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Williams





SLUGFEST™

Operations Manual

* Game Rules & Playfield Shots
* Game Operation & Adjustments
* Game Testing & Problem Diagnosis
* Parts Information
* Reference Diagrams & Schematics

Williams Electronics Games, Inc.
3401 N. California Ave.
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SLUGFEST Jumper Chart

	W14	W15	W16	W17	W18
American*	In	In	In	In	In
French	In	In	In	Out	In
German	In	In	In	In	Out

* All of the above jumpers in, or two or more of these cut

SLUGFEST Solenoid Table

Sol. No.	Function	Solenoid Type	Wire Color Drive	Wire Color Power	Connections	Driver Trnstr	Solenoid Part Number Flashlamp Type
01	Baseball Bat	High Power	Vio-Brn	Vio-Yel	J130-1	Q82	A-14499
02	Magnet	High Power	Vio-Red	Vio-Yel	J130-2	Q80	B-20-9608
03	Not Used	High Power	Vio-Org		J130-4	Q78	NU
04	Not Used	High Power	Vio-Yel		J130-5	Q76	NU
05	Not Used	High Power	Vio-Grn		J130-6	Q64	NU
06	Not Used	High Power	Vio-Blu		J130-7	Q66	NU
07	Knocker	High Power	Vio-Blk	Vio-Yel	J130-8	Q68	AE-23-800
08	Not Used	High Power	Vio-Gry		J130-9	Q70	NU
09	Not Used	Low Power	Brn-Blk		J127-1	Q58	NU
10	Not Used	Low Power	Brn-Red		J127-3	Q56	NU
11	Not Used	Low Power	Brn-Org		J127-4	Q54	NU
12	Not Used	Low Power	Brn-Yel		J127-5	Q52	NU
13	Not Used	Low Power	Brn-Grn		J127-6	Q50	NU
14	Not Used	Low Power	Brn-Blu		J127-7	Q48	NU
15	Not Used	Low Power	Brn-Vio		J127-8	Q46	NU
16	Not Used	Low Power	Brn-Gry		J127-9	Q44	NU
17	F.L. Left Bleacher Home Run	Flasher	Blk-Brn	Red-Wht	J125-1	Q42	#806
18	F.L. Ctr. Bleacher Home Run	Flasher	Blk-Red	Red-Wht	J126-2	Q40	#806
19	F.L. Rt. Bleacher Home Run	Flasher	Blk-Org	Red-Wht	J126-3	Q38	#806
20	F.L. Ramp Left	Flasher	Blk-Yel	Red-Wht	J126-4	Q36	#912
21	Ramp Motor		Blu-Grn	Vio-Org	J126-6	Q28	14-7960
22	Fast Pitch		Blu-Blk	Vio-Org	J126-7	Q30	14-7959
23	Medium Pitch		Blu-Vio	Vio-Org	J126-8	Q34	14-7959
24	Slow Pitch		Blu-Gry	Vio-Org	J126-9	Q32	14-7959
25	F.L. Ramp Middle	Flasher	Blu-Brn	Red-Wht	J122-1	Q26	#912
26	F.L. Ramp Right	Flasher	Blu-Red	Red-Wht	J122-2	Q24	#912
27	Dispenser Motor		Blu-Org	Vio-Org	J122-3	Q22	14-7962 (card)
28	Dispenser Low Lamp		Blu-Yel	Vio-Org	J122-4	Q20	20-9679 (card)
	General Illumination Circuits						
01	G.I. Infield Top	G.I.	Wht-Brn	Brn	J121-7	Q18	#555
02	G.I. Backbox	G.I.	Wht-Org	Org	J120-8	Q10	#555
03	G.I. Pitch Lamps	G.I.	Wht-Yel	Yel	J120-9	Q14	#555
04	G.I. Outfield	G.I.	Wht-Grn	Grn	J121-11	Q16	#555
05	G.I. Infield Bottom	G.I.	Wht-Vio	Vio	J120-11	Q12	#555

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THE SPECIFICATIONS AND PARTS IDENTIFIED IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE.

THIS GAME IS FACTORY SET TO DISPENSE CARDS. SEE THE GAME CONFIGURATION SECTION FOR DISPENSING TICKETS* OR COIN-OP.

*** IMPORTANT! EQUIPPING AN ELECTRONIC GAME WITH A REDEMPTION DEVICE MAY BE PROHIBITED UNDER APPLICABLE LAWS. CHECK WITH LOCAL AUTORITIES CONCERNING THESE LAWS PRIOR TO INSTALLING ANY TICKET OR OTHER REDEMPTION DEVICE.**

Table of Contents

SLUGFEST Game Rules & Playfield Shots . . . . . A-D

Section 1 - Game Operation & Test Information

(System WPC) ROM Summary 1-1

Connector & Component Identification 1-2

Circuit Boards. 1-2

Figure 1. Locations Diagram- Game Circuit Boards and Major Mechanisms. . . . 1-3

Game Control Locations 1-4

Figure 2. Pinball Game Control Locations 1-4

SLUGFEST Game Assembly Instructions 1-5

Figure 3. SLUGFEST Assembly, Cabinet Parts and Leg Levelers Detail 1-5

Game Operation. 1-7

Game Configuration. 1-9

Operating a Ticket Dispenser. 1-10

Menu System Operation 1-11

Main Menu 1-11

Adjustment Menu 1-11

Standard Adjustments 1-11

Feature Adjustments. 1-13

Pricing Adjustments. 1-17

Pricing Table. 1-19

H.S.T.D. Adjustments. 1-20

Printer Adjustments 1-21

Dispenser Adjustments 1-22

Bookkeeping Menu 1-25

Main Audits 1-26

Earnings Audits 1-26

Standard Audits. 1-26

Feature Audits 1-27

Histograms 1-28

Time-Stamps 1-29

Printouts Menu 1-30

Test Menu. 1-30

Switch Edges and Switch Levels Test 1-30

Single Switch Test and Switch Matrix Table. 1-31,1-32

Solenoid Test 1-32

Flasher Test 1-33

Solenoid Table 1-34

General Illumination Test 1-34

Sound and Music Test & Single Lamp. 1-35

Lamp Matrix. 1-36

All Lamp, Flasher and Lamp Test. 1-37

Display Test & Ramp Test. 1-37

Pitch Test 1-32

Utilities Menu 1-39

Clear Audits, Clear Coins, Reset H.S.T.D., Set Time & Date
Custom Message, Set Game I.D., Factory Adjusts, Factory Reset . . . 1-39

Presets 1-39

Preset German/European Games. 1-41

Game Configuration Menu 1-42

Game Configuration Table 1-43

Problem Analysis. 1-44

CPU Board Error Codes. 1-45

Maintenance Information 1-46

Adjusting a Card Dispenser 1-48

Fuse List 1-49

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Table of Contents Cont.

Section 2 - Game Parts Information

Cabinet Parts 2-2
Cabinet Assembly 2-3
Cabinet Assembly - Rear View 2-4
Cabinet Parts - Inside View Drawing 2-5
Cabinet Parts - Top View Drawing 2-6
Locations Diagram - Major Mechanisms 2-7
Lamp Boards 2-8
WPC Audio Board 2-9
WPC CPU Board 2-10, 2-11
Power Driver Board 2-12, 2-13
Dot Matrix Controller Assy. 2-14, 2-15
Opto Ramp Switch Assy. 2-16
Motor Regulator & High Current Driver Assy. 2-17
Diode Switch & Lamp Assy. & Knocker Assy. 2-18
Pitch Unit Assy. 2-19
Ramp Motor Assy. & Motor EMI Filter Assy. 2-20
Bat Unit Assy. 2-21
Card Dispenser Assy. 2-22, 2-23
Base and Motor Assy. 2-24
Card Dispenser PCB Assy. 2-25
Target Board Assy. 2-26
Home Run Deck Assy. 2-27
Home Run Switch & Bracket Assy. 2-28
Coil Magnet Assy. 2-28
Individual Target Assy. 2-29
Inside Light Panel Assy. 2-30
Bleachers Assy. 2-31
Coin Door. 2-32
Coin Door Interface Board & Standup Target Assy. 2-33
Ramp Assy & Ball Flap Assy.. 2-34
Unique Parts 2-35
Lamp Locations and Matrix. 2-36, 2-37
Switch Locations and Matrix 2-38, 2-39
Solenoid Locations and Table 2-40, 2-41
Playfield Parts 2-42

Section 3 - Wiring Diagrams And Schematics

Opto Ramp Switch 3-2
Card Dispenser PCB Assy. 3-3
Motor Regulator Bd. & Schematic. 3-4
Coin Door Interface Board Schematic 3-5
Power Wiring 3-7
CPU Board Schematic 3-8
Dot Matrix Bd 3-9,3-12
Sound Board Schematic 3-13, 3-14
Power Driver Board Schematic. 3-15, 3-17
Backbox Wiring 3-18
Interboard Wiring 3-19

SLUGFEST

PLAYFIELD SHOT MAPS
&
RULES

SLUGFEST GAME INSTRUCTIONS

One Player Game: Press any pitch button to pitch ball. Game selects pitches at random.

Two Player Game: One player pitches; one player bats.

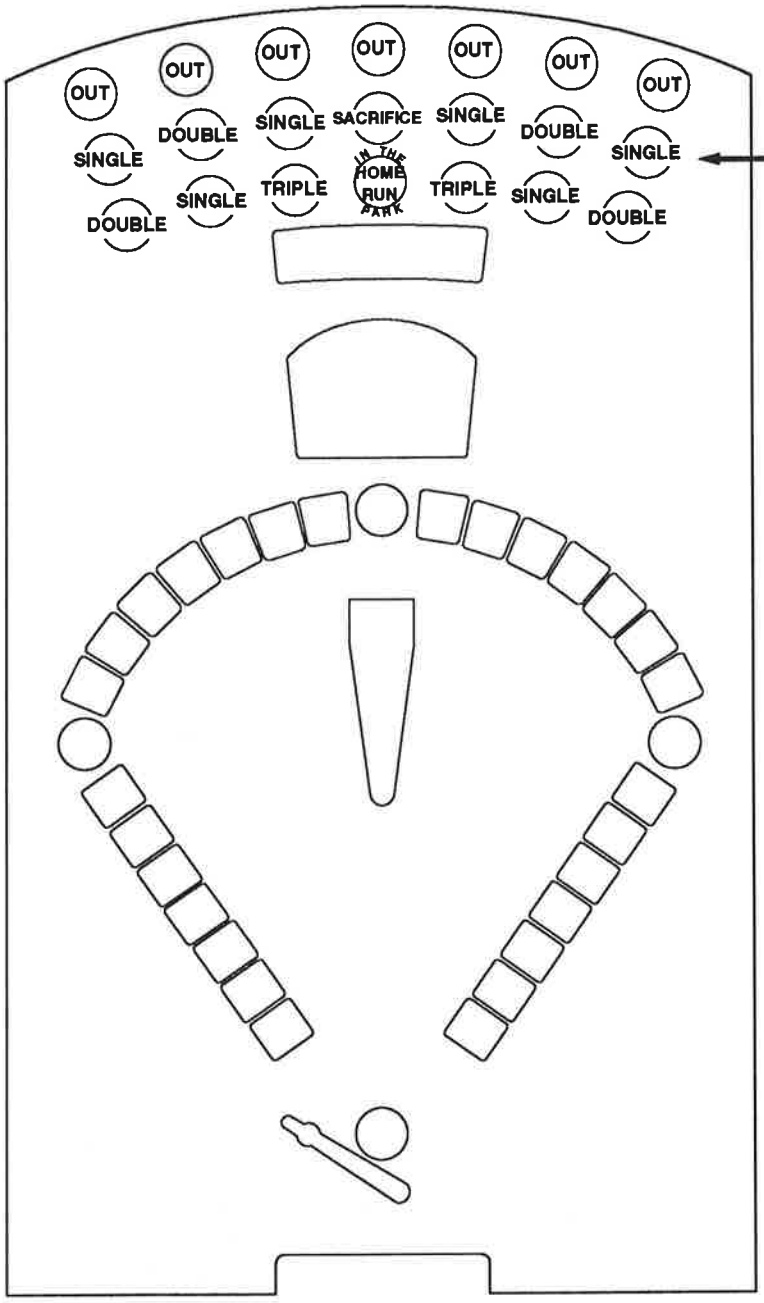
Targets score lit values.

Stealing Bases: When runner flashes on & off, repeatedly press "Steal Base" button on control panel.

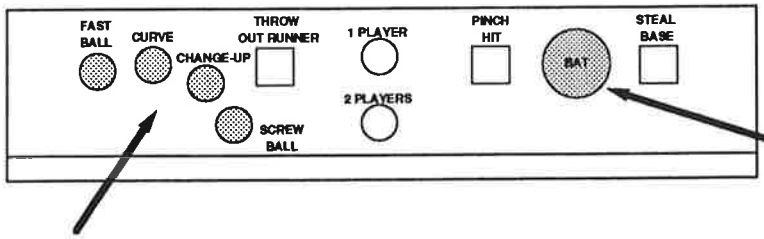
To attempt to Throw Out a Runner: (2 player game), pitcher should repeatedly press "Throw Out Runner" button on control panel.

To Pinch Hit for a batter: Press "Pinch Hit" button (when lit) on control panel.

SLUGFEST



Targets score Lit Value.

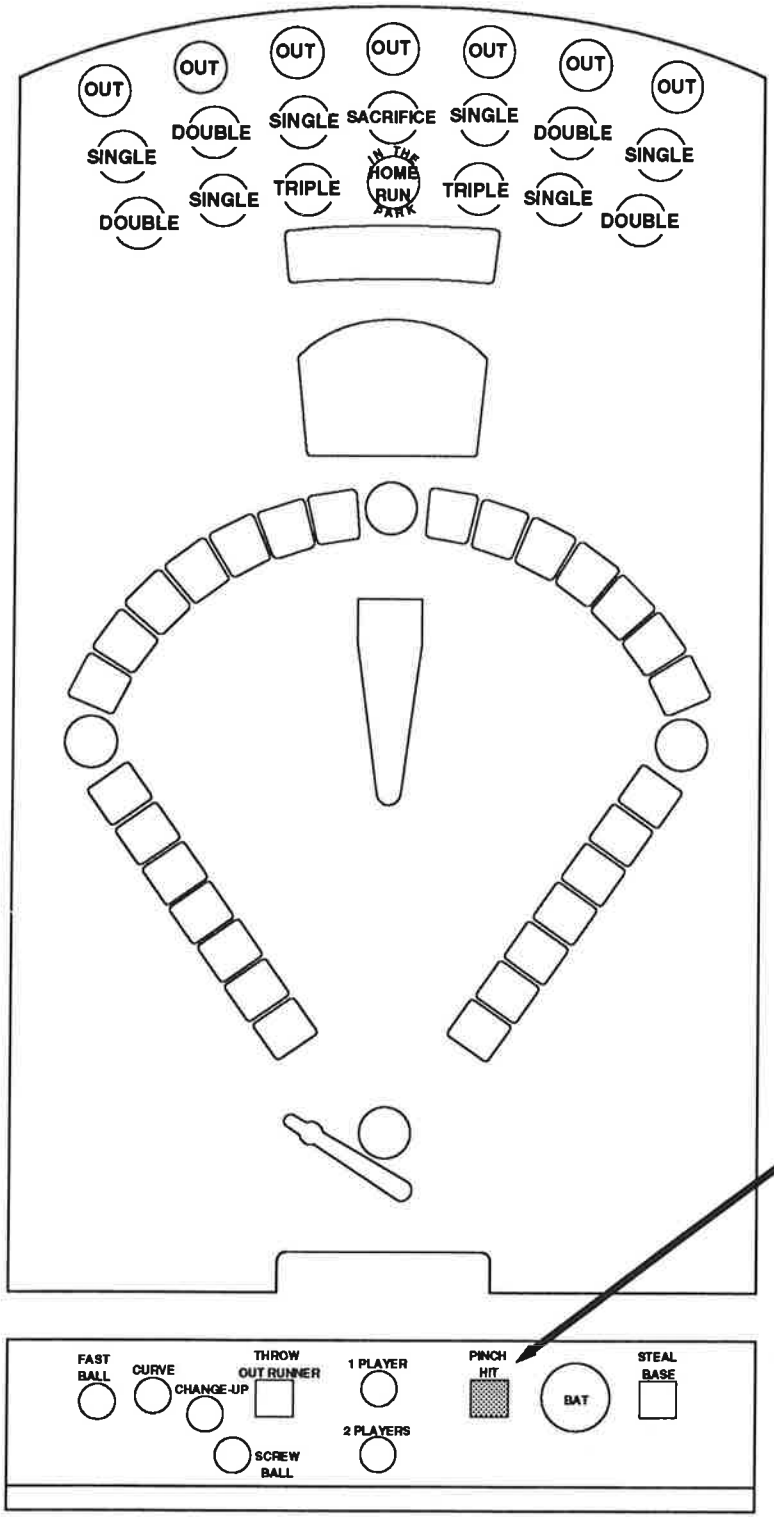


Press "BAT" to hit ball.

One player Pitch:
- Press any Pitch Button to pitch ball.

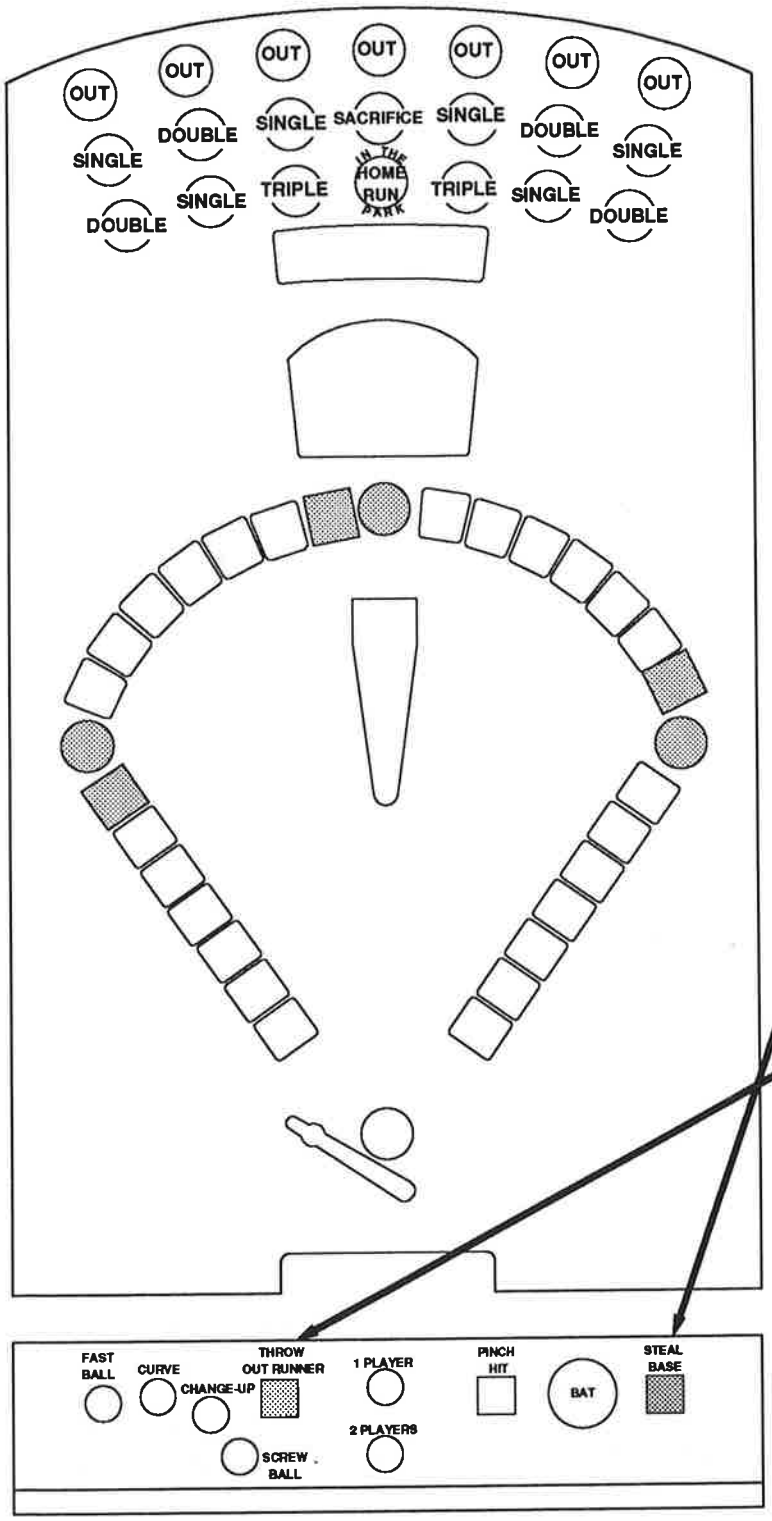
Two player Pitch:
- Pitch is selectable (fast ball, change-up, curve, or screwball).

SLUGFEST



Pinch Hit:
Batter is allowed (1) pinch hit hit per game. This is achieved by pressing the Pinch Hit Button. No outs light and the ramp is in the up position.

SLUGFEST



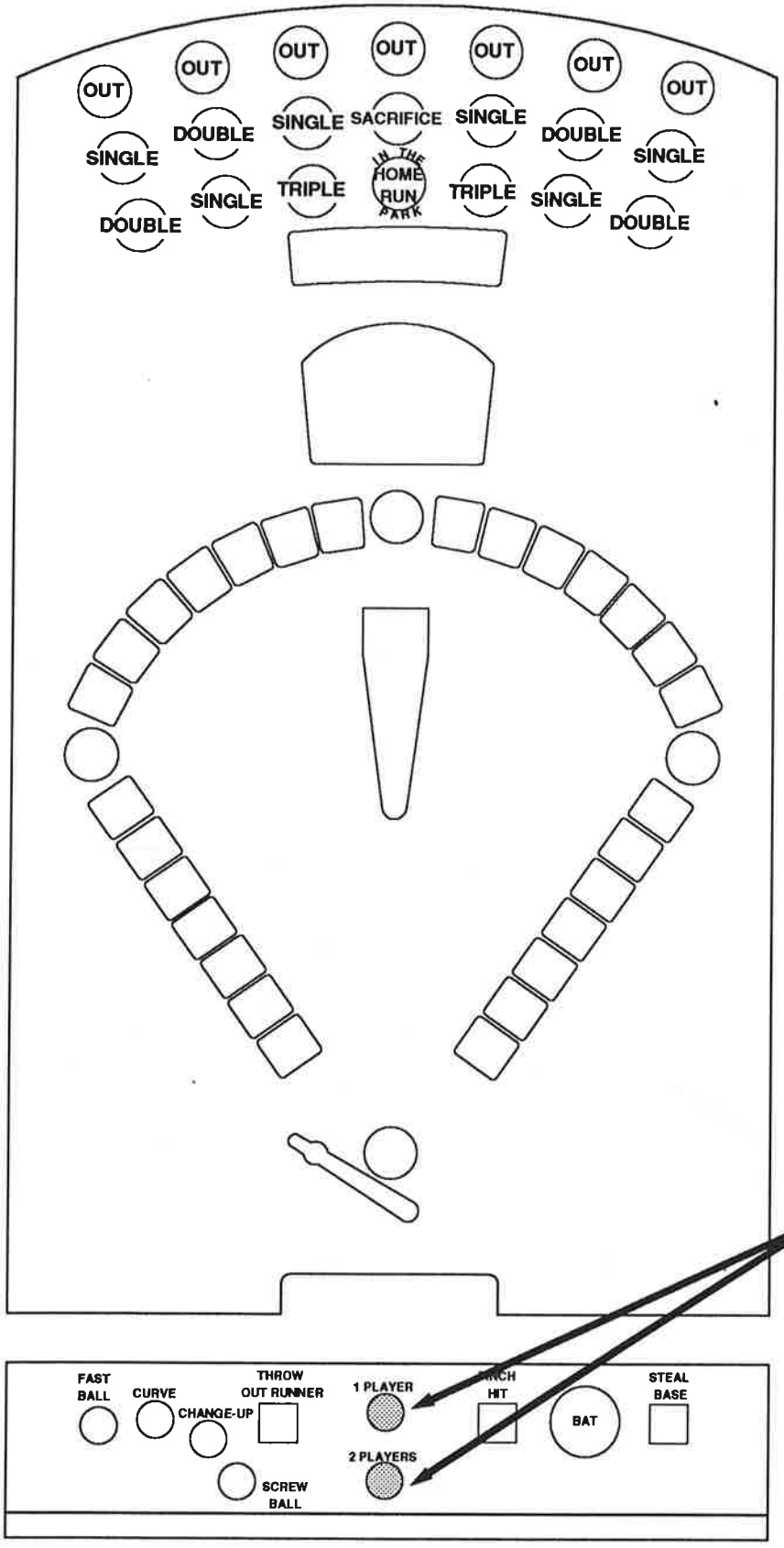
Stealing Bases:

The first base hit of game will enable runner to steal a base. Runner will flash as if to take a lead from that base. Also, the control panel buttons will light. If the batter wishes to steal, he must repeatedly press the "Steal Base" button.

In a 2 player game, the pitcher can attempt to throw out a runner by repeatedly pressing the "Throw Out Runner" button. Note, stealing a second base (in the game) requires the player to hit at least a single, double or triple* (to re-enable the stealing process).

*Operator Adjustable.

SLUGFEST



Buy In Feature:

Player(s) can buy innings to continue play. Drop in coin(s) & press the 1 or 2 Player Start Button(s) to continue game.

Section 1

Game Operation & Test Information

- **SLUGFEST (System WPC) ROM Summary**
- **SLUGFEST Game Assembly Instructions**
- **Game Play**
- **Menu System Operation**
  - **Adjustments**
  - **Audits**
  - **Test/Diagnostic Procedures**
  - **Utilities**

SLUGFEST (System WPC) ROM Summary

IC	TYPE	LOCATION	BOARD	PART NUMBER
Game ROM 1	27020	U6	CPU	A-5343-60001-1
Music/Speech ROM 2	27010	U14	Audio	A-5343-60001-2
Music/Speech ROM 3	27010	U15	Audio	A-5343-60001-3
Music/Speech ROM 4	27010	U18	Audio	A-5343-60001-4

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

Since **SLUGFEST** uses WILLIAMS ELECTRONICS GAMES' WPC Electronics System, a new technique to identify connectors and other game components must be introduced. Each plug or jack receives a number that identifies the circuit board and position on that board that it connects to. J-designations refer to the male part of a connector. P-designations refer to the female part of a connector. For example, J101 designates jack 1 of board 1 (a Power Driver Board Board jack); P306 designates plug 6 of board 3 (a Display Driver 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, J101-3 refers to pin 3 of jack 1 on board 1.

Other game components may also have similar numbers to clarify their locations or related circuit. For example, F501 refers to a fuse located on the Sound Board.

Prefix numbers for the WPC circuit boards are listed below.

1- Power Driver Board
2- CPU Board
5- Sound Board
6- Dot Matrix Controller Board
6-Dot Matrix Display/Driver Board

CIRCUIT BOARDS

WPC Circuit Boards for **SLUGFEST** are in the back of the cabinet. They are accessible by unlocking the Backdoor and swinging it open.

Lamp circuit boards are mounted under the Playfield.

CPU Board

The WPC CPU Board, P/N A-12742-60001, must be equipped with the ROM specified in the ROM Summary.

Sound Board

The Sound Board P/N A-12738-60001, must be equipped with the ROMs specified in the ROM Summary.

Power Driver Board

The Power Driver Board is P/N A-12697-1.

Dot Matrix Controller Board

The Dot Matrix Controller Board is P/N A-14039. This Board supplies the data necessary for the Dot Matrix to operate.

Dot Matrix Display/Driver Board

The Dot Matrix Display/Driver Board is P/N 5901-12784-00. This board contains the Dot Matrix glass and driver board.

SLUGFEST
Locations Diagram - Game Major Mechanisms
Underside of Playfield, Viewed in Raised Position

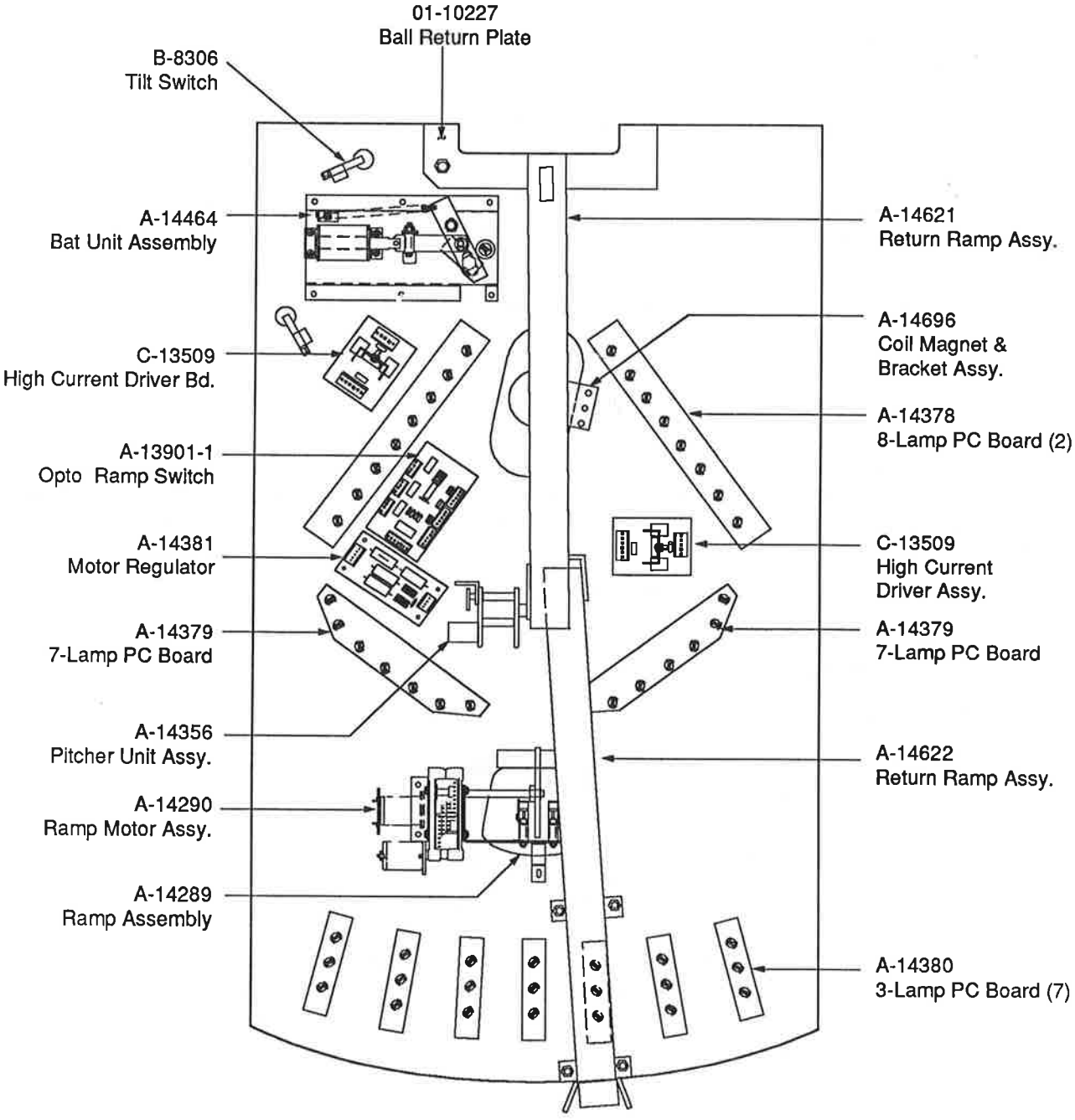


Figure 1. Locations Diagram - Game Circuit Boards & Major Mechanisms

GAME CONTROL LOCATIONS

Cabinet Switches

The On-Off switch is on the bottom of the cabinet near the left front leg.
The Start Button(s) are located in the middle of the control panel. Press either the 1 player Start or the 2 player Start button to begin a game, or during the diagnostic mode, to ask for HELP.

Coin Door Switches

The operator controls all game adjustments, obtains bookkeeping information, and diagnoses problems, using only four pushbutton switches mounted on the inside of the coin door. The Coin Door Switches have two modes of operation Normal Function and Test Function.

Normal Function

The Service Credits switch places credits on the game that are not included in the game audits.
The Volume Up switch raises the sound level of the game. Press and hold the button until the desired level is reached.
The Volume Down switch lowers the sound level of the game. Press and hold the button until the desired level is reached. See Adjustment A.1 28 to shut sound Off completely.
The Begin Test switch starts the Menu System Operation and changes the Coin Door Switches from Normal Function to Test Function.

Test Function

The Escape switch allows you to get out of a menu selection or return to the Attract Mode.
The Up switch allows you to cycle forward through the menu selections or adjustment choices.
The Down switch allows you to cycle backward through the menu selections or adjustment choices.
The Enter switch allows you to get into a menu selection or lock in an adjustment choice.

SLUGFEST Front Box

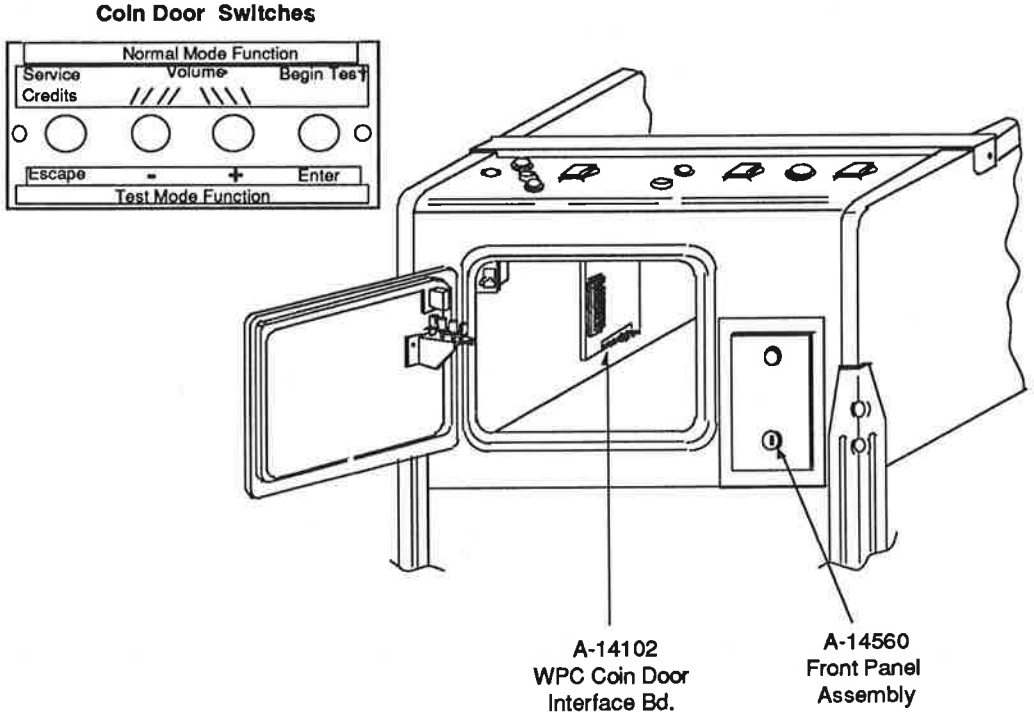


Figure 2. SLUGFEST Game Control Locations

SLUGFEST 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 using leg bolts. Leg levelers and leg bolts are provided among the parts in the cash box.

3. Attach the front legs (after installing leg levelers), using leg bolts. See Figure 3 for details.

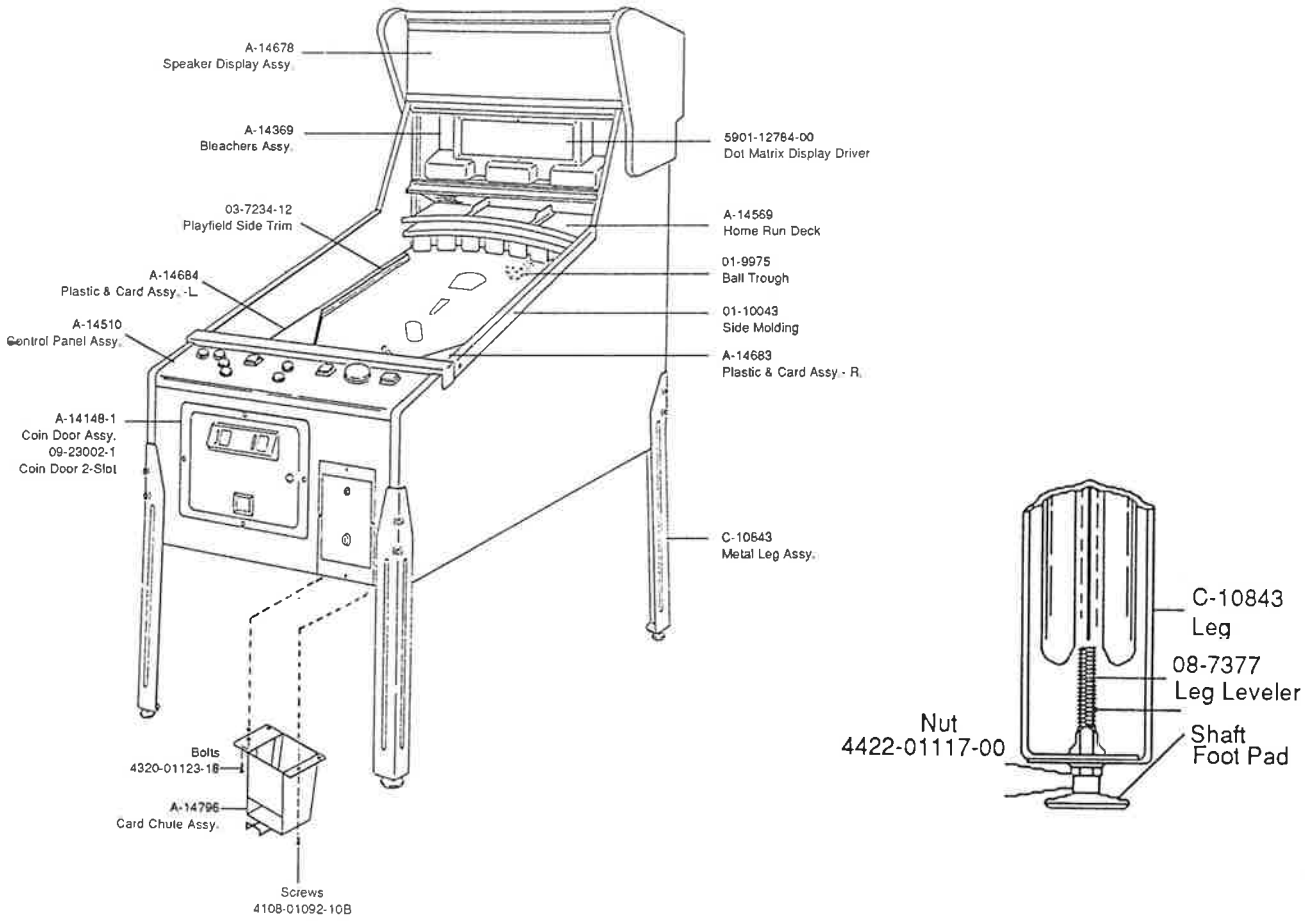


Figure 3. SLUGFEST Assembly, Playfield Pitch Angle, and Leg Leveler Details.

4. Unlock and open the top of the backbox. Place the backbox on to the back of the cabinet and use the two bolts to secure it to the cabinet. Connect the Speaker cable and the General Illumination cable from the backbox to the cabinet (note, the wires to the connector have the same color). Then, replace the backbox top and lock it in place.

FAILURE TO INSTALL the backbox mounting hardware properly can cause personal injury.

5. Extend each leg leveler *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.

6. Unlock and open the coin door. Locate the Trunk Latches, and unlatch them to release the Control Panel. Lift the Control Panel off the cabinet and disconnect the cables, then 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.

PINBALL GAME ASSEMBLY INSTRUCTIONS CON'T.

7. Place a level or an inclinometer on the playfield surface. Adjust the leg levelers for proper playfield level (side-to-side) *and* playfield pitch angle (incline) of approximately 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 leveler shaft to maintain this setting, as shown in Figure 3.

8. Install the Card Chute Assembly (A-14796) to the underside of the cabinet, with the opening towards the front of the game, using a quantity of two 1/4-20 x 1-1/8 carriage bolts (4320-001123-18), two 17/64 ID x 1/2 OD flatwashers (4300-00030-00) and two 1/4-20 flange-grip nuts (4420-01141-00) on the left side. Using the torx wrench (20-9620), provided with your game, mount the right side with two #8 x 5/8 tamper resist screws (4108-01092-10B) and two 13/64 ID x 5/8 OD tamper resist flatwashers (4700-00023-00). See page 2-3 for pictorial reference.

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. **SLUGFEST** uses 6 balls.

11. Clean and reinstall the playfield cover glass, reversing the procedure of step 6. Prepare the game for player operation.

GAME OPERATION

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 displays initially show the last score. 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 BEGIN TEST switch to begin the game test routine. The Dot Matrix Display/Driver shows the game name, the game number and the game software revision. The message changes. The Dot Matrix Display/Driver shows the operating system software revision, and the date the game software was revised.

SLUGFEST		**SLUGFEST**	
60001	**Rev. L-1**	**SY. 0.90**	**4-2-91**

Perform the entire test menu routine to verify that the game is operating satisfactorily (refer to later text entitled "Menu System Operation"). Successful completion of the tests shows that the game is ready to begin earning your investment return.

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' 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"
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.

* - operator-adjustable feature

GAME OPERATION CON'T.

CREDIT POSTING

Insert coin(s). A sound is heard for each coin, and the display shows 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 either the 1 Player or 2 Player Start Button once. A startup sound plays, and the Credit amount shown in the display decreases.

TILTS

Actuating the Slam Tilt switch on the coin door inside the cabinet ends the current game and then proceeds to the Game Over Mode. With the third closure* of any playfield tilt switch, the player loses the remaining play of that inning, 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 display. Credit* may be awarded, when the last two digits of any player's score display (1 through 4) match the random digits. Match, high score, and game over sounds are made, as appropriate.

GAME OVER MODE

The GAME OVER display shows in the display. Then, the high scores flashes on the display. The game proceeds to the Attract Mode.

* - operator-adjustable feature

GAME CONFIGURATION

(REDEMPTION TICKETS, BASEBALL CARDS, COIN-OP)

This game can dispense baseball cards or tickets, or can be used as a regular coin-operated game. It comes shipped ready for dispensing baseball cards. But, it can be easily changed to a coin-operated or ticket redemption type game. There are 3 installs:

In the "Configuration Menu":

C.1 Set Cards
C.2 Set Tickets
C.3 Set Coin-op

These allow the operator to quickly change the game into any configuration. This chapter explains how to change and operated your game in any of these configurations.

CONVERSION TO A BASEBALL CARD DISPENSING GAME:

IMPORTANT! EQUIPPING AN ELECTRONIC GAME WITH A REDEMPTION DEVICE MAY BE PROHIBITED UNDER APPLICABLE LAWS. CHECK WITH LOCAL AUTHORITIES CONCERNING THESE LAWS PRIOR TO INSTALLING ANY TICKET OR OTHER REDEMPTION DEVICE.

Note, the dispenser is not guaranteed to operate properly when the humidity is at or above 90 level.

Note, it is REQUIRED that the PICTURE SIDE OF ALL CARDS faces the back of the dispenser.

Note, use only Vending Machine Baseball Cards. DO NOT use individually wrapped cards (packaged with gum or food) because the dispenser will not operate properly.

Your game is shipped with the baseball card dispenser in place, but after the game is delivered to its location, do not forget to attach the card catcher under the front right corner of the cabinet. The factory game settings are ready to dispense a conservative average of 1 card/quarter (in the USA).

If you have converted this game to tickets or coin-op, then attach the card dispenser and card catcher back onto the machine, and use configuration C.1 "Set Cards".

To load the baseball card dispenser hopper, turn the game off. Then unlock & pull the dispenser open. Move the spring loaded pressure plate to the back of the dispenser. Then, tilting the top of the pressure plate towards the back of the dispenser will lock it in place. Next, add cards from the back of the hopper to the front of the hopper. It is REQUIRED that the PICTURE SIDE OF ALL CARDS faces the back of the dispenser. After the dispenser has been filled, push the cards toward the front of the dispenser, then straighten the pressure plate to allow it to compress the cards. Turn the game on and test the dispenser by pressing the "Unjammed" button on the circuit board. The dispenser should grab and dispense 1 card. Then, turn off the game, push the dispenser back in the cabinet (making sure the cable does not get tangled). Lastly, lock the dispenser and turn the game back on.

CONVERSION TO A TICKET DISPENSING GAME:

IMPORTANT! EQUIPPING AN ELECTRONIC GAME WITH A REDEMPTION DEVICE MAY BE PROHIBITED UNDER APPLICABLE LAWS. CHECK WITH LOCAL AUTHORITIES CONCERNING THESE LAWS PRIOR TO INSTALLING ANY TICKET OR OTHER REDEMPTION DEVICE.

TO ORDER A DISPENSER, you will need a "Dispenser Interface Kit" from your distributor, and you will need to order a dispenser. The "Deltronics Ticket Dispenser" Model DL-1275 with outside mount case from Deltronic Lab Inc., Chalfont, Pennsylvania 18914, (215) 977-8616 is compatible.
Note: Some assembly is required.

OPTIONAL DISPENSER ITEMS. The Deltronic Dispenser does not have a ticket low indicator (lamp and switch). But, if you supply your own switch, lamp and mounting hardware, the "Dispenser Interface Kit" provides wires to use these optional items.

AFTER THE DISPENSER IS IN PLACE, use configuration C.2 "Set Tickets" to setup your game for initial ticket settings to dispense a conservative average of 6 tickets/quarter (in the USA).

CONVERSION TO COIN-OP

REMOVE THE BASEBALL CARD DISPENSER AND CARD CATCHER, use the blank cover plates to cover the dispenser and card catcher holes. Then use configuration C.3 "Set Coin-Op" to setup your game for regular coin operated credits and extra innings. You can now use the other presets or adjustments to change the game to meet the demands of your location.

OPERATING A DISPENSER

DISPLAY OF HISTORICAL DISPENSER RATE. This is how many dispensed items (Tickets or Baseball Cards) have been dispensed per base unit (factory setting is per QUARTER in the USA) with the current game adjustments (i.e. since the game was "FACTORY RESET" or since the "HISTORICAL INFORMATION" was cleared). This rate is displayed after about 100 games (on the bottom of the display) in the dispenser adjustments. You can vary these game adjustments and the game will re-calculate the new dispenser rate based upon previous games. This makes manually adjusting your game easy.

SELECTING A DISPENSER RATE. the operator can select a dispenser rate (i.e. tickets/quarter) and have the game select a set of dispenser adjustments. The only requirement is that the game must gather at least 100 plays before this selection can be done.

AUTOMATICALLY RE-SELECTING A DISPENSER RATE. one a week, the game can be set to automatically re-select a new set of dispenser adjustments at the current "DISPENSER RATE" adjustment.

