

# Operation, Maintenance and Service Manual

Complete with Illustrated Parts Lists

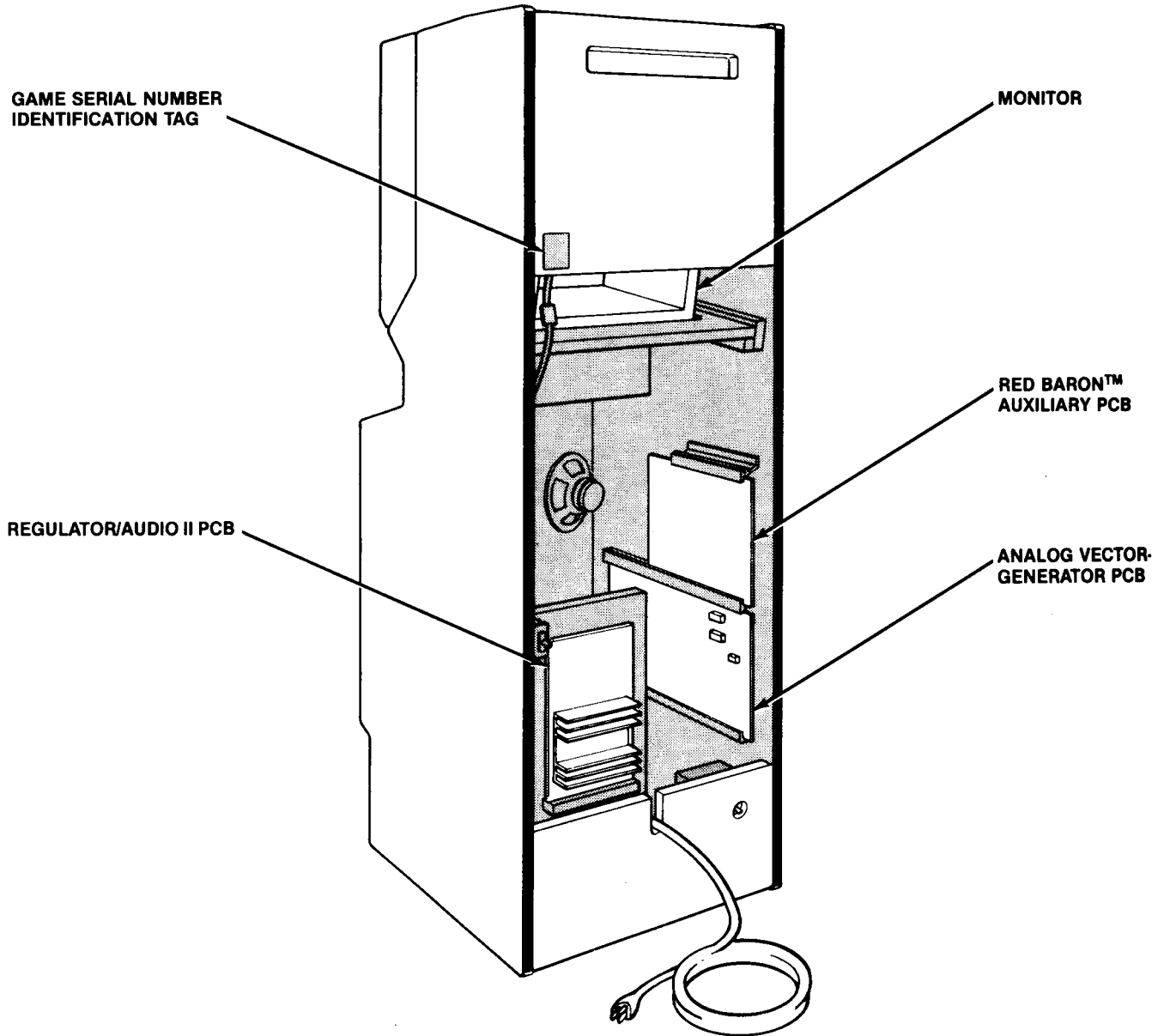


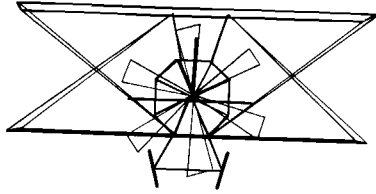
# SEA DOODLE<sup>TM</sup>



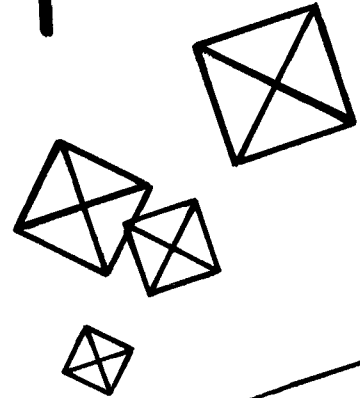
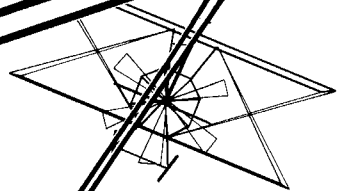
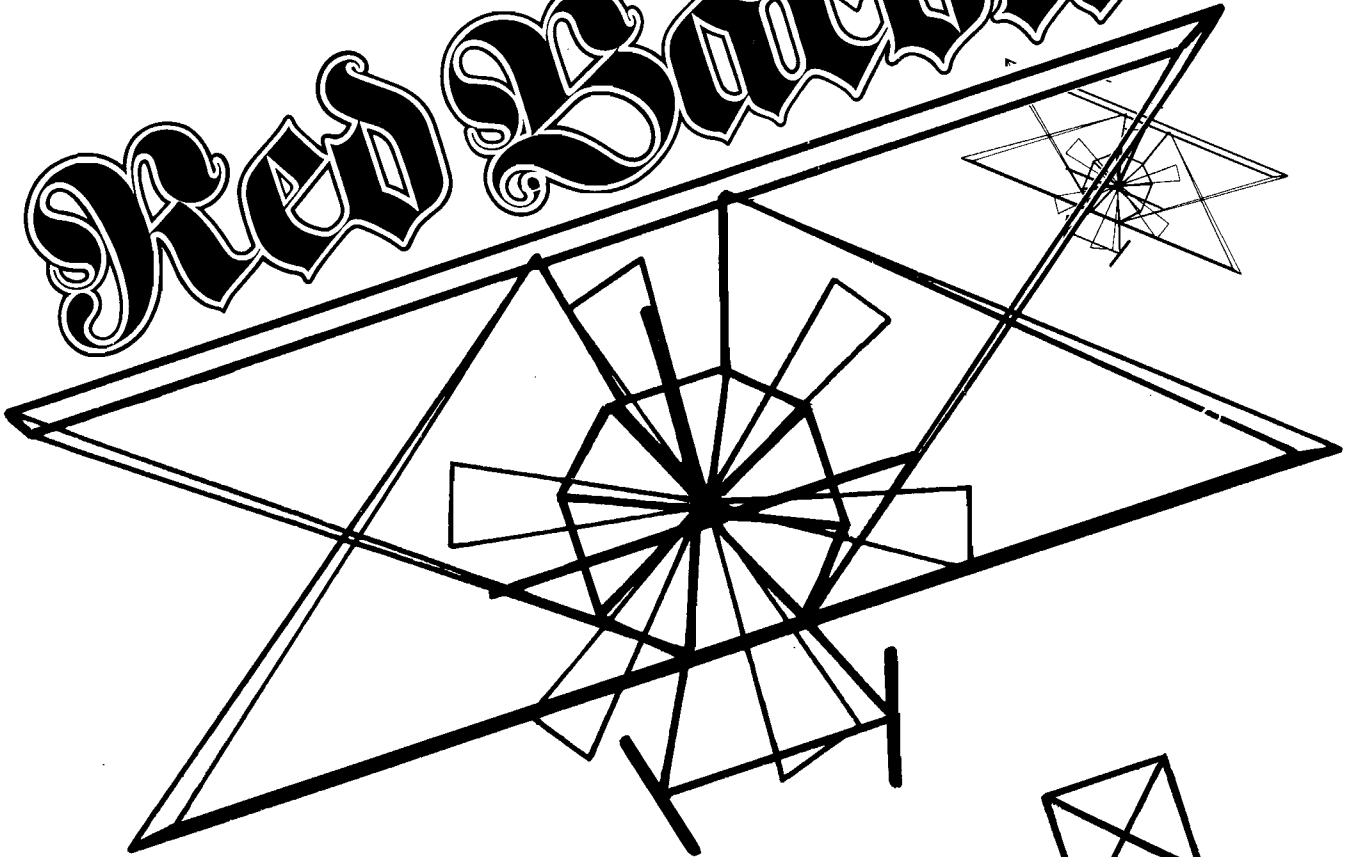
## GAME SERIAL NUMBER LOCATION

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 monitor, Regulator/Audio II PCB, the Red Baron™ Auxiliary PCB, and the Analog-Vector Generator PCB. Please mention this number whenever calling your distributor for service.

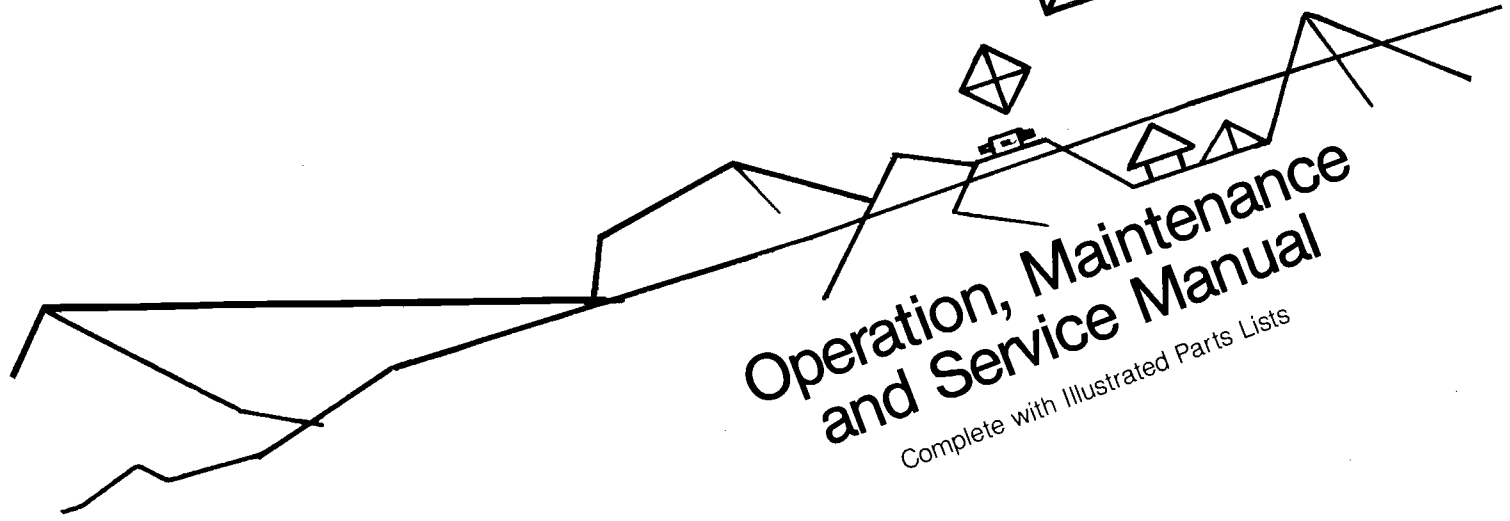




# Red Bull™



**Operation, Maintenance  
and Service Manual**  
Complete with Illustrated Parts Lists



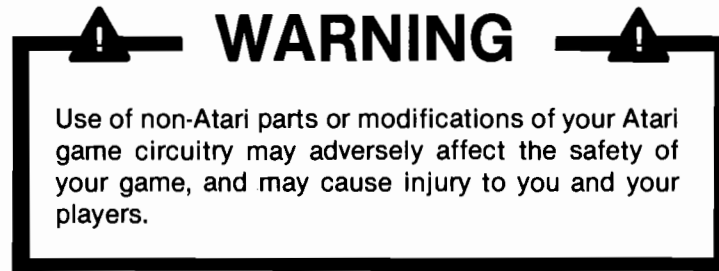
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## Notice Regarding Non-Atari Parts



Atari, Inc.'s warranty (printed on the inside back cover of this manual) may be voided, if you do any of the following:

- 1.) you substitute non-Atari parts in your coin-operated game, or
- 2.) 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 Tele-Help® at the Atari Customer Service office in your geographical area, as shown below.

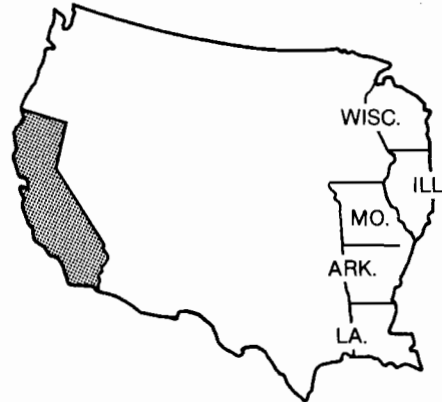
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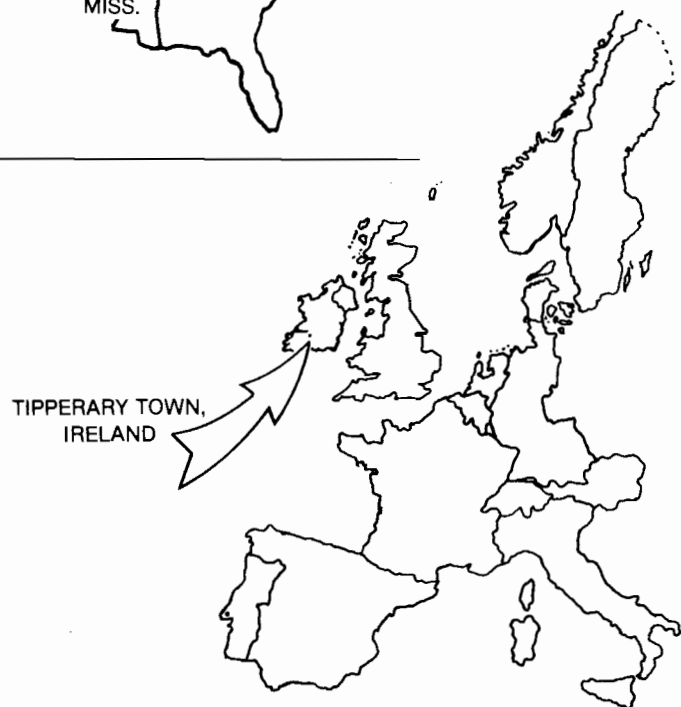
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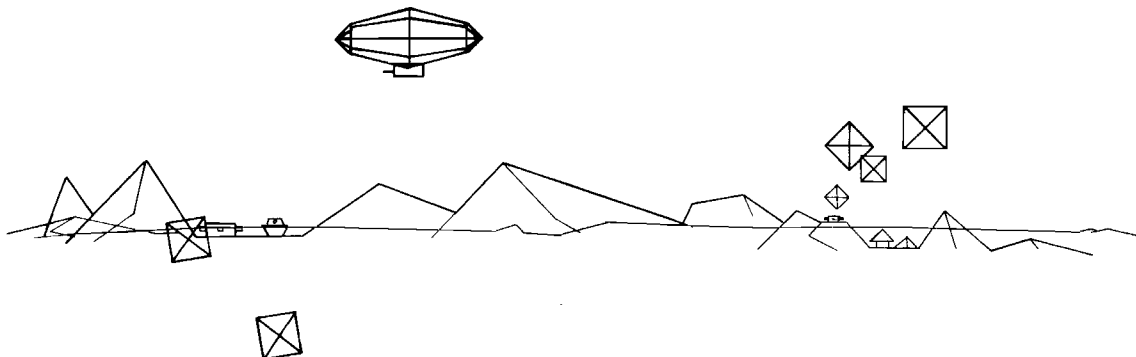
Atari Ireland Limited  
European Customer Service Office  
Tipperary Town, Ireland  
Telex 28165  
(Monday–Friday, 9:00–6:00 pm GMT)

☎ 062-52155





# Location Setup



## A. New Features

The Red Baron™ game has three new features. Even if you are familiar with Atari games, you should note these important differences. The new features are:

- **Gimbal-Type Joystick Control.** This new heavy-duty control provides a realistic simulation of an aircraft control. The X- and Y-direction motions are measured by two potentiometers mounted on this control.
- Red Baron includes a newly designed **power supply assembly**. This power supply has a larger transformer to handle the increased power requirements of the expanded game circuitry.
- **Game Circuitry.** Atari's 3-dimensional X-Y game circuitry has been expanded into two interconnected printed-circuit boards (PCBs)—the Red

Baron Analog Vector-Generator and the Auxiliary PCBs. The circuitry produces more lines on the screen at a faster rate, thus creating a smoother screen image.

The circuitry also has non-volatile memory for part of the high score table. This means that even if power is removed from the game, the three highest scores will permanently stay in memory. To erase these scores follow the instructions in Figure 6, Self-Test Procedure.

In addition, Red Baron is the first Atari game to have a self-adjusting game difficulty feature. For more details on this feature, see Section *F. Game Play*, in this manual.

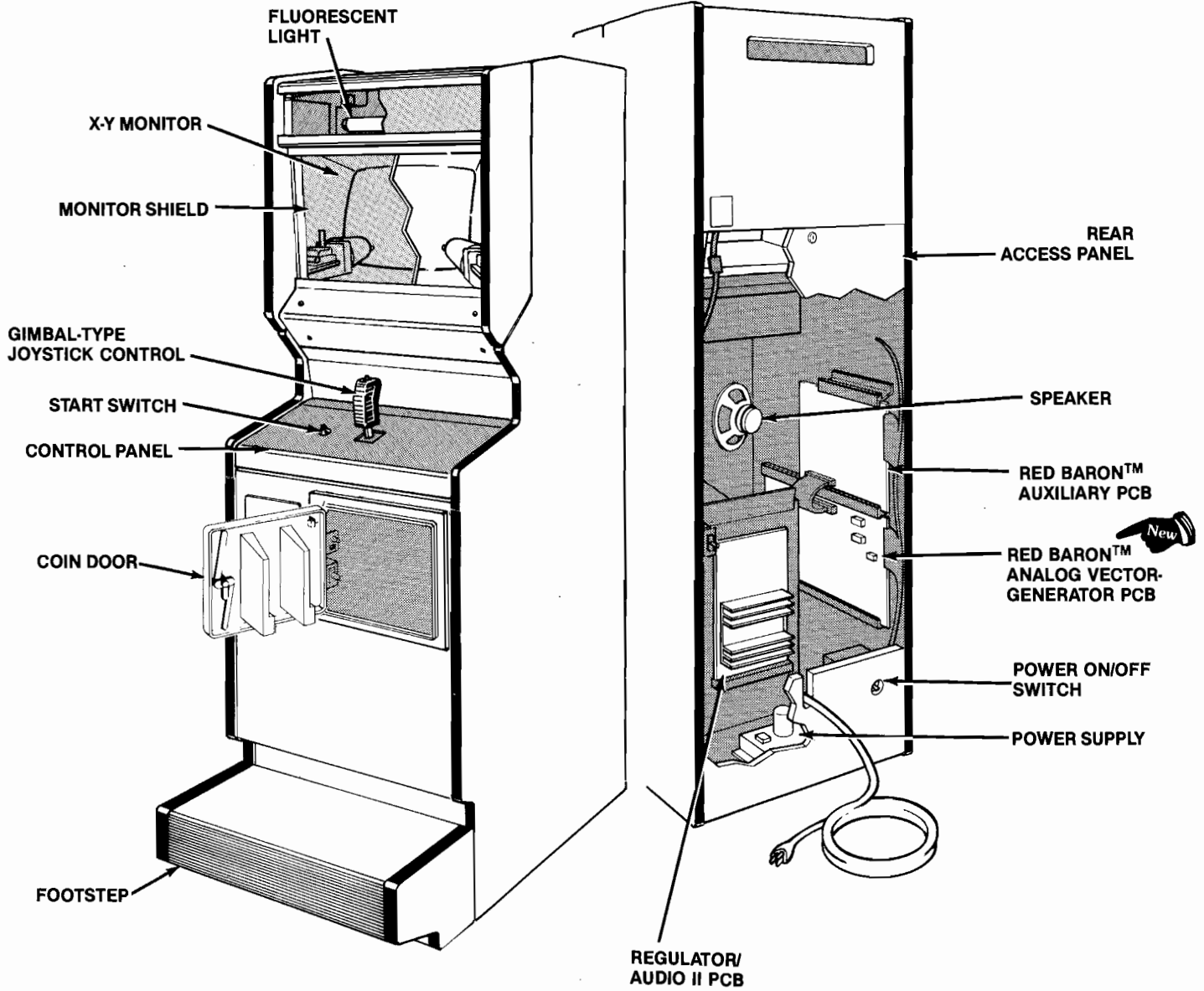
These new parts, as well as all other major parts in the game, are illustrated in Figure 1. Throughout this manual, wherever one of these new parts is mentioned, you will see this symbol:



### ⚠ 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!**





**WARNING**

The footstep **must be installed** for cabinet stability. Without the footstep, this game can tip over onto an aggressive player.

**ATTENTION**

Le piedestal doit être installé pour la stabilité de cabinet. Sans le piedestal, ce jeu pourrait se renverser sur un joueur enthousiaste.

Figure 1 Overview of Game

## 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 rear access panel of the cabinet and inspect the interior of the game as follows:
  - Check that all plug-in connectors (in 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 game PCB are firmly seated in their sockets.
  - Remove the tie-wrap that holds the coiled power cord on the inside cabinet wall. Check the cord for any cuts or dents in the insulation. Place the square black metal strain-relief plate in the wood slot at the bottom of the rear panel opening.

### WARNING

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

- 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 Red Baron™ Analog Vector-Generator PCB, Red Baron Auxiliary PCB, Regulator/Audio II PCB and monitor are all identical. 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 all major subassemblies such as the power supply, control panel and monitor for secure mounting.

## C. Game Installation

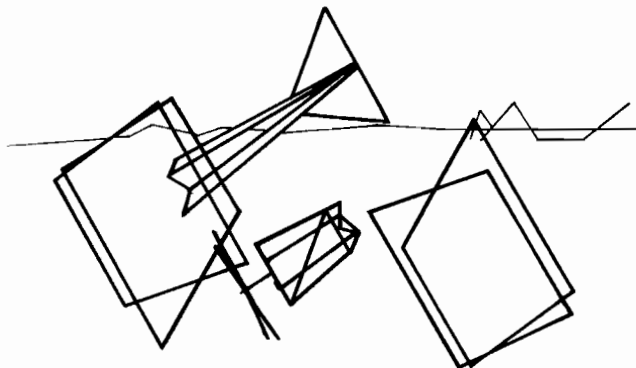
### Figure 2 Installation Requirements

Power	175 watts maximum
Temperature	0 to 38°C (32 to 100°F)
Humidity	Not over 95% relative
Space Required	With footstep: 64 × 84½ cm (25¼ × 33¼ in.) Without footstep: 64 × 64 cm (25¼ × 25¾ in.)
Game Height	190 cm (74¾ in.)

### 1. Voltage Plug Selection

This game has two possible power supplies: the domestic or international. The domestic power supply operates on one line voltage range: 105 to 135 VAC. The international power supply has four colored voltage selection plugs and operates on the line voltage of almost any country in the world.

Before plugging in your game, check your power supply. If the supply *doesn't have* voltage selection plugs and a connector at J3 (see Figure 3), then the game operates on any voltage from 105 to 135 VAC. If the supply *has* the colored voltage selection plugs, make sure that the voltage selection plug on the power supply is correct for your location's line voltage. Check the wire color on the plug and see if it is correct per Figure 3.



