



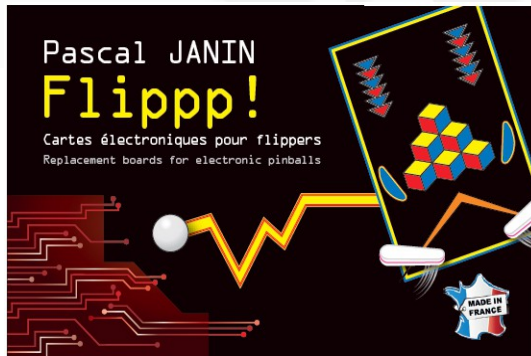
Pinball Board

Installatie & Menus

(C) P.JANIN 2010/2020

Handleiding: Frank SCHOUTEN

(ik dank u !)



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BELANGRIJKE INSTRUCTIES VOOR INSTALLATIE VAN DE PRINTPLAAT:



De flipperkast moet uit staan en de stekker uit het stopcontact voor het weghalen of installeren van een printplaat.
 De elektronische platen moeten aan de randen vastgepakt worden om schade te voorkomen aan statische elektriciteit.
 Het snoer moet in goede conditie zijn en in een stopcontact met aarde gestopt worden voordat het spel aan gaat.
 Alle displays en A6/A7 (geluids)kaart moeten in perfect werkende conditie zijn, alle spoelen en hun diodes moeten goed gecontroleerd zijn.
 Alle zekeringen moeten gecontroleerd zijn en kloppen met de instructies van het spel (waarde, ampère en snelheid), zie originele handleiding.
 Pinnen van alle stekkers van A1 (CPU), A2 (stroomtoevoer), A3 (driver) en A6/A7 (geluid) moeten schoon zijn en vrij van corrosie.



HET INSTALLEREN VAN EEN KAART IN EEN SPEL MET ONBEKENDE CONDITIE KAN DE GARANTIE ONGELDIG MAKEN

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

Softwareversie

januari 2020

WAT IS NIEUW?

« ElDorado City of Gold » Nieuw <<shoot>> spelmodus
 « DEBUG » mode Diagnostische modus, alleen op speciaal verzoek gebruiken

LIJST SPELLEN

Met spelnummer en datum van productie

Vetgedrukt: spel klaar, grijs: nog onder programmering

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	Krull #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	
	Goat Nuts #682, 1/82
	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

PI-80 exclusief -->> Haunted House MULTIBALL

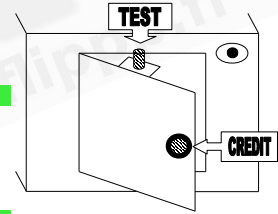
ALTERNATIEVE KIT-SPELLEN

Spel	Maker	Ontleende Gottlieb Regels
Grand 8	Christian Tabart (Frankrijk)	Panthera (System 80)
Ice Mania	IDI (Italië)	Ice Fever (System 80A) en versie met 6 cijfers
Mythology	onbekende	The Games (System 80A)

Zet de taal voor de PI80 op Engels

TEST-knop het menu openen
volgende hoofdmenu kiezen

CREDIT-knop het getoonde item kiezen
waarde veranderen



Spel kiezen

Bij opstarten TEST-knop indrukken, het spelnummer knippert met TEST-knop juiste spel kiezen, met CREDIT-knop bevestigen.

Door het menu navigeren

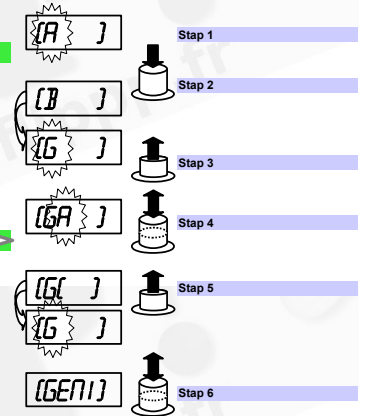
- Stap**
- 1 Druk TEST-knop om het menu in te gaan.
 - 2 Druk TEST-knop om door de submenu's te scrollen tot de gewenste getoond wordt.
 - 3 Druk CREDIT-knop om getoonde submenu in te gaan.
Wanneer "EXIT MENU" wordt getoond en de CREDIT-knop ingedrukt wordt gaat het spel weer naar "GAME OVER".

Navigeren door de submenu's

- Stap**
- 1 Druk de TEST-knop verschillende keren tot de gewenste functie of waarde getoond wordt, of houdt de TEST-knop ingedrukt om ze continu te laten scrollen.
 - 2 Druk de CREDIT-knop in:
- of om de getoonde functie te starten
- of om de getoonde waarde te wijzigen, of houdt de CREDIT-knop ingedrukt om de mogelijke waarden te laten scrollen.
 - 3 Druk de TEST-knop een of meerdere keren in om de getoonde waarde te veranderen, of houdt de TEST-knop ingedrukt om de waarde continu te veranderen.
- Van sommige functies, die een bepaalde tijd kosten om te starten, zal de naam knipperen tijdens starten, totdat het bericht "DONE" kort getoond wordt aan het eind.
 - 4 Druk de CREDIT-knop om uit de submenu's te gaan, of selecteer de getoonde waarde (hangt af van het Submenu)
- De software gaat uit het submenu en keert terug naar het hoofdmenu.

Naam toevoegen aan tabel hoogste score

- Stap**
- 1 Bij halen van hoogste score zal de eerste letter knipperen.
 - 2 Druk CREDIT-knop om juiste letter te kiezen.
 - 3 Bij kort indrukken van de CREDIT-knop zal de letter opgeslagen worden.
 - 4 Om een letter te wissen kies []
 - 5 Druk de CREDIT-knop kort na de 4e positie en de gehele naam wordt opgeslagen, zonder actie na 5 seconden wordt de naam ook opgeslagen.



Hoofdmenu

Nummer (CREDIT)	Menu (tabel 3 en 4)	Omschrijving
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Menu individuele instellingen

Nummer	Omschrijving	Waarden	Omschrijving
S1	alle parameters per spel		
	Nr. Parameter	Omschrijving	druk CREDIT
	LEFT COINS	aantal munten door linkerleuf	Waarde ingestellen
	RIGHT COINS	aantal munten door rechterleuf	
	CENTER COINS	aantal munten door middelste leuf	
	TOTAL PLAYS	total aantal spelen gespeeld	
	TOTAL REPLAYS	total aantal vrije spelen gegeven	
	TOTAL BALLS	total aantal extra ballen gegeven	
	TOTAL TILTS	total aantal tilts	
	TOTAL SLAMS	total aantal slams	
	BEATEN HISSCORE	total aantal HIGH SCORE verlagen is	
	TOTAL TIME	totale speeltijd in dagen, uren, minuten en seconden	

S1 GEBRUIKELIJKE INSTELLINGEN Algemene instellingen voor alle spelen
Zie << COMMON SETTINGS>> menu

S2 SPELINSTELLINGEN Instellingen specifieke spelen, zie bijlage <<SPECIFIC>>
Zie <<SPECIFIC SETTINGS>> menu

Nummer	Omschrijving	Waarden	Omschrijving
S3	Instellingen spelgeluid		
	Display	Omschrijving	
		Beoortelt het type geluid, afhankelijk van spel en zijn geluidskaart	
	SOUND MODE	Als aanvullende PI-FX/80 geïnstalleerd is: voor Panthera, Star Race, James Bond Als aanvullende PI-FX/80 geïnstalleerd is: voor Spiderman, Circus, Courierforce Voor spelen geproduceerd in beide versies: Volcano, Black Hole, Devil's Dare	SCORING CONTINUOUS TONE SOUND CLASSIC SPEECH DISABLE
	ATTRACT MODE	Als aanvullende PI-FX/80 geïnstalleerd is: zet aantrekkingsgeluid uit of aan	12 MIN 6 MIN
	SOUND WAVE	Als aanvullende PI-FX/80 geïnstalleerd is: lichte verandering achtergrondgeluid of bepaalde geluiden (hangt af van geluid en spel)	SINUS SAW TOOTH DISABLE ENABLE
	TREMOLO EFFECT	Als aanvullende PI-FX/80 geïnstalleerd is: lichte verandering geluid bepaalde melodien (hangt af van geluid en spel)	

