

DE DATA
EAST



DATA EAST PINBALL®

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780-5020-00

CPU JUMPER TABLE

Game	CPU* Version	ROM Location	Jumpers	
			Installed	Removed
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
Back to the Future	Ver 3	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
The Simpsons	Ver 3	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
Checkpoint	Ver 3	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
Teen. Mut. Ninja Turtles	Ver 3	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
Batman	Ver 3	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
Star Trek	Ver 3	5C	J1b,J3,J5,J5b,J6b,J7b,&J8	J1a,J2,J4,J5a,J6a,&J7a
Hook	Ver 3	5C	J1b,J3,J5,J5b,J6b,J7b,&J8	J1a,J2,J4,J5a,J6a,&J7a
Lethal Weapon 3	Ver 3	5C	J1b,J3,J5,J5b,J6b,J7b,&J8	J1a,J2,J4,J5a,J6a,&J7a
Star Wars	Ver 3	5C	J1b,J3,J5,J5b,J6b,J7b,&J8	J1a,J2,J4,J5a,J6a,&J7a
Rocky & Bullwinkle	Ver 3	5C	J1b,J3,J5,J5b,J6b,J7b,&J8	J1a,J2,J4,J5a,J6a,&J7a
Jurassic Park	Ver 3	5C	J1b,J3,J5,J5b,J6b,J7b,&J8	J1a,J2,J4,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

Stays On
Flashes 1 Time
Flashes 2 Times
Flashes 3 Times

SUSPECT COMPONENT

One of the 6821 PIAs
6064 RAM at location D5.
EPROM at location B5.
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 & 50Volt coils
F6 5A Slo-Blo Flash Lamps (34VDC)

POWER SUPPLY BOARD

F1 7A Slo-Blo +5VDC Regulator Input (9VAC)
F2 7A Slo-Blo +5VDC Regulator Input (9VAC)
F3 Not Used
F4 8A Slo-Blo Switched Illumination Buss (18VDC)
F5 5A Slo-Blo Solenoid (34VDC) Bumpers Slingshots etc.
F6 5A Slo-Blo Solenoid Buss (34VDC)
F7 0.5A Slo-Blo Display Reg. Input (90VAC)

Motor Control Board

F1=2.5 A
F2=2.5 A
F3=2.5 A

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

PROM SUMMARY

CPU Board: Location 5C

Sound Board: Locations U17 (Voice ROM 1), U21 (Voice ROM 2), and U7 (Sound ROM)

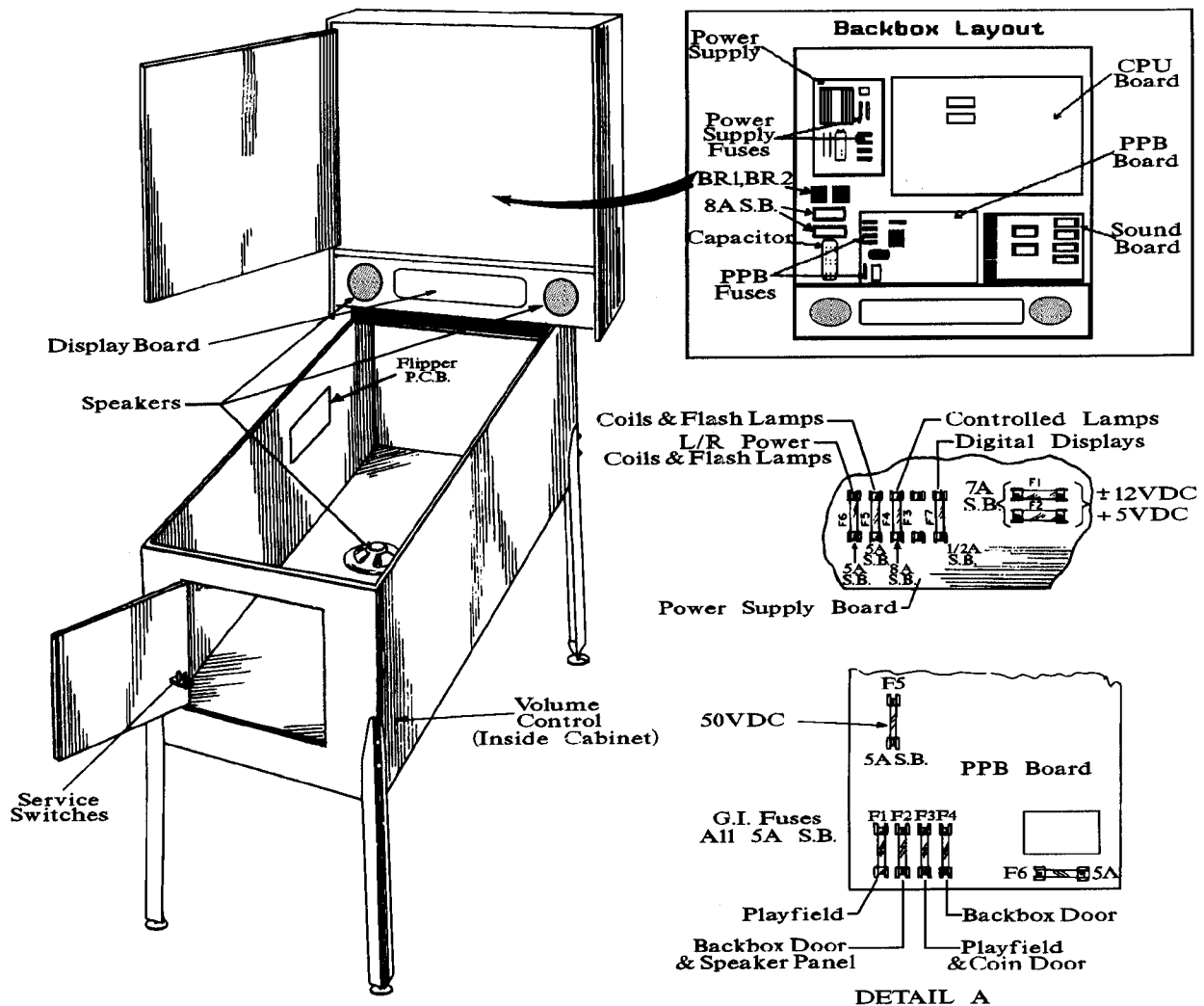
Display Controller Board: Locations U12 & U14

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 support it, by connecting the strap located in the left rear of the cabinet, to the eyebolt on the playfield. (Use the instruction sheet provided in the game to see alternative methods of accessing the playfield bottom.)
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 and using the 2 Way Level located beneath the pricing card on the bottom arch.

16. Using the 2 Way Level below the pricing card, adjust the pitch of the playfield to approximately 6.5 degrees.

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.

GAME OPERATION

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

1) SKILL SHOT

Use the fire button on the tazer gun to stun the dinosaur running across the display. The awards are 2 Million (ball 1), 3 Million (ball 2) & 4 Million (ball 3).

2) SMARTMISSILE

The smart missile can only be used once per game and will collect everything flashing when used. For example if extra ball is flashing the smart missile will collect it for the player instead of the player having to make the shot on the playfield. In various features on the computer it will score the next available value.

3) TRI-BALL

Collect all six target species to complete the map and enable tri-ball lit. In tri-ball lit either feed T-REX or taunt the raptors (3 times 1st tri-ball. 5 times 2nd tri-ball 7 times 3rd tri-ball) then tri-ball can only be started by feeding T-REX. You are now ready for dual jackpot action.

4) DUAL JACKPOTS

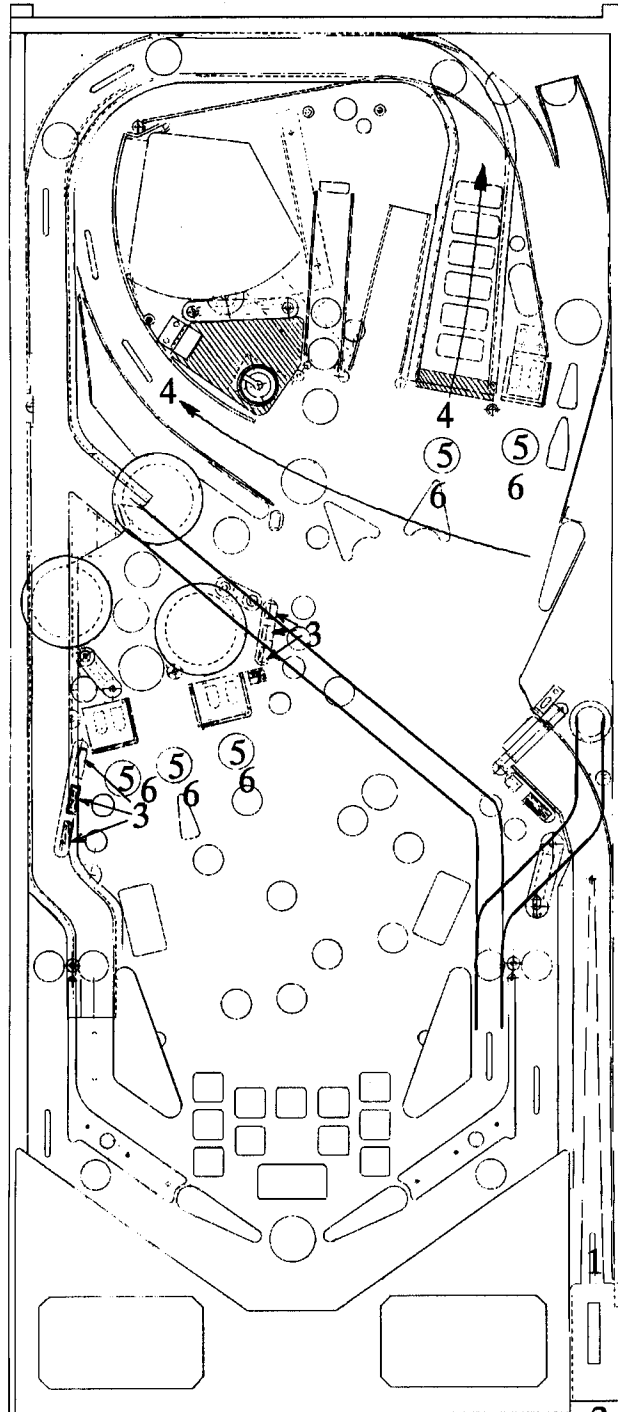
Once in TRI-BALL both the helicopter loop and ramp are lit for Jackpot. All switches on the game add their normal score to the progressive Jackpot in the display. To score each of the Jackpots the player must shoot the ramp and loop. When one is collected it is scored and the other Jackpot continues to increase in value until collected. You are now ready for CHAOS lit with both Jackpots collected.

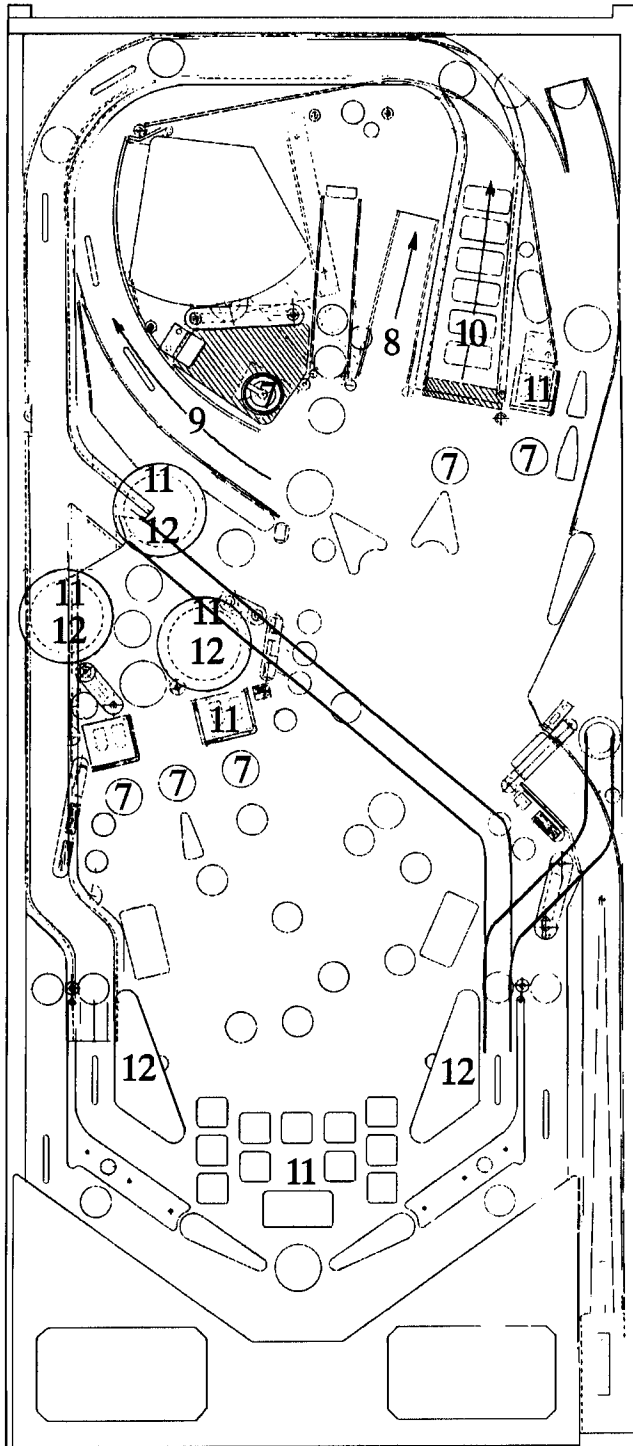
CHAOS LETTERS LIT

After scoring dual jackpots the five CHAOS letters are flashing for five million points each. If all letters are completed then the game goes into CHAOS mode.
(SCORE AN ADDITIONAL 10 MILLION FOR COMPLETING CHAOS)

5) CHAOS MODE / CHAOS FEED T-REX JACKPOT

In CHAOS mode the game will play 6 balls. The CHAOS letter will again be flashing to be completed for 10 million points per letter. When the player collects CHAOS then T-REX will light for 50 million points.





7) SUPER JACKPOTS

While still in six ball play and after T-REX has been fed for 50 million points the playfield jackpots relight for twin SUPER JACKPOTS. TWIN SUPER JACKPOTS score 100 Million points times the number of balls on the playfield, for up to 600 million points. If the player scores SUPER JACKPOTS then the CHAOS letters light again for ten million and repeats feed T-REX and SUPER JACKPOTS until all but one ball drains.

8) RAPTOR PIT/ WILD RAPTORS

The RAPTOR PIT starts with a set value of 3 million and increases by 250k with every shot into the raptor pit. If the player shoots in and out of the RAPTORS rapidly before the danger light stops blinking, then, his raptor score will add it's initial value on to itself until the chain is broken and return to the last raptor score prior to wild raptor mode. When the danger light is on there is a ball freeze protector coming out of the raptor pit.

9) RAPTOR PIT HELD

You can holdover the RAPTOR pit value from ball to ball simply by shooting the Helicopter loop twice in a row with out missing. Two loops also qualifies T-REX to eat the next time a ball is in the paddock in single ball play.

10) GENERAL BONUS HELD

Shooting the ramp twice in a row collects and hold bonus over for the next ball.

11) COMPUTER VALUES

The computer has a total of twelve mini games for the player to explore and challenge. At the start of each ball the control room light above the center scoop will light. Entering the control room will award one of the lit features. After a feature is scored the turbo bumpers will randomly advance the next value. Shooting the power shed (top right scoop) will lock in the next value to be scored. If no value is lit going down the right return it will light the control room for a few seconds and temporarily lock the flashing value in place. If the player scores all eleven features then SYSTEM FAILURE IS READY. (see system failure)

12) ELECTRIC FENCES:

In this game the player has 20 seconds to make 20 switch closures in the turbo bumpers and sling shots to score 30 Million points, and save Timmy. If you don't collect the points Timmy will be electrocuted..

13) SPITTER ATTACK

In this game the player has to shoot any of the 3 lit spitter targets on the lower left side of the playfield. Each shot to the lit spitter target makes the spitter attack Nedry. The first spit is 5 Mil, the second spit is 10 mil and the third spit is 15 mil. Three shots prior to the timer expiring collects a total of 30 million.

14) 2 BALL PLAY

In this round the top right eject is lit (boat dock) for 2 ball play. When the player makes the shot into the eject the 2nd ball is issued into play. The players objective is to shoot the Raptor pit frequently in two ball play for Raptor Jackpots. Raptor Jackpots start at 3 million and add an additional 1 million for each subsequent shot.

15) SYSTEM BOOT

In this round the Bunker, Control Room and Power shed scoops are lit. The player has 20 seconds to score 5 million for the first , 10 million for the second and 15 million for the third completed. This round can score a maximum of 30 million points.

16) RAPTORS RAMPAGE

In this round the Raptors are loose in the kitchen and are roaming back and forth. The player scores the Raptor value is every time he shoots the Raptor pit in this mode. The player can extend the time of this feature by shooting the raptor pit before the counter expires.

17) LIGHTING EXTRA BALL

This feature LIGHT extra ball on the top right eject (boat dock). The player collects extra ball by shooting the eject.

18) MOSQUITO MILLIONS

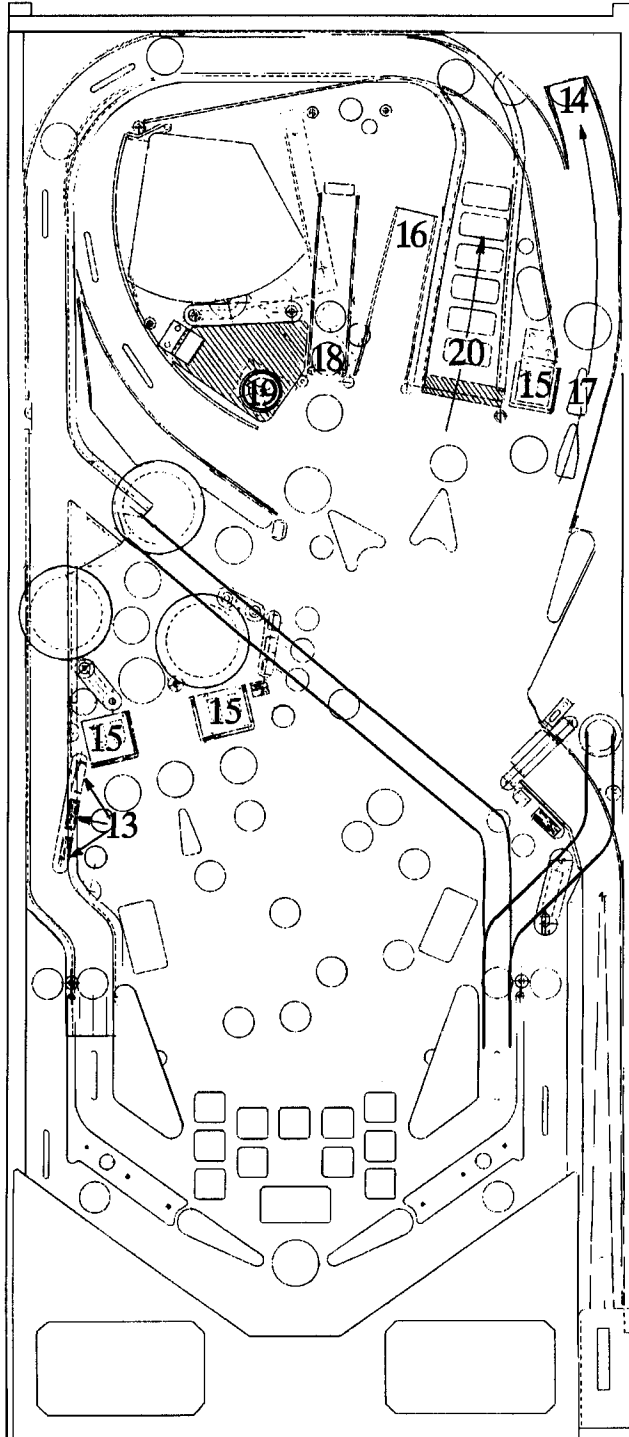
In this round the captive ball lights for 20 seconds and starts with a total value of 5 million. Each and every subsequent shot scores an additional 1 million points.

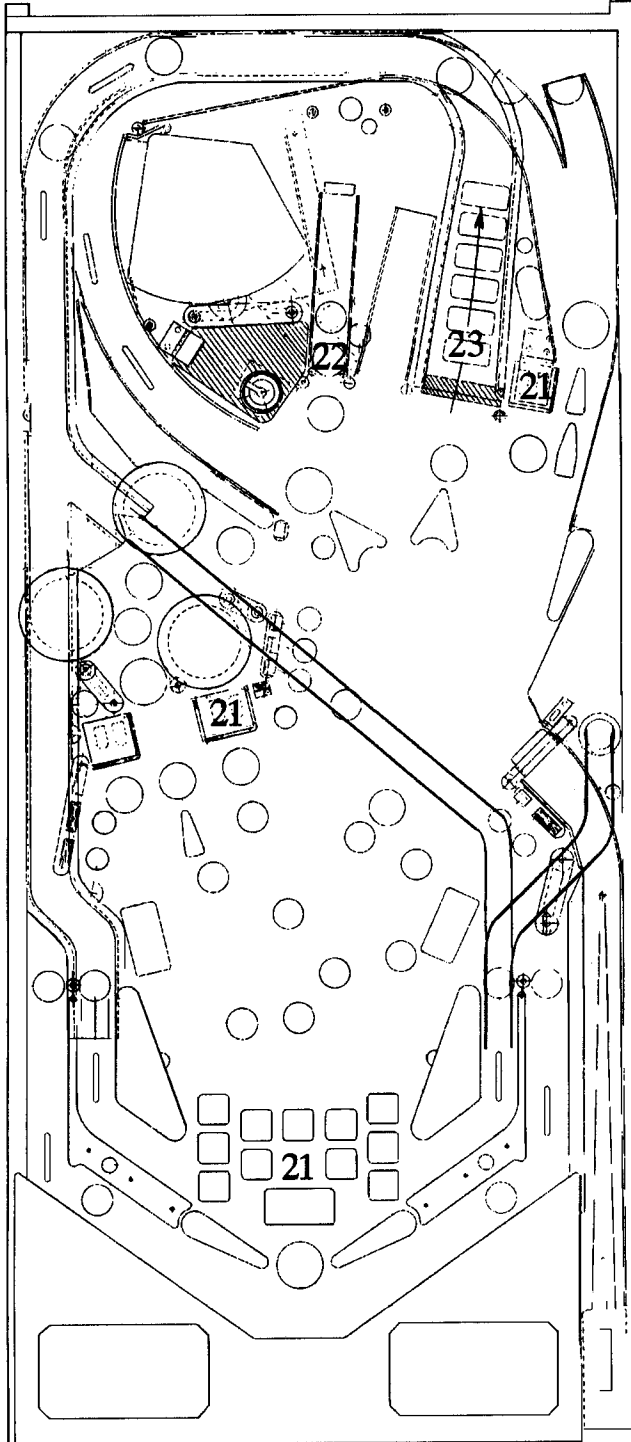
19) FEED T-REX

In this round the player has 30 seconds to shoot the ball into the T-REX paddock and feed T-REX for 25 million points.

20) BONE BUSTING

In this round the player has to shoot the ramp 3 times helping the raptor bust the T-REX skeleton in 20 seconds to score 20 million points.





21) SYSTEM FAILURE

After all computer features are collected the control room and power shed lights will be flashing. If the player shoots either scoop the game will start a 45 second mini round keeping all six balls on the playfield. In this round the player scores one million points per switch closure. After the timer has expired, the flippers are disabled and all six balls are returned to the trough. The players System Failure score is added to his existing score and a new ball is issued to the playfield and the player continues his ball in play.

22) CAPTIVE BALL EGG.

Shooting the captive ball cracks the dinosaur egg. The first egg takes 3 cracks and scores 5 million. The second egg takes 4 cracks and scores 10 million. The third egg takes 5 cracks and scores 15 million. The fourth egg takes 6 cracks and scores extra ball. The fifth egg takes 6 cracks and scores 20 million and the sixth egg scores a mystery of either special lit, extra ball lit, or points. Every seventh egg scores power egg mania.

23) RAMP MOLECULES.

Ramp molecules are collected with every ramp shot. The first three DNA strands take seven shots to collect. DNA strands 4,5, & 6 take 8 ramps to collect. All DNA strands after 6 take 9 ramps to collect. When a DNA strand is complete MR. DNA on the bunker scoop is lit for a select pick. 50 ramps lit extra ball at the boat dock. Every ramp adds to the T-REX paddock Jackpot.

DNA SELECT VALUES

- 5 MILLION
- 10 MILLION
- 15 MILLION
- SUPER POPS
- MIL POPS
- COMPLETE EGG
- LIGHT SPECIAL
- HURRY EXTRA BALL
- HURRY SCORE 15-5 MIL
- HURRY 2 BALL 10-5 MIL
- TRIBALL READY
- SPITTERS DOUBLE ROUND
- ADVANCE BUNKER 5 MIL
- RAPTOR HOLD
- BONUS HOLD

24) ESCAPE ISLA NUBLAR

In this round the player has to try to escape the island by going to the visitors center, heliport and boat dock in any order. The timer begins to count down points from 20 million. Once the player collects this value, an additional 10 million is added to this timer.

The timer again starts to count down the added 10 Million points if the timer is collected before the added 10 million points are subtracted, this step may be repeated an additional time. The maximum score a player can accumulate in this round is 66 million.

25) STAMPEDE

In this round all switches start scoring 250k and add an additional score of 10k to every subsequent switch closure. If the player shoots the T-REX paddock or the Galimimus target in this round he is awarded an additional 5 million points. In the display the T-REX will eat a Galimimus.

26) T-REX PADDOCK JACKPOT

The T-REX jackpot starts at 5 million points each ramp shot adds 100k to the jackpot value. To collect this jackpot you must spell T-REX by shooting the T-REX paddock and the feed T-REX. This value build ball to ball, player to player game to game.

27) VICTORY LAP

After a replay is achieved the ramp will light for 30 seconds. During that time the player has to shoot the ramp a total of 6 times. The first 5 ramps are worth 5 million points and the sixth ramp is worth 25 million. The total points a player can get from victory lap is 50 million.

28) ADVANCE X

Right return lane through the pops to the upper left loop adds 3x value to the bonus multiplier. The bonus multiplier tops out at 9x.

29) HAMMONDS BUNKER

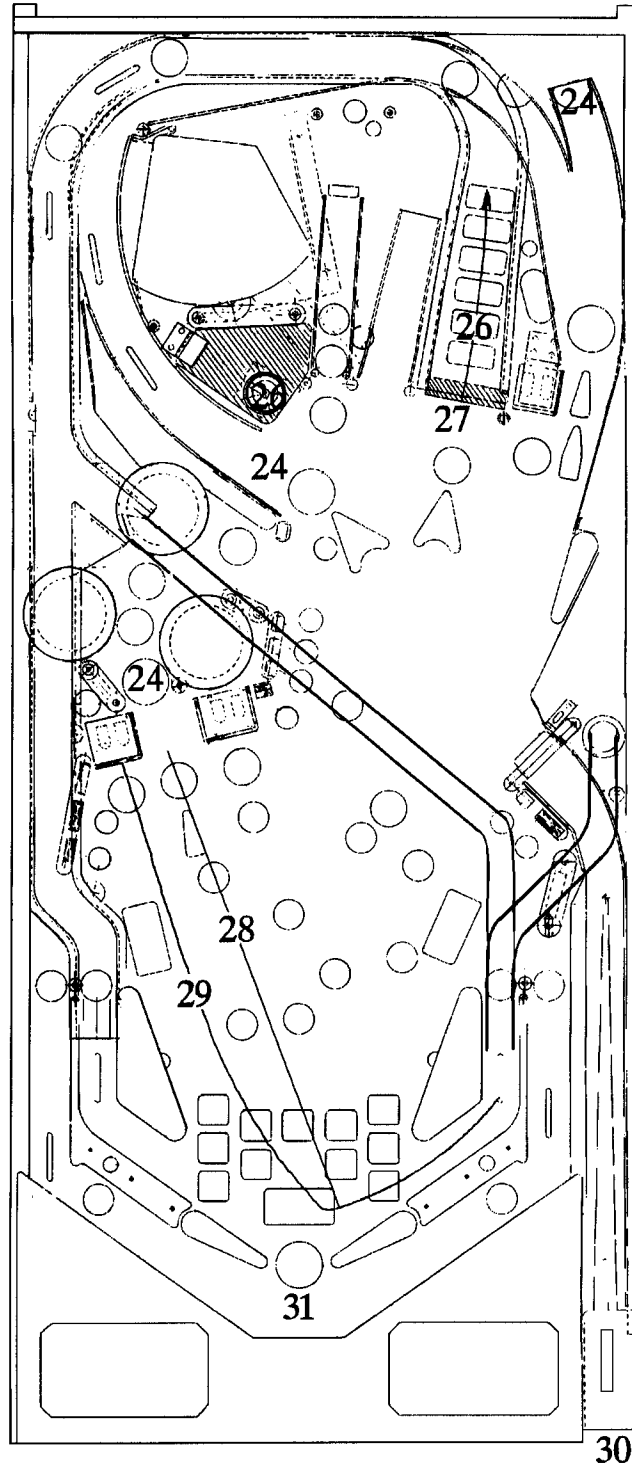
Right return lane to Hammonds Bunker collect hammonds bunker value. Hammonds bunker value is increased from the turbo bumpers.

30) SHOOT OUT

When shoot out is available shoot the trigger rapidly to stun various dinosaurs and collect that dinosaur on the island map.

31) DEATH SAVE

If the player loses his ball but it comes back into play instead of draining without tilting awards 5 million points.



AUDIT FUNCTIONS

GENERAL

There are 70 audit functions provided for accounting purposes and for evaluation of game difficulty adjustments. Audit functions are split into two groups. There are 11 most-used audits (1 through 11) in a 'quick look' group and 58 less-used audits (13 through 70), 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 top of the display, the *Description* is shown next and the *Audit Total* in the display. bottom 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 display indicates AUDITS & ADJUSTMENTS. 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 AUDIT 10, EXPAND AUDITS is displayed. Set the choice to YES as indicated in the lower display by depressing the Game Start push-button and then depress the step push-button. The request is installed and Audit 11 is displayed. When you exit audits and adjustments, the Audit 10 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 **ADJUSTMENT 11**, AUDITS RESET. Game adjustments (1 to 13 and 14 to 48) begin after the last audit function (12 or 70). 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 (AUDIT 1) - the total number of paid credits is displayed.

Free Percent (AUDIT 2) is Free Total (E AUDIT 24) divided by Plays Total (E AUDIT 25).

Ball Time Average (in seconds) (AUDIT 3) is Total Play Time divided by Total Balls Played (AUDIT 13).

Average Game Time (AUDIT 4) is the Average Game Time expressed in minutes and seconds.

Coins (AUDIT 5, 6, 7 and 8) - These four audit totals are provided to show the amount of coins registered for the left, right, center, and 4th coin chutes, respectively.

Total Coins (AUDIT 9) is the total number of coins dropped through all 4 coin chutes.

Total Earnings (AUDIT 10) is the total cash value accumulated since the last Factory Restore occurred.

Last Earnings (AUDIT 11) is the total cash value accumulated since the last Coins Reset occurred.

Expand Audits (AUDIT 12) permits viewing of expanded audits.

Jurassic Park Audit Table

Audit Number	Audit Description	Audit Number	Audit Description
	Jurassic Park PROM ID		
1	Total Paid Credits	36	Proprietary
2	Free Game Percentage	37	Total Buyin Games
3	Average Ball Time	38	Drains Left
4	Av Game Time	39	Drains Center
5	Coins Left	40	Drains Right
6	Coins Right	41	Extraball Lit From Ramp
7	Coins Center	42	Extraball Lit From Grid
8	Coins 4th Chute	43	Extraball Lit From Egg
9	Total Coins	44	Advance Multiplier
10	Total Earnings	45	Extraball Lit From DNA
11	Last Earnings	46	Freeze Used-Skill
12	Expand Audits (ON/OFF)	47	Freeze Used-Raptor
13	Balls Total	48	TRIBALL lit
14	Extra Balls Total	49	TRIBALL Award
15	Extra Ball Percent	50	2nd TRIBALL Award
16	Replay 1 Awards	51	3+TRIBALL Award
17	Replay 2+ Awards	52	Twoball Award
18	Total Replays	53	Restart Award
19	Replay Percent	54	Chaos Award
20	Total Specials	55	T.REX Chaos Lit
21	Special Percent	56	T.REX Chaos Award
22	Total Matches	57	Loop Jackpot
23	Hi Score Wins	58	Ramp Jackpot
24	Total Free Plays	59	Raptor Jackpot
25	Total Plays	60	T.REX Shots
26	0.0 - 49.9 Million	61	T.REX Completed
27	50.0 - 99.9 Million	62	Right Ramp
28	100.0 - 199.9 Million	63	Molecules Complete
29	200.0 - 299.9 Million	64	Raptor Pit Shots
30	300.0 - 399.9 Million	65	Grid Award
31	Over 400 Million	66	Grid Lit
32	Average Scores	67	Eggs Completed
33	Service Credits	68	Smart Missile Used
34	Proprietary	69	"System Failure"
35	Proprietary	70	Total Number of Clicks

EXPANDED FUNCTIONS

Balls Total (Audit 13) is the total of regular and extra balls.

Extra Balls Total (Audit14) is the total number of extra balls awarded.

Extra Ball Percentage (Audit15) is Audit14 divided by Plays Total (Audit 25).

Replay Awards (Audit 16& 17) provide the total awards (credit, extra ball, or audit) for replay level 1 or 2 through 4, respectively.

Total Replays (Audit 18) is the total awards (credits, extra balls, or audit only) for exceeding replay score levels.

Replay Percentage (Audit 19) is the Replay Total awards for exceeding replay score levels (Audit 18) divided by Plays Total (Audit 25).

Total Specials (Audit 20) is the total awards (credits, extra balls, or scores) for making specials.

Special Percentage (Audit 21) is Special Total (Audit20) divided by Plays total (Audit 25).

Total Matches (Audit 22) 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 **Adj. 13** if enabled.

High Score Wins (Audit 23) is the total credits awarded for exceeding the high-score-to-date scores.

Total Free Plays (Audit 24) is the total free credits for replays, high-score-to-date, specials, and match.

Total Games (Audit 25) is the sum of Total Paid Credits (Audit 1) and Free Total (Audit 25). Note that free credits are not recorded in the Audit until they are actually used.

0.0- 49.9 Million (Audit 26) provides the total number of games the Player's final score was between 0 and 49,999,990 points.

50.0 - 99.9 Million (Audit 27) provides the total number of games the Player's final score was between 50,000,000 and 99,999,990 points.

100.0 - 199.9 Million (Audit 28) provides the total number of games the Player's final score was between 100,000,000 and 199,999,990 points.

200.0 - 299.9 Million (Audit 29) provides the total number of games the Player's final score was between 200,000,000 and 299,999,990 points.

300.0 - 399.9 Million (Audit 30) provides the total number of games the Player's final score was between 300,000,000 and 399,999,990 points.

Over 400 Million (Audit 31) provides the total number of games the Player's final score was over 400,000,000 points.

Average Scores (Audit 32) provides the Average Score by adding the Final Score of each game to a table and dividing this sum by the Total Plays .

Service Credits (Audit 33) provides the total number of Service credits added to the game. *See Game Diagnostics on page 21 for instructions regarding entry of Service Credits.*

Proprietary (Audit 34 - Audit 36) provide information to the game designer to aid in design development. (Factory use only.)

Total BuyIn Games (Audit 37) provides the number of times a player utilized the Buy In Feature. (See E Ad 40)

Drains Left (Audit 38) provides the number of times the ball drained out the left drain.

Drains Center (Audit 39) provides the number of times the ball drained out the center drain.

Drains Right (Audit 40) provides the number of times the ball drained out the right drain.

GAME SPECIFIC FUNCTIONS

Extra Ball Lit From Ramp (Audit 41) provides the total number of times Extra Ball light was enabled by completing the Ramp Shot.

Extra Ball Lit From Grid (Audit 42) provides the total number of times Extra Ball light was enabled by completing the Grid.

Extra Ball Lit From Egg (Audit 43) provides the total number of times Extra Ball light was enabled by completing the Egg Shot.

Advance Multiplier (Audit 44) provides the total number of times the Bonus Multiplier was advanced.

Extra Ball Lit From DNA (Audit 45) provides the total number of times Extra Ball light was enabled by completing the DNA Shot.

Freeze Used -Skill (Audit 46) provides the number of times the Freeze Feature saved the ball at the start of the ball..

Freeze Used -Raptor (Audit 47) provides the number of times the Freeze Feature saved the ball after entering the Raptor pit.

TRI-BALL Lit (Audit 48) provides the number of times the TRI-BALL Feature was lit.

TRI-BALL Award (Audit 49) provides the number of games the TRI-BALL Feature was awarded once.

2nd TRI-BALL Award (Audit 50) provides the number of games the TRI-BALL Feature was awarded twice.

3+ TRI-BALL Award (Audit 51) provides the number of games the TRI-BALL Feature was awarded 3 or more times.

TWOBALL Award (Audit 22) provides the number of times the TWOBALL Feature was awarded

Restart Award (Audit 53) provides the number of times the Restart Feature was awarded.

CHAOS Award (Audit 54) provides the number of times the CHAOS Feature was awarded.

T.Rex CHAOS Lit (Audit 55) provides the number of times the Tyrannosaurus Rex CHAOS Feature was Lit.

T.Rex CHAOS Award (Audit 56) provides the number of times the Tyrannosaurus Rex CHAOS Feature was awarded.

Loop Jackpot (Audit 57) provides the number of times the Loop Jackpot was awarded.

Ramp Jackpot (Audit 58) provides the number of times the Ramp Jackpot was awarded.

Raptor Jackpot (Audit 59) provides the number of times the Raptor Jackpot was awarded.

T.Rex Shots (Audit 60) provides the number of times a shot was made to the T.Rex saucer.

T.Rex Completed (Audit 61) provides the number of times the letters spelling TREX were completed.

Right Ramp (Audit 62) provides the number of times the right ramp was completed.

Molecules Complete (Audit 63) provides the number of times the right ramp was used to complete the molecules.

Raptor Pit Shot (Audit 64) provides the number of times the Raptor Pit Shot was completed.

Grid Award (Audit 65) provides the number of times a Grid feature was awarded.

Grid Lit (Audit 66) provides the number of times a Grid feature was enabled.

Eggs Complete (Audit 67) provides the number of times the Eggs were completed by striking the

Smart Missile (Audit 68) provides the number of times the Smart Missile button was used.

"System Failure" (Audit 69) provides the number of times the System Failure occurred by completing all the grids.

Meter Clicks (Audit 70) provides the number of total meter clicks.

GAME ADJUSTMENTS

GENERAL

There are 48 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 top of the display, the *Description* is shown next, and the setting, in the bottom of the 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 AUDIT 1 and the FORWARD/REVERSE switch in the REVERSE (down) position, depress the STEP switch and ADJUSTMENT 48 is shown at the top of the display, FACTORY RESTORE is shown in the middle of the display, and NO is shown in the bottom of the display. With the audits displaying AUDIT 12 or 70 and the FORWARD/REVERSE switch in the FORWARD (up) position, depress the STEP switch and ADJUSTMENT 1 is shown in the top of the display, REPLAY/MANUAL is shown in the middle of the display, and the setting is shown in the bottom of the 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 display indicates 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 (Adjustment 1 through 6)

ADJ.1 Replay Manual/Fixed

- **Manual:** Adjust for percentage of awards for replay levels (1% through 50%). Proceed to ADJ.02 and 03 for starting replay levels.
- **Fixed:** Lower the automatic value below 1% and Player 1 display indicates FIXED. Proceed to ADJ. 2 and 3 for fixed replay levels.

ADJ. 2 Start Replay

- **Manual:** Adjust the starting Replay 1 setting to between 20,000,000 and 9,999,000,000.

ADJ. 3 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 20,000,000 and 9,999,000,000. (Same as Start Replay)
If ADJ. 3 is set for 2, adjust Replay 2 level to between 20,000,000 and 9,999,000,000.
If ADJ. 3 is set for 3, adjust Replay 3 level to between 20,000,000 and 9,999,000,000.
If ADJ. 3 is set for 4, adjust Replay 4 level to between 20,000,000 and 9,999,000,000.

Jurassic Park Game Adjustment Table

Adjustment Number	Description	Factory Setting
1	Replay/Manual	10%
2	Start Replay	300,000,000
3	Levels Replay*	01
4	Game Awards	CREDIT
5	Limit Freegame	03
6	Limit Extraball	03
7	Game Rules	FACTORY
8	Game Price*	USA2
9	Coin Reset	NO
10	Audits Reset	NO
11	Restore HI Scores	NO
12	Expand Adjustments	NO
13	Match Percent	08
14	Balls Per Game	03
15	Tilt Warnings	01
16	Replay Boost	NO
17	Credits Limit	30
18	High Scores Allowed	YES
19	Hiscore 1 Awards	03
20	Hiscore 2 Awards	01
21	Hiscore 3 Awards	00
22	Hiscore 4 Awards	00
23	Backup World Record	300,000,000
24	Backup Hiscore 2	275,000,000
25	Backup Hiscore 3	250,000,000
26	Backup Hiscore 4	225,000,000
27	Backup Hiscore 5	125,000,000
28	Backup Hiscore 6	150,000,000
29	Reset H.S.T.D. Every	700
30	Free Play	NO
31	Custom Message	ON
32	Flash Lamps	NORMAL
33	Coils Pulse	NORMAL
34	Level Adjust By	ANY
35	Next Game Promo	ON
36	Buy In Allowed	NO
37	Restart Game	NO
38	Extra Ball Percentage	25
39	Background Volume	100
40	Bill Validator	NO
41	Raptor Freeze	YES
42	Shaker Motor	ON
43	T.Rex In Memory	YES
44	T.Rex Move Left-Right	YES
45	T.Rex Eat Balls	YES
46	Special In Memory	YES
47	Extra Ball in Memory	YES
48	Factory Restore	NO

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

Adj. 4 Game Awards Set for replays to award: **CREDIT, EXTRA BALL, NONE** or **SPECIAL** (when score threshold is achieved a playfield special is lit).

Adj. 5 Limit FreeGame - Adjust for the maximum number of free games that may be accumulated per game; 0 to 9 .

Adj. 6 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 (Adj. 7)

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.

Adj. 07 Game Rules - Set to **EXTRA EASY, EASY, FACTORY, HARD** or **EXTRA HARD**.
(Note - Additional game features not variable by the Expanded Adjustments may also change using this setting.)

Install Adjustment	Adj. 7 Extra Easy	Adj. 7 Easy	Adj. 7 Factory	Adj. 7 Hard	Adj. 7 Extra Hard
Adj. 43. Raptor Freeze	YES	YES	YES	YES	YES
Adj. 44. T-Rex in Memory	YES	YES	YES	NO	NO
Adj. 47. Extra Ball in Memory	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:

- | | |
|------------------------------|---------------------------------|
| Adj. 1 Manual Replay = Fixed | Adj. 6 Limit Extra Balls = 0 |
| Adj. 2 Start Replay = 00 | Adj. 14 Match Percent = Off |
| Adj. 3 Levels Replay = None | Adj. 20 World Record Awards=0 |
| Adj. 4 Game Awards = None | Adj. 21-23 Todays 1-3 Awards= 0 |
| Adj. 5 Limit Freegame =0 | |

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

- | | | |
|-----------------------------------|---------------------------------|---------------------------|
| Adj. 1 Manual Replay =07% | Adj. 14 Match Percent = 04 | Extra Ball in memory = No |
| Adj. 2 Replay Start = 375,000,000 | Adj. 15 Balls/Game =5 | |
| Adj. 3 Replay Levels = 01 | Adj. 20 World Record Awards = 3 | |
| Adj. 4 Game Awards = Credit | Adj. 21 Todays 1 Award= 1 | |
| Adj. 5 Limit Freegame =3 | Adj. 43 Raptor Freeze = Yes | |
| Adj. 6 Limit Extra Balls = 3 | Adj. 44 T-Rex in Memory = Yes | |

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

- | | |
|---------------------------------|--|
| Adj. 4 Game Awards = Extra Ball | Adj. 19 Scores Highest = No |
| Adj. 5 Limit Freegame = 0 | Adj. 20 to 23 World Record & Todays High Awards= 0 |
| Adj. 14 Match Percent = OFF | |

GAME PRICING (Adj. 8)

There are two methods available for coin switch programming; Standard and Custom. Standard pricing uses a single adjustment (Adj. 8) to select a pricing scheme shown in the **Standard /Custom Pricing Table**. Custom pricing is used to select additional pricing schemes defined by a Drop Down menu .

With Adj. 8 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 the 1st bonus credit(s); 00 to 99.

Coin Switch Pulses Required for 2nd Bonus Credit- Set the number of coin switch pulses required to award the 2nd bonus credit; 00 to 99.

Credits awarded for 1st Bonus - Set the number of credits awarded for achieving the first Bonus level; 00 to 99.

