

SECRET SERVICE



DATA EAST PINBALL

INSTRUCTION MANUAL

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GAME SPECIFICATIONS

POWER REQUIREMENTS

This game is provided with a 3-prong plug and **must be connected to a properly grounded outlet to reduce shock hazard** and insure proper game operation. Refer to AC Power Wiring Diagram for transformer connections required for normal, high, and low line conditions.

Normal Line: 109 to 129 Vac (211 to 225 Vac)

High Line: (226 to 235 Vac)

Low Line: 95 to 108 Vac (200 to 210 Vac)

MAJOR ASSEMBLY AND FUSE LOCATIONS

Refer to the Game Illustration to identify locations of the major assemblies, and fuse values and locations.

PROM SUMMARY

CPU board: Location 5B, 5C

Sound Board: Locations 6F (Voice ROM 1), 4F (Voice ROM 2), and 7F (Sound ROM)

TRANSPORTATION

To reduce the possibility of damage, observe the following precautions whenever transporting the game. Lower the backbox and secure it to the cabinet. Remove the legs and secure the game within the transporting vehicle.

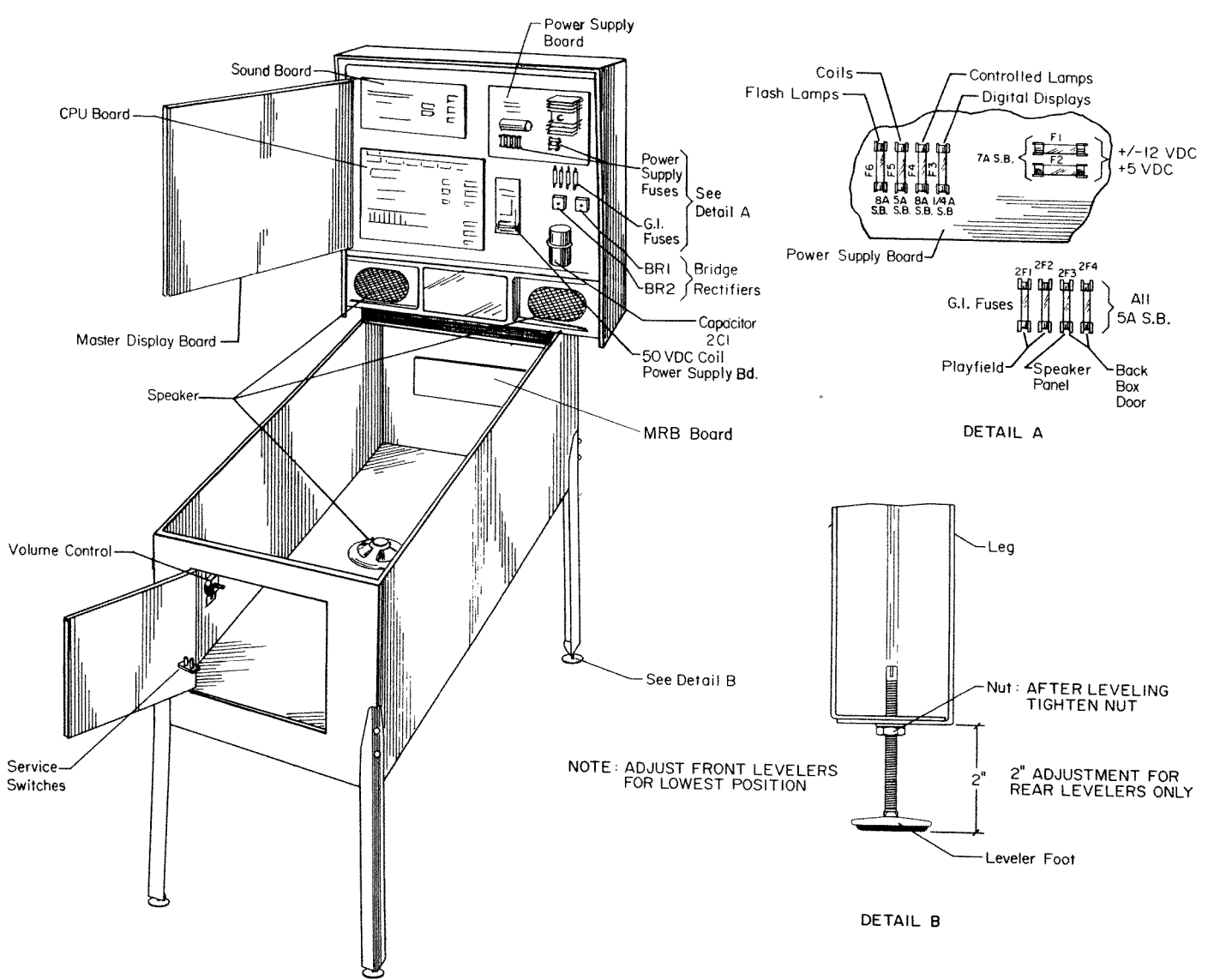
GAME ASSEMBLY PROCEDURES

(Refer to the Game Illustration)

1. Open the top of the carton and lay it on its side with the bottom of the cabinet down.
2. Remove all packing material. Locate cabinet legs in corner packing inserts and assembly parts package in the cashbox. There should be four leg levelers, eight leg bolts, two head bolts with washers, and three pinballs.
3. Attach leg leveler from the parts package to each leg, make sure that each leveler is threaded through a hex nut before threading it into the leg.
4. Support rear of cabinet and attach rear legs using two leg bolts for each leg.
5. Support front of cabinet and attach front legs using two leg bolts for each leg.
6. Reach into the pedestal opening at the rear of the cabinet and free the power cord. Pull the cord from the cabinet and seat it in the slot provided in the pedestal.
7. While assuring that no cables are being pinched, carefully raise the backbox and temporarily secure it in its upright position with the clamp provided on the rear of the cabinet.

WARNING!!!!

Do not attempt to move the game with the backbox secured in this temporary manner. If moved, the backbox could come unclamped and suddenly fall to the lowered positions resulting in possible **injury to personnel and equipment damage.**



GAME ILLUSTRATION

8. Remove backbox keys from the clip on the inside of the coin door and unlock and carefully remove the backglass. Set the backglass aside.
9. Carefully remove the playfield glass and set it aside.
10. Obtain the two bolts and washers from the parts package and open the backbox insert board. Secure the backbox to the cabinet pedestal with the two bolts and washers.
11. Check all connectors in the backbox for loose wire terminations. Reseat any loose wires by pushing in on the terminal.
12. Push on all connectors plugged into the CPU board, Sound Board, Power Supply Boards, and (on insert board) Display board to check that they are properly seated.
13. Check that the fuses on the Power Supply board and fuse panel are seated properly.
14. Raise the playfield and the support bar on the right side of the cabinet; support the playfield by inserting the support bar into the countersunk notch on the bottom side.
15. Check all cabinet cable connector terminations.

16. Remove the Plumb tilt from the parts package and install on the panel on the inside left of the cabinet. Note that this game is not equipped with a ball roll tilt.
17. Lower the playfield and level the playfield side-to-side by adjusting leg levelers.
18. Adjust playfield front-to-back incline for approximately 6 to 7-1/2 degrees using leg levelers. If an incidence meter is not available, adjust the front levelers to the lowest position and the rear levelers for approximately two inches lift. Readjust side-to-side level as required.

NOTE

The playfield incline affects difficulty of play. Use the recommended incline; game difficulty is best varied using game adjustments.

19. Check the plumb tilt and adjust as required.
20. If desired, perform any self tests at this time. With the insert door closed, carefully re-install and lock the backglass.
21. Place the three pinballs on the playfield near the outhole and carefully reinstall the playfield glass.
22. If desired, make game pricing and Add-A-Bal, Novelty, or 5-Ball Play adjustments at this time.

GAME OPERATION

STANDARD FEATURES

Insert coin(s), the game says Secret Service in digital stereo for each coin and the Player 4 display indicates the number of credits posted. Depress the credit button and a start-up sound is produced, the posted credits are reduced by one, Player 1 display flashes, Player 4 display indicates BALL 1, and a ball is served to the plunger trough. Additional players may be added by depressing the Credit button before the end of ball 1.

The third closure (adjustable) of the plumb bob tilt switch tilts the ball in play. Closure of the slam tilt switch in the coin door ends the current game(s).

At the end of each ball, earned bonuses are collected. At the end of the last ball for the last player and after bonuses are collected, the system produces a random 2-digit number (a multiple of 10; 00 to 90) for a Match feature (adjustable). Matching the last two digits of a player score with this number awards a credit. Players exceeding High Score levels receive free credits (adjustable) and are able to enter their initials with the new High Score achieved. The game then proceeds into the game-over mode and then to the attract mode. A custom message (adjustable) is displayed during the attract mode.

AUTOMATIC BALL TIME AVERAGING

Secret Service introduces a new ball time averager feature which can make automatic adjustments affecting player appeal. This feature is provided by Ad 54 and Ad 55; Ad 54 enables the feature as the factory setting and Ad 55 sets the average ball time. Periodically a check is made of the average ball time and adjustments are made to maintain approximately 70-second (adjustable) ball time. This check is made at the same time that highest scores are reset (Ad 18) so make sure that Ad 18 is not set to OFF. (Note that the other highest score adjustments may be disabled if desired.) Refer to Game Adjustments for additional details.

PLAYFIELD POST SETTING

The average ball time can also be controlled by adjustment of the playfield post positioned at the right drain lane and the ball entry gate. To increase average ball time, move the post to the left closing off part of the drain lane. To decrease average ball time, move it to the right.

Instant 2-Ball Play — Making the ramp shot from the plunger or during play locks a ball in the White House. Completing the drop target 5-bank with a ball locked awards instant 2-ball play. During 2-ball play, making the ramp shot, Spy Bar eject, or the ball eater initiates 2X scoring for a timed interval.

Drop Target 5-Bank — Making a drop target starts a variable countdown timer which, when elapsed, resets the drop targets. An audio warning and countdown occurs before the drop targets are reset, to let the player know that time is almost expired. Completing the 5-bank advances lighting and awarding of Instant 2 Ball, Extra Ball, Bonus Holdover, and 100K.

Target 3-Bank — Complete 3-Bank stand-up targets to light grid rows. Making target with flashing light first awards shortcut lighting of all lights. Lighting first lit row raises ball eater in KGB Hideout; make KGB Hideout shot to lock ball. This provides Instant 3-Ball play. Completing three (adjustable) targets during 3-Ball play lights left or right outlanes alternately for Special. Only one Special may be awarded per game. Making ramp shot during 3-Ball play scores Jackpot and Hideout values.

Super Spinner — Left flipper return lane lights right Super Spinner; right flipper return lane lights left Super Spinner. Super Spinner lites for decreasing values starting at 1,000 (adjustable). Making Super Spinner scores and locks in value. Super Spinner Bonus awarded at the end of game is the locked spinner value multiplied by the number of spinner turns.

Laser Kickback — Game starts with kickback lit. Ball entering left outlane with kickback lit is returned and kickback light goes off. Making Spy Bar eject (adjustable) or ramp shot (adjustable) relights kickback. Kickback relights (adjustable) at beginning of second and subsequent balls.

S-P-Y Lanes — Completing S-P-Y advances lighting of 2X, 3X, 4X, and 5X bonus multipliers and (adjustable) Extra Ball. Making ramp shot light or green bullet target spots S-P-Y.

Memory — The following features are held over from ball to ball: S-P-Y lanes (adjustable), Outlane Special (adjustable), 3-Bank Target grid (adjustable), Spy Bar (eject) lamps (adjustable).

AUDIT FUNCTIONS

GENERAL

There are 50 audit functions provided for accounting purposes and for evaluation of game difficulty adjustments. The various auditing functions are summarized in the **Auditing Features Table** and, when accessed, are shown on the player score displays. The **Audit Number** is shown in the Player 3 Display, the **Description** in the Player 1 and 2 Displays, and the **Audit Total** in the Player 4 Display. Access and control is provided from switches located on the inside of the coin door.

To access audit functions the game must be in the game-over mode. Open the coin door and make sure that the FORWARD/REVERSE switch is in the FORWARD (up) position. Depress the STEP switch and the game name is shown in the Player 1 and 2 displays, the Player 3 display is blank, and the PROM revision level is shown in the Player 4 display. This indicates access to audit functions.

With the FORWARD/REVERSE pushbutton switch still in the FORWARD (up) position, depressing the STEP pushbutton switch advances through the audit functions one at a time. To review lower-numbered functions, set the FORWARD/REVERSE pushbutton switch to the REVERSE (down) position and operate the STEP pushbutton switch.

Audit totals may be reset to zero using Game Adjustment Ad 46 Audits Reset. Game adjustments (Ad01-55) begin after the last audit function (AU 50). Once audits functions have been recorded, and if no adjustments are required, you may return the game to the attract mode. If adjustments are required, continue pressing the STEP button until the game adjustments are reached. See Game Adjustments for details.

GAME AUDITS

Audit Number (Player 3 Display)	Audit Description (Players 1 & 2 Displays; totals in Player 4 Display)
--	Secret Service PROM ID
AU 01	Left Coin
AU 02	Center Coin
AU 03	Right Coin
AU 04	Paid Credits
AU 05	Total Plays
AU 06	Total Free
AU 07	Percent Free
AU 08	Replay Awards
AU 09	Percent Replay
AU 10	Special Awards
AU 11	Percent Special
AU 12	Match Awards
AU 13	High Score Awards
AU 14	Percent High Score
AU 15	Extra Balls
AU 16	Percent Extra Balls
AU 17	Average Ball Time (Seconds)
AU 18	Play Time (Minutes)
AU 19	Balls Played
AU 20	Replay 1 Awards
AU 21	Replay 2 Awards
AU 22	Replay 3 Awards
AU 23	Replay 4 Awards
AU 24	1 Player Games
AU 25	2 Player Games
AU 26	3 Player Games
AU 27	4 Player Games
AU 28	Burn In Cycles
AU 29	Attract Mode Cycles
AU 30	High Score Auto Reset Counter
AU 31	Ramp Shots
AU 32	Instant 2 Ball
AU 33	Extra Ball Drop
AU 34	Bonus Drops
AU 35	100K Drops
AU 36	Left Spinner
AU 37	Right Spinner
AU 38	Shortcut
AU 39	All 9 Lights
AU 40	Instant 3 Ball
AU 41	Level 3 Target
AU 42	Special Lit
AU 43	Special Scored
AU 44	Not Used
AU 45	Spy Bar Scored
AU 46	Kick Scored
AU 47	Kick Lit
AU 48	Drain Left
AU 49	Drain Center
AU 50	Drain Right
AU 51	Jackpot Shots

STANDARD FUNCTIONS

Paid Credits (AU 01 through 04)

These four audit totals are provided to show the amount of coins registered and the total in the cashbox. **AU 01**, **02**, and **03** display the number of coins for the left, center, and right coin chutes, respectively. **AU 04** displays the total number of paid credits.

Total and Free Credits (AU 05 through 14)

Total credits (**AU 05**) is the sum of Paid Credits (**AU 04**) and free credits (**AU 06**). Note that free credits are not recorded in the audits until they are actually used.

Percentage of Free Credits (**AU 07**) is Free Credits (**AU 06**) divided by Total Credits (**AU 05**).

Replay awards (**AU 08**) is the total awards (credits, extra balls, or audit only) for exceeding replay score levels.

Percentage of Replay Awards (**AU 09**) is Replay Awards (**AU 08**) divided by Total Credits (**AU 05**).

Special Awards (**AU 10**) is the total awards (credits, extra balls, or points) for specials.

Percentage of Special Awards (**AU 11**) is Special Awards (**AU 10**) divided by Total Credits (**AU 05**).

Credits for Match (**AU 12**) is the total credits awarded for matching the last two digits of the score with the system-generated Match Number at the end of the game. Percentage of match credits will be approximately 10%, if enabled.

High Score Credits (**AU 13**) is the total credits awarded for exceeding the high score levels.

Percentage of High Score Credits (**AU 14**) is **AU 13** divided by Total Credits (**AU 05**).

Number of Balls and Average Times (AU 15 through AU 19)

Extra Balls (**AU 15**) is the total number of extra balls awarded.

Percentage of Extra Balls (**AU 16**) is **AU 15** divided by Total Balls Played (**AU 19**).

Average Ball Time (in seconds) (**AU 17**) is Total Play Time (in minutes) (**AU 18**) divided by Total Balls Played (**AU 19**) with the result multiplied by 60.

Total Play Time (**AU 18**) is the cumulative time of balls in play (in minutes).

Total balls played (**AU 19**) is the total of regular and extra balls.

Replay Awards (AU 20 through 23) provide the total awards (credit, extra ball, or audit) for each of four replay levels.

Game Summary (AU 24 through 27) provide individual totals of 1-player, 2-player, 3-player, and 4-player games.

Burn In Cycles (AU 28) provides the number of diagnostic burn-in cycles (factory use).

Attract Mode Cycles (AU 29) provides the number of cycles through the attract mode (factory use).

High Score Auto Resets (AU 30) provides the number of times that the high score levels have been automatically reset (if enabled).

GAME SPECIFIC FUNCTIONS

Ramp Shots (AU 31) provides the number of times that the ramp shot has been made.

Instant 2 Ball (AU 32) provides the number of times that 2-ball play has been awarded from the drop targets.

Ex Ball Drops (AU 33) provides the number of extra balls awarded from the drop targets.

Bonus Drops (AU 34) provides the number times that bonus was held over from the drop targets.

100K Drops (AU 35) provides the number of times 100,000 points was awarded from the drop targets.

Left Spinner (AU 36) provides the number of times that the left super spinner was scored.

Right Spinner (AU 37) provides the number of times that the right super spinner was scored.

Shortcut (AU 38) provides the number of times that shortcut lighting of the 3-bank targets was achieved.

All 9 Lights (AU 39) provides the number of times all nine 3-bank lights were lit.

Instant 3 Ball (AU 40) provides the number of times Instant 3-ball play was achieved.

Lvl 3 Target (AU 41) provides the number of times that instant 3-ball play was lit from the 3 stand-up targets.

Special Lit (AU 42) provides the number of times the Special was lit from the 3-bank.

Special Scored (AU 43) provides the number of time the Special was scored.

Not Used (AU 44)

Spy Bar Scored (AU 45) provides the number of times that the Spy Bar eject was made when lit.

Kck Scr (AU 46) provides the number of times that the Laser Kick has kicked the ball.

Kck Lit (AU 47) provides the number of times that the Laser Kick was relit.

Drain Left (AU 48) provides the number of balls lost through the left drain.

Drain Center (AU 49) provides the number of balls lost through the center drain.

Drain Right (AU 50) provides the number of balls lost through the right drain.

Jackpot Shot, (AU 51) provides the number of jackpot shots made.

GAME ADJUSTMENTS

GENERAL

There are 55 adjustable functions provided to vary difficulty of play and to periodically reset audits and high score levels. The various game adjustments are summarized in the **Game Adjustments Table** and, when accessed, are shown on the player score displays. The **Adjustment Number** is shown in the player 3 display, the **Description** in the Player 1 and 2 Displays, and the **Setting** in the Player 4 Display. Access and control is provided from switches located on the inside of the coin door.

