



BACK TO THE FUTURE AND THE PINBALL



DATA EAST PINBALL®

1990 Janice Avenue
Melrose Park, IL 60160
708-345-7700
FAX 708-345-7718
1-800-KICKERS

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780-5009-00



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CPU JUMPER TABLE

Game	CPU* Version	ROM Location	Jumpers	
			Installed	Removed
Laser Wars	Ver 1	5C	J1b,J3,J4,J6a,J7a,&J8	J1a,J2,J5,J6,&J7b
	Ver 2	5C	J1b,J3,J4,J5a,J6a,J7b,&J8	J1a,J2,J5,J5b,J6b,&J7a
Secret Service	Ver 2	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
Torpedo Alley	Ver 2	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
Time Machine	Ver 2	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
Playboy	Ver 2	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
ABC M.N. Football	Ver 2	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
Robocop	Ver 2	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
Phantom of the Opera	Ver 2	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a

*Version 1 has a 2K RAM which is a 24-pin IC at location 5D.

*Version 2 has an 8K RAM which is a 28-pin IC at location 5D.

Power-up CPU Self Tests

Upon power-up, the CPU board performs a series of self tests of major components. Turn the game on while observing the LEDs on the CPU board. Tests of the PIAs, RAM, and EPROMs are performed automatically and results of the test are indicated by the PIA LED.

With all tests passed, the LEDs illuminate in the following sequence at power turn-on. The PIA and +5V LEDs illuminate immediately. Approximately 1/2-second later the PIA LED goes out and the Blanking LED illuminates; the +5V and Blanking LEDs remain illuminated until the game is turned off. Test failures are indicated with the PIA LED:

PIA LED	SUSPECT COMPONENT
Stays On	One of the 6821 PIAs
Flashes 1 Time	6064 RAM at location D5.
Flashes 2 Times	EPROM at location B5.
Flashes 3 Times	EPROM at location C5.

QUICK REFERENCE FUSE CHART

PPB BOARD

F1 5A Slo-Blo G.I. 6.3VAC
 F2 5A Slo-Blo G.I. 6.3VAC
 F3 5A Slo-Blo G.I. 6.3VAC
 F4 5A Slo-Blo G.I. 6.3VAC
 F5 5A Slo-Blo Flipper Power 48VAC
 F6 3A Slo-Blo PPB Solenoids/Flash Lamps (34VDC)

POWER SUPPLY BOARD

F1 7A Slo-Blo +5VDC Regulator Input (9VAC)
 F2 7A Slo-Blo +5VDC Regulator Input (9VAC)
 F3 0.25A Slo-Blo Display Reg. Input (90VAC)
 F4 8A Slo-Blo Switched Illumination Buss (18VDC)
 F5 4A Slo-Blo Solenoid Buss (34VDC)
 F6 5A Slo-Blo Solenoid Buss (34VDC)

Five individual fuses for the Turbo Bumpers and Slingshots -2.5A Slo-Blo

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DATA EAST LIMITED WARRANTY

Data East USA, Inc., ("Seller") warrants only to the initial purchaser of its products that the items listed below are free from defects in material and workmanship under normal use and service for the warranty period specified:

PRINTED CIRCUIT BOARDS (GAME LOGIC) 60 DAYS

No other parts of Seller's product are warranted.

Warranty periods are effective from the initial date of shipment from Seller to its authorized distributors.

Seller's sole liability shall be, at its option, to repair or replace products which are returned to Seller during the warranty periods specified, provided:

1. Seller is notified promptly upon discovery by purchaser that stated products are defective.
2. Such products are properly packaged and then returned freight prepaid, to Seller's plant.

This warranty does not apply to any parts damaged during shipment and/or due to improper handling, or due to improper installation or usage, or alteration. In no event shall the Seller be liable for any anticipated profits, loss of profits, loss of use, accidental or consequential damages or any other losses incurred by the customer in connection with the purchase of a Data East USA., product.

WARRANTY DISCLAIMER

EXCEPT AS SPECIFICALLY PROVIDED IN A WRITTEN CONTRACT BETWEEN SELLER AND PURCHASER, THERE ARE NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

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.

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 (page 2) to identify locations of the major assemblies, and fuse values and locations.

PROM SUMMARY

CPU Board: Location 5B, 5C

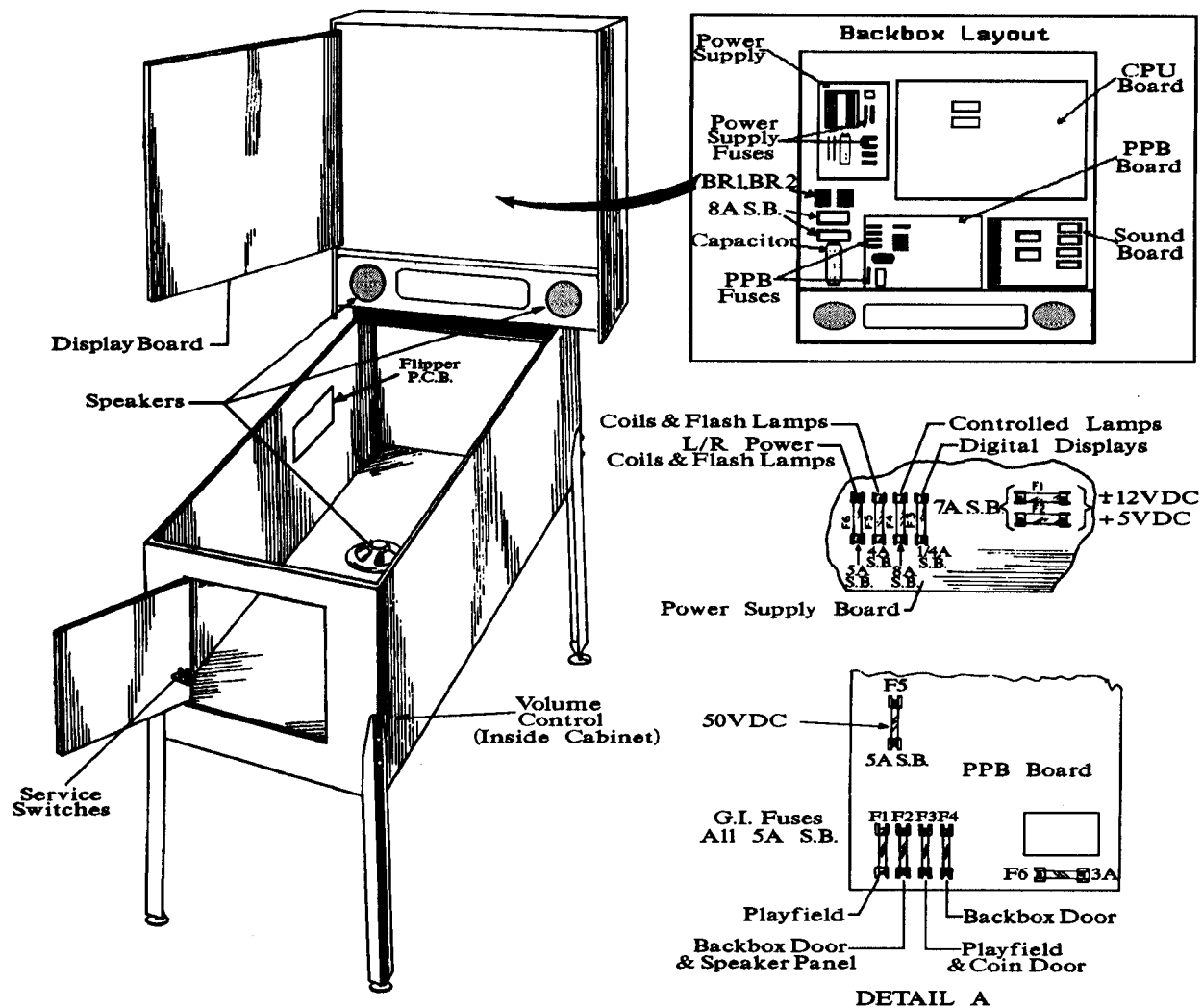
Sound Board: Locations 6F (Voice ROM 1), 4F (Voice ROM 2), and 7F (Sound ROM)

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 on page 2)

1. Open the top of the carton and lay it on its side with the bottom of the cabinet down. Using the plastic banding strip as a handle, slide the game out of the carton.
2. Remove all packing material. Locate cabinet legs in filler packing inserts and assembly parts package in the cashbox. There should be four leg levelers, eight leg bolts, three pinballs and a large Allen Wrench used for securing the backbox.
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. While assuring that no cables are being pinched, carefully raise the backbox and secure it in its upright position by inserting the Allen Wrench in the hole in the back of the cabinet and rotating the wrench 270 degrees (3/4 turn).



GAME ILLUSTRATION

7. Remove the backbox keys from the clip on the inside of the coin door and unlock and carefully remove the backglass. Set the backglass aside.
8. Carefully remove the playfield glass and set it aside.
9. Check all connectors in the backbox for loose wire terminations. Reseat any loose wire by pushing in on the terminal.
10. 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.
11. Check that the fuses on the Power Supply board, PPB board and fuse panel are seated properly.
12. 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.
13. Check all cabinet cable and playfield lamp board connector terminations.

14. 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.

15. Lower the playfield and level the playfield side-to-side by adjusting leg levelers.

16. The playfield front-to-back incline is factory set at approximately 6 degrees. If a pitch indicating meter is not available, adjust the front and rear levelers to the lowest position for the proper pitch. 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.

17. Check the plumb tilt and adjust as required.

18. If desired, perform any self tests at this time. With the insert door closed, carefully reinstall and lock the backglass.

19. Place the three pinballs on the playfield near the outhole and carefully reinstall the playfield glass.

20. If desired, make game pricing and Add-A-Ball, Novelty, or 5-Ball Play adjustments at this time.

STANDARD FEATURES

Insert coin(s), the game makes a sound for the first credit and generates sounds for each subsequent 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 second 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) can be displayed during the attract mode.

MANUAL PERCENTAGING

This game is equipped with Manual Percentage Adjustment.

As previously with our games, you can either set operator adjustments for a replay percent or you can set a fixed replay score.

If you set operator adjustments for a particular replay percent, the game will compute a recommended score to keep the game at that replay percentage. If a change is recommended and the game coin door is opened, the displays will indicate a recommended replay score to beat and make a sound to alert the operator. By pressing the start button, the score to beat will be changed to the recommended level. If you close the coin door or go into audit or adjustment mode, no score change will be made.

You may choose to ignore the recommended change; for example, you may not think last week's players were the usual crowd. Just close the door and the message will disappear without altering the existing level. Or you may choose to make a different score to beat adjustment; this is done by utilizing adjustment AD02.

GAME SPECIFIC FEATURES

Skill shot- Every time a ball is put into the ball shooter lane, a timer will start for one of four awards. They are Extra Ball, 100,000 points x the ball in play, Double Your Score and Take Highest Score. To obtain the award you must make the left ramp before the timer runs out without hitting any other playfield switch.

Clock Tower Eject- The Clock Tower Eject gives 8 different awards. 50,000, 100,000, Bonus Hold, Turbo Bumper Point Increase, 5X Bonus Multiplier, Enable Extra Ball Shot, DeLorean Million and Century Bonus.

DMC Targets- Completing the DMC Drop Target Bank qualifies the left vertical up kicker (VUK) to lock a ball. The bank must be completed three times and the ball must be shot into the VUK three times to enter Multiball.

Double Jackpot Feature- While in Multiball the DMC target bank must be completed to enable the ramps to award the double jackpot feature. Making the left ramp awards the 1885 jackpot and making the right ramp awards the 2015 jackpot. The amount of jackpot points increases with each ramp shot made.

DeLorean Million Feature- Each ramp shot spots a letter in the word DeLorean across the back panel. Spelling DeLorean starts the DeLorean Million Timer. Each ramp shot made while the DeLorean Million Timer is running will award 1,000,000 points.

Special- A Special is awarded by obtaining the 6X bonus multiplier and going over the lit drain lane.

Doc Targets- Completing the DOC targets will increase the bonus multiplier 2X, 3X, etc...

McFly Targets- Completing the McFly targets awards 25,000 points and increase the spinner Casino Value to 5,000 points.

Casino Spinner Bonus- At the end of the game your Casino Spinner Bonus is added to your score.

Skyway Ramp Shot- Successively making ramp shots will award from 50,000 to Enable the Extra Ball Shot.

Refer to the Game Specific Adjustments on page 17 for additional information.

AUDIT FUNCTIONS

GENERAL

There are 83 audit functions provided for accounting purposes and for evaluation of game difficulty adjustments. Audit functions are split into two groups. There are eight most-used audits (AU01 through AU08) in a 'quick look' group and 74 less-used audits (E AU10 through E AU83), in an 'expanded' group. 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, 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 push-button switch still in the FORWARD (up) position, depressing the STEP push-button switch advances through the audit functions one at a time. To review lower-numbered functions, set the forward/reverse push-button switch to the REVERSE (down) position and operate the STEP push-button switch.

To access expanded audits, operate the step push-button until AU09, EXPAND AUDITS is displayed. Set the choice to ON as indicated in the Player 4 display by depressing the Game Start push-button and then depress the step push-button. The request is installed and E AU10 is displayed. When you exit audits and adjustments, the AU09 setting is returned to off for the next time that a review of audits are required.

Audit totals may be reset to zero using Game Adjustment Ad11, Audits Reset. Game adjustments (Ad01 to Ad13 and E Ad14 to E Ad45) begin after the last audit function (AU09 or E AU83). 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.

'QUICK LOOK' FUNCTIONS

Total Paid Credits (AU01) - the total number of paid credits is displayed.

Free Percent (AU02) is Free Total (E AU24) divided by Plays Total (E AU25).

Ball Time Average (in seconds) (AU03) is Total Play Time divided by Total Balls Played (AU10).

Average Game Time (AU04) is the Average Game Time expressed in minutes and seconds.

Coins (AU05, 06, and 07) - These three audit totals are provided to show the amount of coins registered for the left, right, and center coin chutes, respectively.

Total Coins (AU08) is the total number of coins dropped through all 3 coin chutes.

Expand Audits (AU09) permits viewing of expanded audits.

Back to the Future Audit Table

Audit Number (Player 3 Display)	Audit Description (Players 1 & 2 Displays: totals in Player 4 Display)	Audit Number (Player 3 Display)	Audit Description (Players 1 & 2 Displays: totals in Player 4 Display)
	Back to the Future PROM ID		
AU 01	Total Paid Credits	E AU 43	Drain Right
AU 02	Percent Free	E AU 44	Skill 100,000
AU 03	Ball Time Average	E AU 45	Skill Ex Ball
AU 04	Average Game Time	E AU 46	Skill Double
AU 05	Coins Left	E AU 47	Skill TakeHi
AU 06	Coins Right	E AU 48	Skyway 50,000
AU 07	Coins Center	E AU 49	Skyway 75,000
AU 08	Total Coins	E AU 50	Skyway 100,000
AU 09	Expand Audits (ON/OFF)	E AU 51	Skyway 125,000
E AU 10	Balls Total	E AU 52	Skyway Ex Ball
E AU 11	Extra Ball Total	E AU 53	Clock 5X
E AU 12	Extra Ball Percent	E AU 54	Clock Ex Ball
E AU 13	1 Replay Awards	E AU 55	Clock 100,000
E AU 14	2 Replay Awards	E AU 56	Clock Bonus Hold
E AU 15	3 Replay Awards	E AU 57	Clock Million
E AU 16	4 Replay Awards	E AU 58	Clock Bumpers
E AU 17	Replay Total	E AU 59	Clock 50,000
E AU 18	Replay Percent	E AU 60	Century Awards
E AU 19	Special Total	E AU 61	Left Ramp
E AU 20	Special Percent	E AU 62	Right Ramp
E AU 21	Match Total	E AU 63	Million Lit
E AU 22	Hi Score Wins	E AU 64	Million Awards
E AU 23	High Score Percent	E AU 65	VUK Ex Ball
E AU 24	Free Total	E AU 66	VUK Made
E AU 25	Plays Total	E AU 67	2x
E AU 26	0.0 - 1.4 Mil Games	E AU 68	3x
E AU 27	1.5 - 2.4 Mil Games	E AU 69	4x
E AU 28	2.5 - 3.4 Mil Games	E AU 70	5x
E AU 29	3.5 - 4.9 Mil Games	E AU 71	6X
E AU 30	5.0 - 9.9 Mil Games	E AU 72	"Back" Lit
E AU 31	10 + Mil Games	E AU 73	"In" Lit
E AU 32	Average Scores	E AU 74	"Time" Lit
E AU 33	Games 1Player	E AU 75	"Back" Made
E AU 34	Games 2Player	E AU 76	"In" Made
E AU 35	Games 3Player	E AU 77	Multiball
E AU 36	Games 4Player	E AU 78	1885 JP 500,000
E AU 37	Buy In Games	E AU 79	1885 JP 750,000
E AU 38	Attract Minutes	E AU 80	1885 JP 1,000,000
E AU 39	Cycles H.S. Reset	E AU 81	2015 JP 500,000
E AU 40	Coin No Credit	E AU 82	2015 JP 750,000
E AU 41	Drain Left	E AU 83	2015 JP 1,000,000
E AU 42	Drain Center		

EXPANDED FUNCTIONS

Balls Total (E AU10) is the total of regular and extra balls.

Extra Ball Total (E AU11) is the total number of extra balls awarded.

Extra Ball Percentage (AU12) is AU11 divided by Plays Total (AU25).

Replay Awards (E AU13 through 16) provide the total awards (credit, extra ball, or audit) for replay levels 1 through 4, respectively.

Replay Total (E AU17) is the total awards (credits, extra balls, or audit only) for exceeding replay score levels.

Replay Percentage (E AU18) is the Replay Total awards for exceeding replay score levels (E AU17) divided by Plays Total (E AU25).

Special Total (E AU19) is the total awards (credits, extra balls, or scores) for making specials.

Special Percentage (E AU20) is Special Total (E AU19) divided by Plays total (E AU25).

Match Total (E AU21) 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 adjustable from 0% to 10%, by E Ad XX if enabled.

High Score Wins (E AU22) is the total credits awarded for exceeding the high-score-to-date scores.

High Score Percentage (E AU23) is High Score Wins (E AU22) divided by Plays Total (E AU25).

Free Total (E AU24) is the total free credits for replays, high-score-to-date, specials, and match.

Plays Total (E AU25) is the sum of Total Paid Credits (AU01) and Free Total (E AU24). Note that free credits are not recorded in the audits until they are actually used.

0.0 - 1.4 Mil Games (E AU26) provides the total number of games the Player's final score was between 0 and 1,499,990 points.

1.5 - 2.4 Mil Games (E AU27) provides the total number of games the Player's final score was between 1,500,000 and 2,499,990 points.

2.5 - 3.4 Mil Games (E AU28) provides the total number of games the Player's final score was between 2,500,000 and 3,499,990 points.

3.5 - 4.9 Mil Games (E AU29) provides the total number of games the Player's final score was between 3,500,000 and 4,999,990 points.

5.0 - 9.9 Mil Games (E AU30) provides the total number of games the Player's final score was between 5,000,000 and 9,999,990 points.

10 + Mil Games (E AU31) provides the total number of games the Player's final score was over 10,000,000 points.

Average Scores (E AU32) provides the Average Score by adding the Final Score of each game to a table and dividing this sum by the Total Plays (E AU24).

Games - Player (E AU33 through 36) provide individual totals of 1- player, 2-player, 3-player, and 4-player games, respectively.

Buy-In-Games(E AU37) provides the total number of times a game was bought into retaining lit game features.

Attract Minutes(E AU38) provides the number of minutes the game is in Attract mode (Factory use).

Cycles High Score Reset (E AU39) provides the number of times that the high score levels have been automatically reset (if enabled).

Coin No Credit (E AU40) provides the number of times the coin switch was closed without awarding credit(s)-This option is used in multiple coin conditions.(ie. 2 quarters 1 Play)

Drain Left (E AU41) provides the number of times the ball drained out the left drain.

Drain Center (E AU42) provides the number of times the ball drained out the center drain.

Drain Right (E AU43) provides the number of times the ball drained out the right drain.

GAME SPECIFIC FUNCTIONS

Skill 100,000 (E AU44) provides the total number of times the Skill Shot awarded 100,000 points.

Skill Ex Ball (E AU45) provides the total number of times the Skill Shot awarded an Extra Ball

Skill Double (E AU46) provides the total number of times the Skill Shot awarded Double Bonus.

Skill Take Hi (E AU47) provides the total number of times the Skill Shot substituted the highest current score on the game (Multiplayer games only).

Skyway 50,000 (E AU48) provides the total number of times the Skyway shot awarded 50,000 points.

Skyway 75,000 (E AU49) provides the total number of times the Skyway shot awarded 75,000 points.

Skyway 100,000 (E AU50) provides the total number of times the Skyway shot awarded 100,000 points.

Skyway 125,000 (E AU51) provides the total number of times the Skyway shot awarded 125,000 points.

Skyway Ex Ball (E AU52) provides the total number of times the Skyway shot awarded an Extra Ball.

Clock 5x (E AU53) provides the total number of times the Clock Eject awarded 5x Bonus.

Clock Ex Ball (E AU54) provides the total number of times the Clock Eject lit the VUK Extra Ball Feature.

Clock 100,000 (E AU55) provides the total number of times the Clock Eject awarded 100,000 points.

Clock Bonus Hold (E AU56) provides the total number of times the Clock Eject awarded 50,000 points and Bonus Hold.

Clock Million (E AU57) provides the total number of times the Clock Eject lit the De Lorean Millions Feature.

Clock Bumpers (E AU58) provides the total number of times the Clock Eject causes the Turbo Bumper value to be increased to 1,000 points.

Clock 50,000 (E AU59) provides the total number of times the Clock Eject awarded 50,000 points

Century Awards (E AU60) provides the total number of times the Century Bonus was awarded by collecting all the Clock Eject Awards and completing the Clock Eject one more time.

Left Ramp (E AU61) provides the total number of times the Left Ramp was completed.

Right Ramp (E AU62) provides the total number of times the Right Ramp was completed.

Million Lit (E AU63) provides the total number of times DeLorean was lit either by spelling out the individual letters or Clock Millions Feature.

Million Awards (E AU64) provides the total number of times the DeLorean Millions was awarded.

VUK Ex Ball (E AU65) provides the total number of times the Lit VUK Extra Ball was collected.

VUK Made (E AU66) provides the total number of times the VUK shot was completed.

2X (E AU67) provides the number of times 2x bonus was made.

3X (E AU68) provides the number of times 3x bonus was made.

4X (E AU69) provides the number of times 4x bonus was made.

5X (E AU70) provides the number of times 5x bonus was made.

6X (E AU71) provides the number of times 6x bonus was made.

"Back" Lit (E AU72) provides the total number of times the "Back" lite was lit by completing all 3 DMC Targets.

"In" Lit (E AU73) provides the total number of times the "In" lite was lit by completing all 3 DMC Targets a 2nd time.

"Time" Lit (E AU74) provides the total number of times the "Time" lite was lit by completing all 3 DMC Targets a 3rd time.

"Back" Made (E AU75) provides the total number of times the "Back" shot was collected.

"In" Made (E AU76) provides the total number of times the "In" shot was collected.

Multiball (E AU77) provides the total number of times the "Time" shot was collected resulting in 3 Ball Multiball.

1885 JP 500,000 (E AU78) provides the total number of times the 1885 Jackpot awarded 500,000 points.

1885 JP 750,000 (E AU79) provides the total number of times the 1885 Jackpot awarded 750,000 points.

1885 JP 1,00,000 (E AU80) provides the total number of times the 1885 Jackpot awarded 1,000,000 points.

2015 JP 500,000 (E AU81) provides the total number of times the 2015 Jackpot awarded 500,000 points.

2015 JP 750,000 (E AU82) provides the total number of times the 2015 Jackpot awarded 750,000 points.

2015 JP 1,00,000 (E AU83) provides the total number of times the 2015 Jackpot awarded 1,000,000 points.

Notes

GAME ADJUSTMENTS

GENERAL

There are 45 adjustable functions provided to vary difficulty of play and to periodically reset audits and the 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 E Ad45 (Expanded Adjustment 45) is shown in the Player 3 display, FACTORY RESTORE is shown in the Player 1 & 2 displays, and OFF is shown in the Player 4 display. With the audits displaying AU09 (or expanded E AU83) and the FORWARD/REVERSE switch in the FORWARD (up) position, depress the STEP switch and Ad01 is shown in the Player 3 display, REPLAY MANUAL/FIXED is shown in the Player 1 and 2 displays, and the setting is shown in the Player 4 display.

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

REPLAY AND GENERIC FEATURES

Replays may be adjusted either for fixed levels or for a system-adjusted manual 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 manual percentage feature, if the actual replay percentage is higher or lower than that desired, the game computes new recommended manual percentage score(s). When the coin door is subsequently opened the player displays indicate the recommended level and a sound is made to alert the operator of a potential change. This new level is entered into adjustments simply by pressing the game start push-button. (If the coin door is closed or you enter audits/adjustments or diagnostics, the replay level is not changed.)

REPLAYS (Ad 01 through 06)

Ad 01 Replay Manual/Fixed

Manual: 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 and 03 for fixed replay levels.

Ad 02 Start Replay

Manual: Adjust the starting Replay 1 setting to between 100,000 and 99,900,000.

Ad 03 Levels Replay/Level 1,2,3 & 4 Replay

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

Adjust Replay 1 level to between 100,000 and 99,900,000. (Same as Start Replay)

If Ad 03 is set for 2, adjust Replay 2 level to between 100,000 and 99,900,000.

If Ad 03 is set for 3, adjust Replay 3 level to between 100,000 and 99,900,000.

If Ad 03 is set for 4, adjust Replay 4 level to between 100,000 and 99,900,000.

Game Adjustment Table

Adjustment Number (Player 3)	Description (Players 1 & 2)	Factory Setting (Player 4)
Ad 01	Replay/Manual	10%
Ad 02	Start Replay	4,000,000
Ad 03	Levels Replay *	01
Ad 04	Game Awards	CREDIT
Ad 05	Limit Freegame	03
Ad 06	Limit Extraball	03
Ad 07	Game Rules	FACTORY
Ad 08	Coinage*	USA2
Ad 09	Game Cleaned	NO
Ad 10	Coin Reset	NO
Ad 11	Audits Reset	NO
Ad 12	Restore H.S.T.D.	NO
Ad 13	Expand Adjustments	NO
E Ad 14	Match Percent	08
E Ad 15	Balls/Game	03
E Ad 16	Warning Tilt	01
E Ad 17	Buy In Allowed	NO
E Ad 18	Credits Limit	30
E Ad 19	Scores Highest	YES
E Ad 20	World Record Awards	03
E Ad 21	Todays 1 Award	01
E Ad 22	Todays 2 Award	00
E Ad 23	Todays 3 Award	00
E Ad 24	Backup World Record	7,500,000
E Ad 25	Backup Todays 1	6,500,000
E Ad 26	Backup Todays 2	5,500,000
E Ad 27	Backup Todays 3	4,500,000
E Ad 28	Backup Todays 4	3,500,000
E Ad 29	Backup Todays 5	2,500,000
E Ad 30	H.S.T.D. Every	700
E Ad 31	Clean Game Every	1500
E Ad 32	Free Play	NO
E Ad 33	Mesage Custom	ON
E Ad 34	Attract Mode Music	ON
E Ad 35	Flash Lamps	NORMAL
E Ad 36	Coils Pulse	NORMAL
E Ad 37	Ramp Timer	12
E Ad 38	Delorean Style	EASY
E Ad 39	Lock Feature	EASY
E Ad 40	Skyway Timer	FACTORY
E Ad 41	Outlane Toggle	BOTH
E Ad 42	Recall McFly	YES
E Ad 43	McFly Start	EASY
E Ad 44	Recall Clock	YES
E Ad 45	Factory Restore	NO

* Some settings result in Drop-Down Tables- See Text

Ad 04 Game Awards Set for replays to award: **CREDIT, EXTRA BALL, NONE, TICKET** or **AUDIT** (no award but recorded in the audit totals).

Ad 05 Limit FreeGame - Adjust for the maximum number of free games that may be accumulated per game; 0 to 9.

Ad 06 Limit Extra Balls - Adjust for the maximum number of extra balls that may be accumulated per game; 1 to 9 or OFF.

SINGLE-FUNCTION DIFFICULTY ADJUSTMENT (Ad 07)

Any one of five INSTALL settings for this adjustment may be activated to automatically select settings for multiple adjustments affecting game difficulty. Use the Start button to choose the difficulty level you require and press the step button to activate the setting. After activation, the individual adjustments may be readjusted if desired. Refer to Install Adjustment Table for details.

