# PI-80 Pinball Board

# Setup & Menus

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Pascal JANIN
Flippp!
Cartes électroniques pour flippers
Replacement boards for electronic pinballs

MADE IN FRANCE

https://www.flippp.com/
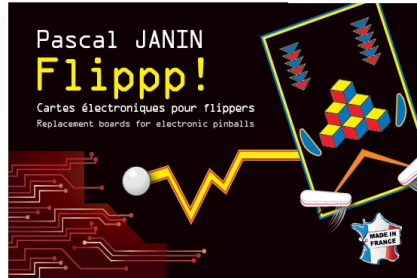
**IMPORTANT PRELIMINARY INSTRUCTIONS PRIOR TO INSTALLING THE BOARD:**

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 2021 |
|---|---|
| **WHAT'S NEW?** | |
| « James Bond-B » | New game, « bonus » mode |
| « James Bond-B » and « -T » | New SUPER MULTIPLIER mode up to 15X |

## 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 | Goin Nuts, #682, 1982 |
| Panthera #652, 5/80 | Caveman #810PV, 9/82 | Amazon Hunt #684, 9/83 |
| Circus #654, 6/80 | Rocky #672, 9/82 | Rack 'Em Up #685, 11/83 |
| Counterforce #656, 8/80 | Spirit #673, 11/82 | Ready Aim Fire #686, 11/83 |
| Star Race #657, 10/80 | Punk #674, 12/82 | Jacks to Open #687, 5/84 |
| James Bond-T #658, 10/80 | Striker #675, 1/83 | Alien Star #689, 8/84 |
| James Bond-B #658, 10/80 | Krull, #676, 2/83 | The Games #691, 8/84 |
| Time Line #659, 11/80 | Q*bert's Quest #677, 3/83 | Touchdown #688, 2/85 |
| Force II #661, 1/81 | Super Orbit #680, 5/83 | El Dorado City of Gold #692, 3/85 |
| Pink Panther #664, 3/81 | Royal Flush Deluxe #681, 6/83 | Ice Fever #695, 5/85 |
| Mars God of War #666, 4/81 | | |
| Volcano #667, 7/81 | | |
| Black Hole #668, 10/81 | | |
| Eclipse #671, 10/81 | | |
| Haunted House #669, 2/82 | | |
| PI-80 exclusive -->> Haunted House MULTIBALL | | |

## DERIVATIVE KIT GAMES

| Game | Maker | Derivative Gottlieb Game |
|---|---|---|
| Grand 8 | Christian Tabart | Panthera (System 80) |
| Ice Mania | IDI (Italie) | Ice Fever (System 80A) en version 6 digits |
| 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 |
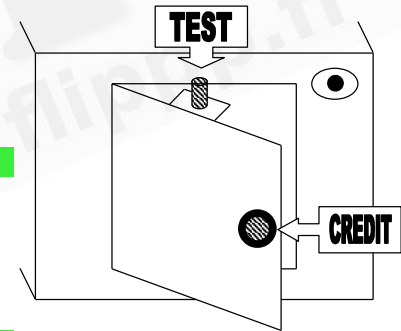
### Change selected game upon power-up

| 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 #<br>(CREDIT) | Menu<br>(PLAYER3 / PLAYER 4) | Description | | | |
|---|---|---|---|---|---|

### INDIVIDUAL SETTINGS MENUS

| A1 | GAME AUDITS | All the parameters backed up game after game | | |
|---|---|---|---|---|
| | **Parameter** | **Description** | **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 TILTS | 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 **D**ays **H**ours **M**inutes and **S**econds | | |

| 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: | | |
| | SOUND MODE | **If addtional 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 |
| | | **If addtional PI-FX/80 sound board installed :** for games Spiderman, Circus, Counterforce | TONE | Modifies some sounds |
| | | | SOUND | Modifies some sounds |
| | | For games released in both versions : Volcano, Black Hole, Devil's Dare | CLASSIC | Uses the 'small' classic sound board (« export » game) |
| | | | SPEECH | Uses the 'large' speech-capable sound board (« domestic » game) |
| | ATTRACT MODE | **If addtional PI-FX/80 sound board installed :** enables or disabled the attract mode | DISABLE | Attract tune is disabled |
| | | | 12 MIN | Attract tune is played every 12 minutes |
| | | | 6 MIN | Attract tune is played every 6 minutes |
| | SOUND WAVE | **If addtional PI-FX/80 sound board installed :** slightly changes the playback rending of certain sounds (depends on sound and game) | SINUS | Sinus sound wave (like the original sound board) |
| | | | SAWTOOTH | Sawtooh sound wave (slightly higher pitched) |
| | TREMOLO EFFECT | **If addtional 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** | **Press CREDIT** |
| | BEAT 1 | First score to beat | 10,000 to 9,999,990 points (System80) or 99,999,990 points (System80A)<br>0 = disabled | Moves to next position (from 10M to 10K)<br>or makes the whole score flash | **Press briefly:**<br>When a single digit flashes: increments it<br>When the whole score flashes: stores it and quits |
| | BEAT 2 | Second score to beat | 10,000 to 9,999,990 points (System80) or 99,999,990 points (System80A)<br>0 = disabled | | **Hold pressed**:<br>resets the whole score (no matter the flashing digit) |
| | BEAT 3 | Third score to beat | 10,000 to 9,999,990 points (System80) or 99,999,990 points (System80A)<br>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)<br>0 = 1st score made will be stored | | |

