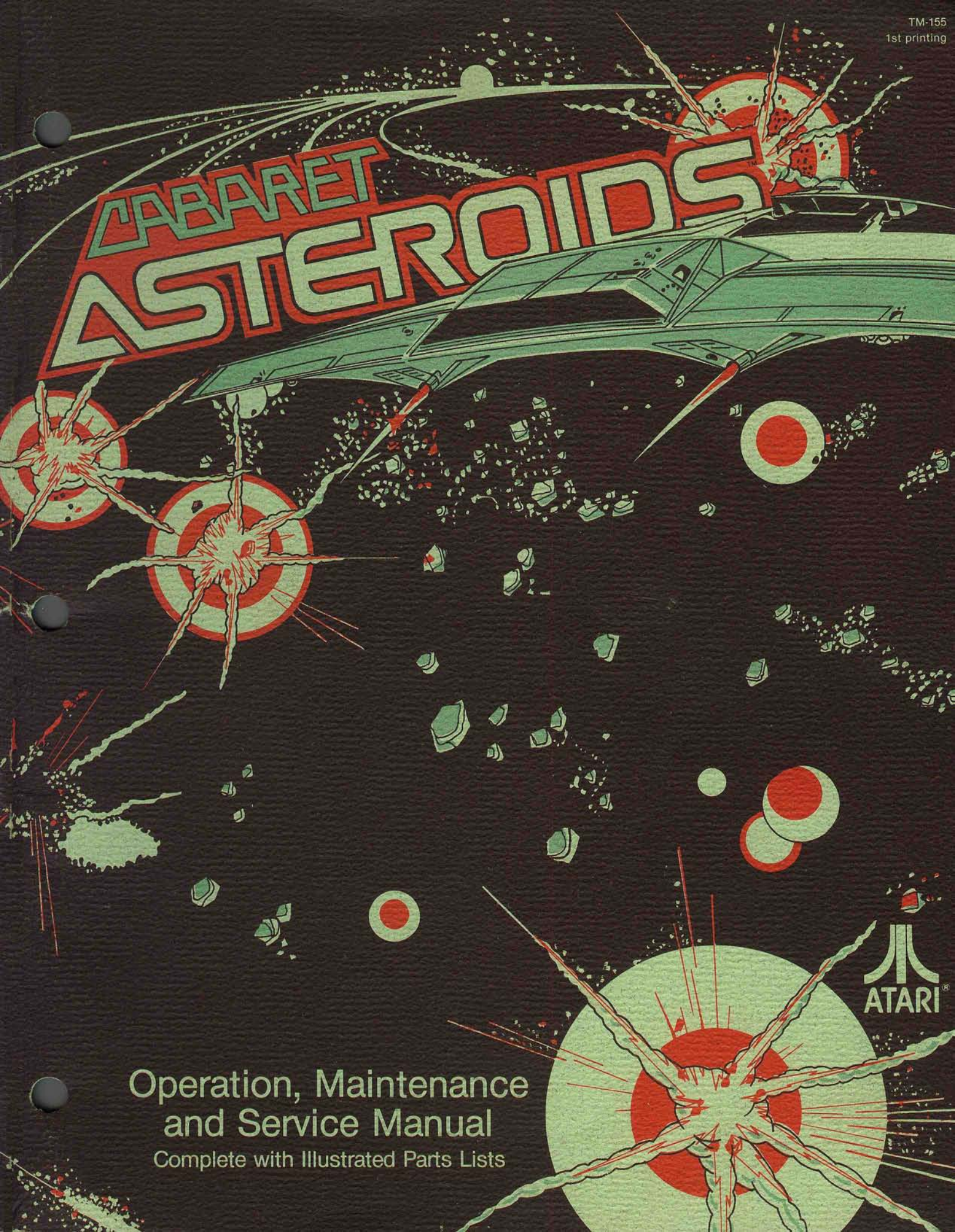
TM-155
1st printing

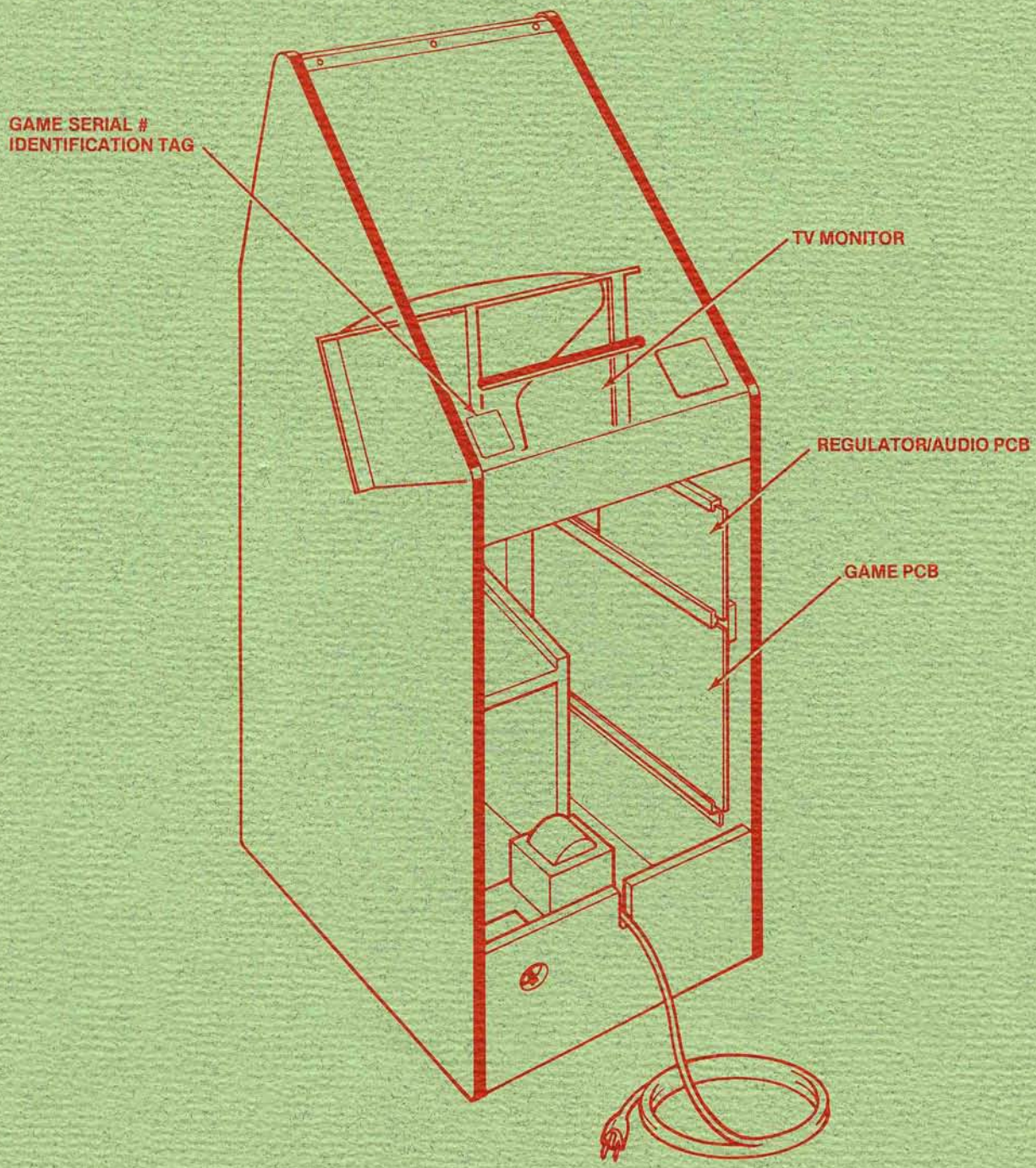


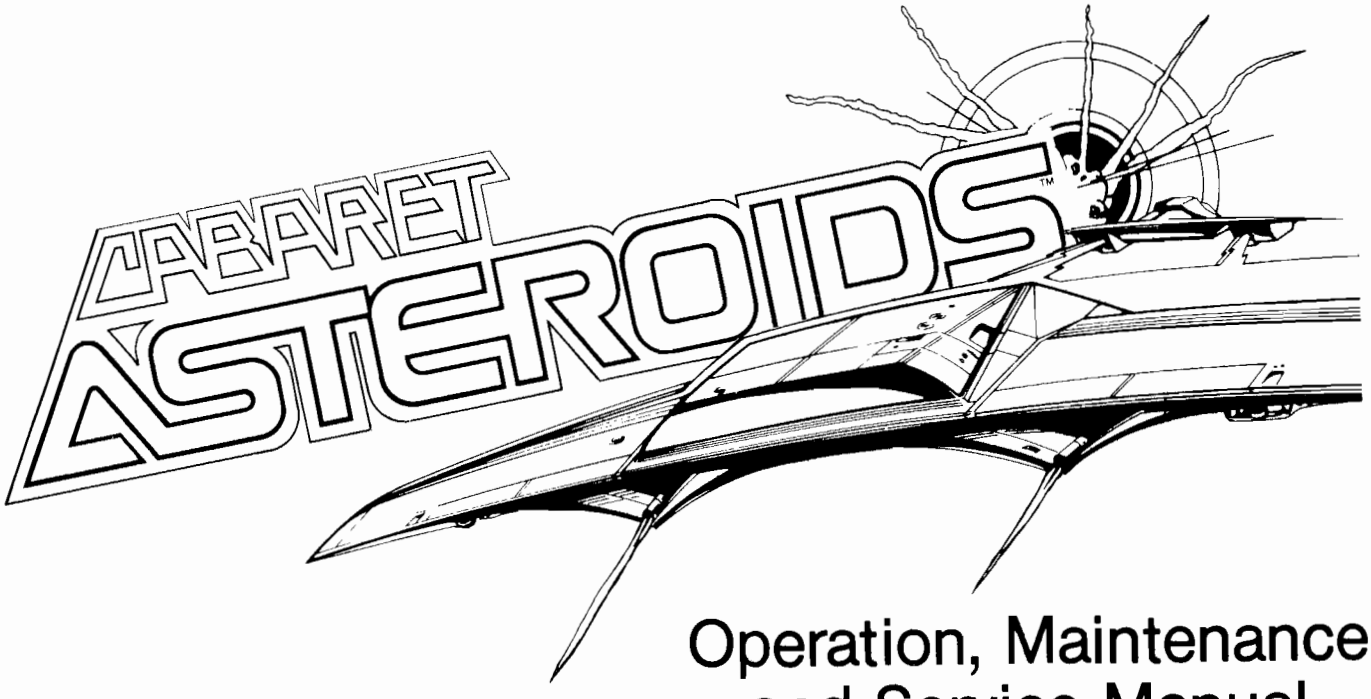
Operation, Maintenance and Service Manual

Complete with Illustrated Parts Lists

GAME SERIAL NUMBER LOCATION

Your game's serial number is stamped on a plate on the outside of the game. The same number is also stamped on the chassis of the TV monitor, on the Regulator/Audio PCB and the Game PCB. Please mention this number whenever calling your distributor for service.





Operation, Maintenance and Service Manual

Complete with Illustrated Parts Lists

Published by:
ATARI INC
1265 Borregas Avenue
P. O. Box 427
Sunnyvale, California 94086

ATARI®

Lithographed in the U.S.A. 6J

A Warner Communications Company

Table of Contents

1 Location Setup

A. New Parts 1
B. Game Inspection 3
C. Game Installation 3
   1. Voltage Selection 3
   2. Interlock and Power On/Off Switches 4
D. Self-Test Procedure 6
E. Game Play 9
   1. Attract Mode 9
   2. Ready-to-Play Mode 9
   3. Play Mode 9
   4. High Score Initial Mode 10

2 Maintenance and Repair

A. Cleaning 12
B. Fuse Replacement 12
C. Opening the Control Panel 12
   1. Leaf Switch Replacement 13
   2. LED Switch Replacement 13
D. TV Monitor Replacement 14
E. Printed-Circuit Board Replacement 15
F. Fluorescent Tube Replacement 16
G. Coin Door Repairs 17
H. Game Operation 19

3 Illustrated Parts Lists

List of Illustrations

Figure 1 Overview of Game 2
Figure 2 Installation Requirements 3
Figure 3 Power Supply 4
Figure 4 Interlock and Power On/Off Switches 5

Figure 5 Location of Self-Test Switch, Volume Control and Option Switches . 6
Figure 6 Self-Test Procedure 7
Figure 7 Option Switch Settings 8
Figure 8 Opening the Control Panel and Replacing Switches 12

Figure 9 TV Monitor Removal 14
Figure 10 Game and Regulator/Audio PCB Replacement 15
Figure 11 Fluorescent Tube Replacement 16
Figure 12 Removing Coin Mechanism 17

Figure 13 Switch and Trip Wire Replacement 18
Figure 14 Coin Door Lamp Replacement 19
Figure 15 Power Distribution 20
Figure 16 Signal Distribution 21

Illustrated Parts Lists:

Figure 17 Cabinet-Mounted Assemblies 24
Figure 18 Control Panel Assembly 26
Figure 19 Fluorescent Light Assembly 27
Figure 20 Regulator/Audio PCB Assembly 28

Figure 21 Asteroids Game PCB Assembly 30
Figure 22 Power Supply Assembly for X-Y Games 34
Figure 23 New Coin Door 36

NOTE

If reading through this manual does not lead to solving a certain maintenance problem, call Tele-Help™ at the Atari Customer Service office in your geographical area, as shown in one of the two maps below. Order all parts from the California office.

WEST and CENTRAL U.S.A.

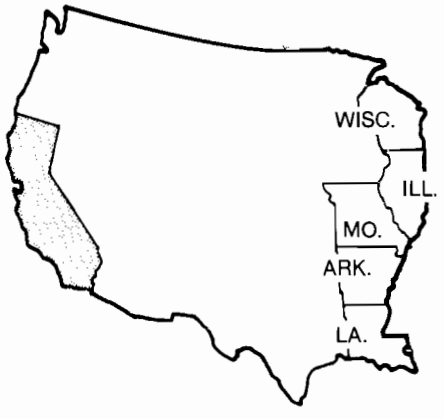
Parts for all Atari Customers. Sales and Service

Atari Coin-Op Customer Service
1344 Bordeaux Drive, Sunnyvale, CA 94086
Telex 17-1103

(Monday - Friday, 7:30 - 4:00 pm Pacific Time)

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

☎ From anywhere else in this area
toll-free (800) 538-1611



EAST U.S.A.

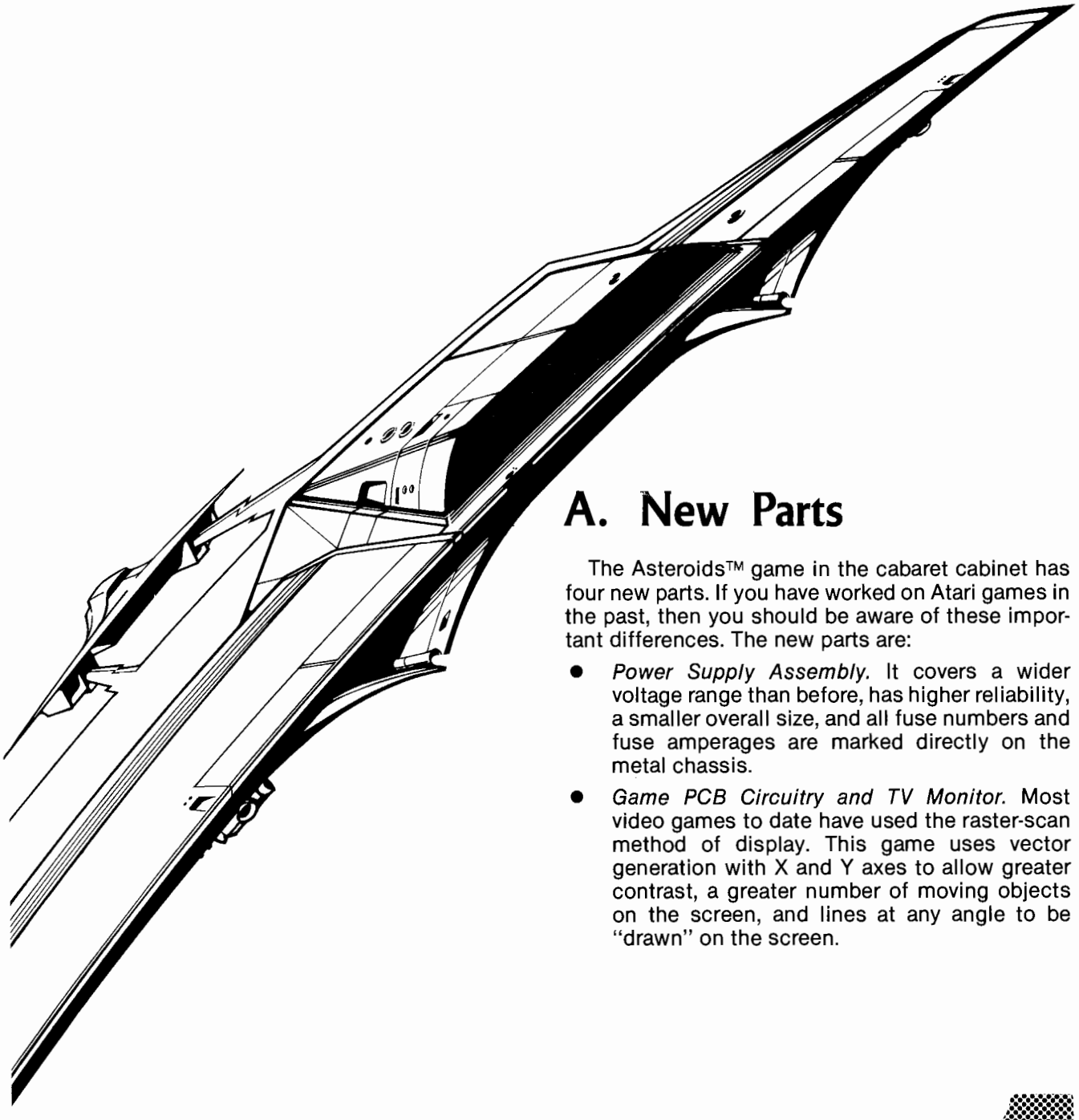
Sales and Service Only

Atari Inc.
New Jersey Customer Service Office
Cottontail Lane, Somerset, NJ 08873
Telex 37-9347

(Monday - Friday, 8:30 - 5:00 pm Eastern time)

☎ From New Jersey
(201) 469-5993

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



A. New Parts

The Asteroids™ game in the cabaret cabinet has four new parts. If you have worked on Atari games in the past, then you should be aware of these important differences. The new parts are:

- *Power Supply Assembly.* It covers a wider voltage range than before, has higher reliability, a smaller overall size, and all fuse numbers and fuse amperages are marked directly on the metal chassis.
- *Game PCB Circuitry and TV Monitor.* Most video games to date have used the raster-scan method of display. This game uses vector generation with X and Y axes to allow greater contrast, a greater number of moving objects on the screen, and lines at any angle to be "drawn" on the screen.

