

Pinball Board

Setup & Menus

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IMPORTANT PRELIMINARY INSTRUCTIONS PRIOR TO INSTALLING THE BOARD:



The pinball game must be turned off and unplugged from outlet before removing/installing any board
 The electronic boards must be handled by their edges to reduce the risk of damage through static electricity
 The AC cord must be in good shape and imperatively plugged into a grounded outlet before turning the pinball game on
 All displays and **A6/A7** (sound) boards must be in perfect working condition, all coils and their respective diodes must have been checked good
 All fuses must have been checked and strictly comply to game's prescriptions (rating -in amperes- and blowing speed) in the original game's manual
 Pins of all connectors around boards **A1** (CPU) **A2** (power supply) **A3** (driver) and **A6/A7** (sound) must be clean and corrosion-free



INSTALLING THE BOARD IN A GAME IN UNKNOWN CONDITION WILL VOID THE GUARANTEE

This color shows all changes in the manual's next pages since last version

This color shows all settings pertaining to Haunted House MULTIBALL game

SOFTWARE VERSION

February 2017

WHAT'S NEW?

- « Rack'Em Up » : Newly added game
- « Black Hole » : Fixup on the captive ball on the bottom playfield

GAMES LIST

with game number and release date

Bold : game ready. Greyed out : under programming.

System 80	System 80A
Spiderman #653, 1/80	Devil's Dare #670, 8/82
Panthera #652, 5/80	Caveman #810PV, 9/82
Circus #654, 6/80	Rocky #672, 9/82
Counterforce #656, 8/80	Spirit #673, 11/82
Star Race #657, 10/80	Punk #674, 12/82
James Bond #658, 10/80	Striker #675, 1/83
Time Line #659, 11/80	Knoll #676, 2/83
Force II #661, 1/81	Q*bert's Quest #677, 3/83
Pink Panther #664, 3/81	Super Orbit #680, 5/83
Mars God of War #666, 4/81	Royal Flush Deluxe #681, 6/83
Volcano #667, 7/81	
Black Hole #668, 10/81	
Eclipse #671, 10/81	
Haunted House #669, 2/82	
PI-80 exclusive -->> Haunted House MULTIBALL	
	Goin Nuts, #682, 1982
	Amazon Hunt #684, 9/83
	Rack 'Em Up #685, 11/83
	Ready Aim Fire #686, 11/83
	Jacks to Open #687, 5/84
	Alien Star #689, 8/84
	The Games #691, 8/84
	Touchdown #688, 2/85
	El Dorado City of Gold #692, 3/85
	Ice Fever #695, 5/85

DERIVATIVE KIT GAMES

Game	Maker	Derivative Gottlieb Game
Grand 8	Christian Tabart	Panthera (System 80)
Mythology	Unknown	The Games (System 80A)

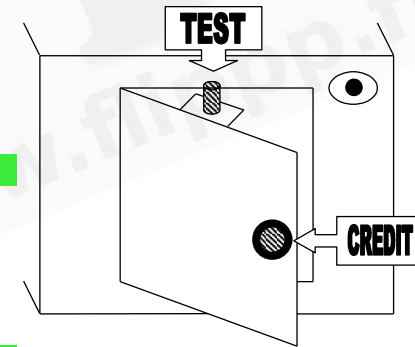
Directions for use of the menus

Key Feature

- TEST** - Enter main menu
- Proceeds to next entry
- CREDIT** - Enters displayed menu
- Increases displayed value
- Selects the next displayed value

Change selected game upon power-up

- Step**
- 1 The game displays « PI80X4 » then the date and the name + number of the currently selected game
 - 2 Press TEST: the game number flashes
 - 3 Press TEST once or several times to scroll thru the implemented games until the desired one is displayed
 - 4 Press CREDIT to select the displayed game



Navigate thru the main menu

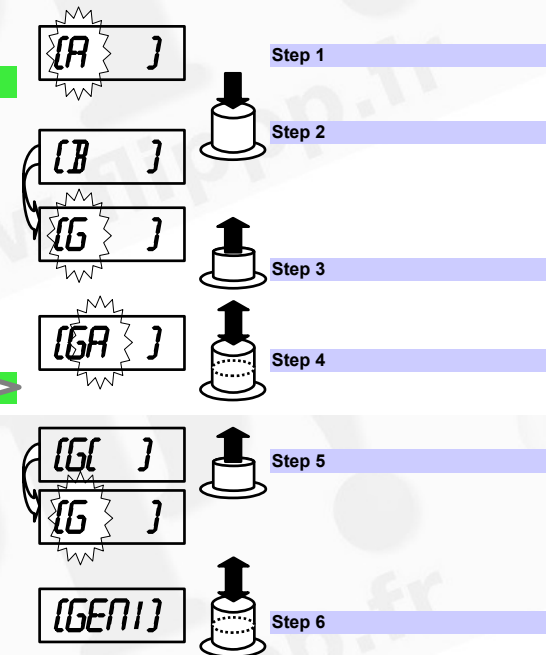
- Step**
- 1 Press TEST to enter the main menu
 - 2 Press TEST once or several times to scroll thru the sub-menus until the desired one is displayed
 - 3 Press CREDIT to enter the displayed sub-menu
- If the displayed sub-menu is "EXIT MENU", the software exits the main menu and returns to "game over" mode

Navigate thru the sub-menus

- Step**
- 1 Press TEST several times to scroll thru the available selections until the desired function or value is displayed, or hold TEST pressed to make them scroll continuously
 - 2 Press CREDIT:
- either to run the displayed function
- or to modify the displayed value, or hold CREDIT pressed to make the possible values scroll continuously
 - 3 Press TEST once or several times to change the displayed value, or hold TEST pressed to change the value continuously
- Some functions, that take a certain time to execute, have their name flashing during execution, until the "DONE" message is briefly displayed in the end
 - 4 Press CREDIT to exit from sub-menu, or select the displayed value (depends on sub-menu)
- The software exits the sub-menu and returns to the main menu

Enter name in high scores table (when enabled) - Example given with « GENI » name:

- Step**
- 1 The currently edited letter flashes at 1st position
 - 2 Press and hold CREDIT: the currently displayed letter scrolls to the next letter in the **A..Z 0..9** list
 - 3 the scrolling stops onto the currently displayed letter (which flashes again) when CREDIT is released
 - 4 Press CREDIT briefly:
the current letter is stored, and the cursor moves to the next character which flashes in turn, and so forth for all 4 positions
 - 5 If CREDIT is held then released when ' [' is displayed, this erases the current letter and brings back to the previous one in list (unless already set on the 1st letter)
 - 6 Press CREDIT briefly after the 4th position: the final name is stored in the table
- Timeout If no action is performed by the player for 5 seconds, the displayed name is automatically stored



