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16-571-101
June 1990



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DINER™

OPERATIONS MANUAL

Game Operation & Adjustments
Parts Information

Game Testing & Problem Diagnosis
Reference Diagrams & Schematics



DINER ROM and Jumper Table

Game	CPU Rev	P/N - U15 Game µP	P/N - U27 G. ROM	P/N - U26 G. ROM	Jumpers	Audio Bd	P/N - U4 A. ROM	P/N - U19 A. ROM	P/N - U20 A. ROM
ROLLERGAMES	System 11C	5400-09150-00	A-5343- 576-2	A-5343- 576-1	W1, 2, 4, 5, 7, 8, 11, 14, 16, 17, and 19	System 11C	A-5343- 576-3	A-5343- 576-4	A-5343- 576-5
DINER	System 11C	5400-09150-00	A-5343- 571-2	A-5343- 571-1	W1, 2, 4, 5, 7, 8, 11, 14, 16, 17, and 19	System 11C	A-5343- 571-3	A-5343- 571-4	A-5343- 571-5

DINER Solenoid Table

Sol. No.	Function	Solenoid Type	Wire Color	Connections		Driver Trnstr	Solenoid Part Number Flashlamp Type q= B'glass; p=P'field
				CPU Bd	Playfield/ Cabinet		
01A ³	Outhole Kicker	Switched	Vio-Brn	1P11-1	5J1-9: 5J4-9 (A)	Q33	AE-23-800
01C ³	Haji Flash	Switched	Blk-Brn	(Gry-Brn)	5J5-9 (C)	Q33	#89/906 flashlamps 1p.1g
02A ³	Ramp Down	Switched	Vio-Red	1P11-3	5J1-7: 5J4-8 (A)	Q25	SM-1-26-600
02C ³	Babs Flash	Switched	Blk-Red	(Gry-Red)	5J5-8 (C)	Q25	#89/906 flashlamps 1p.1g
03A ³	Center 3-Bk Dr Tgt Reset	Switched	Vio-Orn	1P11-4	5J1-6: 5J4-7 (A)	Q32	AE-26-1200
03C ³	Boris Flash	Switched	Blk-Orn	(Gry-Orn)	5J5-7(C)	Q32	#89/906 flashlamps 1p.1g
04A ³	Ramp Up	Switched	Vio-Yel	1P11-5	5J1-5: 5J4-6 (A)	Q24	AE-23-800
04C ³	Pepe Flash	Switched	Blk-Yel	(Gry-Yel)	5J5-5 (C)	Q24	#89/906 flashlamps 1p.1g
05A ³	Upper Left Eject	Switched	Vio-Grn	1P11-6	5J1-4: 5J4-5 (A)	Q31	AE-23-800
05C ³	Buck Flash	Switched	Blk-Grn	(Gry-Grn)	5J5-4 (C)	Q31	#89/906 flashlamps 1p.1g
06A ³	Sub-Pfld Shooter	Switched	Vio-Blu	1P11-7	5J1-3: 5J4-4 (A)	Q23	AE-23-800
06C ³	Cup Flashers	Switched	Blk-Blu	(Gry-Blu)	5J5-3 (C)	Q23	#89/906 flashlamps 4p
07A ³	Knocker (in Backbox)	Switched	Blk-Blk	1P11-8	5J1-2: 5J4-2 (A)	Q30	AE-23-800
07C ³	Clock Flashers	Switched	Blk-Vio	(Gry-Vio)	5J5-2 (C)	Q30	#89 flashlamps 2g
08A ³	Lower Left Eject	Switched	Vio-Gry	1P11-9	5J1-1: 5J4-1 (A)	Q22	AE-23-800
08C ³	DINE - TIME Flashers	Switched	Blk-Gry	(Gry-Blk)	5J5-1 (C)	Q22	#89 flashlamps 1p.2g
09	Right Ramp Flashers	Controlled	Brn-Blk	1P12-1	5J2-9: 5J6-9: 2J4-10	Q17	#89/906 flashlamps 2p.1g
10	Backbox/P'fld Illum Relay	Controlled	Brn-Red	1P12-2	5J2-8: 5J6-8: 2J4-11	Q9	5580-09555-01 ^{4a}
11	Left Ramp Flashers	Controlled	Brn-Orn	1P12-4	5J2-6: 5J6-7: 2J4-12	Q16	#906 flashlamps 2p
12	A/C Select Relay	Controlled	Brn-Yel	1P12-5	5J2-5	Q8	5580-09555-01 ⁵
13	Left 3-Bk Dr Tgt Reset	Controlled	Brn-Grn	1P12-6	5J2-4: 5J6-5: 2J4-13	Q15	AE-26-1200
14	Diverter	Controlled	Brn-Blu	1P12-7	5J2-3: 5J6-3: 2J4-14	Q7	AE-26-1200
15	Clock Wheel (B)	Controlled	Brn-Vio	1P12-8	2J4-15: 2J11-2	Q14	} Stepper Motor 14-7948
16	Clock Wheel (A)	Controlled	Brn-Gry	1P12-9	2J4-16: 2J11-1	Q6	
17	Left Jet Bumper	Special #1	Blu-Brn	1P19-7	5J3-7: 5J7-7	Q75	AE-23-800
18	Left Kicker ("sling")	Special #2	Blu-Red	1P19-4	5J3-6: 5J7-6	Q71	AE-26-1200
19	Right Jet Bumper	Special #3	Blu-Orn	1P19-3	5J3-3: 5J7-3	Q73	AE-23-800
20	Right Kicker ("sling")	Special #4	Blu-Yel	1P19-6	5J3-4: 5J7-5	Q69	AE-26-1200
21	Lower Jet Bumper	Special #5	Blu-Grn	1P19-8	5J3-2: 5J7-2	Q77	AE-23-800
22	Shooter Lane Feeder	Special #6	Blu-Blk	1P19-9	5J3-1: 5J7-1	Q79	AE-23-800
-	<u>Right Flipper</u>	-	Orn-Vio	1P19-1	2J5-5: 2J10-7	-	FL11630/50VDC
-	Lower Right Flipper	-	(Blu-Vio) ²	-	(2J10-1: 2J8-15)	-	
-	<u>Left Flipper</u>	-	Orn-Gry ²	1P19-2	2J5-4: 2J10-8	-	FL11630/50VDC
-	Lower Left Flipper	-	(Blu-Gry) ²	-	(2J10-2: 2J8-14)	-	

NOTES: 1. Wire colors, except flipper ORN-VIO and ORN-GRY, are ground connections (to coil terminal with unbanded end of diode). Flipper ORN-VIO and ORN-GRY wires connect from CPU Board to flipper switch on cabinet. 2. Flipper connections shown in braces are from flipper switch to flipper coil. 3. "A" circuits are pulsed, when Sol. 12 is de-energized; "C" circuits are pulsed, with Sol.12 energized. Wire colors in brackets are those from respective A and C terminals corresponding to the J1-terminal connection listed for the Aux Power Driver Board, which controls the device pulsing by Sol. 12. 4. Relay is mounted on Relay Board: (4a) p/n C-11998-1; (4b) p/n C-11902-1. 5. Relay is mounted on Aux Power Driver Bd, D-12247, in the backbox.

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Section 1

Game Operation & Test Information

- ***D I N E R* (System 11C) ROM Summary**
- **Pinball Game Assembly Instructions**
- **Game Play**
- **Game Status Displays**
- **Game Adjustment Procedure**
- **Game Pricing**
- **Test/Diagnostic Procedures**

***D I N E R* (System 11C) ROM Summary**

IC	DESCRIPTION	TYPE	IDENTIFIER	BOARD	PART NUMBER
Game ROM 1	32K x 8 ROM	27256	U27	CPU	A-5343-571-2
Game ROM 2	32K x 8 ROM	27256	U26	CPU	A-5343-571-1
Music/Speech ROM 1	64K x 8 ROM	27512	U4	Audio	A-5343-571-3
Music/Speech ROM 2	64K x 8 ROM	27512	U19	Audio	A-5343-571-4
Music/Speech ROM 3	64K x 8 ROM	27512	U20	Audio	A-5343-571-5

NOTICE

To order a replacement ROM from your authorized WILLIAMS ELECTRONICS GAMES distributor, specify: (1) part number (if available); (2) ROM label color; (3) ROM level (number) on the label; (4) which game the ROM is used in.

CONNECTOR & COMPONENT IDENTIFICATION

WILLIAMS ELECTRONICS GAMES uses a special technique to identify connectors and other game components. Each plug or jack receives a prefix number (which identifies the circuit board), a letter, and a number. J-designations refer to the male part of a connector. P-designations refer to the female part of a connector. For example, 1J1 designates jack 1 of board 1 (a CPU Board jack); 3P6 designates plug 6 of board 3 (a Power Supply Board plug). Identifying the specific pin number of a connector involves a hyphen, which separates the pin number from the plug or jack designation. For example, 1J1-3 refers to pin 3 of jack 1 on board 1.

Other game components may also have similar prefixes preceding their designator to clarify their locations or related circuit.

Prefix numbers for the System 11C circuit boards and other major assemblies are listed below. A prefix number may precede a component designator to identify its associated unit (e.g., Backbox fuse 6F1).

1 - CPU	6 - Backbox
2 - Master Interconnect	7 - Cabinet
3 - Backbox Power Supply	8 - Playfield
4 - Alphanumeric Display	9 - Insert Board
5 - Aux Power Driver	10 - Audio

D I N E R CIRCUIT BOARDS

System 11C Circuit Boards for *D I N E R* are in the backbox. They are accessible by unlocking the Backbox lock, removing the Backbox glass, unlatching the Insert Board, and swinging it open.

The Master Display Board is mounted on the interior side of the Speaker/Display Panel, below the Backbox glass in the Backbox. To access the Master Display Board, unlock the Backbox, remove the Backbox glass, lift the Speaker/Display Panel, and lay it on the game cabinet.

Lamp circuit boards are mounted on the Playfield and on the Speaker/Display Panel.

CPU BOARD. The System 11C CPU Board (p/n D-11883-571) must be equipped with the ROMs specified in the *D I N E R* (System 11C) ROM Summary. CPU Board jumpers W1, W2, W4, W5, W7, W11, W14, and W16 must be connected.

AUDIO BOARD. The Audio Board is p/n D-11581-571, including ROMs and microprocessor.

POWER SUPPLY BOARD. The Power Supply Board is p/n D-12246.

AUX POWER DRIVER BOARD. The Aux Power Driver Board is D-12247-566.

MASTER INTERCONNECT BOARD. The Master Interconnect Board is D-12313-571.

DISPLAY BOARD. The Alphanumeric Display Unit Board is p/n D-12232-1.

Figure 1 shows the locations of these circuit boards, as well as other devices especially located to make *D I N E R* a great game.

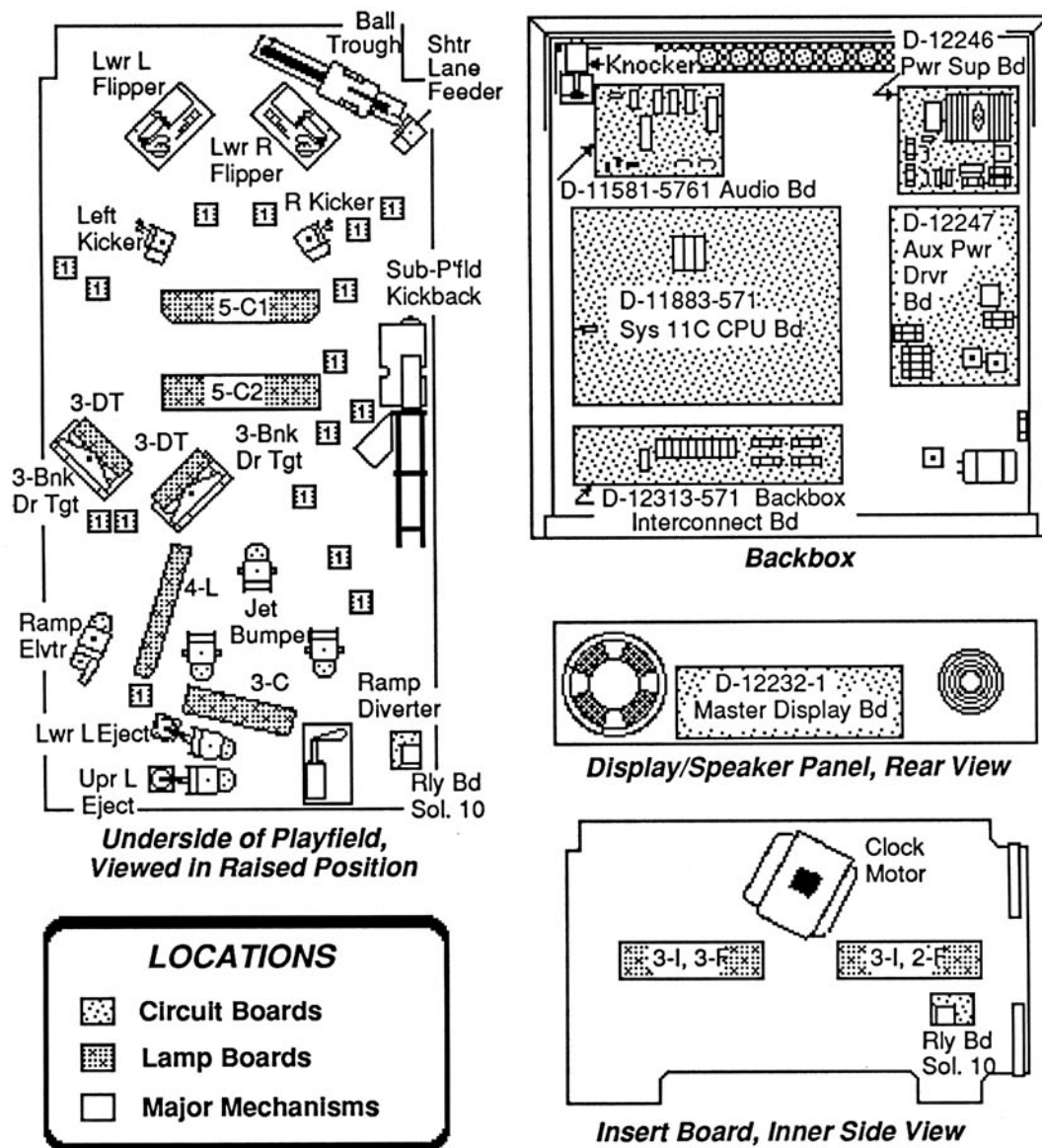


Figure 1. Locations Diagram - Game Circuit Boards and Major Mechanisms

D I N E R GAME CONTROL LOCATIONS

Figure 2 shows the locations of the following switches, except for the last one (CPU Diagnostic switch, which is shown in the Backbox portion of Figure 1, along the left edge of the CPU Board).

The On-Off switch is on the bottom of the cabinet near the right front leg.

The Volume Control is on the left inner wall of the cabinet on the tilt mechanisms board. It is accessible by opening the coin box door.

The Credit switch (also called the START button) is a pushbutton to the left of the coin door on the cabinet exterior.

GAME ADJUSTMENT/DIAGNOSTIC SWITCHES. *D I N E R* allows the operator to control all game adjustments, obtain bookkeeping information, and diagnose problems, using only three switches mounted on the inside of the coin door, along with the Credit button beside the coin door.

ADVANCE, AUTO-UP/MANUAL-DOWN, and HIGH-SCORE RESET are the switches located on the inside of the coin door. Refer to the text discussing Game Status Displays and the Test/Diagnostic Procedures for details concerning button operation.

The Memory Protect switch is on the inside frame of the coin door. This interlock switch must be open to clear bookkeeping totals and to make game adjustments. It automatically opens, when the coin door opens.

Figure 1 shows the location of the CPU Board switch (left edge of CPU Board, Backbox View).

The CPU Diagnostic switch (SW 2) is the switch mounted on the left edge of the CPU Board near a large, socketed microprocessor chip. This switch initiates the Memory Chip Test explained in the Test/Diagnostic Procedures.

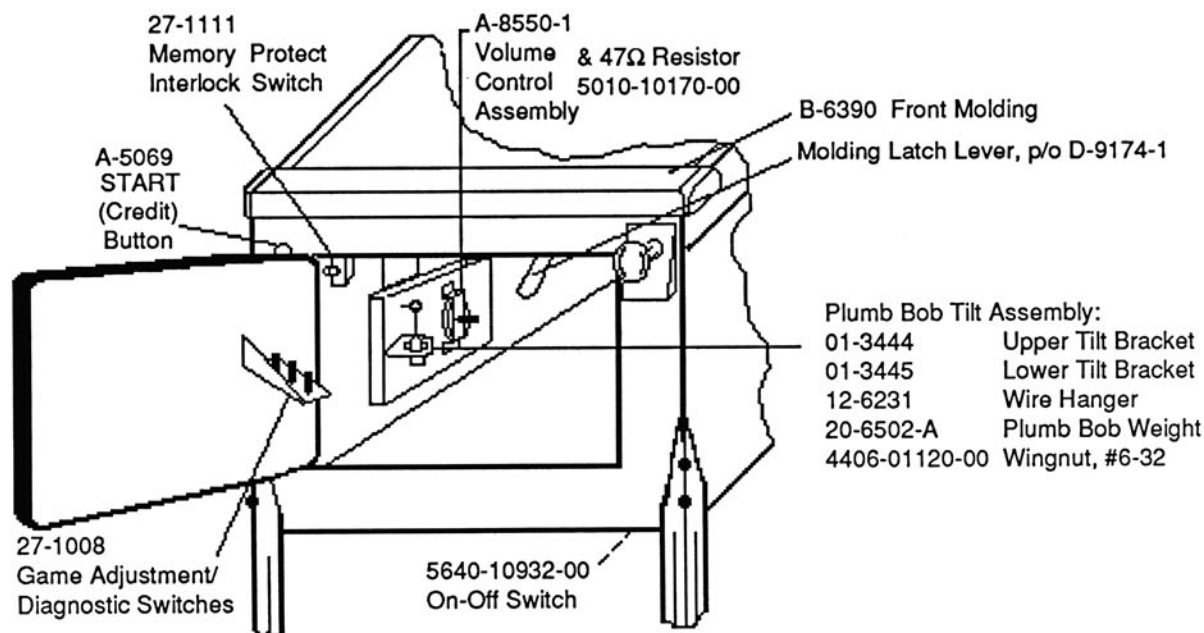


Figure 2. Pinball Game Controls Locations

PINBALL GAME ASSEMBLY INSTRUCTIONS

1. Open the shipping container; remove all cartons, parts, and other items, and set them aside.
2. Place the cabinet on a support and attach rear legs (after installing the leg levellers), using leg bolts. Leg levellers and leg bolts are provided among the parts in the cash box.
3. Attach the front legs (after installing leg levellers), using leg bolts. See Figure 3 for details.

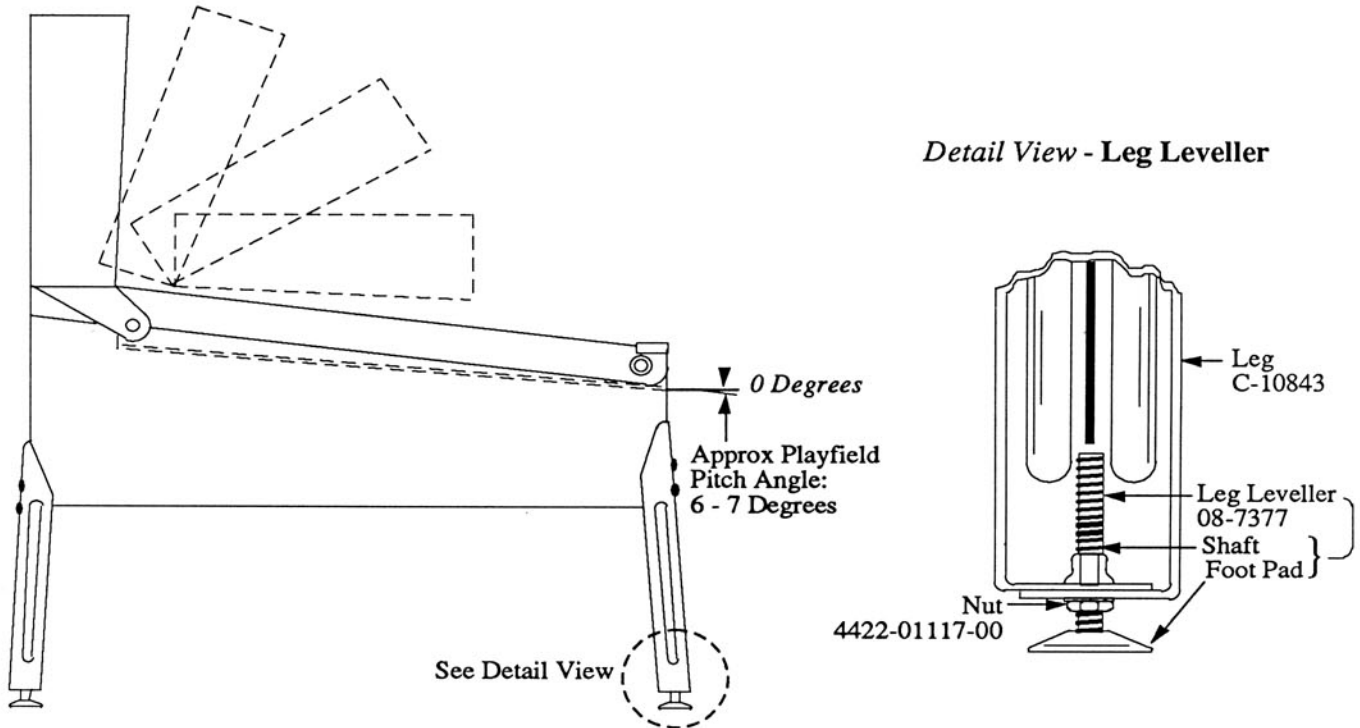


Figure 3. Pinball Assembly, Playfield Pitch Angle, and Leg Leveller Details.

4. Reach into the cabinet and backbox and ensure that the interconnecting cables are free to move (not kinked or pinched). Be careful to avoid damaging wires at any stage of the assembly process.
5. Raise the hinged backbox upright and stabilize it into position. Unlock the backbox, and remove the backbox glass, storing it carefully to avoid scratches. Remove the shipping block holding the Insert Board. Unlatch the Insert Board and open it; lift the Speaker/Display Panel and lay it on the playfield glass. This allows access to the bolt holes used for securing the backbox upright. Install the washer-head mounting bolts through the bottom holes of the backbox into the threaded fasteners in the cabinet to secure the backbox. Remount the Speaker/Display Panel; close the Insert Board and latch it in position. Reinstall the backbox glass, and lock the backbox.

WARNING

FAILURE TO INSTALL the backbox mounting hardware properly can cause personal injury. **NEVER TRANSPORT** a pinball game with the hinged backbox erect. Always lower the backbox forward onto the playfield cabinet on a layer of protective material to prevent marring or damage and possible personal injury.

6. Extend each leg leveller slightly below the leg bottom, so that all four foot pads are extended about the same distance. Remove the cabinet from its support and place it on the floor.

PINBALL GAME ASSEMBLY INSTRUCTIONS (Continued)

7. Unlock and open the coin door. Locate the Molding Latch Lever (shown in Figure 2), and move the lever toward the left side of the game, to release the Front Molding. Lift the Front Molding off the playfield cover glass; return the Latch Lever toward the right, and close the coin door. Carefully slide the glass downward, until it clears the grooves of the Left and Right Side Moldings. Lift the glass up and away from the game, storing it carefully to avoid breakage.
8. Place a level or an inclinometer on the playfield surface. Adjust the leg levellers for proper playfield level (side-to-side) and playfield pitch angle (incline) of approximately 6-7 degrees. NOTE: It is recommended that these measurements be made ON the playfield, not the cabinet nor the playfield cover glass. Tighten the nut on each leg leveller shaft to maintain this setting, as shown in Figure 3.

CAUTION

Playfield pitch angle adjustments can affect the operation of the plumb bob tilt, inside the cabinet. The plumb bob weight is among the parts in the cash box; the operator should install the weight and adjust this tilt mechanism for proper operation, after completion of the desired playfield pitch angle setting.

9. Move the game into the desired location; recheck the level and pitch angle of the playfield.
10. Verify that the **required number** of balls are installed in the game. (*D I N E R*: Install 3 balls; however, only 2 are used in game play!)
11. Clean and reinstall the playfield cover glass, reversing the procedure of step 7. Prepare the game for player operation.

GAME OPERATION

WARNING

After assembly and installation at its site location, this game must be plugged into a properly grounded outlet to prevent shock hazard, and to assure proper game operation. DO NOT use a 'cheater' plug to defeat the ground pin on the line cord. DO NOT cut off the ground pin.

POWERING UP. Perform the following 'power up' routine upon completion of the assembly and installation procedure, as well as at the beginning of each period of game operation. Initially, it will confirm that the game is in proper operating condition; later, it will aid the operator via its messages (refer to later text entitled "Problem Analysis Messages").

Procedure. With the coin door closed, plug the game in, and switch it ON, using the On-Off switch. In normal operation, the player 1 score display initially shows 00. Then, the game goes into the Attract Mode (playfield and backbox lamps flashing, sounds being heard, etc., if the operator does not change the Factory Setting).

Open the coin door and press the AUTO-UP/MANUAL-DOWN switch to MANUAL-DOWN. Press the ADVANCE button to begin the game test routine. Return to AUTO-UP and perform the entire test routine to verify that the game is operating satisfactorily. Successful completion of the tests shows that the game is ready to begin earning your investment return.

GAME OPERATION (Continued)

After the game has been on location for a period of time, the test routine may be preceded by messages concerning game problems. The text entitled 'Problem Analysis Messages' at the end of the Text/Diagnostic Procedures contains more details concerning messages displayed at each game turn-on.

ATTRACT MODE*. Playfield and backbox lamps blink. The player score displays exhibit a series of messages informing the player concerning:

- A. Recent highest scores*;
- B. A "custom message"
("YOU CAN EAT ... YOUR HEART OUT ... AT THE DINER")*;
- C. The score to achieve to obtain a Replay award*;

These (or similar) displays reappear occasionally, accompanied by sounds and music, until a player initiates game play by inserting a coin or, when credits are available, pressing the START button.

CREDIT POSTING. Insert coin(s). A sound is heard for each coin, and the player score displays show the number of credits purchased. So long as the number of maximum allowable credits* are NOT exceeded by coin purchase or high score, credits are posted correctly.

STARTING A GAME. Press the START button once. A startup sound plays, and the Credit amount shown in the player score display decreases by one. The upper Player Score Display flashes 00 (until the first playfield switch is actuated), and the lower Player Score Display shows ball 1, except for 4-player games where the ball # shows in the individual player's display. Additional players may enter the game by pressing the START button once for each player, before the end of play on the first ball.

TILT. Actuating the Slam Tilt switch on the coin door inside the cabinet ends the current game; *DINER* then proceeds to the Game Over Mode. With the third closure* of the plumb bob tilt switch, the player loses the remaining play of that ball, but can complete the game.

END OF GAME. All earned scores and bonuses are awarded. If a player's final score exceeds the specified value, the player receives a designated award for achieving the current highest score. A random digit set* appears in the Match display. Credit* may be awarded, when the last two digits of any player's score display (1 through 4) match the random digits of the Match display. Match, high score, and game over sounds are made, as appropriate.

GAME OVER MODE. The GAME OVER display shows in the player score displays. Then, the high scores flash on the appropriate player score displays. The game proceeds to the Attract Mode.

* - operator-adjustable feature

DINER GAME STATUS DISPLAYS

DINER provides the game owner/operator with a display of information concerning the game's bookkeeping and game play feature adjustments. Basically, three classes of information now become available in this status display mode: Id (Identification); Au (Audit); Ad (Adjustment). Each of the underscored two-letter abbreviations for these classes appears in the Player Score Displays, while the system microprocessor for the *DINER* game is displaying the items within each class.

Identification Information—Id

With the game turned on, the coin door open, and the AUTO-UP/MANUAL-DOWN switch in the AUTO-UP position, the operator can press the ADVANCE switch once, briefly. Player displays immediately change from the Attract Mode to the Game Status Display or Identification (Id) Mode. This is evident by the following display, shown in columnar form. The column headings refer to the two backbox displays.

Upper Player Score Display

DINER

Lower Player Score Display

Id 00 571 L-x*

* x - indicates ROM revision level; e.g., 1 is initial issue; 2, 3, etc. for later revisions.

The game is named in the upper Player Score display. The game's identification number, the ROM revision level, and the Id Mode stage (Id 00) shows in the Lower Player Score display.

Pressing ADVANCE once more causes the Id 01 display to appear. This display describes the installed software more fully; that is, country; development stage; date of revision.

Pressing ADVANCE once more causes the Id 02 display to appear. This display describes which of the "Install" options is currently in effect. For example, if the YES option of the INSTALL FACTORY Adjustment Item (Ad 68) was last selected, *FACTORY SETTING* appears on the player score displays. Changing the setting of any other game adjustment item, after selecting the YES option for Ad 68 causes the display to change to *FACTORY ALTERED*. Similarly, if the operator selects the YES option for INSTALL HARD (Ad 65), the display indicates *HARD SETTING*. Changing a game adjustment item later then causes the display to show *HARD ALTERED*.

Audit Information—Au

While the AUTO-UP switch remains in the Up position, the operator can press the ADVANCE switch once, briefly, to begin the backbox displays of Audit (sometimes called "bookkeeping") Information. Fifty-four audit entries are now available. Calculation of the various factors is no longer necessary because the System 11C game program now performs all the mathematical factor computations. This information is intended to aid the owner/operator in evaluating how the game is performing in each location, by providing knowledge about which game features are receiving the most play. With this information, the owner/operator can determine whether adjusting the game features to other settings will contribute to increased game earnings.

The operator can press the ADVANCE button once to view each Audit Information display item. To proceed more rapidly through this information, the operator only has to press and hold the ADVANCE button. If a desired item is passed, the operator can use the MANUAL-DOWN switch position with the ADVANCE button to back up to the desired item.

The *DINER* Audit Table lists the 54 Audit Items of the *DINER* Game Status Displays. Presentation of these Audit Items again utilizes the player score displays: The Audit Item entry appears in the lower Player Score Display accompanied by the Item's data, while the upper display shows the Item description. A few example entries are shown in the table. Detection of erroneous data affecting any of the counters used in these audit items causes the message, ERROR, to be displayed during display of any audit item associated with that particular counter. (The program does not analyze the cause of the error; it merely alerts the operator of the error's existence by the message.)

D I N E R GAME STATUS DISPLAYS (Continued)

D I N E R Audit Table

Audit Item (Lower)	Descriptive Phrase (Upper Display)	Audit Item ¹ Value (Lower Display)
AU 01	LEFT COINS [chute next to coin door hinge]	432
02	CENTER COINS	0
03	RIGHT COINS	398
04	PAID CREDITS	830
05	TOTAL PLAYS	
06	TOTAL FREE (Total Free Plays)	
07	PERCENT FREE (% Free Plays)	
08	REPLAY AWARDS	
09	PERCENT REPLAY (% Replay Awards)	
10	SPECIAL AWARDS	
11	PERCENT SPECIAL (% Special Awards)	
12	MATCH AWARDS	
13	HSTD (High Score to Date) CREDITS	
14	PERCENT HSTD (% HSTD Credits)	
15	EXTRA BALLS	
16	PERCENT EX. BALL (% Extra Balls)	
17	AV. BALL TIME (Average Time in Seconds)	
18	MINUTES OF PLAY (Minutes of Play)	
19	BALLS PLAYED	
20	REPLAY1 AWARDS	
21	REPLAY2 AWARDS	
22	REPLAY3 AWARDS	
23	REPLAY4 AWARDS	
24	1 PLAYER GAMES	
25	2 PLAYER GAMES	
26	3 PLAYER GAMES	
27	4 PLAYER GAMES	
28	BURN IN CYCLES	
29	MULTIBALLS (# of Multi-Ball™ plays)	
30	RUSH AWARDS (# of "Rush" awards)	
31	DINE TIME AWARDS (# of "Dine-Time" awards)	
32	1,500,000 · GRILL (# of 1.5Mil awards via Grill)	
33	CUP AWARDS (# of 'CUP' plays)	
34	EAT COMPLETE (# of completions of E-A-T lanes)	
35	Not Used	
36	Not Used	
37	CONSOL. EX. BALLS (# of Consolation Extra Balls Awarded)	
38	EARNED EX. BALLS (# of 'Earned' Extra Balls)	
39	H.S.RESET COUNTER	
40	0.0-0.4 MIL. SCORE (# of games <500K)	
41	0.5-0.9 MIL. SCORE (# of games ≥500K, <1M)	
42	1.0-1.4 MIL. SCORE (# of games ≥1M, <1.5M)	
43	1.5-1.9 MIL. SCORE (# of games ≥1.5M, <2.0M)	
44	2.0-2.9 MIL. SCORE (# of games ≥2.0M, <3.0M)	
45	3.0-3.9 MIL. SCORE (# of games ≥3.0M, <4.0M)	
46	4.0-4.9 MIL. SCORE (# of games ≥4.0M, <5.0M)	
47	5.0-5.9 MIL. SCORE (# of games ≥5.0M, <6.0M)	
48	6.0-6.9 MIL. SCORE (# of games ≥6.0M, <7.0M)	
49	7.0-7.9 MIL. SCORE (# of games ≥7.0M, <8.0M)	
50	8.0-99.9 MIL. SCORE (# of games ≥8.0M, <100M)	
51	AV. MIN. GAME TIME (Average Game in Minutes)	
52	LEFT DRAINS (# of drains via Left Outlane)	
53	RIGHT DRAINS (# of drains via Right Outlane)	
54	MINUTES ON	
NOTE: 1. The numbers shown in this column for Items 1 through 4 are examples. Entries for all items depend on the amount of play; thus, they will vary from location to location.		

***DINER* GAME STATUS DISPLAYS (Continued)**

Adjustment Information—Ad

At end of the Audit Information presentation, with the AUTO-UP switch in the Up position, the operator can press the ADVANCE button to proceed to the Adjustment Information portion of the *DINER* Game Status Displays, as shown in the Player Score Displays. A list of the Game Adjustments appears in the *DINER* Game Adjustment Table.

The operator can press the ADVANCE button once to view each Adjustment Information display item. To proceed more rapidly through this information, the operator only has to press and hold the ADVANCE button. If a desired item is passed, the operator can use the MANUAL-DOWN switch position with the ADVANCE button to back up to the desired item.

The *DINER* Game Adjustment Table lists the 70 items of the Adjustment Information portion of the *DINER* Game Status Displays. Presentation of the displays is similar to that for the Audit Information (that is, the upper display shows a descriptive phrase; the light type below the column headings names the respective backbox displays where the information appears, etc.).

The *DINER* Game-specific Adjustments Table lists those game-specific Adjustment Items for which settings vary between the major models of pinball products. The Game Adjustment Table, along with the Game-specific Adjustments Table, provides the Factory Settings for the three major models of pinball products (defined by country/language designation).

NOTE

In these tables, each Adjustment Item's Factory Setting for each of the three major models of pinball products is that shown in the 'Domestic' (US / Can.) column, unless a superseding entry appears in the French or West German columns of these tables. A superseding entry takes precedence over the 'Domestic' entry for the only the particular model indicated.

***DINER* Game-specific Adjustments Table**

Adjustment Item (Lower)	Descriptive Phrase (Upper Display)	Factory Setting (Lower)		
		Domestic (US/Can.)	French	W Ger/ European
Ad 31	1/2 Price Buy in	No		
35	Rush Timer	20 sec	20 sec	18 sec
42	Cah Reg. Ramp (Timer)	12 sec	12 sec	12 sec

D I N E R GAME STATUS DISPLAYS (Continued)

D I N E R Game Adjustment Table

Adjustment Item (Lower)	Descriptive Phrase (Upper Display)	Factory Setting 6 (Lower)		
		Domestic (US/Can.)	French	W Ger/ European
Ad 01	AUTO REPLAY ¹ or FIXED REPLAY ¹	10 (%)		
02	REPLAY START (or REPLAY LEVEL 1) ¹	SCORES 6,000,000	6,000,000	7,000,000
03	REPLAY LEVELS (or REPLAY LEVEL 2) ¹	01 (or OFF)		02
04	(REPLAY LEVEL 3) ¹	(see text)		
05	(REPLAY LEVEL 4) ¹	(see text)		
06	REPLAY AWARD	Credit		
07	SPECIAL AWARD	Credit		
08	MATCH FEATURE	8 %	8%	7%
09	BALLS / GAME	03		
10	TILT WARNING	03	01	
11	EX. BALL / GAME	04		
12	MAXIMUM CREDITS	10	20	30
13	HIGHEST SCORES	On		
14	BACKUP HI. SCR. 1	8,000,000	8,000,000	9,500,000
15	BACKUP HI. SCR. 2	7,500,000	7,500,000	9,000,000
16	BACKUP HI. SCR. 3	7,000,000	7,000,000	8,500,000
17	BACKUP HI. SCR. 4	6,500,000	6,500,000	8,000,000
18	HI. SCR. 1 CREDITS	01	03	03
19	HI. SCR. 2 CREDITS	01	01	00
20	HI. SCR. 3 CREDITS	01	01	00
21	HI. SCR. 4 CREDITS	01	01	00
22	H. S. RESET EVERY	3,000		750
23	FREE PLAY	NO		
24	U.S.A. 2 COINAGE (4 COINS 3 PLAYS) ^{2,3,4}	USA 2	French 1	German 2
25	LEFT UNITS	03	02	06
26	CENTER UNITS	12	10	12
27	RIGHT UNITS	03	20	30
28	UNITS/ CREDIT	04	05	05
29	UNITS/ BONUS	00	20	00
30	MINIMUM UNITS	00	00	00
31 - 58	Game-specific Play / Coinage Adjustments (detailed in text, the Game-specific Adjustments Setting Table, and the Difficulty Setting Comparison Table)			
59 ⁵	INSTALL ADDABALL	NO		
60 ⁵	INSTALL 5-BALL	NO		
61 ⁵	INSTALL NOVELTY	NO		
62 ⁵	INSTALL EX. EASY	NO		
63 ⁵	INSTALL EASY	NO		
64 ⁵	INSTALL MEDIUM	NO		
65 ⁵	INSTALL HARD	NO		
66 ⁵	INSTALL EX. HARD	NO		
67	AUTO BURN-IN	NO		
68	INSTALL FACTORY	NO		
69	CLEAR AUDITS	NO		
70	CLEAR COINS	NO		

NOTES:

1. **Automatic Replay** percentage value range is adjustable from 5 to 25%, via the Credit Button. Item 02 permits changing the factory setting value for Replay Start Level (valid for next 50 games played). Item 03 permits setting up to four replay levels, with values as detailed in text describing Item 03. For **Fixed Replay Scores**, set Auto Replay value to 1 less than 5(%) via the Credit Button. Go to items 02, 03, 04, and 05; install their replay level scores. Turn off any replay level by setting 00 as its value.
2. Phrase in parentheses is **Factory Setting**. Phrase appears in player displays. Press Credit Button to change setting of the game pricing of Item 24.
3. To change country OR coinage setting, press Credit button to obtain 24 Standard Settings, followed by a Custom Setting. The Custom Setting activates items 25 through 30. When a Standard Setting is used, items 25 through 30 are set automatically, and cannot be changed.
4. Refer to **Pricing Table** and text describing these items.
5. Special Preset Adjustment, whose effects are noted in the Game Adjustment text.
6. Entries in Factory Setting columns for French and W. German games show only differences from entries in first (US / Can.) column.

***D I N E R* GAME STATUS DISPLAYS (Continued)**

One of the following *D I N E R* Game Difficulty Setting Tables shows the five game 'difficulty' Adjustment Items (ranging from Ad 62 - Extra Easy through Ad 66 - Extra Hard) for the major models of pinball products (defined by country-language designations). Installing any one of these 'difficulty' Adjustments causes the values shown for each of the included game play Adjustment Items to be installed as a group, changing the level of play from one difficulty level to another. The owner/operator can use the information provided by the Audit Table items to determine whether the 'difficulty level' for this game in this location needs to change to obtain a higher level of earnings from the game or to provide a greater challenge to the location's players.

Once the 'difficulty level' is changed, a careful review of the Audit Items will reveal whether the change has achieved this higher-earnings goal. Sometimes, one (or more) of the Adjustment Items needs further change to keep the number of plays high, while still keeping the earnings level high. "Fine-tuning" of the game's Adjustment Items is a key feature of Williams Electronic Games products.

D I N E R

Game Difficulty Setting Table for US / Canadian / French Games

Adj #	Adj Description	Extra Easy Ad 62	Easy Ad 63	Medium Ad (Factory) 64	Hard Ad 65	Extra Hard Ad 66
31	1/2 Price Buy-in	No	No	No	No	No
32	% Extra Ball / Game	40 %	33 %	25 %	20%	20 %
33	Ex. Ball Lit Memory	Yes	Yes	Yes	Yes	No
34	Spot Multiball	Yes	Yes	Yes	Yes	No
35	Rush Timer	25 sec	23 sec	20 sec	15 sec	12 sec
37	Customer Memory	Yes	Yes	Yes	Yes	No
38	Food Item Memory	Yes	Yes	Yes	Yes	No
39	Today's Special	Easy	Easy	Medium	Hard	Ex. Hard
40	E-A-T Lane Memory	Yes	Yes	Yes	Yes	No
42	Cash Reg. Ramp (Timer)	20 sec	16 sec	12 sec	8 sec	6 sec
43	DINER Ramp	Ex. Easy	Easy	Medium	Hard	Ex. Hard
46	Top Eject Award	Yes	Yes	Yes	Yes	No
47	Consolation Ball Time	40 sec	40 sec	40 sec	40 sec	40 sec
48	Attract Sounds *	On	On	On	On	On

Attract Sounds * for French games are all OFF.

D I N E R GAME STATUS DISPLAYS (Continued)

NOTE

The 'difficulty' Factory Setting for French games is the equivalent of Ad 64 Medium, with 3 balls/game. German/European games also use the equivalent of Ad 64 Medium, with 3 balls/game.

D I N E R

Game Difficulty Setting Table for German / European Games

Adj #	Adj Description	Extra Easy Ad 62	Easy Ad 63	Medium Ad (Factory) 64	Hard Ad 65	Extra Hard Ad 66
31	Not Used	-	-	-	-	-
32	% Extra Ball / Game	35 %	30 %	25 %	20 %	20 %
33	Ex. Ball Lit Memory	Yes	Yes	Yes	Yes	No
34	Spot Multiball	Yes	Yes	Yes	Yes	No
35	Rush Timer	23 sec	21 sec	18 sec	13 sec	10 sec
37	Customer Memory	Yes	Yes	Yes	Yes	No
38	Food Item Memory	Yes	Yes	Yes	Yes	No
39	Today's Special	Easy	Easy	Medium	Hard	Ex. Hard
40	E-A-T Lane Memory	Yes	Yes	Yes	Yes	No
42	Cash Reg. Ramp (Timer)	18 sec	14 sec	10 sec	7 sec	5 sec
43	DINER Ramp	Ex. Easy	Easy	Medium	Hard	Ex. Hard
46	Top Eject Award	Yes	Yes	Yes	Yes	No
47	Consolation Ball Time	40 sec	40 sec	40 sec	40 sec	40 sec
48	Attract Sounds	On	On	On	On	On

GAME ADJUSTMENT PROCEDURE

Adjustment Items 01 through 70

The coin door must be open to access the Game Adjustment/Diagnostic switches. All readings and setting changes require operation of these coin door switches. Some setting changes utilize the START button; some also use the flipper button(s). Additional text describing the game adjustment items follows this procedure; the value of the Factory Setting for each Game Adjustment item is in the preceding *D I N E R* Game Adjustment Table.

1. Use AUTO-UP and press ADVANCE. The Id 00 display initially appears. Press ADVANCE until the Player 3 display indicates **Ad 01**. If the factory setting has not changed, the upper Player Score display indicates AUTO REPLAY, and the lower display shows 10%, indicating a 10% replay percentage. (The game program adjusts itself automatically, as discussed in the following text concerning the 'details' about Adjustment Item 01.)
2. To reach a higher item number (in the lower display), use AUTO-UP and press ADVANCE. To return to a previous item number, use MANUAL-DOWN and press ADVANCE.

GAME ADJUSTMENT PROCEDURE (Continued)

3. With the desired Game Adjustment Item number showing in the lower display, increase the setting value (or select another option) shown in the lower display by using AUTO-UP and pressing the START button. Repeat this step for each item, until all changes to the factory settings for the Game Adjustment Items have been made. The preceding Game Adjustment Table consolidates the Factory Settings into one grouping.

(The same procedure can be used for Audit Items. To zero **Au 01 - 04** (concerning the coin chutes and the total coins), the operator can proceed to item 68, Clear Coins, and press the START button to obtain the YES option. The operator then presses the ADVANCE button and notes the "DONE" display, which verifies that the entry values for items 01 through 04 of the Audit Items are now reset to zero.)

For example, the operator may desire to change the degree of game play difficulty from the Factory Setting (equivalent to the Install Medium [Ad 64] difficulty, along with a number of other automatically installed settings, as shown in the right column of the Game Adjustment Table) to another difficulty more suitable for the players at a particular game site. Four other 'automatic' play difficulty settings (Ad 62 - Ad 66) are available, each of which, if selected, installs all the adjustments listed for that difficulty in the Game Adjustment Setting Comparison Table, which precedes the 'details' text.

4. To proceed rapidly through the entire adjustments series, press and hold ADVANCE, until Ad 70 shows in the lower display. From item 70, you can return to the Game-Over Mode by using AUTO-UP and pressing ADVANCE once. **D I N E R** now goes to the Game-Over Mode.
5. To restore the Factory Settings for Game Adjustment Items (as listed in the Game Adjustments Table), zero all audit (bookkeeping) totals, use AUTO-UP or MANUAL-DOWN to display Ad 68 in the lower display. Press the START button to display the YES option in the lower display. Using AUTO-UP, press ADVANCE once. **D I N E R** now zeroes ALL Audit Item totals and changes ALL Game Adjustment Items back to those originally selected as Factory Settings. It then shows the operator a message ("FACTORY SETTING") that this has occurred. (A problem in the Memory Protection circuit or closing the coin door will cause the message "ADJUST FAILURE" to appear.) Press ADVANCE once more to return to the Game-Over Mode.

GAME ADJUSTMENT PROCEDURE (Continued)

Details of Adjustment Items 01 through 70

01 Auto Replay (or Fixed Replay)

Of the two options, AUTO REPLAY is the percentage of replays automatically awarded per game. The game program aids a pinball's initial installation by causing a comparison of the value of the Replay Level to the value of all players' scores every 50 games. At each comparison, the program increases (or decreases) the Replay Level by an amount necessary to achieve the replay percentage specified either via the factory setting or later operator selection. Use the START button to change the percentage within the range of 5 to 25 (%), with the value increasing using AUTO-UP (or decreasing using MANUAL-DOWN). The next START button change below 5%, selects the FIXED REPLAY option.

For AUTO REPLAY, Ad 02 provides the Starting Replay Level (the upper display shows REPLAY START). Ad 03 provides the number of replay levels (01, 02, 03, or 04). *D I N E R* then proceeds to Ad 06 automatically.

For FIXED REPLAY, Ad 02 is the first replay level (REPLAY LEVEL 1). Ad 03, 04, and 05 are the other replay levels.

02 Starting Replay Level (or Replay Level 1)

For AUTO REPLAY (refer to Ad 01), the initial Factory Setting is listed in the Game Adjustment Table. The range of settings is 1,000,000 through 9,800,000 (by increments of 100,000 with AUTO-UP or decrements of 100,000 with MANUAL- DOWN).

For FIXED REPLAY, the operator can enter the value to be used for the first fixed replay score level via the START button. The range of settings is: OFF; 100,000 through 9,800,000 (by increments of 100,000 with AUTO-UP, or decrements of 100,000 with MANUAL-DOWN).

03 Replay Levels (or Replay Level 2)

For AUTO REPLAY (refer to Ad 01), this is the number of replay levels in a game. The option range is one, two, three, or four replay level(s). When the operator chooses two replay levels, *D I N E R* automatically adjusts the second replay level to be twice the value selected for Ad 02, the starting replay level. Choosing three or four replay levels automatically adjusts their replay levels to three times or four times the Ad 02 value.

For FIXED REPLAY, the technique of value entry and the range of settings are identical to those of Ad 02.

04 (Replay Level 3)

For AUTO REPLAY, this Adjustment Item is not applicable. *D I N E R* automatically bypasses this adjustment.

For FIXED REPLAY, the technique of value entry and the range of settings are identical to those of Ad 02.

05 (Replay Level 4)

For AUTO REPLAY, this Adjustment Item is not applicable. *D I N E R* automatically bypasses this adjustment.

For FIXED REPLAY, the technique of value entry and the range of settings are identical to those of Ad 02.

GAME ADJUSTMENT PROCEDURE (Continued)

06 Replay Award

For either AUTO REPLAY or FIXED REPLAY (Ad 01), the operator can select the form of the award automatically provided when the player exceeds any Replay Level (Automatic or Fixed). The choices are:

- Credit - Reaching each replay level obtains a credit (free game).
- Ball - Reaching each replay level obtains an extra ball.
- Audit - Reaching each replay level obtains nothing to the player; it does increase the entry value of the Audit Item(s) maintaining a tally of these awards (Au 08, and Au 20 through 23, as applicable).

07 Special Award

The operator can select the form of the award automatically provided when the player scores a Special. The choices are:

- Credit - Scoring each Special, when lit, obtains a credit (free game).
- Ball - Scoring each Special, when lit, obtains an extra ball.
- Score - Scoring each Special, when lit, obtains a score advance of 100,000 points to the player.

08 Match Award

The operator can select (via the START button) the desired percentage for the Match action occurring at the completion of each game. The choices are:

- 1%-50% - 1% is 'hard'; 50% is 'extremely easy'. During Match action, the game selects a random two-digit number at end of game and compares each player's score for an identical two digits in the rightmost two positions. A matching of the two digits results in the award of a credit.
- Off - The MATCH display does not operate at completion of the game; no award is given.

