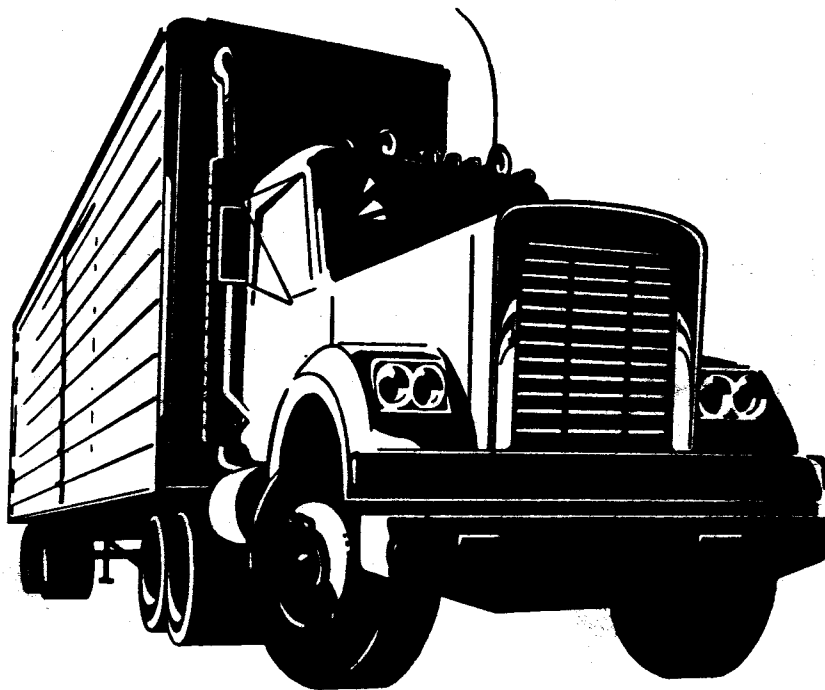


16-2001-101P
October 21, 1988



Operating Manual



MIDWAY MANUFACTURING CO.
Manufacturers of **BALLY** Amusement Games
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ROM Summary

6803 CPU A084-91786-G000 Memory & Jumper Combinations

Game Name	Game No.	Released	U2	U3	Jumpers
Eight Ball Champ	0B38	Aug 1985	Not Used	0B38-00803-0005	2,4,6,8,10
Beat The Clock	0C70	Nov 1985	Not Used	0C70-00803-0005	2,4,6,9,10
Lady Luck	0E34	Feb 1986	Not Used	0E34-00803-0005	2,4,6,8,10
Motor Dome	0E14	May 1986	E14A-42AAE-BX40	E14A-42AAE-CX4D	2,4,6,8,10
Black Belt	0E52	Jul 1986	0E52-00803-0001	0E52-00803-0002	2,4,6,8,10
Special Force	0E47	Sep 1986	0E47-00803-0004	0E47-00803-0005	2,4,6,9,10
Strange Science	0E35	Dec 1986	0E35-00803-0001	0E35-00803-0002	2,4,6,9,10
City Slicker	0E79	Feb 1987	0E79-00803-0002	0E79-00803-0003	2,4,6,9,10
Hard Body	0E94	Mar 1987	E94A-12601-0000	E94A-12602-0000	2,4,6,9,10
Party Animal	0H01	May 1987	H01A-12601-0000	H01A-12602-0000	2,4,6,9,10
Heavy Metal	0H03	Jun 1987	H03A-12601-0000	H03A-12602-0000	2,4,6,9,10
Dungeons & Dragons	0H06	Oct 1987	H06A-12601-0000	H06A-12602-0000	2,4,6,9,10
Escape From Lost World	0H05	Jan 1988	H05A-12601-0000	H05A-12602-0000	2,4,6,8,10
Blackwater 100	0H07	Mar 1988	H07A-12601-0000	H07A-12602-0000	2,4,6,9,10
Truck Stop	2001	Oct 1988	H08A-12601-0000	H08A-12602-0000	2,4,6,9,10

Note: See BALLY-MIDWAY Service Bulletin dated December 26, 1985, summarized below...

Subject: BEAT THE CLOCK and subsequent pinball games.

Symptom: LED flashes eight times, but game fails to power up.

Cause: Starting with BEAT THE CLOCK, game 300, the U3 program was modified for internal testing.

Cure: Current boards include a 100K ohm, 1/4-watt pullup resistor. This runs between the +5-volt bus and pin 12 of microprocessor U1.

Coil Table including Flipper Coils

Sol. No.	Solenoid Description	Solenoid Type	Wire Color	Connections		Solenoid Part No.
				Control Board	Driver Transistor	
01	Left Kicker (Truck Stop)	Momentary	White-Red	CJ9-1	Q18	A365-00067-0029
02	Right Saucer	Momentary	Yellow-White	CJ6-4	Q14	A365-00067-0010
03	Right Kicker (Dock)	Momentary	Yellow-Blue	CJ6-2	Q12	A360-00211-0000
04	Inline Target Reset	Momentary	Blue-White	CJ8-6	Q15	A365-00067-0019
05	Left, Top Slingshot	Momentary	Blue-Orange	CJ8-7	Q16	A365-00067-0029
06	Right, Top Slingshot	Momentary	Yellow-Brown	CJ6-5	Q17	A365-00067-0029
07	Left, Bottom Slingshot	Momentary	Yellow-Red	CJ6-1	Q11	A365-00067-0029
08	Right, Bottom Slingshot	Momentary	Yellow-Green	CJ6-3	Q13	A365-00067-0029
09	Ball Eject	Momentary	White-Brown	CJ9-6	Q22	A360-00211-0000
10	Outhole	Momentary	White-Black	CJ9-8	Q39	A360-00044-0000
11	Knocker	Continuous	White-Gray	CJ9-11	Q40	A360-00046-0000
12	Lane Steering*	Continuous	Yellow-Violet	CJ6-7	Q10	A365-00067-0027
13	SS Relay Bd (Backbox)*	Continuous	Blue-Green	CJ9-10	Q8	A080-91786-G000
14	Flipper-Enabling Relay*	Continuous	Gray-White	--	Q7	114E-00001-0011
15	Not Used	Momentary	White-Blue	CJ9-2	Q19	--
16	Not Used	Momentary	White-Yellow	CJ9-3	Q20	--
17	Not Used	Momentary	White-Green	CJ9-4	Q21	--
18	Not Used	Momentary	White-Orange	CJ9-7	Q38	--
19	Not Used*	Continuous	Brown-Violet	CJ9-9	Q9	--
Flipper Description		Wire Colors and Connectors				Part Number
Top Left Flipper		Orn-Gry: CJ6-8, CBJ7-2; Blk-Grn: CBJ7-6				A365-00067-0021
Bottom Left Flipper		Orn-Gry: CJ6-8, CBJ7-2; Blu-Gry: CBJ7-4				FL11630/50VDC
Top Right Flipper		Orn-Vio: CJ6-9, CBJ7-1; Blk-Yel: CBJ7-5				A365-00067-0021
Bottom Right Flipper		Orn-Vio: CJ6-9, CBJ7-1; Blu-Vio: CBJ7-3				FL11630/50VDC

NOTES:

- To use continuous solenoid 12, install jumper JW10. Remove jumper JW11.
- To use continuous solenoid 19, install jumper JW8. Remove jumper J9.
- To use switch strobe at CJ4-01, install jumper JW9. Remove jumper JW8.
- To use extra display at CJ2-19, install jumper JW11. Remove jumper JW10.
- Coils marked with an asterisk (*) are on the playfield backboard or in the backbox.
- Apply heatsink 112-00001-0047 and compound 0017-00009-0204 to drivers Q11, Q13, Q16, Q17 and Q18. Spread the thermal compound on the back and upper tab area of each transistor.

TRUCK STOP Operating Manual

Sound Board Summary SOUND MODULES USED WITH 6803 CPU MEMORY & JUMPER COMBINATIONS

SQUAWK & TALK A084-91625-A000 (Unprogrammed)							
GAME NAME	U1	U2	U3	U4	U5	U6	JUMPERS
Eight Ball Champ	N/U	N/U	0B38-803-2	0B38-803-3	0B38-803-4	N/U	C,D,E,G,H,L,N,Q, S,U,W,Y,AA,DD,FF
Beat The Clock	N/U	N/U	0C70-803-2	0C70-803-3	0C70-804-4	N/U	Same as Eight Ball Champ

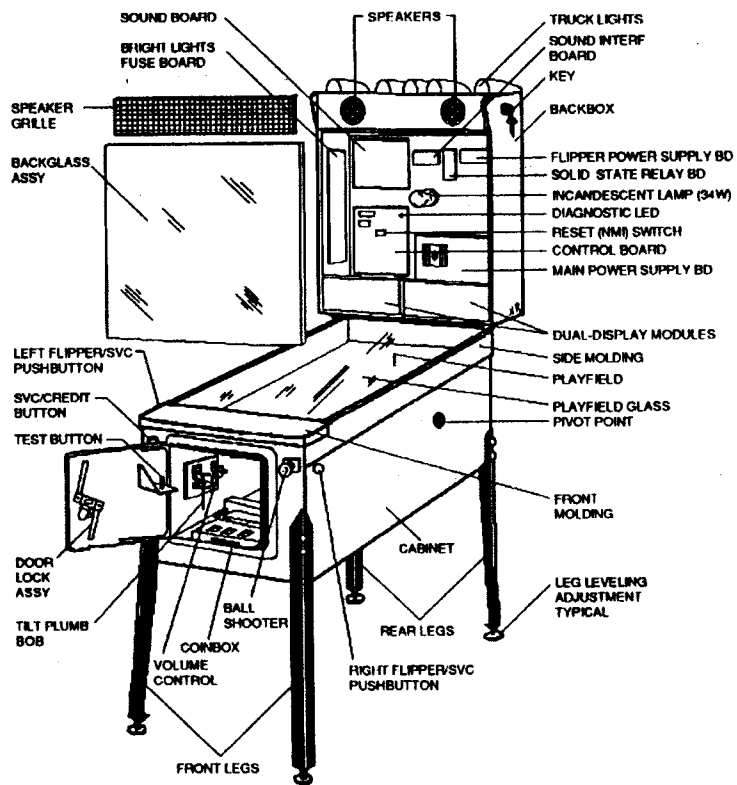
CHEAP SQUEAK A084-91603-C000 (Unprogrammed)							
GAME NAME	U1	U2	U3	U4	U5	U6	JUMPERS
Lady Luck	N/U	N/U	0B38-803-2	0B38-803-3	0B38-803-4	N/U	C,D,E,G,H,L,N,Q, S,U,W,Y,AA,DD,FF

TURBO CHEAP SQUEAK FOR PINBALL A084-91855-C000 (Unprogrammed)		
GAME NAME	U7	JUMPERS
Motor Dome	E14A-47AAE-AX4D	2,3,4,5,6,7,8
Black Belt	0E52-00803-0003	2,3,4,5,6,7,8
Strange Science	0E35-00803-0003	2,3,4,5,6,7,8
City Sliker	0E79-00803-0004	2,3,4,5,6,7,8,9,11
Hard Body	E94A-12603-0000	2,3,4,5,6,7,8,9,11

SOUNDS DELUXE A084-91864-C000 (Unprogrammed)					
GAME NAME	U11	U12	U13	U14	JUMPERS
Special Force	0E47-803-10	0E47-803-11	0E47-803-12	0E47-803-13	1,2,4,7-12
Party Animal	H10A-12603-0000	H01A-12604-0000	H01A-12606-0000	H01A-12606-0000	1,2,4,7-12
Heavy Metal	H03A-12603-0000	H03A-12604-0000	N/U	N/U	1,2,4,7,8
Dungeons & Drags	H06A-12603-0000	H06A-12604-0000	H06A-12605-0000	H06A-12606-0000	1,2,4,7-12
Lost World	H05A-12603-0000	H05A-12604-0000	H05A-80605-0000	H05A-12606-0000	1,2,4,7-12
Blackwater 100	H07A-12603-0000	H07A-12605-0000	H07A-12605-0000	H07A-12606-0000	1,2,4,7-12

WILLIAMS D-11581 Board (Unprogrammed)				
GAME NAME	U4	U19	U20	JUMPERS
Truck Stop	A-5343-2001-1	A-5343-2001-2	A-5343-2001-3	W1, W9

PINBALL GAME PARTS LOCATION



CHAPTER 1: INSTALLATION AND GAMEPLAY

Connector Identification
Circuitboards
Control Locations

Installation Procedure
Game Operation
Buy-In Feature

Select Initials Feature
Game Theme
Game Rules

Game Features

CONNECTOR IDENTIFICATION

BALLY games use a special technique to identify connectors. Each connector receives a prefix letter, followed by "J" (for jack) and a number. Connector pins are expressed by a suffix number.

- The prefix letter identifies the circuitboard where the connector resides.
- J-designations refer to a connector.
- The number identifies which connector we're referring to.
- The suffix number (-1, -15, etc.) refers to a pin number on the connector.

For example, CJ1 designates connector 1 on the Control Board. PJ6-1 designates the first pin of connector 6 on the Power Supply Board. Prefix letters for your game are listed below.

C - 6803 Control Board	PL - Playfield
P - Main Power Supply	S - Sound Board
D1 - Left Display Board	SI - Sound Interface Board
D2 - Right Display Board	L - Lamp Fuse Board
BB - Backbox	R - Solid State Relay Board
CB - Cabinet	F - Flipper Power Supply

CIRCUITBOARDS

Most circuitboards are in the backbox. To access the boards, remove the backbox glass.

CONTROL BOARD. The Control Board is part number A080-91786-G000. It contains the 6803 microprocessor. The Control Board must be equipped with ROMs and jumpers specified in the ROM Summary.

SOUND BOARD. The D-11581-2001 Sound Board is supplied with ROMs and microprocessor. This is a stereo board with speech capabilities and Yamaha organ circuitry. The Sound Board must be equipped with ROMs and jumpers specified in the Sound Board Summary.

DISPLAY BOARDS. There are two, 14-digit display tubes. Each tube is attached to its own printed circuit board. Either tube and its board comprises a Dual Display Module, part number B084-91851-H000.

MAIN POWER SUPPLY BOARD. The Power Supply Board is part number A080-91785-D000. This board incorporates rectifier and regulator circuitry. Each power supply is fused on the board. The power transformer (part MT00-00163-A000) is in the lower cabinet. Power Supply DC voltages include...

- Positive five-volt, logic power
- Positive 190V for displays
- 6.3VAC for general illumination
- 11VAC for feature lamps
- 14VDC for controlled lamps

FLIPPER POWER SUPPLY BOARD. The 50VDC Flipper Power Supply is part number C-9939-2001. This board incorporates rectifier and passive filter circuitry. The power supply includes a 4ASB fuse. The Flipper Power Supply derives AC voltage from an auxiliary power transformer. This flipper power transformer (part 5610-10355-00) is in the lower cabinet.

SOUND INTERFACE BOARD. The Sound Interface Board is part number C-12417. This board includes a regulator for the -12VDC sound power amplifier. Also present is a reset circuit for the Sound Board.

BRIGHT LIGHT FUSE BOARD. The Bright Light Fuse Board is part number A080-91901-B000. This board includes 16 fuses. The fuses protect SCRs in the phase C and phase D lamp drive circuits.

SOLID STATE RELAY BOARD. The Solid State Relay Board is part number A080-91902-A000. This board controls the large, incandescent, backbox-illumination bulb.

BOARDS NOT IN THE BACKBOX

Two other boards are located on the playfield. Emitter Board A084-91895-B000 and Detector Board A084-91894-B000 are under the bottom arch. They optically detect balls on the ball ramp.

CONTROL LOCATIONS

THE ON-OFF SWITCH is on the bottom of the cabinet, near the right, front leg.

THE VOLUME CONTROL is inside the coin door. Look at the left, inner wall of the cabinet, on the tilt mechanism board.

THE CREDIT BUTTON is left of the coin door on the front of the cabinet.

GAME ADJUSTMENT/DIAGNOSTIC SWITCHES. The SELF TEST button switch is inside the coin door. This switch assists you during game adjustments, bookkeeping, and problem diagnosis. Details appear in Chapter 2.

INSTALLATION PROCEDURE

[] 1. Open the shipping container. Remove cartons, parts and other items. Set them aside.

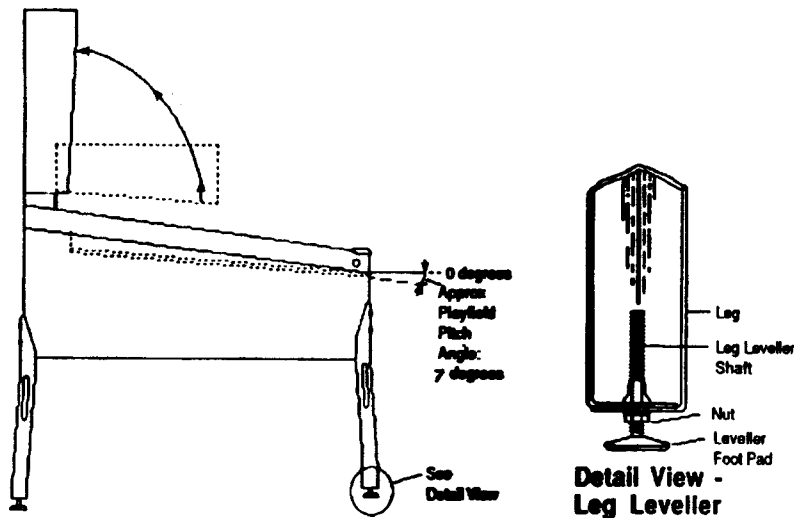
[] 2. Leg levellers and bolts are provided in the cashbox. Install levellers on the game's rear legs. Set the game on a flat surface or dolly. Bolt the rear legs to the game.

[] 3. Install leg levellers on the front legs. Bolt the front legs to the game.

[] 4. Reach into the cabinet and backbox. Check that cable connectors are properly seated on their printed circuit boards. Check the mating of interconnecting cables. Match several wire colors at each connector. Assure that connections are secure.

CAUTION

Assure that cables are free to move (not kinked or pinched). During assembly, be careful not to damage wires.



Pinball Assembly, Playfield Pitch Angle, and Leg Leveller Details

[] 5. Raise the hinged backbox upright. Latch the clamp on the back of the cabinet and backbox.

[] 6. Unlock the backbox. Remove the backbox glass. To avoid scratches, carefully store the glass. Install mounting bolts and flat washers through the bottom holes of the backbox. The bolts mate with threaded fasteners in the cabinet and secure the backbox.

WARNING

NEVER transport a pinball game with the hinged backbox erect. Prevent equipment damage and personal injury! When you lower the backbox, insert a layer of protective material between cabinet and backbox.

[] 7. Extend each leg leveller slightly below the leg bottom. All four foot pads should be extended about the same distance. Remove the cabinet from its support and place it on the floor.

[] 8. Raise the playfield and examine the following areas...

- Are cables clear of moving parts?
- Have wires come loose during shipment?
- Is there loose solder or other foreign material in switches or sockets? Such material may come loose in shipment. It could short switches or lamp sockets.
- Is the power transformer jumpered for local line conditions? Transformer plug wiring must correspond to location voltage. See the table below. Also examine the **BACKBOX WIRING SCHEMATIC**.
- Are coils properly soldered? Vibration in shipment may cause loss of contact.

Transformer Wiring for USA/Europe

Use Main Transformer MT00-00163-A000
& Flipper Transformer 5610-10355-00

Local Line Voltage	Install Main Transformer Wiring	Install Flipper Transformer Wiring
115 VAC	Xfmr Inputs 1 & 5 at CBJ1; 2-8, 3-6, 7-10 at CBJ1	Xfmr inputs 1 & 3; jumpers 1-5, 3-7 at transformer
230 VAC	Xfmr Inputs 1 & 5; jumpers 3-8, 7-10 at CBJ1	Xfmr Inputs 1 & 7; jumpers 3-5 at transformer

Transformer Wiring for Japan

Use Main Transformer MT00-00164-A000
& Flipper Transformer 5610-10355-00

Local Line Voltage	Install Main Transformer Wiring	Install Flipper Transformer Wiring
103.5 VAC	Xfmr Inputs 1 & 3 at CBJ1; no jumpers	Xfmr Inputs 1 & 2; jumpers 1-5, 2-6 at transformer

8. Lower the playfield. Adjust leg levellers for proper playfield level (side-to-side). Rest your level on the playfield, not the cabinet nor the playfield cover glass.

9. Adjust leg levellers for a playfield pitch (incline) of seven degrees. Rest your level on the playfield, not the cabinet nor the playfield cover glass. To maintain step 7 and 8 settings, tighten the nut on each leg leveller shaft.

CAUTION

Playfield pitch adjustments can affect the operation of the plumb bob tilt. The plumb bob tilt is inside the cabinet. After completing playfield pitch adjustments, set this mechanism for desired operation.

10. Move the game into the desired location. Recheck the level and pitch angle of the playfield.

11. Check that the required number of balls are installed in the game. *TRUCK STOP* uses three balls.

12. Clean and reinstall playfield glass. Prepare the game for play.

GAME OPERATION

STUCK SWITCH INDICATION. Turn on the power switch (at the bottom, right front corner of the cabinet). The game resets its drop targets. When the game powers up, names of the closed switches are briefly displayed. Then the phrase **GAME OVER** appears, indicating that the game is ready for play.

CREDITS. The game should accept coins and display the appropriate number of credits. Pressing the **CREDIT** button causes the Multi-Ball™ Kicker to kick out the first ball. This ball enters the shooter lane. Initially, the game holds its three balls in the ball trough.

Each time a player presses the **CREDIT** button, the game posts one player. Remaining credits are reduced by one. The game awards points earned by the players.

BONUS SCORE. The Multi-Ball kicker serves the first ball to the shooter lane. This serve initiates play. Eventually each player's last ball enters the outhole. Then the top-mounted kicker sends the ball to the Multi-Ball™ kicker. Sensors in the ball trough pick up the ball. Reacting, the game computer adds the bonus score to the total game score. Meanwhile the game advances the player-up or current ball indication by one position.

MATCH. After each player completes his game, a random matching number appears in the display. This number may equal the last two digits in a player's score. If so, the player earns another game.

EXTRA BALLS are played immediately after the player's third and last ball enters the outhole. The player-up and current ball aren't advanced before the game serves the extra ball.

BONUS GAME. At the end of the game, the game computer reads the Hiscore Award register. According to the setting of this register, free games may be awarded. Free games result when a player beats the score (or the score exceeds) 10 million.

TILT. Tilting the game results in loss of the ball in play. Bonus points are not awarded, the flippers go dead, and none of the playfield switches score. The purpose of the tilt penalty is to discourage the player from jostling the game in an attempt to prolong gameplay. Game action returns to normal after the kicker serves the ball. Then the Multi-Ball kicker kicks the ball to the shooter lane. At this point, a new turn commences.

SELECT INITIALS FEATURE

The player can use the right flipper button to advance through displayed letters. Or he can use the left flipper button to back up through displayed letters. A player enters each of his three letters by pressing the CREDIT button. The player is given a certain period of time to enter a letter. Otherwise the game enters the default letter "A."

During Attract Mode, initials and scores appear on the display. To view scores and initials, players press the lower left button.

GAME THEME

TRUCK STOP captures America at its most manic, and spins it on eighteen big rubber wheels... The player (truck driver) is pitted against the Interstate System and other gearjammers. The truck route winds between five proud cities of the sun belt and rust belt: LA, Denver, Dallas, Chicago and New York. Each has its own spirit and its own adventure. The player must show his true grit over long stretches of open road. A long tank of gasoline is a job. And it's power, light and the way back home.

GAME RULES

- The ramp shot scores city letters.
- To qualify for locking a ball, spot flashing city lights.
- To reach the destination city and qualify for release, spell C-I-T-Y five times.

- When "Multi-Ball" is lit, the Gas Station releases Multi-Ball.
- When the ball lock is lit, the Gas Station locks the ball.
- Center drop targets qualify the center target to advance the bonus multiplier.
- When lit, mushrooms spot city letters.

GAME FEATURES

CITY BONUS FEATURE

The "City" bonus is a grid of five lamp columns. (Sometimes we refer to this grid as a "card.") Each column contains four "City" letter indicators and one "City" indicator. There are also three "Destination Log" lamps.

A turn is one ball of the game, played by one individual. After each turn, players collect the "City" bonus at the out-hole. The value of this bonus is affected by the bonus multiplier. The maximum multiplier value is seven.

The "City" indicator reads from left to right as follows: LA, Denver, Dallas, Chicago, New York.

Players can light "City" indicators by lighting C-I-T-Y in the column above the city. Another way to light a "City" indicator is to collect a "Spot City" feature.

A completed grid lamp advances when two conditions occur: (1) All lamps in the grid are complete. (2) The "Jackpot" bonus is either completed or the timer runs out.

The points awarded are...

- 5,000 for each lit "City" letter.
- 100,000 for the first lit "Destination Log" indicator.
- 200,000 for the second lit "Destination Log" indicator and 300,000 for the third.

BONUS MULTIPLIER FEATURE

The Bonus Multiplier has three parts: (1) Four green indicator lights, (2) three inline drop targets and (3) one green stationary target. Bonus Multiplier values are from one to seven times the base score. Knocking down all three inline drop targets starts the timer.

While the timer is running, the inline drop targets remain down. The center, green target advances the multiplier.

When a player hits the center target, the multiplier advances and the inlines reset.

The earned multiplier level determines how long the timer runs.

Example: The timer runs longer for a 3X multiplier than it does for 2X. Likewise, it runs longer for 4X than for 3X; etc.

JACKPOT FEATURE

Players who complete a "City" indicator grid qualify for the Jackpot feature. This award is controlled by a timer.

The object of this feature is to collect the Jackpot before the timer runs out. While the timer runs, the player must make all four ramp shots (C-I-T-Y).

Turning on the Load Lamp increments the Jackpot value by 100,000. A player sets the Jackpot value when he collects the Jackpot. Once set, the Jackpot value applies to all players. That is, after one player receives the Jackpot, his opponents qualify for that same value. They may each try for the Jackpot. However, once a player sets the Jackpot value, no player can raise it. After the game is over, Jackpot reverts to one million. The maximum jackpot is six million.

MULTI-BALL CHALLENGE

Locking both balls back into the timer-controlled "Truck Stop" awards the following:

- First, the player wins all the unlit "City" grid (card) indicators.
- After the entire card lights, the game animates card lamps as a player reward. When the animation effect is completed, the game enters Jackpot Mode, releasing both balls.

CAPTIVE BALL FEATURE

When the "Truck Stop" is lit, a player can lock balls there. After the player lights a number of cities, the "Truck Stop" lights for ball capture. (The required number of cities is operator adjustable. See Chapter 2.)

To lock a ball, a player must shoot the ball into the "Truck Stop." The game transports the locked ball to the "Dock Storage Area" on the right. Then the game serves the next ball to the shooter.

At this time, "Truck Stop" lights indicate readiness for ball release. If the player misses the opening "Truck Stop" shot, the Release Light goes out. To relight Release, the player must make a city.

EXTRA BALL FEATURE

This feature consists of two orange targets. When activated and hit, these targets light the "Dock" Saucer, indicating a potential extra ball. When lit, the "Dock" awards the extra ball. The player earns this extra ball by activating the "Dock."

To activate the "Dock," the player makes both targets within a certain amount of time. (Adjustable feature. See Chapter 2.)

BLUE TARGET FEATURE

There are six blue targets. Completing the six targets lights the ramp for "Spots City."

CHAPTER 2: TAILORING THE GAME TO YOUR PLAYERS

Making Game Adjustments

**Game Adjustments: Register Access And Modification
Registers & Options Table**

Coin Setup Procedure

Pricing Table

Game Checkup Registers

Self-Percentaging

MAKING GAME ADJUSTMENTS

INTRODUCTION

The game system is designed to be user friendly. Your game provides you with a wealth of easily accessible information. Press the TEST button and the displays light up with assistance messages. Just by reading the displays and using three cabinet buttons, you can make numerous adjustments...