Main menu

Entry # (CREDIT)	Menu (PLAYERS / PLAYER 4)	Description		
INDIVIDUAL SETTINGS MENUS				
A1	GAME AUDITS	All the parameters backed up game after game		
	Parameter	Description	Values	Press CREDIT
	LEFT COINS	Number of coins inserted in the left coin slot		Reset value
	RIGHT COINS	Number of coins inserted in the right coin slot		
	CENTER COINS	Number of coins inserted in the center coin slot (if present)		
	TOTAL PLAYS	Total number of plays		
	TOTAL REPLAYS	Total number of replays earned: special, beating either score to beat, match, beating high scores		
	TOTAL EXBALLS	Total number of extraballs earned		
	TOTAL TLTS	Total number of tilt triggered		
	TOTAL SLAMS	Total number of slam triggered		
	BEATEN HISCORE	Total number of times the highest score (record) has been beaten		
	TOTAL TIME	Total play time, in Days Hours Minutes and Seconds		
S1	COMMON SETTING	General settings common to all games		
		Refer to « COMMON SETTINGS » menu		
S2	GAME SETTING	Settings specific to selected game, see separate « SPECIFIC » tag		
		Refer to « SPECIFIC SETTINGS » menu		
S3	SOUNDS SETTING	Game sound settings		
	Display	Description	Values	Feature
		Selects the type of played sounds, which depends on the game and its sound board:		
		If additional PI-FX/80 sound board installed : for games Panthera, Star Race, James Bond	SCORING	Does not play some background sounds
			CONTINUOUS	Plays some background sounds
	SOUND MODE	If additional PI-FX/80 sound board installed : for games Spiderman, Circus, Counterforce	tone	Modifies some sounds
		For games released in both versions : Volcano, Black Hole, Devil's Dare	SOUND	Modifies some sounds
			CLASSIC	Uses the 'small' classic sound board (« export » game)
			SPEECH	Uses the 'large' speech-capable sound board (« domestic » game)
			DISABLE	Attract tune is disabled
	ATTRACT MODE	If additional PI-FX/80 sound board installed : enables or disabled the attract mode	12 MIN	Attract tune is played every 12 minutes
			6 MIN	Attract tune is played every 6 minutes
	SOUND WAVE	If additional PI-FX/80 sound board installed : slightly changes the playback rendering of certain sounds (depends on sound and game)	SINUS	Sinus sound wave (like the original sound board)
			SAWTOOTH	Sawtooth sound wave (slightly higher pitched)
	TREMOLO EFFECT	If additional PI-FX/80 sound board installed : modifie légèrement l'enveloppe sonore de certaines mélodies (depends on sound and game)	DISABLE	Variable volume envelope (like the original sound board)
			ENABLE	Flat volume envelope (stronger but flat sound)
S4	SCORES SETTING	Settings of 3 scores to beat and highest game to date, values can be set independantly of each other		
	Scores	Description	Values	Press TEST
	BEAT 1	First score to beat	10,000 to 9,999,990 points (System80) or 99,999,990 points (System80A) 0 = disabled	Moves to next position (from 10M to 10K) or makes the whole score flash
	BEAT 2	Second score to beat	10,000 to 9,999,990 points (System80) or 99,999,990 points (System80A) 0 = disabled	
	BEAT 3	Third score to beat	10,000 to 9,999,990 points (System80) or 99,999,990 points (System80A) 0 = disabled	
	HIGHEST	Highest game to date (any change also erases any name associated to it)	10,000 to 9,999,990 points (System80) or 99,999,990 points (System80A) 0 = 1" score made will be stored	
				Press CREDIT
				Press briefly: When a single digit flashes: increments it When the whole score flashes: stores it and quits Hold pressed: resets the whole score (no matter the flashing digit)
S5	COINS SETTING	Settings of 3 coins slots		
	Coin Slot	Location	Values	Press TEST
	LEFT	Left coin slot	X=1..9 coins give Y=1..9 plays	Switches between X and Y values
	RIGHT	Right coin slot	X=1..9 coins give Y=1..9 plays	
	CENTER	Center coin slot (no effect on games that do not have it)	X=1..9 coins give Y=1..9 plays	Press CREDIT
				Increments the actual value (X or Y)
PRESET MENUS				
To execute the selected preset/clear entry command, press CREDIT once. « Sure ? » is then displayed: press CREDIT again to confirm and hold it pressed until « DONE » is displayed.				
P1	PRESET SETTINGS	Preset of general settings = set of default values		Press CREDIT
		Refer to « General settings » menus above: each parameter's default value is printed in white over black background		Execute & hold to confirm
P2	PRESET SCORES	Preset of 3 scores to beat		Press CREDIT
	Scores	Description	Values	Press CREDIT
	BEAT 1	First score to beat	200,000	Execute & hold to confirm
	BEAT 2	Second score to beat	750,000	
	BEAT 3	Third score to beat	1,500,000	
P3	CLEAR AUDITS	Reset all audits (GAME AUDITS menu)		Press CREDIT
				Execute & hold to confirm
P4	CLEAR HISCORE	Reset high scores table		Press CREDIT
		All hiscore values are set to 0 and their associated names (if any) are erased		Execute & hold to confirm
TEST MENUS				
T1	COILS TEST	Tests all coils specific to the selected game	Press TEST	Press CREDIT
		Each coil can be tested individually	Next coil in list	Engerizes the displayed coil
T2	COILS G-TEST	Tests the 4 « generic » coils that are common to all games	Press TEST	Press CREDIT
		Game over relay coil (Q), Tilt relay coil (T), Coin lockout coil, Klocker coil (SOL8), Coin counters (SOL3, SOL4, SOL7)	Next coil in list	Engerizes the displayed coil
T3	DISPLAYS TEST	Tests all game displays	Press TEST	Press CREDIT
		Displays numbers from « 0 » to « F » in a cyclic way over 4, 6 or 7 digits depending on display type and series (80 ou 80A)	Flash all displays	End of test
T4	SOUNDS TEST	Tests all 5 sound signals (S12/4/8/16) that drive the sound board		Press CREDIT
	Display	Sound test	Press TEST	Press CREDIT
	01..0F	Enables the hexadecimal combination of S8/S4/S2/S1 signals to the sound board	Next sound in list	Plays the selected sound number
	11..1F	Enables the hexadecimal combination of S16/S8/S4/S2/S1 signals to the sound board for sound/speech boards only (depends on game)		
	DEMO PIX	If additional PI-FX/80 sound board installed : plays all game sounds one after another (demonstration mode)		
T5	SWITCH TEST	Tests all switches on the playfield and on the front coins door	Press TEST	
		The last 4 pressed switches are displayed. A permanently held contact is shown with an « M » for Maintained. Four switches can be displayed at the same time.	Displays « 07 » then quits the switches test menu	
T6	LAMPS TEST	Tests all playfield lamps (and also in the front head, for some games)	Press TEST	Press CREDIT
		Each of the lamps L3 to L51 are successively turned on for 100ms.	During scrolling: quits When scrolling is frozen:	During scrolling: freezes scrolling
			- Press briefly to proceed to next lamp in range - Press and hold to quit	When scrolling is frozen: flashes the lamp output 3 times
E	-EXIT- -MENU-	Exit from main menu and return to « game over » mode		