## 2. Interlock and Power On/Off Switches

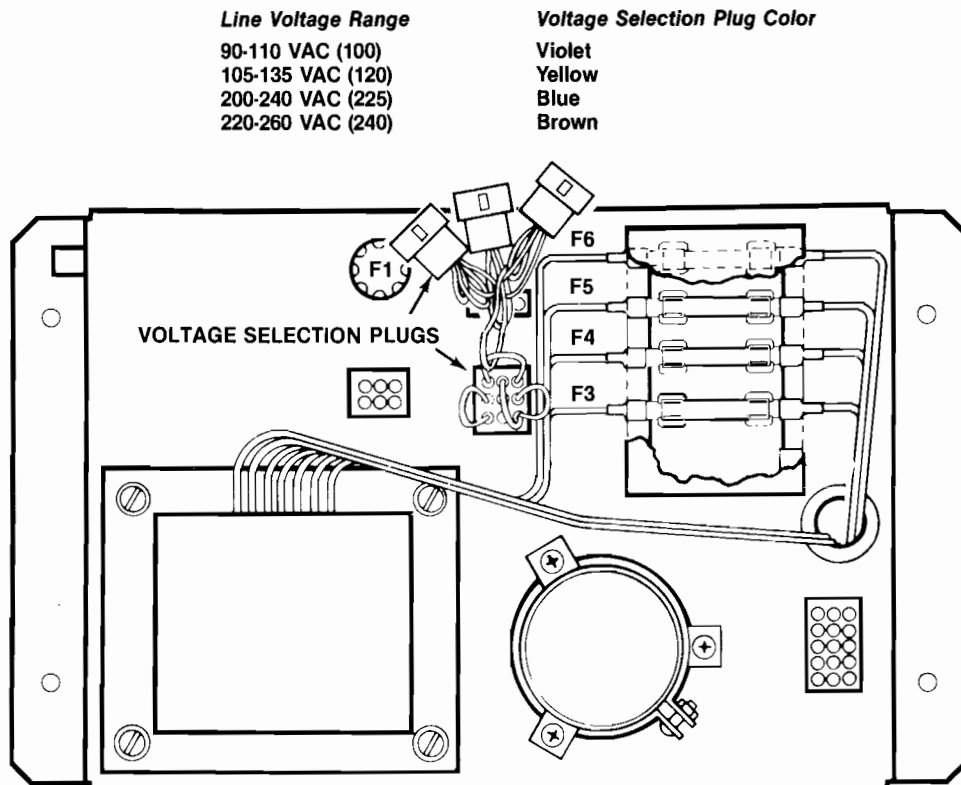
To minimize the hazard of electrical shock while working on the inside of the game cabinet, two interlock switches have been installed (see Figure 4). One is located behind the rear access panel and one is behind the coin door. These switches remove all AC line power from the game circuitry when either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

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

- Be sure the coin door and rear access panel are closed.
- Plug the AC line power cord into an AC outlet.

- Set the power on/off switch to the "on" position. Within 30 seconds the monitor should display a picture.
- Slowly open the rear access panel. The monitor picture should disappear when the door is opened approximately 2.5 cm (1 inch). Close and lock this door and repeat this step with the coin door.
- If the results of the preceding step are satisfactory, the interlock switches are operating properly. If the 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.

**⚠ WARNING ⚠**  
Fuse cover must be in place during game operation.



**Figure 3 International Voltage Plug Selection**

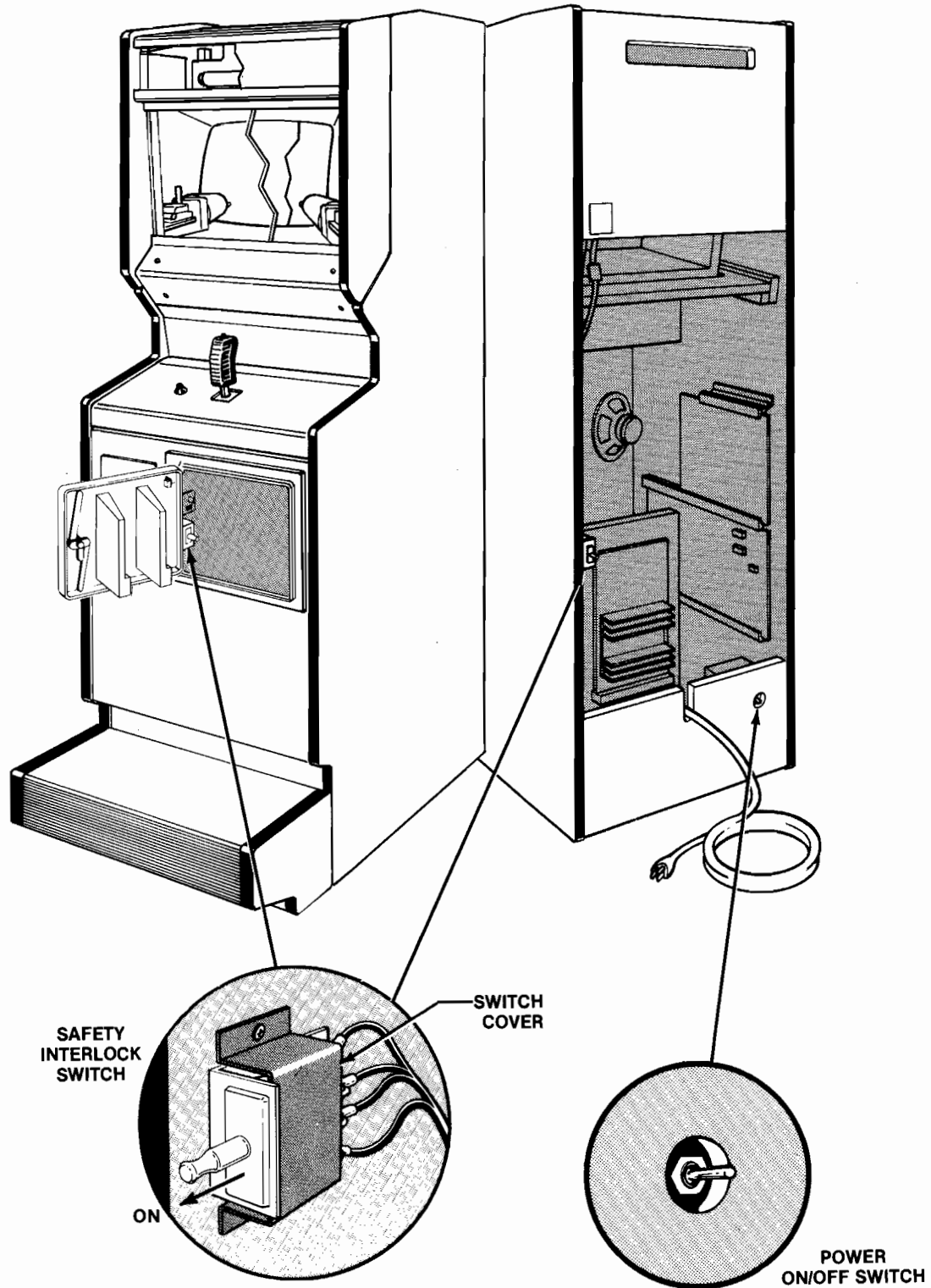


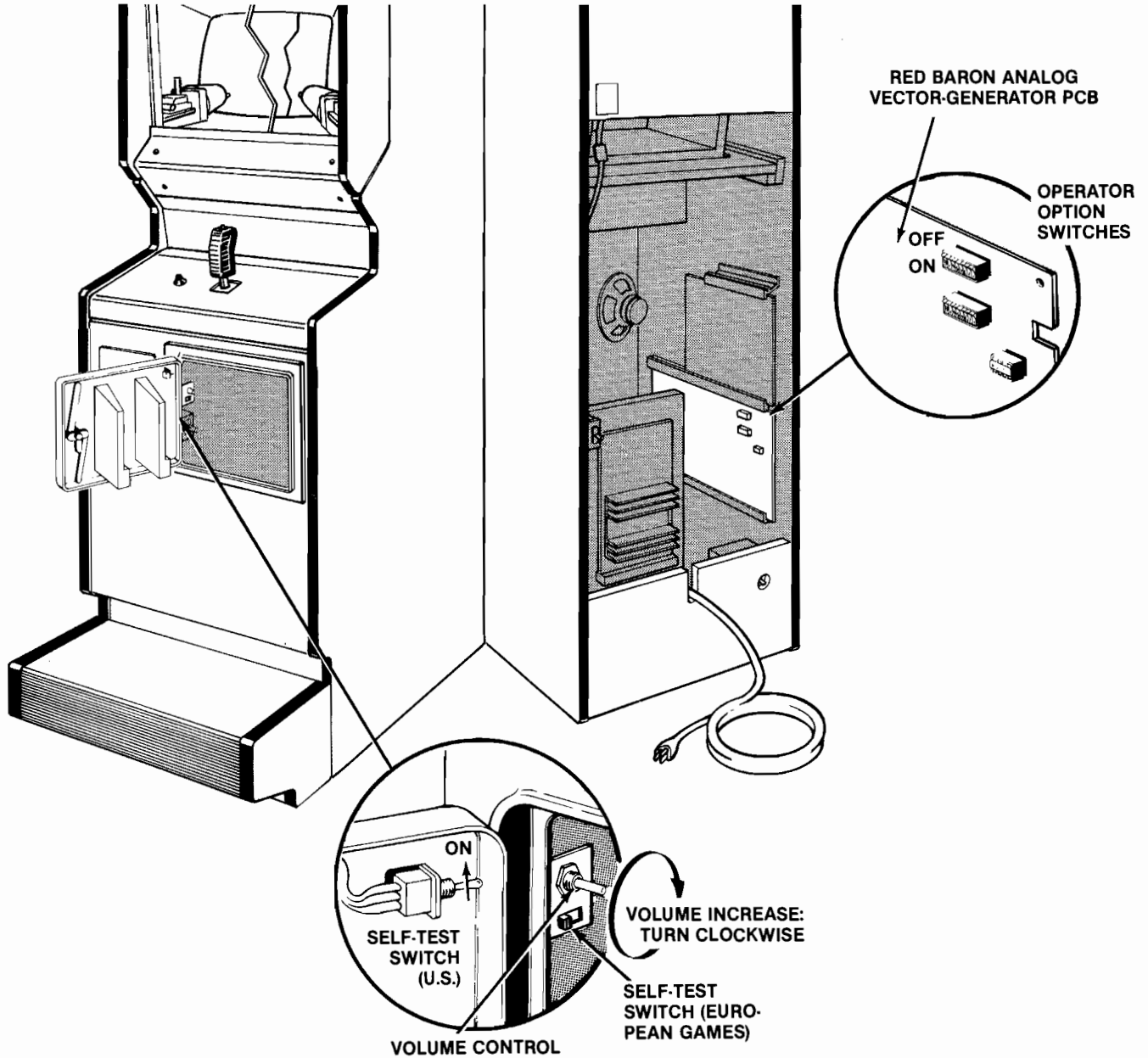
Figure 4 Interlock and Power On/Off Switches

# 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 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.

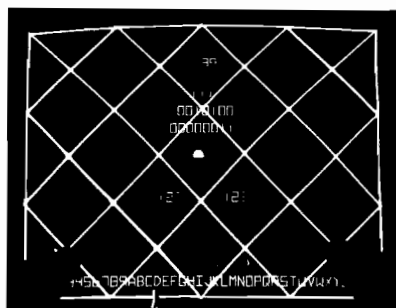
To run the self-test, follow the instructions outlined in Figure 6.



**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 <b>on</b> position (see Figure 5).	After about 10-12 seconds, the monitor displays the picture below. No sounds are produced.	<b>RAM FAILURE</b> is indicated by a sequence of 1 to 10 tones. You will hear a short low tone and a short flash on the LED start pushbutton for each good RAM chip, and a long high tone accompanied by a long pulse on the start pushbutton for a failing RAM chip. The test stops with the first failing RAM-chip pair (example: J2 and H2 are a pair). To restart the sequence, press the reset pushbutton on the Red Baron™ Analog Vector-Generator PCB, or set the self-test switch to <b>off</b> , then again to the <b>on</b> position. Identify the bad RAM chip with the table below. Example: four short low tones followed by a long high tone indicates failure of RAM at location B2.



DISPLAY OF COMPLETE CHARACTER SET

Long High Tone:	Bad RAM Chip Location on Analog Vector-Generator PCB:
1st	J2
2nd	H2
3rd	A2
4th	A1
5th	B2
6th	B1
7th	C2
8th	C1
9th	D2
10th	D1

**ROM/PROM FAILURE** is indicated by two columns of numbers on the left side of the screen. The number in the left column indicates the location of the failing ROM/PROM(s). Identify the bad ROM/PROM with the table immediately below.

Ignore the hexadecimal numbers in the right column on the screen.

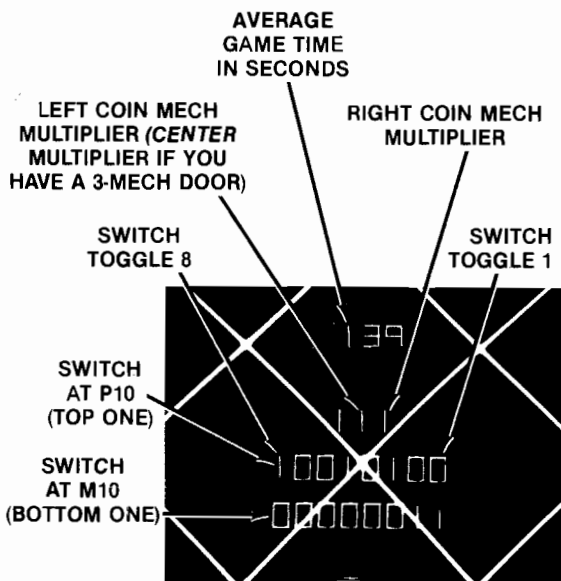


PHOTO ABOVE SHOWS AN EXAMPLE ONLY

Displayed No.:	Bad PROM Chip Location:	Printed-Circuit Board:
0	B/C3 or F/H3*	Analog Vector-Generator PCB
1	A3 or E3	
2	E1	
3	F/H1	
4	J1	
5	K1	
6	L/M1	
7	N1	Auxiliary PCB
8	P1**	
9	C0***	

\* If this PROM is bad, you will hear a continuous low tone, and the program may be unable to display a screen image.

\*\* If this PROM is bad, self-test will not work (screen may be blank or may display "garbage").

\*\*\* If you replace this part, **you must erase** this ROM before locking up the game (see instruction 5 in this self-test procedure). Otherwise the self-test will continue to display 9.

**MATH BOX FAILURE** is indicated by a single letter displayed in the upper right corner of the display. Math-box failure is explained in the Signature Analysis Procedure, on the Red Baron™ schematic Sheet 1, Side B. Identify the failure with the table below.

Displayed Letter	Failure
T	Time out error
H	Data error—high byte
L	Data error—low byte

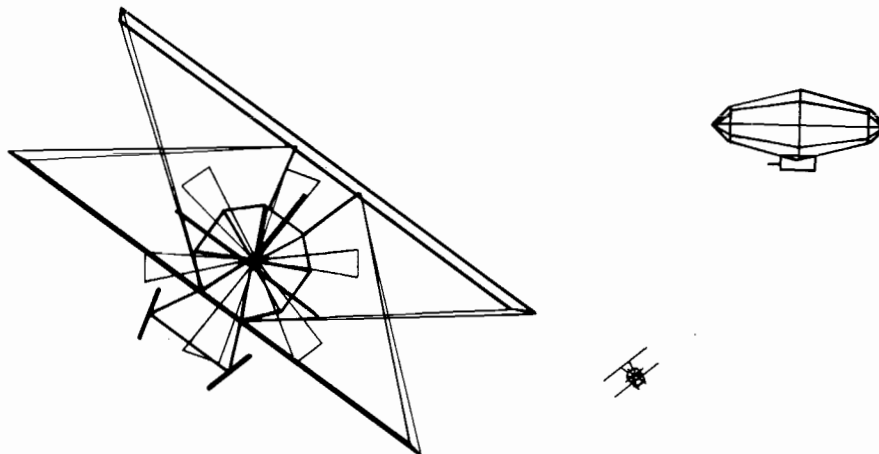
[Self-test is continued on next page]

## Figure 6 Self-Test Procedure, continued

Instruction	Results if Test Passes	Results if Test Fails
2. Activate start switch, fire switch, slam switch, and utility and coin switches.*	As switch activates, you'll hear a beep. As switch deactivates, you'll hear another beep.	You will not hear a beep for the defective switch.
3. Move joystick forward and backward.	The lower left number on the screen will increase with backward motion, and decrease with forward motion. (Ignore any flickering of numbers.)	Incorrect progression of numbers indicates potentiometer harness wires were connected incorrectly. No number change indicates potentiometer is bad or harness wires are loose.
4. Move joystick to the right and left.	The lower right number on the screen will increase with rightward motion, and decrease with leftward motion.	
<p><b>5. Erasing the High Score Table (optional)</b></p> <p>The current three highest scores are held in permanent memory, even if the game is unplugged. If you want to erase these scores, simultaneously press the start and fire buttons. The <i>ERASING</i> message at the center right of the screen will then be displayed for several seconds, until the entire table is erased. The average game time data will also be erased.</p>		
6. When satisfied with test, set self-test switch to <b>off</b> position.		



\* Activate coin switches by inserting at least one coin in each coin slot. You will not trip the coin counters as long as you are in self-test.





## E. Option Switch Settings

### 1. Bonus Play Feature

Red Baron™ offers a bonus play for certain combinations of coins inserted. This bonus feature is operator-selectable, meaning you may choose to offer it or not.

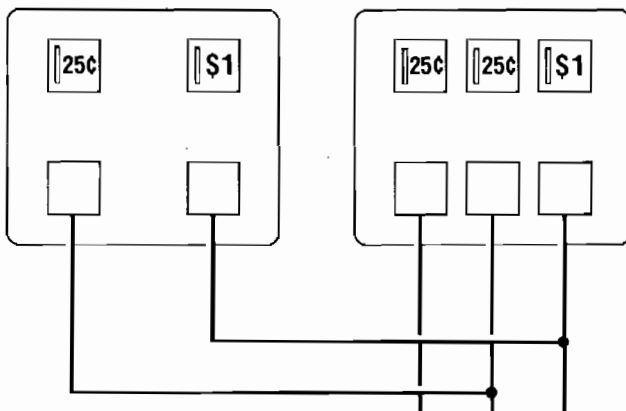
For example, with your game set at 50¢ per play, players who deposit four successive quarters or a \$1.00 coin, then press the start button, will receive a bonus play. Therefore, players receive 3 plays for \$1.00.

This bonus feature encourages players to insert more money than just the minimum 50¢ you could require for one game. Various other bonuses are available (see Figure 8).

### 2. Coin Mechanism Multipliers

The coin-door mechanisms for this game will accept about a dozen different denominations. The door has either two or three mechanisms that can accept the same or different denominations.

All recent Atari game PCBs identify the different mechanisms in a certain pattern. The right coin mechs are all the same to the game's logic, regardless of whether you have two or three mechs in your door. In addition, the logic sees the left mech in a 2-mech door and the center mech in a 3-mech door as the same. Refer to the diagram below.



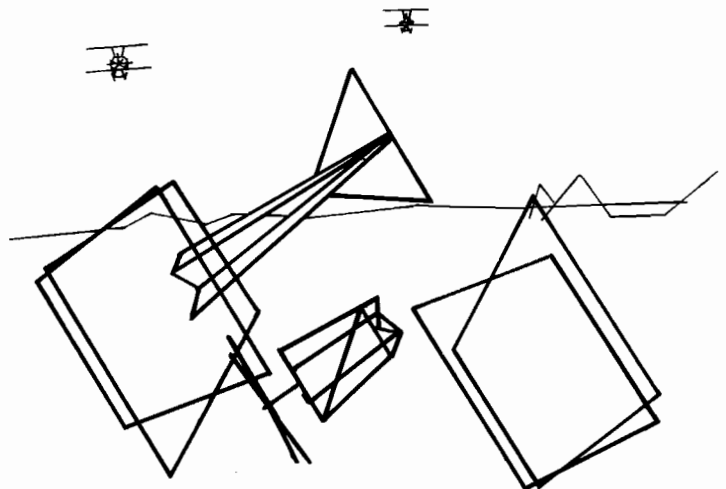
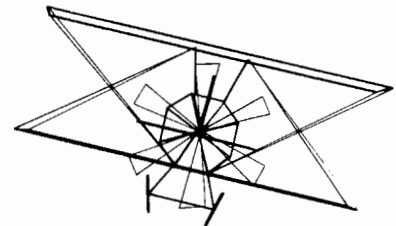
This pattern is important for you to know, so you can correctly set the "multipliers" for each mech. The multipliers determine how much each mechanism will be worth to the game's logic.

The basic unit of measurement is 25¢, which equals a multiplier of  $\times 1$ . Therefore, if you have a 25¢/25¢/\$1 coin door, you will probably want to set the center and right option-switch multipliers at  $\times 1/\times 4$ . (The left mech in a 3-mech door always has a value of  $\times 1$ —you cannot change its value.)

You can set these multipliers with toggles 3 thru 5 on the switch assembly at location M10 on the Red Baron Analog Vector-Generator PCB. For exact settings of these toggles, refer to Figure 8.

### 3. Examples of Option Switch Settings

Figure 8 explains the options, giving twelve examples of the most common U.S. situations. The toggles mentioned are all in the switch at location M10; they **only** relate to game price, coin mechanism multipliers, and bonus play. You should set the toggles relating to other functions as you see fit, although Figure 7, 8, and 9 provide "\$" signs indicating Atari's recommendations.



## Figure 7 Game Option Settings

To change toggle positions on the switch assemblies, you need not remove the game PCB. The switches, usually colored blue, are easily accessible when the Red Baron Analog Vector-Generator PCB is mounted in place.

When changing the options, verify proper results on the monitor display **by performing the self-test**. Note that changing an option on any of the following eight toggles will cause an immediate change on the monitor screen during the self-test.

**Toggle Settings of 8-Toggle Switch on Red Baron PCB (at P10)**  
(TOP switch when PCB is in game)

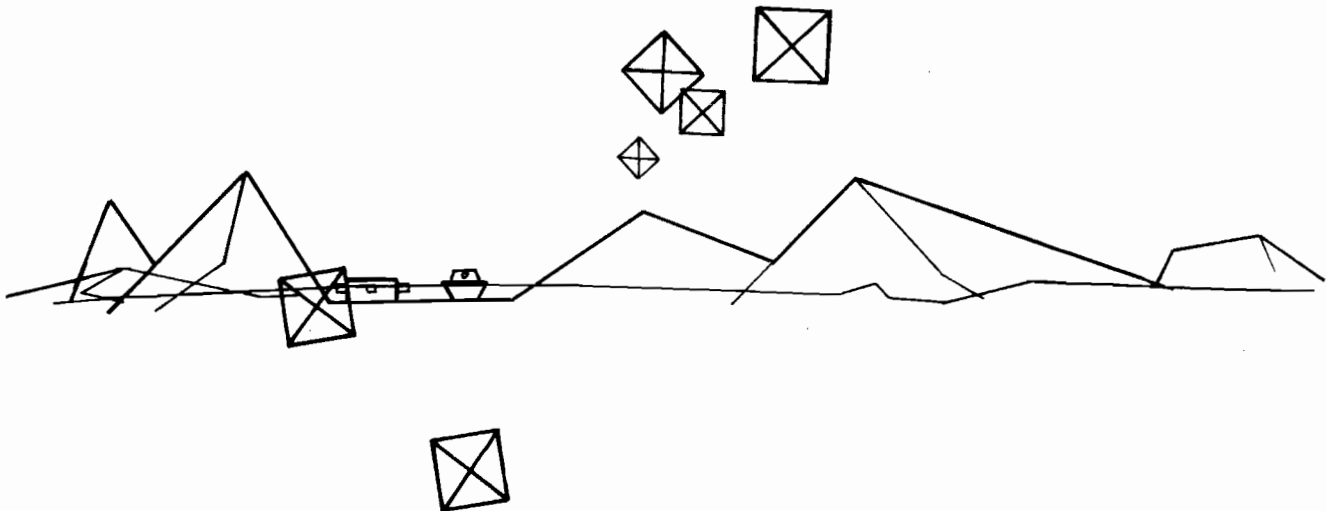
8	7	6	5	4	3	2	1	Option
						Off	Off	English \$
						Off	On	Spanish
						On	Off	French
						On	On	German
				Off	Off			Bonus airplane granted at:
				Off	On			2,000, 10,000 and 30,000 points \$
				On	Off			4,000, 15,000 and 40,000 points
				On	On			6,000, 20,000 and 50,000 points
								No bonus airplanes
		Off	Off					2 airplanes per game
		Off	On					3 airplanes per game \$
		On	Off					4 airplanes per game
		On	On					5 airplanes per game
	Off							1-play minimum \$
	On							2-play minimum
Off								Self-adjusting game difficulty feature turned off
On								Self-adjusting game difficulty feature turned on \$



If self-adjusting game difficulty feature is turned on, the program strives to maintain the following average game lengths (in seconds):

Bonus airplane granted at:	Airplanes per game:			
	2	3	4	5
2,000, 10,000 and 30,000 points	90	105\$	120	135
4,000, 15,000 and 40,000 points	75	90	105	120
6,000, 20,000 and 50,000 points	60	75	90	105
No bonus airplanes	45	60	75	90

\$ Manufacturer's suggested settings



## Figure 8 Game Price Settings

The white block below contains Atari's suggested settings. All numbers 1 thru 8 are toggle settings on the 8-toggle switch at location M10, on the Red Baron™ Analog Vector-Generator PCB (the **CENTER** switch assembly).

