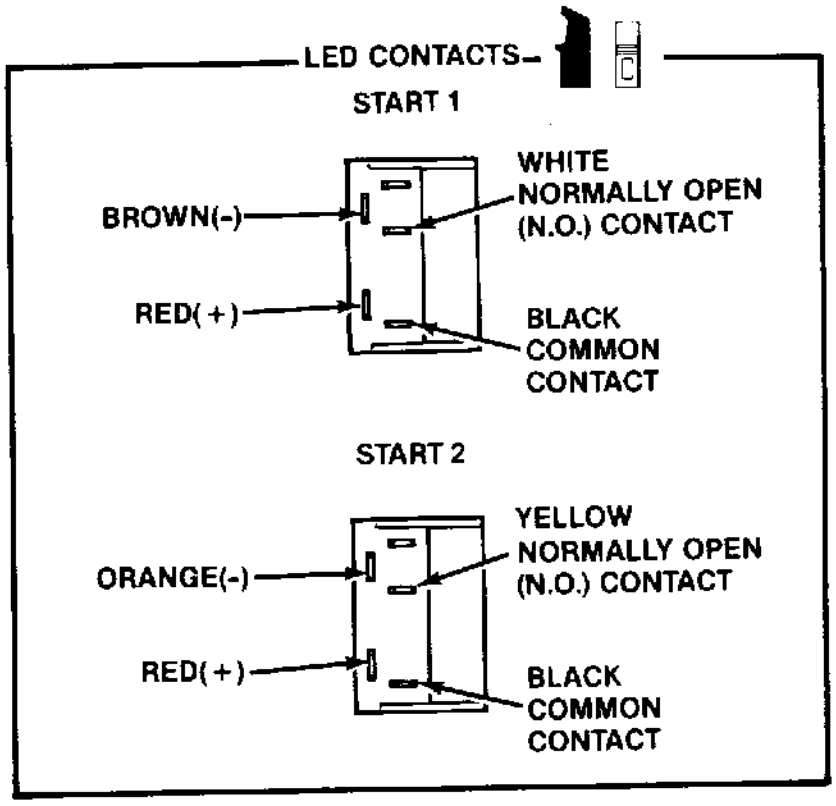


Figure 3-2 The Control Panel





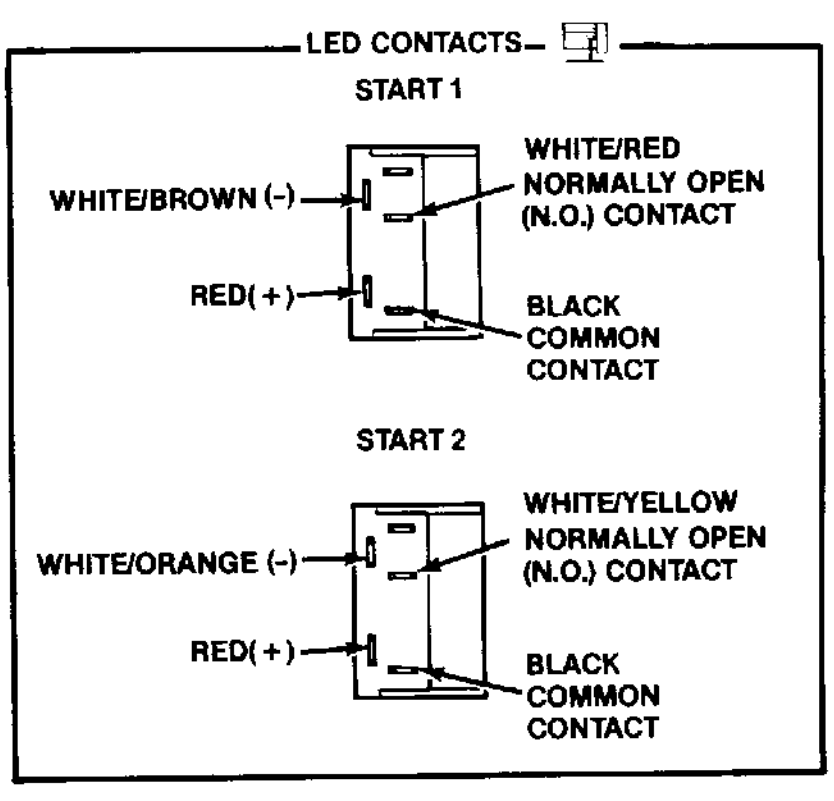


Figure 3-3 Control Panel Assembly

A038270-01 A
A038323-01 A
A038368-01 A

Figure 3-3 Control Panel Assembly, continued
Parts List

Part No.	*Description*
	Upright Cabinet
A038269-01	Control Panel with Decal
A038270-01	Control Panel Assembly
A038299-01	Control Panel Harness Assembly
038267-01	Control Panel
038268-04	Control Panel Decal
	Cabaret Cabinet
A038299-01	Control Panel Harness Assembly
A038322-01	Control Panel with Decal
A038323-01	Control Panel Assembly
78-6900402	Vinyl Foam Single-Coated Adhesive Tape, ¼-Inch wide × ⅛-Inch thick *(24 in. required)*
038324-01	Control Panel
038325-01	Control Panel Decal
	Cocktail Cabinet
A038368-01	Control Panel Assembly
A038369-01	Control Panel with Decal
A038382-01	Control Panel Harness Assembly
038367-04	Control Panel Decal
038376-01	Control Panel
	For Upright, Cabaret, and Cocktail Cabinets
75-9910N0	#⅝-11 Steel Stamped Nut
62-039	SPDT Momentary Pushbutton Start Switch with Red Light-Emitting Diode
036895-01	Black Molded Switch Bezel
160013-001	Leaf Switch and Button Holder *(leaf switch only is part no. 160012-001)*
171016-001	Joystick Assembly
178030-003	Black Pushbutton Assembly

WARNING

Prior to removing or repairing the joystick, **unplug the game.**

To Repair the Joystick:

1. First, remove the entire joystick assembly from the control panel (see *Figure 3-3*). Now locate the four screws in the plastic joystick frame and remove these screws.
2. Next, remove the clip ring from the bottom of the shaft. The assembly will come apart.
3. To replace the *bellows*, pry it up and out of the plastic frame.
   - Reassemble in reverse order.
   - Note that the inner raised ring on the bellows is longer on one side. This side goes on the top of the assembly (toward the control knob).
4. To replace a *leaf switch*, you don't need to disassemble the joystick.
   - Using your thumbs, pry apart the plastic flanges on the switch holder. With your index finger, lift the switch up so that it will clear the plastic tab located on the outside end of the switch holder.
   - Slide the switch out of its holder. Replace the switch in reverse order. Adjust the switch for a narrow gap.

Disassemble in the order indicated. (Circled numbers match the numbered instructions.)

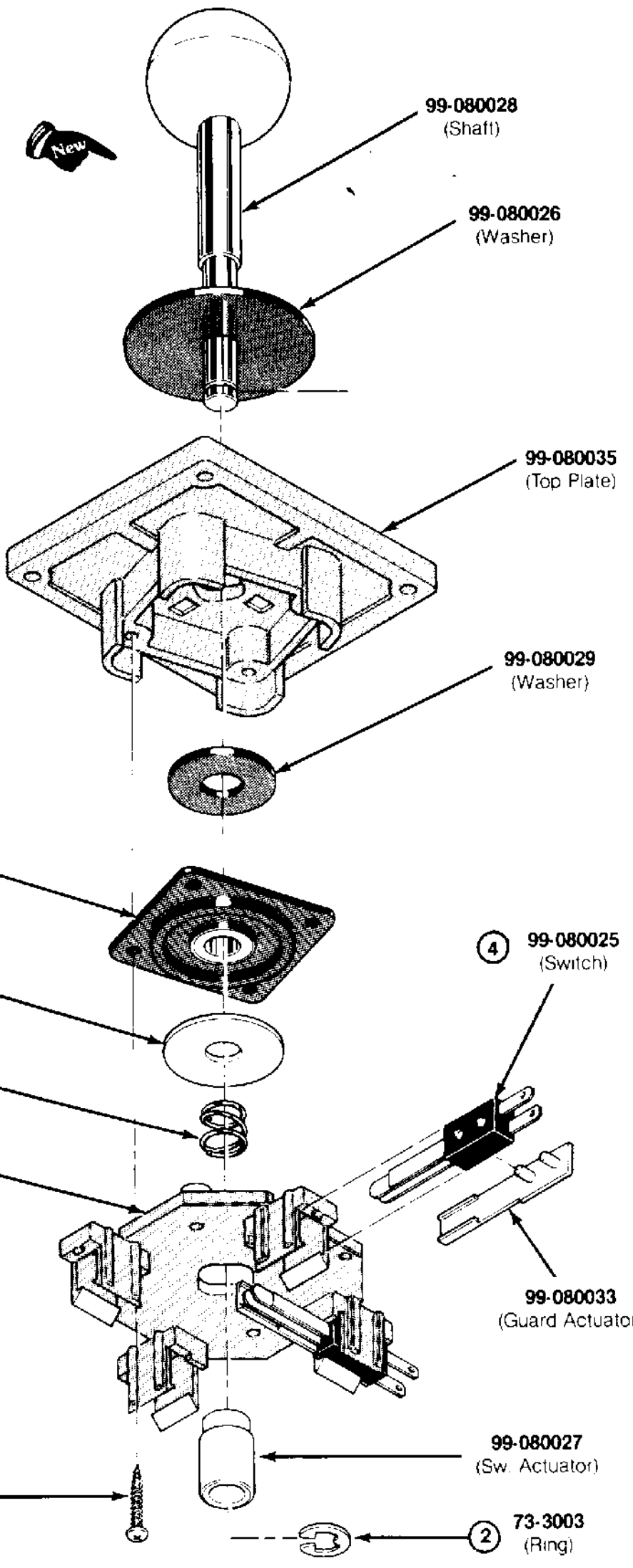


Figure 3-4 Joystick Assembly

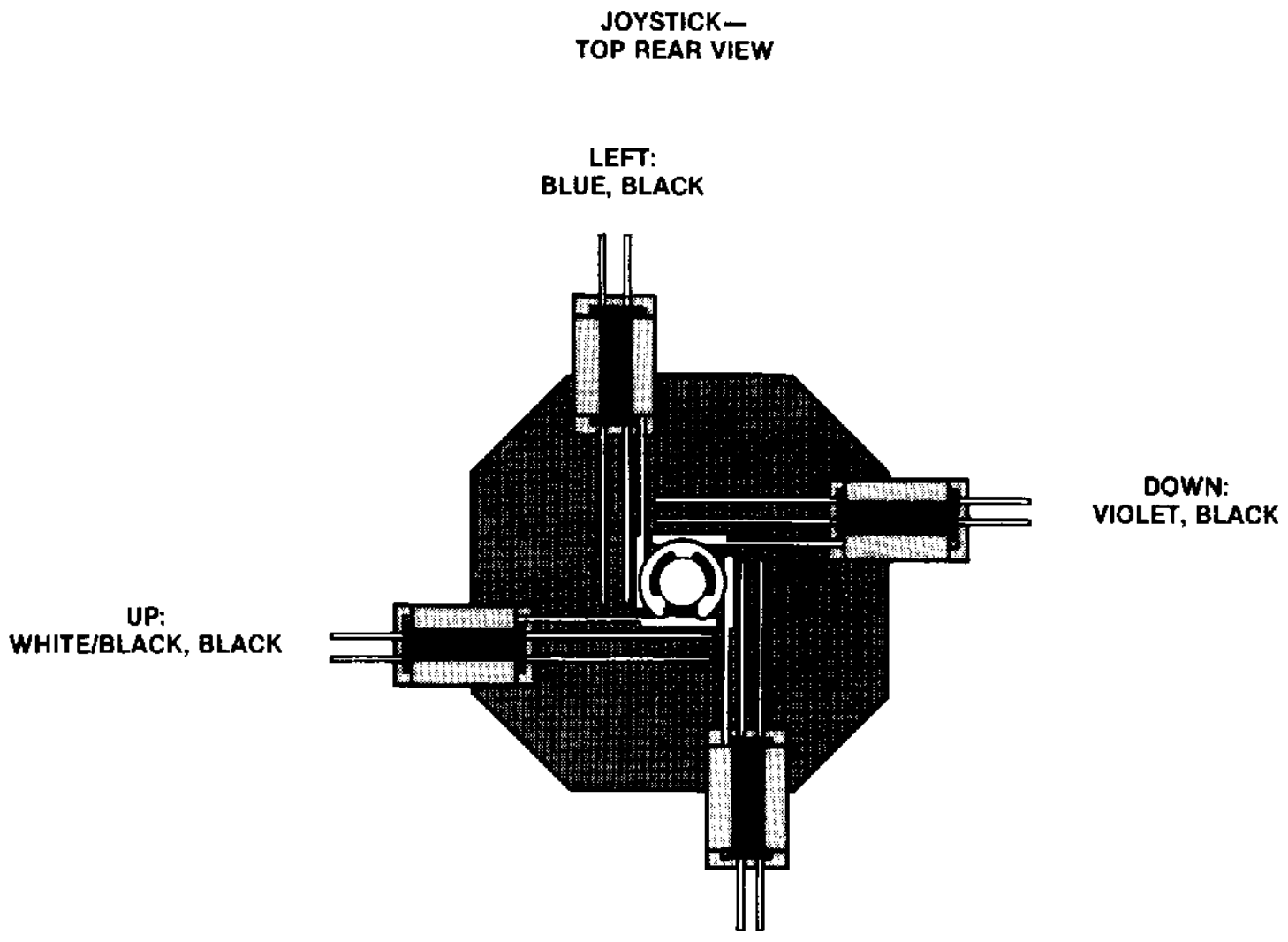


Figure 3-4 Joystick Assembly, continued
Parts List

Part No.	*Description*
A038404-01	Joystick Harness
73-3003	Retaining Ring
82-AL616	#6 x 1-Inch Cross-Recessed Pan-Head Type BT Tapping Steel Screw
99-080025	Leaf Switch
99-080026	2-Inch Black Plastic Washer
99-080027	Nylon Switch Actuator
99-080028	Metal Shaft
99-080029	Nylon Washer
99-080030	Spring
99-080031	Bellows
99-080032	Flat Steel Washer
99-080033	Plastic Guard Actuator
99-080034	Switch Mounting Plate
99-080035	Top Plate
171016-001	Joystick Assembly

C. Fluorescent Tube and Speaker

WARNING

Prior to removing or repairing the speaker, fluorescent tube or fan, **unplug the game.**

If you drop a fluorescent tube and it breaks, *it will implode!* Shattered glass can fly 6 feet or more from the implosion. Use care when replacing any fluorescent tube.

To Replace Fluorescent Tube:

1. At the top front of the game, remove the three screws that secure the upper attraction-panel retainer to the cabinet. Loosen the three screws that secure the lower retainer to the cabinet. Lift the attraction panel up and out of its lower retainer.
2. Remove the cardboard locking tab at each end of the tube.
3. Slightly rotate the tube up or down, and carefully remove it from the lampholders. Replace with a new tube. Do not snap the tube in vigorously—*you may break it, causing an implosion!* Replace the locking tabs.
4. Check that the green ground wire is securely attached to the large metal bracket and the ballast transformer on the wood panel. If the tube is not grounded, it may not start.

To Replace Speaker:

5. Remove the two Phillips screws that secure the light board to the cabinet. Slide the board out and unplug the 5-pin harness connector. Remove the board from the cabinet.
6. Unplug the two plug-in connectors on the speaker. Remove the hardware that attaches the speaker to the board. Replace the speaker, reattach the plug-in connectors, reinstall the wood board and reconnect the harness.

Disassemble in the order indicated. (Circled numbers match the numbered instructions.)

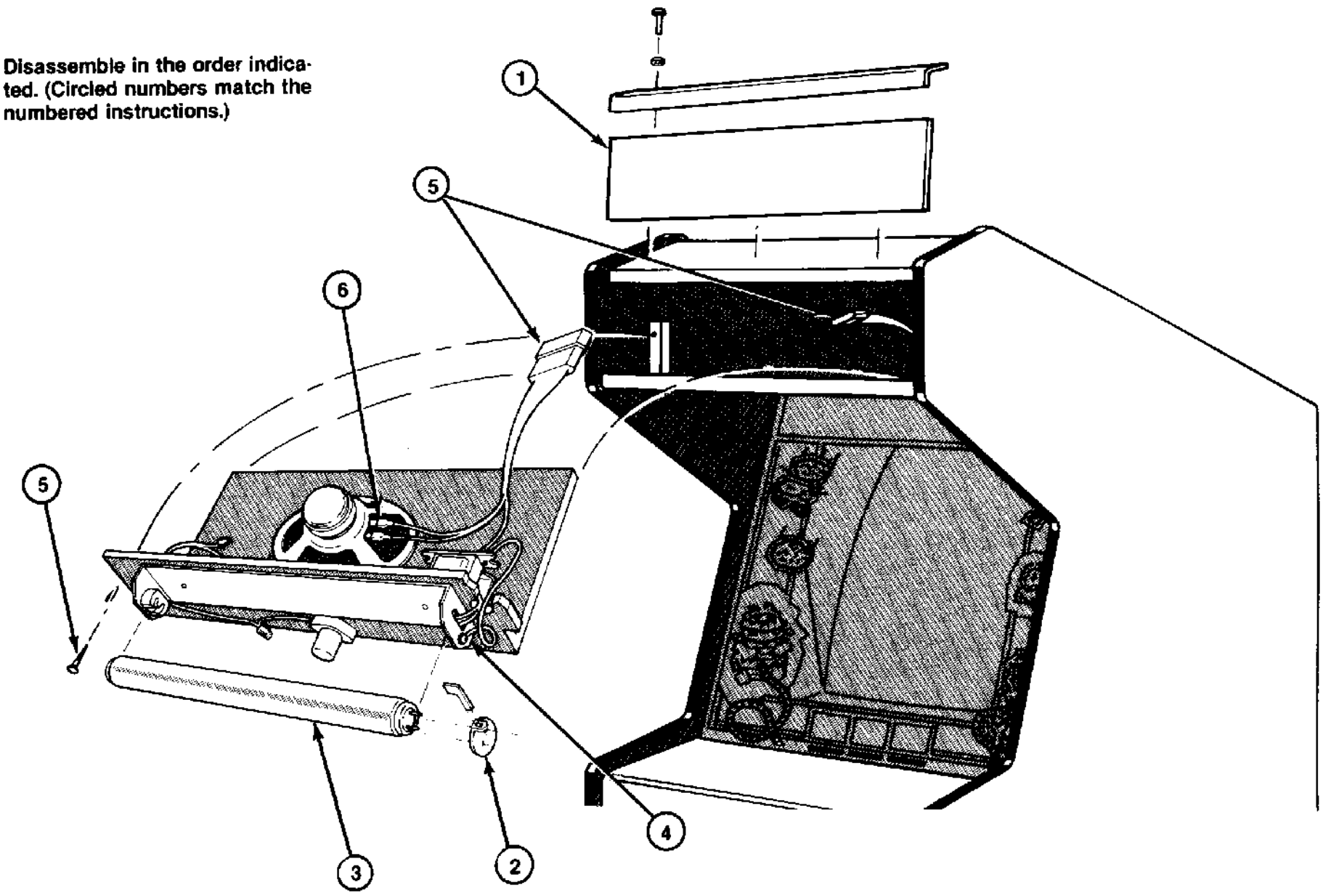


Figure 3-5 Fluorescent Tube and Speaker Upright Cabinet

NOTE

To ensure that the fluorescent tube starts, make sure the green ground wire is firmly attached to both the ballast transformer and the steel lamp bracket.

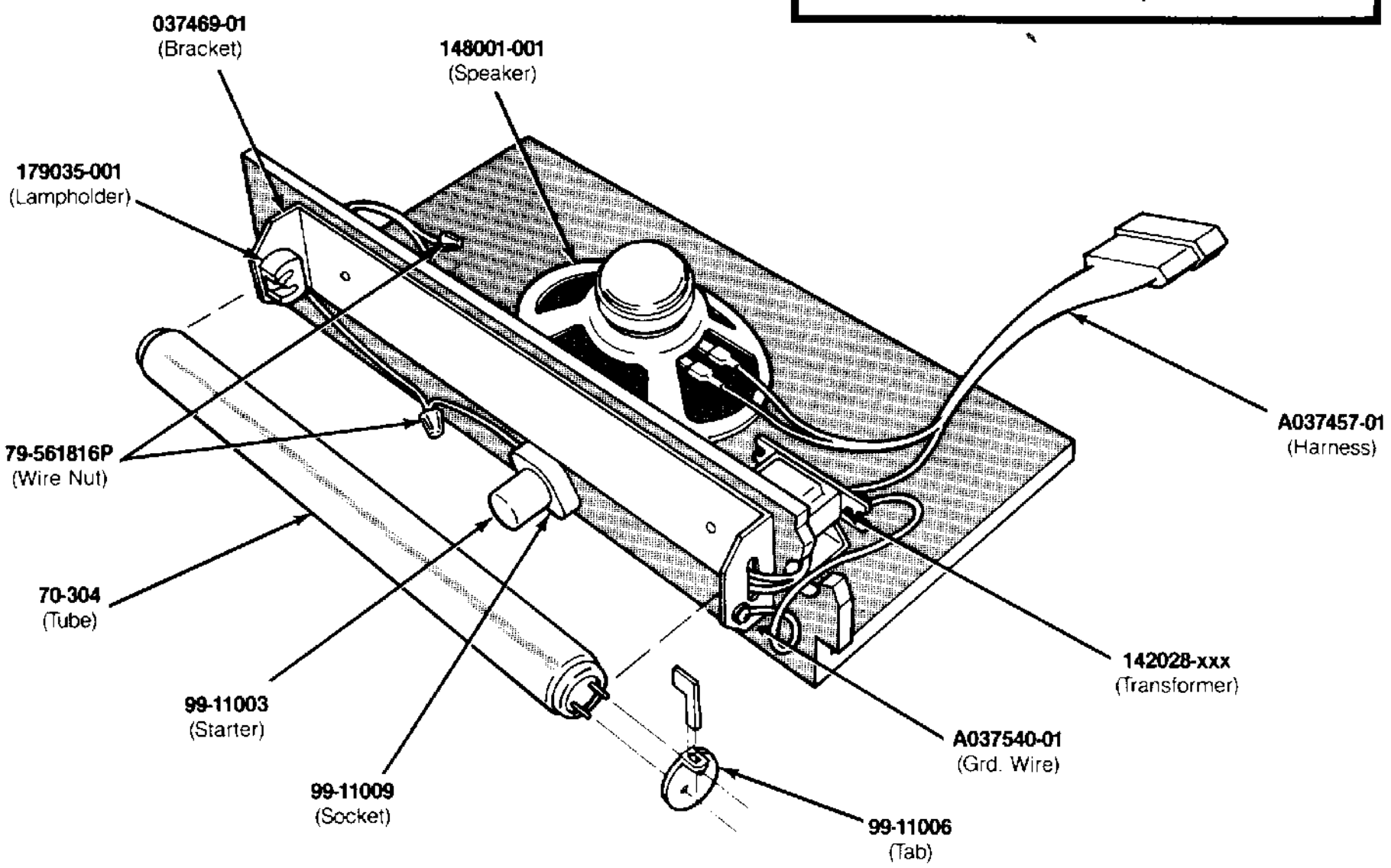


Figure 3-5 Fluorescent Tube and Speaker, continued Upright Cabinet

Parts List

Part No.	*Description*
A037417-01 & -02	Fluorescent Tube and Speaker Assembly
A037457-01	Light and Speaker Harness
A037540-01	Ground Wire with Ring Lug
70-304	18-Inch 15W Cool White Fluorescent Tube
79-561816P	Spring-Connector Wire Nut for 16- to 18-Gauge Wires
99-11003	Fluorescent Lamp Starter
99-11006	Fluorescent Lamp Locking Tab *(tab consists of two pieces)*
99-11009	Starter Socket
037469-01	Steel Lamp Bracket
142028-001	60 Hz 118V Ballast Transformer *(used on A037417-01 assembly)*
142028-002	50 Hz 118V Ballast Transformer *(used on A037417-02 assembly)*
148001-001	6 × 9-Inch 4-Ohm 15W Oval High-Fidelity Speaker
179035-001	2-Pin Fluorescent Lampholder

D. Video Display

⚠ WARNING ⚠

Shock Hazard

The following procedure should only be performed by a *qualified service technician.* Prior to removing or repairing the video display, **unplug the game.** As an extra precaution, we highly recommend *you discharge the high voltage* from the picture tube.

High voltages may exist in any video display, even with power disconnected. Use extreme caution and do not touch electrical parts of the display yoke area with your hands or with metal objects in your hands!

Implosion Hazard

If you drop the display and the picture tube breaks, *it will implode!* Shattered glass and the yoke can fly 6 feet or more from the implosion. Use care when replacing any display.

To Remove Video Display

Upright and Cabaret Cabinets:

1. **Unplug the game.** Open the rear access panel. Unplug the three display harness connectors, and disconnect the ground wire.
2. Remove the wood screw and flat washer used to secure the rear of the *Upright* display chassis to a wood cleat. Remove the hex nut, flat washer and carriage bolt used to secure the *Cabaret* display chassis to a metal bracket.
3. Open control panel (see *Figure 3-2, The Control Panel*) . For the *Cabaret* cabinet, remove the upper display-shield retainer.
4. Remove the video display shield.
5. Carefully remove the cardboard bezel.
6. Remove the four sets of hardware that secure the display chassis to the wood frame.
7. Carefully pull the display out through the front of the cabinet. Service the display and reinstall in reverse order.

To Remove Video Display

Cocktail Cabinet:

1. **Unplug the game.** Unlock and open the table top and access panel (see *Chapter 1, Section B*).
2. Reach through the access panel opening and unplug the three display harness connectors underneath the display. Disconnect the ground wire.
3. Seven screws (four Pan-Head and three Phillips-Head) and three L-clamps hold the display assembly to the cabinet. Remove the screws and the L-clamps.
4. Carefully lift the display assembly up and out of the cabinet. Service the display and reinstall in reverse order.