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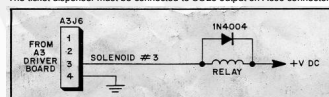
Entry # (CREDIT)	Menu (PLAYER3 / PLAYER 4)	Description			
COMMON SETTING		General settings common to all games			
	Réglages	Description	Original DIPSW (PLAYER2)	Values (PLAYER1)	Features
0	BALLS P GAME	Number of balls per game	17	3 5	3 balls per play 5 balls per play
1	MAX PLAYS	Maximum number of credits allowed	15	8 PLAY 15 PLAY 25 PLAY	Max. 8 plays Max. 15 plays Max. 25 plays
		Enable free play mode	new	FREE	Unlimited plays: free play, the credits display shows 99
2	DISPLA CREDIT	Shows the number of remaining plays in « credit » display	28	DISABLE	Credit display remains off
				ENABLE	Number of remaining credits
3	COIN TUNE	Plays a tune (or a sound) upon each newly inserted coin	27	DISABLE	No sound
				ENABLE	Sound or tune
4	REPLAY TUNE	Plays a tune (or a sound) upon each newly started game when pressing the red credit button	26	DISABLE	No sound
				ENABLE	Sound or tune
5	MAX SPECIAL	Awarded replay limit (by scoring points or playfield special) per game in play	19	1	Only 1 awarded play, any additionally awarded play is ignored
				UNLIM	No limit on awarded plays
6	GAME SPECIAL	Award given to player when playfield special is scored	22	NOTHING	No award
				NORMAL	1 free play
				EXBALL	1 extraball
			new	50 K	50,000 points
			new	100 K	100,000 points
			new	250 K	250,000 points
			new	500 K	500,000 points
7	REPLAY AWARD	Award given to player when beating either of the 3 scores to beat	new	NOTHING	No award
				NORMAL	1 free play
				EXBALL	1 extraball
8	TILT MODE	Tilt effect upon game in play	29	BALL	Current ball and bonus in play are lost for current player only
				GAME	The entire game in play is lost
9	BONUS CNTDOWN	Way to count bonus down (depends on game)	new	NORMAL	Normal count down
				CUMULAT	Count down is cumulated per multiplier (in 1 pass)
10	HIT FLASH	Briefly flashes lamps coupled to a target, a rollover.. (visual effect)	new	DISABLE	No effect
				ENABLE	Brief flash
11	FLASH EXBALL	Flashes extraball playfield lamp(s), instead of turning them on steadily (visual effect)	new	DISABLE	No effect
				ENABLE	Flash lamp
12	FLASH SPECIAL	Flashes special playfield lamp(s), instead of turning them on steadily (visual effect)	new	DISABLE	No effect
				ENABLE	Flash lamp
13	ANIM MULTIPL	Animates bonus multiplier lamps upon value change (visual effect, depends on game)	new	DISABLE	No effect
				ENABLE	Alternately flash lamps
14	TILT LEVEL	Tilt level	new	UNLIM	Tilt is disabled, game can be shaken at will
				1	1 hit triggers tilt (normal)
				2	2 hits trigger tilt
				3	3 hits trigger tilt
15	EXBALL LEVEL	Number of extraballs that can be cumulated during the game in play, or award for extraball	new	DISABLE	No extraball
				1	1 extraball (normal)
				2	2 extraballs
				UNLIM	No limit, the player can earn as many extraballs as s/he can
				50 K	50,000 points
				100 K	100,000 points
				250 K	250,000 points
				500 K	500,000 points
16	ANIMAT GAME	Additional visual animations during game in play: display, lamps..	new	DISABLE	Disabled
				ENABLE	Enabled
17	PLAYER LEVEL	Storage of certain game parameters carried over from ball to ball for each player, and other features (depends on game) Refer to « PLAYER LEVEL » menu	new	EASY	Easier than normal level (more backed-up parameters)
				NORMAL	Normal level (as on original CPU)
				HARD	More difficult than normal level (less backed-up parameters)
				HARDEST	No storage, all features must be re-scored with every new ball
18	MAX BONUS	Maximum bonus value on games with a bonus lamps ramp on the playfield (depends on game)	new	NORMAL	19,000 or 20,000 points
				39	39,000 points (if 20,000 bonus lamp exists)
19	1-MILL AWARD	Extra award each time million points is reached (System80 series only)	new	DISABLE	No award
				ENABLE	Award depends on setting 7
20	CHANCE BALL	Chance ball: the ball is given back to the player if s/he played for less time than set, even if some points were made	new	NONE	Disabled
				5 SEC	5 seconds
				10 SEC	10 seconds
				15 SEC	15 seconds
21	HISCOR TABLE	Management and display of top high score(s)	new	NONE	No high score remembered nor displayed
				TOP 1	1 highest game to date (as on original CPU)
				TOP 1+N	1 highest game to date along with player's name
				TOP 5+N	Table of 5 highest games to date along with players' names
22	HISCOR AWARD	Award given when hiscores are beaten	23	NONE	No award
				1 PLAY	1 replay
				2PLAYS	2 replays
				3PLAYS	3 replays
23	AWARD MATCH	Upon game end, draws a ten number at random (00 to 90) which is displayed in « MATCH ». Any player(s) whose last 2 scores digits match this number are given the award set here	18	DISABLE	No award
				ENABLE	1 replay if setting 7 = NORMAL, none otherwise
24	SLAM	Enables or disables SLAM feature: the weighted switch on the back of the coin door + captive ball in the cabinet Note : when triggered, the SLAM cancels the whole game in play	new	DISABLE	Slam disabled
				ENABLE	Slam enabled
25	ENTER NAMES	Selects the names entry mode for the players' names in the high scores table (if enabled) The « SLOTS » mode requires a re-wiring of right and center coin slots switches (description on demand)	new	NORMAL	Normal mode: the CREDIT button is used
				SLOTS	Right and center coin slots switches scroll the letters
26	POWER IDLE	Turns off all playfield illumination lamps after a given delay (when in « game over » mode), to save energy	new	DISABLE	Lamps are never turned off (normal mode)
				30 SEC	Lamps are turned off 30 seconds after last played game ended
				2 MIN	Lamps are turned off 2 minutes after last played game ended
				4 MIN	Lamps are turned off 4 minutes after last played game ended
27	USE KNOCKER	Disables « knocker » coil that 'knocks' for every replay earned (special, match, high scores, beat scores) Notice: the coil can still be energized in COILS TEST menu	new	DISABLE	Knocker coil disabled
				ENABLE	Knocker coil enabled
28	CHECK BUMPER	Periodically monitors all pop bumpers to check if they are locked up in down position (electrical or mechanical failure). In case of trouble, the game in play ends and the switch number associated to the faulty bumper is displayed.	new	DISABLE	Bumpers are not monitored
				ENABLE	Bumpers are periodically monitored
29	SINGLE PLAYER	Restricts the number of players to 1 (impossible to add a new player after the first) and disables force-restarting the game in play Useful for tournaments, school festivals, etc	new	DISABLE	Normal mode: 1 to 4 players can play at the same time
				ENABLE	Only 1 player can play
30	7 DIGIT MODE	For System80 games: allows to switch to 7-digit scores displays, as on System80A series WARNING : this mode requires a specific displays rewiring in the front head + 7-digit displays, or new specific LED displays	new	DISABLE	Classic 6-digit System80 display
				ENABLE	7-digit System80A display