| S5 | COINS SETTING | Settings of 3 coins slots | | | |
|---|---|---|---|---|---|
| | **Coin Slot** | **Location** | **Values** | **Press TEST** | **Press CREDIT** |
| | LEFT | Left coin slot | X=1..9 coins give Y=1..9 plays | Switches between X and Y values | Increments the actual value (X or Y) |
| | 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 | | |

### 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 | | |
|---|---|---|---|---|
| | **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 | Energizes 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, Knocker coil (SOL8), Coin counters (SOL3, SOL4,  SOL7) | Next coil in list | Energizes 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 (S1/2/4/8/16) that drive the sound board | | |
|---|---|---|---|---|
| | **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 PIFX | **If addtional 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.<br>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<br>When scrolling is frozen:<br>- Press briefly: to proceed to next lamp in range<br>- Press and hold to quit | During scrolling: freezes scrolling<br>When scrolling is frozen: flashes the lamp output 3 times |

| E- | -EXIT- -MENU- | Exit from main menu and return to « game over » mode |
|---|---|---|

| Entry #<br>(CREDIT) | Menu<br>(PLAYER3 / PLAYER 4) | Description | | | |
|---|---|---|---|---|---|
| N0 | COMMON SETTING | General settings common to all games | | | |
| | **Réglages** | **Description** | **Original DIPSW**<br>(PLAYER2) | **Values**<br>(PLAYER1) | **Features** |
| 0 | BALLS P GAME | Number of balls per game | 17 | 3 | 3 balls per play |
| | | | | 5 | 5 balls per play |
| 1 | MAX PLAYS | Maximum number of credits allowed | 15 | 8 PLAY | Max. 8 plays |
| | | | | 15 PLAY | Max. 15 plays |
| | | | | 25 PLAY | 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 or depends on game: James Bond « Time » |
| | | | new | 50 K | 50,000 points |
| | | | new | 100 K | 100,000 points |
| | | | new | 250 K | 250,000 points |
| | | | new | 500 K | 500,000 points |
| | | | new | GAME | depends on game: James Bond « Time » |
| 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 or depends on game: James Bond « Time » |
| | | | new | GAME | depends on game: James Bond « Time » |
| 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)<br>**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 ».<br>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<br>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)<br>**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)<br>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 in down position (electrical or mechanical failure).<br>In case of trouble, the game in play ends and the switch number associated to the faulty bumper is displayed : see **ERRORS** page | 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<br>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<br>*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 |
| 31 | DEBUG MODE | Puts the game in a special debug mode for troubleshooting purposes. The game will not behave normally in this mode.<br>*Do not activate unless asked by us.* | new | DISABLE | Normal mode |
| | | | | ENABLE | Debug mode |

## Electronic coin validator connection

Starting from version 1.3, the PI-80 board can be connected to a Comestero RM5 electronic coin validator :
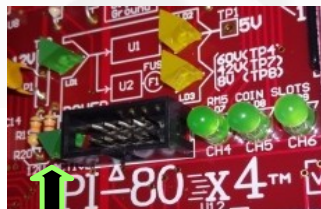There are other compatible models, such as :

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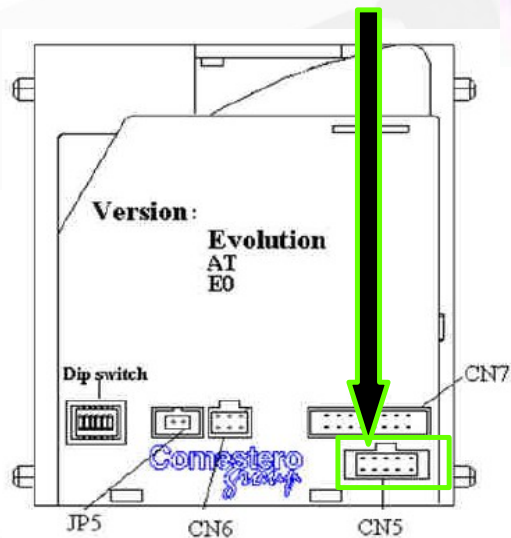
Then into the matching « RM5 » connector on the PI-80 board :

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.

