

ROM

25A-116-E1B20 (U1)
25A-116-E2B20 (U2)

25A-116-E5B20 (U5)
25A-116-E6B20 (U6)

QUICKSILVER

1

2

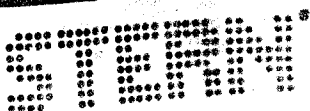


3

4



BALL IN PLAY



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I. INSTALLATION

Assemble the game as follows:

Bolt legs to cabinet. Using flat washers under bolt heads, bolt back box to cabinet. Feed cable connectors and ground braid through cable port in back box. Screw ground braid to braid in back box. Insert connectors so they are completely seated on printed circuit board assemblies.

On all games there are some items that must be checked after shipment. Making these visual inspections may avoid time consuming service work later. Minor troubles caused by abusive handling in shipment are unavoidable. Cable connectors may be loosened, switches (especially tilt switches) may go out of adjustment. Plumb bob tilt switches should always be adjusted after game is set on location and leg levelers are adjusted.

Visual inspections before plugging in line cord:

1. Check wiring of transformer to correspond to location voltage.
2. Check the transformer for any foreign material shorting across wiring lugs.
3. Check that fuses are firmly seated and making good contact.
4. Check wire on coils for proper soldering. Cold solder connections may not show up in factory inspection, but vibration in shipment may break contact.
5. Check switches for loose solder or other foreign material that may have come loose in shipment and could cause shorting of contacts.
6. Check for any wires that may have become disconnected.
7. Check that all cable connectors are completely seated on printed circuit board assemblies.
8. Check that cables are clear of all moving parts.

Check adjustment of the three (normally open) tilt switches:

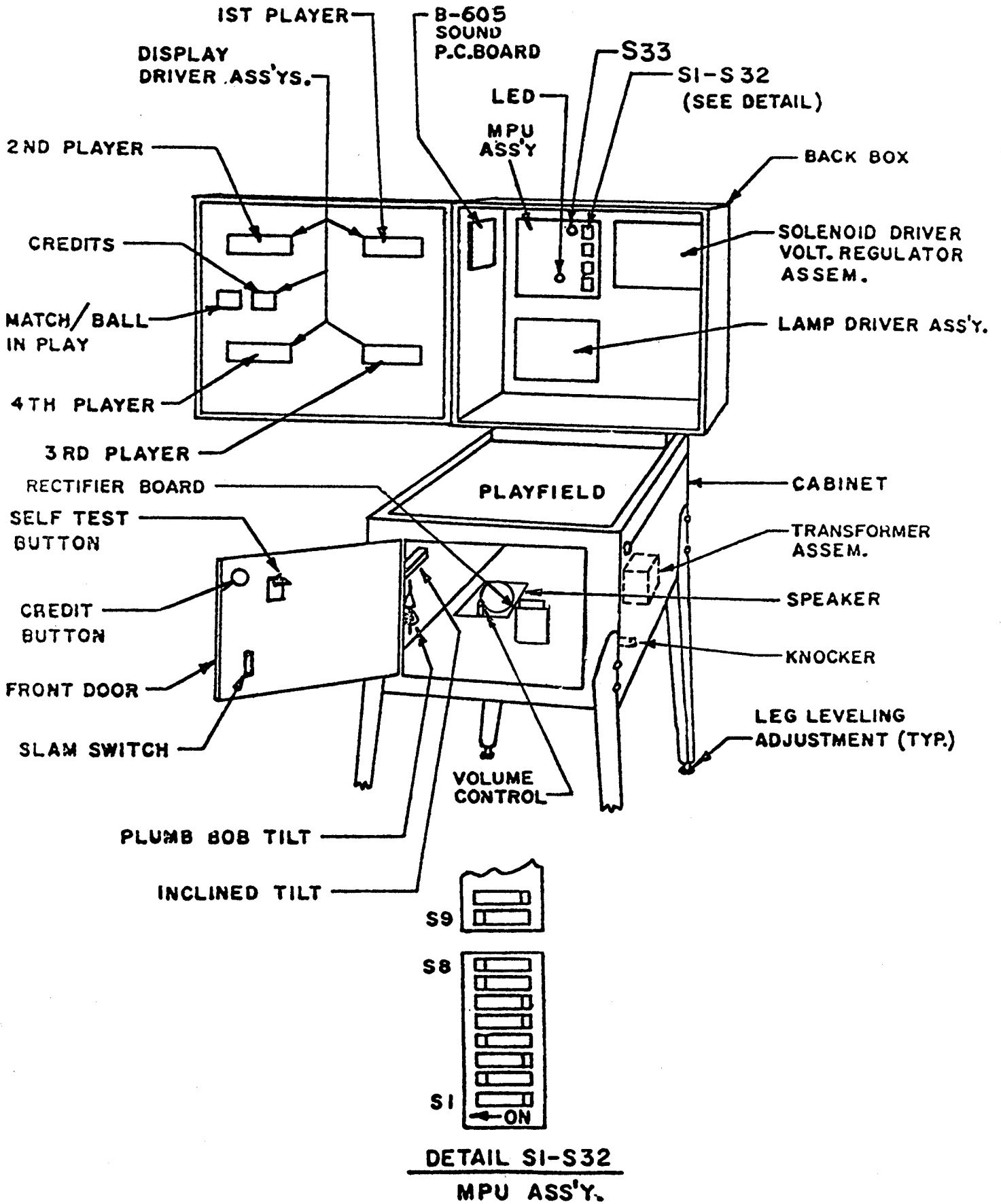
1. Plumb bob tilt on left side of cabinet near front door.
2. Ball tilt above plumb bob tilt. Insert the smaller ball (gold 15/16" dia.) into the ball tilt assembly, and adjust the bracket so the ball will roll free to contact the switch blade, if front of cabinet is raised.
3. Panel tilt on bottom of playfield panel.

NOTE

TO PROTECT SOLID STATE COMPONENTS
BEFORE TOUCHING ANY COMPONENT IN THE
BACK BOX, DISCHARGE ANY POSSIBLE STATIC
BUILD-UP BY TOUCHING ANY GROUND
CIRCUIT, e.g. SIDE ARMOR, GROUND BRAID.

ELECTRONIC PIN BALL GAME

Figure 1



II. ROUTINE MAINTENANCE ON LOCATION:

Self tests, which are programmed into the design of the game, are very helpful. As with any solid state piece of equipment the three prong grounding receptacle is an important piece part of the game, that must not be tampered with and must be used properly.

MPU MODULE SELF-TEST:

During power up, the MPU assembly tests itself, which can visibly be seen by the flashing of a LED on the board. When the game is turned on, the LED will flash once, pause, then flash six more times and go out. A tune is then played to announce game readiness. This indicates proper MPU game operating conditions.

GAME SELF-DIAGNOSTIC TESTS:

Pressing the Self-Test button inside the coin door one time activates the game into its self-diagnostic test.

1. Feature lamps: All feature lamps will flash on and off continuously, determining any burnt lamps.
2. Pressing the Self-Test button again causes each digit on all displays to cycle from 0 thru 9, and repeat continuously.
3. Pressing the Self-Test button again causes each solenoid to be energized, one at a time, in a continuous sequence. Holding both flipper buttons "in" during this test will cause the flipper coils to be energized. The number appearing on the Player Score displays is the same as the number assigned to the solenoid. The sound of a solenoid pulling-in as a number appears indicates proper operation. The absence of a sound shows a fault. If sound is absent, see Solenoid I.D. page in game book for help in Solenoid identification.
4. Pressing the Self-Test button again causes the MPU to look at each switch assembly for stuck contacts.* If there are any stuck, the number of the first set encountered is flashed on the Player Score displays. The number remains until the fault is corrected. See Switch I.D. page in game book for help in Stuck Switch identification. Other numbers may follow if more stuck contacts are present. If there are no stuck switches, the Match/Ball in Play display flashes '0'. **DO NOT BURNISH OR FILE GOLD PLATED SWITCH CONTACTS.**
*Flipper Button Switches are not included.
5. Pressing the Self-Test button eighteen more times causes the MPU to step thru the game levels and bookkeeping functions and finally to repeat the power-up test. To by-pass these functions, turn the game off, then on. The game is now ready to play, after the MPU Self-Test.

Set the game up for play, after successful completion of the Self Diagnostic Test procedure. Exercise each roll-over, thumper-bumper, slingshot, etc., by hand until each switch assembly on the playfield has been checked for proper operation. If actuating a switch assembly results in intermittent or no response, clean contacts by gently closing them on a clean business card or piece of paper and wiping until they wipe clean. Regap, if necessary, to 1/16". Do not burnish or file Gold Plated Switch Contacts.

III. CONTACT SWITCH ADJUSTMENTS

All contact switches should be adjusted to have a gap of 1/16" in the open position, and have .010" overtravel closed. All contact switches (except for flipper button & flipper end of stroke) are plated to resist corrosion and, **SHOULD NOT BE FILED OR BURNISHED.** If contacts have dirt or dust on them, a clean piece of paper should be used to clean them, by closing the contacts and wiping gently.

FLIPPER BUTTON & FLIPPER END OF STROKE SWITCHES ONLY. Tarnish or pitted contacts can be corrected with a contact file followed by a burnishing tool. Severely pitted contacts must be replaced as an assembly.

PLAYFIELD

Stern playfields have a durable long life playing finish. Its life expectancy, as well as playing appeal can be greatly extended by periodic cleaning. Inspect and hand polish the ball with a clean cloth. A chipped ball must be replaced, as it will ruin the finish on the playfield. Do not use water in large quantities, highly caustic cleaners, abrasive cleaners or cleaning pads on the playfield surface.

IV. GENERAL GAME OPERATION

PLACE BALL INTO PLAYFIELD BY OUTHOLE:

COIN GAME. Coin should be rejected. Plug in line cord. For proper game operation grounding circuit must be used. Move power ON-OFF Toggle Switch at bottom right front corner of cabinet to "ON" position. The game will play a tune to announce game-readiness. Drop targets are reset, scores are reset to zero, alternating with the "High Game to Date", and the game is ready for play. Coin Game. The game should accept the coin and post credits* for coins accepted (Adjustable). Pressing the credit button on the door will cause the outhole kicker to move the ball to the shooter lane. The first player display will flash 00. A tune is played to announce play readiness.

One player is registered each time the credit button is pressed (one to four can play). The credits are reduced by one each time the credit button is pressed until the credits are reduced to zero. Credit button is in-operative after 4 players are registered. Shooting the ball initiates play. Thumper Bumper scores 1000 points on 3 Ball. 100 Pts. on 5 Ball. Scoring Bumpers advance Missile No. 1 & 3 when lit. Slingshots score 10 points.

When the ball enters the outhole, the bonus score is added to the player's score. The player-up and/or ball in play on the back box is advanced one position. The bonus score starts at 0 points. The outhole kicker moves the ball to the shooter lane and play is resumed. This continues until each player has played the allowable number of balls per game (adjustable). At this time the "Game Over" light becomes lit. A random "Match" number appears and the "Match" light becomes lit. If the match number is the same as the last two digits in the player's score a free game is awarded.

Extra Ball won during the course of the game is played immediately after the player's regular ball enters the outhole. The player-up and/or ball in play are not advanced for extra ball play. Bonus score is added to the player's score and the bonus is set to 0 points before the game moves the extra ball for play.

At the end of the game, a "High Game to Date" is alternately flashed with all player scores. If the "High Game to Date" is beat, this feature* can award up to 3 free games.

Tilting the game results in loss of the ball in play. The flippers, thumper-bumper, etc., go "dead". Bonus score is not added. The purpose of the tilt penalty is to discourage the player from jostling the machine in an attempt to prolong play. Game action becomes normal after the outhole kicker moves the ball to the shooter lane.

Slamming the machine results in the loss of the game. All feature lights go out and the game becomes "dead" through a built-in time delay circuit. The purpose of the time delay circuit is to discourage abuse of the machine. After the delay, the "Game Over" light lites and the game readiness tune is played. The time delay occurs anytime one of the slam switches is made to contact.

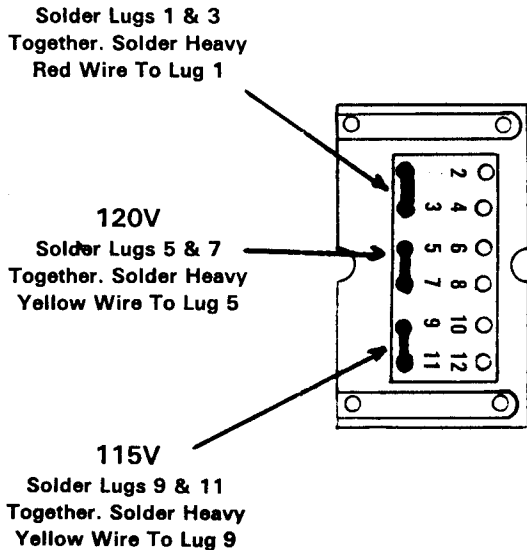
There is a slam switch on the front door, one on the tilt board and one on the playfield. (Any number of slam switches could be installed by the operator, to meet his individual requirement). The switch should be adjusted to have approximately 1/16" gap between the contacts. The weighed blade should be adjusted to attain the desired sensitivity. Decreasing gap between contacts will make the switch more sensitive. Opening the gap will reduce sensitivity.

* Some tunes and features can be disabled by operator if so desired *** See back box adjustments.****

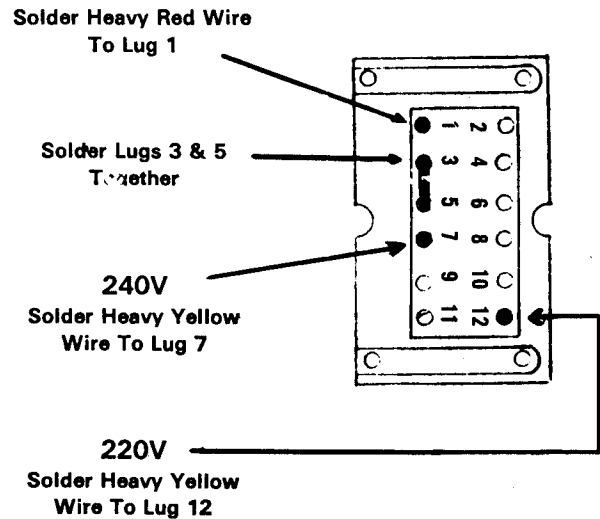
FIGURE 1

STERN 16B-3 TRANSFORMER WIRING CONNECTION INSTRUCTIONS

115/120V., 50/60 Cycle Input.
 Varistor - Soldered to Line Filter on Left Side of Cabinet
 Must Be Stern Part No. 25A-18-1.



220/240V., 50/60 Cycle Input.
 Varistor - Soldered to Line Filter on Left Side of Cabinet
 Must be Stern Part No. 25A-18-2.



II. BOOKKEEPING FUNCTIONS

The game is designed to help the operator perform certain accounting functions. The game can display the number of total plays and replays (free games)*. It can display the number of coins inserted into each coin chute. Each bookkeeping function is displayed on all player score displays simultaneously. An identification number 05 to 11 appears on the Match/Ball-in-Play window as follows:

DESCRIPTION

Current Credits	= 05 00000 to 000040
Total Plays (Played & Free Games)	= 06 00000 to 999999
Total Replays (Free Games)	= 07 00000 to 999999
Total Times "High Game to Date" is beat	= 08 00000 to 999999
Coins Dropped Thru Coin Chute 2"	= 09 00000 to 999999
Coins Dropped Thru Coin Chute 1"	= 10 00000 to 999999
Coins Dropped Thru Coin Chute #3**	= 11 00000 to 999999

The game displays the first bookkeeping entry if the Self-Test Button (See Fig. 3) on the inside of the front door is pushed and released nine times at one second intervals. The number 05 now appears in the "Match/Ball-in Play" window. Current credits appear on all player score displays. Each additional press of the button causes the next entry to be displayed.