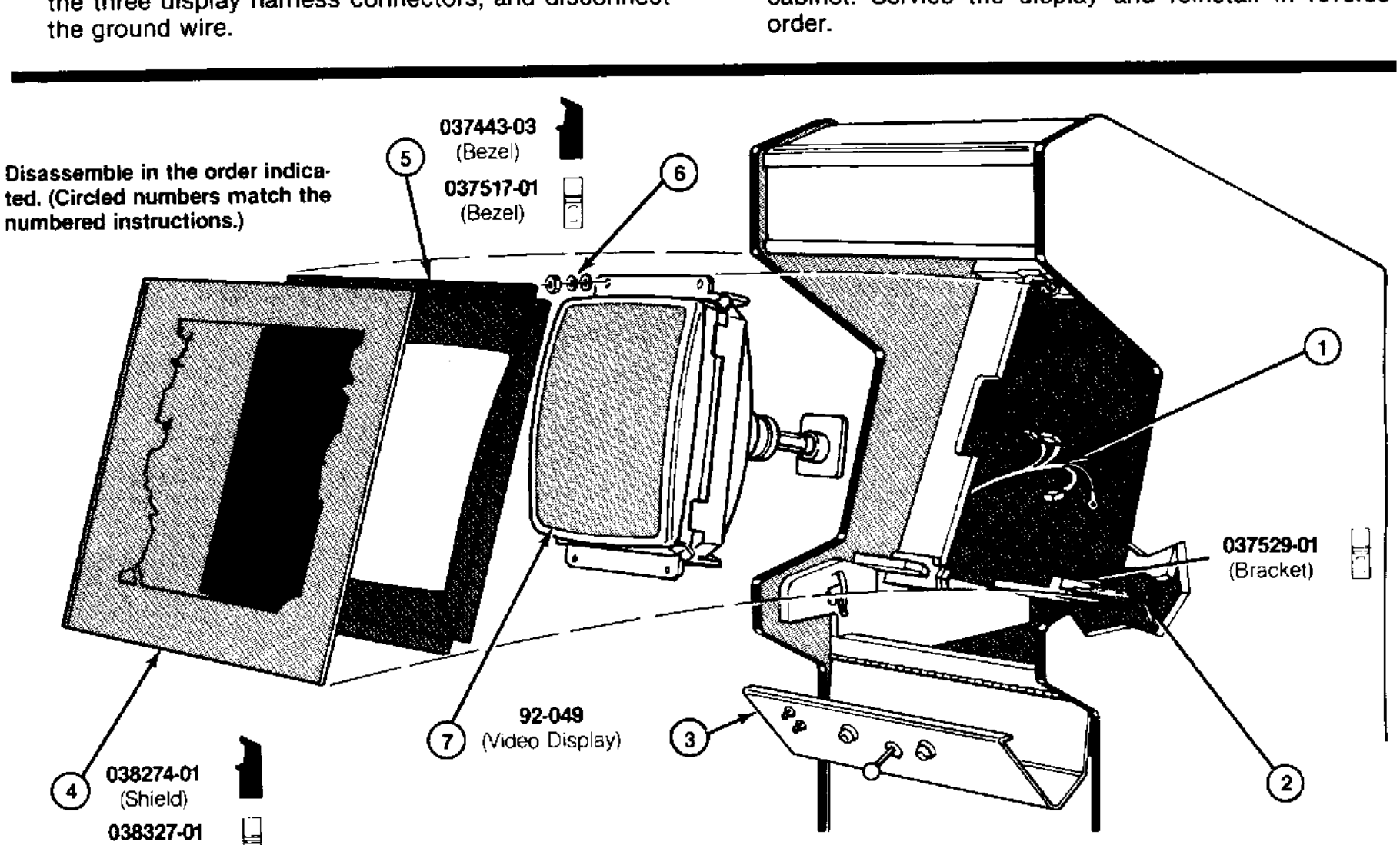


Figure 3-6 Video Display Upright and Cabaret Cabinets

VA038275
VA038320
A037756-02 B

Disassemble in the order indicated. (Circled numbers match the numbered instructions.)

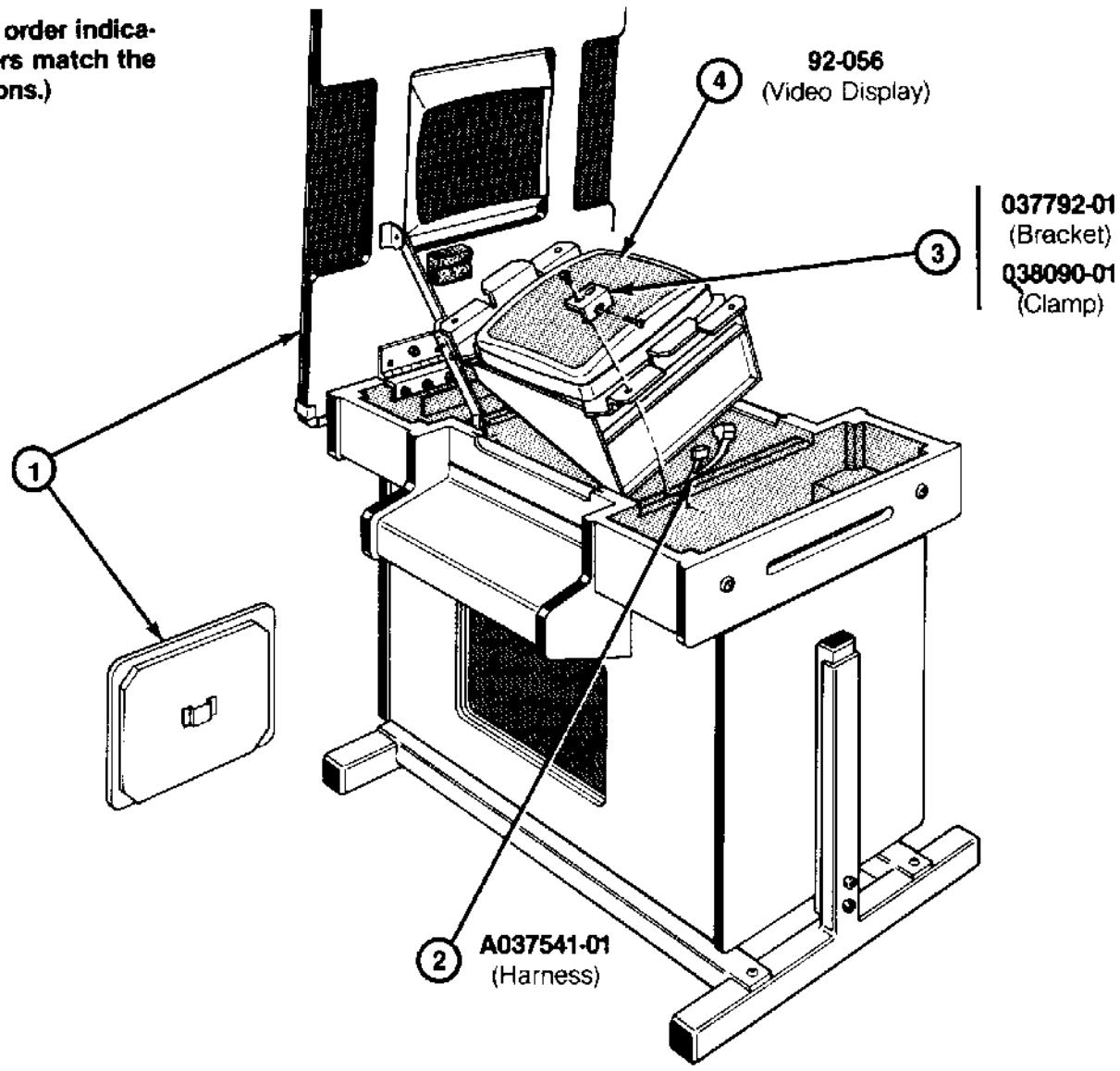


Figure 3-6 Video Display, continued Cocktail Cabinet

Parts List

Part No.	*Description*	
	Upright Cabinet	
92-049	19-Inch Electrohome Color Raster-Scan Video Display	*Acceptable substitute is part no. 92-055—use with TM-201*
038274-01	Display Shield with Graphics	
037443-03	Display Bezel	
	Cabaret Cabinet	
92-049	19-Inch Electrohome Color Raster-Scan Video Display	*Acceptable substitute is part no. 92-055—use with TM-201*
037515-01	Upper Display-Shield Retainer	
037517-01	Display Bezel	
037529-01	Display Bracket	
038327-01	Display Shield with Graphics	
	Cocktail Cabinet	
A037541-01	Display Adaptor Harness	
A037756-02	14-Inch Color Video Display Assembly	
92-056	14-Inch Color Electrohome Raster-Scan Video Display, model GO7-910	
037792-01	Display Mounting Bracket	
038090-01	L-Clamp	

E. Coin Doors

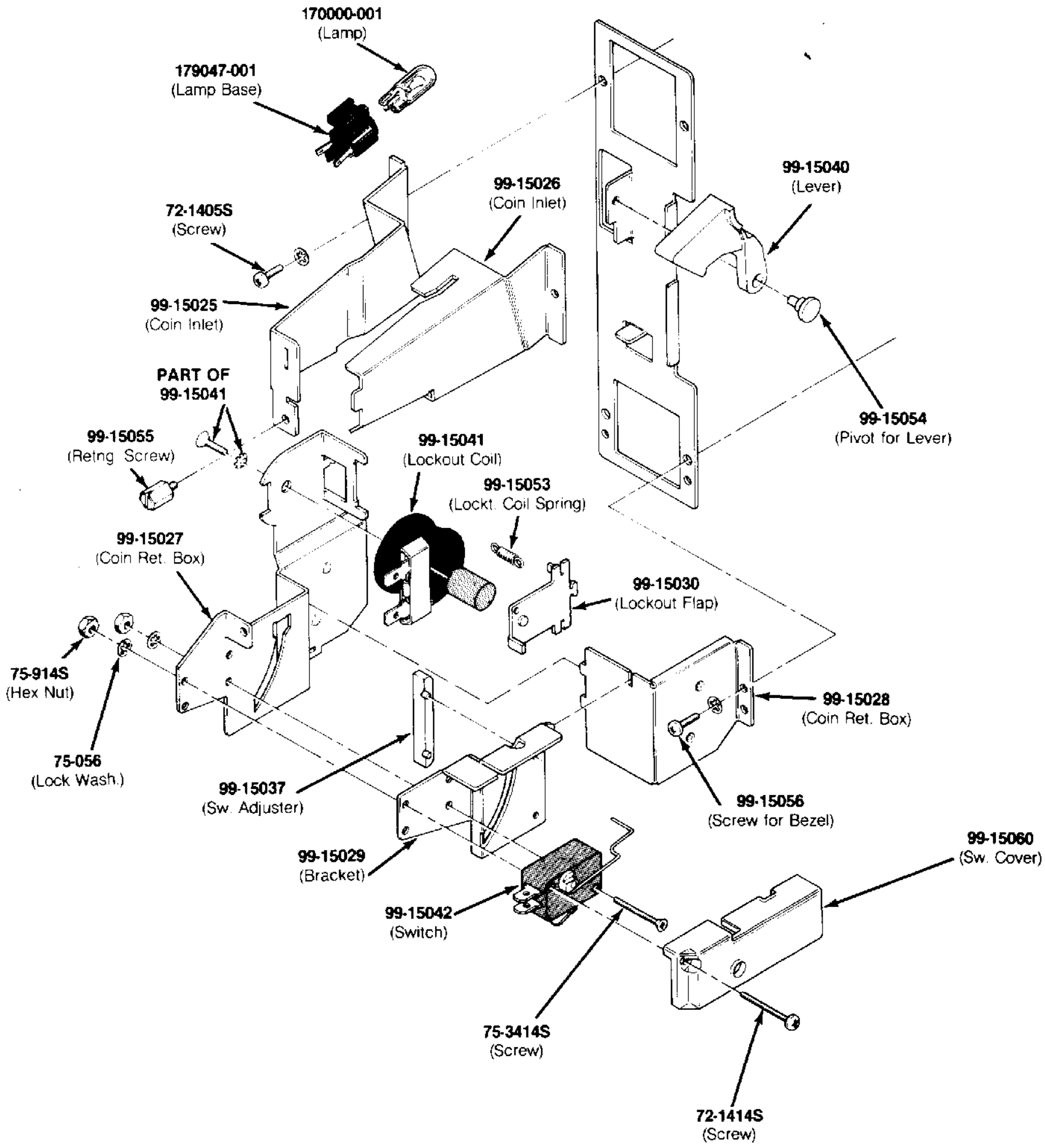
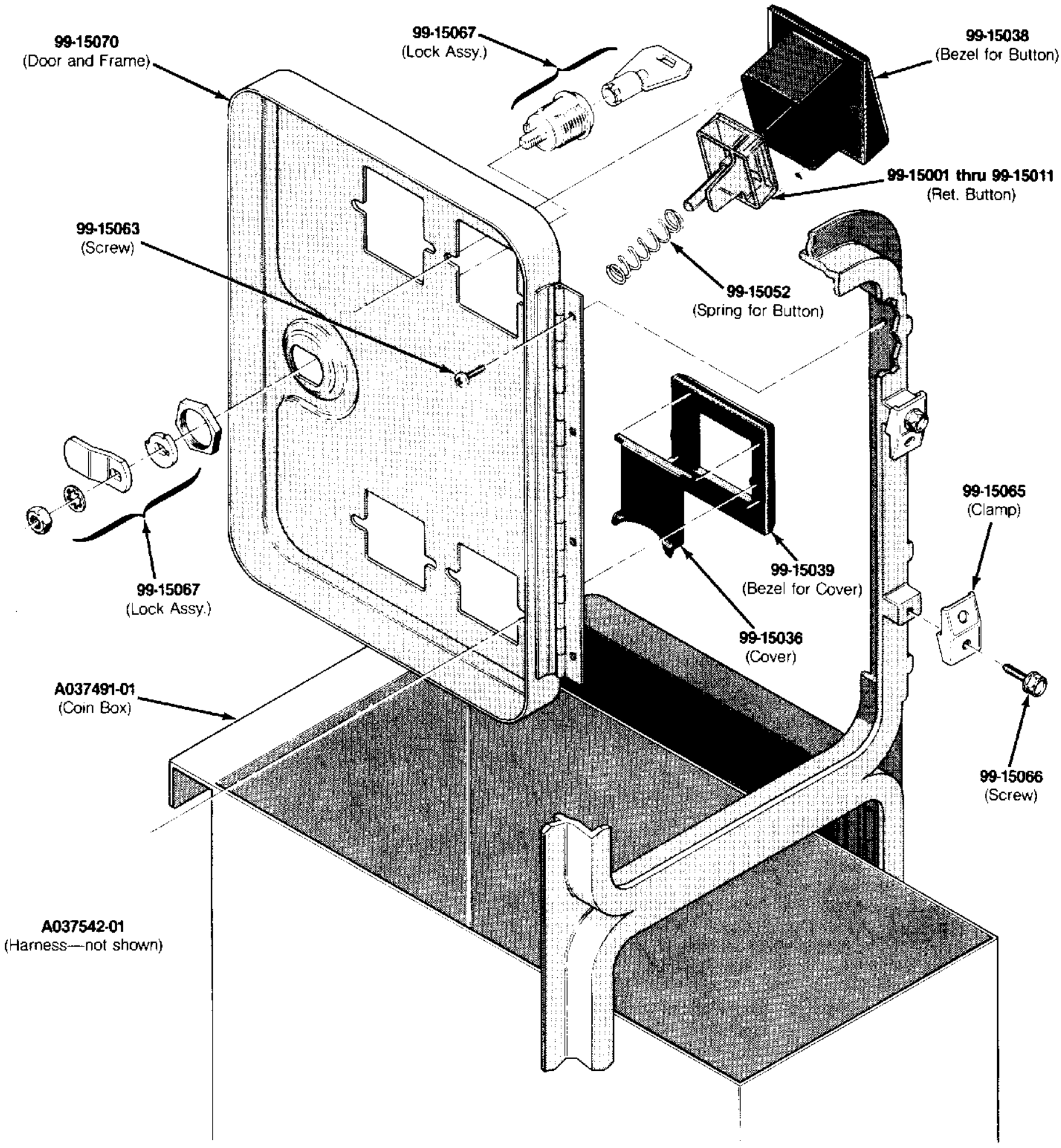


Figure 3-7 Vertical-Mounted Coin Door Upright and Cabaret Cabinets



A037619-01 — U.S. 25¢/25¢ Coin Door
A037619-02 — U.S. 50¢/50¢ Coin Door
A037619-03 — Canadian 25¢/25¢ Coin Door
A037619-04 — British 10 P/10 P Coin Door
A037619-05 — British 10 P/50 P Coin Door
A037619-06 — British 20 P/50 P Coin Door
A037619-07 — Australian 20¢/20¢ Coin Door
A037619-08 — German 1 DM/1 DM Coin Door
A037619-09 — German 2 DM/1 DM Coin Door
A037619-10 — German 2 DM/5 DM Coin Door
A037619-11 — German 1 DM/5 DM Coin Door
A037619-12 — 5 Fr/5 Fr Coin Door
A037619-13 — Swiss 1 Fr/1 Fr Coin Door
A037619-14 — French 1 Fr/1 Fr Coin Door
A037619-15 — French 2 Fr/1 Fr Coin Door
A037619-16 — Swedish 1 Kr/1 Kr Coin Door
A037619-17 — Spanish 25 Pts/25 Pts Coin Door
A037619-18 — Italian 100 L/100 L Coin Door
A037619-19 — Hong Kong $1/$1 Coin Door
A037619-20 — Japanese 100Y/100Y Coin Door

Figure 3-7 Vertical-Mounted Coin Door, continued
Upright and Cabaret Cabinets

Figure 3-7 Vertical-Mounted Coin Door, continued
Upright and Cabaret Cabinets
Parts List

Part No.	*Description*
A037491-01	Coin Box *(Not included in assembly)*
A037542-01	Harness Assembly
71006-035	Metal Coin Mechanism
72-1405S	#4-40 × 5/16-Inch Cross-Recessed Pan-Head Steel Machine Screw
72-1414S	#4-40 × 1/8-Inch Cross-Recessed Pan-Head Steel Machine Screw
75-056	#6 Internal-Tooth Zinc-Plated Steel Lock Washer
75-914S	#4-40 Steel Machine Hex Nut
75-3414S	#4-40 × 1/8-Inch 82° Cross-Recessed Flat-Head Steel Machine Screw
99-15001	Coin Return Button with U.S. 25¢ Price Plate
99-15002	Coin Return Button with U.S. $1 Price Plate
99-15003	Coin Return Button with German 1 DM Price Plate
99-15004	Coin Return Button with German 2 DM Price Plate
99-15005	Coin Return Button with German 5 DM Price Plate
99-15006	Coin Return Button with Belgian 5 Fr Price Plate
99-15007	Coin Return Button with French 1 Fr Price Plate
99-15008	Coin Return Button with Japanese 100 Yen Price Plate
99-15009	Coin Return Button with British 10 Pence Price Plate
99-15010	Coin Return Button with Australian 20¢ Price Plate
99-15011	Coin Return Button with Italian 100 Lire Price Plate
99-15025	Left Half of Coin Inlet
99-15026	Right Half of Coin Inlet
99-15027	Side Plate of Coin Return Box
99-15028	Base Plate of Coin Return Box
99-15029	Switch Bracket
99-15030	Flap for Lockout Coil *(U.S. 25¢)*
99-15036	Metal Coin Return Cover
99-15037	Switch Adjuster
99-15038	Bezel for Coin Return Button
99-15039	Metal Bezel for Coin Return Cover
99-15040	Coin Return Lever
99-15041	Lockout Coil
99-15042	Coin Switch for U.S. 25¢
99-15052	Spring for Coin Return Button
99-15053	Spring for Lockout Coil
99-15054	Pivot for Coin Return Lever
99-15055	Retaining Screw
99-15056	Screw for Both Bezels
99-15060	Switch Cover
99-15063	Screw for Hinge
99-15065	Clamp for Frame
99-15066	Screw for Clamp
99-15067	Lock Assembly
99-15070	Door and Frame
170000-001	6.3V Miniature Wedge Base Incandescent Lamp
179047-001	Lamp Base

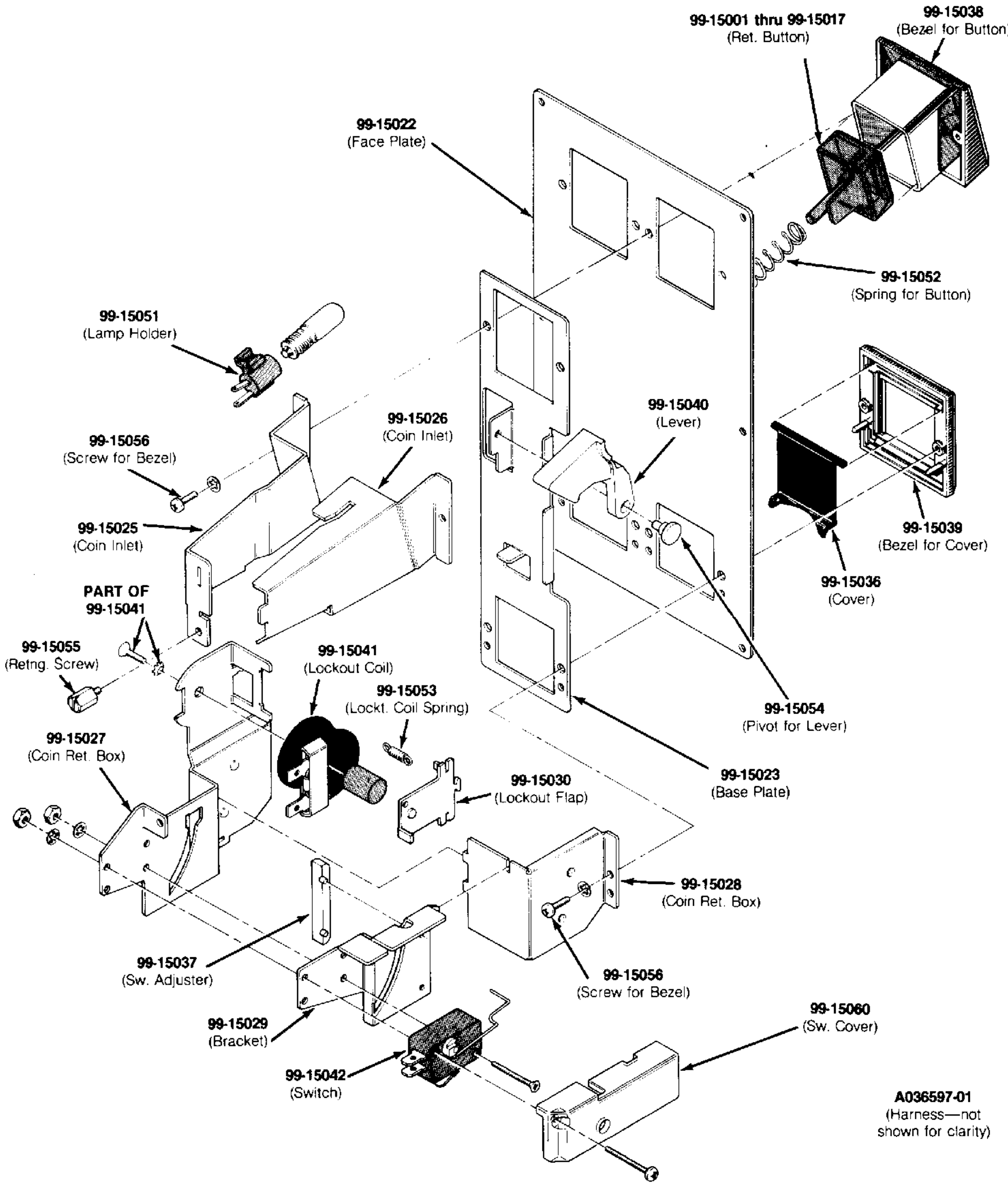


Figure 3-8 Double Coin Acceptor/Mount Assembly Cocktail Cabinet

Figure 3-8 Double Coin Acceptor/Mount Assembly, continued
Cocktail Cabinet Parts List

Part No.	*Description*
A036597-01	Double Coin Acceptor Harness Assy.
99-15001	Coin Return Button with U.S. 25¢ Price Plate
99-15002	Coin Return Button with U.S. $1 Price Plate
99-15003	Coin Return Button with German 1 DM Price Plate
99-15004	Coin Return Button with German 2 DM Price Plate
99-15005	Coin Return Button with German 5 DM Price Plate
99-15006	Coin Return Button with Belgian 5 Fr Price Plate
99-15007	Coin Return Button with French 1 Fr Price Plate
99-15008	Coin Return Button with Japanese 100 Yen Price Plate
99-15009	Coin Return Button with British 10 Pence Price Plate
99-15010	Coin Return Button with Australian 20¢ Price Plate
99-15011	Coin Return Button with Italian 100 Lire Price Plate
99-15012	Coin Return Button with U.S. 50¢ (2 x 25¢) Price Plate
99-15013	Coin Return Button with British 20 Pence Price Plate
99-15014	Coin Return Button with British 50 Pence Price Plate
99-15015	Coin Return Button with French 2 Franc Price Plate
99-15016	Coin Return Button with Swiss 1 Franc Price Plate
99-15017	Coin Return Button with Hong Kong $1 Price Plate
99-15022	Dual-Entry Face Plate
99-15023	Single-Entry Base Plate
99-15025	Left Half of Coin Inlet
99-15026	Right Half of Coin Inlet
99-15027	Side Plate of Coin Return Box
99-15028	Base Plate of Coin Return Box
99-15029	Switch Bracket
99-15030	Flap for Lockout Coil *(U.S. 25¢)*
99-15036	Coin Return Cover
99-15037	Switch Adjuster
99-15038	Bezel for Coin Return Button
99-15039	Bezel for Coin Return Cover
99-15040	Coin Return Lever
99-15041	Lockout Coil
99-15042	Coin Switch for U.S. 25¢
99-15051	Lamp Holder
99-15052	Spring for Coin Return Button
99-15053	Spring for Lockout Coil
99-15054	Pivot for Coin Return Lever
99-15055	Retaining Screw
99-15056	Screw for Both Bezels
99-15060	Switch Cover

A036693-01 — U.S. 25¢/25¢ Coin Door
A036693-02 — U.S. 50¢/50¢ Coin Door
A036693-03 — British 10 P/10 P Coin Door
A036693-04 — British 10 P/50 P Coin Door
A036693-05 — British 20 P/50 P Coin Door
A036693-06 — German 1 DM/1 DM Coin Door
A036693-07 — German 2 DM/1 DM Coin Door
A036693-08 — German 2 DM/5 DM Coin Door
A036693-09 — German 1 DM/5 DM Coin Door
A036693-10 — Belgian 5 Fr/5 Fr Coin Door
A036693-11 — French 1 Fr/1 Fr Coin Door
A036693-12 — French 2 Fr/1 Fr Coin Door
A036693-13 — Swedish 1 Kr/1 Kr Coin Door
A036693-14 — Hong Kong $1/$1 Coin Door
A036693-15 — Canadian 25¢/25¢ Coin Door
A036693-16 — Spanish 25 Pts/25 Pts Coin Door
A036693-17 — Swiss 1 Fr/1 Fr Coin Door
A036693-18 — Italian 100 L/100 L Coin Door
A036693-19 — Japanese 100Y/100Y Coin Door
A036693-20 — Australian 20¢/20¢ Coin Door

F. Printed-Circuit Boards

WARNING

Prior to removing or repairing any printed-circuit board, **unplug the game.**

To Remove Printed-Circuit Boards:

1. Open the rear access panel on the *Upright* and *Cabaret* cabinets. Open the table top on the *Cocktail* cabinet.
2. Locate the hardware that secures the PCB to the cabinet. Remove and save this hardware. (The *Cocktail* cabinet Regulator/Audio II PCB has no securing hardware.)
3. If you are removing the game board, first remove the tie wraps that fasten the edge connector to that board. Then unplug the edge connector. If you are removing the Regulator/Audio II PCB, disconnect the three small harness connectors on this board.
4. Carefully slide the PCB straight out of its retainers. (For the *Upright* cabinet, slide and *lift* the Regulator/Audio II PCB out of its slot.) Be careful not to twist the boards, as this may loosen connections or components. Repair as required.