CUSTOM PRICING TABLE

Left	Coin Mechs			4th	Plays/Coins	Adjustments							
	Right	Center				Left Pulses	Right Pulses	Mid Pulses	4th Pulses	Pulses /Credit	Pulses /bonus	Pulses/ 2nd Bon	Credit/ 1st Bonus
25¢	25¢	\$1.00	n/u		1/25¢ 3/50¢ 1/25¢ 5/\$1.00 1/25¢/ 6/\$1.00	01 01 05	01 01 05	04 04 20	00 00 00	01 01 04	02 04 20	00 00 00	01 01 01
5SCH	10SCH	10SCH	n/u		1/10 SCH 1/10 SCH 4/30SCH	01 04	02 08	02 08	00 00	02 06	00 00	00 00	00 00
10P	£1	50P	20P		1/30P 2/50P 5/£1 1/50P 3/£1 1/30P 4/£1	01 01 01	15 15 12	06 05 05	02 02 02	03 05 03	00 00 00	00 00 00	00 00 00
20¢	\$1.00	n/u	n/u		1/60¢ 2/\$1.00	01	05	00	00	03	05	00	01

STANDARD PRICING TABLE

Adj. 8 Standard Pricing Select	Coin Mechs				Plays Per Coin			
	Left 1st	Center 2nd	Right 3rd	4th	1st	2nd	3rd	4th
USA 1-1 Coin 1 Play	25¢	\$1.00	25¢		1PLAY/1COIN	4PLAY/1COIN	1PLAY/1COIN	
USA 2-4 Coin 3 Play *	25¢	\$1.00	25¢		1PLAY/2COIN 2PLAY/3COIN 3PLAY/4COIN	3PLAY/1COIN 6PLAY/2COIN 9PLAY/3COIN	1PLAY/2COIN 2PLAY/3COIN 3PLAY/4COIN	
USA 3-2 Coin 1 Play	25¢	\$1.00	25¢		1PLAY/2COIN	2PLAY/1COIN	1PLAY/2COIN	
USA 4-2 Coin 1 Play	25¢		25¢			1PLAY/2COIN For the 1st Play 1PLAY/1COIN during BUY-IN		
USA 5-\$2.00 5 Plays	25¢	\$1.00	25¢		1PLAY/2COIN 5PLAY/8COIN	2PLAY/1COIN 5PLAY/2COIN	1PLAY/2COIN 5PLAY/8COIN	
USA 6- 50¢ - 3/\$1Bill	25¢	\$1.00	25¢		1PLAY/2COIN 2PLAY/4COIN	3PLAY/1COIN 6PLAY/2COIN	1PLAY/2COIN 2PLAY/4COIN	
USA 7-\$2.00 6 Plays	25¢	\$1.00	25¢		1PLAY/2COIN 2PLAY/4COIN	2PLAY/1COIN 6PLAY/2COIN	1PLAY/2COIN 2PLAY/4COIN	
Austria	5 SCH	10 SCH	10 SCH		1PLAY/2COIN 2PLAY/3COIN 3PLAY/4COIN	1PLAY/1COIN 3PLAY/2COIN	1PLAY/1COIN 3PLAY/2COIN	
Australia	20¢	\$1.00	\$2.00		1PLAY/5COIN	1PLAY/1COIN	3PLAY/1COIN	
Belgium	5f	20f	50f		1PLAY/4COIN	1PLAY/1COIN	3PLAY/1COIN	
Canada	25¢	25¢	\$1.00		1PLAY/2COIN 2PLAY/3COIN 3PLAY/4COIN	1PLAY/2COIN 2PLAY/3COIN 3PLAY/4COIN		
Denmark	1Kr	5Kr	10Kr	20Kr	1PLAY/3COIN	2PLAY/1COIN	4PLAY/1COIN	8PLAY/1COIN
French 1 *	1f	5f	10f	20f	1PLAY/3COIN 2PLAY/5COIN 5PLAY/10COIN	2PLAY/1COIN 5PLAY/2COIN 11PLAY/4COIN	5PLAY/1COIN 11PLAY/2COIN	11PLAY/1COIN
French 2	1f	5f	10f	20f	1PLAY/5COIN 3PLAY/10COIN 7PLAY/20COIN	1PLAY/1COIN 3PLAY/2COIN 7PLAY/4COIN	3PLAY/1COIN 7PLAY/2COIN	7PLAY/1COIN
French 3	1f	5f	10f	20f	1PLAY/3COIN 2PLAY/5COIN 4PLAY/10COIN	2PLAY/1COIN 4PLAY/2COIN 9PLAY/4COIN	4PLAY/1COIN 9PLAY/2COIN	9PLAY/1COIN
German 1	1 DM	2 DM	5 DM		1PLAY/1COIN 2PLAY/2COIN 3PLAY/3COIN	2PLAY/1COIN 4PLAY/2COIN 6PLAY/3COIN	6PLAY/1COIN	
German 2	1 DM	2 DM	5 DM		1PLAY/1COIN 2PLAY/2COIN 3PLAY/3COIN	2PLAY/1COIN 4PLAY/2COIN 6PLAY/3COIN	7PLAY/1COIN 21PLAY/3COIN	
German 3 *	1 DM	2 DM	5 DM		1PLAY/2COIN 2PLAY/3COIN 3PLAY/4COIN	1PLAY/1COIN 3PLAY/2COIN 5PLAY/3COIN	5PLAY/1COIN 10PLAY/2COIN 15PLAY/3COIN	
Italy 1	500L		500L		1PLAY/1COIN		1PLAY/1COIN	
Italy 2	500L		500L		1PLAY/2COIN 3PLAY/4COIN		1PLAY/2COIN 3PLAY/4COIN	
Japan			100¥				1PLAY/1COIN 3PLAY/2COIN	
Korea	100 Won		100 Won		1PLAY/1COIN		1PLAY/1COIN	
Netherland 1	1 Guilder	1 Guilder	2.5Guilder		1PLAY/1COIN	1PLAY/1COIN	3PLAY/1COIN	
Netherland 2	1 Guilder	2.5Guilder	5 Guilder		1PLAY/1COIN	3PLAY/1COIN	6PLAY/1COIN	
New Zealand 1	\$1.00		\$2.00		1PLAY/1COIN		2PLAY/1COIN	
New Zealand 2	\$1.00		\$2.00		1PLAY/1COIN		3PLAY/1COIN	
Spain	100Pts		500Pts		1PLAY/1COIN		6PLAY/1COIN	
Sweden	1 Skr	5 Skr	10 Skr		1PLAY/3COIN	2PLAY/1COIN	4PLAY/1COIN	
Swiss 1	1 SFR	2 SFR	5 SFR		1PLAY/1COIN	2PLAY/1COIN	6PLAY/1COIN	
Swiss 2	1 SFR	2 SFR	5 SFR		1PLAY/1COIN	3PLAY/1COIN	9PLAY/1COIN	
UK 1	10P	50P	£1	20P	1PLAY/5COIN 3PLAY/10COIN	1PLAY/1COIN 3PLAY/2COIN	3PLAY/1COIN	3PLAY/5COIN
UK 2	10P	50P	£1	20P	1PLAY/4COIN 2PLAY/8COIN 3PLAY/10COIN	1PLAY/1COIN 3PLAY/2COIN	3PLAY/1COIN	1PLAY/2COIN 2PLAY/4COIN 3PLAY/5COIN
UK 3	10P	50P	£1	20P	1PLAY/5COIN 2PLAY/10COIN	1PLAY/1COIN 2PLAY/2COIN	2PLAY/1COIN	2PLAY/5COIN
Yugoslavia	5 Dur		5 Dur		1PLAY/1COIN		1PLAY/1COIN	

ADDITIONAL GENERIC FEATURES

Adj. 9 Coin Reset - When enabled (set to **YES**) all coin and paid credit totals will be reset to zero when STEP is depressed.

Adj. 10 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.

Adj. 11 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 .

Adj. 12 Expand Adjustments - When set to **NO**, depressing the STEP push-button advances directly to Adj. 46, 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.

Adj. 13 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.

Adj. 14 Balls Per Game - Adjust the number of balls per game; **2** to **5**.

Adj. 15 Tilt Warnings - Adjust the number of plumb bob tilt switch closures before the ball in play is tilted; **1** to **3** or **OFF**.

Adj. 16 Replay Boost - Set to **YES** or **NO**. When set to **YES**, exceeding a replay will set a temporary replay level for each time a replay level is surpassed. This new level will equal the player's final score (when the replay was awarded) for each following game, until the replays have all been played. At this time the previous level is resumed.

Adj. 17 Credits Limit - Adjust the maximum number of credits that may be posted; **4** to **50**.

HIGH SCORE LEVELS (Adj. 18 through 29)

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.

Adj. 18 Hiscores Allowed - Set to enable or disable the four high score levels; **YES** or **NO**.

Adj. 19 World Record - Adjust the number of credits awarded for exceeding level 1 (the highest of the four levels); **0** to **5**.

Adj. 20 Highscore 2 Award- Adjust the number of credits awarded for exceeding level 1; **0** to **3**.

Adj. 21 Highscore 3 Award - Adjust the number of credits awarded for exceeding level 2; **0** to **2**.

Adj. 22 Highscore 4 Award - Adjust the number of credits awarded for exceeding level 3; **0** to **1**.

Adj. 23 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 Adj.30 (Factory Reset defaults to 7,500,000).

Adj. 24 Backup Highscore 2 - Adjust the backup score level to which level 1 may be reset.

Adj. 25 Backup Highscore 3- Adjust the backup score level to which level 2 may be reset.

Adj. 26 Backup Highscore 4- Adjust the backup score level to which level 3 may be reset.

Adj. 27 Backup Highscore 5- Adjust the backup score level to which level 4 may be reset.

Adj. 28 Backup Highscore 6- Adjust the backup score level to which level 5 may be reset.

Adj. 29 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).

Adj. 30 Free Play - When set to **YES**, no coins are required for games.

Adj. 31 Custom Message - 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 Adj. 34.

Adj. 32 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.

Adj. 33 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.

Adj. 34 Level Adjust by - When set to **INT. OPERATOR**, the Manual Percentage Replay Adjustment can only be altered with the front door open (see manual page 3). When set to **EXT.OPERATOR**, the Manual Percentage Replay Adjustment will display the message "PRESS START TO CHANGE REPLAY LEVEL" on power up if a change is recommended, and immediately operating the replay button will initiate the change to the replay score.

Adj. 48 Factory Restore-Depressing STEP without changing the value shown in the Player 4 Display locks in any custom message set with Adj.33 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 (Adj. 35 TO Adj. 47)

Adj. 35 Next Game Promo- Set to **ON** or **OFF**. When set to **ON**, the game, in attract mode will randomly display a short promotion for our next game. When set to **OFF**, the game in attract mode will not generate any sounds or graphics referring to the next game.

Adj. 36 Buy in Allowed - Set to **YES** or **NO**. When set to **YES**, the game will display a countdown timer at the end of each game allowing the player to "Buy in" most of the features accumulated during the previous game. When set to **NO**, none of the previous game features will be retained and no countdown timer will appear.

Adj. 37 Game Restart -Set to **YES** or **NO**. When set to **YES**, a new game may be started during any ball after the first ball is completed. (Note-Pressing start during the first ball will add additional players.) When set to **NO**, The game disables the start button after the first ball until the final ball is in play.

Adj. 38 Extra Ball Percentage -Set from **0** to **50**. Allows the operator to adjust how frequently the Extra Ball feature is made available to the player.

Adj. 39 Background Volume - Set to **0**, **25**, **50**, **75** or **100** percent. Allows the operator to adjust the background music volume independantly from the normal game sounds.

Adj. 40 Bill Validator - Set to **YES** or **NO**. When set to **YES** , the display, in game attract mode, will show an "Insert Bill Animation". When set to **NO**, the display, in game attract mode will show "Insert Coin Animation".

Adj. 41 Tournament Style - Set to **NONE**, **PINBALL EXPO**, **IFPA-PAPA** or **HOME**. This function determines the default conditions to quickly prepare a game for tournament play. When this setting is changed all audits will be reset and all adjustments will be initiated to the particular style selected. The game will then return to game over attract mode, as if a Factory Restore had been performed.

NONE - Same as a Factory Reset conditions.

IFPA-PAPA - Straight 50¢ play, no replay, no Extra Ball, no High Scores , 2 Tilt Warnings and No Match.

PINBALL EXPO- Same as IFPA-PAPA settings except Free Play is enabled.

HOME-Sets game for Free Play, extra ball play, no replay, 10% Match and Extra Ball percentage = 30%.

Adj. 42 Shaker Motor- Set to **ON** or **OFF**. Allows operation of the vibrating Shaker motor during certain events in game play.

Adj. 43 Raptor Freeze- Set to **YES** or **NO**. When set to **YES** , all balls shot directly into the outhole from the Raptor pit shot will be kicked back into play for the same player.

Adj.44 T-Rex in Memory- Set to **YES** or **NO**. When set to **YES** , all letters lit in **TREX** on the bottom arch will be retained in memory from ball to ball for the same player in a game. When set to **NO**, all letters lit in **TREX** will go out at the end of each ball.

Adj.45 T-Rex move Left-Right - Set to **YES** or **NO**. Used to disable the left and right movement of the T-Rex mechanism during game play so the game will still operate even if there is a problem with the motor circuit.

Adj.46 T-Rex Eat Balls - Set to **YES** or **NO**. Used to disable the up and down movement of the T-Rex mechanism during game play so the game will still operate even if there is a problem with the motor circuit.

Adj.47 Extra ball in Memory - Set to **YES** or **NO**. When set to **YES** , the lit shoot for extra ball saucer will be retained in memory from ball to ball for the same player. When set to **NO**, the lit shoot for extra ball saucer will go out at the end of each ball.

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 (WHT-YEL) and column (GRN-BRN) wire color codes shown in the Player 3 display, and the switch number shown in the Player 4 display.

BLK=Black
BRN=Brown
RED=Red
ORN=Orange
YEL=Yellow

GRN=Green
BLU=Blue
VIO=Violet
GRY=Grey
WHT=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 (U.S. including Illinois) and the toll number (708) 345-7700 (Outside the United States). this indicates entry into game diagnostics.

Service Credits

With the phone number displayed depress the STEP push-button switch. The game now gives the technician the option of adding 1 to 5 service credits. These credits allow the technician to test-play the game without adding any counts to the coin audits (AU 01 & AU 05-AU 08). When the message appears, press and hold the Game Start pushbutton until the desired number of credits are shown on the display. Then press the step button again to add these credits to the game and enter Tech Alert. If no Service Credits are desired, press the step button with the initial message displayed.

Tech Alert

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.

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 Adj. 11 or a Factory Restore Adj. 99.

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 U17) VOICE ROM2 (Loc U21) MUSIC TEST (Sound ROM Loc U7)	Left Sine (Left Speaker Only) Center Sine (All speakers) Right Sine (Right Speaker Only) "Oh no!....No no!....." "Shoot again" Level 1 Through Level 3 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 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.

DIGITAL DISPLAY TEST

The Digital display utilizes a Dot Matrix Display Control board mounted in piggyback fashion to the display driver Board. The purpose behind this board is to provide more information (32 X 128 Dots) to the operator as well as displaying graphics to the player.

The board is controlled by a 68B09E microprocessor and it's personality ROMs (Unique to the Game) . It receives Data, Reset & Clock information from the CPU Board via the ribbon cable and sends back multiple Status and Busy signals to the CPU . This is to insure synchronized communication between the CPU and the Display Controller board.

The Drivers for the rows and columns are provided on 4 surface mounted integrated circuits on the Display driver board.

Automatic Test

To enter Display tests, operate the STEP push-button switch from the Sound Manual test. The displays will first illuminate one vertical column of dots in the Display. After a slight delay it will cycle one column from left to right. After a period of time, it will begin the Row test by lighting the top row of the display, then turning it off and illuminating the next row, until each row has been individually lit, while the other rows are off. The test will then turn all the dots in the display on except for one column. It will then cycle this blank column from left to right. After a period of time, it will begin the second Row test by blanking the top row of the display, then turning it on and blanking the next row, until each row has been individually blanked, while the other rows are on. The next test begins with every other dot lit, in both the rows and columns. These dots then go out, and the unlit dots light, resulting in an alternating checkerboard pattern. The test will then repeat these cycles again until advanced to the next test or until the power is removed. (Please Note- these tests may be interrupted at any time by operating the STEP push-button switch to advance to the next test.)

T-REX Test

This test shows the status of all the switches on the T-Rex mechanism, and provides motor control when the appropriate switches are properly adjusted. To move the creature left and right, use the left and right flipper buttons. **Note:** *The T-REX Top Switch must indicate ON to allow left and right movement.* To move the creature up and down, use the start button. **Note:** *The T-REX Center Switch must indicate ON to allow up and down movement.* When adjusting the center switch **Do not bend the actuator**, loosen the mounting screws and re-position the entire switch.

Operating the trigger switch should pulse the Jaw coil.

Laser Kick Test

This test provided to insure proper interaction between certain switches and their associated solenoids without entering game play. For example, by rolling the ball over the left outlane switch the Laser Kick should fire. If it kicks too early or too late, the switch actuator should be adjusted to compensate for this error. If it fails to fire, use the switch test or coil test to help determine the the cause of failure. Note: During this function, similar tests may be performed on Vertical Up Kickers or Saucers in the game.

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 Laser Kick 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.

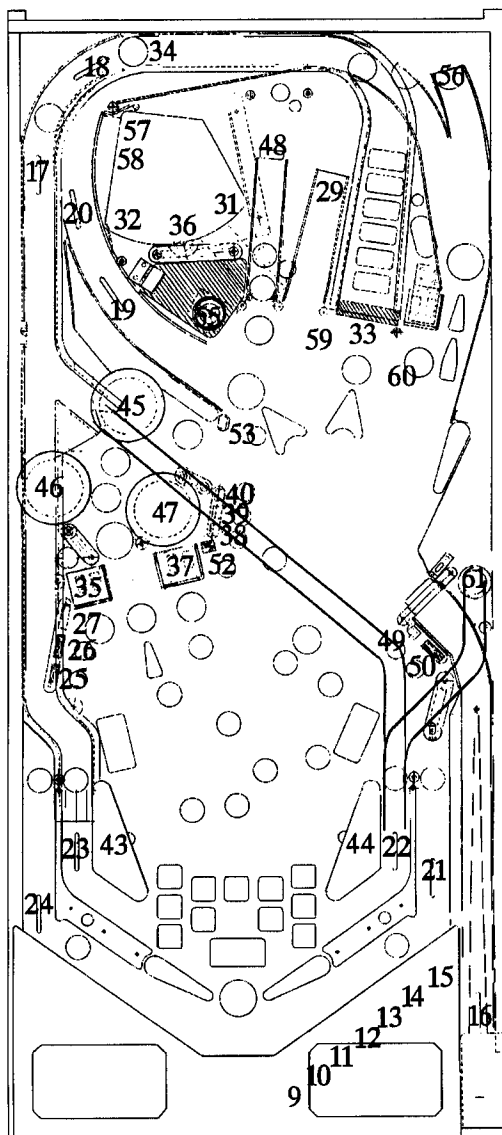
SWITCH MATRIX CHART

COLUMN \ ROW	1 GRN-BRN CN8-1 Q55	2 GRN-RED CN8-2 Q54	3 GRN-ORN CN8-3 Q53	4 GRN-YEL CN8-4 Q52	5 GRN-BLK CN8-5 Q51	6 GRN-BLU CN8-7 Q50	7 GRN-VIO CN8-8 Q49	8 GRN-GRY CN8-9 Q48
1 WHT-BRN CN10-9	Plumb Tilt 1	Trough #1 Left 9	Outer Loop Low 17	Spitter Target#1 Bottom 25	Right Ramp Enter 33	Launch Trigger 41	Baryonyx Target 49	T.Rex Top (Up) 57
2 WHT-RED CN10-8	4th Coin 2	Trough #2 10	Outer Loop Top 18	Spitter Target#2 Middle 26	Right Ramp Exit 34	Smart Bomb Button 42	Gallimimus Target 50	T.Rex Bottom (Down) 58
3 WHT-ORN CN10-7	Credit Button 3	Trough #3 11	Inner Loop Low 19	Spitter Target#3 Top 27	Left Scoop 35	Left Slingshot 43	Not Used 51	T.Rex Trough 59
4 WHT-YEL CN10-6	Right Coin 4	Trough #4 12	Inner Loop Top 20	Not Used 28	T.Rex Center 36	Right Slingshot 44	Triceritop Target 52	Right Scoop Trough 60
5 WHT-GRN CN10-5	Center Coin 5	Trough #5 13	Right Outlane 21	Raptor Pit 29	Center Scoop 37	Top Turbo Bumper 45	Brachia- saurus Top 53	Right VUK 61
6 WHT-BLU CN10-3	Left Coin 6	Trough #6 14	Right Return 22	Not Used 30	Herrera saurus - Low 38	Left Turbo Bumper 46	Not Used 54	Not Used 62
7 WHT-VIO CN10-2	Slam Tilt 7	Trough #7 Right 15	Left Return 23	T.Rex Right 31	Herrera saurus - Top 39	Right Turbo Bumper 47	T.Rex Saucer Eject 55	Left Flipper 63
8 WHT-GRY CN10-1	Not Used 8	Shooter Lane 16	Left Outlane 24	T.Rex Left 32	Brachia- saurus Low 40	Mosquito Captive Ball 48	Right Saucer Eject 56	Right Flipper 64

Jurassic Park - Switch Part Numbers

Switch Number	Description	Part No.
01*	Plumb Tilt	See Cabinet
02*	4th Coin	-
03*	Credit Button	500-5097-02
04*	Right Coin	180-5024-00
05*	Center Coin	180-5024-00
06*	Left Coin	180-5024-00
07*	Slam Tilt	180-5022-00
08	Not Used	-
09	Trough #1 Left	180-5119-00
10	Trough #2	180-5119-00
11	Trough #3	180-5119-00

Switch Number	Description	Part No.
12	Trough #4	180-5119-00
13	Trough #5	180-5119-00
14	Trough #6	180-5119-00
15	Trough #7 Right	180-5119-00
16	Shooter Lane	180-5100-01
17	Outer Loop Low	500-5142-00
18	Outer Loop Top	500-5142-00
19	Inner Loop Low	500-5142-00
20	Inner Loop Top	500-5142-00
21	Right Outlane	500-5142-00
22	Right Return	500-5142-00
23	Left Return	515-5138-00
24	Left Outlane	515-5138-00
25	Spitter Target #1 Bottom	180-5114-02
26	Spitter Target #2 Middle	180-5114-02
27	Spitter Target #3 Top	180-5114-02
28	Not Used	-
29	Raptor Pit	180-5100-01
30	Not Used	-
31	T.Rex Right	180-5040-00
32	T.Rex Left	180-5040-00
33	Right Ramp Enter	180-5087-00
34	Right Ramp Exit	180-5117-00
35	Left Scoop	180-5116-00
36	T.Rex Center	180-5123-00
37	Center Scoop	500-5442-01
38	Herrerasaurus Low	180-5120-02
39	Herrerasaurus Top	180-5120-02
40	Brachiasaurus Low	180-5120-04
41	Launch Trigger	180-5111-00
42	Smart Bomb Button	515-5825-00
43	Left Slingshot	180-5054-00
44	Right Slingshot	180-5054-00
45	Top Turbo Bumper	180-5015-01
46	Left Turbo Bumper	180-5015-01
47	Right Turbo Bumper	180-5015-01
48	Mosquito Captive Ball	180-5114-08
49	Baryonyx Target	180-5120-02
50	Gallimimus Target	180-5120-04
51	Not Used	-
52	Triceritops Target	180-5120-04
53	Brachiasaurus Top	180-5120-04
54	Not Used	-
55	T.Rex Saucer Eject	180-5027-00
56	Right Saucer Eject	180-5027-00
57	T.Rex Top (Up)	180-5040-00
58	T.Rex Bottom (Down)	180-5040-00
59	T.Rex Trough	180-5057-00
60	Right Scoop Trough	180-5057-00
61	Right VUK	180-5064-00
62	Not Used	-
63	Left Flip. Cab	180-5048-01
64	Right Flip. Cab	180-5022-00



Switch Locations

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.

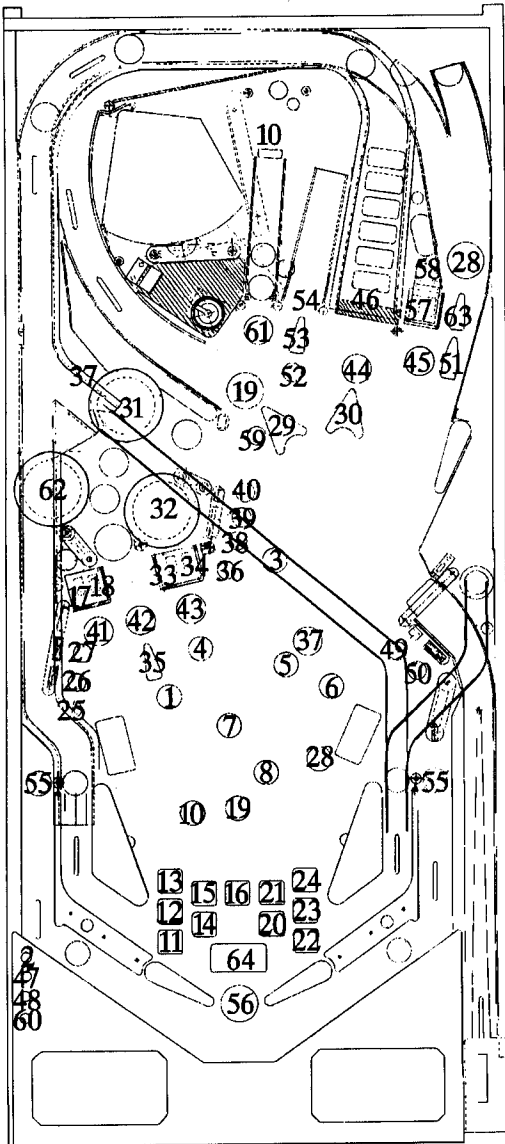
SingleLamp

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

ROW \ COLUMN	1 Q71 YEL-BRN CN7-1	2 Q70 YEL- RED CN7-2	3 Q69 YEL-ORN CN7-3	4 Q68 YEL-BLK CN7-4	5 Q67 YEL-GRN CN7-6	6 Q66 YEL-BLU CN7-7	7 Q65 YEL-VIO CN7-8	8 Q64 YEL-GRY CN7-9
1 Q72 RED-BRN CN6-1	Visitor Center X2 1	Credit Button 9	Left Scoop Bottom 17	Spitter #1 Bottom 25	Center Scoop Bottom 33	C 41	Baryonyx Target 49	Right Scoop Bottom 57
2 Q73 RED-BLK CN6-2	"T" Arch 2	Mosquito X2 10	Left Scoop Top 18	Spitter #2 26	Center Scoop Top 34	H 42	#2 50	Right Scoop Top 58
3 Q74 RED-ORN CN6-3	Brachia- saurus Map 3	Electric Fence 11	Helo X2 19	Spitter #3 27	Advance X 35	A 43	2Ball Play Arrow 51	Brachia- saurus Top 59
4 Q75 RED-YEL CN6-5	Spitter Map 4	Spitter Attack 12	Raptor Multi- Million 20	Boat Dock X2 28	Triceratop 36	0 44	Raptor Pit 5 Million 52	"X" Arch 60
5 Q76 RED-GRN CN6-6	Herrera- saurus Map 5	2 Ball Grid 13	Feed T.Rex 21	Jackpot Loop 29	T-Rex Map 37	S 45	Raptor Pit Jackpot 53	Egg 61
6 Q77 RED-BLU CN6-7	Map 6	System Boot 14	Bone Buster 22	Jackpot Map 30	Herrera- saurus Low 38	Gate X2 46	Raptor Pit Danger 54	Left Turbo Bumper 62
7 Q78 RED-VIO CN6-8	Triceratop Map 7	Raptor Rampage 15	Escape Isla Nubar 23	Top Turbo Bumper 31	Herrera- saurus Top 39	"R" Arch 47	Outlanes Special X2 55	Extra Ball Arrow 63
8 Q79 RED-GRY CN6-9	Gallimus 8	Light Extra Ball 16	Stampede 24	Right Turbo Bumper 32	Brachia- saurus Low 40	"C" Arch 48	Shoot Again 56	Smart Bomb X2 64

Lamp Number	Description
01	Visitor Center (2 Bulbs)
02	"T" Arch
03	Brachiasaurus Map
04	Spitter Map
05	Herrerasaurus Map
06	Map
07	Triceratops Map
08	Gallimimus
09	Credit Button
10	Mosquito (2 Bulbs)
11	Electric Fence



Lamp Locations

Note:
See page 36 for lamp part numbers

12	Spitter Attack
13	2 Ball Grid
14	System Boot
15	Raptor Rampage
16	Lite Extra Ball
17	Left Scoop Bottom
18	Left scoop Top
19	Helo (2 Bubs)
20	Raptor Multi-Million
21	Feed T.Rex
22	Bone Buster
23	Escape Isla Nubar
24	Stampede
25	Spitter #1 Bottom
26	Spitter #2
27	Spitter #3
28	Boat Dock (2 Bulbs)
29	Jackpot Loop
30	Jackpot Map
31	Top Turbo Bumper
32	Right Turbo Bumper
33	Center Scoop Bottom
34	Center Scoop Top
35	Advance X
36	Triceratops
37	T-Rex Map
38	Herrerasaurus Low
39	Herrerasaurus Top
40	Brachiasaurus Low
41	C
42	H
43	A
44	O
45	S
46	Gate (2 Bulbs)
47	"R" Arch
48	"C" Arch
49	Baryonyx Target
50	#2
51	2 Ball Play Arrow
52	Raptor Pit 5 Million
53	Raptor Pit Jackpot
54	Raptor Pit Danger
55	Outlanes Special (2 Bulbs)
56	Shoot Again
57	Right Scoop Bottom
58	Right Scoop Top
59	Brachiasaurus Top
60	"X" Arch
61	Egg
62	Left Turbo Bumper
63	Extra Ball Arrow
64	Smart Bomb (2 Bulbs)

FLASH 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.

Flash Lamp

From the Single Lamp test, depress the STEP push-button switch. All Flash lamps will fire randomly. This allows the Technician to easily spot any burned out bulbs and replace them without stepping through the tests below.

Automatic Test

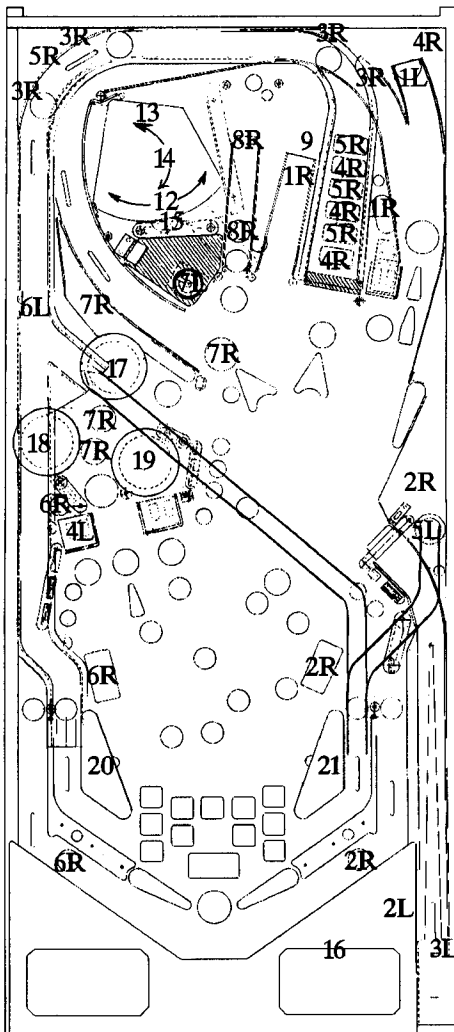
From the Flash Lamps test, depress the STEP push-button switch. Player 1 and 2 displays indicate ALL COILS. The test pulses each regular solenoid or flash lamp sequentially with the coil/flash lamp name indicated in the Player 1 and 2 displays and the wire colors in the Player 3 and 4 displays.

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 once. The game returns to the game-over mode.

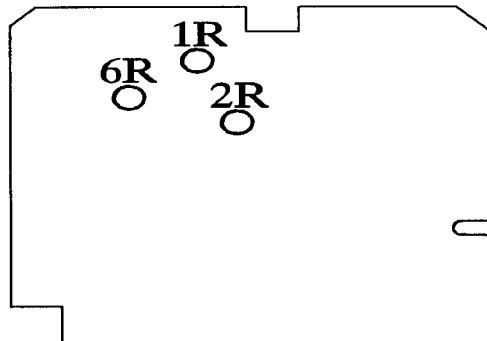


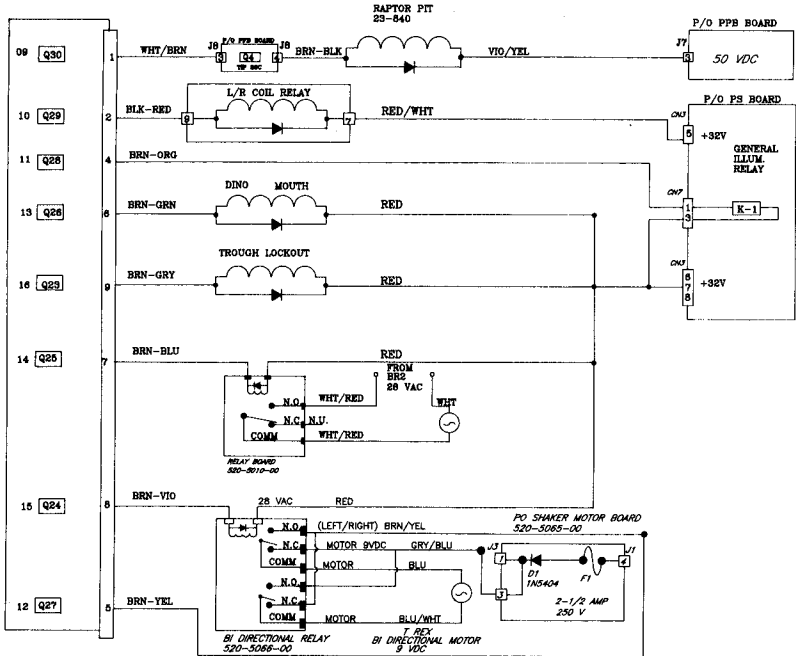
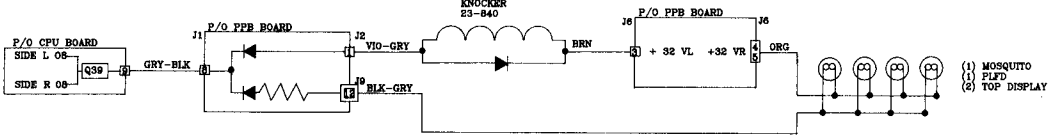
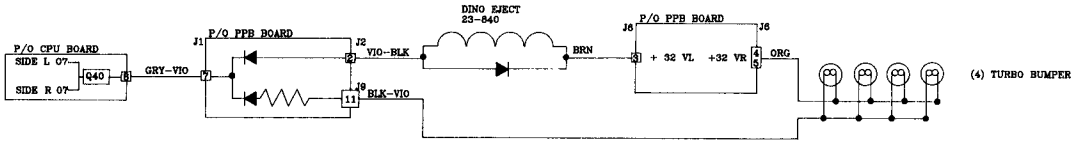
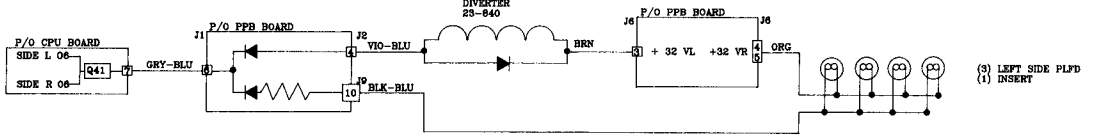
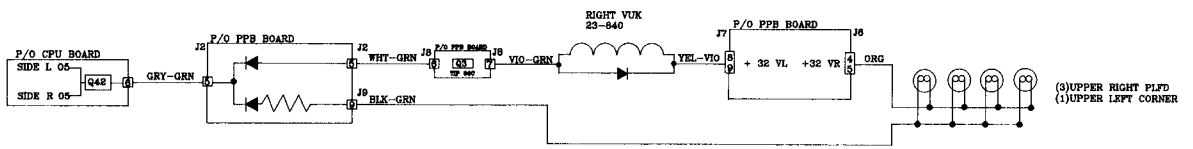
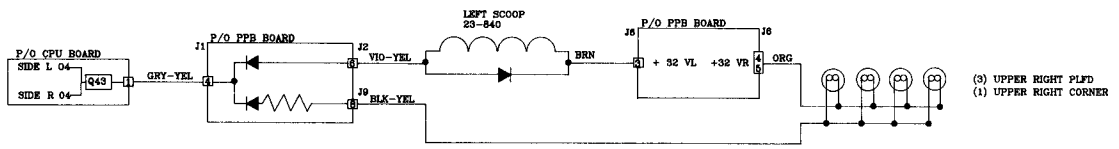
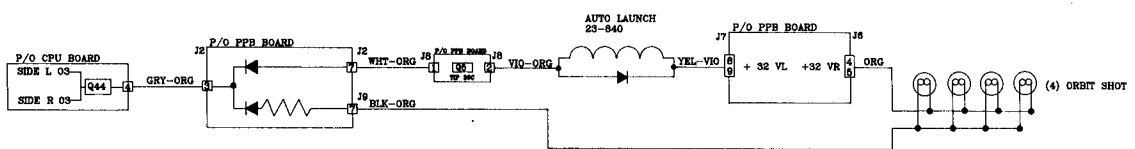
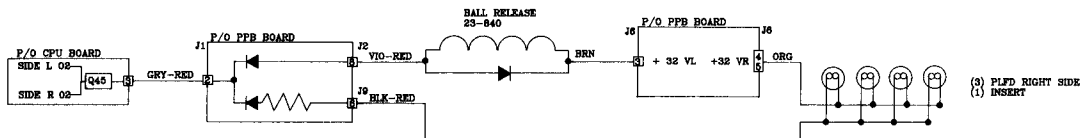
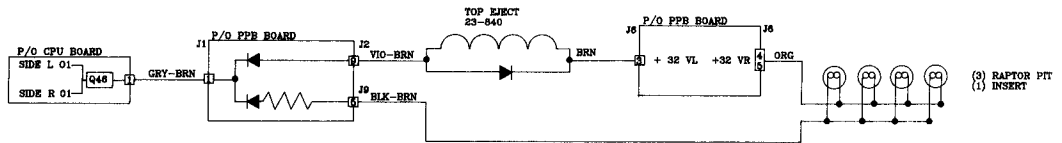
CPU Controlled Auxillary Solenoids

Coil Number	Coil Description	Control Line (CPU to Coil)	Power Line (PS to Coil)	Drive Transistor	Coil Type
17	Top Turbo Bumper	BLU-BRN CPU CN19-7	RED PS CN3-6	Q11	23-800
18	Left Turbo Bumper	BLU-RED CPU CN19-4	RED PS CN3-6	Q9	23-800
19	Right Turbo Bumper	BLU-ORN CPU CN19-3	RED PS CN3-6	Q8	23-800
20	Left Slingshot	BLU-YEL CPU CN19-6	RED PS CN3-6	Q10	23-800
21	Right Slingshot	BLU-GRN CPU CN19-8	RED PS CN3-6	Q12	23-800
22	Shaker Motor (See Schematic)	BLU-BLK CPU CN19-9	VIO-YEL PPB J7-3	Q13	23-800

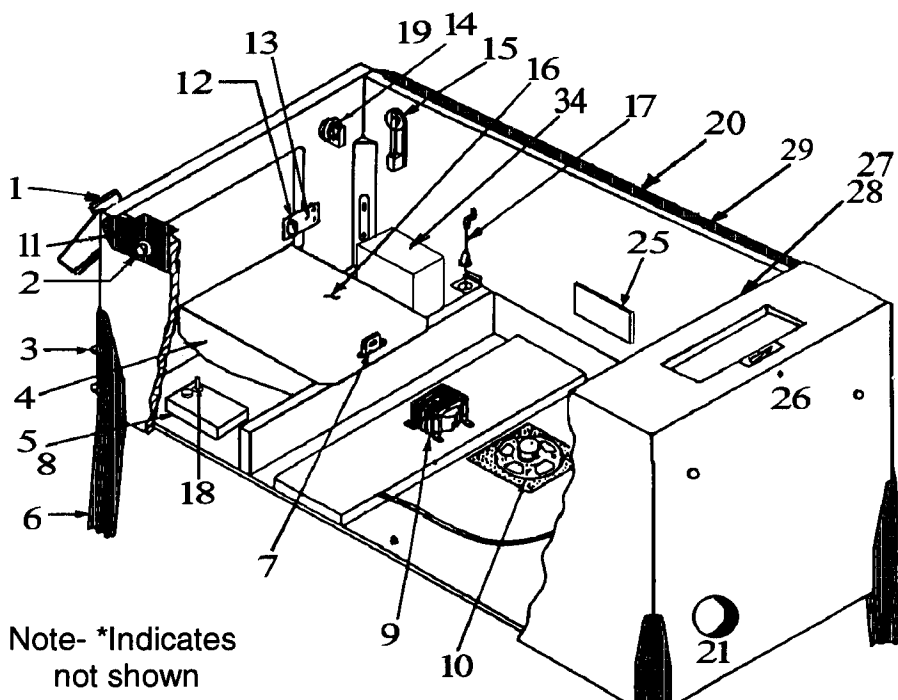
Flipper Solenoids

Coil Description	Flipper GND CPU to Flip Sw. to Flip.PCB	Power Lines FlipPc toCoil	Coil Type	Power Input To Flip PCB
Left Flipper 090-5020-30	ORN-GRY CPU CN19-2	BLU-GRY CN1-9	GRY-YEL CN2-4,5	23-900 BLK-WHT 50VDC
Right Flipper 090-5020-30	ORN-VIO CPU CN19-1	BLU-VIO CN1-1	BLU-YEL CN2-7,8	23-900 GRY, GRY-GRN 8VAC
Upper Right Flipper 090-5041-00	ORN-VIO CPU CN19-1	GRY-VIO CN1-12	BLK-YEL CN2-1,2	25-1800





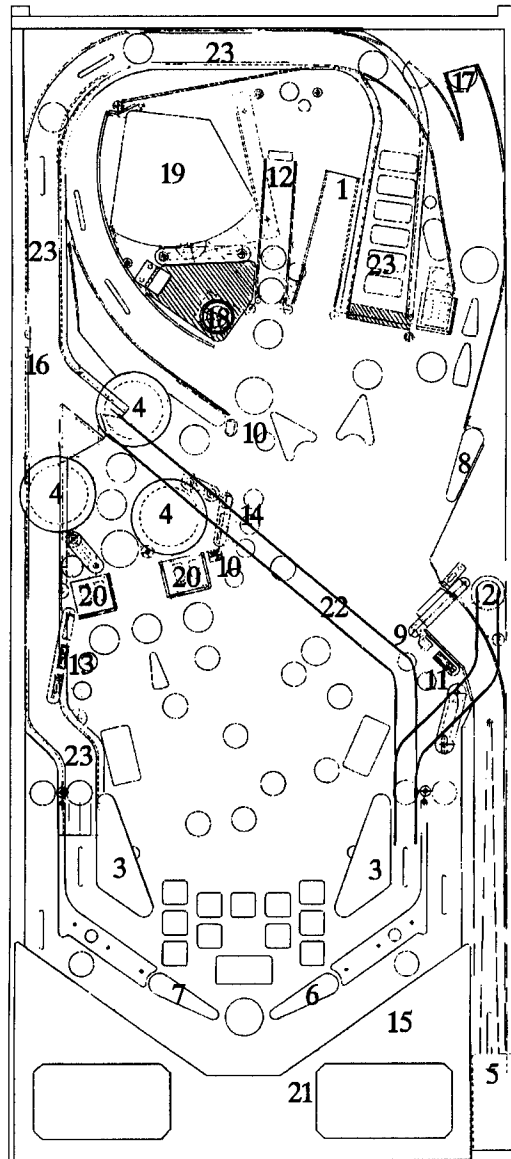
CABINET PARTS ILLUSTRATION



Note- *Indicates not shown

Item	Description	Part No.
1	Shooter Gun Assy.	500-5673-00
2	Flipper Button	500-5026-36
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	515-5360-00
9	Transformer	010-5003-00
10	Speaker-Round (8")	031-5005-00
11	Side Armor-Right	535-5010-31
12	Memory Protect Switch	180-5000-00
13	Memory Protect Switch Bracket	535-6409-00
14	Push Button Switch	180-0028-00
15	Left Flipper Leaf Switch	180-5048-01
15a	Right Flipper Leaf Switch *	180-5122-00
16	Cash Box Top	535-5013-03
17	Plumb Bob Tilt Assembly	500-5023-00
18	Volume Control	123-5000-02
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 *	500-5021-10
25	S.S.Flipper P.C.B.	520-5033-02
26	Roto Lock Bottom	355-5006-01
27	Rear Plastic Extrusion for Playfield Glass	545-5038-00
28	Mounting Foam for Extrusion	626-5004-00
29	Plastic Channel (Right & Left)	545-5017-00
30	Backbox Hinge Left *	535-6172-00
31	Backbox Hinge Right *	535-6172-01
32	Leg Leveler *	500-5017-00
33	Coin Door with Validator Blank*	500-5018-17
34	Shaker Motor	500-5228-00
35	Shaker Motor P.C. Board *	520-5065-00

Playfield - Major Assemblies



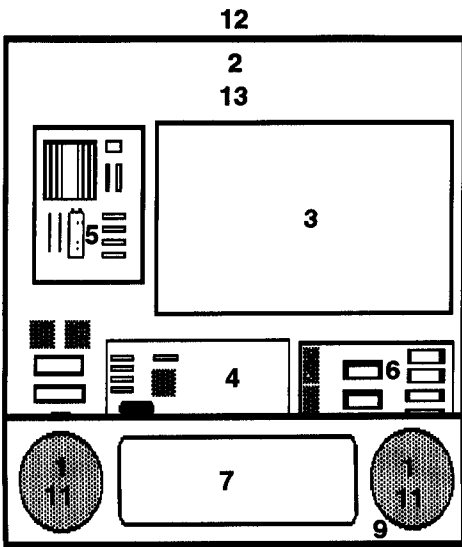
Item Description

Part No.

