

CYBERNAUT

System Information Manual



Bally **MIDWAY** MFG. CO.

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WARNING

THIS GAME MUST BE GROUNDED. FAILURE TO DO SO MAY RESULT IN DESTRUCTION TO ELECTRONIC COMPONENTS.

WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a CLASS A computing device pursuant to SUBPART J of PART 15 of FCC RULES, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

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PINBALL

Bally **MIDWAY**

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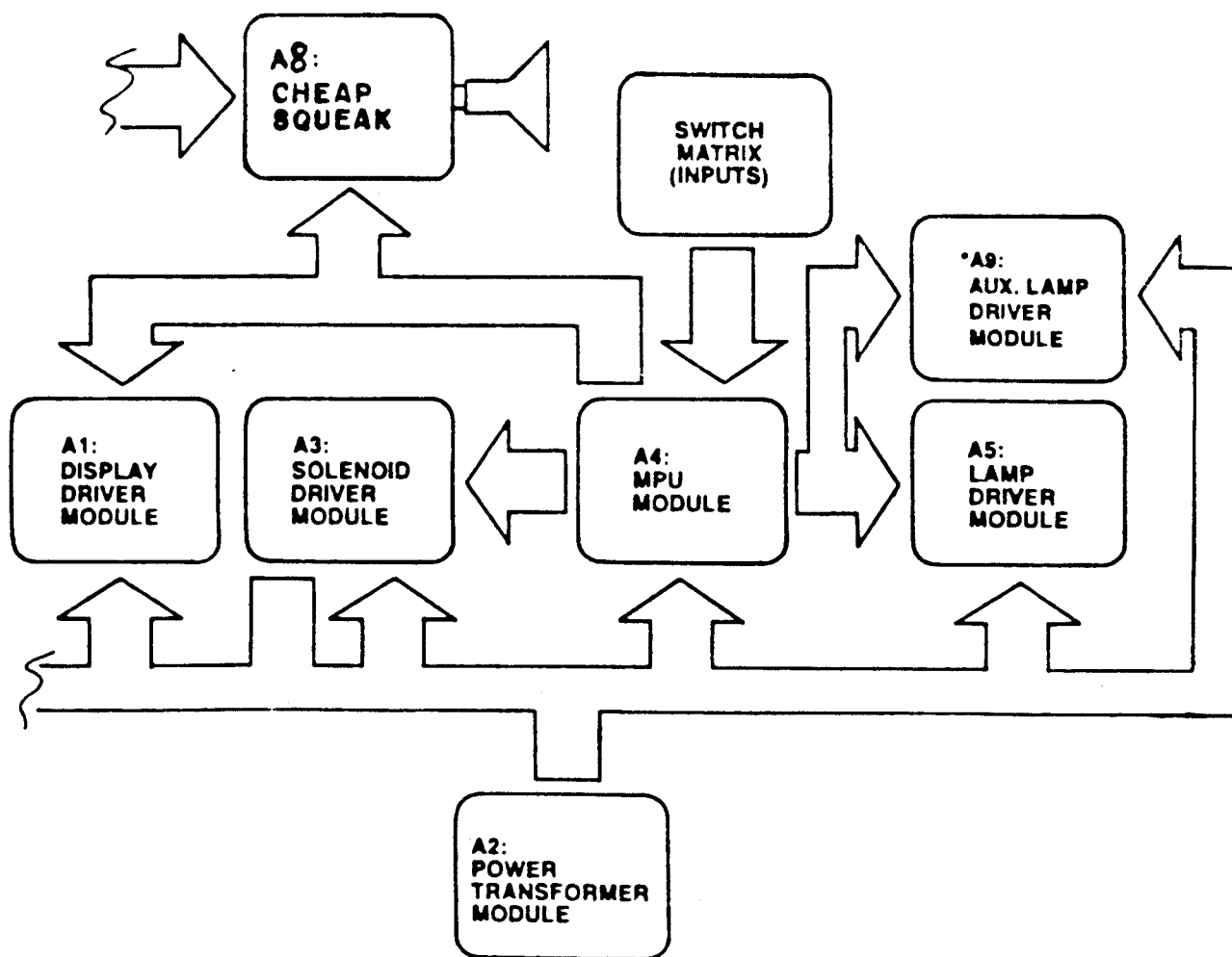
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**CYBERNAUT
INFORMATION SYSTEM MANUAL**

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BLOCK DIAGRAM—ELECTRONIC PINBALL GAME



BOOKKEEPING FUNCTION QUICK REFERENCE

- 01 High Score Threshold #1 - See Page 8
- 02 High Score Threshold #2 - See Page 8
- 03 High Score Threshold #3 (if used) - See Page 8
- 04 High Score to Date Register - See Page 8
- 05 Current Credits - See Page 3
- 06 Total Plays - See Page 3
- 07 Total Replays - See Page 3
- 08 Game Percentage - See Page 3
- 09 Total Times "High Score to Date" is Beaten - See Page 3
- 10 Coins Dropped Thru Coin Chute #1 (Left) - See Page 3
- 11 Coins Dropped Thru Coin Chute #2 (Middle) - See Page 3
- 12 Coins Dropped Thru Coin Chute #3 (Right) - See Page 3
- 13 Number of Specials Awarded Only From Playfield Features - See Page 3
- 14 Total Number Minutes of Game Play - See Page 3
- 15 Number of Service Credits - See Page 3
- 16 Playfield Special Award Feature - See Page 6
- 17 High Score Special Award Feature - See Page 6
- 18 Sound Option - See Page 7 (Sound Options & Feature Options)
- 19 High Score to Date Award Feature - See Page 6
- 20 Not used
- 21 Not used

BACK BOX ADJUSTMENTS

Each game has thirty-two switches located on the MPU module, located in the backbox, that allows play to be customized to the location (See Fig. 3). Credits per coin, maximum credits, credit display, balls (3 or 5) per game, match feature, high game feature special award, are selectable by means of switches. The switches are contained in four-sixteen lead packages numbered S1-8, S9-16, S17-24, and S25-32 for easy identification. The "On" position is marked on the assembly. **TURN OFF POWER BEFORE MAKING ADJUSTMENTS, MAKE ADJUSTMENTS BEFORE TURNING POWER BACK ON.**

CYBERNAUT FIXED SWITCH ADJUSTMENT

- 32 Balls Per Game - See Page 6
- 31 Balls Per Game — - See Page 6
- 30 Cybernaut Bonus Special Adjustment - See Page 7
- 29 1 Credit Awarded Per Player Per Game - See Page 7
- 28 Match Feature - See Page 6
- 27 Credit Display - See Page 6
- 26 Maximum Credits - See Page 5
- 25 Maximum Credits - See Page 5
- 24 Top Roll-over Button Special Active Adjustment - See Page 7
- 23 Saucer Multiplier Adjustment - See Page 7
- 22 B-L-A-S-T Special Adjustment - See Page 7
- 21 B-L-A-S-T Special Adjustment - See Page 7
- 20 Middle Coin Chute #2 Adjustment - See Page 5
- 19 Middle Coin Chute #2 Adjustment - See Page 5
- 18 Middle Coin Chute #2 Adjustment - See Page 5
- 17 Middle Coin Chute #2 Adjustment - See Page 5
- 16 Guardian Drop Targets Adjustment - See Page 7
- 15 Ramp Ion-Generator Special Adjustment - See Page 7
- 14 Bonus Multiplier Advance Adjustment - See Page 7
- 13 Right Coin Chute #3 Adjustment - See Page 5
- 12 Right Coin Chute #3 Adjustment - See Page 5
- 11 Right Coin Chute #3 Adjustment - See Page 5
- 10 Right Coin Chute #3 Adjustment - See Page 5
- 9 Right Coin Chute #3 Adjustment - See Page 5
- 8 Tube Special Adjustment - See Page 7
- 7 Tube Special Adjustment - See Page 7
- 6 Top R.O.B. Special - See Page 7
- 5 Left Coin Chute #1 Adjustment - See Page 5
- 4 Left Coin Chute #1 Adjustment - See Page 5
- 3 Left Coin Chute #1 - See Page 5
- 2 Left Coin Chute #1 Adjustment - See Page 5
- 1 Left Coin Chute #1 Adjustment - See Page 5

DETACHING OF PIN-GAME BACK BOX

When the back box is in an up-right position and the 3/8" hold-down bolts are removed, the back box can be removed from the main cabinet by lifting the right corner of the back box (about 3/4") and pulling it slightly towards you. Now both hinges are disengaged and the back box can be removed.

I. INSTALLATION

Assemble the game as follows:

Bolt legs to cabinet. Bolt back box to cabinet. Use flat washers under bolt heads. Gently feed cable connectors and ground braid through cable port in back box. Screw ground braid to braid in back box. Carefully and fully insert connectors on printed circuit assemblies.

On all games there are certain items that should be checked after shipment. These are visual inspections which may avoid time consuming service work later. Minor troubles caused by abusive handling in shipment are unavoidable. Cable connectors may be loosened, switches (especially tilt switches) may go out of adjustment. Plumb bob tilt switch should always be adjusted after game is set on location and leg levelers are adjusted.