# Ver.                    February 2021

## 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 | Check all CPU-driven coils and their associated diode in parallel |
| | | Driving transistor (under the playfield or on the PI-80 board) is dead shorted | 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) | Check that given coil |
| | | Fuse in serial with the coil is blown or missing (do not replace it blindly, look for the true reason behind!) | Check the fuse of that coil (refer to game's manual), then the coil itself and its associated diode |
| | | Driving transistor (under the playfield or on the PI-80 board) is dead open | 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 | Check all CPU-driven coils and their associated diode in parallel |
| | | *Also refer to error #1* | 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 | Check all contacts at the bottom of the holes, the upkickers.. |
| | | Drop target cannot be brought back up: broken target, or reset mechanism not operating or too weak | Check the coil mechanical assy |
| | | Ball stuck on the bottom of a hole: eject mechanism not operating or too weak | 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 | Check that the 2 pairs of switches under the pop bumper are normally open |
| | | Jammed or faulty pop bumper mechanism | 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

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

**RED PLUG**            **BLACK PLUG**
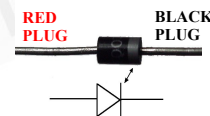
| Gottlieb Part number | Common Coil Usage | Resistance (ohms) | Number of turns | Wire gauge | Wrapper color |
|---|---|---|---|---|---|
| A-1496 | Slingshots (kicking rubbers), pop bumpers | 2,95 | 635 | #23 | yellow |
| A-4893 | Pop bumpers, ball kicker | 2,1 | 535 | #22 | red |
| A-5194 | Gong | 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.
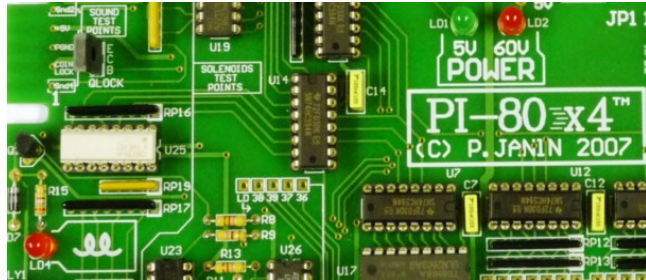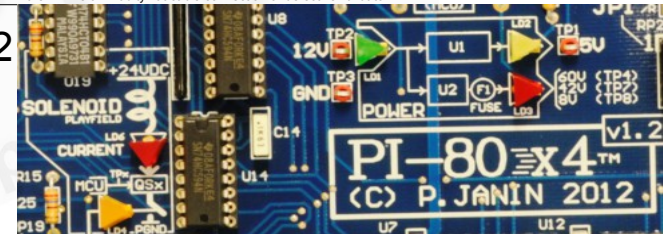
## Status LED

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 | 01/03/17 | | | |
| **12V** <br> 12V general power supply | | LD1 | LD1 | LD1 | **12V available** | 12V missing | This LED lights up when the game is turned on. <br> If not, check the wires coming to pins 1 & 2 of power connector A2J1 <br> Check the « POWER SUPPLY » fuse in the cabinet, refer to the game's original manual for exact location and rating <br> Measure the 12V DC voltage across pins 1 & 3 of screw-clamp connector J1 |
| **5V** <br> 5V power supply (PI-80 board, pop bumpers, sound board..) | LD1 | LD2 | LD2 | LD2 | **5V available** | 5V missing | This LED lights up when the game is turned on. <br> If not, there is a problem around U1 chip, or the 12V general power supply is missing (12V LED unlit, if present). <br> Measure the 5V DC voltage across pins 2 & 3 of screw-clamp connector J1 |
| **60V/42V/8V** <br> 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. <br> If not, there is a problem around U2 chip, or the 12V general power supply is missing (12V LED unlit, if present). <br> Check the fast-blow 100mA fuse (brown or black cylinder) mounted on a socket to the right of connector A2J3. <br> Measure the 60V DC voltage across pins 1 & 4 of connector A2J3 <br> Measure the 42V DC voltage across pins 3 & 4 of connector A2J3 <br> Measure the 8V DC voltage at test point TP8 below connector A2J1 |
| **Solenoids relay (RLY1)** | LD4 | LD4 | LD4 | LD4 | Relay is energized <br> (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. <br> 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. <br> Refer to the previous « ERRORS » page for diagnostics. |
| **TEST** <br> Test point for lamps/coils outputs | LD3 | 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. <br> With a grip wire, connect the test point TPT (under the LED) to the desired lamp/coil test point. <br> This will energize the corresponding output. <br> If the LED is lit: the transistor under test is most probably good (base-emitter junction flooding) <br> If the LED is unlit: the transistor is most probably defective (base-emitter junction open) |
| **SOLENOID CURRENT** <br> A current floods thru coils 1 2 5 6 8 or 9 | | | LD6 | LD6 | A current is flooding | **No current is flooding** | This LED is normally unlit, and is on when either coil 1 2 5 6 8 or 9 is briefly energized. <br> If the LED is on all the time: one of the output coils transistors (Qsx) or its transil diode (DTSx) is shorted. <br> 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. <br> Refer to the previous « ERRORS » page for diagnostics. <br> Also, check the « SOLENOIDS » fuse in the cabinet, refer to the game's original manual for exact location and rating |
| RM5 coin validator: output 4 | | | | LD7 | A coin has been inserted | No coin detected | Each LED is normally unlit, and is on when briefly only when a coin is sensed by the validation of the matching type in slots 4/5/6. |
| RM5 coin validator: output 5 | | | | LD8 | A coin has been inserted | No coin detected | If the LED is always on : validator is defective or wrongly connected. |
| RM5 coin validator: output 6 | | | | LD9 | A coin has been inserted | No coin detected | If the LED is always off when a coin is inserted : wrong coin type, faulty flat cable connection, defective validator. |
| RM5 coin validator: +12V power supply | | | | LD10 | Validator is powered | No power supply to the validator | This LED is normally on upon game power-up. <br> If the LED is off : faulty flat cable connection or defective validator. |