1.	Kickback Assy.	500-5081-00
2.	Super VUK	500-5116-04
3.	Sling Shot Assy.	500-5226-00
4.	Pop Bumper	500-5277-00
5.	Ball Launch	500-5477-00
6.	Flipper Right	500-5606-77
7.	Flipper Left	500-5606-78
8.	Flipper Right Upper	500-5606-79
9.	S/U Narrow Tgt. Assy.	500-5639-12
10.	S/U Tgt. 1 Bank Green	500-5639-14
11.	1 Bank ST/UP Target	500-5640-14
12.	1 Bank ST/UP Target	500-5640-18
13.	3 Bank ST/UP Target	500-5640-32
14.	3 Bank ST/UP Target	500-5641-00
15.	6 Ball Switch Assy.	500-5645-00
16.	Diverter Assy.	500-5661-00
17.	Ball Eject	500-5664-00
18.	Dino Eject	500-5665-00
19.	Dinosaur Assy.	500-5667-00
20.	Double Scoop	515-5772-00
21.	Outhole Ball Deflector	535-6568-00
22.	Wire Ramp	535-6531-00
23.	Ramp Assembly	500-5669-00

Note:
See page 27 for switch part numbers

Individual part breakdowns for most of these assemblies can be found on pages 37 through 43 and 68 through 72.



Item	Description	Part No.
1	Speakers	031-5004-00
2	Back Box Lock	355-5008-00
3	CPU †	520-5003-00NR
4	PPB Board	520-5021-05
5	Power Supply	520-5047-02
6	Sound Board †	520-5050-02
7	Dot Matrix ‡	520-5052-XX
8	Display Controller Board †	520-5055-00
9	Speaker Housing	545-5180-01
10	BackGlass Mylar *	830-5220-00
11	Speaker Grill	830-5623-00
12	Back Box Plastic	545-5391-00
13	Back Box Lock Plate	535-5860-00
14	Static Shield*	545-5463-00
15	Backglass Clear	660-5008-00

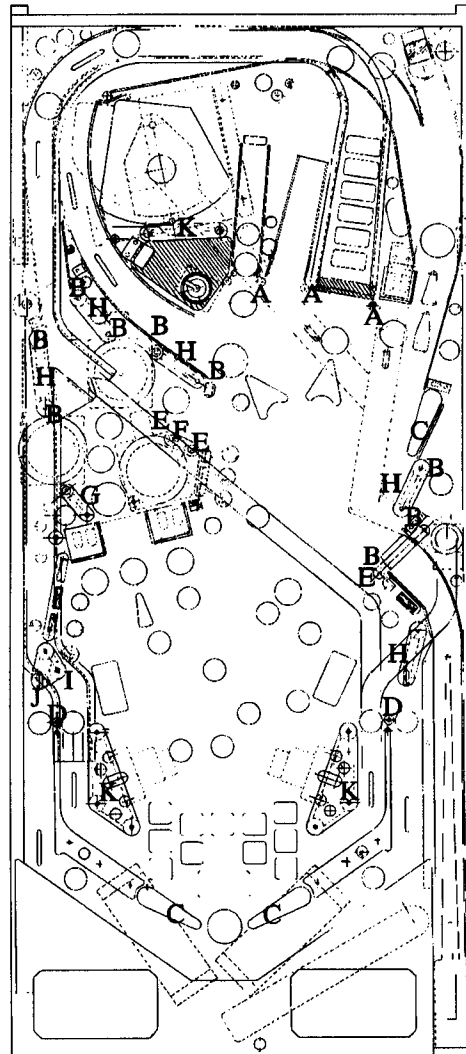
† When ordering PC Boards with ROMs please specify game name

* Not Shown

‡ Indicate Manufacturer

RUBBER PARTS ILLUSTRATION

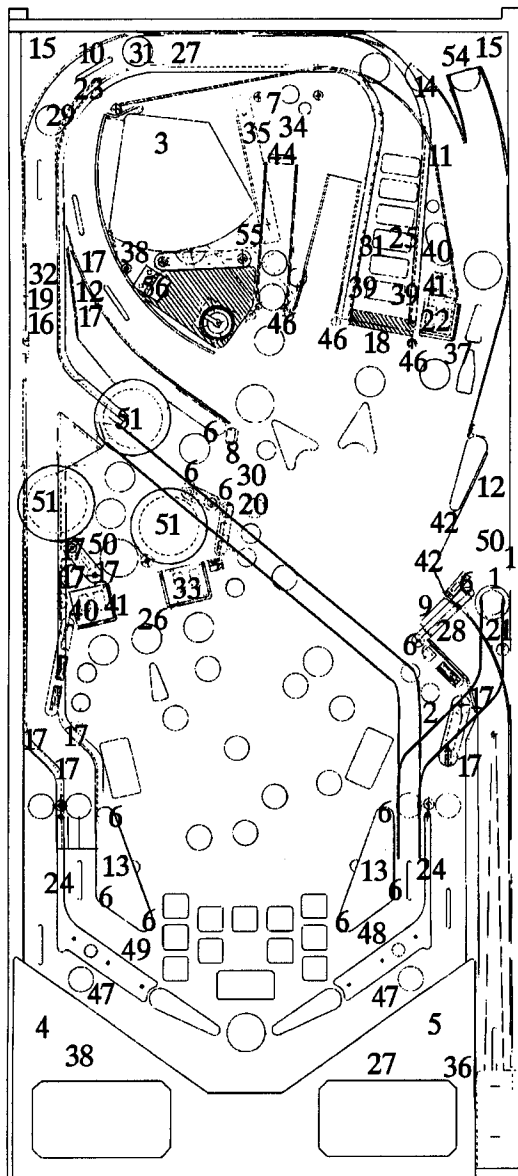
Item	Description	Part #
A	Post Rubber (3)	545-5009-00
B	Post Rubber (9)	545-5151-00
C	Flipper Rubber (3)	545-5277-00
D	3/16" I.D. Ring (3)	545-5348-01
E	3/8" I.D. Ring (3)	545-5348-03
F	3/4" I.D. Ring (1)	545-5348-04
G	1" I.D. Ring (1)	545-5348-05
H	1 1/4" I.D. Ring (5)	545-5348-06
I	1/2" I.D. Ring (1)	545-5348-07
J	3/8" O.D. Ring (1)	545-5348-19
K	2 3/4" I.D. Ring (3)	545-5348-20



Playfield Parts

No. Description

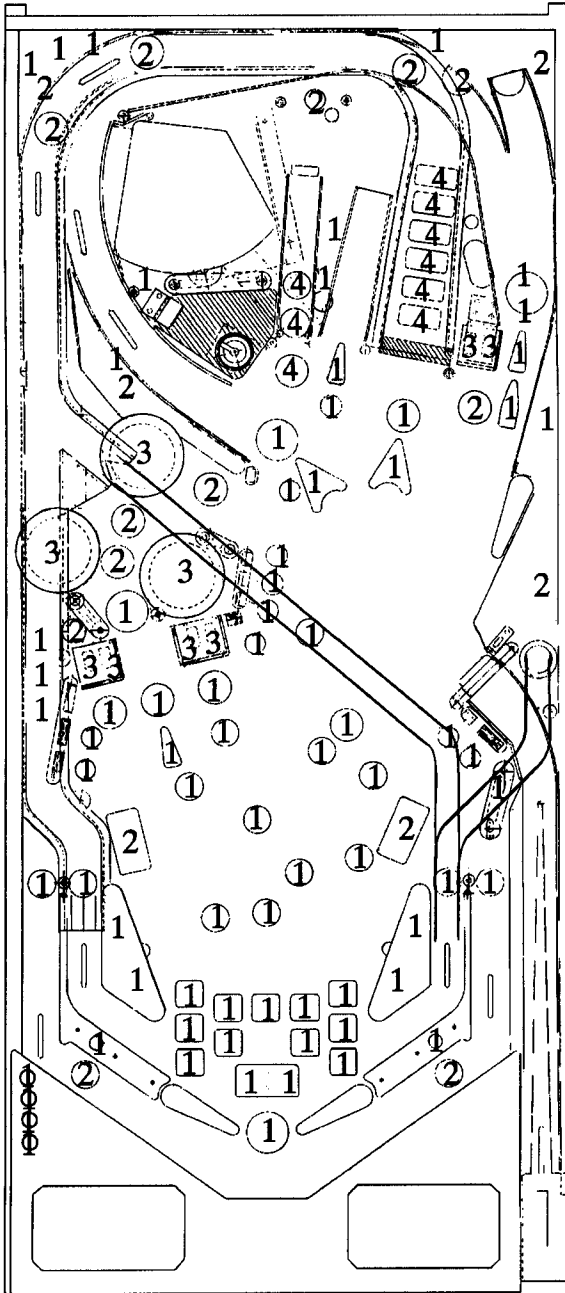
Part No.



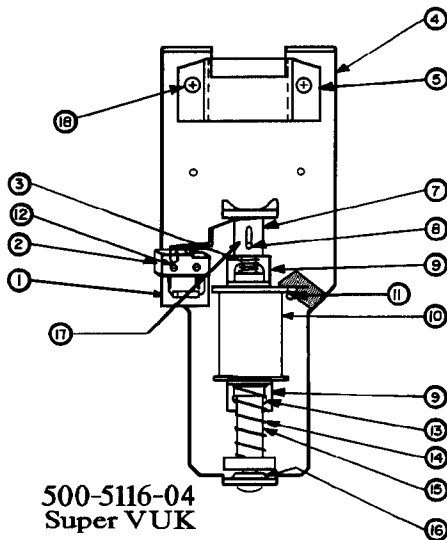
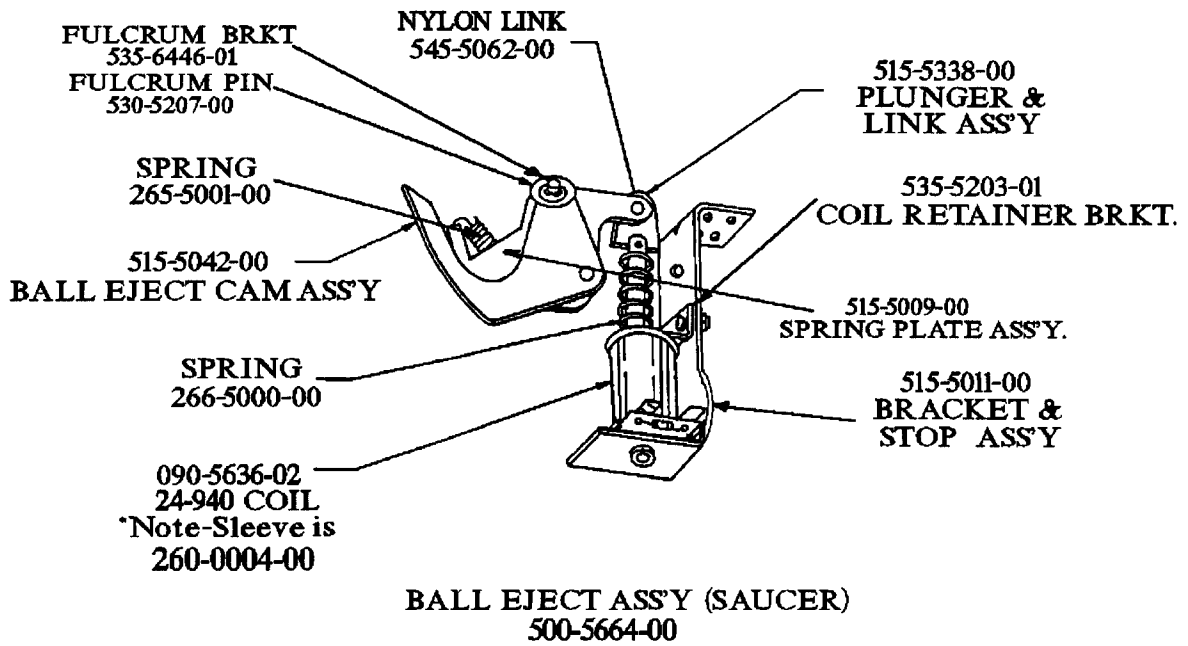
Note:
See page 27 for switch part numbers

- | | |
|------------------------------|-------------|
| 1. Spacer 1" | 254-5000-04 |
| 2. Wire Ramp | 535-6532-00 |
| 3. Dino Asy. | 500-5667-00 |
| 4. T-Rex Lamp | 500-5670-00 |
| 5. Lock Ball Assy. | 500-5684-00 |
| 6. Metal Standoff | 530-5035-01 |
| 7. Amber Plastic (Fossil) | 545-5331-00 |
| 8. Rebound Gate | 515-5797-00 |
| 9. Rebound Gate | 535-5022-00 |
| 10. Ramp Switch | 500-5679-00 |
| 11. Wire Form 2 1/2" | 535-5300-01 |
| 12. Wire Form 3" | 535-5300-02 |
| 13. Wire Form 1" | 535-5300-05 |
| 14. Wire Form 1 3/4" | 535-5300-09 |
| 15. Mini Mars Red | 550-5055-02 |
| 16. Retaining Ring | 250-0008-00 |
| 17. Bumper Post | 545-5308-00 |
| 18. Ramp Plate | 535-6534-00 |
| 19. Diverter Spring | 266-5034-00 |
| 20. Rebound Hinge Pin | 535-5372-00 |
| 21. Pteranodon | 545-5396-00 |
| 22. Ball Deflector | 535-5380-01 |
| 23. Wire Gate | 535-5625-00 |
| 24. Wire Form | 535-5642-00 |
| 25. Wire Gate | 535-5694-00 |
| 26. Scoop Gate | 535-5696-00 |
| 27. Wire Gate | 535-5697-00 |
| 28. Rebound Brkt. | 535-5742-00 |
| 29. Wire Gate and Swith Brkt | 535-5960-00 |
| 30. Ball Gate Flap | 535-6043-01 |
| 31. Sw. Body Protectant | 535-6539-00 |
| 32. Diverter Assembly | 515-5781-00 |
| 33. Scoop Plate | 535-6548-00 |
| 34. Lite Brkt. | 535-6559-00 |
| 35. Fossil Brkt | 535-6562-00 |
| 36. Ball Deflector | 535-6568-00 |
| 37. Ball Hopper | 535-6592-00 |
| 38. T-Rex Brkt. | 535-6596-00 |
| 39. Lite Cover Red | 545-5014-02 |
| 40. Lite Cover Green | 545-5014-04 |
| 41. Lite Cover Yellow | 545-5014-06 |
| 42. Double Rubber | 545-5209-01 |
| 43. Lite Shield | 545-5255-00 |
| 44. Amber Mosquito | 545-5331-00 |
| 45. Small Plastic Spacer | 550-5034-01 |
| 46. Metal Standoff | 530-5007-00 |
| 47. Return Lane Guides | 550-5037-01 |
| 48. Return Guide-Right | 550-5043-01 |
| 49. Return Guide-Left | 550-5045-01 |
| 50. Mini Mars Clear | 550-5055-01 |
| 51. Pop Bumper Cap | 550-5056-01 |
| 52. Decal Sheet | 820-6030-00 |
| 53. Screened Playfield | 830-5120-00 |
| 54. Ball Deflector | 535-6017-00 |
| 55. Brkt, Dino Skirt | 535-6618-00 |
| 56. Brkt, Dino Deflector | 535-6619-00 |

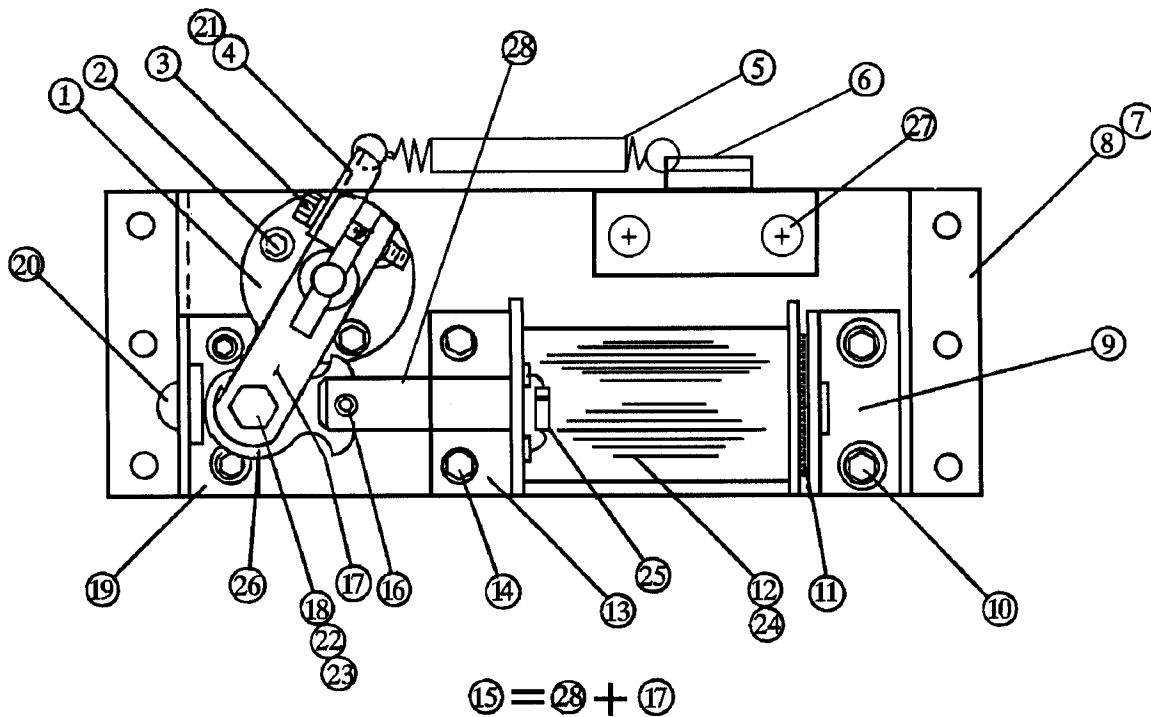
Lamp Bulb Part Numbers



Item	Description	Part Number
1	#44 Bulb	165-5000-44
2	#89 Bulb	165-5000-89
3	#555 Bulb	165-5002-00
4	# 906 Bulb	165-5004-00



Item	Description	Part #
1	Sw. Insulator	545-5193-00
2	Micro Switch	180-5064-00
3	Cap Spring	266-5025-00
4	Ball Kickup Mtg. Brkt.	535-5298-00
5	Ball Guide Brkt.	535-6047-00
6	# 6-32 x ³ / ₈ SEMS (2)*	232-5201-00
7	Vert. Kick. Cap	545-5227-00
8	Pin ³ / ₃₂ x ⁷ / ₁₆	251-5004-00
9	Coil Retainer Brkt. (2)	535-5203-01
10	Coil 23-800	090-5001-01
11	1N4004 Diode	112-5003-00
12	2-56 x ¹ / ₂ Screw (2)	237-5806-00
13	# 6-32 x ¹ / ₄ Phil.M.S.	232-5200-00
14	Spring	266-5009-00
15	Plunger Assy.	515-5352-00
16	Bumper	545-5105-00
17	Compression Ring (3)	270-5010-00
18	#6-32 x ¹ / ₄ SEMS	232-5200-00



Item	Description	Part #	Item	Description	Part #
1	Flipper Bushing	545-5070-00	15	Plunger, Link & Pawl	515-5051-00
2	#6 x ³ / ₈ Hex Hd.scr.	234-5000-00	16	Pin	251-5000-00
3	#10-32 x ³ / ₄ Soc.Hd.scr.	232-2206-12	17	Pawl	530-5070-00
4	Spring Brkt. (left)	535-6421-00	18	10-32x ³ / ₄ Shoulder Bolt	231-5019-00
5	Flipper Return Spring	265-5029-02	19	Rebound Brkt.	535-5279-00
6	Spring Bracket	535-6469-00	20	Rubber Bumper	545-5105-00
7	Flipper Base (left)	515-5077-02	21	Spring Brkt. (right)	535-6422-00
8	Flipper Base (right)	515-5077-01	22	Bushing (inside Link)	530-5139-00
9	Coil Stop Brkt.	515-5346-00	23	10-32 Elastic Stop Nut	238-1306-00
10	¹ / ₄ -20x ³ / ₈ Soc.Hd.scr.	231-2507-06	24	Coil Sleeve	260-0003-00
11	Spring Washer	269-5002-00	25	1N4004 Diode	112-5003-00
12	Coil 23-900	090-5020-30	26	Flipper Link	545-5401-00
13	Front Brkt.	515-5129-00	27	#8 ³ / ₈ Pan Hd.Thr.Form	237-5821-00
14	#8 x ³ / ₈ Hex Hd.Scr.	234-5100-00	28	Plunger & Link Ass'y.	515-5822-00

Flipper Assemblies

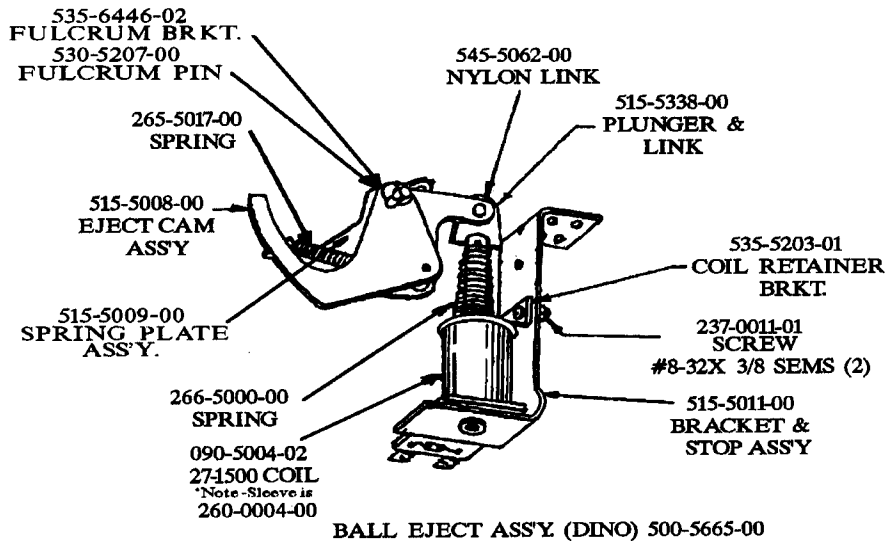
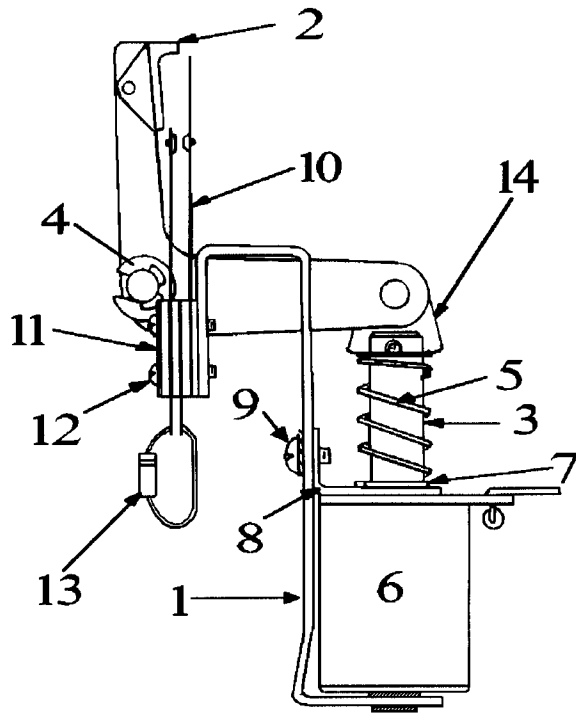
500-5693-01 Right

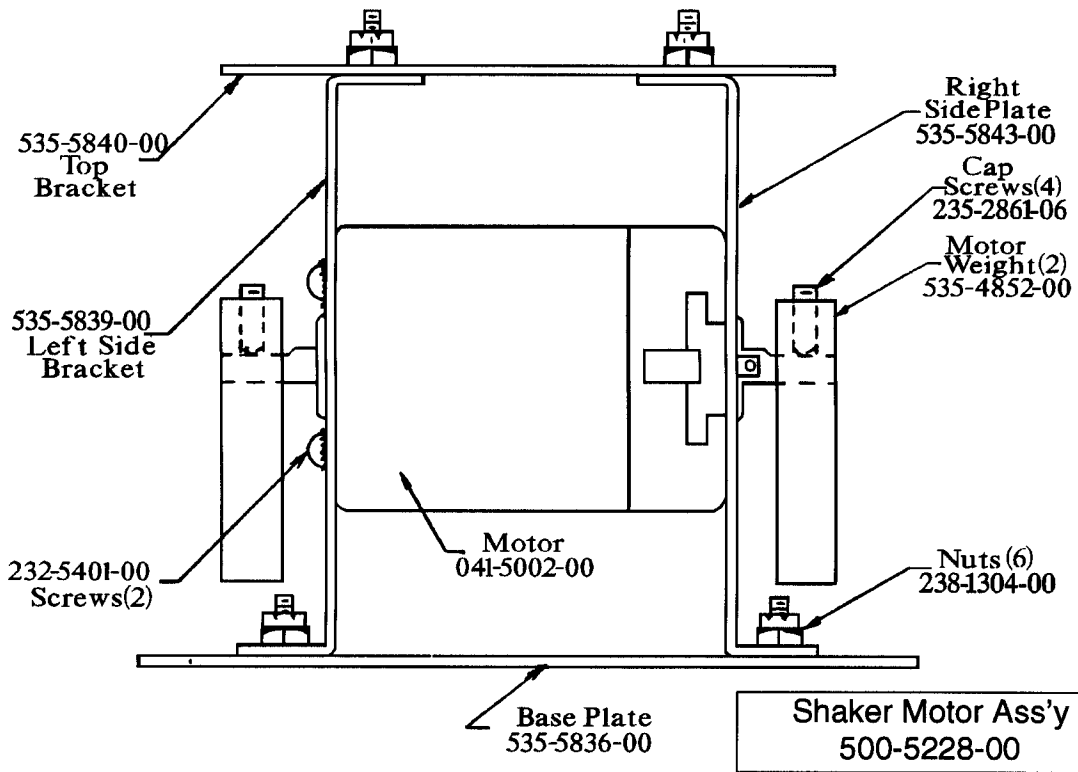
500-5693-02 Left (uses Switch 180-5124-00)

500-5694-01 Upper Right (uses coil 090-5030-00)

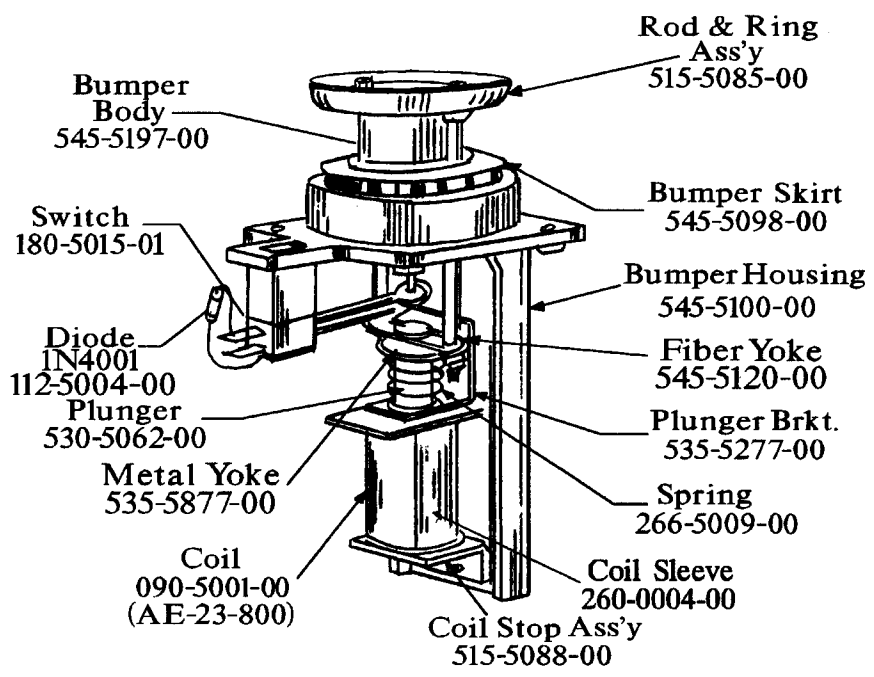
Slingshot Assembly 500-5226-00

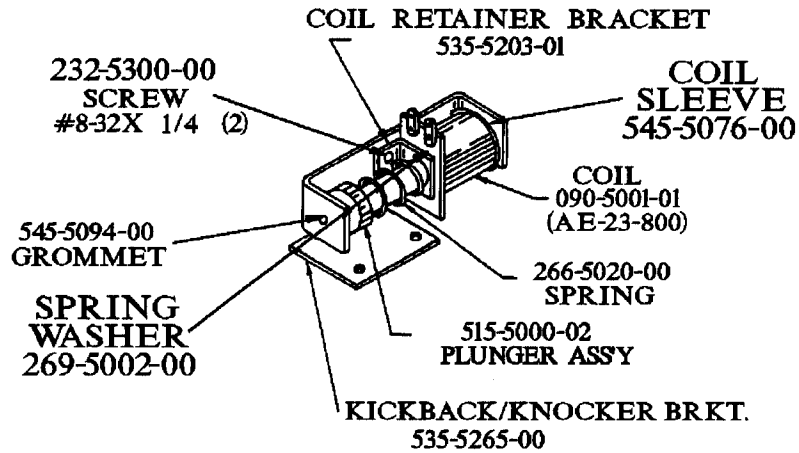
Item	Description	Part No.
1	Slingshot Bracket	515-5339-00
2	S.S. Arm & Tip Assy.	515-5340-00
3	Plunger & Link Assy.	515-5338-00
4	1/4 Retaining Ring (2)	270-5002-00
5	Spring	266-5020-00
6	23-800 Coil w/Sleeve	090-5001-02
7	Coil Sleeve	260-0004-00
8	Coil Retainer	535-5203-01
9	#8-32 X 1/4" Screw (2)	232-5300-00
10	Slingshot Switch (2)	180-5054-00
11	Tension Plate (2)	535-5846-00
12	#4-40 X 1/2" Screw (4)	237-5837-00
13	Diode 1N4004 (2)	112-5004-00
14	Link	545-5062-00



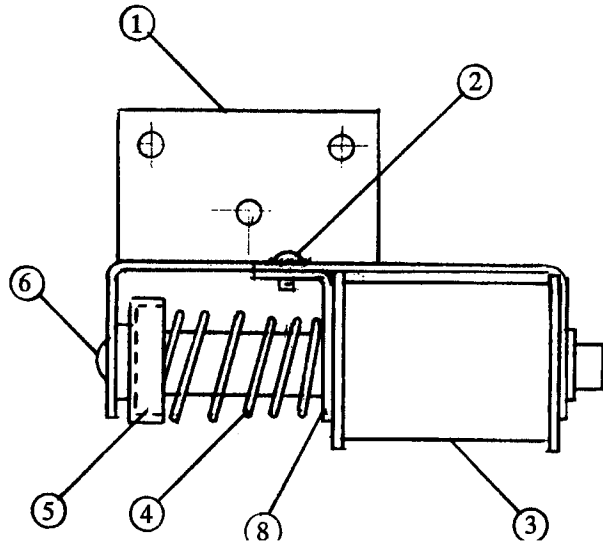


**Turbo Bumper
500-5227-00**



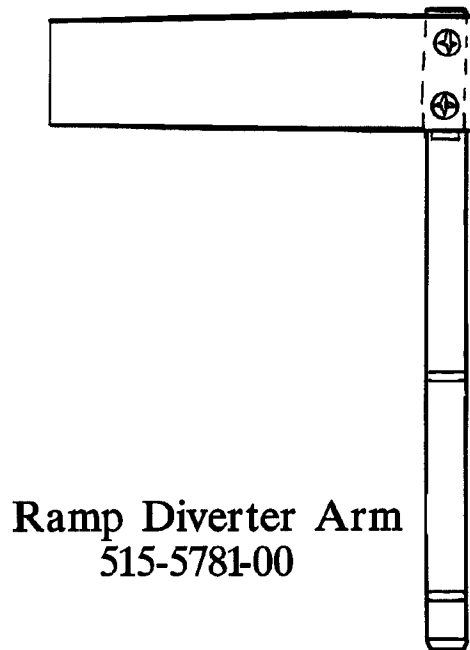
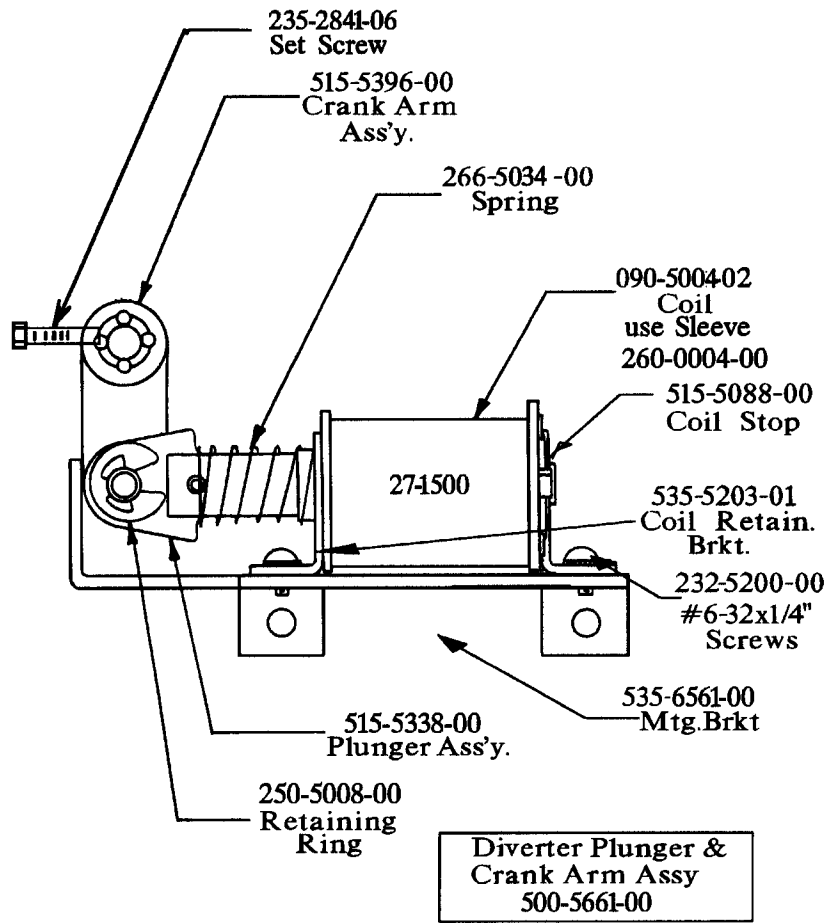


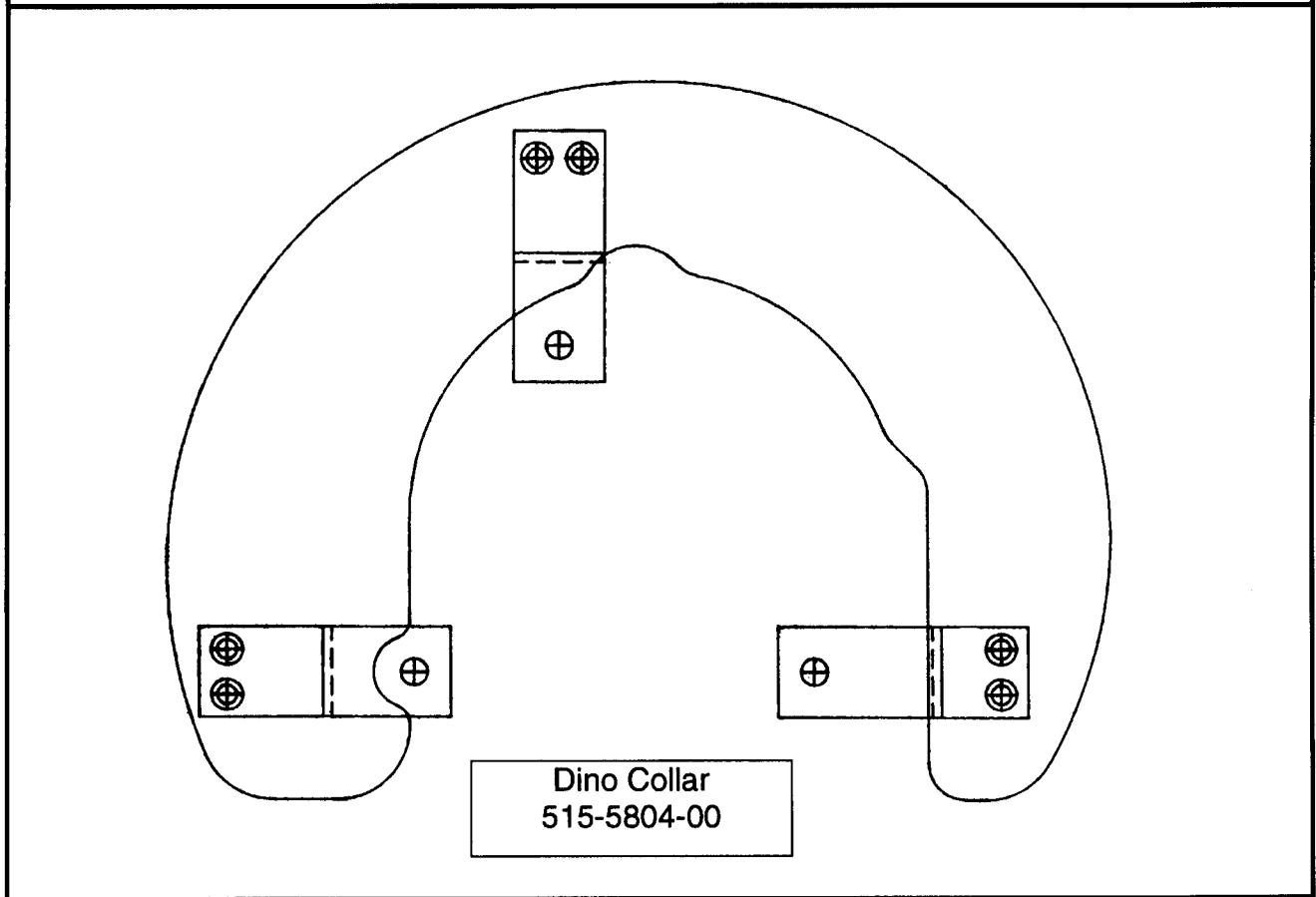
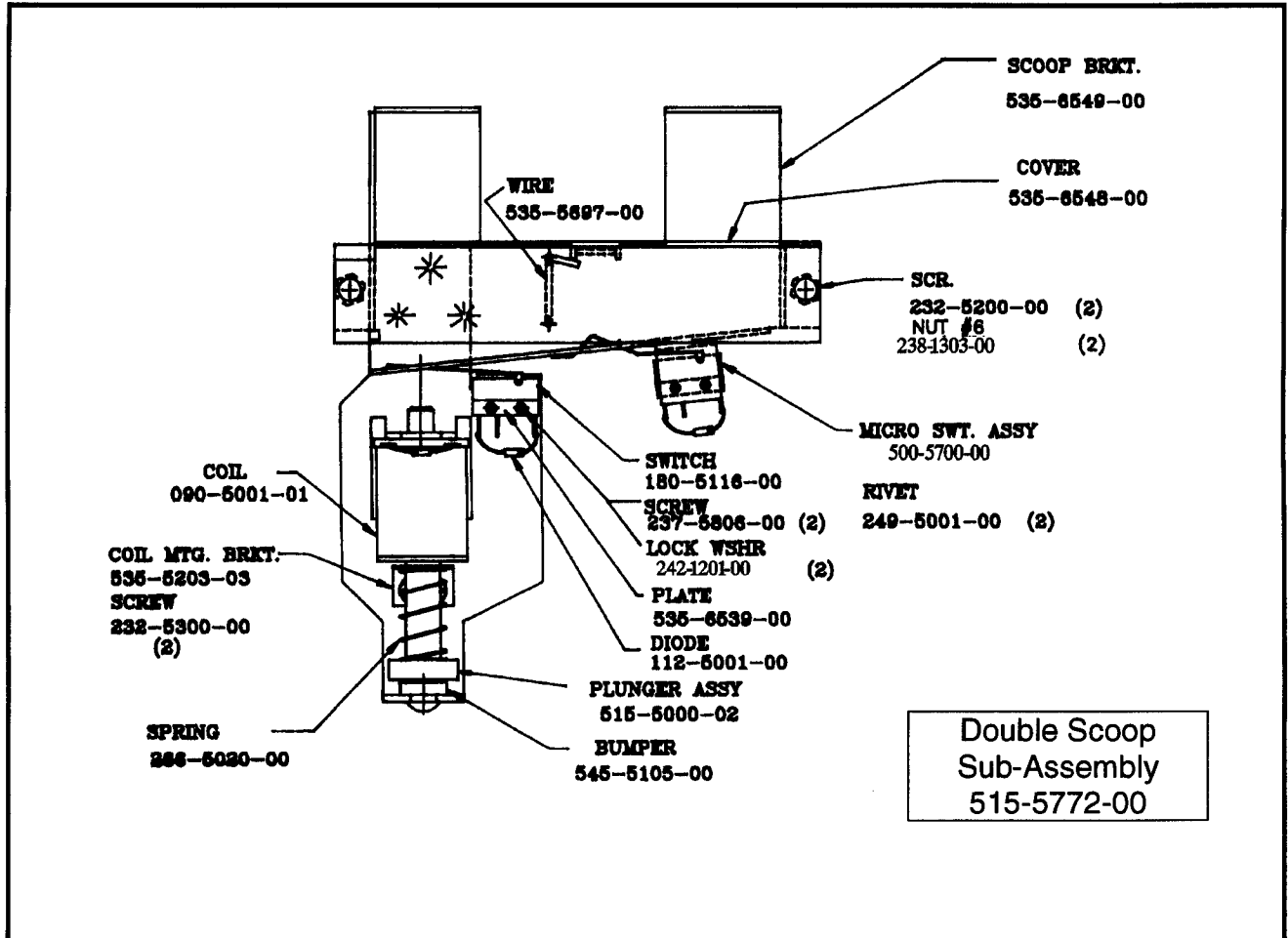
KICKBACK &
KNOCKER ASSEMBLY 500-5081-00

