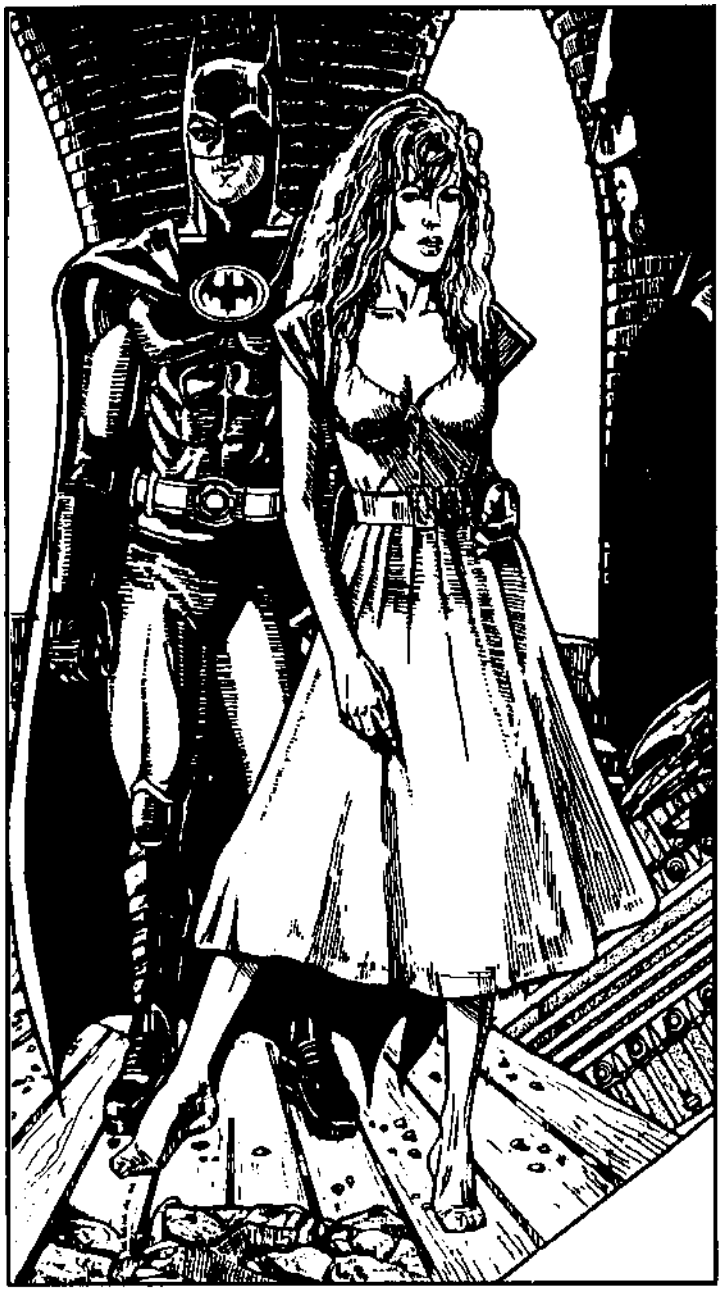
DATA
EAST

BATMAN



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

DATA EAST PINBALL® **1-800-KICKERS**

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CPU JUMPERTABLE

Game	CPU* Vereion	ROM Location	Jumpers Installed	Removed
Laser Wars	Ver 1	5C	J1b,J3,J4,J6a,J7a,&J8	J1a,J2,J5,J6,&J7b
	Ver 2	5C	J1b,J3,J4,J5a,J6a,J7b,&J8	Jla,J2,J5,J5b,J6b,&J7a
Secret Servlce	Ver 2	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	Jla,J2,J5,J5a,J6a,&J7a
Torpedo Alley	Ver 2	5B.5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
Tlme Machine	Ver 2	5B.5C	Jlb,J3,J4,J5b,J6b,J7b,&J8	Jia,J2,J5,J5a,J6a,&J7a
Playboy	Ver 2	5B.5C	J1b,J3,J4,J5b,J6b,J7b,&J8	JldfJZjJSfJSd, J6a,&J7a
ABC M.N. Football	Ver 2	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	Jla,J2,J5,J5a,J6a,&J7a
Robocop	Ver 2	5B.5C	J1b,J3,J4,J5b,J6b,J7b,&J8	Jla,J2,J5,J5a,J6a,&J7a
Phantom of thè Opera	Ver 2	5B.5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J13, J2, J5,J5a,J6a,&J7a
Back to thè Future	Ver 3	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	Jla,J2,J5,J5a,J6a,&J7a
Thè Simpsons	Ver 3	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
Checkpolnt	Ver 3	5B,5C	Jlb,J3,J4,J5b,J6b,J7b,&J8	Jla,J2,J5,J5a,J6a,&J7a
Teen. Mut. NinjaTurtles	Ver 3	5B.5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
Batman	Ver 3	5B.5C	Jlb,J3,J4,J5b,J6b,J7b,&J8	Jla,J2,J5,J5a,J6a,&J7a

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

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

Power-up CPU Self Tests

Upon power-up, thè CPU board performs a series of self tests of major components. Turn thè game on whlle observlng thè LEDS on thè CPU board. Tests of thè PIAs, RAM, and EPROMs are performed automatlcally and results of thè test are indicated by thè PIA LED.

With all tests passed, thè LEDs illuminate in thè following sequence at power turn-on. Thè PIA and +5V LEDs Illuminate Immediately. Approximately 1/2-second later thè PIA LED goes out and thè Blanking LED illumInates; thè +5Vand Blanking LEDs remain Illuminateci until thè game is turned off. Test failures are Indicated wlth thè PIA LED:

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

QUICK REFERENCE FUSE CHART

PPB BOARD

F1 5A Slo-Blo G.l. 6.3VAC
F2 5A Slo-Blo G.l. 6.3VAC
F3 5A Slo-Blo G.l. 6.3VAC
F45A Slo-Blo G.1.6.3VAC
F5 5A Slo-Blo Flipper Power 48VAC
F6 5A Slo-Blo PPB Solenolds/Flash Lamps (34VDC)

POWER SUPPLY BOARD

F1 7A Slo-Blo +5VDC Regulator Input (9VAC)
F2 7A Slo-Blo +5VDC Regulator Input (9VAC)
F3 NotUsed
F4 8A Slo-Blo Switched IllumInatIon Buss (18VDC)
F5 4A Slo-Blo Solenold Buss (34VDC)
F6 5A Slo-Blo Solenold Buss (34VDC)
F7 0.5A Slo-Blo Display Reg. Input (90VAC)

BATMAN
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Slingshot Assembly .....
Trough Eject Assembly .....
Outhole Ball Return Assembly .....
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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

Referto thè Game lllustration (page 2) to Identify locations of thè major assemblles, and fuse values and locations.

PROM SUMMARY

CPU Board: Location 5B, 5C
Sound Board: Locations U17 (Voice ROM1), U21 (Voice ROM 2), and U7 (Sound ROM)
Display Board: Location U8

TRANSPORTATION

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

GAME ASSEMBLY PROCEDURES
(Refer to thè Game lllustration on page 2)

1. Open thè top of thè carton and lay it on its side with thè bottoni of thè cabinet down. Using thè plastic bandlng strip as a handle, slide thè game out of thè carton.

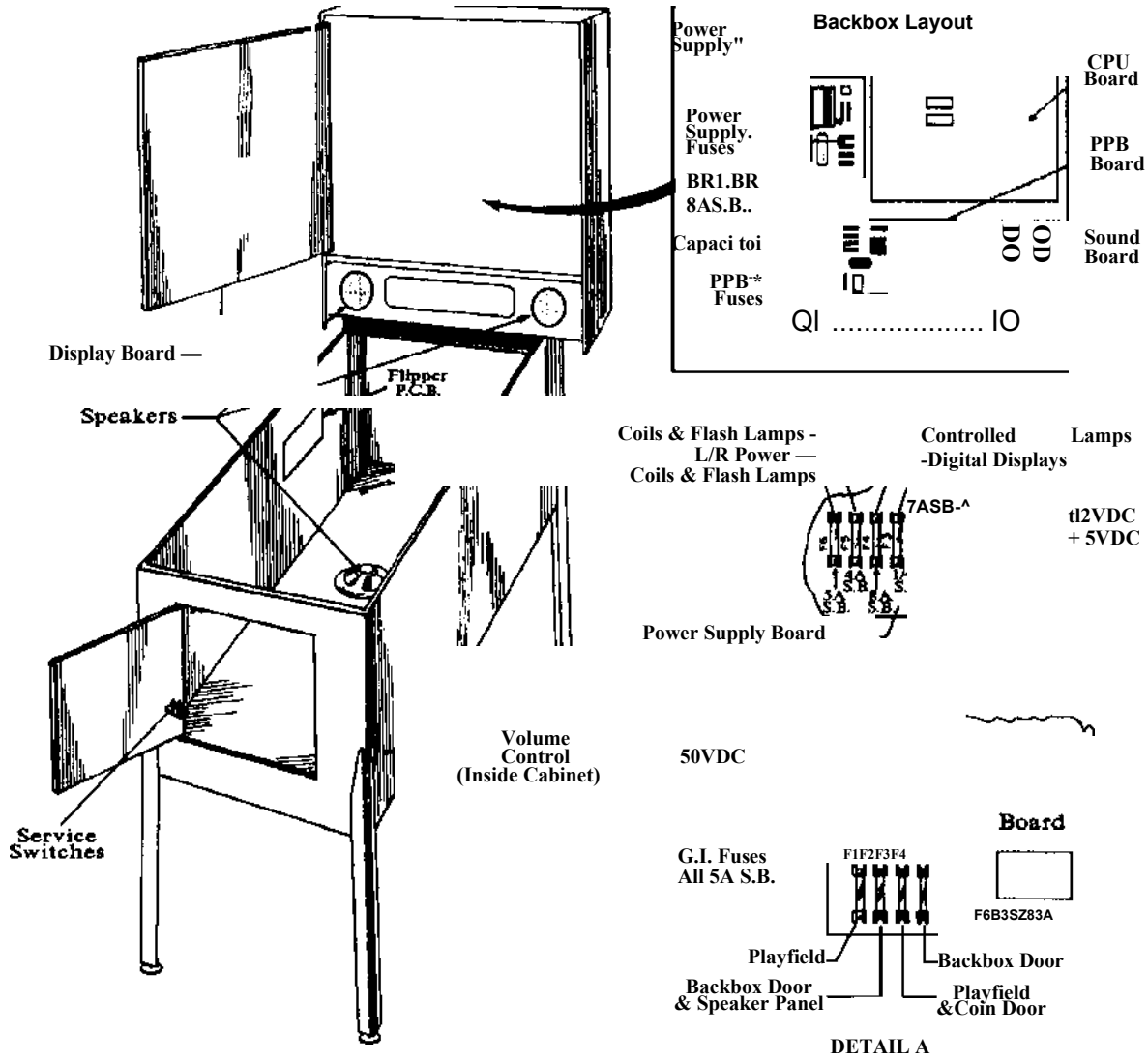
2. Remove all packing material. Locate cabinet legs in filler packing Inserts and assembly parts package In thè cashbox. There should be four leg levelers, eight leg bolts, three pinballs and a large Alien Wrench used for securlng thè backbox.

3. Attach leg leveler from thè parts package to each leg, make sure that each leveler is threaded through a hex nut before threading it into thè 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 belng pinched, carefully raise thè backbox and secure it in Its uprlght posltlon by inserting thè Alien Wrench in thè hole in thè back of thè cabinet and rotating thè wrench 270 degrees(3/4 tum).



GAME ILLUSTRATION

7. Remove thè backbox keys from thè clip on thè inside of thè coin door and unlock and carefully remove thè backglass. Set thè backglass aside.

8. Carefully remove thè playfield glass and set it aside.

9. Check all connectors in thè backbox for loose wire terminations. Reseat any loose wire by pushing in on thè terminal.

10. Push on all connectors plugged intothe CPU board, Sound Board, Power Supply Boards, and (on Inserì board) Display board to check that they are properly seated.

11. Check that thè fuses on thè Power Supply board, PPB board and fuse panel are seated properly.

12. Raise thè playfield and thè support bar on thè right side of thè cabinet; support thè playfield by inserting thè support bar into thè countersunk notch on thè bottom side.

13. Check all cabinet cable and playfield lamp board connector terminations.

14. Remove thè Plumb tilt from thè parts package and Instali on thè panel on thè Inside left of thè cabinet. Note that this game is not equipped wlth a ball roll tilt.

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

16. Using an incllnometer (protractor) adjust thè pitch of thè playfield to 6.5 degrees. If a pitch indicating meter Is not avallable, adjust thè front levelers to thè lowest position and extend thè rearleg levelers approxlmately half way out. Readjust side-to-side level as required.

NOTE

Thè playfleld Incline affects dlfflculty of play. Use thè recommended Incline; game dlfflculty Is best varled using game adjustments.

17. Check thè plumb tilt and adjust as required.

18. If deslred, perform any self tests at this tlme. With thè inserì door closed, carefully reinstall and lock thè backglass.

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

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

GAME OPERATION

STANDARD FEATURES

Inserì coln(s), thè game makes a sound for thè first credit and generates sounds for each subsequent coin and thè Player 4 display Indicates thè number of credits posted. Depress thè credit button and a start-up sound Is produced, thè posted credits are reduced by one, Player 1 display flashes, Player 4 display indicates BALL 1, and a ball Is served to thè plunger trough. Addìtional players may be added by depressing thè Credit button before thè end of ball 1.

Thè second closure (adjustable) of thè plumb bob tilt switch tilts thè ball in play. Closure of thè slam tilt swltch In thè coin door ends thè current game(s).

At thè end of each ball, earned bonuses are collected. At thè end of thè last ball for thè last player and after bonuses are collected, thè System produces a random 2-digit number (a multiple of 10; 00 to 90) for a Match feature (adjustable). Matchlng thè last two dlgits of a player score wlth this number awards a credit. Players exceedlng high score levels recelve free credits (adjustable) and are able to enter their Initials with thè new High Score achleved. Thè game then proceeds into thè game-over mode and then to thè attract mode. A custom message (adjustable) can be displayed during thè attract mode.

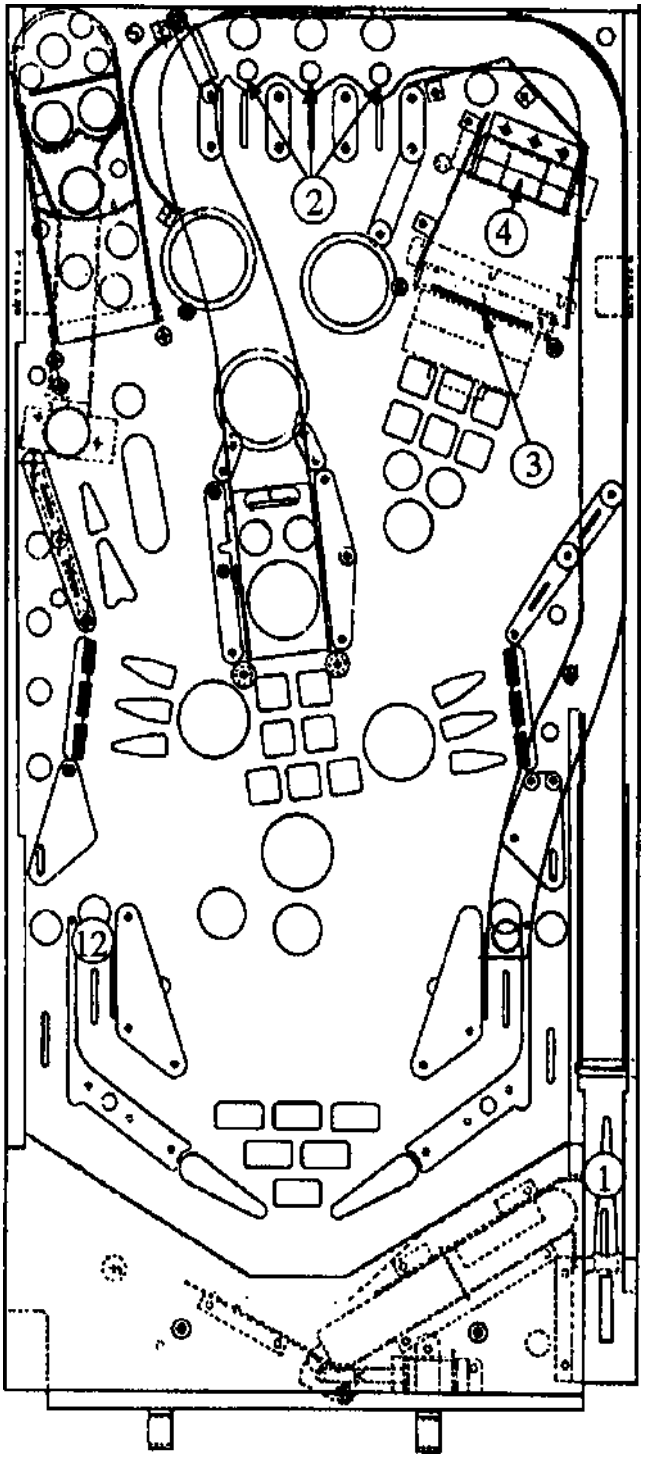
MANUAL PERCENTAGING

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, thè game will computo a recommended score to keep thè game at that replay percentage. If a change Is recommended and thè game coln door Is opened, thè dlsplays will Indicate a recommended replay score to beat and make a sound to alerì thè operator. By pressing thè start button, thè score to beat will be changed to thè recommended level. If you dose thè coin door or go into audit or adjustment mode, no score change will be made.

You may choose to ignore thè recommended change; for example, you may not think last week’s players were thè usuai crowd . Just dose thè door and thè message will disappear without altering thè exlsting level. Or you may choose to make a different score to beat adjustment; this is done by utllizing adjustment AD02.

GAME SPECIFIC FEATURES



Skillshot

From plunger (1) shoot ball Into one of three Flashing lanes (2) In Ramp.
(See Display and Back Panel)

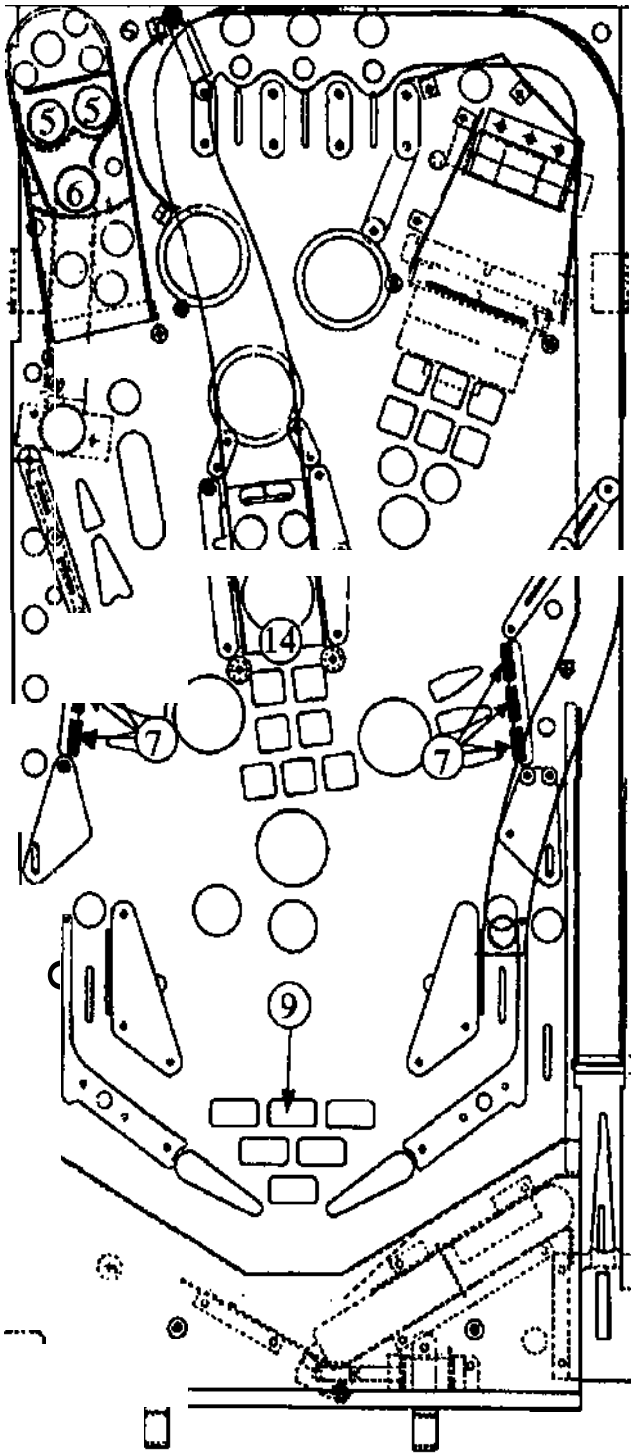
Jackpot & Multiteli (2 & 3)

Complete BATMAN by shooting thè Fugelheim Target (3).
When completed thè Target (3) will Drop.

Shoot a ball Into thè Museum (4) and a second ball will be automatlcally Into play.- The ball in thè Museum (4) will be shot back Into play (2 Ball).

Shooting both balls Into thè Museum will cause a third ball to come Into Play. One shot Into thè Fugelheim Target (3) will lite thè Museum (4) for Jackpot Award.
(See Backglass for Values)

Thè Left Return Lane (12) to Fugelheim Target (3) Spots two Lettere in BATMAN.



Joker Jump

Shooting thè Left & Rlght Eye (5) will lite thè Mouth (6) for 4 Milllon Polnts or elther Eye (5) for 2 Milllon.

Young Jack & Old Jack Targete

Completlng all sixtargets (7) scores 1,000,000 or 2,000,000 Points.
2,000,000 for completlng thè last target by striklng it wlth a ball, 1,000,000 by shooting thè thè uni It Ramp to complete thè last Target.
(See Ramp)

MuJìlplter

Completing thè top three rollovers (8) increases thè Players Bonus Multiplier.

For Bonus Status see thè llghts (9) located above thè Flippers.

Bamp

When a Ramp Value (13) Is Ut, Shoot ramp (14) to collect thè Ut Value.
Shooting thè unlit Ramp (14) will spot one Old or New Jack Target

Ramp Values

- 1 Milllion Points
- 100K Super Turbos - Thè player Is awarded 100K per hit on any of three Turbo Bumpers (15).
- Lite Extra Ball- Extra Ball can be collected in Hole (11)
- Lite Fast Money- Thè player can collect 50K per switch by shooting any hole (5) or (6) when Fast Money Is Ut.
- Instant 2-Ball

  1 Million Plus - Shoot Ramp (14)

  1 st Shot awards 1 Million, 2nd shot 2 Million etc. until thè countdown timer runs out.
- Maximum X Value - Thè Multipller (9) wlll be set to Maximum for thè current Ball in Play.

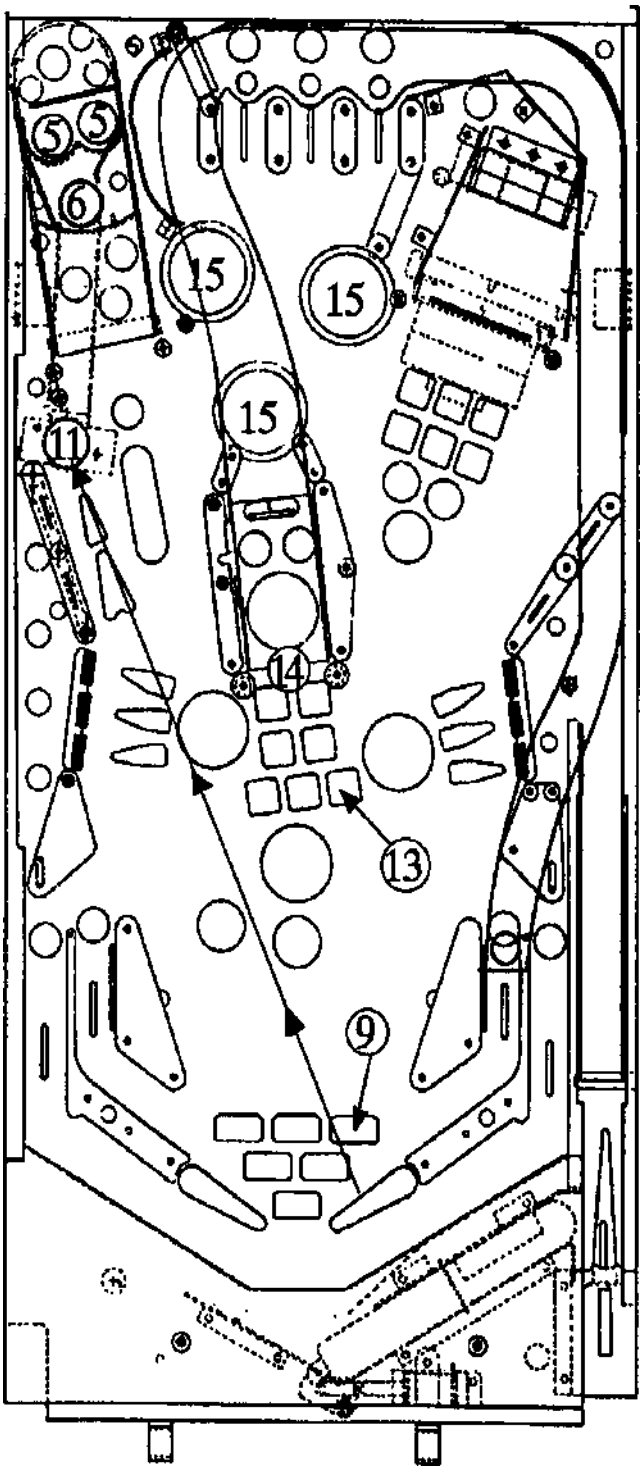
Mystery Hole

RIght Return lane (10)to Hole (11) awards Mystery Value.

Shooting Hole (11) Spots one of seven Ramp Values (13).

Any shot into Hole (11) toggles thè Ramp value (13).

Completlng thè Ramp Shot (14) awards thè Ut Value(13).



AUDIT FUNCTIONS

GENERAL

There are 74 audit functions provided for accounting purposes and for evaluation of game difficulty adjustments. Audit functions are split Into two groups. There are eight most-used audits (AU01 through AU08) in a 'quick look' group and 65 less-used audits (E AU10 through E AU74), in an 'expanded' group. Thè varlous auditing functions are summarlzed In thè **AUDITING FEATURES TABLE** and, when accessed, are shown on thè player score dlsplays. Thè *Audit Number* is shown in thè Player 3 Display, thè *Description* in thè Player 1 and 2 Displays, and thè *Audit Total* in thè Player 4 Display. Access and control is provided from switches located on thè inside of thè coin door.

To access audit functions,open thè coln door and make sure that thè FORWARD/REVERSE swltch Is In thè FORWARD (up) position. Depress thè STEP switch and thè game name Is shown in thè Player 1 and 2 dlsplays, thè Player 3 display is blank, and thè PROM revision level is shown In thè Player 4 display. This indlcates access to audit functions.

With thè FORWARD/REVERSE push-button switch stili in thè FORWARD (up) position, depressing thè STEP push-button switch advances through thè audit functions one at a time. To revlew lower-numbered functions, set thè forward/reverse push-button switch to thè REVERSE (down) position and operate thè STEP push-button switch.

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

Audit totals may be reset to zero using Game Adjustment Adi 1, Audits Reset. Game adjustments (Ad01 to Ad13 and E Ad14 to E Ad45) begin after thè last audit function (AU09 or E AU74). Once audits functions have been recorded, and If no adjustments are requlred, you may return thè game to thè attract mode. If adjustments are required, continue pressing thè STEP button until thè game adjustments are reached. See Game Adjustments for details.

QUICK LOOK' FUNCTIONS

Total Paid eredita (AU01) - thè total number of paid credits is displayed.

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

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

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

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

Total Coins (AU08) is thè toal number of coins dropped through all 3 coln chutes.

Expand Audits (AU09) permits vlewing of expanded audits.