09 Balls / Game

The operator can define a "game" by specifying the number of balls to be played. The range of this setting is 1 through 9.

10 Tilt Warning

The operator can specify the number of total actuations of the plumb bob mechanism that can occur before the game is "tilted". The range of this setting is 1 through 5.

11 Extra Ball / GAME

The operator can choose (via the START button) the number of Extra Balls to be awarded to a player. The range of this setting is:

- 00 - NO extra ball play; displays a message, NO EX. BALL.
- 1 -9 Extra Balls - 1 through 9 Extra Balls per game.

12 Maximum Credits

The operator can specify the maximum number of credits the game can accumulate, either through game play awards or coin purchases. The range of settings is 5 through 10. Reaching the specified setting prevents the award of any credits.

13 Highest Scores

The operator can specify (via the START button) whether the game is to maintain a record of the four highest scores achieved to date. The choices are:

- Off - NO high scores are recorded.
- On - The four highest scores are stored in memory for use by Game Adjustment 22.

GAME ADJUSTMENT PROCEDURE (Continued)

14 Backup High Score 1

The operator can set the Backup High Score value in the upper display (for Player 1), using the START button. The game automatically restores this value, when the operator presses, and holds, the HIGH SCORE RESET switch, or when an automatic High Score Reset event (Ad 22) occurs.

15 Backup High Score 2

This adjustment is similar to Ad 14, except that this applies to the Player 2 Score display. The adjustment technique is identical to Ad 14. It is also restored as described for Ad 14.

16 Backup High Score 3

This adjustment is similar to Ad 14, except that this applies to the Player 3 Score display. The adjustment technique is identical to Ad 14. It is also restored as described for Ad 14.

17 Backup High Score 4

This adjustment is similar to Ad 14, except that this applies to the Player 4 Score display. The adjustment technique is identical to Ad 14. It is also restored as described for Ad 14.

18 Credits for Highest Score 1

The operator can select the number of credits to be awarded, by using the START button, whenever a player exceeds the previous Highest Score. The range of this setting is 00 through 10.

19 Credits for Highest Score 2

This adjustment is similar to Ad 18, except that this applies to the player's exceeding the second highest score. The START button adjustment technique is the same as for Ad 18. The range of this setting is 00 through 03.

20 Credits for Highest Score 3

This adjustment is similar to Ad 18, except that this applies to the player's exceeding the third highest score. The START button adjustment technique is the same as for Ad 18. The range of this setting is 00 through 03.

21 Credits for Highest Score 4

This adjustment is similar to Ad 18, except that this applies to the player's exceeding the fourth highest score. The START button adjustment technique is the same as for Ad 18. The range of this setting is 00 through 03.

22 Automatic High Score Reset

The operator can specify (via the START button) that the game will provide an automatic reset of the displayed "Highest Scores", and the number of games to be played before the reset occurs. (Audit item 39 displays the games remaining before the reset.) The values provided upon reset are those selected by the operator in Ad 14 through 17, the Backup High Scores. The range of this setting is Off (to disable this adjustment), and 250 to 24,750 games (in increments of 250).

23 Free Play

The operator can select (via the START button) whether a player can operate the game without a coin (free play) or with a coin. The choices are:

- No - A coin is necessary for game play.
- Yes - Game play is free; no coin is required.

GAME ADJUSTMENT PROCEDURE (Continued)

24 Coinage Selections

The operator can specify (via the START button) any of the 23 Standard Settings for game pricing, each of which exhibits a message identifying the country and the number of coins required and the number of games that the coin requirement purchases. Choosing a Standard Setting permits the game to omit items Ad 25 through 30, which are adjustments allowing for a special custom coinage setting.

Following the last Standard Setting is a Custom Coinage Setting, which allows the operator to utilize Ad 25 through 30 in establishing a special coinage setting. A message, CUSTOM COINAGE, indicates that the operator can enter the appropriate values into the Ad 25 through 30 adjustment items.

The values for Ad 25 through 30 of each Standard Setting, as well as other possible values for the Custom Coinage Setting are shown in the Pricing Table.

25 Left Chute Coin Units

The operator can specify (via the START button) the number of coin units purchased by a coin passing through the left coin chute.

26 Center Chute Coin Units

The operator can specify (via the START button) the number of coin units purchased by a coin passing through the center coin chute.

27 Right Chute Coin Units

The operator can specify (via the START button) the number of coin units purchased by a coin passing through the right coin chute.

28 Units Required for Credit

The operator can define (via the START button) the number of coin units required to obtain 1 Credit. A coin unit counter in the game program totals the number of coin units purchased through all coin chutes prior to each game. If the total of these coin units matches, or exceeds, the Units per Credit value by a multiple (or more, coin units) of the specified Units per Credit value, the Credits display shows the proper number of Credits. The coin unit counter retains any remaining coin units, until the start of a game; then, the coin unit counter is cleared (its contents are zeroed).

29 Units Required for Bonus

The operator can specify (via the START button) that 1 additional Credit is to be indicated in the Credits display, when a certain number of coin units are accumulated.

30 Minimum Units Required for any Credits Posted

The operator can specify that NO Credits are to be posted (indicated in the Credits display), until the credits units counter reaches a particular value, by setting this value to 02 (or more). A setting of 01 allows the Credits display to show fractional coin units.

The System 11C game program defines the following 28 Adjustment items as "game-specific"; that is, they are unique for each game. The Game Designer/Engineer/Programmer team members work together to use these as controlling factors for game play. By varying the setting of these Adjustment items, it is possible to "fine-tune" a game to suit a particular location, enabling the owner/operator to reap maximum earnings, while still providing the players with sufficient challenge to keep them playing.

GAME ADJUSTMENT PROCEDURE (Continued)

- 31 1/2 PRICE BUY IN** (American Games ONLY; this Adjustment Item is NOT USED for foreign games)
The operator can choose (via the START button) whether, at the end of a game, the player is allowed to purchase ('buy-in') subsequent games at 1/2 price. The number of games offered at 1/2 price is determined by the number of players in the previous game; that is, if the previous game had three players, three Credits can be purchased at 1/2 price. NOTE: This requires that the left coin slot is always the smallest denomination of coin. When these conditions exist, the choices are:
- Yes - The player has 10 seconds to 'buy-in' the next game(s) at 1/2 the original cost.
No - The 'buy-in' feature is disabled (not available).
- 32 % EXTRA BALLS / GAME**
The operator can specify (via the START button) the number of Extra Balls awarded per game, as determined by the percentage setting selected. The range of this adjustment setting is 1% (Conservative) through 99% (Extremely Liberal), and 0 for Off.
- 33 EX. BALL LIT MEMORY**
The operator can choose (via the START button) whether any lighted Extra Ball lamps are retained in memory for 'Next Ball' play. The choices are:
- Yes - Lighted Extra Ball lamps are retained in memory for 'Next Ball' play.
No - Lighted Extra Ball lamps are NOT retained in memory for 'Next Ball' play.
- 34 SPOT MULTIBALL**
The operator can choose (via the START button) whether a shot into TODAY'S SPECIAL (Sub-Playfield Shooter Assembly) starts Multi-Ball play, when the first ball is locked under the left Elevator Ramp. The choices are:
- Yes - Multi-Ball play starts with a Today's Special shot.
No - Player must earn Multi-Ball in the usual manner.
- 35 RUSH TIMER**
The operator can choose (via the START button) the time period for making the two RUSH shots to light the RUSH lamps. (During 2-ball Multi-Ball play, while the RUSH lamps are lighted, all Left and Right Ramp shots score 500,000 points.) The range of setting is 4 Seconds (Conservative) through 25 Seconds (Liberal). This adjustment cannot be turned off.
- 36 NOT USED**
- 37 CUSTOMER MEMORY**
The operator can choose (via the START button) whether the number of customers lighted (via drop target bank completions) is retained in memory for 'Next Ball' play. The choices are:
- Yes - Lighted Customer lamps are retained in memory for 'Next Ball' play.
No - Lighted Customer lamps are NOT retained in memory for 'Next Ball' play.
- 38 FOOD ITEM MEMORY**
The operator can specify (via the START button) whether lighted Food Items are retained in memory for 'Next Ball' play. The choices are:
- Yes - Food Items ARE retained in memory for 'Next Ball' play.
No - Food Items are NOT retained in memory for 'Next Ball' play.

GAME ADJUSTMENT PROCEDURE (Continued)

39 TODAY'S SPECIAL

The operator can choose (via the START button) the operating conditions for the TODAY'S SPECIAL feature. A shot into Today's Special obtains a random of one of the following: Mystery Score, Extra Ball, Advance Dine-Time, Start Multi-ball, and Spot Customer. The choices are:

- Ex. Easy* - Always on during single ball (Not Multi-ball) play.
- Easy* - On at each ball start and relighted via Left Return lane with no timer.
- Medium* - On at each ball start and relighted via Left Return WITH timer.
- Hard* - On at first ball start and relighted via Left Return WITH timer.
- Ex. Hard* - Off at each ball start and relighted via Left Return WITH timer.

40 E - A - T LANE MEMORY

The operator can choose (via the START button) whether lighted E - A - T lane lamps are retained in memory for 'Next Ball' play. The choices are:

- Yes* - Lighted E - A - T lane lamps ARE retained in memory for 'Next Ball' play.
- No* - Lighted E - A - T lane lamps are NOT retained in memory for 'Next Ball' play.

41 NOT USED

42 CASH REG. RAMP

The operator can choose (via the START button) the time period that the player has to make the next Cash Register (left) Ramp shot to advance the Cash Register value. The range of settings is *5 Seconds* (Conservative) - *20 Seconds* (Liberal), and *0*, for Off.

43 DINER RAMP

The operator can choose (via the START button) the difficulty associated with operating the diverter to 'open' the cup and lighting Lock 1. By spelling D-I-N-E-R, the player raises the Cash Register Ramp to 'lock' a ball, and 'opens' the Cup for the Cup Bonus shot. The choices are:

- Ex. Easy* - First shot always lights Lock 1 and 'opens' the Cup. D-I-N-E-R always stays lighted.
- Easy* - Game starts with D-I-N-E-R lighted. After the Cup Bonus is awarded, only D-I-N will be lighted.
- Medium* - Game starts with D-I-N-E-R lighted. After the Cup Bonus is awarded, the player must spell D-I-N-E-R to 'open' the Cup.
- Hard* - Game starts with D-I-N lighted. After the Cup Bonus is awarded, the player must spell D-I-N-E-R to 'open' the Cup.
- Ex. Hard* - The player must always spell D-I-N-E-R.

44 & 45 NOT USED

GAME ADJUSTMENT PROCEDURE (Continued)

46 TOP EJECT AWARD

The operator can choose (via the START button) whether the Top Left Eject awards are available via a shot from the Sub-Playfield Shooter. The choices are:

Yes - (Liberal) Awards are available via a shot from the Sub-Playfield Shooter.

No - (Conservative) Awards are NOT available via a shot from the Sub-Playfield Shooter.

47 CONSOL. BALL TIME

The operator can choose (via the START button) the time period that causes the award of a Consolation Extra Ball. This Consolation Extra Ball enables less-skilled players to enjoy the game. The range of this setting is 0 (No Consolation Extra Ball play is allowed), and 1 *Second* (Conservative) through 99 *Seconds* (Liberal).

48 ATTRACT SOUNDS

The operator can choose (via the START button) whether the Attract Mode sounds occur. The choices are:

On - Sounds ARE heard during the Attract Mode.

Off - Sounds are NOT heard during the Attract Mode.

49 CUSTOM MESSAGE

The operator can choose (via the START button) whether to display a message during the Attract Mode. (When display of a message is selected, the operator can either utilize the message provided or change the message.) Three choices are available:

- 1 - Display a message during the Attract Mode. The lower display shows this choice as ON. The 3-line message provided is:

YOU CAN EAT ... YOUR HEART OUT ... AT THE DINER.

- 2 - Do NOT display a message during the Attract Mode. (Lower display shows OFF.)
- 3 - The lower display shows this choice as CHANGE. The operator can enter a special ("custom") message, as follows:
 - A. Press ADVANCE once. The operator can now enter as many as three 16-character lines for display during the Attract Mode.
 - B. Use the flipper button(s) to select each message character (alphabet, numbers, and special symbols are available). In case of error, enter a "back arrow" (just before "space") to correct, followed by correct character. For a period after any letter, use letters with periods (following the special symbols). The entire character set is the following:
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z 0 1 2 3 4 5 6 7 8 9 < > ? - / * ' _
A . B . C . D . E . F . G . H . I . J . K . L . M . N . O . P . Q . R . S . T . U . V . W . X . Y . Z . _
 - C. Move to the next character via the Credit button. The game program does not allow entirely blank lines to be displayed.

50 DISPLAY AU 01 - 04

The operator can choose (via the START button) how to display the coinage audit information, Au 01 - 04. No information is lost; it remains stored in the CPU memory. The information is now available for readout via the player score displays. Three choices are available:

Yes - Both the audit text (slot identification) and the value is displayed.

Nbr - Only the numerical value is displayed.

No - NO display occurs.

GAME ADJUSTMENT PROCEDURE (Continued)

51 & 52 NOT USED

53 - 58 Special Preset Adjustment Settings

SPECIAL PRESET ADJUSTMENTS CAUTION

Adjustments 53 through 66 are Special Preset Adjustments to enable the operator to perform the setting of multiple adjustments at once. They permit the operator to: (1) modify the game for a specific area (for example, coinage settings for a country); (2) change a group of adjustments to conform with laws of certain localities; and (3) change the degree of difficulty of game play (Ad 62 through 66). Whenever the operator chooses to use any Special Preset Adjustment, the operator can later access any or all of the individual Adjustments affected by that Special Adjustment for subsequent changes.

A similar technique is recommended in the event of error or uncertainty concerning any Special Preset Adjustment, after the operator selects it: The operator can restore the factory setting of each individual Adjustment, then select the desired Special Preset Adjustment, and then return to any of the preceding individual adjustments to determine whether use of the Special Adjustment has had the desired effect.

The Backbox displays for each Special Preset Adjustment indicate whether the operator has selected it, by identifying the Adjustment in the upper displays by name and the selection choice of NO, meaning Not Selected (this is the Factory Setting), or YES, meaning Selected, in the lower display. Operator installation of the 'selected' Preset Adjustment occurs by using the START button to choose YES and then pressing the ADVANCE switch. The displays then show the name of the Adjustment again, with DONE to show that the installation is now in effect.

Note that, when an operator installs any of the Special Preset Adjustments, Adjustment Items using the automatic adjust feature of the game program reset to the INITIAL auto adjust value listed for that Adjustment Item.

NOTE

A game in which the CPU has ROMs installed for German (Deutsch) or French (Francais) language and play adjustments automatically has certain Adjustment Items preset. The following tables show these Preset Adjustment Items for each of the special language games.

GAME ADJUSTMENT PROCEDURE (Continued)

53 through 58 (For USA / Canadian Games only)

The operator can use these Adjustment Items to modify the game pricing selection and the type of game play in certain Adjustments..

D I N E R

Preset Game Adjustments Table for US / Canadian Games

Adj #	Adj Description	Install Ad Buy-In 53	Ad 54	Install Ad 3 Ball 55	3 Balls/ Ad 2 Coins 56	3 Balls/ Ad 1 Coin 57	5Balls/ Ad 2 Coins 58
02	Replay Start	--	NOT USED	6,000,000	6,000,000	6,000,000	7,000,000
09	Balls / Game	--		3	3	3	5
14	Backup High Score 1	--		8,000,000	8,000,000	8,000,000	9,000,000
15	Backup High Score 2	--		7,500,000	7,500,000	7,500,000	8,500,000
16	Backup High Score 3	--		7,000,000	7,000,000	7,000,000	8,000,000
17	Backup High Score 4	--		6,500,000	6,500,000	6,500,000	7,500,000
24	Coinage Setting	USA 3		USA 2	USA 2	USA 1	USA 3
31	1/2 Price Buy-In	Yes		No	No	No	No
64	Install Medium	No		Yes	Yes	Yes	No
65	Install Hard	No		No	No	No	Yes

GAME ADJUSTMENT PROCEDURE (Continued)

53 through 58 For German/European Games Only: Install German 1, 2, 3, 4, 5 or 6

The operator can use these Adjustment Items to modify the game pricing selection of Standard Setting named "German 2 or German 1" in the Pricing Table to permit the style of play for the particular price shown in the *DINER* Preset Game Adjustments Table for German/European Games.

DINER

Preset Game Adjustments Table for German/European Games

Adj #	Adj Description	German Ad 1 53	German Ad 2 54	German Ad 3 55	German Ad 4 56	German Ad 5 57	German Ad 6 58
06	Replay Award	Credit	Coil	Audit	Credit	Coil	Audit
07	Special Award	Credit	Ball	Score	Credit	Ball	Score
08	Match Feature	7 %	7 %	Off	7 %	7 %	Off
14	Backup High Score 1	9.500.000	9.500.000	00	9.500.000	9.500.000	00
15	Backup High Score 2	9.000.000	8.000.000	00	9.000.000	9.000.000	00
16	Backup High Score 3	8.500.000	8.500.000	00	8.500.000	8.500.000	00
17	Backup High Score 4	8.000.000	8.000.000	00	8.000.000	8.000.000	00
18	High Score 1 Credits	01	01	00	01	01	00
19	High Score 2 Credits	00	00	00	00	00	00
20	High Score 3 Credits	00	00	00	00	00	00
21	High Score 4 Credits	00	00	00	00	00	00
24	Coinage Setting	6 spiele/5 DM	6 spiele/5 DM	6 spiele/5 DM	7 spiele/5 DM	7 spiele/5 DM	7 spiele/5 DM

53 through 58 For French Games Only: Install French 1, 2, 3, 4, 5, or 6.

The operator can use these Adjustment Items to modify the style of play for the particular setting shown in the *DINER* Preset Adjustments Table for French Games.

DINER

Preset Game Adjustments Table for French Games

Adj #	Adj Description	French Ad 1 53	French Ad 2 54	French Ad 3 55	French Ad 4 56	French Ad 5 57	French Ad 6 58
32	% Ex Ball / Game	25 %	20 %	70 %	25 %	25 %	20 %
60	Install 5 Ball	N/A	N/A	N/A	N/A	N/A	Yes

GAME ADJUSTMENT PROCEDURE (Continued)

59 Install Add-A-Ball

The operator can utilize this option to delete all Free Play awards and replace them with Extra Ball awards. Individual Adjustments are affected, as follows:

Ad	Name	New Setting	Ad	Name	New Setting
06	Replay Award	Ball	19	Hi Scr 2 Credits	00
07	Special Award	Ball	20	Hi Scr 3 Credits	00
08	Match Feature	Off	21	Hi Scr 4 Credits	00
18	Hi Scr 1 Credits	00			

60 Install 5 Ball

The operator can change the game to 5-ball play, including the changing of certain features to the recommended 5-ball difficulty level. NOTE: Ad 65 (Install HARD) settings are also set when the game is changed to '5-ball Play'. Other Adjustments are affected, as follows:

Ad	Name	New Setting	Ad	Name	New Setting
02	Replay Start	7,500,000	16	B'up Hi Score 3	8,500,000
09	Balls / Game	05	17	B'up Hi Score 4	8,000,000
14	B'up Hi Score 1	9,500,000	65	Install Hard	Yes
15	B'up Hi Score 2	9,000,000			

61 Install Novelty

The operator can remove all Free Play and Extra Ball awards by selecting the Yes Option. Individual Adjustments are affected, as follows:

Ad	Name	New Setting	Ad	Name	New Setting
01	Fixed Replay	SCORES	13	Highest Scores	Off
02	Replay Level 1	Off	18	Hi Scr 1 Credits	00
03	Replay Level 2	Off	19	Hi Scr 2 Credits	00
04	Replay Level 3	Off	20	Hi Scr 3 Credits	00
05	Replay Level 4	Off	21	Hi Scr 4 Credits	00
06	Replay Award	Audit	32	Ex Ball Percent	Off
07	Special Award	Score			
08	Match Feature	Off			
11	No Extra Balls	00			

62 Install Extra Easy

The operator can change the game play difficulty adjustments to a combination that is much less difficult than the Factory Settings. The Game Difficulty Setting Table, which precedes these 70 individual Adjustments descriptions, lists the Adjustments and the settings that comprise the 'Extra Easy' group.

63 Install Easy

The operator can change the game play difficulty adjustments to a combination that is somewhat less difficult than the Factory Settings. The Game Difficulty Setting Table, which precedes these 70 individual Adjustments descriptions, lists the Adjustments and the settings that comprise the 'Easy' group.

64 Install Medium

The operator can change the game play difficulty adjustments to a combination that is about the same difficulty as the Factory Settings. The Game Difficulty Setting Table, which precedes these 70 individual Adjustments descriptions, lists the Adjustments and the settings that comprise the 'Medium' group.

GAME ADJUSTMENT PROCEDURE (Continued)

65 Install Hard

The operator can change the game play difficulty adjustments to a combination that is somewhat more difficult than the Factory Settings. The Game Difficulty Setting Table, which precedes these 70 individual Adjustments descriptions, lists the Adjustments and the settings that comprise the 'Hard' group.

66 Install Extra Hard

The operator can change the game play difficulty adjustments to a combination that is much more difficult than the Factory Settings. The Game Difficulty Setting Table, which precedes these 70 individual Adjustments descriptions, lists the Adjustments and the settings that comprise the 'Extra Hard' group.

67 Auto Burn-In

The operator can choose the YES option for this Special Preset Adjustment to perform certain automatic testing of the game, as used in the factory. It does not affect the game operation, but merely provides for a cyclic testing of most of the game's mechanisms.

68 Install Factory

The operator can request the game (via the START button) to provide the normal Factory Settings, essentially restoring the game to its 'factory condition'. The operator must select the 'YES' option for this adjustment to obtain the resetting action. The 'YES' option clears all Audits, resets all Game Adjustments to the respective Factory Settings, and provides a restart of the Auto Replay (Ad 01). After selecting the YES option, the operator must press the ADVANCE button. The game then displays the message, FACTORY SETTING.

Closing of the coin door before appearance of the FACTORY SETTING message or a problem in the Memory Protect circuit will cause the game to display ADJUST FAILURE. A loss of battery power or improper treatment of the Game Adjustments will cause the game to attempt to restore Factory Settings. The game announces the results of this reset process with the appropriate message, FACTORY SETTING or ADJUST FAILURE.

69 Clear Audits

The operator can request the clearing of the non-coinage audits (Au 05 through 55) by selecting (via the START button) the YES option, as shown in the lower display. This Adjustment zeroes the counters tallying the remaining Audit factors. Please note that this does NOT affect the Automatic Replay Percentage data nor the automatic High Score Reset counter. After the YES option is displayed, the operator must press the ADVANCE button. The game then displays DONE to show that the non-coinage audits were reset to zero.

70 Clear Coins

The operator can request the clearing of the coinage audits (Au 01 through 04) by selecting (via the START button) the YES option, as shown in the lower display. This adjustment zeroes the counters tallying the number of coins through each slot, the Paid Credits counter, and the Credits display. After the YES option is displayed, the operator must press the ADVANCE button. The game then displays DONE to show that the coinage audits were reset to zero.

RESETTING THE HIGH SCORES

The challenge of exceeding the High Score (either the factory setting or a higher score by another player) is the goal of many pinball game players. To keep a pinball game challenging requires a method of resetting the High Score value for those occasions when a skilled player registers a truly excellent score. Other players note this score and may decide not to play simply because their skill is not adequate to exceed an extremely high score.

For *D I N E R*, in fact, three methods of resetting the High Score values are available. The simplest method involves allowing Game Adjustment Item Ad 22 to reset the High Score values automatically after the specified number of plays designated by the operator. The second method requires pressing the High Score Reset switch on the inside of the coin door in the Attract Mode. This action simply erases the previous high score values and replaces them with the Backup High Score values. The third method establishes new values replacing the factory setting values or previous operator setting values; it requires performing the following steps:

1. Using AUTO-UP or MANUAL-DOWN, reach item Ad 14 (and items Ad 15, 16, and 17, if desired). The High Score value of the factory setting (or previous operator-adjusted setting) appears in the upper display. If this value is satisfactory, go to step 4 below.
2. If you wish to increase the High Score value from that displayed in the upper display, use AUTO-UP, and press the Credit button, until the desired value shows in the upper display.
3. If you wish to decrease the High Score value, use MANUAL-DOWN, and press the Credit button, until the desired value shows in the upper display.
4. Using AUTO-UP, press and hold down ADVANCE, until the lower display shows Ad 70 Press ADVANCE once, to return to Game- Over Mode.
5. Press the High Score Reset switch (on coin door), and listen for the sound signifying that the score reset action is complete. Observe player score displays to verify that the new High Score values are displayed.

GAME PRICING

PRICING MADE EASY. Game Adjustment Item Ad 24 allows the operator an easy method of setting the pricing functions. Pressing the Credit button allows the operator a choice of one of the 16 "Standard" Settings, with associated automatic pricing (the upper display shows the Country identifier, with a number for a country having more than one "Standard" Setting; the lower displays show the games per coin(s) information). In the Pricing Table, each "Standard" Setting is denoted by a Country Identifier. Automatic Pricing causes each of the other pricing items (columns 25 through 30) to change to the value shown in the table for that selected "Standard" Setting. In the table where the word "CUSTOM" appears, the owner/operator must enter the values shown (columns 25 through 30) to obtain the games per coin factor shown in the Games/Coin column of the table. To make these setting adjustments, the owner/operator must press the Credit button until the words "CUSTOM COINAGE" appear in the player score displays.

CUSTOM PRICING. Adjustment Item 24 must be set to the Custom Coinage Setting (upper display showing CUSTOM COINAGE) to enable the operator to enter desired custom pricing selections for Items 25 through 30, based on the Pricing Table. Item 25 is the left coin chute multiplier. Item 26 is the center coin chute multiplier. Item 27 is the right coin chute multiplier. Item 28 is the number of coin units equal to one Credit. (A Credit is usually equal to one game.)

The calculation of the ratio of Games : Price uses the ratio equation of $X : VC$, where:

X = Coin Chute Multiplier (Item 25, 26, or 27 in Pricing Table);

V = Value of coin;

C = Coin units equivalent to one Credit (Item 28).

For example, for 25¢ chutes at the factory setting, substituting values in the Games : Price ratio calculation gives $1 : 25 \times 1$, or one game for 25¢.

UNITS REQUIRED FOR BONUS CREDIT. Item 29 is the number of coin units that must pass through the coin chute(s) before an additional Credit (game) is posted (displayed). At the factory setting, the number in this item is 00. (This 00 means that NO bonus credit (free game) is awarded, although purchase of more than one game at a time occurs.)

MINIMUM COIN UNITS. Item 30 determines the number of coin units that must pass through the coin chute(s) before play may begin. The Factory Setting for this item is 00. (This 00 means that the Minimum Coin Units feature (Item 30) is disabled; a 01 setting also means that this feature is still disabled, yet the Credits message display should display fractional coin units.)

D I N E R Pricing Table

Country	Coin Chute			Games/Coin	Ad 24 Display	Pricing Functions					
	Left	Center	Right			25	26	27	28	29	30
USA and Canada	25¢	-	25¢	1/25¢, 4\$1 ²	U.S.A. 1	01	04	01	01	00	00
				1/50¢, 2/75¢, 3/\$1 ¹²	U.S.A. 2	03	12	03	04	00	00
				1/50¢, 2/\$1 ²	U.S.A. 3	01	04	01	02	00	01
				1/25¢, 3/\$1 ²	U.S.A. 4	01	00	01	02	04	01
				1/25¢, 3/50¢, 6/\$1	CUSTOM	01	04	01	01	02	00
				1/25¢, 5/\$1	CUSTOM	01	00	01	01	04	00
				1/50¢ ; Add'l game: 25¢	CUSTOM	98	00	98	99	00	00
Austria	5 Sch	10 Sch	10 Sch	1/2x5 Sch, 3/2x10 Sch ²	AUSTRIA	01	02	02	02	04	01
	5 Sch	-	10 Sch	2/5 Sch, 5/10 Schilling	CUSTOM	02	00	05	01	00	00
	1 Sch	5 Sch	10 Sch	2/5x1 Sch, 2/5 Sch, 5/10 Sch	CUSTOM	02	10	25	05	00	00
Australia	20¢	-	\$1	1/3x20¢, 2/\$1 ²	AUSTRAL	02	00	10	05	00	00

GAME PRICING (Continued)

D I N E R Pricing Table (Continued)

Country	Coin Chute			Games/Coin	Ad 24 Display	Pricing Functions					
	Left	Center	Right			25	26	27	28	29	30
United Kingdom	10 P	50 P	1£	1/2x10 P, 3/50 P, 7/1£ ²	UK	03	15	30	05	30	00
	10 P	50 P	20 P	1/10 P, 5/50 P, 2/20 Pence	CUSTOM	03	15	30	05	30	00
Switzerland	1 F	2 F	5 F	1/1 F, 3/2 F, 7/5 Franc ²	SWISS	01	03	07	01	00	00
	1 F	-	2 F	1/1 F, 3/2 F	CUSTOM	03	00	06	02	00	00
Belgium	20 F	20 F	20 F	3/20 Franc ²	BELGIUM	03	03	03	01	00	00
	5 F	-	20 F	1/2x5 F, 2/20 Franc	CUSTOM	01	00	04	02	00	01
	5 F	20 F	20 F	1/2x5 F, 2/20 F, 2/20 F	CUSTOM	01	04	04	02	00	01
	5 F	5 F	20 F	1/2x5 F, 1/2x5 F, 2/20 F	CUSTOM	01	01	04	02	00	01
West Germany	1 DM	2 DM	5 DM	1/1 DM, 2/2 DM, 7/5 DM ²³	GERMAN 1	06	12	30	05	30	00
				1/1 DM, 2/2 DM, 6/5 DM ¹²	GERMAN 2	06	12	30	05	00	00
				1/1 DM, 3/2 DM, 9/5 DM	CUSTOM	09	18	45	05	00	00
				1/2x1 DM, 1/2 DM, 3/5 DM	CUSTOM	03	06	15	05	00	00
				2/1 DM, 5/2 DM, 14/5 DM	CUSTOM	13	26	65	05	65	00
Netherlands	1 Hfl	2.5 Hfl	2.5 Hfl	1/1 Hfl, 3/2.5 Holland Florin ²	NETHERL	06	15	15	05	00	00
	25¢	-	1 G	1/25¢, 5/1 Guilder	CUSTOM	01	00	05	01	00	00
	1 G	-	1 G	1/1 Guilder ²	HOLLAND	01	00	01	01	00	00
Sweden	5 Kr	5 Kr	5 Kr	1/5 Krona ²	SWEDEN	01	01	01	01	00	00
	1 Kr	-	1 Kr	1/2x1 Krona	CUSTOM	01	04	01	02	00	01
France	1 F	5 F	10 F	1/3x1 F, 2/5 F, 5/10 Franc ¹²	FRANCE	02	10	20	05	20	00
	1 F	5 F	10 F	1/2x1 F, 3/5 F, 7/10 Franc	CUSTOM	03	15	30	05	30	00
	5 F	10 F	10 F	1/5 F, 3/10 F, 7/2x10 Franc	CUSTOM	03	15	30	10	60	15
	5 F	10 F	10 F	2/5 F, 4/10 F, 9/2x10 Franc	CUSTOM	02	10	20	05	40	10
	5 F	10 F	10 F	2/5 F, 5/10 F, 11/2x10 Franc	CUSTOM	01	05	10	02	20	05
Italy	500 L	500L	500 L	1/500 Lire ²	ITALY	01	01	01	01	00	00
Spain	25 P	-	100P	1/25 P, 5/100 Peseta ²	SPAIN	05	00	20	04	00	00
	25 P	-	100P	1/25 P, 4/100 Peseta	CUSTOM	01	00	04	01	00	00
	25 P	-	100P	1/2x25 P, 2/100 Peseta	CUSTOM	01	00	04	02	00	00
	25 P	-	100P	1/2x25 P, 3/100 Peseta	CUSTOM	03	00	12	04	00	06
Japan	100 ¥	-	100 ¥	1/100 Yen ²	JAPAN	01	00	01	01	00	00
	-	100 ¥	-	2/100 ¥	CUSTOM	01	04	01	02	00	01
Antilles, Netherl.	25¢	-	1G	1/25¢, 4/1 Guilder ²	ANTILLES	01	01	04	01	00	00
Chile	Token	-	Token	1/1 Token ²	CHILE	01	04	01	01	00	00
Denmark	1 Kr	5 Kr	10 Kr	1/2x1 Kr, 3/5 Kr, 7/10 Krone ²	DENMARK	03	15	30	05	30	00
Finland	1 Mka	-	5 Mka	1/2x1 Mka, 3/5 Markka ²	FINLAND	03	00	15	05	00	00
New Zealand	20¢	-	20¢	1/3x20¢ ²	N.Z.	01	00	01	03	00	01
Norway	1 Kr	-	1 Kr	1/2x1 Kr, 3/5x1 Krone ²	NORWAY	01	00	01	02	05	00
Argentina	10¢	10¢	10¢	1/1 Token ²	ARG.	01	01	01	01	00	00
Greece	10D	20D	50D	1/2x10D, 1/20D, 3/50 Drachma ²	GREECE	03	06	15	05	00	00

Notes: 1. Factory Default. 2. Standard Setting - Change by pressing Start button. 3. Other functions are also affected; see the explanations for Adjustment Items 53 through 58.

TEST/DIAGNOSTIC PROCEDURES

WILLIAMS ELECTRONICS GAMES also provides a series of diagnostic tests to aid the operator in determining game condition (that is, whether the game's features and highlights are operating satisfactorily). These tests activate virtually all the electronic and electromechanical devices comprising the game, so that the operator can readily locate a malfunctioning device or simply verify that all devices are working properly. In order, these tests deal with the music, the displays, the game sounds, the lamps, the solenoids, and the switches.

In addition to the diagnostic testing, a feature called the Auto Burn-in Mode is available. Activating this mode enables the operator to observe the game while all of the diagnostic tests, except the switch tests, occur. This can be very helpful in locating 'intermittent' problems.

Activating either the entire test series or one of the individual tests requires use of the Game Adjustment/Diagnostic switches. Open the coin door for access to these switches. To proceed to the Diagnostic Tests, the operator must simply switch the game On, set the AUTO-UP/MANUAL- DOWN switch to MANUAL-DOWN, and press the ADVANCE button.

CAUTION

The System 11C game program greatly aids the operator and service personnel: At the beginning of the Test/Diagnostic Procedures (and also at game Turn-On), the player score displays now signal, with a message ("Press ADVANCE for Report") that the game program has detected a problem that affects game play. Messages for *DINER* include "Check Switch ##", "Pinball Missing", etc. Refer to the text on Problem Analysis Messages at the end of the Test/Diagnostic Procedures for more details concerning the messages' meaning. To proceed with the Test/ Diagnostic Procedures, use AUTO-UP, and press ADVANCE.

MUSIC TEST.

1. In the Music Test, observe that the upper displays show the message, MUSIC TEST. Switching to AUTO-UP, observe that the message now reads MUSIC OFF, and that the lower display shows 00 00. Press the Credit button to select the desired music selection: 01 through 07 (the selections repeat). Adjust the volume control for proper sound level for the game location.
2. Use the AUTO-UP position.

DISPLAY TEST.

1. To initiate the Display Test, press ADVANCE. Observe that upper display briefly shows the message, DISPLAY TEST, and that the lower display shows 01 (the Display Test identifier).
2. Use AUTO-UP. Observe that all displays begin a display cycle of all 0s through all 9s, one digit at a time. Verify that the proper comma segments light during display of the odd-numbered digits. Next, a special "all segments" character 'walks' from left to right across each player score display.
3. To halt the display cycle, use MANUAL-DOWN. Then, press ADVANCE to step through the sequential digit display, digit by digit, and the subsequent "all segments" characters display test. Use AUTO-UP to resume cycling, and to proceed to the next test.

SOUND TEST.

1. (From Display Test) To initiate the Sound Test, press ADVANCE. Observe that the upper displays show the message, SOUND TEST, and that the lower display shows 02 (the Sound Test identifier). The lower display shows a series of test steps from 00 through 07.
2. To repeatedly pulse a single sound, use MANUAL-DOWN. Verify that one particular sound repeats. Press ADVANCE to step to the next sound, which repeats until ADVANCE is pressed again. Use AUTO-UP to resume cycling the sounds, and to proceed to the next test.

TEST/DIAGNOSTIC PROCEDURES (Continued)

LAMP TESTS.

1. All Lamps.

(From Sound Test) To initiate the first Lamps Test, press ADVANCE. Observe that the upper displays show the message, ALL LAMPS, and that the lower display shows 03 (All Lamps Test identifier) and that all feature lamps (playfield and backbox) blink on and off. (Note, however, that the General Illumination lamps remain lighted steadily.) To locate the wiring associated with a particular feature lamp, refer to the **Lamp-Matrix Table**. CPU Board connections at jacks 1J6 (columns) and 1J7 (rows) are also listed in the table.

2. Single Lamps.

From the All Lamps test, using AUTO-UP, press ADVANCE to initiate the Single Lamps Test. The upper displays initially show the message, SINGLE LAMPS, and the lower display shows 04. Then, the lower display shows 04 01, and the upper displays change to show "W", the name of the lamp currently blinking. Press the START button to proceed through an ascending series of designator numbers (01 through 64), with the upper displays showing the individual lamp's name. (To proceed through a descending series of lamp identifiers, use MANUAL-DOWN.) Press and hold the START button to proceed rapidly to the desired lamp.

D I N E R Lamp-Matrix Table

COLUMN ROW	1 Q66 YEL-BRN 1J7-1	2 Q64 YEL-RED 1J7-2	3 Q62 YEL-ORN 1J7-3	4 Q60 YEL-BLK 1J7-4	5 Q58 YEL-GRN 1J7-6	6 Q56 YEL-BLU 1J7-7	7 Q54 YEL-VIO 1J7-8	8 Q52 YEL-GRY 1J7-9
Q80 RED-BRN 1 1J6-1	20K (C Regstr) 1	Serve Again 9	D (in DINER) 17	Jukebox 1 25	Haji 33	100K Grill BONUS 41	1 o'clock Dine Time 49	9 o'clock Dine Time 57
Q81 RED-BLK 2 1J6-2	40K (C Regstr) 2	Ramp Scores 500K (L Ramp) 10	I (in DINER) 18	Jukebox 2 26	Babs 34	250K Grill BONUS 42	2 o'clock Dine Time 50	10 o'clock Dine Time 58
Q82 RED-ORN 3 1J6-3	60K (C Regstr) 3	Ramp Scores 500K (R Ramp) 11	N (in DINER) 19	Jukebox 3 27	Boris 35	500K Grill BONUS 43	3 o'clock Dine Time 51	11 o'clock Dine Time 59
Q83 RED-YEL 4 1J6-5	80K (C Regstr) 4	LOCK (L Ramp) 12	E (in DINER) 20	Jukebox 4 28	Pepe 36	1 Million Grill BONUS 44	4 o'clock Dine Time 52	12 o'clock Dine Time 60
Q84 RED-GRN 5 1J6-6	100K (C Regstr) 5	Release (Upr Right) 13	R (in DINER) 21	Jukebox 5 29	Buck 37	Extra Ball Grill BONUS 45	5 o'clock Dine Time 53	Top 5 Hits w/Lit 61
Q85 RED-BLU 6 1J6-7	Adv DINE TIME (L Return Lane) 6	RUSH 1 (Upr Right) 14	E ② (Top Lane) 22	Hot Dog (C Dr Tgt) 30	Root Beer (L Dr Tgt) 38	Spot Food (L) 46	6 o'clock Dine Time 54	Today's Special 62
Q86 RED-VIO 7 1J6-8	Adv DINE TIME (R Return Lane) 7	RUSH 2 (Lwr Right) 15	A ② (Top Lane) 23	Burger (C Dr Tgt) 31	Fries (L Dr Tgt) 39	Cup Scores 10X Diner Letter 47	7 o'clock Dine Time 55	Dine Time Collect 63
Q87 RED-GRY 8 1J6-9	Extra Ball (Right Outlane) 8	Spinner 16	T ② (Top Lane) 24	Chili (C Dr Tgt) 32	Iced Tea (L Dr Tgt) 40	Extra Ball (Left Outlane) 48	8 o'clock Dine Time 56	Spot Food (R) 64

BR = Bottom right; BL = Bottom Left ○ = Multiple Lamps

TEST/DIAGNOSTIC PROCEDURES (Continued)

SOLENOID TEST.

- (From Lamp Test) Using AUTO-UP, press ADVANCE. Observe that the upper display shows the message, COIL TEST, the lower display shows 05 (Solenoid Test identifier). Next, the lower display shows a series of test steps from 01 through 27, while the upper display shows the solenoid/circuit name. During each of these steps, pulsing of the respective solenoid/circuit occurs. The test cycles repeatedly, unless halted via the MANUAL-DOWN switch. Refer to the **Solenoid Table** for solenoid numbers and wiring information. CPU Board connections at 1P11, 1P12, and 1P19 are also listed in the table.

To continuously pulse a single solenoid/circuit, use MANUAL-DOWN. Press ADVANCE to sequence through the switched, controlled, and special solenoids. Use AUTO-UP to resume test cycling, and to proceed to the next test.

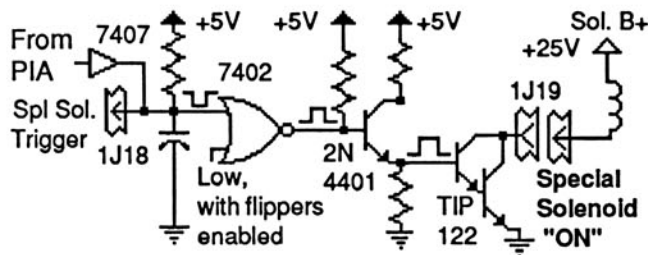
D I N E R Solenoid Table

Sol. No.	Function	Solenoid Type	Wire Color	Connections		Driver Trnstr	Solenoid Part Number Flashlamp Type g= B'glass; p=Pl'field
				CPU Bd	Playfield/ Cabinet		
01A ³	Outhole Kicker	Switched	Vio-Brn	1P11-1	5J1-9: 5J4-9 (A)	Q33	AE-23-800
01C ³	Haji Flash	Switched	Blk-Brn	(Gry-Brn)	5J5-9 (C)	Q33	#89/906 flashlamps 1p,1g
02A ³	Ramp Down	Switched	Vio-Red	1P11-3	5J1-7: 5J4-8 (A)	Q25	SM-1-26-600
02C ³	Babs Flash	Switched	Blk-Red	(Gry-Red)	5J5-8 (C)	Q25	#89/906 flashlamps 1p,1g
03A ³	Center 3-Bk Dr Tgt Reset	Switched	Vio-Orn	1P11-4	5J1-6: 5J4-7 (A)	Q32	AE-26-1200
03C ³	Boris Flash	Switched	Blk-Orn	(Gry-Orn)	5J5-7(C)	Q32	#89/906 flashlamps 1p,1g
04A ³	Ramp Up	Switched	Vio- Yel	1P11-5	5J1-5: 5J4-6 (A)	Q24	AE-23-800
04C ³	Pepe Flash	Switched	Blk-Yel	(Gry-Yel)	5J5-5 (C)	Q24	#89/906 flashlamps 1p,1g
05A ³	Upper Left Eject	Switched	Vio-Grn	1P11-6	5J1-4: 5J4-5 (A)	Q31	AE-23-800
05C ³	Buck Flash	Switched	Blk-Grn	(Gry-Grn)	5J5-4 (C)	Q31	#89/906 flashlamps 1p,1g
06A ³	Sub-P'fld Shooter	Switched	Vio-Blu	1P11-7	5J1-3: 5J4-4 (A)	Q23	AE-23-800
06C ³	Cup Flashers	Switched	Blk-Blu	(Gry-Blu)	5J5-3 (C)	Q23	#89/906 flashlamps 4p
07A ³	Knocker (in Backbox)	Switched	Vio-Blk	1P11-8	5J1-2: 5J4-2 (A)	Q30	AE-23-800
07C ³	Clock Flashers	Switched	Blk-Vio	(Gry-Vio)	5J5-2 (C)	Q30	#89 flashlamps 2g
08A ³	Lower Left Eject	Switched	Vio-Gry	1P11-9	5J1-1: 5J4-1 (A)	Q22	AE-23-800
08C ³	DINE - TIME Flashers	Switched	Blk-Gry	(Gry-Blk)	5J5-1 (C)	Q22	#89 flashlamps 1p,2g
09	Right Ramp Flashers	Controlled	Brn-Blk	1P12-1	5J2-9:5J6-9:2J4-10	Q17	#89/906 flashlamps 2p,1g
10	Backbox/Pl'fld Illum Relay	Controlled	Brn-Red	1P12-2	5J2-8:5J6-8:2J4-11	Q9	5580-09555-01 ^{4a}
11	Left Ramp Flashers	Controlled	Brn-Orn	1P12-4	5J2-6:5J6-7:2J4-12	Q16	#906 flashlamps 2p
12	A/C Select Relay	Controlled	Brn-Yel	1P12-5	5J2-5	Q8	5580-09555-01 ⁵
13	Left 3-Bk Dr Tgt Reset	Controlled	Brn-Grn	1P12-6	5J2-4:5J6-5:2J4-13	Q15	AE-26-1200
14	Diverter	Controlled	Brn-Blu	1P12-7	5J2-3:5J6-3:2J4-14	Q7	AE-26-1200
15	Clock Wheel (B)	Controlled	Brn-Vio	1P12-8	2J4-15: 2J11-2	Q14	} Stepper Motor 14-7948
16	Clock Wheel (A)	Controlled	Brn-Gry	1P12-9	2J4-16: 2J11-1	Q6	
17	Left Jet Bumper	Special #1	Blu-Brn	1P19-7	5J3-7: 5J7-7	Q75	AE-23-800
18	Left Kicker ('sling')	Special #2	Blu-Red	1P19-4	5J3-6: 5J7-6	Q71	AE-26-1200
19	Right Jet Bumper	Special #3	Blu-Orn	1P19-3	5J3-3: 5J7-3	Q73	AE-23-800
20	Right Kicker ('sling')	Special #4	Blu-Yel	1P19-6	5J3-4: 5J7-5	Q69	AE-26-1200
21	Lower Jet Bumper	Special #5	Blu-Grn	1P19-8	5J3-2: 5J7-2	Q77	AE-23-800
22	Shooter Lane Feeder	Special #6	Blu-Blk	1P19-9	5J3-1: 5J7-1	Q79	AE-23-800
-	<u>Right Flipper</u>	-	Orn-Vio	1P19-1	2J5-5: 2J10-7	-	FL11630/50VDC
-	Lower Right Flipper	-	(Blu-Vio) ²		(2J10-1: 2J8-15)	-	
-	<u>Left Flipper</u>	-	Orn-Gry	1P19-2	2J5-4: 2J10-8	-	FL11630/50VDC
-	Lower Left Flipper	-	(Blu-Gry) ²		(2J10-2: 2J8-14)	-	

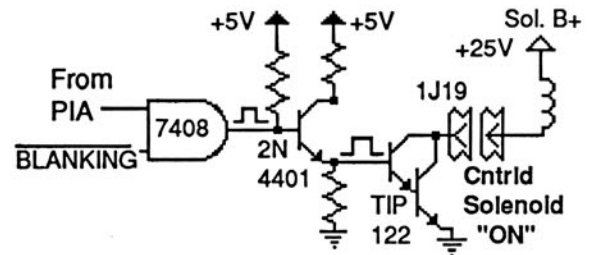
NOTES: 1. Wire colors, except flipper ORN-VIO and ORN-GRY, are ground connections (to coil terminal with unbanded end of diode). Flipper ORN-VIO and ORN-GRY wires connect from CPU Board to flipper switch on cabinet. 2. Flipper connections shown in braces are from flipper switch to flipper coil. 3. "A" circuits are pulsed, when Sol. 12 is de-energized; "C" circuits are pulsed, with Sol.12 energized. Wire colors in brackets are those from respective A and C terminals corresponding to the J1-terminal connection listed for the Aux Power Driver Board, which controls the device pulsing by Sol. 12. 4. Relay is mounted on Relay Board: (4a) p/n C-11998-1; (4b) p/n C-11902-1. 5. Relay is mounted on Aux Power Driver Bd, D-12247, in the backbox.

TEST/DIAGNOSTIC PROCEDURES (Continued)

"On" State Logic - Special Solenoid



"On" State Logic - Controlled Solenoid



"Off" State - Special Solenoid:

The Special Switch Trigger Input goes low. Meanwhile, the PIA line remains high. The remaining signals reverse their states.

"Off" State - Controlled Solenoid:

The Enable Input (from the PIA) goes low. Meanwhile, the BLANKING signal remains high. The rest of the signals reverse their states.

NOTE

As directed by the game program, the Solenoid A/C Select Relay (solenoid 12) switches the solenoid B+ power between two power busses to permit actuating two groups of solenoids at the proper times. In its de-energized state, the Relay connects the 'circuit A power' to 16 "controlled" and "switched" solenoids (identified in the table with no suffix letter or the letter A, after the solenoid number). Individual solenoid operation then depends on the game program enabling the ground path for solenoid actuation via the driver transistor associated with each solenoid circuit. For example, the game program can actuate the Outhole Kicker solenoid (sol. 01A), via the driver transistor Q33.

When the game program determines that the Solenoid A/C Select Relay (sol. 12) must be energized, the relay connects 'circuit C power' to eight group C solenoids (01C through 08C). Now, driver transistor Q33 can actuate the Haji Flash circuit (sol. 01C). Using this "multiplexing" technique, the same driver transistor can control actuation of two separate (A side and C side) solenoid circuits.