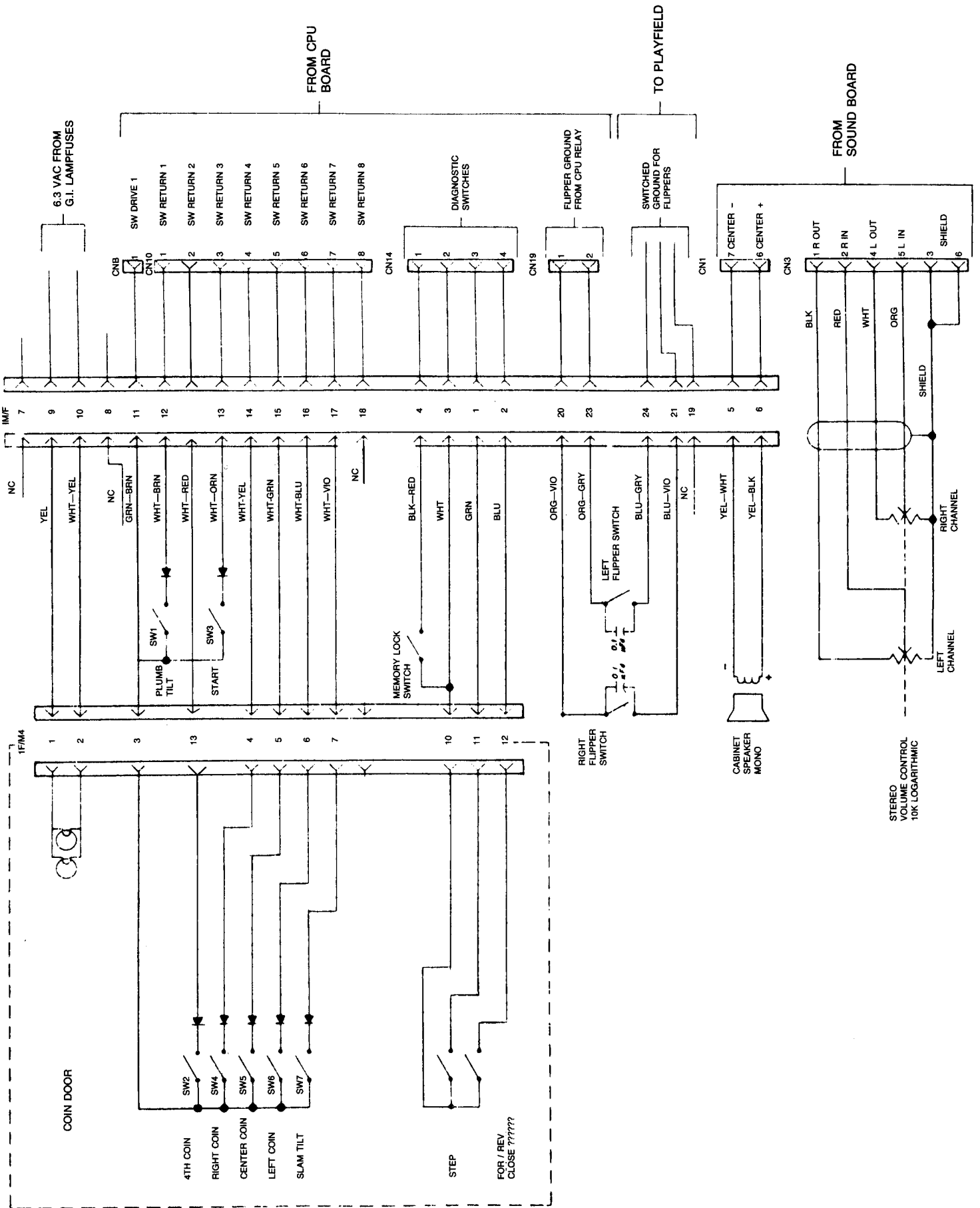


Item	Description	Part #
1	Coil Mtg. Brkt.	535-6385-00
2	8-32x1/4 Sems.(2)	232-5300-00
3	Coil 23-800	090-5001-01
4	Spring	266-5020-00
5	Plunger Ass'y.	515-5000-02
6	Grommet	545-5105-00
7	1N4004 Diode	112-5003-00
8	Coil Retainer Brkt.	535-5203-03

Ball Launch Ass'y
500-5477-00







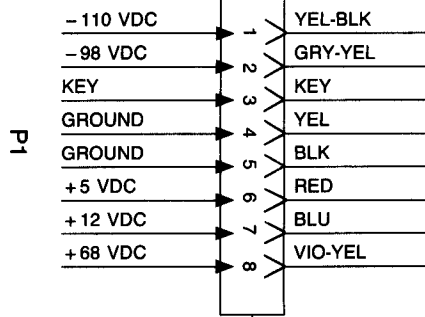
44 Cabinet Wiring Diagram

DOT MATRIX BOARD

520-5052-00

CONTROLLER BOARD

520-5055-00



RIBBON CABLE P2

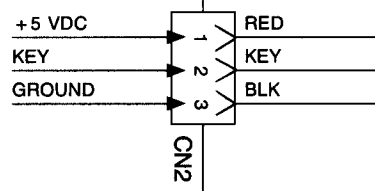
1	0	0	DISPLAY ENABLE	GROUND
2	0	0	ROW DATA	GROUND
3	0	0	ROW CLOCK	GROUND
4	0	0	COL. LATCH	GROUND
5	0	0	PIX CLOCK	GROUND
6	0	0	SER. DATA	GROUND
7	0	0	NOT USED	NOT USED

RIBBON CABLE CN1

1	0	0	DISPLAY ENABLE	GROUND
2	0	0	ROW DATA	GROUND
3	0	0	ROW CLOCK	GROUND
4	0	0	COL. LATCH	GROUND
5	0	0	PIX CLOCK	GROUND
6	0	0	SER. DATA	GROUND
7	0	0	NOT USED	NOT USED

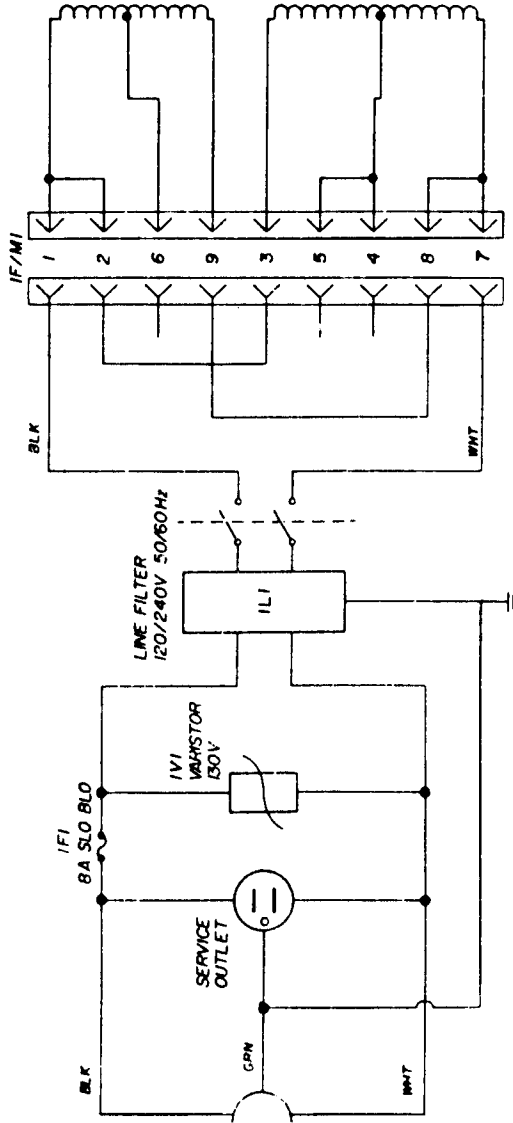
RIBBON CABLE CN3

1	0	0	NOT USED	NOT USED
2	0	0	SWITCH 1	SWITCH 2
3	0	0	SWITCH 3	SWITCH 4
4	0	0	SWITCH 5	SWITCH 6
5	0	0	SWITCH 7	SWITCH 8
6	0	0	DATA 0	DATA 1
7	0	0	DATA 2	DATA 3
8	0	0	DATA 4	DATA 5
9	0	0	DATA 6	DATA 7
10	0	0	STB	RESET
11	0	0	NOT USED	STAT 0
12	0	0	STAT 1	STAT 2
13	0	0	STAT 3	BUSY



THIS CONFIGURATION FOR 115V

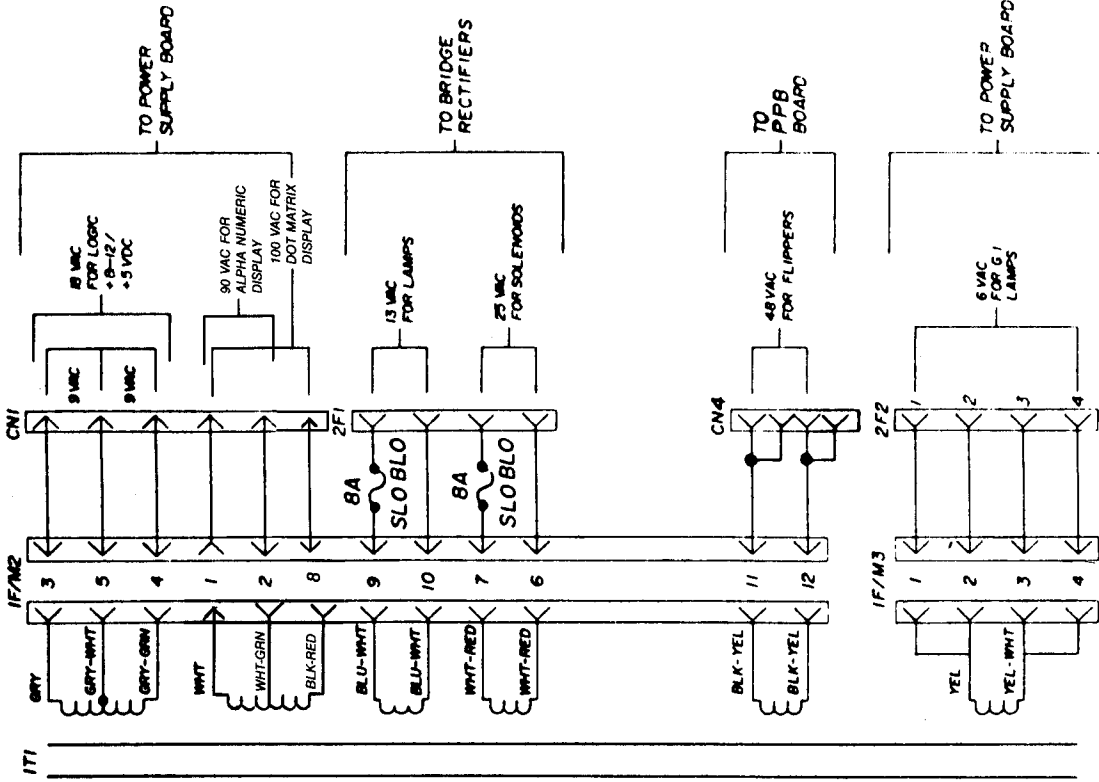
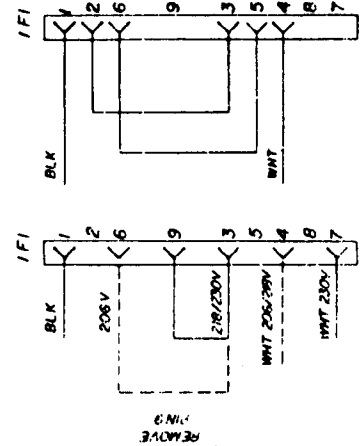
FOR LOWER LINE VOLTAGES
OR 230 VOLT OPERATION
SEE SAMPLES BELOW

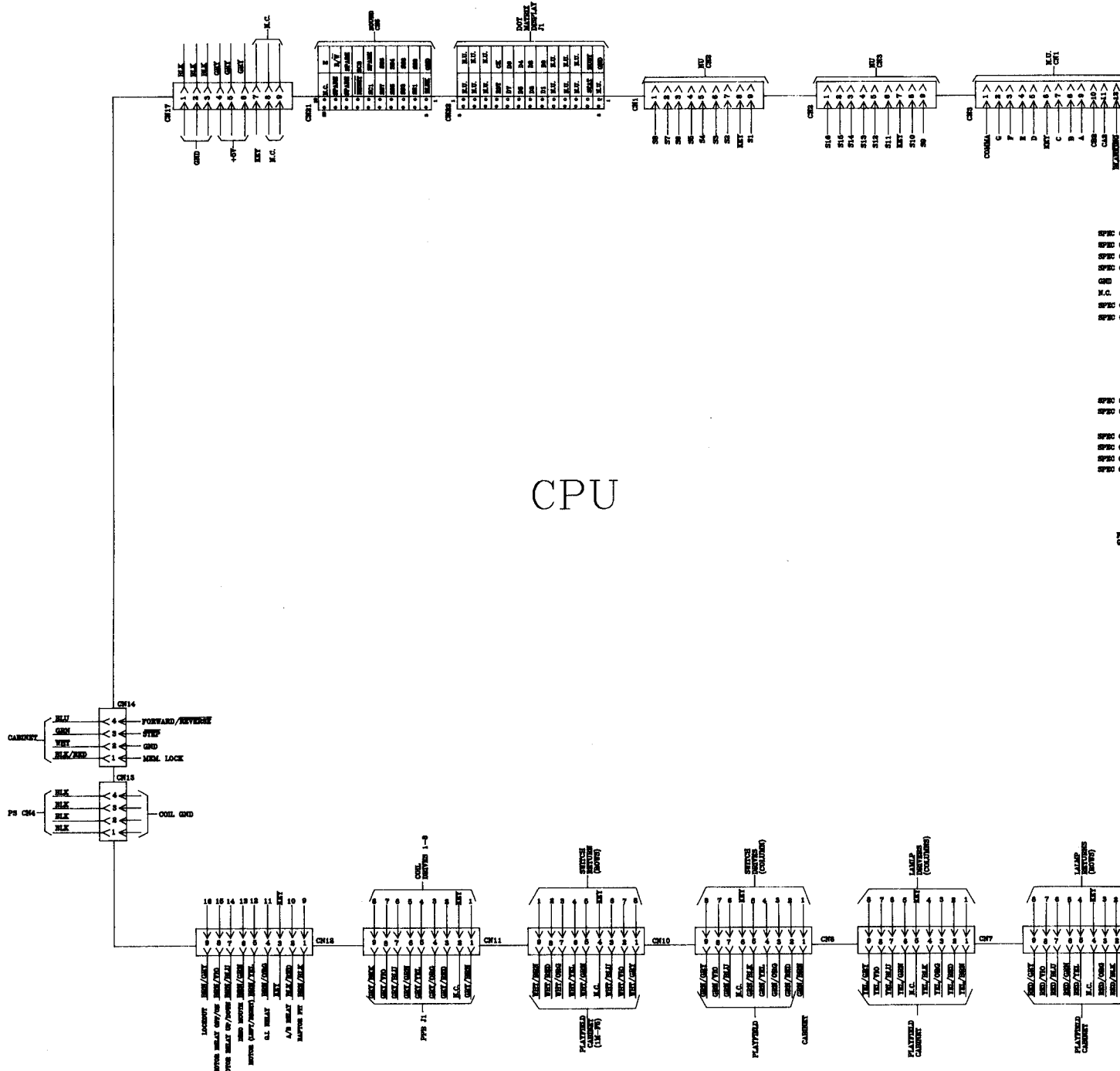
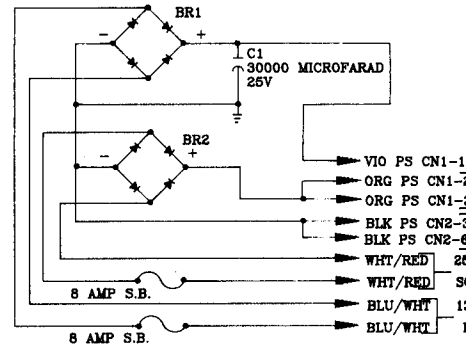
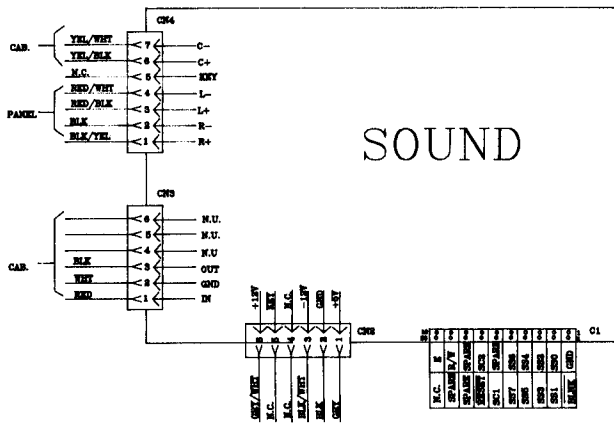


JUMPERS FOR VOLTAGE VARIATION

230/218/206 VOLTS 100/105 VOLTS

IF1 - 4A SLO BLO IF1 - 8A SLO BLO
I/V1 - 275V VARIATOR I/V1 - 130V VARIATOR





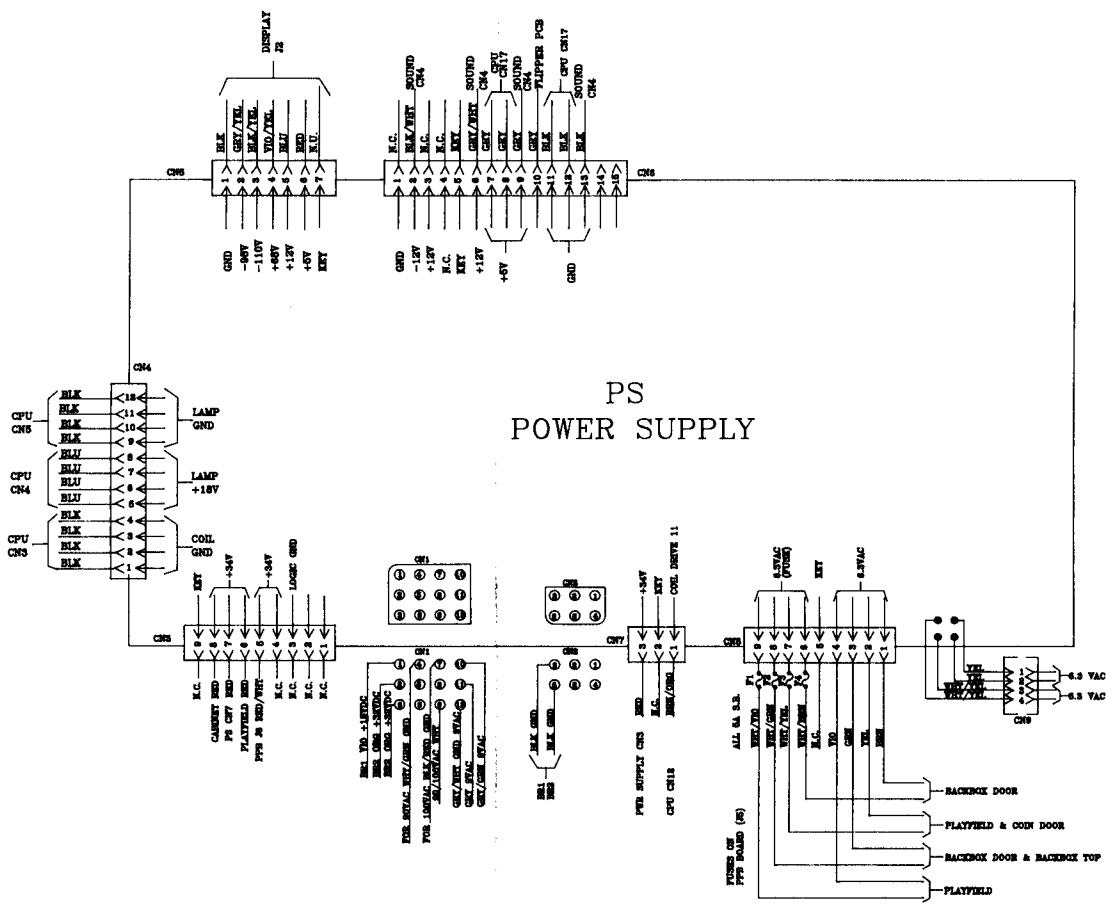
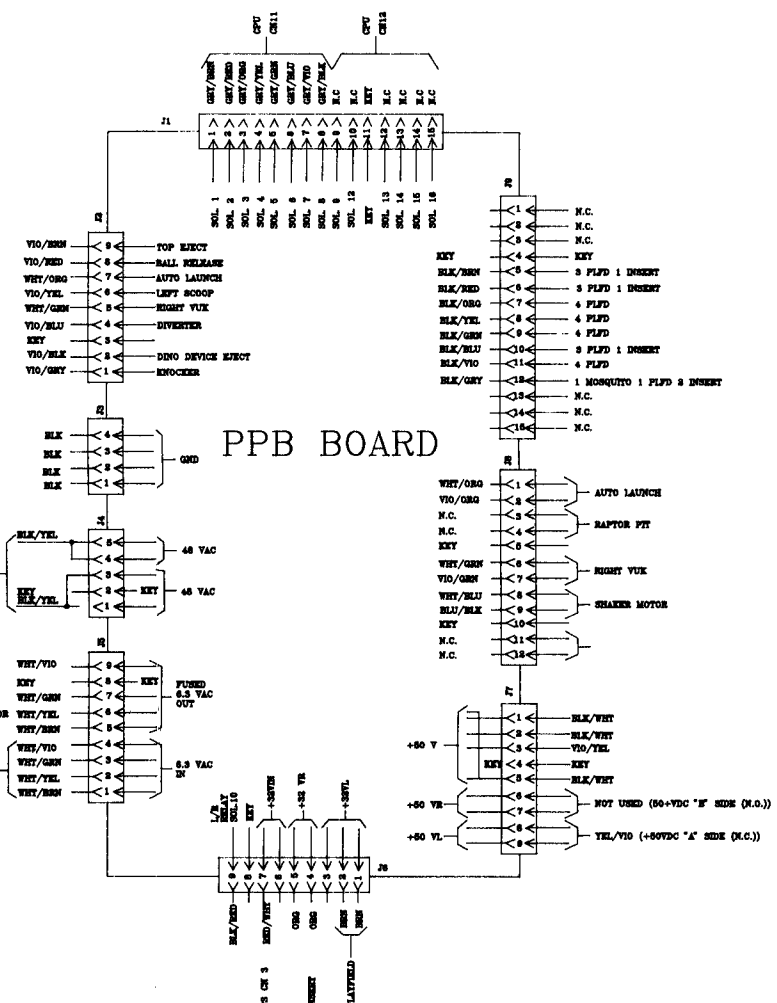
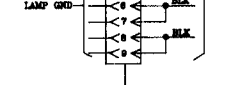
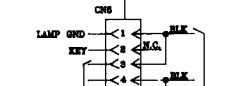
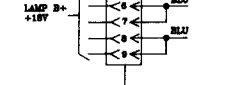
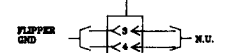
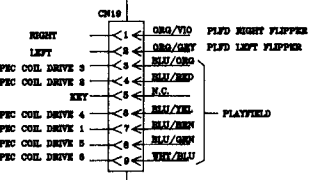
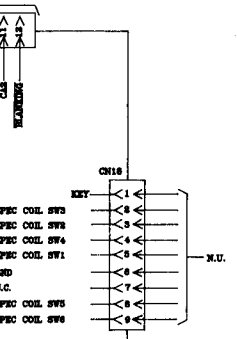
SOUND

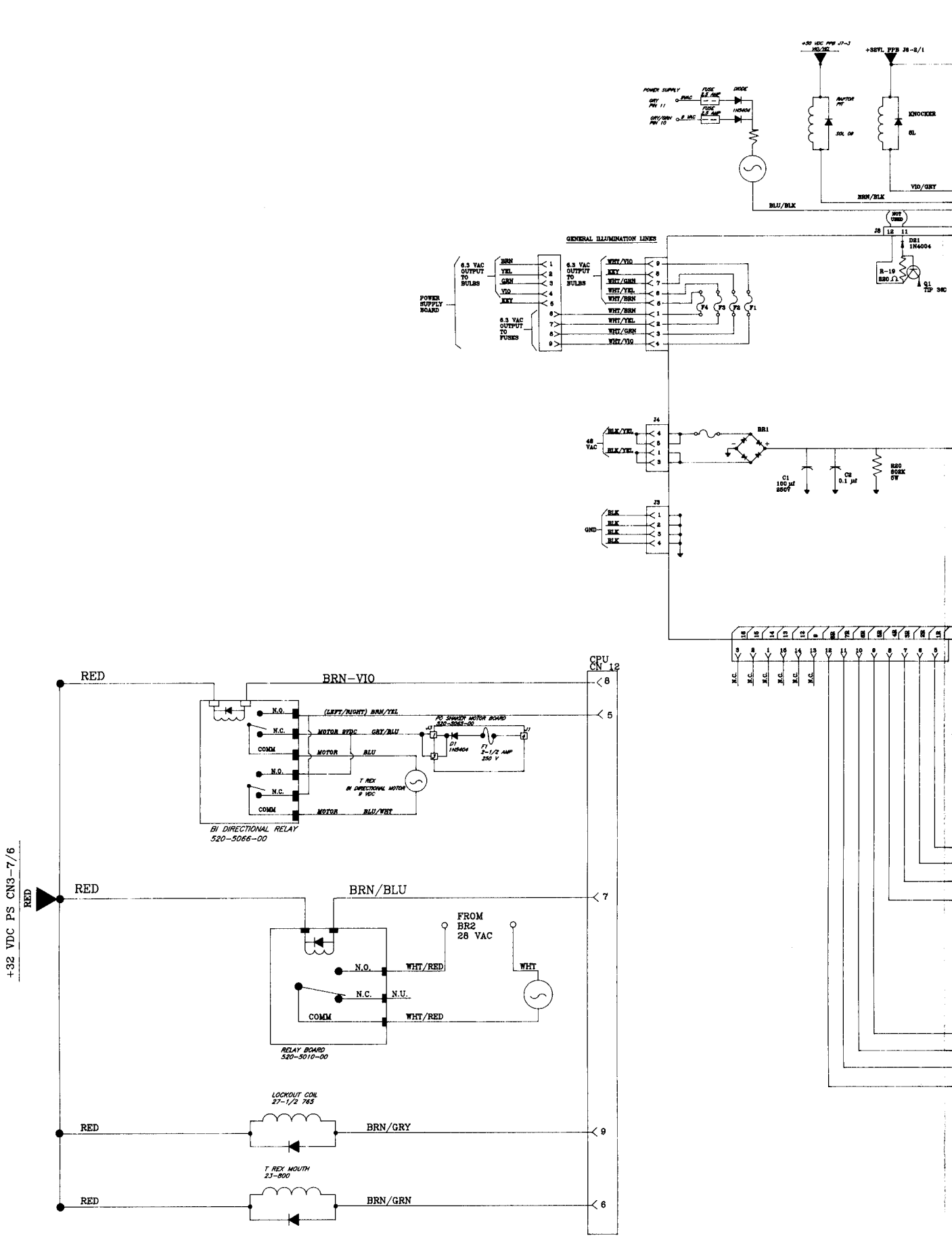
CPU

1-1 +18VDC
 41-2 +34VDC
 41-3 GND
 42-3 GND
 42-6 GND

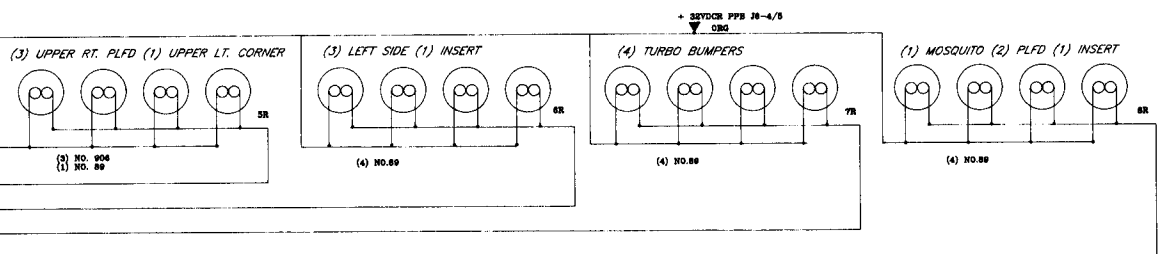
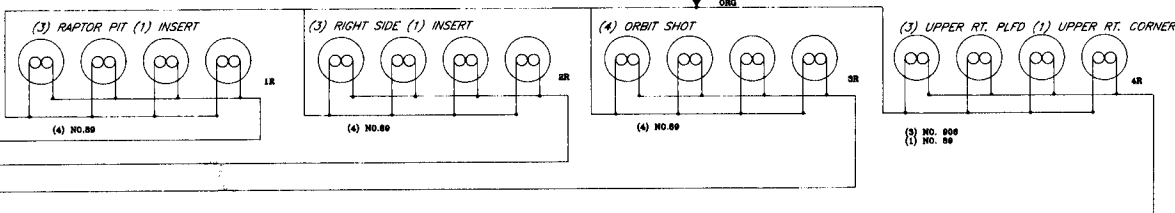
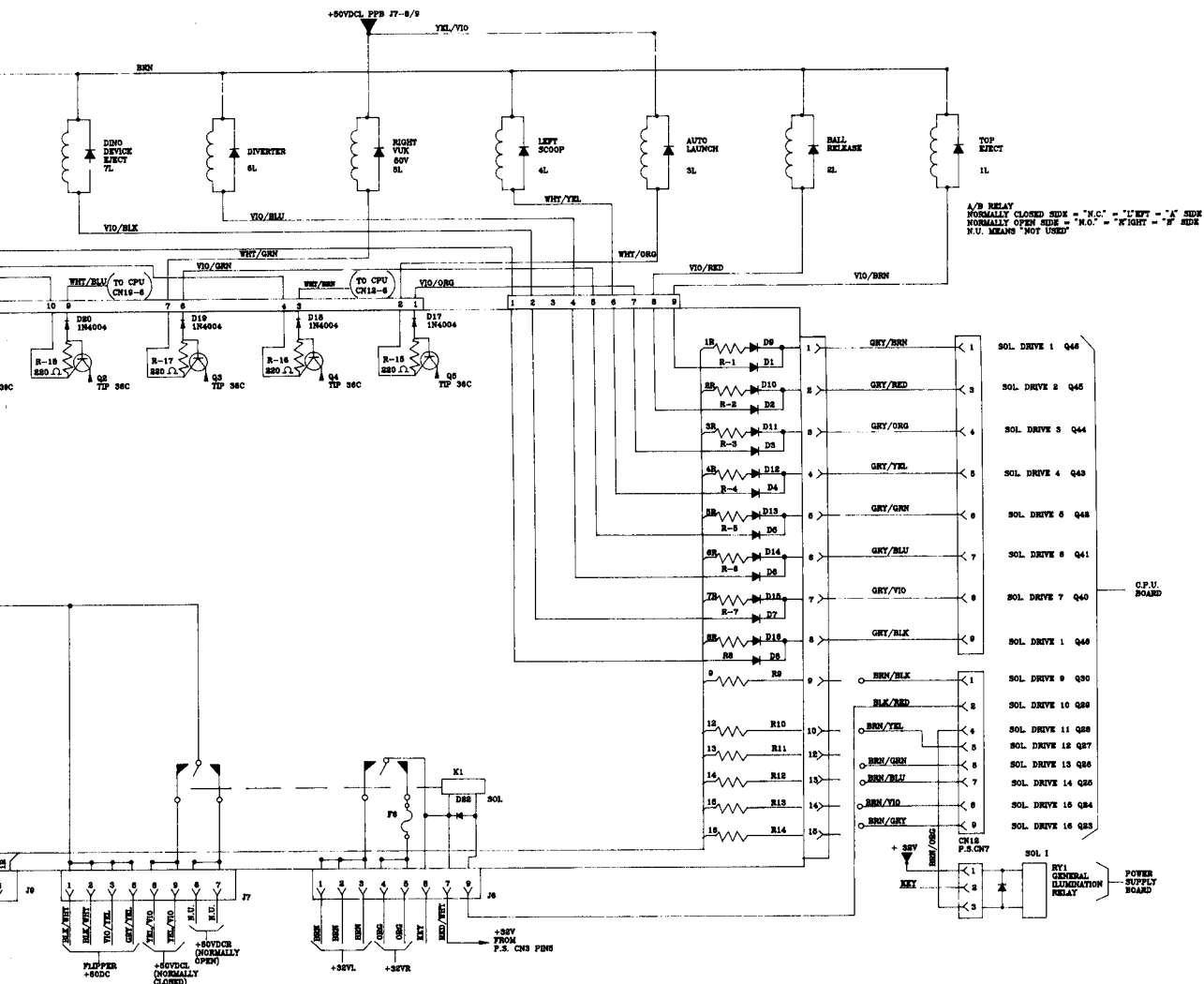
25VAC FOR SOLENOIDS
 13VAC FOR LAMPS

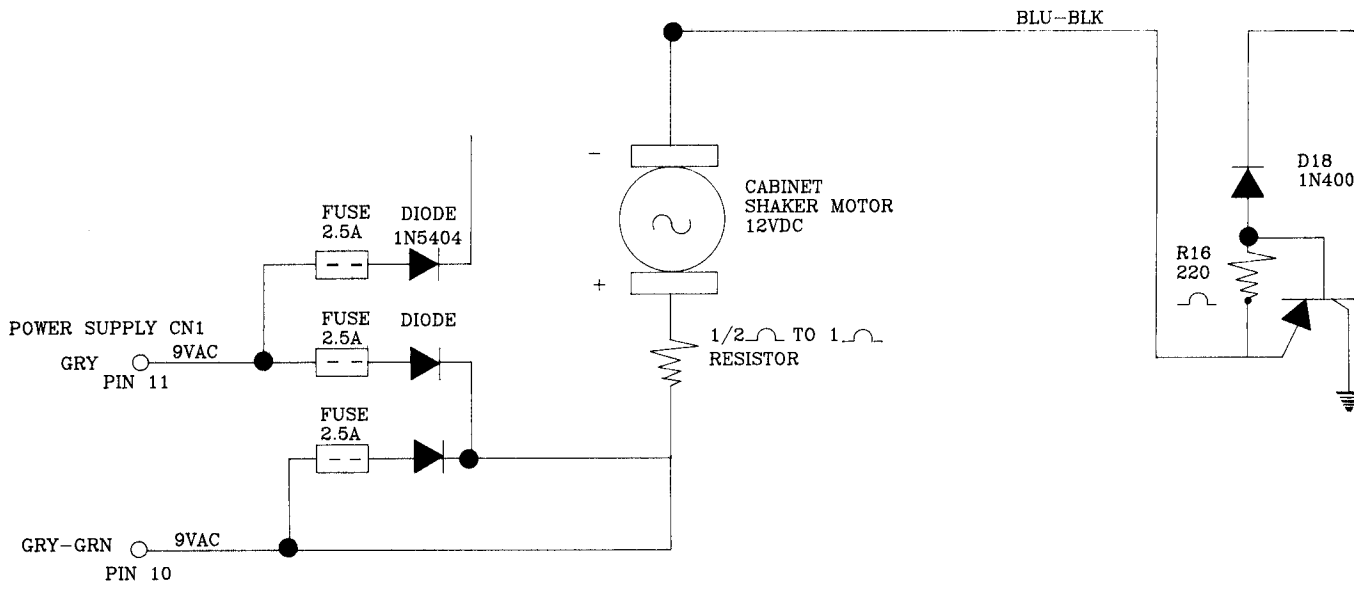
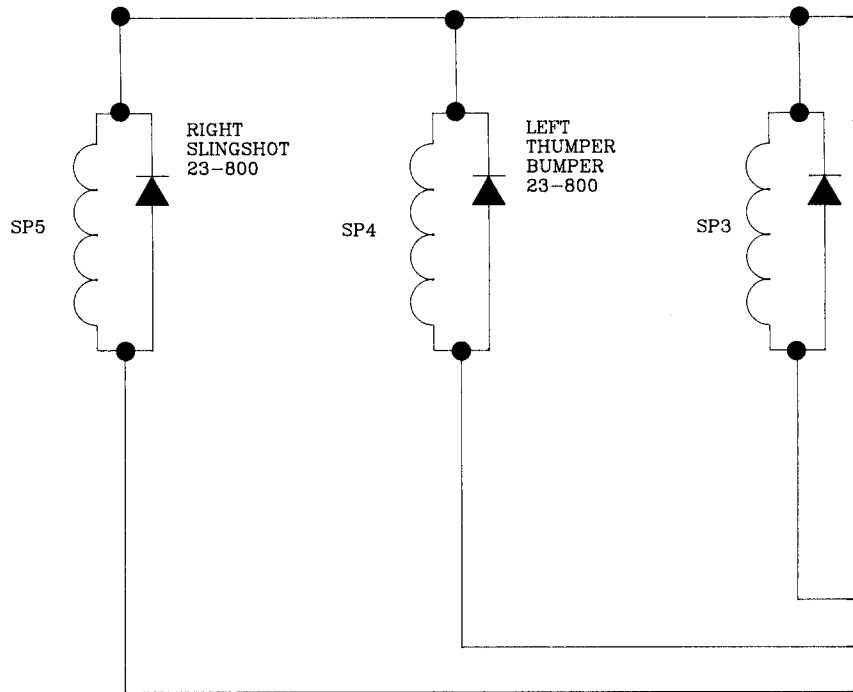
FROM POWER
 WIRING DIAGRAM

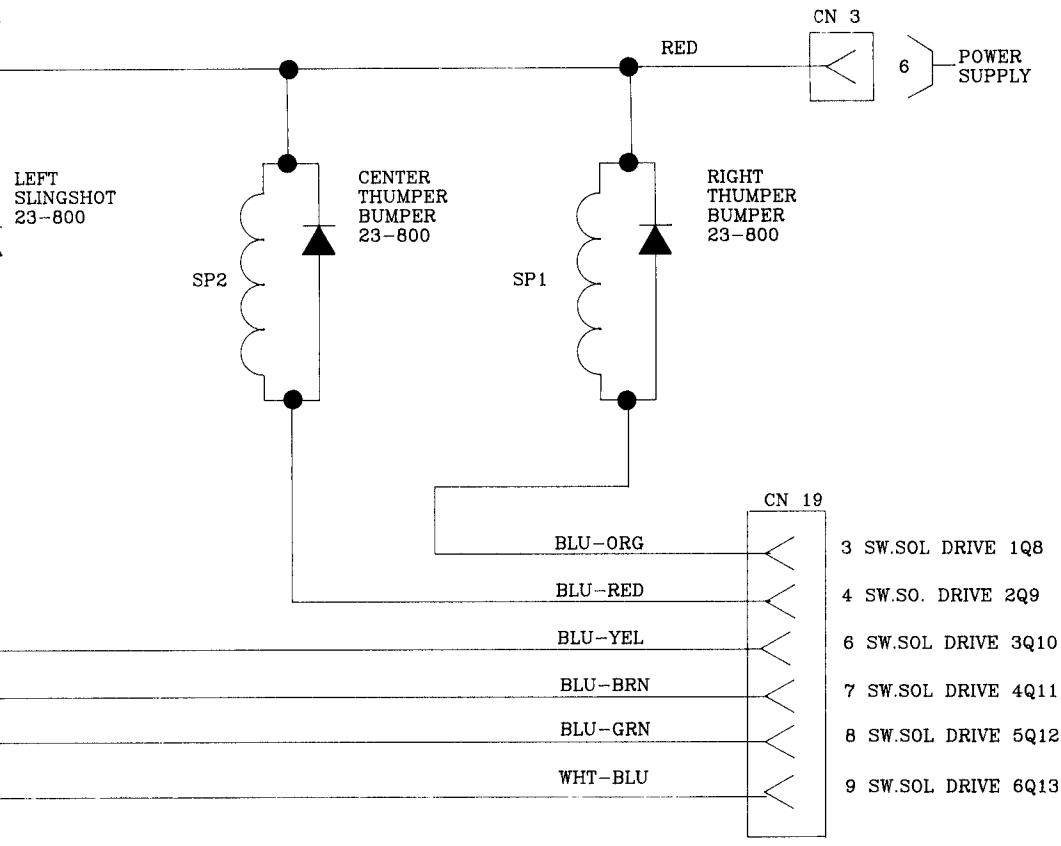




48 Playfield Coil/Flash Lamp Wiring Diagram



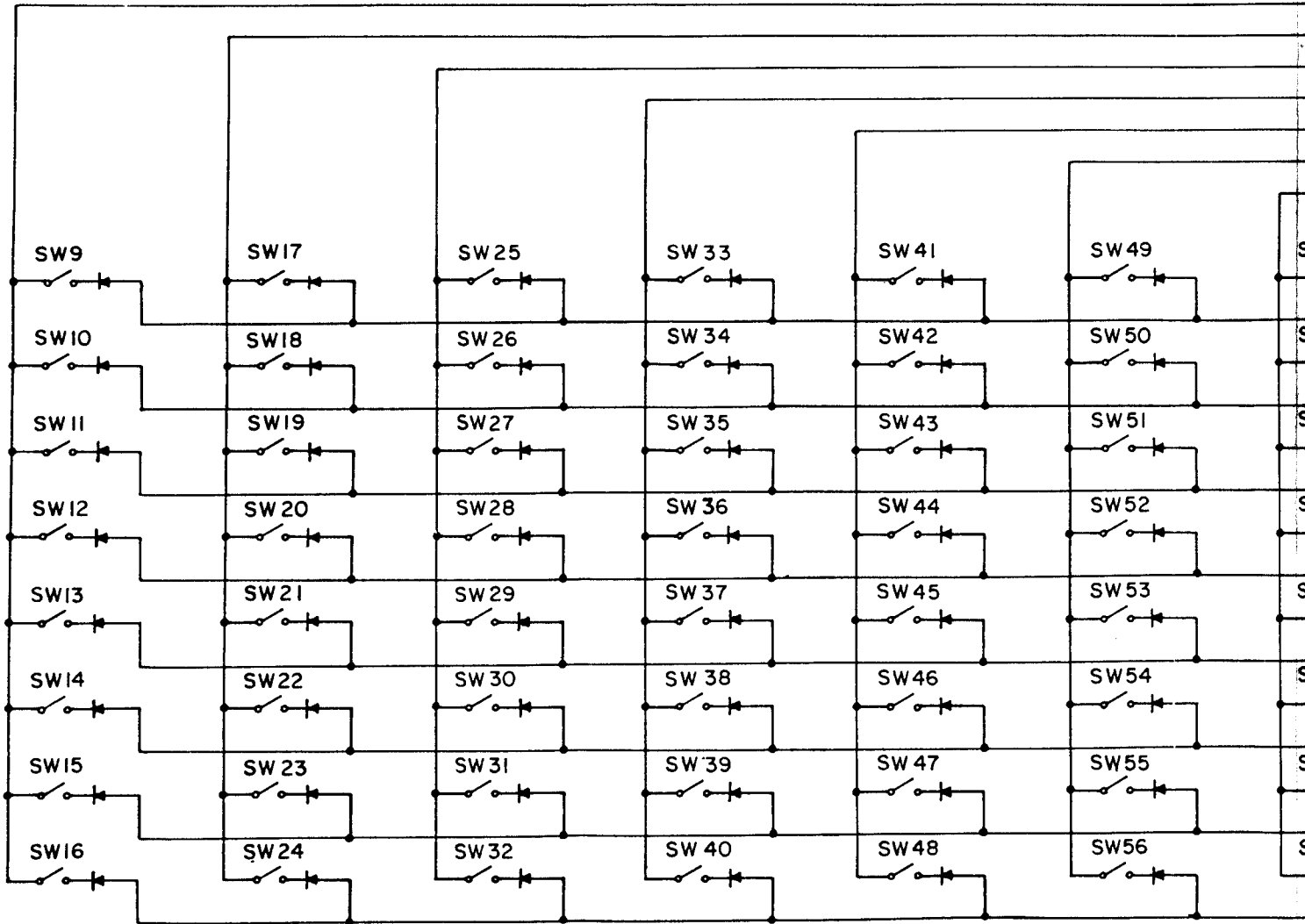




004

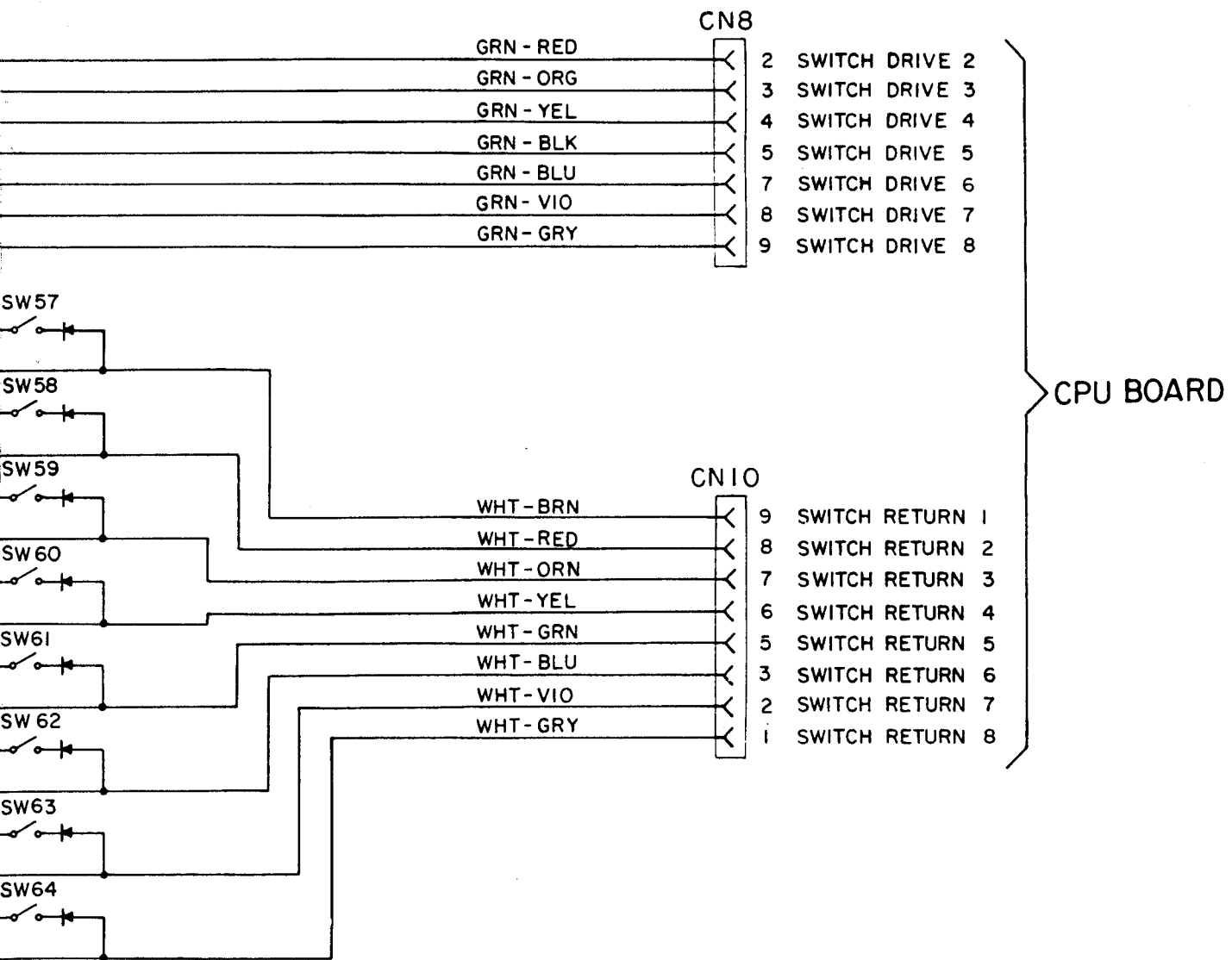


Switch Number	Description	Part No.					
01*	Plumb Tilt	See Cabinet	17	Outer Loop Low	500-5142-00	33	Right
02*	4th Coin	-	18	Outer Loop Top	500-5142-00	34	Right
03*	Credit Button	500-5097-02	19	Inner Loop Low	500-5142-00	35	Left S
04*	Right Coin	180-5024-00	20	Inner Loop Top	500-5142-00	36	T.Rex
05*	Center Coin	180-5024-00	21	Right Outlane	500-5142-00	37	Centr
06*	Left Coin	180-5024-00	22	Right Return	500-5142-00	38	Herre
07*	Slam Tilt	180-5022-00	23	Left Return	515-5138-00	39	Hierre
08	Not Used	-	24	Left Outlane	515-5138-00	40	Brach
09	Trough #1 Left	180-5119-00	25	Spitter Target #1 Bottom	180-5114-02	41	Launc
10	Trough #2	180-5119-00	26	Spitter Target #2Middle	180-5114-02	42	Smarr
11	Trough #3	180-5119-00	27	Spitter Target #3Top	180-5114-02	43	Left S
12	Trough #4	180-5119-00	28	Not Used	-	44	Right
13	Trough #5	180-5119-00	29	Raptor Pit	180-5100-01	45	Top T
14	Trough #6	180-5119-00	30	Not Used	-	46	Left T
15	Trough #7 Right	180-5119-00	31	T.Rex Right	180-5040-00	47	Right
16	Shooter Lane	180-5100-01	32	T.Rex Left	180-5040-00	48	Mosc