Nummer	Omschrijving	Waarden	Druk TEST-knop	Druk CREDIT-knop
S4	Instellingen voor 3 scores om te halen en hoogste score kunnen apart van elkaar gekozen worden			
	Scores			
	BEAT 1	Eerste score om te verslaan 10.000 tm 9.999.990 punten (System00) of 99.999.990 punten (System0A) 0 = niet werkend	10K	Kort drukken: Als een cijfer verhoogd deze Als de hele score knipper: slaat deze op en gaat eruit Ingedrukt houden: de hele score wordt gemiddeld (ongeacht knipperende cijfer)
	BEAT 2	Tweede score om te verslaan 10.000 tm 9.999.990 punten (System00) of 99.999.990 punten (System0A) 0 = niet werkend	10K	
	BEAT 3	Derde score om te verslaan 10.000 tm 9.999.990 punten (System00) of 99.999.990 punten (System0A) 0 = niet werkend	10K	
	HIGHEST	Hoogste score ooit gehaald (iedere verandering vist ook de bijbehorende naam) 10.000 tm 9.999.990 punten (System00) of 99.999.990 punten (System0A) 0 = 1e score die gemaakt wordt, wordt opgepast		

Nummer	Omschrijving	Waarden	Druk TEST-knop	Druk CREDIT-knop
S5	Instelling van 3 muntleuven			
	Muntleuf	Locatie		
	LEFT	Muntleuf links	X = 1-9 munten geven Y = 1-9 spelen	
	RIGHT	Muntleuf rechts		
	CENTER	Muntleuf midden (geen effect op spelen die deze niet hebben)		

PRESET MENUS

Om te kiezen voor groep volgende instellingen druk de CREDIT-knop in. <<SURE?>> wordt getoond; druk CREDIT-knop totdat <<DONE>> getoond wordt.

Nummer	Omschrijving	Waarden	Druk TEST-knop	Druk CREDIT-knop
P1	Als algemene instellingen gaan naar originele waarden			
	Zie menu algemene instellingen, originele waarden zijn in wit met zwarte achtergrond			
P2	Instellen 3 scores om te verslaan			
	Scores			
	BEAT 1	Eerste score om te verslaan 200.000		
	BEAT 2	Tweede score om te verslaan 750.000		
	BEAT 3	Derde score om te verslaan 1.500.000		

P3 CLEAR AUDITS Instellingen alle parameters (GAME AUDITS menu)
Indrukken en ingedrukt houden

P4 CLEAR HISSCORE Hoogste score ooit gehaald resetten
Alle hoogste scores gaan naar 0 inclusief en bijbehorende namen worden gewist
Indrukken en ingedrukt houden

TEST MENU'S

T1 COILS TEST Test alle spoelen specifiek van het geselecteerde spel
Iedere spoel kan individueel getest worden
Druk TEST-knop
Volgende spoel in de lijst
Druk CREDIT-knop
Activeert de getoonde spoel

T2 COILS G-TEST Test de 4 gemiddelde spoelen die alle spelen hebben
Game over relay (G), Tilt relay (T), Coin lockout, Knockout, (SOLB), Muntlevers (SOL4, SOL4, SOL7)
Druk TEST-knop
Volgende spoel in de lijst
Druk CREDIT-knop
Activeert de getoonde spoel

T3 DISPLAYS TEST Test alle displays
Displaynummers 0 tm F activeren in 4, 6 of 7 olijers afhankelijk van displaytype en serie (80 of 80A)
Druk TEST-knop
Knippert alle displays
Druk CREDIT-knop
Einde test

T4 SOUNDS TEST Test alle 5 geluidsgroepen (S1/2/4/8/16) die geluidskaart sturen
Display
01 tm 0F
11 tm 1F
DEMO PFX
Maakt de hexadecimale combinatie van S8/S4/S2/S1 naar de geluidskaart voor sound/speech mogelijk (afhankelijk van het spel)
Als additioene PI-FX geluidskaart geïnstalleerd is: speelt alle geluiden achtereen (demonstratiemodus)
Press TEST
Volgende geluid in de lijst
Druk CREDIT-knop
Speelt het geselecteerde geluidsnummer

T5 SWITCH TEST Test alle schakelaars op het aanwezig en in de voorkeur
De laatste 4 gebruikte schakelaars worden getoond. Een altijd gestolen schakelaar wordt getoond met een <<lb>> voor 'Maintained' (onderhoud nodig).
Four switches can be displayed at the same time.
Druk TEST-knop
Toon <<?>, gaat dan uit de test

T6 LAMPS TEST Test alle lampen (ook in de noodgevallen van sommige spelen)
Ieder lampje L3 tm L51 gaan achter elkaar aan voor 100msec.
Druk TEST-knop
Tijds scores: uit test
Als scrolen gestopt is:
Druk kort om naar de volgende lamp te gaan
Drukken en ingedrukt houden om uit de test te gaan
Druk CREDIT-knop
Tijds scores: stop het scrolen
Als scrolen gestopt is: knippert de lamp 3 keer