Game adjustments are accessed from the audit mode. With the audits displaying game identification and the FORWARD/REVERSE switch in the REVERSE (down) position, depress the STEP switch and Ad 55 (Adjustment 55) is shown in the the Player 3 display, RESTORE FACTORY is shown in the Player 1 and 2 displays, and OFF is shown in the Player 4 display. With the audits displaying AU 50 and the FORWARD/REVERSE switch in the FORWARD (up) position, depress the STEP switch and Ad 01 is shown in the the Player 3 display, AUTO/FIXED REPLAY is shown in the Player 1 and 2 displays, and the setting is shown in the Player 4 display.

With the FORWARD/REVERSE pushbutton switch in the FORWARD (up) position, depressing the STEP pushbutton switch advances through the game adjustments one at a time. With it in the REVERSE (down) position, the STEP pushbutton switch selects lower-numbered adjustments. To rapidly scroll through adjustments, hold the STEP pushbutton switch depressed. Adjustment values are changed by operating the GAME START pushbutton switch and the FORWARD/REVERSE pushbutton switch setting determines whether the values are increased or decreased. When the STEP pushbutton switch is depressed the Player 1 and 2 displays indicate REQUEST INSTALLED.

NOTE

To lock in any adjustment, the game must be returned to game over mode by pushing STEP button with Ad 55 displayed.

REPLAY AND GENERIC FEATURES

Replays may be adjusted either for fixed levels or for a system-adjusted automatic percentage of replay awards. Four levels may be selected. Adjustments allow awarding of a credit or an extra ball as each level is exceeded. With the automatic feature, replay percentages are monitored and adjusted to maintain a preset percentage of replay level awards.

REPLAYS (Ad 01 through 06)

Ad 01 Automatic/Fixed Replay

Automatic: Adjust for percentage of awards for replay levels (1% through 50%). Proceed to ad 02 and 03 for starting replay levels.

Fixed: Lower the automatic value below 1% and Player 1 display indicates FIXED. Proceed to Ad 02 through 05 for fixed replay levels.

Ad 02 Replay Start/Replay 1

Automatic: With Ad 01 set for automatic, adjust the starting Replay 1 setting to between 800,000 and 9,900,000.

Fixed: With Ad 01 set for fixed, adjust Replay 1 level to between 100,000 and 9,900,000. To disable Replay 1, lower the setting to 00.

Ad 03 Replay Levels/Replay 2

Automatic: With Ad 01 set for automatic, adjust the number of replay levels to be active (1 to 4). Any additional starting replay levels are automatically set to values higher than Replay 1. Proceed to Ad 06.

Fixed: With Ad 01 set for fixed, adjust Replay 2 level to between 100,000 and 9,900,000. To disable Replay 2, lower the setting 00.

GAME ADJUSTMENT TABLE

Adjustment Number (Player 3)	Description (Players 1 & 2)	Factory Setting (Player 4)
AD 01	AUTO REPLAY/FIXED	13%
AD 02	REPLAY START/REPLAY 1	1,800,000
AD 03	REPLAY LEVELS/REPLAY 2	01
AD 04	REPLAY 3	--
AD 05	REPLAY 4	--
AD 06	REPLAY AWARDS	CREDITS
AD 07	SPECIAL AWARD	CREDITS
AD 08	MATCH FEATURE	ON
AD 09	BALL/GAME	03
AD 10	TILT WARNING	02
AD 11	MAXIMUM EX BALL	03
AD 12	MAXIMUM CREDITS	30
AD 13	HIGHEST SCORES	ON
AD 14	HSCR 1 CREDITS	03
AD 15	HSCR 2 CREDITS	00
AD 16	HSCR 3 CREDITS	00
AD 17	HSCR 4 CREDITS	00
AD 18	HSRESET EVERY	1.000
AD 19	FREE PLAY	OFF
AD 20	(Standard/Custom Pricing)	USA 1
AD 21	LEFT COIN UNITS	--
AD 22	CENTER COIN UNITS	--
AD 23	RIGHT COIN UNITS	--
AD 24	UNITS FOR CREDIT	--
AD 25	UNITS FOR BONUS CREDIT	--
AD 26	INSTALL ADDABAL	OFF
AD 27	INSTALL 5 BALL	OFF
AD 28	INSTALL NOVELTY	OFF
AD 29	INSTALL EXEASY	OFF
AD 30	INSTALL EASY	OFF
AD 31	INSTALL MEDIUM	ON
AD 32	INSTALL HARD	OFF
AD 33	INSTALL EX HARD	OFF
AD 34	SPY BAR LITES KICKBACK	ON
AD 35	S-P-Y LANE MEMORY	ON
AD 36	SPECIAL MEMORY	OFF
AD 37	TARGET MEMORY	ON
AD 38	SPY BAR MEMORY	ON
AD 39	RAMP SPOTS S-P-Y LANES	ON
AD 40	ATTMODE MUSIC	ON
AD 41	S-P-Y LANES LITE EX BALL	ON
AD 42	TARGETS FOR SPECIAL	03
AD 43	RAMP LITES KICKBACK	OFF
AD 44	SPINNER START VALUE	1.000
AD 45	LASER KICKBACK START	ON
AD 46	AUDITS RESET	OFF
AD 47	COIN RESET	OFF
AD 48	HISCR RESET	OFF
AD 49	CUSTOM MESSAGE	ON
AD 50	ENGLISH/GERMAN/FRENCH TEXT	ENGLISH
AD 51	SPY BAR EX BALL MEMORY	ON
AD 52	UP POST TIMER	ON
AD 53	5-BANK TIMER	FACTORY
AD 54	AUTO BALL TIME AVERAGER	ON
AD 55	AVERAGE BALL TIME (seconds)	70
AD 56	RESTORE FACTORY	OFF

Ad 04 Replay 3 (Fixed Only) - With Ad 01 set for fixed, adjust Replay 3 level to between 100,000 and 9,900,000. To disable Replay 3, lower the setting to 00.

Ad 05 Replay 4 (Fixed only) - With Ad 01 set for fixed, adjust Replay 4 level to between 100,000 and 9,900,000. To disable Replay 4, lower the setting to 00.

Ad 06 Replay Award - Set for replays to award: CREDIT, EXTRA BALL, or AUDIT (no award but recorded in the audit totals).

Ad 07 Special Award - Set for Special to award: CREDIT, EXTRA BALL, or SCORE LEVEL.

Ad 08 Match Feature - Set the Match feature ON or OFF.

Ad 09 Balls Per Game - Adjust the number of balls per game; 2 to 9.

Ad 10 Tilt Warning - Adjust the number of plumb bob tilt switch closures before the ball in play is tilted; 1 to 5.

Ad 11 Maximum Extra Balls - Adjust for the maximum number of extra balls that may be accumulated per ball; 1 to 9 or OFF.

Ad 12 Maximum Credits - Adjust the maximum number of credits that may be posted; 5 to 99.

HIGH SCORE LEVELS (Ad 13 through 18)

There are four high score levels with associated player initials that are displayed during the attract mode. When players exceeds these levels, the player initials may be entered to replace the previous ones. These levels may be adjusted to award credits and to be reset to factory settings after a selected number of games. Note that these reset values are not ADJUSTABLE.

Ad 13 Highest Scores - Set to enable or disable the four high score levels; ON or OFF.

Ad 14 High Score Credits Level 1 - Adjust the number of credits awarded for exceeding level 1; 0 to 9.

Ad 15 High Score Credits Level 2 - Adjust the number of credits awarded for exceeding level 2; 0 to 9.

Ad 16 High Score Credits Level 3 - Adjust the number of credits awarded for exceeding level 3; 0 to 9.

Ad 17 High Score Credits Level 4 - Adjust the number of credits awarded for exceeding level 4; 0 to 9.

Ad 18 High Score Reset - Adjust the number of games between automatic resets of high score levels to factory settings and ball time averager adjustments; 1,000 to 99,000 or OFF (no reset or adjustment).

Ad 19 Free Play - When set to ON, no coins are required for games.

GAME PRICING (Ad 20 to 25)

There are two methods available for coin switch programming; Standard and Custom. Standard pricing uses a single adjustment (Ad 20) to select a pricing scheme shown in the **Standard Pricing Table**. Custom pricing is used to select additional pricing schemes defined by Ad 21 to 25. In order to program Ad 21 to 25, Ad 20 must be set to CUSTOM.

With Ad 20 set to CUSTOM, Ad 21, 22, and 23 represent coin switch units for the left, center, and right coin slots. Ad 24 prescribes the number of units required for one credit. For example, if Ad 21 was set to 02 and Ad 24 to 01, a coin in the left slot would produce two credits. Further, if Ad 21 was set to 01 and Ad 24 to 02, two coins in the left slot would be required for one credit.

Ad 25 may be set to post bonus credits when a minimum amount of coins are inserted at one time. For example, if Ad 21 was set to 01, Ad 24 to 01, and Ad 25 to 04, one credit would be posted for each of the first three coins in the left slot and two credits for the fourth coin.

Ad 20 Standard Pricing Select - Set for the desired pricing scheme from the **Standard Pricing Table** as indicated in the Player 1 and 2 Displays. For Custom Pricing, set to CUSTOM. When set to CUSTOM, Ad 21 to 25 must be adjusted.

Ad 21 Left Coin Switch Units - Set the number of units registered for closure of the left coin switch; 00 to 99.

Ad 22 Center Coin Switch Units - Set the number of units registered for closure of the center coin switch; 00 to 99.

Ad 23 Right Coin Switch Units - Set the number of units registered for closure of the right coin switch; 00 to 99.

Ad 24 Coin Switch Units Required for 1 Credit - Set the number of coin switch units required to post one credit; 00 to 99.

Ad 25 Coin Switch Units Required for Bonus Credit - Set the number of coin switch units required to award a bonus credit; 00 to 99.

CUSTOM PRICING TABLE

Coin Mechs			Plays/Coins	Adjustment Numbers					
Left	Center	Right		20	21	22	23	24	25
25¢	\$1	25¢	1/25¢ 3/50¢ 1/25¢ 5/\$1.00 1/25¢ 6/\$1.00	custom custom custom	01 01 05	04 04 20	01 01 05	01 01 04	02 04 20
5SCH	10SCH	10SCH	1/10SCH 1/10SCH 4/30SCH	custom custom	01 04	02 08	02 08	02 06	00 00
20¢	--	\$1.00	1/20¢ 1/60¢ 2/\$1.00	custom custom	01 01	00 00	05 05	01 03	00 05
10P	50P	10P	1/10P 6/50P 1/20P 3/50P	custom custom	01 01	05 05	01 01	01 02	05 05

STANDARD PRICING TABLE

Ad 24 Standard Pricing Select (Player) 1 2 4	Coin Mechs			Plays/Coins		
	Left	Center	Right	Left	Center	Right
USA1 1 COIN 1 PLAY	25¢	\$1.00	25¢	1 PLAY/1 COIN	4 PLAY/1 COIN	1 PLAY/1 COIN
USA2 4 COINS 3 PLAYS	25¢	\$1.00	25¢	1 PLAY/2 COIN 2 PLAY/3 COIN 3 PLAY/4 COIN	3 PLAY/1 COIN	1 PLAY/2 COIN 2 PLAY/3 COIN 3 PLAY/4 COIN
USA3 2 COINS 1 PLAY	25¢	\$1.00	25¢	1 PLAY/2 COIN	2 PLAY/1 COIN	1 PLAY/2 COIN
AUSTRIA COINAGE	5SCH	10SCH	10SCH	1 PLAY/2 COIN 2 PLAY/3 COIN 3 PLAY/4 COIN	2 PLAY/1 COIN 3 PLAY/2 COIN	2 PLAY/1 COIN 3 PLAY/2 COIN
AUSTRAL COINAGE	20¢		\$1.00	1 PLAY/2 COIN		3 PLAY/1 COIN
UK COINAGE SWISS COINAGE	10P 1F	50P	10P 2F	1 PLAY/1 COIN 1 PLAY/1 COIN 3 PLAY/2 COIN	5 PLAY/1 COIN	1 PLAY/1 COIN 3 PLAY/1 COIN
BELGIUM COINAGE	5F	5F	20F	1 PLAY/2 COIN 2 PLAY/3 COIN 3 PLAY/4 COIN	1 PLAY/2 COIN 2 PLAY/3 COIN 3 PLAY/4 COIN	3 PLAY/1 COIN
GERMAN1 5 DM 7 PLAYS	1DM	2DM	5DM	1 PLAY/1 COIN 7 PLAY/5 COIN	2 PLAY/1 COIN 8 PLAY/3 COIN	7 PLAY/1 COIN
GERMAN2 5 DM 9 PLAYS	1DM	2DM	5DM	1 PLAY/1 COIN 3 PLAY/2 COIN 5 PLAY/3 COIN 7 PLAY/4 COIN 9 PLAY/5 COIN	3 PLAY/1 COIN 7 PLAY/2 COIN 10 PLAY/3 COIN 14 PLAY/4 COIN	9 PLAY/1 COIN
NETHLND COINAGE	1HFI	2-5HFI	2-5HFI	1 PLAY/1 COIN 6 PLAY/5 COIN	3 PLAY/1 COIN	3 PLAY/1 COIN
SWEDEN COINAGE	1KR	5KR	2KR	1 PLAY/3 COIN 2 PLAY/5 COIN	2 PLAY/1 COIN	2 PLAY/1 COIN
FRANCE COINAGE	1F	5F	10F	1 PLAY/3 COIN 2 PLAY/5 COIN	2 PLAY/1 COIN	4 PLAY/1 COIN
ITALY COINAGE	500L		500L	1 PLAY/1 COIN		1 PLAY/1 COIN
SPAIN COINAGE	25P		100P	1 PLAY/1 COIN		5 PLAY/1 COIN
JAPAN COINAGE		100¥			1 PLAY/1 COIN	

5-BALL/NOVELTY PLAY (Ad 26 to 28)

These three INSTALL adjustments may be activated to automatically select settings for multiple adjustments. After activation, the individual adjustments may be readjusted if desired.

Ad 26 Install Add-A-Ball - Set to disable awarding of credits, replacing replay and Special awards with an extra ball; ON or OFF. If ON the following settings are established:

Ad 06 Replay Awards = Extra Ball
Ad 07 Special Awards = Extra Ball
Ad 08 Match Feature = Off
Ad 13 Highest Scores = OFF
Ad 14 to 17 High Score Credits = 00

Ad 27 Install 5-Ball Play - Set to establish recommended settings for 5-ball play; ON or OFF. If ON the following settings are established:

Ad 01 Automatic Replay = 7%	Ad 39 Ramp Spots S-P-Y Lanes = OFF
Ad 02 Replay Start = 3,000,000	Ad 41 S-P-Y Lanes Lites Extra Ball = OFF
Ad 03 Replay Levels = 01	Ad 42 Targets for Special = 09
Ad 09 Balls/Game = 05	Ad 43 Ramp Lites Kickback = OFF
Ad 34 Spy Bar Lites Kickback = OFF	Ad 44 Spinner Start Value = 1,000
Ad 35 S-P-Y Lane Memory = ON	Ad 45 Kickback Start = ON
Ad 36 Special Memory = OFF	Ad 51 Spy Bar Extra Ball Memory = OFF
Ad 37 Target Memory = ON	Ad 52 Up Post Timer = ON
Ad 38 Spy Bar Memory = ON	Ad 53 5-Bank Timer = Factory

Ad 28 Install Novelty Play - Set to establish settings for no free play or extra balls; ON or OFF. If ON the following settings are established:

Ad 01 Fixed Replay = Fixed
Ad 02 to 05 Replays 1 to 4 = 00
Ad 06 Replay Award = Audit
Ad 07 Special Award = Score 100K
Ad 08 Match Feature = OFF
Ad 11 Maximum Extra Balls = OFF
Ad 13 Highest Scores = OFF
Ad 14 to Ad 17 High Score Credits = 00

SINGLE-FUNCTION DIFFICULTY ADJUSTMENTS (Ad 29 to 33)

These five INSTALL adjustments may be activated to automatically select settings for multiple adjustments affecting game difficulty. After activation, the individual adjustments may be readjusted if desired. Refer to **Install Adjustment Table** for details.

Ad 29 Install Extra Easy - Set to ON or OFF.

Ad 30 Install Easy - Set to ON or OFF.

Ad 31 Install Medium - Set to ON or OFF.

Ad 32 Install Hard - Set to ON or OFF.

Ad 33 Install Extra Hard - Set to ON or OFF.

INSTALL ADJUSTMENT TABLE

Install Adjustment	Ad 29 Extra Easy	Ad 30 Easy	Ad 31 Medium	Ad 32 Hard	Ad 33 Extra Hard
Ad 34 Spy Bar Lites Kickback	ON	ON	ON	OFF	OFF
Ad 35 S-P-Y Lane Memory	ON	ON	ON	ON	OFF
Ad 36 Special Memory	ON	OFF	OFF	OFF	OFF
Ad 37 Target Memory	ON	ON	ON	ON	OFF
Ad 38 Spy Bar Memory	ON	ON	ON	ON	OFF
Ad 39 Ramp Spots S-P-Y	ON	ON	ON	OFF	OFF
Ad 41 S-P-Y Lanes Lites ExBall	ON	ON	ON	OFF	OFF
Ad 42 Targets for Special	01	02	03	06	09
Ad 43 Ramp Lites Kickback	ON	OFF	OFF	OFF	OFF
Ad 44 Spinner Start Value	2,000	2,000	1,000	1,000	1,000
Ad 45 Kickback Start	ON	ON	ON	OFF	OFF
Ad 51 Spy Bar ExBall Memory	ON	ON	ON	OFF	OFF
Ad 52 Up Post Timer	ON	ON	ON	HARD	OFF
Ad 53 5-Bank Timer	EASY	EASY	FACTORY	FACTORY	HARD

GAME SPECIFIC ADJUSTMENTS (ad 34 to 45)

Ad 34 Spy Bar (eject) Lites Laser Kickback - Set to ON or OFF.

Ad 35 S-P-Y Lane Memory - Set to ON or OFF.

Ad 36 Special Memory - Set to ON or OFF.

Ad 37 Target Memory - Set to ON or OFF.

Ad 38 Spy Bar (eject) Memory - Set to ON or OFF.

Ad 39 Ramp Spots S-P-Y Lanes - Set to ON or OFF.

Ad 40 Attract Mode Music - Set to ON (once every seven attract mode cycles), OFTEN (every attract mode cycle), or OFF.

Ad 41 S-P-Y Lanes Lites Extra Ball (for completing S-P-Y lanes with 5X multiplier lit) - Set to ON or OFF.

Ad 42 Targets for Special - Number of 3-Bank target lamps that must be lit to light left and right outlanes for Special - Set to 3 through 9.

Ad 43 Ramp Shot Lites Laser Kickback - Set to ON or OFF.

Ad 44 Spinner Start Value - Set to 1000 through 5000.

Ad 45 Laser Kickback Start (turned on at the start of second and subsequent balls) - Set to ON or OFF.

ADDITIONAL GENERIC FEATURES (Ad 46 to 50)

Ad 46 Audits Reset - When enabled (set to ON) all audit totals will be reset to zero when STEP is depressed with FORWARD/REVERSE button in the FORWARD position.

Ad 47 Coin Reset - When enabled (set to ON) all coin and paid credit totals will be reset to zero when STEP is depressed.

Ad 48 High Score Level Reset - When enabled (set to ON) the High Score Levels and associated initials will be restored to factory settings when STEP is depressed with FORWARD/REVERSE button in the FORWARD position.