50 Playfield Switch Wiring Diagram

Right Ramp Enter	180-5087-00	49	Baryonyx Target	180-5120-02
Right Ramp Exit	180-5117-00	50	Gallimimus Target	180-5120-04
Right Scoop	180-5116-00	51	Not Used	-
Right Center	180-5123-00	52	Triceritops Target	180-5120-04
Right Scoop	500-5442-01	53	Brachiasaurus Top	180-5120-04
Triceratops Low	180-5120-02	54	Not Used	
Triceratops Top	180-5120-02	55	T.Rex Saucer Eject	180-5027-00
Brachiasaurus Low	180-5120-04	56	Right Saucer Eject	180-5027-00
Launch Trigger		57	T.Rex Top (Up)	180-5040-00
Start Bomb Button		58	T.Rex Bottom (Down)	180-5040-00
Slingshot	180-5054-00	59	T.Rex Trough	180-5057-00
Right Slingshot	180-5054-00	60	Right Scoop Trough	180-5057-00
Right Turbo Bumper	180-5015-01	61	Right VUK	180-5064-00
Left Turbo Bumper	180-5015-01	62	Not Used	-
Right Turbo Bumper	180-5015-01	63	Left Flip. Cab	180-5048-01
Antisquito Captive Ball	180-5114-01	64	Right Flip. Cab	180-5048-01



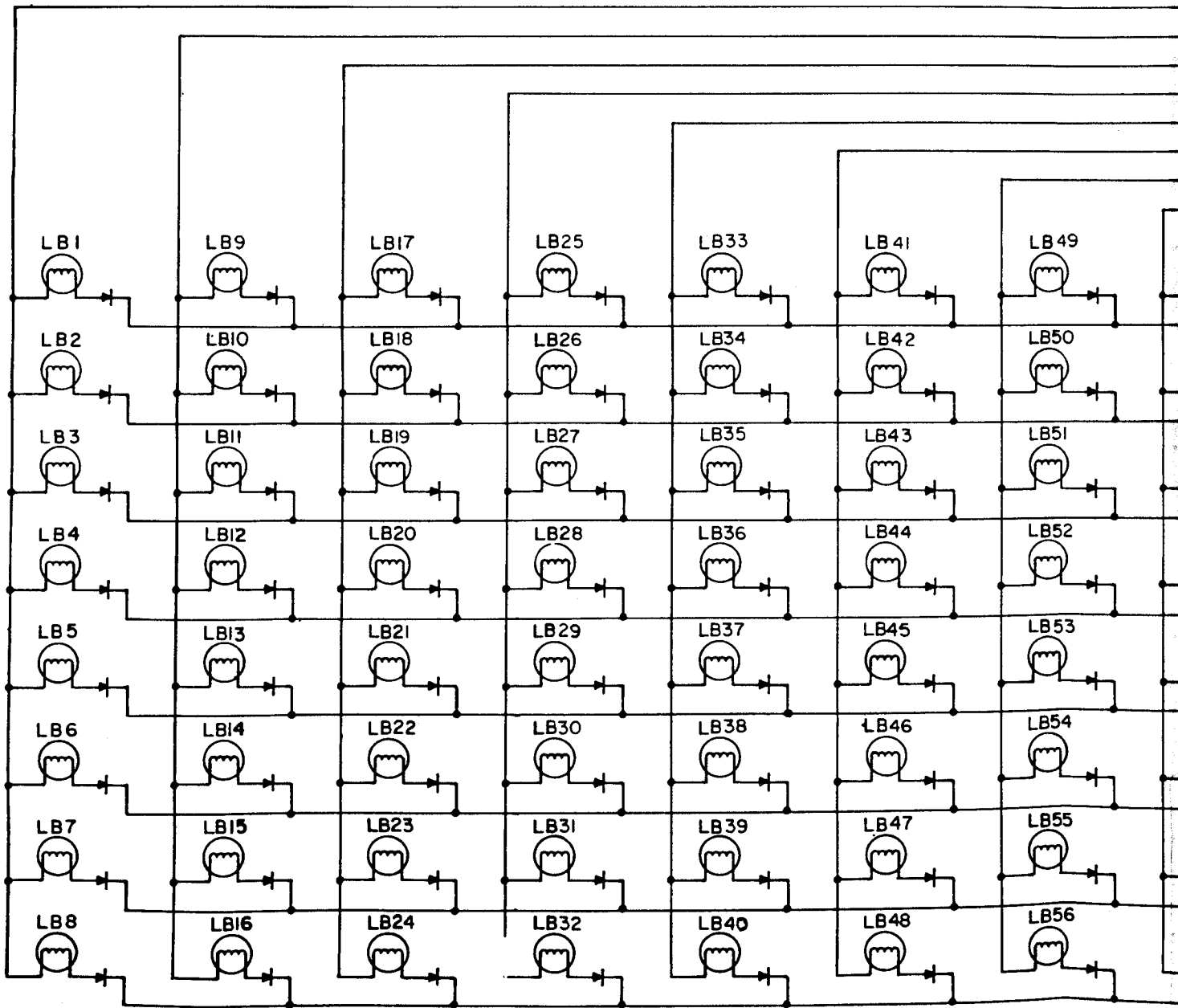
Lamp Number Description

- 01 Visitor Center (2 Bulbs)
- 02 "T" Arch
- 03 Brachiasaurus Map
- 04 Spitter Map
- 05 Herrerasaurus Map
- 06 Map
- 07 Triceratops Map
- 08 Gallimimus
- 09 Credit Button
- 10 Mosquito (2 Bulbs)
- 11 Electric Fence
- 12 Spitter Attack
- 13 2 Ball Grid
- 14 System Boot
- 15 Raptor Rampage
- 16 Lite Extra Ball ce

- 17 Left Scoop Bottom
- 18 Left scoop Top
- 19 Helo (2 Bubs)
- 20 Raptor Multi-Million
- 21 Feed T.Rex
- 22 Bone Buster
- 23 Escape Isla Nubar
- 24 Stampede
- 25 Spitter #1 Bottom
- 26 Spitter #2
- 27 Spitter #3
- 28 Boat Dock (2 Bulbs)
- 29 Jackpot Loop
- 30 Jackpot Map
- 31 Top Turbo Bumper
- 32 Right Turbo Bumper

- 33 Center Scoop
- 34 Center Scoop
- 35 Advance
- 36 Triceratops
- 37 "T" Arch
- 38 Herrerasaurus
- 39 Herrerasaurus
- 40 Brachiasaurus
- 41 C
- 42 H
- 43 A
- 44 O
- 45 S
- 46 Gate (2 Bulbs)
- 47 "R" Arch
- 48 "C" Arch

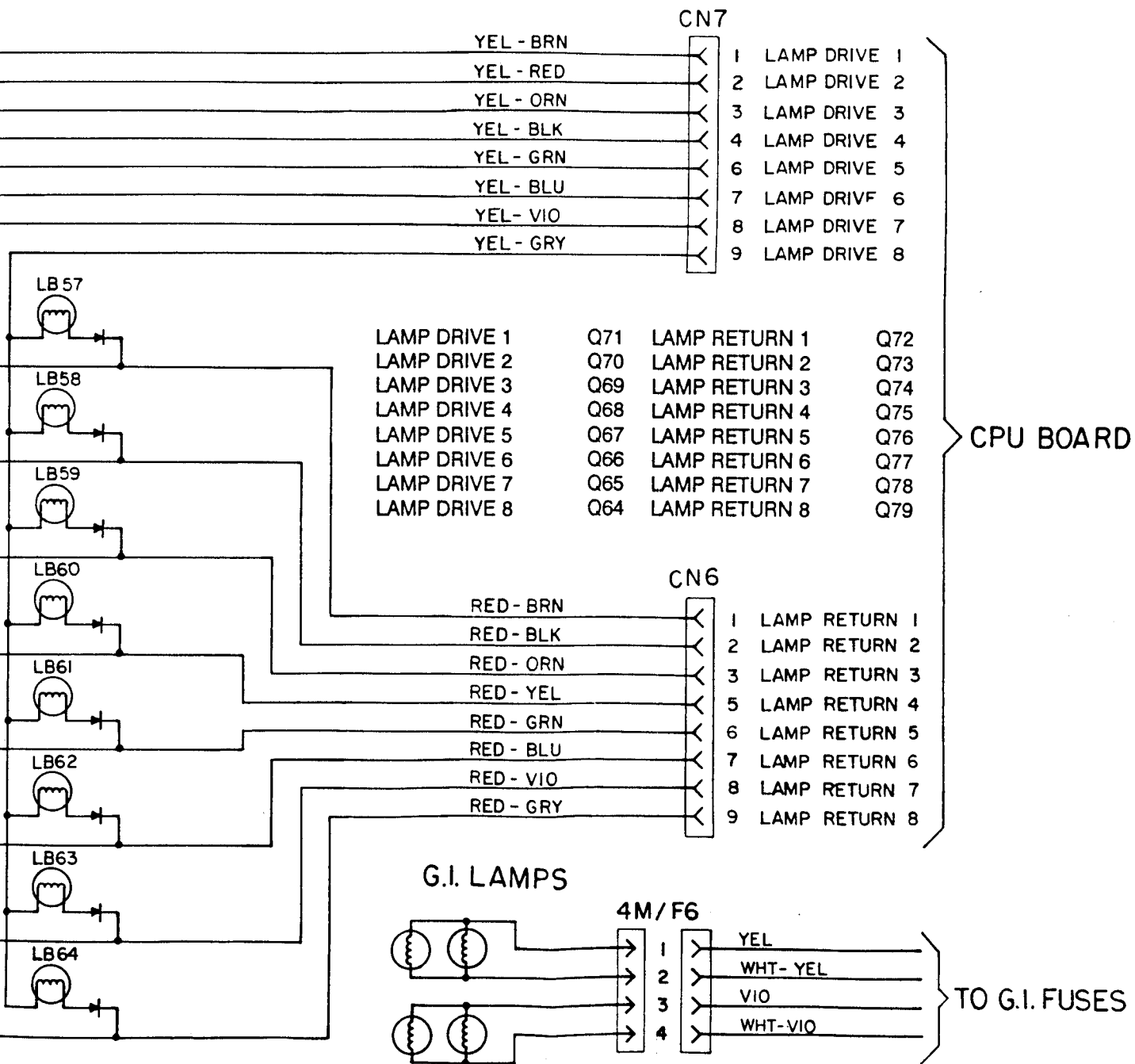
*Indicates Speaker or Backbox Lamp



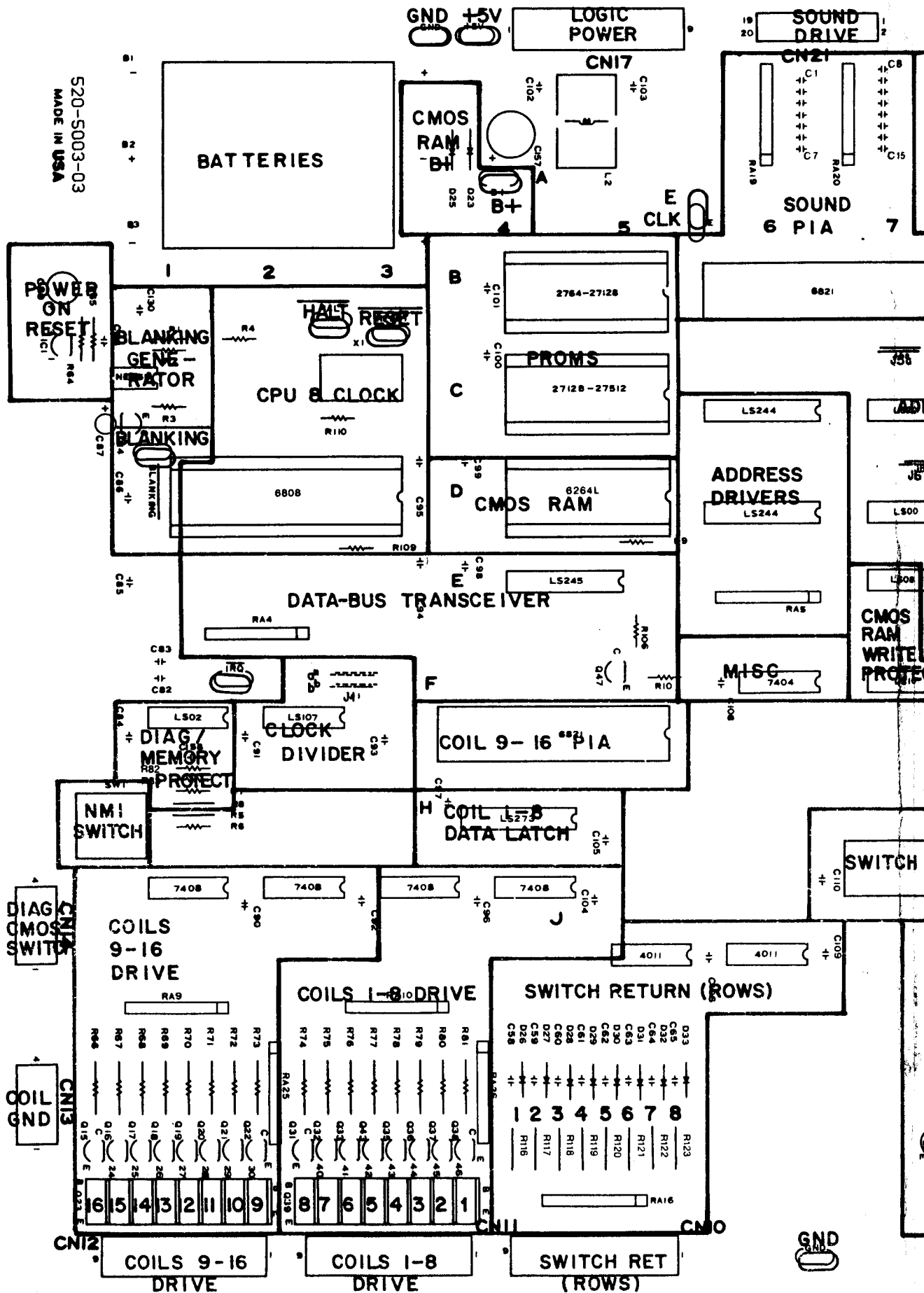
r Scoop Bottom
 r Scoop Top
 ce X
 itops
 ch
 asaurus Low
 asaurus Top
 asaurus Low

- 49 Baryonyx Target
- 50 #2
- 51 2 Ball Play Arrow
- 52 Raptor Pit 5 Million
- 53 Raptor Pit Jackpot
- 54 Raptor Pit Danger
- 55 Outlanes Special (2 Bulbs)
- 56 Shoot Again
- 57 Right Scoop Bottom
- 58 Right Scoop Top
- 59 Brachiasaurus Top
- 60 "X" Arch
- 61 Egg
- 62 Left Turbo Bumper
- 63 Extra Ball Arrow
- 64 Smart Bomb (2 Bulbs)

2 Bulbs)
 ch
 ch

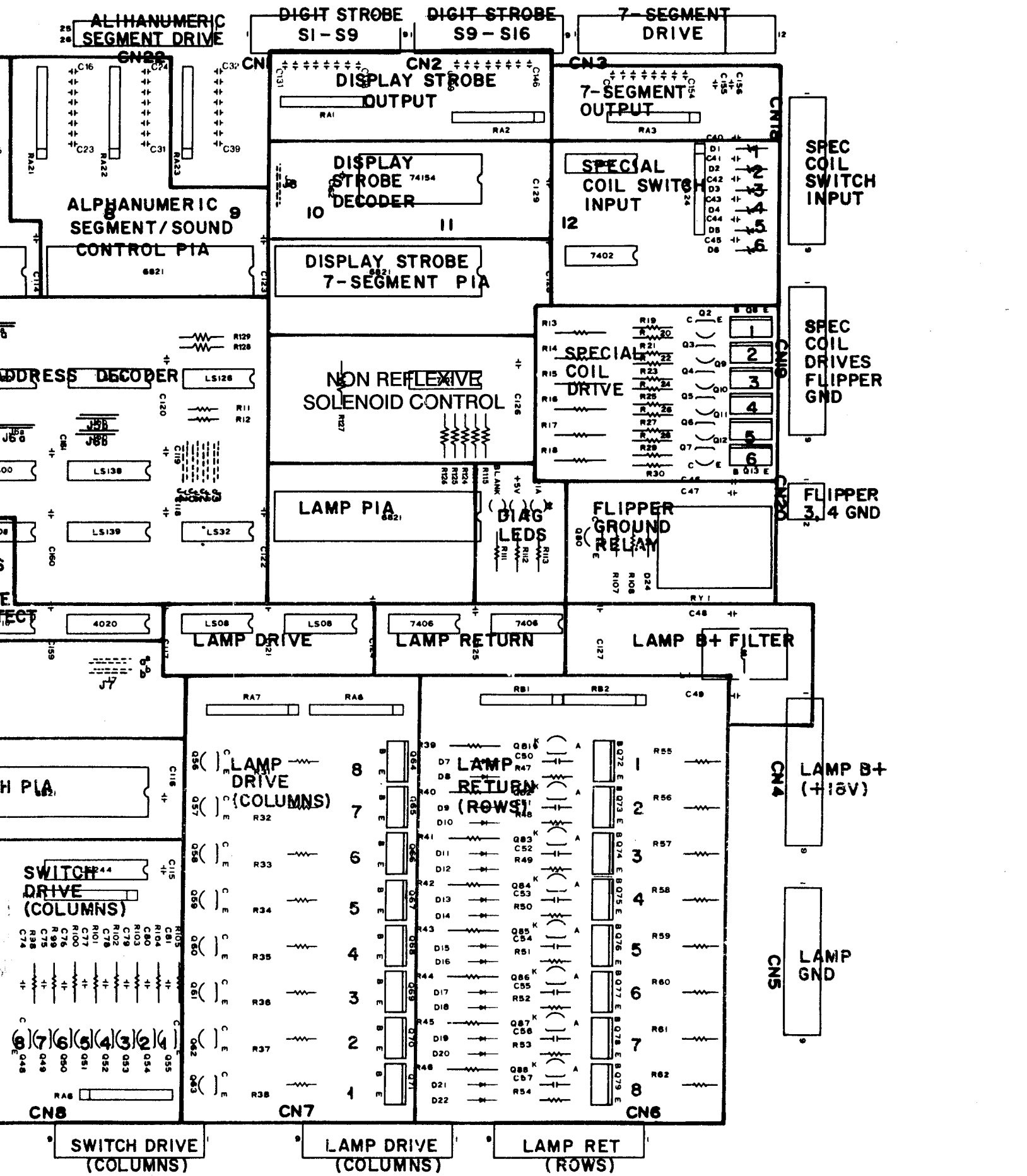


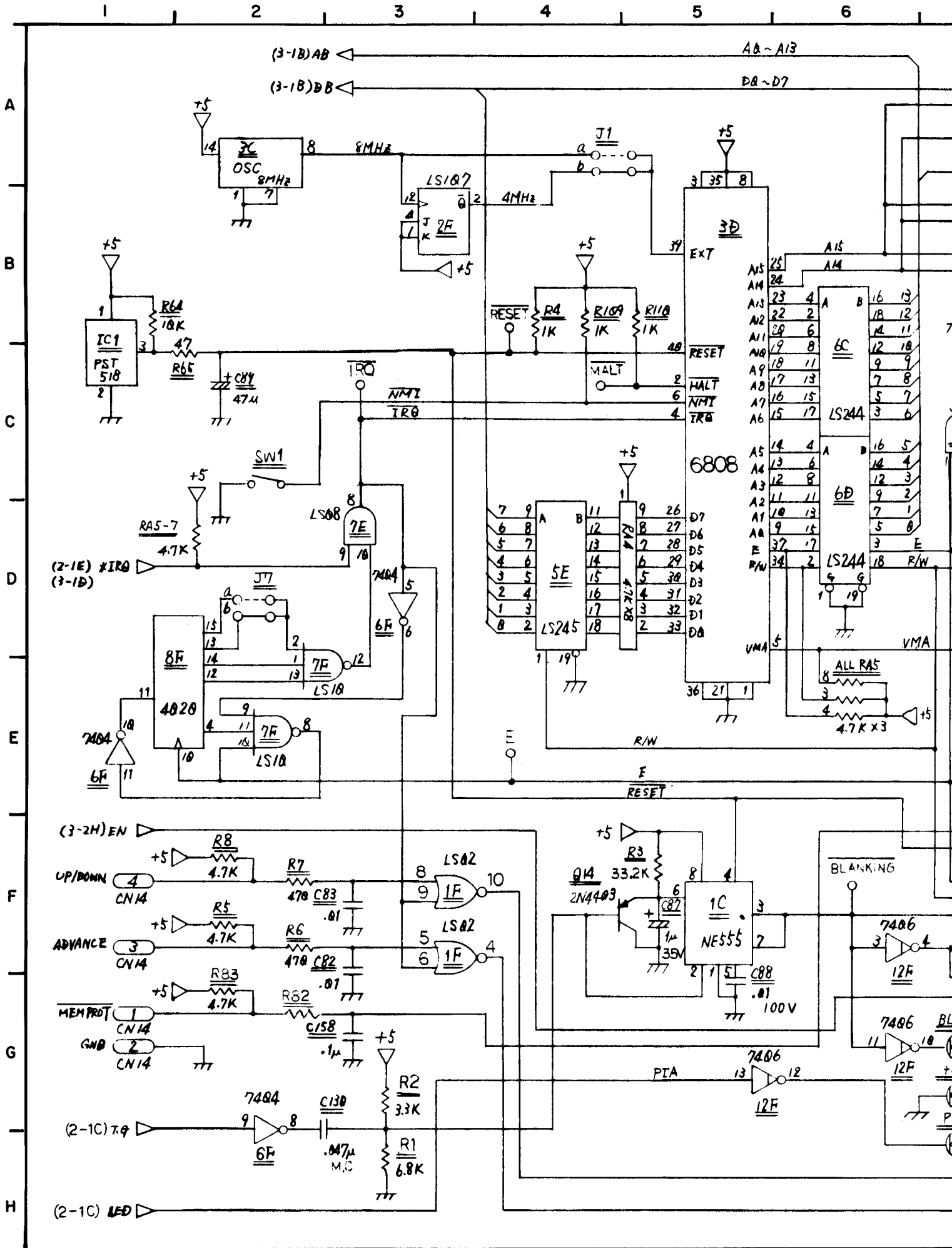
520-5003-03
MADE IN USA

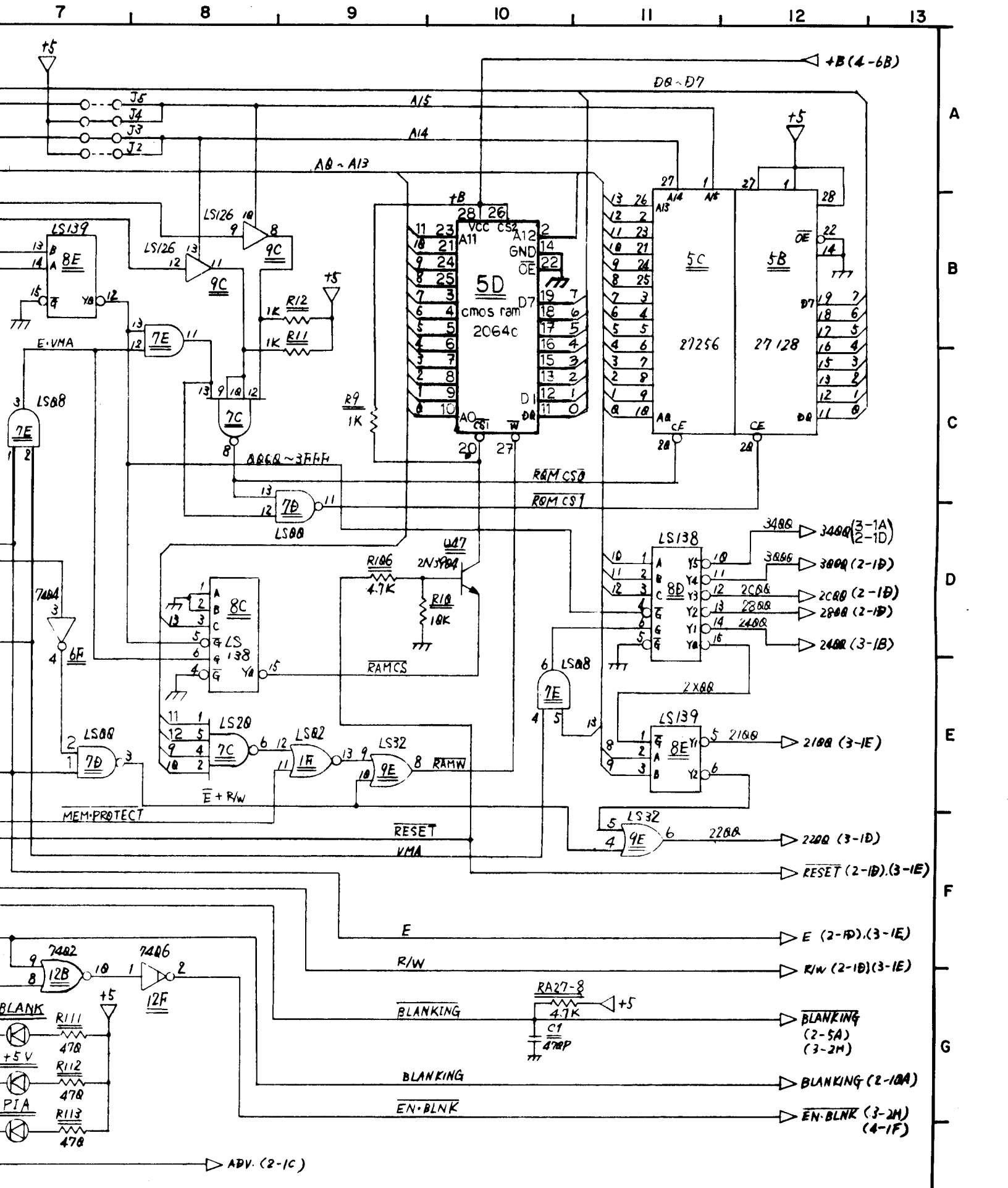


520-5003-03 REV-A
0E-0262-3A

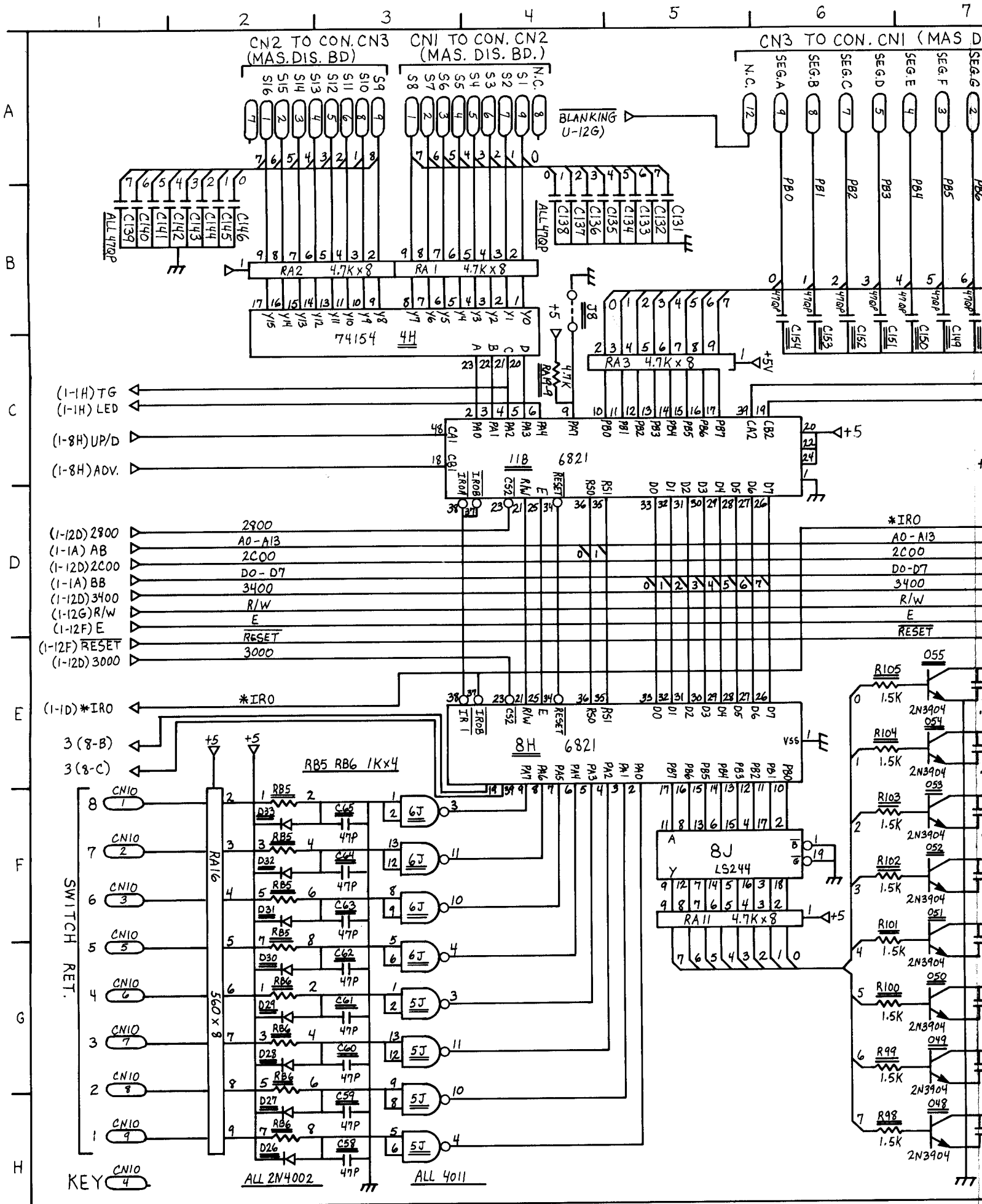
52 CPU Board Assembly Diagram



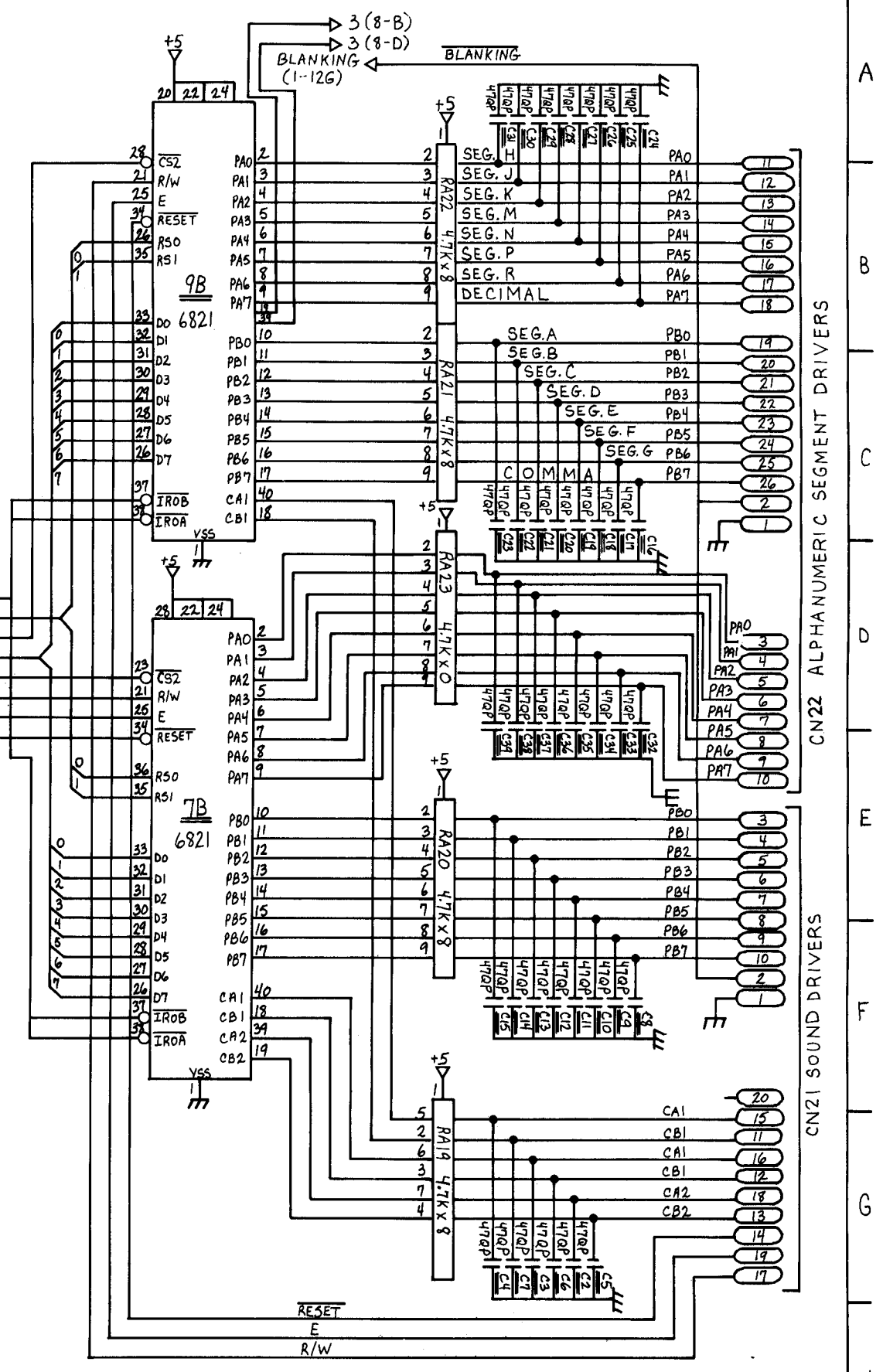
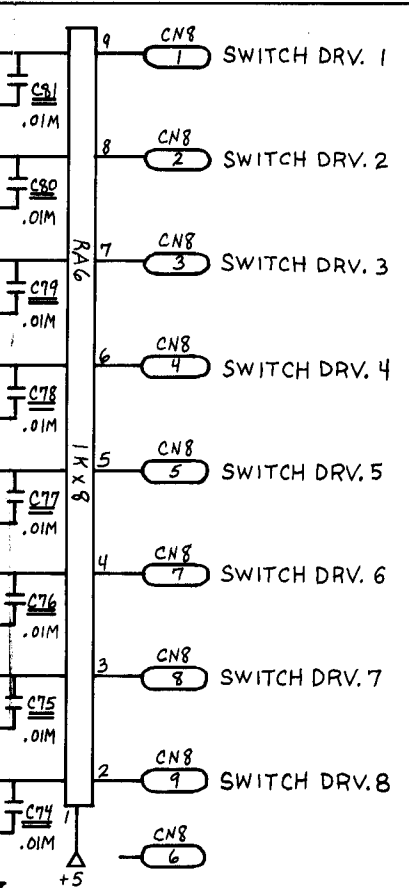
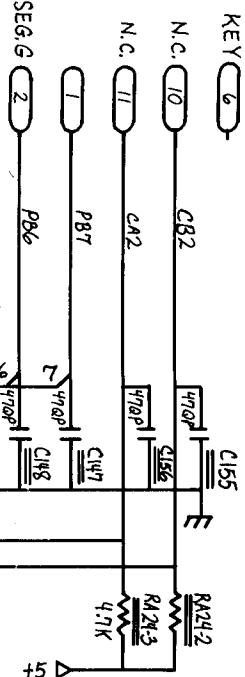




CPU BOARD 1 OF 4

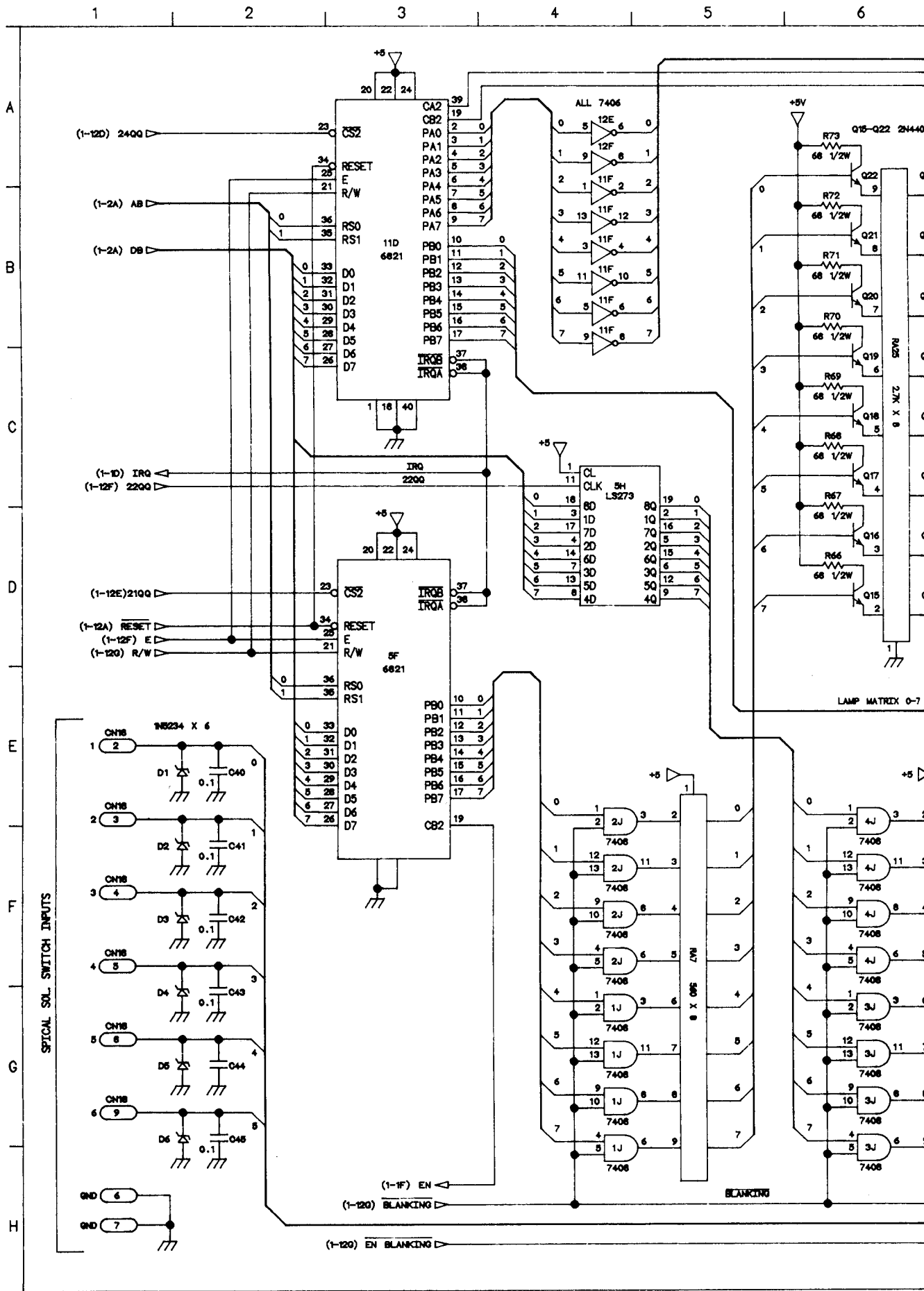


54 CPU Board Logic Diagram (Sheet 2 of 4)

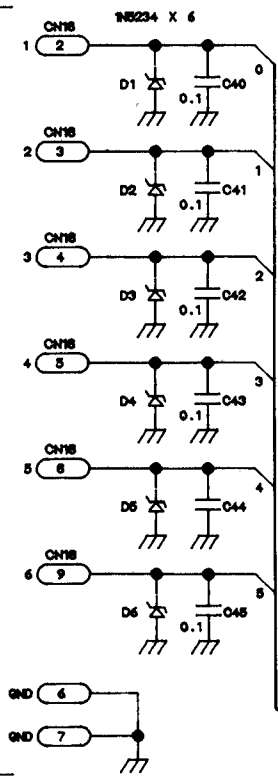


CN22 ALPHANUMERIC SEGMENT DRIVERS

CN21 SOUND DRIVERS



SPECIAL SOL. SWITCH INPUTS



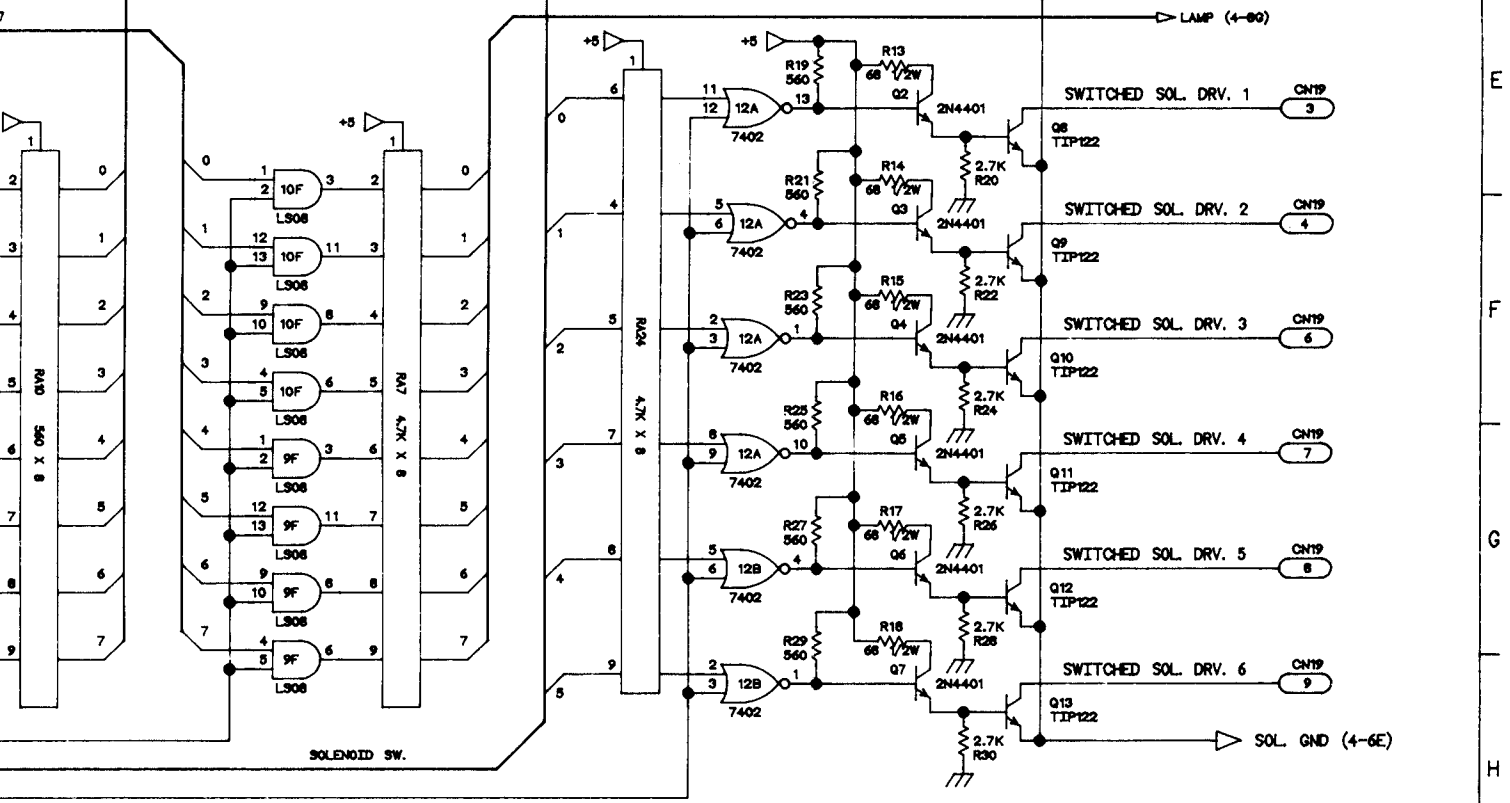
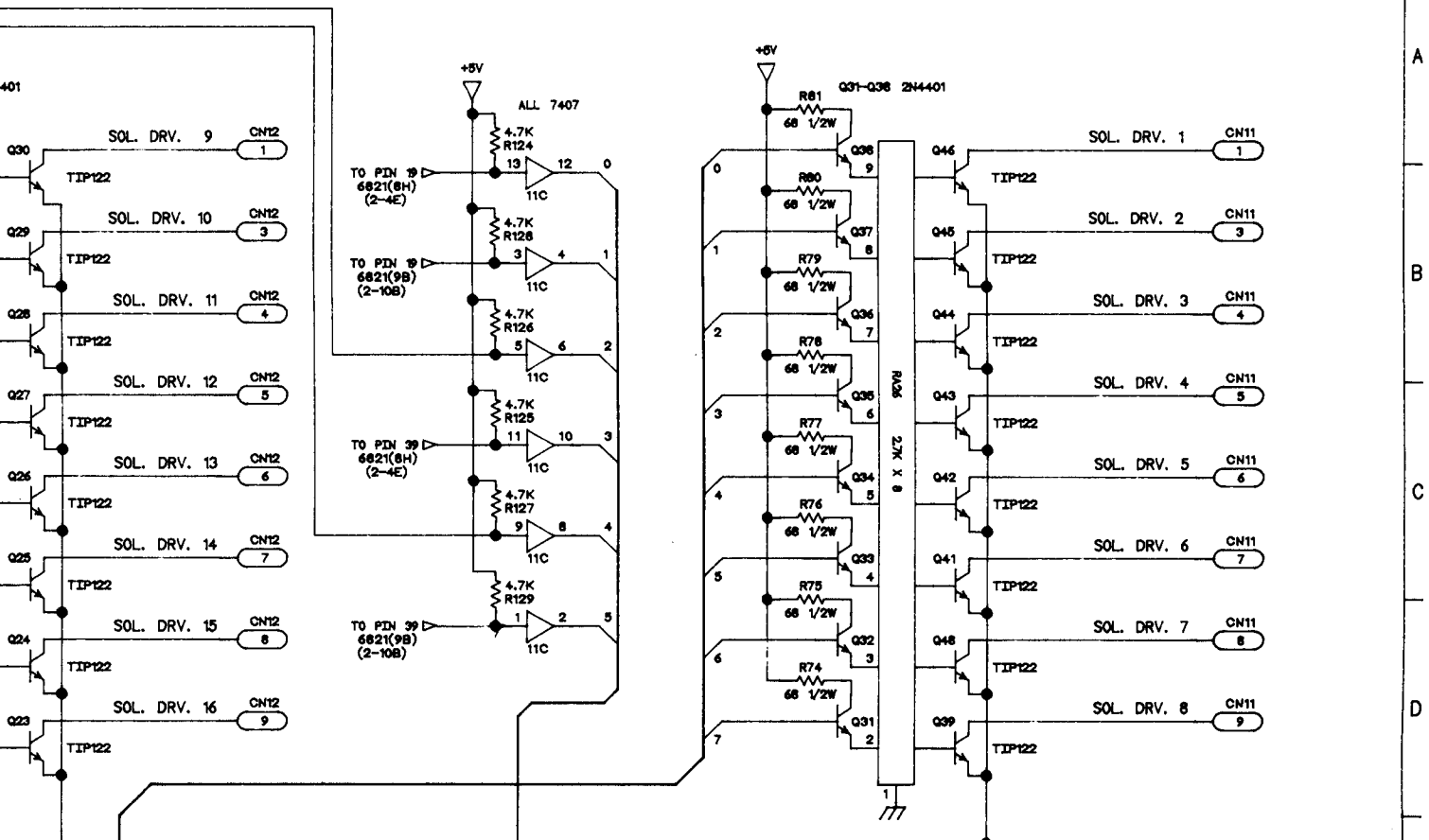
(1-1F) EN
 (1-12G) EN BLANKING
 (1-12G) EN BLANKING