To Replace Printed-Circuit Boards:

- Reinstall the PCB, making sure that the connectors are properly plugged in. Note that they are keyed to fit only one way, so if they don't slip on easily, don't force them. **A reversed connector will probably damage your game** and void the warranty.
- Replace the hardware that secures the PCB to the cabinet wall. Close and lock the rear access panel or table top.
- Check that the operation of the game is correct by performing the self-test. This is very important when you repair a PCB. Unless you are a qualified technician, **do not turn the small knob on the Regulator/Audio II PCB.**

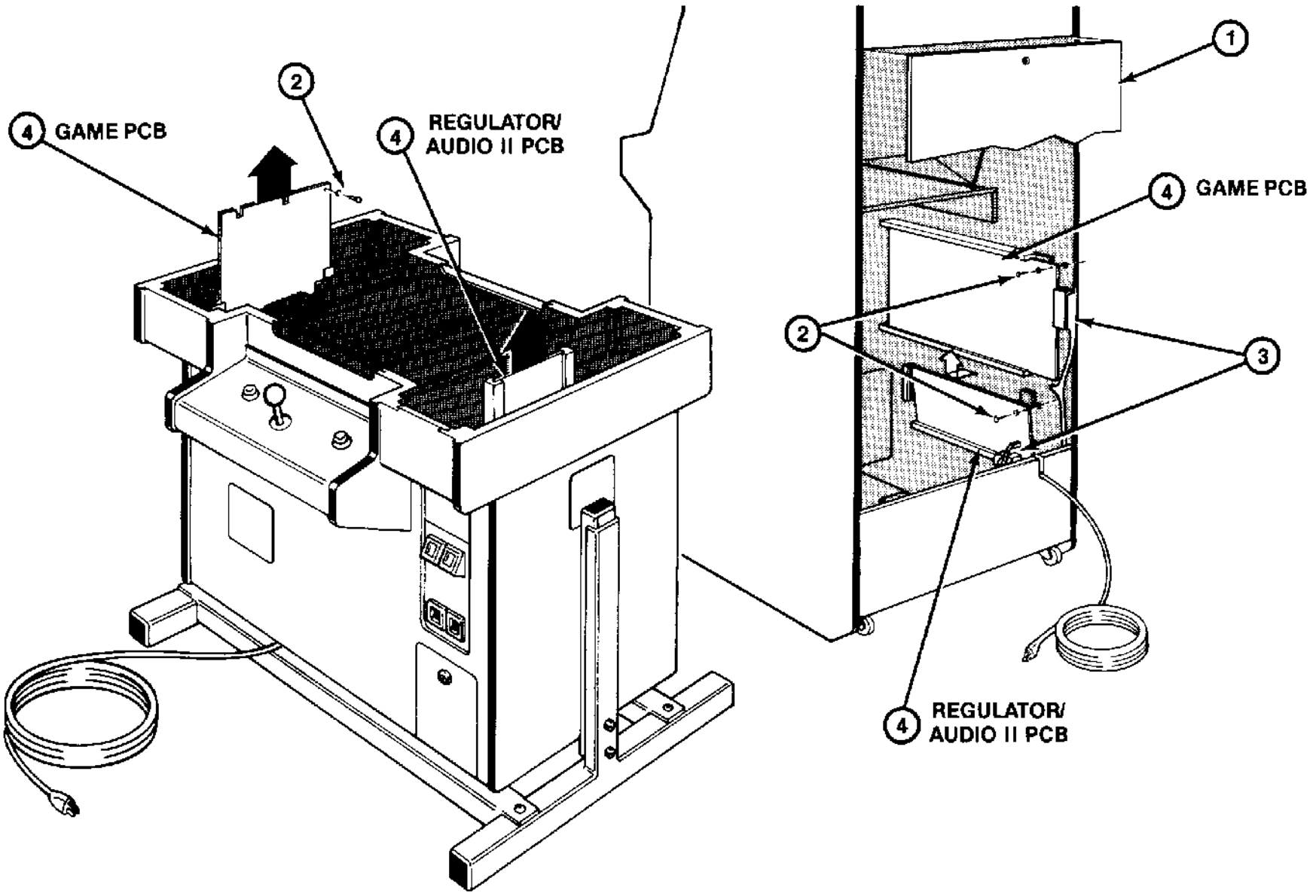


Figure 3-9 Printed-Circuit Board Removal

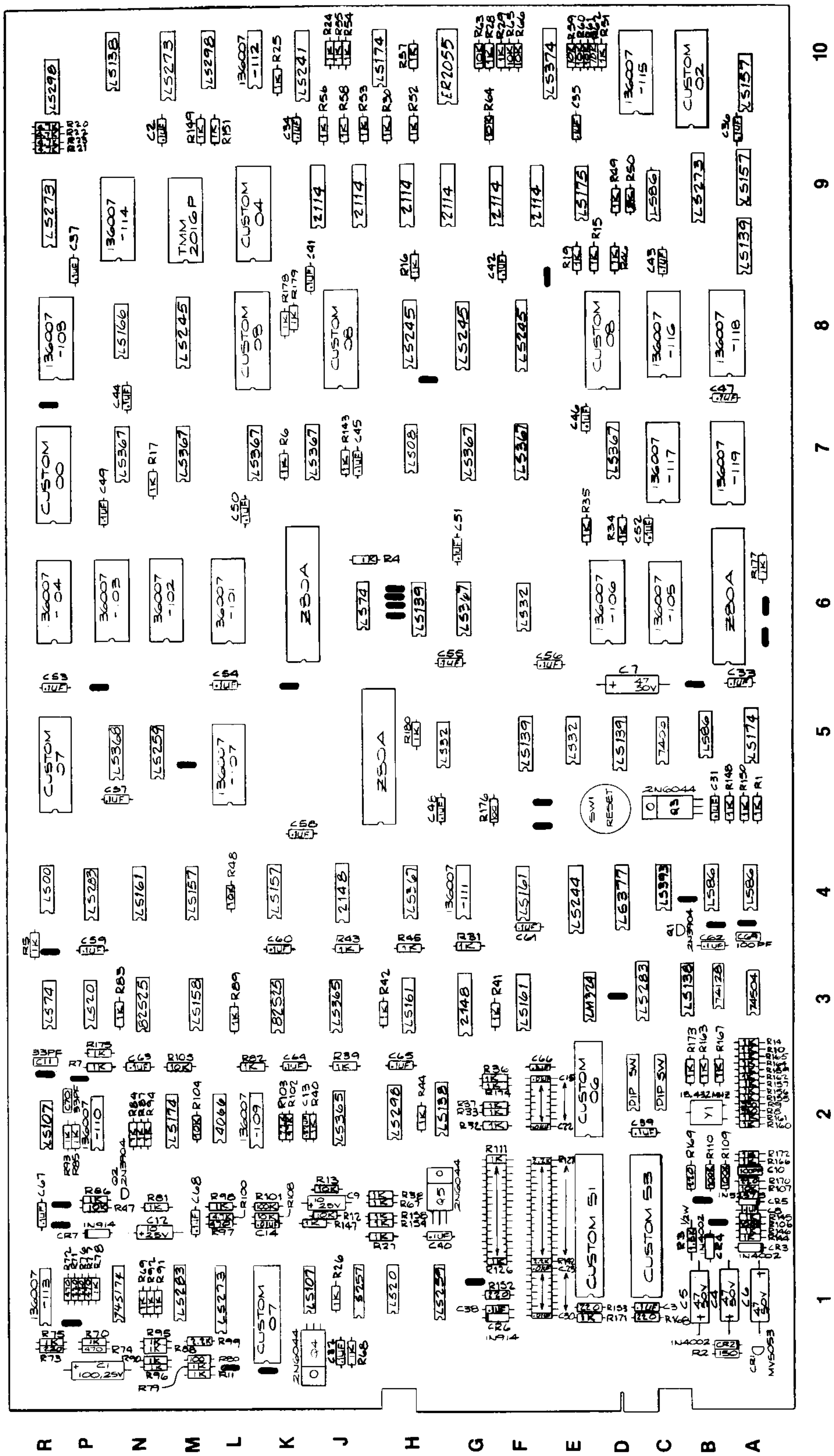


Figure 3-10 Dig Dug™ Game PCB Assembly

Figure 3-10 Dig Dug™ Game PCB Assembly, continued Parts List

Part No.	*Description (Reference Designations and Locations in Bold)*
A038156-01	Dig Dug Game PCB Assembly
24-250106	10 μF 25V Aluminum Electrolytic Fixed Axial-Lead Capacitor **(C9, 12)**
24-250107	100 μF 25V Aluminum Electrolytic Fixed Axial-Lead Capacitor **(C1)**
24-500476	47 μF 50V Aluminum Electrolytic Fixed Axial-Lead Capacitor **(C4-7)**
29-088	.1 μF 25V Ceramic-Disc Radial-Lead Capacitor **(C2, 3, 8, 31-69)**
31-1N4002	Type-1N4002 100V Switching Diode **(CR2-4)**
31-1N914	Type-1N914 75V Switching Diode **(CR6, 7)**
34-2N3904	Type-2N3904 NPN 60V 1W Transistor **(Q1, 2)**
34-2N6044	Type-2N6044 Darlington NPN Transistor **(Q3-5)**
37-4066	Type-4066 Quad Analog Switch Integrated Circuit **(2L)**
37-7406	Type-7406 Integrated Circuit **(5C)**
37-74LS00	Type-74LS00 Integrated Circuit **(4R)**
37-74LS08	Type-74LS08 Integrated Circuit **(7H)**
37-74LS20	Type-74LS20 Integrated Circuit **(1H, 3P)**
37-74LS32	Type-74LS32 Integrated Circuit **(5E, 6F, 5G/H)**
37-74LS74	Type-74LS74 Integrated Circuit **(6H/J, 3R)**
37-74LS86	Type-74LS86 Integrated Circuit **(4A, 4B, 5B, 9C)**
37-74LS139	Type-74LS139 Integrated Circuit **(8/9A, 5D, 5F, 6H)**
37-74LS157	Type-74LS157 Integrated Circuit **(9A, 10A, 4K, 4M)**
37-74LS161	Type-74LS161 Integrated Circuit **(3F, 4F, 3H, 4N)**
37-74LS166	Type-74LS166 Integrated Circuit **(8N)**
37-74LS174	Type-74LS174 Integrated Circuit **(5A, 10H/J, 2M/N)**
37-74LS175	Type-74LS175 Integrated Circuit **(9E)**
37-74LS241	Type-74LS241 Integrated Circuit **(10J/K)**
37-74LS244	Type-74LS244 Integrated Circuit **(4E)**
37-74LS245	Type-74LS245 Integrated Circuit **(8F, 8G, 8H, 8M)**
37-74LS259	Type-74LS259 Integrated Circuit **(1G/H, 5M/N)**
37-74LS273	Type-74LS273 Integrated Circuit **(9B, 1L, 10M/N, 9R)**
37-74LS367	Type-74LS367 Integrated Circuit **(7D, 7F, 6G, 7G, 4H, 7J/K, 7K/L, 7M, 7P)**
37-74LS374	Type-74LS374 Integrated Circuit **(10E/F)**
37-74LS377	Type-74LS377 Integrated Circuit **(4D)**
37-74LS393	Type-74LS393 Integrated Circuit **(4C)**
37-74S04	Type-74S04 Integrated Circuit **(3A)**
37-LM324	Type-LM324 Integrated Circuit **(3D/E)**
38-MV5053	Type-MV5053 Light-Emitting Diode **(CR1)**
62-001	SPST Momentary Pushbutton Switch **(SW1)**
66-118P1T	8-Station Single-Throw, Dual-Inline-Package Switch **(2C, 2C/D)**
72-6810S	#8 × ⅝-Inch Cross-Recessed Pan-Head Screw *(for mounting PCB to cabinet wall)*
78-24012	5-Inch Beaded Nylon Tie Wrap
79-42C22	22-Contact Medium-Insertion-Force Integrated Circuit Socket **(10G)**
79-42C24	24-Contact Medium-Insertion-Force Integrated Circuit Socket **(7A/B, 8A/B, 6C-8C, 10C/D, 6D, 5L, 6L, 6M, 9M, 9N, 6N/P, 6R, 8R)**
79-42C28	28-Contact Medium-Insertion-Force Integrated Circuit Socket **(10B, 8D, 2E, 8J, 1K, 9K, 8K/L, 5R, 7R)**
79-42C40	40-Contact Medium-Insertion-Force Integrated Circuit Socket **(6A/B, 5H/J, 6J/K)**
79-42C42	42-Contact Medium-Insertion-Force Integrated Circuit Socket **(1/2C, 1/2E)**

[Continued on next page]

Figure 3-10 Dig Dug™ Game PCB Assembly, continued
Parts List

Part No.	*Description (Reference Designations and Locations in Bold)*
81-4302	Nylon Snap-In Fastener
90-7005	Random-Access Memory **(3K, 3N)**
90-7036	Random-Access Memory **(9E/F, 9F/G, 9G/H, 9H, 9H/J, 9J/K)**
110000-101	100 Ohm, ±5%, ¼W Resistor **(R80, 176)**
110000-102	1K Ohm, ±5%, ¼W Resistor **(R1, 4-7, 10, 11, 14-7, 19, 24-46, 49-58, 67-70, 75, 78, 79, 81-96, 98, 111-126, 143-151, 154-167, 171-175, 177-180)**
110000-103	10K Ohm, ±5%, ¼W Resistor **(R12, 13, 47, 48, 59-66, 104, 105, 107, 108)**
110000-104	100K Ohm, ±5%, ¼W Resistor **(R101, 106, 109, 110)**
110000-151	150 Ohm, ±5%, ¼W Resistor **(R2)**
110000-221	220 Ohm, ±5%, ¼W Resistor **(R71, 73, 76, 152, 153, 168-170)**
110000-222	2.2K Ohm, ±5%, ¼W Resistor **(R99, 127-142)**
110000-223	22K Ohm, ±5%, ¼W Resistor **(R103)**
110000-331	330 Ohm, ±5%, ¼W Resistor **(R8, 9)**
110000-471	470 Ohm, ±5%, ¼W Resistor **(R72, 74, 77, 97)**
110000-472	4.7K Ohm, ±5%, ¼W Resistor **(R20-23, 100)**
110000-473	47K Ohm, ±5%, ¼W Resistor **(R102)**
110001-152	1.5K Ohm, ±5%, ½W Resistor **(R3)**
111004-224	.22 μF 25V Ceramic Disc Radial-Lead Capacitor **(C13)**
122004-224	.22 μF 25V Ceramic-Disc Radial-Lead Capacitor **(C13)**
122005-103	.01 μF 25V ±10% Ceramic Disk Radial-Lead Capacitor **(C14-30)**
128002-101	100 pF 100V Epoxy-Dipped Radial-Lead Mica Capacitor **(C10, 69)**
128002-330	33 pF 100V Epoxy-Dipped Radial-Lead Mica Capacitor **(C11, 70)**
131003-001	Type-1N5257B 6.2V 1W Zener Diode **(CR5)**
136007-101	Programmable Read-Only Memory, ROM0 **(6L)**
136007-102	Programmable Read-Only Memory, ROM1 **(6M)**
136007-103	Programmable Read-Only Memory, ROM2 **(6N/P)**
136007-104	Programmable Read-Only Memory, ROM3 **(6R)**
136007-105	Programmable Read-Only Memory, ROM4 **(6C)**
136007-106	Programmable Read-Only Memory, ROM5 **(6D)**
136007-107	Programmable Read-Only Memory, ROM6 **(5L)**
136007-108	Programmable Read-Only Memory **(8R)**
136007-109	Programmable Read-Only Memory **(2K/L)**
136007-110	Programmable Read-Only Memory **(2P)**
136007-111	Programmable Read-Only Memory **(4G)**
136007-112	Programmable Read-Only Memory **(10K/L)**
136007-113	Programmable Read-Only Memory **(1R)**
136007-114	Programmable Read-Only Memory **(9N)**
136007-115	Programmable Read-Only Memory **(10C/D)**
136007-116	Programmable Read-Only Memory **(8C)**
136007-117	Programmable Read-Only Memory **(7C)**
136007-118	Programmable Read-Only Memory **(8A/B)**
136007-119	Programmable Read-Only Memory **(7A/B)**
137161-001	Read-Only Memory **(10G)**
137168-001	Type-74LS368 Integrated Circuit **(5N/P)**
137169-001	Type-74LS107 Integrated Circuit **(1J/K, 2R)**

[Continued on next page]

Figure 3-10 Dig Dug™ Game PCB Assembly, continued Parts List

Part No.	*Description (Reference Designations and Locations in Bold)*
137177-001	Type-74LS138 Integrated Circuit **(3B/C, 2G/H, 10N/P)**
137186-001	Multi-CPU Bus Controller Custom Chip 08 **(8D, 8J, 8K/L)**
137187-001	Coin and I/O Controller Custom Chip 51 **(1/2E)**
137188-001	Steering Controller Custom Chip 53 **(1/2C)**
137189-001	Video Ram Addresser Custom Chip 00 **(7R)**
137190-001	Universal Shift Register Custom Chip 02 **(10B)**
137191-001	Motion Object Controller Custom Chip 04 **(9K)**
137192-001	Controller Custom Chip 06 **(2E)**
137193-001	Sync Generator Custom Chip 07 **(1K, 5R)**
137194-001	4.0 MHz Z80A Central Processing Unit **(6A/B, 5H/J, 6J/K)**
137199-001	Random-Access Memory **(3G, 4J)**
137200-001	Type-74LS365 Integrated Circuit **(2J, 3J)**
137201-001	Type-74LS298 Integrated Circuit **(2H/J, 10L/M, 10R)**
137202-001	Type-74128 Integrated Circuit **(3A/B)**
137203-001	Type-74LS158 Integrated Circuit **(3M)**
137204-001	Type-74LS283 Integrated Circuit **(3C/D, 1M, 4P)**
137209-001	Type-74S174 Integrated Circuit **(1N/P)**
137211-001	Static Random-Access Memory **(9M)**
137217-001	Type-74S257 Integrated Circuit **(1H/J)**
144000-002	18.432 MHz Crystal **(Y1)**
175004-706	#6 Spacer for Mounting Printed Circuit Board
179051-001	Test Point *Acceptable substitute is part no. 020670-01*

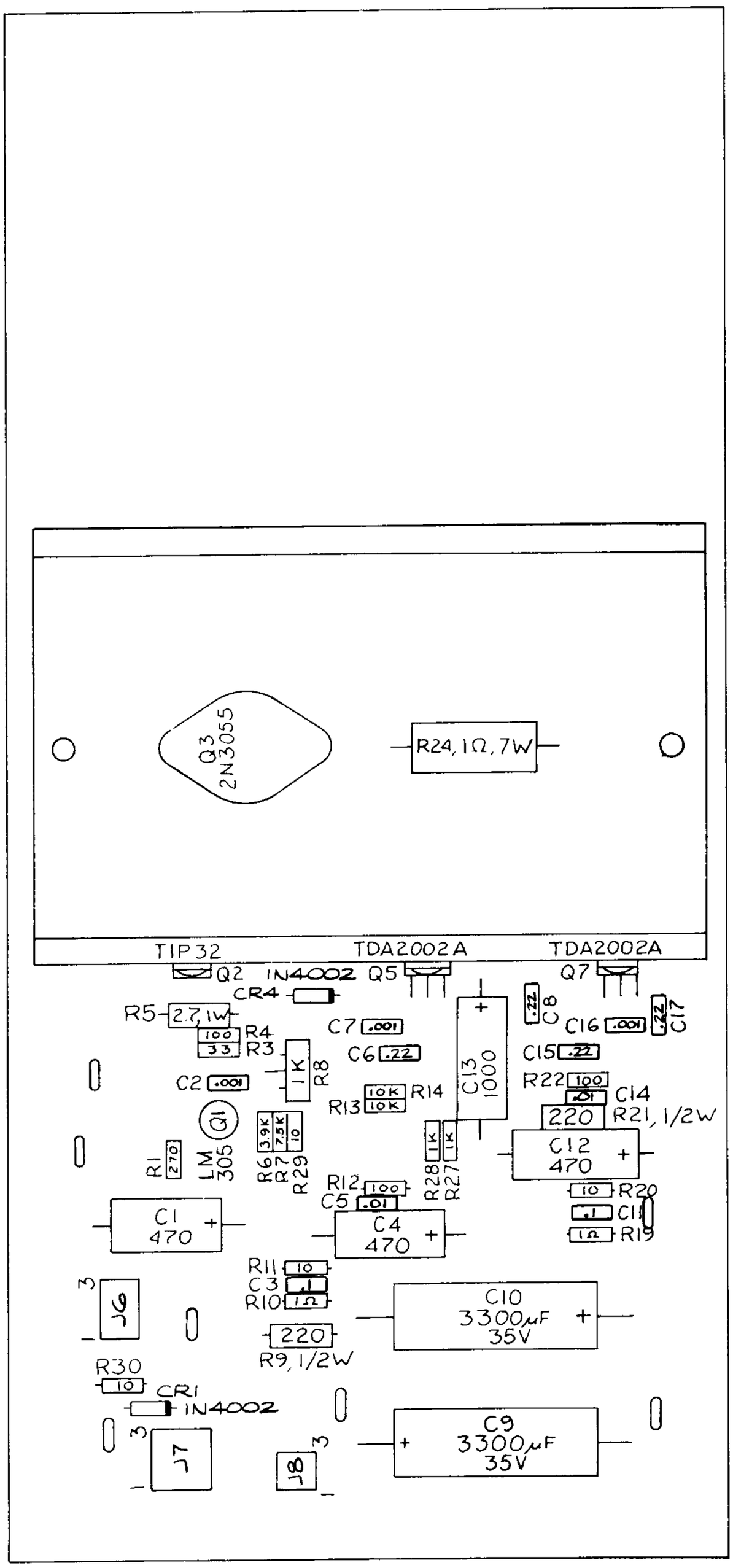


Figure 3-11 Regulator/Audio II PCB Assembly

Figure 3-11 Regulator/Audio II PCB Assembly Parts List

Part No.	*Description (Reference Designations and Locations in Bold)*
A035435-01	Regulator/Audio II PCB Assembly *Acceptable substitute is part no. A035435-02 thru -04.*
19-100P1015	.1 Ohm, ±3%, 7W Wirewound Resistor **(R24)**
19-315102	1K Ohm Vertical PCB-Mounting Cermet Trimpot **(R8)** *Acceptable substitute is part no. 119002-102.*
24-250108	1000 μF 25V Aluminum Electrolytic Fixed Axial-Lead Capacitor **(C13)**
24-250477	470 μF 25V Aluminum Electrolytic Fixed Axial-Lead Capacitor **(C1, 4, 12)**
24-350338	3300 μF 35V Aluminum Electrolytic Fixed Axial-Lead Capacitor **(C9, 10)**
29-088	.1 μF 25V Ceramic-Disc Radial-Lead Capacitor **(C3, 11)**
31-1N4002	Type-1N4002 100V 1-Amp. Silicon Rectifier Diode **(CR1, 4)**
33-TIP32	Type-TIP32 PNP Power Transistor **(Q2)**
34-2N3055	Type-2N3055 NPN Silicon Transistor **(Q3)**
37-LM305	5V Linear Voltage Regulator **(Q1)**
72-1608C	#6-32 × ½-Inch Cross-Recessed Pan-Head Corrosion-Resistant Steel Machine Screw
72-6606S	#6 × ⅜-Inch Pan-Head Thread-Forming Cross-Recessed Type-AB Zinc-Plated-Steel Screw
75-99516	#6-32 Nut/Washer Assembly
75-F60405	#6-32 × ¼-Inch Binder-Head Nylon Screw
78-16008	Thermally Conductive Compound **(Q3)**
78-16014	Thermally Conductive Silicon Insulator **(Q2)**
79-58306	6-Position Connector Receptacle **(J6)**
79-58308	9-Position Connector Receptacle **(J7)**
79-58354	4-Position Connector Receptacle **(J8)**
034531-01	Heat Sink
100015-103	.01 μF 25V Ceramic-Disc Radial-Lead Capacitor **(C5, C14)**
110000-010	1 Ohm, ±5%, ¼W Resistor **(R10, 19)**
110000-100	10 Ohm, ±5%, ¼W Resistor **(R11, 20, 29, 30)**
110000-101	100 Ohm, ±5%, ¼W Resistor **(R4, 12, 22)**
110000-102	1K Ohm, ±5%, ¼W Resistor **(R27, 28)**
110000-103	10K Ohm, ±5%, ¼W Resistor **(R13, 14)**
110000-271	270 Ohm, ±5%, ¼W Resistor **(R1)**
110000-330	33 Ohm, ±5%, ¼W Resistor **(R3)**
110000-392	3.9K Ohm, ±5%, ¼W Resistor **(R6)**
110000-562	5.6K Ohm, ±5%, ¼W Resistor **(R32, 33)**
110000-752	7.5K Ohm, ±5%, ¼W Resistor **(R7)**
110001-221	220 Ohm, ±5%, ½W Resistor **(R9, 21)**
110009-027	2.7 Ohm, ±5%, 1W Resistor **(R5)**
122002-102	.001 μF 25V Ceramic-Disc Minimum Radial-Lead Capacitor **(C2, 7, 16)**
122004-224	.22 μF 25V Ceramic-Disc Capacitor **(C6, 8, 15, 17)**
137151-002	Type-TDA2002A 8W Linear Audio Amplifier **(Q5, 7)**
179051-001	Test Point *Acceptable substitute is part no. 020670-01.*

G. Power Supply Assembly

WARNING

Fuse cover must be in place during game operation.