- Alter difficulty levels
- Change awards
- Modify threshold level settings
- Check special awards
- Monitor replay percent
- Keep track of income

GAME ADJUSTMENTS

REGISTER ACCESS AND MODIFICATION

- [] 1. Enter Test Mode by pressing the TEST button inside the front door.
- [] 2. Change the category by pressing either flipper button.
- [] 3. Select the category and open its directory by pressing the CREDIT button.
- [] 4. Change the directory by pressing either flipper button.
- [] 5. Select and open a register in the directory by pressing the CREDIT button.
- [] 6. Change register values by pressing either flipper button.
- [] 7. Lock in selected register values by pressing CREDIT.
- [] 8. For more register changes or changes in the same category, repeat steps 4 through 7. To exit Test Mode, press the TEST button.

Registers and Options Table

Category	Register Directory			
	Player #1 & 2 Displays	Player #3 & 4 Displays	See Notes	Register Description
Game Status	Total coins	XXXXXXX	1	Total, all chutes
	Games played	XXXXXXX	1	Number of games
	Replays awarded	XXXXXXX	1	Number of replays
	Replays percent	XX	1	Percent of replays
	Avg game time	XX XX	1	Minutes: seconds
	Balls played	XXXXXXX	1	Number of heats
	X-balls awarded	XXXXXXX	1	Number of extra balls
	X-ball percent	XX	1	Percent extra balls awarded
	Avg ball time	XX XX	1	Minutes: seconds
Clear account	NO**	2	Clear account time	
Replay Status	Level 1 special	XXXXXXX	1	No. of 1st Threshold specials awarded
	Level 2 special	XXXXXXX	1	No. of 2nd Threshold specials awarded
	Level 3 special	XXXXXXX	1	No. of 3rd Threshold specials awarded
	High score spcl	XXXXXXX	1	No. of high score specials awarded
	Playfield special	XXXXXXX	1	No. of playfield specials awarded
	Match special	XXXXXXX	1	No. of match feature specials awarded
Scoring Status	Level 1 score	XXXXXXX	3	Set and display first award level
	Level 2 score	XXXXXXX	3	Set and display second award level
	Level 3 score	XXXXXXX	3	Set and display third award level
	High score =	XXXXXXX	3	Set high score replay level
	Times HS beaten	XXXXXXX	1	Times point total exceeded high score
	Level 1 percent	XX	1	% of first level replays awarded
	Level 2 percent	XX	1	% of second level replays awarded
	Level 3 percent	XX	1	% of third level replays awarded
	Target percent	XX	4	Enter desired % replays awarded for reaching first threshold level
Coin Status	Left coins =	XXXXXXX	1	No. of coins through left coin chute
	Middle coins =	XXXXXXX	1	No. of coins through middle coin chute
	Right coins =	XXXXXXX	1	No. of coins through right coin chute
	Total coins =	XXXXXXX	1	Total coins through all chutes
	Bonus credits	XXXXXXX	1	No. of bonus credits awarded
Coin Setup***	Left XX Coin	YY CRDT, ZZ BONS	10	Left coin chute setup
	Middle XX Coin	YY CRDT, ZZ BONS	10	Middle coin chute setup
	Right XX Coin	YY CRDT, ZZ BONS	10	Right coin chute setup

*Player # 3 and 4 indicate a variable range of values. The XXXXXXXX represents the number value. XX represents the % value. Player #4 shows values that can be selected to replace the value shown in Player #3.

**Factory Setting.

***See Coin Setup Procedure examples

Category	Register Directory			
	Player #1 & 2 Displays	Player #3 & 4 Displays	See Notes	Register Description
Misc. Information	Total Time =	XXXXXXX	1	Time (in minutes) that the game is powered up. Starts when the game is ready for play.
Game Setup	Factory setting	No**	2	Reset to factory selected options
	Credit limit =	10**	5	Set credit limit from 1 through 4
	Balls allowed	03**	5	Number of balls allowed (1-5)
	Levels award	Replay**	6	Set award for exceeding thresholds
	Special award	Replay**	6	Set award for lighting Special lights
	HiScore award	3 Replay**	7	Set award for exceeding high score
	Bkground sound	On**	8	Provide background music
	Match percent	10**	5	Set allowed match percent, 00-10%
	Display credits	Yes**	2	Display credits when game is over
	No limit replay	Yes**	2	Allow more than 1 special per player
	Free play	No**	2	NO = coins, or YES = Free Play Mode
	Tilt warning	01**	5	Number of tilt warnings
	Attract sounds	On**	8	Attract sound in Game-Over Mode
Slingshots	On**	8	Activate slingshots	
Game options	Medlum**	9	Set difficulty level	
Maximum players	04**	5	Number of players allowed (1-4)	
Buy-in balls	02**	5	Number of buy-in turns (0-3)	
Game Checkup	All lamps			Flashes playfield lamps.
	Single lamps			Lamps flash sequentially until you press either lower cabinet button. Advance to next lamp in test by pressing lower right cabinet button. Press lower left cabinet button to back up to previous test.
	Display Test			Continuously cycles through all segments of a selected digit in either display module. Press the lower right cabinet button to advance to the next digit to the right. Press the lower left cabinet button to back up one digit.
	Coil Test			To advance to the next solenoid, press the lower right cabinet button. To test the same solenoid, press the lower left cabinet button.
	Program version			Program version of U2 and U3
	Switch Test			Game displays name of stuck switch

NOTES:

1. Feature can only be reset to 00.
2. Feature can only be changed to YES (enabled) or NO (disabled).
3. Feature can be changed in 100,000 point steps.
4. Feature has a value from 00 through 20. If this setting is 00, self-percentaging feature is off (disabled).
5. Feature can be changed in unit steps.
6. Feature can be changed to REPLAY, XBALL, POINTS or NOTHING.
7. Feature can be changed to 3 REPLAYS, 2 REPLAYS, 1 REPLAY or NOTHING.
8. Feature can be changed to ON (enabled) or OFF (disabled).
9. Feature can be changed to XX-EASY, X-EASY, MEDIUM, HARD, X-HARD or XX-HARD.
10. Coin value XX buys YY credits. The game awards bonus credits when the player buys ZZ credits.

Category	Register Directory	
	Player #1, 2, 3 & 4 Displays	Register Description
Help Read Me Help	AV BALL TIME IS HIGH XX YY	If average ball time is more than 60 seconds.
	AV BALL TIME IS LOW XX YY	If average ball time is less than 30 seconds.
	RAISE LEVEL 1 TO X,X00,000	The next adjustable threshold appears as X,X00,000 when both of these conditions occur: (1) "Threshold #1 Percent" exceeds "Target Percent." (2) At least 100 games have been played.
	LOWER LEVEL 1 TO X,X00,000	Adjustable threshold appears as X,X00,000 when both of these conditions occur: (1) "Threshold #1 Percent" is less than "Target Percent." (2) At least 100 games have been played.
	CHECK SWITCHS IN GAME CHECKUP	One or more playfield switches remain closed.
	SWITCH XX MAY BE OPEN	During at least five minutes of play, one switch hasn't closed.
	CHECK LEFT COINS CHUTE	Left coin switch is stuck.
	CHECK MIDDLE COINS CHUTE	Middle coin switch is stuck.
	CHECK RIGHT COINS CHUTE	Right coin switch is stuck.
	All OK	Game is okay. If the game detects a problem, assistance information appears on game displays.

COIN SETUP PROCEDURE

You may use factory settings for convenience, or price a game of pinball as you desire. Coin Setup is a simple procedure involving three settings for each coin chute. (U.S. games have two coin chutes.) Suggested settings are provided in the Pricing Table, later in this chapter.

Your coin settings alter values in the Coin Setup Category of game registers. (See the Registers and Options Table.) First you select the left or right coin chute. Then you set the cost of a game. You do this by adjusting the ratio, number of coins per number of credits (games). Finally you set the

bonus value. We'll define "bonus" in a moment. But first, let's get the hang of coin setup with a few examples...

EXAMPLE 1

You want to set the right coin chute at three credits for two coins. Also, you don't want to award any credits for the first coin.

[] 1. Enter the Coin Setup category.

[] 2. Enter the directory

[] 3. Set the directory to RIGHT, 02 COIN, 03 CREDIT and 00 BONS.

See Example	Step	Player 1 Display	Player 2 Display	Player 3 Display	Player 4 Display
1	1	RIGHT	XX COIN	YYCREDIT	XX BONS
1	2	RIGHT	02 COIN	03 CREDIT	00 BONS
2	1	RIGHT	XX COIN	YY CREDIT	XX BONS
2	2	RIGHT	01 COIN	01 CREDIT	02 BONS

EXAMPLE 2

You want to set the right coin chute at three credits for two coins. The game must award one credit for the first coin. You also desire the game to award two credits on the second coin.

BONUS CONCEPT. To achieve the Example 2 coin setting, you must specify bonus credits (XX BONS). You may specify any two-digit number. Select the number of coins that enter a coin chute before bonus is awarded. No more than one bonus credit can be awarded.

[] 1. Enter the Coin Setup category.

[] 2. Enter the directory.

[] 3. Set the directory to RIGHT, 01 COIN, 01 CREDIT and 02 BONS.

Pricing Table

*Indicates recommended setting

Country	Coin Chute		Games/Coin	Player 1 Display	Player 2 Display	Player 3 Display	Player 4 Display		
	Left	Center Right							
USA	25c - 25c		1/25, 4/\$1* (1)	LEFT	01 COIN	01 CREDIT	00 BONS		
				RIGHT	01 COIN	01 CREDIT	00 BONS		
			1/50, 2/75, 3/\$1	LEFT	02 COIN	01 CREDIT	03 BONS		
				RIGHT	02 COIN	01 CREDIT	03 BONS		
			1/50, 2/\$1	LEFT	02 COIN	01 CREDIT	00 BONS		
				RIGHT	02 COIN	01 CREDIT	00 BONS		
			1/25, 3/50, 6/\$1	LEFT	01 COIN	01 CREDIT	02 BONS		
				RIGHT	01 COIN	01 CREDIT	02 BONS		
			2/25, 8/\$1	LEFT	01 COIN	02 CREDIT	00 BONS		
				RIGHT	01 COIN	02 CREDIT	00 BONS		
			Canada	25c - \$1	1/25, 5/\$1*	LEFT	01 COIN	01 CREDIT	00 BONS
						RIGHT	01 COIN	04 CREDIT	04 BONS
West Germany	1DM, 2DM, 5DM		1/1, 2/2, 7/5 DM	LEFT	01 COIN	01 CREDIT	00 BONS		
				MIDDLE	01 COIN	02 CREDIT	00 BONS		
				RIGHT	01 COIN	07 CREDIT	00 BONS		
			1/1, 2/2, 6/5 DM*	LEFT	01 COIN	01 CREDIT	00 BONS		
				MIDDLE	01 COIN	02 CREDIT	00 BONS		
				RIGHT	01 COIN	06 CREDIT	00 BONS		
			1/1, 3/2, 9/5 DM	LEFT	01 COIN	01 CREDIT	00 BONS		
				MIDDLE	01 COIN	02 CREDIT	01 BONS		
				RIGHT	01 COIN	09 CREDIT	00 BONS		
			1/2x1DM, 1/2, 3/5DM	LEFT	02 COIN	01 CREDIT	00 BONS		
				MIDDLE	01 COIN	02 CREDIT	00 BONS		
				RIGHT	01 COIN	05 CREDIT	00 BONS		
			2/1, 5/2, 14/5DM	LEFT	01 COIN	02 CREDIT	00 BONS		
				MIDDLE	01 COIN	05 CREDIT	00 BONS		
				RIGHT	01 COIN	14 CREDIT	00 BONS		
France	1F, 5F, 10F	1/1, 3/5, 7/10F*	LEFT	01 COIN	01 CREDIT	00 BONS			
			MIDDLE	01 COIN	03 CREDIT	00 BONS			
			RIGHT	01 COIN	07 CREDIT	00 BONS			
Belgium	20F - 20F	1/20, 1/20*	LEFT	01 COIN	01 CREDIT	00 BONS			
			RIGHT	01 COIN	01 CREDIT	00 BONS			
Switzer- land	1F - 2F	1/1, 7/2*	LEFT	01 COIN	01 CREDIT	00 BONS			
			RIGHT	01 COIN	07 CREDIT	00 BONS			
Japan	100Y - 100Y	1/100*	LEFT	01 COIN	01 CREDIT	00 BONS			
			RIGHT	01 COIN	01 CREDIT	00 BONS			
Italy	200L - 500L	1/2x200, 3/2x500*	LEFT	02 COIN	01 CREDIT	00 BONS			
			RIGHT	02 COIN	03 CREDIT	00 BONS			
Australia	20c - 20c	1/3x20, 1/3x20*	LEFT	03 COIN	01 CREDIT	00 BONS			
			RIGHT	03 COIN	01 CREDIT	00 BONS			

Pricing Table, Continued

*Indicates recommended setting

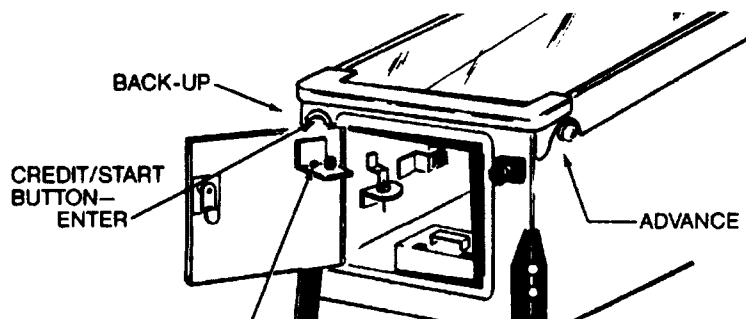
Country	Coin Chute			Games/Coin	Player 1	Player 2	Player 3	Player 4
	Left	Center	Right		Display	Display	Display	Display
United Kingdom	10 Pence-1 Pound			1/2x10P, 6/1L*	LEFT RIGHT	02 COIN 01 COIN	01 CREDIT 06 CREDIT	00 BONS 00 BONS
Denmark	1Kroner-10Kroner			1/2x1Kr, 7/10 Kr*	LEFT RIGHT	02 COIN 01 COIN	01 CREDIT 07 CREDIT	00 BONS 00 BONS
Finland	1Markka-5 Mka			1/2x1 Mka, 3/5 Mka*	LEFT RIGHT	02 COIN 01 COIN	01 CREDIT 03 CREDIT	00 BONS 00 BONS
Norway	1Kroner-5 Kroner			1/3x1 Kr, 2/5 Kr*	LEFT RIGHT	03 COIN 01 COIN	01 CREDIT 02 CREDIT	00 BONS 00 BONS
Sweden	5 Kroner-5 Kroner			2/5 Kr*	LEFT RIGHT	01 COIN 01 COIN	02 CREDIT 02 CREDIT	00 BONS 00 BONS
Holland	1 Guilder - 1 G			1/1 G*	LEFT RIGHT	01 COIN 01 COIN	01 CREDIT 01 CREDIT	00 BONS 00 BONS

GAME CHECKUP REGISTERS

The following registers are located in the Game Checkup category of Test Mode...

- Lamps
- Single lamps
- Display Test
- Coil Test
- Program version
- Switch Test

Except the Program Version register, these are Diagnostic Test registers. The Program Version register displays EPROM program version information. The application of each Diagnostic Test register is explained in Chapter 4. An abbreviated description of these registers is given in the Game Checkup category of the *Registers & Options Table*.



DIAGNOSTIC TESTS

Operate Diagnostic Tests as follows:

NOTICE

At any time, you can exit from Test Mode by pressing the TEST button.

[] 1. Enter the Game Checkup category's directory. Select a register by using the CREDIT button and either of the flipper buttons. The procedure is described at Steps 1 through 4 of Game Adjustments.

[] 2. When the selected register appears in the display, press the CREDIT button. Pressing CREDIT opens the register and begins tests. Until you exit the directory, flipper buttons are used in sequencing through register tests.

[] 3. When the test is completed, (except Switch Test), press the CREDIT button again. Pressing CREDIT causes the game to enter the next register. Repeating this procedure advances you to the end of the directory. The last register in the directory is Switch Test.

[] 4. After completing Switch Test, exit from the register and the directory. Do this by holding in the CREDIT button for one full second. Or exit from Test Mode by pressing the TEST button.

NOTICE

SINGLE LAMPS TEST OR COIL TEST. Holding in the right flipper button advances the display from driver to driver. Holding in the left flipper button displays drivers in reverse.

Chapter 4, Troubleshooting contains Diagnostic Test procedures for the following test registers...

- All Lamps
- Single Lamps
- Display Test
- Coil Test
- Switch Test

SELF-PERCENTAGING

Self-Percentaging is the game's ability to automatically adjust the First Replay Threshold score. This score is adjusted to attain a desired replay percentage known as Target Percent.

Self-Percentaging also applies to extra balls, when used instead of replays.

Self-Percentaging only adjusts the score level of the First Replay Threshold. Other award features aren't adjusted. The Second Replay Threshold Level and the Third Threshold Level aren't affected by Self-Percentaging.

The Self-Percentaging routine goes into effect after 200 games are played. Then the game program monitors the current replay percentage of the First Replay Threshold. If necessary, the program makes an adjustment after every 50 games.

The following registers are located in the Scoring Status category of your game's Test Mode...

- | | |
|---------------------------|-------------------|
| A.Level 1 Score | F.Level 1 Percent |
| B.Level 2 Score | G.Level 2 Percent |
| C.Level 3 Score | H.Level 3 Percent |
| D.Highest Score | I.TARGET Percent |
| E.Times High Score Beaten | |

These registers are described in this section.

FIRST, SECOND OR THIRD REPLAY THRESHOLD. To set or check the current score level of a replay threshold:

1.Step through the Test Mode categories until you reach SCORING STATUS.

2.To select SCORING STATUS and enter its directory, press the CREDIT button.

3.The first register displayed is LEVEL 1 SCORE. You'll find similar registers entitled LEVEL 2 SCORE and LEVEL 3 SCORE. These registers display the current score levels of the first, second and replay thresholds. Choose the desired register.

4.Use either flipper button to select any value from zero to 9,900,000. This value can only be changed in steps of 100,000 points.

5.To set the desired score level, press the CREDIT button.

6.Use either flipper button to exit the directory. Or press the TEST button and exit the Test Mode.

REPLAY PERCENTAGE. To adjust replay percentage for the First Replay Threshold...

1.Step through the game's Test Mode until you reach the category titled SCORING STATUS.

2.To select this category, press the CREDIT button and enter the category's directory.

[] 3. Select the Target Percent register in the directory with either flipper button. This register displays the desired percentage of replays to be awarded for reaching the First Replay Threshold Level.

[] 4. Suppose that you want to award a replay in 15 percent of games. Use either flipper button to select 15 percent. Then press the CREDIT button to set the percentage. The register will then display 15 percent as your goal or Target Percent.

[] 5. To exit the directory, use either flipper button. To exit Test Mode, press the TEST button.

NOTICE

When the Target Percent register is set at zero, the Self-Percentaging feature is disabled. This register defaults to 10 percent when the Factory Setting register is disabled. The Factory Setting register appears in the Game Setup category.

TOTAL REPLAY PERCENTAGE will be 10 or 15 percent higher with the addition of Match, Special and High Score credits.

FIRST, SECOND AND THIRD REPLAY THRESHOLD. To manually check the replay percentage of the three replay threshold levels...

[] 1. Step through Test Mode until you reach the category titled Scoring Status.

[] 2. Select Scoring Status and enter its directory by pressing the CREDIT button.

[] 3. Use either flipper button to select the register in the desired directory. (That is, Level 1 Percent, Level 2 Percent or Level 3 Percent.) This register displays the replay percentage awarded for reaching the desired replay threshold

level. Monitor self-percentaging progress by comparing the displayed value with Target Percent.

[] 4. To exit the directory, use either flipper button. Or press the TEST button and exit Test Mode.

ADJUSTMENT SIZE. You can determine the size of Self-Percentaging adjustments to the First Replay Threshold score. Check the difference between Target Percent and replay percentage awarded for reaching First Replay Threshold. (Target Percent is an operator entry.)

- A 10 percent or greater difference results in a 10 percent adjustment.
- A five to 10 percent difference results in a five percent adjustment.
- A difference less than five percent results in a one percent adjustment.

CLEAR ACCOUNT REGISTER. To reinitiate the Self-Percentaging process, enable the Clear Account register (enter YES).

HIGH SCORE LEVEL. To adjust the high score level at which a replay (or replays) is awarded...

[] 1. Step through the game's Test Mode until you reach the category titled Scoring Status.

[] 2. Press the CREDIT button to select Scoring Status and enter its directory.

[] 3. Use either flipper button to select the Highest Score register in the directory. This register displays the high score for which the replay level is set. High score is also known as High Score to Date, HS and HSTD.

[] 4. Use either flipper button to select any value from zero to 990,000. The Highest Score register value can only be changed in steps of 100,000 points.

[] 5. Set the desired score level by pressing the CREDIT button.

[] 6. Use either flipper button to exit the directory. Or exit Test Mode by pressing the TEST button.

HIGH SCORE LEVEL. To check the number of times the high score was exceeded...

[] 1. Step through the game's Test Mode until you reach the category Scoring Status.

[] 2. Press the CREDIT button to select this category and enter its directory.

[] 3. Use either flipper button to select the Times HS Beaten register in the directory. This register displays the number of times the high score was exceeded. This information aids you in deciding what point level the Highest Score register will contain.

[] 4. Use either flipper button to select any value from zero to 9,900,000. The Highest Score register value can be changed only in steps of 100,000 points.

[] 5. Press the CREDIT button to set the desired score level.

[] 6. Use either flipper button to exit the directory. Exit Test Mode by pressing the TEST button.

CHAPTER 5: UNIQUE PARTS

ELECTRICAL PARTS

Cables
Electronics

Electromechanical Parts

HARDWARE

Backbox, Cabinet and Playfield Parts
Ballguides, Plates, Ramps, Rails and Wireforms

Brackets With Switches
Brackets Without Switches
Bumpers, Posts and Studs

Glass and Plastic Parts
Miscellaneous Hardware

ELECTRICAL PARTS

CABLES

Cabinet Cable	H-12411
City Switches Cable	A365-00H08-0032
Display/Cont Cable	H-12410
Marquee Cable Assembly	A365-00H08-0031
Playfield Cable Assembly	A365-00H08-0005
Playfield Lamp Cable	H-12416
Playfield Solenoid Cable	H-12417
Playfield Switch Cable	H-12415
Top Light Cable	H-12412

ELECTRONICS

Electro Cap, 11,000 uF/20V	0175-323D8-FXBX
Electro Cap, 160 uF/250V	0175-242NA-EXJX
General Illum PCB	A365-07260-0002
Power Module	A365-00H08-0013
Sound Board	D-1158-2001
Sound Interface Assembly	C-12417
Sound Interface PCB	5768-12345-00

ELECTROMECHANICAL PARTS

Ball Kicker Assembly	A365-05250-0001
Ball-Scoop Assembly	A365-06400-0002
Ball-Scoop Assembly: Notched	A365-06400-0003
Flipper with Shaft	0365-04800-0005
Lane-Change™ Mech	A365-07500-0011
Left Ejector	A365-05320-0013
Mushroom Assembly, red	A365-05750-0001
Mushroom Assembly, yellow	A365-05750-0003
Right Ejector, S/L	A365-05310-0013

Right Ejector, S/L, U/A
Vertical Kicker Assembly

A365-05310-0023
A365-05250-0003

HARDWARE

BACKBOX, CABINET AND PLAYFIELD PARTS

Backboard Assembly A365-00H08-0009
Backboard, Screened 0365-00H08-1005
Backbox Assembly 2001-BB

Bottom Arch, Screened 31-1008-2001
Cabinet Assembly 2001-CAB
Logo Nameplate 0365-17009-0001

Pinball Cabinet 11-881
Pinball Backbox 11-882
Playfield & Insert Assy A-11-2001-PL

Playfield Assembly 2001-PL
Playfield, Screened 31-1002-2001
Screened Shooter Gauge 31-1009-2001

Side Molding Assembly A-12359-1
Speaker Grille 01-8996
Speaker Panel 0365-04200-0011

U.S.A. Cashbox Assembly A-8567-2001
Vent Grille 01-8998

BALLGUIDES, PLATES, RAMPS, RAILS AND WIREFORMS

Ballguide Plate w/3 holes 0365-04750-0008
Ballguide Plate w/5 holes 0365-04750-0009
Channel Ballguide 0365-03760-0001

Channel Ballguide-Left 0365-03760-0002
Channel Ballguide, Overhead 0365-03760-0003
Flat Plate 0365-04700-0019

L. Flipper Return Frame	01-6794-L-2
Lock Mounting Plate	0365-04700-0016
Main Ramp Assembly	A365-00H08-0023
Rail, 1/2 x 33-1/2"	0365-04200-0113
Ramp Entry Plate, Top	0365-04600-0005
Ramp Entry Plate, Bottom	0365-04600-0006
Ramp Entry Plate, Shooter	0365-04600-0007
R. Flipper Return Frame	01-6794-R-2
Right Outrail	0365-00H08-1017
Wireform Ballguide, 1-1/8"	0365-00151-1125
Wireform Ballguide, 2-1/4"	0365-00151-2250
Wireform Ballguide, 1-5/8"	0365-00157-1625
Wireform for Microswitch	0365-02160-0102
Vacuformed, Main Ramp	0365-00H08-1015

BRACKETS WITH SWITCHES

Switch Assembly, Eject hole	A365-06900-0012
Switch Assembly Lane-select	A365-06900-0022
Switch Assy, Spinner Microsw	A365-06900-0026
Switch Assembly, Mushroom	A365-06900-0016
Switch Assembly, Slingshot	A365-06901-0001
Switch Assembly, Right Spinner	A365-06900-0020
Switch Assembly, 3-inline target	A365-06900-0025
Switch Assembly, sling, w/Diode	A365-06901-0002

BRACKETS WITHOUT SWITCHES

Back Panel Bracket	0365-00172-0001
Backbox-mtg Bracket, R	0365-02700-0054
Ballstop Bracket	0365-02700-0056
Backboard Bracket	0365-02700-0042
Gusset Bracket	0365-03000-0013
Hanger Bracket Assembly	A-12360
Hinge Backup Bracket	01-8992

Hold-Down Bracket	0365-02800-0007
Lamp Bkt, Vacuformed	0365-02950-0010
1" L, Scoop Bracket	0365-02700-0005

PCB-Mounting Bracket	0365-02860-0001
Ramp Bracket	0365-02700-0055
Ramp Support Bracket	0365-02700-0040

3" L, Scoop Bracket	0365-02700-0006
Vacuformed Support "C" Bkt	0365-02950-0011

BUMPERS, POSTS AND STUDS

Hex, #6-20 x 1 Stud, 1-1/16" L	0365-04400-0003
Hex, #6-20 x 1 Stud, 1-1/2" L	0365-04400-0004
Hex, #6-32 x 1 Stud, 1-11/16" L	0365-04400-0005

Mini Post, 1-3/4" L	0365-04400-0013
Post, 2-1/4" L	0365-04400-0011
Post, 2-3/32" L	0365-04400-0012

Rubber Bumper 7/16" diameter	0365-17041-0011
Rubber Bumper 3/4" diameter	0365-17041-0013
3/8" x 1" Post	0365-17042-2201

Willy Post, Transpnt Red Plastic	03-8044-9
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GLASS AND PLASTIC PARTS

Actuator Button	0365-17042-5015
Backbox Glass	08-7463
Backglass, Screened	31-1357-2001

Game Decals	0365-00H08-1021
Glass Assembly	A-12361
Mylar Insulator	0365-03050-0002