OPERATING YOUR DISPENSER . The "Dispenser Low" lamp turns on when the dispenser is low on tickets or baseball cards. It also blinks when the dispenser is empty or jammed (requiring service). During normal operation, it should be off.

DISPENSER JAMS. If the dispenser should jam or become empty, the dispenser is turned off and the ticket low lamp will blink. There is a game adjust A.6 06 "Dispenser Errors" which can direct the game to stop until the problem is resolved (for dispensing tickets), or ignore the problem and continue the game (for dispensing cards). After the operator corrects the problem (tickets are re-loaded to just show through the dispenser exit hole, and baseball cards can be in any position), the operator should press the "ticket unjammed" switch located inside the dispenser on the printed circuit card. The game will then dispense the remaining tickets that have accumulated.

NOTE: If this amount is excessive, turn the game "OFF" then "ON".

TO MANUALLY DISPENSE A TICKET OR BASEBALL CARD. Press the "ticket unjammed" switch (located inside the dispenser) during the game or during the attract mode (assuming that there are no jams). The dispenser will dispense 1 item, without effecting any audits.

MENU SYSTEM OPERATION

SLUGFEST operates on a Menu System. The Main Menu allows you to choose from several main categories, which in turn lead to other menus to choose from. To enter the Menu System, open the coin door and press the Begin Test button. The display shows the Game I.D. Mode. Press the Enter button and the Main Menu appears. To cycle through the Main Menu selections press either the Up or Down button. Activate any selection by pressing the Enter button when the desired selection appears in the display. To return to the Attract Mode while viewing the Main Menu, or to return to a previous menu selection, press the Escape button. Press the Start button for HELP at any time.

MAIN MENU

B. Bookkeeping
P. Printouts (optional board required)
T. Tests
U. Utilities
C. Game Configuration Adj.
A. Adjustments

The game Adjustments are the first category available from the Main Menu. Press the Enter button to activate the Adjustments Menu. Press the Up or Down button to cycle through the Adjustment Menu selections. Press the Enter button to activate the desired Adjustment Group when that group appears in the display.

A. ADJUSTMENTS MENU

A.1 Standard Adjustments
A.2 Feature Adjustments
A.3 Pricing Adjustments
A.4 H.S.T.D Adjustments
A.5 Printer Adjustments (optional board required)
A.6 Dispenser Adjustments

Once you have entered the adjustment group desired, press the Up or Down button to cycle through the available adjustments in that group. When the desired adjustment appears press the Enter button to activate that adjustment. When an adjustment is activated, the setting value begins to flash. Use the Up or Down button to raise or lower the setting value. When the desired value is displayed press Enter to lock in the value. IF you realize you have made an error, press the Escape button while "Saving Adjustment Value" is displayed. The new value is ignored and the original value is retained.

A.1 Standard Adjustments

A.1 02 Tilt Warnings
The operator specifies 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 10.

A.1 09 Replay Level 1**

The operator chooses the value to be used for the first Fixed Replay. The range of this setting is 00 to 25, 000, 000.

A.1 10 Replay Level 2**

The operator chooses the value to be used for the second Fixed Replay. The range of this setting is 00 to 25, 000, 000.

A.1 11 Replay Level 3**

The operator chooses the value to be used for the third Fixed Replay. The range of this setting is 00 to 25, 000, 000. ** For Fixed Replay

A.1 12 Replay Level 4**

The operator chooses the value to be used for the fourth Fixed Replay. The range of this setting is 00 to 25, 000, 000. ** For Fixed Replay

A.1 14 Replay Award

For Fixed Replay the operator can choose the form of the award automatically provided when the player exceeds any replay level. The choices are:

Credit - Reaching each Replay level awards credit.
Ticket - Reaching each Replay level awards a ticket.
Inning- Reaching each Replay level awards an Extra Inning.
Audit - Reaching each Replay level awards nothing to the player; it does increase the entry value of the Audit Item(s) maintaining a tally of these awards.

A.1 16 Match Award

The operator can choose the award automatically provided when the players wins a match. The choices are:

Credit - Winning a Match awards a Credit.
Ticket - Winning a Match awards a Ticket.

A.1 17 Extra Inning Ticket

The operator can choose whether a Ticket is awarded when the player earns an Extra Inning. The choices are:

YES - The player is awarded a Ticket in addition to an Extra Inning.
NO - The player is not awarded a Ticket.

A.1 19 Match Feature

The operator can choose the desired percentage for the Match Feature occurring at the end of the game. The range of this setting is:

OFF - Match Feature is not available.
1-50% - 1% is 'hard'; 50% is 'extremely easy'. During the Match Feature the game selects a random two-digit number at the end of the game and compares each players score for an identical two digits in the rightmost two positions. A matching of these two digits result in the award of a Credit or a Ticket.

A.1 20 Custom Message

The operator chooses if a message is displayed during the Attract Mode. The choices are:

YES - A message is displayed
NO - A message is not displayed.

A.1 21 Language

The operator chooses what language the game uses. The choices are: English, French, or German.

A.1 22 Clock Style

The operator chooses what style of clock the game uses. The choices are: A.M./P.M. or 24 Hours.

A.1 23 Date Style

The operator chooses what style of date the game uses. The choices are: Month/Date/Year, or Date/Month/Year.

A.1 24 Show Date and Time

The operator chooses whether the date and time show in the Attract Mode. The choices are:

YES - Show the date, time in status report or in the Attract Mode.
NO - Do Not show date, time in status report or in the Attract Mode.

A.1 25 Allow Dim Illumination

The operator chooses whether to allow the game program to dim the General Illumination for special effects and during the Attract Mode. The choices are:

YES - Allow dimming the General Illumination during the Attract Mode & Effects.
NO - Do Not dim the General Illumination.

A.1 26 Tournament Play

The operator chooses whether to equalize Multi-ball and Jackpots during multi-player games, (do not carry over to next player). The choices are:

YES - Keep Multi-ball and Jackpots equal.
NO - Do Not Keep Multi-ball and Jackpots equal.

A.1 27 Euro. Scr. Format

The operator chooses whether to have commas or dots between digits when numbers are displayed. The choices are:

YES - Dots instead of commas, (example- 1.000.000).
NO - Commas instead of dots, (example- 1, 000, 000).

A.1 28 Minimum Volume Control

The operator chooses whether the volume can be turned Off. The choices are:

YES - Volume can be turned Off.
NO - Volume can be turned Down but not Off.

A.1 29 G.I. Power Saver

This adjustment allows the General Illumination lamps to be dimmed following a time interval after a game is played. A.1 30 (POWER SAVER LEVEL) determines how dim the lamps get. The use of this feature substantially increases the life of the General Illumination lamps. The range of this setting is Off, 2 through 60 minutes.

A.1 30 Power Saver Level

When G.I. Power Saver (A.1 29) is turned On, this is the intensity level that is used once the game is idle for the specified period of time. The range of this setting is 4 through 7.

Press the Escape button to return to the Adjustments Menu. Press the Up button to advance to the next desired Adjustments Group, (or press the Down button to return to a previous group). Press the Enter button to activate. Use the Up or Down button to cycle through the available adjustments.

A.2 Feature Adjustments

A.2 01 One Player Game

The operator chooses if this game is for 1 player only. Note, this is useful when 2 players are cooperating to get high scores. The choices are:

No = Allow both 1 & 2 player games.
Yes = One player games only.

A.2 02 Auto Select Pitch

The operator chooses if the game should automatically select which pitch to use. When this adjustment uses "Auto. Select Pitch", the next adjustment chooses the difficulty level. The choices are:

Never = The player can select the pitch.
1 Player Game = The game will select the pitch for ALL 1 player games.
Always = The game will select the pitch for ALL games.

A.2 03 Auto Pitch Difficulty

The operator chooses how difficult pitches are pitched when the previous adjustment (Auto. Sel. Pitch) is allowed. The range of this setting is Ex. Easy (liberal) through Ex. Hard (conservative).

A.2 04 Allow Steal Home

The operator chooses if the "Steal Base" feature will allow a running to steal from 3rd base to home plate. Stealing from 1st base to 2nd base and 2nd base to 3rd base is always allowed. The choices are:

Yes = Player can steal from 3rd base to Home plate.
No = Player cannot steal from 3rd base to Home plate.

A.2 05 All Runners Steal

The operator chooses if the "Steal Base" feature will allow all runners on every base to advance a base or only 1 runner is allowed to steal a base. Note, only 1 runner can be "tagged" out, the other runners are always "safe".

Yes=All runners will steal a base.
No=Only 1 runner will steal a base.

A.2 06 Liberal Steals

The operator chooses how easy "Steal Bases" occur until this feature will be made "hard".The choices are:

0 = (conservative) Start hard.
1-50 = Wait 1-50 (liberal) steals until being hard.

A.2 07 Re-allow Stealing

The operator chooses when the steal base feature is allowed to be started. The choices are:

SINGLE = when at LEAST a single is hit.
DOUBLE = when at LEAST a double is hit.
TRIPLE = when at LEAST a triple is hit.

A.2 08 Pinch Hits/Start
A.2 09 Pinch Hits/Buyin

The operator chooses how many pinch hitters are added to the current number of allowed pinch hitters (per Player) when the start button is pressed, or when a buyin occurs. Pinch hitters are always "stacked" until the end of a game. The choices are:

0 = No more pinch hitters.
1-10 = 1-10 more pinch hitters.

A.2 10 Tie, Free Inning

The operator chooses if 1 free inning will occur when a 2 player game has their "runs" tied. The choices are:

Yes = Allow 1 extra inning when runs are tied.
No = Do not allow an extra inning when runs are tied.

A.2 11 Out Lamp Difficulty

The operator chooses how difficult the playfield "Out" lamps become during the normal course of a game. The range of this setting is Ex. Easy (liberal) through Ex. Hard (conservative).

A.2 12 Heckler Memory

The operator chooses if the buildup of the heckler score is retained from inning to inning. The choices are:

Yes = The heckler score builds up until the end of a game.
No = The heckler score builds up until the end of an inning.

A.2 13 Double Hit Target

The operator chooses how to resolve multiple hit playfield targets. The choices are:

Highest = Select highest value target.
First = Select first hit target.

A.2 14 Unknown Hits

The operator chooses how to resolve pitches that did not hit any scoring switches. The choices are:

Ball = Call it a ball, 4 balls and a walk occurs.
Foul Ball = Call it a foul ball (a strike up to two strikes).
Strike = Call it a strike, 3 strikes yer out.

A.2 15 Un-Swung Bat

The operator chooses how the umpire calls a pitch when the bat is NOT moved. The choices are:

Strike = A strike, 3 strikes and "yer out".
3 Balls = A ball up to 3 balls (no walks) then strikes up to three strikes & "yer out". (A maximum of 5 pitches & "yer out".)

A.2 16 National Anthem

The operator chooses if the National Anthem is played at game start. The choices are:

Yes = The National Anthem is played at game start.
No = The National Anthem is NOT played at game start.

A.2 17 Attract Mode Sounds

The operator chooses if the game will make sounds during the attract mode. The choices are:

A lot = Sounds will be made during the attract mode.
None = No sounds will be made during the attract mode.

A.2 18 Family Mode

The operator chooses if the game will contain colorful speech and or actions. For "SLUGFEST", the batter names are not shown. The choices are:

Yes = Colorful speech/actions are NOT allowed.
No = Colorful speech/actions are allowed.

A.2 19 Maximum Innings

The operator chooses how many innings the game will allow to be bought. The choices are 1 to 99 innings.

A.2 20 Two Player Extra Inning

The operator chooses if an extra inning can be awarded during a 2 player game (an extra inning is awarded to BOTH players). Any extra innings are always awarded for a 1 player game. Note, the "Tie - Extra Inning" feature is not effected by this adjustment. The choices are:

NO = No Extra Innings are awarded during a 2 player game.
YES = Extra Innings are awarded to BOTH players in a 2 player game.

A.2 21 Heckler/ Extra Inning
A.2 22 Heckler/ Extra Inning
A.2 23 Heckler/ Extra Inning
A.2 24 Heckler/ Extra Inning

The operator chooses up to 4 different innings that allow the Heckler (when lit) to award 1 extra inning. The choices are:

None = The "Hit Heckler" will not award an extra inning.
1-99 = "Hitting the Heckler" will award an extra inning (inning 1 to 99).

A.2 25 Runs Award

The operator chooses what to award when the below "Runs Level" is reached. The choices are:

Credit = 1 credit.
Extra Inning = 1 Extra Inning.
Nothing = All "Runs Level" do nothing.

A.2 26 Runs Level 1
A.2 27 Runs Level 2
A.2 28 Runs Level 3
A.2 29 Runs Level 4

The operator chooses up to 4 different runs (a batter crossing that can generate an extra inning, credit, or nothing (as per the "Runs Award" adjustment) during the game. The choices are:

None = This adjustment will not award anything.
1-99 = When the player reaches this many runs the game will award the "Runs Award".

A.2 30 7th Inning Stretch

The operator chooses if the game will pause for a show during the middle of the 7th inning. The choices are:

YES = Display a 7th inning stretch show.
NO = Do NOT display a 7th inning stretch show.

A.2 31 Extra Inning Awards a Pinch Hitter

The operator chooses if the game should award 1 extra pinch hitter when an extra inning is awarded. The choices are:

YES = Award 1 pinch hitter with the extra inning.
NO = Do not award pinch hitters with extra inning (pinch hitters only given by game start and buyin).

Press the Up button to advance to the next desired Adjustment Group, (or press the Down button to return to a previous Adjustment Group). Press the Enter button to activate that group. Press the Up or Down button to cycle through the available adjustments in that group.

A. 3 Pricing Adjustments

A.3 01 Game Pricing (if set to custom, then 02 to 09 are available)
The operator chooses the cost for a game from a selection of Standard pricing or by installing Custom pricing.

A.3 02 Left Coin Units
The operator can specify the number of coin units purchased by a coin passing through the left coin chute.

A.3 03 Center Coin Units
The operator can specify the number of coin units purchased by a coin passing through the center coin chute.

A.3 04 Right Coin Units
The operator can specify the number of coin units purchased by a coin passing through the right coin chute.

A.3 05 4th Slot Units
The operator can specify the number of coin units purchased by a coin passing through the fourth coin chute.

A.3 06 Units/Credits
The operator defines 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 number of these coin units exceeds or matches the Unit 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 Ball 2; then the coin unit counter is cleared (its contents are zeroed).

A.3 07 Units/Bonus
The operator can specify that additional credits are to be indicated in the credits display, when a certain number of coin units are accumulated.

A.3 08 Bonus Credits
The operator specifies the number of credits that are awarded when the Units/Bonus level is achieved.

A.3 09 Minimum Units
The operator can specify that No credits are to be posted (indicated in the credit display), until the credits unit counter reaches a particular value, by setting this value to 02 (or more).

A.3 10 Coin Door Type (if set to custom, then 11 to 15 are available)
This adjustment is used to preset adjustments 11 to 15 based on standard coin doors (U.S.A., German, etc.).

A.3 11 Collection Text
The operator chooses what coin system is used to display the Earning Audits.

A.3 12 Left Slot Value
The operator can specify the monetary value of the left coin chute.

A.3 13 Center Slot Value
The operator can specify the monetary value of the center coin chute.

A.3 14 Right Slot Value
The operator can specify the monetary value of the right coin chute.

A.3 15 4th Slot Value
The operator can specify the monetary value of the 4th coin chute.

A.3 16 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 this setting is 5 through 10. Reaching the specified setting prevents the award of any credits.

A.3 17 Free Play
The operator can specify 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 required.

A.3 18 Hide Coin Audits
The operator chooses whether or not to show the coin audits. The choices are:

YES - The coin audits are not displayed.
NO - The coin audits are displayed.
HIDE NAMES - The coin audit value is shown but not the audit name.

A.3 19 Not Used

A.3 20 Base Coin Size
The operator can specify the base monetary value of the allotment of tickets audits per "base monetary value".

A.3 21 Credits To Start
The operator chooses 1-99 credits it takes to start a game for each player.

A.3 22 Start Innings
The operator chooses 1-99 innings each player has at game start.

A.3 23 Credits To Buyin
The operator chooses how many credits it takes to (buyin) to a game for each player. The range is:

0 = No buyin or continuance allowed.
1-99 = 1-99 credits/player needed to buyin or continue a game.

A.3 24 Buyin Innings
The operator chooses how many additional innings each player receives when a buyin occurs. Note, there is a maximum of 99 innings. The range is:

0 = No buyin or continuance allowed.
1-99 = 1-99 "buyin" innings added to current game.

A.3 25 Buyin Time
The operator chooses 3-10 initial seconds the game will take to offer a buyin after the game has just become over (assuming buyin is allowed).

SLUGFEST Pricing Table

Country	Coin Chute Left	Center	Right	Credits/Coin	Display	Pricing Adjustments A.3 02	03	04	05	06	07	08	09
USA	25¢	-	25¢	1/25¢, 4/$1 [2]	U.S.A. 4/$1								
				1/25¢, 9/$2 [2]	U.S.A. 9/$2								
				1/50¢, 2/$1 [2]	U.S.A. 2/$1								
				2/25¢, 9/$1 [2]	U.S.A. 9/$1								
				1/25¢, 3/50¢, 6/$1	CUSTOM	01	04	01	00	01	02	01	00
				1/25¢, 5/$	CUSTOM	01	00	01	00	01	04	01	00
				1/50¢, 9/$4.00 [1]	CUSTOM	01	04	01	00	02	16	01	00
Canada	25¢	-	$1	1/50¢, 2/75¢, 3/$1 [2]	CANADA 1								
				1/50¢, 2/$1 [2]	CANADA 2								
Austria	5 Sch	10 Sch	10 Sch	1/2x5 Sch, 3/2x10 Sch [2]	AUSTRIA								
	5 Sch	-	10 Sch	2/5 Sch, 5/10 Schilling	CUSTOM	02	00	05	00	01	00	01	00
Australia	20¢	-	$1	1/3x20¢, 2/$1 [2]	AUSTRALIA								
United Kingdom	10 P	50 P	1£	1/2x10 P, 3/50 P, 7/1£ [2]	U.KINGDOM								
	10 P	50 P	20P	1/10 P, 5/50 P, 2/20 Pence	CUSTOM	01	05	02	00	01	00	01	00
Switzerland	1 Fr	2 Fr	5 Fr	1/1 Fr, 3/2 Fr, 7/5 Franc [2]	SWISS								
	1 Fr	-	2 Fr	1/1 Fr, 3/2 Fr	CUSTOM	03	00	06	00	02	00	01	00
Belgium	5 Fr	20 Fr	50 Fr	1/4X5 F, 1/20 F, 3/50 F [2]	BELGIUM								
West Germany	1 DM	2 DM	5 DM	1/1 DM, 2/2 DM, 7/5 DMark [2,3]	GER. 7/6 DM								
				1/1 DM, 2/2 DM, 6/5 DM [1,2]	GER. 6/5 DM								
				1/1 DM, 3/2 DM, 9/5 DM	CUSTOM	09	18	45	00	05	00	01	00
				1/2x1 DM, 1/2 DM, 3/5 DM	CUSTOM	03	06	15	00	05	00	01	00
				2/1 DM, 5/2 DM, 14/5 DM	CUSTOM	13	26	65	00	05	65	01	00
Netherlands	1 HFl	2.5 HFl	2.5 HFl	1/1 HFl, 3/2.5 Holland Florin [2]	NETHERLND								
	25¢	-	1G	1/25¢, 5/1 Guilder	CUSTOM	01	00	05	00	01	00	01	00
	1G	-	1G	1/1 Guilder [2]	HOLLAND								
Sweden	5 Kr	5 Kr	5 Kr	1/5 Krona 2	SWEDEN								
	1 Kr	-	1 Kr	1/2x1 Krona	CUSTOM	01	04	01	00	02	00	01	01
France	1 Fr	5 Fr	10 Fr	1/3x1 F, 2/5 F, 5/10 Franc [1,2]	TARIF 1								
	1 Fr	5 Fr	10 Fr	1/2x1 F, 3/5 F, 7/10 Franc	TARIF 2	03	15	30	30	05	30	01	00
	1 Fr	5 Fr	10 Fr	1/5 F, 3/10 F, 7/2x10 Franc	TARIF 3	03	15	30	30	10	60	01	15
	1 Fr	5 Fr	10 Fr	2/5 F, 4/10 F, 9/2x10 Franc	TARIF 4	02	10	20	20	05	40	01	10
	1 Fr	5 Fr	10 Fr	2/5 F, 5/10 F, 11/2x10 Franc	TARIF 5	01	05	10	10	02	20	01	05
	1 Fr	5 Fr	10 Fr	1/5 F, 3/10 F (5 ball play)	TARIF 6								
Italy	500L	-	500L	1/500 Lire [2]	ITALY								
Spain	25 P	-	100 P	1/25 P, 5/100 Peseta [2]	SPAIN								
	25 P	-	100 P	1/25 P, 4/100 Peseta	CUSTOM	01	00	04	00	01	00	01	00
	25 P	-	100 P	1/2x25 P, 2/100 Peseta	CUSTOM	01	00	04	00	02	00	01	00
	25 P	-	100 P	1/2x25 P, 3/100 Peseta	CUSTOM	03	00	12	00	04	00	01	06
Japan	100 ¥	-	100 ¥	1/100 Yen [2]	JAPAN								
Antilles, Nthrlnd	25¢	-	1G	1/25¢, 4/1 Guilder [2]	ANTILLES								
Chile	Token	-	Token	1/1 Token [2]	CHILE								
Denmark	1 Kr	5 Kr	10 Kr	1/2x1 Kr, 3/5 Kr, 7/10 Krone [2]	DENMARK								
Finland	1 Mka	-	5 Mka	1/2x1 Mka, 3/5 Markka [2]	FINLAND								
New Zealand	20¢	-	20¢	1/3x20¢ [2]	N. ZEALAND								
Norway	5 Kr	-	10 Kr	1/5 Kr, 2/10 Kr, 5/20 Krone [2]	NORWAY								
Argentina	10¢	10¢	10¢	1/1 Token [2]	ARGENTINA								
Greece	10 D	20 D	50 D	1/2x10D, 1/20D, 3/50 Drachma [2]	GREECE								
Hungary	10 F	20 F	20 F	1/1x20F, 1/2x10F, 3/2x20 Forint	HUNGARY								

Notes: 1. Factory Default. 2. Standard Setting - Change by pressing Enter button. 3. Other functions are also affected.

Press the Escape button to return to the Adjustment Menu. Press the Up button to advance to the next desired Adjustment Group, (or press the Down button to return to a previous Adjustment Group). Press the Enter button to activate that group. Press the Up or Down button to cycle through the available adjustments in that group.

A.4 H.S.T.D. Adjustments

A.4 0 1 Highest Scores

The operator specifies 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, or displayed.
ON - The four highest scores, Grand Champion, & Billionaire Club H.S. are stored in memory and displayed in the Attract Mode.

A.4 0 2 H.S.T.D. Award

The operator chooses the award given for achieving the High Score To Date, or the Champion H.S.T.D.. The choices are a Credit or a Ticket.

A.4 0 3 Champion H.S.T.D.

The operator chooses whether the "Highest" High Score is displayed in the Attract Mode. This score is not cleared when "High Score Reset Every" occurs. The choices are:

ON - The "Highest" High Score is retained in memory and displayed.
OFF - The "Highest" High Score is not retained.

A.4 0 4 Champion Credits

The operator chooses the number of credits awarded for a Grand Champion Score. The range of this setting is 00 through 10.

A.4 0 5 H.S.T.D. 1 Credits

The operator selects the number of credits to be awarded whenever a player exceeds the previous Highest Score. The range of this setting is 00 to 1

A.4 0 6 H.S.T.D. 2 Credits

The operator selects the number of credits to be awarded whenever a player exceeds the second highest score. The range of this setting is 00 to 10.

A.4 0 7 H.S.T.D. 3 Credits

The operator selects the number of credits to be awarded whenever a player exceeds the third highest score. The range of this setting is 00 to 10.

A.4 0 8 H.S.T.D. 4 Credits

The operator selects the number of credits to be awarded whenever a player exceeds the fourth highest score. The range of this setting is 00 to 10.

A.4 0 9 High Score Reset Every

The operator can specify 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. The values provided upon reset are those selected by the operator in the Back-up High Scores. The range of this setting is OFF (disabled) and 250 to 20, 000.

A.4 10 Backup Champion

The operator sets the Back-up Grand Champion Score. The range of this setting is 00 through 99, 900, 000.

A.4 11 Backup H.S.T.D. 1
A.4 12 Backup H.S.T.D. 2
A.4 13 Backup H.S.T.D. 3
A.4 14 Backup H.S.T.D. 4

The operator can set the first to fourth Back-up High Score value. The game automatically restores this value when the High Score Reset Every value is reached. The range of this setting is 00 to 99, 900, 000.

A.4 15 Most Runs Award

The operator chooses the award given for achieving any of the 10 "Most Runs" positions. The choices are "Credit" or "Ticket". Note, A.4.01 "Highest Scores" has to be set to "ON".

A.4 16 M. Runs 1 Credit
A.4 17 M. Runs 2-10 Credit

The operator selects the number of credits to be awarded when the player exceeds the 1st position or 2nd to 10th position of the "Most Runs" table. The choices are: 0 to 10 credits.

A.4 18 Backup M. Runs 1
A.4 19 Backup M. Runs 2-10

The operator can set the 1st and 2nd to 10th backup (initial settings) runs. The game automatically restores this value when the "High Score Reset Every" value is reached. The range of this setting is 0 to 9,999 runs.

Press the Up button to advance to the next desired Adjustment Group, (or press the Down button to return to a previous Adjustment Group). Press the Enter button to activate that group. Press the Up or Down button to cycle through the available adjustments in that group.

A.5 Printer Adjustments (optional board required)

A.5 01 Column Width

The operator chooses the column width to be printed. The range of this setting is 22 through 80.

A.5 02 Lines Per Page

The operator chooses the amount of lines per page. The range of this setting is 20 through 80.

A.5 03 Pause Every Page

The operator chooses whether the printer pauses at the end of a page. The choices are:

YES - The printer does pause.
NO - The printer doesn't pause.

A.5 04 Printer Type

The operator selects which kind of printer to use. The choices are: PARALLEL, SERIAL, or ADP.

A.5 05 Serial Baud Rate

The operator selects which baud rate to use for serial or ADP communications (bit rate). The choices are: 300, 600, 1200, 2400, 4800, or 9600.

A.5 06 Serial D.T.R. (Data Terminal Ready)

When a serial printer is used, this line may be connected to a printer output line signaling that the printer is busy.
Normal - Normal D.T.R. signal goes low to indicate the printer is not ready.
Inverted - Inverted D.T.R. (busy) signal goes high to indicate the printer is not ready.
Ignore - D.T.R. signal is ignored.

Press the Escape button to return to the Adjustments Menu. Press the Up button to advance to the next desired Adjustments Group, (or press the Down button to return to a previous group). Press the Enter button to activate. Use the Up or Down button to cycle through the available adjustments.

A.6 Dispenser Adjustments

IMPORTANT! EQUIPPING AN ELECTRONIC GAME WITH A REDEMPTION DEVICE MAY BE PROHIBITED UNDER APPLICABLE LAWS. CHECK WITH LOCAL AUTHORITIES CONCERNING THESE LAWS PRIOR TO INSTALLING ANY TICKET OR OTHER REDEMPTION DEVICE.

A.6 01 Dispense What?

The operator chooses if the game has a dispenser and which dispenser is being used. When the dispenser is set to "TICKETS" or "CARDS" all ticket adjustments will operate. The choices are:

Nothing = Nothing is dispensed.
Tickets = Tickets will be dispensed.
Cards = Baseball Cards will be dispensed.

A.6 02 Historical Information

The operator chooses when to clear out all historical information for the dispenser rate calculation and for the historical dispenser ticket/card rate. This is used when a dispenser is attached to the game. When a game is placed in a NEW location, we recommend using the "FACTORY RESET" (U.8) then use the presets and adjustments to alter your game. Later, if you change playfield pitch, coinage settings, or game settings we further recommend you to use this adjustment to clear out the "Historical" information that was gathered for the old game settings. The choices are:

Clear = Clear out all the "Historical information".
Gather = Game is gathering "Historical information".

A.6 03 Dispenser Units

The operator chooses the base dispenser units to use in all calculations. The choices are:

/Game = Number of tickets or cards per game.
/Credit = Number of tickets or cards per credit.
/(Coin) = Number of tickets or cards per coin,the coin is selected by adjust A.3-11 "Collection Text" (in USA, this is per quarter), and its value is selected by A.3-30 "Ticket Coin Value".

A.6 04 Dispenser Rate

The operator chooses the rate of dispense and allows the game to choose a set of dispenser settings. The rate (for USA factory settings) is measured in tickets (or baseball cards) per quarter.

Note, at least 100 plays must accumulate before this adjustment will actually choose a set of adjustments. (However, it can be changed to any number for "AUTO. DISPEN. RATE").

A.6 04 Dispenser Rate Continued

Note, A.6 09 "Tickets/Game Start" and **A.6 10** "Tickets/Buyin" must first be MANUALLY set to their desired settings.

Note, this uses "Historical" information to obtain a set of ticket settings. These settings are biased upon the current game, coin, and hardware settings. If you change any of these settings (other than the ticket settings) you should reset the "Historical Information" and gather fresh information. The choices are:

0.0/unit = Never choose any dispenser settings.
0.1-99.9/unit = A rate of 0.1-99.9 dispensed items per unit.

A.6 05 Auto. Dispen. Rate

The operator chooses if the game will re-adjust its ticket or baseball card settings (after about 1 week of play) to the above "Dispenser Rate". The choices are:

Yes = The game will constantly re-adjust its dispenser rate. Note, the clock must be set for this to operate.
No = The game will not automatically re-adjust its dispenser rate.

A.6 06 Dispenser Errors

The operator chooses how to resolve dispenser problems. Note, the dispenser ALWAYS blinks its dispenser lamp when a problem has occurred. The choices are:

Wait = Stop the game and wait for operator to resolve the problem.
Ignore = Continue the game, but do not dispense any more items.

A.6 07 Cards Till Empty

When the dispenser is set to dispense CARDS, the operator chooses how many baseball cards it takes until the dispenser is considered "empty" after the "dispenser low" switch is activated. Note, the card dispenser should not dispense the last 30 cards. The choices are:

0-199 = Number of cards allowed to dispense after the "Dispense low" switch has activated.

A.6 08 Max. Tick./Player

The operator can choose the MAXIMUM amount of tickets each player can earn per buyins + game starts. The range is 0 to 255.

NOTE, The "Dispense What?" adjust must be set to dispense TICKETS or CARDS in order for any "TICKET/?????" adjust to operate. Note, Tickets or Cards can be dispensed, but in the interest of brevity, it is assumed that you are dispensing tickets. All choices are:

0 = No tickets or cards are dispensed.
1-99 = Number of tickets or cards to dispense.

A.6 09 Tickets/Game Start

The operator chooses how many tickets or baseball cards the game will dispense (per player) when a game is started.

A.6 10 Tickets/Buyin

The operator chooses how many tickets or baseball cards the game will dispense (per player) when a buyin (continue game) occurs. (This does not include starting a game).

A.6 11 Tickets/1 Heckler
A.6 12 Tickets/2 Hecklers
A.6 13 Tickets/3 Hecklers (or more)

The operator chooses how many tickets or baseball cards the game will dispense when a player "hits" the 1st, 2nd, or more hecklers for a "heckler" Grand Slam.

A.6 14 Tickets/Grand Slam

The operator chooses how many tickets or baseball cards the game will dispense when a player hits a "Grand Slam" without hitting the heckler.

A.6 15 Tickets/Bleacher Center
A.6 16 Tickets/Bleacher Left
A.6 17 Tickets/Bleacher Right

The operator chooses how many tickets or baseball cards the game will dispense when a player receives a Home Run for the center, left, or right slot of the Bleacher.

A.6 18 Tickets/Playfield H.R.

The operator chooses how many tickets or baseball cards the game will dispense when a player receives a Home Run for the playfield.

A.6 19 Level 1 Runs
A.6 20 Tick./Level 1 Run
A.6 21 Level 2 Runs
A.6 22 Tick./Level 2 Run
A.6 23 Level 3 Runs
A.6 24 Tick./Level 3 Run
A.6 25 Level 4 Runs
A.6 26 Tick./Level 4 Run

The operator can choose how many tickets to award for 4 different run levels. The "run levels" can be set to award tickets when 1 to 50 runs have been reached (0 runs = Do not award any tickets for this level).

A.6 27 Tickets/Extra Inning

The operator chooses how many tickets or baseball cards the game will dispense when an extra inning (from the replay) is also awarded. Note, A.1.14 "Replay Award" has to be set to "Ex. Inning" and A.1.17 "Ex. Inning ticket" has to be set to "Yes".

A.6 28 Tickets/Replay

The operator chooses how many tickets or baseball cards the game will dispense when a replay awards a ticket. Note, A.1.14 "Replay Award" has to be set to "Ticket".

A.6 29 Tickets/Match

The operator chooses how many tickets or baseball cards the game will dispense when a match occurs. Note, A.1.16 "Match Award" has to be set to "Ticket".

A.6 30 Tickets/Champion

The operator chooses how many tickets or baseball cards the game will dispense when a "Grand Champion" (in this game it is called "Most Valuable Player") occurs. Note, A.4.02 "H.S.T.D. Award" has to be set to "Ticket" and A.4.01 "Highest Scores" has to be set to "ON".

A.6 31 Tickets/H.S.T.D. 1
A.6 32 Tickets/H.S.T.D. 2
A.6 33 Tickets/H.S.T.D. 3
A.6 34 Tickets/H.S.T.D. 4

The operator chooses how many tickets or baseball cards the game will dispense when any of the High Scores to date (in this game it is called "Hall of Fame") occurs. Note, A.4.02 "H.S.T.D. Award" has to be set to "Ticket" and A.4.01 "Highest Scores" has to be set to "ON".

A.6 35 Tick./M. Runs 1

The operator chooses how many tickets or baseball cards the game will dispense when a player exceeds the number one position in the "Most Runs Award" table. Note, A.4.15 "Most Runs Award" has to be set to "Ticket" and A.4.01 "Highest Scores" has to be set to "ON".

A.6 36 Tick./M. Runs 2-10

The operator chooses how many tickets or baseball cards the game will dispense when a player exceeds any of the two to ten positions in the "Most Runs Award" table. Note, A.4.15 "Most Runs Award" has to be set to "Ticket" and A.4.01 "Highest Scores" has to be set to "ON".

A.6 37 Tick./Inning

The operator chooses how many Tickets or Baseball cards the game will dispense when a player completes an inning. This adjustment is mostly for shows or contests.

Press the Escape button to return to the Adjustments Menu. Then, either press the Up or Down button to return to a previous Adjustment Menu Group, or press the Escape button again to return to the Main Menu. Once in the Main Menu, either press the Up button to advance to the next menu selection, the Bookkeeping Menu, or press the Down button to to return to a previous Main Menu selection.

Press the Enter button to activate the Bookkeeping Menu, once the menu name is shown under the Main Menu. Then, use the Up or Down button to cycle through the Bookkeeping Menu selections. Press the Enter button to activate the desired Bookkeeping Group when that group appears in the display.

B. BOOKKEEPING MENU

B.1 Main Audits
B.2 Earning Audits
B.3 Standard Audits
B.4 Feature Audits
B.5 Histograms
B.6 Time-Stamps

Once you have entered the desired Bookkeeping Group, press the Up or Down button to cycle through the available audits in that group. Audits cannot be set, they can only be cleared by using U1 and U2 from the Utilities Menu.

One-Button Audit System

Information from the Bookkeeping Menu is obtainable directly from the Attract Mode. Continually pressing the Enter button, while in the Attract Mode, will cycle through all of the game audits.

B.1 Main Audits

These audits (which also appear in other groups) are the most important, and are grouped here for easier access.

B.1 01 Total Earnings	00
B.1 02 Recent Earnings	00
B.1 03 Free Play Percent	00
B.1 04 Average Inning Time	00
B.1 05 Average Game Time	00
B.1 06 Total Points	00
B.1 07 Replay Awards	00
B.1 08 Percent Replays	00
B.1 09 Extra Innings	00
B.1 10 Percent Extra Innings	00
B.1 11 Ticket Awards	00
B.1 12 Ticket Rate	00/Quarter

Press the Escape button to return to the Bookkeeping Menu. Press the Up button to advance to the next desired Bookkeeping Group, (or press the Down button to return to a previous group). Press the Enter button to activate that group. Press the Up or Down button to cycle through the available audits in that group.

B.2 Earning Audits

B.2 01 Recent Earnings	00
B.2 02 Recent Left Slot	00
B.2 03 Recent Center Slot	00
B.2 04 Recent Right Slot	00
B.2 05 Recent 4th Slot	00
B.2 06 Recent Paid Credits	00
B.2 07 Recent Service Credits	00
B.2 08 Total Earnings*	00
B.2 09 Total Left Slot*	00
B.2 10 Total Center Slot*	00
B.2 11 Total Right Slot*	00
B.2 12 Total 4th Slot*	00
B.2 13 Total Paid Credits*	00
B.2 14 Total Service Credits*	00
B.2 15 Recent Tickets	00
B.2 16 Recent Ticket Rate	00/Quarter
B.2 17 Total Tickets*	00
B.2 17 Total Ticket Rate	00/Quarter

* Note: These Audits are NOT Resettable. They are a record of the earnings of the game since the "CLOCK 1ST SET" Time -Stamp.

Press the Escape button to return to the Bookkeeping Menu. Press the Up button to advance to the next desired Bookkeeping Group, (or the Down button to return to a previous Bookkeeping Group). Press the Enter button to activate that group. Press the Up or Down button to cycle through the available audits in that group.

B.3 Standard Audits

B.3 01 Games Started	00
B.3 02 Total Points•	00
B.3 03 Total Free Play	00
B.3 04 Free Play Percent	00

• As a new WPC feature, the "Total Points" counter only counts completed gamed. A game is considered completed when the final ball begins. Audit information from an incomplete game is ignored.

B.3 Standard Audits, continued

B.3 05	Replay Awards	00
B.3 06	Percent Replays	00
B.3 07	Not Used	
B.3 08	Not Used	
B.3 09	Match Awards	00
B.3 10	Percent Match	00
B.3 11	H.S.T.D. Credits	00
B.3 12	Percent H.S.T.D	00
B.3 13	Extra Inning	00
B.3 14	Percent Extra Inning	00
B.3 15	Tickets Awarded	00
B.3 16	Percent Tickets	00
B.3 19	Average Inning Time	00
B.3 20	Average Game Time	00
B.3 21	Minutes of Play	00
B.3 22	Minutes On	00
B.3 23	Innings Played	00
B.3 24	Tilts	00
B.3 25	Replay 1 Awards	00
B.3 26	Replay 2 Awards	00
B.3 27	Replay 3 Awards	00
B.3 28	Replay 4 Awards	00
B.3 29	1 Player Games	00
B.3 30	2 Player Games	00
B.3 33	H.S.T.D. Reset Count	00
B.3 34	Burn-in Cycles	00
B.3 35	1st Replay Level	

Therefore operation for test and service do not affect the Audits.

Press the Escape button to return to the Bookkeeping Menu. Press the Up button to advance to the next desired Bookkeeping Group, (or press the Down button to return to a previous group). Press the Enter button to activate that group. Press the Up or Down button to cycle through the available audits in that group.

B.4 Feature Audits

B.4 01	Start Credits	00
B.4 02	Game Starts	00
B.4 03	Buyin Credits	00
B.4 04	Total Buyins	00
B.4 05	0 Buyins	00
B.4 06	1 Buyin	00
B.4 07	2 Buyins	00
B.4 08	3 Buyins	00
B.4 09	4 Buyins	00
B.4 10	5 Buyins	00
B.4 11	Over 5 Buyins	00
B.4 12	Total Innings	00
B.4 13	Most Run Credits	00
B.4 14	Tied Innings	00
B.4 15	Heckler Available	00
B.4 16	Heckler Hits	00
B.4 17	Other Grand Slam	00
B.4 18	Steal Base, Available	00

B.4 Feature Audits, continued

B.4 19	Steal Base, Start	00		
B.4 20	Steal Base, Safe	00		
B.4 21	Steal Base, Out	00		
B.4 22	Pinch Hits	00		
B.4 23	Unknown Hits	00		
B.4 24	Balls	00		
B.4 25	Walks	00		
B.4 26	Foul Strikes	00		
B.4 27	Playfield Strikes	00		
B.4 28	Strike Outs	00		
B.4 29	Playfield Outs	00		
B.4 30	Playfield Singles	00		
B.4 31	Playfield Doubles	00		
B.4 32	Playfield Triples	00		
B.4 33	Playfield Home Runs	00		
B.4 34	Bleacher Left Home Runs	00		
B.4 35	Bleacher Left/Right Home Runs	00		
B.4 36	Bleacher Center Home Runs	00		
B.4 37	Outfield Target - Left	00		
B.4 38	Outfield Target - 2 Left	00		
B.4 39	Outfield Target - 3 Left	00		
B.4 40	Outfield Target - Center	00		
B.4 41	Outfield Target - 3 Right	00		
B.4 42	Outfield Target - 2 Right	00		
B.4 43	Outfield Target - Right	00		
B.4 44	Fast Pitches	00		
B.4 45	Changeup Pitches	00	B.4 49 Run 1 Awards	00
B.4 46	Curve Pitches	00	B.4 50 Run 2 Awards	00
B.4 47	Screw Pitches	00	B.4 51 Run 3 Awards	00
B.4 48	Total Runs	00	B.4 52 Run 4 Awards	00

Press the Escape button to return to the Bookkeeping Menu. Press the Up button to the advance to the next desired Bookkeeping Group, (or press the Down button to return to a previous Bookkeeping Group). Press the Enter button to activate that group. Press the Up or Down button to cycle through the available audits in that group.

B.5 Histograms

B.5 01	0.0-0.5 Million Scores	00%	00
B.5 02	0.5-1.0 Million Scores	00%	00
B.5 03	1.0-1.5 Million Scores	00%	00
B.5 04	1.5-2.0 Million Scores	00%	00
B.5 05	2.0-3.0 Million Scores	00%	00
B.5 06	3.0-4.0 Million Scores	00%	00
B.5 07	4.0-5.0 Million Scores	00%	00
B.5 08	5.0-6.0 Million Scores	00%	00
B.5 09	6.0-8.0 Million Scores	00%	00
B.5 10	8.0-10 Million Scores	00%	00
B.5 11	10-15 Million Scores	00%	00
B.5 12	15-20 Million Scores	00%	00
B.5 13	Over 20 Million	00%	00
B.5 14	Game Time 0.0-1.0 Min.	00%	00
B.5 15	Game Time 1.0-1.5 Min.	00%	00
B.5 16	Game Time 1.5-2.0 Min.	00%	00

B.5 Histograms, continued

B.5 17	Game Time 2.0-2.5 Min.	00%	00
B.5 18	Game Time 2.5-3.0 Min.	00%	00
B.5 19	Game Time 3.0-3.5 Min.	00%	00
B.5 20	Game Time 3.5-4.0 Min.	00%	00
B.5 21	Game Time 4-5 Min.	00%	00
B.5 22	Game Time 5-6 Min.	00%	00
B.5 23	Game Time 6-8 Min.	00%	00
B.5 24	Game Time 8-10 Min.	00%	00
B.5 25	Game Time 10-15 Min.	00%	00
B.5 26	Game Time Over 15 Min.	00%	00

Press the Escape button to return to the Bookkeeping Menu. Press the Up button to the advance to the next desired Bookkeeping Group, (or press the Down button to return to a previous Bookkeeping Group). Press the Enter button to activate that group. Press the Up or Down button to cycle through the available audits in that group.

B.6 Time-Stamps

The Time-Stamps Menu allows you to view dates and times that are important to game software.

B.6 01 Current Time
B.6 02 Clock 1st Set
B.6 03 Clock Last Set
B.6 04 Audits Cleared
B.6 05 Coins Cleared
B.6 06 Factory Setting
B.6 07 Last Game Start
B.6 08 Last Replay
B.6 09 Last H.S.T.D. Reset
B.6 10 Champion Reset
B.6 11 Last Printout
B.6 12 Last Service Credits
B.6 13 Historical Information Reset
B.6 14 Dispenser Rate

Press the Escape button to return to the Bookkeeping Menu. Then, either press the Up or Down button to return to a previous Bookkeeping Menu Group, or press the Escape button again to return to the Main Menu. Once in the Main Menu either press the Up button to advance to the next menu selection, the Printouts Menu, or press the Down button to return to a previous Main Menu selection.

Press the Enter button to activate the Printouts Menu, once the menu name is shown under the Main Menu. Then, use the Up or Down button to cycle through the Printouts Menu selections. Press the Enter button to activate the desired Printouts Group when that group appears in the display.

P. PRINTOUTS MENU

(optional board required)

P.1 Earnings Data
P.2 Main Audits
P.3 Standard Audits
P.4 Feature Audits
P.5 Score Histograms
P.6 Time Histograms
P.7 Time-Stamps
P.8 All Data

The Printouts Menu is a combination of the other menus. This menu allows you to access and print information in the available menu selections.
If no Printer is attached the the message "Waiting for Printer" appears in the display. Note: Set the print specification from the Adjustment Menu, A.5 Printer Adjustments.
Press the Escape button to return to the Printouts Menu. Then, either press the Up or Down button to return to a previous Printouts Menu Group, or press the Escape button again to return to the Main Menu. Once in the Main Menu press the Up button to advance to the next menu selection, the Test Menu, or press the Down button to return to a previous Main Menu selection.
Press the Enter button to activate the Test Menu, once the menu name is shown under the Main Menu. Then, use the Up or Down button to cycle through the Test Menu selections. Press the Enter button to activate the desired test when that test appears in the display.

T. TEST MENU

T.1 Switch Edges
T.2 Switch Levels
T.3 Single Switch
T.4 Solenoid Test
T.5 Flasher Test
T.6 General Illumination
T.7 Sound & Music Test
T.8 Single Lamps
T.9 All Lamps
T.10 Lamp & Flasher Tests
T.11 Display Test
T.12 Ramp Test
T.13 Pitch Test

T.1 Switch Edges

The entire switch matrix (8 column by 8 rows) is displayed on the left hand side of the display. It shows the state of ALL switches. A dot means the switch is open. A square means that the switch is closed.

A short to ground (on either the row or column wire) always appears as a shorted row(s). However, a column wire shorted to ground will disappear when all of the indicated row switches are "open" (row wire shorted to ground wire will not disappear).

A shorted diode in the switch matrix can cause other switches to appear closed. These "phantom" switches (though not actually closed) always complete a rectangle in the switch matrix. In a simple case, if 2 switches in the same column are closed (say 22 and 24), and a third switch is pressed in another column but is in the same row as one of the other 2

T.1 Switch Edges, continued

switches (say 32), the "phantom" switch 34 is falsely indicated closed. The offending switch with the diode shorted is diagonally opposite the "phantom" switch (in this case 22).