Circled numbers refer to game pricing labels you should use with each situation (labels are on the following page). Use the label no. 6 (indicated with ⑥) only if you set toggle 7 at PCB switch assembly P10 to **on**.

### 50¢ PER PLAY

	No bonus	Bonus \$1.00 = 3 plays	Bonus \$.75 = 2 plays \$1.00 = 3 plays																																																																
<b>Straight 25¢ Door</b>	① <table border="1"> <tr><td>8</td><td>7</td><td>6</td><td>5</td></tr> <tr><td>Off</td><td>Off</td><td>Off</td><td>Off</td></tr> <tr><td>4</td><td>3</td><td>2</td><td>1</td></tr> <tr><td>Off</td><td>Off</td><td>On</td><td>On</td></tr> </table>	8	7	6	5	Off	Off	Off	Off	4	3	2	1	Off	Off	On	On	③ <table border="1"> <tr><td>8</td><td>7</td><td>6</td><td>5</td></tr> <tr><td>Off</td><td>On</td><td>On</td><td>Off</td></tr> <tr><td>4</td><td>3</td><td>2</td><td>1</td></tr> <tr><td>Off</td><td>Off</td><td>On</td><td>On</td></tr> </table>	8	7	6	5	Off	On	On	Off	4	3	2	1	Off	Off	On	On	④ <table border="1"> <tr><td>8</td><td>7</td><td>6</td><td>5</td></tr> <tr><td>Off</td><td>Off</td><td>On</td><td>Off</td></tr> <tr><td>4</td><td>3</td><td>2</td><td>1</td></tr> <tr><td>Off</td><td>Off</td><td>On</td><td>On</td></tr> </table>	8	7	6	5	Off	Off	On	Off	4	3	2	1	Off	Off	On	On																
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## Figure 8 Game Price Settings, continued

The switch settings below relate to options for game price, coin mechanism multipliers, and bonus play. This information is useful in case you need to temporarily set the Red Baron™ game on free play, or if you have German coin mechanisms in your door.

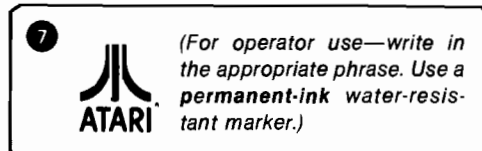
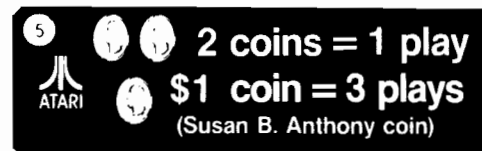
To achieve bonus plays, all coins must be inserted before pressing the start button. The label no. 6 shown below should be used only if you set toggle 7 at PCB switch assembly P10 to on.

Toggle Settings of 8-Toggle Switch on Red Baron PCB (at M10). CENTER switch when PCB is in game							Option	
8	7	6	5	4	3	2	1	
						Off	Off	Free play
						Off	On	1 coin* for 2 plays
						On	Off	1 coin* for 1 play \$
						On	On	2 coins* for 1 play
				Off	Off			Right coin mech × 1 \$
				Off	On			Right coin mech × 4
				On	Off			Right coin mech × 5
				On	On			Right coin mech × 6
			Off					Left coin mech × 1 \$
			On					Left coin mech × 2
Off	Off	Off						No bonus coins \$
Off	Off	On						For every 2 coins* inserted, game logic adds 1 more coin*
Off	On	Off						For every 4 coins* inserted, game logic adds 1 more coin*
Off	On	On						For every 4 coins* inserted, game logic adds 2 more coins*
On	Off	Off						For every 5 coins* inserted, game logic adds 1 more coin*
On	Off	On						For every 3 coins* inserted, game logic adds 1 more coin*

\*In the U.S., a "coin" is defined as 25¢. In Germany a "coin" is 1 DM.

\$ Manufacturer's suggested settings

### Game Pricing Labels



## Figure 9 Coin Counter Option Settings

[These toggles determine which coin mechanisms activate which counters]

Toggle Settings of 4-Toggle Switch on Game PCB (L11)				Two coin acceptors in the coin door:	Two coin acceptors and a push-button utility coin switch in the game:	Three coin acceptors in the coin door:
4	3	2	1			
		On	On	Both acceptors activate all coin counters simultaneously.	<i>Do not use this setting.</i>	All 3 are same denomination and they activate all coin counters simultaneously.
		Off	On	Both acceptors activate 2 counters separately.	<i>Do not use this setting.</i>	Left and center acceptor activate one coin counter; right acceptor activates another coin counter.
Not Used	Not Used	On	Off	Both acceptors activate all coin counters simultaneously.	Utility coin switch will not activate a coin counter, if you do not hook it up. Both acceptors activate all coin counters simultaneously.	Left acceptor activates one coin counter; center and right acceptor activate another coin counter. <i>Not for any currently designed 3-mech coin door.</i>
		Off	Off	Both acceptors activate 2 counters separately. \$	Utility coin switch will not activate a coin counter, if you do not hook it up. Left and right acceptors activate 2 coin counters separately.	Left, center and right acceptors activate 3 coin counters separately. \$

\$ Manufacturer's suggested setting

## F. Game Play

Atari's Red Baron™ game is a one-player game with an X-Y or vector-generator monitor. The game depicts a first-person's view from a World War I biplane cockpit. The player's goal is to destroy as many enemy biplanes, blimps, tanks, pillboxes, pyramids and buildings as possible.

Players can maneuver their airplanes with the joystick control. Moving the joystick in its four directions creates a sensation of diving, climbing, or banking to the left or right.

The 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 unit, after a play or high score initial mode, or after self-test. This mode is continuous and is only

interrupted when a play is paid for and accepted or when in self-test. In this mode, the monitor displays three possible pictures.

One of the pictures displays a typical game play sequence, with a view looking out of the airplane cockpit at the horizon and mountains below. The player's propellor is almost always visible at the center bottom of the screen during this phase.

Enemy biplanes swoop towards the player's airplane and eventually overtake it. The *VALUE* message at the top center of the screen indicates the current number of points a player can earn for shooting the enemy biplane. The value ranges from 10 to 300 points, and decreases as the enemy plane comes closer to the player.

Blimps also appear in this scene. The blimps, tanks, and pillboxes may be firing shells at the player. If hit, the player sees a bullet picture on the windshield, and the scenery spins around, indicating that the player has crashed.

The second picture displayed during this mode will only appear if no credits remain in the game. The screen shows the *RED BARON* banner pulled

by a plane traveling towards the left. The propellor usually at the bottom of the screen disappears during this phase.

The third picture shows the three to seven highest scores and their matching initials. If you erase the special "permanent" memory (see Figure 6, Self-Test Procedure), then this table will not appear on the screen. The table is redeveloped from scores of subsequent games.

## 2. Ready-to-Play Mode

This mode begins when sufficient coins are accepted for a game. It ends when the START pushbutton is pressed. When this mode begins, the message *PRESS START* flashes in the center of the screen. The displayed pictures are otherwise the same as those shown in the attract mode.

Operators may choose one- or two-play minimums by selecting one of the option switch settings on the Analog-Vector Generator PCB (see Figure 7, Game Option Settings). If you select the two-play minimum and a player inserts enough money for only one play, the message *2 PLAYS MINIMUM* flashes on the screen until the required number of coins is inserted.

## 3. Play Mode

The play mode begins when the start pushbutton is pressed. The mode ends when the player's last airplane is lost.

Players can score various points for shooting the different objects; the point values for each are silk-screened on the control panel. As mentioned earlier in Section 1, *Attract Mode*, the value for enemy planes can vary. Point values for all other objects remain fixed.

The game starts with a slow enemy biplane appearing on the screen; the first four planes are rela-

tively passive. As game time progresses, the player's biplane speed increases and the enemy planes become more evasive.

After four airplane "attacks", the player will see various objects on the ground. Later on, to provide challenge, the tanks, pillboxes, and blimps will start shooting at the player. If the player gets a very high score, the planes themselves will finally start shooting at the player.

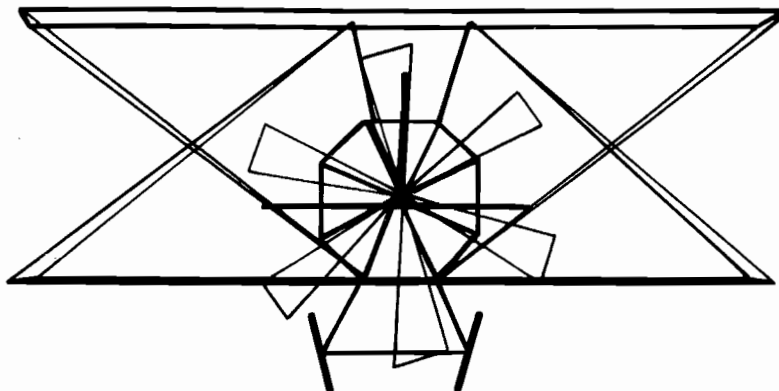
One of the new operator-selectable features of Red Baron™ is its self-adjusting game difficulty. Figure 7 shows the option switch settings that determine an average game time in seconds (displayed on the screen during self-test). The game program accumulates an average of the last 32 games' lengths. If the accumulated average exceeds the operator-selected average, at the beginning of the next game the computer makes the play harder. The logic does so by increasing the speed of the player's airplane and enemy airplanes. In essence, this feature adjusts the difficulty to establish a consistent average game time.

The average is stored in the non-volatile memory—as are the top three scores on the high score table. Therefore, if you select this game difficulty option, you need not worry that the average will be "lost" if you turn off the game each night.

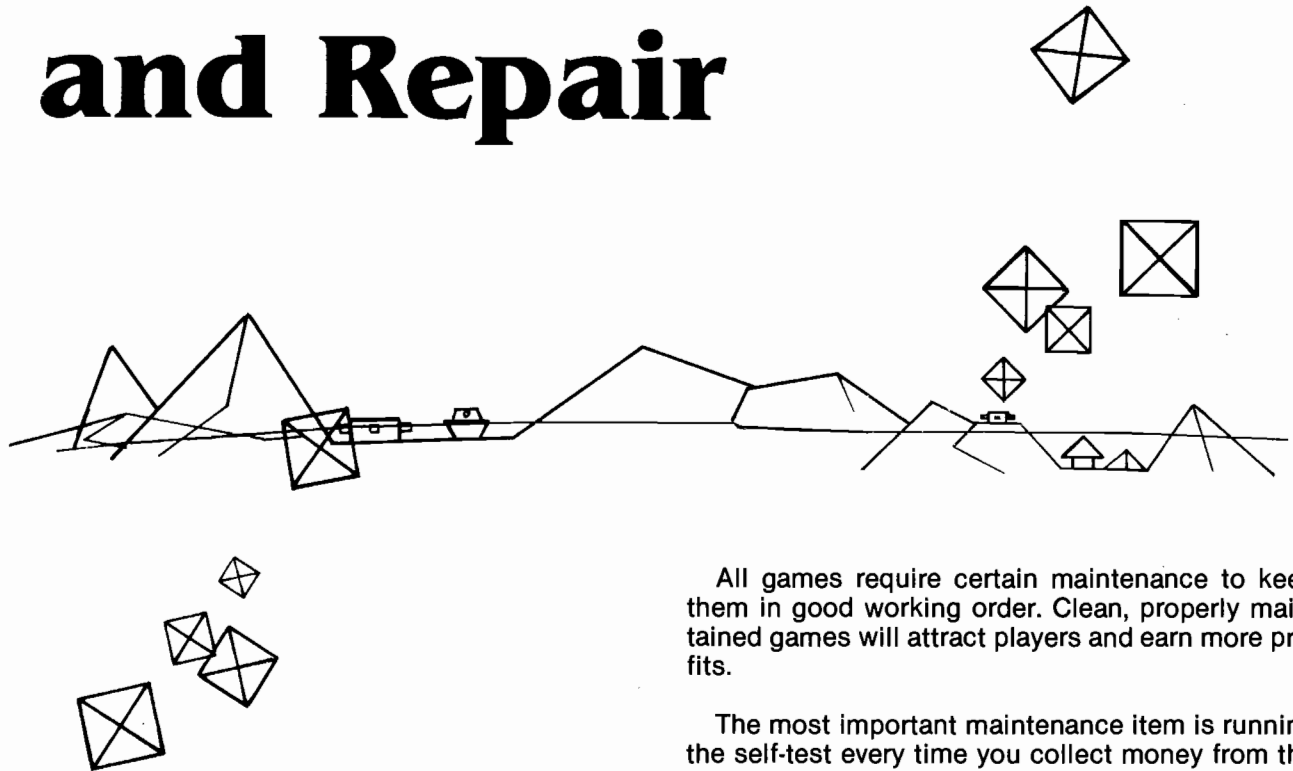
## 4. High Score Initial Mode

At the beginning of this mode, player instructions appear near the upper center of the screen, and *A \_ \_* appears below them. Players enter initials one character at a time.

Pressing the fire button a third time causes the initials and game score to transfer to the high score table. This table contains a maximum of seven scores and appears during the attract and ready-to-play modes.



# Maintenance and Repair



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 coin box. Just looking at a game will not tell you if the gimbal-type joystick control or light-emitting-diode switch is broken, or if the LED has 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 lubricate the joystick control— for details see this chapter.

# 2

## 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 five fuses—all on the power supply assembly (not including the monitor fuses). Replace fuses only with the same type as listed in Figure 24 of this manual. See the Quadrascan monitor manual, TM-146, for the monitor fuse data.

## C. Opening the Control Panel

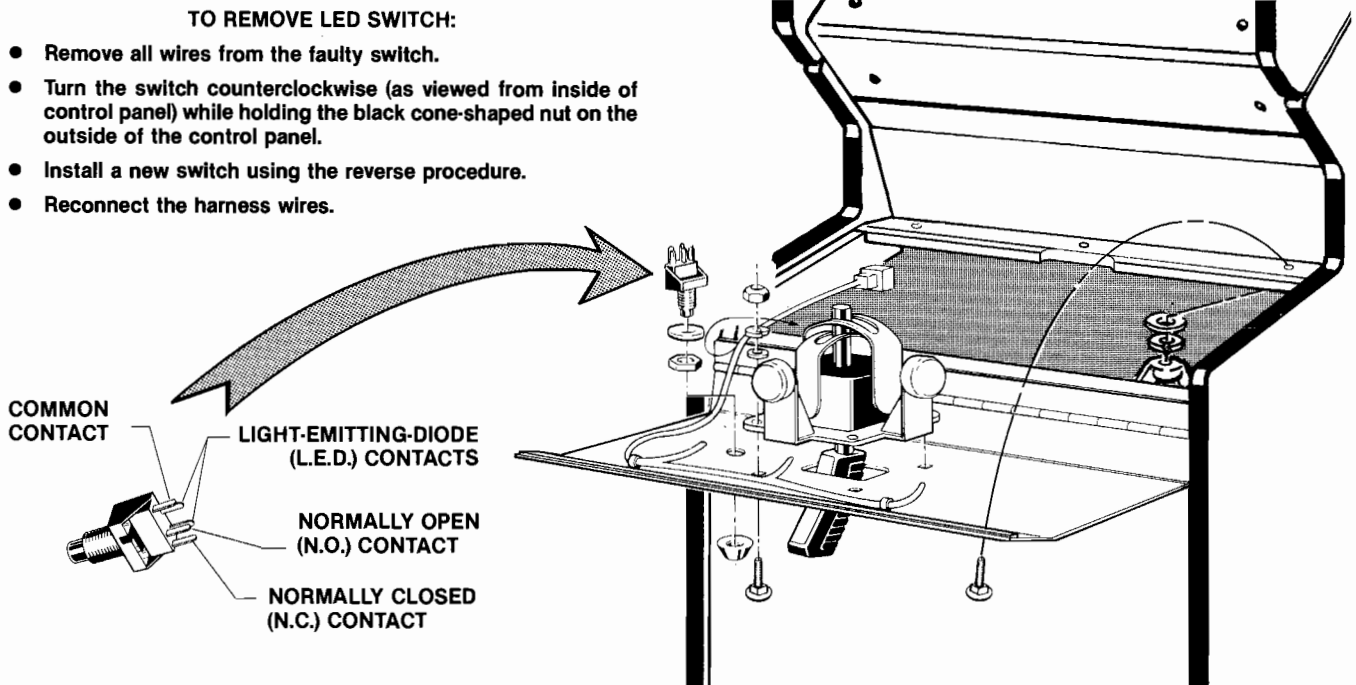
Prior to repairing or replacing any item on the control panel, unplug the game. Then open the coin door.

Reach through the opening and remove all three sets of carriage bolts, wing nuts, flat and lock washers, located on the underside of the control panel (see Figure 10). Lift up on the control panel, and tilt it towards you.

### 1. LED Start Switch Replacement

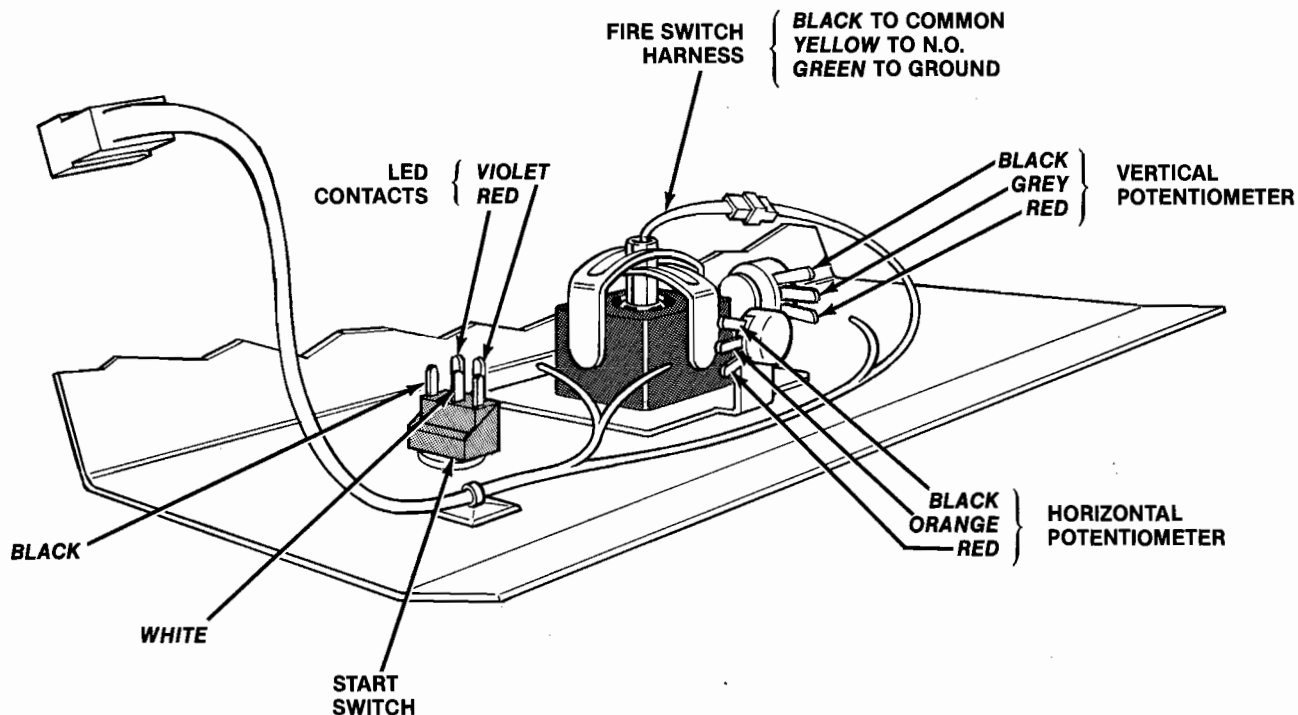
The light-emitting diode (LED) switch on the control panel has a very low failure rate. In case the switch should ever be suspect, first test it per the description that follows. To replace the switch, refer to Figure 10.

- Remove the wires from the suspected switch.
- Set multimeter to ohms scale. Set ohms scale to R x 1, then zero the meter.
- Connect multimeter leads to appropriate LED switch contacts (see Figure 10 for designation of switch contacts and meter lead placement).
- 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 as outlined in the figure.



**Figure 10 Opening the Control Panel**





**Figure 11A Joystick Maintenance and Repair**

## 2. Joystick Maintenance and Repair

Normal maintenance involves lubricating four parts in the joystick control approximately every three months (this requires removing the control). First open the control panel as described previously. Then unplug the "quick-disconnect" connectors on the two potentiometers, as well as the connector for the fire switch.

From the inside of the control panel, remove the four flat and lock washers, hex nuts and carriage bolts that mount the joystick onto the control panel.

Then open up the joystick control assembly by removing the four flat washers, hex nuts, and long screws (see Figure 11B). At this point, most of the parts should become disassembled.

For lubrication, use only Nyogel 779 lubricant (Atari part no. 178027-001). Lubricate the following parts inside the control:

- The ball pinned to the shaft and the ends of the pivot pins that protrude from the ball.
- The insides of the two black linkages, located on the potentiometer shafts.
- The insides of the two gimbals, where the bottom of the shaft wears against them.
- The four holes on the sides of the pivot ball housings, where the gimbals are attached.

To replace the bellows, remove both gimbals and the bellows cap. Slide the bellows off the bottom of the shaft and over the harness wires. Slide the new bellows up over the harness and shaft.

Reassemble the joystick control, and then reinstall it in the control panel. Reconnect the harness wires as shown in the Figure 11A: **make sure the right colors go to the tabs on the potentiometers and the fire switch.**

Repairs on the control handle would probably only involve replacement of potentiometers, the fire switch or the centering bellows.