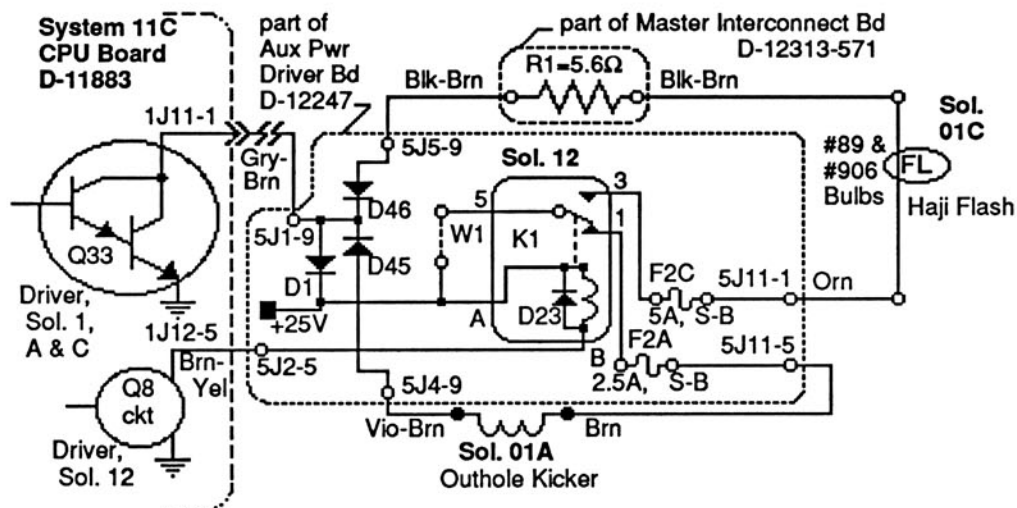


Figure 4. Typical Solenoid A/C Select Relay Circuit, showing the function of Solenoid 12, the Solenoid A/C Select Relay.

TEST/DIAGNOSTIC PROCEDURES (Continued)

SWITCH TESTS.

1. Switch Levels.

(From Solenoid Test) To initiate the Switch Levels Test, press ADVANCE. Observe that the upper display shows the message, SWITCH LEVELS, and the lower display shows 06 (Switch Levels Test identifier). Normally, the right portion of the lower display remains blank, indicating that no switch is actuated.

If, however, a switch is actuated (possibly stuck closed), the lower display shows that switch's number, while the upper displays indicate the switch's name. A sound also accompanies the displays. (This is another facet of the *DINER* game program's switch testing capability.) If more than one switch is closed, a series of displays show each actuated switch's name and number.

(In addition, either of these problems could result in the reporting of a switch problem (or problems) at game Turn-On or at the beginning of Diagnostic Tests.)

As soon as the operator opens a closed switch, its name and number are eliminated from the Switch Levels display series. For *DINER*, switch numbers can range from 01 through 64. Refer to the **Switch-Matrix Table** for switch numbers and wiring information. CPU Board connections at jacks 1J8 (columns) and 1J10 (rows) are also listed in the table.

DINER Switch-Matrix Table

COLUMN ROW	1 Q45 GRN-BRN 1J8-1	2 Q49 GRN-RED 1J8-2	3 Q44 GRN-ORN 1J8-3	4 Q48 GRN-YEL 1J8-4	5 Q43 GRN-BLK 1J8-5	6 Q47 GRN-BLU 1J8-7	7 Q42 GRN-VIO 1J8-8	8 Q46 GRN-GRY 1J8-9
1 WHT-BRN 1J10-9	Plumb Bob Tilt 1	Outhole 9	Cup 17	25	33	41	Upper Left Eject 49	Flipper Right 57
2 WHT-RED 1J10-8	C Side Power A/C Relay 2	Up/Down (L Ramp) 10	Grill Bonus 18	26	34	42	Lower Left Eject 50	Flipper Left 58
3 WHT-ORN 1J10-7	Game Start 3	Ball Trough #1 (right) 11	E (Top Lane) 19	R Ramp Entry 27	35	43	Left Jet Bumper 51	Clock Wheel 59
4 WHT-YEL 1J10-6	Right Coin Chute 4	Ball Trough #2 (mid) 12	A (Top Lane) 20	R Ramp Exit 28	L Ramp Exit 36	44	Right Jet Bumper 52	60
5 WHT-GRN 1J10-5	Center Coin Chute 5	Ball Trough #3 (left) 13	T (Top Lane) 21	Cup Entry R Ramp 29	Left Outlane 37	45	Lower Jet Bumper 53	61
6 WHT-BLU 1J10-3	Left Coin Chute 6	Shooter Lane 14	Hot Dog (C 3-Bk Dr Tgt) 22	Root Beer (L 3-Bk Dr Tgt) 30	Left Return Lane 38	46	BR Kicker ("sling") 54	62
7 WHT-VIO 1J10-2	Slam Tilt 7	Sub-P'fld Shooter 1 15	Burger (C 3-Bk Dr Tgt) 23	Fries (L 3-Bk Dr Tgt) 31	Right Return Lane 39	47	BL Kicker ("sling") 55	63
8 WHT-GRY 1J10-1	High Score Reset 8	Sub-P'fld Shooter 2 16	Chili (C 3-Bk Dr Tgt) 24	Iced Tea (L 3-Bk Dr Tgt) 32	Right Outlane 40	48	Spinner 56	64

BL = Bottom Left BR = Bottom Right

Row Problems. If a display of two (or more) switch numbers of a row occurs, although only one switch is closed, check for a short circuit between the column wires.

Multiple Switch Number Indications. Check the associated column wire for a short circuit to ground.

Column Problems. If display of two (or more) switch numbers in a column occurs (while only one switch is actuated), check for a short circuit between the row wires.

Use AUTO-UP to proceed to the next test.

TEST/DIAGNOSTIC PROCEDURES (Continued)

SWITCH TESTS (Continued).

2. Switch Edges.

From the Switch Levels Test, press ADVANCE. Observe that the upper display shows the message, SWITCH EDGES; the lower display shows 07 (Switch Edges Test identifier). The right portion of the lower display is blank, indicating that no switch is actuated.

This test permits the operator to test whether actuating a switch provides the proper signal to the System 11C switch testing program. When actuating a switch, the operator should see the switch's name and number in the displays. If no indication appears at the time the switch is actuated, the operator then knows that there is a malfunction associated with that switch.

Using this technique, the operator can test each switch appearing in the *DINER* switch problem reporting displays (either at game Turn-On or at the beginning of the Diagnostic Tests) to determine whether the switch can be actuated. If the switch's name and number are displayed while the operator checks its operation, the operator then knows that the reported problem with that switch is NOT currently caused by a switch malfunction. The operator can then seek other causes for the reported problem, being almost certain now that the switch did not fail. This test is also useful when the operator is adjusting the sensitivity of a particular switch's actuation mechanism.

Among the possibilities is the fact that the players have not actuated that switch because of some other problem; the operator should try to analyze what could cause the switch to be missed during game play, and remedy that problem cause. With these new tests, switch problems are, therefore, more easily isolated.

3. **Playfield or CPU Board?** To determine whether a switch problem is in the playfield or the CPU Board, remove connectors 1P8 and 1P10 from the CPU Board. Begin the Switch Test. Use a jumper wire to simulate switch actuation. For example, placing a jumper between 1J10-9 and 1J8-2 should (based on the Switch-Matrix Table) should produce an indication of switch 09 being actuated.

C-SIDE TEST

From the Switch Test, press ADVANCE. Observe that the upper display shows a message, C-SIDE TEST, and that the lower displays shows 08 (C-Side Test identifier). This test confirms that Solenoid A/C Select Relay (Sol. 12) does alternate between the "A" and "C" sides of the circuitry.

The upper display then changes to show the 'side' of the circuit being tested, alternating between "SELECTED A-SIDE" and "SELECTED C-SIDE", while the lower display shows the state of the C-Side Switch. While the "SELECTED C-SIDE" test is occurring, when the C-Side Switch closes, the lower display shows "C-SIDE". When the "SELECTED A-SIDE" message appears, the word "Err" appears in the lower display to indicate that there is no electrical connection from the C-Side to the A-Side. The message "Err" also appears whenever the C-Side Switch is not operating properly. Causes of improper operation can be: (1) blown fuses (F8 or F2C) or a faulty relay on the Aux Pwr Driver Board; (2) failure of the 12- or 24-volt power circuits; (3) a switch matrix failure; or (4) faulty connections between the circuit boards in the game's backbox (CPU Board, Aux Power Driver Board, Backbox Interconnect Board). To halt the A/C Relay's operational test, press MANUAL-DOWN and press ADVANCE to activate the A/C Relay manually.

WHEEL TEST (Backbox DINE-TIME Clock)

From the C-Side Test, press ADVANCE. Observe that the upper display shows the message, WHEEL TEST, and the lower display shows 09 (Wheel Test identifier). Use AUTO-UP to automatically test the DINE-TIME Wheel (backbox clock). The clock hand moves to '12 o'clock' position (lower display shows 001), and then moves clockwise step-by-step, until it reaches '11:59' (lower display shows 191). The clock hand then travels all the way around the clockface to begin the "pendulum test" at the 001 position. From 001, the hand moves to 191, then reverses to 021, forward to 181, reverses to 031, forward to 171, etc., until it reaches position 111, completing the entire test cycle. It then begins the cycle again. Any detected errors will appear in the display.

TEST/DIAGNOSTIC PROCEDURES (Continued)

WHEEL TEST (Backbox DINE-TIME Clock) (Continued)

To test the DINE-TIME Wheel manually, use MANUAL-DOWN. Then, pressing the right flipper switch moves the wheel one position clockwise (1/10 of a step), and pressing the left flipper switch then moves the wheel counterclockwise one position. Pressing ADVANCE causes the wheel to move clockwise completely around to the next step.

ENDING THE DIAGNOSTIC TESTS.

To end the Diagnostic Tests, reach the Wheel Test (09 in the lower display), use AUTO-UP and press ADVANCE. The backbox displays should show the *D I N E R* game's Identification Information (the Id 00 screen). Use MANUAL-DOWN, and press ADVANCE to reach Adjustment Item 70 (Clear Coins). Use AUTO-UP, and press ADVANCE to go to the Attract Mode.

AUTO BURN-IN MODE.

The Auto Burn-in Mode permits the operator to check intermittent (or nonrecurring) problems associated with most portions of the game's circuitry. Repeatedly cycling through a group of tests can sometimes bring a problem, which occurs only randomly or occasionally, to exhibit itself more frequently, thereby aiding in the isolation of the problem. To activate the Auto Burn-in Mode:

1. While in the Game Adjustments, reach Ad 67 and change the Factory Setting of NO to YES, via the Credit button. Set the AUTO-UP/MANUAL-DOWN switch to AUTO-UP.
2. Press ADVANCE to start the Auto Burn-in Mode. This mode repeatedly sequences through the Music Test, the Display Test, the Sound Test, the All Lamps portion of the Lamp Test, and the Solenoid Test.
3. To halt the Auto Burn-in Mode, switch the game Off and then On. *D I N E R* now starts in the Attract Mode. (If a switch problem is now reported by the displays, perform the Switch Tests again to determine the nature of the problem; then, perform necessary repairs.)

SYSTEM 11C MEMORY CHIP TEST.

A new feature is now included in the Memory Chip Test for System 11C. During power-up, the CPU performs a self-testing routine. When all tests are satisfactory, the game proceeds to the Attract Mode, allowing players to use the game. Whenever a portion of the testing does not produce satisfactory results, the game displays a message, before proceeding to the next portion of the testing. ONLY after all tests are satisfactory does the game allow play to begin.

In addition to the displayed message, when any part of the self-test routine fails, LED2 ('DIAGNOSTIC'), mounted on the CPU Board, can be observed to determine the probable cause of the problem. This LED blinks, or flashes, a certain number of times to identify the probable cause, as described in the **CPU LED Indicator Codes Table**. The operator can also start the self-test routine by pressing the CPU Diagnostic Switch (SW 2) on the edge of the CPU Board.

CPU LED Indicator Codes Table

Diagnostic LED		
Blinks/ Flashes	CPU Problem	Explanation
1	U25 RAM FAILURE	U25 RAM could not be used properly (NO other tests are performed; the game is locked here, until the game is turned off).
2	MEM. PROT. FAILURE	This message means that (A) the Coin Door may be shut; (B) the Memory Protect Switch may be stuck in the ON position; (C) the memory protect logic is protecting the memory; or (D) a U25 RAM failure is occurring. (See Note 1)
3	U51 PIA FAILURE	U51 has a malfunction. (See Note 2)
4	U38 PIA FAILURE	U38 has a malfunction. (See Note 2)
5	U41 PIA FAILURE	U41 has a malfunction. (See Note 2)
6	U42 PIA FAILURE	U42 has a malfunction. (See Note 2)
7	U54 PIA FAILURE	U54 has a malfunction. (See Note 2)
8	U10 PIA FAILURE	U10 has a malfunction. (See Note 2)
9	IRQ FAILURE	IRQ has a malfunction. It may be missing or too fast or too slow.
10	U27 ROM FAILURE	U27's internal checksums do not match. It may be a ROM failure, or its associated connections and connecting devices are causing it to appear to have a problem. (The following U26 test is skipped.)
11	U26 ROM FAILURE	U26's internal checksums do not match.
Notes: 1. This test assumes that the Coin Door is OPEN; it is initiated ONLY by pressing the CPU Diagnostic Switch (SW2). 2. Alternatively, its associated connections or connecting devices are causing the IC to appear to have problems.		

TEST/DIAGNOSTIC PROCEDURES (Continued)

SYSTEM 11C SOUND CIRCUITRY TESTS.

Testing of the System 11C Sound circuitry, including the Audio Board, is possible only after successful completion of the System 11C Memory Chip Test.

Audio Board Test. The game program conducts a brief check of the Audio Board (D-11581) circuitry at game Turn-on; the game program reports the test results by brief sounds, as follows: No sound = Audio Board is not operating, or a failure is affecting the sound circuitry (broken cable; dead amplifier; etc.); 1 sound = system OK; 2 sounds = RAM problem; 3 sounds = U4 problem; 4 sounds = U19 problem; 5 sounds = U20 problem.

NO SOUND DURING THIS TEST (but sound can be heard during the Diagnostic Tests).

Check the -12 V supply voltage on the Audio Board. If this -12V dc voltage is low (or AC ripple seems too high), perform the following checks:

1. The gray and gray-green transformer secondary wires for 19.4 V ac.
2. The CPU Board filter capacitor C26 for -12 V dc.
3. The filter capacitor C26 for excessive AC ripple (over 0.75V ac).

If the previous checks did not isolate the problem, turn the Volume Control for maximum output. Momentarily touch a powered-up AC soldering pencil on the center tap of the Volume Control.

CAUTION

DO NOT use a soldering iron over 40 watts. Note also that cordless soldering irons will NOT work for this test.

Hearing a low hum or a 'click' indicates that the power amplifier (U1, TDA2002), the Volume Control, and the speaker are operating satisfactorily, as is the sound circuit cabling. Not hearing a sound requires repeating the test with the Volume Control turned part way down, to determine whether the Volume Control is faulty. Also, check the cable connectors for proper mating, and that no broken wires affect this circuit.

PROBLEM ANALYSIS MESSAGES

The System 11C game program has a great capability to aid the operator and service personnel: At Game Turn-on (and also at the beginning of the Test/Diagnostic Procedures) after the game has been operating for an extended period, the player score displays now may signal with a message, "Press **ADVANCE** for Report", that the game program has detected a possible problem with the game.

To obtain details of the problem, open the coin door and press the AUTO-UP/MANUAL-DOWN switch to MANUAL-DOWN. Press the **ADVANCE** button to begin displaying the message(s). The following messages apply to your *DINER* game.

Adjust Failure. This message indicates a problem with the setting of Game Adjustments. For example, if the game operator changes Adjustment Item settings by selecting Yes for AD 68 (Install Factory) and then closes the coin door before the appearance of the **FACTORY SETTING** message, the game will display the **ADJUST FAILURE** message to indicate that the resetting of the Adjustment Items did not occur properly. As mentioned earlier in the Game Adjustment Procedure text (near Ad 68), other factors can also cause this message to appear.

Check Switch ##. This message indicates that at least one switch was stuck 'On' at game turn-on or has NOT been actuated during ball play (for 90 balls or ~30 games) by displaying the message "**Check Switch ##**", listing each problem switch by number. (The game program compensates the game play requirements affected by each disabled switch to allow 'nearly normal' play. This helps keep *DINER* earning, until the service technician can repair the problem, bringing the game back to its normal good profits!)

To verify the problem, refer to the Test/ Diagnostic Procedures text describing Switch Testing, and check each reported switch using applicable Switch Levels and Switch Edges tests. Always check switch operation using a ball, to simulate game conditions. (Switch problems may often be resolved by adjusting the wire switch actuators, fixing switch circuitry problems, securing loose connectors, etc. Mechanisms using 'opto switches' (drop targets, etc.) need to be checked for proper power connections (+12V dc and ground).

Pinball Missing. *DINER* normally uses three balls; however, it will operate with two balls. This message announces that a ball is missing or stuck somewhere. When the ball is located, return it to the game via the Outhole. Other possibilities for this problem could be malfunctions of the Ball Trough switches (#11, #12, or #13) or the Shooter Lane switch (#14).

MAINTENANCE INFORMATION

Regular maintenance is essential to a game's continuing contribution to the operator's earnings.

LUBRICATION

The two main lubrication points of the Left and Right Kickers ("Slingshots") mechanism are the pivots for the Kicker Arm. Because of the functional design (arm-actuated via solenoid plunger operation), the pivot points of the Left and Right Kickers ("Slingshots") all require lubrication as a regular servicing procedure. MBI Instrument Grease, also known as Drop Target Switch Lubricant, with a Williams' part number of 20-8886, is a recommended lubricant. A medium viscosity oil (20W or 30W) is satisfactory for these devices; however, oil tends to vaporize, leaving a sticky film.

Lubrication to ensure proper operation also applies to the target blades of the 3-Bank Drop Target. MBI Instrument Grease, also known as Drop Target Switch Lubricant, with a Williams' part number of 20-8886, is a recommended lubricant.

SWITCH CONTACTS

For proper game operation, switch contacts should be free of dust, dirt, contamination, and corrosion. Blade switch contacts are plated to resist corrosion. Cleaning blade switch contacts requires gentle closing of the contacts on a clean business card or piece of paper, and then pulling the paper about 2 inches, which should restore the clean contact surface. Adjust the switch contacts to a 1/16-inch gap.

Flipper button switches and the End of Stroke (EOS) switch on the flipper tend to suffer from pitting caused by the high current in this circuit. Weak or "slow" flipper action is the result of this pitting. Carefully restore the surface of the flipper switch contact with a very fine contact file; finish the surface restoration with a contact burnishing tool. This should bring the flipper action back to its usual 'snappy' action. The contact surfaces of these switches should be adjusted to enable the maximum area of contact during switch closure. This allows the current flowing through these switches to be at the designed, peak value for best flipper action.

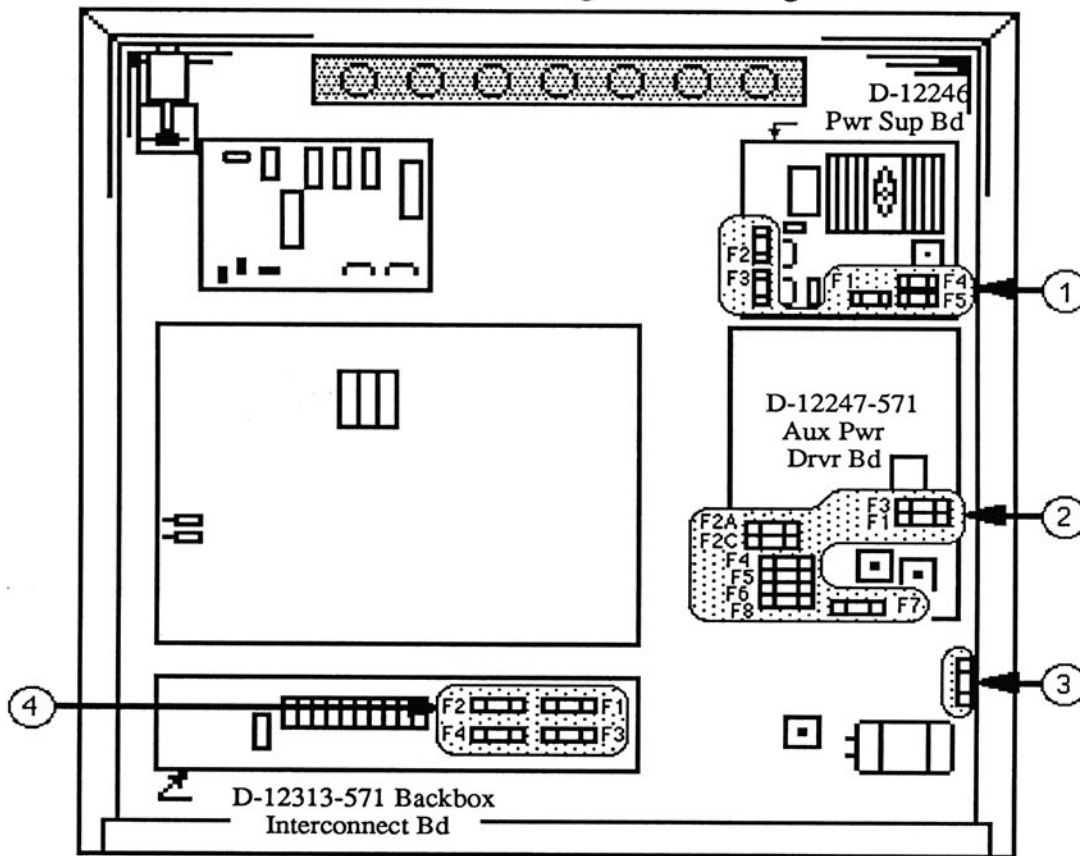
CLEANING

Good game action and extended playfield life are the results of regular playfield cleaning. During each collection stop, the playfield glass should be removed and thoroughly cleaned. The playfield should be wiped off with a clean, lint-free cloth. The game balls should be cleaned and inspected for any chips, nicks, or pits. Replace any damaged balls to prevent playfield damage.

Regular, more extensive, playfield cleaning is recommended. However, avoid excessive use of water and caustic or abrasive cleaners because they tend to damage the playfield surface. Playfield wax or polish may be used sparingly, to prevent a buildup on the playfield surface. Do not use cleaners containing petroleum distillates on any playfield plastics because they may dissolve the plastic material or damage the artwork.

Fuse Listing

Fuse Locations Diagram & Listing



Item	Part Number	Description	Circuit/Location
1	5731-12328-00	Fuse, 3/8A., Slow-Blow (S-B), 250V	F1; D-12246 Power Supply Board
1	5731-12327-00	Fuse, 1/8A., S-B, 250V	F2, F3; D-12246 Power Supply Board
1	5731-09432-00	Fuse, 7A S-B, 250v	F4, F5; D-12246 Power Supply Board
2	5731-09128-00	Fuse, 2-1/2A., S-B, 250v	F2A, F3, F4; D-12247 Aux Pwr Driver Board
2	5731-09651-00	Fuse, 5A., S-B, 250v	F1, F2C; D-12247 Aux Pwr Driver Board
2	5731-08665-00	Fuse, 2A., S-B, 250v	F5, F6; D-12247 Aux Pwr Driver Board
2	5731-06314-00	Fuse, 4A., S-B, 250v	F7; D-12247 Aux Pwr Driver Board
2	5731-09432-00	Fuse, 7A., S-B, 250v	F8; D-12247 Aux Pwr Driver Board
3	5730-09071-00	Fuse, 8A., Normal-Blow (N-B), 32v	+18 Vdc Lamp Ckt/ Lwr Rt B'box fuseholder (1)
4	5731-09651-00	Fuse, 5A., S-B, 250v	F1 - F4: Gen. Illumin/B'box Interconnect Board
-	5730-09252-00	Fuse, 8A., N-B, 125v	Input ("high voltage") Power Line/Cabinet Box*

* One 4A., S-B, 250v fuse (5731-06314-00) is provided for an overseas (220v) game installation.

Concerning the fuses listed as item 2, **F1** protects the +25V dc Special Solenoid circuit connected via the Red-White wires, including the Shooter Lane Feeder, Left, Right, and Lower Jet Bumpers for *DINER*. **F2A** protects the "A" Solenoids connected with Brown wires, including the Outhole Kicker, the Ramp Down solenoid, and both Eject Hole solenoids. **F2C** protects the "C" Solenoids connected with Orange wires, which are flashlamp circuits. **F3** protects the Controlled Solenoids connected with Red wires, including the Backbox/Playfield General Illumination Relays, and the Left and Right Ramp flashers. **F4** protects the +50V Solenoids connected with Violet-Yellow wires, including the Left and Right Kickers, and the Left 3-Bank Drop Target. **F5** protects the +50V Solenoids connected with Yellow-Violet wires, including the Sub-Playfield Shooter, Knocker, Center 3-Bank Drop Target, the Ramp Up solenoid, and the Ramp Diverter. **F6** protects the Lower Left and Right Flippers. **F7** protects the input to the +50V dc rectifier, and **F8** protects the input to the +25V dc rectifier on the Aux Power Driver Board.

Section 2

Game Parts Information

- **Parts Lists & Diagrams**

Locations:

Game Circuit Boards and Major Mechanisms

Power Supply Board (D-12246)

Aux Power Driver Board (D-12247-571)

Backbox Interconnect Board (D-12313-571)

Audio Board (D-111581-571)

System 11C CPU Board (D-11883-571)

Master Display Board (D-12232-1)

Score Display & Lamp Boards

All Major Assemblies of *D I N E R*

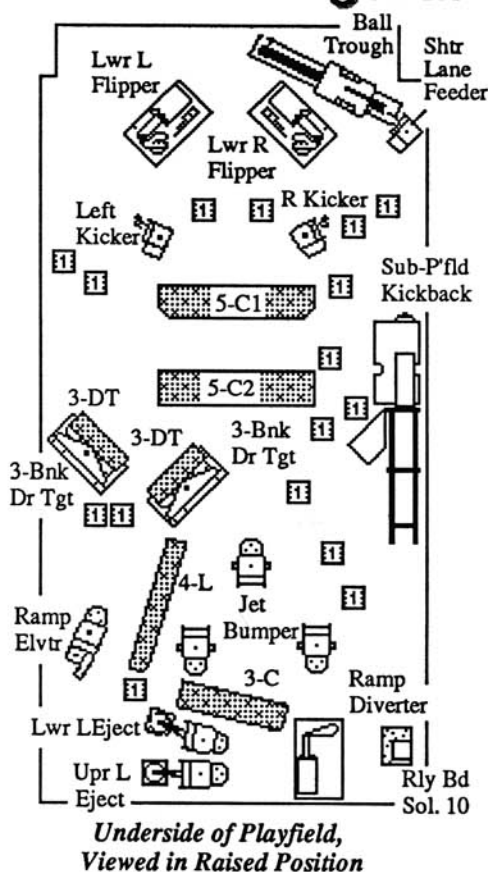
Solenoids/Flashers & Rubber Parts

Switches

Lamps

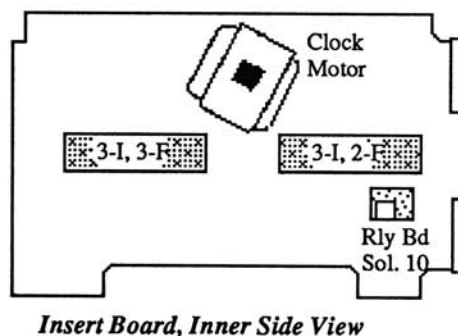
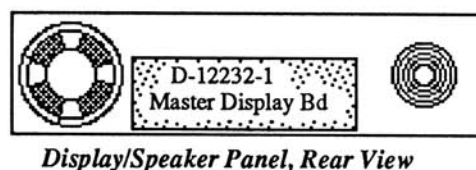
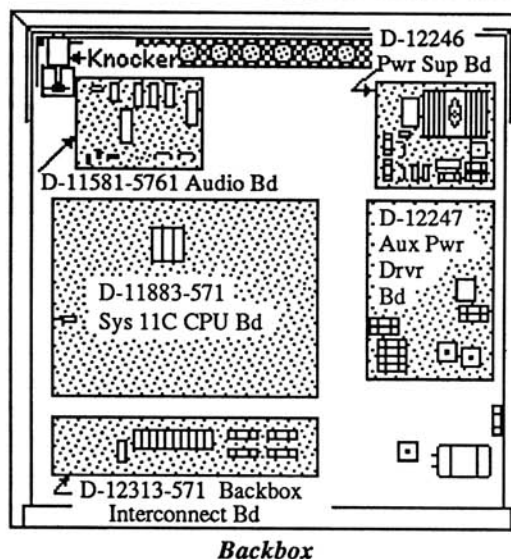
Playfield Parts

Locations Diagram - Game Circuit Boards and Major Mechanisms



LOCATIONS

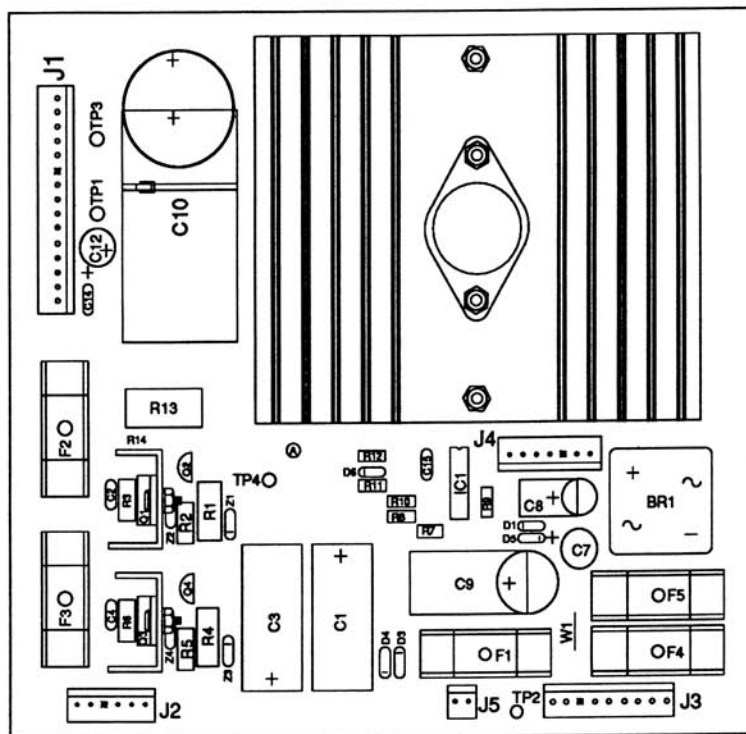
- Circuit Boards
- Lamp Boards
- Major Mechanisms



- C-13174-L Lower Left Flipper
- C-13174-R Lower Right Flipper
- C-9638 Shooter Lane Feeder
- B-9362-L-1 Coil & Bracket Assembly
- B-12665 Left & Right Kicker Arm Assembly
- B-11203-R-1 Coil & Bracket Assembly
- B-12224 Lamp Board ("1")
- C-13535 Lamp Board ("5-C1")
- C-13538 Lamp Board ("5-C2")
- C-11223-1 3-Bank Drop Target
- C-13205 3-Bank Opto Board
- C-13523 Lamp Board ("3-DT")
- B-13652 Sub-p'fld Shooter Assembly
- 12-6904 Sub-p'fld Shooter Ramp
- B-9414-1 Jet Bumper (3 total)
- B-9415-1 Bumper Coil & Bracket Assembly (3)
- B-11304-2 Ramp Mover
- C-13539 Lamp Board ("4-L")
- C-12000 Lamp Board ("3-C")
- B-9361-R-1 Eject Hole Arm Assembly
- B-13655 Coil & Bracket Assembly
- B-13348 Diverter Arm Assembly
- B-13346 Coil & Bracket Assembly
- C-11998-1 Relay Board (Sol. 11 Gen. Illum)

- B-10686-1 Knocker Assembly
- D-11581-571 Audio Board
- D-12246 Power Supply Board
- D-11883-571 System 11C CPU Board
- D-12247-566 Aux Power Driver Board
- D-12313-571 Backbox Interconnect Board
- D-13711 Speaker/ Display Panel Assembly
- D-12232-1 Master Display Board
- C-12036-3 Clock Wheel Assembly
- D-12045 Stepper Motor Control Board
- C-13624 Lamp Board ("3-I, 3-F")
- C-13624-1 Lamp Board ("3-I, 2-F")
- C-11998-1 Relay Board (Sol. 11 Gen. Illum)

Power Supply p/n D-12246



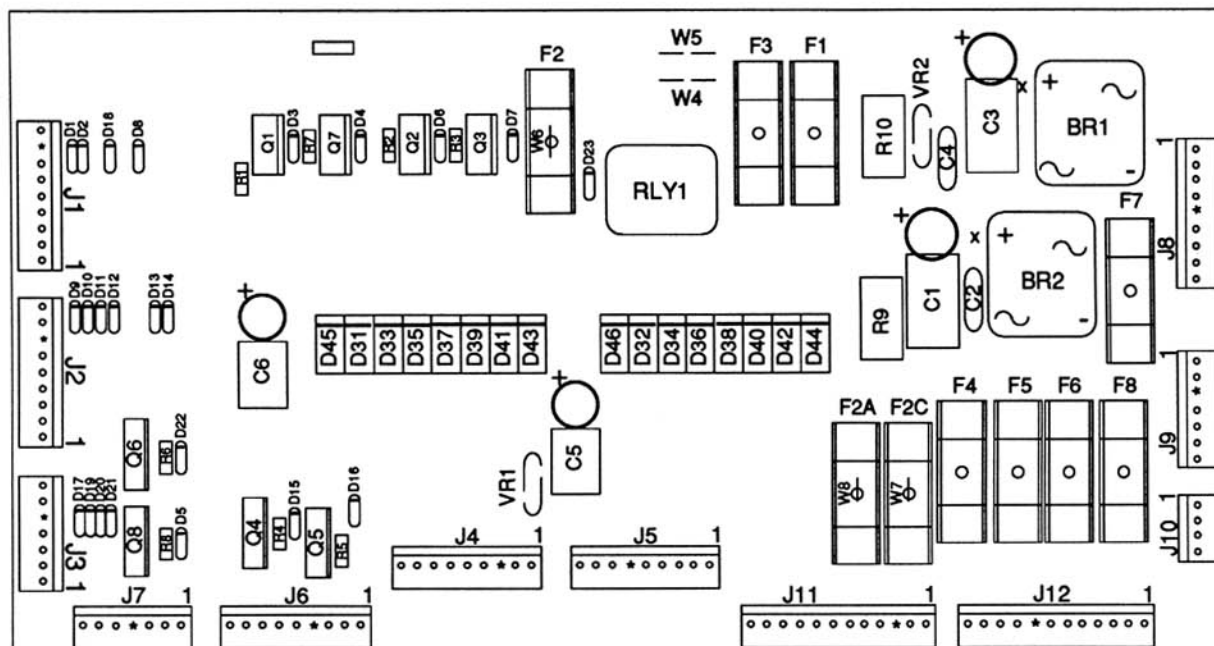
Item	Part No.	Ckt Symbol	Description	Item	Part No.	Ckt Symbol	Description
1	5765-12317-00		Power Supply PCB	26	5075-09060-00	ZR2, ZR4	Zener, 1N4764, 100v, 1w
2	5733-12060-01	F1-F5	Fuse Holder	27	5460-09424-00	IC1	IC, Volt. Reg., MC1723C5
3	5731-09432-00	F4, F5	Fuse, 7A., S-B, 250v	28	5010-09069-00	R3, R6	Resistor, 330K, 5%, 1/2w, C.F.
4	5731-12328-00	F1	Fuse, 3/8A., S-B, 250v	29	5010-10631-00	R2, R5	Resistor, 1.2K, 5%, 1/2w
5	5730-12327-00	F2, F3	Fuse 1/8 A., 250v	30	5010-09536-00	R1, R4	Resistor, 39K, 5%, 1w
6	5791-10862-15	J1	Connector, 15-pin Hdr	31	5013-09426-00	R7	Resistor, 2.15K, 1%, 1/4w, C. F.
7	5791-10862-06	J2	Connector, 6-pin Hdr	32	5013-09427-00	R8	Resistor, 4.99K, 1%, 1/4w, C. F.
8	5791-10862-09	J3	Connector, 9-pin Hdr	33	5010-09541-00	R9	Resistor, 2.7K, 2%, 1/4w, C. F.
9	5100-09690-00	BR1	Bridge Rectifier, 35A., 200V	34	5010-09085-00	R10	Resistor, 1.5K, 5%, 1/4w, C. F.
10	5164-12154-00	Q1	Transistor, MJE15030, NPN	35	5010-09428-00	R11	Resistor, 1.5K, 2%, 1/4w, C. F.
11	5194-12155-00	Q3	Transistor, MJE15031, PNP	36	5010-09508-00	R12	Resistor, 270Ω, 2%, 1/4w, C. F.
12	5194-09055-00	Q2	Transistor, MP5D52, PNP	37	5012-09429-00	R13	Resistor, 0.12Ω, 5%, 5w
13	5164-09056-00	Q4	Transistor, MP5D02, NPN	38	5040-12324-00	C1, C3	Capacitor, 150 mfd, 160v, radial
14	5162-09425-00	Q5	Transistor, 2N6057, NPN	39	5043-09072-00	C2, C4	Capacitor, 0.1 mfd, 500v, disc
15	5701-09652-00		Thermal Pad T0-3	40	5040-09421-00	C7	Capacitor, 100 mfd, 25v, radial
16	4006-01003-06		Mach. Screw, 6-32 x 3/8	41	5040-09422-00	C8	Capacitor, 47 mfd, 50v, radial
17	4006-01003-08		Mach. Screw, 6-32 x 1/2	42	5040-09420-00	C9	Capacitor, 1000 mfd, electr, 25v, axial or radial
18	20-9229		Thermal Compound		5040-08893-00		Capacitor, 18,000 mfd, electr, 20v, axial
19	4406-01117-00		Nut, 6-32 Hex.	43	5040-09419-00	C10	Capacitor, 330 mfd, electr, 10v, radial
20	5010-09534-00	W1	Resistor, 0Ω	44	5040-09423-00	C12	Capacitor, 0.1 mfd, 50v, disc
21	4703-00007-00		Lockwasher, #6 Ext.	45	5043-09446-00	C14	Capacitor, 470 pfd
22	5705-12330-00		Heatsink 4"	46	5043-09065-00	C15	Terminal, #1502-1 (Test Post)
23	5705-09199-00		Heatsink 6030B	47	5824-09248-00	TP1-TP4	Tie Wrap, 8" Long
24	5070-09054-00	D1, D3-D6	Diode, 1N4004	48	03-7947		
25	5075-09059-00	ZR1, ZR3	Zener, 1N5990, 3.9v, 1/2w				

Notes:

1. Heatsink compound must be applied between transistor and heat sink.
2. Observe index mark on integrated circuit, polarity of capacitors and diodes, and position of transistors.
3. The view of Q5 and its related heat sink and hardware is from the bottom of the heatsink, to clarify installation.

Auxiliary Power Driver Board

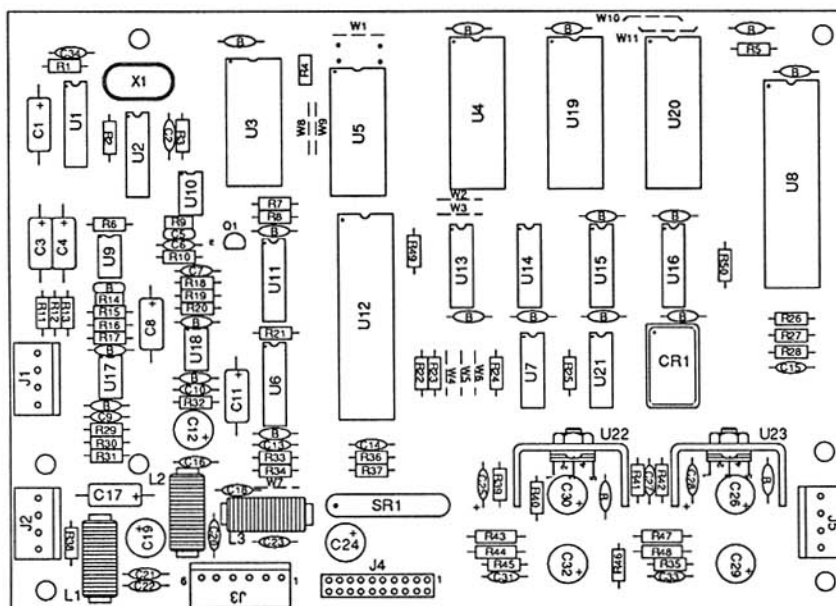
p/n D-12247-566



Part Number	Ckt Designator	Description
5763-12184-00		Bare PC Board
5040-09537-00	C1, C3	Capacitor, 100 μ fd., 100v, Radial
5040-12181-00	C5, C6	Capacitor, 10 μ fd., 100v, Radial
5043-09072-00	C2, C4	Capacitor, 0.1 μ fd., 500v
5010-09160-00	R1 - R8	Resistor, 220 Ω , 1/4w C.F., 5%
5012-12238-00	R9	Resistor, 3.3K Ω , 5w, 10%
5010-09534-00	W1, W3, W4, W6	Resistor, 0 Ω
5017-12180-00	VR1, VR2	Varistor, 100v
5100-09690-00	BR1, BR2	Bridge Rectifier, 35A, 200v
5070-08785-00	D1 - D23	Diode, 1N4003
5070-09045-00	D31 - D46	Diode, MR501
5191-12179-00	Q1 - Q8	Transistor, TIP36C
5580-09555-01	K1	Relay, DPDT, 13A
5733-12060-01		Fuse Holder
5731-08665-00	F5, F6	Fuse, 2A, S-B, 250v
5731-09128-00	F1, F2A, F3, F4	Fuse, 2-1/2A, S-B, 250v
5731-09651-00	F2C	Fuse, 5A, S-B, 250v
5731-06314-00	F7	Fuse, 4A, S-B, 250v
5731-09432-00	F8	Fuse, 7A, S-B, 250v
5791-10862-09	J1, J2, J4 - J6, J8	Connector, 9-pin Hdr, Sq Pin
5791-10862-07	J3, J7, J9	Connector, 7-pin Hdr, Sq Pin
5791-10862-12	J11, J12	Connector, 12-pin Hdr, Sq Pin
5791-10862-04	J10	Connector, 4-pin Hdr, Sq Pin
16-8850-215		PCB Label

Audio Board

p/n D-11581-571



Part Number	Ckt Designator	Description	Part Number	Ckt Designator	Description
5766-12130-00		Bare PC Board	5010-09162-00	R39	Resistor, 100K Ω , 1/4w, 5%
5371-11087-00	U1	IC, D/A Conv, YM3012	5010-10258-00	R40	Resistor, 1M Ω , 1/4w, 5%
a) 5700-09006-00		Socket, IC, 16-pin (U1)	5010-09179-00	R10	Resistor, 3.3M Ω , 1/4w, 5%
5370-11086-00	U3	IC, Sound Processor, YM2151	5010-08772-00	R18	Resistor, 15K Ω , 1/4w, 5%
a) 5700-09004-00		Socket, IC, 24-pin (U3)	5010-08824-00	R32	Resistor, 43K Ω , 1/4w, 5%
5400-10320-00	U8	IC, μ Processor, MC68B09E	5010-08846-00	R31	Resistor, 220K Ω , 1/4w, 5%
a) 5700-08985-00		Socket, IC, 40-pin (U8)	5010-08991-00	R12	Resistor, 4.7K Ω , 1/4w, 5%
A-5343-571-3	U4	IC, Audio ROM 1	5010-09219-00	R38	Resistor, 8.2K Ω , 1/4w, 5%
A-5343-571-4	U19	IC, Audio ROM 2	5010-09331-00	R16	Resistor, 13K Ω , 1/4w, 5%
A-5343-571-5	U20	IC, Audio ROM 3	5010-09333-00	R29	Resistor, 180K Ω , 1/4w, 5%
a) 5700-10176-00		Socket, IC, 28-pin (U4, U19, U20)	5010-09342-00	R30	Resistor, 36K Ω , 1/4w, 5%
5371-09152-00	U11	IC, D/A Convtr, MC1408	5010-09534-00	W3, W9	Resistor, 0 Ω
5430-10322-00	U12	IC, PIA, MC68B21	5010-10985-00	R14, R15	Resistor, 20K Ω , 1/4w, 5%
5340-10139-00	U5	IC, RAM/S 5516-2 2Kx8	5013-09427-00	R13	Resistor, 4.9K Ω , 1/4w, 5%
5281-09487-00	U7, U16	IC, Dual D Flipflop, 74LS74	5040-09343-00	C1, C3, C4, C8, C17	Capacitor, 10 μ fd, 20v, $\pm$ 20%
5281-10043-00	U13	IC, 74LS175	5040-10974-00	C12, C19, C24	Capacitor, 100 μ fd, 35v
5281-09235-00	U21	IC, Triple NAND, 74LS10	5040-09776-00	C26, C30	Capacitor, 470 μ fd, 16v, $\pm$ 50, -10%
5370-09321-00	U9, U10, U17, U18	IC, Op Amp, MC1458	5040-09365-00	C11	Capacitor, 1 μ fd, 63v, $\pm$ 50 -10%
5281-09215-00	U2	IC, Hex Inv, 74LS04	5040-12006-00	C29, C32	Capacitor, 1000 μ fd, 16v, 20%
5281-09246-00	U14	IC, 2-4 Dec, 74LS139	5041-09243-00	C25, C28	Capacitor, 10 μ fd, 10v, $\pm$ 10%
5281-09745-00	U15	IC, Dual Mux, 74LS138	5043-08980-00	C5, B (20)*	Capacitor, 0.01 μ fd, 50v, $\pm$ 80, -20%
5370-09156-00	U22, U23	IC, Audio Amp, TDA2002	5043-08996-00	C31, C33	Capacitor, 0.1 μ fd, 50v, $\pm$ 20%
a) 5705-09199-00		Heatsink, #6030B	5043-09065-00	C13 - C15	Capacitor, 470 pfd, 50v, $\pm$ 20%
b) 4006-01003-06		Mach. Screw, 6-32 x 3/8	5043-09492-00	C2, C34	Capacitor, 100 pfd, 50v, $\pm$ 10%
c) 4406-01117-00		Nut, 6-32 Hex.	5043-09844-00	C6	Capacitor, 47 pfd, 50v, $\pm$ 20%
d) 4703-00007-00		Lockwasher, #6 Ext.	5043-09845-00	C16, C18, C20 - C23, C27	Capacitor, 1000 pfd, 50v, $\pm$ 20%
5160-10269-00	Q1	Transistor, 2N3904, NPN	5046-09346-00	C7	Capacitor, 1200pfd, 50V, $\pm$ 5%
5060-10396-00	SP1	SIP 4.7K & 470pfd, 8R8C	5046-09350-00	C9	Capacitor, 180pfd, 100V, $\pm$ 5%
5010-09181-00	R44, R48	Resistor, 1.0 Ω , 1/2w, 5%	5048-10992-00	C10	Capacitor, 4700pfd, 50v,
5010-09161-00	R35, R45	Resistor, 2.2 Ω , 1/4w, 5%	5370-09691-00	U6	IC, 55536, CVSD
5010-09361-00	R43, R46, R47	Resistor, 220 Ω , 1/2w, 5%	5520-09020-00	X1	Crystal, 3.58 MHz
5010-09358-00	R41, R42	Resistor, 1K Ω , 1/4w, 5%	5521-10931-00	CR1	Oscillator, 8 MHz
5010-08998-00	R2, R3	Resistor, 2.2K Ω , 1/4w, 5%	5551-09822-00	L1 - L3	Inductor, 4.7 μ H, 3A.
5010-08983-00	R7-R9	Resistor, 3.3K Ω , 1/4w, 5%	5791-09437-00	J4	Connector, 20 pin, (Hdr), Rib. Cbl
5010-08991-00	R1, R4, R5, R11,	Resistor, 4.7K Ω , 1/4w, 5%	5791-10862-04	J1, J2, J5	Connector, 4 pin (Hdr)
	R25 - R28, R33,	Resistor, 4.7K Ω , 1/4w, 5%	5791-10862-06	J3	Connector, 6 pin (Hdr)
	R36, R37, R49, R50	Resistor, 10K Ω , 1/4w, 5%	16-8850-281		PCB I.D. Label
5010-09034-00	R22-R24, R17, R34	Resistor, 27K Ω , 1/4w, 5%	20-9229		Thermal Compound
5010-09324-00	R6, R19, R20, R21				

Notes... *20 capacitors (shown on diagram with "B" symbol) provide +5VDC filtering for ICs.
 All capacitors are ceramic, 50v, axial, unless otherwise noted.
 All resistors are 5%, 1/4w, Carbon Film, unless otherwise noted.