For all switches, the number on the left indicates the column, the number on the right indicates the row. Example- Switch 23 means 2nd column, 3rd row.

To activate the Switch Edges Test, from the Test Menu, press the Enter button. The name and number of each switch that is pressed is shown in the displays. If any other switch, or no switch at all is indicated, the system has detected a problem with the switch circuit.

Press Escape to return to the Test Menu. Press the Up button to display the next test, (or the Down button to return to a previous test). Press the Enter button to activate that test.

T.2 Switch Levels

Once the test name is shown under the Test Menu, press the Enter button. The name and number of each switch that is activated is shown in the displays. This test automatically cycles through all switches that are detected closed.

Press the Escape button to return to the Test Menu. Press the Up button to display the next test, (or the Down button to return to a previous test). Press the Enter button to activate that test.

T.3 Single Switches

Once the test name is shown under the Test Menu, press the Enter button. The Single Switch Test isolates a particular switch by blocking signals from all other switches. Use the Up or Down buttons to select the switch to be tested. Either Open or Closed appears in the displays to indicate the state of the switch at the present time. When the switch is activated, an "A" appears in the displays. Press the Start button to obtain wire color, connector, and fuse information of any switch when that switch is displayed.

Press the Escape button to return to the Test Menu. Press the Up button to display the next test, (or the Down button to return to a previous test). Press the Enter button to activate that test.

SLUGFEST Switch Matrix — White — Green

Dedicated Grounded Switches	Row \ Column	1 Green-Brown	2 Green-Red	3 Green-Orange	4 Green-Yellow	5 Green-Black	6 Green-Blue	7 Green-Violet	8 Green-Gray
Orange-Brown (1) Left Coin Chute D1	1 White-Brown	Not Used 11	**Slam Tilt** 21	Pinch Hit 31	Target Panel - L. 41	Back-Row Trough 51	Left Bleacher 61	Not Used 71	Not Used 81
Orange-Red (2) Center Coin Chute D2	2 White-Red	Not Used 12	**Coin Door Closed** 22	Fast Ball Pitch 32	Target Panel - 2L. 42	Strike Trough 52	Middle Bleacher 62	Not Used 72	Not Used 82
Orange-Black (3) Right Coin Chute D3	3 White-Orange	Not Used 13	**Dispenser Prize** 23	Changeup Pitch 33	Target Panel - 3L. 43	Strike Through 53	Right Bleacher 63	Not Used 73	Not Used 83
Orange-Yellow (4) 4th Coin Chute D4	4 White-Yellow	Not Used 14	**Always Closed** 24	Curve Pitch 34	Target Panel - M. 44	Pitch Home 54	Not Used 64	Not Used 74	Not Used 84
Orange-Green (5) Normal Function / Test Function: Service Credits / Escape D5	5 White-Green	Not Used 15	Steal Base/Run 25	Screw Ball Pitch 35	Target Panel - 3R. 45	Ramp Switch 55	Not Used 65	Not Used 75	Not Used 85
Orange-Blue (6) Normal Function / Test Function: Volume Down / Down D6	6 White-Blue	Not Used 16	Bat Switch 26	Throw Out Runner 36	Target Panel - 2R. 46	Playfield Tilt 1 56	Not Used 66	Not Used 76	Not Used 86
Orange-Violet (7) Normal Function / Test Function: Volume Up / Up D7	7 White-Violet	Not Used 17	Dispenser Low 27	Start Player 1 37	Target Panel - R. 47	Playfield Tilt 2 57	Not Used 67	Not Used 77	Not Used 87
Orange-Gray (8) Normal Function / Test Function: Begin Test / Enter D8	8 White-Gray	Not Used 18	Dispenser Unjammed 28	Start Player 2 38	Not Used 48	Not Used 58	Not Used 68	Not Used 78	Not Used 88

Note: Dedicated Switches are connected directly to ground.

T.4 Solenoid Test

Once the test name is shown under the Test Menu, press the Enter button. The Solenoid Test has three modes, Repeat, Stop, and Running. Only one solenoid should turn On at a time. The system has detected a problem if, more then one solenoid turns On, a solenoid comes On and stays On, or no solenoid turns On during the Repeat or Running test modes. Press the Start button to see the wire color, driver number, connector and, fuse information of any coil, when that coil is displayed.

Repeat - This test allows you to stop and pulse a single coil or flashlamp. Once you have entered the Solenoid Test, coil 1 shows in the displays and the corresponding solenoid activates. Press the Up or Down button to cycle through the solenoids, one at a time, manually. The same solenoid pulses until you press the Up or Down button to move to the next one. Either press the Escape button to return to the Test Menu, or press the Enter button to move to the next test mode.

Stop - This test allows you to stop the Solenoid Test at any point. Press Enter during the Repeat test mode and the Solenoid Test stops. There should not be any solenoids activated while the test is stopped. Either press the Escape button to return to the Test Menu, or the Enter button to move to the next test mode.

T.4 Solenoid Test, continued

Running - This test allows you to cycle through the solenoids automatically. Press the Enter button during the Stop test mode. The display shows you the name and number of the solenoid currently being pulsed.

Either press the Enter button to return to the Repeat test mode, or press the Escape button to return to the Test Menu. Once in the Test Menu press, the Up button to display the next test, (or the Down button to return to a previous test). Press the Enter button to activate that test.

T.5 Flasher Test

Once the test name is shown under the Test Menu, press the Enter button. This test allows you to test the flashlamp part of the solenoid circuit exclusively. This test, like the Solenoid Test, has three test modes Repeat, Stop, and Running. During this test, only one flashlamp circuit should turn On at a time. If, more then one flashlamp circuit turns On, or stays On, or no flashlamp circuit turns On at all during the Repeat or Running test modes the system has detected a problem. Press the Start button to see the wire color, driver number, connector, and fuse information of any flashlamp circuit when that circuit appears in the displays.

Repeat - This test allows you to stop and pulse a single flashlamp. Once you have entered the Flasher Test the name and number of the first flashlamp circuit shows in the display and the corresponding bulb(s) flashes. Press the Up or Down button to cycle through all of the flashlamps circuits one at a time, manually. The same flashlamp circuit pulses until you press the Up or Down button to move to the next one. Either, press the Escape button to return to the Test Menu, or press the Enter button to advance to the next test mode.

Stop - This test allow you to stop the Flasher Test at any time. Press the Enter button during the Repeat test mode. The Flasher Test stops. There should not be any flashlamp circuit turned On during this test mode. Either press the Escape button to return to the Test Menu, or press the Enter button to advance to the next test mode.

Running - This test allows you to cycle through the flashlamps automatically. Press the Enter button during the Stop test mode. The display shows you the name and number of the flashlamp currently being pulsed, and the corresponding bulb(s) flashes.

Either press the Enter button to return to the Repeat test mode or, press the Escape button to return to the Test Menu. Once in the Test Menu, press the Up button to display the next test, (or the Down button to return to a previous test). Press the Enter button to activate that test.

SLUGFEST SOLENOID TABLE

Sol. No.	Function	Solenoid Type	Wire Color		Connections	Driver Trnstr	Solenoid Part Number Flashlamp Type
			Drive	Power			
01	Baseball Bat	High Power	Vio-Brn	Vio-Yel	J130-1	Q82	A-14499
02	Magnet	High Power	Vio-Red	Vio-Yel	J130-2	Q80	B-20-9608
03	Not Used	High Power	Vio-Orn		J130-4	Q78	NU
04	Not Used	High Power	Vio-Yel		J130-5	Q76	NU
05	Not Used	High Power	Vio-Grn		J130-6	Q64	NU
06	Not Used	High Power	Vio-Blu		J130-7	Q66	NU
07	Knocker	High Power	Vio-Blk	Vio-Yel	J130-8	Q68	AE-23-800
08	Not Used	High Power	Vio-Gry		J130-9	Q70	NU
09	Not Used	Low Power	Brn-Blk		J127-1	Q58	NU
10	Not Used	Low Power	Brn-Red		J127-3	Q56	NU
11	Not Used	Low Power	Brn-Orn		J127-4	Q54	NU
12	Not Used	Low Power	Brn-Yel		J127-5	Q52	NU
13	Not Used	Low Power	Brn-Grn		J127-6	Q50	NU
14	Not Used	Low Power	Brn-Blu		J127-7	Q48	NU
15	Not Used	Low Power	Brn-Vio		J127-8	Q46	NU
16	Not Used	Low Power	Brn-Gry		J127-9	Q44	NU
17	F.L. Left Bleacher Home Run	Flasher	Blk-Brn	Red-Wht	J125-1	Q42	#806
18	F.L. Ctr. Bleacher Home Run	Flasher	Blk-Red	Red-Wht	J126-2	Q40	#806
19	F.L. Rt. Bleacher Home Run	Flasher	Blk-Orn	Red-Wht	J126-3	Q38	#806
20	F.L. Ramp Left	Flasher	Blk-Yel	Red-Wht	J126-4	Q36	#912
21	Ramp Motor		Blu-Grn	Vio-Orn	J126-6	Q28	14-7960
22	Fast Pitch		Blu-Blk	Vio-Orn	J126-7	Q30	14-7959
23	Medium Pitch		Blu-Vio	Vio-Orn	J126-8	Q34	14-7959
24	Slow Pitch		Blu-Gry	Vio-Orn	J126-9	Q32	14-7959
25	F.L. Ramp Middle	Flasher	Blu-Brn	Red-Wht	J122-1	Q26	#912
26	F.L. Ramp Right	Flasher	Blu-Red	Red-Wht	J122-2	Q24	#912
27	Dispenser Motor		Blu-Orn	Vio-Orn	J122-3	Q22	14-7962 (card)
28	Dispenser Low Lamp		Blu-Yel	Vio-Orn	J122-4	Q20	20-9679 (card)
	General Illumination Circuits						
01	G.I. Infield Top	G.I.	Wht-Brn	Brn	J121-7	Q18	#555
02	G.I. Backbox	G.I.	Wht-Org	Org	J120-8	Q10	#555
03	G.I. Pitch Lamps	G.I.	Wht-Yel	Yel	J120-9	Q14	#555
04	G.I. Outfield	G.I.	Wht-Grn	Grn	J121-11	Q16	#555
05	G.I. Infield Bottom	G.I.	Wht-Vio	Vio	J120-11	Q12	#555

T.6 General Illumination

Once the test name is shown under the Test Menu, press the Enter button. This test allows you to check all of the General Illumination circuits. There are two modes of operation, Stop and Run. To obtain wire color, driver number, connector, and fuse information, press the Start button when the desired General Illumination circuit appears in the display.

Stop - Press the Up or Down buttons to cycle through the General Illumination Test manually. All illumination is tested first, followed by an individual circuit test. The circuit name and number shows in the display while the corresponding lamps lights. If any other result occurs, the system has detected an error.

Run - Press the Enter button any time during Stop test mode and the General Illumination Test cycles through automatically. For each circuit shown in the display the corresponding bulbs should light. If any other result occurs, the system has detected a problem.

Either press the Enter button to return to Stop test mode, or the Escape button to return to the Test Menu. Once in the Test Menu press the Up button to advance to the next test, (or the Down button to return to a previous test). Press the Enter button to activate that test.

T.7 Sound and Music Test

Once the test name is shown under the Test Menu, press the Enter button. The Sound and Music Test allows you to check the audio circuits. This test has three modes for testing the sound and music circuits, Running, Repeat and Stop.

The Interlock switch in the coin door enables the operator to adjust the volume level while the game is in the Sound and Music Test. Press and hold the Interlock switch while using the Up and Down buttons to adjust the volume level of the game.

Running - This test steps through a sequence of sounds and music. Pressing the Up or Down button during this portion of the Sound and Music test allows you to advance to a particular sound or tune without having to wait for the program to play all the sounds available in the test. For each name and number that appears in the display a sound or tune should be heard. Any other result indicates the system has detected a problem.

Repeat - Press the Enter button at any time during the Running test mode to cause the program to stop and repeat a particular sound or tune. The same sound should repeat continuously until the Up or Down button is pressed. Any other result indicates the system has detected a problem.

Stop - Press the Enter button at any time during the Repeat test mode to stop this test altogether. Nothing should be heard. Any other result indicates the system has detected a problem.

Use the Enter button to return to the Running test mode, or the Escape button to return to the Test Menu. Once in the Test Menu press the Up button to display the next test, (or the Down button to return to a previous test). Press the Enter button to activate that test.

T.8 Single Lamp Test

For all lamps, the number on the left indicates the column, the number on the right indicates the row. Example- Lamp 23 means 2nd column, 3rd row.

Once the test name is shown under the Test Menu, press the Enter button. This test allows you to test each lamp circuit individually. Press the Up or Down button to cycle through this test. For each name and number that is shown in the displays the corresponding lamp should light. Any other result indicates the system has detected a problem. Press the Start button to obtain wire color, connector, and fuse information when the desired lamp is lit.

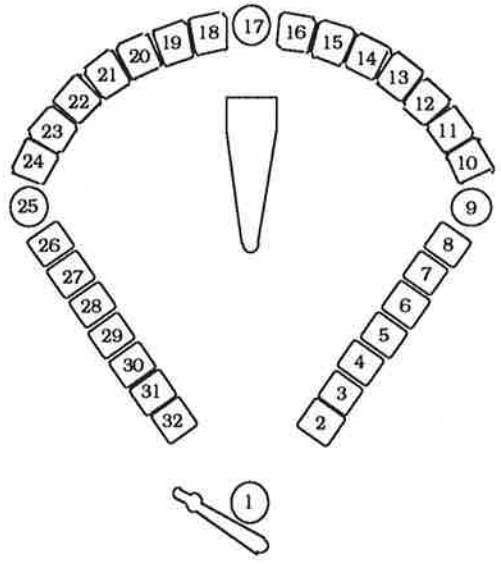
Press the Escape button to return to the Test Menu. Press the Up button to display the next test, (or the Down button to return to a previous test). Press the Enter button to activate that test.

SLUGFEST Lamp Matrix

Yellow (B+) — Red

Row \ Column	1 Yellow-Brown	2 Yellow-Red	3 Yellow-Orange	4 Yellow-Black	5 Yellow-Green	6 Yellow-Blue	7 Yellow-Violet	8 Yellow-Gray
1 Red-Brown	Left Bleacher Home Run 11	Middle Bleacher Home Run 21	Right Bleacher Home Run 31	#32 41	#24 51	#16 61	#8 71	Pinch Hit 81
2 Red-Black	Out (T. - L.) 12	Single (M. - L.) 22	Double (B. - 2.) 32	#31 42	#23 52	#15 62	#7 72	Bat Ready 82
3 Red-Orange	Out (T. - 2L.) 13	Double (M. - 2L.) 23	Single (B. - 2L.) 33	#30 43	#22 53	#14 63	#6 73	Steal Base 83
4 Red-Yellow	Out (T. - 3L.) 14	Single (M. - 3L.) 24	Triple (B. - 3L.) 34	#29 44	#21 54	#13 64	#5 74	Throw Out Runner 84
5 Red-Green	Out (T. - M.) 15	Sacrifice (M. - M.) 25	Home Run (B. - M.) 35	#28 45	#20 55	#12 65	#4 75	Player 1 Start 85
6 Red-Blue	Out (T. - 3R.) 16	Single (M. - 2R.) 26	Triple (B. - 2R.) 36	#27 46	#19 56	#11 66	#3 76	Player 2 Start 86
7 Red-Violet	Out (T. - 2R.) 17	Double (M. - 1R.) 27	Single (B. - 1R.) 37	#26 47	#18 57	#10 67	#2 77	87
8 Red-Gray	Out (T. - R.) 18	Single (M. - R.) 28	Double (B. - R.) 38	#25 48	#17 58	#1 68	#9 78	88

Please use the playfield map located below to find lamps #41 - #78.



SLUGFEST 1-36

T.9 All Lamps Test

Once the test name is shown under the Test Menu, press the Enter button. This test causes all the controlled lamps to flash at the same time. Every controlled lamp should flash. Any other result indicates the system has detected a problem.

Press the Escape button to return to the Test Menu. Press the Up button to display the next test, (or the Down button to return to a previous test). Press the Enter button to activate that test.

T.10 Lamp and Flasher Test

Once the test name is shown under the Test Menu, press the Enter button. This test causes all the flashlamps and the controlled lamps to flash at the same time. The controlled lamps blink, while the flashlamps cycle from highest to lowest. Any other result indicates the system has detected a problem.

Press the Escape button to return to the Test Menu. Press the Up button to display the next test, (or the Down button to return to a previous test). Press the Enter button to activate that test.

Press the Escape button to return to the Test Menu. Then, either press the Up or Down button to return to a previous Test, or press the Escape button again to return to the Main Menu. Once in the Main Menu, press the Up button to move to the next menu selection, the Utilities Menu, or press the Down button to return to a previous Main Menu selection.

T.11 Display Test

Once the test name is shown under the Test Menu, press the Enter button. This test automatically turns On and Off every dot on the Dot Matrix Display/Driver Board. A series of patterns appear in sequence. It starts with one line, turned On, moving across the display vertically, then horizontally. The pattern inverses and one line, turned Off, moves across the display vertically, then horizontally. The second pattern is a series of lines, turned On, moving across the display diagonally. The pattern inverses and there is a series of lines, turned Off, moving across the display diagonally. The third pattern is gridlines turned On, then Off. The last pattern is a box forming an outline of dots around the display that are turned On. After the box outline the test is repeated. Press the Up or Down button to cycle through the test manually.

T.12 Ramp Test

This test is just like the coil or music test except that it cycles the center ramp up and down. The operator may select either "Running", "Repeat" or "Stopped" mode by pressing the "Enter" switch. The "+" and "-" keys will select another sub-test. Press "escape" to exit the test.

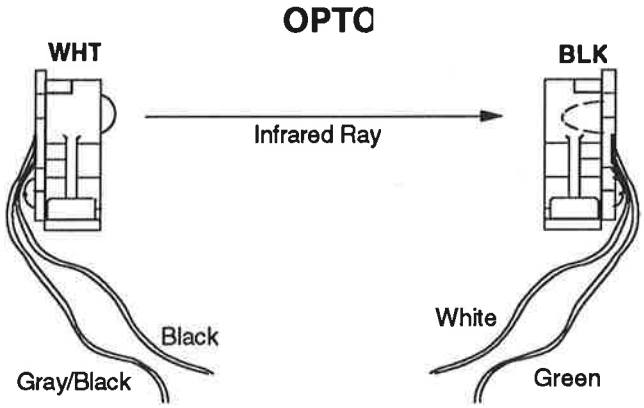
The Ramp opto beam (normally "UNBLOCKED") state is displayed as BLOCKED/UNBLOCKED on the bottom of the display. A "MOVING" message (right of screen) is displayed when power is supplied to the motor. If there is a problem, the word "ERROR" is printed on the top line.

The ramp motor is wired to rotate counter-clockwise (when viewing the unit from the left side of the game). Normally the ramp motor stops when the opto beam is unblocked.

Opto receiver (detector) should be about 0.1 - 0.7 volts when the opto beam is unblocked and

T.12 Ramp Test, continued

11-13 volts when the opto beam is blocked. The opto transmitter (emitter or L.E.D.) should always be about 1.4 volts. Note, the transmitter (L.E.D.) is larger than the receiver (it sticks out further from its case).



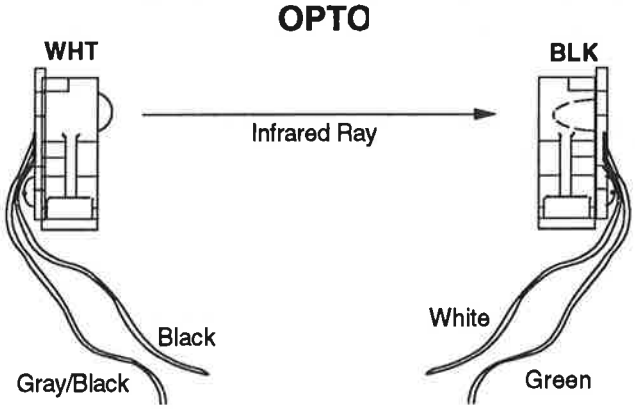
T.13 Pitch Test

This test is just like the coil or music test except that it cycles the pitch unit. The operator may select either "Running", "Repeat" or "Stopped" mode by pressing the "Enter" switch. The "+" and "-" keys will select another sub-test. Press "escape" to exit the test.

The Pitch opto beam (normally "UNBLOCKED") is displayed as BLOCKED/UNBLOCKED on the bottom of the display. A "PITCHING" message (right of screen) is displayed when power is supplied to the motor. If there is a problem, the word "ERROR" is printed on the top line. The magnet works best with slow pitches. The fast ball is not significantly effected by the magnet.

The pitch motor is wired to rotate clockwise (when viewing the unit from the left side of the game). With the pitch arm pointing towards the front of the game, the opto beam should be unblocked.

Opto receiver (detector) should be about 0.1 - 0.7 volts when the opto beam is unblocked and 11-13 volts when the opto beam is blocked. The opto transmitter (emitter or L.E.D.) should always be about 1.4 volts. Note, the transmitter (L.E.D.) is larger than the receiver (it sticks out further from its case).



Press the Enter button to activate the Utilities Menu, once the menu name is shown under the Main Menu. Then, use the Up or Down button to cycle through the Utility Menu selections.

Press the Enter button to activate the desired Utility or Utility Group when it appears in the displays. If you change a utility setting and realize you have made a mistake, press the Escape button while "Saving Adjustment Value" is still in the display. The original setting is retained and the new setting is ignored.

U. UTILITIES MENU

U.1 Clear Audits
U.2 Clear Coins
U.3 Reset H.S.T.D.
U.4 Set Time & Date
U.5 Custom Message
U.6 Set Game I.D.
U.7 Factory Adjustments
U.8 Factory Resets
U.9 Presets
U.10 Clear Credits
U.11 Auto Burn-in
U.12 Team 1 Name
U.13 Team 2 Name

U.1 Clear Audits

Press the Enter button to clear the Standard Audits, Feature Audits, and Histograms. Press the Up button to display the next utility.

U.2 Clear Coins

Press the Enter button to clear the Earnings Audits. Press the Up button to display the next utility.

U.3 Reset H.S.T.D.

Press the Enter button to clear the High Score to Date Table and the Grand Champion & Billionaires Club H.S.T.D. Press the Up button to display the next utility.

U.4 Set Time and Date

Press the Enter button to activate the time and date. Use the Up or Down button to change the value, then press the Enter button to lock in that value. If you make a mistake press the Escape button while "Saving Adjustment Value" is displayed. Press the Up button to move to the next utility.

U.5 Custom Message

This utility allows the operator to install a message that appears in the displays during the Attract Mode. Press the Enter button to activate the Custom Message. Use the Up or Down button to rotate letters. Use the Start button to rotate punctuation marks, (if desired). Press the Enter button to lock in the desired letter and punctuation. Note: Set Adjustment A.1 20 to YES before trying to write a Custom Message.

U.6 Set Game I.D.

This utility allows the operator to install a message, such as game location, that only appears on printouts . Press the Enter button to activate Set Game I.D.. Use the Up or Down button to rotate letters. Use the Start button to rotate punctuation marks, (if desired). Press the Enter button to lock in the desired letter and punctuation.

U.7 Factory Adjustment

Press the Enter button to restore the adjustments to factory settings, then press the Up button to display the next utility.

U.8 Factory Reset

Press the Enter button to restore the adjustments to their factory setting, clear the Audits, H.S.T.D & Billionaires Club Table, and Custom Message/Game I.D. Press the Up button to display the next utility.

U.9 Presets

Press the Enter button to activate the Presets Group. Use the Up or Down buttons to cycle through the available Presets. When the desired Preset is displayed, press the Enter button to lock in that Preset. If you realize you have made a mistake, press the Escape button while "Saving Adjustment Value" is displayed. The new value is ignored and the original value is retained.

U.9 01 Install Extra Easy
U.9 02 Install Easy
U.9 03 Install Medium
U.9 04 Install Hard
U.9 05 Install Extra Hard

The operator can change the game play difficulty, factory settings are the same as "install medium". All these installs modify the Feature Adjustments from A.2.03 "1 Player Difficulty" to A.2.13 "Double Hit Target".

U.9 08 Install Add -An -Inning

The operator utilizes this option to delete all Free Play awards and replace them with Extra Inning awards. Individual adjustments are affected as shown below:

Ad	Name	New Setting
A.1 14	Replay Award	Extra Inning
A.1 19	Match Feature	Off
A.1 19	Match Feature	Off
A.2 25	Runs Award	Extra Inning
A.4 05	High Score 1 Credits	00
A.4 05	High Score 2 Credits	00
A.4 08	High Score 3 Credits	00
A.4 07	High Score 4 Credits	00
A.4 16	M. Runs 1 credits	00
A.4 17	M. Run. 2-10 Credit	00

U.9 10 Install Novelty

The operator utilizes this option to remove all Free Play and Extra Inning awards. Individual adjustments are affected as shown below:

Ad	Name	New Setting
A.1 09	Replay Level 1	Off
A.1 10	Replay Level 2	Off
A.1 11	Replay Level 3	Off
A.1 12	Replay Level 4	Off
A.1 19	Match Feature	Off
A.2 21	Heckler/Ex. Inning	None
A.2 22	Heckler/Ex. Inning	None
A.2 23	Heckler/Ex. Inning	None
A.2 24	Heckler/Ex. Inning	None
A.2 25	Runs Award	Nothing
A.4 01	Highest Score	On
A.4 04	Champion Credits	00
A.4 05	High Score 1 Credits	00
A.4 06	High Score 2 Credits	00
A.4 07	High Score 3 Credits	00

A.4 08	High Score 4 Credits	00
A.4 16	M. Runs 1 credits	00
A.4 17	M. Run. 2-10 Credit	00

U.9 17 Install German 1• **• For German Jumpered CPU Boards only.**
U.9 18 Install German 2•
U.9 19 Install German 3•
U.9 20 Install German 4•
U.9 21 Install German 5•
U.9 22 Install German 6•

The operator uses this adjustment to modify the game pricing and the type of game play. The Preset Game Adjustments Table for German/European Games lists the adjustments and settings that comprise the 'Install German 1' to 'Install German 6' Group.

Preset Game Adjustments Table for German/European Games

Adj #	Adj Description	German 1 U.9 17	German 2 U.9 18	German 3 U.9 19	German 4 U.9 20	German 5 U.9 21	German 6 U.9 22
A.1 14	Replay Award	Credit	Ticket	Audit	Credit	Ticket	Audit
A.1 15	Special Award	Credit	Ex. Ball	Points	Credit	Ex. Ball	Points
A.1 16	Match Award	Credit	Ticket	Credit	Credit	Ticket	Credit
A.1 19	Match Feature	7 %	7 %	Off	7 %	7 %	Off
A.2 21	Heckler/Ex. Inning	1	1	None	1	1	None
A.2 22	Heckler/Ex. Inning	3	3	None	3	3	None
A.2 23	Heckler/Ex. Inning	5	5	None	5	5	None
A.2 24	Heckler/Ex. Inning	9	9	None	9	9	None
A.2 25	Runs Award	Ex. Inning	Ex. Inning	Nothing	Ex. Inning	Ex. Inning	Nothing
A.3 01	Game Pricing	6 spiele/5 DM	6 spiele/5 DM	6 spiele/5 DM	7 spiele/5 DM	7 spiele/5 DM	7 spiele/5 DM
A.4 02	H.S.T.D. Award	Credit	Ticket	Credit	Credit	Ticket	Credit
A.4 04	Champion Credits	03	03	00	03	03	00
A.4 05	High Score 1 Credits	01	01	00	01	01	00
A.4 06	High Score 2 Credits	00	00	00	00	00	00
A.4 07	High Score 3 Credits	00	00	00	00	00	00
A.4 08	High Score 4 Credits	00	00	00	00	00	00
A.4 10	Backup Champion	1,500,000	1,500,000	00	1,500,000	1,500,000	00
A.4 11	Backup High Score 1	1,000,000	1,000,000	00	1,000,000	1,000,000	00
A.4 12	Backup High Score 2	800,000	800,000	00	800,000	800,000	00
A.4 13	Backup High Score 3	600,000	600,000	00	600,000	600,000	00
A.4 14	Backup High Score 4	400,000	400,000	00	400,000	400,000	00
A.4 16	M. Runs 1 Credits	10	10	00	10	10	00
A.4 17	M. Run 2-10 Credit	8	8	00	8	8	00

U.9 23 Install French 1* ***For French Jumpered CPU Boards only.**
U.9 24 Install French 2*
U.9 25 Install French 3*
U.9 26 Install French 4*
U.9 27 Install French 5*
U.9 28 Install French 6*

The operator uses this adjustment to modify the game pricing and the type of game play. The Preset Game Adjustments Table for French Games lists the adjustments and settings that comprise the'Install French 1' to 'Install French 6' Group.

U.9 29 $2.25/9 Innings (straight 25¢ / inning)
U.9 30 $1.50/9 Innings (straight 50¢ / 3 innings)
U.9 31 $1.25/9 Innings (50¢ first 2 innings, 25¢ additional 2 innings, 9 innings / $1.25)
U.9 32 $1.00/9 Innings (25¢ / 2 innings, $1 = 9 innings)
U.9 33 75¢/9 Innings (straight 25¢ / 3 innings)
U.9 34 $2.00/9 Innings (1 inning/25$, 9 innings/$2.00)
U.9 35 $4.00/9 Innings (1 inning/50¢, 9 innings/$4.00)
U.9 36 $2.50/9 Innings (First Inning 50¢, additional innings 25¢)

These presets set the game to the indicated coinage, and change some game settings. **Note**, if you are dispensing cards or tickets and change the coinage, you will also need to adjust your ticket or card rate.

Press the Escape button to return to the Presets menu. Then press the Up button to display the next utility, (or the Down button to return to a previous utility).

U.10 Clear Credits

Press the Enter button to clear the game Credits. Press the Up button to display the next utility.

U.11 Auto Burn-in

Press the Enter button to activate Auto Burn-in. This utility allows you to automatically cycle through several tests. This helps in finding intermittent problems. The tests that Auto Burn-in cycles through are the Display Test, the Sound and Music Test, the All Lamps Test, the Solenoid Test, the Flashers Test, and the General Illumination Test.

U.12 Team 1 Name
U.13 Team 2 Name

These utilities allows the operator to set the name of each team. Press "enter" to change the name. A name of up to 8 letters is allowed to be entered. Use "+" and "-" to change the letter, press "Enter" to keep this letter. Pressing "Escape" will cancel this sequence and ask you if you wish to use the factory name. Press "Enter" to set the factory name, press "Escape"to keep the current name.

Press the Enter button to activate the Utilities Menu, once the menu name is shown under the Main Menu. Then, use the Up or Down button to cycle through the Utility Menu selections. Press the Enter button to activate the desired Utility or Utility Group when it appears in the displays. If you change a utility setting and realize you have made a mistake, press the Escape button while "Saving Adjustment Value" is still in the displays. The original setting is retained and the new setting is ignored.

C. GAME CONFIGURATION MENU

C.1 Clear Audits
C.2 Clear Coins
C.3 Reset H.S.T.D.

C.1 Set Cards

The operator utilizes this option to remove credit awards and replace them with a conservative initial set of Baseball card dispense rate of 1 per quarter.

C.1 Set Tickets

The operator utilizes this option to remove credit awards and replace them with a conservative initial set of Ticket dispense rate of 3 per quarter.

C.1 Set Coin-Op

The operator utilizes this option to remove all redemption awards and replace them with regular coin-operated credit awards.

Adjustment	Name	Set Cards	Set Tickets	Set Coin-OP
A.1.14	Replay Award	Audit	Audit	Credit
A.1.16	Match Award	Ticket	Ticket	Credit
A.1.17	Extra Inning Ticket	Yes	Yes	No
A.1.19	Match Feature	Off	Off	8%
A.1.20	Two Player Extra Inning	Yes	Yes	Yes
A.4.15	Most Runs Award	Ticket	Ticket	Credir
A.4.02	HSTD Award	Ticket	Ticket	Credit
A.6.01	Dispense What?	Cards	Tickets	Nothing
A.6.04	Dispenser Rate	1/ Quarter	3/Quarter	Not Used
A.6.06	Dispenser Errors	Ignore	Wait	Not Used
A.6.08	Max. Tickets/Player	25	50	Not Used
A.6.09	Tickets/Game Start	1	0	Not Used
A.6.10	Tickets/Buyin	1	0	Not Used
A.6.11	Tickets/Heckler	3	10	Not Used
A.6.12	Tickets/2 Hecklers	4	15	Not Used
A.6.13	Tickets/3 (or more) Hecklers	5	20	Not Used
A.6.14	Tickets/Grand Slam	3	10	Not Used
A.6.15	Tickets/Center H.R. Center	2	5	Not Used
A.6.16	Tickets/Center H.R. Left	2	5	Not Used
A.6.17	Tickets/Center H.R. Right	2	5	Not Used
A.6.18	Tickets/Playfield H.R.	0	3	Not Used
A.6.19	Level 1 Runs	5	5	Not Used
A.6.20	Tickets/Level 1 Run	1	4	Not Used
A.6.21	Level 2 Runs	15	15	Not Used
A.6.22	Tickets/Level 2 Run	1	8	Not Used
A.6.23	Level 3 Runs	25	25	Not Used
A.6.24	Tickets/Level 3 Run	1	12	Not Used
A.6.25	Level 4 Runs	35	35	Not Used
A.6.26	Tickets/Level 4 Run	1	15	Not Used
A.6.27	Tickets/Extra Inning	0	0	Not Used
A.6.28	Tickets/Replay	0	0	Not Used
A.6.29	Tickets/Match	0	0	Not Used
A.6.30	Tickets/Champion	4	20	Not Used
A.6.31	Tickets/H.S.T.D. 1	3	10	Not Used
A.6.32	Tickets/H.S.T.D. 2	2	5	Not Used
A.6.33	Tickets/H.S.T.D. 3	2	5	Not Used
A.6.34	Tickets/H.S.T.D. 4	1	5	Not Used
A.6.35	Tickets/Most Runs 1	1	3	Not Used
A.6.36	Tickets/Most Runs 2-10	1	2	Not Used
A.6.37	Tickets Inning	0	0	Not Used

IMPORTANT! An electronic game with a redemption device may be prohibited under applicable laws. Check with local authorities concerning these laws prior to installing or operating a game equipped with a ticket dispenser.

Press the Escape button to return to the Game Configuration Menu. Then, either press the Up or Down button to return to a previous Menu Group, or press the Escape button again to return to the Main Menu. Once in the Main Menu either use the Up or Down buttons to return to a previous menu selection, or press the Escape button again to return to the Attract Mode.

PROBLEM ANALYSIS MESSAGES

The WPC game program has a great capability to aid the operator and service personnel: At Game Turn-on (and after pressing the Begin Test switch) once the game has been operating for an extended period, the display may signal with a message, "Press ENTER for Test 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 Begin Test switch. Press the Enter button to begin displaying the message(s). The following messages apply to your **SLUGFEST** game.

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 "Adjust 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 **SLUGFEST** 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 Menu text describing Switch Testing, and check each reported switch using applicable switch 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).

xxxxx Sw. is Stuck On

This message indicates that a switch, which is not usually On, remains in the On position after the game is switched On. The stuck switch is essential for game play (for example, a coin chute switch, the slam tilt switch, the plumb bob tilt switch), and should be cleared to permit proper game operation.

Ground Short Row-N, Wht-xxx

Frequent appearance of this message requires activation of the Switch Levels Test to locate the switch causing the "WHT-xxx ROW x SHORT" message. Possible 'row short' causes are: 1) Slam Tilt (or other coin door) switch touching the grounded coin door; 2) A *leaf-type,* playfield switch touching a grounded part; 3) Players poking metallic objects (wires, coat hangers, etc.) into the game; 4) Switch cable insulation pierced or damaged allowing bare wire contact with a grounded part; 5) All switches in a row closing at the same time (Note: This instance is NOT a switch problem; however, for most games this is a very rare possibility).

Ramp Position Error

The ramp did not get into its desired position. Go to the "Ramp Test" diagnostic and make sure that the motor operates and that the ramp switch (normally "unblocked") changes.

Fast Pitch Error
Med. Pitch Error
Slow Pitch Error

The pitch unit did not move or the pitch opto switch is not functioning. Note, there are 3 coil drives that control the speed of the motor, each coil drive has its own error message. If only 1 message is present, the most likely (but not certain) problem is a loose motor drive wire.

Factory Settings Restored

This message indicates that the CMOS RAM no longer retains any custom Pricing or Game Adjustment settings and has reverted to factory default settings. Generally, the following CPU checks will isolate the cause of the CMOS RAM memory failure. The voltage at pin 28 and pin 26 of U8 should be +5V (game turned On) and at least +4V (game turned Off). When the voltage drops below +4V, memory reset occurs. Check the batteries and battery holder. Be sure that the batteries are good and that there is no contamination on the battery holder terminals. Turn the game OFF, and use an ohmmeter to check diodes D1 and D2 on the CPU Board. D1 should read 0 ohms when forward-biased and infinite ohms when reverse-biased. D2 should read 15 ohms when forward-biased and infinite ohms when reverse-biased.

U6 Checksum Error

The game ROM checksum is invalid. If this occurs replace the game ROM.

Time and Date Not Set

The real time clock is not running. If this occurs go to U.4 of the Utilities Menu and set the time and date.

Card Dispenser Problem

The cards from the card dispenser are taking too long to dispense. This usually means that the cards are not falling freely into the card catcher. Possible problems are;

1) The card chute is adjusted too far towards the back of the dispenser, putting additional drag on the card after the card leaves the motor. (See adjusting your card dispenser in the Maintenance Information Section).
2) The card is hitting something when it goes through the cabinet hole to the card catcher. There should be no obstructions.
3) The cards have curled too much probably due to humidity, or the cards are too old. Replace all the cards with fresh cards.
4) The picture side of the baseball cards are NOT ALL facing to the back of the dispenser. The dispenser cannot reliably grip the picture side of the cards. Remedy, ALL CARDS must have the picture side towards the back of the dispenser.

CPU LEDs

The CPU has three LEDs located on the upper left side of the board, D19, D20, D21. On game power-up D19 and D21 turn On for a moment then, D19 turns Off and D20 starts to blink rapidly. D21 remains On. The system has detected a problem if the following happens:

CPU Board LED Error Codes

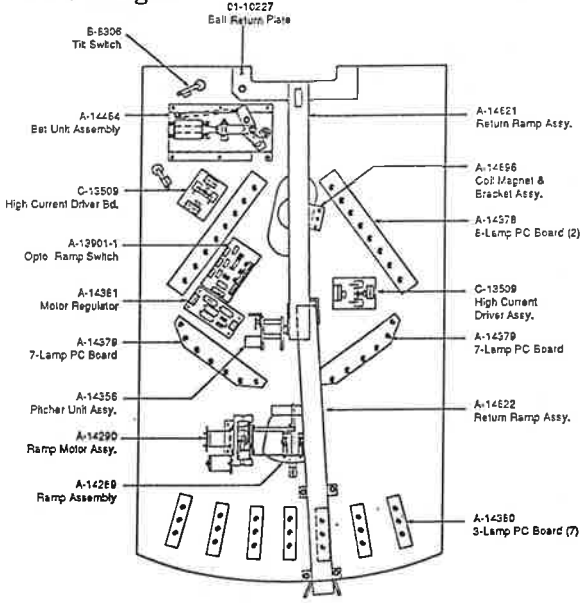
D 20 blinks one time -	ROM Error U6
D 20 blinks two times -	RAM Error U8
D 20 blinks three times -	Custom Chip Failure U9

MAINTENANCE INFORMATION

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

ADJUSTING THE PITCH UNIT

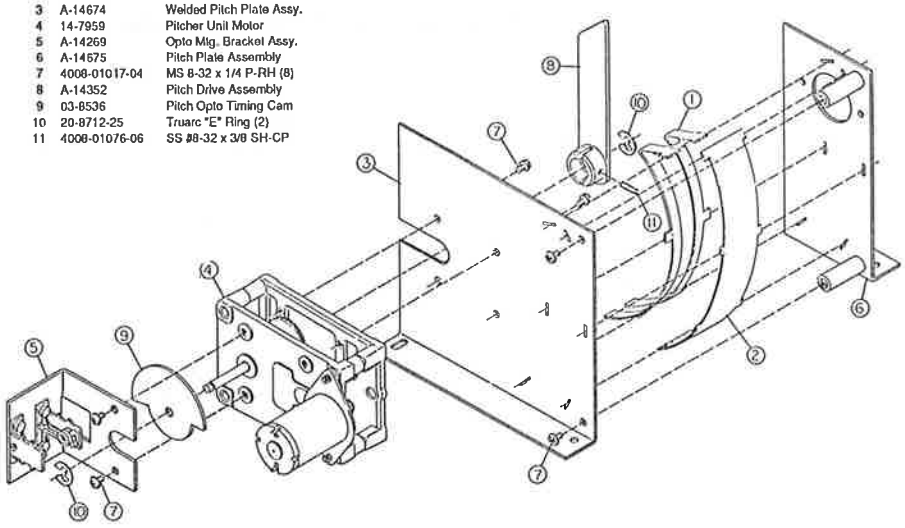
The balls should fall into the pitch unit. The lowest trough connects to the pitch unit and is adjustable. The trough should be adjusted so that you can just see the entrance hole to the pitch unit from the bottom of the trough.



The ball should not be launched into the air during a fast pitch. This is adjustable by the top of the pitch unit. Carefully lift both of the pitch "spring steel" covers (WARNING, the edges are extremely sharp), and bend the metal deflector tab downward. But, do not lower it too much so that it prevents a ball from traveling through the guide. The smaller of the 2 "spring steel" guides should also be firmly pressing down on the ball guide to prevent the ball from lifting. When this adjustment is done, re-check the slow pitch and make sure that the ball is still being pitched. If the ball is not being pitched, release some tension on the smaller spring steel guide.

A-14356 Pitcher Unit Assembly

Item	Part Number	Description
1	01-2531	Ball Guide Rail
2	01-2532	Ball Guide Rail
3	A-14674	Welded Pitch Plate Assy.
4	14-7959	Pitcher Unit Motor
5	A-14269	Opto Mtg. Bracket Assy.
6	A-14675	Pitch Plate Assembly
7	4008-01017-04	MS 8-32 x 1/4 P-RH (8)
8	A-14352	Pitch Drive Assembly
9	03-8536	Pitch Opto Timing Cam
10	20-8712-25	Truarc "E" Ring (2)
11	4008-01076-06	SS #8-32 x 3/8 SH-CP



MAINTENANCE INFORMATION CON'T.

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.

CLEANING

Good game action and extended playfield life are the result of regular playfield cleaning. During each collection stop, the playfield glass should be removed and thoroughly cleaned and 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 any carnauba based 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.

Your card dispenser has been preadjusted at the factory, there should be no need to re-adjust it. However, if the cards in your supply are either to thick or too thin; located on the left side of the dispenser are 4 slotted screws that adjust the motor assembly. The motor assembly should be moved forward or backward so that only 1 card is dispensed at a time.

Important Tips Concerning Card Dispenser Information:

- **Do not operate when the humidity level is at or above 90%.**
- **Do not re-dispense Baseball Cards (use more than once).**
- **Use only baseball cards that are used for Vending Machines (do not use the cards packaged with chewing gum or food).**
- **All baseball cards must be loaded in the dispenser with the picture side of the card facing the back of the dispenser.**
- **The dispenser can hold around 1,030 cards (64 cards per inch).**
- **30 cards are always left over when the dispenser is considered empty.**
- **Dispensable cards (per filling) = 1,000**
- **Factory set to dispense an average of 1 card per quarter.**
- **Income before refilling dispenser is about $250.00.**

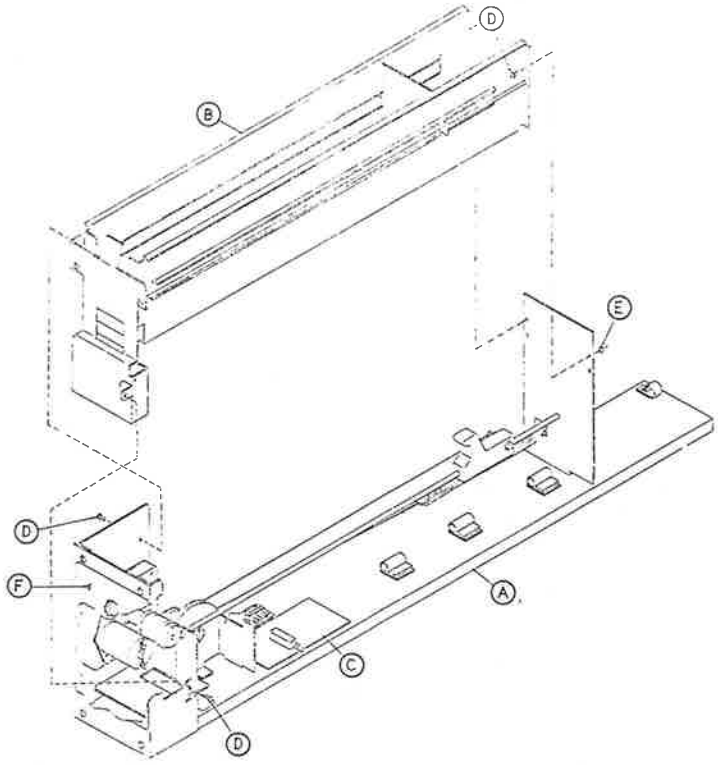
ADJUSTING A CARD DISPENSER

Note, the dispenser is not guaranteed to operate properly when the humidity is at or above 90% level.

Note, it is REQUIRED that the PICTURE SIDE OF ALL CARDS faces the back of the dispenser.

Note, use only Vending Machine Baseball Cards. DO NOT use individually wrapped cards (packaged with gum or food) because the dispenser will not operate properly.

Your card dispenser has been preadjusted at the factory, there should be no need to re-adjust it. However, if your supply of baseball cards are to thick or too thin, on the left side of the dispenser are 4 slotted screws that adjust the motor assembly for various size cards. The motor assembly should be moved forward or back so that only 1 card is dispensed at a time.