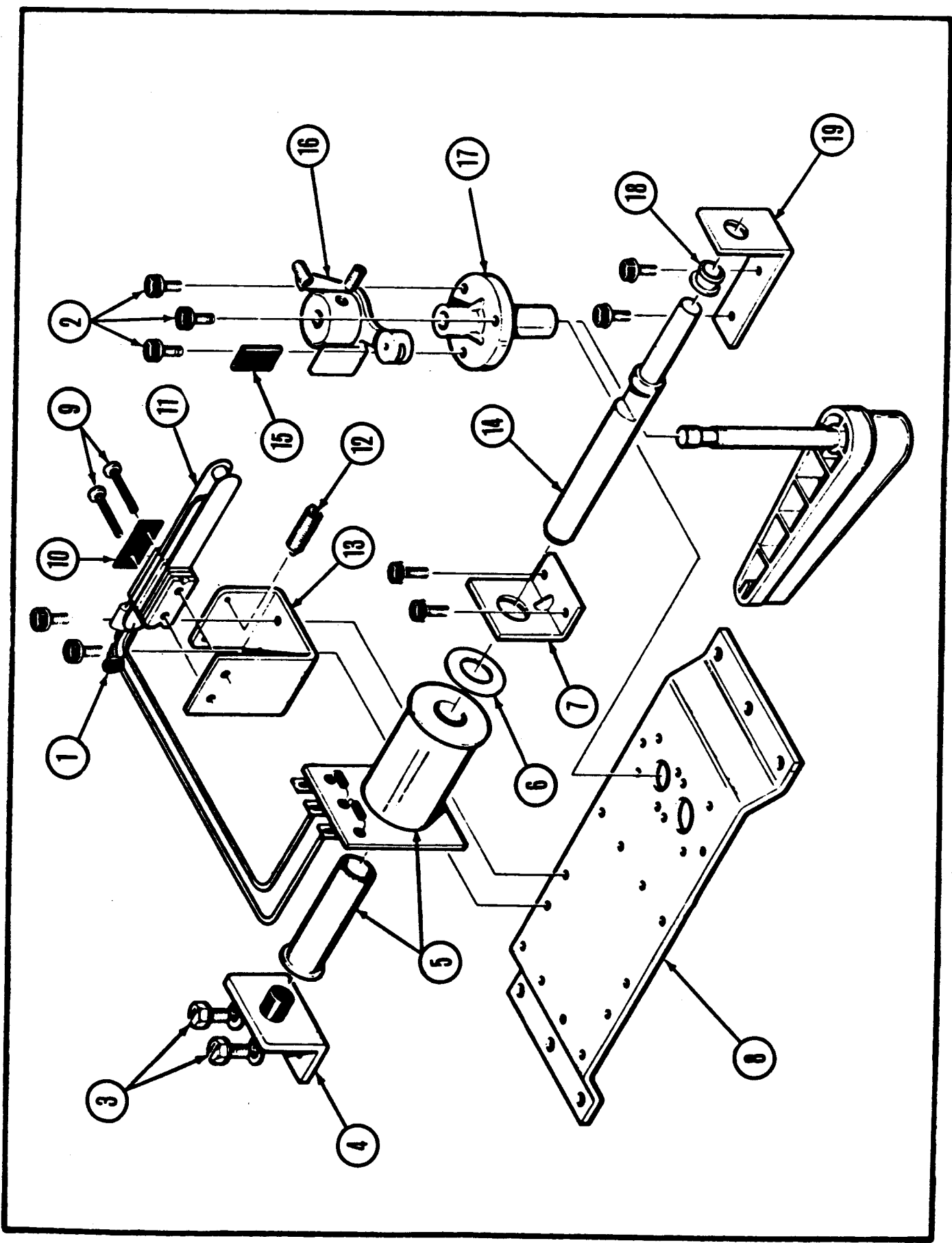
Nylon, PCB Spacer, 1/4"	0365-17042-2003
Nylon, PCB Spacer, 3/8"	0365-17042-2004
Nylon Spacer, 1.095"	0365-17042-2002

Playfield Mylar	0365-00H08-1009
Screened Plastics	31-1006-2001

MISCELLANEOUS HARDWARE

Glass-Locking Cam	0365-04300-0020
Lamp Arch Assembly	A365-07500-0011
Left Flipper Rtn Frame	A-8108-L-2
Marquee Support Bar	A365-00H08-0033
Right Flipper Rtn Frame	A-8108-R-2
Shooter Gauge	0365-00H08-1010
Tag	M051-00H08-A007

Top-Left Flipper: Parallel-Wired, Single Switch

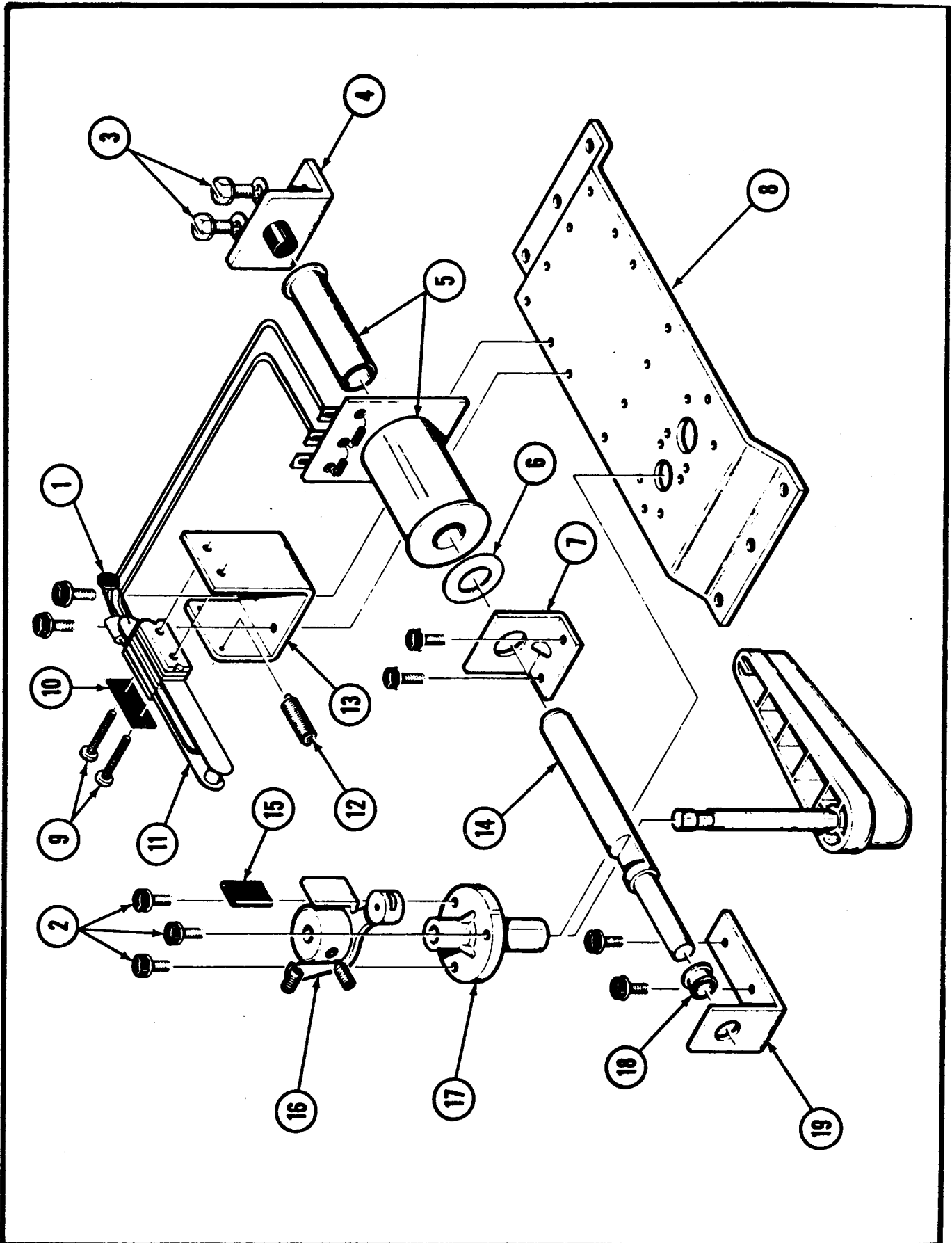


Flipper Assembly Parts List--Single Switch, Top-Left Flipper

Part No. A365-05040-0001

Item	Part Number	Description	Qty
1	0171-097P6-AXPC	Capacitor: 0.01uF/500V ceramic disc	1
2	0017-00101-0184	#8-32 x 3/8" hex head screw	9
3	0017-00101-0816	#10-32 x 3/8" slotted hex head screw	2
4	A365-00024-0000	Core plug and bracket assembly	1
5	AC70-00026-0000	Coil and tubing assembly: 3-lug	1
	A365-00067-0021	Coil: 3-lug	1
	0017-00041-0605	Tubing: Coil, L = 1.686 x 5/8"	1
	5070-09054-00	Diode, 1N4004GP, 400VAC, 1A	2
6	0017-00104-0073	Washer: Spring: 0.515" ID, 0.875" OD, 0.13" th.	1
7	0360-00318-00XF	Coil bracket	1
8	0365-00101-00XF	Flipper mounting bracket	1
9	4005-01016-07	#5-40 x 7/16" Phillips round head screw	2
10	0020-00202-0000	Switchplate	1
11	A365-00315-0400	Switch assembly for flipper mechanism	1
12	0010-00275-0353	Extension spring	1
13	0360-00145-00XF	Switch bracket	1
14	0360-00718-00XF	Plunger	1
15	0360-00945-0000	Tubing: 5/16 x 1/2"	1
16	A360-00038-0000	Lever arm hub and cap assembly: left	1
	0017-00101-0186	Set screw	2
17	0017-00042-0413	Flipper bearing	1
18	0017-00042-0418	Nyliner: snap-in coil type	1
19	0360-00152-01XF	Left flipper stop bracket	1

Top-Right Flipper: Parallel-Wired, Single Switch

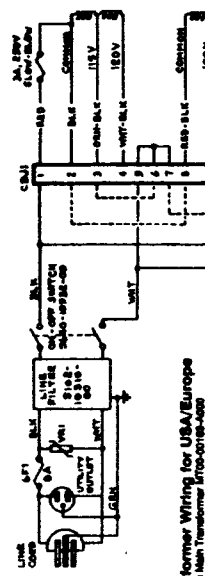
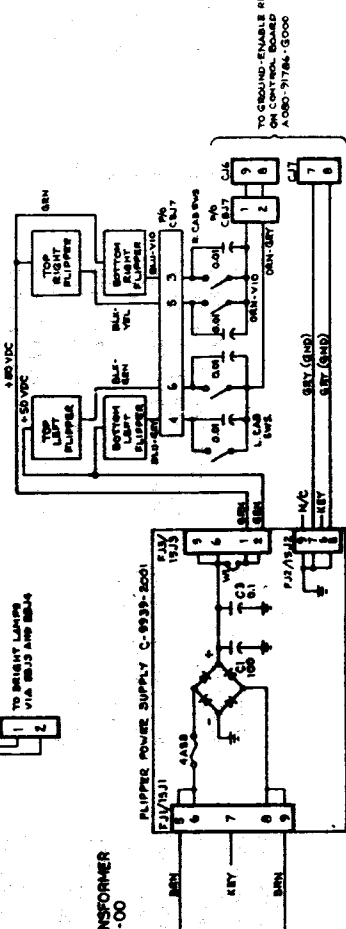
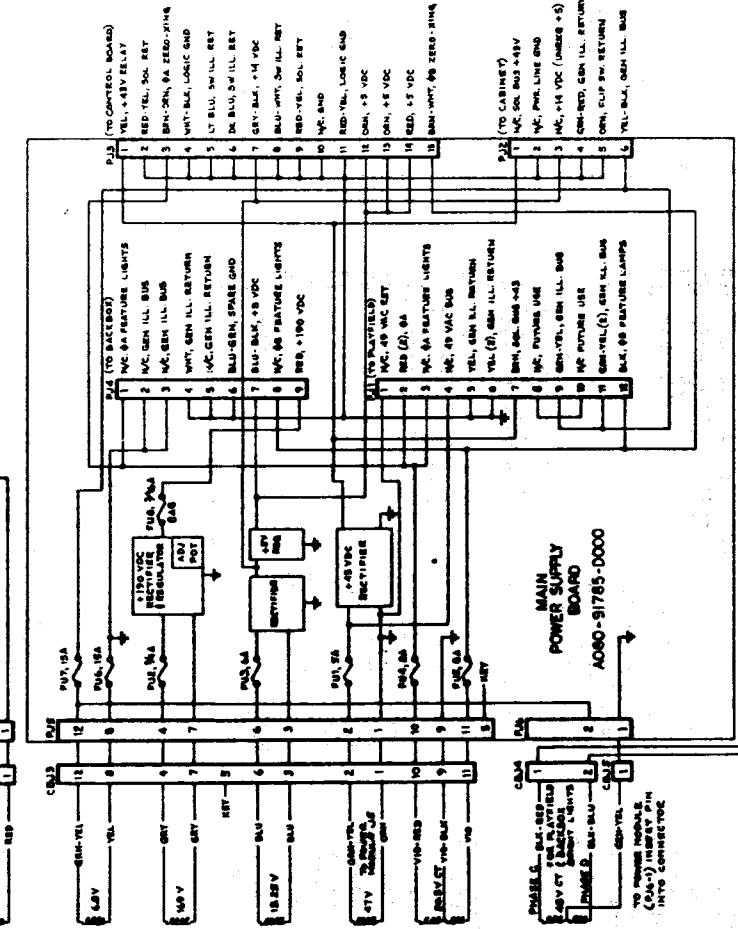


Flipper Assembly Parts List--Single Switch, Top-Right Flipper

Part No. A365-05030-0001

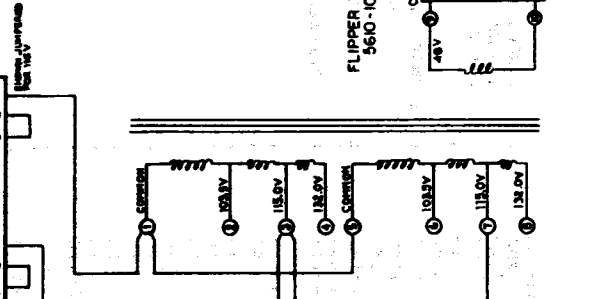
Item	Part Number	Description	Qty
1	0171-097P6-AXPC	Capacitor: 0.01uF/500V ceramic disc	1
2	0017-00101-0184	#8-32 x 3/8 hex head screw	9
3	0017-00101-0816	#10-32 x 3/8 slotted hex head screw	2
4	A365-00024-0000	Core plug and bracket assembly	1
5	AC70-00026-0000	Coil and tubing assembly: 3-lug	1
	A365-00067-0021	Coil: 3-lug	1
	0017-00041-0605	Tubing: Coil, L = 1.686 x 5/8	1
	5070-09054-00	Diode, 1N4004GP, 400VAC, 1A	2
6	0017-00104-0073	Washer: Spring: 0.515" ID, 0.875" OD, 0.13" th.	1
7	0360-00318-00XF	Coil bracket	1
8	0365-00101-00XF	Flipper mounting bracket	1
9	4005-01016-07	#5-40 x 7/16 Phillips round head screw	2
10	0020-00202-0000	Switchplate	1
11	A365-00315-0400	Switch assembly for flipper mechanism	1
12	0010-00275-0353	Extension spring	1
13	0360-00145-00XF	Switch bracket	1
14	0360-00718-00XF	Plunger	1
15	0360-00945-0000	Tubing: 5/16 x 1/2	1
16	A360-00039-0000	Lever arm hub and cap assembly: right	1
	0017-00101-0186	Set screw	2
17	0017-00042-0413	Flipper bearing	1
18	0017-00042-0418	Nyloner: snap-in coil type	1
19	0360-00152-02XF	Right flipper stop bracket	1

POWER TRANSFORMER FOR U.S. (EUROPEAN GAMES; MT50-0015-A800)
 POWER TRANSFORMER FOR JAPANESE GAMES; MT50-0014-A800



Local Line Voltage	Local Mains Transformer Wiring	Local Flipper Transformer Wiring
115 VAC	Wire Jumper 1 & 2 at CB1; 2-4, 5-6, 7-10 at CB1	Wire Jumper 1 & 2; Jumper 1-4, 5-7 at transformer
230 VAC	Wire Jumper 1 & 2; Jumper 2-4, 7-10 at CB1	Wire Jumper 1 & 2; Jumper 2-4 at transformer

Local Line Voltage	Local Mains Transformer Wiring	Local Flipper Transformer Wiring
115 VAC	Wire Jumper 1 & 2 at CB1; 2-4, 5-6, 7-10 at CB1	Wire Jumper 1 & 2; Jumper 1-4, 5-7 at transformer
230 VAC	Wire Jumper 1 & 2; Jumper 2-4, 7-10 at CB1	Wire Jumper 1 & 2; Jumper 2-4 at transformer



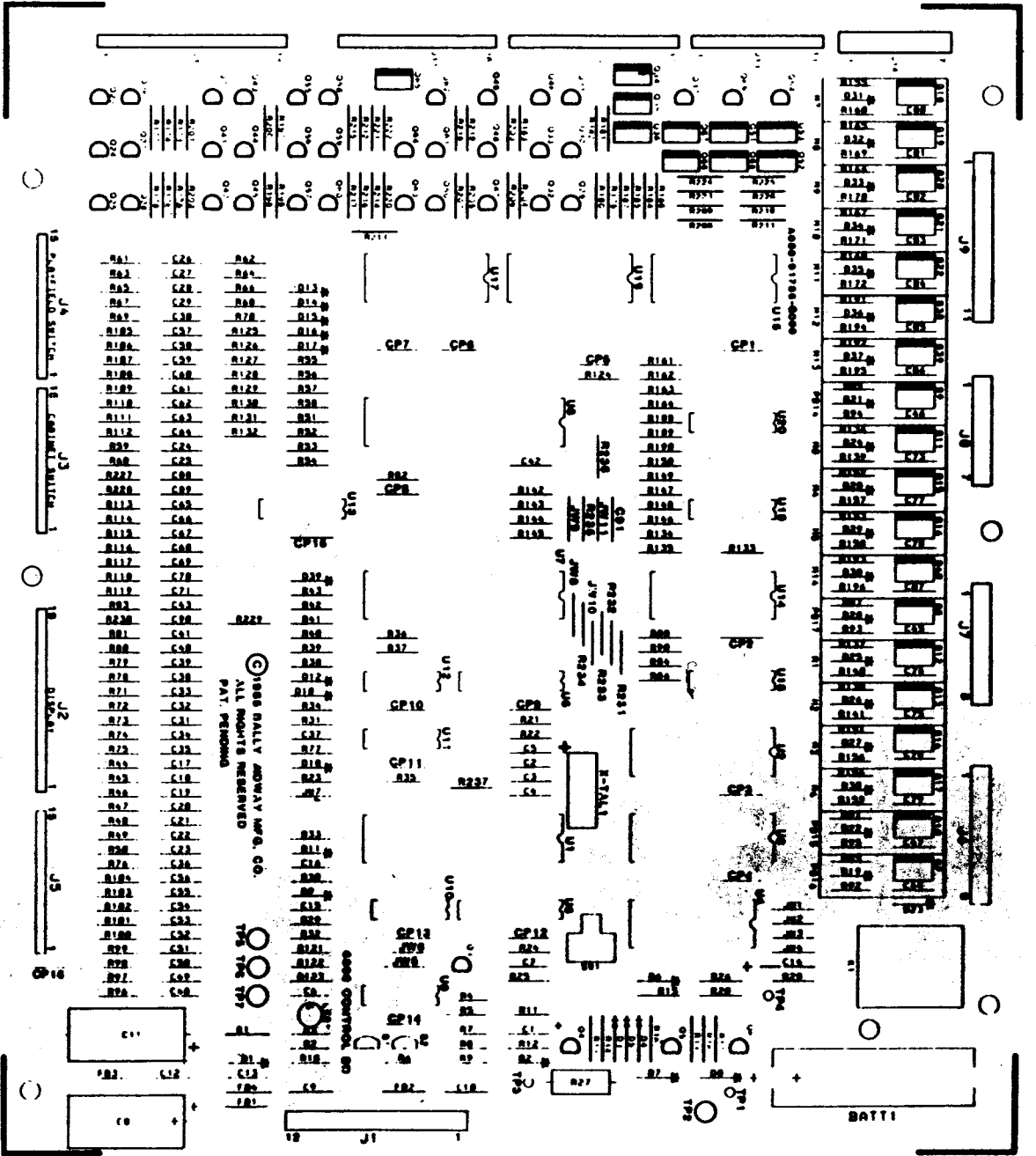
TO GROUND ENABLE RELAY ON CONTROL BOARD
 A000-91784-0000

6803 CONTROL BOARD
A084-91786-6000
M051-00C53-6003

CROSS REFERENCE LIST

CROSS REFERENCE LIST

DESCRIPTION	QTY.	DESIGNATION NO.	PART NOS.	DESCRIPTION	QTY.	DESIGNATION NO.	PART NOS.
270 OHM 1/4W 5% CER.	2	C2, C3	0360-00800-0052	7.5 1/4W 5%	1	R5	100E-00005-0085
470 OHM 1/4W 5% CER.	1	C7	0360-00800-0027	9.1 1/4W 5%	1	R4	100E-00005-0087
390 OHM 50V CER.	25	C24-C30, C57-C71	0360-00800-0001	10K 1/4W 5%	4	R12, R13, R30, R33	100E-00005-0088
470 OHM 1KV CER.	27	C88-C90	0307-00800-0008	15K 1/4W 5%	2	R31, R34	100E-00005-0092
.002 OHM 1KV CER.	19	C17-C23, C31-C36, C38-C41, C48-C56, C91	0360-00800-0012	39K 1/4W 5%	1	R7	100E-00005-0102
.003 OHM 1KV CER.	1	C44-C47, C73-C87	0360-00800-0025	47K 1/4W 5%	2	R10, R11	100E-00005-0104
.01 OHM 50V CER.	24	C43	0365-00800-0014	56K 1/4W 5%	14	R62, R64, R66, R68	100E-00005-0106
.05 OHM 16V CER.	1	C6, C9, C10, C12, C13	0360-00800-0006	62K 1/4W 5%	1	R70, R125-R132, R229	100E-00005-0107
.1 OHM 50V CER.	1	C15, C16, C42, C41-CP16	0360-00800-0058	82K 1/4W 5%	1	R15	100E-00005-0112
4.7 OHM 25V TANT	2	C37	0360-00800-0008	100K 1/4W 5%	2	R14	100E-00005-0115
6.8 OHM 25V TANT	1	C5, C14	0360-00800-0008	270K 1/4W 5%	1	R26, R237	100E-00005-0126
470 OHM 16V ELEC	1	C1	0360-00800-0048	82 OHM 1W 10%	1	R27	100E-00007-0014
82 OHM 1/4W 5%	1	C8	0360-00800-0022	IN9588 ZENER	1		103E-00001-0002
100 OHM 1/4W 5%	1	C11	0360-00800-0024	IN4004	20	D1	103E-00003-0005
110 OHM 1/4W 5%	1	R9	100E-00005-0031	IN4148	13	D19-D38	103E-00002-0005
120 OHM 1/4W 5%	1	R8	100E-00005-0033	IN4606	5	D2, D4, D5, D7, D8	103E-00002-0006
		R9	100E-00005-0034	2N3904	3	D2, D4, D5, D6	104E-00001-0006
		R83	100E-00005-0035	2N4403	2	D3, D5	104E-00002-0006
		R24, R85, R87, R89		2N5080	35	D23-D33, D37, D41-050, D54-064, D69, D70	104E-00015-0001
		R91, R121, R136-R138, R151-R155, R165-R168, R191-R193		2N5305	1	D1	104E-00007-0003
		R28	100E-00005-0044	MCRI106-1	10	D1	0360-00802-0009
		R92-R95, R139-R141, R156-R160, R169-R172, R194-R196, R231-R234	100E-00005-0047	SE9302	19	D34-D36, D51-053	0360-00802-0008
		R96-R104		4011	1	D55-058	0360-00803-0010
		R1	100E-00005-0051	4502	1	D57-022, D58-040	0360-00803-0005
		R25	100E-00005-0054	4514B	3	D1	0360-00803-0013
		R19	100E-00005-0056	4584	1	D15-D17	0066-0908X-XXDX
		R18	100E-00005-0057	6116 RAM	1	D4	0365-00803-0013
		R3	100E-00005-0059	6803 MPU	1	D1	0360-00803-0048
		R44-R50, R59-R61, R63, R65, R67, R69, R71-R76	100E-00005-0061	6821 PIA	2	D7, D8	0360-00803-0017
		R78-R82, R105-R119, R122		74LS10	1	D10	0A15-00803-0010
		R161-R164, R188-R190, R227, R228, R230, R236		74LS154	1	D9	0A89-00803-0007
		R20		74HCT245	1	D4	0360-00803-0024
		R123, R173-R187	100E-00005-0065	74LS373	1	D5	0365-00803-0014
		R197-R226	100E-00005-0068	CA3081	3	D6	0A89-00803-0006
		R2, R6		3.580 MHZ CRYSTAL	1	D18-U20	0360-00803-0007
		R17	100E-00005-0071	LED GREEN	1	XTAL-1	109E-00001-0003
		R21-R22, R35, R51-R59, R84, R86, R88, R90	100E-00005-0073	TEST POINTS	7	LED 1	0017-00007-0131
		R36-R43	100E-00005-0074	SWITCH P.R.	1	TP1-TP7	0017-00007-0131
		R16	100E-00005-0077	BATTERY P.R.	1	SW1	0017-00032-0038
			100E-00005-0079	BATTERY 3.6V	1	BATT-1	0017-00003-0172
			100E-00005-0082	ZERO OHM RES. JUMPER	5	JW2, JW4, JW6, JW8, JW10	117E-00001-0001
				RELAY 4RVDC	1	K1	114E-00001-0011
				40 PIN I.C. SOCKET	3	XU1, XU7, XUR	110E-00001-0011
				28 PIN I.C. SOCKET	2	XU2, XUS	110E-00001-0010
				24 PIN I.C. SOCKET	2	XU4	110E-00001-0007
				FERRITE BEAD	4	FBI-FR4	0316-00804-0002



THIS DRAWING IS CONFIDENTIAL & PROPERTY OF MIDWAY MFG. CO.

