

GAME 1173 · E
FO 642

FUTURE Spa

Bally

PINBALL DIVISION

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GAME #1173 FUTURE SPA

Installation and General Game Operation Instructions

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I. INSTALLATION

Assemble the game as follows:

Bolt legs to cabinet. Bolt back box to cabinet. Use flat washers under bolt heads. Gently feed cable connectors and ground braid through cable port in back box. Screw ground braid to braid in back box. Carefully and fully insert connectors on printed circuit assemblies.

On all games there are certain items that should be checked after shipment. These are visual inspections which 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 switch should always be adjusted after game is set on location and leg levelers are adjusted.

Visual inspections before plugging in line cord:

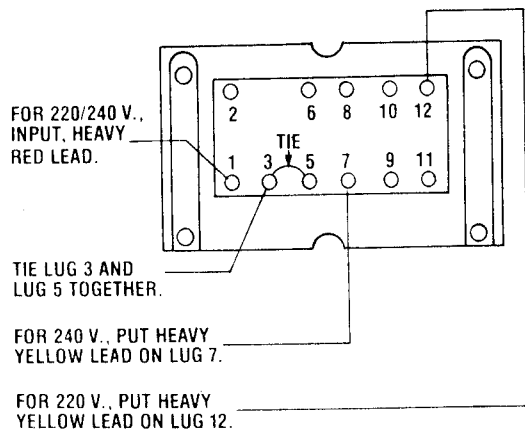
1. Check that all cable connectors are completely seated on printed circuit assemblies.
2. Check that cables are clear of all moving parts.
3. Check for any wires that may have become disconnected.
4. Check switches for loose solder or other foreign material that may have come loose in shipment and could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

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

1. Panel tilt on bottom of playfield panel.
2. Plumb bob tilt on left side of cabinet near front door.
3. Ball tilt above plumb bob tilt. Insert the smaller ball (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.

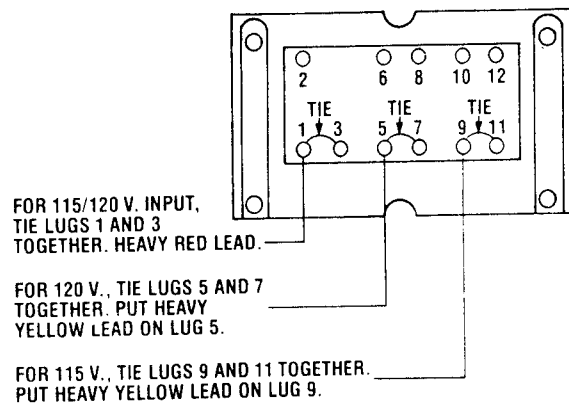
TRANSFORMER CONNECTION INSTRUCTIONS

E-122-131 TRANSFORMER WIRING FOR 220/240 V.,
50/60 CYCLE INPUT.



VARISTOR, BALLY PART NO. E-713-1,
LOCATED IN CABINET, MUST BE USED
FOR OPERATION AT 220 V. OR 240 V. A.C.

E-122-131 TRANSFORMER WIRING FOR 115/120 V.,
50/60 CYCLE INPUT.



FOR 120 V., TIE LUGS 5 AND 7
TOGETHER. PUT HEAVY
YELLOW LEAD ON LUG 5.

FOR 115 V., TIE LUGS 9 AND 11 TOGETHER.
PUT HEAVY YELLOW LEAD ON LUG 9.

VARISTOR, BALLY PART NO. E-713,
LOCATED IN CABINET, MUST BE USED
FOR OPERATION AT 115 OR 120 V. A.C.

FIGURE I. TRANSFORMER
(PART OF POWER—TRANSFORMER MODULE A2, LOCATED IN BACK BOX).

II. GENERAL GAME OPERATION

Place ball into playfield by outhole.

Coin game. Coin should be rejected. Plug in line cord. Move power ON-OFF master switch at bottom right front corner of cabinet to 'ON' position. The game will play a power-up tune to announce game-readiness. Drop targets are reset, scores are set to zero, alternating with the 'High Score 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 serve the ball to the shooter alley. The 1st player-up lite is lit. A game-up tune* is played to announce play-readiness. The bonus score is advanced to 1000 points.

One player is posted each additional 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.

Shooting the ball initiates play. Rebound switches score 10 points. Thumper-bumpers, when not lit, score 10 points.

The game awards all points earned by the player. If spinner is turning and scoring when the ball hits a target, the spinner and the target scores are awarded.

When the ball enters the outhole, the bonus score is added to the total score. The player-up and/or ball in play on the back box is advanced one position. The bonus score is advanced to 1000 points. The outhole kicker serves the ball to the shooter alley 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 is lit. A random Match* number appears and the 'Match' light is lit. If the number is the same as the last two digits in a player's score, a free game is awarded.

Extra balls won during the course of the game are played immediately after the player's regular ball enters the outhole. The player-up and/or ball in play on the back box are not advanced for extra ball play. Bonus score is added to the player's score and the bonus is set to 1000 points before the game serves the extra ball for play.

Scoring over 1,000,000 gives "High Score to Date" award.

At the end of the game, a 'High Score to Date' is alternately flashed with all 4 player scores. If the 'High Score to Date' is beat, this feature* awards free games.

Tilting the game results in loss of a ball. The flippers, thumper-bumpers, etc., go 'dead.' Bonus points are not scored. 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 ball kicker assembly serves the ball to the shooter alley.

Slamming the machine results in loss of the game. All feature lights go out, the game goes 'dead,' and a time delay occurs. The purpose of the time delay is to discourage unnecessary abuse of the machine. After the delay, the 'Game Over' light lites and the power-up tune is played. The time delay occurs anytime one of the slam switches is made to contact. There is one factory installed slam switch on the front door. (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 weighted blade should be adjusted to attain the desired sensitivity. Decreasing the 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.

III. BOOKKEEPING FUNCTIONS

The game is designed to help the operator certain perform accounting functions. The game can display the number of total plays and replays (free games). It can display the number of coins dropped down each coin chute. The bookkeeping functions are displayed on all player score displays simultaneously. An identification number, 05 to 14, appears on the Match/Ball in Play window as follows:

- 05— 00 to— 40=Current Credits
- *06—10000 to—99999=Total Plays (Payed & Free Games)
- *07—10000 to—99999=Total Replays (Free Games)
- 08— 00 to—99999=Total times 'High Score to Date' is beat
- *09—10000 to—99999=Coins Dropped thru Coin Chute #1
- *10—10000 to—99999=Coins Dropped thru Coin Chute #2**
- *11—10000 to—99999=Coins Dropped thru Coin Chute #3**
- *12— 00 to—99999=Number of Specials awarded from Panel Specials Only
- *13— 00 to—99999=Number of minutes of Game Play
- *14— 00 to—99999=Number of Service Credits

The game displays the first bookkeeping entry if the Self-Test button (See Fig. III) on the inside of the front door is pressed ten times. Alternately push and release the Self-Test button at one second intervals. The number 05 appears in the 'Match/Ball in Play' window. Current credits appear on the 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 A4, the MPU module in the back box (See Fig. III), or by pressing the Coin Chute #3 switch. Any or all registers can be cleared by alternating between the Self-Test button and the switch button S33 on the MPU module or Coin Chute #3 switch. The operator is given this option as a possible convenience and can elect to use or not use it as his needs direct.

Pressing the button once more with the 14th entry displayed causes the game to play the power-up tune and light the Game Over light.

Service credits are designed to allow the serviceman to test the game under actual play conditions without disturbing the bookkeeping records that reside at identification numbers 06, 07, 09, 10 and 11.

To obtain Service Credits, push and release the Self-Test switch until identification number 05 appears in the 'Match/Ball in Play' window. Hold in the Credit button until the desired number of Service Credits (up to five) appears on the player score displays.

NOTE: If, upon accessing identification number 05, a number of credits greater than five is displayed, pressing the credit button has no effect.

Identification number 14 is reserved as a record of the number of Service Credits used.

*The 10,000 level is pre-set at the factory; can be set to zero, initially, if desired.

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

FUTURE SPA
#1173-E
FEATURE OPERATION & SCORING

A. When the ball goes thru 6 top rollovers F-U-T-U-R-E, lites the corresponding lite in center of playfield.

A-1 center target spots S-P-A letters when hit.

A-2 liting FUTURE SPA first time 18,000 bonus lites.

Liting FUTURE SPA second time 36,000 bonus and special lites.

Liting FUTURE SPA third and each additional time awards one replay.

B. Saucer & Rollover Button Features

A—Saucer; 1st time scores 3,000 points

2nd time scores 6,000 points.

3rd and each additional time scores 9,000 points and will reset back to 3,000 when ball goes thru outhole.

B—Rollover button;

1st time scores 2,000 points.

2nd time scores 4,000 points.

3rd time scores 6,000 points.

4th time scores 8,000 points.

5th and each additional time scores 10,000 points and will reset back to 2,000 points when ball goes thru outhole.

C. 4 In-Line Drop Target Feature

1st target down lites left & right spinners for 1,000 points and spots FUTURE SPA letters if spots letter lite is on.

2nd target down lites 2X multiplier and does spotting as first target.

3rd target down lites 4X multiplier and does spotting as first target.

4th target down lites 6X multiplier and does spotting as first target.

Last stand up target lites extra ball first time hit, special 2nd time hit and 20,000 points 3rd and each additional time hit (all 4 in-line targets score 400 points each when hit).

D. Left Kicker Feature

1st time ball in kicker scores 3,000 points spots FUTURE SPA letters if spot letter lite is on and will kick ball back on playfield.

2nd time ball in kicker scores 5,000 points.

3rd time ball in kicker scores 7,000 points.

4th and each additional time scores 9,000 points and kicker will do spotting as first time providing spot letter lite is on.

E. Top Arrows 5,000 point Feature

When all 6 top rollovers are made 2 top green arrow lites alternate for 5,000 points.

F. Top Arrows Gate Feature

When ball goes thru Yellow lit arrow, left bottom gate opens to score 3,000 points.

G. Bonus Score and Recall Feature

A bonus of 2,000 points for each FUTURE SPA lit lite is awarded when ball enters outhole, times any lit multiplier.

18,000 and 36,000 bonus points are part of the multiplier.

The recall feature applies to lit FUTURE SPA 18,000 and 36,000 bonus only.

H. Bottom 1,000 Bumper Feature

When center target SPA lites are out, right bottom bumper lites to score 1,000 points.

I. Special Replay/X-Ball/Novelty Modes

Switch #6 and #7 give the operator flexibility to award a replay, extra ball or score (Novelty) when a special is scored (drop target, S-P-A). The following chart explains the settings.

SWITCH	SW. 6 ON	SW. 6 OFF	SW. 6 ON
Positions	SW. 7 ON	SW. 7 ON	SW. 7 OFF
SPA Special	Replay	X-Ball	Novelty
Drop target special	Replay	X-Ball*	50,000
Drop target X-Ball	Replay	*	50,000
Scoring thresholds	X-Ball	X-Ball**	25,000
	Replay	X-Ball**	No award

(*) 50,000 if Same Player Shoot Again is lit.

(**) 25,000 if Same Player Shoot Again is lit.

V. GAME ADJUSTMENTS

A. Playfield Panel Post Adjustments:

Posts that control left and right outlane opening on panel can be moved to make access to outlanes easier or harder for ball to enter. See Figure II.

Easier entry will decrease playing time and scoring (conservative).
Harder entry will increase playing time and scoring (liberal).

B. Back Box Game Adjustments:

Each game has thirty-two switches located on A4, the MPU module, located in the back box, that allow play to be customized to the location. See Figure III. Credits per coin, maximum credits, credit display, balls per game, match feature, high game feature, special award and melody are selectable by means of the 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" toggle position is marked on the assembly. **Turn off power before making adjustments.**

Credits/Coin Adjustments:

The credits per coin are selectable by means of S17-S20 for coin chute #2. The switch settings and resultant credits/coin are as follows:

S20	S19	S18	S17	Credits/Coin
OFF	OFF	OFF	OFF	Same as Coin Chute #1 Settings
OFF	OFF	OFF	ON	1/1 Coin
OFF	OFF	ON	OFF	2/1 Coin
OFF	OFF	ON	ON	3/1 Coin
OFF	ON	OFF	OFF	4/1 Coin
OFF	ON	OFF	ON	5/1 Coin
OFF	ON	ON	OFF	6/1 Coin
OFF	ON	ON	ON	7/1 Coin
ON	OFF	OFF	OFF	8/1 Coin
ON	OFF	OFF	ON	9/1 Coin
ON	OFF	ON	OFF	10/1 Coin
ON	OFF	ON	ON	11/1 Coin
ON	ON	OFF	OFF	12/1 Coin
ON	ON	OFF	ON	13/1 Coin
ON	ON	ON	OFF	14/1 Coin
ON	ON	ON	ON	15/1 Coin

The credits given per coin are selectable by means of switches 1-5 incl., for coin chute #1 and switches 9-13 incl., for coin chute #3. Thirty-one different credit ratios are available for each coin chute. The switch settings and resultant credits/coin are listed below.

CREDITS/COIN ADJUSTMENTS

COIN CHUTE #1 (HINGE SIDE) OR #3	SWITCHES					CREDITS/COIN
	5	4	3	2	1	
	13	12	11	10	9	
	OFF	OFF	OFF	OFF	OFF	3/2 COINS**
	OFF	OFF	OFF	OFF	ON	3/2 COINS**
	OFF	OFF	OFF	ON	OFF	1/COIN
	OFF	OFF	OFF	ON	ON	1/2 COINS*
	OFF	OFF	ON	OFF	OFF	2/COIN
	OFF	OFF	ON	OFF	ON	2/2 COINS*
	OFF	OFF	ON	ON	OFF	3/COIN
	OFF	OFF	ON	ON	ON	3/2 COINS*
	OFF	ON	OFF	OFF	OFF	4/COIN
	OFF	ON	OFF	OFF	ON	4/2 COINS*
	OFF	ON	OFF	ON	OFF	5/COIN
	OFF	ON	OFF	ON	ON	5/2 COINS*
	OFF	ON	ON	OFF	OFF	6/COIN
	OFF	ON	ON	OFF	ON	6/2 COINS*
	OFF	ON	ON	ON	OFF	7/COIN
	OFF	ON	ON	ON	ON	7/2 COINS*
	ON	OFF	OFF	OFF	OFF	8/COIN
	ON	OFF	OFF	OFF	ON	8/2 COINS*
	ON	OFF	OFF	ON	OFF	9/COIN
	ON	OFF	OFF	ON	ON	3/2 COINS*
	ON	OFF	ON	OFF	OFF	10/COIN
	ON	OFF	ON	OFF	ON	10/2 COINS*
	ON	OFF	ON	ON	OFF	11/COIN
	ON	OFF	ON	ON	ON	11/2 COINS*
	ON	ON	OFF	OFF	OFF	12/COIN
	ON	ON	OFF	OFF	ON	12/2 COINS*
	ON	ON	OFF	ON	OFF	13/COIN
	ON	ON	OFF	ON	ON	13/2 COINS*
	ON	ON	ON	OFF	OFF	14/COIN
	ON	ON	ON	OFF	ON	14/2 COINS*
	ON	ON	ON	ON	OFF	15/COIN
	ON	ON	ON	ON	ON	15/2 COINS*

*No Credits until second coin is dropped

**One Credit for first coin Two Credits for second coin provided that no scoring occurred between 1st and 2nd coin drops. If scoring occurred, second coin gives one credit.

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 is selectable by means of switches 25 and 26. Four credit limits are available. Switch settings are listed below.

MAXIMUM CREDITS	SWITCHES	
	26	25
10	OFF	OFF
15	OFF	ON
25	ON	OFF
40	ON	ON

BALLS PER GAME:	# BALLS/GAME	SWITCH 31
	5	ON
	3	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 a player's score, a free game is awarded. The Match feature creates an incentive to play.

MATCH	SWITCH 28
ON	ON
OFF	OFF

CREDIT DISPLAY:	CREDITS DISPLAYED	SWITCH 27
	YES	ON
	NO	OFF

HIGH SCORE FEATURE:

The game is designed to award an Extra Ball or Free Game at each of the three score levels. See Front Door Game Adjustments.

AWARD	SWITCH 7	SWITCH 6
REPLAY	ON	ON
EXTRA BALL	ON	OFF
NO AWARD	OFF	OFF

HIGH SCORE TO DATE OR OVER 1,000,000 SCORE FEATURE:

The game is designed to award free games as an option if high score to date is beat or player exceeds 1,000,000 points. Each time this happens, the winning score becomes the new high score to beat. This score is displayed on all 4 player score displays at the end of each game as an incentive to play. Recommended setting is underlined.

HIGH SCORE TO DATE FEATURE	SWITCH 22	SWITCH 21
No Award	OFF	OFF
One Credit	OFF	ON
Two Credits	ON	OFF
<u>Three Credits</u>	<u>ON</u>	<u>ON</u>

State and local laws may regulate the use of the above features, and they have been designed to allow for appropriate adjustment in order to conform to such requirements.

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SOUND OPTION:

The game is designed to make several tones and noises to announce power-up, game-up, etc. The tones are intended to attract attention to the game and increase game usage. The tones are controlled by switch settings as shown.

SW. 29, 30 ON.

Playfield switches associated noises with background.

SW. 29 ON, SW. 30 OFF.

Playfield switches associated noises without background.

SW. 29, 30 OFF.

Most scoring will have a chime effect.

SW. 29 OFF, SW. 30 ON.

Most all scoring will have a noise effect.

GAME FEATURE OPTIONS:

2 top green and yellow arrow adjustment:

Liberal	SW. 16 ON	First "U" and "R", "T" and 2nd "U" lite together.
Conservative	SW. 16 OFF	First "U" and "R", "T" and 2nd "U" lite one at a time.

Kickback and drop target spotlight adjustment:

Liberal	SW. 24 ON	Lites stay ON.
Conservative	SW. 24 OFF	Lites come on every 3rd time.

Drop target special adjustment:

Liberal	SW. 32 ON	Special can be collected more than one time.
Conservative	SW. 32 OFF	Special can be collected only one time, then 20,000 lites.