After the data in each bookkeeping register is recorded, it can be set to zero simply by pressing switch button S33, located on the MPU module in the back box. Any or all registers can be cleared by alternating between the Self-Test button and the switch button on the MPU module. The operator is given this option as a possible convenience and can elect to use or not use it as needed.

Pressing the button once more with the eleventh entry displayed causes the game to play the power-up tune and light the Game-Over Light.

* Some tunes and feature can be disabled by operator if so desired. See Back Box Adjustments.

** If Coin Chute is not used in game, number displayed (if other than 00) on Player Score Displays has no significance.

MPU-200 JUMPER COMBINATIONS

The MPU-200 can be converted to use 25A Roms or E-Proms or any combination of Roms or E-Proms. Below are listed the jumpers needed for each memory chip.

U1
ROM Stern #25A- _____ **E-PROMS** (paper on top)
 E9 to E8 _____ E9 to E10
 E28 to E26 _____ E28 to E27

U5
ROM _____ **E-PROM**
 E19 to E20 _____ E19 to E21
 E29 to E31 _____ E29 to E30

U2
ROM _____ **E-PROM**
 E5 to E1 _____ E5 to E7
 E2 to E6 _____ E2 to E3

U6
ROM _____ **E-PROM**
 E13 to E12 _____ E13 to E14
 E25 to E22 _____ E25 to E23

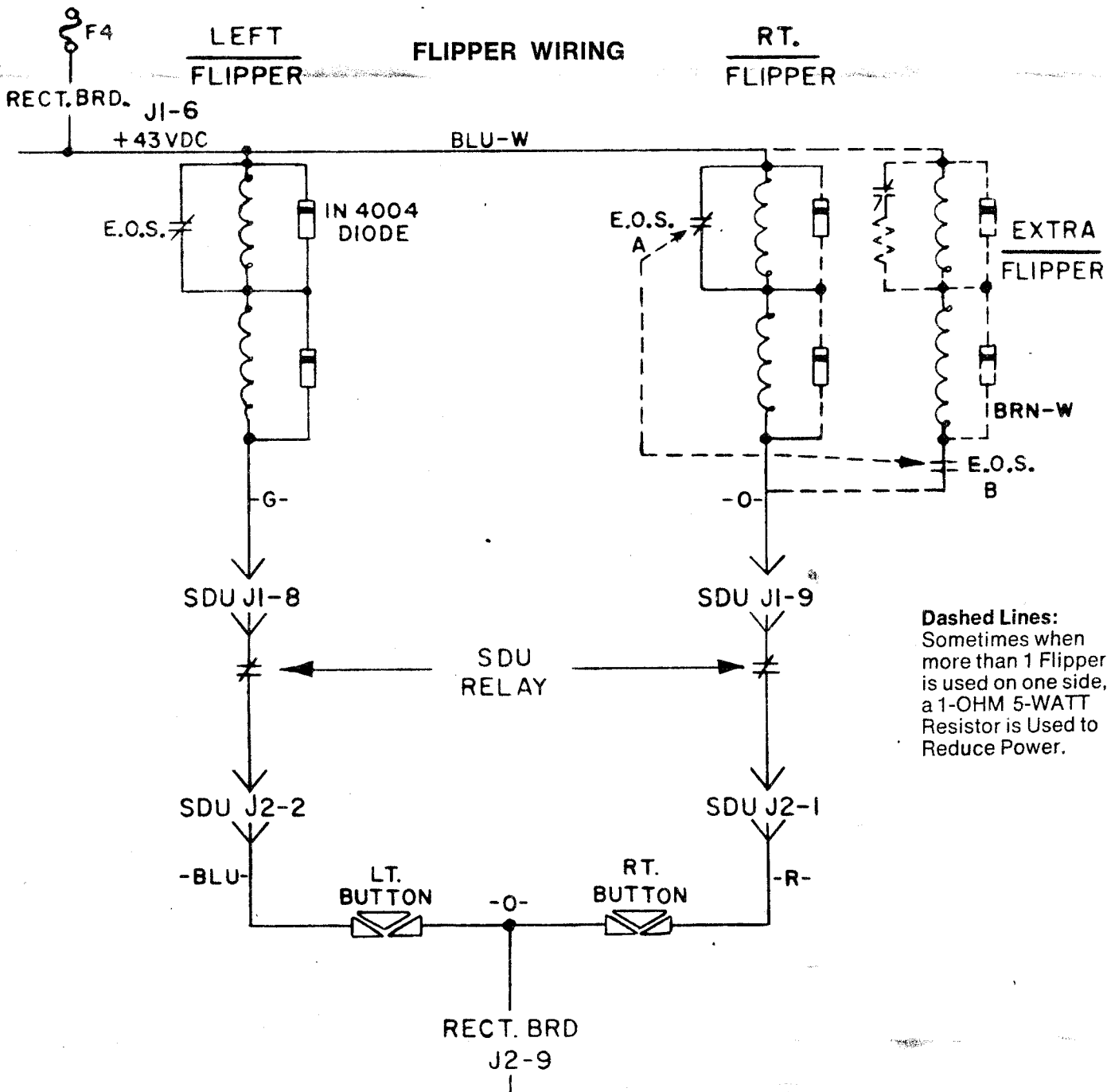
The MPU-200 can be down graded to act as a MPU-100 (Rom's Only) following are jumper modifications:

Remove - E32 - E33

Remove - E34 - E35

U2
ROM
 E5 to E7

U6
ROM
 E11 to E13



III. FRONT DOOR GAME ADJUSTMENTS:

HIGH SCORE FEATURE ADJUSTMENTS:

The game is designed to award an extra ball or a free game (option) at three score levels. (See High Score Feature in game book). The recommended levels are on the score card on the game.

Any level from 10,000 or 990,000 can be set, as desired. It is also possible to reset or turn off (00) any or all of the levels, if desired.

1. Push and release Self-Test button at one second intervals five times or until number 01 appears on the Match/Ball in Play display.
2. The number on the Player Score Displays is the first score level*. It can be increased, if desired, by holding the credit button in. To decrease the score level, reset to '00', and then hold the credit button in. Release the credit button when the desired High Score appears. Note that the level changes 10,000 points at a time. If the number '00' is left on the displays, the high score feature is eliminated for that level.
3. Repeat steps 1 and 2 for the second and third high score levels. The number '02' and '03' on the Match/Ball-in-Play display are for the second and third levels, respectively.

NOTE: Only One Extra Ball Can Be Achieved Per Ball In Play.

HIGH GAME TO DATE FEATURE:

The game is designed to award up to 3 free games (option) when "High Game to Date" is beat. **For the recommended, factory present level**, see game book.

It is recommended that the level, which will build with game play, be periodically reset to the factory recommended level to encourage game play. The adjustment procedure is the same as for the High Score Feature Adjustment, Steps 1 and 2. Continue pushing the Self-Test button until the number '04' appears on the Match/Ball-in-Play display and then do Step 2.

Any level from '00' to 990,000 can be set as described. It is to be noted that '00' does not turn off the feature, as it does on High Score feature. The feature is turned off by positioning switches to the "OFF" position.

*Can be quickly set to '00' by pressing S33 on the MPU assembly in the back box.

VII. CREDIT/COIN AND GAME ADJUSTMENTS

A. Playfield Post Adjustments:

Posts that control left and right outlane openings on playfield can be moved to make access to outlanes conservative or liberal for ball to enter. (See Fig. 3).

Conservative entry will decrease playing time and scoring.
Liberal entry will increase playing time and scoring.

B. Back Box Game Adjustments:

Each game has thirty-two switches located on the MPU module, located in the back box, that allows play to be customized to the location. (See Fig. 1). Credits per coin, maximum credits, credit display, balls (3 or 5) per game, match feature, high game feature, special award, maximum extra balls and background sound are selectable by means of switches. The switches are contained in four sixteen lead packages numbered S1-8, S9-16, S17-24, and S25-32 for easy identification. The "On" position is marked on the assembly. TURN OFF POWER BEFORE MAKING ADJUSTMENTS. MAKE ADJUSTMENTS BEFORE TURNING POWER BACK ON.

QUICK SILVER SWITCH ASSIGNMENT

				ON	OFF												
32	Special Award	<table border="1"><tr><td>NONE</td><td>X BALL</td><td>100K</td><td>REPLAY</td></tr><tr><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr><tr><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr></table>	NONE	X BALL	100K	REPLAY	OFF	ON	OFF	ON	OFF	OFF	ON	ON	32	←	←
NONE	X BALL	100K	REPLAY														
OFF	ON	OFF	ON														
OFF	OFF	ON	ON														
31	Award		31	←	←												
30	Special Replay Limit		30	1/GAME	1/BALL												
29	Quick Silver Special		29	Start Fresh	Carry Over												
28	Coin Chute #3		28	See Catalog													
27			27														
26			26														
25			25														
24	Special Lite	<table border="1"><tr><td>0</td><td>3</td><td>2</td><td>1</td></tr><tr><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr><tr><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr></table>	0	3	2	1	OFF	OFF	ON	ON	OFF	ON	OFF	ON	24	←	←
0	3	2	1														
OFF	OFF	ON	ON														
OFF	ON	OFF	ON														
23	Alternation		23	←	←												
22	Quick Extra Ball		22	YES	NO												
21	Match Feature		21	YES	NO												
20	Credit Display		20	YES	NO												
19	Maximum Credits	<table border="1"><tr><td>10</td><td>15</td><td>25</td><td>40</td></tr><tr><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr><tr><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr></table>	10	15	25	40	OFF	OFF	ON	ON	OFF	ON	OFF	ON	19	←	←
10		15	25	40													
OFF	OFF	ON	ON														
OFF	ON	OFF	ON														
18			18	←	←												
17	Quick Extra Ball Per Game		17	ONCE	OPEN END												
16	High Game To	<table border="1"><tr><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr><tr><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr></table>	0	1	2	3	OFF	OFF	ON	ON	OFF	ON	OFF	ON	16	←	←
0	1	2	3														
OFF	OFF	ON	ON														
OFF	ON	OFF	ON														
15	Date Features		15	←	←												
14	Background Sound		14	ON	OFF												
13	5 Ball - Extra Ball Flashing Lite		13	Start Over	Retain												
12	Coin Chute #2		12	See Catalog													
11			11														
10			10														
9			9														
8	Maximum Add-a-Balls		8	5	3												
7	Ball Per Game		7	5	3												
6	High Score Feature		6	Replay	X Ball												
5	Add-a-Ball (Memory)		5	3 or 5	1 Only												
4	Coin Chute #1		4	See Catalog													
3			3														
2			2														
1			1														

CREDITS/COIN ADJUSTMENTS:

The credits given are selectable by means of MPU switches. Sixteen credit ratios are available. The MPU switch settings and resultant credits/coin are as follows:

CREDITS/COIN ADJUSTMENTS SWITCHES

SWITCH No. 1 (BLU)	28	27	26	25	CREDITS	COIN
SWITCH No. 2 (BRN-WHITE)	4	3	2	1		
SWITCH No. 3 (RED-WHITE)	12	11	10	9		
OFF	OFF	OFF	OFF	OFF	1	}
OFF	OFF	OFF	ON	ON	2	
OFF	OFF	ON	OFF	OFF	3	
OFF	OFF	ON	ON	ON	4	
OFF	ON	OFF	OFF	OFF	5	
OFF	ON	OFF	ON	ON	6	
OFF	ON	ON	OFF	OFF	7	
OFF	ON	ON	ON	ON	10	
ON	OFF	OFF	OFF	OFF	14	1

	CREDITS	COINS	SEQUENCE OF CREDITS PER COIN			
			1	2	3	4
ON OFF OFF ON	1	2	0	1		
ON OFF ON OFF	3	2	1	2		
ON OFF ON ON	5	2	0	5		
ON ON OFF OFF	7	2	0	7		
ON ON OFF ON	3	4	0	1	0	2
ON ON ON OFF	5	4	1	1	1	2
ON ON ON ON	7	4	1	2	1	3

If two or three coin chutes are adjusted the same for multiple coins, credits will increase as if dropped in same chute.

Credit sequence will reset when:

- 1) credit button is pressed
- 2) any points are scored

ADD-A-BALL (MEMORY):

This adjustment can store in memory 3 or 5 "Add-A-Balls."

ADD-A-BALL (MEMORY)

1 Only
3
5

MPU SWITCHES

5	8
OFF	
ON	OFF
ON	ON

HIGH SCORE FEATURE:

The game is designed to award an Extra Ball or Free Game at one, two or three high score levels. See Front Door Game Adjustments.

AWARD
Extra Ball
Replay

MPU SWITCH 6

OFF
ON

BALL PER GAME:

NO. OF BALL PER GAME

3
5

MPU SWITCH 7

OFF
ON

5 BALL - EXTRA BALL FLASHING LITE:

With MPU SW. 7 in the "ON" position (5 balls per game), this feature will control the "Q-U-I-C-K" extra ball feature to either be retained from ball to ball or to start over for each ball.

EXTRA BALL LITE

Start Over
Retain

MPU SWITCH 13

ON
OFF

BACKGROUND SOUND:

The background sound during game play can be controlled as follows:

SOUND

OFF
ON

MPU SWITCH 14

OFF
ON

HIGH GAME TO DATE FEATURE:

The game is designed to award up to 3 free games as an option of high score to date is beat. Each time this happens, the winning score becomes the new high game score to beat. This score is displayed on all 4 player score displays at the end of each game as an incentive to play.

AWARD	MPU SWITCHES	
	16	15
Novelty	OFF	OFF
1 Free Game	OFF	ON
2 Free Games	ON	OFF
3 Free Games	ON	ON

QUICK EXTRA BALL PER GAME:

These switches determines amount of extra balls per game.

EXTRA BALL PER GAME	MPU SWITCHES	
	22	17
No Extra Ball	OFF	
One Per Game	ON	ON
Open Ended	ON	OFF

MAXIMUM CREDITS:

The maximum credits accepted by the machine limits the number of games that can be accumulated by coining, by winning replays or both. The maximum number of credits are adjustable by means of switches 18 and 19. Four credit limits are available.

MAXIMUM CREDITS	MPU SWITCHES	
	19	18
10	OFF	OFF
15	OFF	ON
25	ON	OFF
40	ON	ON

CREDIT DISPLAY:

CREDIT DISPLAY	MPU SWITCH 20
YES	ON
NO	OFF

MATCH FEATURE:

When the MATCH FEATURE is On, a random number appears in the "MATCH/BALL in Play" window and the word MATCH is illuminated. If the number matches the tens digit in player's score a free game is awarded. The MATCH feature creates an incentive to play.

MATCH	MPU SWITCH 21
ON	ON
OFF	OFF

SPECIAL LITE ALTERNATION:

The number of special lites to be lit on the playfield can be controlled as follows:

LITES	MPU SWITCHES	
	23	24
No Special Lites ON--- Feature Off	OFF	OFF
1 Lite on at a time, All three positions alternate	ON	ON
2 Lites On----Top lite on all the time, bottom two alternate.	OFF	ON
All 3 Lites stay on all the time	ON	OFF

QUICK SILVER SPECIAL:

Special award on game can be programmed to either carry over from ball to ball or to start fresh for each ball.