Batman Audit Tabi e

Audit Number (Player 3 Display)	Audit Description (Players 1&2 Displays: totals in Player 4 Display)	Audit Number (Player 3 Display)	Audit Description (Players 1 &2 Displays: totals in Player 4 Display)
	Batman PROM ID		
AU 01	Total Paid Credits	EAU 38	Cycles H.S. Reset
AU 02	Free Percent	EAU 39	Coins No Credit
AU03	Ball Tlme Average	EAU 40	Service Credits
AU04	Game Urne Average	EAU 41	Total Tlckets
AU 05	Coins Left	EAU 42	Drains Left
AU 06	Colns Right	EAU 43	Dralns Center
AU 07	Coins Center	EAU 44	Drains Right
AU 08	Total Coins	EAU 45	Ramp Shots
AU 09	Expand Audits (ON/OFF)	EAU 46	Skill Shots Made
EAU 10	Balls Total	EAU 47	Young Jack Made
EAU 11	Extra Balls Total	EAU 48	Old Jack Made
EAU 12	Extra Ball Percent	EAU 49	Spot Jack Target
EAU 13	Replay 1 Awards	EAU 50	2 Ball Multiball
EAU 14	Replay 2 Awards	EAU 51	3 Ball Multiball
EAU 15	Replay 3 Awards	EAU 52	Jackpot Ut
EAU 16	Replay 4 Awards	EAU 53	Jackpot Award
EAU 17	Total Replays	EAU 54	Million Award
EAU 18	Replay Percent	EAU 55	Super Bumps Award
EAU 19	Total Specials	EAU 56	XBall Award
EAU 20	Special Percent	EAU 57	Fast Money Award
E Al) 21	Total Matches	EAU 58	Multiball Award
EAU 22	Hi Score Wins	EAU 59	Loop Award
EAU 23	High Score Percent	EAU 60	Mon. 10X Award
EAU 24	Total Free Plays	EAU 61	2X Made
EAU 25	Total Games	EAU 62	4X Made
EAU 26	0.0 - 0.9 Million	EAU 63	6X Made
EAU 27	1.0 - 4.9 Million	EAU 64	8X Made
EAU 28	5.0 - 9.9 Million	EAU 65	10XMade
EAU 29	10.0-19.9 Million	EAU 66	MoreThan 10XMade
EAU 30	20.0 -29.9 Million	EAU 67	VUK Mystery Scores
EAU 31	30 Million Plus	EAU 68	VUK Extra Ball
EAU 32	Average Scores	EAU 69	Outlane Special Lit
EAU 33	Games 1 Player	EAU 70	Outlane Special Award
EAU 34	Games 2Player	EAU 71	Rerace Award
EAU 35	Games 3Player	EAU 72	Bat Cave Special Lit
EAU 36	Games 4Player	EAU 73	Bat Cave Special Award
EAU 37	Attract Minutes	EAU 74	# Of Victory Shots

EXPANDED FUNCTIONS

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

Extra Balls Total (E AU11) is thè total number of extra balls awarded.

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

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

Total Replays (E AU17) is thè total awards (credits, extra balls, or audit only) for exceedlng replay score levels.

Replay Percentage (E AU18) Is thè Replay Total awards for exceedlng replay score levels (E AU17) divided by Plays Total (EAU25).

Total Specials (E **AU**19) is thè total awards (credits, extra balls, or scores) for making speclals.

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

Match Total (E AU21) is thè total credits awarded for matching thè last two diglts of thè score with thè system-generated Match Number at thè end of thè game. Percentage of match credits will be adjustable from 0% to 10%, by **E Ad 14** if enabled.

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

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

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

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

0.0- 0.9 Million (E AU26) provides thè total number of games thè Player's final score was between 0 and 999,990 polnts.

1.0 - 4.9 Million (E AU27) provides thè total number of games thè Player's final score was between 1,000,000 and 4.999.990 points.

5.0 - 9.9 Million (E AU28) provides thè total number of games thè Player's final score was between 5,000,000 **and** 9.999.990 points.

10.0 -19.9 Million (E AU29) provides thè total number of games thè Player's final score was between **10,000,000** and 19,999,990 points.

20.0 - 29.9 Million (E AU30) provides thè total number of games thè Player's final score was between **20,000,000** and 29,999,990 points.

30 Million Plus (E AU31) provides thè total number of games thè Player's final score was over 30,000,000 points.

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

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

Attract Minutes (E AU37) provides thè number of mlnutes thè game is in Attract Mode (Factory use).

Cycles High Score Reset (E AU38) provldes thè number of times that thè high score levels have been automatically reset (if enabled).

Coin No Credit (E AU39) provides thè number of times thè coin switch was closed without awarding credit(s)-Thls option is used in multiple coin conditions.(ie. 2 quarters 1 Play)

Service Credits (E AU40) provides thè total number of Service credits added to thè game. *See Game Diagnostics on page 19 for instructions regarding entry of Service Credits.*

Total Tickets (E AU41) provides thè total number of tickets dispensed.

Drains Left (E AU42) provides thè number of times thè ball drained out thè left drain.

Drains Center (E AU43) provides thè number of times thè ball drained out thè center drain.

Drains Right (E AU44) provides thè number of times thè ball drained out thè right drain.

GAME SPECIFIC FUNCTIONS

Ramp Shots (E AU45) provides thè total number of times thè Ramp was completed.

Skill Shot Made (E AU46) provides thè total number of times thè Skill Shot Feature was accomplished.(Note- thè feature is enabled at thè start of each new ball.)

Young Jack Made (E AU47) provides thè total number of times thè Right Standup Targets were completed.

Old Jack Made (E AU48) provides thè total number of times thè Left Standup Targets were completed.

Spot Jack Target (E AU49) provides thè total number of times, one of thè Jack Targets were Spotted by thè Ramp Shot.

2 Ball Multiball (E AU50) provides thè total number of times 2 Ball Multiball was acheived.

3 Ball Multiball (E AU51) provides thè total number of times 3 Ball Multiball was achieved.

Jackpot Lit (E AU52) provldes thè total number of times thè Jackpot feature was active during Multiball.

Jackpot Award (E AU53) provides thè total number of times thè Jackpot Feature awarded one of thè lit values on thè Backglass.

Million Awards (E AU54) provides thè total number of times thè Million Feature was awarded by completing thè Ramp Shot when lit.

Super Bumps Award (E AU55) provides thè total number of times thè Super Bumps Feature was enabled by completing thè Ramp Shot when lit.

XBall Award (E AU56) provides thè total number of times thè Extra Ball was enabled by completing thè Ramp Shot when lit and then collected by shooting thè Left VUK.

Fast Money Award (E AU57) provides thè total number of times thè Fast Money Feature was enabled by completing thè Ramp Shot when Ut and then collected by shooting thè Joker's Face.

Multiball Award (E AU58) provides thè total number of times thè Multiball Feature was enabled by completing thè Ramp Shot when Ut.

Loop Award (E AU59) provides thè total number of times thè Looping Feature was enabled by completing thè Ramp Shot when lit.

Mon. 10X Award (E AU60) provides thè total number of times thè 10X Bonus Feature was enabled by completing thè Ramp Shot when lit.

2X (E AU61) provides thè number of times 2X bonus was enabled.

4X (E AU62) provides thè number of times 4X bonus was enabled.

6X (E AU63) provides thè number of times 6X bonus was enabled.

8X (E AU64) provides thè number of times 8X bonus was enabled.

10X (E AU65) provides thè number of times 10X bonus was enabled.

More Than 10X Made (E AU66) provides thè number of times, completing thè Top 3 Lanes after 10X is enabled 500,000 points would be awarded.

VUK Mystery Score (E AU67) provides thè number of times thè Left VUK Mystery Score was awarded.

VUK Extra Ball (E AU68) provides thè number of times thè Left VUK Extra Ball was awarded.

Outlane Special Lit(E AU69) provides thè total number of times thè Outlane Special was lit by completing thè shot from thè right flipper return lane to thè Left VUK during thè 2nd or 3rd ball.

Outlane Special Made(E AU70) provides thè total number of times thè Lit Outlane awarded a Special.

Rerace Award (E AU71) provides thè total number of times thè Multiball Feature was re-enabled by thè program. (Note- In thè early stages of Multiball, a safety timer Is used to re-establish thè feature,should a ball exit prematurely.)

Bat Cave Special Lit ((E AU72) provides thè total number of times thè Bat Cave Special was lit. (Note- Thè Bat Cave lites at random during thè last ball of thè game.)

Bat Cave Special Made ((E AU73) provides thè total number of times thè Bat Cave Special was awarded for completing thè lit Ramp shot.

# of Vlctory Shots (E AU74) provides thè number of times thè game awarded 3 Million points, by completing thè Ramp during Vlctory Mode.

Notes

GAME ADJUSTMENTS

GENERAL

There are 45 adjustable functions provlded to vary difficulty of play and to periodically reset audits and thè high score levels. Thè various game adjustments are summarized in thè **Game Adjustments Table** and, when accessed, are shown on thè player score dlsplays. Thè *Adjustment Number* is shown in thè Player 3 Display, thè *Descriptìon* In thè Player 1 and 2 Displays, and thè setting in thè Player 4 Display. Access and control is provlded from switches located on thè Inside of thè coln door.

Game adjustments are accessed from thè audlt mode. With thè audits displaying game identification and thè FORWARD/REVERSE swltch in thè REVERSE (down) position, depress thè STEP switch and E Ad45 (Expanded Adjustment 45) is shown in thè Player 3 display, FACTORY RESTORE is shown in thè Player 1 & 2 displays,and OFF is shown In thè Player 4 display.With thè audits displaying AU09 (or expanded E AU74)and thè FORWARD/REVERSE switch in thè FORWARD (up) position, depress thè STEP switch and Ad01 Is shown in thè Player 3 display, REPLAY MANUAL/FIXED is shown In thè Player 1 and 2 displays, and thè settlng Is shown In thè Player 4 display.

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

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 thè manual percentage feature, if thè actual replay percentage is higher or lower than that desired, thè game computes new recommended manual percentage score(s). When thè coln door Is subsequently opened thè player displays indicate thè recommended level and a sound is made to alert thè operator of a potential change. Thls new level is entered into adjustments simply by pressing thè game start push-button. (If thè coin door is dosed or you enter audlts/adjustments or diagnostlcs, thè replay level is not changed.)

REPLAYS (Ad 01 through 06)

Ad 01 Replay Manual/FIxed

- **Manual:** Adjust for percentage of awards for replay levels (1 % through 50%). Proceed to Ad 02 and 03 for starting replay levels.

  Fixed: Lower thè automatic value below 1 % and Player 1 display Indicates FIXED. Proceed to Ad 02 and 03 for fixed replay levels.

Ad 02 Start Replay

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

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

Adjust thè number òf replay levels to be actlve (1 to 4). Any addltlonal starting replay levels are automatically set to values higher than Replay 1

- Adjust Replay 1 level to between 100,000 and 99,900,000. (Same as Start Replay)
  If Ad 03 Is set for 2, adjust Replay 2 level to between 100,000 and 99,900,000.
  If Ad 03 Is set for 3, adjust Replay 3 level to between 100,000 and 99,900,000.
  If Ad 03 Is set for 4, adjust Replay 4 level to between 100,000 and 99,900,000.

BATMAN

Game Adjustment Table

Adjustment Number (Player 3)	Descrlption (Players 1& 2)	Factory Setting (Player 4)
Ad 01	Replay/Manual	10%
Ad 02	Start Replay	20,000,000
Ad 03	Levels Replay *	01
Ad 04	Game Awards	CREDIT
Ad 05	Limit Freegame	03
Ad 06	Limit Extraball	03
Ad 07	Game Rules	FACTORY
Ad 08	Game Prlce*	USA2
Ad 09	Game Cleaned	NO
Ad 10	Coln Reset	NO
Ad 11	Audits Reset	NO
Ad 12	Restore H.S.T.D.	NO
Ad 13	Expand Adjustments	NO
E Ad 14	Match Percent	08
E Ad 15	Balls Per Game	03
E Ad 16	Tilt Warnings	01
EAd17	Replay Boost	NO
E Ad 18	Credits Limit	30
E Ad 19	High Scores Allowed	YES
E Ad 20	Hlscore 1 Awards	03
E Ad 21	Hiscore 2 Awards	01
E Ad 22	Hlscore 3 Awards	00
E Ad 23	Hlscore 4 Awards	00
E Ad 24	Backup World Record	30,000,000
E Ad 25	Backup Hiscore 1	25,000,000
E Ad 26	Backup Hiscore 2	20,000,000
E Ad 27	Backup Hiscore 3	18,000,000
E Ad 28	Backup Hiscore 4	16,000,000
E Ad 29	Backup Hiscore 5	14,000,000
E Ad 30	Reset H.S.T.D. Every	700
E Ad 31	Clean Game Every	1500
E Ad 32	Free Play	NO
E Ad 33	Custom Mesage	ON
E Ad 34	Attract Mode Music	ON
E Ad 35	Flash Lamps	NORMAL
E Ad 36	Coils Pulse	NORMAL
E Ad 37	Level Adjust By	ANY
E Ad 38	Instali Country	USA
E Ad 39	Ticket Dispenser	OFF
E Ad 40	# Tickets Per Award	1
E Ad 41	Outlane Toggle	BOTH
E Ad 42	Joker Timer	FACTORY
E Ad 43	Winners Clrcle	OFF
E Ad 44	Million Plus Loop Timer	FACTORY
E Ad 45	Factory Restore	OFF

* Some settlngs result In Drop-Down Tables- See Text

Ad 04 Game Awards Setforreplaystoaward: **CREDIT, EXTRA BALL, NONE** or **SPECIAL** (when score threshold Is achieved a playfield special is lit).

Ad 05 Limit FreeGame - Adjust for thè maximum number of free games that may be accumulated per game; 0 to9.

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

SINGLE-FUNCTION DIFFICULTY ADJUSTMENT (Ad 07)

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

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

Instali Adjustment	EAdO7 Extra Easy	EAdO7 Easy	EAdO7 Factory	EAdO7 Hard	EAdO7 Extra Hard
E Ad 41 Outlane Toggle	FLIPPER	BOTH	BOTH	SLING	SUNG
E Ad 42 Joker Timer	EXEASY	EASY	FACTORY	HARD	EXHARD
E Ad 44 Million Plus Loop Timer	EXEASY	EASY	FACTORY	HARD	EXHARD

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

Thè following three combinations are recomended for situations where locai laws restrict certain game features regarding thè use of replays or thè number of balls per game:

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

Ad 01 Manual Replay = Fixed
Ad 02 Start Replay = 00
Ad 03 Levels Replay = None
Ad 04 Game Awards = None
Ad 05 Limit Freegame =0
Ad 06 Limit Extra Balls = 0
E Ad 14 Match Percent = Off
E Ad 20 World Record Awards=0
E Ad 21 -23 Todays 1 -3 Awards = 0

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

Ad 01 Manual Replay =07%
Ad 02 Replay Start = 30,000,000
Ad 03 Replay Levels = 01
Ad 04 Game Awards = Credit
Ad 05 Limit Freegame =3
Ad 06 Limit Extra Balls = 3
E Ad 14 Match Percent = 04
E Ad 15 Balls/Game =5
E Ad 20 World Record Awards = 3
E Ad 21 Todays 1 Award = 1
E Ad 41 OutlaneToggle = Slings
E Ad 42 Joker Timer = Factory
E Ad 43 Winners Circle = Off
E Ad 44 Million Plus Loop Timer. = Hard

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

Ad 04 Game Awards = Extra Ball
Ad 05 Limit Freegame = 0
E Ad 14 Match Percent = OFF
E Ad 19 Scores Highest = No
E Ad 20 to 23 World Record & Todays High Awards = 0

GAME PRICING (Ad 08)

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

With Ad 08 set to CUSTOM operatlng thè step button again initiates a drop down menu representing coin swltch pulses for thè left, right, and center coin slots.The prescribes thè 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 thè 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 thè 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 thè flrst three coins In thè left slot and two credits for thè fourth coin.

Standard/Custom Pricing - Set for thè desired pricing scheme from thè Standard Pricing Table as indicated in thè Player 1 and 2 displays. For Custom Pricing, setto CUSTOM. When setto CUSTOM, thè followingadjustments are utilized to tailor each individuai coin chute.

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

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

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

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

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

CUSTOM PRICING TABLE

Coin Mechs				Adjustments					
Left	Right	Center	Plays/Coins	Ad08	LeftP	Right P	MidP	Pulse/1Cr	Puls/bon
250	250	$1.00	1/250 3/500	Custom	01	01	04	01	02
			1/250 5/$1.00	Custom	01	01	04	01	04
			1/250/ 6/$1.00	Custom	05	05	20	04	20
5SCH	10SCH	10SCH	1/10 SCH	Custom	01	02	02	02	00
			1/10 SCH 4/30SCH	Custom	04	08	08	06	00
200	$1.00	—	1/200	Custom	01	05	00	01	00
			1/600 2/$1.00	Custom	01	05	00	03	05
10P	10P	50P	1/10P 6/50P	Custom	01	01	05	01	05
			1/20P 3/50P	Custom	01	01	05	02	05

STANDARD PRICING TABLE

Ad 08 Standard Pricing Select 1 2 4	Coin Mechs Left	Center	Right	Plays/Coins Left	Center	Right
USAI 1COIN 1PLAY	250	$1.00	250	1 PLAY/1 COIN	4 PLAY/1 COIN	1 PLAY/1 COIN
USA2 4COINS3PLAYS	250	$1.00	250	1 PLAY/2COIN 2PLAY/3COIN 3PLAY/4COIN	3 PLAY/1 COIN	1 PLAY/2COIN 2PLAY/3COIN 3PLAY/4COIN
USA3 2 COINS 1 PLAY	250	$1.00	250	1 PLAY/2COIN	2 PLAY/1 COIN	1 PLAY/2COIN
USA4 2COINS 1 PLAY 1COIN BUY-IN	250		250	2 COINS FOR THÈ 1st PLAY 1PLAY/1 COINOM.Y *DURING* BUY-IN		
AUSTRIA COINAGE	5SCH	10SCH	10SCH	1 PLAY/2COIN 2PLAY/3COIN 3PLAY/4COIN	1 PLAY/1 COIN 3PLAY/2COIN	1 PLAY/1 COIN 3PLAY/2COIN
AUSTRALIA COINAGE	200	$1.00	$2.00	1 PLAY/ 3COIN	2 PLAY/1 COIN	4 PLAY/1 COIN
UK COINAGE	10P	50P	£1	1 PLAY/3COIN	2 PLAY/1 COIN	5 PLAY/1 COIN
SWISS 1 SWISS 2	1 SFR	2 SFR	5 SFR	Same as German 1 Same as German 2		
BELGIUM COINAGE	20/	50/	20/	1 PLAY/1 COIN	3 PLAY/1 COIN	1 PLAY/1 COIN
HERMAN 5DM 7PLAYS 1	1DM	2DM	5DM	1 PLAY/1 COIN	2 PLAY/1 COIN	7 PLAY/1 COIN
3ERMAN 5DM 9PLAYS 2	1DM	2DM	5DM	1 PLAY/1 COIN 3PLAY/2COIN 5PLAY/3COIN 7PLAY/4COIN 9PLAY/5COIN	3 PLAY/1 COIN 7PLAY/2COIN 10PLAY/3COIN 14PLAY/4COIN	9 PLAY/1 COIN
NETHERLAND COINAGE	1 Guilder	1 Guilder	2.5Guilder	1 PLAY/1 COIN	1 PLAY/1 COIN	3 PLAY/1 COIN
SWEDEN COINAGE	1KR	5KR	5KR	1 PLAY/3COIN 2PLAY/5COIN	2 PLAY/1 COIN	2 PLAY/1 COIN
FRANCE1 COINAGE	1/	5/	10/	1 PLAY/3COIN 2PLAY/5COIN	2 PLAY/1 COIN	5 PLAY/1 COIN
FRANCE 2 COINAGE	V	5/	10/	1 PLAY/ 5COIN	1 PLAY/1 COIN	3 PLAY/1 COIN.
ITALY COINAGE	500L		500L	1 PLAY/1 COIN		1 PLAY/1 COIN
SPAIN COINAGE	25P		100P	1 PLAY/1 COIN		5 PLAY/1 COIN
JAPAN COINAGE			100¥			1 PLAY/1 COIN 3PLAY/2COIN

ADDITIONAL GENERIC FEATURES

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

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

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

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

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

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

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

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

E Ad 17 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 thè player's final score (when thè replay was awarded) for each followlng game, untll thè replays have all been played. At this time thè prevlous level Is resumed.

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

HIGH SCORE LEVELS (E Ad 19 through 30)

There are four of thè six high score levels with associated player inltlals that are displayed during thè attract mode. This provides a high-score-to-date feature. When players exceed these levels, thè player initials may be entered to replace thè previous ones. These levels may be adjusted to award credits and to be reset to backup values after a selected number of games.

E Ad 19 Hiscores Allowed - Set to enable or disable thè four high score levels; YES or NO.

E Ad 20 World Record-Adjust thè number of credits awarded for exceeding level 1 (thè highestof thè four levels); Oto **5.**

E Ad 21 Highscore 1 Award- Adjust thè number of credits awarded for exceeding level 1 ; 0 to 3.

E Ad 22 Highscore 2 Award - Adjust thè number of credits awarded for exceeding level 2; 0 to 2.

E Ad 23 Highscore 3 Award - Adjust thè number of credits awarded for exceeding level 3; 0 to 1.

E Ad 24 Backup World Record - Adjust thè score level to which thè world record (thè highest of thè four levels) may be altered. This adjustment is not affected by E Ad30 (Factory Reset defaults to 7,500,000).

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

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

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

E Ad 28 Backup Highscore 4- Adjust thè backup score level to whlch level 4 may be reset.

E Ad 29 Backup Highscore 5- Adjust thè backup score level to whlch level 5 may be reset.

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

E Ad 31 Clean Game Every- Adjust thè number of games in whlch thè Clean Game message appears in Tech Alert to indicate thè playfleld needs cleaning. Adjustable from 100 to 2000.

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

E Ad 33 Custom Message - When deslred, thls function is used to establish a custom message periodically displayed durlng thè attract mode. Set thè feature to **CHANGE** using thè Credit button and depress STEP. Thè letter A Is indicated In thè flrst posltlon of thè Player 1 display. Vary thè letter by operatlng thè left and rlght flippers. With thè deslred letter indicated, depress thè CREDIT button to lock in thè letter and advance to thè next display character. Repeat thls procedure untll thè desired message Is Indicated in thè Player 1 and 2 dlsplays. At this time, depress thè STEP push-button swltch to advance to E Ad 34.

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

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

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

E Ad 37 Level Adjust by - When set to **OPERATOR,** thè Manual Percentage Replay Adjustment can only be altered with thè front door open (see manual page 3). When set to ANY, thè Manual Percentage Replay Adjustment wlll display thè message "PRESS START TO CHANGE REPLAY LEVEL" on power up if a change Is recommended, and anyone operating thè replay button will inltiate thè change to thè replay score.

E Ad 38 Instali Country- Set to **USA, FRENCH** or **GERMAN.** Determlnes thè default settings for thè respectlve country for game pricing etc.

E Ad 45 Factory Restore-Depressing STEP wlthout changlng thè value shown in thè Player 4 Display locks In any custom message set with E Ad33 and returns thè game to GameOver.Set thè value to ON and depress STEP switch to revert all game adjustments to factory settings, clear thè Custom Message and return to Game Over.

GAME SPECIFIC FEATURES (E Ad 39 TO E Ad 45)

E Ad 39 Ticket dispenser- Set to **ON** or **OFF.** When set to **ON,** thè game will despense ticket(s) (optional) when each replay award levels Is attalned. When set to OFF, no tlckets will be despensed.

E Ad 40 # Tickets per Award- Set from **1** thru 5. Thè game will dispense thè selected number of tickets for each award level.

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

E Ad 42 Joker Timer- Set to **EXEASY, EASY, FACTORY, HARD** or **EXHARD.** Determines how long thè Joker feature remains enabled In seconds.

EXEASY	EASY	FACTORY	HARD	EXHARD
18 Seconds	16 Seconds	14 Seconds	12 Seconds	10 Seconds

E Ad 43 Winners CIrcle- Set to **YES** or NO. When set to **YES,** at thè end of thè game, in a multiplayer game, thè higher scoring player will be hlghlighted on thè display and receive an additional 20 seconds of unllmlted balls. (Thls will allow thè player to bulld up hls score and attempt to gain replays etc.) When set to NO thè game will end normally.

E Ad 44 Million **Plus** Loop Timer- Set to **EXEASY, EASY, FACTORY, HARD** or **EXHARD.** Determines how long thè Millions Plus Loop feature remains enabled In seconds.

EXEASY	EASY	FACTORY	HARD	EXHARD
24 Seconds	22 Seconds	20 Seconds	18 Seconds	16 Seconds

GAME DIAGNOSTICS

Thè Data East Pinball System provldes tests for sounds, digitai displays, lamps, swltches, and solenolds. Each feature may be tested manually or automatically using thè STEP and FORWARD/REVERSE push-button swltches Inside thè coin door and thè Game Start push-button switch on thè front of thè cabinet. Thè automatlc tests may be used for a qulck verlflcation of automatlc test functions and thè manual tests, for troubleshooting.

Durlng game play, activatlon of swltches and operatlon of colls wlth associated swltches are monltored. If a switch Is not made for 50 games it is considered bad. When operation of a coil should dose or open a switch and does not, thè coil Is considered bad. In Game over attract mode, bad swltches and colls (If any) are reported (See Tech Alert Descrlption below). Note that reporting of an unused switch does not constitute a problem and that a bad coll could mean that thè associated switch requires adjustment.

Wlring to switches, solenolds and controlled lamps uses color-coded wires that baslcally follows a resistor color-code scheme for thè eight rows and eight columns. During thè switch tests and during thè discrete lamp test, identification of thè color of thè row and column wires are indicated in thè Player 3 & 4 Displays. For example, maklng thè right coln switch during thè Switch Test results in thè switch functional name (RIGHT COIN) shown In thè Player 1 and 2 Displays, thè row (WHT-YEL) and column (GRN-BRN) wire color codes shown In thè Player 3 display, and thè switch number shown In thè Player 4 display.

BLK=Black	**GRN=Green**
BRN=Brown	**BLU = Blue**
RED = Red	**VIO=Violet**
ORN=Orange	**GRY=Grey**
YEL=Yellow	**WHT=Whlte**

ENTERING DIAGNOSTICS

Wlth thè game In thè game-over mode, open thè coln door and make sure that thè FORWARD/REVERSE push-button switch Is set to REVERSE (down) and depress thè STEP push-button switch. Thè Player displays will show thè tollfree Customer Service number 1-800-KICKERS, that Is 1-800-542-5377 (U.S. including Illinois) and thè toll number (708) 345-7700 (Outslde thè Unlted States). thls indlcates entry into game diagnostlcs.

Service Credile

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

Tech Alert

Thè player displays will now Indicate If there are any Bad Swltches (Switches that are closed, that should not be or switches that have not been activated In 50 games) it also Indlcates If thè game requires cleanlng, based on thè number set in E Ad 31.

Burn-In Minutes

Pressing thè step button whlle In Tech Alert mode will step game into Burn-In Mode(Factory use). At this stage pressing thè game start button will cause thè game to exercize all CPU I/O functions. This Is provlded to constantly exercise sounds, solenoids, etc...

To stop thè test press thè start button agaln. Cumulative Burn-ln minutes wlll be dlsplayed. To reset Burn-ln minutes to 00, you must perform a Audlt Reset Ad 11 or a Factory Restare E Ad 45,

SOUND TESTS

Thè Data East Pinball sound System produces true digitai stereo sound on left and right speakers and mono on a center speaker. During Sound tests, thè bottom display shows thè sound board circult under test and thè corresponding sounds are selected by operating thè left and right flipper buttons to choose thè circult to be tested. Now press thè start button to initiate thè sound. Refer to thè Sound Test Chart for thè sound clrcuits displayed and thè sounds produced.

Thè sound functions allow verification that all channels are functioning properly and that thè 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	Left Sine (Left Speaker Only)
CENTER SPEAKER	Center Sine (All speakers)
RIGHT SPEAKER	Right Sine (Right Speaker Only)
VOICE ROM1 (Loc F6)	"Did you ever dance with thè devll in thè pale moonllght?"
VOICE ROM2 (Loc F4)	" Who are you? "
MUSIC TEST (Sound ROM Loc F7)	Level 1 Through Level 4 Music

Speaker Phase Testing

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

To test for proper speaker phasing, use thè sound test to cycle through thè Left, Center, and Right Slne functions. If thè Center Sine produces more volume and bass than thè Left and Right Sines, thè speakers are connected properly. If it produces thè same ofless, 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 thè speakers have polarity marklngs, verify that thè slngle-color wire (BLK, YEL or RED) Is connected to thè negative (-) terminal.
2. Disconnect thè speaker output connector from thè Sound Board and connect a 1.5-volt battery across each speaker pair one at a time while observing thè speakers. Make sure that thè positive battery terminal Is connected to thè positive lead (CN1 -pln 1,3, or 6) each time. As thè connection is made, check speaker cone movement; proper connections are Indicated by outward movement.

DIGITAL DISPLAY TEST

Digital display utilizes an intelligent Dot Matrix Display Board. Thè purpose behlnd thls board Is to provlde more Information to thè operator as well as displaylng graphics to thè player.

Thè board is controlled by a Z80A microprocessor and it's personality ROM . (Unique to thè Game). It receives Data, Reset & Clock information from thè CPU Board via thè ribbon cable and sends back Status and Busy slgnals to thè CPU. This is to insure syncronized communication of both boards.

Thè Drivers for thè rows and columns are provided on 3 surface mounted integrated circuits. U13 & U14 supply thè anode power to thè columns and U15 supplies thè cathode power to thè rows.

Automatic Test

To enter Display tests, operate thè STEP push-button switch from thè Sound Manual test. Thè displays will first illuminate all dots in thè entire Display. After a slight delay it will cycle one column from left to rlght. After a period of time, it will begin thè Row test by lighting thè top row of thè display, then turning it off and iluminating thè next row, until each row has been has been indivudally lit, while thè other rows are off. Thè next test begins with every other dot lit, in both thè rows and columns. These dots then go out, and thè unlit dots light, resulting in an alternatlng checkerboard pattern. Thè test concludes with thè words "DOT MATRIX LIVES". (Please Note- these tests may be interrupted at any time by operating thè STEP push-button switch to advance to thè next test.