1

Location Setup

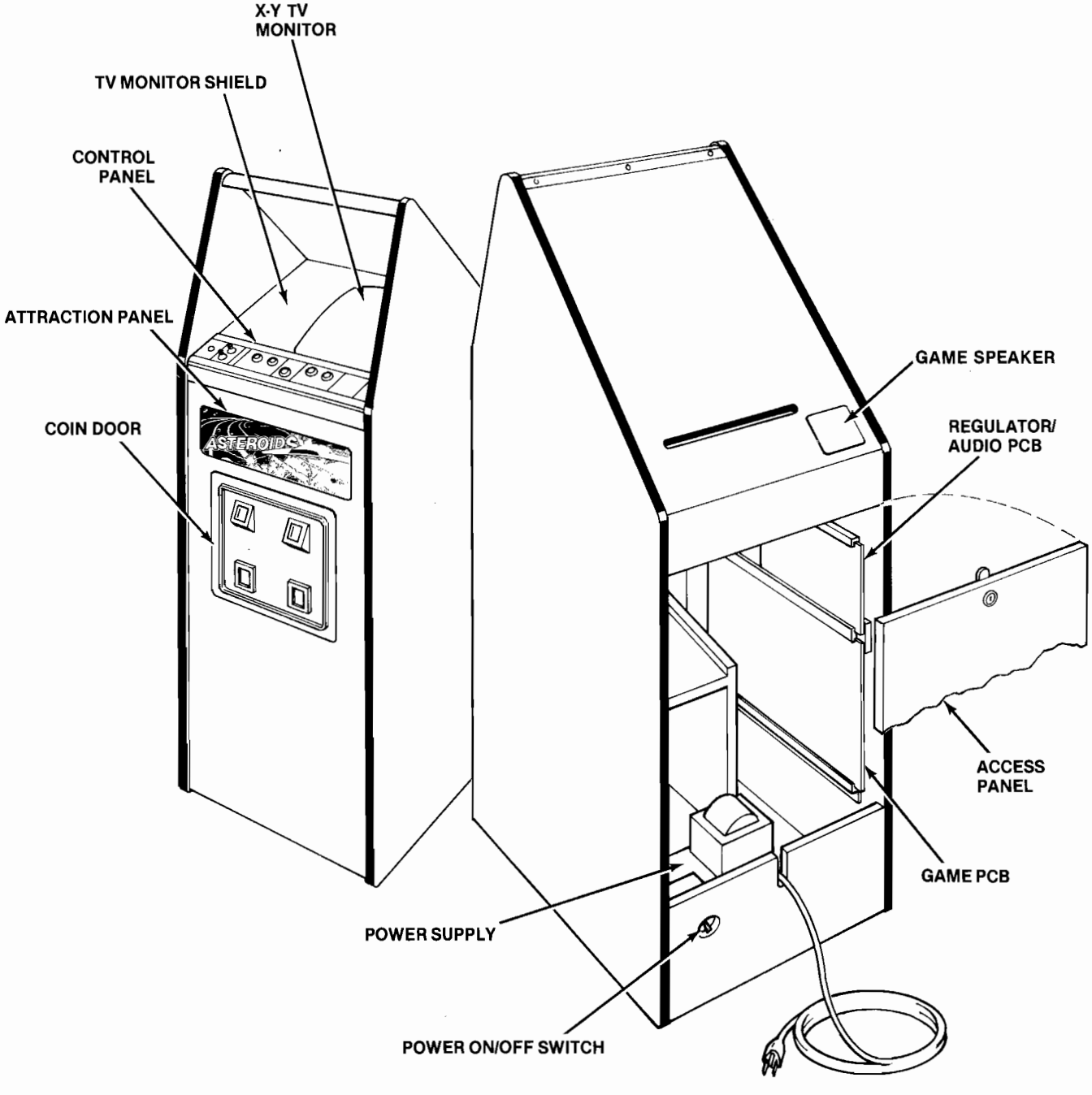


Figure 1 Overview of Game

- *Cabaret Cabinet Design.* This more compact cabinet was designed to occupy less than 4 square feet of floor space.

- *New Coin Door.* This door will accomodate two or three mechanisms, and up to four coin counters. Its triple-arm locking bar provides added security. For greater ease of access, the self-test switch is now mounted on the door, rather than inside the cabinet. Also, for simpler maintenance the door's coin mechanisms require no adjustments.

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

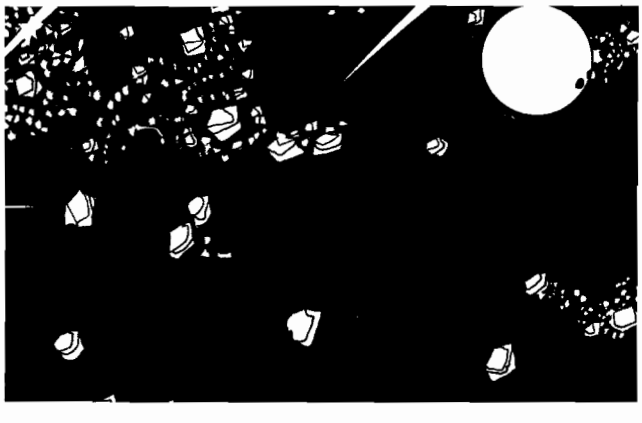
B. Game Inspection

This new game is ready to play upon removal from the shipping carton. However, your careful inspection is needed to supply the final touch of quality control. Please follow these steps to help us insure that your new game 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. Unlock and open the access panel of the cabinet and inspect the interior of the game as follows:
   a. 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!**
   b. Check that all plug-in integrated circuits on the game PCB are firmly seated in their sockets.



WARNING

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

   c. Note the location of the game's serial number—it is printed on the special label on the outside of the game cabinet. Verify that the serial numbers also stamped on the Game PCB, Regulator/Audio PCB and TV Monitor are all identical. A drawing of the serial number locations is on the inside front cover of this manual. Please mention this number whenever you call your distributor for service.
   d. Check all major subassemblies such as the power supply, control panel and TV monitor for secure mounting.

C. Game Installation

Figure 2 Installation Requirements

Power	175 watts
Temperature	0 to 38°C (32 to 100°F)
Humidity	Not over 95% relative
Space Required	52 × 60 cm (20 3/8 × 23¾ in.)
Game Height	140 cm (55 in.)

1. Voltage Selection

Before plugging in your game, make sure that the voltage selection plug on the power supply (see Figure 3) is correct for your location's line voltage. Check the wire color on the plug and see if it is correct per the list below.

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

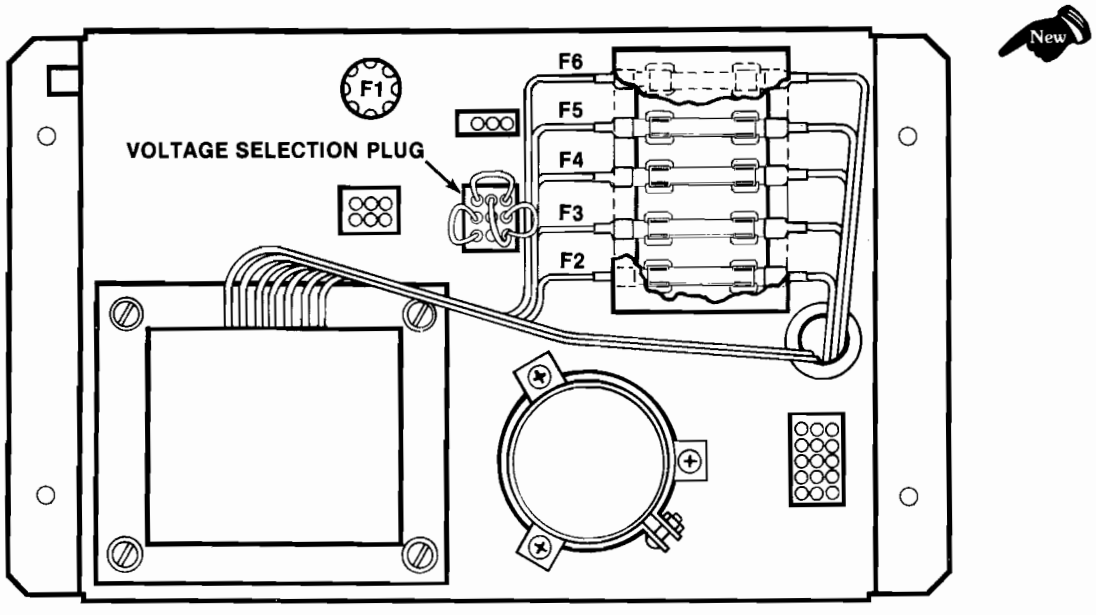


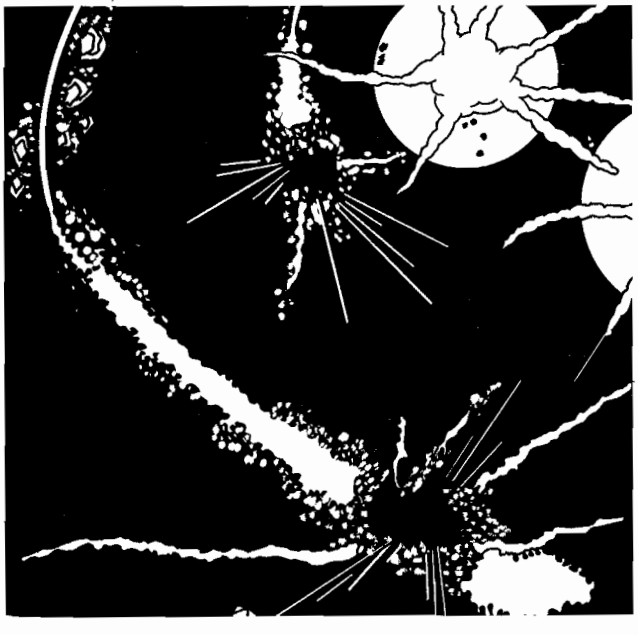
Figure 3 Power Supply

2. Interlock and Power On/Off Switches

To minimize the hazard of electrical shock while working on the inside of the game cabinet, two interlock switches have been installed (see Figure 4). One is located behind the access panel and one is behind the coin door. These switches remove all AC line power from the game circuitry when a door is opened.

Check for proper operation of the interlock switches by performing the following steps:

- Unlock and open the access panel and the coin door.
- Plug the AC line power cord into an AC outlet.
- Close the access panel and coin door.
- Set the power on/off switch to the on position. Within 30 seconds the TV monitor should display a picture.
- Slowly open the access panel. The TV monitor picture should disappear when the panel is opened approximately 2.5 cm (1 inch). Close and lock the access panel and repeat this step with the coin door.
- If the results of the previous step are satisfactory, the interlock switches are operating properly. If the TV monitor doesn't go off as described, check to see if the corresponding interlock switch is broken from its mounting or stuck in the "on" position.



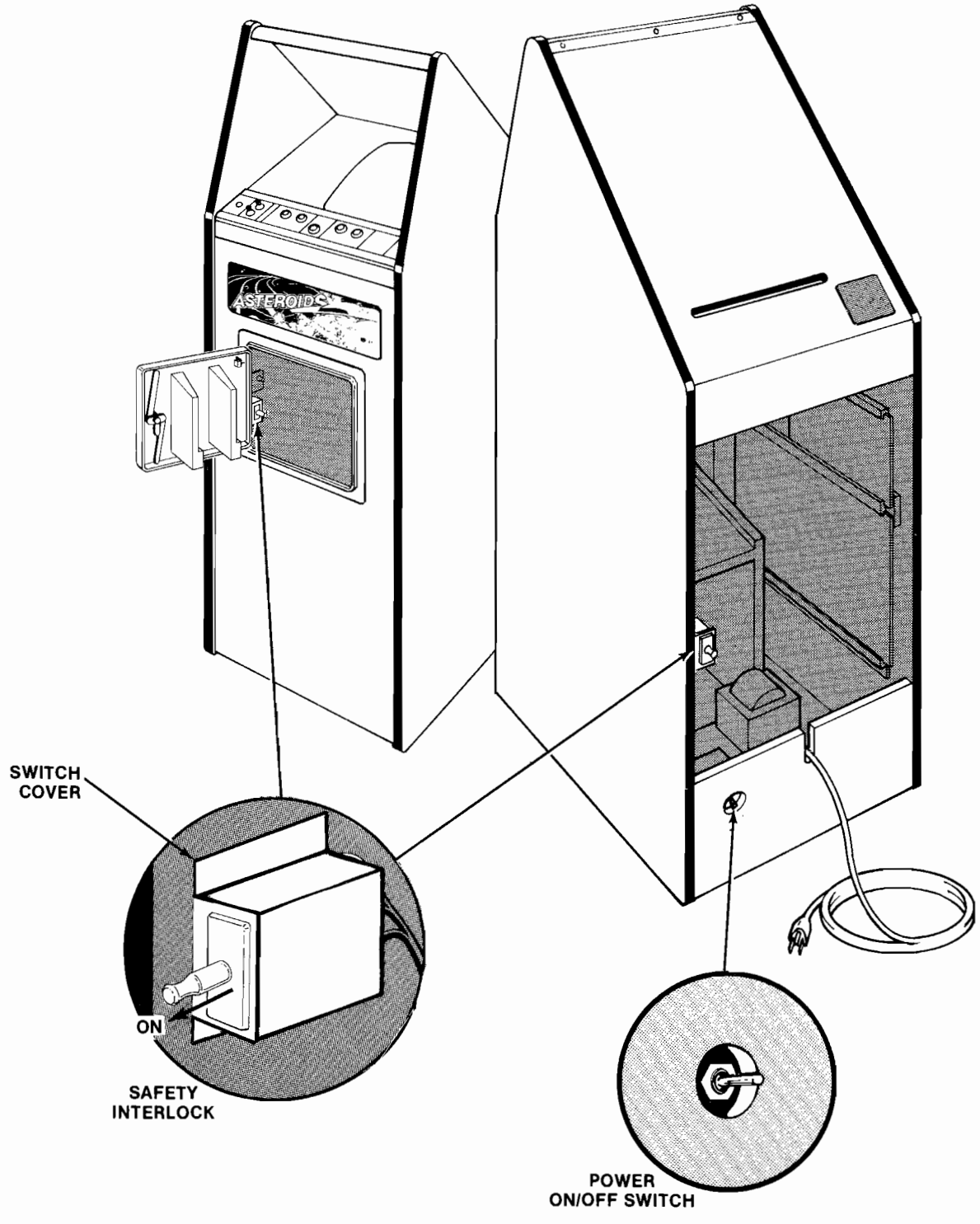


Figure 4 Interlock and Power On/Off Switches

D. Self-Test Procedure

This game will test itself and provide data to demonstrate that the game's circuitry and controls are operating properly. The data is provided on the TV monitor and the game speaker; no additional equipment is necessary.

Part of the self-test procedure includes a display of the operator-selectable game options. Therefore, we suggest you run the self-test procedure anytime you need to change the game's options.

To run the self-test, follow the instructions outlined in Figure 6.

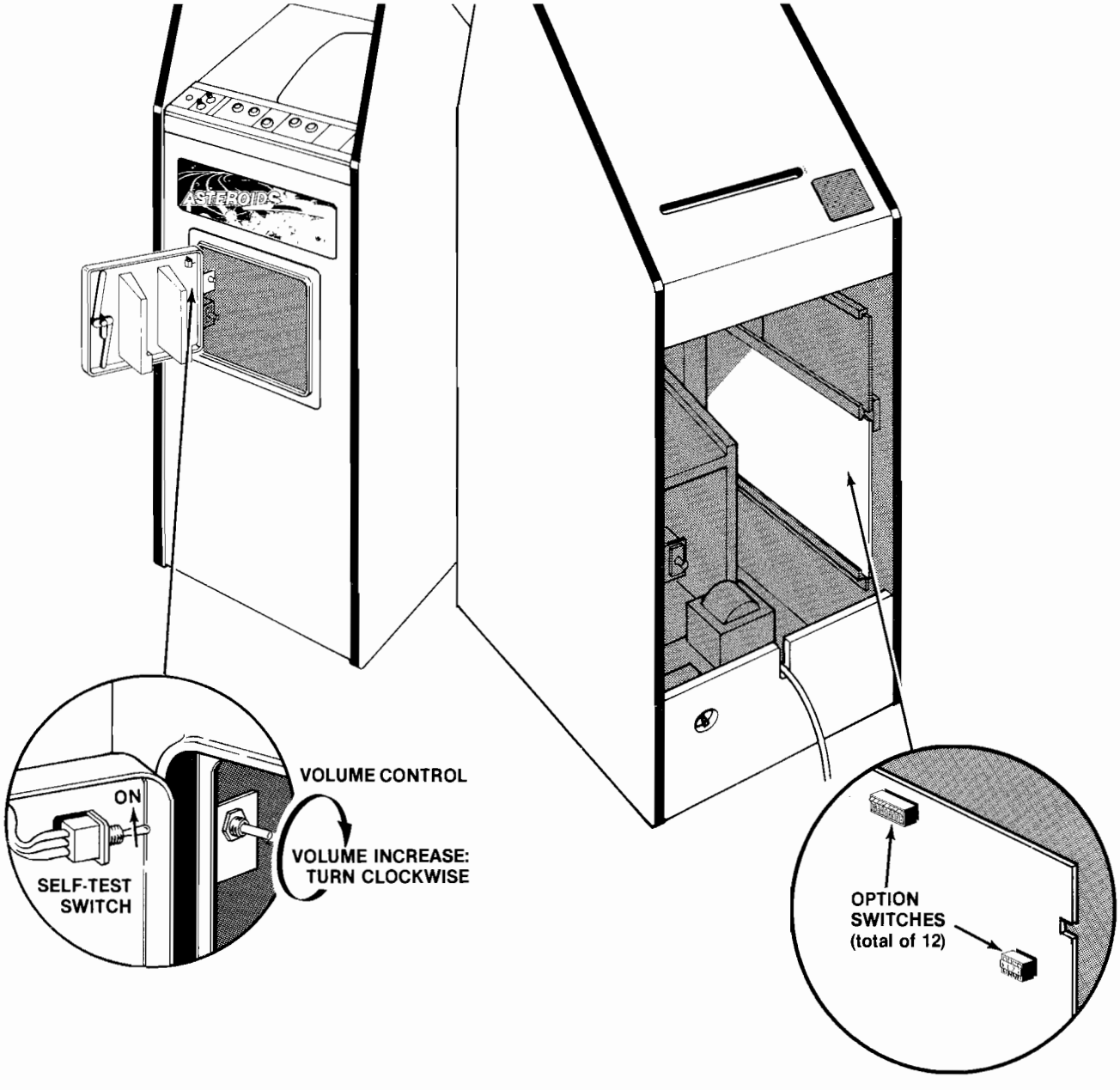


Figure 5 Location of Self-Test Switch, Volume Control and Option Switches

Figure 6 Self-Test Procedure

INSTRUCTION	RESULTS IF TEST PASSES	RESULTS IF TEST FAILS
1. Set self-test switch to **on** position (see Figure 5).	TV monitor displays picture as shown in Figure 7.	*RAM FAILURE* is indicated by a sequence of from 1 to 6 tones. A low-frequency tone is heard for each good RAM chip. A much lower frequency is heard for a failing RAM chip. The test stops with the first failing RAM chip. To restart the sequence, press the Reset pushbutton on the game PCB or set the self-test switch to **off,** then again to the **on** position. Identify the bad RAM chip with table below. Example: Three tones, then a tone of much lower frequency indicates failure of RAM chip R4.

TONE #	RAM CHIP LOCATION
1	D2
2	E2
3	M4
4	R4
5	N4
6	P4

ROM/PROM FAILURE is indicated by two columns or lines of numbers in the upper left-hand corner of the display. The number in the left column or first line indicates the failing ROM/PROM chip(s). Identify the bad ROM/PROM with table below.

The number in the right column or second line indicates the failing data bit of the failing ROM/PROM. Identify the bad bit with the second table below. If more than one bit is failing, the displayed number(s) are hexadecimal combinations of the numbers shown below. Examples:

1) If bits D2 and D3 fail, C is displayed.
2) If bits D2, D3 and D7 fail, 8C is displayed.
3) If bits D4 and D5 fail, 30 is displayed.
4) If bits D1, D3, D5 and D6 fail, 6A is displayed

DISPLAYED NO.	FAILING ROM/PROM		
0 1	N/P3	K4, L4	
2 3	F1	F2, L1	F2, H1 L2, L1
4 5	D/E1	H2, J1	H2, J1 M2, M1
6 7	C1	K1, J2	J2, K1 N2, N1

DISPLAYED NO.	FAILING BIT
1	D0
2	D1
4	D2
8	D3
10	D4
20	D5
40	D6
80	D7

RAMSEL SIGNAL FAILURE is indicated by a **BANK ERROR** or **PAGE SELECT ERROR** message at lower middle of display.