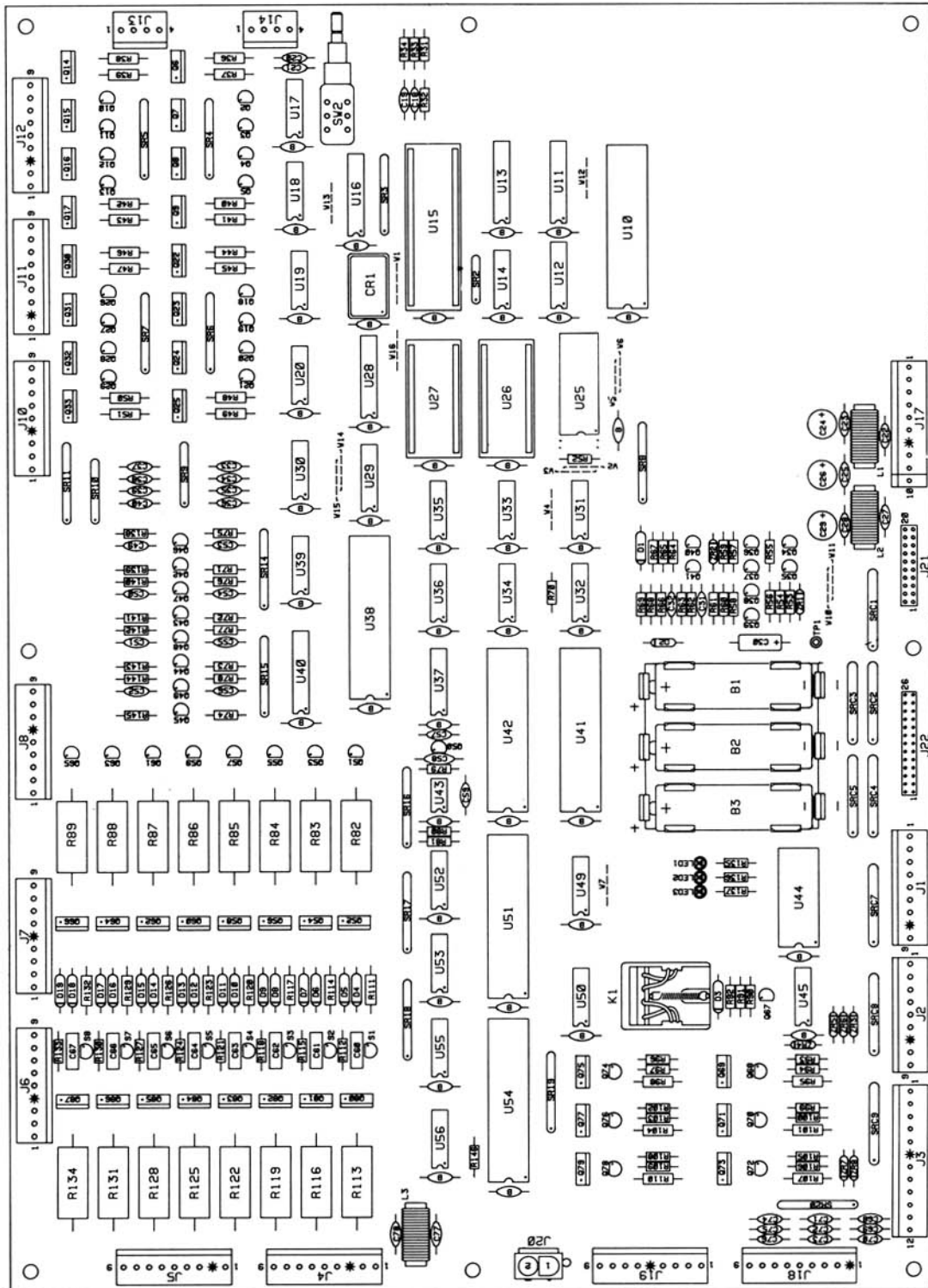
System 11C CPU Board p/n D-11883-571

Part No.	Ckt Designator	Description	Part No.	Ckt Designator	Description
5764-12206-00		Bare PC Board	5012-09037-00	R113, R116, R119, R122, R125, R128, R131, R134	Resistor, 0.4Ω, 5%, 3w, Wire-Wnd.
5281-09308-00	U16	IC, Octal Bus Xcvt, 74LS245	5010-08993-00	R36-R51, R95, R98, R101, R104, R107, R110	Resistor, 68Ω, 5%, 1/2w, C. F.
5430-08972-00	U10, U38, U41, U42, U51, U54	IC, PIA, MC6820/6821	5012-10860-00	R82-R89	Resistor, 27Ω, 5%, 2w, C. F.
5340-10139-00	U25	IC, 2K x 8 CMOS Static RAM	5010-10003-00	R62, R63	Resistor, 390Ω, 5%, 1/4w, C. F.
5280-09010-00	U44	IC, 4-16 Decoder, 74154	5010-10171-00	R67	Resistor, 56Ω, 5%, 1/4w, C. F.
5281-09246-00	U12	IC, 2-4 Decoder, 74LS139	5010-10170-00	R69	Resistor, 47Ω, 5%, 1/4w, C. F.
5075-09406-00	ZR3 - ZR8	Diode, Zener, 6.2v, 0.5w	5010-09160-00	R59, R61, W12, W13	Resistor, 220Ω, 5%, 1/4w, C. F.
5164-10998-00	Q42 - Q49	Transistor, NPN, 2N5550, TO-92	5010-09416-00	R33, R34, R71-R78, R135-R137	Resistor, 470Ω, 5%, 1/4w, C. F.
5431-09449-00	U43	IC, Timer, MC1455	5010-10631-00	R111, R114, R117, R120, R123, R126, R129, R132	Resistor, 1.2KΩ, 5%, 1/2w, C. F.
5310-09236-00	U29	IC, 14-b Counter, 4020	5019-09783-00	SR18	SIP, 9R, 10-pin, 6.8KΩ, .125w/R, 5%
5281-09743-00	U32	IC, Quad 2-Input AND, 74LS08	5019-09362-00	SR3, SR15, SR17, SR19, SR20	SIP, 9R, 10-pin, 4.7KΩ, .125w/R, 5%
5281-09247-00	U14	IC, Quad 2-Input NOR, 74LS02	5019-09808-00	SR4, SR6, SR11	SIP, 9R, 10-pin, 560Ω, .125w/R, 5%
5281-09235-00	U35	IC, Triple 3-Input NAND, 74LS10	5019-09785-00	SR16	SIP, 9R, 10-pin, 2.2KΩ, .125w/R, 5%
5280-09013-00	U36	IC, Hex Inverter, 7404	5019-10472-00	SR14	SIP, 9R, 10-pin, 3.3KΩ, .125w/R, 5%
5281-09499-00	U31, U34	IC, Quad 2-Input NAND, 74LS00	5019-09669-00	SR8	SIP, 9R, 10-pin, 1.0KΩ, .125w/R, 5%
5281-10014-00	U33	IC, Dual 4-Input NAND, 74LS20	5019-09780-00	SR9, SR10	SIP, 4R, 8-pin, 1KΩ, 5%
5281-09486-00	U28	IC, Octal D Flip-flop, 74LS374	5019-09786-00	SR2	SIP, 5R, 6-pin, 4.7KΩ, .125w/R, 5%
5281-09745-00	U37	IC, 3-8 Decoder, 74LS138	5019-09792-00	SR5, SR7	SIP, 9R, 10-pin, 2.7KΩ, .125w/R, 5%
5281-09867-00	U11, U13, U40	IC, Octal Buffer, 74LS244	5060-10396-00	SRC1 - SRC5, SRC7 - SRC9	SIP, 8R, 8C, 10-pin, 4.7KΩ & 470pfd
5280-08973-00	U17-U20, U52, U53	IC, Quad 2-Input AND, 7408	5043-08980-00	C18, C19, C21, C31, C32, C49-C56, C59, + 43 Bypass, marked B	Capacitor, 0.01 μfd, 50v(±20%), Axial
5280-08974-00	U55, U56	IC, Hex Inverter, 7406	5043-09845-00	C22, C23, C25, C27, C28	Capacitor, 1K pfd, 50v(±20%), Axial
5310-09155-00	U30, U39	IC, Quad 2-Input NAND, MC14011	5043-08996-00	C70-75, C77, C78	Capacitor, 0.1 μfd, 50v(±20%), Axial
5280-08948-00	U45, U50	IC, Quad 2-Input NOR, 7402	5040-10974-00	C24, C26, C29	Capacitor, 100μfd, Electr, 25v(±20%), Axial
5280-09309-00	U49	IC, Hex Buffer, 7407	5045-09796-00	C60-C67	Capacitor, 0.1 μfd, Polycarbonate Rad, 100v(±10%)
5671-09019-00	LED1-LED3	LED, Red, Display	5043-09065-00	C33-C40, C68, C69, C76	Capacitor, 470 pfd, 50v(±20%), Axial
5521-10506-00	CR1	Oscillator, 4 MHz	5040-09545-00	C30	Capacitor, 22μfd, Electr, 10v(±50,-10%) Ax
5162-08976-00	Q51, Q53, Q55, Q57, Q59, Q61, Q63, Q65	Transistor, NPN Darl. 2N6427, TO-92	5041-09031-00	C58	Capacitor, 1 μfd, Tant., 25v(±20%), Axial
5191-08978-00	Q52, Q54, Q56, Q58, Q60, Q62, Q64, Q66	Transistor, PNP, TIP42, TO-220	5043-09030-00	C57	Capacitor, 0.047 μfd, 50v(±20%), Axial
5162-09410-00	Q6-Q9, Q14-Q17, Q22-Q25, Q30-Q33, Q69, Q71, Q73, Q75, Q77, Q79, Q80-Q87	Transistor, NPN, TIP122, TO-220	5551-09822-00	L1-L3	Inductor, 4.7 μH, 3A
5160-08938-00	Q2-Q5, Q10-Q13, Q18-Q21, Q26-Q29, Q34-Q38, Q41, Q67, Q68, Q70, Q72, Q74, Q76, Q78	Transistor, NPN, 2N4401, TO-92	5641-09312-00	SW1	Switch, Pushbutton, DPDT, 100v, 5A
5160-10269-00	Q40	Transistor, NPN, 2N3904, TO-92	5641-09653-00	B1-B3	Battery, Alkaline, 1.5v, AA
5190-09016-00	Q39, Q50	Transistor, PNP, 2N4403, TO-92	5880-09022-00		Battery Holder, #171
5130-09014-00	S1-S8	SCR, 30v, 0.8A, 2N5060	5881-09021-00		IC Socket, 28 pin
5070-06258-00	D3-D19	Diode, 1N4001	5700-10176-00	a)A-5343-571-1 U26	IC, Game ROM 2, 27256
5070-08919-00	D2	Diode, 1N4148, 150mA	b)A-5343-571-2 U27		IC, Game ROM 1, 27256
5070-09266-00	D1	Diode, 1N5817, 1.0A	5700-08985-00	a)5400-09150-00 U15	IC Socket, 40 pin
5075-09018-00	ZR1	Diode, Zener, 1N596A, 6.8v, 0.5w	5824-09248-00	TP1, TP2	IC, μProcessor, 6802
5075-09059-00	ZR2	Diode, Zener, 1N5990, 3.9v, 0.5w	20-9229		Test Point
5010-08992-00	R94, R97, R100, R103, R106, R109	Resistor, 560Ω, 5%, 1/4w, C. F.	5580-08994-01	K1	Thermal Compound
5010-09039-00	R56	Resistor, 10Ω, 5%, 1/4w, C. F.	5791-10862-09	1J1, 1J2, 1J4-1J8, 1J10-1J12, 1J17-1J19	Relay, 4-pole, 40Ω, 6v
5010-09534-00	W1, W2, W4, W5, W7, W11, W14, W16	Resistor, 0Ω, 5%, 1/4w, C. F.	5791-10862-04	1J13, 1J14	Connector, 9 pin (Hdr)
5010-08991-00	R31, R32, R52	Resistor, 4.7KΩ, 5%, 1/4w, C. F.	5791-10862-12	1J3	Connector, 4 pin (Hdr)
5010-09358-00	R55, R68, R92, R146	Resistor, 1.0KΩ, 5%, 1/4w, C. F.	5791-10850-00	1J22	Connector, 12 pin (Hdr)
5010-09113-00	R79	Resistor, 33KΩ, 5%, 1/4w, C. F.	5791-09437-00	1J21	Connector, 26 pin Ribbon (Hdr)
5010-08983-00	R70, R80	Resistor, 3.3KΩ, 5%, 1/4w, C. F.	20-9491	W18, W19	Connector, 20 pin Ribbon (Hdr)
5010-09034-00	R53, R60, R65, R90	Resistor, 10KΩ, 5%, 1/4w, C. F.	16-8850-305		Bus Wire, Jumper
5010-09086-00	R81	Resistor, 6.8KΩ, 5%, 1/4w, C. F.			Label PCB Assembly
5010-08997-00	R23, R24, R91, R93, R96, R99, R102, R105, R108, R112, R115, R118, R121, R124, R127, R130, R133	Resistor, 2.7KΩ, 5%, 1/4w, C. F.			

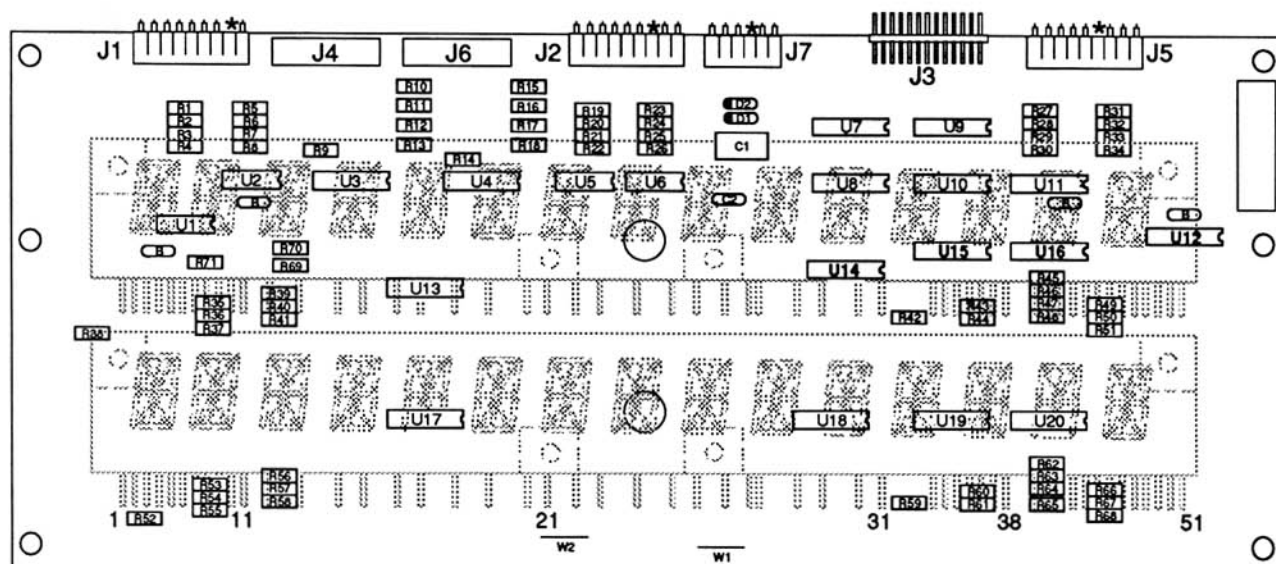
Notes...

- For Schematic, refer to drawing #16-9019.
- Standard Jumper: W1, W2, W4, W5, W7, W11, W14, W16

System 11C CPU Board p/n D-11883-571



Master Display Board p/n D-12232-1

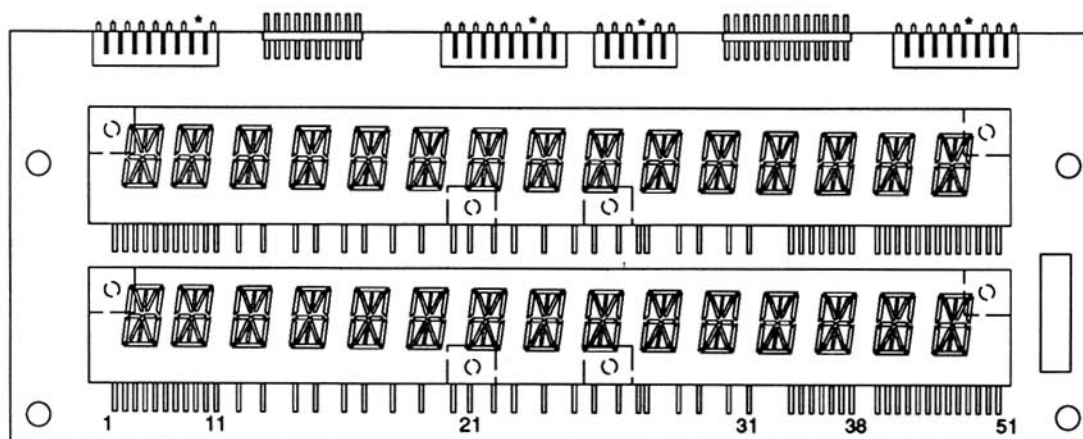


Part Number	Ckt Designator	Description
5760-12306-00		Bare PC Board
5670-12308-00	DSPL1, DSPL2	Display, 16-Character, A/N
5310-09882-00	U1, U2, U5, U6	I.C. 4001
5310-08975-00	U7 - U12	I.C. 4049
5680-08968-00	U13, U14, U17, U18	I.C. 6184, Anode Driver
5680-08969-00	U15, U16, U19, U20	I.C. 7180, Cathode Driver
5040-09343-00	C1	Axial Cap, 10 μ fd, 20v, $\pm$ 20%
5043-08980-00	Bypass	Axial Cap, 0.01 μ fd, 50v, +80, -20%
5075-09135-00	D1, D2	Zener, 1N4740A, 10v, 1w
5791-10869-09	J1, J2, J5	9-pin Header, Rt. Angle
5791-10869-06	J7	6-pin Header, Rt. Angle
5791-10851-00	J3	26-pin Header, Rt. Angle
5010-08773-00	R1-R8, R19-R35, R41, R43, R45, R71	Resistor, 18K Ω , 1/4w, 5%
5010-10258-00	R38, R52	Resistor, 1M Ω , 1/4w, 5%
5010-10927-00	R36, R39, R40, R42, R47, R48, R50, R51, R54, R56, R57, R59, R64, R65, R67, R68	Resistor, 8.2K Ω , 1/2w, 5%
5010-08981-00	R37, R44, R46, R49, R55, R61, R63, R66	Resistor, 10K Ω , 1/2w, 5%
03-8088-1	Support	Support, Display
16-8850-234		PCB Label
23-6634		Cover, Display

Pinout Table
used on Master Display Board, p/n D-12232-1 or -2

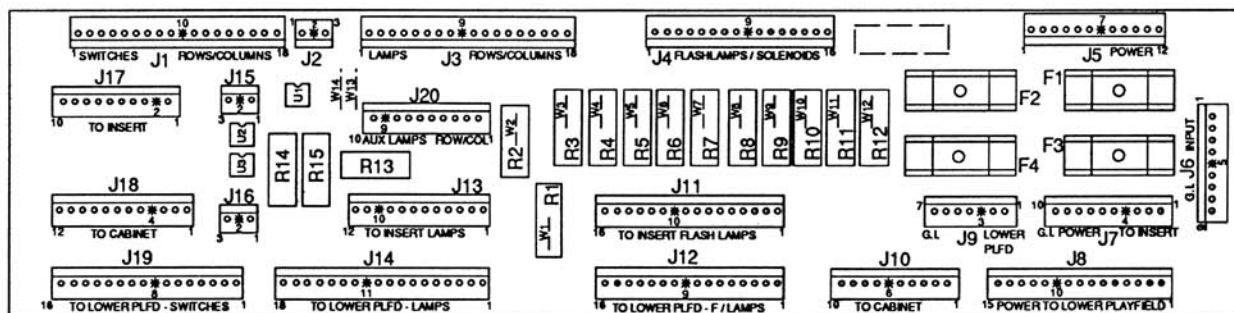
Board Pin #	Glass Pin #	Signal/ Function	Board Pin #	Glass Pin #	Signal/ Function	Board Pin #	Glass Pin #	Signal/ Function	Board Pin #	Glass Pin #	Signal/ Function
1	1	N/C		24	cut	31	47	Strobe 8		70	cut
2	2	Segment A	23	25	Strobe 12		48	cut	40	71	Strobe 4
3	3	Segment J		26	cut	32	49	Strobe 8		72	cut
4	4	Segment B	24	27	Strobe 12		50	cut		73	cut
5	5	Strobe 16		28	cut		51	cut		74	cut
6	6	Segment K		29	cut		52	cut	41	75	Strobe 3
7	7	Strobe 16		30	cut	33	53	Strobe 7		76	cut
8	8	Segment H	25	31	Strobe 11		54	cut	42	77	Strobe 3
9	9	Segment F		32	cut	34	55	Strobe 7		78	cut
10	10	Segment M	26	33	Strobe 11		56	cut	43	79	Strobe 2
11	11	Strobe 15		34	cut	35	57	Strobe 6	44	80	Comma
12	12	Segment C		35	cut		58	cut	45	81	Strobe 2
13	13	Strobe 15		36	cut		59	cut	46	82	Segment P
14	14	N/C	27	37	Strobe 10		60	cut	47	83	Segment R
15	15	Strobe 14		38	cut	36	61	Strobe 6	48	84	Segment E
16	16	Dot	28	39	Strobe 10		62	cut	49	85	Strobe 1
17	17	Strobe 14		40	cut	37	63	Strobe 5	50	86	Segment N
18	18	Segment D	29	41	Strobe 9		64	cut	51	87	Strobe 1
19	19	Strobe 13		42	cut	38	65	Strobe 5	52	88	Segment
20	20	Dot	30	43	Strobe 9		66	cut	53	89	-100V dc
21	21	Strobe 13		44	cut		67	cut			
22	22	N/C		45	cut		68	cut			
	23	cut		46	cut	39	69	Strobe 4			

16-Character Display Glass
p/n 5670-12308-00



Backbox Interconnect Board

p/n D-12313-571



Part Number	Ckt Designator	Description
5768-12332-00		Master Interconnect PCB
5010-09534-00	W10, W12, W13	Resistor, 0Ω
5012-10024-00	R1 - R5, R7	Resistor, 5.6Ω, 5w, 10%
5012-12238-00	R14, R15	Resistor, 3.3KΩ, 5w, 10%
5012-12337-00	R13	Resistor, 1.5KΩ, 5w, 10%
5012-10023-00	R8, R9, R11	Resistor, 4Ω, 5w, 10%
5012-12188-00	R6	Resistor, 3Ω, 5w, 10%
5490-10892-00	U1 - U3	Opto Isolator 4N25
5731-09651-00	F1-F4	Fuse, 5A.S.B., 250v
5733-12060-01		Fuse Holder, F1-F4
5791-12273-03	J2, J15, J16	Connector, 3-pin Str Sq Pin
5791-10862-07	J9	Connector, 7-pin Hdr Sq Pin
5791-10862-09	J6	Connector, 9-pin Hdr Sq Pin
5791-10862-10	J7, J10, J17	Connector, 10-pin Hdr Sq Pin
5791-10862-12	J5, J13, J18	Connector, 12-pin Hdr Sq Pin
5791-10862-15	J8	Connector, 15-pin Hdr Sq Pin
5791-10862-16	J4, J11, J12, J19	Connector, 16-pin Hdr Sq Pin
5791-10862-18	J1, J3, J14	Connector, 18-pin Hdr Sq Pin
16-8850-304		PCB Label

General Illumination Relay Board

(Solenoid 11)

p/n C-11998-1

Part Number	Description
5768-12243-00	Lamp PCB
5070-09054-00	Diode, 1N4004, 1.0A. (D1)
5580-09555-01	Relay, 24vdc, 30A. (K1)
5010-09534-00	Resistor 0Ω (W1, W2)
5791-12273-02	Header, 2-pin Sq post (J1)
5791-12273-07	Header, 7-pin Sq post (J2)

Lamp Boards

Lamp Board ("3-DT")
p/n C-13523

Part Number	Description
5768-12610-00	Lamp PCB
24-8767	Twist Lamp Socket
24-8768	Bulb #555 (6.3v, 0.25A.)
5070-09054-00	Diode, 1N4004, 1.0A.
5791-10871-05	Connector, 5-pin Sq post

Lamp Board ("3-C")
p/n C-12000

Part Number	Description
5768-12245-00	Lamp PCB
24-8767	Twist Lamp Socket
24-8768	Bulb #555 (6.3v, 0.25A.)
5070-09054-00	Diode, 1N4004, 1.0A.
5791-10871-05	Connector, 5-pin Sq post

Lamp Board ("4-L")
p/n C-13539

Part Number	Description
5768-12615-00	Lamp PCB
24-8767	Twist Lamp Socket
24-8768	Bulb #555 (6.3v, 0.25A.)
5070-09054-00	Diode, 1N4004, 1.0A.
5791-10871-06	Connector, 6-pin Sq post

Lamp Board ("1")
p/n B-12224

Part Number	Description
5768-12312-00	Lamp PCB
24-8767	Twist Lamp Socket
24-8768	Bulb #555 (6.3v, 0.25A.)
5070-09054-00	Diode, 1N4004, 1.0A.

Lamp Board ("5-C1")
p/n C-13535

Part Number	Description
5768-12612-00	Lamp PCB
24-8767	Twist Lamp Socket
24-8768	Bulb #555 (6.3v, 0.25A.)
5070-09054-00	Diode, 1N4004, 1.0A.
5791-10871-07	Connector, 7-pin Sq post

Lamp Board ("5-C2")
p/n C-13538

Part Number	Description
5768-12614-00	Lamp PCB
24-8767	Twist Lamp Socket
24-8768	Bulb #555 (6.3v, 0.25A.)
5070-09054-00	Diode, 1N4004, 1.0A.
5791-10871-07	Connector, 7-pin Sq post

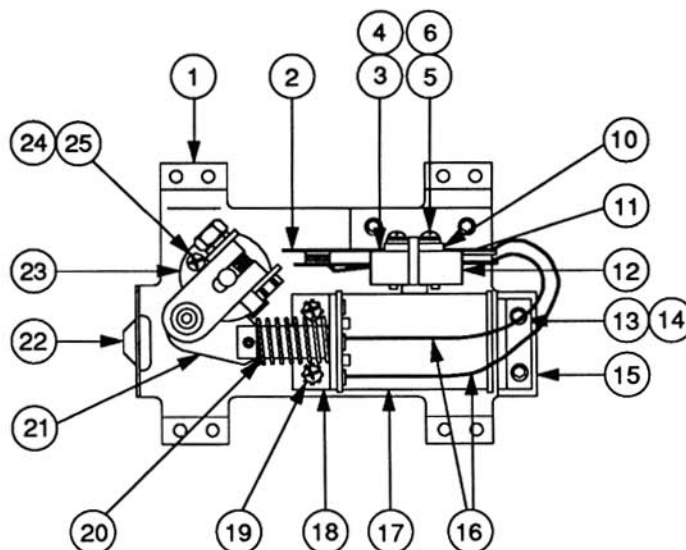
Lamp Board ("3I + 3F")
p/n C-13624

Part Number	Description
5768-12644-00	Lamp PCB
24-8767	Twist Lamp Socket
24-8768	Bulb #555 (6.3v, 0.25A.)
24-8803	Twist Lamp Socket
24-8802	Bulb #906 (13v, 0.69A.)
5791-10871-07	Connector, 7-pin Sq post

Lamp Board ("3I + 2F")
p/n C-13624-1

Part Number	Description
5768-12644-00	Lamp PCB
24-8767	Twist Lamp Socket
24-8768	Bulb #555 (6.3v, 0.25A.)
24-8803	Twist Lamp Socket
24-8802	Bulb #906 (13v, 0.69 A.)
5791-10871-07	Connector, 7-pin Sq post

Right Flipper Assembly p/n C-13174-R



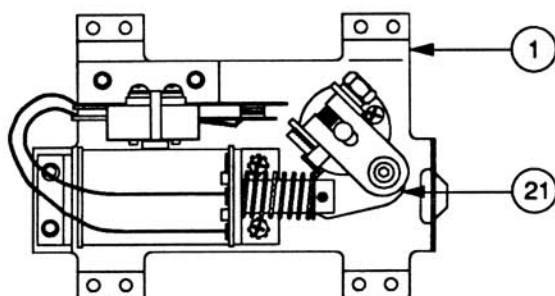
Item	Part Number	Description	Item	Part Number	Description
1	B-13104-R	Flipper Base Assy, R.	21	B-10655-R	Crank Link Assembly, Right
2	03-7811	End of Stroke (EOS) Sw	a)	02-4179	Link Spacer Bushing
3	RM-21-06	Sleeve, Vinyl (Cap. leads)	b)	4010-01086-14	Cap Screw, 10-32 x 7/8, SH
4	5045-12098-00	Capacitor, 2.2 μ Fd, 250V, 20%	c)	4700-00023-00	Washer, 5/8 x 13/64 x 16ga.
5	4701-00002-00	Lockwasher, #6 Split	d)	4701-00004-00	Lockwasher, #10 Split
6	4105-01019-10	Sh. Metal Screw, #5 x 5/8	e)	4410-01132-00	Nut, 10-32 ESNA
7	23-6622	Tape, Double-sided	f)	A-10656*	Flipper Link Assembly
8	4008-01079-05	Cap Screw, 8-32 x 5/16	1.)	02-4219	Coil Plunger
9	4701-00003-00	Lockwasher, #8 Split	2.)	20-9370-1	Spring Pin, 5/32 dia. x 7/16
10	01-9375	Switch Mounting Bracket	3.)	03-8050-1	Flipper Link
11	03-7520-2	Ty-Wrap, Nylon	g)	B-10657-R	Flipper Crank Assy, R.
12	20-6516	Speednut, Tinnerman	1.)	01-8073-R	Flipper Crank, R.
13	4010-01066-06	Cap Screw, 10-32 x 3/8, SH	2.)	17-1037	Crank Washer
14	4701-00004-00	Lockwasher, #10 Split	3.)	4010-01066-18	Cap Screw, 10-32 x 1-1/8
15	A-12111	Flipper Stop Assembly	4.)	4410-01127-00	Nut, 10-32 Hex Hd.
16	HW-30018-6	Wire, 18 AWG, Blue	5.)	4700-00107-00	Flatwasher, 5/8 x 13/64 x 12 ga.
17	FL-11630	Flipper Coil (Red)	6.)	4701-00004-00	Lockwasher, #10 Split
18	01-7695	Solenoid Bracket	7.)	RM-23-06	Tubing, H. S. 1/4 DWP
19	4006-01017-04	Mach. Screw, 6-32 x 1/4	22	23-6577	Bumper Plug
20	10-376	Coil Plunger Spring	23	03-7568	Flipper Bushing
			24	4006-01005-06	Mach. Screw, 6-32 x 3/8
			25	4406-01117-00	Nut, 6-32 Hex.

* See Separate Diagram

Associated Parts:

20-9250-6	Flipper Arm on Shaft (Yellow)
23-6519-4	Red Rubber Ring

Left Flipper Assembly p/n C-13174-L



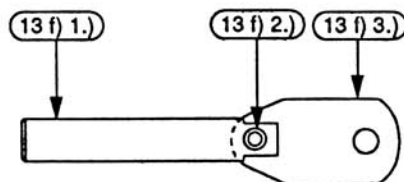
(Parts listed replace same items of C-13174-R)

Item	Part No.	Description
1	B-13104-L	Flipper Base Assembly, L
21	B-10655-L	Crank Link Assembly, Left
	g) B-10657-L	Flipper Crank Assembly, L
	1.) 01-8073-L	Flipper Crank, Left

Flipper Assembly Notes...

1. Each Flipper Assembly on the Lower Playfield is mounted beneath the playfield, in conjunction with the plastic Flipper Paddle and Shaft (20-9250-6) and Flipper Rubber (23-6519-4) on the upper side of the playfield.
2. The tip of the EOS Switch must travel 0.150 (+ .010, - .000) inch, before the contacts fully open, with the flipper in the actuated position. The EOS Switch contacts must have a gap of 0.062 ($\pm$.015) inch. Adjustment of the EOS Switch must be made at a minimum distance of 0.25 inch from the switch body.
3. All moving elements of the assembly must operate freely, with no evidence of binding.
4. The large end of the Coil Plunger Spring (item 20) must fit within the four lugs of the Solenoid Bracket.
5. For coil replacement, remove the Solenoid Bracket (item 18) to prevent screw damage.
6. Use Loctite™ 242 when reattaching screws to the Flipper Stop Assembly, the Solenoid Bracket, and the Flipper Bushing.
7. When replacing their Bumper Plug (item 22) to restore proper flipper operation, readjust the flipper paddle and shaft position.
8. Solid-color blue wire connects to the banded end of each diode, mounted on the connector end of the Flipper Coil (item 17). Trace-color wire connects to the unbanded end of the diode.

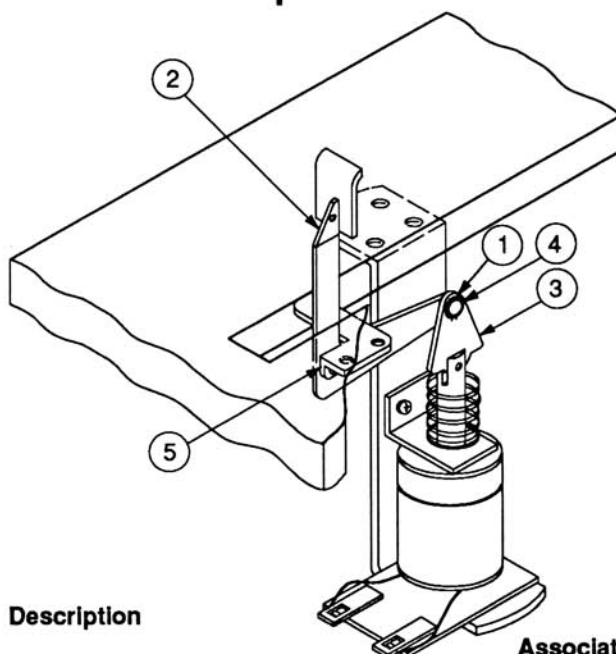
Flipper Link Assembly p/n A-10656



(Items listed refer to items for C-13174-R)

Item	Part No.	Description
13 f) 1.)	02-4219	Coil Plunger
13 f) 2.)	20-9370-1	Spring Pin, 5/32 dia. x 7/16
13 f) 3.)	03-8050-1	Flipper Link

Right & Left Slingshot Kicker Assembly p/n B-12665



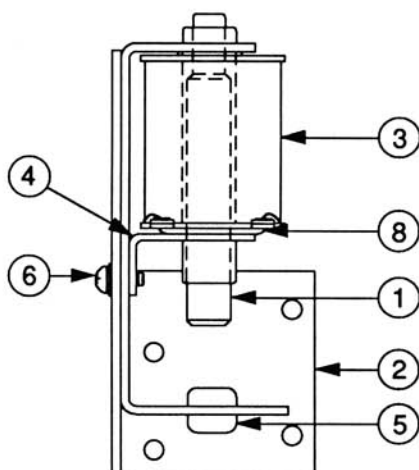
Item Part Number Description

1	12-6227	Clip, Hairpin
2	A-12664	Kicker Crank Assembly
3	A-5103	Coil Plunger Assembly
a)	02-2364	Coil Plunger
b)	20-8716-5	Roll Pin, 1/8 x 7/16
c)	03-8085	Armature Link
4	4700-00030-00	Flatwasher, 17/64 x 1/2 x 15ga.
5	A-5653	Mounting Bracket Assembly

Associated Parts

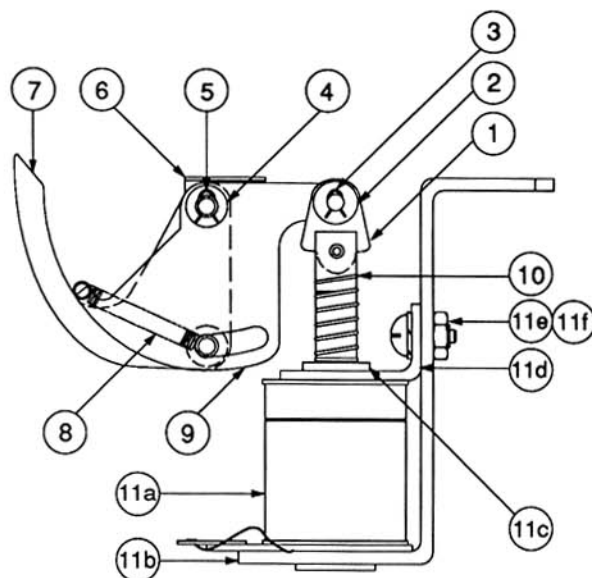
B-11203-R-1	Coil & Bracket Assembly
B-7572-1	Bracket & Stop Assembly
01-8-508-S	Coil Retaining Bracket
4006-01017-06	Mach. Screw, 6-32 x 3/8
4406-01119-00	Nut, 6-32 ESN
AE-26-1500	Coil Assembly
03-7066	Coil Tubing

Knocker Assembly p/n B-10686-1



Item	Part Number	Description
1	A-5387	Coil Plunger Assembly
a)	02-2653	Coil Plunger
b)	03-6013	Bell Arm Ext.
2	B-7409-2	Mtg. Bracket Assembly
3	AE-23-800	Coil Sub-Assembly
4	01-8-508-T	Coil Retaining Bracket
5	23-6420	Rubber Grommet
6	4008-01017-06	Mach. Screw, 8/32 x 3/8
7	H-11835	Knocker Cable
8	03-7067-5	Coil Tubing

Eject Hole Arm Assembly p/n B-9361-R-1



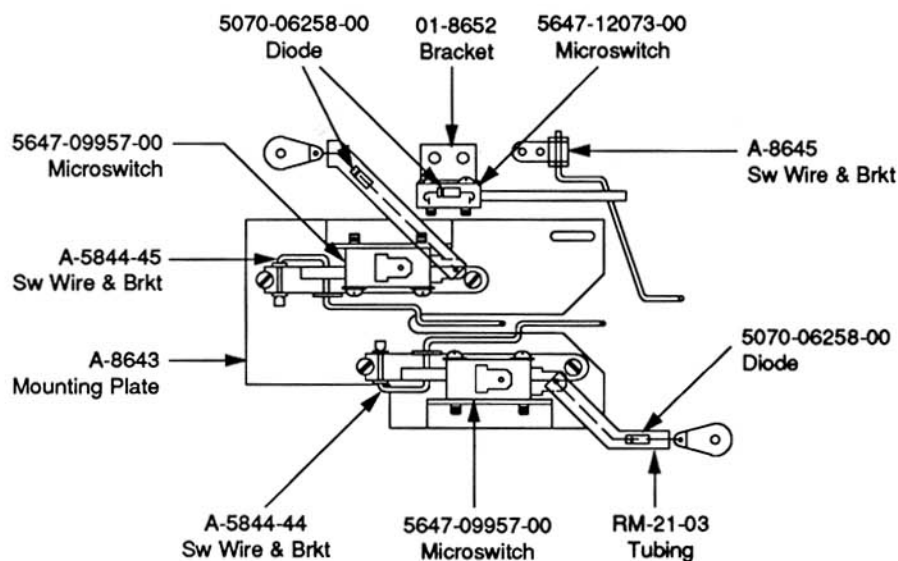
Item	Part Number	Description
1	12-6227	Hairpin Clip
2	A-7471-R	Eject Cam Assembly
3	10-362	Ejector Spring (Plain)
4	A-6949-R	Spring Plate Assembly
5	A-8050-1	Coil Plunger Assy, 2-1/8"
a)	02-3407-2	Coil Plunger, 2-1/8"
b)	20-8716-5	Roll Pin, 1/8 x 7/16
c)	03-8085	Armature Link
6	12-6227	Hair Pin Clip
7	4700-00030-00	Flatwasher, 17/64 x 1/2 x 15 ga.
8	4700-00103-00	Flatwasher, 17/64 x 1/2 x 28 ga.
9	A-8268	Mounting Bracket Assembly

Associated Parts

10	10-128	Spring
11	B-13655	Coil & Bracket Assembly
a)	AE-23-800	Coil Assembly
b)	B-7572-1	Bracket & Stop Assembly
c)	03-7066	Coil Tubing
d)	01-8-508-S	Coil Retaining Bracket
e)	4006-01017-06	Mach. Screw, 6-32 x 3/8
f)	4406-01119-00	Nut, 6-32 ESN

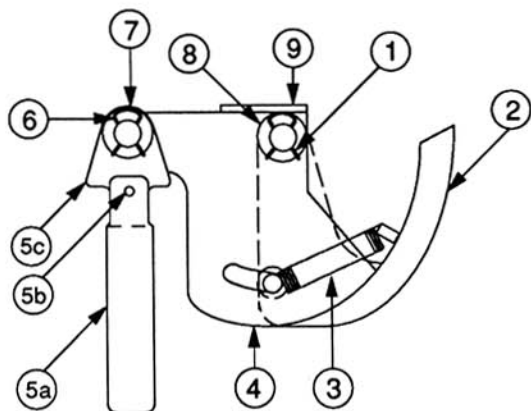
Ball Trough Switches

(Viewed from underside of playfield to show locations)



Ball Shooter Lane Feeder

p/n C-9638



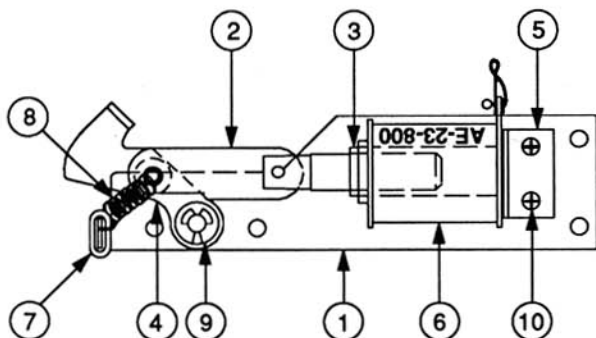
Item	Part Number	Description
1	12-6227	Hair Pin Clip
2	A-8247	Eject Cam Assembly
3	10-362	Ejector Spring (Plain)
4	A-6949-L	Spring Plate Assembly
5	A-8050-1	Coil Plunger Assy, 2-1/8"
a)	02-3407-2	Coil Plunger, 2-1/8"
b)	20-8716-5	Roll Pin, 1/8 x 7/16
c)	03-8085	Armature Link
6	12-6227	Hair Pin Clip
7	4700-00030-00	Flatwasher, 17/64 x 1/2 x 15ga.
8	4700-00103-00	Flatwasher, 17/64 x 1/2 x 28ga.
9	A-8268	Mounting Bracket Assembly

Associated Parts

B-9362-L-1	Coil & Bracket Assembly
B-7572-1	Bracket & Stop Assembly
01-8-508-S	Coil Retaining Bracket
4006-01017-06	Mach. Screw, 6-32 x 3/8
4406-01119-00	Nut, 6-32 ESN
AE-23-800	Coil Assembly
03-7066	Coil Tubing

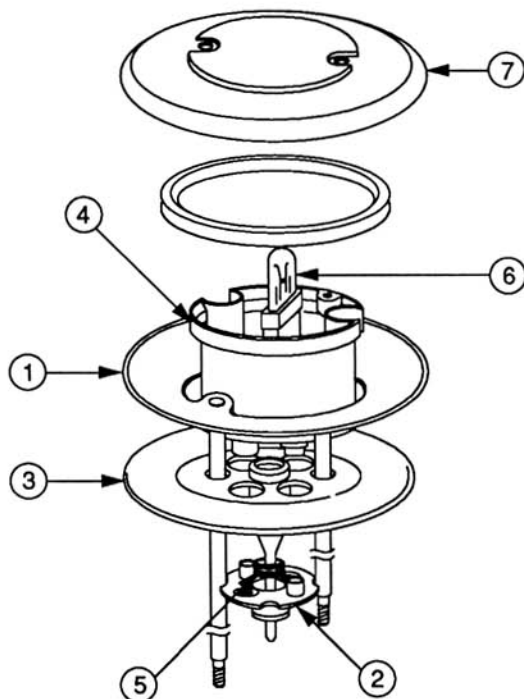
Outhole Kicker Assembly

p/n B-8039-2



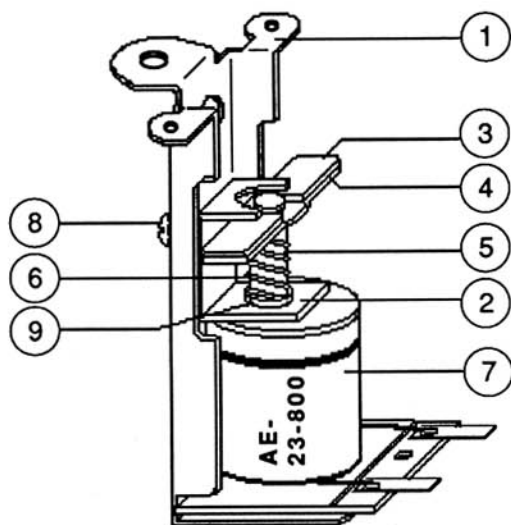
Item	Part Number	Description
1	A-6378	Mounting Plate Assembly
2	A-8335	Coil Plunger Assembly
a)	02-2364	Coil Plunger
b)	20-8716-5	Roll Pin, 1/8 x 7/16
c)	01-4251	Ball Return Link
3	03-7066	Coil Tubing
4	A-6889	Kicker Lever Assembly
5	A-8038	Coil Stop Assembly
6	AE-23-800	Coil Assembly
7	03-7176-1	Striker Ring
8	10-101-4	Spring-Reset
9	20-8712-25	"E" Ring, 1/4" Shaft
10	4006-01003-03	Mach. Screw, 6-32 x 3/16

Jet Bumper Assembly p/n B-9414-1



Item	Part Number	Description
1	A-4754	Bumper Ring Assembly
2	03-6009-A5	Bumper Base - White
3	03-6035-1	Bumper Wafer - Blue
4	03-7443-5	Bumper Body - White
5	10-7	Spring - Jet Bumper
6	A-11199	Socket & Bulb
7	03-8254-9	Jet Bumper Cap - Trans. Red

Jet Bumper Coil Assembly p/n B-9415-1

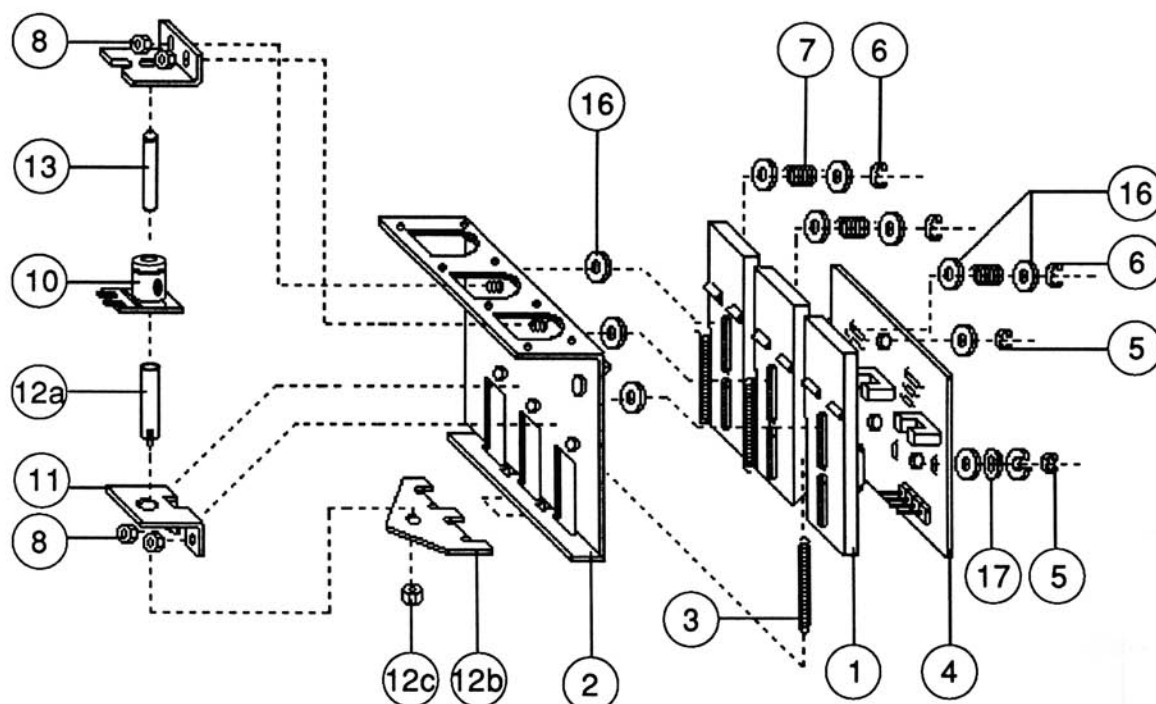


Item	Part Number	Description
1	B-7417	Bracket & Stop Assembly
2	01-1747	Coil Retaining Bracket
3	01-5492	Armature Link, Steel
4	01-5493	Armature Link, Bakelite
5	02-3406-1	Coil Plunger
6	10-326	Armature Spring
7	AE-23-800	Coil Assembly
8	4006-01017-04	Mach. Screw, 6-32 x 1/4
9	03-7066	Coil Tubing

Associated Parts

B-12030-2	Jet Bumper Sw & Diode
B-12029-2	Jet Bumper Sw & Brkt. Assy
SW-11A-37	Jet Bumper Switch Assy
01-1168	Mounting Brkt., Bumper Sw
01-3670	Switch Plate - Curved
03-7395	Switch Actuator
4005-01051-12	Mach. Screw, 5-40 x 3/4
4405-01117-00	Nut, 5-40 Hex.
5070-06258-00	Diode, 1N4001, 1.0A.