Museum Motor Test

Thls Game has a feature which lowers a Target Switch (Museum) to allow a shot to thè VUK below thè playfield. Thè motor on this mechanism Is controlled by a relay driven by Q23 on thè CPU and there are 2 Limit switches (Museum motor Up & Museum Motor Down) used by thè CPU to determine thè status of thè Museum Motor.

After entering this test, press and hold thè game's Start Button. This will cause thè relay to pulse repeatedly as long as thè Button is depressed. At thè same time you will notice that thè switch status (ON & OFF) will be indicated In both thè upper and lower portions of thè display (Museum motor Up & Museum Motor Down). Thè appropriate switch should be closed just prior to thè limit of thè Museum Motor Mechanism and both switches should not be closed (ON) at thè same time.

This test Is located before thè Switch Tests so thè technician can move thè mechanism until both switches read OFF. This will help eliminate erronious readings while trying to trace a problem during Active Switch Test.

Switches

Switches are configured in an 8 x 8 matrix of columns (switch drives) and rows (switch returns) with up to 64 switches possIble. Thè 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 thè Display Manual test, operate STEP push-button switch. Player 1 and 2 displays Indicate SWITCH TEST, dose each switch and observe thè displays. Thè Player 1 and 2 displays will indicate thè switch name, thè Player 3 display indicates thè row and column wire colors, and thè Player 4 display indicates thè switch number. When a switch is released, thè name and number dIsappear until another switch is closed or thè test is exited.

Active Switches

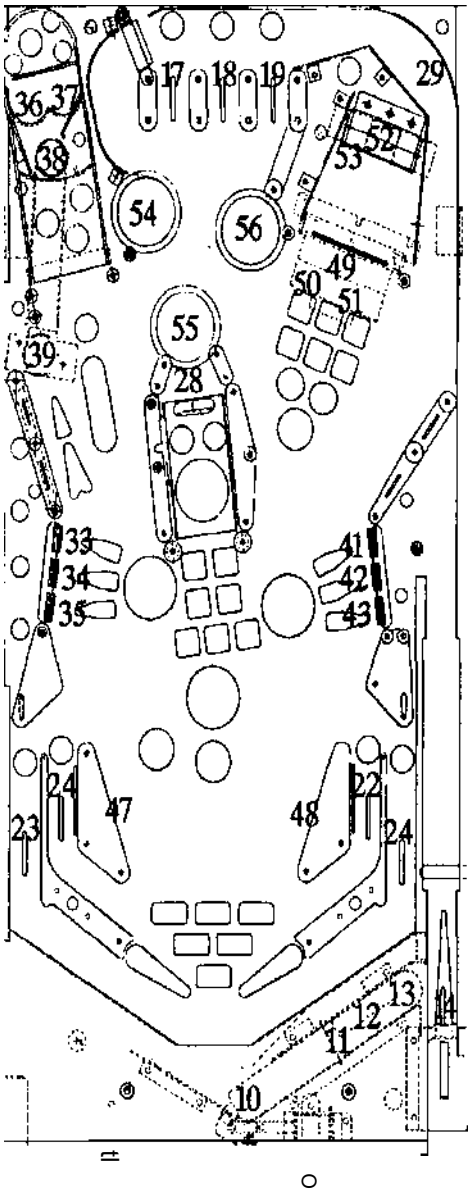
Operate thè STEP push-button switch from thè Switch Test. Player 1 and 2 Displays indicate ACTIVE SWITCHES. If any switches are stuck closed (or madefrom thè presence of a ball), thè Player 1 and 2 displays sequence through switch names, thè Player 3 display indicates thè row and column wire colors, and thè switch numbers are indicated in thè Player 4 display. This cycle continues until all switches are cleared or until thè STEP push-button switch Is depresseci.

SWITCH MATRIX CHART

'*S_sC0LUMN ROU^X^	1 Q55 GRN-BRN CN8-1	2 Q54 GRN-RED CN8-2	3 Q53 GRN-0RN CN8-3	4 Q52 GRN-YEL CN8-4	5 Q51 GRN-BLK CN8-5	6 Q50 GRN-BLU CN8-7	7 Q49 GRN-VIO CN8-8	8 Q48 GRN-GRY CN8-9
1 UHT-BRN CN10-9	Plunb Tilt !	Not Used 9	Left Top Lane 17	Not Used 25	Left 3 Bank Top 33	Right 3 Bank TOP 41	Bat Bar. Standup4g	Not Used 57
2 UHT-RED CN10-8	Not Used 2	Outhole 10	Center Lane 18	Not Used 26	Left 3 Bank Niddle 34	Right 3 Bank Middle 42	MuseuM Motor UP 58	Not Used 58
3 UHT-ORN CN10-7	Credit Button 3	Trough #1 H Left il	Right Top Lane 19	Not Used 27	Left 3 Bank Botton35	Right 3 Bank Bottom 43	MuseuM Notor Down 51	Not Used 59
4 UHT-YEL CN10-6	Right Coin 4	Trough #2 Center 12	Not Used 20	Ranp Entrance 28	Joker Left Eye 36	Not Used 44	Right UUK Top 52	Not Used 60
5 UHT-GRN CN10-5	Center Coin 5	Trough #3 Right 13	Left Return	Ranp Exit 29	Joker Right Eye 37	Not Used 45	Right UUK BottOH53	Not Used 61
6 UHT-BLU CN10-3	Left Coin g	Shooter L™ 14	Right Return 22	Not Used 38	Joker Nouth 3Q	Not Used 46	Left Turbo Bunper54	Not Used 62
7 UHT-VIO CN10-2	Slan Tilt	Left E0S 15	Left Outlane^	Not Used 31	Left UUK 39	Left Slingshot 47	Center Turbo BUMperg g	Not Used 63
8 UHT-GRV CN10-1	Not Used 8	Right EOS 16	Right Outlane 24	Not Used 32	Not Used 40	Right Slingshot 48	Right Turbo Bunpergg	Not Used 64

Batman - Switch Part Numbers

Number	Description	Part No.
0 ·	Plumb Tilt	See Cabinet
02	Not Used	
03*	Credit Button	500-5097-02
04*	Right Coin	180-5024-00
05*	Center Coin	180-5024-00
[illegible]	Left Coin	180-5024-00
[illegible]	Slam Tilt	180-5022-00
[illegible]	Not Used	
[illegible]	Not Used	



Number	Description	Part No.
1	□ut Hole	180-5011-00
0	Trough#1 (Left)	180-5009-00
12	Trough #2 (Center)	180-5009-00
13	Trough #3 (Right)	180-5010-00
14	Shooter Lane	500-5303-00
15*	Left Flip. Cab. Switch	180-5067-00
16*	Right Flip. Cab. Switch	180-5067-00
[illegible]	Left Top Lane	515-5138-00
[illegible]	Center Top Lane	515-5138-00
[illegible]	Right Top Lane	515-5138-00
[illegible]	Not Used	
		515-5138-00
22	Right Return Lane	500-5142-00
23	Left Outlane	500-5142-00
24	Right Outlane	500-5142-00
25	Not Used	
26	Not Used	
27	Not Used	
28	Ramp Entrance	180-5085-00
29	Ramp Exit	180-5085-00
[illegible]	Not Used	
[illegible]	Not Used	
[illegible]	Not Used	
32	Left Bank Top	515-5124-13
[illegible]	Left Bank Middle	515-5124-13
35	Left Bank Bottoni	515-5124-13
[illegible]	Joker Left Eye	180-5010-00
[illegible]	Joker Right Eye	180-5010-00
38	Joker Mouth	180-5010-00
39	Left VUK	180-5072-00
40	Not Used	
41	Right 3 Bank Top	515-5124-13
42	Right 3 Bank Middle	515-5124-13
[illegible]	Right 3 Bank Bottom	515-5124-13
[illegible]	Not Used	
[illegible]	Not Used	
[illegible]	Not Used	
	Left Slingshot Sw. (2)	180-5054-00
	Right Slingshot Sw. (2)	180-5054-00
	Bat Bar StandupTarget	515-5262-00
[illegible]	Museum Motor Up	180-5052-00
[illegible]	Museum Motor Down	180-5052-00
[illegible]	Right VUK Top	180-5072-00
[illegible]	Right VUK Bottom	180-5072-00
[illegible]	Bumper Left	180-5015-00
55	Bumper Center	180-5015-00
[illegible]	Bumper Right	180-5015-00
57	Not Used Through 64	

· Indicates Cabinet Switches

Switch Locations

LAMPTESTS

Controlled lamps are conflgured In an 8 x 8 matrlx of columns (lamp drlves) and rows (lamp returns) with up to 64 lamps possible. Thè lamp tests Include tour parts, all lamps, lamp return (row), lamp drive (column), and discrete (individuai) lamps. Row and column wire colors are indicated in thè discrete lamp test using corresponding resistor color code numbers.

All LBITIDS

From thè Active Switch test, operate thè STEP push-button switch. Player 1 and 2 displays Indicate ALL LAMPS and all controlled lamps will light.

Lamp Returns

From thè ALL LAMPS test, depress thè STEP push-button switch. Thè top display indicates LAMP RETURNS and thè Bottom display Indicates wire color and thè LAMP RETURN driver transistor. All controlled lamps In row 1 should be lit. Operating thè Game Start push-button switch cycles through each of thè rows separately.

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

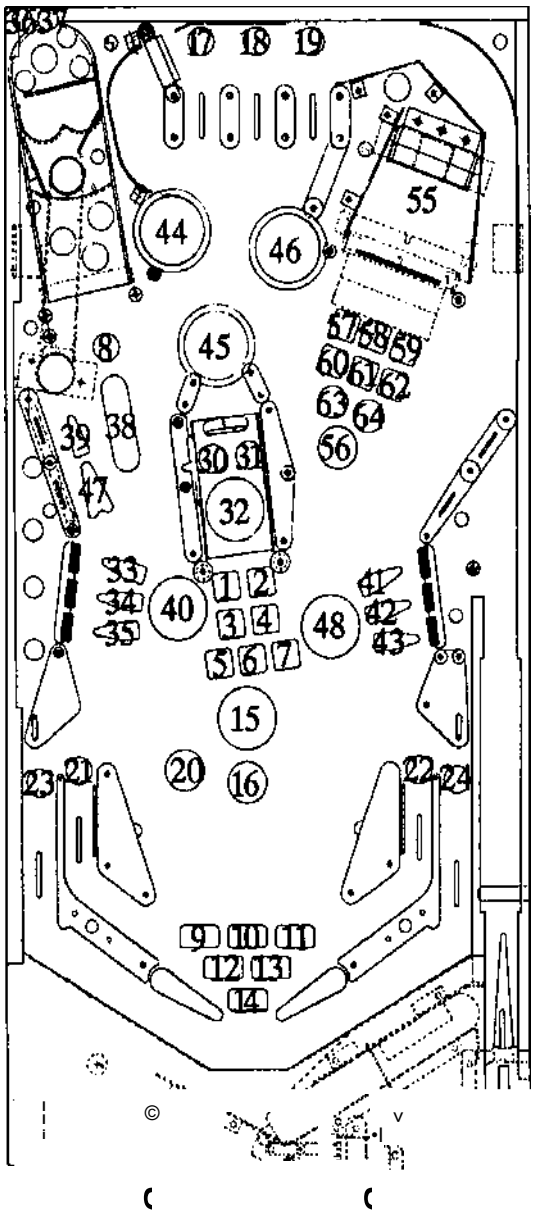
FrorS thè LAlJp DRIVES test, depress thè STEP push-button switch. Thè top display Indicates lamp name. Thè bottom display Indicates thè row and column wire colors and thè lamp matrix number. Lamp 01 should tight. With thè FORWARD/REVERSE push-button switch in thè FORWARD (up) posltion, operating thè Game Start push-button switch selects hlgher-numbered lamps; with it in thè REVERSE (down) position, Game Start selects lower-numbered lamps.

LAMP MATRIX CHART

'SffILUMN ROLJ***^	1 Q71 VEL-BRN CN7-1	2 670 VEL- REO CN7-2	3 Q69 YEL-ORN CN7-3	4 Q68 VEL-BLK CN7-4	5 667 YEL-GRN CN7-6	6 666 YEL-BLU CN7-7	7 565 YEL-UIO CN7-8	8 564 YEL-GRY CN7-9
1 Q72 RED-BRN CN6-1	1 Million |	Bottom 2X 9	Left Toplane^	ìackpanel Left 25	Left 3 Bank TOP 33	Right 3 Bank TOP 41	Ramp Diverter 49	BATMAN 57
2 Q7 3	Super BUMPS 2	Bottom « 10	Center Toplane^g	ìackpanel Center26	Left 3 Bank Middle34	Right 3 Bank Middle42	Insert-Moon 50	BATMAN 58
3 Q7 4	Lite Extra Ball 3	Bottom 6X n	Right Toplane^	ìackpanel Ri?ht27	Left 3 Bank Bottom35	Right 3 Bank Bottom43	Insert-5 Million 51	BATMAN 59
4 675 RED-YEL CN6-5	Fast Money 4	Bottom 8X 12	Playfield Moon 20	ìackpanel 500K 28	Joker Left Eye 36	Left BumPer44	Insert-15 Million 52	BATMAN 60
5 Q76 RED-GRN CN6-6	Instant 2 Ball 5	Bottom 10X 13	Left Return2|	ìackpanel XBall 2g	Joker Right Eye 37	Center Bumper^	Insert-10 Million 53	BATMAN " 61
6 677 REO-BLU CN6-7	Million Plus 6	Shoot Again 14	Right Return^	Doublé Score	Joker 2 Million^g	Right Bumper4g	Cab.-Start Button54	BATMAN 62
7 Q78 RED-VIO CN6-8	Max X Value 7	Batman's Head 15	Left Outlane„ 23	Under Ramp XBall31	Left VUK XBall 39	Spot Bat Monitor^	Museum Bat Symbol55	Lockball *1 63
8 Q79 RED-GRY CN6-9	Spot Fast Money 8	Batman's Chest 16	Right Outlane 24	3 Million 32	Left 3 Bank Done 40	Right 3 Bank Done 4Q	Jackpot Lit ss	Lockball *2 64

Lamp Number	Descrlptlon
01.	1 Million
02.	Super Bumps
03.	Lite Xball
04.	Fast Money
05.	Instant 2 Ball
06	Million Plus
07.	Max X Value
08.	Spot Fast Money
09.	Bottom 2X
10	Bottom 4X
11	Bottom 6X
12	Bottom 8X
13	Bottom 10X
14	Shoot Again
15	Batman's Head
16	Batman's Chest
17	Left Toplane
18	Center Toplane
.	Right Toplane
19	Playfield Moon
ho	Left Return Lane
ho	Right Return Lane
23.	Left Outlane
24.	Right Outlane
25.*	Backpanel Left
26.*	Backpanel Center
27.*	Backpanel Right
28.*	Backpanel 500K
29.*	Backpanel XBall
30.	Doublé Score
o	Under Ramp XBall
ho	3 Million
	Left 3 BankTop
	Left 3 Bank Middle
	Left 3 Bank Bottom
	Joker Left Eye
	Joker Right Eye
	Joker 2 Million
	Left VUK Extra Ball
	Left 3 Bank Done
	Right 3 BankTop
	Right 3 Bank Middle
	Right 3 Bank Bottom
44.	Left Bumper
45.	Center Bumper
46.	Right Bumper
47.	Spot Bat Monitor
48.	Right 3 Bank Done
49.	Ramp Diverter
50.*	Insert-Moon (2)
51.*	Insert-5 Million
52.*	Insert-15 Million
53*	Insert-10 Million
54.	Cab.-Start Button
55.	Museum Bat Symbol
56.	Jackpot Lit
57.	BATMAN
58.	BATMAN
59.	BATMAN
60.	BATMAN
61.	BATMAN
62.	BATMAN
63	Lock Ball #1
.	Lock Ball #2

25 26 27 28 29



Lamp Locations

* Indicates Insert Panel or Backpanel Lamps

FLASH LAMP COIL TESTS

Twenty-Two regular (pulsed under mlcroprocessor control) coll drlvers are provided to swltch ground to colls. Thè Left/Right relay is used inconjunctionwithdrives 1 through8toswitch +32 voltsbetween coils or flash lamps; these sets are termed "left" and "right". Thls relay Is locateci on thè PPB board which provldes Isolatlon dlodes and current limitlng reslstors. Thls effectlvely provldes 29 regular coils.

From thè Single Lamp test, depress thè STEP push-button swltch. All Flash lamps will fire randomly. Thls allows thè Technlcian to easily spot any burned out bulbs and replace them without steplng through thè tests below.

Automatic Test

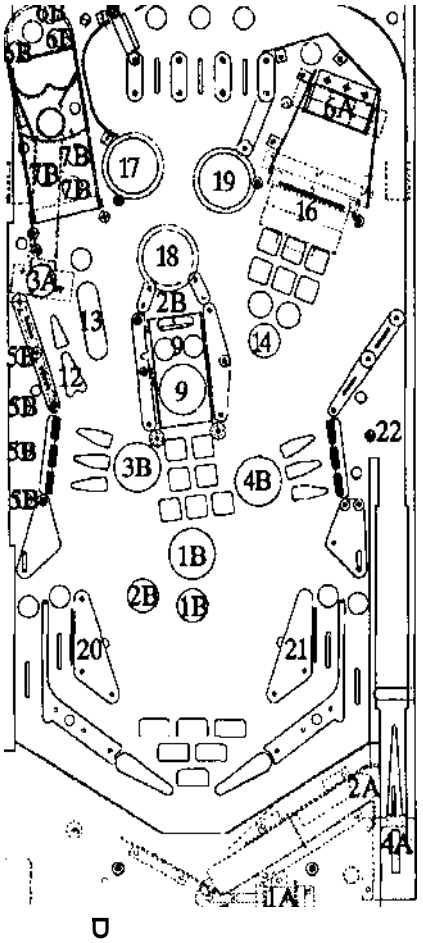
From thè Flash Lamps test, depress thè STEP push-button switch. Player 1 and 2 displays Indicate ALL COILS. Thè test pulses each regular solenold or flash lamp sequentially wlth thè coil/flash lamp name Indlcated In thè Player 1 and 2 displays and thè wire colors In thè Player 3 and 4 displays.

Select Coll

From thè Coll Test, depress thè STEP push-button switch. Player 1 and 2 displays indicate SELECT COIL and then thè name of 1 st drive, thè wire colors are Indlcated In thè Player 3 and 4 displays. Operate either Flipper push-button swltch to select thè coll or flash lamp to be tested. Wlth thè desired drive number indlcated In thè Player 4 display, depress thè START push-button swltch to cause it to be pulsed repeatedly.

RETURN TO GAME OVER

From thè Select Coil test, depress thè STEP push-button switch once. Thè game returns to thè game-over mode.



CPU Controlled Auxlllary Solenoide

Coll Number	Coll Descriptlon	Control Line (CPU to Coil	Power Une (PS to Coll)	Drive Transistor	Coll Type
17	Leti Turbo Bumper	BLU-ORN CPU CN19-3	RED PSCN3-6	oa	23-800
18	Center Turbo Bumper	BLU-REO CPUCN1B-4	RED PSCN3-8	08	23-800
19	Right Turbo Bumper	BLU-YEL CPUCN18-8	RED PSCN3-6	Q10	23-800
20	Left Slingshot	BLU-BRN CPU CN19-7	RED PSCN3-8	Q11	23-800
21	Right Slingehot	BLU-GRN CPU CN19-8	RED PSCN3-8	Q12	23-800
22	Motor Circuii (See Schematici	CPU CN19-9	PSCN3-6	Q13	

Flipper Solenoide

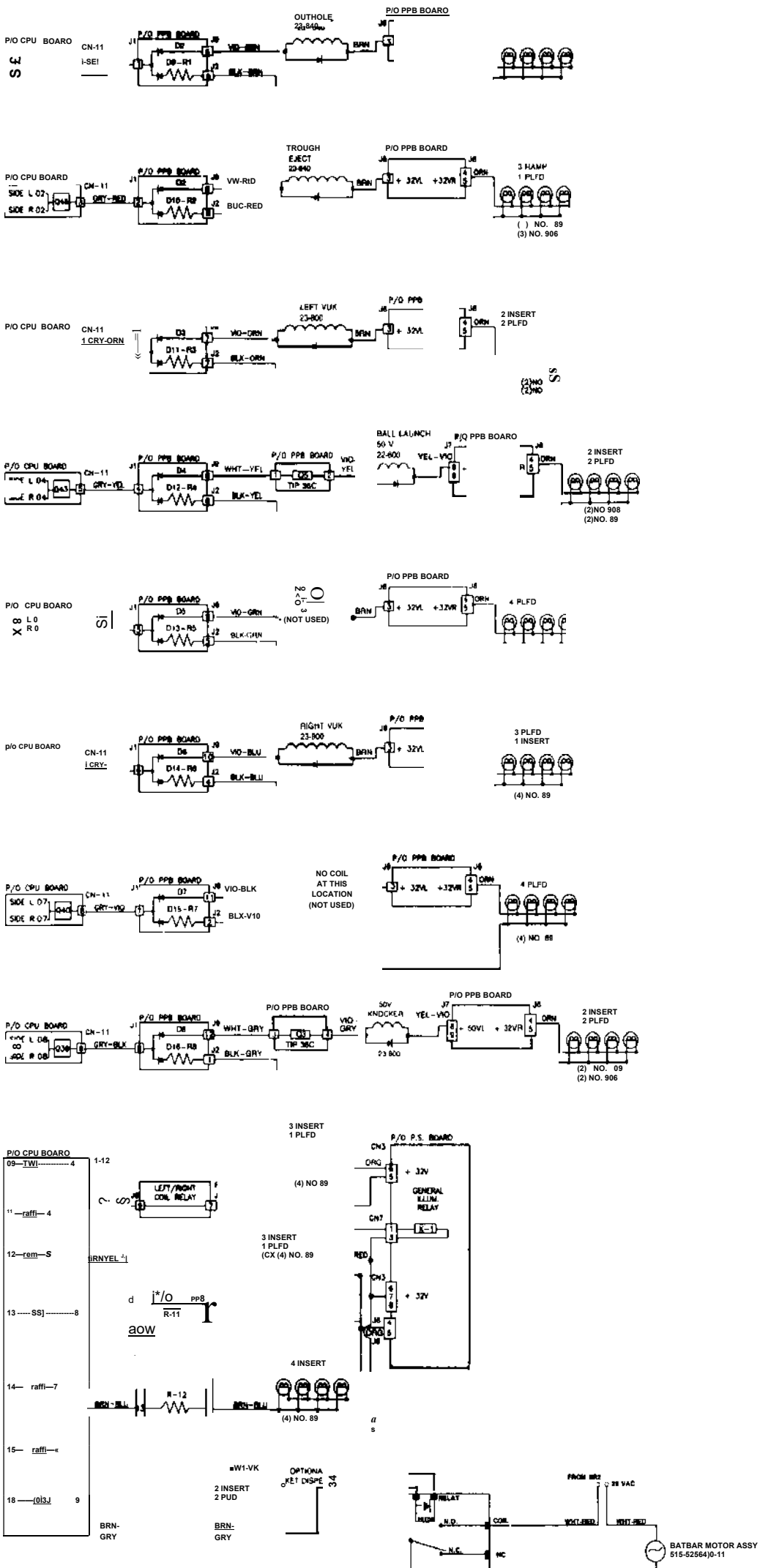
Coll Descriptlon	Flipper GND CPU to Coll Sw. to Flip.PCB		Power linee FlipPc toCol	Coll Type	Power Input To Flip PCB
Loft Flipper	ORN-GRY CPUCN1B-2	BLU-GRY CN1-9	GRY-YEL CN2-1.2	23-900	BLK-WHT 50VDC GRY, GRY-GRN SVAC
RlghtFHpper	ORN-VIO CPU CN18-1	BLU-VIO CN1-1	BLK-WHT CN1-1	23-900	



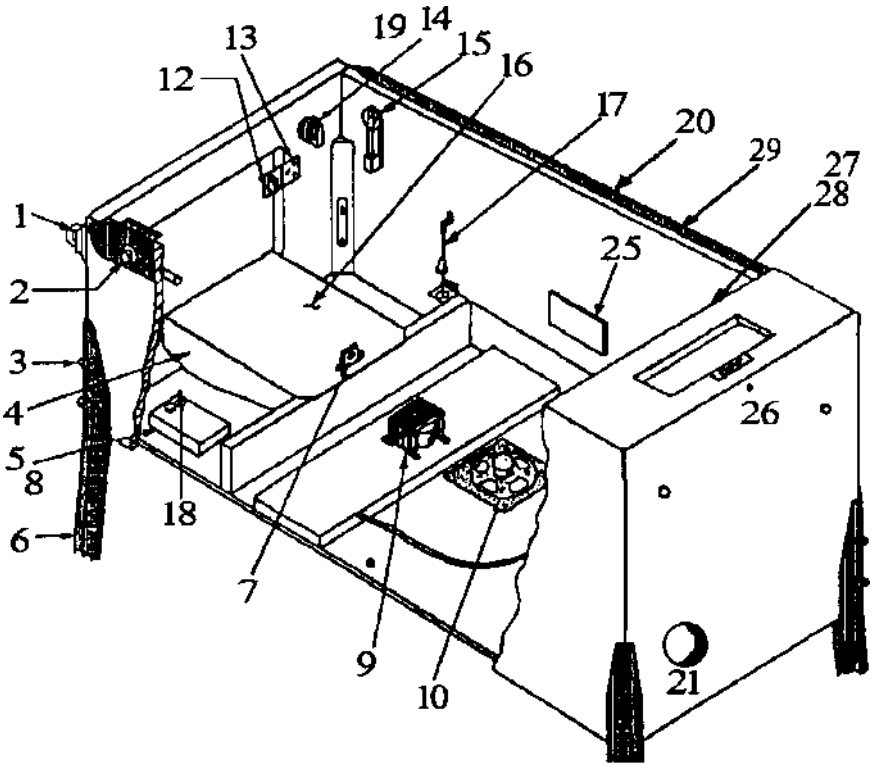
8B 8B

7B © © Backbox Flash Lamps C

^©G@©©@

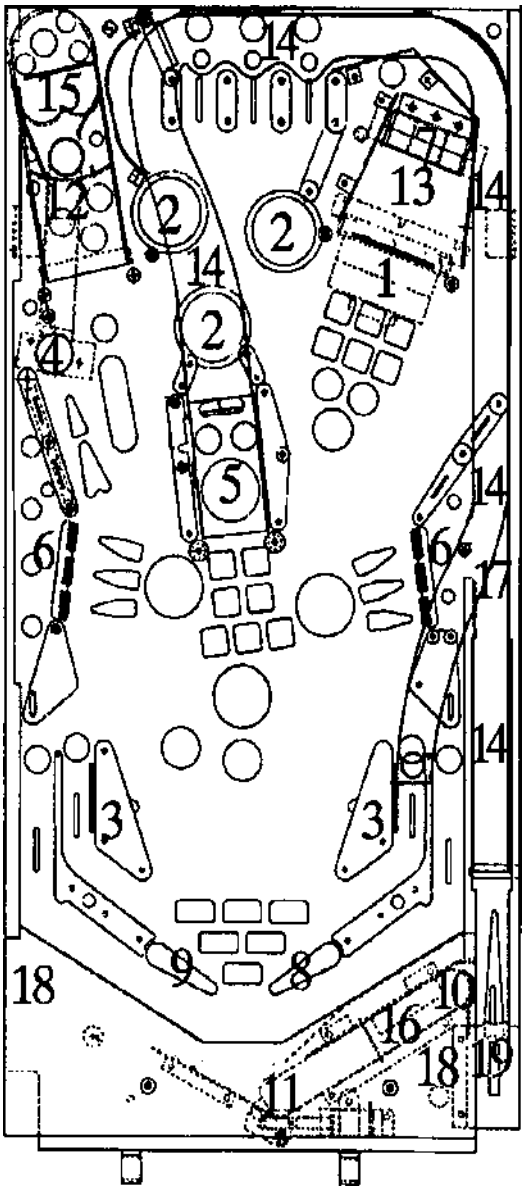

P/O CPU BOARD
CN-11
P/O PPB BOARD
OUTHOLE
P/O PPB BOARD
TROUGH EJECT
P/O PPB BOARD
3 RAMP
1 PLFD
VW-RtD
BUC-RED
( ) NO. 89
(3) NO. 906
LEFT VUK
P/O PPB
2 INSERT
2 PLFD
1 CRY-ORN
BALL LAUNCH
50 V
P/O PPB BOARO
2 INSERT
2 PLFD
(2)NO 908
(2)NO. 89
P/O PPB BOARD
4 PLFD
(NOT USED)
RIGHT VUK
3 PLFD
1 INSERT
(4) NO. 89
NO COIL
AT THIS
LOCATION
(NOT USED)
VIO-BLK
BLX-V10
(4) NO 88
P/O PPB BOARO
P/O PPB BOARD
KNOCKER
2 INSERT
2 PLFD
(2) NO. 09
(2) NO. 906
P/O CPU BOARO
3 INSERT
1 PLFD
P/O P.S. BOARD
(4) NO 89
GENERAL
ILLUM.
RELAY
3 INSERT
1 PLFD
(CX (4) NO. 89
4 INSERT
(4) NO. 89
LEFT/RIGHT
COIL RELAY
2 INSERT
2 PUD
BRN-
GRY
BATBAR MOTOR ASSY
515-52564)0-11

CABINET PARTS ILLUSTRATION



Item	Description	Part No.
I	Ball-Shooter Assy	500-5409-06-04
	Flipper Button	500-5026-16
	Leg Bolt (Black)	231-5000-01
	Cash Box Bottom	545-5090-00
	On/Off Switch DP/ST	180-5001-00
	Leg (Black)	535-5020-30
	Lock Bracket-Cash Box	535-5215-00
	Power Input Box Assy	515-5360-00-10
	Transformer	010-5003-00
10	Speaker-Round (6")	031-5000-00
II	Side Armor-Right(Not Shown)	535-5010-31
12	Memory Protect Switch	180-5000-00
13	Memory Protect Switch Bracket	535-5225-01
14	Start Switch Assembly	500-5407-06
15	Flipper Mlcro Switch	180-5048-01
16	Cash Box Top	535-5013-01
17	Plumb Bob Tilt Assembly	500-5023-00
18	Volume Control	123-5000-00
19	Playfield Glass (Tempered)	660-5001-00
20	Side Armor -Left	535-5010-32
21	Recessed cup for Line cord	545-5122-00
22	Servlce Switch (Not Shown)	180-5012-00
23	Front Moldlng Lockdown Assy.	500-5020-00
24	Front Molding -Black (Not Shown)	500-5021-10
25	S.S.Flipper P.C.B.	520-5033-00
26	Roto Lock Bottom	355-5006-01
27	Rear Plastlc Extrusion for Playfield Glass	545-5038-00
28	Mounting Foam for Extrusion	626-5004-00
29	Plastic Channel (Right & Left)	545-5017-00

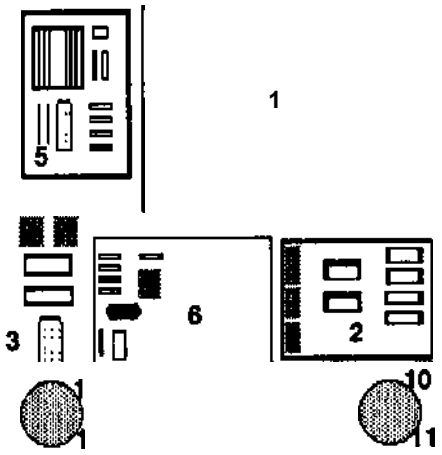
Playfield - Major Assemblles



Item	Description	Pari Number
	Up Down Target	500-5386-00-11
	Pop Bumper	500-5227-00
	Sling Shot	500-5226-00
	Super VUK	500-5116-04
	Bat Cave	545-5281-00
	3 Bank Standup Target	500-5384-03
	Super VUK	500-5116-03
	Flipper Assy Rlght	500-5177-71
	Flipper Assy Left	500-5177-72
10.	Ball Trough eject	500-5012-01
	Outhole Klcker	500-5082-00
12.	Joker Chute Assy.	535-5929-00
13.	Up Down Chute Assy.	515-5400-00
14.	Plastlc Ramp Assy.	500-5385-00-11
15.	Joker Ramp Assy.	500-5388-00-11
	Ball Trough Assy.	500-5044-00
16.	Ball Diverter	535-6116-00
	Bottom Arch	545-5170-00
17.	Turbo Kicker	500-5406-00

Individuai part breakdowns for most of these assemblies can be found on pages 35 through 41 and 63 & 64.