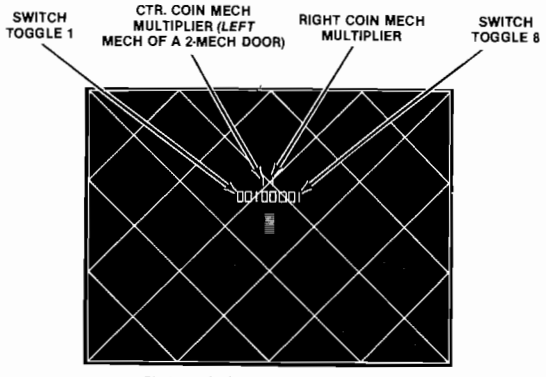
2. Activate all control panel and coin door switches. When satisfied with test, set self-test switch to **off** position.	1 PLAYER START and 2 PLAYER START LEDs are lighted. High-pitched click for each activated switch.	1 PLAYER START and/or 2 PLAYER START LEDs not lighted. High-pitched click sound is not heard for any particular switch.

Figure 7 Option Switch Settings

To change toggle positions of the switch assemblies, you need not remove the game PCB. The switch, usually colored blue, is easily accessible when the game PCB is mounted in place.

When changing the options, verify proper results on the TV monitor display during self-test. A switch toggle in the **on** position is indicated by a **0** for that switch on the TV monitor display. A switch in the **off** position is indicated by the number **1**.

Toggle Settings of 8-Toggle Switch on Game PCB								Option
8	7	6	5	4	3	2	1	
						On	On	English
						On	Off	German
						Off	On	French
						Off	Off	Spanish
					On			4-Ship Game
					Off			3-Ship Game
				On				Center Coin Mech × 1
				Off				Center Coin Mech × 2
								(Both settings are for left mech, if a 2-mech door)
		On	On					Right Coin Mech × 1
		On	Off					Right Coin Mech × 4
		Off	On					Right Coin Mech × 5
		Off	Off					Right Coin Mech × 6
On	On							Free Play
On	Off							1 Coin* for 2 Plays
Off	On							1 Coin* for 1 Play
Off	Off							2 Coins* for 1 Play



Photograph above shows toggles 1, 2, 4-7 on, and toggles 3 and 8 off.

Suggested settings are shown in illustration at right.

*Note: In the U.S. and Germany only, a "coin" is defined as 25¢ or 1 DM. If your game also has $1, 2 DM or 5 DM mechanisms, you must set the center and right coin mechanism factors as per your choice.

Toggle Settings of 4-Toggle Switch on Game PCB				For Games Having These Coin Doors:	Option
4	3	2	1		
		On	On	Thai 1 Baht/1 Baht, German 1 DM/1 DM, U.S. 25¢/25¢, Belgian or French 5 Fr/5 Fr, Swiss or French 1Fr/1 Fr, U.S. 25¢/25¢/25¢, Japanese Y100/Y100, Swedish 1 Kr/1 Kr, U.K. 10 P/10 P, Australian 20¢/20¢, or Italian 100 L/100 L	All 3 coin mechanisms are same denomination; all register on **one** coin counter.
		Off	On	German 2 DM/1 DM, German 1 DM/5 DM, U.S. 25¢/25¢/$1, or U.S. 25¢/$1	Left and center mechanisms are same denomination; right mech is another denomination. Requires **two** coin counters.
		On	Off	*No coin door is currently designed for this configuration.*	Left mech is one denomination; center and right mech are another denomination. Requires **two** coin counters.
		Off	Off	German 1 DM/2 DM/5 DM	Left, center and right mechs are 3 different denominations. Requires **three** coin counters.

E. Game Play

Atari's Asteroids™ game has five possible modes of operation: Attract, Ready-to-Play, Play, High Score Initial, and Self-Test. Self-test is a special mode for checking the game switches and computer functions. You may enter this mode at any time. When entered, all game credits are cancelled.

1. Attract Mode

The attract mode begins when power is applied to the game, after a play or high score initial mode, or after self-test. This mode is continuous and is only interrupted when a coin is inserted and accepted or when in self-test. In this mode, the TV monitor displays two possible pictures. Both pictures have three score values across the top of the screen and a message that states the number of coins for a game. The middle score represents the high score to date. The left score is for player 1. The right score is for player 2.

One picture displays asteroids and an occasional enemy spaceship "floating" across the screen. The second picture displays up to 10 of the highest scores since the game was last powered up or since the last self-test. These two displays alternate every 16 seconds.

2. Ready-to-Play Mode

This mode begins when sufficient coins have been accepted for a one- or two-player game. It ends when the 1 PLAYER START or 2 PLAYER START pushbutton is pressed. When this mode begins, the message *PUSH START* flashes immediately below the center score at the top of the screen. The displayed pictures are otherwise the same as those shown in the attract mode.

3. Play Mode

The play mode begins when either start pushbutton is pressed. The mode ends when the player's last ship of the game is lost.

If the 1 PLAYER START pushbutton is pressed, the following picture is displayed: the PLAYER 2's score disappears; the PLAYER 1's score becomes 00, and the number of ships (3 or 4, depending on the operator's setting) for the game appears below that score. The message *PLAYER 1* also appears below the high score to date. Two seconds after pressing the 1 PLAYER START button the *PLAYER 1* message disappears, and the game ship appears at the center of the display. Four large asteroids appear and drift in from the outer edges of the display.

If the 2 PLAYER START pushbutton is pressed, the following picture is displayed: the PLAYER 1 and PLAYER 2 scores become 00, and the number of ships for the game appears below each score. The player 1 score also flashes as the message *PLAYER 1* appears below the high score to date. Two seconds after the 2 PLAYER START pushbutton is pressed, the *PLAYER 1* message disappears. The game ship for player 1 appears at the center of the display as four large asteroids appear and drift in from the outer edges of the display.

By pressing the LEFT ROTATE and RIGHT ROTATE pushbuttons on the control panel, the player may aim a spaceship toward any of the asteroids. By pressing the FIRE pushbutton, the player may shoot at the asteroids.

When shot, each large asteroid divides into two medium-sized asteroids and the game adds twenty points to the player's score. Medium-sized asteroids, when shot, divide into two small-sized asteroids, and the player receives fifty points. Small-sized asteroids, when shot, will completely disappear, and the game awards 100 points to the player. When players have shot all asteroids, a new set of large asteroids again appear and drift in from the outer edges of the TV monitor display. At the beginning of the game, four large asteroids appear. At the beginning of the next cycle when large asteroids reappear, there are six, the next time eight, and thereafter ten—to increase player challenge.

At any time during game play, a flying saucer may appear from either side of the display. The game awards players 200 points for shooting a large saucer and 1000 points for a small saucer. (The latter is a smaller target for players, though not any faster moving than the large one. It also shoots more accurately.)

The player's objective in the game is to shoot and destroy as many asteroids as possible before all his or her spaceships are destroyed. A ship is destroyed if an asteroid or saucer smashes into it, or if a flying saucer shoots it. To prevent losing a ship, the player may press the THRUST pushbutton to move out of the path of an asteroid or saucer. As an emergency maneuver, players can press the HYPERSPACE pushbutton: the ship disappears and reappears at a random location on the display—however, possibly right on top of, or in the path of, an asteroid. The ship may also explode on reentry.

The game awards an extra ship each time a player's score reaches multiples of 10,000; i.e., one

ship is awarded at 10,000 points, another ship at 20,000 points, etc.

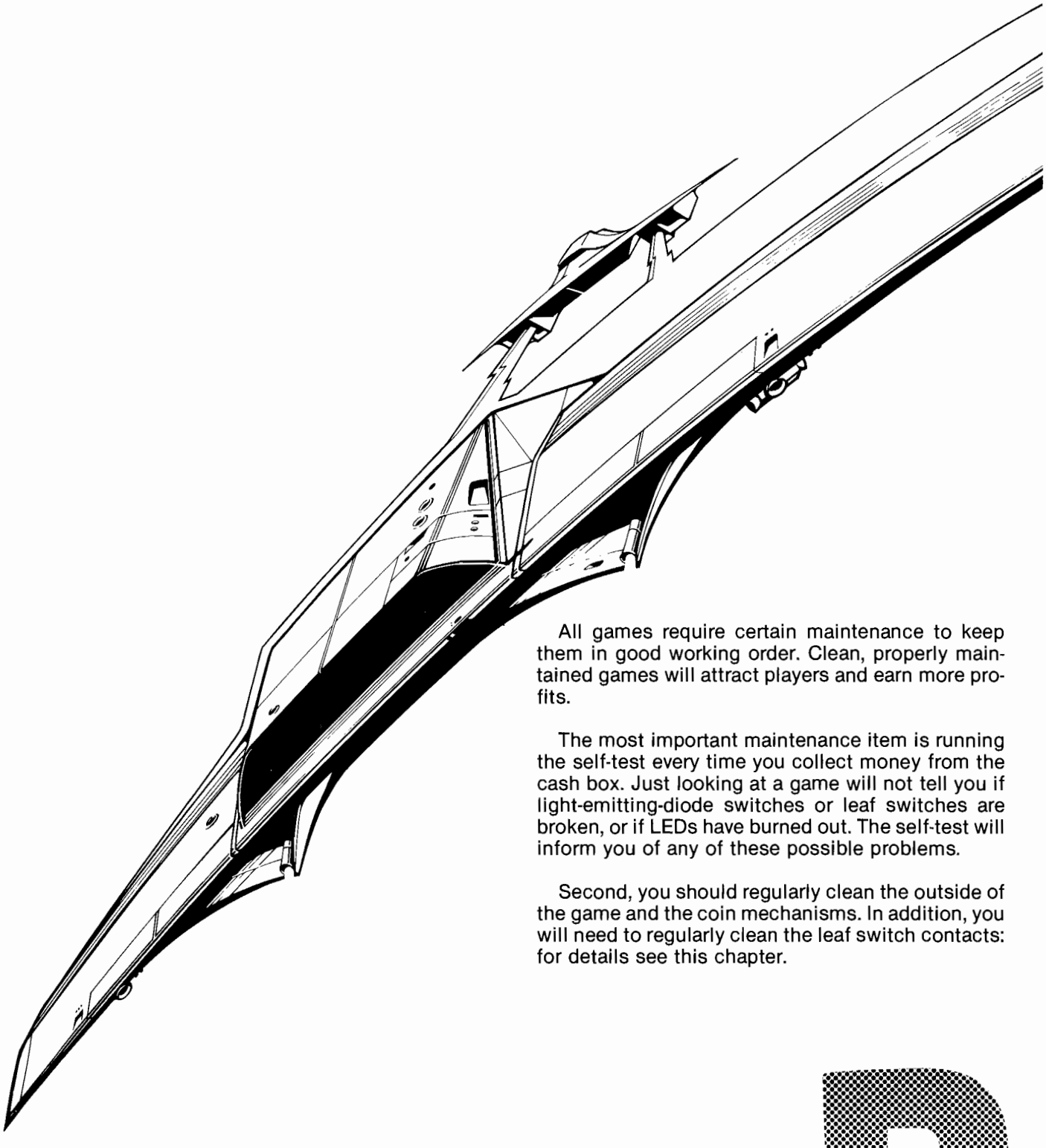
When the last ship of the game is destroyed, the message *GAME OVER* appears below the high score. This message remains for 3 seconds before the high score initial mode begins.

4. High Score Initial Mode

At the beginning of the high score initial mode, the player instructions appear at the top of the screen, and A _ _ appears at the lower center of the display. Players enter initials one character at a time. By pressing the LEFT ROTATE pushbutton, the displayed character steps through the alphabet from A to Z. By pressing the RIGHT ROTATE pushbutton, the character steps backwards through the alphabet from A to *a blank*, then from Z to A.

Once the game displays the desired letter, players should press the HYPERSPACE pushbutton to record the letter; then an A appears in the next space.

If players need only two letters for their initials, they should use the *blank* between Z and A in one of the three locations. Pressing the HYPERSPACE pushbutton a third time will cause the initials and game score to be transferred to the "10 highest scores" listing that appears during the attract mode.



All games require certain maintenance to keep them in good working order. Clean, properly maintained games will attract players and earn more profits.

The most important maintenance item is running the self-test every time you collect money from the cash box. Just looking at a game will not tell you if light-emitting-diode switches or leaf switches are broken, or if LEDs have burned out. The self-test will inform you of any of these possible problems.

Second, you should regularly clean the outside of the game and the coin mechanisms. In addition, you will need to regularly clean the leaf switch contacts: for details see this chapter.

2

Maintenance and Repair

A. Cleaning

The exterior of the game cabinet and the metal and acrylic surfaces may be cleaned with any non-abrasive household cleaner. If desired, special coin machine cleaners that leave no residue can be obtained from your distributor. **Do not** dry-wipe any of the acrylic panels, because any dust can scratch the surface and result in fogging the plastic.

B. Fuse Replacement

This game contains six fuses—all on the power supply assembly (not including the TV monitor fuses). Replace fuses only with the same type as listed in Figure 22 of this manual. See the Quadrascan TV monitor manual, TM-151, for the monitor fuse data.

C. Opening the Control Panel

Prior to repairing or replacing any switch on the control panel or prior to removing the TV monitor, unplug the game. Then open the coin door.

Reach through the opening and remove both sets of carriage bolts, wing nuts, split lock washers, and flat washers, located on the underside of the control panel (see Figure 8). Lift up on the control panel and swing it towards you.

To remove LED switch:

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

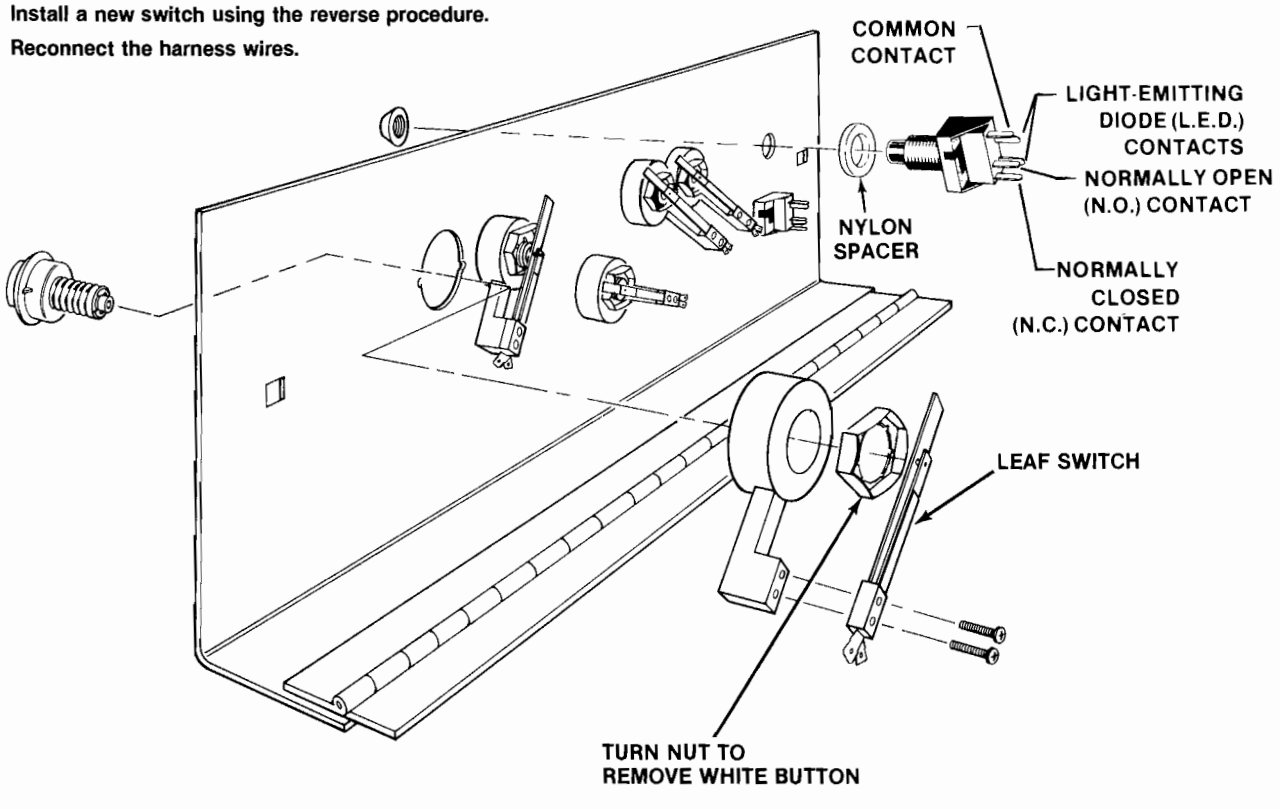


Figure 8 Opening the Control Panel and Replacing Switches

1. Leaf Switch Replacement

NOTE

Adjust switches for a narrow gap. When a switch button is depressed, the resulting wiping action of the contacts provides a self-cleaning feature.

All five of these leaf switches operate on 5 volts at a very low current. Therefore, pitting of these switches would be extremely rare. Probably the only reason that pitting would occur is in very high-humidity locations.

Don't burnish the switches. Burnishing them removes their plating, thus increasing the corrosion of the contacts. **The best method of cleaning the switch contacts is to wipe them with a non-abrasive surface.** A business card works very well.

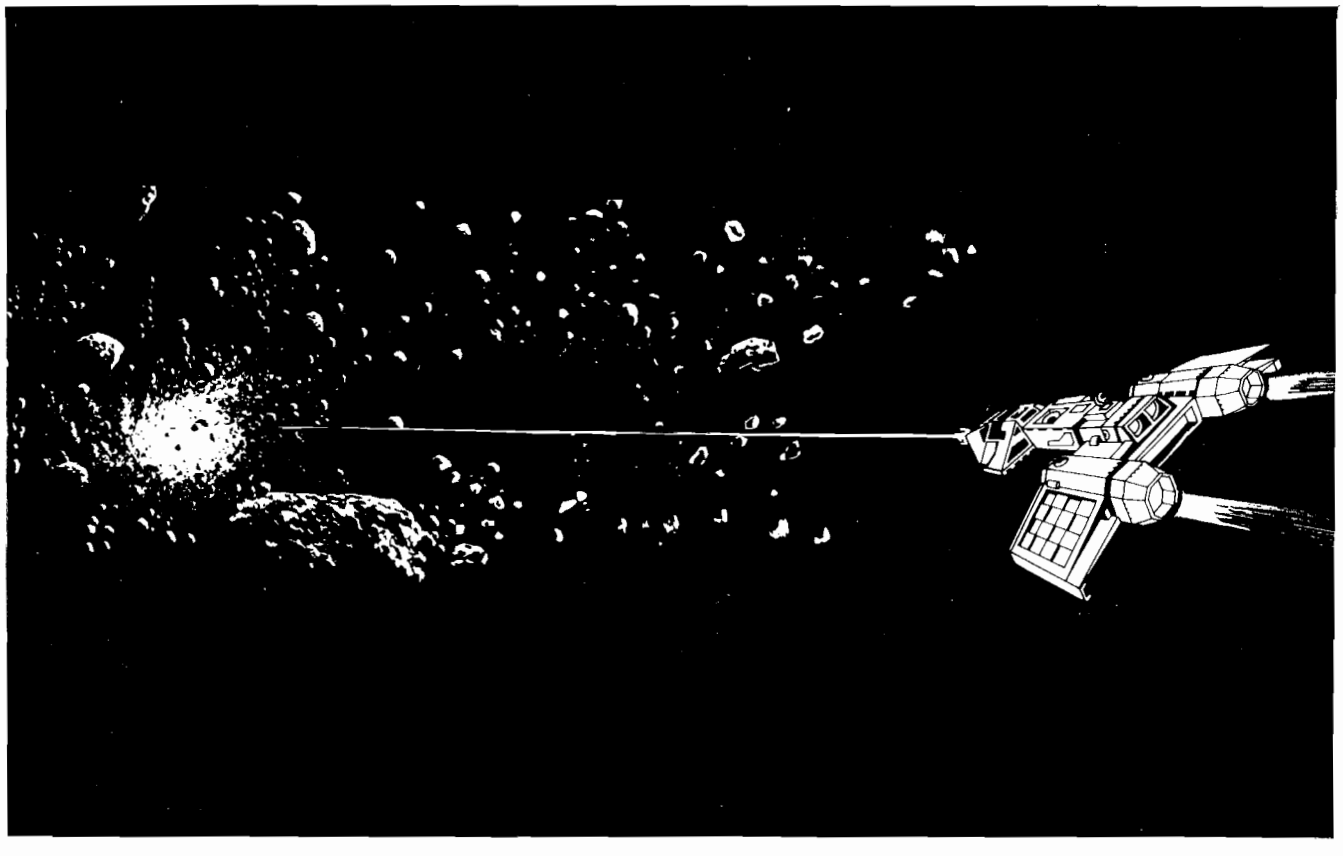
To replace any switch, remove both of its screws with a Phillips-head screwdriver—see Figure 8.