Ad 49 Custom Message - When desired, this function is used to establish a custom message periodically displayed during the attract mode. Set the feature ON using the Credit button and depress STEP. The letter A is indicated in the first position of the Player 1 display. Vary the letter by operating the left and right flippers. With the desired letter indicated, depress the Credit button to lock in the letter and advance to the next display character. Repeat this procedure until the desired message is indicated in the Player 1 and 2 displays. At this time, depress the STEP pushbutton switch to advance to Ad 50.

NOTE

To lock in the custom message, the game must be returned to Game Over by depressing STEP with Ad 55 displayed.

Ad 50 English/German/French Text - Select English, German, or French for display during Audits, Adjustments, and Game Diagnostics.

ADDITIONAL GAME SPECIFIC FEATURES (Ad 51 to 53)

Ad 51 Spy Bar Extra Ball Memory - Set to ON or OFF.

Ad 52 Up Post Timer - Set to EASY (longest duration), FACTORY (post does not come up at all) or HARD (shortest duration).

Ad 53 5-Bank Timer - Sets time allowed to complete 5-bank before the bank is reset. Set to EASY, FACTORY, or HARD.

Ad 54 Ball Time Averager - Maintains average ball time close to 70 seconds. Every 1,000 (vary with Ad 18) games, average is checked. If greater than 70 seconds, Ad 52 is set (adjustable) to HARD and Ad 45 is set to OFF. If less than 70 seconds, Ad 52 is set to EASY and Ad 45 is set to ON.

Ad 55 Average Ball Time - Sets the average ball time. Set to between 50 and 80 seconds.

Ad 56 Install Factory - Depressing STEP without changing the value shown in the Player 4 display from OFF locks in any custom message set with Ad 49 and returns the game to Game Over. Set the value to ON and depress STEP to revert all game adjustments to factory settings; depress STEP a second time to return to Game Over.

GAME DIAGNOSTICS

The Data East Pinball system provides tests for sounds, digital displays, lamps, switches, and solenoids. Each feature may be tested manually or automatically using the STEP and FORWARD/REVERSE pushbutton switches inside the coin door and the Game Start pushbutton switch on the front of the cabinet. The automatic tests may be used for a quick verification of automatic test functions and the manual tests for troubleshooting.

During game play, activation of switches and operation of coils with associated switches are monitored. If a switch is not made for 100 games it is considered bad. When operation of a coil should close or open a switch and does not, the coil is considered bad. Each time the game is powered up, bad switches and coils are reported. Note that reporting of an unused switch does not constitute a problem and that a bad coil could mean that the associated switch requires adjustment.

ENTERING DIAGNOSTICS

With the game in the game-over mode, open the coin door and make sure that the FORWARD/REVERSE pushbutton switch is set to REVERSE (down) and depress the STEP pushbutton switch. The Player displays will show the toll-free Customer Service number 1-800-KICKERS, that is 1-800-542-5377 (outside Illinois) and the toll number (312) 345-7700 (inside Illinois). This indicates entry into game diagnostics.

SOUND TESTS

The Data East Pinball sound system produces true digital stereo sound on left and right speakers and mono on a center speaker. During Sound tests, the Player 1 and 2 displays show the sound board circuit under test and the corresponding sounds are produced. Refer to the **Sound Test Chart** for the sound circuits displayed and the sounds produced. The sine wave functions allow verification that all channels are functioning properly and that the speaker connections are correct. Speaker Phase Testing procedures follow for checking speaker connections.

Automatic Test

With Customer Service telephone numbers displayed, depress the STEP pushbutton switch. Player 1 and 2 displays indicate SOUNDS AUTO and the system sequences through the test producing the sounds indicated in the Sound Test Chart.

Manual Test

Operate the STEP pushbutton switch during the Automatic tests until SOUNDS MANUAL is indicated in the Player 1 and 2 displays. Depressing the Game Start pushbutton switch allows you to advance through each sound function.

Speaker Phase Testing

Connections to each of the three speakers are polarized and each must be connected appropriately for the best quality sound. If one speaker has the positive and negative connections reversed with respect to the other two, bass frequencies will not be produced properly and the overall sound quality will be poor.

To test for proper speaker phasing, use the manual sound test to cycle through the Left, Center, and Right Sine functions. If the Center Sine produces more volume and bass than the Left and Right Sines, the speakers are connected properly. If it produces the same or less, one speaker is connected improperly. To isolate and correct reversed speaker connections, one of two methods may be used.

1. Check each speaker for polarity markings. If the speakers have polarity markings, verify that the single-color wire (BLK, YEL, or RED) is connected to the negative (-) terminal.
2. Disconnect the speaker output connector from the Sound Board and connect a 1.5-volt battery across each speaker pair one at a time while observing the speakers. Make sure that the positive battery terminal is connected to the positive lead (CN1-pin 1, 3, or 6) each time. As the connection is made, check speaker cone movement; proper connections are indicated by outward movement.

SOUND TEST CHART

Auto/Manual Tests (Player 1 & 2)	Sounds Produced
LEFT SINE	60 CYCLE TONE (Left Speaker Only)
CENTER SINE	60 CYCLE TONE (All Speakers)
RIGHT SINE	60 CYCLE TONE (Right Speaker Only)
VOICE ROM 1 (Loc F6)	boing, KGB HIDEOUT, door slam, ricochet 2 BALL, BABY YOU'RE THE BEST, crash noise
VOICE ROM 2 (Loc F4)	SUPER SPINNER, ESCAPE, OOOH!. COMING IN FOR JACKPOT SHOT, ROGER AIR FORCE 1 RAMP CLEARED FOR JACKPOT, laugh, sounds
MUSIC TEST (Sound ROM Loc F7)	<i>NOBODY DOES IT BETTER</i> MUSIC

DIGITAL DISPLAY TEST

Digital displays are driven by digit and segment driver circuits. Digit drivers sequentially select individual character positions (Player 1 and 2 displays) and digit positions (Player 3 and 4 displays). Segment drivers (16 for Player 1 and 2 characters; 7 for Player 3 and 4 digits) select the individual segments of each position.

Automatic Test

To enter Display tests, operate the STEP pushbutton switch from the Sound Manual test. Player 1 and 2 displays indicate DISPLAY AUTO. The displays will sequence from all ZEROS to all nines in the four displays. Next all segments are lit for each digit position in sequence.

Manual Test

Operate the TEST pushbutton switch from the automatic test; Player 1 and 2 displays indicate DISPLAY MANUAL and then display ZEROS in all positions. Operate the Game Start pushbutton switch to cycle through each portion of the test.

SWITCH TEST

Switches are configured on an 8 x 8 matrix of columns (switch drives) and rows (switch returns) with up to 64 switches possible. The switch tests include three parts; switch test, active switches, and bad switches.

Switch Test

From the Display Manual test, operate the STEP pushbutton switch. Player 1 and 2 displays indicate SWITCH TEST. Close each switch and observe the displays. The Player 1 and 2 displays will indicate the switch name and the Player 4 display indicates the switch number. When a switch is released, the name disappears but the switch number remains until another switch is closed or the test is exited.

Active Switches

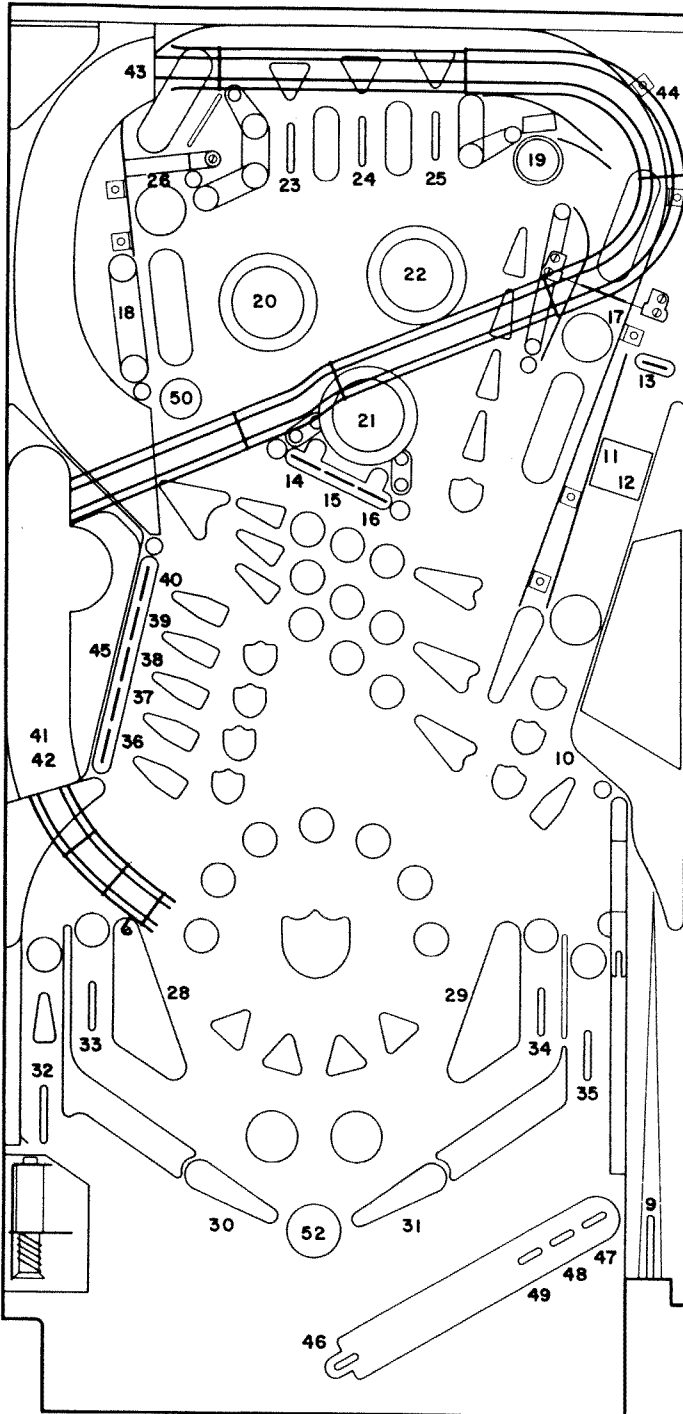
Operate the STEP pushbutton switch from the Switch Test. Player 1 and 2 displays indicate ACTIVE SWITCHES. If any switches are stuck closed (or made from the presence of a ball), the Player 1 and 2 displays sequence through switch names and the switch numbers are indicated in the Player 4 display. This cycle continues until all switches are cleared or until the STEP pushbutton switch is depressed.

Bad Switches

Operate the STEP pushbutton switch from the Switch Test. Player 1 and 2 Displays indicate BAD SWITCHES. During game play, the system keeps track of the last game in which each switch was made. Should a switch not be made for 100 games, it is considered to be bad. If there are any, the Player 1 and 2 displays sequence through switch names and the switch numbers are indicated in the Player 4 display. This cycle continues until the STEP pushbutton switch is depressed.

COLUMN ROW	1 GRN-BRN	2 GRN-RED	3 GRN-ORN	4 GRN-YEL	5 GRN-BLK	6 GRN-BLU	7 GRN-VIO	8 GRN-GRY
1 WHT-BRN	Plumb Tilt 1	Shooter Lane 9	Right Spinner 17	"Y" Lane 25	Left Return 33	Kickbig 1 41	Trough 3 49	Not Used 57
2 WHT-RED	Not Used 2	Bullet Target 10	Top 10 Point 18	Left Spinner 26	Right Return 34	Kickbig 2 42	Star Rollover 50	Not Used 58
3 WHT-ORN	Credit Button 3	Eater 1 11	Top Right Eject 19	Left 10 Point 27	Right Outlane 35	Top Left Ramp Switch 43	Not Used 51	Not Used 59
4 WHT-YEL	Right Coin 4	Eater 2 12	Red Pop Bumper 20	Left Slingshot 10 Point 28	Drop 1 36	Top Right Ramp Switch 44	Up Post 52	Not Used 60
5 WHT-GRN	Center Coin 5	Target Eater 13	Clear Pop Bumper 21	Right Slingshot 10 Point 29	Drop 2 37	Behind 5-Bank 10 Point 45	Not Used 53	Not Used 61
6 WHT-BLU	Left Coin 6	Target 1 14	Blue Pop Bumper 22	Left EOS 30	Drop 3 38	Outhole 46	Not Used 54	Not Used 62
7 WHT-VIO	Slam Tilt 7	Target 2 15	S Lane 23	Right EOS 31	Drop 4 39	Trough 1 47	Not Used 55	Not Used 63
8 WHT-GRY	Not Used 8	Target 3 16	P Lane 24	Left Kickback 32	Drop 5 40	Trough 2 48	Not Used 56	Not Used 64

PLAYFIELD SWITCHES



Switch
Number Description

- 01* Plumb Tilt
- 02 Not Used
- 03* Credits Button
- 04* Right Coin
- 05* Center Coin
- 06* Left Coin
- 07* Slam Tilt
- 08 Not Used
- 09 Shooter Lane
- 10 Bullet Target
- 11 Eater 1 (KGB Hideout)
- 12 Eater 2 (KGB Hideout)
- 13 Eater Target (KGB Hideout)
- 14 Target 1
- 15 Target 2
- 16 Target 3
- 17 Right Spinner
- 18 Top 310 Point
- 19 Top Right Eject
- 20 Red Pop Bumper
- 21 Clear Pop Bumper
- 22 Blue Pop Bumper
- 23 S Lane
- 24 P Lane
- 25 Y Lane
- 26 Left Spinner
- 27 Left 310 Point
- 28 Left Slingshot
- 29 Right Slingshot
- 30 Left Flipper EOS
- 31 Right Flipper EOS
- 32 Laser Kickback
- 33 Left Return
- 34 Right Return
- 35 Right Outlane
- 36 Drop 1
- 37 Drop 2
- 38 Drop 3
- 39 Drop 4
- 40 Drop 5
- 41 Kickbig 1 (Whitehouse)
- 42 Kickbig 2 (Whitehouse)
- 43 Top Left Switch (Ramp)
- 44 Top Right Switch (Ramp)
- 45 310 Point Behind Drops
- 46 Outhole
- 47 Trough 1
- 48 Trough 2
- 49 Trough 3
- 50 Star Rollover
- 51 Not Used
- 52 Up Post
- 53 Not Used
- thru
- 64

* Indicates cabinet switches.

LAMP TESTS

Controlled lamps are configured on an 8 x 8 matrix of columns (lamp drives) and rows (lamp returns) with up to 64 lamps possible. The lamp tests include four parts, all lamps, lamp return (row), lamp drive (column), and discrete lamps.

All Lamps

From the Bad Switch test, operate the STEP pushbutton switch. Player 1 and 2 displays indicate ALL LAMPS and all controlled lamps will light.

Lamp Returns

From the ALL LAMPS test, depress the STEP pushbutton switch. Player 1 and 2 displays indicate LAMP ROWS and the Player 4 display indicates 01 for row 1. All controlled lamps in row 1 should be lit. Operating the Game Start pushbutton switch cycles through each of the rows separately.

Lamp Drives

From the LAMP ROWS test, depress the STEP pushbutton switch. Player 1 and 2 displays indicate LAMP COLUMNS and the Player 4 display indicates 01 for column 1. All controlled lamps in column 1 should be lit. Operating the Game Start pushbutton switch cycles through each of the columns separately.

Discrete Lamp

From the LAMP COLUMNS test, depress the STEP pushbutton switch. Player 1 and 2 displays indicate LAMP TEST and then the name assigned to lamp 01; Player 4 display indicates 01. Lamp 01 should light. With the FORWARD/REVERSE pushbutton switch in the FORWARD (up) position, operating the Game Start pushbutton switch selects higher-numbered lamps; with it in the REVERSE (down) position, Game Start selects lower-numbered lamps.

COLUMN \ ROW	1 YEL-BRN	2 YEL-RED	3 YEL-ORN	4 YEL-BLK	5 YEL-GRN	6 YEL-BLU	7 YEL-VIO	8 YEL-GRY
1 RED-BRN	Spy Again 1	Left Red Arrow 9	Left Clear Arrow 17	Left Blue Arrow 25	5-Bank Arrow 1 33	5-Bank Instant 2-Ball 41	Laser Kick 49	Bonus 8K 57
2 RED-BLK	White House #2 2	Left Red Circle 10	Right Clear Circle 18	Left Blue Circle 26	5-Bank Arrow 2 34	5-Bank Extra Ball 42	Left Out Special 50	Bonus 16K 58
3 RED-ORN	Russian Embassy #2 (Jackpot) 3	Center Red Circle 11	Center Clear Circle 19	Center Blue Circle 27	5-Bank Arrow 3 35	5-Bank Bonus Hold 43	Left Return 51	Bonus 32K 59
4 RED-YEL	Jefferson Memorial #1 (Jackpot) 4	Right Red Circle 12	Right Clear Circle 20	Right Blue Circle 28	5-Bank Arrow 4 36	5-Bank 100K 44	Right Return 52	Bonus 64K 60
5 RED-GRN	Jefferson Memorial #2 5	Right Red Arrow 13	Right Clear Arrow 21	Right Blue Arrow 29	5-Bank Arrow 5 37	Eject 25K 45	Right Special 53	2X Bonus 61
6 RED-BLU	"S" Lane 6	Russian Shield Grn 14	2X Scores 22	Super Arrow 30	Bullet Target 38	Eject 50K 46	Bonus 1K 54	3X Bonus 62
7 RED-VIO	"P" Lane 7	Russian 100K Shield Cir 15	Bonus Hold 23	Left Spinner 31	Hotline (2) 39	Eject 75K 47	Bonus 2K 55	4X Bonus 63
8 RED-GRY	"Y" Lane 8	Shield Amber Russian Lites Laser Kick 16	Up Post 24	Right Spinner 32	Eject Extra Ball 40	Eject 100K 48	Bonus 4K 56	5X Bonus 64

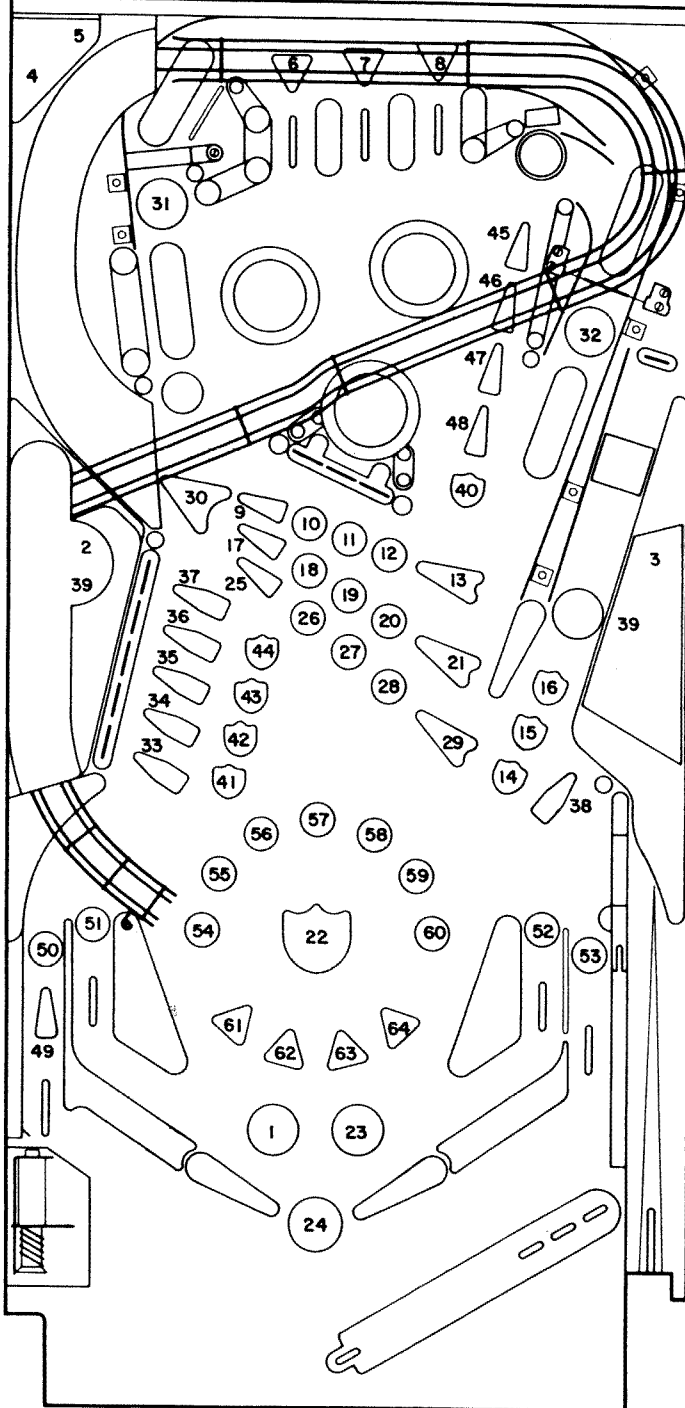
**Lamp
Number Description**

- 01 Spy Again
- 02 White House #2
- 03 Russian Embassy #2
- 04 Jefferson Memorial #1 (Jackpot)
- 05 Jefferson Memorial #1 (Jackpot)
- 06 "S" Lane
- 07 "P" Lane
- 08 "Y" Lane
- 09 Left Red Arrow
- 10 Left Red Circle