E. EXIT - MENU: Uit het menu gaan en terug naar <<game over>> modus

Ver. januari 2020

Nummer (CREDIT)	Menu (spelers 3 en 4)	Omschrijving			
Nr.	GEBRUUKLIJKE INSTELLINGEN	algemene instellingen gebruikelijk voor alle spellen			
	Parameter	Omschrijving	originele DIP-switch (speler 2)	Waarden (speler 1)	mogelijkheden
0	BALLS P GAME	3 of 5 ballen per spel	17	3	3 ballen per spel 5 ballen per spel
1	MAX PLAYS	totaal aantal spellen 8, 15 of 25, FREE = onbegrensd	15	8 PLAY 15 PLAY 25 PLAY	Max. 8 spellen Max. 15 spellen Max. 25 spellen
2	DISPLA CREDIT	aantal spellen tonen (ENABLE) of niet (DISABLE)	new	FREE	Onbegrensd aantal spellen, credits toont 99
3	COIN TUNE	geluid bij munt inbrengen (ENABLE) of niet (DISABLE)	28	DISABLE	Credits worden niet getoond
4	REPLAY TUNE	geluid bij starten spel (ENABLE) of niet (DISABLE)	27	ENABLE	Aantal credits wordt getoond
5	MAX SPECIAL	1 vrij spel per spel (ENABLE) of meer per spel (DISABLE)	26	ENABLE	Geen geluid Geluid of deuntje
6	GAME SPECIAL	beloning SPECIAL (niets, 1 vrij spel, extra bal of punten)	19	UNLIM	Slechts 1 vrij spel uitgekeerd, overige worden genegeerd Oneindig aantal vrije spellen per spel
			22	NOTHING	Geen beloning
				NORMAL	1 vrij spel
				EXBALL	1 extra bal
			new	50 K	50.000 punten
			new	100 K	100.000 punten
			new	250 K	250.000 punten
			new	500 K	500.000 punten
7	REPLAY AWARD	beloning verslaan hoogste score (niets, vrij spel of extra bal)	new	NOTHING	Geen beloning
				NORMAL	1 vrij spel
				EXBALL	1 extra bal
8	TILT MODE	effect TILT: voor huidige bal (BALL) of hele spel (GAME)	29	BALL	Huidige bal en bonus raken verloren
				GAME	Het hele spel raakt verloren
9	BONUS CNTDOWN	aftellen bonus normaal (NORMAL) of snel (CUMULAT)	new	NORMAL	Normale aftelling
				CUMULAT	Aftelling is opgeteld in 1 stap
10	HIT FLASH	kort knipperen lampjes bij raken (ENABLE) of niet (DISABLE)	new	DISABLE	Geen effect
11	FLASH EXBALL	knipperend lampje EXTRA BALL (ENABLE) of niet (DISABLE)	new	ENABLE	Kort knipperen
12	FLASH SPECIAL	knipperend lampje SPECIAL (ENABLE) of niet (DISABLE)	new	ENABLE	Kort knipperen
13	ANIM MULTIPL	visueel effect bij MULTIPLIER (ENABLE) of niet (DISABLE)	new	ENABLE	Geen effect
14	TILT LEVEL	instellen TILT: uit (UNLIM), 1 bij 1x tilten, 2x of 3x tilten	new	UNLIM	Om en om knipperend Tilt is uitgezet, je kunt schudden wat je wilt!
				1	1x tilt-contact (normaal)
				2	2x tilt-contact
				3	3x tilt-contact
15	EXBALL LEVEL	instellen EXTRA BALL: uit (DISABLE) 1 of 2 per spel, onbegrensd (UNLIM) of punten	new	DISABLE	Geen extra bal
				1	1 extra bal (normaal)
				2	2 extra ballen
				UNLIM	Oneindig aantal ballen per spel
				50 K	50.000 punten
				100 K	100.000 punten
				250 K	250.000 punten
				500 K	500.000 punten
16	ANIMAT GAME	extra visueel effect (ENABLE) of niet (DISABLE)	new	DISABLE	Uit
				ENABLE	Aan
17	PLAYER LEVEL	instellingen meenemen naar volgende bal: gemakkelijker dan normaal (EASY), als origineel spel (NORMAL), moeilijker (HARD) of niets (HARDEST) Zie <<PLAYER LEVEL>> menu	new	EASY	Gemakkelijker dan normaal
				NORMAL	Normaal niveau
				HARD	Moeilijker niveau
				HARDEST	Geen opslag, alles moet opnieuw met nieuwe bal
18	MAX BONUS	maximale bonuswaarde 19 of 20.000 (NORMAL) of 39.000 (39)	new	NORMAL	19.000 of 20.000 punten
				39	439.000 punten (als 20.000 bonus lamp bestaat)
19	1-MILL AWARD	beloning score meer dan 1 miljoen (ENABLE, hangt af van stap 7) of geen beloning (DISABLE)	new	DISABLE	Geen beloning
20	CHANCE BALL	bal opnieuw als deze weg is binnen 5, 10 of 15 seconden (5 SEC, 10 SEC, 15 SEC) of niet (NONE)	new	ENABLE	Beloning hangt af van instelling 7
				NONE	Uit
				5 SEC	5 seconden
				10 SEC	10 seconden
				15 SEC	15 seconden
21	HISCOR TABLE	top 5 hoogste scores tonen (TOP 5+N), 1 hoogste met naam (TOP1+N), 1 zonder naam (TOP 1) of geen HIGH SCORE (NONE)	new	NONE	Geen hoogste score onthouden, ook niet getoond
				TOP 1	1 hoogste score (als originele computer)
				TOP 1+N	1 hoogste score met naam speler
				TOP 5+N	5 hoogste scores met namen van spelers
22	HISCOR AWARD	beloning verslaan HIGH SCORE 1, 2 of 3 vrije spellen, of niet (NONE)	23	NONE	Geen beloning
				1 PLAY	1 vrij spel
				2 PLAYS	2 vrije spellen
				3 PLAYS	3 vrije spellen
23	AWARD MATCH	vrij spel op eindcijfer (ENABLE) of niet (DISABLE), hangt af van stap 7 Any player(s) whose last 2 scores digits match this number are given the award set here	18	DISABLE	Geen beloning
24	SLAM	effect SLAM-schakelaar aan (ENABLE) of niet (DISABLE)	new	ENABLE	1 vrij spel als instelling 7 NORMAL staat, anders niets
				DISABLE	SLAM-schakelaar uit
25	ENTER NAMES	gebruik CREDIT-knop (NORMAL) of muntschakelaars (SLOTS) moet echter geïnstalleerd worden De SLOTS-modus heeft een nieuwe bedrading nodig van rechter- en middelste muntgleuf (omschrijving op aanvraag)	new	ENABLE	SLAM-schakelaar aan
				NORMAL	Normale modus: CREDIT-knop wordt gebruikt
26	POWER IDLE	spel zet licht uit na 30 seconden (30 SEC), 2 of 4 minuten of niet (DISABLE)	new	SLOTS	Rechter en midden muntgleuf schakelaar scrollen door de letters
				DISABLE	Lampjes gaan nooit uit
				30 SEC	Lampjes gaan uit na 30 seconden na laatste spel
				2 MIN	Lampjes gaan uit na 2 minuten
				4 MIN	Lampjes gaan uit na 4 minuten
27	USE KNOCKER	klap bij behalen vrij spel (ENABLE) of niet (DISABLE) Opmerking: de spoel kan nog wel afgaan in het TEST-menu	new	DISABLE	Geluid vrij spel uit
				ENABLE	Geluid vrij spel aan
28	CHECK BUMPER	controle bumpers (ENABLE) of niet (DISABLE)	new	DISABLE	Bumpers worden niet gemonitord
				ENABLE	Bumpers worden periodiek gemonitord
29	SINGLE PLAYER	In geval van problemen, eindigt het huidige spel en het nummer van de bijtorende bumper wordt getoond; zie pagina ERRORS slechts 1 speler kan spelen (ENABLE) of niet (DISABLE)	new	DISABLE	Normale modus: 1 t/m 4 spelers kunnen spelen
				ENABLE	Slechts 1 speler kan spelen
30	7 DIGIT MODE	6 cijfers (DISABLE) of 7 cijfers (ENABLE), moet erbij gemaakt Waarschuwing: deze modus heeft een specifieke nieuwe bedrading nodig in de kopkast en 7-cijferige displays, of nieuwe specifieke LED-displays	new	DISABLE	Klassiek 6 cijfers System80 display
				ENABLE	7 cijfers System80A display
31	DEBUG MODE	doel is testen van spel, niet gebruiken en op DISABLE houden	new	DISABLE	Normale modus
				ENABLE	'Debug' modus

Version **januari 2020**

Electronic coin validator connection

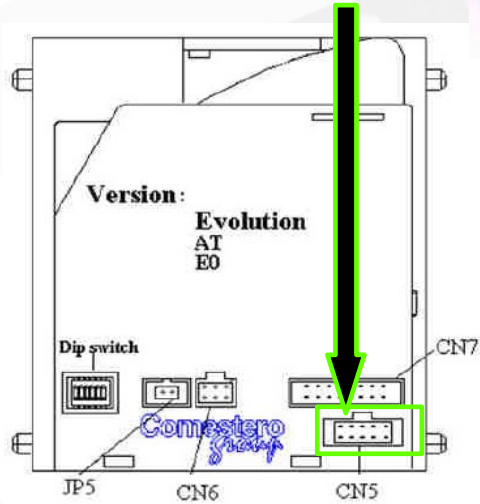
Starting from version 1.3, the PI-80 board can be connected to a Comestero RM5 electronic coin validator :

There are other compatible models, such as :

- Cashflow C330
- Coin Controls SR3
- Coin Controls C120
- NRI G-13
- Alberici

The link to the PI-80 board is a 2x5 pin flat ribbon cable:

It plugs into the RM5 standard 10-pin connector « CN5 » :



Then into the matching « RM5 » connector on the PI-80 board :



The 12V/ACTIVE LED, to the left of the connector on the PI-80 board, is lit when the RM5 coin validator is duly powered.

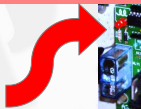
Only the channels 4 5 and 6 of the RM5 coin validator are used, and must be programmed according to the coins type :

RM5 channel	Corresponds to the flipper coin slot	LED on PI-80 board
4	left coin chute (SW17)	CH4
5	right coin chute (SW27)	CH5
6	center coin chute (SW37)	CH6

The PI-80 board requires no specific setting.

Error codes

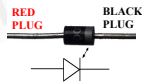
Upon energizing each coil (solenoids 1 2 5 6 8 9 only), the PI-80 board measures the current flooding thru the coil and scans its associated switches (for example, bottom hole switch, or the switches behind the drop targets).
 The board also monitors the current during a game in play.
 In case of trouble, 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 menu.
 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 Also refer to error #1	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)
5	BUMPER ERROR : one of the pop bumpers is locked in down position for more than 2 seconds	Badly adjusted cup switch Jammed or faulty pop bumper mechanism	Check that the 2 pairs of switches under the pop bumper are normally open Check that the pop bumper plunger and ring move freely and don't remain stuck in down position

How to check a coil and its diode

Disorder 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-4653	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, outsole	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-18316	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.

