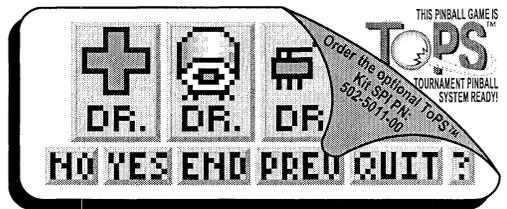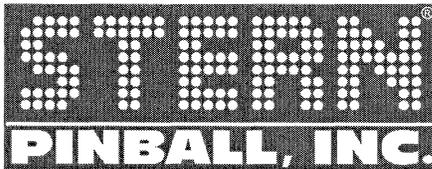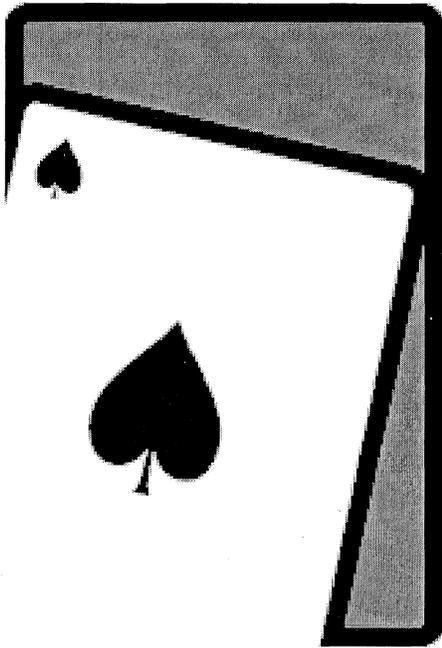**Find-It-In-Front:**
Dr. Pinball Section
The inside cover & the front pages
DR. ❶ thru DR. ❿ covers the basics...

Find the answers to your questions here...
If you still need help, give us a call!

STERN
PINBALL, INC.

THIS PINBALL GAME IS
TOPS ™
Order the optional TOURNAMENT PINBALL
Kit SPI P.N. SYSTEM READY!
502-5011-00

DR. DR. DR.
NO YES END PREV QUIT ?

The Portals™ Service Menu,
Section 3, is your Technical Friend...

WORLD POKER TOUR ™

Joe Blackwell
DIRECTOR,
Parts Sales &
Technical Support

Patty Schraps
Stock Room
SUPERVISOR

Dorothy Brown
Parts Sales
REPRESENTATIVE

Your Parts Sales & Technical Support Team

Chas Siddiqi
Technical Support
ENGINEER

Patrick Powers
Technical Support
ENGINEER

J. Alfer
Technical Support
Documentation
ADMINISTRATOR

Pinball Service Game Manual (Sample Games)

Some pages, chapters and / or sections are incomplete or may have been excluded for final editing (noted within).

Go to **www.sternpinball.com** and click **Tech. Support & Parts Sales** (Tech Support & Parts Sales) Once there, you will find **Service Bulletins, ROM Code, Parts, Appendixes, Coin Cards, helpful information** and much more!

• *Toll-Free:* **1-800-KICKERS (542-5377)** *or* **1-708-345-7700** • *eMail:* **parts.service@sternpinball.com** •

HOW TO UPDATE YOUR GAME CODE FOR THE NEW S.A.M. SYSTEM

//

USB 2.0 Memory Sticks (a.k.a. Thumb, Flash or Jump Drives) 64MB min., **recommendation 128MB** *or* 256MB

S.A.M. System compatible, tested & SPI approved USB Memory Sticks *(subject to change due to availability or technology)* :

PNY Technologies Attaché™ 128MB (SPI PN: 970-0128-00*) *or*   Lexar JumpDrive™ Secure 128MB (SPI PN: 970-0128-01*) *or*
PNY Technologies Attaché™ 256MB (SPI PN: 970-0256-00*)   Lexar JumpDrive™ Secure 256MB (SPI PN: 970-0256-01*)

see it via : http://www.pny.com/products/flash/attache.asp   *see it via : http://www.lexar.com/jumpdrive/jd_secure.html*

* to get the Memory Stick with the latest WPT Game Code copied to it, add "-88" to above part numbers.

//

Game Code is subject to change. Update this game with the latest code downloaded from our website or order through your local distributor *(ask for the part numbers above)*. With Dip Switch #8 set to 'ON', enter the **SERVICE MENU**, "**GO TO UTILITIES MENU**," "**GO TO USB MENU**," then enter the "**GAME CODE UPDATE MENU**" and follow on-screen prompts.

Upon power-up the display will describe the version of code installed in your game. When directed to do so (via Service Bulletin or website announcement) you will need to update your code ... with the BOOT FLASH EPROM* installed, here's how:

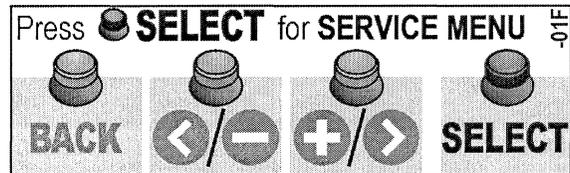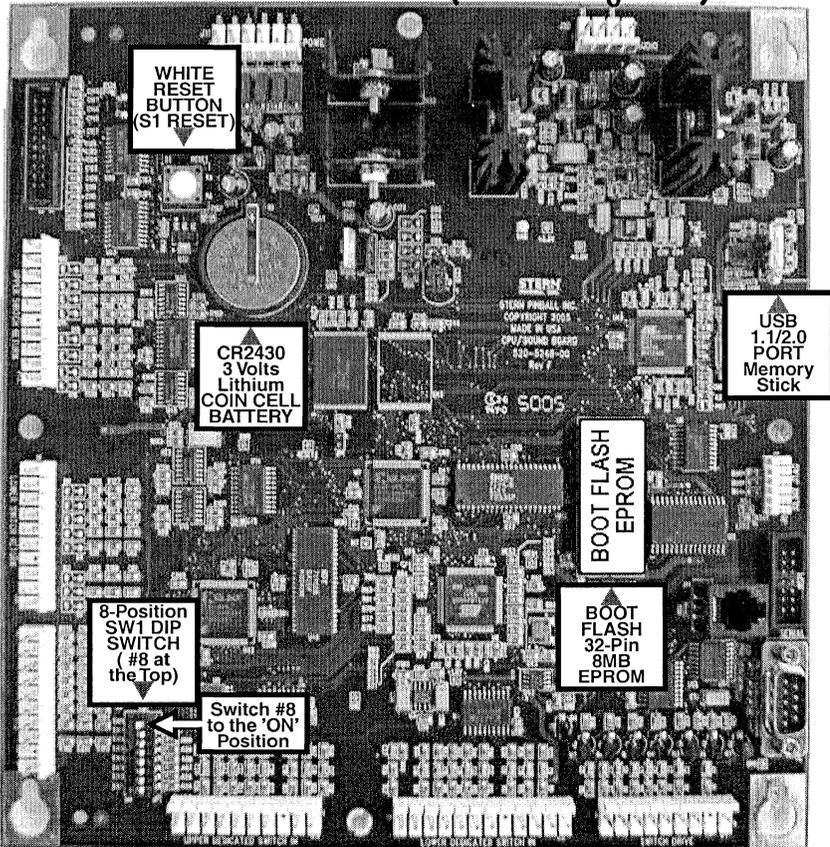**STEP 1** Open the Back Box and locate the **8-Position Dip Switch** *(SW1 on the CPU/Sound Board).*

STEP 2 Switch Dip Switch **#8** to **'ON'**. *(*BOOT FLASH EPROM must be installed.)*

STEP 3 Press the **White Reset Button** *(S1 RESET on the CPU/Sound Board)* or Power Cycle the game **OFF/ON** *(outside cabinet bottom front right).*

STEP 4 Using the 4-Button Service Switch Set *(inside the Coin Door):*

4A } Press **[SELECT]**.
4B } Press **[>]**. Go to the "UTIL" *Icon*. Press **[SELECT]**.
4C } Press **[>]**. Go to the "USB" *Icon*. Press **[SELECT]**.
4D } Press **[>]**. Go to the "UPDT" *Icon*. Press **[SELECT]**.
4E } Follow on-screen prompts.

Press ✊**SELECT** for **SERVICE MENU** ⁻⁰¹ᶠ

BACK ◁/⊖ ⊕/▷ SELECT

● **Green Button**
Press to
Escape Back
(or Exit).

●● **Red Buttons**
Press to move
< Left , Right >.
Press to **– Decrease**
or **+ Increase** values
or to change settings.

● **Black Button**
Press to
Enter
Select
(or 'OK').

CPU/Sound Board (S.A.M. System)

WHITE RESET BUTTON (S1 RESET)

CR2430 3 Volts Lithium COIN CELL BATTERY

USB 1.1/2.0 PORT Memory Stick

BOOT FLASH EPROM

8-Position SW1 DIP SWITCH (#8 at the Top)

Switch #8 to the 'ON' Position

BOOT FLASH 32-Pin 8MB EPROM

× BOOT EPROM ×
VERSION
PRESS 'SELECT' TO BEGIN

SERVICE MENU

DIAG AUD ADJ UTIL TOUR QUIT
GO TO UTILITIES MENU

MORE TIME RESET USB PREU QUIT MORE
GO TO USB MENU

DUMP UPDT BKUP PREU QUIT HELP
UPDATE GAME CODE

GAME CODE UPDATE
INSERT USB MEMORY STICK
OR
PRESS 'BACK' TO EXIT

♠7 **WORLD POKER TOUR**™

//

Got confused? Comments? Questions? Call Technical Support at 800-542-5377 or 708-345-7700 (Option 1).

Backbox Fuses*, Cabinet Fuses, Playfield Fuses and Cabinet Switches

QUICK REFERENCE FUSE CHART

3/4A S.B. 200-5000-17 | 3A S.B. 200-5000-08 | 4A S.B. 200-5000-06 | 5A S.B. 200-5000-01 | 7A S.B. 200-5000-03 | 8A S.B. 200-5000-05

BACKBOX FUSES
I/O POWER DRIVER BOARD
with RED LED STATUS INDICATORS (if any RED LED is OFF, check the fuse)

F1	5A S.B.	5.7VAC G.I. Lamps [BROWN-WHITE⇆WHT-BRN]
F2	5A S.B.	5.7VAC G.I. Lamps [YELLOW⇆WHITE-YEL Circuit]
F3	5A S.B.	5.7VAC G.I. Lamps [GREEN⇆WHITE-GRN Circuit]
F4	5A S.B.	5.7VAC G.I. Lamps [VIOLET⇆WHITE-VIO Circuit]
F5	7A S.B.	50VDC Coils / Flippers [48VAC feed to BRDG 1]
F6	3A S.B.	24VAC Motor or Special Application
F7	4A S.B.	50VDC Magnet(s) or Special Application
F8	3A S.B.	50VDC Coils
F9	8A S.B.	18VDC Control Lamps [13VAC feed to BRDG 4]
F10	5A S.B.	20VDC Coils / Flashers [16VAC feed to BRDG 2]
F11	4A S.B.	5VDC Logic Power [8VAC feed to BRDG 5]
F12	5A S.B.	12VDC Audio / Switches [19VAC feed to BRDG 3]
F13	5A S.B.	12VDC Audio / Switches [19VAC feed to BRDG 3]

DISPLAY POWER SUPPLY BOARD

F1	3/4A S.B.	90VDC High Voltage Dot Display Board

CABINET FUSES
POWER (SERVICE OUTLET) BOX
(Access through Coin Door inside cabinet, front bottom.)

8A S.B.	110-120V Main Line US / Canada / Japan
5A S.B.	220-240V Main Line International

PLAYFIELD FUSES
FLIPPER OR SPECIAL APPLICATION
(Coil Fuses are located under the playfield near assembly.)

3A S.B.	50VDC R. Flipper [BLU-YEL⇆RED-YEL]
3A S.B.	50VDC L. Flipper [GRY-YEL⇆RED-YEL]
3A S.B.	50VDC Additional Flipper Coil, if used.
3A S.B.	50VDC Spcl. Application Coil, if used.

For location & more details on fuses, see Sec. 5, Chp. 2.

> ⚠ **ALL FUSES ARE 250V S.B. (SLO-BLO)**
> **SEE FUSE OR TABLES FOR AMP RATING**
> **C A U T I O N : FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE FUSE WITH IDENTICAL ELECTRICAL RATING!** ⚡

Stern Pinball®, Inc. ©2006   820-6384-00 Rev. A

CPU/Sound Board does not have fuses.
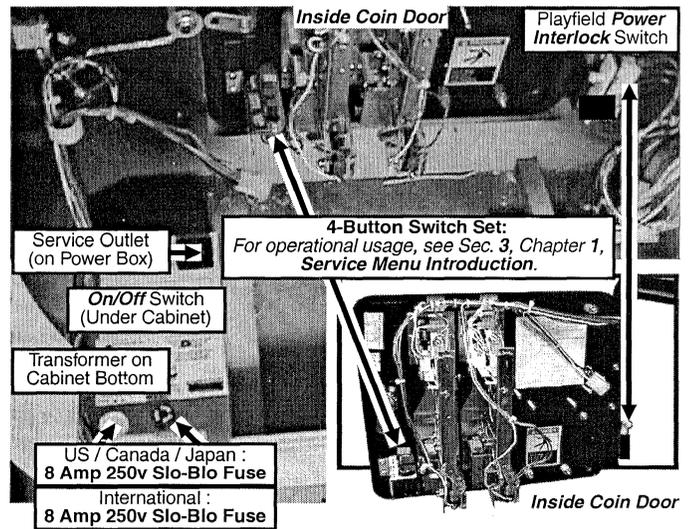
Inside Coin Door
Playfield *Power Interlock* Switch
Service Outlet (on Power Box)
4-Button Switch Set: For operational usage, see Sec. 3, Chapter 1, *Service Menu Introduction*.
On/Off Switch (Under Cabinet)
Transformer on Cabinet Bottom
US / Canada / Japan : 8 Amp 250v Slo-Blo Fuse
International : 8 Amp 250v Slo-Blo Fuse
Inside Coin Door

Find-It-In-Front:
Dr. Pinball

WORLD POKER TOUR™

DR. ❶

The key technical data from various parts of the manual were extracted and combined into the "Find-It-In-Front: Dr. Pinball Section." This front section (Pages **DR. ❶ - ❶❻**) will assist the technician in locating important technical information needed to troubleshoot the Pinball Machine. **Dr. Pinball** is also available in a Flow Chart Help Format in the **Service Menu**. These menus can assist you in troubleshooting a problem with the machine in a Flow Chart format *(answer the questions using the Service Menu buttons). To access or enter, read below.*

◉ ● ● ● Service Switch X4 Set Overview

The four buttons *(inside Coin Door)* have dual functions depending if you have entered the **Service Menu** or not.
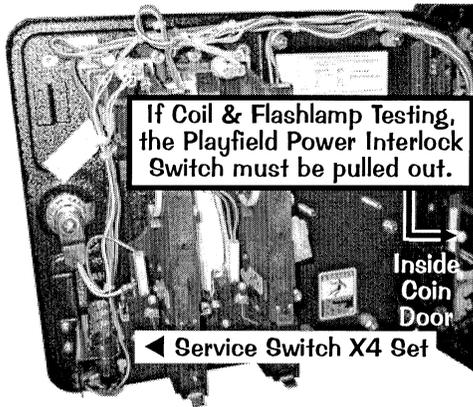
Functions in Game or Attract Mode

Green   Red   Red   Black

CREDIT ⊖VOLUME⊕ MENU

◉ **Green Button** Press for **Service Credit(s)**.	●● **Red Buttons** Press for **Volume Adjustment** *– for less (quieter),* *+ for more (louder)*	● **Black Button** Press for **Service Menu** entry.

Functions in the Service Menu

Press ● **SELECT** for SERVICE MENU ⁺⁰⁻

BACK ⟨/⊖ ⊕/⟩ SELECT

◉ **Green Button** Press to **Escape Back** *(or Exit).*	●● **Red Buttons** Press to move **< Left , Right >.** Press to **– Decrease** *or* **+ Increase** values *or* to change settings.	● **Black Button** Press to **Enter Select** *(or 'OK').*

If Coil & Flashlamp Testing, the Playfield Power Interlock Switch must be pulled out.

Inside Coin Door

◀ Service Switch X4 Set

OPEN THE COIN DOOR TO ACCESS THE SERVICE SWITCH X4 SET.

To enter the **SERVICE MENU**, then enter the **DR. PINBALL FLOW CHART MENUS,** perform the below steps.

Step 1 Press **[Select]**.

Step 2 ... "DIAG" *Icon.* Press **[Select]**.

Step 3 Press **[>]**. Go to the + "DR." *Icon.* Press **[Select]**.

Step 4 Press **[>]**. Go to the **Coil, Switch** or **Lamp** "DR." *Icons.* Press **[Select]**.

Press [BACK] to exit or escape at any time.

Continue through the other menus. Select the Coil "DR" *Icon* for the **COIL FLOW CHART**; Select the Switch "DR" *Icon* for the **SWITCH FLOW CHART**; Select the Lamp "DR" *Icon* for the **LAMP FLOW CHART.** Each menu will help you diagnose the particular circuit. After selection, *Dr. Pinball* will display a question or a procedure to follow, such as *"Does the lamp turn on?"* or *"Check bridge rectifier BR-20, if short replace."* When *Dr. Pinball* displays a question or requests a procedure, *simply answer them. You the operator or technician must respond by using the* **Red Buttons** to highlight an answer, and the **Black Button** to select it or to say 'OK'.

More details & information on the **Service Menu** *is covered in Section 3. Review the Table of Contents for page numbers.*

IF MENU(S) ARE NOT FUNCTIONING, LOOK FOR FUTURE UPDATES.

The Service Menu is subject to change. Update this game with the latest code downloaded from out website with a USB Memory Stick (64MB min., recommendation 128MB or higher). See the inside front cover for directions or in the Service Menu "Go To Utilities Menu" then "Go To USB Menu" and follow prompts.

SERVICE MENU

DIAG AUD ADJ UTIL TOUR QUIT
GO TO DIAGNOSTICS MENU

SW COIL LAMP FLASH WPT MORE
GO TO SWITCH MENU

MORE BURN FUSES DR. PREU QUIT MORE
DR. PINBALL

DR. DR. DR. PREU QUIT HELP
COIL FLOW CHART

DR. DR. DR. PREU QUIT HELP
SWITCH FLOW CHART

DR. DR. DR. PREU QUIT HELP
LAMP FLOW CHART

WPT™

DIAGNOSTIC AIDS

```
    CLOSE COIN DOOR
  50V / 20V DISABLED
CHECK FUSES: F5,F7,F8,F10
```

Both of these *alert displays* alternate when the **50V / 20V Power** is disabled. Follow the on-screen instructions. The warning can be turned off while you're working on the game with the Coin Door open by pressing the 'escape' **Green [BACK] Button**.

```
   OPERATOR ALERT!
   #2 AUTO LAUNCH
  COIL MALFUNCTION
```

This *alert display* is shown momentarily during **Game Mode** or **Power-Up** to alert the operator of a coil malfunction *(coil doesn't energize or coil fires a multiple number of times)*. **OPERATOR ALERT!** works by monitoring any *switch activated coil* that has the potential to trap a ball when disabled *(e.g. in the Auto Launch, Scoop, Eject, etc.)*. This alert can also appear if a switch associated with a coil *(e.g. #16 Shooter Lane & #2 Auto Launch)* is stuck closed *(caused by a switch jam or stuck ball)*; the **CPU/Sound Board** will activate the coil approximately ten times and if the switch remains closed, the game will report this switch in **Technician Alerts** & will indicate the *following display warning:*

```
   PLEASE CHECK
   TECH REPORT
 PORTALS->DIAG->TECH
```

If this *Tech Report Alert flashes* (along with an audible sound), the game has detected faulty switches and/or missing pinballs. Select the "TECH" *Icon* for information *(review **Technician Alerts**, Pages 24-25)*. For this *Alert display* to appear, Standard Adjustment *49*, Tech Alert Warning, **must be changed** to **POWERUP, COIN DOOR** or **POWERUP AND COIN DOOR**. The default is **NEVER** *(review Sec. 3, Chp. 4, **GO TO ADJUSTMENTS MENU**, Standard Adjustments, Page 44)*.