Ad 07 Game Rules - Set to **EXTRA EASY, EASY, FACTORY, HARD** or **EXTRA HARD**.

Install Adjustment	E Ad07 Extra Easy	E Ad07 Easy	E Ad07 Factory	E Ad07 Hard	E Ad07 Extra Hard
E Ad 37 Ramp Timer	18	15	12	10	08
E Ad 38 DeLorean Style	EASY	EASY	EASY	FACTORY	HARD
E Ad 39 Lock Feature	EASY	EASY	EASY	FACTORY	HARD
E Ad 40 Skyway Timer	EXEASY	EASY	FACTORY	HARD	EXHARD
E Ad 41 Outlane Toggle	FLIPPER	FLIPPER	BOTH	BOTH	SLING
E Ad 42 Recall McFly	YES	YES	YES	NO	NO
E Ad 43 McFly Start	EASY	EASY	FACTORY	HARD	HARD
E Ad 44 Recall Clock	YES	YES	YES	NO	NO

NOVELTY / 5-BALL/ADD-A-BALL SETTINGS

The following three combinations are recommended for situations where local laws restrict certain game features regarding the use of replays or the number of balls per game:

Novelty Play Rules - Set to establish recommended settings for no free play or extra balls:

Ad 01 Manual Replay = Fixed
Ad 02 Start Replay = 00
Ad 03 Levels Replay = None
Ad 04 Game Awards = None
Ad 05 Limit Freegame = 00

Ad 06 Limit Extra Balls = 00
E Ad 14 Match Percent = Off
E Ad 20 World Record Awards = 00
E Ad 21-23 Todays 1-3 Awards = 00

5-Ball Play Rules - Set to establish recommended settings for 5-ball play:

Ad 01 Manual Replay = 07%
Ad 02 Replay Start = 7,000,000
Ad 03 Replay Levels = 01
Ad 04 Game Awards = Credit
Ad 05 General Scores = Factory
Ad 06 General Timer = Factory

E Ad 14 Match Percent = 04
E Ad 15 Balls/Game = 5
E Ad 20 World Record Awards = 3
E Ad 21 Todays 1 Award = 1
E Ad 37 Ramp Timer = 10
E Ad 38 DeLorean Style = Factory

E Ad 39 Lock Feature = Factory
E Ad 40 Skyway Timer = Ex.Hard
E Ad 41 Outlane Toggle = Flipper
E Ad 42 Recall McFly = No
E Ad 43 Mc Fly Start = Factory
E Ad 44 Recall Clock = No

Extra Ball Settings-To disable awarding of credits and provide awards with an extra ball make the following adjustments:

Ad 04 Game Awards = Extra Ball
Ad 05 Limit Freegame = 00
E Ad 14 Match Percent = OFF

E Ad 19 Scores Highest = No
E Ad 20 to 23 World Record & Todays High Awards = 00

GAME PRICING (Ad 08)

There are two methods available for coin switch programming; Standard and Custom. Standard pricing uses a single adjustment (Ad 08) to select a pricing scheme shown in the **Standard /CustomPricing Table**. Custom pricing is used to select additional pricing schemes defined by a Drop Down menu .

With Ad 08 set to **CUSTOM** operating the step button again initiates a drop down menu representing coin switch pulses for the left, right, and center coin slots. The prescribes the number of pulses required for one credit. For example, if *Left Coin Pulses*, was set to 02 and *Coin Switch Pulses Required for 1 Credit*, to 01 a coin in the left slot would produce two credits. Further, if *Left Coin Pulses*, was set to 01 and *Coin Switch Pulses Required for 1 Credit*, to 02, two coins in the left slot would be required for one credit.

Coin Switch Pulses Required for Bonus Credit may be set to post bonus credits when a minimum amount of coins are inserted at one time. For example, if *Left Coin Pulses* was set to 01, *Coin Switch Pulses Required for 1 Credit* to 01 and *Coin Switch Pulses Required for Bonus Credit* 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.

Standard/Custom Pricing - 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, the following adjustments are utilized to tailor each individual coin chute.

Left Coin Switch Pulses - Set the number of pulses registered for closure of the left coin switch; 00 to 99.

Right Coin Switch Pulses - Set the number of pulses registered for closure of the right coin switch; 00 to 99.

Center Coin Switch Pulses - Set the number of pulses registered for closure of the center coin switch; 00 to 99.

Coin Switch Pulses Required for 1 Credit - Set the number of coin switch pulses required to post one credit; 00 to 99.

Coin Switch Pulses Required for Bonus Credit- Set the number of coin switch pulses required to award a bonus credit; 00 to 99.

CUSTOM PRICING TABLE

Coin Mechs			Plays/Coins	Adjustments					
Left	Right	Center		Ad08	Left P	Right P	Mid P	Pulse/1Cr	Puls/bon
25¢	25¢	\$1.00	1/25¢ 3/50¢	Custom	01	01	04	01	02
			1/25¢ 5/\$1.00	Custom	01	01	04	01	04
			1/25¢/ 6/\$1.00	Custom	05	05	20	04	20
5SCH	10SCH	10SCH	1/10 SCH	Custom	01	02	02	02	00
			1/10 SCH 4/30SCH	Custom	04	08	08	06	00
20¢	\$1.00	--	1/20¢	Custom	01	05	00	01	00
			1/60¢ 2/\$1.00	Custom	01	05	00	03	05
10P	10P	50P	1/10P 6/50P	Custom	01	01	05	01	05
			1/20P 3/50P	Custom	01	01	05	02	05

STANDARD PRICING TABLE

Ad 08 Standard Pricing Select			Coin Mechs			Plays/Coins		
1	2	4	Left	Center	Right	Left	Center	Right
USA1	1COIN	1PLAY	25¢	\$1.00	25¢	1 PLAY/ 1COIN	4 PLAY/ 1COIN	1 PLAY/ 1COIN
USA2	4 COINS	3PLAYS	25¢	\$1.00	25¢	1 PLAY/ 2COIN 2 PLAY/ 3COIN 3 PLAY/ 4COIN	3 PLAY/ 1COIN	1 PLAY/ 2COIN 2 PLAY/ 3COIN 3 PLAY/ 4COIN
USA3	2 COINS	1 PLAY	25¢	\$1.00	25¢	1 PLAY/ 2COIN	2 PLAY/ 1COIN	1 PLAY/ 2COIN
USA4	2COINS	1 PLAY 1COIN BUY-IN	25¢		25¢	2 COINS FOR THE 1st PLAY 1PLAY/ 1 COIN ONLY DURING BUY-IN		
AUSTRIA COINAGE			5 SCH	10 SCH	10SCH	1 PLAY/ 2COIN 2 PLAY/ 3COIN 3 PLAY/ 4COIN	2 PLAY/ 1COIN 3 PLAY/ 2COIN	2 PLAY/ 1COIN 3 PLAY/ 2COIN
AUSTRALIA COINAGE			20¢		\$1.00	1 PLAY/ 2COIN		3 PLAY/ 1COIN
UK COINAGE			10P	50P	£1	1 PLAY/ 3COIN	2 PLAY/ 1COIN	5 PLAY/ 1COIN
SWISS 1 SWISS 2			1 SFR	2 SFR	5 SFR	Same as German 1 Same as German 2		
BELGIUM COINAGE			20f	50f	20f	1 PLAY/ 1COIN	3 PLAY/ 1COIN	1 PLAY/ 1COIN
GERMAN 5DM 1			1DM	2DM	5DM	1 PLAY/ 1COIN 7 PLAY/ 5COIN	2 PLAY/ 1COIN 8 PLAY/ 3COIN	7 PLAY/ 1COIN
GERMAN 5DM 2			1DM	2DM	5DM	1 PLAY/ 1COIN 3 PLAY/ 2COIN 5 PLAY/ 3COIN 7 PLAY/ 4COIN 9 PLAY/ 5COIN	3 PLAY/ 1COIN 7 PLAY/ 2COIN 10 PLAY/ 3COIN 14 PLAY/ 4COIN	9 PLAY/ 1COIN
NETHERLAND COINAGE			1 Guilder		1 Guilder	1 PLAY/ 2COIN		1 PLAY/ 2COIN
SWEDEN COINAGE			1KR	5KR	2KR	1 PLAY/ 3COIN 2 PLAY/ 5COIN	2 PLAY/ 1COIN	2 PLAY/ 1COIN
FRANCE COINAGE			1f	5f	10f	1 PLAY/ 3COIN 2 PLAY/ 5COIN	2 PLAY/ 1COIN	5 PLAY/ 1COIN
ITALY COINAGE			500L		500L	1 PLAY/ 1COIN		1 PLAY/ 1COIN
SPAIN COINAGE			25P		100P	1 PLAY/ 1COIN		5 PLAY/ 1COIN
JAPAN COINAGE					100¥			3 PLAY/ 2COIN

ADDITIONAL GENERIC FEATURES

Ad 09 Game Cleaned - When enabled (set to **YES**) the game cleaning counter will be reset to zero and Game Clean-Me Green light will go out when STEP is depressed. (Also see E Ad31.)

Ad 10 Coin Reset - When enabled (set to **YES**) all coin and paid credit totals will be reset to zero when STEP is depressed.

Ad 11 Audits Reset - When enabled (set to **YES**) all audit totals except for coins and paid credits will be reset to zero when STEP is depressed.

Ad 12 Restore High Score - When enabled (set to **YES**) the High Score Levels and associated initials will be restored to backup settings when STEP is depressed .

Ad 13 Expand Adjustments - When set to **NO**, depressing the STEP push-button advances directly to E Ad 45, FACTORY RESTORE. When set to **YES**, depressing the STEP push-button sequences through the expanded adjustments. When exiting from expanded adjustments, this function is reset to **OFF** for the next time that adjustments are required.

E Ad 14 Match Percent- Set Match percent from **00%** to **10%** or **OFF**. At **00%** the match display occurs at the end of the game but never awards a credit.

E Ad 15 Balls Per Game - Adjust the number of balls per game; **2** to **5**.

E Ad 16 Warning Tilt - Adjust the number of plumb bob tilt switch closures before the ball in play is tilted; **1** to **3** or **OFF**.

E Ad 17 Buy In Allowed-Set to **YES** or **NO**. Determines if starting another game immediately after the Match feature will retain accumulated lit playfield features.

E Ad 18 Credits Limit - Adjust the maximum number of credits that may be posted; **4** to **50**.

HIGH SCORE LEVELS (E Ad 19 through 30)

There are four of the six high score levels with associated player initials that are displayed during the attract mode. This provides a high-score-to-date feature. When players exceed 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 backup values after a selected number of games.

E Ad 19 Scores Highest - Set to enable or disable the four high score levels; **YES** or **NO**.

E Ad 20 World Record - Adjust the number of credits awarded for exceeding level 1 (the highest of the four levels); **0** to **5**.

E Ad 21 Todays 1 Award- Adjust the number of credits awarded for exceeding level 1; **0** to **3**.

E Ad 22 Todays 2 Award - Adjust the number of credits awarded for exceeding level 2; **0** to **2**.

E Ad 23 Todays 3 Award - Adjust the number of credits awarded for exceeding level 3; **0** to **1**.

E Ad 20 Backup World Record - Adjust the score level to which the world record (the highest of the four levels) may be altered. This adjustment is not affected by E Ad30 (Factory Reset defaults to 7,500,000).

E Ad 25 Backup Todays 1 - Adjust the backup score level to which level 1 may be reset.

E Ad 26 Backup Todays 2- Adjust the backup score level to which level 2 may be reset.

E Ad 27 Backup Todays 3- Adjust the backup score level to which level 3 may be reset.

E Ad 28 Backup Todays 4- Adjust the backup score level to which level 4 may be reset.

E Ad 29 Backup Todays 5- Adjust the backup score level to which level 5 may be reset.

E Ad 30 High Score Reset Every - Adjust the number of games between automatic resets of high score levels to backup settings and ball time averager adjustments; 100 to 900 or OFF (no reset or adjustment).

E Ad 31 Clean Game Every- Adjust the number of games in which the Green Light turns on to indicate the playfield needs cleaning. Adjustable from 100 to 2000.

E Ad 32 Free Play - When set to **YES**, no coins are required for games.

E Ad 33 Message Custom - When desired, this function is used to establish a custom message periodically displayed during the attract mode. Set the feature to **CHANGE** 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 push-button switch to advance to E Ad 34.

NOTE

To lock in the custom message, the game must be returned to Game Over by depressing STEP with E Ad 45 displayed.

E Ad 34 Attract Mode Music - Set to **ON** (approximately every 3 minutes), or **OFF**.

E Ad 45 Factory Restore-Depressing STEP without changing the value shown in the Player 4 Display locks in any custom message set with E Ad33 and returns the game to GameOver. Set the value to **ON** and depress STEP switch to revert all game adjustments to factory settings, clear the Custom Message and return to Game Over.

GAME SPECIFIC FEATURES (E Ad 35 TO E Ad44)

E Ad 35 Flash Lamps- Set to **NORMAL**, **DIM** or **OFF**. When set to **NORMAL** the Flash Lamps are active, when **DIM** the Flash Lamps impulse power is reduced by 25% and when **OFF** the Flash Lamps do not flash.

E Ad 36 Coils Pulse- Set To **NORMAL**, **HARD** or **SOFT**. When **HARD** the coil pulse power is increased by 12.5% of the normal pulse rate. When set to **SOFT** the coil pulse power is reduced by 12.5% of the normal pulse rate. These adjustments are provided to compensate for Low Line or High Line voltage conditions where the solenoids appear to kicking too weak or too hard.

E Ad 37 Ramp Timer- Set from **05** to **30**. Determines the number of seconds in which the DeLorean Millions feature remains active when its enabled. Should the feature be activated multiple times in the same game, 2 seconds are subtracted from the timer whenever the feature is reenabled during the course of the game(Down to 5 Seconds).

E Ad 38 DeLorean Style- Set to **EASY**, **FACTORY** or **HARD**. When set to **EASY**, all the lit letters in DeLorean are carried over in memory from player to player, game to game. When set to **FACTORY**, all the lit letters in DeLorean carried over individually for each player from ball to ball .

E Ad 39 Lock Feature- Set to **EASY**, **FACTORY** or **HARD**. When set to **EASY** the completing the DMC targets in any order will qualify the player to lock a ball. When set to **FACTORY**, the targets may still be hit in any order but each ball must be locked to allow the player to shoot the DMC targets and qualify the next ball. When set to **HARD**, the targets must be knocked down in sequence and each ball must be locked to allow the player to shoot the DMC targets and qualify the next ball.

EAd 40 Skyway Timer -Set to **EXEASY, EASY, FACTORY, HARD** or **EXHARD**. Determines how long the each Skyway Value remains enabled in seconds.

Setting/Skyway Value	50K	75K	100K	125K	Lites Extra Ball
Extra Hard	10	8	6	4	3
Hard	15	12	9	6	3
Factory	20	16	12	8	4
Medium	25	20	15	10	5
Ex Easy	30	24	18	12	6

E Ad 41 Outlane Toggle- Set to **FLIPPER, SLING** or **BOTH**. This feature controls how the lit Outlane Special will alternate from the left lane to the right. When set to **FLIPPER** operating either flipper button will cause the Special light to move from one lane to the other. When set to **SLING** operating either Slingshot switch will cause the Special light to move from one lane to the other. When set to **BOTH** operating either the Flipper or Slingshot switches will cause the Special light to move from one lane to the other.

E Ad 42 Recall Mc Fly- Set to **YES** or **NO**. When set to **YES**, all lit letters on the word McFly will be carried over from ball to ball for each individual player.

E Ad 43 McFly Start- Set to **EASY,FACTORY** or **HARD**. When set to **EASY**, the letters **Mc** will be lit in the McFly targets at the start of each game. When set to **FACTORY**, the letter **M** will be lit in the McFly targets at the start of each game. When set to **HARD**, no letters in McFly will be lit at the start of the game.

E Ad 44 Recall Clock-Set to **YES**, or **NO**. When set to **YES**, each feature lit on the Clock Eject will be carried over from ball to ball for each individual player.

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 push-button switches inside the coin door and the Game Start push-button 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 50 games it is considered bad. When operation of a coil should close or open a switch and does not, the coil is considered bad. In Game over attract mode, bad switches and coils (if any) are reported (See Tech Alert Description below). 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.

Wiring to switches, solenoids and controlled lamps uses color-coded wires that basically follows a resistor color-code scheme for the eight rows and eight columns. During the switch tests and during the discrete lamp test, identification of the color of the row and column wires are indicated in the Player 3 & 4 Displays. For example, making the right coin switch during the Switch Test results in the switch functional name (RIGHT COIN) shown in the Player 1 and 2 Displays, the row (WH-YE) and column (GR-BR) wire color codes shown in the Player 3 display, and the switch number shown in the Player 4 display.

BK = Black
BR = Brown
RE = Red
OR = Orange
YE = Yellow

GR = Green
BL = Blue
VI = Violet
GY = Grey
WH = White

ENTERING DIAGNOSTICS

With the game in the game-over mode, open the coin door and make sure that the FORWARD/REVERSE push-button switch is set to REVERSE (down) and depress the STEP push-button switch. The Player displays will show the tollfree Customer Service number 1-800-KICKERS, that is 1-800-542-5377 (outside Illinois) and the toll number (708) 345-7700 (inside Illinois). this indicates entry into game diagnostics.

Tech Alert

With the phone number displayed depress the STEP push-button switch. The player displays will now indicate if there are any Bad Switches (Switches that are closed, that should not be or switches that have not been activated in 50 games) it also indicates if the game requires cleaning, based on the number set in E Ad 31. It should also be noted that the Tech Alert works in conjunction with the RED "Tech Check" and GREEN "Clean me Lights" located under the Start Button on the front of the game.

The Following conditions may occur in Game Over Attract Mode.

Red light- ON Indicates a non critical switch (ie. Outlane switch) is either stuck or has not been closed for 50 games.

Red light- FLASHING Indicates a critical switch (ie. Drop Target switch) is either stuck or has not been closed for 50 games.

Green light- ON Indicates 1500 games (operator adjustable E Ad 31) have been played and playfield cleaning is recommended

Green light- FLASHING Indicates 2250 games (1.5 X E Ad 31) have been played and playfield cleaning is strongly recommended

The Red Light will go off automatically after the bad switch (s) have been repaired. To turn the Green Light off you must enter Game Cleaned Ad 09 and change its setting from NO to YES by depressing the start button. Doing so will reset the Clean Game counter to 0.

Burn-In Minutes

Pressing the step button while in Tech Alert mode will step game into Burn-in Mode(Factory use). At this stage pressing the game start button will cause the game to exercise all CPU I/O functions. This is provided to constantly exercise sounds, solenoids, etc... To stop the test press the start button again. Cumulative Burn-In minutes will be displayed. To reset Burn-In minutes to 00, you must perform a Audit Reset Ad 11 or a Factory Restore E Ad 45.

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 bottom display shows the sound board circuit under test and the corresponding sounds are selected by operating the left and right flipper buttons to choose the circuit to be tested. Now press the start button to initiate the sound. Refer to the Sound Test Chart for the sound circuits displayed and the sounds produced.

The sound 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.

SOUND TEST CHART

Auto/Manual Tests (Player 1 & 2)	Sounds Produced
LEFT SPEAKER CENTER SPEAKER RIGHT SPEAKER VOICE ROM1 (Loc F6) VOICE ROM2 (Loc F4) MUSIC TEST (Sound ROM Loc F7)	ThunderBolt (Left Speaker Only) ThunderBolt (All speakers) ThunderBolt (Right Speaker Only) "Hey McFly" "Great Scott!" Level 1 Through Level 5 Music

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 sound test to cycle through the Left, Center, and Right Thunderbolt 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.

DIGITAL DISPLAY TEST

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

Automatic Test

To enter Display tests, operate the STEP push-button switch from the Sound Manual test. The displays will illuminate all segments in a single digit and sequence that digit from left to right in the Top Display and right to left in the Bottom Display. When each digit completes its cycle to the end of the display it reverses direction.

Switches

Switches are configured in 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. Row and column wire colors are indicated in each test using corresponding resistor color code numbers.

Switch Test

From the Display Manual test, operate STEP push-button 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, the Player 3 display indicates the row and column wire colors, and the Player 4 display indicates the switch number. When a switch is released, the name and number disappear until another switch is closed or the test is exited.

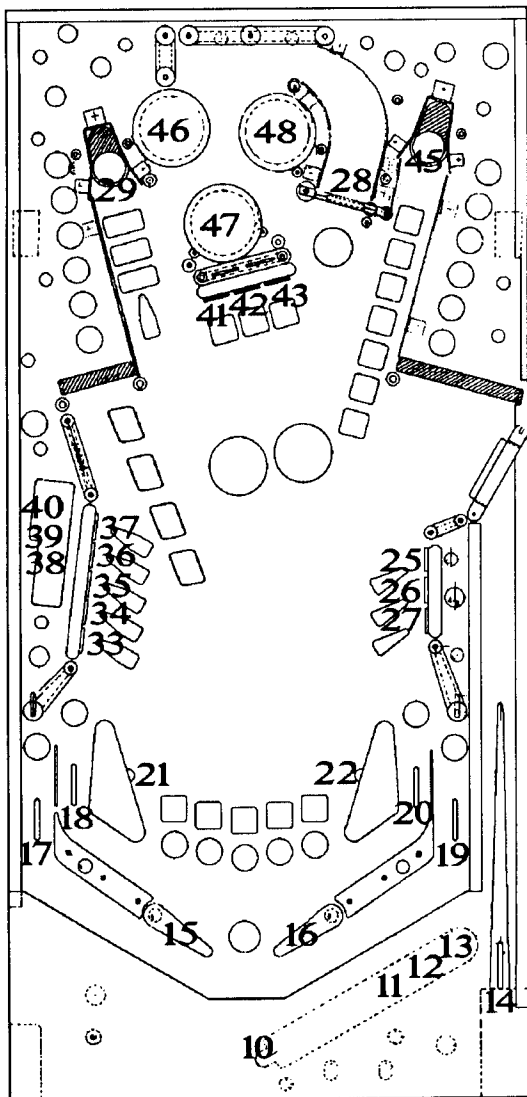
Active Switches

Operate the STEP push-button 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, the Player 3 display indicates the row and column wire colors, and the switch numbers are indicated in the Player 4 display. This cycle continues until all switches are cleared or until the STEP push-button switch is depressed.

SWITCH MATRIX CHART

COLUMN ROW	1 Q55 GRN-BRN CN8-1	2 Q54 GRN-RED CN8-2	3 Q53 GRN-ORN CN8-3	4 Q52 GRN-YEL CN8-4	5 Q51 GRN-BLK CN8-5	6 Q50 GRN-BLU CN8-7	7 Q49 GRN-VIO CN8-8	8 Q48 GRN-GRY CN8-9
1 WHT-BRN CN10-9	Plumb Tilt 1	Not Used 9	Left Outlane 17	DOC 25	McFLY 33	Drop Target D 41	Not Used 49	Not Used 57
2 WHT-RED CN10-8	Not Used 2	Outhole 10	Left Return 18	DOC 26	McFLY 34	Drop Target M 42	Not Used 50	Not Used 58
3 WHT-ORN CN10-7	Credit Button 3	Trough #1 Left 11	Right Outlane 19	DOC 27	McFLY 35	Drop Target C 43	Not Used 51	Not Used 59
4 WHT-YEL CN10-6	Right Coin 4	Trough #2 Center 12	Right Return 20	Spinner 28	McFLY 36	Not Used 44	Not Used 52	Not Used 60
5 WHT-GRN CN10-5	Center Coin 5	Trough #3 Right 13	Left Slingshot 21	Lock VUK 29	McFLY 37	Clock Eject 45	Not Used 53	Not Used 61
6 WHT-BLU CN10-3	Left Coin 6	Shooter Lane 14	Right Slingshot 22	Left Ramp 30	Left Lock Bottom 38	Left Turbo Bumper 46	Not Used 54	Not Used 62
7 WHT-VIO CN10-2	Slam Tilt 7	Left EOS 15	Not Used 23	Right Ramp 31	Left Lock Center 39	Center Turbo Bumper 47	Not Used 55	Not Used 63
8 WHT-GRY CN10-1	Not Used 8	Right EOS 16	Not Used 24	Not Used 32	Left Lock Top 40	Right Turbo Bumper 48	Not Used 56	Not Used 64

Number	Description	Part No.	Number	Description	Part No.
01*	Plumb Tilt	500-5023-00	10	Out Hole	180-5011-00
02	Not Used	--	11	Trough #1(Left)	180-5009-00
03	Credit Button	500-5097-00	12	Trough #2(Center)	180-5009-00
04*	Right Coin	180-5024-00	13	Trough #3(Right)	180-5010-00
05*	Center Coin	180-5024-00	14	Shooter Lane	500-5143-00
06*	Left Coin	180-5024-00	15	Left Flip. Cab. Switch	180-5067-00
07*	Slam Tilt	180-5022-00	16	Right Flip.Cab. Switch	180-5067-00
08	Not Used	--	17	Left Outlane	500-5142-00
09	Not Used	--	18	Left Return Lane	500-5142-00
			19	Right Outlane	515-5138-00
			20	Right Return Lane	515-5138-00
			21	Left Slingshot Sw.	180-5054-00
			22	Right Slingshot Sw.	180-5054-00
			23	Not Used	-
			24	Not Used	-
			25	DOC	515-5124-14
			26	DOC	515-5124-14
			27	DOC	515-5124-14
			28	Spinner	500-5193-00
			29	Lock VUK	180-5063-00
			30	Left Ramp	180-5010-00
			31	Right Ramp	180-5010-00
			32	Not Used	-
			33	McFLY	515-5124-18
			34	McFLY	515-5124-18
			35	McFLY	515-5124-18
			36	McFLY	515-5124-18
			37	McFLY	515-5124-18
			38	Left Lock Bottom	180-5062-00
			39	Left Lock Center	180-5062-00
			40	Left Lock Top	180-5062-00
			41	Drop Target D	8-141
			42	Drop Target M	8-141
			43	Drop Target C	8-141
			44	Not Used	-
			45	Clock Eject	180-5027-00
			46	Left Turbo Bumper	180-5015-00
			47	Center Turbo Bumper	180-5015-00
			48	Right Turbo Bumper	180-5015-00
			49	Not Used Through 64	-



Switch Locations

*INDICATES CABINET SWITCHES.

LAMP TESTS

Controlled lamps are configured in 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 (individual) lamps. Row and column wire colors are indicated in the discrete lamp test using corresponding resistor color code numbers.

All Lamps

From the Active Switch test, operate the STEP push-button 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 push-button switch. The top display indicates LAMP RETURNS and the Bottom display indicates wire color and the LAMP RETURN driver transistor. All controlled lamps in row 1 should be lit. Operating the Game Start push-button switch cycles through each of the rows separately.

Lamp Drives

From the LAMP RETURNS test, depress the STEP push-button switch. The Top display indicates LAMP COLUMNS and the bottom display indicates wire color and the LAMP DRIVES driver transistor. All controlled lamps in column 1 should be lit. Operating the Game Start push-button switch, cycles through each of the columns separately.

Single Lamp

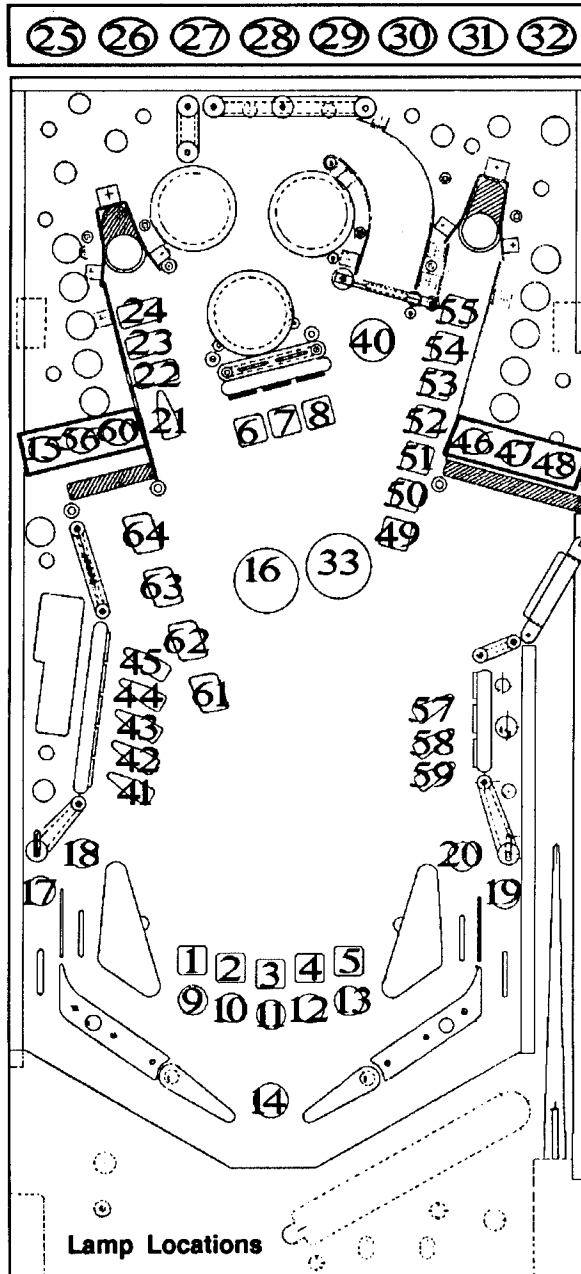
From the LAMP DRIVES test, depress the STEP push-button switch. The top display indicates lamp name. The bottom display indicates the row and column wire colors and the lamp matrix number. Lamp 01 should light. With the FORWARD/REVERSE push-button switch in the FORWARD (up) position, operating the Game Start push-button switch selects higher-numbered lamps; with it in the REVERSE (down) position, Game Start selects lower-numbered lamps.