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 unit	Additional information and what to check
	1.0	1.1	1.2 and up	01/03/17			
12V general power supply		LD1	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...)		LD2	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	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	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	LD5	LD5	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	LD6	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 (2N2) or its trans 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
RMS coin validator: output 4			LD7	LD7	A coin has been inserted	No coin detected	Each LED is normally unlit, and turns on briefly only when a coin is sensed by the validation of the matching type in slots 4/5/6. If the LED is always on : validator is defective or wrongly connected. If the LED is always off when a coin is inserted : wrong coin type, faulty flat cable connection, defective validator. This LED is normally on upon game power-up. If the LED is off : faulty flat cable connection or defective validator.
RMS coin validator: output 5			LD8	LD8	A coin has been inserted	No coin detected	
RMS coin validator: output 6			LD9	LD9	A coin has been inserted	No coin detected	
RMS coin validator: +12V power supply			LD10	LD10	Validator is powered	No power supply to the validator	

NAME Alien Star
SERIES SYSTEM-80A
GAME PROM NUMBER 689
DATE August 1984
NUMBER OR BALLS 2
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 sound: the game plays silently between scored points	31	DISABLE ENABLE	No background sound Regular background sound

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	Refer to « NORMAL »
NORMAL	A-L-I-E-N bullseye targets + capture lamp in 3-ball mode only (5 ball mode: not remembered)
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	Hole	F13 : 1A sloblo (*1)	QS1	A-16570
SOL 8	A3J5-8	Knocker	none	QS8	A-5195
SOL 9	A3J4-8	Outhole	F13 : 1A sloblo (*1)	QS9	A-16570
L12	A3J3-25	Ball Release	F12 : 1A sloblo	QL12 (*P)	A-16570

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

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

NAME Amazon Hunt
SERIES SYSTEM-80A
GAME PROM NUMBER 684 & 684B The 684B version has different switch numbers assigned to the drop targets and the left/right holes
DATE September 1983 The 684B was released in september 1985
NUMBER OR BALLS 1
 Two versions :
 - Speech
SOUND BOARD (but does not speak) The version with the speech sound board is not equipped with the speech processor SC01
 - Non speech
 (the most common one)
PI-FX COMPATIBLE? Yes for the non speech version

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	No background melody
1	GAME TYPE	Selects the playfield model : normal (the most common, released in 1983) or specific (B model, rare, released in 1985) <i>Note : the normal game PROM was stamped « 684 » or « 684A », the specific prom was stamped « 684B »</i>	new	NORMAL	Normal playfield « B » playfield

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	No parameter is remembered
NORMAL	No parameter is remembered
HARD	Center left and right black drop targets (only those 2 are brought back up)
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	Right Bank Trip	F11 : 2A sioblo (*1)	QS1	A-5194
SOL 2	A3J4-13	Left Bank Trip	F11 : 2A sioblo (*1)	QS2	A-5194
SOL 5	A3J4-6	Left Bank Reset	F11 : 2A sioblo (*1)	QS5	A-17891
SOL 6	A3J4-12	Right Bank Reset	F11 : 2A sioblo (*1)	QS6	A-17891
SOL 8	A3J5-8	Knocker	none	QS8	A-5195
SOL 9	A3J4-8	Outhole	F10 : 1A sioblo	QS9	A-5195
L12	A3J3-25	Left Hole	F12 : 2A sioblo (*2)	QL12 (*P)	A-5194
L13	A3J3-24	Right Hole	F12 : 2A sioblo (*2)	QL13 (*P)	A-5194

(*1) = the same fuse is shared by those 4 coils
 (*2) = the same fuse is shared by those 2 coils
 (*P) = drives a PNP 2N5679 transistor, remotely installed under the playfield

NAME Black Hole
SERIES SYSTEM-80
GAME FROM 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 (PLAYER)	Values (PLAYER)	Features
0	SOUND MODE	Selects which sound board is installed in the game: classic (non-speech) or speech. Note: this is the same sound mode setting as in SOUND SETTING general menu	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	52	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	A334-7	4 Pos. Bank Upper Playfield	F14 : 2A sloblo (*2)	QS1	A-18318
SOL 2	A334-13	5 Pos. Bank Upper playfield	F14 : 2A sloblo (*2)	QS2	A-17891
SOL 5	A334-6	4 Pos. Bank Lower Playfield	F18 : 2A sloblo	QSS	A-18318
SOL 6	A334-12	3 Pos. Bank Lower Playfield	F20 : 1A sloblo (*3)	QSS	A-18102
SOL 8	A335-8	Capture Hole Upper Playfield	none	QSS	A-5195
SOL 9	A334-8	Outhole	F15 : 1A sloblo (*1)	QSS	A-16570
L3	A332-10	Ball Return Gate Lower Playfield	F19 : 1A sloblo	U21,Q22-11 (P)	A-16570
L12	A335-25	Hole Kicker Lower Playfield	F20 : 1A sloblo (*3)	QL12 (P)	A-16570
L13	A335-24	Hole Kicker Upper Playfield	F15 : 1A sloblo (*1)	QL13 (P)	A-16570
L14	A335-22	Ball Lift Kicker Lower Playfield	F17 : 6 1/2 A sloblo	QL14 (P)	A-4893
L15	A335-23	Trough Ball Gate (Card Holder)	F16 : 1A sloblo	QL15 (P)	A-16570
L16	A335-13	U Relay	none	QL16 (P)	A-16890
L17	A335-14	L Relay	none	QL17 (P)	A-16890
L18	A335-16	Wireform Ball Gate Upper Playfield	none	QL18 (P)	A-17564

Main playfield (upper) (*)1 = the same fuse is shared by those 2 coils
 Bottom playfield (lower) (*)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, special, 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 stoblo (*)	QS1	A-16570
SOL 2	A3J4-13	Roto Unit	2A stoblo (*)	QS2	A-17891
SOL 5	A3J4-6	Target bank reset	2A stoblo (*)	QS5	A-18318
SOL 8	A3J5-8	Knocker	none	QS8	A-5195
SOL 9	A3J4-8	Outhole	1A stoblo (*)	QS9	A-16570

(*) = the same fuse is shared by those 2 coils
 (*) = 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 extraball target once the missiles bank (reset 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 special target lamp on, when all missiles are destroyed on the 1st row	32	LIBERAL CONSERV	Give a replay and turns the special target lamp on Turn the special 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	none	G58	A-5195
SOL 9	A3J4-8	Outsole	1A slobio (*1)	G59	A-1496
SOL 1	A3J4-7	Hole kicker		GS1	A-1496
SOL 2	A3J4-13	Bank reset	2A slobio (*2)	GS2	A-16570
SOL 5	A3J4-6	Bank reset		GS5	A-16570
L12	A3J3-25	Drop target trip coil 2	none	QL12	A-18642
L13	A3J3-24	Drop target trip coil 4	none	QL13	A-18642
L14	A3J3-22	Drop target trip coil 6	none	QL14	A-18642
L15	A3J3-23	Drop target trip coil 1	none	QL15	A-18642
L16	A3J3-13	Drop target trip coil 3	none	QL16	A-18642
L17	A3J3-14	Drop target trip coil 5	none	QL17	A-18642
L18	A3J3-16	Drop target trip coil 7	none	QL18	A-18642

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

NAME Devil's Dare
SERIES SYSTEM-80A
GAME PROM NUMBER 670
DATE August 1982
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 Speech sound board
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 Thibaut Grandvilliers)	new	DISABLE ENABLE	1 st ball ejected from « CAPTIVE CAVE » hole and lost 1 st ball ejected from « CAPTIVE CAVE » hole and put back in play
2	BONUS CNTDOWN	Bonus count down speed	new	NORMAL FAST	Slow Fast
3	BACKGD SND	Turns off background music: the game plays silently between scored points	32	DISABLE ENABLE	No background music (only once when ball is put in play) Regular background music