If the white button itself needs to be replaced, turn the stamped nut with a wrench in a counter-clockwise direction, as seen from the inside of the control panel. The white ring on the outside of the control panel should not spin, due to its design.

2. LED Switch Replacement

The light-emitting diode (LED) switches on the control panel have a very low failure rate. In case a switch should ever be suspect, first test it per the description that follows. To replace the switch, refer to Figure 8.

1. Remove the wires from the suspected switch.
2. Set multimeter to ohms scale. Set ohms scale to R × 1, then zero the meter.
3. Connect multimeter leads to appropriate LED switch contacts (see Figure 8 for designation of switch contacts and meter lead placement).
4. Check contacts (push and release the switch button) for closed and open continuity.
5. If the contacts do not operate sharply or always remain closed or open, then replace the LED switch as outlined in the figure.



D. TV Monitor Replacement

CAUTION

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

If you drop the TV monitor 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 TV monitor.

If you should need to remove the Quadrascan X-Y TV monitor, follow steps 1 thru 6 as listed on this page. Refer to the accompanying Figure 9.

1. Open the control panel as described in Section C, Opening the Control Panel. **Be sure the game is unplugged from its wall outlet!**
2. Remove the acrylic TV monitor shield by lifting up and sliding out its lower edge. Remove the small ¼" plywood panel that acts as a monitor shield support (it prevents players from flexing the shield downwards).
3. Carefully remove the black cardboard bezel: it lies on top of the wood cleats and is attached with staples.
4. Open the rear access panel and unplug the 12-pin TV monitor harness connector.
5. Remove the four screws that hold down the metal TV chassis.
6. Carefully tilt and lift the TV monitor chassis out the top opening of the game.

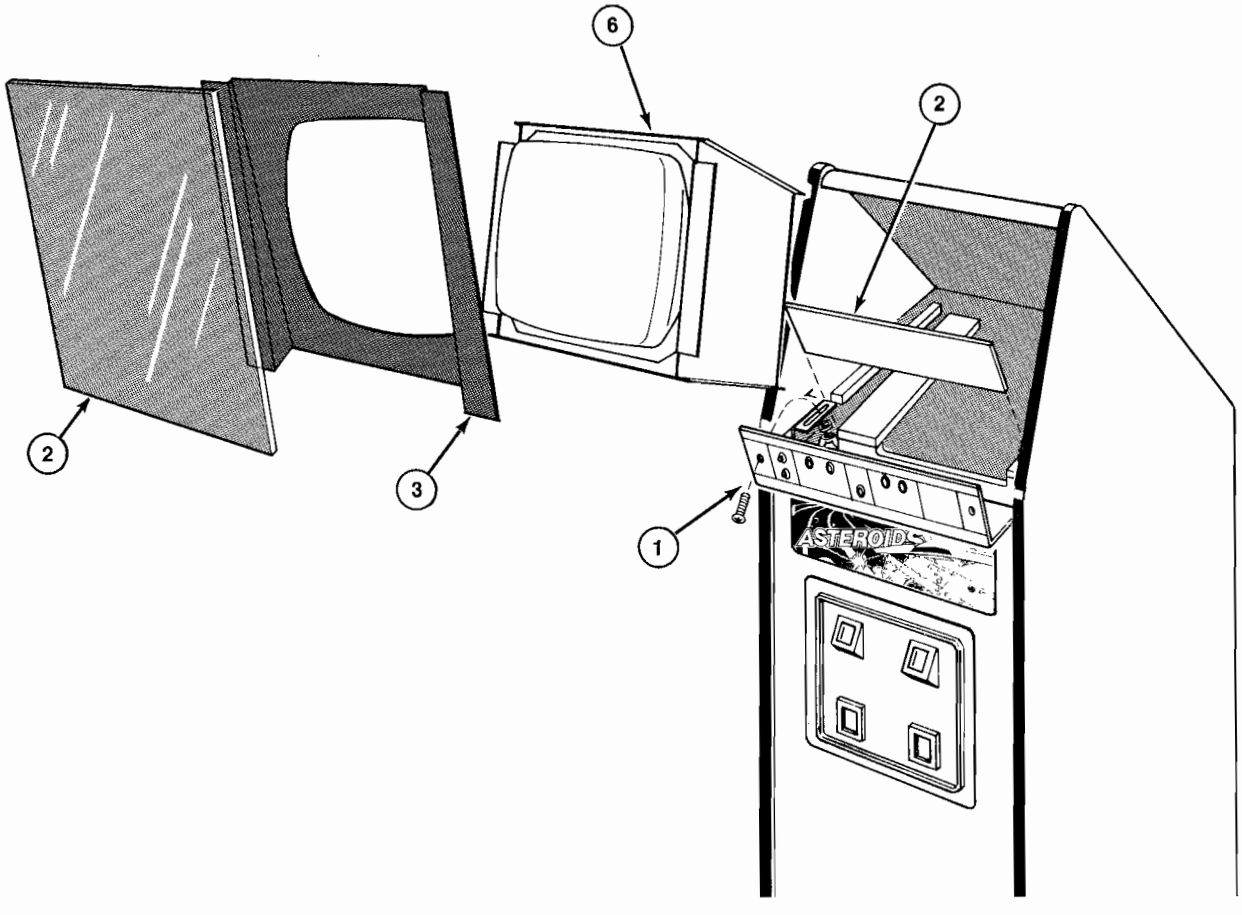


Figure 9 TV Monitor Removal

E. Printed-Circuit Board Replacement

You may wish to remove the game printed-circuit board (PCB) or the Regulator/Audio PCB for service or inspection. To do this, refer to Figure 10 and proceed as follows:

1. Open the rear access panel.
2. Locate the securing screw that holds down the PCB in its slots, and remove.
3. If you are removing the game board, first remove the two tie wraps that fasten the edge connector to the game PCB. Then unplug the edge connector on the game PCB. If you are removing the Regulator/Audio PCB, simply disconnect the three small harness connectors on this board.
4. Carefully slide either PCB straight out of its gray plastic slots. Be careful not to twist the board, as this may loosen connections or components. Replace or repair as required.
5. Reinstall the PCB, making sure that the connectors are properly plugged in. Note that they are keyed to fit on only one way, so if they don't slip on easily, don't force them! **A reversed connector will probably damage your game** and will void the warranty.
6. Replace the securing screw in the PCB. Reinstall the tie wraps used to secure the edge connectors to the PCB. Close and lock the rear access panel.
7. Check that the operation of the game is correct by performing the **self-test**. This is especially important with any game when you replace a PCB. Normally the **only** adjustments on this game are option switch changes (made on the 4- or 8-toggle DIP switches). Unless you are a qualified technician, ***do not turn any of the knobs near the game PCB's edge connector. Also do not turn the small knob on the Regulator/Audio PCB.***

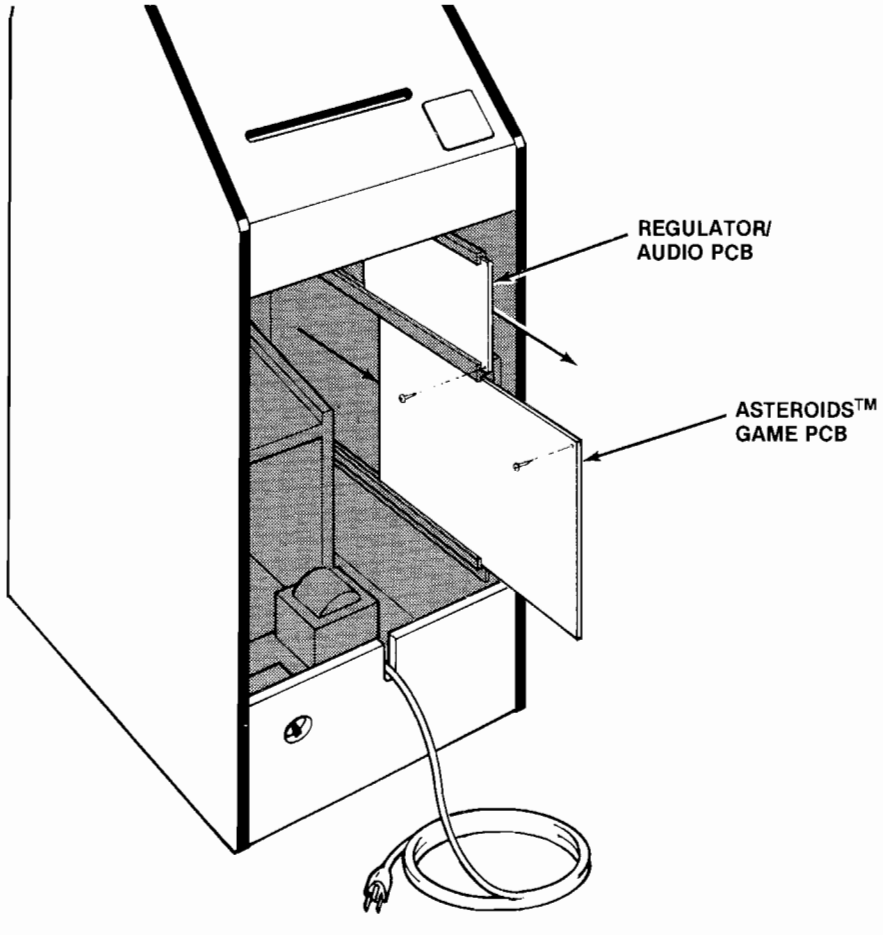


Figure 10 Game and Regulator/Audio PCB Replacement

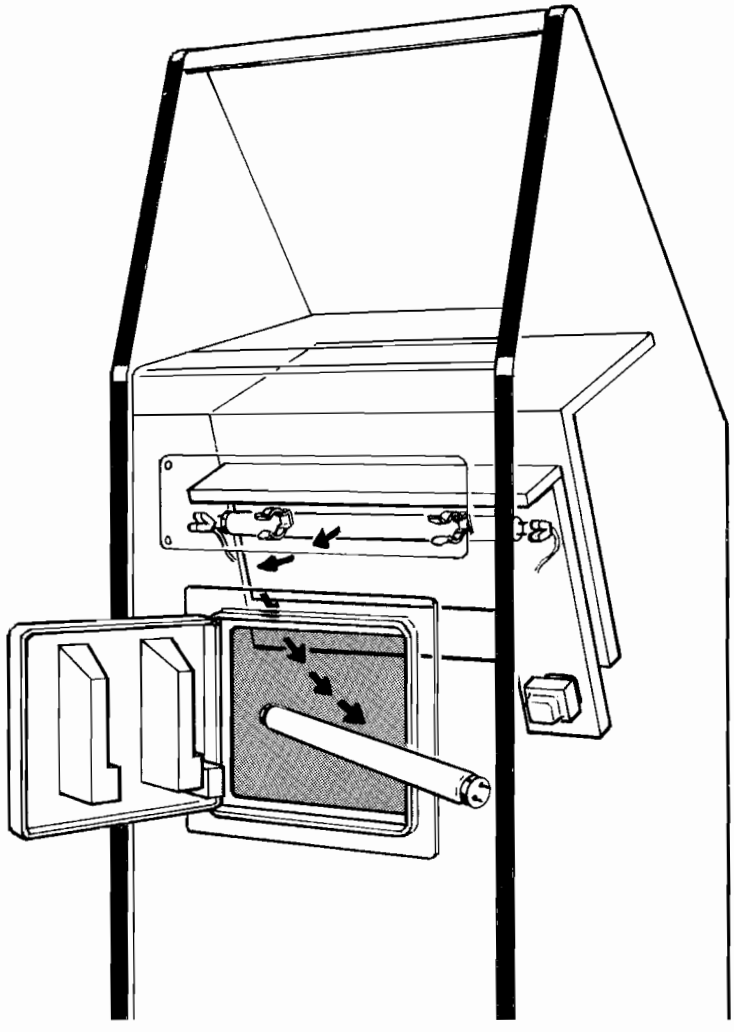


Figure 11 Fluorescent Tube Replacement

F. Fluorescent Tube Replacement

⚠ CAUTION ⚠

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.

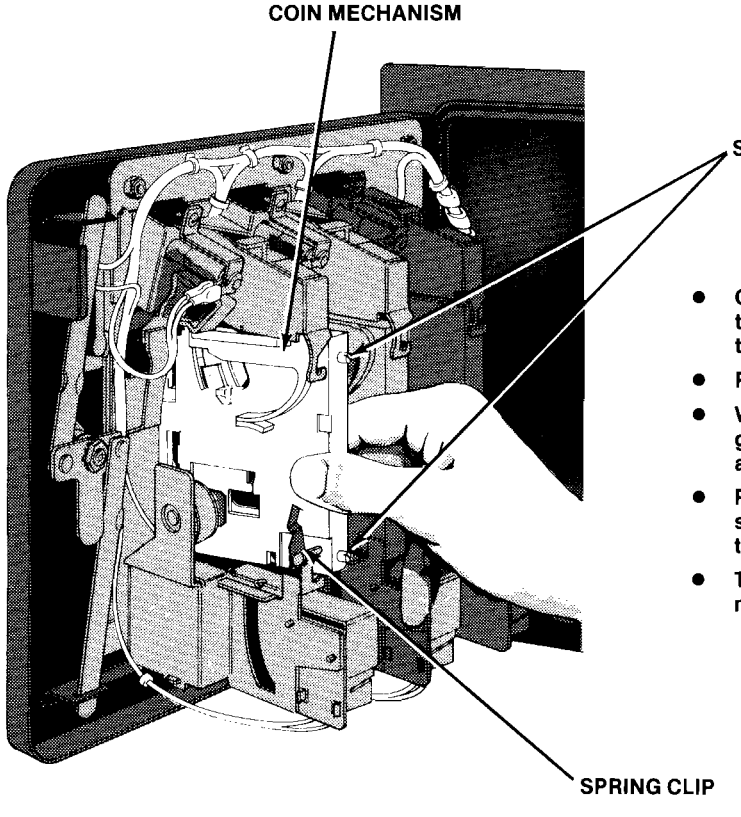
To replace the white fluorescent tube behind the front graphics attraction panel, follow this procedure (see Figure 11).

1. Open the coin door. Remove the two Y-shaped connectors from the ends of the fluorescent tube. Now carefully remove the tube from its clamps by pulling it towards you.
2. Replace with a new tube. Do not snap the tube in vigorously—**you may break it, causing an implosion!**
3. Close the coin door and lock it.

G. Coin Door Repairs

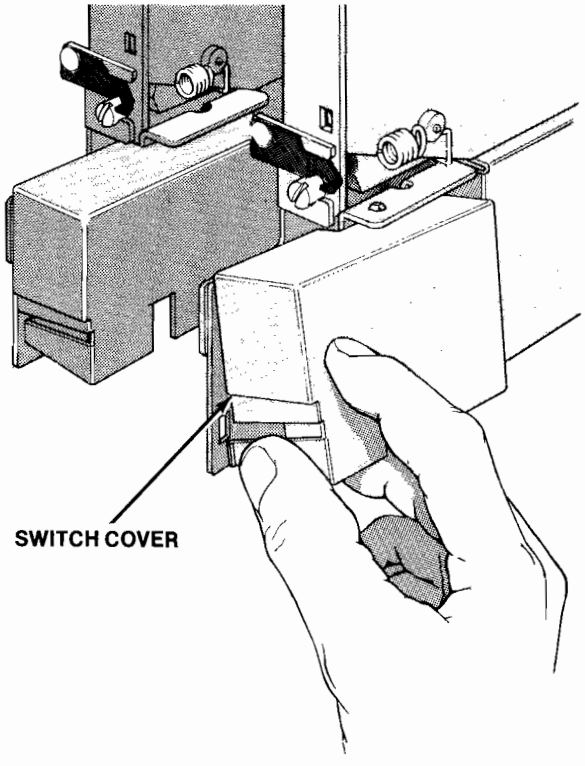
The new Atari coin door has been totally redesigned, as described on page 3 of this manual. For ease of maintenance, the coin door mechanisms require no adjustments. For plastic mechs, use only hot soapy water to clean them: boiling water is not needed nor even recommended, as this would soften the plastic.

To remove any mechanisms, or to replace the small lamps, switches or trip wires, follow the illustrations and instructions given in Figures 12 through 14. To obtain part numbers for ordering purposes, refer to the detailed exploded drawing of the coin door and parts list in Figure 23.

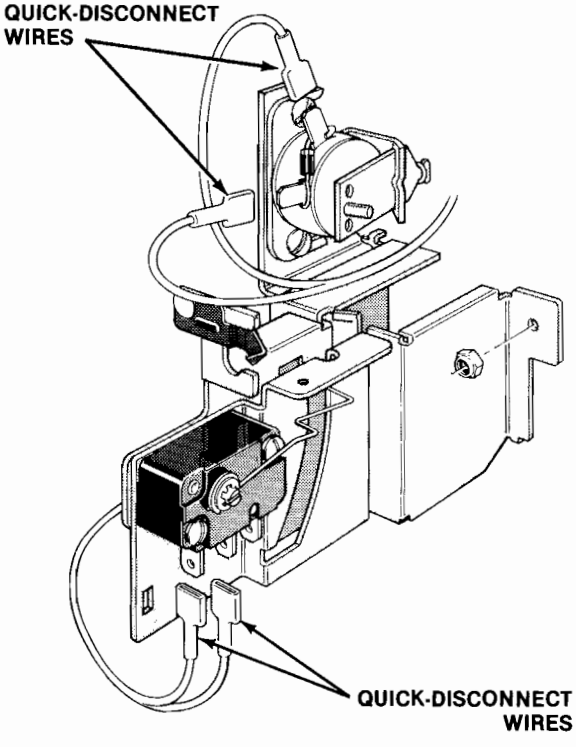


- **Open coin door. To clean or replace a mechanism, locate the black spring clip above the coin switch. Pull this clip towards you, then swivel it up 90°.**
- **Push the mechanism towards the right, then pull it out.**
- **When reinserting the mechanism, be certain that no wires get caught up in it. Align the mechanism between the top and bottom pairs of vertical tabs in the inner door panel.**
- **Push the part of the mechanism closest to you to the left, so both of its round studs slip into the curved notches on the inlet and return chutes.**
- **Turn the black spring clip down again to secure the mechanism in place.**

Figure 12 Removing Coin Mechanism



- Remove the plastic switch cover by squeezing together its two prongs (just underneath the switch). Tilt the bottom edge of the cover out to the right while pulling down on it.
- Unplug the quick-disconnect wires on the switch and lockout coil. Use a longer-style ¼" socket wrench, so you won't damage the trip wire, and remove both nuts that secure the coin return chute onto the inner panel.
- Now hold the return chute subassembly together in one hand, and replace the defective switch.
- The trip wire can be replaced by carefully prying up the black internal-tooth retainer with a small flat screwdriver. Then remove the wire from the brass-colored stud.
- Be sure to replace the wire with another of the proper color (four are available, depending on coin denomination). If the new wire is loose when placed on the stud, squeeze the stud's two halves together with a pair of pliers to secure the wire. Then replace the retainer.
- *Make certain* that the wire projects thru the entire width of the coin slot: otherwise no credits will be granted, even for genuine coins. The wire's normal rest position is against the top of the curved slot.