LAMP MATRIX 0-7

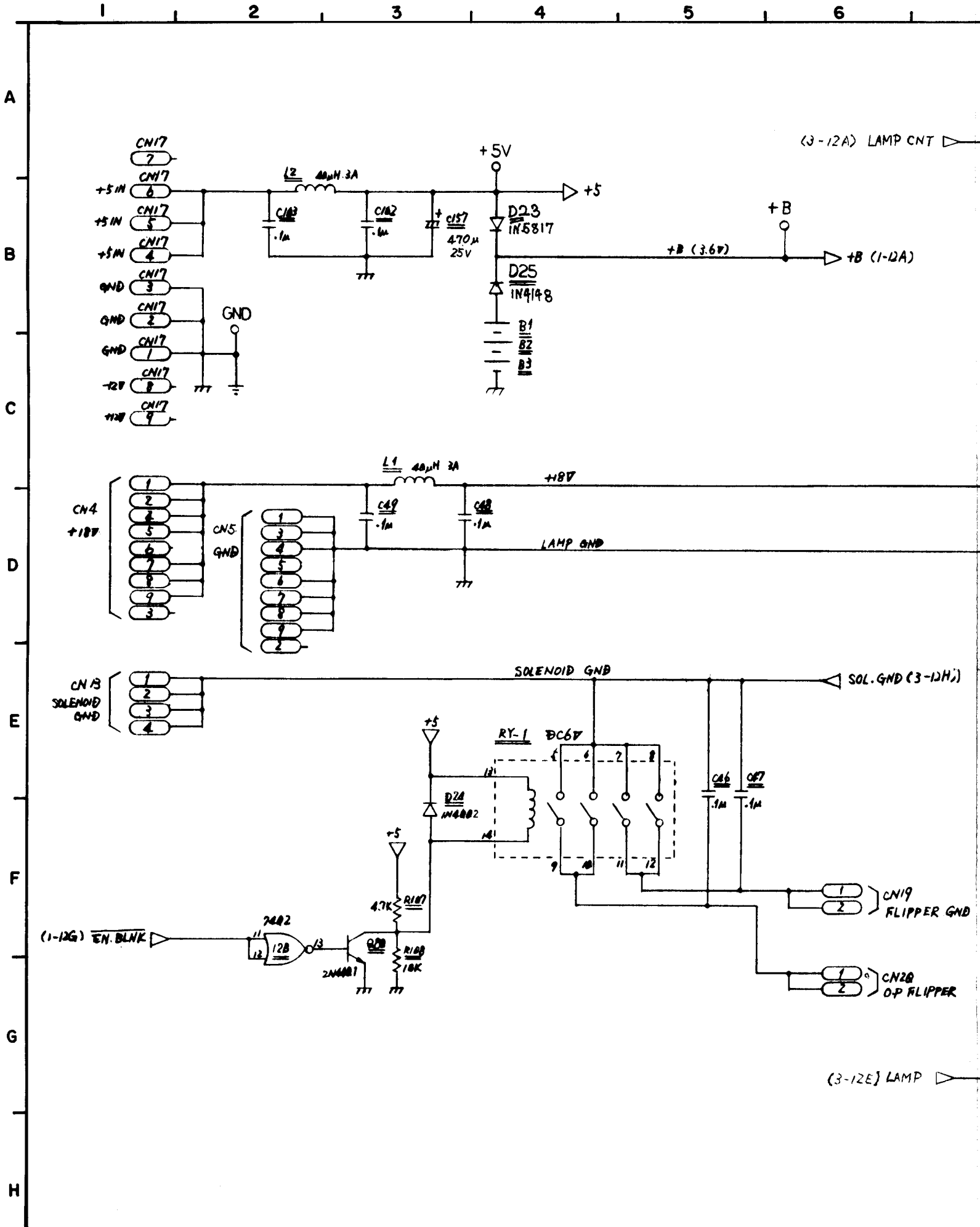
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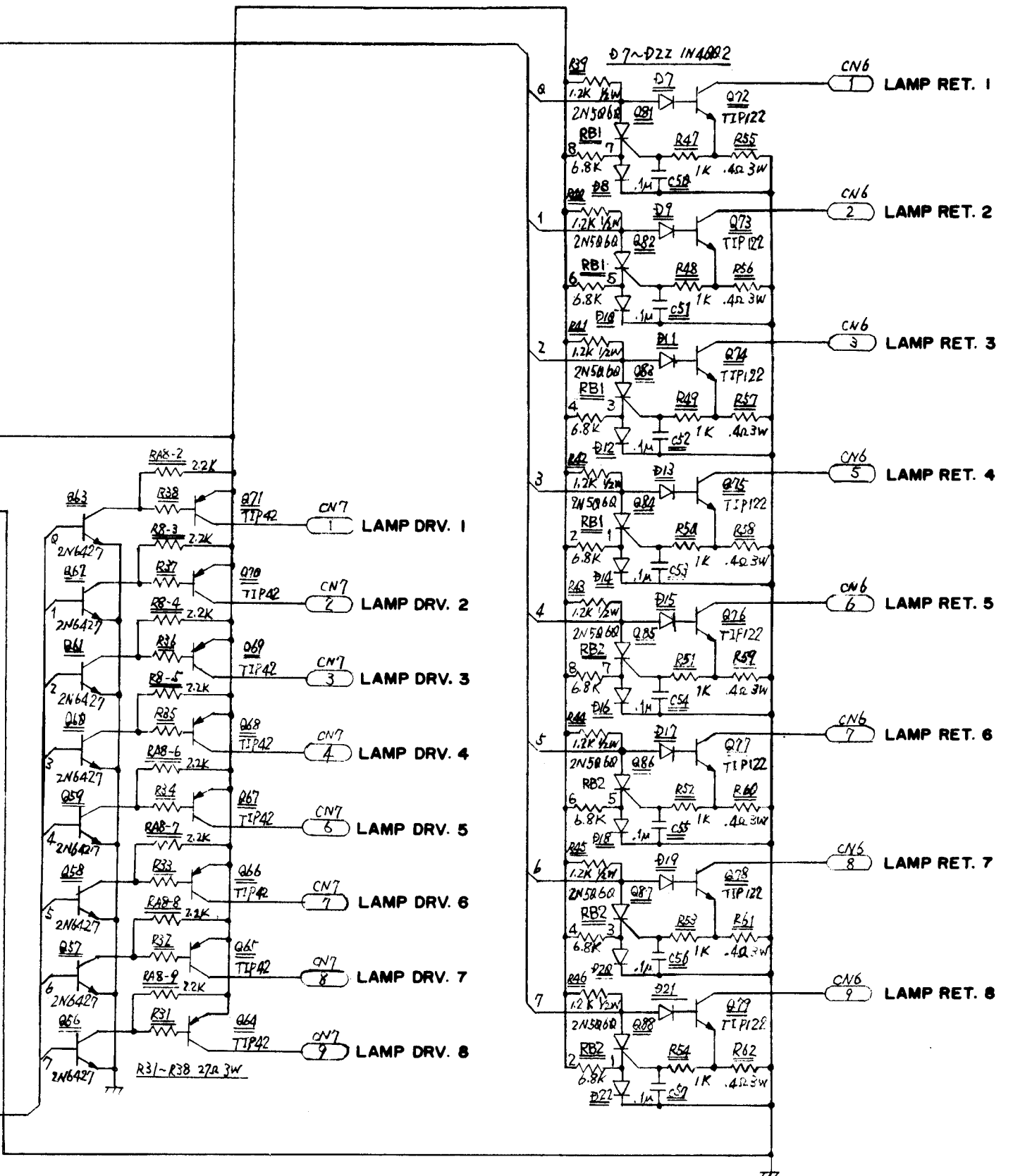
LAMP MATRIX CONT. 0-7

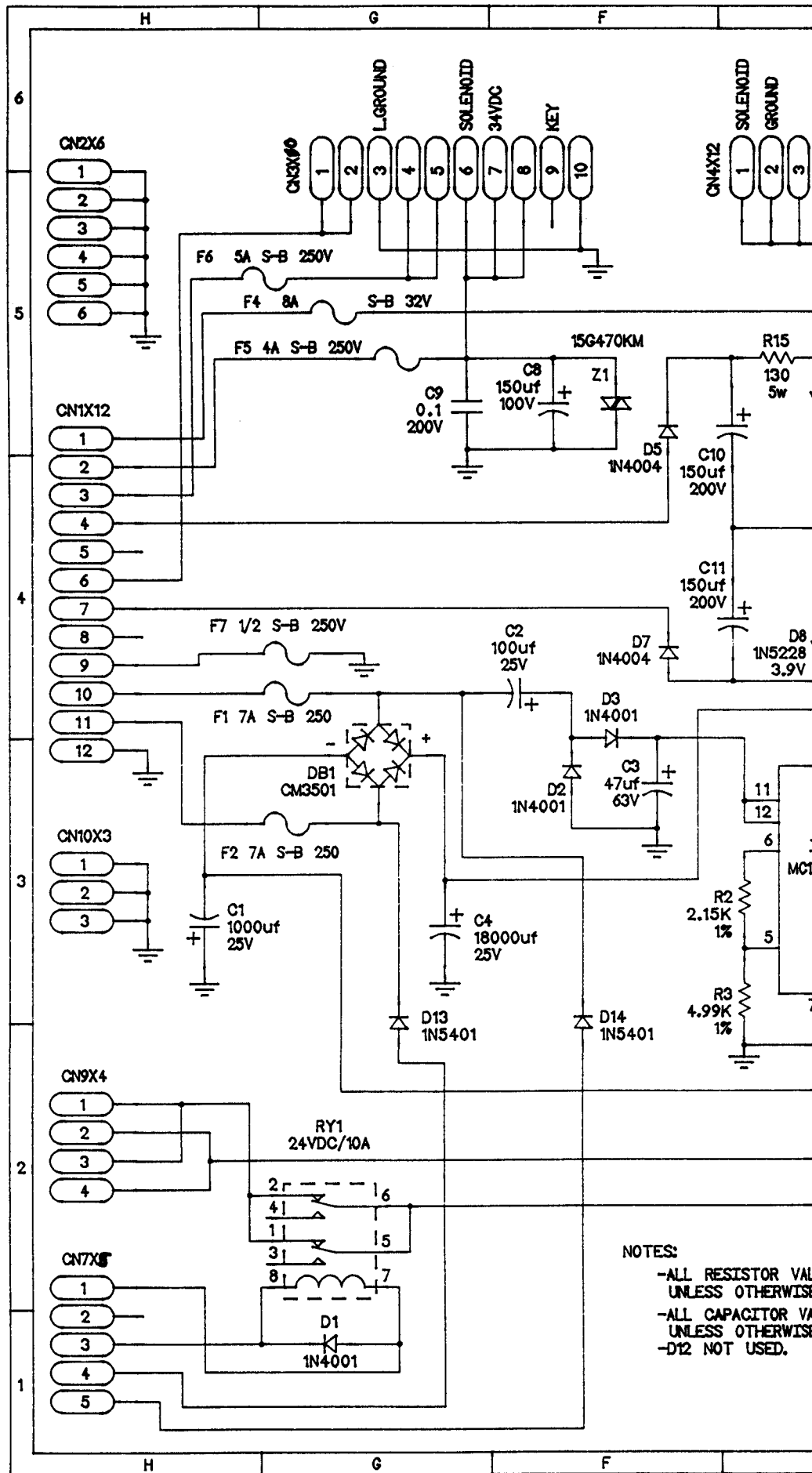
LAMP CNT (4-8A)



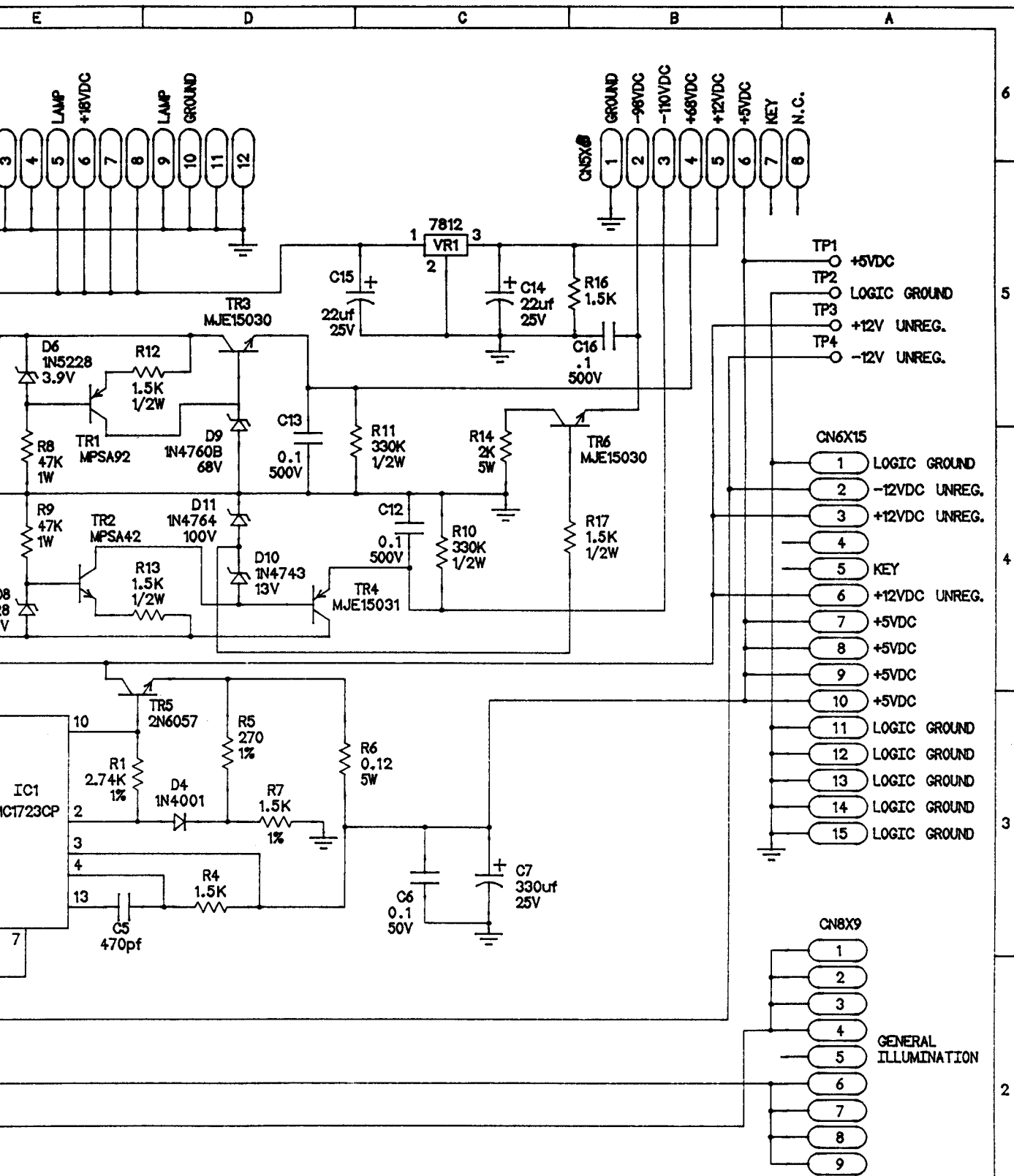
CPU BOARD 3 OF 4 REV.B







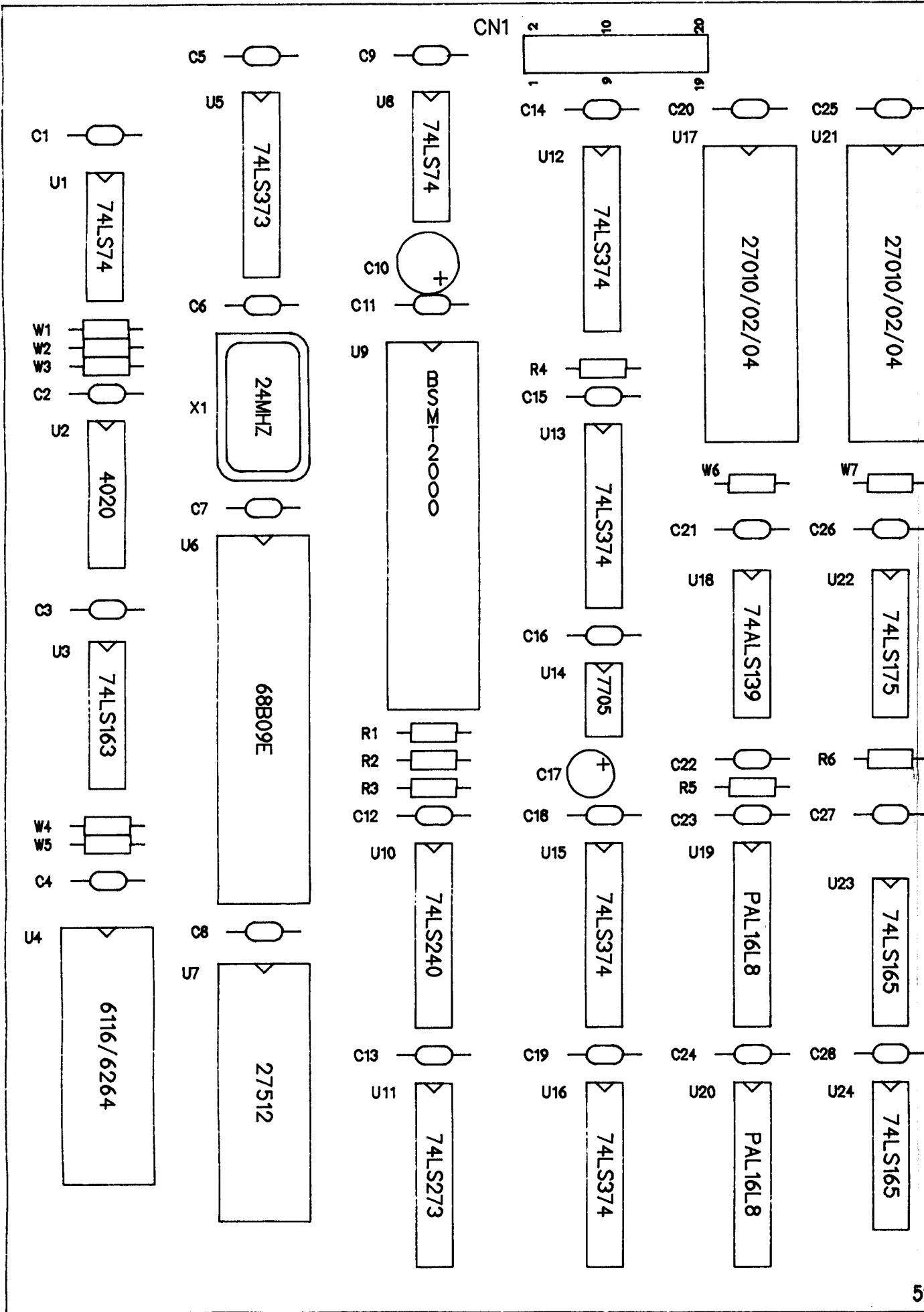
NOTES:
 -ALL RESISTOR VAL
 UNLESS OTHERWISE
 -ALL CAPACITOR VA
 UNLESS OTHERWISE
 -D12 NOT USED.

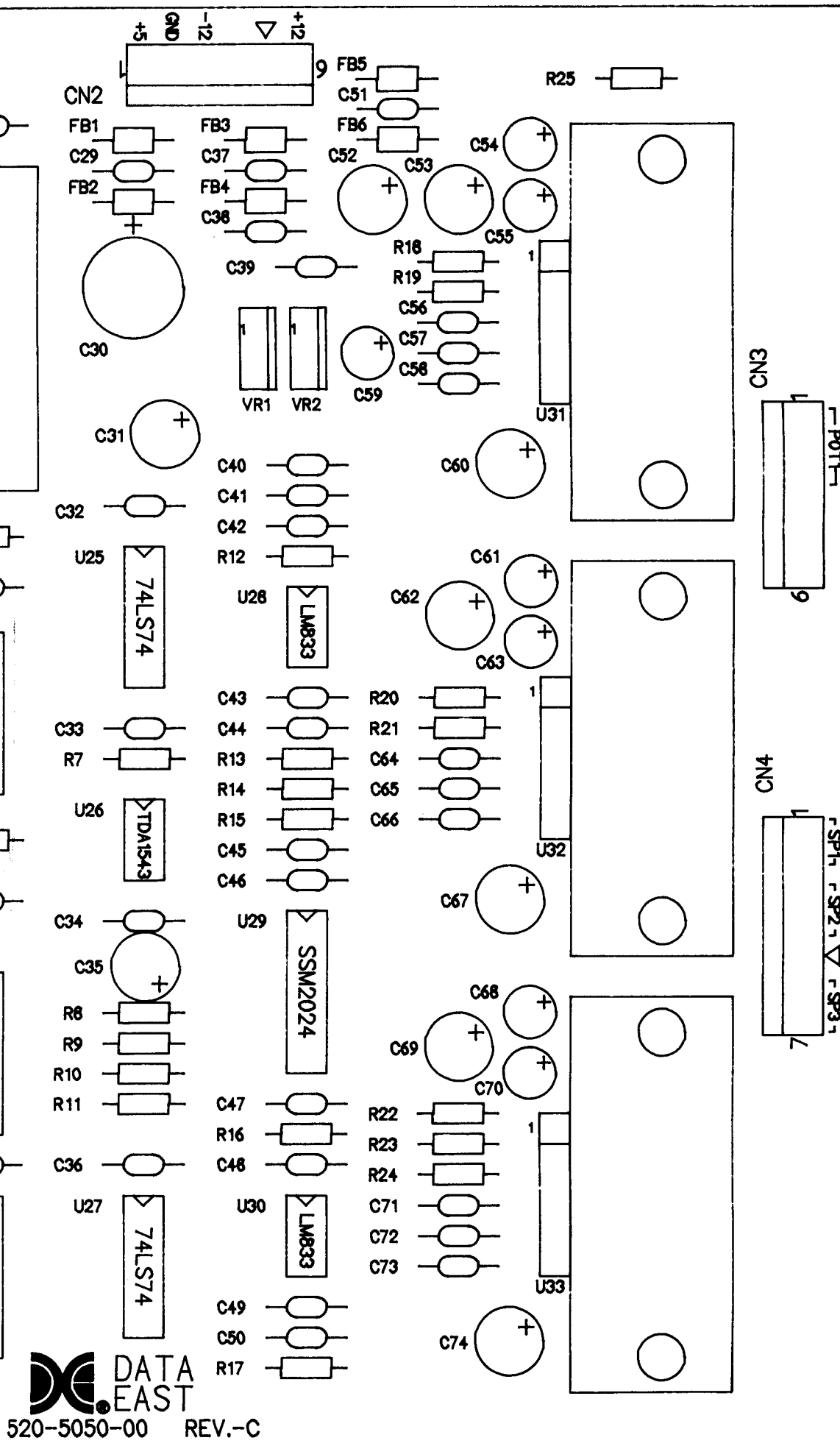


VALUES ARE IN OHMS, 5%, 1/4W, UNLESS SPECIFIED.
 VALUES ARE IN MICROFARADS, UNLESS SPECIFIED.

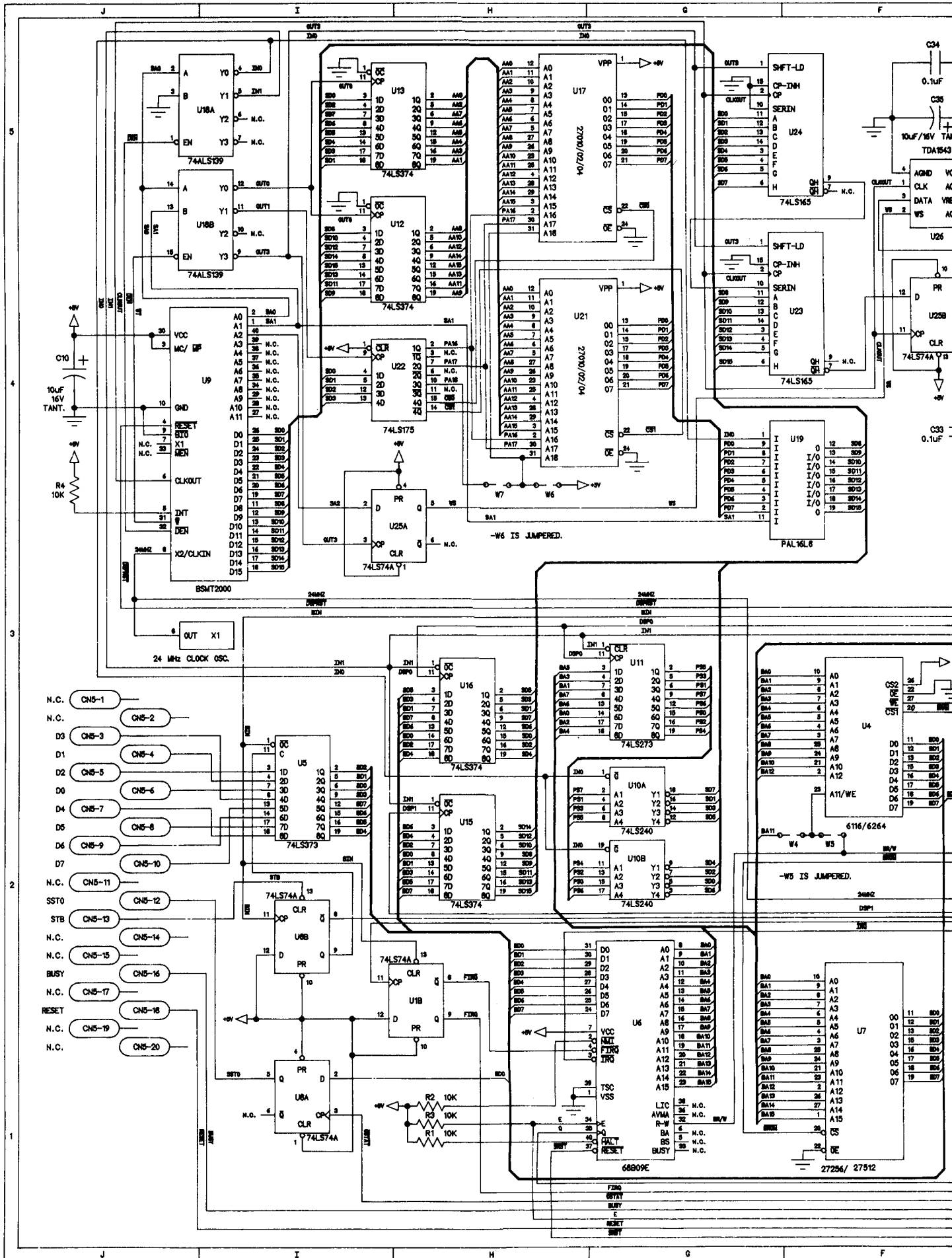
DATA EAST PINBALL POWER SUPPLY BOARD SCHEMATIC

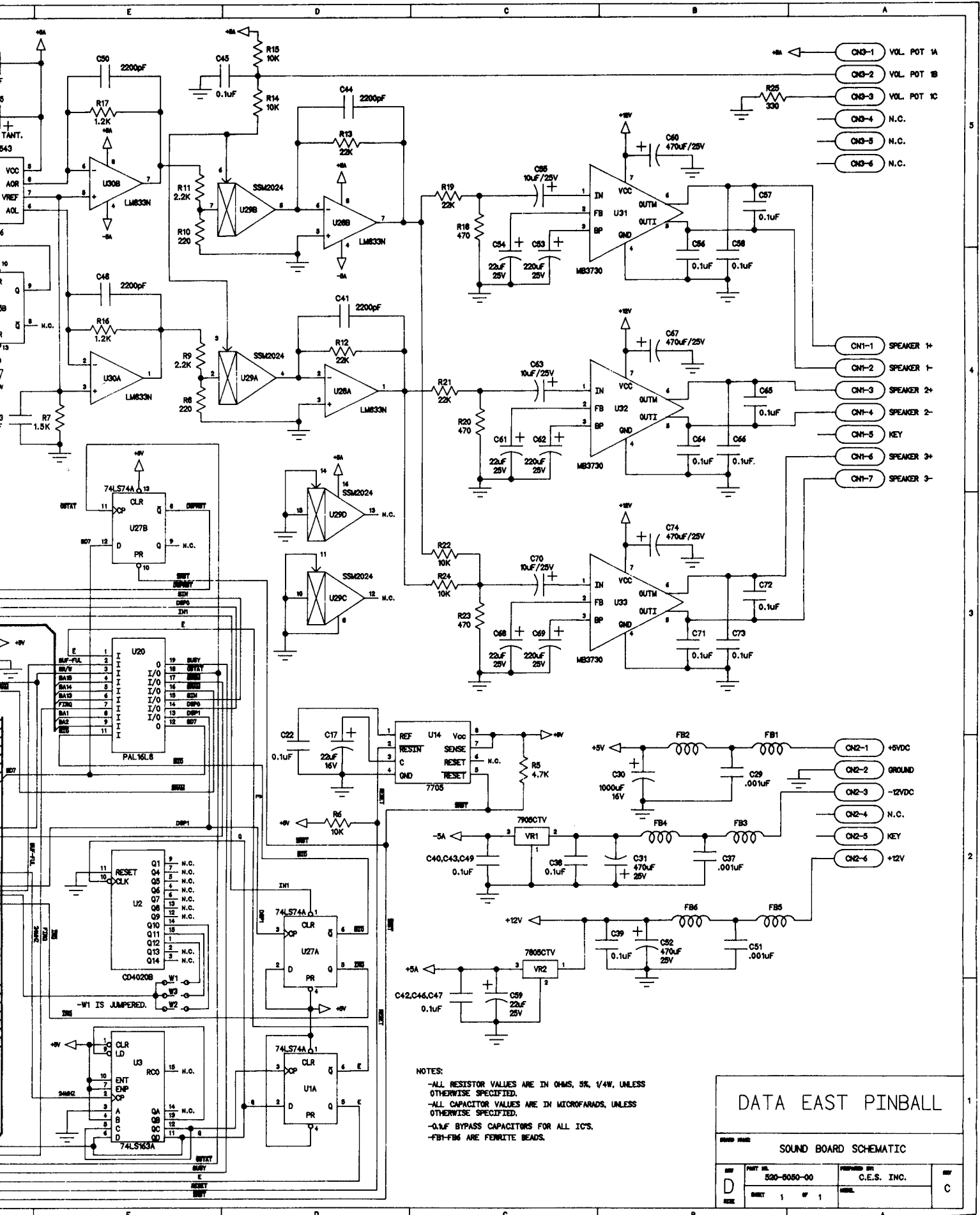
PREPARED BY: CES INC.	DWG C	PART NO. 520-5047-02	REV A
	SIZE	SHEET 1 OF 1	MODEL





DATA EAST



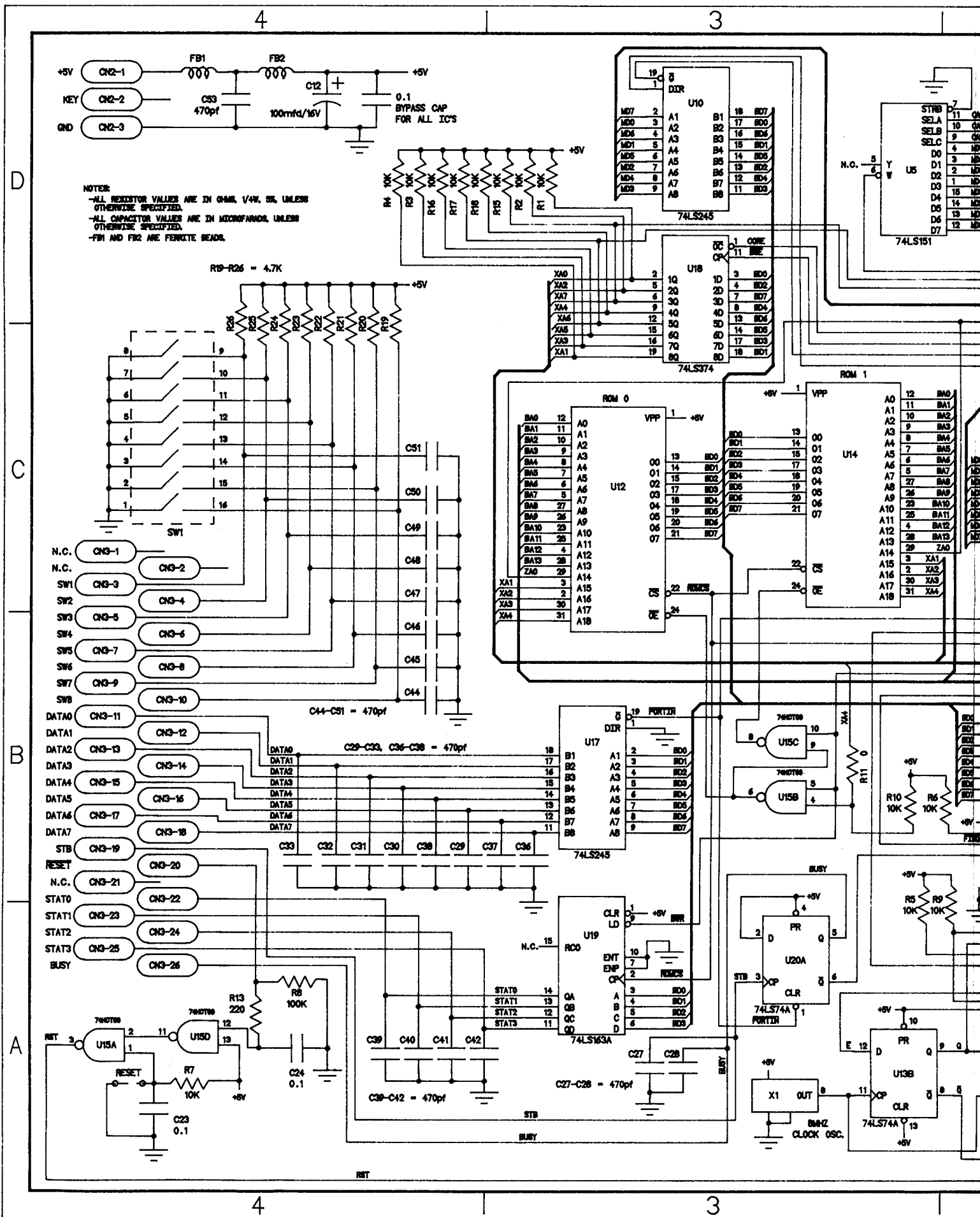


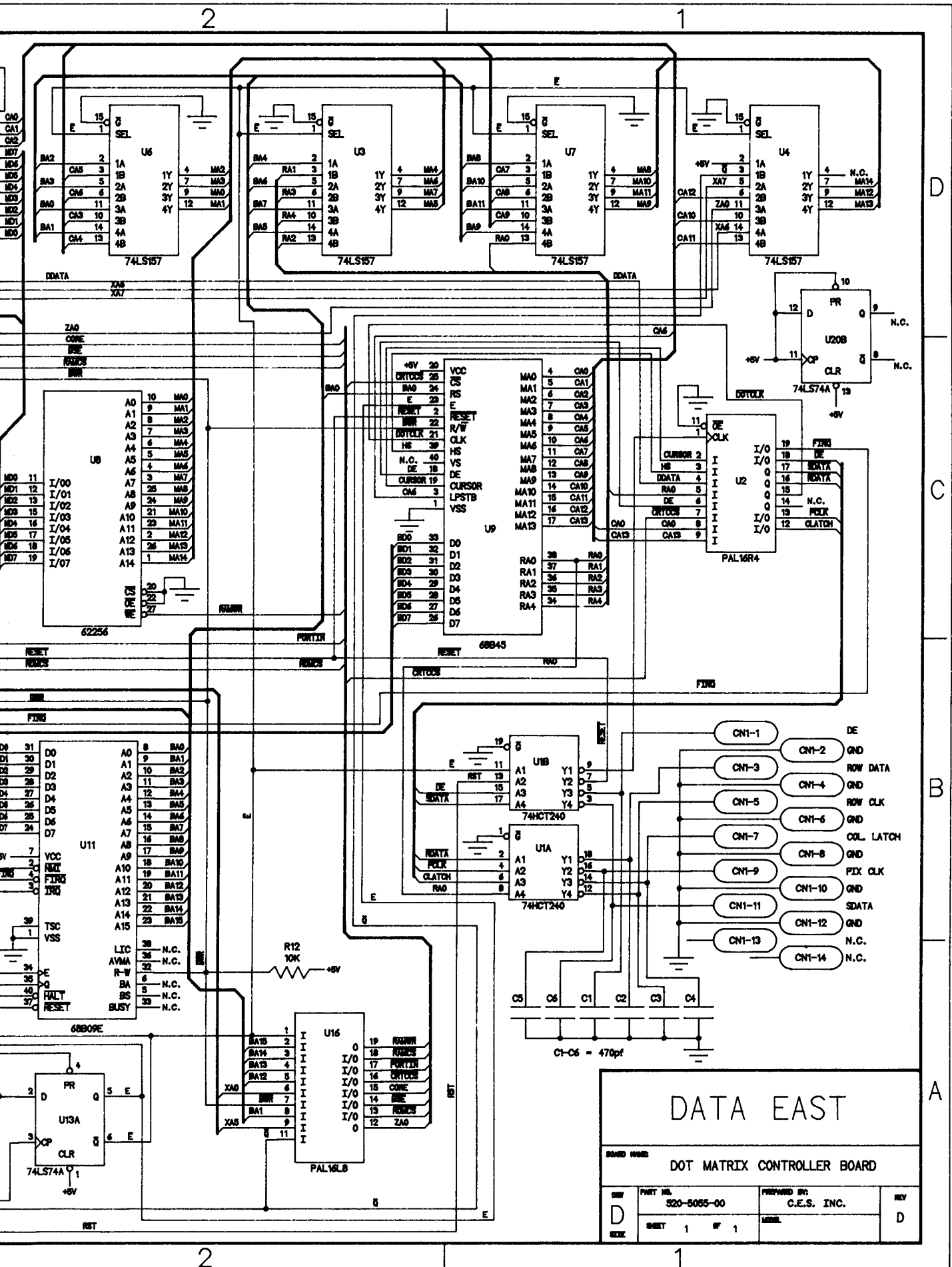
- NOTES:
- ALL RESISTOR VALUES ARE IN OHMS, 5%, 1/4W, UNLESS OTHERWISE SPECIFIED.
 - ALL CAPACITOR VALUES ARE IN MICROFARADS, UNLESS OTHERWISE SPECIFIED.
 - 0.1uF BYPASS CAPACITORS FOR ALL IC'S.
 - FB1-FB6 ARE FERRITE BEADS.