DIM TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL .125 DECIMAL .005 HOLE DIA .005 ANGLE 1/2"		DATE 04/08/86 DRAWN BY [Signature] CHECKED BY [Signature]	
MIDWAY MFG. CO. FRANKLIN, PA. U.S.A. ASSY DRAWING 6803 CONTROL BO. A084-91786-6000		REVISIONS NO. 1 - 0-0-C-5-3-G-0-0-3	

6803 CONTROL BOARD
A084-91786-0000
M031-00C35-0003

DESIGNATION LIST

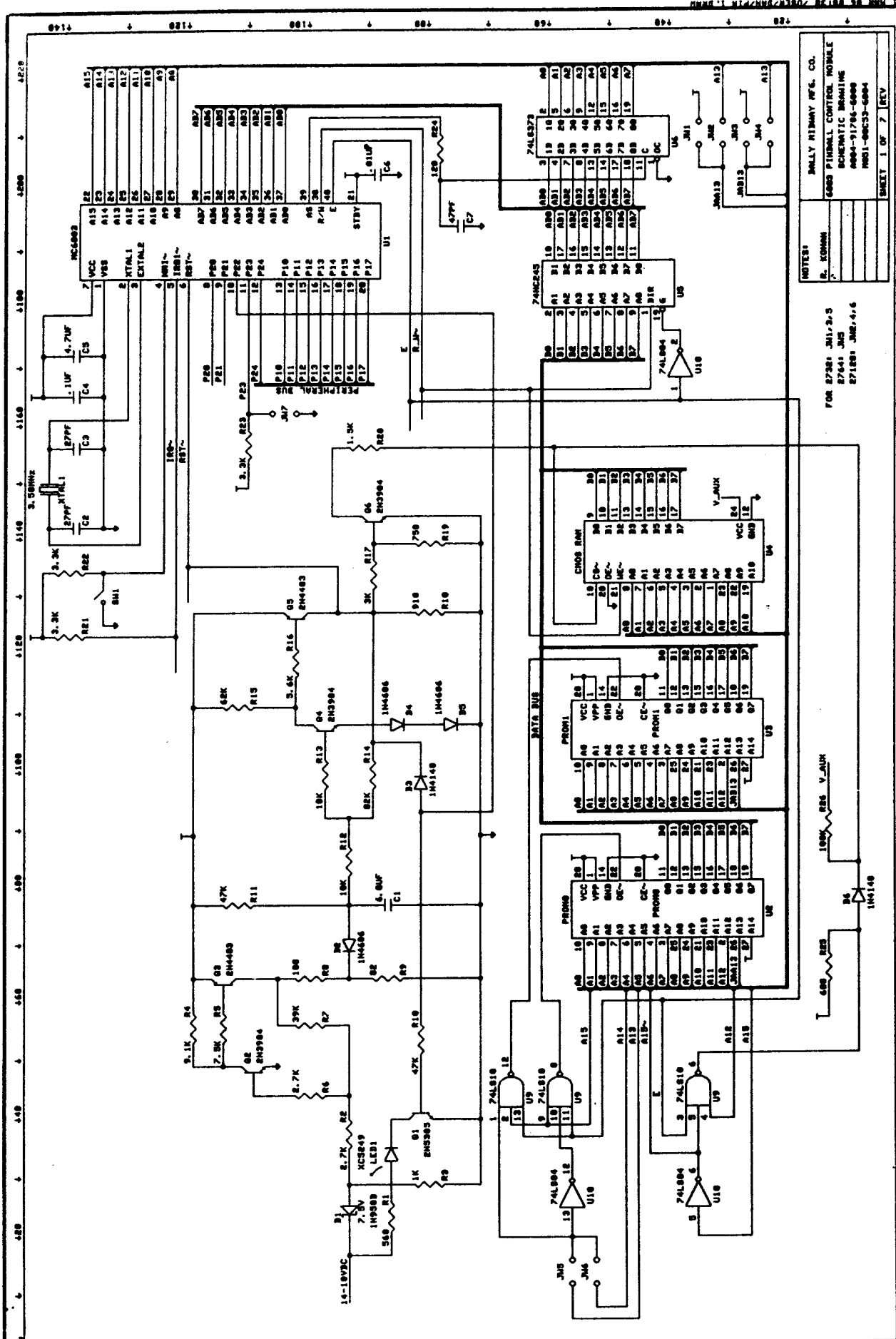
DESIGNATION	DESCRIPTION	DESIGNATION	DESCRIPTION	DESIGNATION	DESCRIPTION	DESIGNATION	DESCRIPTION
C1	6.8UF 25V TANT.	R28	270 OHM 1/4W 5K	R165 - R168	120 OHM 1/4W 5K	U15 - U17	4514B
C2,C3	27PF 50V CER.	R29	1K 1/4W 5K	R169 - R172	330 OHM 1/4W 5K	U18 - U20	CA3081
C4	.01UF 50V CER.	R30	10K 1/4W 5K	R173 - R187	2K 1/4W 5K	XTAL-1	3.580 MHZ CRYSTAL
C5	4.7UF 25V TANT.	R31	15K 1/4W 5K	R188 - R190	1.2K 1/4W 5K	LED 1	LED GREEN
C6	.01UF 50V CER.	R32	1K 1/4W 5K	R191 - R193	120 OHM 1/4W 5K	TP1 - TP7	TEST POINTS
C7	47PF 50V CER.	R33	10K 1/4W 5K	R194 - R196	330 OHM 1/4W 5K	SW1	SWITCH P.P.R.
C8	470UF 16V FLEC.	R34	15K 1/4W 5K	R197 - R226	2K 1/4W 5K	RATT-1	BATTERY 3.6V
C9,C10	.01UF 50V CER.	R35	3.3K 1/4W 5K	R227,R228	1.2K 1/4W 5K	JW2	ZERO OHM RES. JUMPER
C11	470UF 25V FLEC.	R36 - R43	4.7K 1/4W 5K	R229	56K 1/4W 5K	JW4	ZERO OHM RES. JUMPER
C12,C13	.01UF 50V CER.	R44 - R50	1.2K 1/4W 5K	R230	1.2K 1/4W 5K	JW6	ZERO OHM RES. JUMPER
C14	4.7UF 25V TANT.	R51 - R58	3.3K 1/4W 5K	R231 - R234	330 OHM 1/4W 5K	JW8	ZERO OHM RES. JUMPER
C15,C16	.01UF 50V CER.	R59 - R61	1.2K 1/4W 5K	R235	3.3K 1/4W 5K	JW10	ZERO OHM RES. JUMPER
C17 - C23	470PF 1KV CER.	R62	56K 1/4W 5K	R236	1.2K 1/4W 5K	K1	ZERO OHM RES. JUMPER
C24 - C30	390PF 50V CER.	R63	1.2K 1/4W 5K	R237	100K OHM 1/4W 5K	XU1,XU7,XU8	RELAY 48V DC
C31 - C36	470PF 1KV CER.	R64	56K 1/4W 5K	D1	1N958B	XU2, XU5	40 PIN IC SOCKET
C37 - C41	.05UF 16V CER.	R65	1.2K 1/4W 5K	D2	1N4606	XU4	28 PIN IC SOCKET
C42	470PF 1KV CER.	R66	56K 1/4W 5K	D3	1N4148	FBI - FB4	FERRITE READ
C43	.003UF 1KV CER.	R67	1.2K 1/4W 5K	D4,D5	1N4606	J1	11 - .045 SO. PINS
C44 - C47	.002UF 1KV CER.	R68	56K 1/4W 5K	D6	1N4148	J2	18 - .025 SO. PINS
C48 - C56	470PF 1KV CER.	R69	1.2K 1/4W 5K	D7,D8	1N4606	J3	14 - .025 SO. PINS
C57 - C71	390PF 50V CER.	R70	56K 1/4W 5K	D9 - D18	1N4148	J4	14 - .025 SO. PINS
C72 - C87	.002 1KV CER.	R71 - R76	1.2K 1/4W 5K	D19 - D38	1N4004	J5	14 - .025 SO. PINS
C88 - C90	390PF 50V CER.	R77	270K 1/4W 5K	D39	1N4148	J6	8 - .045 SO. PINS
C91	470PF 1KV CER.	R78 - R82	1.2K 1/4W 5K	D40	2N5305	J7	7 - .045 SO. PINS
CP1 - CP16	.01 50V CER.	R83	110 OHM 1/4W 5K	D41	2N5304	J8	6 - .045 SO. PINS
R1	560 OHM 1/4W 5K	R84	3.9K 1/4W 5K	D42	2N4403	J9	10 - .045 SO. PINS
R2	2.7K 1/4W 5K	R85	120 OHM 1/4W 5K	D43	2N3904	J10	18 - .025 SO. PINS
R3	1K 1/4W 5K	R86	3.9K 1/4W 5K	D44	2N4403	J11	17 - .025 SO. PINS
R4	9.1K 1/4W 5K	R87	120 OHM 1/4W 5K	D45	2N3904	J12	16 - .025 SO. PINS
R5	7.5K 1/4W 5K	R88	3.9K 1/4W 5K	D46	SF9302	J13	12 - .025 SO. PINS
R6	2.7K 1/4W 5K	R89	120 OHM 1/4W 5K	D47	2N5060	J14	5 - .045 SO. PINS
R7	39K 1/4W 5K	R90	470 OHM 1/4W 5K	D48	2N5060	P/O RATT-1	TY-WRAP
R8	100 OHM 1/4W 5K	R91	120 OHM 1/4W 5K	D49	2N5060	6803 CONTROL RD.	P.C. BOARD
R9	R2 OHM 1/4W 5K	R92 - R95	330 OHM 1/4W 5K	D50	SF9302		
R10,R11	47K 1/4W 5K	R96 - R104	1.2K 1/4W 5K	D51	MCR 104-1		
R12,R13	10K 1/4W 5K	R105 - R119	120 OHM 1/4W 5K	D52	SF9302		
R14	82K 1/4W 5K	R120	120 OHM 1/4W 5K	D53	MCR 104-1		
R15	62K 1/4W 5K	R121	1.2K 1/4W 5K	D54	2N5060		
R16	5.6K 1/4W 5K	R122	2K 1/4W 5K	D55	6803		
R17	3K 1/4W 5K	R123	3.3K 1/4W 5K	D56	6116 RAM		
R18	910 OHM 1/4W 5K	R124	56K 1/4W 5K	D57	74HC1245		
R19	750 OHM 1/4W 5K	R125 - R132	1.2K 1/4W 5K	D58	74LS375		
R20	1.5K 1/4W 5K	R133 - R135	330 OHM 1/4W 5K	D59	6821		
R21 - R23	3.3K 1/4W 5K	R136 - R138	330 OHM 1/4W 5K	D60	74LS10		
R24	120 OHM 1/4W 5K	R139 - R141	3.3K 1/4W 5K	D61	74LS04		
R25	680 OHM 1/4W 5K	R142 - R145	1.2K 1/4W 5K	D62	4011		
R26	100K 1/4W 5K	R146 - R150	330 OHM 1/4W 5K	D63	4584		
R27	82 OHM 1W 10K	R151 - R155	1.2K OHM 1/4W 5K	D64	4502		
		R156 - R160	1.2K OHM 1/4W 5K	D65	74LS194		
		R161 - R164	1.2K OHM 1/4W 5K	D66			

6803 CONTROL BOARD
A084-91786-6000
M051-000C53-6003

CROSS REFERENCE LIST

<u>DESCRIPTION</u>	<u>QTY.</u>	<u>DESIGNATION NO.</u>	<u>PART NOS.</u>
.025 SO. PINS	123	J2, J3, J4, J5, J10, J11, J12, J13	0304-00804-0009
.045 SO. PINS	47	J1, J6, J7, J8, J9, J14	0304-00804-0010
TY-WRAP	1	P/O BATT-1	0017-00042-0622
P.C. BOARD	1	6803 CONTROL BOARD	A080-91786-6000

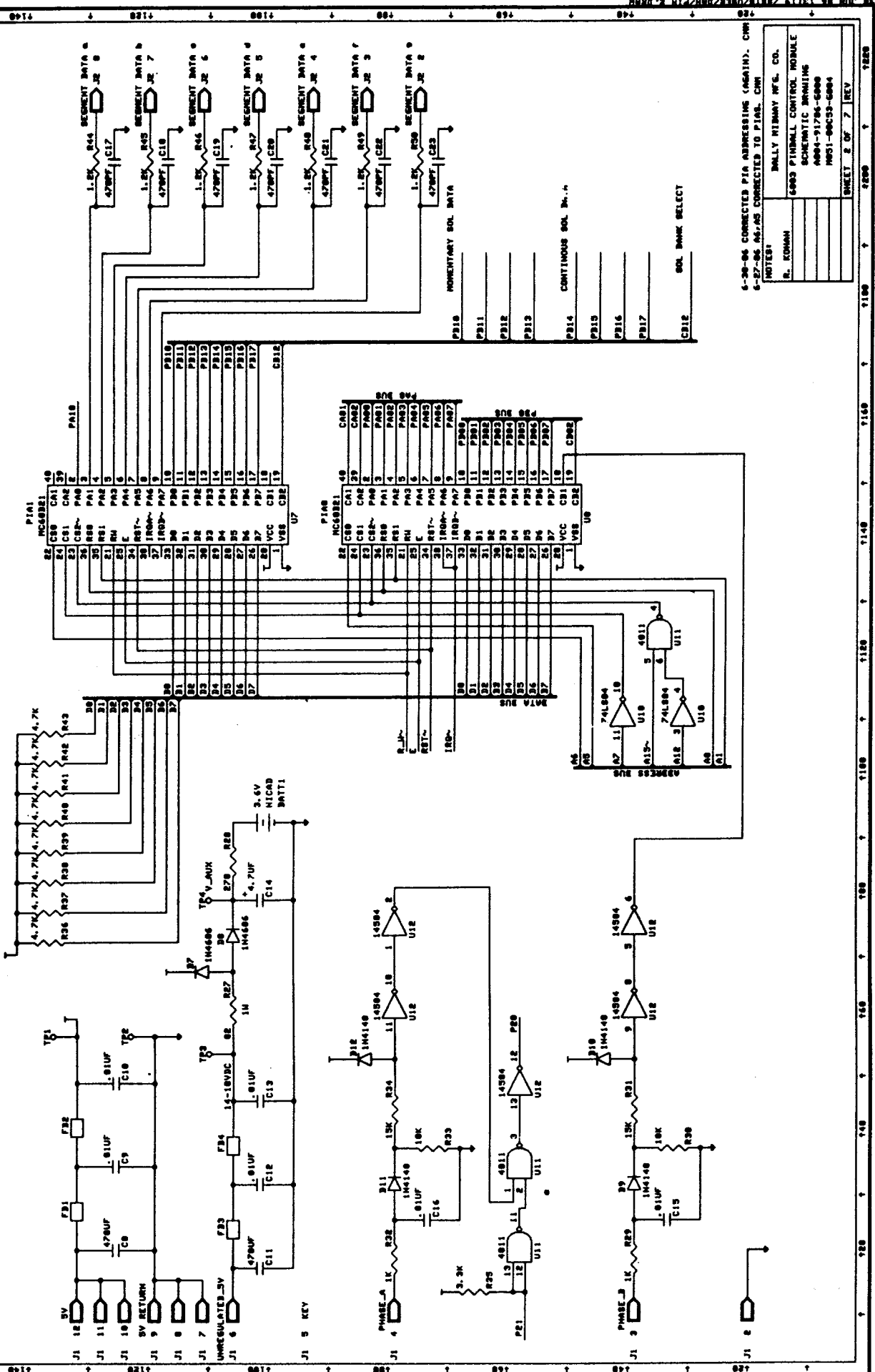
4-23-86 REV. 1.0 Fixed Part Number for 470PF Cap.



NOTES:
 R. KONN
 6800 PERIPHERAL CONTROL MODULE
 SCHEMATIC DRAWING
 8004-91785-0000
 8001-80C33-0004
 SHEET 1 OF 7 REV

FOR 27284 JMI-2-3
 27643 JMS
 27188 JME-4-6

1480 1460 1440 1420 1400 1380 1360 1340 1320 1300 1280 1260 1240 1220 1200 1180 1160 1140 1120 1100 1080 1060 1040 1020 1000 980 960 940 920 900 880 860 840 820 800 780 760 740 720 700 680 660 640 620 600 580 560 540 520 500 480 460 440 420 400 380 360 340 320 300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0



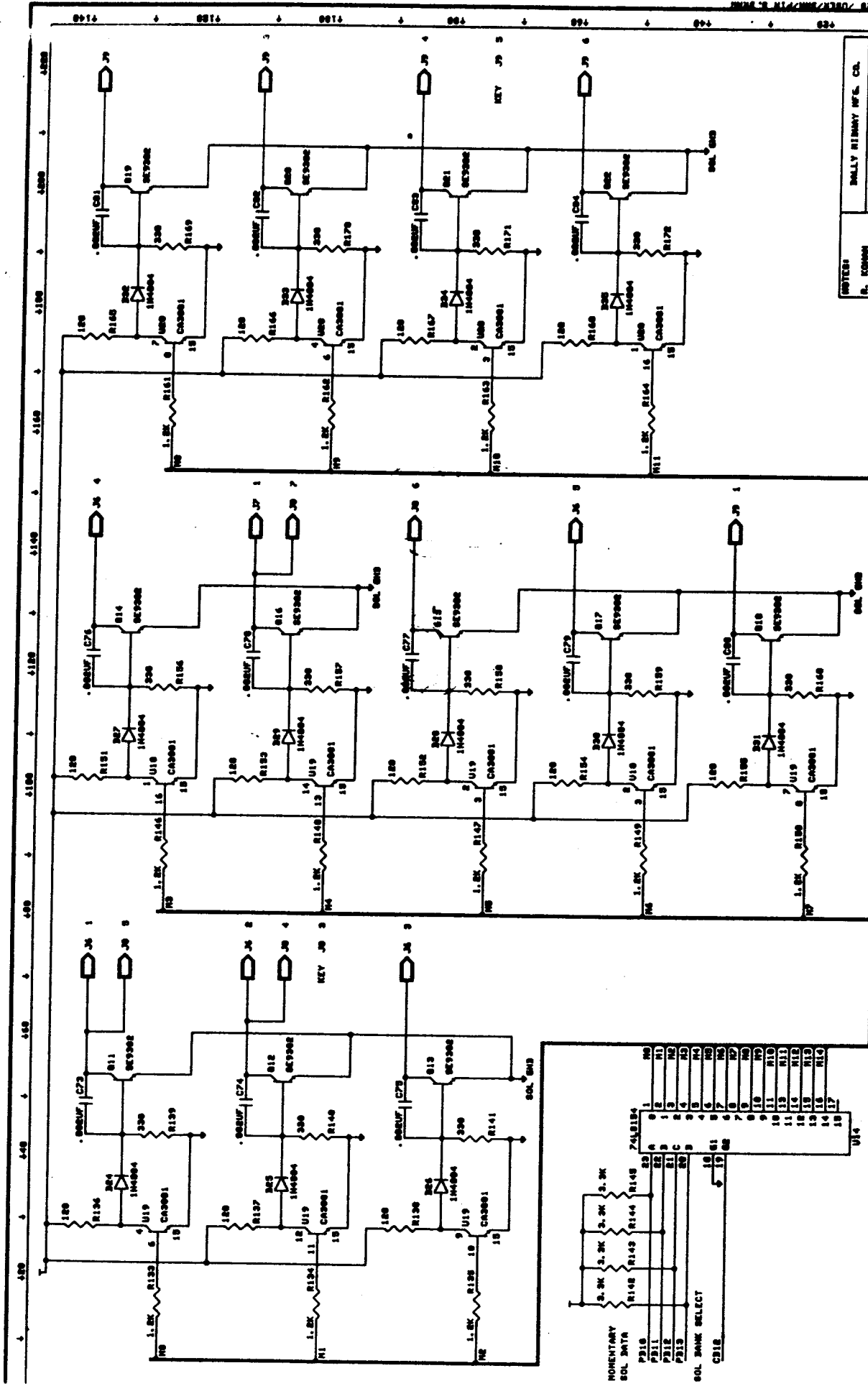
6-26-86 CORRECTED PIA ADDRESSING (AGAIN). CWR
 6-27-86 867AS CORRECTED TO PINS. CWR

NOTES:

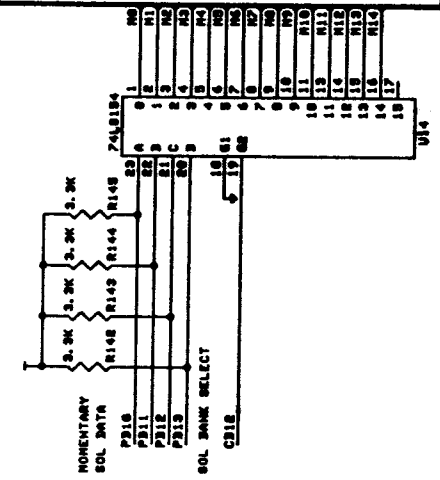
6493 PINBALL CONTROL MODULE
SCHEMATIC DRAWING
4884-91785-6000
4851-86C53-6004
SHEET 2 OF 7 REV

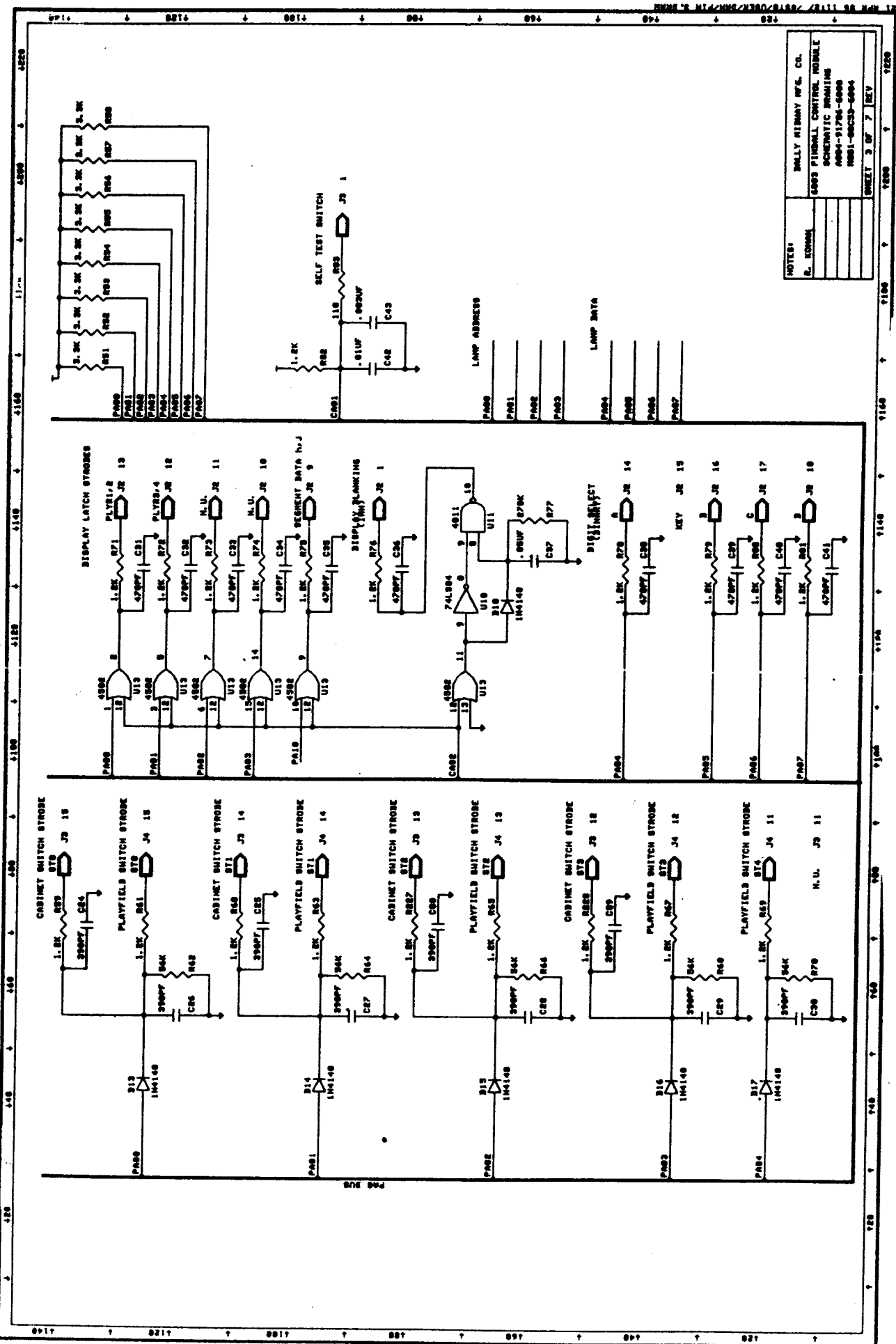
R. KONAN

BALLY HIMWAY MFG. CO.

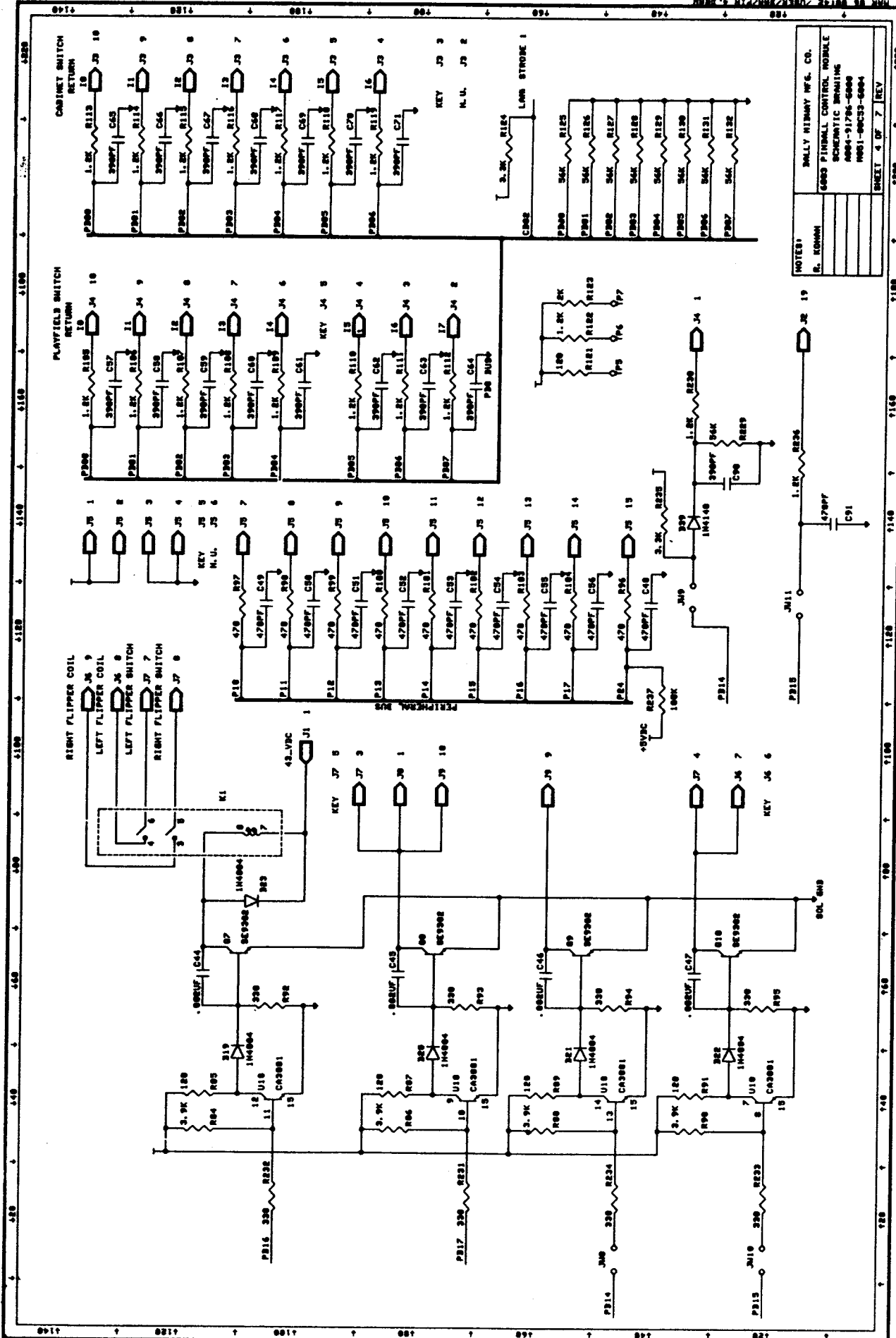


NOTES:
 1. COMPANY: BALLY BIRNEY MFG. CO.
 2. SCHEMATIC DRAWING: 6000 PERSONAL CONTROL MODULE
 3. PART NUMBER: 4004-21704-0000
 4. REVISION: 0001-00020-0004
 5. SHEET 5 OF 7 REV