LAMP MATRIX CHART

COLUMN \ ROW	1 YEL-BRN CN7-1	2 YEL-RED CN7-2	3 YEL-ORN CN7-3	4 YEL-BLK CN7-4	5 YEL-GRN CN7-6	6 YEL-BLU CN7-7	7 YEL-VIO CN7-8	8 YEL-GRY CN7-9
1 RED-BRN CN6-1	2x 1	Skyway 50K 9	Left Outlane 17	DeLorean 25	Picture Right 33	Left Bank "H" 41	Clock Multip. 5x 49	Right Bank "D" 57
2 RED-BLK CN6-2	3x 2	Skyway 75K 10	Left Return 18	DeLorean 26	Jackpot 500,000 Left 34	Left Bank "c" 42	Clock Lite Ex.Ball 50	Right Bank "O" 58
3 RED-ORN CN6-3	4x 3	Skyway 100K 11	Right Outlane 19	DeLorean 27	Jackpot 750,000 Left 35	Left Bank "F" 43	Clock 100K 51	Right Bank "C" 59
4 RED-YEL CN6-5	5x 4	Skyway 125K 12	Right Return 20	DeLorean 28	Jackpot 1,000,000 Left 36	Left Bank "L" 44	Clock Bonus Hold 52	Ramp Left Million 60
5 RED-GRN CN6-6	6x Lite Special 5	Skyway Extraball 13	Extra Ball Arrow 21	DeLorean 29	Jackpot 500,000 Right 37	Left Bank "Y" 45	Clock Lite Million 53	Skill Take Hi Scores 61
6 RED-BLU CN6-7	Drop Target D 6	Shoot Again 14	Lock #3 "Future" 22	DeLorean 30	Jackpot 750,000 Right 38	Ramp Right Skill 46	Clock Bumper Power 54	Skill Double Scores 62
7 RED-VIO CN6-8	Drop Target M 7	Ramp Left Skill 15	Lock #2 "In" 23	DeLorean 31	Jackpot 1,000,000 Right 39	2015 Jackpot 47	Clock 50K 55	Skill Extra Ball 63
8 RED-GRY CN6-9	Drop Target C 8	Picture Left 16	Lock #1 "Back" 24	DeLorean 32	Spinner 40	Ramp Right Million 48	1885 Jackpot 56	Skill 100K 64

Lamp Number	Description
01	2X
02	3X
03	4X
04	5X
05	6X Lite Special
06	Drop Target D
07	Drop Target M
08	Drop Target C
09	Skyway 50K
10	Skyway 75K

34	35	36	37	38	39
----	----	----	----	----	----



11	Skyway 100K
12	Skyway 125K
13	Skyway Extraball
14	Shoot Again
15	Ramp Left Skill
16	Picture Left
17	Left Outlane
18	Left Return
19	Right Outlane
20	Right Return
21	Extra Ball Arrow
22	Lock #3 "Future"
23	Lock #2 "In"
24	Lock #1 "Back"
25	DeLorean
26	DeLorean
27	DeLorean
28	DeLorean
29	DeLorean
30	DeLorean
31	DeLorean
32	DeLorean
33	Picture Right
34*	Jackpot 500,000 Left
35*	Jackpot 750,000 Left
36*	Jackpot 1,000,000 Left
37*	Jackpot 500,000 Right
38*	Jackpot 750,000 Right
39*	Jackpot 1,000,000 Right
40	Spinner
41	Left Bank "M"
42	Left Bank "C"
43	Left Bank "F"
44	Left Bank "L"
45	Left Bank "Y"
46	Ramp Right Skill
47	2015 Jackpot
48	Ramp Right Million
49	Clock Multiplier 5X
50	Clock Lite Extra Ball
51	Clock 100K
52	Clock Bonus Hold
53	Clock Lite Millions
54	Clock Power Bumper
55	Clock 50K
56	1885 Jackpot
57	Right Bank "D"
58	Right Bank "M"
59	Right Bank "C"
60	Ramp Left Million
61	Skill Take High Scores
62	Skill Double Scores
63	Skill Extra Ball
64	Skill 100K

*Indicates Speaker Lamp

COIL TESTS

Twenty-Two regular (pulsed under microprocessor control) coil drivers are provided to switch ground to coils. The Left/Right relay is used in conjunction with drives 1 through 8 to switch + 32 volts between coils or flash lamps; these sets are termed "left" and "right". This relay is located on the PPB board which provides isolation diodes and current limiting resistors. This effectively provides 29 regular coils.

Automatic Test

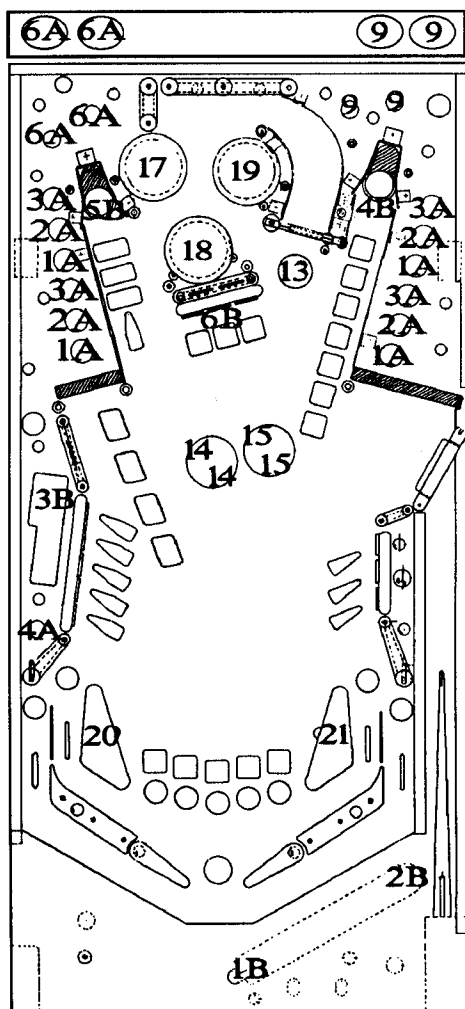
From the Discrete Lamps test, depress the STEP push-button switch. Player 1 and 2 displays indicate ALL COILS. The test pulses each regular solenoid or flash lamp sequentially with the coil/flash lamp name indicated in the Player 1 and 2 displays and the wire colors in the Player 3 and 4 displays.

Select Coil

From the Coil Test, depress the STEP push-button switch. Player 1 and 2 displays indicate SELECT COIL and then the name of 1st drive, the wire colors are indicated in the Player 3 and 4 displays. Operate either Flipper push-button switch to select the coil or flash lamp to be tested. With the desired drive number indicated in the Player 4 display, depress the START push-button switch to cause it to be pulsed repeatedly.

RETURN TO GAME OVER

From the Select Coil test, depress the STEP push-button switch Twice to exit through the VUK test (Factory Use to test for proper operation of the Ball Lock Switches). The game returns to the game-over mode.

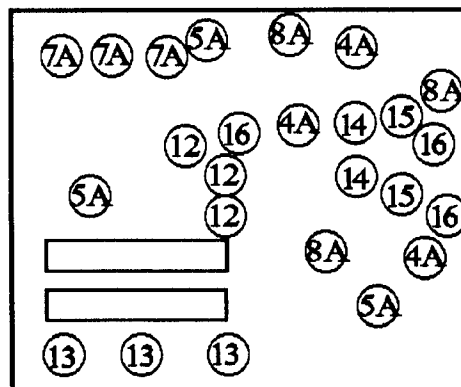


CPU Controlled Auxiliary Solenoids

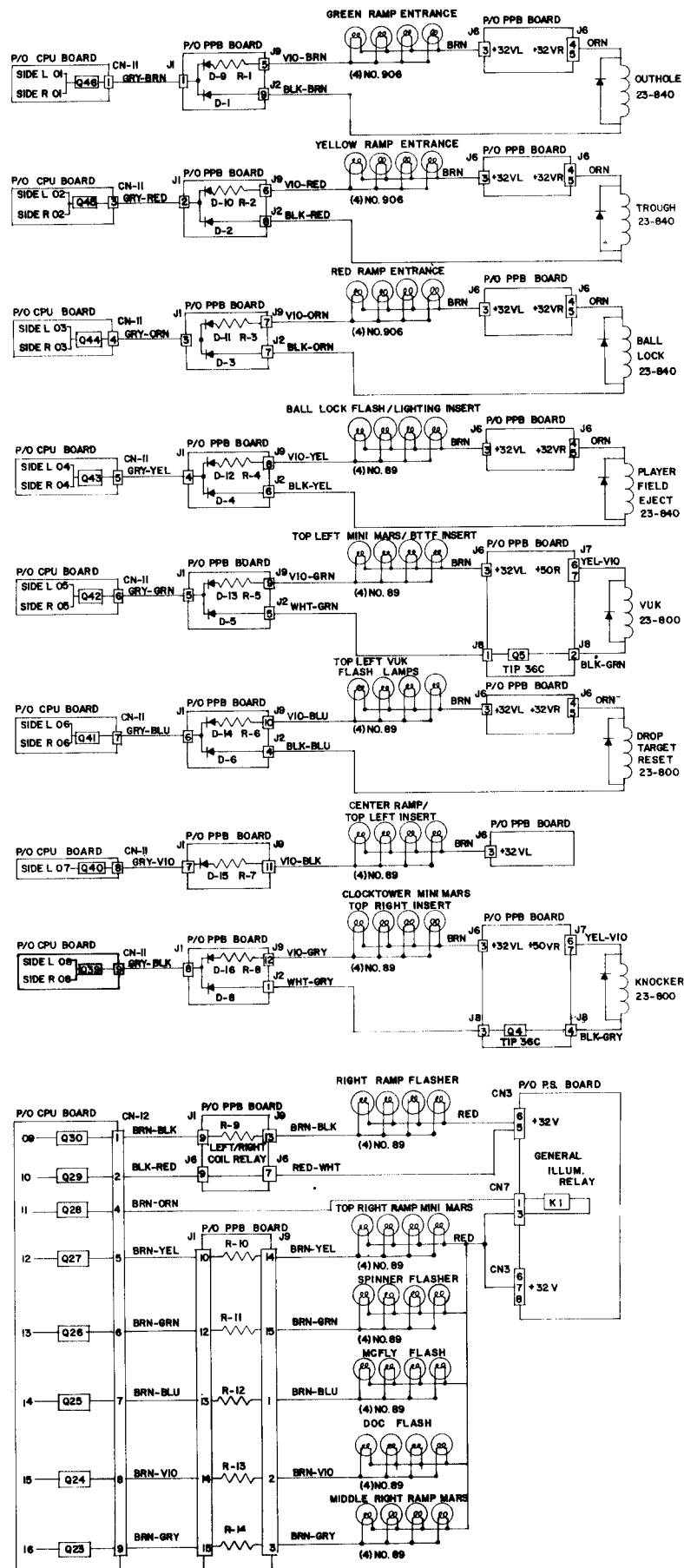
Coil Number	Coil Description	Control Line (CPU to Coil)	Power Line (PS to Coil)	Drive Transistor	Coil Type
18	Right Turbo Bumper	BLU-ORN CPU CN19-3	RED PS CN3-6	Q8	23-800
19	Center Turbo Bumper	BLU-ORN CPU CN19-4	RED PS CN3-6	Q9	23-800
20	Left Slingshot	BLU-ORN CPU CN19-6	RED PS CN3-6	Q10	23-800
21	Left Turbo Bumper	BLU-ORN CPU CN19-7	RED PS CN3-6	Q11	23-800
22	Right Slingshot	BLU-ORN CPU CN19-8	RED PS CN3-6	Q12	23-800
23	NOT USED	CPU CN19-9	PS CN3-6	Q13	

Flipper Solenoids

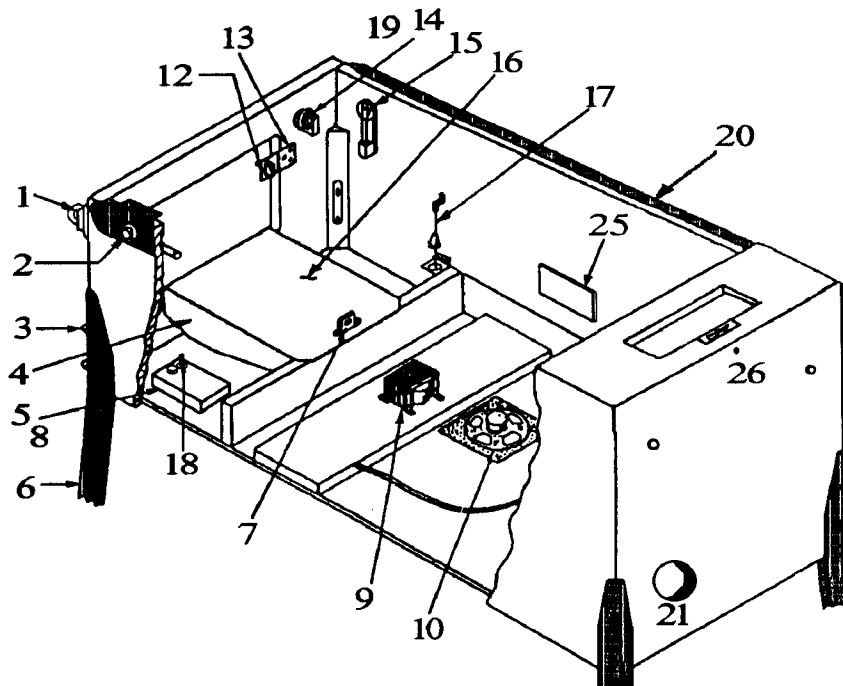
Coil Description	Flipper GND		Power Lines FlipPc to Coil	Coil Type	Power Input To Flip PCB
	CPU to Coil	Sw. to Flip.PCB			
Left Flipper	ORN-GRY CPU CN19-2	BLU-GRY CN1-9	GRY-YEL CN2-1,2	23-800	BLK-WHT 50VDC
Right Flipper	ORN-VIO CPU CN19-1	BLU-VIO CN1-1	BLK-WHT CN1-1	23-800	GRY, GRY-GRN 8VAC



Backbox Flash lamps



CABINET PARTS ILLUSTRATION



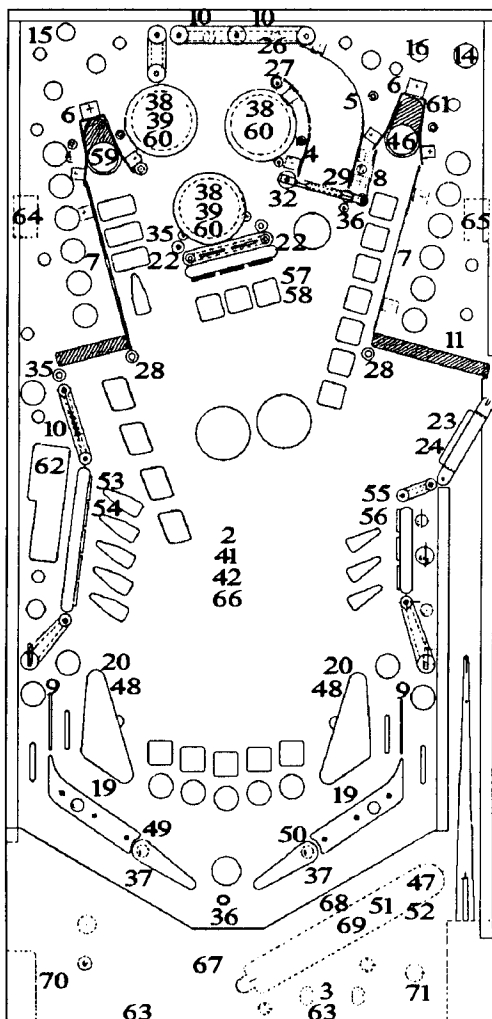
Item	Description	Part No.
1	Ball-shooter Assy	500-5019-14
2	Flipper Button	500-5026-18
3	Leg Bolt (Black)	231-5000-01
4	Cash Box Bottom	545-5090-00
5	On/Off Switch DP/ST	180-5001-00
6	Leg (Black)	535-5020-30
7	Lock Bracket-Cash Box	535-5215-00
8	Power Input Box Assy	515-5153-00-09
9	Transformer	010-5002-00
10	Speaker-Round (6")	031-5000-00
11	Side Armor-Right(Not Shown)	535-5010-31
12	Memory Protect Switch	180-5000-00
13	Memory Protect Switch Bracket	535-5225-00
14	Start Switch	500-5097-00
15	Flipper Micro Switch Assembly	500-5251-00-09
16	Cash Box Top	535-5013-01
17	Plumb Bob Tilt	535-5029-00
18	Volume Control	123-5000-00
19	Playfield Glass (Tempered)	660-5001-00
20	Side Armor -Left	535-5010-32
21	Recessed cup for Line cord	545-5122-00
22	Service Switch (Not Shown)	180-5012-00
23	Front Molding Lockdown Assy.	500-5020-00
24	Front Molding -Black (Not Shown)	500-5021-10
25	S.S.Flipper P.C.B.	520-5033-00
26	Roto Lock Bottom	355-5006-01

Playfield Parts

Number Description

Part Number

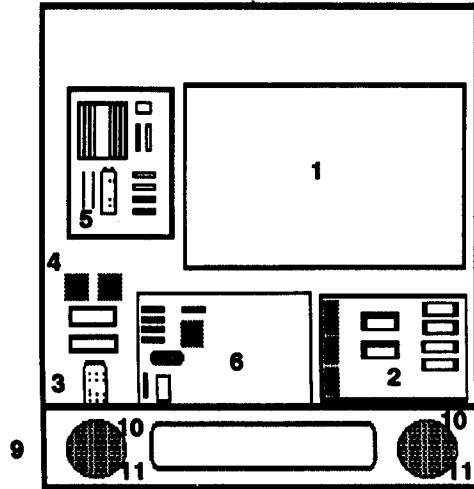
1. Black Acorn Nut (28) 240-5006-00
2. Completely Assmbl. Playfield 505-6004-09-09
3. Outhole Kicker Assy. 500-5082-00
4. Ball Guide Left of Spinner lane 500-5263-00
5. Ball Guide Right of Spinner lane 500-5264-00
6. Ball Guide VUK & Clock (2) 500-5258-00
7. Ball Guide(Long)Left of VUK (2) 500-5266-00
8. Ball Guide Left of Clock Tower 500-5267-00
9. Outlane Wire Guides (2) 535-5300-12
10. 1" Wire Guide (3) 535-5300-05
11. Plastic Ramp 515-5321-00-09
- *12. RmpRollunderWrfrm.Mtg Bkt(2) 535-5712-00
- *13. Ramp Rollunder Wireform (2) 535-5354-03
14. Red Mini- Mars (2) 545-5004-02
15. Amber Mini- Mars 545-5004-03
16. Clear Mini- Mars 545-5004-01
- *17. Ramp Shadow Box (2) 525-5042-00
- *18. Wire Ramp 500-5391-00



19. L\R Return lane Ball Guide(2) 535-5407-01
20. Red 1 1/16 Jeweled post (13) 545-5013-02
- *21. 1" Hex Spacer (3) 254-5008-06
22. Metal Standoff W/Grove (15) 530-5035-01
23. ShterLn.RollndrWrfrm.Mtg.Bkt 535-5269-01
24. ShooterLn.Rollndr Wireform. 535-5307-01
25. 1/2" Hex Spacer (3) 254-5008-03
26. BumperRollndrWrfrm.Mtg.Bkt 535-5210-00
27. Bumper Rollunder Wireform. 535-5307-07
- *28. Bumper Post (4) 530-5007-00
29. Spinner Target 515-5236-00
- *30. Spinner Decal Front 820-5210-01
- *31. Spinner Decal Back 820-5210-02
- *32. Spinner Mtg. Bracket 535-5249-00
- *33. Spinner Actuator wire 535-5387-00
- *34. Spinner Target Washers (2) 545-5037-00
35. Bumper Post (2) 530-5057-00
36. Mini Post (2) 530-5004-00
37. Flipper Bat & Shaft (2) 515-5133-01
38. Turbo Bumper Cap (3) 545-5035-32
39. Turbo Bumper Decals (2) 820-5310-00
- *40. Decal Sheet 820-5042-XX
41. Playfield Mylar 820-5812-00
42. Screened Playfield 830-5112-00
- *43. Screened Plastics 830-5416-XX
- *44. Clear Plastics 830-5417-XX
- *45. Shooter Lane Side Rail Guard 535-5795-00
46. P.F. Yellow Eject Hole 545-5060-06
47. Ball Trough Eject 500-5012-00
48. Slingshot Assembly (2) 500-5226-00
49. Left Flipper Assembly 500-5177-32
50. Right Flipper Assembly 500-5177-31
51. Ball Trough Sw. Plate 500-5190-09
52. Ball Trough Ramp 535-5026-00
53. 5 Bank S.U. Tgt. Assy. 500-5234-00
54. 5 Bank S.U. Tgt. Decals (5) 820-5113-00
55. 3 Bank S.U. Tgt. Assy. 500-5103-14
56. 3 Bank S.U. Tgt. Decals (3) 820-5117-00
57. 3 Bank Drop Tgt. Assy. 500-5196-00
58. 3 Bank Drop Tgt. Decals (3) 820-5114-00
59. Vertical Up Kicker 500-5067-03
60. Turbo Bumper Assy. (3) 500-5227-00
61. Playfield Eject Assembly 500-5051-05
62. Lock Ball Assembly 500-5104-01
63. Playfield Support Brkts. (2) 535-5216-00
64. Left Playfield Hinge 535-5222-00
65. Right Playfield Hinge 535-5223-00
66. P.F.Glass (Tempered) 660-5001-00
67. Bottom Arch 545-5170-00
68. Bottom Arch RollunderWirefrm. 535-5393-00
69. Retainng Clps for Item #68(2) 270-5011-00
70. Left Bottom Arch Decal 820-5043-01
71. Right Bottom Arch Decal 820-5043-02

* Denotes not shown on
Drawing

BACKBOX PARTS ILLUSTRATION

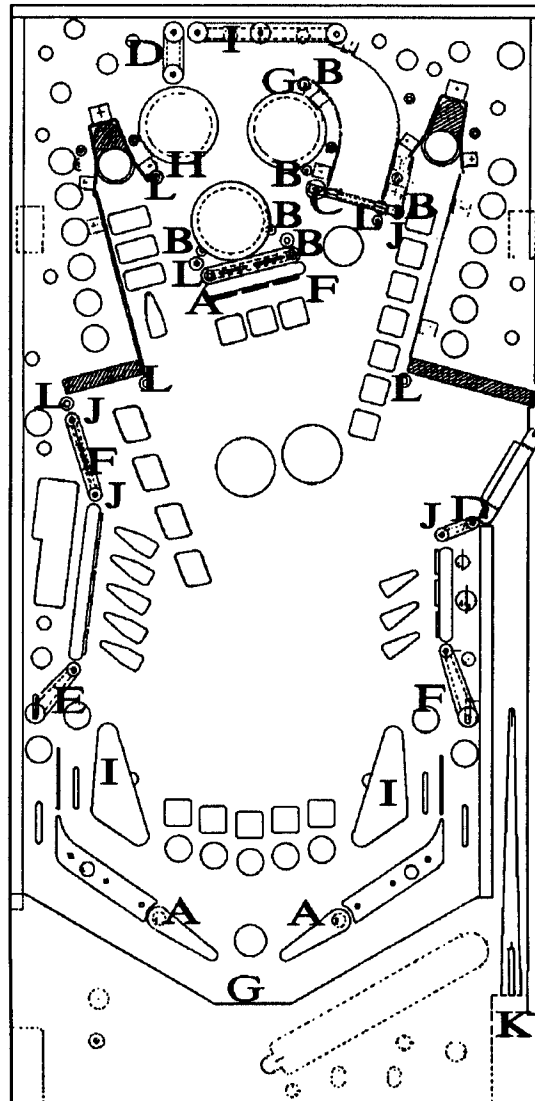


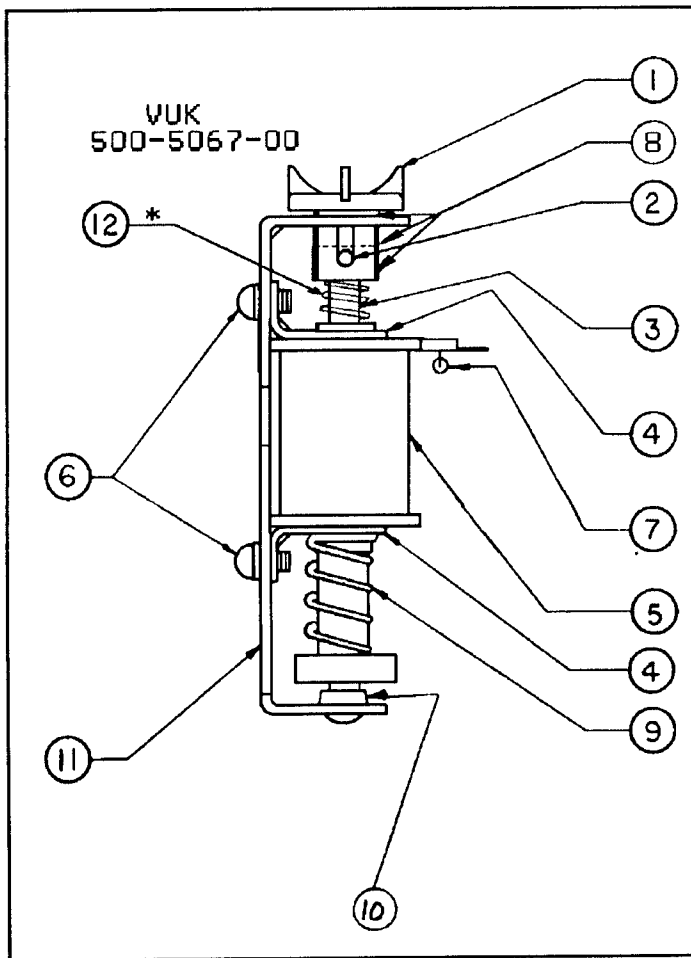
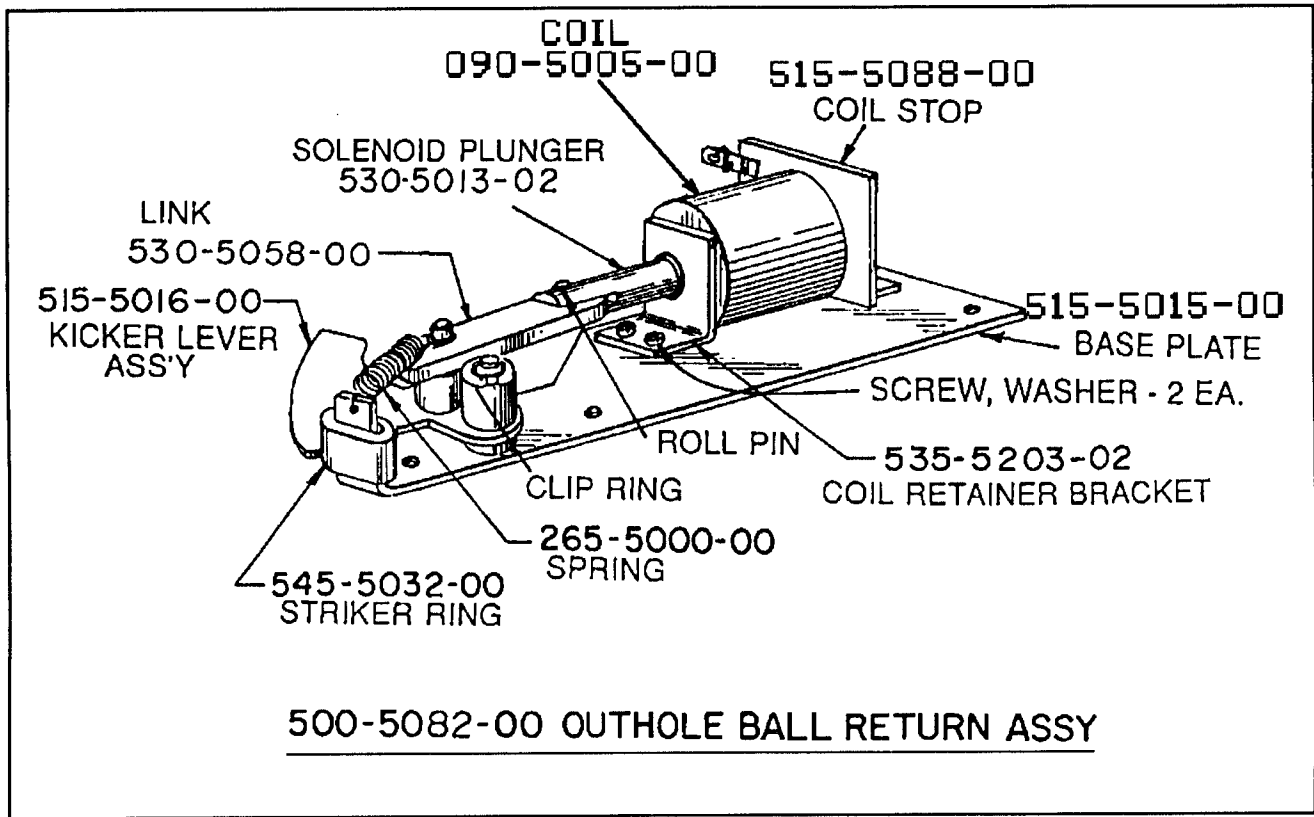
Item	Description	Part No.
1	CPU Board Assy.(Non-Refix)	520-5003-03-09
2	Sound Board Assy	520-5002-01-09
3	Capacitor 2C1	125-5000-00
4	Bridge Rectifiers	112-5000-00
5	Power Supply Bd. Assy	520-5000-00
6	PPB Board	520-5021-02
7	Combined Display Bd Assy*	520-5030-00
8	Display Ribbon Cable*	036-5001-30
9	Speaker Housing	515-5217-00
10	Speakers (2)	031-5004-00
11	Speaker Grill (2)	830-5601-00
12	Back Box Glass*	830-5209-01
13	Roto-Lock Top*	355-5006-02