Thumper bumper lite adjustment:

Liberal	SW. 8 ON	1,000 Lite stays on
Conservative	SW. 8 OFF	1,000 Lite comes on with SPA

C. FRONT DOOR GAME ADJUSTMENTS

High Score Feature Adjustments:

The game is designed to award an extra ball (option) or a free game at each of three score levels. The recommended levels are on the score card in the game.

Any level from 10,000 to 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 (See Figure III) at one second intervals approximately six times or until identification number 01 appears on the 'Match/Ball in Play' display.
2. The number on the Player Score Displays is the score level.* It can be increased, if desired, by holding the credit button in. To decrease the score level, hold the credit button in and depress and release the Self-Test button. Release the credit button when the desired number 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 score levels. The identification numbers '02' and '03' on the Match/Ball in Play display are for the second and third levels, respectively.

High Score to Date and 1,000,000 Feature:

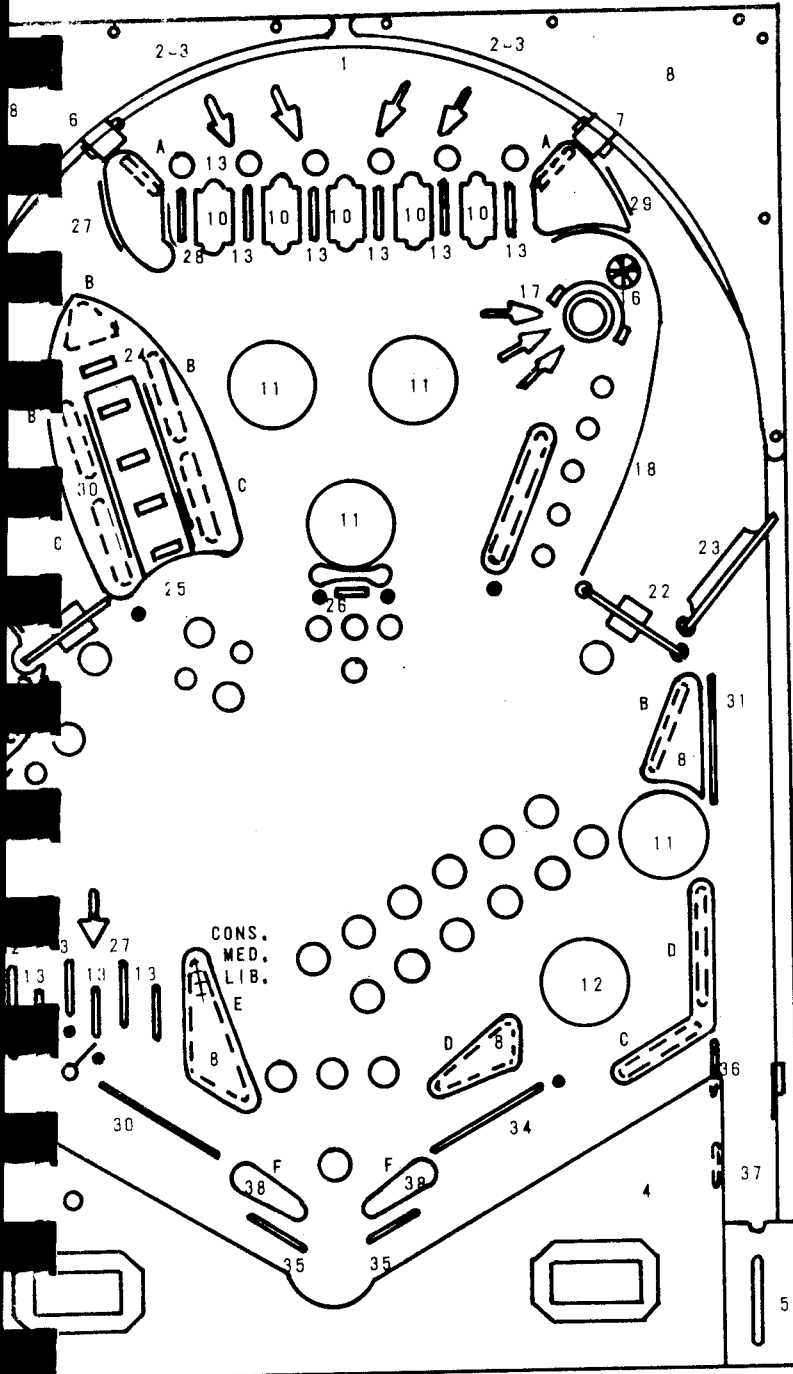
The game is designed to award free games when 'High Score to Date' is beat, or if the player exceeds 1,000,000 points.

It is recommended that the level, which will build with 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 identification 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 as discussed under 'Back Box Game Adjustments.'

*Can be quickly set to '00' by pressing S33 on the MPU assembly in the back box or Coin Chute switch #3. (See Figure III).

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RUBBER PARTS

A. R-521	3/4" Dia.	(3)
B. R-521-1	1" Dia.	(4)
C. R-521-2	1 1/2" Dia.	(3)
D. R-521-3	2" Dia.	(3)
E. R-521-5	3" Dia.	(1)
F. R-406-3	Flippers	(2)
G. R-243	5/16" Dia.	(20)

PANEL TOP PARTS

1. Arch Rail	M-1774-2
2. Rail Post	C-907 (4)
3. Rail Post Cap	C-908 (4)
4. Bottom Arch	R-5871-71
5. Shooter Gauge	P-6359-37
6. Ball Gate (L)	A-1475-12
7. Ball Gate (R)	A-1475-13
8. Screened Plastic (Set)	M-1330-166
9. Ball Guide (1 Sided)	C-938-5 (2)
10. Ball Guide (2 Sided)	C-937-5 (5)
11. Thumper Cap	A-3713-58 (4)
12. Thumper Cap	A-3713-57
13. R.O. Wire & Brkt.	ASE-2806 (9)
14. R.O. Wire & Brkt.	ASE-2806-25
15. Kicker Ass'y.	ASE-1566-26
16. R.O. Button	C-900
17. Ball Guide Ass'y.	A-3032-38
18. Ball Guide Ass'y.	A-3032-41
19. Ball Guide Ass'y.	A-3032-39
20. Ball Guide Ass'y.	A-3032-40
21. Spinner Ass'y.	ASE-2250-73
22. Spinner Ass'y.	ASE-2250-74
23. Gate & Wire Ass'y.	ASE-2250-24
24. Sw. & Target (Y)	ASE-2911-34
25. In Line Target Ass'y.	ASE-2993-3
26. Sw. & Target (Y)	ASE-2911-21
27. Guide Wire	M-121-56 (2)
28. Guide Wire	M-121-88
29. Guide Wire	M-121-89
30. Guide Wire	M-121-33 (3)
31. Guide Wire	M-121-30
32. Guide Wire	M-121-45
33. Guide Wire	M-121-90
34. Guide Wire	M-121-18
35. Buffer Wire	M-121-53 (2)
36. Guide Wire	M-121-65
37. Guide Wire	M-121-46
38. Flipper & Shaft	ASE-2214-24 (2)

CONS. — Conservative
 MED. — Medium
 Lib. — Liberal

Indicates Movable Posts.
 For scoring adjustments.

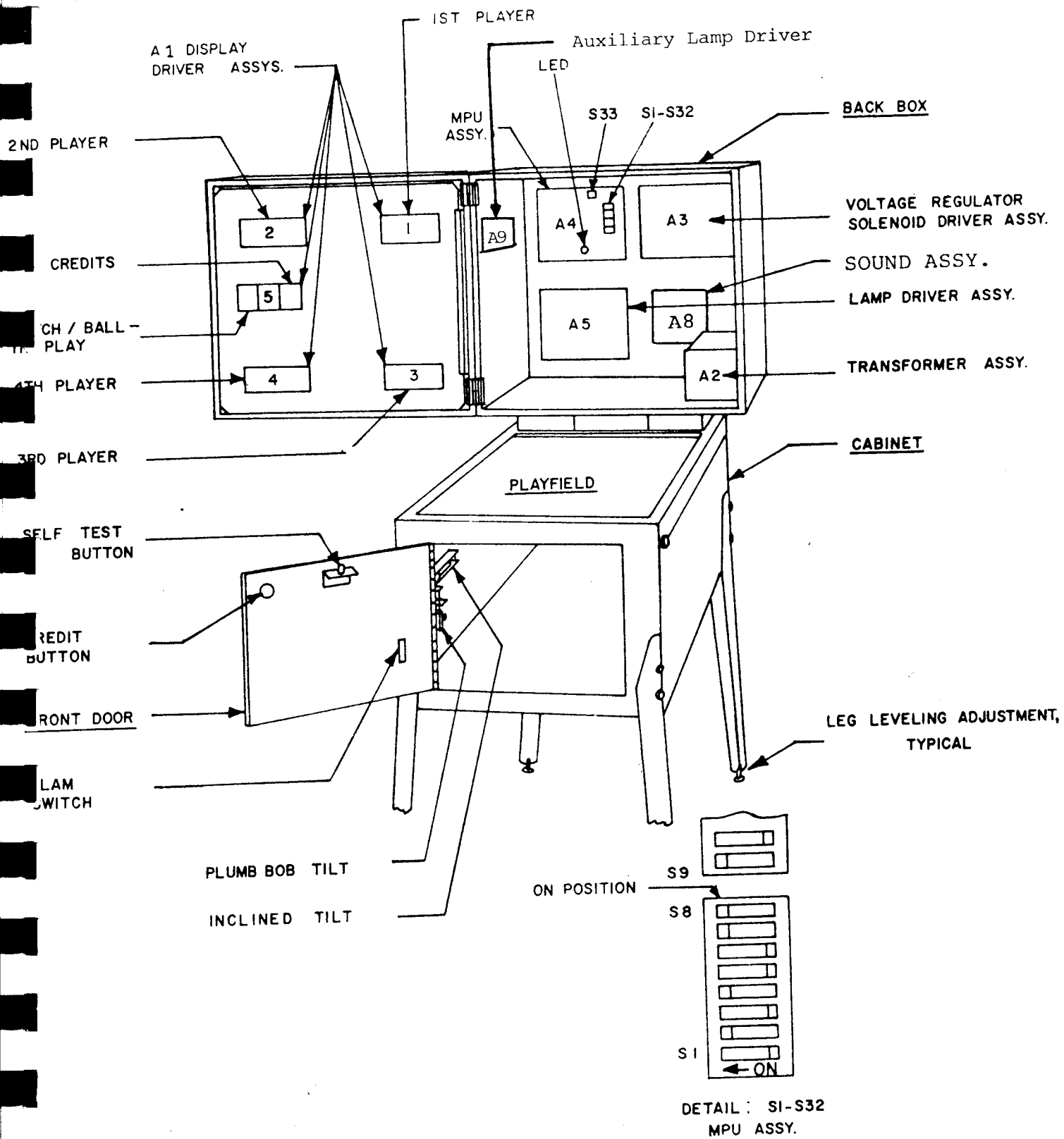


FIGURE III. ELECTRONIC PIN BALL MACHINE

RECOMMENDED

Instruction, Score Cards and High Score feature settings to be used on FUTURE SPA, #1173.

3-BALL

REPLAYS	
Instruction Card	M-1508-86-E
Score Card	M-1508-86-B
1 Replay at 220,000	
1 Replay at 460,000	
EXTRA BALL	
Instruction Card	M-1508-86-F
Score Card	M-1508-86-MM
1 Extra Ball at 240,000	
1 Extra Ball at 480,000	
1 Extra Ball at 700,000	

5-BALL

REPLAYS	
Instruction Card	M-1508-86-TT
Score Card	M-1508-86-A
1 Replay at 260,000	
1 Replay at 500,000	
EXTRA BALL	
Instruction Card	M-1508-86-F
Score Card	M-1508-86-MM
1 Extra Ball at 240,000	
1 Extra Ball at 480,000	
1 Extra Ball at 700,000	

(ALL PLAYFIELD POSTS IN MEDIUM POSITION)

ADDITIONAL CARDS

REPLAYS

M-1508-H	120,000	360,000	
M-1508-I	140,000	380,000	
M-1508-J	160,000	400,000	
M-1508-K	180,000	420,000	
M-1508-L	200,000	440,000	
M-1508-M	220,000	460,000	
M-1508-N	240,000	480,000	
M-1508-O	260,000	500,000	
M-1508-P	280,000	520,000	
M-1508-Q	300,000	540,000	
M-1508-R	320,000	560,000	
M-1508-S	340,000	580,000	
M-1508-T	360,000	600,000	
M-1508-U	380,000	620,000	
M-1508-V	400,000	640,000	
M-1508-W	420,000	660,000	
M-1508-X	440,000	680,000	
M-1508-Y	460,000	700,000	
M-1508-AA	140,000	430,000	580,000
M-1508-BB	160,000	450,000	600,000
M-1508-CC	180,000	470,000	620,000
M-1508-DD	200,000	490,000	640,000
M-1508-EE	220,000	510,000	660,000
M-1508-FF	240,000	530,000	680,000
M-1508-GG	260,000	550,000	700,000
M-1508-HH	280,000	570,000	720,000
M-1508-II	300,000	590,000	740,000
M-1508-JJ	320,000	610,000	760,000
M-1508-KK	340,000	630,000	780,000
M-1508-LL	360,000	650,000	800,000

EXTRA BALL

M-1508-MM	240,000	480,000	700,000
M-1508-NN	270,000	510,000	730,000
M-1508-OO	300,000	540,000	760,000
M-1508-PP	330,000	570,000	790,000
M-1508-QQ	360,000	600,000	820,000
M-1508-RR	390,000	630,000	850,000
M-1508-SS	420,000	660,000	880,000

INSTRUCTION CARD, NOVELTY

M-1508-86-G

BLANKS (3)

High game to date recommended levels: (reset periodically):

3-Ball	540,000
5-Ball	580,000

**#1173 FUTURE SPA
RECOMMENDED SETTINGS**

		3-BALL	5-BALL
SPECIAL: REPLAY	SW. 6	ON	ON
	SW. 7	ON	ON
OPENS GATE AND 5,000 ARROW LITES	SW. 16	ON	ON
KICK BACK AND DROP TARGET SPOT LITE	SW. 24	ON	OFF
DROP TARGET SPECIAL	SW. 32	OFF	OFF
THUMPER BUMPER 1,000 LITE	SW. 8	ON	OFF

The following chart gives recommendations for 3 typical types of operation.

	3-BALL	5-BALL
REPLAY		
Instruction Card	M-1508-86-E	M-1508-86-TT
Score Card	M-1508-86-B	M-1508-86-A
Major Mode	SW. 6, 7, ON	SW. 6, 7, ON
Match	SW. 28 ON	SW. 28 ON
High Score to Date	SW. 21, 22, ON	SW. 21, 22, ON
X-BALL		
Instruction Card	M-1508-86-F	M-1508-86-F
Score Card	M-1508-86-B w/MM	M-1508-86-A w/MM
Major Mode	SW. 6 OFF	SW. 6 OFF
	SW. 7 ON	SW. 7 ON
Match	SW. 28 OFF	SW. 28 OFF
High Score to Date	SW. 21, 22, OFF	SW. 21, 22, OFF
NOVELTY		
Instruction Card	M-1508-86-G	M-1508-86-G
Major Mode	SW. 6, 7, OFF	SW. 6, 7, OFF
Match	SW. 28 OFF	SW. 28 OFF
High Score to Date	SW. 21, 22, OFF	SW. 21, 22, OFF

**GAME #1173-E FUTURE SPA (Figure V)
SOLENOID IDENTIFICATION TABLE**

Self-Test #	SOLENOID IDENTIFICATION	Self-Test #	SOLENOID IDENTIFICATION
01	OUTHOLE KICKER	08	BOTTOM LEFT THUMPER BUMPER
02	KNOCKER	09	BOTTOM RIGHT THUMPER BUMPER
03	SAUCER	10	LEFT SLINGSHOT
04	LEFT KICKBACK	11	DROP TARGET RESET
05	TOP LEFT THUMPER BUMPER		
06	TOP RIGHT THUMPER BUMPER	12	COIN LOCKOUT DOOR
07	TOP CENTER THUMPER BUMPER	13	K1 RELAY (FLIPPER ENABLE)
		14	GATE

SWITCH ASSEMBLY SELF-TEST DISPLAY NUMBERS

Self-Test #	DESCRIPTION	Self-Test #	DESCRIPTION
01	FIRST DROP TARGET	21	1st "U" ROLLOVER LANE
02	DROP TARGET 2X	22	"F" ROLLOVER LANE
03	DROP TARGET 4X	23	SPA TARGET
04	DROP TARGET 6X	24	SAUCER
05	FUTURITY TARGET	25	FLIPPER FEED LANE
06	CREDIT BUTTON	26	GATE OPEN ARROW LANE
07	TILT (3)	27	LEFT OUTLANE
08	OUTHOLE	28	LEFT KICKBACK
09	COIN III (RIGHT)	29	
10	COIN I (LEFT)	30	
11	COIN II (MIDDLE)	31	
12	RIGHT ROLLOVER BUTTON	32	
13	30-POINT REBOUND (4)	33	
14	RIGHT SPINNER	34	
15	LEFT SPINNER	35	LEFT SLINGSHOT
16	SLAM (2)	36	BOTTOM RIGHT THUMPER BUMPER
17	"E" ROLLOVER LANE	37	BOTTOM LEFT THUMPER BUMPER
18	"R" ROLLOVER LANE	38	TOP CENTER THUMPER BUMPER
19	2nd "U" ROLLOVER LANE	39	TOP RIGHT THUMPER BUMPER
20	"T" ROLLOVER LANE	40	TOP LEFT THUMPER BUMPER

NOTE: SLINGSHOT & THUMPER BUMPER COILS WILL BE ENERGIZED WHEN SWITCH IS MADE.