Visual inspections before plugging in line cord:

1. Check that all cable connectors are completely seated on printed circuit assemblies.
2. Check that cables are clear of all moving parts.
3. Check for any wires that may have become disconnected.
4. Check switches for loose solder or other foreign material that may have come loose in shipment and could cause shorting of contacts.
5. Check wires on coils for proper soldering. Cold solder connections may not show up in factory inspection, but vibration in shipment may break contact.
6. Check that fuses are firmly seated and making good contact.
7. Check the transformer for any foreign material shorting across wiring lugs.
8. Check wiring of transformer to correspond to location voltage. See figure 1.

Check adjustment of the two (normally open) tilt switches:

1. Plumb bob tilt on left side of cabinet near front door.
2. Ball tilt above plumb bob tilt. Insert the smaller ball (15/16" dia.) into the ball tilt assembly, and adjust the bracket so the ball will roll free to contact the switch blade, if front of cabinet is raised.

TRANSFORMER CONNECTION INSTRUCTIONS

REFER TO POWER SUPPLY SCHEMATIC
IN GAME MANUAL FOR TABLE "A"

115 VAC, 2-8, 3-6, 7-10
120 VAC, 2-8, 4-6, 7-11
220 VAC, 4-8, 7-9
240 VAC, 4-8, 7-11

PART OF POWER TRANSFORMER MODULE A2,
LOCATED IN LOWER CABINET

II. GENERAL GAME OPERATION

Place ball into playfield by outhole.

Coin game. Coin should be rejected. Plug in line cord. Move power ON-OFF master switch at bottom right front corner of cabinet to "ON" position. The game will play a power-up tune to announce game-readiness. Drop targets are reset, scores are set to zero, alternating with the "High Score to Date", and the game is ready for play. Coin game. The game should accept the coin and post credits* for coins accepted (adjustable). Pressing the credit button on the cabinet will cause the outhole kicker to serve the ball to the shooter alley. A game-up tune* is played to announce play-readiness.

One player is posted each additional time the credit button is pressed (one to four can play). The credits are reduced by one each time the credit button is pressed until the credits are reduced to zero.

Shooting the ball initiates play.

The game awards all points earned by the player. If spinner is turned and scoring when the ball hits a target, the spinner and the target scores are awarded.

When the ball enters the outhole, the bonus score is added to the total score. The player-up and/or ball in play on the back box is advanced one position. The outhole kicker serves the ball to the shooter alley and play is resumed. This continues until each player has played the allowable number of balls per game (adjustable). At this time 'Game Over' light is lit. A random Match* number appears and the "Match" light is lit. If the number is the same as the last two digits in a player's score, a free game is awarded.

Extra balls won during the course of the game are played immediately after the player's regular ball enters the outhole. The player-up and/or ball in play on the back box are not advanced for extra ball play. Bonus score is added to the player's score before the game serves the extra ball for play.

Scoring over 10,000,000 gives "High Score to Date" award.

At the end of the game, a "High Score to Date" is alternately flashed with all 4 player scores. If the "High Score to Date" is beat, this feature* awards

* Some tunes and features can be disabled by operator if so desired. See Back Box Adjustments.

NOTE: Scoring and feature units will differ from game to game.

free games.

Tilting the game results in loss of a ball. The flippers, thumper bumpers, etc., go 'dead'. Bonus points are not scored. The purpose of the tilt penalty is to discourage the player from jostling the machine in an attempt to prolong play. Game action becomes normal after the ball kicker assembly serves the ball to the shooter alley.

Slamming the machine results in loss of the game. All feature lights go out, the game goes "dead", and a time delay occurs. The purpose of the time delay is to discourage unnecessary abuse of the machine. After the delay, the "Game Over" light lights and the power-up tune is played. The time delay occurs anytime one of the slam switches is made to contact. There are two factory installed slam switches, one on the front door, and one on the left side of the cabinet. (Any number of slam switches could be installed by the operator, to meet his individual requirement.) The switch should be adjusted to have approximately 1/16" gap between the contacts. The weighted blade should be adjusted to attain the desired sensitivity. Decreasing the gap between contacts will make the switch more sensitive. Opening the gap will reduce sensitivity.

III. BOOKKEEPING FUNCTIONS

The game is designed to help the operator perform certain accounting functions. The game can display the number of total plays and replays (free games). It can display the number of coins dropped down each coin chute. The bookkeeping functions are displayed on all player score displays simultaneously. An identification number, 05 to 15, appears on the Match/Ball in Play window as follows:

- 05 - 00 to - 40 = Current Credits
- *06 - 10000 to -99999 = Total Plays (Paid & Free Games)
- *07 - 10000 to -99999 = Total Replays (Free Games)
- 08 - 00 to -99999 = Game Percentage
- 09 - 00 to -99999 = Total times "High Score to Date" is beat
- *10 - 10000 to -99999 = Coins Dropped thru Coin Chute #1
- *11 - 10000 to -99999 = Coins Dropped thru Coin Chute #2**
- *12 - 10000 to -99999 = Coins Dropped thru Coin Chute #3**
- *13 - 00 to -99999 = Number of Specials awarded from Playfield Specials Only
- *14 - 00 to -99999 = Number of minutes of Game Play (Total)
- *15 - 00 to -99999 = Number of Service Credits

The game displays the first bookkeeping entry if the Self-Test button (See Fig. III) on the inside of the front door is pressed ten times. Alternately push and release the Self-Test button at one second intervals. The number 05 appears in the "Match/Ball in Play" window. Current credits appear on the player score displays. Each additional press of the button causes the next entry to be displayed.

After the data in each bookkeeping register is recorded, it can be set to zero simply by pressing switch button S33, located on A4, the MPU module in the back box (See Fig. III), or by pressing the Coin Chute #3 switch. Any or all registers can be cleared by alternating between the Self-Test button and the switch button S33 on the MPU module or Coin Chute #3 switch. The operator is given this option as a possible convenience and can elect to use or not use it as his needs direct.

Pressing the button 5 more times causes the game

* The 10,000 level is pre-set at the factory; can be set to zero, initially, if desired.

** If Coin Chute is not used in game, number displayed (if other than 00) on Player Score displays has no significance.

to play the power-up tune and light the Game Over light.

Service credits are designed to allow the serviceman to test the game under actual play conditions without disturbing the bookkeeping records that reside at identification numbers 06, 07, 10, 11 and 12.

To obtain Service Credits, push and release the Self-Test switch until identification number 05 appears in the "Match/Ball in Play" window. Hold in the Credit button until the desired number of Service Credits (up to five) appears on the player score displays.

NOTE: If, upon accessing identification number 05, a number of credits greater than five is displayed, pressing the credit button has no effect.

Identification number 15 is reserved as a record of the total number of Service Credits obtained.

NOTE: If "Total Play" register is reset to zeroes then "Total Replays" register should also be reset to zeroes to maintain the game percentage value.

IV FEATURE OPERATIONS & SCORING

A) TOP ROLL-OVER BUTTONS FEATURE

Each button scores 1,000 points and advances the Cybernaut bonus. Making all buttons lites the "Collect Bonus" lite; saucer scores 5000 points and 10,000 points for each lit roll-over button lite; bonus is collected in the saucer (RAMP ION-GENERATOR BONUS and OUTHOLE BONUS). Making all buttons when the "Special" lite is lit, scores Special; top right rebound puts out the "Special" lite* (see F.D.S. # 24 below).

F.D.S. #6—controls the Roll-Over Button Special:
ON—one Special per ball may be earned
OFF—one Special per game may be earned

F.D.S. #23—controls the Bonus Multipliers collected in the saucer:
ON—saucer collects with bonus multipliers
OFF—saucer collects without bonus multipliers

F.D.S. #24—also controls the Roll-over Button Special.
ON—top Roll-over Button Special Feature Active.
OFF—top Roll-over Button Special Feature Inactive.

B) RAMP ION-GENERATOR TARGETS FEATURE

Each target scores 500 points and advances the bonus. Targets must be hit in sequence to spot the lites. Making a row across scores the lit value (90,000 — EXTRA BALL — SPECIAL). Making all 9 lites awards an Ion-Generator Value Lite (90,000 — 180,000 — 270,000). 10,000 points for each lit Ramp Ion-Generator Bonus Lite is scored in the outhole and in the saucer when qualified.

F.D.S. #15—controls the Ion Generator Special:
ON—Special on with 180,000
OFF—Special on with 270,000

C) GUARDIAN DROP TARGET FEATURE

Each drop target scores the indicated value. All targets down opens the right gate and increases the indicated value upon reset.

F.D.S. #16—controls the Drop Targets reset thereafter:
ON—resets upon completion of 2rd row of ramp lites
OFF—resets upon completion of 1st row of ramp lites

NOTE: Guardian drop target values reset on a 5-ball game, all other times, they are in memory.

D) TUBE SHOT FEATURE

A ball through the tube scores the lit value and opens the lower left gate. The ball is returned to the shooter tip if the right gate is open (see "C" and "E").