* Not Shown

RUBBER PARTS ILLUSTRATION

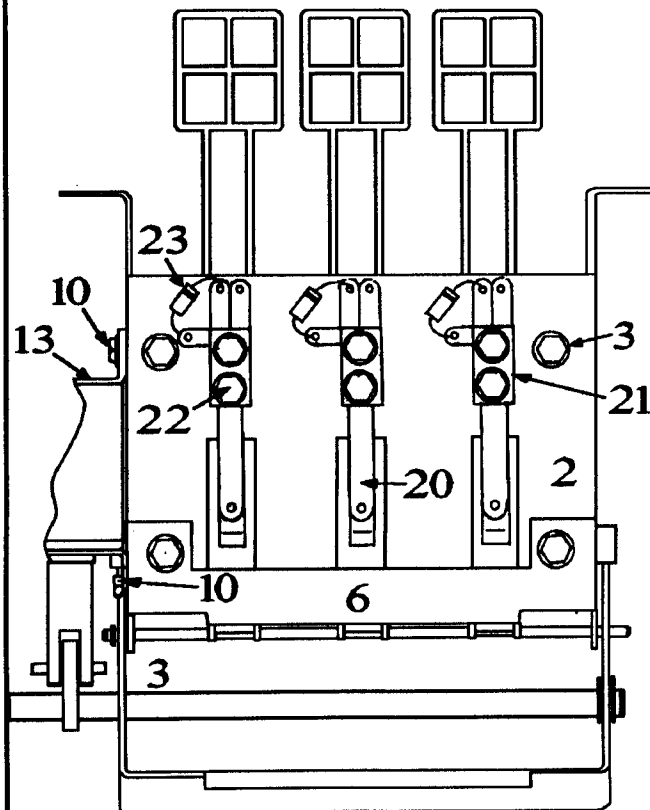
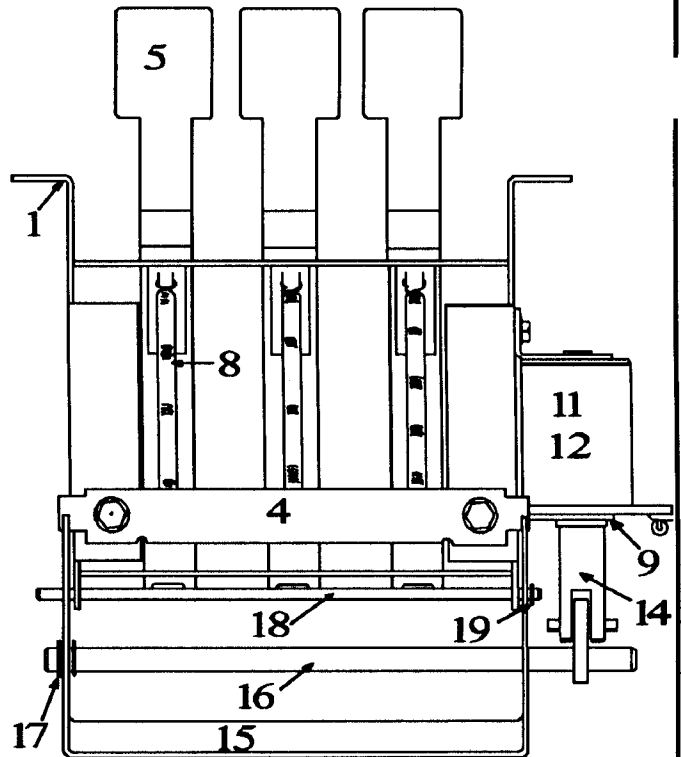
Item	Description	Part #
A.	Red Flipper (3)	545-5024-02
B.	$\frac{3}{16}$ " (6)	545-5025-01
C.	$\frac{5}{16}$ " (1)	545-5025-02
D.	$\frac{3}{4}$ " (2)	545-5025-04
E.	$1\frac{1}{4}$ " (1)	545-5025-06
F.	$1\frac{1}{2}$ " (3)	545-5025-07
G.	$\frac{7}{16}$ " Outer Diameter (2)	545-5025-17
H.	$\frac{3}{8}$ " Outer Diameter (1)	545-5025-19
I.	$2\frac{3}{4}$ " (3)	545-5025-20
J.	Rubber Post -Short(4)	545-5151-00
K.	Shooter Tip (1)	545-5027-00
L.	Rubber Post -Tall(6)	545-5009-00





Item	Part #	Description
1	545-5073-00	Vert. Kick. Cap
2	251-5004-00	Pin 3/32 x 7/16
3	515-5096-00	Plunger Assy.
4	535-5203-01	Coil Retainer Brkt. (2)
5	090-5001-01	Coil 23-800
6	#8-32x 1/4" LG.	Phillips Screw (4)
7	112-5003-00	1N4004 Diode
8	270-5010-00	Compression Ring (3)
9	266-5009-00	Spring
10	280-5003-00	Bumper
11	535-5271-00	VUK Bracket
12	265-5016-00	Cap Spring *

Item	Description	Part No.
1	Target End Plate (2)	1-308
2	Bank Target Frame	1-309-3
3	#8-32 X $\frac{3}{8}$ Screw (6)	31-802
4	Spring Mounting Plate	1-310-3
5	Target (3)	4-124-1
6	Drop Tgt.Retain.Brkt.	1-158-3
7	Washer $\frac{13}{64}$ X $\frac{1}{2}$ (2)	3-103
8	Target Reset Spring (3)	5-106
9	Coil Support Bracket	1-152
10	#6-32 X $\frac{3}{8}$ Screw (4)	31-600
11	23-800-Coil	090-5001-00
12	Coil Sleeve	4-211-2

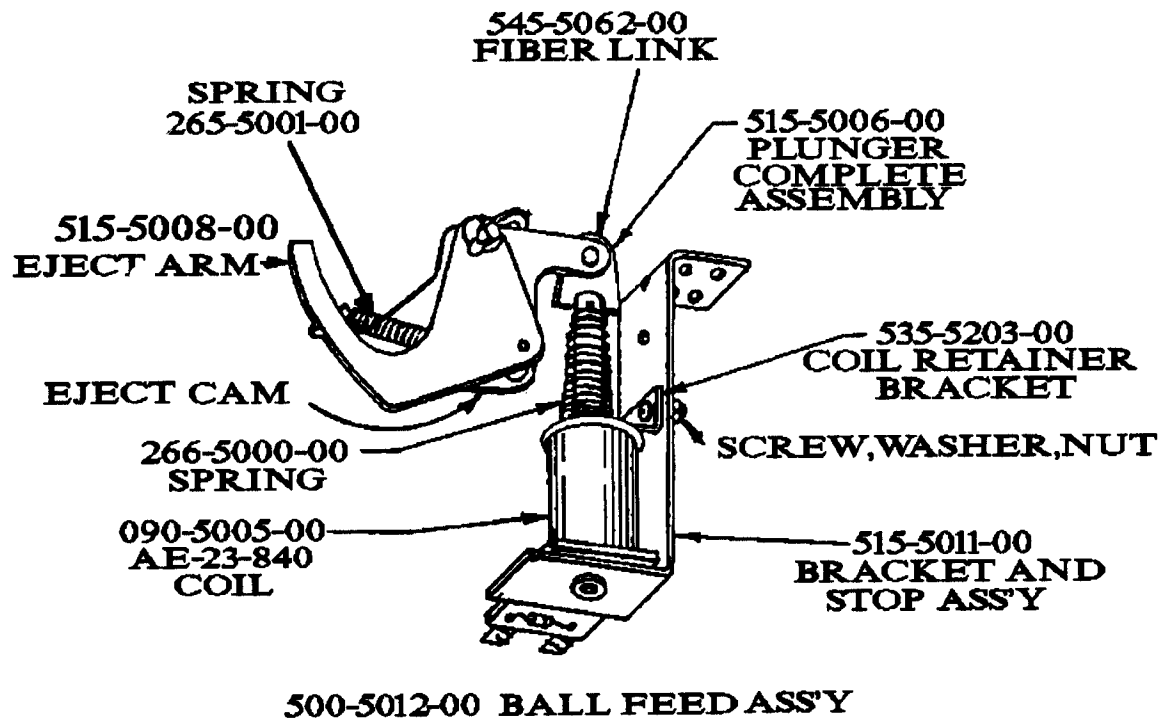
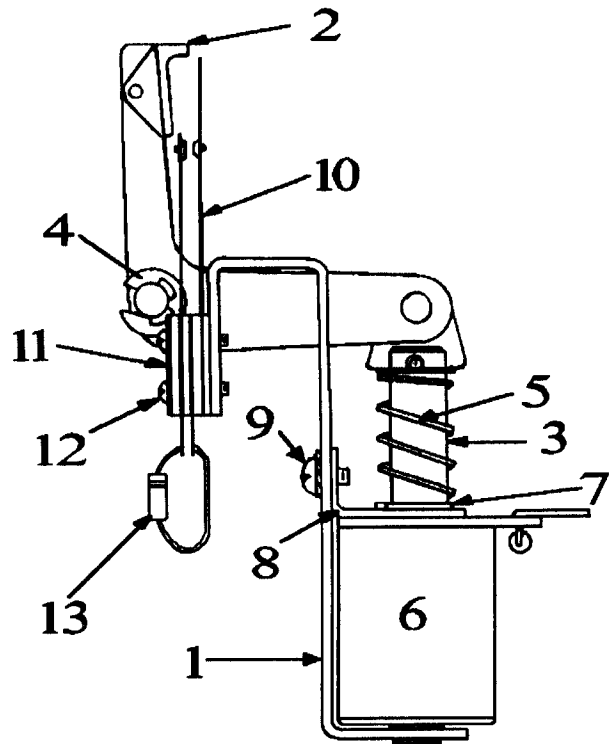


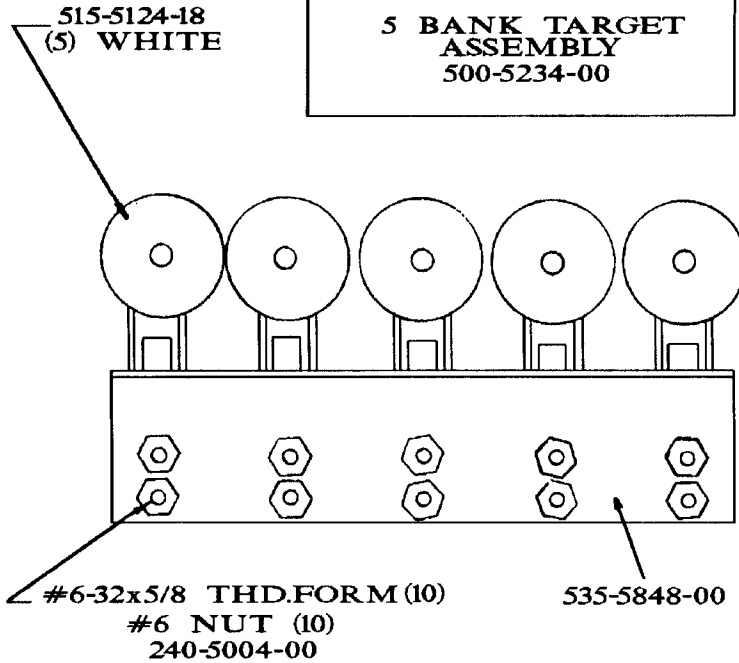
Item	Description	Part No.
13	Plunger Stop Assy.	A-118
14	Plunger & Link Assy.	A-133
15	Target Lift Bracket	1-311-3
16	Target Shaft	2-182-3
17	Retaining Ring (2)	17-100-12
18	Pivot Shaft	2-183-3
19	Retaining Ring (2)	17-100-25
20	Switch (3)	8-141
21	SwitchPlate (3)	1-230
22	#6-32 X $\frac{1}{2}$ " (6)	31-610
23	Diode 1N4001	25-102

**3 Bank Drop Target
Assembly
Both Front & Rear Views
500-5196-31**

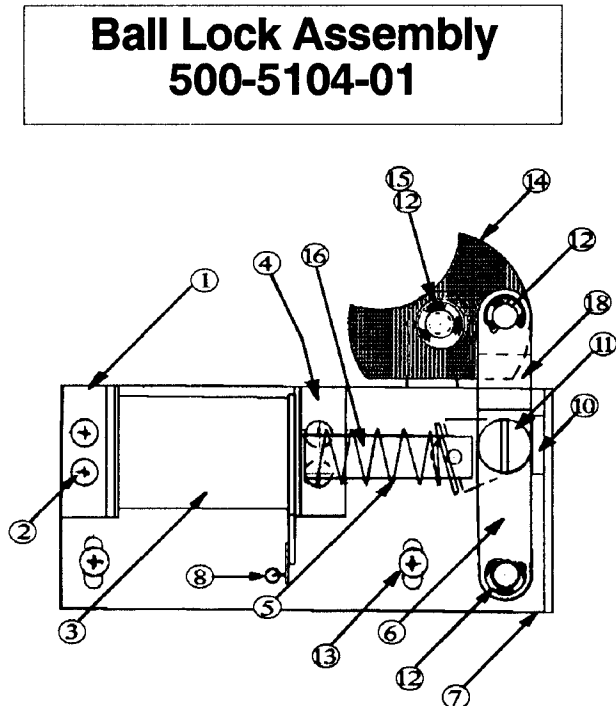
Slingshot Assembly 500-5226-00

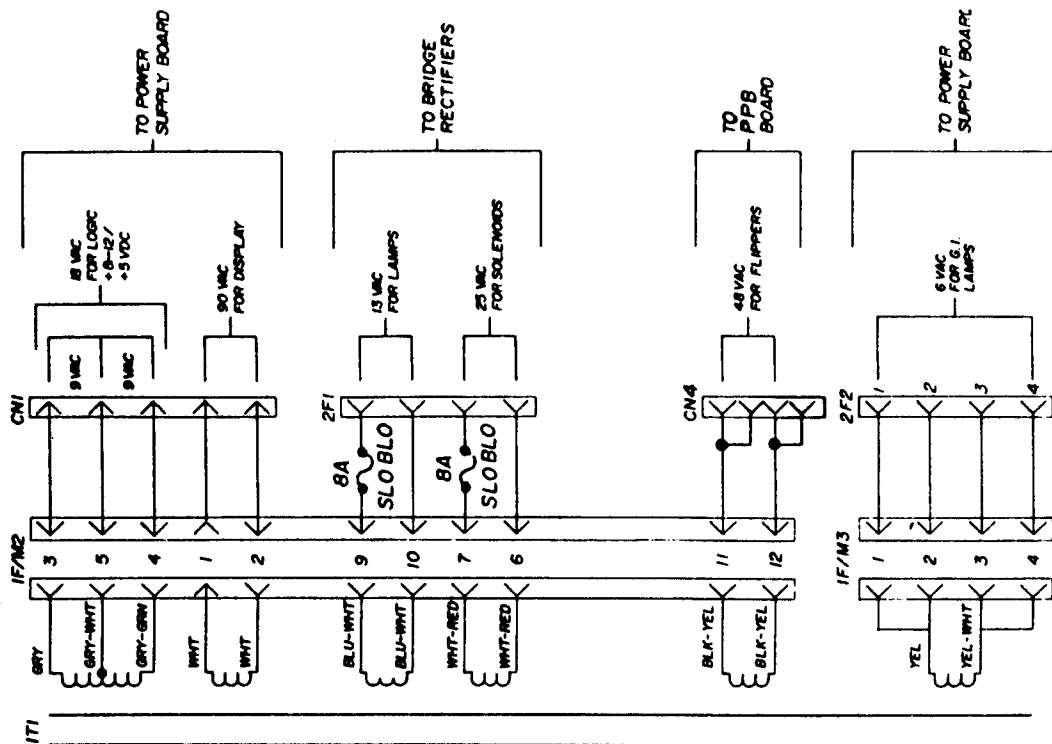
Item	Description	Part No.
1	Slingshot Bracket	A-208
2	S.S. Arm & Tip Assy.	A-158
3	Plunger & Link Assy.	A-133
4	1/4 Retaining Ring (2)	17-100-25
5	Spring	5-103
6	23-800 Coil	090-5001-00
7	Coil Sleeve	4-211-2
8	Coil Retainer	1-151
9	#8-32 X 1/2" Screw (2)	4-211-2
10	Slingshot Switch	8-117
11	Tension Plate	17-111
12	#4-40 X 1/2" Screw (2)	31-401
13	Diode 1N4001	25-102





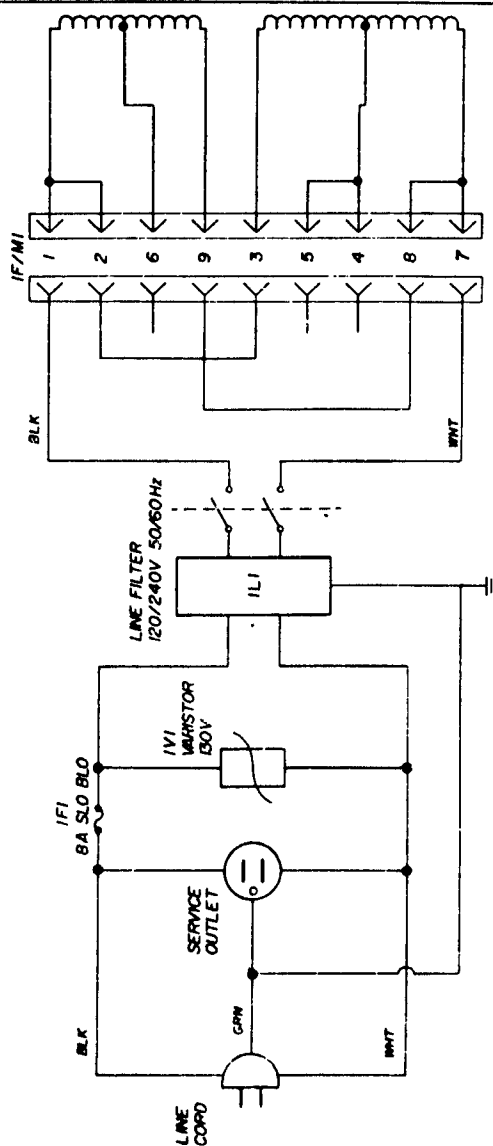
Item	Description	Part No.
1	Coil Stop Brkt. Assy.	515-5088-00
2	#6-32 X 1/4 Screw (4)	-
3	Coil 24-900	090-5002-01
4	Front Coil Brkt.	535-5203-02
5	Plunger Spring	266-5019-00
6	Link	535-5085-00
7	Lock Ball Brkt. Assy	515-5132-00
8	Diode 1N4004	112-5003-00
9	Mounting Bracket *	535-5854-00
10	Rubber Bumper	280-5004-00
11	Shoulder Screw	530-5064-00
12	ERing-Trurc 5133-25(3)	-
13	#8-32 X 1/4Screw (2)	237-5600-00
14	Lock Ball Cam Assy.	515-5130-00
15	.031x .437 x.225 Wash.	242-5012-00
16	Plunger Assy.	515-5006-00
17	#8-32 Elastic Stp Nut *	240-5102-00
18	Offset Link	535-5095-00