#1173 FUTURE SPA

○ INDICATES SWITCH ASSEMBLY
IDENTIFICATION NUMBERS.
NOTE: CABINET: 07, 16
DOOR: 06, 09,
10, 11, 16

□ INDICATES SOLENOID
IDENTIFICATION NUMBERS.
NOTE: DOOR: 12
BACKBOX: 13
CABINET: 02

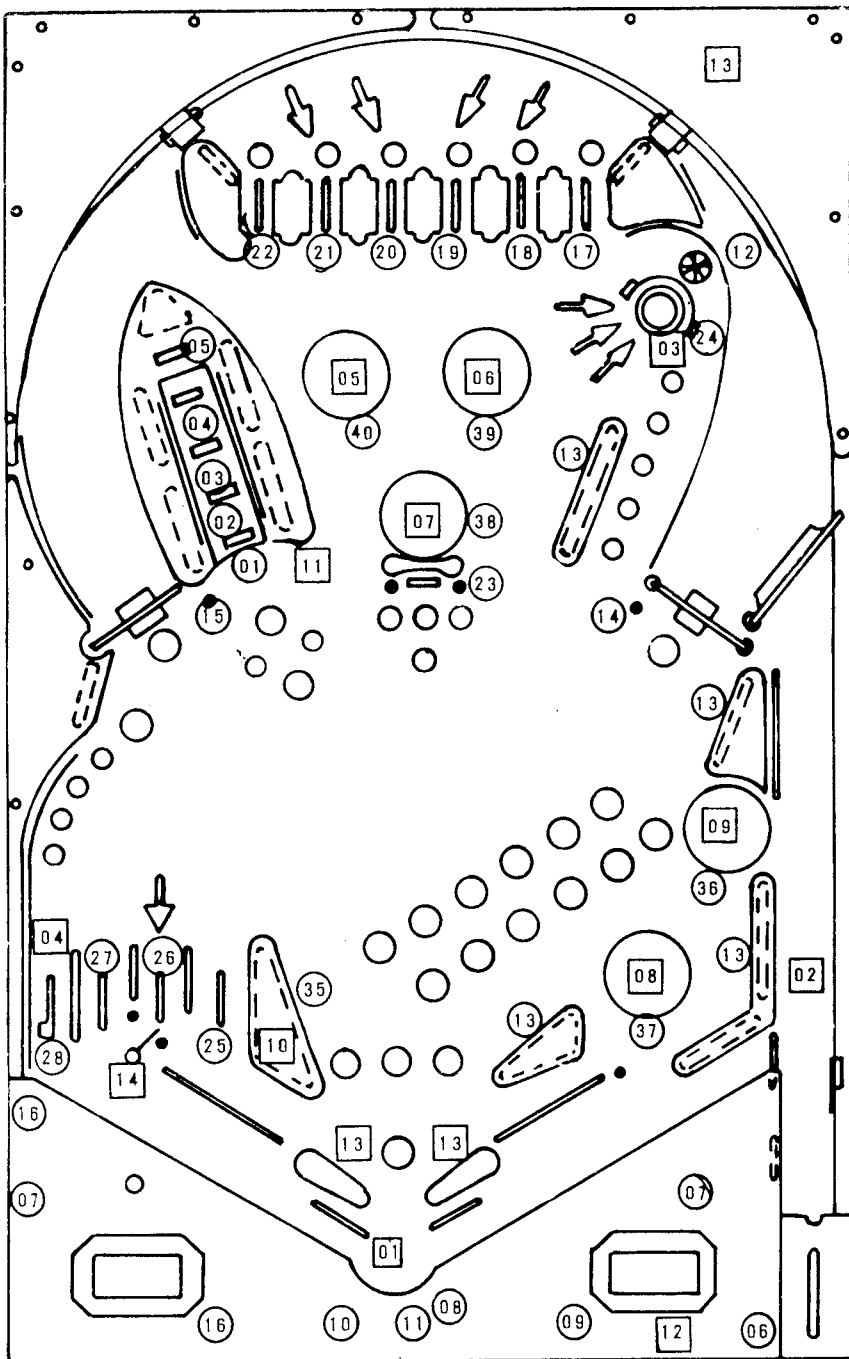


FIGURE V

**XI. PARTS LIST
#1173 FUTURE SPA**

MISCELLANEOUS	PART NUMBER
Transformer (Domestic or Export)	E-122-131
Bulbs, #44	E-125-22
Fuse, 1 Amp. 3 AG Slow Blow (Playfield Solenoid Protection)	E-133-44

ASSEMBLY COILS	
Coin Lockout	FO-36-7000
Flipper (2)	AQ-25-500/ 34-4500
Knocker	AR-26-1200
Outhole Kicker	AN-26-1200
Thumper-Bumper (5)	AN-26-1200
Sling-Shot	AN-26-1200
Drop Target Reset	NO-26-1900
Saucer (1)	AO-27-1300
Left Kickback	AN-26-1200
Gate	GA-34-4000

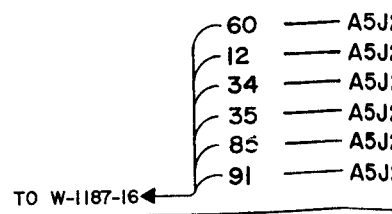
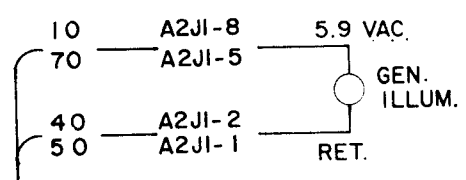
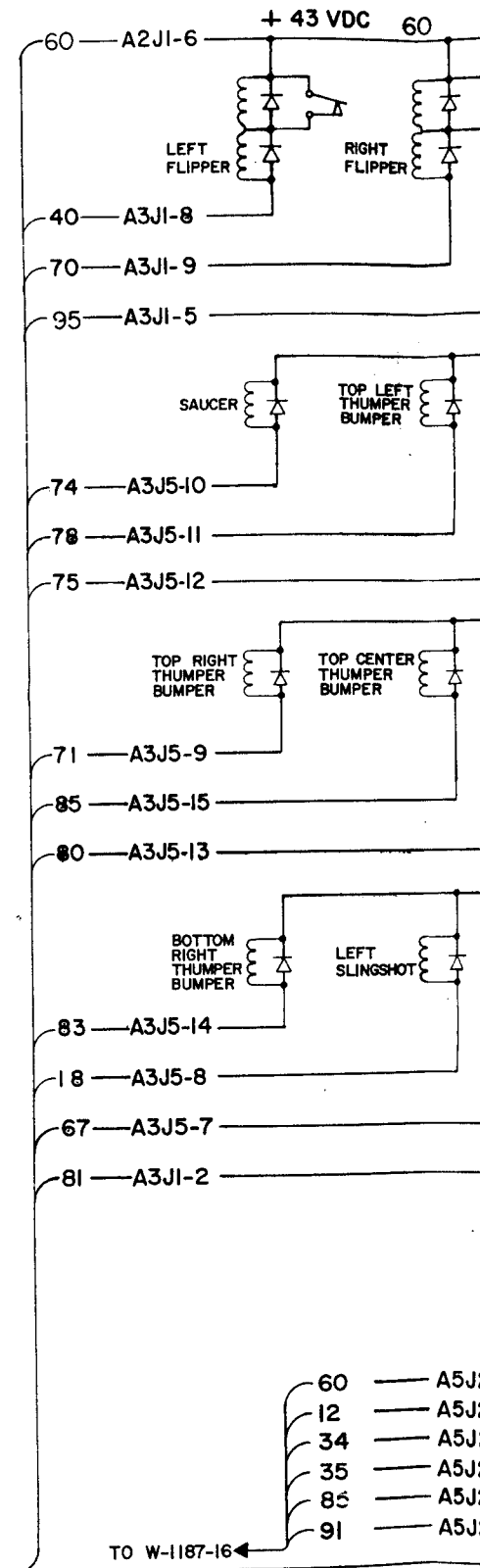
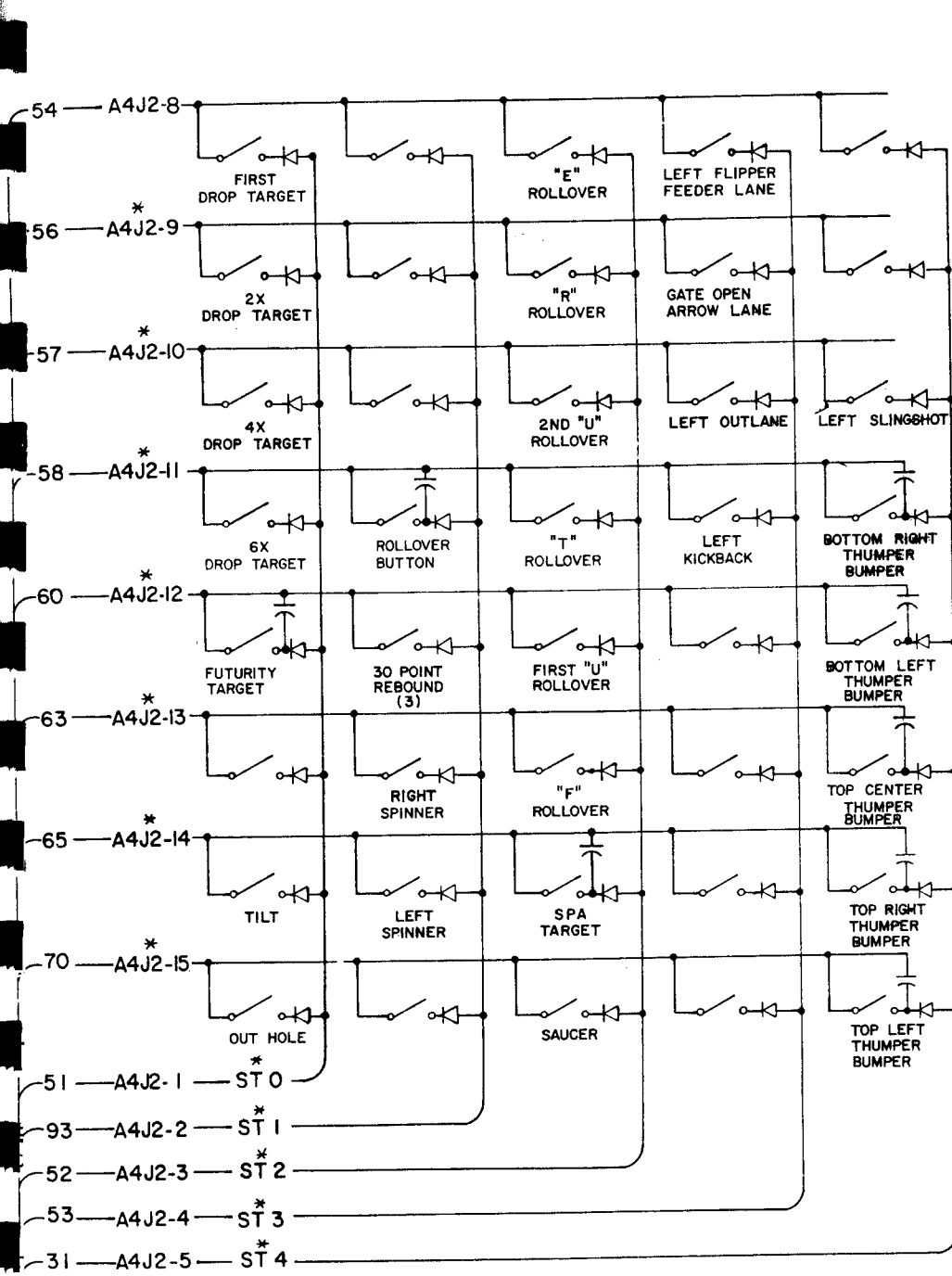
PLAYFIELD PARTS See Figure II

MODULES	
Lamp Driver A5	AS-2518-23
Display Driver A1 (5 used)	AS-2518-21
Solenoid Driver/Voltage Regulator A3	AS-2518-22
MPU A4	AS-2962-14
Transformer & Rectifier A2	AS-2877-3
Rectifier Board (Part of A2)	AS-2518-49
Sound	AS-3022-1
Auxiliary Lamp Driver A9	AS-2518-43

REPAIRS PROCEDURES/AIDS	
Module & Component Replacement	F.O.560-1
AID (Assistance in Diagnostics)	
Kit, used with F.O.560-1	KIT #485-1

MODULE COMPONENTS
SEE MODULE PARTS LIST

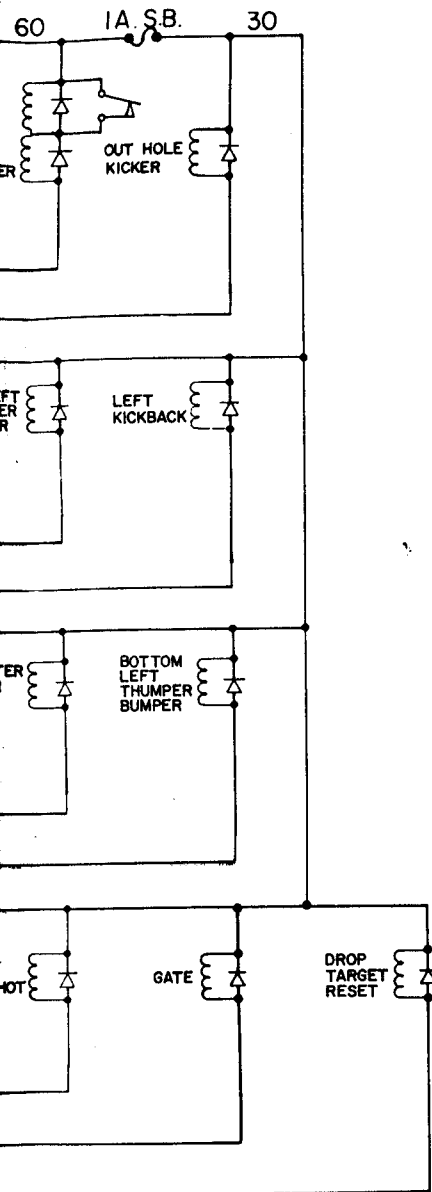
MODULE COMPONENT STARTER KITS
(Each Kit contains an assortment of the most needed electronic parts for use in Module repair.)
Kit #558—For Rectifier Board (Part of A2)
Kit #503—For MPU Board A4 (Less Memory U1-U6)
Kit #492—For Solenoid Driver/Voltage Regulator A3
Kit #493—For Display Driver A1
Kit #494—For Lamp Driver A5
Kit #559—For Sound A8



PLAYFIELD A6

NOTES

1. INDICATES NOT USED
2. N/U = NOT USED ON PLAYFIELD
3. * INDICATES AID TEST POINT
4. ALL COIL DIODES ARE IN4004 (E-587-6) SWITCH DIODES ARE IN 414
- ALL CAPACITORS ARE .05 MFD. (E-586-80)



- A5J2-1 DROP TARGET SPOT LETTER
- A5J2-14 10K ROLLOVER BUTTON
- A5J2-16 2K ROLLOVER BUTTON
- A5J2-20 4K ROLLOVER BUTTON
- A5J2-6 6K ROLLOVER BUTTON
- A5J2-7 8K ROLLOVER BUTTON

- 58 — A5J1-18 CENTER TARGET "S"
- 60 — A5J1-19 FIRST "U" ROLLOVER
- 57 — A5J1-17 "E" ROLLOVER
- 56 — A5J1-23 LOWER "S"
- 54 — A5J1-14 LOWER FIRST "U"
- 13 — A5J1-15 LOWER "E"
- 12 — A5J1-16 KICKBACK 3K
- 78 — A5J1-28 SAUCER 3K
- 50 — A5J1-24 "R" ROLLOVER ARROW
- 90 — A5J1-25 DROP TARGET 20K
- 91 — A5J1-26 N/U
- 53 — A5J1-27 2X BONUS
- 41 — A5J1-1 CENTER TARGET "P"
- 52 — A5J1-9 "T" ROLLOVER
- 51 — A5J1-8 18K BONUS
- 45 — A5J1-3 LOWER "P"
- 43 — A5J1-2 LOWER "T"
- 23 — A5J1-10 RIGHT SPINNER
- 34 — A5J1-7 KICKBACK 5K
- 25 — A5J1-6 SAUCER 6K
- 48 — A5J1-5 2ND "U" ROLLOVER ARROW
- 65 — A5J1-11 DROP TAR. EXTRA BALL
- 35 — A5J1-4 N/U
- 61 — A5J1-12 4X BONUS
- 96 — A5J1-13 SAUCER 9K

- 38 — A5J3-26 CENTER TARGET "A"
- 36 — A5J3-25 2ND "U" ROLLOVER
- 67 — A5J3-19 36K BONUS
- 27 — A5J3-17 LOWER "A"
- 25 — A5J3-16 LOWER 2ND "U"
- 98 — A5J3-23 LEFT SPINNER
- 40 — A5J3-27 KICKBACK 7K
- 30 — A5J3-21 "T" ROLLOVER ARROW
- 64 — A5J3-20 DROP TARGET SPECIAL
- 23 — A5J3-22 SAME PLAYER S. A.
- 72 — A5J3-24 6X BONUS
- 10 — A5J3-1 "F" ROLLOVER
- 21 — A5J3-12 "R" ROLLOVER
- 53 — A5J3-15 SPA SPECIAL
- 20 — A5J3-11 LOWER "F"
- 15 — A5J3-9 LOWER "R"
- 13 — A5J3-13 CREDIT INDICATOR
- 14 — A5J3-4 KICKBACK 9K
- 95 — A5J3-2 BOTTOM LEFT T. B.
- 91 — A5J3-10 FIRST "U" ROLLOVER ARROW
- 56 — A5J3-18 S-P-A 5K
- 81 — A5J3-3 BOTTOM GATE OPEN ARROW
- 84 — A5J3-14 KICKBACK SPOTS LETTER
- 20 — A2J1-7 FEATURE LAMP BUS

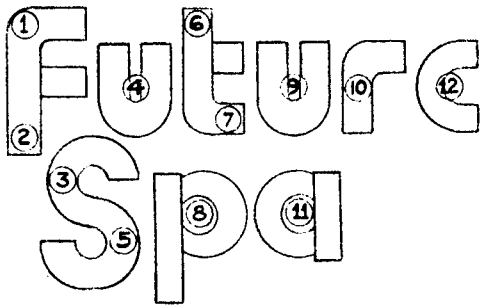
5.4 VDC

IN 4148, (E-587-14)