F.D.S. #7 and #8—controls the Tube Special:

#7	#8	Tube Special at:
ON	ON	60,000
OFF	ON	80,000
ON	OFF	100,000
OFF	OFF	120,000

F.D.S. #14—controls the Bonus Multipliers:
ON—"Advance Multipliers" lites every 2nd time
OFF—"Advance Multipliers" lites every 3rd time

E) B-L-A-S-T Feature

Lit targets and lanes spot B-L-A-S-T. Completing B-L-A-S-T awards the lit value and opens the right gate (50,000 — 100,000 — 150,000 — 200,000).

F.D.S. #21 and #22—control the B-L-A-S-T Special:

#21	#22	Special on with:
ON	ON	50,000
OFF	ON	100,000
ON	OFF	150,000
OFF	OFF	200,000

F) OUTHOLE BONUS FEATURE

Outhole collects 10,000 points for each lit Ramp Ion-Generator Bonus lite and Cybernaut Bonus Value, with Multipliers.

F.D.S. #30 — controls the Cybernaut Bonus Special:
ON—Special at 300,000
OFF—Special at 395,000

G) SPECIAL REPLAY/X-BALL/NOVELTY MODES

Self-test positions 16 and 17 give the operator flexibility to award a replay ball or score (Novelty) when a special is scored. A combination of X-Ball, Novelty can be obtained through the following chart.

	Set to "03"	Set to "02"	Set to "01"
Self-Test Position 16	AWARD	AWARD	AWARD
Playfield X-Balls and Specials	REPLAY	X-BALL *	50,000
Top Buttons special	REPLAY	X-BALL *	50,000
Tube special	REPLAY	X-BALL *	50,000
Ion-Generator special	REPLAY	X-BALL *	50,000
Ramp Targets special	REPLAY	X-BALL *	50,000
B-L-A-S-T special	REPLAY	X-BALL *	50,000
Ramp Targets X-Ball	X-BALL	X-BALL**	25,000
Self-Test Position 17	Set to "03"	Set to "02"	Set to "01"
	AWARD	AWARD	AWARD
Scoring Thresholds	REPLAY	X-BALL **	25,000

*50,000 if same player shoot again is lit.

**25,000 if same player shoot again is lit.

V. GAME ADJUSTMENTS

A. PLAYFIELD PANEL POST ADJUSTMENTS:

Posts that control left and right outlane opening on panel can be removed to make access to outlanes easier or harder for ball to enter. See Figure II.

Easier entry will decrease playing time and scoring (conservative).

Harder entry will increase playing time and scoring (liberal).

B. BACK BOX GAME ADJUSTMENTS:

Each game has thirty-two switches located on A4,

S20	S19	S18	S17	Credits/Coin	S20	S19	S18	S17	Credits/Coin
OFF	OFF	OFF	OFF	Same as Coin Chute #1 Settings	ON	OFF	OFF	OFF	8/1 Coin
OFF	OFF	OFF		1/1 Coin	ON	OFF	OFF	ON	9/1 Coin
OFF	OFF	ON	OFF	2/1 Coin	ON	OFF	ON	OFF	10/1 Coin
OFF	OFF	ON	ON	3/1 Coin	ON	OFF	ON	ON	11/1 Coin
OFF	ON	OFF	OFF	4/1 Coin	ON	ON	OFF	OFF	12/1 Coin
OFF	ON	OFF	ON	5/1 Coin	ON	ON	OFF	ON	13/1 Coin
OFF	ON	ON	OFF	6/1 Coin	ON	ON	ON	OFF	14/1 Coin
OFF	ON	ON	ON	7/1 Coin	ON	ON	ON	ON	15/1 Coin

The credits given are selectable by means of switches 1-5 incl., for coin chute #1 and switches 9-13 incl., for coin chute #3. Thirty-one different credit

the MPU module, located in the back box, that allow play to be customized to the location. See Figure III. Credits per coin, maximum credits, credit display, balls per game, match feature, high game feature, special award and melody are selectable by means of the switches. The switches are contained in four-sixteen lead packages numbered S1-8, S9-16, S17-24, and S25-32 for easy identification. The "ON" toggle position is marked on the assembly.

Turn off power before making adjustments.

Credits/Coin Adjustments:

The credits per coin are selectable by means of S17-S20 for coin chute #2 (Center). The switch settings and resultant credits/coin are as follows:

ratios are available for each coin chute. The switch settings and resultant credits/coin are listed below.

CREDITS/COIN ADJUSTMENTS

COIN CHUTE	5	4	3	2	1	CREDITS	CREDITS	CREDITS	CREDITS	TOTAL CREDITS/COINS
#1(HINGE SIDE) OR #3	13	12	11	10	9	1/1 Coin				
(RIGHT SIDE)	OFF	OFF	OFF	OFF	OFF	2/1 Coin				
	OFF	OFF	OFF	ON	OFF	3/1 Coin				
	OFF	OFF	OFF	ON	ON	4/1 Coin				
	OFF	OFF	ON	OFF	OFF	5/1 Coin				
	OFF	OFF	ON	OFF	ON	6/1 Coin				
	OFF	OFF	ON	ON	OFF	7/1 Coin				
	OFF	OFF	ON	ON	ON	8/1 Coin				
	OFF	ON	OFF	OFF	OFF	9/1 Coin				
	OFF	ON	OFF	OFF	ON	12/1 Coin				
	OFF	ON	OFF	ON	OFF	14/1 Coin				
	OFF	ON	OFF	ON	ON	1/2 Coins*				
	OFF	ON	ON	OFF	OFF	2/2 Coins*				
	OFF	ON	ON	OFF	ON	3/2 Coins*				
	OFF	ON	ON	ON	OFF	4/2 Coins*				
	OFF	ON	ON	ON	ON	5/2 Coins*				
	ON	OFF	OFF	OFF	OFF	6/2 Coins*				
	ON	OFF	OFF	OFF	ON	7/2 Coins*				
	ON	OFF	OFF	ON	OFF	8/2 Coins*				
	ON	OFF	OFF	ON	ON	9/2 Coins*				
	ON	OFF	ON	OFF	OFF	12/2 Coins*				
	ON	OFF	ON	OFF	ON	14/2 Coins*				
	ON	OFF	ON	ON	OFF	1/1ST Coin	2/2nd Coin			3/2
	ON	OFF	ON	ON	ON	0/1ST Coin*	1/2nd Coin	1/3rd	1/4th	3/4
	ON	ON	OFF	OFF	OFF	0/1ST Coin*	1/2nd Coin	0/3rd**	2/4th	3/4
	ON	ON	OFF	OFF	ON	1/1ST Coin	1/2nd Coin	1/3rd	2/4th	5/4
	ON	ON	OFF	ON	OFF	1/1ST Coin	2/2nd Coin	1/3rd	3/4th	7/4
	ON	ON	OFF	ON	ON	1/1ST Coin	2/2nd Coin	2/3rd	2/4th	7/4
	ON	ON	ON	OFF	OFF	0/1ST Coin***	0/2nd Coin***	1/3rd	1/3	
	ON	ON	ON	OFF	ON	0/1ST Coin**	0/2nd Coin**	0/3rd**	1/4th	1/4
	ON	ON	ON	ON	OFF	0/1ST Coin****	0/2nd Coin****	0/3rd****	0/4th****	1/5th
	ON	ON	ON	ON	ON	0/1ST Coin***	0/2nd Coin***	1/3rd	0/4th****	1/5th

*No Credits until 2nd coin is dropped.

***No Credits until 3rd coin is dropped.

**No Credits until 4th coin is dropped.

****No Credits until 5th coin is dropped.

MAXIMUM CREDITS:

The maximum credits accepted by the machine limits the number of games that can be accumulated by coining, by winning replays or both. The maximum number of credits is selectable by means of switches 25 and 26. Four credit limits are available. Switch settings are listed below.

MAXIMUM CREDITS	SWITCHES	
	26	25
10	OFF	OFF
15	OFF	ON
25	ON	OFF
40	ON	ON

BALLS PER GAME:

# BALLS/ GAME	SWITCHES	
	32	31
5	OFF	ON
4	ON	OFF
3	OFF	OFF
2	ON	ON

MATCH FEATURE:

When the Match Feature is ON, a random number appears on the Match/Ball in Play window and the word Match is illuminated. If the number matches the tens digit in a player's score, a free game is awarded. The Match Feature creates an incentive to play.

MATCH	SWITCH 28
ON	ON
OFF	OFF

CREDIT DISPLAY:

CREDITS DISPLAYED?	SWITCH 27
YES	ON
NO	OFF

HIGH SCORE FEATURE:

The game is designed to award an Extra Ball or Free Game at each of the two or three score levels. See Front Door Game Adjustments.

AWARD GIVEN	SELF TEST POSITION 16 (Playfield)	SELF TEST POSITION 17 (High Score)
REPLAY	SET TO "03"	SET TO "03"
NO AWARD	SET TO "02"	SET TO "02"
NOVELTY	SET TO "01"	SET TO "01"
NO AWARD	SET TO "00"	SET TO "00"

For combinations of replay/X-ball/Novelty Modes see page 4 "J". "Special Replay/X-ball/Novelty Modes".