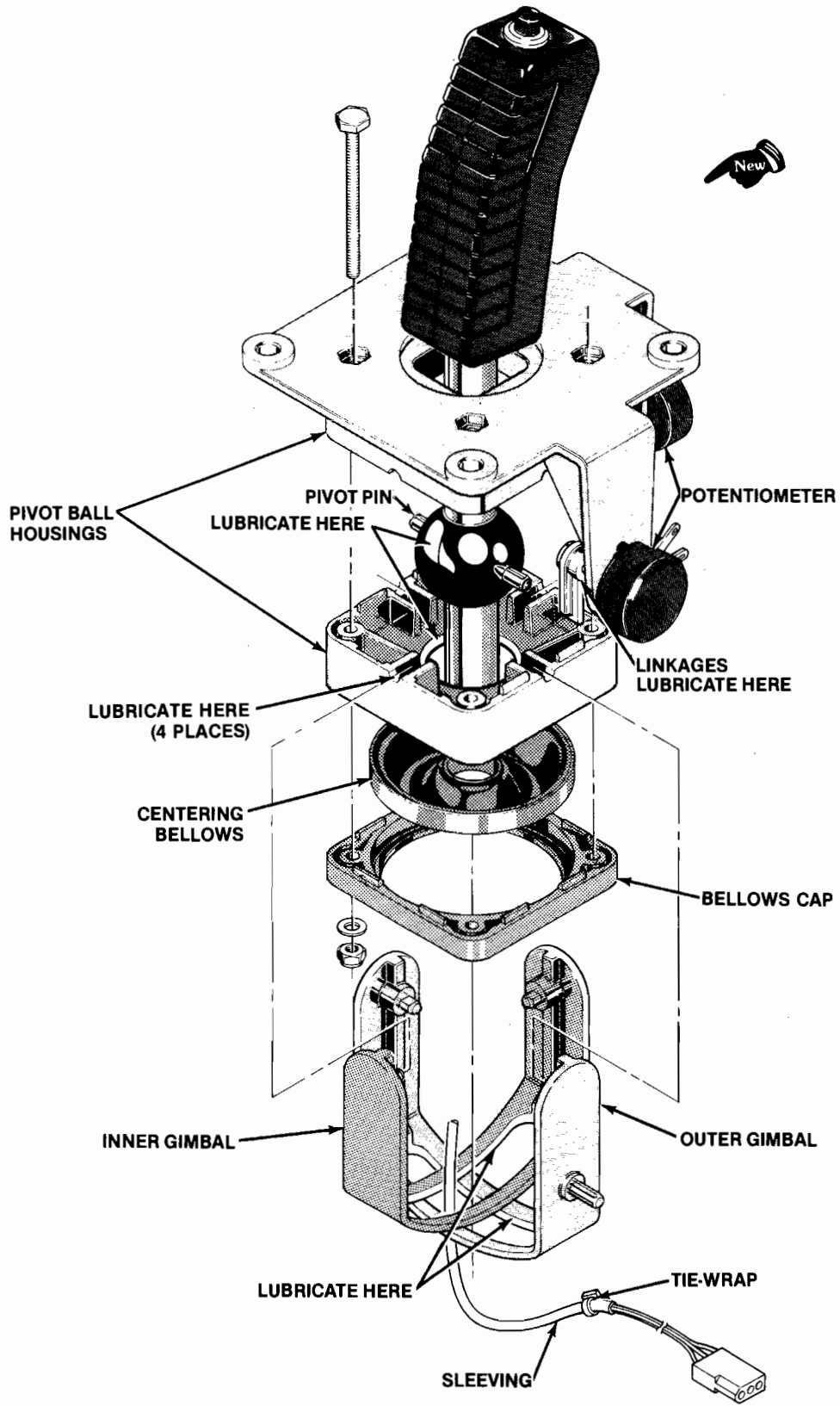


Figure 11B Joystick Maintenance and Repair

## D. Monitor Removal

### ⚠ WARNING ⚠

#### **Shock Hazard**

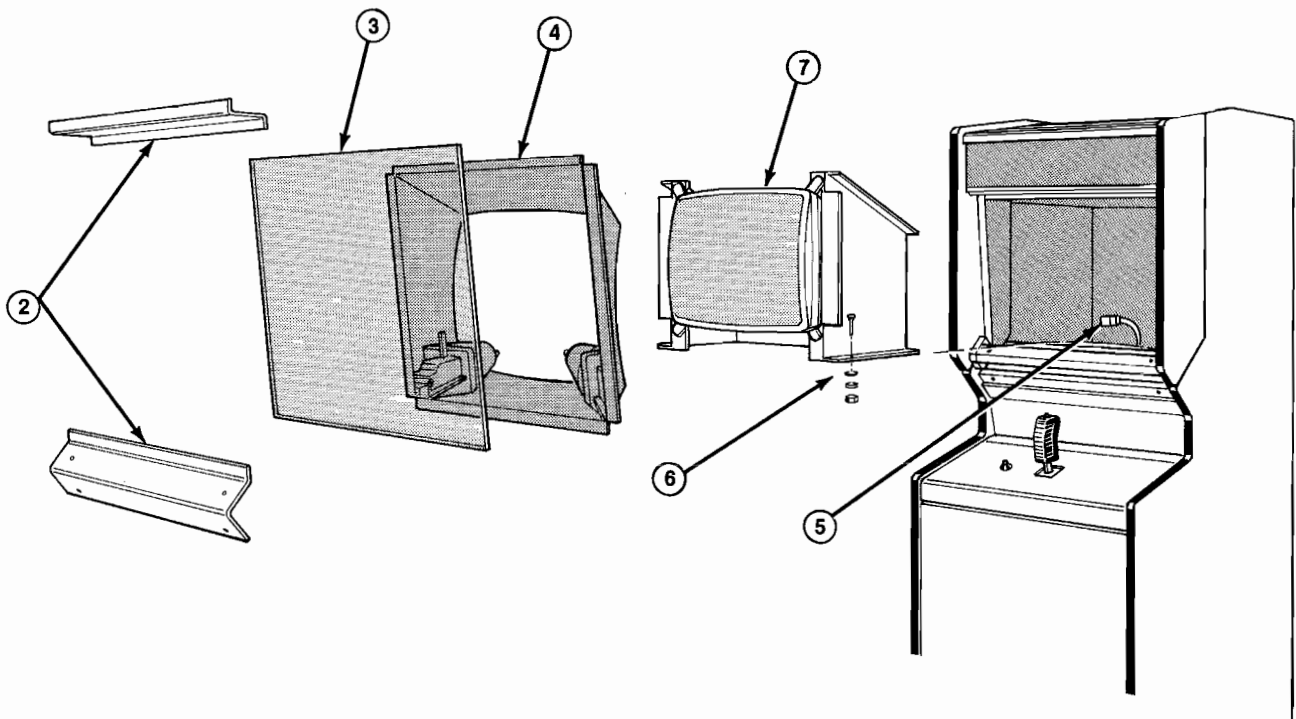
High voltages may exist in any television or monitor, even with power disconnected. Use extreme caution and do not touch electrical parts of the yoke area with your hands or with metal objects in your hands!

#### **Implosion Hazard**

If you drop the 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 monitor.

If you should need to remove the Quadrascan X-Y monitor, follow steps 1 thru 7 as listed on this page. Refer to Figure 12 below.

1. Open the rear access panel. **Be sure the game is unplugged from its wall outlet!**
2. Remove the middle and bottom retainers at the front of the game. Set aside the attraction panel.
3. Then remove the acrylic monitor shield by pulling its upper edge out.
4. Working up from the bottom side corners, carefully pry loose the two side flaps of the colorful 2-piece cardboard bezel. (A 4-inch strip of double-sided adhesive tape is centered behind both side flaps, flush with each edge.) Remove the bezel as a complete unit—do not remove the smaller part first.
5. Unplug the monitor harness connector underneath the monitor.
6. Remove the four sets of carriage bolts, flat and split lock washers, and self-locking hex nuts that hold down the metal chassis of the monitor. These are underneath the monitor shelf.
7. Carefully slide the monitor chassis out the front of the game.



Disassemble in the order indicated. (Circled numbers match the steps above.)

Figure 12 Monitor Removal

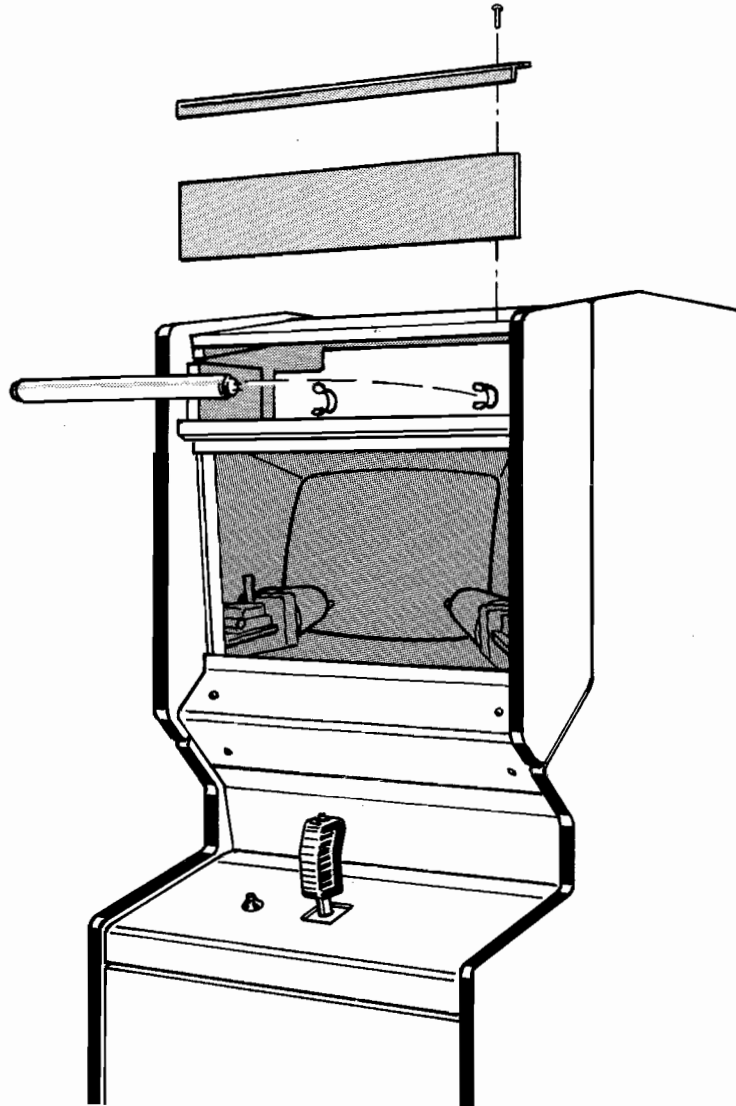


Figure 13 Fluorescent Tube Removal

## E. Fluorescent Tube Replacement

### ⚠ WARNING ⚠

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 13):

1. Remove the six Allen-head screws and lock washers that secure the middle and top retainers at the front of the game. Set aside the attraction panel.
2. 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.
3. Replace with a new tube. Do not snap the tube in vigorously—**you may break it, causing an implosion!**
4. Reconnect the Y-shaped connectors. Reinstall the attraction panel and its two retainers.

## F. Printed-Circuit Board Removal

You may wish to remove the Red Baron Analog-Vector Generator printed-circuit board (PCB), Auxiliary PCB, or the Regulator/Audio II PCB for service or inspection. To do this, refer to Figure 14 and proceed as follows:

### 1. Analog Vector-Generator and Auxiliary PCB Removal

- Open the rear access panel.
- Unplug the 24-pin PCB interconnector from the Auxiliary PCB or the Analog Vector-Generator PCB (whichever board you are removing).
- Remove the 44-pin edge connector from the right side of the PCB.
- Locate the Phillips-head screw that extends through the PCB and into the wood block (at the right side of the board). Remove and save this screw as well as the fiber washer.
- Remove the PCB from the cabinet by carefully pulling it straight out of the plastic PCB retainer.

Be careful not to twist the board, as this may loosen connections or components. Replace or repair as required.

- Reinstall the PCB, making sure that the 44-pin edge connector is properly plugged in. Note that the connector is keyed to fit on only one way, so if it doesn't slip on easily, don't force it! **A reversed connector will probably damage the PCB and will void the warranty.**
- 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.

### 2. Regulator/Audio II PCB Removal

- Unlock and open the rear access panel.
- Remove the five plug-in connectors on the Regulator/Audio II PCB. Note that all of these connectors are keyed for proper orientation.
- Locate the two Phillips-head screws that extend through the PCB and into the wood behind the PCB. Remove and save these two screws and the two fiber washers.
- Remove the PCB from the interior wall of the cabinet.

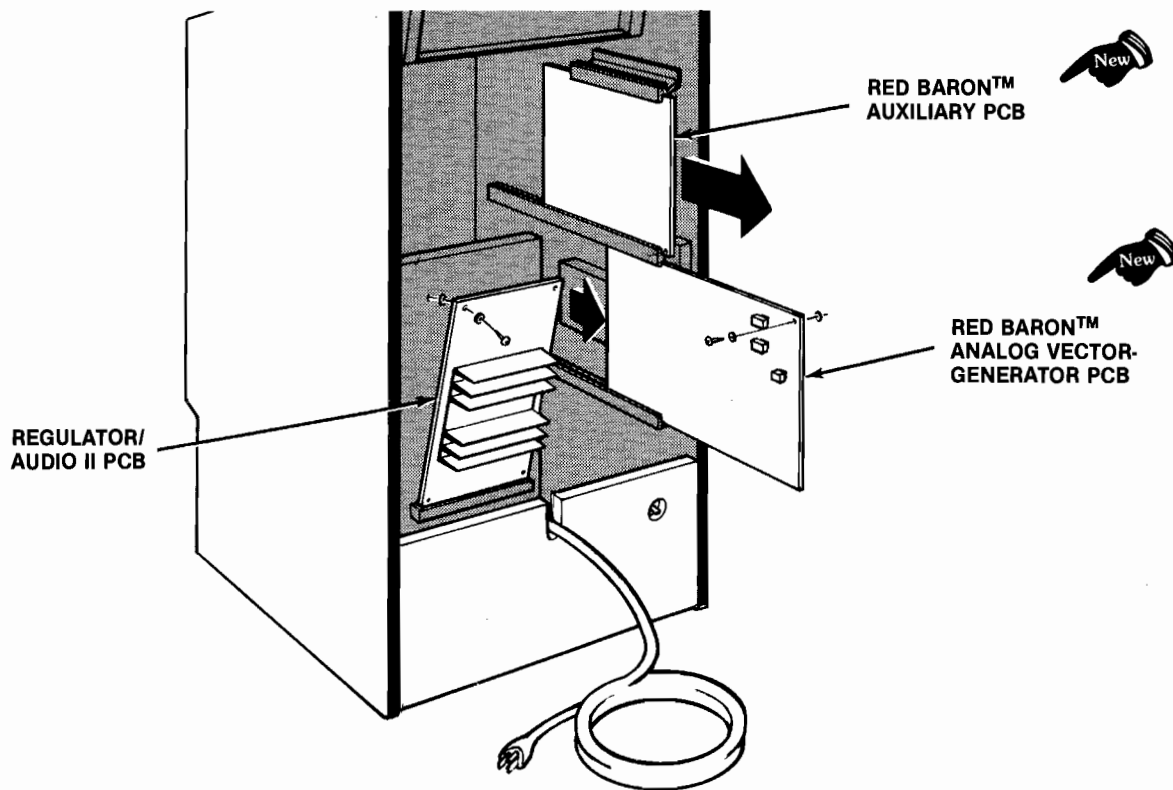


Figure 14 Printed-Circuit Board Removal

## G. Game Operation

With this manual you received three large sheets that contain the wiring and schematic diagrams for the Red Baron™ (upright) game. Sheet 1, Side A, includes a "table of contents" that shows the arrangement of these diagrams. They include explanations of the functions of the circuits; the diagrams also define inputs and outputs.

Atari's Red Baron is a microprocessor-controlled game. The microprocessor is contained on the Analog Vector-Generator PCB. This board receives switch and potentiometer inputs from the control panel and coin door. These inputs are processed by the Analog Vector-Generator PCB and output to the monitor, Regulator/Audio II PCB, and control panel.

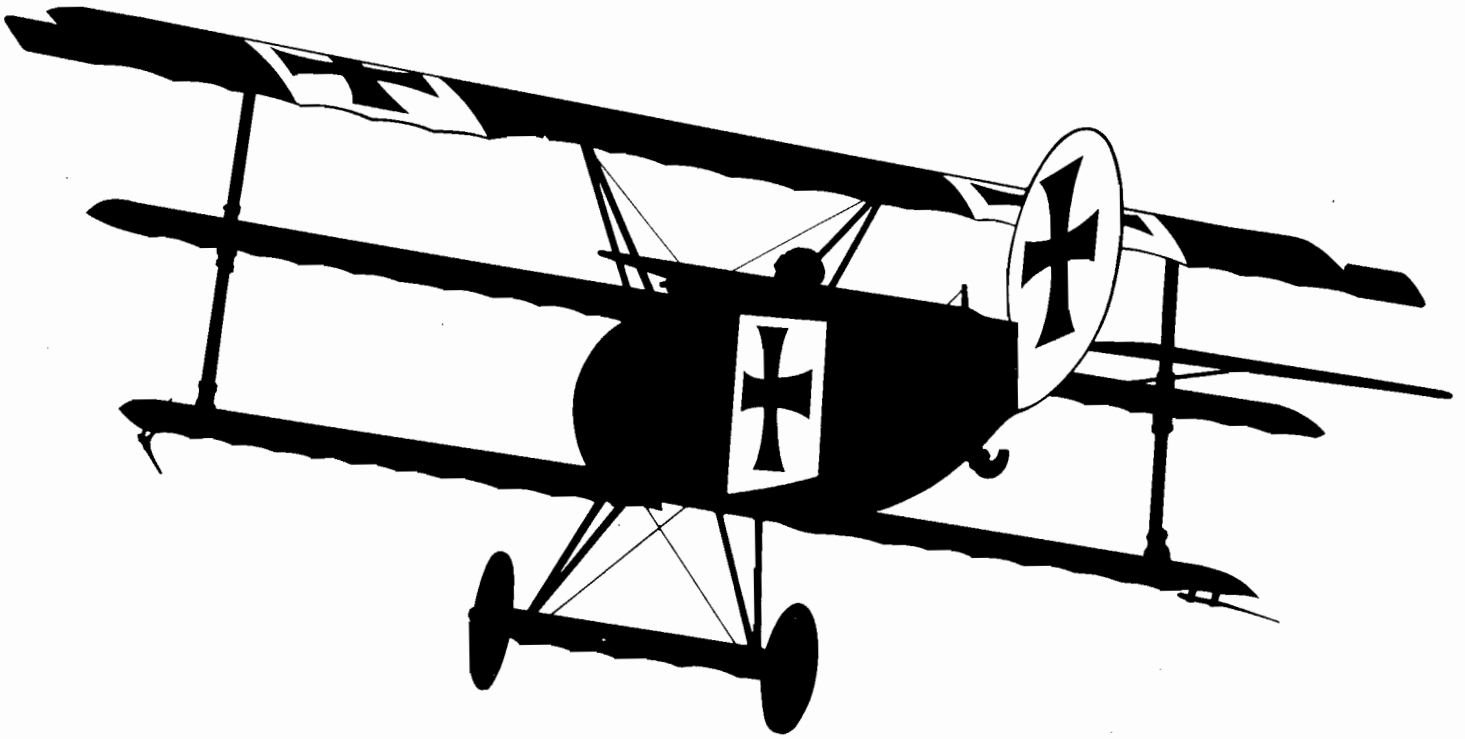
The monitor is an X-Y monitor. Therefore, the monitor receives signals for the X, Y and Z axes. Since the location of the beam in the monitor is totally controlled by the X- and Y-axis outputs of the Analog Vector-Generator PCB, this board does not contain a standard sync circuit. The X- and Y-axis inputs 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 II PCB performs two functions: 1) it regulates the voltages from the power supply to  $\pm 5$  VDC and  $\pm 12$  VDC, and 2) it amplifies the audio output from the Auxiliary PCB.

Specifically, the +5 VDC from the Regulator/Audio II PCB provides most logic power to the Analog Vector-Generator and Auxiliary PCBs;  $\pm 22$  VDC is regulated on the Analog Vector-Generator PCB to produce  $\pm 15$  and +5 VDC (the latter for the digital-to-analog converters); and +22 VDC provides power for the audio output of the Auxiliary PCB. The audio output from the Regulator/Audio II 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 four fuses in the fuse block on the power supply chassis (F3-F6). The primary winding of the power-supply transformer is protected by the fuse in the separate fuse post on the power-supply chassis (F1).

Figure 14 illustrates the distribution of power in this game. Figure 15 illustrates the distribution of signals.