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	Refer to « NORMAL »
NORMAL	« CAPTURE CAVE » hole's capture lamp
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	Top Bank	F10 : 1A sloblo (*1)	QS1	A-18102
SOL 2	A3J4-13	Top Ball Kicker (Captive Pit)	F13 : 2A sloblo (*2)	QS2	A-5194
SOL 3	A3J6-3	Hole (Captive Cave)	F12 : 1A sloblo	QS3 (*P)	A-5195
SOL 4	A3J6-2	Ball Save Relay (B)	none	QS4	A-16890
SOL 5	A3J4-6	Left Bank	F13 : 2A sloblo (*2)	QS5	A-17891
SOL 6	A3J4-12	Right Bank (center targets)	F13 : 2A sloblo (*2)	QS6	A-17891
SOL 8	A3J5-8	Knocker	none	QS8	A-5195
SOL 9	A3J4-8	Outhole	F10 : 1A sloblo (*1)	QS9	A-16570
L12	A3J3-25	Ball Release	F11 : 1A sloblo	QL12 (*P)	A-16570

(*1) = the same fuse is shared by those 2 coils
 (*2) = the same fuse is shared by those 3 coils
 (*P) = drives a PNP 2N5875 transistor, remotely installed under the playfield

NAME Eclipse
SERIES SYSTEM-80
GAME PROM NUMBER 671
DATE October 1981
NUMBER OR BALLS 3
SOUND BOARD Non speech Cheap version of BLACK HOLE (non speech, single playfield)
A « 671K » (K for KIT) version exists, to install in a JAMES BOND cabinet
PI-FX COMPATIBLE? Yes

SPECIFIC SETTINGS TO SELECTED GAME

Setting number (CREDIT)	Setting	Description	Original DIPSW (PLAYER2)	Value (PLAYER1)	Features
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 CUMULAT	Green lamp lights just once Cumulates green lamp scorings
1	ROLLUNDER MODE	Selects the speed at which the 3 50,000/extraball/special lamps of the top rollunder scroll, the slowest speed allows to aim at the desired lit lamp precisely	new	NORMAL SLOW	Normal speed (fast) 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 ENABLE	No background sound Regular background sound

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	Strobing lamp (top left rollunder) + kicking target + top rollovers are remembered
NORMAL	Kicking target + top rollovers are remembered
HARD	Top rollovers are remembered
HARDEST	No parameter is remembered

Coils driven by the PI-80, and associated fuses (Eclipse 1st Edition)

Coil or Lamp Output	Connector and Pin	Function	Dedicated Fuse	Driven by PI-80	Gottlieb coil reference
SOL 1	A3J4-7	4 Pos. Bank	2A sloblo (*1)	QS1	A-18318
SOL 2	A3J4-13	5 Pos. Bank	2A sloblo (*1)	QS2	A-17891
SOL 5	A3J4-6	Ball Shooter	1A sloblo (*2)	QS5	A-19300
SOL 6	A3J4-12	3 Pos. Bank	1A sloblo (*2)	QS6	A-18102
SOL 8	A3J5-8	Knocker	none	QS8	A-5195
SOL 9	A3J4-8	Outhole	1A sloblo (*2)	QS9	A-16570
L12	A3I3-25	Ball Gate	1A sloblo	QL12 (*P)	A-16570
L13	A3I3-24	Hole Kicker	2A sloblo (*1)	QL13 (*P)	A-1496

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

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

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

NAME EIDorado City of Gold
SERIES SYSTEM-80A
GAME PROM NUMBER 692
DATE March 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	No background melody
1	ROTATE TARGET	Both pop bumpers and the 30-pts switch move the flashing lamp on to the next drop target and rollover, just like the spot targets	new	ENABLE	Regular background melody
2	SHOOT MODE	Enables the specific « SHOOT » mode. Refer to description below.	new	ENABLE	Disabled Enabled

« SHOOT » mode : This mode completely changes the game rules and the way to shoot the drop targets.

The player starts each ball with 3 "lives" (=mis-hits permissions) displayed by the lamps 2X & 3X:
 - both 2X and 3X lit: 3 lives (with each new ball in play)
 - 2X lit alone: 2 lives
 - both 2X and 3X unlit: 1 life (last one)

When the ball is thrown into play, the game makes the first group of targets flash, the others remains off.

The 15 drop targets must be hit in a given order: each target hit of a given group will proceed to the next group.

If one of the flashing targets is hit:

The player earns 10.000 points and 1 bonus, the whole group of drop targets is steadily lit (no longer flashes), the extraball is earned if lit, and the next group of targets of the same level flashes. Once all groups of targets of the level have been scored, all drop targets are reset, the 1st time the extraball is lit, the 2nd time the special is lit (or 100.000 points are given if already lit) and a new group of targets flashes. There are 6 different levels to complete, from easiest (3 banks of 5 targets) to hardest (each target must be individually hit) with 4 intermediate levels (grouping the targets by 2, 3 or 4).

If one of the steadily lit targets is hit:

The player earns 1.000 points but no bonus, and does not lose a « life ».

If one of the unlit targets is hit:

The player earns no score and no bonus, and loses a « life ». Once all 3 « lives » have been lost, the player loses the ball in play, the TILT relay is energized, all lamps go off, flippers are turned off, the message « -LOST- » is displayed.

Upon end of ball, each lit bonus lamp scores 100.000 points.
The game remembers the current level and targets groups from ball to ball.

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	Refer to « NORMAL »
NORMAL	Remembers when the top target bank has been hit in full once
HARD	No parameter is remembered
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 2	A3J4-13	Top Target Bank Reset (*)	F12 : 3A sloblo (*)	QS2	A-18318
SOL 5	A3J4-6	Bottom Target Bank Reset	F13 : 2A sloblo	QS5	A-17891
SOL 6	A3J4-12	Top Target Bank Reset (*)	F12 : 3A sloblo (*)	QS6	A-18318
SOL 8	A3J5-8	Knocker	no	QS8	A-5195
SOL 9	A3J4-8	Outhole	F14 : 1A sloblo	QS9	A-5195

(*) driven at the same time by the CPU

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

NAME Force II
SERIES SYSTEM-80
GAME PROM NUMBER 661
DATE January 1981
NUMBER OR BALLS 2
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	GONG AWARD	Turns off gong that rings upon each awarded play (scoring or special)	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 »
NORMAL	Top blue/white/red rollovers + bonus lamps before red/blue drop targets
HARD	Refer to « NORMAL »
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 1	A3J4-7	Outhole	1A sloblo (*1)	QS1	A-16570
SOL 2	A3J4-13	Top Drop Target Bank	2A sloblo (*2)	QS2	A-18318
SOL 5	A3J4-6	Right Drop Target Bank	2A sloblo (*2)	QS5	A-17891
SOL 6	A3J4-12	Left Drop Target Bank	2A sloblo (*2)	QS6	A-17891
SOL 8	A3J5-8	Knocker	none	QS8	A-5195
SOL 9	A3J4-8	Trough	1A sloblo (*1)	QS9	A-16570
L12	A3J3-25	Memory Relay	none	QL12	A-16890
L13	A3J3-24	Ball Kicker	2A sloblo (*2)	QL13 (*P)	A-5194
L14	A3J3-22	Hole Kicker	1A sloblo (*1)	QL14 (*P)	A-18642
L15	A3J3-23	#1 Left Drop Target trip coil (bottom left)	none	QL15	A-18642
L16	A3J3-13	#2 Left Drop Target trip coil	none	QL16	A-18642
L17	A3J3-14	#3 Left Drop Target trip coil	none	QL17	A-18642
L18	A3J3-16	#4 Left Drop Target trip coil	none	QL18	A-18642
L19	A3J3-15	#5 Left Drop Target trip coil	none	QL19	A-18642
L20	A3J3-21	#1 Top Drop Target trip coil (left)	none	QL20	A-18642
L21	A3J3-20	#2 Top Drop Target trip coil	none	QL21	A-18642
L22	A3J3-18	#3 Top Drop Target trip coil	none	QL22	A-18642
L23	A3J3-19	#4 Top Drop Target trip coil	none	QL23	A-18642
L24	A3J3-9	#1 Right Drop Target trip coil (top left)	none	QL24	A-18642
L25	A3J3-10	#2 Right Drop Target trip coil	none	QL25	A-18642
L26	A3J3-12	#3 Right Drop Target trip coil	none	QL26	A-18642
L27	A3J3-11	#4 Right Drop Target trip coil	none	QL27	A-18642
L28	A3J3-Y	#5 Right Drop Target trip coil	none	QL28	A-18642