BACKBOX PARTS ILLUSTRATION



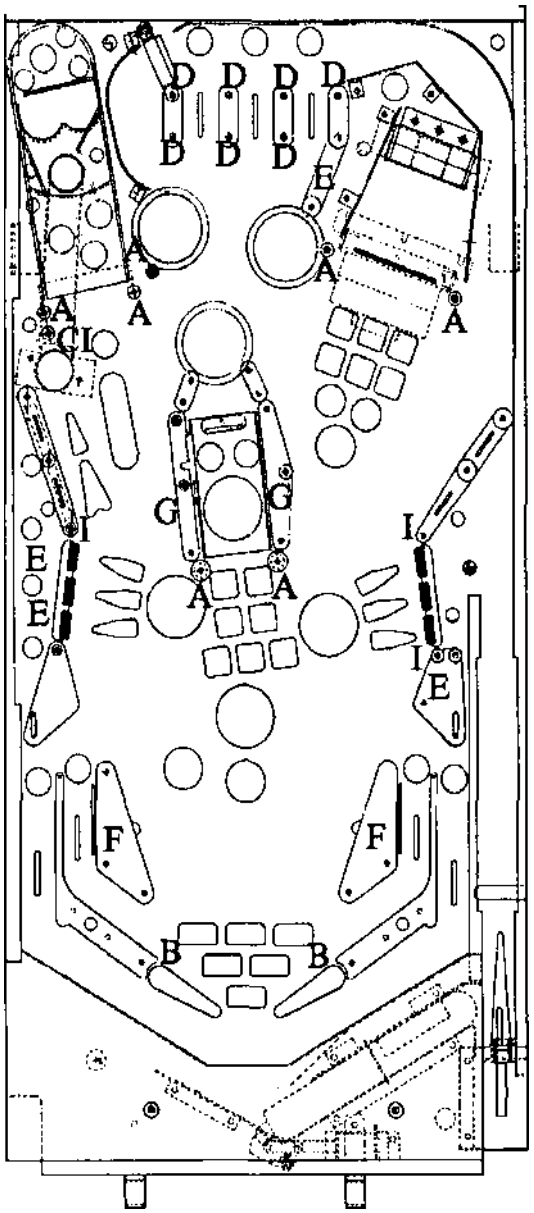
Item	Description	Part No.
	CPU Board Assy.(Non-Reflx)	520-5003-031
	Sound Board Assy	520-5050-001
	Capacitor 2C1	125-5000-00
	Bridge Rectifiers	112-5000-00
	Power Supply Bd. Assy	520-5047-00
	PPB Board	520-5021-04
	Dot Matrix Display Bd	520-5042-001
	Display Rlbbon Cable*	036-5000-24-10
	Speaker Housing	500-5416-00-10
	Speakers (2)	031-5004-00
	Speaker Grill (2)	830-5604-00
	Back Box Glass*	830-5211-00
	Roto-Lock Top*	355-5006-02

* Not Shown

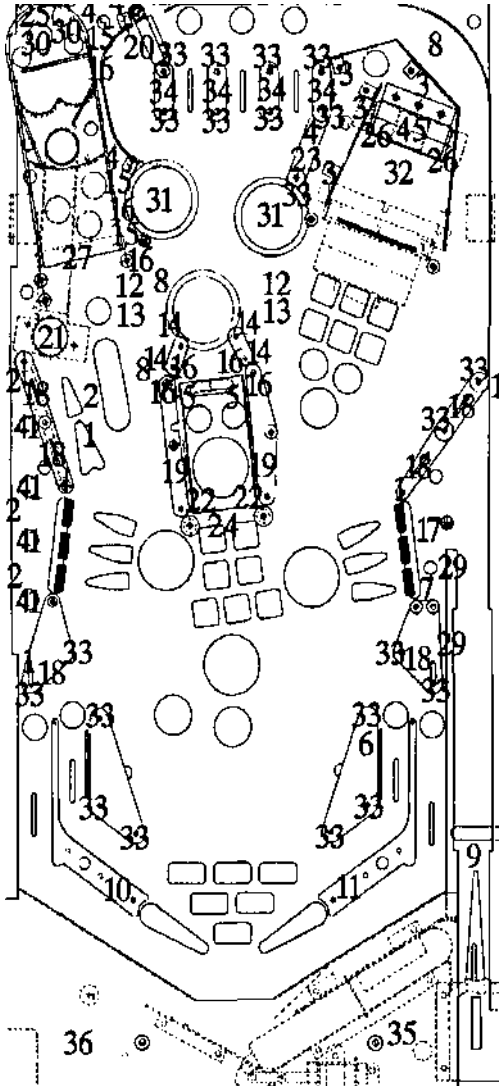
t When ordering PC Boards wlth ROMs please specify game name

RUBBER PARTS ILLUSTRATION

Item	Description	Pari#
	Rubber Post -Long(8)	545-5260-00
	Flipper (2)	545-5277-00
	3/i6"(2)	545-5025-01
	5/i6" (8)	545-5025-02
	1/2" (3)	545-5025-07
	2 72" (2)	545-5025-09
	2 3/4"(2)	545-5025-20
	Shooter Tip	545-5027-00
	Rubber Post -Short (2)	545-5151-00



Playfield Parts



No.	Description	Pari Number
	#6X1/2 HexTyp.	234-5001-02
2.	Plastic Spacer (1)	254-5000-02
3.	Plastic Spacer (1)	254-5000-06
4.	Plastic Spacer (1)	254-5000-07
5.	1/2 Hex Spacer	254-5008-03
6.	1 3/4 Plastic Spacer	254-5008-10
7.	Retaining Ring	270-5002-00
8.	Wire Gate and Switch	500-5314-00-11
9.	Batmoblle	500-5328-00-11
10.	Lower Left Return	517-0111-07-11
11.	Lower Right Return	517-0111-08-11
12.	Bumper Post Mach	530-5007-00
13.	Post Wood Screw	530-5010-01
14.	Mach Post	530-5012-02
15.	Metal Standoff	530-5035-01
16.	Mach Post Screw	530-5012-02
17.	Diverter Shaft	530-5173-07
18.	Wire Form 1"	535-5300-08
19.	Wire Form	535-5300-12
20.	Rebound Hinge	535-5372-00
21.	Ball Deflector	535-5380-01
22.	Ramp Side Piate	535-5442-00
23.	Wire Form	535-5603-00
24.	Ramp Piate	535-5884-00
25.	Joker Ramp Brkt.	535-5890-00
26.	Museum Brkt.	535-5894-01
27.	Joker Ramp Piate	535-6052-00
28.	Ball Diverter	535-6116-00
*29.	Llght Cover Red	545-5014-02
*30.	Light Cover Green	545-5014-04
31.	Bumper Cap	545-5225-03
32.	Flugenheim Museum	545-5280-00
33.	Small Plastic Post	550-5034-03
34.	Light Hood Single	550-5035-03
*35.	Coìnage Card	755-5008-02
*36.	Instruction Card	755-5011-00
37.	Decal Sheet	820-5060-XX
*38.	Playfield Mylar	820-5818-00
*39.	Screened Playfield	830-5111-00
*40.	Screened Plastics	830-5415-XX
41.	SB Mini Hat Mars Amber	550-5032-03
42.	SB Mini Mars Amber	550-5031-03
43.	SB Mini Mars	550-5031-07
44.	SB Mini Mars Clear	550-5031-01
45.	Scoop	535-6030-00

Note:
See page 25 for switch part numbers

· Indicates not shown

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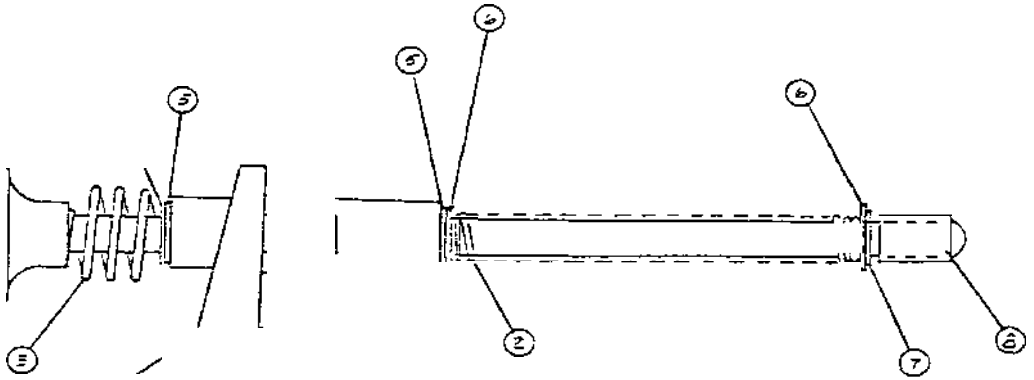
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REV	DESCRIPTION	BY	DATE	A**



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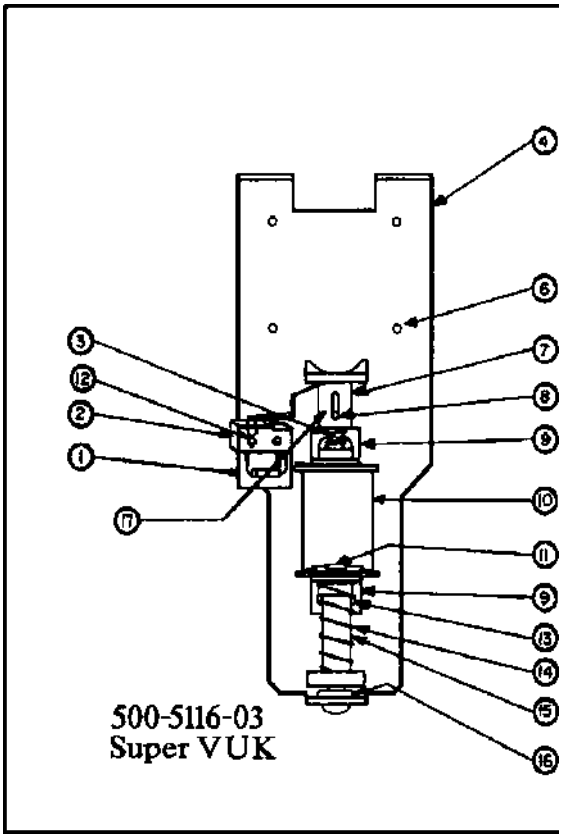
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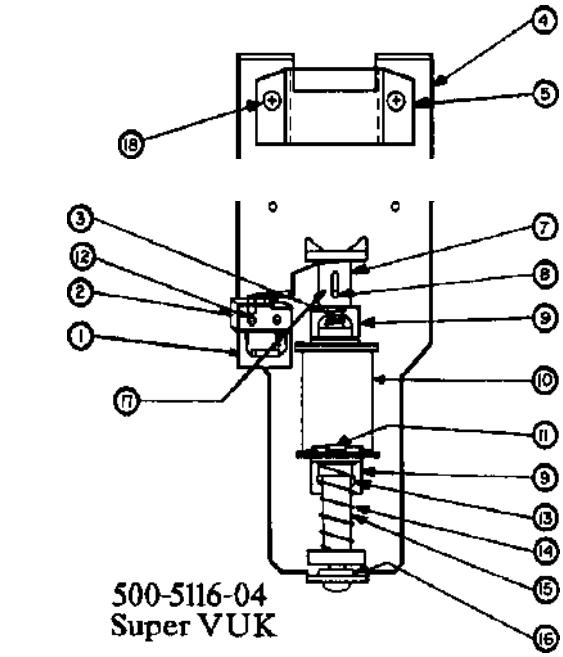
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!XÉ DATA EAST P1NBALL, INO.
1990 JANICE AVE.. ME3P0SE PASK. IL SCI50

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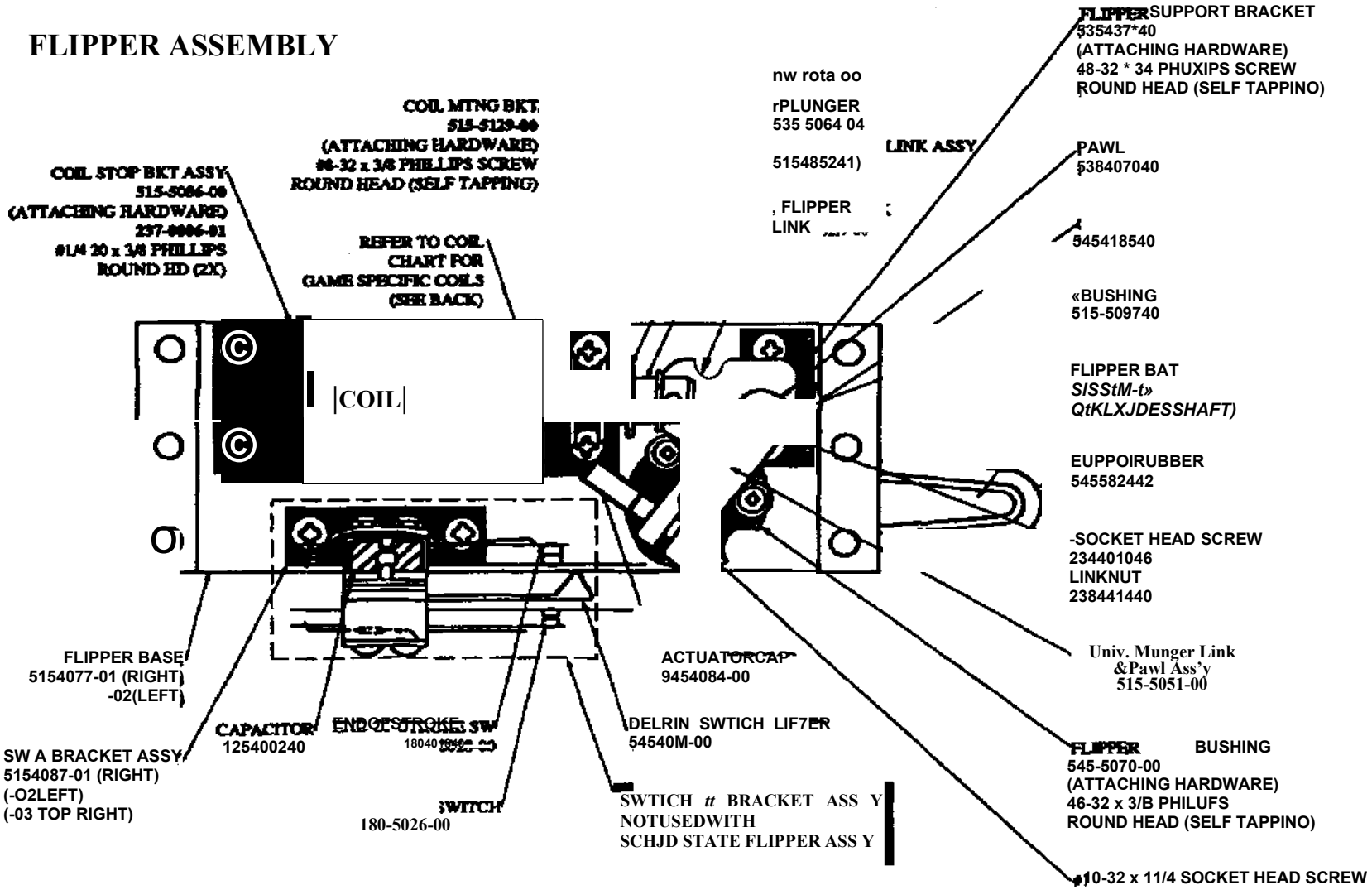


Item	Part#	Description
1	545-5193-00	Sw.Insulator
2	180-5064-00	Micro Switch
3	266-5025-00	Cap Spring
4	535-5298-01	Ball Kickup Mtg. Brkt
5		6-32 Tap (4)
6	232-5201-00	#6-32X3/s SEMS(2)
7	545-5227-00	Vert.Kick.Cap
8	535-5111-00	Pin /32 x 7/l 6
9	535-5203-01	Coil Retainer Brkt. (2)
10	090-5023-00	Coil 22-600
11	112-5003-00	1N4004 Diode
12	237-5806-00	2-56x1/2 Screw(2)
13	232-5200-00	#6-32x1/4 Phil.M.S.
14	266-5009-00	Spring
15	515-5352-00	Plunger Assy.
16	280-5003-00	Bumper
17	270-5010-00	Compression Ring(3)



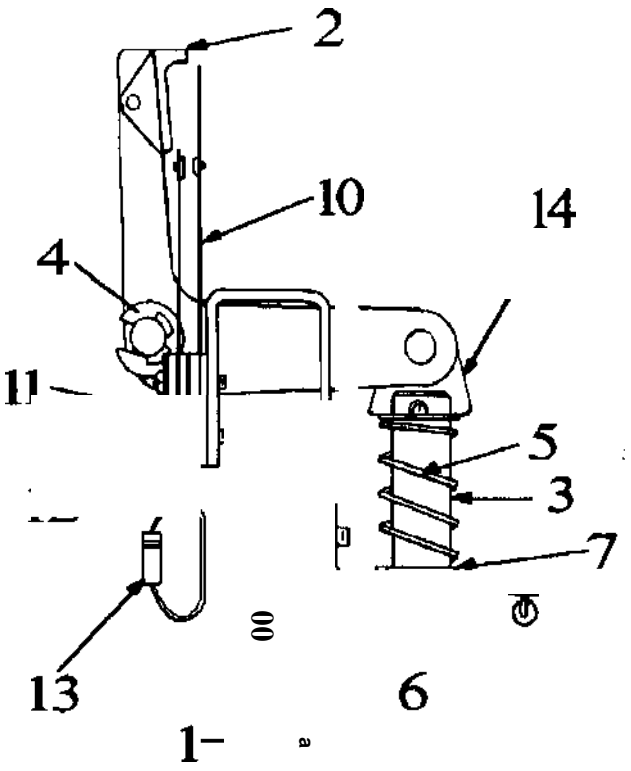
Item	Part#	Description
1	545-5193-00	Sw.Insulator
2	180-5064-00	Micro Switch
3	266-5025-00	Cap Spring
4	535-5298-00	Ball Kickup Mtg. Brkt
5	535-6047-00	Ball Guide Brkt
6	232-5201-00	#6-32X3/8 SEMS(2)
7	545-5227-00	Vert.Kick.Cap
8	535-5111-00	Pin 3/32 x 7/i 6
9	535-5203-01	Coil Retainer Brkt. (2)
10	090-5001-00	Coil 23-800
11	112-5003-00	1N4004 Diode
12	237-5806-00	2-56x1/2 Screw(2)
13	232-5200-00	#6-32x1/4 Phil.M.S.
14	266-5009-00	Spring
15	515-5352-00	Plunger Assy.
16	280-5003-00	Bumper
17	270-5010-00	Compression Ring(3
18	232-5200-00	#6-32 X1/4 SEMS

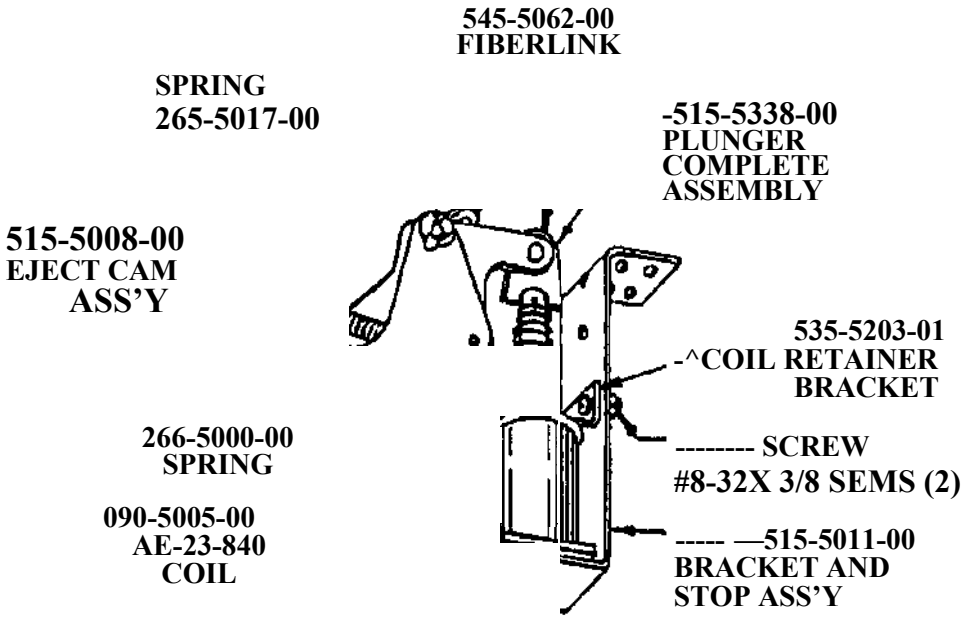
FLIPPER ASSEMBLY



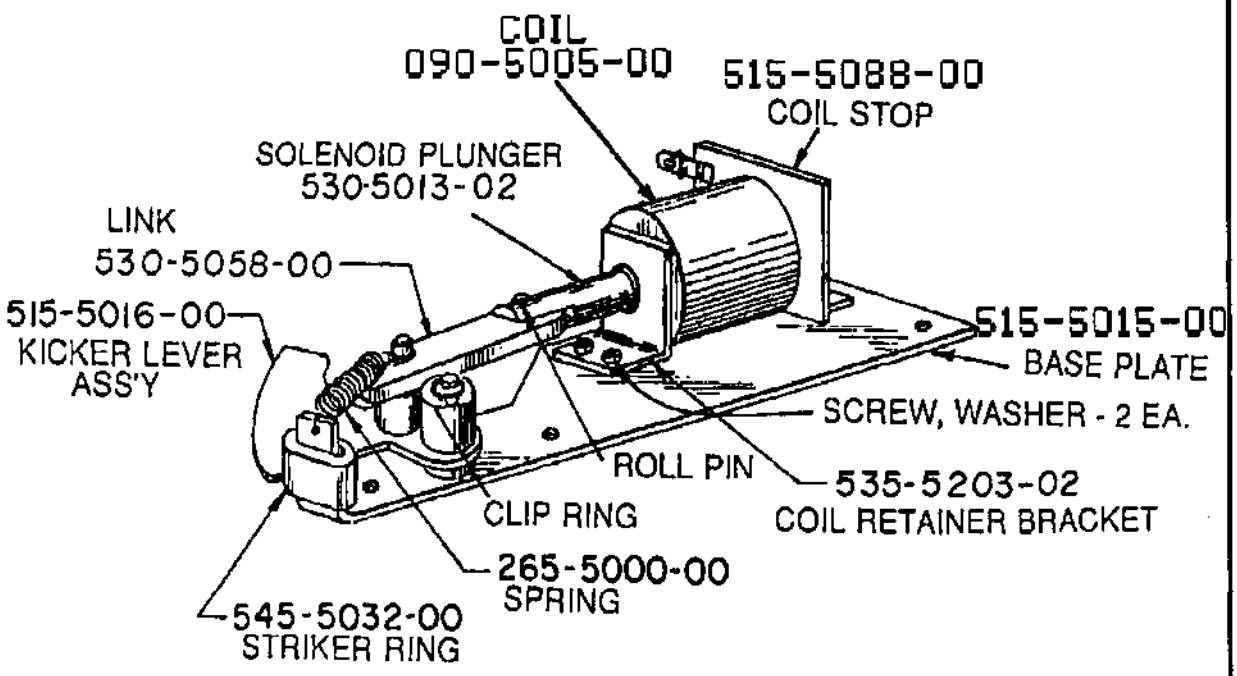
Slingshot Assembly
500-5226-00

Item	Description	Part No.
1	Slingshot Bracket	515-5339-00
2	S.S. Arm & Tip Assy.	515-5340-00
3	ritinger & Link Assy.	515-5338-00
4	1/4 Retaining Ring (2)	270-5002-00
5	Spring	266-5020-00
6	23-800 Coil	090-5001-02
7	Coil Sleeve	260-0004-00
8	Coil Retainer	535-5203-01
9	#8-32 X1/4" Screw (2)	232-5300-00
10	Slingshot Switch (2)	180-5054-00
11	Tension Piate (2)	535-5846-00
12	#4-40X1/2" Screw (4)	237-5837-00
13	Diode 1N4004 (2)	112-5004-00
14	Link, Plunger	545-5062-00

