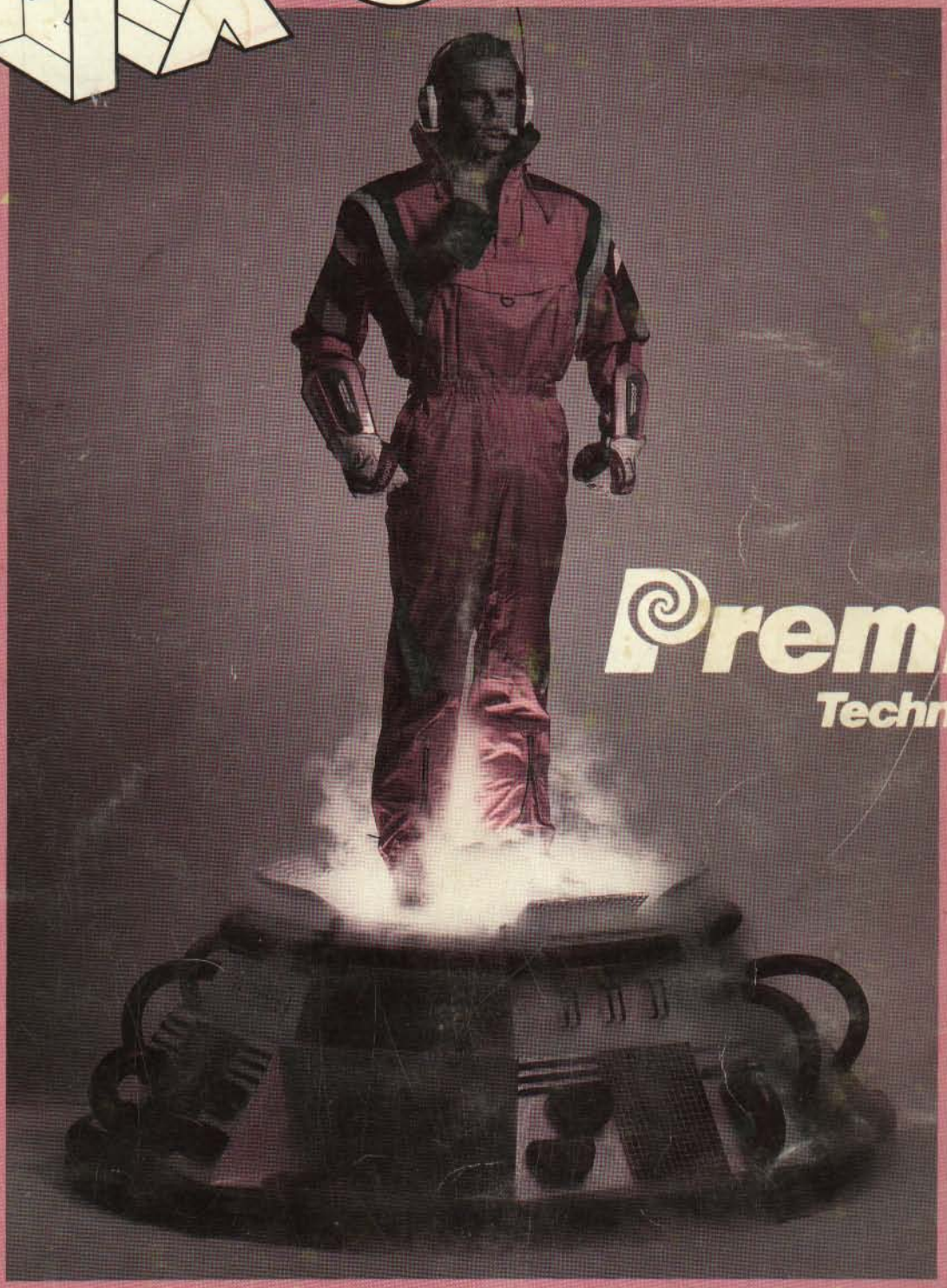
TX-SECTOR™



Premier® Technology

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THE PREMIER NAME IN PINBALL

INSTRUCTION MANUAL

TX-SECTOR

(GAME #712)

(3 BALL GAME)

INSTRUCTION MANUAL

Applicable for all games.