V1.0



V1.2



V1.1
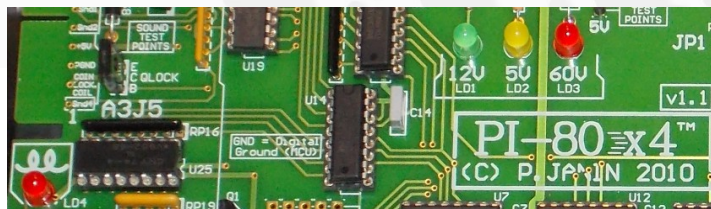


V1.3
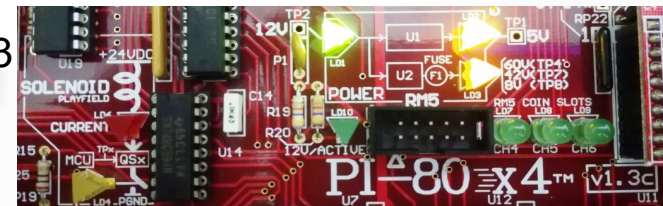
| NAME | Alien Star |
|---|---|
| **SERIES** | SYSTEM-80A |
| **GAME PROM NUMBER** | 689 |
| **DATE** | August 1984 |
| **NUMBER OR BALLS** | 2 |
| **SOUND BOARD** | Non speech |
| **PI-FX COMPATIBLE?** | Yes |

## 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 | No background sound |
| | | | | ENABLE | 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 | |
| **SOUND BOARD** | Two versions :<br>- Speech<br>(but does not speak)<br>- Non speech<br>(the most common one) | The version with the speech sound board is not equipped with the speech processor SC01 |
| **PI-FX COMPATIBLE?** | Yes for the non speech version | |

## SPECIFIC SETTINGS TO SELECTED GAME

| Setting number<br>(CREDIT) | Setting | Description | Original DIPSW<br>(PLAYER2) | Values<br>(PLAYER1) | Features |
|---|---|---|---|---|---|
| 0 | BACKGD SND | Turns off background melody: the game plays silently between scored points | 31 | DISABLE | No background melody |
| | | | | ENABLE | Regular background melody |
| 1 | GAME TYPE | Selects the playfield model : normal (the most common, released in 1983) or specific (B model, rare, released in 1985)<br>*Note : the normal game PROM was stamped « 684 » or « 684A », the specific prom was stamped « 684B »* | new | NORMAL | Normal playfield |
| | | | | 684-B | « 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 sloblo (*1) | QS1 | A-5194 |
| SOL 2 | A3J4-13 | Left Bank Trip | F11 : 2A sloblo (*1) | QS2 | A-5194 |
| SOL 5 | A3J4-6 | Left Bank Reset | F11 : 2A sloblo (*1) | QS5 | A-17891 |
| SOL 6 | A3J4-12 | Right Bank Reset | F11 : 2A sloblo (*1) | QS6 | A-17891 |
| SOL 8 | A3J5-8 | Knocker | *none* | QS8 | A-5195 |
| SOL 9 | A3J4-8 | Outhole | F10 : 1A sloblo | QS9 | A-5195 |
| L12 | A3J3-25 | Left Hole | F12 : 2A sloblo (*2) | QL12 (*P) | A-5194 |
| L13 | A3J3-24 | Right Hole | F12 : 2A sloblo (*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 2N5879 transistor, remotely installed under the playfield