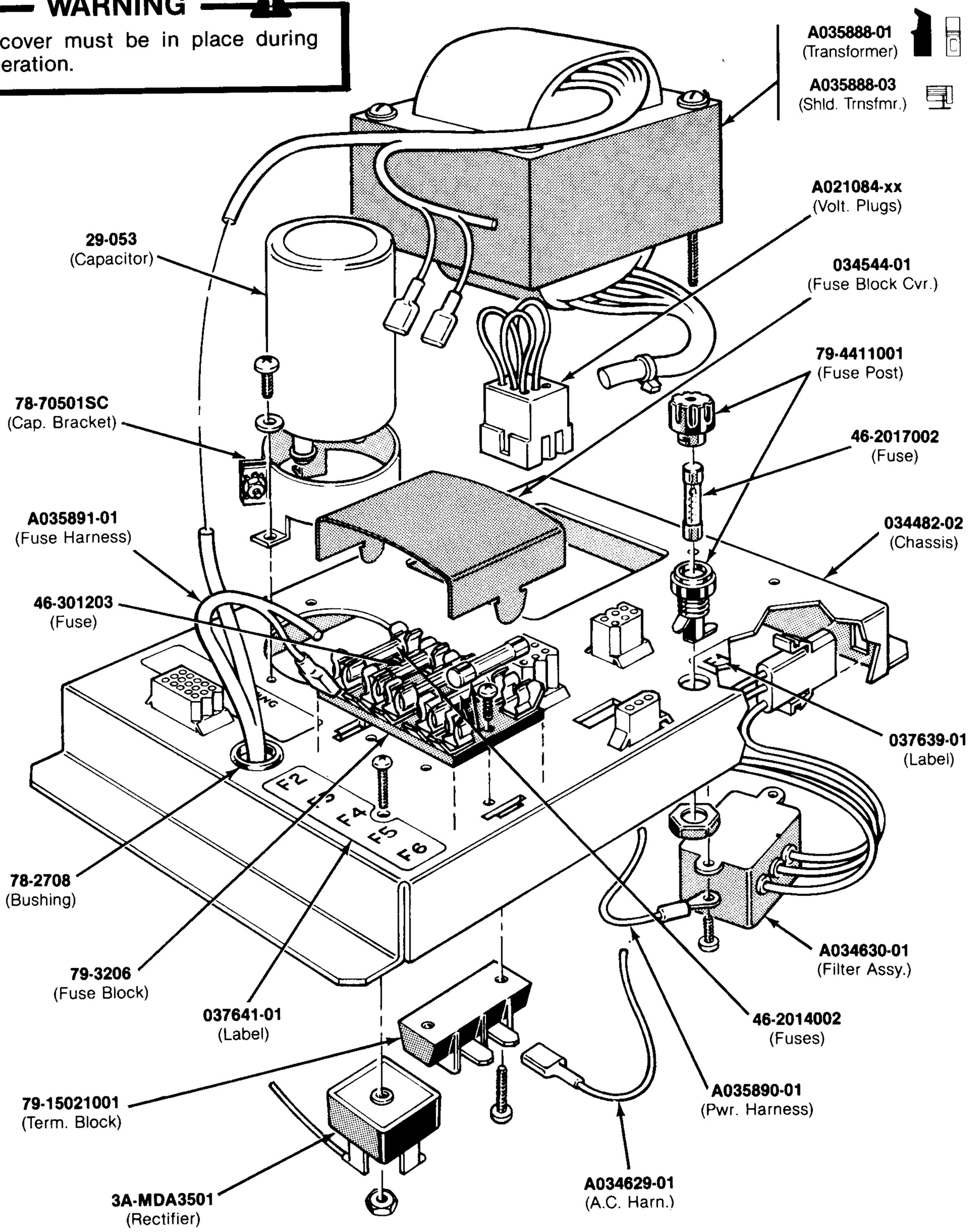


Figure 3-12 Power Supply Assembly

Figure 3-12 Power Supply Assembly, continued
Parts List

Part No.	*Description (Reference Designations in Bold)*
A021084-01	Voltage Plug for 100V *(violet)*
A021084-02	Voltage Plug for 120V *(yellow)*
A021084-04	Voltage Plug for 220V *(blue)*
A021084-05	Voltage Plug for 240V *(brown)*
A034629-01	A.C. Harness Assembly
A034630-01	RFI Filter Assembly **(FL1)**
A035888-01	Upright and Cabaret Transformer Assembly **(T1)** *Acceptable substitute is part no. A035888-02*
A035888-03	Cocktail Shielded Transformer Assembly **(T1)** *Acceptable substitute is part no. A035888-04*
A035890-01	Power Harness Assembly
A035891-01	Fuse Harness Assembly
A037671-xx*	Upright and Cabaret Power Supply Assembly
A037672-xx**	Cocktail Power Supply Assembly
29-053	27,000 μF 15V DC Electrolytic Capacitor **(C1)**
3A-MDA3501	Bridge Rectifier, Type MDA 3501 **(CR1)**
46-2014002	4-Amp. 250V 3AG Slow-Blow Glass Cartridge-Type Fuse **(F2, F4–F6)**
46-2017002	7-Amp. 250V 3AG Slow-Blow Glass Cartridge-Type Fuse **(F1)**
46-301203	20-Amp. 32V 3AG Slow-Blow Glass Cartridge-Type Fuse **(F3)**
78-2708	Nylon Type 6/6 Hole Bushing with ⅝-Inch Inside Diameter × $^{55}/_{64}$-Inch Outside Diameter × ¼-Inch Thick
78-70501SC	2-Inch Diameter Capacitor Mounting Bracket
79-15021001	2-Circuit Single-Row Terminal Block
79-3206	5-Position 3AG Fuse Block with ¼-Inch Quick-Disconnect Terminals
79-4411001	Panel-Mounting Non-Indicating 3AG Cartridge-Type Fuse Post
034482-02	Power Supply Chassis
034544-01	Fuse Block Cover
037243-01	Metal Base Plate *(goes under the power supply—not shown in illustration)*
037639-01	Label for Fuse Value **(F1)**
037641-01	Label for Fuse Values **(F2–F6)**

*A037671-01 power supply assembly has the 120V plug
A037671-02 has the 100V, 220V and 240V plugs
A037671-03 has the 220V and 240V plugs

**A037672-01 power supply assembly has the 120V plug
A037672-02 has the 100V, 220V and 240V plugs
A037672-03 has the 220V and 240V plugs

Line Voltage Range	**Voltage Selection Plug Wire Color**
90-110 VAC (100)	**Violet**
105-135 VAC (120)	**Yellow*** **
200-240 VAC (220)	**Blue**
220-260 VAC (240)	**Brown**

***This is the *only* plug provided on the North American power supply.

Warranty

Seller warrants that its printed-circuit boards and parts thereon are free from defects in material and workmanship under normal use and service for a period of ninety (90) days from date of shipment. Seller warrants that its video displays (in games supplied with displays) are free from defects in material and workmanship under normal use and service for a period of thirty (30) days from date of shipment. None of the Seller's other products or parts thereof are warranted.

If the products described in this manual fail to conform to this warranty, Sellers' sole liability shall be, at its option, to repair, replace, or credit Buyer's account for such products which are returned to Seller during said warranty period, provided:

(a) Seller is promptly notified in writing upon discovery by Buyer that said products are defective;

(b) Such products are returned prepaid to Sellers' plant; and

(c) Seller's examination of said products discloses to Seller's satisfaction that such alleged defects existed and were not caused by accident, misuse, neglect, alteration, improper repair, installation or improper testing.

In no event shall Seller be liable for loss of profits, loss of use, incidental or consequential damages.

Except for any express warranty set forth in a written contract between Seller and Buyer which contract supersedes the terms of this order, this warranty is expressed in lieu of all other warranties expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose, and of all other obligations or liabilities on the Seller's part, and it neither assumes nor authorizes any other person to assume for the Seller any other liabilities in connection with the sale of products under this order.

The use of any non-Atari parts may void your warranty, according to the terms of the warranty. The use of any non-Atari parts may also adversely affect the safety of your game and cause injury to yourself and others. Be very cautious in using non-Atari-supplied components with our games, in order to insure your safety.

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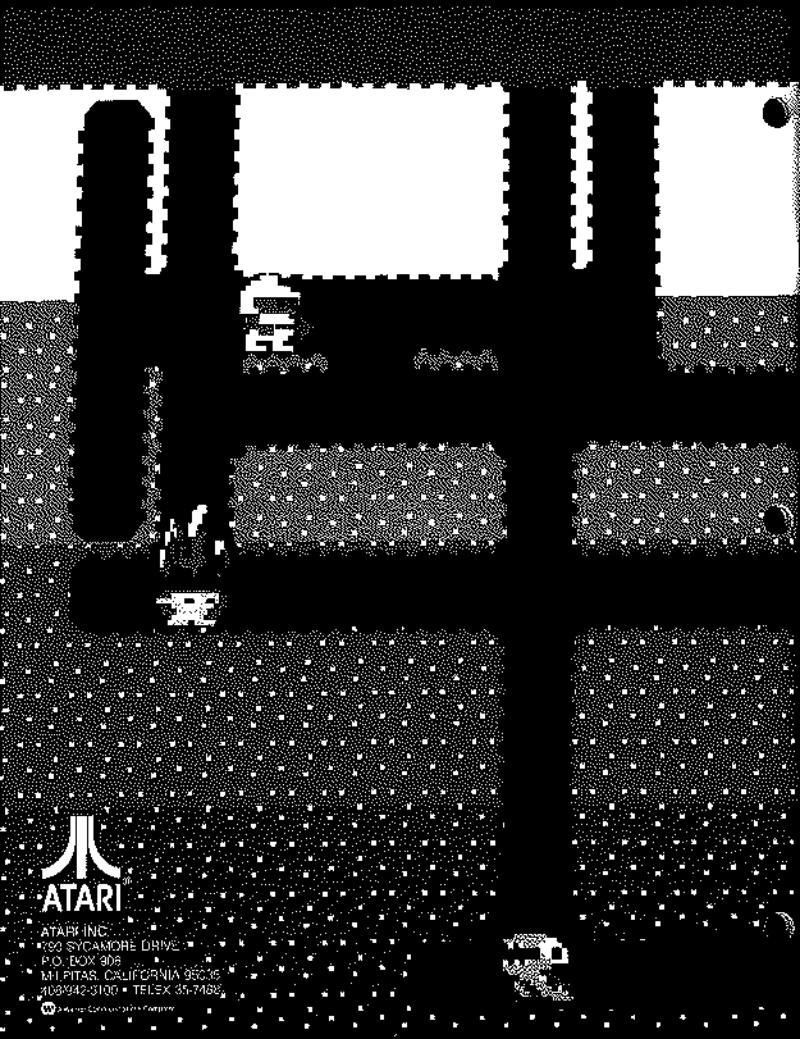

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1265 SYCAMORE DRIVE
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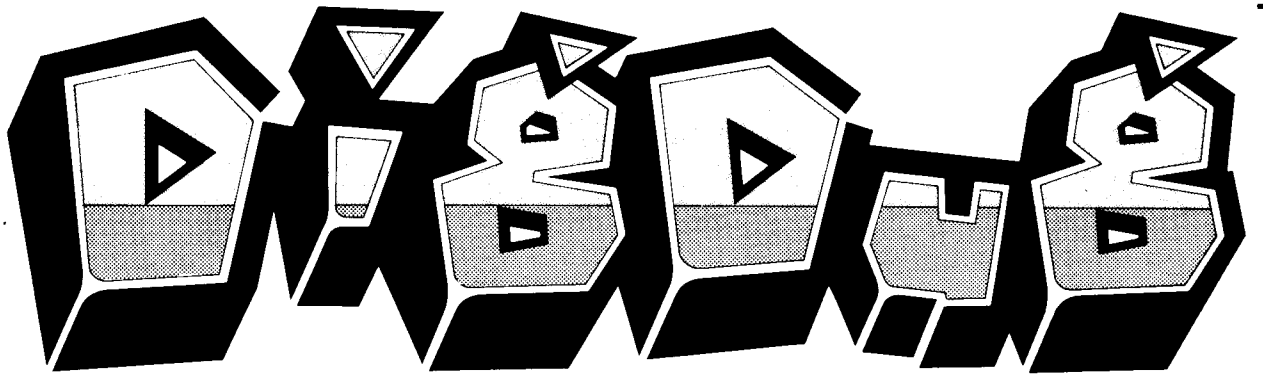
Schematic Package Supplement to



Operation, Maintenance and Service Manual

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A Warner Communications Company

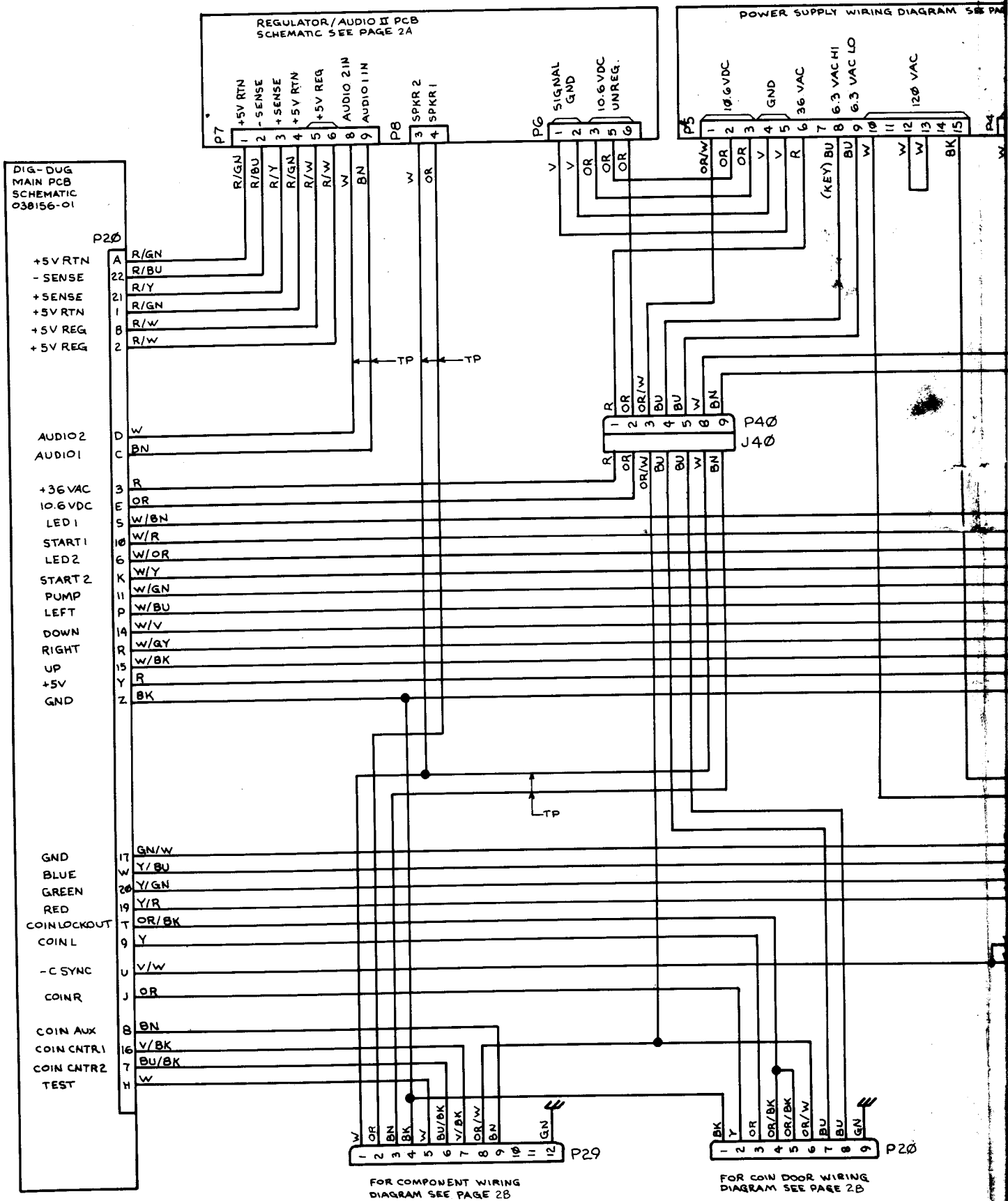
4L

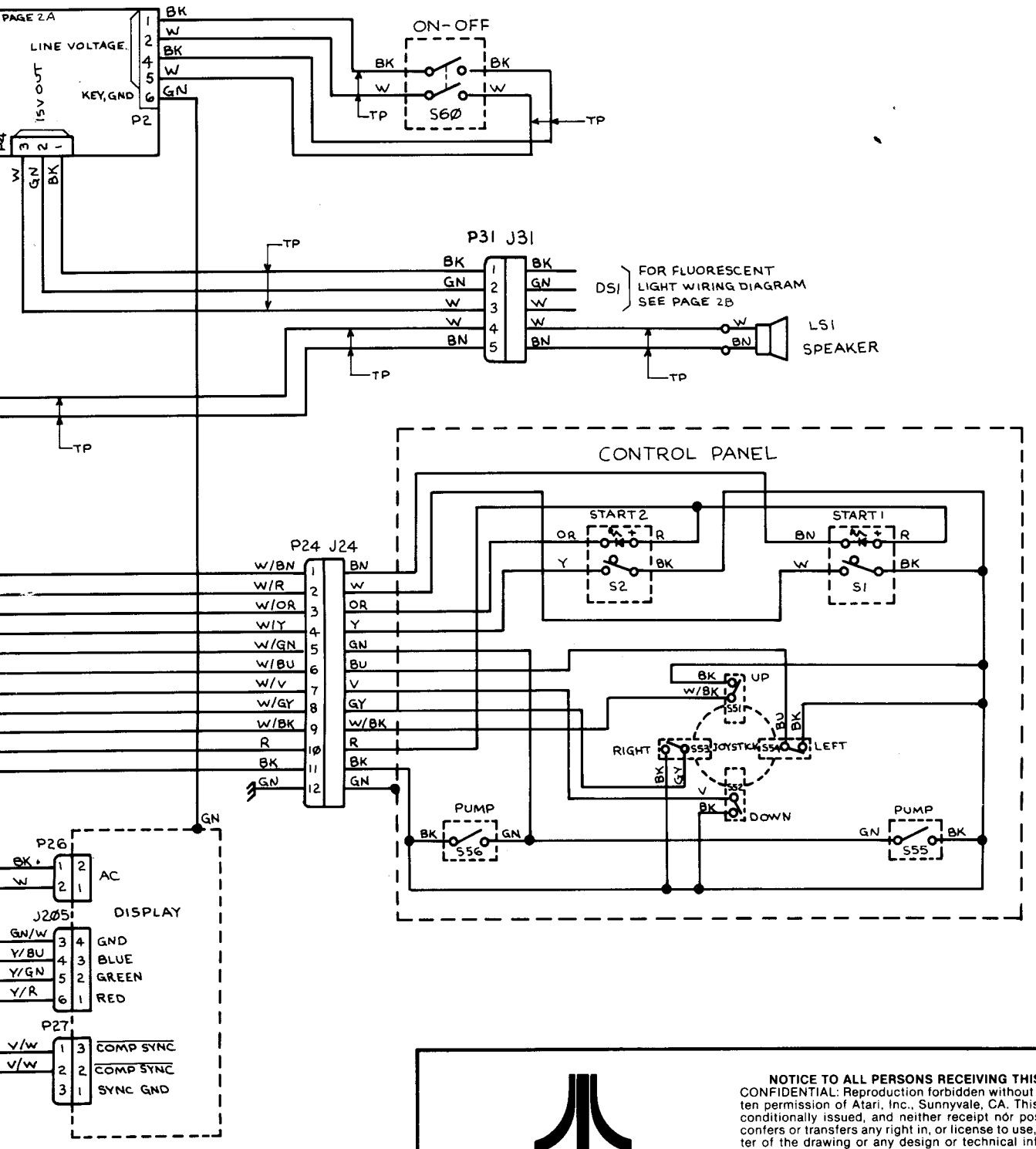
SP-203 Sheet 1A
2nd printing 4L

Table of Contents

NOTE
This staple temporarily holds the schematic package together. Remove the staple before using the schematics.

Upright Wiring Diagram





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Dig Dug Upright Wiring Diagram

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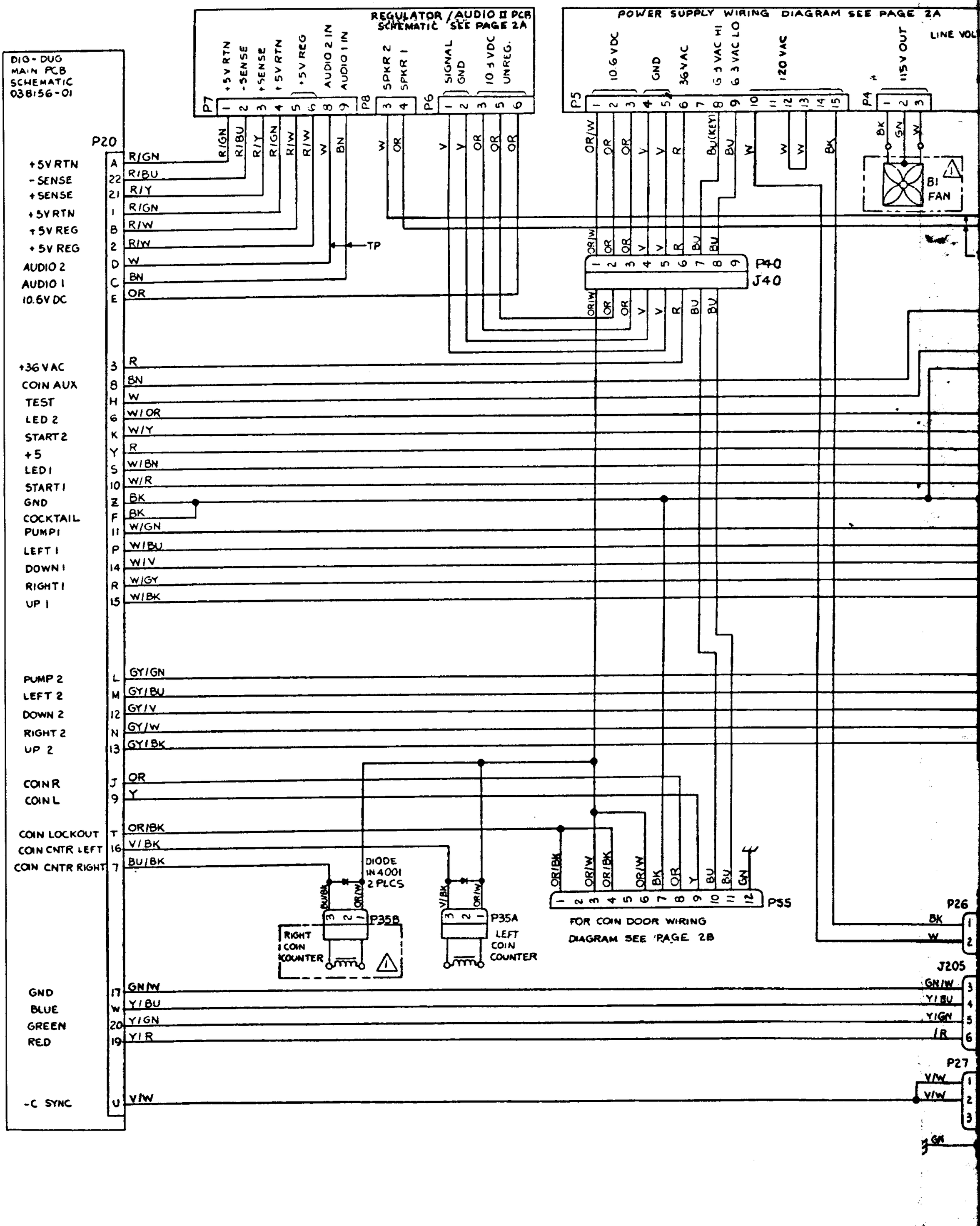
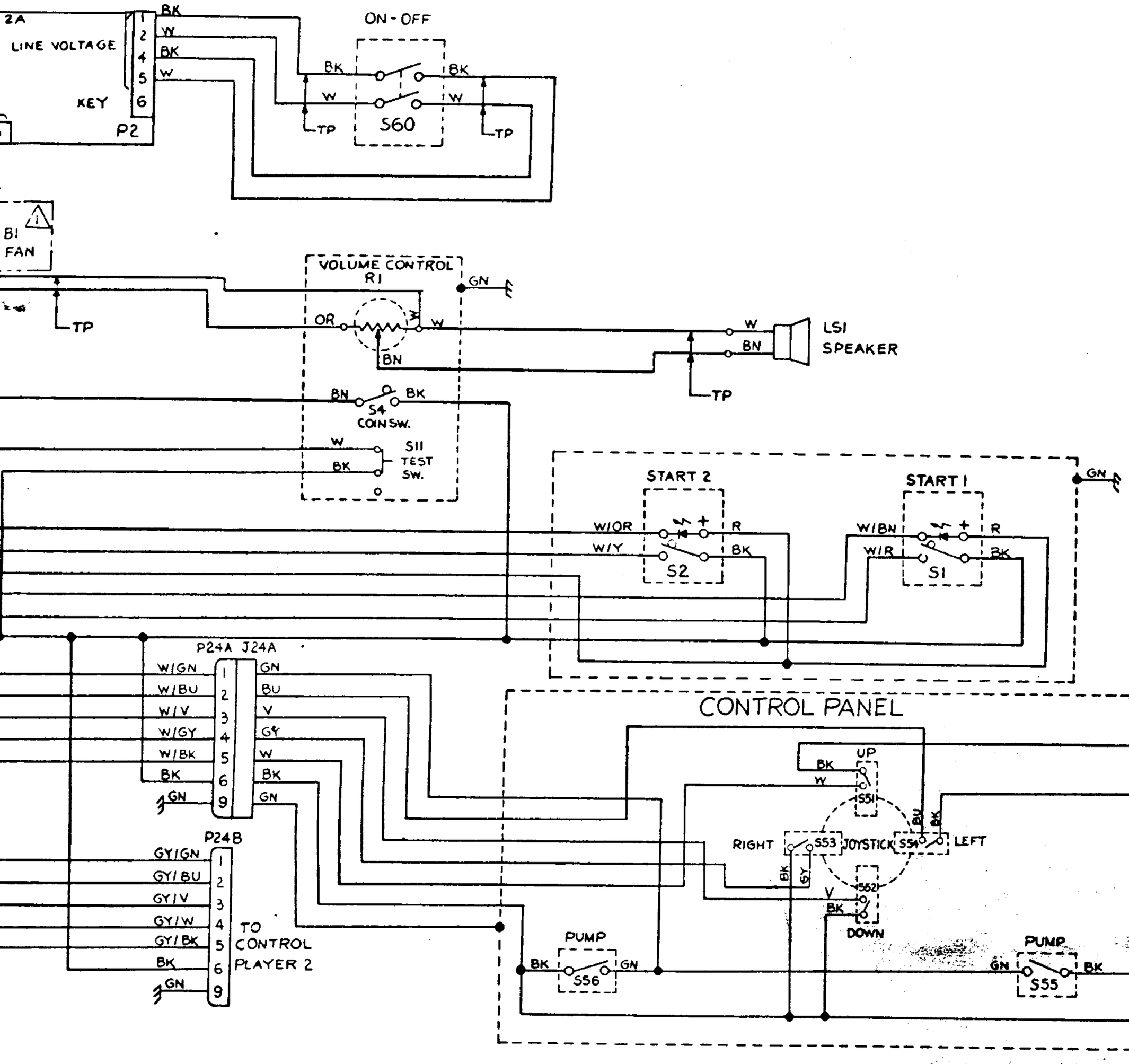
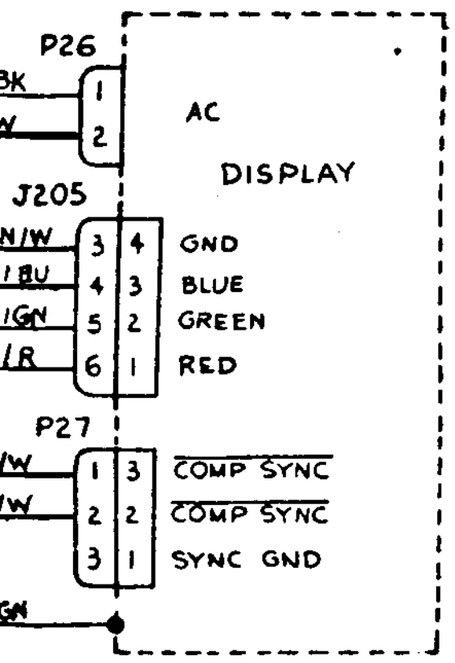
SP-203 Sheet 1B
2nd printing 4L