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

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

NAME Haunted House

SERIES SYSTEM-80

GAME PROM NUMBER 669

DATE February 1982

NUMBER OR BALLS 1

SOUND BOARD Speech but not equipped with the speech processor SC01

PI-FX COMPATIBLE? No

SPECIFIC SETTINGS TO SELECTED GAME

Setting number (CREDIT)	Setting	Description	Original DIPSW (PLAYER2)	Values (PLAYER1)	Features
0	UPKICK CONFIG	Selects the way the « upkicker » (top right hole on the main playfield) is driven It required different GAME PROMs on the original CPU board: version 668/1 (pre-series) or 668/2 (normal)	new	NORMAL PROTO	Driven by SOL2 (normal production run) Driven by LAMP 14 + transistor on the playfield (pre-series playfield)
1	BACKGD SND	Turns off background melody: the game plays silently between scored points In this mode, rollover switch 04 (on the main playfield, under the bottom left pop bumper) plays another sound (fix)	new	DISABLE ENABLE	No background melody Regular background melody
2	SOUND MODE	Enable speech playback during some game sequences This modes requires a sound board equipped with the speech processor SC01 + the specific SOUND PROMS from the Davroux brothers: http://projets.fr/H-parlant_EN.php	new	CLASSIC SPEECH	Regular sounds Sounds + speech

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	Refer to « NORMAL »
NORMAL	Bullseye targets (top playfield) + 1-2-3-4-5 targets (main playfield) Refer to « NORMAL »
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	Top center hole	F15 : 2A slobber (*1)	Q51	A-16570
SOL 2 (°C)	A3J4-13	Up Kicker (top right hole), ejects the ball to the upper playfield : on production games	F14 : 2.5A slobber (*2)	Q52	A-5194
SOL 5	A3J4-6	4 Bank (upstairs)	F15 : 2A slobber (*1)	Q55	A-18102
SOL 6	A3J4-12	Special hole (lower)	F15 : 2A slobber (*1)	Q56	A-16570
SOL 8	A3J5-8	Knocker	none	Q58	A-5195
SOL 9	A3J4-8	Outhole	F15 : 2A slobber (*1)	Q59	A-5195
L12	A3J3-25	K Relay (lower), drives the Vertical Up Kicker (VUK) from lower playfield	none	QL12	A-20558 + A-4893
L13	A3J3-24	5 Bank (lower)	F14 : 2.5A slobber (*2)	QL13 (*P)	A-17891
L14 (°C)	A3J3-22	Up Kicker (top right hole), ejects the ball to the upper playfield : on sample games	F14 : 2.5A slobber (*2)	QL14 (*P)	A-5194
L15	A3J3-23	Extraball Right Side Kicker	F14 : 2.5A slobber (*2)	QL15 (*P)	A-5195
L16	A3J3-13	Trap Door, under the ramp to the upper playfield	F14 : 2.5A slobber (*2)	QL16 (*P)	A-17875
L17	A3J3-14	U Relay, powers the bottom playfield flippers	none	QL17	A-16880

(°C) this coil is wired in one of those 2 possible configurations, depending on the main playfield version (production run or pre-series); the actual configuration must be selected by means of specific setting #0 : CONFIG UPKICK

Main playfield	*1) = the same fuse is shared by those 4 coils
Lower playfield	*2) = the same fuse is shared by those 4 coils
Upper playfield	
Pre-series main playfield	(*P) = drives a PNP 2N5675 transistor, remotely installed under the playfield

NAME Haunted House Multiball

(C) Pascal Janin & Cédric Bérenger

SERIES SYSTEM-80
GAME PROM NUMBER None (based on 669)
DATE January 2014
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	UPKICK CONFIG	Selects the way the « upkicker » (top right hole on the main playfield) is driven It required different GAME PROMs on the original CPU board: version 668/1 (proto) or 668/2 (normal)	new	NORMAL	Driven by SOL2 (normal production run)
1	BACKGND SND	Turns off background melody; the game plays silently between scored points In this mode, rollover switch 04 (under the main playfield's bottom left pop bumper) plays another sound (fix)	new	PROTO	Driven by LAMP 14 + transistor on the playfield (preseries playfield)
2	MULTIBALL	Selects the multiball mode Refer to the Haunted House Multiball specific manual available on line	new	NORMAL	Normal mode
				SELECT	Select mode

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	Refer to « NORMAL »
NORMAL	Bullseye targets (top playfield) + 1-2-3-4-5 targets (main playfield) 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	Top center hole	F15 : 2A sloblo (*1)	QS1	A-16570
SOL 2 (*C)	A3J4-13	Up Kicker (top right hole), ejects the ball to the upper playfield : on production games	F14 : 2.5A sloblo (*2)	QS2	A-5194
SOL 3	A3J6-3	Ball release (lower playfield)	F1A sloblo (*3)	QS3	A-16570
SOL 4	A3J6-2	Ball release (main playfield)	F15 : 2A sloblo (*1)	QS4	A-16570
SOL 5	A3J4-6	4 Bank (upstairs)	F15 : 2A sloblo (*1)	QS5	A-18102
SOL 6	A3J4-12	Special hole (lower)	F15 : 2A sloblo (*1)	QS6	A-16570
SOL 8	A3J5-8	Knocker	none	QS8	A-5195
SOL 9	A3J4-8	Outsole	F15 : 2A sloblo (*1)	QS9	A-5195
L12	A3J3-25	K Relay (lower), drives the Vertical Up Kicker (VUK) from lower playfield	none	QL12	A-20558 + A-4893
L13	A3J3-24	5 Bank (lower)	F14 : 2.5A sloblo (*2)	QL13 (*P)	A-17891
L14 (*C)	A3J3-22	Up Kicker (top right hole), ejects the ball to the upper playfield : on sample games	F14 : 2.5A sloblo (*2)	QL14 (*P)	A-5194
L15	A3J3-23	Extraball Right Side Kicker	F14 : 2.5A sloblo (*2)	QL15 (*P)	A-5195
L16	A3J3-13	Trap Door, under the ramp to the upper playfield	F14 : 2.5A sloblo (*2)	QL16 (*P)	A-17875
L17	A3J3-14	U Relay, powers the bottom playfield flippers	none	QL17	A-16890
L49	A3J3-H	Z Relay	none	QL49	A-16890

(*C) this coil is wired in one of those 2 possible configurations, depending on the main playfield version (production run or pre-series): the actual configuration must be selected by means of specific setting #0 : CONFIG UPKICK

Main playfield	(*1) = the same fuse is shared by those 5 coils
Lower playfield	(*2) = the same fuse is shared by those 4 coils
Upper playfield	(*3) = separate dedicated fuse
Pre-series main playfield	(*P) = drives a PNP 2N5875 transistor, remotely installed under the playfield
Specific to this Multiball version	

NAME Ice Fever
SERIES SYSTEM-80A
GAME PROM NUMBER 695
DATE May 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	Controls background sound (crowd) level	31	LOW HIGH	Low volume High volume
1	ATTRAC + SND	Turns off sound and lights animation over bonus lamps ramp at regular periods of time in <i>game over</i> mode	32	DISABLE ENABLE	Animation is turned off Animation is turned on
2	TICKET DISPENSER	Dispenses a given number of tickets (set by common setting 22 « HISCORE AWARD ») when the highest game to date is beaten. This feature was available in specific game prom version « 695/Y ».	Prom version /Y	DISABLE ENABLE	Ticket dispenser disabled Ticket dispenser enabled

