AIRBORNE™

PARTS: (847) 797-6320
SERVICE: (847) 797-6192
FAX: (847) 797-6306

PRELIMINARY OPERATORS MANUAL

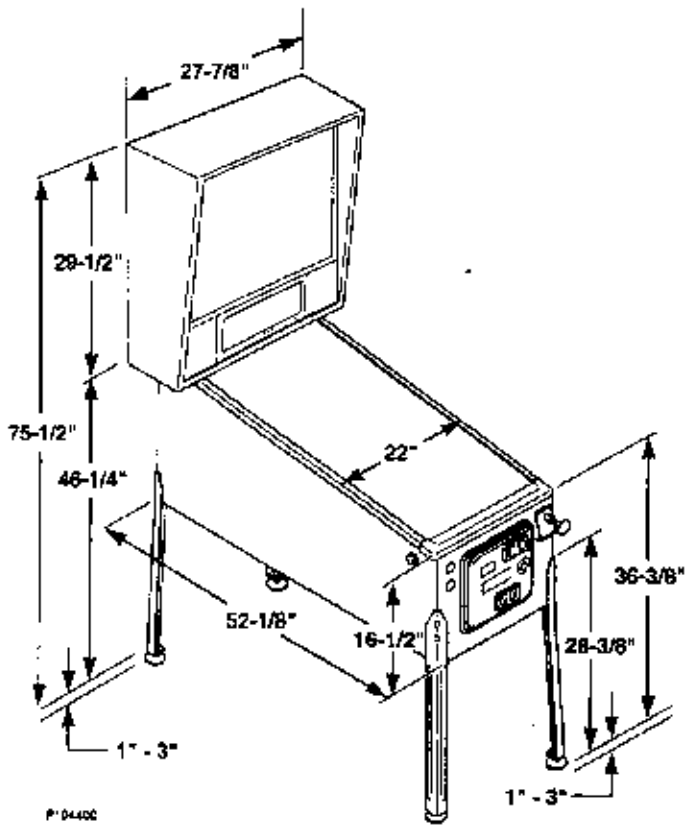
PM00131
ISSUE DATE:02/12/96

COPYRIGHT© 1996
CAPCOM® COIN-OP, Inc.

GAME SPECIFICATIONS

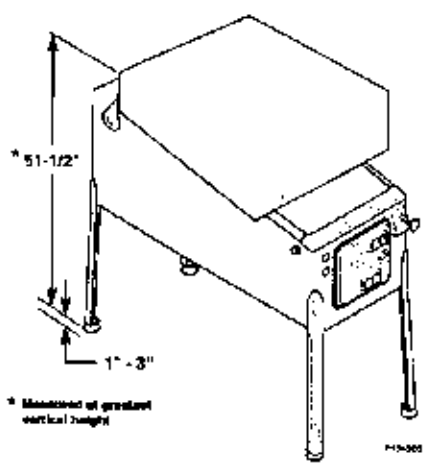
CHARACTERISTIC	DESCRIPTION
ELECTRICAL INPUT RATINGS	100 to 115V AC 50/60HZ 8 AMPS 200 to 230V AC 50/60HZ 4 AMPS
CIRCUIT PROTECTION	Slow-Blo fuses, Varistor Surge Protection, IEC-Type Grounded Receptacle
SHIPPING CARTON INFORMATION	Height: 55-1/2"(1.41M) Width: 30-1/2"(0.77M) Depth: 30-1/2"(0.77M) Weight: 250 Pounds (113.1Kg)
PRODUCT COMPLIANCE	FCC, Part 15, Class A Digital Device CE Marking
AUDIO SYSTEM	MPEG Digital 3 Channel Mono Output (Left, Center, Right) Rated at 10Watts RMS • Two 4" 2-way Speakers for Mid & High Frequencies • One 8" Bass Speaker for Low Frequencies
DISPLAY	128 X 32 Character Dot Matrix
COIN DOOR	Standard: 2 Coin Acceptors Optional: Additional 2 Coin Acceptor or Bill Acceptor
OPERATOR ADJUSTABLES	Audio: Volume Control, Sound Effects Visual: Standard or Custom Display Messages Coinage: U. S. Standard; Custom Configuration for Foreign Currencies Play Mode: Free Play, Tournament, and Game Difficulty Level Game Play: Replay Percentage, Match Credits, Game Restart Password Protection: 3 Levels of Security
SPECIAL SOFTWARE FEATURES	•182 Individual Audits •11 Self-Test Modes •Adjustable Flipper Strength •6 Internal Diagnostic Levels •Automated Software Troubleshooting

CABINET DIMENSIONS



NOTE:

DIMENSIONS DO NOT INCLUDE CABINET PROTRUSIONS, SUCH AS THE BALL SHOOTER, COIN DOOR, FLIPPER BUTTONS, OR BACKBOX LATCH.



Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

TABLE OF CONTENTS

DESCRIPTION	PAGE
Installation & Setup	1
Game Rules	4
Menu System	
Menu System Description	10
Audits Data Table	13
Game Adjustments	16
Game Diagnostics	21
Reset Functions	29
Reports	30
Redemption	39
Component Parts Identification & Service Parts Listing	
Backbox Parts Identification	42
Cabinet & Backbox Parts Identification	43
Sound Board	46
Driver Board	48
Power Board	52
Switch Board	54
CPU Board	56
Display Power Supply Board	58
Interface Board	59
Diode Board	60
Lamp Boards	62
Playfield Lamps	64
Backbox Lamp Location	66
Rubber Rings	68
Playfield Ramps and Ball Guides	69
Playfield Wireforms	70
Playfield Posts	71
Location of Switches and Optos	72
Opto Boards	73
Location of Solenoids, Motors, and Flashers	74
Playfield Plastics	75
Playfield - Mechanisms	85
Troubleshooting Guide	
Power-up Problems	124
Coin Door Problems	125
Dot Matrix Display Problems	126
Sound Problems	127
Playfield Problems - Mechanical	128
Playfield Problems - Solenoids & Motors	129
Playfield Problems - Switches	130
Illumination Problems - Playfield & Backbox	131
Theory of Operation	133
Schematic Diagrams	

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

PACKING LIST

The following parts are included in the packing box of the game container. Some parts are required for assembly of the game while others are included as spare parts. If any part(s) are missing, contact your local Capcom® distributor.

ITEM	QTY	PART NUMBER
PINBALLS	3	BL00103
PLATE, LINE CORD BACKING	1	MT00325
LEVELERS, LEG	4	MS00101-1
NUT, LEG, LEVELERS, 3/8-16 X 3.0	4	NT00100-16
CORD, LINE	1	*SEE NOTE
CARD, BUSINESS REPLY	1	PM00117
SCREW, 8-13 X 1 MACHINE, CABINET	1	SC00101-08
BUSHING, CORD INSULATION, CABINET	1	PL00259-05
BOB, TILT MECH PLUMB, CABINET	1	MS00102-1
WIRE, PLUMB BOB HOOK, CABINET	1	MS00105-1
COVER, 3 SLOT CASH BOX, CABINET	1	A-00143-1
BOX, CASH, CABINET	1	PL00238
LEGS, PINBALL, CABINET	4	MT00231
SCREW, 3/8 - 16 X 2 - 1/2, THUMB, BACKBOX	2	SC00154-20
WASHER, FLAT # 3/8, BACKBOX	2	WS00100-12
WASHER, LOCK # 3/8, BACKBOX	2	WS00104-15
**BAG, SPARE PARTS	1	A-00486-PB4

*NOTE: There are several types of line cords available. If this item is missing, contact your Capcom® distributor with the model number of your game.

**INCLUDED IN THE SPARE PARTS BAG:

ITEM	QTY	PART NUMBER
PLASTIC, LEFT SLINGSHOT	1	AW00125-1
PLASTIC, RIGHT SLINGSHOT	1	AW00125-2
DECAL, DROP TARGET	1	AW00164-1
COIL, 23 800T	1	CL00109
COIL, 22 1100T	1	CL00111
DIODE, 1N4004	1	DI00100
FUSE, 3 AMP SLO-BLO	1	FS00100-03
FUSE, 4 AMP SLO-BLO	1	FS00100-04
FUSE, 5 AMP SLO-BLO	1	FS00100-05
FUSE, 7 AMP SLO-BLO	1	FS00100-07
FUSE, 8 AMP SLO-BLO	1	FS00100-08
FUSE, 10 AMP SLO-BLO	1	FS00100-10
TARGET, DROP (WHITE)	1	PL00325-W
LINK, FLIPPER PLUNGER	1	PL00202-1

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

INSTALLATION INSTRUCTIONS

1) Remove strapping from carton. Remove staples and open top flaps (see Figure 1).

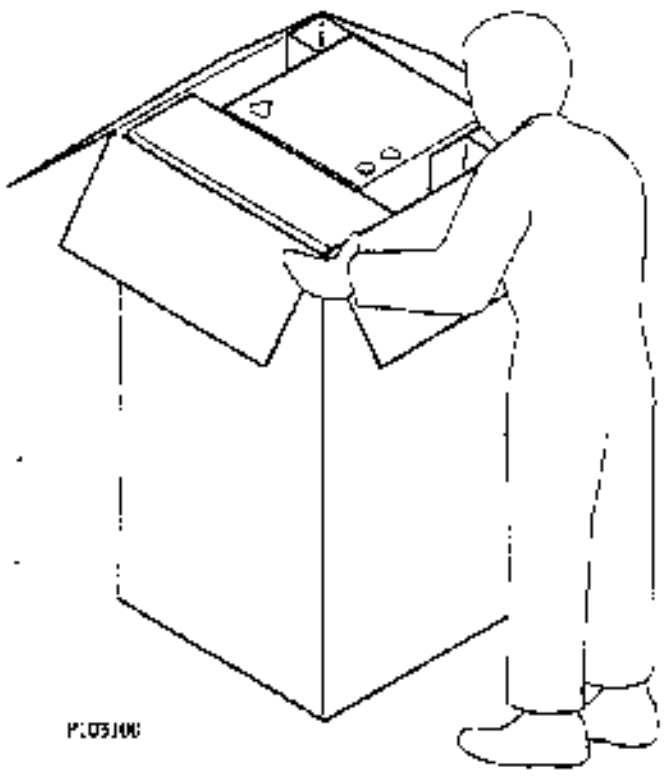


FIGURE 1: OPENING SHIPPING CARTON

2) Two or more people should lay the carton on its side. Slide game and packing materials out from carton (see Figure 2). Open the parts box.

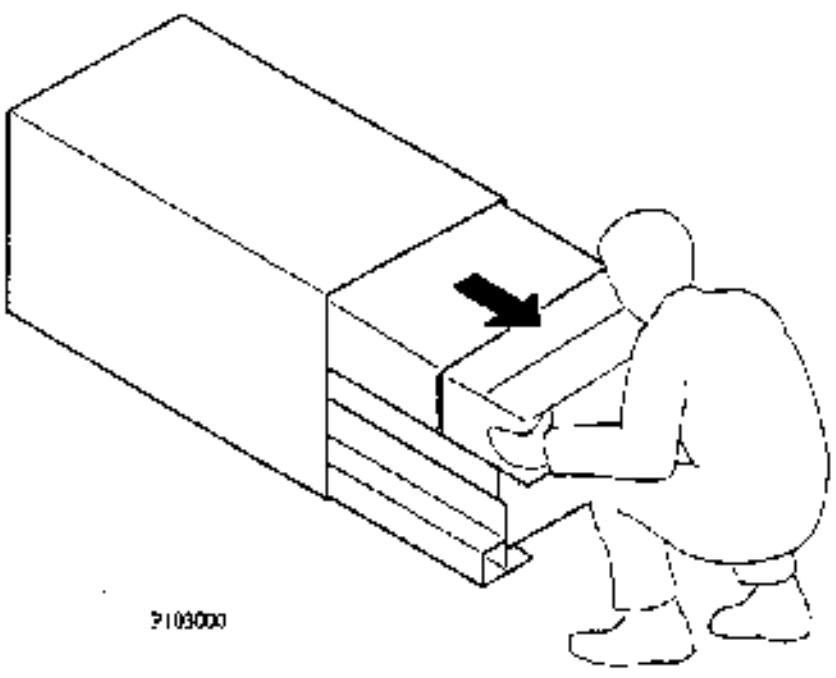


FIGURE 2: REMOVING GAME AND PARTS BOX

3) Keys are attached to the ball shooter. Open coin door and remove cash box. Remove parts and re-install cash box (see Figure 3).

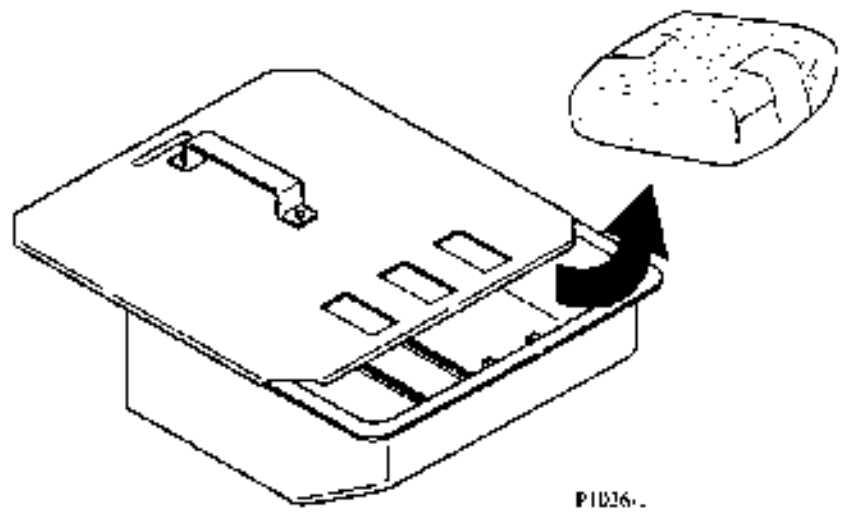


FIGURE 3: PARTS IN CASHBOX

4) Check loose parts against packing list. Report any damaged or missing parts.

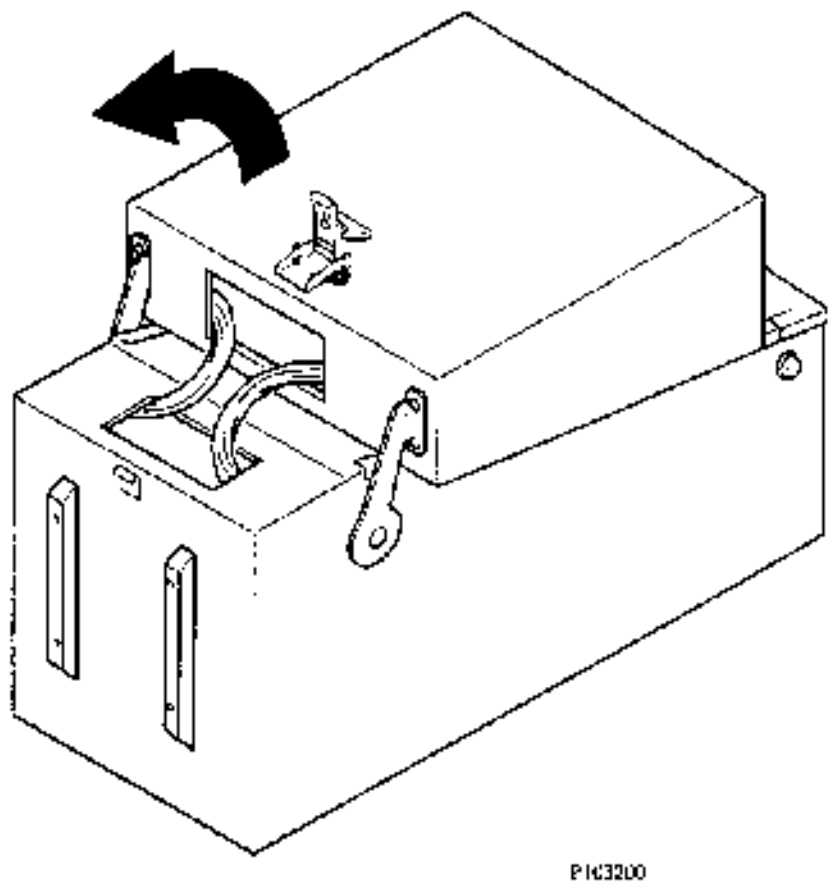


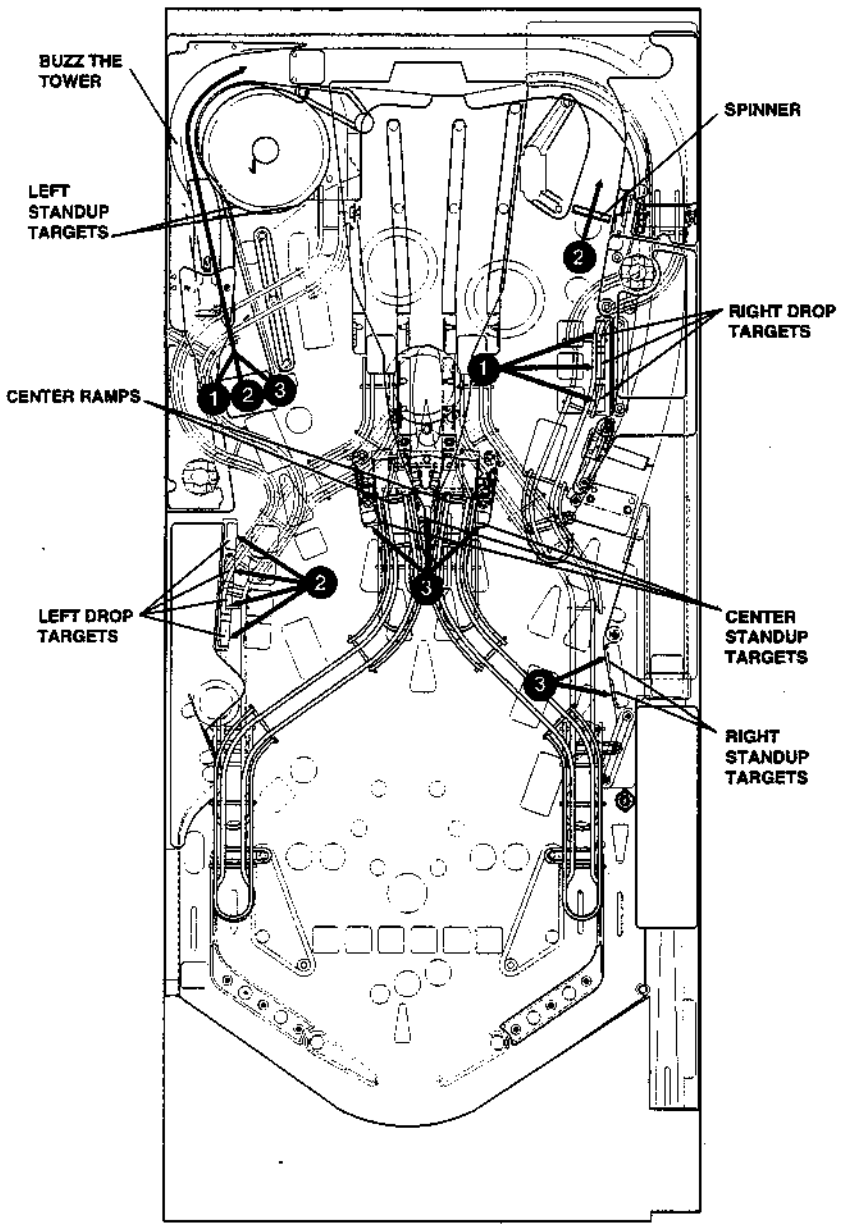
FIGURE 4: RAISING BACKBOX UPRIGHT

5) Raise the backbox to its upright position. Ensure that cables are not pinched (see Figure 4).

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

GAME RULES

You are a pilot competing in six airshows located in the US, France, Germany, Britain, Italy, and Spain. You fly one jet for the entire competition. There are stunts to be completed at each show. Each country has a time limit. When the time expires, the pilot moves to the next country. Any time left over for a completed country gets multiplied by a point value.

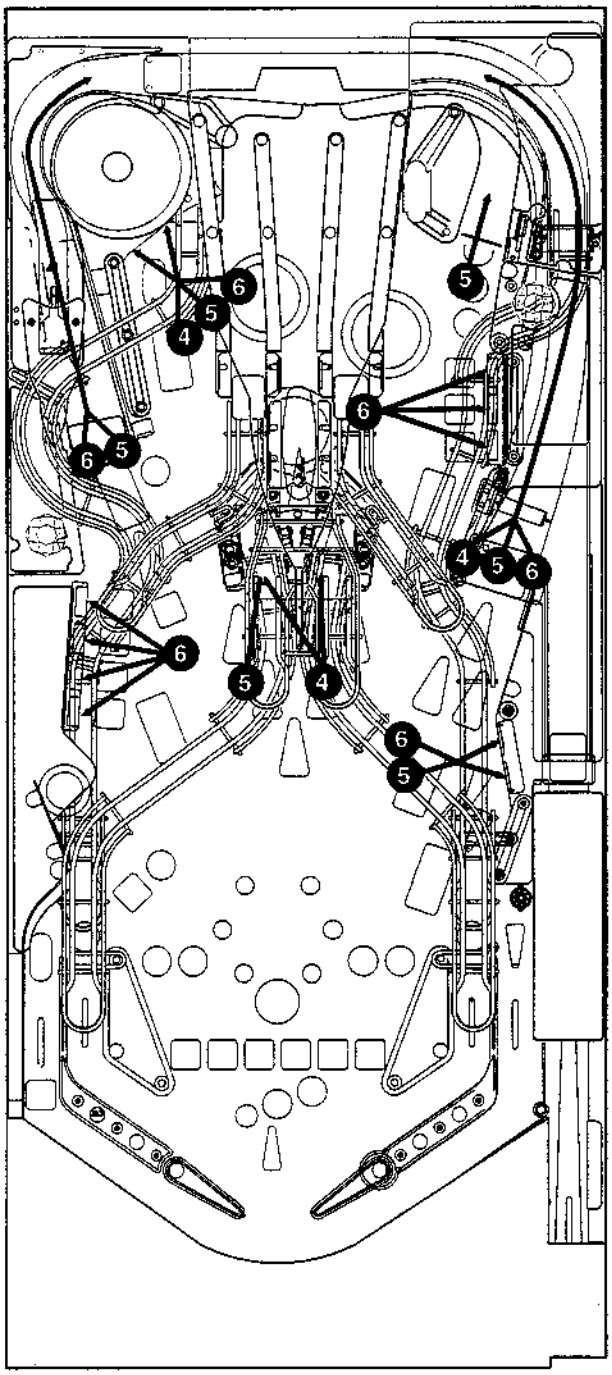


In the United States of America, you must perform 2 stunts. First you must make the left ramp to "Buzz the Tower". Second you must hit the right drop targets.

In France, you must complete 3 stunts. First reach Mach 1 with the spinner. Next knock down the left drop targets. And last make the left ramp 3 times.

In Germany, you have to perform 3 stunts. First hit the 3 center standup targets without hitting the center scoops (otherwise the stunt is over and the plane crashes). Then "Buzz the Tower". And the last trick to perform is to hit the right standup targets.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.



4

In Britian, you must complete 3 stunts. First, make any of the center loops 4 times. Next, hit the 2 left standups. And last, make the right ramp 3 times.

5

In Italy, there are 4 stunts to complete. First "Buzz the Tower". Second, hit both the right and the left standups. Next, reach Mach 3 with the spinner. And the last stunt that you must complete is a 3 hit combo. You must do these stunts in this exact order: 1) make the left center ramp. 2) make the right ramp; 3) hit the spinner.

6

The last stunt show is in Spain. There are a total of 6 stunts to complete and all of these stunts may be completed in any order: 1) knock down the left drop targets; 2) make the left ramp to "Buzz the Tower"; 3) hit the left standup targets; 4) knock down the right drop targets; 5) make the right ramp. 6) hit the right standup targets.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

GAME RULES (continued)

END OF WORLD

Once the player has completed all of the 6 previous airshows, the player then goes on to *World Frenzy* (see Feature Rules). Points are then awarded based upon the number of stunts completed. Each completed stunt raises the player's rank by one, as follows:

Start at:	6th place. Sergeant
Advance to:	5th place: Lieutenant
Advance again to:	4th place: Captain
Advance again to:	3rd place: Major
Advance again to:	2nd place: Colonel
Finish with:	1st place: Ace

Upon reaching Ace, the player is awarded the following:

1st Time	-	Light extra ball
2nd Time	-	Give extra ball
3rd Time	-	Light 1 special lamp
4th Time	-	Light 2 special lamps
5th Time +	-	30 Mil

LEFT DROP TARGETS (S-H-O-W)

Hitting all of the targets enables the left saucer lock & points. If A-I-R targets are dropped, *Night Flying Mode* is activated.

LEFT SAUCER

Points are determined by the left drop targets:

No Drop - 800 K
1st Drop - 1.5 Mil
2nd Drop - 2.5 Mil
3rd Drop - 5 Mil, light extra ball

LEFT STANDUP TARGETS

Hitting both targets will enable the left outlane eject lock. If the ball drains out the left outlane, it will act as an ordinary locked ball. However, if the player drains, this ball will release and give him a free ball. The left outlane lock acts as a kickback on the first ball.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

GAME RULES (continued)

LEFT RAMP - TOWER

The left ramp is lowered by hitting an orbit shot on the playfield. Dropping the left ramp during a stunt is a "Tower Buzz" whereby the ball is fed to the left flipper. If not part of a stunt, it results in a "Tower Flyby" and the ball is then directed towards the right flipper. Making the ramp repeatedly will result in increased scoring of 3 Mil, 4 Mil, 5 Mil, and 6 Mil.

LEFT RAMP STANDUP TARGET

Each time the target is hit, the letter is added to the dot matrix display to spell A-I-R-B-O-R-N-E. When completed, the player is awarded a random award of Light Special, Light Extra Ball, Upgrade, *Night Flying*, Spot Stunt, 12 Mil, or 20 Mil.

RIGHT DROP TARGETS (A-I-R)

Hitting all of the targets enables the back right saucer lock. The player then has an opportunity to drop the S-H-O-W targets for *Night Flying Mode*. After the player gets the mode once, the player must hit the A-I-R, and then the S-H-O-W targets at an increasing level of difficulty (the timer speeds-up).

RIGHT STANDUP TARGETS

Hitting the right standup targets will enable the right outlane diverter for a ball save. The diverter gate is active until 'ball save' or 'ball end' occurs.

RIGHT RAMP

When the ball is shot up the right ramp, the injector may be used to guide the ball into any of the Jet lanes or may be shot all the way around for a "Tower Flyby". Each of the 4 shots starts at a base value of 1 Mil. Each time the ball is hit in the same lane, the value increases by 1 Mil.

INJECTOR

The movable injector, at the back of the jet, will guide the ball into one of the three Jet Lanes. It is activated by hitting the flipper buttons at any time the ball goes up the right ramp or off the plunger shot. It is not active during *Air Mayhem.*

BUMPERS

Star bumpers start at a base value of 200 K. This value is doubled after every 16 hits. The maximum value is 1.25 Mil.

MACH SPINNER

The spinner starts at a base value of 55 K. Each time the spinner is hit, the jet increases its speed. This results in more bonus points and the jet reaching Mach speed. At Mach 1, the spinner value is 200 K, Mach 2 is 350 K, and Mach 3 is 500 K.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

GAME RULES (continued)

SKILL SHOT

The skill shot is made by shooting the ball into any of the Jet lanes. The center lane will lock the ball and give the player another ball. The left and right lanes award 1 Mil and 4 Mil points which alternate every ball. If the first ball is locked, the player has an opportunity to start *2-Ball Mayhem* by hitting the center lane and locking the second ball. If a ball has been left in the lock by a previous game, *2-Ball Mini Mayhem* can start with only one shot off the plunger.

HURRY UP!!!

When the country timer reaches 10 seconds times the number of stunts left, the player has this much time to hit the next stunt. If the stunt is completed, the timer is then reset to the number of stunts now remaining times 10 seconds. The process is repeated until all country stunts are made, or time runs out.

NIGHT FLYING MODE

Hitting the right targets (A-I-R) and then the left targets (S-H-O-W) starts the *Night Flying Mode*. All shots are then worth 500 K and additional time is added to the airshow timer. The player still has the opportunity to complete stunts for an additional 1 Mil and may advance to the next country (even though the timer for that country has stopped).

AIR MAYHEM

Only one ball can be stored in the center Jet ball lock. Another two balls may be locked in other locations on the playfield. Shooting your last ball at the Jet lock will release any previous locked ball held there, however, it remains locked and available for the next player.

2-Ball Mini Mayhem (Dogfight Mayhem) - The object is to defeat two other jets in a dogfight by shooting each of the center ramps three times. The loops are worth 1.5 Mil to start. After 3 loops on one side are made, the opposing plane is shot down. That ramp then increases value to 4 Mil for the remainder of *Mayhem*. When one ball is lost, *Mayhem* ends.
3-Ball Air Frenzy - Three-ball *Mayhem* starts when three balls are locked in any of the four locks. The jackpot values are doubled for 3 balls on the playfield. *Mayhem* has a climbing altitude theme. Four jackpots of increasing value. First, shoot the ground orbit under tower for 4 Mil or 8 Mil. Second, the right center loop at level 2 for 5 Mil or 10 Mil. Third, the left center loop at level two for 6 Mil or 12 Mil. Fourth is the Super Jackpot for the right ramp at level 4 for 10 Mil or 20 Mil.
The jackpot cycle repeats until 1 ball remains.
World Frenzy - This mode starts after completion of all countries. The game will wait until a ball is locked in any ball lock. Once a ball is locked, *World Frenzy* starts. The jackpots are the left ramp - 5 Mil, and the right ramp - 15 Mil all the way around, 10 Mil for the Jet lanes.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

GAME RULES (continued)

BLUE ANGELS FORMATION

The Blue Angel Formation is made by completing the following five shots at any time during the game: left stand up, left loop, center standup, right loop, right standup, and the center standup. The formation resets at the beginning of the ball and additional time is added to the airshow timer. Once the 5 shots are made, the center standup target is qualified for the following award(s):

1st formation - 7 Mil
2nd formation - 13 Mil
3rd formation - 19 Mil, Lights extra ball
4th formation - Lights special

PLANE UPGRADES

Plane upgrades are available after making all of the 3 jet lanes. The copilot is added after the first stunt and may be ejected when the ball is locked in the far right saucer or the near left lock. All plane upgrades will remain for the entire game and are awarded in this order:

1) Copilot - The player receives a copilot to help guide him to the next target;
2) Jet Refueling - Adds 20 seconds to current airshow time, 5 seconds to all additional shows;
3) Targeting Capabilities - This suspends all other game play. Random single shots will be illuminated one at a time. The first one is illuminated for 20 seconds. Each additional shot is illuminated for two seconds less. The mode ends when the player does not hit the target in the allotted time. Target Points start at 7 Mil and increase by 1 Mil after every hit.
4) Engine Upgrade - The spinner is multiplied by a factor of 3.

END OF BALL BONUS

Spelling the J-E-T lanes at the top of the playfield advances Bonus to 2x, 3x, 5x, 7x, 8x and 10x. This Bonus is then used to multiply the sum of the other bonuses, shown below, to arrive at a "total" bonus:

Base Bonus - Get this for not tilting - 100 K
Drop Bonus - Completing drop targets - 200 K for each time dropped
Flyby Bonus - Number of flybys - 350 K per flyby
Stunt Bonus - Number of completed stunts - 200 K per stunt
Jet Speed Bonus - Increased by hitting the spinner - 1K times speed

HIGH SCORE TABLES

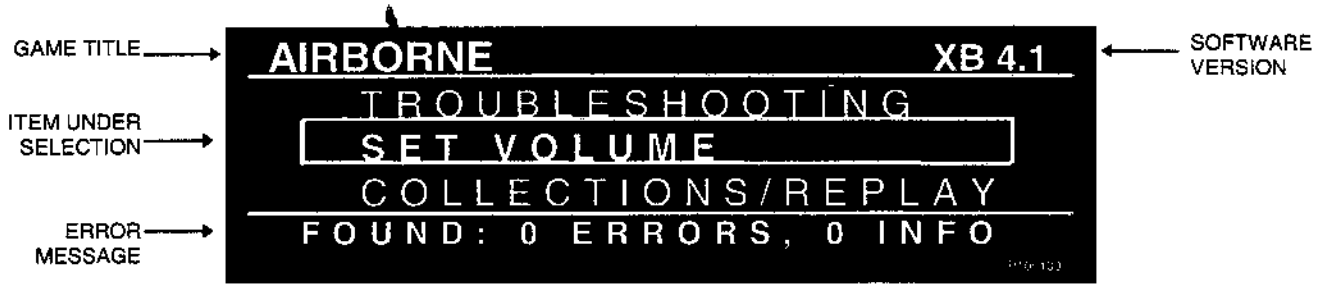
Flyby King - Most consecutive loops.
High Scores
Buy-in High Scores

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

MENU SYSTEM

The menu system is started when the coin door is opened. When the coin door is closed, the game will return to the Attract mode. If a game is in progress when the coin door is opened, the game will be preserved and restored (if possible) when the coin door is closed again. A game in progress is ended if an adjustment (except the volume or service credit adjustments) is changed or if a diagnostic function is selected.

When the coin door is opened, the dot matrix display shows the following main menu:



The start-up menu displays the number of ERRORS or problems that were found during game play or while in the Attract Mode. ERRORS are major problems, such as non-operative switches, that should be repaired/replaced before game play is resumed. INFO items are minor problems, such as burned-out lamps, that need repair/replacement during the next regular maintenance cycle.

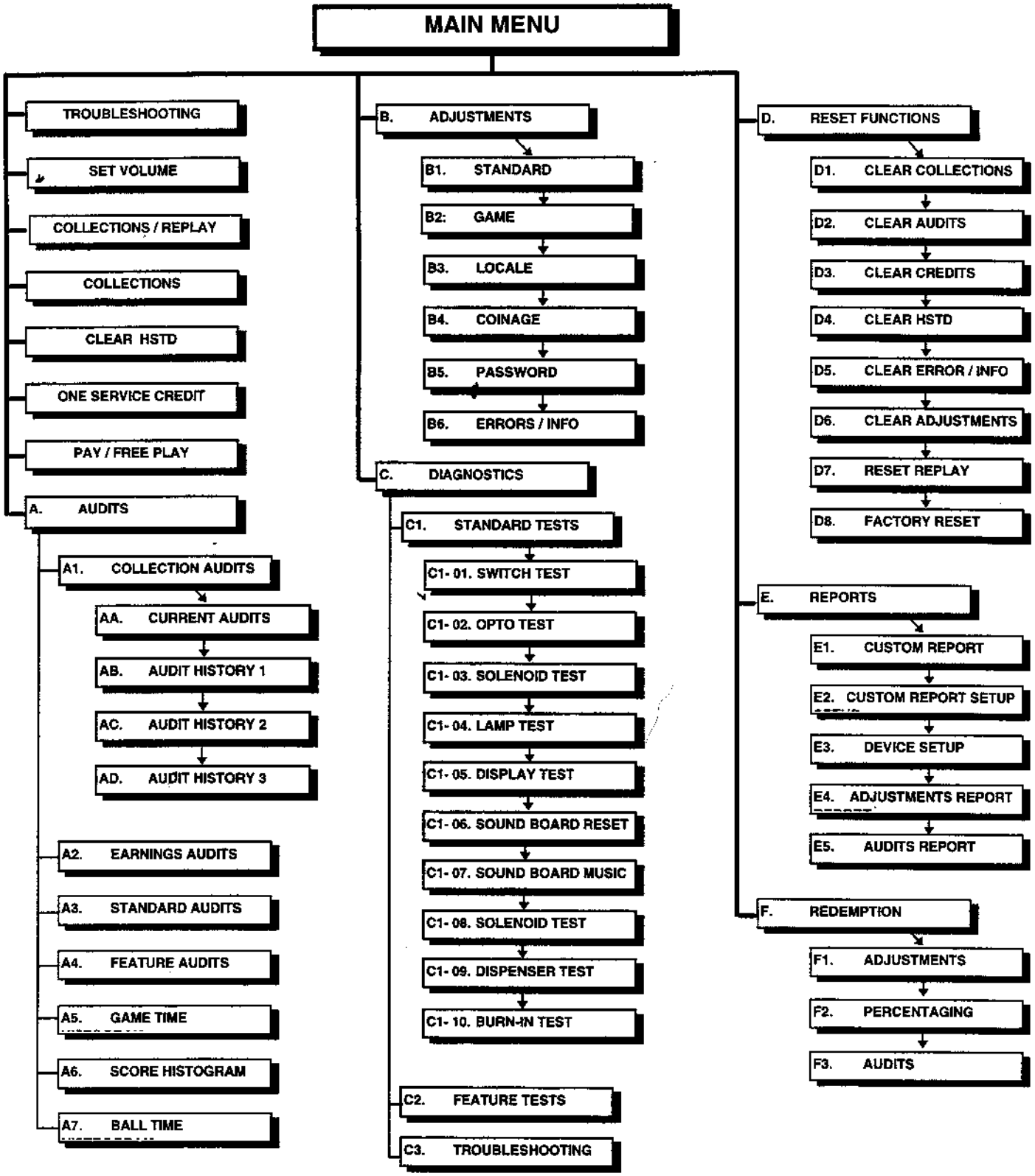
The menu system is controlled by the use of the left & right flipper buttons and the Start button. Pressing these button(s) will result in the following menu actions:

1) Right Flipper button	increment, or move to the next field
2) Left Flipper button	decrement, or move to the previous field
3) Left & Right Flipper buttons together	cancel, back-up, or restore the original setting
4) Start button	accept, enter, or keep new setting

MENU SYSTEM LAYOUT

The menu system has the following main categories and sub-menus:

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.



Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

MAIN MENU FUNCTIONS

TROUBLESHOOTING: Use this menu to start troubleshooting the game's electrical components. NOTE: Troubleshooting can also be accessed through the *DIAGNOSTICS* Menu.

SET VOLUME: Plays a test tune so that the game volume can be adjusted.

COLLECTIONS/REPLAY: Allows the operator to scroll through recent collections audits. The operator may optionally clear the audits and adjust the replay score to meet the target replay percentage (see Adjustment B1:04A, "Replay Percentage").

COLLECTIONS: Same as COLLECTIONS/REPLAY, except the replay score is **not** adjusted when the collections audits are cleared.

ONE SERVICE CREDIT: Issues one service credit to the game.

PAY / FREE PLAY: Set the game mode to Pay-to-Play (disables Adjustment B1:10, *Free Play*) or to continuous Free Play (enables Adjustment B1:10, *Free Play*).

A. AUDITS: Allows the operator to retrieve the games' earnings and performance information.

B. ADJUSTMENTS: Operator adjustables are available for *STANDARD, GAME, LOCALE, COINAGE, PASSWORD,* and *ERRORS/INFO.*

C. DIAGNOSTICS: Use *STANDARD TESTS, FEATURE TESTS, and TROUBLESHOOTING* to perform in-depth, automated testing of electrical and mechancal components.