**Lamp
Number Description**

- 11 Center Red Circle
- 12 Right Red Circle
- 13 Right Red Arrow
- 14 Russian Embassy Green? Shield
- 15 Russian Embassy Yellow Shield
- 16 Russian Embassy Clear Shield
- 17 Left Clear Arrow
- 18 Left Clear Circle
- 19 Center Clear Circle
- 20 Right Clear Circle
- 21 Right Clear Arrow
- 22 All Scores Double
- 23 Bonus Held
- 24 Up Post
- 25 Left Blue Arrow
- 26 Left Blue Circle
- 27 Center Blue Circle

PLAYFIELD LAMPS



- 28 Right Blue Circle
- 29 Right Blue Arrow
- 30 Super Arrow
- 31 Left Spinner
- 32 Right Spinner
- 33 5-Bank Arrow 1
- 34 5-Bank Arrow 2
- 35 5-Bank Arrow 3
- 36 5-Bank Arrow 4
- 37 5-Bank Arrow 5
- 38 Bullet Target
- 39 Hotline (White House)
- 40 Eject Green Shield
- 41 5-Bank Green Shield
- 42 5-Bank Orange Shield
- 43 5-Bank Amber Shield
- 44 5-Bank Clear Shield
- 45 Eject Red Arrow
- 46 Eject Clear Arrow
- 47 Eject Blue Arrow
- 48 Eject Amber Shield
- 49 Laser Kickback
- 50 Left Outlane Special
- 51 Left Return Lane
- 52 Right Return Lane
- 53 Right Outlane Special
- 54 1K Bonus
- 55 2K Bonus
- 56 4K Bonus
- 57 8K Bonus
- 58 16K Bonus
- 59 32K Bonus
- 60 64K Bonus
- 61 2X
- 62 3X
- 63 4X
- 64 5X

COIL TEST

Sixteen regular (pulsed under microprocessor control) and six switch-triggered coil drivers are provided to switch ground to coils. Coil number 10 is used in conjunction with drives 1 through 8 to switch +34 volts between coils or flash lamps; these sets are termed "left" and "right". Coil number 10 is located on the MRB board which provides isolation diodes and current limiting and heater resistors. This effectively provides 23 regular coils.

There are two coil tests for testing the regular coils; COIL TEST and SELECT COIL. The first test sequentially pulses each coil and the second pulses a selected coil repeatedly. Pop bumper and slingshot coils are switch-triggered and may be tested by closing the associated switch triggers.

Automatic Test

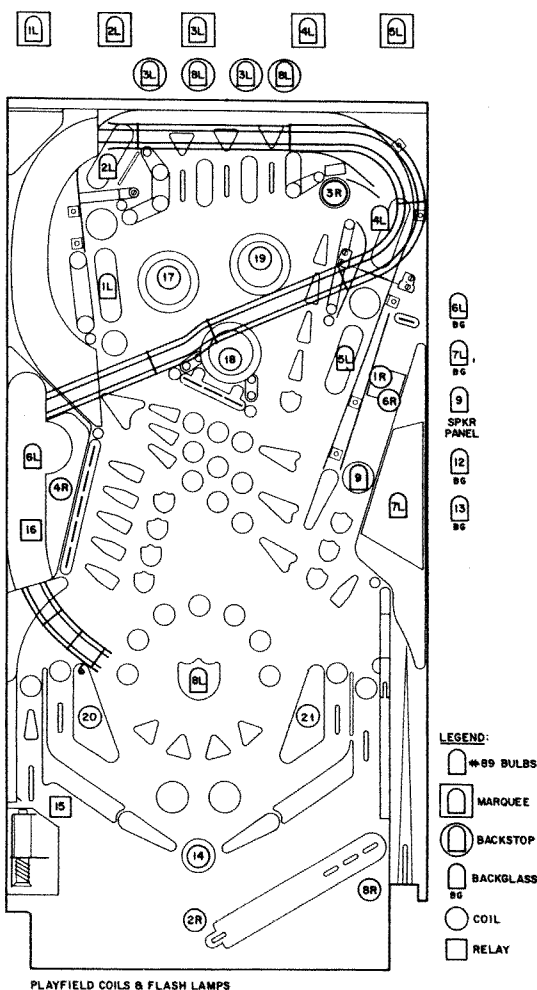
From the Discrete Lamps test, depress the STEP pushbutton switch. Player 1 and 2 displays indicate COIL TEST. The test pulses each regular solenoid or flash lamp sequentially with the coil/flash lamp name indicated in the Player 1 and 2 displays and the drive number in the Player 4 display.

Select Coil

From the Coil Test, depress the STEP pushbutton switch. Player 1 and 2 displays indicate SELECT COIL and then the name of drive 1L, the drive number is indicated in the Player 4 display. Operate the Game Start pushbutton switch to select the coil or flash lamp to be tested. With the desired drive number indicated in the Player 4 display, depress the STEP pushbutton switch to cause it to be pulsed repeatedly.

RETURN TO GAME OVER

From the Select Coil test, depress the STEP pushbutton switch one time if a selected coil is pulsing or two times none is pulsing. The game returns to the game-over mode.

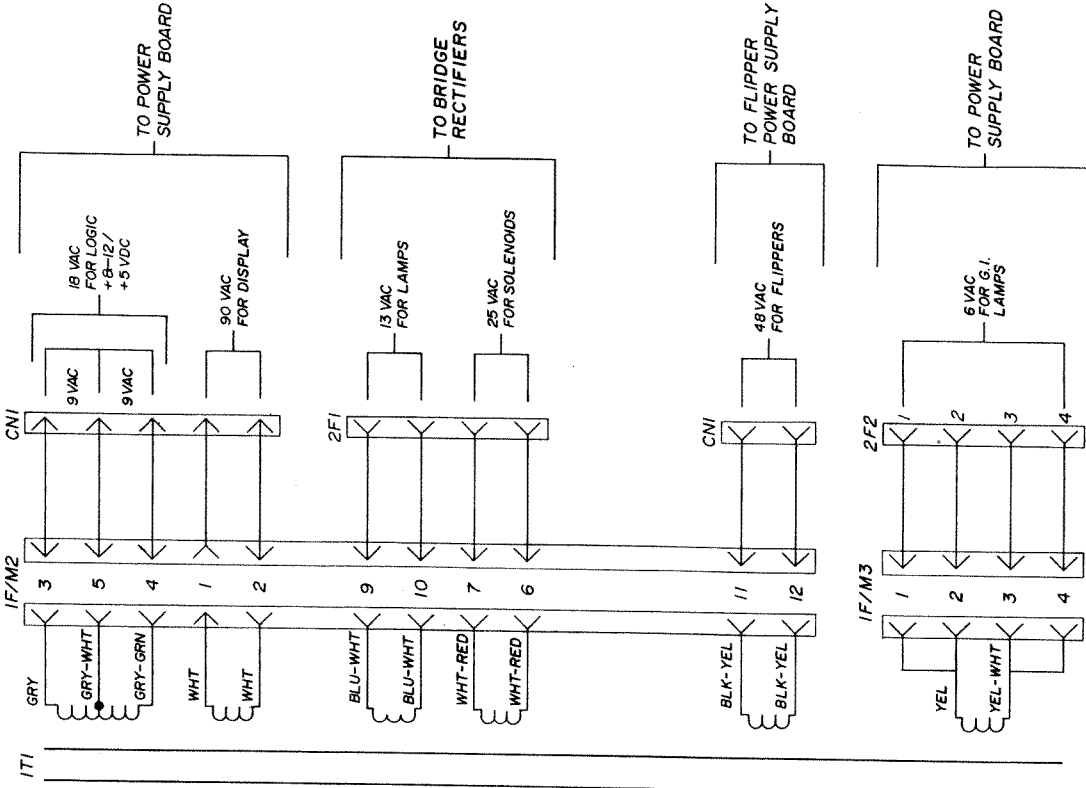


Coil Number Description

Coil Number	Description
01L	Left Red Hotdog, Left Red Backbox Top
01R	Eater Down
02L	Left Yellow Hotdog, Left Yellow Backbox Top
02R	Outhole
03L	Blue Mars, Backglass
03R	Eject Hole
04L	Right Yellow Hotdog, Right Yellow Backbox Top
04R	5-Bank Reset
05L	Right Red Hotdog, Right Red Backbox Top
05R	Not Used
06L	White House, Backglass
06R	Eater Up
07L	Russian Embassy, Backglass
07R	Knocker
08L	Shield, Clear Mars
08R	Trough
09	KGB Hideout, Music Credits (Speaker Panel)
10	Solenoid B + Relay
11	General Illumination Relay
12	Spies (Backglass)
13	Secret Service (Backglass), Clear Mars
14	Post
15	Laser Kickback
16	Kickbig
17 (SP1)	Red Pop BUMPER
18 (SP2)	Clear Pop Bumper
19 (SP3)	Blue Pop Bumper
20 (SP4)	Left Slingshot
21 (SP5)	Right Slingshot
22 (SP6)	Not Used

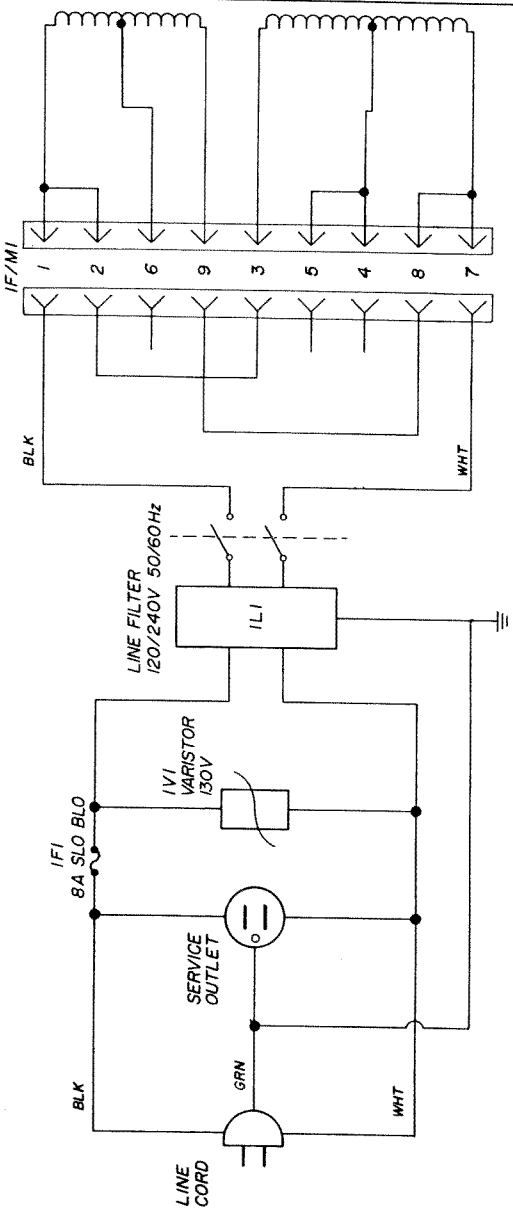
COIL IDENTIFICATION TABLE

Coil Number (Player 4)	Coil Description (Player 1 & 2)	CPU (Playfield)	Wire Colors MRB (Spec Sw)	Power	Drive Transistor	Device Type
01L	Top Left Red Hotdog Left Red Marquee	GRY-BRN	VIO-BRN	BRN	Q46	#89 Bulbs
01R	Ball Eater Down	GRY-BRN	BLK-BRN	ORN	Q46	32-590 Coil
02L	Top Left Yellow Hotdog Left Yellow Marquee	GRY-RED	VIO-RED	BRN	Q45	#89 Bulbs
02R	Outhole	GRY-RED	BLK-RED	ORN	Q45	23-840 Coil
03L	Blue Mars (backstop) Blue Marquee	GRY-ORN	VIO-ORN	BRN	Q44	#89 Bulbs
03R	Eject Hole	GRY-ORN	BLK-ORN	ORN	Q44	27-1500 Coil
04L	Top Right Yellow Hotdog Right Yellow Marquee	GRY-YEL	VIO-YEL	BRN	Q43	#89 Bulbs
04R	5-Bank Reset	GRY-YEL	BLK-YEL	ORN	Q43	23-1200 Coil
05L	Top Right Red Hotdog Right Red Marquee	GRY-GRN	VIO-GRN	BRN	Q42	#89 Bulbs
05R	Not Used	GRY-GRN	BLK-GRN	ORN	Q42	--
06L	White House Backglass (2)	GRY-BLU	VIO-BLU	BRN	Q41	#89 Bulbs
06R	Ball Eater Up	GRY-BLU	BLK-BLU	ORN	Q41	27-1500 Coil
07L	Russian Embassy Backglass (2)	GRY-VIO	VIO-BLK	BRN	Q40	#89 Bulbs
07R	Knocker	GRY-VIO	BLK-VIO	ORN	Q40	23-800 Coil
08L	Shield, Clear Mars (backstop)	GRY-BLK	VIO-GRY	BRN	Q39	#89 Bulbs
08R	Trough	GRY-BLK	BLK-GRY	ORN	Q39	23-840 Coil
09	KGB Hideout Music Credits (Speaker panel)	BRN-BLK	BRN-BLK	RED	Q30	#89 Bulbs
10	Left/Right Coil Relay	BRN-RED	--	RED	Q29	Relay (MRB)
11	General Illumination Relay	BRN-ORN	--	RED	Q28	Relay (PS)
12	2 Spies (Backglass)	BRN-YEL	BRN-YEL	RED	Q27	#89 Bulbs
13	Secret Service (Backglass)	BRN-GRN	BRN-GRN	RED	Q26	#89 Bulbs
14	Post	BRN-BLU	--	RED	Q25	23-800 Coil
15	Kickback Relay Kickback Coil	BRN-VIO (BLK)	--	RED VIO-YEL or GRY	Q24	+ 24V Relay 24-900 Coil
16	Kickbig Relay Kickbig Coil	BRN-GRY (BLK)	--	RED VIO-YEL or GRY	Q23	+ 24V Relay 24-900 Coil
SP1	Red Pop Bumper	BLU-BRN	(ORN-BRN)	WHT	Q8	23-800 Coil
SP2	Clear Pop Bumper	BLU-RED	(ORN-RED)	WHT	Q9	23-800 Coil
SP3	Blue Pop Bumper	BLU-ORN	(ORN-BLK)	WHT	Q10	23-800 Coil
SP4	Left Slingshot	BLU-YEL	(ORN-YEL)	WHT	Q11	23-800 Coil
SP5	Right Slingshot	BLU-GRN	(ORN-GRN)	WHT	Q12	23-800 Coil
SP6	Not Used	BLU-BLK	(ORN-BLU)	WHT	Q13	
--	Left Flipper	(BLU-GRY)	--	GRY-YEL	--	23-620/30-2600
--	Right Flipper	(BLU-VIO)	--	BIU-YEL	--	23-620/30-2600
--	Upper Right Flipper	(BLK-YEL)	--	GRY-YEL	--	23-620/30-2600



THIS CONFIGURATION FOR 115V

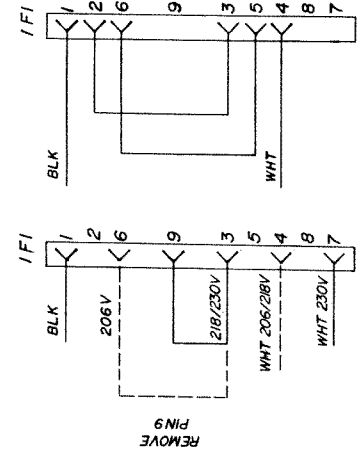
FOR LOWER LINE VOLTAGES
OR 230 VOLT OPERATION
SEE SAMPLES BELOW



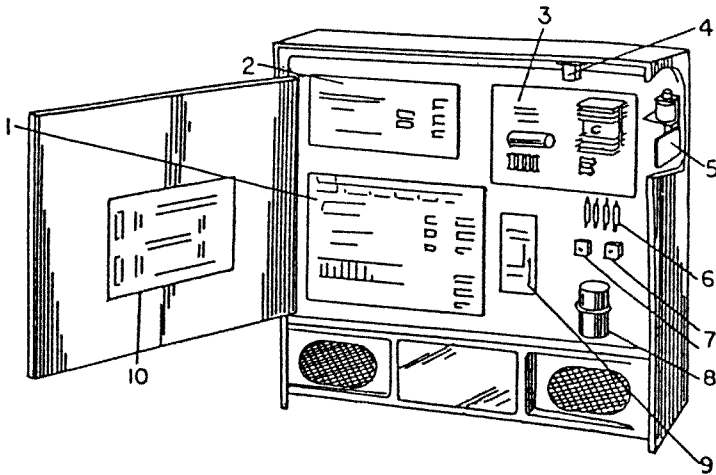
JUMPERS FOR VOLTAGE VARIATION

230/218/206 VOLTS
IF1 = 4A SLO BLO
IV1 = 275V VARIATOR

100/105 VOLTS
IF1 = 8A SLO BLO
IV1 = 130V VARIATOR



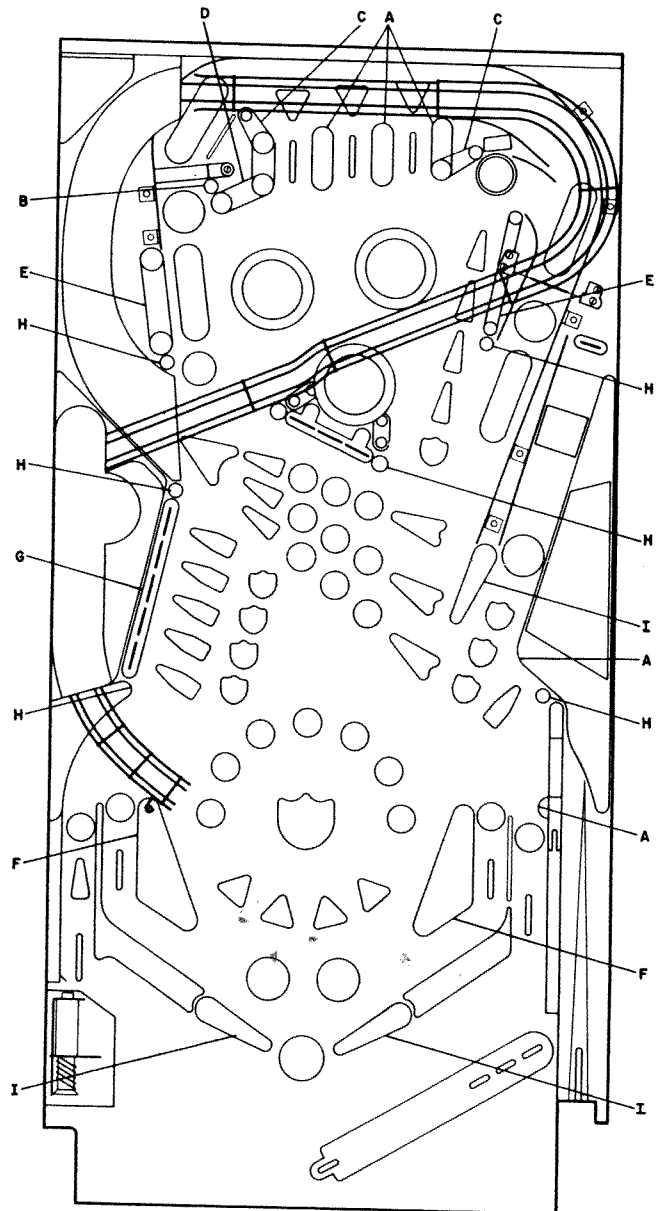
BACKBOX PARTS ILLUSTRATION



Item	Description	Part No.
1	CPU Board Assy	520-5003-02
2	Sound Board Assy	520-5002-01
3	Power Supply Bd Assy	520-5000-00
4	Relay Board Assy	520-5010-00
5	Knocker Assy	500-5009-00
6	G.I. Fuse Holder	205-5000-01
7	Bridge Rectifiers	112-5000-00
8	Capacitor 2C1	125-5000-00
9	Flipper Pwr Supply Bd Assy	520-5001-00
10	Master Display Bd Assy	520-5004-00