SPECIAL LITE	MPU SWITCH 29
Start Fresh Each Ball	ON
Carry Over	OFF

NO. OF SPECIALS:

The number of specials per game can be limited as follows:

REPLAYS	MPU SWITCH 30
1 Per Ball	OFFN
1 Per Game	ON

SPECIAL AWARD:

Award received when "Special" lite is lit.

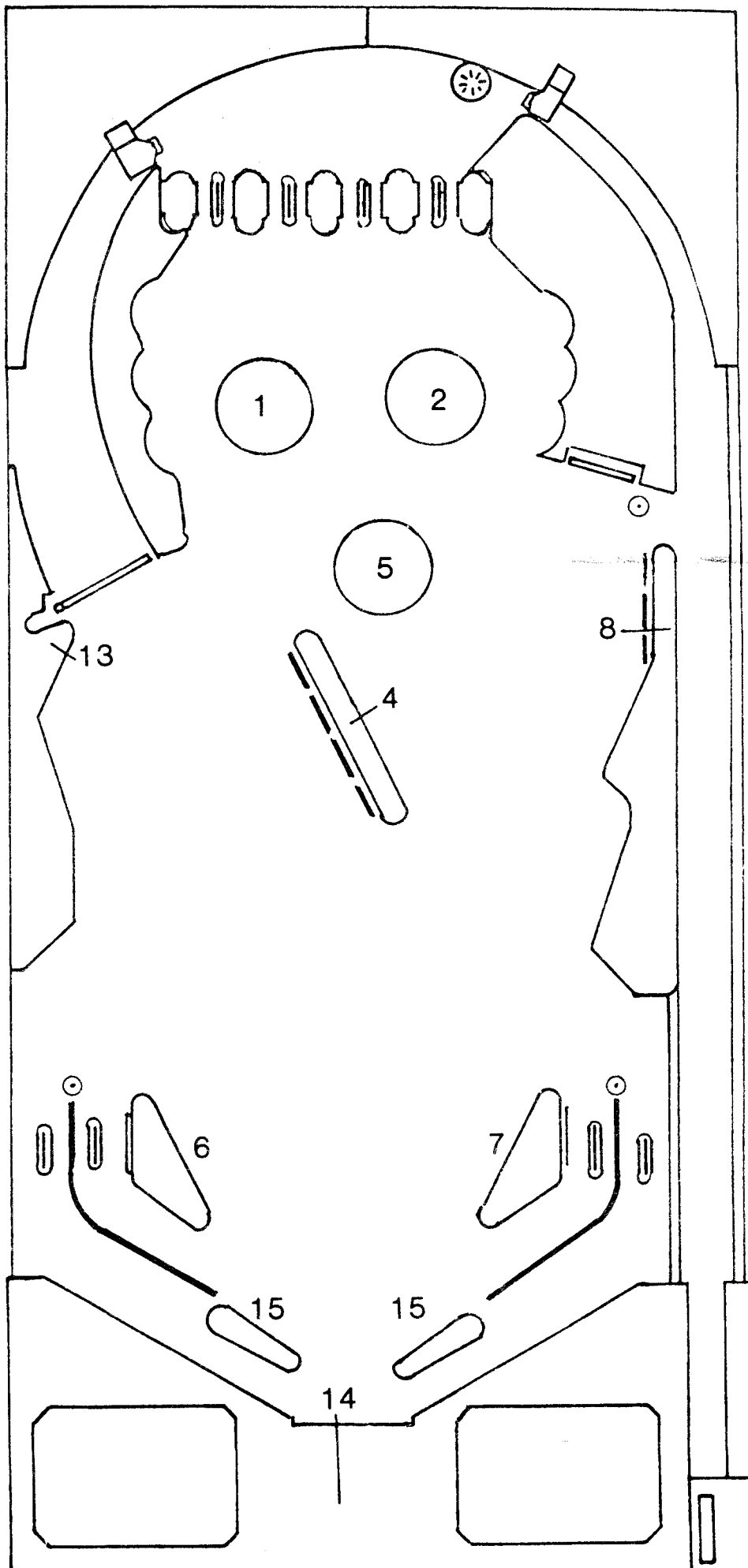
AWARD	MPU SWITCHES	
	31	32
No Award	OFF	OFF
Extra Ball	OFF	ON
100,000 Points	ON	OFF
Replay	ON	ON

QUICKSILVER SWITCH IDENTIFICATION SELF TEST DISPLAY NUMBERS

SOLENOID & SDU "Q" TRANSISTOR NO.	SOLENOID LOCATION
1	LEFT THUMPER
2	RIGHT THUMPER
3	KNOCKER
4	CENTER BANK TARGET
5	LOWER THUMPER
6	LEFT SLINGSHOT
7	RIGHT SLINGSHOT
8	RIGHT BANK TARGET
9	OPEN
10	OPEN
11	OPEN
12	OPEN
13	KICK-OUT HOLE
14	OUT-HOLE
15	FLIPPERS (2)
16	OPEN
17	OPEN
18	OPEN
19	COIN LOCK-OUT
20 THRU 29	SOUND

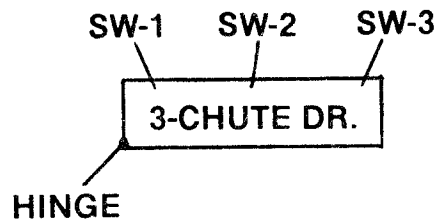
SOLENOIDS
QUICKSILVER

NOT ON PLAYFIELD
3-KNOCKER
19-LOCKOUT



QUICK SILVER SWITCH IDENTIFICATION SELF TEST DISPLAY NUMBERS

SWITCH NO.	SWITCH LOCATION	SWITCH NO.	SWITCH LOCATION
1	COIN CHUTE SEE	21	CENTER DROP TARGET (1) (HIGHEST)
2	COIN CHUTE DRWG.	22	CENTER DROP TARGET (2)
3	COIN CHUTE BELOW	23	CENTER DROP TARGET (3)
4	RIGHT SPINNER	24	CENTER DROP TARGET (4) (LOWEST)
5	LEFT SPINNER	25	RIGHT STAND-UP TARGET (TOP)
6	CREDIT	26	CENTER STAND-UP TARGET (TOP)
7	TILT	27	BOTTOM STAND-UP TARGET (TOP)
8	SLAM	28	SPECIAL ROLL-OVER SWITCH
9	RIGHT POP BUMPER	29	KICKOUT HOLE
10	LEFT POP BUMPER	30	RIGHT DROP TARGET (1) (HIGHEST)
11	BOTTOM POP BUMPER	31	RIGHT DROP TARGET (2)
12	LEFT SLINGSHOT	32	RIGHT DROP TARGET (3) (LOWEST)
13	RIGHT SLINGSHOT	33	OUTHOLE
14	BOTTOM LEFT STAND-UP TARGET	34	LEFT OUTSIDE LANE
15	CENTER LEFT STAND-UP TARGET	35	RIGHT OUTSIDE LANE
16	TOP LEFT STAND-UP TARGET	36	LEFT RETURN LANE
17	LEFT TOP ROLL-OVER LANE (Q)	37	RIGHT RETURN LANE
18	TOP ROLL-OVER LANE (U)	38	ALL 10 POINT BOUNCE SWITCH
19	TOP ROLL-OVER LANE (I)	39	10 POINT ROLL-OVER SWITCH (NO-SHF)
20	TOP RIGHT ROLL-OVER LANE (C)	40	LANE STAND-UP TARGET

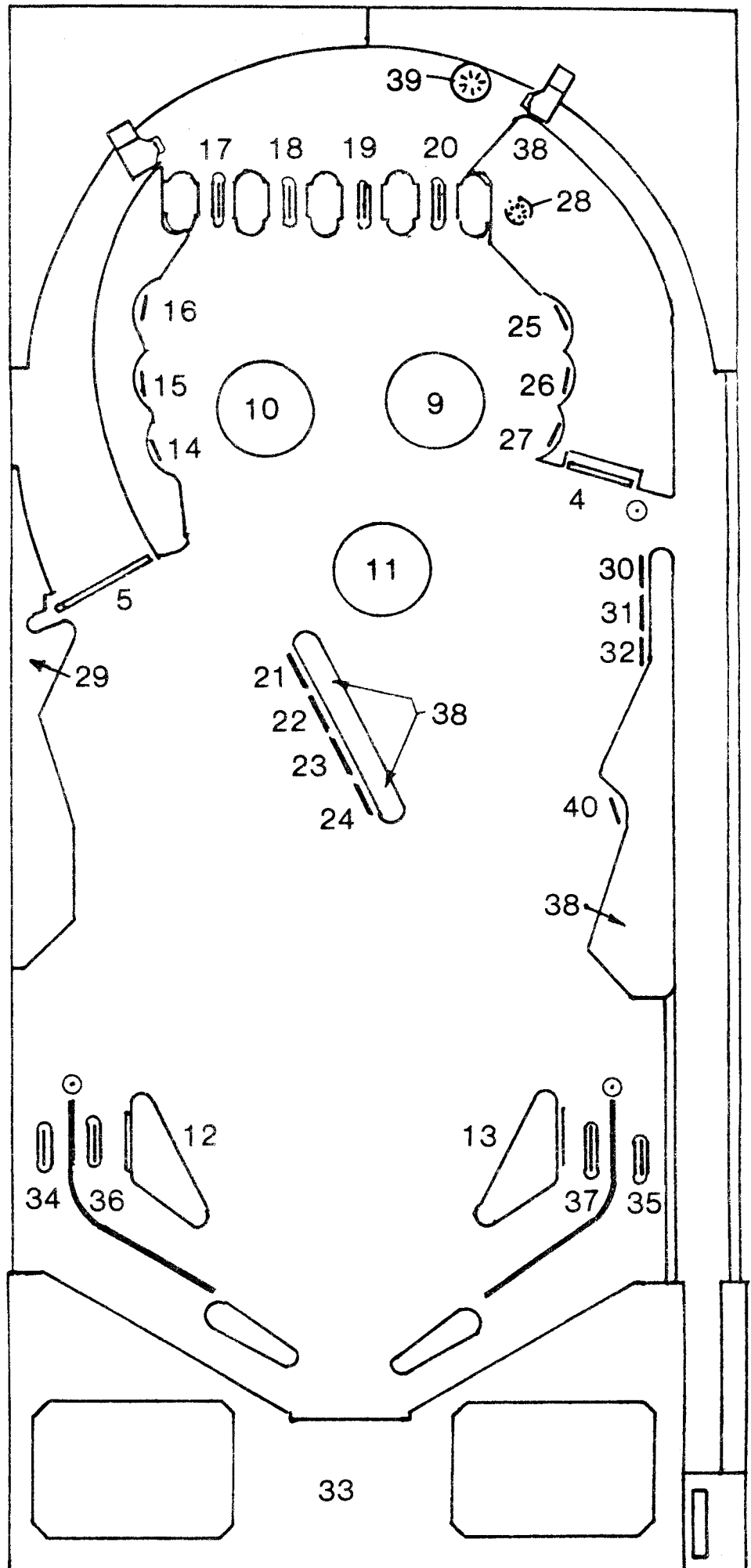


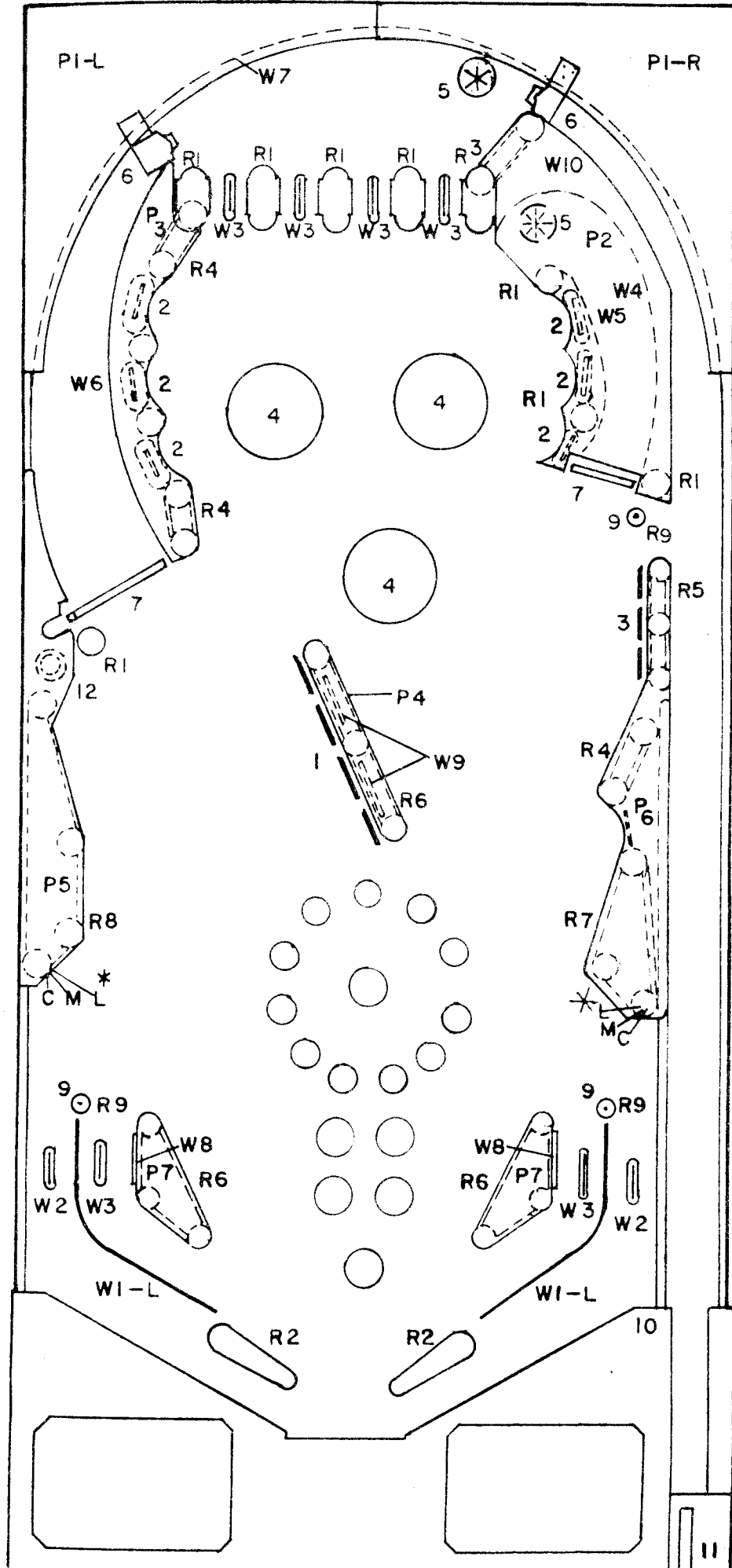
SWITCHES QUICKSILVER

SWITCHES NOT
ON PLAYFIELD

1. LEFT CHUTE*
2. CENTER CHUTE*
3. RIGHT CHUTE*
6. CREDIT BUTTON
7. ROLL TILT
7. PENDULUM
8. TILT BOARD
8. DOOR V.B.

*SEE DRWG. ON
SWITCH IDENTIFICATION
PAGE.