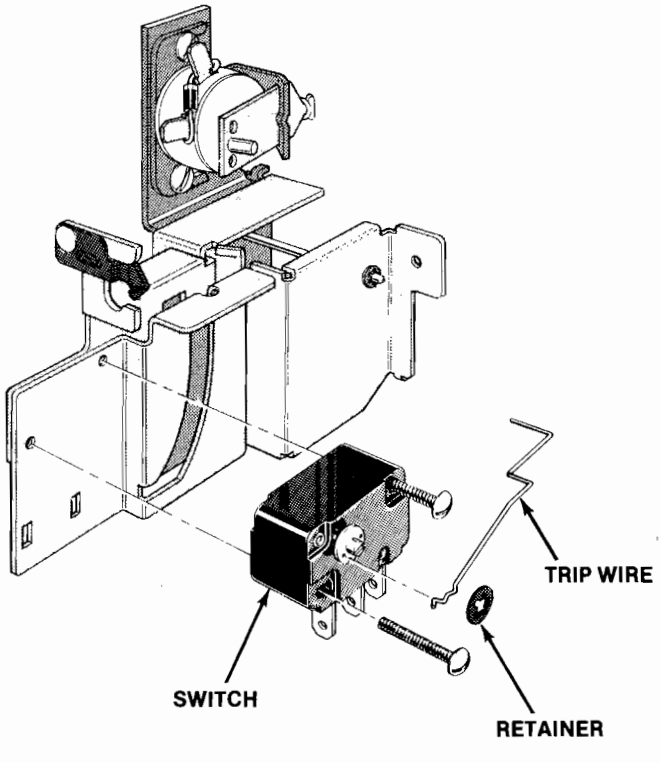
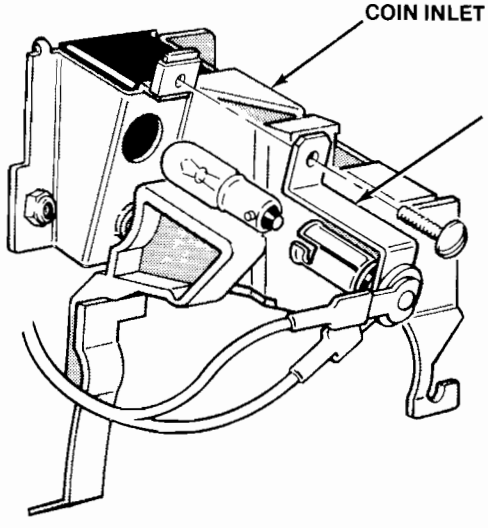


Figure 13 Switch and Trip Wire Replacement



- **Remove the screw that secures the lamp and its "Z" bracket to the coin inlet chute.**
- **Replace the burned-out bulb. Then mount the lamp holder bracket back on the coin inlet chute.**

Figure 14 Coin Door Lamp Replacement

H. Game Operation

With this manual you received two large sheets that contain the wiring and schematic diagrams for your game. Sheet 1, Side A, includes information that shows the arrangement of these diagrams. These diagrams include information that explains the functions of the circuits and defines inputs and outputs.

Atari Asteroids™ is a microprocessor-controlled game. The microprocessor is contained on the game PCB. The game PCB receives switch inputs from the control panel and coin door. These inputs are processed by the game PCB and output to the TV monitor, Regulator/Audio PCB, and control panel.

The TV monitor is an X-Y monitor. Therefore, the monitor receives signals for the X, Y and Z axes. Since the location of the beam in the monitor is totally controlled by the X- and Y-axis outputs of the game PCB, the game PCB does not contain a standard sync circuit. The X- and Y-axis inputs to the monitor step in increments of 1024 steps for the X (horizontal) axis, and 768 steps for the Y (vertical) axis. The Z axis merely controls the intensity of the beam.

The Regulator/Audio PCB performs two functions: 1) it regulates the +10.3 VDC from the power supply to +5 VDC, and 2) it amplifies the audio output from the game PCB. The +5 VDC from the Regulator/Audio PCB provides most logic power to the game PCB. The audio output from the Regulator/Audio PCB directly drives the game speaker and is controlled by the volume control, mounted inside the coin door.

The Power Supply is the source of all voltages in the game. These voltages are protected by five fuses in the fuse block on the power supply chassis. The primary winding of the power supply transformer is protected by the cartridge-type fuse in the power supply chassis.

Figure 15 illustrates the distribution of power in this game. Figure 16 illustrates the distribution of signals.

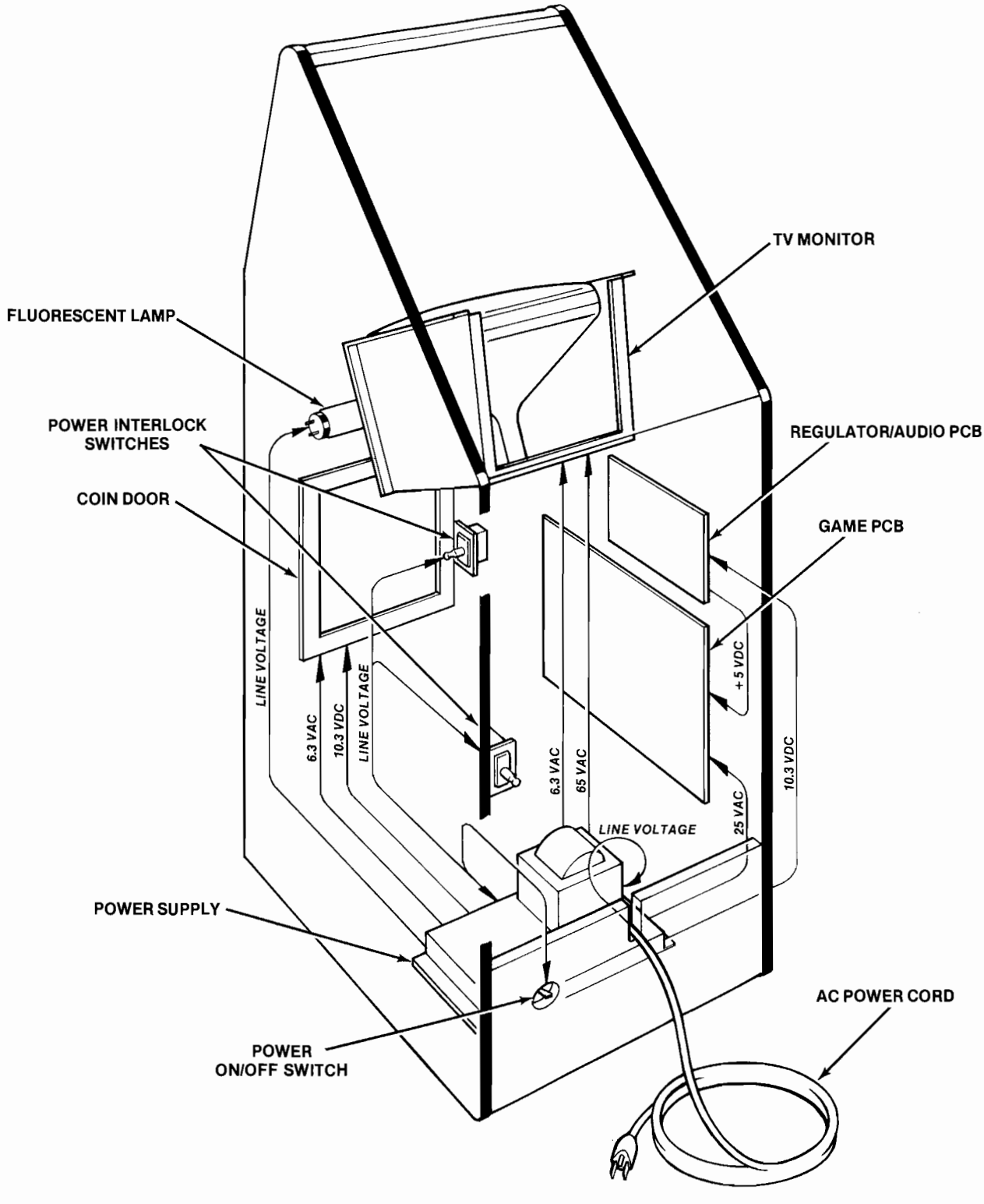


Figure 15 Power Distribution

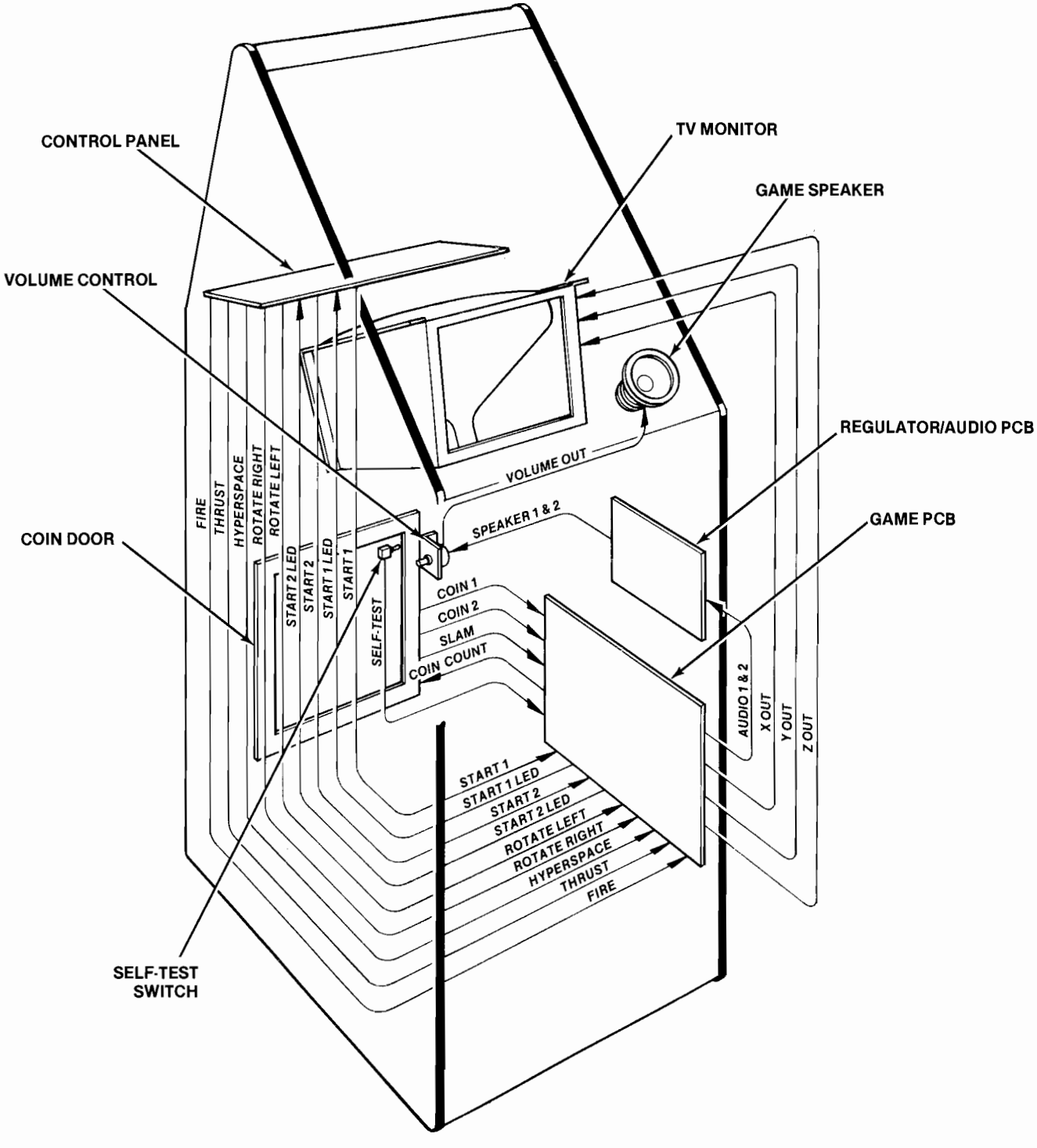
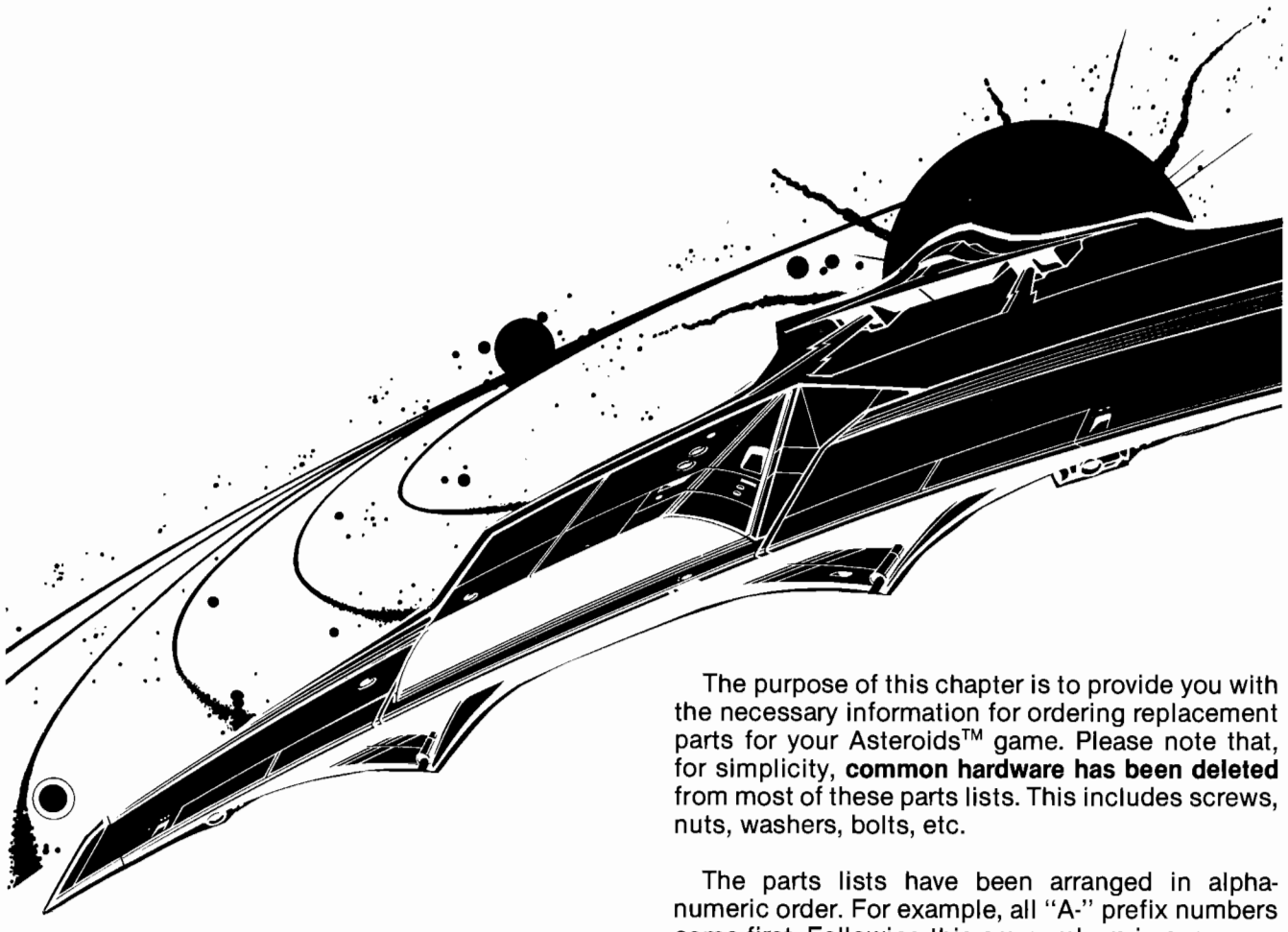


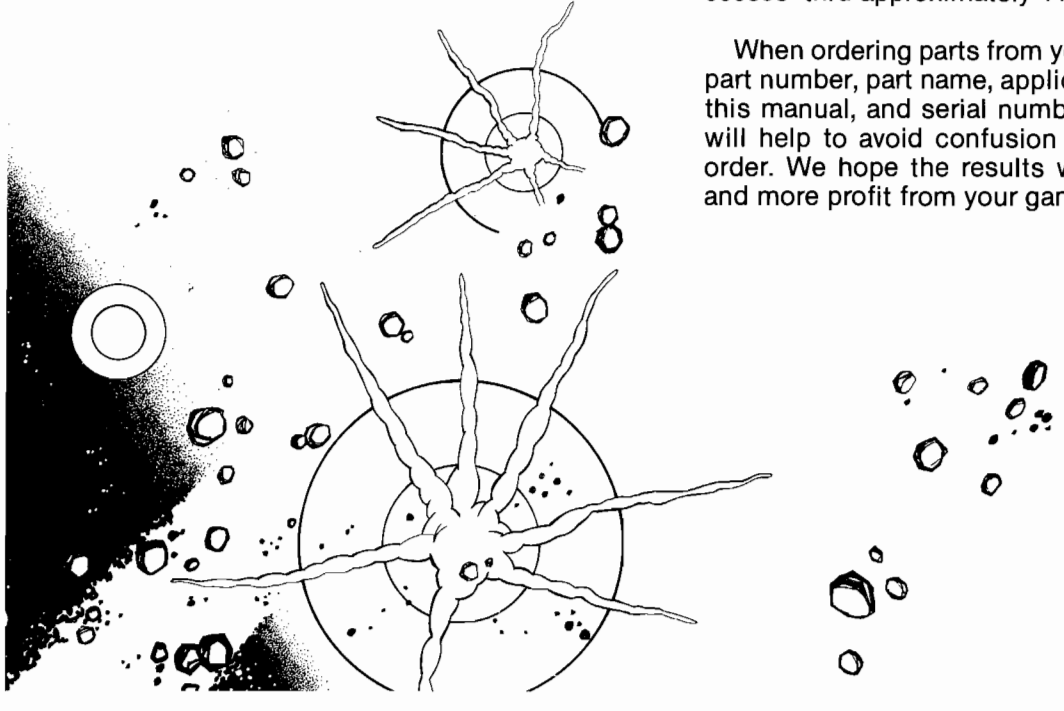
Figure 16 Signal Distribution



The purpose of this chapter is to provide you with the necessary information for ordering replacement parts for your Asteroids™ game. Please note that, for simplicity, **common hardware has been deleted** from most of these parts lists. This includes screws, nuts, washers, bolts, etc.

The parts lists have been arranged in alpha-numeric 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 110000-.

When ordering parts from your distibutor, 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.