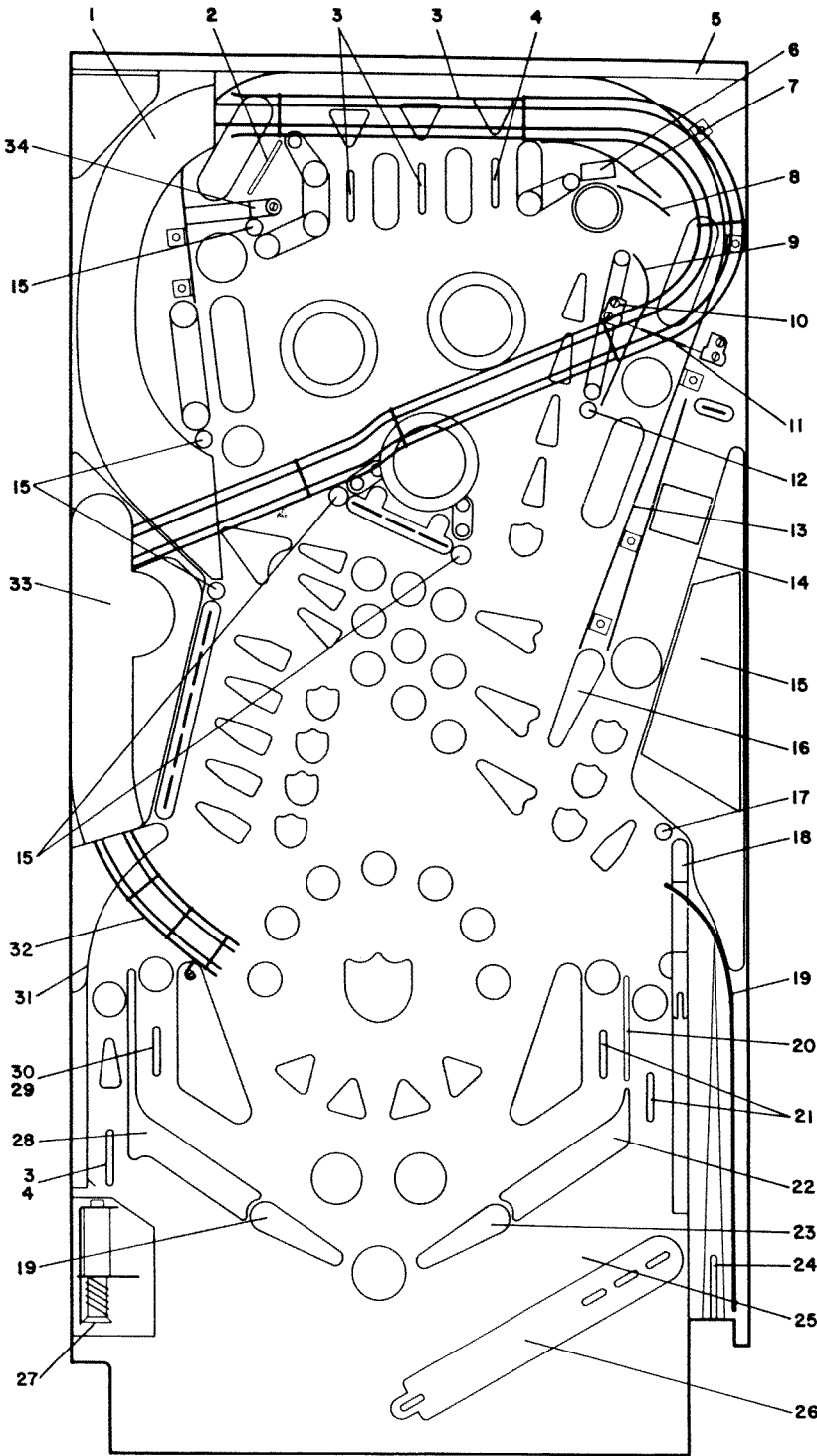
RUBBER PARTS ILLUSTRATION

Item	Description	Part No.
A	5/16" I.D. Ring	545-5025-02
B	7/16" O.D. Ring	545-5025-17
C	3/4" I.D. Ring	545-5025-04
D	1 1/4" I.D. Ring	545-5025-06
E	1 1/2" I.D. Ring	545-5025-07
F	2 3/4" I.D. Ring	• 545-5034-00
G	3" I.D. Ring	545-5025-10
H	Bumper Post	545-5009-00
I	Flipper Rubber (Red)	545-5024-02



RUBBER PARTS

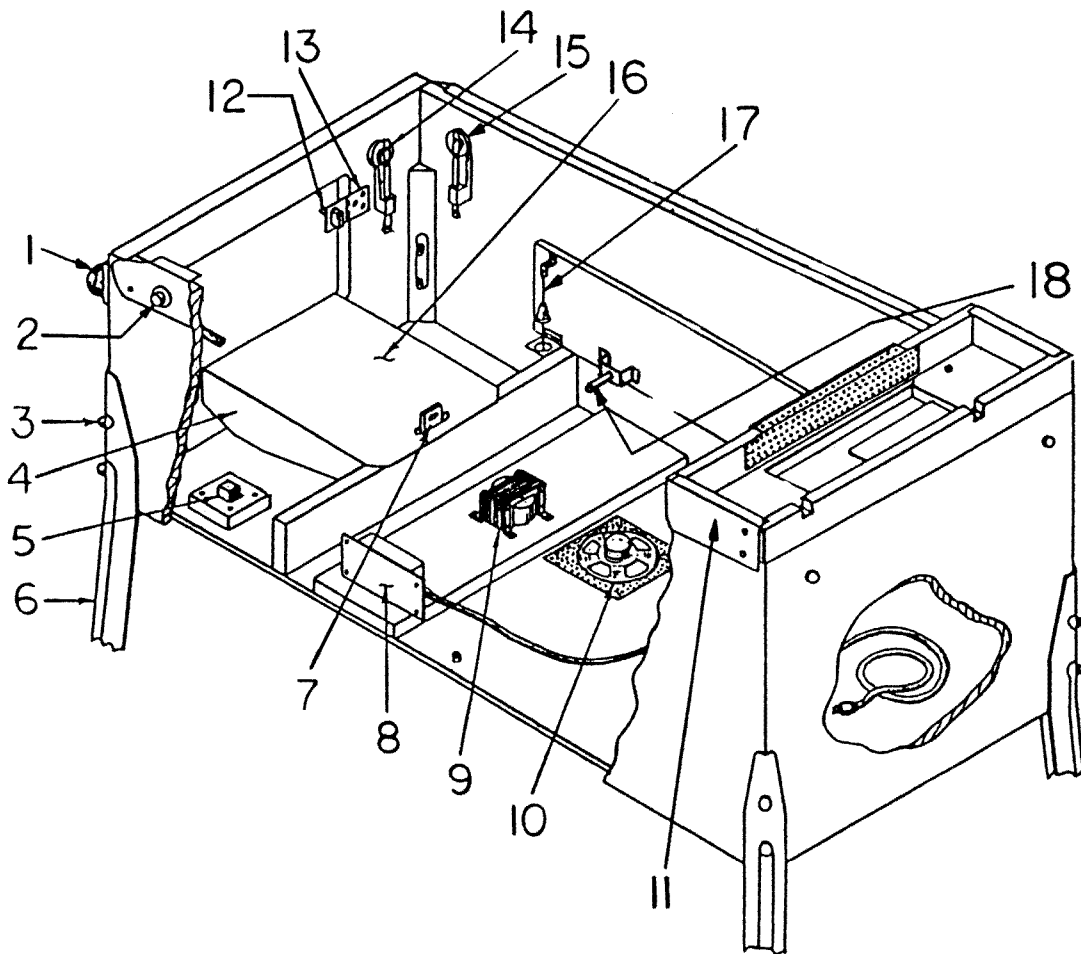
PLAYFIELD PARTS ILLUSTRATION



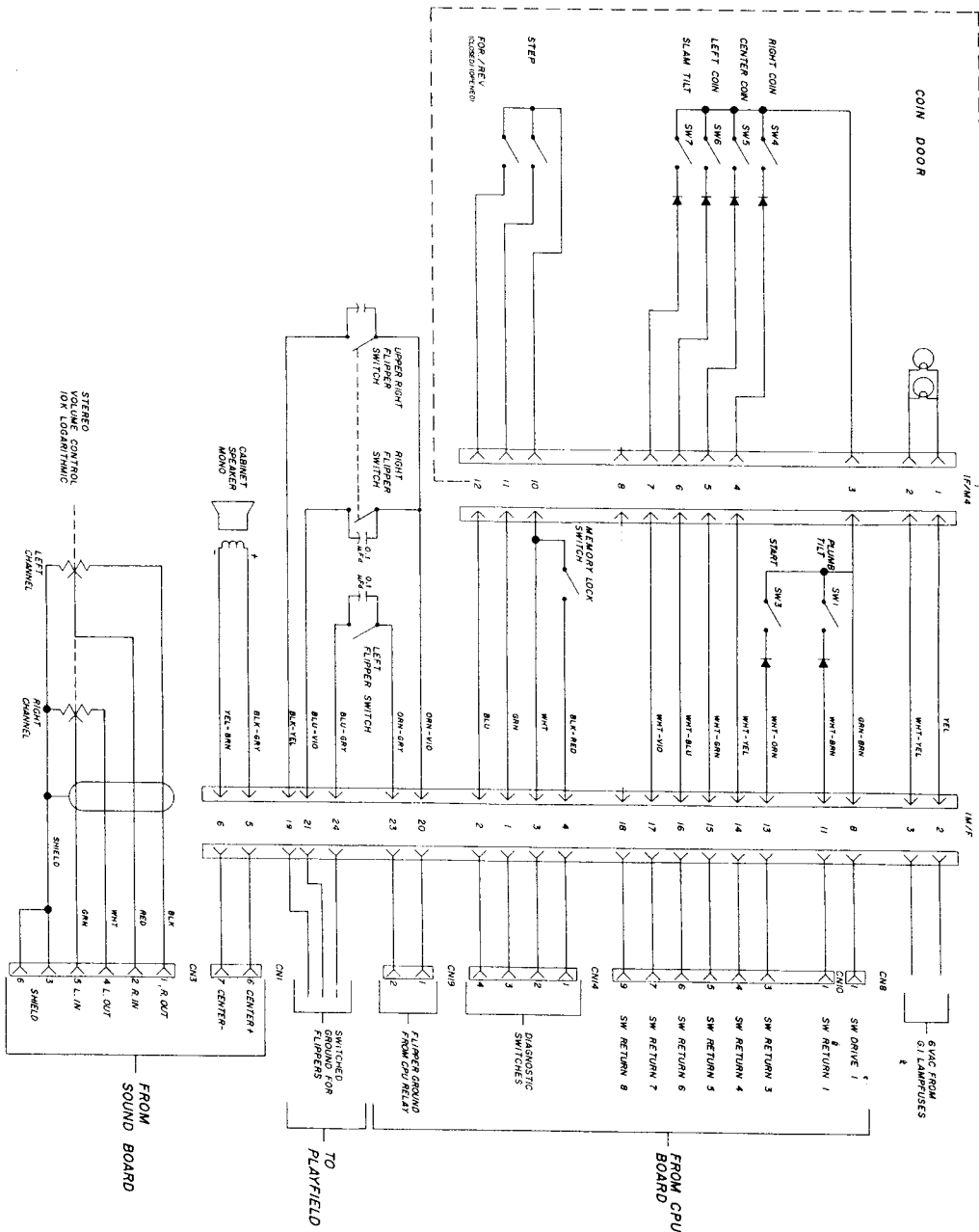
Item	Description	Part No.
1	Ramp Assembly	515-5068-00
2	Wire Form - 1 $\frac{3}{4}$ "	535-5300-09
3	Rollover Wire	535-5315-01
4	Rollover Bracket - Right	535-5238-01
5	Wire Ramp Assy	515-5066-00
6	P/F Back Panel Assy	515-5061-00
7	Wire Form - Curved	535-5324-00
8	Ball Stop Bkt - Mod.	535-5252-00
9	Wire Form - Guide	535-5325-00
10	Wire Form - Curved	535-5326-00
11	Spinner Bkt - Lft	535-5259-02
12	Spinning Target Assy.	500-5052-01
13	Spinning Bkt - Right	535-5259-01
14	Ball Guide Assy. - Top	500-5064-00
15	Bumper Post - Mach.	530-5007-00
16	Wire Form - 8"	535-5300-08
17	Ball Guide Assy - Upper Right	500-5061-00
18	Russian Embassy Assy	515-5073-00
19	Flipper Assy	515-5038-00
20	Ball Gate Assy	500-5063-00
21	Ball Guide Assy. - Lower Right	500-5059-00
22	Wire Form Straight - 2 $\frac{1}{2}$ "	535-5300-01
23	Return Ball Guide - Right	535-5407-00
24	Rollover Wire - B/S	535-5313-00
25	Wire Form & Brkt Assy	500-5042-00
26	Switch Plate Assy	500-5041-00
27	Kick Back Assy	500-5000-00
28	Return Ball Guide - Left	535-5406-00
29	Rollover Bkt - Left	535-5238-02
30	Rollover Wire	535-5315-02
31	Ball Guide Assy - Lower Lft.	500-5058-00
32	Wire Ramp	535-5321-00
33	White House Assy	515-5072-00
34	Spinning Target & Bkt Assy	500-5060-01