QUICKSILVER PLAYFIELD PARTS

RUBBER RINGS

R1-7A-120-031	R5-7A-120-200
R2-7A-121-W	R6-7A-120-300
R3-7A-120-125	R7-7A-120-225
R4-7A-120-100	R8-7A-120-350
	R9-7A-125

BALL GUIDES & ROLLOVERS

W1-6A-253-L&R	W6-6B-266
W2-A-383	W7-D-701
W3-A-149	W8-6A-101
W4-B-702	W9-6A-101-G
W5-6A-267	W10-6A-268

PLASTIC SHIELDS

TOP ARCH SET

"QUICK SILVER" SET
(P1-P7)

MISC. PARTS & ASSEMBLIES

1. 4 Bank Target D-580-4
2. Target Assembly
3. 3 Bank Target D-580-3
4. Thumper Cap
5. Rollover Cap 4B-275
6. Ball Gate Assembly L&R
7. Spin Target Assembly 14A-7-13
(Target & Wire only)
8. Flipper & Shaft Assembly A-193
9. Ball Guide Post 2A-200
10. Instruction Plate 14B-6-1
11. Shooter Gauge 14A-2-7

**POST ADJUSTMENT

C-CONSERVATIVE

L-LIBERAL

M-MEDIUM

PARTS LIST QUICK SILVER

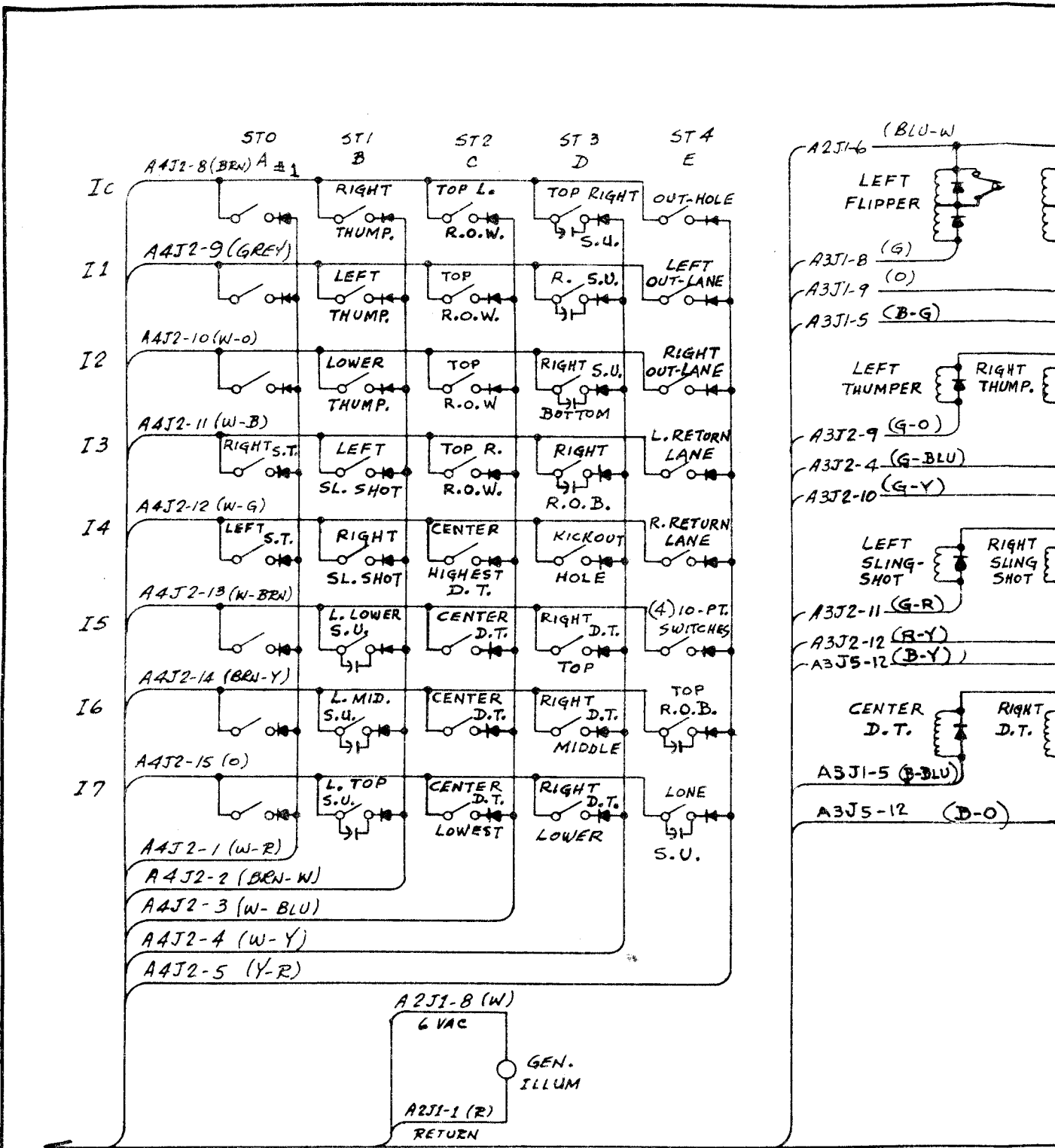
MISCELLANEOUS	PART NUMBER
TRANSFORMER (DOMESTIC OR EXPORT)	16B-6
TRANSFORMER & RECTIFIER BOARD	B-438-2
BULBS #44	8A-101
U1	25A-117-E1A8
U2	25A-117-E2A8
U5	25A-117-E5A8
U6	25A-117-E6A8

ASSEMBLY COINS	
COIN LOCKOUT	C-36-5300
DROP TARGET RESET(2)	B-27-2300
FLIPPER (2)	J-25-475/34-4500
KNOCKER	N-26-1200
OUTHOLE KICKER	JX-26-1200
THUMPER BUMPER (3)	J-26-1200
SLINGSHOT (2)	J-26-1500
EJECT HOLE	J-28-2300

MODULES	
LAMP DRIVER	B-431
DISPLAY DRIVER (4)	A-645
MATCH/BALL IN PLAY DISPLAY	A-434
SOLENOID DRIVER/VOLTAGE REGULATOR	B-432
MPU (FOR GAME CHIPS SEE MISCELLANEOUS ABOVE)	C-602
RECTIFIER BOARD	A-430
SOUND MODULE	C-605

PLAYFIELD PARTS

SEE PLAYFIELD DIAGRAM



NOTES:

N/U = NOT USED

ALL DIODES ARE IN - 4004

D.T. = DROP TARGET

S.U. = STAND-UP TARGET

R.O.B. = ROLL-OVER BUTTON

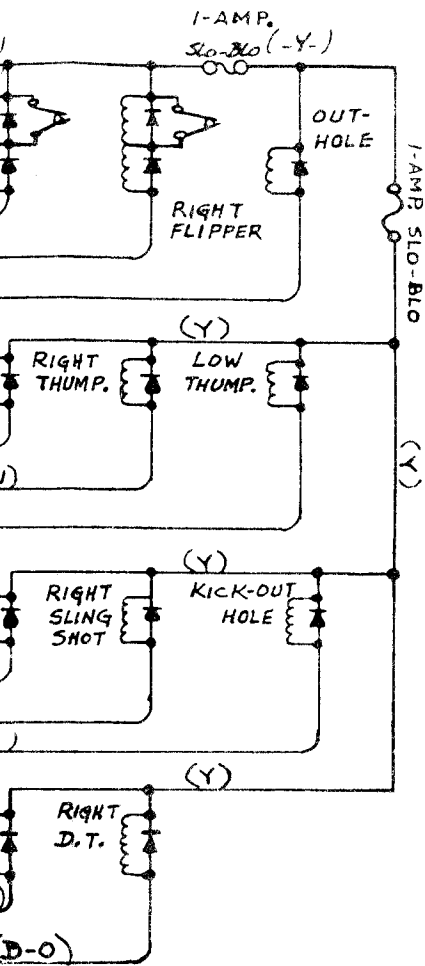
SP.T. = SPINNING TARGET

R.O.W. = ROLL-OVER WIRE FORM

PLAYFIELD

NO. 12B-432-S-117

ISSUE	CHANGE



DESCRIPTION	WIRE COLOR	JACK LDA	PIN NO.
BONUS 1,000	BRN-B	J1	18
BONUS 2,000	BLU-R	J1	1
BONUS 3,000	BLACK	J3	26
BONUS 4,000	G-R	J3	1
BONUS 5,000	GREY-G	J1	19
BONUS 6,000	GREY	J1	9
BONUS 7,000	R-Y	J3	25
BONUS 8,000	B-Y	J3	12
BONUS 9,000	PURPLE	J1	17
BONUS 10,000	G-B	J1	3
BONUS 20,000	B-R	J3	19
SUPER BONUS	W-B	J3	15
BONUS 2X	GREY-O	J1	14
BONUS 3X	PUR-W	J1	2
BONUS 4X	R-B	J3	16
BONUS 5X	W-R	J3	9
CENTER BANK TARG. 10,000	R-G	J1	3
CENTER BANK TARG. 15,000	Y-BLU	J3	17
CENTER BANK TARG. 20,000	WHITE	J3	11
FLASHING EXTRA BALL	BRN-BLU	J1	24
LEFT SPECIAL	WHITE	J2	14
LEFT SPINNER	BLU-W	J2	6
LEFT RETURN LANES	BLACK	J2	16
RIGHT RETURN LANES	O-G	J2	20
RIGHT SPINNER	YELLOW	J2	6
RIGHT SPECIAL	ORANGE	J2	15
RIGHT BANK TARG. 2X	BLACK	J1	16
RIGHT BANK TARG. 3X	Y-G	J1	7
RIGHT BANK TARG. 4X	O-W	J3	27
RIGHT BANK TARG. 5X	R-W	J3	4
RIGHT BANK TARG. 25,000	B-W	J1	28
SHOOT AGAIN	GREY-R	J1	26
S.U. TARG. (LEFT) "S"	GREEN	J3	3
S.U. TARG. (LEFT) "I"	W-GREY	J3	23
S.U. TARG. (LEFT) "L"	GREY-Y	J1	10
S.U. TARG. (RIGHT) "V"	BRN-R	J1	6
S.U. TARG. (RIGHT) "E"	W-BLU	J1	13
S.U. TARG. (RIGHT) "R"	Y-B	J3	2
TOP R.O. DIVIDERS (L TO R)	R-BLU	J3	18
TOP R.O. DIVIDERS	W-O	J3	20
TOP R.O. DIVIDERS	B-O	J1	11
TOP R.O. DIVIDERS	PUR-B	J1	25
TOP R.O. DIVIDERS (RIGHT)	GREY-B	J3	10
TOP R.O. LAMPS "Q"	B-W	J2	3
TOP R.O. LAMPS "U"	PUR-B	J2	4
TOP R.O. LAMPS "I"	W-Y	J2	12
TOP R.O. LAMPS "C"	GREY-G	J2	13
S.U. TARGET LAMPS "K"	B-Y	J2	5
TOP SPECIAL	GREEN	J2	2
5,000 CENTER DR. TARG.	BLU-W	J1	23

AYFIELD

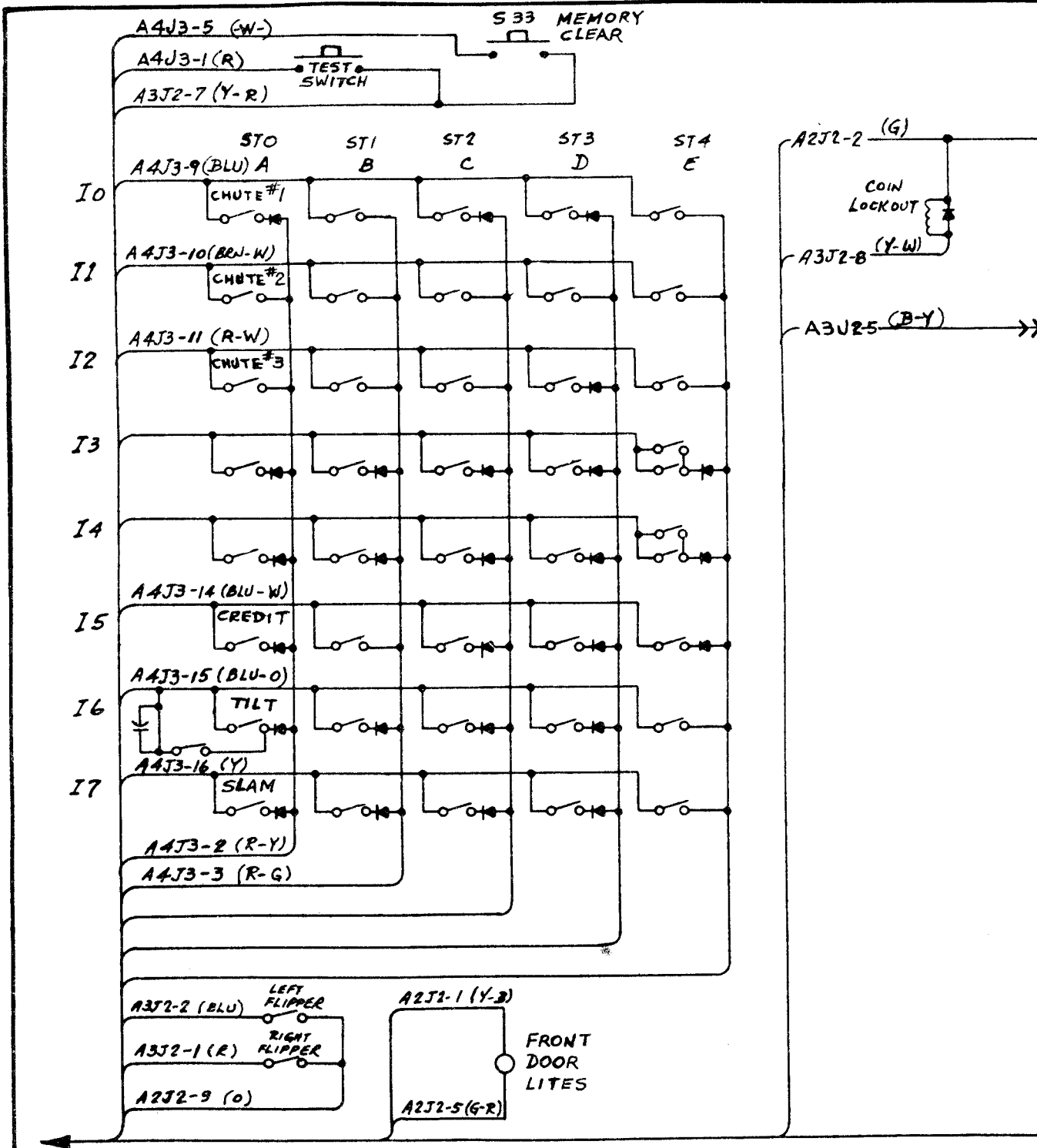
A2J5-7 (W-BLU) FEATURE LAMP BUS →

STERN ELECTRONICS INC.		
1725 DIVERSEY BLVD. CHICAGO 60614		
WIRING DIAGRAM		
FOR QUICK SILVER		
DRN. <i>EW</i>	DATE	AM'T <i>LD</i>
MAT <i>EW</i>	FIN. <i>EW</i>	APPR.

SCALE: *LD* PART MUST BE FREE OF BURRS

Unless otherwise specified, all fractional dimensions carry tolerances of plus and minus .010: All decimal dimensions plus and minus .005. Exceptions: Drilled holes plus .003 minus .001. Die casting fractional plus and minus .005: Decimal plus and minus .003. Decimal dimensions on tools plus and minus .001. Angles ± 30' unless otherwise specified.