Cocktail Wiring Diagram







Dig Dug Cocktail Wiring Diagram

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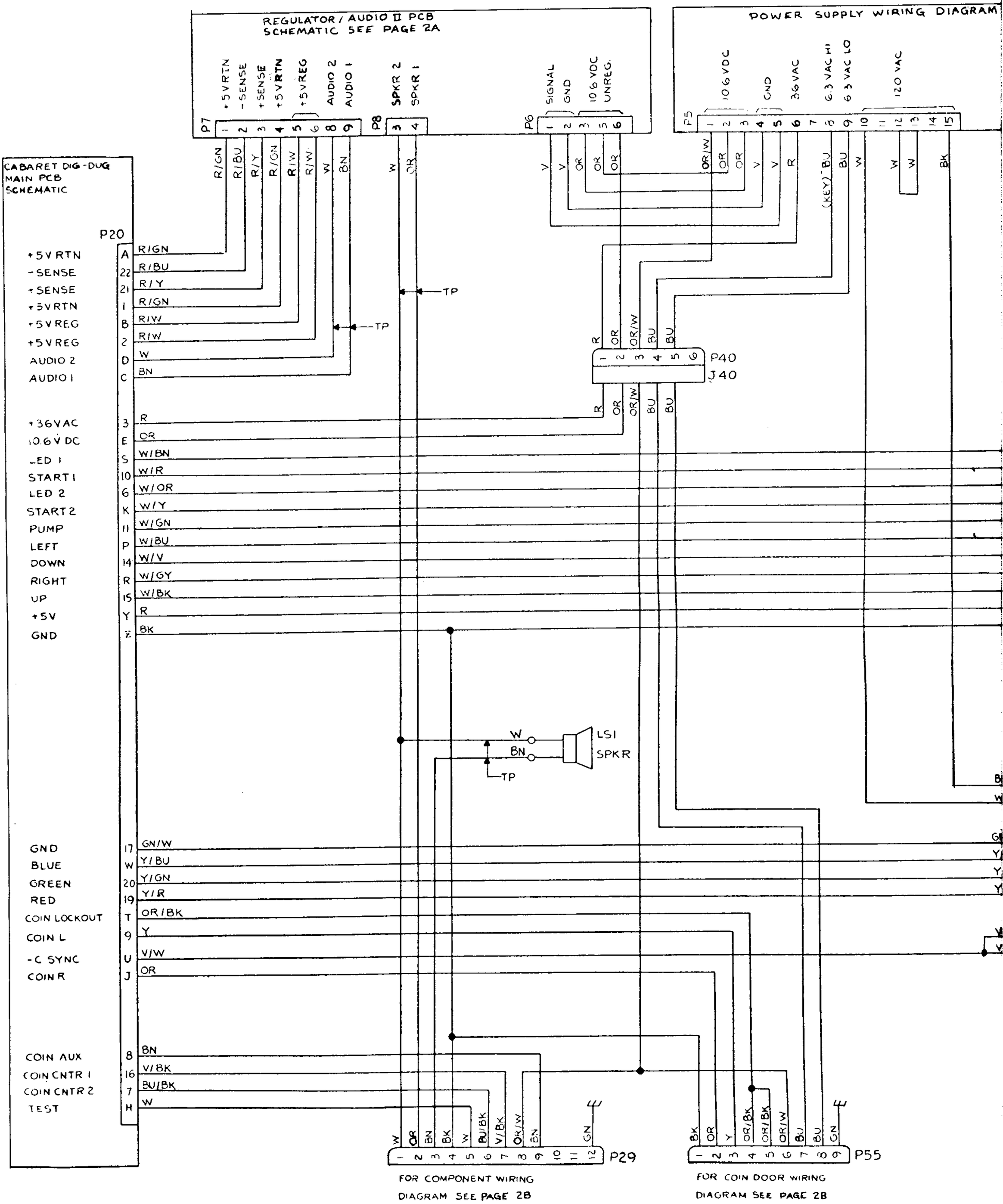
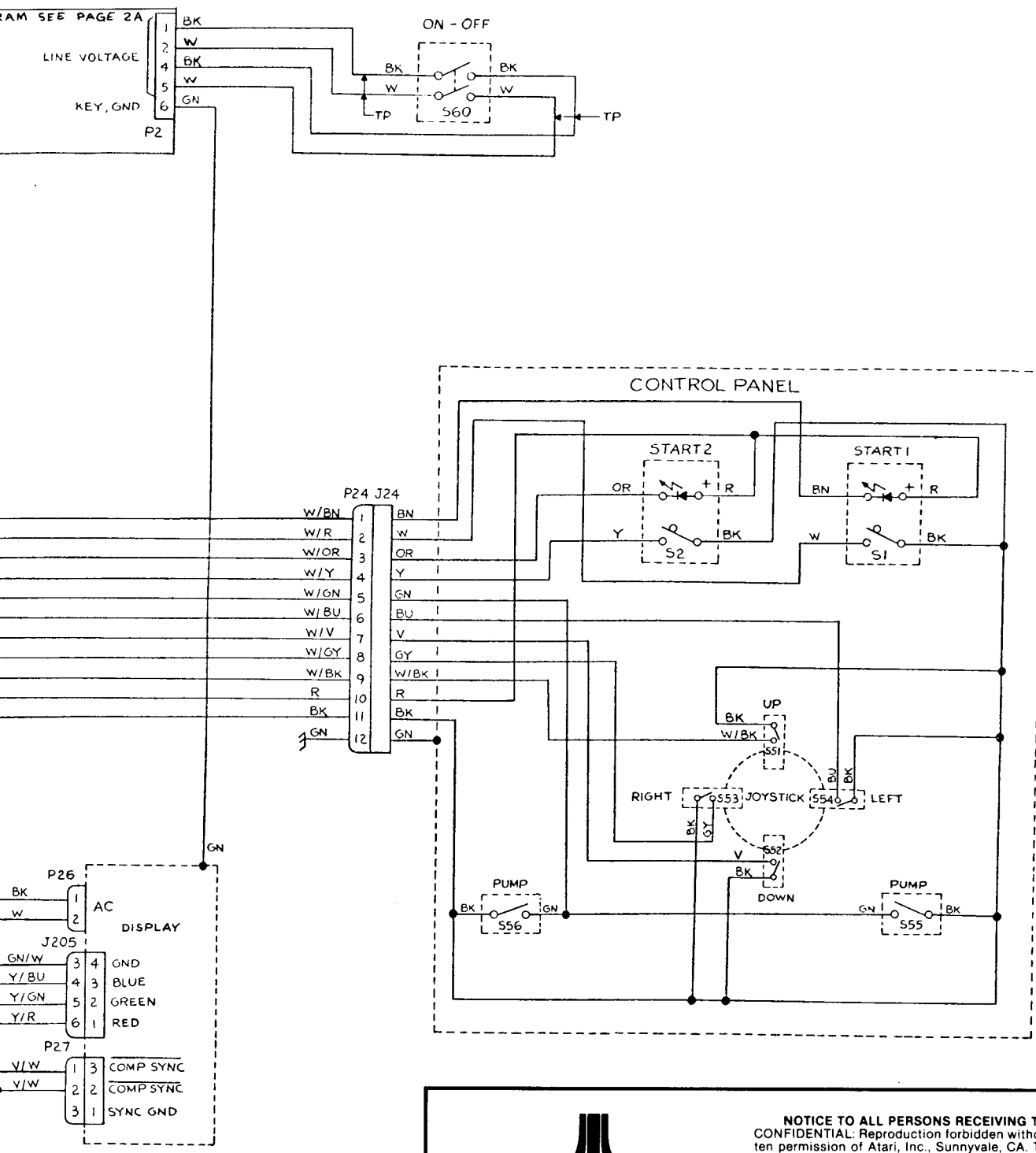
2nd printing 4L

Cabaret Wiring Diagram





Dig Dug Cabaret Wiring Diagram

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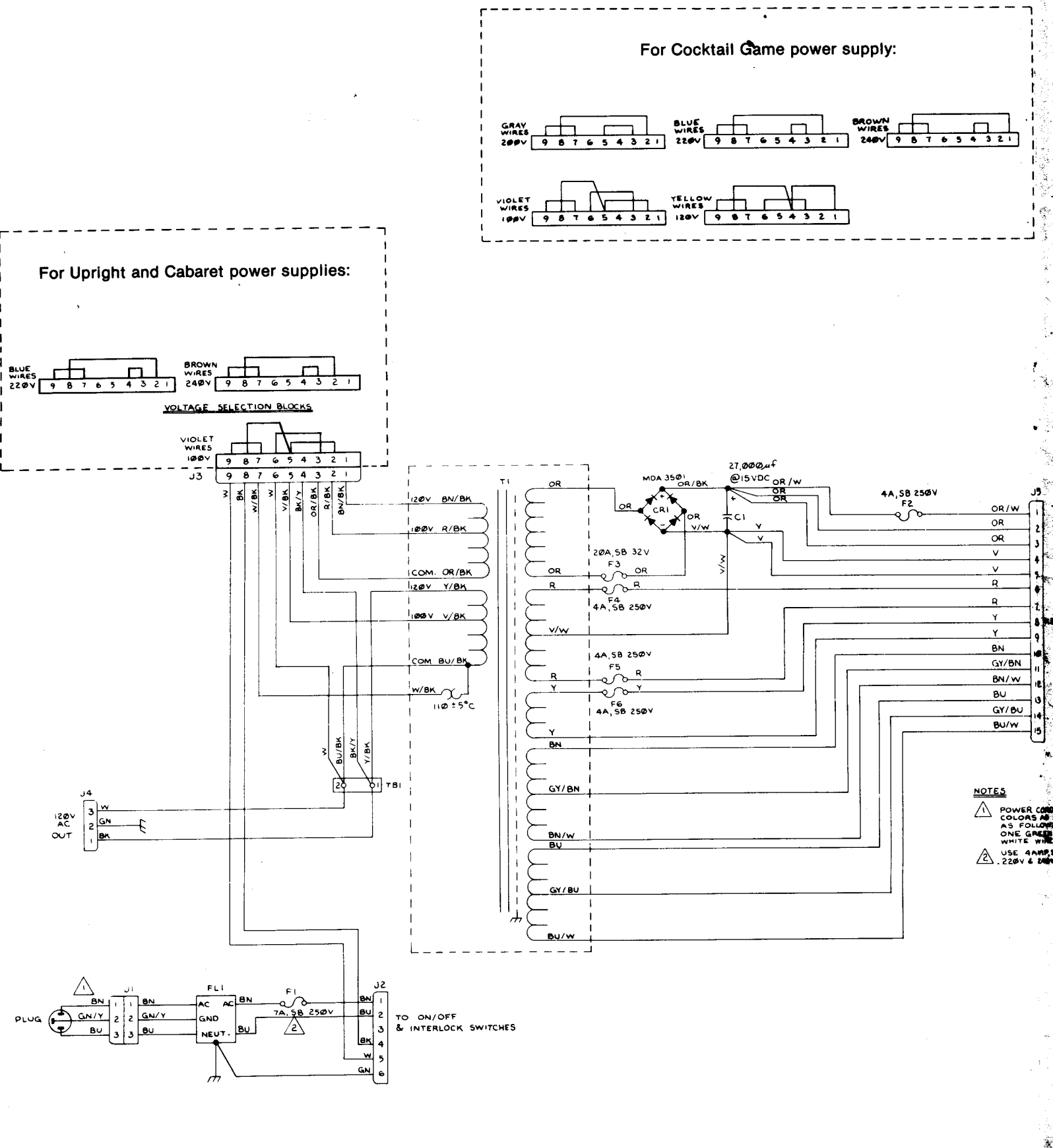
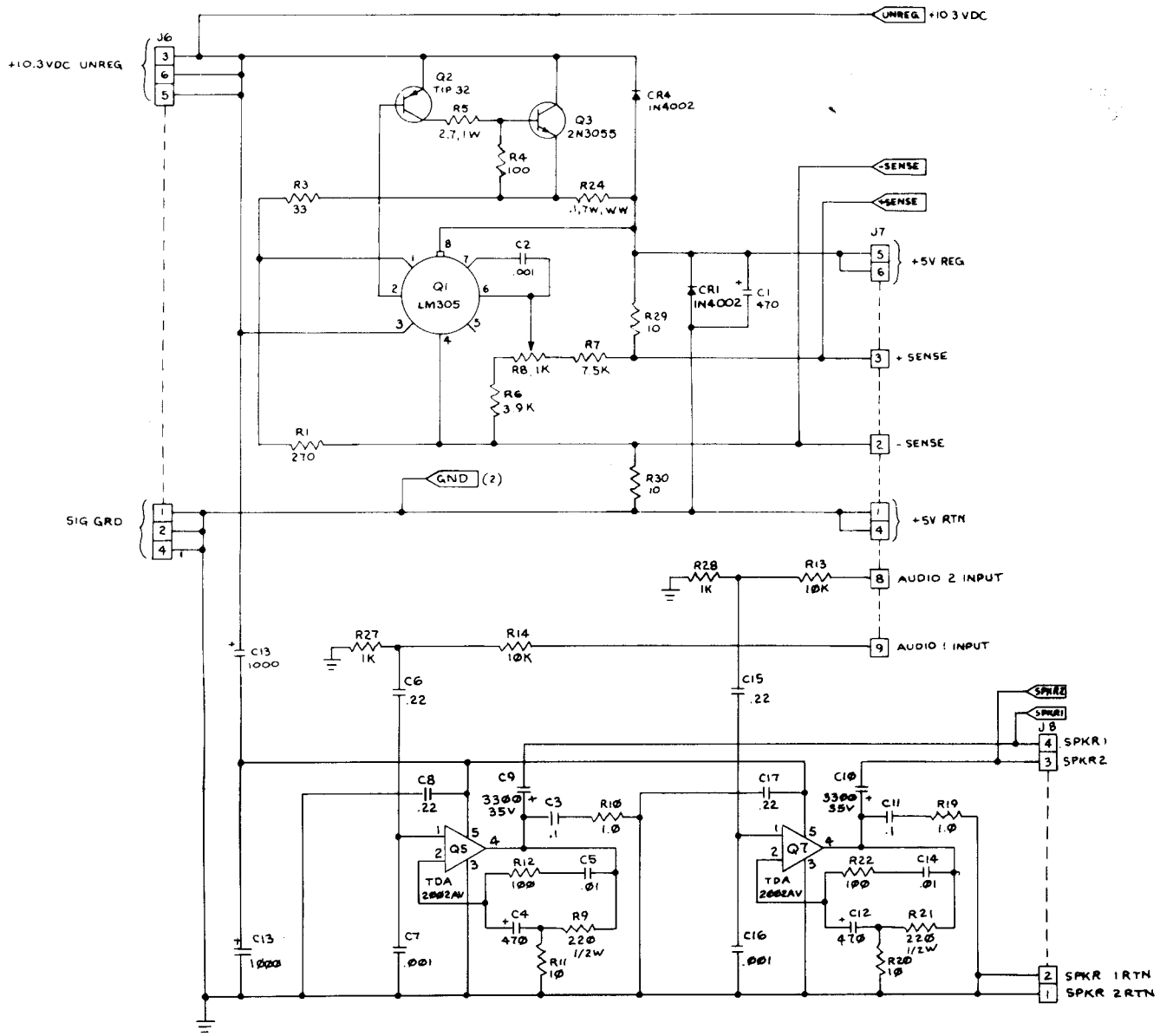
2nd printing 4L

Color Raster Power Supply Wiring Diagram



Regulator/Audio II PCB Schematic Diagram



RD ASSY MAY HAVE WIRE
S SHOWN OR WIRE COLORS
WS: ONE BLACK WIRE (AC),
EN WIRE (GND) AND ONE
RE (NEUTRAL)
P, SB 250V FUSE AT F1 WITH
0Y (EUROPEAN ONLY)

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Dig Dug Power Supply and Reg./Audio II PCB

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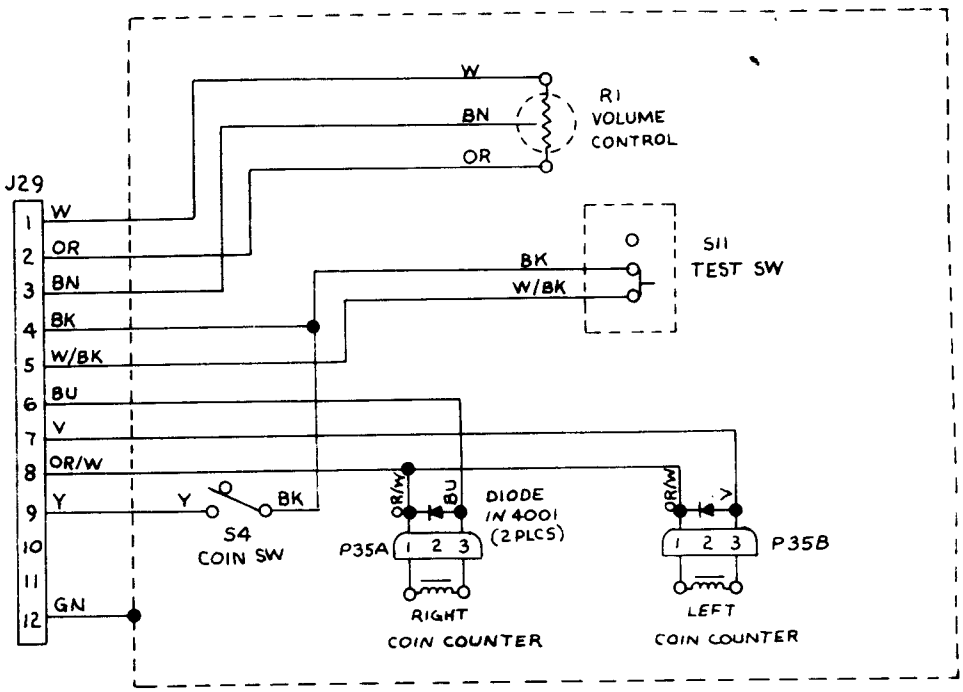
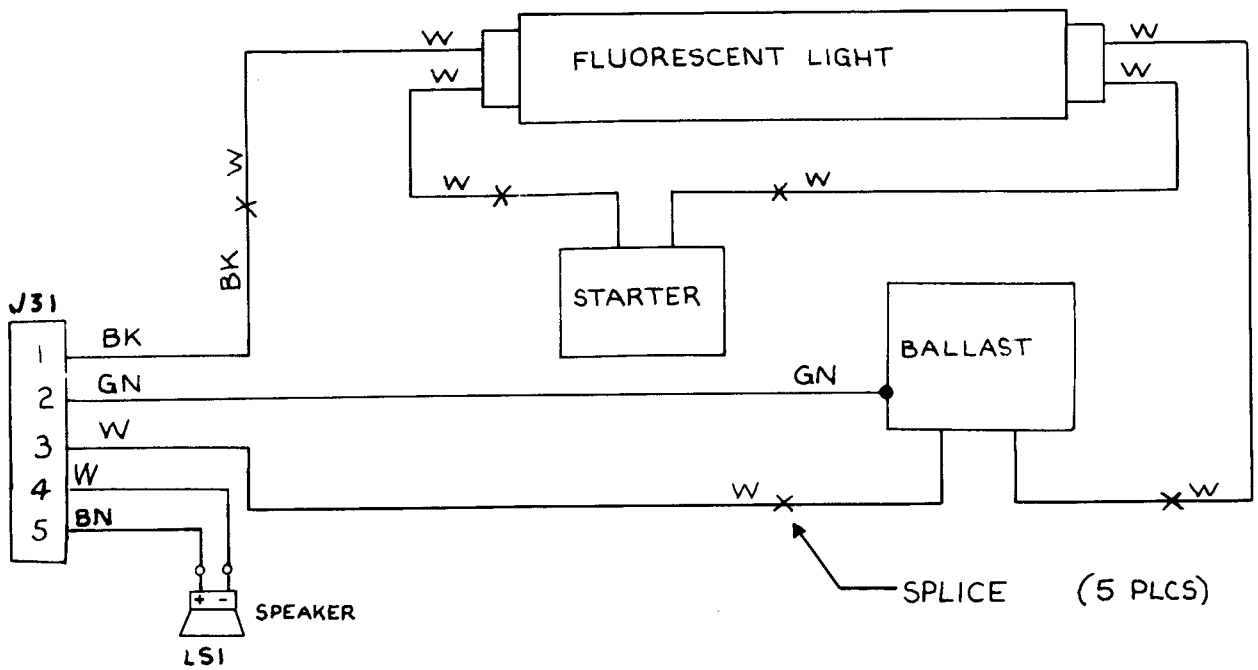
2nd printing 4L

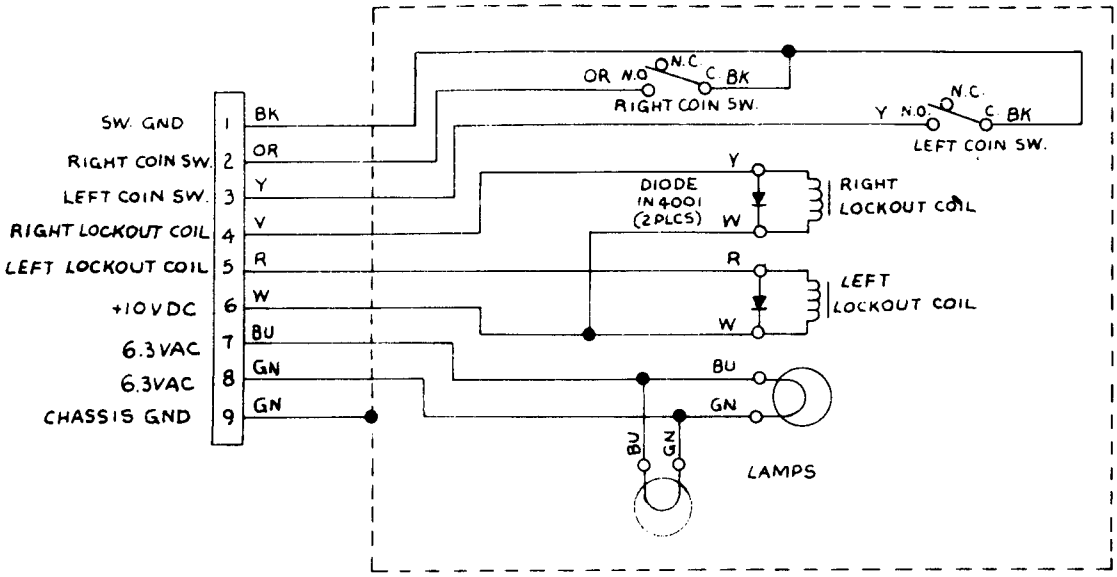
Utility Panel Wiring Diagram



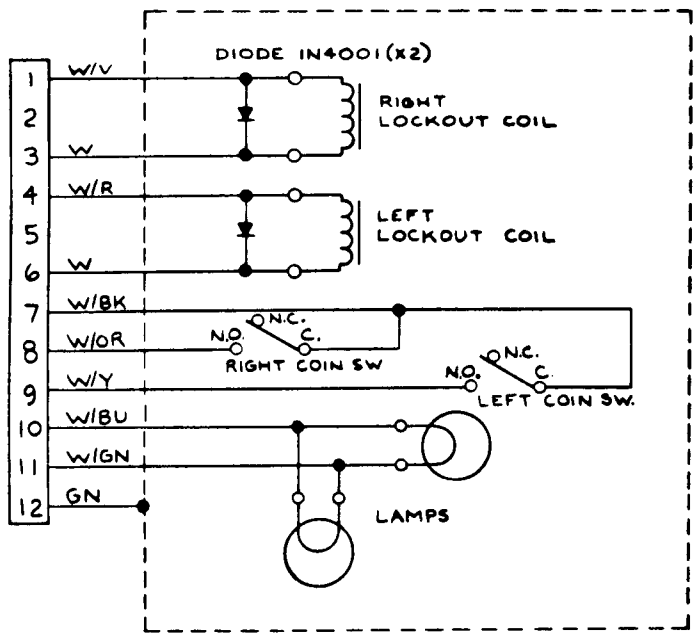
Fluorescent Light and Speaker Wiring Diagram



Upright and Cabaret Coin Door Wiring Diagram



Cocktail Coin Door Wiring Diagram



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Dig Dug Game Wiring Interfaces

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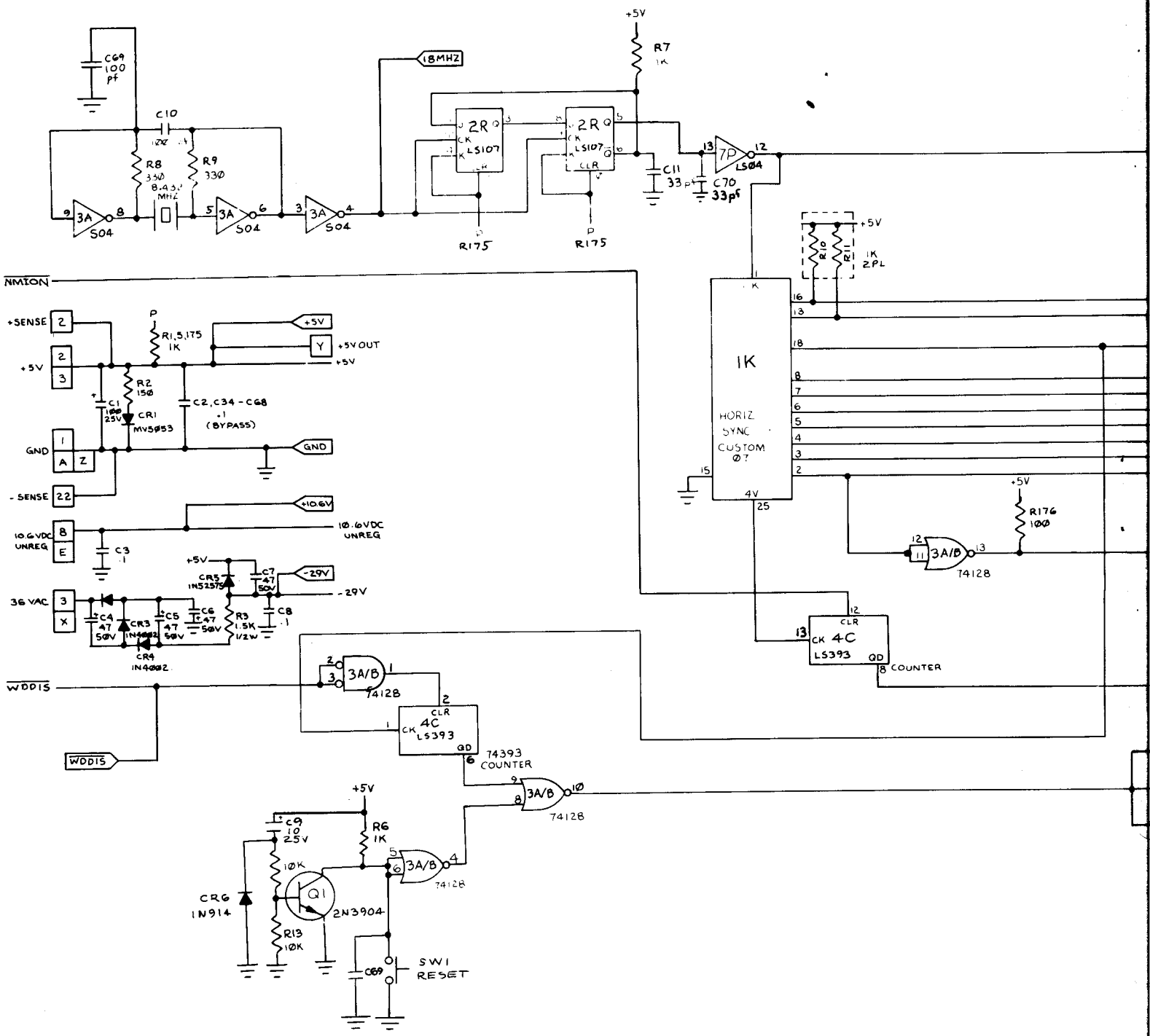
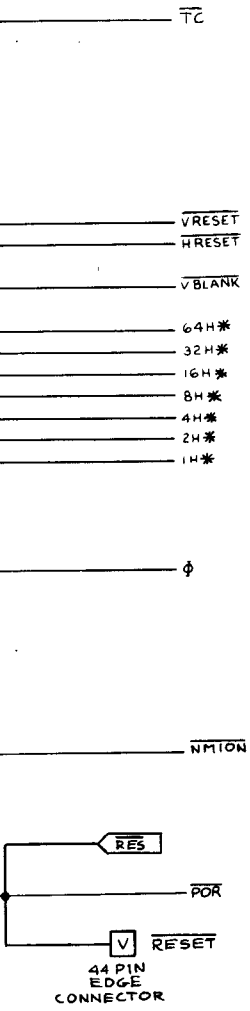
2nd printing 4L