D. RESET FUNCTIONS: Allows the operator to individually clear certain *AUDITS* and *ADJUSTMENTS* data or elect to re-configure the game to the original factory settings.

E. REPORTS: Allows the operator to output *AUDIT* and *ADJUSTMENTS* data to a serial communications device, such as a printer or laptop computer.

F. REDEMPTION Allows the pinball game to be configured as a Redemption game. Tickets or tokens are dispensed when a preset score is achieved by the player.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

AUDITS DATA TABLE

REF	AUDIT #	DESCRIPTION	TOTALS	PERCENTAGES	AVERAGE PER GAME
		A1 : COLLECTION AUDITS			
1	A1:AA:01	CURRENT : RECENT EARNINGS			
2	A1:AA:02	CURRENT : RECENT 1ST COIN CHUTE		% OF RECENT COINS	
3	A1:AA:03	CURRENT : RECENT 2ND COIN CHUTE		% OF RECENT COINS	
4	A1:AA:04	CURRENT : RECENT 3RD COIN CHUTE		% OF RECENT COINS	
5	A1:AA:05	CURRENT : RECENT 4TH COIN CHUTE		% OF RECENT COINS	
6	A1:AA:06	CURRENT : RECENT CREDITS			
7	A1:AA:07	CURRENT : RECENT COIN CREDITS		% OF RECENT CREDITS	
8	A1:AA:08	CURRENT : RECENT SERVICE CREDITS		% OF RECENT CREDITS	
9	A1:AA:09	CURRENT : RECENT FREE CREDITS		% OF RECENT CREDITS	
10	A1:AA:10	CURRENT : RECENT TOURNT CREDITS		% OF RECENT CREDITS	
11	A1:AB:01	HISTORY 1 : RECENT EARNINGS			
12	A1:AB:02	HISTORY 1 : RECENT 1ST COIN CHUTE		% OF RECENT COINS	
13	A1:AB:03	HISTORY 1 : RECENT 2ND COIN CHUTE		% OF RECENT COINS	
14	A1:AB:04	HISTORY 1 : RECENT 3RD COIN CHUTE		% OF RECENT COINS	
15	A1:AB:05	HISTORY 1 : RECENT 4TH COIN CHUTE		% OF RECENT COINS	
16	A1:AB:06	HISTORY 1 : RECENT EARNINGS			
17	A1:AB:07	HISTORY 1 : RECENT COIN CREDITS		% OF RECENT CREDITS	
18	A1:AB:08	HISTORY 1 : RECENT SERVICE CREDITS		% OF RECENT CREDITS	
19	A1:AB:09	HISTORY 1 : RECENT FREE CREDITS		% OF RECENT CREDITS	
20	A1:AB:10	HISTORY 1 : RECENT TOURNT CREDITS		% OF RECENT CREDITS	
21	A1:AC:01	HISTORY 2 : RECENT EARNINGS			
22	A1:AC:02	HISTORY 2 : RECENT 1ST COIN CHUTE		% OF RECENT COINS	
23	A1:AC:03	HISTORY 2 : RECENT 2ND COIN CHUTE		% OF RECENT COINS	
24	A1:AC:04	HISTORY 2 : RECENT 3RD COIN CHUTE		% OF RECENT COINS	
25	A1:AC:05	HISTORY 2 : RECENT 4TH COIN CHUTE		% OF RECENT COINS	
26	A1:AC:06	HISTORY 2 : RECENT EARNINGS			
27	A1:AC:07	HISTORY 2 : RECENT COIN CREDITS		% OF RECENT CREDITS	
28	A1:AC:08	HISTORY 2 : RECENT SERVICE CREDITS		% OF RECENT CREDITS	
29	A1:AC:09	HISTORY 2 : RECENT FREE CREDITS		% OF RECENT CREDITS	
30	A1:AC:10	HISTORY 2 : RECENT TOURNMT CREDITS		% OF RECENT CREDITS	
31	A1:AD:01	HISTORY 3 : RECENT EARNINGS			
32	A1:AD:02	HISTORY 3 : RECENT 1ST COIN CHUTE		% OF RECENT COINS	
33	A1:AD:03	HISTORY 3 : RECENT 2ND COIN CHUTE		% OF RECENT COINS	
34	A1:AD:04	HISTORY 3 : RECENT 3RD COIN CHUTE		% OF RECENT COINS	
35	A1:AD:05	HISTORY 3 : RECENT 4TH COIN CHUTE		% OF RECENT COINS	
36	A1:AD:06	HISTORY 3 : RECENT EARNINGS			
37	A1:AD:07	HISTORY 3 : RECENT COIN CREDITS		% OF RECENT CREDITS	
38	A1:AD:08	HISTORY 3 : RECENT SERVICE CREDITS		% OF RECENT CREDITS	
39	A1:AD:09	HISTORY 3 : RECENT FREE CREDITS		% OF RECENT CREDITS	
40	A1:AD:10	HISTORY 3 : RECENT TOURNT CREDITS		% OF RECENT CREDITS	
		A2 : EARNINGS AUDITS			
41	A2:01	TOTAL COINS-IN			
42	A2:02	TOTAL 1ST COIN CHUTE		% OF TOTAL COINS	
43	A2:03	TOTAL 2ND COIN CHUTE		% OF TOTAL COINS	
44	A2:04	TOTAL 3RD COIN CHUTE		% OF TOTAL COINS	
45	A2:05	TOTAL 4TH COIN CHUTE		% OF TOTAL COINS	
46	A2:06	TOTAL CREDITS			
47	A2:07	TOTAL COIN CREDITS		% OF TOTAL CREDITS	
48	A2:08	TOTAL SERVICE CREDITS		% OF TOTAL CREDITS	
49	A2:09	TOTAL FREE CREDITS		% OF TOTAL CREDITS	
50	A2:10	TOTAL TOURNAMENT CREDITS		% OF TOTAL CREDITS	
		A3 : STANDARD AUDITS			
51	A3:01	AVERAGE BALL TIME	HRS MIN SEC		
52	A3:02	1 PLAYER GAMES		% OF ALL GAMES	
53	A3:03	2 PLAYER GAMES		% OF ALL GAMES	
54	A3:04	3 PLAYER GAMES		% OF ALL GAMES	
55	A3:05	4 PLAYER GAMES		% OF ALL GAMES	
56	A3:06	TOTAL STARTED CREDITS			
57	A3:07	TOTAL FINISHED CREDITS			
58	A3:08	REPLAY AWARDS		% OF GAMES	
59	A3:09	TOTAL STARTED BALLS			

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

AUDITS DATA TABLE

REF	AUDIT #	DESCRIPTION	TOTALS	PERCENTAGES	AVERAGE PER GAME
		A3 : STANDARD AUDITS (CONTINUED)			
60	A3:10	TOTAL FINISHED BALLS			
61	A3:11	MATCH AWARDS		% OF GAMES	
62	A3:12	EXTRA BALLS			
63	A3:13	LEFT DRAINS		% OF ALL DRAINS	
64	A3:14	RIGHT DRAINS		% OF ALL DRAINS	
65	A3:15	CENTER DRAINS		% OF ALL DRAINS	
66	A3:16	TILTS			
67	A3:17	SLAM TILTS			
68	A3:18	HSTD CREDITS		% OF GAMES	
69	A3:19	BUY-IN 1			
70	A3:20	BUY-IN 2			
71	A3:21	BUY-IN 3 +			
72	A3:22	HSTD RESET COUNT			
73	A3:23	TOTAL TIME ON	DAYS HRS MIN SEC		
74	A3:24	TOTAL GAME TIME	HRS MIN SEC	% OF TOTAL TIME ON	
75	A3:25	AVERAGE GAME TIME	HRS MIN SEC		
76	A3:26	TOTAL BURN-IN TIME	HRS MIN SEC		
		A4 : FEATURE AUDITS			
77	A4:01	TARGETTING MODE			
78	A4:02	PLANE REFUELING			
79	A4:03	UPGRADE SPINNER			
80	A4:04	COMPLETED STUNTS			
81	A4:05	NIGHT VISION			
82	A4:06	BLUE ANGELS			
83	A4:07	DOG FIGHT			
84	A4:08	AIR MAYHEM			
85	A4:09	REACHED FRANCE			
86	A4:10	REACHED GERMANY			
87	A4:11	REACHED BRITAIN			
88	A4:12	REACHED ITALY			
89	A4:13	REACHED SPAIN			
90	A4:14	FINISHED WORLD			
91	A4:15	FLYBYS			
92	A4:16	FLYBY HSTD CREDITS			
		A5:GAME TIME HISTOGRAM			
93	A5	GAME TIME HISTOGRAM 0.0 - 0.9 MINS			
94	A5	GAME TIME HISTOGRAM 1.0 - 1.9 MINS			
95	A5	GAME TIME HISTOGRAM 2.0 - 2.9 MINS			
96	A5	GAME TIME HISTOGRAM 3.0 - 3.9 MINS			
97	A5	GAME TIME HISTOGRAM 4.0 - 4.9 MINS			
98	A5	GAME TIME HISTOGRAM 5.0 - 5.9 MINS			
99	A5	GAME TIME HISTOGRAM 6.0 - 6.9 MINS			
100	A5	GAME TIME HISTOGRAM 7.0 - 7.9 MINS			
101	A5	GAME TIME HISTOGRAM 8.0 - 8.9 MINS			
102	A5	GAME TIME HISTOGRAM 9.0 - 9.9 MINS			
103	A5	GAME TIME HISTOGRAM 10 - 11 MINS			
104	A5	GAME TIME HISTOGRAM 11 - 12 MINS			
105	A5	GAME TIME HISTOGRAM 12 - MINS			
		A6: SCORE HISTOGRAM			
106	A6	SCORE HISTOGRAM 0 - 19 MILLION			
107	A6	SCORE HISTOGRAM 20 - 39 MILLION			
108	A6	SCORE HISTOGRAM 40 - 59 MILLION			
109	A6	SCORE HISTOGRAM 60 - 79 MILLION			
110	A6	SCORE HISTOGRAM 80 - 99 MILLION			
111	A6	SCORE HISTOGRAM 100 - 119 MILLION			
112	A6	SCORE HISTOGRAM 120 - 139 MILLION			
113	A6	SCORE HISTOGRAM 140 - 159 MILLION			
114	A6	SCORE HISTOGRAM 160 - 179 MILLION			
115	A6	SCORE HISTOGRAM 180 - 199 MILLION			
116	A6	SCORE HISTOGRAM 200 - 219 MILLION			
117	A6	SCORE HISTOGRAM 220 - 239 MILLION			
118	A6	SCORE HISTOGRAM 240 - 259 MILLION			
119	A6	SCORE HISTOGRAM 260 - 279 MILLION			

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

AUDITS DATA TABLE

REF	AUDIT #	DESCRIPTION	TOTALS	PERCENTAGES	AVERAGE PER GAME
		A6: SCORE HISTOGRAM (CONTINUED)			
120	A6	SCORE HISTOGRAM 280 - 299 MILLION			
121	A6	SCORE HISTOGRAM 300 - 319 MILLION			
122	A6	SCORE HISTOGRAM 320 - 339 MILLION			
123	A6	SCORE HISTOGRAM 340 - 359 MILLION			
124	A6	SCORE HISTOGRAM 360 - 379 MILLION			
125	A6	SCORE HISTOGRAM 380 - 399 MILLION			
126	A6	SCORE HISTOGRAM 400 - 419 MILLION			
127	A6	SCORE HISTOGRAM 420 - 439 MILLION			
128	A6	SCORE HISTOGRAM 440 - 459 MILLION			
129	A6	SCORE HISTOGRAM 460 - 479 MILLION			
130	A6	SCORE HISTOGRAM 480 - 499 MILLION			
131	A6	SCORE HISTOGRAM 500 - MILLION			
		A7:BALL TIME HISTOGRAM			
132	A7	BALL TIME HISTOGRAM 0 - 9 SECS			
133	A7	BALL TIME HISTOGRAM 10 - 19 SECS			
134	A7	BALL TIME HISTOGRAM 20 - 29 SECS			
135	A7	BALL TIME HISTOGRAM 30 - 39 SECS			
136	A7	BALL TIME HISTOGRAM 40 - 49 SECS			
137	A7	BALL TIME HISTOGRAM 50 - 59 SECS			
138	A7	BALL TIME HISTOGRAM 60 - 69 SECS			
139	A7	BALL TIME HISTOGRAM 70 - 79 SECS			
140	A7	BALL TIME HISTOGRAM 80 - 89 SECS			
141	A7	BALL TIME HISTOGRAM 90 - 99 SECS			
142	A7	BALL TIME HISTOGRAM 100 - 109 SECS			
143	A7	BALL TIME HISTOGRAM 110 - 119 SECS			
144	A7	BALL TIME HISTOGRAM 120 - 129 SECS			
145	A7	BALL TIME HISTOGRAM 130 - 139 SECS			
146	A7	BALL TIME HISTOGRAM 140 - 149 SECS			
147	A7	BALL TIME HISTOGRAM 150 - 159 SECS			
148	A7	BALL TIME HISTOGRAM 160 - 169 SECS			
149	A7	BALL TIME HISTOGRAM 170 - 179 SECS			
150	A7	BALL TIME HISTOGRAM 180 - 189 SECS			
151	A7	BALL TIME HISTOGRAM 190 - 199 SECS			
152	A7	BALL TIME HISTOGRAM 200 - 209 SECS			
153	A7	BALL TIME HISTOGRAM 210 - SECS			

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

B. ADJUSTMENTS

B1: STANDARD ADJUSTMENTS

AUDIT REF.	AUDIT NAME	RANGE	FACTORY SETTING	DESCRIPTION
B1-01	BALLS PER GAME	1 - 10 BALLS	3 BALLS	THE NUMBER OF BALLS GIVEN IN A GAME.
B1-02	TILT WARNINGS	0 - 10	2	THE NUMBER OF TIMES THE GAME CAN "TILT" BEFORE ENDING THE CURRENT BALL IN PLAY.
B1-03	ATTRACT MODE SOUNDS	YES, NO	YES	SELECT WHETHER SOUNDS & MUSIC ARE PLAYED DURING ATTRACT MODE.
B1-04+	ALLOW REPLAY	YES, NO	YES	SELECT WHETHER REPLAY CREDITS ARE AWARDED. IF *YES* IS SELECTED, ADDITIONAL REPLAY ADJUSTMENTS CAN BE SET (SEE B1-04A,B,C,D).
B1-04A	REPLAY PERCENT	5 - 50 %	10%	THE "IDEAL" PERCENTAGE OF GAMES THAT RECEIVE A REPLAY. THIS VALUE IS THEN USED TO SUGGEST ACTUAL REPLAY SCORE VALUES ONCE A HISTORY OF GAME SCORES IS ACCUMULATED.
B1-04B	REPLAY START SCORE	0 - 4,000,000,000	100,000,000	THE INITIAL SCORE AT WHICH A REPLAY CREDIT IS AWARDED.
B1-04C	REPLAY MINIMUM	0 - 4,000,000,000	70,000,000	THE MINIMUM SCORE, DURING A REPLAY CREDIT GAME, THAT MUST BE ACCOMPLISHED BEFORE AN ADDITIONAL REPLAY CREDIT IS AWARDED.
B1-04D	REPLAY BUMP	0 - 4,000,000,000	10,000,000	THE AMOUNT BY WHICH THE REPLAY START SCORE IS INCREASED AFTER A REPLAY CREDIT IS AWARDED.
B1-05+	ALLOW HSTD	YES, NO	YES	SELECT WHETHER THE HIGH SCORE TO DATE FEATURE IS ENABLED. IF *YES* IS SELECTED, ADDITIONAL HSTD ADJUSTMENTS CAN BE SET (SEE B1-05A,B,C,D).
B1-05A	HSTD FIRST SCORE	0 - 42,999,000,000	500,000,000	THE HIGHEST SCORE WRITTEN TO THE HSTD TABLE **AFTER** THE TABLE IS CLEARED BY THE RESET FUNCTION (D4). THE GAME WILL AUTOMATICALLY GENERATE SCORES BETWEEN THE *HSTD FIRST SCORE* AND THE *HSTD LAST SCORE* TO FILL-IN MIDDLE ENTRIES IN THE TABLE.
B1-05B	HSTD LAST SCORE	0 - 42,999,000,000	250,000,000	THE LOWEST SCORE WRITTEN TO THE HSTD TABLE **AFTER** THE TABLE IS CLEARED BY THE RESET FUNCTION (D4). THE GAME WILL AUTOMATICALLY GENERATE SCORES BETWEEN THE *HSTD FIRST SCORE* AND THE *HSTD LAST SCORE* TO FILL-IN MIDDLE ENTRIES IN THE TABLE.
B1-05C	CREDITS FOR GRAND CHAMP	0 - 99 CREDITS	3 CREDITS	THE NUMBER OF CREDITS AWARDED FOR EXCEEDING THE *GRAND CHAMP*.
B1-05D	CREDITS FOR #1-4 SCORES	0 - 99 CREDITS	1 CREDIT	THE NUMBER OF CREDITS AWARDED FOR EXCEEDING THE #1 -#4 HIGH SCORES.
B1-06	MATCH PERCENT	0 - 95%	8%	THE PERCENTAGE OF GAMES THAT AWARD A MATCH CREDIT AT THE END OF THE GAME.
B1-07	REPLAY AWARD	CREDIT, EXTRA BALL, POINTS	CREDIT	THE TYPE OF AWARD ISSUED WHEN A *REPLAY* IS EARNED BY THE PLAYER.
B1-08	EXTRA BALL AWARD	EXTRA BALL, POINTS	EXTRA BALL	THE TYPE OF AWARD ISSUED WHEN AN *EXTRA BALL* IS EARNED BY THE PLAYER.
B1-09	SET GAME LOCATION	0 - 99,999	0	A TRACKING NUMBER USED TO INDICATE THE PHYSICAL LOCATION OF A GAME.
B1-10	SET MACHINE ID	0 - 99,999	0	ASSIGN A SECONDARY ID TO A GAME WHERE MULTIPLE GAMES MAY EXIST IN THE SAME LOCATION.
B1-11	FREE PLAY	YES, NO	NO	ENABLES / DISABLES *FREE PLAY* MODE. ALSO CONTROLS THE MAIN MENU SETTINGS FOR *PAY-TO- PLAY* AND *FREE PLAY*.
B1-12	PLAY MODE	NORMAL, TOURNAMENT	NORMAL	SELECT *NORMAL* OR *TOURNAMENT* MODE. *TOURNAMENT* MODE EQUALIZES THE SCORING OF CERTAIN FEATURES AMONGST PLAYERS IN MULTI-PLAYER GAMES.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

AUDIT REF.	AUDIT NAME	RANGE	FACTORY SETTING	DESCRIPTION
B1-13	SOL.(ENOID) VOLTAGE PERCENT	0 - 90%	10%	SELECT THE PERCENTAGE OF SOLENOID VOLTAGE REGULATION (FOR DISPLAY PURPOSES ONLY). **DOES NOT** ACTIVELY REGULATE THE GAMES' SOLENOIDS.
B1-14	SHOW MESSAGE OF THE DAY	YES, NO, VIEW/EDIT	NO	SELECT A MESSAGE FOR DISPLAY DURING ATTRACT MODE. THIS MESSAGE MAY BE CUSTOMIZED BY CHOOSING *VIEW/EDIT*.
B1-15	FLIPPER STRENGTH	1 - 16	12	SELECT RELATIVE STRENGTH OF FLIPPER COILS. A SETTING OF *12* REPRESENTS 3/4 STRENGTH (12/16). MAY BE USED TO ADJUST THE AMOUNT OF BALL TRAVEL WHEN PLAYFIELD PITCH IS CHANGED.
B1-16+	DISPENSER TYPE	NONE TICKET TOKEN	NONE	SELECT THE TYPE OF DISPENSER CONNECTED TO THE GAME. AFTER A DISPENSER IS SELECTED, AUDIT A3:27, *TOTAL DISPENSES*, IS INCREMENTED AND THE DEVICE MOTOR DRIVE IS PULSED **NOTE:** TICKET DISPENSERS CURRENTLY SUPPORTED: 1) DELTRONICS, MODEL 1275; 2) COIN CONTROLS, MODEL CTD10. TOKEN DISPENSERS CURRENTLY SUPPORTED: UNIVERSAL-TYPE DISPENSER WITH THE FOLLOWING SOLENOID TIMING SPECS: i) PULL-IN TIME: 32ms (100% DUTY CYCLE); ii) HOLD-IN TIME: 333ms (50% DUTY CYCLE); iii) OFF-TIME : 667ms.
B1-16A	DISPENSES/ CREDIT	0, 1 - 99	0	SELECT THE NUMBER OF ITEMS TO BE DISPENSED FOR EACH *FREE CREDIT* AWARDED. IF YOUR GAME IS **NOT** EQUIPPED WITH A TICKET DISPENSER, SELECT "0", OTHERWISE, SELECT THE NUMBER OF TICKETS/TOKENS TO BE DISPENSED PER FREE CREDIT AWARDED (EXAMPLE: IF THIS OPTION IS SET TO "6" AND "3" FREE CREDITS ARE EARNED, "18" TOTAL TICKETS WILL BE DISPENSED)
B1-16B	END OF GAME SCORE	0 - 4,000,000,000	0	SELECT THE SCORE THAT THE PLAYER MUST REACH AT THE END OF HIS/HER GAME TO RECEIVE AN ADDITIONAL DISPENSED ITEM (1). **NOTE:** IF "0" IS SELECTED, NO ITEMS ARE DISPENSED.
B1-17	REPLAY INDICATOR	ON, OFF	OFF	INDICATOR (STARS) APPEARS ON THE DISPLAY DURING ATTRACT MODE (REPLAY AT...) TO SHOW A NEW REPLAY VALUE HAS BEEN CALCULATED (SEE B1-04A).
B1-18	SHOW CREDIT FRACTIONS	YES, NO	YES	AVAILABLE FOR COUNTRIES (SUCH AS THE NETHERLANDS) WHERE COINAGE MAY RESULT IN FRACTIONAL CREDITS.
B1-19	ALLOW BUY-IN	YES, NO	YES	SELECT WHETHER BUY-IN FEATURE IS ALLOWED.

B2: GAME ADJUSTMENTS

AUDIT REF.	AUDIT NAME	RANGE	FACTORY SETTING	DESCRIPTION
B2-01	GAME DIFFICULTY	EXTRA EASY, EASY, NORMAL, HARD, EXTRA HARD	NORMAL	SETS THE OVERALL DIFFICULTY OF THE GAME. THIS OPTION WILL AUTOMATICALLY CONFIGURE THE SETTINGS FOR B2-02,03,04.
B2-02	BALL SAVER TIME	0-15 SECONDS	7 SECONDS	SETS A GRACE PERIOD FOR "QUICK DRAIN" BALLS. ANY BALL "LOST" BEFORE THE TIMER EXPIRES WILL BE RETURNED TO THE PLAYER.
B2-03	CREDITS FOR FLYBY TABLE	0-99	1	SETS THE NUMBER OF CREDITS AWARDED FOR EXCEEDING THE FLYBY HSTD.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

B3: LOCALE ADJUSTMENTS

AUDIT REF.	AUDIT NAME	RANGE	FACTORY SETTING	DESCRIPTION
B3-01	COUNTRY	UNITED STATES, FRANCE, GERMANY, SPAIN, MEXICO, CANADA (ENGLISH), CANADA (FRENCH), SWITZERLAND (GERMAN), SWITZERLAND (FRENCH), SWITZERLAND (ITALIAN); ITALY, UNITED KINGDOM, NETHERLANDS	UNITED STATES	SETS THE COUNTRY LOCATION OF THE GAME. THIS SETTING CONTROLS NUMBERS, TIMES, DATES, AND MONETARY VALUES SHOWN ON THE DOT MATRIX DISPLAY. THIS OPTION WILL ALSO CHANGE THE SETTINGS FOR B3-02 AND B3-03.
B3-02	TEXT LANGUAGE	ENGLISH, FRENCH, GERMAN, SPANISH, **ITALIAN**, DUTCH	ENGLISH	SETS THE LANGUAGE USED FOR TEXT SHOWN ON THE DOT MATRIX DISPLAY.
B3-03	SPEECH LANGUAGE	ENGLISH, FRENCH, GERMAN, SPANISH, **ITALIAN**, DUTCH	ENGLISH	SETS THE LANGUAGE USED FOR SOUND EFFECTS.
		NOTE: LANGUAGES AND SPEECH IN **BOLD** ARE NOT CURRENTLY IMPLEMENTED.		

B4: COINAGE ADJUSTMENTS

AUDIT REF.	AUDIT NAME	RANGE	FACTORY SETTING	DESCRIPTION
B4-01	CONFIGURE COINAGE TO	1/2 3/4 GAMES/COINS 1/2 2/3 3/4 1/2 2/4 3/6 5/8 USA, 50c, 5/$2.00 USA, 50c, 2/75c 3/$1.00 FR ANCE 3/1 5/2 10/5 20/11 FR 5/1 10/3 20/17 FRANCE, 1/5 3/10 7/20 FR, 1/3 2/5 4/10 9/20 FRANCE, 1/6 2/10 5/20 GERMAN 1/2 2/3 3/4 5/5 GERMAN 1/4 2/6 3/8 5/10 SPAIN, 1/100 6/500 U. K., 1/50p 3/L1 U. K., 1/50p U. K., 3/L1 SWISS, 1/1 2/2 6/5 CUSTOM PRICING 1 GAME / 1 COIN 1 GAME / 2 COINS 1 GAME / 3 COINS 2 GAMES / 1 COIN 1/1 3/2 GAMES/COINS	1/2 3/4 GAMES/COINS	SETS THE RATIO OF NUMBER OF COINS TO THE NUMBER OF CREDITS. SELECT THE ***CUSTOM PRICING*** FEATURE AND CHOOSE UP TO FOUR SEPARATE COIN/CREDIT CONFIGURATIONS.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

B4: COINAGE ADJUSTMENTS (CONTINUED

AUDIT REF.	AUDIT NAME	RANGE	FACTORY SETTING	DESCRIPTION
B4-02+	COIN DOOR TYPE	ALL CHUTE UNITS 1 COIN USA 25-25 USA 25 W/MULTIPULSE DBV FRANCE ELEC1-5-10-20 FRANCE MECH 5-10 GERMANY ELEC 1-2-5 GERMANY MECH 1-2-5 UK ELEC L1-50-20-10 ITALY MECH 500-500 N.Z. MECH 1-2 SPAIN MECH 100-500 JAPAN MECH 100-100 JAPAN MECH 100 PORT MECH 100-200 GREECE MECH 50-100 HUNGARY MECH 20-20 AUSTRIA MECH 5-10-10 AUSTRIA MECH 5-10 KOREA MECH 100-100 HONG KONG MECH 1-2 SWISS MECH 1-2-5 SWISS MECH 1-5 SWISS MECH 1-1-1 HOLLAND MECH 1-1 HOLLAND MECH 1-2.5-5 CANADA MECH .25-1 CANADA MECH .25-.25-1 NORWAY MECH 5-10 NORWAY MECH 10-5-20 NORWAY ELEC 5-10-20 DENMARK ELEC 1-5-10-20 AUSTRALIA MECH .20-1 AUSTRALIA MECH 1-2 AUSTRALIA ELEC .20-1-2 FINLAND ELEC 1-5 FINLAND ELEC 5-1 BELGIUM MECH 20-20 BELGIUM ELEC 5-20-50 SWEDEN ELEC 1-5-10 SINGAPORE MECH 1-1 ITALY ELEC 500 CUSTOM	ALL CHUTE UNITS 1 COIN	SETS THE COIN DOOR TYPE AND THE COIN UNITS FOR EACH CHUTE. SELECT ***CUSTOM*** FOR INDIVIDUAL DOOR TYPE CONFIGURATIONS AND CHUTE UNITS (SEE B4-02A THRU B4-02I).
B4-02A	1ST COIN CHUTE UNITS	0 - 65,535	0	THE NUMBER OF COIN UNITS USED FOR THE 1ST CHUTE.
B4-02B	2ND COIN CHUTE UNITS	0 - 65,535	0	THE NUMBER OF COIN UNITS USED FOR THE 2ND CHUTE.
B4-02C	3RD COIN CHUTE UNITS	0 - 65,535	0	THE NUMBER OF COIN UNITS USED FOR THE 3RD CHUTE.
B4-02D	4TH COIN CHUTE UNITS	0 - 65,535	0	THE NUMBER OF COIN UNITS USED FOR THE 4TH CHUTE.
B4-02E	CHUTE 1 TYPE	MECHANICAL, ELECTRICAL	MECHANICAL	SELECT THE CHUTE TYPE.
B4-02F	CHUTE 2 TYPE	MECHANICAL, ELECTRICAL	MECHANICAL	SELECT THE CHUTE TYPE
B4-02G	CHUTE 3 TYPE	MECHANICAL, ELECTRICAL	MECHANICAL	SELECT THE CHUTE TYPE
B4-02H	CHUTE 4 TYPE	MECHANICAL, ELECTRICAL	MECHANICAL	SELECT THE CHUTE TYPE
B4-02I	COIN METER UNITS	0 - 65,535	1	SELECT THE NUMBER OF COIN CHUTE UNITS THAT ARE **EQUIVALENT TO** ONE PULSE OF THE *SOFTWARE-CONTROLLED COIN METER #5 (NOT CURRENTLY IMPLEMENTED IN HARDWARE).
B4-03	COIN VALUE	NOT APPLICABLE	0.25	SETS THE MULTIPLIER (COIN VALUE) FOR DETERMINING COIN CHUTE TOTALS IN *A1: COLLECTION AUDITS*. DEFAULTS TO BASE VALUE AS SET IN *B4-01 : COINAGE ADJUSTMENT*

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

B5 : PASSWORD

AUDIT REF.	AUDIT NAME	RANGE	FACTORY SETTING	DESCRIPTION
B5-01+	PASSWORD	OFF, ON, CHANGE	OFF	SETS THE PASSWORD USED BY THE OPERATOR. SELECT ***CHANGE*** FOR A NEW OR REVISED PASSWORD; SELECT ***ON*** TO SET ADDITIONAL PASSWORD PROTECTION (SEE B5-01A,B). **CAUTION:** IF THE PASSWORD HAS BEEN SET **ON** AND CAN'T BE REMEMBERED BY THE OPERATOR, THE GAME MUST BE FACTORY RESET (SEE D7: FACTORY RESET). THIS ACTION DESTROYS ANY PREVIOUS AUDIT INFORMATION AND OPERATOR ADJUSTMENTS TO THE GAME.
B5-01A	HIDE EARNINGS	YES, NO	NO	ALLOW EARNINGS INFO (AUDITS MENU) TO APPEAR/NOT APPEAR ON THE DOT MATRIX DISPLAY.
B5-01B	PROTECT ADJUSTMENTS	YES, NO	NO	SELECT ***YES*** TO PROTECT OPERATOR-SET ADJUSTMENTS FROM RESET (D8:FACTORY RESET).
B5-01C	PROTECT AUDITS	YES,NO	NO	SELECT ***YES*** TO PROTECT OPERATOR-SET AUDITS FROM RESET (SEE D8:FACTORY RESET).

B6 : ERRORS/INFO

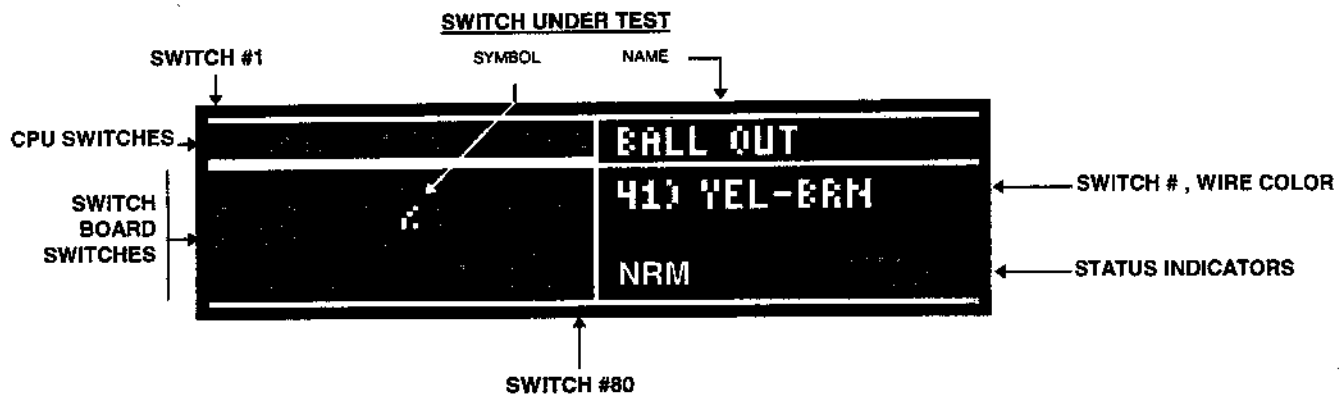
AUDIT REF.	AUDIT NAME	RANGE	FACTORY SETTING	DESCRIPTION
B6-01	SWITCH ERRORS	REPORT ALL, DISABLE MOMENTARIES, DISABLE ALL	REPORT ALL	SETS THE OPTION TO DISPLAY OR HIDE ERROR MESSAGES ON-THE SCREEN DISPLAY.
B6-02	SWITCH INFO MSG	REPORT ALL, DISABLE MOMENTARIES, DISABLE ALL	REPORT ALL	SETS THE OPTION TO DISPLAY OR HIDE *INFO* MESSAGES ON-THE SCREEN DISPLAY.
B6-03	SOLENOID ERRORS	REPORT ALL, DISABLE MOMENTARIES, DISABLE ALL	REPORT ALL	SETS THE OPTION TO DISPLAY OR HIDE *ERROR* MESSAGES ON-THE SCREEN DISPLAY.
B6-04	SOLENOID INFO MSG	REPORT ALL, DISABLE MOMENTARIES, DISABLE ALL	REPORT ALL	SETS THE OPTION TO DISPLAY OR HIDE *INFO* MESSAGES ON-THE SCREEN DISPLAY.
B6-05	LAMP ERRORS	REPORT ALL, DISABLE MOMENTARIES, DISABLE ALL	REPORT ALL	SETS THE OPTION TO DISPLAY OR HIDE *ERROR* MESSAGES ON-THE SCREEN DISPLAY.
B6-06	LAMP INFO MSG	REPORT ALL, DISABLE MOMENTARIES, DISABLE ALL	REPORT ALL	SETS THE OPTION TO DISPLAY OR HIDE *INFO* MESSAGES ON THE SCREEN DISPLAY.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

C. DIAGNOSTICS

C1: STANDARD TESTS

C1- 01 : SWITCH TEST

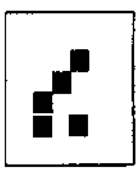


The Switch Test displays a graphical representation of the switch matrix, indicating which switches are seen as open and which are seen as closed. Also shown is information about the switch under test (name, number, wire color, and status indicators). The status indicators, when highlighted, show:

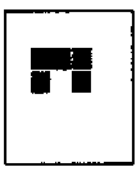
NRM - Normal operation; no problems are detected;

DEAD Indicates when a switch has not been activated in past games.

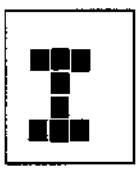
The Switch icons are:



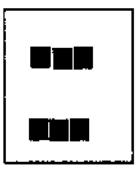
OPEN SWITCH



CLOSED SWITCH



OPTO WITH VERTICAL BEAM OFLIGHT



OPTO WITHOUT BEAM OF LIGHT (BLOCKED OPTO)

NOTE: If a status indicator is blinking, it is indicative of a problem area.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

C1- 02 : OPTO TEST

The Opto Test is used to verify opto operation by blinking the controlled lamps and flashers. The dot matrix display screen is similar to the Switch Test (C1-01) above, however, when selected, the following screen appears:

Open the backbox and remove connector J15 from the Power Board. Then, when verifying each opto, check that the opto icon does NOT have a vertical line (representing a "triggered" receiver condition). In this case, make sure that all balls are secure in a ball holding device (since infrared light can be reflected off the game ball) and re-test. If the opto continues to fail this test, repair/replace as required.

NOTE: Reconnect J15 at the Power Board after completing this test.

C1- 03 : SOLENOID TEST

The Solenoid Test will test solenoids, motors, and flashers on the game. The screen displays information on the name of the device, a representative icon for the device, wire colors, driver board connector & pin number, power board wire color, and status indicators (NRM, OFF). For each test, the device will be energized and the icon will pulse.

The status indicators, when highlighted, represent the following conditions:

NRM	Normal operation; no problems are detected;
OFF	A short circuit is detected. The device may be in a cooling-down period and will automatically enable itself after reaching the proper operating temperature;
OFF?	Momentary short circuit (e.g. at some point the device had been detected as shorted, although it may be fine now). This is a good way to detect intermittent problems.

Use the flippers to cycle from solenoid to solenoid. Press both flippers to exit the Solenoid Test.

NOTE: If an indicator is blinking, there is a software-detected problem with this device.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

C1- 04 : LAMP TEST

The Lamp Test will start all game lamps flashing. The flippers can then be used to get detailed information about any individual lamp. This information includes the lamp name and number, row and column information from the lamp matrix, its' wire colors, and an icon indicating whether the lamp is active.

The lamp's indicators report:

NRM = If BRIGHT, no electrical problems have been detected.

CONN = If this indicator is BRIGHT, an electrical connection is detected. If this indictor is dim, there is a break in the wiring to the lamp.

CONN? = At some point the device had been detected as not connected, although it may be fine now. This is a good way to find intermittent problems.

ROW.OFF = A row driver is disabled from a ROW or BULB short circuit -- The device was shorted and is now inactive (may be in a 15 second cool-down period).

ROW.OFF? =Indicates a momentary row short. At some point the device had been detected as shorted, although it may be fine now. This is a good way to find intermittent problems.

COLUMN = A column driver can be overheated and thermally shutdown, most likley from a column short-to-ground or an entire column without lamps (i.e. loose or disconnected column wire at the driver board or burned-out lamps).

COLUMN? = Indicates a momentary column problem. At some point the device had a column problem, although it may be fine now. This is a good way to find intermittent problems.

NOTE: If an indicator is blinking, this is the the problem area. Use the flippers to cycle from lamp to lamp. Press both flippers to exit the Lamp Test.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

ADDITIONAL NOTES ON LAMP INDICATORS:

CONN: A bright indicator shows that at least 1 bulb is connected and is lit. For 2 bulbs at a single location, both bulbs must be burned-out (or disconnected) before this indicator is made bright.

SERVICE TIP : Fix column problems *BEFORE* using this indicator to troubleshoot bulb problems.

ROW.OFF: A bright indicator reflects the drive is cooling from an unknown voltage short on the row side of a column/row matrix OR a short across the bulb. The "?"after this indicator helps to isolate either a bulb short or a row short. If all or multiple "?" are on the same row of the same matrix, then this would tend to indicate a row-short-to-power supply. **Row-shorts-to-ground are not detectable** (the only symptom is that all the bulbs in a particular row are extremely bright). If there is only one "?" in a row, then most likely a short exists at the bulb, socket, or terminals.