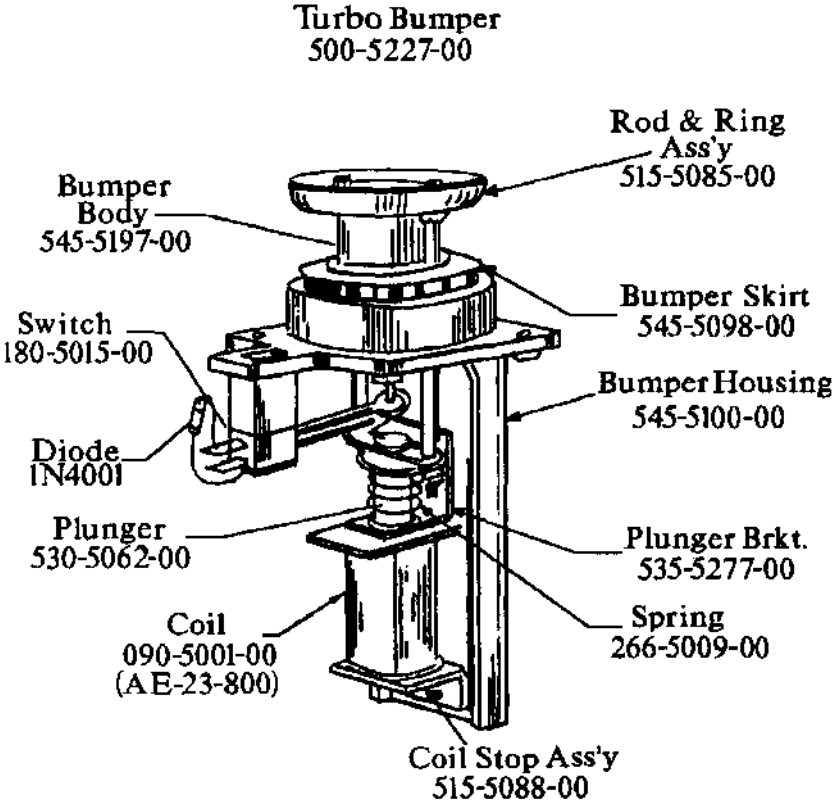


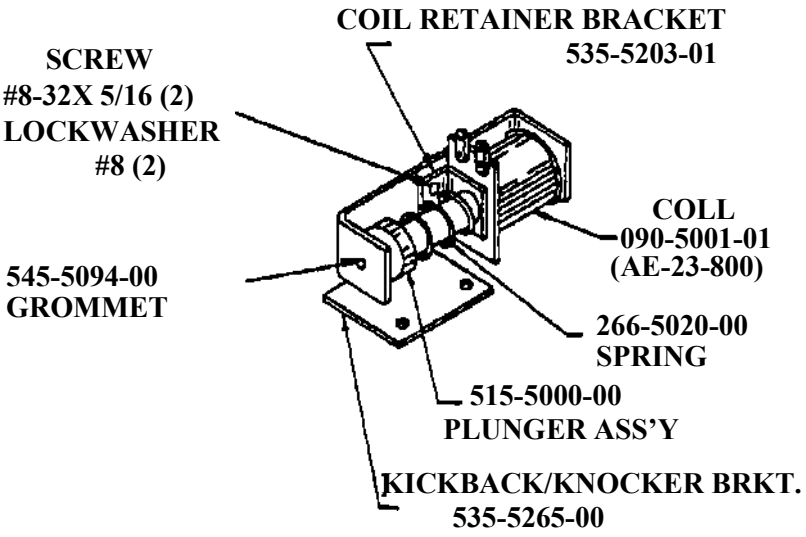


500-5012-01 BALL FEED ASS'Y (TROUGH EJECT)

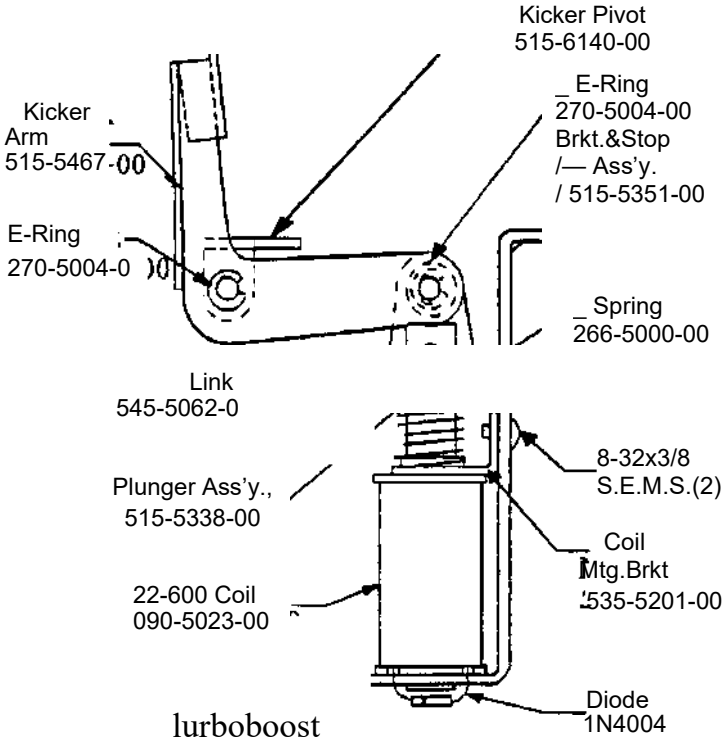


500-5082-00 OUTHOLE BALL RETURN ASSY

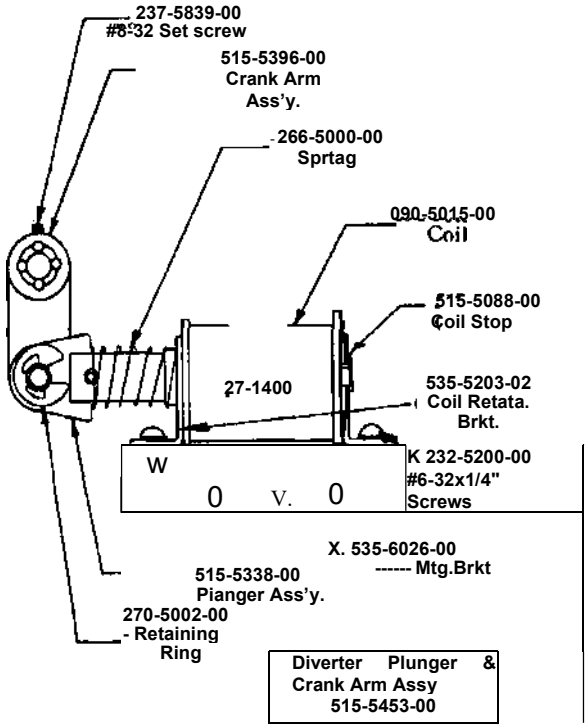


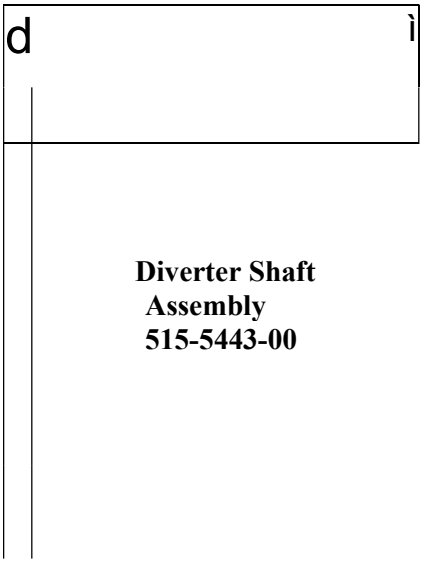


KICKBACK ASSEMBLY 500-5080-00 (COIL LUGS ON THÈ SIDE)
KNOCKER ASSEMBLY 500-5081-00 (PICTURED)

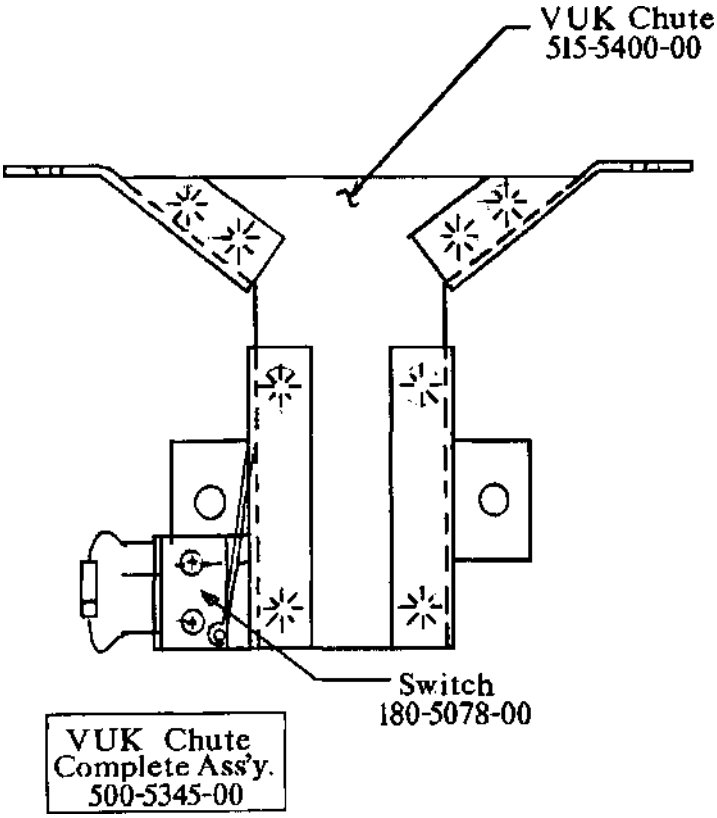


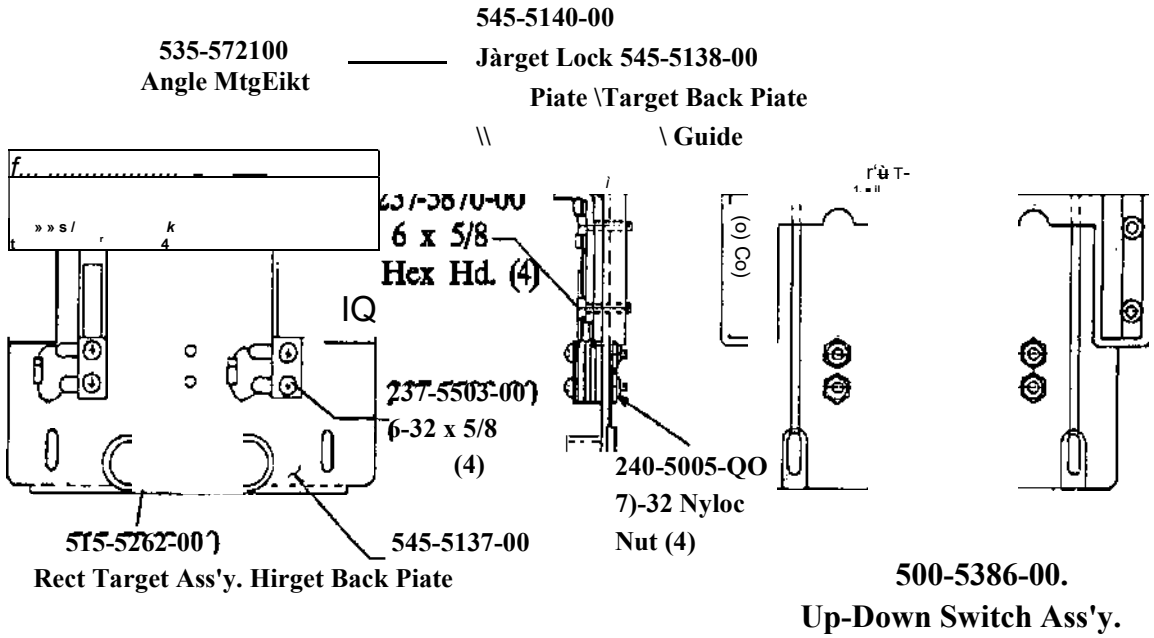
lurboboost
Kicker
500-5406-00

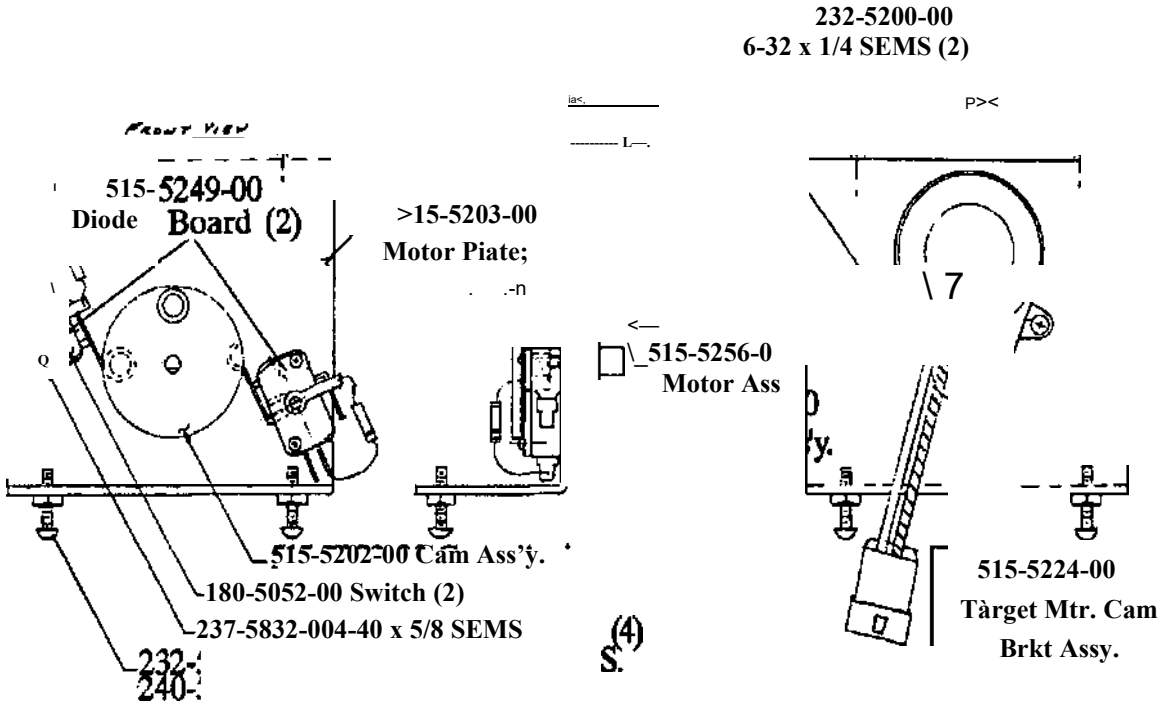


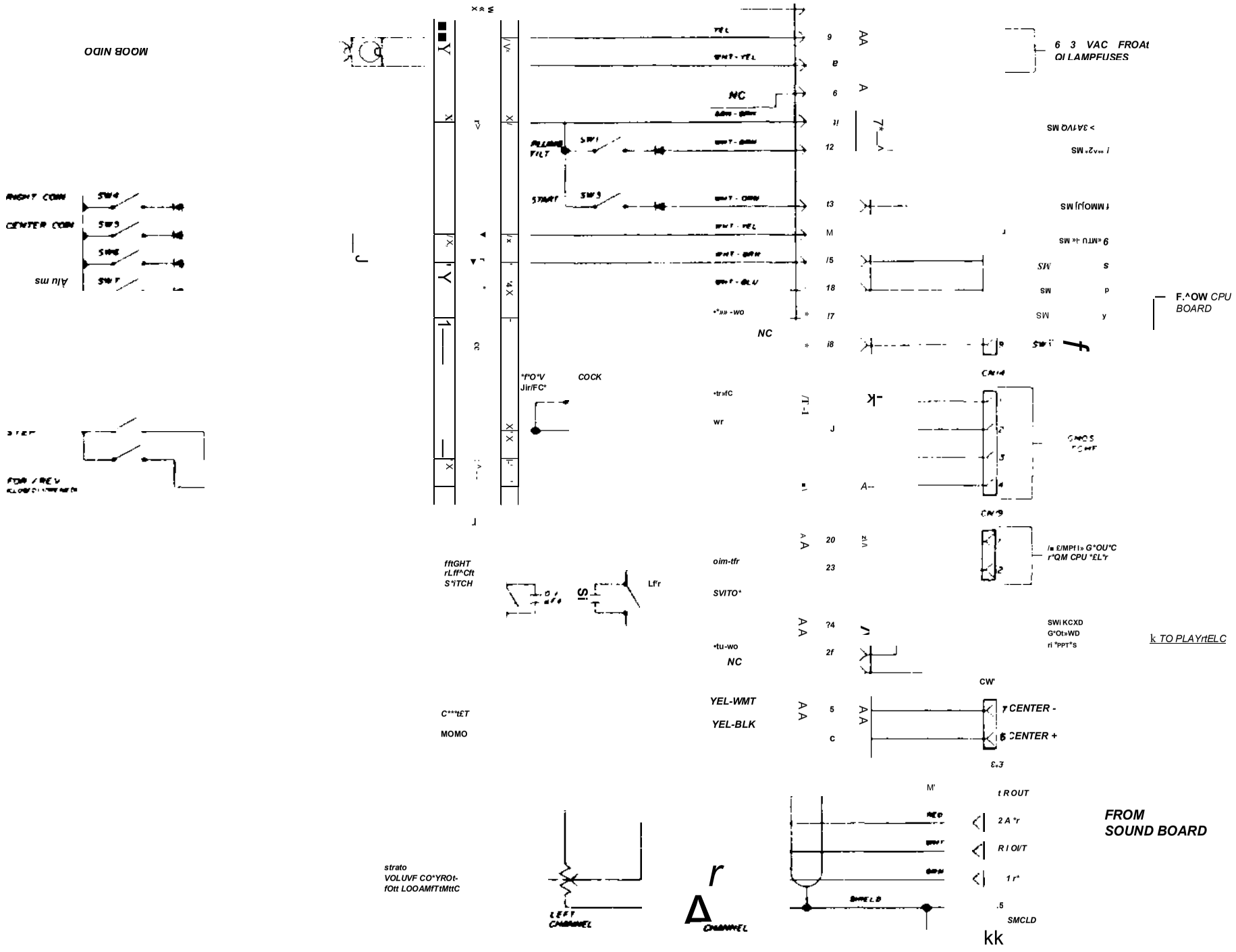


Diverter Shaft Assembly 515-5443-00




545-5140-00
535-572100
Angle MtgEikt
Jàrget Lock 545-5138-00
Piate \Target Back Piate
\\ \ Guide
6 x 5/8
Hex Hd. (4)
IQ
237-5503-00)
6-32 x 5/8
(4)
240-5005-QO
7)-32 Nyloc
Nut (4)
515-5262-00)
545-5137-00
Rect Target Ass'y. Hirget Back Piate
500-5386-00.
Up-Down Switch Ass'y.


232-5200-00
6-32 x 1/4 SEMS (2)
515-5249-00
Diode Board (2)
>15-5203-00
Motor Piate;
515-5256-0
Motor Ass
515-5202-00 Cam Ass'y.
180-5052-00 Switch (2)
237-5832-004-40 x 5/8 SEMS
515-5224-00
Tàrget Mtr. Cam
Brkt Assy.


6 3 VAC FROAt
OI LAMPFUSES
F.^OW CPU
BOARD
NC
NC
COCK
fftGHT
rLff^Cft
S'ITCH
LFr
SWi KCXD
G*Ot»WD
ri *PPT*S
k TO PLAYrtELC
CW'
7 CENTER -
6 CENTER +
YEL-WMT
YEL-BLK
C***tET
MOMO
t R OUT
2 A *r
R I OI/T
1 r*
.5
SMCLD
FROM
SOUND BOARD
strato
VOLUVF CO*YROt-
fOtt LOOAMfTtMttC
LEFT
CHANNEL
kk

DOT MATRIX DISPLAY

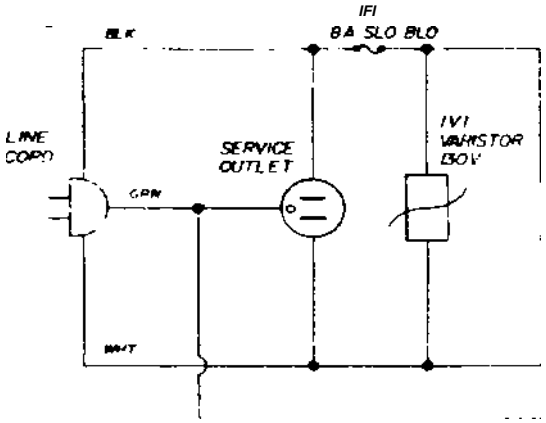
J2

High Voltage Gnd	(D	YEL
High Voltage Gnd	00	YEL
—100vDC	N	BLK-YEL
—98vDC	O)	GRY-YEL
+ 68vDC	Ol	VIO-YEL
+ 12vDC	A	BLU
Key	C	KEY
Ground	O	BLK
+ 5vDC		RED

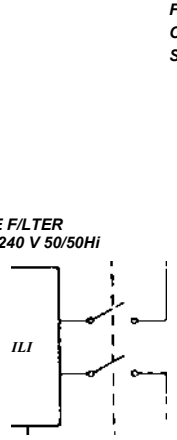
J1

RIBBON CABLE

-*■ ho			
0	0	Ground	Not Used
0	0	Busy	Status
0	0	Not Used	Not Used
0	0	Not Used	Not Used
o	0	Not Used	Not Used
0	0	Data 0	Data 1
0	0	Data 2	Data 3
0	0	Data 4	Data 5
0	0	Data 6	Data 7
0	0	Clock	Reset
0	0	Not Used	Not Used
0	0	Not Used	Not Used
0	0	Not Used	Not Used

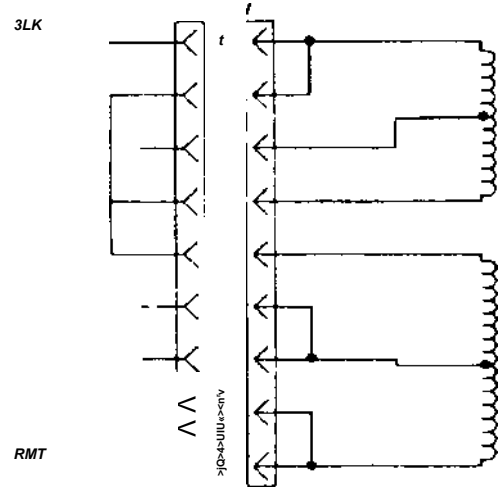


LINE F/LTER
120/240 V 50/50Hi

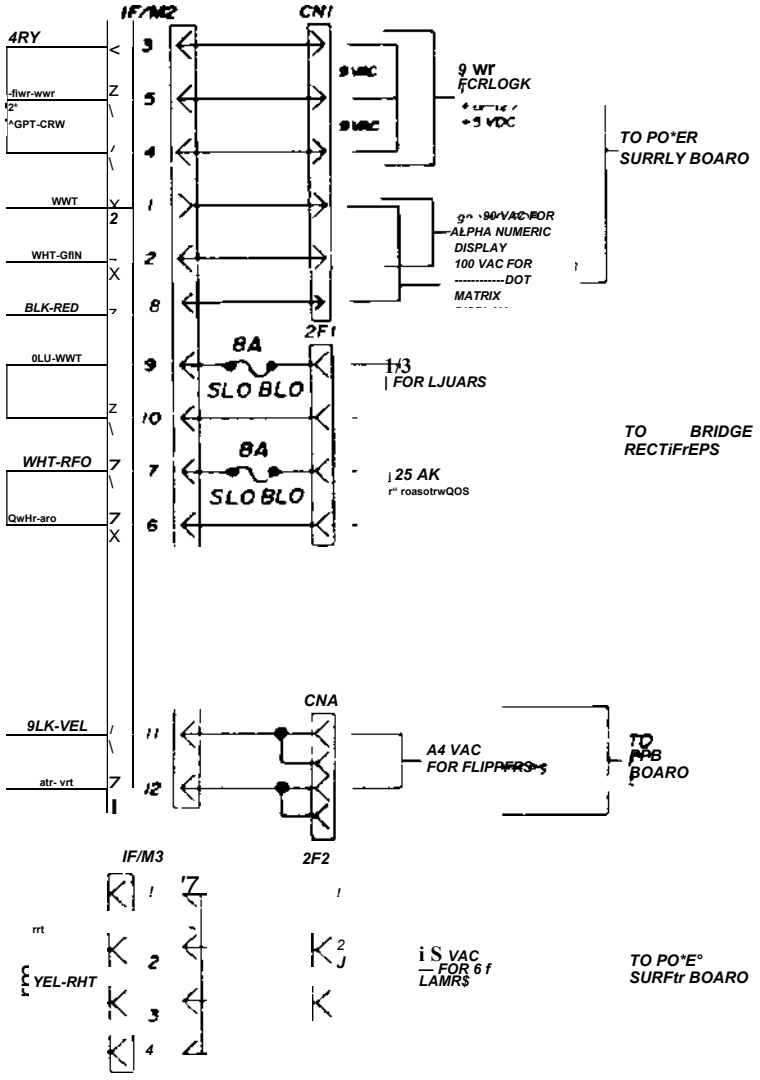


TRIS CONFfGURATION FOR U9V

FOR LOWER LINE VOLTAGE S
OR 230 VOLT OPERATION
SEE SAMPLES BELO*



ITI



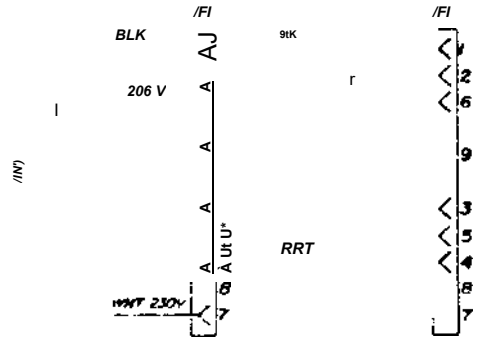
JUMPERS FOR VOLTAGE VARIATION

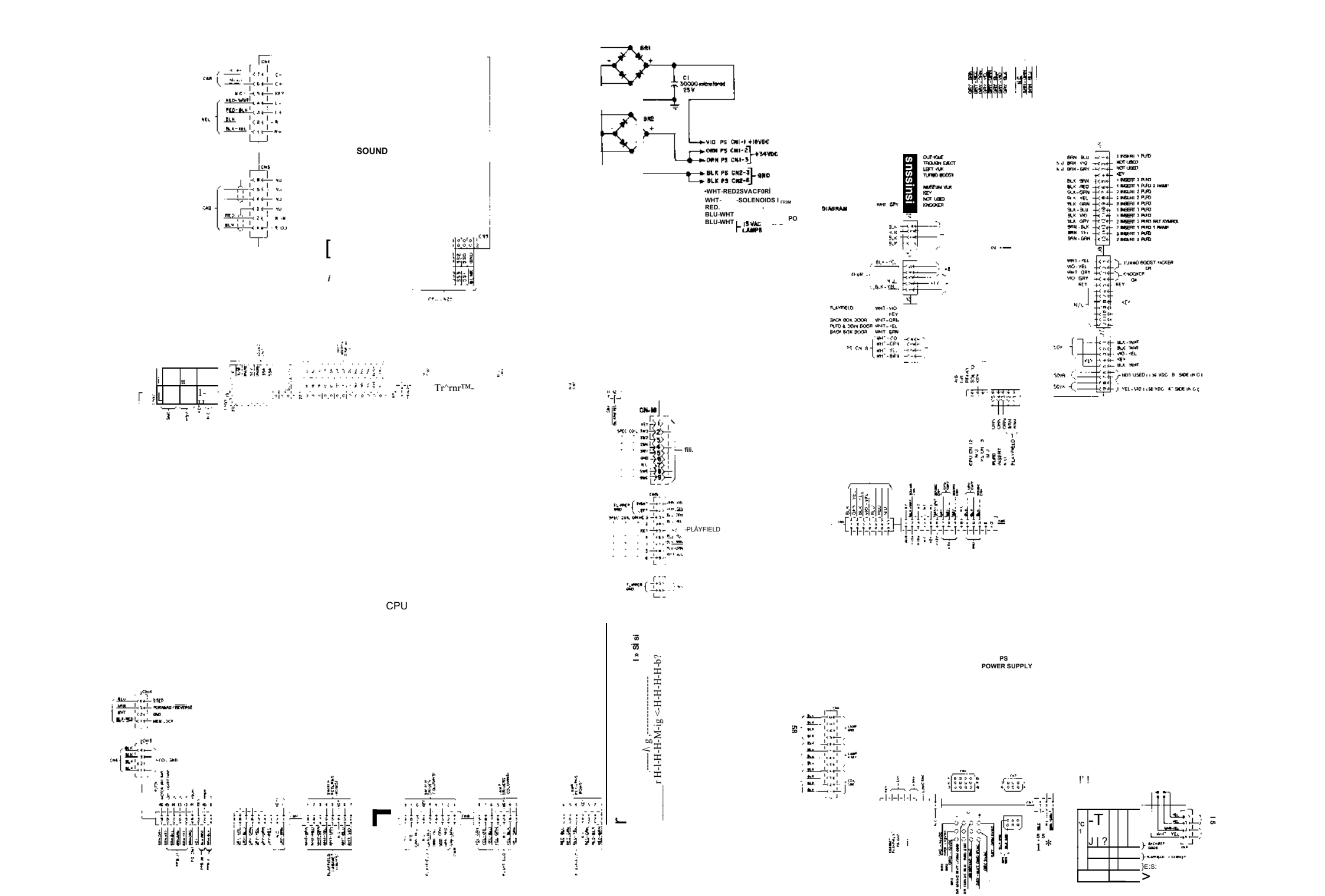
230/218/206VOLTS

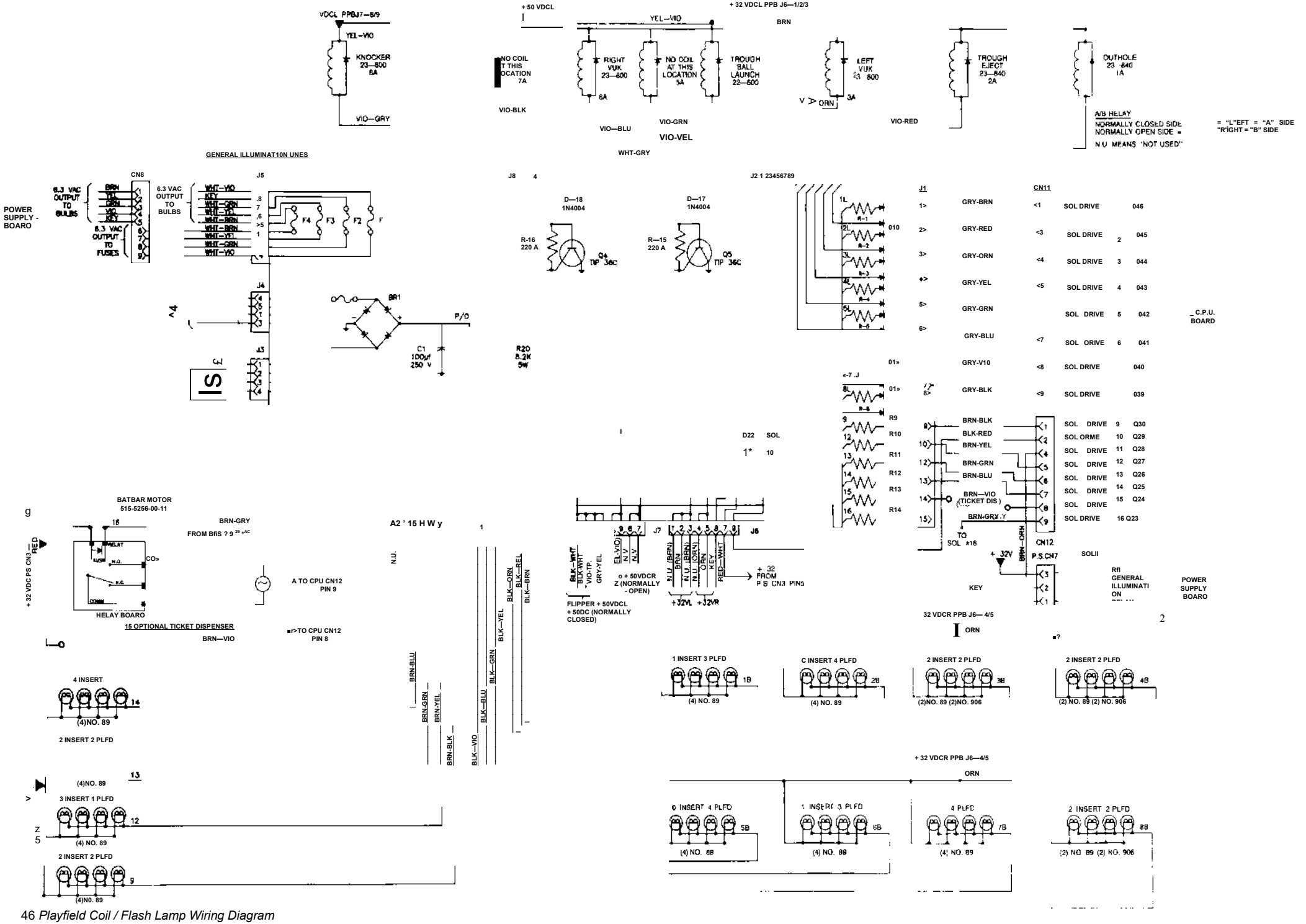
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IVI • 273V VARtSTOR