CPU DIP SWITCH SETTINGS

The 8-Pos. Dip Switch [SW1] is on the CPU/Sound Board (between Conn. J3 & J13, lower left corner)

CPU COUNTRY SETTING tables (Pos. 1–8, ON = ▲ / OFF = ▼):

Country	1	2	3	4	5	6	7	8
USA	▼	▼	▼	▼	▼	▼	▼	▼
Austria	▲	▼	▼	▼	▼	▼	▼	▼
Australia	▲	▼	▲	▲	▼	▼	▼	▼
Belgium	▼	▲	▼	▼	▼	▼	▼	▼
Canada	▲	▲	▼	▼	▼	▼	▼	▼
Croatia	▲	▲	▼	▲	▼	▼	▼	▼
Denmark	▲	▼	▲	▼	▼	▼	▼	▼
Finland	▲	▼	▲	▼	▼	▼	▼	▼
France	▲	▲	▼	▼	▼	▼	▼	▼
Germany	▲	▲	▲	▼	▼	▼	▼	▼
Greece	▲	▲	▲	▲	▼	▼	▼	▼
Italy	▼	▼	▼	▲	▼	▼	▼	▼
Japan	▲	▼	▲	▼	▲	▼	▼	▼
Middle East	▲	▲	▲	▼	▲	▼	▼	▼
Netherlands	▼	▼	▲	▼	▼	▼	▼	▼
New Zealand	▼	▼	▼	▼	▲	▼	▼	▼
Norway	▲	▼	▲	▼	▼	▼	▼	▼
Portugal	▲	▼	▼	▲	▼	▼	▼	▼
Russia	▲	▼	▼	▲	▲	▼	▼	▼
So. Africa	▼	▼	▲	▼	▲	▼	▼	▼
Spain	▲	▼	▼	▲	▼	▼	▼	▼
Sweden	▲	▲	▲	▼	▲	▼	▼	▼
Switzerland	▼	▼	▲	▲	▼	▼	▼	▼
Taiwan	▼	▼	▲	▲	▼	▼	▼	▼
UK	▼	▼	▲	▲	▲	▼	▼	▼

Find-It-In-Front:
Dr. Pinball

WORLD POKER TOUR™

SWITCH MATRIX GRID (01-64) {Switch Locations on the next page}

CPU/Sound Board	01 IC-U22A RETURN WHT-BRN J6-P9	02 IC-U22B RETURN WHT-RED J6-P8	03 IC-U22C RETURN WHT-ORG J6-P7	04 IC-U22D RETURN WHT-YEL J6-P6	05 IC-U16A RETURN WHT-GRN J6-P5	06 IC-U16B RETURN WHT-BLU J6-P3	07 IC-U16C RETURN WHT-VIO J6-P2	08 IC-U16D RETURN WHT-GRY J6-P1	09 IC-U36A RETURN TAN-BLK J12-P9	10 IC-U36B RETURN TAN-RED J12-P8	11 IC-U36C RETURN TAN-ORG J12-P7	12 IC-U36D RETURN TAN-YEL J12-P6	13 IC-U40A RETURN TAN-GRN J12-P4	14 IC-U40B RETURN TAN-BLU J12-P3	15 IC-U40C RETURN TAN-VIO J12-P2	16 IC-U40D RETURN TAN-WHT J12-P1
01 Q1 DRIVE ► GRN-BRN J1-P1	SW.#1 NOT USED	SW.#2 NOT USED	SW.#3 SHOOTER LANE VUK «D.O.T.S.»	SW.#4 RIGHT DROP #1 (TOP) OPTO 'U' 520-5252-04 On Assembly	SW.#5 RIGHT DROP #2 OPTO 'U' 520-5252-04 On Assembly	SW.#6 RIGHT DROP #3 OPTO 'U' 520-5252-04 On Assembly	SW.#7 RIGHT DROP #4 (TOP) OPTO 'U' 520-5252-04 On Assembly	SW.#8 RIGHT ORBIT SPINNER Above P/F	SW.#9 RIGHT RAMP ENTER GATE SW. Above P/F	SW.#10 MIDDLE DROP #1 (L) OPTO 'U' 520-5252-04 On Assembly	SW.#11 MIDDLE DROP #2 OPTO 'U' 520-5252-04 On Assembly	SW.#12 MIDDLE DROP #3 OPTO 'U' 520-5252-04 On Assembly	SW.#13 MIDDLE DROP #4 (R) OPTO 'U' 520-5252-04 On Assembly	SW.#14 LOWER RIGHT 10 PT Below P/F	SW.#15 TOURNAMENT START OPTIONAL 502-5011-00 Optional Kit	SW.#16 START BUTTON 180-5174-00 In Cabinet
02 Q2 DRIVE ► GRN-RED J1-P3	SW.#17 NOT USED	SW.#18 4-BALL TROUGH #4 (L) 180-5119-02 On Assembly	SW.#19 4-BALL TROUGH #3 180-5119-02 On Assembly	SW.#20 4-BALL TROUGH #2 180-5119-02 On Assembly	SW.#21 VUK OPTO TROUGH #4 (R) TRANS./REC. TX 515-0173-00 RX 515-0174-00	SW.#22 4-BALL STACKING OPTO TRANS./REC. TX 515-0173-00 RX 515-0174-00	SW.#23 SHOOTER LANE 180-5200-00 Below P/F	SW.#24 LEFT OUTLANE LEFT 500-5227-01 Below P/F	SW.#25 RETURN LANE 500-5227-01 Below P/F	SW.#26 LEFT SLING-SHOT 180-5054-00 2 per Asm.	SW.#27 RIGHT SLING-SHOT 180-5054-00 2 per Asm.	SW.#28 RIGHT RETURN LANE 500-5227-01 Below P/F	SW.#29 RIGHT OUTLANE 500-5227-01 Below P/F	SW.#30 LEFT BUMPER 180-5015-04 On Assembly	SW.#31 RIGHT BUMPER 180-5015-04 On Assembly	SW.#32 BOTTOM BUMPER 180-5015-04 On Assembly
03 Q3 DRIVE ► GRN-ORG J1-P4	SW.#33 LEFT DROP #1 (BOT) OPTO 'U' 520-5252-04 On Assembly	SW.#34 LEFT DROP #2 OPTO 'U' 520-5252-04 On Assembly	SW.#35 LEFT DROP #3 OPTO 'U' 520-5252-04 On Assembly	SW.#36 LEFT DROP #4 OPTO 'U' 520-5252-04 On Assembly	SW.#37 LEFT DROP #5 OPTO 'U' 520-5252-04 On Assembly	SW.#38 LEFT DROP #6 OPTO 'U' 520-5252-04 On Assembly	SW.#39 LEFT DROP #7 OPTO 'U' 520-5252-04 On Assembly	SW.#40 LEFT DROP #8 (TOP) OPTO 'U' 520-5252-04 On Assembly	SW.#41 LOWER LEFT 10 PT Below P/F	SW.#42 LOWER LEFT TARGET Below P/F	SW.#43 LEFT ORBIT SPINNER Above P/F	SW.#44 LEFT ORBIT HI Above P/F	SW.#45 POP STANDUP #1 (L) RED SQ. Below P/F	SW.#46 POP STANDUP #2 RED SQ. Below P/F	SW.#47 POP STANDUP #3 RED SQ. Below P/F	SW.#48 POP STANDUP #4 (R) RED SQ. Below P/F
04 Q4 DRIVE ► GRN-YEL J1-P5	SW.#49 POP EJECT On Assembly	SW.#50 RIGHT ORBIT HI GATE SW. Above P/F	SW.#51 SHOOTER VUK EXIT GATE SW. Above P/F	SW.#52 RIGHT RAMP MADE OPTO PAIR 500-6775-00 On Assembly	SW.#53 UPF EXIT GATE SW. Above P/F	SW.#54 LEFT RAMP MADE OPTO PAIR 500-6775-00 On Assembly	SW.#55 LEFT VUK «D.O.T.S.» on Back Panel	SW.#56 UPF ABOVE LEFT VUK OPTO PAIR 500-6775-00 On Assembly	SW.#57 JAIL BARS BASH TRANS./REC. TX 520-5247-00 RX 520-5248-00	SW.#58 JAIL BARS REST TRANS./REC. TX 520-5247-00 RX 520-5248-00	SW.#59 TRANS-FER TUBE OPTO PAIR 500-6775-00 On Assembly	SW.#60 UPF STANDUP #1 (L) WHT RECT. on Back Panel	SW.#61 UPF STANDUP #2 WHITE SQ. on Back Panel	SW.#62 UPF STANDUP #3 WHITE SQ. on Back Panel	SW.#63 JAIL BARS UP OPTO 'U' 520-5251-00 On Assembly	SW.#64 NOT USED

Wire Color Abbreviations used: BLK Black | BLU Blue | BRN Brown | GRY Gray | GRN Green | LGN Light Grn. | ORG Orange | PNK Pink | RED Red | TAN Tan | VIO Violet | WHT White | YEL Yellow

Dedicated Switches (D1-D24) {Dedicated Switch Locations on the next page} // CPU/Snd. SW1 Dip Switches (1-8)

CPU/SND Board	IC-U2 PNK-BRN J2-P2	IC-U2 PNK-RED J2-P3	IC-U2 PNK-ORG J2-P4	IC-U2 PNK-YEL J2-P6	IC-U2 PNK-GRN J2-P7	IC-U2 PNK-BLU J2-P8	IC-U2 PNK-VIO J2-P9	IC-U2 PNK-GRY J2-P10	IC-U4 GRY-BRN J3-P1	IC-U4 GRY-RED J3-P2	IC-U4 GRY-ORG J3-P4	IC-U4 GRY-YEL J3-P5	IC-U4 GRY-GRN J3-P6	IC-U4 GRY-BLU J3-P7	IC-U4 GRY-VIO J3-P8	IC-U4 GRY-BLK J3-P9
GROUND (BLK) J2-P1/11 & J3-P10	SW.D-1 LEFT COIN SLOT 180-5204-00 Coin Door	SW.D-2 CENTER COIN SLOT/DBA 180-5204-00 Coin Door	SW.D-3 RIGHT COIN SLOT 180-5204-00 Coin Door	SW.D-4 4TH COIN SLOT 180-5204-00 Coin Door	SW.D-5 5TH COIN SLOT IF USED	SW.D-6 NOT USED	SW.D-7 LT POST SAVE (UK ONLY) 180-5160-01 Cabinet Side	SW.D-8 RT POST SAVE (UK ONLY) 180-5160-01 Cabinet Side	SW.D-9 LEFT FLIPPER BUTTON 180-5160-01 Cabinet Side	SW.D-10 LEFT FLIPPER E.O.S. 180-5149-00 Flipper Asm.	SW.D-11 RIGHT FLIPPER BUTTON 180-5160-01 Cabinet Side	SW.D-12 RIGHT FLIPPER E.O.S. 180-5149-00 Flipper Asm.	SW.D-13 UPR. LT. FLIPPER BUTTON 180-5160-01 Cabinet Side	SW.D-14 UPR. LT. FLIPPER E.O.S. 180-5149-00 Flipper Asm.	SW.D-15 UPR. RT. FLIPPER BUTTON 180-5160-01 Cabinet Side	SW.D-16 UPR. RT. FLIPPER E.O.S. 180-5149-00 Flipper Asm.

CPU/SND Board	IC-41 LGN-BRN J13-P1	IC-41 LGN-RED J13-P3	IC-41 LGN-ORG J13-P4	IC-41 LGN-YEL J13-P5	IC-41 LGN-BLK J13-P6	IC-41 LGN-BLU J13-P7	IC-41 LGN-VIO J13-P8	IC-41 LGN-GRY J13-P9	CPU/SOUND BD. SW1 DIP SWITCH (located between Connectors J3/J13)							
GROUND (BLK) J13-P10	SW.D-17 TILT PENDULUM (PLUMB BOB) See Sec. 4, Chp. 1, Pg. 63 for cab. parts	SW.D-18 SLAM TILT (OPT) OPTIONAL 502-5032-00 Optional Kit	SW.D-19 TICKET NOTCH IF USED 180-5119-02 Below P/F	SW.D-20 NOT USED	SW.D-21 BACK BUTTON (GREEN) 180-5192-04 Coin Door	SW.D-22 < / − BUTTON (RED) 180-5192-02 Coin Door	SW.D-23 + / > BUTTON (RED) 180-5192-02 Coin Door	SW.D-24 SELECT BUTTON (BLACK) 180-5192-00 Coin Door	DIP SWITCH POSITION #1 ON / OFF	DIP SWITCH POSITION #2 ON / OFF	DIP SWITCH POSITION #3 ON / OFF	DIP SWITCH POSITION #4 ON / OFF	DIP SWITCH POSITION #5 ON / OFF	DIP SWITCH POSITION #6 ON / OFF	DIP SWITCH POSITION #7 ON / OFF	DIP SWITCH POSITION #8 ON / OFF

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SWITCH LOCATIONS
{Switch Matrix Grid (01-64) on the previous page}

Typical Switch Wiring & Schematic

Column: Switch Drive Wire	Blocking Diode (1N4004)	Row: Switch Return Wire
GRN-XXX		WHT-XXX
N.O. Normally Open Switch Terminal	COM. Common Switch Terminal	N.C. Normally Closed Switch Terminal

GRN-XXX

N.C.

WHT -XXX

CATHODE
banded side

-XXX = Varying Wire Color.
See Matrix Grid for color.

Dedicate Switch Schematic

Dedicated Switch Inputs	Ground
GRY-XXX	BLACK
N.O. Normally Open Switch Terminal	COM. Common Switch Terminal

◀ Playfield | Back Panel ▼

☐ = Switches above Playfield.

■ = Switches below Playfield.

▨ = Switches in Cabinet & on Back Panel.

Switch Part Notes: ¥ Yen Coin Switch is 180-5091-00. Part Numbers which start with 515- or 500- include the bracket, target, and/or housing.

Sw. 56 Part Note: The Switch is comprised of a Hanger Bracket (535-5319-00) and Contact Wire (535-7563-01) located in the Cabinet. **Some Switch Diodes may be located under the playfield, in the Cabinet or Backbox** on Terminal Strips or Diode Boards and not on the assemblies.

DOTS: D iode O n T erminal S trip, see Sec. 5, Chp.2, Playfield Wiring.

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LAMP MATRIX GRID (01-80) {Lamp Locations on the next page}

I/O Power Driver Board	01 IC-U17 18VDC YEL-BRN J13-P9	02 IC-U16 18VDC YEL-RED J13-P8	03 IC-U15 18VDC YEL-ORG J13-P7	04 IC-U14 18VDC YEL-BLK J13-P6	05 IC-U13 18VDC YEL-GRN J13-P5	06 IC-U12 18VDC YEL-BLU J13-P4	07 IC-U11 18VDC YEL-VIO J13-P3	08 IC-U10 18VDC YEL-GRY J13-P1
01 Q33 GROUND RED-BRN J12-P1	#555 Clear LP. #1 START BUTTON 165-5002-00	#CM86 Clr. LP. #2 TOURNAMENT BUTTON 165-5103-00	#555 Clear LP. #3 DEAL AGAIN 165-5002-00	#555 Clear LP. #4 LEFT SPECIAL 165-5002-00	#555 Clear LP. #5 L. TRIPLE SCORE 165-5002-00	#555 Clear LP. #6 R. TRIPLE SCORE 165-5002-00	#555 Clear LP. #7 RIGHT SPECIAL 165-5002-00	#555 Clear LP. #8 LIGHT LOCK 165-5002-00
02 Q34 GROUND RED-BLK J12-P2	#555 Clear LP. #9 ONE PAIR 165-5002-00	#555 Clear LP. #10 TWO PAIR 165-5002-00	#555 Clear LP. #11 THREE OF A KIND 165-5002-00	#555 Clear LP. #12 SKILL FLIP 165-5002-00	#555 Clear LP. #13 LEFT RAMP ARROW 165-5002-00	#44 Clear LP. #14 LEFT RAMP RIVER 165-5000-44-HF	#555 Clear LP. #15 RIGHT RAMP ARROW 165-5002-00	#44 Clear LP. #16 RIGHT RAMP RIVER 165-5000-44-HF
03 Q35 GROUND RED-ORG J12-P3	#555 Clear LP. #17 STRAIGHT 165-5002-00	#555 Clear LP. #18 FLUSH 165-5002-00	#555 Clear LP. #19 FULL HOUSE 165-5002-00	#555 Clear LP. #20 MYSTERY 165-5002-00	#44 Clear LP. #21 LEFT RAMP TURN 165-5000-44-HF	#44 Clear LP. #22 LEFT RAMP FLOP 165-5000-44-HF	#44 Clear LP. #23 RIGHT RAMP TURN 165-5000-44-HF	#44 Clear LP. #24 RIGHT RAMP FLOP 165-5000-44-HF
04 Q36 GROUND RED-YEL J12-P4	#555 Clear LP. #25 FOUR OF A KIND 165-5002-00	#555 Clear LP. #26 STRAIGHT FLUSH 165-5002-00	#555 Clear LP. #27 ROYAL FLUSH 165-5002-00	#555 Clear LP. #28 ADVANCE HOLD 'EM 165-5002-00	#555 Clear LP. #29 LEFT RAMP CHIP TRICK 165-5002-00	#555 Clear LP. #30 EJECT ARROW 165-5002-00	#555 Clear LP. #31 WPT CHAMP-IONSHIP 165-5002-00	#555 Clear LP. #32 RIGHT RAMP CHIP TRICK 165-5002-00
05 Q37 GROUND RED-GRN J12-P5	#44 Clear LP. #33 ACE OF SPADES 165-5000-44-HF	#44 Clear LP. #34 QUEEN OF HEARTS 165-5000-44-HF	#44 Clear LP. #35 TEN OF SPADES 165-5000-44-HF	#44 Clear LP. #36 JACK OF DIAMONDS 165-5000-44-HF	#555 Clear LP. #37 POKER CORNER 165-5002-00	#555 Clear LP. #38 EJECT LOCK 165-5002-00	#555 Clear LP. #39 ARUBA 165-5002-00	#555 Clear LP. #40 LOS ANGELES 165-5002-00
06 Q38 GROUND RED-BLU J12-P6	#44 Clear LP. #41 EIGHT OF SPADES 165-5000-44-HF	#44 Clear LP. #42 QUEEN OF SPADES 165-5000-44-HF	#44 Clear LP. #43 TEN OF CLUBS 165-5000-44-HF	#44 Clear LP. #44 KING OF CLUBS 165-5000-44-HF	#555 Clear LP. #45 SPIN A CARD 165-5002-00	#555 Clear LP. #46 EJECT CHIP TRICK 165-5002-00	#555 Clear LP. #47 BAHAMAS 165-5002-00	#555 Clear LP. #48 PARIS 165-5002-00
07 Q39 GROUND RED-VIO J12-P8	#44 Clear LP. #49 NINE OF SPADES 165-5000-44-HF	#44 Clear LP. #50 KING OF HEARTS 165-5000-44-HF	#44 Clear LP. #51 NINE OF DIAMONDS 165-5000-44-HF	#44 Clear LP. #52 JACK OF SPADES 165-5000-44-HF	#555 Clear LP. #53 LEFT ORBIT ARROW 165-5002-00	#555 Clear LP. #54 LEFT ORBIT CHIP TRICK 165-5002-00	#555 Clear LP. #55 ATLANTIC CITY 165-5002-00	#555 Clear LP. #56 LAS VEGAS 165-5002-00
08 Q40 GROUND RED-GRY J12-P9	#44 Clear LP. #57 KING OF DIAMONDS 165-5000-44-HF	#44 Clear LP. #58 SEVEN OF SPADES 165-5000-44-HF	#44 Clear LP. #59 QUEEN OF CLUBS 165-5000-44-HF	#44 Clear LP. #60 KING OF SPADES 165-5000-44-HF	#555 Clear LP. #61 RIGHT ORBIT ARROW 165-5002-00	Lamp Note 2 LP. #62 LEFT BUMPER «D.O.T.S.» 112-5024-08	#555 Clear LP. #63 STEAL THE BLIND 165-5002-00	#555 Clear LP. #64 A CHIP AND A CHAIR 165-5002-00
09 Q41 GROUND RED-WHT J12-P10	#555 Clear LP. #65 LEFT VUK ARROW 165-5002-00	#555 Clear LP. #66 CUT THE CARDS 165-5002-00	Lamp Note 1 LP. #67 POP STANDUP #1 (L) 112-5023-08	Lamp Note 1 LP. #68 POP STANDUP #2 112-5023-08	#555 Clear LP. #69 RIGHT ORBIT CHIP TRICK 165-5002-00	Lamp Note 2 LP. #70 RIGHT BUMPER «D.O.T.S.» 112-5024-08	#555 Clear LP. #71 PLAY THE BUTTON 165-5002-00	#555 Clear LP. #72 SPOT THE TELL 165-5002-00
10 Q42 GROUND RED J12-P11	#555 Clear LP. #73 LEFT VUK LOCK 165-5002-00	#555 Clear LP. #74 EXTRA BALL 165-5002-00	Lamp Note 1 LP. #75 POP STANDUP #3 112-5023-08	Lamp Note 1 LP. #76 POP STANDUP #4 (R) 112-5023-08	LP. #77 NOT USED	Lamp Note 2 LP. #78 BOTTOM BUMPER «D.O.T.S.» 112-5024-08	#555 Clear LP. #79 KNOW YOUR OUTS 165-5002-00	#555 Clear LP. #80 CHANGE GEARS 165-5002-00

Wire Color Abbreviations used: BLK Black | BLU Blue | BRN Brown | GRY Gray | GRN Green | ORG Orange | RED Red | VIO Violet | WHT White | YEL Yellow

Lamp Note 1 = White LED Module (Bayonet #44 Style) 112-5023-08
Lamp Note 2 = White LED Module (Wedge Base #555 Style) 112-5024-08

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LAMP LOCATIONS
{Lamp Matrix Grid (01-80) on the previous page}

Typical Lamp Schematic & Wiring

Row: Ground
RED -XXX

Column: 18V
YEL -XXX

YEL -XXX

RED -XXX

1N4004 DIODE

CATHODE
banded side

COMMON

-XXX = Varying Wire Color.
See Matrix Grid for color.

◀ Playfield | Back Panel ▼

Front View
Steel Ramp
Not Shown

☐ = Lamps above Playfield.

■ = Lamps below Playfield.

▨ = Lamps in Cabinet & on Back Panel.

Lamp Part Notes: #555 Wedge Base (W.B.) Bulb Clear = 165-5002-00.
#44 Bayonet Bulb (Heavy Filament) Clear = 165-5000-44-HF.
#555 LED Wedge Base White = 112-5024-08
See Section 4, Chapter 1, Parts Identification & Location,
Pages 78-80 for more details on bulbs and corresponding sockets.
Some Lamp Diodes may be located under the playfield, in the Cabinet
or Backbox on Terminal Strips and not on or with the Lamp Socket.