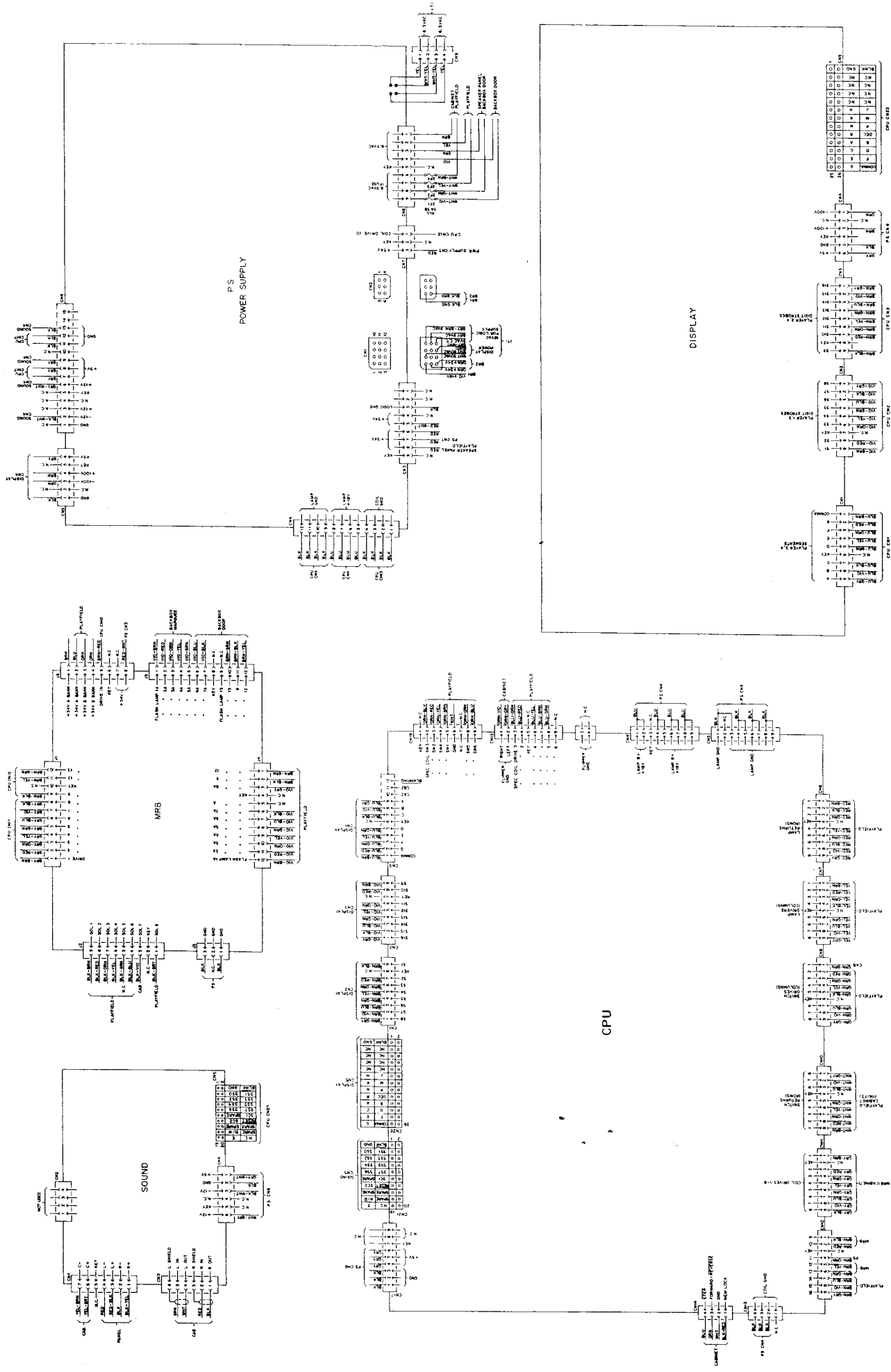
PLAYFIELD PARTS

CABINET PARTS ILLUSTRATION

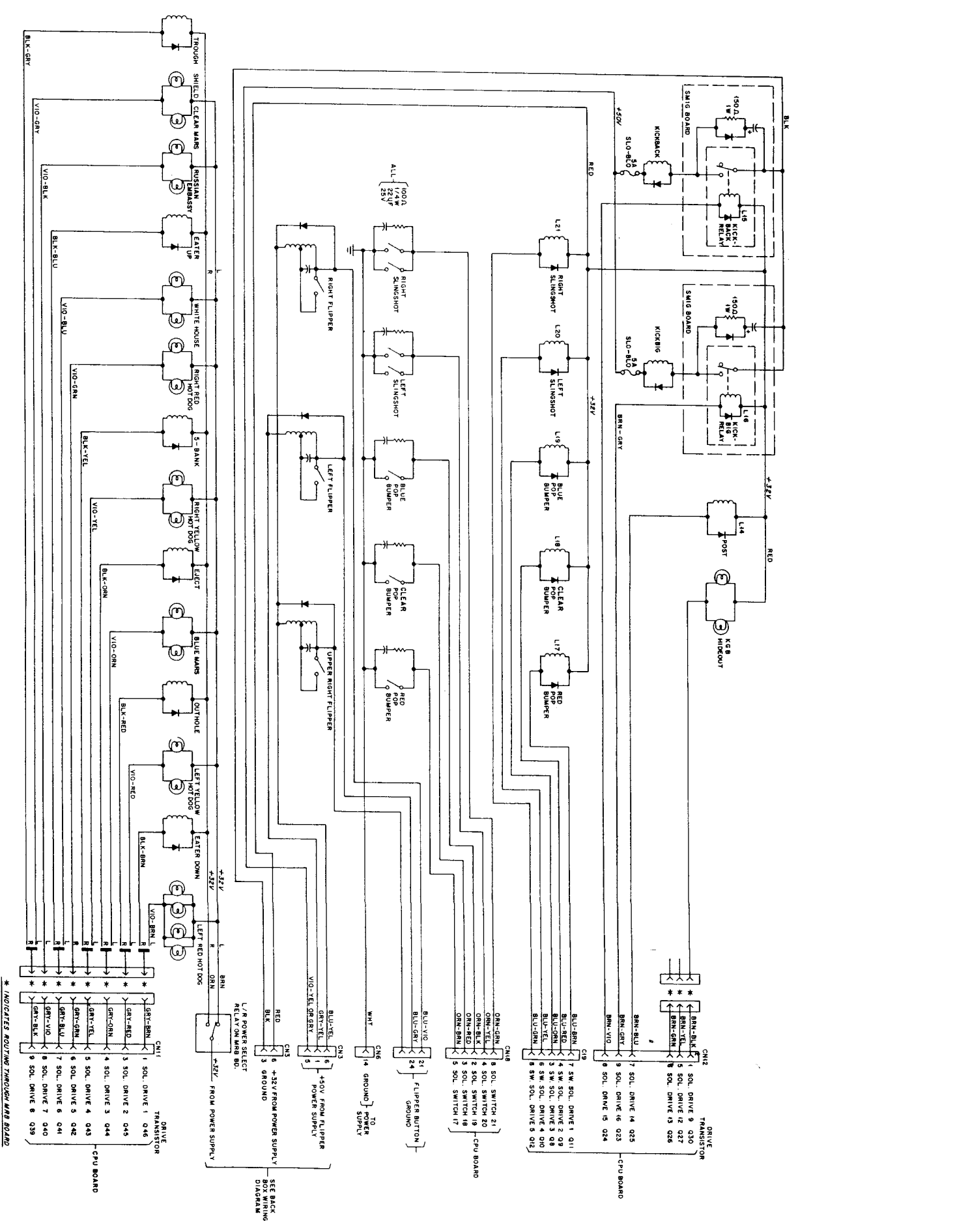


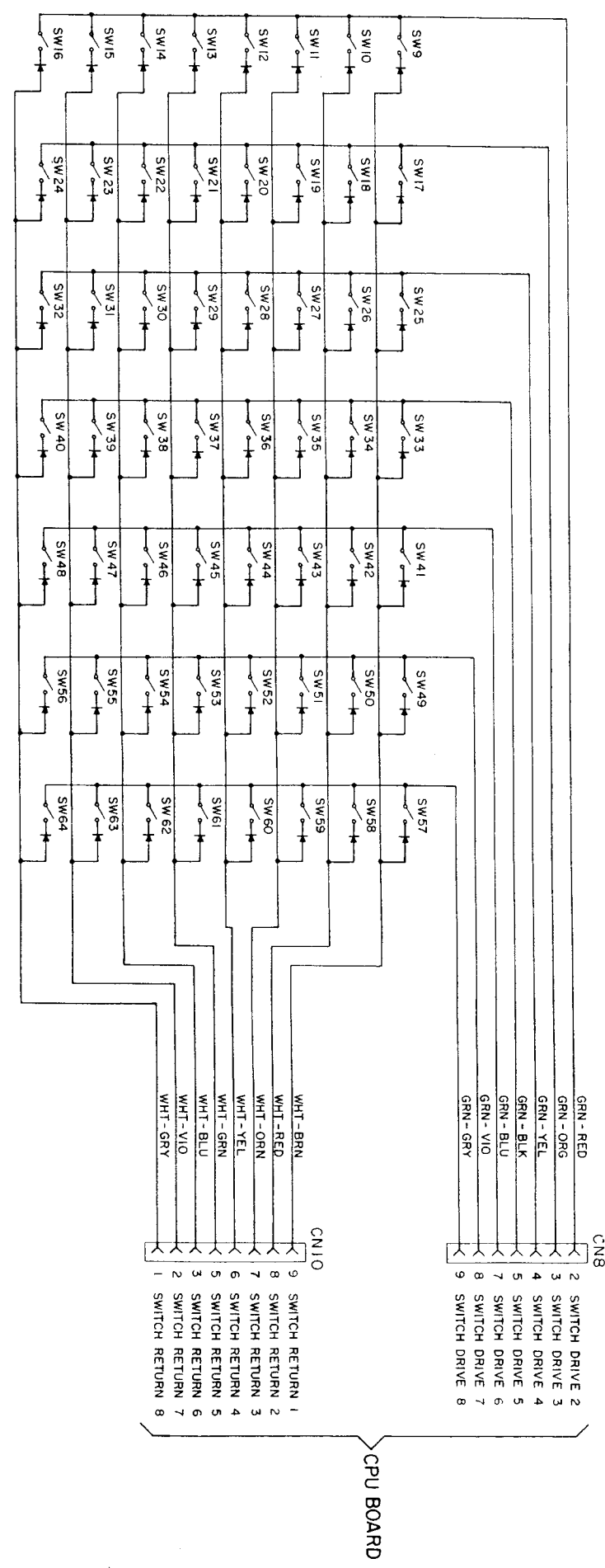
Item	Description	Part No.
1	Ball-shooter Assy	500-5019-02
2	Flipper Button	500-5026-02
3	Leg Bolt (Chrome)	231-5000-00
4	Cash Box Bottom	535-5014-00
5	On/Off Switch DP/ST	180-5001-00
6	Leg (Chrome)	535-5020-10
7	Lock Bracket - Cash Box	535-5215-00
8	Power Input Box Assy	515-5018-10
9	Transformer	010-5002-00
10	Speaker-Round (6")	031-5000-00
11	Side Armor-Right	535-5010-01
12	Memory Protect Switch	180-5000-00
13	Memory Protect Switch Bracket	535-5225-00
14	Start Switch	180-5016-00
15	Tungston Switch-Flipper	180-5013-00
16	Cash Box Top	535-5013-00
17	Plumb Bob Tilt Mech. Assy	500-5023-00
18	Volume Control	123-5000-00





Interboard Wiring Diagram





Switch Number	Description
09	Shooter Lane
10	Bullet Target
11	Eater 1 (KGB Hideout)
12	Eater 2 (KGB Hideout)
13	Eater Target (KGB Hideout)
14	Target 1
15	Target 2
16	Target 3
17	Right Spinner
18	Top 310 Point
19	Top Right Eject
20	Red Pop Bumper

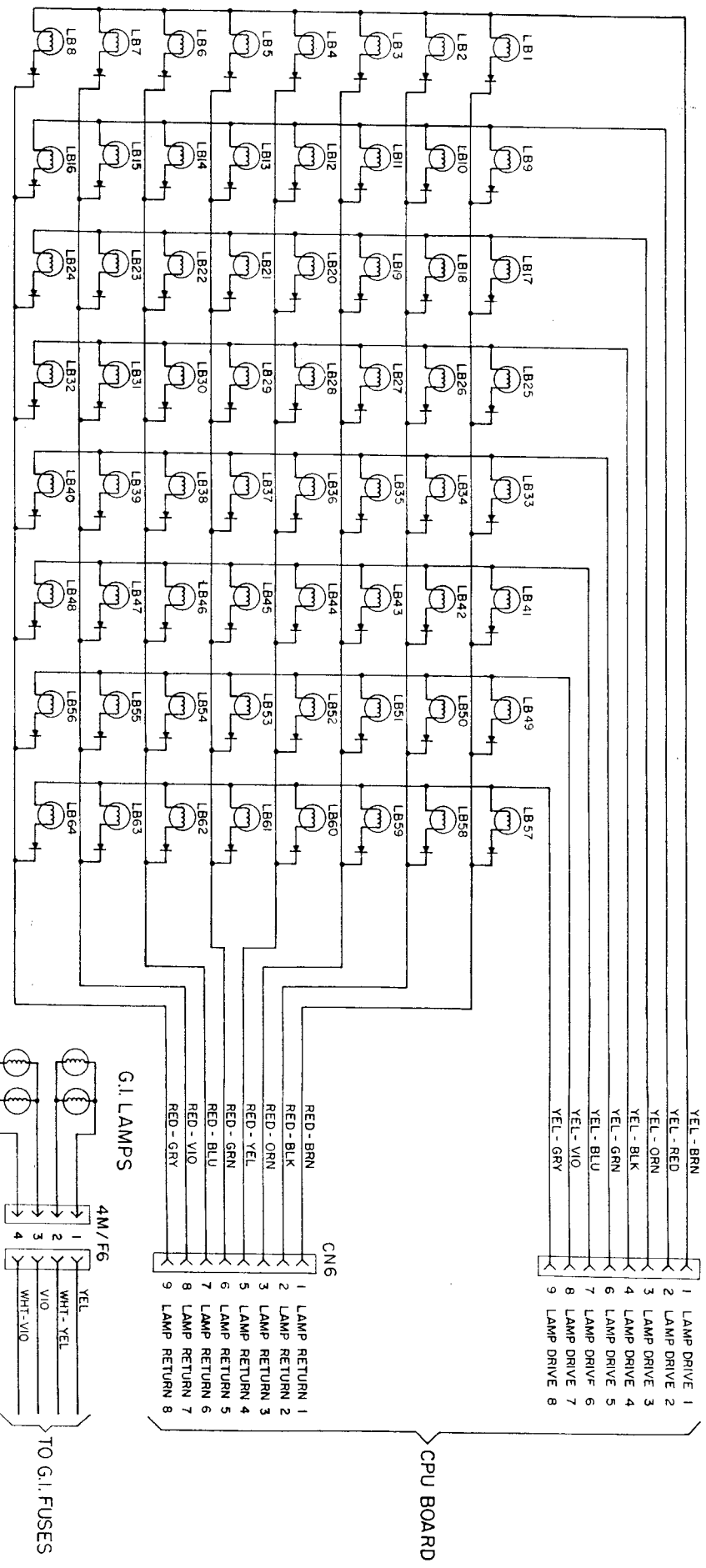
21	Clear Pop Bumper
22	Blue Pop Bumper
23	S Lane
24	P Lane
25	Y Lane
26	Left Spinner
27	Left 310 Point
28	Left Slingshot
29	Right Slingshot
30	Left Flipper EOS
31	Right Flipper EOS
32	Laser Kickback

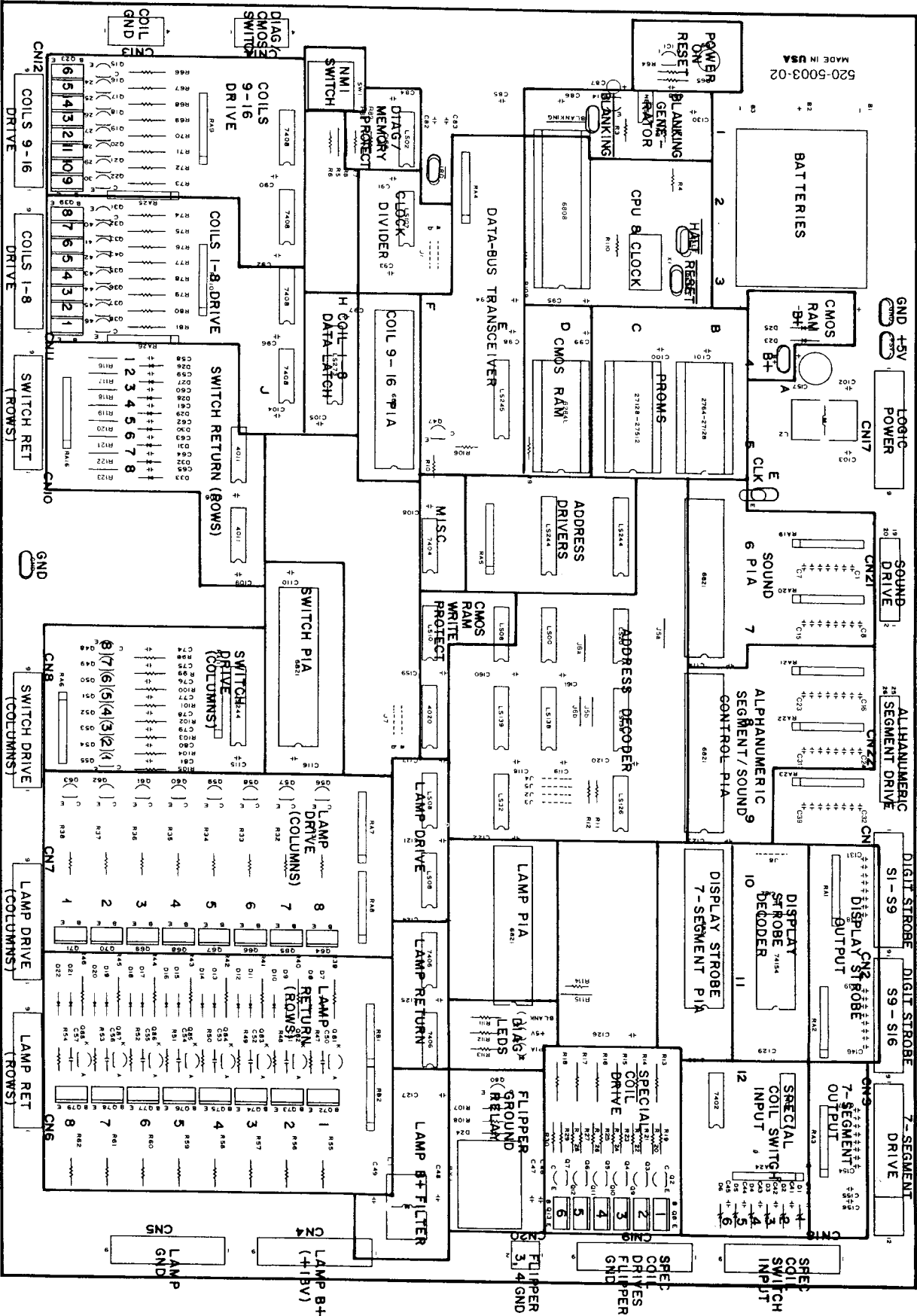
33	Left Return
34	Right Return
35	Right Outlane
36	Drop 1
37	Drop 2
38	Drop 3
39	Drop 4
40	Drop 5
41	Kicking 1 (Whitehouse)
42	Kicking 2 (Whitehouse)
43	Top Left Switch (Ramp)
44	Top Right Switch (Ramp)

45	310 Point Behind Drops
46	Outhole
47	Trough 1
48	Trough 2
49	Trough 3
50	Star Follower
51	Not Used
52	Up Post
53	Not Used
thru	
64	

CPU BOARD

Lamp Number	Description
01	Spy Again
02	White House #2
03	Russian Embassy #2
04	Jefferson Memorial #1 (Jackpot)
05	Jefferson Memorial #1 (Jackpot)
06	"S" Lane
07	"P" Lane
08	"Y" Lane
09	Left Red Arrow
10	Left Red Circle
11	Center Red Circle
12	Right Red Circle
13	Right Red Arrow
14	Russian Embassy Green? Shield
15	Russian Embassy Yellow Shield
16	Russian Embassy Clear Shield
17	Left Clear Arrow
18	Left Clear Circle
19	Center Clear Circle
20	Right Clear Circle
21	Right Clear Arrow
22	All Scores Double
23	Bonus Held
24	Up Post
25	Left Blue Arrow
26	Left Blue Circle
27	Center Blue Circle
28	Right Blue Circle
29	Right Blue Arrow
30	Super Arrow
31	Left Spinner
32	Right Spinner
33	5-Bank Arrow 1
34	5-Bank Arrow 2
35	5-Bank Arrow 3
36	5-Bank Arrow 4
37	5-Bank Arrow 5
38	Bullet Target
39	Holline (White House)
40	Eject Green Shield
41	5-Bank Green Shield
42	5-Bank Orange Shield
43	5-Bank Amber Shield
44	5-Bank Clear Shield
45	Eject Red Arrow
46	Eject Clear Arrow
47	Eject Blue Arrow
48	Eject Amber Shield
49	Laser Kickback
50	Left Outlane Special
51	Left Return Lane
52	Right Return Lane
53	Right Outlane Special
54	1K Bonus
55	2K Bonus
56	4K Bonus
57	8K Bonus
58	16K Bonus
59	32K Bonus
60	64K Bonus
61	2X
62	3X
63	4X
64	5X