CHANGE DATE



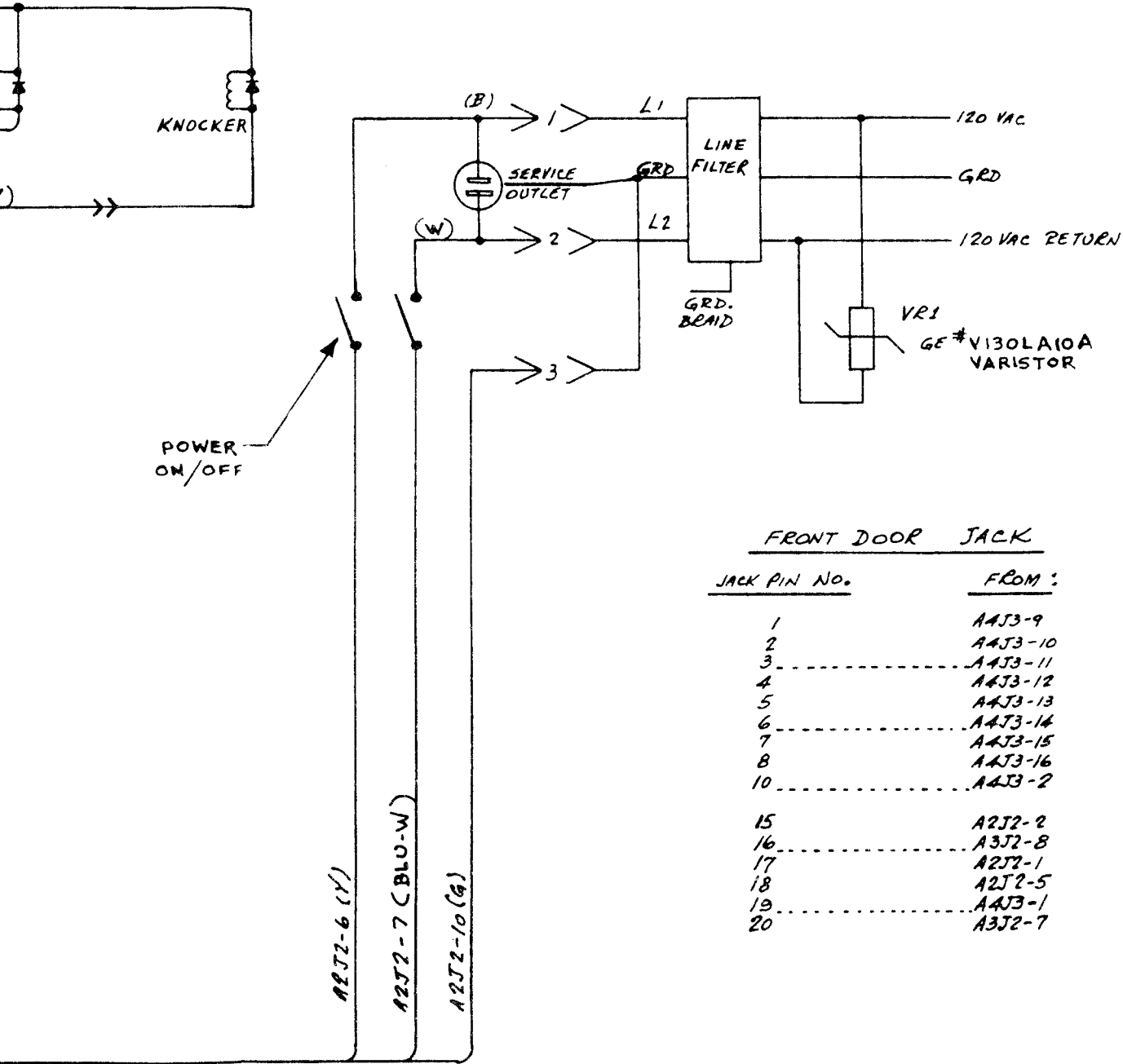
N/U = NOT USED
 ALL DIODES ARE IN-4004

12B-432-S-121

DIETZEN NO. 198M AGEPROOF

ISSUE	CHANGE

C.
 O 60614
 ATIC



FRONT DOOR JACK

JACK PIN No.	FROM :
1	A4J3-9
2	A4J3-10
3	A4J3-11
4	A4J3-12
5	A4J3-13
6	A4J3-14
7	A4J3-15
8	A4J3-16
10	A4J3-2
15	A2J2-2
16	A3J2-8
17	A2J2-1
18	A2J2-5
19	A4J3-1
20	A3J2-7

CHANGE	DATE

STERN ELECTRONICS INC.
 1725 DIVERSEY BLVD. CHICAGO 60614

CABINET AND FRONT DOOR WIRING

FOR STANDARD

DRN. C.W.	DATE 10-16-79	AMT. <i>AW</i>
MAT. <i>AW</i>	FIN. <i>CD</i>	APPR.

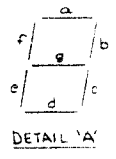
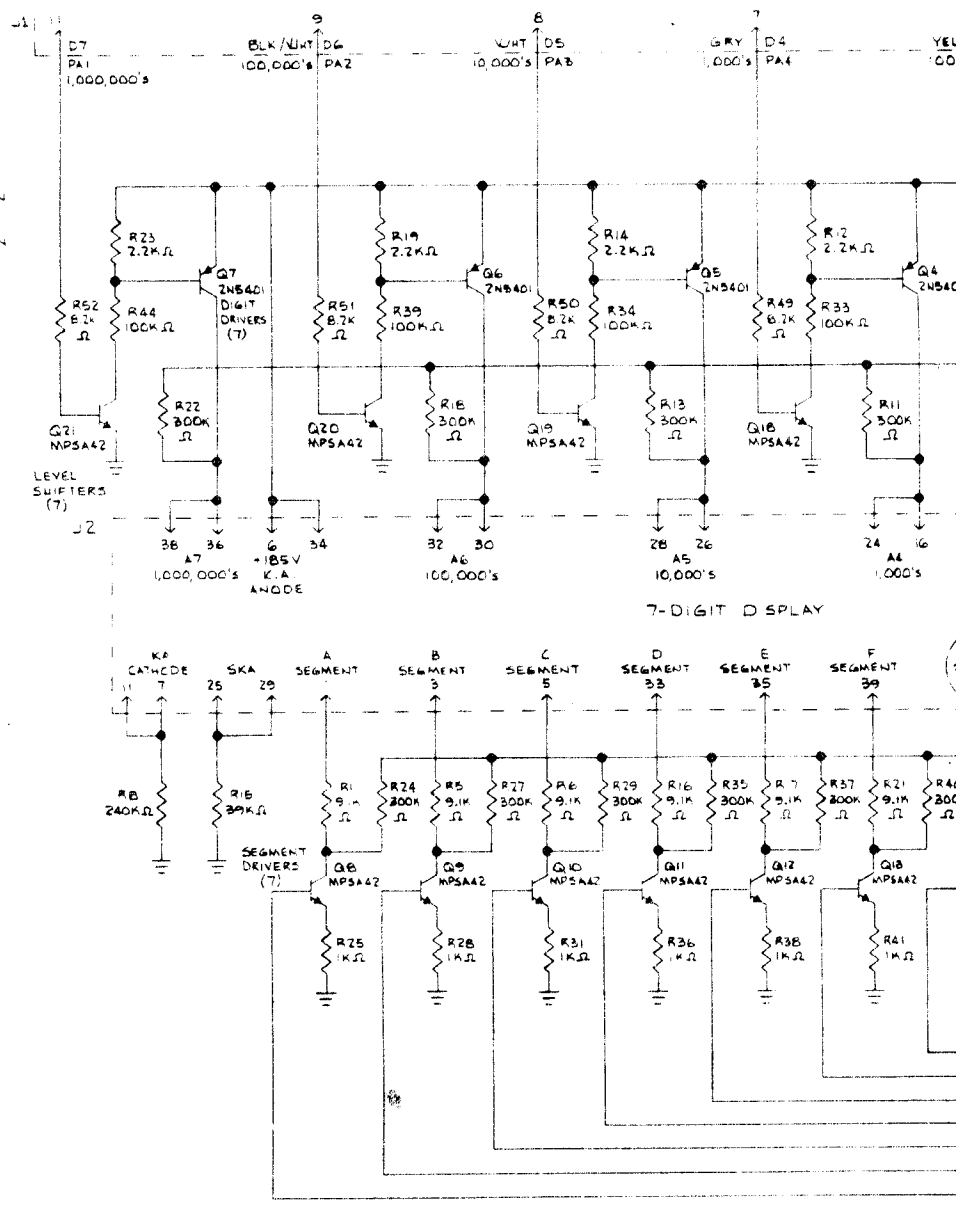
434-S1

NOTES:

DIN IS	WIRE COLOR
PLAYER # 1	BLK/WHY
PLAYER # 2	DRG/BLU
PLAYER # 3	RED/YEL
PLAYER # 4	BRN/DRG
MATCH BALL	RED/BLACK

- 2. LAST '0' NUMBER USED Q2
- LAST '0K' NUMBER USED Q1
- LAST '00' NUMBER USED J2
- LAST '0' NUMBER USED Q2
- LAST '0K' NUMBER USED R6
- LAST '00' NUMBER USED TP2
- LAST '0' NUMBER USED U1

- 3. ON P.C. BOARD LEGENDS:
 - NOMENCLATURE DD IS THE ABBREVIATION FOR DIGIT DRIVER
 - NOMENCLATURE LS IS THE ABBREVIATION FOR LEVEL SHIFTER

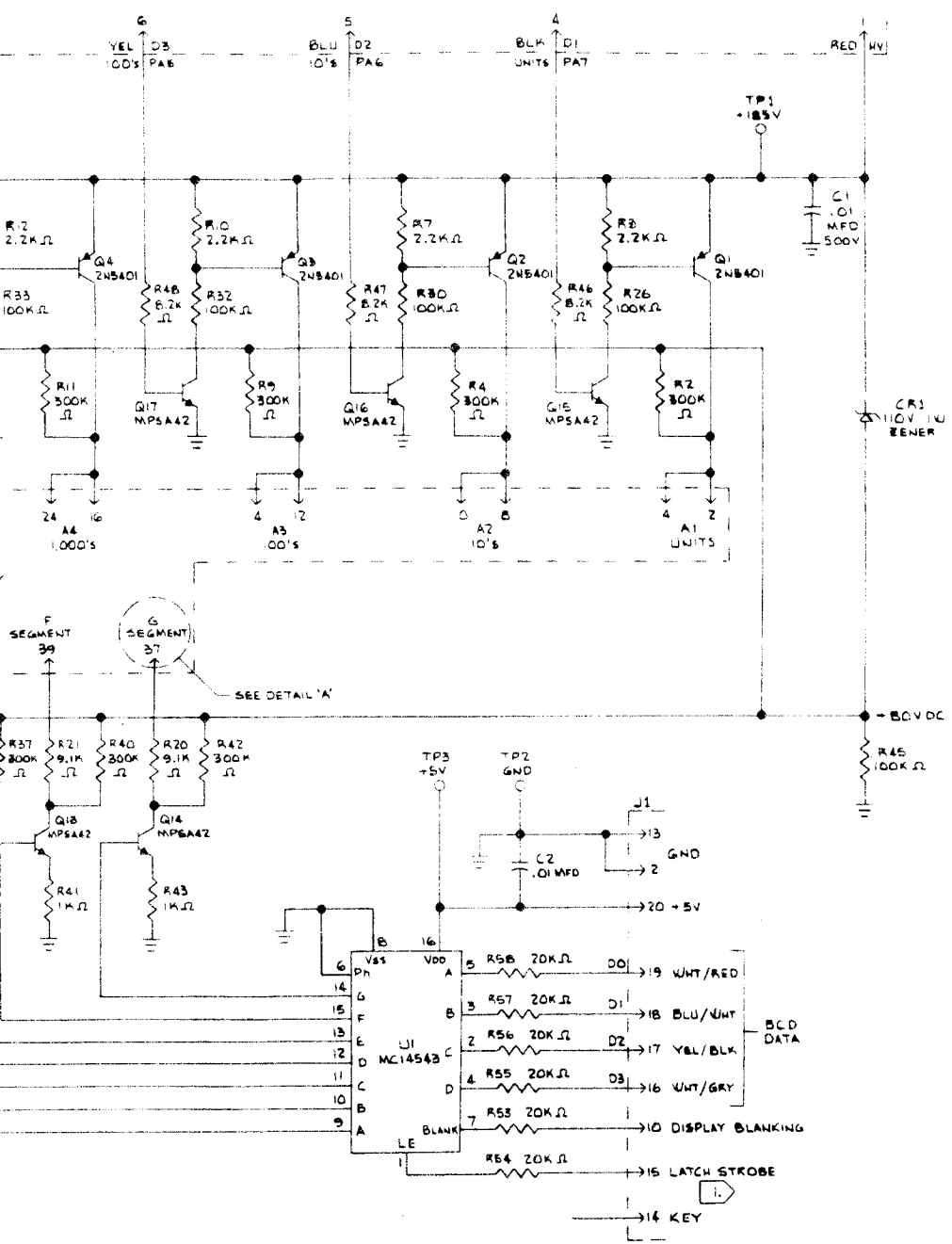


C.
O 60614
C. BOARD
R.

NO. 12B-645-5

DIETZEN NO. 180M AGEPROOF

ISSUE	CHANGE
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STERN ELECTRONICS INC.		
1725 DIVERSEY BLVD. CHICAGO 60614		
SCHEMATIC, 7 DIGIT DISPLAY P.C. BD.		
FOR GEN. USE		
DRN. B.P.	DATE 1-10-80	AM'T —/—
MAT —/—	FIN. —/—	APPR. —/—

SCALE: —/—	PART MUST BE FREE OF BURRS
CHANGE	DATE

Unless otherwise specified, all fractional dimensions carry tolerances of plus and minus .010: All decimal dimensions plus and minus .005. Exceptions: Drilled holes plus .003 minus .001. Die casting fractional plus and minus .005: Decimal plus and minus .003. Decimal dimensions on tools plus and minus .001. Angles ± 30' unless otherwise specified.