TABLE OF CONTENTS

GAME PROMS:	SOUND PROMS:
712/PROM 1	712/DROM 1
712/PROM 2	712/YROM 1

NOTE: ANY PROM CHANGES DURING PRODUCTION WILL BE INDICATED BY A REVISION NUMBER FOLLOWING THE GAME NUMBER. CONSULT YOUR DISTRIBUTOR FOR ANY PROM CHANGE UPDATE.

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SUPPLEMENTAL ADDENDUM

ATTACHED TO AND A PART OF ALL
SYSTEM 80B ALPHANUMERIC DISPLAY
GAME INSTRUCTION MANUALS

DISPLAY BOARD(A4)

1. THE ALPHANUMERIC DISPLAY BOARD(A4) IN THIS GAME MAY BE DIFFERENT THAN THE ONE AS ILLUSTRATED ON PAGE(S) 34 AND 35-36.

2. THE DIFFERENT DISPLAY BOARD (A4), PART NO. MA-644F, CONTAINS DISPLAYS DS1 AND DS2, PART NOS. XO-870.

3. THE DISPLAY BOARDS AS AN ASSEMBLY ARE INTERCHANGEABLE; HOWEVER, THE DISPLAY(S) DS1 AND DS2 ARE NOT INTERCHANGEABLE FROM ONE ASSEMBLY TO ANOTHER.

4. TO QUICKLY DETERMINE WHICH DISPLAY BOARD (A4) IS USED IN THIS GAME, OBSERVE THE LOCATION OF THE VACUUM EXHAUST TIP.

FIGURE 1A. DISPLAY BOARD (A4), (MA-644), DISPLAY(S) XO-840
FIGURE 1B. DISPLAY BOARD (A4), (MA-644F), DISPLAY(S) XO-870

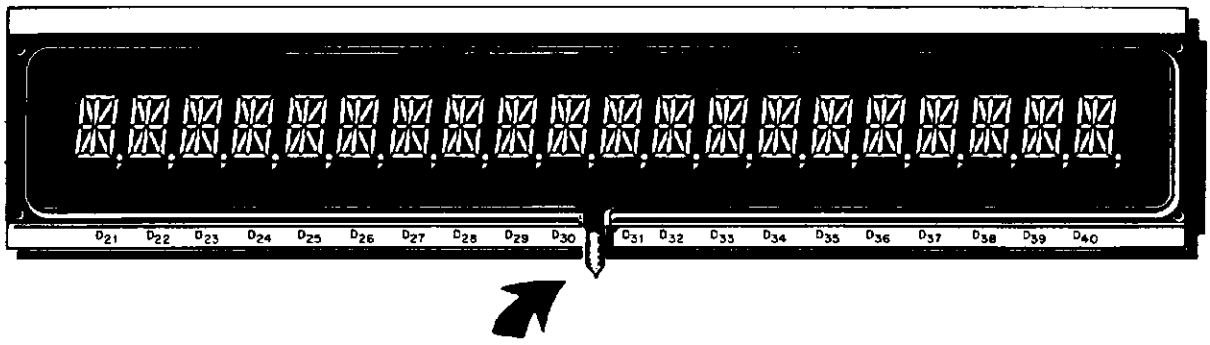


FIGURE 1A.

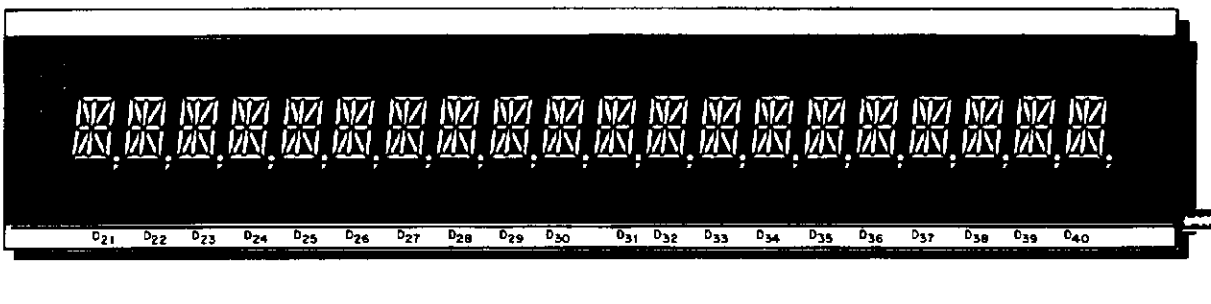


FIGURE 1B.