Power Input, Clock, NMI, and Watchdog



MEMORY MAP

HEXA-DECIMAL ADDRESS	R/W	DATA								FUNCTION
		D7	D6	D5	D4	D3	D2	D1	D0	
0000-3FFF	R	D	D	D	D	D	D	D	D	1st Priority Z80 CPU ROM (16K)
0000-1FFF	R	D	D	D	D	D	D	D	D	2nd Priority Z80 CPU ROM (8K)
0000-0FFF	R	D	D	D	D	D	D	D	D	3rd Priority Z80 CPU ROM (4K)
6800-680F	W					D	D	D	D	Audio Control
6810-681F	W					D	D	D	D	Audio Control
6820	W								D	0 = Reset IRQ1 (Latched)
6821	W								D	0 = Reset IRQ2 (Latched)
6822	W								D	0 = Enable NMI3 (Latched)
6823	W								D	0 = Reset 2nd and 3rd Z80 CPUs (Latched)
6825	W								D	Custom Chip 53 Mode Control (Latched)
6826	W								D	Custom Chip 53 Mode Control (Latched)
6827	W								D	Custom Chip 53 Mode Control (Latched)
6830	W									Watchdog Reset
7000	R/W	D	D	D	D	D	D	D	D	Custom Chip 06—Data
7100	R/W	D	D	D	D	D	D	D	D	Custom Chip 06—Command
8000-87FF	R/W	D	D	D	D	D	D	D		2K Playfield RAM
8B80-8BFF	R/W	D	D	D	D	D	D	D	D	1K Motion RAM (PIC, COLOR)
9380-93FF	R/W	D	D	D	D	D	D	D	D	1K Motion RAM (VPOS, HPOS)
9B80-9BFF	R/W	D	D	D	D	D	D	D	D	1K Motion RAM (FLIP)
A000	W								D	Playfield Select (Latched)
A001	W								D	Playfield Select (Latched)
A002	W								D	Alphanumeric Color Select (Latched)
A003	W								D	Playfield Enable (Latched)
A004	W								D	Playfield Color Select (Latched)
A005	W								D	Playfield Color Select (Latched)
A007	W								D	Flip Video
B800-B83F	W	D	D	D	D	D	D	D	D	Write EAROM Address and Data
B800	R	D	D	D	D	D	D	D	D	Read EAROM Data
B840	W					D	D	D	D	Write EAROM Control



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Dig Dug Game PCB Schematic Diagram

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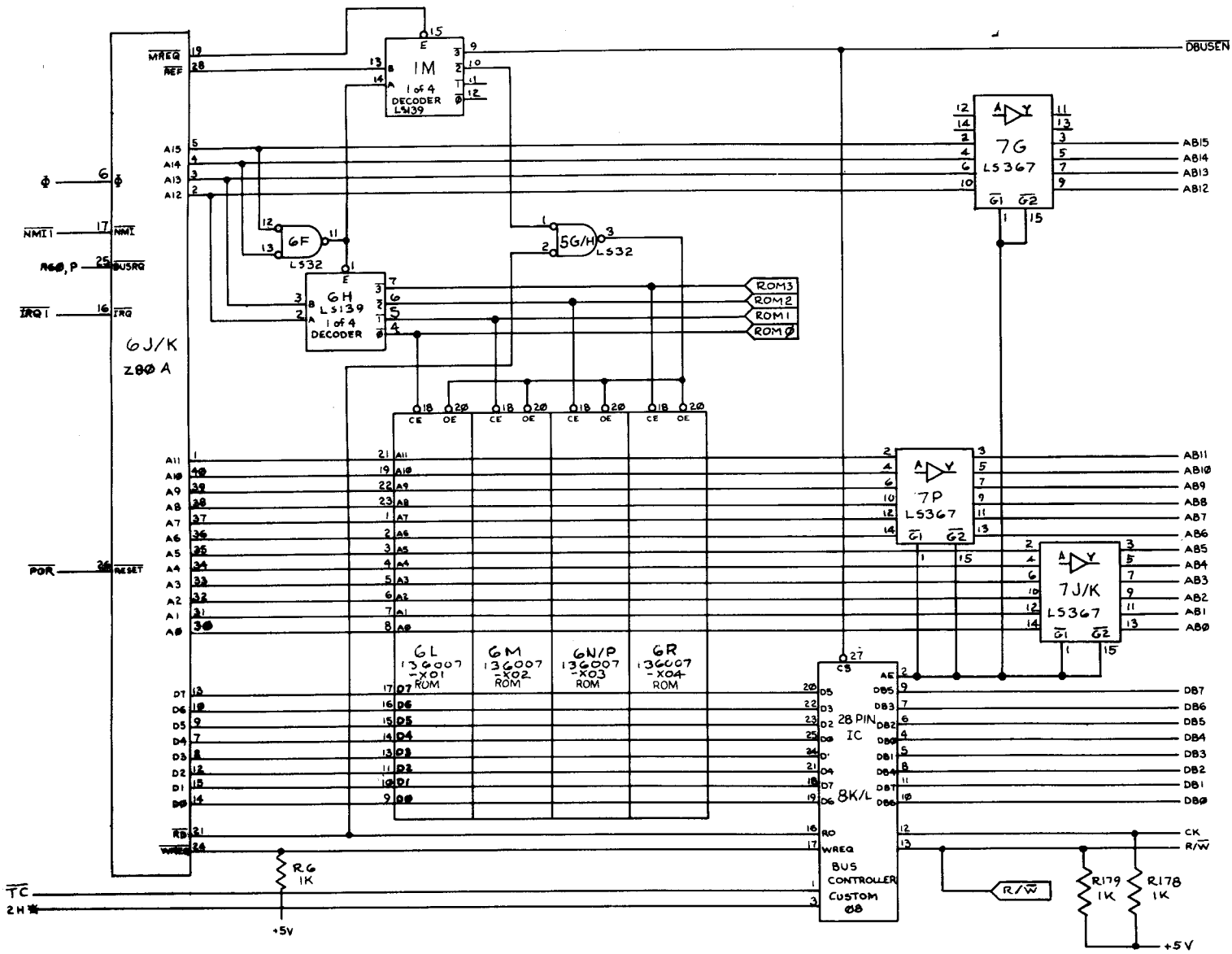
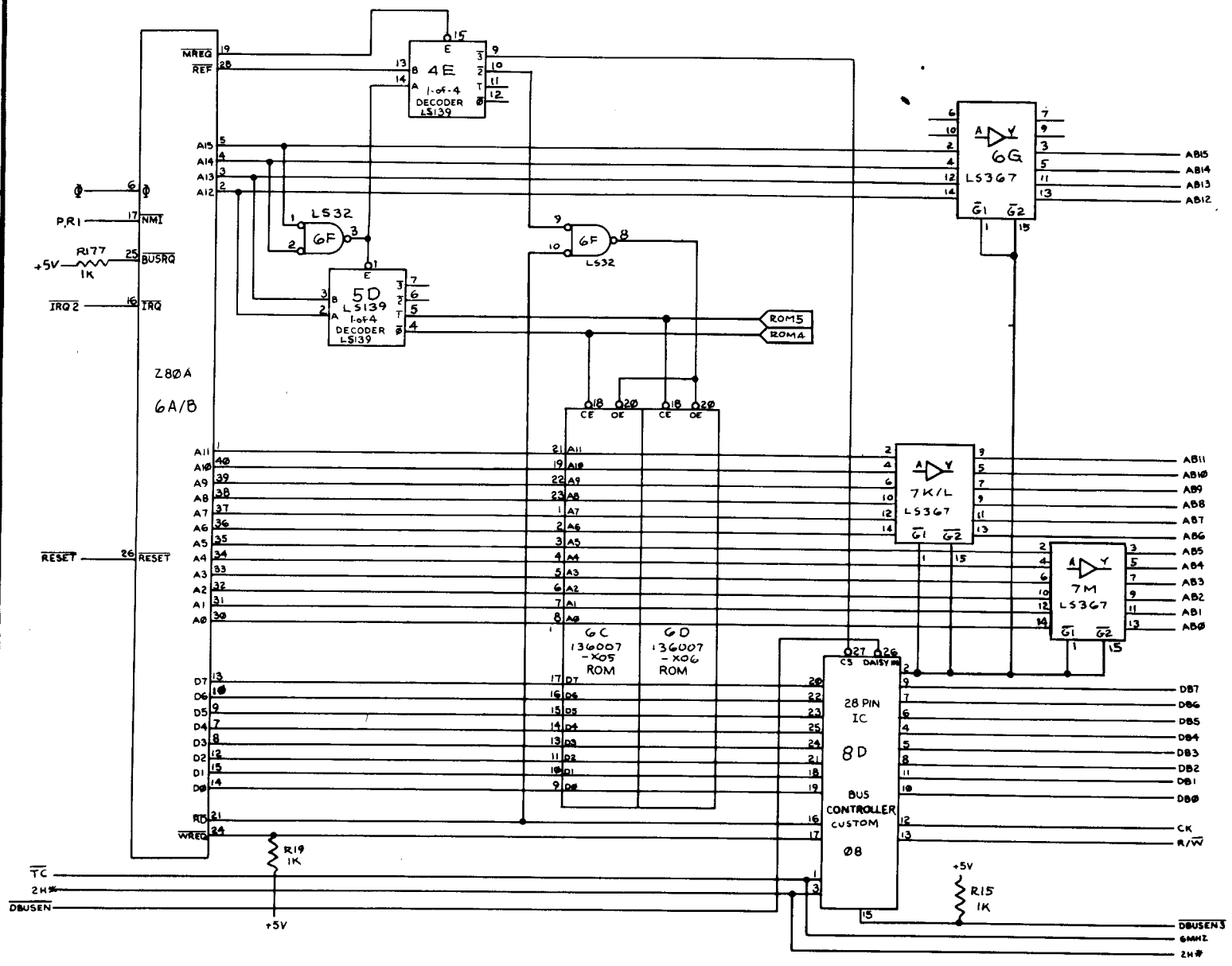
SP-203 Sheet 4A
2nd printing 4L

1st Priority CPU



2nd Priority CPU



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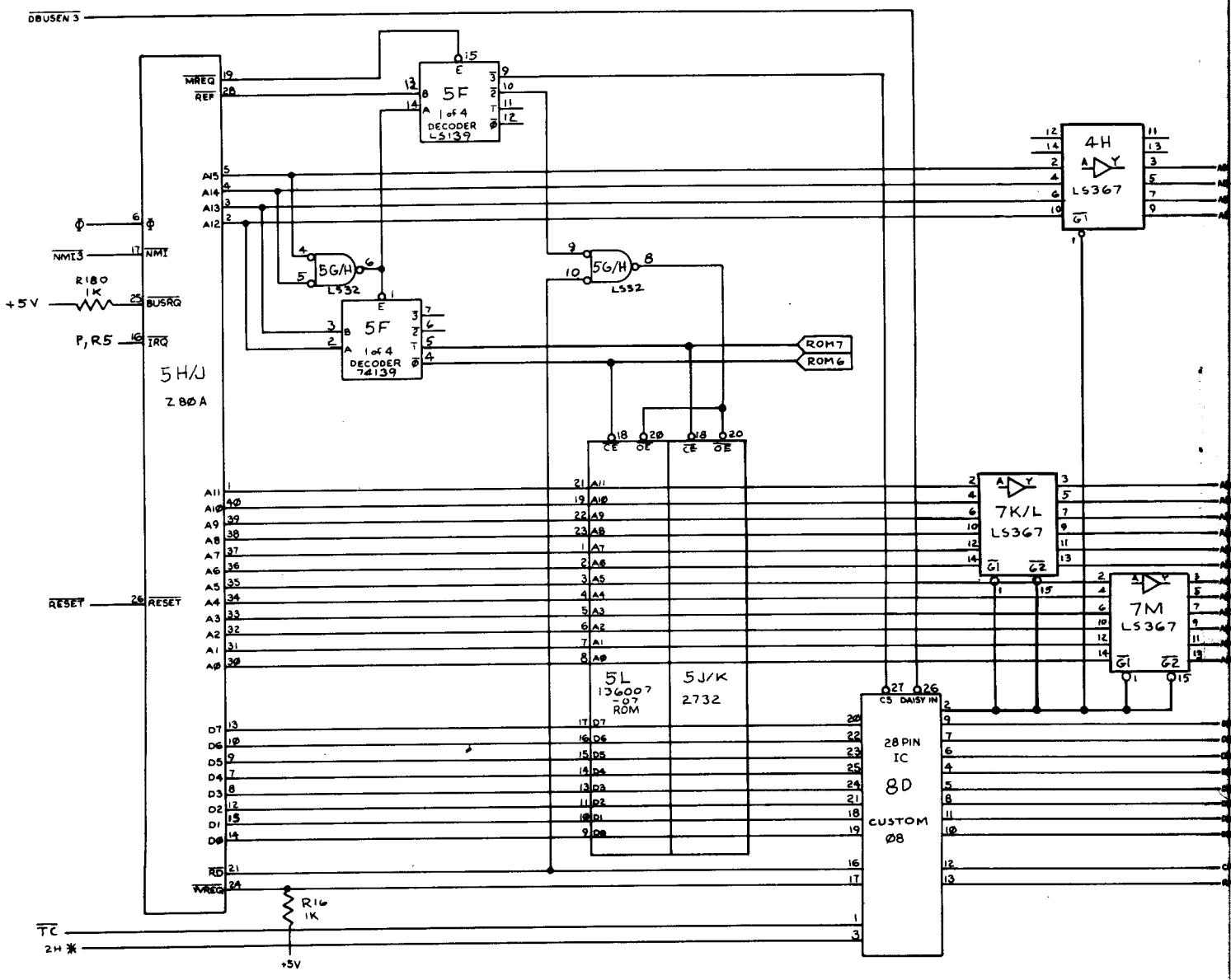
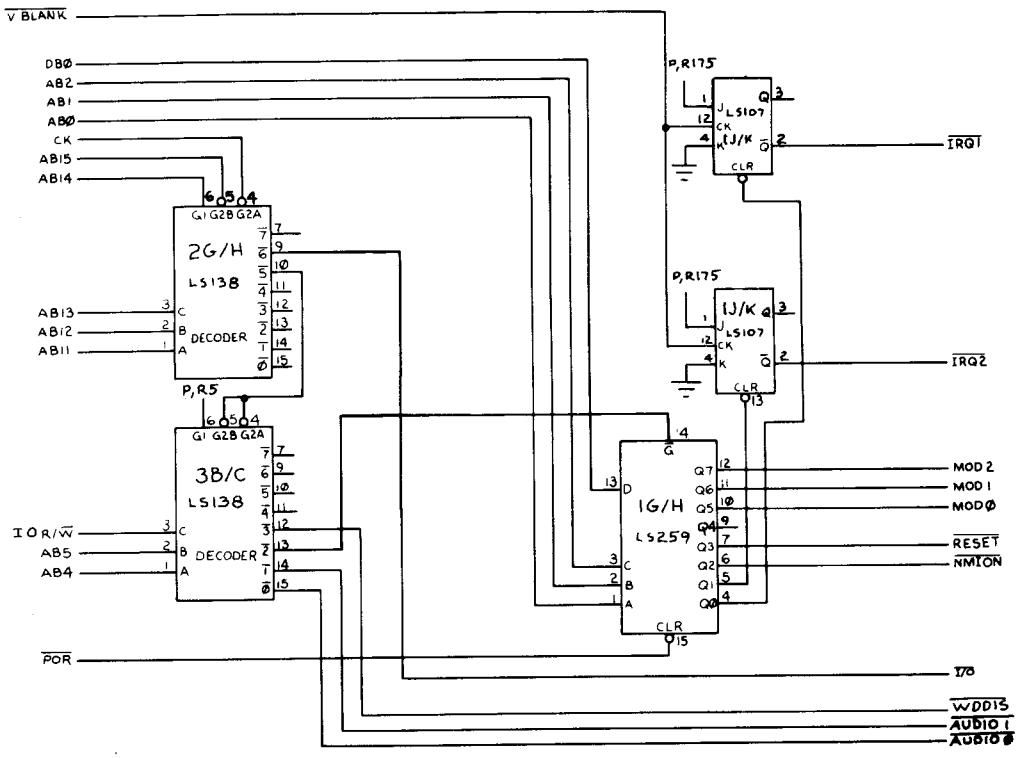
Dig Dug Game PCB Schematic Diagram

SP-203 Sheet 4B
2nd printing 4L

3rd Priority CPU



Address Decoder



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Dig Dug Game PCB Schematic Diagram

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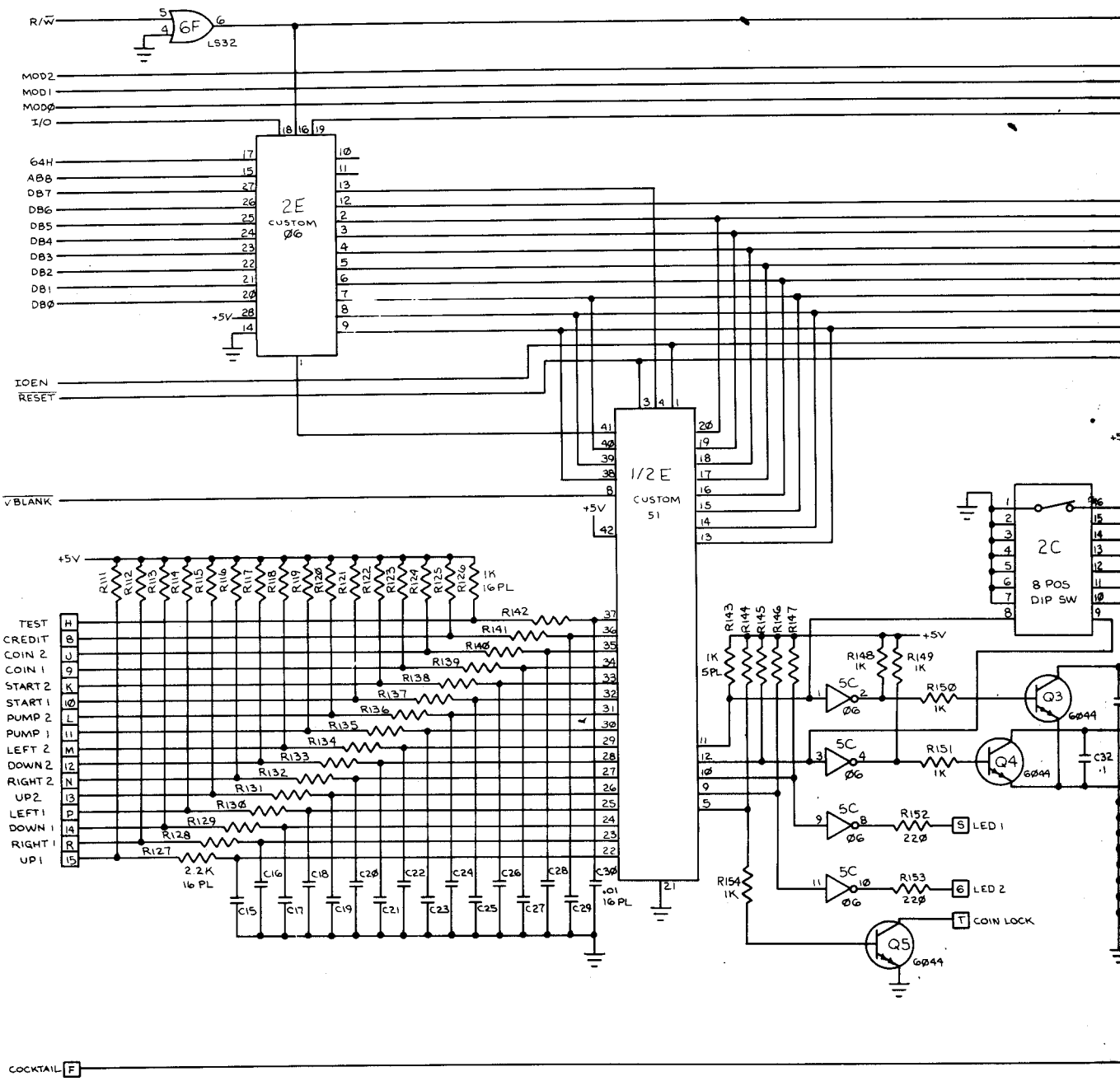
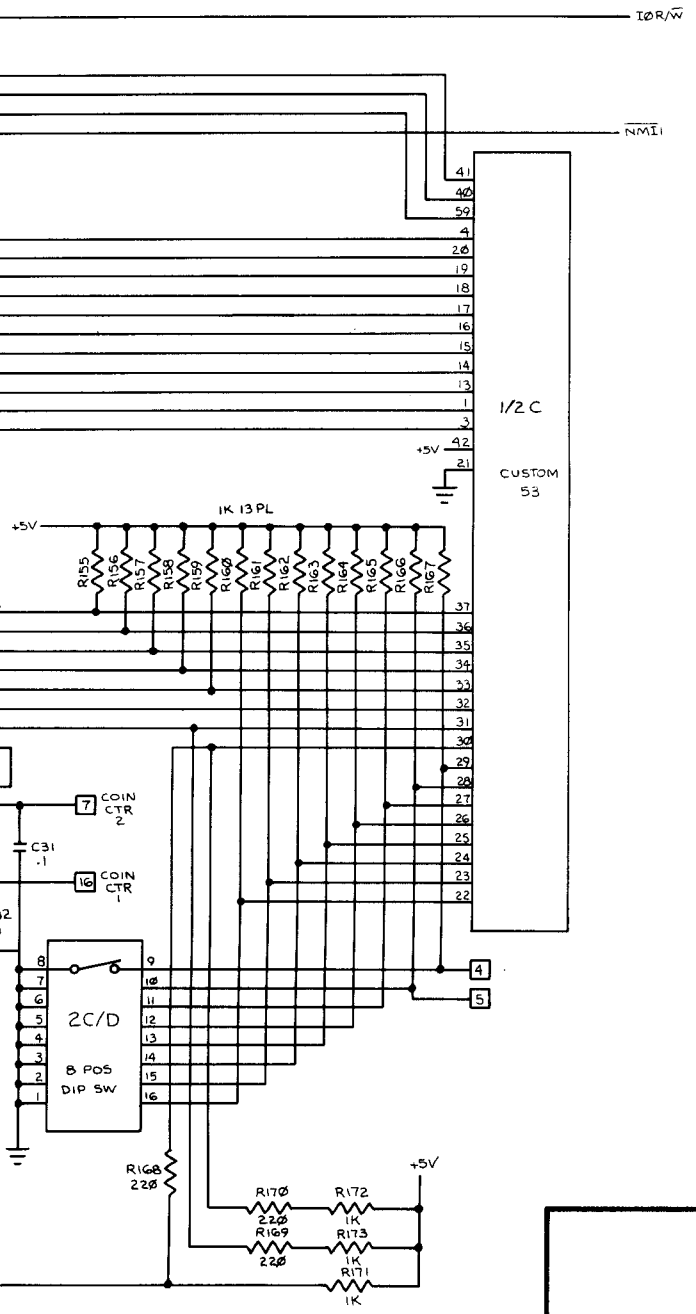
SP-203 Sheet 5A
2nd printing 4L

Switch Inputs, Coin Door and Control Panel



el Outputs



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Dig Dug Game PCB Schematic Diagram

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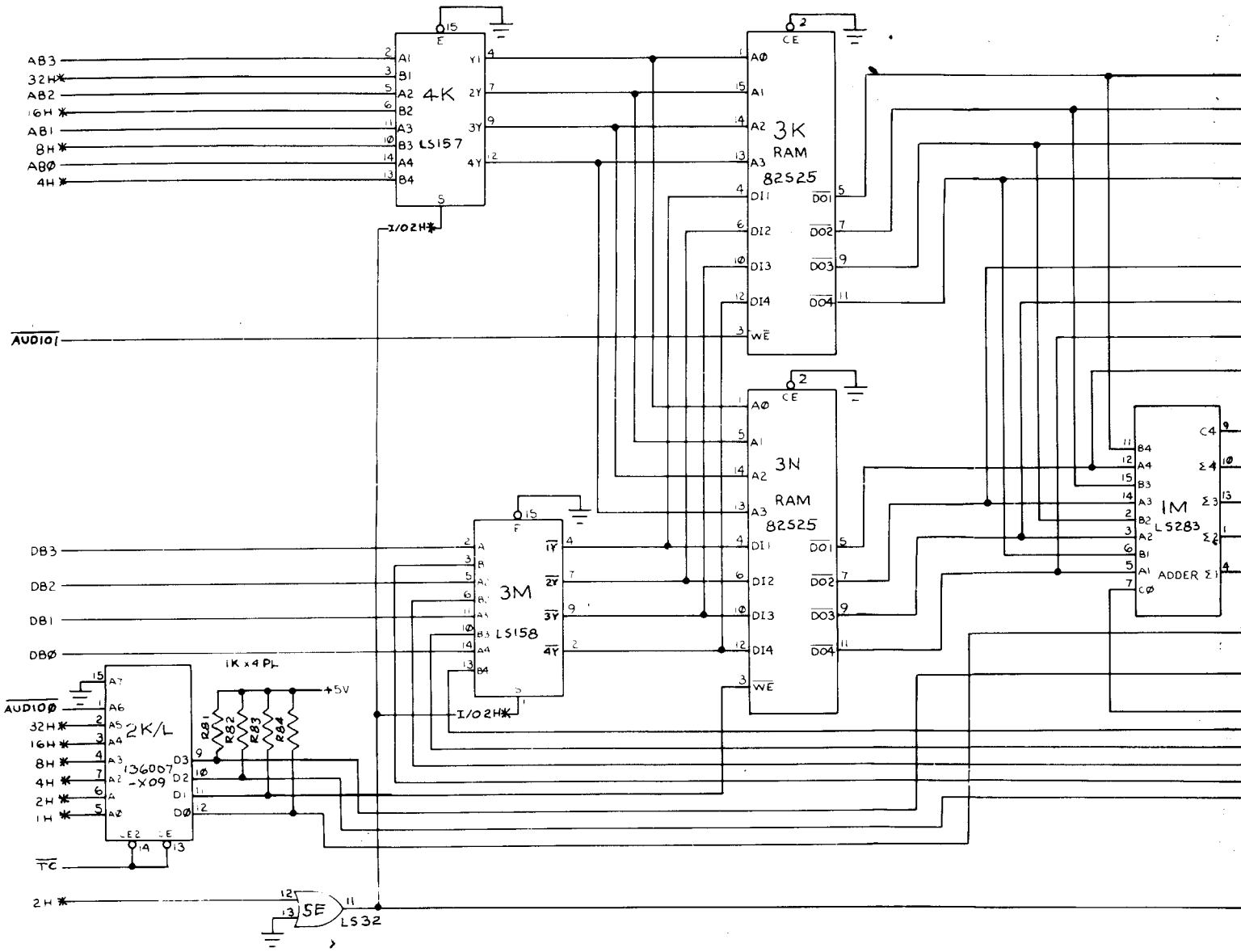
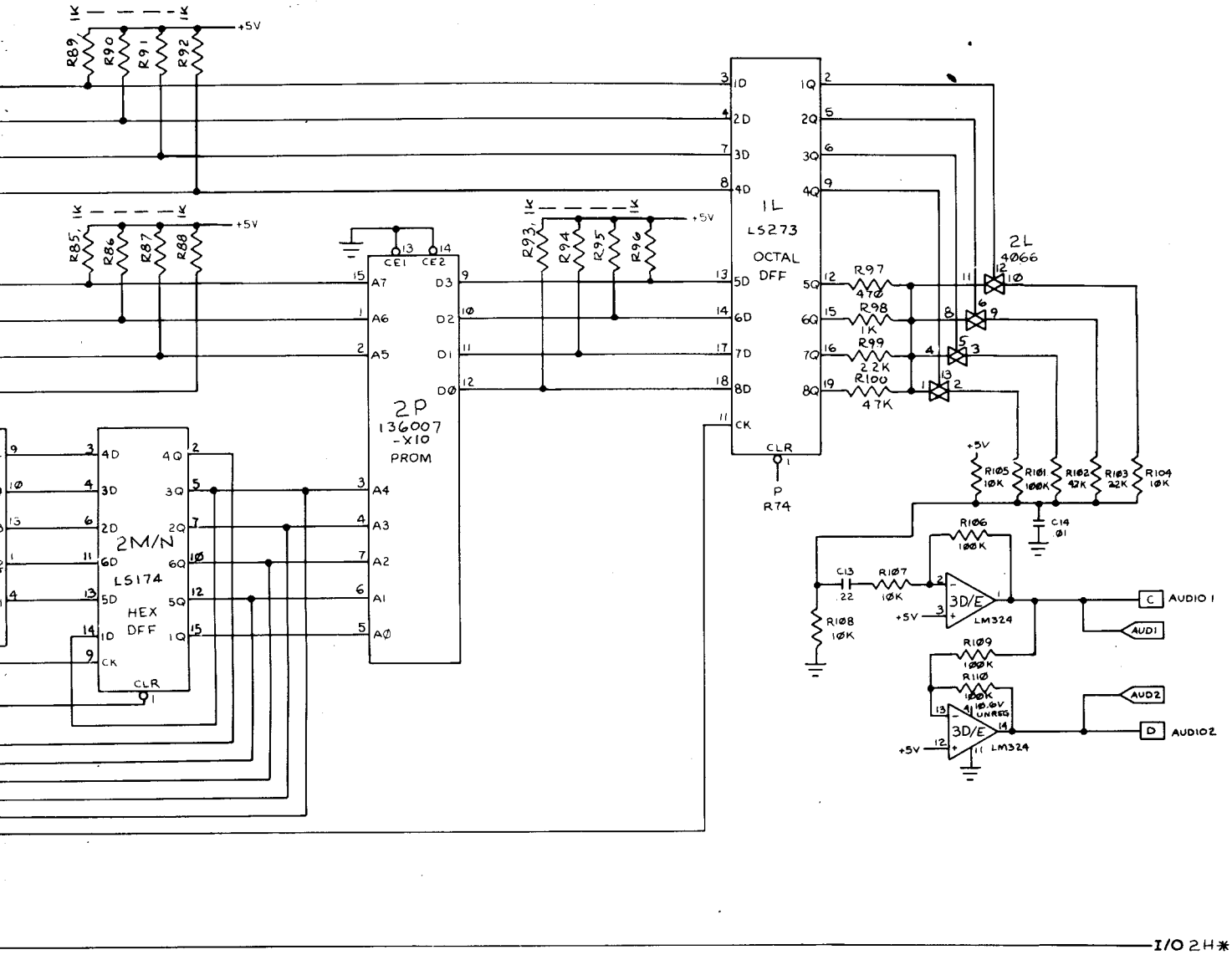
2nd printing 4L