NOTES:

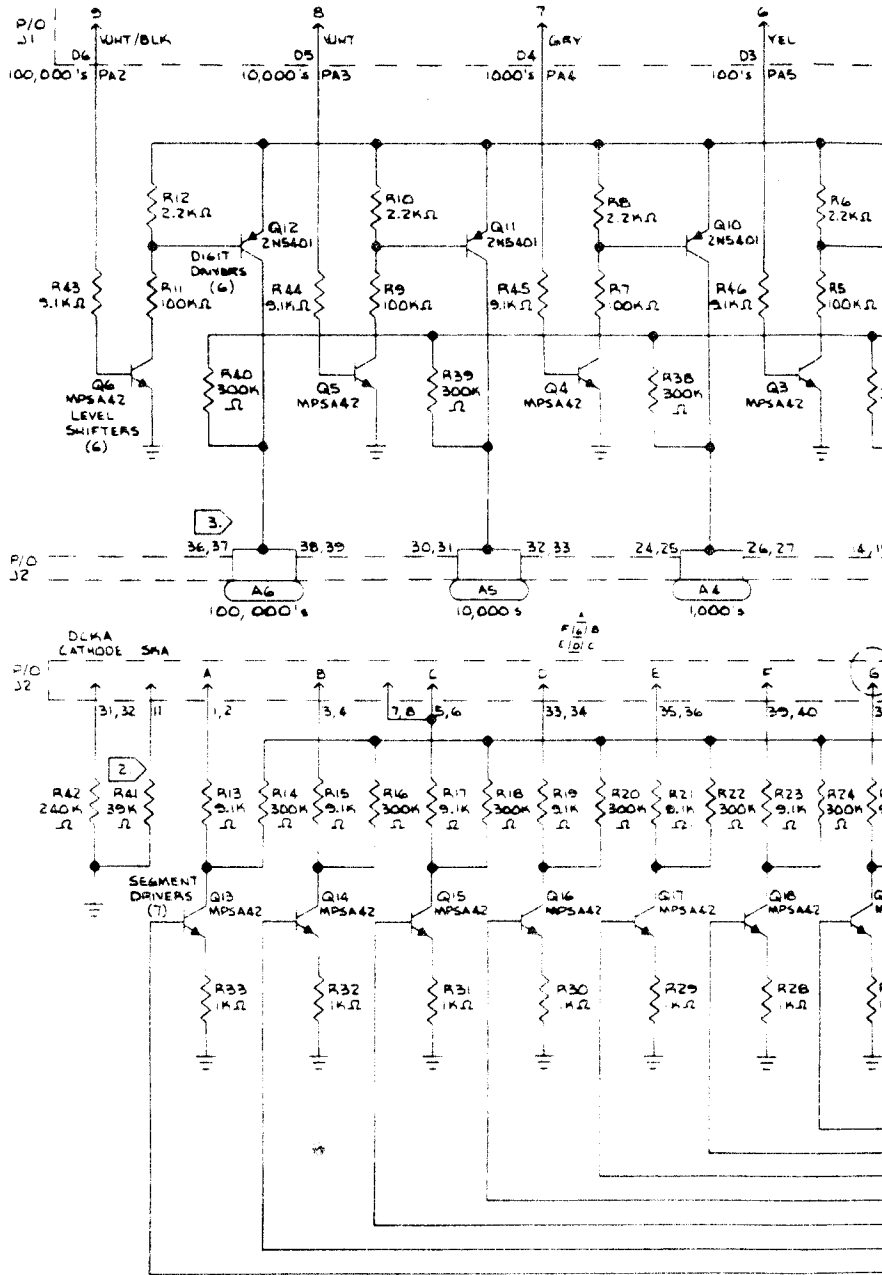
1. PIN IS WIRE COLOR

PLAYER #1 BLK/WHT
 PLAYER #2 YEL/RED
 PLAYER #3 ORG/BLU
 PLAYER #4 BRN/ORG
 MATCH/BALL RED/BLK

2. OMIT FOR BECKMAN DISPLAYS

3. 36, 37 DENOTES

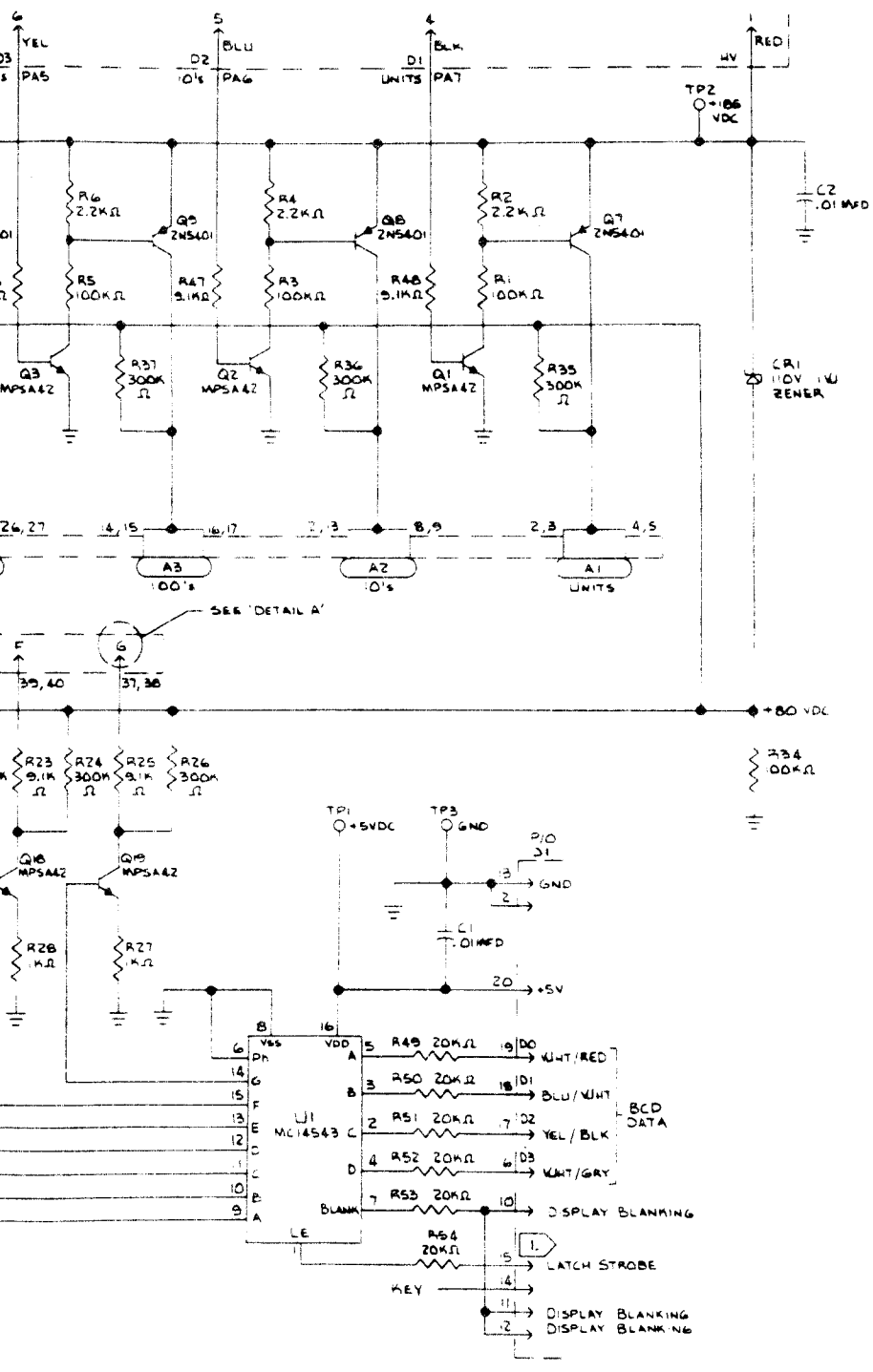
BECKMAN PANTEK
 DISPLAY DISPLAY
 TERMINAL # TERMINAL



NO. 12B-434-S1

DIETZEN NO. 199M AGEPROOF

ISSUE	CHANGE



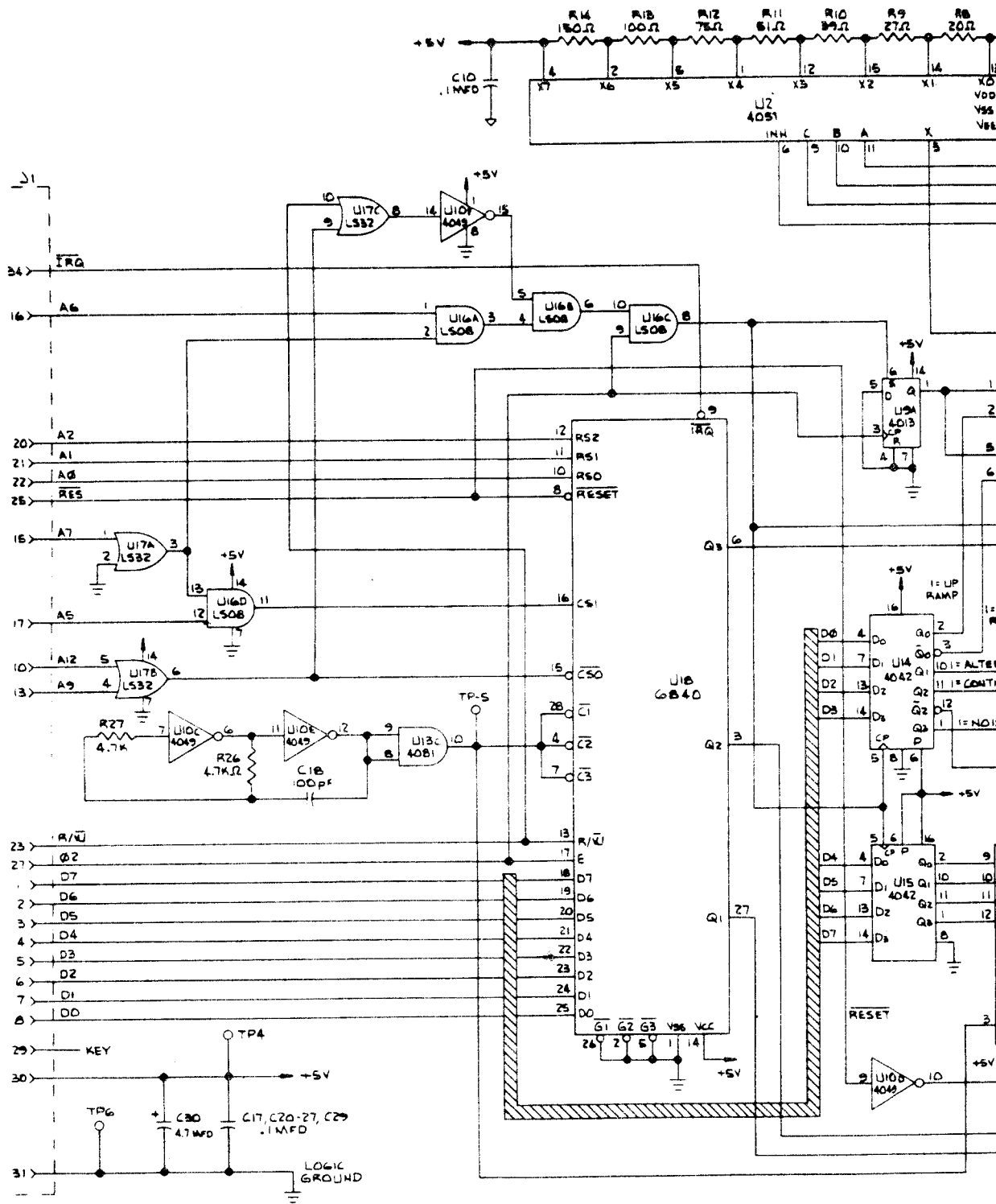
STERN ELECTRONICS INC.		
1725 DIVERSEY BLVD. CHICAGO 60614		
SCHEMATIC, DISPLAY-P.C. BOARD		
FOR GEN. USE		
DRN. <u>EW</u>	DATE <u>5-25-79</u>	AM'T <u>4-</u>
MAT <u>---</u>	FIN. <u>---</u>	APPR. <u>---</u>

CHANGE	DATE

SCALE: $\frac{1}{8}$ PART MUST BE FREE OF BURRS

Unless otherwise specified, all fractional dimensions carry tolerances of plus and minus .010: All decimal dimensions plus and minus .005. Exceptions: Drilled holes plus .003 minus .001. Die casting fractional plus and minus .005: Decimal plus and minus .003. Decimal dimensions on tools plus and minus .001. Angles $\pm 30^\circ$ unless otherwise specified.

BUS
KEY
RET
E GND



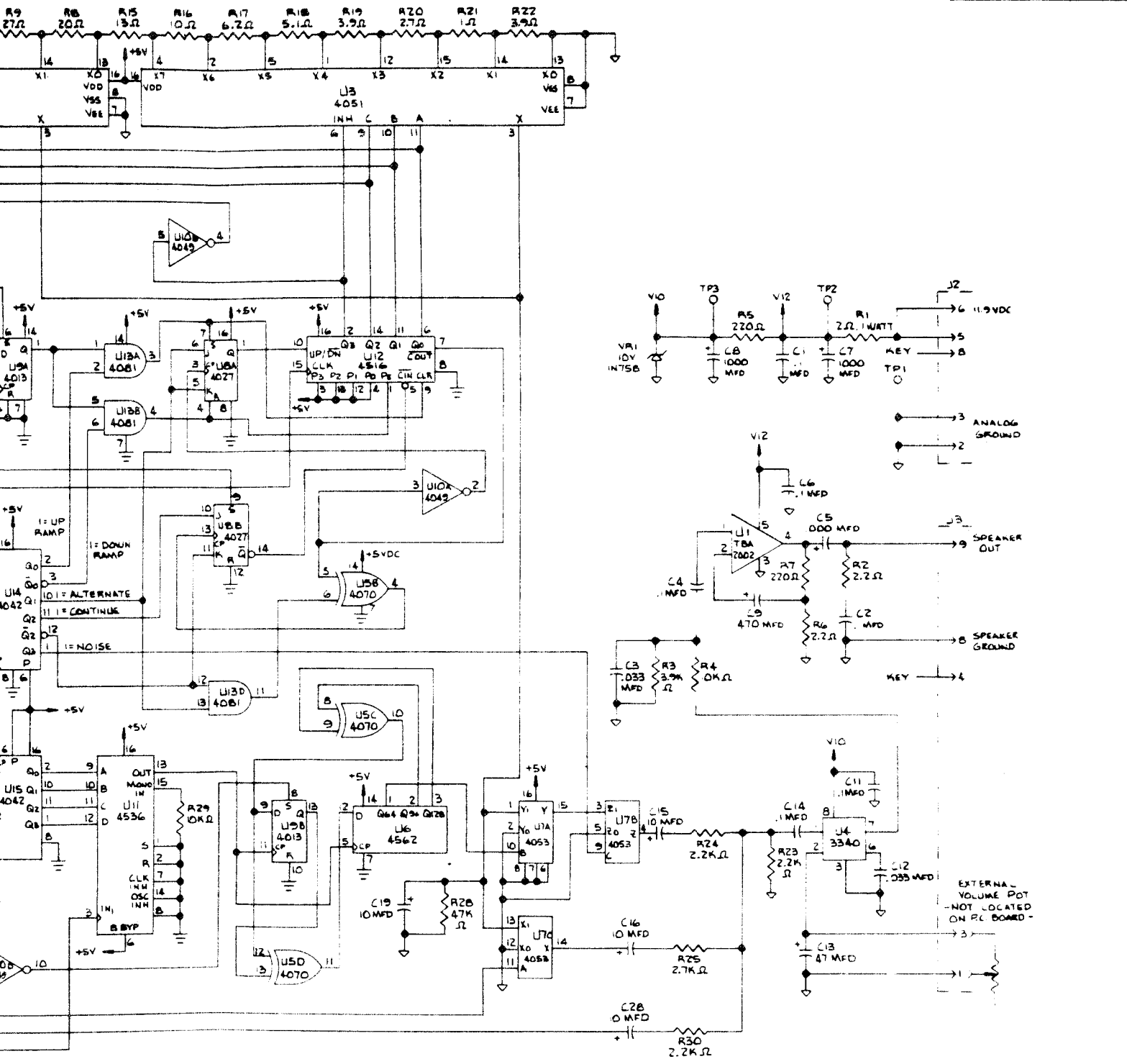
C.
GO 60614

STATE

NO. 12B-605-S

DIETZGEN NO. 198M AGEPROOF

ISSUE	CHANGE



CHANGE	DATE
--------	------

SCALE: PART MUST BE FREE OF BURRS

Unless otherwise specified, all fractional dimensions carry tolerances of plus and minus .010; All decimal dimensions plus and minus .005. Exceptions: Drilled holes plus .003 minus .001. Die casting fractional plus and minus .005; Decimal plus and minus .003. Decimal dimensions on tools plus and minus .001. Angles ± 30' unless otherwise specified.