rQO/fO5 VOLTS

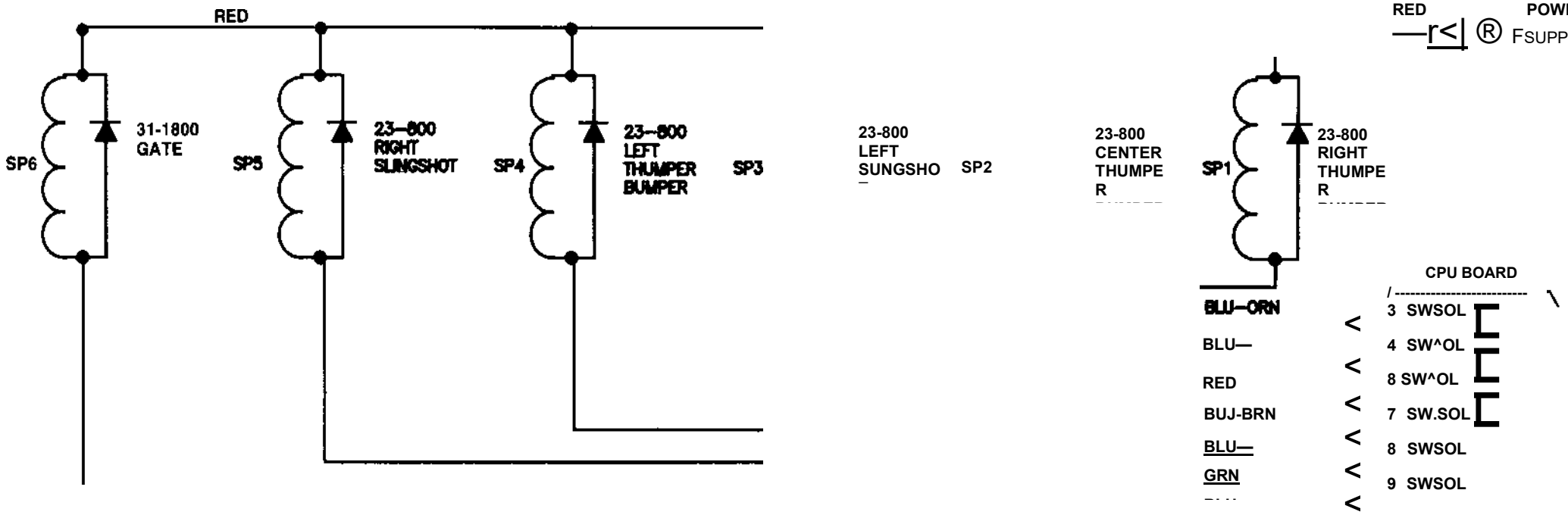
/FI • 94 sto ato
IVI • I30V VARtSTOR




SOUND
CPU
PS
POWER SUPPLY
-PLÀYFIELD
-WHT-RED2SVACF0RÌ
WHT- -SOLENOIDS
RED.
BLU-WHT
BLU-WHT
PO
DIABRAM
sussini

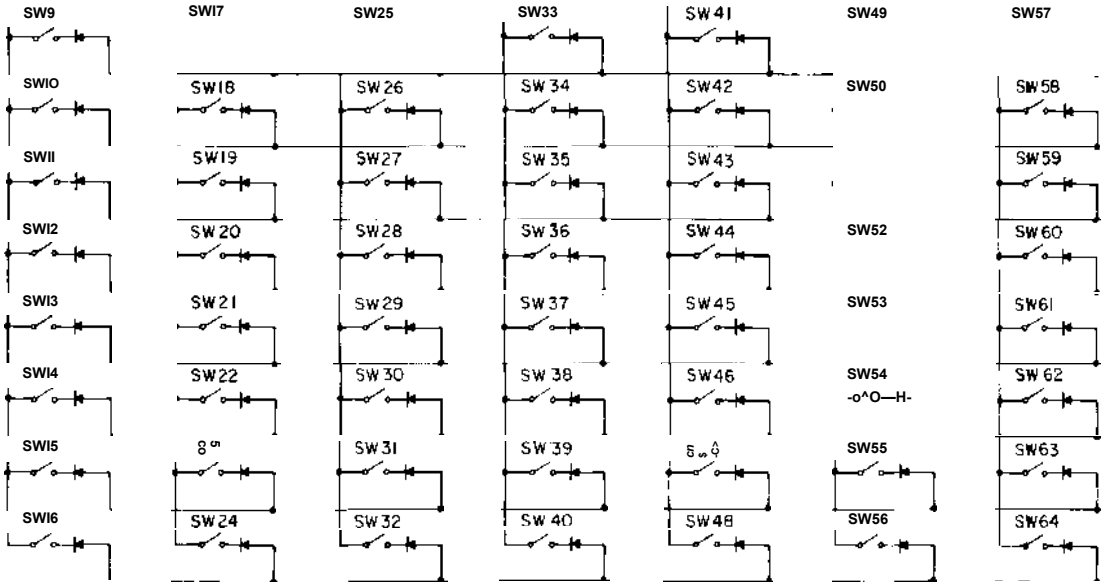


46 *Playfield Coil / Flash Lamp Wiring Diagram*


RED
SP6
31-1800
GATE
SP5
23-800
RIGHT
SLINGSHOT
SP4
23-800
LEFT
THUMPER
BUMPER
SP3
23-800
LEFT
SUNGSHO
SP2
23-800
CENTER
THUMPE
R
SP1
23-800
RIGHT
THUMPE
R
RED
POWER
SUPPLY
CPU BOARD
BLU—ORN
BLU—
RED
BUJ-BRN
BLU—
GRN
3 SWSOL
4 SW^OL
8 SW^OL
7 SW.SOL
8 SWSOL
9 SWSOL

Switch Number	Description
01*	Plumb Tilt
02	Not Used
03	Credit Button
04*	Right Coin
05*	Center Coin
06*	Left Coin
07*	Slam Tilt
08	Not Used
09	Not Used
10	Out Hole
11	Trough#1(Left)
	Trough #2(Center)
	Trough #3(Right)
	Shooter Lane
14	Left Flip. Cab. Switch
16	Right Flip. Cab. Switch
17	Left Top Lane
18	Center Top Lane
19	Right Top Lane
20	Not Used
21	Left Return Lane
22	Right Return Lane
23	Left Outlane
24	Right Outlane
25	Not Used
26	Not Used
27	Not Used
28	Ramp Entrance
29	Ramp Exit
30	Not Used
31	Not Used
32	Not Used
33	Left Bank Top
34	Left Bank Middle
35	Left Bank Bottom
36	Joker Left Eye
37	Joker Right Eye
38	Joker Mouth
39	Left VUK
40	Not Used
41	Right 3 Bank Top
42	Right 3 Bank Middle
43	Right 3 Bank Bottom
44	Not Used
45	Not Used
	Not Used
	Leti Slingshot Sw. (2)
	Right Slingshot Sw. (2)
	Bat Bar StandupTarget
50	Museum Motor Up
51	Museum Motor Down
52	Right VUK Top
53	Right VUKBottom
	Bumper Left
	Bumper Center
	Bumper Right
	Not Used Through 64

* Indicates cabinet switches.



GRN - RED
GRN - ORG
GRN-YEL
GRN - BLK
GRN - BLU
GRN- VIP
GRN-GRY

2 SWITCH DRIVE 2
3 SWITCH DRIVE 3
4 SWITCH DRIVE 4
5 SWITCH DRIVE 5
7 SWITCH DRIVE 6
8 SWITCH DRIVE 7
9 SWITCH DRIVE 8

>CPU BOARD

CNIO

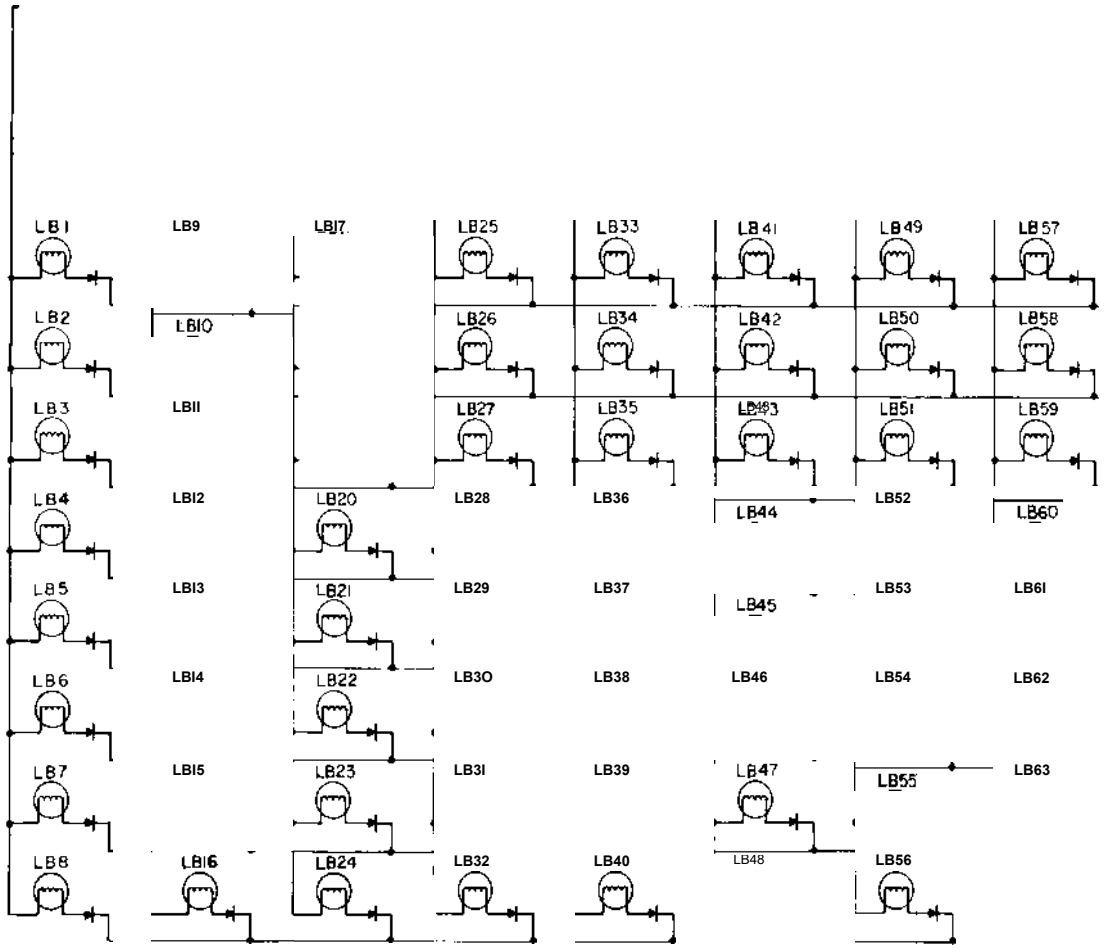
WHT-BRN
WHT-RED
WHT-ORN
WHT-YEL
WHT-GRN
WHT-BLU
WHT-VIO
WHT-GRY

9 SWITCH RETURN I
SWITCH RETURN 2
6 SWITCH RETURN
5 SWITCH RETURN
3 SWITCH RETURN
2 SWITCH RETURN
I SWITCH RETURN

Lamp Description Number

*Indicates Speaker or Backbox Lamp

01.	1 Million	17.	LeftToplane	33.	Left3BankTop
02.	Super Bumps	18.	Center Toplane	34.	Left 3 Bank Middle
03.	LiteXball	19.	Right Toplane	35.	Left 3 Bank Bottom
04.	Fast Money	20.	Playfield Moon	36.	Joker Left Eye
05.	Instant 2 Ball	21.	Left Return Lane	37.	Joker Right Eye
06.	Million Plus	22.	Right Return Lane	38.	Joker 2 Million
07.	Max X Value	23.	Left Outlane	39.	Left VUK Extra Ball
08.	Spot Fast Money	24.	Right Outlane	40.	Left 3 Bank Done
09.	Bottom 2X	25.*	Backpanel Left	41.	Right 3 Bank Top
10.	Bottom 4X	26.*	Backpanel Center	42.	Right 3 Bank Middle
11.	Bottom 6X	27.*	Backpanel Right	43.	Right 3 Bank Bottom
12.	Bottom 8X	28.*	Backpanel 500K	44.	Left Bumper
13.	Bottom 10X	29.*	Backpanel XBall	45.	Center Bumper
14.	ShootAgain	30.	Doublé Score	46.	Right Bumper
15.	Batman'sHead	31.	Under Ramp XBall	47.	Spot Bat Monitor
16.	Batman's Chest	32.	3 Million	48.	Right 3 Bank Done
				49.	Ramp Diverter
				50. *	Insert-Moon (2)
				51. *	Insert-5 Million
				52. *	Insert-15 Million
				53. *	Insert-10 Million
				54.	Cab.-Start Button
				55.	Museum Bat Symbol
				56.	Jackpot Lit
				57.	BATMAN
				58.	BATMAN
				59.	BATMAN
				60.	BATMAN
				61.	BATMAN
				62.	BATMAN
				63.	Look Ball #1
				64.	Look Ball #2



CN7

YEL-BRN	1	LAMP DRIVE
YEL-RED	2	LAMP DRIVE 2
YEL-ORN	3	LAMP DRIVE 3
YEL - BLK	4	LAMP DRIVE 4
YEL- GRN	6	LAMP DRIVE 5
YEL- BLU	7	LAMP DRIVP 6
YEL- VIP	8	LAMP DRIVE 7
YEL - GRY	9	LAMP DRIVE 8

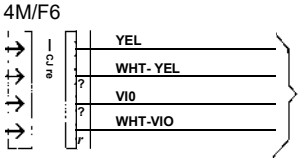
LAMP DRIVE 1	Q71	LAMP RETURN 1	Q72
LAMP DRIVE 2	Q70	LAMP RETURN 2	Q73
LAMP DRIVE 3	Q69	LAMP RETURN 3	Q74
LAMP DRIVE 4	Q68	LAMP RETURN 4	Q75
LAMP DRIVE 5	Q67	LAMP RETURN 5	Q76
LAMP DRIVE 6	Q66	LAMP RETURN 6	Q77
LAMP DRIVE 7	Q65	LAMP RETURN 7	Q78
LAMP DRIVE 8	Q64	LAMP RETURN 8	Q79

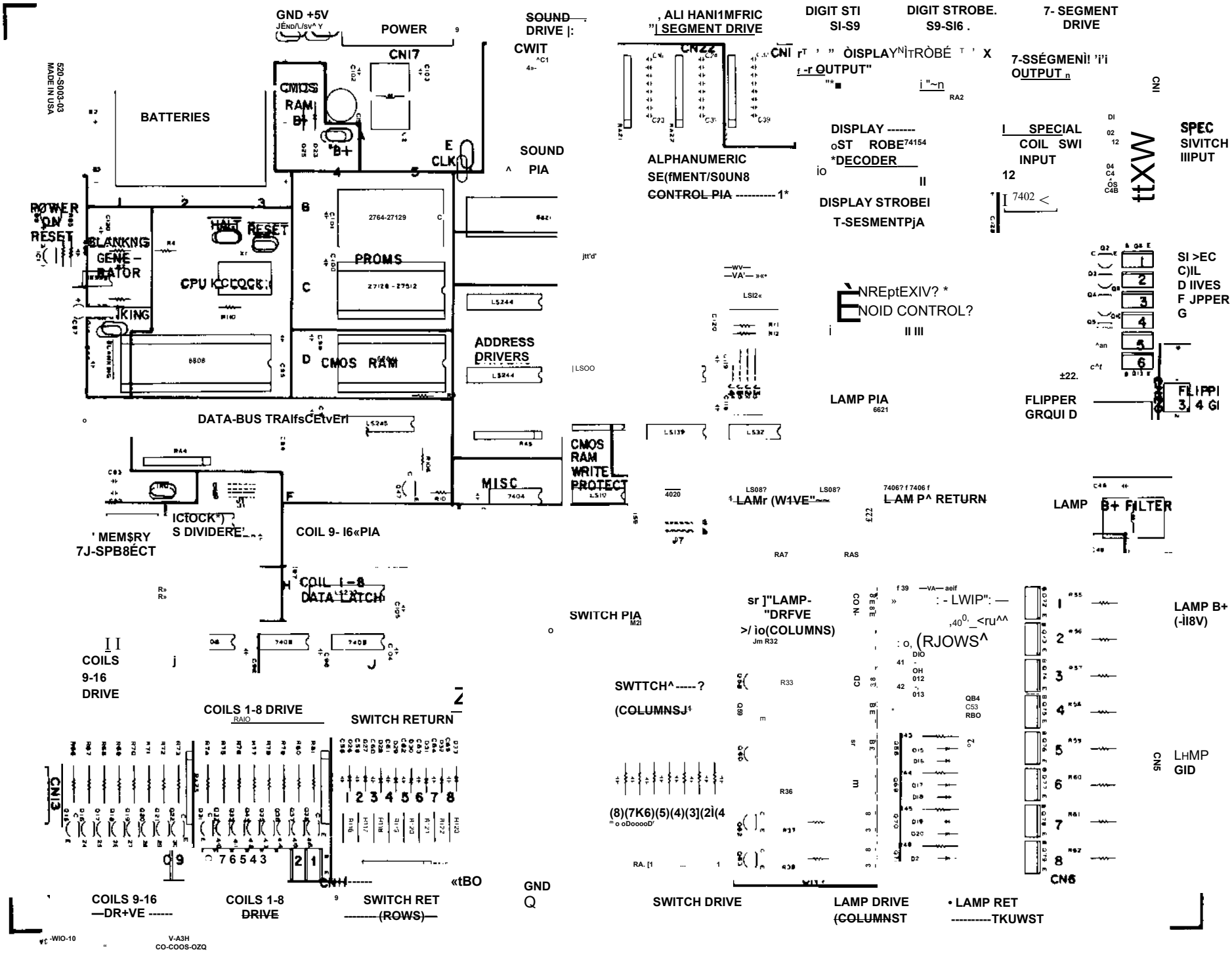
>CPU BOARD

RED-BRN	1	LAMP RETURN I
REO-BLK	2	LAMP RETURN 2
REO - ORN	3	LAMP RETURN 3
RED-YEL	5	LAMP RETURN 4
RED - GRN	6	LAMP RETURN 5
RED - BLU	7	LAMP RETURN 6
RED - VIP	8	LAMP RETURN 7
RED-GRY	9	LAMP RETURN 8