520-5003-02
MADE IN USA

BATTERIES

POWER ON
RESET
BLANKING
GENE-
REACTOR

CPU CLOCK

HALT
RESET

DATA-BUS TRANSCEIVER

CMOS RAM

PROMS

ADDRESS DRIVERS

ADDRESS DECODER

CMOS RAM WRITE PROTECT

LAMP DRIVE

LAMP RETURN

LAMP DRIVE

LAMP RETURN

LAMP DRIVE

LAMP RETURN

LAMP DRIVE

LAMP RETURN

LAMP DRIVE

LAMP RETURN

LAMP DRIVE

LAMP RETURN

LAMP DRIVE

LAMP RETURN

GND +5V

LOGIC POWER

SOUND DRIVE

ALPHANUMERIC SEGMENT DRIVE

ALPHANUMERIC SEGMENT CONTROL PIA

DISPLAY STROBE

DISPLAY STROBE OUTPUT

7-SEGMENT INPUT

7-SEGMENT OUTPUT

FLIPPER COIL DRIVERS

FLIPPER GND

COIL GND

LAMP GND

LAMP GND

LAMP GND

LAMP GND

LAMP GND

LAMP GND

LAMP GND

SOUND 6 PIA

ALPHANUMERIC SEGMENT CONTROL PIA

DISPLAY STROBE 7-SEGMENT PIA

DISPLAY STROBE 7-SEGMENT PIA

7-SEGMENT INPUT

7-SEGMENT OUTPUT

FLIPPER COIL DRIVERS

FLIPPER GND

COIL GND

LAMP GND

LAMP GND

LAMP GND

LAMP GND

LAMP GND

LAMP GND

DATA-BUS TRANSCEIVER

CMOS RAM

PROMS

ADDRESS DRIVERS

ADDRESS DECODER

CMOS RAM WRITE PROTECT

LAMP DRIVE

LAMP RETURN

LAMP DRIVE

LAMP RETURN

LAMP DRIVE

LAMP RETURN

LAMP DRIVE

LAMP RETURN

LAMP DRIVE

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LAMP DRIVE