Audio

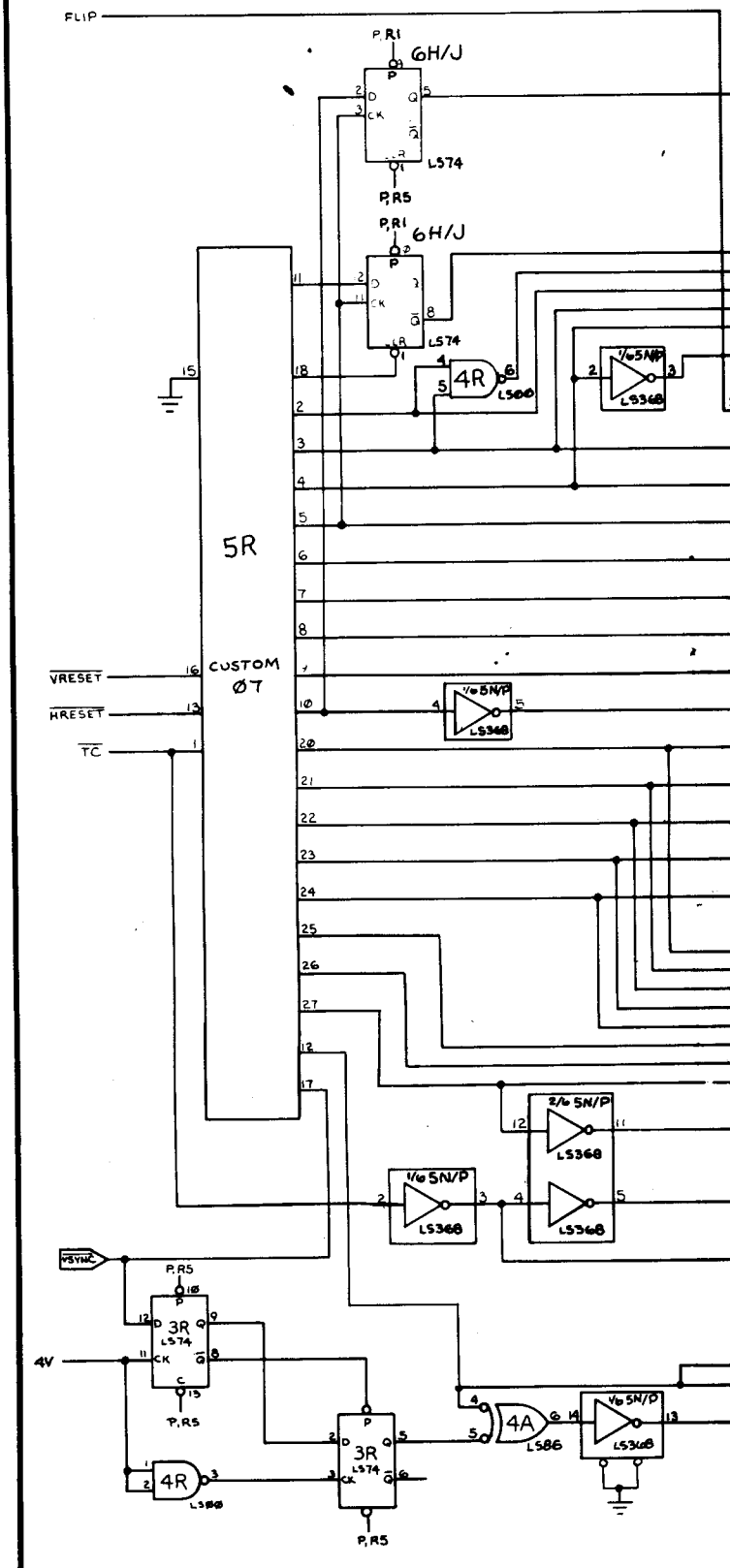

AB3
32H*
AB2
16H*
AB1
8H*
AB0
4H*
4K
LS157
I/O2H*
AUDIO1
3K
RAM
82525
3N
RAM
82525
3M
LS158
1M
LS283
ADDER Σ1
DB3
DB2
DB1
DB0
1K x 4 PL
2K/L
136007
-X09
AUDIO0
32H*
16H*
8H*
4H*
2H*
1H*
+5V
R81
R82
R83
R84
TC
2H*
5E
LS32

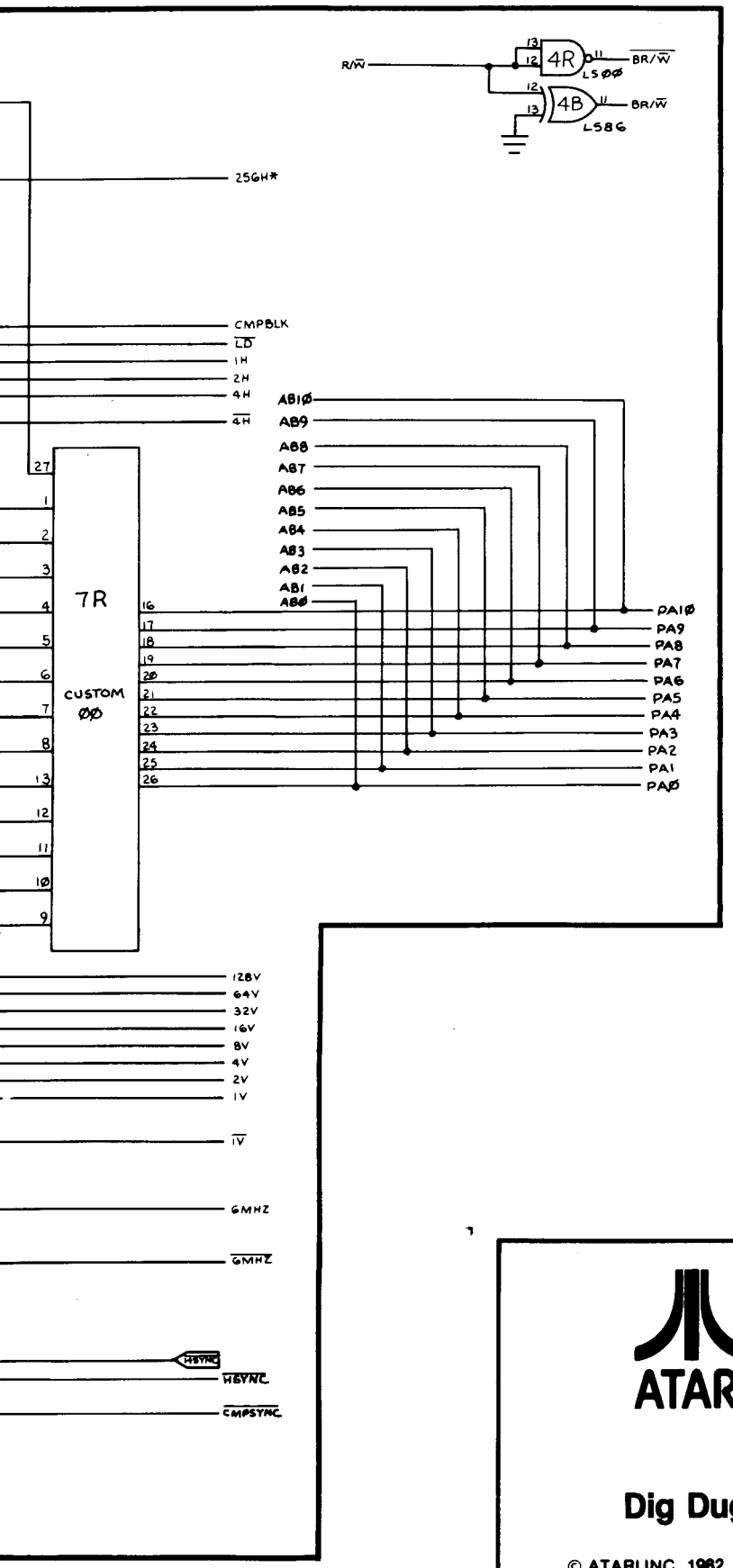


Dig Dug Game PCB Schematic Diagram

SP-203 Sheet 6A
2nd printing 4L

Sync Generator





Dig Dug Game PCB Schematic Diagram

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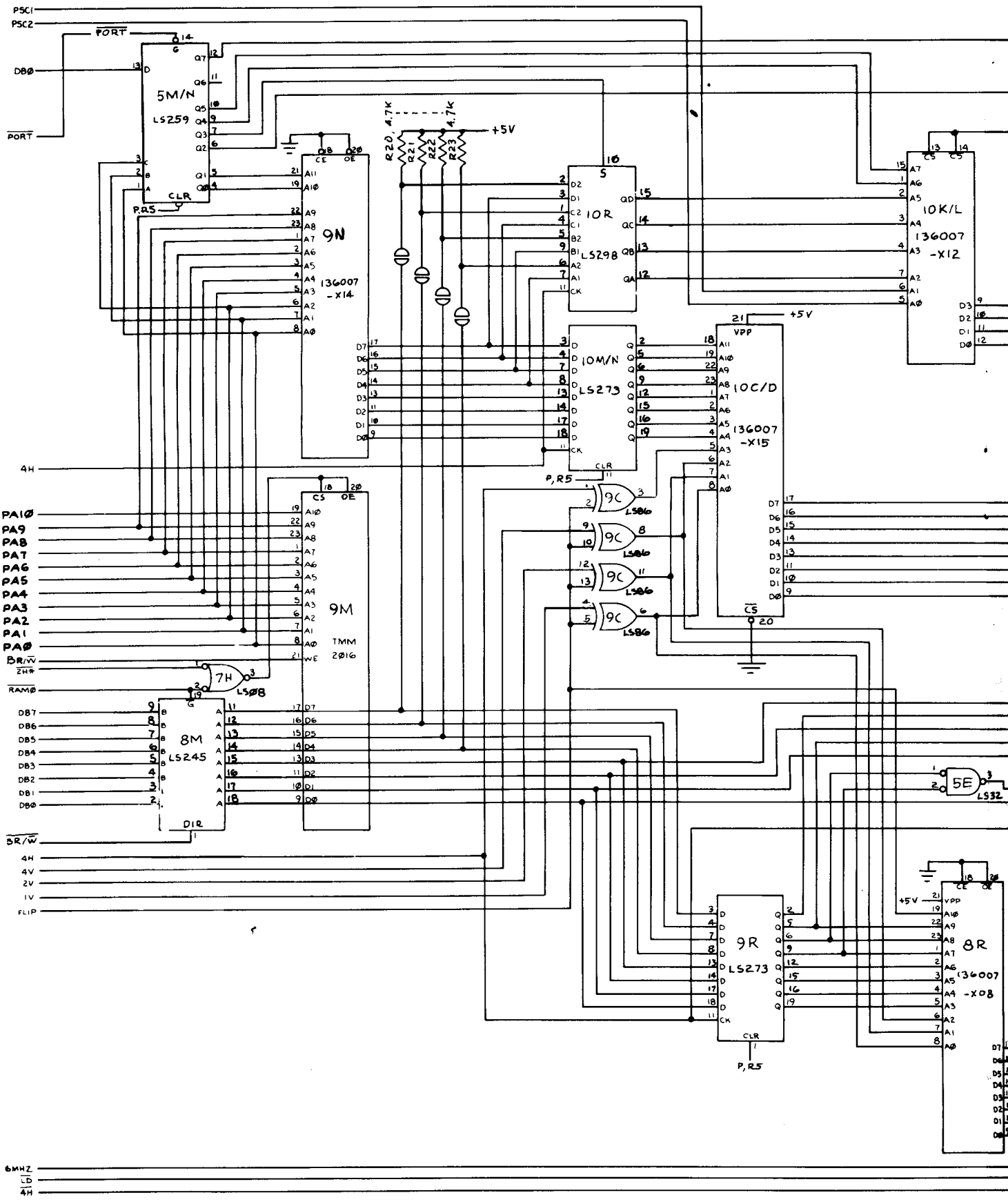
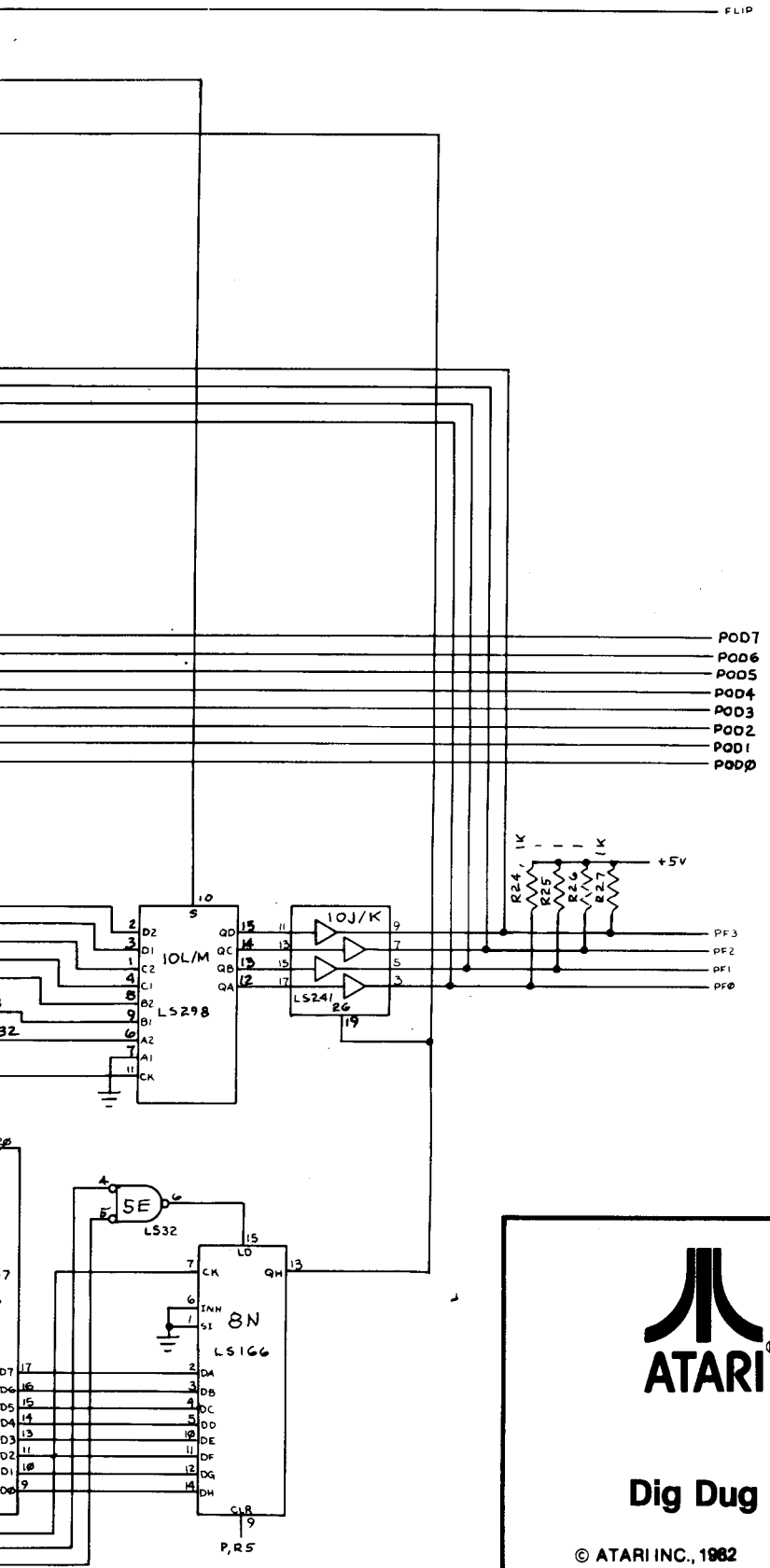
SP-203 Sheet 6B
2nd printing 4L

Playfield Generator





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Dig Dug Game PCB Schematic Diagram

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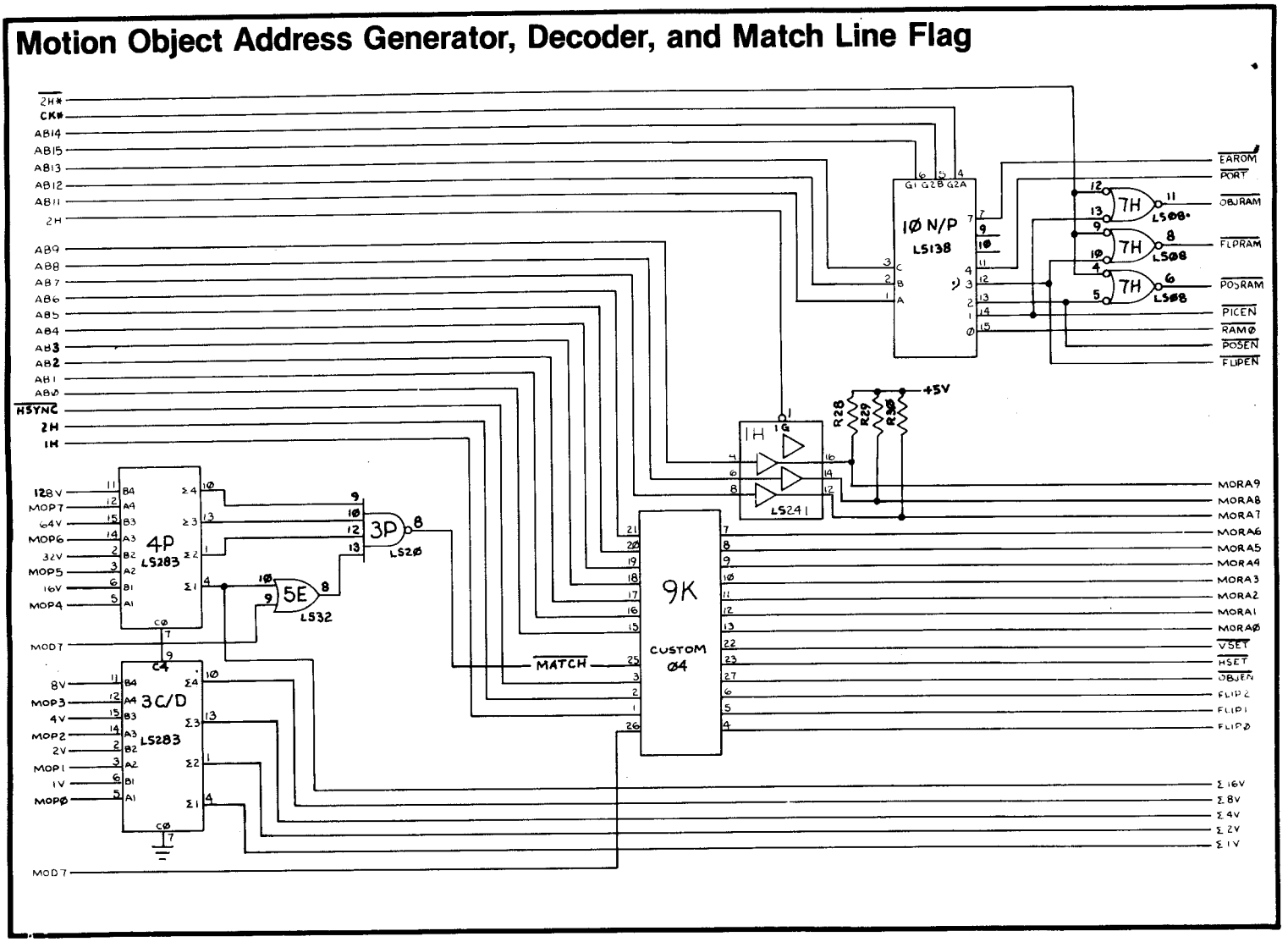
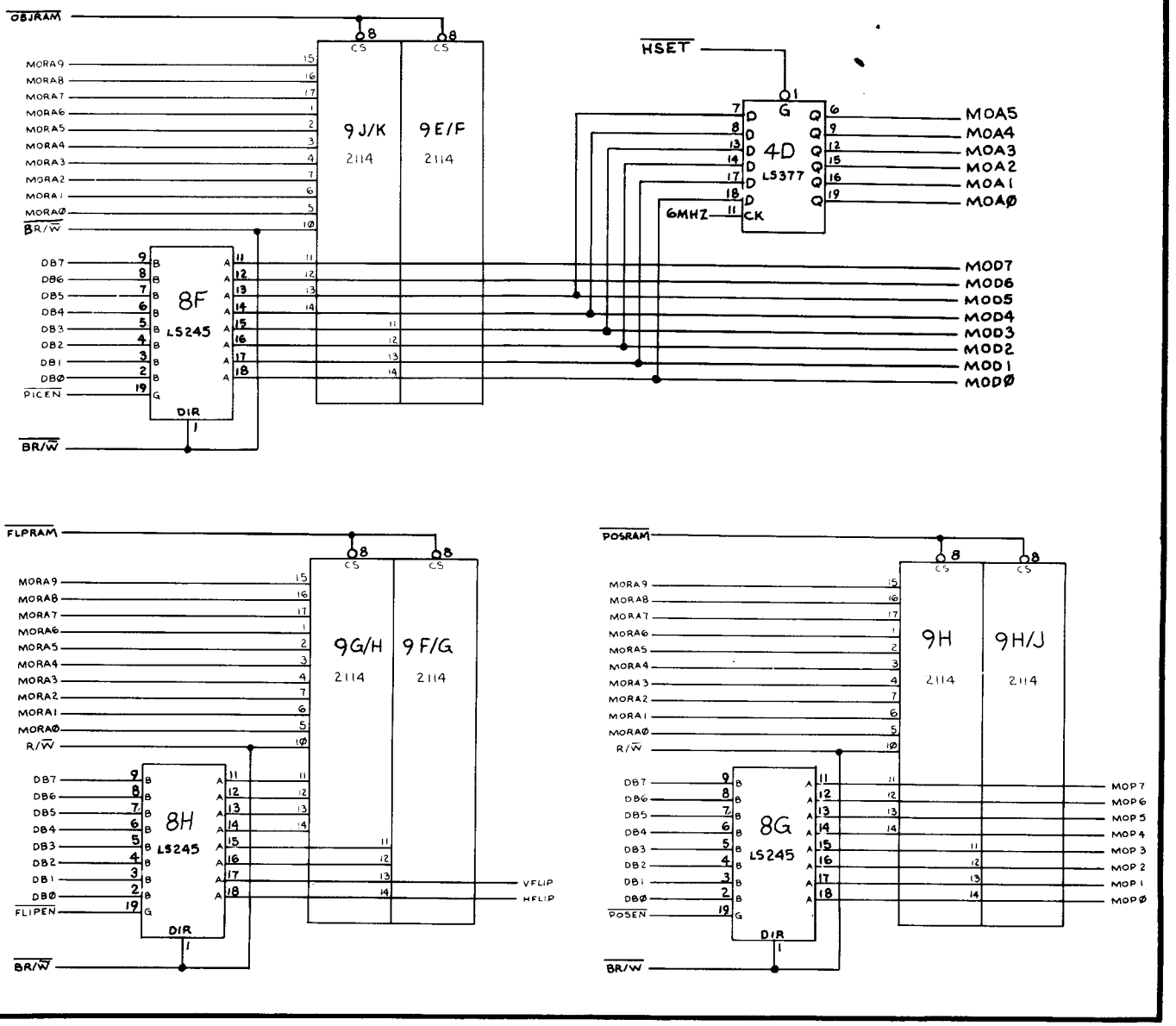
SP-203 Sheet 7A
2nd printing 4L