COLUMN: A bright indicator usuallly reflects a thermally-shutdown column driver caused by a short-to-ground condition, all lamps in the column are burned-out, or a loose/broken column wire. A column shorted to a power source (i.e. any 50 volt supply) usually just burns-out all the bulbs in the column or blows a fuse.

WARNING: TO AVOID RISK OF PERSONAL INJURY, DO NOT TOUCH A COLUMN DRIVER DURING A THERMAL SHUTDOWN.

C1- 05 : DISPLAY TEST

The Display Test can assist the operator in checking the dot matrix display for proper illumination of individual pixel elements. It has six continous test modes that move across the display:

1) A light diagonal bar illuminated against a dark background;
2) A light vertical bar illuminated against a dark background;
3) A light horizontal bar illuminated against a dark background;
4) A dark vertical bar illuminated against a light background;
5) A dark horizontal bar illuminated against a light background;
6) An intensity checker.

In the first five modes, use the flipper buttons to move the bar across the display. If you hold either flipper button "in" continuously, you will notice that the the bar will run off the screen and the display will show the next (or previous) mode. The start button can be used at any time to change the intensity of the bar from normal to medium, dim, and off.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

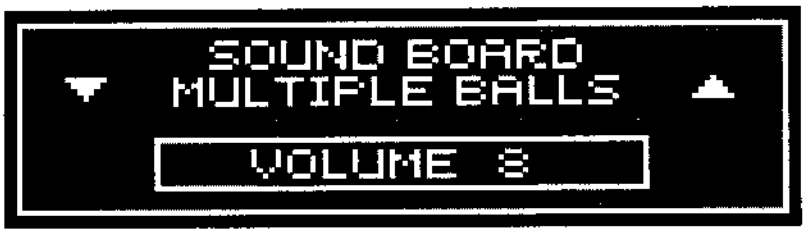
The sixth mode will light every pixel to full intensity. Pressing the flipper button will change the intensity to medium, dim, and off. After the sixth mode, the test cycles back to the first mode.

Press both flippers to exit the Display Test.

C1- 06 : SOUND BOARD RESET

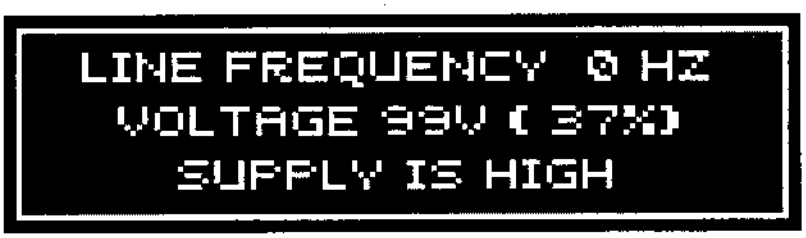
The Sound Board Test resets the sound board and causes it to report its powerup status. Press the start button to restart the test.

C1- 07 : SOUND BOARD MUSIC TEST



The Sound Board Music Test plays several samples of music which fully tests the capabilities of the sound board hardware. The selection of the tune and its' volume level can be changed by the use of the flippers and start button.

C1- 08 : SOL(ENOID) VOLTAGE



This test will measure and display signal strength from the power board (connector J3) to the CPU board (connector J2). The zero cross detection circuit should report the correct non-zero line frequency (top line of display) for this location . The second line of the display reports the flipper's 50 Volt A/D converter voltage to within ±2 volts along with the current percent tolerance.

CAUTION: If any of the following conditions exist, the message **"CHECK 50V INTERLOCK SW."** will be displayed:

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

1) the 50V coin door interlock switch is "off" (the stem is pushed-in instead of "out");
2) the 50V fuse (F6) on the Power Board is blown;
3) the connection from the Power Board to the CPU is disconnected;
4) a power circuit or cabling is not operating properly.

Since the solenoid voltage is unregulated and unloaded at the time of this particular test, this measurement is an excelent indicator of the actual line voltage. The bottom line can display:

"SUPPLY WITHIN 10%" (10% is user-selected in Adjustment B1-12)
"SUPPLY IS HIGH"
"SUPPLY IS LOW"

The normal range of tolerance for the line voltage (not solenoid voltage) is -15% to +10%, for example, 120VAC can measure between 102VAC to 132VAC. The solenoid voltage is dependent upon the line voltage, and the transformer "taps" convert certain line voltages to a nominal non-loaded solenoid voltage of about 76 Volts. If your game is not within the 10% range, you might consider re-tapping the transformer to a high-line or low-line tap (depending if your solenoid voltage is high or low). The extra "cushion" of 5% (for the -15% tolerance) is highly recommended for temporary low-line conditions.

C1- 09 : DISPENSER TEST

NOTE: Before performing this test, make sure that the Menu System, Standard Adjustment B1-15A, *DISPENSES/CREDIT*, is configured for a number greater than "0". The Ticket Audit (A3:27) and Adjustments (B1-15) information is not affected by this test.

FOR A TICKET DISPENSER TEST:

Tickets should be loaded and ready to dispense. This test will check the operation of the ticket dispenser's motor, "notch" switch, and meter.

When the test starts, the motor will try to dispense a ticket and increment the counter. If successful, the message "OK" will appear on the display; if unsuccessful, an "ERROR" is reported to the display. Possible "ERROR" conditions are discussed in the Troubleshooting section of this manual. This test can be repeated at any time by pressing the "START" button.

FOR A TOKEN DISPENSER:

Tokens should be loaded and ready to dispense. This test will activate the solenoid and pulse the token meter. The operator must confirm that the number of tokens dispensed agrees with the number of test(s) performed (one token per test). This test will always display a successful "DISPENSED" (no "ERROR"s will be reported) since typical dispenser solenoids lack provisions for feedback circuitry.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

Possible "ERROR" conditions are discussed in the Troubleshooting section of this manual. This test can be repeated at any time by pressing the "START" button.

C1- 10 : BURN-IN TEST

The Burn-In Test energizes all of the machine hardware in a sequenced pattern. All the solenoids are fired, motors run, and lamps flashed. The dot matrix display and sound system are also activated as well. This test is primarily intended for factory use to assure that all electronic and mechanical features are operating when the game leaves the factory.

To end the Burn-In test, press both flipper buttons at any time. Also, see Audit A3-30 for the total cumulative time that Burn-In Tests have been run on the game.

C2: FEATURE TESTS

CAUTION

THE FOLLOWING TESTS SHOULD ONLY BE PERFORMED BY QUALIFIED SERVICE PERSONNEL.

C2- 01 : CLEAR OUT BALLS

Note: To perform this test, the coin door must be open and the stem of the interlock switch must be pulled-out (disabled).

This test will eject all balls present in the game troughs. It cycles through all 3 ball troughs and highlights (on the display) the current switch being activated.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

CLEARING BALLS	
TROUGH 1	TROUGH OUTHOLE
TROUGH 2	SHOOTER LANE
TROUGH 3	

If this test is started with no balls present in the troughs or re-tested after a previous attempt, the message *"BALL TROUGH IS NOW EMPTY"* will be displayed. Also, if the game is unable to eject a ball from any trough, the message *"BALL TROUGH PROBLEM SUSPECTED"* will be displayed.

C3: TROUBLESHOOTING

The Troubleshooting diagnostic is a shortcut tool to get to the games' troublespots as quickly and conveniently as possible. This diagnostic scans all the switches, solenoids, and lamps for problems and presents a summary of what was found. Use the flipper buttons to automatically step to the appropriate test for each error condition. The tests used (switch, lamp and solenoid) are described in Section C1, Standard Tests.

NOTE: The troubleshooting diagnostic continously gathers and updates information, in real time, about switches, lamps and solenoids. A sound is made when any of this information changes. This allows the operator to make repairs or find loose connections in the game and check his/her results by viewing the display.

There are two catagories of troubleshooting, Errors and Information. Generally, Errors are considered important to game play and should be fixed at the earliest opportunity; Infomation mesages (for example, a lamp behind the backglass is burned-out) are considered less critical and can be serviced as part of a routine maintainence schedule. Errors and Information messages can also be selectively disabled from viewing by Adjustment B6, Errors/Info. Additionally, all Errors and Information messages can be cleared by the reset function D5,Clear Errors/Info.

NOTE: Refer to the previous individual tests (C1-01 to C1-04) for information on indicator status and troubleshooting tips.

ADDITIONAL NOTE: Individual momentaries for a lamp, switch, or solenoid are always "forgotten" when you leave this test.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

D. RESET FUNCTIONS

*D1: CLEAR COLLECTIONS

This function clears all Collection Audits (A1) and moves all Histories down one level in the collections history log (Example: Current audits become History 1 audits, History 1 audits become Histor 2 audits, etc.).

*D2: CLEAR AUDITS

This action clears all other audits, from A2:Earnings Audits to A7:Ball Time Histogram.

D3: CLEAR CREDITS

Reset the Credits counter to zero.

D4: CLEAR HIGH SCORE TO DATE (HSTD)

Used to reset the game's HSTD table based on the settings in Adjustments B1-05A: HSTD High Score and B1-05B: HSTD Last Score.

D5: CLEAR ERRORS/INFO

Clears all troubleshooting errors and info. Always use this after repair or replacement of PCB boards.

*D6: CLEAR ADJUSTMENTS

Returns all B: Adjustments(6) to their factory-set defaults (A:Audits are not affected by this function).

D7: RESET REPLAY

Resets the replay score to meet the target replay percentage (see Adjustment B1-04A:Replay Percent).

D8: FACTORY RESET

Clears ALL audits and adjustments information and returns the game to the original factory default settings. The operator is prompted to select a country for which the locale, language, and coin door adjustments are set (default country is the *United States*, Adjustment B3-01).

***NOTE:** WHEN PASSWORD-PROTECTED, THESE FUNCTIONS **WILL NOT CLEAR** (SEE SECTION B5 , *PASSWORD*)

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

E. REPORTS

THEORY OF OPERATION

The Reports utility permits the operator the ability to "dump" all *Audits* and *Adjustments* data to a serial communications device, such as a printer or a laptop computer. A Report can be generated using one of the the following methods:

1) Automatically, via the "Hot Plug" ("energized" serial port). When the "Hot Plug" method is used, the system software will automatically detect the presence of the printer when the coin door is opened and the printer cable is connected to the serial port of the Interface PCB. The Report will then start printing. The progress of the print job will be shown on the dot matrix display, along with any error messages. When a "Hot Plug" print job is successfully completed, all current audits data will be cleared, replay award levels reset, and the printout counter will be incremented. The operator must close the coin door and re-open it again to generate another "Hot Plug" Report.

2) Manually, through the Menu System using *E1: Custom Report* The operator can also elect to disable the "Hot Plug"method of reporting (see *E3-01B*: *Hotplug Custom Report*), and configure the printer/computer for mode of operation, communications protocol, and customization features of the report. When a "Custom" print job is successfully completed, the printout counter will be incremented and audits data and replay award levels will also be cleared/reset unless the operator elects otherwise (see *E2-01,02: Clear Collections, Reset Replay.*

CAUTION: The "Hot Plug" (serial port) is active when the coin door is opened. For a *Custom Report*, the printer plug must NOT be inserted in the serial port until *E1: Custom Report* is selected and the START button is pushed. Any attempt to generate a *Report* prior to this sequence will always result in a "Hot Plug" *Report.*

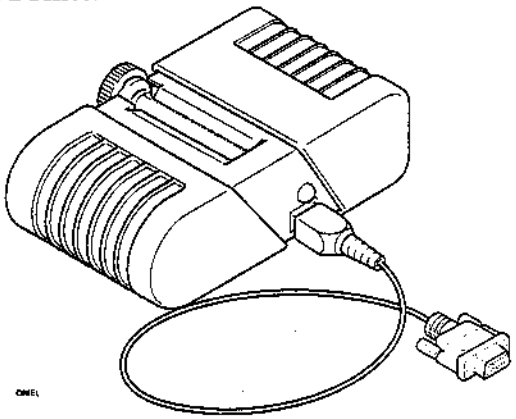
PRINTERS and COMPUTERS CURRENTLY SUPPORTED:

- O'Neil microFlash Receipt Printer;
- NSM Datapoint 3000 Printer/Recorder;
- Citizen Dot-Matrix Printer, Models IDP 560 or 562;
- Any serial printer supporting an ASCII format;
- Any desktop/laptop computer capable of supporting an ASCII format.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

PRINTER/COMPUTER CONFIGURATION AND INSTALLATION

I. O'Neil microFlash Receipt Printer



NOTE: If your game is <u>not</u> equipped with a printer interface PCB, contact your local CAPCOM® distributor for Field Kit K-008-2. Install all necessary hardware and cables using the enclosed instructions.

1) Using the O'Neil Configuration Utility, open to the following sub-menus and configure the printer for the following settings:

a. *Communication Parameters-*
PORT = COM1;
BAUD RATE = 19200;
DATA BITS = 8;
PARITY = NONE;
HANDSHAKING = XON/XOFF.

b. *Printer Options* -
BEEPER = ON;
TIMEOUT = 10 SECONDS;
INFRARED CRC = OFF.

c. *Paper, Fonts, and Graphics Options* -
SET PER USER REQUIREMENTS.

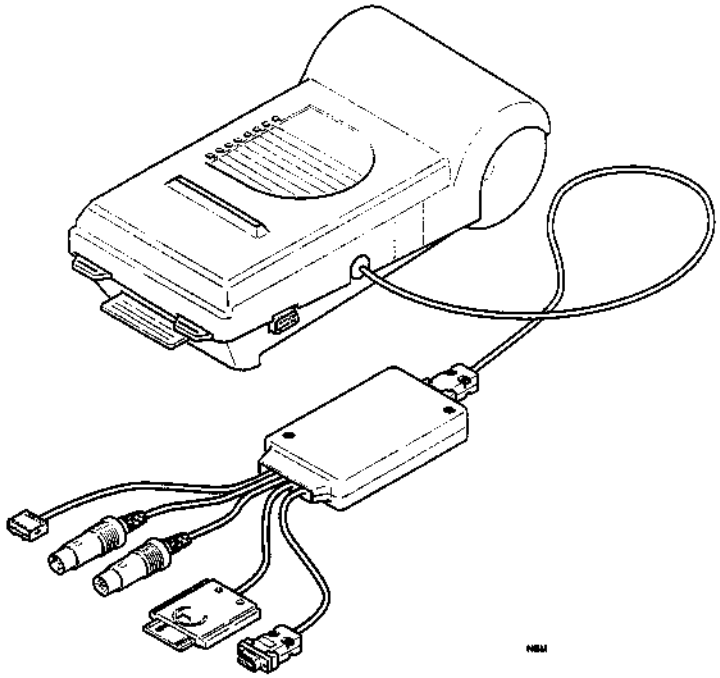
2) Configure the games' *Reports* software as follows:
E3 - 01+: Select O'NEIL MICROFLASH;
E2 -01 thru 17: Select per user requirements for a *Custom Report* (optional).

3) Determine the method of generating the Report. For a "Hot Plug" Report, connect the DB9 female connector (supplied with the printer) to the DB9 male connector now located on the switch bracket inside the coin door. The *Report* will start printing after this connection is made. The *Report* can be repeated, if necessary, by removing the cable, closing and re-opening the coin door, and re-installing the printer cable to the serial port.

4) For a *Custom Report,* scroll through the Menu System to *E1 : Custom Report.* Press the START button and install the printer cable to the serial port . The Custom Report will now begin printing. Remove the printer cable when the print job is finished and close the coin door.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

II. NSM Datapoint 3000 Printer



NOTE: If your game is not equipped with a printer interface PCB, contact your local CAPCOM® distributor for Field Kit K-008-5. Install all necessary hardware and cables using the enclosed instructions.

1) Configure the games' *Reports* software as follows:
E3 - 01+: Select NSM DATAPRINTER, PRINT;
E2 -01 thru 17: Select per user requirements for a *Custom Report* (optional).

2) Check that the NSM Memory Card is fully inserted into its' slot.

3) Determine the method of generating the Report. For a "Hot Plug" Report, connect the DB9 female connector (supplied with the printer) to the DB9 male connector now located on the switch bracket inside the coin door. The Report should start printing automatically. The *Report* will start printing after this connection is made. The *Report* can be repeated, if necessary, by removing the cable, closing and re-opening the coin door, and re-installing the printer cable to the serial port.

4) For a *Custom Report*, scroll through the Menu System to *E1 : Custom Report*. Press the START button and install the printer cable to the serial port . The Custom Report will now begin printing. Remove the printer cable when the print job is finished and close the coin door.

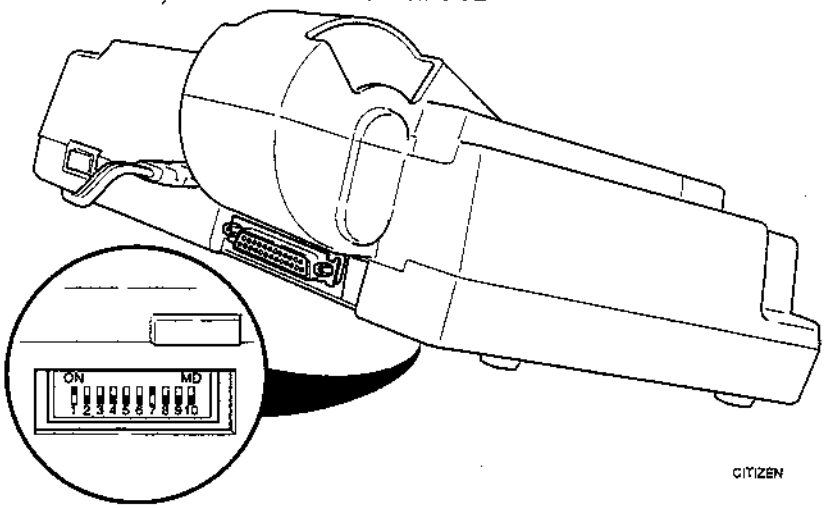
III. NSM Datapoint 3000 Recorder

Same as the NSM Datapoint 3000 Printer above except that the printer is configured through *Reports* software as a memory storage device. The *Reports* data is saved to the NSM memory card and downloaded to a computer through the use of NSM-compatible software, such as DATAcontact 3000©.

You must configure the games' *REPORTS* software, in section E3 - 01+, for **NSM DATAPRINTER, SAVE.** Follow the above NSM Printer steps 2 through 4 to capture a *Report* to the memory card.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

IV. Citizen Dot-Matrix Printer, Models IDP 560 or 562



NOTE: If your game is not equipped with a printer interface PCB, contact your local CAPCOM® distributor for Field Kit K-008-2. Install all necessary hardware and cables using the enclosed instructions.

1) Set the printer's DIP switches as follows:

DIP SWITCH #									
1	2	3	4	5	6	7	8	9	10
ON	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF

2) Configure the games' *Reports* software as follows:

E3 - 01+: Select CITIZEN 560/562;

E2 -01 thru 17: Select per user requirements for a *Custom Report* (optional).

3) Determine the method of generating the Report. For a "Hot Plug" Report, obtain a standard serial printer cable (purchase locally) with DB25 male/ DB9 female connector leads. Connect the DB25 male connector to the printer I/O port and attach the DB9 female connector to the male connector now located on the switch bracket inside the coin door. The Report should start printing automatically. The *Report* will start printing after this connection is made. The *Report* can be repeated, if necessary, by removing the cable, closing and re-opening the coin door, and re-installing the printer cable to the serial port.

4) For a *Custom Report*, scroll through the Menu System to *E1 : Custom Report*. Press the START button and install the printer cable (as described above) to the serial port . The Custom Report will now begin printing. Remove the printer cable when the print job is finished and close the coin door.

V. Generic ASCII

NOTE: If your game is not equipped with a printer interface PCB, contact your local CAPCOM® distributor for Field Kit K-008-2. Install all necessary hardware and cables using the enclosed instructions.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

V. Generic ASCII

NOTE: If your game is not equipped with a printer interface PCB, contact your local CAPCOM® distributor for Field Kit K-008-2. Install all necessary hardware and cables using the enclosed instructions.

1) Set the printer/computer serial port to receive data in the following format:

BAUD RATE = 19200;	STOP BIT(S) = 1;	
DATA BITS = 8;	FLOW CONTROL (HANDSHAKING) =	CTS and/or
PARITY = NONE;		XON/XOFF

2) Configure the games' REPORTS software as follows:

E3 - 01+: Select GENERIC ASCII;

E3 - 02+: Select DELIMITED if data is used for importation into a spreadsheet program, such as Microsoft® Excel.

E2 - 01 thru 17: Select per user requirements for a *Custom Report* (optional).

3a) For a printer, determine the method of generating the Report. For a "Hot Plug" Report, obtain a standard serial printer cable (purchase locally) with DB25 male/ DB9 female connector leads. Connect the DB25 male connector to the printer I/O port and attach the DB9 female connector to the male connector now located on the switch bracket inside the coin door. The Report should start printing automatically. The *Report* will start printing after this connection is made. The *Report* can be repeated, if necessary, by removing the cable, closing and re-opening the coin door, and re-installing the printer cable to the serial port.

For a *Custom Report*, scroll through the Menu System to *E1 : Custom Report*. Press the START button and install the printer cable to the serial port . The Custom Report will now begin printing. Remove the printer cable when print job is finished and close the coin door.

3b) For computers, the pinball game is configured as a data terminal device (DTE) and the receiver is assumed to be a communications device (DCE). This configuration normally requires the use of a null modem cable with DB9 female and DB9/DB25 female terminations. Connect the DB9/DB25 female connector to the computer serial port (COM1 or COM2).

Prepare the computer to receive the ASCII text by opening to a serial port (modem) capture program, such as PROCOMM PLUS® or Microsoft® Windows TERMINAL (look under Program Manager, Accessories Group). Scroll through the Menu System to *E1 : Custom Report*. and press the START button. Now connect the DB9 female connector to the male connector now located on the switch bracket inside the coin door. The Report should begin downloading to the computer terminal. Remove the printer/computer cable when the job is finished and close the coin door.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

E1: Custom Report

The *Custom Report* is an operator-defined report which will be generated according to the settings defined in *E2: Custom Report Setup*. For printing a *Custom Report*, the operator must scroll through the Menu System to *E1 : Custom Report* and press the START button. The printer cable should now be connected to the serial port. The *Custom Report* will begin printing. Remove the printer cable when the print the job is finished and close the coin door.

E2 Custom Report Setup

This menu is used to configure the *Custom Report*. Each device, as described in *Printer/Computer Configuration and Installation,* is pre-configured according to the settings in *E3-01: Install Device.* The user can also customize the Report according to the following table:

REF.	NAME	RANGE	*INSTALLED DEVICE* SETTINGS					DESCRIPTION
			CYNEL	NSM-PRINT	NSM-SAVE	CITIZEN	GENERIC	
E2-01	CLEAR COLLECTIONS	NO, LEAVE COLLECTIONS YES, WHILE PRINTING	YES	YES	YES	YES	YES	SELECT WHETHER *CURRENT AUDITS* SHOULD BE CLEARED AFTER THE PRINT JOB IS COMPLETE.
E2-02	RESET REPLAY	NO, LEAVE REPLAY YES, WHILE PRINTING	YES	YES	YES	YES	YES	SELECT WHETHER *REPLAY AWARDS* SHOULD BE CLEARED AFTER THE PRINT JOB IS COMPLETE.
E2-03+	COLLECTION AUDITS	YES, NO	YES	NO	NO	YES	YES	SELECT WHETHER *COLLECTION AUDITS* SHOULD APPEAR ON THE REPORT. IF **YES**, EACH *COLLECTION AUDIT* IS SELECTED INDIVIDUALLY (E3-03A THROUGH E3-03D) FOR THE REPORT.
E2-03A	CURRENT AUDITS	YES, NO	YES	NO	NO	YES	YES	SHOULD *CURRENT AUDITS* APPEAR ON THE REPORT?
E2-03B	AUDIT HISTORY 1	YES, NO	NO	NO	NO	NO	NO	SHOULD *AUDIT HISTORY 1* APPEAR ON THE REPORT?
E2-03C	AUDIT HISTORY 2	YES, NO	NO	NO	NO	NO	NO	SHOULD *AUDIT HISTORY 2* APPEAR ON THE REPORT?
E2-03D	AUDIT HISTORY 3	YES, NO	NO	NO	NO	NO	NO	SHOULD *AUDIT HISTORY 3* APPEAR ON THE REPORT?
E2-04	EARNINGS AUDITS	YES, NO	YES	NO	NO	YES	YES	SHOULD *EARNINGS AUDITS* APPEAR ON THE REPORT?
E2-05	STANDARD AUDITS	YES, NO	YES	NO	NO	YES	YES	SHOULD *STANDARD AUDITS* APPEAR ON THE REPORT?
E2-06	FEATURE AUDITS	YES, NO	YES	NO	NO	YES	YES	SHOULD *FEATURE AUDITS* APPEAR ON THE REPORT?
E2-07	STANDARD ADJUSTMENTS	YES, NO	NO	NO	NO	NO	NO	SHOULD *STANDARD ADJUSTMENTS* APPEAR ON THE REPORT?
E2-08	GAME ADJUSTMENTS	YES, NO	NO	NO	NO	NO	NO	SHOULD *GAME ADJUSTMENTS* APPEAR ON THE REPORT?
E2-09	LOCALE ADJUSTMENTS	YES, NO	NO	NO	NO	NO	NO	SHOULD *LOCALE ADJUSTMENTS* APPEAR ON THE REPORT?
E2-10	PASSWORD ADJUSTMENTS	YES, NO	NO	NO	NO	NO	NO	SHOULD *PASSWORD ADJUSTMENTS* APPEAR ON THE REPORT?
E2-11	ERROR/INFO ADJUSTMENTS	YES, NO	NO	NO	NO	NO	NO	SHOULD *ERROR/INFO ADJUSTMENTS* APPEAR ON THE REPORT?
E2-12	COINAGE ADJUSTMENTS	YES, NO	NO	NO	NO	NO	NO	SHOULD *COINAGE ADJUSTMENTS* APPEAR ON THE REPORT?
E2-13	REPORT SETTINGS	YES, NO	NO	NO	NO	NO	NO	SHOULD *REPORT SETTINGS* APPEAR ON THE REPORT?
E2-14	DEVICE SETTINGS	YES, NO	NO	NO	NO	NO	NO	SHOULD *DEVICE SETTINGS* APPEAR ON THE REPORT?
E2-15	GAME TIME HISTOGRAMS	YES, NO	NO	NO	NO	NO	NO	SHOULD *GAME TIME HISTOGRAMS* APPEAR ON THE REPORT?
E2-16	SCORE HISTOGRAMS	YES, NO	NO	NO	NO	NO	NO	SHOULD *SCORE HISTOGRAMS* APPEAR ON THE REPORT?
E2-17	BALL TIME HISTOGRAMS	YES, NO	NO	NO	NO	NO	NO	SHOULD *BALL TIME HISTOGRAMS* APPEAR ON THE REPORT?

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

E3: Device Setup

This menu is used to configure the serial communications between the game and the output device. Each device, as described in *Printer/Computer Configuration and Installation,* is pre-configured according to the country setting of the game (see *B3 : Locale Adjustments).* In the chart below, the County Settings are designated as follows:

I - used for the U.S. and all other countries other than France and Germany;
II - used for Germany;
III - not used for any specific country;
IV - used for France;
V - not used for any specific country.

The user can also customize a device according to the following table:

REF.	NAME	RANGE	COUNTRY SETTING I.	II.	III.	IV.	V.	DESCRIPTION
E3-01+	INSTALL DEVICE	CUSTOM GENERIC ASCII O'NEIL MICROFLASH NSM DATAPRINTER, PRINT NSM DATAPRINTER, SAVE CITIZEN 560/562	O'NEIL	NSM-PRINT	NSM-SAVE	CITIZEN	GENERIC	SELECT THE TYPE OF DEVICE CONNECTED TO THE SERIAL PORT. IF *CUSTOM* IS SELECTED, ADDITIONAL PRINTER SETTINGS (E3-01A THROUGH E3-01K) MUST BE SELECTED.
E3-01A	DEVICE TYPE	GENERIC ASCII O'NEIL MICROFLASH NSM DATAPRINTER CITIZEN 560/562	O'NEIL	NSM-	NSM-	CITIZEN	GENERIC	SELECT THE TYPE OF DEVICE CONNECTED TO THE SERIAL PORT.
E3-01B	HOTPLUG CUSTOM REPORT	YES, NO	YES	YES	YES	YES	YES	SELECT WHETHER TO ENABLE (YES) O DISABLE (NO) *CUSTOM REPORTS* FRO THE MAIN MENU.
E3-01C	HOTPLUG QUERY	NONE 3 ASCII NULLS ASCII DC1	3 ASCII NULLS	NONE	NONE	ASCII DC1	NONE	SELECT THE INITIALIZATION STRING FOR YOUR PRINTER AFTER THE CONNECTION IS IS MADE ACTIVE.
E3-01D	HOT PLUG RESPONSE	NONE CTS ACTIVE DSR ACTIVE	CTS	CTS	CTS	CTS	CTS	SELECT WHETHER A HARDWARE HANDSHAKE IS REQUIRED.
E3-01E	SAVE REPORT	YES, NO	NO	NO	YES	NO	NO	SELECT WHETHER TO SAVE THE REPORT TO PRINTER MEMORY (IF SO EQUIPPED).
E3-01F	BAUD RATE	300, 600, 1200, 2400, 4800, 9600,19200	19200	9600	9600	9600	19200	SELECT THE BAUD RATE OF THE SERI PORT. **NOTE:** ONLY 8N1 (8-BIT, NO PARITY, 1 STOP BIT) IS SUPPORTED.
E3-01G	END OF LINE	CR, LF, CR & LF	CR & LF	CR & LF	CR & LF	CR & LF	CR & LF	SELECT THE END OF LINE (EOL) ASCII CHARACTERS TO BE USED: CR- CARRIAGE RETURN LF-LINE FEED
E3-01H	CHARACTERS PER LINE	24 TO 80	42	24	24	40	80	SELECT THE MAXIMUM NUMBER OF CHARACTERS PER LINE OF PRINT.
E3-01I	RS232 CTS HANDSHAKE	YES,NO	NO	NO	YES	YES	YES	SELECT WHETHER A RS232 CTS HANDSHAKE IS REQUIRED BY THE PRINTER DEVICE.
E3-01J	XON/XOFF HANDSHAKE	YES, NO	YES	NO	NO	NO	YES	SELECT WHETHER AN ASCII HANDSHAKE (XON/XOFF) IS REQUIRED BY THE PRINTER DEVICE.
E3-01K	RS232 DSR HANDSHAKE	YES, NO	NO	NO	NO	NO	NO	SELECT WHETHER A RS232 DSR HANDSHAKE IS REQUIRED BY THE PRINTER DEVICE.
E3-01L	EOL/CTS HANDSHAKE	YES, NO	NO	YES	NO	NO	NO	SELECT WHETHER A COMBINATION OF EOL & CTS SIGNALS ARE REQUIRED BY THE PRINTER DEVICE.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

REF.	NAME	RANGE	COUNTRY SETTING I.	II.	III.	IV.	V.	DESCRIPTION
E3-02+	OUTPUT FORMAT	FORMATTED, DELIMITED	FORM.	FORM.	FORM.	FORM.	FORM.	SELECT THE FORMAT FOR DATA OUTPUT. *DELIMITED* (TEXT) OUTPUT WILL GENERALLY BE CAPTURED BY A TERMINAL SOFTWARE PACKAGE AND IMPORTED INTO A SPREADSHEET APPLICATION. IF *DELIMITED* IS CHOSE ADDITIONAL CRITERIA (E3-02A,B) MUST BE SELECTED. *FORMATTED* DATA IS IN A PRINTER-READY, READABLE USER FORMAT, SUCH AS SEEN ON A RECEIP
E3-02A	DELIMITOR	TAB SPACE COMMA SEMI-COLON	TAB	TAB	TAB	TAB	TAB	SELECT THE DELIMITOR TO BE INSERTED BETWEEN THE 3 FIELDS (TITLE, VALUE, PERCENTAGE) OF THE REPORT.
E3-02B	TEXT QUALIFIER	DOUBLE QUOTE SINGLE QUOTE	DOUBL	DOUBL	DOUBL	DOUBL	DOUBL	SPECIFY THE BEGINNING AND ENDING CHARACTER OF A FIELD.

E4: Adjustments Report

Generates a complete listing of ALL of the games' adjustments information. Any sensitive adjustments which are password-protected will not be shown on the report (only the title of the adjustment will appear with the message "PASSWORD PROTECTED"). This report can only be generated through the Menu System (see *E2-01: Custom Report*).

5: Audits Report

Generates a complete listing of ALL of the games' audit information. Any sensitive audits which are password protected will not be shown on the report (only the title of the audit will appear with the message "PASSWORD PROTECTED"). This report can only be generated through the Menu System (see *E2-01: Custom Report*).

STATUS MESSAGES

NOTE: All of the following Status Messages are shown on the dot matrix display and do not appear on the printed report:

1) **PLEASE DISCONNECT PRINTER** - This message appears after an automatic report has been completed using the "Hot Plug" method.

2) **SEARCHING FOR PRINTER... -** This message appears at the beginning of each print job.

3) **ONE MOMENT, PRINTING <type> -** This message appears during a print job where <type> is the title or the section currently being printed.

4) **ONE MOMENT, PRINTING ALL ADJUSTMENTS, <type> -** This message appears during the Adjustments Report where <type> is the title of the section currently being printed.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

5) **ONE MOMENT, PRINTING ALL AUDITS, <type>** - This message appears during the Audits Report where <type> is the title of the section currently being printed.

6) **ONE MOMENT, PRINTING CUSTOM REPORT, <type>** - This message appears during the Custom Report where <type> is the title of the section currently being printed.

7) **PRINT JOB COMPLETE** - This message appears after the completion of the current print job.

8) **PRINT JOB CANCELLED** - This message appears when the operator cancels a print job in progress by pressing both flippers simultaneously.

9) **RESET COLLECTION AUDITS COMPLETE** - This message appears after the *COLLECTIONS* Audits have been cleared.

10) **RESET REPLAY PERCENTAGE COMPLETE** - This message appears after the replay setting has been changed to the recommended settings.

ERROR MESSAGES

NOTE: All of the following Error Messages are shown on the dot matrix display and do not appear on the printed report:

1) **ERROR: PRINTER NOT RESPONDING, CHECK CONNECTION AND TRY AGAIN** - This message appears after a print job is activated and the system is not able to detect the presence of a printer device. Check the printer cable for a loose connection and verify that it is the correct type of serial cable.

2) **ERROR: PRINT JOB INTERRUPTED, CHECK PRINTER AND TRY AGAIN** - This message will appear during a print job if the printer cable becomes disconnected, the printer goes off-line or runs out of paper, or an undetermined error occurs.

3) **PLEASE DISCONNECT PRINTER** - This message will appear after one of the above error messages was previously displayed and the re-connection attempt was unsuccessful. You must unplug the printer cable to remove the message from the display and return to the System Menu.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

F. REDEMPTION

DESCRIPTION

The Redemption Menu is used in configuring the game for a redemption mode of operation when the game is equipped with an optional ticket or token dispenser . The redemption mode has five levels of scoring, payout, mechanism selection (ticken and/or token dispenser), and percentaging. The number and type of prizes (tickets, tokens, free credits, extra balls) that are awarded are operator adjustable and can be set for increasing levels of scoring difficulty. Prizes are awarded incrementally during the game after each scoring level is reached by the player. The player must also score within a preset time limit. After the timer expires, the current game will continue but the dispenser is disabled and prizes are no longer awarded.

F1 : ADJUSTMENTS

AUDIT REF.	AUDIT NAME	RANGE	FACTORY SETTING	DESCRIPTION
F1-01+	REDEMPTION MODE	ON, OFF	OFF	SELECT WHETHER GAME OPERATES IN REDEMPTION MODE (ON).
F1-01A	SCORE 1	0 - 4,000,000	50,000,000	SET THE FIRST LEVEL OF SCORING THAT WILL DISPENSE A PRIZE(S).
F1-01B	PAYOUT 1	0 - 100	1	SET THE AMOUNT OF PRIZE(S) TO BE AWARDED WHEN REACHING A LEVEL 1 SCORE.
F1-01C	MECHANISM 1	TOKEN, TICKET, CREDIT, XBALL	TOKEN	SELECT THE TYPE OF AWARD TO BE ISSUED WHEN REACHING A LEVEL 1 SCORE.
F1-01D	PERCENTAGE 1	1 - 99	40	SET THE "IDEAL" PERCENTAGE OF GAMES THAT SHOULD REACH A LEVEL 1 SCORE. WHEN A HISTORY OF GAME SCORES HAS BEEN ACCUMULATED, THIS PERCENTAGE WILL THEN BE USED IN DETERMINING A "SUGGESTED" LEVEL 1 SCORE (SEE F2, *PERCENTAGING*).
F1-01E	SCORE 2	0 - 4,000,000	100,000,000	SET THE SECOND LEVEL OF SCORING THAT WILL DISPENSE A PRIZE(S).
F1-01F	PAYOUT 2	0 - 100	3	SET THE AMOUNT OF PRIZE(S) TO BE AWARDED WHEN REACHING A LEVEL 3 SCORE.
F1-01G	MECHANISM 2	TOKEN, TICKET, CREDIT, XBALL	TOKEN	SELECT THE TYPE OF AWARD TO BE ISSUED WHEN REACHING A LEVEL 2 SCORE.
F1-01H	PERCENTAGE 2	1 - 99	20	SET THE "IDEAL" PERCENTAGE OF GAMES THAT SHOULD REACH A LEVEL 2 SCORE WHEN A HISTORY OF GAME SCORES HAS BEEN ACCUMULATED, THIS PERCENTAGE WILL THEN BE USED IN DETERMINING A "SUGGESTED" LEVEL 2 SCORE (SEE F2, *PERCENTAGING*).
F1-01I	SCORE 3	0 - 4,000,000	200,000,000	SET THE THIRD LEVEL OF SCORING THAT WILL DISPENSE A PRIZE(S).
F1-01J	PAYOUT 3	0 - 100	6	SET THE AMOUNT OF PRIZE(S) TO BE AWARDED WHEN REACHING A LEVEL 3 SCORE.
F1-01K	MECHANISM 3	TOKEN, TICKET, CREDIT, XBALL	TOKEN	SELECT THE TYPE OF AWARD TO BE ISSUED WHEN REACHING A LEVEL 3 SCORE.
F1-01L	PERCENTAGE 3	1 - 99	10	SET THE "IDEAL" PERCENTAGE OF GAMES THAT SHOULD REACH A LEVEL 3 SCORE. WHEN A HISTORY OF GAME SCORES HAS BEEN ACCUMULATED, THIS PERCENTAGE WILL THEN BE USED IN DETERMINING A "SUGGESTED" LEVEL 3 SCORE (SEE F2, *PERCENTAGING*).