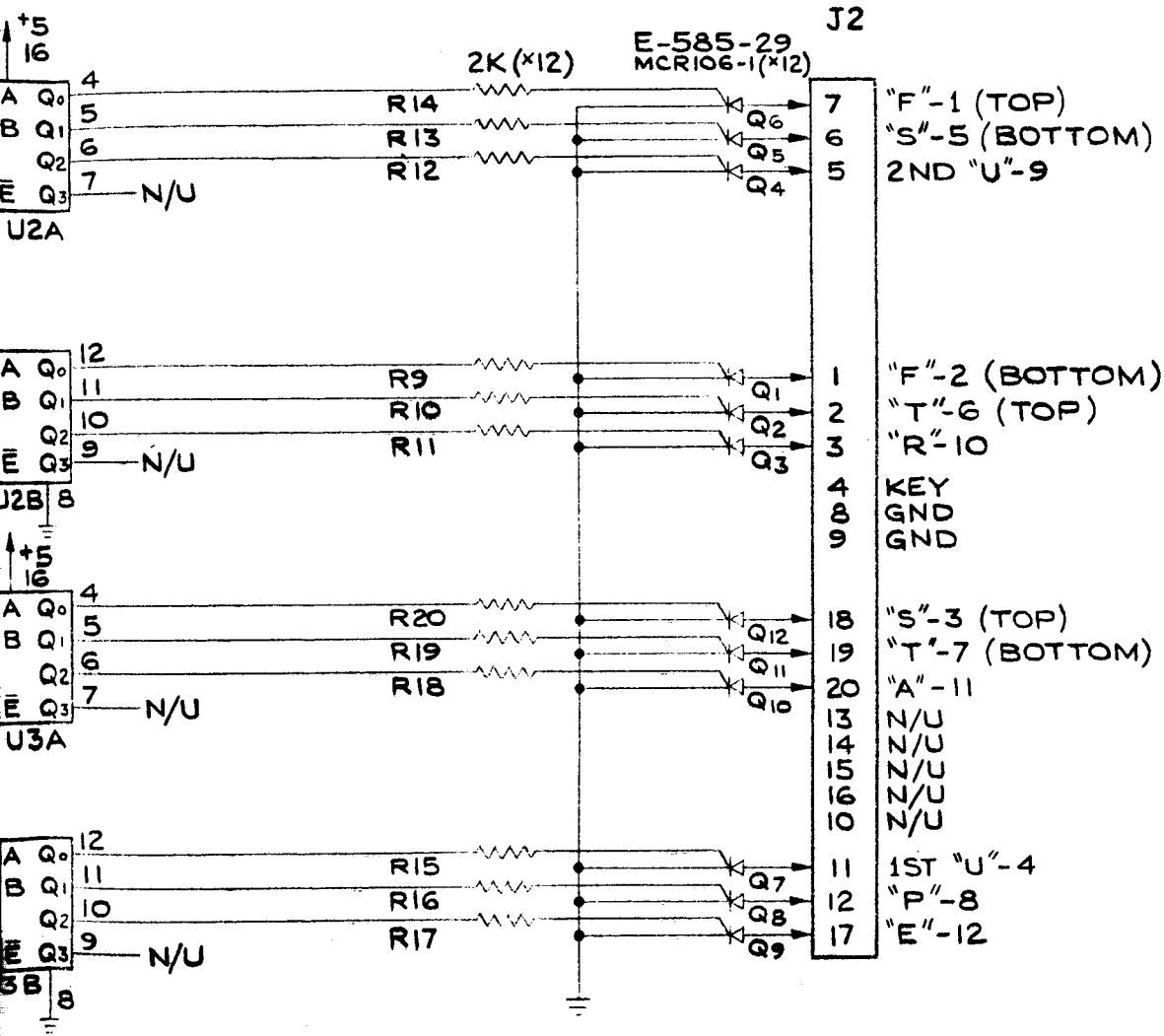
<p>REMOVE ALL BURRS</p> <p>TOLERANCES ON DIMENSIONS UNLESS OTHERWISE SPECIFIED</p> <p>FRACTIONS - 1/64</p> <p>DECIMALS - .005</p> <p>ANGLES - 1°</p> <p>DO NOT SCALE DRAWING</p>				<p>DR BY DATE</p> <p>E. V. 10-6-79</p> <p>CK BY DATE</p>		<p>Bally MANUFACTURING CORP.</p> <p>2640 BELMONT AVENUE</p> <p>CHICAGO, ILLINOIS 1173</p>	
<p>AP'D BY DATE</p> <p>AP'D BY DATE</p> <p>FINISH:</p>				<p>PRINT CONTROL</p>		<p>TOTAL SCALE</p>	
<p>HARDENING</p>				<p>NAME</p> <p>SWITCH MATRIX</p>		<p>ASSEM NO. USED ON W</p>	
<p>LET. CHANGE DATE BY CK</p>				<p>MATERIAL</p> <p>FUTURE SPA</p>		<p>PART NO</p> <p>W-1192-16c</p>	

BULB CHART (INSERT)

G PART NO. W-1207-1



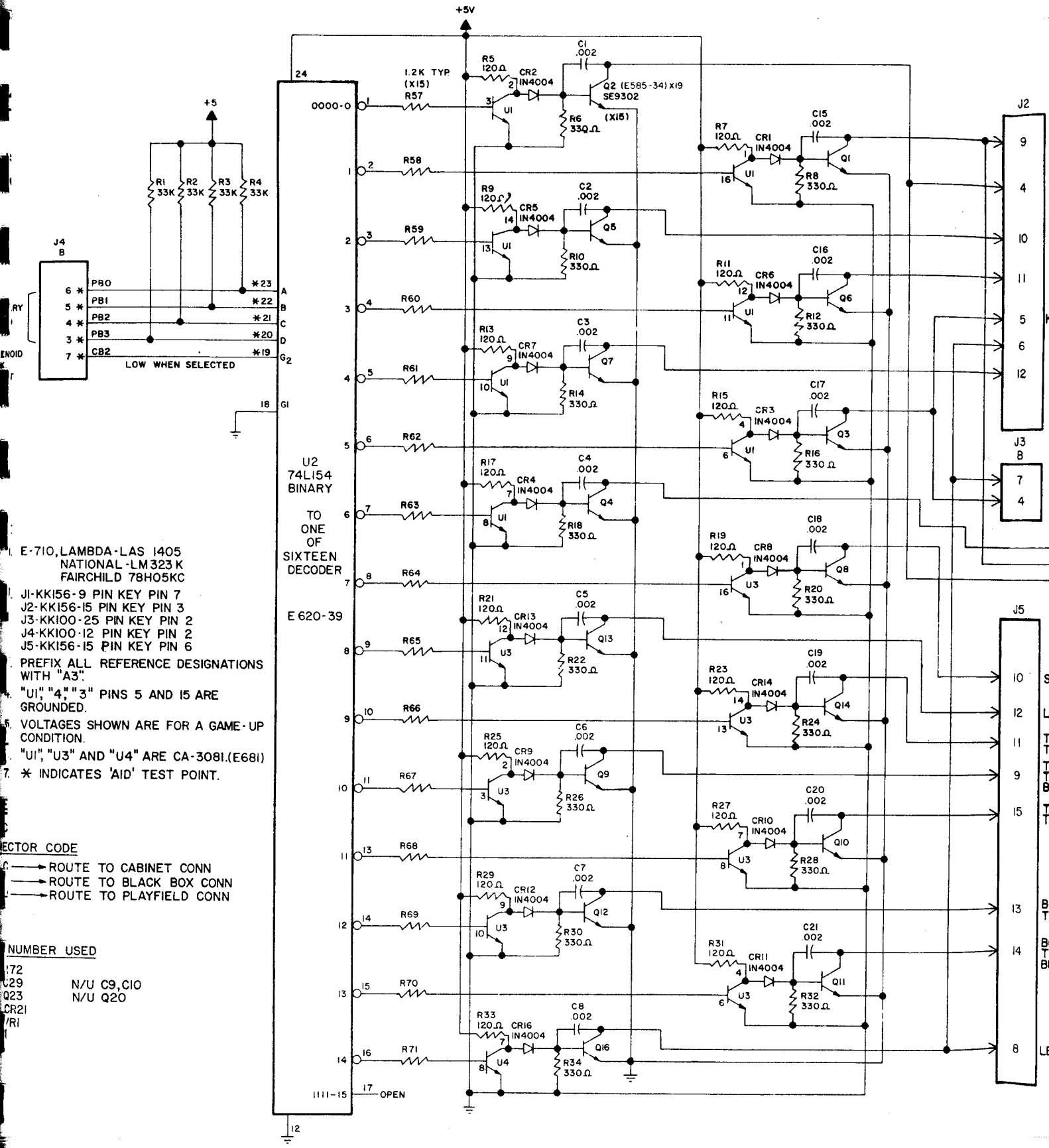
-620-84
MC
#5558



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REMOVE ALL BURRS TOLERANCES ON DIMENSIONS UNLESS OTHERWISE SPECIFIED FRACTIONS ± .008 DECIMALS ± .003 EXCEPT HOLE DIA'S ANGLES ± 1/2° DO NOT SCALE DRAWING	DR. BY E.V.	DATE 9-19-79	Bally MANUFACTURING CORP. 2640 BELMONT AVENUE CHICAGO, ILLINOIS # 1173		
	CHK. BY	DATE			
	AP'D BY	DATE	PRINT CONTROL	NAME (A9) AUXILIARY LAMP DRIVER BOARD ASSEM. NO. USED SCALE	
	AP'D BY	DATE			
FINISH:	MATERIAL		PART NO. W-1207-1		
HARDENING:	CODE				

CHANGE DATE BY



E-710, LAMBDA-LAS 1405
 NATIONAL -LM323 K
 FAIRCHILD 78H05K

- J1-KK156-9 PIN KEY PIN 7
- J2-KK156-15 PIN KEY PIN 3
- J3-KK100-25 PIN KEY PIN 2
- J4-KK100-12 PIN KEY PIN 2
- J5-KK156-15 PIN KEY PIN 6

PREFIX ALL REFERENCE DESIGNATIONS WITH "A3".
 "U1", "U4", "U3" PINS 5 AND 15 ARE GROUNDED.

VOLTAGES SHOWN ARE FOR A GAME-UP CONDITION.

"U1", "U3" AND "U4" ARE CA-3081.(E681)

* INDICATES 'AID' TEST POINT.

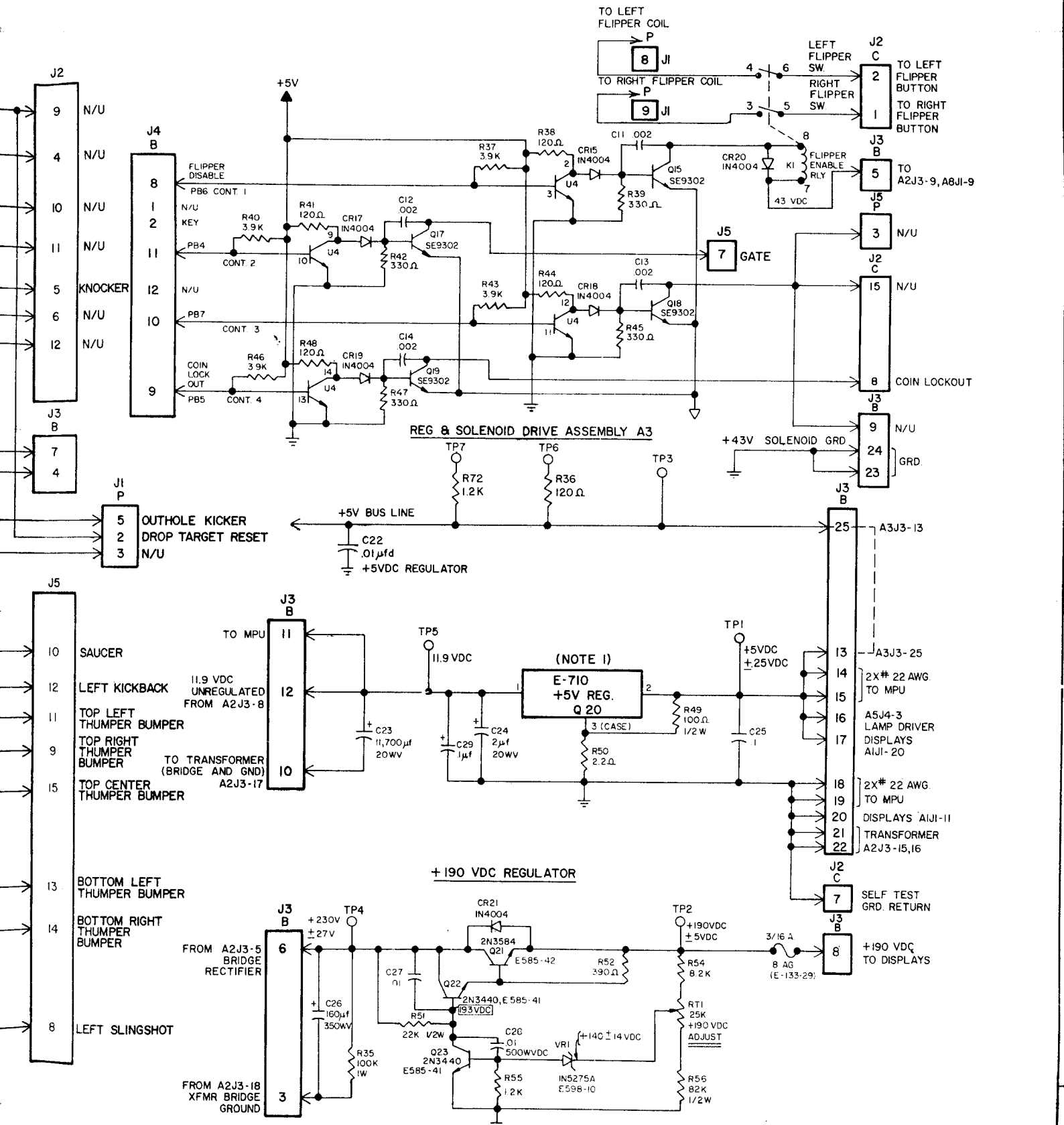
VECTOR CODE

- ROUTE TO CABINET CONN
- ROUTE TO BLACK BOX CONN
- ROUTE TO PLAYFIELD CONN

NUMBER USED

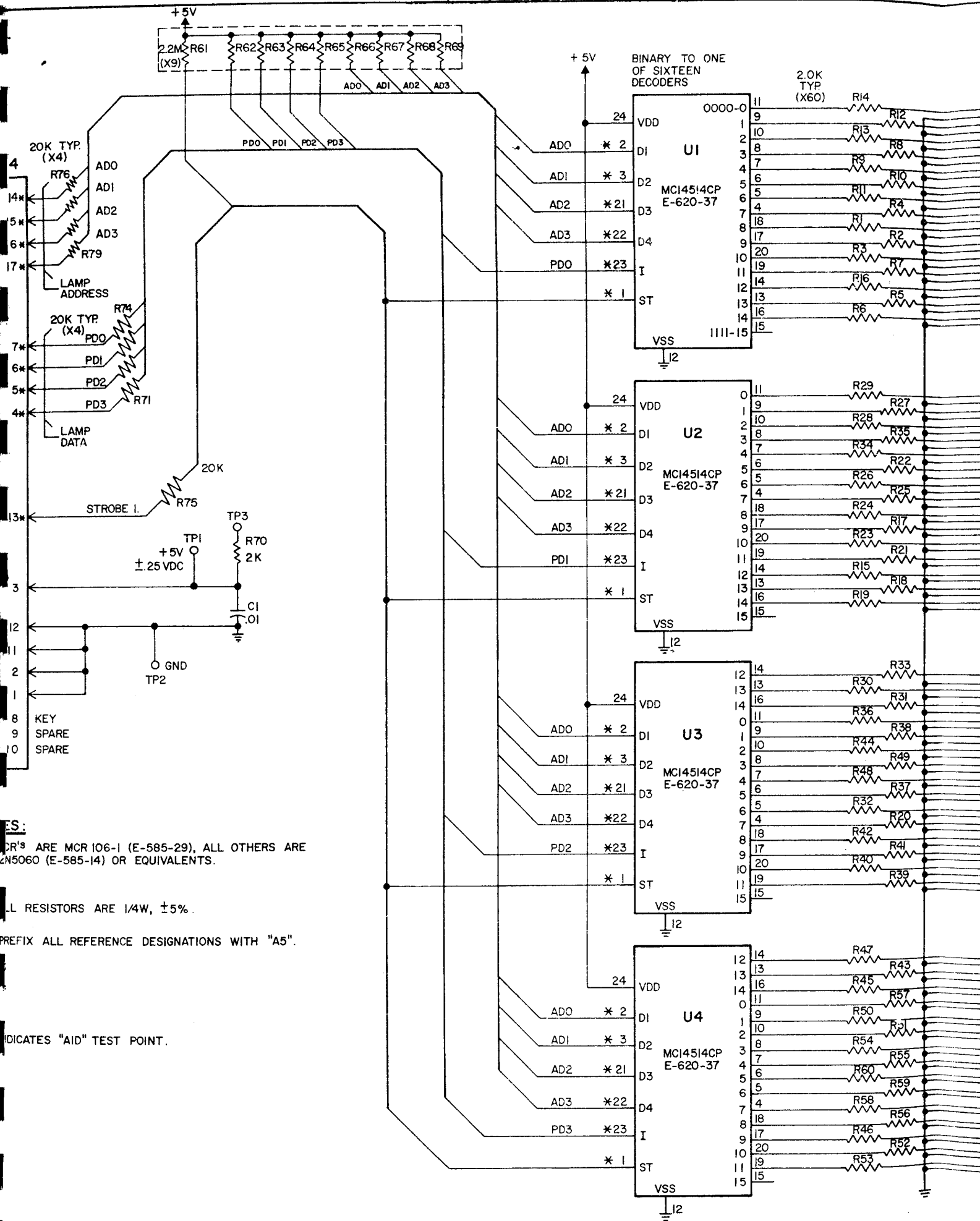
- U72 N/U C9, C10
- U29 N/U Q20
- Q23 N/U Q20
- CR21
- R1

DEPT.	DESCRIPTION	TOOL NO.