3-Bank Drop Target Assembly p/n C-11223-1

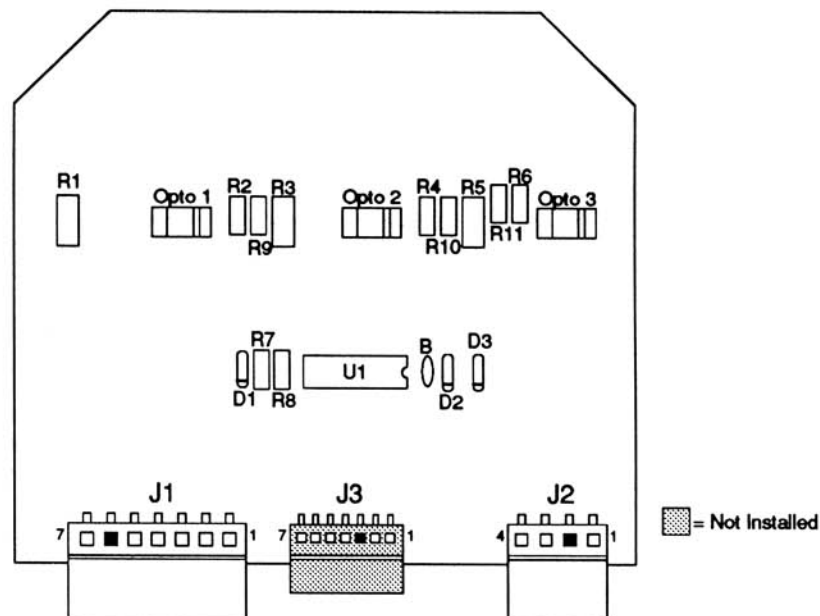


Item	Part Number	Description	Item	Part Number	Description
1	03-8036	Target, Plain	11	01-8413	Bracket Coil Mounting
2	B-13271	3-Bank Tgt Sub-Assy	12	A-11389	Plunger & Reset Plt Assy
3	10-364	Spring - Extension	a)	02-3972-1	Plunger
4	C-13205	3- Bnk Drop Tgt Opto Bd.	b)	01-8408	Reset Plate
5	20-8712-18	"E"-Ring, 3/16" Shaft	c)	4410-01132-00	Nut, 10-32 ESN
6	20-8712-25	"E"-Ring, 1/4" Shaft	13	03-7066-4	Coil Tubing
7	10-392	Spring-Compression	14	4700-00016-00	Flatwasher, 3/16 x 7/16 x 17 ga.
8	4408-01119-00	Nut, 8-32 ESN	15	4008-01016-10	Mach. Screw, 8-32 x 5/8
9	A-11397	Stop Bracket Assy	16	4700-00072-00	Flatwasher, 17/64 x 1/2 x 21 ga.
10	AE-26-1200	Coil Assembly	17	23-6626	Rubber Grommet
			18	4408-01128-00	Nut, 8-32 KEPS

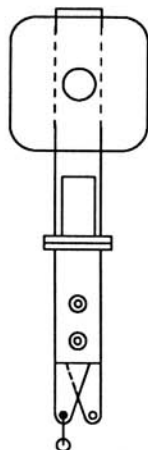
Associated Parts:

31-1463-571-1, -2 3-Bank Drop Target Decals

3-Bank Drop Target Opto Board p/n C-13205



Part Number	Ckt Designation	Description
5768-12546-00		3-Bank Opto Board
5490-10159-00	Opto 1- Opto 3	Opto Interruptor, MDL, S/G
5010-08930-00	R1, R3, R5	Resistor, 470Ω, 1/2w, 5%, C.F.
5010-09162-00	R8	Resistor, 100KΩ, 1/4w, 5%, C.F.
5010-08774-00	R7	Resistor, 22KΩ, 1/4w, 5%, C.F.
5010-09324-00	R2, R4, R6	Resistor, 27KΩ, 1/4w, 5%, C.F.
5010-08773-00	R9 - R11	Resistor, 18KΩ, 1/4w, 5%, C.F.
5043-08980-00	B	Capacitor, .01μfd., +80 -20%
5370-12272-00	U1	I.C., Quad. Comp., LM339
5791-10869-04	J2	Connector, 4-Pin R/A Sq. Pin
5791-10869-07	J1	Connector, 7-Pin R/A Sq. Pin
5070-09054-00	D1 - D3	Diode, 1N4004, 1.0A



Standup Target

Item	Part Number	Description
1	B-12912-4	Sta. Target Assy, Complete
	SW-1A-184-4	Sta. Target Switch
	03-8304-4	Rectangular, Target (Red)
	5070-06258-00	Diode, 1N4001, 1.0A

Right Plastic Ramp Assembly p/n D-13663

Item	Part Number	Description	Item	Part Number	Description
1	A-13709	Switch Gate Assembly	19	23-6535	Rubber Bumper
2	A-13710	Switch Gate Assembly	20	24-8802	Bulb, #906 (13v, 0.69A.)
3	B-13664	Switch Bracket Assembly	21	24-8812	Socket w/Plug, 5/8"
4	H-13729	Cup Ramp Cable	22	31-1006-571-18	Screened Plastic
5	01-8774	Switch Bracket	23	31-1580-571	Decal, Checkered
6	01-9502	Bearing Plate	24	31-1585-571	Decal, Spoon
7	01-9632	Flap Ramp - Enter	25	4002-01005-06	Mach. Screw, 2-56 x 3/8
8	01-9633	Flap Ramp - Exit	26	4006-01003-08	Mach. Screw, 6-32 x 1/2
9	01-9681	Bracket Switch Cover	27	4106-01001-06	Sh. Metal Screw, #6 x 3/8
10	03-7520-2	Ty-Wrap Nylon	28	4106-01001-07	Sh. Metal Screw, #6 x 7/16
11	03-8022-3	Spacer, 1-11/64" Lg.	29	4106-01009-06	Sh. Metal Screw, #6 x 3/8
12	03-8044-9	Mini Post, Trans. Red	30	4106-01022-27	Sh. Metal Screw, #6 x 1-11/16
13	03-8171-18	Mini Dome, Violet	31	4406-01128-00	Nut, 6-32 KEPS
14	03-8172-13	Mini Dome, Clear	32	4700-00003-00	Flatwasher, 1/8 x 9/32 x 21ga.
15	03-8393	Ramp, Coffee Cup	33	4700-00011-00	Flatwasher, 11/64 x 7/16 x 16ga.
16	07-6688-18N	Rivet, 3/16 x 7/32	34	4701-00024-00	Lockwasher, #2 Split
17	07-6688-20N	Rivet, 1/4 x 7/32	35	5070-06258-00	Diode, 1N4001, 1.0A.
18	20-9646	Cover-Switch Protect	36	5647-12073-07	Sub-Mini Microswitch
			37	5647-12073-11	Sub-Mini Microswitch

Upr Left Plastic Ramp Assy p/n D-13666

Item	Part Number	Description
1	B-13664	Switch Bracket Assembly
2	H-13728	Lift Ramp Cable
3	01-8947	Bracket Ball Gate
4	03-6047-2	Spacer, 3/8"
5	03-7520-2	Ty-Wrap Nylon
6	03-8022-1	Spacer, 9/16" Lg.
7	03-8022-5	Spacer, 11/32" Lg.
8	03-8044-9	Mini Post, Trans. Red
9	03-8171-18	Mini Dome - Violet
10	03-8172-13	Dome Rcpt, Clear
11	03-8394	Ramp - Curved Lift
12	07-6688-17N	Rivet, 5/32 x 7/32
13	20-9646	Cover Switch
14	23-6535	Rubber Bumper
15	24-8802	Bulb, #906 (13v, .69A.)
16	24-8812	Socket w/Plug, 5/8"
17	31-1006-571-17	Screened Playfield Plastic
18	4106-01001-06	Sh. Metal Screw, #6 x 3/8
19	4106-01001-07	Sh. Metal Screw, #6 x 7/16
20	4106-01001-16	Sh. Metal Screw, #6 x 1
21	4106-01033-08	Sh. Metal Screw, #6 x 1/2

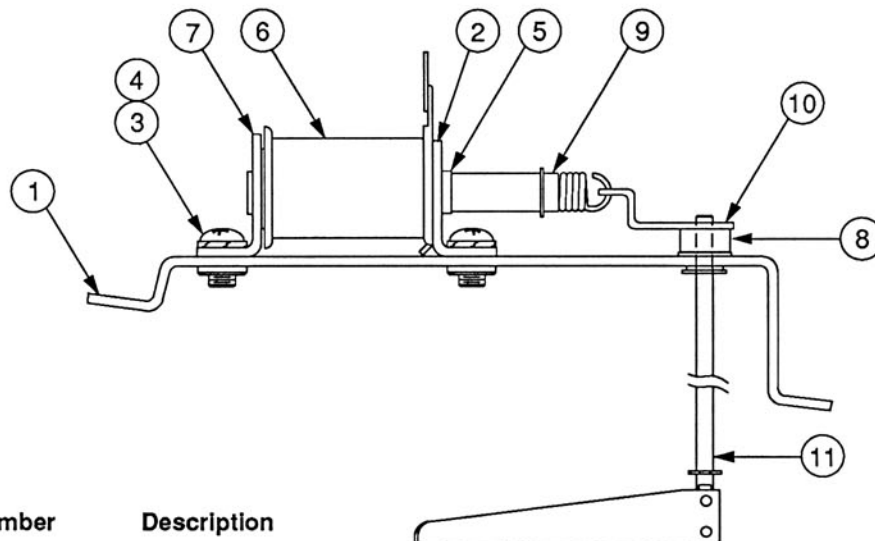
Lwr Left Ramp Assembly p/n D-13665

Item	Part Number	Description
1	01-9630	Bracket Ball Stop
2	03-8395	Crossover Ramp
3	07-6688-20N	Rivet, 1/4 x 7/32
4	4700-00003-00	Flatwasher, 1/8 x 9/32 x 21ga.

Elevator Ramp Assembly p/n B-13662

Item	Part Number	Description
1	01-9680	Lift Ramp
2	01-9629	Lift Ramp Bracket
3	01-9670	Bracket - Crk / Pin Guide
4	01-9669	Plate - Ramp Protect
5	01-9628	Lift Ramp Flap
6	01-9627	Lift Ramp Bracket
7	07-6688-16N	Rivet, 1/8 x 1/8 Lg.
8	31-1579-571	Decal
9	4700-00003-00	Flatwasher, 1/8 x 9/32 x 21ga.

Ramp Diverter Assembly p/n B-13346 & Associated Parts



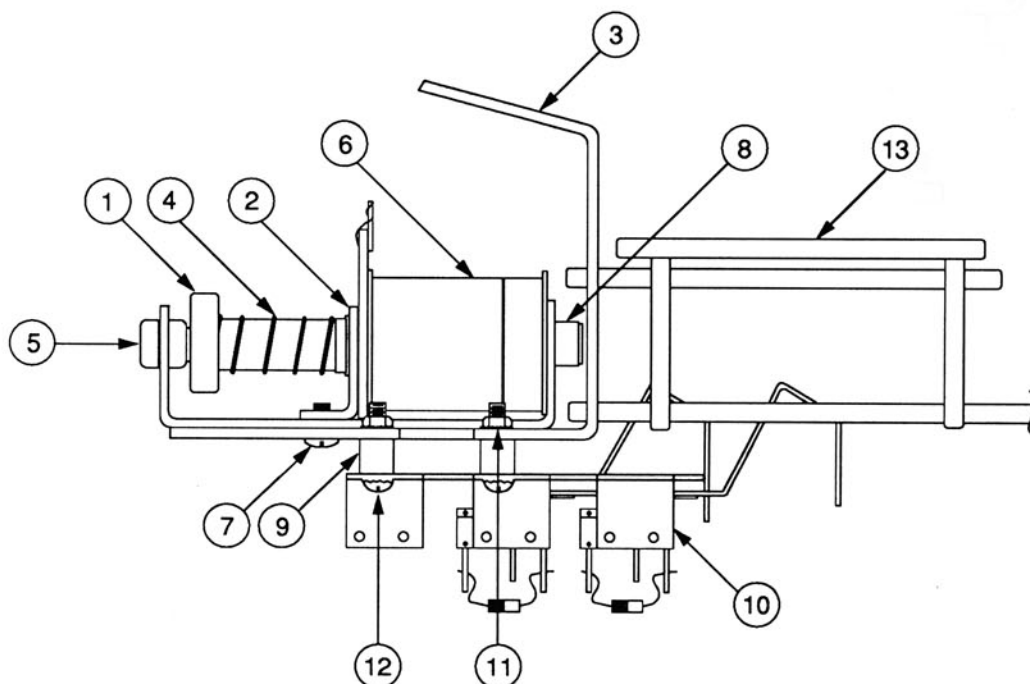
Item	Part Number	Description	Associated Parts		
1	B-13347	Bracket Diverter Assy			
2	01-8413	Bracket Coil Mounting			
3	4701-00004-00	Lockwasher, #10 (Split)			
4	4010-01008-06	Mach. Screw, 10-32 x 3/8			
5	03-7066	Tubing Coil			
6	AE-26-1200	Coil Assembly	9	A-13278	Plunger Assembly
7	A-10821	Flipper Stop Bracket	10	A-13279	Drive Arm Assembly
8	20-8790	Nylined Bearing	11	B-13348	Shaft / Ball Guide Assy

Back Panel Assembly p/n D-13810

Item	Part Number	Description	Item	Part Number	Description
1	A-12887	Socket & Bulb Assembly	9	03-7655-4	Clip Harness, 1/4"
a)	24-8768	Bulb, #555 (6.3v, 0.25A.)	10	03-8022-5	Spacer, 11/32"
b)	24-8807-1	Socket - Wedge Base	11	03-8149-18	Mini Dome, Violet
2	A-9359	Socket & Bulb Assembly	12	11-831-571	Wood Back Panel
a)	24-6421-6	Light Socket	13	31-1006A-571-3	Screened Plastic
b)	24-8704	Bulb, #89	14	31-1559-571-1	Decal, Checkered Panel
3	C-12000	3-Lamp PCB Assy -Top	15	4008-01003-08	Mach. Screw, 8-32 x 1/2
4	C-13337	Single Flashlamp Assy	16	4106-01001-07	Sh. Metal Screw, #6 x 7/16
* 5	C-13661	Jukebox Assembly	17	4106-01033-08B	Sh. Metal Screw, #6 x 1/2
6	CW-30022-4	Wire, 22AWG Yellow	18	4106-01114-08	TCS, #6 x 1/2
* 7	D-13660	Coffee Cup Assembly	19	4106-01115-12	Sh. Metal Screw, #6 x 3/4
8	03-6047-2	Spacer, 3/8"			

* See Separate Parts Listing

Sub-Playfield Shooter Assembly p/n B-13652

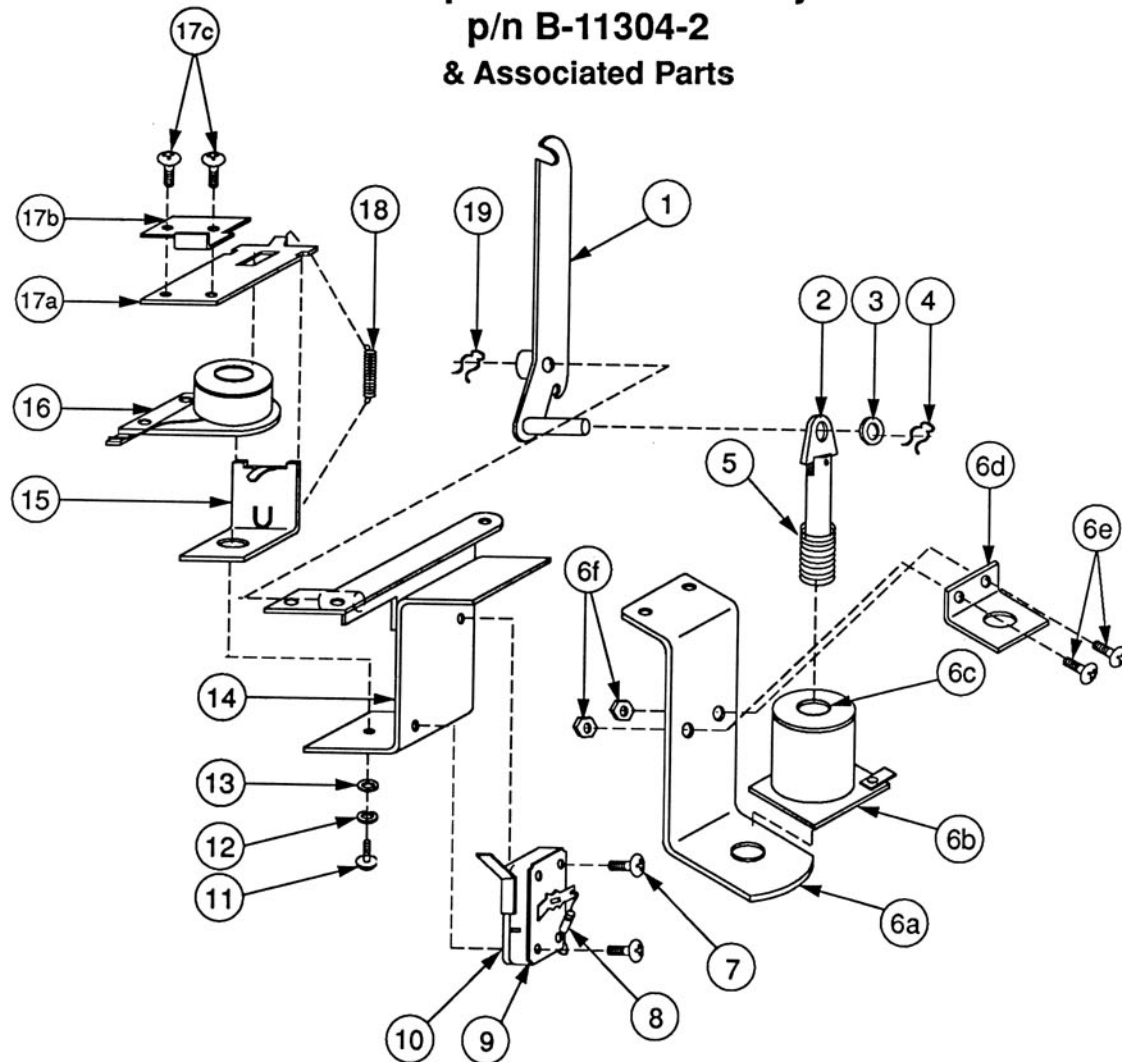


Item	Part Number	Description
1	A-13270	Bell Armature Assembly
2	01-8-508-T	Solenoid Bracket
3	B-13654	Coil Mounting Bracket Assy
4	10-135	Spring
5	23-6420	Rubber Grommet
6	AE-23-800	Coil Sub-Assembly
7	4008-01017-04	Mach. Screw, 8-32 x 1/4
8	03-7067-5	Coil Tubing
9	03-6047-19	Spacer, 9/32"
10	B-13653	Switch Bracket Assy
a)	01-9465	3-Switch Mounting Bracket
b)	5070-06258-00	Diode, 1N4001, 1.0A
c)	5647-12073-32	Microswitch
d)	5647-12073-33	Microswitch
11	4408-01128-00	Nut, 8-32 KEPS
12	4008-01003-12	Mach. Screw, 8-32 x 3/4

Associated Part:

13	12-6904	Wireform -Ramp Kick
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Ramp Elevator Assembly p/n B-11304-2 & Associated Parts



Item	Part Number	Description	Item	Part Number	Description
1	A-11137	Lift Crank Assembly	9	A-7438-1	Terminal Strip Assembly
2	A-8050	Plunger Assembly, 2-1/4"	10	5647-12001-00	Microswitch
3	4700-00073-00	Flatwasher, 9/32x1/2x21ga	11	4008-01021-07	Mach. Screw, 8-32 x 7/16
4	12-6227	Hairpin Clip	12	4701-00003-00	Lockwasher, #8 Split
5	10-128	Spring	13	4700-00089-00	Flatwasher, 11/64x7/16x16ga.
6	B-13655	Coil/Bracket Assembly	14	B-11302	Lift Mechanism Bracket Assy
a)	B-7572-1	Bracket & Stop Assembly	15	A-6892	Frame & Eyelet Assembly
b)	AE-23-800	Coil Assembly	16	SM-1-26-600	Coil Assembly
c)	03-7066	Coil Tubing	17	A-11139	Armature Assembly
d)	01-8-508-S	Coil Retainer Bracket	a)	A-8936	Armature Sub-Assembly
f)	4406-01119-00	Nut, 6-32 ESN	b)	01-8390	Lift Crank Lock
e)	4006-01017-06	Mach. Screw, 6-32 x 3/8	c)	4006-01003-03	Mach. Screw, 6-32 x 3/16
7	4004-01003-10	Mach. Screw, 4-40 x 5/8	18	10-363	Extension Spring
8	5070-06258-00	Diode, 1N4001, 1.0A.	19	12-6227	Hairpin Clip

Coin Door Assembly

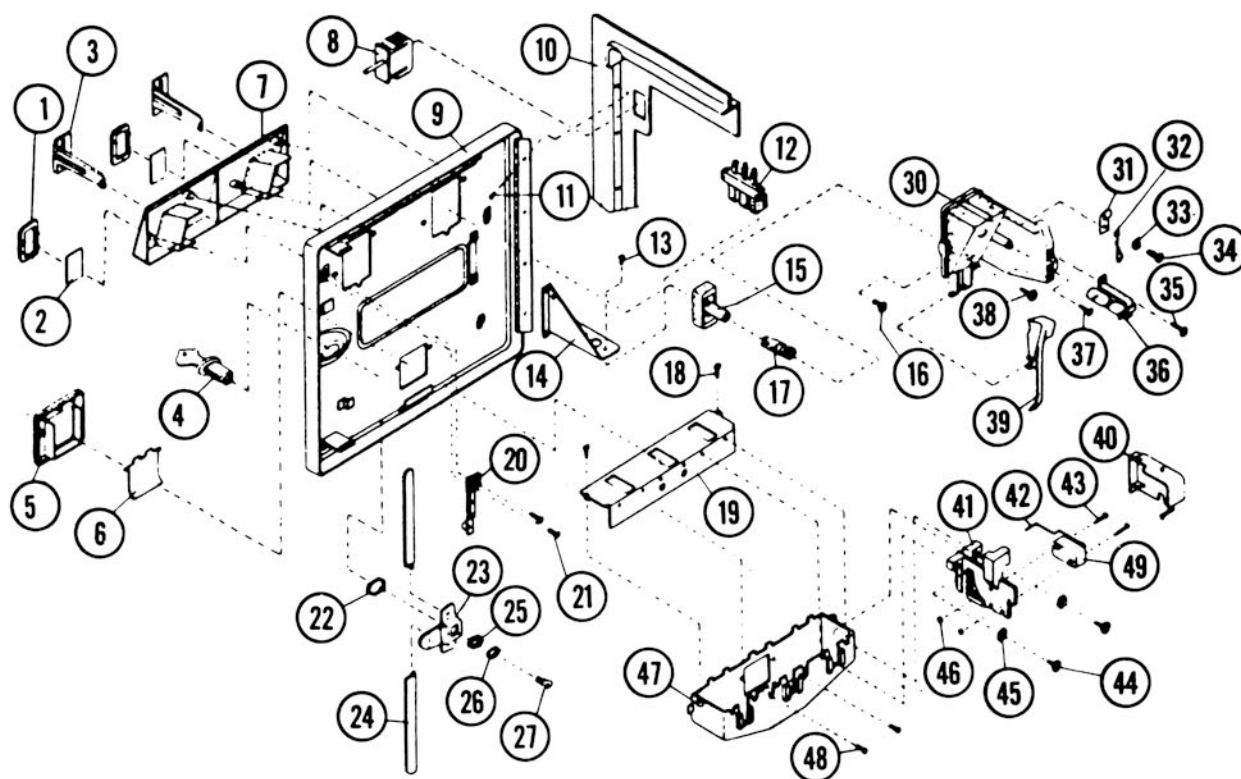
USA Door with decals, p/n C-13155-1

2-Chute Door - 09-17002-x 3-Chute Door - 09-17003-x ("x" is the country designator)

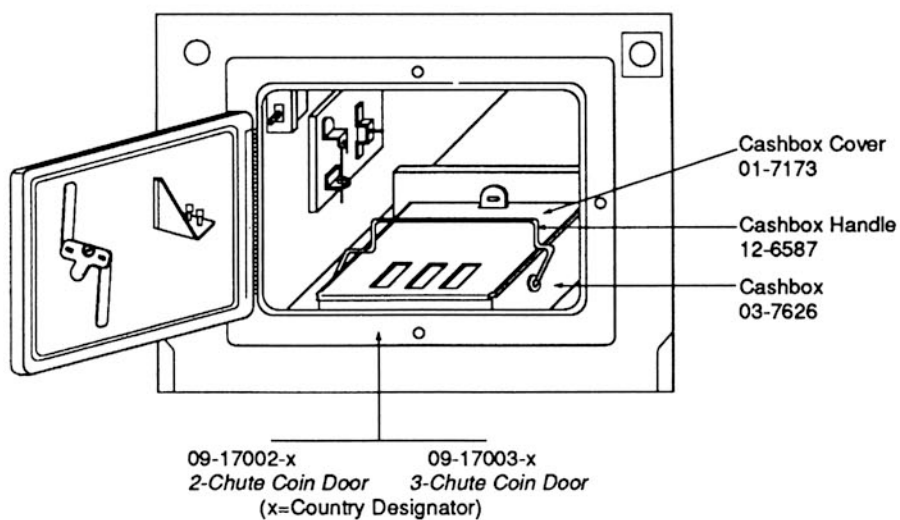
Item	Part Number	Description	Quantity
1	27-1038	Button Cover	2 or 3
2	27-1041-1 → 54	Price Panel	2 or 3
3	27-1026-1 → 15	Coin Entry Plate	2 or 3
4	27-1016	Lock Assembly	1
5	27-1061-1	Coin Return - Bezel	1
6	27-1062	Coin Return Flap	1
7	27-1021	Button Housing - 2-slot	1
	27-1022	Button Housing - 3-slot	1
8	27-1111	Interlock Switch	1
9	27-1006-1	Coin Door , 2-Slot	1
	27-1007-1	Coin Door , 3-Slot	1
10	27-1005	Coin Door Frame	1
11	27-1003	M/C Screw, 6-32 x 3/16	4
12	27-1008	Diagnostic Switch	1
13	27-1101	M/C Screw, 4-40 x 1/4	2
14	27-1102	Bracket, Diagnostic Switch	1
15	27-1037	Button	2 or 3
16	27-1078	M/C Screw, 6-32 x 3/8	2 or 3
17	27-1039	Conical Spring	2 or 3
18	27-1079	Self-tapping Screw, #6 x 1/4	2
19	27-1077-1	Coinbox Cover	1
20	27-1066	Slam Switch	1
21	27-1067	M/C Screw, 4-40 x 1/2	2
22	27-1017	Nut (key)	1
23	27-1012	Locking Cam	1
24	27-1011	Locking Arm	2
25	27-1020	Washer	1
26	27-1018	Star Washer	1
27	27-1019	M/C Screw, 1/4-28 x 5/16	1
28-29	Not Used		
30	27-1112	Coin Inlet Chute	2 or 3
31	27-1088	Cable Clamp	2 or 3
32	27-1025	Key Hook	1
33	27-1086	Washer, #6	2 or 3
34	27-1078	M/C Screw, 6-32 x 3/8	1 or 2
	27-1113	M/C Screw, 6-32 x 7/16	1
35	27-1079	Self-tapping Screw, #6 x 1/4	2 or 3
36	27-1084	Lamp Socket	2 or 3
	27-1085	Lamp	2 or 3
37	27-1096	Self-tapping Screw, #5 x 3/8	2 or 3
38	27-1087	M/C Screw, 6-32 x 5/8	2 or 3
39	27-1082	Lever Arm	2 or 3
40	27-1097	Switch Cover	2 or 3
41	27-1091-1	Coin Accept Chute	2 or 3
42	27-1075	Wire Form (Small)	2 or 3
	or		
	27-1093	Wire Form (Large)	
43	27-1094	M/C Screw, 4-40 x 7/8	4 or 6
44	27-1087	M/C Screw, 6-32 x 5/8	4 or 6
45	27-1086	Washer, #6	4 or 6
46	27-1095	Nut, 4-40 ESNA	4 or 6
47	27-1076-1	Coin Return Box	1
48	27-1078	M/C Screw, 6-32 x 3/8	2
49	27-1092	Microswitch	2 or 3

Coin Door Assembly

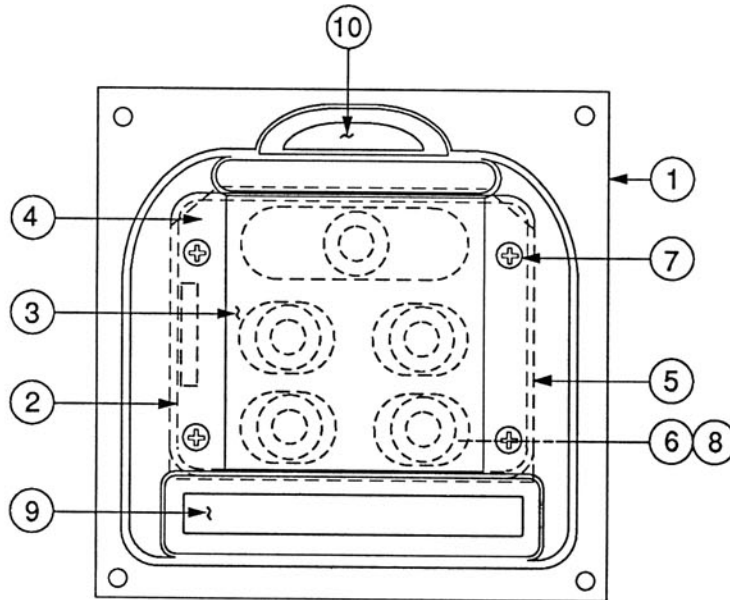
p/n C-13155-1



Pinball Front Box

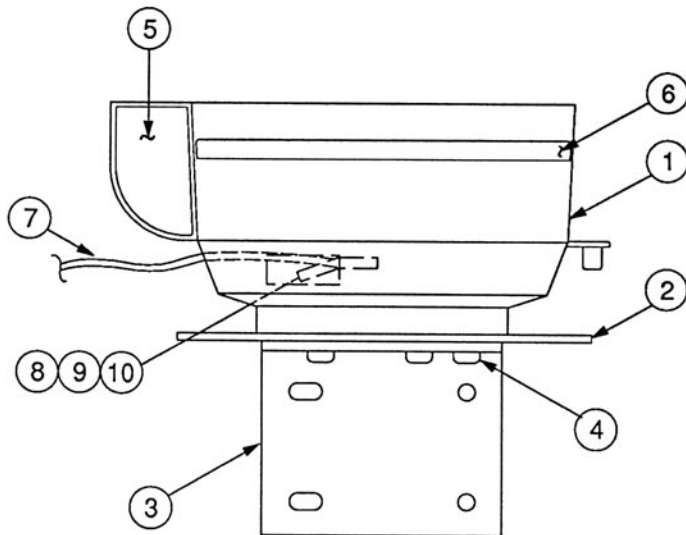


Jukebox Assembly p/n C-13661



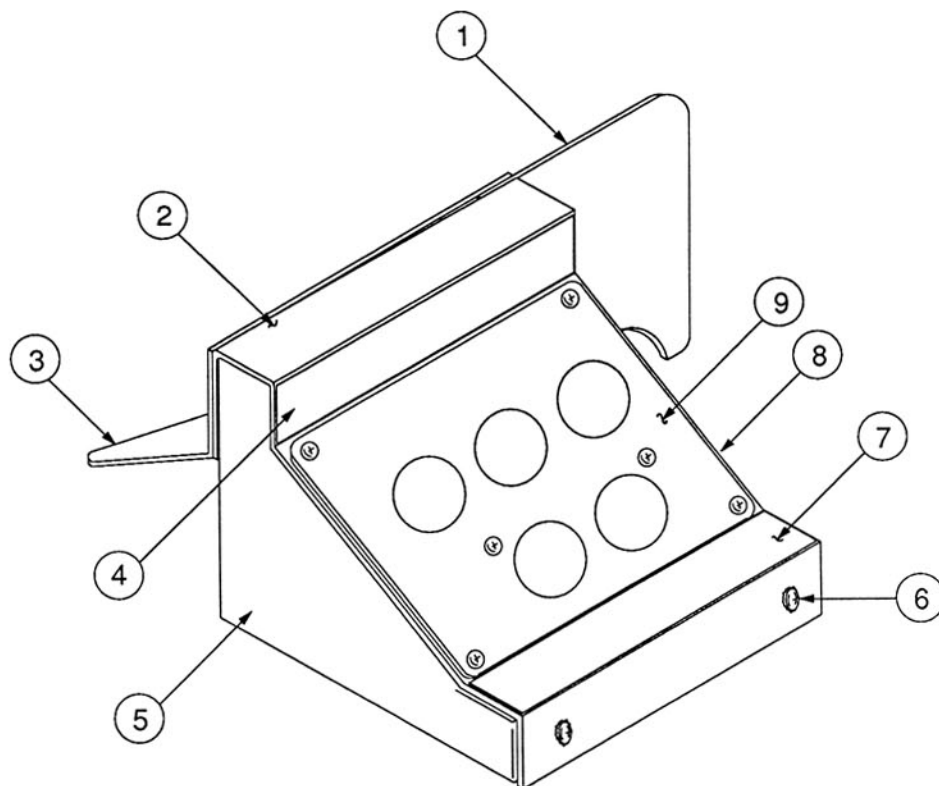
Item	Part Number	Description
1	03-8391	Jukebox
2	03-8392	Jukebox Window
3	31-1006A-571-2	Screened Plastic
4	11-959	Shield - Jukebox Light
5	C-13561	5-Lamp PCB Lamp
6	03-8200-1	Spacer, #8
7	4008-01017-24	Mach. Screw, 8-32 x 1-1/2
8	4408-01128-00	Nut, 8-32 KEPS
9	31-1559-571-3D	Decal, Jukebox Bottom
10	31-1559-571-3C	Decal, Jukebox Top

Coffee Cup Assembly p/n D-13660



Item	Part Number	Description
1	03-8361	Coffee Cup
2	31-1006-571-9	Screened Plastic
3	01-9570	Coffee Cup Bracket
4	4106-01036-10	Screw, PT #6 x 5/8
5	31-1559-571-3B	Decal, Cup Handle
6	31-1559-571-4	Decal, Cup Trim
7	H-13727	Cup Switch Cable
8	5647-12073-17	Subminiature Switch
9	5070-06258-00	Diode, 1N4001, 1.0A.
10	4602-01145-08	Screw, TF #2-32 x1/2

Cash Register Assembly p/n B-13656

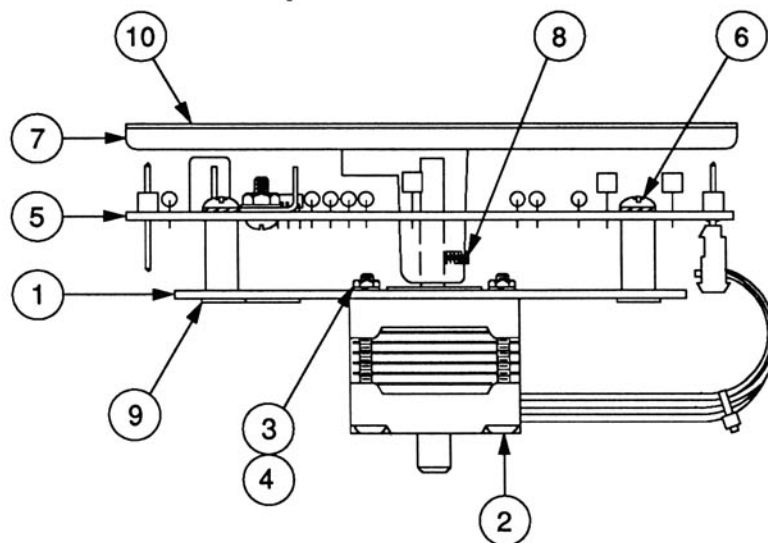


Item	Part Number	Description
1	31-1006-571-16	Screened Playfield Plastic
2	B-13658	Cash Register Top Assy
3	01-9755	Deflector Bracket
4	31-1559-571-3E	Decal - Cash Register Top
5	B-13657-L	Cash Register Left Side
6	4006-01003-06	Mach. Screw, 6-32 x 3/8
7	31-1559-571-3A	Decal - Cash Register Bottom
8	B-13657-R	Cash Register Right Side

Associated Parts

9	B-13659	Cash Register Subassembly
a)	C-13434	Lamp Assembly
b)	03-8200-1	Spacer, #8
c)	11-958	Cash Register Light Shield
d)	31-1006A-571-1	Screened Playfield Plastic
e)	4008-01003-20	Mach. Screw, 8-32 x 1-1/4
f)	4408-01128-00	Nut, 8-32 KEPS

DINER Clock Assembly p/n C-12036-3



Item	Part Number	Description
1	B-12035	Motor Plate Assembly
2	B-12088	Motor & Connector Assy
3	20-9570	Nut, M3 x .5, Hex.
4	4701-00023-00	Lockwasher, #5 Split
* 5	D-12045	Motor Control Board
6	4006-01003-06	Mach. Screw, 6-32 x 3/8
7	03-8161	Wheel
8	4006-01076-04	Set Screw, 6-32 x 1/4
9	16-8587-932	Label
10	31-1559-571-2	Decal, Clock Hand

* See Separate Parts Listing

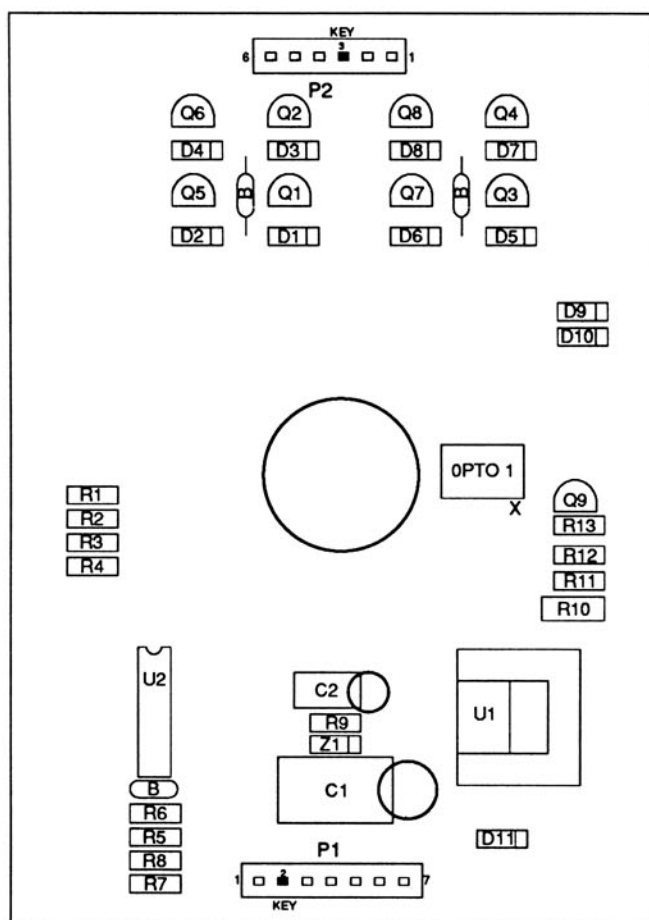
Left DINER People Assembly p/n B-13764-1

Item	Part Number	Description
1	11-967	Wood Spacer
2	4106-01019-06	Sh. Metal Screw, #6 x 3/8
3	A-13763-1	Plastic Subassembly
a)	31-1578-571-1	Decal (Haji)
4	A-13763-2	Plastic Subassembly
a)	31-1578-571-2	Decal (Babs)
5	A-13763-6	Plastic Subassembly
a)	31-1578-571-6	Decal (Cook)
6	4700-00004-00	Flatwasher, 9/64 x 3/8 x 21ga.

Right DINER People Assembly p/n B-13764-2

Item	Part Number	Description
1	11-967	Wood Spacer
2	4106-01019-06	Sh. Metal Screw, #6 x 1/4
3	A-13763-3	Plastic Subassembly
a)	31-1578-571-3	Decal (Boris)
4	A-13763-4	Plastic Subassembly
a)	31-1578-571-4	Decal (Buck)
5	A-13763-5	Plastic Subassembly
a)	31-1578-571-5	Decal (Pepe)
6	4700-00004-00	Flatwasher, 9/64 x 3/8 x 21ga.

Motor Control Board p/n D-12045

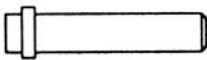
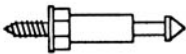
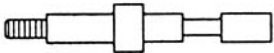
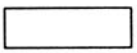
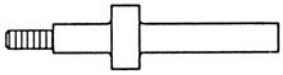
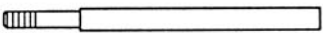
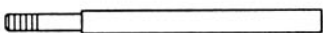
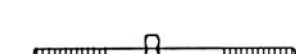
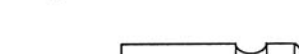


Part Number	Ckt Symbol	Description	Part Number	Ckt Symbol	Description
5768-12270-00		Bare PC Board	5043-08980-00	B	Capacitor, .01μfd, 50v (+8, -20%)
5250-09157-00	U1	IC, Voltage Regulator, 7805	5010-08998-00	R1 - R4	Resistor, 2.2KΩ, 1/4w, 5%, CF
5370-12272-00	U2	IC, Quad Comp, LM339	5010-09034-00	R5, R6, R9	Resistor, 10KΩ, 1/4w, 5%, CF
5490-10159-00	OPTO 1	Opto Interruptor Module	5010-08991-00	R7, R8	Resistor, 4.7KΩ, 1/4w, 5%, CF
5160-08938-00	Q1 - Q4	Transistor, 2N4401	5010-08930-00	R10	Resistor, 470Ω, 1/2w, 5%, CF
5190-09016-00	Q5 - Q8	Transistor, 2N4403	5010-09324-00	R11	Resistor, 27KΩ, 1/4w, 5%, CF
5190-10270-00	Q9	Transistor, 2N3906	5010-09356-00	R12	Resistor, 820Ω, 1/4w, 5%, CF
5070-06258-00	D1 - D10	Diode, 1N4001, 1.0 A.	5010-09162-00	R13	Resistor, 100KΩ, 1/4w, 5%, CF
5070-08919-00	D11	Diode, 1N4148, 150mA.	5791-10871-06	P2	Connector, 6 pin (Hdr)
5075-09059-00	Z1	Zener Diode, 3.9V	5791-10871-07	P1	Connector, 7 pin (Hdr)
5040-12298-00	C1	Capacitor, 100μfd, Electr, 40v (+50%,-10%), Axial	5705-09042-00		Heatsink
5040-09365-00	C2	Capacitor, 1μfd, 10v (+50%,-10%), Axial	4006-01003-06		Mach. Screw, #6-32 x 3/8
			4703-00007-00		Lockwasher, #6 Ext.
			4406-01117-00		Nut, #6-32 Hex.

Unique Parts

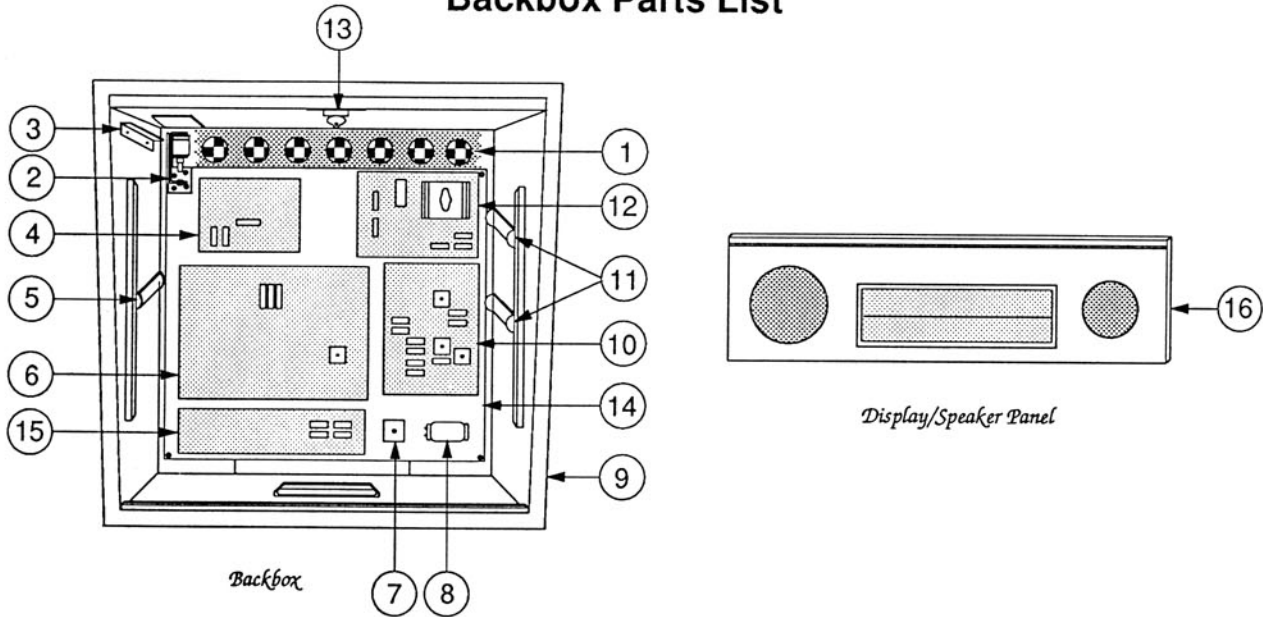
Part Number	Description	Part Number	Description
A-11-571-PL	Playfield & Inserts	02-4277-30	M-F Spacer, 6-32 x 1-7/8
A-13633	Ball Guide Assembly	02-4430	Shaft Diverter
A-13634	Ball Guide Assembly		
A-13635	Ball Guide Assembly		
A-13641	Wireform Main Ramp Assy	03-6047-19	Spacer Tubing, 9/32"
A-13763	DINER Plastic Sub-Assy	03-7960-571	Playfield Mylar
		03-8228-3	Glass Channel Edge
B-11304-2	Elevator Ramp Assembly	03-8359-11	2-1/2" Arrow, Trans. Green
B-13346	Ramp Diverter Assembly	03-8359-12	2-1/2" Arrow, Trans. Orange
B-13348	Shaft Ball Guide Assy	03-8359-16	2-1/2" Arrow, Trans. Yellow
B-13636	Ball Guide Assembly	03-8359-8	2-1/2" Arrow, Trans. Amber
B-13637	Ball Guide Assembly	03-8359-9	2-1/2" Arrow, Trans. Red
B-13652	Ramp Kicker Assembly	03-8361	Coffee Cup
B-13655	Coil Bracket Assembly	03-8391	Jukebox
B-13656	Cash Register Main Assy	03-8392	Jukebox Window
B-13659	Cash Register Sub-Assy	03-8393	Coffee Cup Ramp
B-13662	Elevator Ramp Assembly	03-8394	Curved Lift Ramp
B-13664	Switch Bracket Assy	03-8395	Crossover Ramp
C-13434	Cash Register Lamp Assy	11-571-PL	Wood Playfield
C-13523	3-Lamp PCB Assembly	11-958	Shield, Cash Register Light
C-13535	5-Lamp PCB Assembly		
C-13538	5-Lamp PCB Assembly	12-6902	Main Ramp Wireform
C-13539	4-Lamp PCB Assembly	12-6904	Wireform, Ramp Kick
C-13561	5-Lamp Jukebox Assembly	12-6920	Ball Guide Wire
C-13639	Ball Guide Assembly	12-6921	Ball Guide Wire
C-13640	Ball Guide Assembly	12-6924	Wireform-Switch Gate
C-13661	Jukebox Assembly		
D-11920-17	Mech. Panel Assembly	31-1002-571	Screened Playfield
D-13663	Main Ramp Assembly	31-1006-571-	Screened Plastics Set
D-13665	Crossover Ramp Assembly	31-1006A-571-	Screened Plastics
D-13666	Crossover Lift Ramp Assy	31-1008-571	Screened Bottom Arch
D-13810	Back Panel Assembly	31-1009-571	Screened Shtr Gate Plate
		31-1357-571	Backglass, Screened
H-12190-571	Backbox Cable	31-1420-571	Speaker Panel, Screened
H-12192-571	Cabinet Cable	31-1422-571	Speaker Grill, Screened
H-13544-571	Playfield Switch Gate Assy	31-1559-571-1	Decal, Checkered Panel
H-13545-571	Playfield Lamp Cable	31-1559-571-2	Decal, Clock Hand
H-13546-571	Playfield Solenoid Cable	31-1559-571-4	Decal, Cup Trim
H-13727	Cup Switch Cable	31-1578-571-	Decal, DINER People Set
H-13728	Lift Ramp Cable	31-1579-571	Decal, Money
H-13729	Cup Ramp Cable	31-1585-571	Decal, Spoon
02-4269-4	3" Post Ramp Mounting	31-1559-571-3A	Cash Register Bottom
02-4269-5	4" Post Ramp Mounting	31-1559-571-3B	Decal, Cup Handle
		31-1559-571-3C	Decal, Jukebox Top
		31-1559-571-3D	Decal, Jukebox Bottom
		31-1559-571-3E	Cash Register Top
		31-1580-571	Checkered Ramp Decal

Metal Posts

	Part No.	Description	[Quantity]
	02-3409	Spring Post	[3]
	02-3905	Bumper Post, #8 WS	[4]
	02-4008	Rubber Bumper Post	[2]
	02-4020	Support Post	[5]
	02-4036	Bumper Post, Rubber	[7]
	02-4269-4	Ramp Mounting Post, 3"	[1]
	02-4269-5	Ramp Mounting Post, 4"	[3]
	02-4275-3	Ramp Mtg Post, 3-1/16"	[1]
	02-4277-30	Spacer, 6-32 x 1-7/8	[1]
	02-4339	PC Mounting Post	[4]
	02-4423	Bumper Post	[1]
	02-4424-1	Post, #6-32 / #8-32	[7]
	02-4425 -1	Post, #8-32 / #8-32	[1]
	02-4426-1	Post, #6-32 / #8 SMS	[7]
	02-4434	Post, #8 x 1"	[10]
	02-4450	Post Double Bumper	[1]

Plastic Posts

Backbox Parts List



Item	Part Number	Description	Item	Part Number	Description
1	01-6645	Venting Screen	12	D-12246*	Power Supply Assembly
2	B-10686-1*	Knocker & Bracket Assy	13	20-9637	Lock & Cam Kit
3	A-12497	Upr Insert Bd Hinge Assy	14	D-11581-571*	Audio Board Assembly
4	D-13336	PCB Plate Assembly	15	D-12313-571*	Backbox Interconnect Board
5	A-12498	Lwr Insert Bd Hinge Assy	16	D-13711	Speaker/Display Assembly
6	D-11883-571*	System 11C CPU Board	a)	31-1422-571	Speaker Grille (Screened)
7	5100-09418-00	Bridge Rectifier, 100v, 35A.	b)	31-1420-571	Speaker Panel Cover (Screened)
8	5040-09051-00	Capacitor, 30,000 μ Fd, 25v	c)	D-12232-1*	Master Display Sub-Assembly
9	A-11-927-571	DINER Backbox	d)	5555-12068-00	Piezo Speaker 4", 50w
10	D-12247-566*	Aux. Pwr Driver Board	e)	5555-12015-00	Speaker , 4 Ω , 6" RD 10w
11	01-9047	Insert Stop Bracket			