HIGH SCORE TO DATE OR OVER 10,000,000 SCORE FEATURE:

The game is designed to award free games as an option if high score to date is beaten or player exceeds 10,000,000 points. Each time this happens, the winning score becomes the new high score to beat. This score is displayed on all 4 player score displays at the end of each game as an incentive to play. Recommended setting is underlined.

HIGH SCORE TO DATE FEATURE	SELF TEST POSITION 19
No Award	SET TO "00"
One Credit	SET TO "01"
Two Credits	SET TO "02"
Three Credits	SET TO "03"

State and local laws may regulate the use of the above features, and they have been designed to allow for appropriate adjustment in order to conform to such requirements.

SOUND OPTION

The game is designed to make several tones and noises to announce power-up, game-up, etc. The tones are intended to attract attention to the game and increase game usage. The tones are controlled by pressing Self-Test button until the #18 shows on the match/ball in display. Now pulse replay button to desired sound setting.

Setting "00"

Most switches associated chimes without feature background.

Setting "01"

Playfield switches associated chimes with background.

Setting "02"

Most scoring will have a noise effect without background.

Setting "03"

Most all scoring will have a noise effect with background.

GAME FEATURE OPERATIONS:

Top Roll-over Button Special Adjustment:

Liberal	SW 6 ON	More than 1 Special per game.
Conservative	SW 6 OFF	Only 1 Special per game.

Tube Special Adjustment

Liberal	SW 7 ON	SW 8 ON	Tube Special at 60,000
Medium	SW 7 OFF	SW 8 ON	Tube Special at 80,000
Semi-Medium	SW 7 ON	SW 8 OFF	Tube Special at 100,000
Conservative	SW 7 OFF	SW 8 OFF	Tube Special at 120,000

Bonus Multiplier Advance Adjustment:

Liberal	SW 14 ON	Advance very 2nd Tube Shot.
Conservative	SW 14 OFF	Advance every 3rd Tube Shot.

Ramp Ion-Generator Special Adjustment

Liberal	SW 15 ON	Special on with 180,000
Conservative	SW 15 OFF	Special on with 270,000

Guardian Drop Targets Adjustment:

Liberal	SW 16 ON	Drop Targets reset after Extra Ball is earned.
Conservative	SW 16 OFF	Drop Targets reset after Ramp Special is earned.

B-L-A-S-T Special Adjustment

Liberal	SW 21 ON	SW 22 ON	Special on with 50,000
Medium	SW 21 OFF	SW 22 ON	Special on with 100,000
Semi-Medium	SW 21 ON	SW 22 OFF	Special on with 150,000
Conservative	SW 21 OFF	SW 22 OFF	Special on with 200,000

Saucer Bonus Multiplier Adjustment

Liberal	SW 23 ON	Saucer collects with Multipliers
Conservative	SW 23 OFF	Saucer collects without Multipliers

Top Roll-over Button Special Active Adjustment

Liberal	SW 24 ON	Special Feature is active.
Conservative	SW 24 OFF	Special Feature is inactive.

Cybernaut Bonus Special Adjustment

Liberal	SW 30 ON	Special at 300,000
Conservative	SW 30 OFF	Special at 395,000

C. FRONT DOOR GAME ADJUSTMENTS

HIGH SCORE FEATURE ADJUSTMENTS:

The game is designed to award an extra ball (option) or a free game at each of three score levels. The recommended levels are on the score card in the game.

Any level from 10,000 to 990,000 can be set, as desired. It is also possible to reset or turn off (00) any or all of the levels, if desired.

1. Push and release Self-Test button (See Figure III) at one second intervals approximately six times or until identification number 01 appears on the "Match/Ball in Play" display.
2. The number on the Player Score Displays is the score level.* It can be increased, if desired, by holding the credit button in. To decrease the score level, hold the credit button in and depress and release the Self-Test button. Release the credit button when the desired number appears. Note that the level changes 10,000 points at a time. If the number "00" is left on the displays, the high score feature is eliminated for that level.
3. Repeat steps 1 and 2 for the second and third score levels. The identification numbers "02" and "03" on the Match/Ball in Play display are for the second and third levels, respectively.

HIGH SCORE TO DATE AND 10,000,000 FEATURE:

The game is designed to award free games when "High Score to Date" is beat, or if the player exceeds 10,000,000 points.

It is recommended that the level, which will build with play, be periodically reset to the factory recommended level to encourage game play. The adjustment procedure is the same as for the High Score Feature Adjustment, Steps 1 and 2. Continue pushing the Self-Test button until the identification number "04" appears on the "Match/Ball in Play" display and then do Step 2.

Any level from "00" to 9,990,000 can be set as described. It is to be noted that "00" does NOT turn off the feature, as it does on High Score feature. The feature is turned off by Self-Test position 19 as discussed under "Back Box Game Adjustments".

SELF-TEST SETUP FOR 16-19:

To set up positions 16-19 push and release Self-Test

button till 16 shows on match/ball in play. Now pulse replay button for recommended setup from "00" thru "03". Repeat for positions 17, 18, and 19.

SOUND

In addition to game sounds, there is also a Master Volume Control located on the front door. (refer to page 10)

Please note that the module volume controls should be adjusted prior to setting the control on the front door.

- * Can be quickly set to "00" by pressing S33 on the MPU assembly in the back box or Coin Chute switch #3. (See Figure III.)

CYBERNAUT

RUBBER PARTS

PANEL TOP PARTS

- | | |
|--------------|-----------------|
| A. 17-41-633 | (4) Post |
| B. 17-41-637 | (4) Post |
| C. 17-41-641 | (3) Post |
| D. 17-41-642 | (4) I.D. 3/4" |
| E. 17-41-643 | (1) I.D. 1" |
| F. 17-41-644 | (1) I.D. 1 1/2" |
| G. 17-41-645 | I.D. 2" |
| H. 17-41-646 | I.D. 2 1/2" |
| I. 17-41-647 | I.D. 3" |
| J. 17-41-682 | (2) Flipper Red |

- | | |
|---------------------------------|-----------------|
| 1. DROP TARGET ASSY.-4-TARGET | AB42-00017-0000 |
| 2. TARGETS W/HOT STAMP | AB42-00018-0000 |
| 3. BALL EJECT SAUCER ASSY. | AB42-00033-0000 |
| 4. FREE GATE ASSY. | AB42-00030-0000 |
| 5. FREE GATE ASSY. | AB42-00035-0000 |
| 6. BALL GATE & WIRE ASSY. | AB42-00036-0000 |
| 7. BALL GATE & WIRE ASSY. | AA40-00034-0000 |
| 8. BALL RAMP & SWITCH ASSY. | AB42-00041-0000 |
| 9. TO MTG. KICKER | A360-00234-0000 |
| 10. THUMPER BUMPER ASSY. | A967-00053-0000 |
| 11. SLINGSHOT ASSY. | A967-00059-0000 |
| 12. FLIPPER ASSY. (MIDDLE LEFT) | A391-00052-0100 |
| 13. FLIPPER ASSY. (RIGHT) | A391-00053-0100 |
| 14. FLIPPER ASSY. (LEFT) | A391-00054-0200 |
| 15. BALL REBOUND ASSY. | AA17-00023-0000 |
| 16. BALL GATE & WIRE ASSY. | A967-00057-0000 |
| 17. SWITCH ASSY. (OUTHOLE) | A360-00241-0000 |
| 18. SWITCH & DIODE ASSY. | A390-00040-0000 |
| 19. SWITCH & BRACKET ASSY. | A360-00603-0007 |
| 20. WIRE ACTUATOR ASSY. | A360-00217-0000 |
| 21. WIRE ACTUATOR ASSY. | A967-00062-0000 |
| 22. ROLLOVER BUTTON | A365-00051-0000 |
| 23. BALL GATE ASSY. | A360-00022-0000 |
| 24. SHOOTER GAUGE | OB42-00101-0000 |
| 25. BOTTOM ARCH | OB42-00100-0000 |
| 26. DOWN RAMP | OB42-00106-0000 |
| 27. BALL TUBE | OB42-00904-0000 |
| 28. ROLLOVER BUTTONS | 0390-00906-0000 |
| 29. TARGET SW. BRKT. ASSY. | A390-00017-0000 |
| 30. BALL GUIDE WIRE SPL 2" | OB42-00905-0000 |
| 31. BALL GUIDE WIRE 1-1/4" | 0360-00175-4600 |
| 32. BALL GUIDE WIRE 2" | 0360-00175-5600 |
| 33. BALL GUIDE WIRE 5" | 0360-00175-2300 |
| 34. BALL GUIDE WIRE 5-5/8" | 0360-00126-0000 |
| 35. BUFFER WIRE 2-3/8" | 0360-00175-5300 |
| 36. BALL GUIDE WIRE 3-5/8" | 0360-00175-1800 |
| 37. WIRE ACTUATOR ASSY. | A370-00062-0000 |