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	Top I-C-E rollover lamps, multiplier, special (if not scored) and 1-2-3 goals are remembered
NORMAL	Multiplier, special (if not scored) and 1-2-3 goals are remembered
HARD	1-2-3 goals are remembered
HARDEST	No parameter is remembered

Coils driven by the PI-80, and associated fuses

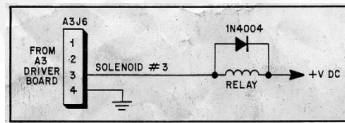
Coil / Lamp Output	Connector and Pin	Function	Dedicated Fuse	Driven by PI-80	Gottlieb coil reference
SOL 2	A3J4-13	Target Bank Reset	F10 : 1A <i>slabla</i> (*1)	Q52	A-18102
SOL 5	A3J4-6	« PUCK » Kicker (in the front head)	F9 : 2A <i>slabla</i>	Q55	A-5194
SOL 8	A3J5-8	Knocker	<i>none</i>	Q58	A-5195
SOL 9	A3J4-8	Outhole	F10 : 1A <i>slabla</i> (*1)	Q59	A-5195

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

TICKER DISPENSER CONNECTION

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

when available in game's specific settings



schematic (c) Gottlieb

NAME Jacks To Open
SERIES SYSTEM-80A
GAME PROM NUMBER 687
DATE May 1984
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
1	ROTATE TARGET	The drop targets must be kicked down in a given order, shown by the corresponding flashing target lamp Otherwise, all targets must be kicked down to try again (much harder play mode)	new	DISABLE ENABLE	Disabled (= normal play mode) Enabled
2	DOUBLE TOP	Scoring all 4 top rollovers directly lights « double bonus » lamp for the ball in play (easier play mode) <i>Note: in 5 ball mode and at « royal flush » step, scoring all 4 top rollovers proceeds directly to extraball level</i>	new	DISABLE ENABLE	Disabled Enabled

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	Refer to « NORMAL » ; top left and right rollovers mutually unlit each other
NORMAL	Current level + drop targets already hit on that level
HARD	Current level only (not the targets that were hit)
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 2	A3J4-13	Target Bank Left Reset	F11 : 2A sloblo (*)	QS2	A-18318
SOL 5	A3J4-6	Target Bank Trip	F12 : 2A sloblo	QS5	A-5194
SOL 6	A3J4-12	Target Bank Right Reset	F11 : 2A sloblo (*)	QS6	A-18318
SOL 8	A3J5-8	Knocker	none	QS8	A-5195
SOL 9	A3J4-8	Outhole	F10 : 1A sloblo	QS9	A-5195

(*) driven at the same time by the CPU

(*) = 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 special and extraball lamps are lit in the warbases	32	DISABLE ENABLE	special from 4X, extraball from 3X special from 5X, extraball 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 (*)	QS1	A-16570
SOL 2	A3J4-13	Right Captive Hole	F15 : 1A sloblo (*)	QS2	A-16570
SOL 5	A3J4-6	Center Drop Target Bank	F14 : 2A sloblo (*)	QS5	A-18318
SOL 6	A3J4-12	Right Drop Target Bank	F14 : 2A sloblo (*)	QS6	A-18318
SOL 8	A3J5-8	Knocker	none	QS8	A-5195
SOL 9	A3J4-8	Outhole	F15 : 1A sloblo (*)	QS9	A-16570
L12	A3J5-25	Right Launch Lane	F16 : 2A sloblo	QL12 (*)	A-19300
L13	A3J3-24	Ball Release	F17 : 1A sloblo	QL13 (*)	A-16570
L8	A3J2-10	Ramp	F18 : 2A sloblo	U21/U22-11 (*)	A-17875

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

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

(*) = 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	Steadily lit lamp
1	ALTERN SPECIAL	Makes <i>special</i> lamp alternate when 10 points switches and bumpers are hit	32	CONSERV	Alternates lamp (harder)
				LIBERAL	Steadily lit lamp
				CONSERV	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 special (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

New >>

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 (*)	QS1	A-16570
SOL 2	A3J4-13	Center Drop Target Bank (White)	1A sloblo (*)	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 (*)	QS9	A-16570
L8	A3J2-10	Left Captive Hole	1A sloblo (*)	U21/U22-11 (*P)	A-16570
L9	A3J2-9	Right Captive Hole	1A sloblo	U21/U22-12 (*P)	A-5195

(*) = the same fuse is shared by those 4 coils
 (*P) = drives a PNP 2N5875 transistor, remotely installed under the playfield

NAME Q*Bert's Quest
SERIES SYSTEM-80A
GAME PROM NUMBER 677
DATE March 1983
NUMBER OR BALLS 1
SOUND BOARD Speech
PI-FX COMPATIBLE? No

SPECIFIC SETTINGS TO SELECTED GAME

Setting number (CREDIT)	Setting	Description	Original DIPSW (PLAYER2)	Values (PLAYER1)	Features
0	ATTRAC + SND	Turns off sound and lights animation over « Coily » at regular periods of time in game over mode	7	DISABLE ENABLE	Animation is turned off Animation is turned on
1	FIG-8 VILLAIN	Controls the destruction of the currently lit villain when the ball makes a grand « 8 » loop	8	ANY POS 1ST POS	Destruction no matter the villain position Destruction only when villain on top 1 st position (harder)
2	PYRAMI SPECIAL	Number of pyramids to complete until special is lit	31	5 6 7 8	5 pyramids 6 pyramids 7 pyramids 8 pyramids
3	TRIPLE ATTACK	New special attack of all 3 villains together, after a certain number of hits on villains	new	DISABLE ENABLE	Disabled Enabled

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	Refer to « NORMAL »
NORMAL	Lit cubes + lit pyramids + villains attack positions + Special if not scored
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 1	A3J4-7	Left 2 Bank Reset	F13 : 1A sloblo (*1)	QS1	A-18102
SOL 2	A3J4-13	Right Kicker	F12 : 2A sloblo (*2)	QS2	A-1496
SOL 5	A3J4-6	Left Kicker	F12 : 2A sloblo (*2)	QS5	A-1496
SOL 6	A3J4-12	Right 2 Bank Reset	F13 : 1A sloblo (*1)	QS6	A-18102
SOL 8	A3J5-8	Knocker	none	QS8	A-5195
SOL 9	A3J4-8	Outhole	F13 : 1A sloblo (*1)	QS9	A-5195

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

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 unlimedly 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 stoblo (*)	QS2	A-5194
SOL 5	A3J4-6	3-bank reset (bottom right)	1A stoblo (*)	QS5	A-18102
SOL 6	A3J4-12	4-bank reset (top left)	2A stoblo (*)	QS6	A-18318
SOL 8	A3J5-8	Knocker	none	QS8	A-5195
SOL 9	A3J4-8	Outhole	1A stoblo (*)	QS9	A-5195

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

NAME Ready Aim Fire!
SERIES SYSTEM-80A
GAME PROM NUMBER 686
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	Top rollover bonus lamp is remembered
NORMAL	Top rollover bonus lamp is remembered
HARD	Top rollover bonus lamp is not remembered (= reset to 5,000 pts)
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 8	A3J5-8	Knocker	none	QS8	A-5195
SOL 9	A3J4-8	Outhole	F15 : 1A sloblo	QS9	A-5195

NAME Royal Flush Deluxe
SERIES SYSTEM-80A
GAME PROM NUMBER 681
DATE June 1983
NUMBER OR BALLS 1
SOUND BOARD Speech but not equipped with the speech processor SC01
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 melody; the game plays silently between scored points	new	DISABLE ENABLE	No background melody Regular background melody
1	ROYAL S-MODE	New 10,000 points bonus on center <i>DIP</i> target and <i>bumper</i> for a limited amount of time Starts with black « K » and black « J » are the only 2 kicked down targets of the bank	new	DISABLE ENABLE	Disabled Enabled