* Refer to Individual Unit's Parts List

Miscellaneous Parts

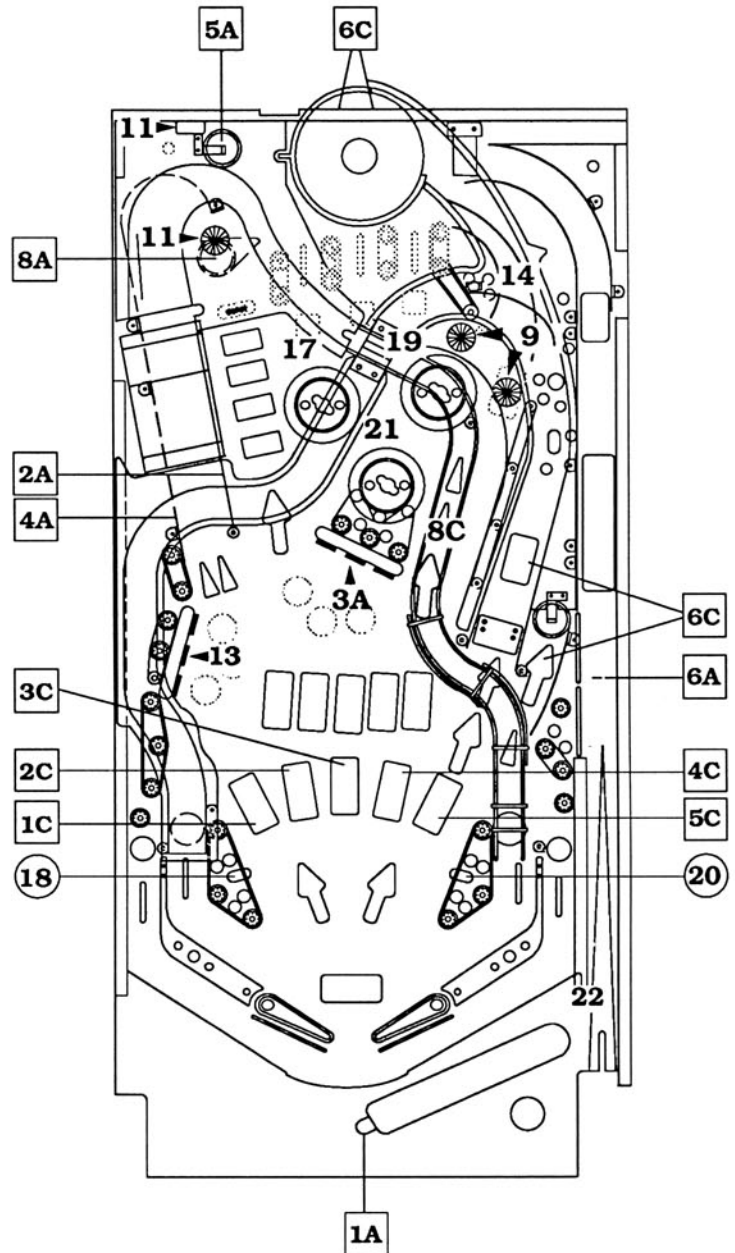
Part Number	Description	Part Number	Description
A-8552-571	Backglass Assembly	571-IN	DINER Insert
31-1357-571	DINER Backglass	01-6571	Hinge Mtg. Bracket, Insert Board
03-7960-571	Playfield Mylar	01-6655	Latch-Insert Board
08-7028-T	Glass-Playfield	01-6652	Stop Bracket
08-7456	Backbox Glass, 27 x 18-7/8	31-1463-571-1	3-Bnk Drop Target Decal
31-1002-571	Playfield (Screened)	31-1463-571-2	3-Bnk Drop Target Decal
31-1006-571	Playfield Plastics	31-1524-1	Decal - Coinage
31-1006A-571	Playfield Plastics	31-1524-2	Decal - Tokens
31-1008-571	Bottom Arch (Screened)	31-1524-3	Decal - See Card
31-1009-571	Shooter Plate (Screened)	5795-10937-09	Ribbon Cable, 20-Conductor, 9"
31-1019-554	Spin Target (Screened)	5795-10938-27	Ribbon Cable, 26-Conductor, 27"
31-1422-571	Speaker Grille (Screened)		

Solenoids/Flashers

Item	Part Number	Description
1A	AE-23-800	Outhole Kicker
1C	#89/906 Flashlamps	Haji Flash
2A	SM-1-26-600	Ramp Down
2C	#89/906 Flashlamps	Babs Flash
3A	AE-26-1200	Cen 3-Bk Dr Tgt Reset
3C	#89/906 Flashlamps	Boris Flash
4A	AE-23-800	Ramp Up
4C	#89/906 Flashlamps	Pepe Flash
5A	AE-23-800	Upper Left Eject
5C	#89/906 Flashlamps	Buck Flash
6A	AE-23-800	Sub-Playfield Shooter
6C	#89/906 Flashlamps	Cup Flash
7A	AE-23-800	Knocker (Backbox)
7C	#89/906 Flashlamps	Clock Flash
8A	AE-23-800	Lower Left Eject
8C	#89 Flashlamps	DINE-TIME Flash
09	#906 Flashlamps	Right Ramp Flash
10	5580-09555-01	B'box/P'fld G I Relays*
11	#906 Flashlamps	Left Ramp Flash
12	5580-09555-01	A/C Select Relay**
13	AE-26-1200	Left 3-Bk Dr Tgt Reset
14	AE-26-1200	Diverter
15	14-7948	Clock Wheel Motor (B)
16	14-7948	Clock Wheel Motor (A)
17	AE-23-800	Left Jet Bumper
18	AE-26-1200	Left Kicker ("sling")
19	AE-23-800	Right Jet Bumper
20	AE-26-1200	Right Kicker ("sling")
21	AE-23-800	Lower Jet Bumper
22	AE-23-800	Shooter Lane Feeder
-	FL-11630/50VDC	Lower Left Flipper
-	FL-11630/50VDC	Lower Right Flipper

* - 5580-09555-01 on Relay Board, C-11998-1, for both Playfield and Backbox General Illumination

** - In Backbox on Aux Power Driver Bd, D-12247-566

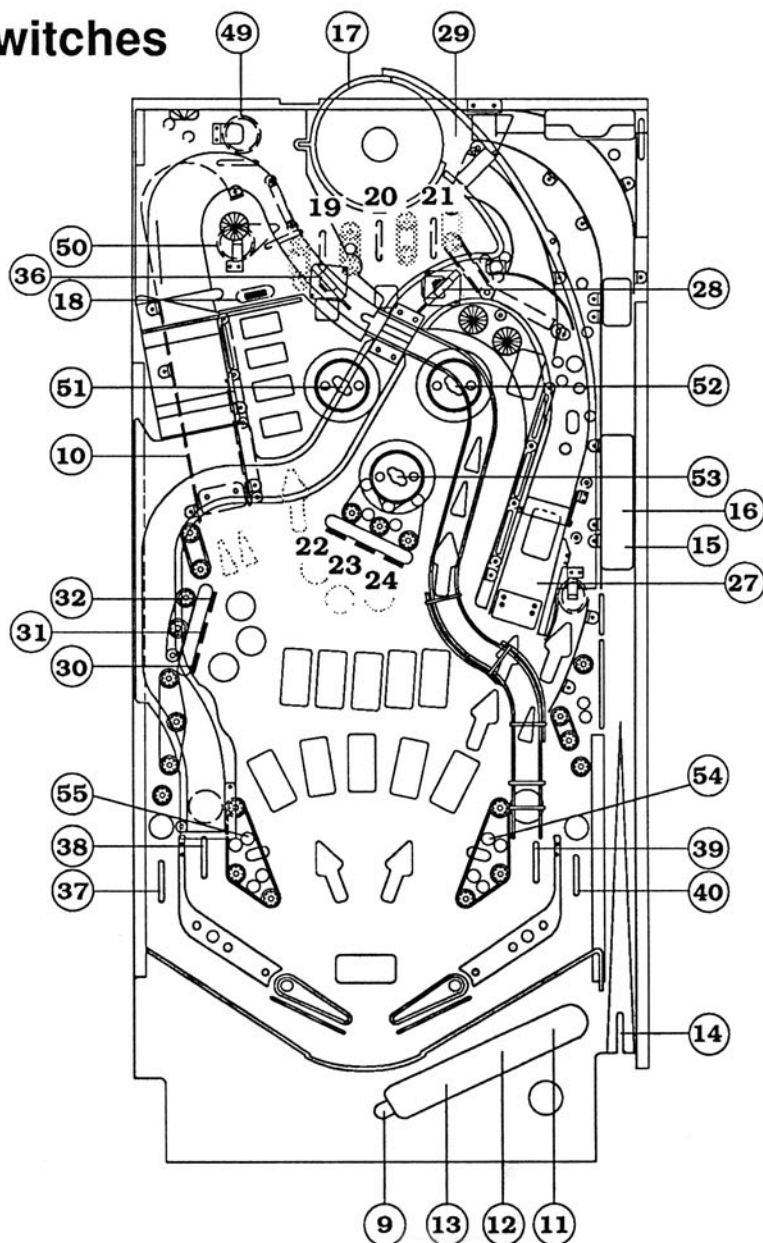


Playfield Rubber Parts

Part No.	Description	Qty
23-6300	5/16" Ring	9
23-6302	1" Ring	2
23-6303	1-1/4" Ring	3
23-6305	2" Ring	1
23-6306	2-1/2" Ring	3
23-6308	3-1/2" Ring	1
23-6327	Shooter Tip	1
23-6519-4	Red Flpr Ring	2
23-6535	Bumper	2
23-6556	Sleeving, Black	7
23-6645	Bumper Pad	3

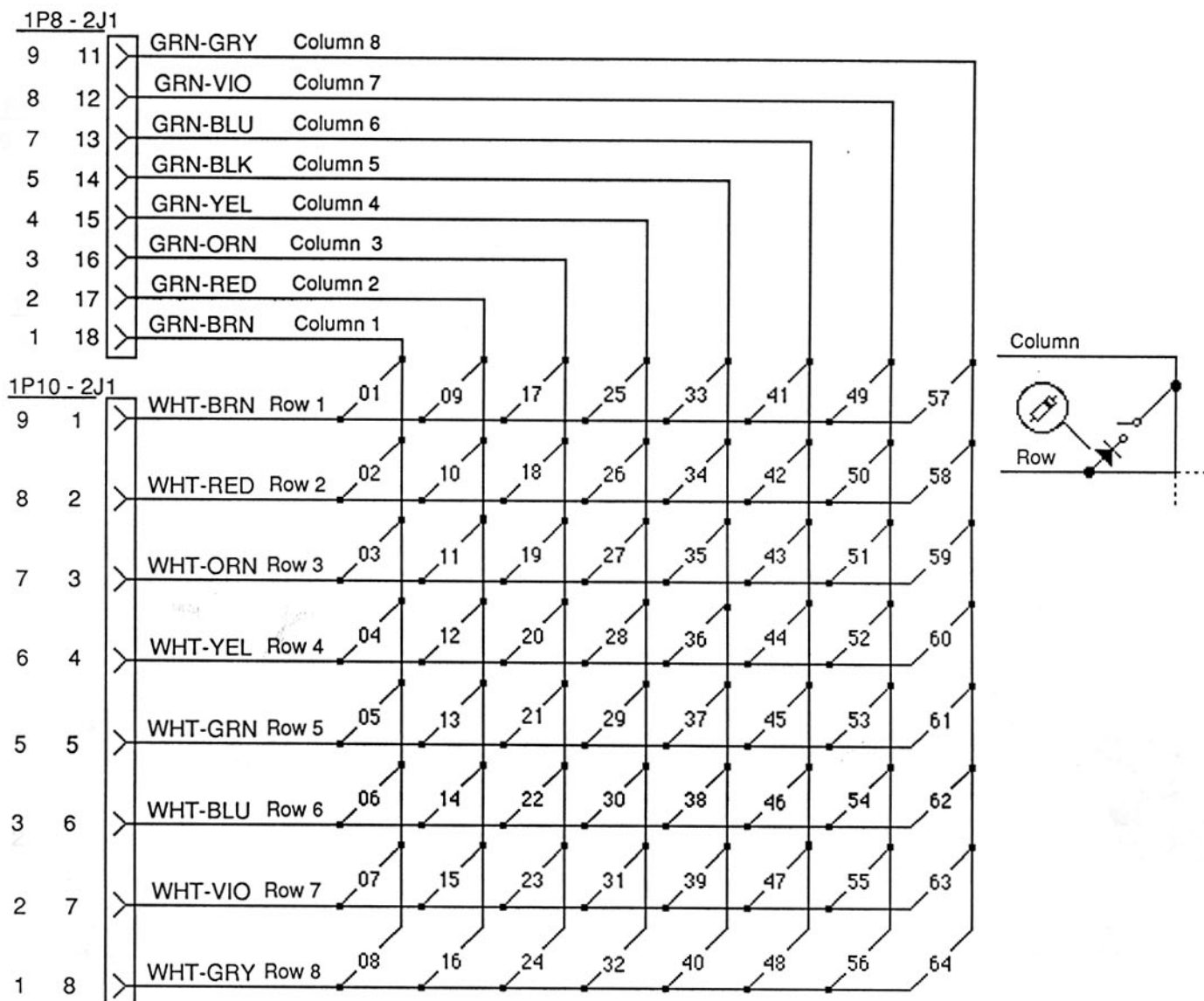
Switches

Item	Part Number	Description
1	(See Fig. 2, Sect. 1)	Plumb Bob Tilt
2	5580-09555-01	A/C Relay, C-Side
3	SW-1A-126	Game START (Credit)
4	27-1092	R Coin Chute (USA)
5	Not Used	Center Coin Chute
6	27-1092	L Coin Chute (USA)
7	27-1066	Slam Tilt
8	27-1008	High Score Reset*
9	5647-12133-12	Outhole
10	5647-12001-00	Up/Down (L Ramp)
11	5647-09957-00	Ball Trough #1 (left)
12	5647-09957-00	Ball Trough #2 (mdl)
13	5647-12073-08	Ball Trough #3 (right)
14	5647-12073-04	Shooter Lane
15	5647-12073-32	Sub-P'fld Shooter 1
16	5647-12073-33	Sub-P'fld Shooter 2
17	5647-12073-17	Cup
18	B-12912-4	Grill Bonus (Standup)
19	5647-12073-19	E (Top Lane)
20	5647-12073-19	A (Top Lane)
21	5647-12073-19	T (Top Lane)
22	p/o C-13205	3-Bank Dr Tgt Opto Bd
23	p/o C-13205	3-Bank Dr Tgt Opto Bd
24	p/o C-13205	3-Bank Dr Tgt Opto Bd
25	Not Used	
26	Not Used	
27	5647-12073-07	Right Ramp Entry
28	5647-12073-21	Right Ramp Exit
29	5647-12073-11	Cup Entry (R Ramp)
30	p/o C-13205	3-Bank Dr Tgt Opto Bd
31	p/o C-13205	3-Bank Dr Tgt Opto Bd
32	p/o C-13205	3-Bank Dr Tgt Opto Bd
33	Not Used	
34	Not Used	
35	Not Used	
36	5647-12073-21	L Ramp Exit
37	5647-12073-19	L Outlane
38	5647-12073-19	L Return Lane
39	5647-12073-19	R Return Lane
40	5647-12073-19	R Outlane
41	Not Used	
42	Not Used	
43	Not Used	
44	Not Used	
45	Not Used	
46	Not Used	
47	Not Used	
48	Not Used	
49	5647-12133-11	Upper Left Eject
50	5647-12133-11	Lower Left Eject
51	B-12030-2	Left Jet Bumper
-	SW-10A-48	Left & Right Flippers (actuated by Flipper Buttons)



Item	Part Number	Description
52	B-12030-2	Right Jet Bumper
53	B-12030-2	Lower Jet Bumper
54	-	Lwr R Kicker***
55	-	Lwr L Kicker***
56	5647-12133-08	Spinner
57	-	R Flpr Lane Change**
58	-	L Flpr Lane Change**
59	p/o D-12046	Clock Wheel Opto Bd
60	Not Used	
61	Not Used	
62	Not Used	
63	Not Used	
64	Not Used	

Notes: * - Part Number is for entire Diagnostic Switch Assembly, Including H S Reset Switch. ** - Optotransistor on Backbox Interconnect Bd. *** - Paired Kicker Actuating Switch: A-4834-H + B-8734-1.

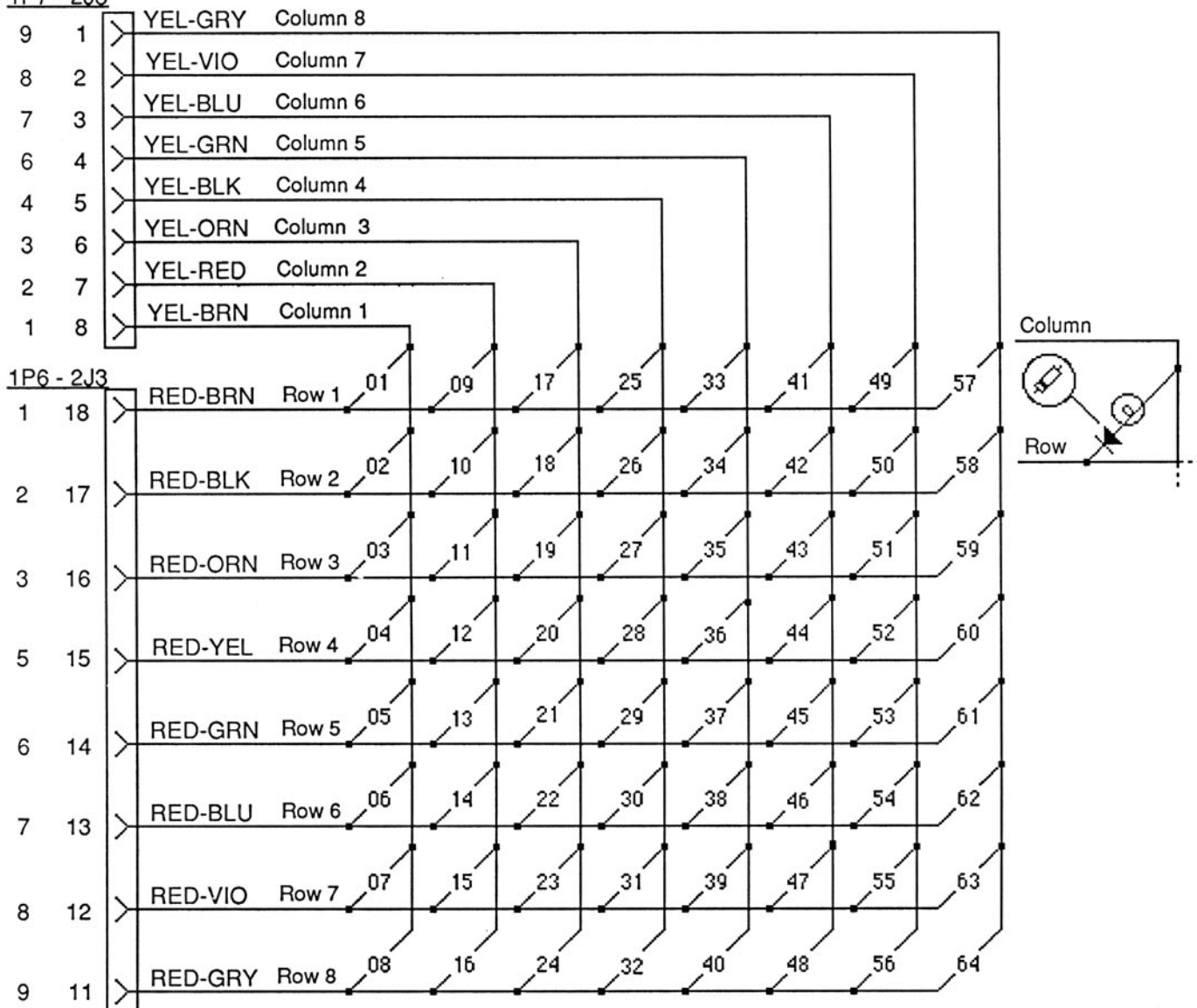


DINER Switch-Matrix Table

COLUMN	1 Q45 GRN-BRN 1J8-1	2 Q49 GRN-RED 1J8-2	3 Q44 GRN-ORN 1J8-3	4 Q48 GRN-YEL 1J8-4	5 Q43 GRN-BLK 1J8-5	6 Q47 GRN-BLU 1J8-7	7 Q42 GRN-VIO 1J8-8	8 Q46 GRN-GRY 1J8-9
1 WHT-BRN 1J10-9	Plumb Bob Tilt 1	Outhole 9	Cup 17	25	33	41	Upper Left Eject 49	Flipper Right 57
2 WHT-RED 1J10-8	C Side Power A/C Relay 2	Up/Down (L Ramp) 10	Grill Bonus 18	26	34	42	Lower Left Eject 50	Flipper Left 58
3 WHT-ORN 1J10-7	Game Start 3	Ball Trough #1 (right) 11	E (Top Lane) 19	R Ramp Entry 27	35	43	Left Jet Bumper 51	Clock Wheel 59
4 WHT-YEL 1J10-6	Right Coin Chute 4	Ball Trough #2 (mid) 12	A (Top Lane) 20	R Ramp Exit 28	L Ramp Exit 36	44	Right Jet Bumper 52	60
5 WHT-GRN 1J10-5	Center Coin Chute 5	Ball Trough #3 (left) 13	T (Top Lane) 21	Cup Entry R Ramp 29	Left Outlane 37	45	Lower Jet Bumper 53	61
6 WHT-BLU 1J10-3	Left Coin Chute 6	Shooter Lane 14	Hot Dog (C 3-Bk Dr Tgt) 22	Root Beer (L 3-Bk Dr Tgt) 30	Left Return Lane 38	46	BR Kicker ("sling") 54	62
7 WHT-VIO 1J10-2	Slam Tilt 7	Sub-P'fld Shooter 1 15	Burger (C 3-Bk Dr Tgt) 23	Fries (L 3-Bk Dr Tgt) 31	Right Return Lane 39	47	BL Kicker ("sling") 55	63
8 WHT-GRY 1J10-1	High Score Reset 8	Sub-P'fld Shooter 2 16	Chili (C 3-Bk Dr Tgt) 24	Iced Tea (L 3-Bk Dr Tgt) 32	Right Outlane 40	48	Spinner 56	64

BL = Bottom Left BR = Bottom Right

1P7 - 2J3



DINER Lamp-Matrix Table

COLUMN ROW	1 Q66 YEL-BRN 1J7-1	2 Q64 YEL-RED 1J7-2	3 Q62 YEL-ORN 1J7-3	4 Q60 YEL-BLK 1J7-4	5 Q58 YEL-GRN 1J7-6	6 Q56 YEL-BLU 1J7-7	7 Q54 YEL-VIO 1J7-8	8 Q52 YEL-GRY 1J7-9
Q80 RED-BRN 1J6-1	20K (C Regstr) 1	Serve Again 9	D (in DINER) 17	Jukebox 1 25	Haji 33	100K Grill BONUS41	1 o'clock Dine Time49	9 o'clock Dine Time 57
Q81 RED-BLK 1J6-2	40K (C Regstr) 2	Ramp Scores 500K (L Ramp) 10	I (in DINER) 18	Jukebox 2 26	Babs 34	250K Grill BONUS42	2 o'clock Dine Time50	10 o'clock Dine Time 58
Q82 RED-ORN 1J6-3	60K (C Regstr) 3	Ramp Scores 500K (R Ramp) 11	N (in DINER) 19	Jukebox 3 27	Boris 35	500K Grill BONUS43	3 o'clock Dine Time 51	11 o'clock Dine Time 59
Q83 RED-YEL 1J6-5	80K (C Regstr) 4	LOCK (L Ramp) 12	E (in DINER) 20	Jukebox 4 28	Pepe 36	1 Million Grill BONUS44	4 o'clock Dine Time52	12 o'clock Dine Time 60
Q84 RED-GRN 1J6-6	100K (C Regstr) 5	Release (Upr Right) 13	R (in DINER) 21	Jukebox 5 29	Buck 37	Extra Ball Grill BONUS45	5 o'clock Dine Time53	Top 5 Hits w/Lit 61
Q85 RED-BLU 1J6-7	Adv DINE TIME (L Return Lane) 6	RUSH 1 (Upr Right) 14	E ② (Top Lane)22	Hot Dog (C Dr Tgt) 30	Root Beer (L Dr Tgt) 38	Spot Food (L) 46	6 o'clock Dine Time54	Today's Special 62
Q86 RED-VIO 1J6-8	Adv DINE TIME (R Return Lane) 7	RUSH 2 (Lwr Right) 15	A ② (Top Lane)23	Burger (C Dr Tgt) 31	Fries (L Dr Tgt) 39	Cup Scores 10X Diner Letter 47	7 o'clock Dine Time55	Dine Time Collect 63
Q87 RED-GRY 1J6-9	Extra Ball (Right Outlane) 8	Spinner 16	T ② (Top Lane)24	Chill (C Dr Tgt) 32	Iced Tea (L Dr Tgt) 40	Extra Ball (Left Outlane) 48	8 o'clock Dine Time56	Spot Food (R) 64

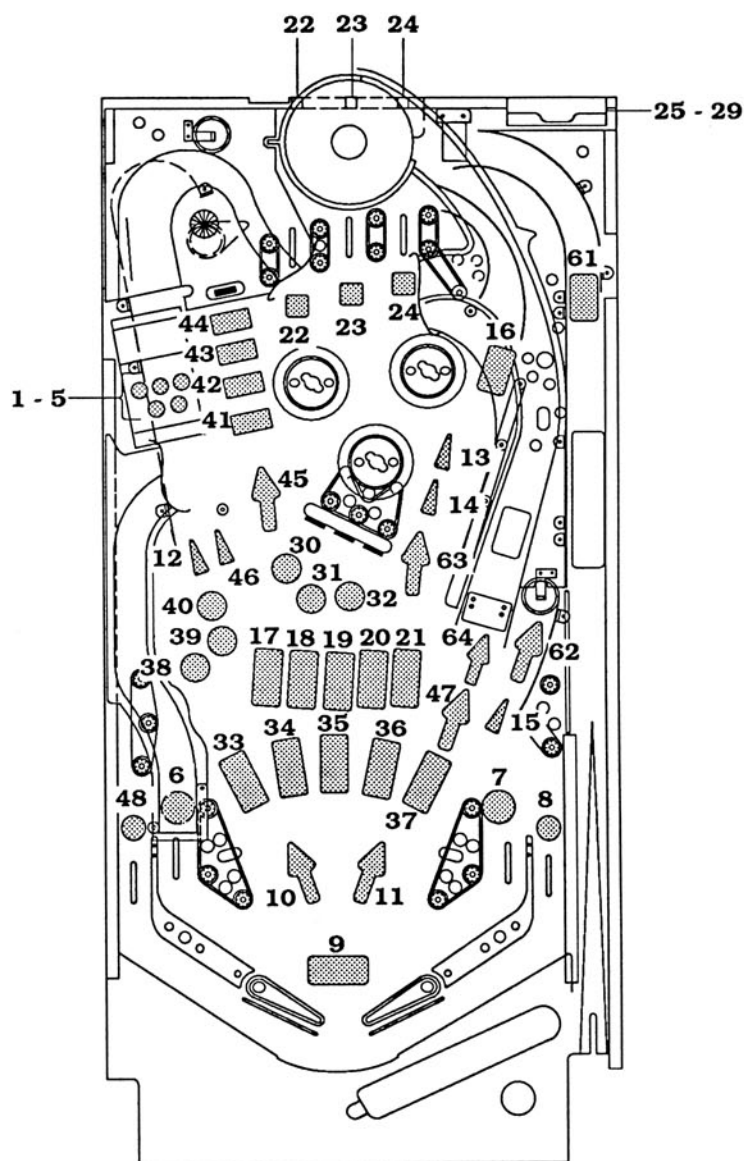
BR = Bottom right; BL = Bottom Left ○ = Multiple Lamps

DINER 76

Lamps

Item Bulb Location/Description

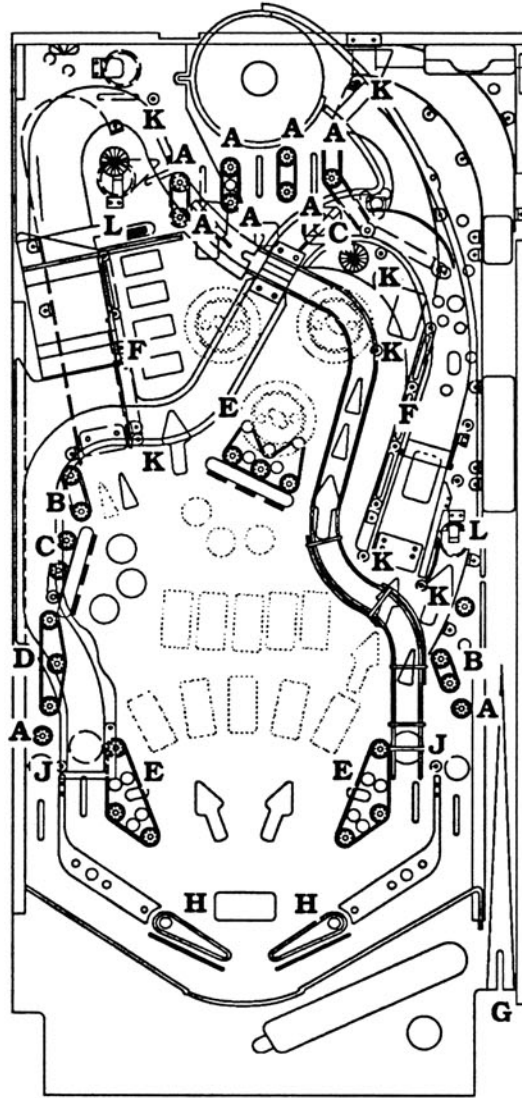
1	555	20K (Cash Reg)
2	555	40K (Cash Reg)
3	555	60K (Cash Reg)
4	555	80K (Cash Reg)
5	555	100K (Cash Reg)
6	555	Adv DINE TIME (L)
7	555	Adv DINE TIME (R)
8	555	Ex. Ball (R Outlane)
9	44	Serve Again
10	555	Ramp Scores 500K (L)
11	555	Ramp Scores 500K (R)
12	555	LOCK (L Ramp)
13	555	Release (Upr R)
14	555	RUSH 1 (Upr R)
15	555	RUSH 2 (Lwr R)
16	44	Spinner
17	555	D (in Diner)
18	555	I (in Diner)
19	555	N (in Diner)
20	555	E (in Diner)
21	555	R (in Diner)
22	555	E (in E-A-T)
23	555	A (in E-A-T)
24	555	T (in E-A-T)
25	555	Jukebox 1
26	555	Jukebox 2
27	555	Jukebox 3
28	555	Jukebox 4
29	555	Jukebox 5
30	555	Hot Dog (C Dr Tgt)
31	555	Burger (C Dr Tgt)
32	555	Chili (C Dr Tgt)
34	555	Haji
35	555	Babs
36	555	Boris
36	555	Pepe
37	555	Buck
38	555	Root Beer (L Dr Tgt)
39	555	Fries (L Dr Tgt)
40	555	Iced Tea (L Dr Tgt)
41	555	100K (Grill Bonus)
42	555	250K (Grill Bonus)
43	555	500K (Grill Bonus)
44	555	1,000,000 (Grill Bonus)
45	555	Extra Ball (Grill Bonus)
46	555	Spot Food (L)
47	555	Cup Scores 10X DINER Letter
48	555	Ex. Ball (L Outlane)
49	555	1 o'clock Dine Time (Backglass)
50	555	2 o'clock Dine Time (Backglass)
51	555	3 o'clock Dine Time (Backglass)
52	555	4 o'clock Dine Time (Backglass)
53	555	5 o'clock Dine Time (Backglass)
54	555	6 o'clock Dine Time (Backglass)



Item Bulb Location/Description

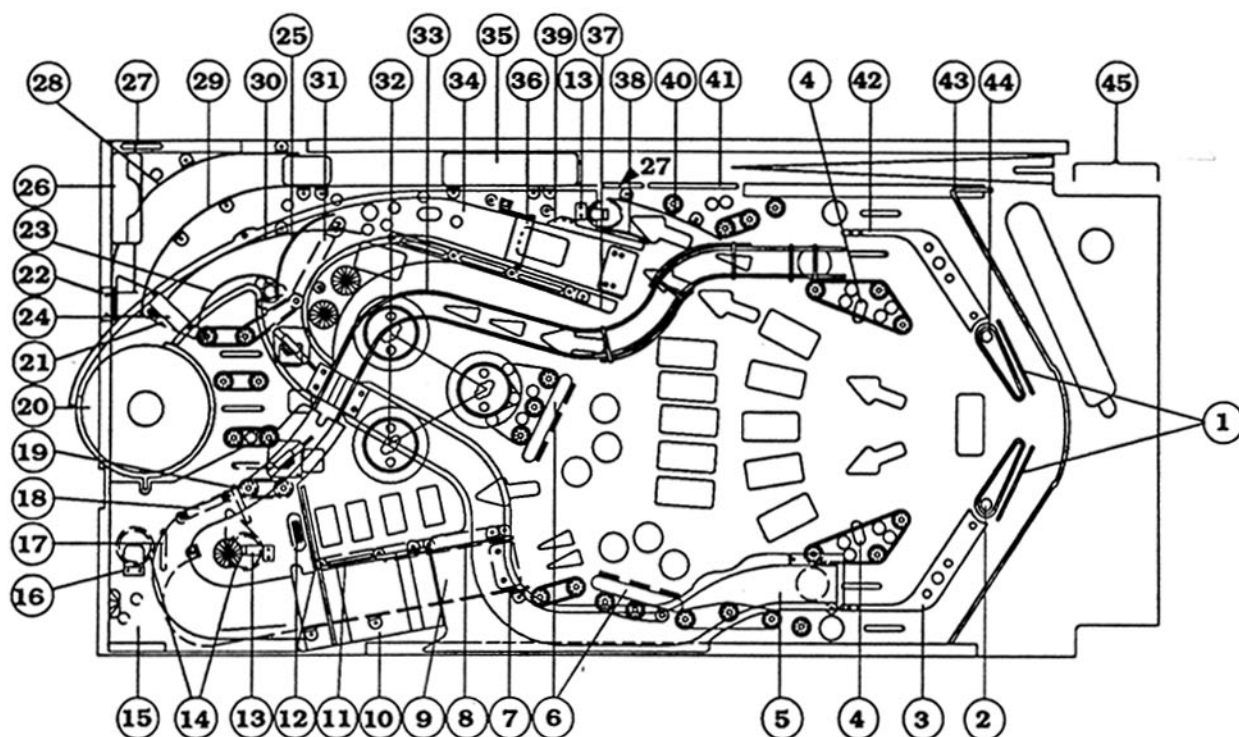
55	555	7 o'clock Dine Time (Backglass)
56	555	8 o'clock Dine Time (Backglass)
57	555	9 o'clock Dine Time (Backglass)
58	555	10 o'clock Dine Time (Backglass)
59	555	11 o'clock Dine Time (Backglass)
60	555	12 o'clock Dine Time (Backglass)
61	44	Top 5 Hits
62	555	Today's Special
63	555	Dine Time Collect
64	555	Spot Food (R)

Playfield Rubber Locations



Item	Part No.	Description	Qty
A	23-6300	5/16" Ring	9
B	23-6302	1" Ring	2
C	23-6303	1-1/4" Ring	3
D	23-6305	2" Ring	1
E	23-6306	2-1/2" Ring	3
F	23-6308	3-1/2" Ring	1
G	23-6327	Shooter Tip	1
H	23-6519-4	Red Flpr Ring	2
J	23-6535	Bumper	2
K	23-6556	Sleeving, Black	7
L	23-6645	Bumper Pad	3

Playfield Parts



Item	Part No.	Description	Item	Part No.	Description
1	12-6468	Anti-rebound Wire	25	B-13348	Divter Arm Assembly
2	C-13174-L	Lower Left Flipper	a)	B-13346	Coil & Bracket Assembly
a)	20-9250-6	Flipper Paddle & Shaft	26	(See p 66)	Jukebox Assembly
3	B-12363-L	L Return Lane Guide	27	12-6466-10	Wireform, 2-1/2"
4	B-12665	Kicker Arm ("Slingshot")	28	C-13639	Ball Guide Assembly
a)	B-11203-R-1	Coil & Bracket Assembly	29	C-13640	Ball Guide Assembly
5	D-13665	Lower Left Ramp	30	B-13636	Ball Guide Assembly
6	C-11223-1	3-Bank Drop Target	31	B-13717	Spinner
a)	C-13205	3-bank Opto Board	32	B-9414-1	Jet Bumper
7	C-13638	Left Elev Ramp Guide	a)	B-9415-1	Coil & Bracket Assembly
8	B-13637	Right Elev Ramp Guide	33	12-6902	Wire Ramp
9	B-13662	Elevator Ramp	34	D-13663	Right Plastic Ramp Assembly
a)	B-11304-2	Ramp Mover	35	01-9575	Shooter Lane Flap
b)	B-13655	Coil & Bracket Assembly	a)	B-13652	Sub-p'ld Shooter Assembly
10	(See p 67)	Cash Register	b)	12-6904	Sub-p'ld Shooter Ramp
11	12-6466-6	Wireform, 1-1/2"	36	A-13710	Ramp Entry Gate Assembly
12	B-12912-4	Grill (Standup) Target	a)	12-6878	Gate Wire
13	A-13443	Eject Deflector (Lwr L) w/pad	37	A-13634	Ball Guide Assembly
14	B-9361-R-1	Eject Hole Arm Assembly	38	12-6920	Wire Ball Guide
a)	B-13655	Coil & Bracket Assembly	39	A-13633	Ramp Entry Ball Guide
15	D-13666	Upper Left Plastic Ramp	40	A-13635	Ball Guide Assembly
16	01-6933	Eject Deflector (Upr L)	41	12-6466-12	Wireform, 3"
17	12-6466-4	Wireform, 1"	42	B-12363-R	R Return Lane Guide
18	A-9465-L	1-way Gate Assembly	43	12-6842	Bottom Arch Fence
a)	12-6565	Gate Wire	44	C-13174-R	Lower Right Flipper
19	12-6466-5	Wireform, 1-1/4"	a)	20-9250-6	Flipper Paddle & Shaft
20	D-13660	Cup Assembly	45	Parts below are located beneath Bottom Arch:	
21	A-9465-R	1-way Gate Assembly	a)	B-8623	Upper Trough Baffle Assembly
a)	12-6565	Gate Wire	b)	C-8235	Lower Trough Baffle Assembly
22	A-8244-R	1-way Gate Assembly	c)	12-6542	Trough Baffle Wire
23	12-6921	Wire Ball Guide	d)	01-3569-1	Ball Trough (runway)
24	A-13709	Ball Gate Assembly	e)	01-5575	Bottom Arch Mounting Bracket
a)	12-6924	Gate Wire	f)	B-8039-2	Outhole Kicker Assembly

NOTES

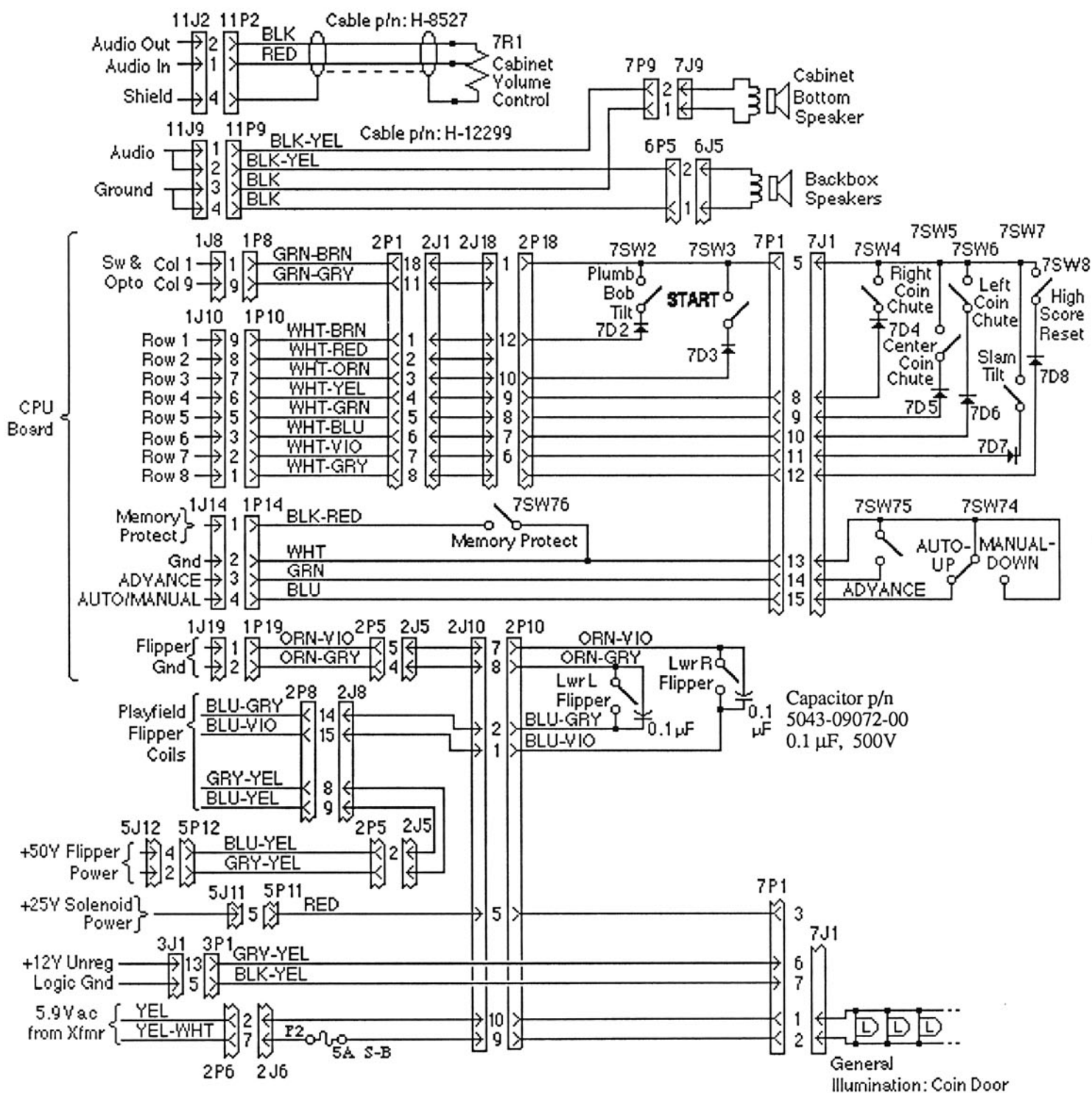
Section 3

Reference Diagrams & Schematics

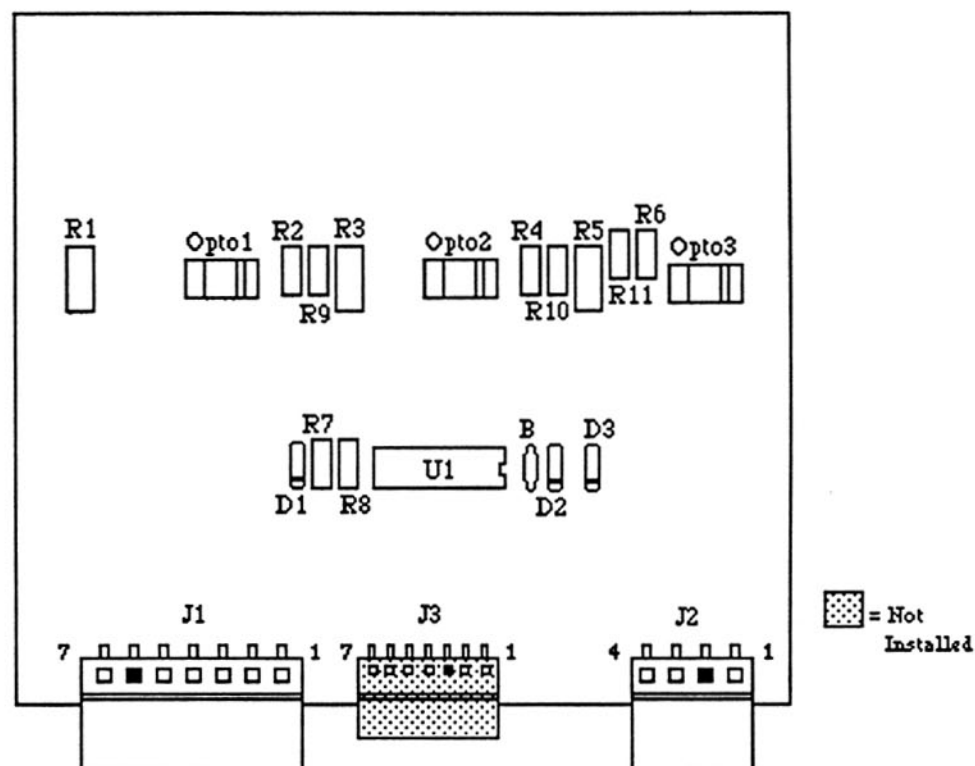
- **Diagrams and Schematics:**

- Cabinet Wiring**
 - 3-Bank Opto Board**
 - Power Supply Board**
 - System 11C CPU Board**
 - Master Display Board**
 - Audio Board**
 - Aux Power Driver Board**
 - Backbox Interconnect Board**
 - Controlled, Special, & Switched Solenoids**
 - Power Wiring**
 - Game Circuit Boards Interboards Signals**