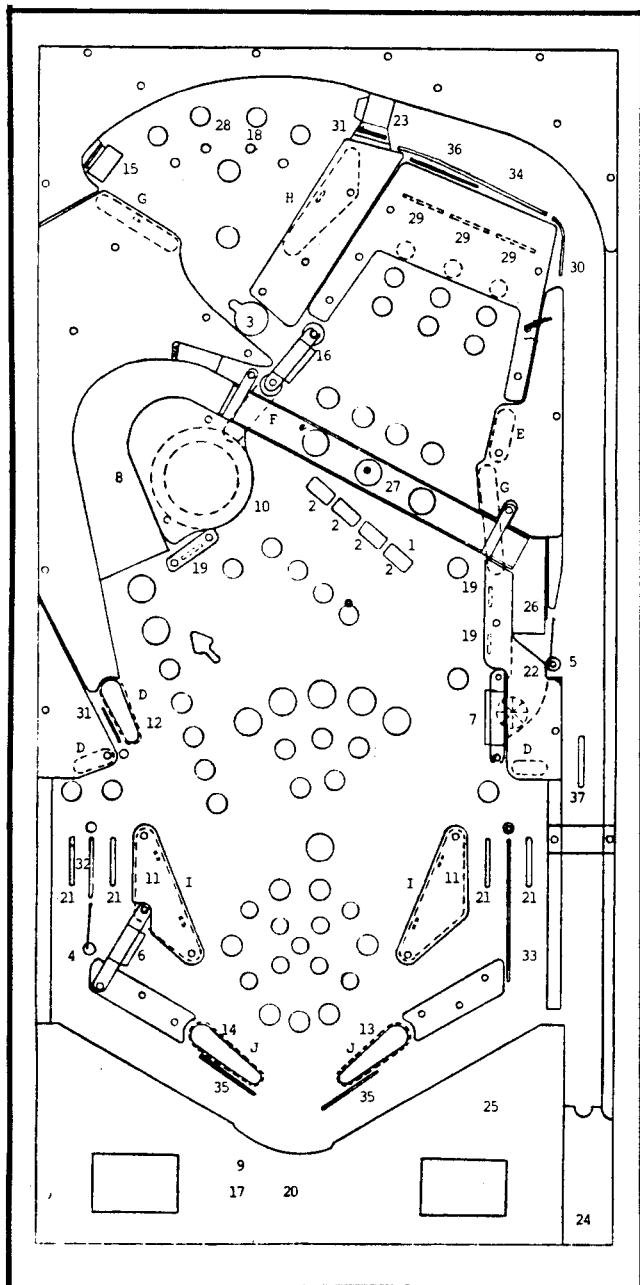


FIGURE II

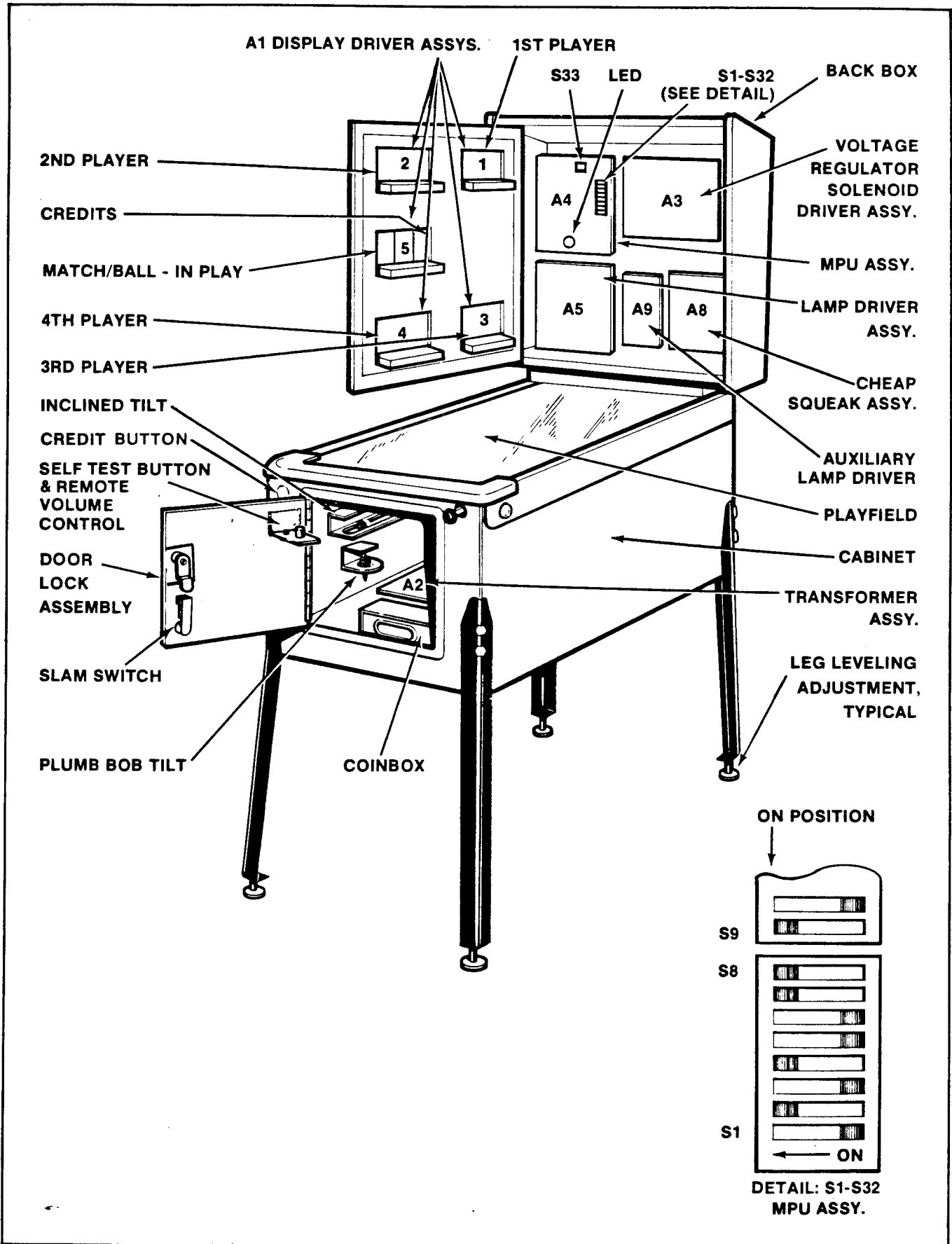


FIGURE III. ELECTRONIC PIN BALL MACHINE

RECOMMENDED

Instructions, Score Cards and High Score Feature Settings to be used on **Cybernaut #0B42**

REPLAYS	3-BALL	REPLAYS	5-BALL
Instruction Card	M051-00B42-A030*	Instruction Card	M051-00B42-A030*
Score Card	M051-00B42-A038	Score Card	M051-00B42-A039
1 Replay at 1,500,000		1 Replay at 2,000,000	
1 Replay at 3,900,000		1 Replay at 4,500,000	
		EXTRA BALL	
		Instruction Card	M051-00B42-A032*
		Score Card	M051-00B42-A038 w/M051-00B42-A074
		1 Extra Ball at 1,400,000	
		1 Extra Ball at 3,700,000	

ADDITIONAL CARDS

REPLAYS	EXTRA BALL	
M051-00B42-A040	800,000	1,900,000
M051-00B42-A041	900,000	2,000,000
M051-00B42-A042	1,000,000	2,000,000
M051-00B42-A043	1,000,000	2,200,000
M051-00B42-A044	1,000,000	2,500,000
M051-00B42-A045	1,200,000	2,700,000
M051-00B42-A046	1,200,000	3,000,000
M051-00B42-A047	1,300,000	3,300,000
M051-00B42-A048	1,400,000	3,700,000
M051-00B42-A049	1,600,000	3,800,000
M051-00B42-A050	1,600,000	4,000,000
M051-00B42-A051	1,700,000	4,100,000
M051-00B42-A052	1,900,000	4,300,000
M051-00B42-A053	2,100,000	4,400,000
M051-00B42-A054	2,300,000	4,800,000
M051-00B42-A054	2,500,000	5,000,000
M051-00B42-A056	2,700,000	5,300,000
M051-00B42-A057	2,900,000	5,500,000
M051-00B42-A064	3,000,000	5,700,000
M051-00B42-A065	3,100,000	5,900,000
M051-00B42-A066	3,300,000	6,000,000
M051-00B42-A067	3,500,000	6,000,000
M051-00B42-A068	3,800,000	6,300,000
M051-00B42-A069	4,000,000	6,300,000
M051-00B42-A070	4,000,000	6,500,000
		M051-00B42-A071
		M051-00B42-A072
		M051-00B42-A073
		M051-00B42-A075
		M051-00B42-A076
		M051-00B42-A077
		1,000,000
		1,200,000
		1,400,000
		2,300,000
		2,700,000
		3,000,000
		2,500,000
		3,000,000
		3,700,000
		4,800,000
		5,300,000
		5,700,000
		CARDS:
		REPLAY: M051-00B42-A031*
		EXTRA BALL: M051-00B42-A033*
		NOVELTY: M051-00B42-A034*
		M051-00B42-A035
		M051-00B42-A036
		M051-00B42-A037
		 *Note: If F.D.S #24 is OFF —use:
		M051-00B42-A031—Replay
		M051-00B42-A030—Extra Ball
		M051-00B42-A035—Novelty
		 High Game to date
		(reset periodically)
		3-BALL 4,500,000
		5-BALL 5,500,000