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

F1 : ADJUSTMENTS (CONTINUED)

F1-01M	SCORE 4	0 - 4,000,000	300,000,000	SET THE FOURTH LEVEL OF SCORING THAT WILL DISPENSE A PRIZE(S).
F1-01N	PAYOUT 4	0 - 100	10	SET THE AMOUNT OF PRIZE(S) TO BE AWARDED WHEN REACHING A LEVEL 4 SCORE.
F1-01O	MECHANISM 4	TOKEN, TICKET, CREDIT, XBALL	TOKEN	SELECT THE TYPE OF AWARD TO BE ISSUED WHEN REACHING A LEVEL 4 SCORE.
F1-01P	PERCENTAGE 4	1 - 99	5	SET THE "IDEAL" PERCENTAGE OF GAMES THAT SHOULD REACH A LEVEL 4 SCORE. WHEN A HISTORY OF GAME SCORES HAS BEEN ACCUMULATED, THIS PERCENTAGE WILL THEN BE USED IN DETERMINING A "SUGGESTED" LEVEL 4 SCORE (SEE F2, *PERCENTAGING*).
F1-01Q	SCORE 5	0 - 4,000,000	400,000,000	SET THE FIFTH LEVEL OF SCORING THAT WILL DISPENSE A PRIZE(S).
F1-01R	PAYOUT 5	0 - 100	1	SET THE AMOUNT OF PRIZE(S) TO BE AWARDED WHEN REACHING A LEVEL 5 SCORE.
F1-01S	MECHANISM 5	TOKEN, TICKET, CREDIT, XBALL	TICKET	SELECT THE TYPE OF AWARD TO BE ISSUED WHEN REACHING A LEVEL 5 SCORE.
F1-01T	PERCENTAGE 5	1 - 99	1	SET THE "IDEAL" PERCENTAGE OF GAMES TO REACH LEVEL 5 SCORING. WHEN A HISTORY OF GAME SCORES HAS BEEN ACCUMULATED, THIS PERCENTAGE WILL THEN BE USED IN DETERMINING A "SUGGESTED" LEVEL 5 SCORE (SEE F2, *PERCENTAGING*).
F1-01U	TIMER	10 - 300 SECONDS	200 SECONDS	SET THE AMOUNT OF TIME ALLOWED FOR REACHING SCORING LEVELS 1 -5.

F2 : PERCENTAGING

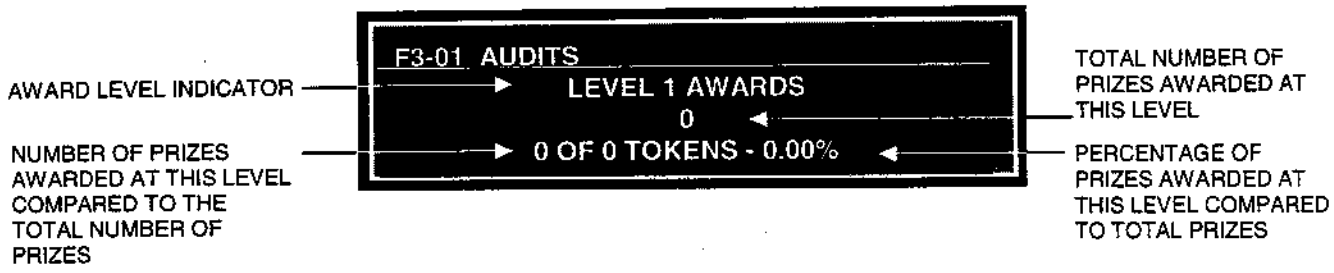
The Percentaging menu suggests to the operator a recommended scoring level that will better approximate the "target replay" percentage as set forth in F1, *Adjustments*. When selected, the following screen appears:

To accept the recommended new score level, press the START button. To cycle through the remaining score levels, press either FLIPPER button. To cancel, back-up, or restore the original setting, press both FLIPPER buttons simultaneously.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

F3 : AUDITS

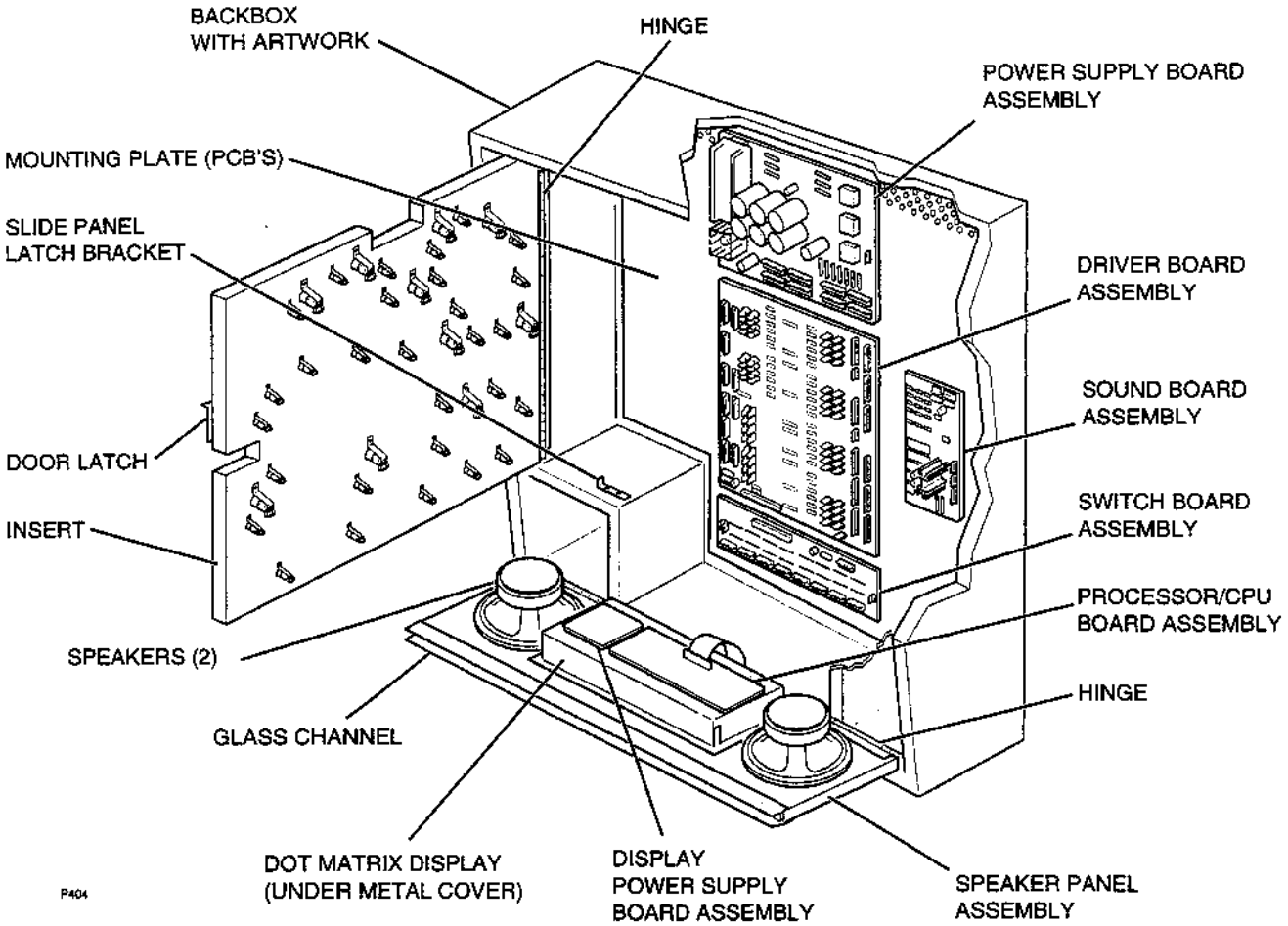
The Audits menu will display awards information accumulated from previous games. A sample Audits screen is shown:



To cycle through the remaining award levels, press either FLIPPER button. To cancel or back-up to a previous menu, press both FLIPPER buttons simultaneously.

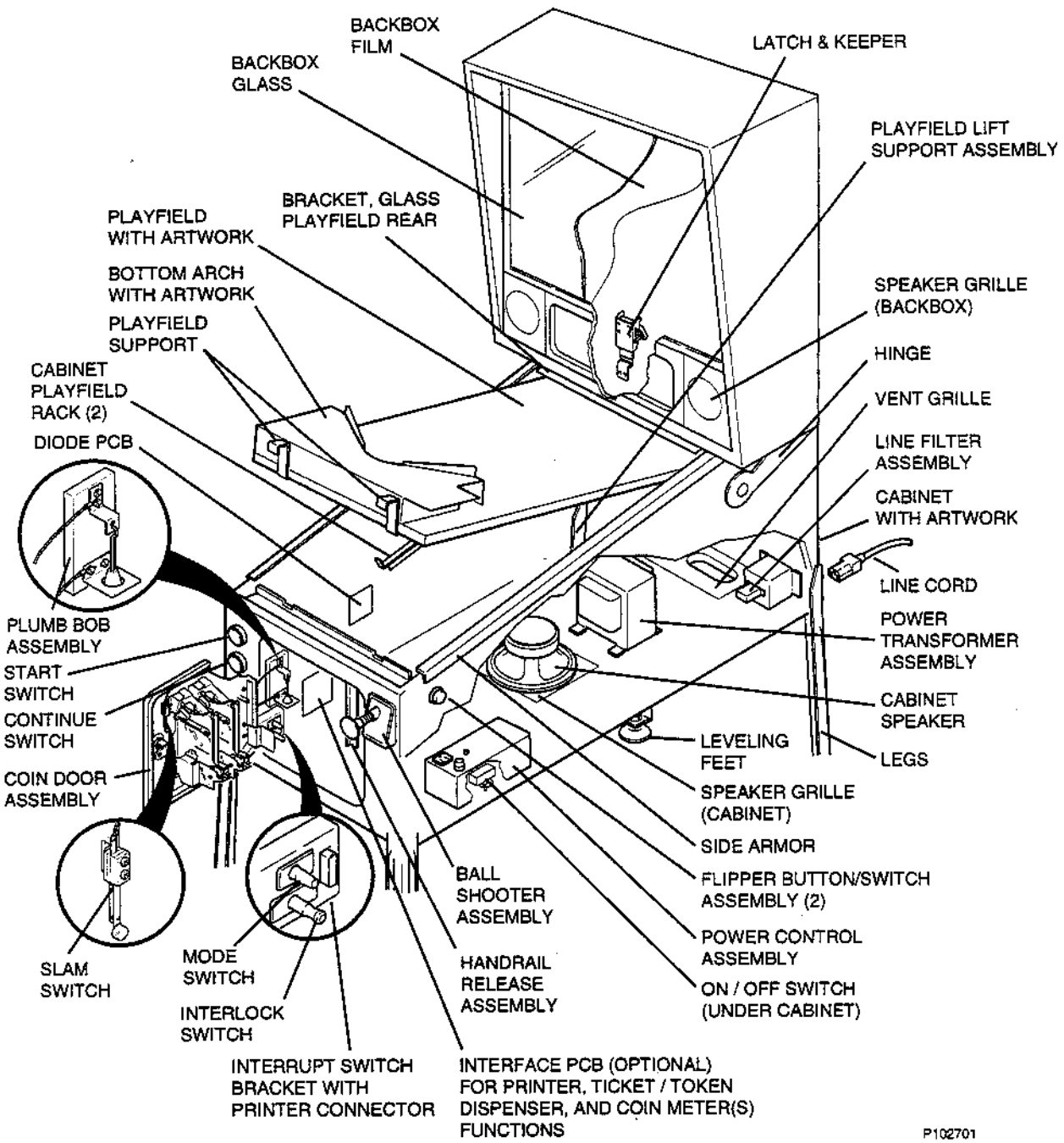
Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

BACKBOX - COMPONENT IDENTIFICATION



Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

CABINET & BACKBOX - COMPONENT IDENTIFICATION



Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

CABINET PARTS LIST

DESCRIPTION	PART NO.
ARCH, BOTTOM	A-00211-PB4
ARM, PLAYFIELD LIFT (LEFT)	A-00351-L
ARM, PLAYFIELD LIFT (RIGHT)	A-00351-R
ARMOR, SIDE, PINBALL, BLACK	MT00163-BK
BRACKET, GLASS, PLAYFIELD, REAR	MT00177-BK
BRACKET, SWITCH, INTERRUPT WITH PRINTER CONNECTOR	MT-00321-2
BUTTON, CONTINUE	SW00131
BUTTON, START	SW00130
CABINET WITH ARTWORK	WD00157-PB4
CONTROL, POWER	A-00414-*
CORD, LINE (POWER)	LC0010*
DOOR, COIN	A-00492-*
FEET, ADJUSTABLE LEVELING	MS00101-1
FILTER, LINE	LF00100
GLASS, PLAYFIELD, TEMPERED (21.0 X 43.0 X 3/16)	GL00102
GRILLE, SPEAKER	PL00173
GRILLE, VENT	PL00310
HANDRAIL ASSEMBLY	A-00124
HANDRAIL, RELEASE	A-00125
HINGE, LEFT	MT00173-L
HINGE, RIGHT	MT00173-R
LATCH (CONNECTED TO CABINET)	MT00428
LEGS	MT00231
PCB, DIODE OBARD	A0016900
PCB, INTERFACE (OPTIONAL) FOR PRINTER, TICKET / TOKEN DISPENSER, AND COIN METER(S) FUNCTION	A0019501
PLAYFIELD WITH ARTOWRK	AW00124
RAIL, LEFT, CABINET PLAYFIELD LIFT	MT00357-L
RAIL , RIGHT, CABINET PLAYFIELD LIFT	MT00357-R
SHOOTER, BALL	A-00192-01
SPEAKER, LARGE (INSIDE CABINET)	SP00101
SUPPORT, PLAYFIELD	MT00162
SWITCH, INTERLOCK	SW-00119
SWITCH, MODE	SW-00132
SWITCH, ON/OFF (UNDER CABINET)	A-00413
SWITCH, SLAM	SW00121
SWITCHES, FLIPPERS RIGHT AND LEFT	SW00114
TILT, PLUMB BOB	A-00065-1
TRANSFORMER, POWER	XF00104

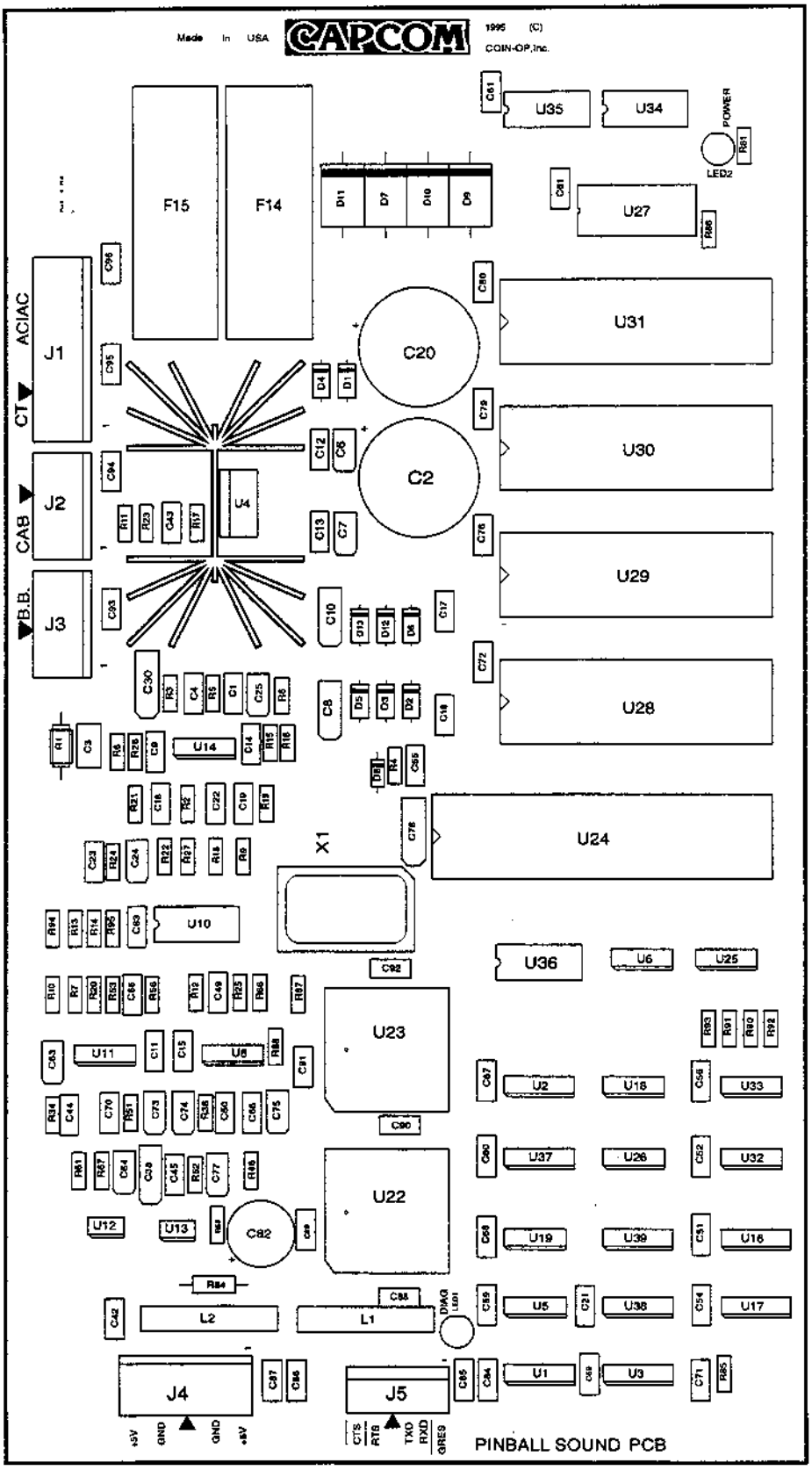
BACKBOX PARTS LIST

DESCRIPTION	PART NO.
ASSEMBLY, INSERT	A-00309-PB4
BACKBOX WITH ARTWORK	WD00132-PB4
BRACKET, LATCH, INSERT, DOOR	MT00221
BRACKET, SLIDE PANEL, LATCH	MT00161
CHANNEL, GLASS	PL00214-01
DISPLAY, DOT MATRIX	DP00102
FILM, GLASS	AW00161
GLASS, BACK	GL00106
GRILLE, SPEAKER	AW00163-L,R
HINGE, INSERT PANEL	MT00158
HINGE, SPEAKER PANEL	A-00163
KEEPER, (CONNECTED TO BACKBOX)	MT00428-1
PCB, CPU BOARD	A0015404-PB4
PCB, DISPLAY POWER SUPPLY	A0015504
PCB, DRIVER BOARD	A0015106
PCB, SOUND BOARD	A0015003-PB4
PCB, SWITCH BOARD	A0015302
PCB, POWER SUPPLY BOARD	A0015205
PLATE, MOUNTING PCB'S	MT00375
SPEAKER PANEL ASSEMBLY	A-00301-PB4
SPEAKERS, BACKBOX (LEFT AND RIGHT)	SP00100

* **NOTE:** WHEN ORDERING FOR SERVICE, PLEASE INDICATE MODEL NUMBER OF YOUR GAME.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

SOUND BOARD



Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

SOUND BOARD ASSEMBLY A0015003
PARTS LIST

DES.	DESCRIPTION	CAPCOM® P/N
J2,J3	CONNECTOR HEADER .156 STRAIGHT 4-PIN LOCK	CN00100-04
J4	CONNECTOR HEADER .156 STRAIGHT 5-PIN LOCK	CN00100-05
J1	CONNECTOR HEADER .156 STRAIGHT 7-PIN LOCK	CN00100-07
J5	CONNECTOR HEADER .100 STRAIGHT 6-PIN LOCK	CN00104-06
C6-7, C24-25, C63-64, C73-75, C77	CAPACITOR , TANTALUM 35V 1.0UF 10% SMT	CP00012-SMT
C9,C11-17 C21, C42, C45, C51-52, C54-56, C59-61, C67-C69, C71-72 C76, C79-81, C83,C88-C96	CAPACITOR, CERAMIC 50V .1UF 10% SMT 1206	CP00056-SMT
C2,C20	CAPACITOR , ELECTROLYTIC 25V 4700UF 20% RAD	CP00020
C1,C4	CAPACITOR , CERAMIC 100V .001UF 10% SMT 1206	CP00055-SMT
C43	CAPACITOR , CERAMIC 100V 470PF 5% SMT 1206	CP00060-SMT
C30,C78	CAPACITOR , TANTALUM 16V 22UF 20% SMT	CP00045-SMT
C19,C22, C44, C50, C65, C70	CAPACITOR , CERAMIC 50V .033UF 5% SMT 1206	CP00061-SMT
C8,C10,C38	CAPACITOR , TANTALUM 25V 4.7UF 20% SMT	CP00050-SMT
C3	CAPACITOR , CERAMIC 50V .22UF 20% SMT 1210	CP00051-SMT
C18	CAPACITOR , CERAMIC 100V .022UF 20% SMT 1206	CP00063-SMT
C23,C49, C66	CAPACITOR , CERAMIC 100V 3300PF 20% SMT 1206	CP00064-SMT
C82	CAPACITOR , ELECTROLYTIC 16V 470UF 20% RAD	CP00054
C84-87	CAPACITOR , CERAMIC 100V 100PF 10% SMT 1206	CP00058-SMT
D1-6,D12-13	DIODE 1N4004 RECTIFIER 1.0A 400VR	DI00100
D8	DIODE 1N4148 SW 200MA 75VR	Di00104
LED1-2	LED LTL4201 RED 20MA T-1 70°	DI00105
D7,D9-11	DIODE 1N5402 RECTIFIER 3.0A 200VR	DI00106
F14-F15	FUSE HOLDER 3AG PC MTG	FS00101
F14,F15	FUSE SLO BLO 3.0A 250V 3AG	FS00100-03
U8,U11,U14	IC TL084 OPERATIONAL AMP SMT	IC00037-SMT
U6	IC 74LS74 DUAL D-TYPE FF SMT	IC00042-SMT
U18-19	IC 74LS04 HEX INVERTER SMT	IC00048-SMT
U4	IC TDA2030A 18W HI-FI AMP	IC00056
U10	IC X9241U QUAD E2POT 50K SMT	IC00061-SMT
U24	IC87C52 PROGRAMMED MICOCONTROLLER	A-00566-U24
U16-17, U38-39	IC 74LS161 4-BIT SYN BIN CTR SMT	IC00083-SMT
U33	IC 74LS00 QUAD 2-IN NAND GATE SMT	IC00084-SMT
U5,U32	IC 74HC74 DUAL D-TYPE F/F SMT	IC00087-SMT

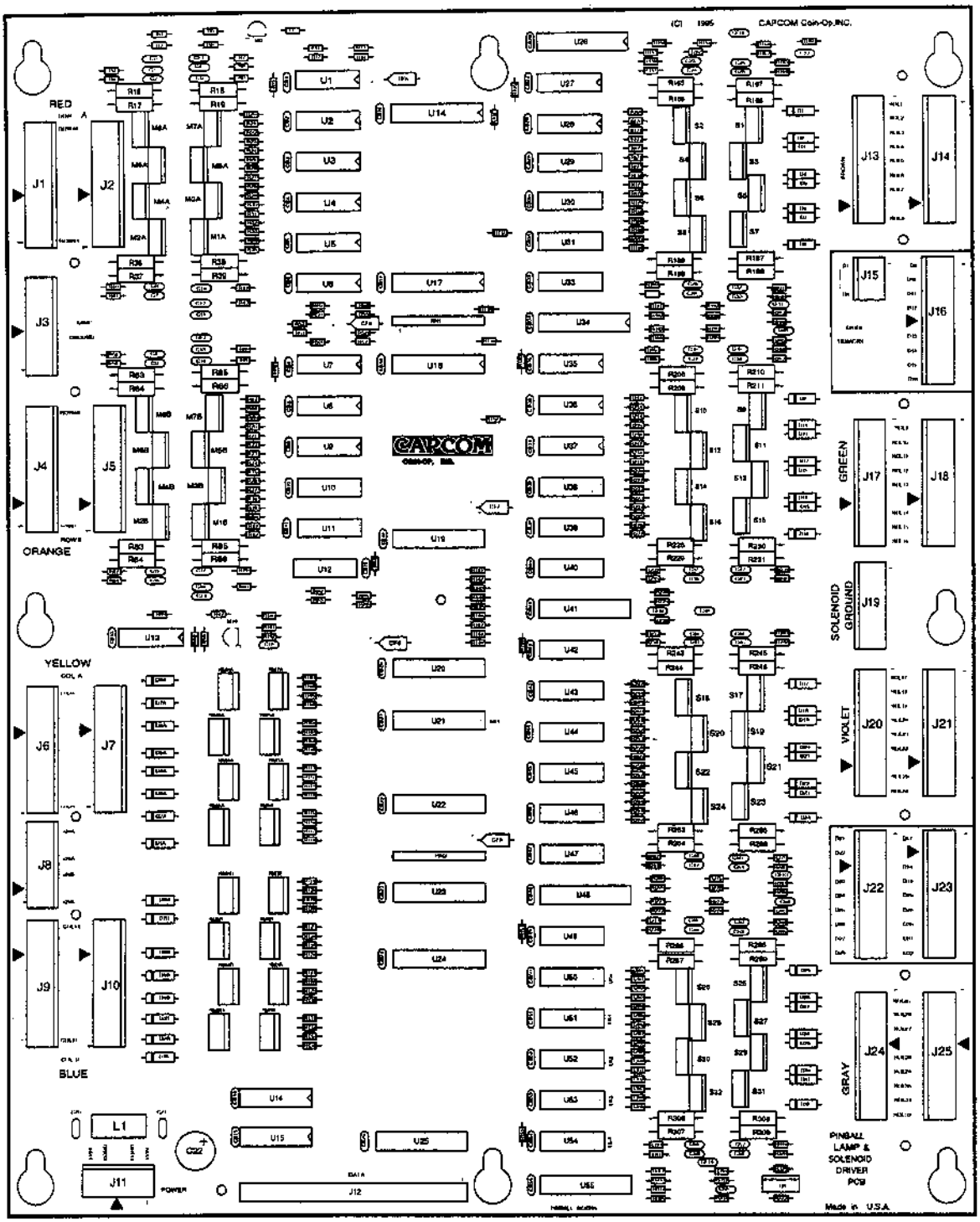
DES.	DESCRIPTION	CAPCOM® P/N
U22-23	IC TMS320AV120 MPEG AUDIO DECODER SMT	IC00086-SMT
U25-26	IC 74LS08 QUAD 2-IN AND GATE	IC00088-SMT
U2,U37	IC 74LS165 8-BIT SHIFT REGISTER SMT	IC00089-SMT
U27	IC SRAM32KX8 SMT	IC00090-SMT
U12-13	IC TDA1545 16-BIT DAC SMT	IC00091-SMT
U34-36	IC 74LS373 OCT D-TYPE LATCH SMT	IC00092-SMT
U1,U3	IC 74LS112 DUAL J-K F/F SMT	IC00093-SMT
*U28	ROM, MASKED	A-00567-U28
*U29	ROM, MASKED	A-00567-U29
*U30	EPROM, PROGRAMMED	A-00567-U30
*U31	EPROM, PROGRAMMED	A-00567-U31
L1-2	IND CHOKE 4.7UH 3A AXIAL	IN00100
X1	CLOCK OSCILLATOR 24MHZ	OS00101
R2	RESISTOR CARBON FILM 1/8W 5% 100 OHM SMT 1206	RS00102-02S
R81	RESISTOR CARBON FILM 1/8W 5% 270 OHM SMT 1206	RS00102-03S
R4,R85	RESISTOR CARBON FILM 1/8W 5% 1K OHM SMT 1206	RS00102-05S
R10,R12, R25, R53, R56,R66, R86,R90-R93	RESISTOR CARBON FILM 1/8W 5% 10K OHM SMT 1206	RS00102-07S
R34,R38, R46,R51	RESISTOR CARBON FILM 1/8W 5% 1.2K OHM SMT 1206	RS00102-08S
R84	RESISTOR CARBON FILM 1/4W 5% 0 OHM	RS00100-10
R18-19, R21-22	NOT USED	----------
R8-9,R11	RESISTOR CARBON FILM 1/8W 5% 680 OHM SMT 1206	RS00102-13S
R3,R5	RESISTOR CARBON FILM 1/8W 5% 12K OHM SMT 1206	RS00102-18S
R16	RESISTOR CARBON FILM 1/8W 5% 39K OHM SMT 1206	RS00102-19S
R15	RESISTOR CARBON FILM 1/8W 5% 47K OHM SMT 1206	RS00102-20S
R6,R17	RESISTOR CARBON FILM 1/8W 5% 22K OHM SMT 1206	RS00102-21S
R23	RESISTOR CARBON FILM 1/8W 5% 2.0K OHM SMT 1206	RS00102-22S
R1	RESISTOR CARBON FILM 1/4W 5% 1 OHM	RS00100-23
R24,R26-27	RESISTOR CARBON FILM 1/8W 5% 4.7K OHM SMT 1206	RS00102-26S
R7,R20,R88	RESISTOR CARBON FILM 1/8W 5% 3.3K OHM SMT 1206	RS00102-27S
R52,R61, R67-68	RESISTOR CARBON FILM 1/8W 5% 11K OHM SMT 1206	RS00102-38S
R13-14	RESISTOR CARBON FILM 1/8W 5% 27K OHM SMT 1206	RS00102-40S
R87	RESISTOR CARBON FILM 1/8W 5% 33 OHM SMT 1206	RS00102-41S
U28-31	ROM SOCKET 32PIN600	SK00112-32
U4	HEATSINK TO-220 W/KOOL CLIP	HS00102
U24	SOCKET 40-PIN DIP	SK00112-40
R94,R95	RESISTOR CARBON FILM 1/8W 5% 2.2K OHM SMT 1206	RS00102-23S

NOTE: C57 & 58 are replaced with jumper wires.

* NOTE: Game ROMs are not included with A0015003: must be purchased separately.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

DRIVER BOARD



Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

DRIVER BOARD ASSEMBLY A0015106
PARTS LIST

DES.	DESCRIPTION	CAPCOM® P/N
J15	CONNECTOR HEADER .156 STR 3 PIN LOCK	CN00100-03
J11	CONNECTOR HEADER .156 STR 5-PIN LOCK	CN00100-05
J8,J19	CONNECTOR HEADER .156 STR 6-PIN LOCK	CN00100-06
J3	CONNECTOR HEADER .156 STR 7-PIN LOCK	CN00100-07
J1-2,J4-7,J9-10, J13-14, J16-18, 20-25	CONNECTOR HEADER .156 STR 9 PIN LOCK	CN00100-09
J12	CONNECTOR HEADER .100 STR 50-PIN 2X25	CN00101-50
CF5-9	CAPACITOR TANT 35V 1.0UF 5% AX	CP00012
C1-11,C13-19, C23-59	CAPACITOR CERAMIC 50V .22UF 20% AX	CP00024
CB14-26,CB34, CB41,CB48, CB55	CAPACITOR CERAMIC 50V .01UF 10% AX	CP00048
CF1-4,CF10-14	CAPACITOR CERAMIC 50V .01UF 10% AX	CP00048
CB42-47,CB49-54	CAPACITOR CERAMIC 50V .001UF 10% AX	CP00049
C22	CAPACITOR ELECT 16V 470UF 20% RAD	CP00054
C20-21	CAPACITOR CERAMIC 50V 100P 10% AX	CP00068
D1-32,D1A,D1B, D2A,D2B,D3A, D3B,D4A,D4B, D5A,D5B,D6A, D6B,D7A,D7B, D8A,D8B-1	DIODE 1N4004 RECT 1.0A 400VR	DI00100
U1,U6-7,U12, U27,U33,U35,U40 U42,U47,U49,U54	IC LM339 VOLTAGE COMPARATOR	IC00036
U21,U23	IC 74LS273 OCTAL D-TYPE FF	IC00041
U2-5,U8-11,U13, 28-31,U36-39,U43-46,	IC 74LS74 DUAL D-TYPE FF	IC00042
U14-15	IC 74LS138 3 OF 8 LINE DECODER	IC00047
U16-20,U22, U24-26,U34,U41,U48,U55	IC 74LS244 OCT BFFR/LINE DR	IC00057
L1	IND 4.7UH 3.4A 15%AX	IN00100
R6,R15,R62,R94,R102,R135,R140, R150-151,R153, R160, R205,R236, R283,R318	RESISTOR CF 1/4W 5% 100 OHM	RS00100-02
R103,R105,R107 R109,R111,R113 R115,R117,R119 R121,R123,R125 R127,R131,R133	RESISTOR CF 1/4W 5% 1K OHM	RS00100-05
R11-14,R49-50, R52-57,R92-93,	RESISTOR CF 1/4W 5% 10K OHM	RS00100-07

DES.	DESCRIPTION	CAPCOM® P/N
R95-96,R104, R106,R108,R110, R112,R114,R116, R118,R120,R122, R124,R126,R128, R130,R132,R134, R142,-149,R154-155,R158-159, R191-194,R197-200,R269-272, R275-278,R312-315	RESISTOR CF 1/4W 5% 10K OHM	RS00100-07
R10,R99	RESISTOR CF 1/4W 5% 330 OHM	RS00100-12
R3-4,R8-9,R40-43,R58-61,R87-88,R90-91	RESISTOR CF 1/4W 5% 680 OHM	RS00100-13
R7,R21,R23,R25,R27,R29,R31,R33,R35,R51,R68,R70, R72,R74,R76,R78, R80,R82,R89,R98, R136-139,R141, 152, R169,R172-173,R176-177, R180-181,R184, R212,R215-216, R219-220,R223-224,R227,R247, R250-251,R254-255,R258-259, R262,R290, R293-294,R297-298, R301-302,R305, RR321-322	RESISTOR CF 1/4W 5% 4.7K OHM	RS00100-26
R156-157,R163-164,R189-190, R195-196,R201-202,R206-207, R232-233,R237-242,R267-268, R273-274,R279-280, R284-285, R310-311,R319-320	RESISTOR CF 1/4W 5% 56 OHM	RS00100-41
R20,R22,R24,R26, R28,R30,R32,R34, R67,R69,R71,R73, R75,R77,R79,R81, R170-171,R174-175, R178-179, R182-183,R213-214,R217-218, R221-222,R225-226,R248-249, R252-253,R256-257,R260-261, R291-292,R295-296,R299-300, R303-304	RESISTOR CF 1/4W 5% 750 OHM	RS00100-42
RN1-2	RESISTOR SIP 10K X 9R 2% BUSSED	RS00104

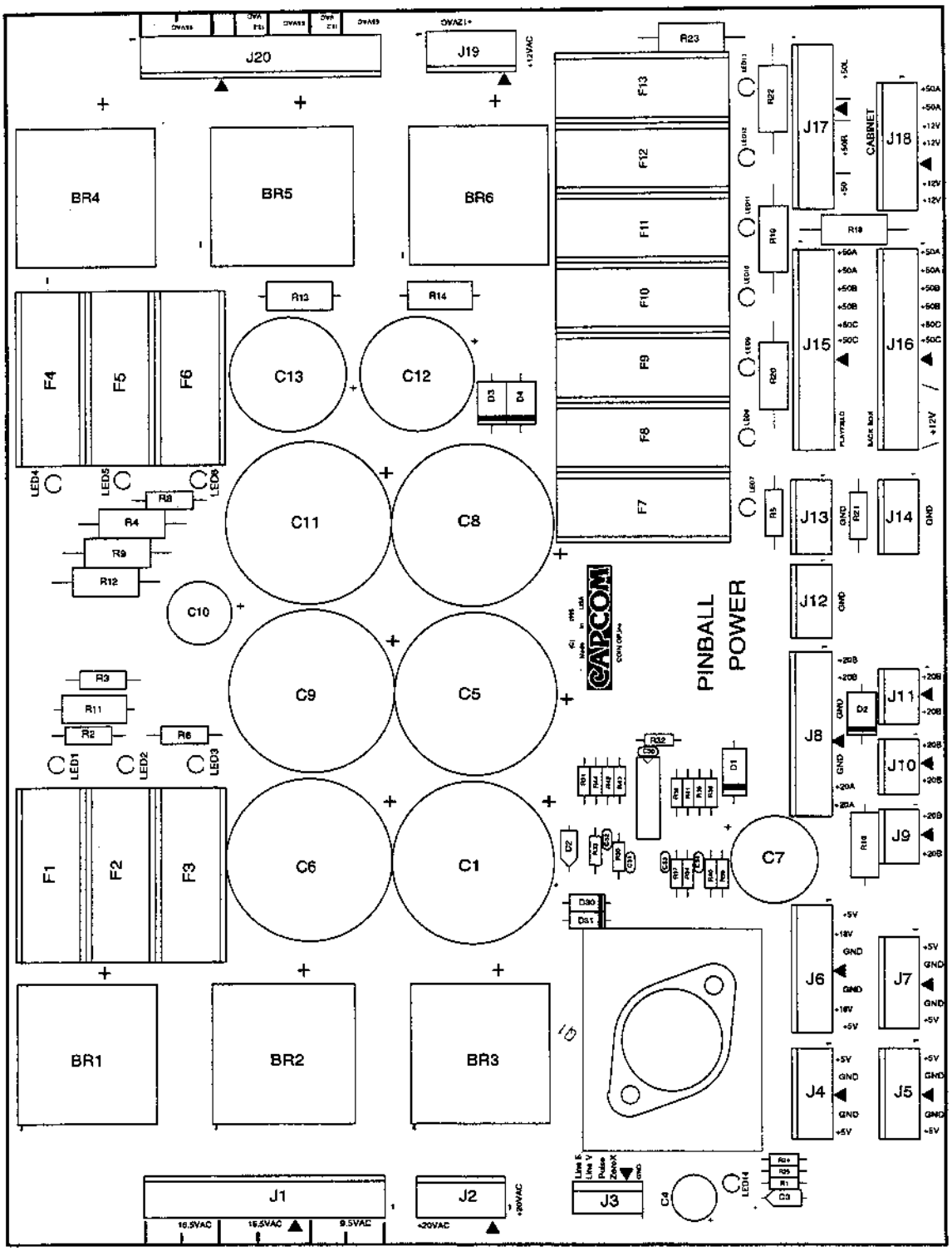
Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

DRIVER BOARD ASSEMBLY A0015106
PARTS LIST (CONT.)