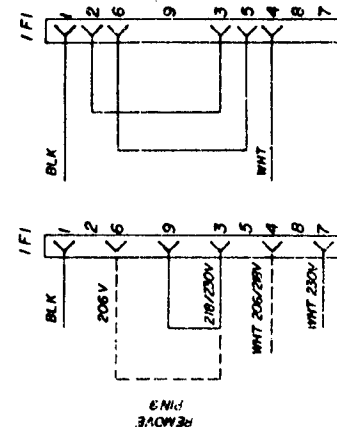
THIS CONFIGURATION FOR 115V

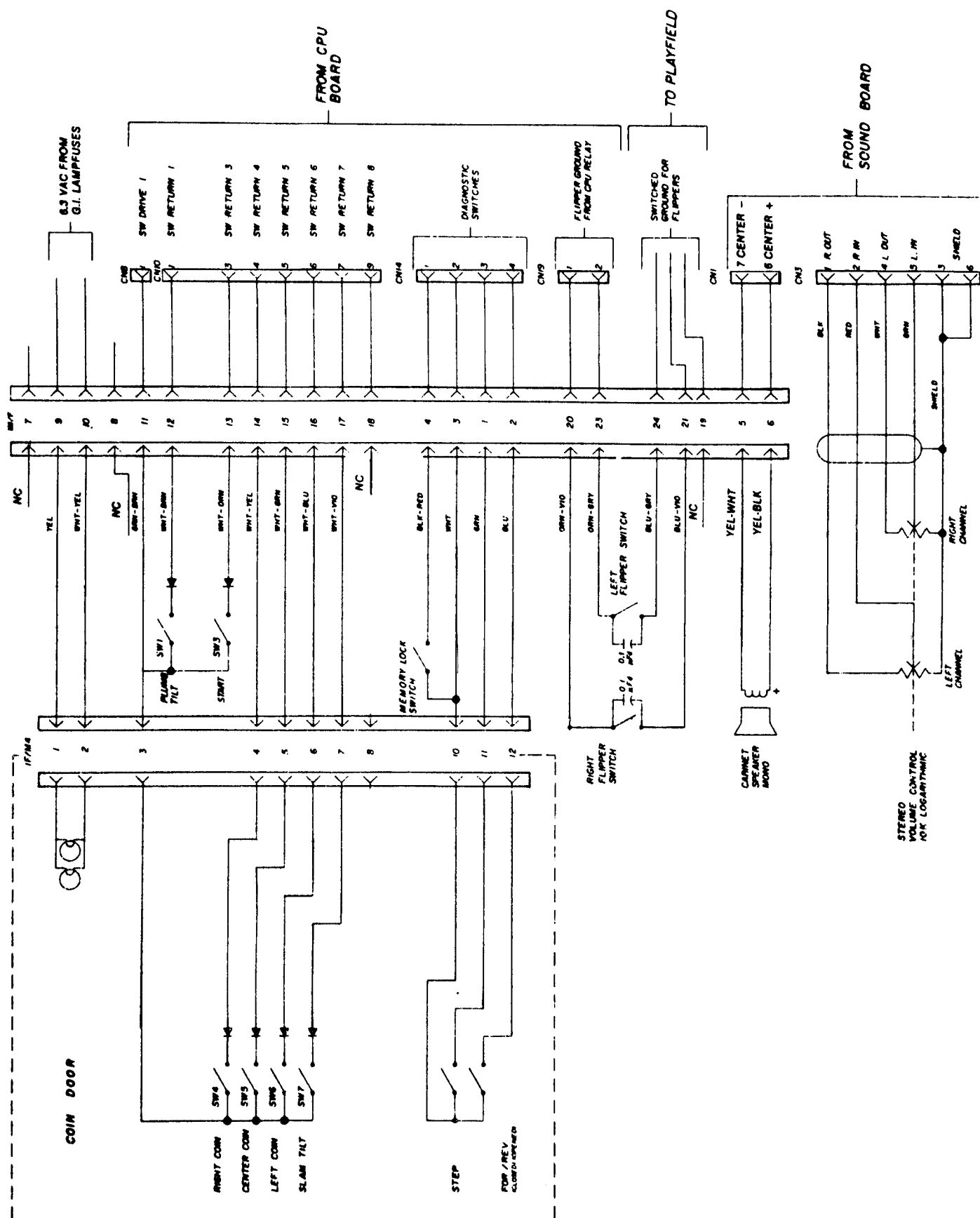
FOR LOWER LINE VOLTAGES
OR 230 VOLT OPERATION
SEE SAMPLES BELOW

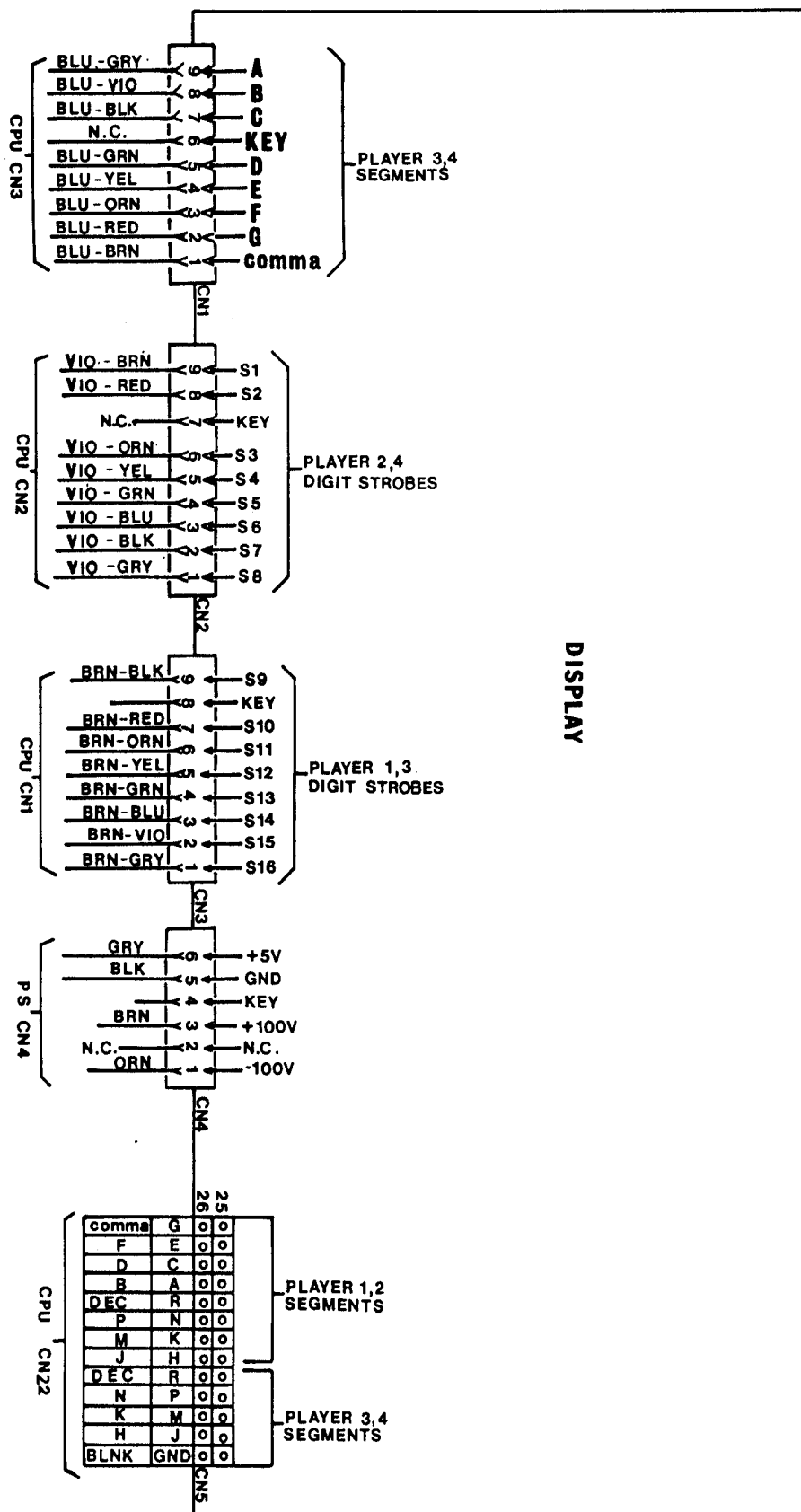


JUMPERS FOR VOLTAGE VARIATION

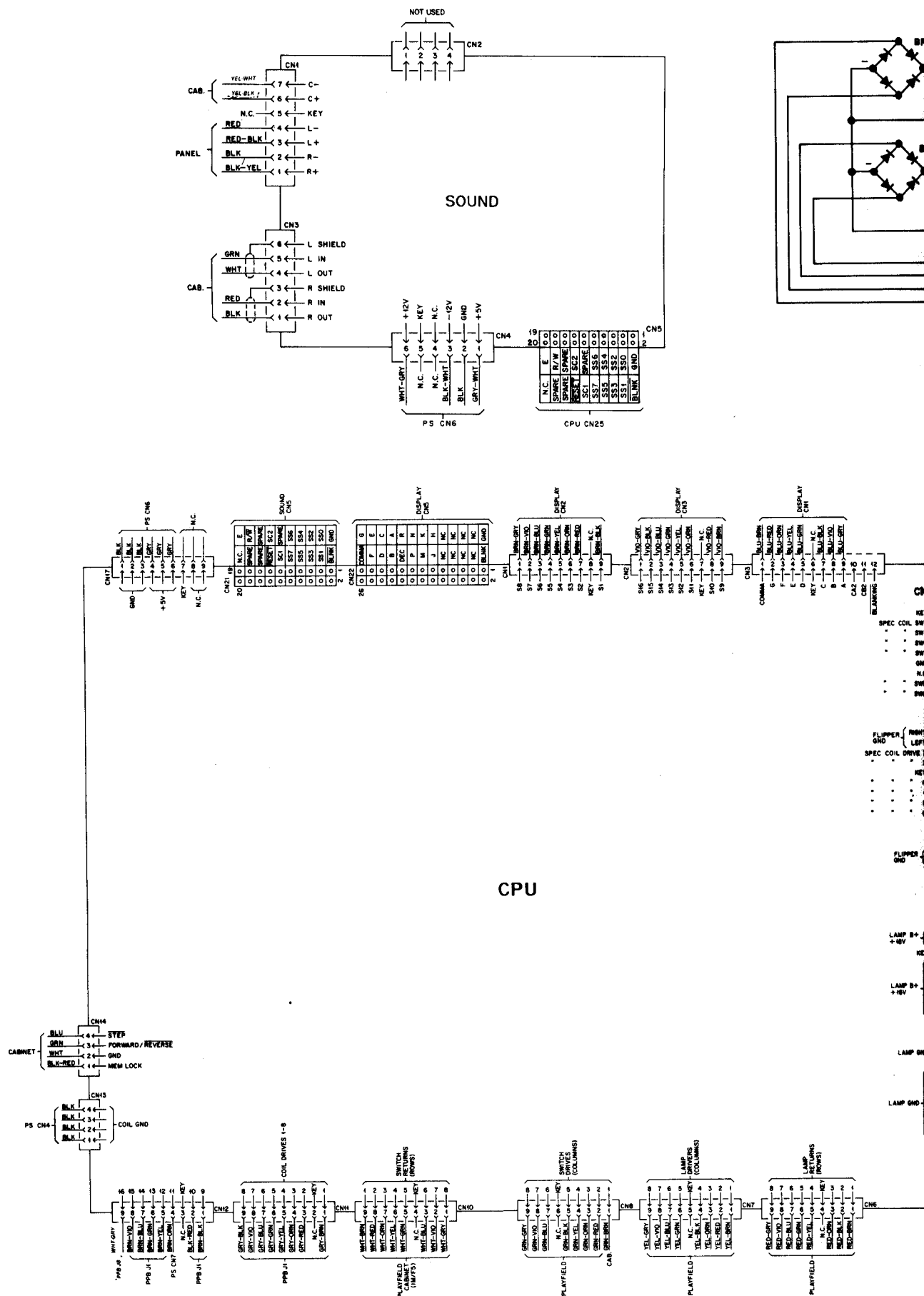
230/218/206 VOLTS	100/105 VOLTS
IF1 - 4A SLO BLO	IF1 - 8A SLO BLO
IV1 - 275V VARISTOR	IV1 - 130V VARISTOR

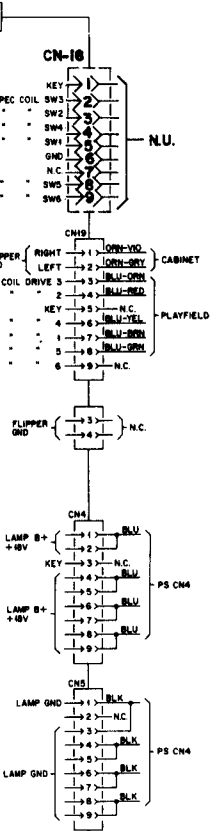


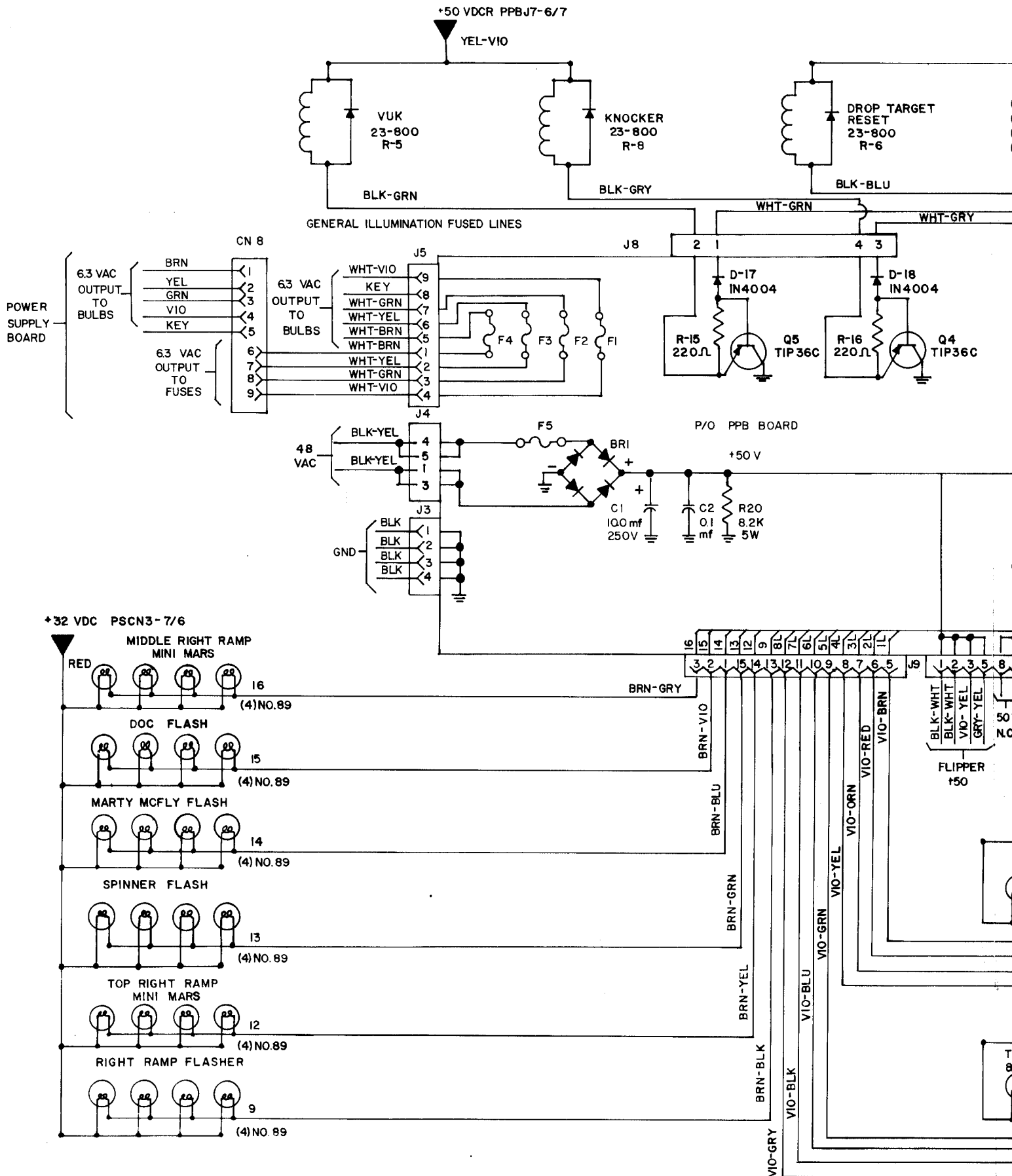


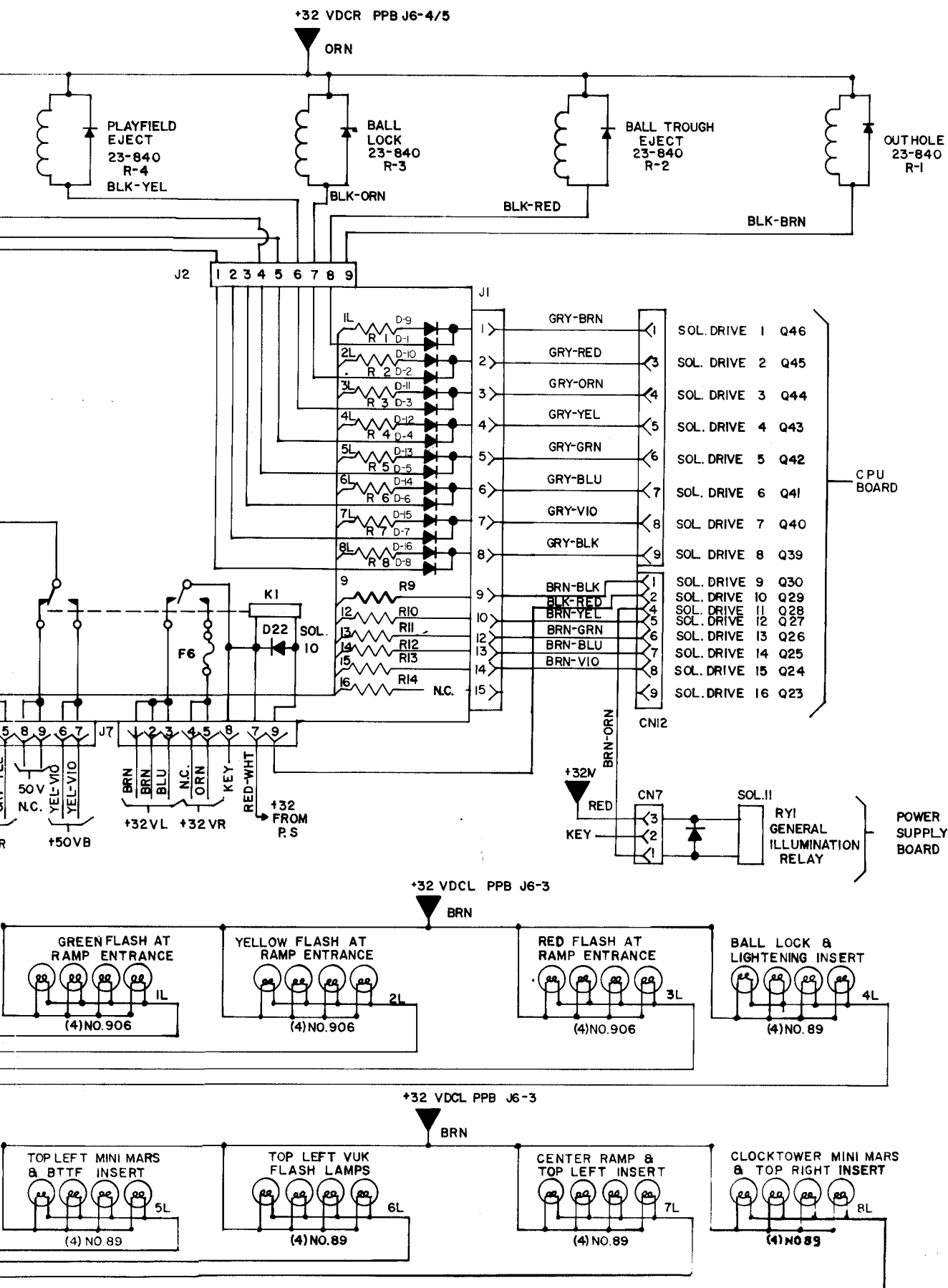


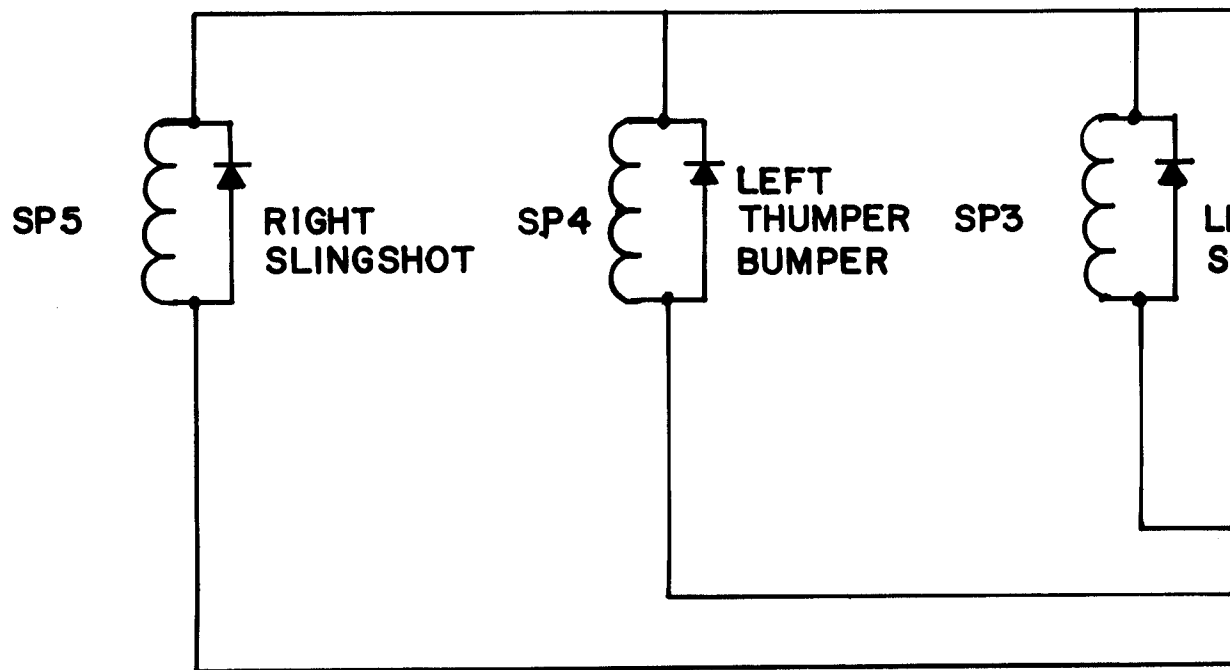
NOTES

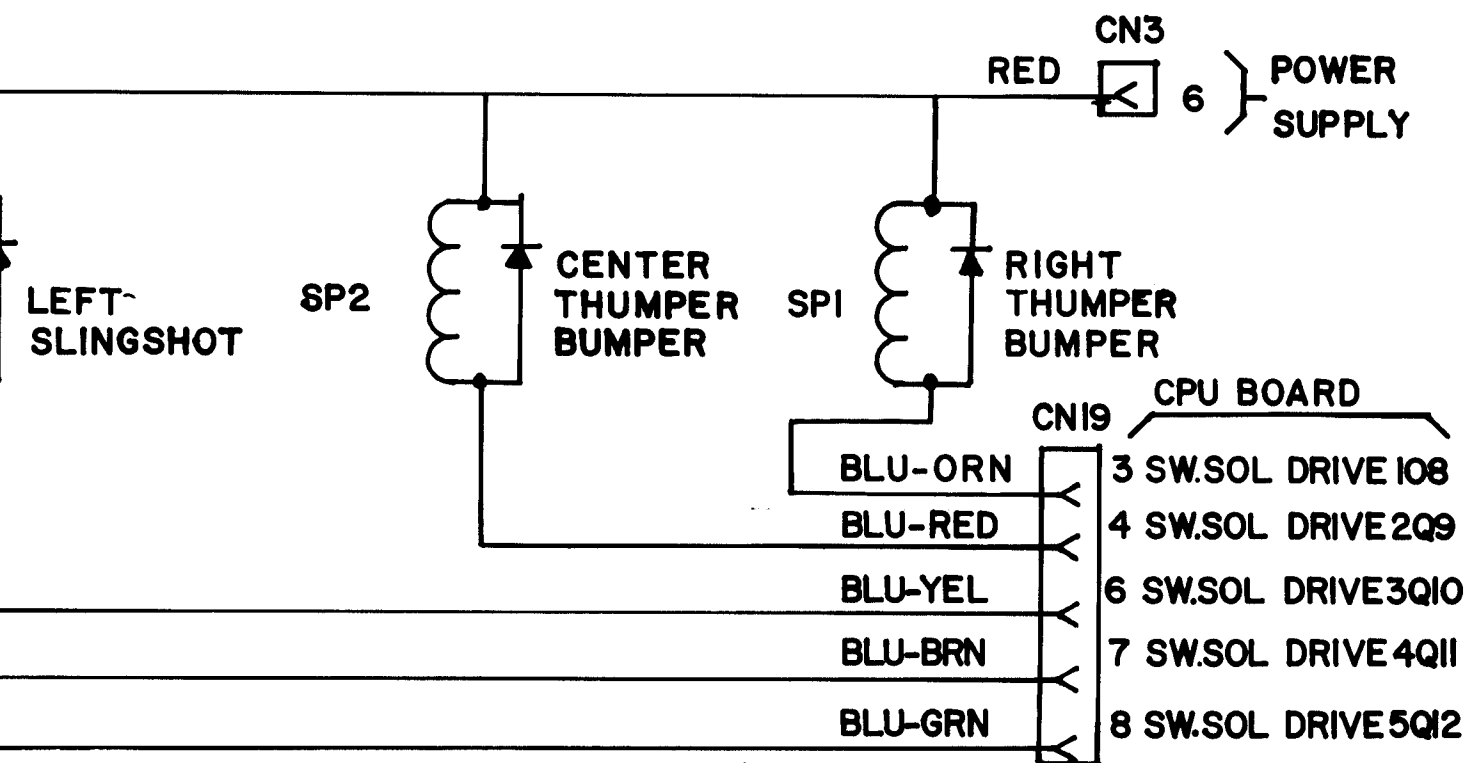










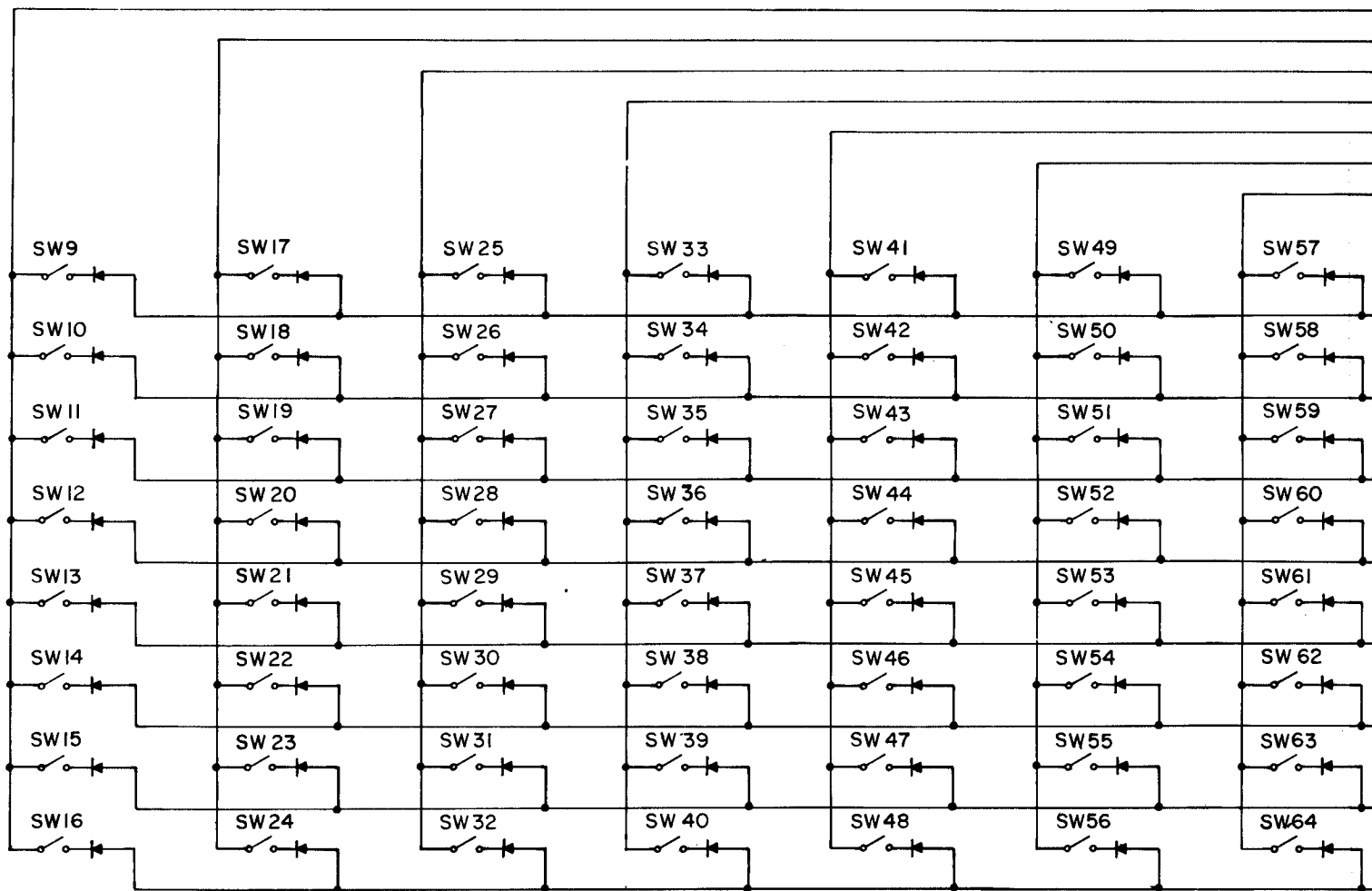


**Switch
Number Description**

01* Plumb Tilt
02 Not Used
03 Credit Button
04* Right Coin
05* Center Coin
06* Left Coin
07* Slam Tilt
08 Not Used
09 Not Used
10 Out Hole
11 Trough #1(Left)
12 Trough #2(Center)
13 Trough #3(Right)
14 Shooter Lane
15 Left Flip. Cab. Switch

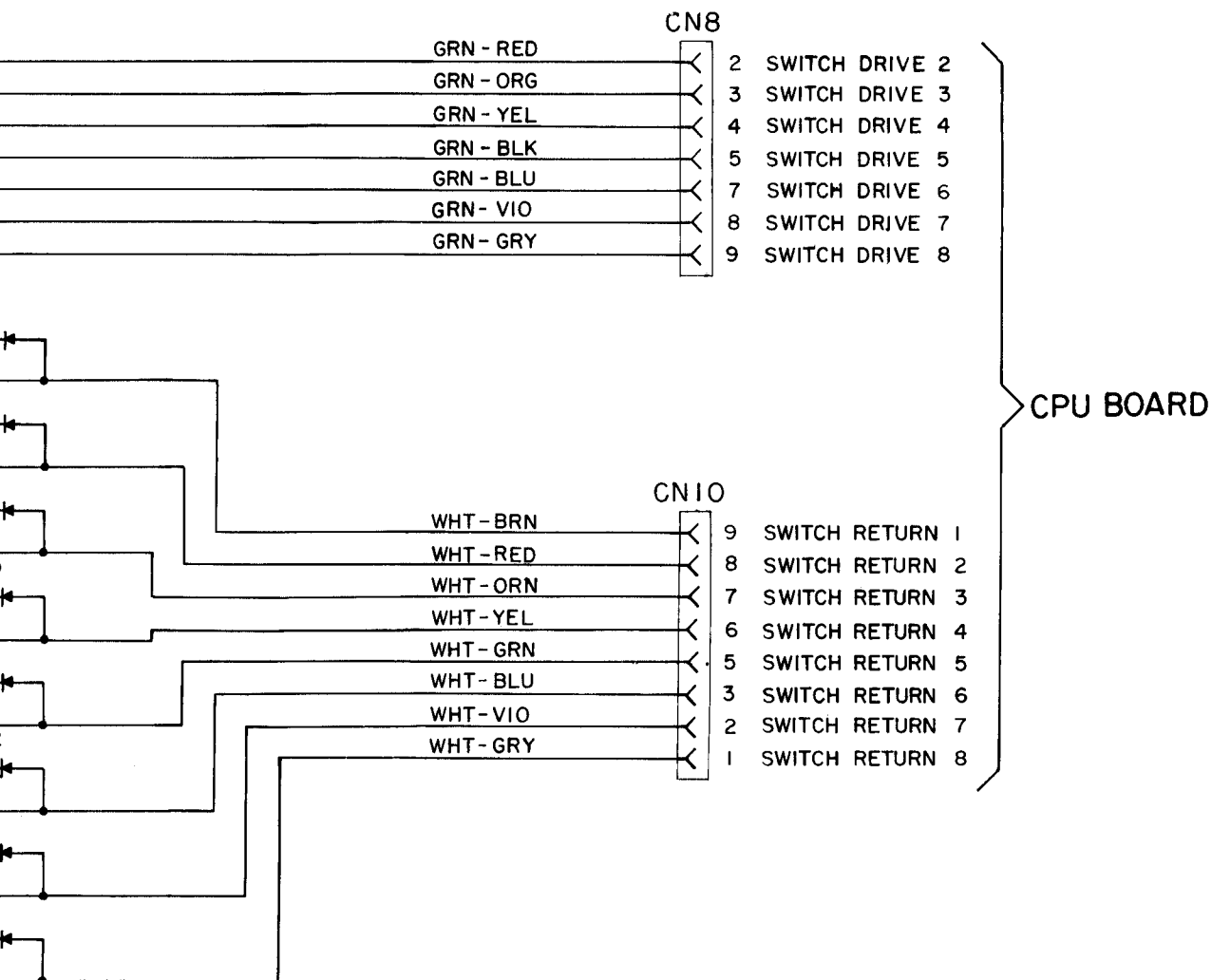
16 Right Flip.Cab. Switch
17 Left Outlane
18 Left Return Lane
19 Right Outlane
20 Right Return Lane
21 Left Slingshot Sw.
22 Right Slingshot Sw.
23 Not Used
24 Not Used
25 DOC
26 DOC
27 DOC
28 Spinner
29 Lock VUK
30 Left Ramp

31 Right Ramp
32 Not Used
33 McFLY
34 McFLY
35 McFLY
36 McFLY
37 McFLY
38 Left Lock
39 Left Lock
40 Left Lock
41 Drop Target
42 Drop Target
43 Drop Target
44 Not Used
45 Clock E



Right Ramp	46	Left Turbo Bumper
Not Used	47	Center Turbo Bumper
cFLY	48	Right Turbo Bumper
cFLY	49	Not Used Through 64
cFLY		
cFLY		
cFLY		
Left Lock Bottom		
Left Lock Center		
Left Lock Top		
Top Target D		
Top Target M		
Top Target C		
Not Used		
Lock Eject		

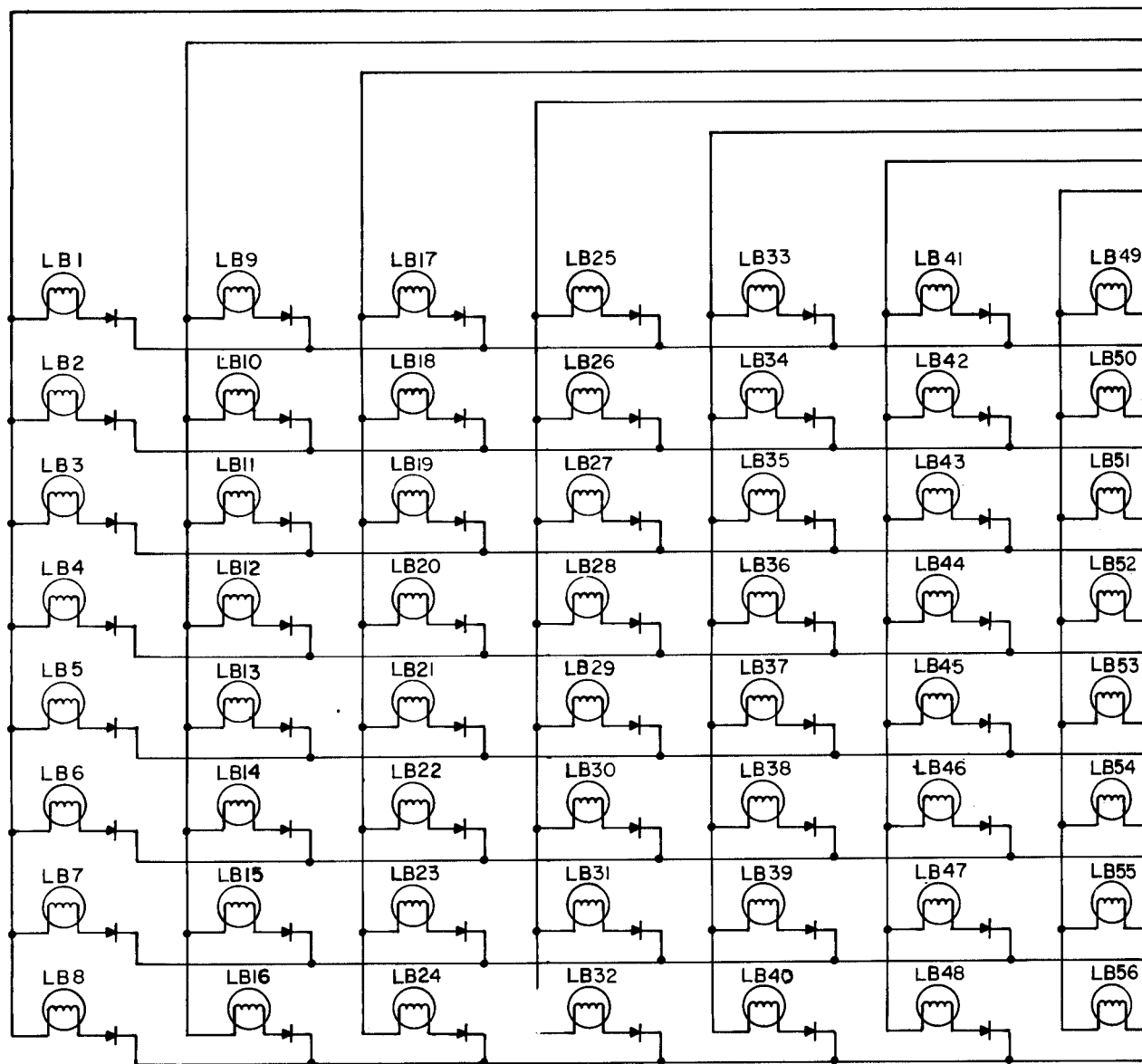
* Indicates cabinet switches.