3

Illustrated Parts Lists

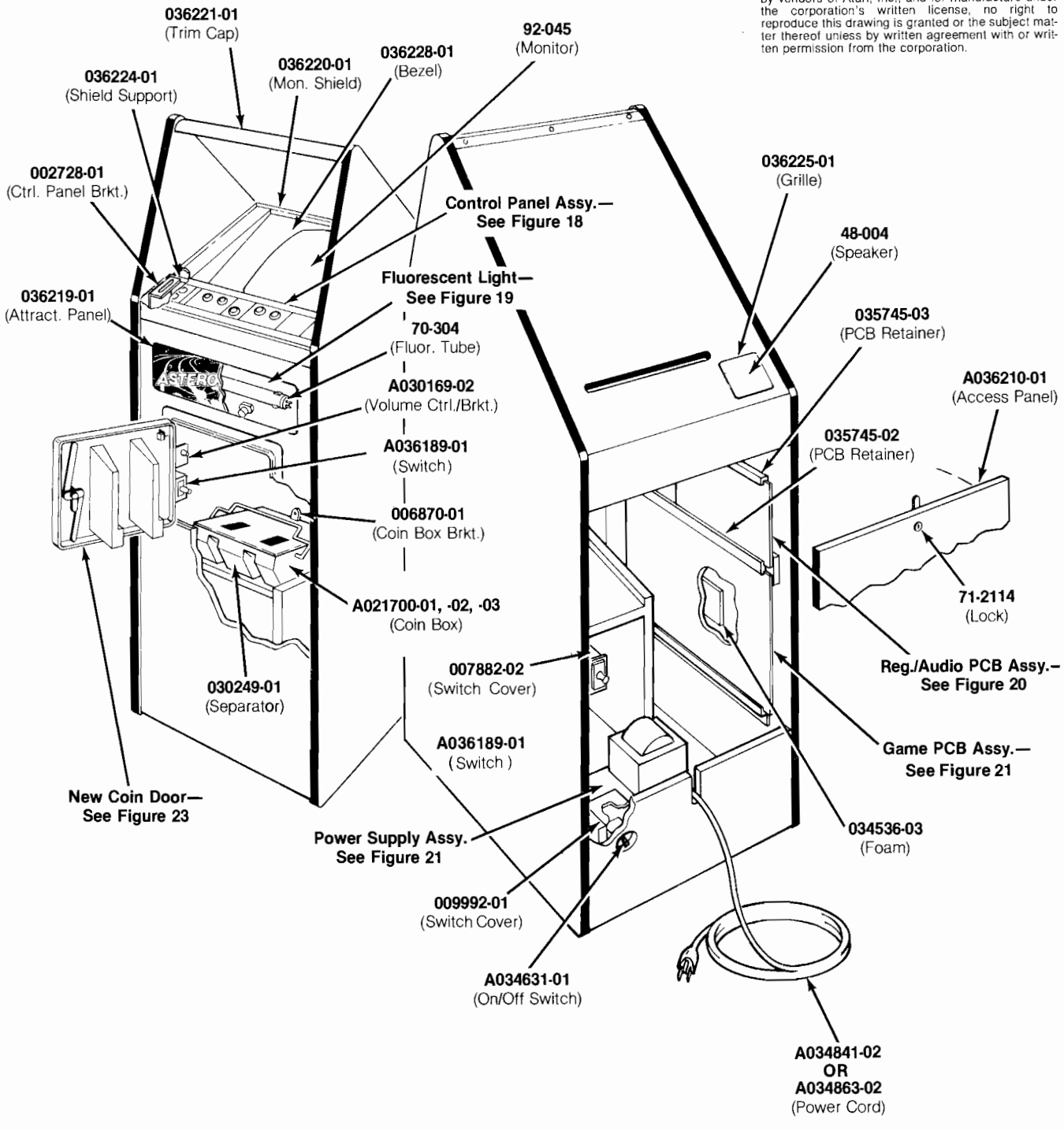


Figure 17 Cabinet-Mounted Assemblies A036218-xx A

Figure 17 Cabinet-Mounted Assemblies Parts List

Part No.	*Description*
A021700-01	Coin Box Assembly *(for all the same coins)*
A021700-02	Coin Box Assembly *(for two different coin denominations—has one separator)*
A021700-03	Coin Box Assembly *(for three different coin denominations—has two separators)*
A030169-02	Volume Control/Bracket Assembly
A034631-01	On/Off Switch Assembly
A034841-02 OR A034863-02	Strain Relief Power Cord *(domestic)* OR Strain Relief Power Cord *(German)*
A036189-01	Interlock Switch & Bracket Assembly *(modified for safety)*
A036210-01	Access Panel Assembly
DP-155-01	Asteroids™/Cabaret Schematic Drawings, Sheet 1
DP-155-02	Asteroids/Cabaret Schematic Drawings, Sheet 2
TM-151	Instruction and Service Manual for QuadraScan™ Model GO5-805 Monochrome X-Y Monitor
TM-155	Asteroids/Cabaret™ Operation, Maintenance, Service Manual
48-004	5″ 8-Ohm 5-Watt High-Fidelity Speaker
70-304	18″ 15-Watt Cool White Fluorescent Lamp
71-2114	Panel Cartridge Lock Mechanism *(for access panel)*
78-24012	5″ Beaded Nylon Tie Wrap *(for securing edge connector to Game PCB)*
92-045	15″ QuadraScan™ X-Y Monitor
002728-01	Control-Panel Mounting Bracket
006870-01	Coin Box Bracket
007882-02	Interlock Switch Cover
009992-01	On/Off Switch Cover
030249-01	Coin Box Separator
034536-03	Foam Vibration Damper
035723-01	Product Identification Label
035745-02	18″-Long Plastic PCB Retainer
035745-03	10″-Long Plastic PCB Retainer
036219-01	Attraction Panel with Graphics
036220-01	Monitor Shield *(smoke color)*
036221-01	Rounded Trim Cap
036224-01	Support for Monitor Shield
036225-01	Speaker Grille
036228-01	Cardboard Bezel *(for monitor)*

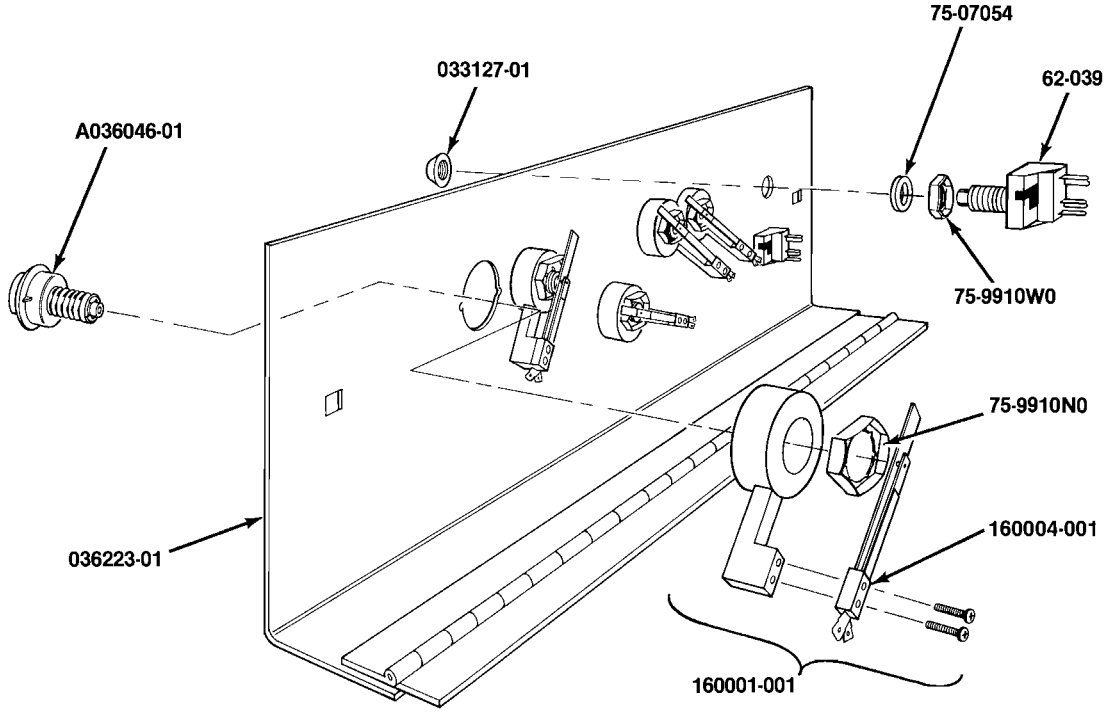


Figure 18 Control Panel Assembly A036226-01 A

Parts List

Part No.	*Description*
A036046-01	Button Assembly
A036254-01	Control Panel Harness Assembly
62-039	SPDT Momentary Pushbutton Switch, with Red Cap and Light-Emitting Diode
75-07054	Flat Nylon Washer, 0.470″ inside diameter × 0.968″ outside diameter × 0.075″ thick
75-9910N0	5/8-11 Steel Stamped Nut
75-9910W0	15/32-32 Steel Stamped Nut
033127-01	Black Molded Switch Bushing
036223-01	Control Panel with Graphics
160001-001	Leaf Switch with Button Holder
160004-001	Leaf Switch Only

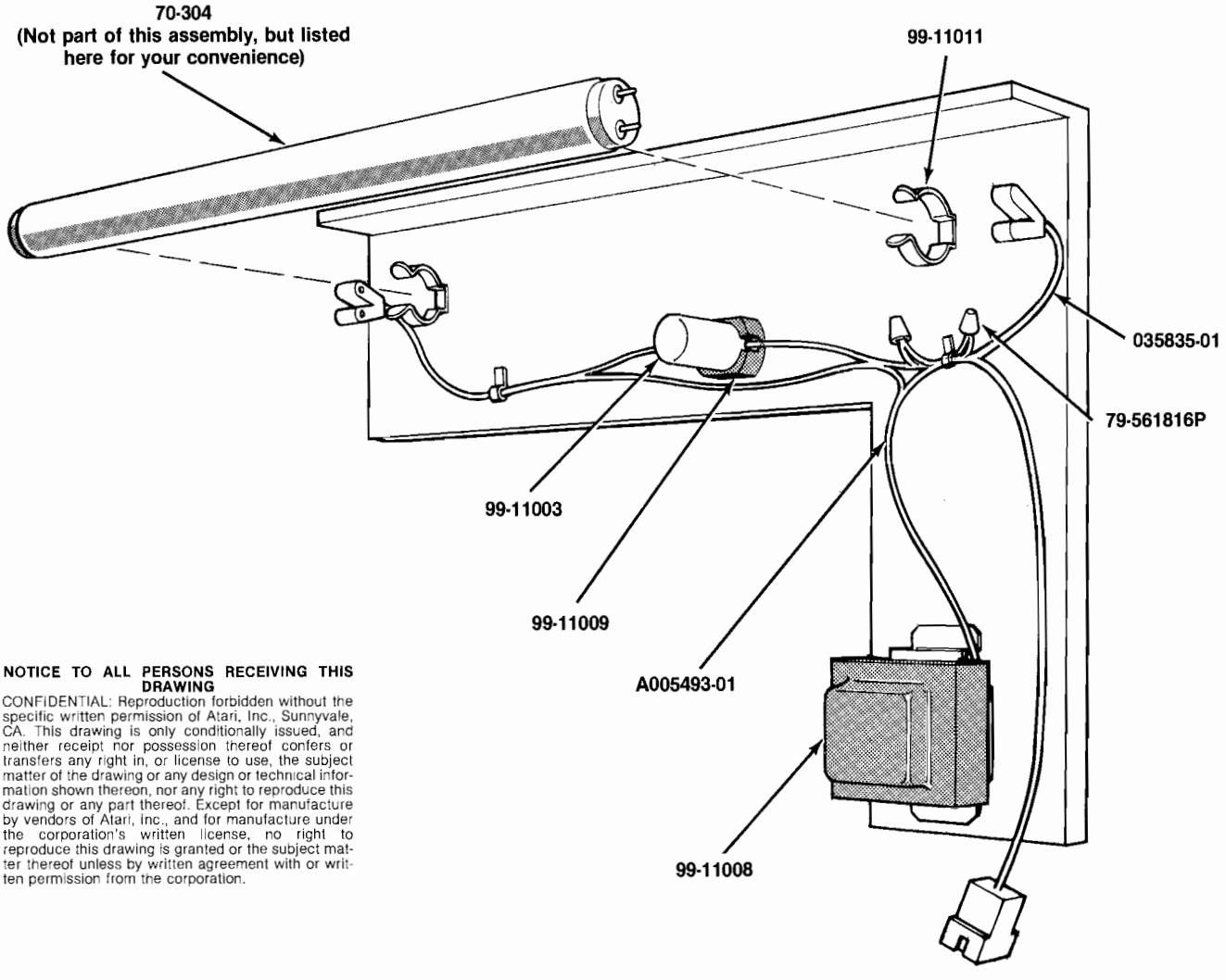


Figure 19 Fluorescent Light Assembly A036205-01 A

Parts List

Part No.	*Description*
A005493-01	Fluorescent Light Harness Assembly
70-304	18″ 15-Watt Cool White Fluorescent Lamp *(not part of this assembly, but listed here for your convenience)*
79-561816P	Wire Nut for 16- to 18-Guage Wires
99-11003	Fluorescent Lamp Starter
99-11008	Ballast Transformer
99-11009	Starter Socket
99-11011	1½″ Clamp
035835-01	Y-Lead Connector

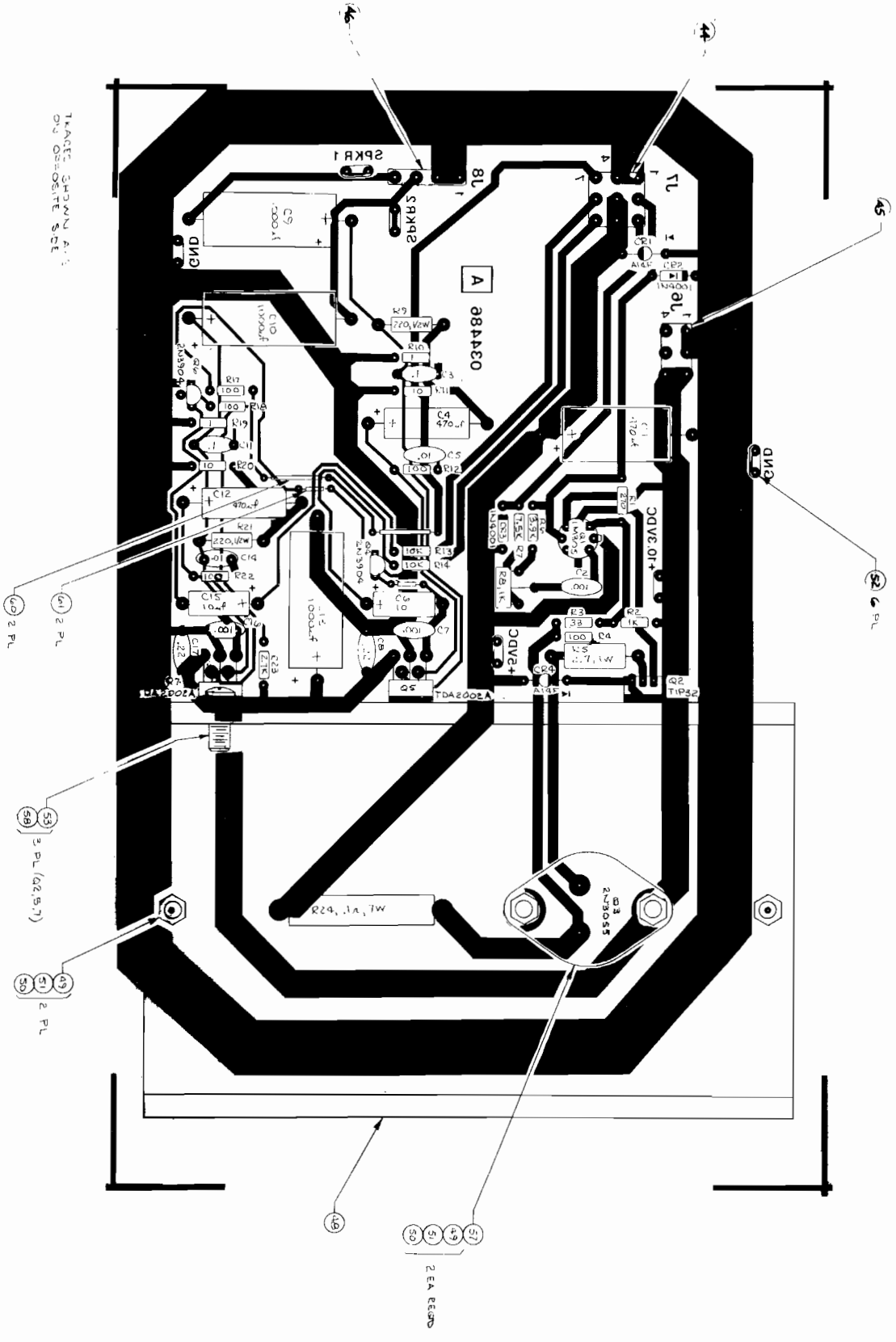
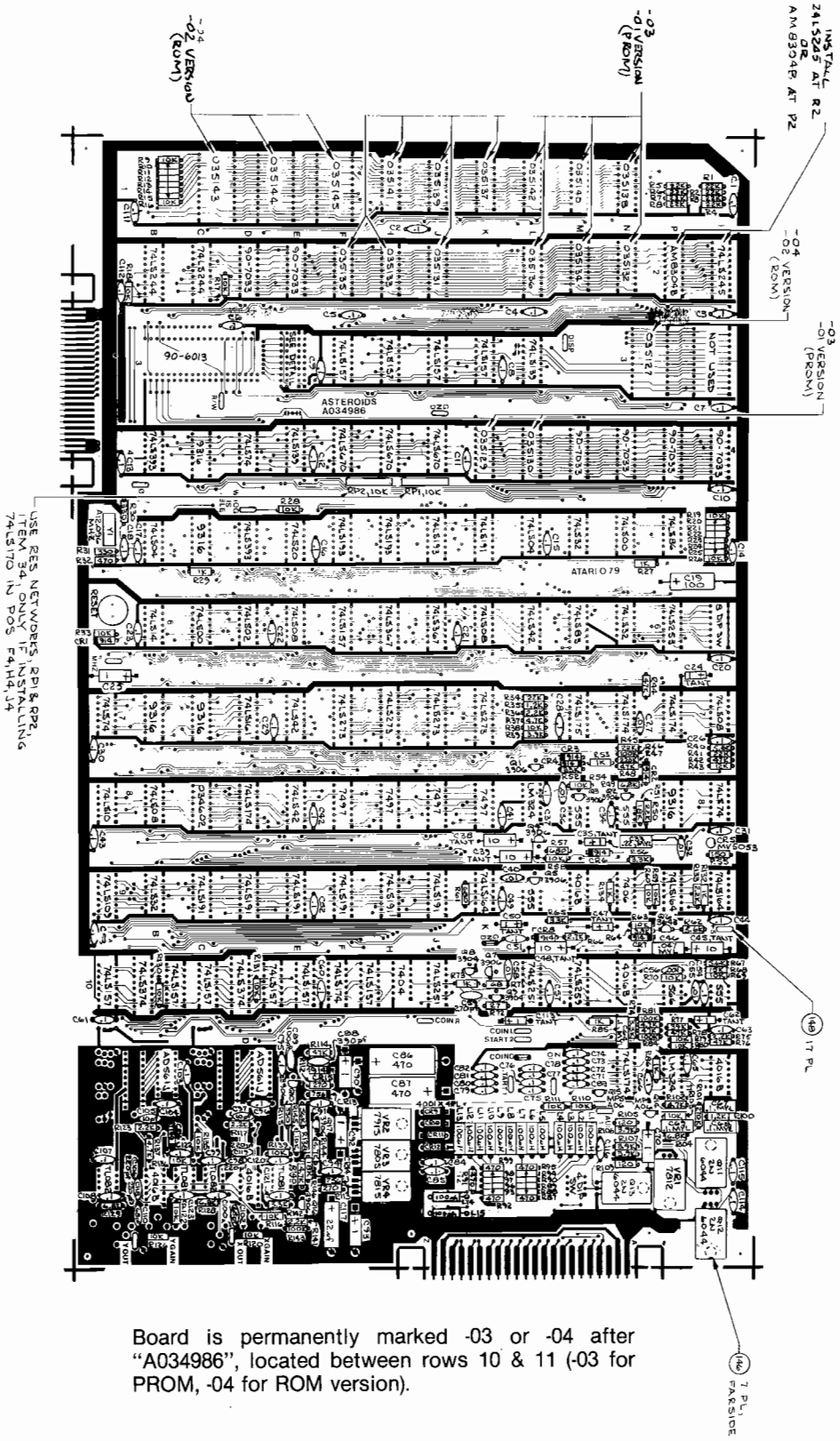