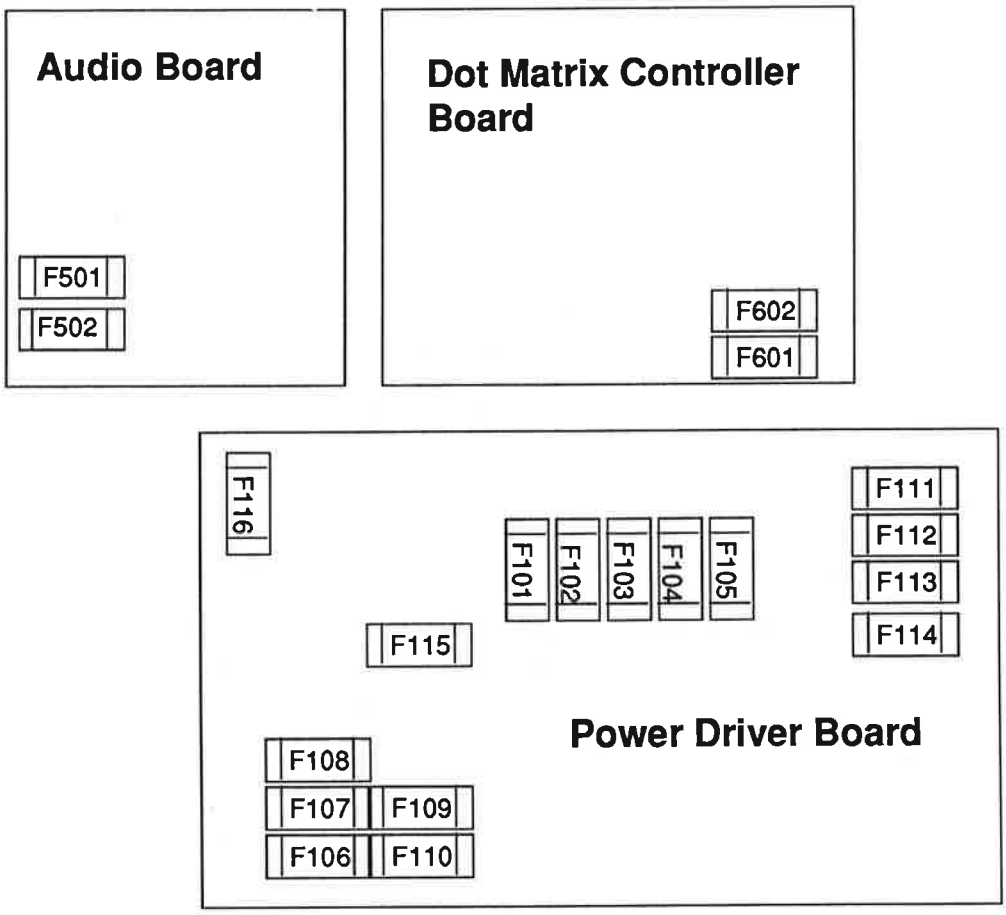


If the card chute is not adjusted properly, cards will not fall when the card passes the motor's pinch roller. The adjustable screw slot on the front right side of the dispenser can widen the narrow gap that a card must fall through before it falls into the wide portion of the card chute. If this narrow path is too narrow, the next card can hold the currently dispensing card and prevent it from falling.

ADJUSTING THE TROUGH CONNECTION (FROM CABINET TO PLAYFIELD)

The cabinet trough is adjustable via slotted screws on the cabinet. The cabinet trough should be higher than the playfield trough (when the playfield is CLAMPED down). This allows the balls to fall freely into the playfield trough.

Fuse List



Audio Board

F501	-25V Circuit	3A, S.B.
F502	+25V Circuit	3A, S.B.

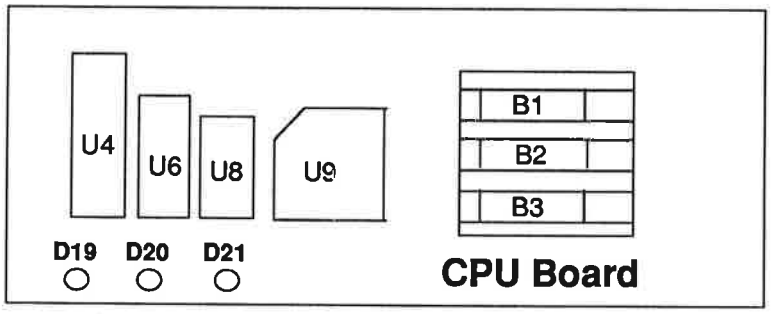
Dot Matrix Controller Board

F601	+62V Circuit	3/8A, S.B.
F602	+125V Circuit	3/8A, S.B.

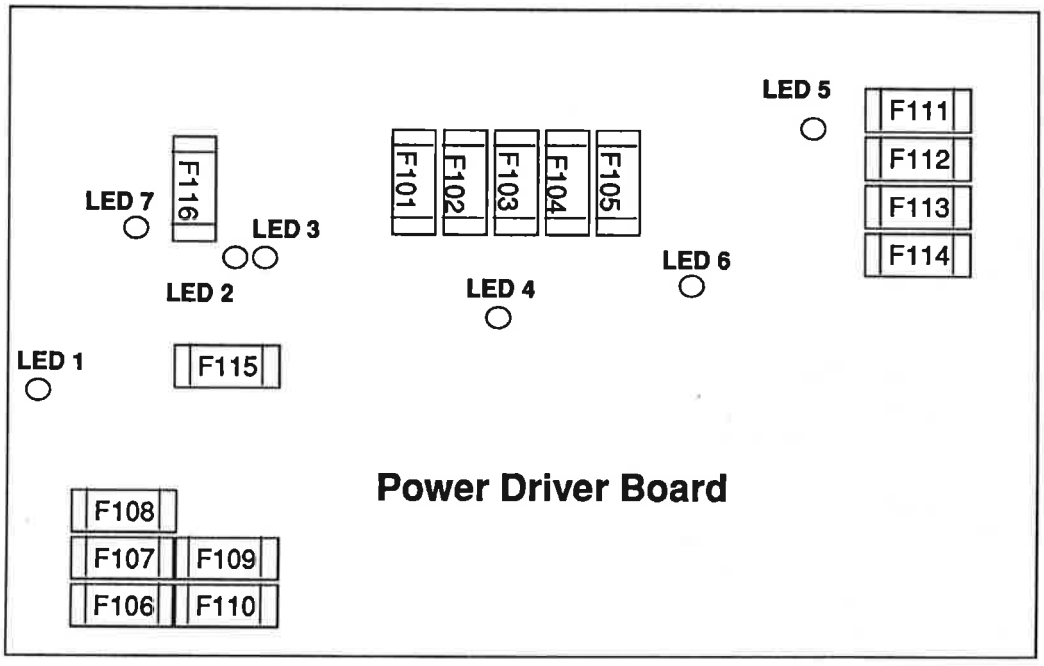
Power Driver Board

F101	Left Flipper	2.5A, S.B.
F102	Right Flipper	2.5A, S.B.
F103	Solenoid 25-28	3A, S.B.
F104	Solenoids 9-16	3A, S.B.
F105	Solenoids 1-8	3A, S.B.
F106	G.I. #2 Wht-Vio	5A, S.B.
F107	G.I. #3 Wht-Yel	5A, S.B.
F108	G.I. #5 Wht-Grn	5A, S.B.
F109	G.I. #4 Wht-Orn	5A, S.B.
F110	G.I. #1	5A, S.B.
F111	Flasher Secondary	5A, S.B.
F112	Solenoid Secondary	5A, S.B.
F113	+5V Logic	5A, S.B.
F114	+18V Lamp Matrix	8A, N.B.
F115	+12V Switch Matrix	3/4A, S.B.
F116	+12V Secondary	3A, S.B.

LED List



CPU Board
D19 , Blanking
D20, Diagnostic
D21, +5vdc
At game Turn-On = D19 & D21 On, D20 Off
During Normal Operation = D19 Off, D20 Flashing, D21 On



Power Driver Board
LED1, +12vdc Switch Circuit, Normally On
LED 2, High/Low Line Voltage Sensor, Normally On
LED 3, High/Low Line Voltage Sensor, Normally Off
LED 4, +5vdc, Digital Circuit, Normally On
LED 5, +20vdc, Flashlamp Circuit, Normally Off
LED 6, +18vdc, Lamps Circuit, Normally On
LED 7, +12vdc, Power Circuit (motors relays etc.), Normally On



SECTION 2

Game Parts Information

Parts Lists & Diagrams

Cabinet Assembly
Major Mech. Location Diagram
WPC Audio Board
WPC System CPU Board
WPC Power Driver Board
Dot Matrix Controller Board

Major Mechanism Assemblies
Lamps
Switches
Solenoids/Flashers
Playfield Parts

Cabinet Parts

Part Number	Description
A-12697-1	Power Driver Assembly
A-14471	Card Dispenser Assembly
A-12742-60001	WPC CPU Assembly
A-12738-60001	Sound Board Assembly
A-13901-2	Opto Ramp Switch Assy.
A-14102	WPC Coin Door Assembly
A-14150	Target Board Assembly
A-14598	Barrier Moulding Assembly
A-14563	Screen Assembly
A-14510	Control Panel Assembly
A-14567	16-Diode Sw. & Lamp Assy.
A-14039	Dot Matrix Controller Assy.
5901-12784-00	Dot Matrix Display
A-14796	Card Chute Assy.
A-14537	Single Flash Lamp PCB
A-14611	Inside Light Panel Assy.
A-14612	Hinged Door Assembly
A-14440	Capacitor & Speaker Assy.
08-7572-1	Playfield Glass
08-7572-2	Glass - Top
C-11026-1	Line Filter Assembly
A-14369	Bleachers Assembly

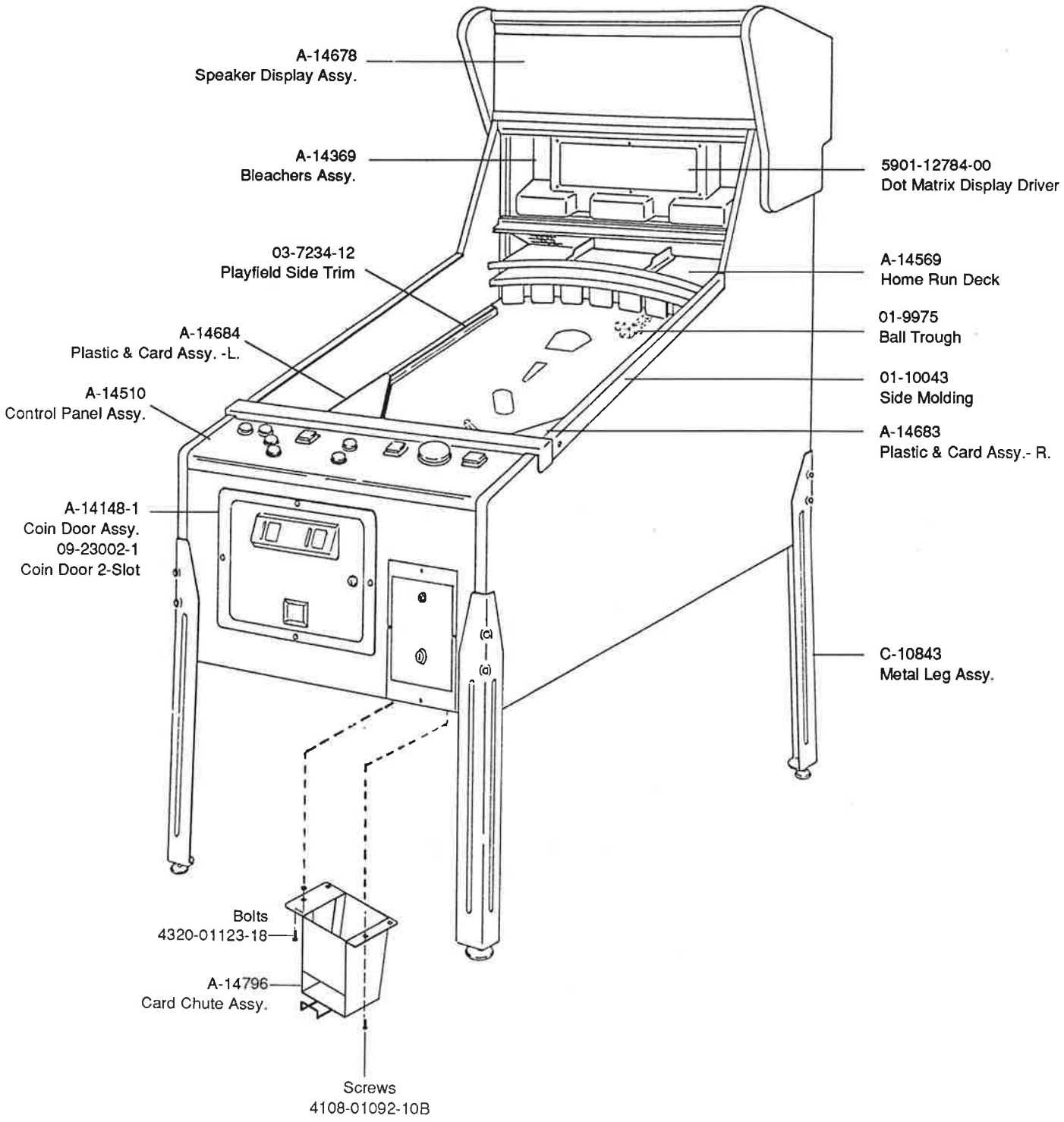
Playfield Parts

A-13901-1	Opto Ramp Sw. Assy.
A-14287	Ball Flap Assembly
A-14289	Ramp Assembly
A-14301	Pitch Unit Assembly
A-14378	8-Lamp Assembly
A-14379	7-Lamp Assembly
A-14380	3-Lamp Assembly
A-14381	Motor Regulator
A-14441	Playfield Assembly
A-14464	Bat Unit Assembly
A-14696	Coil Magnet & Bracket Assy.
A-14622	Ball Return RR Comp.
A-14645	Handle Assembly
A-14621	Ball Return FR Comp.
A-14684	Plastic & Card Assy. - Left
A-14683	Plastic & Card Assy. - Right
01-9975	Ball Trough
03-8516	Bat
B-8306	Tilt Switch
C-13509	High Current Driver Board

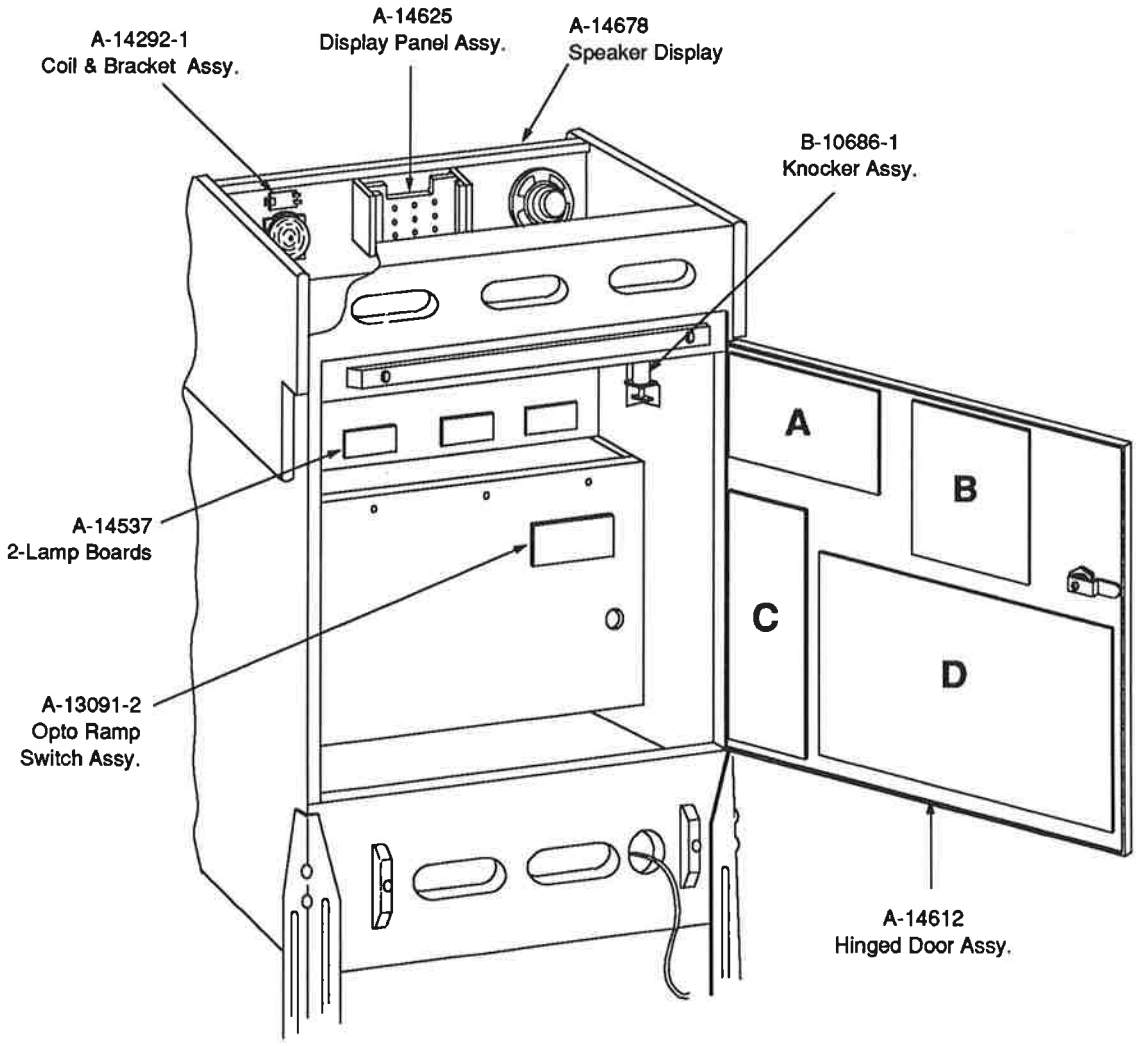
Backbox Parts

A-14625	Display Panel Assembly
A-14570	Wood Backbox Assy.
01-10214-1	Vent Grill
A-14678	Speaker Display Assy.
5555-12015-00	6" Speaker, 8Ω, 20W
5555-12068-00	4" Speaker Piezo, 50W
A-14292-1	Coil & Bracket Assembly
A-14626	Door Panel Assembly

SLUGFEST Cabinet Assembly



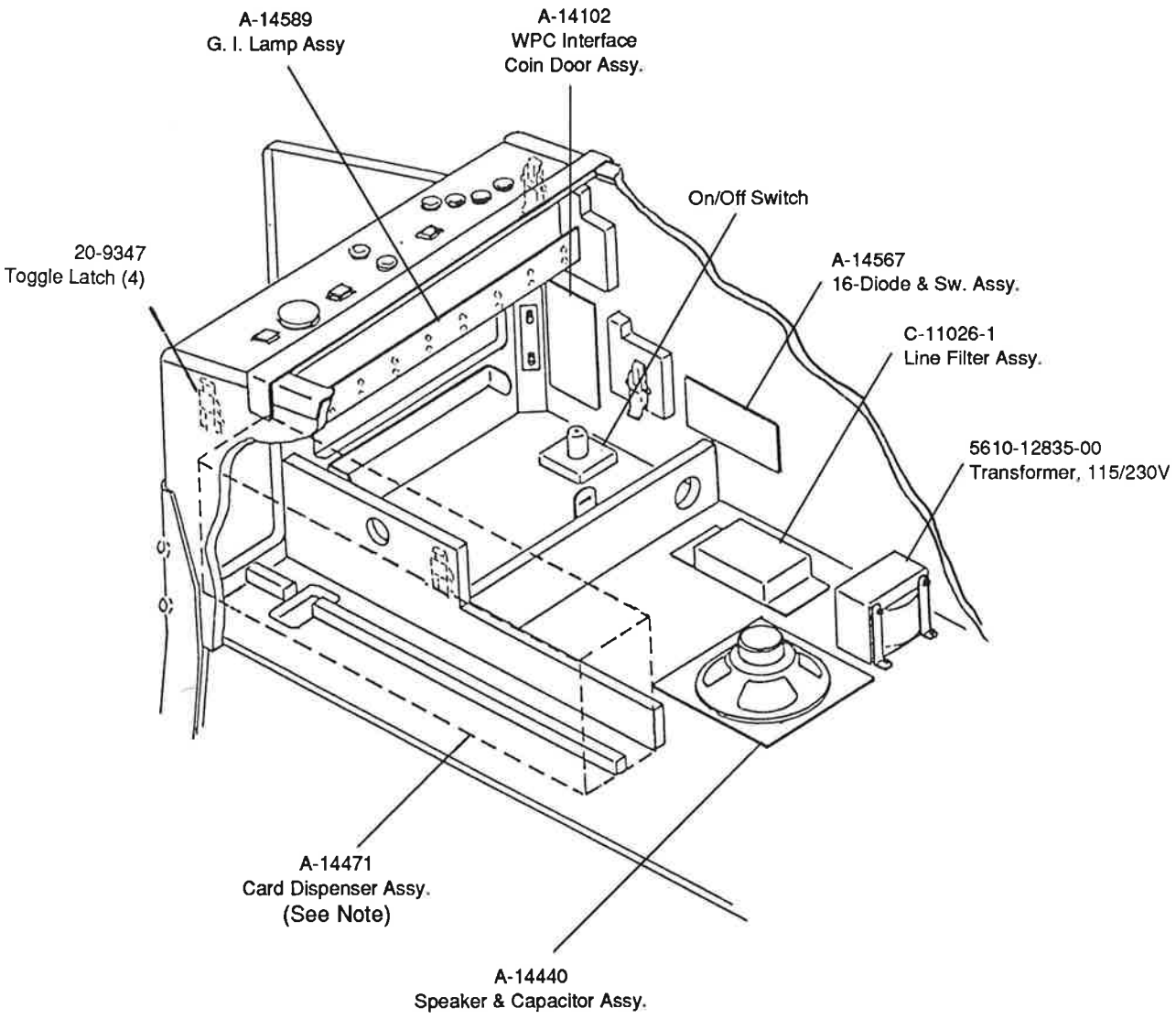
SLUGFEST - Rear View



Printed Circuit Boards

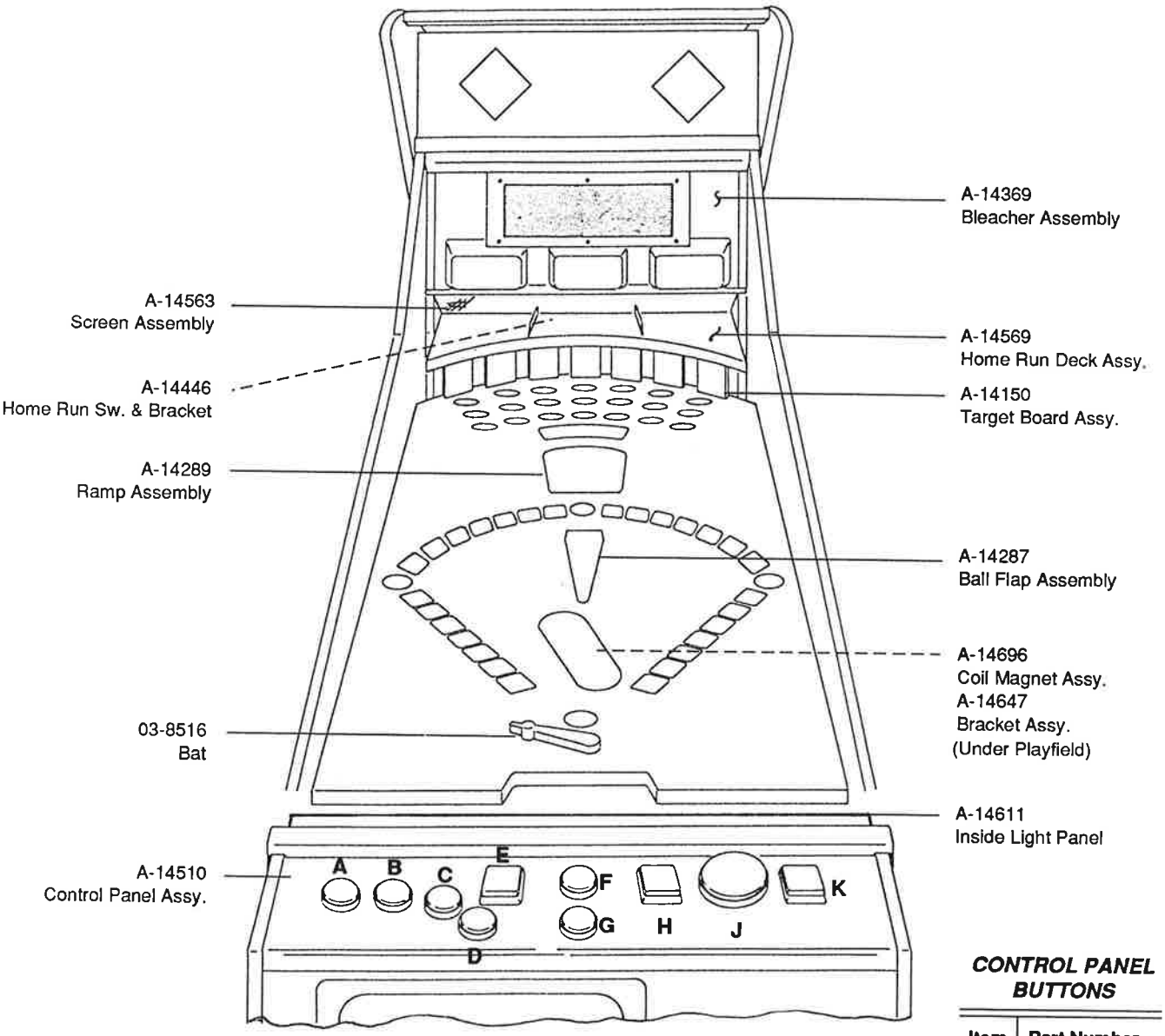
Item	Part Number	Description
A	A-12738-60001	Audio Board
B	A-14039	Dot Matrix Controller
C	A-12742-60001	WPC CPU Board
D	A-12697-1	WPC Power Driver Bd.

Cabinet Parts

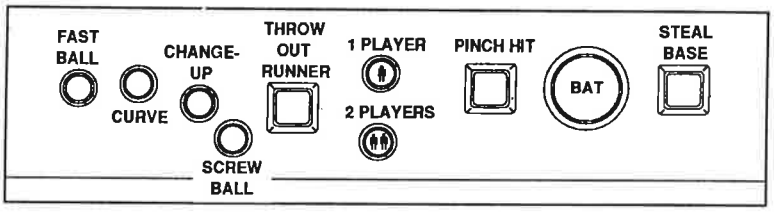


Note: To order replacement or additional baseball cards, contact your authorized **WILLIAMS** Distributor.

SLUGFEST - Top View



Control Panel

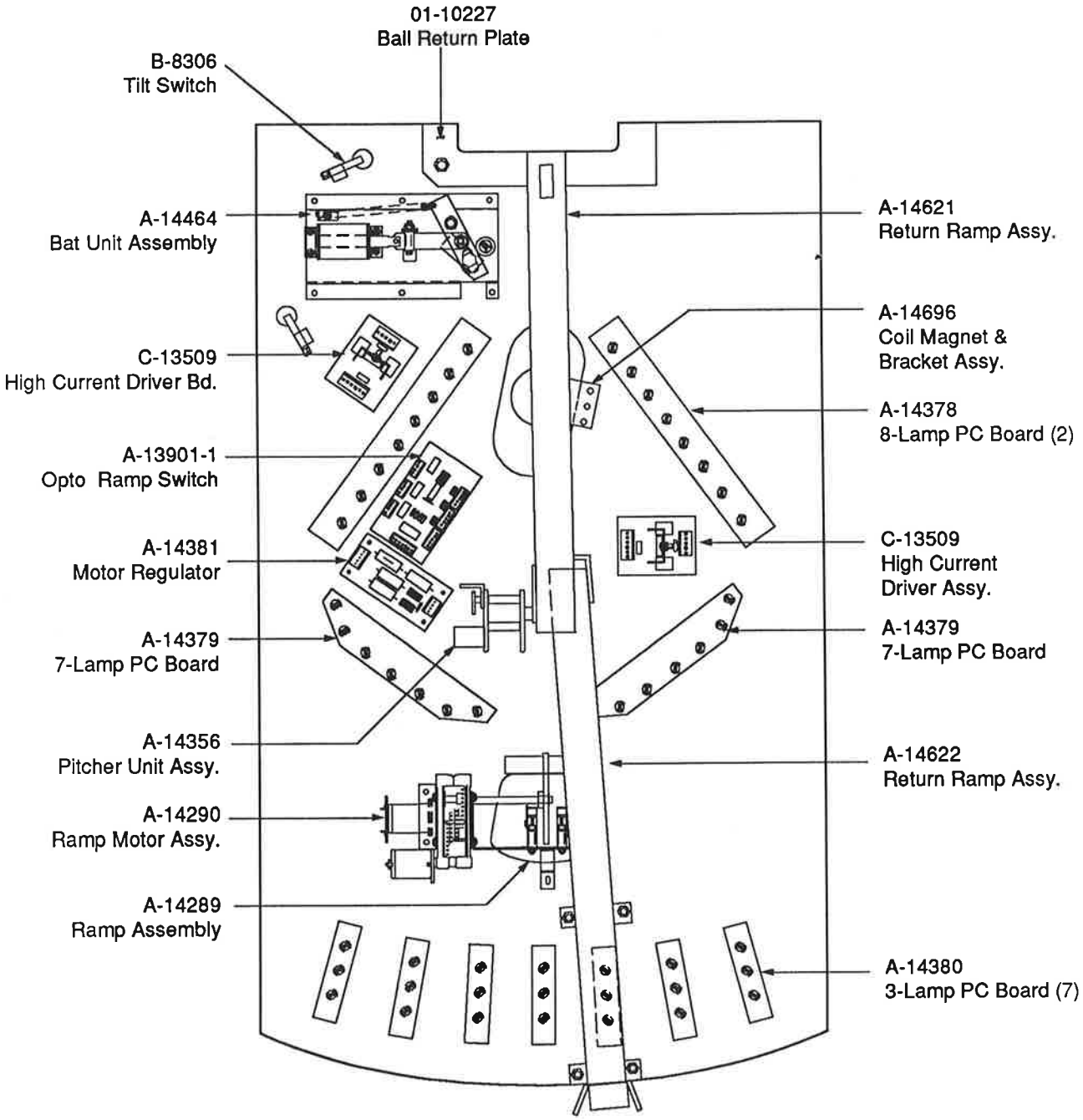


CONTROL PANEL BUTTONS

Item	Part Number
A	20-9663-A-6
B	20-9663-A-5
C	20-9663-A-4
D	20-9663-A-3
E	20-9663-C-3
F	20-9663-A-1
G	20-9663-A-2
H	20-9663-C-1
J	20-9663-B-1
K	20-9663-C-2

Locations Diagram - Game Major Mechanisms

Underside of Playfield, Viewed in Raised Position



Lamp Boards

A-12224-1 Single Lamp Board

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, 1N40004
5010-09534-00	Resistor, 0Ω

A-14378 8-Lamp Board

Part Number	Description
5768-12773-00	Lamp PCB
24-8767	Twist Lamp Socket
24-8768	Bulb #555, (6.3v, 0.25A.)
5070-09054-00	Diode, 1N40004
5791-10871-10	Connector, 10-pin Header Sq Flat

A-14379 7-Lamp Board

Part Number	Description
5768-12774-00	Lamp PCB
24-8767	Twist Lamp Socket
24-8768	Bulb #555, (6.3v, 0.25A.)
5070-09054-00	Diode, 1N40004
5791-10871-09	Connector, 9-pin Header Sq Flat

A-14380 3-Lamp Board

Part Number	Description
5768-12771-00	Lamp PCB
24-8767	Twist Lamp Socket
24-8768	Bulb #555, (6.3v, 0.25A.)
5070-09054-00	Diode, 1N40004
5791-10871-05	Connector, 5-pin Header Sq Flat

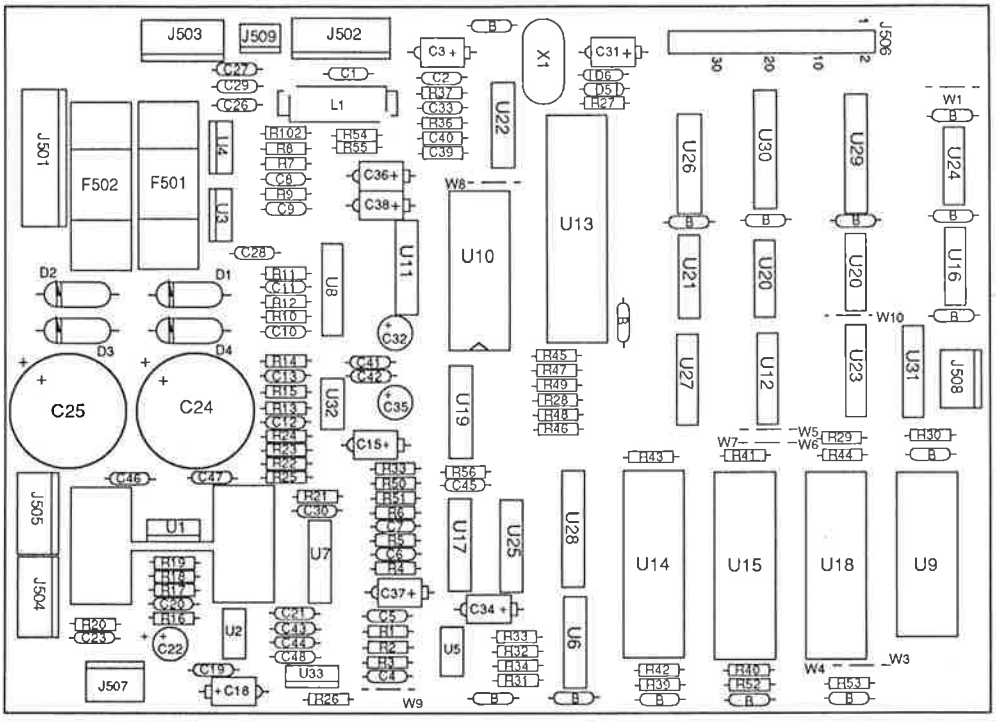
A-14537 Single Flash Lamp

Part Number	Description
5768-12802-00	Lamp PCB
24-8803	Twist Lamp Socket
24-8802	Bulb #906, (13v, 0.69A.)
24-8767	Twist Lamp Socket
24-8768	Bulb #555, (6.3v, 0.25A.)
5070-09054-00	Diode, 1N40004
5791-10871-05	Connector, 5-pin Header Sq. Flat

A-14589 Gen. Illum. Lamp Board

Part Number	Description
5768-12831-00	Lamp PCB
24-8767	Twist Lamp Socket
24-8768	Bulb #555, (6.3v, 0.25A.)
5791-10871-05	Connector, 5-pin Header Sq Flat

A-12738-60001 WPC Audio Board



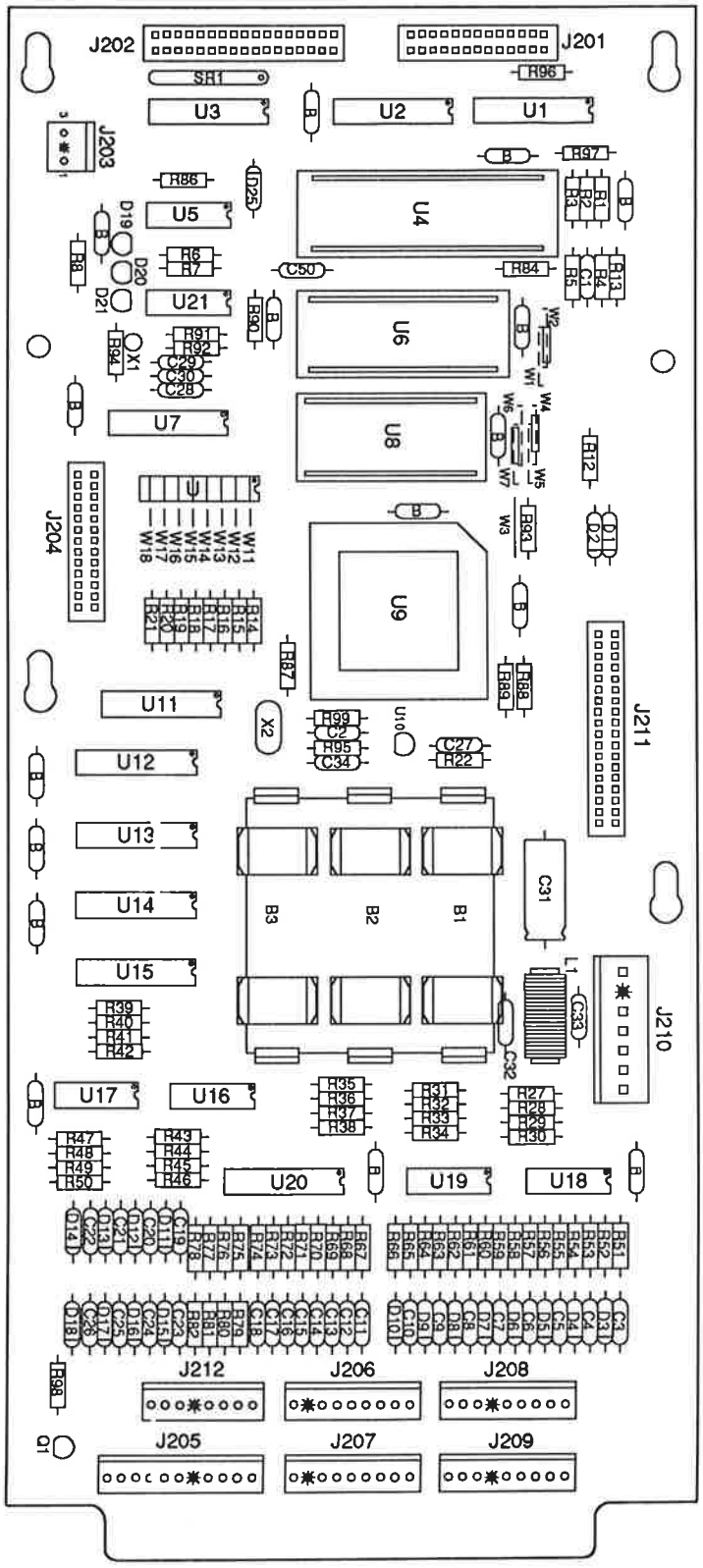
Part No.	Ckt Designator	Description
01-9980		Shield: Wire Protector
20-9229	U1	Thermal Compound
4004-01005-06	U1	Mach. Screw, 4-40 x 3/8
4104-01012-04	U1	Sh. Mach. Screw, #4 x 1/4
4404-01119-00	U1	Nut, 4-40 SNUT
5010-09324-00	R21	Resistor 27KΩ, 1/4w, 5%
5010-12065-00	R22, R25	Resistor, 120KΩ, 1/4w, 5%
5010-08991-00	R51	Resistor, 4.7KΩ, 1/4w, 5%
5010-09034-00	R13, R14, R29-R31, R33, R34, R50, R45-R49	Resistor, 10KΩ, 1/4w, 5%
5010-09035-00	R4	Resistor, 47KΩ, 1/4w, 5%
5010-09036-00	R35	Resistor, 100Ω, 1/4w, 5%
5010-09134-00	R1, R2, R6, R8, R9, R11, R12, R23, R24	Resistor, 150KΩ, 1/4w, 5%
5010-09162-00	R26, R102	Resistor, 100KΩ, 1/4w, 5%
5010-08774-00	R3, R5, R17, R19	Resistor, 22K, 1/4w, 5%
5010-09269-00	R15	Resistor, 12KΩ, 1/4w, 5%
5010-09358-00	R18, R32	Resistor, 1KΩ, 1/4w, 5%
5010-09416-00	R28, R39, R40-R44 R52, R53, R57, R36, R37	Resistor, 470Ω, 1/4w, 5%
5010-09534-00	W3, W5, W7-W10	Resistor, 0Ω
5010-10171-00	R38, R56	Resistor, 56Ω, 1/4w, 5%
5010-10258-00	R16	Resistor,, 1M, 1/4w, 5%
5010-10650-00	R7, R10	Resistor, 62K, 1/4w, 5%
5010-10989-00	R54, R55, R27	Resistor, 470K, 1/4w, 5%
5010-12752-00	R20	Resistor, 1Ω, 1/4w, 5%
5040-08986-00	C3	Capacitor, 100M, 10v (±20%)
5040-09332-00	C15, C18, C34, C36, C38	Capacitor, 47µfd., 25v, Axial
5040-11036-00	C32, C35	Capacitor, 47µfd., 16v, Rad.
5040-12729-00	C24, C25	Capacitor, 4700µfd., 35v
5040-12750-00	C22	Capacitor, 22µfd., 35v, Rad.
5041-09031-00	C26-C29, C37, C46-C48	Capacitor, 1µfd. TANT
5041-09243-00	C20, C21	Capacitor, 10µfd. TANT
5043-08980-00	C41-C44, B(15)	Capacitor, .01M, 50v, (+80, -20)
5043-08996-00	C1, C2	Capacitor, .1µfd., 50v, 10%
5048-11027-00	C8, C10	Capacitor, 33pfd., 50v, 10%
5048-11028-00	C45	Capacitor, 22pfd., 50V, Axial
5048-11029-00	C33, C49	Capacittor, 100pfd., 50v
5048-11030-00	C12	Caapacitor, 470pfd., 50v
5048-11031-00	C19, C31	Capacitor, .001µfd., 50v, 10%
5048-11065-00	C13	Capacitor, .0022µfd., 50v, 10%, Ax.
5048-11072-00	C39, C40	Capacitor, .0033µfd.
5048-12036-00	C23	Capacitor, .22µfd., 10v, Ceramic
5048-12745-00	C4, C6	Capacitor, 1800pfd., 50V, 10%
16-8850-341		PCB Label

Part No.	Ckt Designator	Description
5048-12746-00	C5, C7	Capacitor, 330pfd., 50V
5048-12748-00	C9, C11, C30	Capacitor, 220pfd., 50V
5070-08919-00	D5, D6	Diode, 1N4148
5070-09045-00	D1-D4	Diode MR501, 3.0A.
5250-10495-00	U3	Reg. 7912 1.0A -12v
5281-09215-00	U22	IC, 74LS04 Hex INV
5281-09246-00	U12	IC, 74LS139 2-4 Dec.
5281-09486-00	U28-U30	IC, 74LS374 8 Dual Flipflop
5281-09487-00	U6, U23-U25	IC, 74LS74 Dual Flipflop
5281-09500-00	U31	IC, 74LS32
5281-09745-00	U26, U27	IC, 74LS138 DMLTPX
5281-09850-00	U20	IC, 74LS11 Tripple AND
5281-10577-00	U16	IC, 74LS125 Q/B Bfr
5370-11086-00	U10	IC,, YM2151 Sound
5371-11087-00	U11	IC, YM3012 D/A
5400-10320-00	U13	IC, MPU 68B09E
5284-12651-00	U21	IC 4584
5340-12278-00	U9	S/Ram 2064
5370-09691-00	U17	IC, 55536 CVSD
5370-12260-00	U2	IC, 3340 Elec Allen
5370-12728-00	U1	IC, Audio Amp LM1875
5370-12730-00	U7, U8	IC, Op Amp TL084
5370-12742-00	U32	IC, Op Amp TL082
5371-12727-00	U19	Dac AD7524
5432-12726-00	U5	EE Prom Pot X9503
5460-12423-00	U4	IC, LM7812
5460-12743-00	U33	LM7809 TO-220
5520-09020-00	X1	Crystal, 3.58 MHz.
5521-10931-00	OSC1	Oscillator, 8.0 MHz.
5551-09822-00	L1	Ind, 4.7UH 3.0A.
5700-08985-00	U13	Socket, IC 40-pin, .6"
5700-09004-00	U10	Socket, IC 24-pin, .6"
5700-09006-00	U11	Socket, IC 16-pin, .3"
A-5343-60001-4	U18	IC, Audio ROM
A-5343-60001-3	U15	IC, Audio ROM
A-5343-60001-2	U14	IC, Audio ROM
5700-12088-00		Socket, IC 32-pin (U14, U15, U18)
5705-12755-00	U1	Healsink 5299B-220
5731-08633-00	F501, F502	Fuse, 3A, S-B
5733-12060-01		Fuse Holder (F501, F502)
5766-12433-00		PCB-Sound 90
5791-10862-04	J504, J505	Connector, 4-pin Header Sq. .156
5791-10862-05	J502	Connector, 5-pin Header Sq. .156
5791-10862-07	J501	Connector, 7-pin Header Sq. .156
5791-12462-03	J509	Connector, 3-pin Header Sq. .100
5791-12462-04	J508	Connector, 4-pin Header Sq. .100
5791-12516-00	J506	34 Hen 2x17 STR

A-12742-60001 WPC CPU Board

Item	Part Number	Ckt Designator	Description
1	5010-09034-00	R14-R22, R27-R42, R86, R90, R94, R98	Resistor, 10KΩ, 1/4w, 5%
2	5010-09085-00	R1, R2, R4, R93, R96, R97	Resistor, 1.5KΩ, 1/4w, 5%
3	5010-09314-00	R52, R54, R56, R58, R60, R62, R64, R66, R75-R82	Resistor, 1.2KΩ, 1/4w, 5%
4	5010-09358-00	R3, R43-R51, R53, R55, R57, R59, R61, R63, R65, R67-R74, R84	Resistor, 1KΩ, 1/4w, 5%
5	5010-09416-00	R5-R8, R12, R13, R87-R89	Resistor, 470Ω, 1/4w, 5%
6	5010-09534-00	W1, W4, W7, W13 - W18	Resistor, 0Ω
7	5010-10258-00	R95, R99	Resistor, .01µfdΩ, 1/4w, 5%
8	5010-10989-00	R92	Resistor, 470KΩ, 1/4w, 5%
9	5010-12104-00	R91	Resistor, 22µfd, 1/4w, 5%
10	5019-09362-00	SIP 1	SIP, 9R, 10-pin, 4.7KΩ, 5%
11	5040-08986-00	C31	Capacitor, 100µfd, 10v (±20%)
12	5043-08980-00	B	Capacitor, .01µfd, 50v, (+80, -20%)
13	5043-09030-00	C27	Capacitor, 0.047µfd, 50v (±20%)
14	5043-09065-00	C3 - C26	Capacitor, 470pfd, 50v (±20%)
15	5043-09491-00	C2, C29, C30, C34	Capacitor, 22pfd, 1KV, (±10%)
16	5043-09492-00	C28	Capacitor, 100pfd, 50v, (±10%)
17	5043-09845-00	C32, C33	Capacitor, 1KP, 50v, (±20%)
18	5070-08919-00	D2 - D18	Diode, 1N4148, 150MA
19	5070-09266-00	D1, D25	Diode, 1N5817, 1.0A.
20	5160-10269-00	Q1	Transistor, 2N3904, NPN
21	5162-12422-00	U20	IC, ULN, 2803A
22	5281-09308-00	U3	IC, 74LS245, Octal Bus Tmcv
23	5281-09486-00	U14	IC, 74LS374, 8D F/F
24	5281-09851-00	U5	IC, 74LS14, SMT/TRG
25	5281-09867-00	U1, U2, U7	IC, Octal Buffer, 74LS244
26	5281-10182-00	U11, U12, U13, U15	IC, 74LS240 Driver
27	5284-12651-00	U21	IC, 4584
28	5340-12278-00	U8	S/RAM 2064
29	5370-12272-00	U16 - U19	IC, LM339, Quad. Comp
30	5370-12687-00	U10	MC, 34064 Reset Chip
31	5520-10438-00	X2	Crystal, 8.0MHz.
32	5520-12084-00	X1	Crystal 32.768 KHz
33	5551-09822-00	L1	ILN, 4.7 UH 3A
34	5671-09019-00	D19 - D21	DSPL LED RED
35	5700-08985-00	U4	Socket, IC 40P, .6"
36	5700-12088-00	U6	Socket, IC 32P, .6"
37	5700-12424-00	U9	Socket, 84 Pin PLCC
38	5764-12431-00		PC Board
39	5791-10850-00	J201, J204	Connector, 26-pin Header Str Sq.
40	5791-10862-07	J210	Connector, 7-pin Header Str Sq.
41	5791-12461-08	J212	Connector, 8-pin Header Str Sq.
42	5791-12461-09	J206 - J209	Connector, 9-pin Header Sq. pin
43	5791-12461-12	J205	Connector, 12-pin Header Sq. pin
44	5791-12516-00	J202, J211	34 Hen 2x17 STR
45	5881-09021-00	B1 - B3	Battery Holder "AA"
46	5048-11033-00	C50	Capacitor, 0.022µf, 10v
47	16-8850-340		PCB Label
48	A-5343-60001-1	U6	Game PROM Assembly
49	5410-12426-00	U9	WPC-89 ASIC
50	5400-10320-00	U4	IC MPU 68B09E
51	5880-09022-00	B1 - B3	Battery, Alkaline, 1.5v ("AA")