| NAME | **Black Hole** |
|---|---|
| **SERIES** | SYSTEM-80 |
| **GAME PROM NUMBER** | 668 |
| **DATE** | October 1981 |
| **NUMBER OR BALLS** | 3 |
| **SOUND BOARD** | Two versions : <br> - Speech « domestic » <br> - 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. | new | CLASSIC | Classic sound board (also compatible with **PI-FX** board) |
| | | *Note: this is the same sound mode setting as in SOUND SETTING general menu* | | SPEECH | Speech sound board |
| 1 | OPEN GATE | Open gate mode for upper playfield gate, when the balls is kicked from the bottom playfield. | new | NORMAL | Normal return gate behaviour |
| | | These "easy" modes allow for longer playing time on the bottom playfield. | | 7 SEC | Keep return gate open for 7 seconds |
| | | | | B-5000 | 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 | No background sound |
| | | | | ENABLE | 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) | new | DISABLE | Regular attract mode |
| | | and also animates lamps 4..6 (bottom playfield) and 7 (top playfield spinner) | | ENABLE | 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 ¼ 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, *special*, center rollover | 31 | LIBERAL | Storage enabled |
| | | | | CONSERV | No storage (harder) |
| 1 | MEMORY LEVEL2 | Remember from ball to ball, if lit: bottom left/right rollovers, spinner | 32 | LIBERAL | Storage enabled |
| | | | | CONSERV | 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 | none | 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 *extraball* target once the missiles bank is reset at the end of the chase cycle | 31 | LIBERAL | Extraball lamp remains lit |
| | | | | CONSERV | 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 | Give a replay and turns the *special* target lamp on |
| | | | | CONSERV | 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* | 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 | *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 :<br>- Speech « domestic »<br>- Non speech « export » |
| **PI-FX COMPATIBLE?** | Yes for the non speech « export » version |

## SPECIFIC SETTINGS TO SELECTED GAME

| Setting number<br>(CREDIT) | Setting | Description | Original DIPSW<br>(PLAYER2) | Values<br>(PLAYER1) | Features |
|---|---|---|---|---|---|
| 0 | SOUND MODE | Selects which sound board is installed in the game: classic (non-speech) or speech.<br>*Note: this is the same sound mode setting as in SOUND SETTING general menu* | new | CLASSIC | Classic sound board |
| | | | | SPEECH | Speech sound board |
| 1 | RELEASE CAVE | Once the 1st ball in play is captured into the « CAPTURE CAVE » hole and the 2nd ball in play is lost,<br>this 1st captured ball is put back in play instead of losing it (idea from Thibault Grandvilliers) | new | DISABLE | 1st ball ejected from « CAPTIVE CAVE » hole and lost |
| | | | | ENABLE | 1st 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 |

## 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 |
| **PI-FX COMPATIBLE?** | Yes |

Cheap version of BLACK HOLE (non speech, single playfield)
A « 671K » (K for KIT) version exists, to install in a JAMES BOND cabinet

## SPECIFIC SETTINGS TO SELECTED GAME

| Setting number (CREDIT) | Setting | Description | Original DIPSW (PLAYER2) | Values (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 | Green lamp lights just once |
| | | | | CUMULAT | 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 | 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 |

## 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 | A3J3-25 | Ball Gate | 1A sloblo | QL12 (*P) | A-16570 |
| L13 | A3J3-24 | 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 | ElDorado 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 |
| | | | | ENABLE | Regular 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 | DISABLE | Disabled |
| | | | | ENABLE | Enabled |
| 2 | SHOOT MODE | Enables the specific « SHOOT » mode. Refer to description below. | new | DISABLE | Disabled |
| | | | | ENABLE | 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 (*1) | 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 (*1) | 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           (*1) = 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 | Additionnal award each time 1-million points are reached | 32 | DISABLE | No award |
| | | *Note: same as general setting 19* | | 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 |

## 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 | new | NORMAL | Driven by SOL2 (normal production run) |
| | | It required different GAME PROMs on the original CPU board: version 668/1 (pre-series) or 668/2 (normal) | | PROTO | 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 | new | DISABLE | No background melody |
| | | In this mode, rollover switch 04 (on the main playfield, under the bottom left pop bumper) plays another sound (fix) | | ENABLE | Regular background melody |
| 2 | SOUND MODE | Enable speech playback during some game sequences | new | CLASSIC | Regular sounds |
| | | This modes requires a sound board equipped with the speeck processor SC01 + the specific SOUND PROMS from the Davroux brothers: http://flipprojets.fr/HHparlant_EN.php | | SPEECH | 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) |
| **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 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 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 | Outhole | 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 |

(*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
Lower playfield
Upper playfield

Pre-series main playfield

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

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

(*P) = drives a PNP 2N5875 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 | new | NORMAL | Driven by SOL2 (normal production run) |
| | | It required different GAME PROMs on the original CPU board : version 668/1 (proto) or 668/2 (normal) | | 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 |
| | | In this mode, rollover switch 04 (under the main playfield's bottom left pop bumper) plays another sound (fix) | | ENABLE | Regular background melody |
| 2 | MULTIBALL | Selects the multiball mode | new | NORMAL | Normal mode |
| | | Refer to the Haunted House Multiball specific manual available on line | | 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) |
| 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 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) | 1A 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 | Outhole | 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 |
|---|
| Lower playfield |
| Upper playfield |

| Pre-series main playfield |
|---|

| Specific to this Multiball version |
|---|

(*1) = the same fuse is shared by those 5 coils
(*2) = the same fuse is shared by those 4 coils
(*3) = separate dedicated fuse