Motion Object Address Generator, Decoder, and Match Line Flag



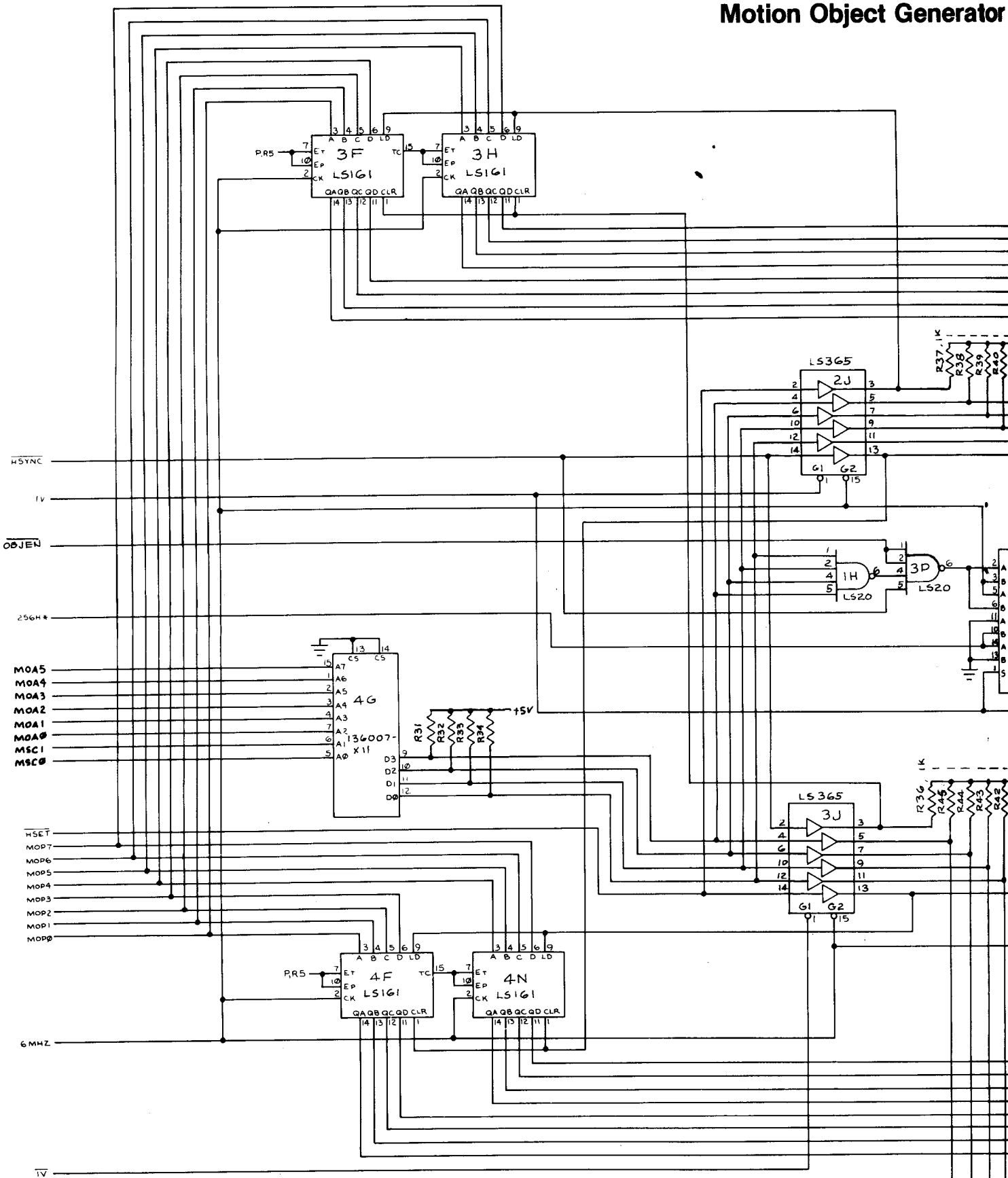
Motion Object RAM



Dig Dug Game PCB Schematic Diagram

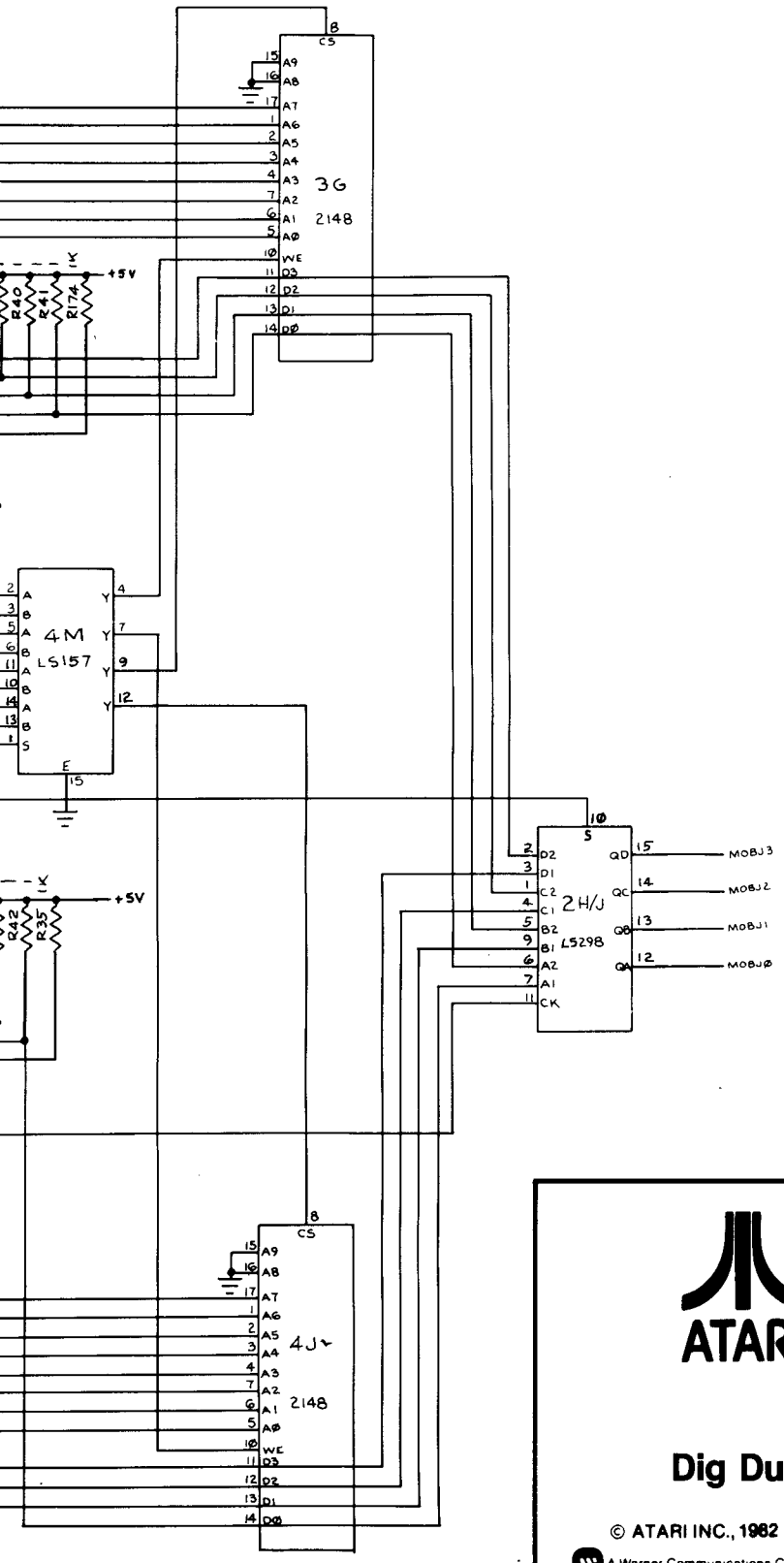
SP-203 Sheet 7B
2nd printing 4L

Motion Object Generator



MOP0 through MOP7 - Motion Object V and H Position Data.
MOBJA0 through MOBJA7 - Motion Object Picture Address.

tor



MOBJ0 through MOBJ3 -
Motion Object Output.

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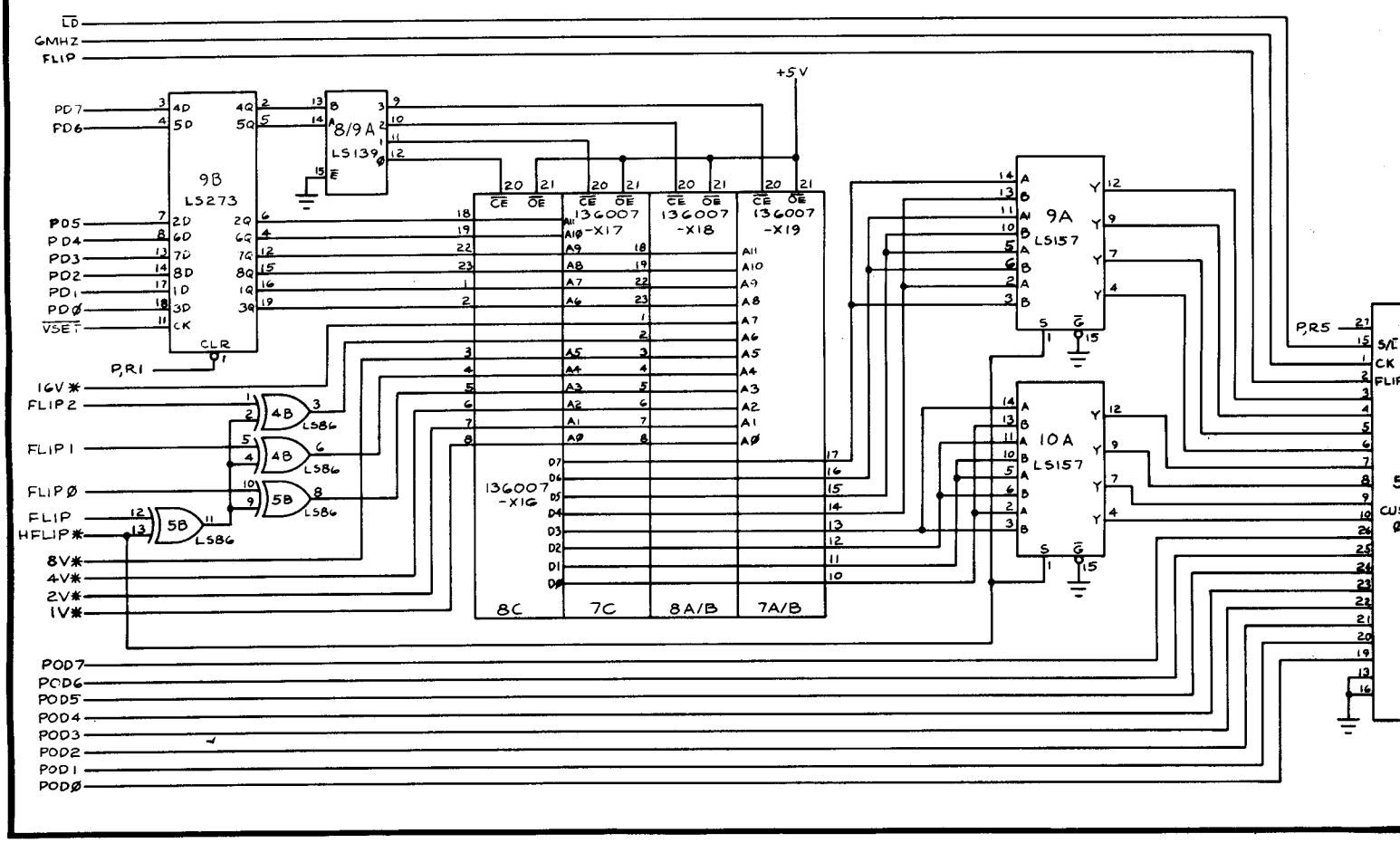
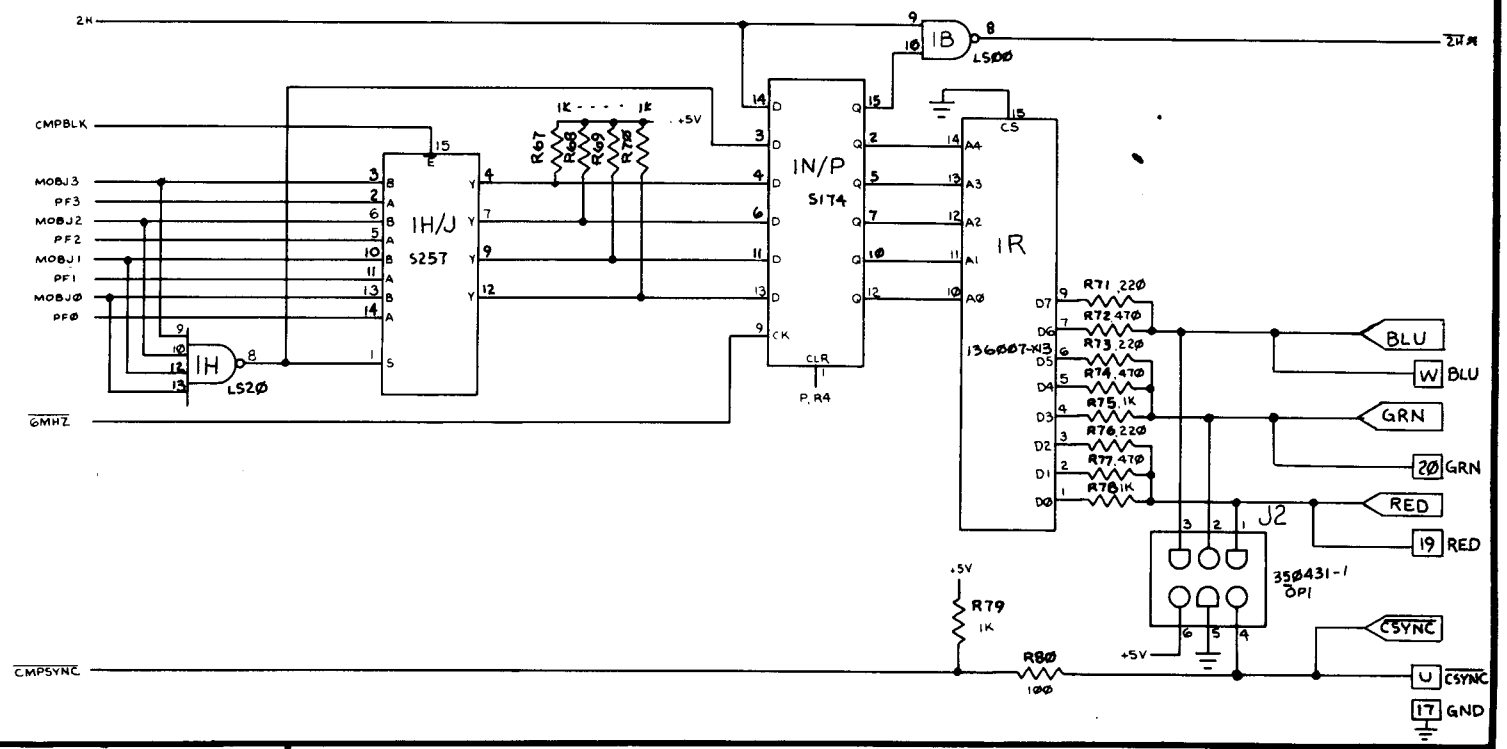
Dig Dug Game PCB Schematic Diagram

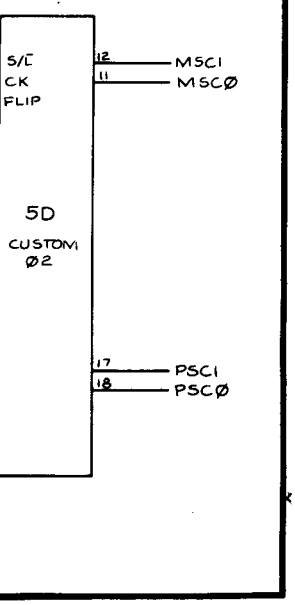
SP-203 Sheet 8A
2nd printing 4L

Video Color Controller



Video Output





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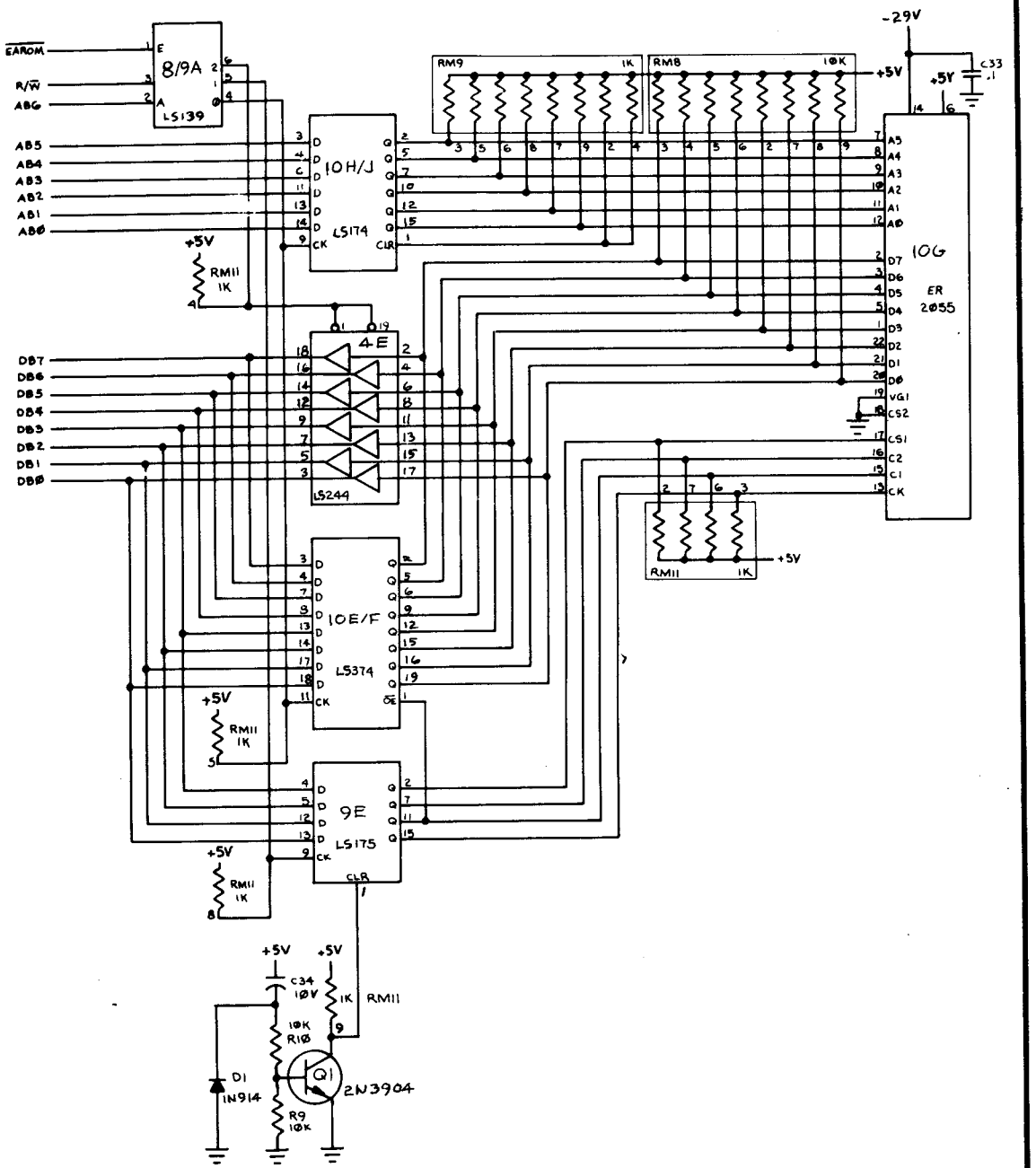
Dig Dug Game PCB Schematic Diagram

SP-203 Sheet 8B
2nd printing 4L

High-Score Table



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Dig Dug Game PCB Schematic Diagram

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SP-203 Sheet 9A
2nd printing 4L

Color Display Schemati

Schematic Notes

Unless otherwise specified

Resistance: (Ω) (K→KΩ, M→MΩ), 1/4 (W) carbon resistor

Capacitance: 1 or higher→ (pF), less than 1→ (μF)
working voltage→ 50 (V)
ceramic capacitor

Inductance: (μH)

Electrolytic Cap: Capacitance Value (μF)/working voltage (V),
NP → non-polar (or bipolar) electrolytic cap.

Refer to the parts list for additional component information.

⏚ indicates test point connection

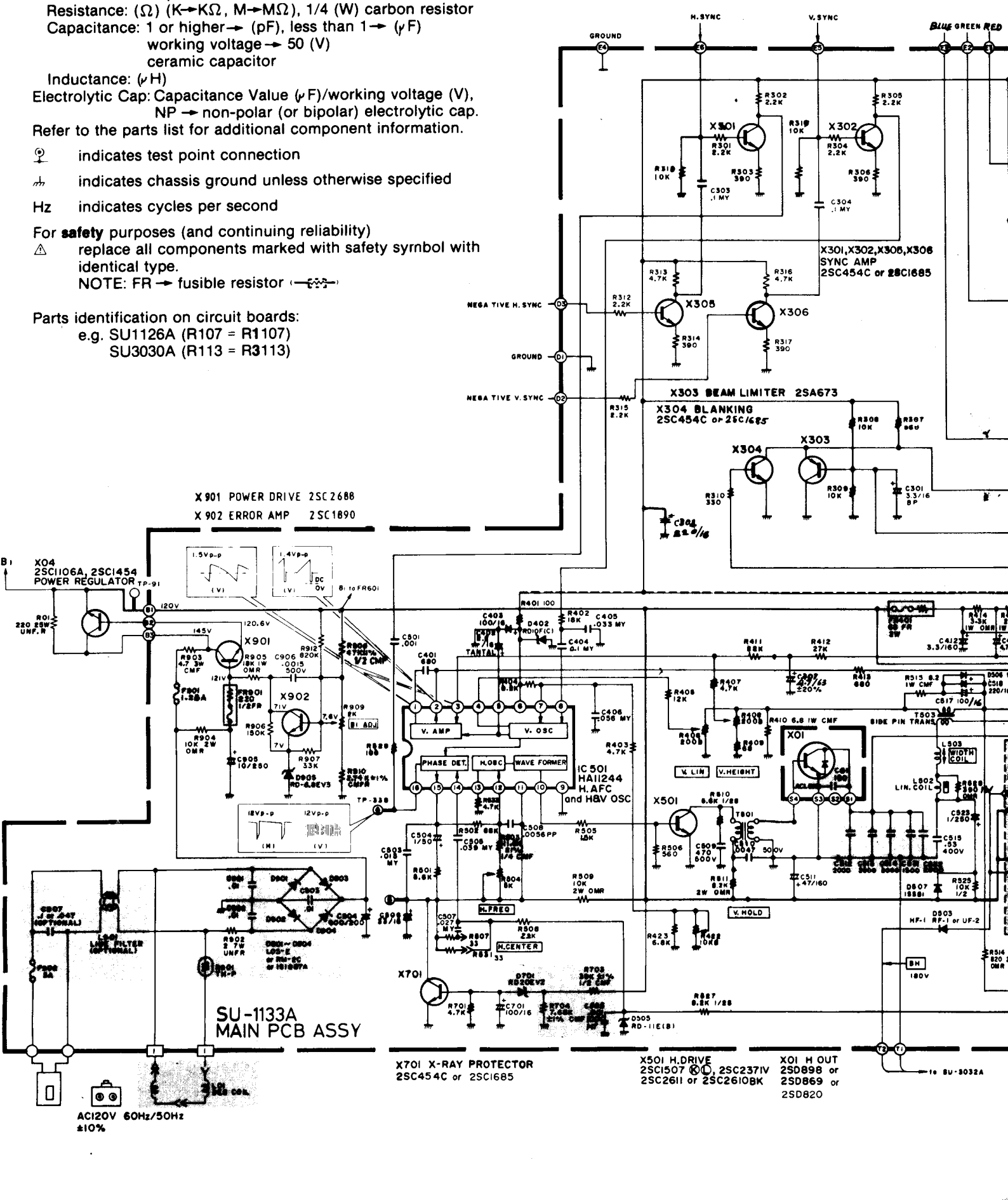
⏚ indicates chassis ground unless otherwise specified

Hz indicates cycles per second

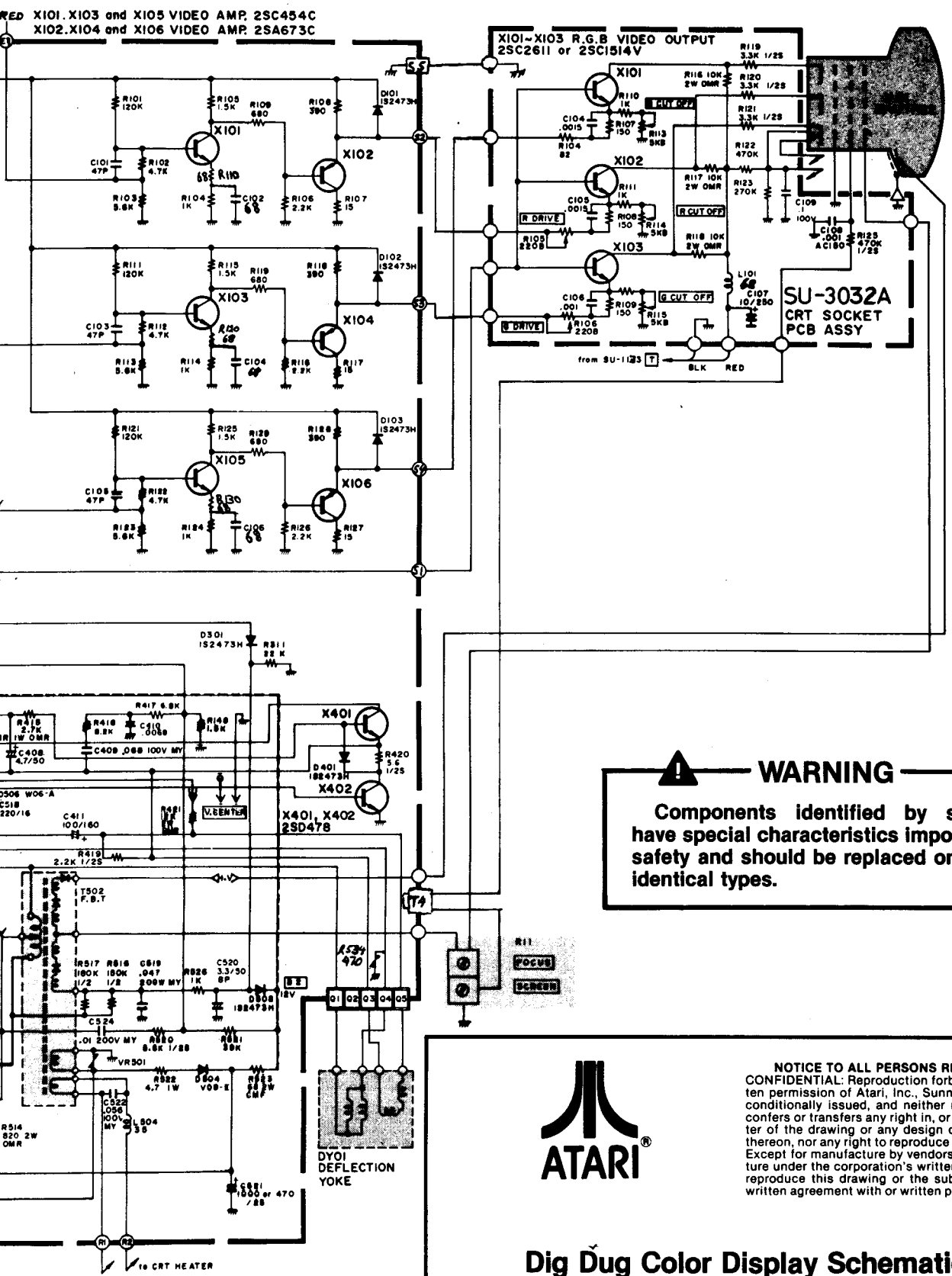
For **safety** purposes (and continuing reliability)

⚠ replace all components marked with safety symbol with identical type.
NOTE: FR → fusible resistor

Parts identification on circuit boards:
e.g. SU1126A (R107 = R1107)
SU3030A (R113 = R3113)



atic Diagram



WARNING

Components identified by shading have special characteristics important to safety and should be replaced only with identical types.

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Dig Dug Color Display Schematic Diagram

SP-203 Sheet 9B
2nd printing 4L