A-12742-60001 WPC CPU Board



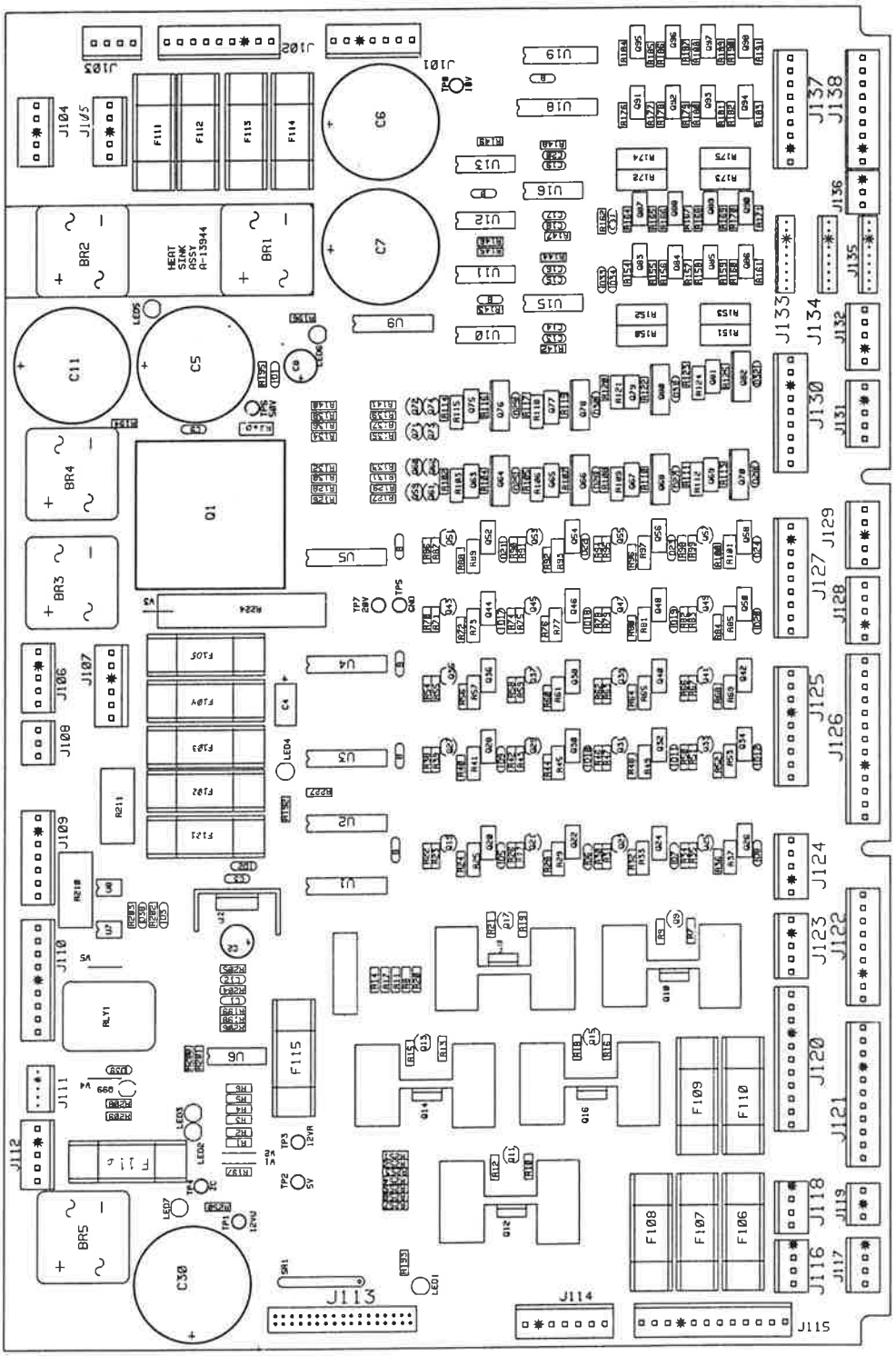
A-12697-1 WPC Power Driver Assembly

Item	Part Number	Ckt Designator	Description
1	20-9229	Q2, Q10, Q12, Q14, Q16, Q18	Thermal Compound
2	4006-01005-06	Q1, Q2	Mach. Screw, 6-32 x 3/8
3	4406-01128-00	Q1, Q2	Nut, 6-32 KEPS
4	4004-01005-06	Q10, Q12, Q14, Q16, Q18	Mach. Screw, 4-40 x 3/8
5	4404-01119-00	Q10, Q12, Q14, Q16, Q18	Nut, 4-40 SNUT
6	5010-08981-00	R260	Resistor, 10KΩ, 1/2w, 5%
7	5010-08991-00	R9, R12, R15, R18, R21, R23, R27, R31, R35, R39, R43, R47, R51, R55, R59, R63, R67, R71, R75, R79, R83, R87, R91, R95, R99, R126, R128, R130, R132, R134, R136, R138, R140, R209, R227	Resistor, 4.7KΩ, 14w, 5%
8	5010-08992-00	R8, R11, R14, R17, R20, R177, R179, R181, R183, R185, R187, R189, R191, R208	Resistor, 560Ω, 1/4w, 5%
9	5010-08993-00	R25, R29, R33, R37, R41, R45, R49, R53, R57, R61, R65, R69, R73, R77, R81, R85, R89, R93, R97, R101, R103, R106, R109, R112, R115, R118, R121, R124	Resistor, 68Ω, 1/4w, 5%
10	5010-08997-00	R24, R28, R32, R36, R40, R44, R48, R52, R56, R60, R64, R68, R72, R76, R80, R84, R88, R92, R96, R100, R102, R105, R108, R111, R114, R117, R120, R123, R195	Resistor, 2.7KΩ, 1/4w, 5%
11	5010-08998-00	R155, R157, R159, R161, R165, R167, R169, R171	Resistor, 2.2KΩ, 1/4w, 5%
12	5010-09034-00	R3, R4, R6, R142-R149, R197-R198	Resistor, 10KΩ, 1/4w, 5%
13	5010-09085-00	R194, R196, R251, R253-R257	Resistor, 1.5KΩ, 1/4w, 5%
14	5010-09086-00	R252	Resistor, 6.8KΩ, 1/4w, 5%
15	5010-09224-00	R1, R2, R192, R201- R205	Ressistor, 270Ω, 1/4w, 5%
16	5010-09314-00	R176, R178, R180, R182 R184, R186, R188, R190	Resistor, 1.2KΩ, 1/4w, 5%
17	5010-09324-00	R206	Resistor, 27KΩ, 1/4w, 5%
18	5010-09358-00	R154, R156, R158, R160, R164, R166, R168, R170, R162, R193, R199, R200 R250	Resistor, 1KΩ, 1/4w, 5%
19	5010-09361-00	R104, R107, R110, R113 R116, R119, R122, R125	Resistor, 220Ω, 1/4w, 5%
20	5010-09416-00	R22, R26, R30, R34, R38, R42, R46, R50, R54, R58, R62, R66, R70, R74, R78, R82, R86, R90, R94, R98, R127, R129, R131, R133, R135, R137, R139, R141	Resistor, 470Ω, 1/4w, 5%
21	5010-09534-00	W1, W2	Resistor, 0Ω
22	5010-11079-00	R7, R10, R13, R16, R19	Resistor, 51Ω, 1/4w, 5%
23	5010-12427-00	R150-R153, R172-R175	Resistor, .22Ω, 1w, 5%
24	5012-12632-00	R224	Resistor, .12Ω, 10w, 5%
25	5012-12238-00	R210, R211	Resistor, 3.3KΩ, 5w, 10%
26	5019-10143-00	SR1	SIP, 9R, 10 pin, 470Ω, 5%
27	5040-08986-00	C4	Capacitor, 100µfd, 10v (±20%)
28	5040-09421-00	C2	Capacitor, 100µfd, 25v (+50, -10%)
29	5040-09537-00	C8	Capacitor, 100µfd, 100v (±20%)
30	5040-12313-00	C5, C6, C7, C11, C30	Capacitor, 15,000µfd, 25v (±20%)
31	5043-08980-00	B-BYPASS	Capacitor, .01µfd, 50v (+80, -20%)
32	5043-08996-00	C13-C20, C31	Capacitor, .1µfd, 50v (±20%)
33	5043-09845-00	C1, C12	Capacitor, 1,000pfd, 50v (±20%)
34	5048-10994-00	C3	Capacitor, .33µfd, 50v (±20%) Ax.
35	5070-08919-00	D33, D34	Diode, 1N4148, 150MA.
36	5070-09054-00	D1-D3, D5-D12, D17-D32, D38, D39	Diode, 1N4004, 1.0A.
37	5100-09690-00	BR3-BR5	Bridge Rectifier, 35A., 200v
38	5131-12725-00	Q10, Q12, Q14, Q16, Q18	Triac, BT138E
39	5162-12422-00	U19	IC, ULN 2803
40	5162-12635-00	Q20, Q22, Q24, Q26, Q28 Q30, Q32, Q34, Q36, Q38, Q40, Q42, Q44, Q46, Q48, Q50, Q52, Q54, Q56, Q58, Q63, Q65, Q67, Q69, Q75, Q77, Q79, Q81, Q83 - Q90	Transistor, TIP 102
41	5194-09055-00	Q9, Q11, Q13, Q15, Q17, Q19, Q21, Q23, Q25, Q27, Q29, Q31, Q33, Q35, Q37, Q39, Q41, Q43, Q45, Q47, Q49, Q51, Q53, Q55, Q57, Q59-Q62, Q71-Q74, Q99	Transistor, 2N4403 PNP
42	5191-12179-00	Q64, Q66, Q68, Q70, Q76 Q78, Q80, Q82	Transistor, TIP36C PNP
43	5192-12428-00	Q91-Q98	Transistor, TIP 107
44	5250-12634-00	Q1	Reg LM 323 5v
45	5281-09486-00	U1-U5, U18	IC, 74LS374 8 Dual D Flipflop
46	5281-09487-00	U10-U13	IC, 74LS74 Dual D Flipflop
47	5281-10182-00	U9	IC, 74LS240, L/Drvr
48	5370-12272-00	U6, U15, U16	IC, LM339 Quad. Comp
49	5460-12423-00	Q2	IC, LM 7812
50	5490-10892-00	U7, U8	Opto Isolator, 4N25
51	5580-08994-01	RLY 1	Relay 4PDT 6VDC5A VS
52	5671-09019-00	LED1 - LED7	Diaplay LED Red
53	5701-09652-00	Q1	Thermal Pad TO-3
54	5705-09199-00	Q2	Heatsink, #6030B
55	A-13944	Bridge Assembly	WPC Heatsink Rectifier Assy
56	5705-12637-00	Q1	Heatsink 5054
57	5705-12638-00	Q10, Q12, Q14, Q16, Q18	Heatsink 5298B
58	5733-12060-01		Fuse Holder, F101-F116
59	5763-12405-00		Bare PCB
60	5791-10862-03	J108, J119, J136	Connector, 3-pin Header STR Sq.
61	5791-10862-04	J103, J116-J118	Connector, 4-pin Header STR Sq.
62	5791-10862-05	J112, J104-J106, J123, J124, J128, J129, J131, J132, J105	Connector, 5-pin Header STR Sq.
63	5791-10862-06	J107	Connector, 6-pin Header STR Sq.
64	5791-10862-07	J101, J109, J114	Connector, 7-pin Header STR Sq.
65	5791-10862-09	J102, J110, J122, J125, J127, J130, J137, J138	Connector, 9-pin Header STR Sq.
66	5791-10862-11	J120, J121	Connector, 11-pin Header STR Sq.
67	5791-10862-12	J115	Connector, 12-pin Header STR Sq.
68	5791-10862-13	J126	Connector, 13-pin Header STR Sq.
69	5791-12461-05	J111	Connector, 5-pin Header STR Sq.
70	5791-12461-09	J133-J135	Connector, 9-pin Header STR Sq.
71	5791-12516-00	J113	34 HEN 2x17 STR
72	5824-09248-00	TP1-TP8	Test Point #1502-1
73	5041-09163-00	C9	Capacitor, 2.2µfd TANT
74-100	Not Used		
101	16-8850-323		ID Label
102	5730-09071-00	F114	Fuse, 8A, 32v
103	5731-09128-00	F101, F102	Fuse, S-B, 2.5A., 250v
104	Not Used		
105	5731-09651-00	F106-F113	Fuse, S-B, 5A., 250v
106	Not Used		
107	5731-10356-00	F103-F105, F116	Fuse, S-B, 3A., 250v
108	5730-09797-00	F115	Fuse, S-B, 3/4A., 250v

NOTE:

For schematic refer to drawing #16-9057.

A-12697-1 WPC Power Driver Board

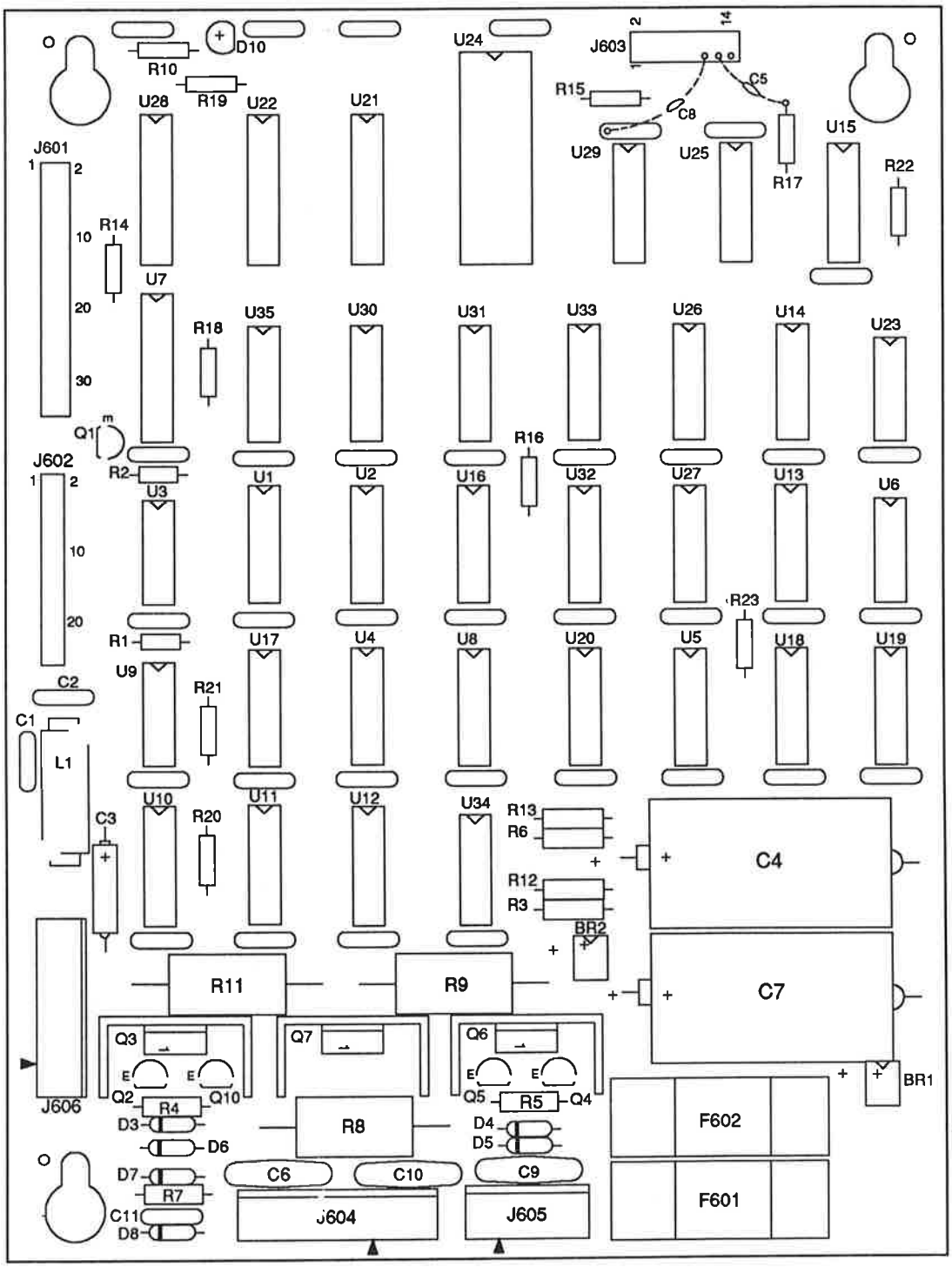


A-14039 Dot Matrix Controller Assembly

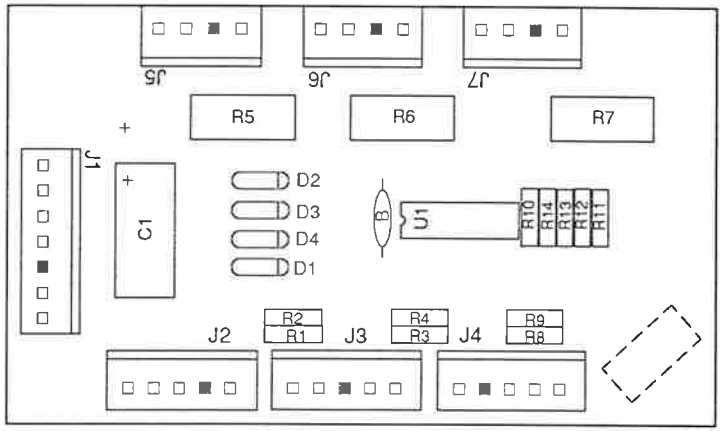
Item	Part Number	Ckt Designator	Description
1	5010-08991-00	R1	Resistor, 4.7KΩ, 1/4w, 5%
2	5010-09224-00	R10	Resistor, 270Ω, 1/4w, 5%
3	5010-09534-00	R7	Resistor, 0Ω
4	5010-12832-00	R3, R6, R12, R13	Resistor, 47KΩ, 1/2w, 5%
5	5010-12841-00	R4, R5	Resistor, 120Ω, 1/2w, 5%
6	5012-12830-00	R9	Resistor, 1.8KΩ, 5w, 5%
7	5012-12842-00	R11	Resistor, 120Ω, 5w, 5%
8	5012-12843-00	R8	Resistor, 4.7K, 5w, 5%
9	5040-08986-00	C3	Capacitor, 100µfd., 10v, (±20%)
10	5040-12324-00	C4, C7	Capacitor, 150µfd., 160v, (±50%)
11	5043-08980-00	BYPASS	Capacitor, .01µfd., 50v, (+80, -20%)
12	5043-09072-00	C6, C9, C10	Capacitor, .1µfd., 500v, (+80, -20%)
13	5043-09845-00	C1, C2, C11	Capacitor, 1KP, 50v, (±20%)
14	5070-09054-00	D7	Diode, 1N4004, 1.0A.
15	5075-12824-00	D6	Zener, 1N4742A, 12v
16	5075-12826-00	D3 - D5	Zener, 1N4759A, 62v
17	5100-12833-00	BR1, BR2	Bridge, 400v, 1A.
18	5160-10269-00	Q1	Transistor, 2N3904 NPN
19	5164-09056-00	Q2, Q10	Transistor, MPSD02, NPN
20	5164-12154-00	Q3, Q7	Transistor,, MJE15030 NPN
21	5194-09055-00	Q4, Q5	Transistor, MPSD52 PNP
22	5194-12155-00	Q6	Transistor, MJE15031 PNP
23	5281-09738-00	U16, U25 - U27	IC, 74LS157
24	5281-10033-00	U3	IC, 74LS30
25	5281-10043-00	U31 - U33, U35	IC, 74LS175
26	5311-10946-00	U4, U5, U17, U18, U20	IC, 74HC74
27	5311-10947-00	U9	IC, 74HC125
28	5311-10951-00	U10 - U12	IC, 74HC161
29	5311-10977-00	U6	IC, 74HC04
30	5311-12817-00	U29	IC, 74HC165
31	5311-12819-00	U21	IC, 74HC688
32	5311-12820-00	U23	IC, 74HC27
33	5311-12822-00	U13 - U15	IC, 74HC193
34	5315-12009-0(	U22	IC, 74HCT374
35	5315-12812-0(	U1, U2, U30	IC, 74HCT138
36	5315-12813-00	U28	IC, 74HCT245
37	5315-12815-00	U8, U34	IC, 74HCT08
38	5315-12816-00	U19	IC, 74HCT32
39	5315-12821-00	U7	IC, 74HCT240
40	5340-12278-00	U24	S/RAM 2064 150NS
41	5551-09822-00	L1	IND 4.7µH, 3.0A.
42	5671-09019-00	D10	Display LED Red
43	5705-09199-00	Q3, Q6, Q7	Heatsink 6030B
44	5731-12328-00	F601, F602	Fuse, 3/8A.,SB, 250v
45	5733-12060-00		Fuse Holder (F601, F602)
46	5760-12710-00		PC Board
47	5791-10850-00	J602	Connector, 26-pin STR Sq.
48	5791-10862-05	J605	Connector, 5-pin Header Sq.
49	5791-10862-07	J606	Connector, 7-pin Header Sq.
50	5791-10862-08	J604	Connector, 8-pin Header Sq.
51	5791-12516-00	J601	34 Hen 17x2 STR
52	5791-12827-00	J603	14 Hen 7x2 STR
53	5010-09036-00	R14-R23	Resistor, 100Ω, 1/4w, 5%
54	20-9229	Q3, Q6, Q7	Thermal Compound
55	4006-01003-06	Q3, Q6, Q7	Mach. Screw, 6-32 x 3/8
56	4406-01128-0(	Q3, Q6, Q7	Nut, 6-32 KEPS
57	5043-09492-0(	C5, C8	Capacitor, 100P, 50v, (±10%)

* Refer to Schematic #16-9148.

A-14039 Dot Matrix Controller Assembly



Opto Ramp Switch Assembly



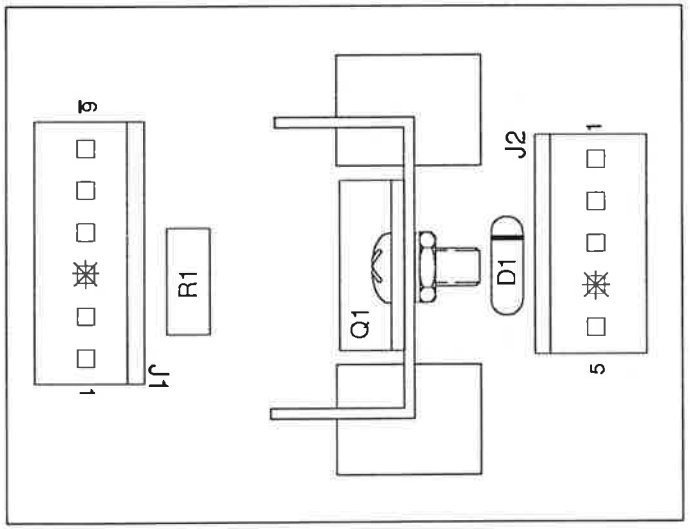
A-13901-1

Part Number	Ckt Designator	Description
5010-08774-00	R10, R13	Resistor, 22KΩ, 1/4w, 5%
5010-09034-00	R14	Resistor, 10KΩ, 1/4w, 5%
5010-09162-00	R11, R12	Resistor, 100KΩ, 1/4w, 5%
5010-09999-00	R1-R4, R8, R9	Resistor, 2KΩ, 1/4w, 5%
5010-12733-00	R5 - R7	Resistor, 220Ω,1w, 5%
5040-12298-00	C1	Capacitor, 100M, 40v, (+50, -10%)
5043-08980-00	B	Capacitor, .01M, 50v, (+80, -20%)
5070-09054-00	D1 - D4	Diode, 1N4004, 1.0A
5370-12272-00	U1	IC, LM339, Quad. Comp
5768-12686-00		Bare PC Board
5791-12273-05	J2, J3	Connector, 5-pin Header
5791-12273-07	J1	Connector, 7-pin Header
16-8850-353		Label

A-13901-2

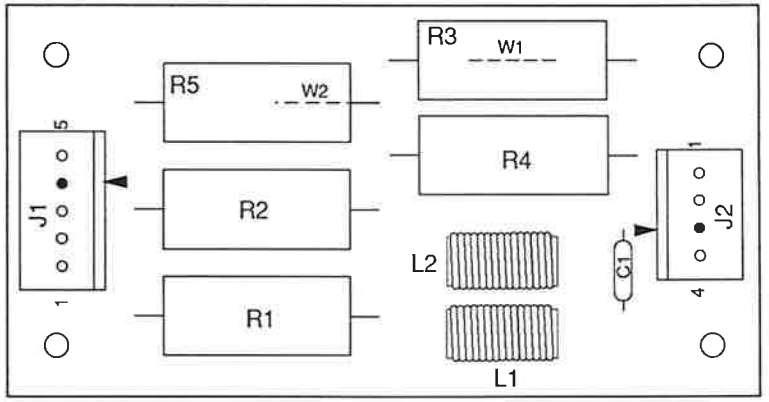
Part Number	Ckt Designator	Description
5010-08774-00	R10, R13	Resistor, 22KΩ, 1/4w, 5%
5010-09034-00	R14	Resistor, 10KΩ, 1/4w, 5%
5010-09162-00	R11, R12	Resistor, 100KΩ, 1/4w, 5%
5010-09999-00	R1-R4, R8, R9	Resistor, 2KΩ, 1/4w, 5%
5010-12733-00	R5 - R7	Resistor, 220Ω,1w, 5%
5040-12298-00	C1	Capacitor, 100M, 40v, (+50, -10%)
5043-08980-00	B	Capacitor, .01M, 50v, (+80, -20%)
5070-09054-00	D1 - D4	Diode, 1N4004, 1.0A
5370-12272-00	U1	IC, LM339, Quad. Comp
5768-12686-00		Bare PC Board
5791-12273-05	J2, J3, J4	Connector, 5-pin Header
5791-12273-07	J1	Connector, 7-pin Header
16-8850-354		Label

C-13509
High Current Driver Assembly



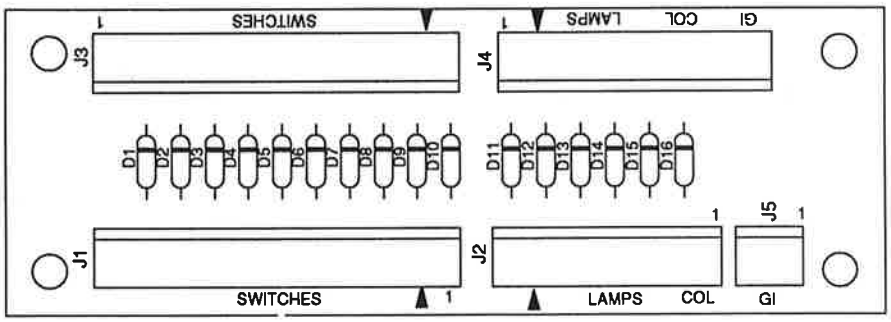
Part Number	Designator	Description
5768-12609-00		Bare PC Board
4703-00015-00		Lockwasher #4, External
4404-01117-00		Nut, 4-40 Hex
4004-01005-06		Mach. Screw, 4-40 x 3/8
5705-09199-00		Heatsink
5010-09361-00	R1	Resistor, 220Ω, 1/2w, 5%
5070-09054-00	D1	Diode, 1N4004, 1.0 A
5191-12179-00	Q1	Transistor, TIP 36C PNP
5791-10862-05	J2	Connector, 5-pin Header
5791-10862-06	J1	Connector, 6-pin Header

A-14381
Motor Regulator



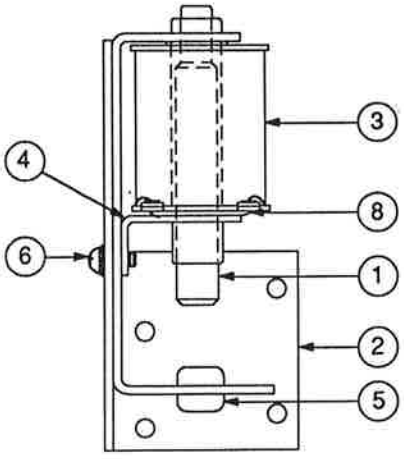
Part Number	Designator	Description
5768-12772-00		Bare PC Board
5791-10862-05	J1	Connector, 5-pin Header Str Sq.
5791-10862-04	J2	Connector, 4-pin Header Str Sq.
5551-09822-00	L1, L2	Ind. 4.7µH, 3AV
5012-12163-00	R1, R3, R4	Resistor, 11Ω, 5w, 10%
5012-10024-00	R2	Resistor, 5.6Ω, 5w, 10%
5043-08980-00	C1	Capacitor, .01µF, 50v, (+80, -20%)
5012-12456-00	R5	Resistor, 1.5Ω, 5w, 10%

A-14567 16-Diode Switch & Lamp Assembly



Part Number	Ckt Designator	Description
5768-12811-00		Bare PC Board
5791-10862-13	J1, J3	Connector, 13-pin Header
5791-10862-08	J2	Connector, 8-pin Header
5791-10862-10	J4	Connector, 10-pin Header
5791-10862-02	J5	Connector, 2-pin Header
5070-09054-00	D1 - D6	Diode 1N4004, 1.0A.

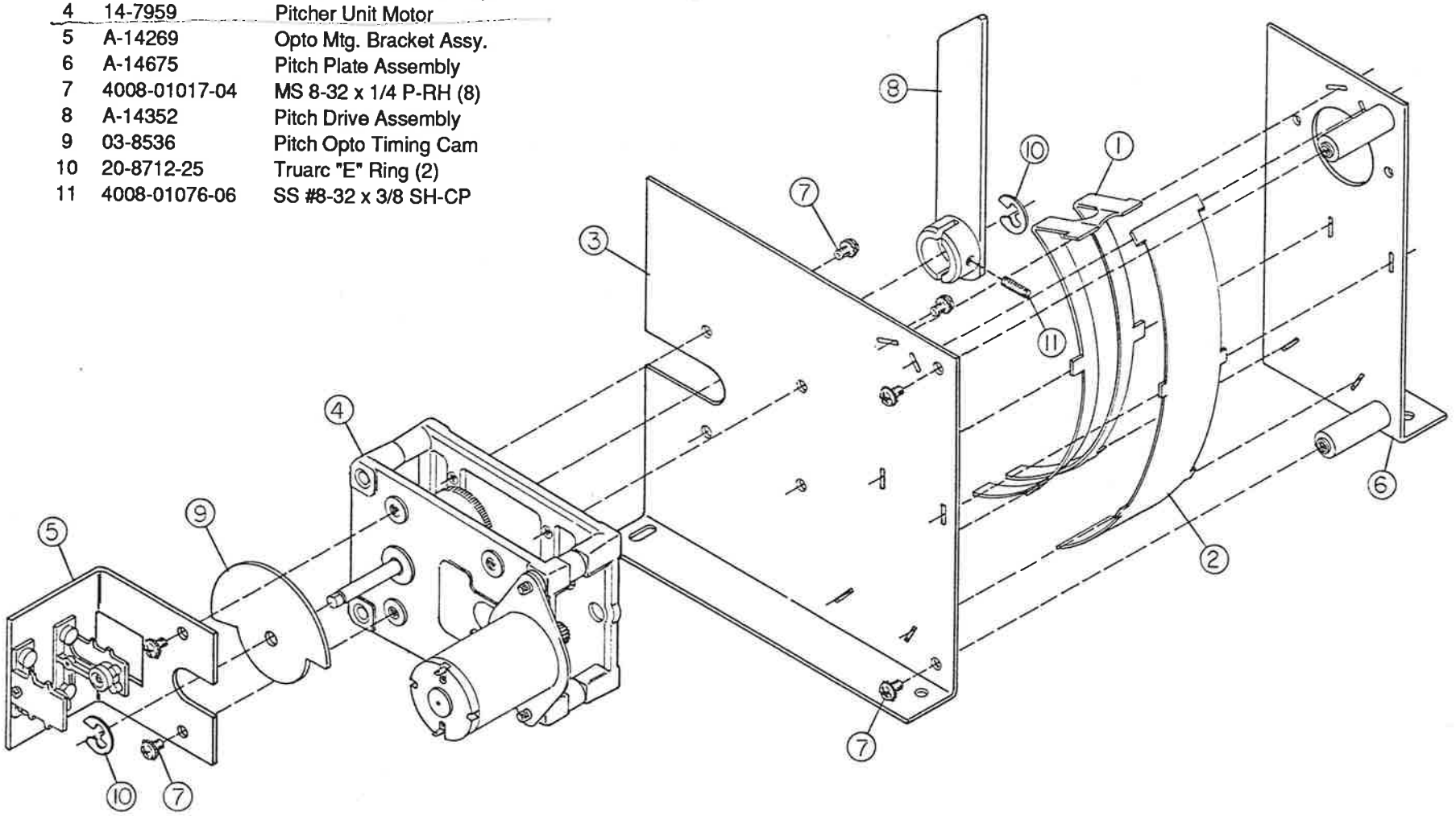
B-10686-1 Knocker Assembly



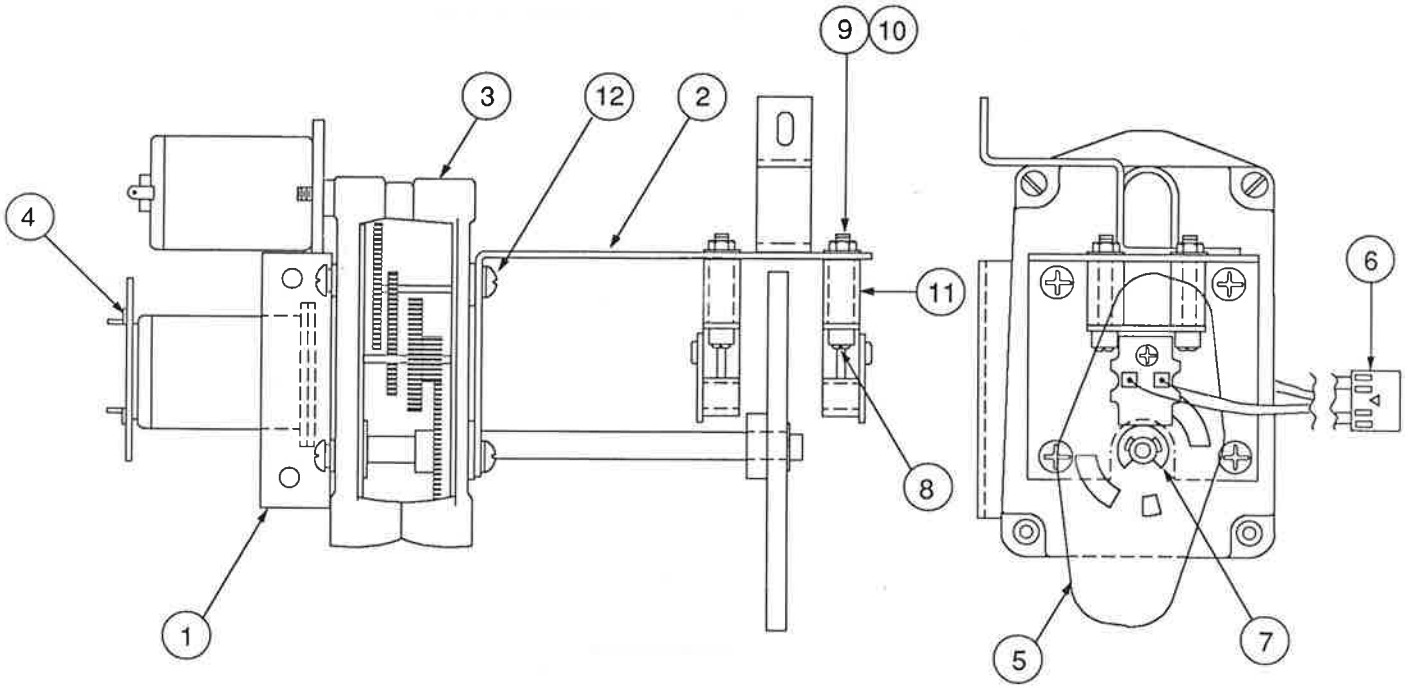
Item	Part Number	Description
1	A-5387	Coil Plunger Assembly
a)	02-2653	Coil Plunger
b)	03-6013	Bell Arm Ext.
2	B-7409-2	Mtg. Bracket Assembly
3	AE-23-800	Coil Sub-Assembly
4	01-8-508-T	Coil Retaining Bracket
5	23-6420	Rubber Grommet
6	4008-01017-06	Mach. Screw, 8/32 x 3/8
7	H-11835	Knocker Cable
8	03-7067-5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

A-14356 Pitcher Unit Assembly

Item	Part Number	Description
1	01-2531	Ball Guide Rail
2	01-2532	Ball Guide Rail
3	A-14674	Welded Pitch Plate Assy.
4	14-7959	Pitcher Unit Motor
5	A-14269	Opto Mtg. Bracket Assy.
6	A-14675	Pitch Plate Assembly
7	4008-01017-04	MS 8-32 x 1/4 P-RH (8)
8	A-14352	Pitch Drive Assembly
9	03-8536	Pitch Opto Timing Cam
10	20-8712-25	Truarc "E" Ring (2)
11	4008-01076-06	SS #8-32 x 3/8 SH-CP

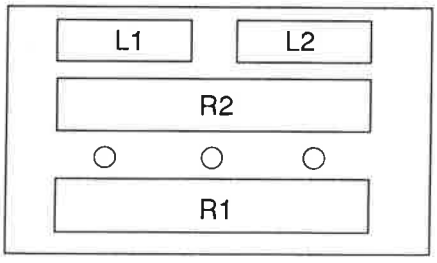


A-14290 Ramp Motor Assembly



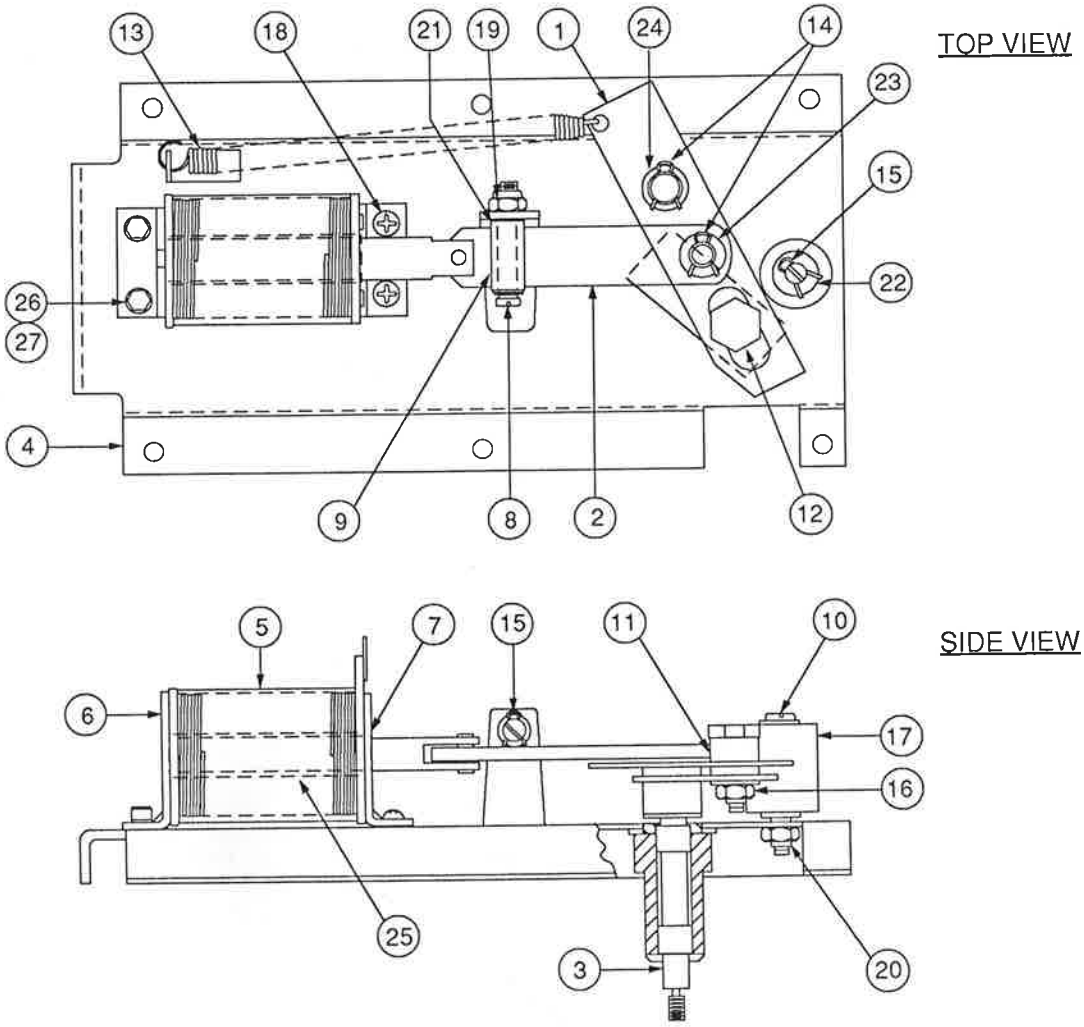
Item	Part Number	Description
1	01-9966	Mounting Bracket
2	A-14644	Opto Mounting Bracket
3	14-7960	Ramp Lift Motor
4	A-14623	Motor EMI Filter Assy.
5	03-8531	Ramp Lift & Timing Cam
6	A-14693	Opto Assembly
7	20-8712-25	"E"-Ring, 1/4" Shaft
8	4004-01005-16	Mach. Screw, 4-40 x 1"
9	4703-00015-00	Flatwasher, #4 Ext.
10	4404-01117-00	Hex Nut #4-40
11	03-6047	Spacer, 9/16"
12	4008-01017-04	Mach. Screw, #8-32 x 1/4

A-14623 Motor EMI Filter Assy



Part Number	Ckt Designator	Description
5012-09429-00	R2	Resistor, .12Ω, 5w, 5%
5768-12522-00		Motor EMI Filter PCB
5012-12458-00	R1	Resistor, 20Ω, 10w, 10%
5551-09822-00	L1, L2	Inductor, 4.7µH, 3A.