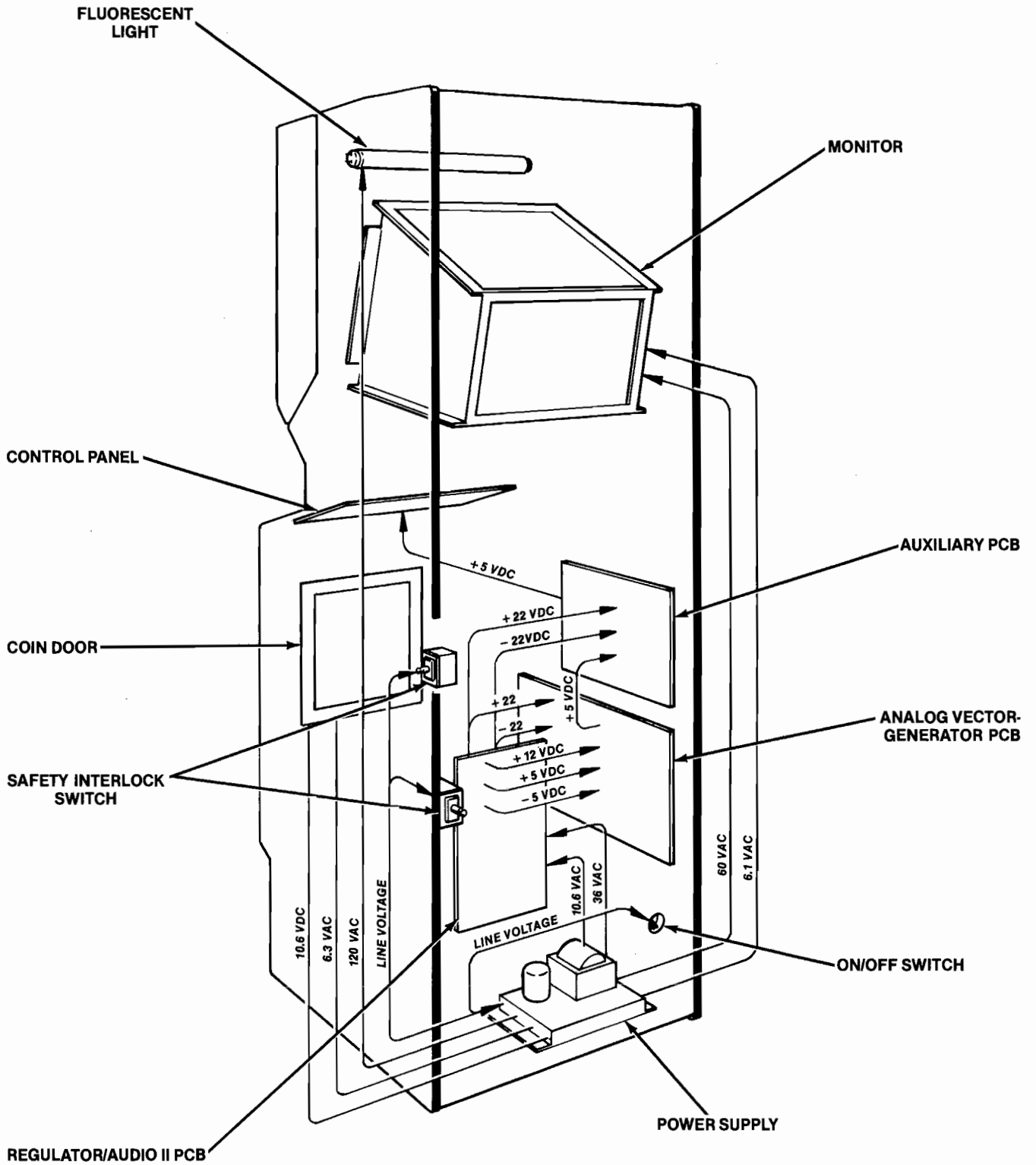


Figure 14 Power Distribution

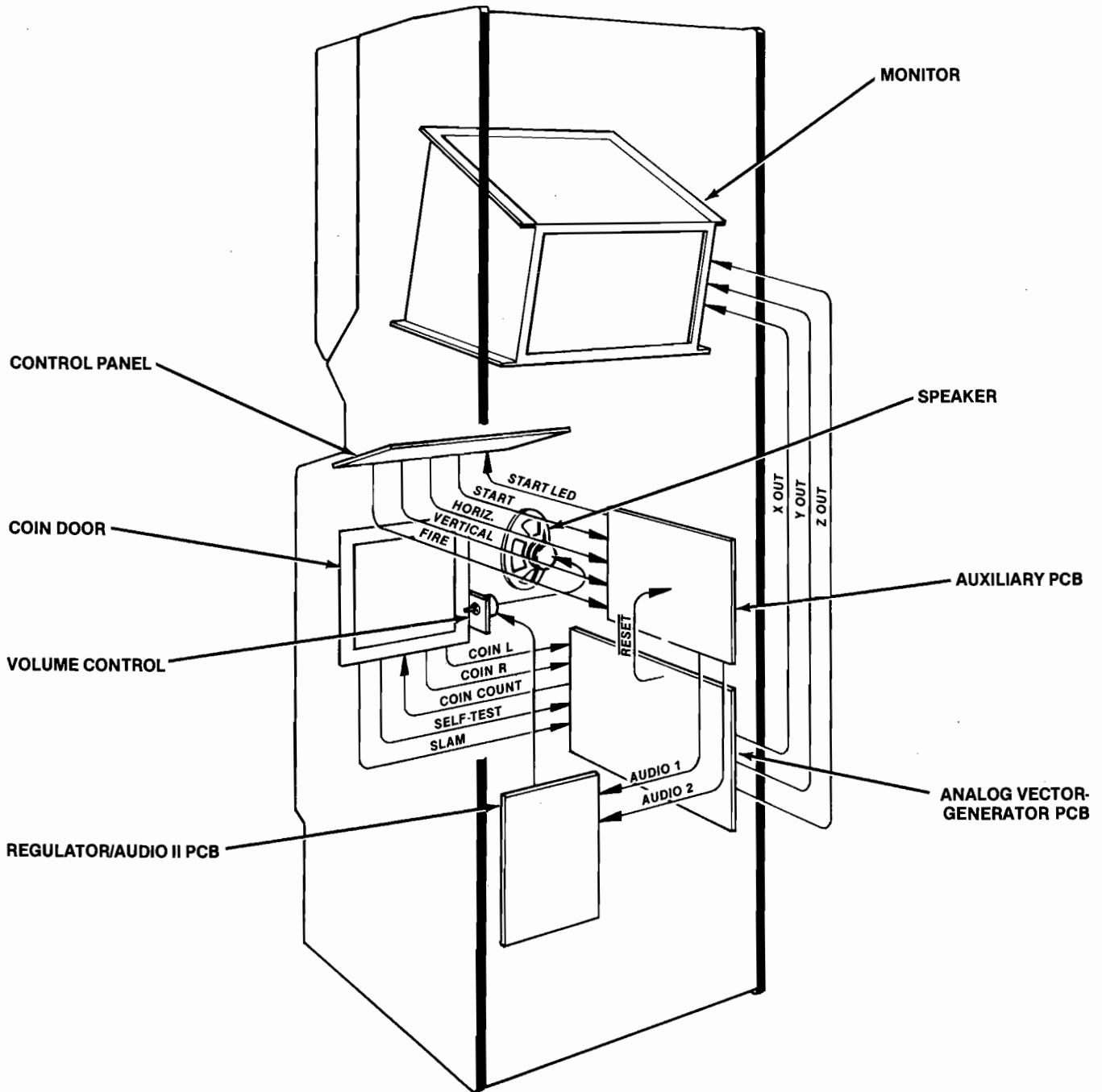
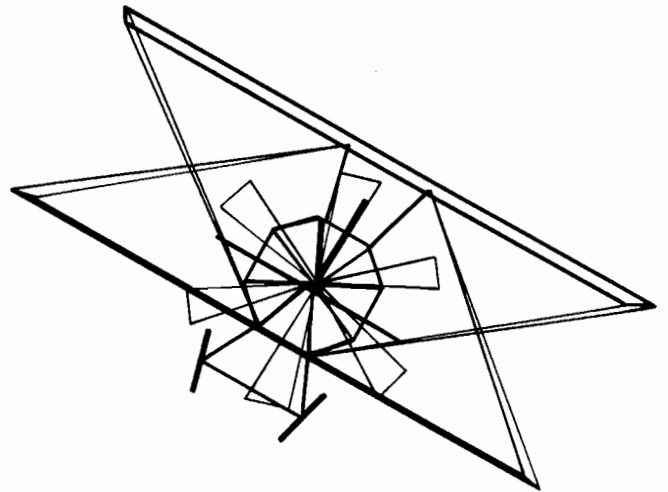
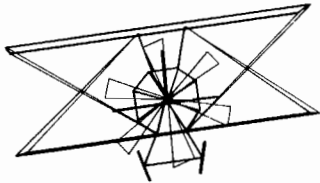
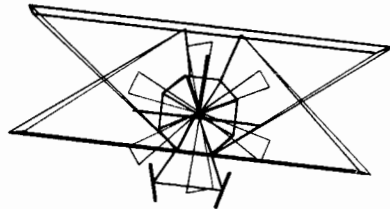
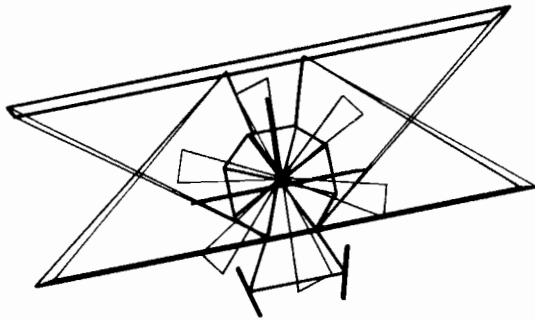


Figure 15 Signal Distribution



# Illustrated Parts Lists



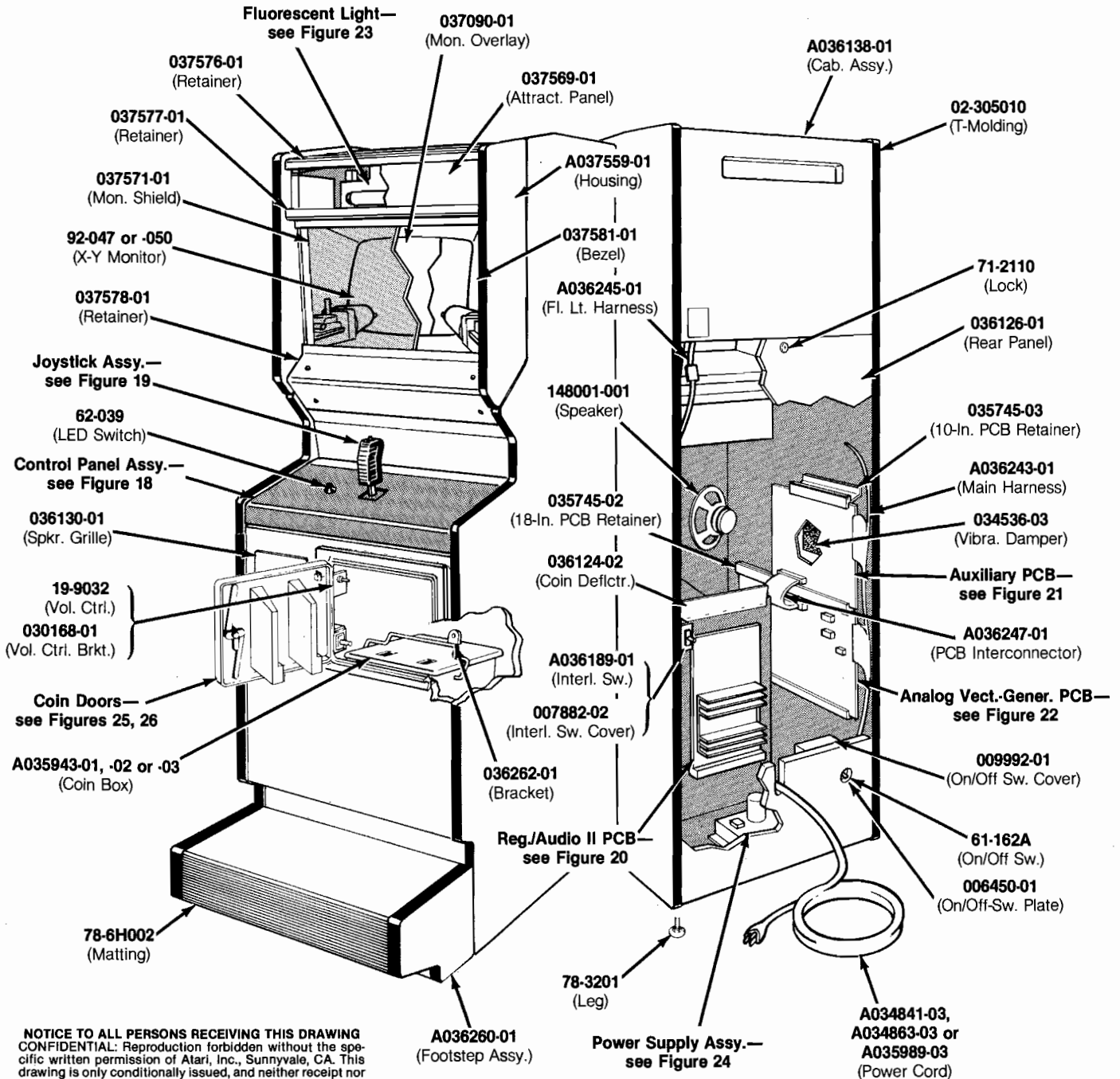
This chapter provides you with the necessary information for ordering replacement parts for your Red Baron™ game. Please note that, for simplicity, **common hardware has been deleted** from most of these parts lists. This includes screws, nuts, washers, bolts, etc.

The parts lists 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 from your distributor, 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.



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



**Figure 17 Cabinet-Mounted Assemblies**  
**A037558-01 A**

## Figure 17 Cabinet-Mounted Assemblies Parts List

Part No.	Description
A034841-03	Strain-Relief Power Cord (U.S.)
A034863-03	Strain-Relief Power Cord (Austria, Belgium, Chile, Denmark, Finland, France, Germany, Greece, Indonesia, Italy, Netherlands, Norway, Spain, Sweden, and Uruguay)
A035943-01	Deep-Well Coin Box Assembly (for all the same coins)
A035943-02	Deep-Well Coin Box Assembly (for two different coin denominations—has one separator)
A035943-03	Deep-Well Coin Box Assembly (for three different coin denominations—has two separators)
A035989-03	Strain-Relief Power Cord (Australia and New Zealand)
A036138-01	Cabinet Assembly (includes legs and PCB retainers, but not the rear access panel)
A036189-01	Interlock Switch Assembly (modified for safety)
A036243-01	Main Harness Assembly
A036245-01	Fluorescent Light Harness (at upper rear of game)
A036247-01	Printed-Circuit-Board Interconnector
A036260-01	Footstep Assembly (includes rubber matting)
A037559-01	Wood Housing Assembly
<i>The following seven items are the technical information supplements to this game:</i>	
DP-169-01	Red Baron™ (Upright) Schematic Drawings (Sheet 1)
DP-169-02	Red Baron Schematic Drawings (Sheet 2)
DP-169-03	Red Baron Schematic Drawings (Sheet 3)
ST-169	Red Baron Label with Self-Test Procedure and Option Switch Settings
TM-151	Instruction and Service Manual for Electrohome G05-802/805 Quadrascan™ X-Y Monitor
TM-164	Service Manual for Wells-Gardner Quadrascan X-Y Monitor
TM-169	Red Baron Operation, Maintenance and Service Manual
02-305010	¾-Inch Black Plastic T-Molding
19-9032	Volume Control
61-162A	DPST Power On/Off Toggle Switch
71-2110	Panel Cartridge Lock Mechanism (for rear access panel)
75-07017	Spacer for Mounting Printed Circuit Boards
78-24012	5-Inch Beaded Nylon Tie Wrap (for PCB edge connectors)
78-3201	Cabinet-Leveling Leg
78-6900402	Vinyl Foam Single-Coated-Adhesive Tape, ¼ inch wide × ⅛ inch thick (for bottom retainer—24 in. required)
78-6H002	1/8-Inch-Thick Corrugated Rubber Matting for Footstep (14½ × 23⅝ inches are required)
92-047	19-Inch Quadrascan™ X-Y Electrohome Monitor
92-050	19-Inch Quadrascan X-Y Wells-Gardner Monitor
006450-01	On/Off-Switch Mounting Plate
007882-02	Interlock Switch Cover
009992-01	On/Off Switch Cover
030168-01	Volume Control Bracket
034536-03	Foam Vibration Damper (for Auxiliary and Analog Vector-Generator PCBs)
035745-02	18-Inch Plastic PCB Retainer
035745-03	10-Inch Plastic PCB Retainer
035942-01	Deep-Well Coin Box Separator
036124-02	Cardboard Coin Deflector
036126-01	Rear Access Panel (does not include lock)
036130-01	Speaker Grille
036262-01	Coin Box Bracket
037090-01	Blue Monitor Overlay with Foam Tape

*[Continued on following page]*

## Figure 17 Cabinet-Mounted Assemblies, continued Parts List

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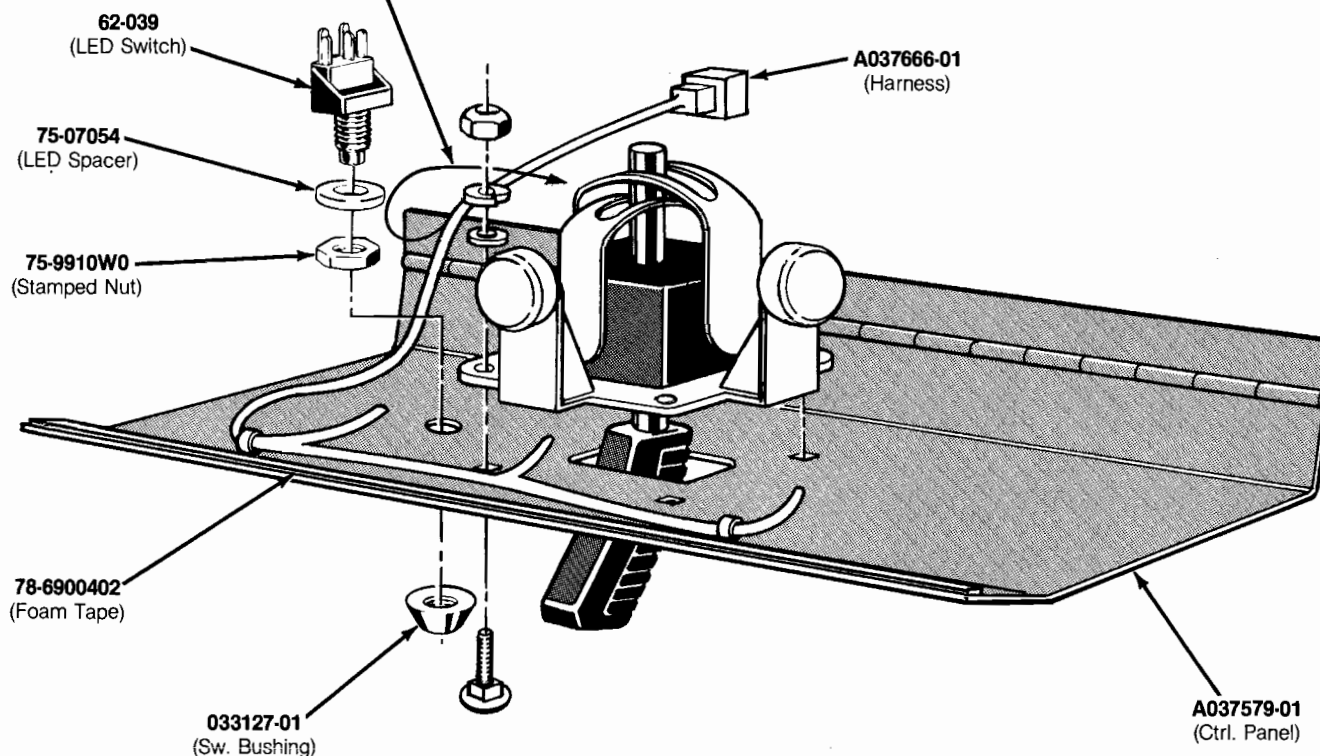
<i>Part No.</i>	<i>Description</i>
037569-01	"Red Baron" Attraction Panel with Graphics
037571-01	Monitor Shield with Graphics
037573-01	Left Side-Panel Decal
037573-02	Right Side-Panel Decal
037576-01	Top Retainer <i>(for attraction panel)</i>
037577-01	Middle Retainer <i>(for attraction panel and monitor shield)</i>
037578-01	Bottom Retainer <i>(for monitor shield)</i>
037581-01	Cardboard Bezel with Graphics
148001-001	6 × 9-Inch 4-Ohm 15-Watt Oval High-Fidelity Speaker

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**CAUTION**

Players may receive an electric shock if this control panel is not properly grounded! After servicing any parts on the panel, check that the ground wire is firmly attached to center mounting bolt before locking up the control panel.

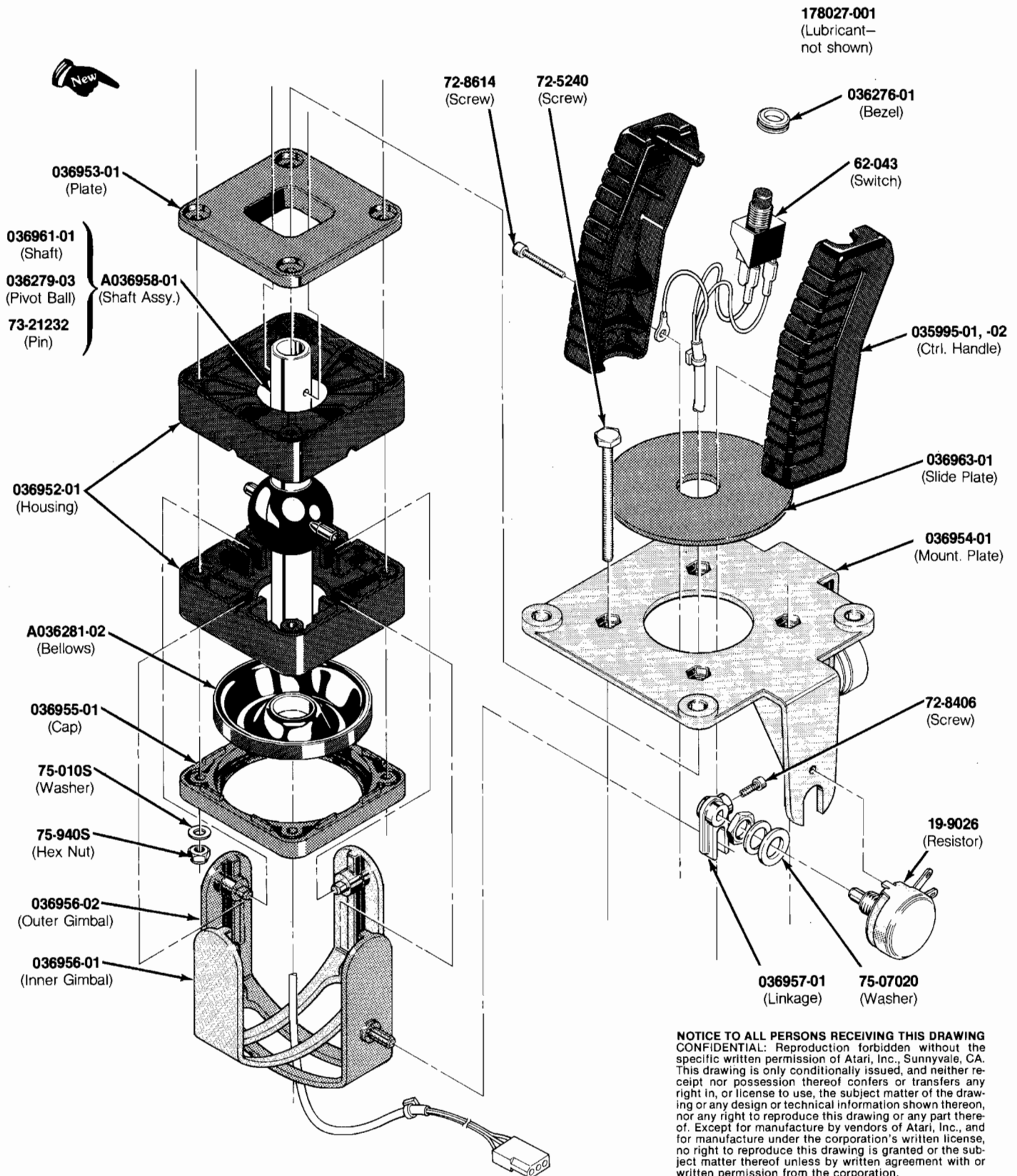
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**Figure 18 Control Panel Assembly  
 A037582-01 A**

### Parts List

<i>Part No.</i>	<i>Description</i>
A037579-01	Control Panel with Graphics
A037666-01	Control Harness Assembly
62-039	Momentary-Contact SPDT Light-Emitting-Diode Switch with Red Cap
75-07054	Nylon Spacer for Light-Emitting-Diode Switch
75-9910W0	#15/32-32 Steel Stamped Nut
78-6900402	Vinyl Foam Single-Coated-Adhesive Tape, 1/8-inch thick × 1/4-inch wide (24 in. required)
033127-01	Black Molded Switch Bushing



**Figure 19 Gimbal-Type Joystick Assembly**  
**A036951-01 A**

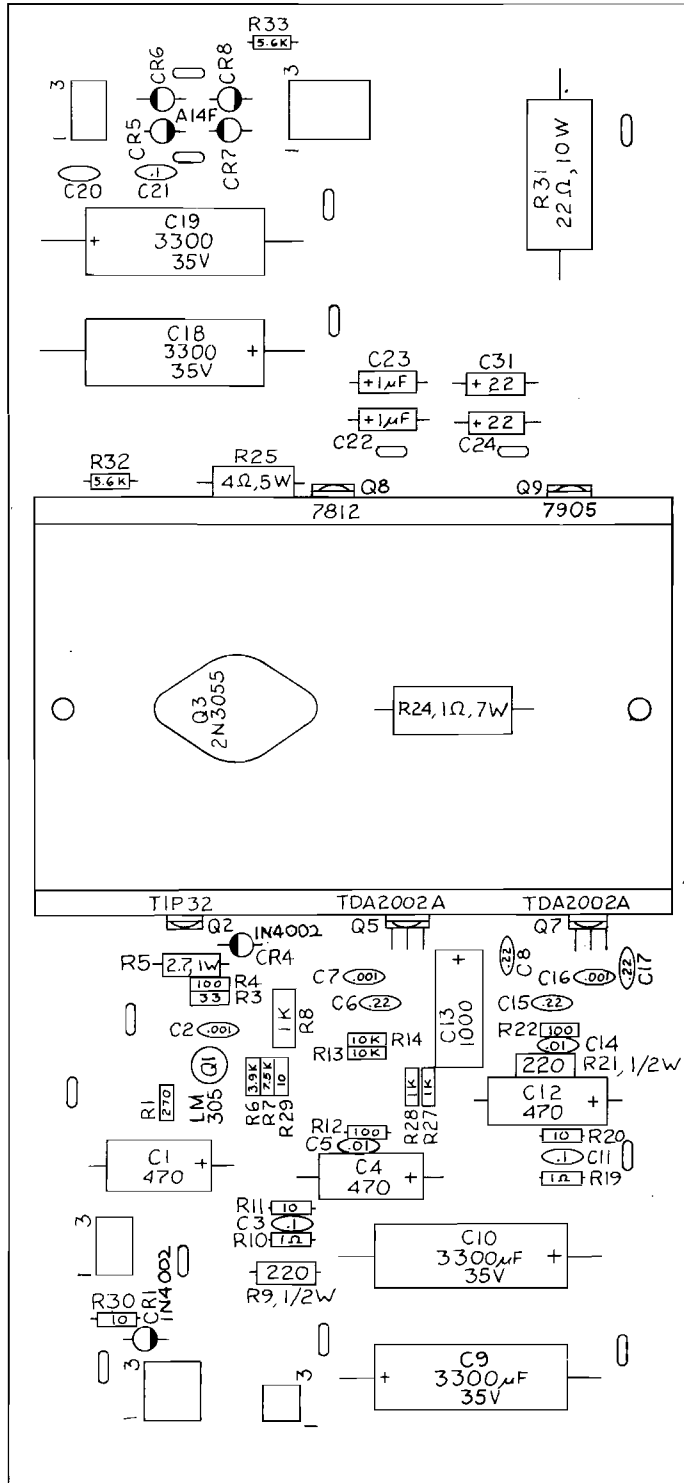
## Figure 19 Gimbal-Type Joystick Assembly Parts List