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REMOVE ALL BURRS				DR. BY	DATE	Bally MANUFACTURING CORP. 2640 BELMONT AVENUE CHICAGO, ILLINOIS #1173				
TOLERANCES ON DIMENSIONS UNLESS OTHERWISE SPECIFIED FRACTIONS ± 0/8 DECIMALS ± 0.01 EXCEPT HOLE DIA. S ANGLES ± 1°				E. V.	10-2-79					
DO NOT SCALE DRAWING				CK. BY	DATE	PRINT CONTROL	DIE SIZE	C.C.	FT. PER M.	LBS. PER M.
				AP'D BY	DATE	NAME		ASSEM. NO. USED		SCALE
				AP'D BY	DATE	SOLENOID DRIVER VOLTAGE REGULATOR SCHEMATIC				
				FINISH		MATERIAL		FUTURE SPA		PART NO.
				HARDENING		CODE				W-1183-20c
NO.	LET.	CHANGE	DATE	BY						



RES:
 CR'S ARE MCR 106-1 (E-585-29), ALL OTHERS ARE
 2N5060 (E-585-14) OR EQUIVALENTS.

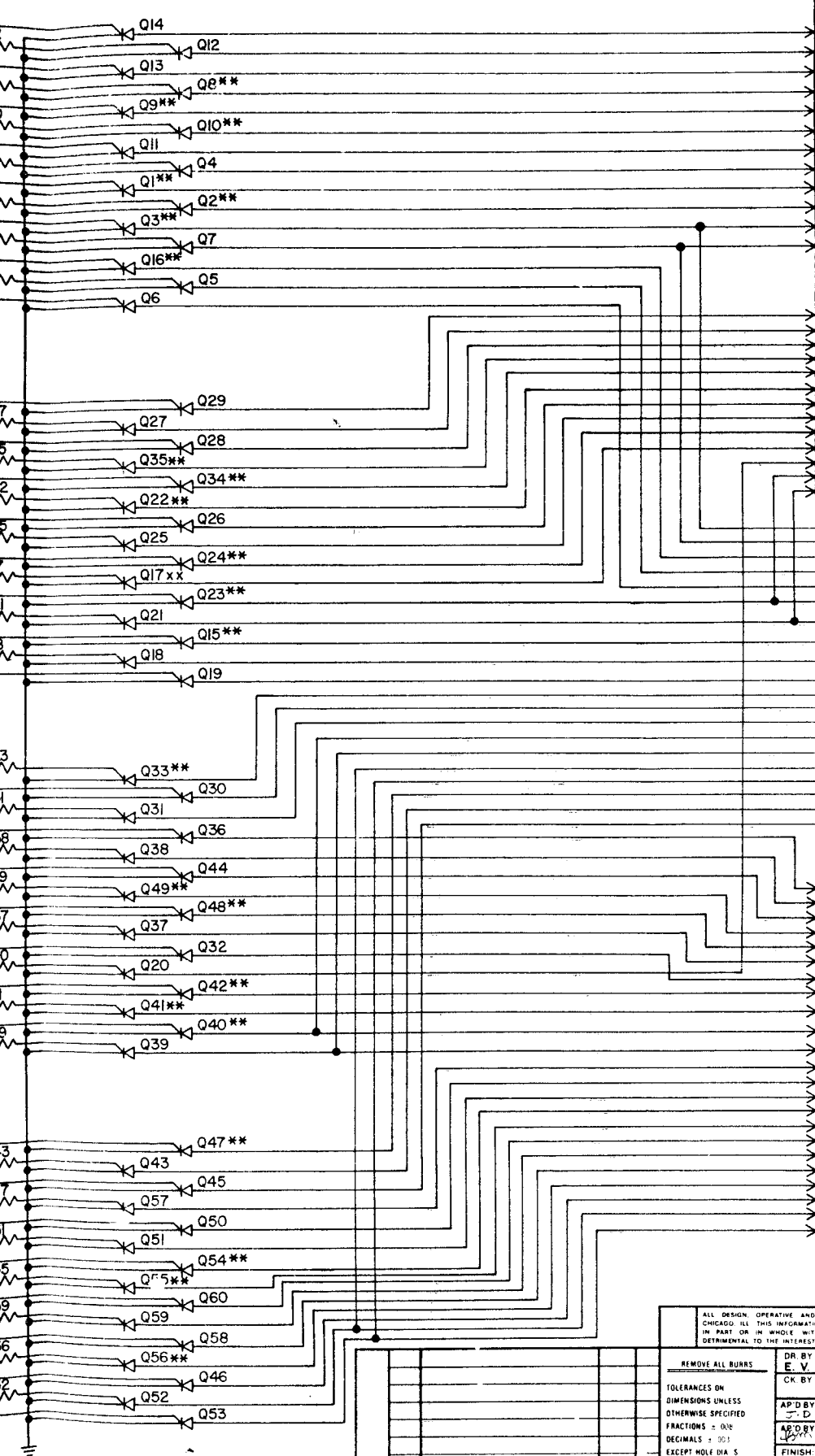
ALL RESISTORS ARE 1/4W, ±5%.

PREFIX ALL REFERENCE DESIGNATIONS WITH "A5".

INDICATES "AID" TEST POINT.

EPT	DESCRIPTION	TOOL NO.

SCR'S



- J1**
- 22 N/U
 - 21 N/U
 - 20 KEY
 - 18 CENTER TARGET "S"
 - 19 FIRST "U" ROLLOVER
 - 17 "E" ROLLOVER
 - 23 LOWER "S"
 - 14 LOWER FIRST "U"
 - 15 LOWER "E"
 - 16 KICKBACK 3K
 - 28 SAUCER 3K
 - 24 "R" ROLLOVER ARROW
 - 25 DROP TARGET 20K
 - 26 N/U
 - 27 2X BONUS
- 1 CENTER TARGET "P"
- 9 "T" ROLLOVER
- 8 18K BONUS
- 3 LOWER "P"
- 2 LOWER "T"
- 10 RIGHT SPINNER
- 7 KICKBACK 5K
- 6 SAUCER 6K
- 5 2ND "U" ROLLOVER ARROW
- 11 DROP TARGET EXTRA BALL
- 13 SAUCER 9K
- 4 N/U
- 12 4X BONUS

- J2**
- 21 SHOOT AGAIN
 - 13 N/U
 - 22 BALL IN PLAY
 - 16 2K ROLLOVER BUTTON
 - 14 10K ROLLOVER BUTTON
 - 8 MATCH
 - 12 N/U
 - 23 HIGH SCORE TO DATE
 - 20 4K ROLLOVER BUTTON
 - 15 N/U
 - 6 GAME OVER
 - 6K ROLLOVER BUTTON
 - 2 N/U
 - 9 N/U
 - 4 N/U
 - 5 N/U
 - 3 N/U
 - 10 TILT
 - 7 8K ROLLOVER BUTTON
 - 1 DROP TAR. SPOT LETTERS
 - 17 N/U
 - 18 N/U
 - 9 N/U

- J3**
- 26 CENTER TARGET "A"
 - 25 2ND "U" ROLLOVER
 - 19 36K BONUS
 - 17 LOWER "A"
 - 16 LOWER 2ND "U"
 - 23 LEFT SPINNER
 - 27 KICKBACK 7K
 - 21 "T" ROLLOVER ARROW
 - 20 DROP TARGET SPECIAL
 - 22 SAME PLAYER S. A.
 - 24 6X BONUS
 - 1 "F" ROLLOVER
 - 12 "R" ROLLOVER
 - 15 SPA SPECIAL
 - 11 LOWER "F"
 - 9 LOWER "R"
 - 3 BOTTOM GATE OPEN ARROW
 - 4 KICKBACK 9K
 - 2 BOTTOM LEFT T. B.
 - 10 FIRST "U" ROLLOVER ARROW
 - 18 S-P-A 5K
 - 13 CREDIT INDICATOR
 - 14 KICKBACK SPOTS LETTER
 - 5 N/U
 - 6 N/U
 - 7 N/U
 - 8 KEY
 - 28 N/U

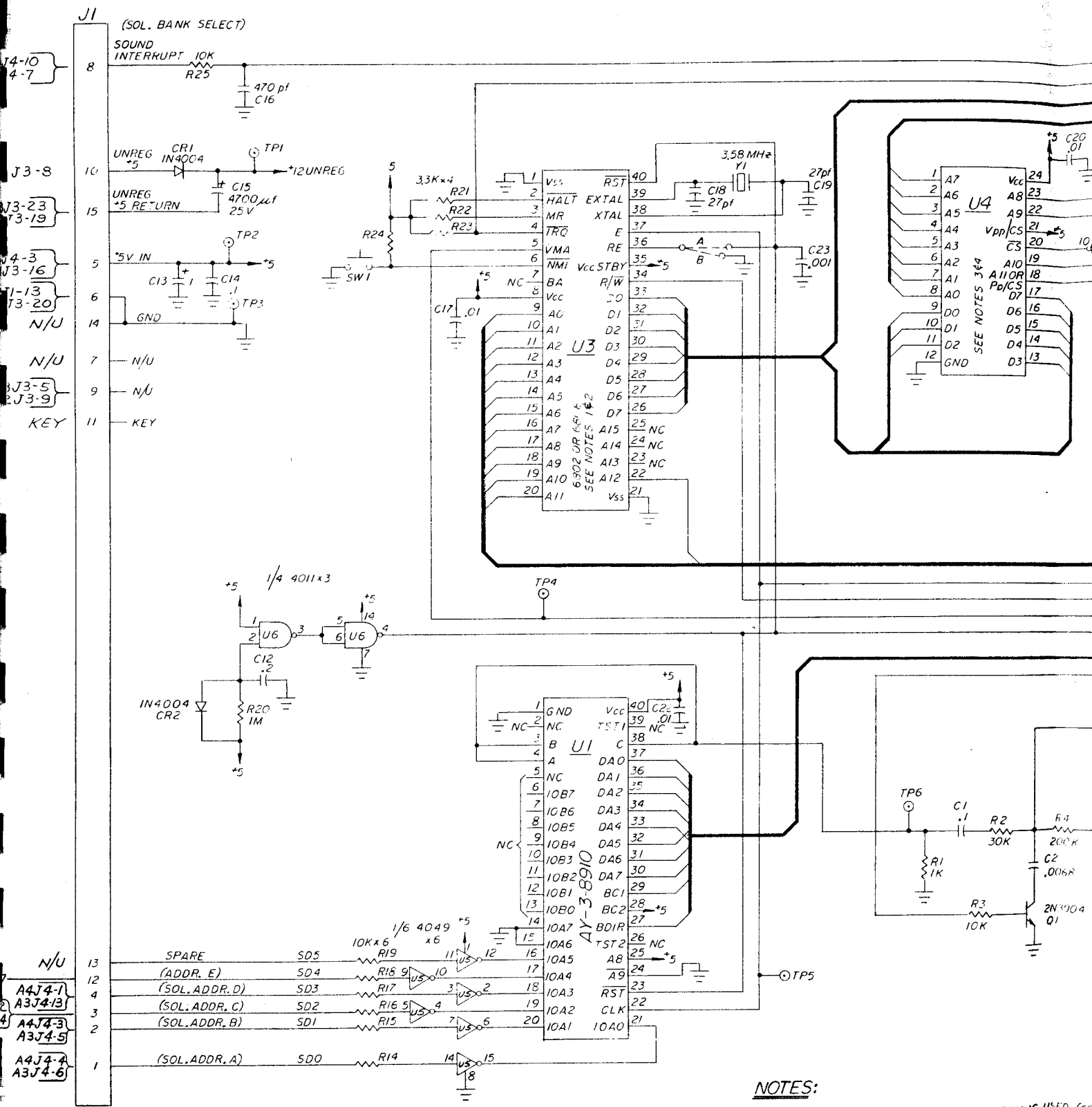
TO PLAYFIELD

TO BACK BOX

TO PLAYFIELD

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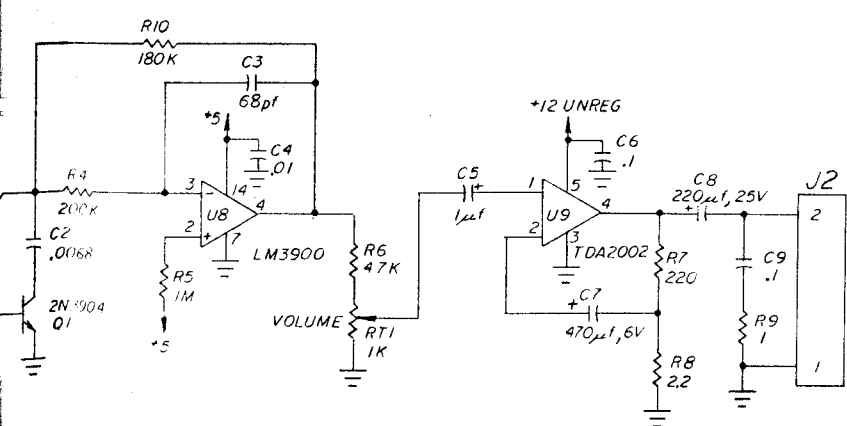
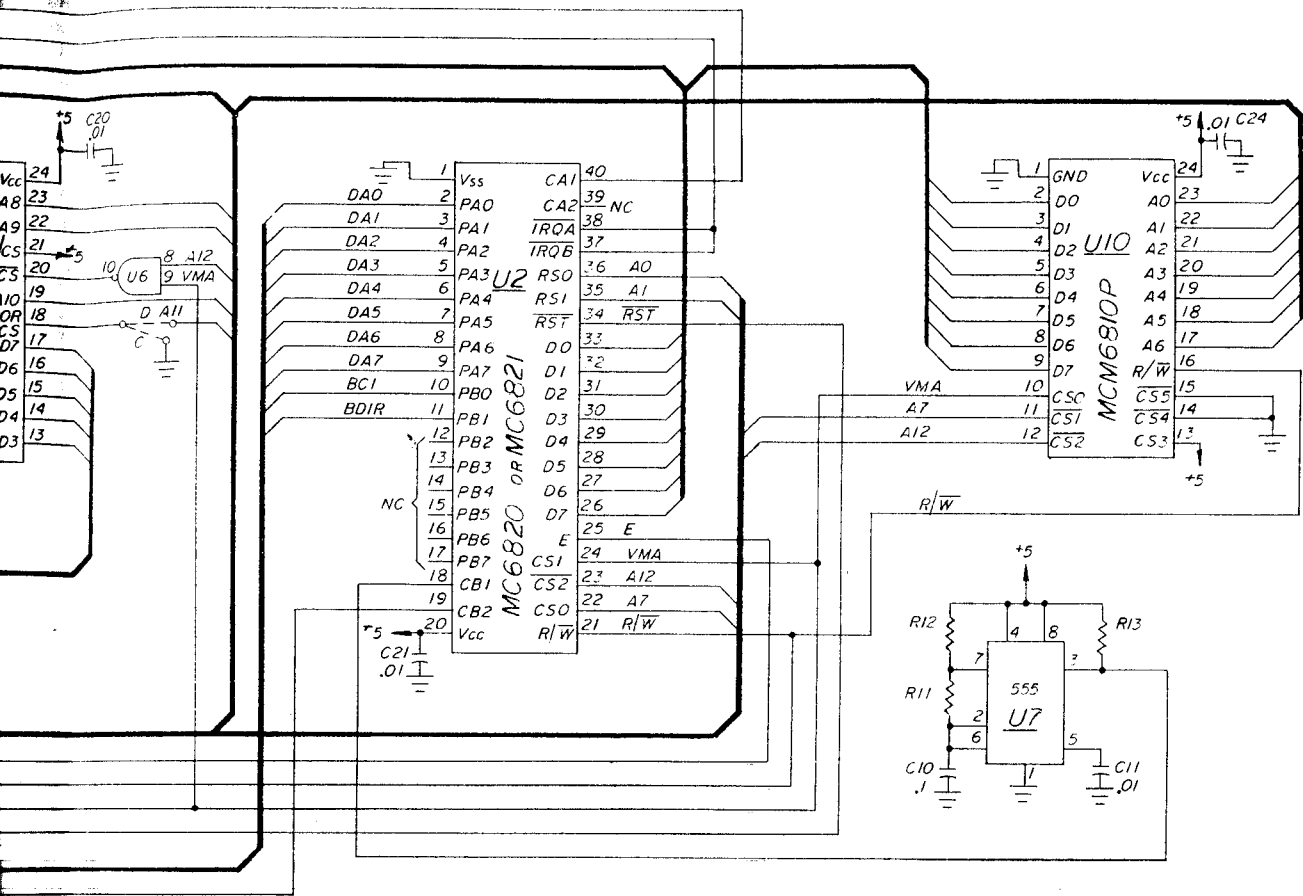
REMOVE ALL BURRS				DR. BY	DATE	Bally MANUFACTURING CORP. 2640 BELMONT AVENUE CHICAGO, ILLINOIS # 1173						
TOLERANCES ON DIMENSIONS UNLESS OTHERWISE SPECIFIED				E. V.	10-3-78							
FRACTIONS - 0/32				CK BY	DATE	AP'D BY	DATE	PRINT CONTROL	DIE SIZE	C.C.	FT. PER M.	LBS. PER M.
DECIMALS - .001						10-5-79	10-5-79					
EXCEPT HOLE DIA'S												
ANGLES - 1:20												
DO NOT SCALE DRAWING						FINISH:	NA 1E				ASSEM NO USED	SCALE
						A5 LAMP DRIVER SCHEMATIC						
						MATERIAL		FUTURE SPA		PART NO.		
						HARDENING:		CODE		W-1182-20c		
NO.	LET.	CHANGE	DATE	BY								



NOTES:

1. USE JUMPER A IF INTERNAL RAM IS USED (6801)
2. " " B " EXTERNAL " " (6802)
3. " " C " 2K ROM (EPROM) " (6801)
4. " " D " 4K " " (6801)
5. U7, R12, R11, R13, C10, C11 NOT USED ON THIS ASSEMBLY
6. UNLESS OTHERWISE INDICATED, ALL RESISTOR VALUES ARE IN OHMS
7. PREFIX ALL REFERENCE DESIGNATIONS WITH A8.