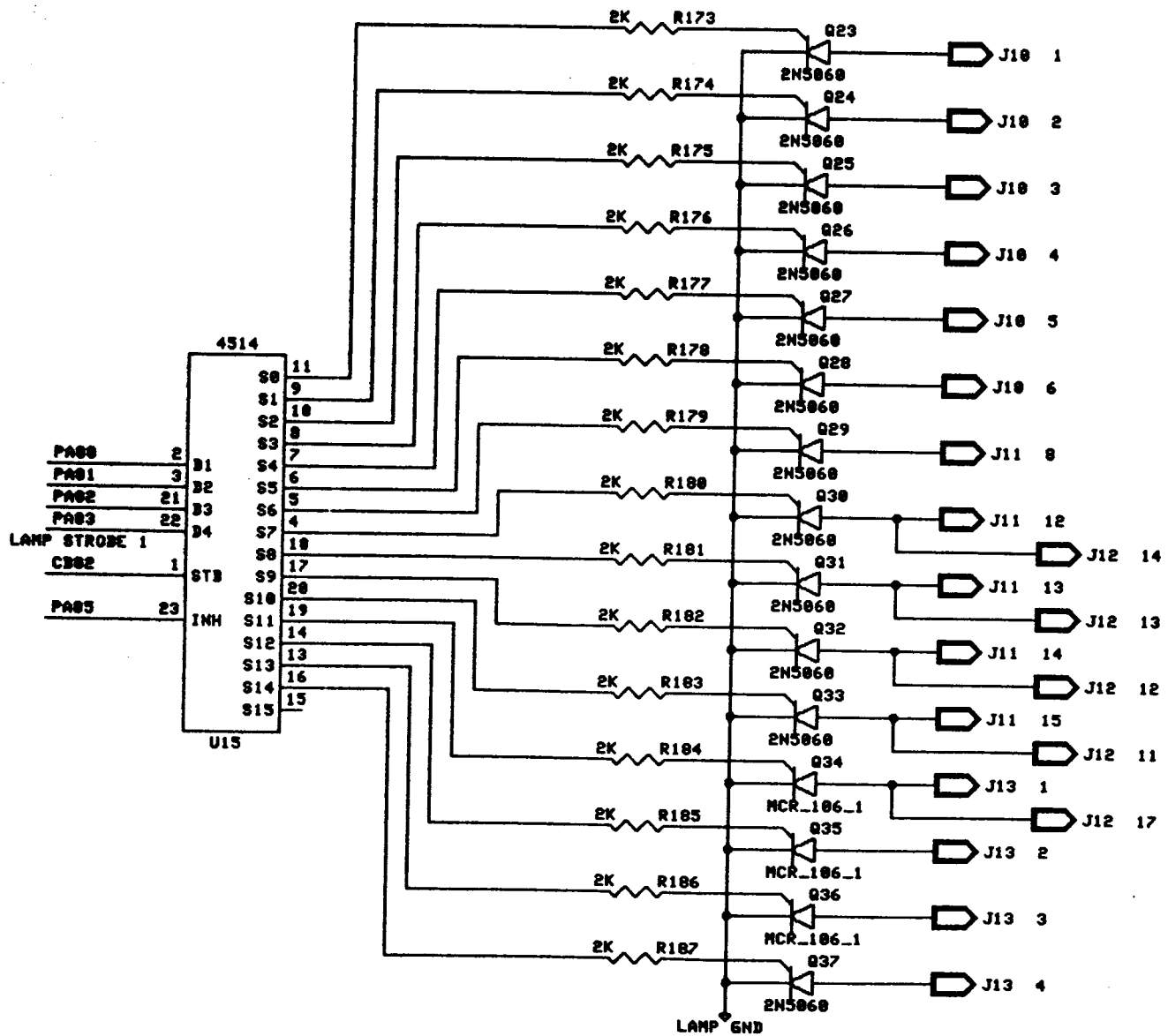
NOTES:
 1. BILLY HIGHWAY W/F. CO.
 2. GARD PLUMBING CONTROL NOBBLE
 3. SCHEMATIC DRAWING
 4. 4004-31706-0000
 5. 4004-31706-0000
 6. 4004-31706-0000
 7. SHEET 3 OF 7 REV

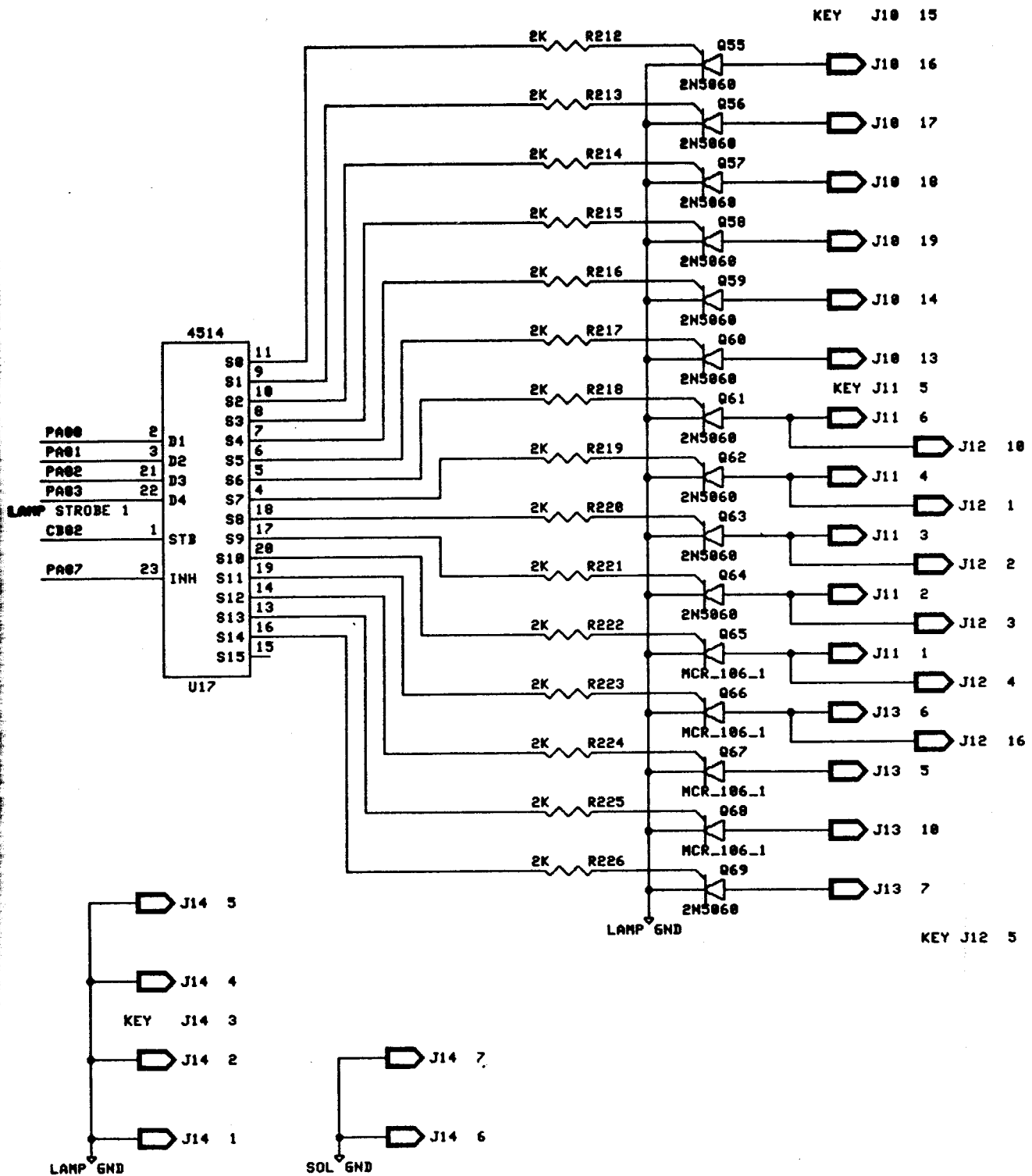


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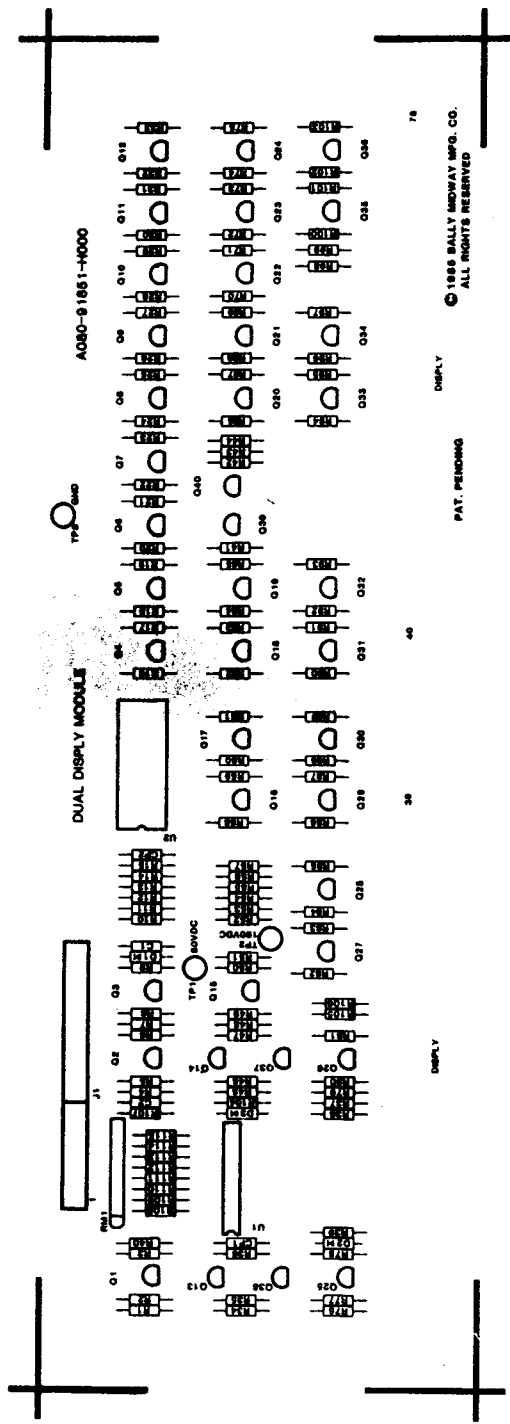
DALLY HIRSHY MFG. CO.
6880 PIVOTAL CONTROL, MOBILE
SCHEMATIC DRAWING
4864-91785-6000
9801-98C33-6004
SHEET 4 OF 7
REV

1100
1105
1110
1115
1120
1125
1130
1135
1140
1145
1150
1155
1160
1165
1170
1175
1180
1185
1190
1195
1200
1205
1210
1215
1220





NOTES:	BALLY MIDWAY MFG. CO.
R. KOHAN	6803 PINBALL CONTROL MODULE
	SCHEMATIC DRAWING
	A084-91786-6000
	M051-00C53-6004
	SHEET 7 OF 7
	REV



A080-91851-H000

DUAL DISPLAY MODULE

PIN BALL

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DEPLY

PAT. PENDING

DEPLY

THIS DWG IS CONFIDENTIAL & PROPERTY OF BALLY/MIDWAY MFG. CO.

DATE: 5/15/87
BY: [Signature]
CHECKED BY: [Signature]

DATE: 5/15/87

STATUS: FULL

Bally/MIDWAY MFG. CO.
FRANKLIN PARK, IL 60151

ASSEMBLY DRAWING
DUAL DISPLAY MODULE
A084-91851-H000

REL. FOR PRODUCTION 15/15/87

REVISIONS

PART NO.

MO.51-0-0.3.6.5-H0.3.3

DUAL DISPLAY MODULE
A084-91851-H000
M051-00365-H042 (Page 3 of 5) REV. 1

DUAL DISPLAY MODULE
A084-91851-H000
M051-00365-H042 (Page 2 of 5) REV. 1

DUAL DISPLAY MODULE
A084-91851-H000
M051-00365-H042 (Page 1 of 5) REV. 1

DESIGNATION LIST

DESIGNATION NO.	DESCRIPTION
C1	.01UF 500V CER.
C2	.100UF 50V AX. CER.
C21, CP2	.01UF 50V CER.
D1	1M110Z510 110V ZENER DIODE
D2-D3	1M4148 DIODE
Q1 - Q4	MPS-A-42 MPN XSTR
Q5	2N5401 PNP XSTR
Q6	MPS-A-42
Q7	MPS-A-42
Q8	MPS-A-42
Q9	2N5401
Q10 - Q21	MPS-A-42
Q22 - Q24	2N5401
Q25	MPS-A-42
Q26	MPS-A-42
Q27	2N5401
Q28	MPS-A-42
Q29 - Q35	MPS-A-42
Q36 - Q40	2N5401
U1	74HC373 CMOS OCTAL LATCH
U2	14514 1-16 DECODER
DISPLAY 1	14 DIGIT, 9 SEGMENT GAS DISCHARGE DISPLAY
J1	-025 SQ. PINS
TP1, TP2, TP3	TEST TAPES
	BUMPER
	DISPLAY MTG. CLIPS
	SCREWS
	DISPLAY MTG. PROCEDURE
	DUAL DISPLAY MODULE P.C.B.

DESIGNATION LIST

DESIGNATION NO.	DESCRIPTION
R89	100K 1/4W 1% METAL FILM
R90	100K 1/4W 1% METAL FILM
R61	9.1K 1/4W 5% CARBON
R62	9.1K 1/4W 5% CARBON
R63	100K 1/4W 5% METAL FILM
R64	9.1K 1/4W 5% METAL FILM
R65	100K 1/4W 5% METAL FILM
R66	100K 1/4W 5% METAL FILM
R67	100K 1/4W 5% METAL FILM
R68	9.1K 1/4W 5% CARBON
R69	100K 1/4W 5% METAL FILM
R70	100K 1/4W 5% CARBON
R71	2.2K 1/4W 5% CARBON
R72	300K 1/4W 5% CARBON
R73	2.2K 1/4W 5% CARBON
R74	300K 1/4W 5% CARBON
R75	2.2K 1/4W 5% CARBON
R76	1.5K 1/4W 5% CARBON
R77	820 OHM 1/4W 5% CARBON
R78	300K 1/4W 5% CARBON
R79	1.5K 1/4W 5% CARBON
R80	820 OHM 1/4W 5% CARBON
R81	300K 1/4W 5% CARBON
R82	300K 1/4W 5% CARBON
R83	2.2K 1/4W 5% CARBON
R84	100K 1/4W 5% METAL FILM
R85	9.1K 1/4W 5% CARBON
R86	300K 1/4W 5% CARBON
R87	2.2K 1/4W 5% CARBON
R88	300K 1/4W 5% CARBON
R89	300K 1/4W 5% CARBON
R90	300K 1/4W 5% CARBON
R91	2.2K 1/4W 5% CARBON
R92	300K 1/4W 5% CARBON
R93	300K 1/4W 5% CARBON
R94	300K 1/4W 5% CARBON
R95	300K 1/4W 5% CARBON
R96	300K 1/4W 5% CARBON
R97	2.2K 1/4W 5% CARBON
R98	1M 1/4W 5% CARBON
R99	1M 1/4W 5% CARBON
R100	300K 1/4W 5% CARBON
R101	2.2K 1/4W 5% CARBON
R102	100K 1/4W 5% METAL FILM
R103	9.1K 1/4W 5% CARBON
R104	150K 1/4W 5% CARBON
R105	10M 1/4W 5% CARBON
R106	1M 1/4W 5% CARBON
R107	10K 1/4W 5% CARBON
R108-R115	20K 1/4W 5% CARBON
RHI	100K 10 PIN SIP

DESIGNATION LIST

DESIGNATION NO.	DESCRIPTION
R1	1.5K 1/4W 5% CARBON
R2	820 OHM 1/4W 5% CARBON
R3	300K 1/4W 5% CARBON
R4	1.5K 1/4W 5% CARBON
R5	510 OHM 1/4W 5% CARBON
R6	300K 1/4W 5% CARBON
R7	1.5K 1/4W 5% CARBON
R8	820 OHM 1/4W 5% CARBON
R9	300K 1/4W 5% CARBON
R10 - R15	20K 1/4W 5% CARBON
R16	9.1K 1/4W 5% CARBON
R17	100K 1/4W 5% METAL FILM
R18	2.2K 1/4W 5% CARBON
R19	300K 1/4W 5% CARBON
R20	100K 1/4W 5% CARBON
R21	9.1K 1/4W 5% METAL FILM
R22	2.2K 1/4W 5% CARBON
R23	9.1K 1/4W 5% CARBON
R24	100K 1/4W 5% METAL FILM
R25	100K 1/4W 5% CARBON
R26	2.2K 1/4W 5% CARBON
R27	300K 1/4W 5% CARBON
R28	9.1K 1/4W 5% CARBON
R29	100K 1/4W 5% METAL FILM
R30	100K 1/4W 5% CARBON
R31	9.1K 1/4W 5% METAL FILM
R32	100K 1/4W 5% CARBON
R33	100K 1/4W 5% METAL FILM
R34	1.5K 1/4W 5% CARBON
R35	820 OHM 1/4W 5% CARBON
R36	300K 1/4W 5% CARBON
R37	1.5K 1/4W 5% CARBON
R38	1.5K 1/4W 5% CARBON
R39	1.5K 1/4W 5% CARBON
R40	100K 1/4W 5% CARBON
R41	100K 1/4W 5% CARBON
R42	1K 1/4W 5% CARBON
R43	1.5K 1/4W 5% CARBON
R44	300K 1/4W 5% CARBON
R45	1.5K 1/4W 5% CARBON
R46	820 OHM 1/4W 5% CARBON
R47	300K 1/4W 5% CARBON
R48	1.5K 1/4W 5% CARBON
R49	820 OHM 1/4W 5% CARBON
R50	300K 1/4W 5% CARBON
R51	100K 1/4W 5% METAL FILM
R52 - R57	2.2M 1/4W 5% CARBON
R58	9.1K 1/4W 5% CARBON

DUAL DISPLAY MODULE
A08A-91851-H000
M051-00365-H042 (Page 4 of 5) REV. 1

CROSS REFERENCE LIST

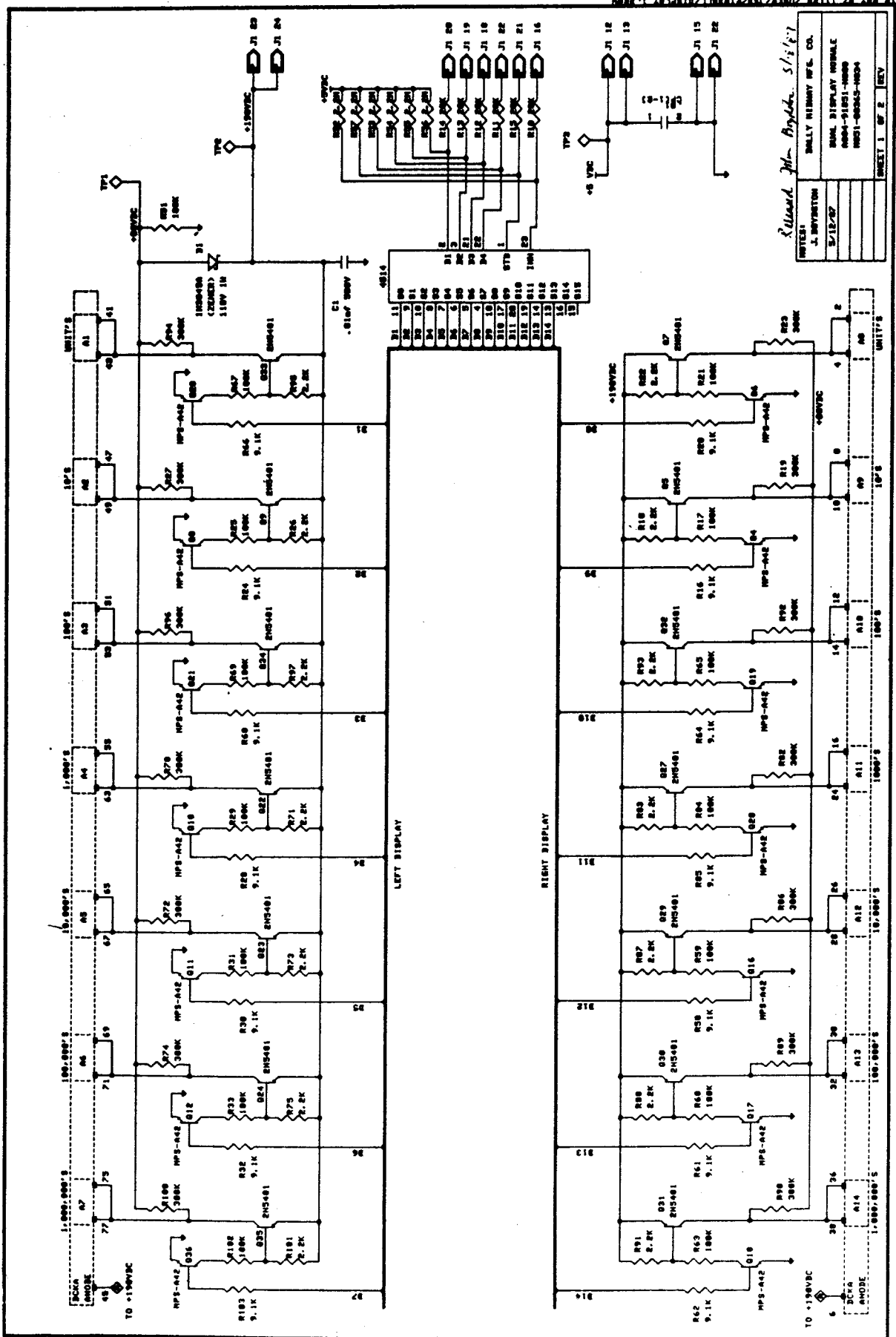
DESCRIPTION	QTY.	DESIGNATION NO.	PART NOS.
510 OHM 1/4W 5% CARBON	1	R5	100E-00005-0053
820 OHM 1/4W 5% CARBON	7	R2,R8,R35,R46 R49,R77,R80	100E-00005-0058
1K 1/4W 5% CARBON	2	R39,R42	100E-00005-0061
1.5K 1/4W 5% CARBON	10	R1,R4,R7,R34,R38 R43,R45,R48 R76,R79	100E-00005-0065
2.2K 1/4W 5% CARBON	14	R18,R22,R26,R71 R73,R75,R83,R87 R88,R91,R93,R95 R97,R101	100E-00005-0069
9.1K 1/4W 5% CARBON	14	R16,R20,R24,R28 R30,R32,R58,R61 R62,R64,R66,R68 R85,R103	100E-00005-0087
10K 1/4W 5% CARBON	1	R107	100E-00005-0088
20K 1/4W 5% CARBON	14	R10-R15,R108-R115	100E-00005-0095
100K 1/4W 5% CARBON	2	R40,R41	100E-00005-0115
100K 1/4W 1% METAL FILM	15	R17,R21,R25,R29 R31,R33,R51,R59 R60,R63,R65,R67 R69,R84,R102	100E-00001-0046
150K 1/4W 5% CARBON	1	R104	100E-00005-0120
300K 1/4W 5% CARBON	24	R3,R6,R9,R19,R23 R27,R36,R37,R44, R47,R50,R70,R72, R74,R78,R81,R82, R86,R89,R90,R92, R94,R96,R100	100E-00005-0127
1.0M OHM 1/4W 5% CARBON	2	R99,R106	100E-00005-0140
2.2M OHM 1/4W 5% CARBON	6	R52 - R57	100E-00005-0147
100K 10 PIN SIP	1	RM1	102E-00004-0045
10.0M OHM 1/4W 5% CARBON	2	R98,R105	100E-00005-0162
100PF AX. CER.	1	C2	0639-00800-0003
.01UF	2	CP1,CP2	0360-00800-0005
.01UF 500V	1	C1	0360-00800-0013
1N4148	2	D2,D3	103E-00002-0005
1M110ZS10 110V ZENER DIODE	1	D1	103E-00001-0028
2N5401 PNP XSTR	14	Q5,Q7,Q9,Q22,Q23 Q24,Q27,Q29,Q30 Q31,Q32,Q33,Q34 Q35	0360-00802-0006
MPS-A-42 NPN XSTR	26	Q1-Q4,Q6,Q8,Q10- Q21,Q25,Q26,Q28 Q36-Q40	0360-00802-0007
14514 1-16 DECODER	1	U2	0360-00803-0013
74HC373 OCTAL LATCH	1	U1	0365-00803-0015
.025SQ. PINS	23	J1	0304-00804-0009
14 DIGIT, 9 SEGMENT GAS DISCHARGE DISPLAY	1	DISPLAY 1	119E-00002-0006
TEST LOOPS	3	TP1 - TP3	0017-00007-0131

DUAL DISPLAY MODULE
A084-91851-H000
M051-00365-H042 (Page 5 of 5) REV. 1

CROSS REFERENCE LIST

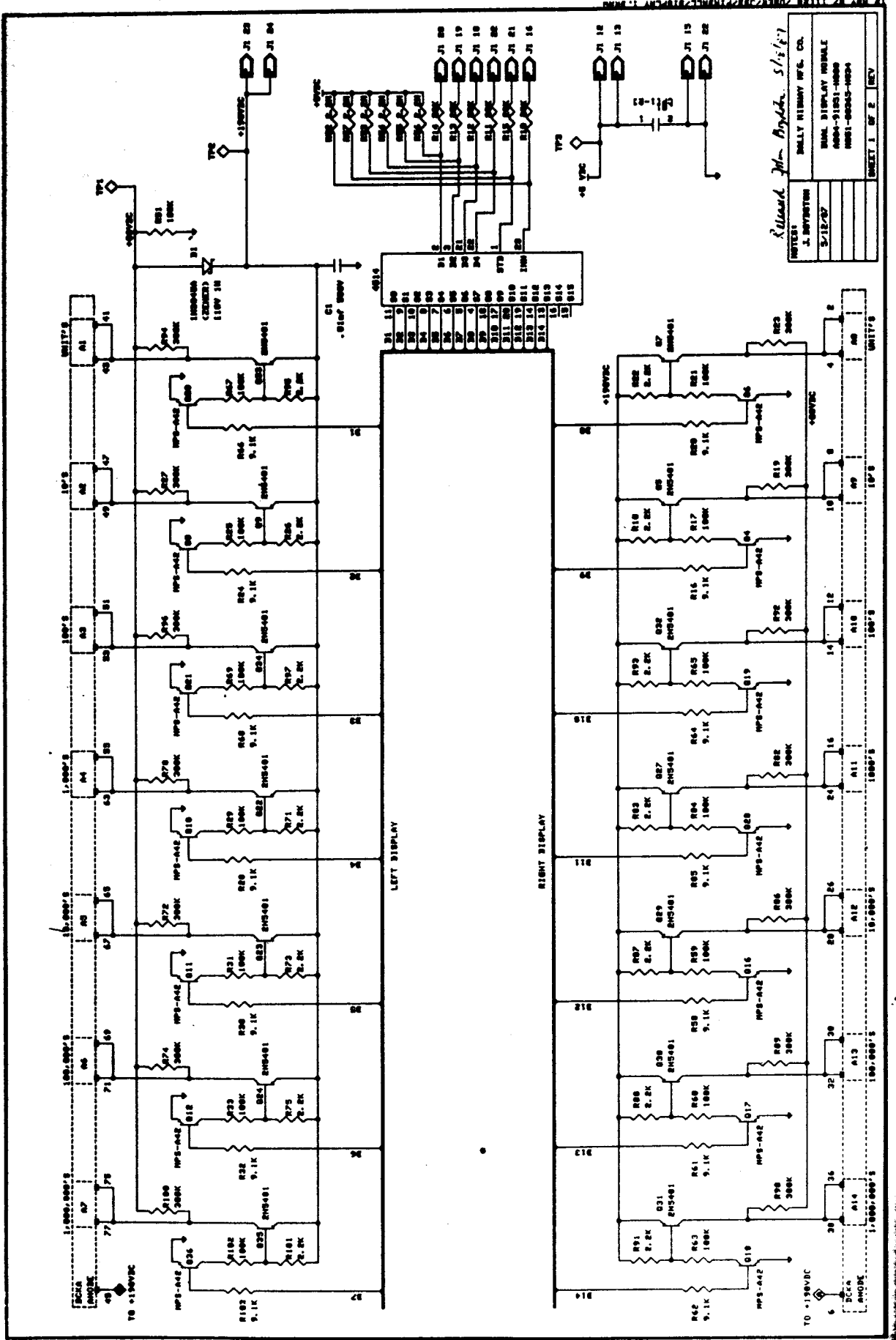
<u>DESCRIPTION</u>	<u>QTY.</u>	<u>DESIGNATION NO.</u>	<u>PART NOS.</u>
FOAM TAPE	2		0017-00081-0289
BUMPER	1		0017-00041-0598
DISPLAY MTG. CLIP	2		0365-00174-00XF
SCREW	2		0017-00101-0175
DISPLAY MTG. PROCEDURE	1		M051-00365-A041
DUAL DISPLAY MODULE PCB	1		A080-91851-H000