Specific settings to selected game

Series (System)	Game Name & Number in its Series	Setting number (CREDIT)	Setting	Description	Original DIPSW (PLAYER2)	Values (PLAYER1)	Features
80	Star Race 657						
80	James Bond 659						
80	Force II 661	0	1-MILL AWARD	Additional award each time 1-million points are reached	32	DISABLE	No award
				<i>Note: same as general setting 19</i>		ENABLE	Award depends on general setting 7
		1	GONG AWARD	Turns off gong that rings upon each awarded play (scoring or special)	new	DISABLE	Gong is turned off
						ENABLE	Gong is turned on
80	Volcano 667	0	KICKING TARGET	Selects the operating mode of the kicking target (bottom right corner): allows to cumulate several scorings of the top 3 green rollovers, or just 1 as on the original board	new	NORMAL	Green lamp lights just once
						CUMULAT	Cumulates green lamp scorings
80	Eclipse 671	1	ROLLUNDER MODE	Selects the speed at which the 3 50,000/extraball/special lamps of the top rollover scroll, the slowest speed allows to aim at the desired 1 lamp precisely	new	NORMAL	Normal speed (fast)
						SLOW	Slow speed (easier)
		2	BACKGD SND	Turns off background sound (both during and out of multiball): the game plays silently between scored points	32	DISABLE	No background sound
						ENABLE	Regular background sound
80	Haunted House 669	0	UPKICK CONFIG	Selects the way the « upkicker » (top right hole on the main playfield) is driven	new	NORMAL	Driven by SOL2 (normal production run)
				<i>It required different GAME PROMs on the original CPU board: version 668/1 (proto) or 668/2 (normal)</i>		PROTO	Driven by LAMP 14 + transistor on the playfield (preseries playfield)
		1	BACKGD SND	Turns off background melody: the game plays silently between scored points	new	DISABLE	No background melody
				<i>In this mode, rollover switch 04 (on the main playfield, under the bottom left pop bumper) plays another sound (fix)</i>		ENABLE	Regular background melody
		0	UPKICK CONFIG	Selects the way the « upkicker » (top right hole on the main playfield) is driven	new	NORMAL	Driven by SOL2 (normal production run)
				<i>It required different GAME PROMs on the original CPU board: version 668/1 (proto) or 668/2 (normal)</i>		PROTO	Driven by LAMP 14 + transistor on the playfield (preseries playfield)
80	Haunted House MULTIBALL	1	BACKGD SND	Turns off background melody: the game plays silently between scored points	new	DISABLE	No background melody
				<i>In this mode, rollover switch 04 (under the main playfield's bottom left pop bumper) plays another sound (fix)</i>		ENABLE	Regular background melody
		2	MULTIBALL	Selects the multiball mode	new	NORMAL	Normal mode
				<i>Refer to the Haunted House Multiball specific manual available on line</i>		SELECT	Select mode
		0	SOUND MODE	Selects which sound board is installed in the game: classic (non-speech) or speech.	new	CLASSIC	Classic sound board
				<i>Note: this is the same sound mode setting as in SOUND SETTING general menu</i>		SPEECH	Speech sound board
80A	Devil's Dare 670	1	RELEASE CAVE	Once the 1 st ball in play is captured into the « CAPTURE CAVE » hole and the 2 nd ball in play is lost, this 1 st captured ball is put back in play instead of losing it (idea from Thibault Grandvilliers)	new	DISABLE	1 st ball ejected from « CAPTIVE CAVE » hole and lost
						ENABLE	1 st ball ejected from « CAPTIVE CAVE » hole and put back in play
		2	BONUS CNTDOWN	Bonus count down speed	new	NORMAL	Slow
						FAST	Fast
		3	BACKGD SND	Turns off background music: the game plays silently between scored points	32	DISABLE	No background music (only once when ball is put in play)
						ENABLE	Regular background music
80A	Rocky 672						
80A	Caveman 810PV (video)						
80A	Sprint 673						
80A	Punk 1 674						
80A	Striker 675	0	BEAT HIGOALS	Award when scored goals record is broken	31	NOTHING	No award
						1 PLAY	1 replay
		1	MAX GOALS SCORE	Max bonus value per scored goal, displayed by the 5,000, 10,000 and 15,000 lamps between the center mini-flippers	new	15 K	From 5,000 up to 15,000 points
				<i>In 100 K mode, the 3 lamps flash together to indicate 100,000 bonus points</i>		100 K	From 5,000 to 30,000 then 100,000 points
80A	Krull 676	0	ATTRAC + SND	Turns off sound and lights animation over « Coily » at regular periods of time in game over mode	7	DISABLE	Animation is turned off
						ENABLE	Animation is turned on
80A	Q*Bert's Quest 677	1	FIG-8 VILLAIN	Controls the destruction of the currently lit villain when the ball makes a grand « 8 » loop	8	ANY POS	Destruction no matter the villain position
						1ST POS	Destruction only when villain on top 1 st position (harder)
		2	PYRAMI SPECIAL	Number of pyramids to complete until special is lit	31	5	5 pyramids
						6	6 pyramids
						7	7 pyramids
						8	8 pyramids
		3	TRIPLE ATTACK	New special attack of all 3 villains together, after a certain number of hits on villains	new	DISABLE	Disabled
						ENABLE	Enabled
80A	Super Orbit 680	0	BACKGD SND	Turns off background sound: the game plays silently between scored points	new	DISABLE	No background sound
						ENABLE	Regular background sound
		1	FLIPPE SOUND	Turns off flippers sound when energized	new	DISABLE	No flippers sound
						ENABLE	Regular flippers sound
		2	ORBIT SPECIAL	Position of « orbit » lamps at which special is lit	31	LIBERAL	Liberal (easiest)
				<i>And number of « orbit » positions advanced upon each hit on targets and rollovers</i>		MEDIUM	Average level
				<i>Note: refer to original game manual for complete details about each setting</i>		CONSERV	Conservative (hardest)
		3	JACKPT MODE	New vartarget jackpot mode, enabled when special is not lit	new	DISABLE	Disabled
						BALL	Jackpot enabled, value is reset with every new ball
						PLAY	Jackpot enabled, value is cumulated ball after ball (per player)
		4	VARTGT DELAY	Delay until vartarget is reset to resting position (bottom) to avoid throwing the ball back in play	new	DISABLE	No delay, immediate return to resting position
						ENABLE	Delay (½ second)
80A	Royal Flush Deluxe 681	0	BACKGD SND	Turns off background melody: the game plays silently between scored points	new	DISABLE	No background melody
						ENABLE	Regular background melody
		1	ROYAL S-MODE	New 10,000 points bonus on center DIP target and bumper for a limited amount of time	new	DISABLE	Disabled
				<i>Starts with black « K » and black « J » are the only 2 kicked down targets of the bank</i>		ENABLE	Enabled
80A	Goin' Nuts 682	0	BACKGD SND	Turns off background melody: the game plays silently between scored points	31	DISABLE	No background melody
						ENABLE	Regular background melody
80A	Amazon Hunt 684	1	GAME TYPE	Selects the playfield model: normal (the most common, released in 1983) or specific (B model, rare, released in 1985)	new	NORMAL	Normal playfield
				<i>Note: the normal game PROM was stamped « 684 » or « 684A », the specific prom was stamped « 684B »</i>		684-B	« B » playfield
80A	Ready, Aim, Fire 686	0	BACKGD SND	Turns off background melody: the game plays silently between scored points	31	DISABLE	No background melody
						ENABLE	Regular background melody
80A	Jacks to Open 687	0	BACKGD SND	Turns off background melody: the game plays silently between scored points	31	DISABLE	No background melody
						ENABLE	Regular background melody
		1	ROTATE TARGET	The drop targets must be kicked down in a given order, shown by the corresponding flashing target lamp	new	DISABLE	Disabled
				<i>Otherwise, all targets must be kicked down to try again (much harder play mode)</i>		ENABLE	Enabled
		2	DOUBLE TOP	Scoring at 4 top rollovers directly lights « double bonus » lamp for the ball in play (easier play mode)	new	DISABLE	Disabled
				<i>Note: in 5 ball mode and at « royal flush » step, scoring all 4 top rollovers proceeds directly to extraball level</i>		ENABLE	Enabled
80A	Alien Star 689	0	BACKGD SND	Turns off background sound: the game plays silently between scored points	31	DISABLE	No background sound
						ENABLE	Regular background sound
80A	The Games 691	0	BACKGD SND	Turns off background melody: the game plays silently between scored points	31	DISABLE	No background melody
						ENABLE	Regular background melody
		1	MEDAL SETTING	Turn on the extraball targets depending on the number of balls per play (3 or 5) and this setting	32	LIBERAL	Extraball easier to earn
				<i>Refer to game's manual for all details about required medals number (for example: 3 balls and LIBERAL = 2 medals)</i>		CONSERV	Extraball more difficult to earn
80A	Eldorado City Of Gold 692	0	BACKGD SND	Controls background sound (crowd) level	31	LOW	Low volume
						HIGH	High volume
80A	Ice Fever 695	1	ATTRAC + SND	Turns off sound and lights animation over bonus lamps ramp at regular periods of time in game over mode	32	DISABLE	Animation is turned off
						ENABLE	Animation is turned on
		2	TICKET DISPENSER	Dispense a given number of tickets (set by common setting 22 « HISCORE AWARD ») when the highest game to date is beaten.	Prom version /Y	DISABLE	Ticket dispenser disabled
				<i>This feature was available in specific game prom version « 695Y ».</i>		ENABLE	Ticket dispenser enabled

TICKET DISPENSER CONNECTION when available in game's specific settings

The ticket dispenser must be connected to SOL3 output on A3J6 connector, as shown on Gottlieb's schematic below:



schematic (c) Gottlieb

Ver. February 2017

Playfield parameters remembered from ball to ball for each player

Refer to « *PLAYER LEVEL* » setting in common settings menu

Series (System)	Game Name & Number in its Series	Player Level	Stored game parameters matching that level
80	Star race 657		
80	James Bond 658		
80	Force II 661	EASY NORMAL HARD HARDEST	Refer to « NORMAL » Top blue/white/red rollovers + bonus lamps before red/blue drop targets Refer to « NORMAL » No parameter is remembered
80	Volcano 667		
80	Eclipse 671	EASY NORMAL HARD HARDEST	Strobing lamp (top left rollunder) + kicking target + top rollovers are remembered Kicking target + top rollovers are remembered Top rollovers are remembered No parameter is remembered
80	Haunted House 669	EASY NORMAL HARD HARDEST	Refer to « NORMAL » Bullseye targets (top playfield) + 1-2-3-4-5 targets (main playfield) Refer to « NORMAL » No parameter is remembered
80	Haunted House MULTIBALL	EASY NORMAL HARD HARDEST	Refer to « NORMAL » Bullseye targets (top playfield) + 1-2-3-4-5 targets (main playfield) Refer to « NORMAL » No parameter is remembered
80A	Devil's Dare 670	EASY NORMAL HARD HARDEST	Refer to « NORMAL » « CAPTURE CAVE » hole's capture lamp Refer to « NORMAL » No parameter is remembered
80A	Caveman 810PV (video)		
80A	Rocky 672		
80A	Spirit 673		
80A	Punk I 674		
80A	Striker 675	EASY NORMAL HARD HARDEST	Refer to « NORMAL » Defense/offense sides + top lit goal rollovers + number of scored goals Defense/offense sides + number of scored goals No parameter is remembered
80A	Krull 676		
80A	Q*Bert's Quest 677	EASY NORMAL HARD HARDEST	Refer to « NORMAL » Lit cubes + lit pyramids + villains attack positions + Special if not scored Refer to « NORMAL » No parameter is remembered
80A	Super Orbit 680	EASY NORMAL HARD HARDEST	Bottom right return gate ; top right rollunder no longer resets it No parameter is remembered No parameter is remembered + lit bumpers give 3,000 instead of 10,000 Refer to « HARD »
80A	Royal Flush Deluxe 681	EASY NORMAL HARD HARDEST	Bottom right return gate No parameter is remembered No parameter is remembered No parameter is remembered
80A	Goin' Nuts 682		
80A	Amazon Hunt 684	EASY NORMAL HARD HARDEST	No parameter is remembered No parameter is remembered Center left and right black drop targets (only those 2 are brought back up) No parameter is remembered
80A	Ready, Aim, Fire 686	EASY NORMAL HARD HARDEST	Top rollover bonus lamp is remembered Top rollover bonus lamp is remembered Top rollover bonus lamp is not remembered (= reset to 5,000 pts) No parameter is remembered
80A	Jacks to Open 687	EASY NORMAL HARD HARDEST	Refer to « NORMAL » ; top left and right rollovers mutually unlit each other Current level + drop targets already hit on that level Current level only (not the targets that were hit) No parameter is remembered
80A	Alien Star 689	EASY NORMAL HARD HARDEST	Refer to « NORMAL » A-L-I-E-N bullseye targets + capture lamp in 3-ball mode only (5 ball mode: not remembered) Refer to « NORMAL » No parameter is remembered
80A	The Games 691	EASY NORMAL HARD HARDEST	Refer to « NORMAL » Remember bonus value and restore it upon next ball in play if all 5 medals were earned on the previous ball No parameter is remembered No parameter is remembered
80A	Eldorado City Of Gold 692		
80A	Ice Fever 695	EASY NORMAL HARD HARDEST	Top I-C-E rollover lamps, multiplier, special (if not scored) and 1-2-3 goals are remembered Multiplier, special (if not scored) and 1-2-3 goals are remembered 1-2-3 goals are remembered No parameter is remembered

Error codes

Upon energizing each coil (solenoids 1 2 5 6 8 9 only), the PI-80 board measures the current flooding thru the coil and scans its associated switches (for example, bottom hole switch, or the switches behind the drop targets).

The board also monitors the current during a game in play.

In case of trouble, an error message « ERR=n » is displayed along with the faulty coil number, and the game currently in play immediately comes to an end.

Furthermore, the PI-80 board puts itself in protection mode:

no new game can be started (to avoid further damage to the board and/or the game) but the user can still enter the test menus.

If the player tries to start a game, the TILT relay flashes briefly.

When in protection mode, the coils driving relay (on the bottom left corner of the board) will be turned off, and the red LED atop the relay will turn off as well.



Error	Description	Possible reasons	What to check
1	Some current is already flooding thru the coil before energizing it	Coil (or its diode in parallel) is dead shorted Driving transistor (under the playfield or on the PI-80 board) is dead shorted	Check all CPU-driven coils and their associated diode in parallel Check all 9 power transistors QS1..QS9 and their associated diodes DTS1..DTS9
2	No current is flooding thru the coil, although it is energized	Dead open coil (cut wire) Fuse in serial with the coil is blown or missing (do not replace it blindly, look for the true reason behind!) Driving transistor (under the playfield or on the PI-80 board) is dead open	Check that given coil Check the fuse of that coil (refer to game's manual), then the coil itself and its associated diode Check the related power transistor QSx, x = given coil number
3	Some current is still flooding thru the coil, although it is no longer energized	Most of the time, the diode in parallel to the coil has just died shorted <i>Also refer to error #1</i>	Check all CPU-driven coils and their associated diode in parallel Check all 9 power transistors QS1..QS9 and their associated diodes DTS1..DTS9
4	A switch is still detected closed after 5 consecutive coil firing attempts	Badly adjusted contact Drop target cannot be brought back up: broken target, or reset mechanism not operating or too weak Ball stuck on the bottom of a hole: eject mechanism not operating or too weak	Check all contacts at the bottom of the holes, the upkickers. Check the coil mechanical assy Check the coil plunger and its reference number (refer to game's manual)

How to check a coil and its diode

Desolder one leg of the diode, otherwise the diode in parallel with the coil would corrupt each other's measurement

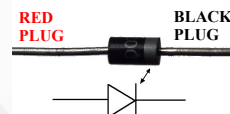
Personal tip: cut the diode's leg at half length, so that it will be easy to restore the leg by soldering over the cut after the measurements

Measure the coil's **resistance** (in ohms) on the multimeter's lowest resistance setting

Refer to the chart below for the expected resistance value depending on coil part number; a difference of +/- 20% is allowed

Measure the diode's **voltage** (in volts) on "diode" setting, or on the lowest resistance setting if the multimeter has no "diode" setting

It should read between 0.5 and 0.7V with red plug on NON BANDED side and black plug on BANDED side, and open when the plugs are reversed
If faulty, the diode must be replaced by a 1N4007



Gottlieb Part number	Common Coil Usage	Resistance (ohms)	Number of turns	Wire gauge	Wrapper color
A-1496	Slingshots (kicking rubbers), pop bumpers	2,95	635	#23	yellow
A-4893	Pop bumpers, ball kicker	2,1	535	#22	red
A-5194	Gong	4,5	780	#24	blue
A-5195	Knocker, hole kicker	12,3	1305	#26	white
A-16570	Hole kicker, outhole	15,5	1450	#27	green
A-16890	Game Over (Q) and Tilt (T) relays, coin lockout	231	4000	#35	orange
A-17564 or A-20558	Gate relay	156	3400	#34	white
A-17875	Flippers (regular strength)	2,8 / 40,0	560 / 1100	#24/31	yellow
A-17891	5 drop targets bank reset	3,35	850	#22	white
A-18102	3 drop targets bank reset, or 7 drop targets bank reset (2 coils in parallel)	9	1430	#24	red
A-18318	4 drop targets bank reset	6,7	1130	#24	orange
A-18642	Memory/drop targets	58	1590	#33	white
A-19300	Ball kicker	7,8	1075	#25	orange
A-20095	Super flippers (high power)	1,55 / 35,5	450/900	#22/31	red

chart (c) Gottlieb About gauge value: the lower the gauge value, the thicker the actual coil wire
About wrapper color: the color may no longer match if the coil is not the original Gottlieb-made one.

Version

February 2017

Status LED

Several LED lamps, of different colors, give information about the general state of the PI-80 board and are very helpful to diagnose failures.
 The location and availability of each LED depend on the PI-80 board's revision, ask if unsure ; also, red LED may sometimes be replaced by orange LED.
 Each LED's normal state is written in **bold**.