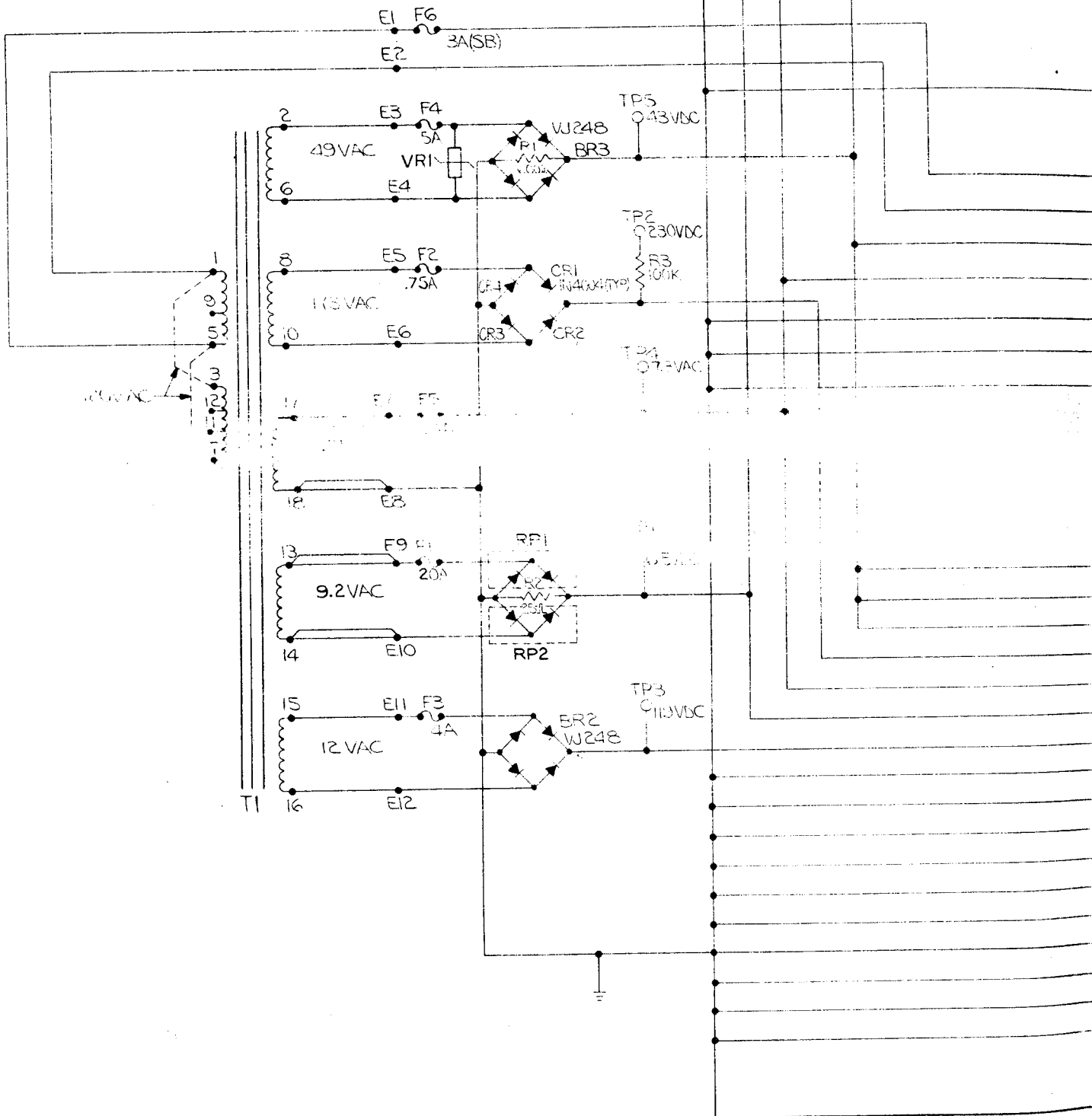
DESCRIPTION	TOOL NO.



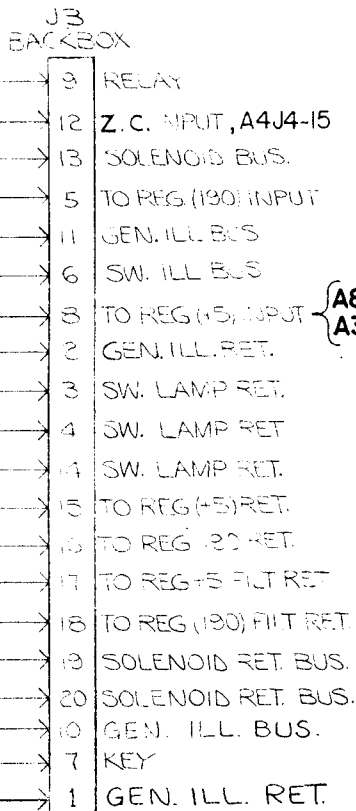
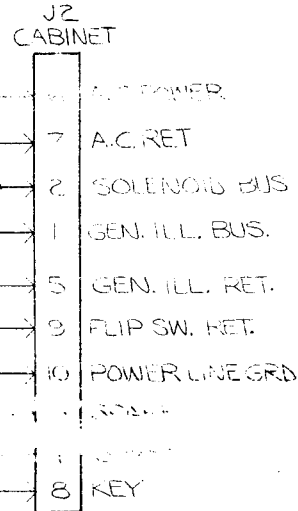
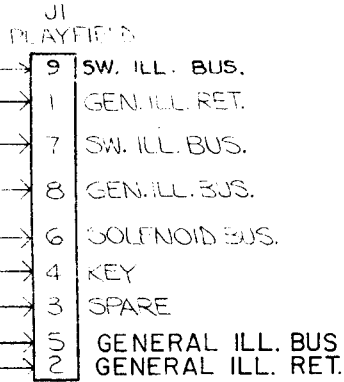
MM IS USED (6802 WITHOUT U10).
 (6808/6810, U10).
 (G1 9316B INTEL 2716 OR EQUIV.).
 (T1 TMS 2532 TMS 4732 OR EQUIV.).
 ON THIS ASSEMBLY,
 ALL RESISTOR VALUES ARE IN OHMS,
 MMF'S.
 TATIONS WITH A8.

REMOVE ALL BURRS				DR. BY NRW		DATE 9-3-79		Bally MANUFACTURING CORP. 1173			
TOLERANCES ON DIMENSIONS UNLESS OTHERWISE SPECIFIED				CK. BY DWM		DATE 9-19-79		SEP 23 1979 2640 BELMONT AVENUE CHICAGO, ILLINOIS			
FRACTIONS = 008				APPLY DATE		PRINT CONTROL		DIE SIZE:		C.C. FT. PER M. LBS. PER M.	
DECIMALS = 003				DATE 4-14-79		FINISH:		NAME		ASSEM. NO. USED	
EXCEPT HOLE DIA S				DATE 9/14/79		FINISH:		COMPUTER SOUND MODULE		AS-2518-51	
ANGLES = 1:2"				HARDENING:		MATERIAL		AB SCHEMATIC		SCALE	
DO NOT SCALE DRAWING				DATE		CODE		PART NO.		W-1211 c	
NO.	LET.	CHANGE	DATE	BY							

TRANSFORMER ASSEMBLY A2



DEPT.	DESCRIPTION	TOOL No.
-------	-------------	----------



{ A8J1-10
A3J3-12 } (A)

NOTES:

1. WIRE STRAP TERMINALS TO BE USED PER TABLE 1.
2. VOLTAGES SHOWN ARE FOR GAME IN POWER-UP CONDITION.
3. PREFIX ALL REFERENCE DESIGNATIONS WITH A2.

TABLE 1
WIRE-LINE CONNECTIONS

LINE VOLTAGE VRMS A.C.	STRAP TERMINALS	SUPPLY POWER TO TERMINALS
115	1T03 AND 3T011	1 AND 9
120	1T03 AND 5T07	1 AND 5
220	3T05	1 AND 2
240	3T05	1 AND 7

DIE SIZE — C.C. — FT. PER M — LBS. PER M —

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NO.	LET.	CHANGE	DATE	BY	CK.
1	A	ADDED A8J1-10, A3J3-12	10-1-79	E.V.	AD

REMOVE ALL BURRS

TOLERANCES ON DIMENSIONS UNLESS OTHERWISE SPECIFIED
FRACTIONS ±
DECIMALS ±
ANGLES ±

DO NOT SCALE DRAWING

DR BY DATE
E.V. 1-10-79

CR. BY DATE
J.D. 1-11-79

AP'D BY DATE
J.D. 1-11-79

AP'D BY DATE
E.V. 1-23-79

FINISH: *h*

HARDENING: *h*

Bally MANUFACTURING CORP.
2640 BELMONT AVENUE
CHICAGO, ILLINOIS 1152-E

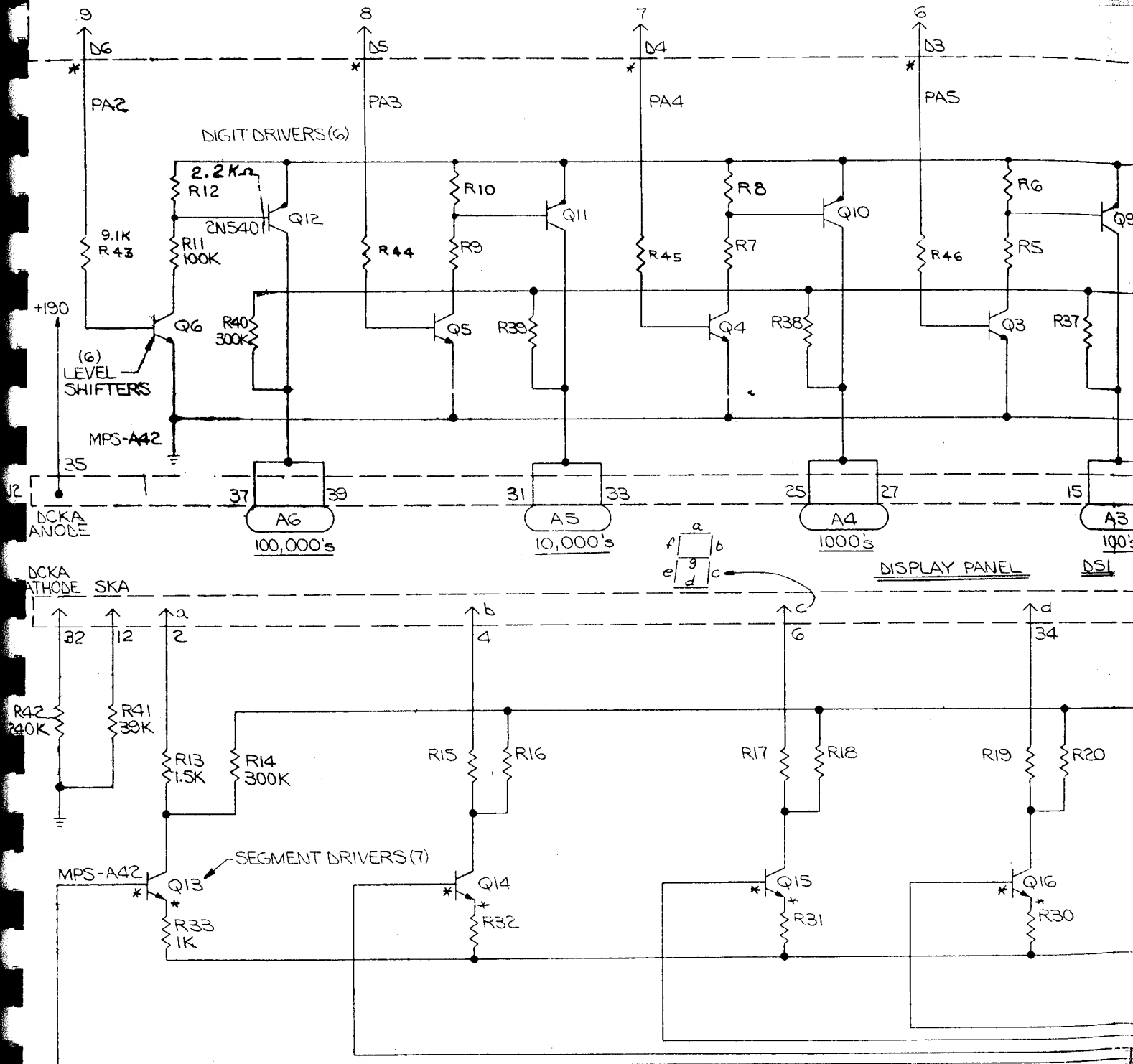
NAME: POWER TRANSFORMER MODULE SCHEMATIC

MATERIAL:

ASSEM. NO. USED ON/W: *h*

PART NO. W-1185-2c

DISPLAY DIGIT ENABLE

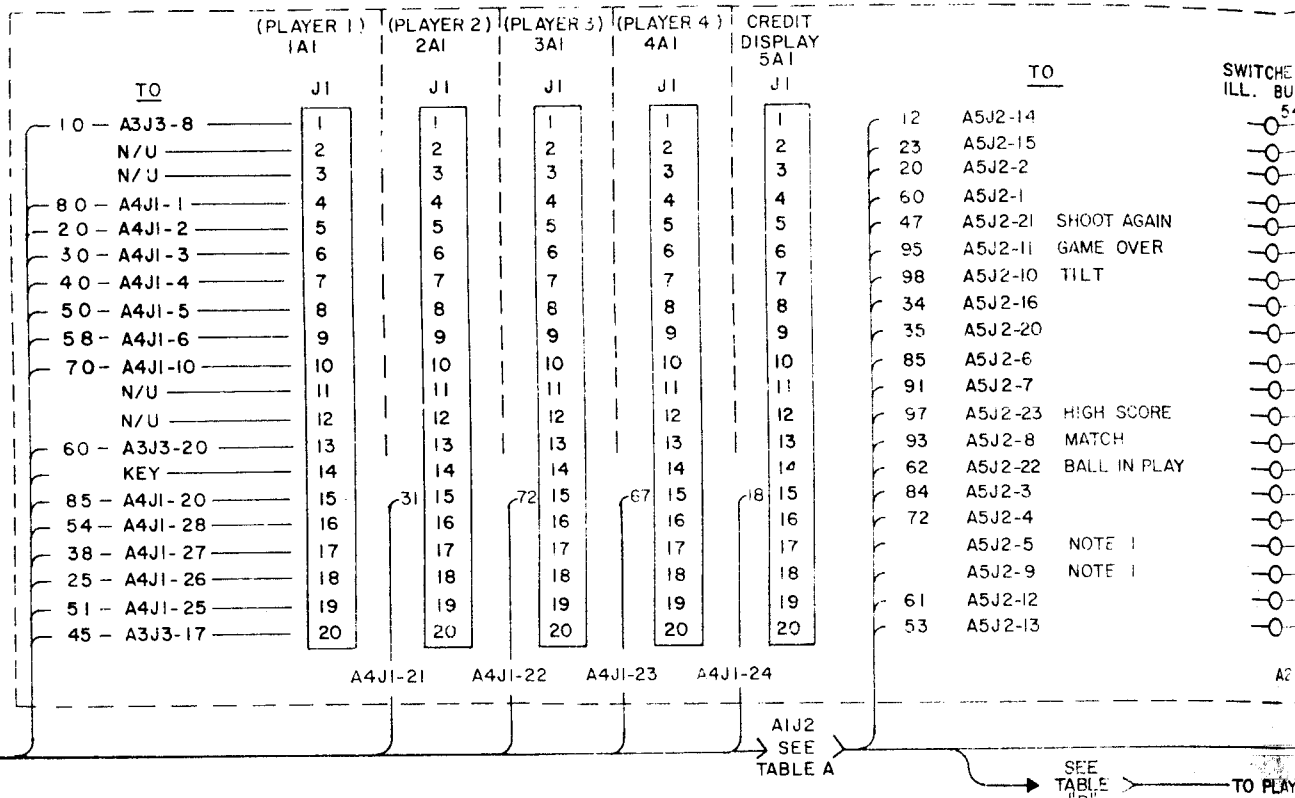


NOTES:

1. UNLESS OTHERWISE SPECIFIED ALL RESISTORS ARE $\pm 5\%$, $1/4W$.
2. PREFIX ALL REFERENCE DESIG. WITH ASSEMBLY REFERENCE DESIG. "A1"
3. * INDICATES 'AID' TEST POINT.