Lamp Number Description

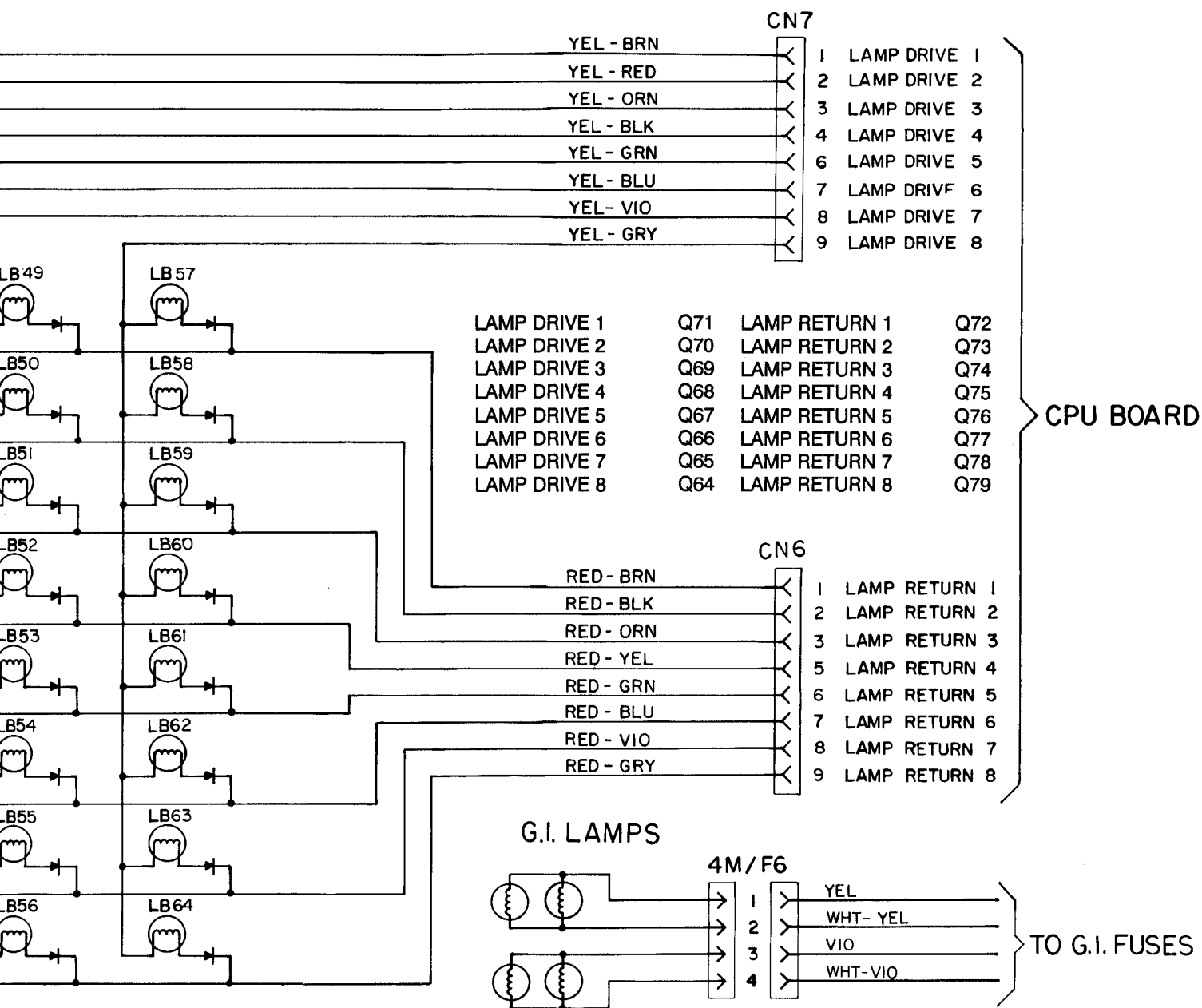
* Indicates insert board

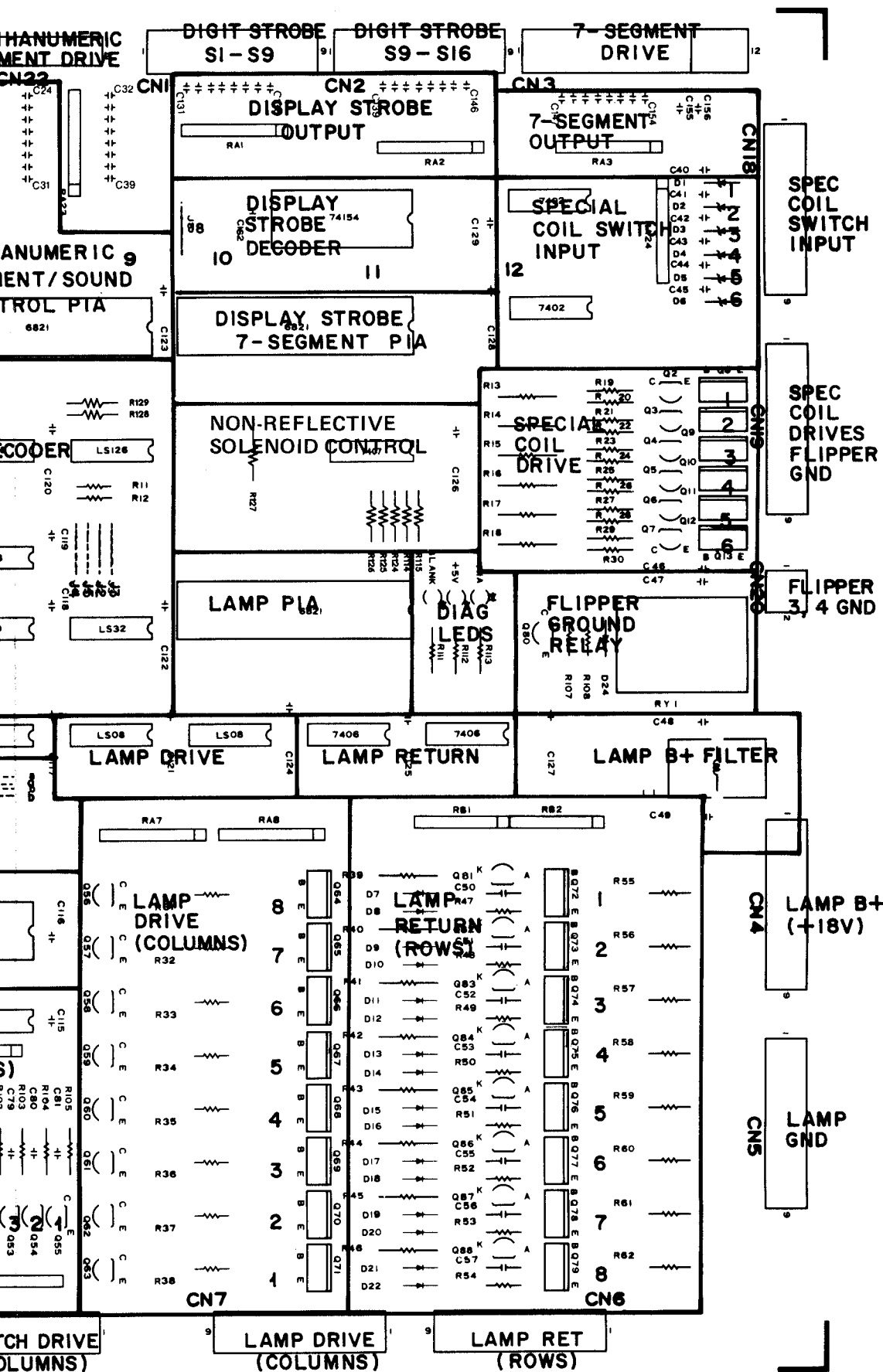
01	2X	17	Left Outlane	33	P
02	3X	18	Left Return	34*	J
03	4X	19	Right Outlane	35*	J
04	5X	20	Right Return	36*	J
05	6X Lite Special	21	Extra Ball Arrow	37*	J
06	Drop Target D	22	Lock #3 "Future"	38*	J
07	Drop Target M	23	Lock #2 "In"	39*	J
08	Drop Target C	24	Lock #1 "Back"	40	S
09	Skyway 50K	25	DeLorean	41	L
10	Skyway 75K	26	DeLorean	42	L
11	Skyway 100K	27	DeLorean	43	L
12	Skyway 125K	28	DeLorean	44	L
13	Skyway Extraball	29	DeLorean	45	L
14	Shoot Again	30	DeLorean	46	F
15	Ramp Left Skill	31	DeLorean	47	2
16	Picture Left	32	DeLorean	48	F

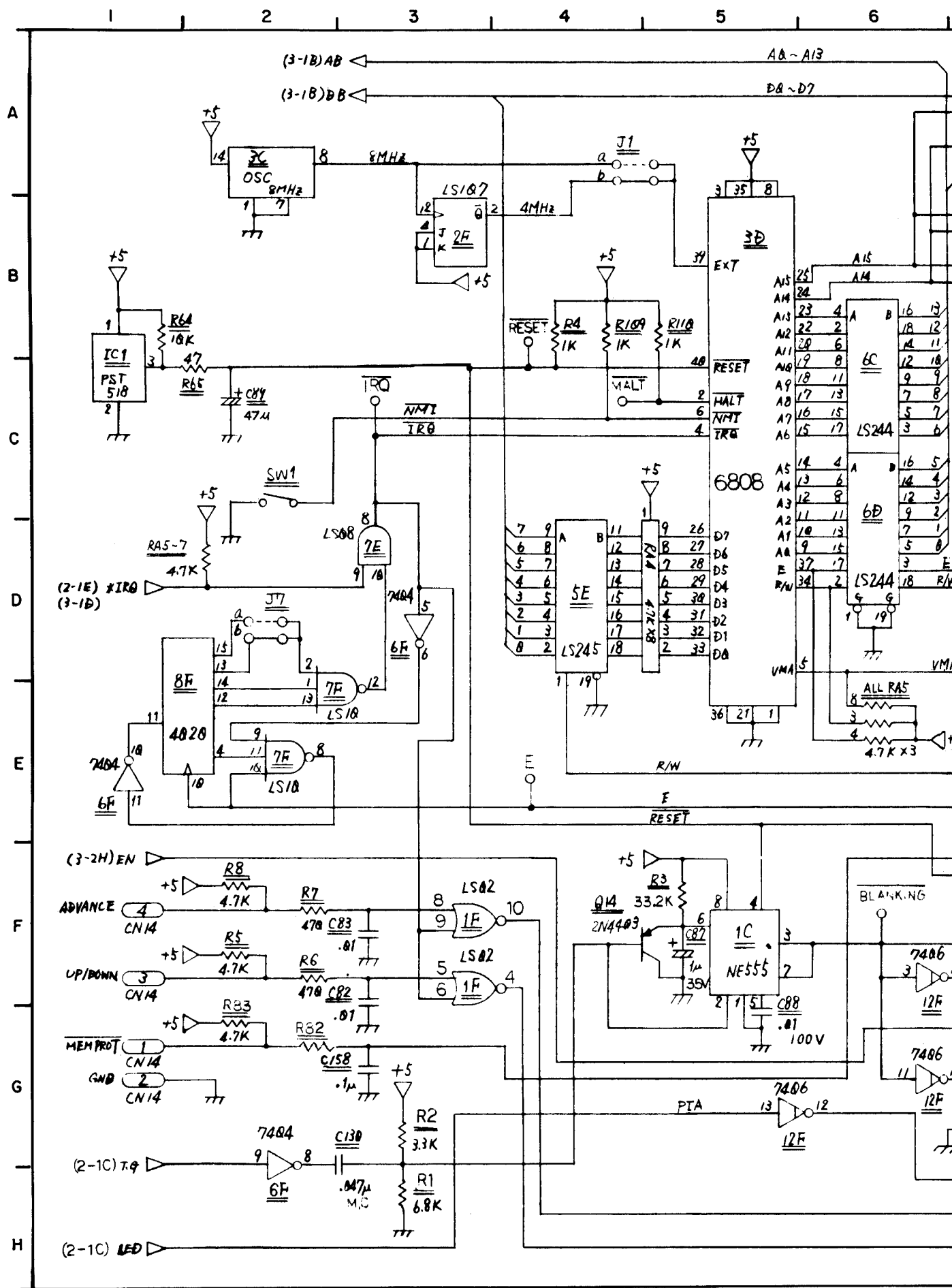


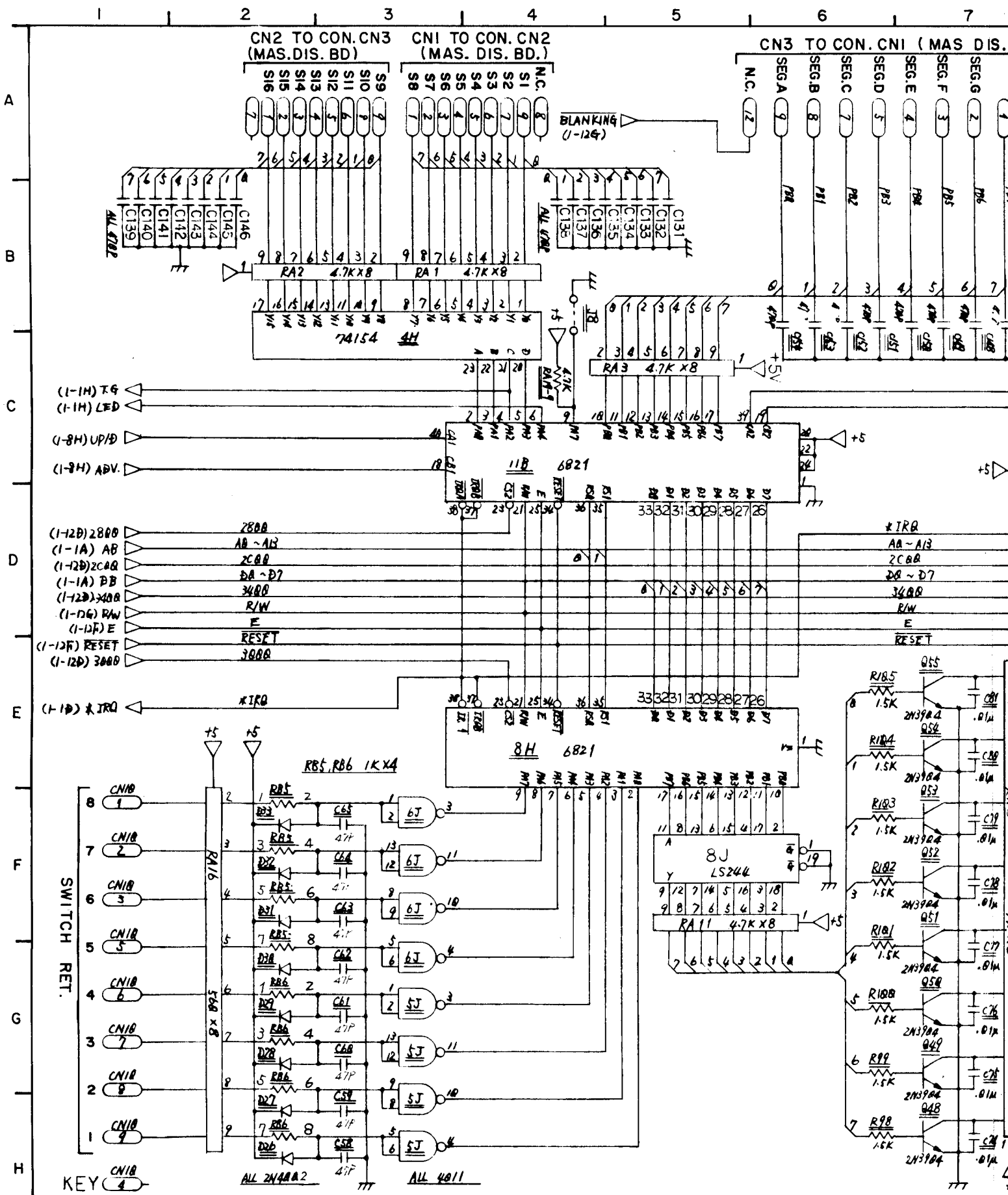
board lamps.

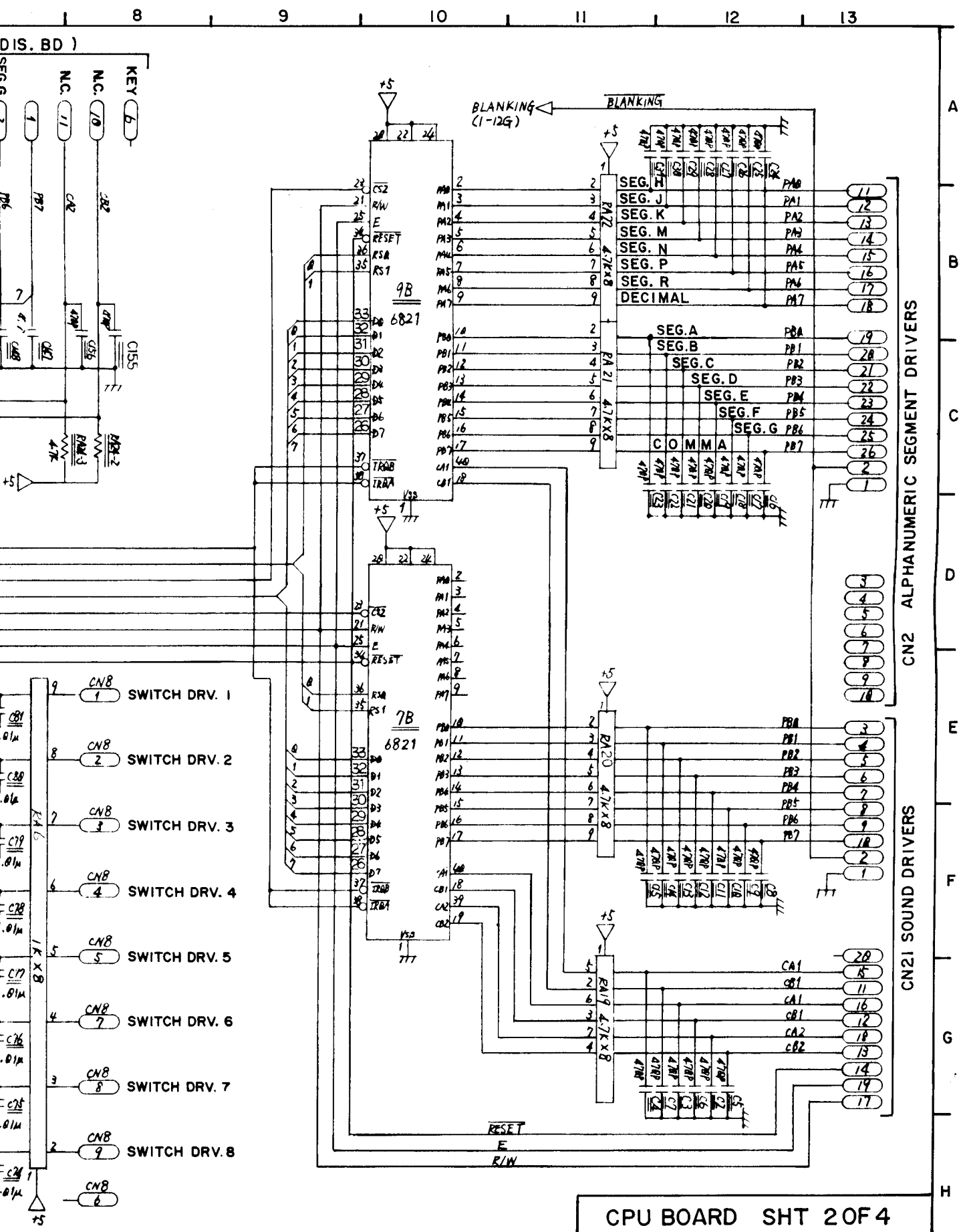
Picture Right	49	Clock Multiplier 5X
Jackpot 500,000 Left	50	Clock Lite Extra Ball
Jackpot 750,000 Left	51	Clock 100K
Jackpot 1,000,000 Left	52	Clock Bonus Hold
Jackpot 500,000 Right	53	Clock Lite Millions
Jackpot 750,000 Right	54	Clock Power Bumper
Jackpot 1,000,000 Right	55	Clock 50K
Spinner	56	1885 Jackpot
Left Bank "M"	57	Right Bank "D"
Left Bank "C"	58	Right Bank "M"
Left Bank "F"	59	Right Bank "C"
Left Bank "L"	60	Ramp Left Million
Left Bank "Y"	61	Skill Take High Scores
Ramp Right Skill	62	Skill Double Scores
2015 Jackpot	63	Skill Extra Ball
Ramp Right Million	64	Skill 100K