5/20/87 REV. 1 - CORRECTION TO DISPLAY MTG. PROCEDURE PART NO. *955*



Edward M. Boyle 5/15/57

UNIT'S	1	OF	2	REV
DESIGNED BY	J. ROYBOSTON			
DATE	5/15/57			
PROJECT	DUAL DISPLAY NORMAL			
	4804-9181-1000			
	MPSI-00045-1000			



REVISION
 J. HAYNES
 5/12/67
 SHEET 1 OF 2 REV

R. L. HULL, JR.
 FULLY HIRSHY WFG. CO.
 SERIAL DISPLAY BOARD
 4000-91001-10000
 4001-90045-10004

6803 PIMBALL POWER MODULE
A084-91785-D000
M051-00C53-D001

DESIGNATION LIST

<u>DESIGNATION</u>	<u>DESCRIPTION</u>	<u>DESIGNATION</u>	<u>DESCRIPTION</u>
C1	11.000uf 20V ELEC.	JW1	JW16
P/O C1	TY-WRAP	TP1	TP10
P/O C1	SOLDER LUG	F1*	5 AMP 3AG FUSE
P/O C1	WIRE 20AWG	F2	3/4 AMP 3AG FUSE
C2	160uf 350V ELEC.	F3	6 AMP 3AG FUSE
P/O C2	TY-WRAP	F4, F5	8 AMP 3AG FUSE
C3	2uf 25V ELEC.	F6, F7	15 AMP 3AG FUSE
C4, C5	.1uf 25V CER.	F8	3/16 AMP 8AG FUSE
C6, C7	.01uf 500V CER.	FC1A - FC3B, FC8A	FUSE CLIPS
R1	600 OHM 10W	FC8B	FUSE CLIPS
R2	100K 1W 5%	FC4A - FC7B	FUSE CLIPS
R3	2.2 OHM 1/4W 5%	J1	12 PIN M-N-L CONN. FEMALE
R4	100 OHM 1/2W 5%	J2	6 PIN M-N-L CONN. MALE
R5	22K 1/2W 5%	J3	15 PIN M-N-L CONN. MALE
R6	100K 1/4W 5%	J4	9 PIN M-N-L CONN. MALE
R7	390 OHM 1/4W 5%	J5	12 PIN M-N-L CONN. MALE
R8	1.2K 1/4W 5%	J6	2 PIN M-N-L CONN. MALE
R9	82K 1/2W 5%	6803	POWER MODULE
R10	8.2K 1/4W 5%		
VR1	0 - 25K 1/4W POT.		
01 - D4	MR751		
05 - D9	IM4004		
D10	IM5275A ZENER		
RR1	KRPC-35-02-W		
P/O RR1	BRIDGE SPACER		
01	2M35R4		
P/O 01	SHIELD		
P/O 01	HEX SPACER		
P/O 01	6-32 X 5 SCREW		
P/O 01	6-32 X 12 SCREW		
P/O 01	LOCKWASHER EXT.		
P/O 01	LOCKWASHER INT.		
P/O 01	FLAT WASHER		
P/O 01	6-32 HEX NUT		
P/O 01	LABEL - CAUTION HIGH VOLT.		
P/O 01	HEATSINK 2		
P/O 01	INSULATOR T0-66		
P/O 01	2N3440		
02, 03	INSULATOR T0-5		
P/O 02, 03	HEATSINK 3		
P/O 03	78H05C REG.		
U1	6-32 X 12 SCREW		
P/O U1	6-32 HEX NUT		
P/O U1	LOCKWASHER EXT.		
P/O U1	FLAT WASHER		
P/O U1	HEATSINK 1		
P/O U1	INSULATOR T0-3		
VA1	VARIATOR		

4-23-86 REV. 1.0 FIXED R2, R6

* TWO FLIPPER GAMES ONLY - SEE SCHEMATIC

6803 PINBALL POWER MODULE
A084-91785-D000
M051-00C53-D001

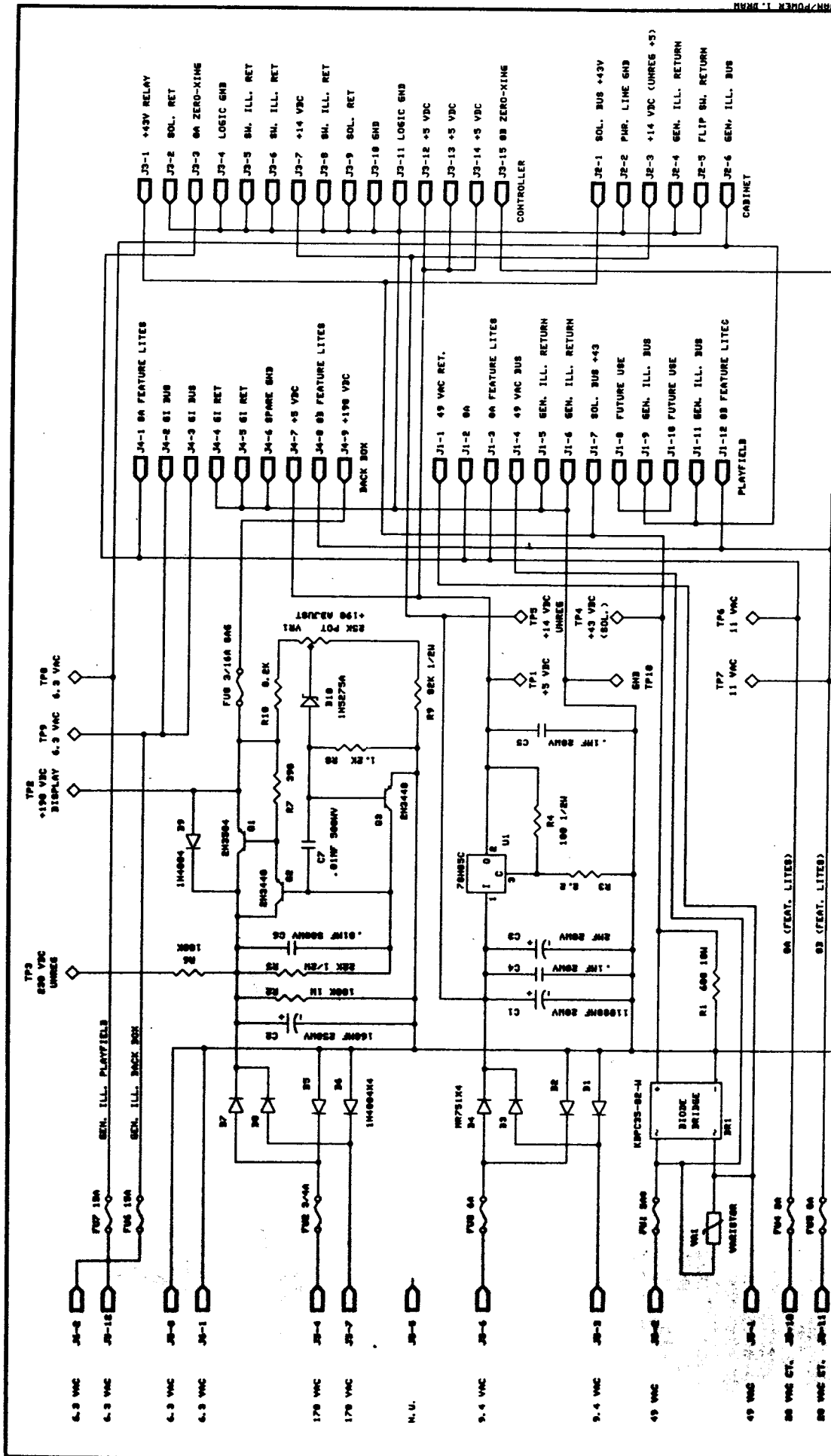
CROSS REFERENCE LIST

DESCRIPTION	QTY.	DESIGNATION NO.	PART NOS.
11UF 500V CER.	2	C6, C7	0360-00800-0013
1UF 25V CER.	2	C4, C5	0360-00800-0026
1UF 25V ELEC.	1	C3	0360-00800-0019
1UF 25V ELEC.	1	C2	0360-00800-0020
100UF 20V ELEC.	1	C1	0360-00800-0024
100HM 1/4W 5K	1	R3	100E-00005-0003
100HM 1/2W 5K	1	R4	100E-00006-0021
100HM 1/4W 5K	1	R7	100E-00005-0049
100HM 10W 10K	1	R1	100E-00002-0049
2K 1/4W 5K	1	R8	100E-00005-0063
2K 1/4W 5K	1	R10	100E-00005-0086
2K 1/2W 5K	1	R5	100E-00006-0065
2K 1/2W 5K	1	R9	100E-00006-0072
2K 1/4W 5K	1	R6	100E-00005-0115
2K 1W 5K	1	R2	100E-00007-0037
25K 1/4W POT	1	VR1	0360-00804-0004
7291	4	D1-D4	103E-00003-0016
84004	5	D5-D9	103E-00003-0005
8275	1	D10	103E-00001-0027
PC-35-02-W	1	RR1	103E-00005-0005
440	2	O2, O3	104E-00005-0002
3284	1	U1	0360-00803-0021
50M5C REG	1	VA1	112E-00001-0002
RESISTOR METAL OXIDE 60V	4	P/O C1, C2	0017-00042-0048
WRAP	16	JW1-JW16	117E-00001-0001
ZERO OHM RES. JUMPER	10	TP1-TP10	0017-00007-0131
1ST POINTS	2	P/O C1	0017-00021-0257
WIRE LUG	2	P/O C1	0017-00033-0448
WIRE WIRE 20AWG	1	P/O U1	0017-00042-0119
AMPLATOR T0-3	2	P/O O2, O3	0017-00042-0151
AMPLATOR T0-5	1	P/O O1	0017-00042-0158
AMPLATOR T0-66	2	P/O O1	0365-00952-0000
SPACER	1	P/O O1	112E-00001-0003
WASHER	1	P/O O1	112E-00001-0002
WASHER 2	1	P/O O3	118E-00001-0004
WASHER 3	1	P/O RR1	0017-00101-0132
EDGE SPACER	4	P/O O1, U1	0017-00101-0132
3/32 X 12 SCREW	2	P/O O1	0017-00101-0595
3/32 X 5 SCREW	4	P/O O1, U1	0017-00103-0005
3/32 HEX NUT	4	P/O O1	0017-00104-0008
LOCKWASHER INT.	4	P/O O1, U1	0017-00104-0009
LOCKWASHER EXT.	4	P/O O1, U1	0017-00104-0106
FLAT WASHER	4	P/O O1, U1	0017-00104-0106
FUSE CLIP	8	FC1A-FC3R, FC4A-FC7A	0017-00071-0033
FUSE CLIP	8	FC4A-FC7A	0017-00071-0034
3/16 AMP 8AG FUSE	1	F8	0017-00003-0206
3/4 AMP 3AG FUSE	1	F2	0017-00003-0010
5 AMP 3AG FUSE	1	F1*	0017-00003-0175
6 AMP 3AG FUSE	1	F3	0017-00003-0008

CROSS REFERENCE LIST

DESCRIPTION	QTY.	DESIGNATION NO.	PART NOS.
8 AMP 3AG FUSE	2	F4, F5	0017-00003-0387
15 AMP 3AG FUSE	2	F6, F7	0017-00003-0011
12 PIN M-N-L CONN. FEMALE	1	J1	0017-00021-0532
6 PIN M-N-L CONN. MALE	1	J2	0017-00021-0424
15 PIN M-N-L CONN. MALE	1	J3	0017-00021-0434
9 PIN M-N-L CONN. MALE	1	J4	0017-00021-0425
12 PIN M-N-L CONN. MALE	1	J5	0017-00021-0426
2 PIN M-N-L CONN. MALE	1	J6	0017-00021-0486
6803 POWER MODULE P.C.B.	1	A080-91785-D000	

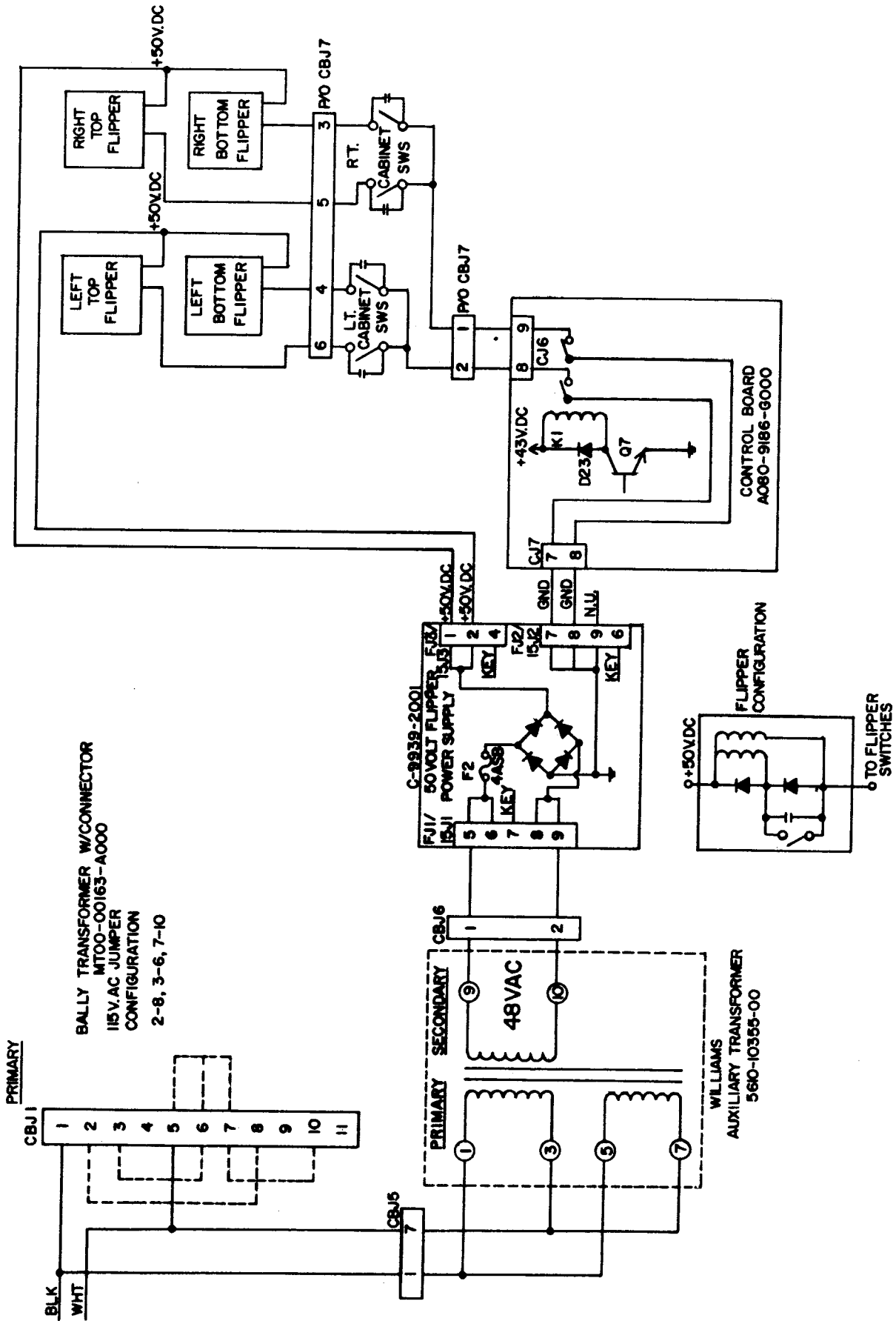
* TWO FLIPPER GAMES ONLY - SEE SCHEMATIC

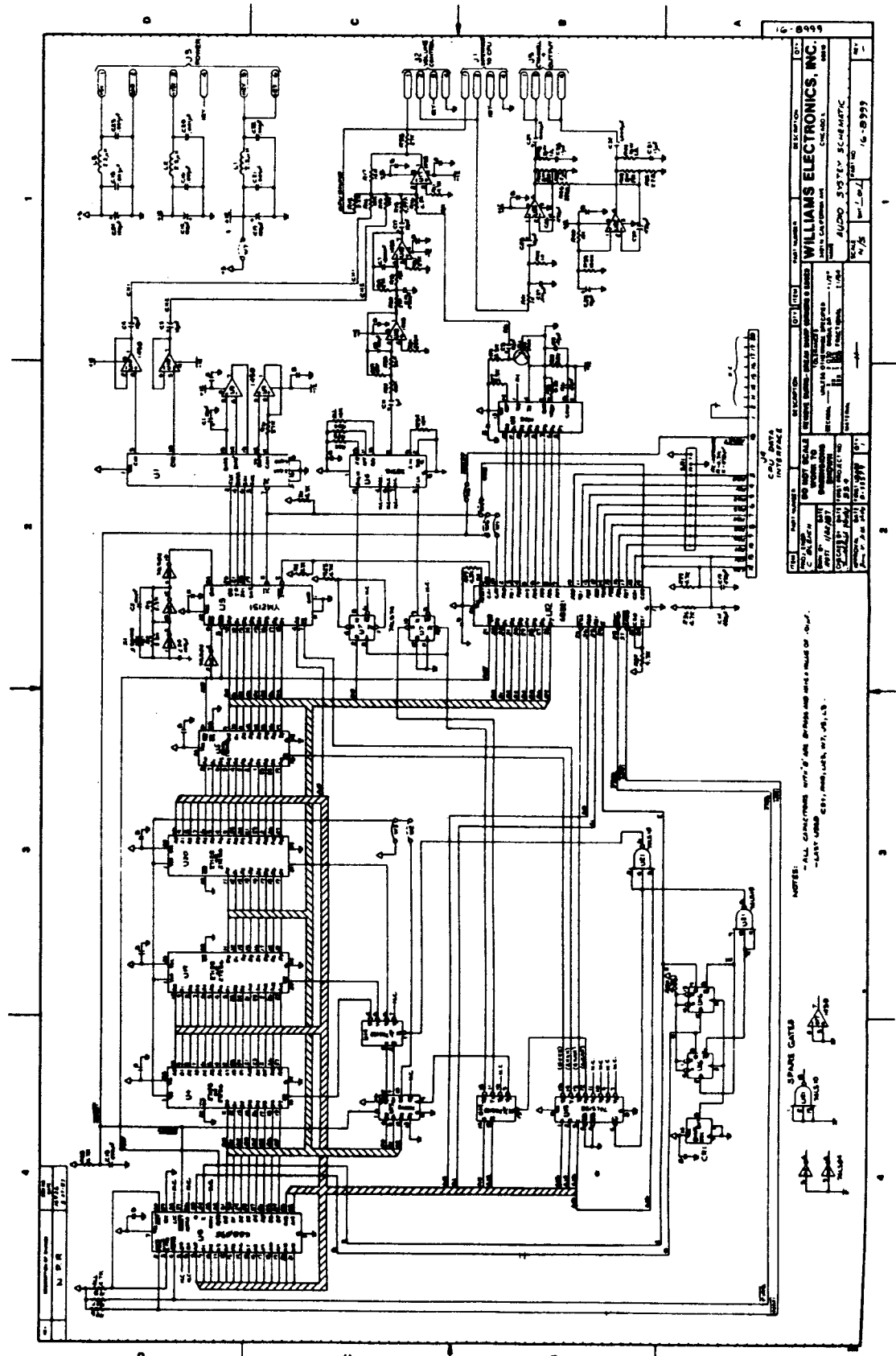


8/14/86 REV 1 CHANGED C6, C7 TO .01 UF. CMH

NOTES:
 R. KOHAN
 IBER
 03/11/86
 6003 PINBALL PUR MODULE
 SCHEMATIC DRAWING
 A884-91785-0000
 M851-06C33-0002
 SHEET 1 OF 1 REV

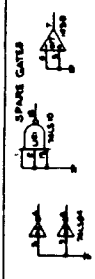
NOTE
 0 WHEN 2FLIPPERS ARE USED FUI SHOULD BE 6AMP
 WHEN 4FLIPPERS ARE USED FUI SHOULD BE 7AMP



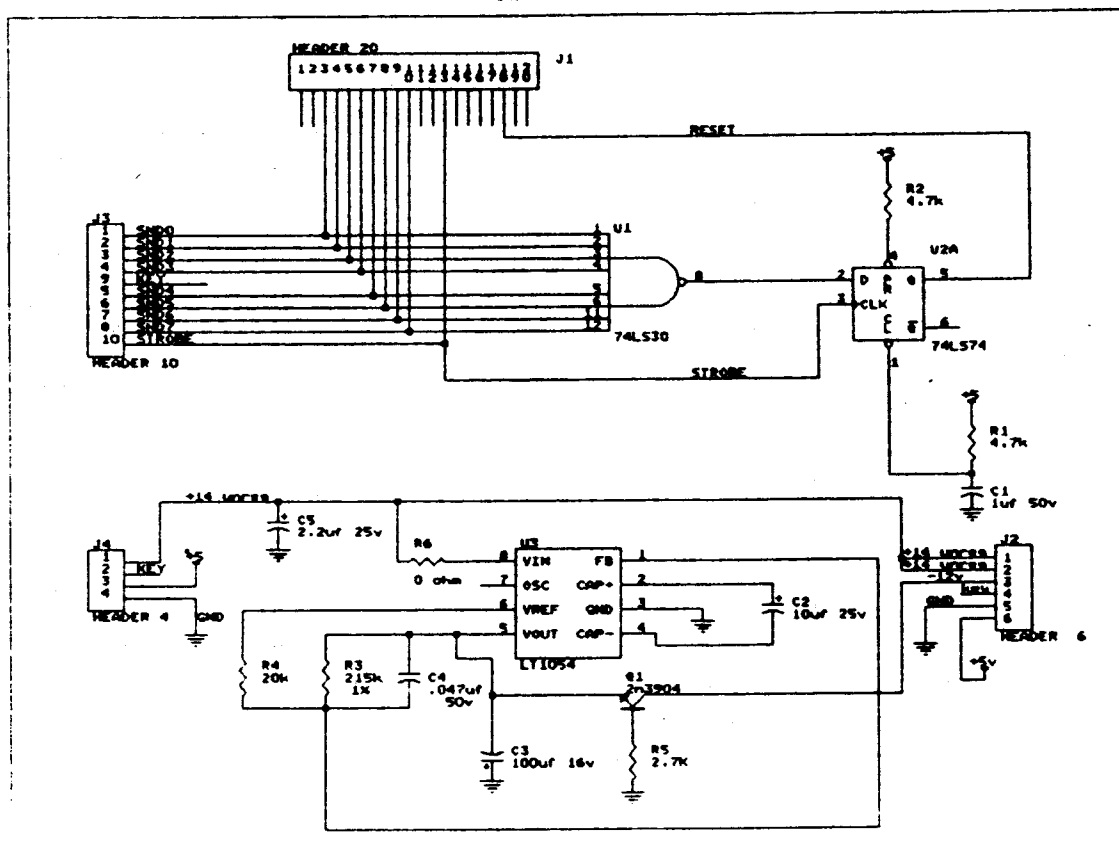
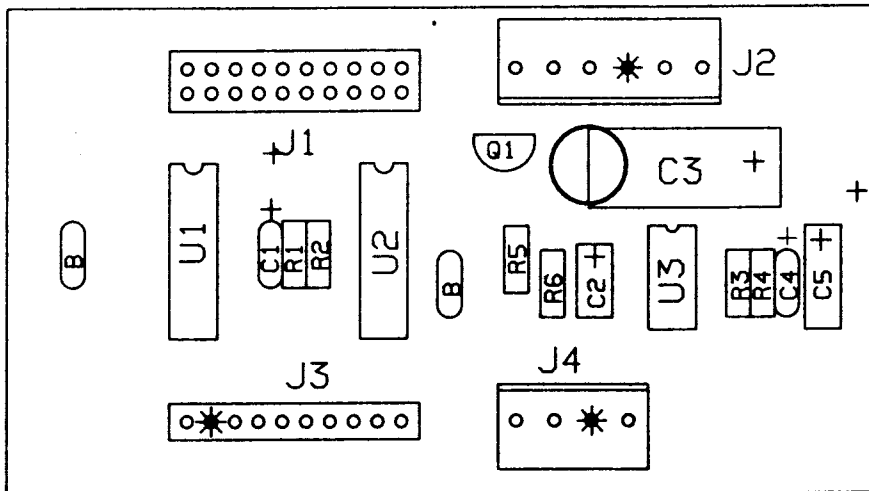


16-8999			
REV. NO.	1		
DATE	11/75		
BY	WJS		
CHECKED BY	WJS		
APPROVED BY	WJS		
DESIGNED BY	WJS		
DRAWN BY	WJS		
TESTED BY	WJS		
PROJECT NO.	16-8999		
PROJECT NAME	AUDIO SYSTEM SCHEMATIC		
COMPANY	WILLIAMS ELECTRONICS, INC.		
ADDRESS	1111 N. LA SALLE ST. CHICAGO, ILL. 60610		
TELEPHONE	(312) 467-1111		
FAX	(312) 467-1111		
TELEX	16-8999		
CITY	CHICAGO, ILL.		
STATE	ILL.		
COUNTRY	U.S.A.		
DESCRIPTION	AUDIO SYSTEM SCHEMATIC		
REVISIONS			
NO.	DATE	BY	DESCRIPTION
1	11/75	WJS	INITIAL SCHEMATIC

NOTES:
 - ALL CAPACITORS WITH 1/2 ARE 50V UNLESS OTHERWISE NOTED.
 - LAST USED 02/01/88, REV. 10/27/87.