DATA EAST PINBALL

SOUND BOARD SCHEMATIC

REV	PART NO. 520-5050-00	PREPARED BY C.E.S. INC.	REV
D	SHEET 1 OF 1	DATE	C





DATA EAST			
BOARD NAME: DOT MATRIX CONTROLLER BOARD			
REV	PART NO.	PREPARED BY:	REV
D	520-5055-00	C.E.S. INC.	D
SIZE	SHEET 1 OF 1	MODEL	

2

1

2

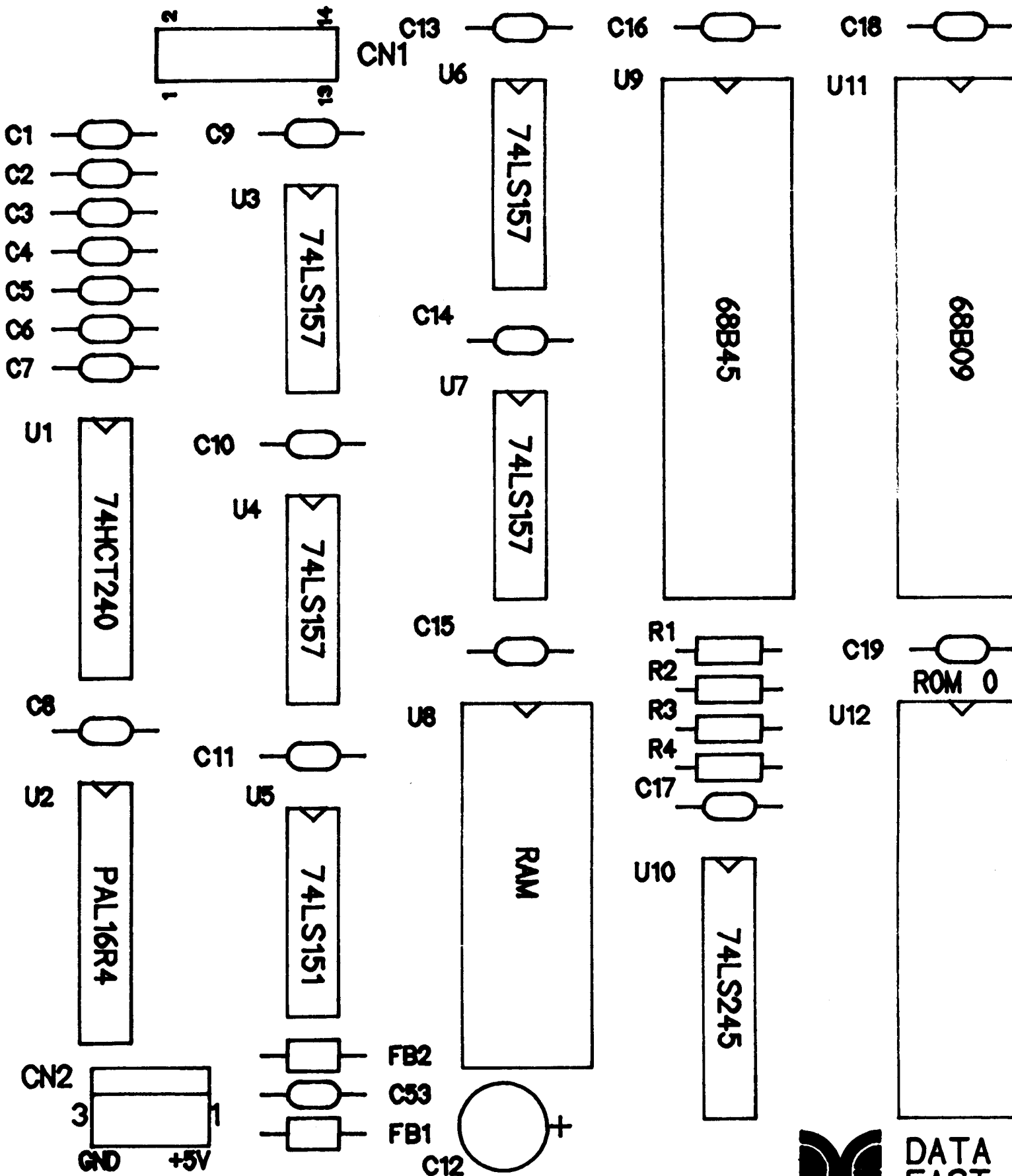
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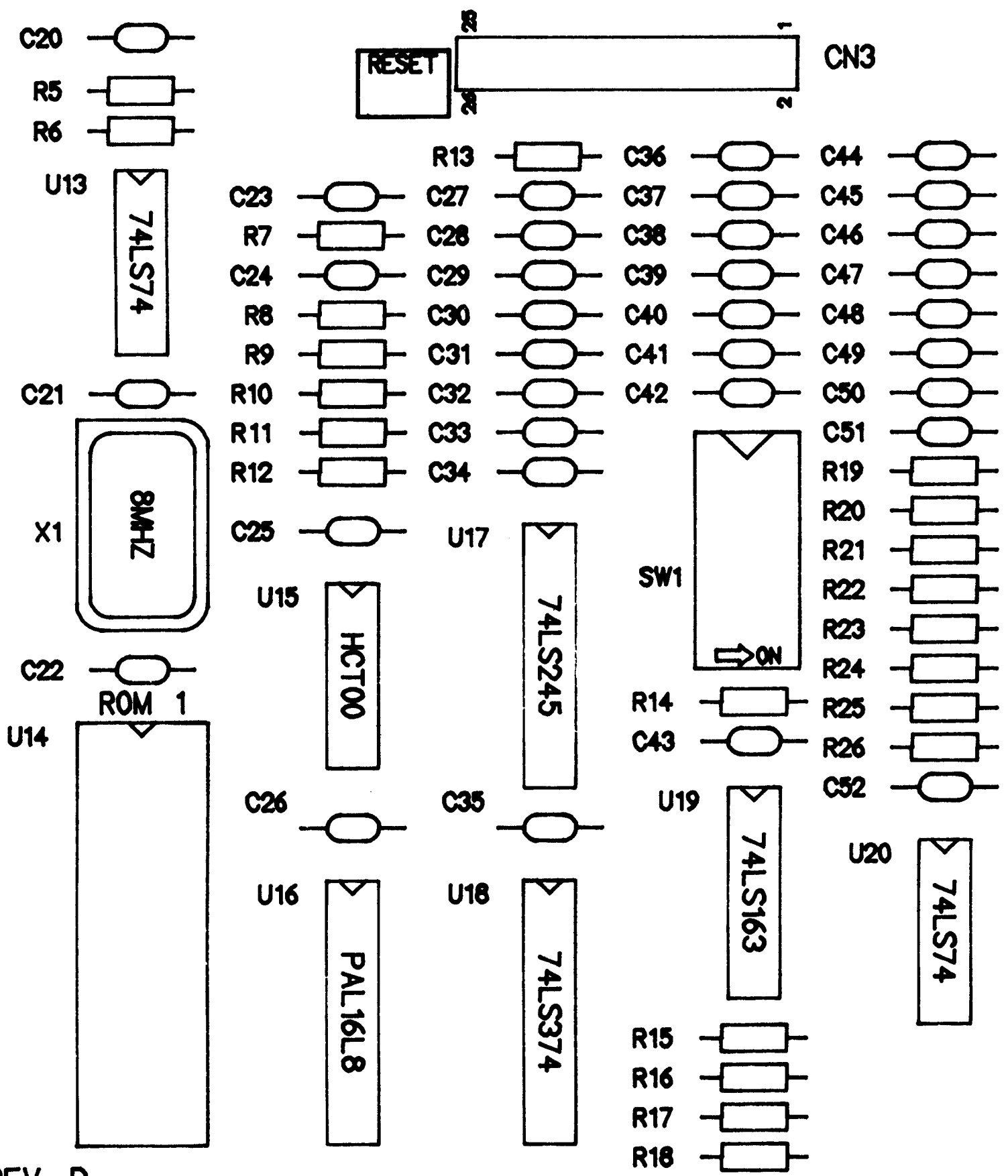
D

C

B

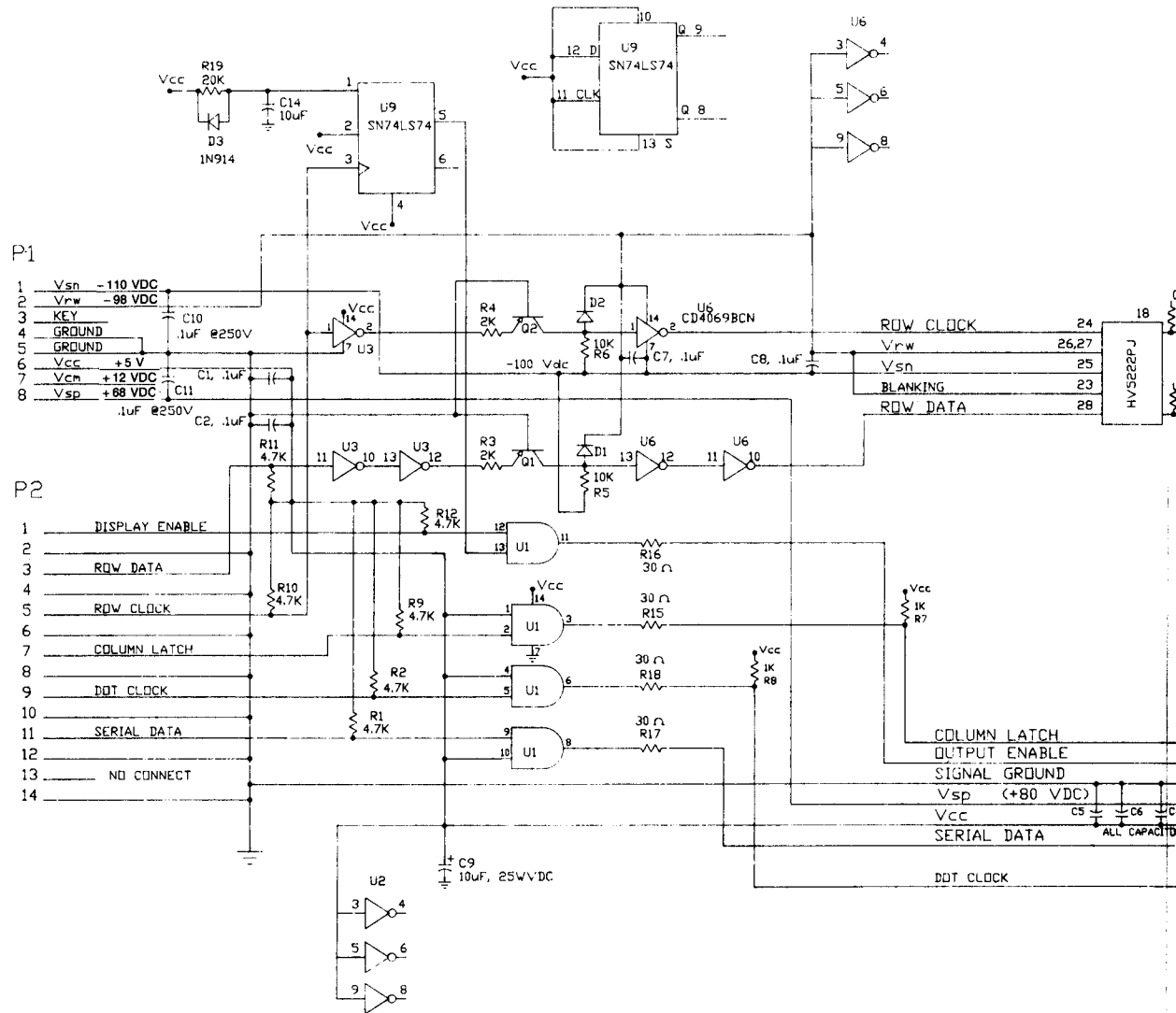
A





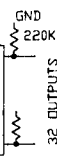
REV.-D
520-5055-00

PART NO.	INTL CODE
281103-01	S



NOTES

REVISIONS				
ZONE	SYM	DESCRIPTION	DATE	APPROVED

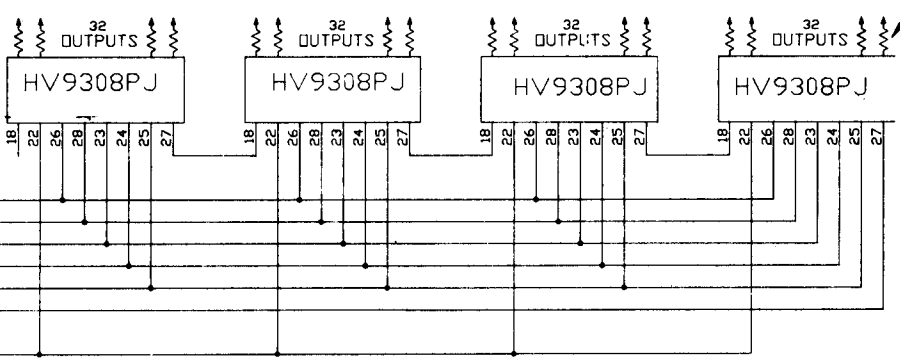


CATHODE CONNECTIONS

DALE PLASMA DISPLAY PD-128G032

ANODE CONNECTIONS

ANODE CONNECTIONS



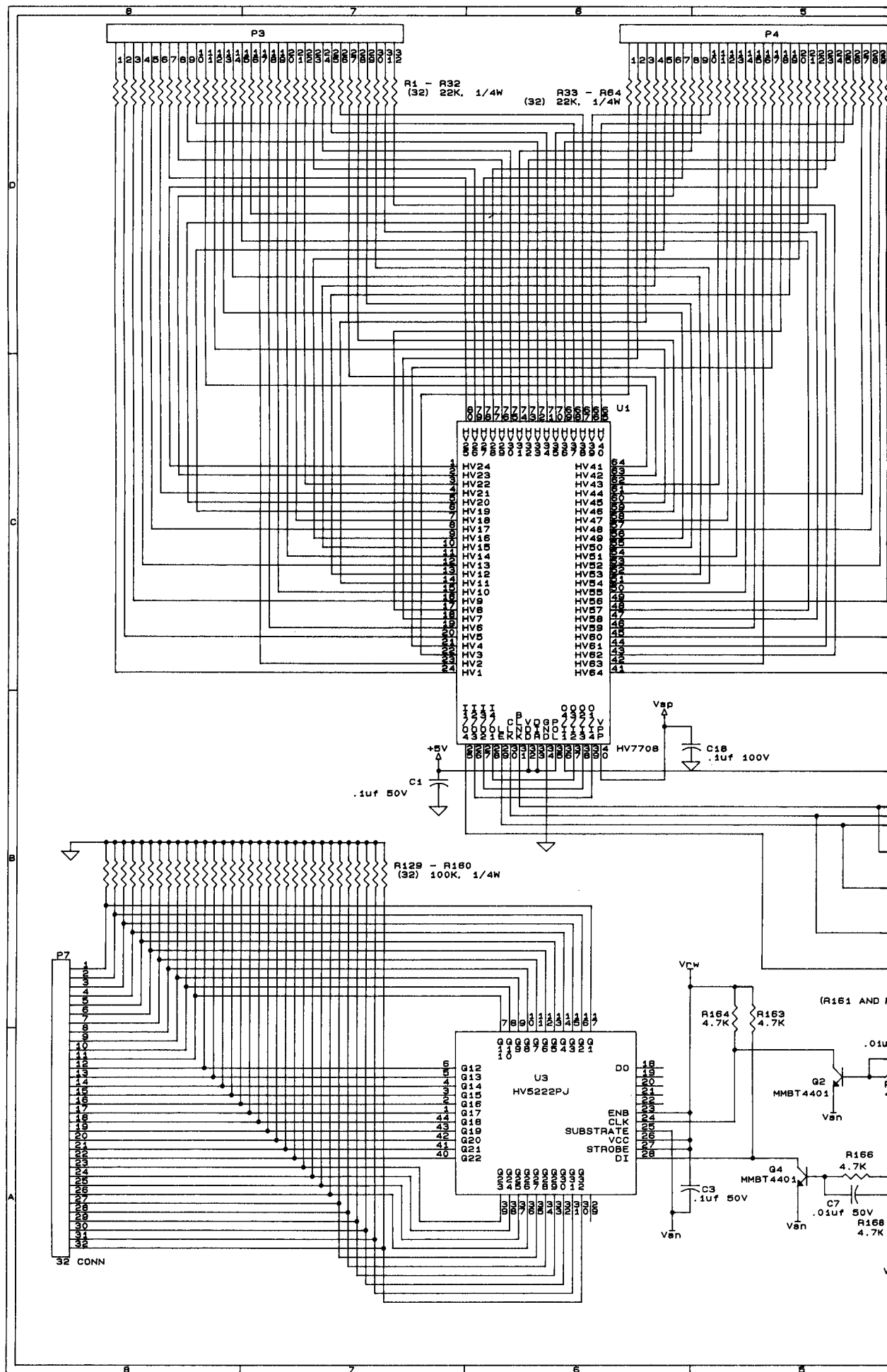
ALL RESISTORS ARE 27K OHM X 128 RESISTORS

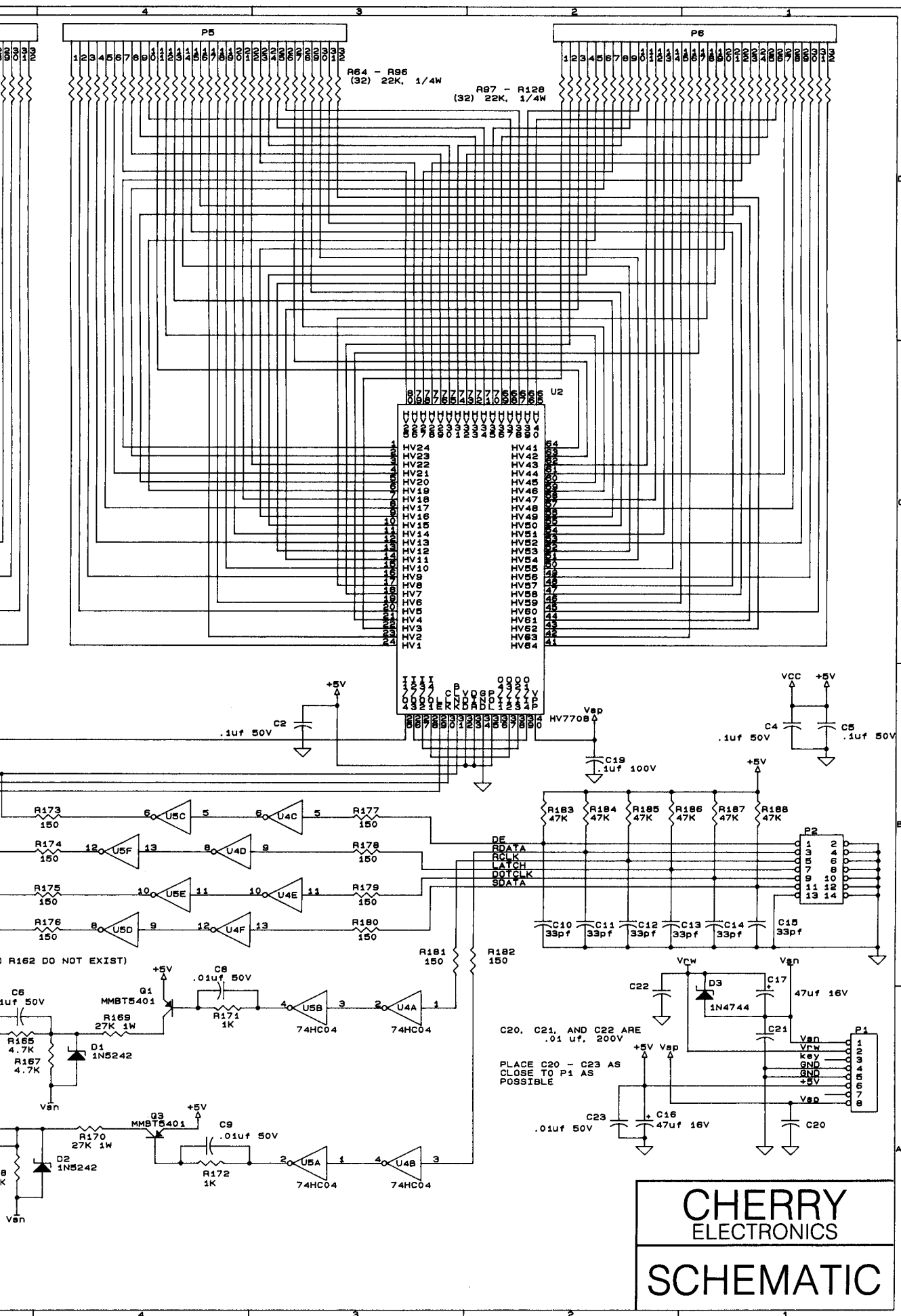
CAPACITORS ARE .1UF.

281103

CLASS 2

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	<small>MATERIAL</small> _____	<small>TITLE</small> ELECTRICAL SCHEMATIC APD-128G032		<small>SIZE CODE IDENT NO. DRAWING NO.</small> D 91637 281103		
	<small>FINISH</small> <input checked="" type="checkbox"/>	<small>SCALE NONE</small>		<small>SHEET 1 OF 1</small>		
	<small>ALL MACHINING SURFACES</small> <input checked="" type="checkbox"/>	<small>APPROVED BY</small> _____				

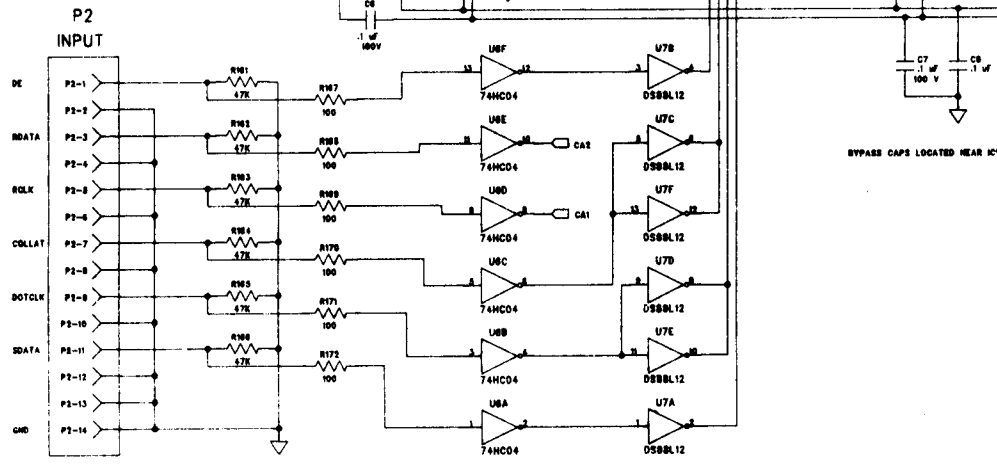




**CHERRY
ELECTRONICS**

SCHEMATIC

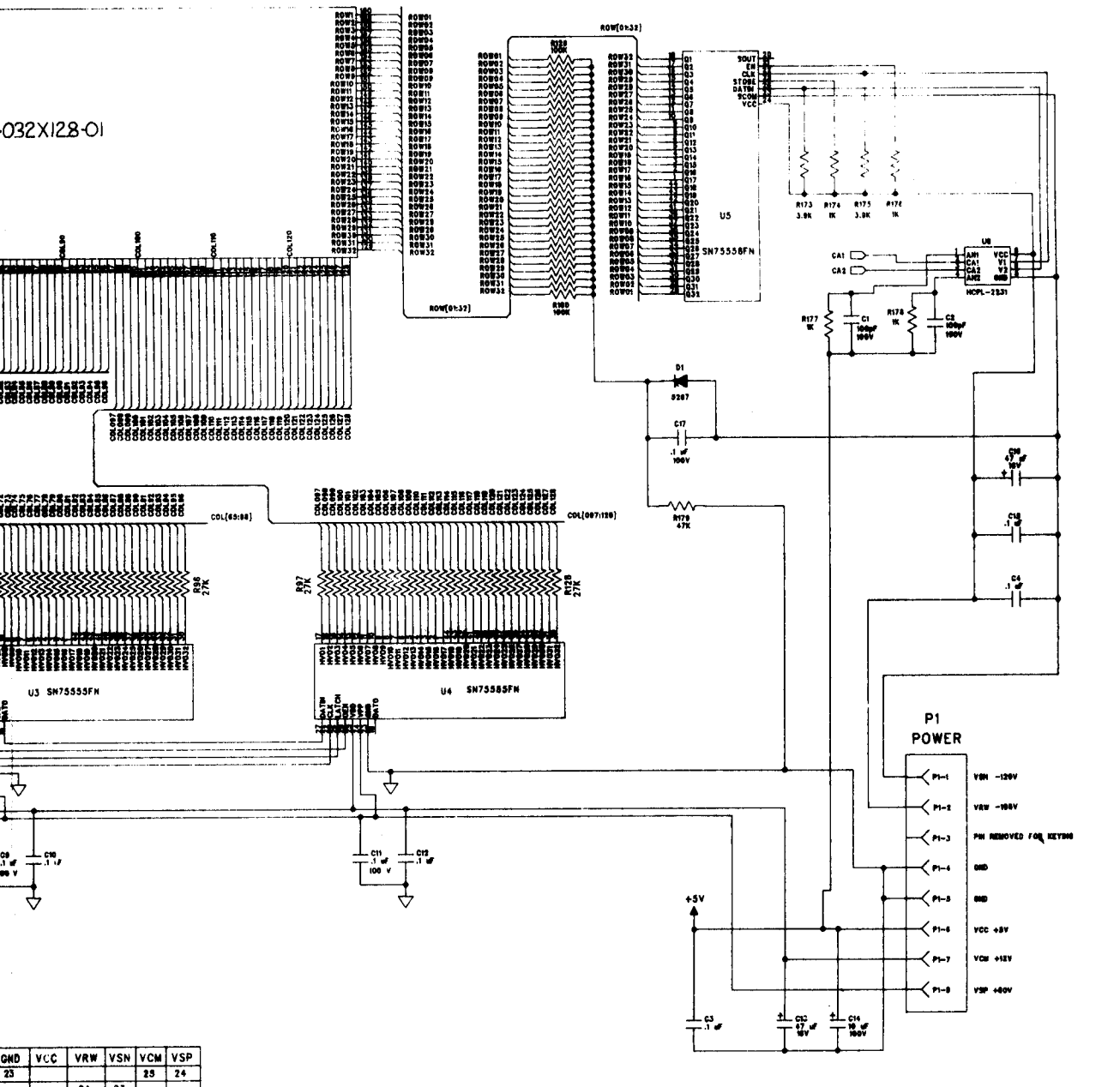
DISPLAY GP-03



REF	DES	QNT
U1 - U4		23
U5		
U6	7	
U7	7	
U8		

- 2. RESISTOR VALUES ARE IN OHMS, 1/8 WATT, 5%.
 - 1. CAPACITOR VOLTAGES ARE 50V, 20%.
- NOTES: UNLESS OTHERWISE SPECIFIED.

032X128-01



GND	VCC	VRW	VSN	VCM	VSP
23		24	23	25	24
7	14				
7		8	5	14	

D

C

B

A

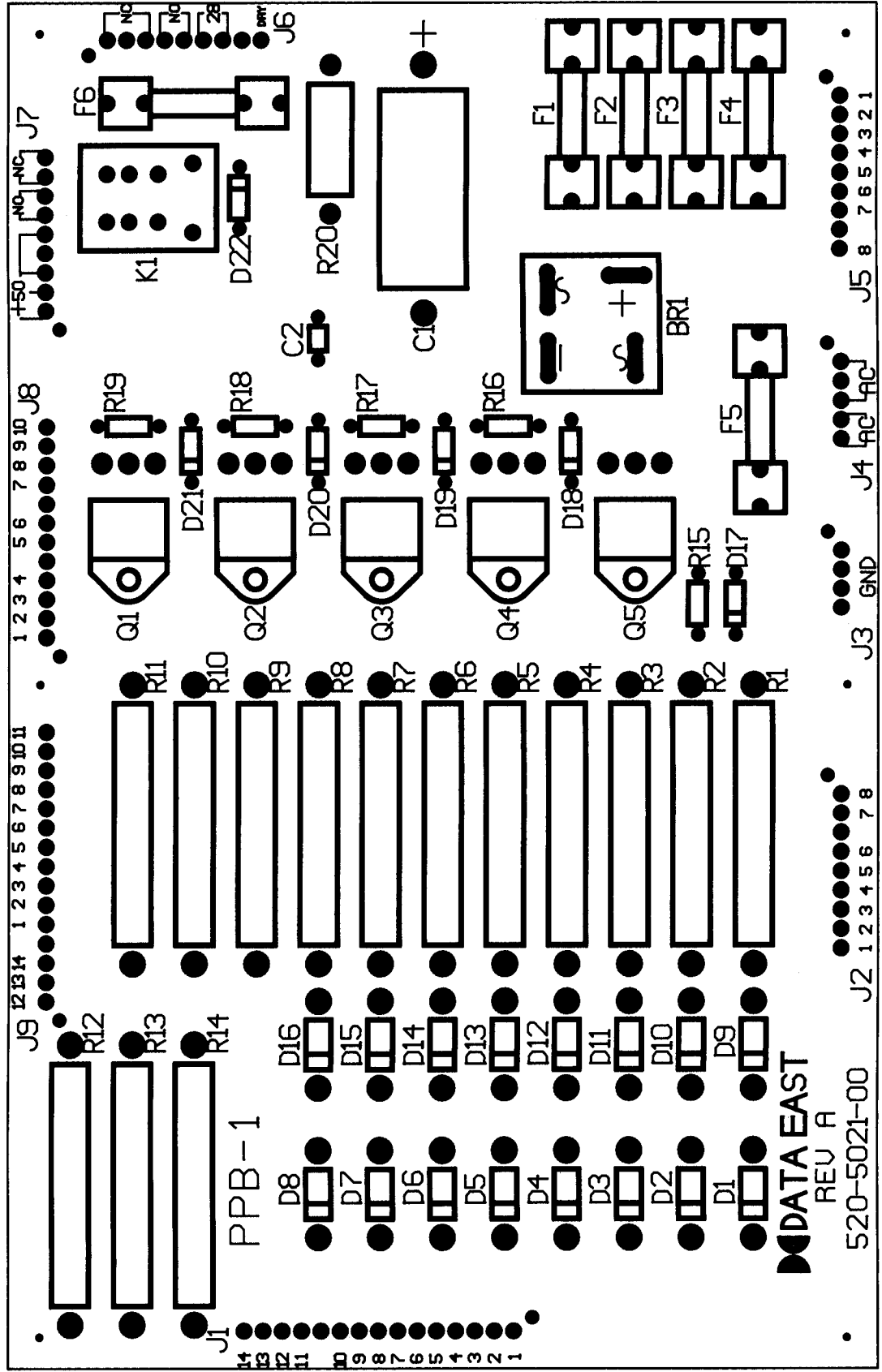
PADS LOGIC VER. 2.03 FILE: DM32129.SCH	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES - XX .005 XX - .020 ANGLES 2	CONTR NO.	BARCOCK DISPLAY PRODUCTS, INC. 1091 S. EAST STREET ANAHEIM, CALIFORNIA 92806
		DRAWN BY RAY DEESE	
		CHECK BY RAY DEESE	DATE 10-14-74
		APPR BY	DATE
		DO NOT SCALE PRINT	
NEXT ASSY 60-022929-01	THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF BARCOCK AND IS HEREBY SUBJECT TO THE CONDITIONS THAT THE INFORMATION (A) IS RELEASED IN CONFIDENCE, (B) NOT BE REPRODUCED OR COPIED IN WHOLE OR IN PART AND (C) NOT BE USED OR INCORPORATED IN ANY PRODUCT, EXCEPT UNDER AN EXPRESS WRITTEN AGREEMENT WITH BARCOCK.	CODE IDENT 66846	1510-0106
APPLICATION USED ON		SCALE	SIZE D SHEET 1 OF 1

4

3

2

1



DATA EAST

REV A

520-5021-00

J2 1 2 3 4 5 6 7 8

J3 GND

J4 AC AC

J5 8 7 6 5 4 3 2 1

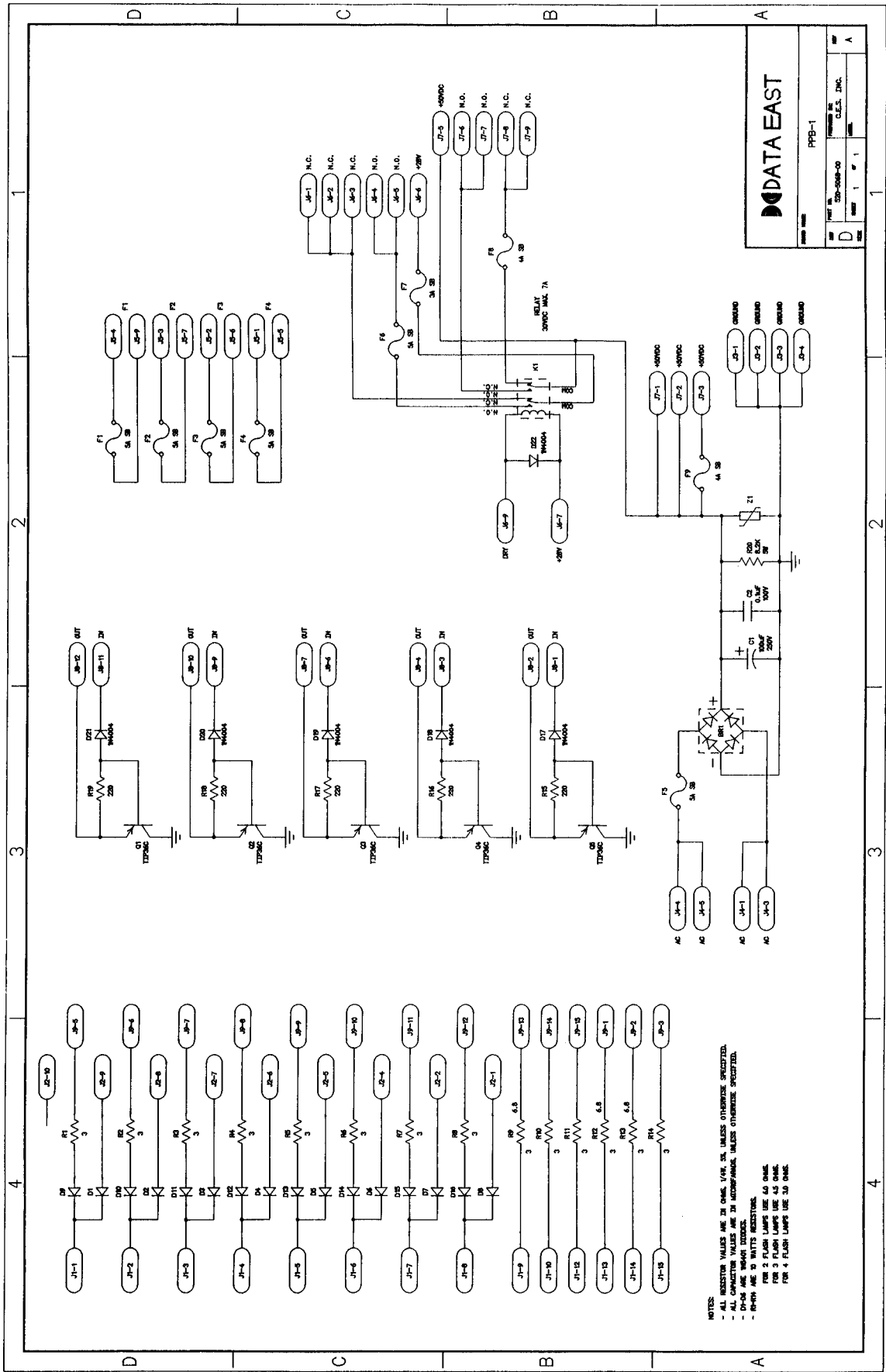
J9 12 13 14 1 2 3 4 5 6 7 8 9 10 11

J8 1 2 3 4 5 6 7 8 9 10

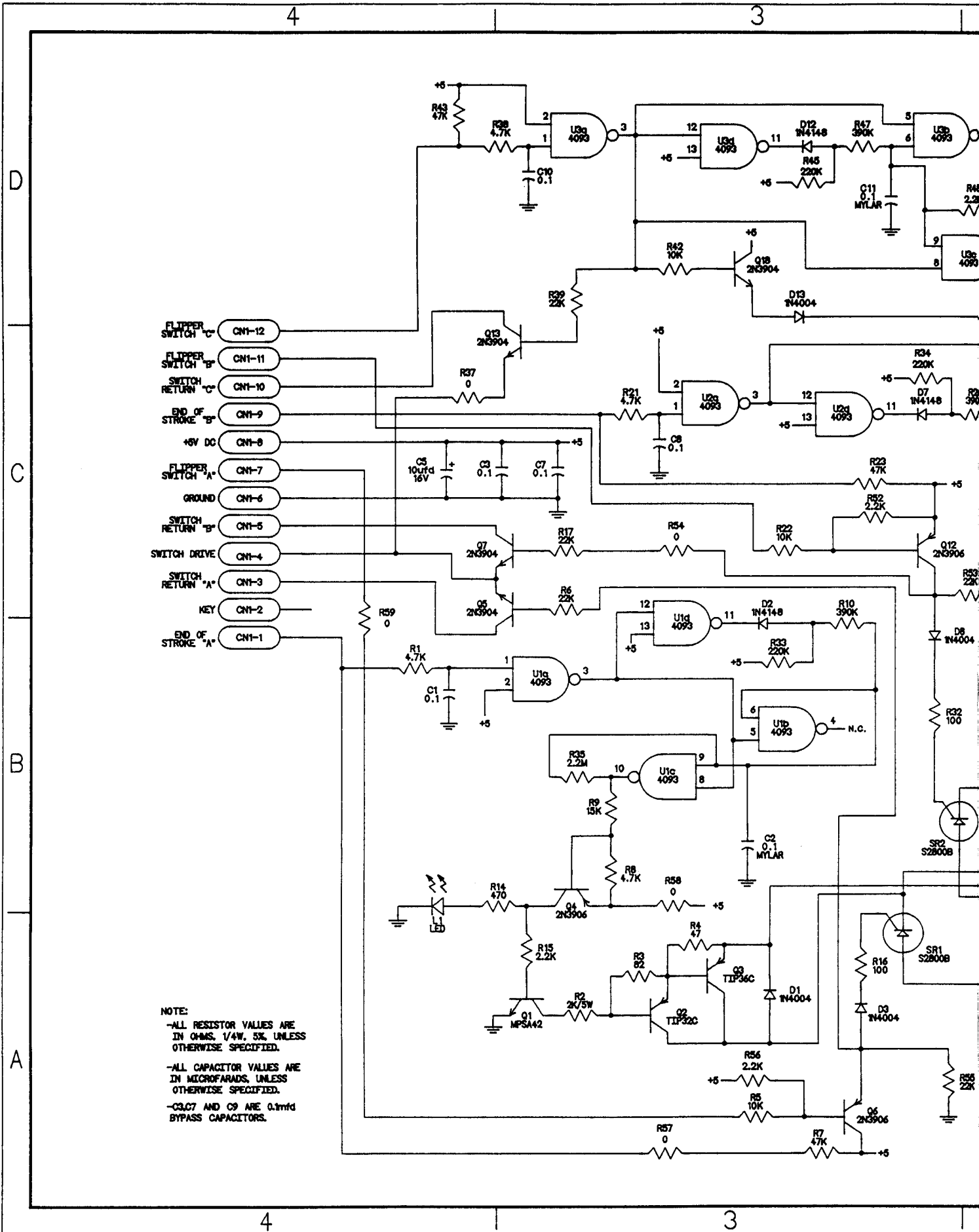
J7 +50 NO NC

PPB-1

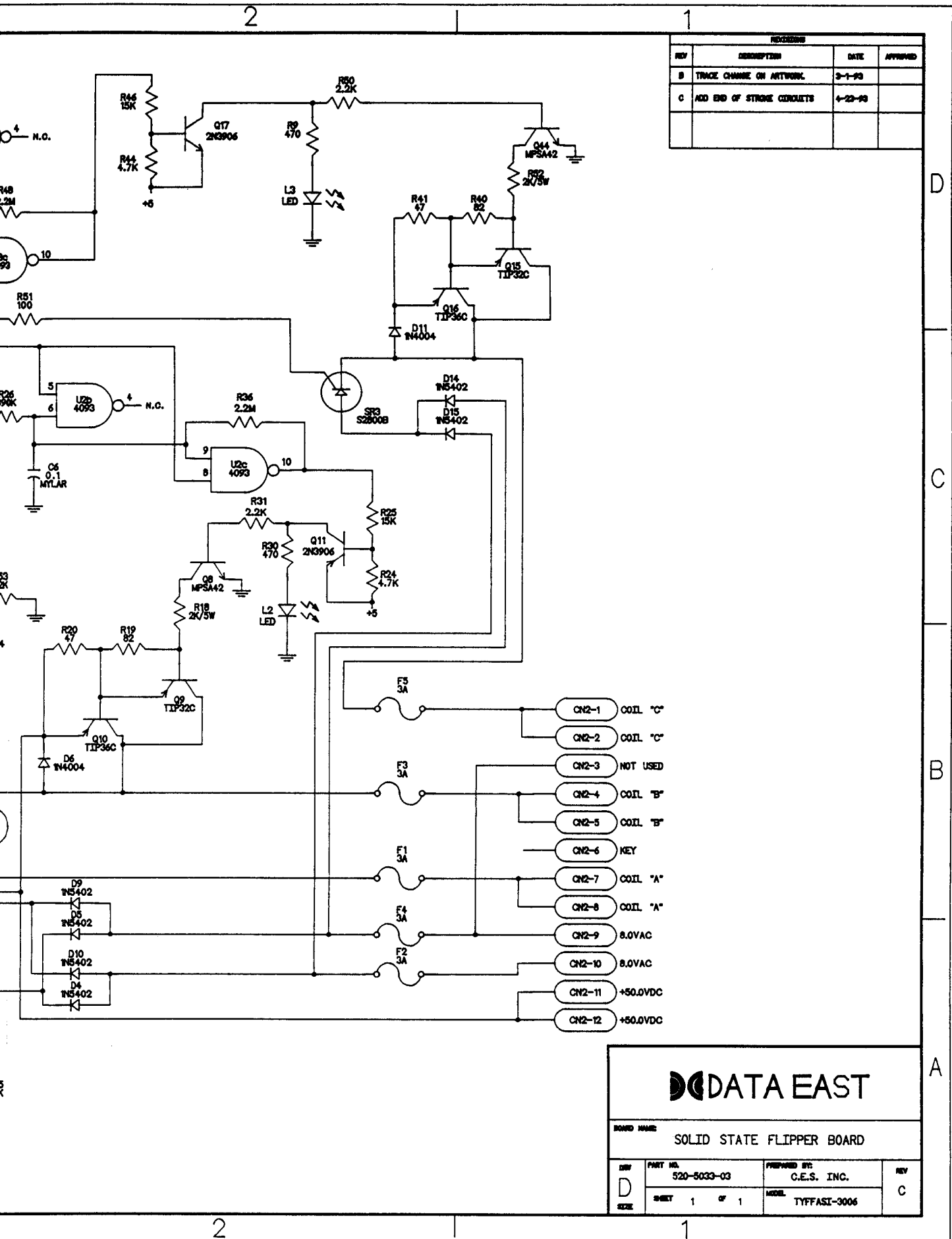
14 13 12 11 10 9 8 7 6 5 4 3 2 1



NOTES:
 - ALL RESISTOR VALUES ARE IN OHMS, UNLESS OTHERWISE SPECIFIED.
 - ALL CAPACITOR VALUES ARE IN MICROFARADS, UNLESS OTHERWISE SPECIFIED.
 - DIODES ARE 1N4148 UNLESS OTHERWISE SPECIFIED.
 - TRANSISTORS ARE 2N2222 UNLESS OTHERWISE SPECIFIED.
 - FOR 2 FLASH LAMPS USE 40 OHM.
 - FOR 3 FLASH LAMPS USE 45 OHM.
 - FOR 4 FLASH LAMPS USE 50 OHM.



NOTE:
 -ALL RESISTOR VALUES ARE IN OHMS, 1/4W, 5%, UNLESS OTHERWISE SPECIFIED.
 -ALL CAPACITOR VALUES ARE IN MICROFARADS, UNLESS OTHERWISE SPECIFIED.
 -C3,C7 AND C9 ARE 0.1µF BYPASS CAPACITORS.