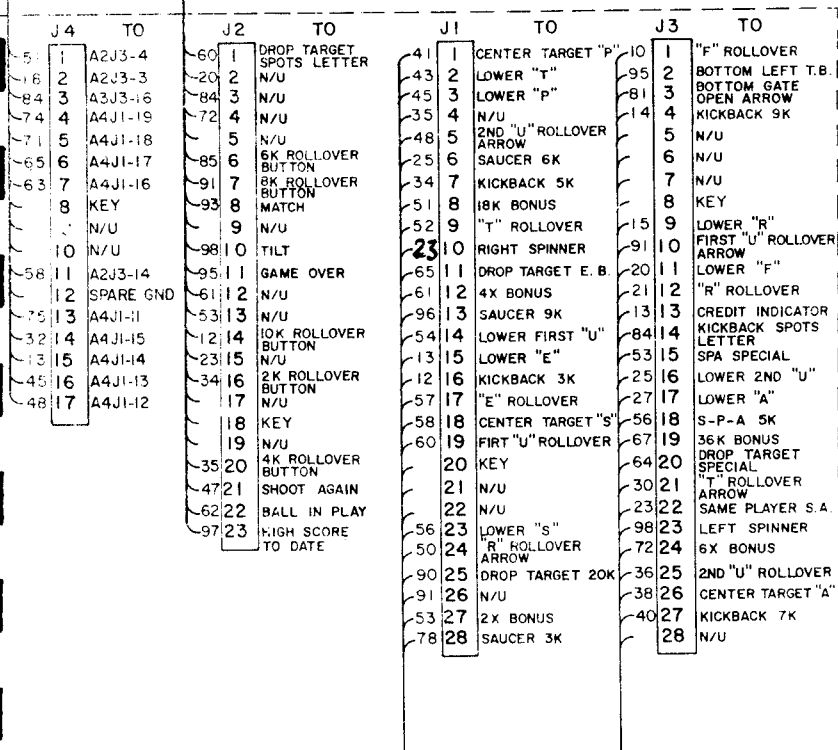
FROM	PIN	WIRE
A2J3-6	1	20
A5J2-14	2	12
A2J3-2	3	50
A2J3-11	4	10
A5J2-23	5	97
A5J2-15	6	23
A5J2-22	7	62
A5J2-8	8	93
A5J2-1	9	60
A5J2-2	10	20
A5J2-11	11	95
A5J2-21	12	47
A5J2-10	13	98
A5J2-7	14	91
A5J2-6	15	85
A5J2-20	16	35
A5J2-16	17	34
A2J3-1	18	40
A2J3-10	19	70
A5J2-13	20	53
A5J2-12	21	61
A5J2-4	22	72
A5J2-3	23	84
	24	

AI INSERT

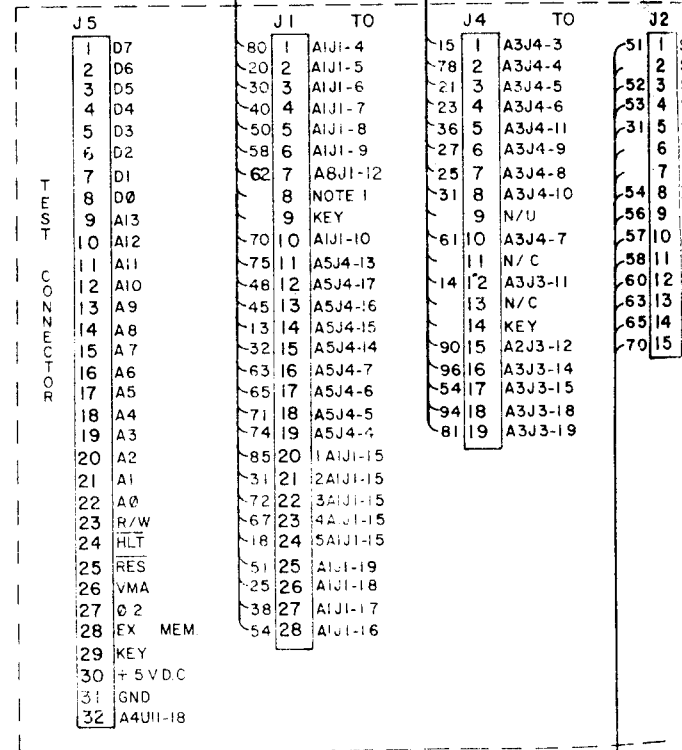


INSERT TO BACK CAB. PLUG

LAMP DRIVER A5



MPU A4



NOTES

1. THESE PINS ARE RESERVED FOR FUTURE USE.
2. WIRE COLORS ARE SHOWN FOR ALL CONNECTOR PINS, SOME WIRES MAY NOT BE USED IN ALL GAMES
3. * INDICATES AID TEST POINT.

TABLE "B"

FROM	TO	WIRE
A5J2-14	1	12
A5J2-16	2	34
A5J2-20	3	35
A5J2-1	4	60
A5J2-6	5	85
A5J2-7	6	91
	7	

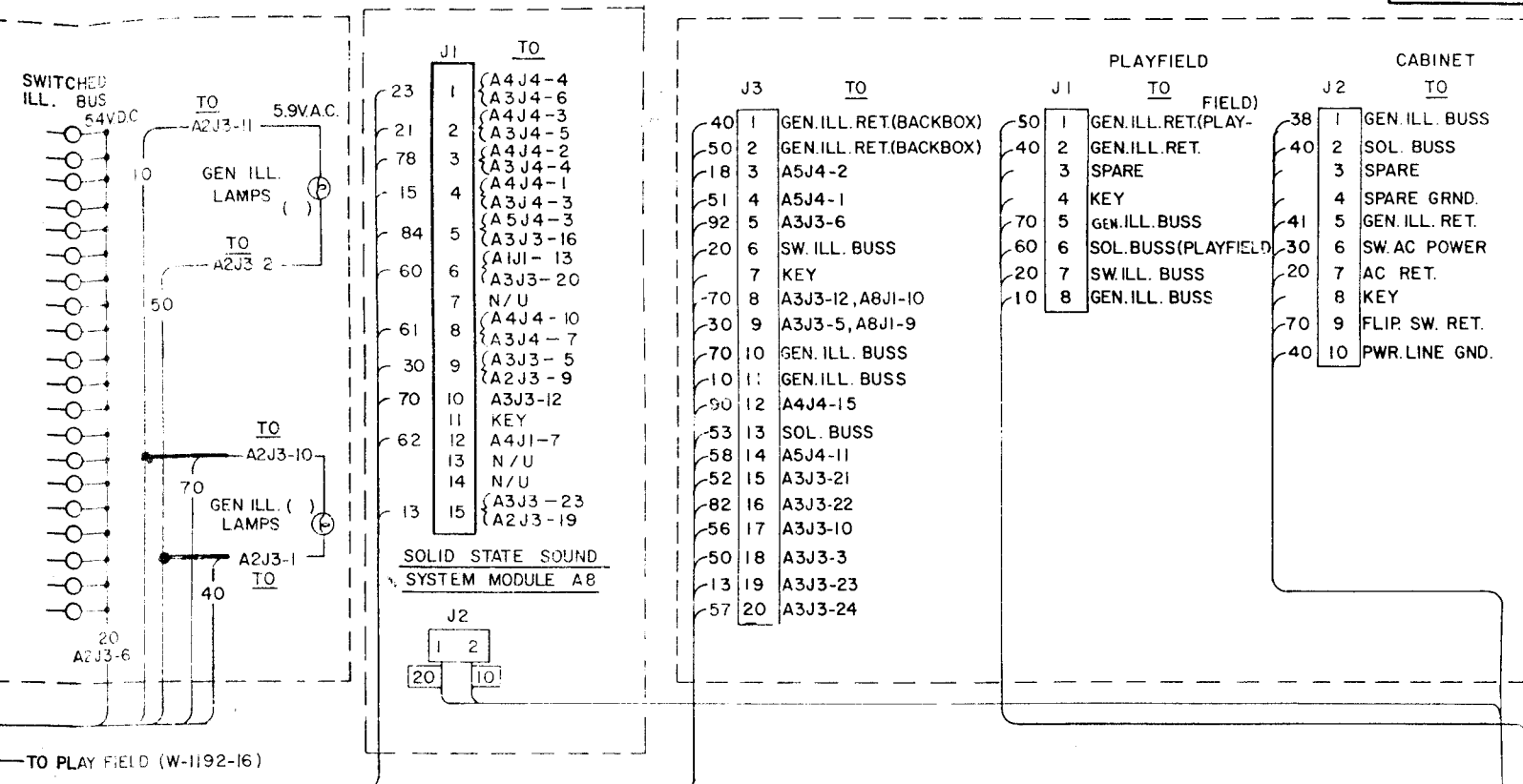
PANEL TO BACK CAB. PLUG

TO CABINET

PLAYFIELD

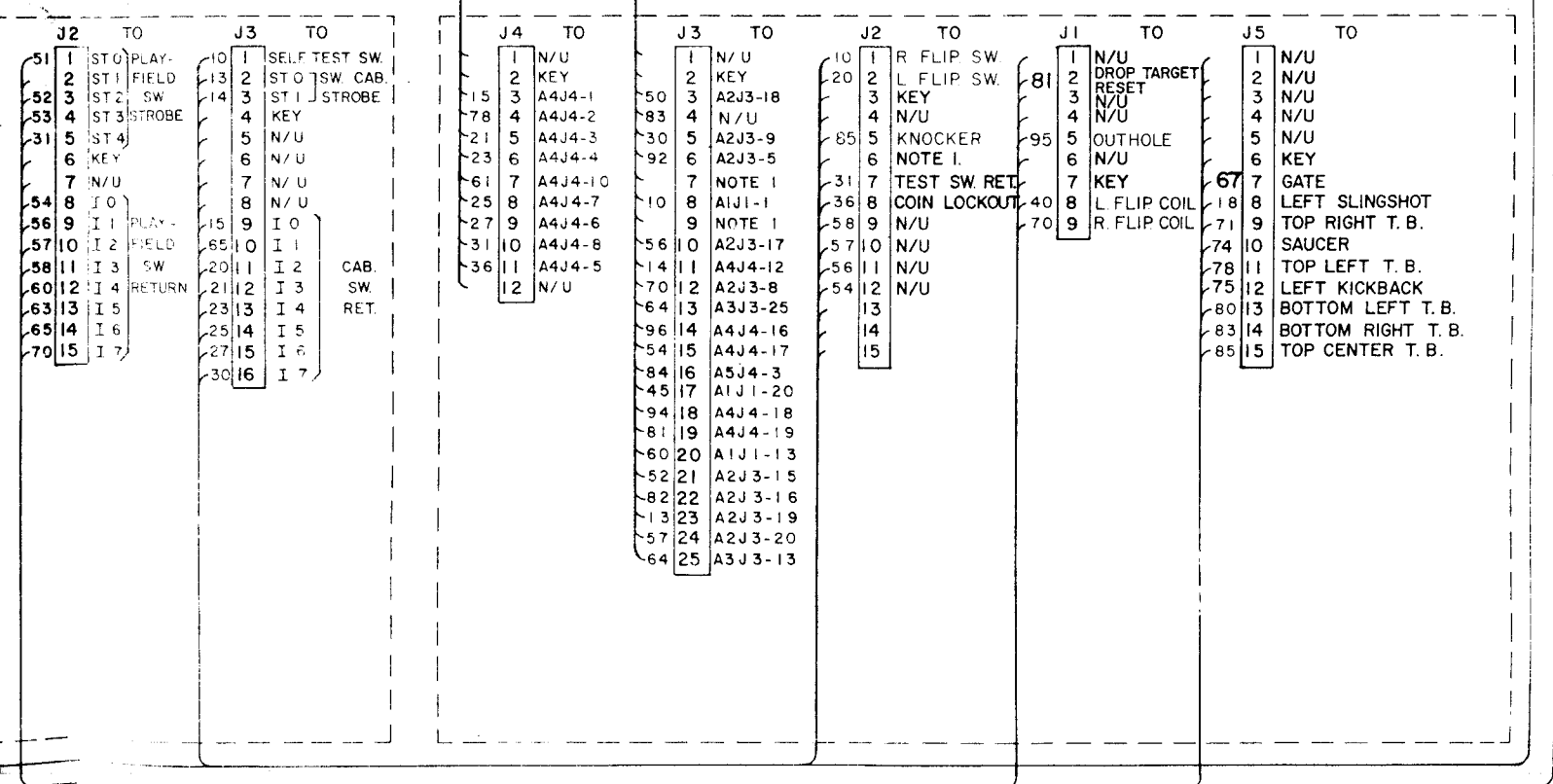
A2 TRANSFORMER

W-1187-16 c



A4

VOLTAGE REGULATOR / SOLENOID DRIVER A3



WIRE COLOR CODE

1 - RED	6 - BROWN
2 - BLUE	7 - ORANGE
3 - V. LOW	8 - BLACK
4 - GREEN	9 - GRAY
5 - WHITE	0 - NO TRACE

REMOVE ALL BURRS

TOLERANCES ON DIMENSIONS UNLESS OTHERWISE SPECIFIED

FRACTIONS - 1/64

DECIMALS - .005

ANGLES - 1

DO NOT SCALE DRAWING

OR BY DATE
E. V. 10.4-79

CR BY DATE

AP'D BY DATE
10.2-79

AP'D BY DATE

FINISH

HARDENING

Bally MANUFACTURING CORP.
2640 BELMONT AVENUE
CHICAGO, ILLINOIS 1173

PRINT CONTACTS

NAME

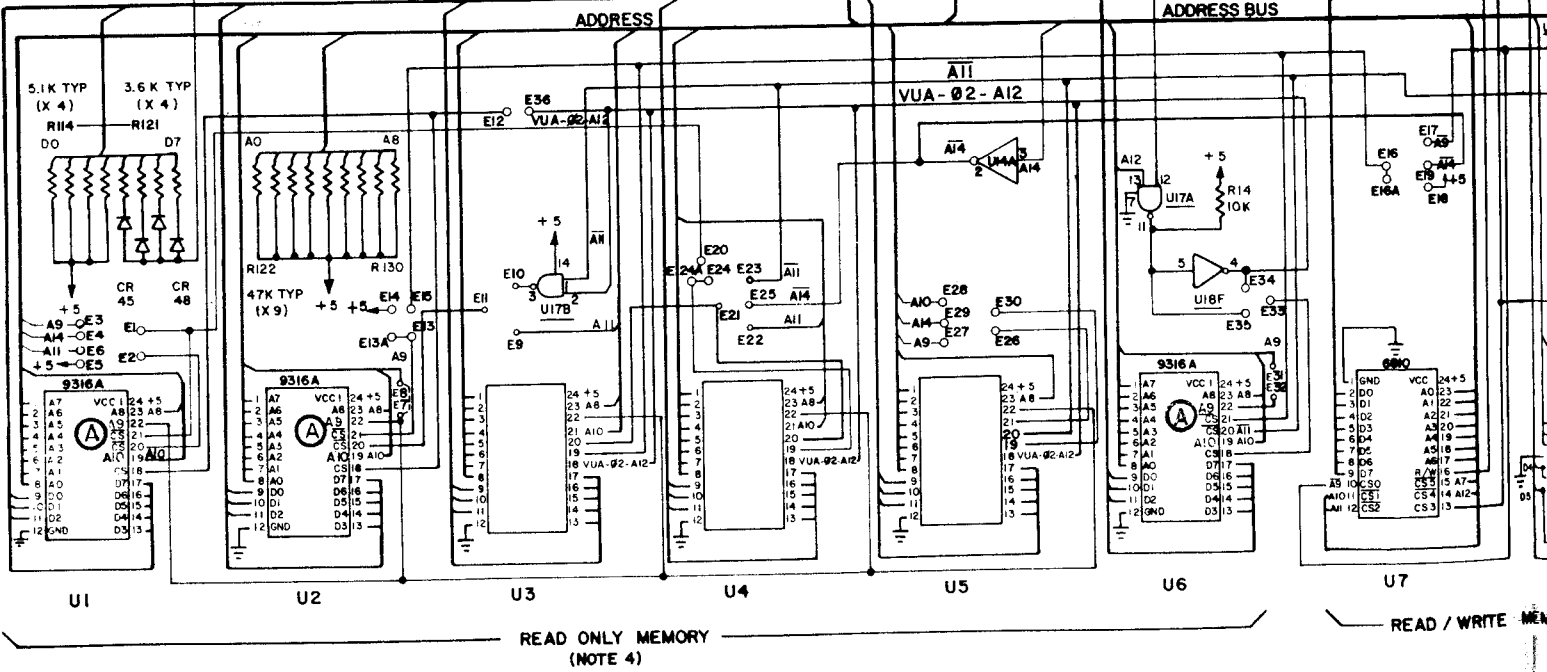
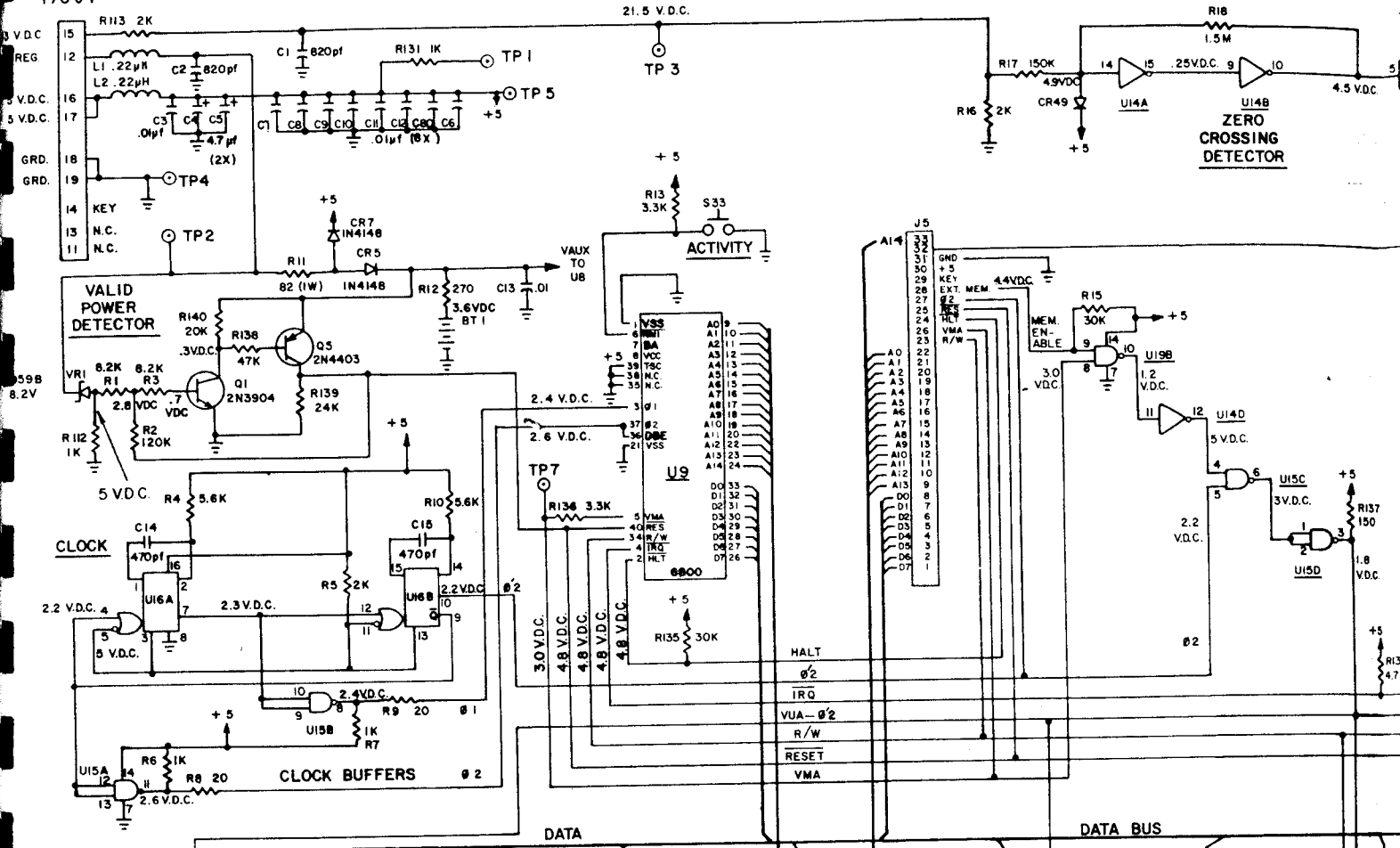
PLUG CONNECTORS