G.I. LAMPS

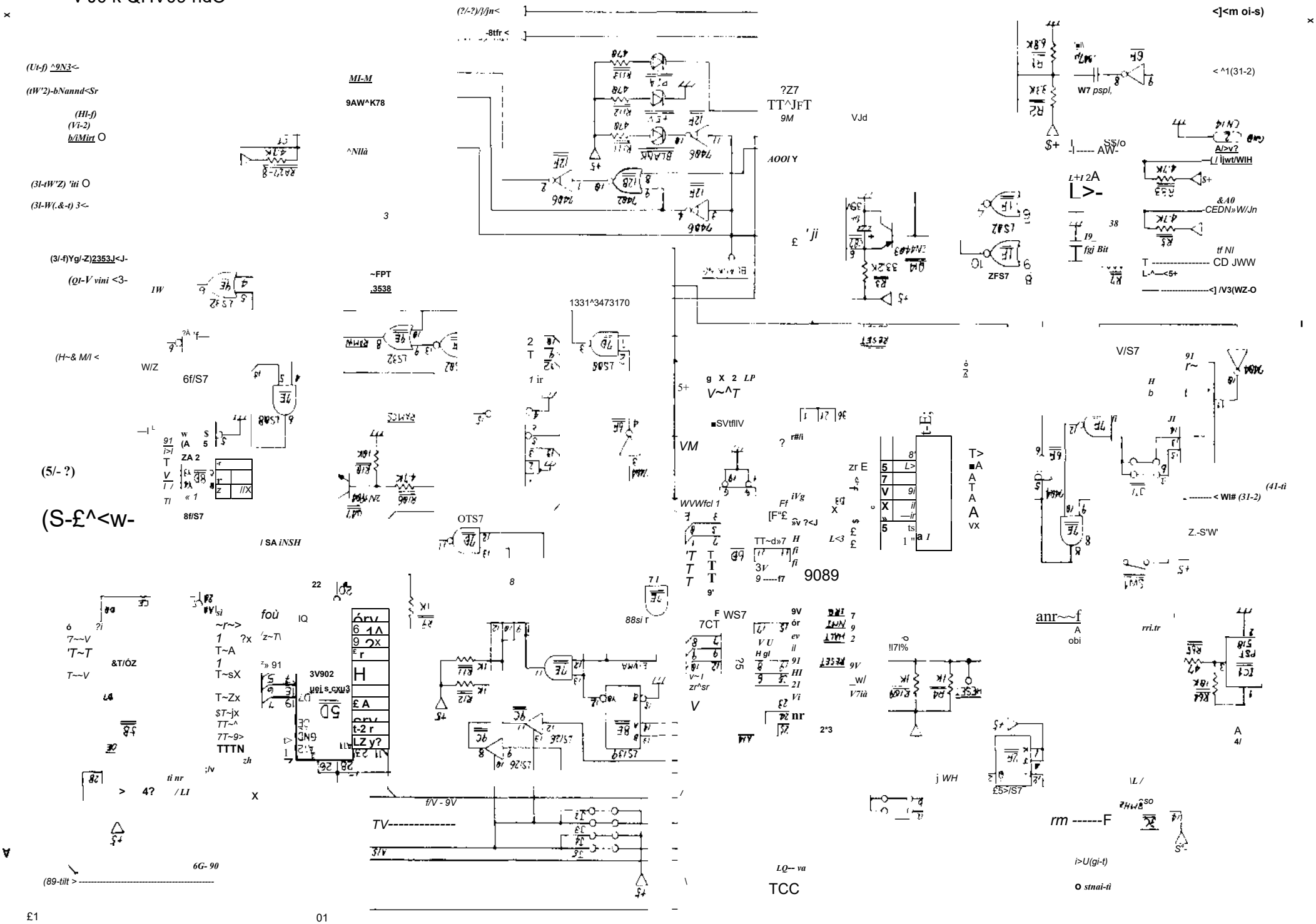
4M/F6

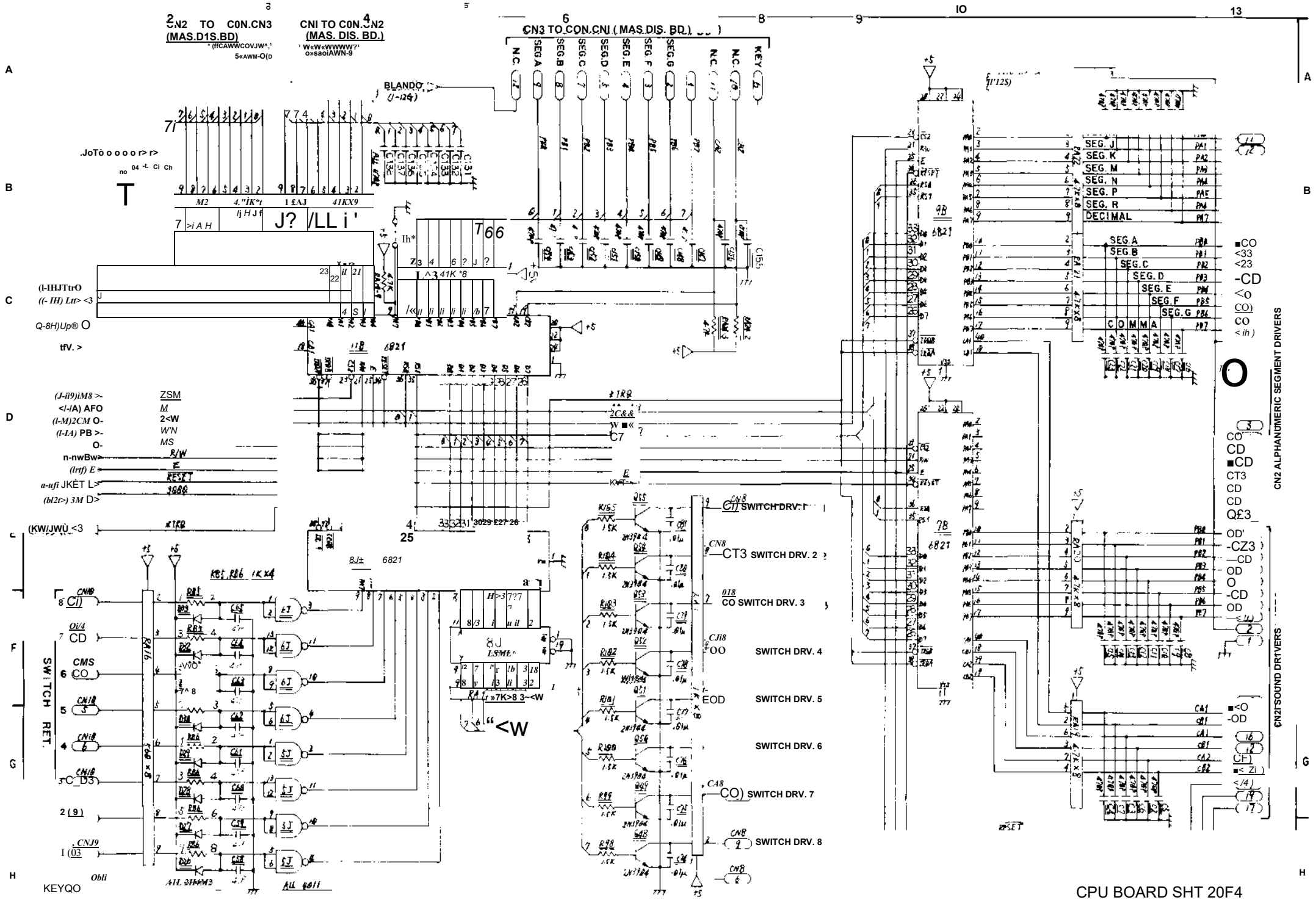




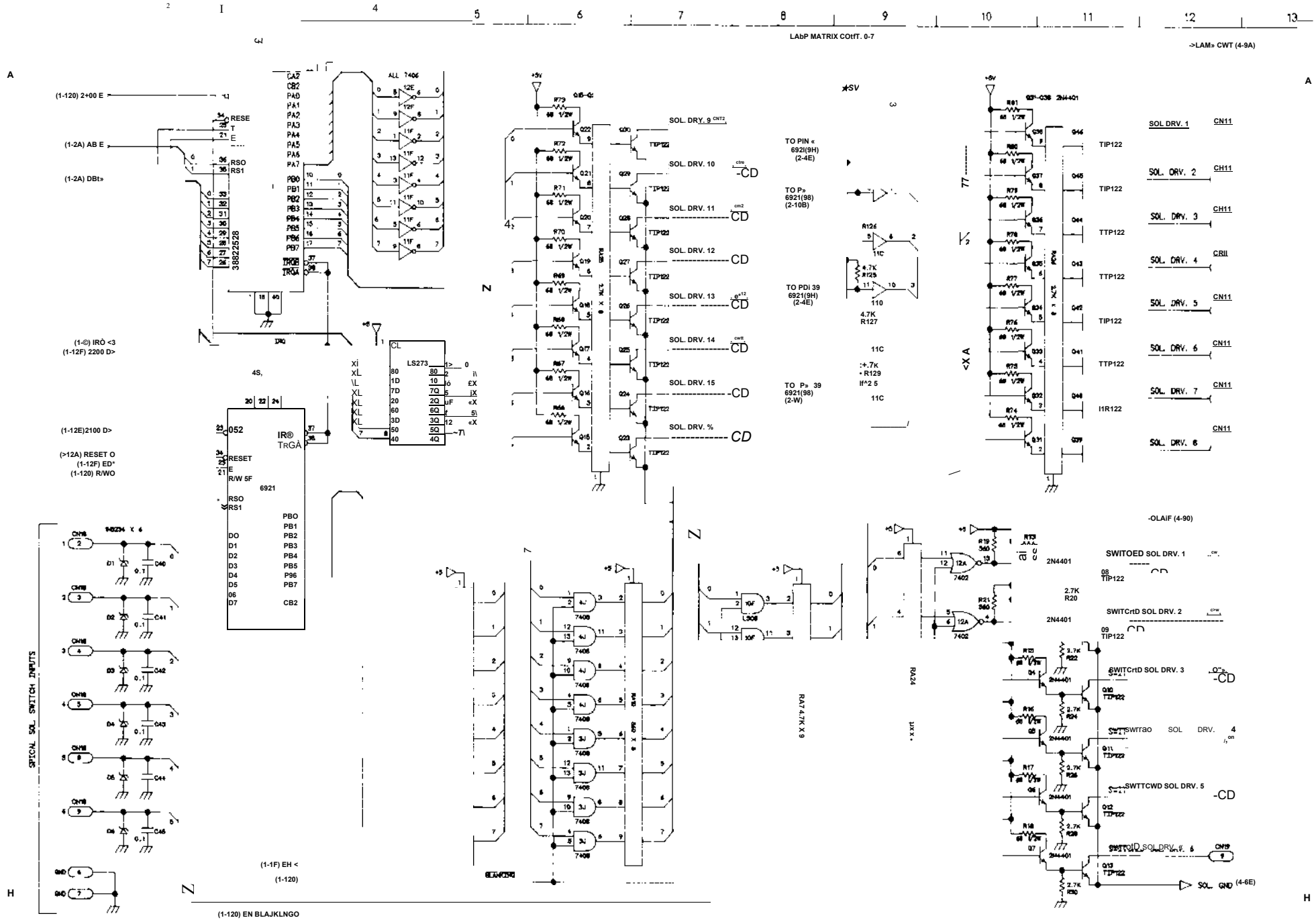
50 *CPU Board Assembly Diagram*

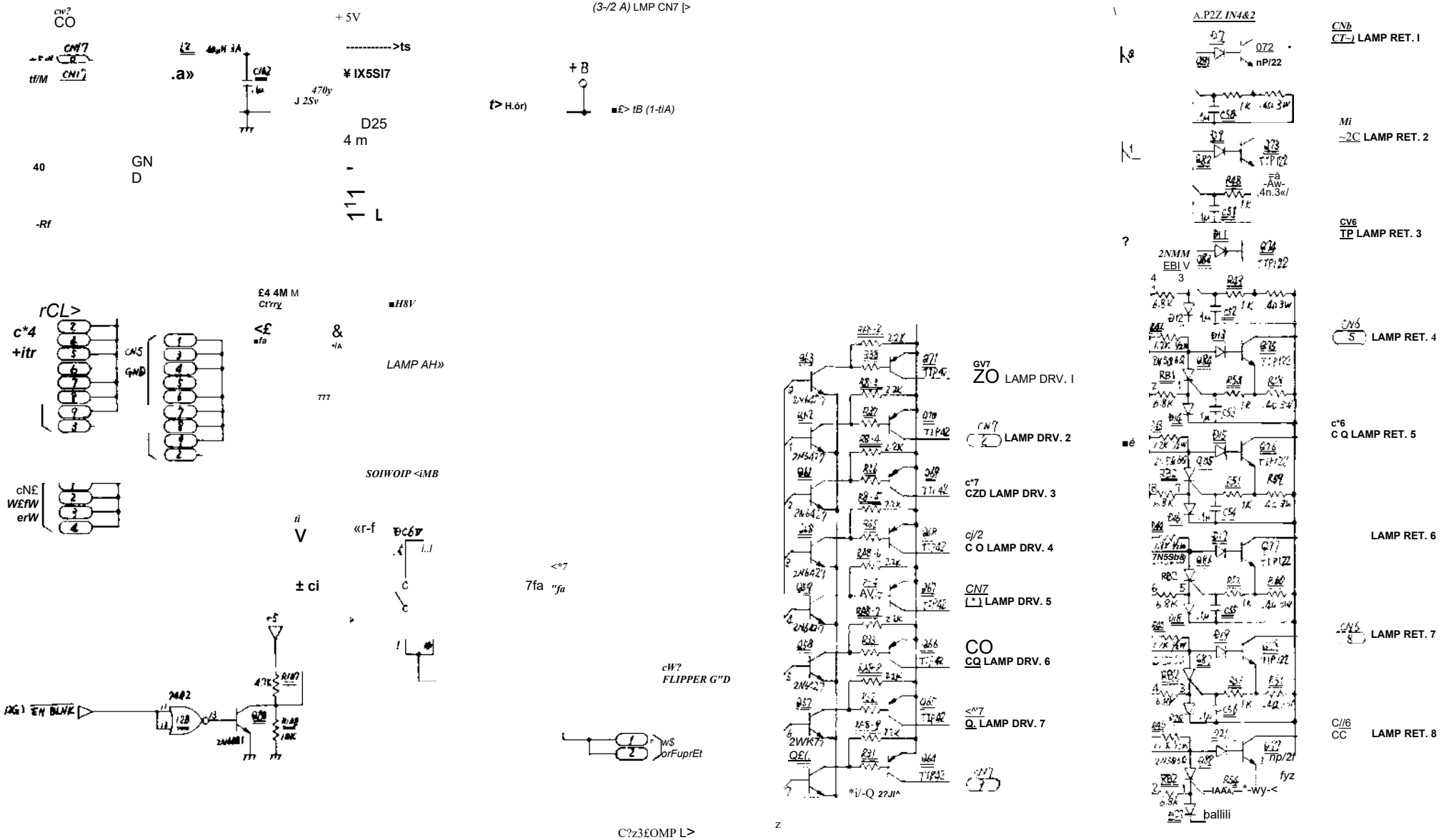
v J0 k QHV09 ndO

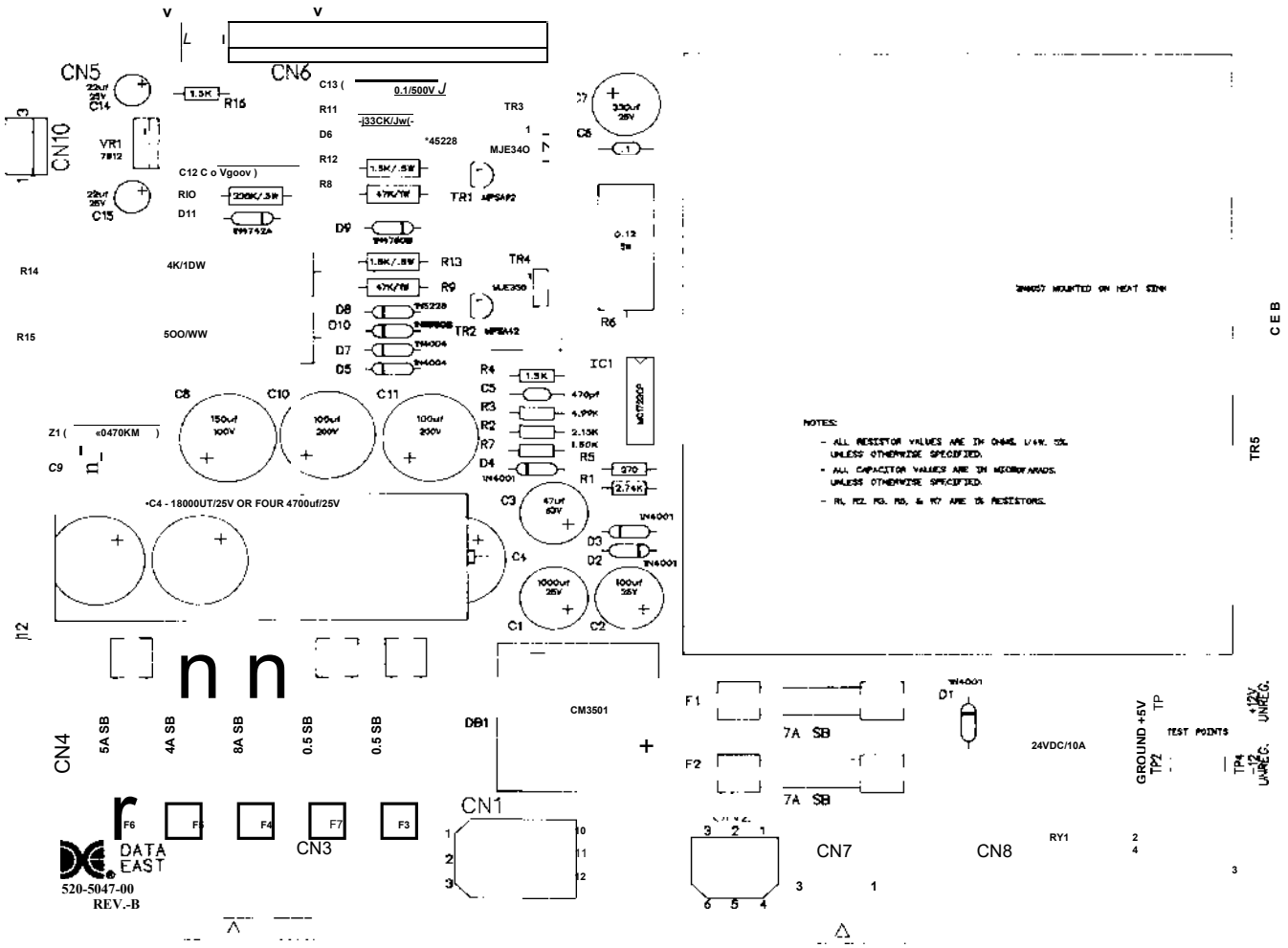


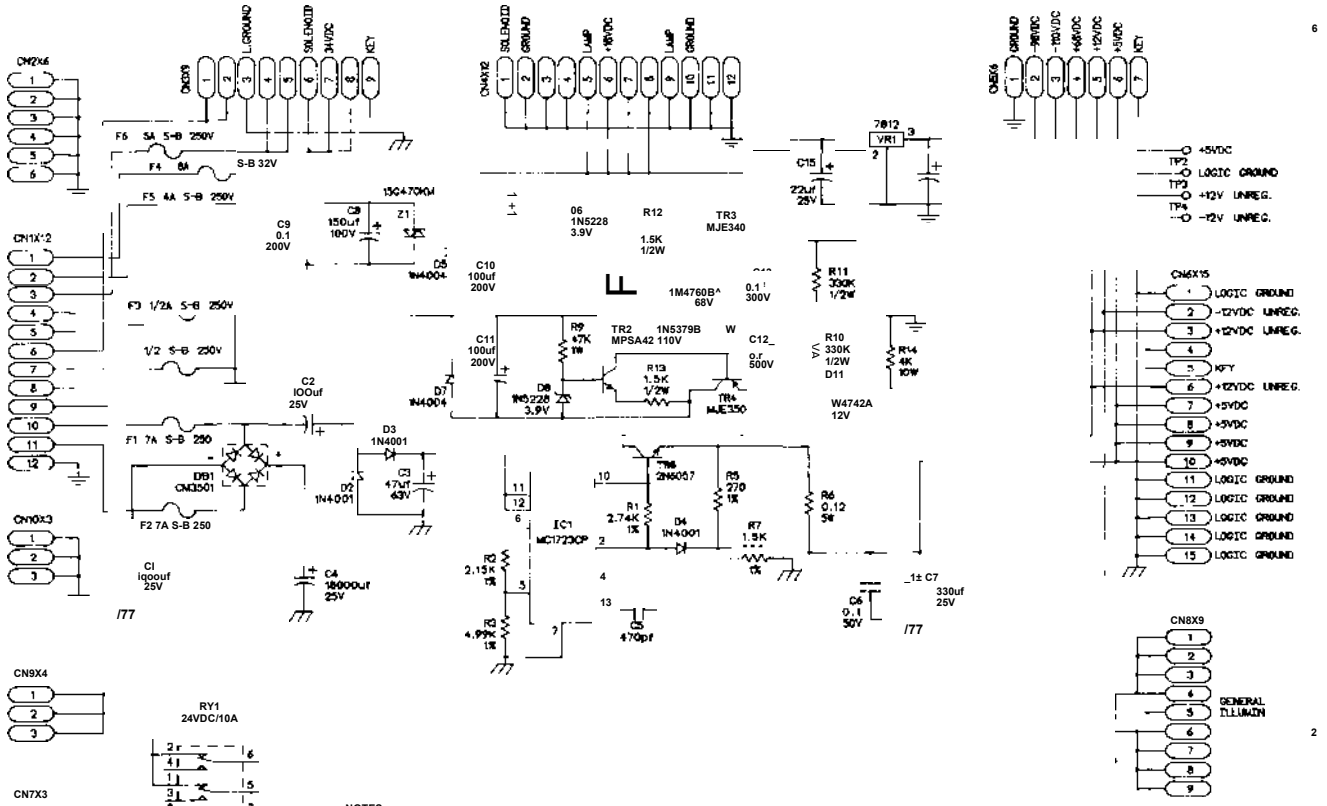


52 *CPU Board Logic Diagram (Sheet 2 of 4)*


LAbP MATRIX COtfT. 0-7
->LAM» CWT (4-9A)
(1-120) 2+00 E
(1-2A) AB E
(1-2A) DBt»
(1-©) IRÒ <3
(1-12F) 2200 D>
(1-12E)2100 D>
(>12A) RESET O
(1-12F) ED*
(1-120) R/WO
SOL. DRV. 9
SOL. DRV. 10
SOL. DRV. 11
SOL. DRV. 12
SOL. DRV. 13
SOL. DRV. 14
SOL. DRV. 15
SOL. DRV. %
TO PIN « 6921(9H) (2-4E)
TO P» 6921(98) (2-10B)
TO PDi 39 6921(9H) (2-4E)
TO P» 39 6921(98) (2-W)
SOL. DRV. 1
SOL. DRV. 2
SOL. DRV. 3
SOL. DRV. 4
SOL. DRV. 5
SOL. DRV. 6
SOL. DRV. 7
SOL. DRV. 8
TIP122
TTP122
CN11
CH11
CRII
-OLAiF (4-90)
SWITOED SOL DRV. 1
SWITCrtD SOL DRV. 2
SWITCrtD SOL DRV. 3
SWTTCWD SOL DRV. 5
SOL. GND (4-6E)
2N4401
7402
7406
CPU BOARD 3 OF 4 REV.B


+ 5V
----------->ts
¥ IX5SI7
D25
4 m
GND
-Rf
LAMP AH»
SOIWOIP <iMB
FLIPPER G"D
(3-/2 A) LMP CN7 [>
+B
■£> tB (1-tiA)
GV7
ZO LAMP DRV. I
LAMP DRV. 2
c*7
CZD LAMP DRV. 3
cj/2
C O LAMP DRV. 4
CN7
(*) LAMP DRV. 5
CO
CQ LAMP DRV. 6
Q. LAMP DRV. 7
CNb
CT~) LAMP RET. I
Mi
~2C LAMP RET. 2
CV6
TP LAMP RET. 3
LAMP RET. 4
c*6
C Q LAMP RET. 5
LAMP RET. 6
LAMP RET. 7
C//6
CC
LAMP RET. 8
ballili
C?z3£OMP L>

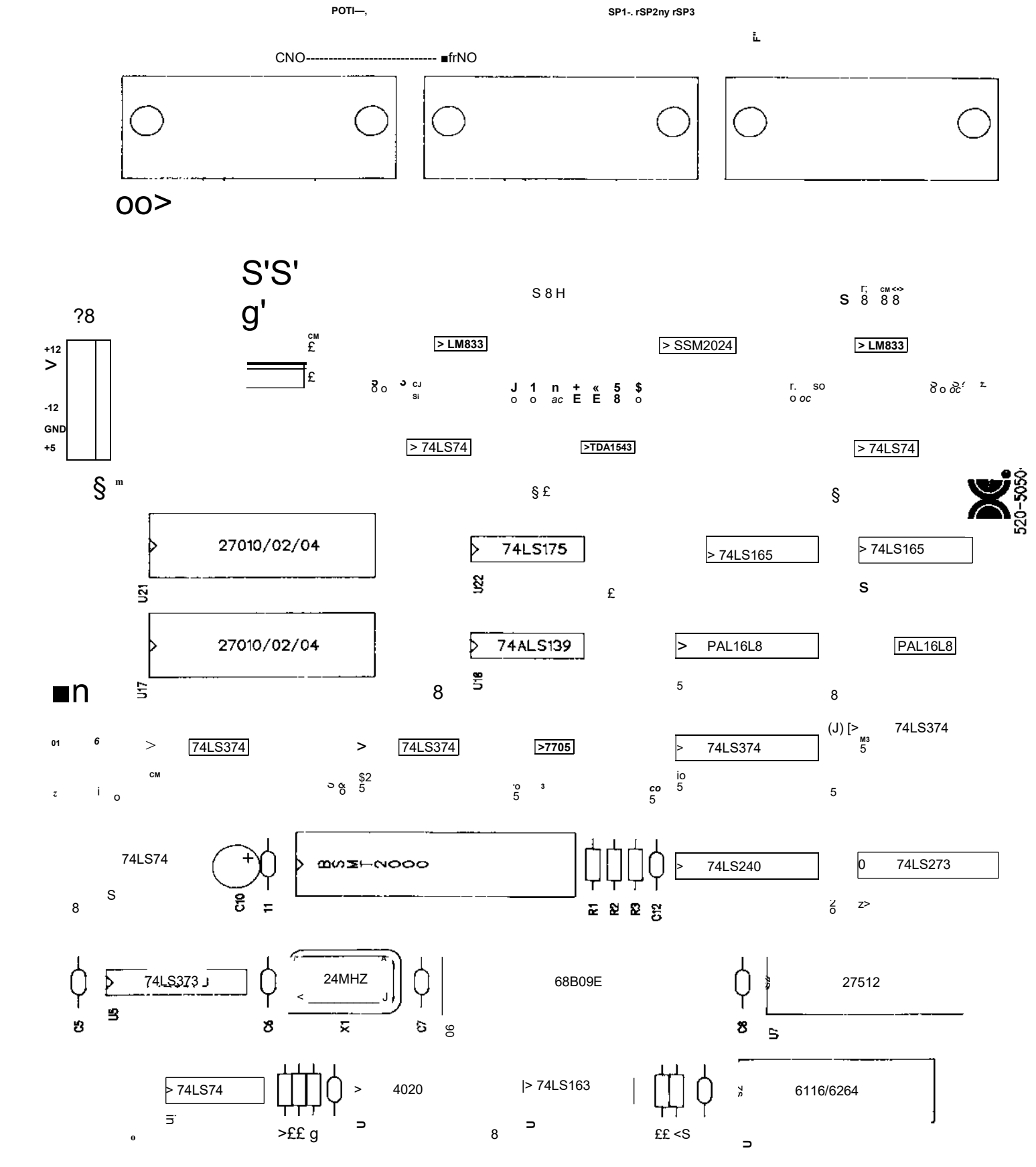


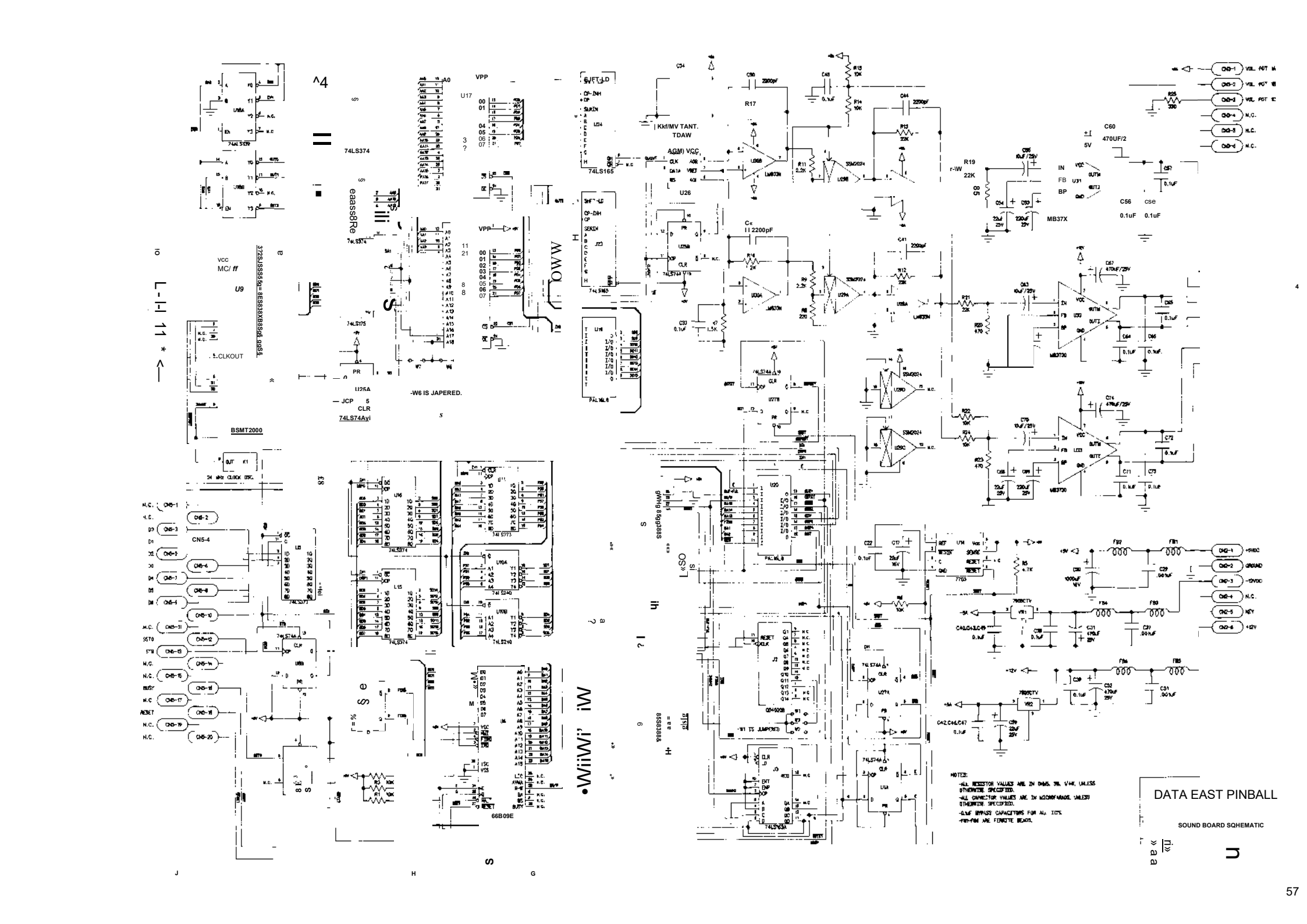


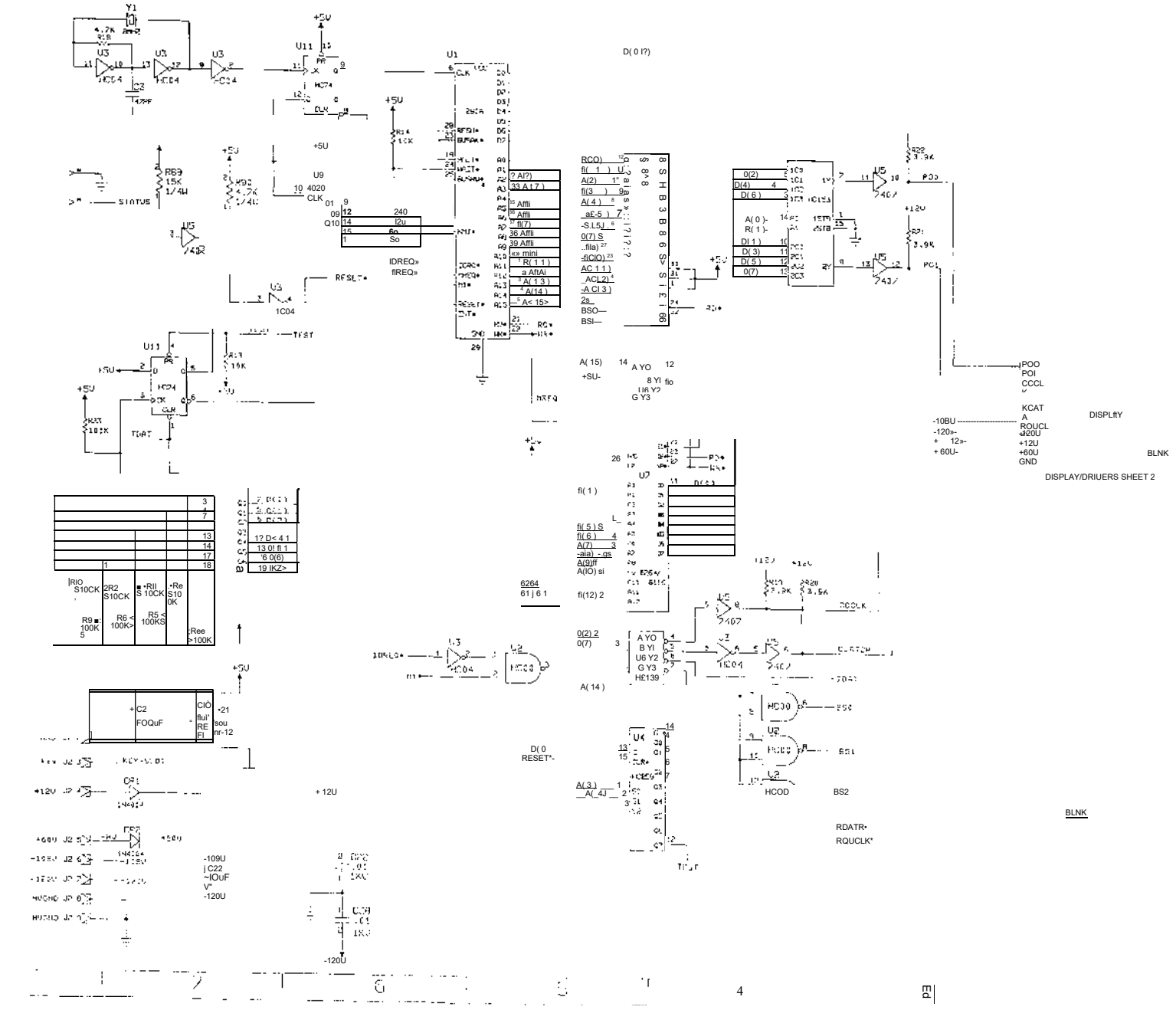
DATA EAST PINBALL

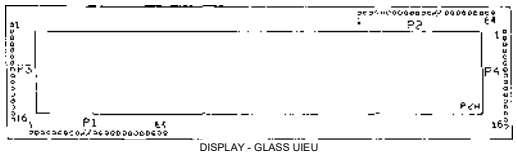
POWER SUPPLY BOARD SCHEMATIC

PfIERARED HY! CES INC.	DVO c SEZE	PART NO. 520-5047-00
		SCET 1 or 1 I MOOEL
C	B	] A

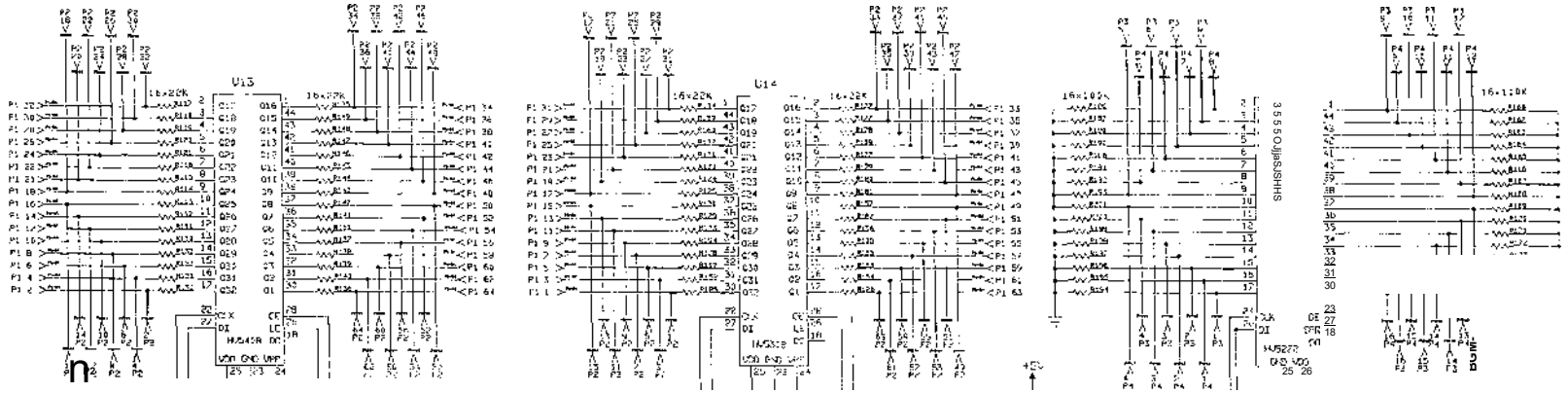

POTI—,
SP1-. rSP2ny rSP3
CNO---------- ■frNO
oo>
S'S'
g'
?8
+12
V
-12
GND
+5
> LM833
> SSM2024
> LM833
> 74LS74
>TDA1543
> 74LS74
520-5050
27010/02/04
74LS175
> 74LS165
> 74LS165
U21
U22
27010/02/04
74ALS139
> PAL16L8
PAL16L8
U17
U18
74LS374
74LS374
>7705
74LS374
74LS374
74LS74
74LS240
74LS273
C10
R1
R2
R3
C12
74LS373
24MHZ
68B09E
27512
C5
U5
C6
X1
C7
C8
U7
> 74LS74
4020
|> 74LS163
6116/6264
Sound Board Assembly Drawing


74LS374
74LS165
74LS74Ayi
BSMT2000
-W6 IS JAPERED.
-W1 IS JUMPERED
MB37X
C60
470UF/2
5V
R19
22K
R17
R18
R14
R15
R16
C56
0.1uF
0.1uF
CN5-4
CN2-1
CN2-2
CN2-3
CN2-4
CN2-5
CN2-6
+5VDC
GROUND
-12VDC
N.C.
KEY
+12V
DATA EAST PINBALL
SOUND BOARD SCHEMATIC
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 ICS.
-FBX-FBX ARE FERRITE BEADS.