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<i>Part No.</i>	<i>Description</i>
A036281-02	Centering Bellows
A036958-01	Shaft Assembly with Fire Switch Harness <i>(includes pivot ball, pivot shaft and slotted pin)</i>
035995-01	Control Handle <i>(right half)</i>
035995-02	Control Handle <i>(left half)</i>
036276-01	Bezel for Fire Pushbutton
036279-03	Pivot Ball
036952-01	Pivot Ball Housing <i>(two of these required per handle)</i>
036953-01	Square Control Plate
036954-01	Mounting Plate
036955-01	Bellows Cap
036956-01	Inner Gimbal
036956-02	Outer Gimbal
036957-01	Gimbal Linkage
036961-01	Pivot Shaft
036963-01	Slide Plate
19-9026	5K Ohm, $\pm 20\%$ , 2¼W Variable Resistor
62-043	SPST Pushbutton Switch with Red Non-Lighting Cap <i>(used as fire switch)</i>
72-5240	#10-32 x 2½-Inch Hex-Head Steel Machine Screw
72-8406	#4-40 x 3/8-Inch Hex Cap-Head Steel Machine Screw
72-8614	#6-32 x 7/8-Inch Hex Socket-Head Steel Machine Screw
73-21232	3/16-Inch Diameter x 2-Inch Long Slotted Pin
75-010S	#10 Zinc-Plated Steel Flat Washer
75-07020	3/8-Inch Flat Washer
75-940S	#10-32 Steel Self-Locking Polymer Hex Nut
178027-001	Nyogel 779 Lubricant

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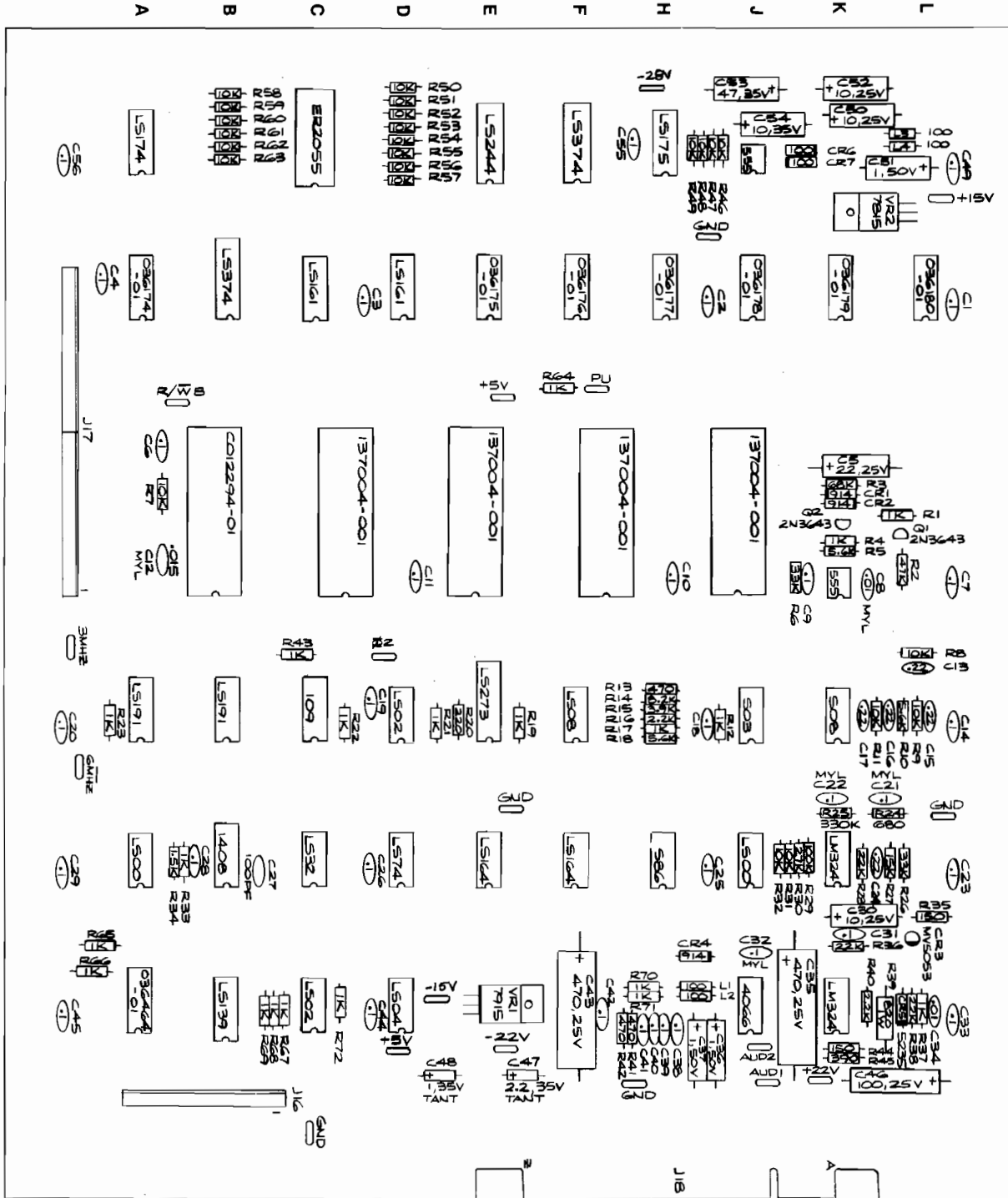
**Figure 20 Regulator/Audio II PCB Assembly  
A035435-02 D**



## Figure 20 Regulator/Audio II PCB Assembly Parts List

Part No.	Description (Reference Designations and Locations in Bold)
12-52P7	2.7 Ohm, $\pm 5\%$ , 1W Resistor <b>(R5)</b>
16-54PO	4 Ohm, $\pm 5\%$ , 5W Wirewound Resistor <b>(R25)</b>
19-100P1015	.1 Ohm, $\pm 3\%$ , 7W Wirewound Resistor <b>(R24)</b>
19-315102	1K Ohm Vertical PCB-Mounting Cermet Trimpot <b>(R8)</b>
24-250108	1000 uf Aluminum Electrolytic Fixed Axial-Lead 25V Capacitor <b>(C13)</b>
24-250477	470 uf Aluminum Electrolytic Fixed Axial-Lead 25V Capacitor <b>(C1, 4, 12)</b>
24-350226	22 uf Aluminum Electrolytic Fixed Axial-Lead 35V Capacitor <b>(C24, 31)</b>
24-350338	3300 uf Aluminum Electrolytic Fixed Axial-Lead 35V Capacitor <b>(C9, 10, 18, 19)</b>
24-500105	1 uf Aluminum Electrolytic Fixed Axial-Lead 50V Capacitor <b>(C22, 23)</b>
29-088	.1 uf Ceramic-Disc 25V Radial-Lead Capacitor <b>(C3, 11, 20, 21)</b>
31-1N4002	100V 1-Amp. Silicon Rectifier Type 1N4002 Diode <b>(CR1, 4-8)</b>
31-5401	100V 3-Amp. Silicon Rectifier Type 1N5401 Diode <b>(CR 5-8)</b>
33-TIP32	PNP Power Transistor, Type TIP32 <b>(Q2)</b>
34-2N3055	NPN Silicon Transistor, Type 2N3055 <b>(Q3)</b>
37-LM305	5V Linear Voltage Regulator <b>(Q1)</b>
37-7812	+ 12V Voltage Regulator, Type 7812 <b>(Q8)</b>
37-7905	- 5V Voltage Regulator, Type 7905 <b>(Q9)</b>
72-1608C	#6-32 $\times$ 1/2-Inch Cross-Recessed Pan-Head Corrosion-Resistant Steel Machine Screw
75-F60405	#6-32 $\times$ 1/4-Inch Binder-Head Nylon Screw
75-99516	#6-32 Nut/Washer Assembly
78-16008	Thermally Conductive Compound <b>(Q3)</b>
78-16014	Thermally Conductive Silicon Insulator <b>(Q2, 9)</b>
79-58306	6-Position Connector Receptacle <b>(J6, 9)</b>
79-58308	9-Position Connector Receptacle <b>(J7)</b>
79-58346	12-Position Connector Receptacle <b>(J10)</b>
79-58354	4-Position Connector Receptacle <b>(J8)</b>
020670-01	Test Point
034531-01	Heat Sink
100015-103	.01 uf Ceramic-Disc 25V Radial-Lead Capacitor <b>(C5, C14)</b>
110000-010	1 Ohm, $\pm 5\%$ , 1/4 W Resistor <b>(R10, 19)</b>
110000-100	10 Ohm, $\pm 5\%$ , 1/4 W Resistor <b>(R11, 20, 29, 30)</b>
110000-101	100 Ohm, $\pm 5\%$ , 1/4 W Resistor <b>(R4, 12, 22)</b>
110000-102	1K Ohm, $\pm 5\%$ , 1/4 W Resistor <b>(R27, 28)</b>
110000-103	10K Ohm, $\pm 5\%$ , 1/4 W Resistor <b>(R13, 14)</b>
110000-271	270 Ohm, $\pm 5\%$ , 1/4 W Resistor <b>(R1)</b>
110000-330	33 Ohm, $\pm 5\%$ , 1/4 W Resistor <b>(R3)</b>
110000-392	3.9K Ohm, $\pm 5\%$ , 1/4 W Resistor <b>(R6)</b>
110000-562	5.6K Ohm, $\pm 5\%$ , 1/4 W Resistor <b>(R32, 33)</b>
110000-752	7.5K Ohm, $\pm 5\%$ , 1/4 W Resistor <b>(R7)</b>
110001-221	220 Ohm, $\pm 5\%$ , 1/2 W Resistor <b>(R9, 21)</b>
116000-220	22 Ohm, $\pm 5\%$ , 10W Wirewound Resistor <b>(R31)</b>
122002-102	.001 uf Ceramic-Disc Minimum 25V Radial-Lead Capacitor <b>(C2, 7, 16)</b>
122004-224	.22 uf Ceramic-Disc 25V Capacitor <b>(C6, 8, 15, 17)</b>
137151-002	Type TDA2002A 8W Linear Audio Amplifier Integrated Circuit <b>(Q5, 7)</b>

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**Figure 21 Red Baron™ Auxiliary PCB Assembly**  
**A036305-01 B+**

## Figure 21 Red Baron™ Auxiliary PCB Assembly Parts List

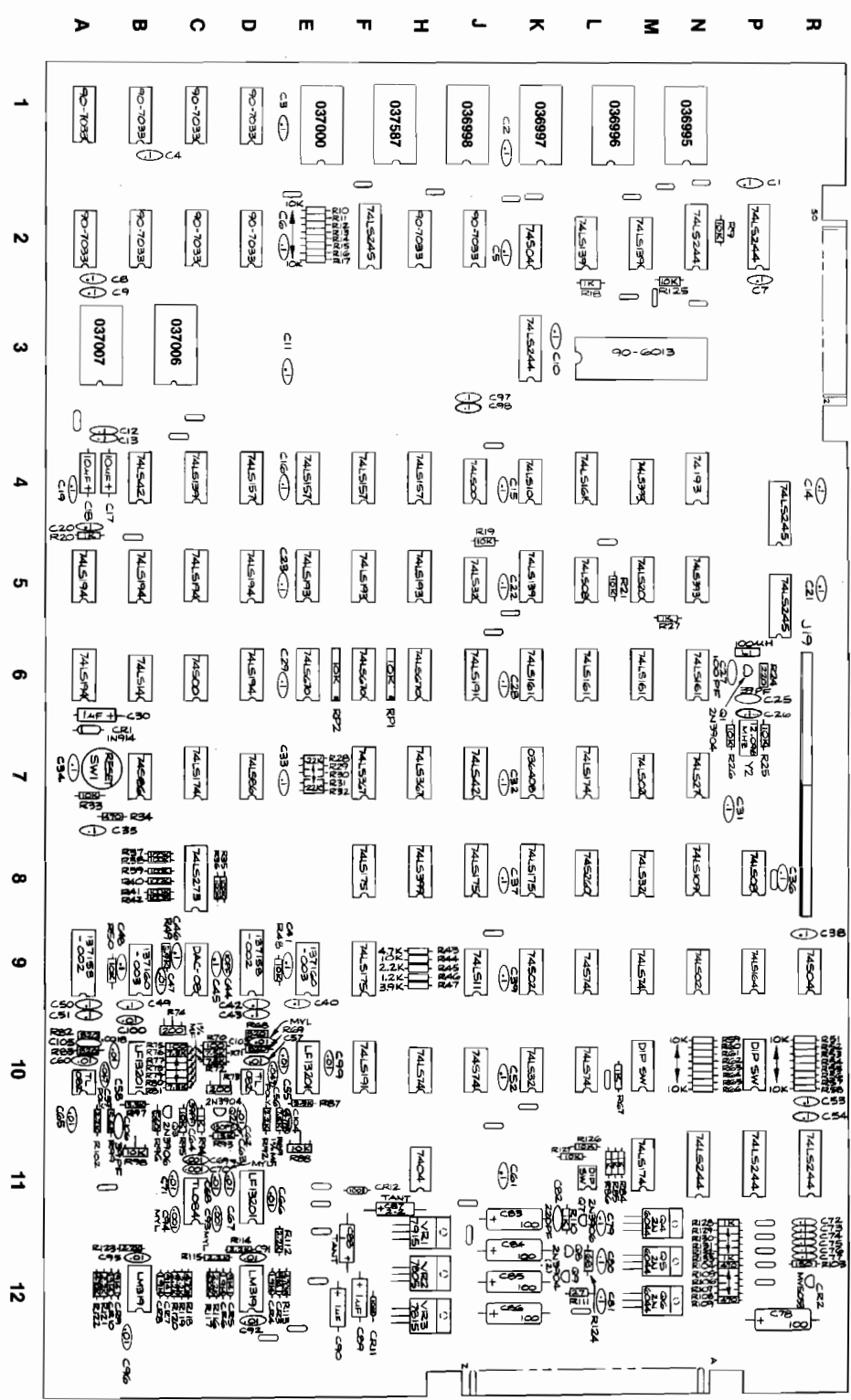


<i>Part No.</i>	<i>Description (Reference Designations and Locations in Bold)</i>
C012294-01	Audio I/O N-Channel MOS/LSI Custom Chip <b>(B2)</b>
12-5821	820 Ohm, ± 5%, 1 W Resistor <b>(R39)</b>
21-101103	.01 uf, ± 10%, Radial-Lead Epoxy-Dipped 100V Mylar Capacitor <b>(C8)</b>
21-101104	.1 uf, ± 10%, Radial-Lead Epoxy-Dipped 100V Mylar Capacitor <b>(C21, 22, 32)</b>
21-101153	.015 uf, ± 10%, Radial-Lead Epoxy-Dipped 100V Mylar Capacitor <b>(C12)</b>
24-250106	10 uf Aluminum Electrolytic Fixed Axial-Lead 25V Capacitor <b>(C30, 50, 52)</b>
24-250107	100 uf Aluminum Electrolytic Fixed Axial-Lead 25V Capacitor <b>(C46)</b>
24-250226	22 uf Aluminum Electrolytic Fixed Axial-Lead 25V Capacitor <b>(C5)</b>
24-250476	47 uf Aluminum Electrolytic Fixed Axial-Lead 25V Capacitor <b>(C53)</b>
24-250477	470 uf Aluminum Electrolytic Fixed Axial-Lead 25V Capacitor <b>(C35, 43)</b>
24-350106	10 uf Aluminum Electrolytic Fixed Axial-Lead 35V Capacitor <b>(C54)</b>
24-350476	47 uf Aluminum Electrolytic Fixed Axial-Lead 35V Capacitor <b>(C53)</b>
24-500105	1 uf Aluminum Electrolytic Fixed Axial-Lead 50V Capacitor <b>(C36, 37, 51)</b>
28-101101	100 pf Radial-Lead Epoxy-Dipped 100V Mica Capacitor <b>(C27)</b>
29-006	1 uf, ± 10%, 35V Tantalum Capacitor <b>(C48)</b>
29-088	.1 uf Ceramic-Disc Radial-Lead 25V Capacitor <b>(C1-4, 6, 7, 9-11, 14, 18-20, 23, 25, 26, 28, 29, 31, 33, 38, 39-42, 44, 45, 49, 55, 56)</b>
31-1N100	100V Type-1N100 Switching Diode <b>(CR6, 7)</b>
31-1N914	75V Type-1N914 Switching Diode <b>(CR1, 2, 4)</b>
32-1N5235	6-8V 500mW Type-1N5235 Zener Diode <b>(CR5)</b>
34-2N3643	60V 300mW Type-2N3643 NPN Transistor <b>(Q1, 2)</b>
37-LM324	Type-LM324 Integrated Circuit <b>(K4, K5)</b>
37-1408	Type-1408 Digital-to-Analog-Converter Integrated Circuit <b>(B4)</b>
37-4066	Type-4066 Analog Switch Integrated Circuit <b>(J5)</b>
37-555	Type-555 Timer Integrated Circuit <b>(J0, K2)</b>
37-74LS00	Type-74LS00 Integrated Circuit <b>(A4, J4)</b>
37-74LS02	Type-74LS02 Integrated Circuit <b>(D3, C5)</b>
37-74LS04	Type-74LS04 Integrated Circuit <b>(D5)</b>
37-74LS08	Type-74LS08 Integrated Circuit <b>(F3)</b>
37-74LS32	Type-74LS32 Integrated Circuit <b>(C4)</b>
37-74LS74	Type-74LS74 Integrated Circuit <b>(D4)</b>
37-74LS139	Type-74LS139 Integrated Circuit <b>(B5)</b>
37-74LS161	Type-74LS161 Integrated Circuit <b>(C1, D1)</b>
37-74LS164	Type-74LS164 Integrated Circuit <b>(E4, F4)</b>
37-74LS174	Type-74LS174 Integrated Circuit <b>(A0)</b>
37-74LS175	Type-74LS175 Integrated Circuit <b>(H0)</b>
37-74LS191	Type-74LS191 Integrated Circuit <b>(A3, B3)</b>
37-74LS244	Type-74LS244 Integrated Circuit <b>(E0)</b>
37-74LS273	Type-74LS273 Integrated Circuit <b>(E3)</b>
37-74LS374	Type-74LS374 Integrated Circuit <b>(F0, B1)</b>
37-74S08	Type-74S08 Integrated Circuit <b>(K3)</b>
37-74109	Type-74109 Integrated Circuit <b>(C3)</b>
37-7815	+ 15V Voltage Regulator <b>(VR2)</b>
37-7915	- 15V Voltage Regulator <b>(VR1)</b>
38-MV5053	Type-MV5053 Red Light-Emitting Diode <b>(CR3)</b>

[Continued on next page]

## Figure 21 Red Baron™ Auxiliary PCB Assembly, continued Parts List

Part No.	Description (Reference Designations and Locations in Bold)
41-3003	100 uH, ± 10%, Hot-Molded Plastic Fixed R.F. Choke (L1-4)
79-42C16	16-Contact Medium-Insertion-Force Integrated Circuit Socket (A1, A5, E1, F1, H1, J1, K1, L1)
79-42C22	22-Contact Medium-Insertion-Force Integrated Circuit Socket (C0)
79-42C40	40-Contact Medium-Insertion-Force Integrated Circuit Socket (B2, C/D2, E2, F/H2, J2)
81-4302	Nylon Snap-In Fastener
020670-01	Test Point
036174-01	Programmable Read-Only Memory (A1)
036175-01	Programmable Read-Only Memory (E1)
036176-01	Programmable Read-Only Memory (F1)
036177-01	Programmable Read-Only Memory (H1)
036178-01	Programmable Read-Only Memory (J1)
036179-01	Programmable Read-Only Memory (K1)
036180-01	Programmable Read-Only Memory (L1)
036464-01	Programmable Read-Only Memory (A5)
100015-103	.01 uf Ceramic-Disc 25V Radial-Lead Capacitor (C34)
110000-102	1K Ohm, ± 5%, ¼ W Resistor (R1, 4, 12, 17, 19, 21-23, 33, 37, 43, 64-72)
110000-103	10K Ohm, ± 5%, ¼ W Resistor (R7-9, 11, 31, 32, 46-63)
110000-104	100K Ohm, ± 5%, ¼ W Resistor (R29)
110000-151	150 Ohm, ± 5%, ¼ W Resistor (R35, 44)
110000-152	1.5K Ohm, ± 5%, ¼ W Resistor (R34)
110000-153	15K Ohm, ± 5%, ¼ W Resistor (R27)
110000-221	220 Ohm, ± 5%, ¼ W Resistor (R20)
110000-222	2.2K Ohm, ± 5%, ¼ W Resistor (R16, 40)
110000-223	22K Ohm, ± 5%, ¼ W Resistor (R28, 36, 38)
110000-273	27K Ohm, ± 5%, ¼ W Resistor (R30)
110000-333	33K Ohm, ± 5%, ¼ W Resistor (R6, 26)
110000-334	330K Ohm, ± 5%, ¼ W Resistor (R25)
110000-391	390 Ohm, ± 5%, ¼ W Resistor (R45)
110000-392	3.9K Ohm, ± 5%, ¼ W Resistor (R15)
110000-471	470 Ohm, ± 5%, ¼ W Resistor (R13, 41, 42)
110000-473	47K Ohm, ± 5%, ¼ W Resistor (R2)
110000-562	5.6K Ohm, ± 5%, ¼ W Resistor (R5, 10, 18)
110000-681	680 Ohm, ± 5%, ¼ W Resistor (R24)
110000-683	68K Ohm, ± 5%, ¼ W Resistor (R3)
110000-822	8.2K Ohm, ± 5%, ¼ W Resistor (R14)
122000-225	2.2 uf, ± 20%, 35V Tantalum Capacitor (C47)
122004-224	.22 uf Ceramic-Disc 25V Radial-Lead Capacitor (C13, 15-17, 24)
137002-001	Type-74S86 Integrated Circuit (H4)
137003-001	Type-74S03 Integrated Circuit (J3)
137004-001	Transistor Array (C/D2, E2, F/H2, J2)
137161-001	Read-Only Memory (C0) <i>Note: If you replace this part, you must erase this ROM before locking up the game. See Figure 6, Self-Test Procedure, in this manual for instructions. If you do not erase the ROM, the self-test will show the ROM to be "defective" by displaying the number 9 on the screen.</i>
179010-001	12-Pin PCB Header (J16, J17)

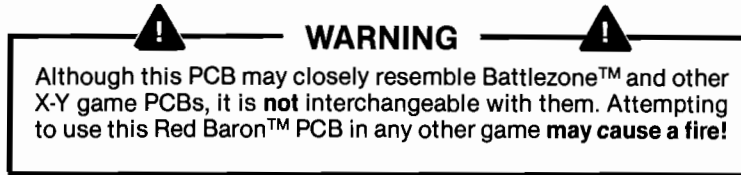


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**Figure 22 Red Baron™ Analog Vector-Generator PCB Assembly A037544-01 A**