MATERIAL FUTURE SPA

ASSEM NO USED ON W

PART NO W-1187-16c

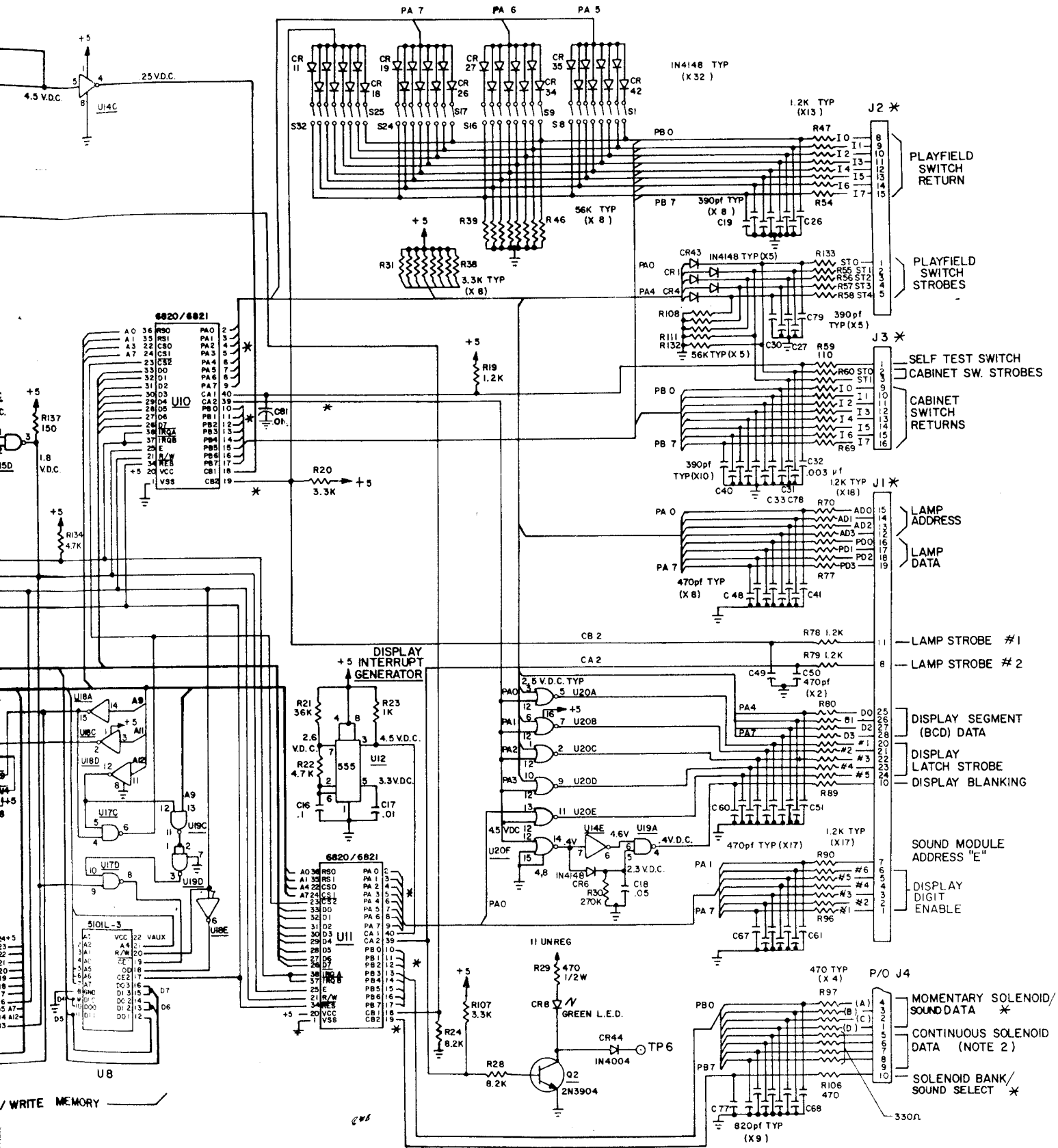
P/O J4



NOTES

- INDICATES "AID" TEST POINT.
- REMOVE A3J4 BEFORE USING AS AID TEST POINT
- PREFIX ALL REFERENCE DESIGNATIONS WITH "A4"

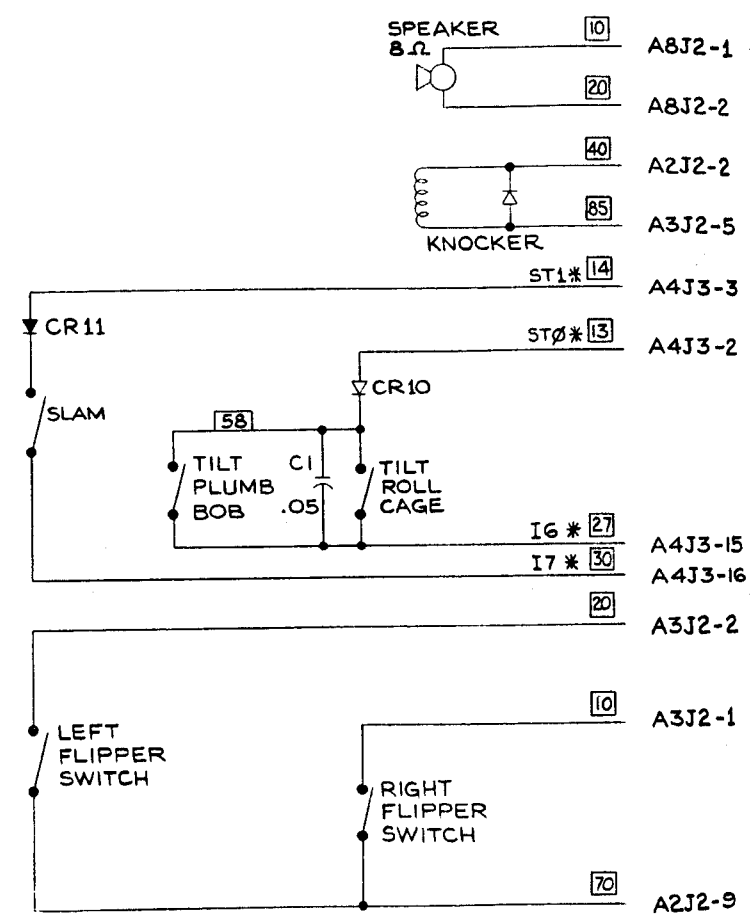
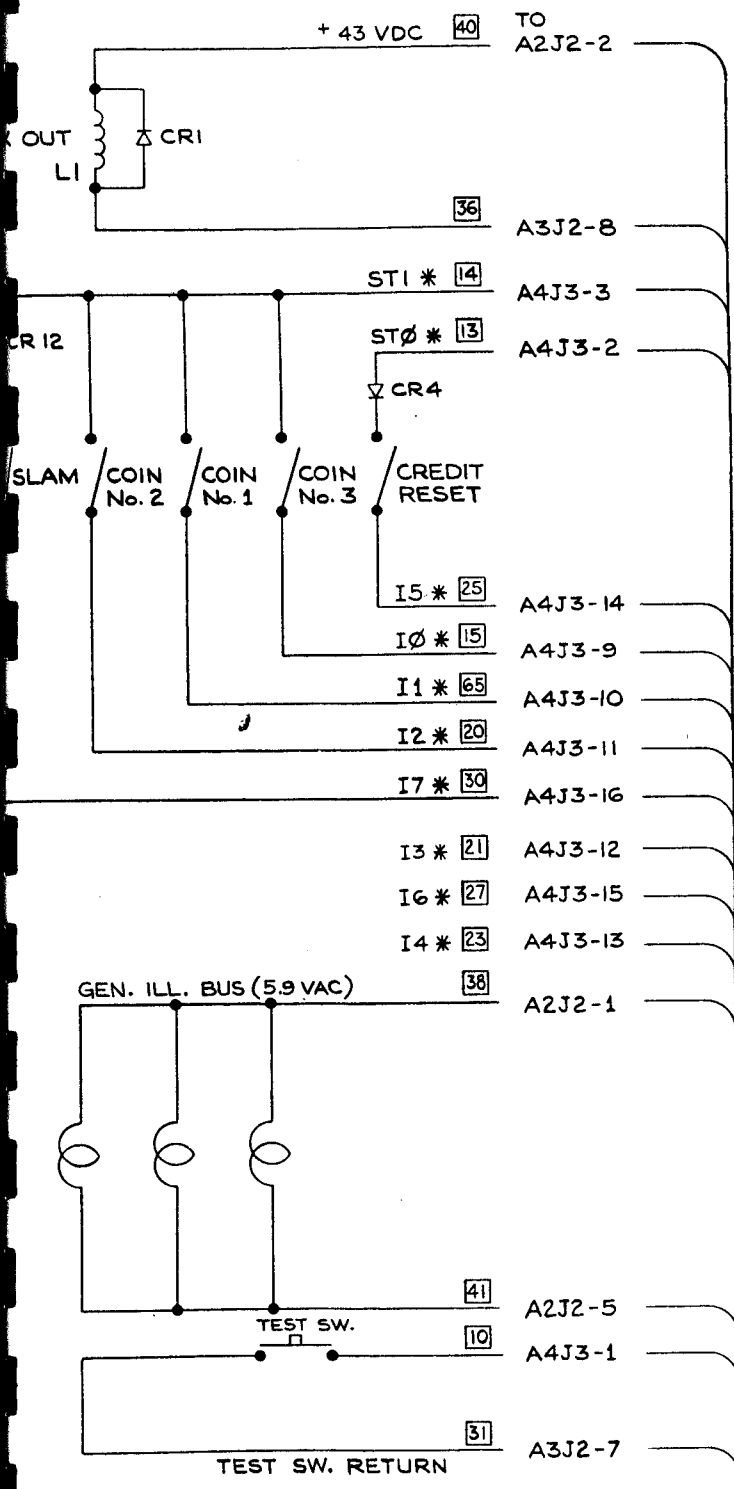
EXACT CHIP COMPLEMENT USED IN SOCKETS U1 THRU U6 CAN VARY FOR DIFFERENT GAMES AND PRODUCTION LOTS. TABLES OF MEMORY CHIPS AND CORRESPONDING JUMPERS FOR DIFFERENT GAMES AVAILABLE FROM BALLY FIELD SERVICE DEPARTMENT.



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REMOVE ALL BURRS				DR. BY DATE E.V. 5-11-78		Bally MANUFACTURING CORP. 2640 BELMONT AVENUE CHICAGO, ILLINOIS		1119-E	
TOLERANCES ON DIMENSIONS UNLESS OTHERWISE SPECIFIED FRACTIONS - 1/64 DECIMALS - .005 ANGLES - 1°				CK BY DATE L.S.M. 5-15-78		PRINT CONTROL		TOTAL SCALE	
DO NOT SCALE DRAWING				APP'D BY DATE L.S.M. 5-15-78		NAME		ASSEM. NO. USED ON #	
				FINISH		M.P.U. CONTROL BOARD SCHEMATIC		PART NO.	
				HARDENING		MATERIAL		W-1181-3c	

No.	LET.	CHANGE	DATE	BY	CK
1	A	A3 WDS VCC 2 on U1, U2, U6 A1C WDS CS			

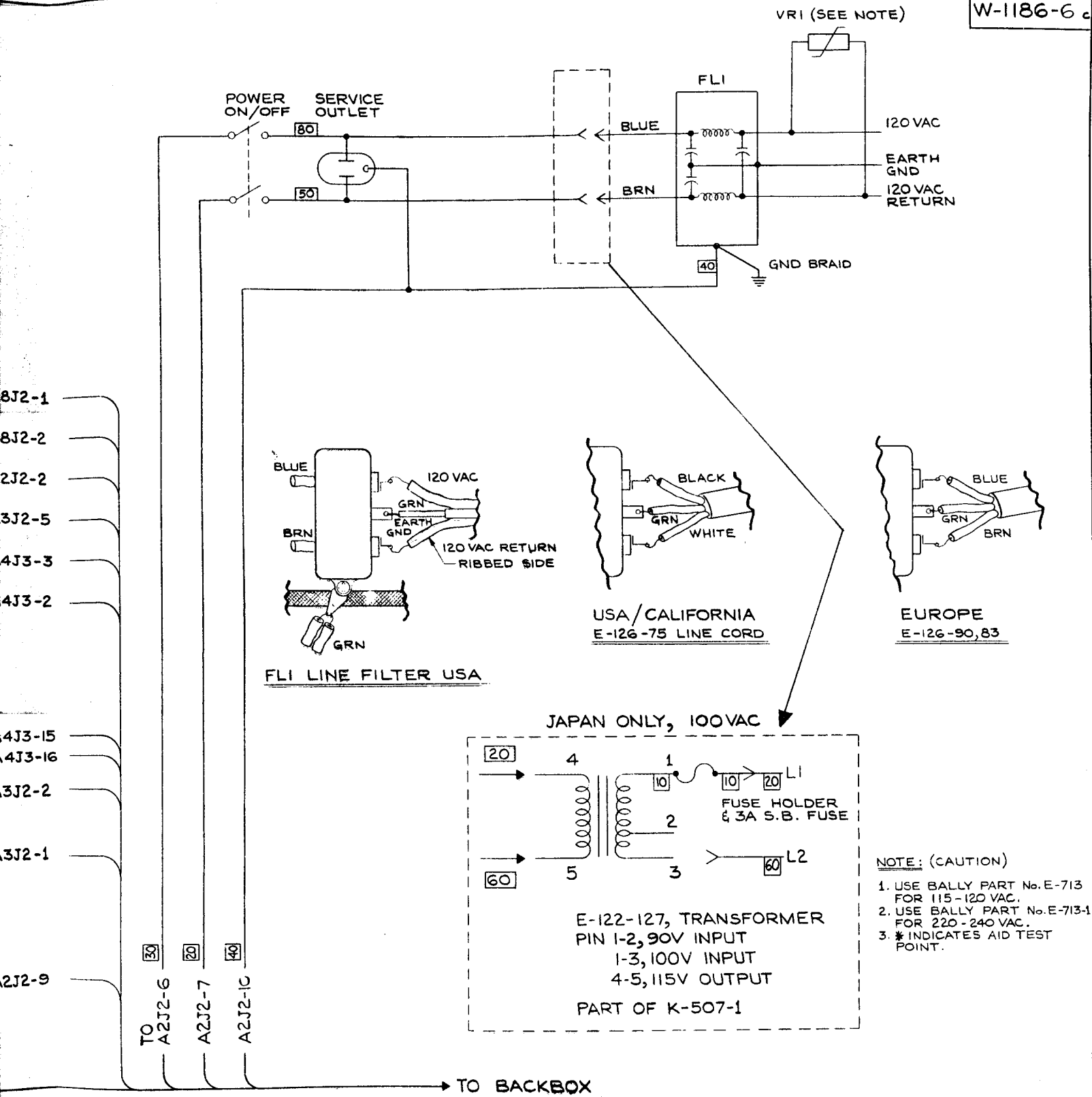


TO	J1 PIN	TO	J1 PIN
A4J3-9	1	A4J3-3	11
A4J3-10	2	A2J2-2	15
A4J3-11	3	A3J2-8	16
A4J3-12	4	A2J2-1	17
A4J3-13	5	A2J2-5	18
A4J3-14	6	A4J3-1	19
A4J3-15	7	A3J2-7	20
A4J3-16	8		
A4J3-2	10		

DOOR PLUG

A7 CABINET ASSY
NOTE: - DIODES ARE IN

DESCRIPTION	TOOL No.



- NOTE: (CAUTION)**
1. USE BALLY PART No. E-713 FOR 115-120 VAC.
 2. USE BALLY PART No. E-713-1 FOR 220-240 VAC.
 3. * INDICATES AID TEST POINT.

ET ASS'Y. WIRING
 ES ARE IN4004, (E-587-6)

REMOVE ALL BURRS		DR BY E.V.		DATE 3-28-79		Bally MANUFACTURING CORP. 2640 BELMONT AVENUE CHICAGO, ILLINOIS		1161-E						
TOLERANCES ON DIMENSIONS UNLESS OTHERWISE SPECIFIED		AP'D BY J.D.	DATE 4-5-79	PRINT CONTROL	PROD. CONT.	PUR.	ENG.	T. D.	COST	IBC	TOOL INSP.	CORR. VEND.	TOTAL	SCALE
FRACTIONS 1/16		AP'D BY E.C.M.	DATE 4-5-79	NAME WIRING DIAGRAM ELECTRONIC		ASSEM. NO.		PART NO. W-1186-6 c						
DECIMALS 1		FINISH		MATERIAL		PART NO.								
ANGLES 1		DO NOT SCALE DRAWING												
LET.	CHANGE	DATE	BY	CK										