DOTS: D iode O n T erminal S trip, see Sec. 5, Chp. 2, Playfield Wiring.

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COILS DETAILED CHART TABLE

High Current Coils Group 1		Drive Transistor	Driver Ouput Board	Power Line Color	Power Line Connection	Power Voltage	Drive Transistor Control Line Color	D.T. Control Line Connect	Coil GA-Turn or Bulb Type
#1	TROUGH UP-KICKER	Q1		YEL-VIO	J10-P9/10	50v DC	BRN-BLK	J8-P1	26-1200 ℧ 090-5044-ND
#2	AUTO LAUNCH	Q2	▲ I/O Power Driver ▼	YEL-VIO	J10-P9/10	50v DC	BRN-RED	J8-P3	24-940 ℧ 090-5036-ND
#3	SHOOTER LANE VUK	Q3		YEL-VIO	J10-P9/10	50v DC	BRN-ORG	J8-P4	26-1200 ℧ 090-5044-ND
#4	LEFT VUK	Q4		YEL-VIO	J10-P9/10	50v DC	BRN-YEL	J8-P5	26-1200 ℧ 090-5044-ND
#5	LOWER LEFT DROP RESET	Q5		YEL-VIO	J10-P9/10	50v DC	BRN-GRN	J8-P6	23-800 ℧ 090-5001-ND
#6	UPPER LEFT DROP RESET	Q6		YEL-VIO	J10-P9/10	50v DC	BRN-BLU	J8-P7	23-800 ℧ 090-5001-ND
#7	MIDDLE DROP RESET	Q7		YEL-VIO	J10-P9/10	50v DC	BRN-VIO	J8-P8	23-800 ℧ 090-5001-ND
#8	RIGHT DROP RESET	Q8		YEL-VIO	J10-P9/10	50v DC	BRN-GRY	J8-P9	23-800 ℧ 090-5001-ND

High Current Coils Group 2		Drive Transistor	Driver Ouput Board	Power Line Color	Power Line Connection	Power Voltage	Drive Transistor Control Line Color	D.T. Control Line Connect	Coil GA-Turn or Bulb Type
#9	LEFT BUMPER	Q9		YEL-VIO	J10-P9/10	50v DC	BLU-BRN	J9-P1	26-1200 ℧ 090-5044-ND
#10	RIGHT BUMPER	Q10	▲ I/O Power Driver ▼	YEL-VIO	J10-P9/10	50v DC	BLU-RED	J9-P2	26-1200 ℧ 090-5044-ND
#11	BOTTOM BUMPER	Q11		YEL-VIO	J10-P9/10	50v DC	BLU-ORG	J9-P4	26-1200 ℧ 090-5044-ND
#12	JAIL UP	Q12		YEL-VIO	J10-P9/10	50v DC	BLU-YEL	J9-P5	26-1200 ℧ 090-5044-ND
#13	UPPER PF LEFT FLIPPER	Q13		GRY-YEL~3A Fuse~RED-YEL	J10-P6/7	50v DC	BLU-GRN	J9-P6	23-1100 ℧ 090-5030-ND
#14	UPPER PF RIGHT FLIPPER	Q14		BLU-YEL~3A Fuse~RED-YEL	J10-P6/7	50v DC	BLU-BLK	J9-P7	23-1100 ℧ 090-5030-ND
#15	LEFT FLIPPER (50v RED/YEL)	Q15		GRY-YEL~3A Fuse~RED-YEL	J10-P6/7	50v DC	ORG-GRY	J9-P8	22-1080 ℧ 090-5032-ND
#16	RIGHT FLIPPER (50v RED/YEL)	Q16		BLU-YEL~3A Fuse~RED-YEL	J10-P6/7	50v DC	ORG-VIO	J9-P9	22-1080 ℧ 090-5032-ND

Low Current Coils Group 1		Drive Transistor	Driver Ouput Board	Power Line Color	Power Line Connection	Power Voltage	Drive Transistor Control Line Color	D.T. Control Line Connect	Coil GA-Turn or Bulb Type
#17	LEFT SLINGSHOT	Q17	▲ I/O Power Driver ▼	BROWN	J7-P1	20v DC	VIO-BRN	J7-P2	23-800 ℧ 090-5001-ND
#18	RIGHT SLINGSHOT	Q18		BROWN	J7-P1	20v DC	VIO-RED	J7-P3	23-800 ℧ 090-5001-ND
#19	JAIL LATCH [MINI-COIL]	Q19		BROWN	J7-P1	20v DC	VIO-ORG	J7-P4	29-1400 ℧ 090-5072-03
#20	LEFT RAMP UP POST	Q20		BROWN	J7-P1	20v DC	VIO-YEL	J7-P6	25-1240 ℧ 090-5034-ND
#21	BUMPER EJECT	Q21	Step-Up Driver!	via Aux. Driver Bd. 520-5254-00 YEL-VIO : J10-P9/10		50v DC	via Aux. Driver Bd. 520-5254-00 VIO-GRN : J7-P7		26-1200 ℧ 090-5044-ND
#22	FLASH: LEFT SLINGSHOT	Q22	▲ I/O Power Driver ▼	ORANGE	J6-P10	20v DC	VIO-BLU	J7-P8	#89 Bulb 165-5000-89
#23	FLASH: RIGHT SLINGSHOT	Q23		ORANGE	J6-P10	20v DC	VIO-BLK	J7-P9	#89 Bulb 165-5000-89
#24	OPTIONAL COIL	Q24		RED	J16-P4>8	5v DC	VIO-GRY	J7-P10	Opt. 5v

Diode On Terminal Strip (if noted)

Low Current Coils Group 2		Drive Transistor	Driver Ouput Board	Power Line Color	Power Line Connection	Power Voltage	Drive Transistor Control Line Color	D.T. Control Line Connect	Coil GA-Turn or Bulb Type
#25	FLASH: LEFT SPINNER	Q25		ORANGE	J6-P10	20v DC	BLK-BRN	J6-P1	#89 Bulb 165-5000-89
#26	FLASH: BACKPANEL #1 (L)	Q26	▲ I/O Power Driver ▼	ORANGE	J6-P10	20v DC	BLK-RED	J6-P2	#89 Bulb 165-5000-89
#27	FLASH: BACKPANEL #2	Q27		ORANGE	J6-P10	20v DC	BLK-ORG	J6-P3	#89 Bulb 165-5000-89
#28	FLASH: BACKPANEL #3	Q28		ORANGE	J6-P10	20v DC	BLK-YEL	J6-P4	#89 Bulb 165-5000-89
#29	FLASH: BACKPANEL #4	Q29		ORANGE	J6-P10	20v DC	BLK-GRN	J6-P5	#89 Bulb 165-5000-89
#30	FLASH: BACKPANEL #5 (R)	Q30		ORANGE	J6-P10	20v DC	BLK-BLU	J6-P6	#89 Bulb 165-5000-89
#31	FLASH: RIGHT VUK	Q31		ORANGE	J6-P10	20v DC	BLK-VIO	J6-P7	#89 Bulb 165-5000-89
#32	RIGHT RAMP DOWN POST	Q32		BROWN	J7-P1	20v DC	BLK-GRY	J6-P8	26-1200 ℧ 090-5044-ND

Note: In Test Flash Lamps Menu ("Flash" Icon), Flashers tested are all Flash Lamps located between Q1-Q32 (This Game: Q22-Q23 & Q25-Q31)

℧ Coil Note: ℧ -ND means 'No Diode'. -00B or -00T can be used for coil replacements, but the diode must be removed. Call for more info.
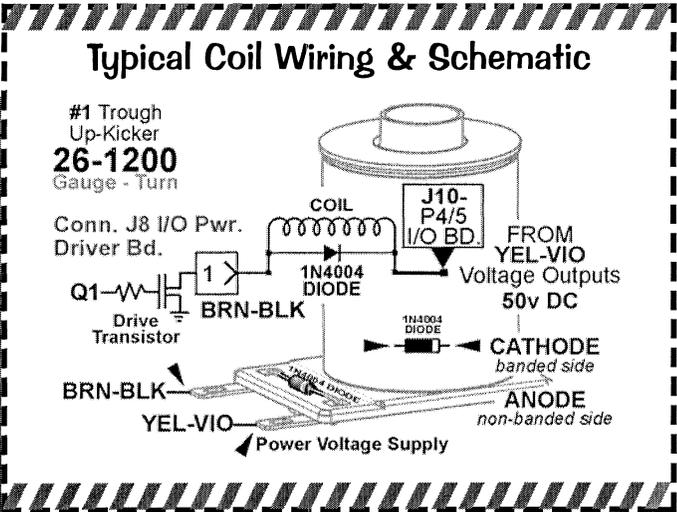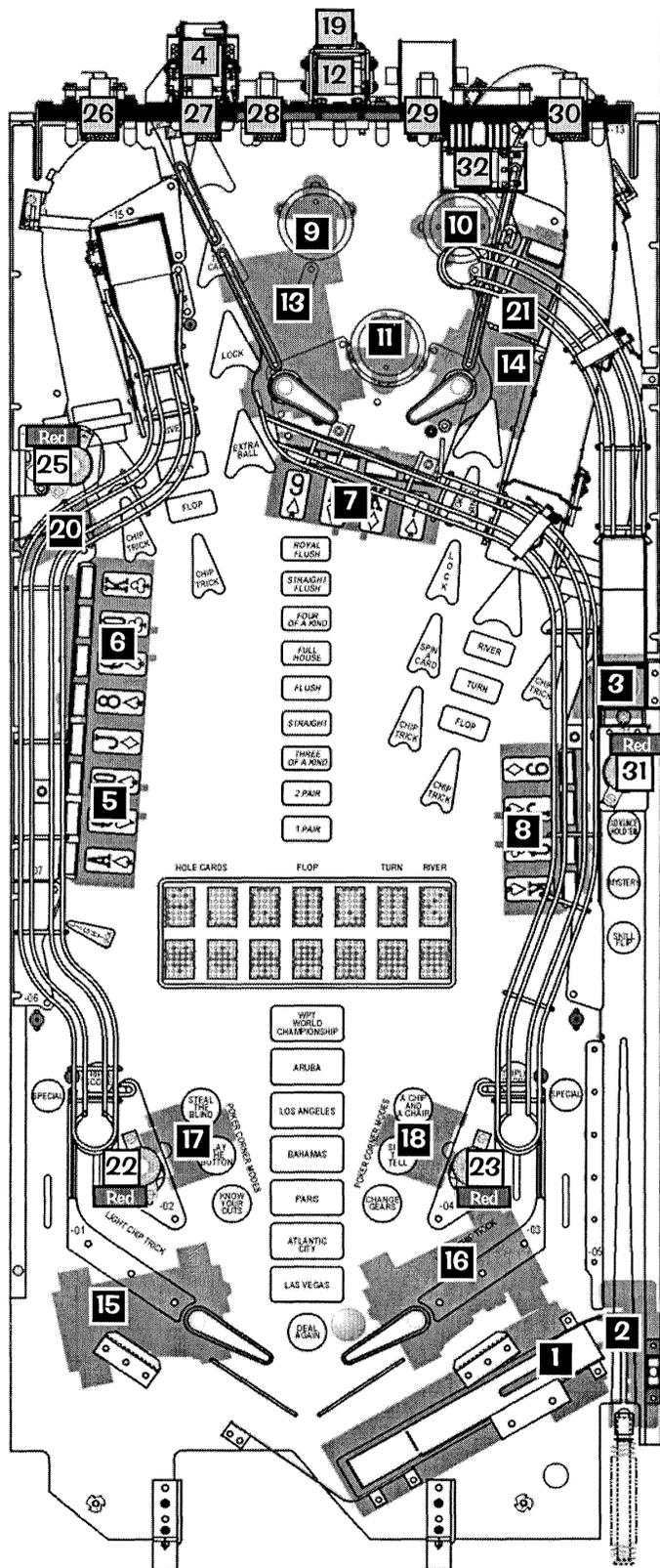
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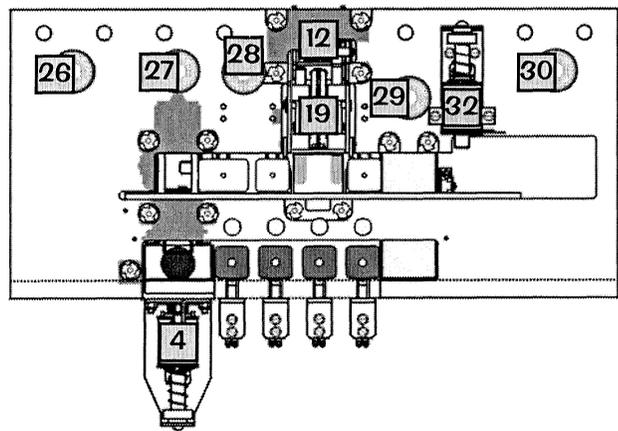
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COIL & FLASH LAMP LOCATIONS
{Coils Detailed Chart Table on the previous page}

Typical Coil Wiring & Schematic

#1 Trough
Up-Kicker
26-1200
Gauge - Turn

Conn. J8 I/O Pwr.
Driver Bd.

Q1 — Drive Transistor

COIL

J10-P4/5 I/O BD.

1N4004 DIODE

BRN-BLK

FROM YEL-VIO
Voltage Outputs
50v DC

1N4004 DIODE

CATHODE
banded side

ANODE
non-banded side

BRN-BLK

YEL-VIO

Power Voltage Supply

◄ Playfield | Back Panel ▼

= Coils / Flash Lamps above Playfield.

= Coils / Flash Lamps below Playfield.

= Coils / Flash Lamps on Back Panel.

Color = Color of Mini-Mars or Flash Lamp Bulb.

Some Coil or Flash Lamp Diodes may be located under the playfield, in the Cabinet or Backbox on Terminal Strips or Diode Boards and not on the assemblies.

Coil Q24 is Optional. If either a Coin Meter, Token Dispenser or Knocker (all optional equipment) is required, call Technical Support for more information, 1-800-542-5377 or 1-708-345-7700.

DOTS: Diode On Terminal Strip, see Sec. 5, Chp. 2, Playfield Wiring.

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GO TO ADJUSTMENTS MENU: STANDARD ADJUSTMENTS (1-64)

To enter the **SERVICE MENU**, then enter the **STANDARD ADJUSTMENT MENU** to review or change a Standard Adjustment Setting, perform the below steps. *For adjustment definitions or summary, review Section 3, Chapter 4, GO TO ADJUSTMENTS MENU. See Section 3, Chapter 5, GO TO INSTALLS MENU, to easily change all adjustments required depending on the Install Type (Easy, Hard, 5-Ball, Home Play, etc.) desired.*

Step 1 Press **[Select]**. Press [BACK] to exit or escape at any time.

Step 2 Press **[>]**. Go to the "ADJ" *Icon.* Press **[Select]**.

Step 3 ... "S.P.I." *Icon.* Press **[Select]**.

Adjustment Number ➡
Adjustment Name ➡
Adjustment Setting ➡
Adjustment Comment ➡

STANDARD ADJUSTMENT #1
REPLAY TYPE
AUTO
(INSTALLED/FACTORY DEFAULT)

Step 4 **STANDARD ADJUSTMENT #1** appears with the Adjustment Name **[REPLAY TYPE]** flashing. With the Adjustment Name flashing, press **[<] [>]** to move between adjustments.

Step 5: To change the Adjustment Setting, press **[SELECT]**. With the Adjustment Setting flashing, press **[<] [>]** repeatedly until the desired setting appears. Press the **[SELECT]** to "install" the change. The Adjustment Comment *(bottom text line)* will indicate **[INSTALLED/FACTORY DEFAULT]**, if the Factory Default Setting is selected *or* **[INSTALLED]** if the change is not the Factory Default Setting.

STANDARD ADJUSTMENTS (1-64)

Nr.	STANDARD ADJUSTMENT NAME	USA DEFAULT	YOUR SETTING	Nr.	STANDARD ADJUSTMENT NAME	USA DEFAULT	YOUR SETTING
1	REPLAY TYPE	AUTO		33	HIGH SCORE #4 AWARD	CREDIT	
2	‡ REPLAY PERCENTAGE	10%		34	GRAND CHAMPION AWARDS	1	
3	‡ REPLAY AWARD	CREDIT		35	HIGH SCORE #1 AWARDS	1	
4	‡ REPLAY LEVELS	1		36	HIGH SCORE #2 AWARDS	0	
5	‡ AUTO REPLAY START	20,000,000		37	HIGH SCORE #3 AWARDS	0	
6	‡ DYNAMIC REPLAY START	60,000,000		38	HIGH SCORE #4 AWARDS	0	
7	‡ REPLAY LEVEL #1	15,000,000		39	HSTD INITIALS	3 INITIALS	
8	‡ REPLAY LEVEL #2	30,000,000		40	HSTD RESET COUNT	2000	
9	‡ REPLAY LEVEL #3	45,000,000		41	FREE PLAY	NO	
10	‡ REPLAY LEVEL #4	60,000,000		42	LANGUAGE	ENGLISH	
11	‡ REPLAY BOOST	YES		43	CUSTOM MESSAGE	ON	
12	SPECIAL AWARD	CREDIT		44	FLASH LAMP POWER	NORMAL	
13	‡ SPECIAL PERCENTAGE	10%		45	COIL PULSE POWER	NORMAL	
14	FREE GAME LIMIT	5		46	KNOCKER VOLUME	NORMAL	
15	EXTRA BALL LIMIT	5		47	GAME RESTART	YES	
16	‡ EXTRA BALL PERCENTAGE	25%		48	BILL VALIDATOR	NO	
17	GAME PRICING	USA 5		49	MUSIC VOLUME	1	
18	MATCH AWARD	CREDIT		50	BALL SAVE TIME	0:05	
19	MATCH PERCENTAGE	9%		51	UK POST SAVE	NO	
20	BALLS PER GAME	3		52	TIMED PLUNGER	OFF	
21	TILT WARNINGS	2		53	FLIPPER BALL LAUNCH	OFF	
22	CREDIT LIMIT	30		54	COINDOOR BALL SAVER	NO	
23	ALLOW HIGH SCORES	YES		55	COMPETITION MODE	NO	
24	GRAND CHAMPION SCORE	75,000,000		56	CONSOLATION BALL	YES	
25	HIGH SCORE #1 SCORE	55,000,000		57	FAST BOOT	YES	
26	HIGH SCORE #2 SCORE	40,000,000		58	Q24 OPTION	COIN METER	
27	HIGH SCORE #3 SCORE	30,000,000		59	TICKET DISPENSER	NO	
28	HIGH SCORE #4 SCORE	25,000,000		60	PLAYER COMPETITION	YES	
29	GRAND CHAMPION AWARD	CREDIT		61	TECH ALERT WARNING	NEVER	
30	HIGH SCORE #1 AWARD	CREDIT		62	TEAM SCORES	NO	
31	HIGH SCORE #2 AWARD	CREDIT		63	LOCATION ID	0	
32	HIGH SCORE #3 AWARD	CREDIT		64	GAME ID	0	

Factory Defaults Settings are subject to change during production (especially Standard Adjustments 2, 4, 5, 13, 15-16, 19, 24-28 & 50).
‡ *Not all Standard Adjustments are shown. Depending on the setting (whether Factory Default or if changed by the operator), associated adjustments do not appear, if not required.* **Note:** *If* **Game Dip Switch** *other than USA is installed, different Defaults will appear.*

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FEATURE ADJUSTMENT #1
NAME
SETTING
(INSTALLED/FACTORY DEFAULT)
FEATURE ADJUSTMENTS
GO TO ADJUSTMENTS MENU
FEATURE ADJUSTMENT 1

GO TO ADJUSTMENTS MENU: PRELIMINARY FEATURE ADJUSTMENTS (1-37)

To enter the **SERVICE MENU**, then enter the **FEATURE ADJUSTMENT MENU** to review or change a Feature Adjustment Setting, perform the below steps. *For adjustment definitions or summary, review Section 3, Chapter 4, GO TO ADJUSTMENTS MENU. See Section 3, Chapter 5, GO TO INSTALLS MENU, to easily change all adjustments required depending on the Install Type (Easy, Hard, 5-Ball, Home Play, etc.) desired.*

Step 1 Press **[Select]**. Press [BACK] to exit or escape at any time.

Step 2 Press **[>]**. Go to the "ADJ" *Icon.*
Press **[Select]**.

Step 3 Press **[>]**. Go to the "WPT" *Icon.*
Press **[Select]**.

Adjustment Number ➡
Adjustment Name ➡
Adjustment Setting ➡
Adjustment Comment ➡

FEATURE ADJUSTMENT #1
NAME
SETTING
(INSTALLED/FACTORY DEFAULT)

Step 4 **FEATURE ADJUSTMENT #1** appears with the Adjustment Name [DISABLE CARD DISPLAY] flashing. With the Adjustment Name flashing, press [<] [>] to move between adjustments.

Step 5: To change the Adjustment Setting, press **[SELECT]**. With the Adjustment Setting flashing, press [<] [>] repeatedly until the desired setting appears. Press the **[SELECT]** to "install" the change. The Adjustment Comment *(bottom text line)* will indicate **[INSTALLED/FACTORY DEFAULT]**, if the Factory Default Setting is selected *or* **[INSTALLED]** if the change is not the Factory Default Setting.