- **Diagnostic Test Flowchart**

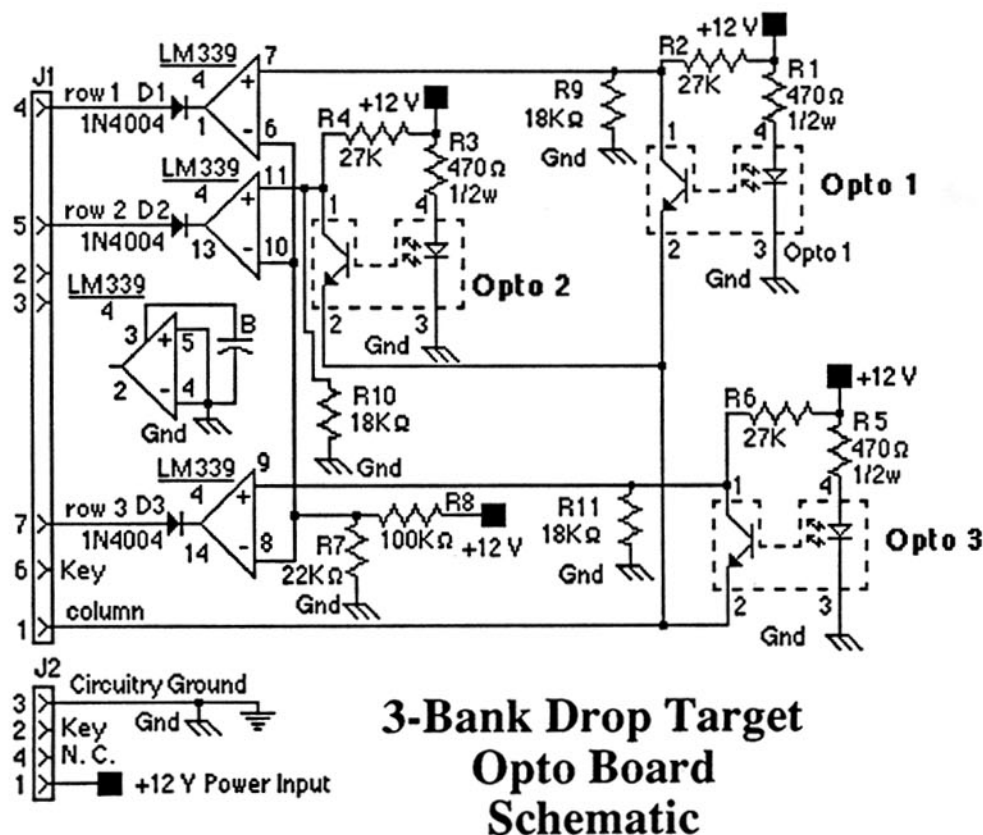


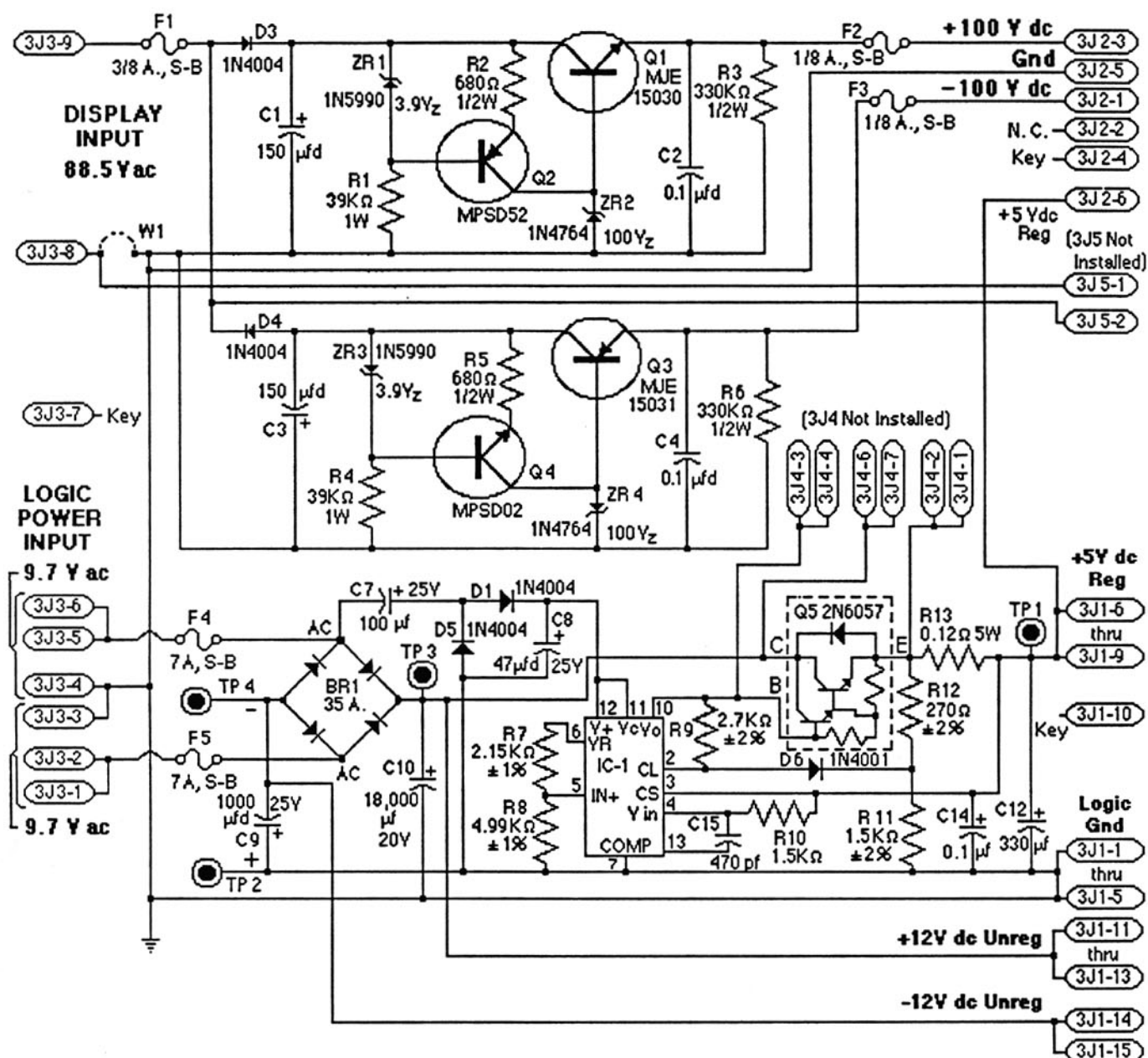
DINER Cabinet Wiring



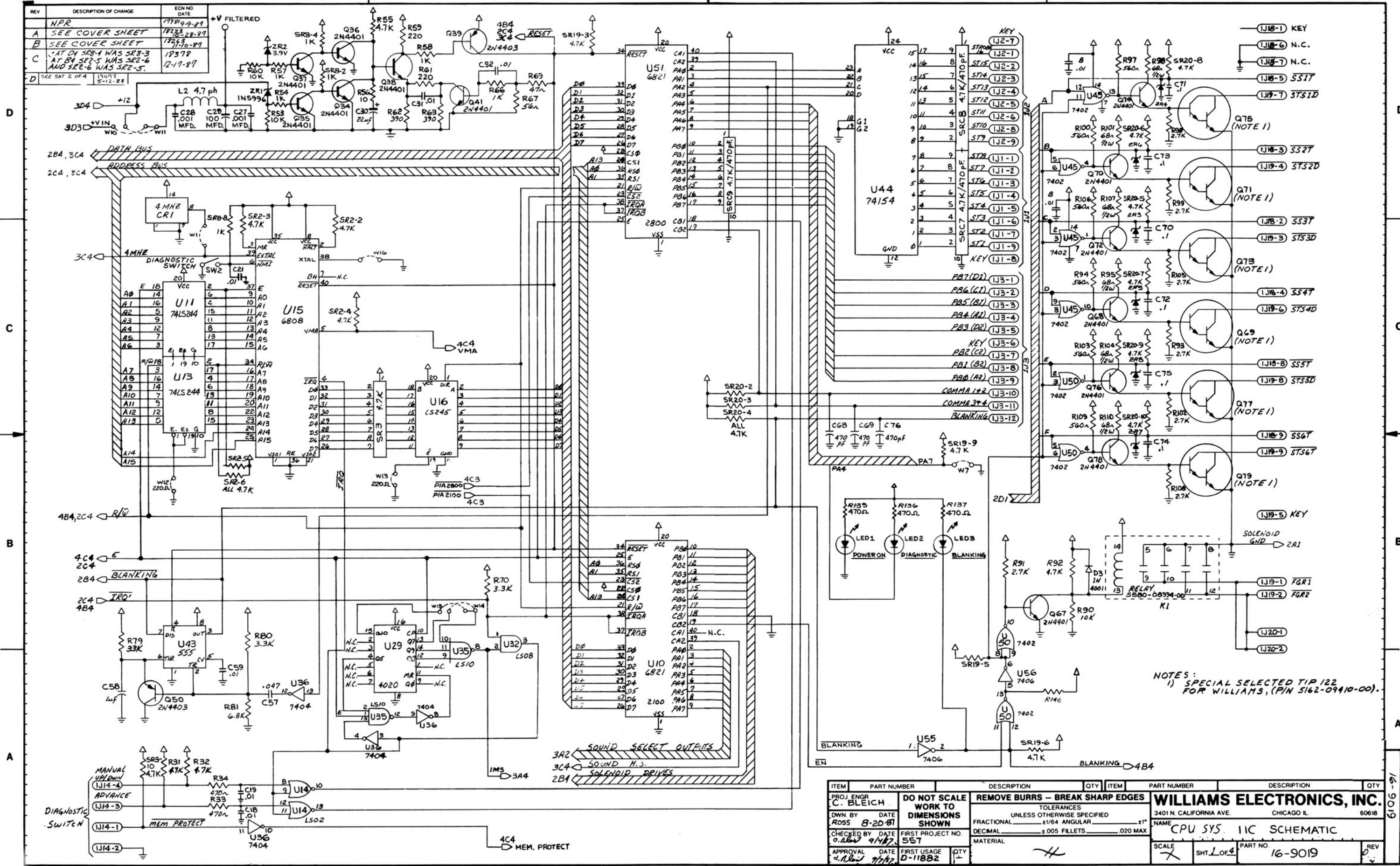
3-Bank Drop Target Opto Board

p/n C-13205

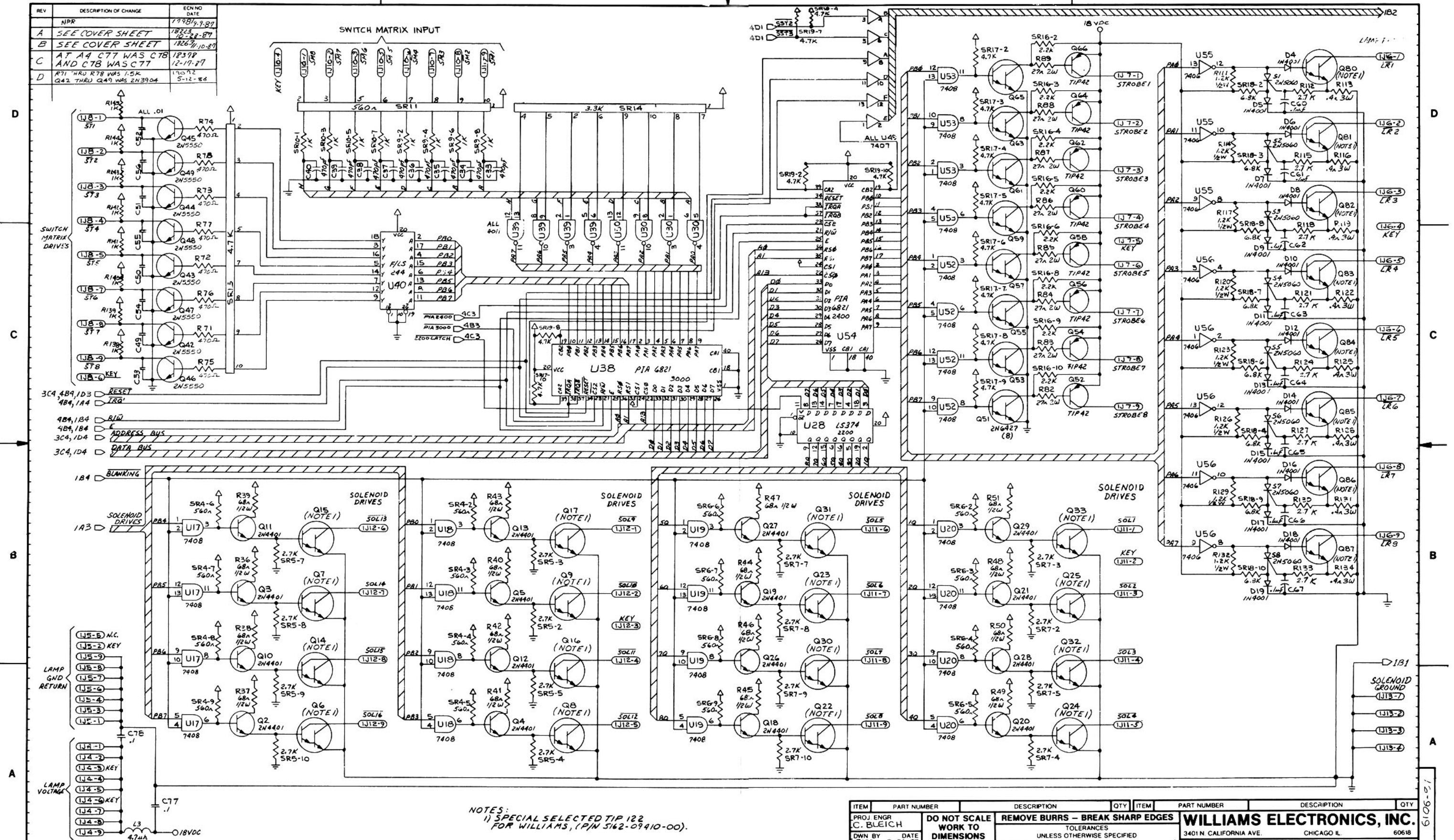




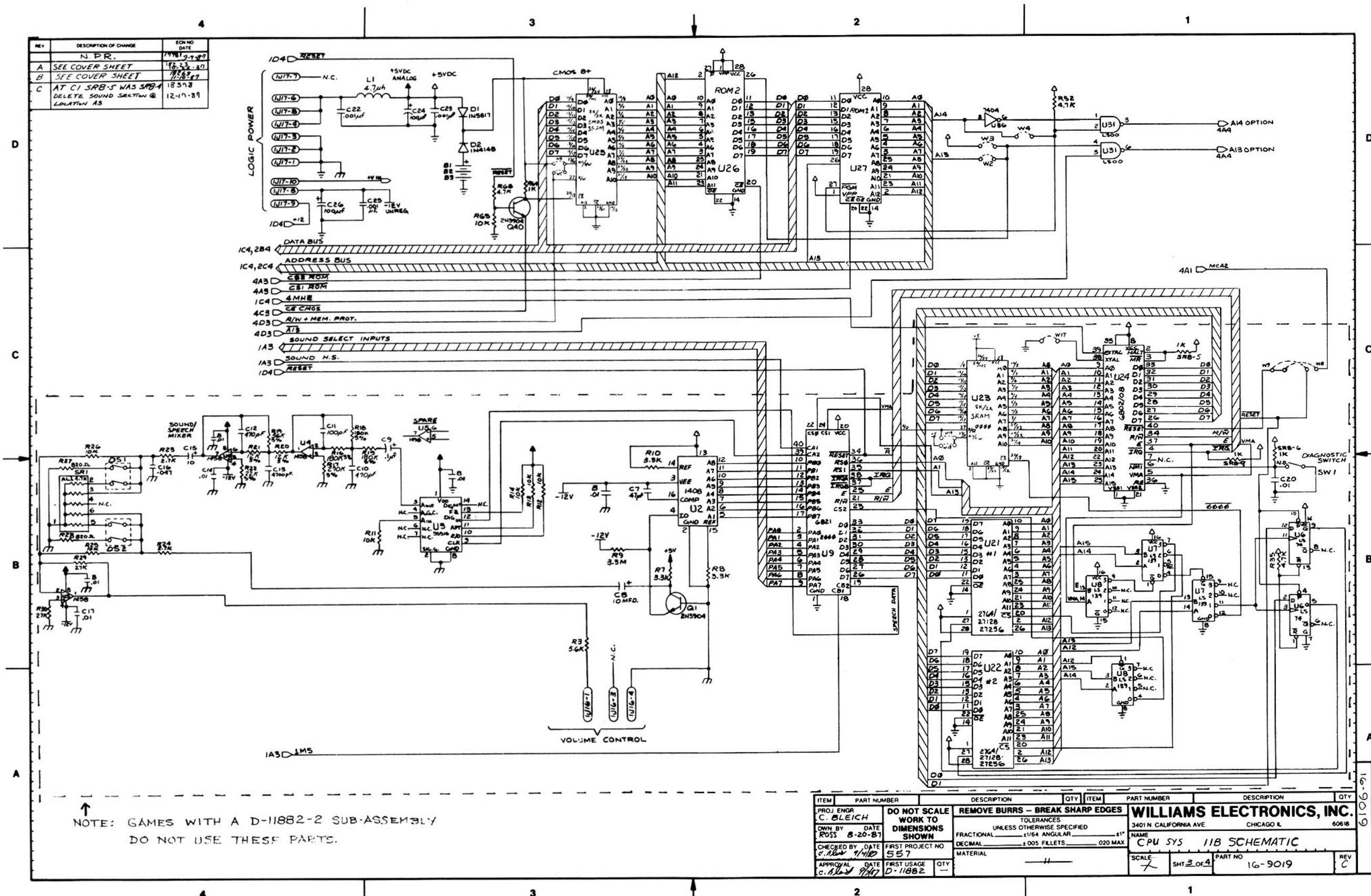
Power Supply Board Schematic



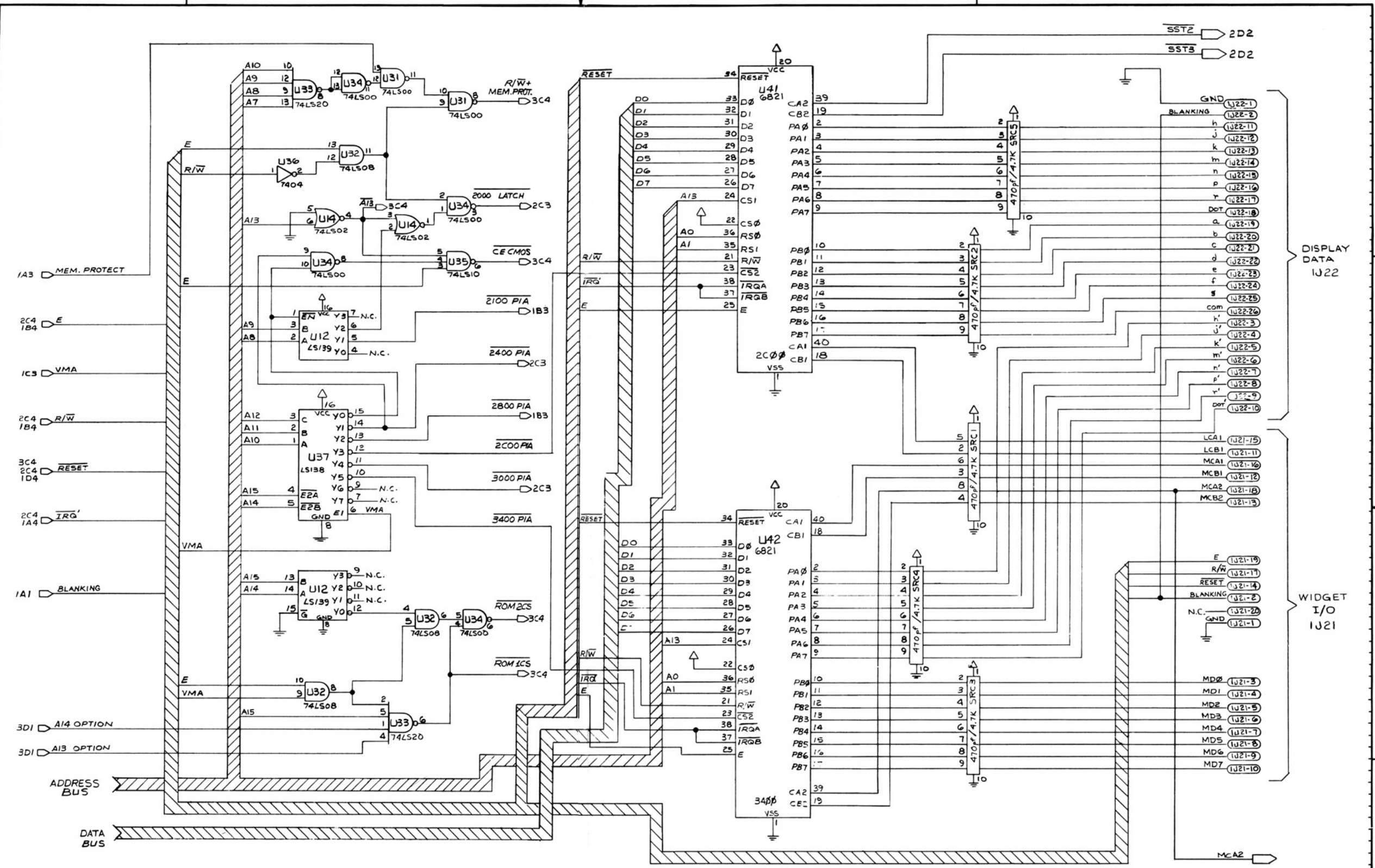
REV	DESCRIPTION OF CHANGE	ECN NO DATE
	NPR	1998/6.7.9.87
A	SEE COVER SHEET	1823.9
B	SEE COVER SHEET	10.82.87 1826.9/10.87
C	AT A4 C77 WAS C78 C78 WAS C77	18398 12-14-87
D	R71 "H0 R78 WAS 1.5K Q42 THRU Q49 WAS 2N3904	19092 5-12-88



ITEM	PART NUMBER	DESCRIPTION	QTY	ITEM	PART NUMBER	DESCRIPTION	QTY
PROJ ENGR C. BLEICH	DO NOT SCALE WORK TO DIMENSIONS SHOWN		REMOVE BURRS — BREAK SHARP EDGES		WILLIAMS ELECTRONICS, INC.		
DWN BY DATE ROSS 8-20-87			TOLERANCES UNLESS OTHERWISE SPECIFIED		3401 N. CALIFORNIA AVE. CHICAGO IL 60618		
CHECKED BY DATE C. BLEICH 7/1/87	FIRST PROJECT NO 557		FRACTIONAL ±1/64 ANGULAR ±1° DECIMAL ±.005 FILETS .020 MAX		NAME CPU SYS IIC SCHEMATIC		
APPROVAL DATE C. BLEICH 7/1/87	FIRST USAGE D-11882		MATERIAL X		SCALE X	SHT 2 OF 4	REV 0
	QTY 1				PART NO 16-9019		

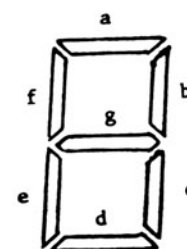
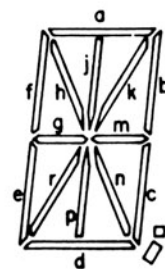
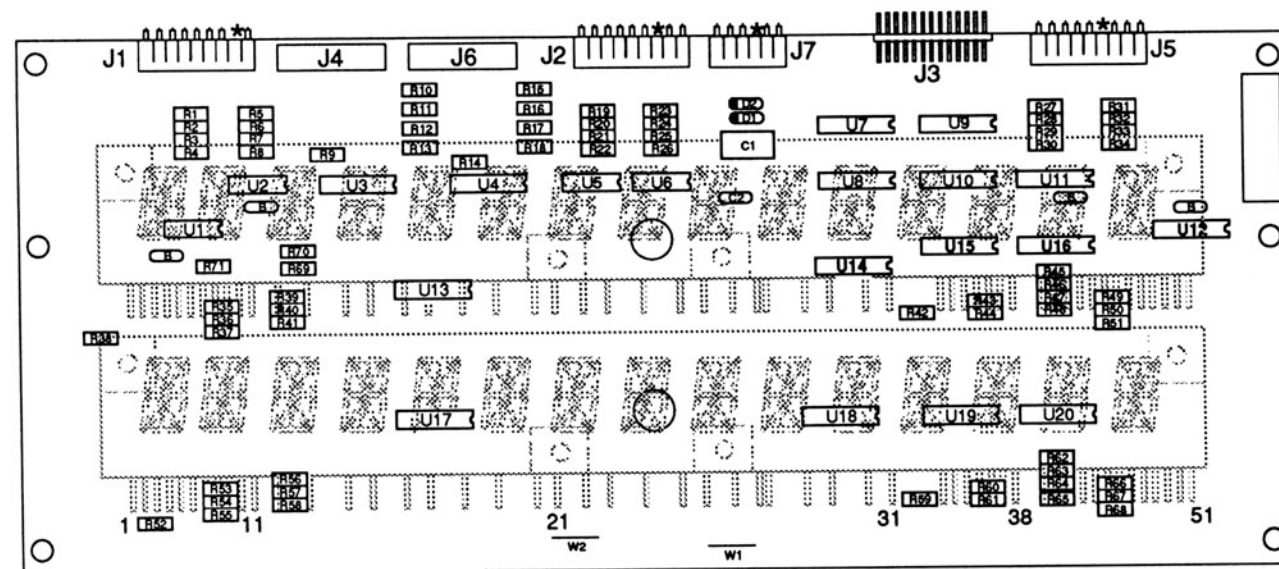


REV	DESCRIPTION OF CHANGE	ECN NO	DATE
	N. P. R.	17981	7-9-89
A	SEE COVER SHEET	18223	10-22-87
B	SEE COVER SHEET	18263	11-19-87
C	SEE SHEET 1-3	18378	12-17-87
D	SEE SHT 2 OF 4	18012	5-12-88

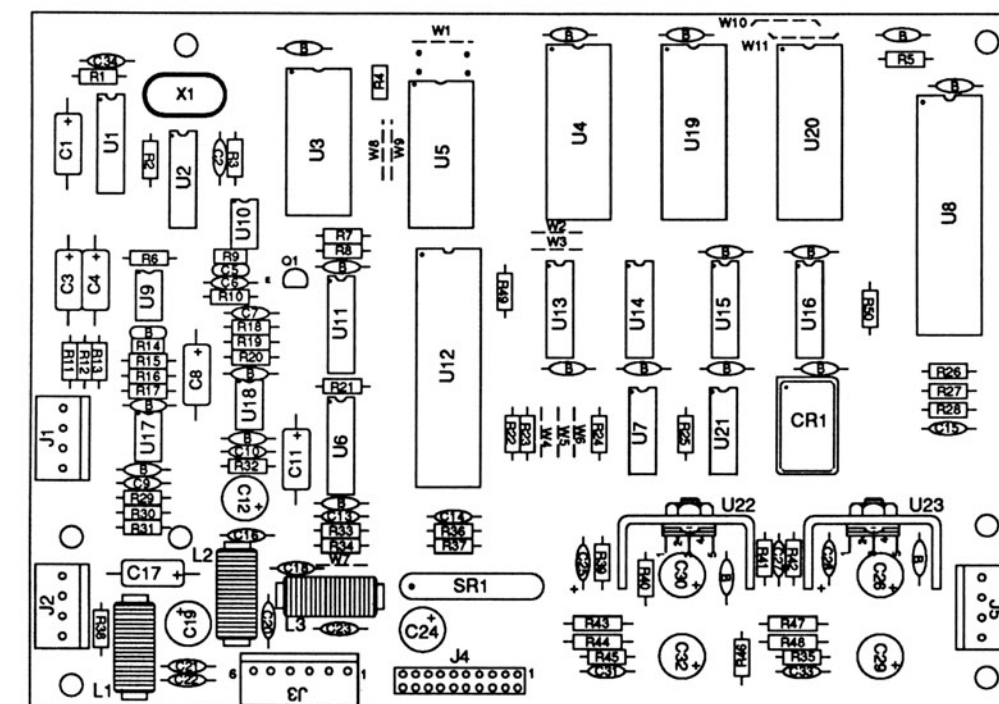


ITEM	PART NUMBER	DESCRIPTION	QTY	ITEM	PART NUMBER	DESCRIPTION	QTY
PROJ. ENGR	C. BLEICH	DO NOT SCALE WORK TO DIMENSIONS SHOWN		REMOVE BURRS - BREAK SHARP EDGES		WILLIAMS ELECTRONICS, INC.	
OWN. BY	ROSS 8-20-87			TOLERANCES UNLESS OTHERWISE SPECIFIED		3401 N. CALIFORNIA AVE.	CHICAGO IL. 60618
CHECKED BY	DATE 7/1/87	FIRST PROJECT NO.	557	FRACTIONAL	±1/64 ANGULAR	NAME	CPU SYS 11B SCHEMATIC
APPROVAL	DATE 7/2/87	FIRST USAGE	10-11832	DECIMAL	±.005 FILLETS .020 MAX	SCALE	N/S
				MATERIAL	11	SHT	2 OF 4
						PART NO.	16-9019
						REV	0

DINER 88



Display Characters Segment Designations



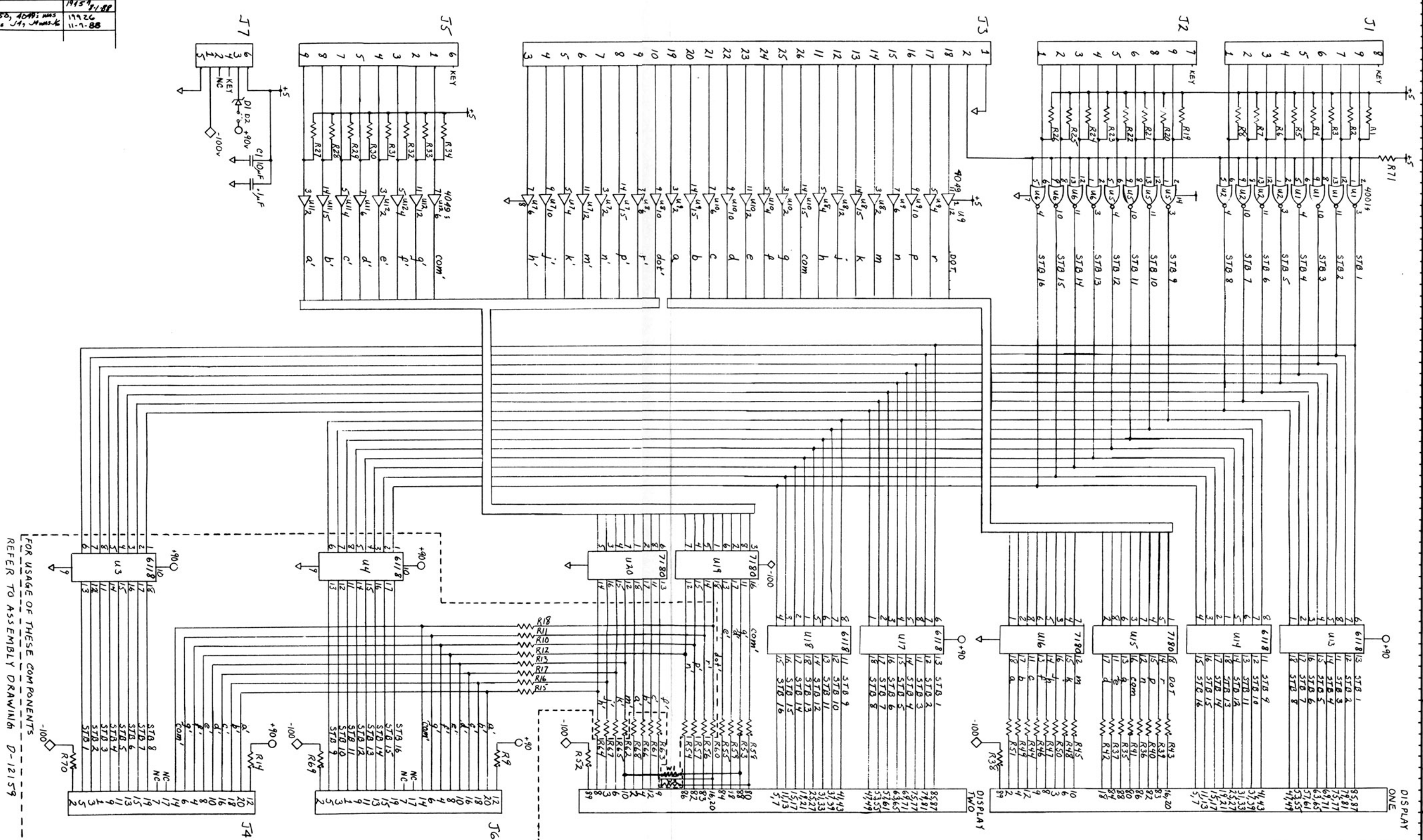
Master Display Board
p/n D-12232-1

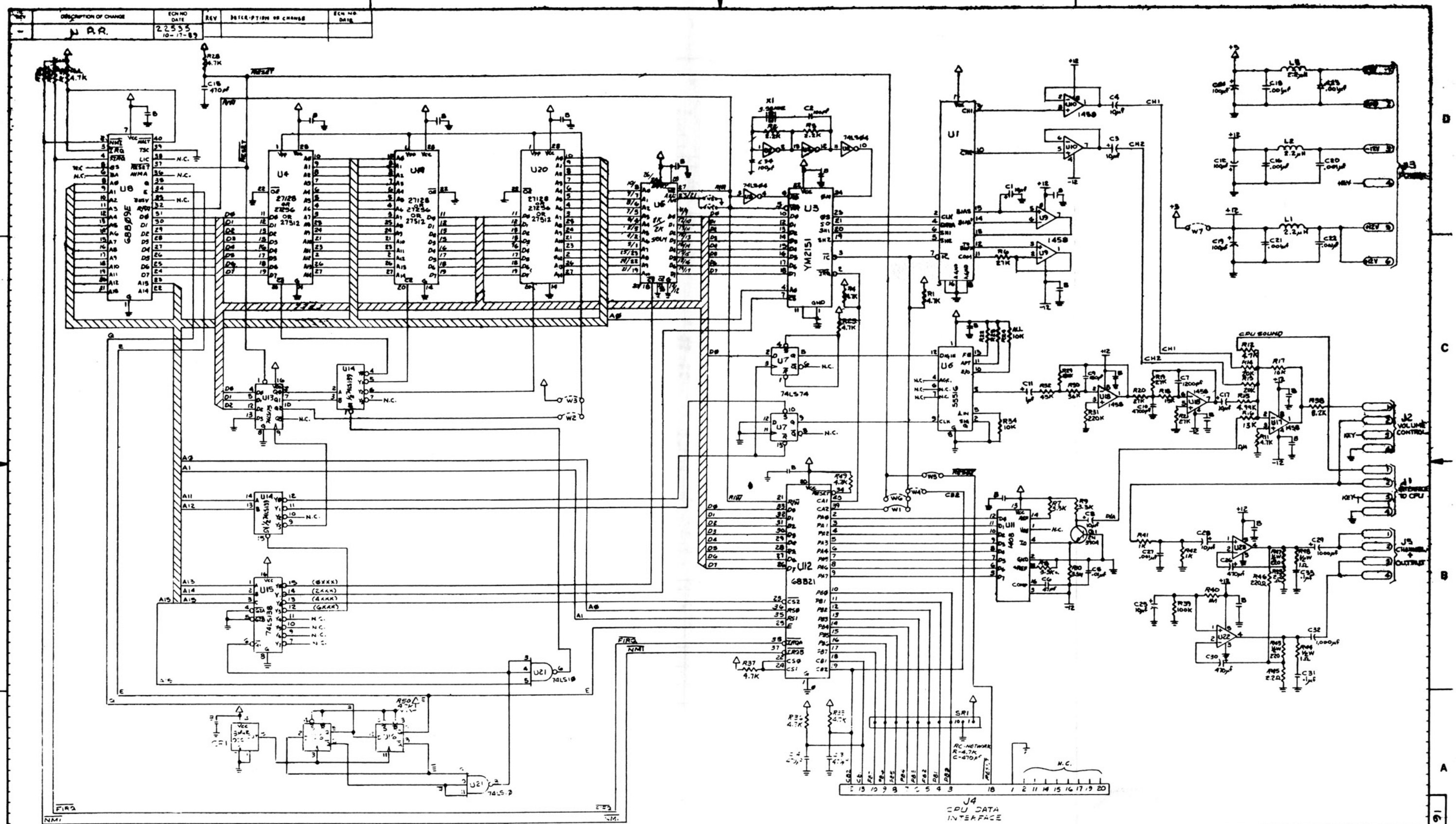
Audio Board
p/n D-11581-571

REV	DESCRIPTION OF CHANGE	ECH NO DATE
—	NPR	1157 11-88
A	4049 was 4050, 4049 was 4050, J6 was J4, M was K	11926 11-7-88

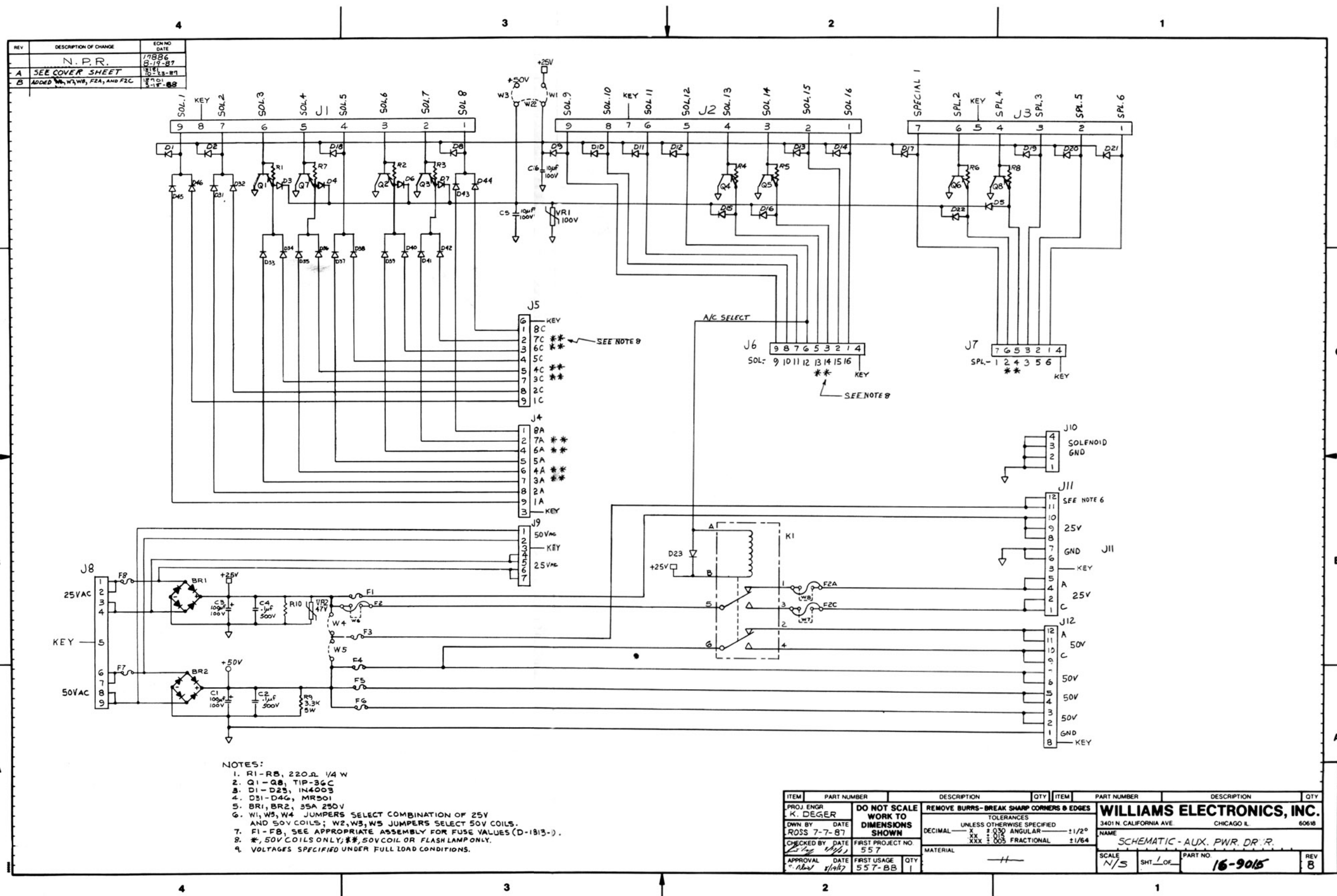
FOR USAGE OF THESE COMPONENTS
REFER TO ASSEMBLY DRAWING D-12159

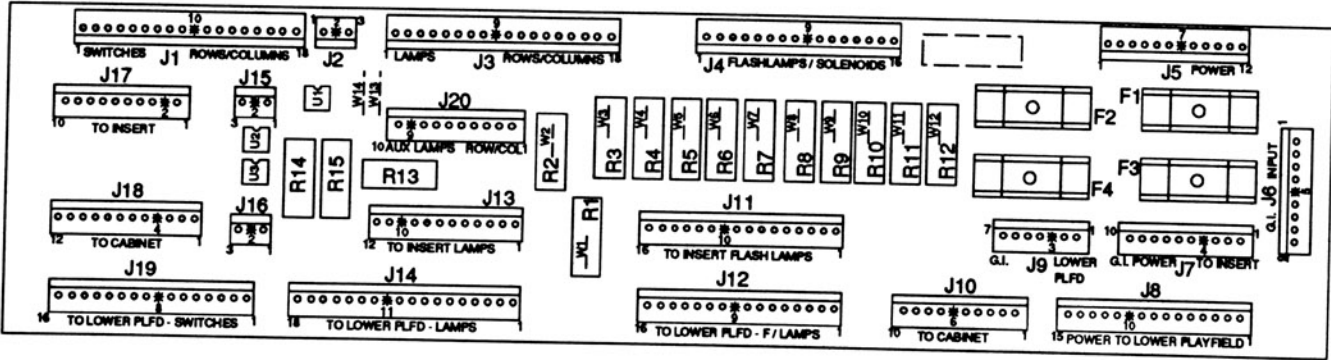
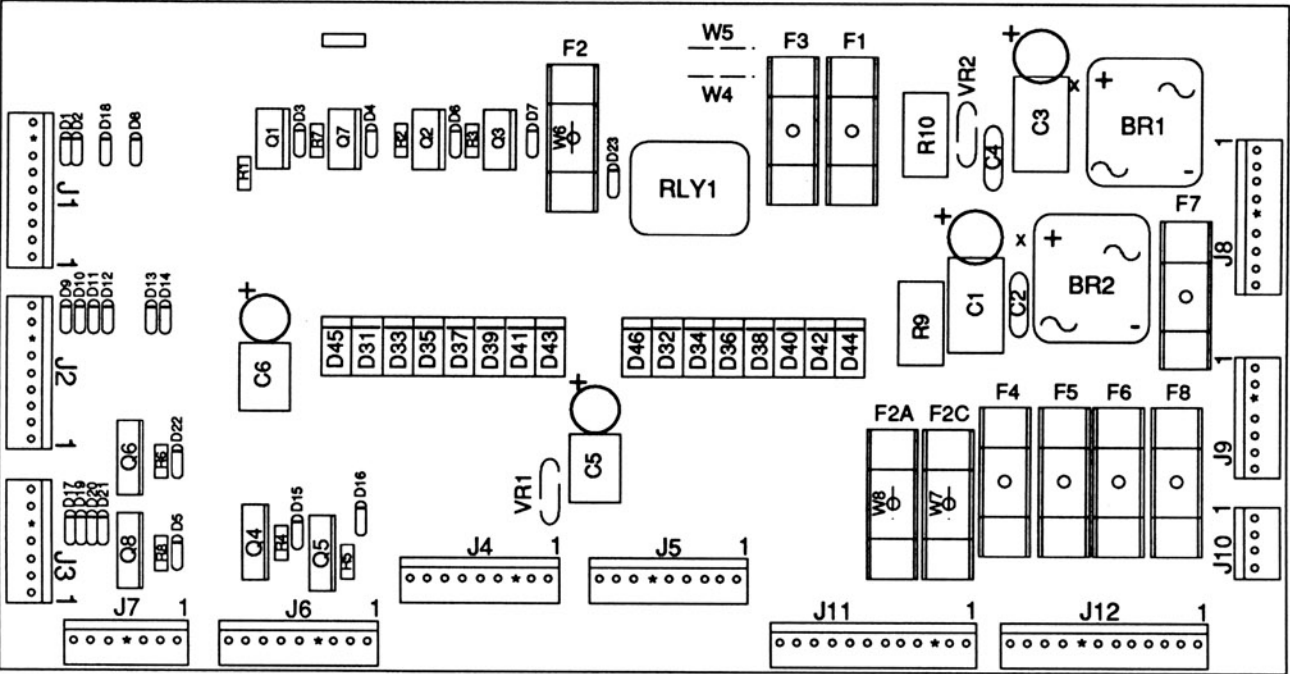
ITEM	PART NUMBER	DESCRIPTION	QTY	ITEM	PART NUMBER	DESCRIPTION	QTY
PROJ ENGR MARK COLDEBELLA OWN BY M.C. 3/21/88 CHECKED BY M.C. 7-24-88 APPROVAL DATE 11-22-88				DO NOT SCALE WORK TO DIMENSIONS SHOWN FIRST PROJECT NO. 553 FIRST USAGE D-12232-1 QTY 1			
REMOVE BURRS — BREAK SHARP EDGES TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL DECIMAL MATERIAL				WILLIAMS ELECTRONICS, INC. 3401 N. CALIFORNIA AVE. CHICAGO IL. 60618 NAME MASTER DISPLAY 88, SCHEMATIC SCALE SHT. 1 OF 1 PART NO. 16-9033 REV A			





ITEM	PART NUMBER	DESCRIPTION	QTY	ITEM	PART NUMBER	DESCRIPTION	QTY
PROJ ENGR C. BLEICH	DO NOT SCALE WORK TO DIMENSIONS SHOWN	REMOVE BURRS-BREAK SHARP CORNERS & EDGES TOLERANCES UNLESS OTHERWISE SPECIFIED DECIMAL .X .030 ANGULAR .1/2° XX .005 FRACTIONAL .1/64		WILLIAMS ELECTRONICS, INC. 3401 N. CALIFORNIA AVE CHICAGO IL 60618			
DOWN BY DATE C. BLEICH 1/22/87	FIRST PROJECT NO 4002	MATERIAL		NAME AUDIO SYSTEM SCHEMATIC			
CHECKED BY DATE D. B. 1/22/87	FIRST USAGE D-11579-3			SCALE N/S	SHT 1 OF 1	PART NO 16-9084	REV -
APPROVAL DATE C. BLEICH 1/22/87							





Aux Power Driver Board
p/n D-12247

Backbox Interconnect Board
p/n D-12313-576



Aux Pwr Driver Board
AC Select Relay 25V Circuits

5J11-4 "A" Side | **5J11-1 "C" Side**

Sol. 01A (Outsole Kicker) → Vio-Brn → D45 → Gry-Brn → Sol. 01C (Haji Flash) (5J1-9 (Q33))

Sol. 02A (Ramp Down) → Vio-Red → D31 → Gry-Red → Sol. 02 (Babs Flash) (5J1-7 (Q25))

Sol. 05A (Upper Left Eject) → Vio-Grn → D37 → Gry-Grn → Sol. 05C (Buck Flash) (5J1-4 (Q31))

Sol. 08A (Lower Left Eject) → Vio-Gry → D43 → Gry-Blk → Sol. 08C (DINE-TIME Flashers) (5J1-1 (Q22))

Sol. 03A (Cen 3-Bank Dr Tgt Reset) → Vio-Orn → D33 → Gry-Orn → Sol. 03C (Boris Flash) (5J1-6 (Q32))

Sol. 04A (Ramp Up) → Vio-Yel → D35 → Gry-Yel → Sol. 04C (Pape Flash) (5J1-5 (Q24))

Sol. 06A (Sub-Pfild Shooter) → Vio-Blu → D39 → Gry-Blu → Sol. 06C (Cup Flashers) (5J1-3 (Q23))

Sol. 07A (Knocker) → Vio-Bk → D41 → Gry-Vio → Sol. 07C (Clock Flashers) (5J1-2 (Q30))

SPECIAL SOLENOIDS (25V)

5J11-1

RED-WHT

Sol. 17

LEFT JET BUMPER (Q75)

5J3-7

Blu-Brn

5J6-7

Sol. 19

RIGHT JET BUMPER (Q73)

5J3-3

Blu-Orn

5J7-3

Sol. 21

LOWER JET BUMPER (Q77)

5J3-2

Blu-Grn

5J7-2

Sol. 22

SHOOTER LANE FEEDER (Q79)

5J3-1

Blu-Blk

5J7-1

SPECIAL SOLENOIDS (50V)

5J12-6 VIO-YEL

Sol. 13

5J12-4 Brn-Grn

5J16-5

LEFT 3-BANK DROP TARGET (Q15)

Sol. 14

5J12-3 Brn-Blu

5J16-3

DIVERter (R Ramp) (Q7)

Sol. 15

5J12-2 Brn-Vio

5J16-2

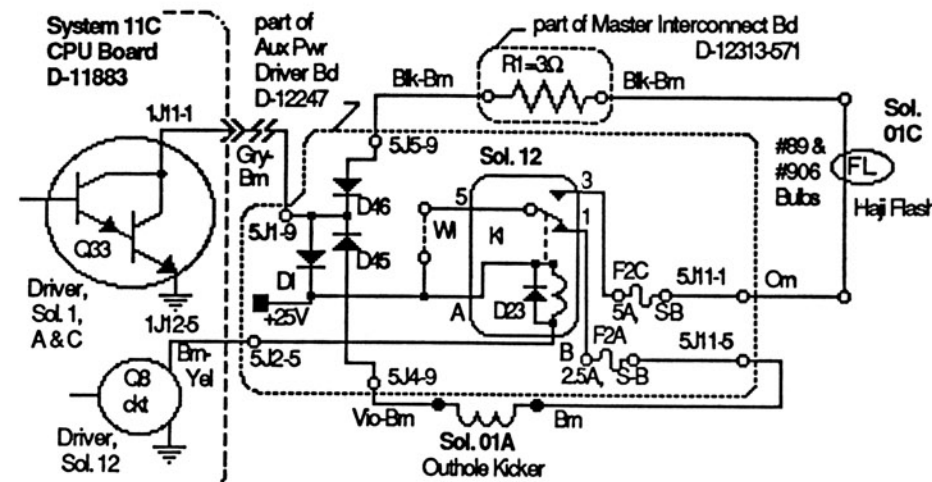
LEFT KICKER (Q14)

Sol. 16

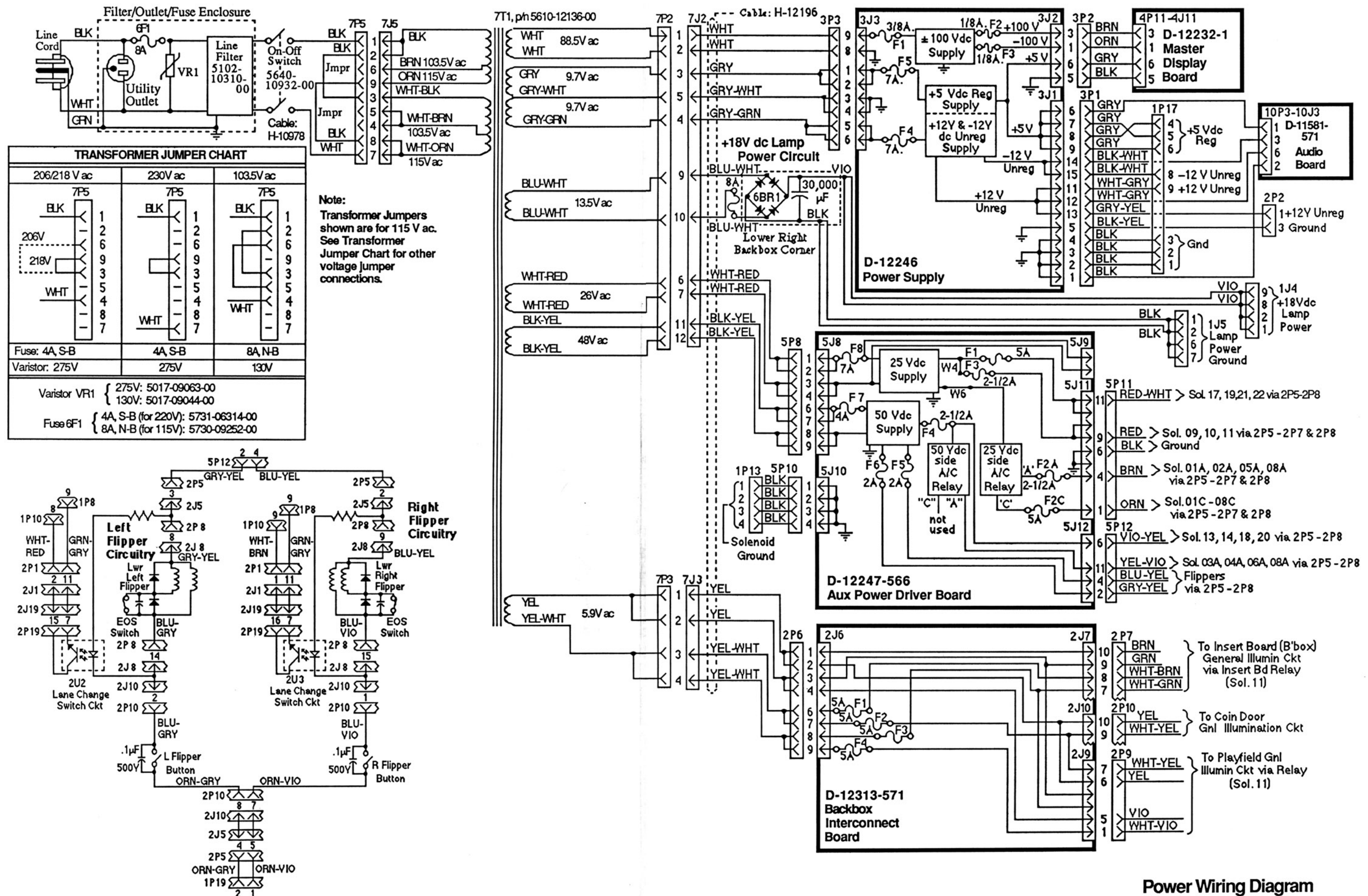
5J12-1 Brn-Gry

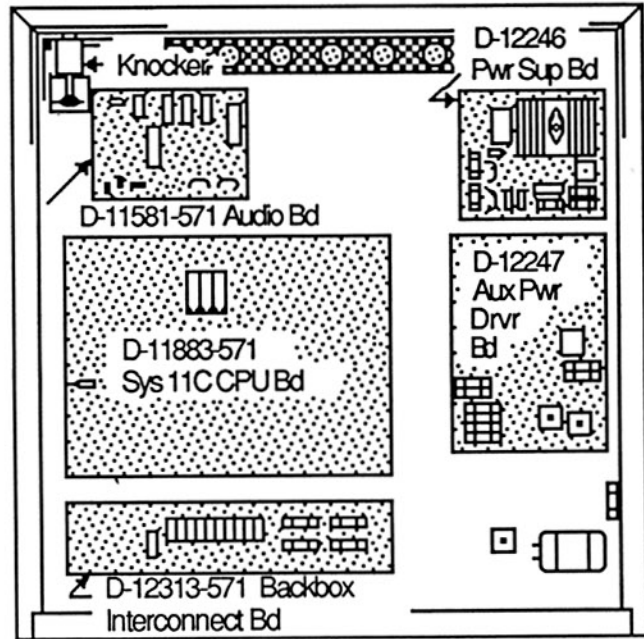
5J16-1

RIGHT KICKER (Q6)