STERN ELECTRONICS INC.
 1725 DIVERSEY BLVD. CHICAGO 60614

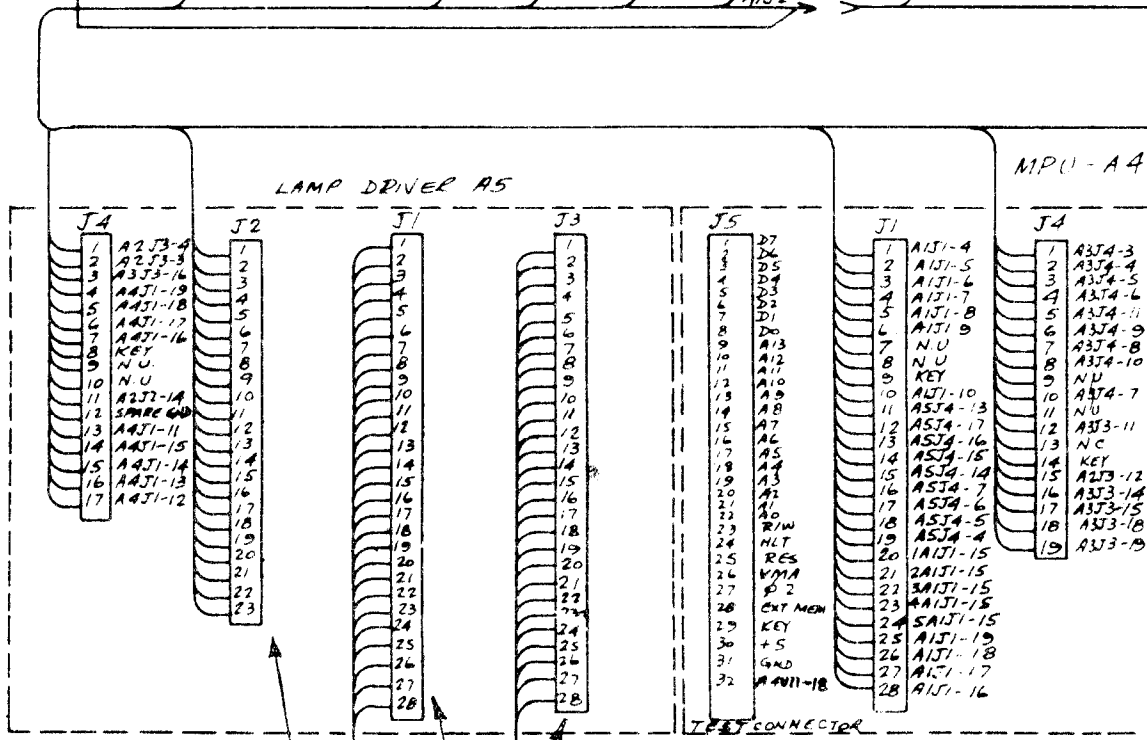
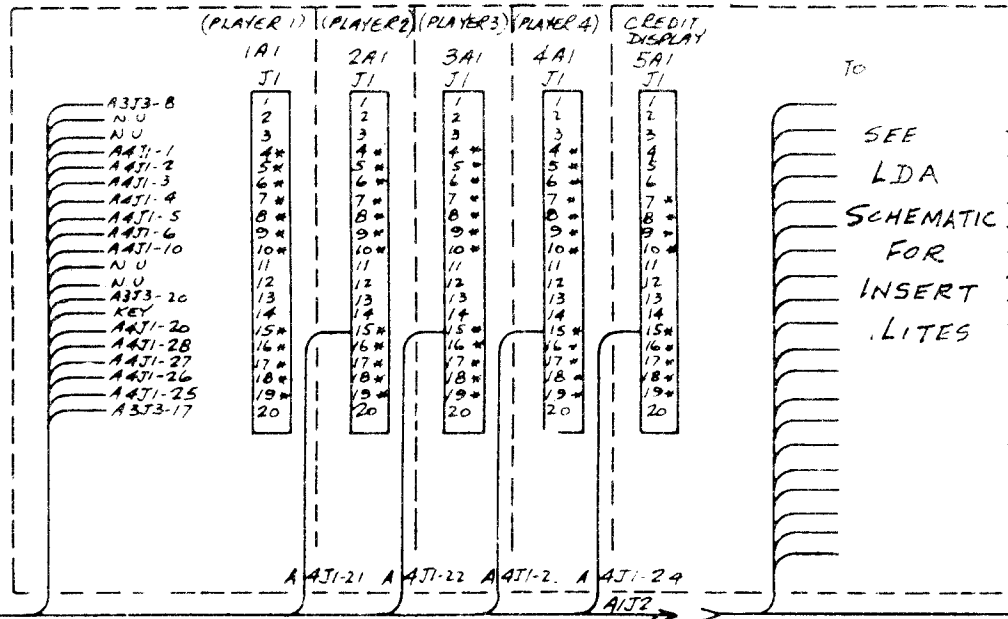
SCHEMATIC, ELECTRONIC SOUNDS

FOR **SOLID STATE**

DRN. EW.	DATE 8-21-79	AMT.
MAT	FIN.	APPR.

A1 INSERT

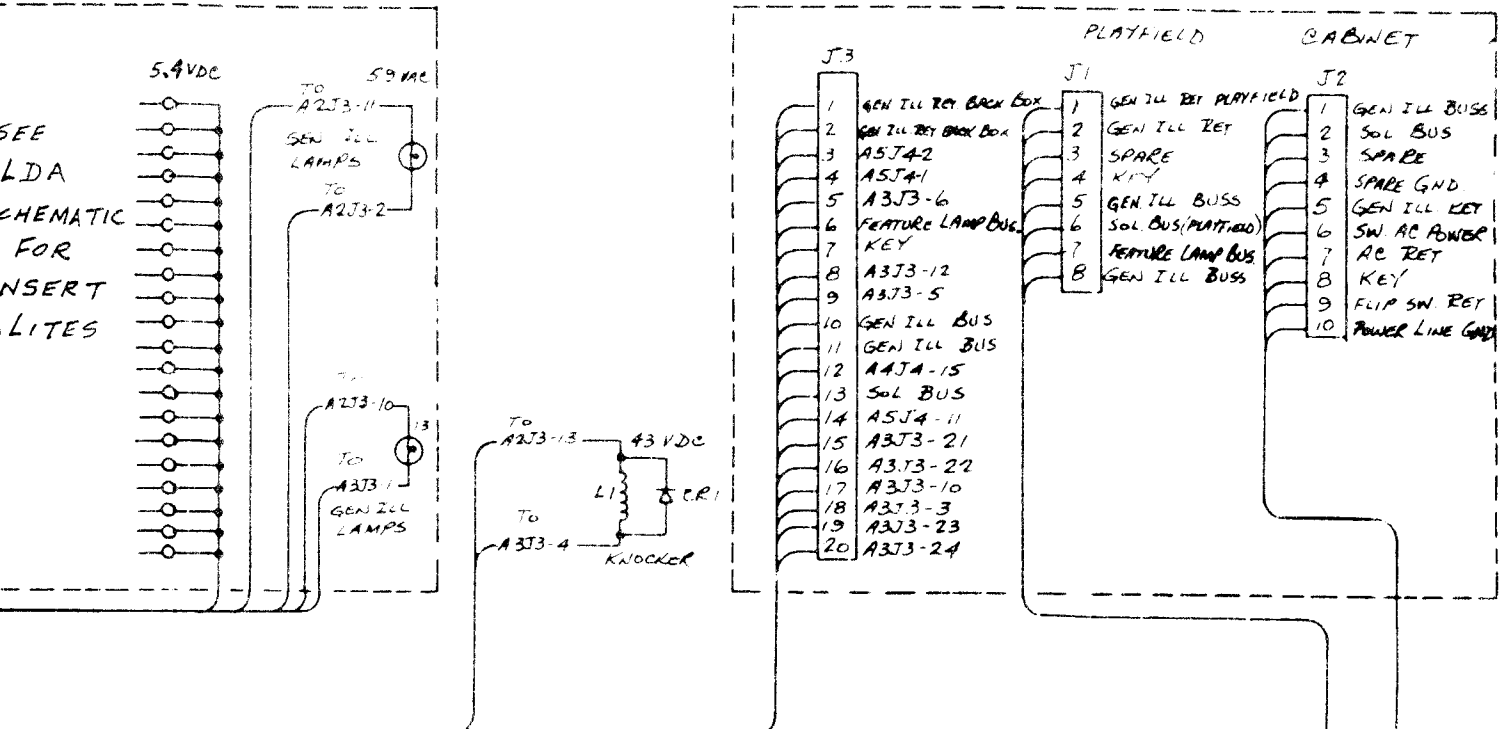
FROM	A1J2 PIN
A2J3-6	1
ASJ2-14	2
A2J3-2	3
A2J3-11	4
ASJ2-23	5
ASJ2-15	6
ASJ2-23	7
ASJ2-8	8
ASJ2-1	9
ASJ2-2	10
ASJ2-11	11
	12
ASJ2-10	13
ASJ2-7	14
ASJ2-6	15
ASJ2-20	16
ASJ2-16	17
A2J3-10	18
A2J3-1	19
	20
	21
	22
	23



TO CABINET
TO PLAYFIELD

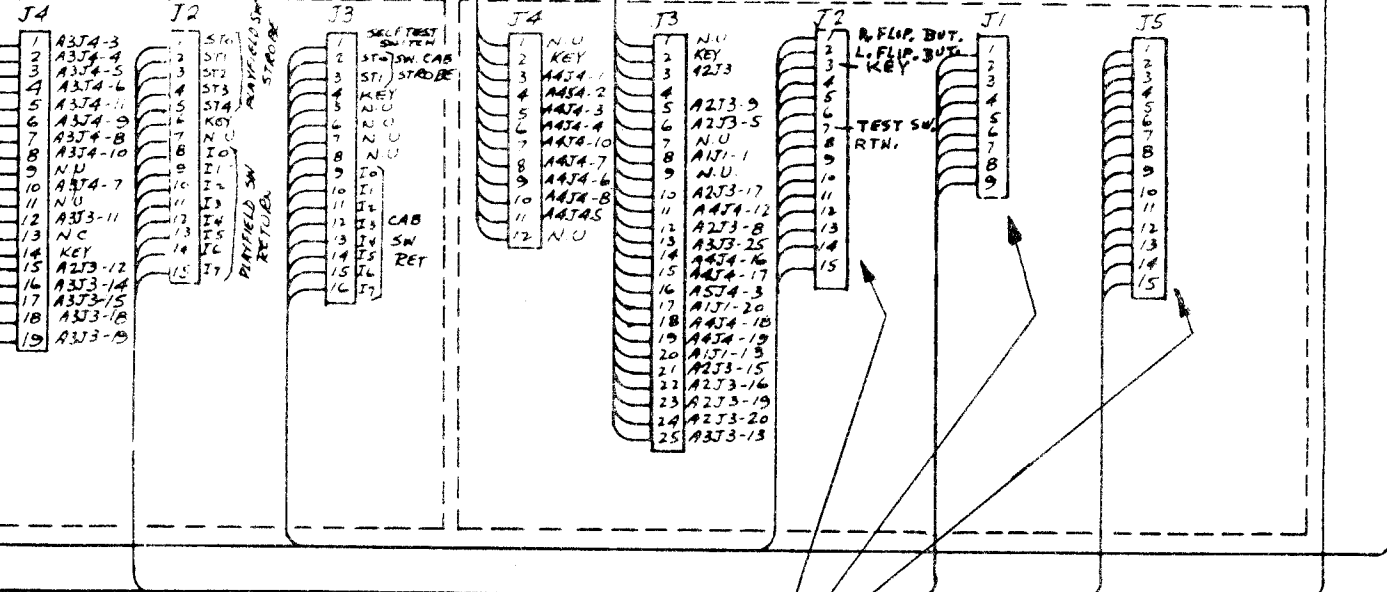
SEE INDIVIDUAL SCHEMATIC DR.
SEE LDA SCHEMATIC FOR
FEATURE LAMP PIN OUTS

A2 TRANSFORMER



MPU-A4

VOLTAGE REGULATOR / SOLEN. DRIVER A3



IC DRAWINGS FOR WIRE COLORS.

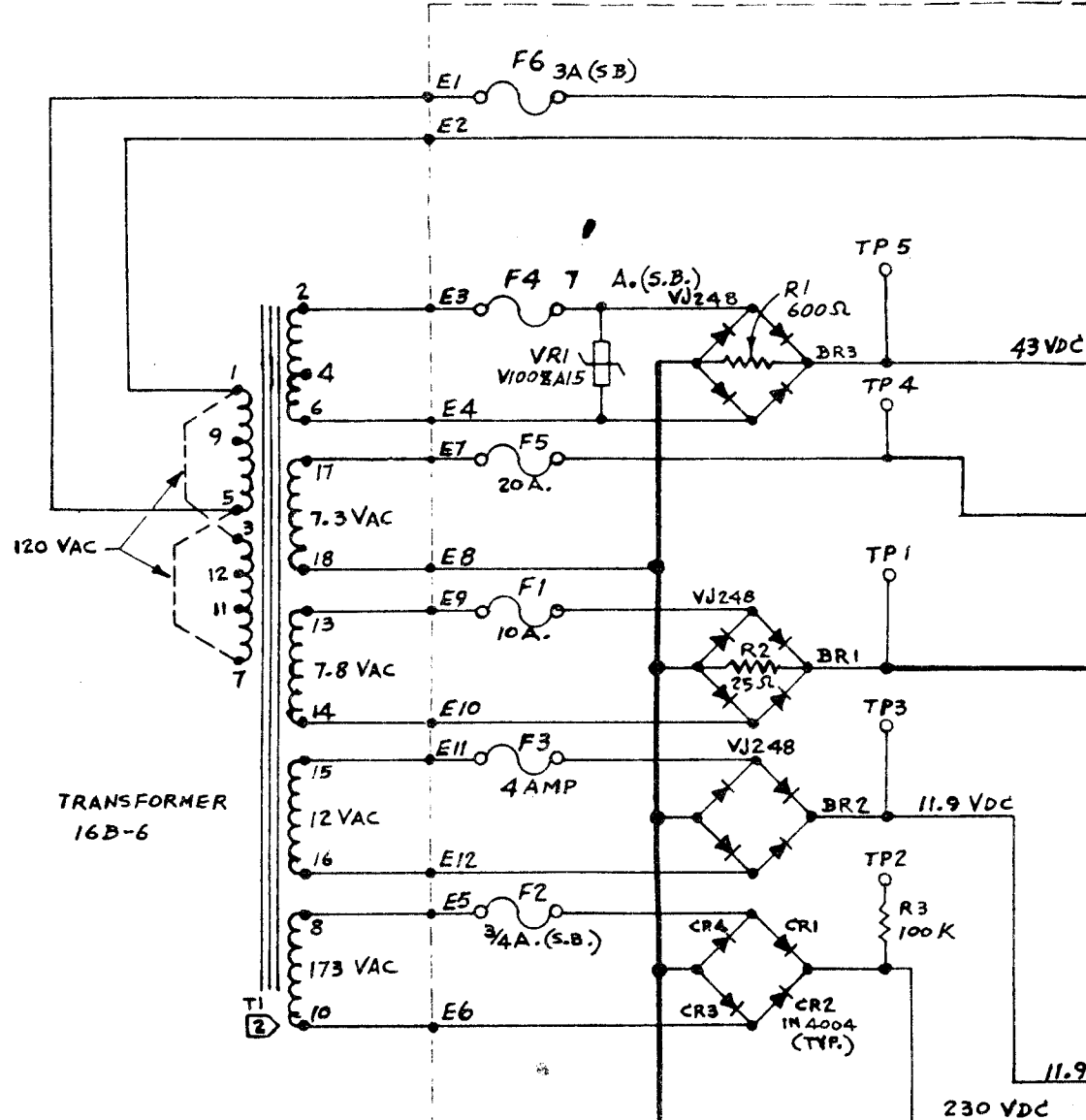
SEE SDU SCHEMATIC FOR SOLENOID PIN OUTS.