CYBERNAUT

RECOMMENDED SETTINGS

RECOMMENDED REPLAY GAME SETTING FOR:		3-BALL	5-BALL
TOP ROLL-OVER BUTTON SPECIAL ADJUSTMENT	SW6	ON	OFF
TUBE SPECIAL ADJUSTMENT	SW7	ON	OFF
	SW8	OFF	OFF
BONUS MULTIPLIER ADVANCE ADJUSTMENT	SW14	ON	OFF
RAMP ION-GENERATOR SPECIAL ADJUSTMENT	SW15	ON	OFF
GUARDIAN DROP TARGETS ADJUSTMENT	SW16	ON	OFF
B-L-A-S-T SPECIAL ADJUSTMENT	SW21	OFF	ON
	SW22	ON	OFF
SAUCER BONUS MULTIPLIER ADJUSTMENT	SW23	ON	OFF
TOP ROLL-OVER BUTTON SPL ACTIVE ADJUSTMENT	SW24*	ON	ON
NUMBER OF GAMES REPLAYS PER GAME	SW29	ON	ON
CYBERNAUT BONUS SPECIAL ADJUSTMENT	SW30	ON	OFF
BALLS PER GAME	SW31	OFF	ON
BALLS PER GAME	SW32	OFF	OFF

REPLAYS

Instruction Card
Score Cards
Major Mode

Match
High Score to Date

3-BALL

M051-00B42-A030*
M051-00B42-A038
Self-Test Position 16, 17
Set to "03"
SW.28 ON
Self-Test Position 19
Set to "03"

5-BALL

M051-00B42-A030*
M051-00B42-A039
Self-Test Position 16, 17
Set to "03"
SW.28 ON
Self Test Position 19
Set to "03"

X-BALL

Instruction Card
Score Card

Major Mode

Match
High Score to Date

M051-00B42-A032*
M051-00B42-A038
w/M051-00B42-A074
Self-Test Position 16, 17
Set to "02"
SW.28 OFF
Self-Test Position 19
Set to "00"

NOVELTY

Instruction Card
Score card
Major Mode

Match
High Score to Date

M051-00B42-A034*
M051-00B42-A036
Self-Test Position 16, 17
Set to "01"
SW.28 OFF
Self-Test Position 19
Set to "00"

M051-00B42-A034*
M051-00B42-A037
Self-Test Position 16, 17
Set to "01"
SW.28 OFF
Self-Test Position 19
Set to "00"

***NOTE:** IF F.D.S. #24 is turned **OFF** disabling the top roll-over button special feature, use the instruction cards listed below:

REPLAYS	M051-00B42-A031
EXTRA BALL	M051-00B42-A033
NOVELTY	M051-00B42-A035

VIII. ROUTINE MAINTENANCE ON LOCATION:

Self-Test routines are written into the game design. They are particularly useful for routine maintenance. The tests are described below. The first test is automatic and occurs on power-up. This test causes the MPU module A4 to examine itself for failures. Seven flashes of an LED indicates proper operation. The second series of self-diagnostic tests causes the MPU to "exercise" each of the other modules in such a way as to make their faults, if any, obvious. See Figure III and Page ii.

It is recommended that these tests be used several times a week to check out the games before play. If faults are discovered, they may be corrected on location if the operator has a stock of replacement modules. See "Trouble Shooting on Location".

MPU Module Self-Test:

At power on, the LED on the MPU module flashes once. (Flicker-Flash.) After a pause, it flashes six more times and goes out. A power-up tune is played to announce game readiness. This indicates proper MPU operating condition and successful completion of the power-up test.

Game Self-Diagnostic Tests:

1. Pressing the Self-Test button inside the door initiates the Self-Test routine. See Figures III and IV. All switched lamps flash off and on continuously.
2. Pressing the Self-Test button again causes each digit on each display to cycle from 0 thru 9, and repeat continuously.
3. Pressing the Self-Test button again causes each solenoid to be energized, one at a time, in a continuous sequence. Hold both flipper buttons "in" during this test. The number appearing on the Player Score displays is the same as the number assigned to the solenoid. The sound of a solenoid pulling-in as a number appears indicates proper operation. The absence of sound is improper. If sound is absent, See Page 17 for help in Solenoid Identification.
4. Pressing Self-Test button again causes the sound module to play same tune repeatedly.
5. Pressing the Self-Test button again causes the MPU to search each switch assembly for stuck contacts. If any are found, the number of the first set encountered is flashed on the Player Score displays. The number remains until the

fault is cleared. See Page 17 for help in Stuck Switch Identification. Other numbers may follow if more stuck contacts are present. If there are no stuck switches, the Match/Ball in Play display flashes "0".

6. Pressing the Self-Test button 20 more times causes the MPU to step thru the threshold and bookkeeping functions described previously and finally to repeat the power-up test. For more rapid exit to power-up, turn the game off, then on. The game is now ready to play.

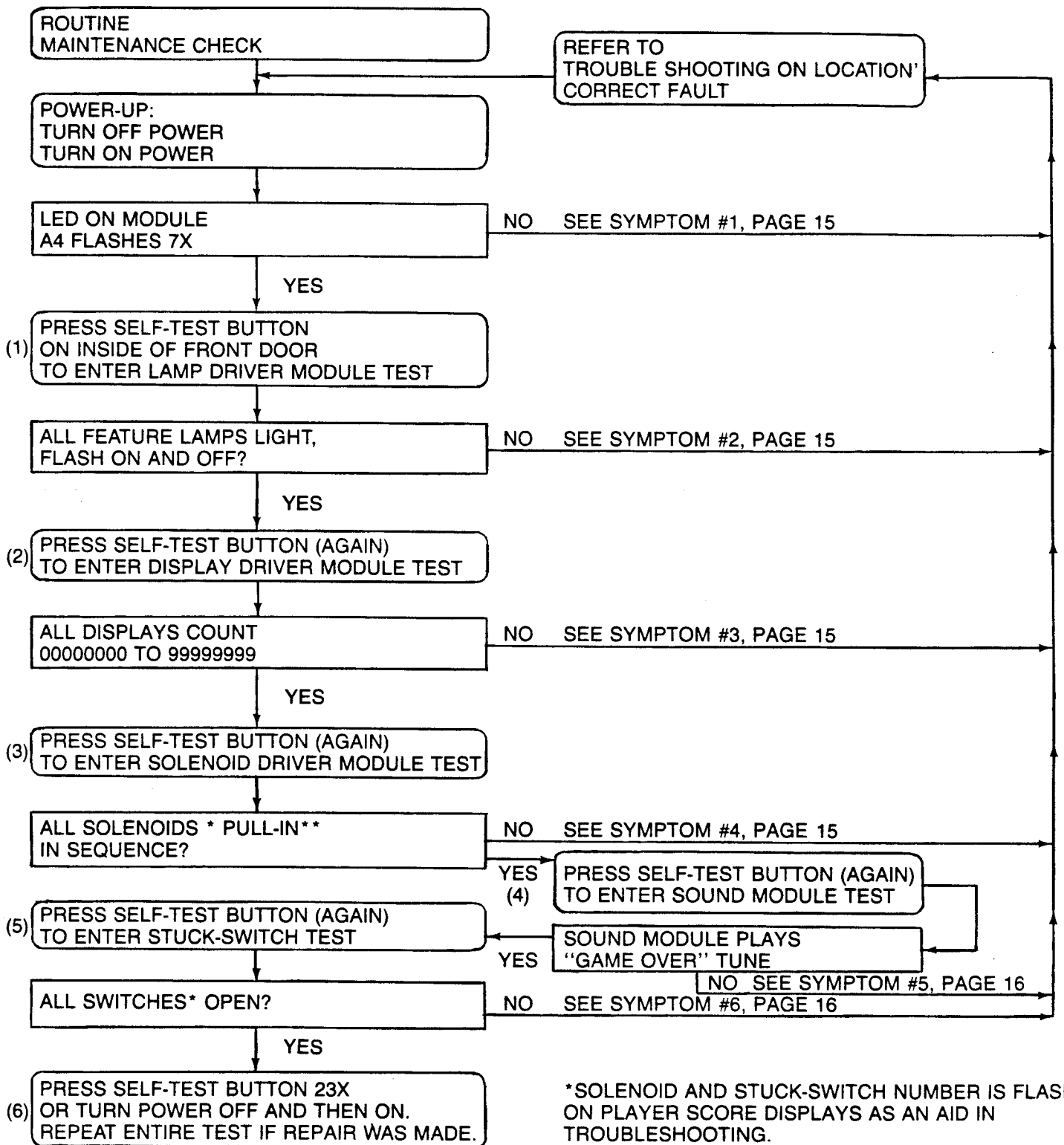
After successful completion of the Self Diagnostic Test Procedure, set the game up for play. Exercise each roll-over, thumper bumper, slingshot, etc., by hand until each switch assembly on the playfield has been checked for proper operation. If actuating a switch assembly results in intermittent or no response, clean contacts by gently closing them on a clean business card or piece of paper and wiping until they wipe clean. Re-gap, if necessary, to 1/16".
Do not burnish or file Gold Plated Switch Contacts.