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

# 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 | Low volume |
| | | | | HIGH | High volume |
| 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 | 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 | Ticket dispenser disabled |
| | | | | ENABLE | 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 sloblo (*1)* | QS2 | A-18102 |
| SOL 5 | A3J4-6 | « PUCK » Kicker (in the front head) | *F9 : 2A sloblo* | QS5 | A-5194 |
| SOL 8 | A3J5-8 | Knocker | *none* | QS8 | A-5195 |
| SOL 9 | A3J4-8 | Outhole | *F10 : 1A sloblo (*1)* | QS9 | A-5195 |

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

**TICKER 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:
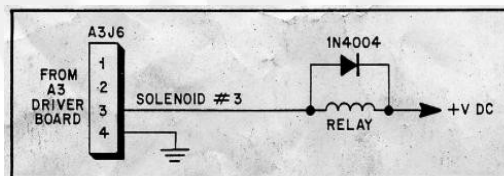


schematic (c) Gottlieb

# 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 | 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 (= normal play mode) |
| | | Otherwise, all targets must be kicked down to try again (much harder play mode) | | ENABLE | Enabled |
| 2 | DOUBLE TOP | Scoring all 4 top rollovers directly lights « double bonus » lamp for the ball in play (easier play mode) | new | DISABLE | Disabled |
| | | *Note: in 5 ball mode and at « royal flush » step, scoring all 4 top rollovers proceeds directly to extraball level* | | ENABLE | 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 (*1) | 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 (*1) | 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

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

| NAME | James Bond-B | «**Bonus**» version |
|---|---|---|

| | | **SPECIFIC FEATURES:** |
|---|---|---|
| **SERIES** | SYSTEM-80 | « Bonus » version of James Bond « Time » game |
| **GAME PROM NUMBER** | 658X | Classic 3/5 ball game |
| **DATE** | October 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 | SUPER MULTIPLIER | Allows to increase the bonus multiplier up to 15X | new | DISABLE | Up to 5X multiplier |
| | | When enabled, the multiplier is reset to 1X with the next ball in play, and no extra bonus is earned when past 5X | | ENABLE | Up to 15X multiplier |
| 1 | UNITS AWARD | Number of time units to reach to be awarded a replay during game | 32 | LIBERAL | 60 (3 ball mode) or 90 (5 ball mode) |
| | | | | CONSERV | 70 (3 ball mode) or 99 (5 ball mode) |
| 2 | DISPLAY | Display « Bonus » and « Time Units » values | new | NORMAL | On the center display, as usual |
| | | Also displays the player number currently in play | | COMBO | On the 2 unused player displays : « BON= » & « TIM= » |

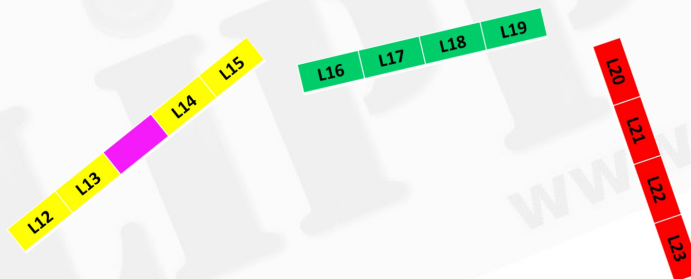## Playfield parameters remembered from ball to ball for each player

| Player Level | Stored game parameters matching that level |
|---|---|
| EASY | Refer to « NORMAL » |
| NORMAL | All drop targets + multiplier + top left purple rollover + purple lamp in front of bottom left bullseye |
| HARD | Same as « NORMAL » but resets the multiplier to « 1X » |
| 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 | Yellow drop targets + center purple target bank (left) | 2A sloblo (*1) | QS2 | A-17891 |
| SOL 5 | A3J4-6 | Green target bank (center) | 2A sloblo (*1) | QS5 | A-18318 |
| SOL 6 | A3J4-12 | Red target bank (right) | 2A sloblo (*1) | QS6 | A-18318 |
| 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 (bottom left) | none | QL12 | A-18642 |
| L13 | A3J3-24 | #2 Yellow Drop Target trip coil | none | QL13 | A-18642 |
| L14 | A3J3-22 | #3 Yellow Drop Target trip coil | none | QL14 | A-18642 |
| L15 | A3J3-23 | #4 Yellow Drop Target trip coil | none | QL15 | A-18642 |
| L16 | A3J3-13 | #1 Green Drop Target trip coil (left) | none | QL16 | A-18642 |
| L17 | A3J3-14 | #2 Green Drop Target trip coil | none | QL17 | A-18642 |
| L18 | A3J3-16 | #3 Green Drop Target trip coil | none | QL18 | A-18642 |
| L19 | A3J3-15 | #4 Green Drop Target trip coil | none | QL19 | A-18642 |
| L20 | A3J3-21 | #1 Red Drop Target trip coil (top left) | none | QL20 | A-18642 |
| L21 | A3J3-20 | #2 Red Drop Target trip coil | none | QL21 | A-18642 |
| L22 | A3J3-18 | #3 Red Drop Target trip coil | none | QL22 | A-18642 |
| L23 | A3J3-19 | #4 Red Drop Target trip coil | none | QL23 | A-18642 |

Note: the center purple target on the yellow target bank has no trip coil to drop it alone.