PRELIMINARY FEATURE ADJUSTMENTS (1-37)

Nr.	FEATURE ADJUSTMENT NAME	USA DEFAULT	YOUR SETTING	Nr.	FEATURE ADJUSTMENT NAME	USA DEFAULT	YOUR SETTING
1	DISABLE CARD DISPLAY	NO		19	SPIN-A-CARD DIFF	DISPLAY	
2	CITY ADVANCE DIFFICULTY	DISPLAY		20	SIDE POT DIFF	DISPLAY	
3	CITY EXTRA BALL DIFF	DISPLAY		21	ALL-IN MB DIFF	DISPLAY	
4	CITY EXTRA BALL MEMORY	YES		22	HURRYUP DIFF	DISPLAY	
5	HOLDEM DIFFICULTY	DISPLAY		23	POKER HAND MB DIFF	DISPLAY	
6	COMBO DIFFICULTY	DISPLAY		24	TRIPLE SCORING TIMER	DISPLAY	
7	DISABLE JAIL	NO		25	POKER CORNER TIMER	DISPLAY	
8	A-I-T-H MB LOCK DIFF	DISPLAY		26	BLIND TROPHY DIFF	DISPLAY	
9	A-I-T-H MB RELEASE DIFF	DISPLAY		27	BUTTON TROPHY DIFF	DISPLAY	
10	ACE-IN-THE-HOLE DIFF	DISPLAY		28	OUTS TROPHY DIFF	DISPLAY	
11	MAIN POT DIFFICULTY	DISPLAY		29	CHIP TROPHY DIFF	DISPLAY	
12	MYSTERY DIFFICULTY	DISPLAY		30	TELL TROPHY DIFF	DISPLAY	
13	MYSTERY EXBALL MEMORY	YES		31	GEAR TROPHY DIFF	DISPLAY	
14	MYSTERY SPECIAL MEMORY	YES		32	DISABLE LL DROP BANK	NO	
15	NO LIMIT MB LOCK DIFF	DISPLAY		33	DISABLE UL DROP BANK	NO	
16	NO LIMIT MB DIFF	DISPLAY		34	DISABLE MID DROP BANK	NO	
17	POKER CORNER DIFF	DISPLAY		35	DISABLE RIGHT DROP BANK	NO	
18	POKER HAND DIFF	DISPLAY		36	DISABLE LEFT POST	NO	
				37	DISABLE RIGHT POST	NO	

Factory Defaults Settings are subject to change during production
Note: *If **Game Dip Switch** other than USA is installed, different Defaults will appear.*

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GO TO AUDITS MENU: EARNINGS AUDITS (1-13) or STANDARD AUDITS (1-59)

To enter the **SERVICE MENU**, then enter the **EARNINGS** or **STANDARD AUDIT MENUS** to review the Earnings or Standard Audits, perform the below steps. *For audit definitions or summary, review Sec. 3, Chapter 3, GO TO AUDITS MENU.*

Step 1 Press **[Select]**. Press [BACK] to exit or escape at any time.

Step 2 Press [>]. Go to the "AUD" *Icon.*
Press **[Select]**.

Step 3 Press [>]. Go to the "EARN" or "S.P.I." *Icon.*
Press **[Select]**.

Step 4 Press [<] [>] to move between audits.

Audit Number ➔
Audit Name ➔
Audit Result ➔

```
EARNINGS AUDIT #1
TOTAL PAID CREDITS
         0
```

EARNINGS AUDITS (1-13) ▼

Nr.	EARNINGS AUDIT NAME	YOUR RESULT	Nr.	EARNINGS AUDIT NAME	YOUR RESULT	Nr.	EARNINGS AUDIT NAME	YOUR RESULT
01	TOTAL PAID CREDITS		06	COINS THRU RIGHT SLOT		11	TOTAL EARNINGS	
02	FREE GAME PERCENTAGE		07	COINS THRU CENTER SLOT		12	METER CLICKS	
03	AVERAGE BALL TIME		08	COINS THRU 4TH SLOT		13	SOFTWARE METER	
04	AVERAGE GAME TIME		09	COINS THRU 5TH SLOT				
05	COINS THRU LEFT SLOT		10	TOTAL COINS				

STANDARD AUDITS (1-59) ▼

Nr.	STANDARD AUDIT NAME	YOUR RESULT	Nr.	STANDARD AUDIT NAME	YOUR RESULT	Nr.	STANDARD AUDIT NAME	YOUR RESULT
01	TOTAL BALLS PLAYED		21	SCORE HISTOGRAM #5		41	RIGHT DRAINS	
02	TOTAL EXTRA BALLS		22	SCORE HISTOGRAM #6		42	TILTS	
03	EXTRA BALL PERCENTAGE		23	SCORE HISTOGRAM #7		43	TOTAL BALLS SAVED	
04	REPLAY 1 AWARDS		24	SCORE HISTOGRAM #8		44	LEFT FLIPPER USED	
05	REPLAY 2 AWARDS		25	SCORE HISTOGRAM #9		45	RIGHT FLIPPER USED	
06	REPLAY 3 AWARDS		26	SCORE HISTOGRAM #10		46	0-1 MINUTE GAMES	
07	REPLAY 4 AWARDS		27	SCORE HISTOGRAM #11		47	1-1.5 MINUTE GAMES	
08	TOTAL REPLAYS		28	SCORE HISTOGRAM #12		48	1.5-2 MINUTE GAMES	
09	REPLAY PERCENTAGE		29	SCORE HISTOGRAM #13		49	2-2.5 MINUTE GAMES	
10	TOTAL SPECIALS		30	SCORE HISTOGRAM #14		50	2.5-3 MINUTE GAMES	
11	SPECIAL PERCENTAGE		31	SCORE HISTOGRAM #15		51	3-3.5 MINUTE GAMES	
12	TOTAL MATCHES		32	SCORE HISTOGRAM #16		52	3.5-4 MINUTE GAMES	
13	HIGH SCORE AWARDS		33	SCORE HISTOGRAM #17		53	4-5 MINUTE GAMES	
14	HIGH SCORE PERCENT		34	AVERAGE SCORES		54	5-6 MINUTE GAMES	
15	TOTAL FREE PLAYS		35	SERVICE CREDITS		55	6-8 MINUTE GAMES	
16	TOTAL PLAYS		36	BALL SEARCH STARTED		56	8-10 MINUTE GAMES	
17	SCORE HISTOGRAM #1		37	LOST BALL FEEDS		57	10-15 MINUTE GAMES	
18	SCORE HISTOGRAM #2		38	LOST BALL GAME STARTS		58	15+ MINUTE GAMES	
19	SCORE HISTOGRAM #3		39	LEFT DRAINS		59	RECENT REPLAY PERCENT	
20	SCORE HISTOGRAM #4		40	CENTER DRAINS				

Note: *Audits are subject to change (with or without notice).*

DR. 12

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GO TO AUDITS MENU: FEATURE AUDITS (1-164)

To enter the **SERVICE MENU**, then enter the **FEATURE AUDIT MENUS** to review the Feature Audits, perform the below steps. *For audit definitions or summary, review Section 3, Chapter 3, GO TO AUDITS MENU.*

Step 1 Press **[Select]**. Press [BACK] to exit or escape at any time.

Step 2 Press [>]. Go to the "AUD" *Icon.*
Press **[Select]**.

Step 3 Press [>]. Go to the "WPT" *Icon.* Press **[Select]**.

Step 4 Press [<] [>] to move between audits.

Audit Number ➝
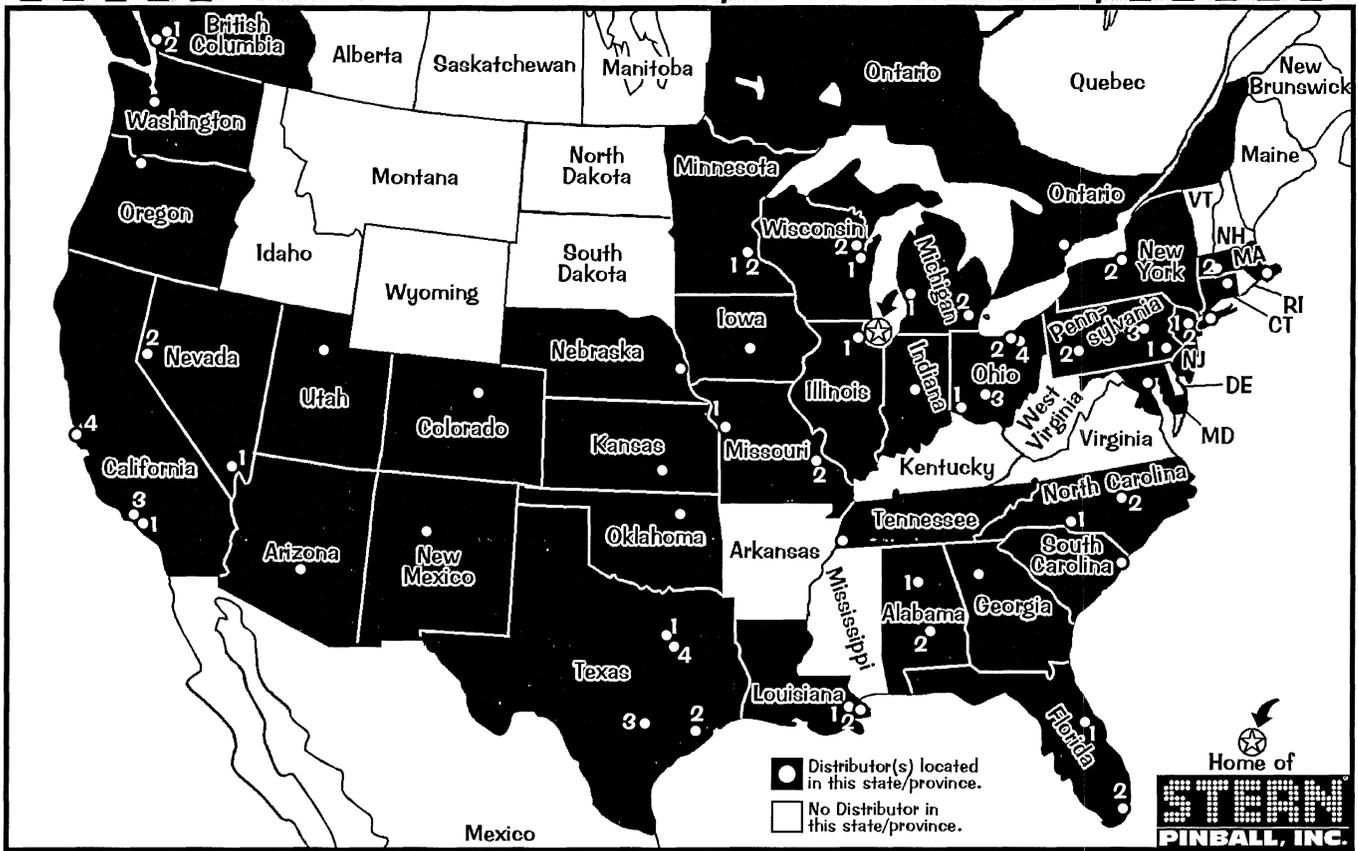Audit Name ➝
Audit Result ➝

FEATURE AUDIT #1
NAME
RESULT

FEATURE AUDITS (1-164)

Nr.	FEATURE AUDIT NAME	YOUR RESULT	Nr.	FEATURE AUDIT NAME	YOUR RESULT	Nr.	FEATURE AUDIT NAME	YOUR RESULT	Nr.	FEATURE AUDIT NAME	YOUR RESULT
01	LEFT OUTLANES		42	HUPS...DRAINED		83	PKR HAND CARDS		124	CHIP TRICKS	
02	LEFT INLANES		43	JAIL BAR HITS		84	SHARPSHTR CARDS		125	UNQ CHIP TRICKS	
03	LEFT SLINGSHOTS		44	JAIL BAR RAISED		85	PkR HAND - 1 PAIR		126	CHIP TRCK TOTAL X	
04	RT SLINGSHOTS		45	J'L BALLS LOCKED		86	HAND - 2 PAIR		127	CHP TRCKS CMPLTD	
05	RIGHT INLANES		46	JAIL BALL HITS		87	HAND - 3/KIND		128	POKER CORNER LIT	
06	RIGHT OUTLANES		47	A/H MB STARTED		88	HAND - STRAIGHT		129	BLINDS STARTED	
07	LEFT REBOUND		48	A/H MB +2 STARTED		89	HAND - FLUSH		130	BLINDS - SM BLINDS	
08	LIGHT LOCK TRGT		49	A/H BAR HITS		90	HAND - FULL HOUSE		131	BLNDS - BIG BLINDS	
09	RIGHT REBOUND		50	A/H BARS RAISED		91	HAND - 4/KIND		132	BLINDS TROPHIES	
10	LEFT ORBITS		51	A/H BALLS LOCKED		92	HAND - STR FLUSH		133	BLINDS TOTAL PNTS	
11	LOOPING LT ORBIT		52	A/H INSTNT LOCKS		93	HAND - ROYAL FLSH		134	P.T. BTTN STARTED	
12	LEFT RAMPS		53	A/H BALL HITS		94	HAND MB STARTS		135	BTN - BTN SHOTS	
13	LEFT VUKS		54	A/H BALL RELEASES		95	HAND MB 2+ STARTS		136	BTN - OTHER SHOTS	
14	POP EJECT SHOTS		55	A/H AUTO R'LEASES		96	PHMB 1X JACKPOTS		134	BTN - TROPHIES	
15	POP EJECT R'BCKS		56	A/H JACKPOTS		97	PHMB 2X JACKPOTS		135	BTN - TOTAL POINTS	
16	RIGHT RAMPS		57	A/H 3X JACKPOTS		98	PHMB 3X JACKPOTS		136	KNOW YOUR OUTS	
17	RIGHT ORBITS		58	A/H SUPER JP LIT		99	PHMB 6X JACKPOTS		140	OUTS - DROPS HIT	
18	LEFT BANK DROPS		59	A/H SUPER JPS		100	PHMB 9X JACKPOTS		141	OUTS - DROPS CMP	
19	MID BANK DROPS		60	A/H TOTAL POINTS		101	PHMB SUPER JP LIT		142	OUTS TROPHIES	
20	RT BANK DROPS		61	HLDEM DEALT FLOP		102	PHMB SUPER JPS		143	OUTS TOTAL PNTS	
21	LT SPINNER SPINS		62	HLDEM DEALT TURN		103	PHMB 3X SPR JPS		144	CHIP & A CHAIR STR	
22	RT SPINNER SPINS		63	HLDM DEALT RIVER		104	PHMB TOTAL PNTS		145	CHIPS - DROPS HIT	
23	POP HITS		64	HLDEM - HIGH CARD		105	NL MB LOCKS LIT		146	CHIPS TROPHIES	
24	TRIPLE POP HITS		65	HOLDEM - 1 PAIR		106	NL MB LOCK 1		147	CHIPS TOTAL PNTS	
25	POP STANDUPS		66	HOLDEM - 2 PAIR		107	NL MB LOCK 2		148	CHNGE GEARS STR	
26	POP S-U COMPLTD		67	HOLDEM - 3/KIND		108	NL MB STARTS		149	- LOW GEAR SHOTS	
27	UPF LEFT LANE		68	HLDEM - STRAIGHT		109	NL MB 2+ STARTS		150	- HIGH GEAR SHOTS	
28	UPF STANDUPS		69	HOLDEM - FLUSH		110	NLMB 1X J'POT LIT		151	GEARS TROPHIES	
29	UPF JAIL BASH		70	HLDM - FULL HOUSE		111	NLMB 2X J'POT LIT		152	GEARS TOTAL PNTS	
30	UPF JAIL HOLE		71	HOLDEM - 4/KIND		112	NLMB 3X J'POT LIT		153	SPOT THE TELL STR	
31	UPF SCOOPS		72	HLDEM - STR FLUSH		113	NLMB J'POT INCRSD		154	TELL - SPOTTED	
32	UPF RIGHT RAMPS		73	HLDM - ROYAL FLSH		114	NLMB DRPS CMPLTD		155	TELL - MISSED	
33	UPF DRAINS		74	EARNED 1 CITY		115	NLMB 1X JACKPOTS		156	TELL TROPHIES	
34	SKL SHOT STARTS		75	EARNED 2 CITIES		116	NLMB 2X JACKPOTS		157	TELL TOTAL POINTS	
35	SS - HOLDEM		76	EARNED 3 CITIES		117	NLMB 3X JACKPOTS		158	P.C. WIZARD MODE	
36	SS - MYSTERY		77	EARNED 4 CITIES		118	NLMB 6X JACKPOTS		159	MYSTERY LIT	
37	SS - SKILL FLIP		78	EARNED 5 CITIES		119	NLMB 9X JACKPOTS		160	MYSTERY CLLCTD	
38	FLIP SHOT MADE		79	EARNED 6 CITIES		120	NLMB TTL POINTS		161	X3 SCORING LIT	
39	UPF HURRYUPS ...		80	WPT CHAMPIONSHIP		121	SIDE POTS		162	X3 SCORING STRTD	
40	HUPS... INCREASED		81	ALL-IN MB STARTS		122	SPIN-A-CARD LIT		163	BONUS X ADV	
41	HUPS...AWARDED		82	ALL-IN MB 2+ STRTS		123	SPN-A-CRD CLCTD		164	BONUS X MAX AWD	

Note: *Audits are subject to change (with or without notice).*

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DR. **13**

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Washington

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Oregon

Idaho

South Dakota | Wisconsin | Michigan | New York | VT NH MA RI CT

Wyoming

Iowa | Pennsylvania | NJ

Nevada

Utah | Colorado | Nebraska | Illinois | Indiana | Ohio | West Virginia | DE

California | Kansas | Missouri | Kentucky | Virginia | MD

Arizona | New Mexico | Oklahoma | Arkansas | Tennessee | North Carolina | South Carolina

Texas | Mississippi | Alabama | Georgia

Louisiana | Florida

Mexico

■ Distributor(s) located in this state/province.
□ No Distributor in this state/province.

Home of

STERN
PINBALL, INC.

▲▲▲▲▲▲▲▲▲ International Distributors Map ▲▲▲▲▲▲▲▲▲▲

(Alaska) | (Yukon)

(B.C.)

United Kingdom | Netherlands | Norway | Sweden | Finland

Denmark
Germany
Moscow, Russia
Austria
Switzerland

Belgium
France

Portugal | Spain | Italy

Port Elizabeth, South Africa

Australia

New Zealand

■ Distributor(s) located in this country.
□ No Distributor in this country.

STERN
PINBALL, INC.
PARTS SALES & TECHNICAL SUPPORT

For *Parts & Service*, call your nearest Distributor. View the above maps & the directories on the next page to locate your closest Distributor in your state, province, or country. Distributors and phone numbers are subject to change. Call **Stern® Pinball, Inc.** *(Parts Sales & Technical Support)* with any questions or if your Distributor cannot help you: **1-800-542-5377** (in **USA** or **Canada**) or **1-708-786-5466**. Visit us at www.SternPinball.com for current Distributor Information & other pinball needs.