IX. TROUBLESHOOTING ON LOCATION

The game is designed to make troubleshooting easy. Several simple procedures are given herein that cover the greatest percentage of game failures. They are written for an operator on location and require module replacement. (See Figure III) Symptoms and the action to be taken are given for each type of problem.

If the problem is more complicated and is not solved by following this procedure, more detailed procedures are available from Bally/Midway. See the Parts List for ordering information.

FIGURE IV SELF DIAGNOSTIC TEST



*SOLENOID AND STUCK-SWITCH NUMBER IS FLASHED ON PLAYER SCORE DISPLAYS AS AN AID IN TROUBLESHOOTING.
See page 17.
*HOLD FLIPPER BUTTONS IN DURING TEST.

1A)

SYMPTOM:

Game does not play power-up tune when power is turned on. General illumination is present.

ACTION:

- A) Turn power OFF. Open back box. Locate light emitting diode (LED) on MPU module A4.
- B) Turn Power ON. LED must flash 7X to indicate that module A4 is good. Correct flash sequence is flicker/flash-pause-and then six more flashes and LED goes out.
- C) If LED does not come on, or does not flash, or flashes, but less than 7X, turn off power. Check fuses. If fuses are good, replace MPU Module A4.

CAUTION: Replacement MPU Module must have same Part Number or incorrect operation will result! See Parts List for MPU Module Part Number.

Turn power ON.

- D) If game is correct, it is now ready for play. If game is not correct, refer to Module Replacement procedure. (See Parts List).

2A)

SYMPTOM:

Not all feature lamps light during game play.

ACTION:

- A) With power ON, open front door. Press button (Self-Test switch) once. If game is correct, all feature lamps flash ON and OFF.
- B) Carefully raise playfield or open back box to gain access to lamps.
- C) Replace bulbs that do not flash.
- D) If game is correct, it is now ready for play.
- E) If game is not correct, turn power OFF. Replace Lamp Driver Module A5. Turn power ON and repeat A.
- F) If game is correct, it is now ready for play.*
- G) If game is not correct, turn power OFF. Replace MPU module A4. See CAUTION 1C. Turn power ON and repeat A.
- H) If game is correct, it is now ready for play.* If game is not correct, refer to Module Replacement Procedure. (See Parts List.)

2B)

SYMPTOM:

One or some switched lamps always ON.

ACTION:

Repeat 2AA, AN, AE, and AF and, if necessary AG & AH.

3A)

SYMPTOM:

Display digits improper on one or several, but less than all Display Driver module(s), A1. Improper: One or several segments always OFF, digits mottled or several segments or digit(s) always ON.

* Turn power On-Off switch OFF and then ON.

ACTION:

- A) With power ON, open front door. Press button (Self-Test switch) twice. If the game is correct, each digit on each Display Driver Module A1 (5 used/game) displays the count 1-9 and 0 continuously in all 6 digit positions. Note defective Display Driver modules.
- B) Turn power OFF.

WARNING: High Voltage is supplied to the Display Driver Modules, A1, from the Solenoid Driver/Voltage Regulator Module A3. Wait 30 seconds for High Voltage to Bleed Off.

- C) Replace Display Driver module(s) A1. Turn power ON. Repeat A.
- D) If game is correct, it is now ready for play.* If game is not correct refer to Module Replacement procedure. (See Parts List).

3B)

SYMPTOM:

All displays improper (all five display Driver modules). Improper: Digit(s) always on or off/segment(s) always on or off, all displays.

ACTION:

- A) Repeat 3AA, and AB.
- B) Replace MPU module A4. See CAUTION NOTE, 1C. Turn power ON. Repeat A.
- C) If game is correct, it is now ready to play.* If game is not correct, refer to Module Replacement Procedure. (See Parts List.)

3C)

SYMPTOM:

One or several displays always off.

ACTION:

- A) Do 3AA, AB, AC, and AD.
- B) Repeat 3BB and BC, if necessary.

4A)

SYMPTOM:

Solenoid(s) do(es) not pull-in during course of game.

ACTION:

- A) With power ON, open front door. Press button (Self-Test switch) three times.
- B) If game was correct, each solenoid would be energized. A number is flashed on the Player Score displays as each solenoid is pulsed. Note any numbers that do not have the sound of a solenoid associated. (NOTE: If most of the Playfield Solenoids DO NOT operate, check the Playfield Fuse to see if it is blown. It generally can be found near the Flipper Assemblies.) See Solenoid Identification Table, Page 17 and Figure V.
- C) Carefully lift the playfield (or open the back box)

to gain access to the solenoid. Turn power OFF. Inspect the solenoid.

- D) If a lead is broken off, repair. Repeat A & B. If game is correct, it is now ready for play.* If solenoid wiring was correct, turn power OFF.
- E) Replace Solenoid Driver/Voltage Regulator module A3. See CAUTION NOTE 3AB.
- F) Repeat AA & AB. If game is correct, it is now ready to play.* If game is not correct, turn power OFF.
- G) Replace Sound Module A8.
- H) Repeat AA & AB if game is correct. It is now ready to play.* If game is not correct, turn power OFF.
- I) Replace MPU module A4. See CAUTION NOTE, 1C.
- J) Repeat A & B. If game is correct, it is now ready to play.* If game not correct, refer to Module Replacement Procedure. (See Parts List).

4B)

SYMPTOM:

Solenoid(s) always energized--Note: if impulse solenoids (ball ejects, slingshots, thumper-bumpers, etc.) are energized continuously, they are subject to damage. Limit troubleshooting to one minute with power ON, followed by **five minutes with power OFF**. Repeat as necessary. Replace damaged solenoids. (NOTE: When troubleshooting Playfield Solenoid Circuits, be advised that a constantly energized Solenoid [i.e. Thumper Bumper] will blow the Playfield Fuse in a few seconds. To avoid replacing the Fuse repeatedly, Try to isolate the faulty Solenoid Circuit as soon as the game power switch is flipped ON.)

ACTION:

Do 4AA, AB, AE, AF, AG, AH and if necessary, AI and AJ.

5)

SYMPTOM:

No Sound.

ACTION:

- A) With power ON, open front door, press Self-Test switch four times.
- B) Turn volume control clockwise to Max.
- C) If correct, sound will be heard. If incorrect, try seating speaker lead connector (J2) and input connector (J1).
- D) If correct, sound will be heard. If incorrect, refer to Module Replacement procedure.

6) SYMPTOM:

Feature (Drop Targets, etc.) does not score.

ACTION: A)

With power ON, open front door. Press button (Self-

Test switch) five times.

- B) If the game is correct, Match/Ball in Play display would flash "0". If a number appears on the Player Score displays, see Switch Assembly Identification Table, Page 17 and Figure V.
- C) Carefully lift the playfield. Locate the switch assembly identified from the number. Visually inspect the switch assembly. If the contacts are "stuck", re-gap them to 1/16". See section under ADJUSTMENTS. Repeat A & B. If the game is correct, it is now ready to play.* If game is not correct, turn the power OFF.
- D) Replace MPU module A4. See CAUTION NOTE 1,C.
- E) Repeat A & B. If game is correct, it is now ready to play.* If game is not correct, refer to Module Replacement Procedure. (See Parts List).

7)

SYMPTOM:

Game blows fuse(s) repeatedly.

ACTION:

See Module Replacement Procedure. F.O. 560-3.

* Turn power On-Off switch OFF and then ON.