DES.	DESCRIPTION	CAPCOM® P/N
R16-19,R36-39, R63-66,R83-86,R165-168, R185-188, R208-211, R228-231, R243-246, R263-266, R286-289, R306-309	RESISTOR CF 1W 5% .020 OHM	RS00112-01
R161,R203,R234R281,R316	RESISTOR MF 1/4W 1% 470 OHM	RS00113-06
R2,R101,R162, R204,R235, R282,R317	RESISTOR MF 1/4W 1% 7.50K OHM	RS00113-08
R1,R100	RESISTOR MF 1/4W 1% 200 OHM	RS00113-11
R5,R97	RESISTOR MF 1/4W 1% 270 OHM	RS00113-12
M1A,M1B, M2A,M2B, M3A, M3B, M4A, M4B, M5A, M5B, M6A,M6B, M7A,M7B, M8A,M8B, S1-32	TRANSISTOR STP20N10L MOSFET N-CH	TR00101
Q1	TRANSISTOR TIP102 NPN	TR00102
SM1A,SM1B, SM2A,SM2B, SM3ASM3B, SM4A, SM4B, SM5A,S M5B, SM6A,S M6B, SM7A,S M7B, SM8A, SM8B-1	TRANSISTOR VN02N MOSFET RELAY	TR00105
M9-10	TRANSISTOR 2N7000 MOSFET N-CH	TR00109

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

POWER BOARD



Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

POWER BOARD ASSEMBLY A0015205
PARTS LIST

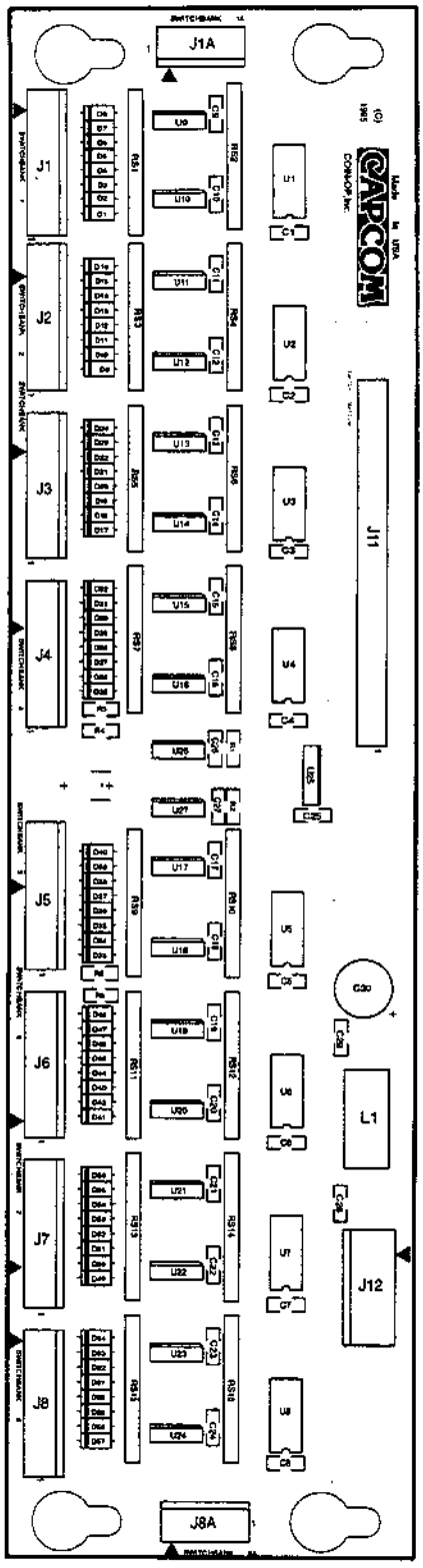
DES.	DESCRIPTION	CAPCOM® P/N
BR1-6	RECTIFIER MB352W BRIDGE 35A 200V	+ *DI00101
U30	IC LM339 VOLTAGE COMPARATOR	IC00036
Q1	VOLTAGE REGULATOR 5A LOW DROP ADJ	*VR00100
J9-11	CONNECTOR HEADER .156 STR 3 PIN LOCK	CN00100-03
J12-14	CONNECTOR HEADER .156 STR 4-PIN LOCK	CN00100-04
J2,J4-5, J7,J19	CONNECTOR HEADER .156 STR 5-PIN LOCK	CN00100-05
J6,J18	CONNECTOR HEADER .156 STR 7-PIN LOCK	CN00100-07
J8,J17	CONNECTOR HEADER .156 STR 9 PIN LOCK	CN00100-09
J15-16	CONNECTOR HEADER .156 STR 11-PIN LOCK	CN00100-11
J1,J20	CONNECTOR HEADER .156 STR 13-PIN LOCK	CN00100-13
J3	CONNECTOR HEADER .100 STR 6-PIN LOCK	CN00104-06
C12-13	CAPACITOR ELECTROLYTIC 100V 2200UF 20% RAD	CP00046
C31	CAPACITOR CERAMIC 50V .033UF 5% AX	CP00047
C1,C5-6, C8-9,C11	CAPACITOR ELECTROLYTIC 35V 15000UF 20% RAD	CP00065
C10	CAPACITOR ELECTROLYTIC 100V 100UF 20% RAD	CP00011-01
C30	CAPACITOR CERAMIC 50V .1UF 10% AX	CP00019
C32	CAPACITOR CERAMIC 50V .01UF 10% AX	CP00048
C33-34	CAPACITOR CERAMIC 100V .001UF 10% AX	CP00066
C2-3	CAPACITOR TANT 35V 1.0UF 5% AX	CP00012
C4	CAPACITOR ELECTROLYTIC 10V 470UF 20% RAD	CP00016
F9-13	FUSE SLO-BLO 4.0A 250V 3AG	FS00100-04
F5,F7-8	FUSE SLO-BLO 3.0A 250V 3AG	FS00100-03
F4	FUSE SOL-BLO 8.0A 250V 3AG	FS00100-08
F1-2,6	FUSE SLO-BLO 10.0A 250V 3AG	FS00100-10
F3	FUSE SLO-BLO 7.0A 250V 3AG	FS00100-07
FH1-13	FUSE HLDR 3AG PC MTG	FS00101
LED1-14	LED LTL4501 RED 20MA T-1 70°	DI00105
D1	RESISTOR, MF JUMPER	RS00117-01

DES.	DESCRIPTION	CAPCOM® P/N
D30-31	DIODE 1N4004 RECTIFIER 1.0A 400VR	DI00100
D2-4	DIODE IN5402 RECTIFIER 20MA T-1 70 °	DI00106
R38	RESISTOR CARBON FILM 1/4W 5% 27K OHM	RS00100-40
R8,R21,R5	RESISTOR CARBON FILM 1/2W 5% 1.2K OHM	RS00102-11
R25	RESISTOR MF 1/4W 1% 374 OHM	RS00113
R4,R9,R18-20,R22-23	RESISTOR MOF 2W 5% 5.6K OHM	RS00114
R24	RESISTOR MF 1/4W 1% 121 OHM	RS00113-01
R30,R42-43	RESISTOR MF 1/4W 1% 11K OHM	RS00113-02
R2-3	RESISTOR CARBON FILM 1/2W 5% 1.5K OHM	RS00101-09
R33	RESISTOR MF 1/4W 1% 2K OHM	RS00113-03
R10-11	RESISTOR MOF 2W 5% 620 OHM	RS00114-01
R12,R14	RESISTOR MOF 2W 5% 6.2K OHM	RS00114-02
R13	RESISTOR MOF 2W 5% 270 OHM	RS00114-03
R1	RESISTOR CARBON FILM1/4W 5% 330 OHM	RS00100-12
R31	RESISTOR MF 1/4W 1% 56.2K OHM	RS00113-10
R36,R32, R44	RESISTOR CARBON FILM 1/4W 5% 3.3K OHM	RS00100-27
R6	RESISTOR CARBON FILM 1/4W 5% 820 OHM	RS00100-30
R41	RESISTOR CARBON FILM 1/4W 5% 1K OHM	RS00100-05
HS1	HEAT SINK TO-3 HEAVY DUTY 2"	*HS00106
----	MS 6-32x1/2 PPH SEMS ZC	SC00100-04
---	NUT 6-32 HEX KEPS	NT00101-06
----	HEAT SINK 1.5 X 4.5 EXTRUSION	*HS00105
----	MS 6-32 X 3/4 PPH SEMS ZC	SC00100-06
----	CIRCUIT BOARD SUPPORT	PL00287-05

* NOTE: Heat sink compound should be applied to ALL heat sink/semi-conductor surfaces
+NOTE: Spacing between the bottom of the bridge and the PCB shall be 1/4".

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

SWITCH BOARD



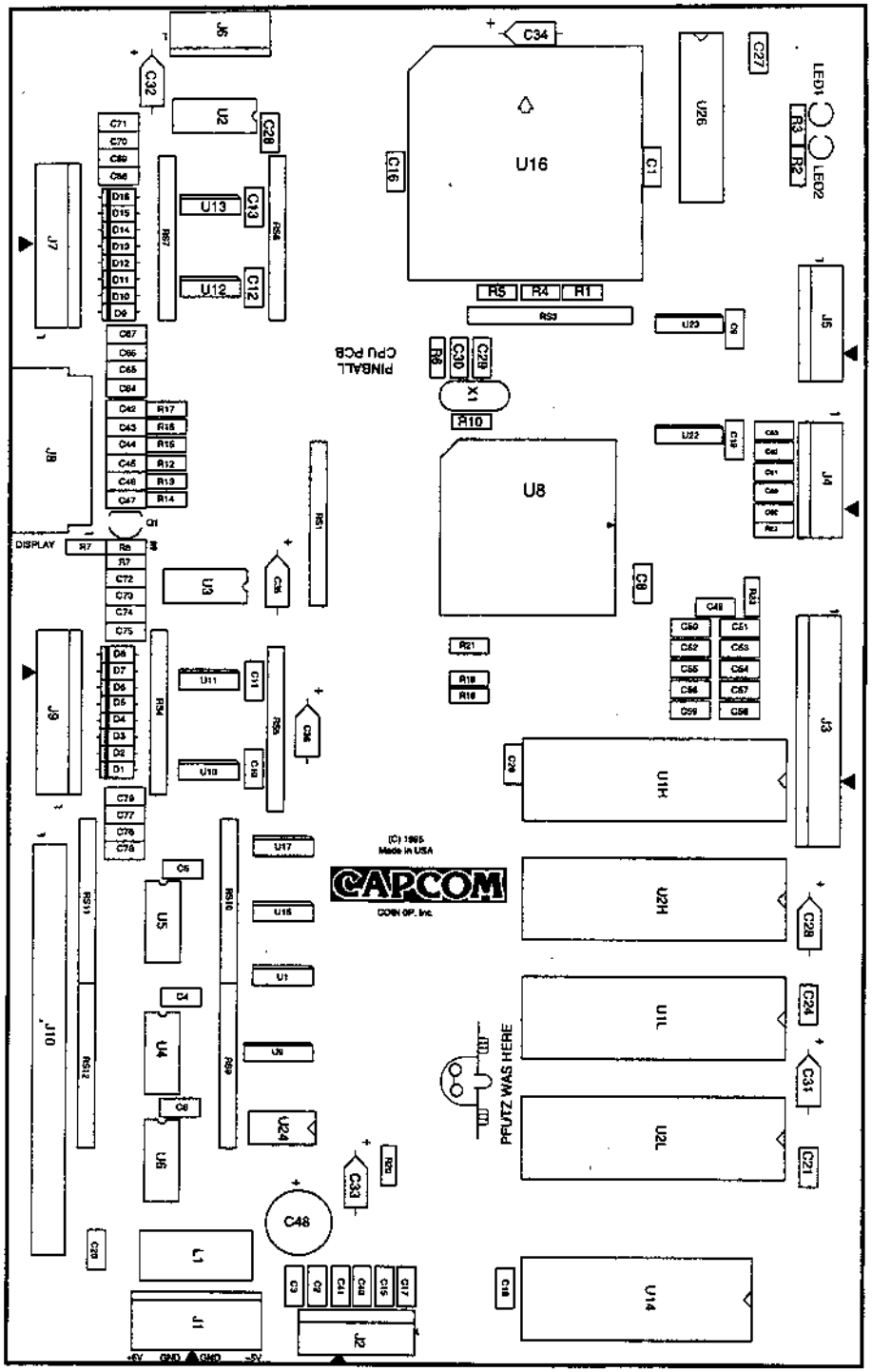
Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

SWITCH BOARD ASSEMBLY A0015302
PARTS LIST

DES.	DESCRIPTION	CAPCOM® P/N
J12	CONNECTOR HEADER.156 STRAIGHT 5-PIN LOCK	CN00100-05
J11	CONNECTOR HEADER.100 STR 50-PIN 2X25	CN00101-50
J1A,J8A-1	CONNECTOR HEADER.100 STRAIGHT 6-PIN LOCK	CN00104-06
J1-8	CONNECTOR HEADER.100 STRAIGHT 10-PIN LOCK	CN00104-10
C1-29	CAPACITOR CERAMIC 50V 0.1UF 10% SMT	CP00019-SMT
C30	CAPACITOR ELECTROLYTIC 16V 470UF 20% RAD	CP00054
D1-64	DIODE 1N4148 SW 200MA 75VR	DI00104
U9-24	IC LM339 VOLTAGE COMPARATOR SMT	IC00036-SMT
U26	IC 74LS74 DUAL D-TYPE FF SMT	IC00042-SMT
U1-8	IC 74LS245 OCT BUS TRANSCEIVER SMT	IC00044-SMT
U25	IC 74LS138 3 OF 8 LINE DECODER SMT	IC00047-SMT
U27	IC 74LS126 QUAD 3-STATE BUFFER SMT	IC00099-SMT
L1	IND 4.7UH 3.4A 15%AX	IN00100
R1-2,R4,R6	RESISTOR CARBON FILM 1/8W 5% 3.3K OHM SMT 1206	RS00102-27S
R3,R5	RESISTOR CARBON FILM 1/8W 5% 620 OHM SMT 1206	RS00102-XXX
RS1,RS3, RS5,RS7, RS9, RS11, RS13,RS15	RESISTOR SIP 2.2K X 9R 2% BUSSED	RS00103
RS2,RS4, RS6,RS8, RS10,RS12 RS14,RS16	RESISTOR SIP 10K X 9R 2% BUSSED	RS00104

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

CPU BOARD



Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

CPU BOARD ASSEMBLY A0015404
PARTS LIST

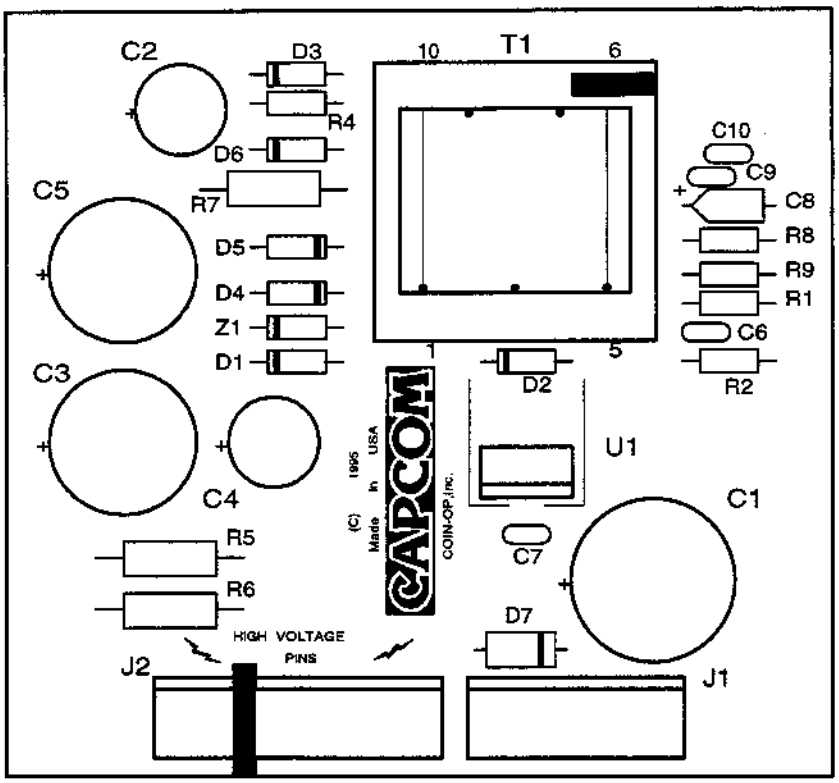
DES.	DESCRIPTION	CAPCOM® P/N
C1,C8,C16, C18,C20-21, C24,C26-27	CAPACITOR CER 50V .1UF 10% SMT 1206	CP00056-SMT
C2-6, C9, C19,C23, C24,C64-79	CAPACITOR CER 50V .01UF 10% SMT 1206	CP00048-SMT
C10-13	CAPACITOR CER 50V .001UF 10% SMT 1206	CP00055-SMT
C15,C17, C40-41, C49-63,C80	CAPACITOR CER 100V 100PF 10% SMT 1206	CP00058-SMT
C28,C31-36	CAPACITOR TANT 35V 1.0UF 5% AX	CP00012
C29-30, C42-47	CAPACITOR CER 100V 10PF 10% SMT 1206	CP00017-SMT
C48	CAPACITOR ELECT 16V 470UF 20% RAD	CP00054
D1-16	DIODE 1N4148 SW 200MA 75VR	DI00104
J1	CONNECTOR HEADER .156 STR 5-PIN LOCK	CN00100-05
J2,J4	CONNECTOR HEADER .100 STR 7-PIN LOCK	CN00104-07
J3	CONNECTOR HEADER .100 STR 14-PIN LOCK	CN00104-14
J6	CONNECTOR HEADER .100 STR 6-PIN LOCK	CN00104-06
J10	CONNECTOR HEADER .100 STR 50-PIN 2X25	CN00101-50
J8	CONNECTOR HEADER .100 RT 14-PIN 2X7 4W	CN00137-14
J7,J9	CONNECTOR HEADER .100 STR 10-PIN LOCK	CN00104-10
L1	IND 4.7UH 3.4A 15% AX	IN00100
LED1-2	LED LTL4201 RED 20MA T-1 70°	DI00105
R1,R10	RESISTOR CF 1/8W 5% 33 OHM SMT 1206	RS00102-41S
R2-3	RESISTOR CF 1/8W 5% 270 OHM SMT 1206	RS00102-03S
R4-7	RESISTOR CF 1/8W 5% 4.7K OHM SMT 1206	RS00102-26S
R8	RESISTOR CF 1/8W 5% 1K OHM SMT 1206	RS00102-05S
R9	RESISTOR CF 1/8W 5% 1.2K OHM SMT 1206	RS00102-08S
R12-17	RESISTOR CF 1/8W 5% 100 OHM SMT 1206	RS00102-02S
R18-21	RESISTOR CF 1/8W 5% 3.3K OHM SMT 1206	RS00102-27S
R22-23	RESISTOR CF 1/8W 5% 10K OHM SMT 1206	RS00102-07S
RS1,RS3	RESISTOR SIP 4.7K X 9R 2% BUSSED	RS00111
RS4,RS7	RESISTOR SIP 1.2K X 9R 2% BUSSED	RS00103
RS5-6, RS9-12	RESISTOR SIP 10K X 9R 2% BUSSED	RS00104

DES.	DESCRIPTION	CAPCOM® P/N
*U1H	EPROM	A-00567-U1H
*U1L	EPROM	A-00567-U1L
*U2H	ROM, GAME	A-00567-U2H
*U2L	ROM, GAME	A-00567-U2L
U1H,U1L, U2H,U2L-1	SOCKET 32 PIN .600 DUAL WIPE	SK00112-32
U1	IC 74LS02 QUAD NOR SMT	IC00098-SMT
U2-6	IC 74LS245 OCT BUS TRANSCEIVER SMT	IC00044-SMT
U8	IC XC68306 MPU 16-BIT	IC00046
U9	IC 74LF139 DUAL 2-4 DECODER SMT	IC00117-SMT
U10-13	IC LM339 VOLTAGE COMPARATOR SMT	IC00036-SMT
U14	IC SRAM 8K X 8 100NS BAT	IC00035
U15	IC 74LS14 HEX SCHMITT TRIG SMT	IC00063-SMT
U16	SOCKET IC 84-PIN PLCC	SK00101-84
U16	ACTEL 1020 PROGRAMMED	IC00106
U17	IC 74LS74 DUAL D-TYPE FF SMT	IC00042-SMT
U22-23	IC 74LS257 QUAD 2-IN MUX SMT	IC00045-SMT
U24	IC MAX699 RESET CHIP	IC00097
U25	IC DRAM 256K X 16 100NS	IC00074-SMT
Q1	TRANSISTOR 2N3904 NPN G.P. AMP	TR00106
X1	CRYSTAL 16.67 MHZ	CR00103

*NOTE: Game ROMs are not included with A0015404: Must be purchased separately.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

DISPLAY POWER SUPPLY BOARD A0015505

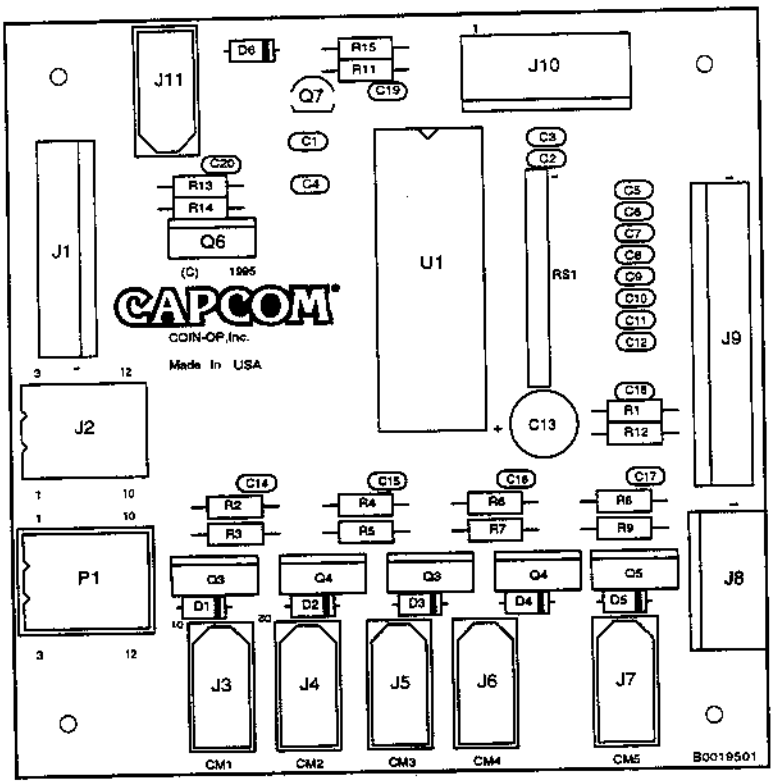


DES.	DESCRIPTION	CAPCOM® P/N
J1	CONNECTOR HEADER .156 STR 6-PIN LOCK	CN00100-06
J2	CONNECTOR HEADER .156 STR 8 PIN LOCK	CN00100-08
C8	CAPACITOR TANT 35V 1.0UF 5% AX	CP00012
C7	CAPACITOR CERAMIC 50V .1UF 10% AX	CP00019
*C3,C5	CAPACITOR ELECT 160V 47UF 20% RAD	CP00034
*C1	CAPACITOR ELECT 25V 4700UF 20% RAD	CP00020
*C4	CAPACITOR ELECT 200V 6.8UF 20% RAD	CP00042
*C2	CAPACITOR ELECT 25V 220UF 20% RAD	CP00041
D1-3	DIODE 1N5819 1A 40V SCHOTTKEY	DI00108
D4-6	DIODE MUR160 1A 600V ULTRA FAST RECOVERY	DI00113
D7	DIODE, IN5402 RECT. 3.0A 200vR	DI00106
Z1	DIODE 1N4748 ZENER 1W 22V	DI00110
U1	SWITCHING REG LT1271CT HI EFF	IC00082
R4	RESISTOR CARBON FILM 1/4W 5% 1.5K OHM	RS00100-09
R8	RESISTOR CARBON FILM 1/4W 5% 330 OHM	RS00100-12
R7	RESISTOR CARBON FILM 1/2W 5% 12K OHM	RS00100-18
R5	RESISTOR CARBON FILM 1/2W 5% 47K OHM	RS00100-20
R6	RESISTOR CARBON FILM 1.0W 5% 15K OHM	RS00112-03
R1	RESISTOR MFD 1/4W 1% 64.9K OHM	RS00113-04
R2	RESISTOR MFD 1/4W 1% 1.24K OHM	RS00113-05
T1	XFMR FLYBACK 47UH 30VA 13-23VDC	XF00103
HS1	HEAT SINK TO220 0.5 X 0.75W	HS00103

* CAPS: C1-C5 are special capacitors for switching power supplies, they are low impedance, high ripple current capacitors.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

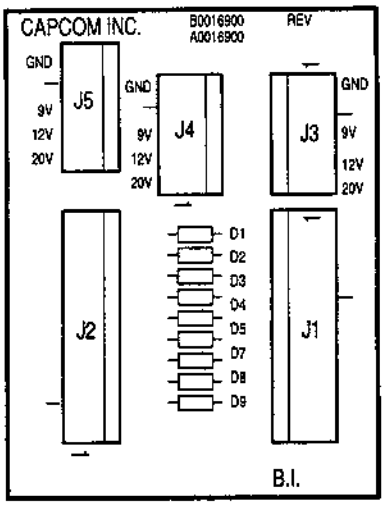
INTERFACE BOARD ASSEMBLY A0019501



DES.	DESCRIPTION	CAPCOM® P/N
J3-7,J11	CONNECTOR, .062, 3-PIN FEMALE, RECEPTACLE	CN00112-03
J8	CONNECTOR HEADER .156 STRAIGHT 4-PIN LOCK	CN00100-04
J2	CONNECTOR .062, 12-PIN FEMALE, RECEPTACLE	CN00111-12
J1	CONNECTOR HEADER .100 STRAIGHT 10-PIN LOCK	CN00104-10
J10	CONNECTOR HEADER .156 STRAIGHT 5-PIN LOCK	CN00100-05
J9	CONNECTOR HEADER .100 STRAIGHT 14-PIN LOCK	CN00104-14
C1-4	CAPACITOR CERAMIC 50V .22UF 10% AX	CP00024
C14-20	CAPACITOR CERAMIC 50V .1UF 10% AX	CP00019
C13	CAPACITOR ELECTROLYTIC 100UF 25V 20% RAD	CP00067
C5-12	CAPACITOR CERAMIC 100V 100PF 10% AX	CP00058
D1-6	DIODE 1N4004 RECT 1.0A 400vR	DI00100
U1	IC LT1337ACN 5V RS232 DRIVER	IC00114
R1,R11-14	RESISTOR CARBON FILM 1/4W 5% 10K OHM	RS00100-07
R2,R4,R6,R8,R15	RESISTOR CARBON FILM 1/4W 5% 4.7K OHM	RS00100-26
RS1	RESISTOR SIP 10K X 9R 5% BUSSED	RS00103
R3,R5,R7,R9	RESISTOR CARBON FILM 1/4W 5% 12K OHM	RS00100-18
Q5-6	TRANSISTOR TIP-102 NPN	TR00102
Q1-4	TRANSISTOR TIP-107 PNP	TR00103
P1	CONNECTOR .062, 12-PIN MALE, PLUG	CN00112-12
P1	TERMINAL MALE PC TAIL .062	CN00139-M
Q7	TRANSISTOR 2N3906 PNP	TR00108

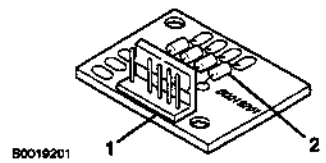
Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

DIODE BOARD A0016900



DES.	DESCRIPTION	CAPCOM® P/N
J3-5	CONNECTOR HEADER .156 STRAIGHT 5-PIN LOCK	CN00100-05
J1-2	CONNECTOR HEADER .156 STRAIGHT 9-PIN LOCK	CN00100-09
D1-9	DIODE 1N4004 RECTIFIER 1.0A 400VR	DI00100

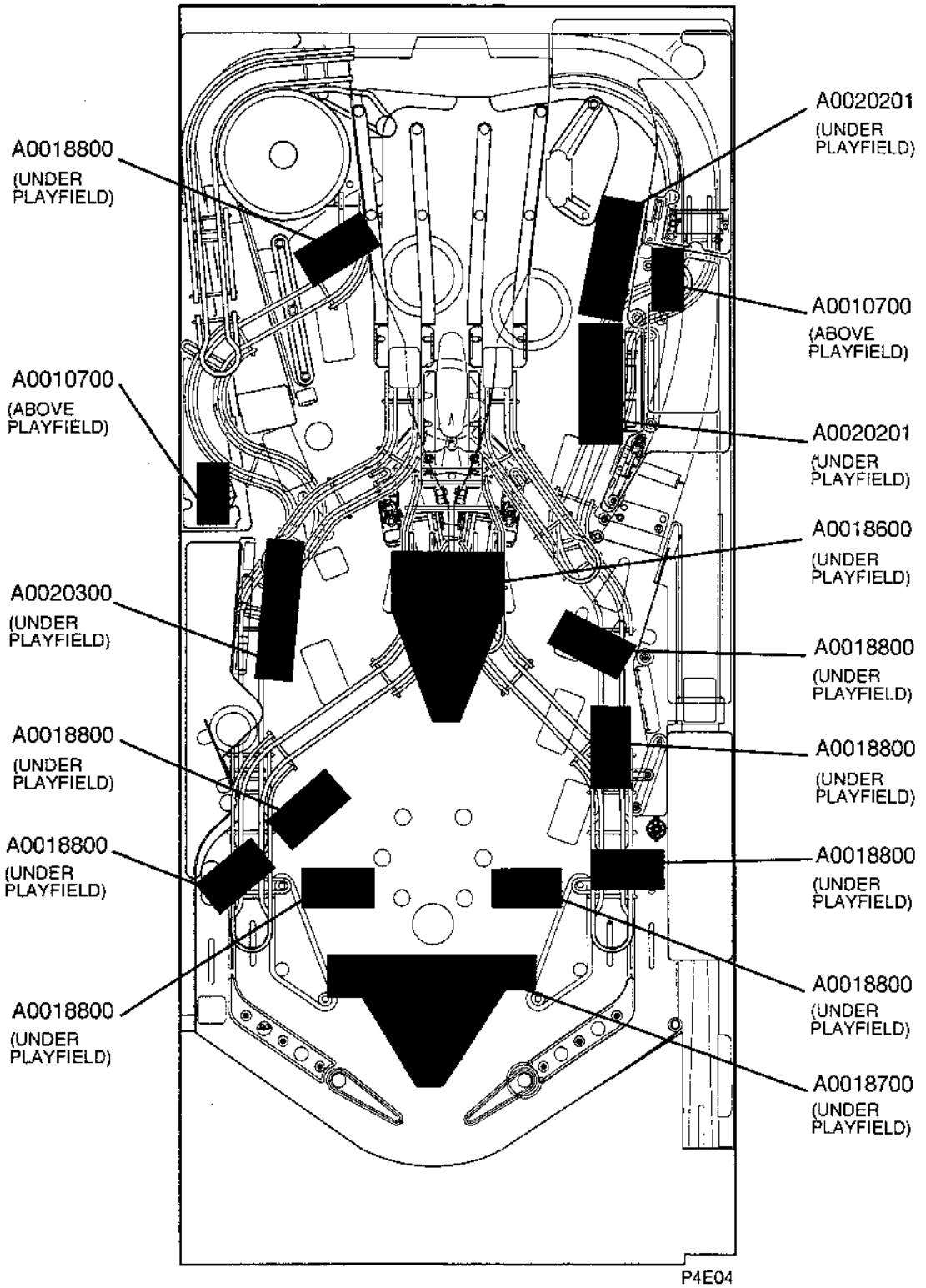
STAR BUMPER DIODE BOARD A0019201



NO.	DESCRIPTION	CAPCOM® P/N
---------	ASSEMBLY, PCB, STAR BUMPER	A0019201
1	CONNECTOR HEADER .156 STRAIGHT	CN00100-06
2	DIODE, 1N4004, RECTIFIER	DI00100

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

LAMP BOARD IDENTIFICATION

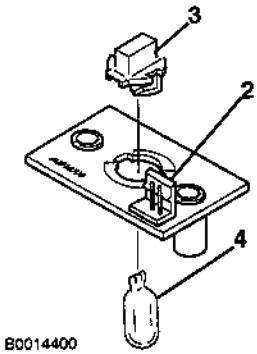


P4E04

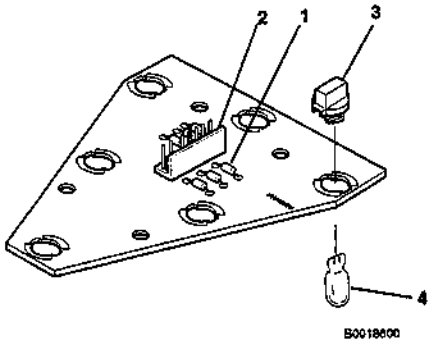
Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

LAMP BOARD ASSEMBLIES

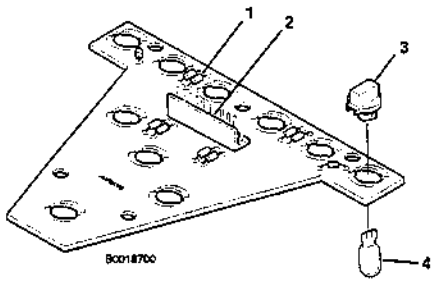
A0010700



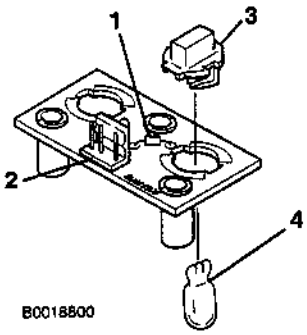
A0018600



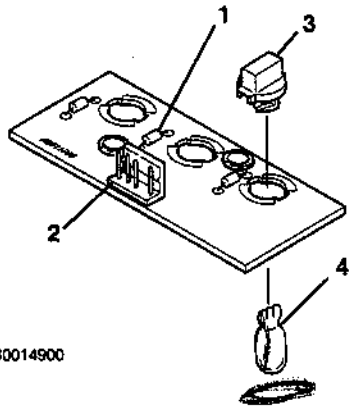
A0018700



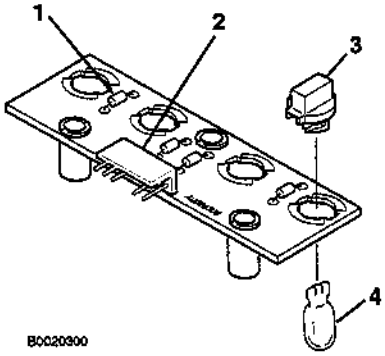
A0018800



A0020201



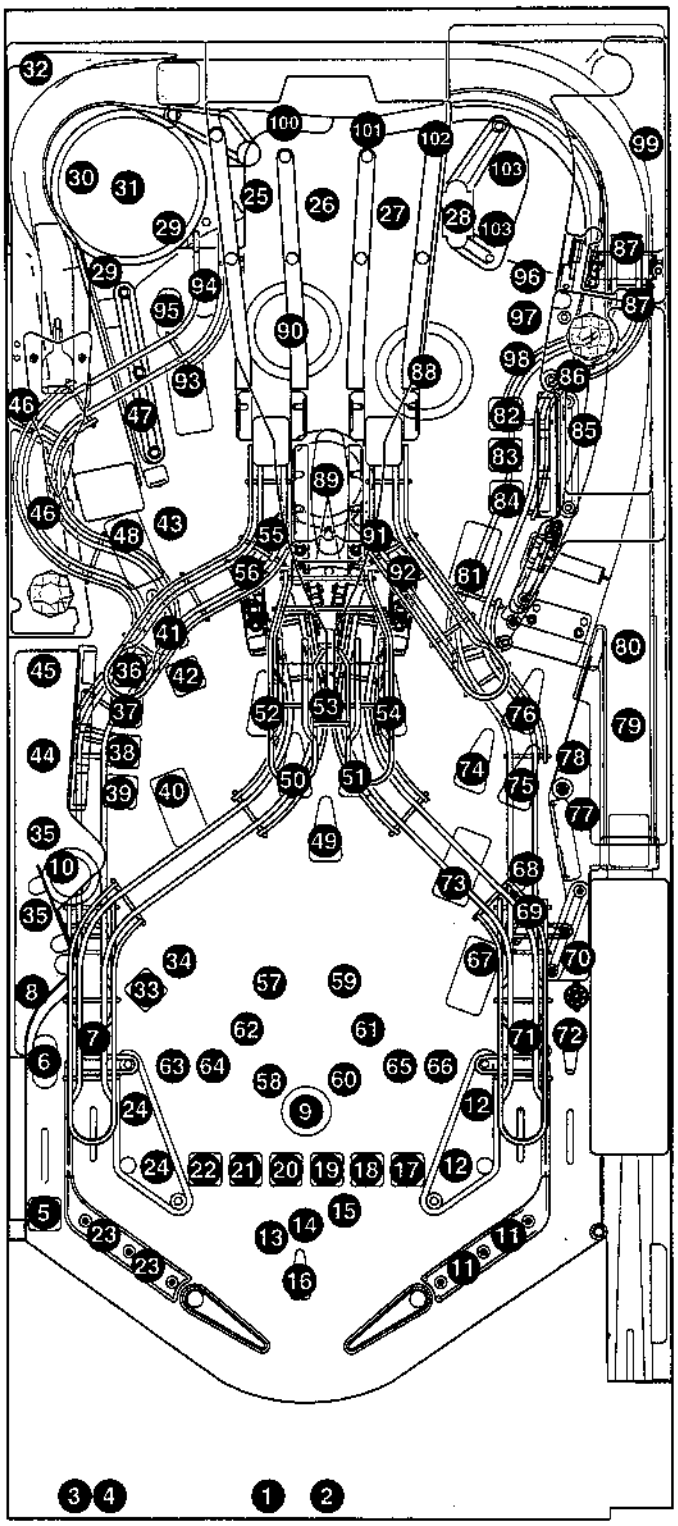
A0020300



REF.	DESCRIPTION	COMPONENT P/N	LAMP BOARD ASSEMBLY P/N AND COMPONENT PART QTY.					
			A0010700	A0018600	A0018700	A0018800	A0020201	A0020300
1	DIODE, IN4004 RECTIFIER	DI00100		6	10	2	3	4
2	CONNECTOR, HEADER	CN00100-03	1					
2	CONNECTOR, HEADER	CN00100-08		1				
2	CONNECTOR, HEADER	CN00100-10			1			
2	CONNECTOR, HEADER	CN00100-04				1		
2	CONNECTOR, HEADER	CN00100-05					1	
2	CONNECTOR, HEADER	CN00100-06						1
3	SOCKET, LAMP	SK00102		6	10	2	3	4
3	SOCKET, LAMP	SK00103	1					
4	LAMP, #555, 6.3V WEDGE	LP00100		6	10	2	3	4
4	LAMP, #906, 13V WEDGE	LP00101	1					