DR. ❶❹

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//// Domestic Pinball & Redemption Distributors Directory ////

ALABAMA

Birmingham Vending
Birmingham (1)
1-205-324-7526

Franco Distributing
Montgomery (2)
1-334-834-3455

ARIZONA

Betson West
Phoenix
1-480-380-8857

Mountain Coin
Phoenix
1-602-269-7596

CALIFORNIA

Betson West
Buena Park (1)
1-714-228-7500

So. San Francisco (2)
1-650-952-4220

C.A. Robinson
Los Angeles (3)
1-323-735-3001

San Francisco (4)
1-650-871-4280

COLORADO

Mountain Coin
Denver
1-303-427-2133

CONNECTICUT

TDM Distributing
Williamantic
1-860-423-1403

FLORIDA

Birmingham Vending
Orlando (1)
1-407-425-1505

Brady Distributing
Miami [Miramar] (2)
1-954-874-1100

Orlando (1)
1-407-872-1666

GEORGIA

Greater Southern Dist.
Smyrna
1-770-803-3040

ILLINOIS

American Vending
Elk Grove Village
1-847-439-9400

Atlas Dist. International
Elk Grove Village
1-847-952-7500

IOWA

Greater America Dist.
Johnston
1-515-278-4455

Moss Distributing
Des Moines
1-515-266-6422

INDIANA

Atlas Dist. International
Indianapolis
1-317-786-6892

Shaffer Distributing
Indianapolis
1-317-899-2530

KANSAS

United Dist., Inc.
Wichita
1-316-263-6181

LOUISIANA

AMA Distributors, Inc.
Metairie (1)
1-504-835-3232

Parts & Service Only:
New Orleans Novelty
New Orleans (2)
1-504-888-3500

MARYLAND

Betson Enterprises
Baltimore
1-410-646-4100

Parts & Service Only:
Weiner Distributing
Baltimore
1-410-525-2600

MASSACHUSETTS

Betson Ent. (NECO)
Norwood (1)
1-781-769-9760

Gekay Sales
E. Longmeadow (2)
1-413-525-2700

MICHIGAN

Atlas Dist. International
Wyoming (1)
1-616-241-1472

Shaffer Distributing
Livonia (2)
1-734-432-1040

MINNESOTA

Lieberman Music
Minneapolis (1)
1-952-887-5299

Moss Distributing
Eagan (2)
1-612-798-8030

MISSOURI

Greater America Dist.
Kansas City (1)
1-816-531-4300

Moss Distributing
Kansas City (1)
1-816-231-6600

Shaffer Distributing
St. Louis (2)
1-314-645-3393

NEBRASKA

Central Dist.
Omaha
1-402-493-5600

Greater America Dist.
Omaha
1-402-553-2812

NEVADA

Mountain Coin
Las Vegas (1)
1-702-798-0900

Reno Game Sales
Reno (2)
1-775-829-2080

NEW JERSEY

Betson Enterprises
Carlstadt (1)
1-201-438-1300

Jack Guarnieri
Service Co., Inc.
(Pinballsales.com)
Lakewood (2)
1-732-364-9900

NEW MEXICO

Mountain Coin
Albuquerque
1-505-345-7706

NEW YORK

Betson Enterprises
New Hyde Park (2)
1-516-354-4647

Syracuse (3)
1-315-437-2400

Parts & Service Only:
Bay Coin
Richmond Hill (1)
1-718-291-5757

NORTH CAROLINA

Brady Distributing
Charlotte (1)
1-704-357-6284

Parts & Service Only:
Operators Distributing
Archdale (2)
1-336-884-5714

OHIO

Atlas Dist. International
Cincinnati (1)
1-513-851-4100

Cleveland Coin
Cleveland (2)
1-216-692-0960

Shaffer Distributing
Columbus (3)
1-614-421-6800

Valley View (4)
1-216-447-4486

OKLAHOMA

Galaxy Distributing
Tulsa
1-918-835-1166

OREGON

Betson West
Portland
1-503-772-4567

Mountain Coin
Portland
1-503-234-5491

Specialty Coin Products
Portland
1-503-786-9200
Toll-Free
1-800-987-4946

PENNSYLVANIA

Betson Enterprises
King Of Prussia (1)
1-610-265-1155

Pittsburgh (2)
1-412-331-8703

Superior Amusements
Wilkes-Barre (3)
1-570-824-9994

Shaffer Distributing
Pittsburgh (2)
1-412-920-1300

SOUTH CAROLINA

Parts & Service Only:
Green Coin
Mrytle Beach
1-843-626-1900

TENNESSEE

Brady Distributing
Memphis
1-901-345-7811

Parts & Service Only:
Green G.A.M.E.S.
Memphis
1-901-353-1000

TEXAS

Amusement Distributors
San Antonio (3)
1-210-225-3844

Betson Texas
Dallas (1)
1-214-638-4900

Commercial Music
Dallas (1)
1-214-741-6381

Discount Arcade Games
Crowley (1)
1-817-297-0440

H.A. Franz, & Co.
Houston (2)
1-713-523-7366

San Antonio (3)
1-210-226-6322

Master Sales
Corsicana (4)
1-903-874-4740

UTAH

Mountain Coin
Salt Lake City
1-801-262-5494

Struve Distributing
Salt Lake City
1-801-328-1636

WASHINGTON

Mountain Coin
Auburn (Seattle)
1-206-682-5700

WISCONSIN

Pioneer Sales & Svc.
Green Bay (1)
1-920-336-5800

Menomonee Falls (2)
1-262-781-1420

Lieberman/Viking Vend.
Menomonee Falls (2)
1-262-703-4168

CANADA

ONTARIO

Starburst Coin Mach.
Toronto
1-416-251-2122

BRITISH COLUMBIA

Parts & Service Only:
Can. Coin Machine
Burnaby (1)
1-604-420-4008

Parts & Service Only:
Pacific Vending
Vancouver (2)
1-604-324-2164

Note: For states and Canadian Provinces which do not have Distributors, call the neighboring state or province with the city closest to you (indicated with a white dot). States or Provinces with more than 1 city containing a distributor are numbered. View the map on the previous page.

Note: Distributors are subject to change. Visit us at www.SternPinball.com for current Distributor Information.

▲▲▲▲▲▲▲ International Distributors Directory ▲▲▲▲▲▲▲▲

AUSTRALIA

Amusement Mach. Dist.
Matraville
[61] 2931-6-6000

AUSTRIA

Parts & Service Only:
R. Rupp
Leibnitz
[43] 3452-8-6105

BELGIUM

NAMUSCO
Brussels
[32] 2414-4596

DENMARK

JK Automater A/S
Thisted
[45] 9792-0925

ENGLAND

see UNITED KINGDOM

FINLAND

Pelika net Oy
Vantaa
[35] 8 (0) 9-290-450

FRANCE

Avranches Automatic
Ducey
[33] 2338-9-6162

SFA
Paris
[33] 1532-6-8080

GERMANY

ADP Gauselmann
Espelkamp
[49] 5741-27-3384

Bergmann Int'l Gaming
Rellingen
[49] 4101-3-0240

Witten
[49] 2302-28-2540

GERMANY CONTINUED

Merkur Gaming GmbH
Espelkamp
[49] 5741-273-520

HOLLAND

see THE NETHERLANDS

ITALY (RSM)

Tecnoplay S.A.
San Marino
[39] 5499-0-1508

JAPAN

HIC, Inc.
Chiba-Ken
[04] 7176-4040

THE NETHERLANDS

JVH Gaming Products
Tilburg
[31] 1359-5-3200

NEW ZEALAND

Coin Cascade Ltd.
Christchuch
[64] 3338-1411

Parts & Service Only:
Amco Machine Supplies
Auckland
[64] 9846-7606

NORWAY

Parts for Pinballs
Sandefjord
[47] 9242-1402

Vendcomatic
Oslo
[47] 2291-8383

PORTUGAL

Jacinto & Martins, S.A.
Belas
[35] 1214-32-5624 or
[35] 1214-32-5638

RUSSIA

O.D.A. Game Machines
Moscow
[095] 219-2949 or
[095] 219-8917

SOUTH AFRICA

K & W Amusements
Port Elizabeth
[27] 4148-4-3344 or
[27] 4148-4-2940

SPAIN

Comercial Cocamatic
Coslada (Madrid)
[34] 9167-1-6980

SWEDEN

Bjuvia Fritid AB
Bjuv
[46] 4238-6900

SWITZERLAND

Novomat, A.G.
Harkingen
[41] 6238-8-8961

UNITED ARAB EMIRATES

Warehouse of Games
Dubai
[97] 1-4881-8431

UNITED KINGDOM

Electrocoin
London, England
[44] 2089-65-2055

Parts & Service Only:
Electrocoin Aftersales
Cardiff, S. Glamorgan
[44] 2920-45-0345

Note: From inside the US, use prefix 011-.

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WORLD POKER TOUR™

DR. 15

⚠️ This game **must be connected to a properly grounded outlet to reduce shock hazard** & insure proper game operation. *See Sec. 5, Schematics & Troubleshooting, Chp. 3, Cabinet Wiring (Transformer Power Wiring), for transformer connections required for* **Normal, High,** *and* **Low Line** *conditions.*

Normal Line:	110v AC - 125v AC @ 60Hz	
Domestic use an 8AMP 250v Slo-Blo Fuse.	**AVG OPERATION**	**MAX OPERATION**
	CURRENT: **2.8AMP**	CURRENT: **8AMP**
	WATTAGE: **329w**	WATTAGE: **940w**
High Line:	218v AC - 240v AC @ 50Hz	
Export use 2x 5AMP 250v Slo-Blo Fuses. (*England & Hong Kong use an 8AMP 250v S/B Fuse.)	**AVG OPERATION**	**MAX OPERATION**
	CURRENT: **1.8AMP**	CURRENT: **5AMP** | **8AMP*** — England & Hong Kong use an 8A Fuse.
	WATTAGE: **412w**	WATTAGE: **1145w** | **1832w***
Low Line:	95v AC - 108v AC @ 50Hz / 60Hz	
Export Japan Only use an 8AMP 250v Slo-Blo Fuse.	**AVG OPERATION**	**MAX OPERATION**
	CURRENT: **2.6AMP**	CURRENT: **8AMP**
	WATTAGE: **264w**	WATTAGE: **812w**

TRANSPORTATION \\\\\\\\ GAME DIMENSIONS \\\\\\\\

BEFORE TRANSPORTING

SECURE BACKBOX

To reduce the possibility of damage, observe **ALL** precautions whenever transporting the game.

Read & follow Section 1, Chapter 1, **Pinball Game Set-Up Procedures,** *and* **How to Secure the Backbox for Transporting.** Remove the legs and secure the game within the transporting vehicle.
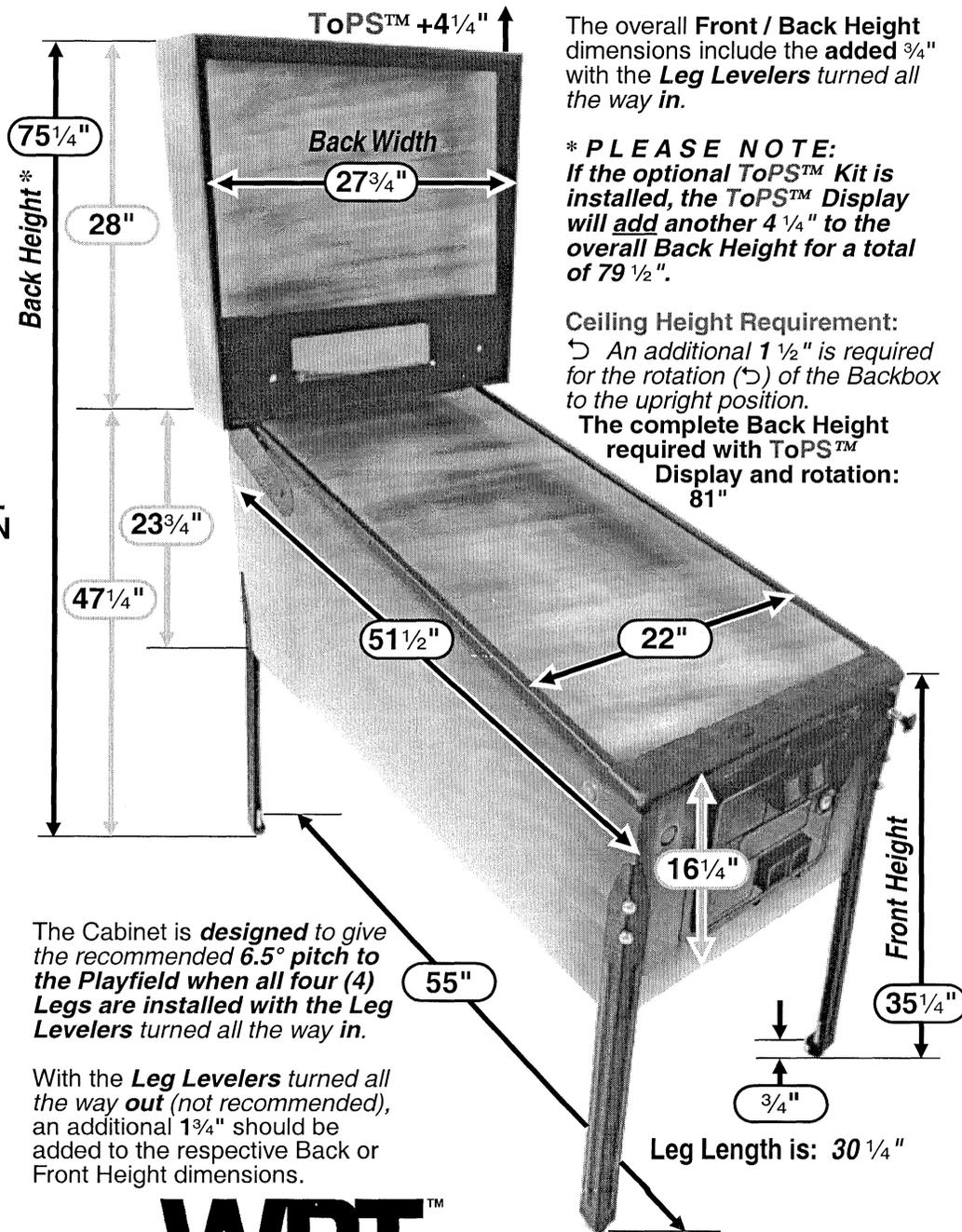
SAVE AND RETAIN ALL PRINTED INFORMATION INSIDE THE CABINET!

Shipping Box Dimensions

Height 56" Width 31"
Depth 31"
Approx. Unboxed Weight:
270lbs. (+/- 10)
Boxed Weight:
Wt. 290lbs. (+/- 5)

C A U T I O N

At least 2 people are required to move and maneuver this game. Use proper moving equipment & extreme care while handling!

DR. **16**

ToPS™ +4¼" ↑

75¼"

Back Width
27¾"

28"

Back Height *

23¾"

47¼"

51½"

22"

16¼"

55"

Front Height

35¼"

¾"

Leg Length is: *30 ¼"*

The Cabinet is **designed** to give the recommended **6.5° pitch** to the **Playfield when all four (4) Legs are installed with the Leg Levelers** turned all the way **in.**

With the **Leg Levelers** turned all the way **out** *(not recommended),* an additional 1¾" should be added to the respective Back or Front Height dimensions.
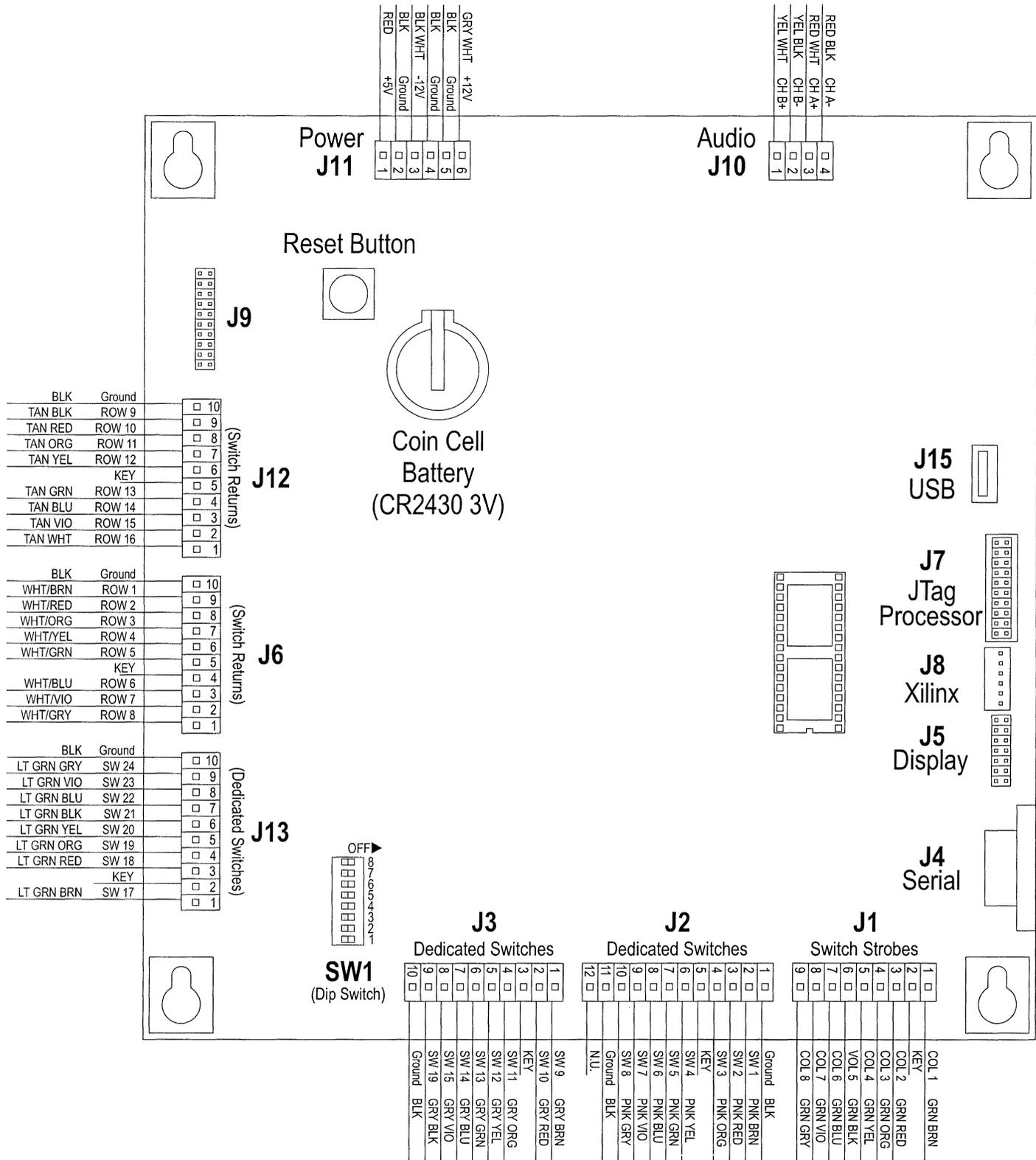
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The overall **Front / Back Height** dimensions include the added ¾" with the **Leg Levelers** turned all the way **in.**

* **P L E A S E   N O T E:**
If the optional ToPS™ Kit is installed, the ToPS™ Display will add another 4 ¼" to the overall Back Height for a total of 79 ½".

Ceiling Height Requirement:
↻ *An additional 1 ½" is required for the rotation (↻) of the Backbox to the upright position.*
The complete Back Height required with ToPS™ Display and rotation: 81"

Find-It-In-Front: ✚
Dr. Pinball

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SCHEMATICS

CPU/SOUND BOARD (S.A.M.)
520-5246-00

Power J11

RED	+5V	1
BLK	Ground	2
BLK WHT	-12V	3
BLK	Ground	4
BLK	Ground	5
GRY WHT	+12V	6

Audio J10

YEL WHT	CH B+	1
YEL BLK	CH B-	2
RED WHT	CH A+	3
RED BLK	CH A-	4

Reset Button

J9

Coin Cell Battery (CR2430 3V)

J15 USB

J7 JTag Processor

J8 Xilinx

J5 Display

J4 Serial

J12 (Switch Returns)

BLK	Ground	
TAN BLK	ROW 9	10
TAN RED	ROW 10	9
TAN ORG	ROW 11	8
TAN YEL	ROW 12	7
	KEY	6
TAN GRN	ROW 13	5
TAN BLU	ROW 14	4
TAN VIO	ROW 15	3
TAN WHT	ROW 16	2
		1

J6 (Switch Returns)

BLK	Ground	
WHT/BRN	ROW 1	10
WHT/RED	ROW 2	9
WHT/ORG	ROW 3	8
WHT/YEL	ROW 4	7
WHT/GRN	ROW 5	6
	KEY	5
WHT/BLU	ROW 6	4
WHT/VIO	ROW 7	3
WHT/GRY	ROW 8	2
		1

J13 (Dedicated Switches)

BLK	Ground	
LT GRN GRY	SW 24	10
LT GRN VIO	SW 23	9
LT GRN BLU	SW 22	8
LT GRN BLK	SW 21	7
LT GRN YEL	SW 20	6
LT GRN ORG	SW 19	5
LT GRN RED	SW 18	4
	KEY	3
LT GRN BRN	SW 17	2
		1

SW1 (Dip Switch) OFF ▶ 8 7 6 5 4 3 2 1

J3 Dedicated Switches

Pin	Signal	Wire
10	Ground	BLK
9	SW 19	GRY BLK
8	SW 15	GRY VIO
7	SW 14	GRY BLU
6	SW 13	GRY GRN
5	SW 12	GRY YEL
4	SW 11	GRY ORG
3	KEY	
2	SW 10	GRY RED
1	SW 9	GRY BRN

J2 Dedicated Switches

Pin	Signal	Wire
12	N.U.	
11	Ground	BLK
10	SW 8	PNK GRY
9	SW 7	PNK VIO
8	SW 6	PNK BLU
7	SW 5	PNK GRN
6	SW 4	PNK YEL
5	KEY	
4	SW 3	PNK ORG
3	SW 2	PNK RED
2	SW 1	PNK BRN
1	Ground	BLK

J1 Switch Strobes

Pin	Signal	Wire
9	COL 8	GRN GRY
8	COL 7	GRN VIO
7	COL 6	GRN BLU
6	COL 5	GRN BLK
5	VOL 5	GRN YEL
4	COL 4	GRN ORG
3	COL 3	GRN RED
2	COL 2	
1	KEY	GRN BRN
	COL 1	GRN BRN

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Printed Circuit
Boards (PCBs)

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Section 5, WPT
Page 3

J11
- BLK/ORG 03
- BLK/YEL 04
- YEL/BLK 40

J10
1		YEL/BLK 40
2		BLK 00
3		KEY
4		BLK 00
5		BLK 00
6		RED/YEL 24
7		RED/YEL 24
8		VIO/YEL 74
9		YEL/VIO 47
10		YEL/VIO 47

J17
- 9 BLU/WHT 69
- 8 BLU/WHT 69
- 7 RED/WHT 29
- 6 WHT/RED 92
- 5 GRY/WHT 89
- 4 RED 22
- 3 GRY/GRN 85
- 2 GRY 88
- 1 RED 22

J16
1		BLK/WHT 09
2		GRY/WHT 89
3		GRY/RED 82
4		RED 22
5		RED 22
6		RED 22
7		RED 22
8		RED 22
9		BLK 00
10		BLK 00
11		BLK 00
12		BLK 00
13		BLK 00
14		KEY
15		BLK 00

J12
	12	N.C.
22 RED	11	
29 RED/WHT	10	
28 RED/GRY	9	
27 RED/VIO	8	KEY
26 RED/BLU	7	
25 RED/GRN	6	
24 RED/YEL	5	
23 RED/ORG	4	
20 RED/BLK	3	
21 RED/BRN	2	
	1	

J9
37 ORG/VIO	9	
38 ORG/GRY	8	
60 BLU/BLK	7	
65 BLU/GRN	6	
64 BLU/YEL	5	
63 BLU/ORG	4	KEY
62 BLU/RED	3	
61 BLU/BRN	2	
	1	

J8
18 BRN/GRY	9	
17 BRN/VIO	8	
16 BRN/BLU	7	
15 BRN/GRN	6	
14 BRN/YEL	5	
13 BRN/ORG	4	
12 BRN/RED	3	KEY
10 BRN/BLK	2	
	1	

J7
78 VIO/GRY	10	
70 VIO/BLK	9	
76 VIO/BLU	8	
75 VIO/GRN	7	
74 VIO/YEL	6	KEY
73 VIO/ORG	5	
72 VIO/RED	4	
71 VIO/BRN	3	
11 BRN	2	
	1	

J6
33 ORG	10	
	9	KEY
08 BLK/GRY	8	
07 BLK/VIO	7	
06 BLK/BLU	6	
05 BLK/GRN	5	
04 BLK/YEL	4	
03 BLK/ORG	3	
02 BLK/RED	2	
01 BLK/BRN	1	

J13
- 10 66 BLU (18 GA)
- 9 41 YEL/BRN
- 8 42 YEL/RED
- 7 43 YEL/ORG
- 6 40 YEL/BLK
- 5 45 YEL/GRN
- 4 46 YEL/BLU
- 3 47 YEL/VIO
- 2 KEY
- 1 48 YEL/GRY

J14
- 9 77 VIO (18 GA)
- 8 55 GRN (18 GA)
- 7 44 YEL (18 GA)
- 6 19 BRN/WHT (18 GA)
- 5 KEY
- 4 97 WHT/VIO (18 GA)
- 3 95 WHT/GRN (18 GA)
- 2 94 WHT/YEL (18 GA)
- 1 91 WHT/BRN (18 GA)

J14 (right block)
- 44 YEL (14 GA)
- 44 YEL (14 GA)
- 49 YEL/WHT (14 GA)
- 49 YEL/WHT (14 GA)
- 49 YEL/WHT (14 GA)

J15

J2 / J3

PNK/WHT P9	BLU/WHT 69	GRN/WHT 59	BRN/WHT 19	PNK PP	GRY 88	VIO 77	BLU 66	YEL 44	GRN 55	ORG 33	BRN 11
12	11	10	9	8	7	6	5	4	3	2	1

ORG/WHT 39	ORG/GRY 38	ORG/VIO 37	ORG/BLU 36	ORG/GRN 35	ORG/YEL 34	KEY	ORG/BLK 30	ORG/RED 32	ORG/BRN 31
10	9	8	7	6	5	4	3	2	1

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STERN PINBALL, INC.