CYBERNAUT

SOLENOID IDENTIFICATION TABLE

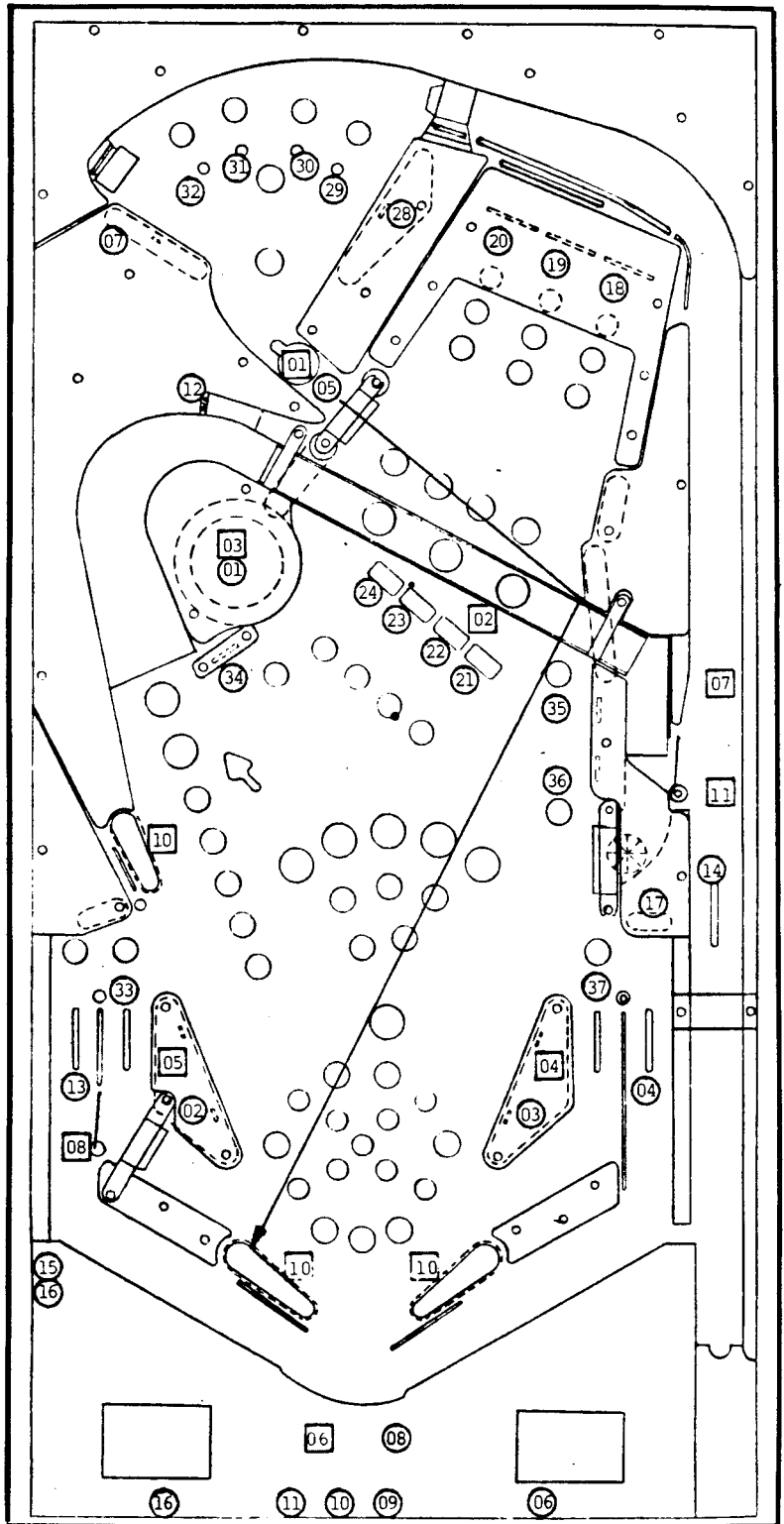
SELF <input type="checkbox"/> TEST #	SOLENOID IDENTIFICATION	SELF <input type="checkbox"/> TEST #	SOLENOID IDENTIFICATION
01	Saucer	07	Knocker
02	Drop Target Reset	08	Left Gate
03	Thumper Bumper	09	
04	Left Sling Shot	10	K1 Relay (Flipper Enable)
05	Right Sling Shot	11	Right Gate
06	Outhole		

SWITCH ASSEMBLY SELF-TEST DISPLAY NUMBERS

SWITCH SELF <input type="radio"/> TEST #	DESCRIPTION	SWITCH SELF <input type="radio"/> TEST #	DESCRIPTION
01	Thumper Bumper	20	Top Left Target
02	Left Slingshot	21	Drop Target #1 (Right)
03	Right Slingshot	22	Drop Target #2
04	Right Outlane	23	Drop Target #3
05	Saucer	24	Drop Target #4
06	Credit	25	
07	Rebound	26	
08	Outhole	27	
09	Coin III (Right)	28	Rebound Special
10	Coin I (Left)	29	Rollover Button #1 (Right)
11	Coin II (Middle)	30	Rollover Button #2
12	Tube Switch	31	Rollover Button #3
13	Left Outlane	32	Rollover Button #4
14	Shooter Lane	33	"B" Return Lane
15	Tilt	34	"L" Target
16	Slam	35	"A" Target
17	Rollover Button	36	"S" Target
18	Top Right Target	37	"T" Return Lane
19	Top Middle Target		

CYBERNAUT

- INDICATES SWITCH ASSEMBLY IDENTIFICATION NUMBERS
NOTE: CABINET 15, 16
DOOR: 06, 09, 10
11, 16
- INDICATES SOLENOID IDENTIFICATION NUMBERS
NOTE: BACK BOX: 10
CABINET: 07



VECTOR SHOWING FOR EJECT SAUCER

BALL SHOULD EXIT AND REBOUND TO
BOTTOM LEFT FLIPPER AS SHOWN

ASSEMBLY ADJUSTMENTS:

GENERAL:

All switch assemblies consist of leaf springs, contacts, separators, plastic tubing and screws to hold them to the mounting surface. Before attempting to adjust a switch assembly, make sure that these screws are tight. If not, tighten screw closest to the contact end of the leaf spring first. This will prevent the assembly from being secured in such a manner that the leaf springs tend to fan out. In general, all leaf springs are adjusted for a 1/16" gap in the open position and .010" over-travel or wipe in the closed position. All contacts should be in good condition. Unless otherwise instructed, they should be dry or non-lubricated. All contacts should be free of dust and dirt. Contacts, with the exception of the flipper button switch assemblies, are plated to resist corrosion. Filing or burnishing breaks the finish and encourages corrosion. Clean by closing the contacts over a clean piece of paper (e.g., a business card) and wiping gently until the contacts are clean. For the flipper button switch assemblies **ONLY**: Tarnish can be removed with a contact file followed by burnishing tool. Severely pitted contacts must be placed and adjusted only when they are found to be a source of game malfunction.

Wildcat #125 is not available, Bally suggests you ask your Distributor to order it. Inspect and hand polish the ball in a clean cloth. A chipped ball must be replaced. It can ruin the finish on the playfield in a short period of time.

DON'T: Use water in large quantities, highly caustic cleaners, abrasive cleaners and cleaning pads on the playfield, or allow a wax or polish build up. Waxes yellow with age and spoil appeal.

X. SERVICE PARTS:

A parts catalogue is available upon request. The catalogue is illustrated and lists all replacement parts for each game manufactured by Bally. Requests should be addressed to:

**BALLY MIDWAY MFG. CO.
10601 WEST BELMONT AVENUE
FRANKLIN PARK, ILLINOIS 60131
ATTN: PARTS DEPARTMENT**

SERVICE HINTS:

The bally playfield has an improved tuff-coat finish with excellent wearing properties. Life expectancy of the playfield, as well as play appeal, can be extended by periodic cleaning.

DO: Bally recommends you clean your playfield with Wildcat #125 (Wildcat Chemical Co. 1349 East Seminary Drive; Fort Worth, Texas 76115; Phone 1-817/924-8321). Wildcat #125 is a combination cleaner and polish. Bally has tried and tested this product and found it to be very effective. If

**XI. PARTS LIST
CYBERNAUT #0B42**

MISCELLANEOUS	MIDWAY PART NUMBER	BALLY PART NUMBER
Transformer (Domestic or Export)	MT00-00115-A000	E-122-142
Bulbs, #555	0017-00003-0484	E-125-73
Fuse, 1 Amp. 3 AG Slow Blow (Playfield Solenoid Protection)	0017-00003-0103	E-133-44
ASSEMBLY COILS		
Flipper (3)	A360-00045-0000	AQ-25-500/ 34-4500
Drop Target Reset (1)	AB42-00045-0000	NO-25-1600
Knocker	A360-00046-0000	AR-26-1200
Outhole Kicker	A360-00044-0000	AN-26-1200
Thumper Bumper (1)	A360-00044-0000	AN-26-1200
Scooter	A360-00211-0000	AO-27-1300
Gate (2)	A390-00027-0000	GA-34-4000
Slingshot (2)	A360-00046-0000	AO-26-1200
PLAYFIELD PARTS		
MODULES		
Lamp Driver A5	A084-91613-A000	AS-2518-23
Display Driver A1 (4 used)	A084-91617-A000	AS-2518-58
Display Driver A1 (1 used)	A084-91491-A000	AS-2518-21
MPU A4	A084-91638-AB42	
Transformer & Rectifier A2	AB87-00009-0000	AS-2877-6
Rectifier Board (Part of A2)	A084-91616-AB87	AS-2518-54
Cheap Squeak	A084-91603-AB42	AS-2518-43
Auxiliary Lamp Driver A9	A084-91614-A000	AS-2518-43
REPAIRS AND PROCEDURES/AIDS		
Module & Component Replacement		F.O. 560-3
AID (Assistance in Diagnostics) Kit, used with F.O. 560-3		KIT 485-1
MODULE COMPONENTS		
SEE MODULE PARTS LIST		

See Figure II