STERN ELECTRONICS INC.
 1725 DIVERSEY BLVD. CHICAGO 60614

WIRING DIAGRAM

FOR **SOLID STATE**

DRN. CW.	DATE	AMT. LAD
MAT. LAD	FIN. LAD	APPR.



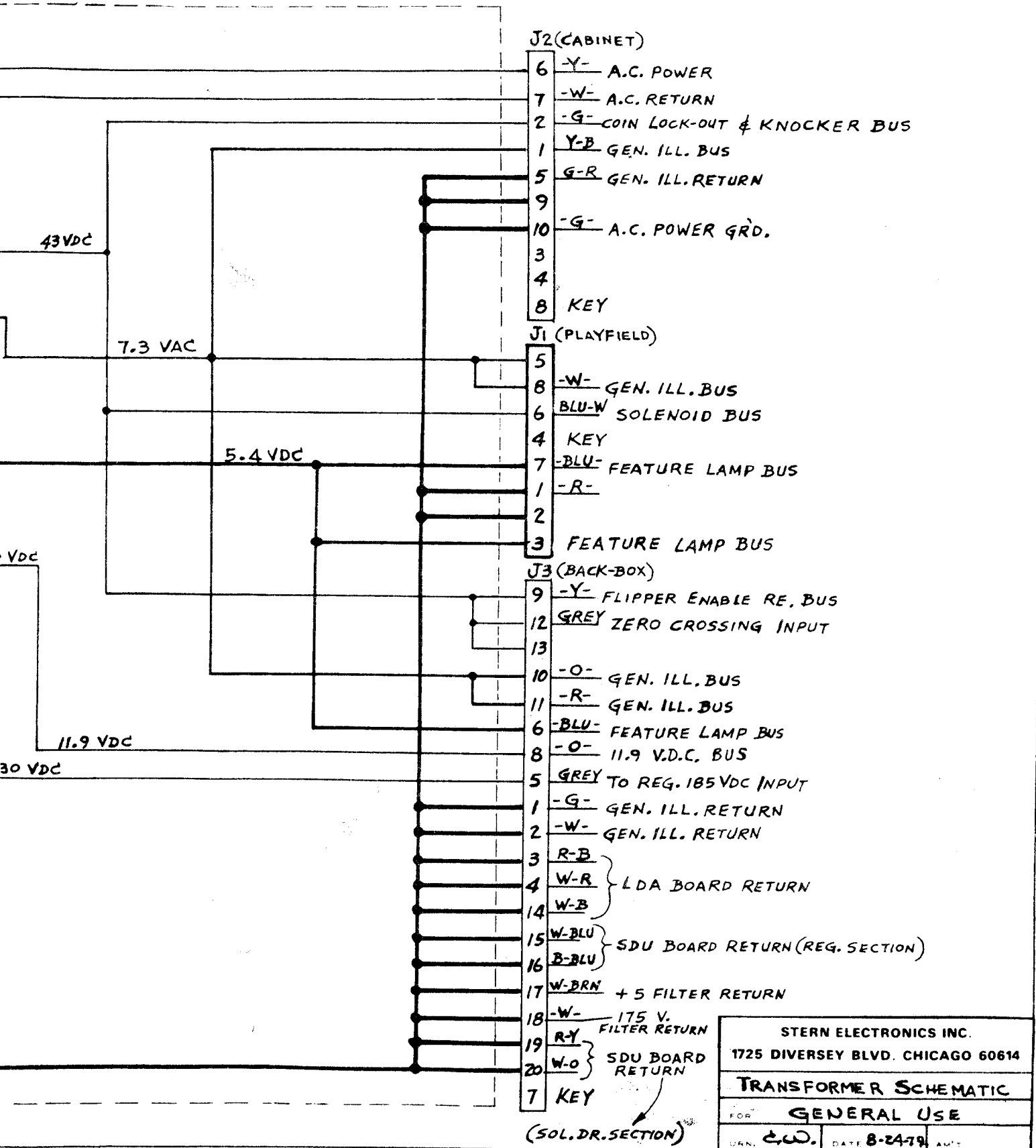
NOTES:

1. POWER LINE CONNECTIONS :-

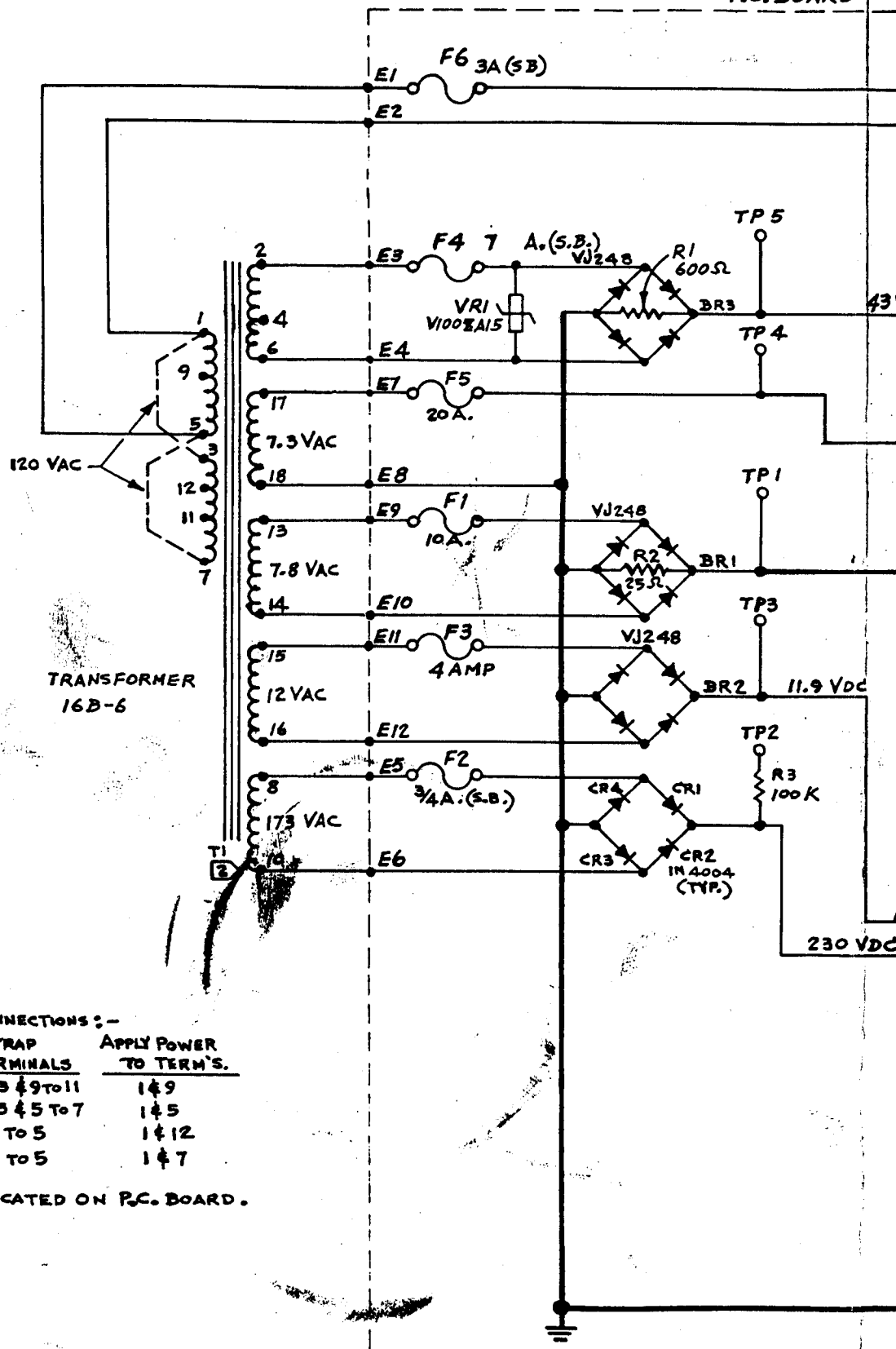
AC LINE VOLTAGE	STRAP TERMINALS	APPLY POWER TO TERM'S.
115	1 to 3 & 9 to 11	1 & 9
120	1 to 3 & 5 to 7	1 & 5
220	3 to 5	1 & 12
240	3 to 5	1 & 7

② T1 IS NOT LOCATED ON P.C. BOARD.

BOARD



STERN ELECTRONICS INC.	
1725 DIVERSEY BLVD. CHICAGO 60614	
TRANSFORMER SCHEMATIC	
FOR GENERAL USE	
DRN. C.W.	DATE 8-24-79



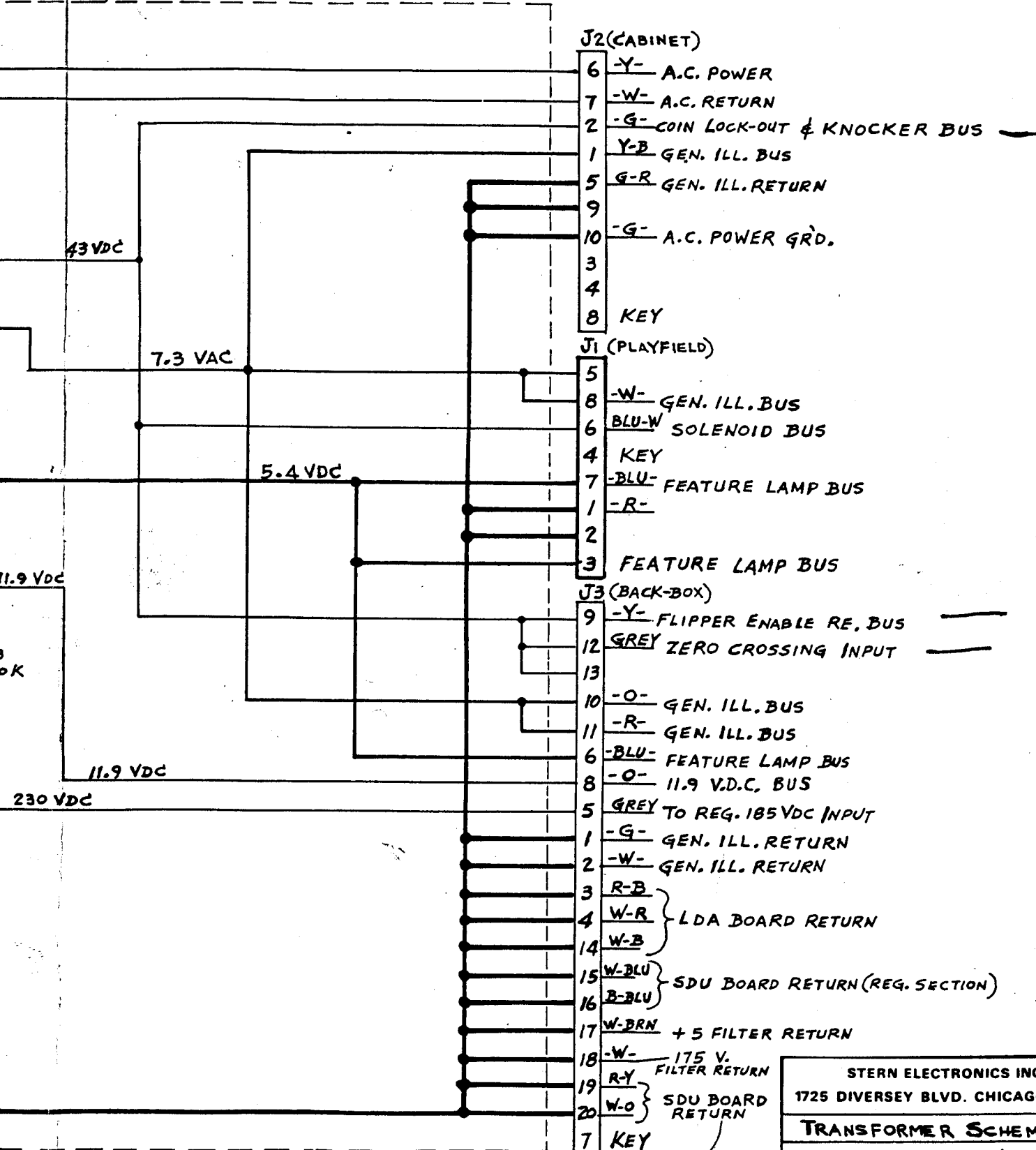
NOTES:

1. POWER LINE CONNECTIONS:-

AC LINE VOLTAGE	STRAP TERMINALS	APPLY POWER TO TERM'S.
115	1 to 3 & 9 to 11	1 & 9
120	1 to 3 & 5 to 7	1 & 5
220	3 to 5	1 & 12
240	3 to 5	1 & 7

② T1 IS NOT LOCATED ON P.C. BOARD.

100 BOARD



J2 (CABINET)

- 6 -Y- A.C. POWER
- 7 -W- A.C. RETURN
- 2 -G- COIN LOCK-OUT & KNOCKER BUS
- 1 -Y-B GEN. ILL. BUS
- 5 -G-R GEN. ILL. RETURN
- 9
- 10 -G- A.C. POWER GRD.
- 3
- 4
- 8 KEY

J1 (PLAYFIELD)

- 5
- 8 -W- GEN. ILL. BUS
- 6 -BLU-W SOLENOID BUS
- 4 KEY
- 7 -BLU- FEATURE LAMP BUS
- 1 -R-
- 2
- 3 FEATURE LAMP BUS

J3 (BACK-BOX)

- 9 -Y- FLIPPER ENABLE RE. BUS
- 12 GREY ZERO CROSSING INPUT
- 13
- 10 -O- GEN. ILL. BUS
- 11 -R- GEN. ILL. BUS
- 6 -BLU- FEATURE LAMP BUS
- 8 -O- 11.9 V.D.C. BUS
- 5 GREY TO REG. 185VDC INPUT
- 1 -G- GEN. ILL. RETURN
- 2 -W- GEN. ILL. RETURN
- 3 R-B
- 4 W-R } LDA BOARD RETURN
- 14 W-B
- 15 W-BLU } SDU BOARD RETURN (REG. SECTION)
- 16 B-BLU
- 17 W-DRN + 5 FILTER RETURN
- 18 -W- 175 V. FILTER RETURN
- 19 R-Y
- 20 W-O } SDU BOARD RETURN
- 7 KEY

(SOL. DR. SECTION)

STERN ELECTRONICS INC.		
1725 DIVERSEY BLVD. CHICAGO 60614		
TRANSFORMER SCHEMATIC		
FOR GENERAL USE		
DRN. E.W.	DATE 8-24-79	AMT