## Figure 22 Red Baron™ Analog Vector-Generator PCB Assembly, continued Parts List



Part No.	Description (Reference Designations and Locations in Bold)
<b>[A035742-02, Rev. C +]</b>	
19-007	10K Ohm, $\pm 20\%$ , 1¼W 8-Pin Dual-Inline-Package Resistor Network (RP1, RP2— <i>use only if board has 74LS170s or 74LS670s at locations E6, F6, H6</i> )
19-315103	10K Ohm Vertical PCB-Mounting Cermet Trimpot (R88, 98)
19-315201	200 Ohm Vertical PCB-Mounting Cermet Trimpot (R73, 74)
21-101102	.001 uf, $\pm 10\%$ , Radial-Lead Epoxy-Dipped 100V Mylar Capacitor (C69, 70, 93, 94)
21-101103	.01 uf, $\pm 10\%$ , Radial-Lead Epoxy-Dipped 100V Mylar Capacitor (C103)
24-250106	10 uf Aluminum Electrolytic Fixed Axial-Lead 25V Capacitor (C17, 18)
24-250107	100 uf Aluminum Electrolytic Fixed Axial-Lead 25V Capacitor (C78, 83-86)
24-500105	1 uf Aluminum Electrolytic Fixed Axial-Lead 50V Capacitor (C30, 89, 90)
27-102182	.0018 pf, $\pm 10\%$ , Radial-Lead Ceramic-Disc 1000V Capacitor (C105)
28-101100	10 pf Radial-Lead Epoxy-Dipped 100V Mica Capacitor (C44)
28-101101	100 pf Radial-Lead Epoxy-Dipped 100V Mica Capacitor (C27)
28-101151	150 pf Radial-Lead Epoxy-Dipped 100V Mica Capacitor (C63)
28-101221	220 pf Radial-Lead Epoxy-Dipped 100V Mica Capacitor (C82)
28-101390	39 pf Radial-Lead Epoxy-Dipped 100V Mica Capacitor (C25, 64, 106)
28-101470	47 pf Radial-Lead Epoxy-Dipped 100V Mica Capacitor (C104)
29-006	1 uf, $\pm 10\%$ , 35V Tantalum Capacitor (C88)
29-088	.1 uf Ceramic-Disc 25V Radial-Lead Capacitor (C1-16, 19-23, 26, 28, 29, 31-39, 42, 43, 45, 46, 50-54, 61, 72-77, 79-81, 97, 98)
31-1N100	100V Type-1N100 Switching Diode (CR11)
31-1N914	75V Type-1N914 Switching Diode (CR1, 3-10)
33-2N3906	Type-2N3906 PNP Switching and Amplifying Transistor (Q3, 7)
34-2N3904	Type-2N3904 NPN 60V 1-Watt Transistor (Q1, 2, 8, 9)
34-2N6044	Type-2N6044 Darlington NPN Transistor (Q4-6)
37-LM319	Type-LM319 Integrated Circuit (B12, D12)
37-TL082CP	Type-TL082 Integrated Circuit (A10, D10)
37-13201	Type-LF13201 Integrated Circuit (B10, D11, E10)
37-347	Type-TL084 Integrated Circuit (C11)
37-74LS00	Type-74LS00 Integrated Circuit (J4)
37-74LS02	Type-74LS02 Integrated Circuit (N9, M7)
37-74LS08	Type-74LS08 Integrated Circuit (L5, P8)
37-74LS10	Type-74LS10 Integrated Circuit (K4)
37-74LS14	Type-74LS14 Integrated Circuit (B6)
37-74LS20	Type-74LS20 Integrated Circuit (M5)
37-74LS27	Type-74LS27 Integrated Circuit (N7)

[Continued on next page]

## Figure 22 Red Baron™ Analog Vector-Generator PCB Assembly, continued Parts List

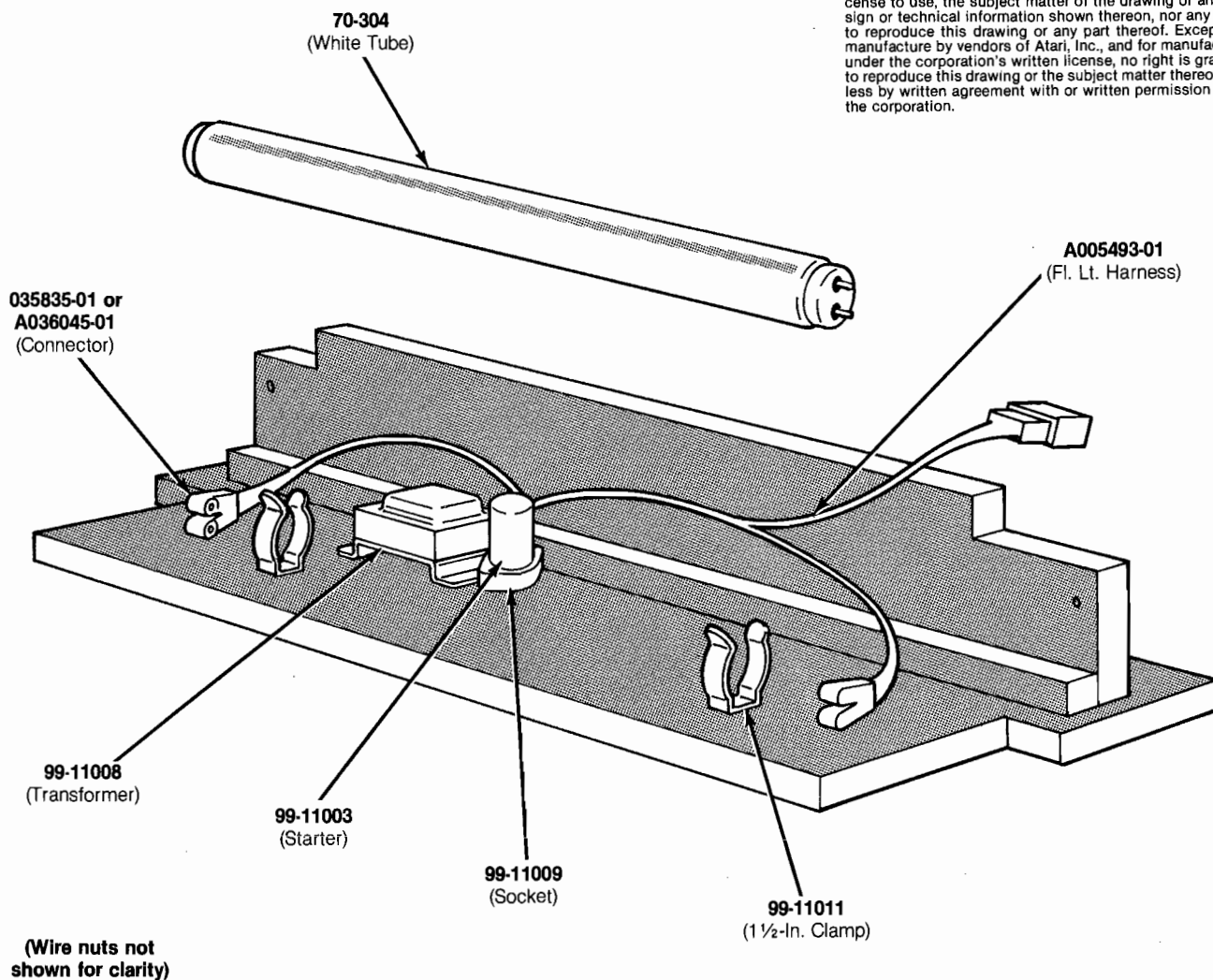
Part No.	Description (Reference Designations and Locations in Bold)
<b>[A035742-02, Rev. C + ]</b>	
37-74LS32	Type-74LS32 Integrated Circuit <b>(J5, K10, M8)</b>
37-74LS42	Type-74LS42 Integrated Circuit <b>(B4, J7)</b>
37-74LS74	Type-74LS74 Integrated Circuit <b>(H10, L10, M9)</b>
37-74LS86	Type-74LS86 Integrated Circuit <b>(D7)</b>
37-74LS109	Type-74LS109 Integrated Circuit <b>(N8)</b>
37-74LS139	Type-74LS139 Integrated Circuit <b>(C4, K5, L2, M2)</b>
37-74LS157	Type-74LS157 Integrated Circuit <b>(D4, E4, F4, H4)</b>
37-74LS161	Type-74LS161 Integrated Circuit <b>(K6, L4, L6, M6, N6)</b>
37-74LS164	Type-74LS164 Integrated Circuit <b>(P9)</b>
37-74LS174	Type-74LS174 Integrated Circuit <b>(C7, L7, M11)</b>
37-74LS175	Type-74LS175 Integrated Circuit <b>(F8, F9, J8, K8)</b>
37-74LS191	Type-74LS191 Integrated Circuit <b>(F10, J6)</b>
37-74LS193	Type-74LS193 Integrated Circuit <b>(E5, F5, H5)</b>
37-74LS194	Type-74LS194 Integrated Circuit <b>(A5, A6, B5, C5, D5, D6)</b>
37-74LS244	Type-74LS244 Integrated Circuit <b>(K3, N2, P2, N11, P11, R11)</b>
37-74LS245	Type-74LS245 Integrated Circuit <b>(F2, R4/5, R5)</b> <i>Acceptable substitute is part no. 37-8304B.</i>
37-74LS273	Type-74LS273 Integrated Circuit <b>(C8)</b>
37-74LS367	Type-74LS367 Integrated Circuit <b>(F7, H7)</b>
37-74LS393	Type-74LS393 Integrated Circuit <b>(M4, N5)</b>
37-74LS399	Type-74LS399 Integrated Circuit <b>(H8)</b>
37-74LS670	Type-74LS670 Integrated Circuit <b>(E6, F6, H6)</b> <i>Acceptable substitute is part no. 37-74LS170.</i>
37-74S00	Type-74S00 Integrated Circuit <b>(C6)</b>
37-74S02	Type-74S02 Integrated Circuit <b>(K9)</b>
37-74S04	Type-74S04 Integrated Circuit <b>(K2, R9)</b>
37-74S74	Type-74S74 Integrated Circuit <b>(J10, L9)</b>
37-74S260	Type-74S260 Integrated Circuit <b>(L8)</b>
37-7404	Type-7404 Integrated Circuit <b>(H11)</b>
37-74193	Type-74193 Integrated Circuit <b>(N4)</b>
37-7805	+ 5V Voltage Regulator <b>(VR2)</b>
37-7815	+ 15V Voltage Regulator <b>(VR3)</b>
37-7915	- 15V Voltage Regulator <b>(VR1)</b>
38-MV5053	Type-MV5053 Light-Emitting Diode <b>(CR2)</b>
41-3004	100 uH, ± 10%, Hot-Molded Plastic Fixed R.F. Choke <b>(L1)</b> <i>Acceptable substitute is part no. 41-3003.</i>
62-001	SPST Momentary Pushbutton Switch <b>(SW1)</b>
66-114P1T	4-Station Single-Throw, Dual-Inline-Package Bit Switch <b>(L11)</b>
66-118P1T	8-Station Single-Throw, Dual-Inline-Package Bit Switch <b>(M10, P10)</b>
79-42C24	24-Contact Medium-Insertion-Force Integrated Circuit Socket <b>(A3, B/C3, D3, E1, E3, F/H1, F/H3, J1, J3, K1, L/M1, N1, P1)</b>
79-42C40	40-Contact Medium-Insertion-Force Integrated Circuit Socket <b>(L/M/N3)</b>
81-4302	Nylon Snap-In Fastener
90-102	12.096 MHz, ± .005%, Crystal <b>(Y2)</b>
90-6013	Microprocessor <b>(L/M/N3)</b>
90-7033	Random-Access Memory <b>(A1, A2, B1, B2, C1, C2, D1, D2, H2, J2)</b>
020670-01	Test Point
036408-01	Programmable Read-Only Memory <b>(K7)</b>

## Figure 22 Red Baron™ Analog Vector-Generator PCB Assembly, continued Parts List

Part No.	Description (Reference Designations and Locations in Bold)
<b>[A035742-02, Rev. C +]</b>	
036995-01	Read-Only Memory <b>(N1)</b>
036996-01	Read-Only Memory <b>(L/M1)</b>
036997-01	Read-Only Memory <b>(K1)</b>
036998-01	Read-Only Memory <b>(J1)</b>
037000-01	Read-Only Memory <b>(E1)</b>
037006-01	Read-Only Memory <b>(B/C3)</b>
037007-01	Read-Only Memory <b>(A3)</b>
037587-01	Read-Only Memory <b>(F/H1)</b>
100015-103	.01 uf Ceramic-Disc Minimum 25V Radial-Lead Capacitor <b>(C47, 55, 57, 58, 60, 62, 65-68, 71, 91, 92, 95, 96, 99, 100)</b>
110000-101	100 Ohm, ± 5%, ¼ W Resistor <b>(R70, 75)</b>
110000-102	1K Ohm, ± 5%, ¼ W Resistor <b>(R18, 20, 27, 67, 84-86, 94, 110, 128-133)</b>
110000-103	120 Ohm, ± 5%, ¼ W Resistor <b>(R9-17, 19, 21, 25, 26, 33, 44, 51-66, 95, 125-127)</b>
110000-104	100K Ohm, ± 5%, ¼ W Resistor <b>(R35-42)</b>
110000-122	1.2K Ohm, ± 5%, ¼ W Resistor <b>(R46)</b>
110000-151	150 Ohm, ± 5%, ¼ W Resistor <b>(R103)</b>
110000-153	15K Ohm, ± 5%, ¼ W Resistor <b>(R93)</b>
110000-221	220 Ohm, ± 5%, ¼ W Resistor <b>(R24)</b>
110000-222	2.2K Ohm, ± 5%, ¼ W Resistor <b>(R45, 92, 102, 112, 114-116, 119-121, 123)</b>
110000-223	22K Ohm, ± 5%, ¼ W Resistor <b>(R28-32)</b>
110000-270	27 Ohm, ± 5%, ¼ W Resistor <b>(R111)</b>
110000-332	3.3K Ohm, ± 5%, ¼ W Resistor <b>(R87, 97)</b>
110000-392	3.9K Ohm, ± 5%, ¼ W Resistor <b>(R47, 49)</b>
110000-471	470 Ohm, ± 5%, ¼ W Resistor <b>(R34, 104-109)</b>
110000-472	4.7K Ohm, ± 5%, ¼ W Resistor <b>(R43)</b>
110000-474	470K Ohm, ± 5%, ¼ W Resistor <b>(R113, 117, 118, 122)</b>
110000-561	560 Ohm, ± 5%, ¼ W Resistor <b>(R96)</b>
110000-562	5.6K Ohm, ± 5%, ¼ W Resistor <b>(R99)</b>
110000-680	68 Ohm, ± 5%, ¼ W Resistor <b>(R124)</b>
110000-681	680 Ohm, ± 5%, ¼ W Resistor <b>(R83)</b>
110000-821	820 Ohm, ± 5%, ¼ W Resistor <b>(R68, 69, 82)</b>
110003-752	7.5K Ohm, ± 1%, ½ W Metal-Film Resistor <b>(R71, 72, 76-81, 89)</b>
121007-473	.047 uf, ± 10%, Radial-Lead Epoxy-Dipped 100V Polycarbonate Capacitor <b>(C56, 59)</b>
122000-225	2.2 uf, ± 10%, 35V Tantalum Capacitor <b>(C87)</b>
137002-001	Type 74S86 Integrated Circuit <b>(B7)</b>
137149-001	Type 74LS11 Integrated Circuit <b>(J9)</b>
137159-001	Type DAC-08 Digital-to-Analog Converter <b>(C9)</b>
137158-002	Type AM6012ADC Digital-to-Analog Converter <b>(A9, D9)</b>
179010-001	12-Pin PCB Header <b>(J19)</b>



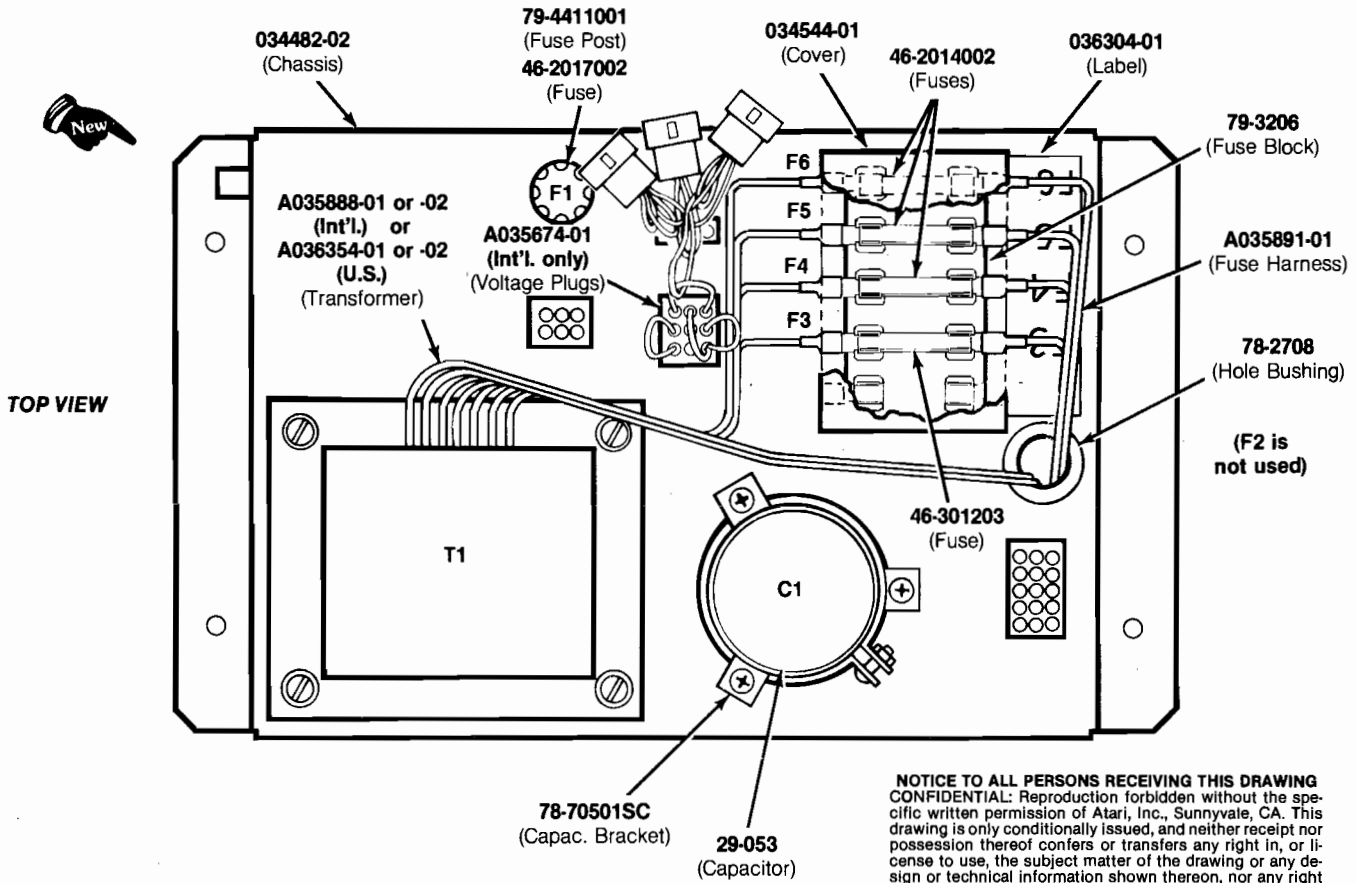
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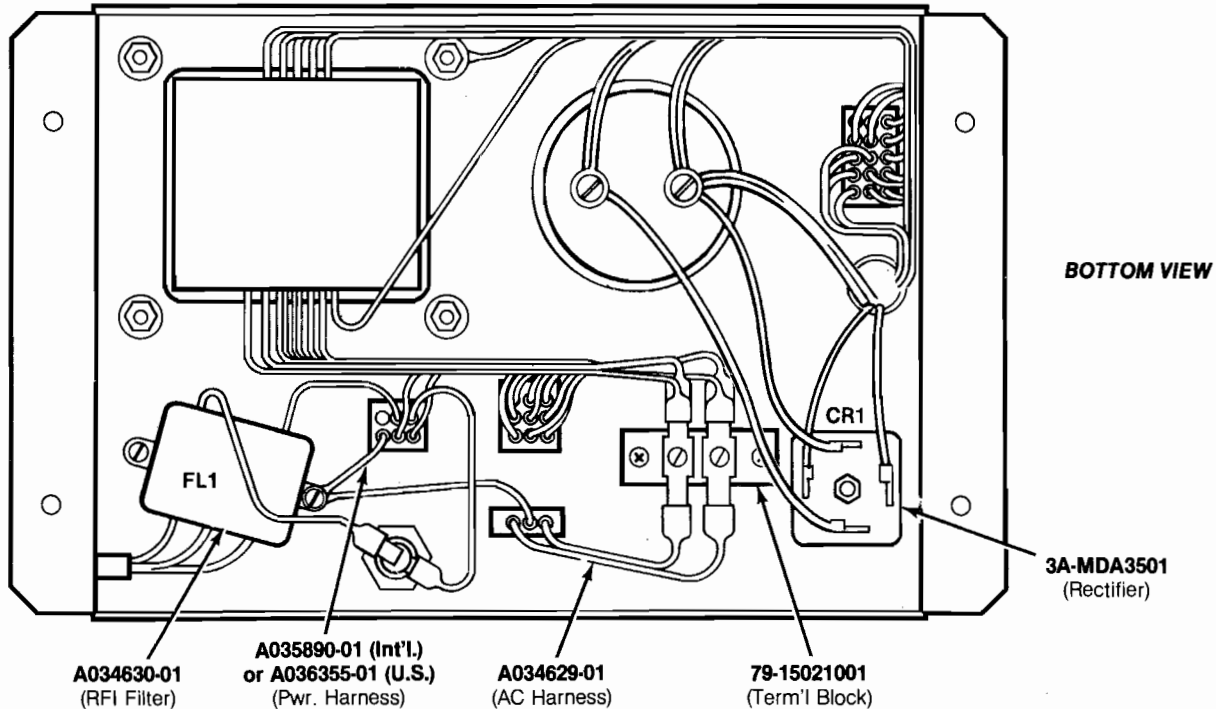
**Figure 23 Fluorescent Light Assembly  
 (from A036146-01 A)**

**Parts List**

Part No.	Description
A005493-01	Fluorescent Light Harness
70-304	18-Inch 15-Watt Cool White Fluorescent Tube
79-561816P	Spring Connector Wire Nut for 16- to 18-Gauge Wires
99-11003	Fluorescent Lamp Starter
99-11008	Ballast Transformer
99-11009	Starter Socket
99-11011	1½-Inch Clamp
035835-01	Y-Lead Connector (part no. A036045-01 is an acceptable substitute)