Controlled, Special, & Switched Solenoids





SYSTEM 11C CPU INTERBOARD SIGNALS

Connector	Wire Color	Signal Designation/Description	Connector	Wire Color	Signal Designation/Description
1J1-1	BRN-GRY	ST-8: Display Digit Strobe / 4J1-1	1J2-1	VIO-GRY	ST-16: Display Digit Strobe / 4J2-1
1J1-2	BRN-VIO	ST-7: Display Digit Strobe / 4J1-2	1J2-2	VIO-BLK	ST-15: Display Digit Strobe / 4J2-2
1J1-3	BRN-BLU	ST-6: Display Digit Strobe / 4J1-3	1J2-3	VIO-BLU	ST-14: Display Digit Strobe / 4J2-3
1J1-4	BRN-GRN	ST-5: Display Digit Strobe / 4J1-4	1J2-4	VIO-GRN	ST-13: Display Digit Strobe / 4J2-4
1J1-5	BRN-YEL	ST-4: Display Digit Strobe / 4J1-5	1J2-5	VIO-YEL	ST-12: Display Digit Strobe / 4J2-5
1J1-6	BRN-ORG	ST-3: Display Digit Strobe / 4J1-6	1J2-6	VIO-ORG	ST-11: Display Digit Strobe / 4J2-6
1J1-7	BRN-RED	ST-2: Display Digit Strobe / 4J1-7	1J2-7	Key Pin	No Connection
1J1-8	Key Pin	No Connection	1J2-8	VIO-RED	ST-10: Display Digit Strobe / 4J2-8
1J1-9	BRN-BLK	ST-1: Display Digit Strobe / 4J1-8	1J2-9	VIO-BLK	ST-9: Display Digit Strobe / 4J2-9
1J3-1	BLU-BRN	D1 / Display BCD / 4J5-1	1J4-1	VIO	Lamp +18V dc Power
1J3-2	BLU-RED	C1 / Display BCD / 4J5-2	1J4-2	VIO	Lamp +18V dc Power
1J3-3	BLU-ORN	B1 / Display BCD / 4J5-3	1J4-3	Key Pin	No Connection
1J3-4	BLU-YEL	A1 / Display BCD / 4J5-4	1J4-4	-	No Connection
1J3-5	BLU-GRN	D2 / Display BCD / 4J5-5	1J4-5	-	No Connection
1J3-6	Key Pin	No Connection	1J4-6	-	No Connection
1J3-7	BLU-BLK	C2 / Display BCD / 4J5-7	1J4-7	-	No Connection
1J3-8	BLU-VIO	B2 / Display BCD / 4J5-8	1J4-8	VIO	Lamp +18V dc Power
1J3-9	BLU-GRY	A2 / Display BCD / 4J5-9	1J4-9	VIO	Lamp +18V dc Power
1J3-10 - 12	-	No Connection	1J6-1	RED-BRN	Lamp Row 1 (Q80) / 2J3-18
1J5-1	-	No Connection	1J6-2	RED-BLK	Lamp Row 2 (Q81) / 2J3-17
1J5-2	Key Pin	No Connection	1J6-3	RED-ORN	Lamp Row 3 (Q82) / 2J3-16
1J5-3	BLK	Ground (Lamp dkt)	1J6-4	Key Pin	No Connection
1J5-4	BLK	Ground (Lamp dkt)	1J6-5	RED-YEL	Lamp Row 4 (Q83) / 2J3-15
1J5-5	-	No Connection	1J6-6	RED-GRN	Lamp Row 5 (Q84) / 2J3-14
1J5-6	-	No Connection	1J6-7	RED-BLU	Lamp Row 6 (Q85) / 2J3-13
1J5-7	-	No Connection	1J6-8	RED-VIO	Lamp Row 7 (Q86) / 2J3-12
1J5-8	BLK	Ground (Lamp dkt)	1J6-9	RED-GRY	Lamp Row 8 (Q87) / 2J3-11
1J5-9	BLK	Ground (Lamp dkt)	1J8-1	GRN-BRN	Switch Col 1 (Q45) / 2J1-18
1J7-1	YEL-BRN	Lamp Col 1 (Q65/66) / 2J3-8	1J8-2	GRN-RED	Switch Col 2 (Q49) / 2J1-17
1J7-2	YEL-RED	Lamp Col 2 (Q63/64) / 2J3-7	1J8-3	GRN-ORN	Switch Col 3 (Q44) / 2J1-16
1J7-3	YEL-ORN	Lamp Col 3 (Q61/62) / 2J3-6	1J8-4	GRN-YEL	Switch Col 4 (Q48) / 2J1-15
1J7-4	YEL-BLK	Lamp Col 4 (Q59/60) / 2J3-5	1J8-5	GRN-GRN	Switch Col 5 (Q43) / 2J1-14
1J7-5	Key Pin	No Connection	1J8-6	Key Pin	No Connection
1J7-6	YEL-GRN	Lamp Col 5 (Q57/58) / 2J3-4	1J8-7	GRN-BLU	Switch Col 6 (Q47) / 2J1-13
1J7-7	YEL-BLU	Lamp Col 6 (Q55/56) / 2J3-3	1J8-8	GRN-VIO	Switch Col 7 (Q42) / 2J1-12
1J7-8	YEL-VIO	Lamp Col 7 (Q53/54) / 2J3-2	1J8-9	GRN-GRY	Switch Col 8 (Q46) / 2J1-11
1J7-9	YEL-GRY	Lamp Col 8 (Q51/52) / 2J3-1	1J11-1	GRY-BRN	Solenoid 1 (Q33) / 5J1-9
1J10-1	WHT-GRY	Switch Row 8 / 2J1-8	1J11-2	Key Pin	No Connection
1J10-2	WHT-VIO	Switch Row 7 / 2J1-7	1J11-3	GRY-RED	Solenoid 2 (Q25) / 5J1-7
1J10-3	WHT-BLU	Switch Row 6 / 2J1-6	1J11-4	GRY-ORN	Solenoid 3 (Q32) / 5J1-6
1J10-4	Key Pin	No Connection	1J11-5	GRY-YEL	Solenoid 4 (Q24) / 5J1-5
1J10-5	WHT-GRN	Switch Row 5 / 2J1-5	1J11-6	GRY-GRN	Solenoid 5 (Q31) / 5J1-4
1J10-6	WHT-YEL	Switch Row 4 / 2J1-4	1J11-7	GRY-BLU	Solenoid 6 (Q23) / 5J1-3
1J10-7	WHT-ORN	Switch Row 3 / 2J1-3	1J11-8	GRY-VIO	Solenoid 7 (Q30) / 5J1-2
1J10-8	WHT-RED	Switch Row 2 / 2J1-2	1J11-9	GRY-BLK	Solenoid 8 (Q22) / 5J1-1
1J10-9	WHT-BRN	Switch Row 1 / 2J1-1	1J13-1	BLK	Solenoid Ground / 5J10-1
1J12-1	BRN-BLK	Solenoid 9 (Q17) / 5J2-9	1J13-2	BLK	Solenoid Ground / 5J10-2
1J12-2	BRN-RED	Solenoid 10 (Q9) / 5J2-8	1J13-3	BLK	Solenoid Ground / 5J10-3
1J12-3	Key Pin	No Connection	1J13-4	BLK	Solenoid Ground / 5J10-4
1J12-4	BRN-ORN	Solenoid 11 (Q16) / 5J2-6	1J14-1	BLK-RED	Memory Protect / 7J1-4
1J12-5	BRN-YEL	Solenoid 12 (Q8) / 5J2-5	1J14-2	WHT	Ground / 7J1-3
1J12-6	BRN-GRN	Solenoid 13 (Q15) / 5J2-4	1J14-3	GRN	ADVANCE Switch / 7J1-1
1J12-7	BRN-BLU	Solenoid 14 (Q7) / 5J2-3	1J14-4	BLU	AUTO/MANUAL Switch / 7J1-2
1J12-8	BRN-VIO	Solenoid 15 (Q14) / 5J2-2	1J19-1	ORN-VIO	Flipper Pwr Ground / 2J5-5
1J12-9	BRN-BRY	Solenoid 16 (Q6) / 5J2-1	1J19-2	ORN-GRY	Flipper Pwr Ground / 2J5-4
1J9, 1J16, 1J20	-	Not Installed	1J19-3	BLU-ORN	Spl Solnd 3 (Q73) / 5J3-3
1J17-1	BLK	Ground / 3J1-2	1J19-4	BLU-RED	Spl Solnd 2 (Q71) / 5J3-6
1J17-2	BLK	Ground / 3J1-3	1J19-5	Key Pin	No Connection
1J17-3	BLK	Ground / 3J1-4	1J19-6	BLU-YEL	Spl Solnd 4 (Q69) / 5J3-4
1J17-4	GRY	Power: +5V dc / 3J1-8	1J19-7	BLU-BRN	Spl Solnd 1 (Q75) / 5J3-7
1J17-5	GRY	Power: +5V dc / 3J1-6	1J19-8	BLU-GRN	Spl Solnd 5 (Q77) / 5J3-2
1J17-6	GRY	Power: +5V dc / 3J1-9	1J19-9	BLU-BLK	Spl Solnd 6 (Q79) / 5J3-1
1J17-7	Key Pin	No Connection	1J21	Ribbon Cable to Audio Board 10J4	
1J17-8	BLK-WHT	Power: -12V dc Unreg / 3J1-14	1J22	Ribbon Cable to Master Display Board 4J3	
1J17-9	WHT-GRY	Power: +12V dc Unreg / 3J1-12			
1J18-1 - 9	-	No Connection			

POWER SUPPLY INTERBOARD SIGNALS

Connector	Wire Color	Signal Designation/Description	Connector	Wire Color	Signal Designation/Description
3J1-1	BLK	Ground / 10J3-2	3J2-1	ORN	Display Power: -100V dc / 4J7-1
3J1-2	BLK	Ground / 1J17-1	3J2-2	-	No Connection
3J1-3	BLK	Ground / 1J17-2	3J2-3	BRN	Display Power: +100V dc / 4J7-3
3J1-4	BLK	Ground / 1J17-3	3J2-4	-	No Connection
3J1-5	BLK-YEL	Logic Ground / 2J2-3	3J2-5	BLK	Ground (Display dkt) / 4J7-5
3J1-6	GRY	CPU Pwr: +5V dc Reg / 10J3-1	3J2-6	GRY	Display Logic Power: +5V dc / 4J7-6
3J1-7	GRY	CPU Pwr: +5V dc Reg / 1J17-5			
3J1-8	GRY	CPU Pwr: +5V dc Reg / 1J17-4	3J3-1	GRY	Transformer: 19.4V ac, 1Φ, C T
3J1-9	GRY	CPU Pwr: +5V dc Reg / 1J17-6	3J3-2	GRY	Transformer: 19.4V ac, 1Φ, C T
3J1-10	Key Pin	No Connection	3J3-3	GRY-WHT	Transformer: 19.4V ac, C T common
3J1-11	WHT-GRY	CPU Pwr: +12V dc Unreg / 10J3-6	3J3-4	GRY-WHT	Transformer: 19.4V ac, C T common
3J1-12	WHT-GRY	CPU Pwr: +12V dc Unreg / 1J17-9	3J3-5	GRY-GRN	Transformer: 19.4V ac, 1Φ, C T
3J1-13	GRY-YEL	CPU Pwr: +12V dc Unreg / 2J2-1	3J3-6	GRY-GRN	Transformer: 19.4V ac, 1Φ, C T
3J1-14	BLK-WHT	CPU Pwr: -12V dc Unreg / 1J17-8	3J3-7	Key Pin	No Connection
3J1-15	BLK-WHT	CPU Pwr: -12V dc Unreg / 10J3-3	3J3-8	WHT	Transformer: 88.5V ac
			3J3-9	WHT	Transformer: 88.5V ac

AUX POWER DRIVER INTERBOARD SIGNALS

Connector	Wire Color	Signal Designation/Description	Connector	Wire Color	Signal Designation/Description
5J1-1	GRY-BLK	CPU: Solenoid 8 (Q22) / 1J11-9	5J2-1, 2	-	No Connection
5J1-2	GRY-VIO	CPU: Solenoid 7 (Q30) / 1J11-8	5J2-3	BRN-BLU	CPU: Solenoid 14 (Q7) / 1J12-7
5J1-3	GRY-BLU	CPU: Solenoid 6 (Q23) / 1J11-7	5J2-4	BRN-GRN	CPU: Solenoid 13 (Q15) / 1J12-6
5J1-4	GRY-GRN	CPU: Solenoid 5 (Q31) / 1J11-6	5J2-5	BRN-YEL	CPU: Solenoid 12 (Q8) / 1J12-5
5J1-5	GRY-YEL	CPU: Solenoid 4 (Q24) / 1J11-5	5J2-6	BRN-ORN	CPU: Solenoid 11 (Q16) / 1J12-4
5J1-6	GRY-ORN	CPU: Solenoid 3 (Q32) / 1J11-4	5J2-7	Key Pin	No Connection
5J1-7	GRY-RED	CPU: Solenoid 2 (Q25) / 1J11-3	5J2-8	BRN-RED	CPU: Solenoid 10 (Q9) / 1J12-2
5J1-8	Key Pin	No Connection	5J2-9	BRN-BLK	CPU: Solenoid 9 (Q17) / 1J12-1
5J1-9	GRY-BRN	CPU: Solenoid 1 (Q33) / 1J11-1	5J4-1	VIO-GRY	CPU: Solenoid 08A
5J3-1	BLU-BLK	CPU: Solenoid 22 (Q79) / 1J19-9	5J4-2	VIO-BLK	CPU: Solenoid 07A
5J3-2	BLU-GRN	CPU: Solenoid 21 (Q77) / 1J19-8	5J4-3	Key Pin	No Connection
5J3-3	BLU-ORN	CPU: Solenoid 19 (Q73) / 1J19-3	5J4-4	VIO-BLU	CPU: Solenoid 06A
5J3-4	BLU-YEL	CPU: Solenoid 20 (Q69) / 1J19-6	5J4-5	VIO-GRN	CPU: Solenoid 05A
5J3-5	Key Pin	No Connection	5J4-6	VIO-YEL	CPU: Solenoid 04A
5J3-6	BLU-RED	CPU: Solenoid 18 (Q71) / 1J19-4	5J4-7	VIO-ORN	CPU: Solenoid 03A
5J3-7	BLU-BRN	CPU: Solenoid 17 (Q75) / 1J19-7	5J4-8	VIO-RED	CPU: Solenoid 02A
5J5-1	WHT-GRY	CPU: Solenoid 08C / 2J4-8	5J4-9	VIO-BRN	CPU: Solenoid 01A
5J5-2	WHT-VIO	CPU: Solenoid 07C / 2J4-7	5J6-1, 2	-	No Connection
5J5-3	WHT-BLU	CPU: Solenoid 06C / 2J4-6	5J6-3	BRN-BLU	CPU: Solenoid 14 / 2J4-14
5J5-4	WHT-GRN	CPU: Solenoid 05C / 2J4-5	5J6-4	Key Pin	No Connection
5J5-5	WHT-YEL	CPU: Solenoid 04C / 2J4-4	5J6-5	BRN-GRN	CPU: Solenoid 13 / 2J4-13
5J5-6	Key Pin	No Connection	5J6-6	-	CPU: Solenoid 12
5J5-7	WHT-ORN	CPU: Solenoid 03C / 2J4-3	5J6-7	BRN-ORN	CPU: Solenoid 11 / 2J4-12
5J5-8	WHT-RED	CPU: Solenoid 02C / 2J4-2	5J6-8	BRN-RED	CPU: Solenoid 10 / 2J4-11
5J5-9	WHT-BRN	CPU: Solenoid 01C / 2J4-1	5J6-9	BRN-BLK	CPU: Solenoid 9 / 2J4-10
5J7-1	BLU-BLK	Solenoid 22	5J8-1	WHT-RED	Transformer: 26V ac / 7J2-6
5J7-2	BLU-GRN	Solenoid 21	5J8-2	WHT-RED	Transformer: 26V ac / 7J2-6
5J7-3	BLU-ORN	Solenoid 19	5J8-3	WHT-RED	Transformer: 26V ac / 7J2-7
5J7-4	Key Pin	No Connection	5J8-4	WHT-RED	Transformer: 26V ac / 7J2-7
5J7-5	BLU-YEL	Solenoid 20	5J8-5	Key Pin	No Connection
5J7-6	BLU-RED	Solenoid 18	5J8-6	BLK-YEL	Transformer: 48V ac / 7J2-11
5J7-7	BLU-BRN	Solenoid 17	5J8-7	BLK-YEL	Transformer: 48V ac / 7J2-11
5J10-1	BLK	Solenoid Ground / 1J13-1	5J8-8	BLK-YEL	Transformer: 48V ac / 7J2-11
5J10-2	BLK	Solenoid Ground / 1J13-2	5J8-9	BLK-YEL	Transformer: 48V ac / 7J2-11
5J10-3	BLK	Solenoid Ground / 1J13-3			
5J10-4	BLK	Solenoid Ground / 1J13-4	5J9-1 - 6	-	No Connection
5J11-1	ORN	+25 V dc "C" Sol. Pwr / 2J5-9	5J12-1	-	No Connection
5J11-2	-	No Connection	5J12-2	GRY-YEL	+50V dc Flipper Power / 2J5-3
5J11-3	Key Pin	No Connection	5J12-3	-	No Connection
5J11-4	BRN	+25 V dc "A" Sol. Pwr / 2J5-12	5J12-4	BLU-YEL	+50V dc Flipper Power / 2J5-2
5J11-5	-	No Connection	5J12-5	-	No Connection
5J11-6	BLK	Ground / 2J5-6	5J12-6	VIO-YEL	+50V dc Solenoid Power / 2J5-10
5J11-7, 8	-	No Connection	5J12-7	-	No Connection
5J11-9	RED	+25 V dc Sol. Pwr / 2J5-8	5J12-8	Key Pin	No Connection
5J11-10	-	No Connection	5J12-9	-	No Connection
5J11-11	RED-WHT	+50 V dc Sol. Pwr / 2J5-1	5J12-10	-	No Connection
5J11-12	-	No Connection	5J12-11	YEL-VIO	+50V dc Solenoid Power / 2J5-11
			5J12-12	-	No Connection

AUDIO BOARD INTERBOARD SIGNALS

Connector	Wire Color	Signal Designation/Description	Connector	Wire Color	Signal Designation/Description
10J1	No Connection		10J2-1	RED	Signal Level (to Vol Cntrl)
10J3-1	GRY	Power: +5V dc Reg / 3J1-7	10J2-2	BLK	Signal Level (from Vol Cntrl)
10J3-2	BLK	Ground / 3J1-1	10J2-3	--	No Connection
10J3-3	BLK-WHT	Power: -12V dc Unreg / 3J1-15	10J2-4	shield	Ground
10J3-4	--	No Connection			
10J3-5	--	No Connection	10J5-1	BLK-YEL	Audio line -Speaker
10J3-6	WHT-GRY	Power: +12V dc Unreg / 3J1-11	10J5-2	BLK-YEL	Audio line -Speaker
			10J5-3	BLK	Audio line -Speaker
10J4	Ribbon Cable from CPU 1J21		10J5-4	BLK	Audio line -Speaker

MASTER DISPLAY INTERBOARD SIGNALS

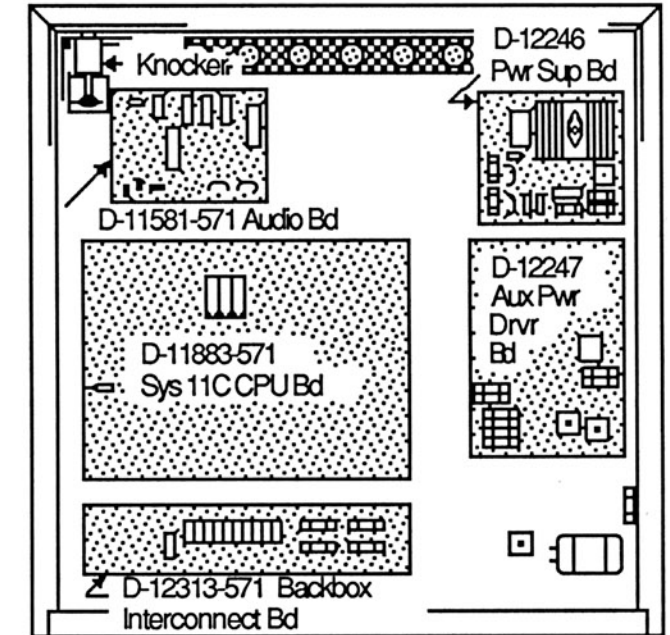
Connector	Wire Color	Signal Designation/Description	Connector	Wire Color	Signal Designation/Description
4J1-1	BRN-GRY	ST-8: Display Digit Strobe / 1J1-1	4J2-1	VIO-GRY	ST-16: Display Digit Strobe / 1J2-1
4J1-2	BRN-VIO	ST-7: Display Digit Strobe / 1J1-2	4J2-2	VIO-BLK	ST-15: Display Digit Strobe / 1J2-2
4J1-3	BRN-BLU	ST-6: Display Digit Strobe / 1J1-3	4J2-3	VIO-BLU	ST-14: Display Digit Strobe / 1J2-3
4J1-4	BRN-GRN	ST-5: Display Digit Strobe / 1J1-4	4J2-4	VIO-GRN	ST-13: Display Digit Strobe / 1J2-4
4J1-5	BRN-YEL	ST-4: Display Digit Strobe / 1J1-5	4J2-5	VIO-YEL	ST-12: Display Digit Strobe / 1J2-5
4J1-6	BRN-ORG	ST-3: Display Digit Strobe / 1J1-6	4J2-6	VIO-ORG	ST-11: Display Digit Strobe / 1J2-6
4J1-7	BRN-RED	ST-2: Display Digit Strobe / 1J1-7	4J2-7	Key Pin	No Connection
4J1-8	Key Pin	No Connection	4J2-8	VIO-RED	ST-10: Display Digit Strobe / 1J2-8
4J1-9	BRN-BLK	ST-1: Display Digit Strobe / 1J1-8	4J2-9	VIO-BLK	ST-9: Display Digit Strobe / 1J2-9
4J5-1	BLU-BRN	D1 / Display BCD / 1J3-1	4J3	Ribbon Cable from CPU 1J22	
4J5-2	BLU-RED	C1 / Display BCD / 1J3-2	4J4, 4J6	Not Installed	
4J5-3	BLU-ORN	B1 / Display BCD / 1J3-3			
4J5-4	BLU-YEL	A1 / Display BCD / 1J3-4	4J7-1	ORN	Display Power: -100V dc / 3J2-1
4J5-5	BLU-GRN	D2 / Display BCD / 1J3-5	4J7-2	--	No Connection
4J5-6	Key Pin	No Connection	4J7-3	BRN	Display Power: +100V dc / 3J2-3
4J5-7	BLU-BLK	C2 / Display BCD / 1J3-7	4J7-4	Key Pin	No Connection
4J5-8	BLU-VIO	B2 / Display BCD / 1J3-8	4J7-5	BLK	Ground (Display ckt) / 3J2-5
4J5-9	BLU-GRY	A2 / Display BCD / 1J3-9	4J7-6	GRY	Display Logic Power: +5V dc / 3J2-6

BACKBOX INTERCONNECT INTERBOARD SIGNALS

Connector	Wire Color	Signal Designation/Description	Connector	Wire Color	Signal Designation/Description
2J1-1	WHT-BRN	Switch Row 1 / 1J11-9	2J2-1	GRY-YEL	+12V dc Unreg / 3J3-13
2J1-2	WHT-RED	Switch Row 2 / 1J11-8	2J2-2	--	No Connection
2J1-3	WHT-ORN	Switch Row 3 / 1J11-7	2J2-3	BLK-YEL	Ground / 3J1-5
2J1-4	WHT-YEL	Switch Row 4 / 1J11-6			
2J1-5	WHT-GRN	Switch Row 5 / 1J11-5	2J3-1	YEL-GRY	Lamp Col 8 (Q51/52) / 1J7-9
2J1-6	WHT-BLU	Switch Row 6 / 1J11-3	2J3-2	YEL-VIO	Lamp Col 7 (Q53/54) / 1J7-8
2J1-7	WHT-VIO	Switch Row 7 / 1J11-2	2J3-3	YEL-BLU	Lamp Col 6 (Q55/56) / 1J7-7
2J1-8	WHT-GRY	Switch Row 8 / 1J11-1	2J3-4	YEL-GRN	Lamp Col 5 (Q57/58) / 1J7-6
2J1-9	Key Pin	No Connection	2J3-5	YEL-BLK	Lamp Col 4 (Q59/60) / 1J7-4
2J1-10	--	No Connection	2J3-6	YEL-ORN	Lamp Col 3 (Q61/62) / 1J7-3
2J1-11	GRN-GRY	Switch Col 8 (Q46) / 1J8-9	2J3-7	YEL-RED	Lamp Col 2 (Q63/64) / 1J7-2
2J1-12	GRN-VIO	Switch Col 7 (Q42) / 1J8-8	2J3-8	YEL-BRN	Lamp Col 1 (Q65/66) / 1J7-1
2J1-13	GRN-BLU	Switch Col 6 (Q47) / 1J8-7	2J3-9	Key Pin	No Connection
2J1-14	GRN-GRN	Switch Col 5 (Q43) / 1J8-5	2J3-10	--	No Connection
2J1-15	GRN-YEL	Switch Col 4 (Q48) / 1J8-4	2J3-11	RED-GRY	Lamp Row 8 (Q87) / 1J6-9
2J1-16	GRN-ORN	Switch Col 3 (Q44) / 1J8-3	2J3-12	RED-VIO	Lamp Row 7 (Q86) / 1J6-8
2J1-17	GRN-RED	Switch Col 2 (Q49) / 1J8-2	2J3-13	RED-BLU	Lamp Row 6 (Q85) / 1J6-7
2J1-18	GRN-BRN	Switch Col 1 (Q45) / 1J8-1	2J3-14	RED-GRN	Lamp Row 5 (Q84) / 1J6-6
			2J3-15	RED-YEL	Lamp Row 4 (Q83) / 1J6-5
2J4-1	WHT-BRN	Solenoid 01C In / 5J5-9	2J3-16	RED-ORN	Lamp Row 3 (Q82) / 1J6-3
2J4-2	WHT-RED	Solenoid 02C In / 5J5-8	2J3-17	RED-BLK	Lamp Row 2 (Q81) / 1J6-2
2J4-3	WHT-ORN	Solenoid 03C In / 5J5-7	2J3-18	RED-BRN	Lamp Row 1 (Q80) / 1J6-1
2J4-4	WHT-YEL	Solenoid 04C In / 5J5-5			
2J4-5	WHT-GRN	Solenoid 05C In / 5J5-4	2J5-1	RED-WHT	+25V dc (Solenoid) / 5J11-12
2J4-6	WHT-BLU	Solenoid 06C In / 5J5-3	2J5-2	BLU-YEL	Flipper Power / 5J12-4
2J4-7	WHT-VIO	Solenoid 07C In / 5J5-2	2J5-3	GRY-YEL	Flipper Power / 5J12-2
2J4-8	WHT-GRY	Solenoid 08C In / 5J5-1	2J5-4	ORN-GRY	Flipper Ground / 1J19-2
2J4-9	Key Pin	No Connection	2J5-5	ORN-VIO	Flipper Ground / 1J19-1
2J4-10	BRN-BLK	Solenoid 9 In / 5J6-9	2J5-6	BLK	Ground / 5J11-9
2J4-11	BRN-RED	Solenoid 10 In / 5J6-8	2J5-7	Key Pin	No Connection
2J4-12	BRN-ORN	Solenoid 11 In / 5J6-7	2J5-8	RED	+25V dc (Solenoid) / 5J11-9
2J4-13	BRN-GRN	Solenoid 13 In / 5J6-5	2J5-9	ORN	+25V dc ("C" Solenoid) / 5J11-1
2J4-14	BRN-BLU	Solenoid 14 In / 5J6-3	2J5-10	VIO-YEL	+50V dc (Solenoid) / 5J12-7
2J4-15	BRN-VIO	Solenoid 15 In / 1P12-8	2J5-11	YEL-VIO	+50V dc (Solenoid) / 5J12-11
2J4-16	BRN-GRY	Solenoid 16 In / 1P12-9	2J5-12	BRN	+25V dc ("A" Solenoid) / 5J11-5
2J6-1	YEL	Xlmr Pwr: 5.9V ac Gen Illum	2J6-6	YEL-WHT	Xlmr Pwr: 5.9V ac Gen Illum
2J6-2	YEL	Xlmr Pwr: 5.9V ac Gen Illum	2J6-7	YEL-WHT	Xlmr Pwr: 5.9V ac Gen Illum
2J6-3	YEL	Xlmr Pwr: 5.9V ac Gen Illum	2J6-8	YEL-WHT	Xlmr Pwr: 5.9V ac Gen Illum
2J6-4	YEL	Xlmr Pwr: 5.9V ac Gen Illum	2J6-9	YEL-WHT	Xlmr Pwr: 5.9V ac Gen Illum
2J6-5	Key Pin	No Connection			

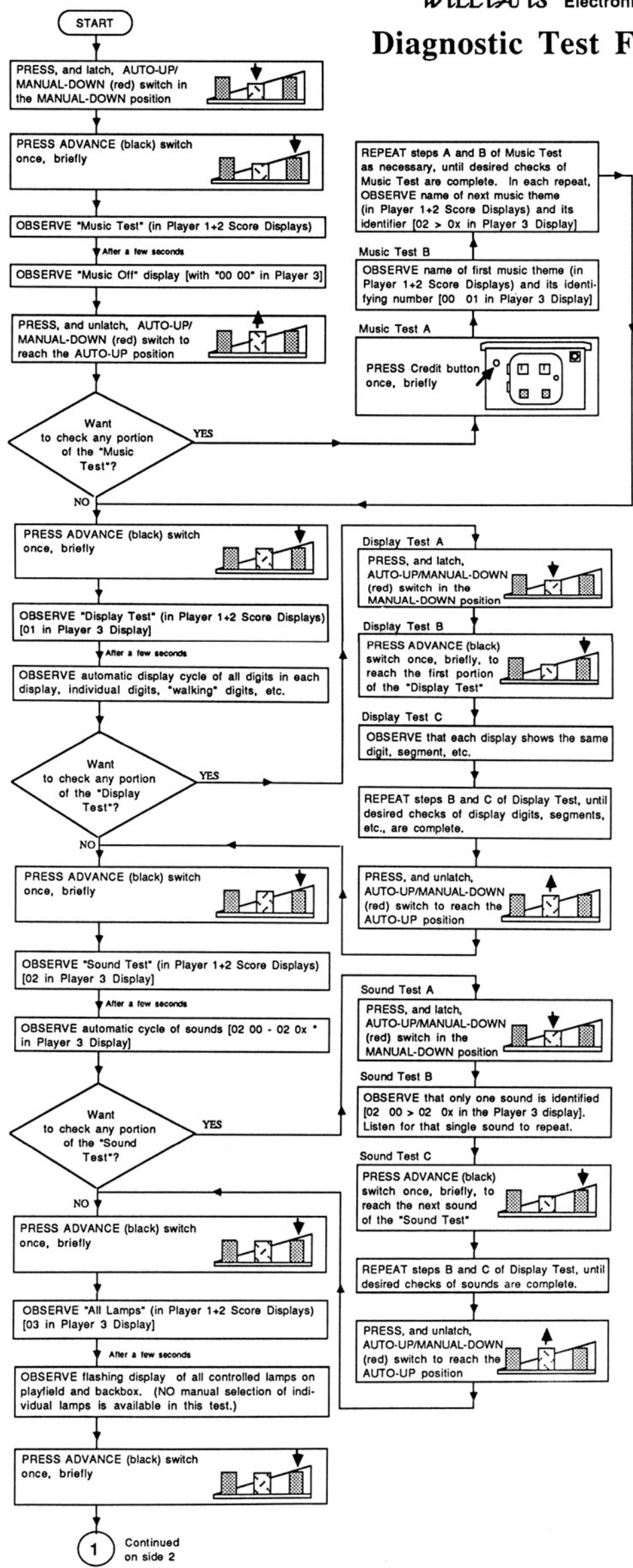
BACKBOX INTERCONNECT INTERBOARD SIGNALS

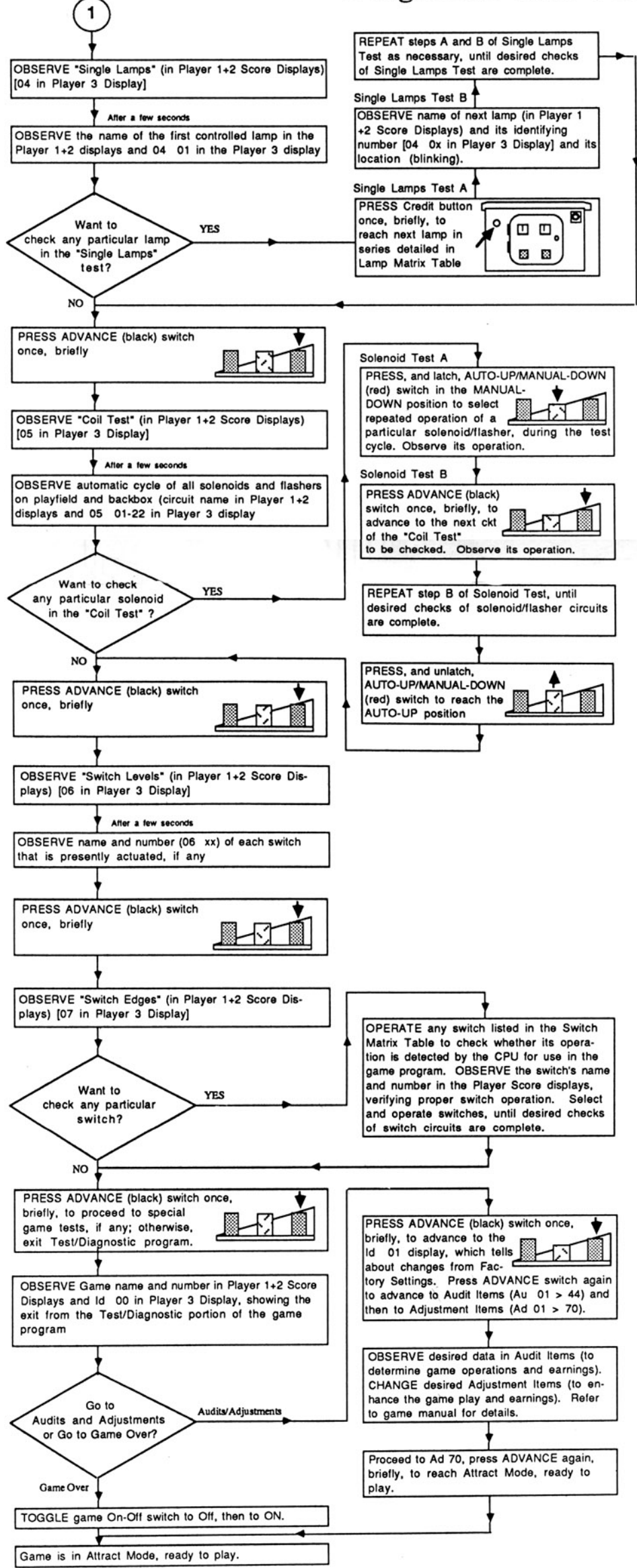
Connector	Wire Color	Signal Designation/Description	Connector	Wire Color	Signal Designation/Description
2J7-1 - 4	--	No Connection	2J9-1	WHT-VIO	Playfield Gen Illum Pwr
2J7-5	ORN	+25V dc ("C" Solenoid) / Flashers	2J9-2 - 4	--	No Connection
2J7-6	RED	+25V dc (Solenoid) / Sol 9, 10, 11	2J9-5	VIO	Playfield Gen Illum Pwr
2J7-7	WHT-GRN	Backbox Gen Illum Pwr / 2J6-8	2J9-6	YEL	Playfield Gen Illum Pwr
2J7-8	WHT-BRN	Backbox Gen Illum Pwr / 2J6-6	2J9-7	WHT-YEL	Playfield Gen Illum Pwr
2J7-9	GRN	Backbox Gen Illum Pwr / 2J6-3			
2J7-10	BRN	Backbox Gen Illum Pwr / 2J6-1	2J10-1	BLU-VIO	Lower Right Flipper Switch
			2J10-2	BLU-GRY	Lower Left Flipper Switch
2J8-1	BRN	+25V dc Power: "A" Solenoids (1, 2, 5, 8)	2J10-3, 4, 6	--	No Connection
2J8-2	YEL-VIO	+50V dc Power: "C" Solenoids (3, 4, 6, 7)	2J10-5	RED	+25V dc Power: Solenoids (9, 10, 11)
2J8-3	VIO-YEL	+50V dc Power: Solenoids 13, 14, 18, 19)	2J10-7	ORN-VIO	Flipper Ground
2J8-4	ORN	+25V dc Power: "C" Solenoids - Flashers	2J10-8	ORN-GRY	Flipper Ground
2J8-5	RED	+25V dc Power: Solenoids (9, 10, 11)	2J10-9	WHT-YEL	Coin Door Gen Illum Pwr
2J8-6, 7, 12, 13	--	No Connection	2J10-10	YEL	Coin Door Gen Illum Pwr
2J8-8	GRY-YEL	Flipper Power			
2J8-9	BLU-YEL	Flipper Power	2J12-1, 2, 9, 10	--	No Connection
2J8-10	Key Pin	No Connection	2J12-3	BRN-BLU	Solenoid 14
2J8-11	RED-WHT	+25V dc Power: Solenoids 17, 19, 21, 22	2J12-4	BRN-GRN	Solenoid 13
2J8-14	BLU-GRY	Lower Left Flipper	2J12-5	BRN-ORN	Solenoid 11
2J8-15	BLU-VIO	Lower Right Flipper	2J12-6	BRN-RED	Solenoid 10
			2J12-7	BRN-BLK	Solenoid 9
2J11-1	BRN-GRY	Solenoid 16	2J12-8	BLK-GRY	Solenoid 08C
2J11-2	BRN-VIO	Solenoid 15	2J12-11	BLK-BLU	Solenoid 06C
2J11-3 - 4	--	No Connection	2J12-12	BLK-GRN	Solenoid 05C
2J11-5	BRN-ORN	Solenoid 11	2J12-13	BLK-YEL	Solenoid 04C
2J11-6	BRN-RED	Solenoid 10	2J12-14	BLK-ORN	Solenoid 03C
2J11-7	BRN-BLK	Solenoid 9	2J12-15	BLK-RED	Solenoid 02C
2J11-8	BLK-GRY	Solenoid 08C	2J12-16	BLK-BRN	Solenoid 01C
2J11-9	BLK-VIO	Solenoid 07C			
2J11-10, 11	--	No Connection	2J14-1	RED-BRN	Lamp Row 1
2J11-12	BLK-GRN	Solenoid 05C	2J14-2	RED-BLK	Lamp Row 2
2J11-13	BLK-YEL	Solenoid 04C	2J14-3	RED-ORN	Lamp Row 3
2J11-14	BLK-ORN	Solenoid 03C	2J14-4	RED-YEL	Lamp Row 4
2J11-15	BLK-RED	Solenoid 02C	2J14-5	RED-GRN	Lamp Row 5
2J11-16	BLK-BRN	Solenoid 01C	2J14-6	RED-BLU	Lamp Row 6
			2J14-7	RED-VIO	Lamp Row 7
2J13-1	RED-BRN	Lamp Row 1	2J14-8	RED-GRY	Lamp Row 8
2J13-2	RED-BLK	Lamp Row 2	2J14-9	--	No Connection
2J13-3	RED-ORN	Lamp Row 3	2J14-10	YEL-BRN	Lamp Col 1
2J13-4	RED-YEL	Lamp Row 4	2J14-11	--	No Connection
2J13-5	RED-GRN	Lamp Row 5	2J14-12	YEL-RED	Lamp Col 2
2J13-6	RED-BLU	Lamp Row 6	2J14-13	YEL-ORN	Lamp Col 3
2J13-7	RED-VIO	Lamp Row 7	2J14-14	YEL-BLK	Lamp Col 4
2J13-8	RED-GRY	Lamp Row 8	2J14-15	YEL-GRN	Lamp Col 5
2J13-9, 10	--	No Connection	2J14-16	YEL-BLU	Lamp Col 6
2J13-11	YEL-VIO	Lamp Col 7	2J14-17	--	No Connection
2J13-12	YEL-GRY	Lamp Col 8	2J14-18	YEL-GRY	Lamp Col 8
2J15-1	GRY-YEL	+12V dc Unreg Pwr: Clock Motor	2J17-1	GRN-GRY	Switch Col 8
2J15-2	--	No Connection	2J17-2 - 7	--	No Connection
2J15-3	BLK-YEL	Ground: Clock Motor	2J17-8	WHT-ORN	Switch Row 3
2J16-1	GRY-YEL	+12V dc Unreg Pwr: 3-Dr Tgt Opto	2J19-1	GRN-RED	Switch Col 2
2J16-2	--	No Connection	2J19-2	GRN-ORN	Switch Col 3
2J16-3	BLK-YEL	Ground: 3-Dr Tgt Opto	2J19-3	GRN-YEL	Switch Col 4
			2J19-4	GRN-BLK	Switch Col 5
2J18-1	GRN-BRN	Switch Col 1	2J19-5	--	No Connection
2J18-2 - 4	--	No Connection	2J19-6	GRN-VIO	Switch Col 7
2J18-5	WHT-GRY	Switch Row 8	2J19-7	--	No Connection
2J18-6	WHT-VIO	Switch Row 7	2J19-8	Key Pin	No Connection
2J18-7	WHT-BLU	Switch Row 6	2J19-9	WHT-GRY	Switch Row 8
2J18-8	WHT-GRN	Switch Row 5	2J19-10	WHT-VIO	Switch Row 7
2J18-9	WHT-YEL	Switch Row 4	2J19-11	WHT-BLU	Switch Row 6
2J18-10	WHT-ORN	Switch Row 3	2J19-12	WHT-GRN	Switch Row 5
2J18-11	--	No Connection	2J19-13	WHT-YEL	Switch Row 4
2J18-12	WHT-BRN	Switch Row 1	2J19-14	WHT-ORN	Switch Row 3
			2J19-15	WHT-RED	Switch Row 2
2J20	Not Installed		2J19-16	WHT-BRN	Switch Row 1



WILLIAMS Electronics Games

Diagnostic Test Flowchart





DINER Lamp-Matrix Table

COLUMN ROW	1 Q66 YEL-BRN 1J7-1	2 Q64 YEL-RED 1J7-2	3 Q62 YEL-ORN 1J7-3	4 Q60 YEL-BLK 1J7-4	5 Q58 YEL-GRN 1J7-6	6 Q56 YEL-BLU 1J7-7	7 Q54 YEL-VIO 1J7-8	8 Q52 YEL-GRY 1J7-9
Q80 RED-BRN 1J6-1	20K (C Regstr) 1	Serve Again 9	D (in DINER) 17	Jukebox 1 25	Haji 33	100K Grill BONUS ₄₁	1 o'clock Dine Time 49	9 o'clock Dine Time 57
Q81 RED-BLK 1J6-2	40K (C Regstr) 2	Ramp Scores 500K (L Ramp) 10	I (in DINER) 18	Jukebox 2 26	Babs 34	250K Grill BONUS ₄₂	2 o'clock Dine Time 50	10 o'clock Dine Time 58
Q82 RED-ORN 1J6-3	60K (C Regstr) 3	Ramp Scores 500K (R Ramp) 11	N (in DINER) 19	Jukebox 3 27	Boris 35	500K Grill BONUS ₄₃	3 o'clock Dine Time 51	11 o'clock Dine Time 59
Q83 RED-YEL 1J6-5	80K (C Regstr) 4	LOCK (L Ramp) 12	E (in DINER) 20	Jukebox 4 28	Pepe 36	1 Million Grill BONUS ₄₄	4 o'clock Dine Time 52	12 o'clock Dine Time 60
Q84 RED-GRN 1J6-6	100K (C Regstr) 5	Release (Upr Right) 13	R (in DINER) 21	Jukebox 5 29	Buck 37	Extra Ball Grill BONUS ₄₅	5 o'clock Dine Time 53	Top 5 Hits w/Lit 61
Q85 RED-BLU 1J6-7	Adv DINE TIME (L Return Lane) 6	RUSH 1 (Upr Right) 14	E ② (Top Lane) 22	Hot Dog (C Dr Tgt) 30	Root Beer (L Dr Tgt) 38	Spot Food (L) 46	6 o'clock Dine Time 54	Today's Special 62
Q86 RED-VIO 1J6-8	Adv DINE TIME (R Return Lane) 7	RUSH 2 (Lwr Right) 15	A ② (Top Lane) 23	Burger (C Dr Tgt) 31	Fries (L Dr Tgt) 39	Cup Scores 10X Diner Letter 47	7 o'clock Dine Time 55	Dine Time Collect 63
Q87 RED-GRY 1J6-9	Extra Ball (Right Outlane) 8	Spinner 16	T ② (Top Lane) 24	Chili (C Dr Tgt) 32	Iced Tea (L Dr Tgt) 40	Extra Ball (Left Outlane) 48	8 o'clock Dine Time 56	Spot Food (R) 64

BR = Bottom right; BL = Bottom Left ○ = Multiple Lamps

DINER Switch-Matrix Table

COLUMN ROW	1 Q45 GRN-BRN 1J8-1	2 Q49 GRN-RED 1J8-2	3 Q44 GRN-ORN 1J8-3	4 Q48 GRN-YEL 1J8-4	5 Q43 GRN-BLK 1J8-5	6 Q47 GRN-BLU 1J8-7	7 Q42 GRN-VIO 1J8-8	8 Q46 GRN-GRY 1J8-9
1 WHT-BRN 1J10-9	Plumb Bob Tilt 1	Outhole 9	Cup 17	25	33	41	Upper Left Eject 49	Flipper Right 57
2 WHT-RED 1J10-8	C Side Power A/C Relay 2	Up/Down (L Ramp) 10	Grill Bonus 18	26	34	42	Lower Left Eject 50	Flipper Left 58
3 WHT-ORN 1J10-7	Game Start 3	Ball Trough #1 (right) 11	E (Top Lane) 19	R Ramp Entry 27	35	43	Left Jet Bumper 51	Clock Wheel 59
4 WHT-YEL 1J10-6	Right Coin Chute 4	Ball Trough #2 (mid) 12	A (Top Lane) 20	R Ramp Exit 28	L Ramp Exit 36	44	Right Jet Bumper 52	60
5 WHT-GRN 1J10-5	Center Coin Chute 5	Ball Trough #3 (left) 13	T (Top Lane) 21	Cup Entry R Ramp 29	Left Outlane 37	45	Lower Jet Bumper 53	61
6 WHT-BLU 1J10-3	Left Coin Chute 6	Shooter Lane 14	Hot Dog (C 3-Bk Dr Tgt) 22	Root Beer (L 3-Bk Dr Tgt) 30	Left Return Lane 38	46	BR Kicker ("sling") 54	62
7 WHT-VIO 1J10-2	Slam Tilt 7	Sub-P'fld Shooter 1 15	Burger (C 3-Bk Dr Tgt) 23	Fries (L 3-Bk Dr Tgt) 31	Right Return Lane 39	47	BL Kicker ("sling") 55	63
8 WHT-GRY 1J10-1	High Score Reset 8	Sub-P'fld Shooter 2 16	Chili (C 3-Bk Dr Tgt) 24	Iced Tea (L 3-Bk Dr Tgt) 32	Right Outlane 40	48	Spinner 56	64

BL = Bottom Left BR = Bottom Right

WARNINGS & NOTICES

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TO MAINTAIN THESE LEVELS, reposition harnesses and reconnect ground straps to their original placements, if they become disconnected during maintenance.

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WARNING:

**Transport this game ONLY
with hinged backbox DOWN!**