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

PLAYFIELD LAMPS



P4E02

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

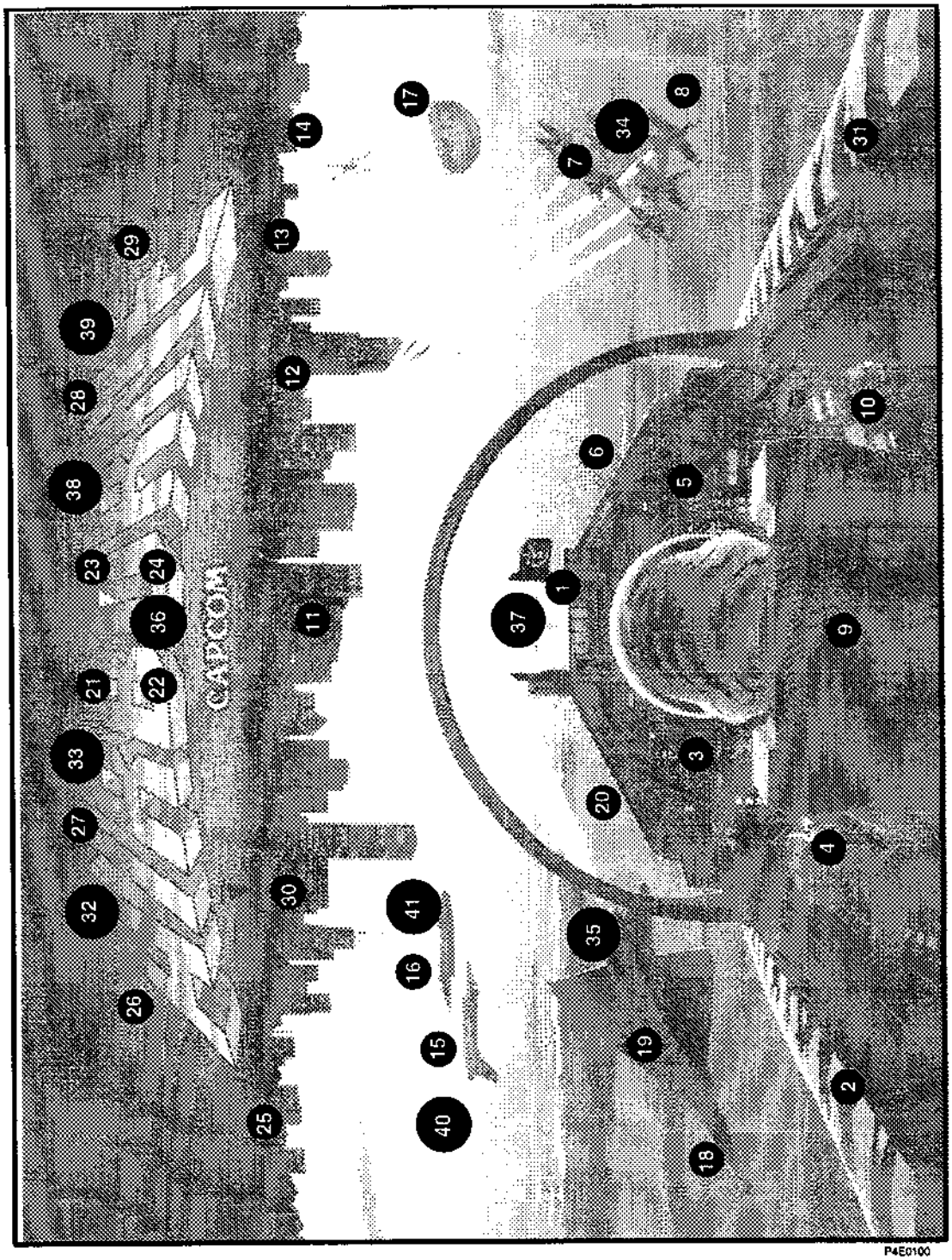
PLAYFIELD LAMPS

REF	SOFTWARE TEST REFERENCE C1-04	WIRE COLOR		BULB	CAPCOM P/N
		COLUMN	ROW		
1	11A COIN DOOR 1&2	YEL/GRY	RED/BRN	259	LP00113
2	12A COIN DOOR 3&4	YEL/GRY	RED/BLK	259	LP00113
3	13A START	YEL/GRY	RED/ORG	555	LP00100
4	14A BUYIN	YEL/GRY	RED/YEL	555	LP00100
5	15A EJECT LOCK	YEL/GRY	RED/GRN	44	LP00104
6	16A LEFT OUTLANE	YEL/GRY	RED/BLU	555	LP00100
7	17A LEFT INLANE	YEL/GRY	RED/VIO	555	LP00100
8	18A LEFT GI 1	YEL/GRY	RED/GRY	44	LP00104
9	21ANIGHT FLYING	YEL/RED	RED/BRN	44	LP00104
10	22A LEFT GI 2 (SAUCER)	YEL/RED	RED/BLK	44	LP00104
11	23A R LANE GI 1&2	YEL/RED	RED/ORG	44	LP00104
12	24A R SLING GI 1&2	YEL/RED	RED/YEL	44	LP00104
13	25A BONUS 2X	YEL/RED	RED/GRN	555	LP00100
14	26A BONUS 3X	YEL/RED	RED/BLU	555	LP00100
15	27A BONUS 5X	YEL/RED	RED/VIO	555	LP00100
16	28AFLY AGAIN	YEL/RED	RED/GRY	555	LP00100
17	31A RANK ACE	YEL/ORG	RED/BRN	555	LP00100
18	32A RANK COLONEL	YEL/ORG	RED/BLK	555	LP00100
19	33A RANK MAJOR	YEL/ORG	RED/ORG	555	LP00100
20	34A RANK CAPTAIN	YEL/ORG	RED/YEL	555	LP00100
21	35A RANK LIEUTENANT	YEL/ORG	RED/GRN	555	LP00100
22	36A RANK SERGEANT	YEL/ORG	RED/BLU	555	LP00100
23	37A L LANE GI 1&2	YEL/ORG	RED/VIO	44	LP00104
24	38AL SLING GI 1&2	YEL/ORG	RED/GRY	44	LP00104
25	41A JET LANE GI 1	YEL/BLK	RED/BRN	44	LP00104
26	42A JET LANE GI 2	YEL/BLK	RED/BLK	44	LP00104
27	43A JET LANE GI 3	YEL/BLK	RED/ORG	44	LP00104
28	44A JET LANE GI 4	YEL/BLK	RED/YEL	44	LP00104
29	45A TOWER GI 1&2	YEL/BLK	RED/GRN	44	LP00104
30	46A LEFT GI 9	YEL/BLK	RED/BLU	44	LP00104
31	47A TOWER TOP	YEL/BLK	RED/VIO	44	LP00104
32	48A LEFT GI 10	YEL/BLK	RED/GRY	44	LP00104
33	51A LEFT SAUCER LOCK	YEL/GRN	RED/BRN	555	LP00100
34	52A EXTRA BALL	YEL/GRN	RED/BLK	555	LP00100
35	53A LEFT GI 3	YEL/GRN	RED/ORG	44	LP00104
36	54A DROP S	YEL/GRN	RED/YEL	555	LP00100
37	55A DROP H	YEL/GRN	RED/GRN	555	LP00100
38	56A DROP O	YEL/GRN	RED/BLU	555	LP00100
39	57A DROP W	YEL/GRN	RED/VIO	555	LP00100
40	58A LEFT DROP STUNT	YEL/GRN	RED/GRY	44	LP00104
41	61A TOWER FLYBY	YEL/BLU	RED/BRN	44	LP00104
42	62A BACK LOCK	YEL/BLU	RED/BLK	44	LP00104
43	63A LEFT RAMP STANDUP	YEL/BLU	RED/ORG	44	LP00104
44	64A LEFT GI 4	YEL/BLU	RED/YEL	44	LP00104
45	65A LEFT GI 5	YEL/BLU	RED/GRN	44	LP00104
46	66A LEFT GI 6&7	YEL/BLU	RED/BLU	44	LP00104
47	67A LEFT GI 8	YEL/BLU	RED/VIO	44	LP00104
48	68A LEFT RAMP STUNT	YEL/BLU	RED/GRY	44	LP00104
49	71A ANGEL 6	YEL/VIO	RED/BRN	555	LP00100
50	72A ANGEL 4	YEL/VIO	RED/BLK	555	LP00100
51	73A ANGEL 5	YEL/VIO	RED/ORG	555	LP00100
52	74A ANGEL 1	YEL/VIO	RED/YEL	555	LP00100
53	75A ANGEL 2	YEL/VIO	RED/GRN	555	LP00100
54	76A ANGEL 3	YEL/VIO	RED/BLU	555	LP00100
55	77A CENTER GI 3	YEL/VIO	RED/VIO	44	LP00104
56	78A CENTER GI 4	YEL/VIO	RED/GRY	44	LP00104
57	81A ENGLAND	YEL/GRY	RED/BRN	44	LP00104
58	82A SPAIN	YEL/GRY	RED/BLK	44	LP00104
59	83A GERMANY	YEL/GRY	RED/ORG	44	LP00104
60	84A ITALY	YEL/GRY	RED/YEL	44	LP00104
61	85A FRANCE	YEL/GRY	RED/GRN	44	LP00104
62	86A USA	YEL/GRY	RED/BLU	44	LP00104
63	87A COPILOT	YEL/GRY	RED/VIO	555	LP00100
64	88A REFUEL	YEL/GRY	RED/GRY	555	LP00100

REF	SOFTWARE TEST REFERENCE C1-04	WIRE COLOR		BULB	CAPCOM P/N
		COLUMN	ROW		
65	11B TARGETING	BLU/BRN	ORG/BRN	555	LP00100
66	12B ENGINE UPGRADE	BLU/BRN	ORG/RED	555	LP00100
67	13B R STANDUP STUNT	BLU/BRN	ORG/BLK	44	LP00104
68	14B R STANDUP TOP	BLU/BRN	ORG/YEL	555	LP00100
69	15B R STANDUP BOTTOM	BLU/BRN	ORG/GRN	555	LP00100
70	16B RIGHT GI	BLU/BRN	ORG/BLU	44	LP00104
71	17B RIGHT INLANE	BLU/BRN	ORG/VIO	555	LP00100
72	18B RIGHT OUTLANE	BLU/BRN	ORG/GRY	555	LP00100
73	21B R RAMP STUNT	BLU/RED	ORG/BRN	44	LP00104
74	22B R RAMP 1	BLU/RED	ORG/RED	555	LP00100
75	23B R RAMP 2	BLU/RED	ORG/BLK	555	LP00100
76	24B R RAMP 3	BLU/RED	ORG/YEL	44	LP00104
77	25B RIGHT GI 2	BLU/RED	ORG/GRN	44	LP00104
78	26B RIGHT GI 3	BLU/RED	ORG/BLU	44	LP00104
79	27B RIGHT GI 4	BLU/RED	ORG/VIO	44	LP00104
80	28B RIGHT GI 5	BLU/RED	ORG/GRY	44	LP00104
81	31B RIGHT DROP STUNT	BLU/ORG	ORG/BRN	44	LP00104
82	32B DROP A	BLU/ORG	ORG/RED	555	LP00100
83	33B DROP I	BLU/ORG	ORG/BLK	555	LP00100
84	34B DROP R	BLU/ORG	ORG/YEL	555	LP00100
85	35B RIGHT GI 6	BLU/ORG	ORG/GRN	44	LP00104
86	36B RIGHT GI 7	BLU/ORG	ORG/BLU	44	LP00104
87	37B RIGHT GI 8&9	BLU/ORG	ORG/VIO	44	LP00104
88	41B BUMPER R	BLU/YEL	ORG/BRN	555	LP00100
89	42B BUMPER C	BLU/YEL	ORG/RED	555	LP00100
90	43B BUMPER L	BLU/YEL	ORG/BLK	555	LP00100
91	44B CENTER GI 1	BLU/YEL	ORG/YEL	44	LP00104
92	45B CENTER GI 2	BLU/YEL	ORG/GRN	44	LP00104
93	46B L STANDUP STUNT	BLU/YEL	ORG/BLU	44	LP00104
94	47B L STANDUP TOP	BLU/YEL	ORG/VIO	44	LP00104
95	48B L STANDUP BOTTOM	BLU/YEL	ORG/GRY	44	LP00104
96	51B MACH 1	BLU/GRN	ORG/BRN	555	LP00100
97	52B MACH 2	BLU/GRN	ORG/RED	555	LP00100
98	53B MACH 3	BLU/GRN	ORG/BLK	555	LP00100
99	55B RIGHT GI 10	BLU/GRN	ORG/YEL	44	LP00104
100	55B LANE J	BLU/GRN	ORG/GRN	44	LP00104
101	56B LANE E	BLU/GRN	ORG/BLU	44	LP00104
102	57B LANE T	BLU/GRN	ORG/VIO	44	LP00104
103	58B SPINNER GI 1&2	BLU/GRN	ORG/GRY	44	LP00104

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

BACKBOX REFERENCE LOCATION



P4E0100

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

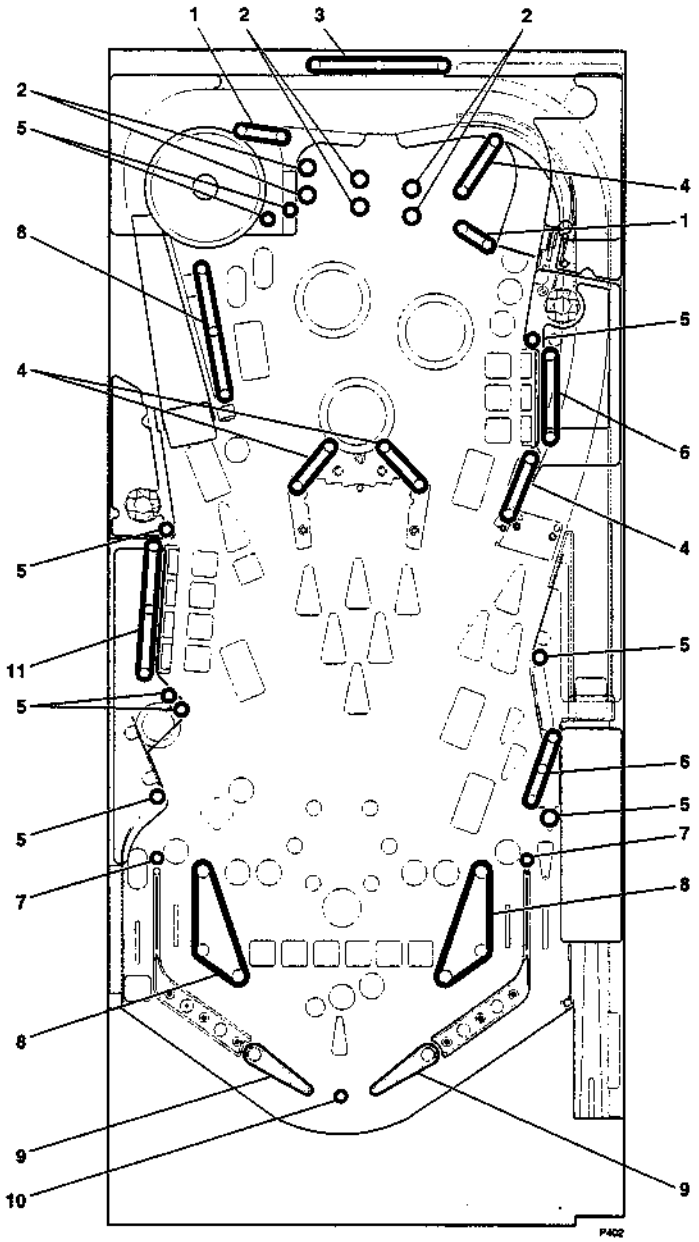
LAMP BOARD REFERENCE & PARTS LIST

LAMP BOARD REF. DES.	SOFTWARE TEST REF. C1-04	BULB TYPE HARDWIRED		ROW DRIVER — TO LAMP DIODE REQUIRED
		BULB #	CAPCOM® PART NO.	
1	61B - BB 21	44	LP00104	YES
2	62B - BB 22	44	LP00104	YES
3	63B - BB 23	44	LP00104	YES
4	64B - BB 24	44	LP00104	YES
5	65B - BB 25 & 26	44	LP00104	YES
6	65B - BB 25 & 26	44	LP00104	YES
7	66B - BB 27 & 28	44	LP00104	YES
8	66B - BB 27 & 28	44	LP00104	YES
9	67B - BB 29	44	LP00104	YES
10	68B - BB 30	44	LP00104	YES
11	71B - BB 11	44	LP00104	YES
12	72B - BB 12	44	LP00104	YES
13	73B - BB 13 & 14	44	LP00104	YES
14	73B - BB 13 & 14	44	LP00104	YES
15	74B - BB 14 & 15	44	LP00104	YES
16	74B - BB 14 & 15	44	LP00104	YES
17	75B - BB 17	44	LP00104	YES
18	76B - BB 18	44	LP00104	YES
19	77B - BB 19	44	LP00104	YES
20	78B - BB 20	44	LP00104	YES
21	81B - BB 1 & 2	44	LP00104	YES
22	81B - BB 1 & 2	44	LP00104	YES
23	82B - BB 3 & 4	44	LP00104	YES
24	82B - BB 3 & 4	44	LP00104	YES
25	83B - BB 5	44	LP00104	YES
26	84B - BB 6	44	LP00104	YES
27	85B - BB 7	44	LP00104	YES
28	86B - BB 8	44	LP00104	YES
29	87B - BB 9	44	LP00104	YES
30	88B - BB 10	44	LP00104	YES
31	38B - BB 31	89	LP00103	NO
32	*S20 LEFT RAMP FLASHER, BB 1	89	LP00103	NO
33	*S21 DROP SHOW FLASH, BB 2	89	LP00103	NO
34	*S22 RIGHT LEFT STUNT FLASH, BB3	89	LP00103	NO
35	*S23 RIGHT STAND FLASH, BB 4	89	LP00103	NO
36	*S24 RIGHT RAMP FLASH, BB 5 & 6	89	LP00103	NO
37	*S24 RIGHT RAMP FLASH, BB 5 & 6	89	LP00103	NO
38	*S25 RIGHT DROP FLASH, BB 7	89	LP00103	NO
39	*S26 RIGHT REAR FLASH, BB 8	89	LP00103	NO
40	*S28 LEFT STAND FLASH, BB 9 & 10	89	LP00103	NO
41	*S28 LEFT STAND FLASH, BB 9 & 10			

***NOTE** SEE SOFTWARE TEST C1-03 (SOLENOIDS).

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

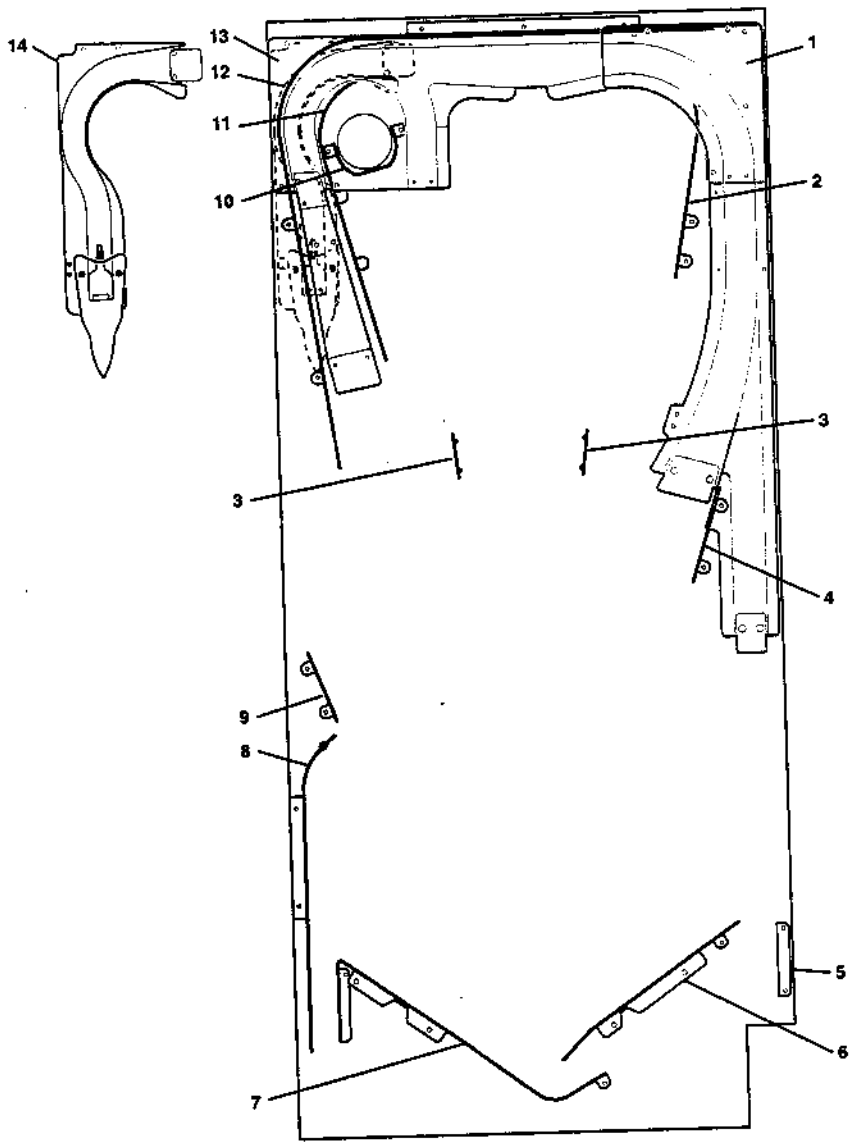
RUBBER RINGS



NO.	DESCRIPTION	CAPCOM® P/N
1	RING, RUBBER 3/4 ID BLACK	RB00108-05
2	RING, RUBBER 5/16 ID BLACK	RB00108-02
3	RING, RUBBER 2 1/2 ID BLACK	RB00108-10
4	RING, RUBBER 1 1/4 ID BLACK	RB00108-07
5	RING, RUBBER 3/16 ID BLACK	RB00108-01
6	RING, RUBBER 1 1/2 ID BLACK	RB00108-08
7	POST, MINI, BUMPER 3/8 OD BLACK	RB00117-01
8	RING, RUBBER 2 3/4 ID BLACK	RB00108-11
9	RING, RUBBER 1 1/2 ID 1/2 W BLACK	RB00114-BK
10	POST, MINI, BUMPER, 7/16 OD BLACK	RB00117-02

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

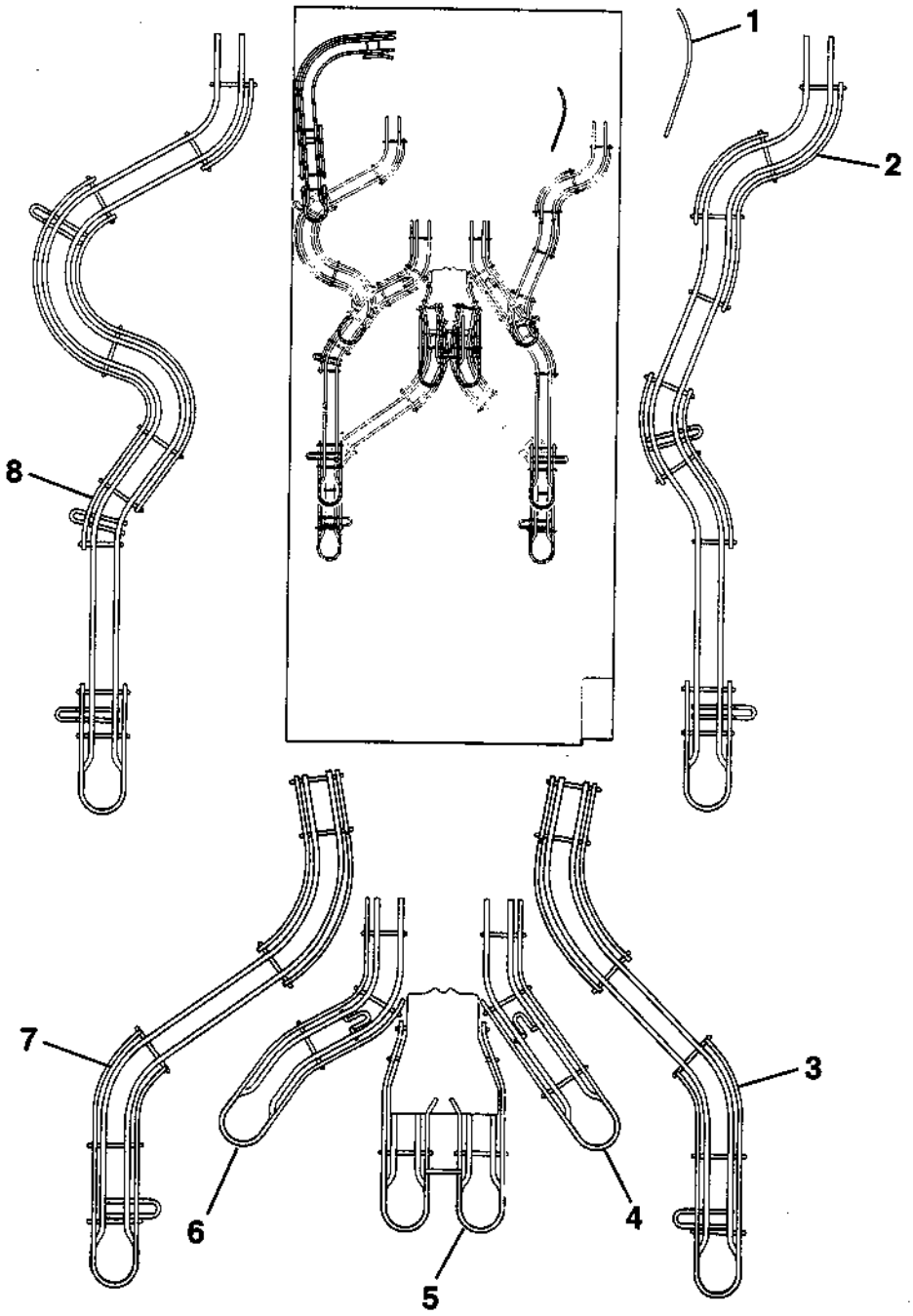
PLAYFIELD RAMPS & BALL GUIDES



NO.	DESCRIPTION	CAPCOM® P/N
1	ASSEMBLY, RAMP RIGHT, LEVEL 4	A-00485
2	ASSEMBLY, BALL GUIDE, RAMP RIGHT, END	A-00463
3	ASSEMBLY, BALL GUIDE, RAMP CENTER, LEFT AND RIGHT	A-00464
4	BALL GUIDE, RAMP RIGHT	MT-00453
5	PLATE, STRIKE, BALL DELIVERY	MT-00369
6	ASSEMBLY, BALL GUIDE, BOTTOM ARCH, RIGHT	A-00422-R
7	ASSEMBLY, BALL GUIDE, BOTTOM ARCH, LEFT	A003171
8	ASSEMBLY, BALL GUIDE, RAIL, BOTTOM, LEFT	A-00296
9	BALL GUIDE, EJECT- LEFT, BALL	MT00303
10	ASSEMBLY, BASE & HOUSING, CONT. TOWER	A-00530
11	ASSEMBLY, BALL GUIDE, RAMP-RIGHT	A-00295
12	ASSEMBLY, BALL GUIDE, RAMP-LEFT	A-002971
13	ASSEMBLY, RAMP, LEVEL 3	A-00489
14	ASSEMBLY, RAMP-LEFT, LEVEL-4	A-00626

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

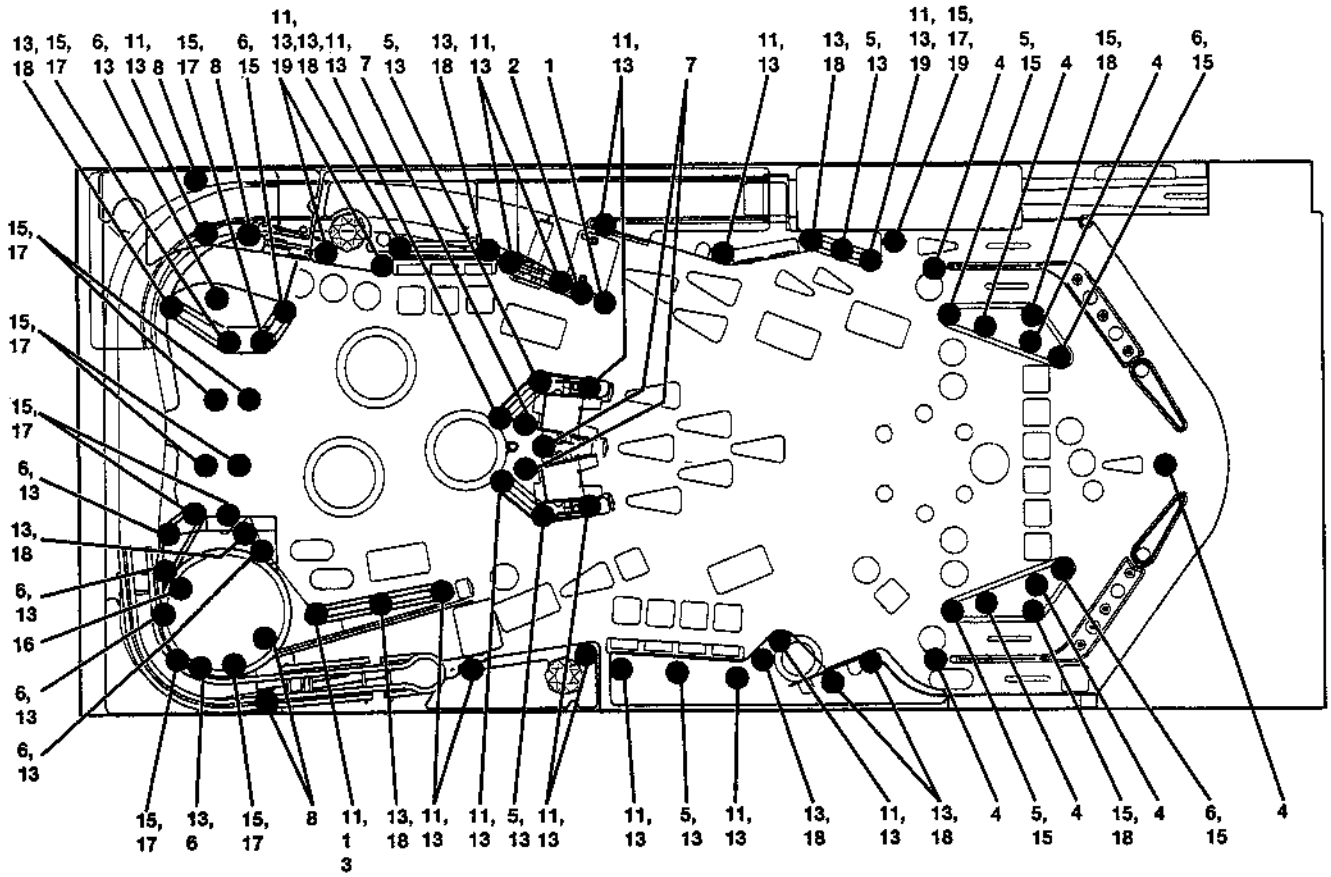
PLAYFIELD WIREFORMS



NO.	DESCRIPTION	CAPCOM® P/N
1	WIREFORM, BALL GUIDE, TOP-RIGHT	WF00130
2	ASSEMBLY, RAMP-RIGHT, WITH WIREFORM, MAIN	WF00129-R
3	WIREFORM, RIGHT, RAMP, JET	WF00128-R
4	WIREFORM, RETURN-RIGHT, RAMP-CENTER	WF00134-R
5	ASSEMBLY, RAMP, WIREFORM, JET NOSE	A-00467
6	WIREFORM, RETURN-LEFT, RAMP-CENTER	WF00134-L
7	WIREFORM, LEFT, RAMP, JET	WF00128-L
8	WIREFORM, RAMP, MAIN	WF00129-L

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

PLAYFIELD POSTS

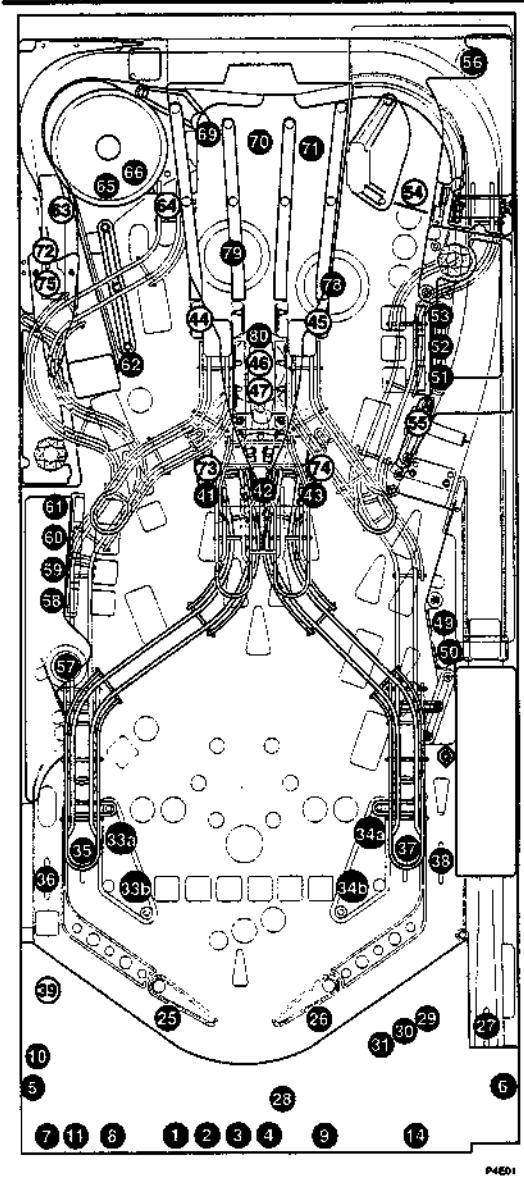


NO.	DESCRIPTION	CAPCOM®P/N
1	POST, BUMPER, 1.00 M-F, 1/2 X 0	SM00145-02
2	POST, BUMPER, 1.00 M-F, 7/8 X 1/2	SM00145-04
3	POST, BUMPER, 1.00 M-F, 7/8 X 0	SM00145-05
4	POST, BUMPER, 1.00 M-F, 7/8 X 1/2	SM00151
5	SCREW, POST, 8/32, 1-1/2 X 1/2	SM00152-02
6	SCREW, POST, 8/32, 1-1/2 X 3/8	SM00152-03
7	STANDOFF, HEX, M-F, 3.607, 1/2 X 1/2	SM00154-09
8	STANDOFF, HEX, M-F, 3.930, 1/2 X 1/2	SM00154-10
9	STANDOFF, HEX, M-F, 3.264, 1/2 X 1/4	SM00154-11
10	STANDOFF, HEX, F-F, 1.360, 1/2 X 1/2	SM00155-02
11	SCREW, POST, #8 WOOD SCREW, 1-1/2 X 3/8	SM00176-03
12	POST, SINGLE, 1.000, #8 HOLE, T/GREEN	PL00164-GT
13	POST, SINGLE, 1.000, #8 HOLE, T/ORANGE	PL00164-OT
14	POST, SINGLE, 1.000, #8 HOLE, T/YELLOW	PL00164-YT
15	POST, BUMPER, 1.000, S/B/T/ORANGE	PL00172-OT
16	POST, BUMPER, 1.000, #6, CLEAR	PL00200-N
17	SCREW, MACHINE 8-32 X 1-3/4 PPH SEMS ZC	SC00101-14
18	SCREW, SELF TAPPING, #8 X 1/2 PPH "AB" ZC	SC00104-12
19	WASHER, FLAT, #8 .375" OD .032T	WS00100-05

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

LOCATION OF SWITCHES & OPTO DETECTORS

REF. NO.	DESCRIPTION	SWITCH P/N
*1	COIN DOOR-CHUTE 1	**
*2	COIN DOOR-CHUTE 2	**
*3	COIN DOOR-CHUTE 3	**
*4	COIN DOOR-CHUTE 4	**
*5	LEFT FLIPPER BUTTON	SW00127
*6	RIGHT FLIPPER BUTTON	SW00127
*7	"START" BUTTON	SW00130
*8	COIN DOOR OPEN (MODE)	SW00132
*9	COIN DOOR - SLAM TILT	SW00121
*10	TILT BOB	A-00065-1
*11	"CONTINUE" BUTTON	SW00131
12-13	NOT USED	
*14	TICKET NOTCH	**
15-24	NOT USED	
25	LEFT FLIPPER EOS	SW00127



P4E01

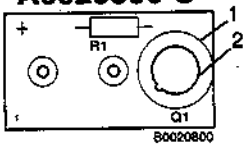
REF. NO.	DESCRIPTION	SWITCH P/N	OPTO RECEIVER P/N	OPTO XMTR. P/N
26	RIGHT FLIPPER EOS	SW00127		
27	SHOOTER LANE	SW00112		
28	OUTHOLE	SW00113		
29	TROUGH 1 OPTO		A0015604-3R	A0015702-3R
30	TROUGH 2 OPTO			
31	TROUGH 3 OPTO			
32	NOT USED			
33a	LEFT SLING -TOP	A-00539-2		
33b	LEFT SLING-BOTTOM	A-00539-1		
34a	RIGHT SLING-TOP	A-00539-1		
34b	RIGHT SLING-BOTTOM	A-00539-2		
35	LEFT INLANE	SW00111		
36	LEFT OUTLANE	SW00111		
37	RIGHT INLANE	SW00111		
38	RIGHT OUTLANE	SW00111		
39	LEFT LOCK OPTO 1		A0020500-R	A0020601
40	NOT USED			
41	RAMP C STAND L	SW00117		
42	RAMP C STAND C	SW00117		
43	RAMP C STAND R	SW00117		
44	JET LANE LEFT OPTO		A0020800-S	A0020601
45	JET LANE RIGHT OPTO		A0020800-S	A0020601
46	JET LOCK BACK OPTO		A0018501-S	A0018401
47	JET LOCK FRONT OPTO			
48	NOT USED			
49	STAND RIGHT TOP	SW00115		
50	STAND RIGHT BOTTOM	SW00115		
51	DROP R	SW00106		
52	DROP I	SW00106		
53	DROP A	SW00106		
54	SPINNER	SW00107		
55	RAMP RIGHT	SW00117		
56	SAUCER LOCK RIGHT	SW00135		
57	LEFT SAUCER LOCK	SW00135		
58	DROP W	SW00106		
59	DROP O	SW00106		
60	DROP H	SW00106		
61	DROP S	SW00106		
62	RAMP LEFT STAND	SW00115		
63	RAMP LEFT OPTO		A0020800-S	A0020901
64	TOWER EXIT OPTO		A0020800-S	A0020901
65	STAND LEFT TOP	SW00115		
66	STAND LEFT BOTTOM	SW00115		
67-68	NOT USED			
69	LANE J	SW00111		
70	LANE E	SW00111		
71	LANE T	SW00111		
72	UNDER RAMP OPTO		A0020800-S	A0020901
73	LEFT SCOOP OPTO		A-00037-R	A-00037-T
74	RIGHT SCOOP OPTO		A-00037-R	A-00037-T
75	HIGH ORBIT OPTO		A0020800-S	A0020901
76-77	NOT USED			
78	STAR BUMPER RIGHT	SW00126		
79	STAR BUMPER LEFT	SW00126		
80	STAR BUMPER CENTER	SW00126		

*** NOTE: SWITCH IS LOCATED IN CABINET.**
**** NOTE: NOT SERVICED SEPARATELY.**

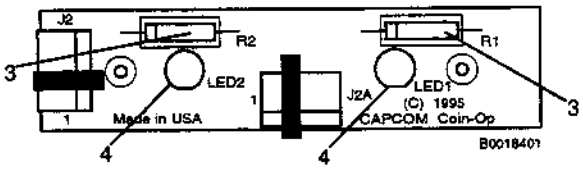
Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