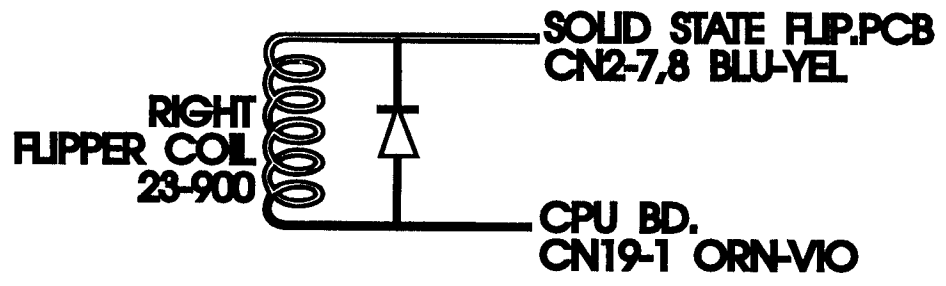
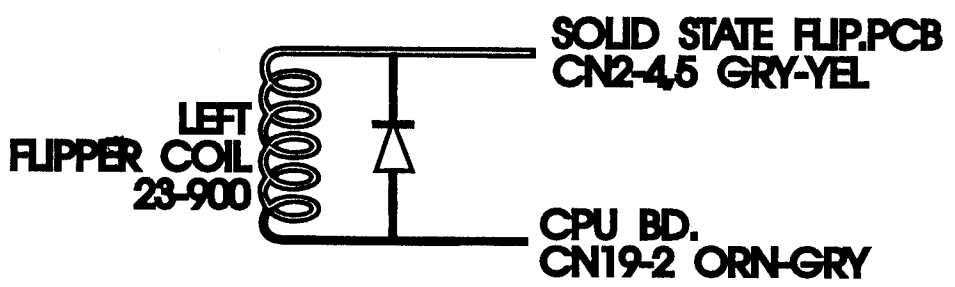
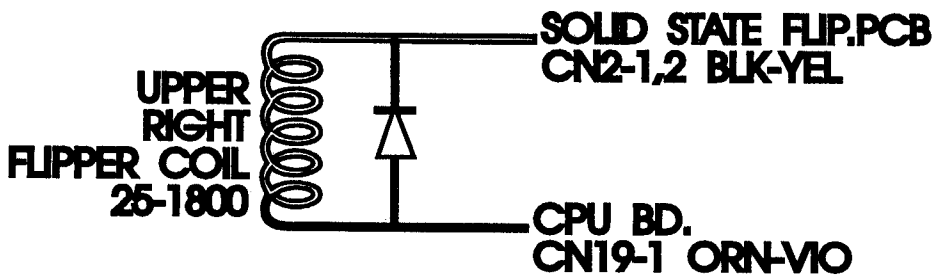
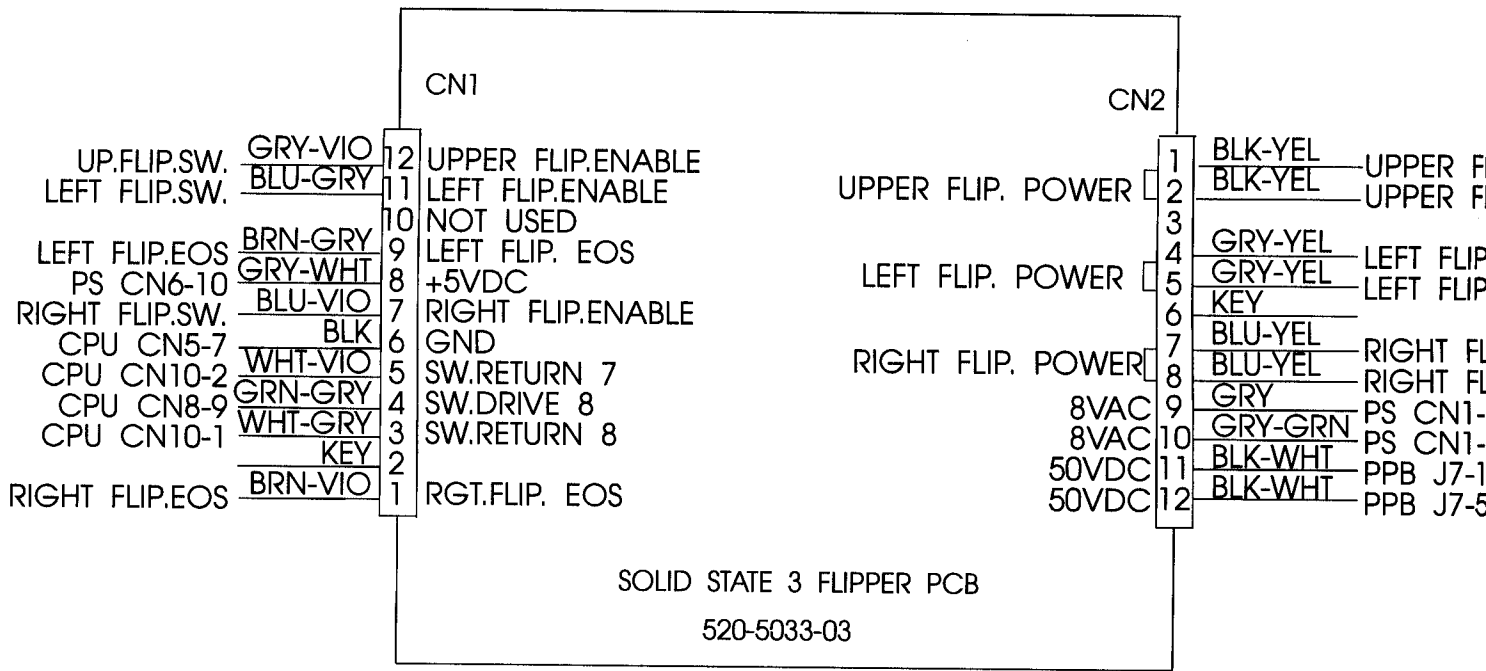


REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
B	TRACE CHANGE ON NETWORK	3-1-93	
C	ADD END OF STROKE COILS	4-29-93	

DATA EAST

BOARD NAME: SOLID STATE FLIPPER BOARD

REV	PART NO.	PREPARED BY:	REV
D	520-5033-03	C.E.S. INC.	C
SIZE	SHEET 1 OF 1	MODEL TYFFAST-3006	



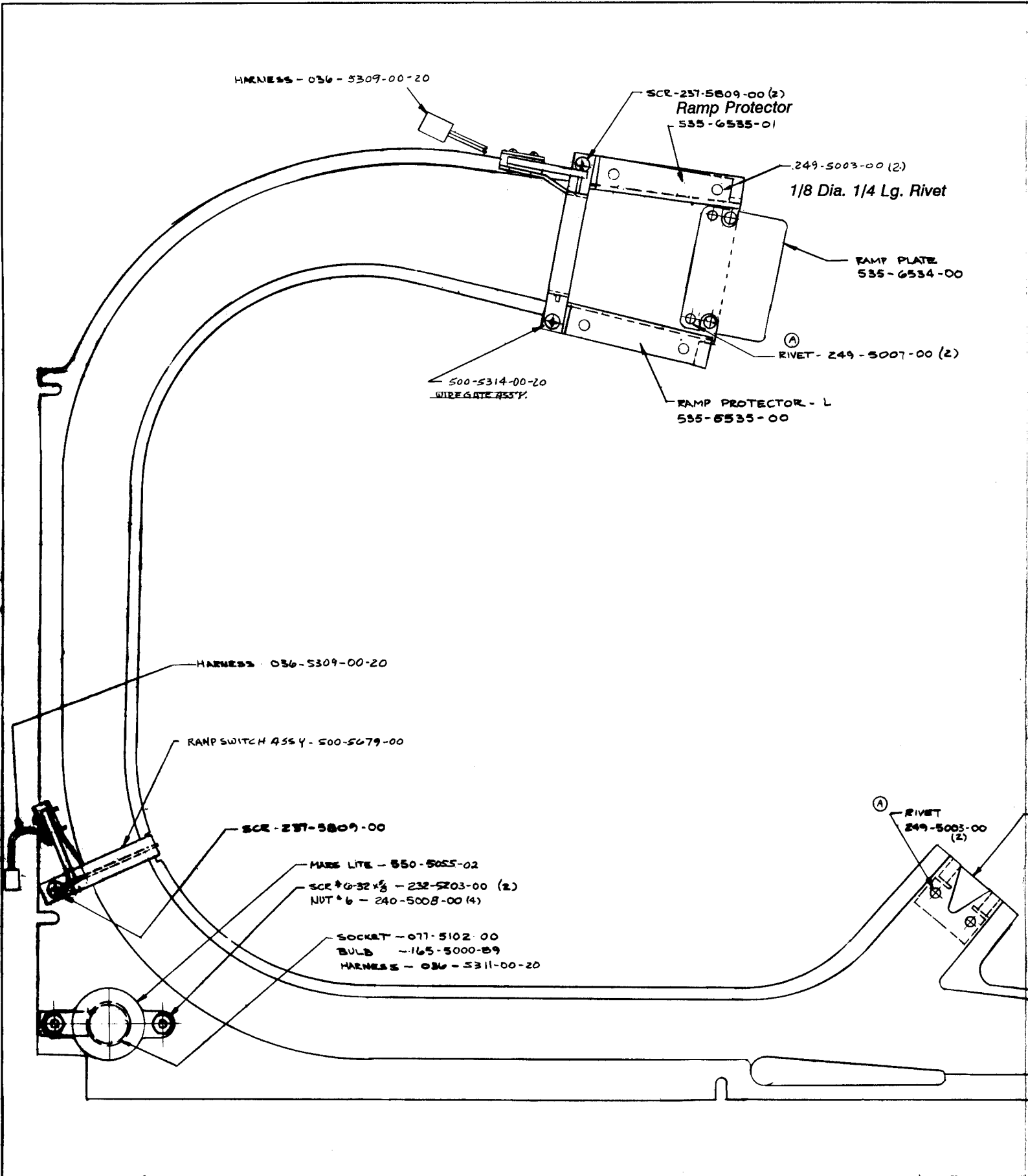
Solid State Flippers
PCB Wiring Diagram

Connector CN 1

Pin#	Goes to	Wire Color	It is
----	-----	-----	-----
FLIP.COIL FLIP.COIL 1	Rgt. Flipper EOS	BRN-GRY	Rgt. Flip End of Stroke
2			Key
IP.COIL IP.COIL 3	CPU CN 10-1	WHT-GRY	Sw. Ret 8
4	CPU CN 8-9	GRN-GRY	Sw. Drive 8
FLIP.COIL FLIP.COIL 5	CPU CN 10-2	WHT-VIO	Sw. Ret 7
6	Rgt. Flipper Sw.	BLU-VIO	Rgt.Flip.Enable
1-11 1-10 1 5 7	CPU CN 5-9	BLK	Gnd
8	PS CN 6-10	GRY-WHT	+5VDC
9	Left Flipper EOS	BRN-GRY	Left Flip. End of Stroke
10			
11	Lft.Flipper Sw.	BLU-GRY	Lft. Flip Enable
12	Upper Rgt.FlpSw.	GRY-VIO	Upper Rgt. Flip Enable

Connector CN 2

Pin #	Goes To	Wire Color	It Is
-----	-----	-----	-----
1	Upper Rgt Flip Coil	BLK-YEL	Upper Rgt Flip. Power
2	Upper Rgt Flip Coil	BLK-YEL	Upper Rgt Flip. Power
3			Not Used
4	Lft. Flip Coil	GRY-YEL	Lft Flip Power
5	Lft. Flip Coil	GRY-YEL	Lft Flip Power
6			Key
7	Rgt Flip Coil	BLU-YEL	Rght. Flip Power
8	Rgt Flip Coil	BLU-YEL	Rght. Flip Power
9	PS CN 1-11	GRY	9VAC
10	PS CN 1-10	GRY-GRN	9VAC
11	PPB J7-1	BLK-WHT	50VDC
12	PPB J7-5	BLK-WHT	50VDC



REV	DESCRIPTION	DATE	BY
A	249-5003-00 WAS 249-5001-00 249-5007-00 WAS 241-5001-00 550-5055-02 WAS 550-5055-01	3-29-93	ED.C.

RAMP BRKT
535-6533-00

END BRKT-RAMP
535-6537-00

PLASTIC RAMP
545-5155-00

④ RIVET
249-5003-00 (2)

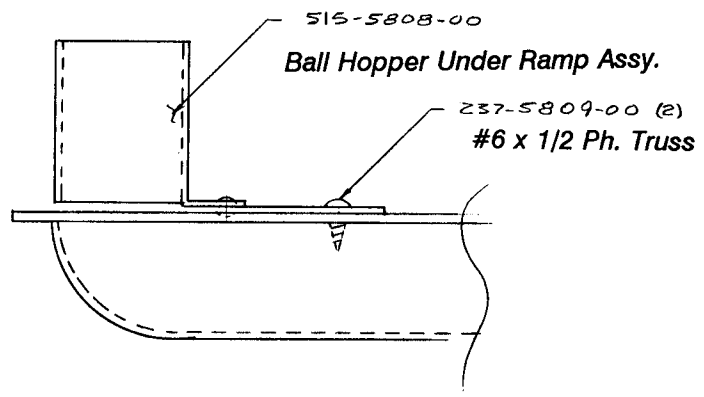
TOLERANCE UNLESS
OTHERWISE SPECIFIED

DIM. X.X ± .05	X.XXX ± .005
X.XX ± .015	X.XXXX ±

ANGULAR
M ± .5°
R ± .1°

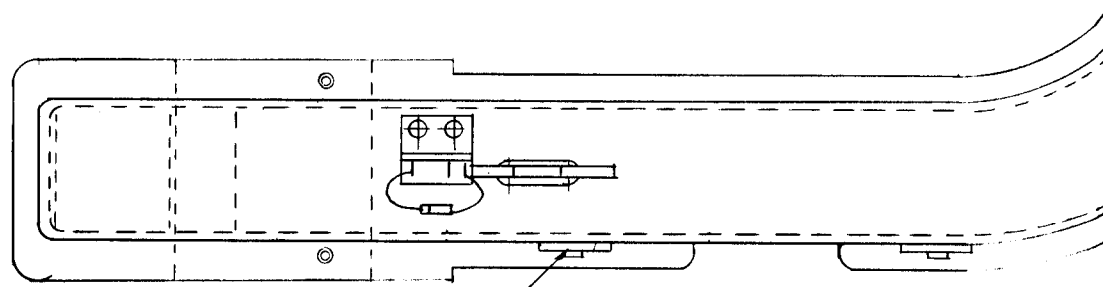
FRACTIONAL ± 1/64

REQ. 1	REV. 1	DATE 2-9-93	TITLE RAMP ASS'Y JUR. PARK
BY	CHKD	SCALE 1:1	PART NO. 500-5669-00
ALT.	DATA EAST PINBALL, INC.		1880 JANICE AVE., MELROSE PARK, IL. 60180
PRG.			



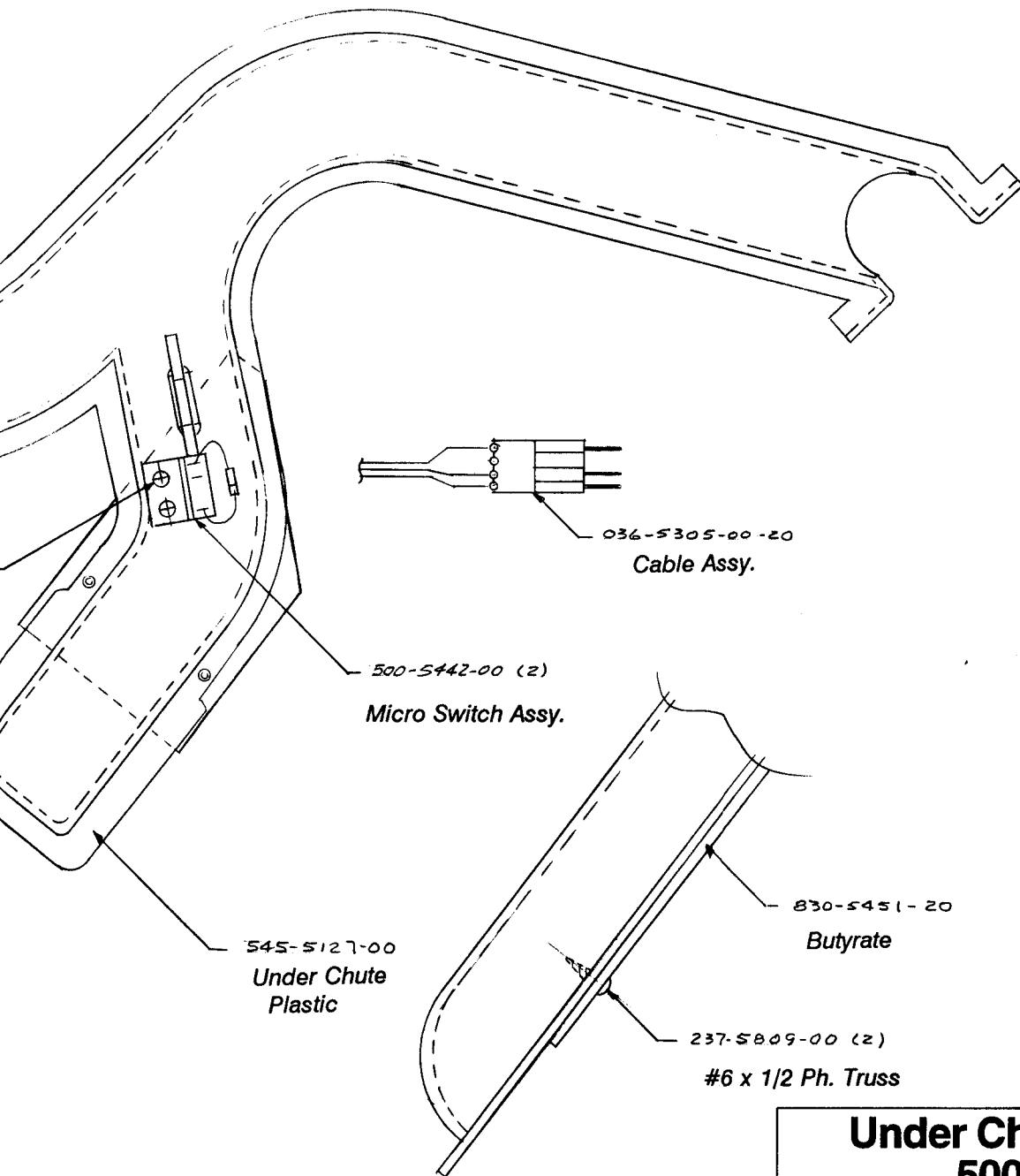
515-5808-00
Ball Hopper Under Ramp Assy.

237-5809-00 (2)
 #6 x 1/2 Ph. Truss

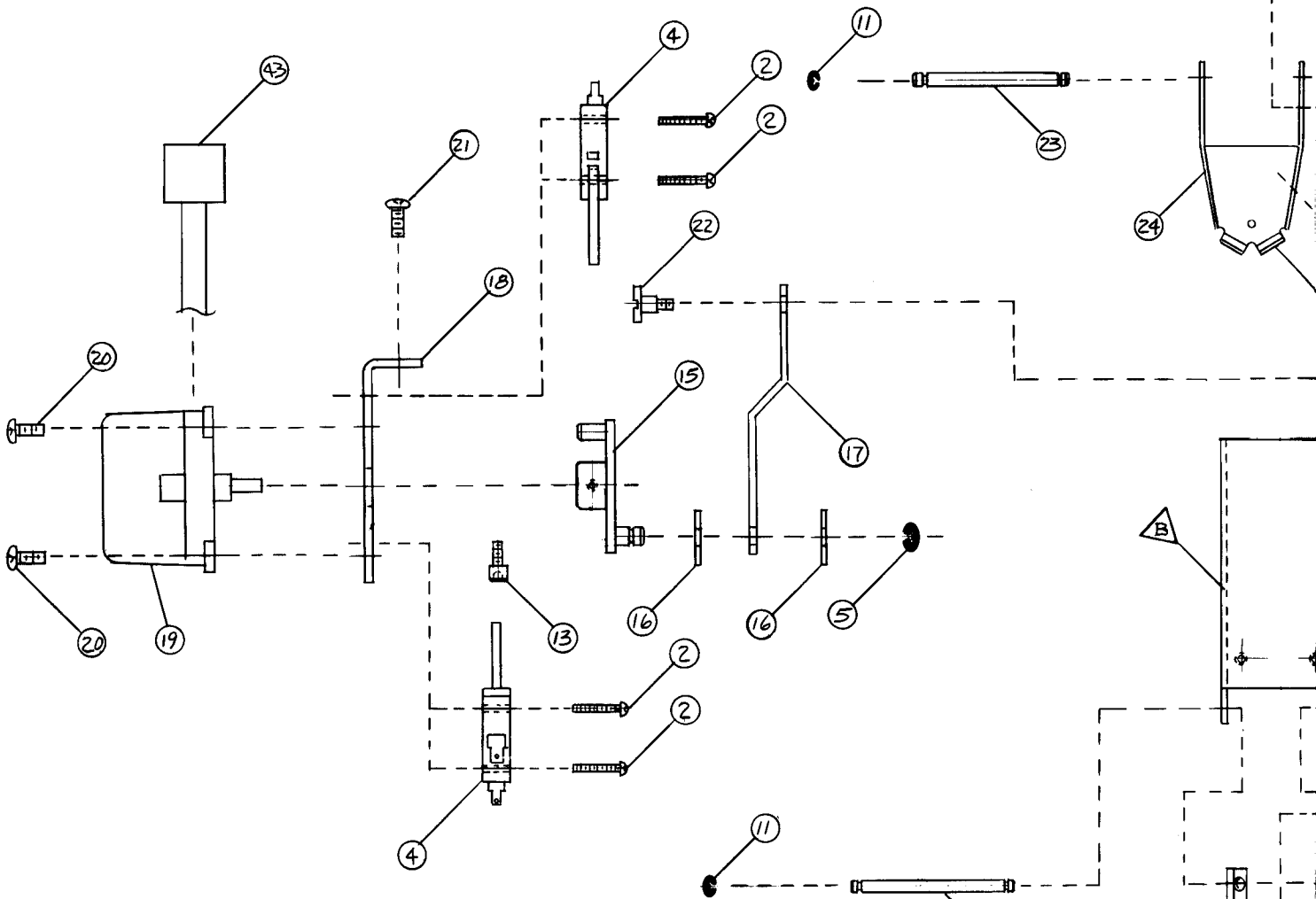


040-5002-00 (2)
 TIE HOLDER
 040-5001-02 (2) TIE

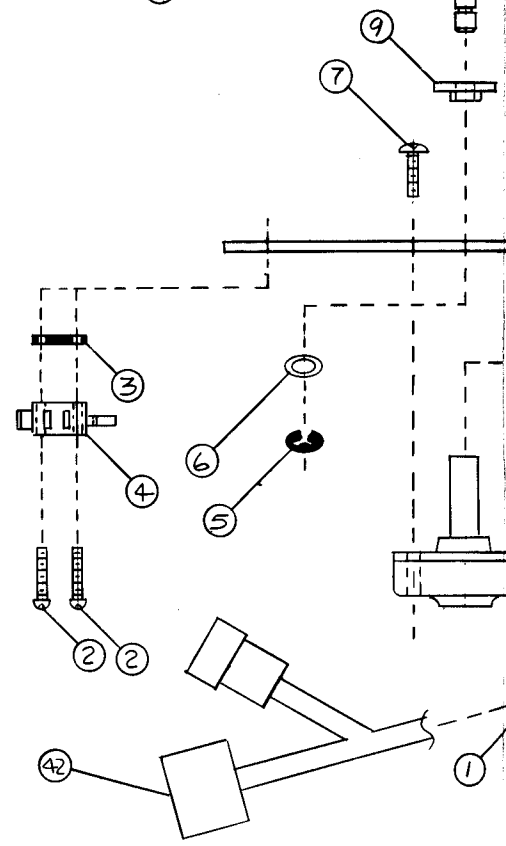
249-5011-00
 1/8 x 5/16 Brass
 Rivet



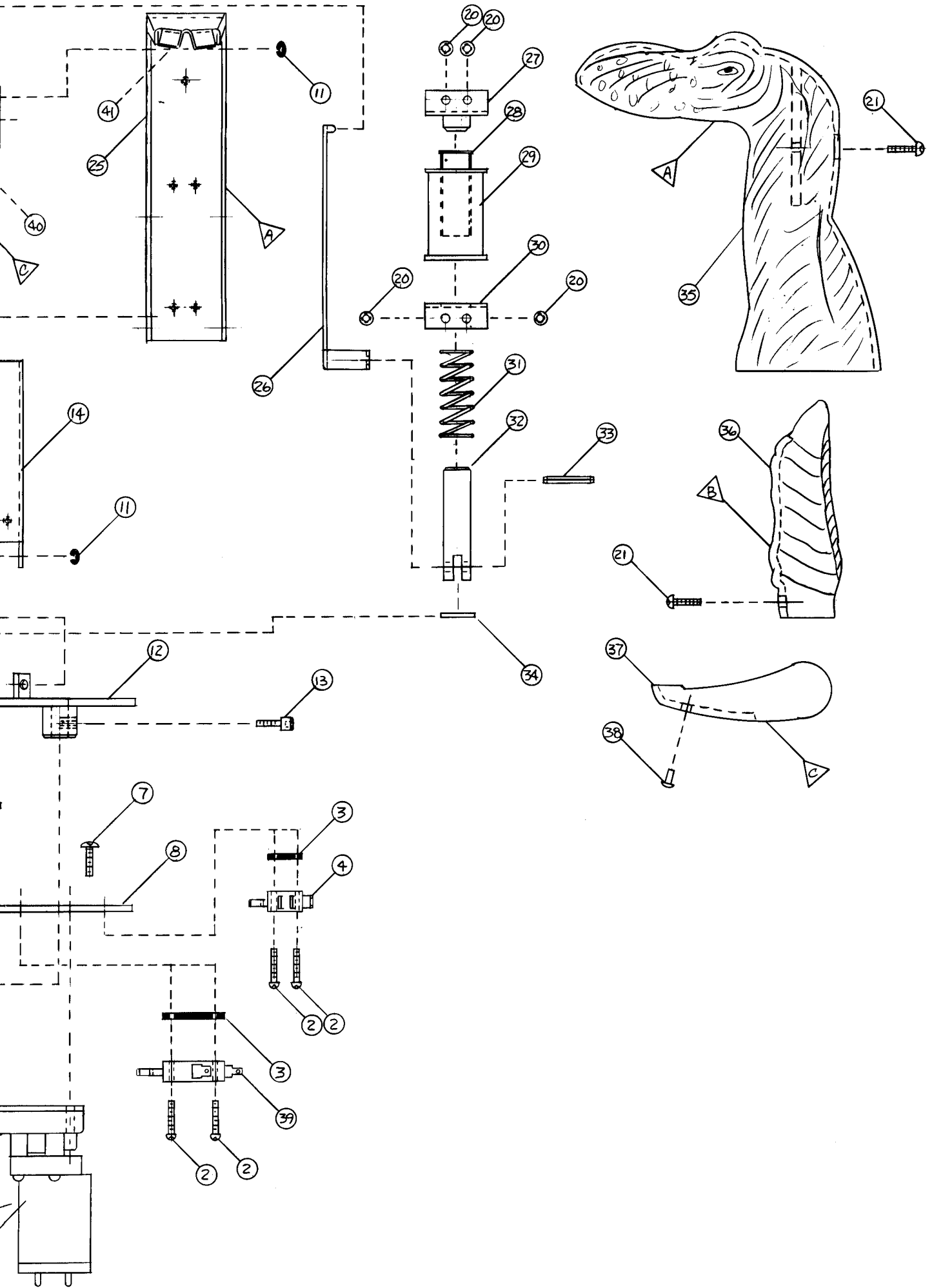
Under Chute Assembly
500-5668-00



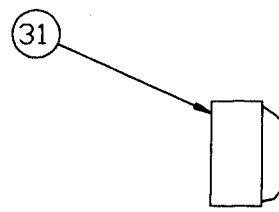
28	545-5031-00	COIL SLEEVE	1	43	036-5304-00	UP-DOWN CABLE	1
27	515-5088-00	COIL STOP ASSY	1	42	036-5300-00	DINO BASE CABLE	1
26	535-6640-00	LINK	1	41	820-6030-08	DECAL UPPER JAW	1
25	535-6643-00	DINO NECK	1	40	820-6030-05	DECAL BOTTOM JAW	1
24	535-6641-00	DINO JAW	1	39	180-5123-00	MICRO SWITCH ROLLER	1
23	530-5242-01	DINO SHAFT	1	38	249-5007-00	1/8X 7/32 RIVET	1
22	530-5248-00	SHOULDER SCREW	1	37	545-5405-00	DINO JAW	1
21	232-5301-00	8-32X 3/8 PH. R.H. SEMS	5	36	545-5404-00	DINO FRONT	1
20	232-5200-00	6-32X 1/4 PH. R.H. SEMS	6	35	545-5403-00	DINO HEAD-BACK	1
19	041-5026-00	BOWMAN II RPM 24 VAC	1	34	626-5025-00	PLUNGER STOP PAD	1
18	535-6645-00	MOTOR MTG. BRKT	1	33	515-5811-00	1/8X 3/4 ROLL PIN	1
17	535-6657-00	CRANK ARM	1	32	530-5013-01	PLUNGER	1
16	242-5021-00	1/4 STEEL WASHER	2	31	266-5035-00	PLUNGER SPRING	1
15	515-5814-00	MOTOR CAM ASSY	1	30	535-6658-00	COIL SUPPORT BRKT	1
14	535-6642-00	DINO BODY	1	29	090-5034-00	COIL-25-1240	1
13	237-5897-00	8-32X 3/8 SOC. HD. SCR	2				
12	515-5812-00	DINO MTG. PLATE ASSY	1				
11	270-5001-00	3/16 "E" RING	4				
10	530-5242-00	DINO SHAFT	1				
9	545-5398-00	NYLON SHOULDER WASHER	1				
8	535-6644-00	MOUNTING PLATE	1				
7	232-5304-00	8-32X 3/4 PH. HD. SEMS	4				
6	242-5008-00	1/4" FLAT WASHER	1				
5	270-5002-00	1/4" "E" RING	2				
4	180-5040-00	MICRO SWITCH	4				
3	545-5402-00	SWITCH SPACER	3				
2	237-5832-00	4-40X 5/8 R. HD. MS. SEMS	10				
1	041-5025-00	5VDC MOTOR - MULTI	1				
ITEM	PART NO	DESCRIPTION	REQD	ITEM	PART NO	DESCRIPTION	REQD



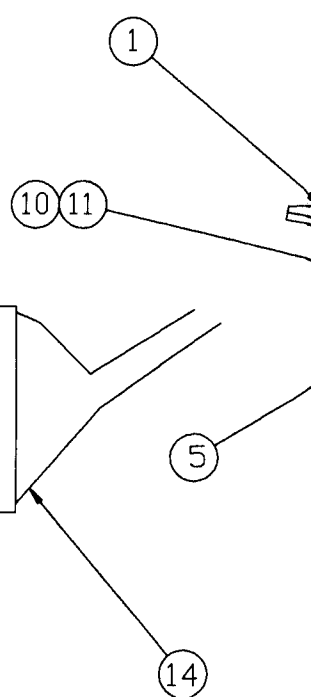
70 Dino Assembly



ITEM	PART NO.	DESCRIPTION	QTY
17	515-5817-00	LOCK BALL BRKT ASSY	1
18	515-5815-00	LOCK BALL CAM ASSY	1
19	530-5250-00	PLUNGER, Ø7/16 X 2 1/4 LG	1
20	535-6649-00	LINK, LOCK BALL	1
21	266-5036-00	SPRING	1
22	545-5400-00	SPACER	1
23	090-5034-00	COIL, 25-1240	1
24	515-5088-00	CORE STOP ASSY	1
25	535-6658-00	COIL RETAINING BRKT	1
26	545-5031-00	COIL SLEEVE	1
27	242-5022-00	WASHER, BRASS	2
28	270-5002-00	E-RING, 25 SHAFT	2
29	237-5898-00	#6-32 HWH TC X .38 LG	4
30	237-5606-00	#8-32 PPH X 1" LG	1
31	036-5301-01	WIRING HARNESS	1

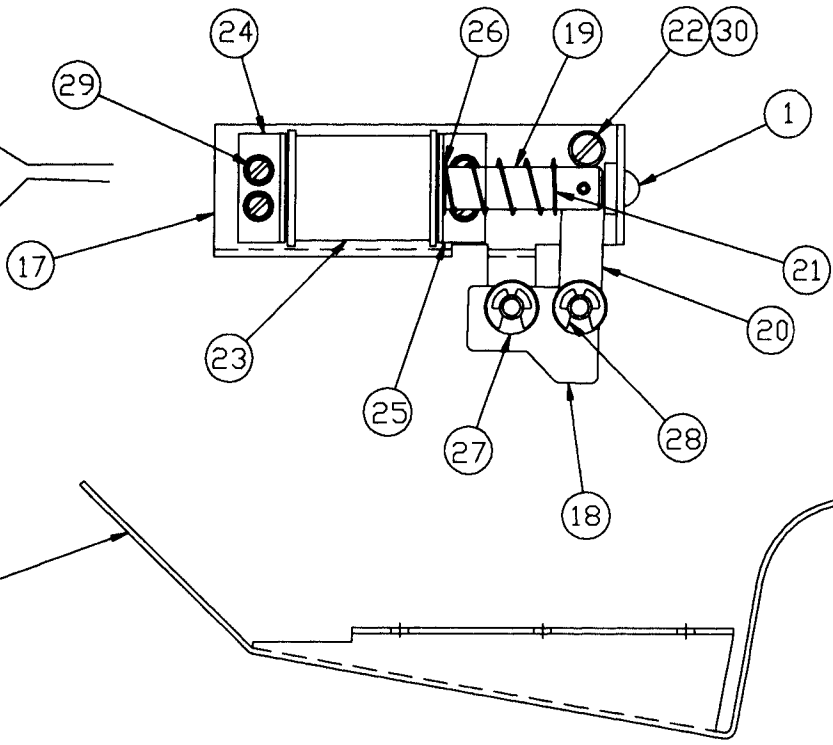


535-6606-00
DEFLECTOR

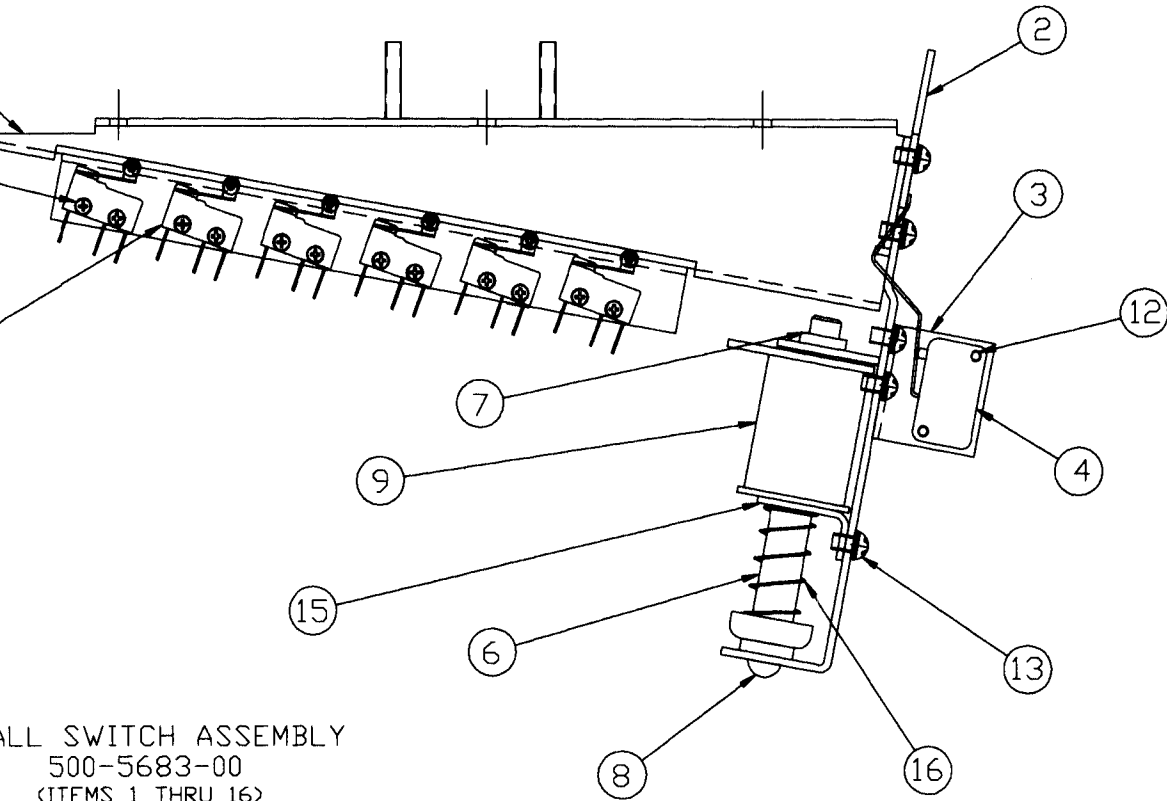


16	266-5020-00	SPRING	1
15	535-5203-01	COIL RETAINING BRKT	1
14	036-5301-00	WIRE HARNESS	1
13	232-5300-00	#8-32 PPHW/SEM X .25 LG	8
12	237-5832-00	#4-40 PPH X .62 LG	2
11	244-5001-00	#2 SPLIT LW	12
10	237-5806-00	#2-56 PPH X .5 LG	12
9	090-5001-00	COIL, 23-800	1
8	545-5105-00	RUBBER BUMPER	1
7	545-5076-00	COIL SLEEVE	1
6	515-5000-02	PLUNGER ASSY	1
5	180-5119-00	SWITCH, SUBMINIATURE	12
4	180-5118-00	SWITCH, MINIATURE	1
3	535-6623-00	SWITCH MTG BRKT	1
2	535-6622-00	COIL MTG BRKT	1
1	535-6621-00	OUTHOLE MTG BRKT	1
ITEM	PART NO.	DESCRIPTION	QTY

6 BA



LOCK BALL ASSEMBLY
500-5684-00
(ITEMS 17 THRU 31)

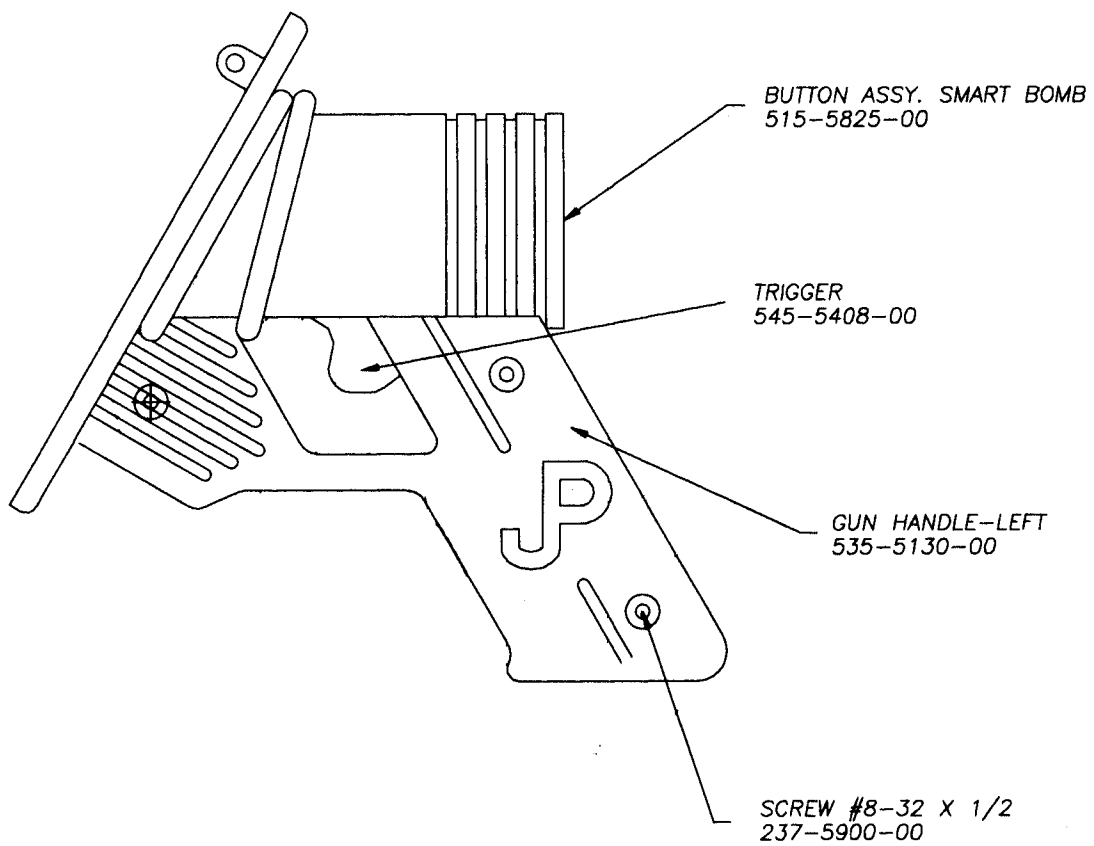


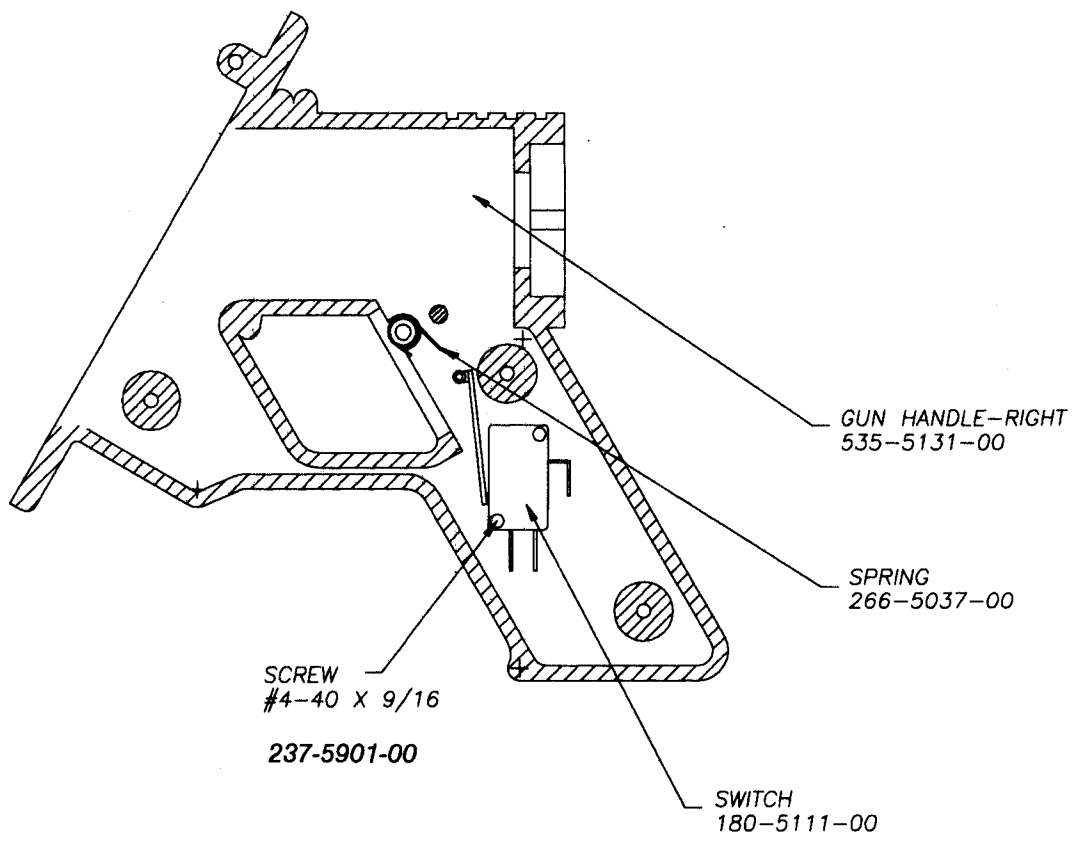
6 BALL SWITCH ASSEMBLY
500-5683-00
(ITEMS 1 THRU 16)

TOLERANCE UNLESS OTHERWISE NOTED

DIMENSION FRACTIONAL ± 1/64
XX ± .005 ANGULAR ± 1/8°
XXX ± .010
XXXX ± .005

REQ.	NEXT ASSY.	DWN. N.R./URZ	DATE 4-16-93	TITLE 6 BALL OUT HOLE TROUGH ASSEMBLY
MAT.		CHK'D	SCALE 1:1	PART NO.
H.T.	DATA EAST PINBALL, INC.			
FIN.	1990 JANICE AVE. MELROSE PARK, IL. 60160			TRUFFASY





SCREW
#4-40 X 9/16
237-5901-00

GUN HANDLE-RIGHT
535-5131-00

SPRING
266-5037-00

SWITCH
180-5111-00

TOLERANCE UNLESS
OTHERWISE NOTED

DIMENSION FRACTIONAL & 1/64
XX & .005 ANGULAR & 1/2°
XXX & .005

REQ. 1	NEXT ASSY.	DWN. TWS	DATE 4.20.93	TITLE
MAT.		CH'KD	SCALE 1:1	J/P GUN ASS'Y.
H.T.	DATA EAST PINBALL, INC.			PART NO.
FIN.	1990 JANICE AVE., MELROSE PARK, IL. 60160			500-5673-00

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.