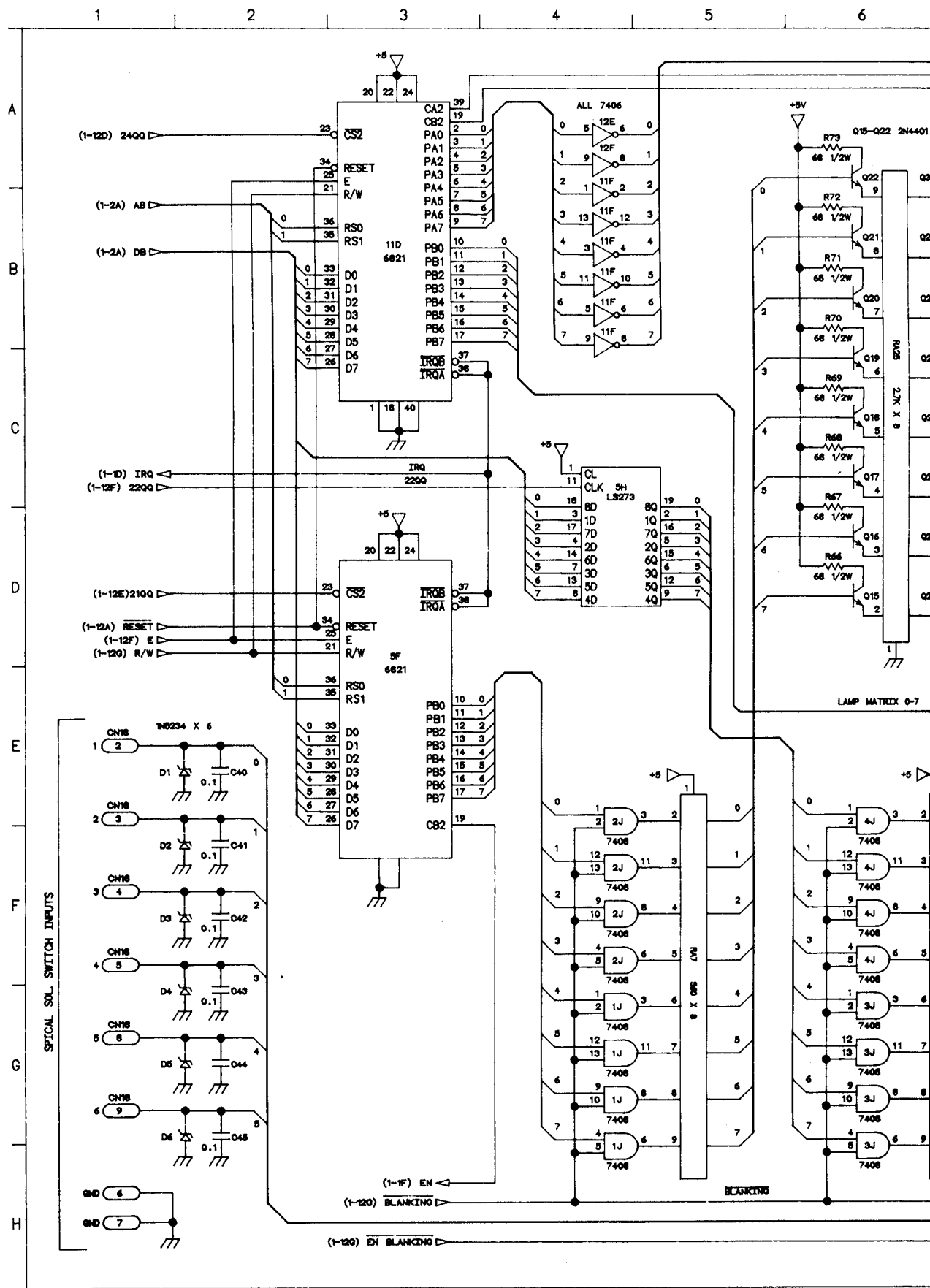


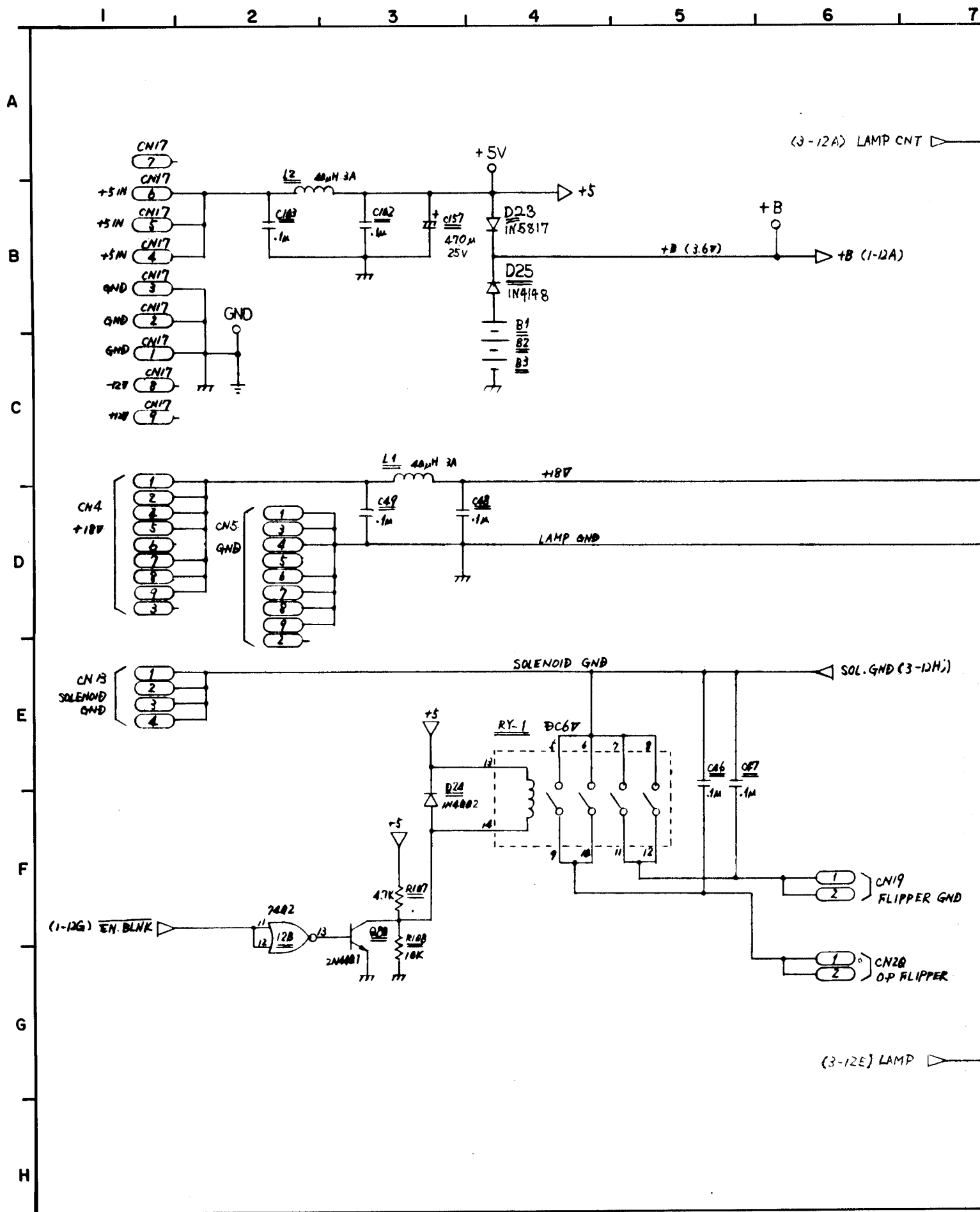


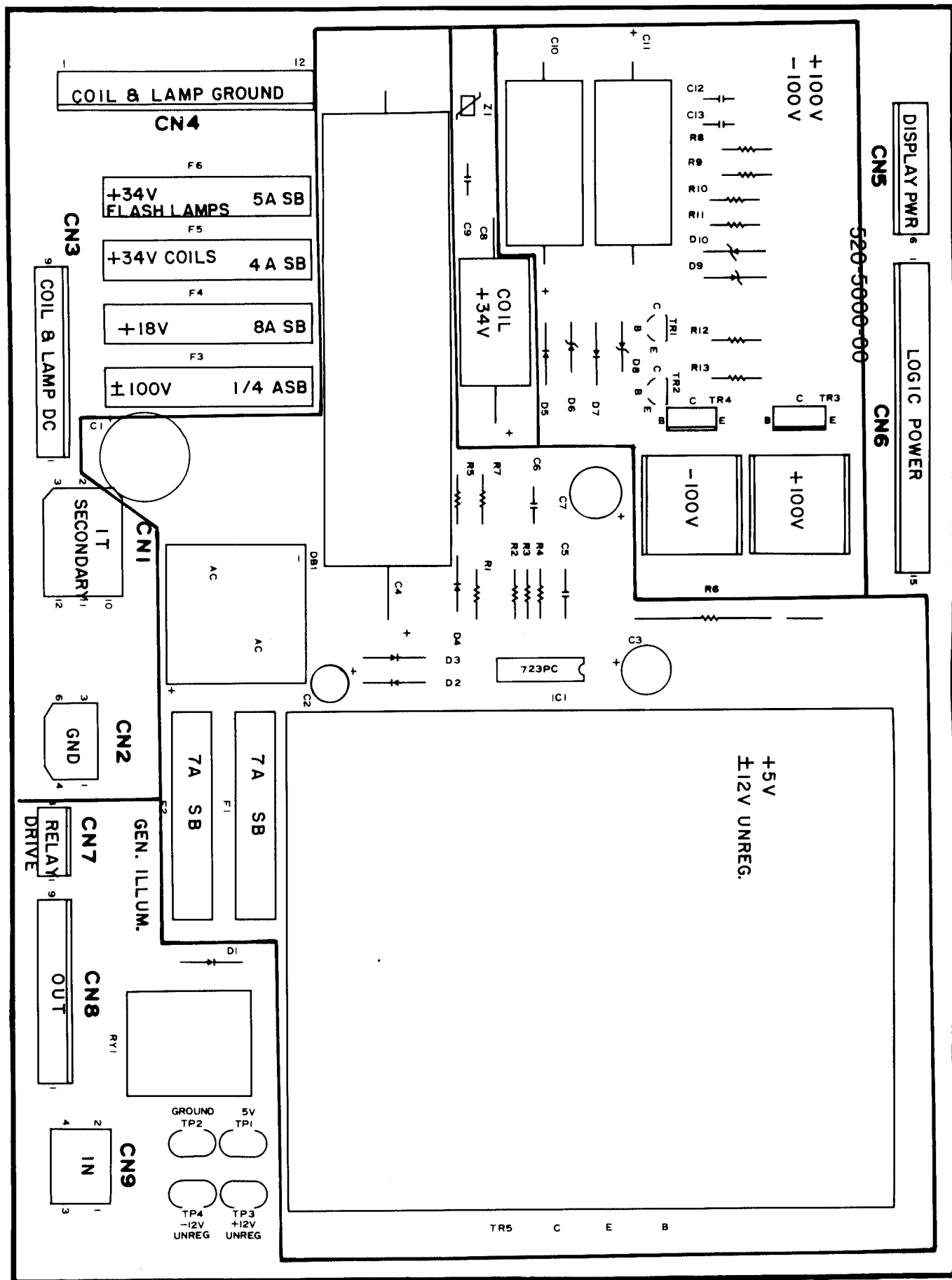


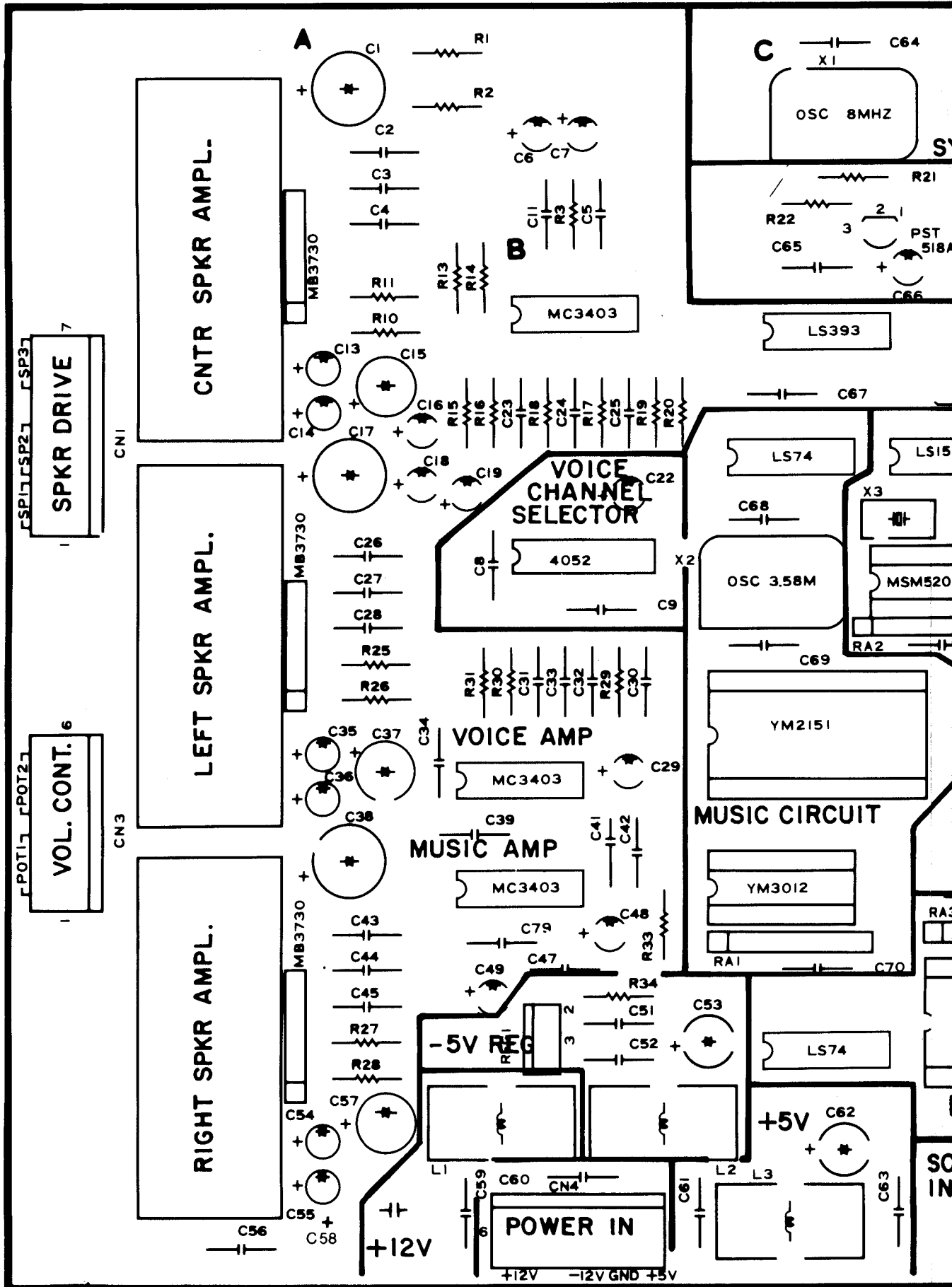


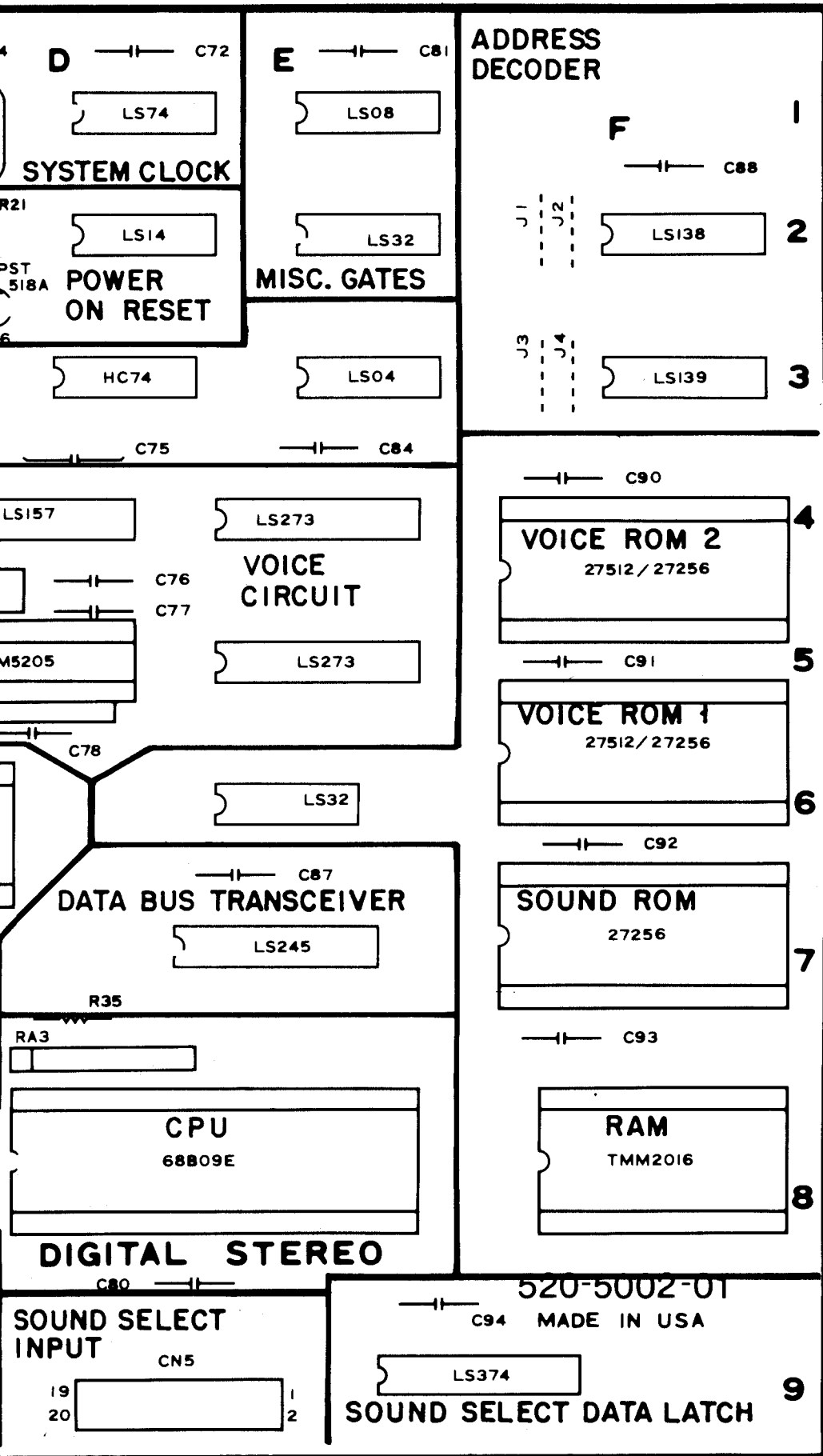


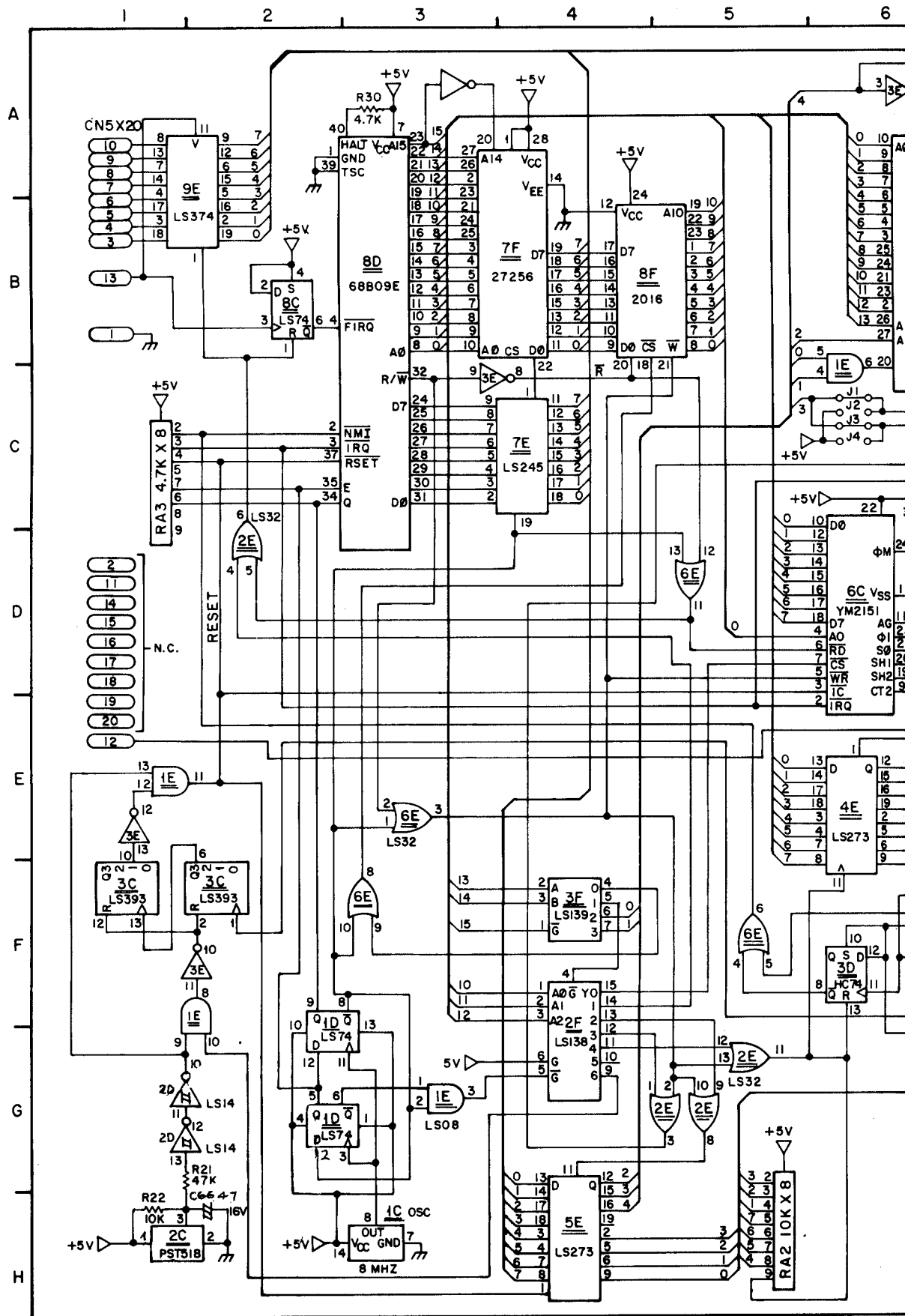


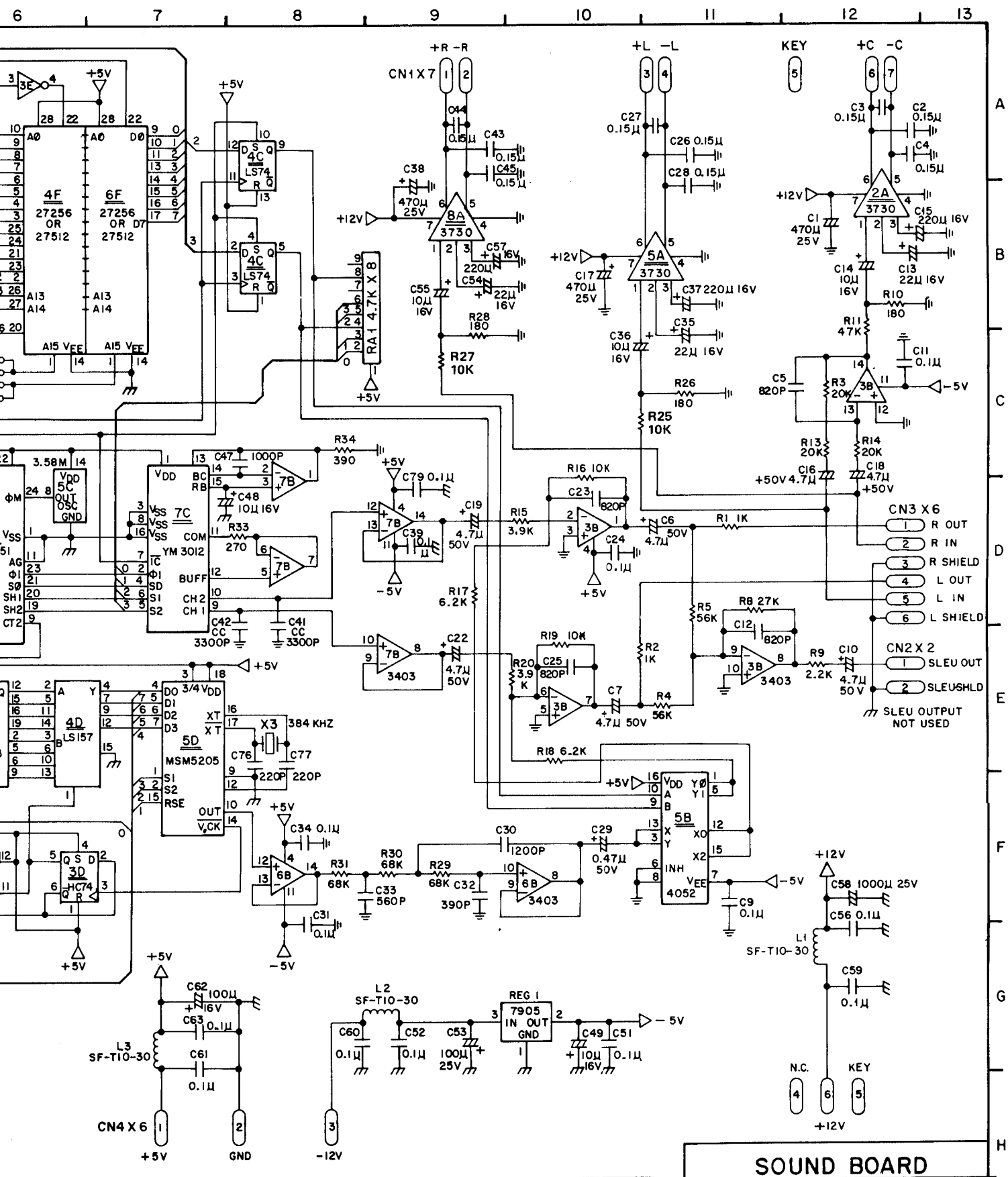




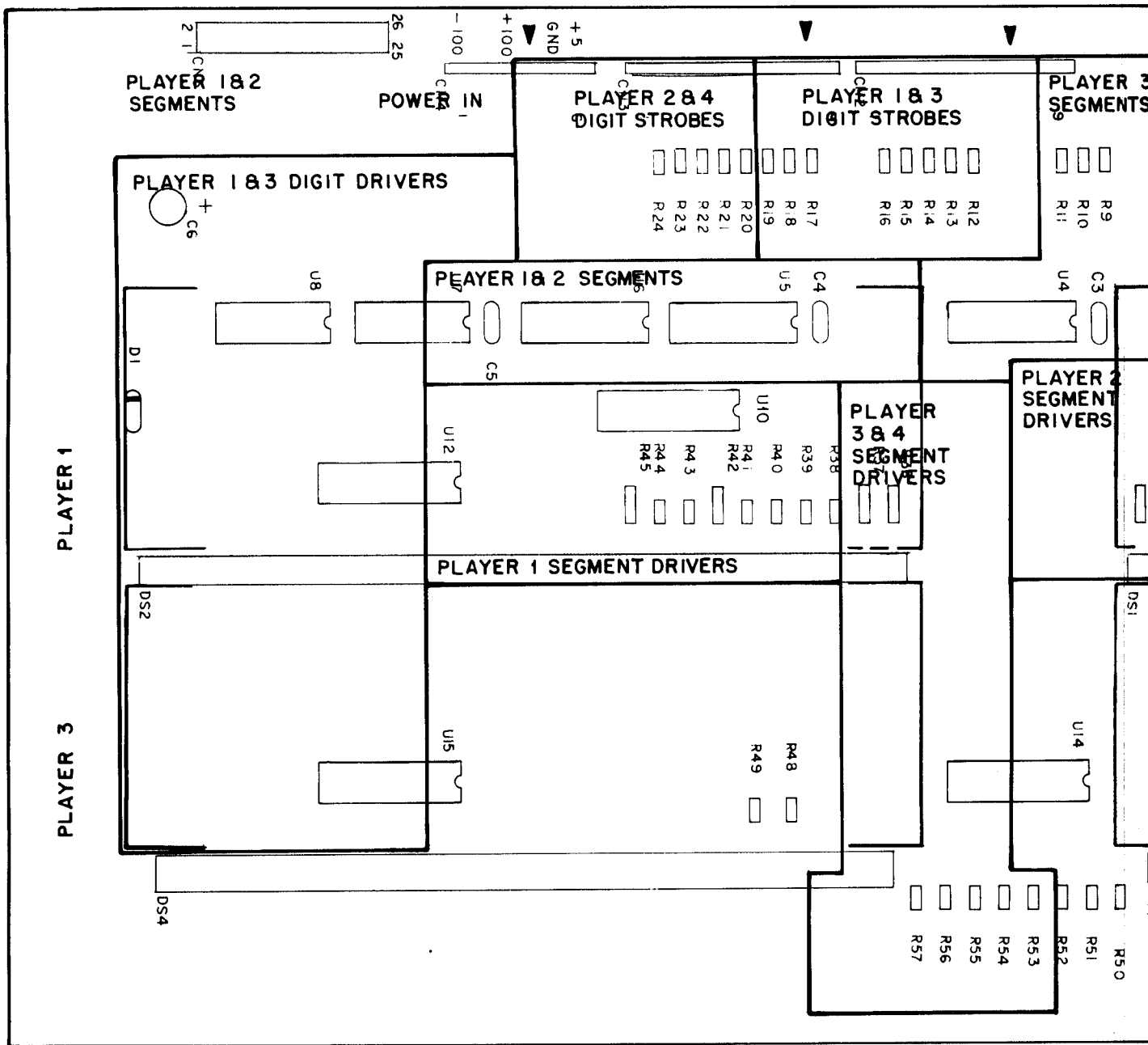








Sound Board Logic Diagram



ER 384
ENTS

CN1

9

R1
R2
R3
R4
R5
R6
R7
R8

PLAYER 2 & 4
DIGIT DRIVERS

R25
C1

PLAYER 2

PLAYER 4

U2

U11

U13

C2

U9

R26
R27
R28
R29

R30
R31
R32
R33

R34
R35

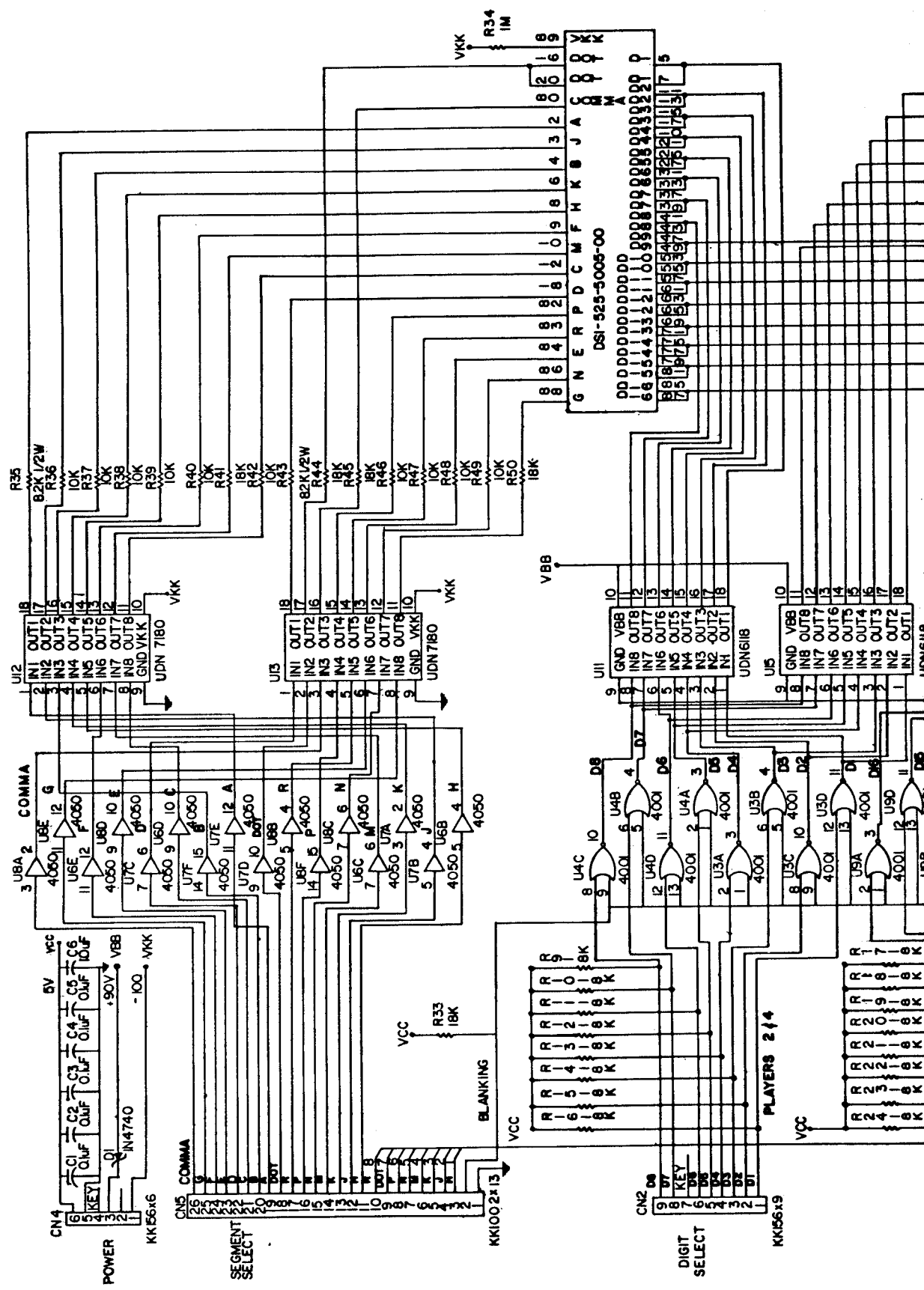
R46

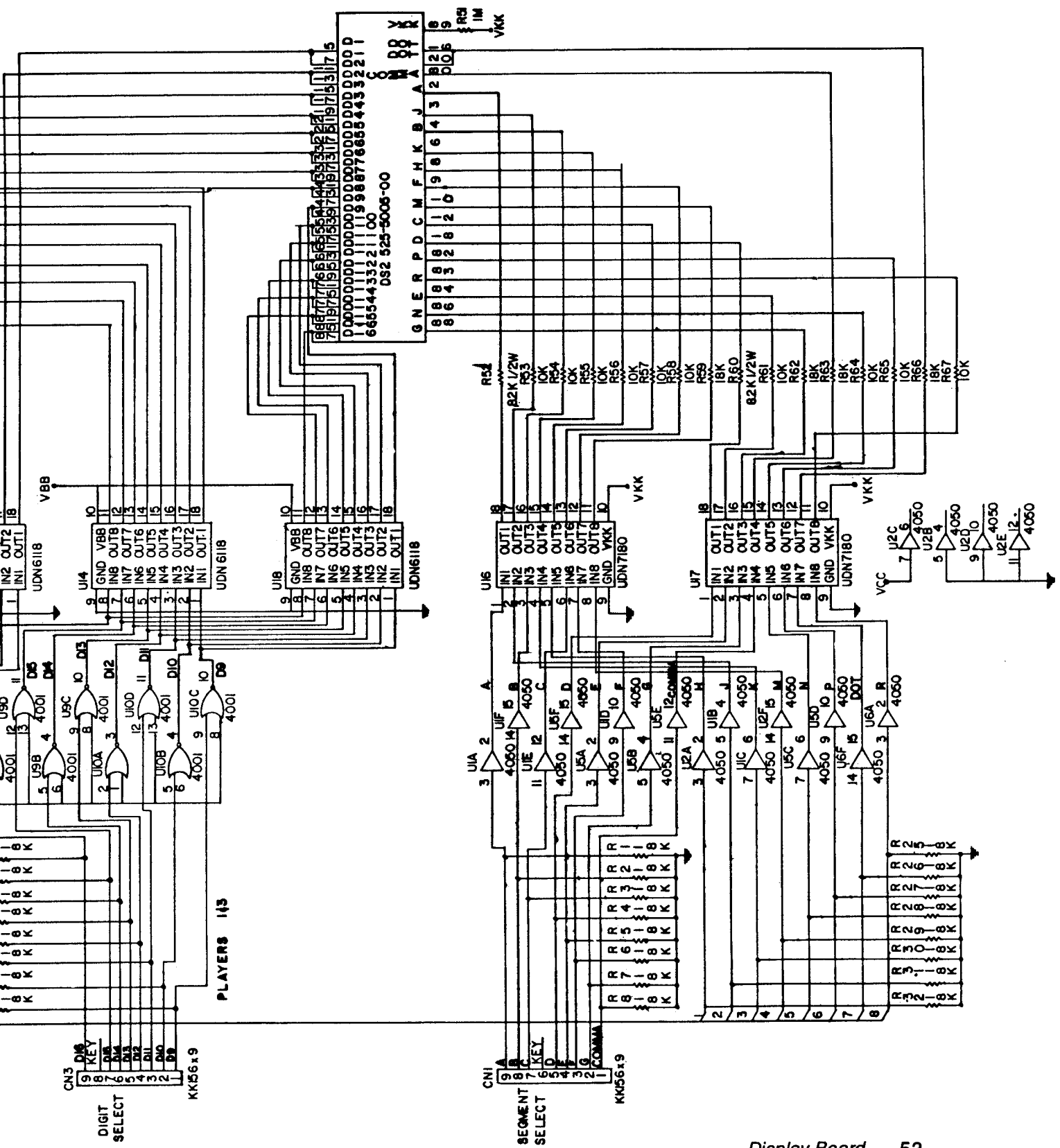
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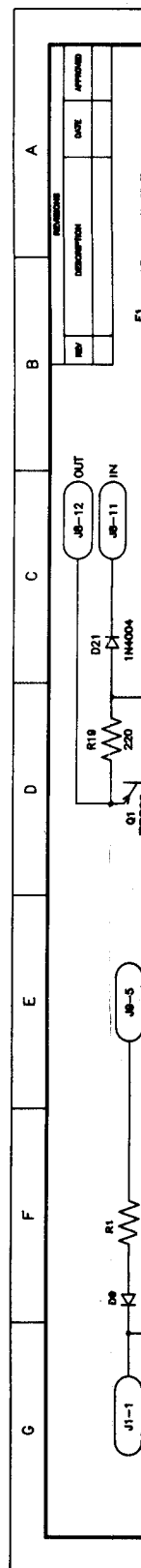
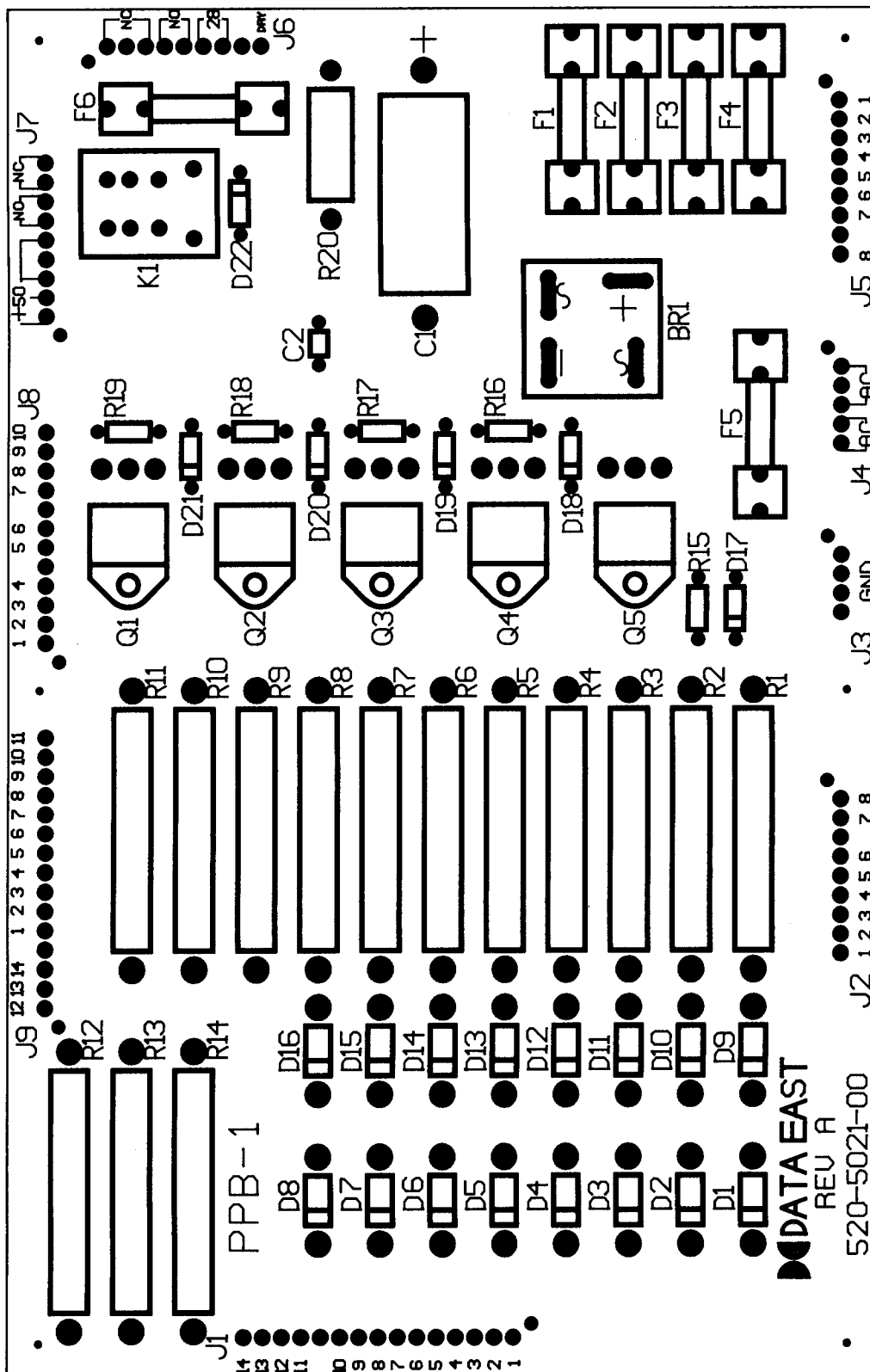
DS1

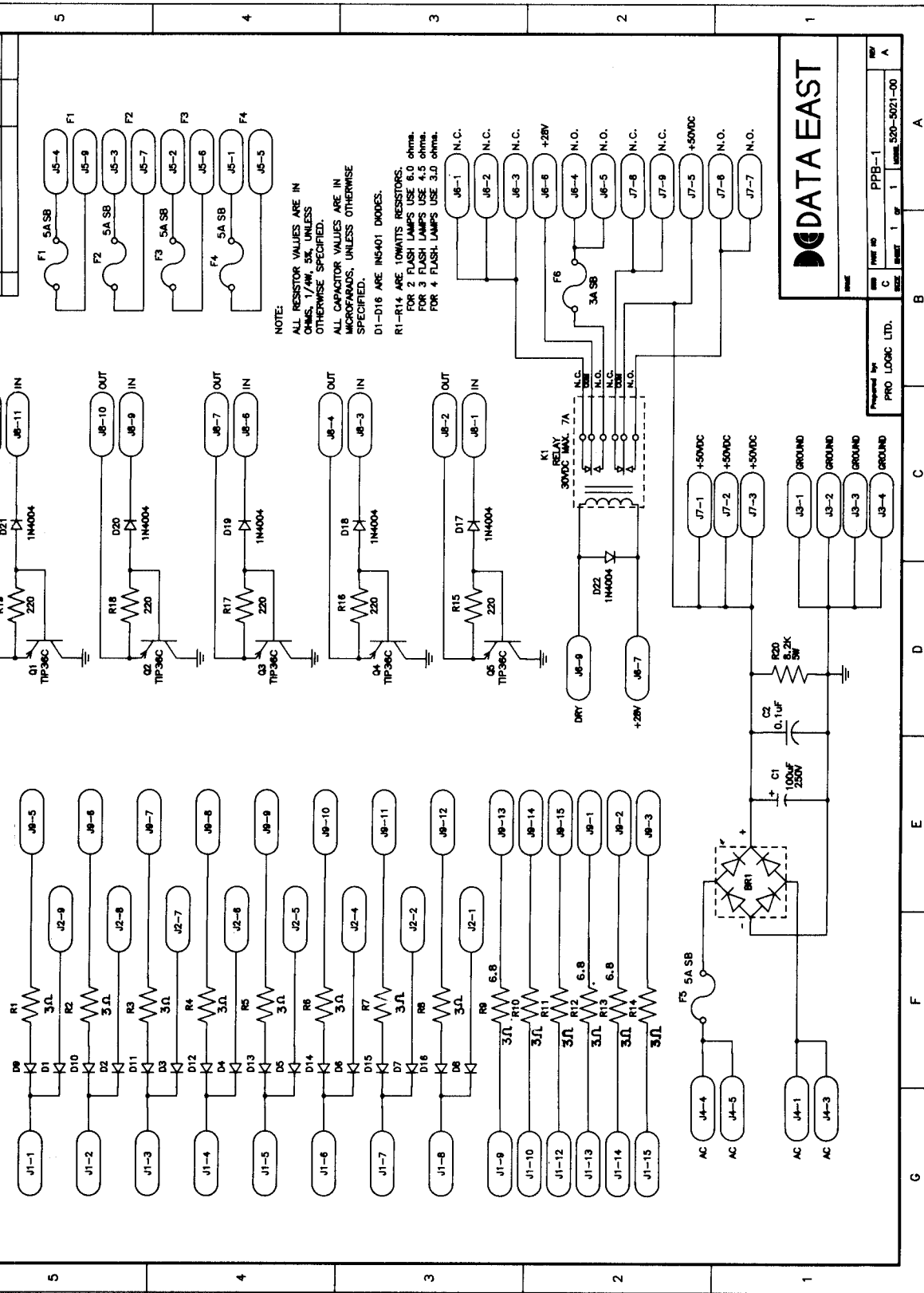
DS3

R50









DATA EAST

REV	1	DATE	5-20-5021-00
DESIGN	PPB-1	BY	
CHECKED		BY	
APPROVED		BY	

Prepared by
PRO LOGIC LTD.

G F E D C B A



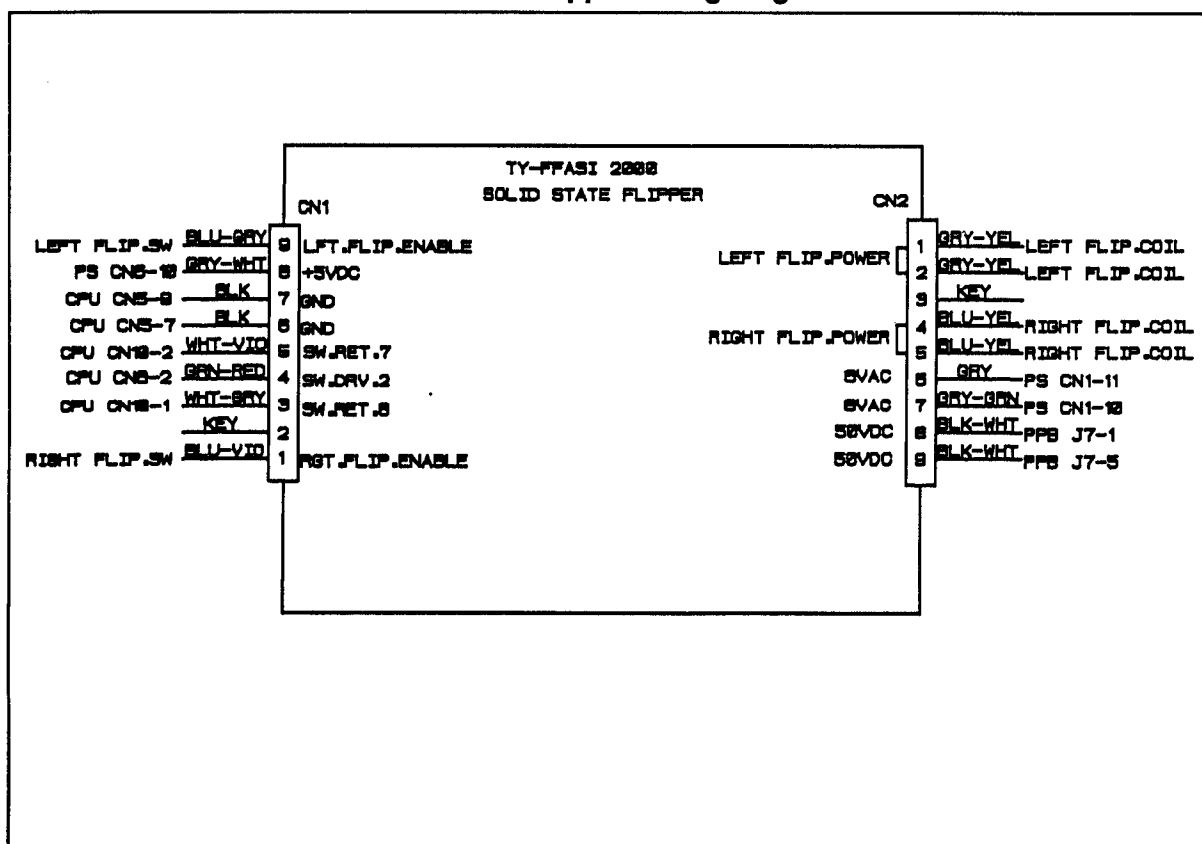
Theory of Operation for the Solid State Flippers

- The solid state flipper board is a dual flipper solenoid driver circuit. Each solenoid driver circuit contains a one shot timer, a 50V driver, and an 8V driver.

Looking at one circuit, Schmidt NAND gates U1A, U1B, and U1D make up the one shot timer. The timer length is controlled by R10, R33 and C2. The output of the timer is gated at U1C with the buffered switch input from Q6. The output of U1C controls the 50V driver circuit consisting of Q4, Q1, Q2, Q3, and D1. As long as the flipper button is activated, Q6 will keep the 8V driver circuit, SR1, on.

The 50V provides the actuation power to the flipper solenoid while the 8V provides the holding power.

Solid State Flipper Wiring Diagram



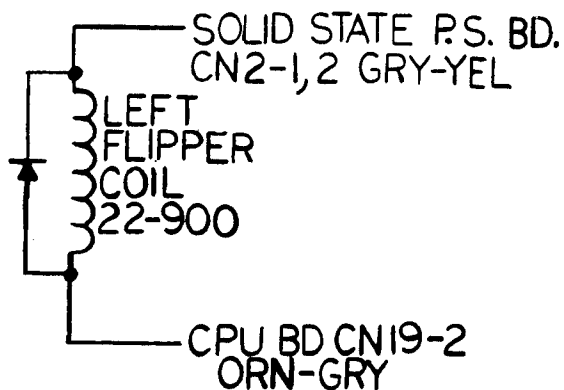
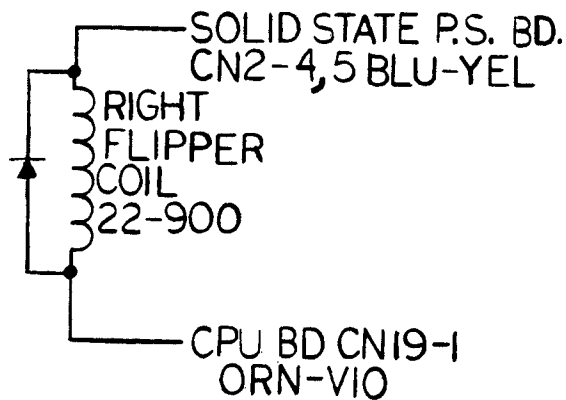