LED feature	Board's Revision			When lit	When unlit	Additional information and what to check
	1.0	1.1	1.2 and up			
12V general power supply		LD1	LD1	12V available	12V missing	This LED lights up when the game is turned on. If not, check the wires coming to pins 1 & 2 of power connector A2J1 Check the « POWER SUPPLY » fuse in the cabinet, refer to the game's original manual for exact location and rating Measure the 12V DC voltage across pins 1 & 3 of screw-clamp connector J1
5V power supply (PI-80 board, pop bumpers, sound board..)	LD1	LD2	LD2	5V available	5V missing	This LED lights up when the game is turned on. If not, there is a problem around U1 chip, or the 12V general power supply is missing (12V LED unit, if present). Measure the 5V DC voltage across pins 2 & 3 of screw-clamp connector J1
60V, 42V, 8V power supplies (displays)	LD2	LD3	LD3	60V 42V 8V available	60V 42V 8V missing	This LED lights up when the game is turned on. If not, there is a problem around U2 chip, or the 12V general power supply is missing (12V LED unit, if present). Check the fast-blow 100mA fuse (brown or black cylinder) mounted on a socket to the right of connector A2J3. Measure the 60V DC voltage across pins 1 & 4 of connector A2J3 Measure the 42V DC voltage across pins 3 & 4 of connector A2J3 Measure the 8V DC voltage at test point TP8 below connector A2J1
Solenoids relay (RLY1)	LD4	LD4	LD4	Relay is energized (during a game in play)	Relay is off	The relay is normally turned off when the game is turned on, then is energized when a play is started. In case of error detected by the PI-80 board on any of the coils 1 2 5 6 8 or 9, the relay is turned off to avoid further damage. Refer to the previous « ERRORS » page for diagnostics.
Test point for lamps/coils outputs	LD3	LD5	LD5	Tested transistor is on	No test in progress , or tested transistor is bad	This LED is normally off, it is used for transistor test purposes only. With a grip wire, connect the test point TPT (under the LED) to the desired lamp/coil test point. This will energize the corresponding output. If the LED is lit: the transistor under test is most probably good (base-emitter junction flooding) If the LED is unlit: the transistor is most probably defective (base-emitter junction open)
A current floods thru coils 1 2 5 6 8 or 9			LD6	A current is flooding	No current is flooding	This LED is normally off, and is on when either coil 1 2 5 6 8 or 9 is briefly energized. If the LED is on all the time: one of the output coils transistors (Qsx) or its transil diode (DTSx) is shorted. If the LED is never lit: the relay RLY1 has been turned off due to a problem, or the « SOLENOIDS » fuse in the cabinet is blown. Refer to the previous « ERRORS » page for diagnostics. Also, check the « SOLENOIDS » fuse in the cabinet, refer to the game's original manual for exact location and rating

NAME Black Hole
SERIES SYSTEM-80
GAME PROM NUMBER 668
DATE October 1981
NUMBER OR BALLS 3

SOUND BOARD Two versions :
 - Speech « domestic »
 - Non speech « export »

PI-FX COMPATIBLE? Yes for the non speech
 « export » version

SPECIFIC SETTINGS TO SELECTED GAME

Setting number (CREDIT)	Setting	Description	Original DIPSW (PLAYER2)	Values (PLAYER1)	Features
0	SOUND MODE	Selects which sound board is installed in the game: classic (non-speech) or speech. <i>Note: this is the same sound mode setting as in SOUND SETTING general menu</i>	new	CLASSIC SPEECH	Classic sound board (also compatible with PI-FX board) Speech sound board
1	OPEN GATE	Open gate mode for upper playfield gate, when the balls is kicked from the bottom playfield. These "easy" modes allow for longer playing time on the bottom playfield.	new	NORMAL 7 SEC B-5000	Normal return gate behaviour Keep return gate open for 7 seconds Keep return gate open as long as earned bonus is < 5,000 points
2	BACKGD SND	Turns off background sound (both during and out of multiball): the game plays silently between scored points	32	DISABLE ENABLE	No background sound Regular background sound
3	ANIMAT EXPAND	Prevents the game's various relays & return game from « clicking » during the attract mode (which therefore becomes completely silent) and also animates lamps 4..6 (bottom playfield) and 7 (top playfield spinner)	new	DISABLE ENABLE	Regular attract mode Expanded attract mode

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	Refer to « NORMAL » + spinner + bottom right « open gate » rollover + top right « HOLE » rollover + return gate status
NORMAL	Yellow bullseye targets + top rollovers + lit BLACK/HOLE drop targets + capture hole (top playfield)
HARD	Yellow bullseye targets + top rollovers + lit BLACK/HOLE drop targets
HARDEST	No parameter is remembered

Coils driven by the PI-80, and associated fuses

Coil / Lamp Output	Connector and Pin	Function	Dedicated Fuse	Driven by PI-80	Gottlieb coil reference
SOL 1	A3J4-7	4 Pos. Bank Upper Playfield	F14 : 2A sloblo (*2)	QS1	A-18318
SOL 2	A3J4-13	5 Pos. Bank Upper playfield	F14 : 2A sloblo (*2)	QS2	A-17891
SOL 5	A3J4-6	4 Pos. Bank Lower Playfield	F18 : 2A sloblo	QS5	A-18318
SOL 6	A3J4-12	3 Pos. Bank Lower Playfield	F20 : 1A sloblo (*3)	QS6	A-18102
SOL 8	A3J5-8	Capture Hole Upper Playfield	none	QS8	A-5195
SOL 9	A3J4-8	Outhole	F15 : 1A sloblo (*1)	QS9	A-16570
L8	A3J2-10	Ball Return Gate Lower Playfield	F19 : 1A sloblo	U21/U22-11 (*P)	A-16570
L12	A3J3-25	Hole Kicker Lower Playfield	F20 : 1A sloblo (*3)	QL12 (*P)	A-16570
L13	A3J3-24	Hole Kicker Upper Playfield	F15 : 1A sloblo (*1)	QL13 (*P)	A-16570
L14	A3J3-22	Ball Lift Kicker Lower Playfield	F17 : 6 1/2 A sloblo	QL14 (*P)	A-4893
L15	A3J3-23	Trough Ball Gate (Card Holder)	F16 : 1A sloblo	QL15 (*P)	A-16570
L16	A3J3-13	U Relay	none	QL16 (*P)	A-16890
L17	A3J3-14	L Relay	none	QL17 (*P)	A-16890
L18	A3J3-16	Wireform Ball Gate Upper Playfield	none	QL18 (*P)	A-17564

Main playfield (upper)

Bottom playfield (lower)

(*1) = the same fuse is shared by those 2 coils

(*2) = the same fuse is shared by those 2 coils

(*3) = the same fuse is shared by those 2 coils

(*P) = drives a PNP 2N5875 transistor, remotely installed under the playfield

NAME Circus
SERIES SYSTEM-80
GAME PROM NUMBER 654
DATE June 1980
NUMBER OR BALLS 1
SOUND BOARD Non speech
PI-FX COMPATIBLE? Yes

SPECIFIC SETTINGS TO SELECTED GAME

Setting number (CREDIT)	Setting	Description	Original DIPSW (PLAYER2)	Values (PLAYER1)	Features
0	MEMORY LEVEL1	Remember from ball to ball, if lit: top rollovers, <i>special</i> , center rollover	31	LIBERAL CONSERV	Storage enabled No storage (harder)
1	MEMORY LEVEL2	Remember from ball to ball, if lit: bottom left/right rollovers, spinner	32	LIBERAL CONSERV	Storage enabled No storage (harder)

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	Refer to « NORMAL »
NORMAL	Depends on the 2 specific settings
HARD	Refer to « NORMAL »
HARDEST	No parameter is remembered (has priority over specific settings)

Coils driven by the PI-80, and associated fuses

Coil or Lamp Output	Connector and Pin	Function	Dedicated Fuse	Driven by PI-80	Gottlieb coil reference
SOL 1	A3J4-7	Hole Kicker	1A sloblo (*1)	QS1	A-16570
SOL 2	A3J4-13	Roto Unit	2A sloblo (*2)	QS2	A-17891
SOL 5	A3J4-6	Target bank reset	2A sloblo (*2)	QS5	A-18318
SOL 8	A3J5-8	Knocker	<i>none</i>	QS8	A-5195
SOL 9	A3J4-8	Outhole	1A sloblo (*1)	QS9	A-16570

(*1) = the same fuse is shared by those 2 coils

(*2) = the same fuse is shared by those 2 coils

NAME Counterforce
SERIES SYSTEM-80
GAME PROM NUMBER 656
DATE August 1980
NUMBER OR BALLS 1
SOUND BOARD Non speech
PI-FX COMPATIBLE? Yes