OPTO BOARDS

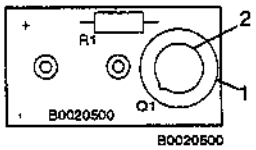
A0020800-S



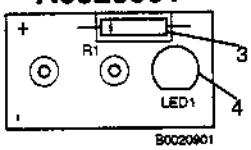
A0018401



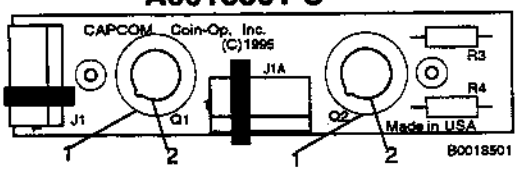
A0020500-R



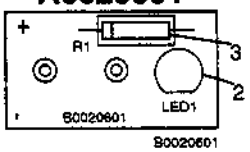
A0020901



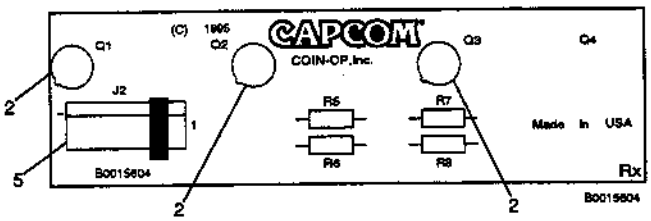
A0018501-S



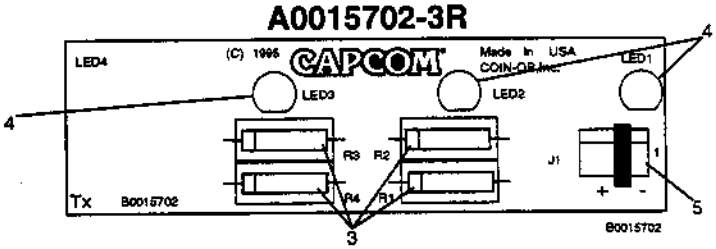
A0020601



A0015604-3R



A0015702-3R

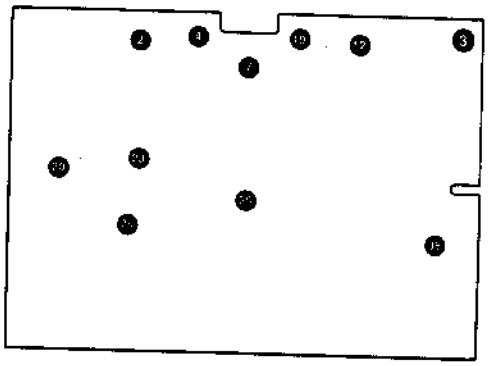


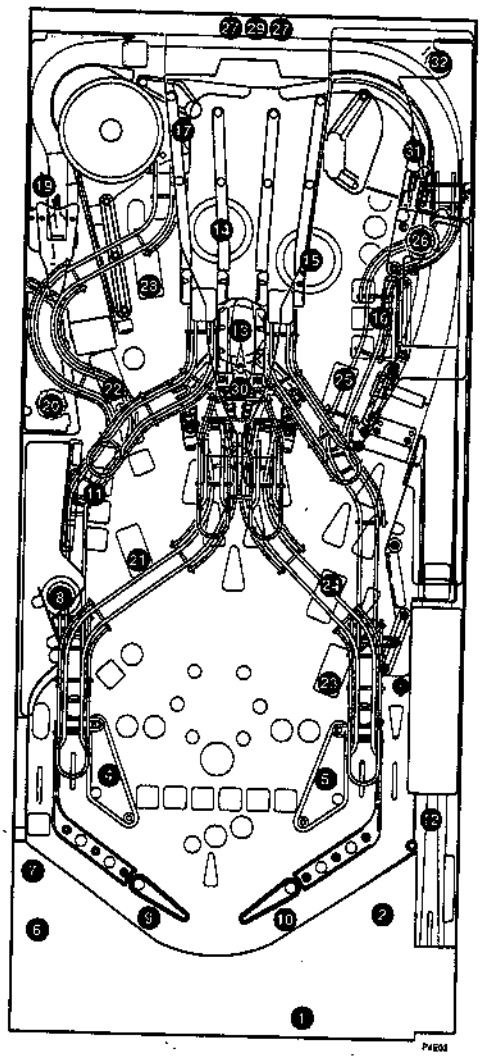
REF.	DESCRIPTION	COMPONENT P/N	OPTO BOARD ASSEMBLY P/N & COMPONENT							
			A0020800-S	A0020901	A0018401	A0018501-S	A0020500-R	A0020601	A0015604-3R	A0015702-3R
1	SHROUD	PL00284	1			2	1			
2	TRANSISTOR 21T313 NPN PHOTO	TR00104	1			2	1		3	
3	RESISTOR CF 1W 5% 560 OHM	RS00112-02		1	2			1		
3	RESISTOR CF 1/4W 5% 2.7K OHM	RS00100-35					1			
3	RESISTOR CF 1/2W 5% 620 OHM	RS00101-10								1
4	IRED 21E187 100MA T-1 3/4	DI00103		1	1			1		3
5	CONNECTOR HEADER .100 R/A 7-PIN	CN00137-07							1	
5	CONNECTOR HEADER .100 R/A 4-PIN	CN00137-04								1

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

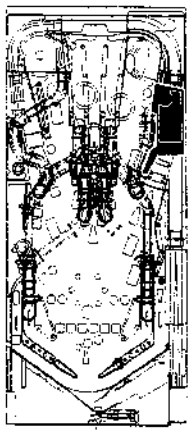
LOCATION OF SOLENOIDS, AND FLASHERS

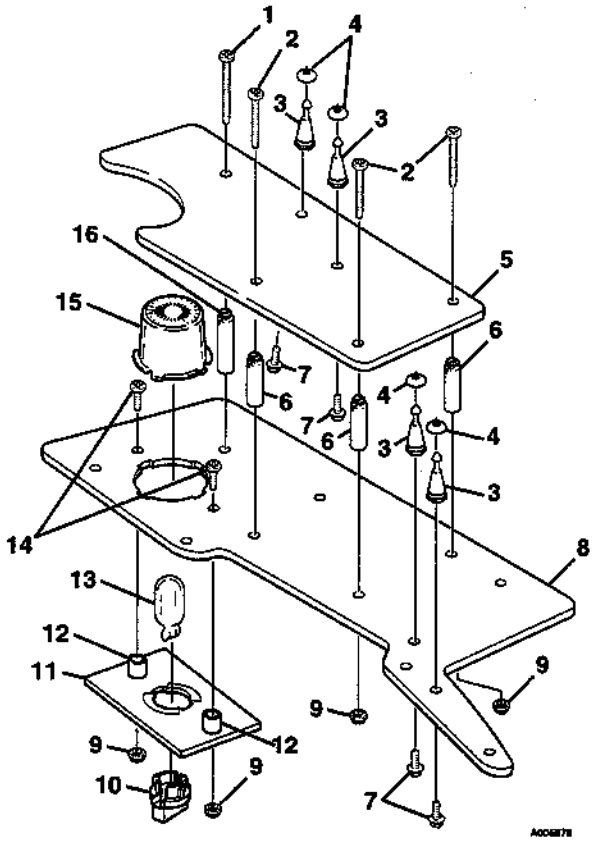
REF	DESCRIPTION	CAPCOM® P/N
1	OUTHOLE	CL00109
2	TROUGH	CL00109
3	KNOCKER	CL00109
4	LEFT SLING	CL00109
5	RIGHT SLING	CL00109
6	NEAR LOCK KICKER	CL00109
7	NEAR LOCK DOOR	CL00109
8	NEAR SAUCER	CL00109
9	LEFT FLIPPER	CL00111
10	RIGHT FLIPPER	CL00111
11	DROP SHOW	CL00109
12	NEAR RIGHT SAUCER	CL00109
13	CENTER BUMPER	CL00109
14	LEFT BUMPER	CL00109
15	RIGHT BUMPER	CL00109
16	DROP AIR	CL00109
17	TOWER DIVERTER	CL00109
18	NOT USED	----------
19	LEFT RAMP	CL00109
20	LEFT RAMP FLASHER (PLAYFIELD)	LP00101
20	BACKBOX FLASHER 1	LP00103
21	DROP SHOW FLASH (PLAYFIELD)	LP00101
21	NOT USED	----------
22	RIGHT, LEFT, STUNT FLASH (PLAYFIELD)	LP00101
22	TOWER FLASHER	LP00101
22	BACKBOX FLASHER 3	LP00103
23	RIGHT STAND FLASH (PLAYFIELD)	LP00101
23	BACKBOX FLASHER 4	LP00103
24	RIGHT RAMP FLASH (PLAYFIELD)	LP00101
24	BACKBOX 5 AND 6	LP00103
25	RIGHT DROP FLASH (PLAYFIELD)	LP00101
25	BACKBOX FLASHER 7	LP00103
26	RIGHT REAR FLASH (PLAYFIELD)	LP00101
26	BACKBOX FLASHER 8	LP00103
27	LEFT BACK FLASH	LP00101
28	LEFT STAND FLASH (PLAYFIELD)	LP00101
28	BACKBOX FLASHER 9 AND 10	LP00103
29	BACK KICKER	CL00109
30	CENTER LOCK	CL00109
31	RIGHT DIVERTER	CL00109
32	RIGHT LOCK	CL00109





Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.



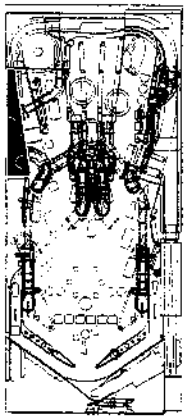


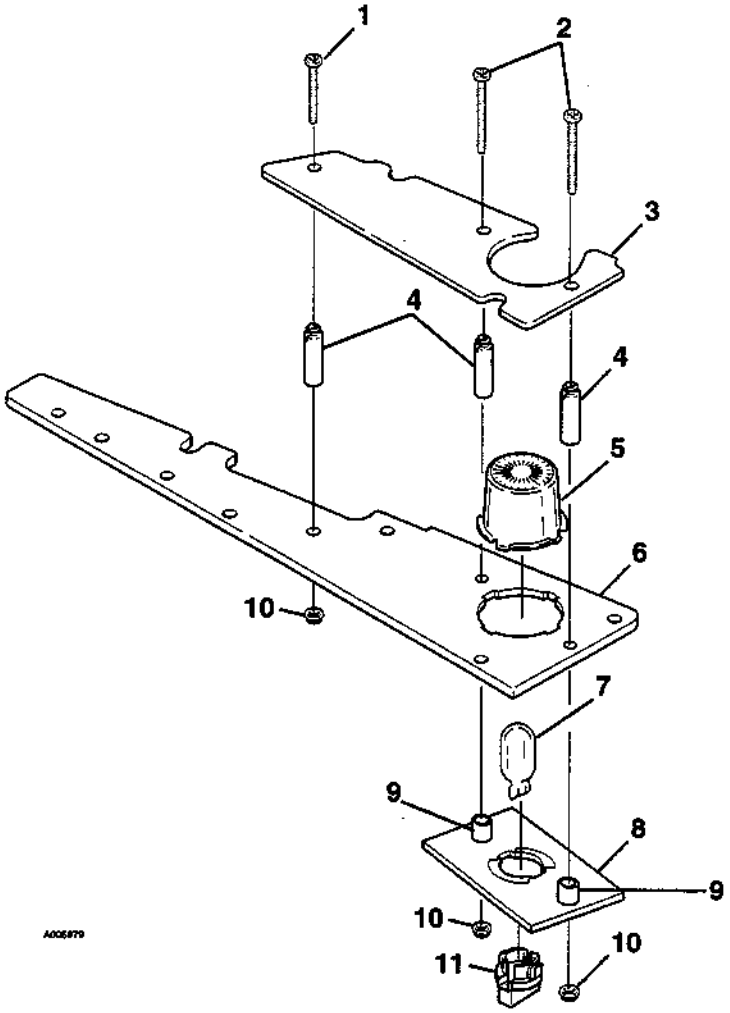
3 BANK DROP PLASTIC ASSEMBLY

No.	Part Number	Description	Req.
	A-00597-8	ASSEMBLY, PLASTIC, 3 BANK DROP	
		consists of the following parts:	
1	SC00165-12	MACHINE SCREW 8-32 X 1-1/2 PTH ZC	1
2	SC00165-10	MACHINE SCREW 8-32 X 1-1/4 PTH ZC	3
3	PL00200-N	POST, BUMPER, 1.000" #6	4
4	RB00117-02	BUMPER, MINI-POST	4
5	AW00125-27	PLASTIC OVER 3 BANK	1
6	PL00237-05	SPACER, SELF RETAINING, #8 BLACK NYLON X 3/4	3
7	SC00121-03	STS #6 X 3/8 SLHWH "AB" ZC	4
8	AW00125-11	PLASTIC, 3 BANK DROP	1
9	NT00104-08	NUT 8-32 STOP NYLON INS ZC	6
*10	SK00103	SOCKET, LP WEDGE PCB T-5	1
11	A0010700	PC BOARD	1
12	PL00108-01	SPACER, #8 X 1/4 SELF RETAINING	2
*13	LP00101	LAMP, #906 13V WEDGE T-15	1
14	SC00165-06	MACHINE SCREW 8-32 X 3/4 PTH ZC	2
15	PL00165-YT	LITE DOME, MINI-MARS, T-YEL	1
16	PL00237-07	SPACER, SELF RETAINING, #8 X 1.0, BLACK	1

*NOTE: REFERENCE ONLY- NOT INCLUDED WITH ASSEMBLY. MUST BE PURCHASED SEPARATELY.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.



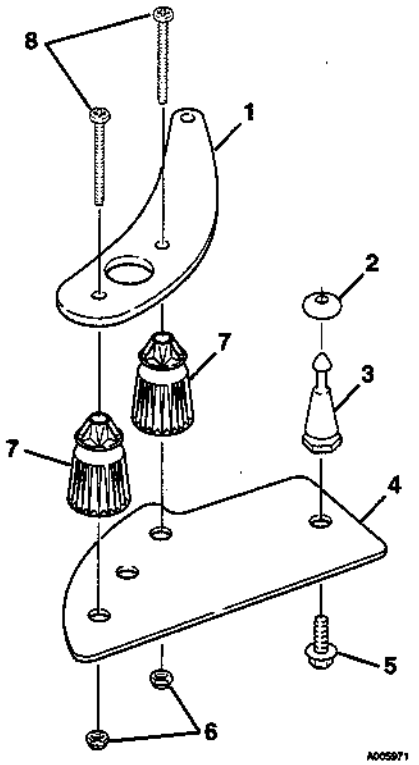


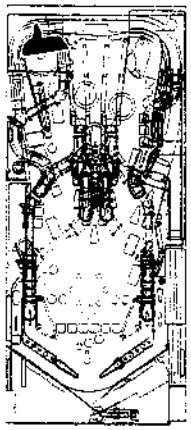
UP/DOWN RAMP-LEFT PLASTIC ASSEMBLY

No.	Part Number	Description	Req.
	A-00597-9	ASSEMBLY, PLASTIC, UP/DOWN RAMP-LEFT	
		consists of the following parts:	
1	SC00165-12	MACHINE SCREW 8-32 X 1-1/2 PTH ZC	1
2	SC00165-16	MACHINE SCREW 8-32 X 2.00 PTH ZC	2
3	AW00125-9	PLASTIC, OVER UP & DOWN RMP, LEFT	1
4	PL0237-06	SPACER, SELF RETAINING, #8 SLACK NYLON	3
5	PL00165-YT	LITE DOME, MINI-MARS, T/YEL	1
6	AW00125-7	PLASTIC, LEFT UP AND DOWN RAMP	1
*7	LP00101	LAMP, #906 13V WEDGE T-15	1
8	A0010700	ASSEMBLY, PCB BOARD	1
9	PL00108-01	SPACER, #8 X 1/4 SELF RETAINING	2
10	NT00104-08	NUT 8-32 STOP NYLON INS ZC	3
*11	SK00103	SOCKET, LP WEDGE PCB T-5	1

*NOTE: REFERENCE ONLY- NOT INCLUDED WITH ASSEMBLY. MUST BE PURCHASED SEPARATELY.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

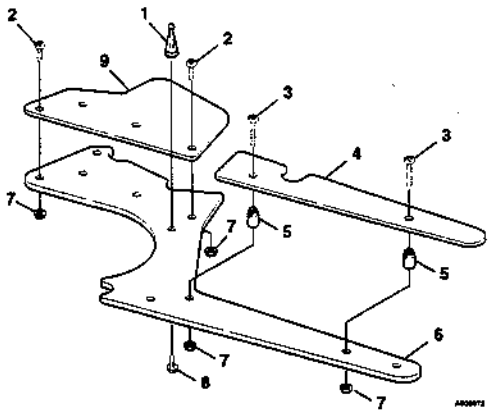


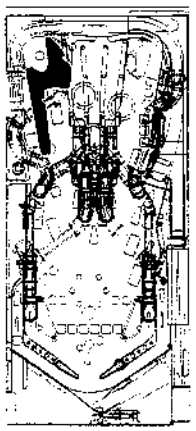


BELOW TOWER PLASTIC ASSEMBLY

No.	Part Number	Description	Req.
	A-00597-1	ASSEMBLY, PLASTIC, BELOW TOWER *consists of the following parts:*	
1	AW00125-43	PLASTIC, BALL GUIDE	1
2	RB00117	BUMPER, MINI-POST	1
3	PL00200-N	POST, BUMPER, 1.000" #6	1
4	AW00125-22	PLASTIC, UNDER TOWER	1
5	SC00121-03	STS #6 X 3/8 SLHWH "AB" ZC	1
6	NT00104-08	NUT 8-32 STOP NYLON INS ZC	2
7	PL00172-0T	POST, BUMPER, 1.000, S/B, T/ORG	2
8	SC00101-13	MACHINE SCREW 8-32 X 1 5/8 PPH SEMS ZC	2

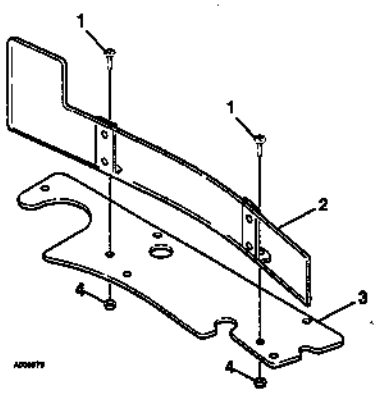
Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

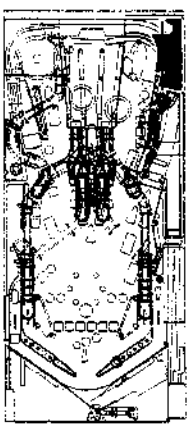




RIGHT SIDE LEFT RAMP PLASTIC ASSEMBLY

No.	Part Number	Description	Req.
	A-00597-2	ASSEMBLY, PLASTIC, L-RAMP, RIGHT SIDE	
		consists of the following parts:	
1	PL00200-N	POST, BUMPER, 1.000", #6	1
2	SC00165-03	MACHINE SCREW 8-32 X 3/8 PTH ZC	2
3	SC00165-06	MACHINE SCREW 8-32 X 3/4 PTH ZC	2
4	AW00125-32	PLASTIC, RIGHT SIDE OF UP AND DOWN RAMP	1
5	PL00237-01	SPACER, SELF RETAINING, #8 BLACK NYLON	2
6	AW00125-29	RIGHT SIDE OF UP AND DOWN LEFT RAMP	1
7	NT00104-08	NUT 8-32 STOP NYLON INS ZC	4
8	SC00121-03	STS #6 X 3/8 SHWH "AB" ZC	1
9	AW00125-42	PLASTIC, UNDER TOWER	1

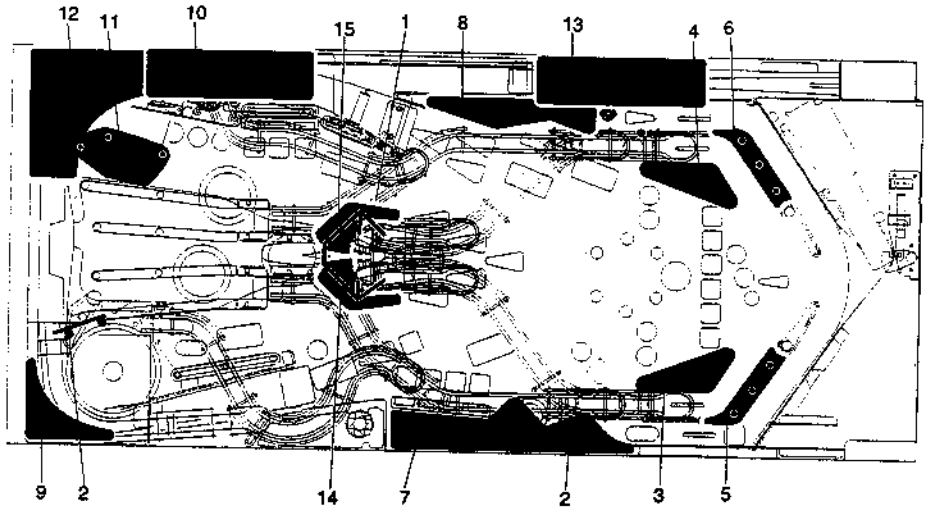


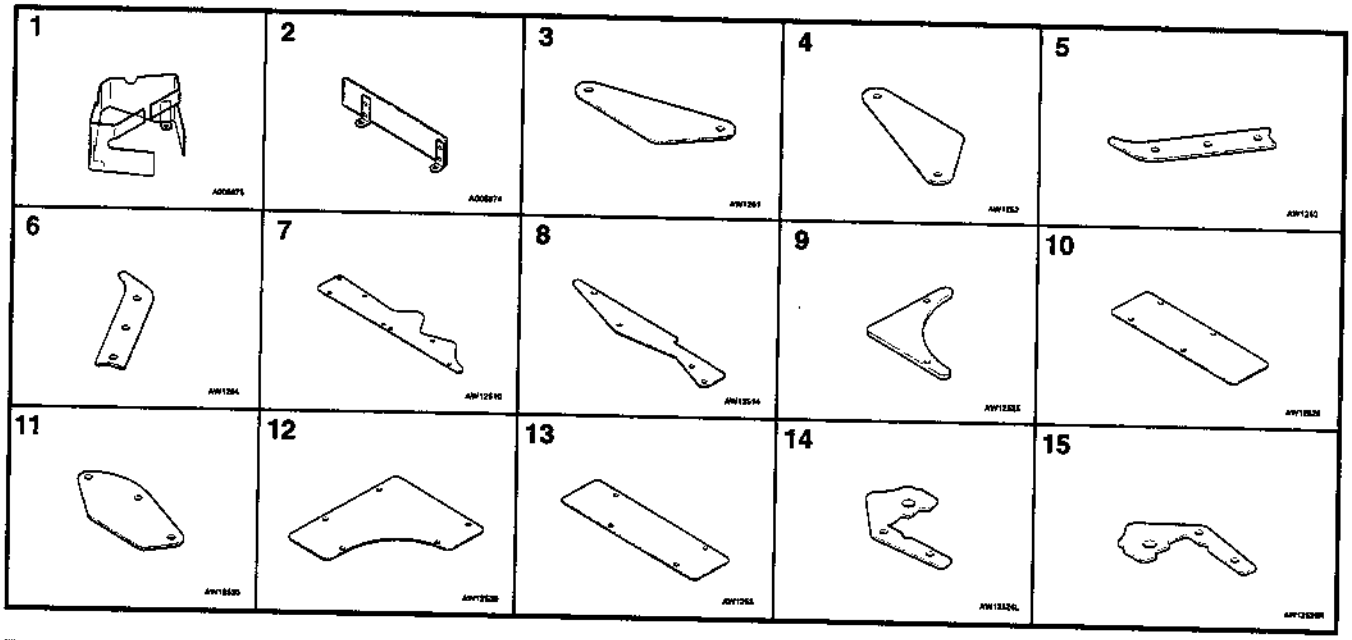


TOP RIGHT EJECT PLASTIC ASSEMBLY

No.	Part Number	Description	Req.
	A-00597-6	ASSEMBLY, PLASTIC, EJECT, TOP RIGHT	
		consists of the following parts:	
1	SC00101-03	MACHINE SCREW 8-32 X 3/8 SEMS ZC	2
2	A-00597-7	ASSEMBLY, SUB, PLASTIC, TOP RIGHT	1
3	AW00125-8	PLASTIC, TOP RIGHT EJECT	1
4	NT00104-08	NUT, 8-32 STOP NYLON INS ZC	1

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

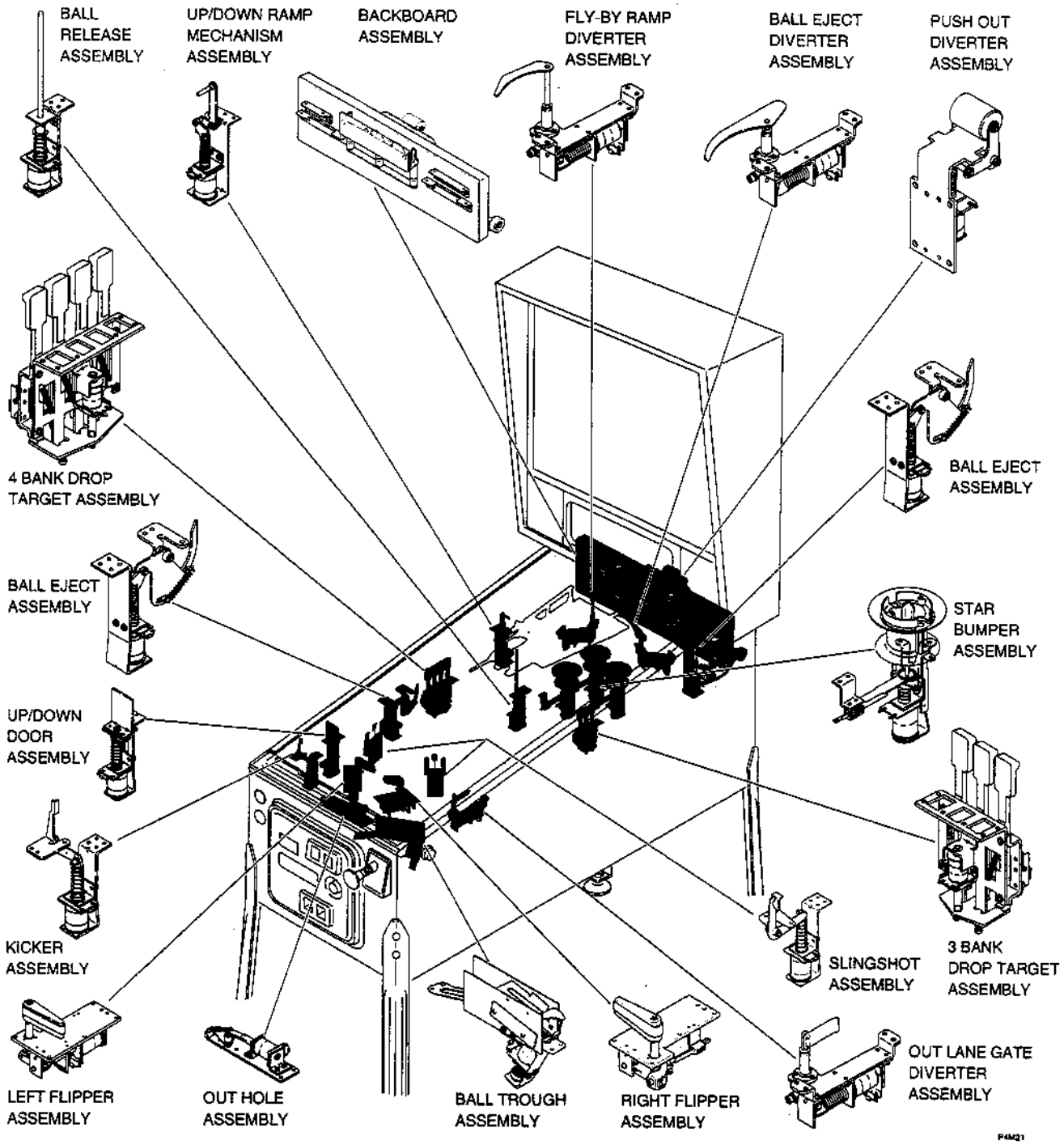




No.	Part Number	Description	Req.
1	A-00597-5	ASSEMBLY, PLASTIC, SHIELD, SCOOPS	1
2	A-00597-4	ASSEMBLY, PLASTIC, LOWER-L/S, DEFLECTOR	1
3	AW00125-1	PLASTIC, SLING SHOT, LEFT	1
4	AW00125-2	PLASTIC, SLING SHOT, RIGHT	1
5	AW00125-3	PLASTIC, DRAIN LANE, LEFT	1
6	AW00125-4	PLASTIC, DRAIN LANE, RIGHT	1
7	AW00125-10	PLASTIC, 4-BANK DROP	1
8	AW00125-14	PLASTIC, GATE LOWER RIGHT	1
9	AW00125-25	PLASTIC, CORNER TOP LEFT	1
10	AW00125-26	PLASTIC, RAMP COVER	1
11	AW00125-30	PLASTIC, SPINNER	1
12	AW00125-39	PLASTIC, UPPER RIGHT RAMP	1
13	AW00125-5	PLASTIC, SHOOTER LANE	1
14	AW00125-6L	PLASTIC, CENTER SCOOP, LEFT	1
15	AW00125-6R	PLASTIC, CENTER SCOOP, RIGHT	1

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

COMPONENT IDENTIFICATION - PLAYFIELD MECHANISMS



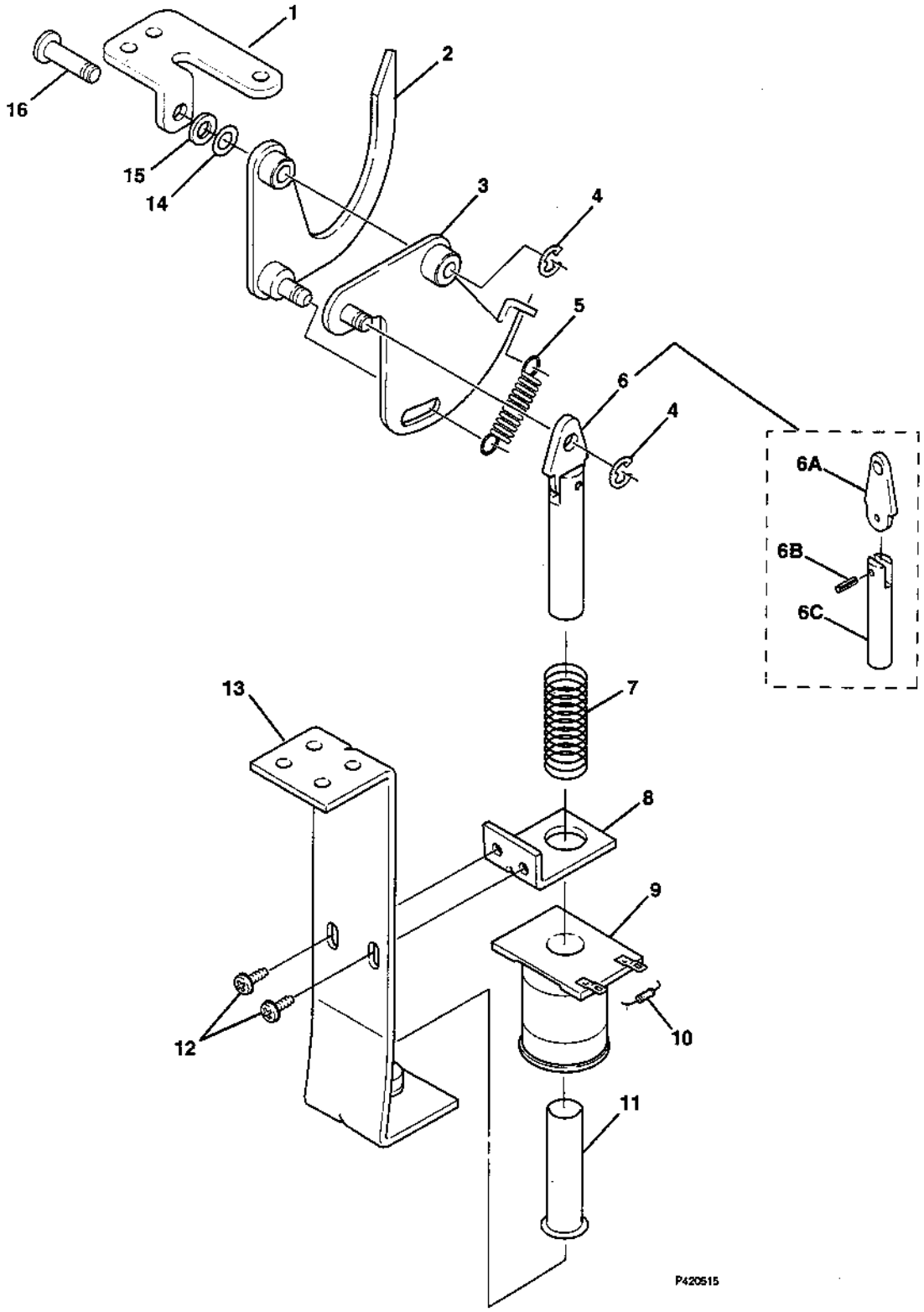
Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

BALL EJECT DIVERTER ASSEMBLY

No.	Part Number	Description	Req.
	A-00605	ASSEMBLY, BALL EJECT, DIVERTER	
		consists of the following parts:	
1	MT00181-R	BRACKET, DIVERTER, RIGHT	1
2	A-00134-1	ASSEMBLY, BRACKET, COIL STOP	1
3	SC00101-02	MACHINE SCREW 8-32 X 1/4 PPH SEMS ZC	6
4	CL00109	COIL, 800T #23	1
5	DI00100	DIODE 1N4004 RECT 1.0A 400VR	1
			1
6	PL00132-03	SLEEVE, COIL	1
7	MT00185-1	BRACKET, COIL RETAINING	1
8	SG00104-1	SPRING, COMP.	1
9	A-00228	ASSEMBLY, PLUNGER/LINK, 34°	1
		consists of the following parts:	
9A	SM00113-05	PLUNGER, CLEVIS, 34°	1
9B	PL00150	LINK, PLUNGER, 34°	1
9C	MT00183-1	CLAMP, SHAFT	1
9D	RP00100-04	PIN, ROLL 1/8 X 1/2" L	2
			1
10	NT00104-11	NUT, 10-32 STOP NYLON INS ZC	1
11	SC00135-05	CAP SCREW 10-32 X 5/8 SH ALLOY	1
12	A-00227	ASSEMBLY, BLADE & SHAFT	1
13	MT00323	BRACKET, LINK STOP	1
14	PL00149	BUSHING, FLIPPER	1
			1
15	SC00100-03	MACHINE SCREW 6-32 X 3/8 PPH SEMS ZC	3
16	RR00100-25	E-RING FOR 0.250 D. SHAFT	1

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

BALL EJECT ASSEMBLY



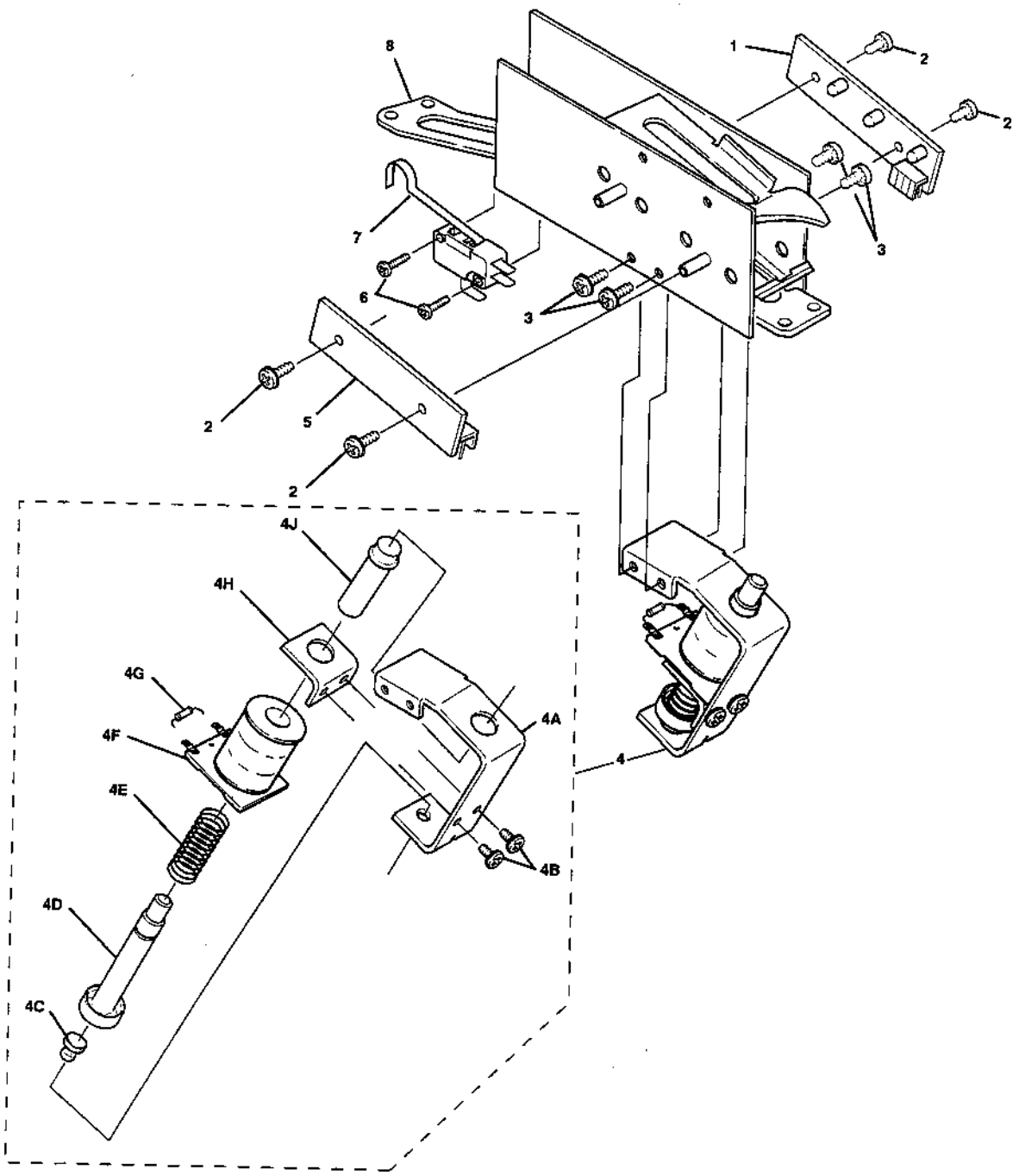
Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