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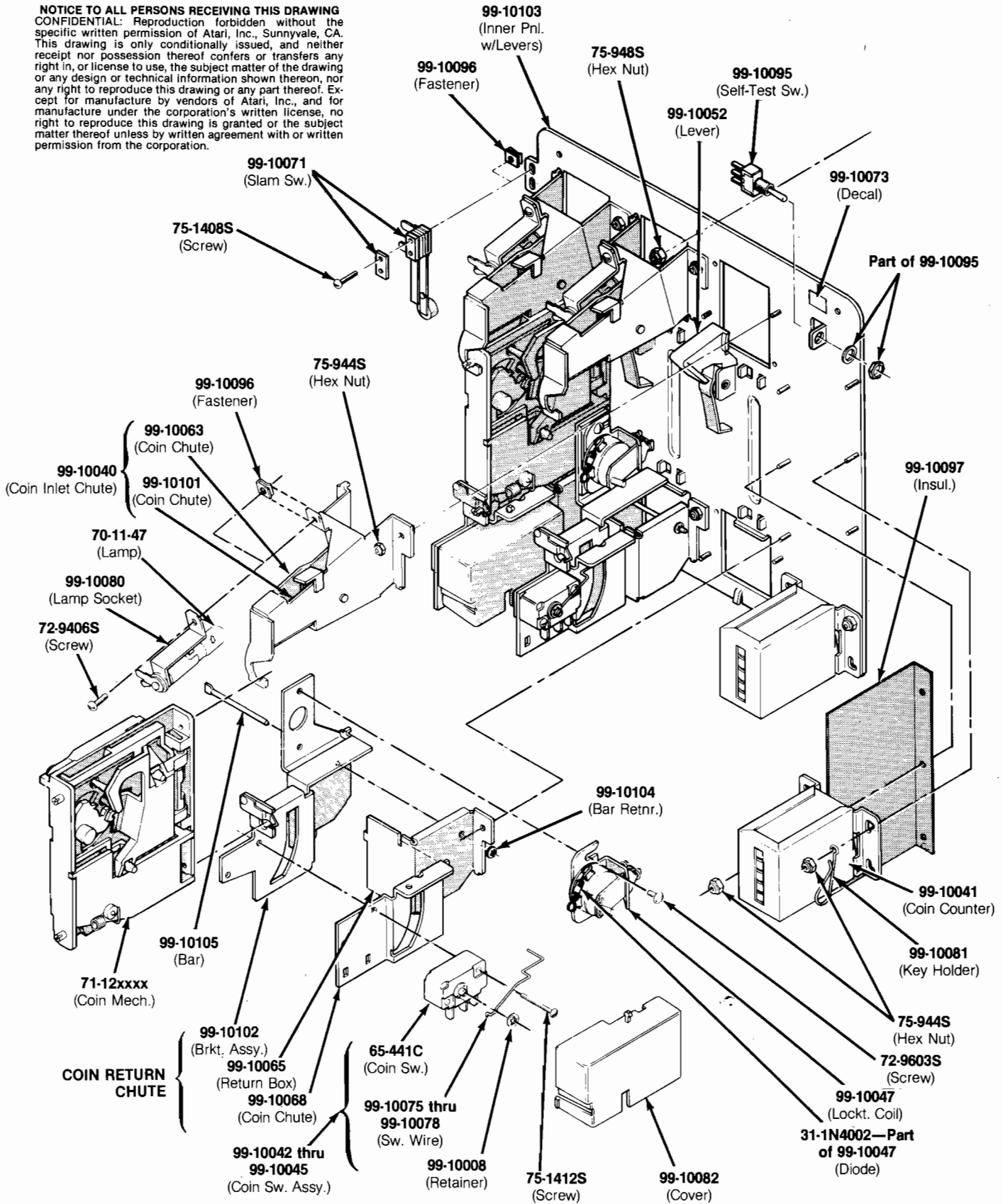


**Figure 24 Power Supply Assemblies for X-Y Games  
 A035892-01 (International) A / A036353-01 (U.S.) A**

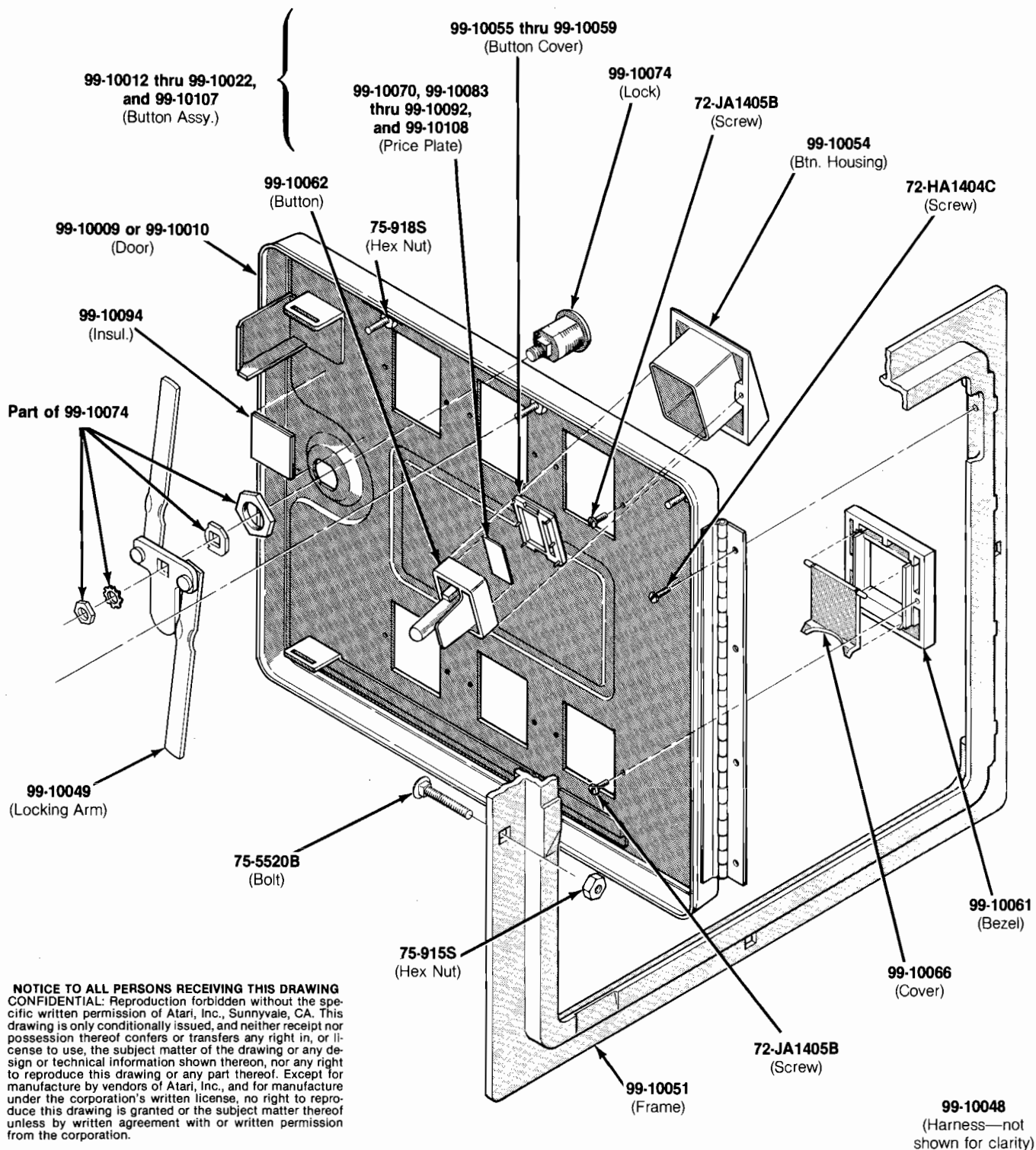
## Figure 24 Power Supply Assemblies for X-Y Games Parts List

<i>Part No.</i>	<i>Description (Reference Designations and Locations in Bold)</i>
A034629-01	A.C. Harness Assembly
A034630-01	RFI Filter Assembly <b>(FL1)</b>
A035674-01	Voltage Plug Assembly <i>(set of four plugs—for international power supply only)</i>
A035888-01	Transformer Assembly <i>(international only)</i> <b>(T1)</b> <i>Acceptable substitute is A035888-02.</i>
A035890-01	Power Harness Assembly <i>(international only)</i>
A035891-01	Fuse Harness Assembly
A036354-01	Transformer Assembly <i>(U.S. only)</i> <b>(T1)</b> <i>Acceptable substitute is A036354-02.</i>
A036355-01	Power Harness Assembly <i>(U.S. only)</i>
29-053	27,000 uf 15 VDC Electrolytic Capacitor <b>(C1)</b>
3A-MDA3501	Bridge Rectifier, Type MDA 3501 <b>(CR1)</b>
46-2014002	4-Amp. 250 V 3AG Slow-Blow Glass Cartridge-Type Fuse <b>(F4, F5, F6)</b>
46-2017002	7-Amp. 250 V 3AG Slow-Blow Glass Cartridge-Type Fuse <b>(F1)</b>
46-301203	20-Amp. 32 V 3AG Slow-Blow Glass Cartridge-Type Fuse <b>(F3)</b>
78-2708	Nylon Type 6/6 Hole Bushing with 5/8-Inch Inside Diameter × 55/64-Inch Outside Diameter × 1/4-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 1/4-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
036304-01	Label for Fuse Values

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**Figure 25 American-Made Coin Door  
 71-10xxxx D**



- 71-102201 — U.S. 25¢/25¢ Coin Door
- 71-103202 — U.S. 25¢/25¢/25¢ Coin Door
- 71-103203 — U.S. 25¢/25¢/\$1 Coin Door
- 71-102204 — German 2 DM/1 DM Coin Door
- 71-103205 — German 1/2/5 DM Coin Door

- 71-102206 — German 1 DM/5 DM Coin Door
- 71-102207 — Belgian 5 Fr/5 Fr Coin Door
- 71-102208 — Swiss 1 Fr/1 Fr Coin Door
- 71-102209 — Japanese 100Y/100Y Coin Door
- 71-102210 — British 10 P/10 P Coin Door

- 71-102211 — Australian 20¢/20¢ Coin Door
- 71-102212 — Italian 100 L/100 L Coin Door
- 71-102213 — U.S. 50¢/50¢ (2 x 25¢) Coin Door
- 71-103214 — U.S. 50¢/50¢/50¢ Coin Door
- 71-103215 — U.S. 50¢/50¢/\$1 Coin Door

**Figure 25 American-Made Coin Door**  
**71-10xxxx D**

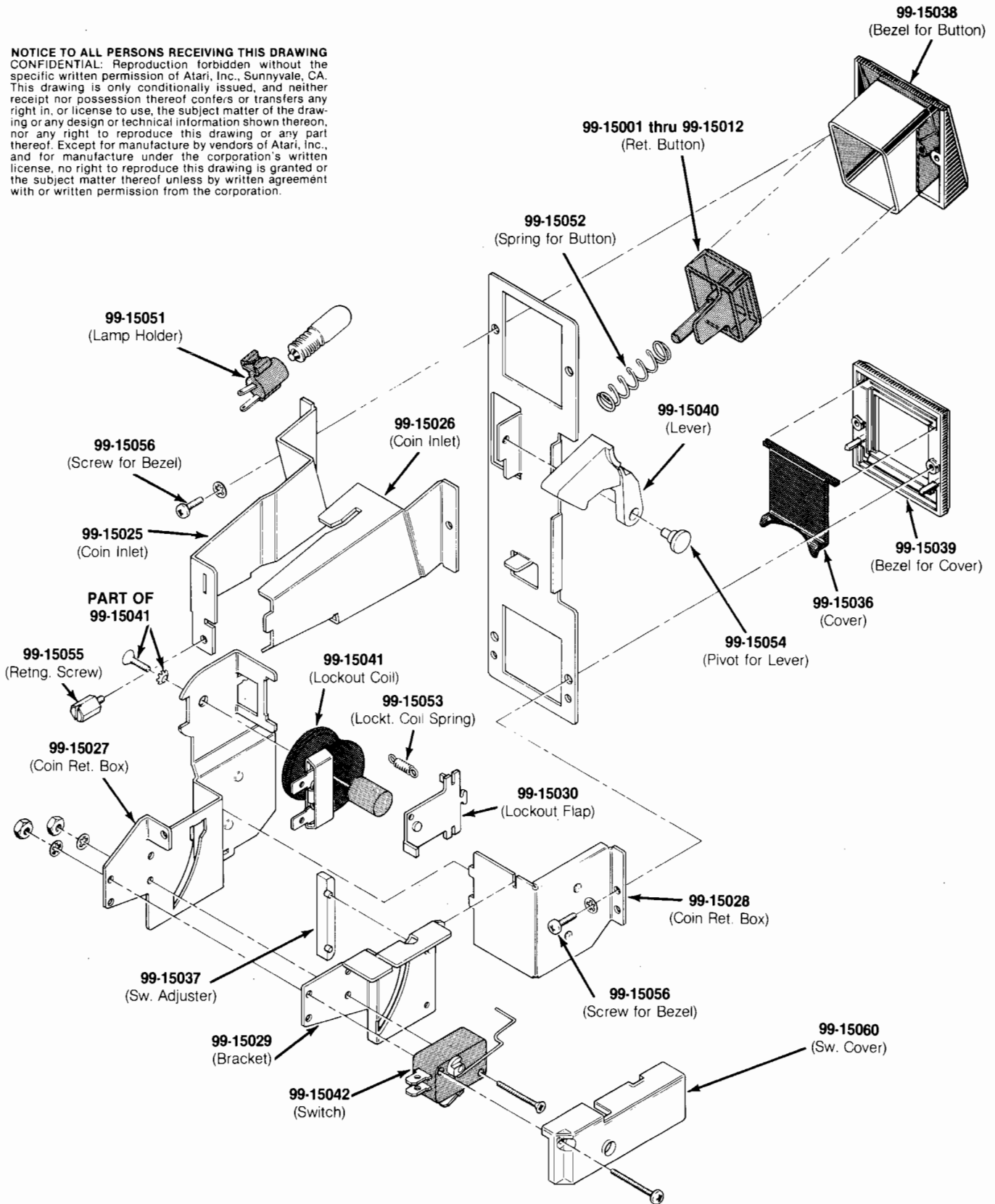
## Figure 25 American-Made Coin Door, continued Parts List

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	#4 × ¼-Inch Slotted Pan-Head Thread-Rolling Tri-Fluted "Taptite" Cadmium-Plated Screw
72-JA1405B	#4 × 5/16-Inch Slotted Pan-Head Thread-Rolling Tri-Fluted "Plastite" Black Screw
72-9406S	#4-40 × 3/8-Inch Slotted Truss-Head Steel Machine Screw
72-9603S	#6-32 × 3/16-Inch 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	#4-40 × ½-Inch Slotted Pan-Head Steel Machine Screw
75-1412S	#4-40 × ¾-Inch Slotted Pan-Head Steel Machine Screw
75-5520B	#¼-20 × 1¼-Inch 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
99-10012	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 ( <i>silver wire</i> )
99-10043	Coin Switch Assembly for German 1 DM, Swiss 1 Fr, and Japanese Y100 Coins ( <i>black wire</i> )
99-10044	Coin Switch Assembly for U.S. \$1.00, German 2 DM, and Italian 100 Lire Coins ( <i>gold wire</i> )
99-10045	Coin Switch Assembly for German 5 DM, U.K. 10 P, and Australian 20¢ Coins ( <i>green wire</i> )
99-10047	Lockout Coin Assembly
99-10048	Coin Door Harness Assembly

## Figure 25 American-Made Coin Door, continued Parts List

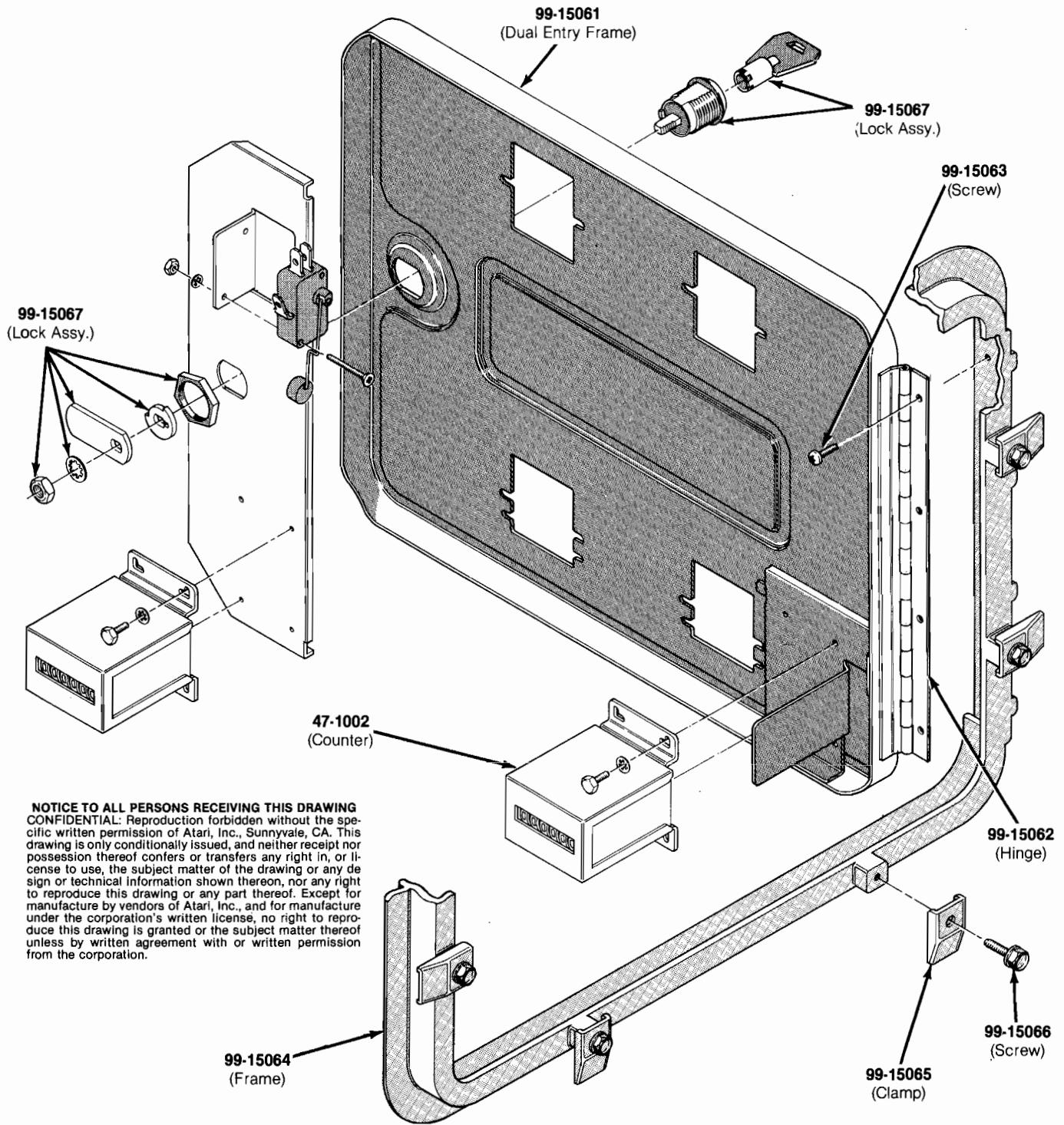
<i>Part No.</i>	<i>Description</i>
99-10049	Locking Arm Assembly
99-10051	Coin Door Frame
99-10052	Coin Return Lever
99-10054	Coin Button Housing
99-10055	Coin Return Button Cover for Japanese 100Y Coin
99-10056	Coin Return Button Cover for German 1 DM and Swiss 1 Fr Coins
99-10057	Coin Return Button 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
99-10065	Coin Return Box
99-10066	Coin Return Cover
99-10068	Coin Chute
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 1 DM, Swiss 1 Fr and Japanese 100Y Coins
99-10076	Silver Switch Wire for U.S. 25¢ and Belgian 5 Fr Coins
99-10077	Gold Switch Wire for U.S. \$1.00, German 2 DM and Italian 100 Lire Coins
99-10078	Green Switch Wire for German 5 DM, U.K. 10 P 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	Left Half of Coin Inlet Chute
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
99-10107	U.S. 50¢ Coin Return Button Assembly <i>(for two quarters)</i>
99-10108	U.S. 50¢ Price Plate <i>(for two quarters)</i>

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**Figure 26 British-Made Coin Door**  
**171001-xxx A**





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- 171001-001 — British 10 P/10 P Coin Door
- 171001-002 — British 10 P/50 P Coin Door
- 171001-003 — British 20 P/50 P Coin Door
- 171001-004 — German 1 DM/1 DM Coin Door
- 171001-005 — German 2 DM/1 DM Coin Door

- 171001-006 — German 2 DM/5 DM Coin Door
- 171001-007 — Belgian 5 Fr/5 Fr Coin Door
- 171001-008 — French 1 Fr/1 Fr Coin Door
- 171001-009 — French 2 Fr/1 Fr Coin Door
- 171001-010 — Swedish 1 Kr/1 Kr Coin Door

- 171001-011 — Hong Kong \$1/\$1 Coin Door
- 171001-012 — Canadian 25¢/25¢ Coin Door
- 171001-013 — U.S. 25¢/25¢ Coin Door
- 171001-014 — Spanish 25 Pts/25 Pts Coin Door
- 171001-015 — Swiss 1 Fr/1 Fr Coin Door

**Figure 26 British-Made Coin Door**  
**171001-xxx A**

## Figure 26 British-Made Coin Door, continued 171001-xxx A

<i>Part No.</i>	<i>Description</i>
47-1002	Coin Counter
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 × 25¢) 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	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
99-15061	Dual Entry Frame
99-15062	Hinge
99-15063	Screw
99-15064	Coin Door Frame
99-15065	Clamp for Frame
99-15066	Screw
99-15067	Lock Assembly

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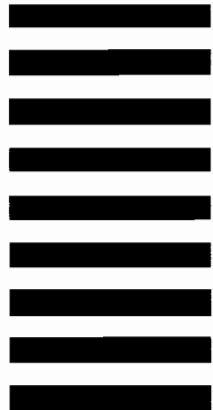


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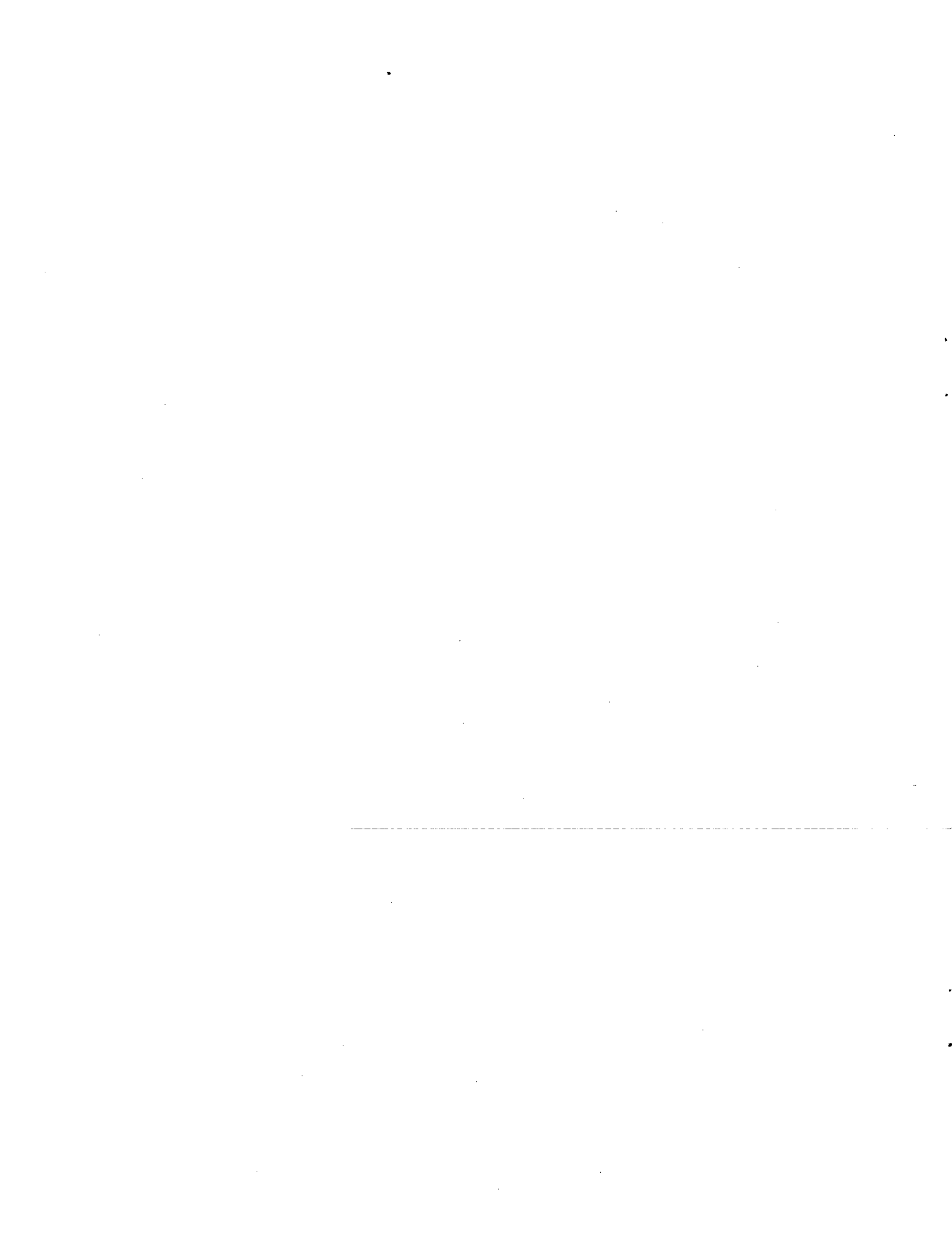
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