A-14464 Bat Unit Assembly



Item	Part Number	Description
1	A-4690	Drive Arm Assembly
2	A-14462	Coil Plunger Assembly
3	A-6338	Driven Arm Assembly
4	A-14463	Bat Frame Sub-Assembly
5	A-14789	Bat Coil Assembly
6	A-14487	Solenoid Stop Bracket
7	01-10102	Solenoid Bracket
8	02-2577	Roller Stud
9	02-2578	Roller
10	02-2732	Adjustment Post
11	02-2750	Roller Drive Arm
12	02-2966	Roller Stud
13	10-431	Extension Spring
14	12-6225	Hairpin Clip

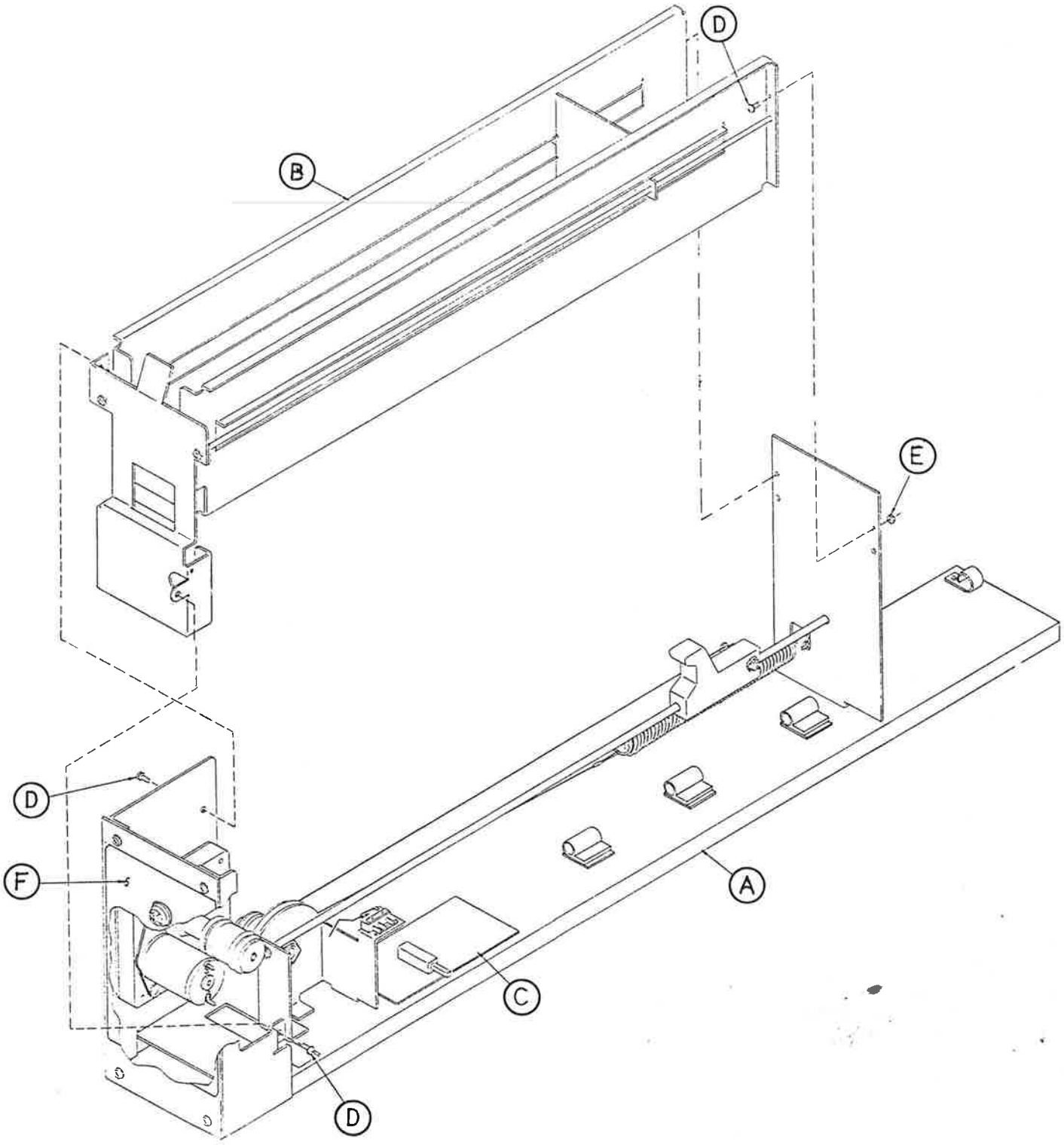
Item	Part Number	Description
15	12-6227	Hairpin Clip
16	4420-01132-00	Nut, 1/4 - 28 ESN
17	23-6312	Bumper
18	4008-01017-04	Mach. Screw, 8-32 x 1/4
19	4408-01119-00	Nut, 8-32 ESN
20	4410-01132-00	Nut, 10-32 ESN
21	4700-00013-00	Washer Brass
22	4700-00027-00	Flatwasher, 1/4 x 1/2 x 21ga.
23	4700-00104-00	Flatwasher, 23/64 x 1/2 x 16ga.
24	4700-00051-00	Flatwasher, 25/64 x 5/8 x 16ga.
25	03-7066-5	Coil Tubing
26	4008-01079-06	Cap Screw, 8-32 x 3/8
27	4701-00003-00	Lockwasher #8 Split

A-14471
Card Dispenser Assembly

Item	Part Number	Description
A.	A-14473	Base & Motor Assembly (See p. 2-24)
1.)	A-14474	Base Welded Assembly
2.)	A-14469	Gear Motor Assembly
3.)	A-14527	Cable & Pulley Assembly
4.)	03-8541	Piston
5.)	01-10079	Rear Support Bracket
6.)	02-4523	Guide Rod
7.)	10-427	Extension Spring
8.)	20-9674	Shoulder Screw, .375 Sckt. Hd.
9.)	4425-01132-00	Nut, 5/16 18 ESN-NE
10.)	5647-12693-01	Mini-Micro Switch
11.)	4008-01003-08	Mach. Screw, 8-32 x 1/2
12.)	4006-01005-16	Set Screw, 6-32 x 1
13.)	4406-01117-00	Nut, 6-32 Hex.
14.)	4010-01006-08	Mach. Screw, 10-32 x 5/8
15.)	4002-01105-08	Mach. Screw, 2-56 x 1/2
16.)	01-8240	Plate Nut #2-56
17.)	4006-01017-06	Mach. Screw, 6-32 x 3/8
18.)	4406-01128-00	Nut, 6-32 KEPS
19.)	4006-01097-08S	Cap Screw, 6-32 x 1/2
20.)	A-14560	Front Panel Asssembly
21.)	20-9678-2	Standoff Circuit Board
22.)	4106-01036-05	TFS #6 PH-PH
23.)	4406-01119-00	Nut, 6-32 ESN
24.)	A-14316	Opto Transistor Assy.
25.)	A-14315	Opto LED assembly
26.)	4106-01115-06Y	Sh. Metal Screw, #6 x 3/8
27.)	03-7722-4	Kwick-Klip, 1/4"
28.)	H-14672	Cable
29.)	01-3670-1	Switch Plate
30.)	01-8600	Insulator
31.)	03-7655-8	Cable Clamp
32.)	4006-01026-06	Mach. Screw, 6-32 x 3/8
33.)	4406-01128-00	Nut, Hex. #6-32, KEPS
B.	A-14472	Magazine Assembly
1.)	A-14704	Support Bracket
2.)	01-10077	Magazine
3.)	02-4522	Guide Rod
4.)	01-10233	Pressure Plate
5.)	4406-01128-00	Nut, 6-32 KEPS
6.)	16-9227	Lable
C.	A-14633	Card Dispenser PCB Assembly
D.	4006-01005-06	Mach. Screw, 6-32 x 3/8 P-PH
E.	4406-01128-00	Nut, 6-32 KEPS
F.	31-1631	Decal

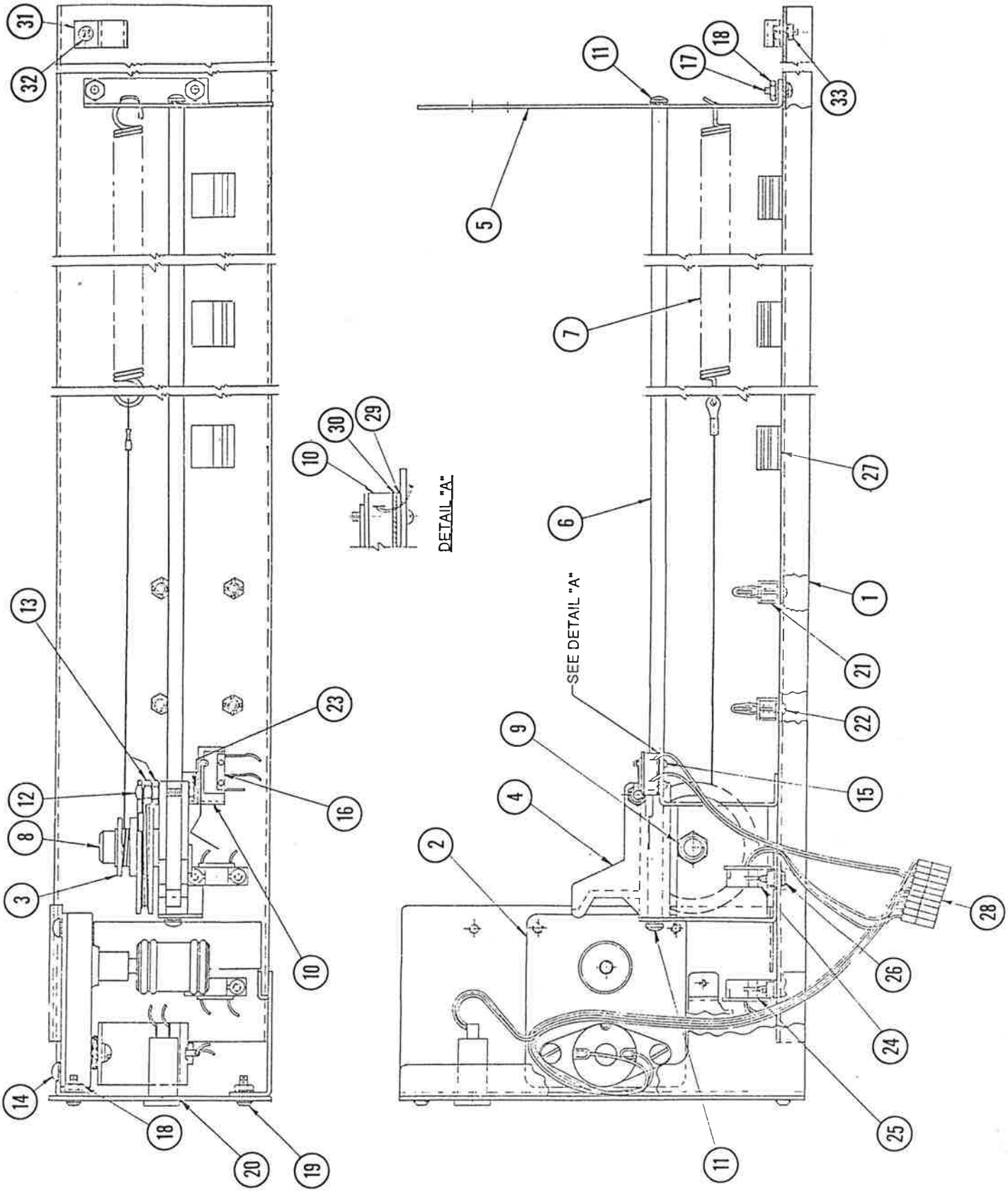
Note: To order replacement or additional baseball cards, contact your authorized **WILLIAMS** Distributor.

A-14471
Card Dispenser Assembly

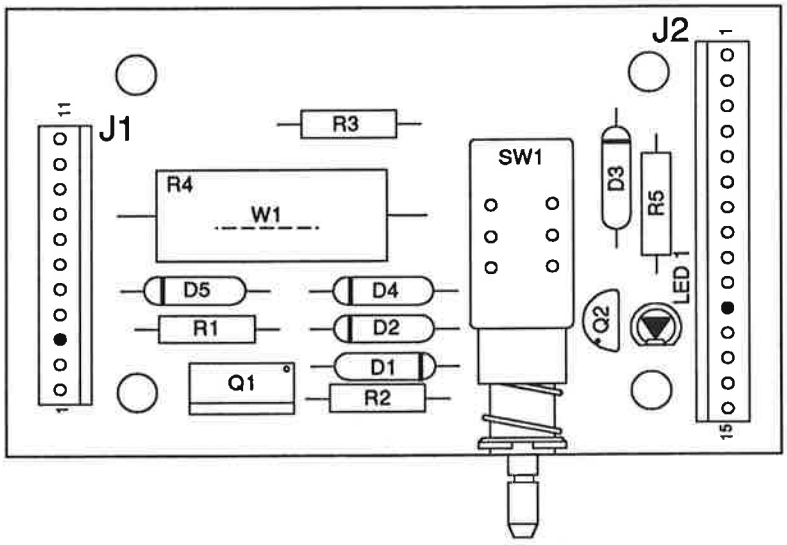


A-14473 Base & Motor Assembly

See p. 2-22 for parts listing.

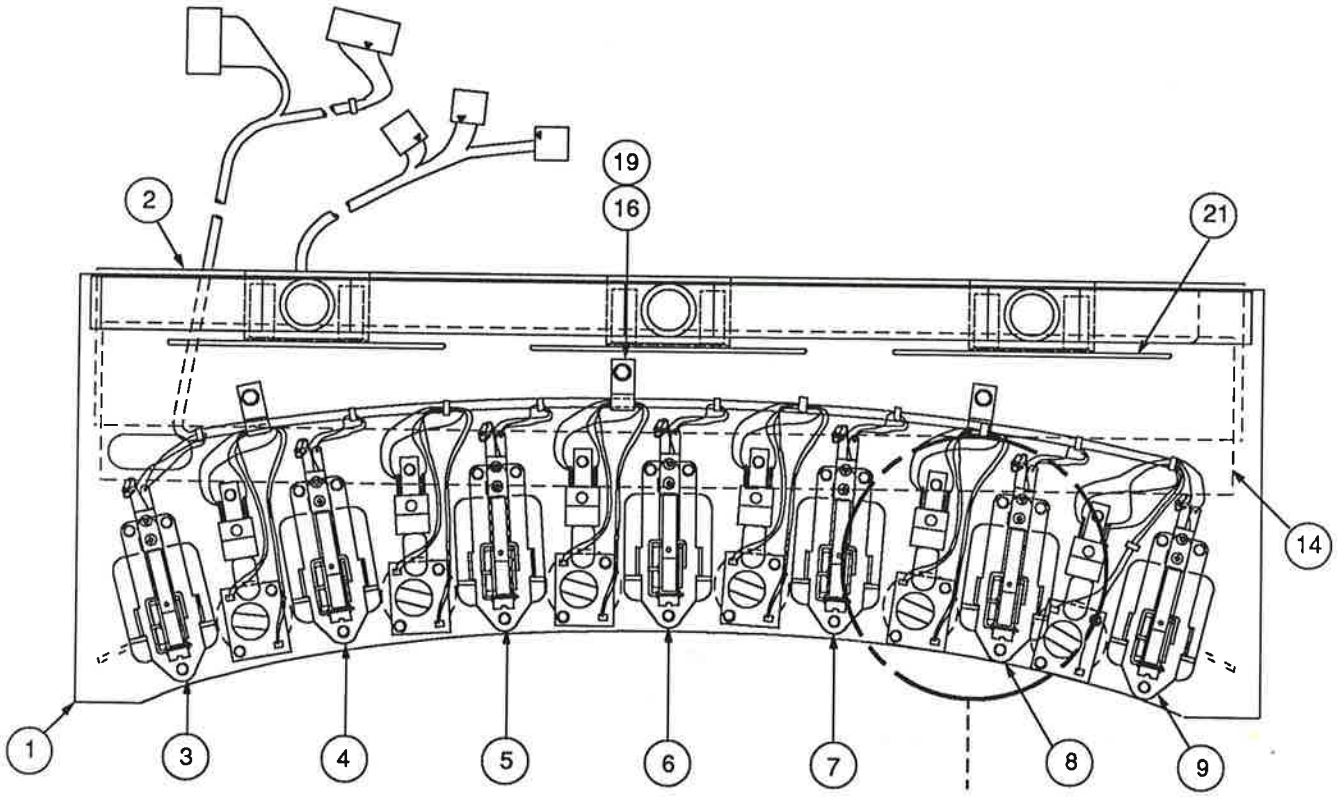


A-14633 Card Dispenser PCB Assembly



Part Number	Ckt Designator	Description
5768-12845-00		Bare PC Board
5791-12462-15	J2	Connector, 15-pin Header Str. Sq.
5791-12462-11	J1	Connector, 11-pin Header Str. Sq.
5162-12635-00	Q1	Transistor, TIP 102 NPN
5070-09054-00	D1 - D5	Diode, 1N4004, 1.0A.
5160-10269-00	Q2	Transistor, 2N3904 NPN
5012-10860-00	R4	Resistor, 27Ω, 5w, 10%
5010-09034-00	R1	Resistor, 10KΩ, 1/4w, 5%
5641-09312-00	SW1	Switch R DPDT, 100v, 5A.
5010-12733-00	R3	Resistor, 220Ω, 1w, 5%
5010-08998-00	R2	Resistor, 2.2KΩ, 1/4w, 5%
5010-09061-00	R5	Resistor, 680Ω, 1/2w, 5%
5671-09019-00	LED 1	Disp. LED Red

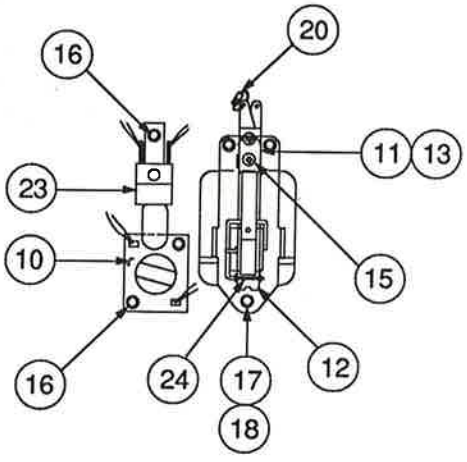
A-14150 Target Board Assembly



See Figure 1.

Item	Part Number	Description
1	11-989	Panel Target Board
2	A-14446	Home Run Switch & Bracket
* 3	A-14452-1	Target Assembly
* 4	A-14452-2	Target Assembly
* 5	A-14452-3	Target Assembly
* 6	A-14452-4	Target Assembly
* 7	A-14452-5	Target Assembly
* 8	A-14452-6	Target Assembly
* 9	A-14452-7	Target Assembly
10	A-12224-1	Single Lamp & Diode Assy.
11	A-14697	Target Switch Assy.
12	01-60-A	Rollover Switch Bracket
13	01-3670-1	Switch Plate - Flat
14	01-10163	Ball Deflector
15	4005-01149-14	Mach. Screw, #5-40 x 7/8 P-BH-S
16	4608-01081-07	H-F #8 x 11/16 PL-HWH
17	4608-01081-11	H-F #8 x 11/16 PL-HWH
18	4700-00011-00	Flatwasher, 11/64 x 7/16 x 16ga.
19	03-7655-04	Harness Clip, 1/4"
20	5070-09054-00	Diode, 1N4004, 1.0A.
21	12-6466-21	Ball Guide Wireform, 5-1/4"
22	H-14665	Target Panel Cable
23	A-12887	Socket & Bulb Assy. (#555)
24	12-6367	Target Switch Wire

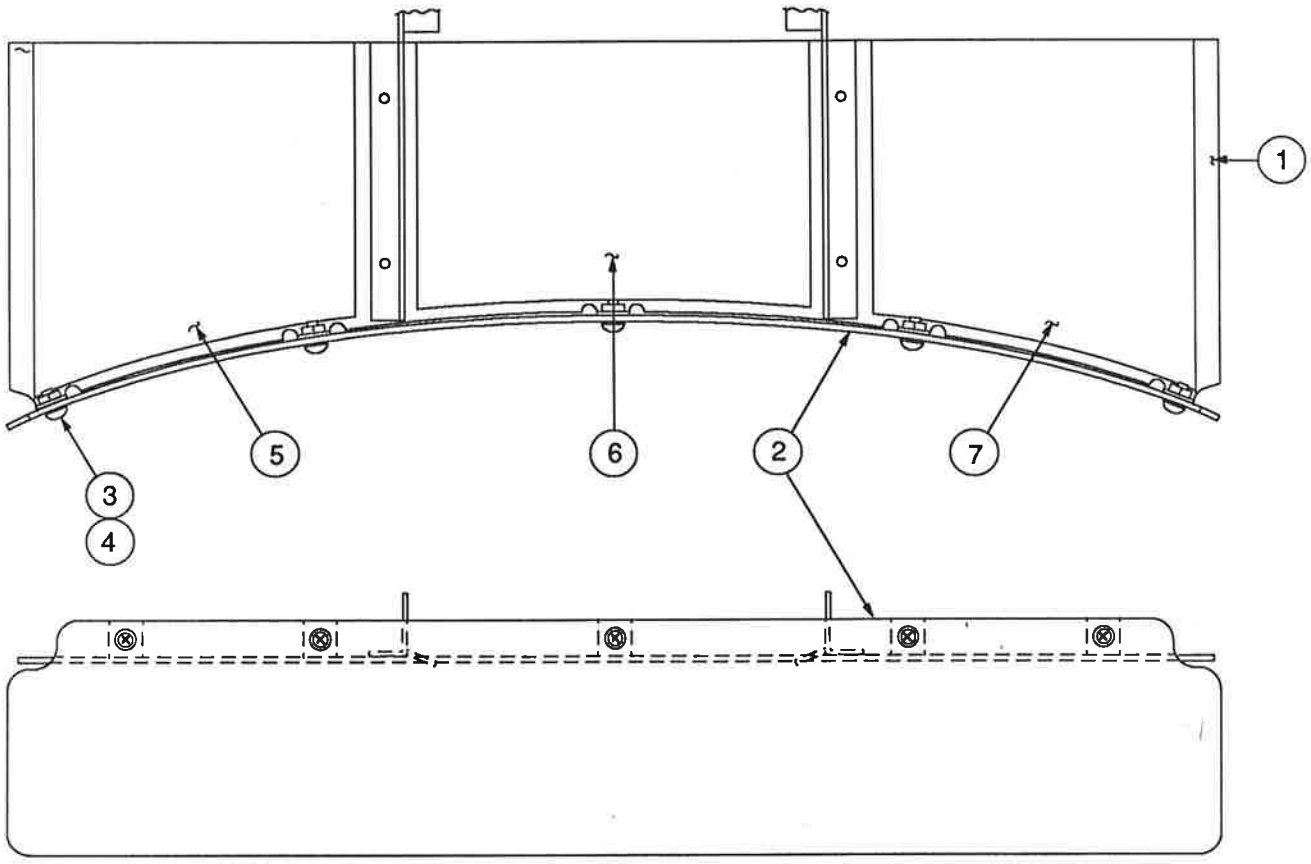
FIGURE 1



* See p.2- 30 for Target Assembly.

A-14569 Home Run Deck Assembly

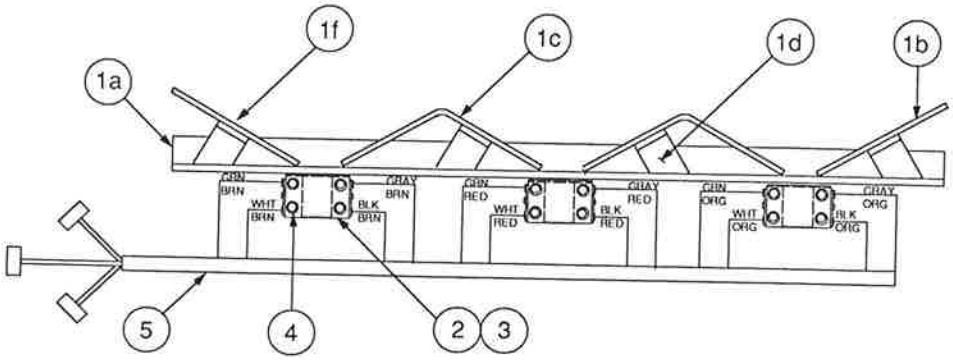
TOP VIEW



FRONT VIEW

Item	Part Number	Description
1	A-14569-1	Home Run Deck Sub-Assembly
2	31-1-60001-7	Playfield Plastic
3	4006-01027-06	Mach. Screw, #6-32 x 3/8
4	4406-01128-00	Nut, #6-32 KEPS
5	31-2-60001-1	Decal - Double (Left)
6	31-2-60001-2	Decal - Tripple (Center)
7	31-2-60001-3	Decal - Double (Right)

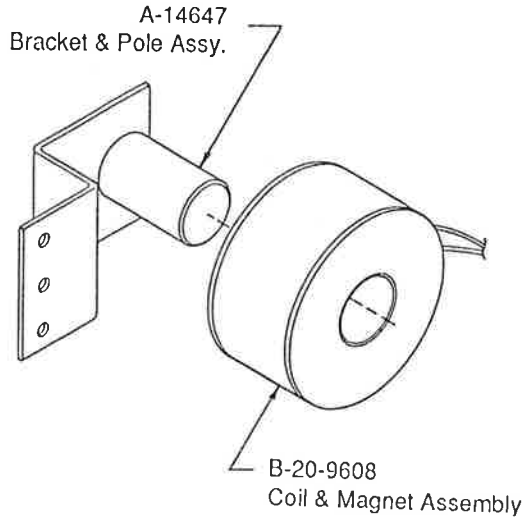
A-14446 Home Run Switch & Bracket Assembly



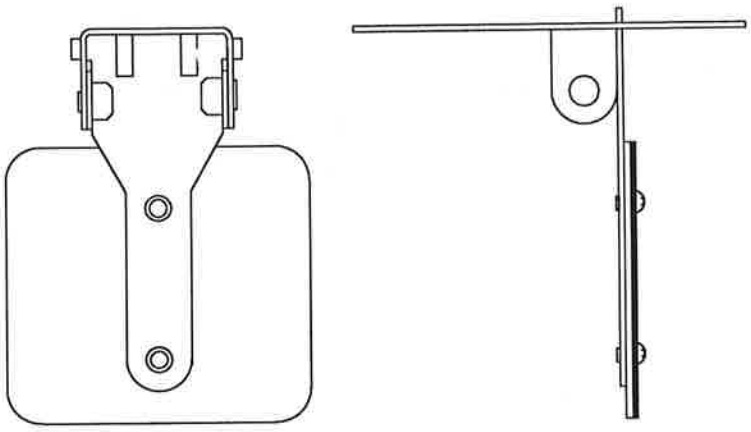
Item	Part Number	Description
1	A-14447	Switch Bracket Sub-Assembly
a)	01-10049	Switch Bracket
b)	01-10264-R	End Ramp Bracket- R.
c)	01-10265-L	Center Ramp Bracket- L.
d)	01-10265-R	Center Ramp- R.
e)	01-10219	Mounting Bracket
f)	01-10264-L	End Ramp Bracket - L.
2	A-14316	Opto Transistor Assembly
3	A-14315	Opto LED Assembly
4	4106-01115-08	Sh. Metal Screw, #6 x 1/2
5	H-14699	Opto Cable

A-14696 Coil Magnet Assembly

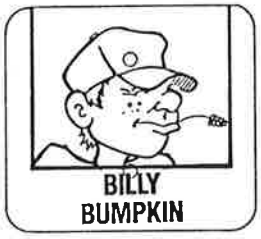
Associated Part : **A-14647 Bracket Assembly**



A-14452 (Family)
Individual Target Assemblies



Target Boards



A-14452-1



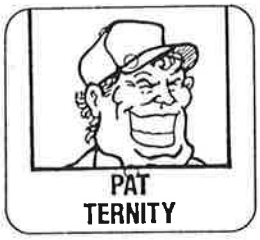
A-14452-2



A-14452-3



A-14452-4



A-14452-5

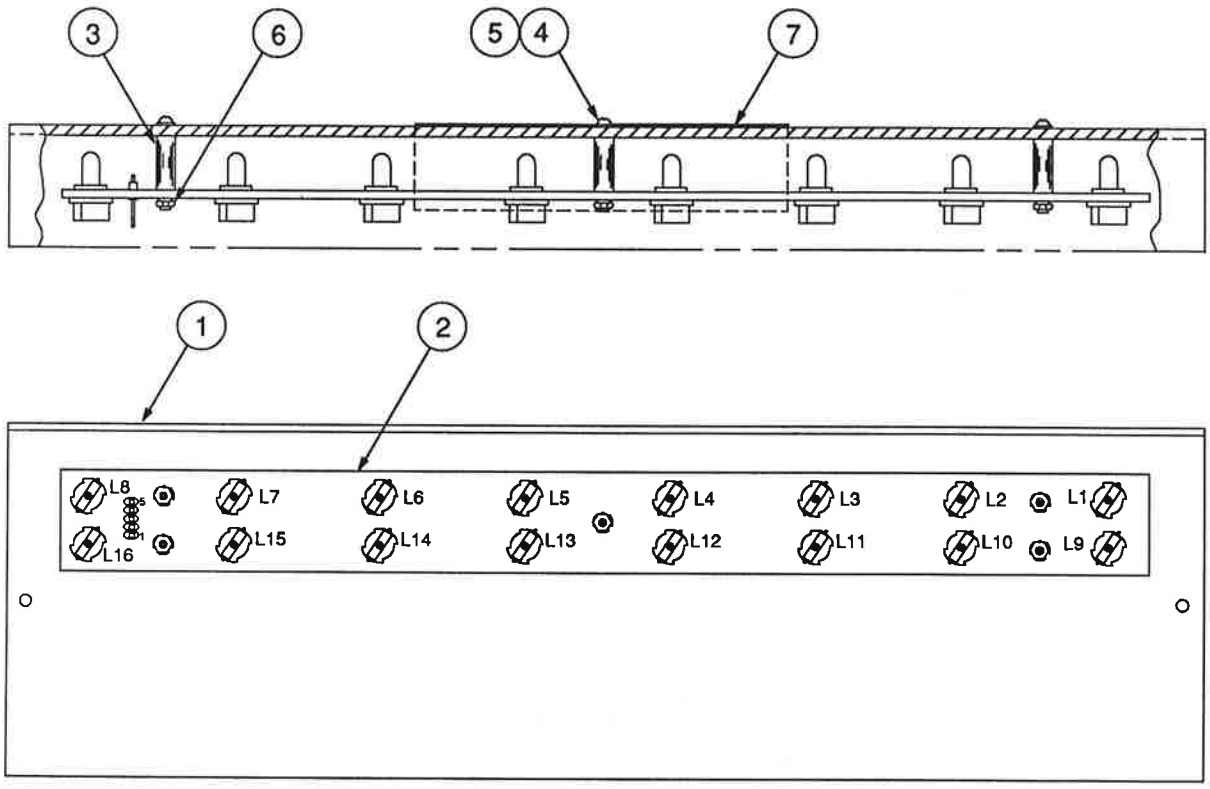


A-14452-6



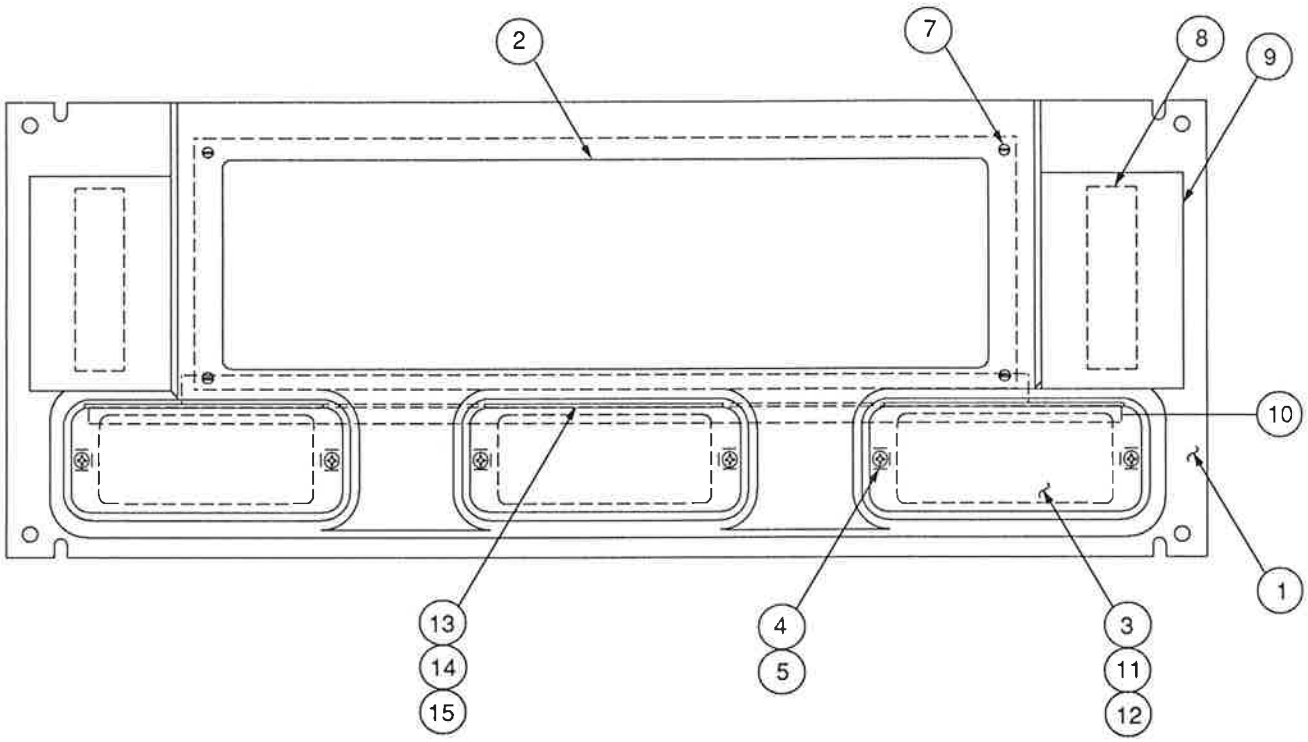
A-14452-7

A-14611 Inside Light Panel Assembly



Item	Part Number	Description
1	03-8575	Inside Light Panel
2	A-14589	G.I. Lamp Assembly
3	03-8022-2	Spacer, 1-1/16"
4	4700-00076-00	Flatwasher, 5/32 x 5/16 x 19ga.
5	4006-01005-24	Mach. Screw, 6-32 x 1-1/2
6	4406-01128-00	Nut, 6-32 KEPS
7	31-2-60001-4	Decal

A-14369 Bleachers Assembly



Item	Part Number	Description
1	03-8522	Bleacher
2	03-8589	Window
3	31-1-60001-4	Playfield Plastic (Screened)
4	03-8544-1	Grommet, Plastic Stud
5	4108-01001-10	Sh. Metal Screw, #8 x 5/8
6	Not Used	
7	20-9684	Plastic Rivet
8	RM-22-08	Double-Sided Tape
9	See Note	Baseball Card Set
10	01-10204	Light Shield
11	31-1-60001-5	Playfield Plastic (Screened)
12	31-1-60001-6	Playfield Plastic (Screened)
13	31-2-60001-6	Decal
14	31-2-60001-7	Decal
15	31-2-60001-8	Decal

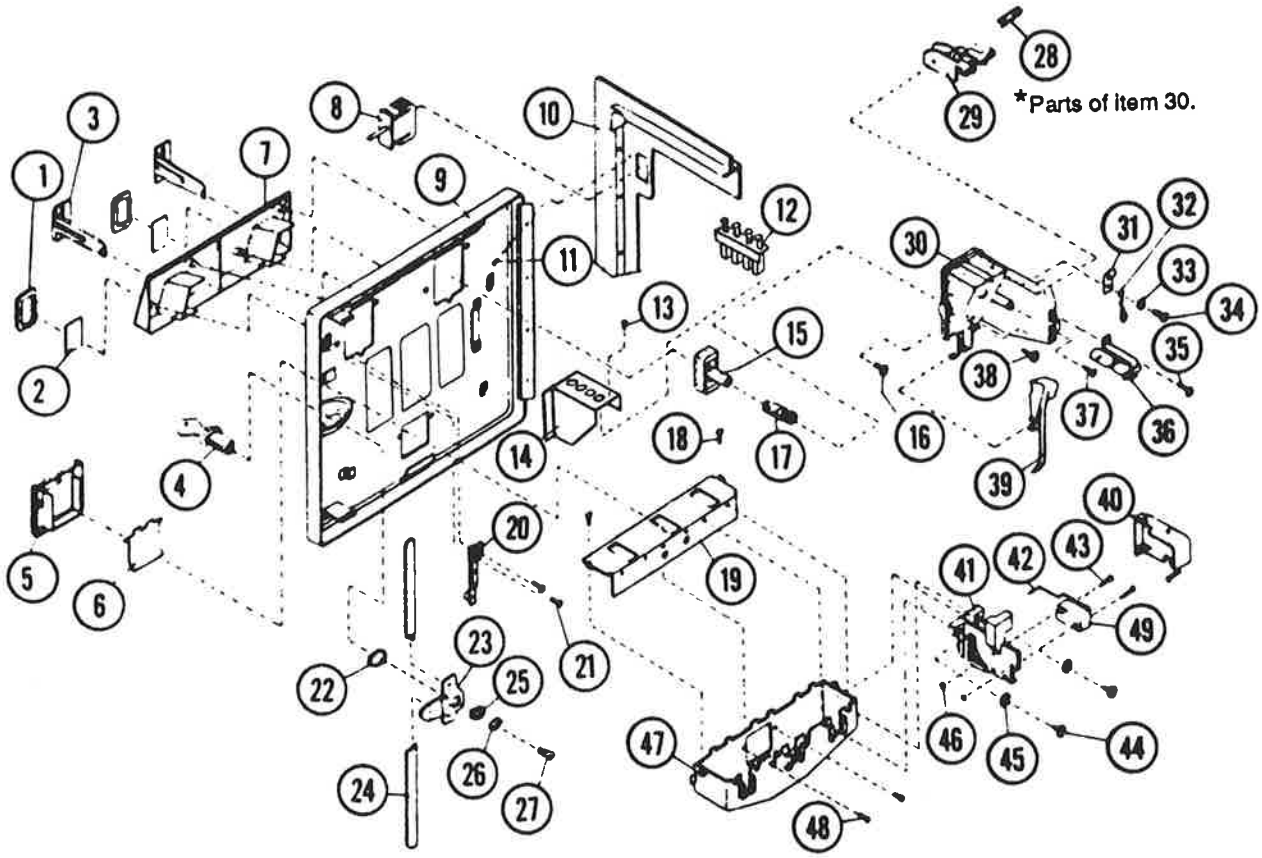
Note: To order replacement or additional baseball cards, contact your authorized **WILLIAMS** Distributor.

A-14148-1 Coin Door Assembly

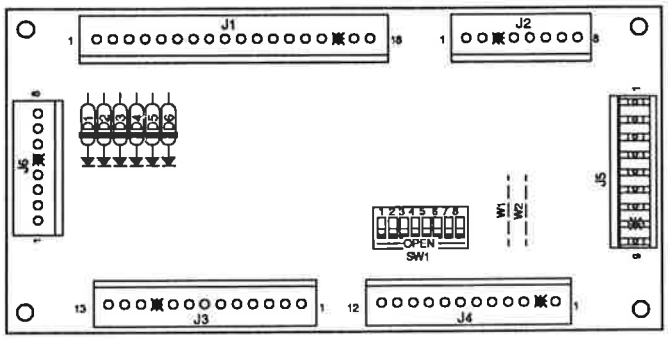
U.S.A. Door with Decals

Item	Part No.	Description	Quantity
1	27-1038	Button Cover	2 or 3
2	27-1041-1→58	Price Panel	2 or 3
3	27-1026-1→17	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	5641-12724-00	Diagnostic Switch	1
13	27-1101	M/C Screw, 4-40 x 1/4	2
14	01-9885	Bracket, Diagnostic Switch	1
15	03-7601-4	Button, Red	2
	03-7601-7	Button, Black	2
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	Not Used		
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

A-14148-1 Coin Door Assembly



A-14102 WPC Coin Door Interface Board



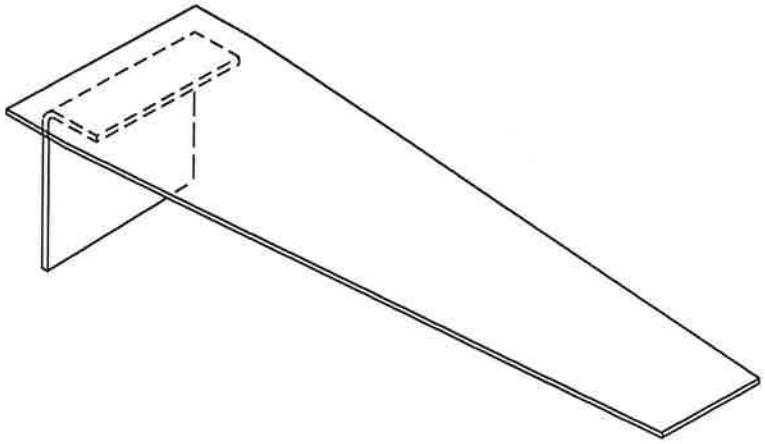
Part Number	Designator	Description
5768-12716-00		WPC Bare PC Board
5070-09054-00	D1-D6	Diode, 1N4004, 1.0A.
5791-10862-18	J1	Connector, 18-pin Header Str Sq.
5791-10862-08	J2, J6	Connector, 8-pin Header Str Sq.
5791-10862-13	J3	Connector, 13-pin Header Str Sq.
5791-10862-09	J5	Connector, 9-pin Header Str Sq.
5792-10817-09	J5	9R Mt/End 22/.156

Notes:
1. For Belgium, France and England use A-14102-1 Coin Door Interface Board.
2. For schematic refer to drawing #16-9152.

A-14289 Ramp Assembly



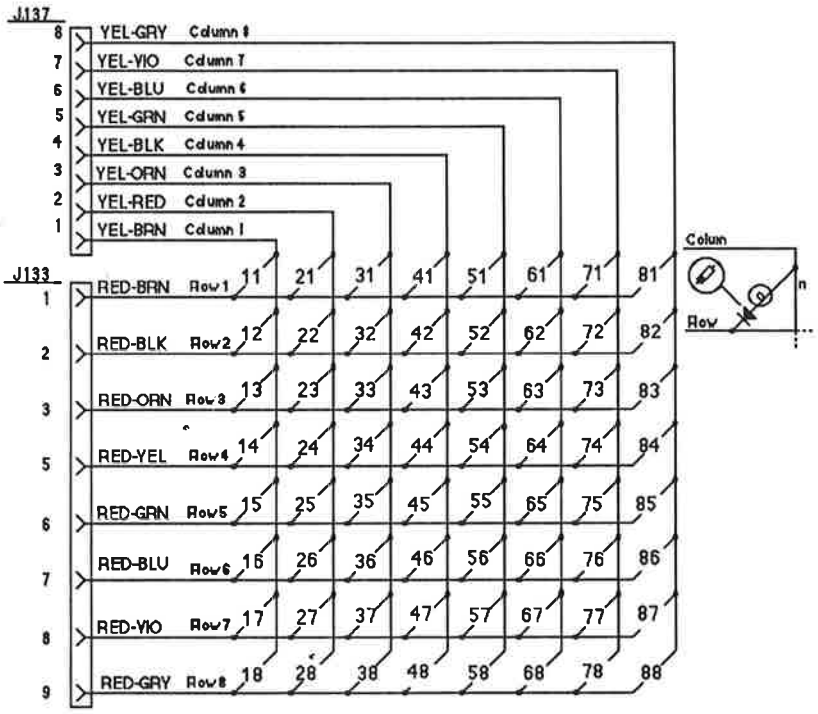
A-14287 Ball Flap Assembly



Unique Parts

Part Number	Description
A-14442	Target Holder Assembly
A-14560	Front Panel Assembly
A-14561	Screen Strap Asy. - Small
A-14562	Screen Strap Assy. - Large
A-14563	Screen Assembly
A-14567	16-Diode Switch & Lamp Assy.
A-14570	Wood Backbox Assy.
A-14589	G. I. Lamp Assembly
A-14598	Barrier Molding Assy.
A-14611	Inside Light Panel
A-14612	Hinged Door Assembly
A-14620	Ball Return FR Assembly
A-14621	Ball Return FR Assembly
A-14622	Ball Return RR Assembly
A-14643	Cashbox Assembly
A-14677	Speaker Panel Assembly
A-14678	Speaker Display Assembly
A-14683	Plastic & Card Assy. (R)
A-14684	Plastic & Card Assy. (L)
A-14692	Pitch Motor Opto Assy.
H-14657	Playfield Cable
H-14658	Cabinet Cable
H-14659	Front Panel Cable
H-14660	Secondary Cable
H-14661	Logic Power Cable
H-14662	Dot Display Power Cable
H-14663	Speaker Cable
H-14667	Pitch Opto Cable
H-14668	Ramp Opto Cable
H-14669	Magnet Cable
H-14670	Bat Cable
H-14671	Pitch Motor Cable
01-10163	Ball Deflector Target Board
01-10175	Barrier Molding- Bottom
01-10176	Barrier Molding - Top
01-10177	Glass Molding Top
01-2077	Card Plate
03-8558	Screen
03-8559	Ball Catch Rear
08-7572-1	Glass Playfield
08-7572-2	Glass Top
20-9676	Cam Lock
20-9679	Light Indicator
31-1-60001-1	Playfield Plastic #1 Card
31-1-60001-2	Playfield Plastic #2 Card
31-1-60001-3	Playfield Plastic #3 Card
31-1629	Speaker Panel Cover (Screened)

Lamp Matrix



SLUGFEST Lamp Matrix

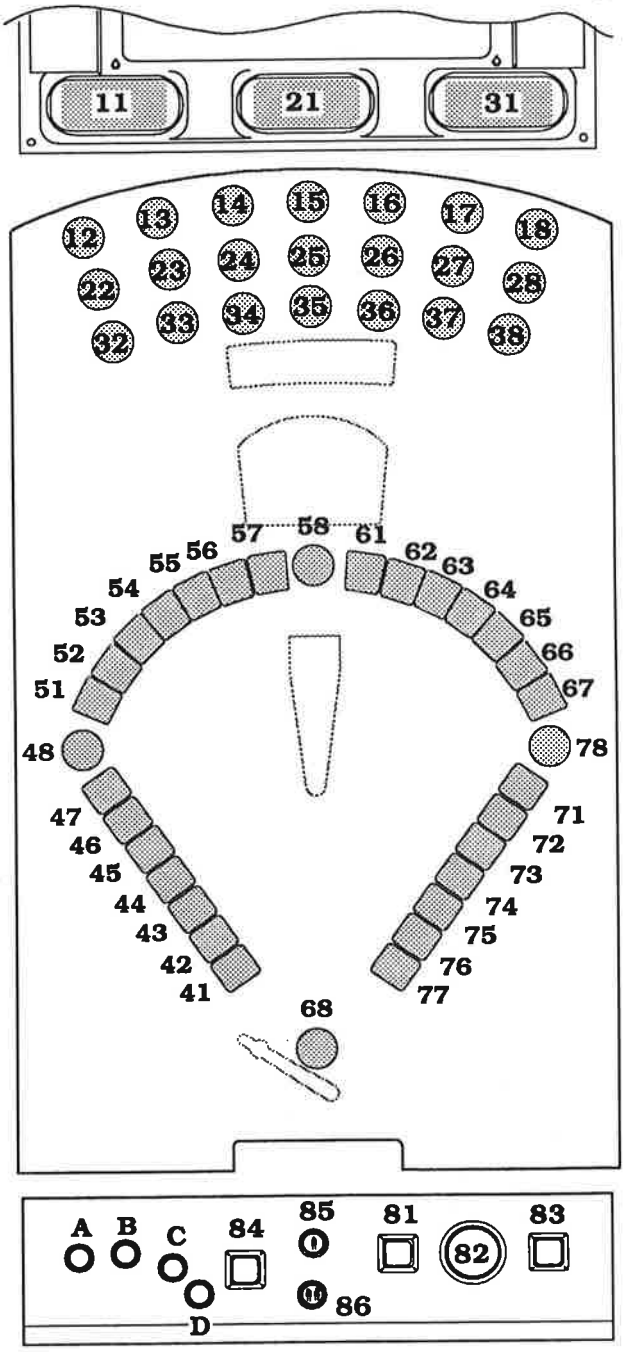
Yellow (B+) — Red

Row \ Column	1 Yellow-Brown	2 Yellow-Red	3 Yellow-Orange	4 Yellow-Black	5 Yellow-Green	6 Yellow-Blue	7 Yellow-Violet	8 Yellow-Gray
1 Red-Brown	Left Bleacher Home Run 11	Middle Bleacher Home Run 21	Right Bleacher Home Run 31	#32 41	#24 51	#16 61	#8 71	Pinch Hit 81
2 Red-Black	Out (T. - L.) 12	Single (M. - L.) 22	Double (B. - 2.) 32	#31 42	#23 52	#15 62	#7 72	Bat Ready 82
3 Red-Orange	Out (T. - 2L.) 13	Double (M. - 2L.) 23	Single (B. - 2L.) 33	#30 43	#22 53	#14 63	#6 73	Steal Base 83
4 Red-Yellow	Out (T. - 3L.) 14	Single (M. - 3L.) 24	Triple (B. - 3L.) 34	#29 44	#21 54	#13 64	#5 74	Throw Out Runner 84
5 Red-Green	Out (T. - M.) 15	Sacrifice (M. - M.) 25	Home Run (B. - M.) 35	#28 45	#20 55	#12 65	#4 75	Player 1 Start 85
6 Red-Blue	Out (T. - 3R.) 16	Single (M. - 2R.) 26	Triple (B. - 2R.) 36	#27 46	#19 56	#11 66	#3 76	Player 2 Start 86
7 Red-Violet	Out (T. - 2R.) 17	Double (M. - 1R.) 27	Single (B. - 1R.) 37	#26 47	#18 57	#10 67	#2 77	87
8 Red-Gray	Out (T. - R.) 18	Single (M. - R.) 28	Double (B. - R.) 38	#25 48	#17 58	#1 68	#9 78	88

SLUGFEST Lamp Locations

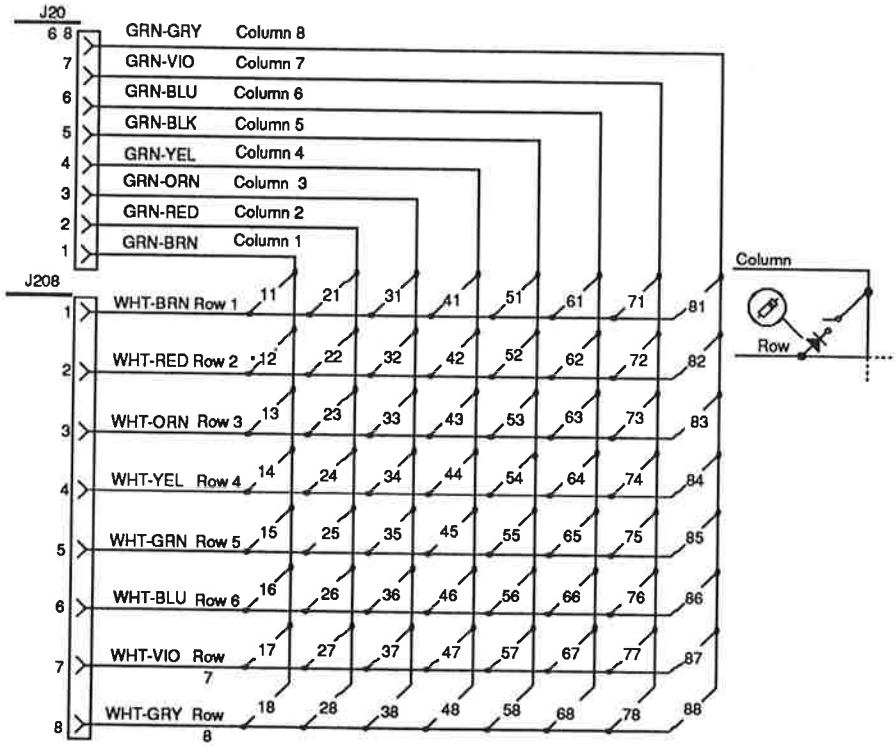
No.	Description	Bulb #
11.	Left Grand Home Run	555
12.	Out (T. - L.)	555
13.	Out (T. - 2L.)	555
14.	Out (T. - 3L.)	555
15.	Out (T. - M.)	555
16.	Out (T. - 3R.)	555
17.	Out (T. - 2R.)	555
18.	Out (T. - R.)	555
21.	Middle Grand Home Run	555
22.	Single (M. - L.)	555
23.	Double (M. - 2L.)	555
24.	Single (M. - 3L.)	555
25.	Sacrifice (M. - M.)	555
26.	Single (M. - 2R.)	555
27..	Double (M. - 1R.)	555
28.	Single (M. - R.)	555
31.	Right Grand Home Run	555
32.	Double (B. - 2.)	555
33.	Single (B. - 2L.)	555
34.	Tripple (B. - 3L.)	555
35.	Home Run (B. - M.)	555
36.	Tripple (B. - 2R.)	555
37.	Single (B. - 1R.)	555
38.	Double (B. - R.)	555
41.	#32	555
42.	#31	555
43.	#30	555
44.	#29	555
45.	#28	555
46.	#27	555
47.	#26	555
48.	#25	555
51.	#24	555
52.	#23	555
53.	#22	555
54.	#21	555
55.	#20	555
56.	#19	555
57.	#18	555
58.	#17	555
61.	#16	555
62.	#15	555
63.	#14	555
64.	#13	555
65.	#12	555
66.	#11	555
67.	#10	555
68.	#1	555
71.	#8	555
72.	#7	555
73.	#6	555
74.	#5	555
75.	#4	555
76.	#3	555
77.	#2	555
78.	#9	555
81.	Pinch Hit	555

Bleachers Assy.