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	Bottom right return gate
NORMAL	No parameter is remembered
HARD	No parameter is remembered
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 2	A3J4-13	Target Bank Reset (*)	F12 : 2A sloblo (*)	QS2	A-18102
SOL 5	A3J4-6	Hole	F11 : 1A sloblo (*)	QS5	A-5195
SOL 6	A3J4-12	Target Bank Reset (*)	F12 : 2A sloblo (*)	QS6	A-18102
SOL 8	A3J5-8	Knocker	non	QS8	A-5195
SOL 9	A3J4-8	Outhole	F11 : 1A sloblo (*)	QS9	A-5195
L12	A3J3-25	Gate	non	QL12	A-20558

(*) driven at the same time by the CPU

(*) = the same fuse is shared by those 2 coils
 (*) = 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 Spirit
SERIES SYSTEM-80A
GAME PROM NUMBER 673
DATE November 1982
NUMBER OR BALLS 3
SOUND BOARD Speech but not equipped with the speech processor SC01
PI-FX COMPATIBLE? No

SPECIFIC SETTINGS TO SELECTED GAME

Setting number (CREDIT)	Setting	Description	Original DIPSW (PLAYER2)	Values (PLAYER1)	Features
0	FAST MULTIBALL	Ejects the captured balls much faster when the multiball sequence starts	new	DISABLE ENABLE	Green lamp lights just once Cumulates green lamp scorings
1	HOMAGE STEVE	During the attract mode, displays a scrolling message about the Spirit-A-Go-Go alignment held at Bourgogne Game Show expo in september 2017, in homage to our friend Steve Charland (1956-2017)	new	DISABLE ENABLE	No message Homage message to Steve
2	RELEASE CAPTURE	If one or several balls have been captured and the ball in play is lost, one of the captured balls is immediately released, allowing the current player to continue to play : once per ball in play, or as long as some balls remain captured. Warning : choosing the last setting may lead to very long plays, as they continue while captured balls last.	new	NO ONCE INFINITE	Normal game play Captured ball released once No limit on captured balls releases

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	Refer to « NORMAL » + « STARGATE » ramp remains open for 30 hits (instead of 15) + pop bumper remains flashing for 30 hits (instead of 15)
NORMAL	Remembers « S-P-I-R-I-T » letters
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	3 Bank	F10 : 1A sloblo (*1)	QS1	A-18102
SOL 2	A3J4-13	Left Bottom Hole	F15 : 2A sloblo (*2)	QS2	A-5194
SOL 5	A3J4-6	3 Bank Upper Playfield	F11 : 1A sloblo (*3)	QS5	A-18102
SOL 6	A3J4-12	Center Top Hole	F15 : 2A sloblo (*2)	QS6	A-5194
SOL 8	A3J5-8	Knocker	none	QS8	A-5195
SOL 9	A3J4-8	Outhole	F10 : 1A sloblo (*1)	QS9	A-16570
L12	A3J3-25	Ball Release	F13 : 1A sloblo	QL12 (*P)	A-16570
L13	A3J3-24	STARGATE Ramp	F14 : 2A sloblo	QL13 (*P)	A-17875
L14	A3J3-22	Left Top Hole	F11 : 1A sloblo (*3)	QL14 (*P)	A-16570
L15	A3J3-23	Right Bottom Hole	F12 : 1A sloblo	QL15 (*P)	A-16570

Main playfield

Upper playfield

(*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 Striker
SERIES SYSTEM-80A
GAME PROM NUMBER 675
DATE January 1983
NUMBER OR BALLS 2
SOUND BOARD Speech, 3 national anthems versions :
 American, French, German
PI-FX COMPATIBLE? No

SPECIFIC SETTINGS TO SELECTED GAME

Setting number (CREDIT)	Setting	Description	Original DIPSW (PLAYER2)	Values (PLAYER1)	Features
0	BEAT HIGOALS	Award when scored goals record is broken	31	NOTHING	No award 1 replay
1	MAX GOALSCORE	Max bonus value per scored goal, displayed by the 5,000 10,000 and 15,000 lamps between the center r In 100 K mode, the 3 lamps flash together to indicate 100,000 bonus points	new	15 K 100 K	From 5,000 up to 15,000 points From 5,000 to 30,000 then 100,000 points

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	Refer to « NORMAL »
NORMAL	Defense/offense sides + top lit goal rollovers + number of scored goals
HARD	Defense/offense sides + number of scored goals
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	Hole	F12 : 1A sloblo (*1)	QS1	A-5195
SOL 2	A3J4-13	Center 4 Bank	F11 : 2A sloblo (*2)	QS2	A-18318
SOL 5	A3J4-6	Left 5 Bank	F11 : 2A sloblo (*2)	QS5	A-17891
SOL 6	A3J4-12	Right 5 Bank	F11 : 2A sloblo (*2)	QS6	A-17891
SOL 8	A3J5-8	Knocker	none	QS8	A-5195
SOL 9	A3J4-8	Outhole	F12 : 1A sloblo (*1)	QS9	A-16570
L12	A3J3-25	Ball Release	F10 : 1A sloblo	QL12 (*P)	A-16570

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

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

(*P) = drives a PNP 2N5879 transistor, remotely installed under the playfield

NAME Super Orbit
SERIES SYSTEM-80A
GAME PROM NUMBER 680
DATE May 1983
NUMBER OR BALLS 1
SOUND BOARD Speech but not equipped with the speech processor SC01
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	FLIPPE SOUND	Turns off flippers sound when energized	new	DISABLE ENABLE	No flippers sound Regular flippers sound
2	ORBIT SPECIAL	Position of « orbit » lamps at which <i>special</i> is lit. And number of « orbit » positions advanced upon each hit on targets and rollovers <i>Note: refer to original game manual for complete details about each setting</i>	31	LIBERAL MEDIUM CONSERV	Liberal (easiest) Average level Conservative (hardest)
3	JACKPT MODE	New <i>varitarget</i> jackpot mode, enabled when <i>special</i> is not lit	new	DISABLE BALL PLAY	Disabled Jackpot enabled, value is reset with every new ball Jackpot enabled, value is cumulated ball after ball (per player)
4	VARITG DELAY	Delay until <i>varitarget</i> is reset to resting position (bottom) to avoid throwing the ball back in play	new	DISABLE ENABLE	No delay, immedaite return to resting position Delay (½ second)

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	Bottom right return gate ; top right rollunder no longer resets it
NORMAL	No parameter is remembered
HARD	No parameter is remembered + lit bumpers give 3,000 instead of 10,000
HARDEST	Refer to « HARD »

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 8	A3J5-8	Knocker	none	QS8	A-5195
SOL 9	A3J4-8	Outhole	F13 : 1A sloblo	QS9	A-5195
L12	A3J3-25	Gate	none	QL12	A-20558
L13	A3J3-24	Vari-Target Reset	none	QL13	A-17564

NAME The Games
SERIES SYSTEM-80A
GAME PROM NUMBER 691
DATE August 1984
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
1	MEDAL SETTING	Turn on the extraball targets depending on the number of balls per play (3 or 5) and this setting <i>Refer to game's manual for all details about required medals number (for example: 3 balls and LIBERAL = 2 medals)</i>	32	LIBERAL CONSERV	Extraball easier to earn Extraball more difficult to earn

Playfield parameters remembered from ball to ball for each player

Player Level	Stored game parameters matching that level
EASY	Refer to « NORMAL »
NORMAL	Remember bonus value and restore it upon next ball in play if all 5 medals were earned on the previous ball
HARD	No parameter is remembered
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	Hole	F13 : 1A st0blo (*)	QS1	A-16570
SOL 8	A3J5-8	Knocker	no	QS8	A-5195
SOL 9	A3J4-8	Outhole	F13 : 1A st0blo (*)	QS9	A-5195
L12	A3J3-25	Vari-Target Reset	no	QL13	A-17564

(*) = the same fuse is shared by those 2 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 special)	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 skoblo (*)	Q55	A-16570
SOL 6	A3J4-12	Right hole	1A skoblo (*)	Q56	A-16570
SOL 8	A3J5-8	Knocker	none	Q58	A-5195
SOL 9	A3J4-8	Outrole	1A skoblo (*)	Q59	A-5195

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