DISPLAY/DRIUERS SHEET 2
BLNK
DISPLRY
HCOD
BS2
RDATR•
RQUCLK•
BLNK
^LECTRICfiL PRODUCTS
TRDNICS DIUISION
=T DOT MATRIX DRIVER
0120-4152



DISPLAY - GLASS UIEU

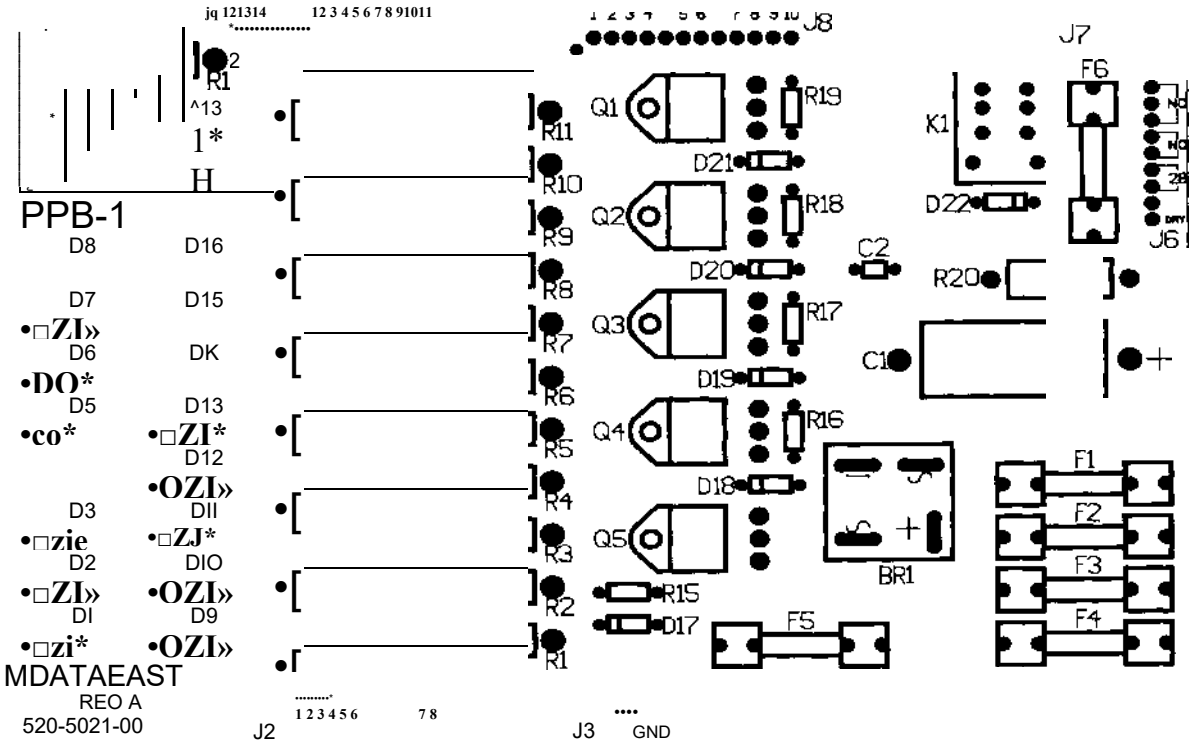


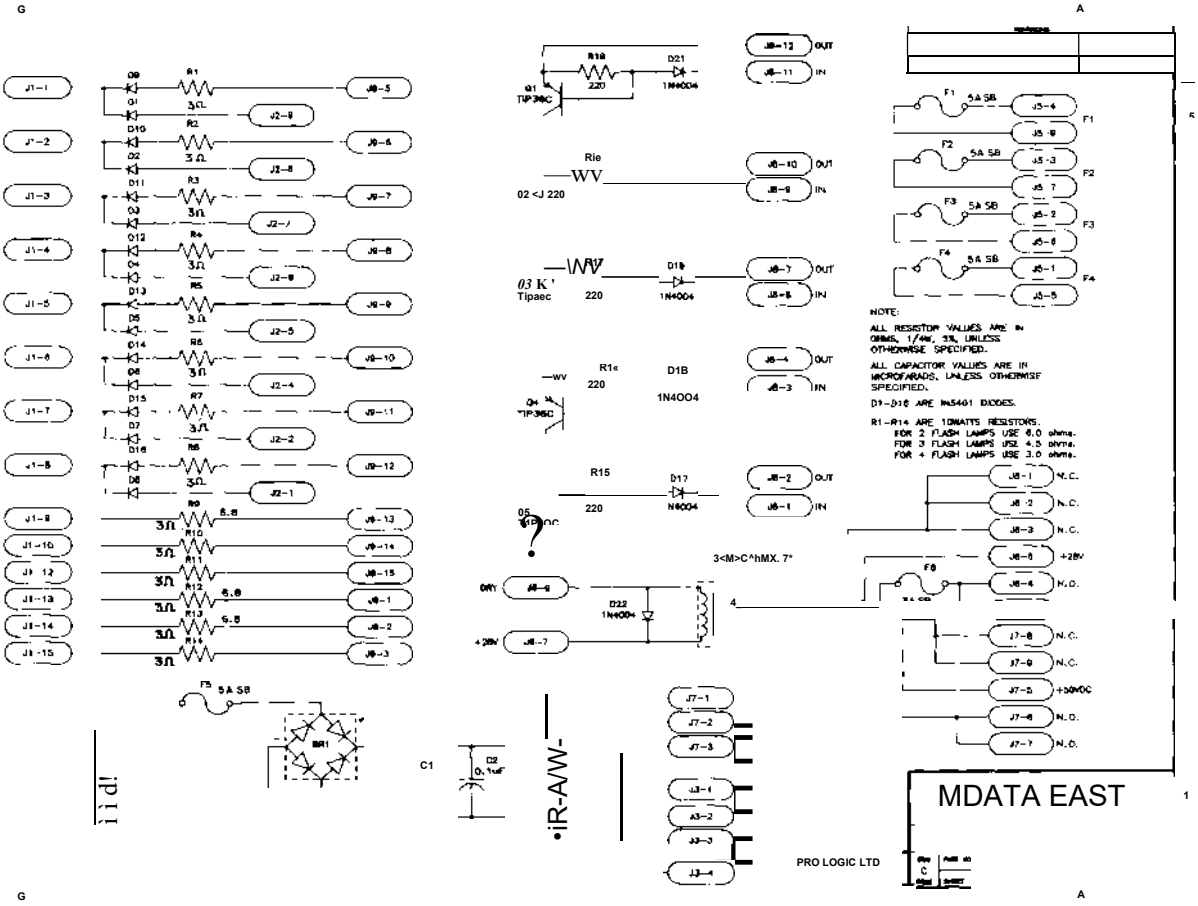
CrL-P.Y ELECTRICAL PRODUCTS
'LECTRONICS DIUISION

EfiST DOT MATRIX DISPLAY

D I : ;0120-4152

I SHEET 2 of 2 I REU. 2


PPB-1
MDATAEAST
REO A
520-5021-00
J2
J3
GND
J7
J8
F6
K1
D22
C2
R20
C1
F1
F2
F3
F4
BR1
F5
Q1
Q2
Q3
Q4
Q5
D21
D20
D19
D18
D17
R19
R18
R17
R16
R15
D8
D16
D7
D15
D6
DK
D5
D13
D12
D3
DII
D2
DIO
DI
D9
D4
D11

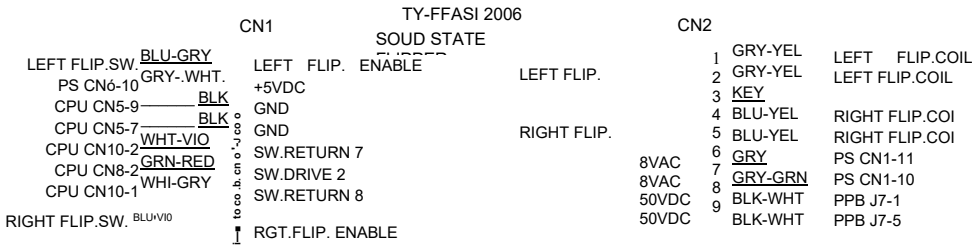

MDATA EAST
PRO LOGIC LTD
NOTE:
ALL RESISTOR VALUES ARE IN OHMS, 1/4W, 5%, UNLESS OTHERWISE SPECIFIED.
ALL CAPACITOR VALUES ARE IN MICROFARADS, UNLESS OTHERWISE SPECIFIED.
D1-D16 ARE IN5401 DIODES.
R1-R14 ARE 10WATTS RESISTORS.
FOR 2 FLASH LAMPS USE 6.0 ohms.
FOR 3 FLASH LAMPS USE 4.5 ohms.
FOR 4 FLASH LAMPS USE 3.0 ohms.

Theory of Operation
for thè Solid State Flippers

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

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

Thè 50V provides thè actuation power to thè flipper solenoid while thè 8V provides thè holding power.



Solid Stale Flippers
PCB Wiring Diagram

Connector CN 1

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

Connector CN 2

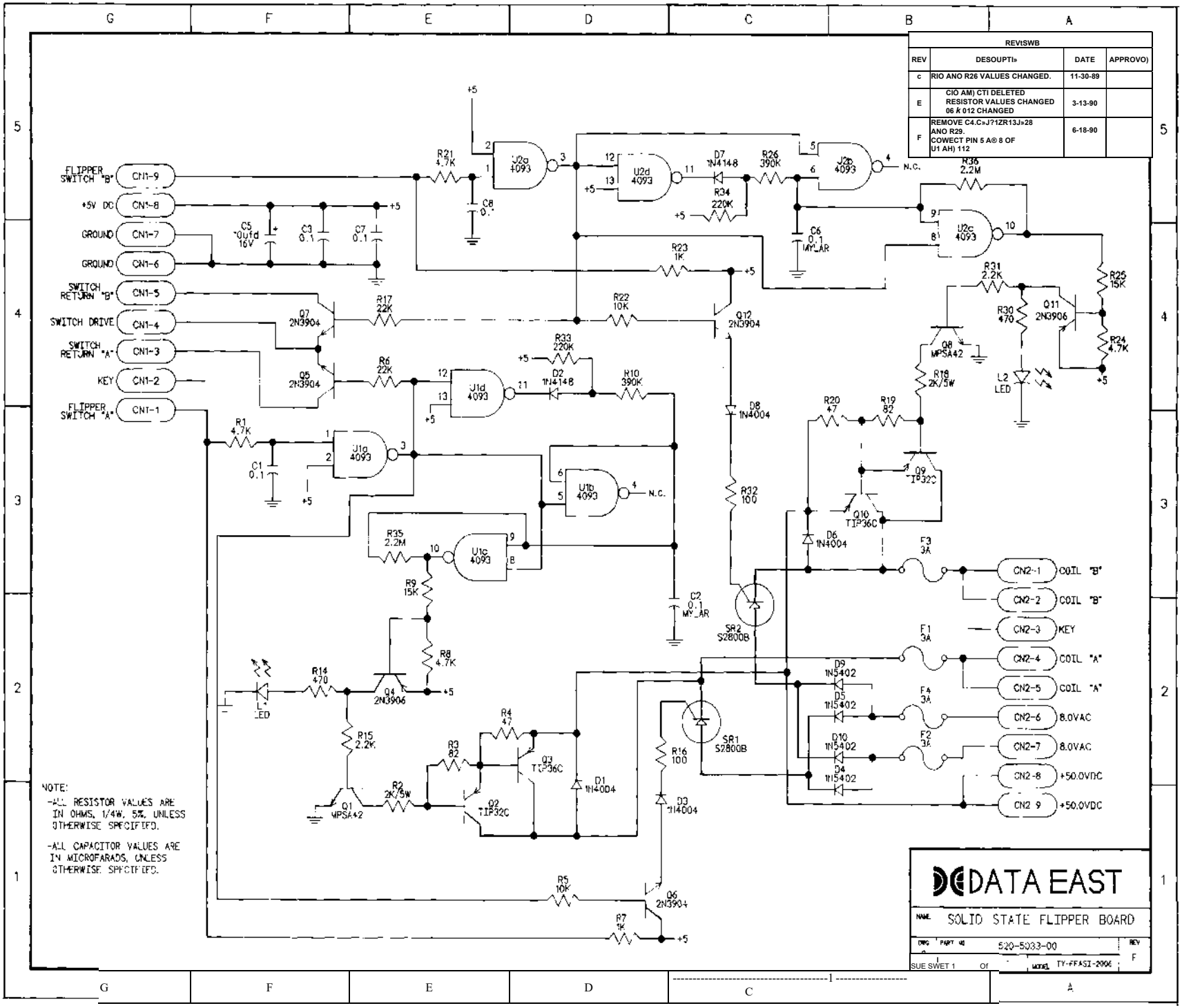
Pin f	Goes To	Wire Color	It IS
1	Lft. Flip Coil	GRY-YEL	LFT. FLIP POWER
2			
3			KEY
4	Rgt. Flip Coil	BLU-YEL	RGT. FLIP POWER
5			
6	PS CN1-11	GRY	9 VAC
7	PS CN1-10	GRY-GRN	9 VAC
8	PPB J7-1	BLK-WHT	50 VDC
9	PPB J7-5	BLK-WHT	50 VDC

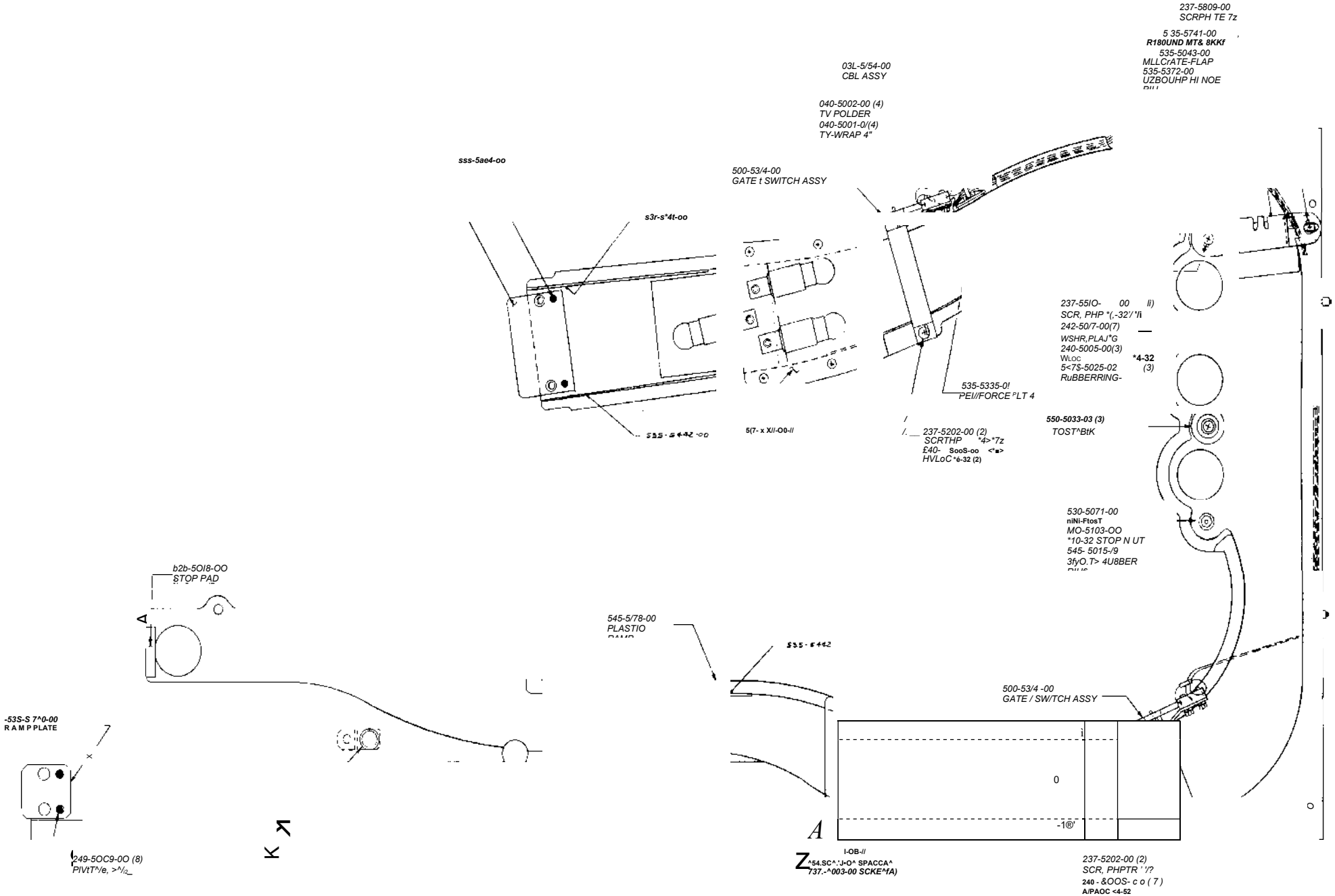
1----- SOLID STATE RS. 8D
r-J CN2-4 5 BLU-YEL
2 RIGHT
„ SFLIPPER
" ±01L

CPU BDCN19-
1

------ SOLID STATE RS. BD.
CN2-I.2 GRY-YEL
[LEFT
FLIPPER
COIL

WF


REVISWB
REV | DESOUPTI» | DATE | APPROVO)
c | RIO ANO R26 VALUES CHANGED. | 11-30-89
E | CIÓ AM) CTI DELETED RESISTOR VALUES CHANGED 06 k 012 CHANGED | 3-13-90
F | REMOVE C4.C»J?1ZR13J»28 ANO R29. COWECT PIN 5 A® 8 OF U1 AH) 112 | 6-18-90
FLIPPER SWITCH "B"
+5V DC
GROUND
GROUND
SWITCH RETURN "B"
SWITCH DRIVE
SWITCH RETURN "A"
KEY
FLIPPER SWITCH "A"
CN1-9
CN1-8
CN1-7
CN1-6
CN1-5
CN1-4
CN1-3
CN1-2
CNT-1
R21 4.7K
U2a 4093
U2d 4093
D7 1N4148
R26 390K
U2b 4093
N.C.
R34 220K
C6 0.1 MYLAR
R36 2.2M
U2c 4093
C5 *0uf d 16V
C3 0.1
C7 0.1
C8 0.
R23 1K
R31 2.2K
R25 15K
R30 470
Q11 2N3906
R24 4.7K
L2 LED
Q8 MPSA42
R18 2K/5W
R17 22K
R22 10K
Q7 2N3904
Q12 2N3904
R33 220K
Q2 1N4148
R10 390K
Q5 2N3904
R6 22K
U1d 4093
D8 1N4004
R20 47
R19 82
Q9 TIP32C
R1 4.7K
U1a 4093
C1 0.1
U1b 4093
N.C.
R32 100
Q10 TIP36C
D6 1N4004
R35 2.2M
U1c 4093
F3 3A
CN2-1 COIL "B"
CN2-2 COIL "B"
CN2-3 KEY
CN2-4 COIL "A"
CN2-5 COIL "A"
CN2-6 8.0VAC
CN2-7 8.0VAC
CN2-8 +50.0VDC
CN2 9 +50.0VDC
R9 15K
C2 0.1 MYLAR
SR2 S2800B
F1 3A
F4 3A
F2 3A
D9 1N5402
D5 1N5402
D10 1N5402
D4 1N5402
R8 4.7K
R14 470
Q4 2N3906
LED
R4 47
R15 2.2K
R3 82
Q3 TIP36C
D1 1N4004
R2 2K/5W
Q1 MPSA42
Q2 TIP32C
SR1 S2800B
R16 100
D3 1N4004
R5 10K
Q6 2N3904
R7 1K
NOTE:
-ALL RESISTOR VALUES ARE IN OHMS, 1/4W, 5% UNLESS OTHERWISE SPECIFIED.
-ALL CAPACITOR VALUES ARE IN MICROFARADS, UNLESS OTHERWISE SPECIFIED.
DATA EAST
NAME SOLID STATE FLIPPER BOARD
DWG PART NO 520-5033-00
REV F
SUE SWET 1 Of
MODEL TY-FFASI-2006

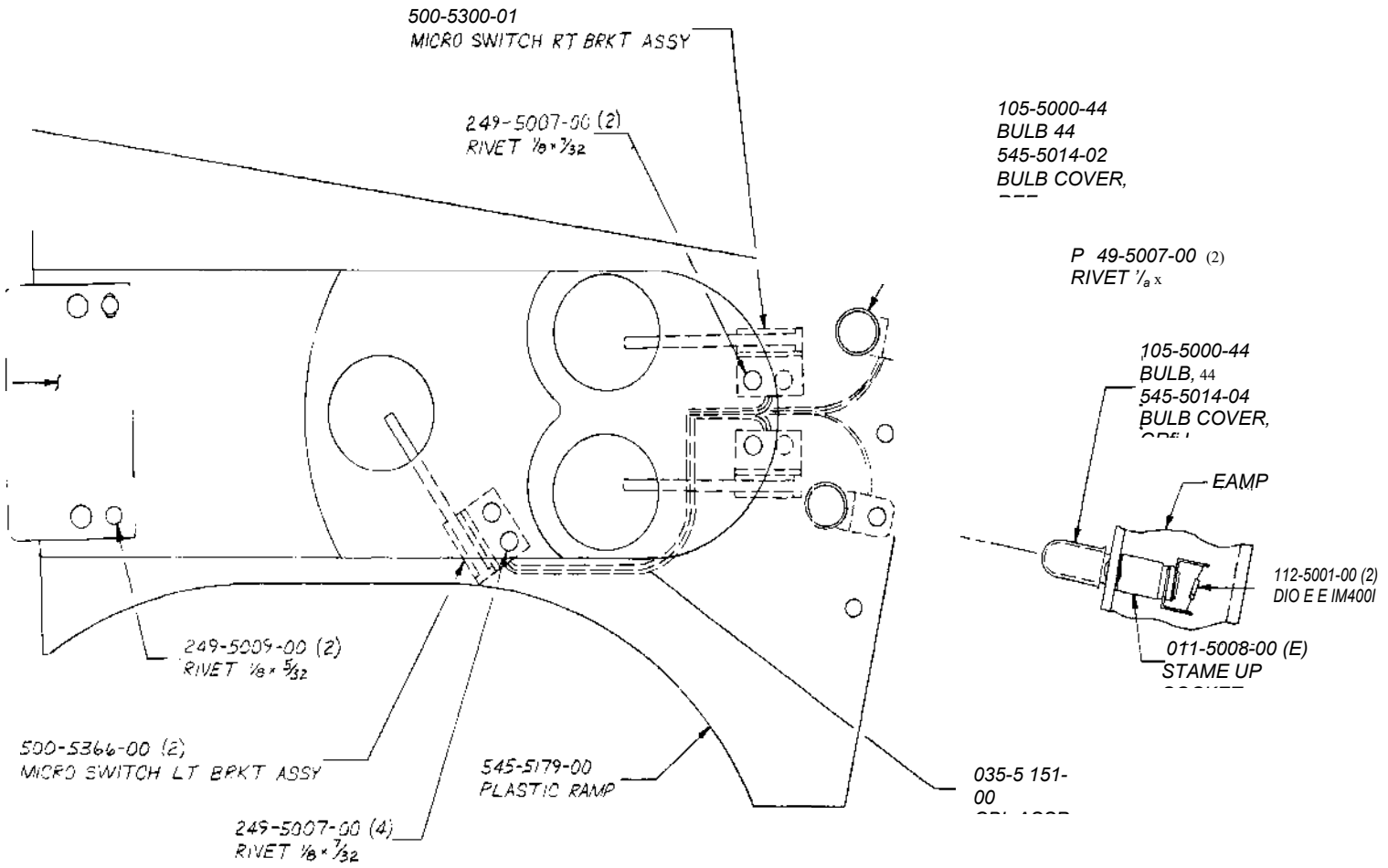


IOIERANCE UNL&S OTHERWISE «CREO

«ti f	OWK ,	"V .	TM PLASTIC RAMP ASSY
"T		KM£	
	DATA EAST PINBALL, INC. 77^		Oj)
	1990JANICEAVE .MELROSEPARK.IL 60160		JO OJ UU

8ATMAAJ

REV	DESCRIPTION	BY	DATE	APP



TOLERAwCE UNLESS OTHERWISE
DIM X X ± 05 X XXX ±005
X.XX ±.015 X.XXXX±
AHGULAR HUCTIOHAtt
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MAT.
H.T.
FIN.

DWN.
CH*KD.
9/
FULL

TITLE
JOKER RAMP ASSY

DATA EAST PINBALL, INC.
1990 JANICE AVE., MELROSE PARK. IL. 60160

PARINO.
500-5383-00

DATA EAST LIMITED WARRANTY

Data East USA, Ine., ("Seller") warrants only to thè inltlal purchaser of Its produets that thè Items llsted below are free from defeets In material and workmanshlp under normal use and servlce for thè warranty perlod speclfled:

PRINTED CIRCUIT BOARDS (GAME LOGIC) 60 DAYS

No other parts of Seller's product are warranted.

Warranty perìods are effective from thè initial date of shlpment from Seller to Its authorlzed distributore.

Seller's sole liability shall be, at Its optlon, to repalr or replace produets whlch are returned to Seller durlng thè warranty periods speclfled, provlded:

1. Seller Is notified promptly upon discovery by purchaser that stated produets are detective.

2. Such produets are properly packaged and then returned frelght prepald, to Seller's plant.

Thls warranty does not apply to any parts damaged durlng shlpment and/or due to Improper handllng, or due to improper installatlon or usage, or alteratlon. In no event shall thè Seller be liable for any anticlpated profits, loss of profits, loss of use, accidental or consequentlal damages or any other losses Incurred by thè customer in connection with thè 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 IMPUED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABIUTY OR FITNESS FOR A PARTICULAR PURPOSE.

WARNING-Thls equlpment generates, uses, and can radiate radio frequency energy, and If not Installed and used in accordance with thè instructions manual, may cause Interference to radio communlcatlons. It has been tested and found to comply with thè llmlts for a Class A computing devlce pursuant to Subpart J of Pari 15 of FCC Rules, which are designed to provide reasonable protection agalnst such Interference when operated In a commercial environment. Operation of thls equlpment In a resldential area is likely to cause Interference In whlch case thè user at hls own expense wlll be requlred to take whatever measures may be requlred to correct thè Interference.