No.	Description	Bulb #
82.	Bat Ready	555
83.	Steal Base	555
84.	Throw Out Runner	555
85.	Player 1 Start	555
86.	Player 2 Start	555
A	Gen. Illumination	555
B	Gen. Illumination	555
C	Gen. Illumination	555
D	Gen. Illumination	555

Switch Matrix



SLUGFEST Switch Matrix

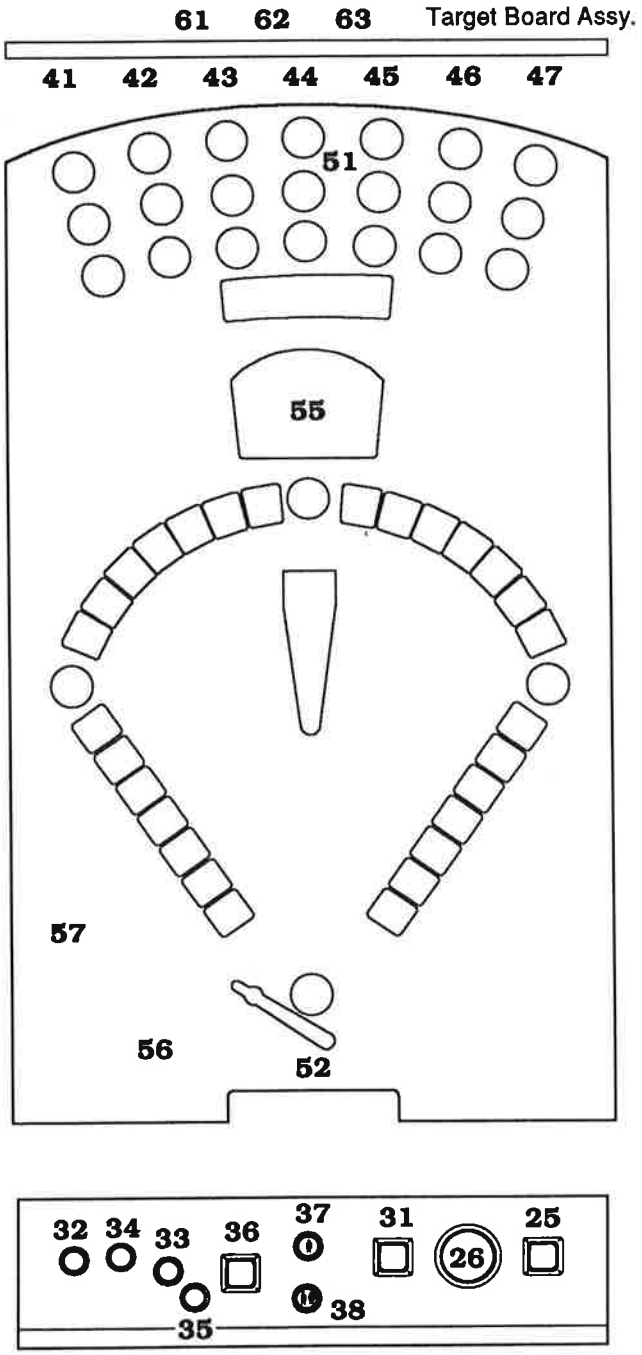
White —|— Green

Dedicated Grounded Switches	Row \ Column	1 Green-Brown	2 Green-Red	3 Green-Orange	4 Green-Yellow	5 Green-Black	6 Green-Blue	7 Green-Violet	8 Green-Gray
Orange-Brown (1) Left Coin Chute D1	1 White-Brown	Not Used 11	Slam Tilt 21	Pinch Hit 31	Target Panel - L. 41	Back-Row Trough 51	Left Bleacher 61	Not Used 71	Not Used 81
Orange-Red (2) Center Coin Chute D2	2 White-Red	Not Used 12	Coin Door Closed 22	Fast Ball Pitch 32	Target Panel - 2L. 42	Strike Trough 52	Middle Bleacher 62	Not Used 72	Not Used 82
Orange-Black (3) Right Coin Chute D3	3 White-Orange	Not Used 13	Dispenser Prize 23	Changeup Pitch 33	Target Panel - 3L. 43	Not Used 53	Right Bleacher 63	Not Used 73	Not Used 83
Orange-Yellow (4) 4th Coin Chute D4	4 White-Yellow	Not Used 14	Always Closed 24	Curve Pitch 34	Target Panel - M. 44	Pitch Home 54	Not Used 64	Not Used 74	Not Used 84
Orange-Green (5) Normal Function: Service Credits; Test Function: Escape D5	5 White-Green	Not Used 15	Steal Base/Run 25	Screw Ball Pitch 35	Target Panel - 3R. 45	Ramp Switch 55	Not Used 65	Not Used 75	Not Used 85
Orange-Blue (6) Normal Function: Volume Down; Test Function: Down D6	6 White-Blue	Not Used 16	Bat Switch 26	Throw Out Runner 36	Target Panel - 2R. 46	Playfield Tilt 1 56	Not Used 66	Not Used 76	Not Used 86
Orange-Violet (7) Normal Function: Volume Up; Test Function: Up D7	7 White-Violet	Not Used 17	Dispenser Low 27	Start Player 1 37	Target Panel - R. 47	Playfield Tilt 2 57	Not Used 67	Not Used 77	Not Used 87
Orange-Gray (8) Normal Function: Begin Test; Test Function: Enter D8	8 White-Gray	Not Used 18	Dispenser Unjammed 28	Start Player 2 38	Not Used 48	Not Used 58	Not Used 68	Not Used 78	Not Used 88

SLUGFEST Switch Locations

Item	Part Number	Description
11.		Not Used
12.		Not Used
13.		Not Used
14.		Not Used
15.		Not Used
16.		Not Used
17.		Not Used
18.		Not Used
21.	27-1066	Slam Tilt
22.	A-8630	Coin Door Closed
23.	A-14316*	Dispenser Prize
24.	A-8630	Always Closed
25.	20-9663-C-2	Steal Base/Run
26.	20-9663-B-1	Bat Switch
27.	5647-12693-01	Dispenser Low
28.	5641-09312-00	Dispenser Unjammed
31.	20-9663-C-1	Pinch Hit
32.	20-9663-A-6	Fast Ball Pitch
33.	20-9663-A-4	Changeup Pitch
34.	20-9663-A-5	Curve Pitch
35.	20-9663-A-3	Screw Ball Pitch
36.	20-9663-C-3	Throw Out Runner
37.	20-9663-A-1	Start Player 1
38.	20-9663-A-2	Start Player 2
41.	A-14697	Target Panel - L.
42.	A-14697	Target Panel - 2L.
43.	A-14697	Target Panel - 3L.
44.	A-14697	Target Panel - 3R.
45.	A-14697	Target Panel - M.
46.	A-14697	Target Panel - 2R.
47.	A-14697	Target Panel - R.
48.		Not Used
51.	5647-12133-08	Back - Row Trough
52.	5647-12133-08	Strike Trough
53.		Not Used
54.	14-7959	Pitch Home
55.	A-14693*	Ramp Switch
56.	SW-1A-117	Playfield Tilt - 1
57.	SW-1A-117	Playfield Tilt - 2
58.		Not Used
61.	A-14447*	Left Grand Stand
62.	A-14447*	Middle Grand Stand
63.	A-14447*	Right Grand Stand

* An Opto Switch Assembly

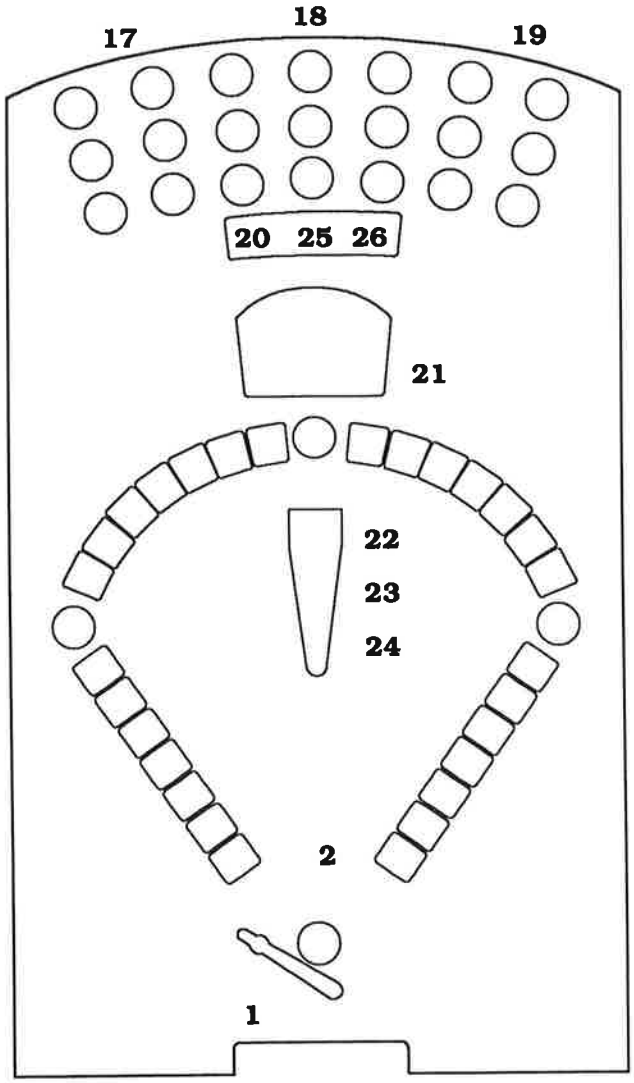


SLUGFEST Solenoid Table

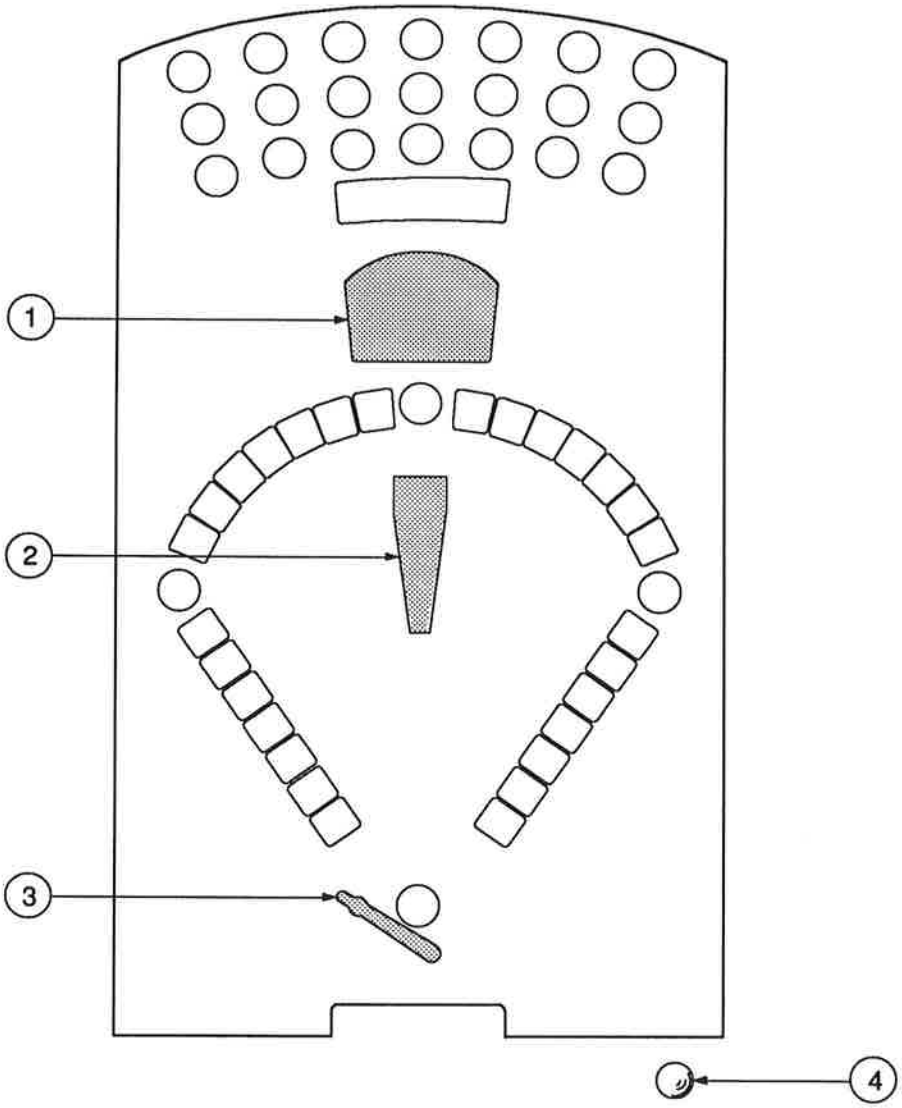
Sol. No.	Function	Solenoid Type	Wire Color		Connections	Driver Trnstr	Solenoid Part Number Flashlamp Type
			Drive	Power			
01	Baseball Bat	High Power	Vio-Brn	Vio-Yel	J130-1	Q82	A-14499
02	Magnet	High Power	Vio-Red	Vio-Yel	J130-2	Q80	B-20-9608
03	Not Used	High Power	Vio-Orn		J130-4	Q78	NU
04	Not Used	High Power	Vio-Yel		J130-5	Q76	NU
05	Not Used	High Power	Vio-Grn		J130-6	Q64	NU
06	Not Used	High Power	Vio-Blu		J130-7	Q66	NU
07	Knocker	High Power	Vio-Blk	Vio-Yel	J130-8	Q68	AE-23-800
08	Not Used	High Power	Vio-Gry		J130-9	Q70	NU
09	Not Used	Low Power	Brn-Blk		J127-1	Q58	NU
10	Not Used	Low Power	Brn-Red		J127-3	Q56	NU
11	Not Used	Low Power	Brn-Orn		J127-4	Q54	NU
12	Not Used	Low Power	Brn-Yel		J127-5	Q52	NU
13	Not Used	Low Power	Brn-Grn		J127-6	Q50	NU
14	Not Used	Low Power	Brn-Blu		J127-7	Q48	NU
15	Not Used	Low Power	Brn-Vio		J127-8	Q46	NU
16	Not Used	Low Power	Brn-Gry		J127-9	Q44	NU
17	F.L. Left Bleacher Home Run	Flasher	Blk-Brn	Red-Wht	J125-1	Q42	#806
18	F.L. Ctr. Bleacher Home Run	Flasher	Blk-Red	Red-Wht	J126-2	Q40	#806
19	F.L. Rt. Bleacher Home Run	Flasher	Blk-Orn	Red-Wht	J126-3	Q38	#806
20	F.L. Ramp Left	Flasher	Blk-Yel	Red-Wht	J126-4	Q36	#912
21	Ramp Motor		Blu-Grn	Vio-Orn	J126-6	Q28	14-7960
22	Fast Pitch		Blu-Blk	Vio-Orn	J126-7	Q30	14-7959
23	Medium Pitch		Blu-Vio	Vio-Orn	J126-8	Q34	14-7959
24	Slow Pitch		Blu-Gry	Vio-Orn	J126-9	Q32	14-7959
25	F.L. Ramp Middle	Flasher	Blu-Brn	Red-Wht	J122-1	Q26	#912
26	F.L. Ramp Right	Flasher	Blu-Red	Red-Wht	J122-2	Q24	#912
27	Dispenser Motor		Blu-Orn	Vio-Orn	J122-3	Q22	14-7962 (card)
28	Dispenser Low Lamp		Blu-Yel	Vio-Orn	J122-4	Q20	20-9679 (card)
	General Illumination Circuits						
01	G.I. Infield Top	G.I.	Wht-Brn	Brn	J121-7	Q18	#555
02	G.I. Backbox	G.I.	Wht-Org	Org	J120-8	Q10	#555
03	G.I. Pitch Lamps	G.I.	Wht-Yel	Yel	J120-9	Q14	#555
04	G.I. Outfield	G.I.	Wht-Grn	Grn	J121-11	Q16	#555
05	G.I. Infield Bottom	G.I.	Wht-Vio	Vio	J120-11	Q12	#555

SLUGFEST Solenoid Locations

Item	Part Number	Description
01	A-14499	Baseball Bat
02	B-20-9608	Magnet
03		Not Used
04		Not Used
05		Not Used
06		Not Used
07	AE-23-800	Knocker
08		Not Used
09		Not Used
10		Not Used
11		Not Used
12		Not Used
13		Not Used
14		Not Used
15		Not Used
16		Not Used
17	#806	F. L. Left Grand Home Run
18	#806	F. L. Center Grand Home Run
19	#806	F. L. Right Grand Home Run
20	#912	F. L. Ramp Left
21	14-7960	Ramp Motor
22	14-7959	Fast Pitch
23	14-7959	Medium Pitch
24	14-7959	Slow Pitch
25	#912	F. L. Ramp Middle
26	#912	F. L. Ramp Right
27	14-7962	Dispenser Motor
28	20-9679	Dispenser Low



SLUGFEST Playfield Parts Locations



Item	Part Number	Description
1	A-14289	Ramp Assembly
2	A-14287	Ball Flap Assy.
3	03-8516	Bat
4	20-6520	Steel Ball, 3/4" (6)

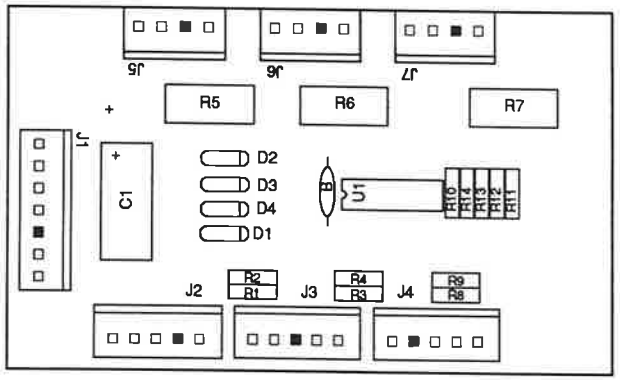


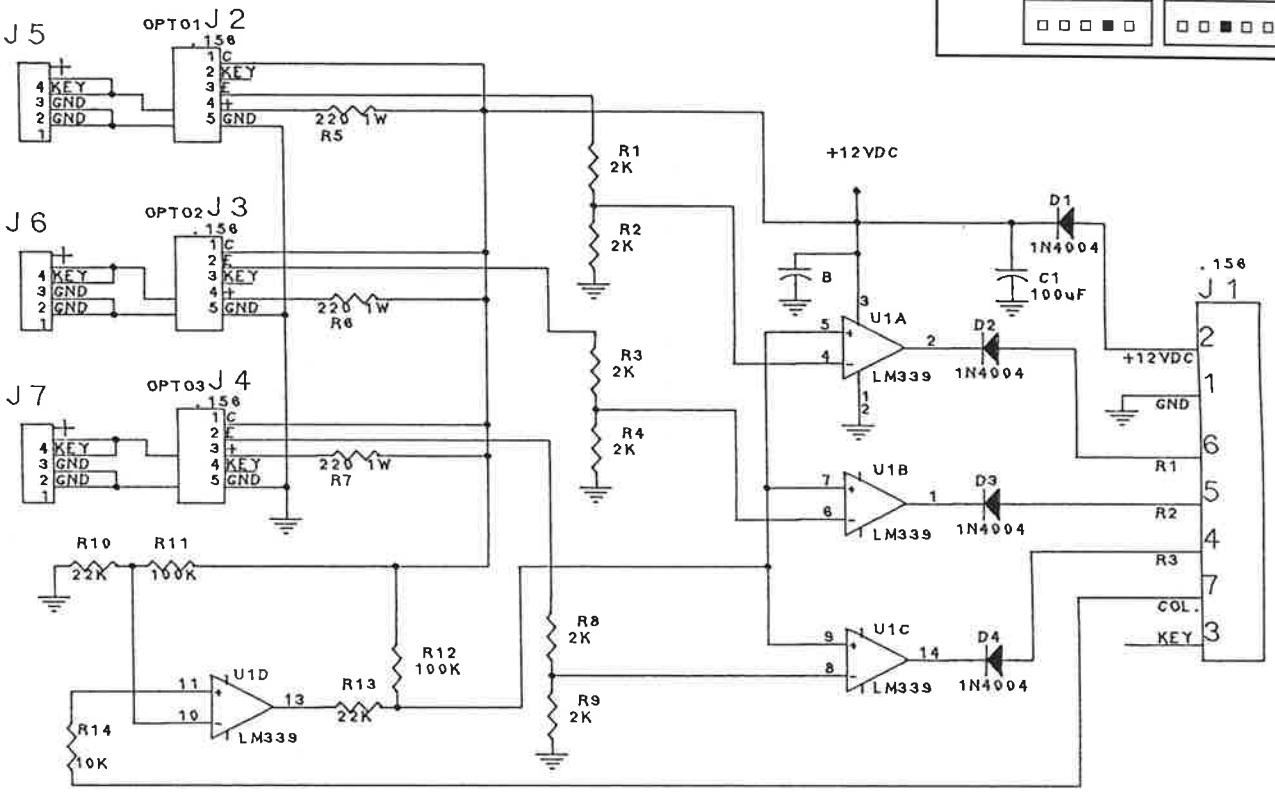
SECTION 3
Wiring Diagrams and Schematics

Diagrams & Schematics

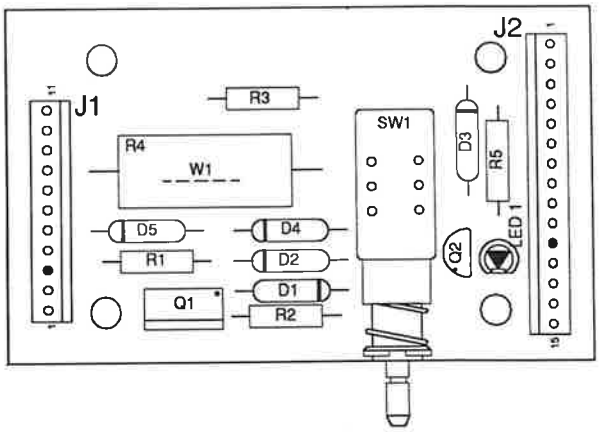
Opto Ramp Switch
Card Dispenser
Motor Regulator
Coin Interface Board
Power Wiring
CPU Board
Sound Board
Power Driver Board
Dot Matrix Board
Backbox Wiring
Interboard Wiring

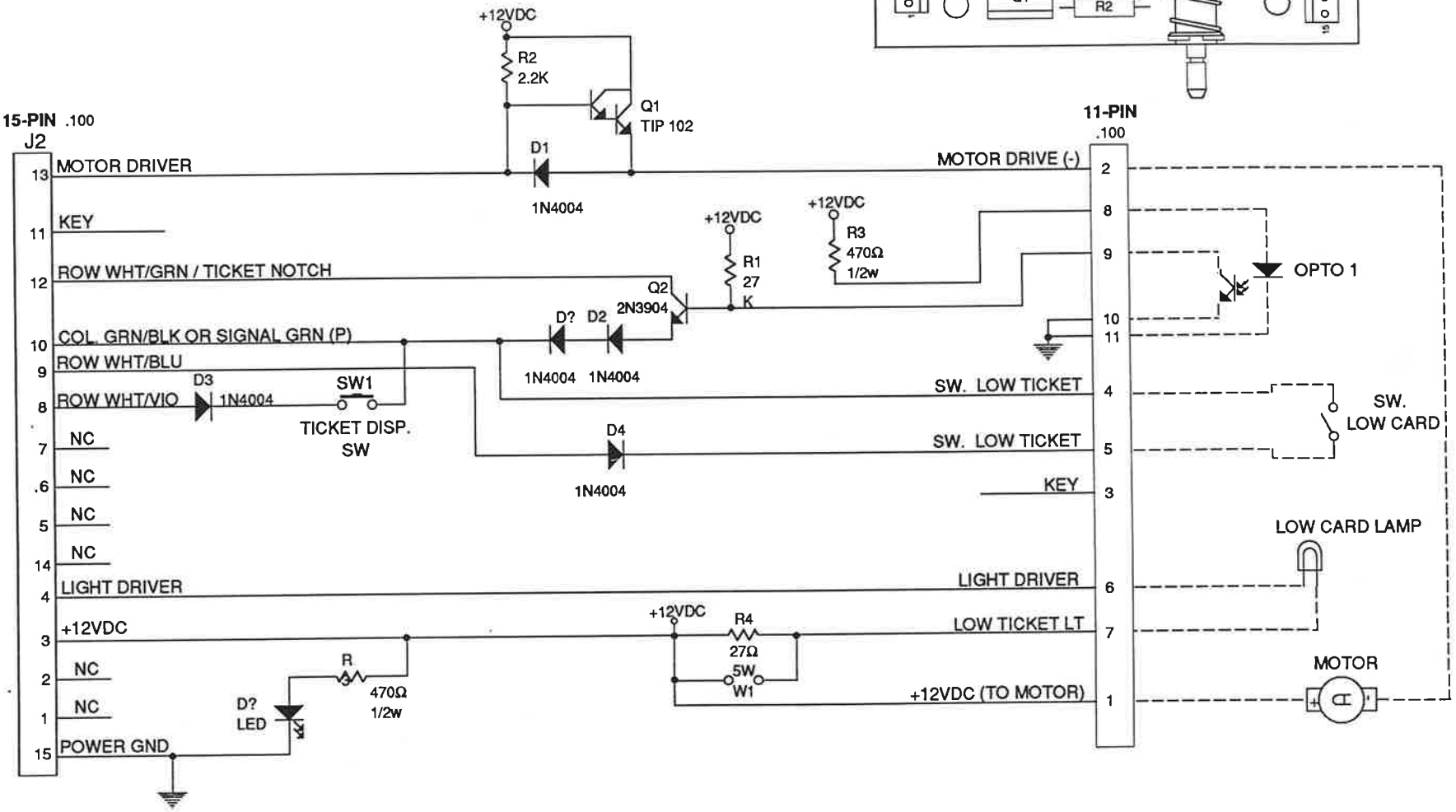
A-13901- Opto Ramp Switch Board & Schematic



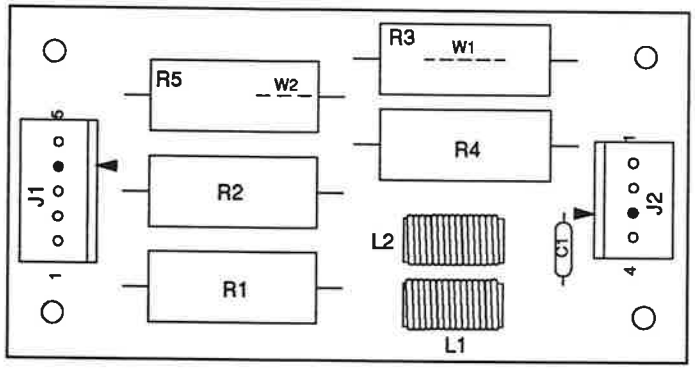


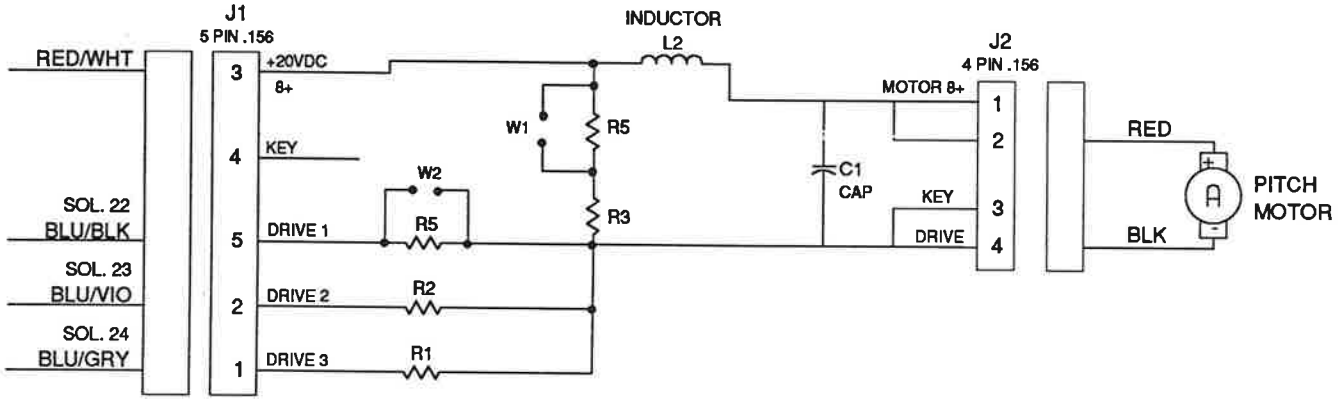
A-14633 Card Dispenser PCB Assy. & Schematic



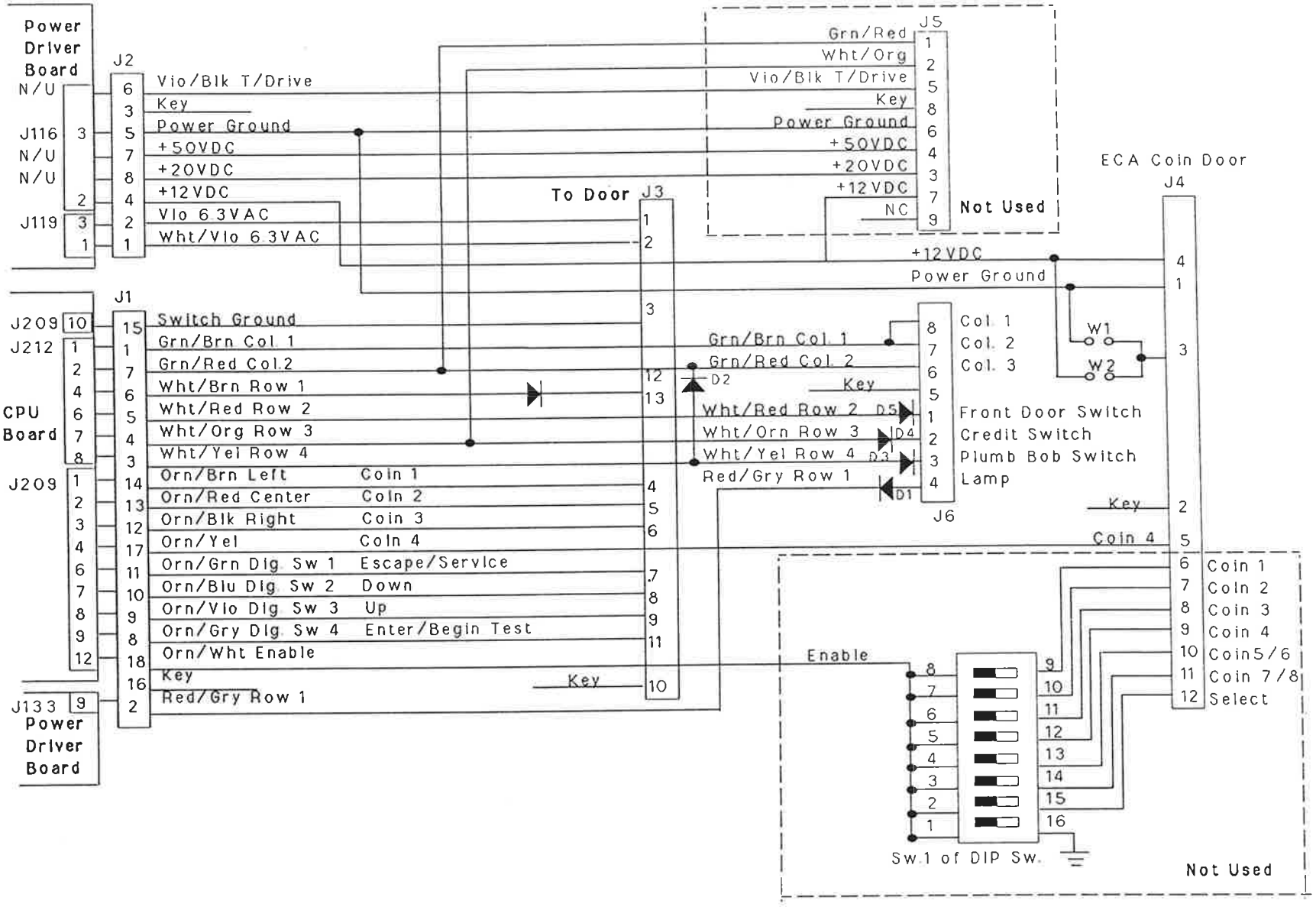


A-14381
Motor Regulator Board & Schematic





16-9152 Coin Door Interface Schematic



NOTES:

WPC TRANSFORMER 2
5610-12718-00

1 BLK
2 BLK
6 BRN
9 ORG
3 WHT-BLK
5 WHT-BRN
4 WHT-ORG
8 WHT-ORG
7

LINE FILTER ASSEMBLY

J?
PLUG AC FEMALE

F?
FUSE

LINE FILTER

RV?
VARISTOR

POWER SWITCH

S?
SW DPST

J?
PLUG AC MALE

OPTIONAL POWER CONNECTIONS

FOR 115VAC
1 2 6 9 3 5 4 8 7

FOR 103.5VAC
1 2 6 9 3 5 4 8 7

FOR 230VAC
1 2 6 9 3 5 4 8 7

FOR 218 VAC
1 2 6 9 3 5 4 8 7
218V

FOR 206 VAC
1 2 6 9 3 5 4 8 7
206V

TRANSFORMER

N.C.	2	2	
N.C.	8	8	
6.8VAC	1	1	YEL
	4	4	YEL
	7	7	YEL
	3	3	YEL-WHT
	6	6	YEL-WHT
	9	9	YEL-WHT
	5	5	YEL-WHT
51.4VAC	7	7	BLK-YEL
	10	10	BLK-YEL
16VAC	3	3	WHT-RED
	4	4	WHT-RED
13.3VAC	14	14	BLU-WHT
	15	15	BLU-WHT
9VAC	1	1	RED
	2	2	RED
9.8VAC	11	11	WHT-GRN
	13	13	WHT-GRN
80VAC	5	5	WHT
	8	8	WHT
18VAC	6	6	GRAY
18VAC	9	9	GRY-WHT
	12	12	GRY-GRN

SECONDARY CABLE

POWER DRIVER BOARD

J115
2 3 4 5 6 12 11 10 8 7 1

J102
9 8 5 6 3 4 1 2

J101
4 5 6 7 1 2

J112
4 5 3 1

F106 F110 F109 F107 F108

G.I.
TRIAC'S

J120
11 7 8 10 9 6 3 5 1 2

F102 RIGHT FLIPPER
F101 LEFT FLIPPER

J109
7 5

F112 +50V

J107
1 2 3 4 5 6

F103 CONTINIOUS
F104 LOW POWER
F105 HIGH POWER

F111 +20V FLASH LAMP POWER
LED5

F114 +18VDC +12VDC DIGITAL
LED6 LED1 +12V +5V

J114
1 2 3 4 5 7

F113 +5VDC
LED4

J118
4 3 2

F116
LED7

DISPLAY DRIVER BOARD

J307
1 4

F301 +100VDC -100VDC

+5VDC

J306
1 3

SOUND BOARD

J501
4 5 6 7 1 2

F502 +25VDC -25VDC +12VDC -12VDC

F501

+5VDC

J502
1 3 4 5

CPU

+12VDC
+5VDC

J210
6 7 5 4 3 1

WILLIAMS ELECTRONICS			
Title: POWER WIRE DIAGRAM			
Size: C	Document Number: A:TRANCBL.SCH		REV:
Date: October 17, 1990	Sheet:	of	

REV	DESCRIPTION OF CHANGE	ECN NO. DATE

POWER PIN CONNECTIONS OF I.C.'s

ULN-2803	+12V	PIN 10
	GND	PIN 9
74LS374	+5V	PIN 20
74LS244	GND	PIN 10
74LS245		
LM-339	+12V	PIN 3
	GND	PIN 12
68B09E	+5V	PIN 7
	GND	PIN 1

ALL 10K OHM

ALL 1K OHM

8-470pF CAPACITORS

COLUMN DRIVES

SWITCH ROWS

DIRECT SWITCHES

WPC CPU SUB-ASSEMBLY D-12741
WPC CPU ASSEMBLY D-12742
WPC CPU PWB 5764-12431-00

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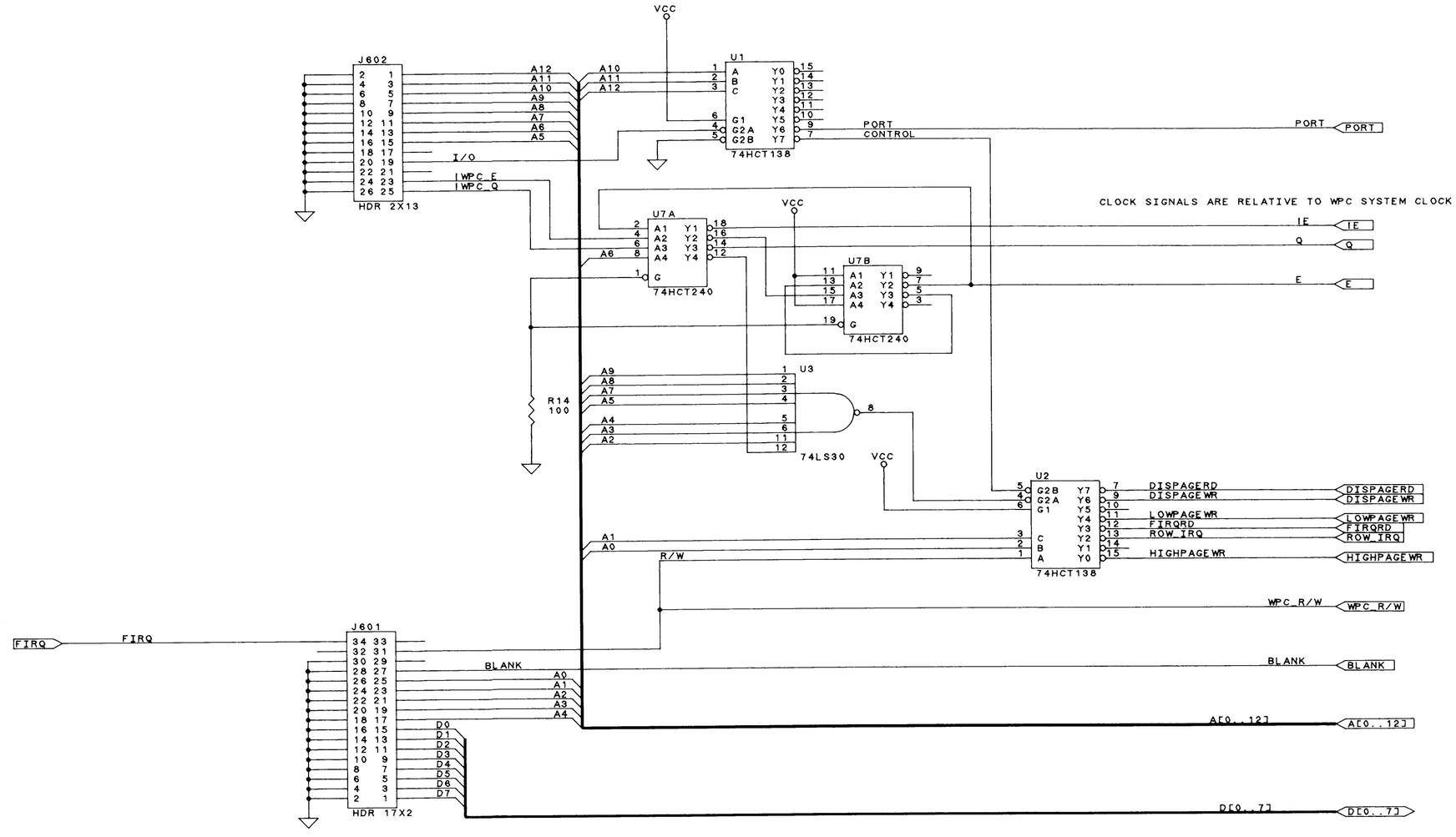
PROJ. ENGR. MARK COLDEBELLA	FIRST PROJ. NO.	WILLIAMS ELECTRONICS GAMES, INC. 3401 N. CALIFORNIA AVE. CHICAGO, IL. 60618
DWN. BY MARK COLDEBELLA DATE	FIRST USAGE	DESCRIPTION WPC CPU SCHEMATIC
CHECKED BY DATE		
APPROVAL DATE	SHT _3_ OF _3_	PART NUMBER 16-9060 REV 4

REV	DESCRIPTION OF CHANGE	ECN NO. DATE
2	Revised & Redrawn	26379 3-17-91

WPC R/W
PORT
IE
A[0..12]
ROW_A[0..4]
BYTE_A[0..3]
HIGHPAGEWR
LOWPAGEWR
DISPAGEWR
NEXTPAGE
E
D[0..7]
SHIFT_CLOCK
SHIFT/ILOAD
ROW A4
ROW A3
ROW A2
ROW A1
ROW A0
BYTE A3
BYTE A2
BYTE A1
BYTE A0
A9
A8
A7
A6
A5
A4
A3
A2
A1
A0
DISP_A0
DISP_A1
DISP_A2
DISP_A[0..2]
BA[0..12]
BD[0..7]
VCC
OVCC
R15 100
R16 100
R17 100
R18 100
U10A 74HCT32
U10C 74HCT32
U19D 74HCT32
U34A 74HCT08
U34B 74HCT08
U25 74LS157
U26 74LS157
U27 74LS157
U16 74LS157
U24 2064
U28 74HCT245
U29 74HC165
U35 74LS175
U33 74LS175
U31 74LS175
U32 74LS175
DISPLAY ENABLE
ROW DATA
ROW CLOCK
COLUMN LATCH
DOT CLOCK
SERIAL DATA
J803 HDR 2X7