I/O POWER DRIVER BOARD

| 520-5249-00 | Rev A 5/20/2005 | Page 1 of 4 |

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STERN PINBALL, INC.
I/O POWER DRIVER BOARD

| 520-5249-00 | Rev A 5/20/2005 | Page 2 of 4 |

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STERN PINBALL, INC.

I/O POWER DRIVER BOARD

520-5249-00	Rev A 5/20/2005	Page 3 of 4

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STERN PINBALL, INC.

I/O POWER DRIVER BOARD

520-5249-00	Rev A	Page 4 of 4
	5/20/2005	

WORLD POKER TOUR™

Display Power Supply Board Schematic

Display Power Supply Board Component Layout & Parts
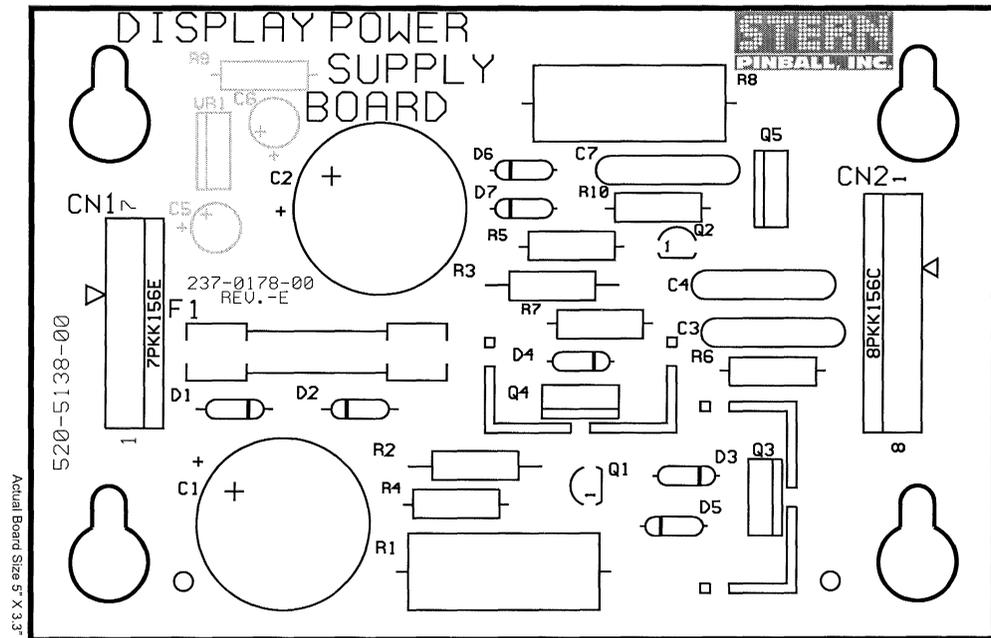
ITEM	QTY	PART NUMBER	REF-DESIGNATOR	DESCRIPTION (NS = Not Stuffed)
—	1	520-5138-00	Display Power Supply Board	Complete PCB Assembly
01	2	125-5044-00	C1, C2	220uF, 200v, Radial Lytic Cap.
02	3	125-5035-00	C3, C4, C7	0.1uF, 500v, Ceramic Disk Cap.
03	0	125-5003-00	(C5, C6: NS)	22uF, 35v, Rad Lytic Cap
04	1	045-5015-07	CN1	7PKK156E (PIN5=KEY)
05	1	045-5015-08	CN2	8PKK156 (PIN3=KEY)
06	2	112-5003-00	D1, D2	1N4004, Diode
07	2	112-5003-00	D3, D4	1N5228, 3.9v, Diode
	1	112-0062-00	D5	1N4760A, 68v, Diode
	1	112-0049-00A	D6	1N4764A, 100v, Diode
	1	112-0061-00	D7	1N4743, 13v, Diode
	1	200-5000-17	F1	3/4A (0.75A) S.B. Fuse
	2	205-0004-00	F1	Fuse Clip
	1	110-0100-00	Q1	MPSA92, Transistor
	1	110-0082-00	Q2	MPSA42, Transistor
	2	110-0101-00	Q3, Q5	MJE15030, Transistor
	2	535-5000-11	Q3, Q4	Heatsinks - AAVID #563002
	2	240-5008-00	Q3, Q4	#6-32 KEPS Nut
	2	237-5501-00	Q3, Q4	#6-32 X 3/8" PPH Screw
	1	110-0103-00	Q4	MJE15031, Transistor
	1	121-5061-00	R1	130 Ω 5W Res.
	2	121-5060-00	R2, R3	47K Ω 1W Res.
	3	121-5038-00	R4, R5, R10	1.5K Ω 1/2W Res. (R9: NS)
	2	121-5059-00	R6, R7	330K Ω 1/2W Res.
	1	121-5062-00	R8	2K Ω 5W Res.
	0	124-5003-00	(VR1: NS)	7812CT

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Trough Up-Kicker Dual OPTO Boards Theory of Operation & Schematic

As light from the **Transmitter LED1** falls on the **Receiver LED1**, it generates a Positive Bias Voltage (0.7v to 1.5v) which is applied to the **Gate (G)** of **Q1 (Fet 2N5460)** turning **Q1** off. When **Q1** is held off, no current flows through **Q2's (2N3906) Base (B)**. With no *base current,* **Q2** is off and acts as an *OPEN SWITCH.* When the light is interrupted *(BLOCKED)* **R1** (Rec. Bd.) bleeds the gate voltage off of **Q1** allowing it to conduct, switching **Q2** on, which acts as a *CLOSED SWITCH.* The **LED2 (Trans/Rec) Circuit** operates identical as the **LED1 Circuit.**

520-5173-00 Transmitter | **520-5174-00 Receiver**

⇉ = Emitting Light

| G=Gate | D=Drain | S=Source |
| B=Base | E=Emitter | C=Collector |
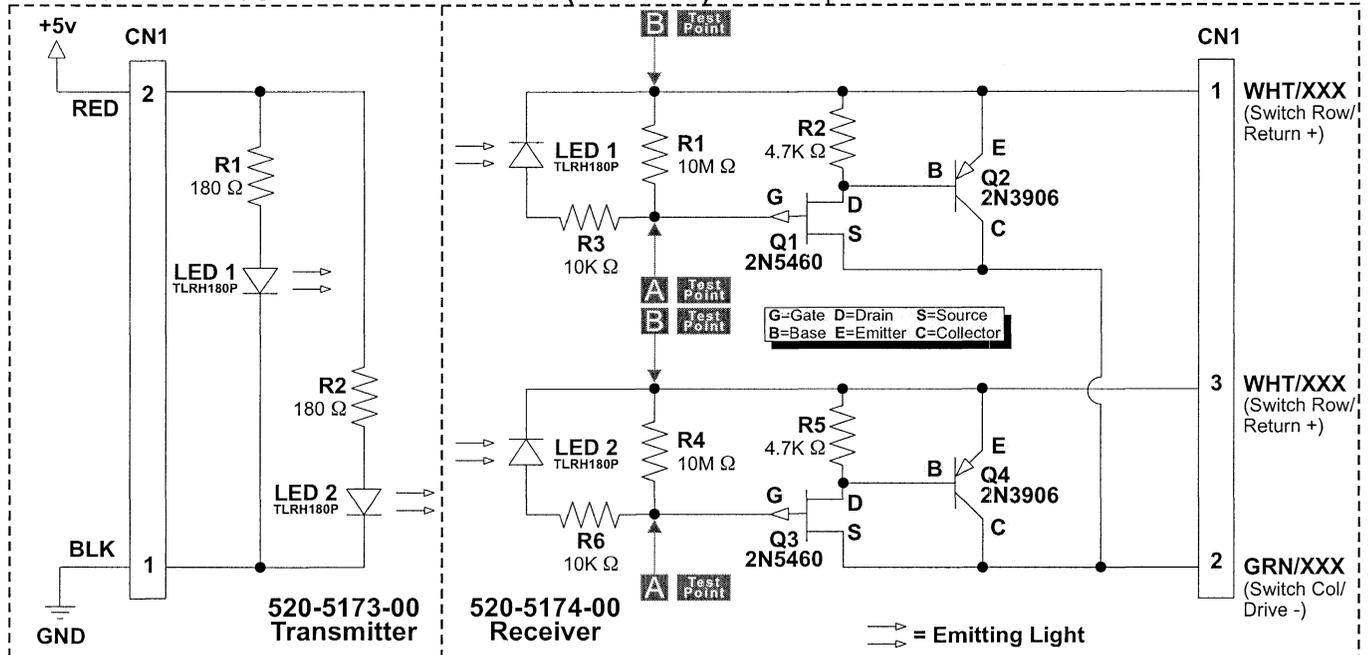
Trough Up-Kicker Dual OPTO Boards Component Layout & Parts

520-5173-00 (TRANS)   **Boards Actual Size**   **520-5174-00 (REC)**
(Screened Text Printed Larger for Clarity)

Front Side (LEDs & 2-Pin Connector) | **Back Side** (Solder / Surface Mounts) | **Back Side** (Solder / Surface Mounts) | **Front Side** (LEDs & 3-Pin Connector)

ITEM	QTY	PART NUMBER	REF-DESIGNATOR	DESCRIPTION
A	1	515-0173-00	Dual-OPTO Trans. Bd. Assy.	PCB Assy. (with all **Items 1-5**)
—	1	520-5173-00	Dual-OPTO Trans. Board	PCB Assy. (with **Items 1-3** only)
01	1	045-5111-02	CN1	2X, .156" Rt. Angle (26-60-5020) Conn.
02	2	165-5052-00	LED1, LED2	LED TLRH180P (Ultra Bright Red)
03	2	121-5067-00	R1, R2	180 Ω 1/8W Chip Res. (CRCW)
04	3	530-5308-02	n/a	OPTO PCB Brass Tube Spacer
05	3	545-5518-00	n/a	OPTO PCB Rubber Grommet
B	1	515-0174-00	Dual-OPTO Rec. Bd. Assy.	PCB Assy. (with all **Items 1-9**)
—	1	520-5174-00	Dual-OPTO Rec. Board	PCB Assy. (with **Items 1-7** only)
01	1	045-5111-00	CN1	3X, .156" Rt. Angle (26-60-5030) Conn.
02	2	165-5052-00	LED 1, LED 2	LED TLRH180P (Ultra Bright Red)
03	2	110-5006-00	Q1, Q3	2N5460, Transistor (P-FET SOT-23)
04	2	110-0086-00	Q2, Q4	2N3906, Transistor
05	2	121-5082-00	R1, R4	10M Ω 1/8W Chip Res. (CRCW)
06	2	121-5083-00	R2, R5	4.7K Ω 1/8W Chip Res. (CRCW)
07	2	121-5011-00	R3, R6	10K Ω 1/8W Chip Res. (CRCW)
08	3	530-5308-02	n/a	OPTO PCB Brass Tube Spacer
09	3	545-5518-00	n/a	OPTO PCB Rubber Grommet

Replacement Part:
LED TLRH180P
(T1-3/4 GaAlAs)
SPI Part Nº:
165-5052-00

OPTO Troubleshooting

1. Volt Meter Test (indicates normal operating condition):

A. **OPEN OPTO** (Light Falling on LED) = *SWITCH OPEN*. Place meter leads across points **A** and **B** on the **LED1 Circuit** *(Refer to Schematic Drawing on previous page, 520-5174-00 Receiver Side)*. It should read approximately 0.8 - 1.2v DC. The **LED2 Circuit** operates the same.

B. **CLOSED OPTO** (Light Blocked) = *SWITCH CLOSED*. Place meter leads across points **A** and **B** on the **LED1 Circuit** *(Refer to Schematic Drawing on previous page, 520-5174-00 Receiver Side)*. It should read approximately 0.0 - 0.1v DC. The **LED2 Circuit** operates the same.

2. Oscilloscope Test (indicates normal operating condition):

Fig. A

Fig. B

Tl = Switch Read Period
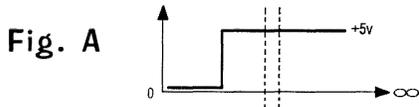
A. **OPEN OPTO** (Light Falling on LED) = *SWITCH OPEN*. Place Scope lead at **Pin-1** of OPTO Rec. Board with Scope Grounded (see Schematic). The Scope should display a **STEADY +5v** as shown in **Fig. A**, Wave Form Diagram.
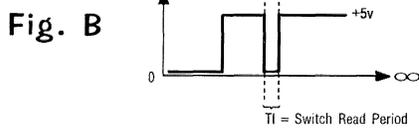
B. **CLOSED OPTO** (Light Blocked) = *SWITCH CLOSED*. Place Scope lead at **Pin-1** of OPTO Rec. Board with Scope Grounded (see Schematic). The Scope should display a **PULSE STREAM** indicating **Q2** has switched "On" as shown in **Fig. B**, Wave Form Diagram. This is your Switch Drive Pulse.

3. Bench Test (See Fig. C):

Please Note: To perform this test you must use a spare 560Ω Pull-Up Resistor, SPI Nº: 121-5047-00

Disconnect the **OPTO Transmitter / Receiver Board** from the circuit. Connect one side of a 560Ω Pull-Up Resistor to **Pin-1** of the OPTO Receiver Bd. and the other side of the resistor to a 5v DC source. Connect **Pin-2** to GND. Connect a +5v DC source to **Pin-1** of the Transmitter & GND to **Pin-2**. Align with the Receiver OPTO approx. 3" distance. Using your Volt-Meter or an Oscilloscope, monitor **Pin-1** while *BLOCKING* and *UNBLOCKING* the *BEAM* from the Trans. The output will be approx. +5v DC when the *BEAM IS NOT BLOCKED* and approx. 0v when the *BEAM IS BLOCKED.*

Fig. C
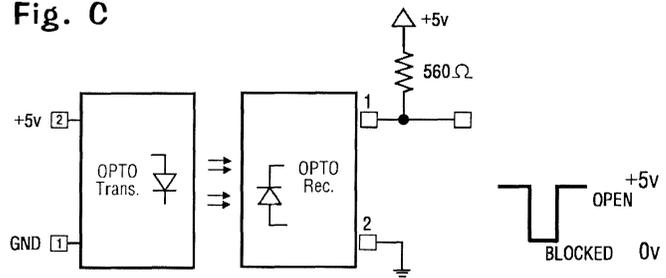
Trough Dual OPTO Boards Alignment / Test for LED1

When a working **OPTO** is installed and connected in a game, the transmitter should light *(LED1 lower & LED2 upper)* when the power is switched on. With the playfield in **Service Position #1** *(playfield lifted up in the half-way position resting on the Prop Rod or edge slide support brackets)* and the game on, the LED lights should show up as a **BRIGHT RED RINGS** through the back of the Receiver Board around the **Receivers LED1 & LED2** *(see Fig. 1)*. Testing only **LED1:** With the game in *Switch Test Mode*, lifting the Trough Plunger with a fingertip should block the **BEAM** and cause the Switch Position to trigger *(see Fig. 2)*. View **Fig. 2a** & **2b** *(on the next page)* for a sectional view of the Light Path *(note alignment)* and what happens as a ball breaks the light beam.
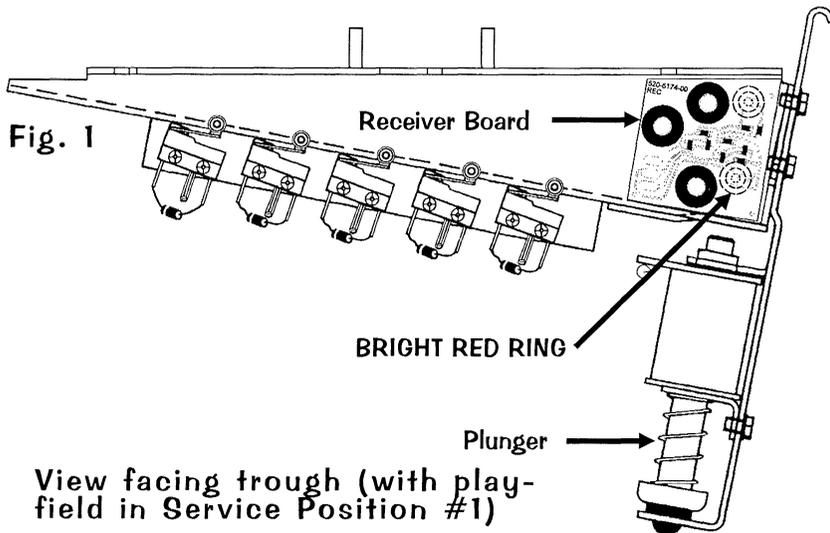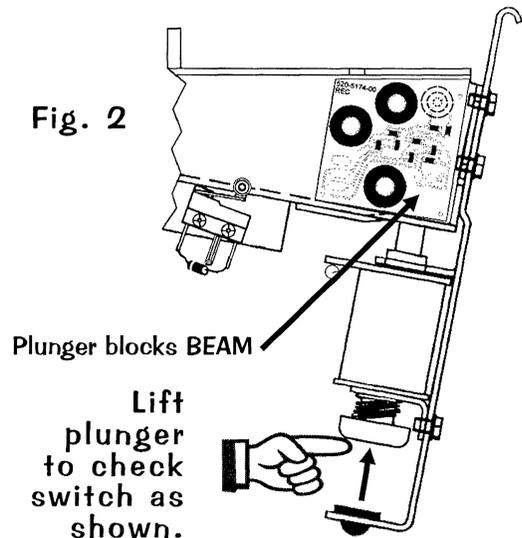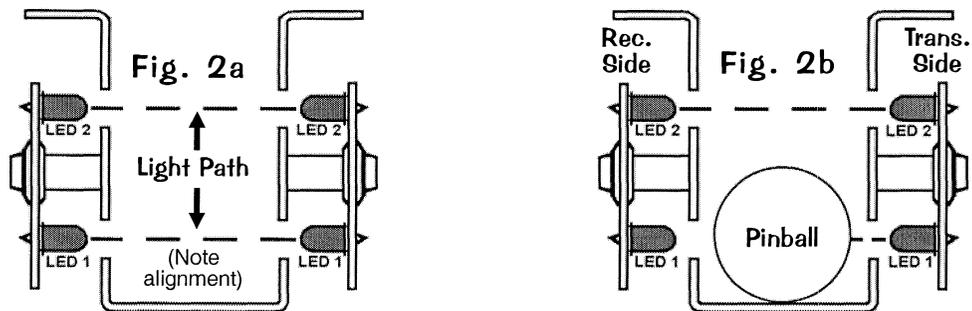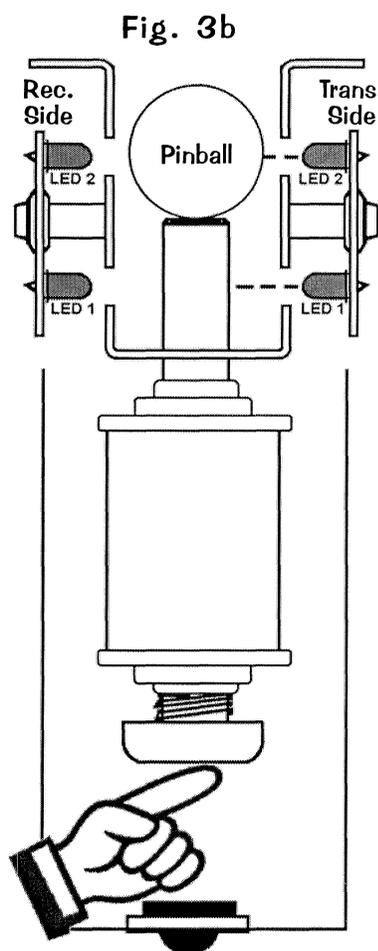
Fig. 1

Receiver Board →

BRIGHT RED RING

Plunger →

View facing trough (with play-field in Service Position #1)

Fig. 2

Plunger blocks BEAM

Lift plunger to check switch as shown.