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

| NAME | James Bond-T | « **Time** » version |
|---|---|---|
| **SERIES** | SYSTEM-80 | |
| **GAME PROM NUMBER** | 658 | **SPECIFIC FEATURES:** |
| **DATE** | October 1980 | Timer countdown, unlimited balls |
| **NUMBER OR BALLS** | 1 | 3/5 ball setting does not apply |
| **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 | SUPER MULTIPLIER | Allows to increase the bonus multiplier up to 15X | new | DISABLE | Up to 5X multiplier |
| | | When enabled, the multiplier is reset to 1X with the next ball in play, and no extra bonus is earned when past 5X | | ENABLE | Up to 15X multiplier |
| 1 | SPECIAL TARGET | Earn several « Special » during the game | 32 | ONE | Once (harder) = CONSERVATIVE |
| | | | | MULTI | Unlimited = LIBERAL |
| 2 | DISPLAY | Display « Bonus » and « Time Units » values | new | NORMAL | On the center display, as usual |
| | | Also displays the player number currently in play | | COMBO | On the 2 unused player displays : « BON= » & « TIM= » |
| 3 | GAME SPECIAL | Award given to player when playfield special is scored | 21 | EXBALL | **Gives another ball even if « TIM=0 »** |
| | | | | GAME | **20 time units** |
| | | *Note: identical to common setting 21* | | other values | As common setting 21 |
| 4 | REPLAY AWARD | Award given to player when beating either of the 3 scores to beat | 22 | EXBALL | **Gives another ball even if « TIM=0 »** |
| | | | | GAME | **15,000 points + 1 bonus + 20 time units** |
| | | *Note: identical to common setting 22* | | other values | As common setting 22 |

## Playfield parameters remembered from ball to ball for each player
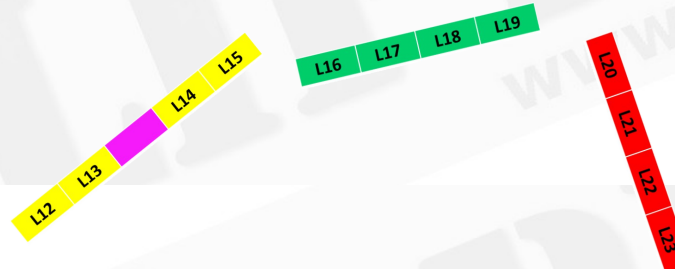
| Player Level | Stored game parameters matching that level |
|---|---|
| EASY | Refer to « NORMAL » |
| NORMAL | All drop targets + multiplier + top left purple rollover + purple lamp in front of bottom left bullseye |
| HARD | Same as « NORMAL » but resets the multiplier to « 1X » |
| HARDEST | No 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 | Yellow drop targets + center purple target bank (left) | 2A sloblo (*1) | QS2 | A-17891 |
| SOL 5 | A3J4-6 | Green target bank (center) | 2A sloblo (*1) | QS5 | A-18318 |
| SOL 6 | A3J4-12 | Red target bank (right) | 2A sloblo (*1) | QS6 | A-18318 |
| 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 (bottom left) | none | QL12 | A-18642 |
| L13 | A3J3-24 | #2 Yellow Drop Target trip coil | none | QL13 | A-18642 |
| L14 | A3J3-22 | #3 Yellow Drop Target trip coil | none | QL14 | A-18642 |
| L15 | A3J3-23 | #4 Yellow Drop Target trip coil | none | QL15 | A-18642 |
| L16 | A3J3-13 | #1 Green Drop Target trip coil (left) | none | QL16 | A-18642 |
| L17 | A3J3-14 | #2 Green Drop Target trip coil | none | QL17 | A-18642 |
| L18 | A3J3-16 | #3 Green Drop Target trip coil | none | QL18 | A-18642 |
| L19 | A3J3-15 | #4 Green Drop Target trip coil | none | QL19 | A-18642 |
| L20 | A3J3-21 | #1 Red Drop Target trip coil (top left) | none | QL20 | A-18642 |
| L21 | A3J3-20 | #2 Red Drop Target trip coil | none | QL21 | A-18642 |
| L22 | A3J3-18 | #3 Red Drop Target trip coil | none | QL22 | A-18642 |
| L23 | A3J3-19 | #4 Red Drop Target trip coil | none | QL23 | A-18642 |