SPECIFIC SETTINGS TO SELECTED GAME

Setting number (CREDIT)	Setting	Description	Original DIPSW (PLAYER2)	Values (PLAYER1)	Features
0	EXTRABALL MODE	Turn off the <i>extraball</i> target once the missiles bank isreset at the end of the chase cycle	31	LIBERAL CONSERV	Extraball lamp remains lit Extraball lamp is turned off (harder)
1	SPECIAL MODE	Give a replay in addition to turning the <i>special</i> target lamp on, when all missiles are destroyed on the 1st row	32	LIBERAL CONSERV	Give a replay and turns the <i>special</i> target lamp on Turn the <i>special</i> target lamp on alone (harder)

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	The missiles sequence always resumes at the 1st row for each ball in play
NORMAL	The missiles sequence resumes at the previous position and the slowest speed
HARD	The missiles sequence resumes at the previous position and the same speed
HARDEST	No parameter is remembered

Coils driven by the PI-80, and associated fuses

Coil or Lamp Output	Connector and Pin	Function	Dedicated Fuse	Driven by PI-80	Gottlieb coil reference
SOL 8	A3J5-8	Knocker	<i>none</i>	QS8	A-5195
SOL 9	A3J4-8	Outhole	1A sloblo (*1)	QS9	A-1496
SOL 1	A3J4-7	Hole kicker		QS1	A-1496
SOL 2	A3J4-13	Bank reset	2A sloblo (*2)	QS2	A-16570
SOL 5	A3J4-6	Bank reset		QS5	A-16570
L12	A3J3-25	Drop target trip coil 2	<i>none</i>	QL12	A-18642
L13	A3J3-24	Drop target trip coil 4	<i>none</i>	QL13	A-18642
L14	A3J3-22	Drop target trip coil 6	<i>none</i>	QL14	A-18642
L15	A3J3-23	Drop target trip coil 1	<i>none</i>	QL15	A-18642
L16	A3J3-13	Drop target trip coil 3	<i>none</i>	QL16	A-18642
L17	A3J3-14	Drop target trip coil 5	<i>none</i>	QL17	A-18642
L18	A3J3-16	Drop target trip coil 7	<i>none</i>	QL18	A-18642

(*1) = the same fuse is shared by those 2 coils

(*2) = the same fuse is shared by those 2 coils

NAME Mars God of War
SERIES SYSTEM-80
GAME PROM NUMBER 666
DATE January 1981
NUMBER OR BALLS 3
SOUND BOARD Speech
PI-FX COMPATIBLE? No

SPECIFIC SETTINGS TO SELECTED GAME

Setting number (CREDIT)	Setting	Description	Original DIPSW (PLAYER2)	Values (PLAYER1)	Features
0	BACKGD SND	Turns off background sound: the game plays silently between scored points	new	DISABLE ENABLE	No background sound Regular background sound
1	LAST CHANCE	Enables last chance ball upon the very last ball in game: if the ball is lost thru the outlanes and if at least one ball remains captured in either warbase	31	DISABLE ENABLE	Last chance disabled Last chance enabled
2	SPC-EB LEVEL	Multiplier level above which <i>special</i> and <i>extraball</i> lamps are lit in the warbases	32	DISABLE ENABLE	<i>special</i> from 4X, <i>extraball</i> from 3X <i>special</i> from 5X, <i>extraball</i> from 4X (harder)

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	Refer to « NORMAL »
NORMAL	M-A-R-S rollovers + spinner lamps + left & right warbases
HARD	Refer to « NORMAL »
HARDEST	No parameter is remembered

Coils driven by the PI-80, and associated fuses

Coil / Lamp Output	Connector and Pin	Function	Dedicated Fuse	Driven by PI-80	Gottlieb coil reference
SOL 1	A3J4-7	Left Captive Hole	F15 : 1A sloblo (*1)	QS1	A-16570
SOL 2	A3J4-13	Right Captive Hole	F15 : 1A sloblo (*1)	QS2	A-16570
SOL 5	A3J4-6	Center Drop Target Bank	F14 : 2A sloblo (*2)	QS5	A-18318
SOL 6	A3J4-12	Right Drop Target Bank	F14 : 2A sloblo (*2)	QS6	A-18318
SOL 8	A3J5-8	Knocker	non	QS8	A-5195
SOL 9	A3J4-8	Outhole	F15 : 1A sloblo (*1)	QS9	A-16570
L12	A3J3-25	Right Launch Lane	F16 : 2A sloblo	QL12 (*P)	A-19300
L13	A3J3-24	Ball Release	F17 : 1A sloblo	QL13 (*P)	A-16570
L8	A3J2-10	Ramp	F18 : 2A sloblo	U21/U22-11 (*P)	A-17875

(*1) = the same fuse is shared by those 3 coils

(*1) = the same fuse is shared by those 2 coils

(*P) = drives a PNP 2N5875 transistor, remotely installed under the playfield

NAME Panthera
SERIES SYSTEM-80
GAME PROM NUMBER 652
DATE May 1980
NUMBER OR BALLS 1
SOUND BOARD Non speech
PI-FX COMPATIBLE? Yes

SPECIFIC SETTINGS TO SELECTED GAME

Setting number (CREDIT)	Setting	Description	Original DIPSW (PLAYER2)	Values (PLAYER1)	Features
0	ALTERN EXBALL	Makes <i>extraball</i> lamp alternate when 10 points switches and bumpers are hit	31	LIBERAL CONSERV	Steadily lit lamp Alternates lamp (harder)
1	ALTERN SPECIAL	Makes <i>special</i> lamp alternate when 10 points switches and bumpers are hit	32	LIBERAL CONSERV	Steadily lit lamp Alternates lamp (harder)

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	Refer to « NORMAL » + Extraball if not scored
NORMAL	Color rollovers + targets (of the same color of the already scored rollovers) + Special if not scored
HARD	No parameter is remembered
HARDEST	No parameter is remembered

Coils driven by the PI-80, and associated fuses

Coil Output	Connector and Pin	Function	Dedicated Fuse	Driven by PI-80	Gottlieb coil reference
SOL 1	A3J4-7	#3 Target Bank Reset	2A sloblo (*1)	QS1	A-18318
SOL 2	A3J4-13	#1 Target Bank Reset	2A sloblo (*1)	QS2	A-18318
SOL 5	A3J4-6	#2 Target Bank Reset	2A sloblo (*1)	QS5	A-18318
SOL 6	A3J4-12	Hole Kicker	2A sloblo (*1)	QS6	A-1496
SOL 8	A3J5-8	Knocker	none	QS8	A-5195
SOL 9	A3J4-8	Outhole	1A sloblo	QS9	A-16570
L12	A3J3-25	#1 Yellow drop target trip coil	none	QL12	A-18642
L13	A3J3-24	#1 Blue drop target trip coil	none	QL13	A-18642
L14	A3J3-22	#1 White drop target trip coil	none	QL14	A-18642
L15	A3J3-23	#1 Green drop target trip coil	none	QL15	A-18642
L16	A3J3-13	#2 Yellow drop target trip coil	none	QL16	A-18642
L17	A3J3-14	#2 Blue drop target trip coil	none	QL17	A-18642
L18	A3J3-16	#2 White drop target trip coil	none	QL18	A-18642
L19	A3J3-15	#2 Green drop target trip coil	none	QL19	A-18642
L20	A3J3-21	#3 Yellow drop target trip coil	none	QL20	A-18642
L21	A3J3-20	#3 Blue drop target trip coil	none	QL21	A-18642
L22	A3J3-18	#3 White drop target trip coil	none	QL22	A-18642
L23	A3J3-19	#3 Green drop target trip coil	none	QL23	A-18642

(*1) = the same fuse is shared by those 4 coils

NAME Pink Panther
SERIES SYSTEM-80
GAME PROM NUMBER 664
DATE March 1981
NUMBER OR BALLS 3
SOUND BOARD Non speech
PI-FX COMPATIBLE? Yes

SPECIFIC SETTINGS TO SELECTED GAME

Setting number (CREDIT)	Setting	Description	Original DIPSW (PLAYER2)	Values (PLAYER1)	Features
0	TIME SPECIAL	Time during which <i>special</i> (black drop targets bank) remains lit in multiball mode	31	20 SEC 25 SEC	20 seconds 25 seconds
1	MAX DIAMOND	Maximum number of cumulated diamonds in multiball mode	32	40DIAM 50DIAM 99DIAM	40 diamonds 50 diamonds 99 diamonds