LAMP RETURN

LAMP DRIVE

LAMP RETURN

LAMP DRIVE

DATA-BUS TRANSCEIVER

CMOS RAM

PROMS

ADDRESS DRIVERS

ADDRESS DECODER

CMOS RAM WRITE PROTECT

LAMP DRIVE

LAMP RETURN

LAMP DRIVE

LAMP RETURN

LAMP DRIVE

LAMP RETURN

LAMP DRIVE

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LAMP DRIVE

DATA-BUS TRANSCEIVER

CMOS RAM

PROMS

ADDRESS DRIVERS

ADDRESS DECODER

CMOS RAM WRITE PROTECT

LAMP DRIVE

LAMP RETURN

LAMP DRIVE

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LAMP RETURN

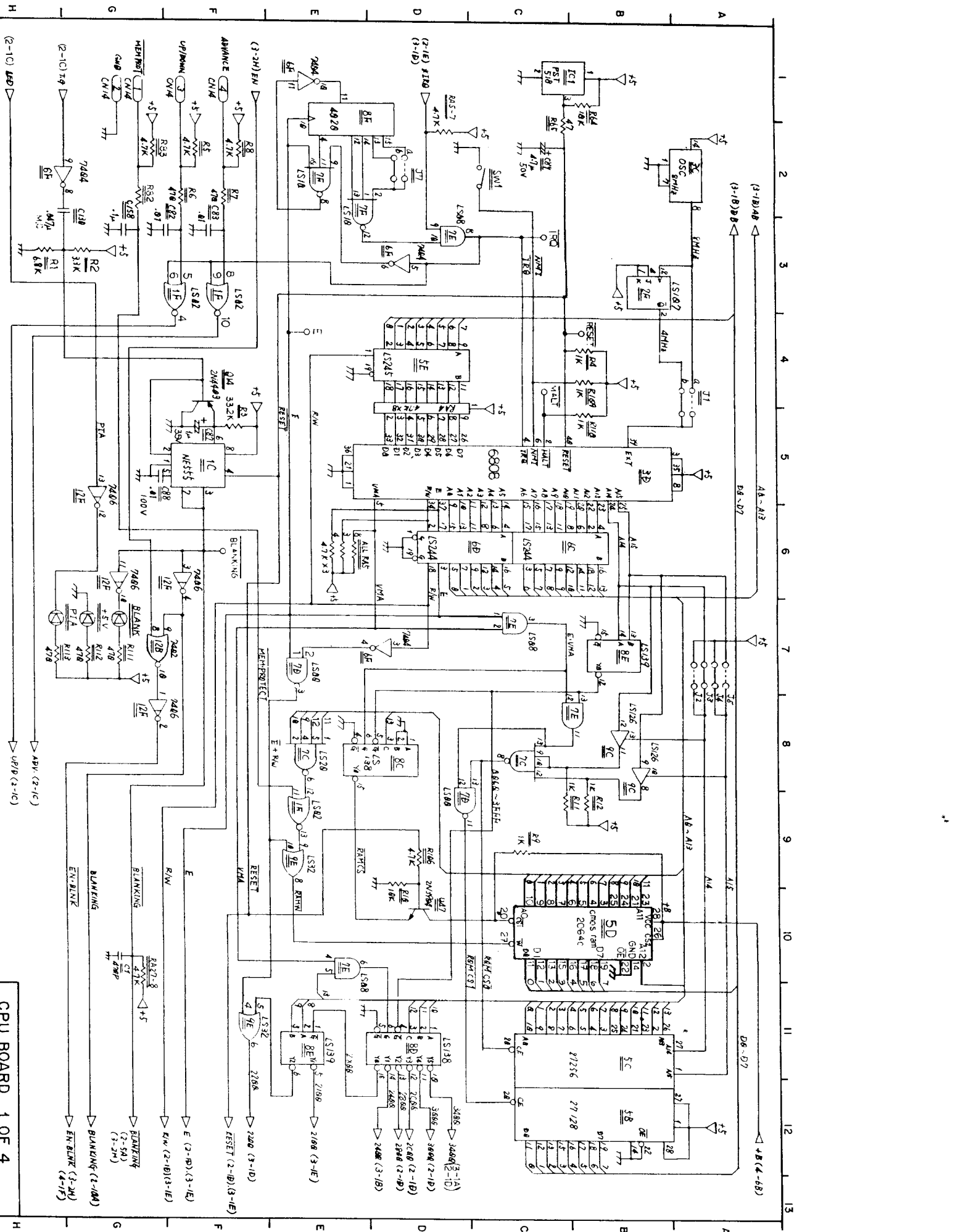
LAMP DRIVE

LAMP RETURN

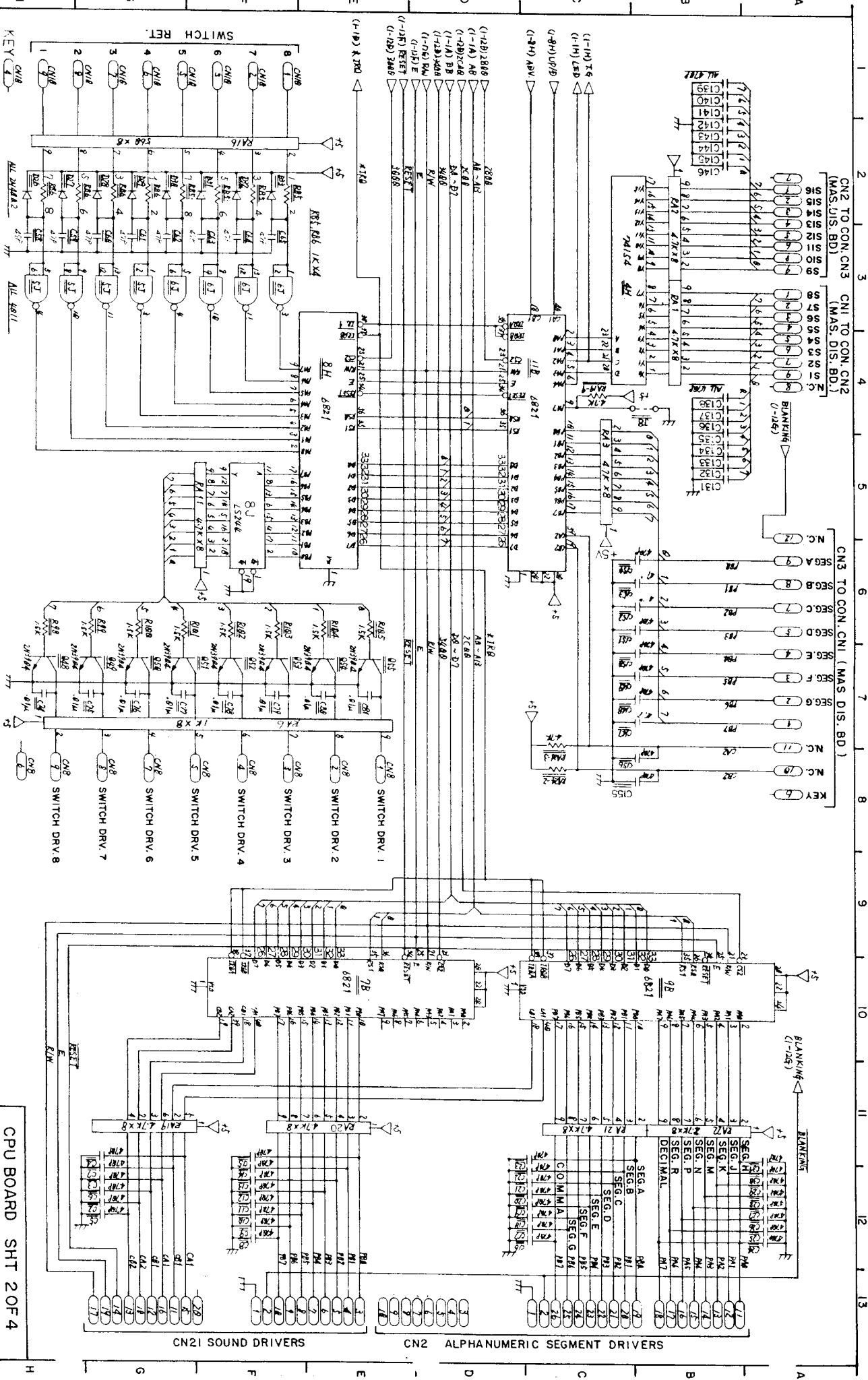
LAMP DRIVE

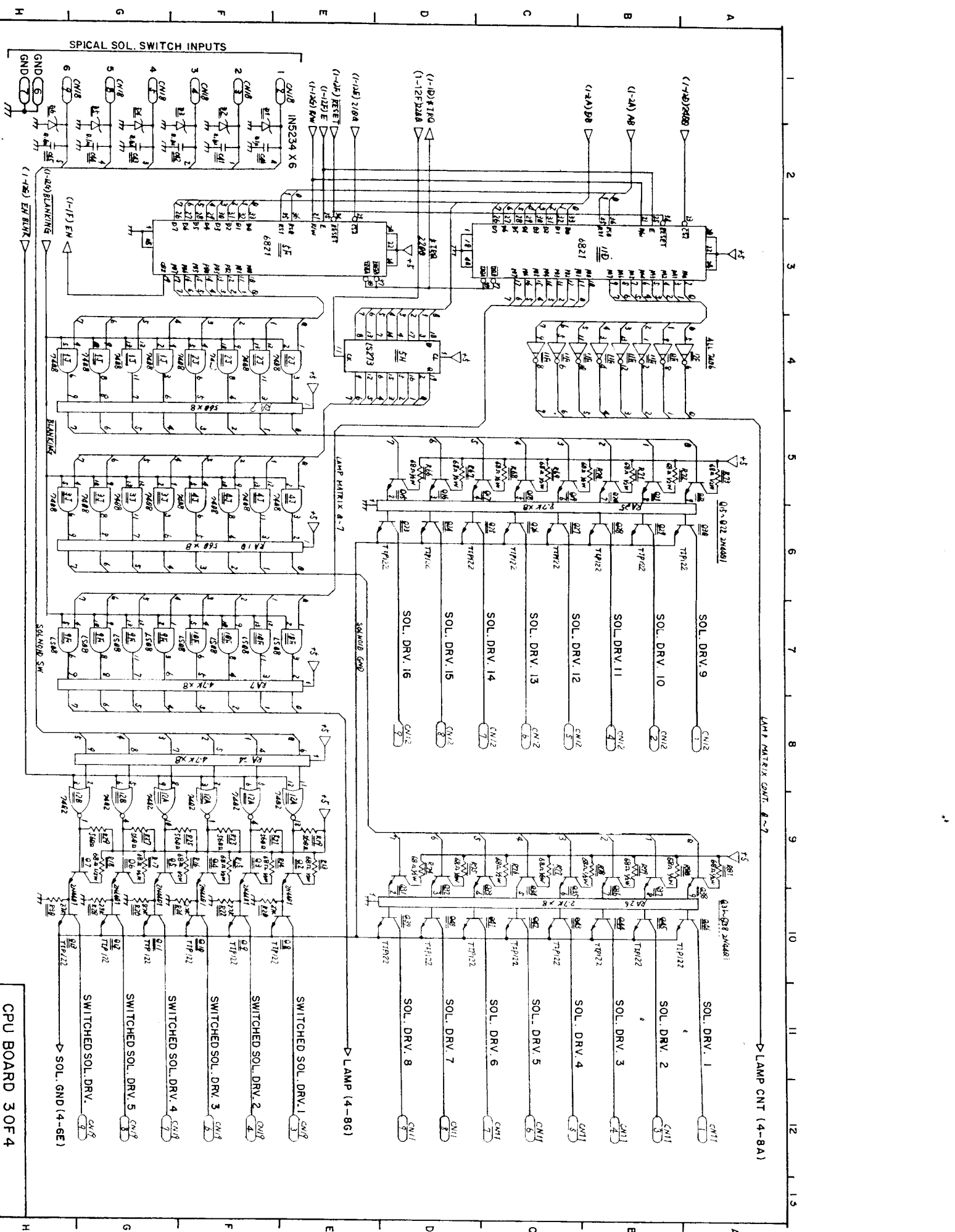
LAMP RETURN

LAMP DRIVE

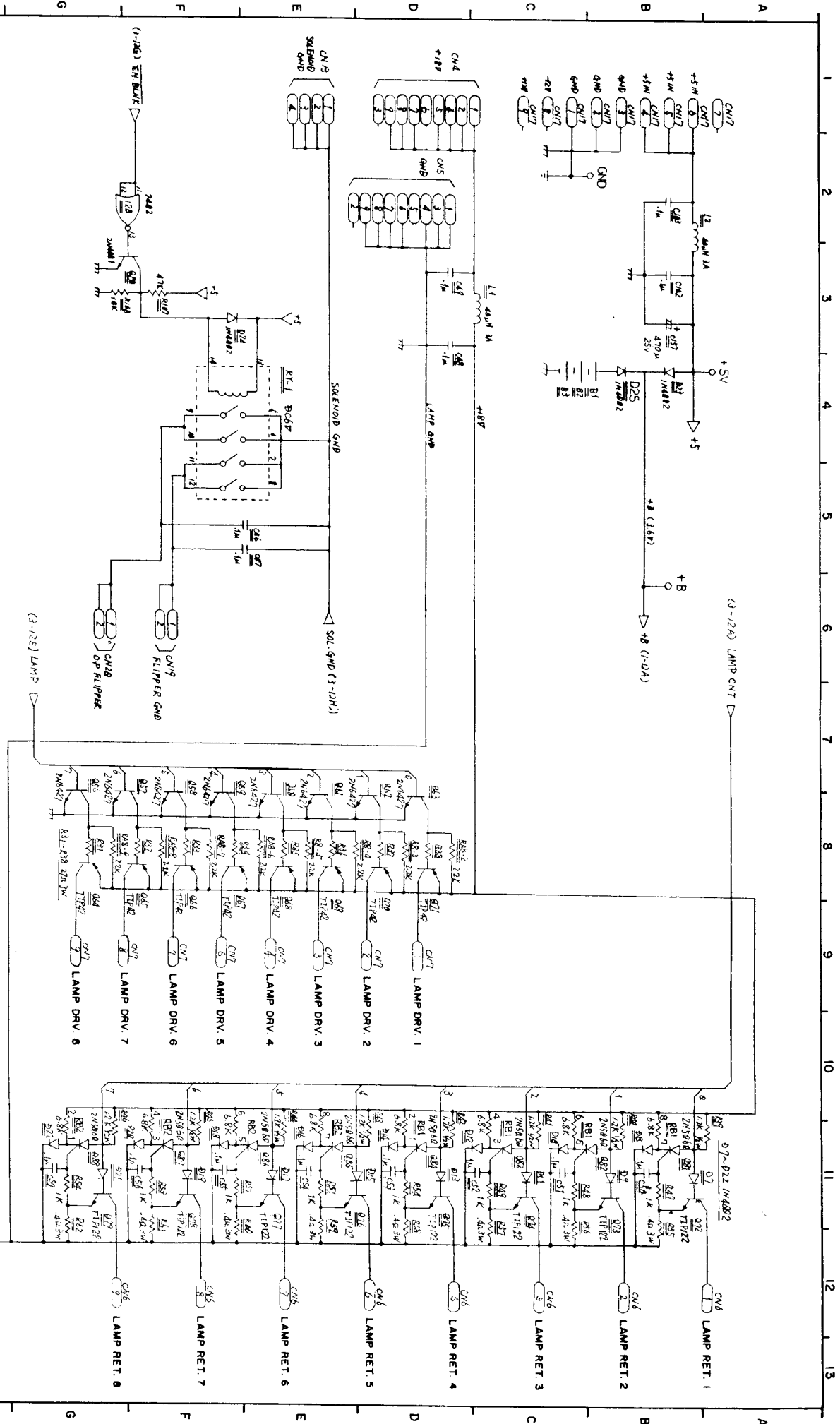


CPU BOARD 1 OF 4



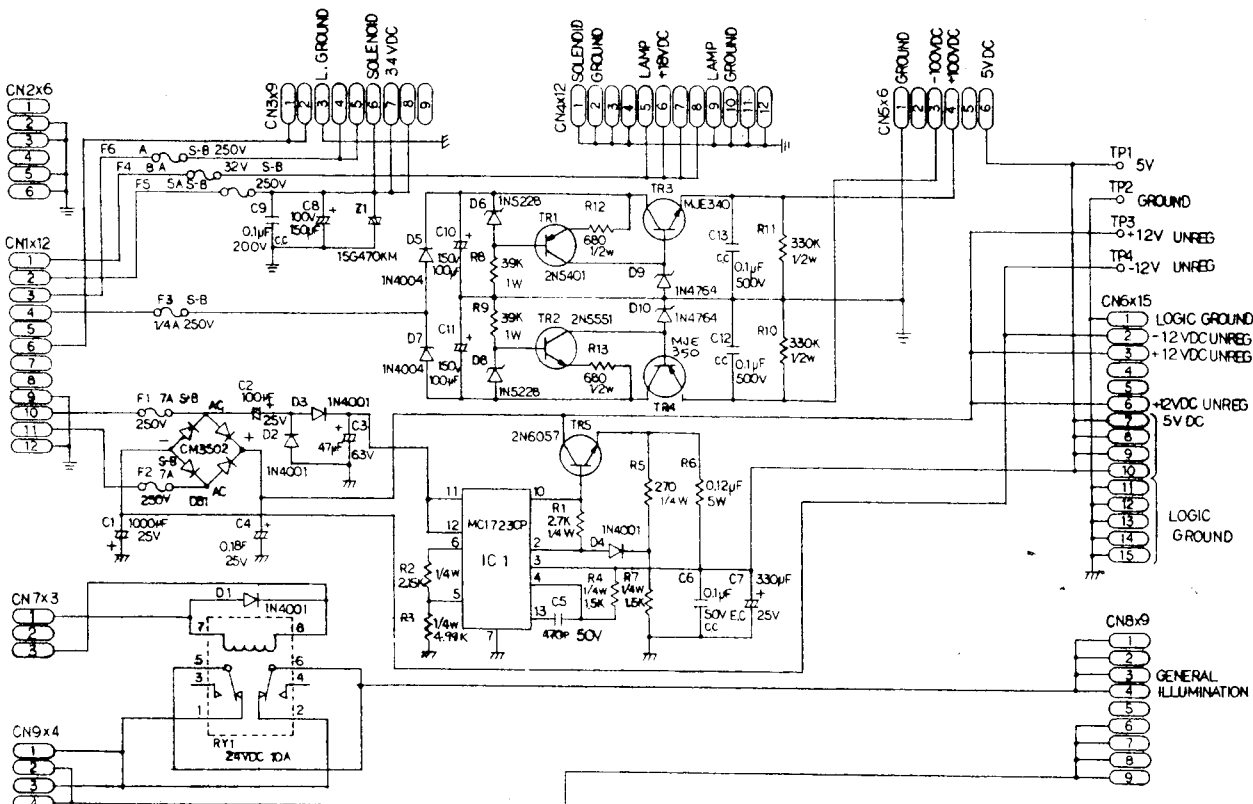
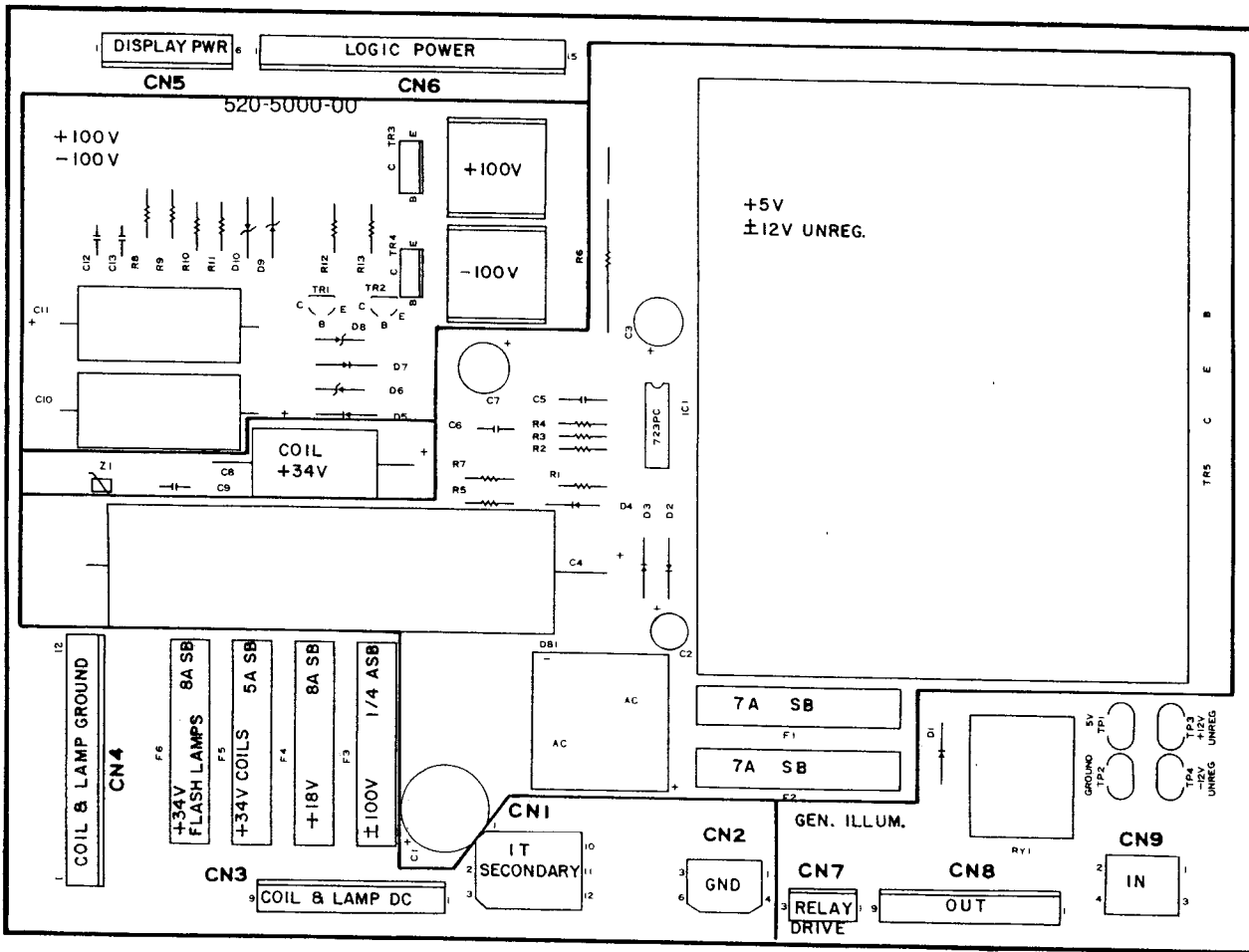


CPU BOARD 30F4

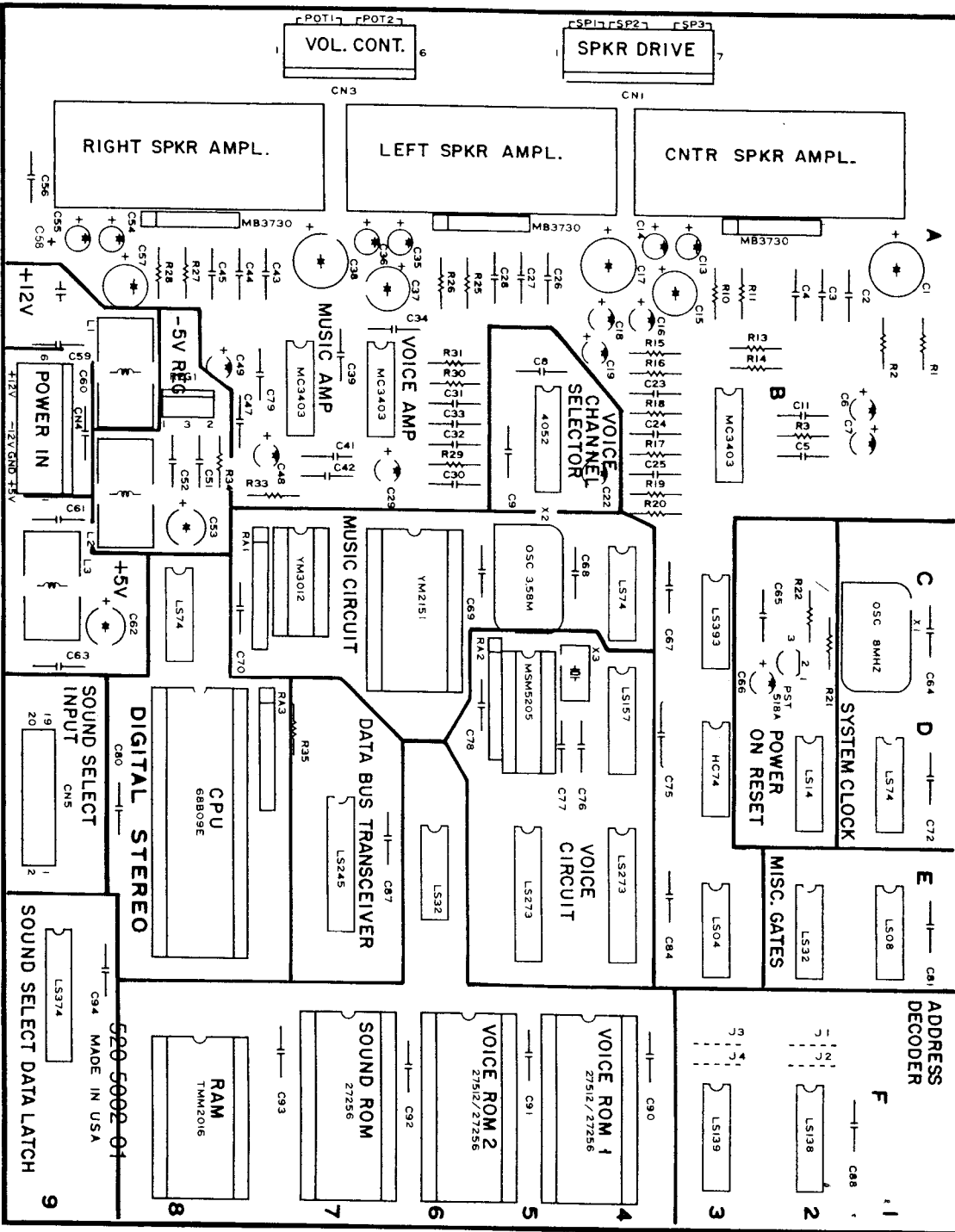


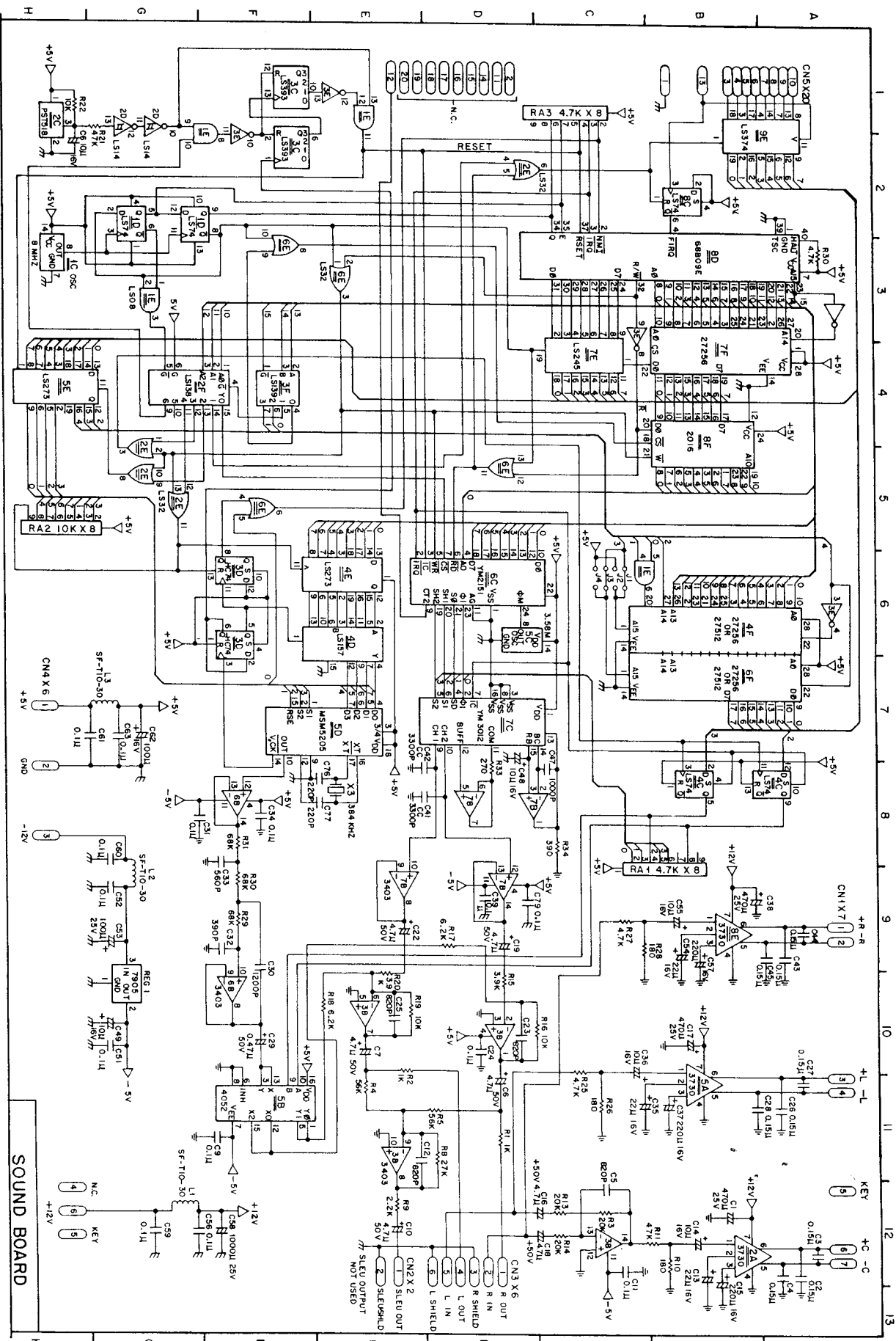
CPU BOARD SHT 4 OF 4

11

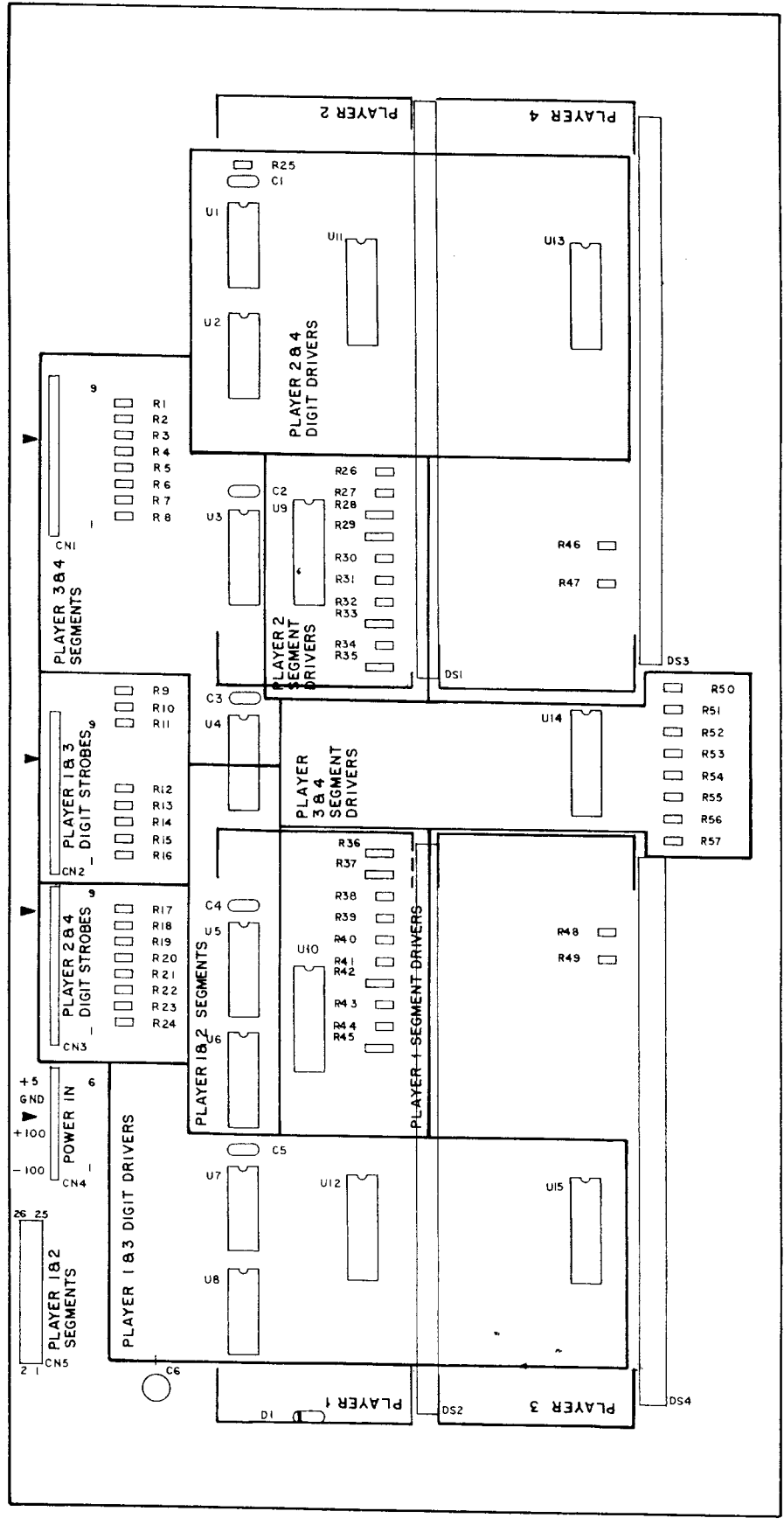


Power Supply Board Assembly and Schematic Diagrams





SOUND BOARD



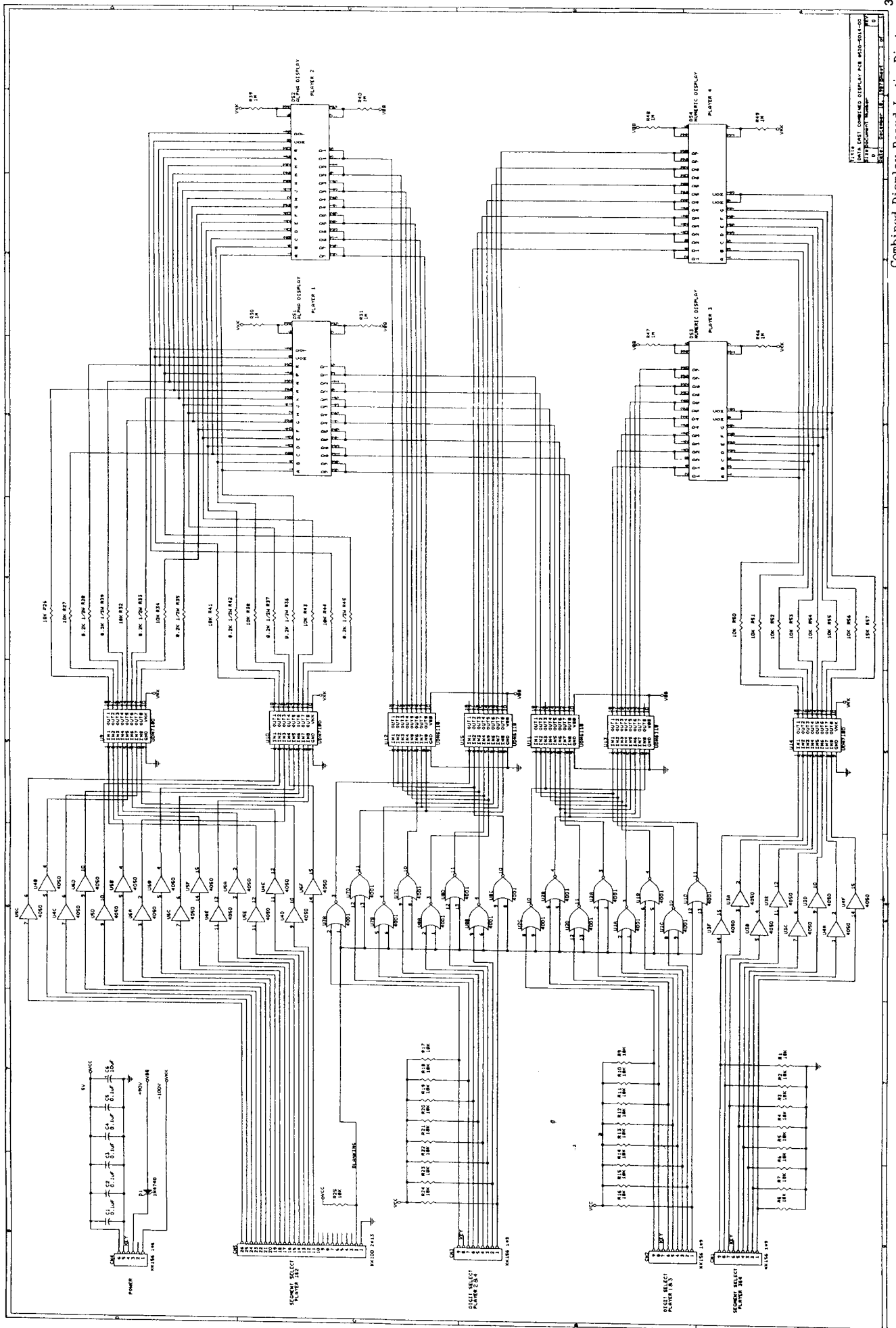


FIG. 105 COMBINED DISPLAY BOARD WITH 74145
 74147 DECODERS
 REV. 10-1968