Figure 20 Regulator/Audio PCB Assembly
A034485-01 D

Figure 20 Regulator/Audio PCB Assembly Parts List

Item	*Part No.*	*Description (Reference Designations in Bold)*
2	110000-010	1 Ohm, ± 5%, ¼W Resistor **(R10, 19)**
3	110000-100	10 Ohm, ± 5%, ¼W Resistor **(R11, 20)**
4	110000-330	33 Ohm, ± 5%, ¼W Resistor **(R3)**
5	110000-101	100 Ohm, ± 5%, ¼W Resistor **(R4, 12, 17, 18, 22)**
6	110000-271	270 Ohm, ± 5%, ¼W Resistor **(R1)**
7	110000-102	1K Ohm, ± 5%, ¼W Resistor **(R2)**
8	110000-272	2.7K Ohm, ± 5%, ¼W Resistor **(R23)**
9	110000-752	7.5K Ohm, ± 5%, ¼W Resistor **(R7)**
10	110000-103	10K Ohm, ± 5%, ¼W Resistor **(R13, 14)**
11	110000-392	3.9K Ohm, ± 5%, ¼W Resistor **(R6)**
13	110001-221	220 Ohm, ± 5%, ½W Resistor **(R9, 21)**
15	12-52P7	2.7 Ohm, ± 5%, 1W Resistor **(R5)**
16	19-100P1015	.1 Ohm, ± 3%, 7W Wirewound Resistor **(R24)**
17	19-315102	1K Ohm Vertical PCB-Mounting Cermet Trimpot, Bournes Series 3352V-1-1K **(R8)**
20	24-250106	10 uf Aluminum Electrolytic Fixed Axial-Lead 25V Capacitor **(C6, 15)**
22	24-250477	470 uf Aluminum Electrolytic Fixed Axial-Lead 25V Capacitor **(C1, 4, 12)**
23	24-250108	100 uf Aluminum Electrolytic Fixed Axial-Lead 25V Capacitor **(C9, 10, 13)**
25	27-250103	.01 uf Ceramic-Disc 25V Radial-Lead Capacitor **(C5, C14)**
26	27-250104	.1 uf Ceramic-Disc 25V Radial-Lead Capacitor **(C3, C11)**
27	27-250224	.22 uf Ceramic-Disc 25V Radial-Lead Capacitor **(C8, 17)**
29	27-250102	.001 uf Ceramic-Disc 25V Radial-Lead Capacitor **(C2, 7, 16)**
31	31-A14F	50V 2.5A Miniature Axial-Lead High-Current Rectifier **(CR1, CR4)**
32	31-1N4001	50V Silicon Rectifier 1N4001 Diode **(CR2-3)**
34	33-TIP32	PNP Power Transistor, Type TIP32 **(Q2)**
35	34-2N3055	NPN Silicon Transistor, Type 2N3055 **Q3)**
36	34-2N3904	NPN Silicon Transistor, Type 2N3904 **(Q4, 6)**
38	37-LM305	5V Linear Voltage Regulator **(Q1)**
39	137151-002	Type TDA2002A 8W Linear Audio Amplifier Integrated Circuit **(Q5, 7)**
44	79-58008	9-Position Connector Receptacle **(J7)**
45	79-58092	6-Position Connector Receptacle **(J6)**
46	79-58059	4-Position Connector Receptacle **(J8)**
47	79-20230	Female PCB-Mounting Terminal
48	034531-01	Heat Sink
49	72-1608C	#6-32 × ½″ Cross-Recessed Pan-Head Corrosion-Resistant Steel Machine Screw
50	75-99516	#6-32 Nut/Washer Assembly
51	75-056	#6 Internal-Tooth Steel Lock Washer
52	020670-01	Test Point
53	75-F60805	#6-32 × ½″ Binder-Head Nylon Screw
57	78-16008	Thermally Conductive Compound for the 2N3055
58	78-16014	Thermally Conductive Compound for TDA2002A and TIP32
60	52-003	Teflon-Insulated Solder-Plated Solid Copper PCB-Mounting Jumper Wire with .6″ Centers
61	52-004	Teflon-Insulated Solder-Plated Solid Copper PCB-Mounting Jumper Wire with .3″ Centers



Board is permanently marked -03 or -04 after "A034986", located between rows 10 & 11 (-03 for PROM, -04 for ROM version).

Figure 21 Asteroids Game PCB Assembly A034986-03 and -04 G

Figure 21 Asteroids Game PCB Assembly Parts List

Item	Part No.	Description (Reference Designations and Locations in Bold)
2	100000-270	27 Ohm, ±5%, ¼W Resistor **(R72)**
3	100000-680	68 Ohm, ±5%, ¼W Resistor **(R71)**
4	100000-121	120 Ohm, ±5%, ¼W Resistor **(R105, 109)**
5	100000-151	150 Ohm, ±5%, ¼W Resistor **(R55)**
6	100000-331	330 Ohm, ±5%, ¼W Resistor **(R30, 31, 115)**
7	100000-471	470 Ohm, ±5%, ¼W Resistor **(R32, 87-99)**
8	100000-681	680 Ohm, ±5%, ¼W Resistor **(R57, 61)**
9	100000-102	1K Ohm, ±5%, ¼W Resistor **(R27, 29, 53, 73, 85, 86, 132, 134)**
10	100000-271	270 Ohm, ±5%, ¼W Resistor **(R112, 113)**
11	100000-122	1.2K Ohm, ±5%, ¼W Resistor **(R35, 100)**
12	100000-222	2.2K Ohm, ±5%, ¼W Resistor **(R36, 75, 117, 123, 133, 141)**
13	100000-272	2.7K Ohm, ±5%, ¼W Resistor **(R66)**
14	100000-332	3.3K Ohm, ±5%, ¼W Resistor **(R56, 65, 74, 142)**
15	100000-392	3.9K Ohm, ±5%, ¼W Resistor **(R39, 64, 106-108)**
16	100000-472	4.7K Ohm, ±5%, ¼W Resistor **(R37, 82, 102, 137, 140, 144)**
17	100000-562	5.6K Ohm, ±5%, ¼W Resistor **(R40, 62, 67)**
18	100000-682	6.8K Ohm, ±5%, ¼W Resistor **(R49, 104, 128, 129)**
20	100000-103	10K Ohm, ±5%, ¼W Resistor **(R9-26, 28, 33, 38, 54, 58-60, 63, 69, 70, 79, 80, 103, 110, 111, 116, 122, 130, 131, 135, 136, 138, 139)**
21	100000-123	12K Ohm, ±5%, ¼W Resistor **(R43)**
22	100000-153	15K Ohm, ±5%, ¼W Resistor **(R68)**
23	100000-183	18K Ohm, ±5%, ¼W Resistor **(R51, 146)**
24	100000-223	22K Ohm, ±5%, ¼W Resistor **(R1-8, 34, 41, 45, 50)**
25	100000-333	33K Ohm, ±5%, ¼W Resistor **(R52)**
26	100000-473	47K Ohm, ±5%, ¼W Resistor **(R42, 44, 48, 76, 78, 83, 114)**
27	100000-563	56K Ohm, ±5%, ¼W Resistor **(R145)**
28	100000-104	100K Ohm, ±5%, ¼W Resistor **(R46, 81, 84, 143)**
29	100000-224	220K Ohm, ±5%, ¼W Resistor **(R47)**
30	100000-274	270K Ohm, ±5%, ¼W Resistor **(R101)**
33	100000-393	39K Ohm, ±5%, ¼W Resistor **(R77)**
34	19-007	10K Ohm, 8-Pin Resistor Network. Use with the LS170 only, item 120. **(RP1, 2)**
35	19-315103	10K Ohm Vertical PCB-Mounting Cermet Trimpot, Bournes Series 3352V-1-10K **(R120, 126)**
39	21-101104	.1 uf, ±10%, Radial-Lead Epoxy-Dipped 100V Mylar Capacitor **(C64, 67-69)**
40	21-101224	.22 uf, ±10%, Radial-Lead Epoxy-Dipped 100V Mylar Capacitor **(C33)**
41	21-101473	.047 uf, ±10%, Radial-Lead Epoxy-Dipped 100V Mylar Capacitor **(C46)**
44	24-250105	1.0 uf Aluminum Electrolytic Fixed Axial-Lead 25V Capacitor **(C25, 70, 90, 92, 93)**
45	24-250107	100 uf Aluminum Electrolytic Fixed Axial-Lead 25V Capacitor **(C19)**
46	24-250477	470 uf Aluminum Electrolytic Fixed Axial-Lead 25V Capacitor **(C86, 87)**
47	24-250226	22 uf Aluminum Electrolytic Fixed Axial-Lead 25V Capacitor **(C117)**
49	27-250102	.001 uf Ceramic-Disc 25V Radial-Lead Capacitor **(C56)**
50	27-250103	.01 uf Ceramic-Disc 25V Radial-Lead Capacitor **(C27, 32, 36, 40, 55, 58)**
51	29-088	.1 uf Ceramic-Disc 25V Radial-Lead Capacitor **(C1-18, 20-23, 26, 28-31, 34, 37, 41-44, 49, 51-54, 57, 60, 61, 63, 65, 66, 71-85, 91, 94-96, 99, 100, 103, 104, 107, 108, 111, 112, 114-116, 120-123)**
53	28-101100	10 pf Radial-Lead Epoxy-Dipped 100V Mica Capacitor **(C97, 105)**
54	28-101680	68 pf Radial-Lead Epoxy-Dipped 100V Mica Capacitor **(C102, 110)**
55	28-101101	100 pf Radial-Lead Epoxy-Dipped 100V Mica Capacitor **(C89)**
56	28-101221	220 pf Radial-Lead Epoxy-Dipped 100V Mica Capacitor **(C98, 106, 118, 119)**
57	28-101271	270 pf Radial-Lead Epoxy-Dipped 100V Mica Capacitor **(C59)**
58	28-101391	390 pf Radial-Lead Epoxy-Dipped 100V Mica Capacitor **(C88)**
61	29-006	1.0 uf, ±10%, 35V Tantalum Capacitor **(C24, 35, 47, 50, 62, 113)**
63	29-046	10 uf, ±10%, 20V Tantalum Capacitor **(C38, 39, 45, 48)**
65	31-1N100	100V Type-1N100 Switching Diode **(CR16)**
66	31-1N914	75V Type-1N914 Switching Diode **(CR1-4, 6-8, 15)**
67	31-1N4001	50V Type-1N4001 Silicon Rectifier Diode **(CR9-12)**

Figure 21 Asteroids Game PCB Assembly, continued Parts List

Item	*Part No.*	*Description (Reference Designations and Locations in Bold)*
68	31-1N756A	8.2V, ±5%, 1N756A Zener Diode **(CR13, 14)**
71	33-2N3906	Type-2N3906 PNP Switching and Amplifying Transistor **(Q1-5, 7, 10, 16, 17)**
72	34-2N3643	Type-2N3643 NPN Silicon Transistor **(Q6)**
73	34-2N3904	Type-2N3904 NPN 60V 1-Watt Transistor **(Q8, 9)**
74	34-2N6044	Type-2N6044 Darlington NPN Transistor **(Q11-13)**
75	34-MPSA06S	Type-MPSA06S NPN 80V 500ma Transistor **(Q14, 15)**
78	37-74LS00	Type 74LS00 Integrated Circuit **(N5, C6)**
79	37-74LS02	Type 74LS02 Integrated Circuit **(D6)**
80	37-7404	Type 7404 Integrated Circuit **(H10)**
81	37-74LS04	Type 74LS04 Integrated Circuit **(B5, L5)**
82	37-7406	Type 7406 Integrated Circuit **(N9)**
83	37-74LS08	Type 74LS08 Integrated Circuit **(E6, K6, R7, B8)**
84	37-74LS10	Type 74LS10 Integrated Circuit **(A8)**
85	37-74LS14	Type 74LS14 Integrated Circuit **(B6)**
86	37-74LS20	Type 74LS20 Integrated Circuit **(E5)**
87	37-74LS32	Type 74LS32 Integrated Circuit **(M5, N6, B9)**
88	37-74LS42	Type 74LS42 Integrated Circuit **(L6, E7, E8)**
89	37-74LS74	Type 74LS74 Integrated Circuit **(D4, A7, R8)**
91	37-74LS83	Type 74LS83 Integrated Circuit **(M6)**
92	37-74LS86	Type 74LS86 Integrated Circuit **(P5)**
93	37-7497	Type 7497 Integrated Circuit **(F8, H8, J8, K8)**
94	37-74LS109	Type 74LS109 Integrated Circuit **(A9)**
95	37-74LS139	Type 74LS139 Integrated Circuit **(L3, E4)**
97	37-74LS157	Type 74LS157 Integrated Circuit **(F3, H3, J3, K3, F6, A10, B/C10, C10, D/E10, E10, F/H10)**
98	37-74LS161	Type 74LS161 Integrated Circuit **(D7)**
99	37-74LS164	Type 74LS164 Integrated Circuit **(K9, P9, R9)**
101	37-74LS174	Type 74LS174 Integrated Circuit **(N7, P7, D8, N11, F10)**
102	37-74LS175	Type 74LS175 Integrated Circuit **(M7)**
104	37-74LS191	Type 74LS191 Integrated Circuit **(K5, C9, D9, E9, F9, H9, J9)**
105	37-74LS193	Type 74LS193 Integrated Circuit **(F5, H5, J5)**
106	37-74LS244	Type 74LS244 Integrated Circuit **(B2, C2)**
107	37-74LS245	Type 74LS245 Integrated Circuit **(R2, E3)**
	OR	
108	37-8304B	Type 8304B Integrated Circuit—*substitute for item 107* **(P2, E3)**
110	37-74LS251	Type 74LS251 Integrated Circuit **(J10, L10)**
111	37-74LS253	Type 74LS253 Integrated Circuit **(P6)**
112	37-74LS259	Type 74LS259 Integrated Circuit **(M10)**
113	37-74LS273	Type 74LS273 Integrated Circuit **(F7, H7, J7, K7)**
114	37-74LS367	Type 74LS367 Integrated Circuit **(H6, J6)**
116	37-74LS393	Type 74LS393 Integrated Circuit **(B4, D5)**
117	37-74LS374	Type 74LS374 Integrated Circuit **(B10, D10)**
	OR	
118	37-74LS273	Type 74LS273 Integrated Circuit—*substitute for item 117* **(B10, D10)**
119	37-74LS670	Type 74LS670 Integrated Circuit **(F4, H4, J4)**
	OR	
120	37-74LS170	Type 74LS170 Integrated Circuit—*substitute for item 119* **(F4, H4, J4)**
121	37-9316	Type 9316 Integrated Circuit **(C4, C5, P8, B7, C7)**
122	37-LM324	Type LM324 Integrated Circuit **(L8, P11)**
124	37-555	Type 555 Timer Integrated Circuit **(M8, N8, L9, R10)**
125	37-566	Type 566 Function Generator Integrated Circuit **(P10)**
127	37-4016B	Type 4016B Integrated Circuit **(M9, N10, R11, B12, D12)**
128	37-TL082CP	Type TL082CP Integrated Circuit **(A12, C12)**
129	37-AD561J	Type AD561J Integrated Circuit **(B11, D11)**
130	137108-001	Type TL081CP Operational Amplifier Integrated Circuit **(B/C12, E12)**
132	37-7805	+5V Voltage Regulator **(VR3)**

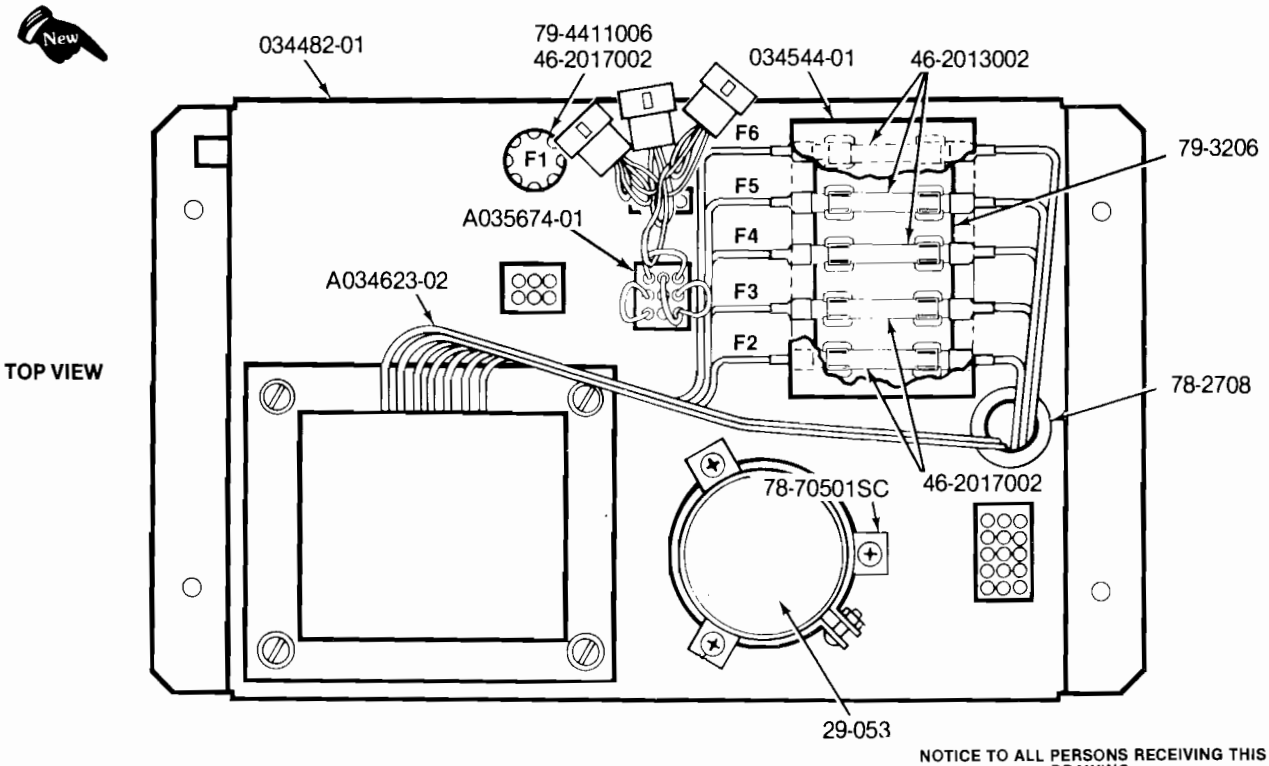
Figure 21 Asteroids Game PCB Assembly, continued Parts List

Item	*Part No.*	*Description (Reference Designations and Locations in Bold)*
133	37-7812	+ 12V Voltage Regulator **(VR1)**
134	37-7815	+ 15V Voltage Regulator **(VR4)**
135	37-7915	– 15V Voltage Regulator **(VR2)**
137	38-MV5053	Type MV5053 Light-Emitting Diode **(CR5)**
139	41-3003	100 uH, ±5%, Hot-Molded Plastic Fixed R.F. Choke **(L1-15)**
141	62-001	SPST Pushbutton Switch **(A6)**
142	66-118P1T	8-Station Single-Throw, Dual-Inline-Package Bit Switch **(R6)**
143	66-114P1T	4-Station Single-Throw, Dual-Inline-Package Bit Switch **(M12)**
144	79-42C40	40-Contact Medium-Insertion-Force Integrated Circuit Socket **(C3)**
146	81-4302	Nylon Snap-In Fastener
148	020670-01	Test Point
150	90-102	12.096 MHz, ±.005%, Crystal **(Y1)**
151	90-6013	Microprocessor **(C3)**
152	90-7033	Random-Access Memory **(D2, E2, M4, N4, P4, R4)**
155	034602-01	Programmable Read-Only Memory **(C8)**
157	035127-01	Read-Only Memory **(N/P3)**
		OR THE FOLLOWING TWO ITEMS:
159	035129-01	Programmable Read-Only Memory, MSB—*substitute for half of item 157* **(K4)**
159	035130-01	Programmable Read-Only Memory, LSB—*substitute for half of item 157* **(L4)**
187	79-42C18	18-Contact Medium-Insertion-Force Integrated Circuit Socket **(F2, H1, H2, J1, J2, K1, K4, L1, L2, L4, M1, M2, N1, N2—*used only on A034986-03 PCB assembly)***
188	79-42C24	24-Contact Medium-Insertion-Force Integrated Circuit Socket **(C1, D/E1, F1, N/P3)**

For remaining memory components and their part numbers, see listing below.