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Sectional view from right (Fig. 2a & 2b)

Fig. 2a

LED 2   LED 2

Light Path

LED 1   LED 1
(Note alignment)

Rec. Side   Fig. 2b   Trans. Side

LED 2   LED 2

Pinball

LED 1   LED 1

Trough Dual OPTO Boards Alignment / Test for LED2

When a working **OPTO** is installed and connected in a game, the transmitter should light *(LED1 lower & LED2 upper)* when the power is switched on. With the playfield in **Service Position #1** *(playfield lifted up and resting on the Playfield Support Slide Brackets)* and the game on, the LED lights should show up as a **BRIGHT RED RINGS** through the back of the Receiver Board around the **Receivers LED1 & LED2** *(see Fig. 1, previous page)*. Testing only **LED2:** *TO PERFORM THIS TEST, A PINBALL MUST BE IN THE BALL TROUGH.* With the game in **Switch Test Mode**, lifting the Trough Plunger with a finger tip should block the **BEAM** on LED2 and cause the Switch Position to trigger *(see Fig. 3)*. View **Fig. 3a** & **3b** for a sectional view of the Light Path *(note alignment)* and what happens as a "double-stacked" ball scenario breaks the light beam.

Fig. 3

Plunger blocks BEAM

Lift plunger to check switch as shown.

Fig. 3a

LED 2   LED 2

Light Path

LED 1   LED 1
(Note alignment)

Fig. 3b

Rec. Side   Pinball   Trans. Side

LED 2   LED 2

LED 1   LED 1
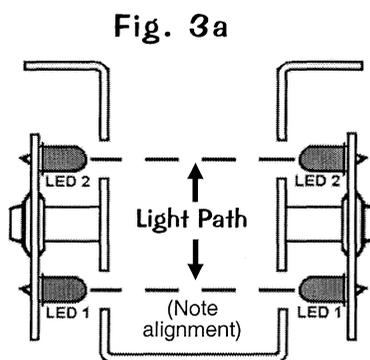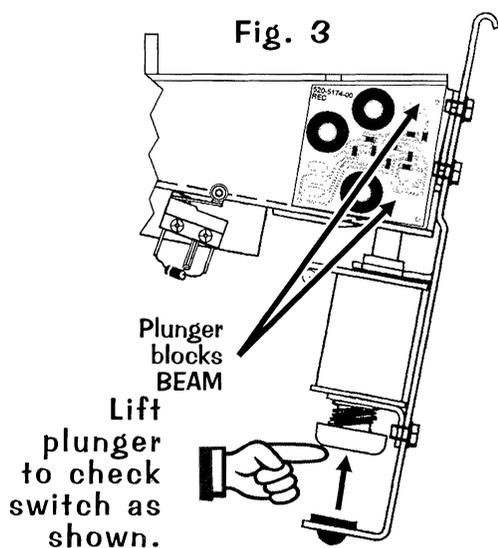
I M P O R T A N T

If replacement of **LED** is required, insure that is **mounted correctly before and after soldering** *(See Fig. 4a / 4b)*.
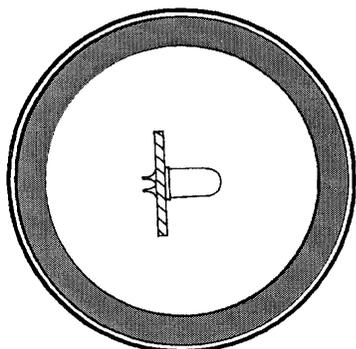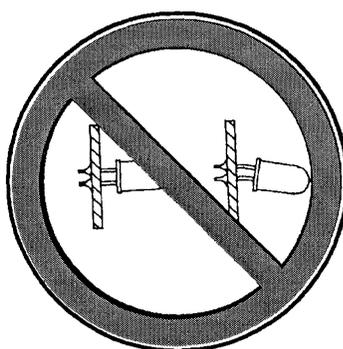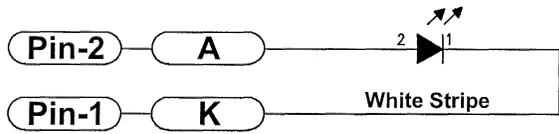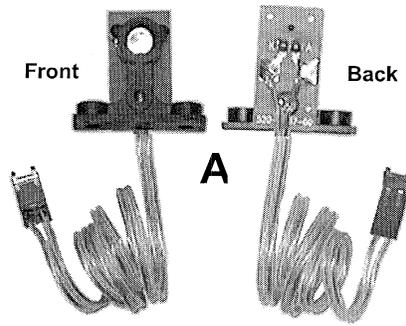
Fig. 4a
Correct Position

Fig. 4b
Incorrect Position

Playfield Switches OPTO Transceiver Boards Schematic, Component Layout & Parts

Pin-2 — A — (diode) 2 ▶|1

Pin-1 — K — White Stripe

Mini PCB OPTO 12" Lead (Black Bracket) 500-6775-00

Front   Back

A

ITEM	QTY	PART NUMBER	REF-DESIGNATOR	DESCRIPTION
A	8	**500-6775-00**	**MINI PCB OPTO ASM WHT / 12" LEAD**	**PCB Assy.** (with all **Items 1-5**)
—	1	520-5237-00	Mini OPTO Trans. or Rec. Board	**PCB Only Plain**
01	1	545-6092-00		Black Bracket (Plastic) Holder
02	1	237-5909-00		#4-40 X 1/4 PPH Screw
03	**1**	**165-5052-00**		**LED (Ultra Bright Red)**
04	1	601-5023-12	K, A	12" Speaker Wire (1-Side White Stripe)
05	1	045-5020-02	*Note White Strip to Pin-1*	2-Pin Cn., .100 KK Cmp Trm Molex 08-50-0113

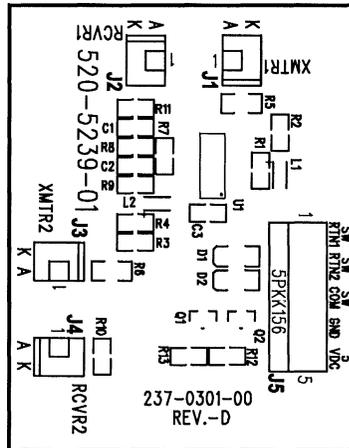# Playfield OPTO Transmitter / Receiver Amplifier Board Schematic

Section 5, WPT
Page 16

WPT™
WORLD POKER TOUR

Printed Circuit
Boards (PCBs)
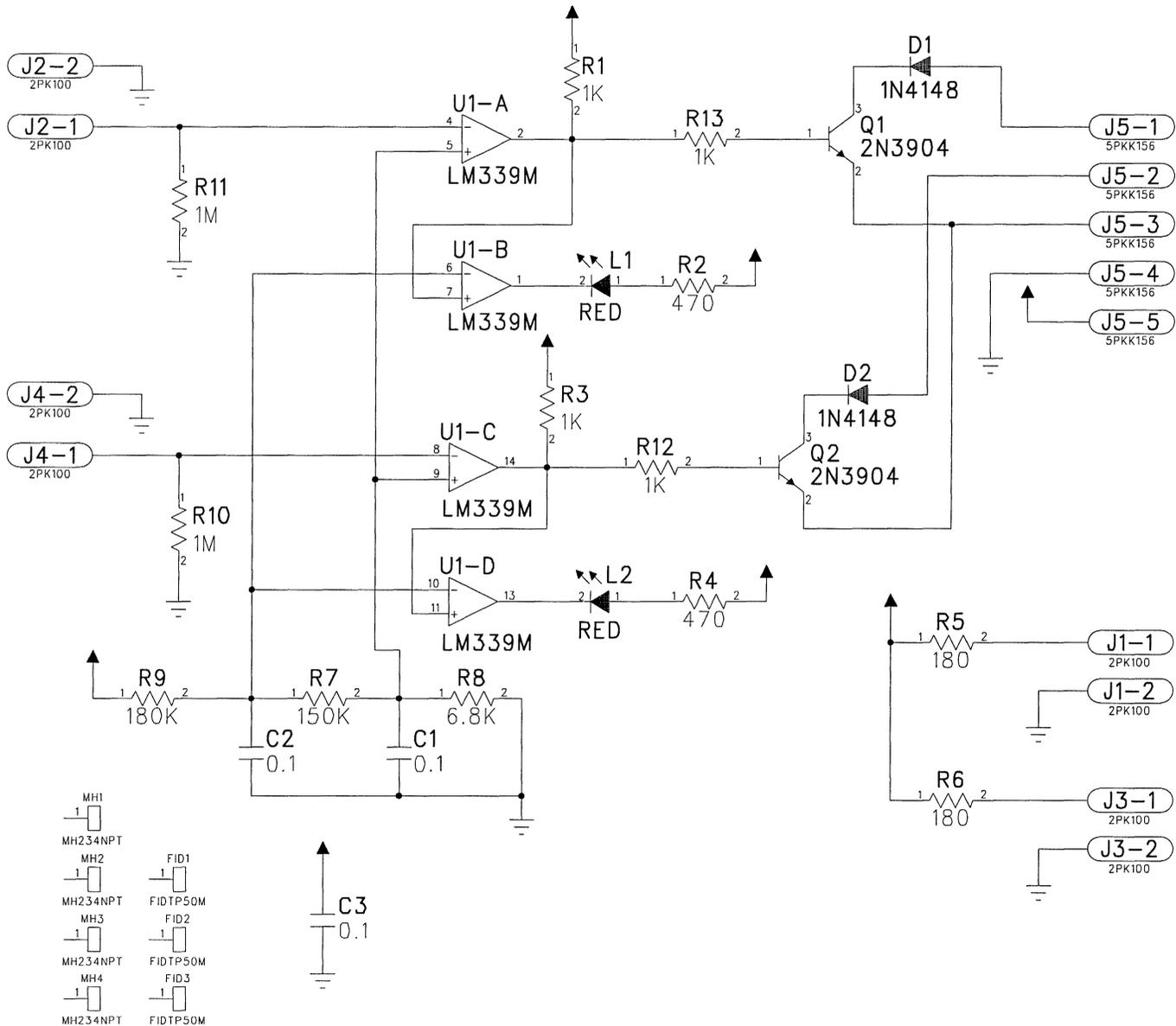
Playfield OPTO Transmitter/Receiver Amplifier Board Component Layout & Parts
(for OPTO Switches 52, 54, 56 & 59)
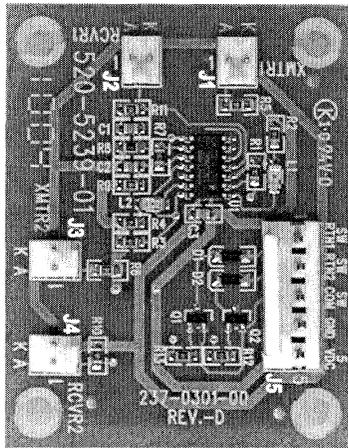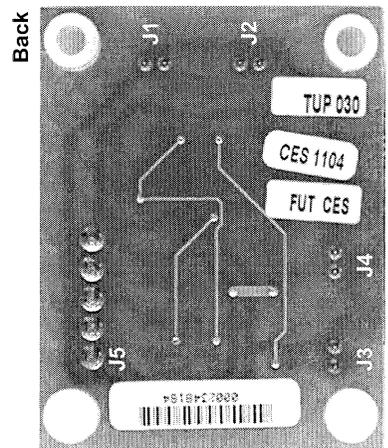
ITEM	QTY	PART NUMBER	REF-DESIGNATOR	DESCRIPTION
—	2	520-5239-01	OPTO Transmitter/Receiver Amplifier Board	**Complete PCB Assembly**
01	1		R7	SMT 150K Ω 1/10W Resistor 805, 5%
02	2		R5, R6	SMT 180 Ω 1/10W Resistor 805, 5%
03	1	*If a part is*	R9	SMT 180K Ω 1/10W Resistor 805, 5%
04	4	*required where a*	R1, R3, R12, R13	SMT 1K Ω 1/10W Resistor 805, 5%
05	2	*part number is*	R10, R11	SMT 1M Ω 1/10W Resistor 805, 5%
06	2	*not provided, call*	R2, R4	SMT 470 Ω 1/10W Resistor 805, 5%
07	1	*Technical*	R8	SMT 6.8K Ω 1/10W Resistor 805, 5%
08	3	*Support (see*	C1, C2, C3	SMT Cer. .1uF 50v Cap., 10% X7R
09	2	*back of cover).*	D1, D2	1N4148W, Diode, 100v, 350MW
10	2		Q1, Q2	MMST3904, NPN, 40v, .02A
11	1		U1	LM339M, Low Power Offset QUA
12	4	Mfg. 22-23-2021	J1, J2, J3, J4	2-Pin, 0.1 Header (1 Row, VT, Tin)
13	1	Mfg. 640445-5	J5	5-Pin, .156 Header (1 Row, VT, Tin)
14	2	Mfg. APT3216SURC	L1, L2	LEDD-SMT, Red 1206
15	4		n/a	Spacer (Nylon), .153" ID X 9/32" OD X 3/8"

Playfield OPTO Transmitter/Receiver Amplifier Board Wiring (General)
(for OPTO Switches 52, 54, 56 & 59)
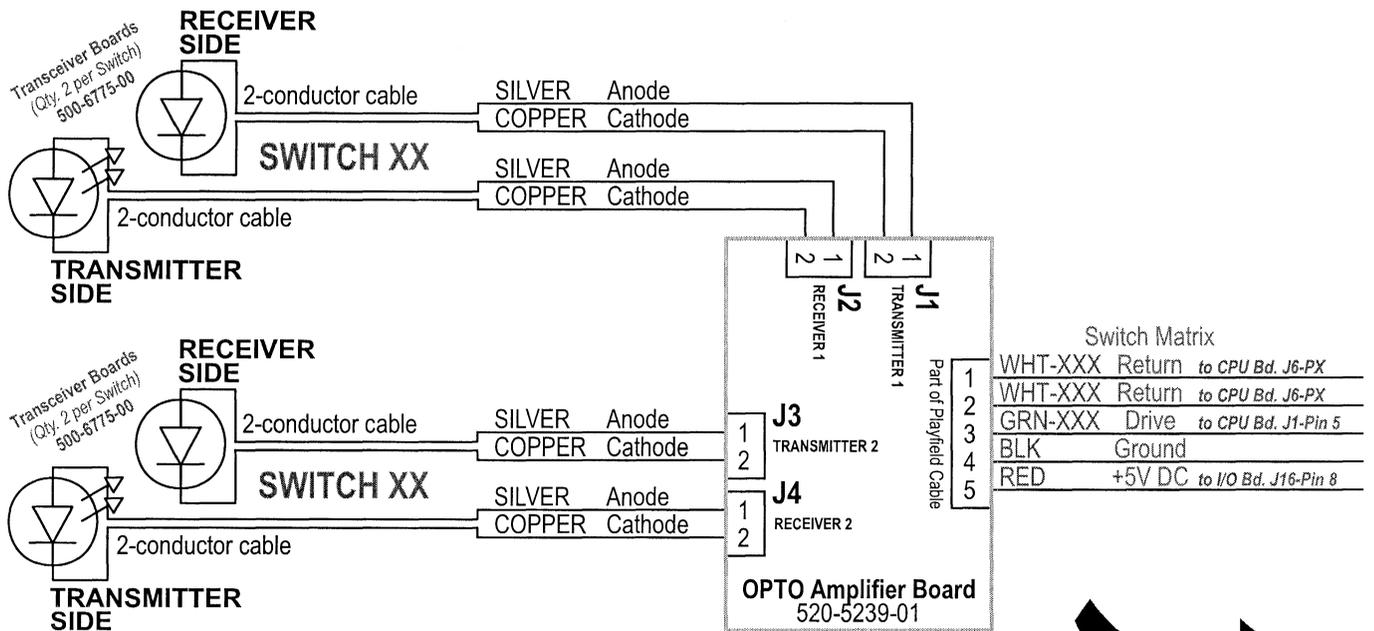
For details on Board Wiring Configuration for Boards 1 & 2, see opposite page.

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Amplifier Board 2 (Left)

Amplifier Board 1 (Right)

J2

J4 J3

J1

520-5239-01

237-0301-00
REV.-D

SPKK156

J2 J1

520-5239-01

J3

J4

237-0301-00
REV.-D

SPKK156

**Right Ramp Made
Sw. 52**

**Transfer
Tube
Sw. 59**

Amplifier Board 2 (Left)
J5-P1 TAN-ORG (Sw. 59)
*   to CPU J12-P7*
J5-P2 WHT-YEL (Sw. 52)
*   to CPU J6-P6*
J5-P3 GRN-YEL
*   to CPU J1-P5 Drive*
J5-P4 BLK (Ground)
J5-P5 RED (+5V DC)
*   to CPU J16-P8*
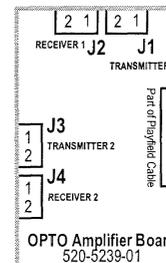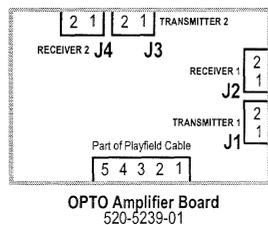
**Upper Playfield
Above Left VUK
Sw. 56**

Amplifier Board 1
(Right)
J5-P1 WHT-GRY
*   (Sw. 56)*
*   to CPU J6-P1*
J5-P2 WHT-BLU
*   (Sw. 54)*
*   to CPU J6-P3*
J5-P3 GRN-YEL
*   to CPU J1-P5*
*   (Drive)*
J5-P4 BLK
*   (Ground)*
J5-P5 RED
*   (+5V DC)*
*   to CPU J16-P8*

WPT
WORLD POKER TOUR

Rear View of the Backpanel

| 2 1 | 2 1 | TRANSMITTER 2 |
RECEIVER 2 J4 J3
RECEIVER 1 | 2 / 1 |
J2
TRANSMITTER 1 | 2 / 1 |
J1
Part of Playfield Cable
| 5 4 3 2 1 |

OPTO Amplifier Board
520-5239-01

**Left Ramp
Made
Sw. 54**

*To Reverse-O-Matic,
Upper Left
Corner Playfield
(Left Wire Ramp)*

| 2 1 | 2 1 |
RECEIVER 1 J2 J1
TRANSMITTER 1
| 1 2 3 4 5 |
| 1 / 2 | J3
TRANSMITTER 2
| 1 / 2 | J4
RECEIVER 2
Part of Playfield Cable

OPTO Amplifier Board
520-5239-01

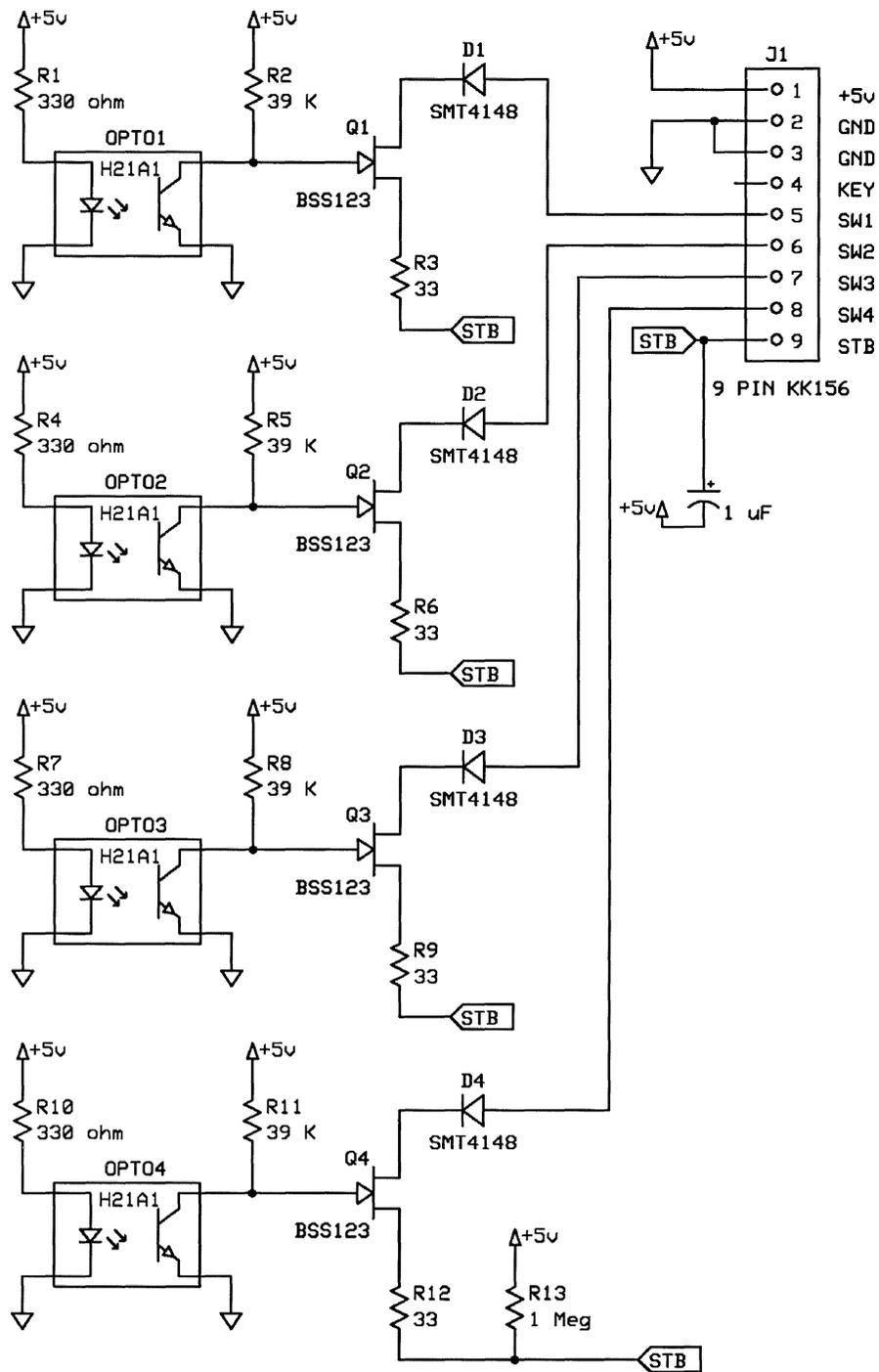Rear View of the Backpanel

Mini PCB OPTOs
(500-6775-00) to
OPTO Trans/Rec
Amplifier Board
Wiring Configuration
for Boards 1 & 2