Audio Board (D-11581) Schematic



ITEM	PART NUMBER	DESCRIPTION	QTY	ITEM	PART NUMBER	DESCRIPTION	QTY
PROJ ENGR		DO NOT SCALE WORK TO DIMENSIONS SHOWN		REMOVE BURRS - BREAK SHARP CORNERS & EDGES		WILLIAMS ELECTRONICS, INC.	
OWN BY		FIRST PROJECT NO		UNLESS OTHERWISE SPECIFIED		3421 N. CALIFORNIA AVE CHICAGO IL 60618	
CHECKED BY		FIRST USAGE		DECIMAL .X ± .030 ANGULAR ± 1/2°		NAME	
APPROVAL		QTY		XX ± .015 FRACTIONAL ± 1/64		SOUND INTERFACE ASSY	
				MATERIAL		SCALE	
						SHT OF	
						PART NO	
						REV	
						C-124-7	

REV	DESCRIPTION OF CHANGE	ESN AND DATE
-----	-----------------------	--------------

D

C

B

A

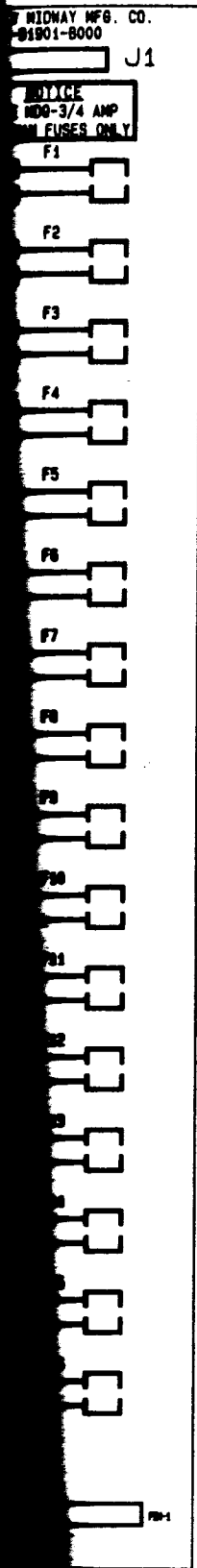
20	5010-09534-00	R6	0 OHM 1/4W	1
19	5010-08997-00	R5	2.7K OHM 1/4W	1
18	5160-10269-00	Q1	2N3904	1
17	5043-08980-00	B	CAP .01MF 50V axial	2
16	5768-12345-00	PCB	SMD INTERFACE PCB	1
15	5041-12360-00	C4	CAP .047MF 50V	1
14	5041-12358-00	C2	CAP 10MF 25V	1
13	5010-08991-00	R1, R2	RES 4.7K 1/4W	2
12	5013-12359-00	R3	RES 215K 1/4W 1%	1
11	5010-10985-00	R4	RES 20K 1/4W	1
10	5041-12361-00	C5	CAP 2.2MF 25V	1
9	5041-12357-00	C3	CAP 100MF 15V	1
8	5791-10862-06	J2	HEADER 6 PIN	1
7	5370-12356-00	U3	LT1054	1
6	5791-10862-04	J4	HEADER 4 PIN	1
5	5791-09437-00	J1	HEADER 20 PIN	1
4	5791-12362-00	J3	HEADER 10 PIN	1
3	5041-09031-00	C1	CAP 1MF 25V axial	1
2	5281-09487-00	U2	IC 74LS74	1
1	5281-10033-00	U1	IC 74LS30	1
ITEM	PART NO.	PART DESIGNATION	DESCRIPTION	QTY
BILL OF MATERIALS				

BRUNING AU 51003 310724

BRIGHT LIGHT FUSE BOARD
 A084-91901-B000
 M051-00114-B211

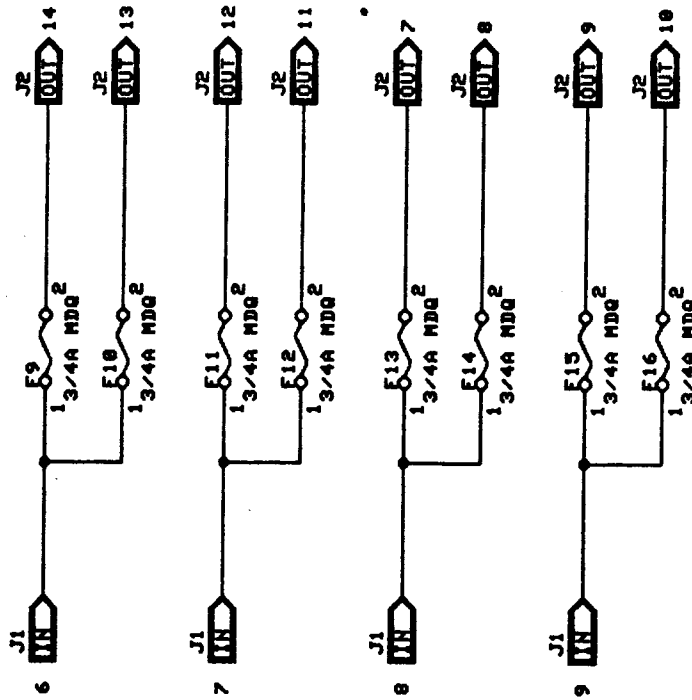
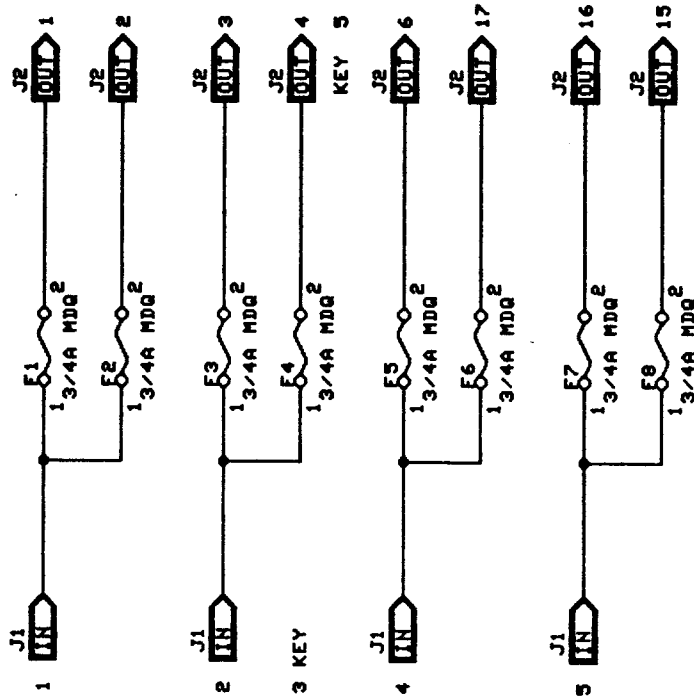
CROSS REFERENCE/DESIGNATION LIST

DESCRIPTION	QTY	DESIGNATION	PART NUMBER
AUTO INSERT PINS .025	8	J1	0304-00804-B000
AUTO INSERT PINS .025	16	J2	0304-00804-B000
PCB FUSE CLIPS	32	F1-F16	0017-00071-0034
BRIGHT LIGHT FUSE BOARD	1	PCB	A084-91901-B000



*Released for Production
 988 2/4/88*

PROJECT ENG: J. BOYDSTON		USED ON 0365		BALLY/MIDWAY MFG	
DO NOT SCALE DWS.		HEAT TREAT	SCALE FULL	FRANKLIN PARK ILL.	
TOLERANCES DECIMAL +/- .005 HOLE DIA. +.002-.004	DRW. D.B.S.	MATL. .062" FR-4	ASSEMBLY DRAWING BRIGHT LIGHTS FUSE PCB		PART NO. M051-00114-B
	DATE 01/18/88	FINISH			



10-33

Released for production JBB 2/1/88

NOTES:	BALLY MIDWAY MFG. CO.
J. BOYDSTON	BRIGHT LIGHTS FUSE PCB
02-04-88	A084-91901-3000
	M051-00114-3212
	SHEET 1 OF 1 REV

SOLID STATE RELAY
A084-91878-A000
M051-00114-A174

DESIGNATION LIST

DESIGNATION NO.

C1 .1UF 50V AX. CER. CAP
C2 .1UF 400V POLYESTER CAP
R1 100 OHM 1/4W 5%
R2 180 OHM 1/4W 5%
R3 1.8K 1/4W 5%
Q1 T2322 TRIAC
U1 MOC3031 OPTO COUPLER
J1 KK156 MACHINE INSERT PINS
CABLE CONNECTION
P.C. MTG. HARDWARE
J2 P.C. BOARD
PCMH1-PCMH4
A080-91878-A000

CROSS REFERENCE LIST

DESCRIPTION
.1UF 50V AX. CER.
.1UF 400V POLYESTER
100 OHM 1/4W 5%
180 OHM 1/4W 5%
1.8K 1/4W 5%
T2322 TRIAC
MOC3031 OPTO COUPLER
KK156 PLUS
CABLE CONNECTION
P.C. MTG. HDR W
P.C. BOARD

QTY.

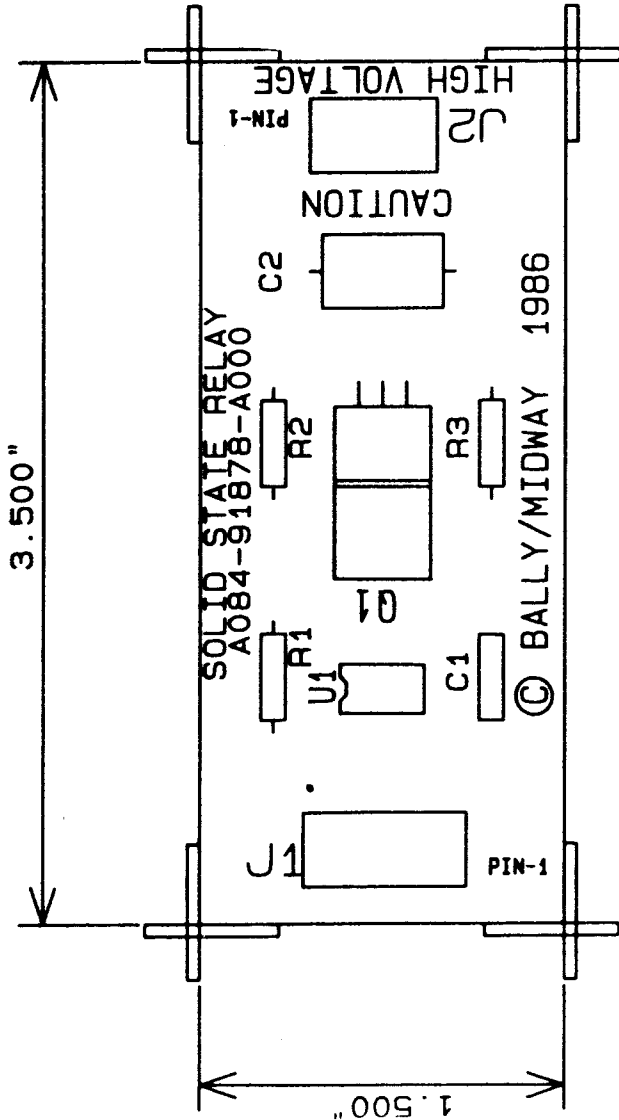
1
1
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3
1
4
1

DESIGNATION NO.

C1
C2
R1
R2
R3
Q1
U1
J1
J2
PCMH1-PCMH4
-

PART NOS.

0C68-00800-0005
0E35-00800-0001
100E-00005-0033
100E-00005-0039
100E-00005-0067
0365-00804-0019
120E-00002-0002
0304-00804-0010
A639-00024-0000
0017-00042-0320
A080-91878-A000



Revised 12-2-86 RK

BALLY MIDWAY MFG. CO.

ASSEMBLY DRAWING
SOLID STATE RELAY PC
A084-01878-A000

M051-00114-A173

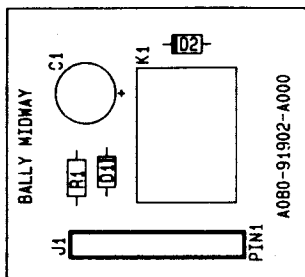
J.S.
10/17/86
FR-400

AUX COIL DRIVE
A080-91902-A000
M051-00114-A214

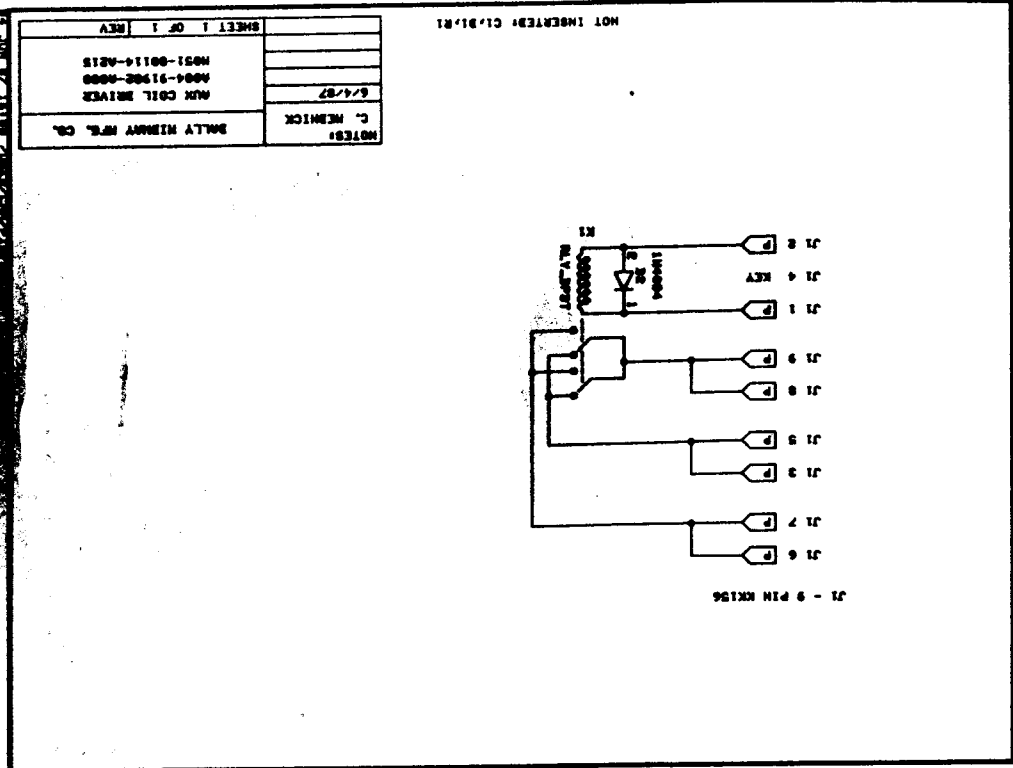
CROSS REFERENCE LIST

DESCRIPTION	QTY.	DESIGNATION NO.	PART NO.
1N4004 DIODE	1	D2	103E-00003-0005
.045 SQ. PIN RELAY	8	J1	0304-00804-0010
	1	K1	114E-00001-0011
NOT INSERTED	3	C1, O1, R1	
AUX COIL DRIVER PCB	1		A080-91902-A000

6/4/87 - Released for Production. CMH



<i>BALLY MIDWAY MFG. CO.</i>	
PROJECT ENG. C. MEDNICK	D.B.S. 05/28/87
ASSEMBLY DRAWING AUX. COIL DRIVER BD.	
M051-00114-A213	



NOTES:	C. MEDNICK
	6/4/87
AUX COIL DRIVER	
M051-00114-A213	
M051-00114-A213	
SHEET 1 OF 1 REV	

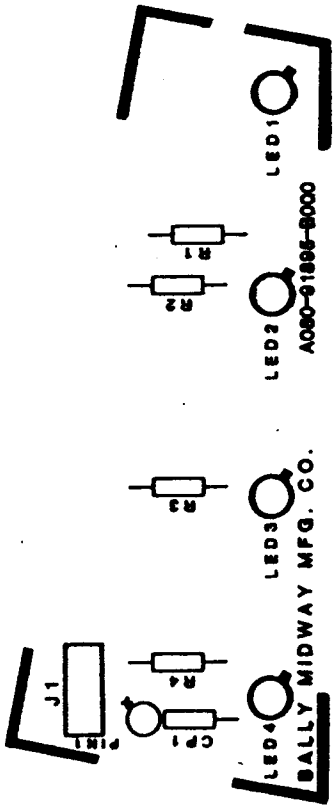
4-POS EMITTER
 A084-91895-8000
 M051-00114-B205 (REV. 1)

CROSS REFERENCE LIST

DESCRIPTION	QTY.	DESIGNATION NO.	PART NOS.
10MF CAP AX. TANT	1	CPI	0986-00800-3400
68 OHM 1/2W 5%	4	R1-R4	100E-00006-0020
MLED 930 IR EMIT DIODE	4	LED 1- LED 4	119E-00003-0004
HEADER KK100 4 PIN OMIT #2	1	J1	0017-00021-1878
4 POS. EMITTER PCB	1		A080-91895-8000

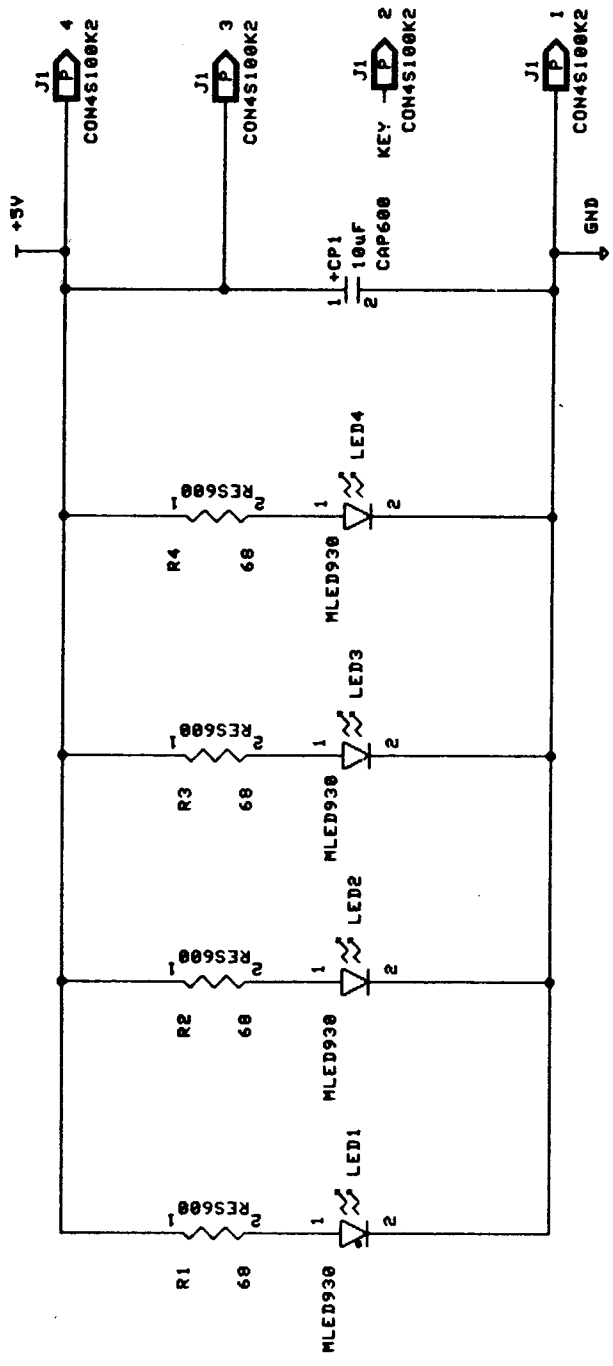
8/3/87 - RELEASED FOR PRODUCTION JBB
 8/6/87 - REV. 1 Conn. Chng. JBB

JBB



10-36

PROJECT ENG: J. BOYDSTON		HEAT TREAT	
DO NOT SCALE DWG.		SCALE FULL	
DIM. TOLERANCES UNLESS SPECIFIED		NO. REQ'D 1 PER	
DRILL DBS	MAT'L.	USED ON OH06	
CONCENTRICITY T.I.R. 003	FINISH	REVISIONS	
FRACTIONAL 1/64		New Release <i>JBB</i>	
DECIMAL .005		8/3/87	
HOLE DIA. ±.002 ±.000 MAT'L			
ASSEMBLY DRAWING		Bally / MIDWAY MFG. CO.	
4-POS. EMITTER PCB		FRANKLIN PK. ILL.	
(A084-91895-B000)		PART NO.	
		M051-00114-B204	



NOTES:

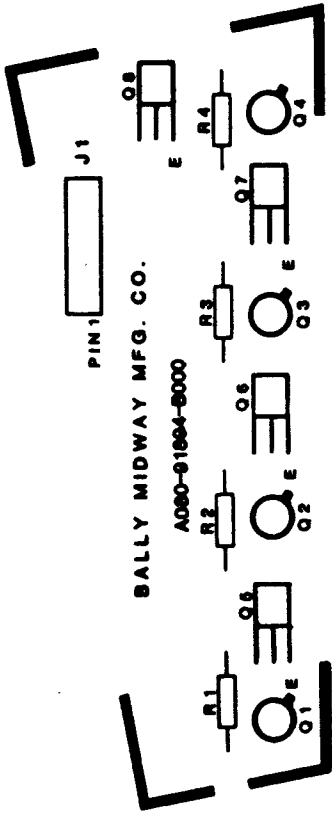
8/3/87	BALLY MIDWAY MFG. CO.
J. BOYDSTON	4 POSITION EMITTER PCB
	0804-91895-0000
	M051-00114-0206
	SHEET 1 OF 1 REV

4-POS. DETECTOR
 A084-91894-B000
 M051-00114-B202 (REV. 1)

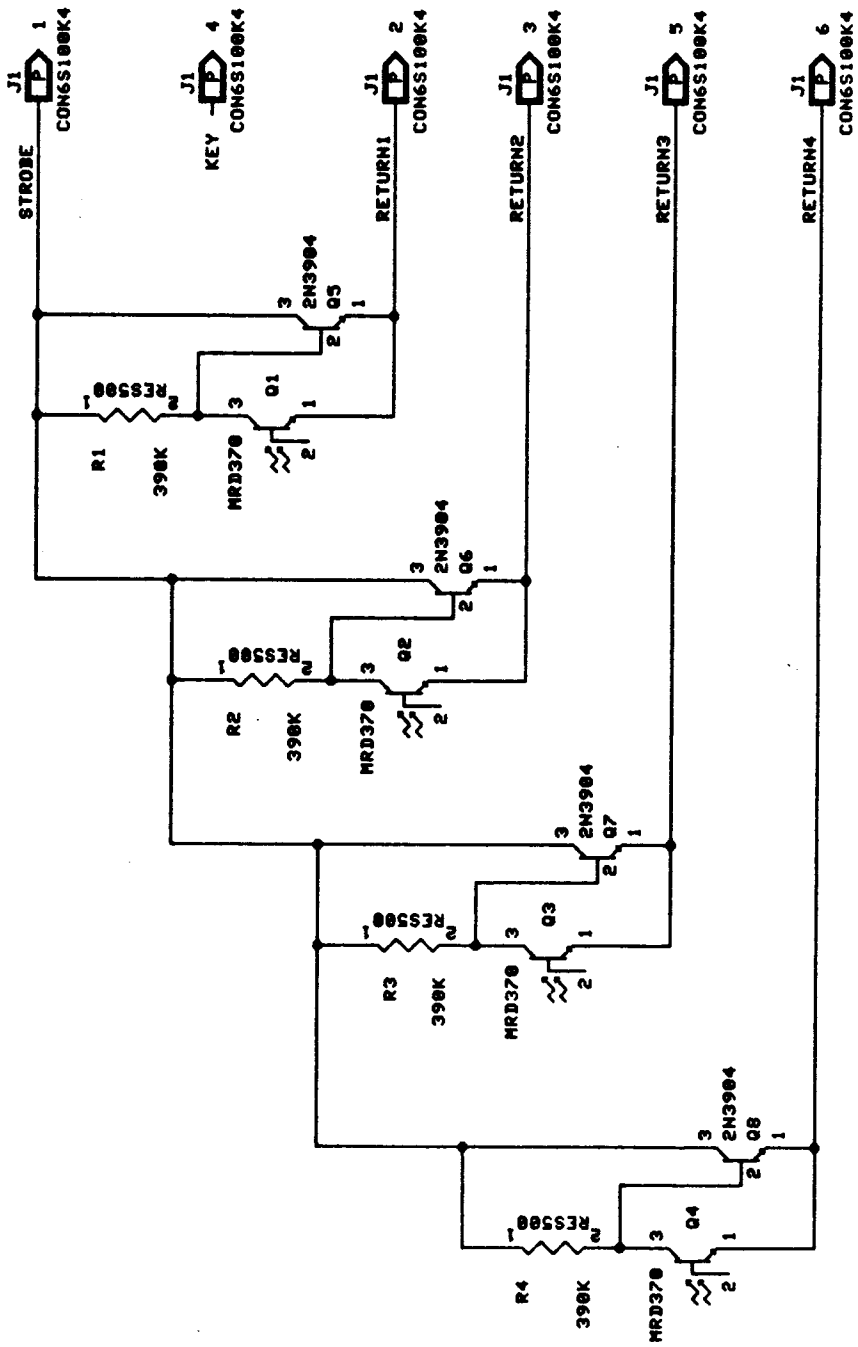
CROSS REFERENCE LIST

DESCRIPTION	QTY.	DESIGNATION	PART NOS.
390K OHM 1/4W 5%	4	R1-R4	100E-00005-0130
2N3904 MPN XSTR	4	Q5-Q8	104E-00001-0006
MRD370 PHOTO XSTR	4	Q1-Q4	119E-00003-0001
HEADER KK100 6 PIN OMIT #4	1	J1	0017-00021-1848
4-POS. DETECTOR PCB	1		A080-91894-B000

8/3/87 - RELEASED FOR PRODUCTION JBB
 8/6/87 - REV. 1 Conn. Chng. JBB

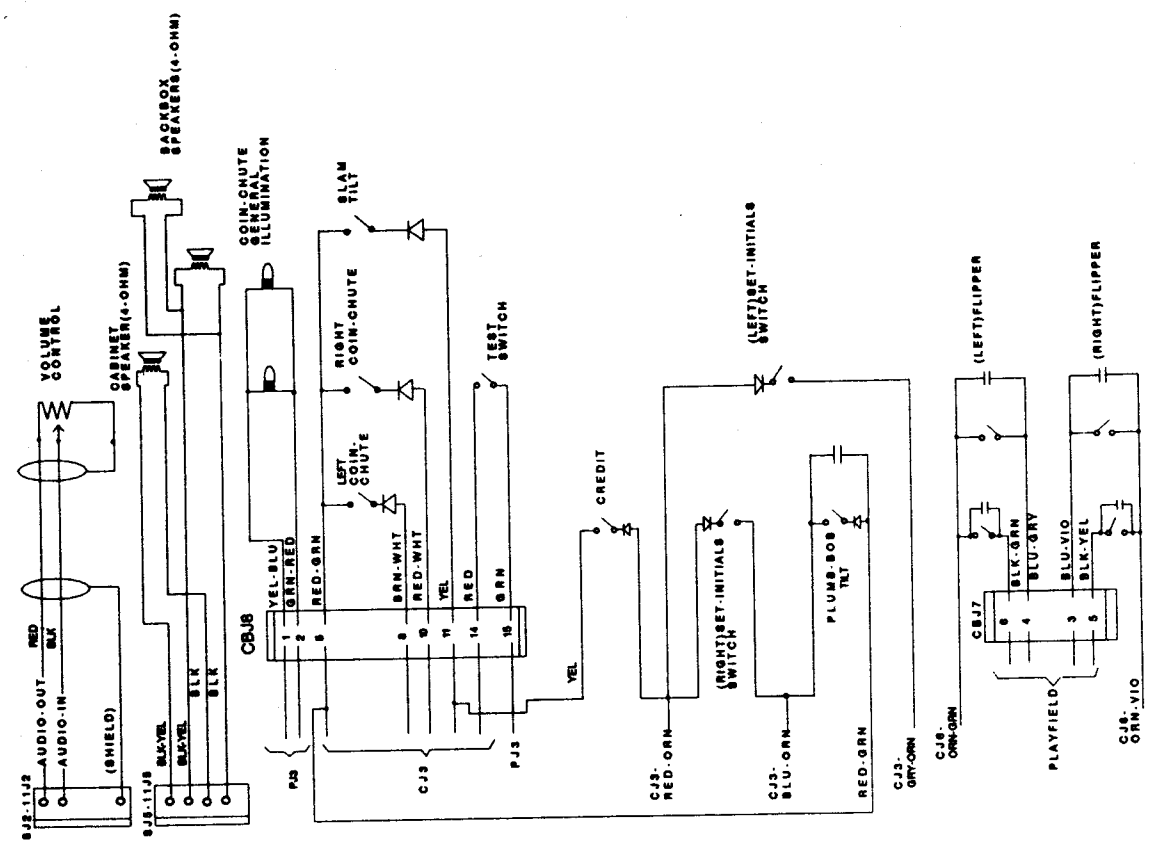


PROJECT ENG: J. BOYDSTON		USED ON OH06	
DO NOT SCALE DWG.		NO. RECD 1 PER	
DIM. TOLERANCES UNLESS SPECIFIED		SCALE FULL	
CONCENTRICITY T.I.R. .003		ASSEMBLY DRAWING	
FRACTIONAL 1/64		4-POS. DETECTOR PCB	
DECIMAL005		(A084-91894-B000)	
HOLE DIA. +.002 - .000		PART NO. M051-00114-B201	
DATE 8/13/87		REVISIONS	
DRG. DBS		B	
CHK. [Signature]		New Release JBB	
DATE 8/13/87		9/5/87	
PART NO. M051-00114-B201		REVISIONS	
MIDWAY MFG. CO.		FRANKLIN PK. ILL.	