PCB NO. 5760-12710-00
ASSY NO. A-14099

REV	DESCRIPTION OF CHANGE	ECN NO. DATE
2	Revised & Reissued	26371 3-19-91

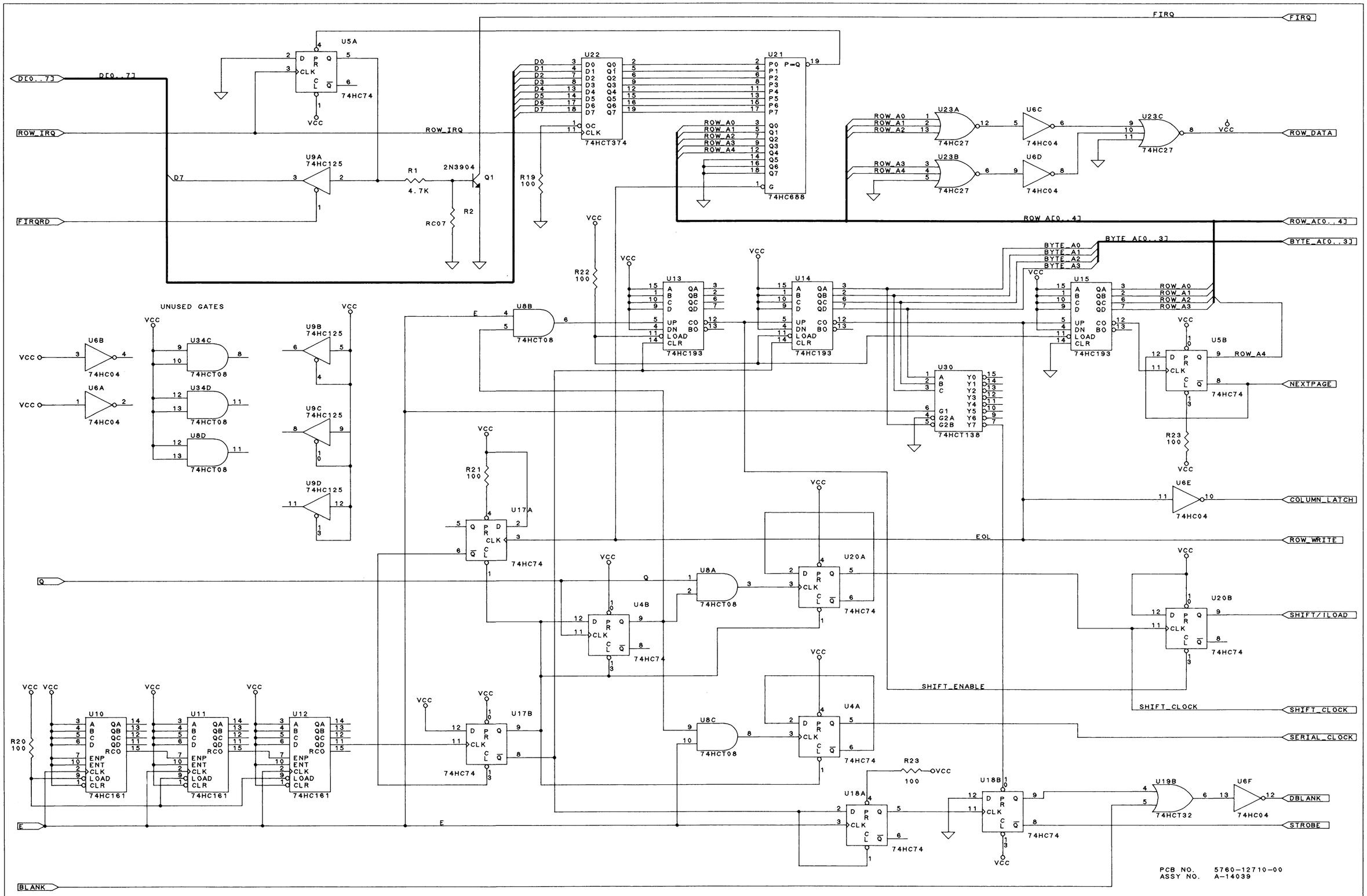


PCB NO. 5760-12710-00
ASSY NO. A-14039

REV	DESCRIPTION OF CHANGE	ECN NO. DATE
2	Revised & Redrawn	26273 5-1-91

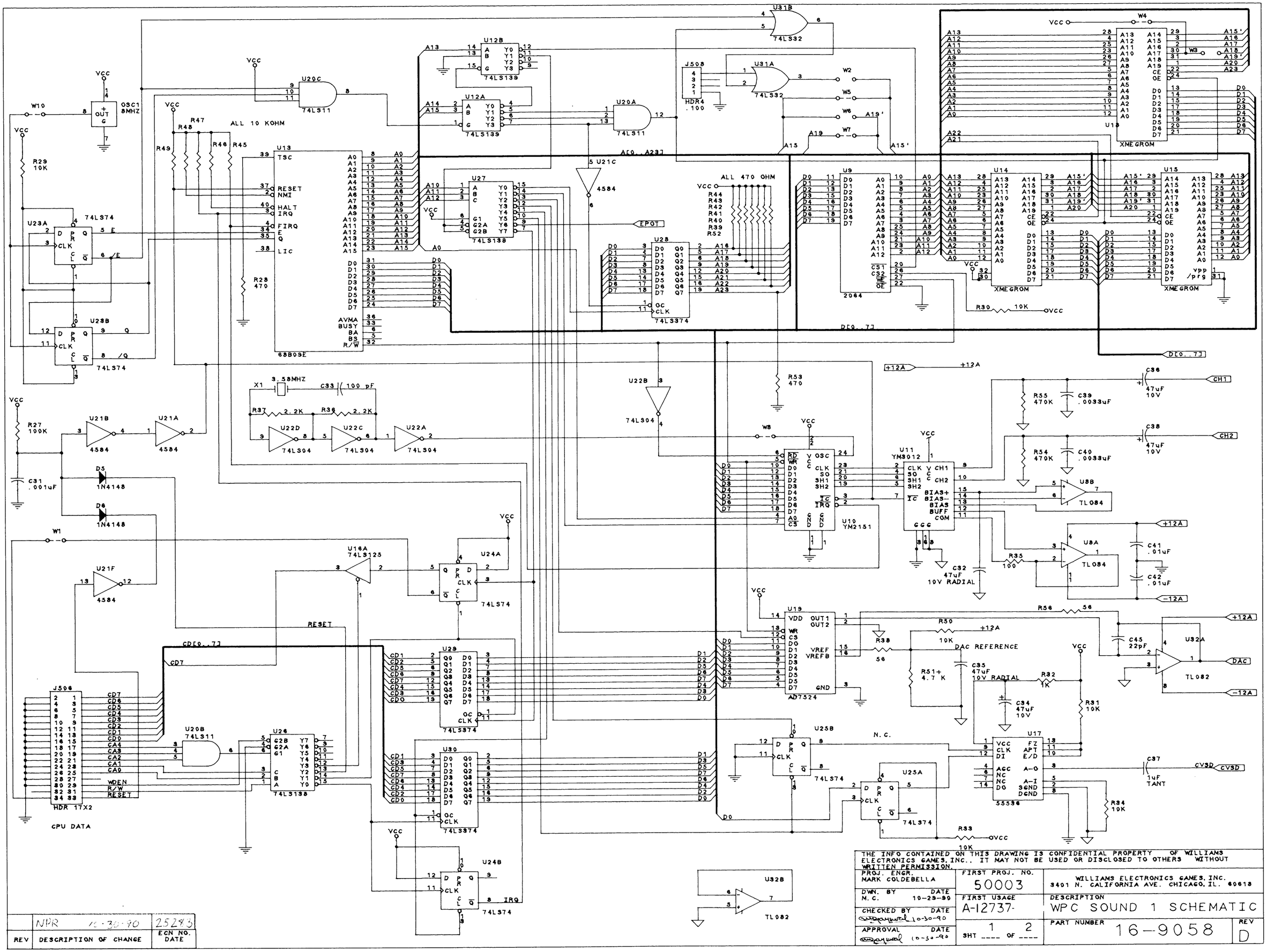
BR1
1 AMP
400V
R11
120 OHM
5 WATT
R3
47K
1/2 WATT
Q2
NPN
Q3
MJE15030
C4
150uF
160V
R12
47K
1/2 WATT
F601
FUSE
D3
1N4759
62V
Q10
NPN
R4
120 OHM
1/2 WATT
C6
.1uF
500V
+62V
VCC
J604
8
7
6
5
4
3
2
1
KEY
HDR8
J605
1
2
3
4
5
KEY
HDR5
R5
120 OHM
1/2 WATT
C9
.1uF
500V
Q4
PNP
R8
4.7K
5 WATT
R9
1.8K
5 WATT
C10
.1uF
500V
F602
FUSE
D4
1N4759
62V
Q7
MJE15030
-118V
D6
1N4742
12V
D5
1N4759
62V
-125V
Q6
MJE15031
C7
150uF
160V
R13
47K
1/2 WATT
Q5
PNP
R6
47K
1/2 WATT
BR2
1 AMP
400V
D7
1N4004
R7
0 OHM JUMPER
+12V
VCC
L1
3A COIL
R10
270 OHM
C11
.01 uF
D8
NO PART
J606
7
6
5
4
3
2
1
KEY
HDR7
C1
.01 uF
C2
.01 uF
C8
100 uF
10V
D10
LED

PCB NO. 5760-12710-00
ASSY NO. A-14039



PCB NO. 5760-12710-00
ASSY NO. A-14039

REV	DESCRIPTION OF CHANGE	ECN NO. DATE
2	Revised & Redrawn	20399 2-17-91



REV	DESCRIPTION OF CHANGE	ECN NO. DATE
	NPR 12-30-90	25293

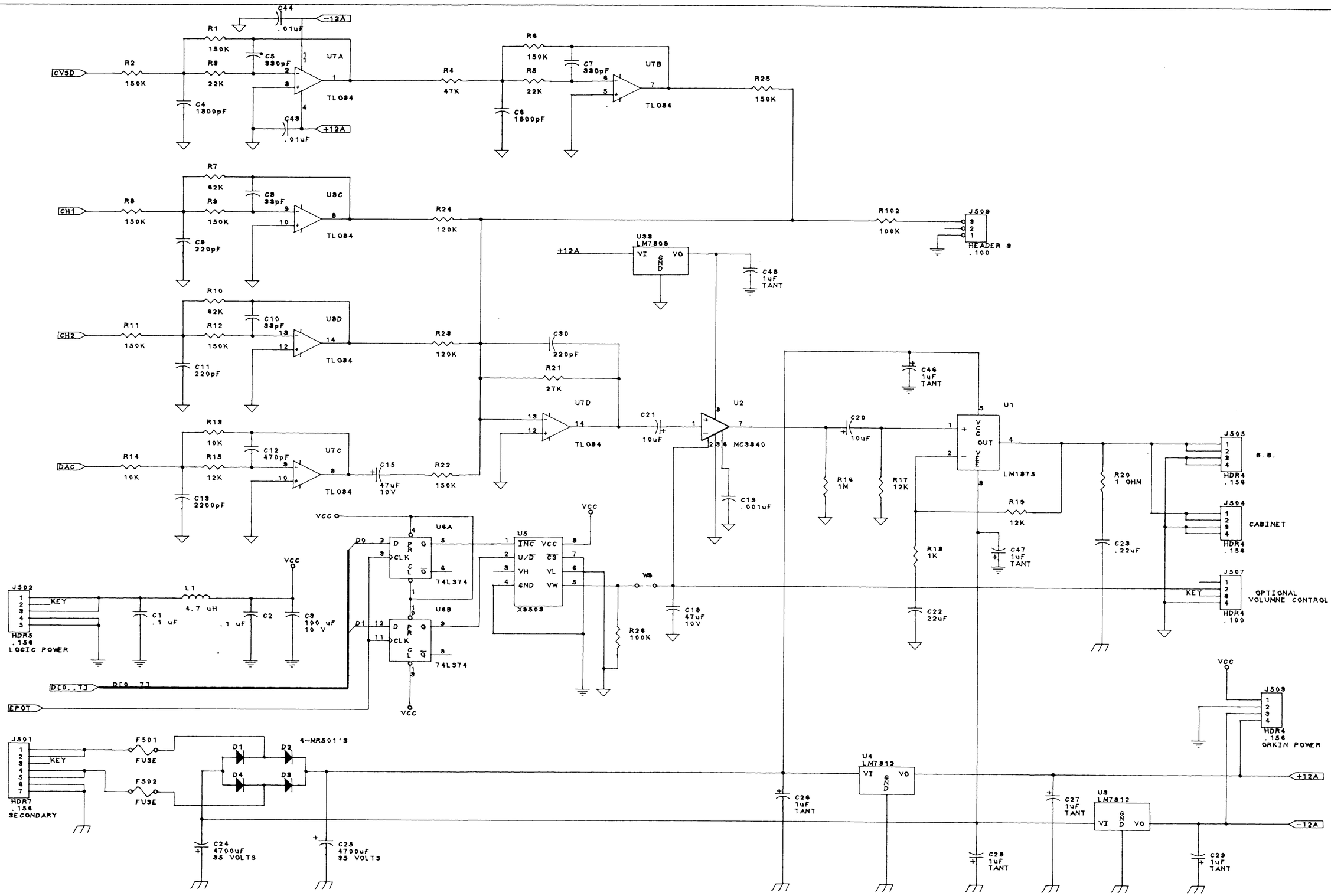
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PROJ. ENGR. MARK COLDEBELLA	FIRST PROJ. NO. 50003
DWN. BY M. C. DATE 10-29-90	FIRST USAGE A-12737-
CHECKED BY DATE 10-30-90	SHT 1 OF 2
APPROVAL DATE 10-30-90	

WILLIAMS ELECTRONICS GAMES, INC.
3401 N. CALIFORNIA AVE. CHICAGO, IL. 60618

DESCRIPTION: WPC SOUND 1 SCHEMATIC

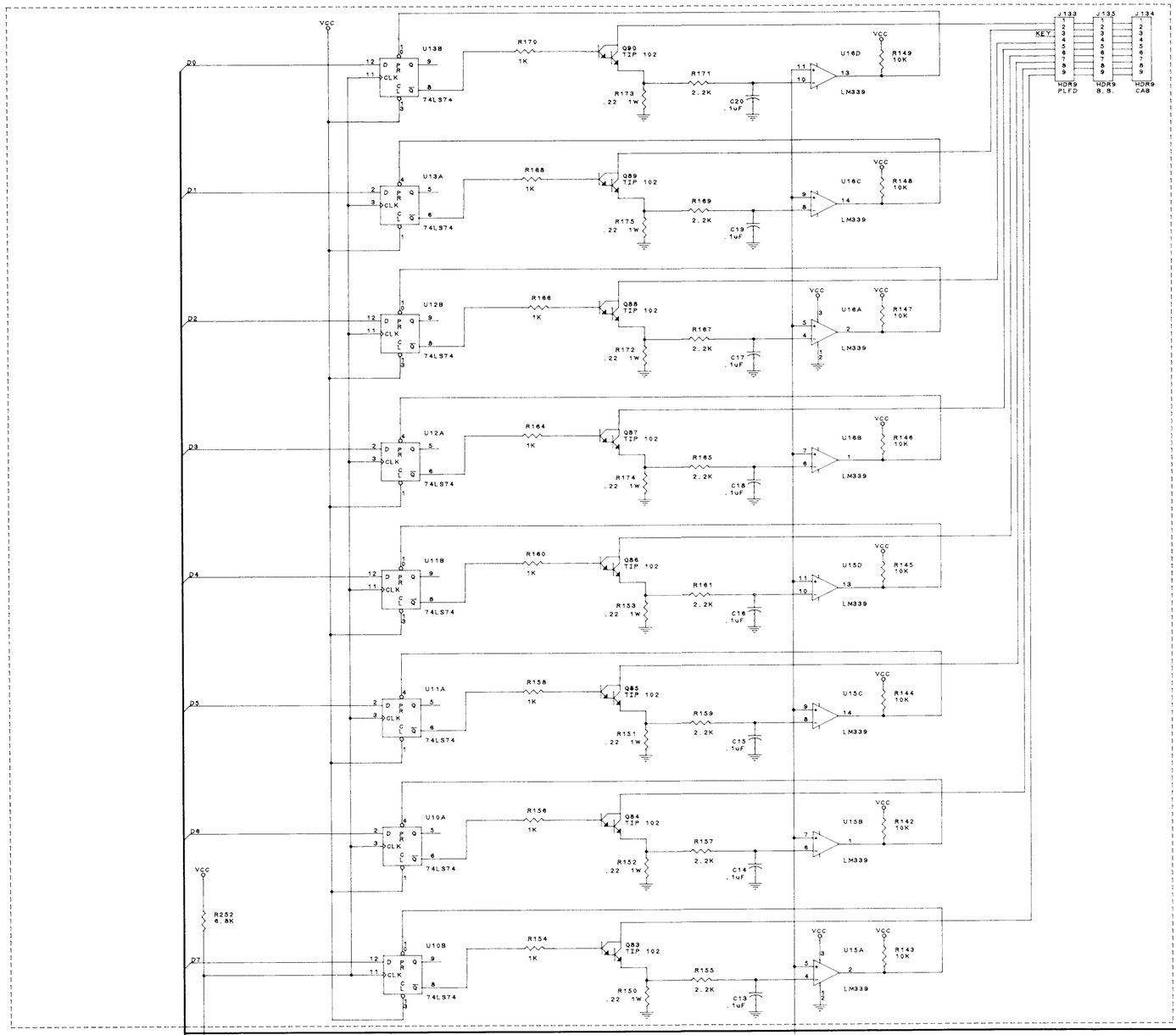
PART NUMBER: 16-9058 REV D



REV	DESCRIPTION OF CHANGE	ECN NO. DATE
	NDR 10-30-90	25293

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PROJ. ENGR. MARK COLDEBELLA	FIRST PROJ. NO. 50003	WILLIAMS ELECTRONICS GAMES, INC. 3401 N. CALIFORNIA AVE. CHICAGO, IL. 60618
DWN. BY M. C. DATE 10-29-90	FIRST USAGE A-12737-	DESCRIPTION WPC SOUND 1 SCHEMATIC
CHECKED BY DATE 10/30/90	SHT 2 OF 2	PART NUMBER 16-9058 REV D
APPROVAL DATE 10/30/90		



POWER PIN CONNECTIONS OF I.C.'s

74LS374	+5V	PIN	20
	GND	PIN	10
74LS74	+5V	PIN	14
74LS09	GND	PIN	7
LM339	+5V	PIN	3
	GND	PIN	12
ULN-2803	+18V	PIN	10
	GND	PIN	9

SCHEMATIC NO. 16-9057
PWB NO. 5763-12405-00
SUB ASSEMBLY NO. -12697
ASSEMBLY NO. -12698

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PROJ. ENGR. M. SOLDEBELLA	FIRST PROJ. NO. 5703
DWN. BY M. SOLDEBELLA DATE	FIRST USAGE
CHECKED BY DATE 11-90	DESCRIPTION SCHEMATIC POWER-DRIVER (LAMPS)
APPROVAL DATE	PART NUMBER 16-9057 REV 1

WILLIAMS ELECTRONICS GAMES, INC.
3401 N. CALIFORNIA AVE. CHICAGO, IL. 60618

SHT 2 OF 3

16-9057

GENERAL

J115 HDR12 — KEY, GND REF

J102 HDR9 — KEY — F112, F111

BR3 BRIDGE — 50VDC — C8 1000UF 150V — R260 10K — TP6

BR4 BRIDGE — 20VDC — C11 15,000uF — TP7

R224 .12 OHMS 10 WATTS — W3 0 OHM

LED5 — R194 1.5 K

J104 HDR5 B.B. / J105 HDR5 PLFD — KEY

VCC — 3R1

TP4

J103 HDR4

J113 HDR 17X2 — ZERO CROSS SW J2 — SW J1 BLANKING

/SOL 1, /SOL 4, /LMP COL, NC, /TRIAC, /SOL 3, /SOL 2, /LMP ROW, SW ROW 2, SW ROW 1, SW COL 1, /SW J2 ZERO CROSS

SOL3, SOL2, LAMP ROW — LAMP COL, SOL4, SOL1

DRIVER DATA BUS D0-D7

U1 LS374SOL — D0-D7 / Q0-Q7, OC, CLK

R257 1.5K

TP1 — BR5 BRIDGE — +12 VOLTS — C30 15,000uF — LED7 — R250 1 KOHM

J112 HDR5 — KEY — F116

TP5 GROUND

TP2 — Q1 LM323 — +5 VOLT DIGITAL — C9 .33 uF — C4 100UF

R192 270 OHMS — LED4

BR2 BRIDGE — F113 — C5 15,000uF

J101 HDR7 CAB — KEY

D38 1N4004 — R203 10 K — C1 .001 UF — R204 10 K

D3 1N4004 — R202 10 K — C12 .001 UF — R205 10 K

U6B, U6C LM339 — R206 27 K — R198 10K — R197 10K — R199 1 K — ZERO CROSS

F114 — BR1 BRIDGE — C7 15,000uF — C6 15,000uF

R196 1.5 K — LED6

D1 1N4004 — D2 1N4004 — Q2 LM7812 — F115 — C3 .33 uF — C2 100UF

TP8 — +18 VOLTS TO LAMP COLUMNS

R200 1 K — R201 270

U6A, U6D LM339 — R6 10K — R3 10K — R4 10K — R5

R1 270 — LED2 — W1 JUMPER

R2 270 — LED3 — W2 JUMPER

R193 1 K — LED1

TP3

J114 HDR7 DIGITAL POWER — +12 V DIGITIAL, +5 V DIGITAL — KEY

J116 HDR4 PLFD / J117 HDR4 B.B. / J118 HDR4 CAB — +5 V DIGITAL, +12 V POWER — KEY

T9 — R20 560 — R21 10K — Q17 2N4403 — R19 .51 OHM — HEAT SINK — Q18 SC141

T1 — R8 560 — R9 10K — Q9 2N4403 — R7 .51 OHM — HEAT SINK — Q10 SC141

T2 — R14 560 — R15 10K — Q13 2N4403 — R13 .51 OHM — HEAT SINK — Q14 SC141

T3 — R17 560 — R18 10K — Q15 2N4403 — R16 .51 OHM — HEAT SINK — Q16 SC141

T4 — R11 560 — R12 10K — Q11 2N4403 — R10 .51 OHM — HEAT SINK — Q12 SC141

VCC

F108, F107, F110, F109, F106, F105 — J120 HDR11 PLFD — J121 HDR11 B.B. — J119 HDR3 CAB — KEY

T5, T6, T7 — J111 HDR5 PLFD — KEY

F103 CONTINIOUS DUTY

F104 LO POWER PULSE

F105 HI POWER PULSE

FLASH LAMP POWER

F102 RIGHT FLIPPER

F101 LEFT FLIPPER

J107 HDR6 PLFD / J106 HDR5 B.B. / J108 HDR3 CAB — KEY

R211 3.3K 5 WATTS — U8 4N25

R210 3.3K 5 WATTS — U7 4N25

J109 HDR7 PLFD — KEY

J110 HDR9 CAB — KEY

T7 — R208 560 OHM — R209 4.7K — Q99 2N4403 — D39 1N4004

K1 RELAY DPDT — R FLIP. RETURN — L FLIP. RETURN

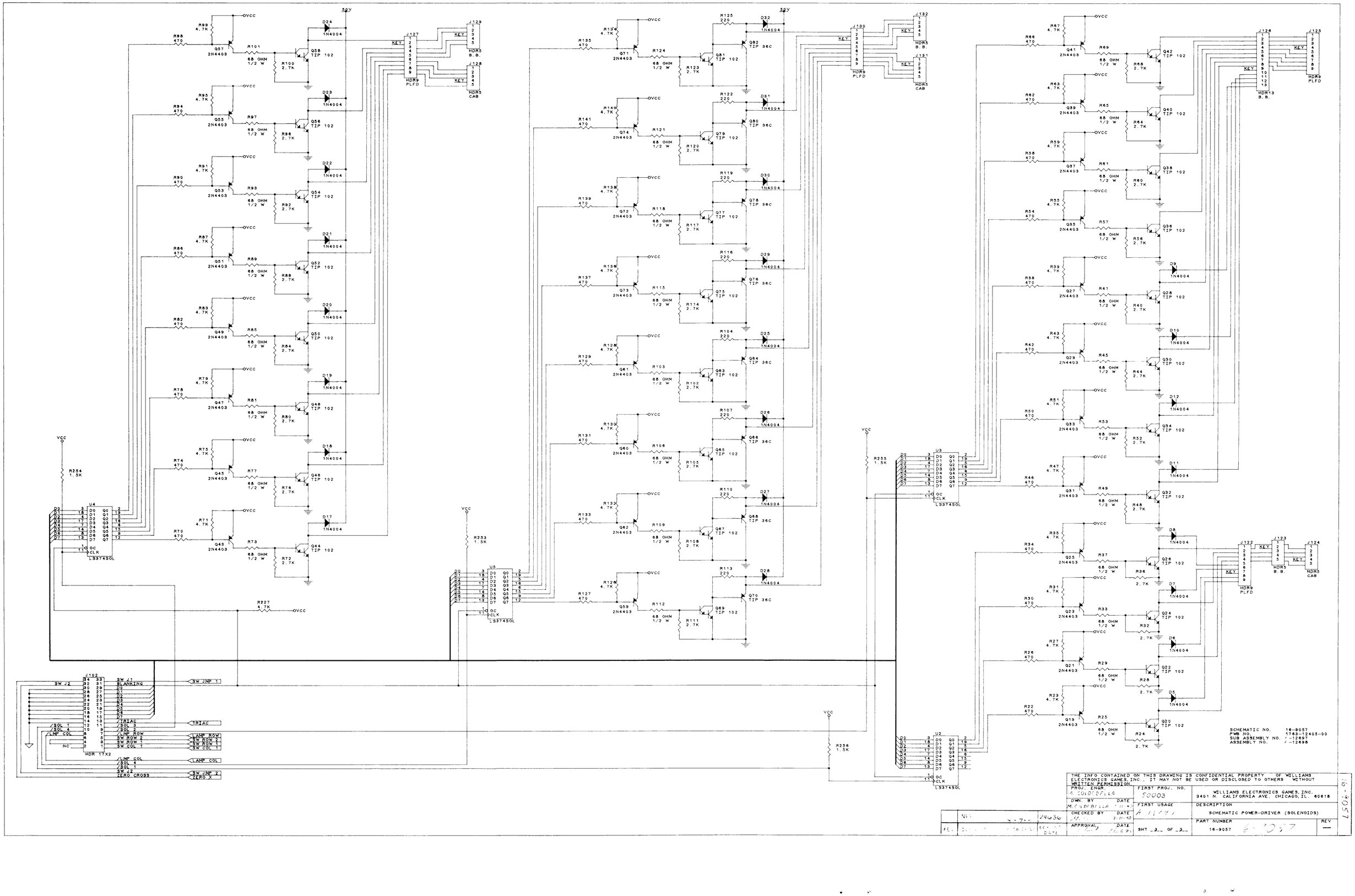
W4 JUMPER — W5 JUMPER

SCHEMATIC NO. 16-9057
PWB NO. 5763-12405-00
SUB ASSEMBLY NO. A-12697
ASSEMBLY NO. A-12698

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PROJ. ENGR. M. SHELELLA	FIRST PROJ. NO. 50003	WILLIAMS ELECTRONICS GAMES, INC. 3401 N. CALIFORNIA AVE. CHICAGO, IL. 60618			
DWN. BY	DATE	FIRST USAGE	DESCRIPTION SCHEMATIC, POWER-DRIVER (POWER/TRIACS)		
CHECKED BY	DATE				
APPROVAL	DATE	SHT 3 OF 3	PART NUMBER 16-9057	REV —	16-9057

REV	DESCRIPTION OF CHANGE	ECN NO. DATE	
NPR	4-7-1	24636	


50V
OVCC
VCC
R99 4.7K
R98 470
Q57 2N4403
R101 68 OHM 1/2 W
R100 2.7K
Q58 TIP 102
D24 1N4004
R95 4.7K
R94 470
Q55 2N4403
R97 68 OHM 1/2 W
R96 2.7K
Q56 TIP 102
D23 1N4004
R91 4.7K
R90 470
Q53 2N4403
R93 68 OHM 1/2 W
R92 2.7K
Q54 TIP 102
D22 1N4004
R87 4.7K
R86 470
Q51 2N4403
R89 68 OHM 1/2 W
R88 2.7K
Q52 TIP 102
D21 1N4004
R83 4.7K
R82 470
Q49 2N4403
R85 68 OHM 1/2 W
R84 2.7K
Q50 TIP 102
D20 1N4004
R79 4.7K
R78 470
Q47 2N4403
R81 68 OHM 1/2 W
R80 2.7K
Q48 TIP 102
D19 1N4004
R75 4.7K
R74 470
Q45 2N4403
R77 68 OHM 1/2 W
R76 2.7K
Q46 TIP 102
D18 1N4004
R71 4.7K
R70 470
Q43 2N4403
R73 68 OHM 1/2 W
R72 2.7K
Q44 TIP 102
D17 1N4004
J127
KEY
HDR9 PLFD
J129
HDR5 B.B.
J128
HDR5 CAB
R254 1.5K
U4
LS374SOL
R227 4.7K
R253 1.5K
U5
LS374SOL
R255 1.5K
U3
LS374SOL
R256 1.5K
U2
LS374SOL
R135 470
R124 68 OHM 1/2 W
R123 2.7K
Q81 TIP 102
R125 220
D32 1N4004
Q82 TIP 36C
R140 470
R121 68 OHM 1/2 W
R120 2.7K
Q79 TIP 102
R122 220
D31 1N4004
Q80 TIP 36C
R139 470
R118 68 OHM 1/2 W
R117 2.7K
Q77 TIP 102
R119 220
D30 1N4004
Q78 TIP 36C
R137 470
R115 68 OHM 1/2 W
R114 2.7K
Q75 TIP 102
R116 220
D29 1N4004
Q76 TIP 36C
R129 470
R103 68 OHM 1/2 W
R102 2.7K
Q63 TIP 102
R104 220
D25 1N4004
Q64 TIP 36C
R131 470
R106 68 OHM 1/2 W
R105 2.7K
Q65 TIP 102
R107 220
D26 1N4004
Q66 TIP 36C
R133 470
R109 68 OHM 1/2 W
R108 2.7K
Q67 TIP 102
R110 220
D27 1N4004
Q68 TIP 36C
R127 470
R112 68 OHM 1/2 W
R111 2.7K
Q69 TIP 102
R113 220
D28 1N4004
Q70 TIP 36C
J130
KEY
HDR9 PLFD
J132
HDR5 B.B.
J131
HDR5 CAB
R66 470
R69 68 OHM 1/2 W
R68 2.7K
Q42 TIP 102
R67 4.7K
Q41 2N4403
R63 4.7K
R62 470
Q39 2N4403
R65 68 OHM 1/2 W
R64 2.7K
Q40 TIP 102
R59 4.7K
R58 470
Q37 2N4403
R61 68 OHM 1/2 W
R60 2.7K
Q38 TIP 102
R55 4.7K
R54 470
Q35 2N4403
R57 68 OHM 1/2 W
R56 2.7K
Q36 TIP 102
R39 4.7K
R38 470
Q27 2N4403
R41 68 OHM 1/2 W
R40 2.7K
Q28 TIP 102
D9 1N4004
R43 4.7K
R42 470
Q29 2N4403
R45 68 OHM 1/2 W
R44 2.7K
Q30 TIP 102
D10 1N4004
R51 4.7K
R50 470
Q33 2N4403
R53 68 OHM 1/2 W
R52 2.7K
Q34 TIP 102
D12 1N4004
R47 4.7K
R46 470
Q31 2N4403
R49 68 OHM 1/2 W
R48 2.7K
Q32 TIP 102
D11 1N4004
R35 4.7K
R34 470
Q25 2N4403
R37 68 OHM 1/2 W
R36 2.7K
Q26 TIP 102
D8 1N4004
R31 4.7K
R30 470
Q23 2N4403
R33 68 OHM 1/2 W
R32 2.7K
Q24 TIP 102
D7 1N4004
R27 4.7K
R26 470
Q21 2N4403
R29 68 OHM 1/2 W
R28 2.7K
Q22 TIP 102
D6 1N4004
R23 4.7K
R22 470
Q19 2N4403
R25 68 OHM 1/2 W
R24 2.7K
Q20 TIP 102
D5 1N4004
J126
KEY
HDR13 B.B.
J125
HDR9 PLFD
J122
KEY
HDR9 PLFD
J123
KEY
HDR5 B.B.
J124
HDR5 CAB
J102
HDR 17X2
SW J2
SW J1
BLANKING
D0
D1
D2
D3
D4
D5
D6
D7
/TRIAC
/SOL 3
/SOL 2
/LMP ROW
SW ROW 2
SW ROW 1
SW COL 1
/LMP COL
/SOL 4
/SOL 1
SW J2 ZERO CROSS
NC
SW JMP 1
TRIAC
LAMP ROW
LAMP COL
SW JMP 2 ZERO X
SCHEMATIC NO. 16-9057
PWB NO. 5763-12405-00
SUB ASSEMBLY NO. /-12697
ASSEMBLY NO. /-12695
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PROJ. ENGR. A. COLOSELLA
DWN. BY M. COLOSELLA DATE 1-11-90
CHECKED BY DATE 1-11-90
APPROVAL DATE
FIRST PROJ. NO. 50003
FIRST USAGE A 11C11
DESCRIPTION SCHEMATIC POWER-DRIVER (SOLENOIDS)
PART NUMBER 16-9057 E-20577
REV —
SHT 3 OF 3
WILLIAMS ELECTRONICS GAMES, INC. 3401 N. CALIFORNIA AVE., CHICAGO, IL. 60618
16-9057

ON INSERT PANEL

DISPLAY DRIVER
ASSEMBLY # A-12739-1
PCB 5764-12482-00
SCHEMATIC 16-8039

J301 DISPLAY OUPUT 1
J302 EXTENDED DISPLAY 1
J303 EXTENDED DISPLAY 2
J304 DISPLAY OUPUT 2
DISPLAY PORT INPUT J305
POWER INPUT J306
POWER INPUT J307
F301

5765-10938-00

5765-12659-11

J401/J402

DISPLAY GLASS
ASSEMBLY # A-12794
PCB 5760-12447-00
SCHEMATIC 16-8065

5765-12659-03

J401/J402

DISPLAY GLASS
ASSEMBLY # A-12794
PCB 5760-12447-00
SCHEMATIC 16-8065

TO J304 5765-12659-03 J402
TO J301 5765-12659-03 J401

DISPLAY GLASS
ASSEMBLY # A-12793
PCB 5760-12448-00
SCHEMATIC 16-8062

DISPLAY GLASS

J202 SOUND AND I/O PORT
J201 EXTENDED I/O PORTY
203 WATCHDOG DISABLE

CPU
ASSEMBLY
A-12742-

J204 DISPLAY I/O PORT

WPC 89 ASIC
5410-12426-00

PCB 5764-12481-00
SCHEMATIC 16-8060
SU-ASSY 0-12741

SWITCH MATRIX
SWITCH ROW AND COL J212
SWITCH ROW INPUTS J206
SWITCH COLUMN OUTPUTS J208
DIRECT SWITCH INPUT J205 J207 J209

J211 POWER/DRIVER I/O PORT
5765-12653-03
J113 POWER/DRIVER I/O PORT
LED 1 +12V

J210 POWER INPUT
J114 POWER OUTPUT

J115
F108 F107 F106 F109 F110

J116 J118 J120 J123 J124 J125 J127 J130 J133 J134 J137
J117 J119 J121 J122 J126 J128 J129 J131 J132 J135 J136 J138

GENERAL ILLUMINATION
LOW POWER
LOW POWER CONFIGURABLE AND FLASH LAMP
LOW POWER
HIGH POWER
ROW
COLUMN

CONNECTOR ROW IDENTIFICATION
PLAYFIELD
BACK BOX AND CABINET

H-12888
H-12887

SOUND
ASSEMBLY
A-12738-

PCB 5764-12488-00
SCHEMATIC 16-8058
SU-ASSY A-12737

DIGITAL SECTION
ANALOG SECTION

J506
J502
J508 F501
J509 F502
J507
J201 J203 J204

J112 J111 J110 FLIPPER SW J109 FLIP POWER J108 J106 POWER J107
J104 J105 J103 GND J102 J101

RELAY
FLIPPER CONTROL
F116 LED 7 LED 2 LED 3
F101 F102 F103 F104 F105
LED 4 +5V
5V REGULATOR
LED 5 +50V
LED 6 +10V
F115

HEAT SINK ASSY A-12844

F111 F112 F113 F114

PWR/DRV
ASSEMBLY # A-12697
PCB 5765-12480-00
SCHEMATIC 16-8057

SOLENOID
LAMP MATRIX

IN CABINET
TRANSFORMER 5610-12425-00
LINE FILTER ASSY
LINE CORD
POWER SWITCH
SPEAKER

WILLIAMS ELECTRONICS GAMES INC.
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Switch Circuits

Wire Color	Function		Connector from CPU To Playfield	To Cabinet	Transistor
Green/Brown	Column 1				U20-18
Green/Red	Column 2		J207-2		U20-17
Green/Orange	Column 3		J207-3		U20-16
Green/Yellow	Column 4		J207-4		U20-15
Green/Black	Column 5			J206-5	U20-14
Green/Blue	Column 6		J207-6		U20-13
Green/Violet	Column 7				U20-12
Green/Gray	Column 7				U20-11
White/Brown	Row 1			J208-1	U18-11
White/Red	Row 2			J208-2	U18-9
White/Orange	Row 3				U18-5
White/Yellow	Row 4		J209-4	J208-4	U18-7
White/Green	Row 5		J209-5	J208-5	U19-11
White/Blue	Row 6		J209-7	J208-7	U19-9
White/Violet	Row 7		J209 -8	J208-8	U19-5
White/Gray	Row 8		J209-9		U19-7
Orange/ Brown	Direct 1	Left Coin		J205-1	U17-5
Orange/Red	Direct 2	Center Coin		J205-2	U17-7
Orange/Black	Direct 3	Right Coin		J205-3	U17-11
Orange/Yellow	Direct 4	4th Coin		J205-4	U17-9
Orange/Green	Direct 5	Escape/Service		J205-6	U16-9
Orange/Blue	Direct 6	Down/Vol Down		J205-7	U16-11
Orange/Violet	Direct 7	Up/ Vol Up		J205-8	U16-7
Orange/Gray	Direct 8	Enter/Test		J205-9	U16-5
Black		Ground		J205-10	
Orange/White		Enable		J205-12	

Lamp Circuits

Wire Color	Function	Connectors from Power Driver Board To Playfield	To Backbox	Transistor
Yellow/Brown	Column 1	J137-1	J138-1	Q98
Yellow/Red	Column 2	J137-2	J138-2	Q97
Yellow/Orange	Column 3	J137-3	J138-3	Q96
Yellow/Black	Column 4	J137-4		Q95
Yellow/Green	Column 5	J137-5		Q94
Yellow/Blue	Column 6	J137-6		Q93
Yellow/Violet	Column 7	J137-7		Q92
Yellow/Gray	Column 8		J138-9	Q91
Red/Brown	Row 1	J134-1	J135-1	Q90
Red/Black	Row 2	J134-2	J135-2	Q89
Red/Orange	Row 3	J134-4	J135-4	Q88
Red/Yellow	Row 4	J134-5	J135-5	Q87
Red/Green	Row 5	J134-6	J135-6	Q86
Red/Blue	Row 6	J134-7	J135-7	Q85
Red/Violet	Row 7	J134-8		Q84
Red/Gray	Row 8	J134-9		Q83

General Illumination Circuits

Wire Color	Function	Connectors from Power Driver Board To Playfield	To Cabinet	To Insert	Transistor
Green	Feed 1	J120-5			Q12
Violet	Feed 2			J121-6	Q10
Brown	Feed 3			J121-1	Q18
Yellow	Feed 4			J121-3	Q14
Orange	Feed 5	J120-2			Q16
White/Green	Return 1	J120-9			F7
White/Violet	Return 2			J121-11	F6
White/Brown	Return 3			J121-7	F10
White/Yellow	Return 4			J121-9	F8
White/Orange	Return 5	J120-8			F9

Power Circuits

Wire Color	Function	Connectors from Power Driver Board To Playfield	To Cabinet	To Insert
Gray	Digital +5V	J117-4	J116-4	
Gray/Green	Switch +12V			
Gray/Yellow	Analog +12V	J117-2	J116-2	
Black	Ground	J117-3	J116-3	

Power Circuits

Wire Color	Function	Connectors from Power Driver Board To Playfield	To Insert
Violet/Yellow	High Power 50V	J107-3	
Violet/Orange	Low Power 50V		
Violet/Green	Other 50V	J107-1	
Red	Flasher 20V	J107-5	J106-5
Red/White	Flasher 20V	J107-6	
White/Blue	50VAC		
White/Blue	50VAC		

Logic Circuits

Wire Color	Function	
Ribbon Cable	Data	J201 Connector to /from Extended Board (optional)
Ribbon Cable	Data	J202 Connector to /from Sound Board
Ribbon Cable	Data	J204 Connector to/from Display Driver
		Connectors from Power Driver Board
Black	Ground	J210-1
Black	Ground	J210-3
Gray	+5VDC	J210-4
Gray	+5VDC	J210-5
Gray/Green	+12VDC	J210-6
Gray/Green	+12VDC	J210-7
Ribbon Cable	Data	J211 To J113 on Power Driver Board

Display Circuits

Wire Color	Function	
Ribbon Cable	Data	J301 Connector to/from Dual Display Board (glass 1)
Ribbon Cable	Data	J304 Connector to/from Dual Display Board (glass 2)
Ribbon Cable	Data	J305 Connector to/from CPU
		Connector from CPU/Power Driver Board
Gray	+5VDC	J306-1
Black	Ground	J306-3
		Connector from Transformer
White	100VAC	J307-1
White	100VAC	J307-4

Sound Circuits

Wire Color	Function	
		Connector from Transformer Secondary
Gray/Green	+12VDC	J501-1
Gray/Green	+12VDC	J501-2
Gray	+5VDC	J501-4
Gray	+5VDC	J501-5
Gray/White	-12VDC	J501-6
Gray/White	-12VDC	J501-7
		Power from CPU/Power Driver Board
Gray	+5VDC	J502-1
Gray	+5VDC	J502-3
Black	Ground	J502-4
Black	Ground	J502-5
		Cabinet Speaker Connections
Gray/Yellow	Speaker	J504-2
		Backbox Speaker Connections
Black	Speaker	J505-3
		Connector to/from CPU Board
Ribbon Cable	Data	J506

Solenoid Circuits

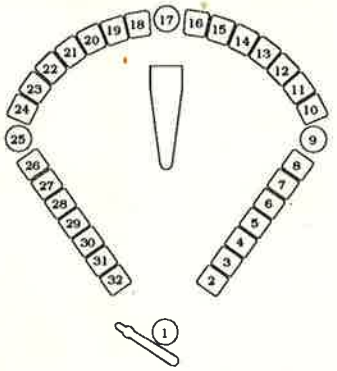
Wire Color	Function	To Backbox	Connectors from Power Driver Board To Playfield	Transistor
Violet/Brown	Solenoid 1, High Power		J130-1	Q82
Violet/Red	Solenoid 2, High Power		J130-2	Q80
Violet/Orange	Solenoid 3, High Power		J130-4	Q78
Violet/Yellow	Solenoid 4, High Power			Q76
Violet/Green	Solenoid 5, High Power			Q64
Violet/Blue	Solenoid 6, High Power			Q66
Violet/Black	Solenoid 7, High Power	J131-4		Q68
Violet/Gray	Solenoid 8, High Power			Q70
Brown/Black	Solenoid 9, Low Power			Q58
Brown/Red	Solenoid 10, Low Power			Q56
Brown/Orange	Solenoid 11, Low Power			Q54
Brown/Yellow	Solenoid 12, Low Power			Q52
Brown/Green	Solenoid 13, Low Power			Q50
Brown/Blue	Solenoid 14, Low Power			Q48
Brown/Violet	Solenoid 15, Low Power			Q46
Brown/Gray	Solenoid 16, Low Power			Q44
Black/Brown	Flasher 1	No Diode	J125-1	Q42
Black/Red	Flasher 2	No Diode	J125-2	Q40
Black/Orange	Flasher 3	No Diode	J125-3	Q38
Black/Yellow	Flasher 4	No Diode	J126-4	Q36
Blue/Green	Special 1 Drive	Diode Tie Back	J126-5	Q28
Blue/Black	Special 2 Drive	Diode Tie Back	J126-6	Q30
Blue/Violet	Special 3 Drive	Diode Tie Back	J126-7	Q34
Blue/Gray	Special 4 Drive	Diode Tie Back	J126-8	Q32
Blue/Brown	Special 5 Drive	Diode Tie Back Diode Tie Back		Q26
Blue/Red	Special 6 Drive	Diode Tie Back Diode Tie Back		Q24

SLUGFEST Lamp Matrix

Yellow (B+) — Red

Row \ Column	1 Yellow-Brown	2 Yellow-Red	3 Yellow-Orange	4 Yellow-Black	5 Yellow-Green	6 Yellow-Blue	7 Yellow-Violet	8 Yellow-Gray
1 Red-Brown	Left Bleacher Home Run 11	Middle Bleacher Home Run 21	Right Bleacher Home Run 31	#32 41	#24 51	#16 61	#8 71	Pinch Hit 81
2 Red-Black	Out (T. - L.) 12	Single (M. - L.) 22	Double (B. - 2.) 32	#31 42	#23 52	#15 62	#7 72	Bat Ready 82
3 Red-Orange	Out (T. - 2L.) 13	Double (M. - 2L.) 23	Single (B. - 2L.) 33	#30 43	#22 53	#14 63	#6 73	Steal Base 83
4 Red-Yellow	Out (T. - 3L.) 14	Single (M. - 3L.) 24	Triple (B. - 3L.) 34	#29 44	#21 54	#13 64	#5 74	Throw Out Runner 84
5 Red-Green	Out (T. - M.) 15	Sacrifice (M. - M.) 25	Home Run (B. - M.) 35	#28 45	#20 55	#12 65	#4 75	Player 1 Start 85
6 Red-Blue	Out (T. - 3R.) 16	Single (M. - 2R.) 26	Triple (B. - 2R.) 36	#27 46	#19 56	#11 66	#3 76	Player 2 Start 86
7 Red-Violet	Out (T. - 2R.) 17	Double (M. - 1R.) 27	Single (B. - 1R.) 37	#26 47	#18 57	#10 67	#2 77	87
8 Red-Gray	Out (T. - R.) 18	Single (M. - R.) 28	Double (B. - R.) 38	#25 48	#17 58	#1 68	#9 78	88

Please use the playfield map located below to find lamps #41 - #78.



SLUGFEST Switch Matrix

White — Green

Dedicated Grounded Switches	Row \ Column	1 Green-Brown	2 Green-Red	3 Green-Orange	4 Green-Yellow	5 Green-Black	6 Green-Blue	7 Green-Violet	8 Green-Gray
Orange-Brown (1) Left Coin Chute D1	1 White-Brown	Not Used 11	Slam Tilt 21	Pinch Hit 31	Target Panel - L. 41	Back-Row Trough 51	Left Bleacher 61	Not Used 71	Not Used 81
Orange-Red (2) Center Coin Chute D2	2 White-Red	Not Used 12	Coin Door Closed 22	Fast Ball Pitch 32	Target Panel - 2L. 42	Strike Trough 52	Middle Bleacher 62	Not Used 72	Not Used 82
Orange-Black (3) Right Coin Chute D3	3 White-Orange	Not Used 13	Dispenser Prize 23	Changeup Pitch 33	Target Panel - 3L. 43	Not Used 53	Right Bleacher 63	Not Used 73	Not Used 83
Orange-Yellow (4) 4th Coin Chute D4	4 White-Yellow	Not Used 14	Always Closed 24	Curve Pitch 34	Target Panel - M. 44	Pitch Home 54	Not Used 64	Not Used 74	Not Used 84
Orange-Green (5) Normal Function: Service Credits; Test Function: Escape D5	5 White-Green	Not Used 15	Steal Base/Run 25	Screw Ball Pitch 35	Target Panel - 3R. 45	Ramp Switch 55	Not Used 65	Not Used 75	Not Used 85
Orange-Blue (6) Normal Function: Volume Down; Test Function: Down D6	6 White-Blue	Not Used 16	Bat Switch 26	Throw Out Runner 36	Target Panel - 2R. 46	Playfield Tilt 1 56	Not Used 66	Not Used 76	Not Used 86
Orange-Violet (7) Normal Function: Volume Up; Test Function: Up D7	7 White-Violet	Not Used 17	Dispenser Low 27	Start Player 1 37	Target Panel - R. 47	Playfield Tilt 2 57	Not Used 67	Not Used 77	Not Used 87
Orange-Gray (8) Normal Function: Begin Test; Test Function: Enter D8	8 White-Gray	Not Used 18	Dispenser Unjammed 28	Start Player 2 38	Not Used 48	Not Used 58	Not Used 68	Not Used 78	Not Used 88

WARNINGS & NOTICES

WARNING

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FOR SERVICE...

CALL your authorized
WILLIAMS' Distributor.

WILLIAMS ELECTRONICS GAMES, INC.
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Chicago, IL 60618

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