Solid State Flippers
PCB Wiring Diagram

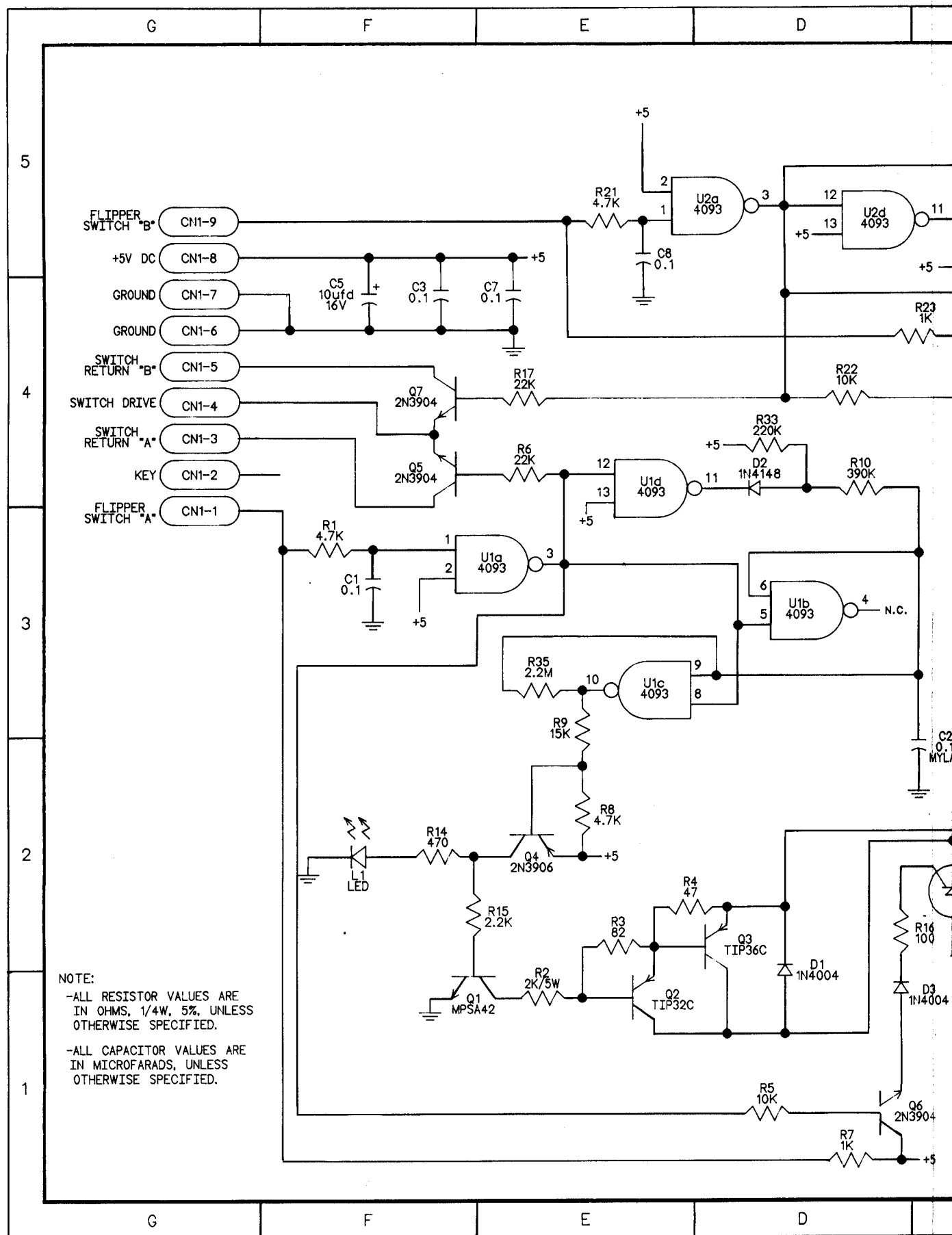
Connector CN 1

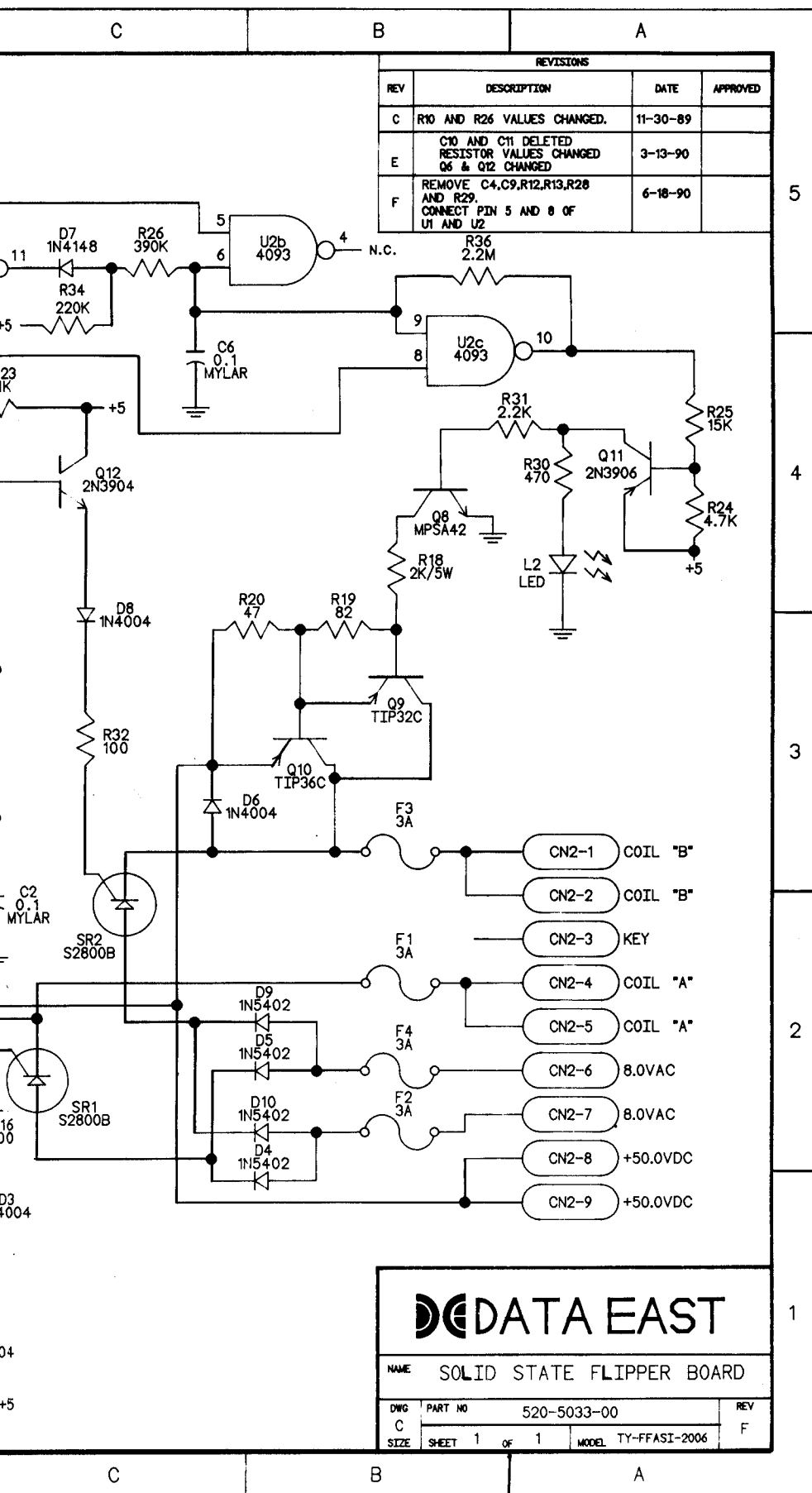
Pin #	Goes To	Wire Color	It Is
1	Rgt. Flipper Sw.	BLU-VIO	RGT. FLIP ENABLE
2			KEY
3	CPU CN10-1	WHT-GRY	SW. RET 8
4	CPU CN8-2	GRN-RED	SW. DRV 2
5	CPU CN10-2	WHT-VIO	SW. RET 7
6	CPU CN5-7	BLK	GND
7	CPU CN5-9	BLK	GND
8	PS CN6-10	GRY-WHT	+5VDC
9	Lft. Flipper Sw.	BLU-GRY	LFT. FLIP ENABLE

Connector CN 2

Pin #	Goes To	Wire Color	It Is
1	Lft. Flip Coil	GRY-YEL	LFT. FLIP POWER
2	"" "" "" ""	"" "" ""	"" "" "" ""
3			KEY
4	Rgt. Flip Coil	BLU-YEL	RGT. FLIP POWER
5	"" "" "" ""	"" "" ""	"" "" "" ""
6	PS CN1-11	GRY	9 VAC
7	PS CN1-10	GRY-GRN	9 VAC
8	PPB J7-1	BLK-WHT	50 VDC
9	PPB J7-5	BLK-WHT	50 VDC







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PRINTED CIRCUIT BOARDS (GAME LOGIC) 60 DAYS

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Warranty periods are effective from the initial date of shipment from Seller to its authorized distributors.

Seller's sole liability shall be, at its option, to repair or replace products which are returned to Seller during the warranty periods specified, provided:

1. Seller is notified promptly upon discovery by purchaser that stated products are defective.
2. Such products are properly packaged and then returned freight prepaid, to Seller's plant.

This warranty does not apply to any parts damaged during shipment and/or due to improper handling, or due to improper installation or usage, or alteration. In no event shall the Seller be liable for any anticipated profits, loss of profits, loss of use, accidental or consequential damages or any other losses incurred by the customer in connection with the purchase of a Data East USA., product.

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