NOTES:	BALLY MIDWAY MFG. CO.
	8/3/87
	J. BOYDSTON
	4 POSITION DETECTOR PCB
	A084-91894-2000
	M851-00114-2203
	SHEET 1 OF 1 REV

Truck Stop Cabinet Wiring

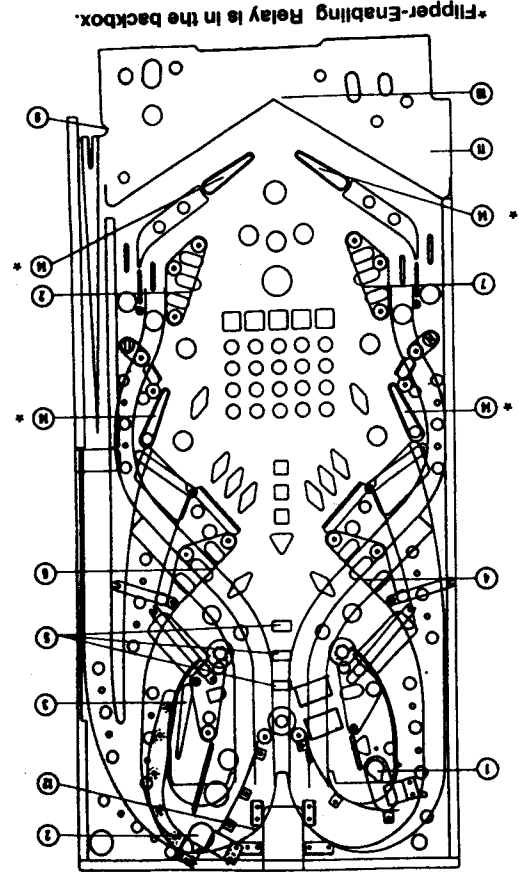


Playfield Coils

Coil Table including Flipper Coils

Coil No.	Solenoid Description	Solenoid Color	Wire Color	Connections	Solenoid Part No.
01	Left Flipper	Momentary	White-Red	CJB-1	A365-00097-0026
02	Right Flipper	Momentary	Yellow-White	CJB-4	A365-00097-0010
03	Right Kicker (Dook)	Momentary	Yellow-Blue	CJB-2	A365-00097-0010
04	In-Line Target Reset	Momentary	Blue-White	CJB-6	A365-00097-0018
05	Left, Top Slingshot	Momentary	Blue-Orange	CJB-7	A365-00097-0029
06	Left, Bottom Slingshot	Momentary	Yellow-Brown	CJB-5	A365-00097-0029
07	Right, Top Slingshot	Momentary	Yellow-Red	CJB-1	A365-00097-0029
08	Right, Bottom Slingshot	Momentary	Yellow-Green	CJB-3	A365-00097-0029
09	Ball Eject	Momentary	White-Brown	CJB-8	A365-00097-0029
10	Knocker	Momentary	White-Black	CJB-9	A365-00097-0029
11	Lane Steering*	Continuous	White-Gray	CJB-11	A365-00044-0000
12	88 Relay Bd (Backbox)*	Continuous	Yellow-Violet	CJB-10	A365-00044-0000
13	Flipper-Enabling Relay*	Continuous	Blue-Green	CJB-7	A365-00087-0027
14	Not Used	Continuous	Gray-White	CJB-10	A365-00087-0027
15	Not Used	Momentary	White-Blue	CJB-2	114E-00001-0011
16	Not Used	Momentary	White-Yellow	CJB-3	-
17	Not Used	Momentary	White-Green	CJB-4	-
18	Not Used	Momentary	White-Orange	CJB-7	-
19	Not Used	Continuous	Brown-Violet	CJB-9	-

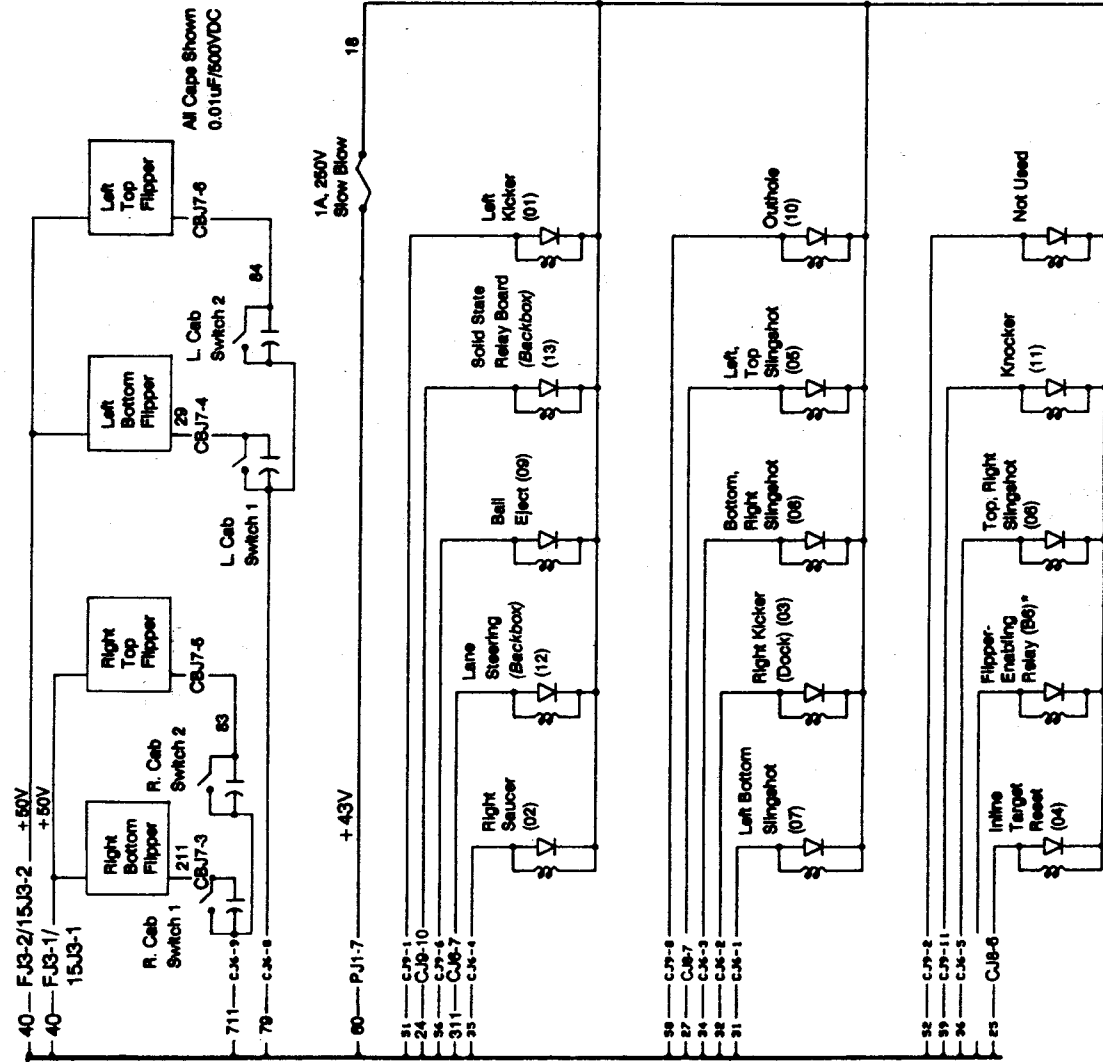
NOTES:
 -To use continuous solenoid 12, install jumper JW10. Remove jumper JW11.
 -To use continuous solenoid 19, install jumper JW8. Remove jumper JW9.
 -To use switch stubs at CJB-01, install jumper JW8. Remove jumper JW9.
 -To use switch stubs at CJB-19, install jumper JW11. Remove jumper JW10.
 -Coils with asterisk (*) are on the playfield backboard or in the backbox.
 -Apply heatshink 132-0001-0047 and compound 0017-00009-0204 to drivers O11, O13, O16, O17 and O18. Spread the thermal compound on the back and upper tab area of each translator.



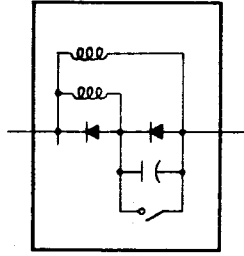
Playfield Coil Location Drawing

Cabinet Wiring

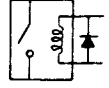
*Flipper-Enabling Relay is in the backbox.



Flipper Configuration



Flipper Enabling Relay (14)



Control Board (Backbox)

COLOR CODE

10- RED
20- BLUE
30- YELLOW
40- GREEN
50- WHITE
60- BROWN
70- ORANGE
80- BLACK
90- GRAY
110- VIOLET

SOLENOIDS

PROTBY:
M. STONE
3/22/88

HITWAY MFG. CO.

**TRUCK STOP
COIL WIRING**

SHEET 1 OF 3 REV A

Phase "A" and "C" Lamp Table

CJ10-01 Red-Blue Left C-1 (1)	CJ10-18 Green-Yellow Left T-1 (17)	CJ11-13 Orange-Yellow Left Y-1 (25)	CJ11-01 Green-Black Bright #1* (33)	CJ13-12 Green-Black L. Spin (41)
CJ10-07 Blue-Green C-2 (2)	CJ10-04 Red-White T-2 (10)	CJ11-10 Brown-Black Y-2 (26)	CJ13-01 Black-Red Bright #2* (34)	CJ13-04 Black-White Spin (42)
CJ10-18 Yellow-Black C-3 (3)	CJ11-08 Brown-Green T-3 (11)	CJ11-03 White-Gray Y-3 (27)	CJ13-08 Gray-Yellow Bright #3* (35)	CJ13-05 Black-White Left (43)
CJ10-02 Red-Yellow C-4 (4)	CJ11-18 Orange-Black T-4 (12)	CJ11-14 Orange-Green Y-4 (28)	CJ13-06 Black-Orange Bright #4* (36)	CJ13-11 Gray-White Right (44)
CJ10-08 Blue-White R. C-5 (5)	CJ11-06 Brown-Blue Right T-5 (21)	CJ11-08 Brown-Orange Right Y-5 (29)	CJ13-02 Black-Yellow Bright #5* (37)	CJ13-07 Gray-Red Jeopardy (45)
CJ10-17 Green-Red Diamond (6)	CJ11-12 Orange-Blue T-Ramp Diamond (22)	CJ11-02 White-Black Y-Ramp Diamond (30)	CJ13-13 Gray-Orange Bright (38)	
CJ10-03 Red-Gm C-Ramp Ltr (7)	CJ11-11 Orange-Red L-Ramp Letter (23)	CJ11-16 Orange-White L-Ramp Letter (31)	CJ13-05 Black-Brown Bright (39)	
CJ10-09 Blue-Brown SPSA (8)	CJ11-04 Brown-Red Look (24)	CJ11-07 Brown-Yellow Release (32)	CJ13-03 Black-Green Bright (40)	

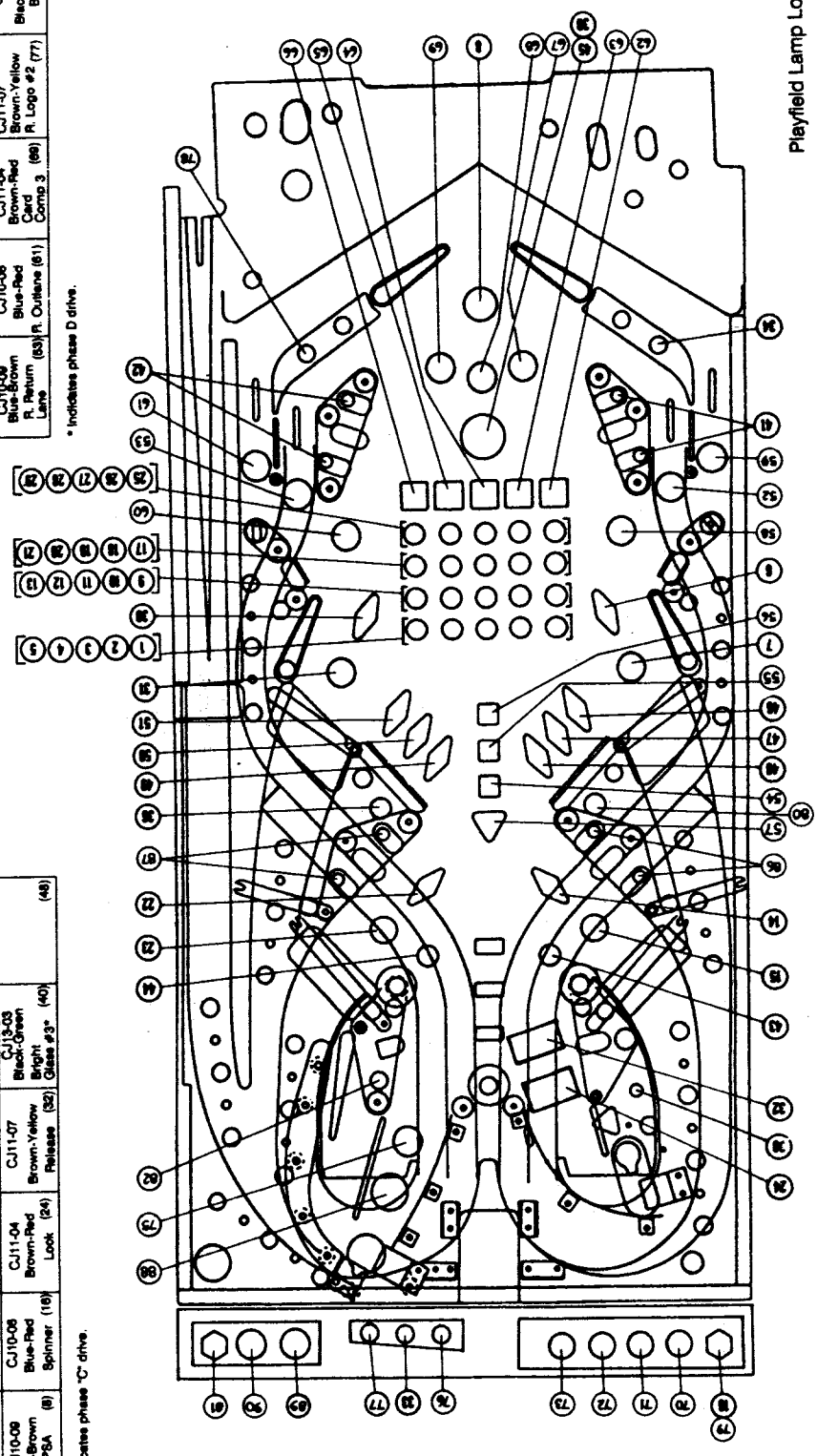
* Indicates phase "C" drive.

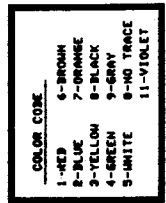
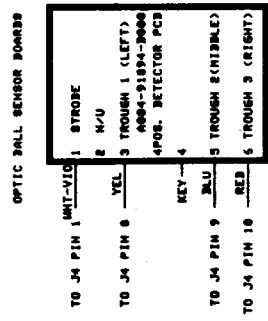
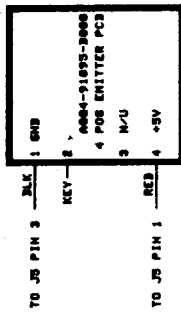
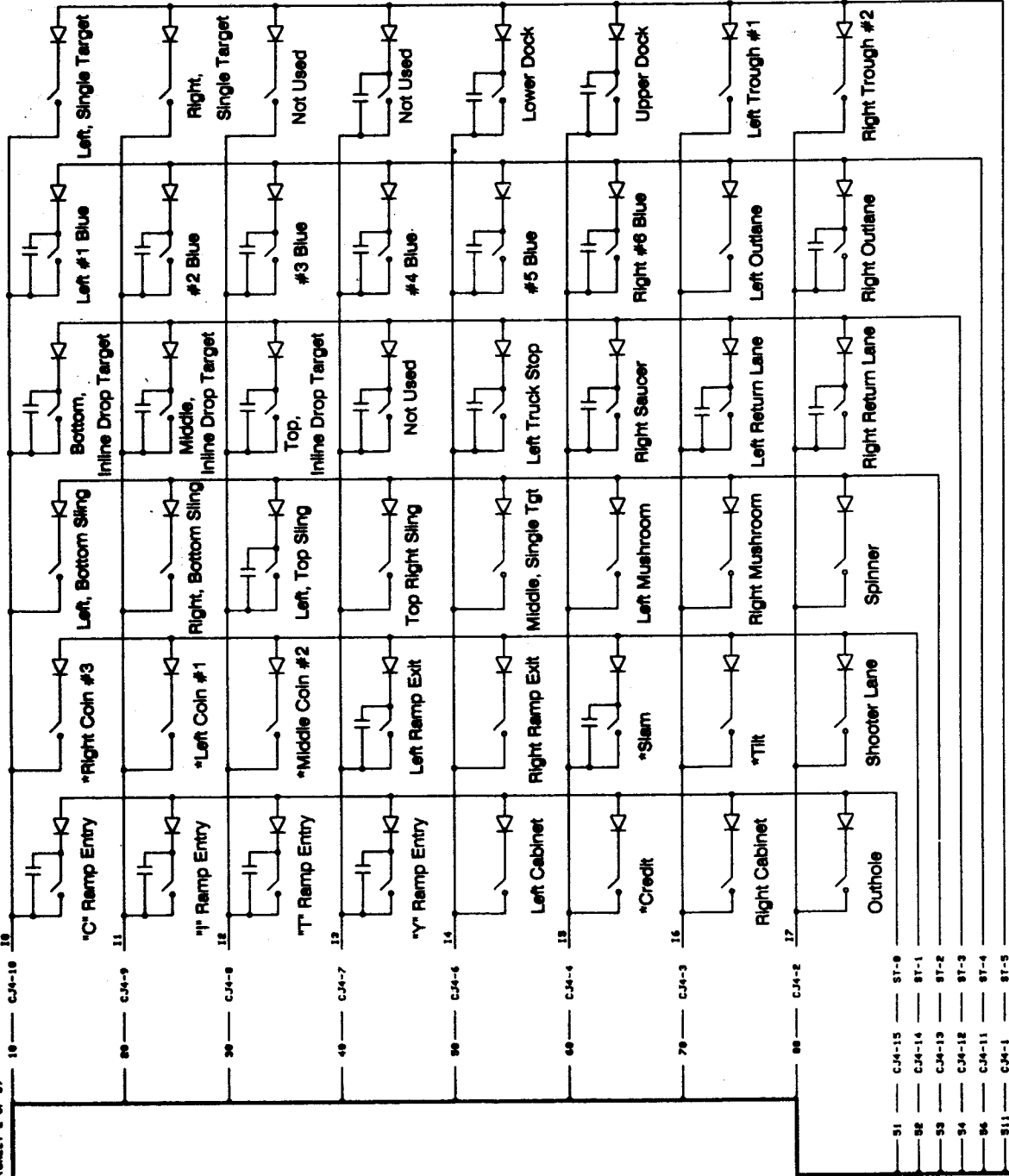
Phase "B" and "D" Lamp Table

CJ10-01 Red-Blue L. Blue #1 (48)	CJ10-18 Green-Yellow TX Bonus Multiplier (54)	CJ10-10 Blue-Black Los Angeles (62)	CJ11-13 Orange-Yellow L. Spinner #1 (70)	CJ13-01 Green-Black Bright (78)	CJ13-12 Green-Red Left Top (86)
CJ10-07 Blue-Green Blue #2 (47)	CJ10-11 Red-White TX Bonus Multiplier (55)	CJ10-13 Yellow-Black Denver (63)	CJ11-10 Brown-Black Spinner #2 (71)	CJ13-02 Black-Red Back Bright (79)	CJ13-10 Gray-Green Right Top (87)
CJ10-16 Yellow-Black Blue #3 (46)	CJ10-11 Yellow-Red TX Bonus Multiplier (56)	CJ11-08 Brown-Green Dallas (64)	CJ11-03 White-Gray Spinner #3 (72)	CJ13-09 Gray-Yellow Blue Light (80)	CJ13-04 Black-White Top Ball (88)
CJ10-02 Red-Yellow Blue #4 (49)	CJ10-18 Green-White TX Bonus Multiplier (57)	CJ11-16 Orange-Black Chicago (65)	CJ11-14 Orange-Green R. Spinner #4 (73)	CJ13-05 Black-Orange Bright #4* (81)	CJ13-11 Gray-White L. Look #1 (89)
CJ10-08 Blue-White Blue #5 (50)	CJ10-06 Red-Black Left Target (58)	CJ11-09 Brown-Blue New York (66)	CJ11-09 White-Black New York (74)	CJ13-06 Black-Yellow Bright (82)	CJ13-07 Gray-Red R. Look #2 (90)
CJ10-17 Green-Red R. Blue #6 (51)	CJ10-12 Yellow-Orange Card Comp 1 (59)	CJ11-12 Orange-Blue Card Comp 1 (67)	CJ11-02 White-Black Spot Letter Saucer (75)	CJ13-13 Gray-Orange Back #6 (83)	
CJ10-03 Red-Gm L. Return Lamp (52)	CJ10-14 Yellow-Blue R. Target (60)	CJ11-11 Orange-Red Card Comp 2 (68)	CJ11-15 Orange-White L. Logo #1 (76)	CJ13-08 Black-Brown Bright* (84)	
CJ10-09 Blue-Brown R. Return Lamp (53)	CJ10-06 Blue-Red R. Outline (61)	CJ11-04 Brown-Red Card Comp 3 (69)	CJ11-07 Brown-Yellow R. Logo #2 (77)	CJ13-03 Black-Green Bright* (85)	

* Indicates phase D drive.

Playfield Lamps

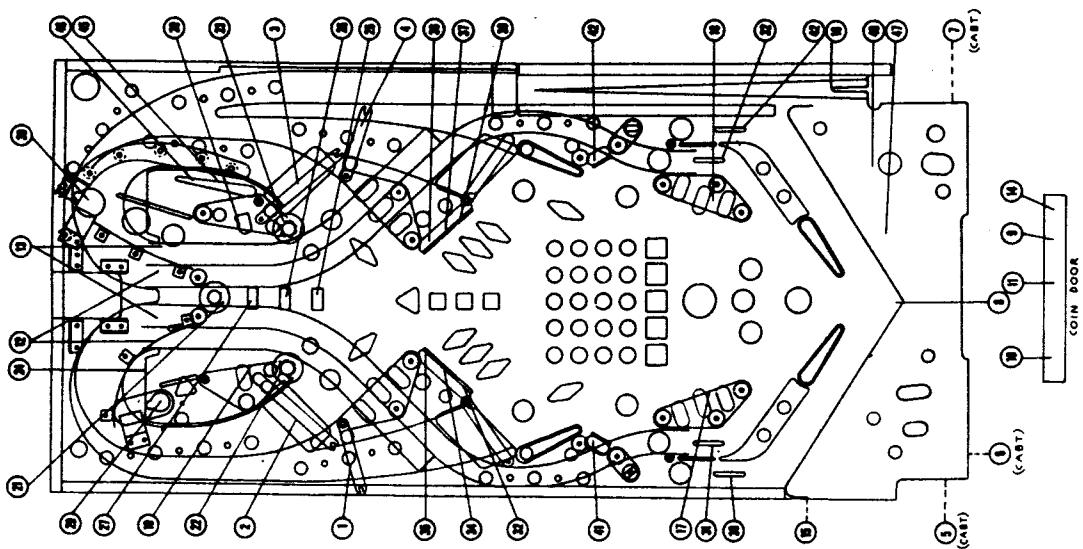




NOTE 1. ALL SWITCH BIDDERS ARE 1M4149
 NOTE 2. 9 INDICATES NOT USED ON PLAYFIELD.
 BRAMING ONLY TO SHOW RESPECTIVE CABINET
 SWITCH POSITION IN SWITCH MATRIX.
 NOTE 3. ALL CAPACITORS ARE .05MFD/25V

PLAYFIELD SWITCHES

NOTES:
M. STONE
3/23/48
TRUCK STOP
SWITCH WIRING
SHEET 2 OF 3
REV 3



Switch Matrix Table

Row	Column	(1) White-Red CJA-15	(2) *Right Coin #3 (9)	(3) White-Blue CJA-14	(4) White-Yellow CJA-13	(5) White-Green CJA-12	(6) White-Brown CJA-11	(7) White-Violet CJA-01
(1) Red CJA-10	10	*C Ramp Entry (1)	*Right Coin #3 (9)	Left, Btm Sling (17)	Btm, Inline Dp. Tgt (26)	Left #1 Blue (33)	Left #1 Blue (33)	L., Single Tgt (41)
(2) Blue CJA-9	11	*I Ramp Entry (2)	*Left Coin #1 (10)	Right, Btm Sling (18)	Mid, Inline Dp. Tgt (28)	#2 Blue (34)	#2 Blue (34)	R., Single Tgt (42)
(3) Yellow CJA-8	12	*T Ramp Entry (3)	*Middle Coin #2 (11)	Left, Top Sling (19)	Top, Inline Dp. Tgt (27)	#3 Blue (35)	#3 Blue (35)	
(4) Green CJA-7	13	*Y Ramp Entry (4)	Left Ramp Exit (12)	Top Right Sling (20)		#4 Blue (36)	#4 Blue (36)	
(5) White CJA-6	14	Left Cabinet (5)	R. Ramp Exit (13)	Mid, Single Target (21)	Left Truck Stop (29)	#5 Blue (37)	#5 Blue (37)	Lower Dock (46)
(6) Brown CJA-4	15	*Credit (6)	*Slam (14)	Left Mush-room (22)	Right Saucer (30)	Right #6 Blue (38)	Right #6 Blue (38)	Upper Dock (48)
(7) Orange CJA-3	16	Right Cabinet (7)	*Tilt (15)	Right Mush-room (23)	L. Return Lane (31)	Left Outlane (39)	Left Outlane (39)	L. Trough #1 (47)
(8) Black CJA-2	17	Outhole (8)	Shooter Lane (16)	Spinner (24)	R. Return Lane (32)	Right Outlane (40)	Right Outlane (40)	R. Trough #2 (48)

*These switches are in the cabinet, not on the playfield.

WARNINGS & NOTICES

WARNING

FOR SAFETY AND RELIABILITY, substitute parts and equipment modifications are not recommended.

USE OF NON-BALLY PARTS or circuit modifications may cause injuries or equipment damage.

SUBSTITUTE PARTS OR MODIFICATIONS may void FCC Type Acceptance.

THIS GAME IS PROTECTED by Federal copyright, trademark and patent laws. Unauthorized software or hardware modifications may be illegal under Federal law.

THIS "MODIFICATION" PRINCIPLE ALSO APPLIES to unauthorized facsimiles of *BALLY* logos, designs, publications and assemblies. Moreover, facsimiles of *BALLY* equipment (or any feature thereof) may be illegal under Federal law. Whether or not such facsimiles are manufactured with *BALLY* components, this rule applies.

WARNING

This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

WARNING

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

WARNING

FCC STICKER. Check the back of your game for an FCC sticker. When *BALLY* ships a game, the game has been found to comply with FCC Rules. The sticker is proof. If the sticker is missing, legal repercussions to the owner and distributor of the game may result. If your game (manufactured after December 1982) has no FCC sticker, call *BALLY* for advice. Or write us a note on your game-registration card. Be sure the card bears your game's serial number.

WARNING

THREE-WIRE PLUG. Prevent shock hazard and assure proper game operation! Only plug this game into a properly grounded outlet. **DO NOT** use a "cheater" plug to defeat the power cord's ground pin. **DO NOT** cut off the ground pin.

RF-INTERFERENCE NOTICE

YOUR GAME'S CABLE-HARNESS PLACEMENT and ground-strap routing are very important. They are designed to keep RF radiation and conduction within levels accepted by FCC Regulations.

MAINTAIN THESE LEVELS. Servicing may require that you disconnect harnesses or ground straps. When you're finished, reposition and reconnect them as they were.

NOTICE

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