Memory Components and Their Equivalents (Locations Shown in Bold)

-01 P.C. Boards (PROMs)	**Alternate -01 P.C. Boards (PROMs)**	**-02 P.C. Boards (ROMs)**
035131-02 **J2**	035150-02 **J2**	035143-02 **C1**
035132-02 **N2**		
035137-02 **K1**	035153-02 **K1**	
035138-02 **N1**		
035133-02 **H2**	035151-02 **H2**	035144-02 **D/E1**
035134-02 **M2**		
035139-02 **J1**	035154-02 **J1**	
035140-02 **M1**		
035135-02 **F2**	035152-02 **F2**	035145-02 **F1**
035136-02 **L2**		
035141-02 **H1**	035155-02 **H1**	
035142-02 **L1**		



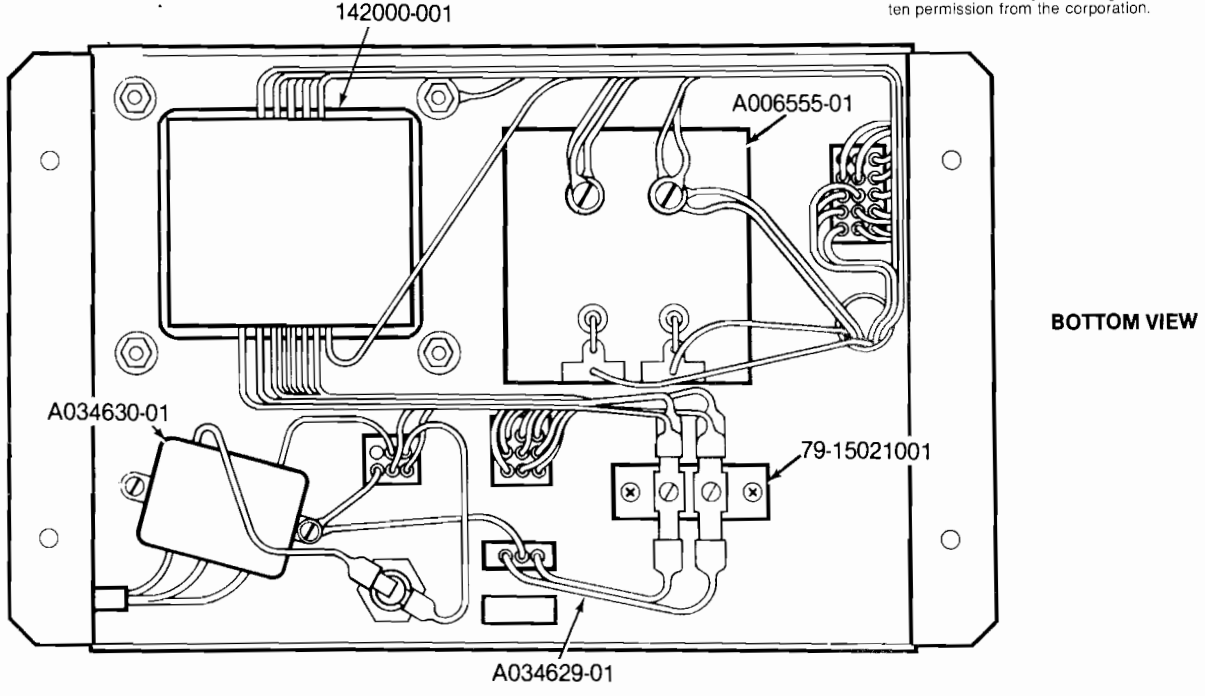


Figure 22 Power Supply Assembly for X-Y Games
A034561-03 E

Figure 22 Power Supply Assembly for X-Y Games Parts List

Part No.	*Description*
A006555-01	Rectifier Printed Circuit Board Assembly
A034623-03	Power Supply Harness Assembly, includes Shielded Power Transformer
A034629-01	A.C. Harness Assembly
A034630-01	RFI Filter Assembly
A035674-01	Voltage Plug Assembly *(set of four plugs)*
29-053	26,000 uf 15 V Electrolytic Capacitor
46-2013002	3-Amp. 250 V 3AG Slow-Blow Glass Cartridge-Type Fuse
46-2017002	7-Amp. 250 V 3AG Slow-Blow Glass Cartridge-Type Fuse
78-2708	Nylon Type 6/6 Hole Bushing with 5/8″ Inside Diameter × 55/64″ Outside Diameter × ¼″ Thick
78-70501SC	2″ Diameter Capacitor Mounting Bracket
79-15021001	2-Circuit Single-Row Terminal Block
79-3206	5-Position 3AG Fuse Block with ¼″ Quick-Disconnect Terminals
79-4411006	Panel-Mounting Non-Indicating 3AG Cartridge-Type Fuse Post
034482-01	Power Supply Chassis
034544-01	Fuse Block Cover
142000-001	Shielded Power Transformer

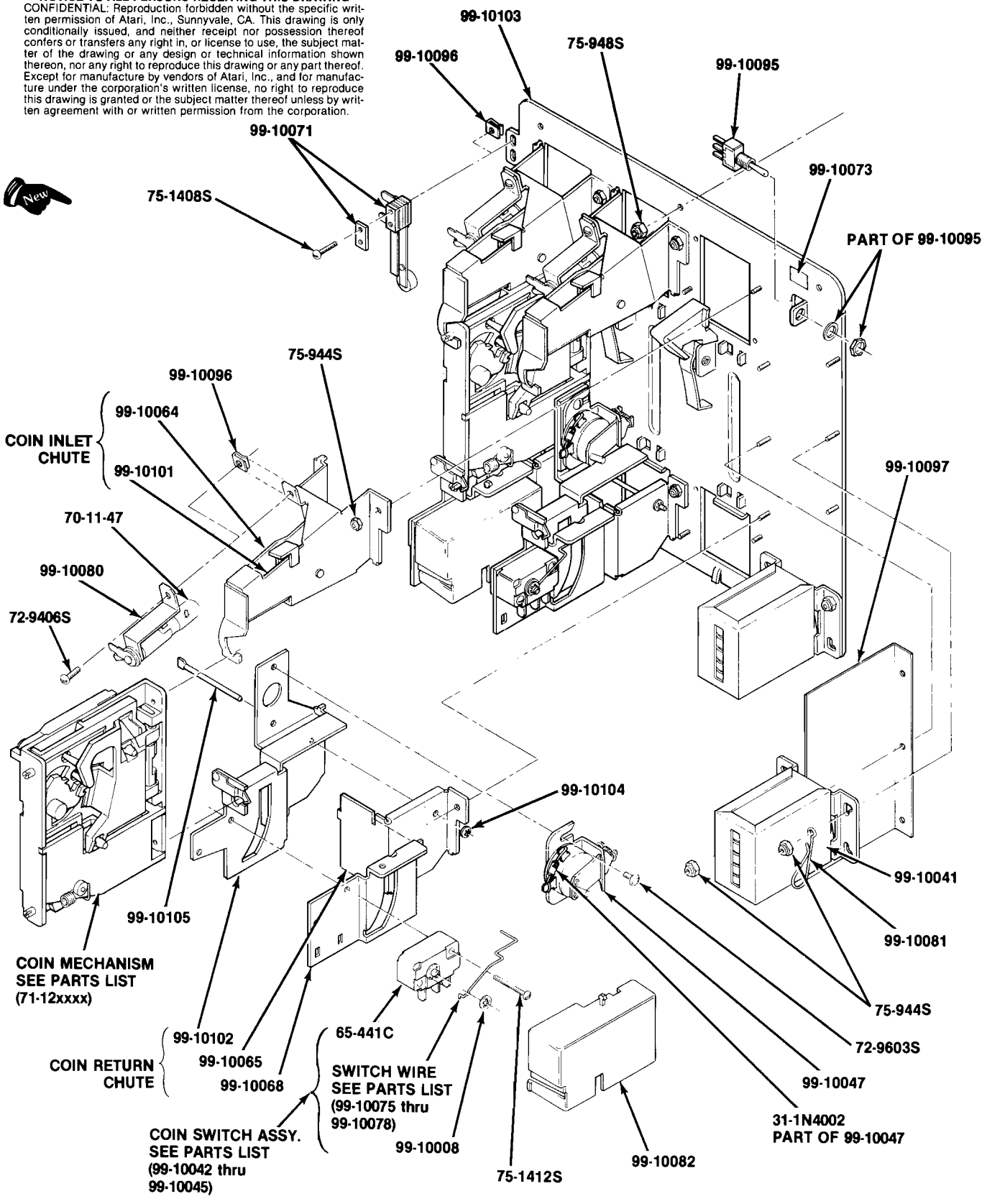


Figure 23 New Coin Door 71-10xxxx

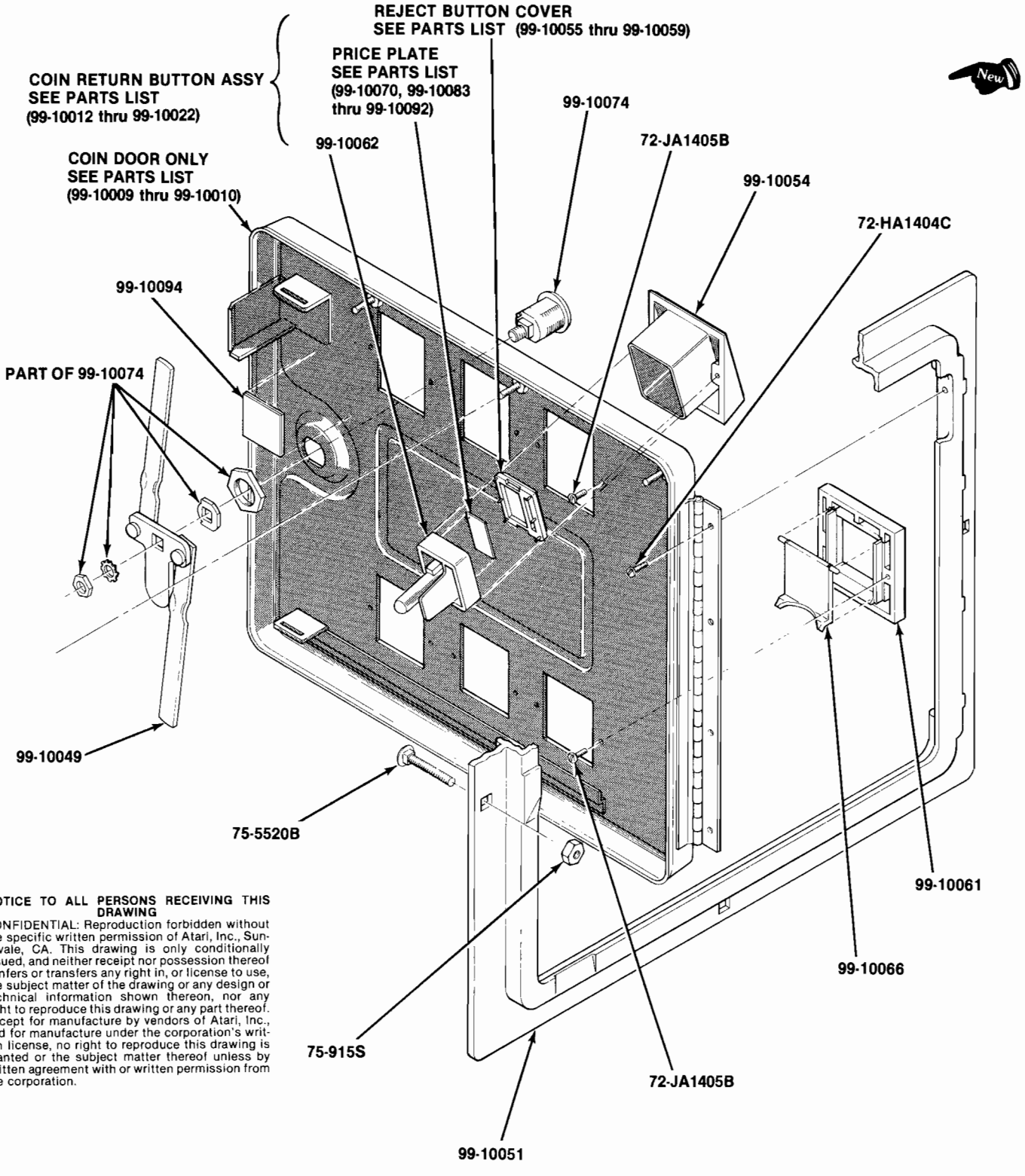


Figure 23 New Coin Door 71-10xxxx

Figure 23 New Coin Door, continued
Parts List

Part No.	*Description*
31-1N4002	100V Silicon Rectifier 1N4002 Diode
65-441C	General-usage low-force miniature switch
70-11-47	Miniature bayonet-base incandescent lamp, type #47
71-1201ADU	U.S. $1.00 coin mechanism
71-1201FCH	Swiss 1 Fr coin mechanism
71-1201MG	German 1 DM coin mechanism
71-1202MG	German 2 DM coin mechanism
71-1205FB	Belgian 5 Fr coin mechanism
71-1205MG	German 5 DM coin mechanism
71-1210PE	U.K. 10 P coin mechanism
71-1220CA	Australian 20¢ coin mechanism
71-1225CU	U.S. 25¢ coin mechanism
71-12100LI	Italian 100 Lire coin mechanism
71-12100YJ	Japanese Y100 coin mechanism
72-HA1404C	#4x¼" Slotted pan-head thread-rolling tri-fluted "Taptite" cadmium-plated screw
72-JA1405B	#4x5/16" Slotted pan-head thread-rolling tri-fluted "Plastite" black screw
72-9406S	#4-40x3/8" Slotted truss-head steel machine screw
72-9603S	#6-32x3/16" Slotted truss-head steel machine screw
75-915S	#¼-20 Standard pattern cadmium-plated steel hex nut
75-918S	#8-32 Standard pattern cadmium-plated steel hex nut
75-944S	#4-40 Polymer self-locking steel hex nut
75-948S	#8-32 Polymer self-locking steel hex nut
75-1408S	#4-40x½" Slotted pan-head steel machine screw
75-1412S	#4-40x¾" Slotted pan-head steel machine screw
75-5520B	#¼-20x1¼" Round-head square-neck steel bolt with black finish
99-10008	Switch wire retainer
99-10009	2-Mech coin door only
99-10010	3-Mech coin door only
99-10011	Inner panel
99-10012	U.S. 25¢ coin return button assembly
99-10013	U.S. $1.00 coin return button assembly
99-10014	German 1 DM coin return button assembly
99-10015	German 2 DM coin return button assembly
99-10016	German 5 DM coin return button assembly
99-10017	Belgian 5 Fr coin return button assembly
99-10018	Swiss 1 Fr coin return button assembly
99-10019	Japanese Y100 coin return button assembly
99-10020	U.K. 10 P coin return button assembly
99-10021	Australian 20¢ coin return button assembly
99-10022	Italian 100 Lire coin return button assembly
99-10040	Coin inlet chute assembly
99-10041	Coin counter assembly
99-10042	Coin switch assembly for U.S. 25¢ and Belgian 5 Fr coins (silver wire)
99-10043	Coin switch assembly for German 1 DM, Swiss 1 Fr, and Japanese Y100 coins (black wire)
99-10044	Coin switch assembly for U.S. $1.00, German 2 DM, and Italian 100 Lire coins (gold wire)

Figure 23 New Coin Door, continued
Parts List

Part No.	*Description*
99-10045	Coin switch assembly for German 5 DM, U.K. 10 P, and Australian 20¢ coins (green wire)
99-10047	Lockout coil assembly
99-10048	Coin door harness assembly
99-10049	Locking arm assembly
99-10051	Coin door frame
99-10054	Coin button housing
99-10055	Coin return button cover for Japanese Y100 coin
99-10056	Coin return button cover for German 1 DM and Swiss 1 Fr coins
99-10057	Coin return button cover for U.S. 25¢ and Belgian 5 Fr coins
99-10058	Coin return button cover for U.S. $1.00, German 2 DM, and Italian 100 Lire coins
99-10059	Coin return button cover for German 5 DM, U.K. 10 P, and Australian 20¢ coins
99-10061	Coin return bezel
99-10062	Coin return button
99-10063	Right half of coin inlet chute
99-10064	Left half of coin inlet chute
99-10065	Coin return box
99-10066	Coin return cover
99-10070	U.S. 25¢ price plate
99-10071	Slam switch assembly
99-10073	Test switch decal
99-10074	Lock assembly
99-10075	Black switch wire—for German 1DM, Swiss 1Fr and Japanese Y100 coins
99-10076	Silver switch wire—for U.S. 25¢ and Belgian 5Fr coins
99-10077	Gold switch wire—for U.S. $1.00, German 2DM and Italian 100 Lire coins
99-10078	Green switch wire—for German 5DM, U.K. 10P and Australian 20¢ coins
99-10080	Miniature bayonet-base lamp socket
99-10081	Wire key holder
99-10082	Switch cover
99-10083	U.S. $1.00 price plate
99-10084	German 1 DM price plate
99-10085	German 2 DM price plate
99-10086	German 5 DM price plate
99-10087	Belgian 5 Fr price plate
99-10088	Swiss 1 Fr price plate
99-10089	Japanese Y100 price plate
99-10090	U.K. 10 P price plate
99-10091	Australian 20¢ price plate
99-10092	Italian 100 Lire price plate
99-10094	Fish paper insulation
99-10095	Toggle switch
99-10096	"U"-type fastener
99-10097	Fish paper insulation
99-10101	Coin inlet chute sub-assembly
99-10102	Switch and lockout coil bracket sub-assembly
99-10103	Inner panel with levers sub-assembly
99-10104	Anti-penny-flip bar retainer
99-10105	Anti-penny-flip bar

TM-155
1st printing

YOUR COMMENTS, PLEASE!

Your comments will assist Atari in improving the usefulness of our publications. They are an important part of preparing for revisions of manuals and parts catalogs. No postage stamp is necessary if mailed in the U.S.A.

If you have any technical questions about certain Atari or Kee Games products, or are requesting additional publications, we will immediately forward your note to the appropriate person.

Page: Comments:

Fill in if you wish a reply:

Name _____ Firm _____

Address _____

City _____ State _____ Zip _____

☐ Distributor
☐ Operator
☐ Other _____

First fold

No Postage
Necessary
if mailed in
the United States

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 1004 SUNNYVALE, CA

POSTAGE WILL BE PAID BY ADDRESSEE

Atari, Inc.
Attn.: Field Service/Coin-Op Division
P. O. Box 427
Sunnyvale, California 94086

Cut along this line

Second fold

ATARI, INC.
P.O. BOX 427
SUNNYVALE, CA 94086

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 television monitors (in games supplied with monitors) 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.

Atari distributors are independent, being privately owned and operated. In their judgment they may sell parts or accessories other than Atari parts or accessories. Atari cannot be responsible for the quality, suitability or safety of any non-Atari part or any modification including labor which is performed by such distributor.

ATARI INC
1265 BORREGAS AVENUE
P.O. BOX 427
SUNNYVALE, CALIFORNIA 94086
408/745-2000 • TELEX 35-7488
A Warner Communications Company