Note: the center purple target on the yellow target bank has no trip coil to drop it alone.          (*1) = the same fuse is shared by those 3 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 | No background sound |
| | | | | ENABLE | 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 | Last chance disabled |
| | | | | ENABLE | Last chance enabled |
| 2 | SPC-EB LEVEL | Multiplier level above which *special* and *extraball* lamps are lit in the warbases | 32 | DISABLE | *special* from 4X, *extraball* from 3X |
| | | | | ENABLE | *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 (*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 | *none* | 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

(*2) = 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 *extraball* lamp alternate when 10 points switches and bumpers are hit | 31 | LIBERAL | Steadily lit lamp |
|   |   |   |   | CONSERV | Alternates lamp (harder) |
| 1 | ALTERN SPECIAL | Makes *special* lamp alternate when 10 points switches and bumpers are hit | 32 | 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 | 20 seconds |
| | | | | 25 SEC | 25 seconds |
| 1 | MAX DIAMOND | Maximum number of cumulated diamonds in multiball mode | 32 | 40DIAM | 40 diamonds |
| | | | | 50DIAM | 50 diamonds |
| | | | New >> | 99DIAM | 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 | 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 | Animation is turned off |
| | | | | ENABLE | 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 | Destruction no matter the *villain* position |
| | | | | 1ST POS | Destruction only when *villain* on top 1st 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 |

## 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<br>(CREDIT) | Setting | Description | Original DIPSW<br>(PLAYER2) | Values<br>(PLAYER1) | Features |
|---|---|---|---|---|---|
| 0 | BACKGD SND | Turns off background melody: the game plays silently between scored points | 31 | DISABLE | No background melody |
| | | | | ENABLE | 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 | 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 | No background melody |
| | | | | ENABLE | 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 | 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 |
| | | Starts with black « K » and black « J » are the only 2 kicked down targets of the bank | | ENABLE | 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 (*1) | QS2 | A-18102 |
| SOL 5 | A3J4-6 | Hole | F11 : 1A sloblo (*2) | QS5 | A-5195 |
| SOL 6 | A3J4-12 | Target Bank Reset (*) | F12 : 2A sloblo (*1) | QS6 | A-18102 |
| SOL 8 | A3J5-8 | Knocker | *non* | QS8 | A-5195 |
| SOL 9 | A3J4-8 | Outhole | F11 : 1A sloblo (*2) | QS9 | A-5195 |
| L12 | A3J3-25 | Gate | *non* | QL12 | A-20558 |

(*) driven at the same time by the CPU

(*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 | 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 | Green lamp lights just once |
| | | | | ENABLE | 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 | No message |
| | | | | ENABLE | 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 | Normal game play |
| | | | | ONCE | Captured ball released once |
| | | | | INFINITe | 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 | (*1) = the same fuse is shared by those 2 coils |
|---|---|
| Upper playfield | (*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 |

## 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 PLAY | 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 | new | 15 K | From 5,000 up to 15,000 points |
| | | In 100 K mode, the 3 lamps flash together to indicate 100,000 bonus points | | 100 K | 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 | 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 And number of « orbit » positions advanced upon each hit on targets and rollovers *Note: refer to original game manual for complete details about each setting* | 31 | LIBERAL | Liberal (easiest) |
| | | | | MEDIUM | Average level |
| | | | | CONSERV | Conservative (hardest) |
| 3 | JACKPT MODE | New *varitarget* 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 | VARITG DELAY | Delay until *varitarget* is reset to resting position (bottom) to avoid throwing the ball back in play | new | DISABLE | No delay, immedaite return to resting position |
| | | | | ENABLE | 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 | 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 |
| | | *Refer to game's manual for all details about required medals number (for example: 3 balls and LIBERAL = 2 medals)* | | CONSERV | 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 sloblo (*1)* | QS1 | A-16570 |
| SOL 8 | A3J5-8 | Knocker | *no* | QS8 | A-5195 |
| SOL 9 | A3J4-8 | Outhole | *F13 : 1A sloblo (*1)* | QS9 | A-5195 |
| L12 | A3J3-25 | Vari-Target Reset | *no* | QL13 | A-17564 |

(*1) = 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 | Additionnal award each time 1-million points are reached | 32 | DISABLE | No award |
| | | *Note: same as general setting 19* | | ENABLE | Award depends on general setting 7 |
| 1 | BACKGD SND | Turns off background sound: the game plays silently between scored points | new | DISABLE | No background sound |
| | | | | ENABLE | Regular background sound |
| 2 | 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 |

## 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 | No background melody |
| | | | | ENABLE | 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 3rd 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 | *none* | QS8 | A-5195 |
| SOL 9 | A3J4-8 | Outhole | 1A sloblo (*1) | QS9 | A-5195 |

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