BALL EJECT ASSEMBLY

No.	Part Number	Description	Req.
	A-00436-R3	ASSEMBLY, BALL EJECT	
		consists of the following parts:	
1	MT00585-R	BRACKET, FULCRUM	1
2	A-00510	ASSEMBLY, CAM	1
3	A-00509	ASSEMBLY, ARM, CAM	1
4	RR00100-25	E-RING, EXT. FOR .250" D SHAFT	2
5	SG00124	SPRING, BALL EJECT	1
6	A-00329	ASSEMBLY, PLUNGER/LINK	1
		consists of the following parts:	
6A	PL00246	LINK, PLUNGER, BLUE	1
6B	RP00100-06	PIN, ROLL 1/8 X 5/8	1
6C	SM00113-06	PLUNGER, CLEVIS 2.000"L	1
7	SG00123	SPRING COMP.	1
8	MT00136-01	BRACKET, COIL RETAINING	1
9	CL00109	COIL, 800T #23	1
10	DI00100	DIODE, 1N4004 RECT 1.0A 400VR	1
11	PL00132-01	SLEEVE, COIL, 1.745"	1
12	SC00101-02	MACHINE SCREW 8-32 X 1/4 PPH SEMS ZC	2
13	A-00508	ASSEMBLY, BRACKET, COIL MOUNTING	1
14	WS00100-22	WASHER, FLAT .266 ID .500 OD .012T	1
15	WS00100-21	WASHER, FLAT .266 ID .500OD .040T	1
16	SM00212	PIVOT, EJECT ARM	1

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

BALL TROUGH ASSEMBLY



P117590

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

BALL TROUGH ASSEMBLY, 3 BALLS

No.	Part Number	Description	Req.
	A-00411-3R	ASSEMBLY, BALL TROUGH, 3 BALLS	
		consists of the following parts:	
1	*A0015702-3R	ASSEMBLY, OPTO, TRANSMITTER	1
2	SC00100-04	MACHINE SCREW 6-32 X 1/4 PPH SEMS ZC	4
3	SC00101-03	MACHINE SCREW 8-32 X 3/8 PPH SEMS ZC	4
4	A-00371	ASSEMBLY, KICKER, BALL TROUGH	1
		consists of the following parts:	
4A	MT00378	BRACKET, KICKER ASSEMBLY	1
4B	SC00101-03	MACHINE SCREW 8-32 X 3/8 PPH SEMS ZC	2
4C	RB00103	BUTTON, RUBBER	1
4D	A00369	ASSEMBLY, PLUNGER/TIP	1
4E	SG00103	SPRING, COMP.	1
4F	CL00109	COIL, 8000T #23	1
4G	DI00100	DIODE 1N4004 RECT 1.0A 400VR	1
4H	MT00191	BRACKET, COIL RETAINING	1
4J	PL00133-05	SLEEVE, COIL 1.880"L WITH .188 EXT	1
5	*A0015603-3R	ASSEMBLY, OPTO, RECEIVER	1
6	SC00120-06	MACHINE SCREW 4-40 X 3/4 PPH SEMS ZC	2
7	SW00113	SWITCH, MICRO, WITH ACTUATOR	1
8	A-00370	ASSEMBLY, SUB, TROUGH WELDMENT	1

*NOTE: REFERENCE ONLY- NOT INCLUDED IN ASSEMBLIES SHOWN. MUST BE ORDERED SEPARATELY.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

TROUBLESHOOTING GUIDE

POWER-UP PROBLEMS

SYMPTOM	POSSIBLE CAUSE	PROBABLE SOLUTION
Game Is Completely Dead -No Lights, No Sound, No Pushbuttons, No Display	Main Power Switch not set to ON position.	1. Set Main Power Switch to the ON position. (Switch located under cabinet near right front leg.)
	Broken Plug or Power Cord.	1. Inspect Cord and Plug for defects and repair or replace the entire cord set. 2. Check Plug for loose wires and tighten as required.
	No AC Power.	1. Connect Plug to AC power outlet. 2. Check building circuit breakers or fuses. 3. Check Power Transformer, Line Filter assemblies.
	Main Power Fuse defective.	1. Replace fuse with another of the exact same type. 2. Check Power Transformer, Line Filter assemblies. (Fuse located inside cabinet near right front leg.)
	Low Voltage AC Fuse defective.	1. Replace fuse with another of the exact same type. 2. Check Low Voltage DC Power rectifiers. (Fuse located inside backbox on top circuit board.)
	Low Voltage DC Fuse defective.	1. Replace fuse with another of the exact same type. 2. Check Low Voltage DC Voltage Regulator.
	Low Voltage DC Wiring Harness unplugged or damaged.	1. Check Low Voltage DC Wiring Harness Connectors. 2. Test Low Voltage DC Wiring Harness for continuity.
	Game set up for incorrect AC Line Voltage.	1. Check Power Transformer Line Voltage Wiring (Connector located near transformer in cabinet.)
Game Accepts Currency Or Tokens, But Does Not Start.	Acceptor Mechanism not seated fully on its own mounting bracket.	1. Open Coin Door and check each Acceptor by hand to ensure proper mounting. Ensure that each of the release latches is in the closed and locked position. 2. Check for switch activation when known good token or currency is inserted into Acceptor. Adjust switch or carefully bend lever to improve alignment if necessary.
	Faulty or intermittent Coin Door Wiring Harness connections.	1. Open coin door to enter System Menu, then select *Standard Tests* and go to the *Switches* routine. Check each device independently to locate trouble. 2. Look for pinched or cut wires where harness touches moving parts. Repair and reroute wires away from area.
Game Accepts Currency Or Tokens And Gives Players Instructions, But Does Not Produce A Ball To Begin Play.	High Voltage DC Power disabled.	1. Open coin door to enter System Menu, then select *Standard Tests* and go to *Voltage* to look for Check Interlock report. Pull out on switch actuator to reset. (Interlock Switch is located at left side of Coin Door.) 2. Switch damaged or broken. Replace Interlock Switch. (NOTE: The Switch routine will not test this switch!)
	High Voltage AC Fuse defective.	1. Replace fuse with another of the exact same type. 2. Check High Voltage DC Power rectifiers.
	High Voltage DC Fuse defective.	1. Replace fuse with another of the exact same type. 2. Check High Voltage DC Power filter capacitor.
	High Voltage DC Wiring Harness unplugged or damaged.	1. Check all High Voltage DC Power Wiring Connectors. 2. Check High Voltage DC Wiring Harness for continuity.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

COIN DOOR PROBLEMS

SYMPTOM	POSSIBLE CAUSE	PROBABLE SOLUTION
Game Will Not Start When Coins, Bills, Tokens, Etc. Are Inserted Into Acceptors.	Coin Door Wiring Harness unplugged or damaged.	1. Check Coin Door Wiring Harness Connectors. 2. Test Coin Door Wiring Harness for continuity.
	Acceptor Mechanism is jammed.	1. Open Coin Door, unlatch and remove Acceptor Mechanism, inspect and clear currency path as needed. 2. Object in cabinet blocking currency at Cash Box.
	Acceptor not level.	1. Repair or replace Coin Door if bent or damaged. 2. Adjust Game using internal Bubble Level.
	Cash Box filled to maximum capacity.	1. Check Cash Box for presence of counterfeit currency. 2. Remove currency from game more frequently.
	Acceptor Switch defective.	1. Open Coin Door to enter System Menu, then select Standard Tests and go to Switches to look for Dead reports. If manual switch activation does not change the Dead report then there is an electrical problem.
	Acceptor Assembly defective.	1. Clean and lubricate Acceptor Mechanism following specific manufacturer's detailed instructions. 2. Substitute known good Acceptor to verify that problem is not external to Acceptor.
Acceptor Mechanism Rejects Known Good Currency, Tokens, Etc.	Dirt or Debris in Acceptor Mechanism.	1. Open Coin Door, unlatch and remove Acceptor Mechanism, inspect and clear currency path as needed 2. Clean and lubricate Acceptor Mechanism following specific manufacturer's detailed instructions.
	Acceptor Mechanism out of adjustment.	1. Ensure that all removable parts are installed correctly and fully seated against the chassis of the Acceptor. 2. Clean and adjust Acceptor Mechanism following specific manufacturer's detailed instructions.
	Acceptor Mechanism defective.	1. Substitute known good unit to verify that problem is not external to Acceptor. 2. Repair or replace Acceptor assembly.
External Acceptor Indicators (Pricing, Flashing Arrows, Etc.) Not Illuminated.	No DC Power to indicator circuits.	1. Check Coin Door Wiring Connectors. 2. Test Coin Door Wiring Harness for continuity.
	Defective indicator lamp.	1. Go to System Menu and perform Lamp Test. 2. Substitute known good lamp to verify that problem is not external to Acceptor.
Acceptor Takes Known Good Currency But Game Will Not Start Or Continue.	Acceptor Switch out of adjustment.	1. Go to System Menu and perform Switch Test. 2. Clean and adjust Acceptor Switch following specific manufacturer's detailed instructions.
	Acceptor Switch defective.	1. Open Coin Door to enter System Menu, then select Standard Tests and go to Switches to look for Dead reports. If manual switch activation does not change the Dead report then there is an electrical problem. 2. Substitute known good switch to verify that problem is not external to Acceptor.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

DOT MATRIX DISPLAY PROBLEMS

SYMPTOM	POSSIBLE CAUSE	PROBABLE SOLUTION
Game Plays But Message Center (Dot Matrix Display) Is Completely Blank.	System Communication failure.	1. Check Communication Wiring Harness Connectors. 2. Test Communication Wiring Harness for continuity.
	Display Power Harness unplugged or damaged.	1 Check Display Power Wiring Harness Connectors. 2. Test Display Power Wiring Harness for continuity.
	Display Power AC Fuse defective.	1. Replace fuse with another of exact same type. 2. Check Display Power DC rectifiers, decoupling diode. (Fuse located inside backbox on top circuit board.)
	Display Board Assembly defective.	1. Check if any dot matrix display pixels are illuminated. 2. Inspect display glass for cracks, chips, darkened areas.
	Display Power Supply Board Assembly defective.	1. Test Display Power Supply diodes, transformer, caps. 2. Check Display Power Supply Switching Regulator IC.
Game Plays But Part Of Message Center Is Blank Or Illuminated All The Time.	System Communication failure.	1. Check Communication Wiring Harness Connectors. 2. Test Communication Wiring Harness for continuity.
	Display Board Assembly defective.	1. Inspect display glass for cracks, chips, darkened areas. 2. Check soldered connections between glass panel and printed circuit board, and resolder using minimum heat.
Random Patterns On Message Center (Some Images May Be Correct While Others Are Corrupted).	Incorrect Display Program.	1. Game or Image Memory IC installed in wrong order. 2. Music or Voice Memory IC installed on Processor Board Assembly (i.e., right chip, wrong socket). 3. Display or Game Memory IC defective. 4. Custom Control (FPGA) IC defective. 5. Microprocessor (MPU) IC defective.
	Display Board Assembly defective.	1. Open Coin Door to enter System Menu, then select Standard Tests and go to the Display routine. Check each pixel independently to locate trouble.
Checkerboard Pattern On Message Center (Display Never Changes).	No Display Program.	1. Game or Image Memory IC removed from socket. 2. Game or Image Memory IC defective.
Messages Appear Normal, Then Display Locks Up In The Same Place Every Time.	Corrupt Display Program.	1. Bent, broken, shorted pins on Memory IC. 2. Game or Image Memory IC defective.
Message Center Always In Game Menu And Troubleshooting Mode; Will Not Return To Game Play.	Coin Door open.	1. Close and lock Coin Door to go to normal game play.
	Mode Switch defective.	1. Switch Mounting Bracket bent, loose, or missing. 2. Mode Switch Wiring Harness may be faulty.
	Dirty or intermittent Mode circuit connection.	1. Check Mode Switch Wiring Harness Connectors. 2. Check Mode Switch Wiring Harness for continuity.
Game Will Not Retain Audit Information Or Custom Settings When Turned OFF. (An Error Message May Be Displayed).	Memory Back Up Battery or Memory IC defective.	1. Set Main Power Switch to the OFF position for one minute, then restore power to game. If RAM ERROR message appears, replace Processor Board Assembly. NOTE: The battery is integrated onto the Memory IC; it cannot be repaired or replaced separately.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

SOUND PROBLEMS

SYMPTOM	POSSIBLE CAUSE	PROBABLE SOLUTION
Game Plays But No Sound Is Heard At Any Time.	Volume set to zero loudness.	1. Open Coin Door to enter System Menu, then select SET VOLUME from the menu and use Flipper Buttons to adjust the sound to a comfortable loudness.
	Loudspeaker Wiring Harness unplugged or damaged.	1. Check Loudspeaker Wiring Connectors. 2. Test Loudspeaker Wiring Harnesses for continuity.
	Audio Power AC Fuse defective.	1. Replace fuse with another of exact same type. 2. Check Audio Power DC rectifiers. (Fuse located inside backbox on right side circuit board.)
	Faulty Loudspeaker.	1. Test each Loudspeaker for continuity. 2. Check each Loudspeaker for voice coil binding.
	System Communication failure.	1. Check Communication Wiring Harness Connectors. 2. Test Communication Wiring Harness for continuity.
	Sound Board Assembly defective.	1. Verify that the Light Emitting Diodes are functional. 2. Check Spike Protection Diodes, Audio Amplifier IC.
Game Plays But Sound Is Limited To Hum (Low Frequency Buzzing Noise) From All Loudspeakers.	Audio Power AC Fuse defective.	1. Replace fuse with another of exact same type. 2. Check Audio Power DC rectifiers, Filter Capacitors. (Fuse located inside backbox on right side circuit board.)
	Sound Board Assembly defective.	1. Check Audio Amplifier IC.
Weak Or Distorted Sound From One Or Two Loudspeakers.	Faulty Loudspeaker.	1. Check Loudspeakers for torn paper, liquid spills, etc. 2. Inspect speaker boxes for loose screws, dirt or debris
	Dirty or intermittent audio connections.	1. Carefully unplug and reseat each loudspeaker wire. 2. Check Loudspeaker Wiring Harnesses for continuity.
Little Or No High Frequency (Treble), Muffled Or Distant Sound Quality.	Loudspeakers disconnected.	1. Check small Loudspeakers in backbox for operation. 2. Test each small Loudspeaker for continuity. 3. Check Loudspeaker Wiring Harnesses for continuity.
Little Or No Low Frequency (Bass), Weak Or Hollow Sound Quality.	Loudspeakers disconnected or wired out of phase.	1. Check large Loudspeaker in cabinet for operation. 2. Connectors on small Loudspeakers installed in reverse. 3. Check Loudspeaker Wiring Harnesses for continuity.
Unintelligible Voice Messages, Strange Noises, Unrecognizable Music.	Incorrect Sound Program.	1. Music or Voice Memory ICs installed in wrong order. 2. Display or Game Memory ICs installed on audio board. 3. Defective Voice or Music Memory IC.
Continuous Medium Pitch Tone (Middle Frequency).	No Sound Program (1khz Self Test Tone is active).	1. Music or Voice Memory ICs removed from sockets. 2. Defective Music or Voice Memory IC.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

PLAYFIELD PROBLEMS - MECHANICAL

SYMPTOM	PROBABLE CAUSE	PROBABLE SOLUTION
Game Plays But One Or More Balls Continually Stick In One Area Of The Playfield.	Build up of dirt or debris.	1. Clean the playfield to remove any spills or sticky substances. Check for depressions on playfield surface. 2. Replace cracked cabinet glass or other sources of leaks.
	Loose screws cause parts to shift out of alignment.	1. Reposition parts and retighten screws firmly. 2. Apply removable threadlocking adhesive to fasteners.
	Damaged or broken guides, troughs, forms, etc.	1. Cracked or deformed items should be replaced. 2. Broken joints may be brazed or welded as a repair.
	Binding trip lever on position detection switch.	1. Move wiring harness out of lever path. 2. Loosen mounting screws and adjust switch position. 3. Carefully bend trip lever to improve alignment. 4. Repair or replace detection switch.
	Insufficient solenoid force to eject ball from assembly.	1. Clean and lubricate assembly linkages, bearings, etc. 2. Ensure that correct solenoid return spring is installed. 3. Open Coin Door to enter System Menu, then select Standard Tests and go to Sol. Volts to look for Low Voltage report. Check Power Transformer Line Voltage Wiring. (Connector located near transformer in cabinet.) 4. Check playfield angle using a protractor or level.
Game Plays OK But Balls Hit Hard And Bounce Too Much.	Excessive solenoid force.	1. Rubber bumper button damaged or missing from one or more solenoid assemblies. 2. Ensure that correct solenoid return spring is installed. 3. Open Coin Door to enter System Menu, then select Standard Tests and go to Sol. Volts to look for Hi Voltage report. Check Power Transformer Line Voltage Wiring. (Connector located near transformer in cabinet.) 4. Check playfield angle using a protractor or level.
Premature Breakage Of Posts, Targets, Buttons, Or Other Plastic Parts.	Aftermarket replacement parts installed during previous game repair.	1. Use only new *factory* parts and assemblies for repairs. Other parts may fit and function but they will not last. 2. Fasteners tightened excessively, cracking parts during installation. Do not use too much force when tightening.
One Or More Balls Are Missing When The Game Is Started Or In Play	Mechanical part failure or poor alignment (ball dropped in cabinet, stuck somewhere on the playfield, etc.)	1. Game will automatically initiate its own "ball search" by cycling through each solenoid and motor assembly a few times to dislodge a ball stuck on the playfield. 2. After an unsuccessful attempt at freeing a missing ball, the game will resume operation with fewer balls. A game will continue with only one ball.
	Ball removed from game or placed in cabinet during service.	1. Locate missing ball in cabinet and return to playfield. Game will accept ball and return to normal operation. 2. Check your pockets!
Ball Trough Is Inoperative (Jams, Not Able To Eject A Ball For The Shooter, Etc.)	Binding trip lever on position detection switch.	1. Check harness for wires caught in lever path. Relocate wires so they can not get into switch lever path again. 2. Loosen mounting screws and adjust switch position. Carefully bend lever to improve alignment if necessary. 3. Repair or replace detection switch.
	Loose part caught in Ball Trough Assembly.	1. Remove Bottom Arch from playfield to expose the interior of the Ball Trough Assembly. Extract loose part and realign as necessary to restore proper operation. 2. Reinstall Bottom Arch and loose part onto playfield.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

PLAYFIELD PROBLEMS - MECHANICAL (CONT.)

SYMPTOM	PROBABLE CAUSE	POSSIBLE SOLUTION
Tilt Or Slam Switches Are Stuck, Causing Constant Game Tilt	An item in the cabinet is pressing against the switch, causing a false Tilt or Slam indication.	1. Open Coin Door to enter System Menu, then select Standard Tests and go to the Switches routine. Check each device independently to locate trouble. 2. Look for objects that can touch either switch when the Coin Door would be in its closed and locked position.
	Loose part caught in mechanism.	1. Check Tilt Switch Assembly for loose thumbscrew on weight or hookwire separated from hanger bracket. 2. Make sure that playfield bottom assemblies do not contact either switch. Realign and tighten fasteners.

PLAYFIELD PROBLEMS - SOLENOIDS & MOTORS

SYMPTOM	PROBABLE CAUSE	POSSIBLE SOLUTION
Solenoids Firing Randomly, Sometimes Two At One Time.	Faulty or intermittent solenoid connections.	1. Open coin door to enter System Menu, then select Standard Tests and go to the Solenoids routine. Check each device independently to locate trouble. 2. Look for pinched or cut wires where harness touches moving parts. Repair and reroute wires away from area. 3. Damaged or missing diodes on solenoid coils. 4. Test Communication Wiring Harness for continuity.
	Driver Board Assembly defective.	1. Damaged or missing diodes on Driver Board Assembly. Repair or replace Driver Board Assembly.
Motors Running Too Long Or Not Long Enough When Game Assembly Is Active.	Limit Switches not activated at the correct time.	1. Check motorized assembly for dirt and debris blocking motion. Clean and lubricate linkages, bearings, etc. 2. Open coin door to enter System Menu, then select Feature Tests and go to the Wand or Stage routine. Check each device independently to locate trouble. 3. Carefully bend trip lever to improve alignment.
	Gearmotor Assembly defective.	1. Gears worn or teeth broken. Replace entire assembly.
Flippers Respond Too Slowly Or Do Not Reset Quickly.	Flipper Assembly binding or defective.	1. Clean and lubricate assembly linkages, bearings, etc. 2. Ensure that correct solenoid return spring is installed. 3. Open coin door to enter System Menu, then select Standard Tests and go to the Solenoids routine. Check each device independently to locate trouble.
None Of The Solenoids Work.	High Voltage DC Power disabled.	1. Open coin door to enter System Menu, then select Standard Tests and go to Voltage to look for Check Interlock report. Pull out on switch actuator to reset. (Interlock Switch is located at left side of Coin Door.) 2. Switch damaged or broken. Replace Interlock Switch. (NOTE: The Switch routine will not test this switch!)
	High Voltage AC Fuse defective.	1. Replace fuse with another of the exact same type. 2. Check High Voltage DC Power rectifiers.
	High Voltage DC Fuse defective.	1. Replace fuse with another of the exact same type. 2. Check High Voltage DC Power filter capacitor.
	High Voltage DC Wiring Harness unplugged or damaged.	1. Check all High Voltage DC Power Wiring Connectors. 2. Check High Voltage DC Wiring Harness for continuity.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

PLAYFIELD PROBLEMS - SOLENOIDS & MOTORS (CONT.)

SYMPTOM	PROBABLE CAUSE	POSSIBLE SOLUTION
None Of The Solenoids Work.	System Communication failure.	1. Check Communication Wiring Harness Connectors. 2. Test Communication Wiring Harness for continuity.
	Driver Board Assembly defective.	1. Check Low Voltage DC Power filter capacitor and coil.
Game Plays But A Small Group Of Solenoids Do Not Operate.	Solenoid Assembly Wiring Harness unplugged or damaged.	1. Check Solenoid Assembly Wiring Harness Connectors. 2. Test Solenoid Assembly Wiring Harnesses for continuity.
	System Communication failure.	1. Check Communication Wiring Harness Connectors. 2. Test Communication Wiring Harness for continuity.
One Or More Solenoids, Lamps, Or Motors Is Always On When Main Power Is ON.	Cross connection between two DC Voltage sources.	1. Look for pinched or cut wires where harness touches moving parts. Repair and reroute wires away from area.
	Driver Board Assembly defective.	1. Check Smart Solid State Relays (Power IC devices).
Solenoids Or Motors Repeatedly Burn Out.	System Communication failure.	1. Check Communication Wiring Harness Connectors. 2. Test Communication Wiring Harness for continuity.

PLAYFIELD PROBLEMS - SWITCHES

SYMPTOM	PROBABLE CAUSE	POSSIBLE SOLUTION
Premature Failure Of A Few Switches, Causing Irregular Scoring Or Inability To Complete All Steps In Game.	Excessive solenoid force.	1. Use only new factory parts and assemblies for repairs. Other parts may fit and function but they will not last. 2. Fasteners tightened excessively, cracking parts during installation. Do not use too much force when tightening. 3. Open Coin Door to enter System Menu, then select Standard Tests and go to Sol. Volts to look for Hi Voltage report. Check Power Transformer Line Voltage Wiring. (Connector located near transformer in cabinet.) 4. Check playfield angle using built-in bubble level.
Switches Firing Randomly, Sometimes Two At One Time.	Faulty or intermittent switch connections.	1. Open coin door to enter System Menu, then select Standard Tests and go to the Switches routine. Check each device independently to locate trouble. 2. Look for pinched or cut wires where harness touches moving parts. Repair and reroute wires away from area. 3. Test Communication Wiring Harness for continuity.
Too Many Or Not Enough Tilt Or Slam Detections.	Incorrect switch adjustment.	1. Slam Switch caught on clothing or cash box and bent. Refer to Slam Switch Sensitivity Adjustment instructions. 2. Tilt Switch caught on wiring or aligned incorrectly. Refer to Tilt Switch Sensitivity Adjustment instructions.
A Standard Switch Has Not Been Activated In Several Games.	Players are concentrating on other shots or not skilled enough to activate switch.	1. Open Coin Door to enter System Menu, then select Standard Tests and go to Switches to look for Dead reports. If manual switch activation changes the report to OK then players are the cause of this condition.
	Switch defective.	1. Open Coin Door to enter System Menu, then select Standard Tests and go to Switches to look for Dead reports. If manual switch activation does not change the Dead report then there is an electrical problem.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

PLAYFIELD PROBLEMS - SWITCHES (CONT.)

SYMPTOM	PROBABLE CAUSE	POSSIBLE SOLUTION
An Optical Switch Has Not Been Activated In Several Games.	External light leakage is enough to prevent normal activation of switch.	1. Open Coin Door to enter System Menu, then select Standard Tests and go to Switches to look for Dead reports. If manual switch path blockage changes the report to OK then leakage is the cause of this condition. 2. Check for missing light shields or misalignment.
	Switch defective.	1. Open Coin Door to enter System Menu, then select Standard Tests and go to Switches to look for Dead reports. If manual switch activation does not change the Dead report then there is an electrical problem. 2. Ensure that Optodetector Board Assembly is oriented properly
	Faulty or intermittent switch connections.	1. Open Coin Door to enter System Menu, then select Standard Tests and go to the Switches routine. Check each device independently to locate trouble. 2. Look for pinched or cut wires where harness touches moving parts. Repair or reroute wires away from area.
None Of The Switches Work.	Low Voltage DC Wiring Harness unplugged or damaged.	1. Check Low Voltage DC Power Wiring Connectors. 2. Test Low Voltage DC Wiring Harness for continuity.
	System Communication failure.	1. Check Communication Wiring Harness Connectors. 2. Test Communication Wiring Harness for continuity.
	Switch Board Assembly defective.	1. Check Low Voltage DC Power filter capacitor and coil. 2. Repair or replace Switch Board Assembly.
System Menu Is Not Displayed When Opening Coin Door.	Cabinet Switch Wiring Harness unplugged or damaged.	1. Check Cabinet Switch Wiring Harness Connectors. 2. Test Cabinet Switch Wiring Harness for continuity.
	Switch defective.	1. Temporarily jumper switch to get into System Menu. 2. Test System Menu Switch for continuity.
	Processor Board Assembly defective.	1. Check signal diodes for rectification and leakage.

PLAYFIELD & BACKBOX PROBLEMS - ILLUMINATION

SYMPTOM	PROBABLE CAUSE	POSSIBLE SOLUTION
Premature Burn Out Of Many Lamps (Bulbs May Or May Not Appear Excessively Bright).	Higher than normal line voltage or excessive temperature stresses bulbs.	1. Open coin door to enter System Menu, then select Standard Tests and go to Sol. Volts to look for Hi Line report. Check Power Transformer Line Voltage Wiring. (Connector located near transformer in cabinet.) 2. Move game away from sources of heat such as heat registers and high intensity lighting. Ensure that air flows freely around cabinet and backbox ventilation holes.
	Incorrect bulbs used as a replacement during a previous game repair.	1. Use only new factory parts and assemblies for repairs. Other parts may fit and function but they will not last.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

PLAYFIELD & BACKBOX PROBLEMS - ILLUMINATION (CONT.)

SYMPTOM	PROBABLE CAUSE	POSSIBLE SOLUTION
Lamps Firing Randomly, Sometimes Two At One Time.	Faulty or intermittent lamp connections.	1. Open coin door to enter System Menu, then select Standard Tests and go to the Lamps routine. Check each device independently to locate trouble. NOTE: Some lamps are wired in pairs; refer to Lamp Matrix charts. 2. Look for pinched or cut wires where harness touches moving parts. Repair and reroute wires away from area. 3. Damaged or missing diodes on lamp sockets. 4. Test Communication Wiring Harness for continuity.
	Driver Board Assembly defective.	1. Damaged or missing diodes on Driver Board Assembly. Repair or replace Driver Board Assembly.
	Medium Voltage DC Wiring Harness unplugged or damaged.	1. Check Medium Voltage DC Wiring Harness Connectors. 2. Test Medium Voltage DC Wiring Harness for continuity.
Game Plays But About Half Of The Lamps Are Not Illuminated.	Medium Voltage AC Fuse defective.	1. Replace fuse with another of the exact same type. 2. Check Medium Voltage DC Power rectifiers.
	Medium Voltage DC Fuse defective.	1. Replace fuse with another of the exact same type. 2. Check Medium Voltage DC Power filter capacitor.
Game Plays But A Small Group Of Lamps Are Not Illuminated.	Lamp Matrix Row or Column Wiring Harness unplugged or damaged.	1. Check Lamp Matrix Wiring Harness Connectors. 2. Test Lamp Matrix Wiring Harnesses for continuity.
	System Communication failure.	1. Check Communication Wiring Harness Connectors. 2. Test Communication Wiring Harness for continuity.
Game Plays But A Small Group Of Lamps Are Constantly Illuminated.	One Lamp Matrix Row or Column stuck ON (continuously powered).	1. Look for pinched or cut wires where harness touches moving parts. Repair and reroute wires away from area.
	Driver Board Assembly defective.	1. Check Smart Solid State Relays (Power IC devices). 2. Check Field Effect Transistors (Power Transistors).
One Or More Lamps Very Dim But Still Illuminated.	Incorrect bulbs used as a replacement during a previous game repair.	1. Use only new factory parts and assemblies for repairs. Other parts may fit and function but they will not last.
	Blackened glass, weak or old bulb filament, etc.	1. Replace bulb with another of the exact same type. 2. Test lamp diode for rectification and leakage.
Several Lamps Illuminate When Only One Or Two Should Be On ("Phantom" Effect).	Lamp Matrix defective.	1. Open coin door to enter System Menu, then select Standard Tests and go to Lamps routine. Check each device independently to locate trouble. 2. Test lamp diode for rectification and leakage.
	Lamp Wiring Harness damaged.	1. Look for pinched or cut wires where harness touches moving parts. Repair and reroute wires away from area.
One Or More Large Lamps ("Flashers") Are Constantly Illuminated.	Lamp Wiring Harness damaged.	1. Look for pinched or cut wires where harness touches moving parts. Repair and reroute wires away from area.
	Driver Board Assembly defective.	1. Check Field Effect Transistors (Power Transistors). 2. Test lamp diode for rectification and leakage.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

THEORY OF OPERATION

POWER SUPPLY CIRCUIT AND RELATED COMPONENTS

AC POWER CIRCUITS

The AC line cord may be any one of several domestic or international grounding type cordsets. Power enters the machine through a shielded I.E.C. (International Electrotechnical Commission) connector and passes through an electromagnetic interference filter. This filter reduces both common mode and differential conducted noise on the AC power wires. Power then travels through the main fuse to the unswitched convenience outlet and the OFF/ON switch. Both sides of the line are switched to prevent shock hazard during machine maintenance. The power transformer has dual tapped primary windings which must be connected in parallel for AC voltages less than 200 and in series for voltages more than 200. Multiple secondary windings provide low, medium, and high voltage power to the power supply circuit board for rectification, filtering, regulation, and protection. The high voltage power goes through a standard interlock switch to protect against shock or accidental equipment damage during routine maintenance or service. Note that the main fuse must be changed when switching between series and parallel configuration.

DC POWER CIRCUITS

All power sources are fused at their point of entry onto this board. Each power source is rectified by a full wave diode bridge and filtered by an electrolytic capacitor and a bleeder resistor to discharge the voltages during equipment service. Immediately following the capacitor is a light emitting diode with a current limiting resistor which indicates the presence of voltage. Additional fuses and LED indicators are used for branch circuits, and the low and medium voltage sources have series diodes to protect against power cross with higher voltages. All power supply voltages are positive with respect to ground to reduce noise sensitivity.

The lowest voltage source is the most critical since it runs the system microprocessors, the digital logic circuits, memory, and the interface circuits, so it gets its own three-terminal voltage regulator and filter capacitors. A voltage divider is used to provide the minimum load for regulator operation and at the same time set the output to five volts. This regulator has thermal shutdown to avoid damage due to overheating. Short-circuit protection is automatic, so there is no separate fuse required for the regulated low voltage.

DC SIGNAL CIRCUITS

Four voltage comparators are used to monitor the critical power supply characteristics. Two of the devices act as detectors for Alternating Current. One triggers on positive voltages, the other on negative voltages. The output of the circuit is a series of narrow pulses at twice the frequency of the AC Line Voltage. These pulses are used by the processor to determine the AC frequency and zero cross points.

The remaining two voltage comparators are used to check analog voltages against a processor generated reference signal. One circuit monitors regulated low voltage; the other an unregulated high voltage source. Since the high voltage power supply is not regulated, it will rise or fall with changes in the AC Line Voltage. The microprocessor varies the reference signal to determine the value of these DC voltage sources.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

AUDIO CIRCUITS AND RELATED COMPONENTS

All audio information is compressed using the MPEG digital signal processing standard and stored in Read Only Memory.

Once the digital signals have been expanded and converted to analog audio signals, the remainder of the circuitry is used to amplify the sound and provide volume and tone control functions.

PROCESSOR BOARD AND RELATED COMPONENTS

A MC68306 Microprocessor is used to control the game functions, the diagnostics, the adjustable features, and the system communications. In addition, this processor has indirect control of display functions through a Programmable Logic Device and sound (the Sound Board has its own dedicated microprocessor). This 16-bit device was selected because it has common elements with the well known MC68000 family of integrated processors. The MC68306 is optimized for use with memory and communications.

INPUT / OUTPUT CIRCUITS

Each time power is applied to the game, a timer circuit generates a reset signal to start the microprocessor. The DC signals from the Power Supply circuit generate interrupt messages, allowing the processor to identify the AC power line characteristics. Cabinet switches create input signals used to control game play, system operating mode, menu item selection, etc. The remainder of the input signals are collected from other boards through a mixture of serial and parallel communications channels.

One output from the microprocessor is used for the display. The characters and images are stored in Read Only Memory. The Field Programmable Gate Array temporarily saves this data to Random Access Memory and converts this information to row and column signals for the display dot matrix. The Sound Board receives data commands from the processor and then generates the voices, music, and sound effects to go along with the display images and messages. Lamp, motor, and solenoid drive circuits receive control signals from the processor through a parallel communication port.

In system diagnostic mode, more circuits become active. The microprocessor sends test signals through the drive and switch circuits to determine the state (normal operation, fault conditions, etc.) of the switches, lamps, motors, and solenoids. The processor is also able to recognize cable disconnections, communication errors, switch related problems, etc., and issues messages or reports as necessary.

MEMORY CIRCUITS

Game parameters, custom messages, adjustable features, intermittent conditions, etc., are saved in Static Random Access Memory. This circuit has a built-in back up battery to prevent data corruption or loss.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

INDICATOR CIRCUITS

There are two Light Emitting Diodes located on the Processor Board. One LED indicates the presence of regulated low voltage DC power. The other LED serves as a low level status indicator for the microprocessor. Internal fault conditions generate an error code which can be useful when the display circuits malfunction or system diagnostics are not available.

POWER CIRCUITS

Two types of filter circuits are used on the Processor Board. Small bypass capacitors are used on the data lines to reduce the effects of noise. The regulated low voltage DC power source uses a more complex filter network (two capacitors and an inductor) to eliminate interference present on the power supply wiring.

SWITCH BOARD AND RELATED COMPONENTS

The Switch Board has two main functions. Switches close and open very rapidly in the course of a pinball game, and there are instances where several switches may operate simultaneously. During game play, momentary switch connections are tracked and turned into signals which the microprocessor uses to determine the location of the balls. These input signals allow interaction with the players by increasing point score, illuminating indicator lamps, activating solenoids or motors, and by triggering images or sounds at the appropriate times. When the diagnostics routines are in use, the Switch Board circuits test the continuity of each switch device and its associated wiring. This permits the system to locate faults and provide service information on demand.

SWITCH SENSE CIRCUITS

Each switch has its own dedicated line to the Switch Board. The inputs have series diodes to protect against power cross with higher voltages. Each comparator has one switch input signal and one from a fixed DC voltage obtained from a voltage divider on the low voltage regulated power source. Any switch closure causes one comparator to change its output state; this signal is then buffered before being sent off board. Independent output lines prevent a single fault from disabling more than one switch signal.

One contact of each switch is connected to system ground. This is done to reduce the effects of noise on the switch and processor circuits when a switch is activated.

The addition of a resistor directly to each set of switch contacts allows the switch circuits to detect the difference between a normal circuit path and a faulty condition. This resistor forms a voltage divider with others located on the circuit board. This resistor has no effect on the normal operation of the switch.

When the system is operating in its Diagnostic or Troubleshooting modes, the microprocessor sends a digital message to the Switch Board to activate the test circuits. This message is decoded and turned into two signals, one for each switch group. These test signals go through flip-flop circuits wired as latches and then on to individual driver circuits. The outputs of the drivers effectively bypass one of the resistors in the voltage divider, changing the value of the reference voltage to a higher threshold during switch tests. Under this condition, the processor can detect whether a switch is normally open or the circuit is defective.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

POWER CIRCUITS

Two types of filter circuits are used on the Switch Board. Small bypass capacitors are used on the integrated circuits to reduce the effects of noise caused by solenoids and motors operating. The regulated low voltage DC power source uses a more complex filter network consisting of two capacitors and an inductor to eliminate any interference which might be present on the power supply wiring.

DRIVER BOARD AND RELATED COMPONENTS

Two types of drive circuits are used on this board. Low power loads (indicator and illuminator lamps) are connected in a typical row and column matrix configuration to reduce the number of components and wires needed. High power loads (flashing lamps, motors, or solenoids) have individual independent control circuitry. Both circuit types feature protection from electrical noise, thermal overload, and short circuits.

The majority of the lamps used in the game are connected in two identical matrices. Each matrix has eight rows and eight columns for a total of sixty four controlled positions; however, some of the positions have two lamps wired in parallel. The maximum number of lamps supported by one matrix is eighty.

Motors, solenoids, and flashing lamps have their own dedicated drive devices. By maintaining separate circuit paths many loads can operate simultaneously, but interaction with other game functions is eliminated.

INPUT / OUTPUT CIRCUITS

The Processor must send an enable signal to the Driver Board before any of the circuits will respond. This signal allows control data to pass through flip-flop circuits and into the driver devices. Lamp data from the microprocessor is decoded and turned into signals for rows and columns. In addition to lamp location, the program changes lamp brightness independently by varying how long each selected position is active. A lamp warming routine in the program keeps each location continuously powered at a very low level to reduce filament inrush current, turn on time, and voltage fluctuations on the power supply circuits.

Power for each matrix is delivered by eight row drivers and eight column drivers. The lamp row drives use conventional devices with comparator circuits to sense excessive current and provide circuit protection. So called Smart Power Solid State Relays are used for the lamp columns and the independent drive circuits. These devices have built-in overtemperature protection circuitry and a status output signal. Diodes are connected in series with these output circuits to prevent damage from power cross with higher voltages.

At the end of each complete pass through all of the lamps in a matrix, the microprocessor sends a digital message to the Driver Board to activate the test circuits. This message is decoded and turned into two signals, one for each lamp group. These test signals go through flip-flop circuits wired as latches and then on to individual driver circuits. The outputs of the drivers effectively bypass one of the resistors in the voltage divider, changing the value of the reference voltage to a lower threshold during lamp tests. Under this condition, the processor can detect whether a lamp is shorted or the circuit is defective.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.

POWER CIRCUITS

Two types of filter circuits are used on the Switch Board. Small bypass capacitors are used on the integrated circuits to reduce the effects of noise caused by solenoids and motors operating. The regulated low voltage DC power source uses a more complex filter network consisting of two capacitors and an inductor to eliminate any interference which might be present on the power supply wiring.

Proprietary and confidential information, not to be disclosed or copied without the express permission of CAPCOM® COIN-OP, INC.