OPTO Interrupter (520-5251-00) Schematic
(for OPTO Switch 63)

U-Shaped OPTO
Located on the Ace-in-the Hole Assembly
Sw. 53, Jail Bars Up

I/O
J16-P4/8
RED   2 RED   +5 Vdc

CPU/SND
J12-P2
TAN-VIO   4 WHT/VIO   SW RTN   D1 1N4148

CPU/SND
J1-P5
GRN/YEL   3 GRN/YEL   SW DRV   R3 33

I/O
GROUND
BLACK   1 BLK   GND

03-06-2042 MLX

Q1 BSS123   R2 22 K   OPTO 1   R1 150   QVE11233

OPTO Transmitter (520-5247-00) Schematic
(for OPTO Switches 57 [front] & 58 [rear])

OPTO PCB (Top)
Located on the Ace-in-the Hole Assembly
Sw. 57, Jail Bars Bash, Sw. 58 Jail Bars Rest

I/O
J16-P4/8
RED   2   RED   +5 Vdc   2

I/O
GROUND
BLK   1   BLK   GND   1

03-06-2023 MLX

R1 150 ohm, R2 150 ohm, R3 150 ohm
L1 ADP3224, L2 ADP3224, L3 ADP3224

Note: L3 used as light only (Receiver LED is not used)

OPTO Receiver (520-5248-00) Schematic
(for OPTO Switches 57 [front] & 58 [rear])

OPTO PCB (Bottom)
Located on the Jail/Mouse Trap Assembly

WHT/BLK 4   CPU/SND J12-P9 TAN/BLK SW 57

WHT/RED 5   CPU/SND J12-P8 TAN/RED SW 58

GRN/YEL 3   CPU/SND J1-P5 GRN/YEL

RED 2   I/O J16-P4/8 RED

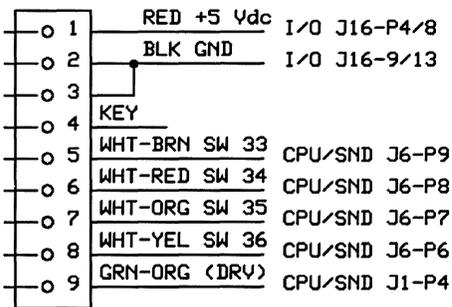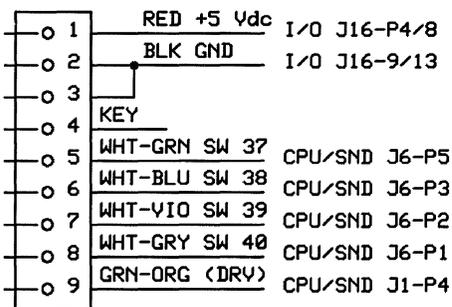BLK 1   I/O GROUND BLK

03-06-2055 MLX

OPTO Interrupter (520-5252-04) Schematic
(for OPTO Switches 4-7, 10-13 & 33-40))

U-Shaped X4 OPTO
Located on the 4-Bank Middle Assembly,
4-Bank Right Assembly & 8-Bank Left Assembly
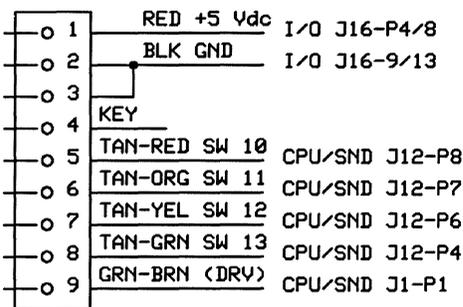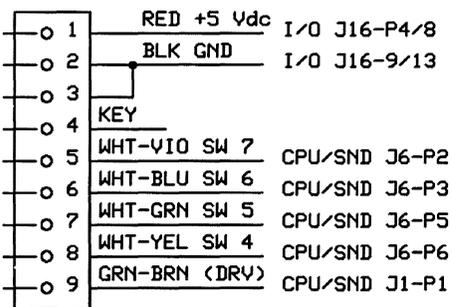*(8-Banks require 2X Boards)*

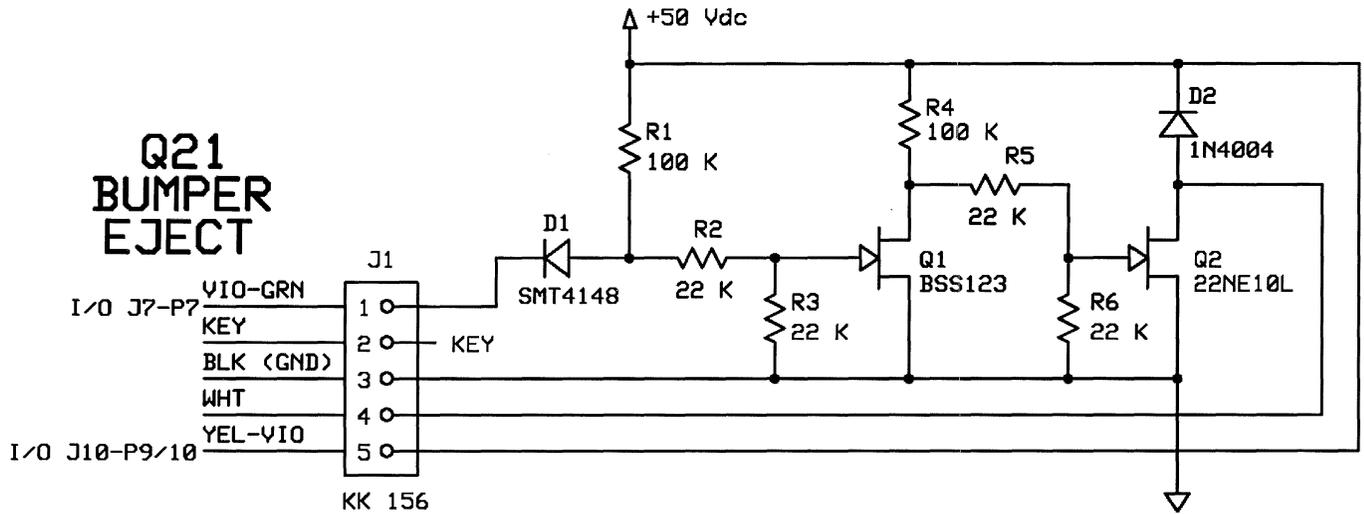## PLAYFIELD HARNESSES

8-BANK DROP TARGET (LEFT)

Pin	Signal	Connection
1	RED +5 Vdc	I/O J16-P4/8
2	BLK GND	I/O J16-9/13
3		
4	KEY	
5	WHT-GRN SW 37	CPU/SND J6-P5
6	WHT-BLU SW 38	CPU/SND J6-P3
7	WHT-VIO SW 39	CPU/SND J6-P2
8	WHT-GRY SW 40	CPU/SND J6-P1
9	GRN-ORG (DRV)	CPU/SND J1-P4

Pin	Signal	Connection
1	RED +5 Vdc	I/O J16-P4/8
2	BLK GND	I/O J16-9/13
3		
4	KEY	
5	WHT-BRN SW 33	CPU/SND J6-P9
6	WHT-RED SW 34	CPU/SND J6-P8
7	WHT-ORG SW 35	CPU/SND J6-P7
8	WHT-YEL SW 36	CPU/SND J6-P6
9	GRN-ORG (DRV)	CPU/SND J1-P4

4-BANK DROP TARGET (MIDDLE)

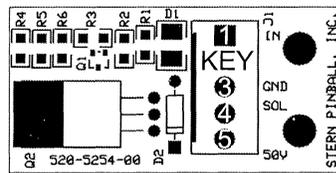| Pin	Signal	Connection
1	RED +5 Vdc	I/O J16-P4/8
2	BLK GND	I/O J16-9/13
3		
4	KEY	
5	TAN-RED SW 10	CPU/SND J12-P8
6	TAN-ORG SW 11	CPU/SND J12-P7
7	TAN-YEL SW 12	CPU/SND J12-P6
8	TAN-GRN SW 13	CPU/SND J12-P4
9	GRN-BRN (DRV)	CPU/SND J1-P1

4-BANK DROP TARGET (RIGHT)

Pin	Signal	Connection
1	RED +5 Vdc	I/O J16-P4/8
2	BLK GND	I/O J16-9/13
3		
4	KEY	
5	WHT-VIO SW 7	CPU/SND J6-P2
6	WHT-BLU SW 6	CPU/SND J6-P3
7	WHT-GRN SW 5	CPU/SND J6-P5
8	WHT-YEL SW 4	CPU/SND J6-P6
9	GRN-BRN (DRV)	CPU/SND J1-P1

J1 — 9 PIN KK156

Pin	Signal
1	+5v
2	GND
3	GND
4	KEY
5	SW1
6	SW2
7	SW3
8	SW4
9	STB

R1 330 ohm, R2 39 K, OPTO1 H21A1, Q1 BSS123, D1 SMT4148, R3 33, STB
R4 330 ohm, R5 39 K, OPTO2 H21A1, Q2 BSS123, D2 SMT4148, R6 33, STB
R7 330 ohm, R8 39 K, OPTO3 H21A1, Q3 BSS123, D3 SMT4148, R9 33, STB
R10 330 ohm, R11 39 K, OPTO4 H21A1, Q4 BSS123, D4 SMT4148, R12 33, R13 1 Meg, STB
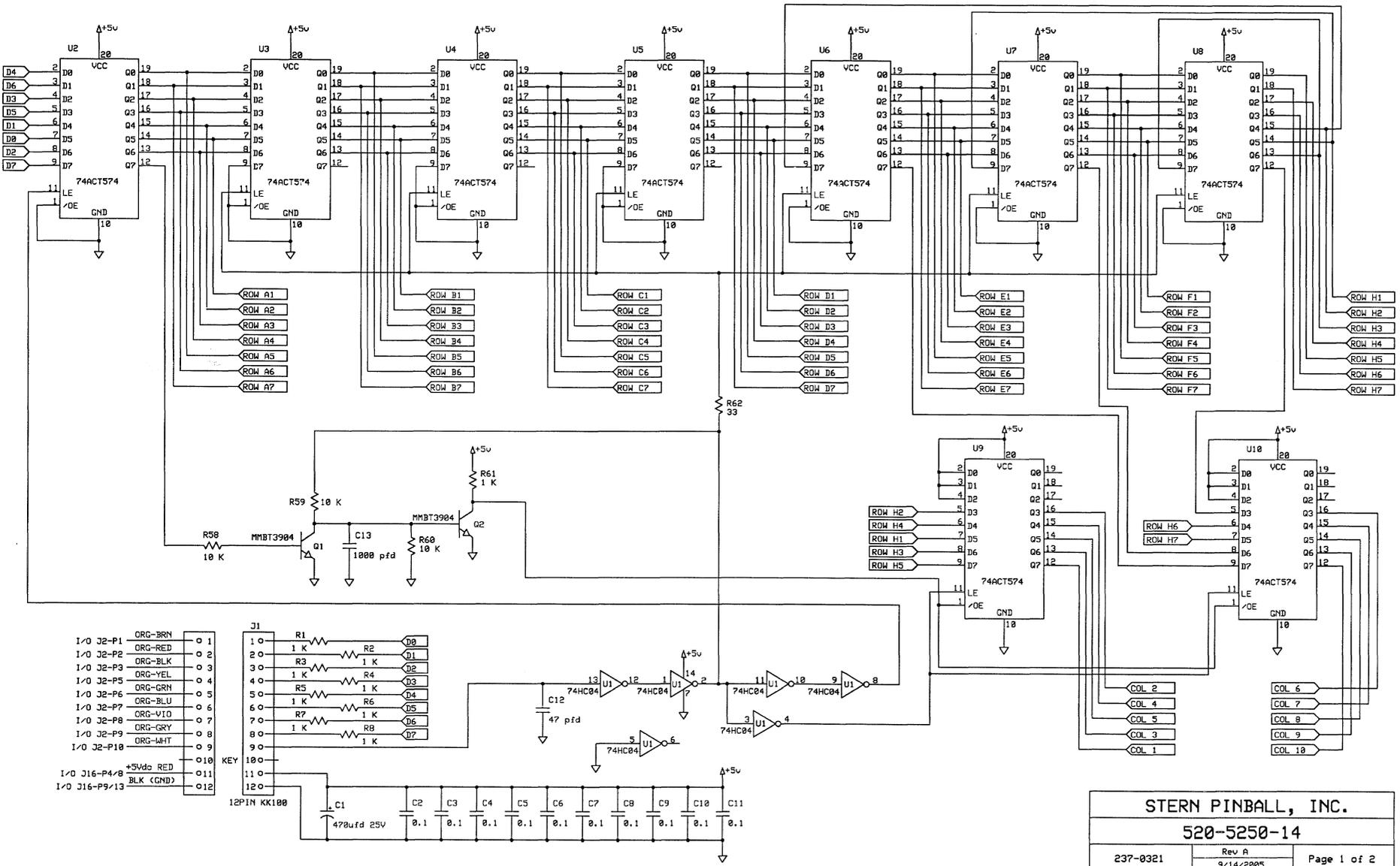1 uF

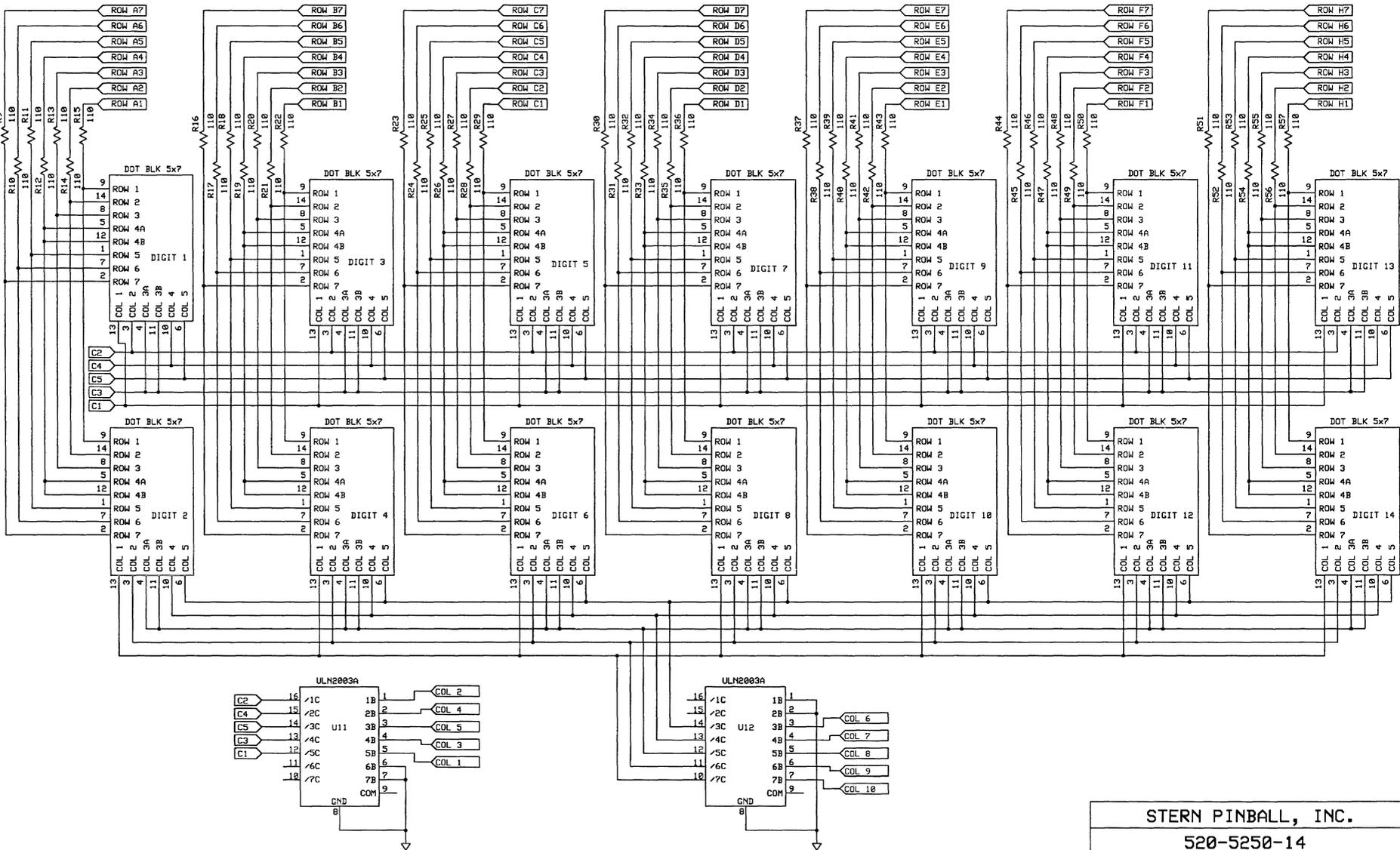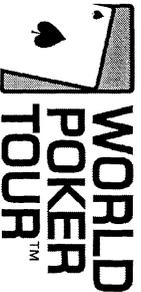**WPT** ™
WORLD POKER TOUR

Q21 50V Step-Up Driver Board Schematic
(for Coil #21 Bumper Eject))

Q21 50V Step-Up Driver Board (520-5254-00) Component Layout
(for Coil #21 Bumper Eject))

Printed Circuit
Boards (PCBs)

WPT
WORLD POKER TOUR

Section 5, WPT
Page 22

STERN PINBALL, INC.		
520-5250-14		
237-0321	Rev A 9/14/2005	Page 1 of 2

Printed Circuit
Boards (PCBs)

Section 5, WPT
Page 23

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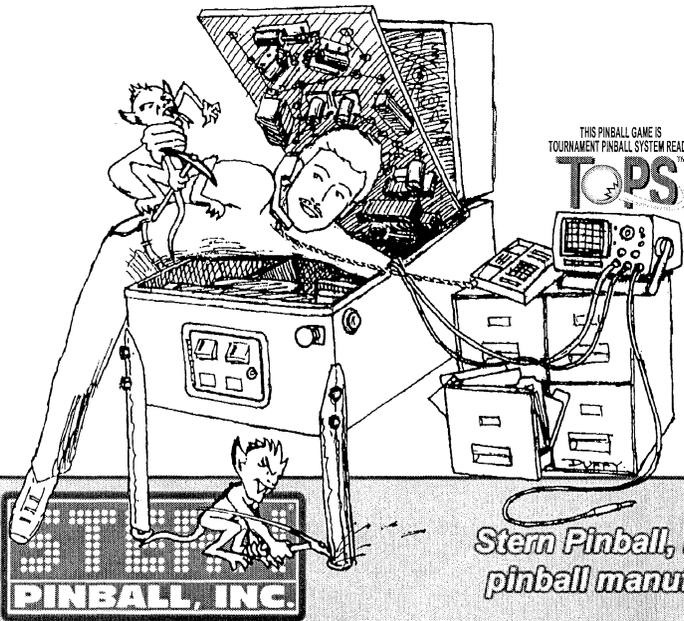
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Drawings on the White Star Board System™

Tricks & Tips
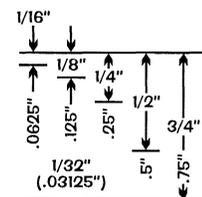1st Time Pinball Set-Up / Prev. Maintenance

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Radio Shack Component Catalogue

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Metric Conversion

1/16"
1/8"
1/4"
1/2"
.0625"
.125"
.25"
3/4"
1/32"
(.03125")
.5"
.75"

1" = 2.54 cm or 25.4 mm
1 cm = .3937"
1 mm = .03937"

For metric, multiply the inch value by the metric value:
example: 5" X 2.54 cm = 12.7 cm or 127 mm

For US, multiply the metric value by the inch value:
example: 13 cm X .3937" = 5.1181"

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7 8 0 - 5 0 8 8 - 0 0