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	Refer to « NORMAL » + Extraball if not scored + P-I-N-K rollovers
NORMAL	Capture status of both left and right capture holes
HARD	Refer to « NORMAL »
HARDEST	No parameter is remembered

Coils driven by the PI-80, and associated fuses

Coil / Lamp Output	Connector and Pin	Function	Dedicated Fuse	Driven by PI-80	Gottlieb coil reference
SOL 1	A3J4-7	Lower Right Hole Kicker	1A sloblo (*1)	QS1	A-16570
SOL 2	A3J4-13	Center Drop Target Bank (White)	1A sloblo (*1)	QS2	A-18102
SOL 5	A3J4-6	Left Drop Target Bank (Black)	2A sloblo	QS5	A-18318
SOL 6	A3J4-12	Trough Switch (Ball Release)	1A sloblo	QS6	A-16570
SOL 8	A3J5-8	Knocker	non	QS8	A-5195
SOL 9	A3J4-8	Outhole	1A sloblo (*1)	QS9	A-16570
L8	A3J2-10	Left Captive Hole	1A sloblo (*1)	U21/U22-11 (*P)	A-16570
L9	A3J2-9	Right Captive Hole	1A sloblo	U21/U22-12 (*P)	A-5195

(*1) = the same fuse is shared by those 4 coils

(*P) = drives a PNP 2N5875 transistor, remotely installed under the playfield

NAME Rack'Em Up
SERIES SYSTEM-80A
GAME PROM NUMBER 685
DATE November 1983
NUMBER OR BALLS 1
SOUND BOARD Non speech
PI-FX COMPATIBLE? Yes

SPECIFIC SETTINGS TO SELECTED GAME

Setting number (CREDIT)	Setting	Description	Original DIPSW (PLAYER2)	Values (PLAYER1)	Features
0	BACKGD SND	Turns off background melody: the game plays silently between scored points	31	DISABLE ENABLE	No background melody Regular background melody

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	Refer to « NORMAL » + right flipper button unlimitedly cycles lamps in front of targets and rollovers
NORMAL	Remember center lamps, lamps in front of targets and rollovers, and special if not scored during previous ball
HARD	Refer to « NORMAL »
HARDEST	No parameter is remembered

Coils driven by the PI-80, and associated fuses

Coil Output	Connector and Pin	Function	Dedicated Fuse	Driven by PI-80	Gottlieb coil reference
SOL 2	A3J4-13	Shooter	2A sloblo (*1)	QS2	A-5194
SOL 5	A3J4-6	3-bank reset (bottom right)	1A sloblo (*2)	QS5	A-18102
SOL 6	A3J4-12	4-bank reset (top left)	2A sloblo (*1)	QS6	A-18318
SOL 8	A3J5-8	Knocker	none	QS8	A-5195
SOL 9	A3J4-8	Outhole	1A sloblo (*2)	QS9	A-5195

(*1) = the same fuse is shared by those 2 coils

(*2) = the same fuse is shared by those 2 coils

NAME Spider-Man
SERIES SYSTEM-80
GAME PROM NUMBER 653
DATE January 1980
NUMBER OR BALLS 1
SOUND BOARD Non speech
PI-FX COMPATIBLE? Yes

SPECIFIC SETTINGS TO SELECTED GAME

No specific setting

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	Refer to « NORMAL » + spinner lamp
NORMAL	1-2-3 holes + green multiplier lamps before right targets
HARD	Green multiplier lamps before right targets
HARDEST	No parameter is remembered

Coils driven by the PI-80, and associated fuses

Coil Output	Connector and Pin	Function	Dedicated Fuse	Driven by PI-80	Gottlieb coil reference
SOL 1	A3J4-7	#2 Hole Kicker	1A sloblo (*1)	QS1	A-16570
SOL 2	A3J4-13	#1 & #3 Hole Kickers (2 coils)	1A sloblo (*1)	QS2	A-16570
SOL 5	A3J4-6	Left target bank reset	1A sloblo (*1)	QS5	A-18102
SOL 6	A3J4-12	Right target bank reset	2A sloblo	QS6	A-17891
SOL 8	A3J5-8	Knocker	none	QS8	A-5195
SOL 9	A3J4-8	Outhole	1A sloblo (*1)	QS9	A-16570

(*1) = the same fuse is shared by those 5 coils

NAME Time Line
SERIES SYSTEM-80
GAME PROM NUMBER 659
DATE November 1980
NUMBER OR BALLS 1
SOUND BOARD Non speech
PI-FX COMPATIBLE? Yes

SPECIFIC SETTINGS TO SELECTED GAME

Setting number (CREDIT)	Setting	Description	Original DIPSW (PLAYER2)	Values (PLAYER1)	Features
0	1-MILL AWARD	Additional award each time 1-million points are reached <i>Note: same as general setting 19</i>	32	DISABLE ENABLE	No award Award depends on general setting 7
1	BACKGD SND	Turns off background sound: the game plays silently between scored points	new	DISABLE ENABLE	No background sound Regular background sound
2	GONG AWARD	Turns off gong that rings upon each awarded play (scoring or <i>special</i>)	new	DISABLE ENABLE	Gong is turned off Gong is turned on

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	Refer to « NORMAL » + 5,000 lamps before yellow targets + return gate
NORMAL	5,000 lamps before red targets + 1-2-3 targets + Extraball if not scored + multiplier level + X/O matrix
HARD	Multiplier level alone (X/O matrix emptied)
HARDEST	No parameter is remembered

Coils driven by the PI-80, and associated fuses

Coil / Lamp Output	Connector and Pin	Function	Dedicated Fuse	Driven by PI-80	Gottlieb coil reference
SOL 1	A3J4-7	Yellow Drop Target Bank Reset	2A sloblo (*1)	QS1	A-18318
SOL 2	A3J4-13	Red Drop Target Bank Reset	2A sloblo (*1)	QS2	A-17891
SOL 5	A3J4-6	Ball Kicker	2A sloblo (*1)	QS5	A-5194
SOL 6	A3J4-12	Black Drop Target Bank Reset	2A sloblo (*1)	QS6	A-17891
SOL 8	A3J5-8	Knocker	none	QS8	A-5195
SOL 9	A3J4-8	Outhole	1A sloblo	QS9	A-16570
L34	A3J3-K	Gong	2A sloblo	U17/U18-17 (*P)	A-5194
L45	A3J3-F	Gate Open Relay	none	QL45	A-20558
L47	A3J3-M	Auxiliary Relay	none	QL47	A-16890

(*1) = the same fuse is shared by those 4 coils

(*P) = drives a PNP 2N5875 transistor, remotely installed under the playfield

NAME Touchdown
SERIES SYSTEM-80A
GAME PROM NUMBER 688
DATE February 1985
NUMBER OR BALLS 1
SOUND BOARD Non speech
PI-FX COMPATIBLE? Yes

SPECIFIC SETTINGS TO SELECTED GAME

Setting number (CREDIT)	Setting	Description	Original DIPSW (PLAYER2)	Values (PLAYER1)	Features
0	BACKGD SND	Turns off background melody: the game plays silently between scored points	31	DISABLE ENABLE	No background melody Regular background melody

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	Remember yards and touchdown lamps, and re-lit flashing holes if not scored or if PASS spinner not scored
NORMAL	Remember yards and touchdown lamps
HARD	No parameter is remembered
HARDEST	No parameter is remembered, and defense stepback occurs every 3 rd kicking targets hit (instead of 5)

Coils driven by the PI-80, and associated fuses

Coil Output	Connector and Pin	Function	Dedicated Fuse	Driven by PI-80	Gottlieb coil reference
SOL 5	A3J4-6	Left hole	1A sloblo (*1)	QS5	A-16570
SOL 6	A3J4-12	Right hole	1A sloblo (*1)	QS6	A-16570
SOL 8	A3J5-8	Knocker	<i>none</i>	QS8	A-5195
SOL 9	A3J4-8	Outhole	1A sloblo (*1)	QS9	A-5195

(*1) = the same fuse is shared by those 3 coils