5. THE DIFFERENT DISPLAYS, XO-840 AND XO-870, ARE ELECTRICALLY EQUIVALENT. HOWEVER, THE PINOUT NUMBERING SEQUENCES ARE DIFFERENT. FIGURE 2 ILLUSTRATES THE SCHEMATIC PORTION OF MA-644F UTILIZING THE XO-870 DISPLAYS.

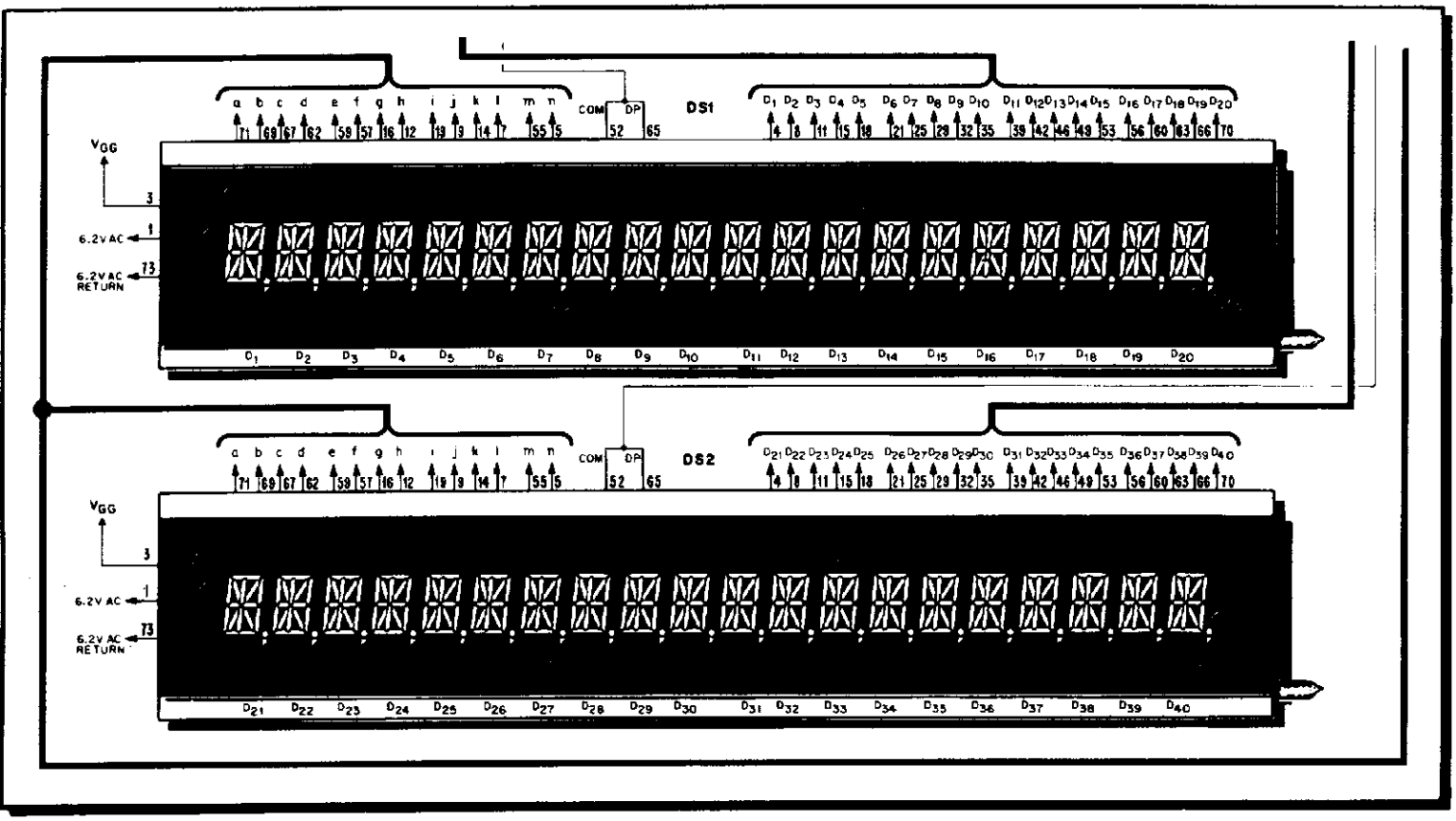


FIGURE 2.

SYSTEM 80B OVERVIEW

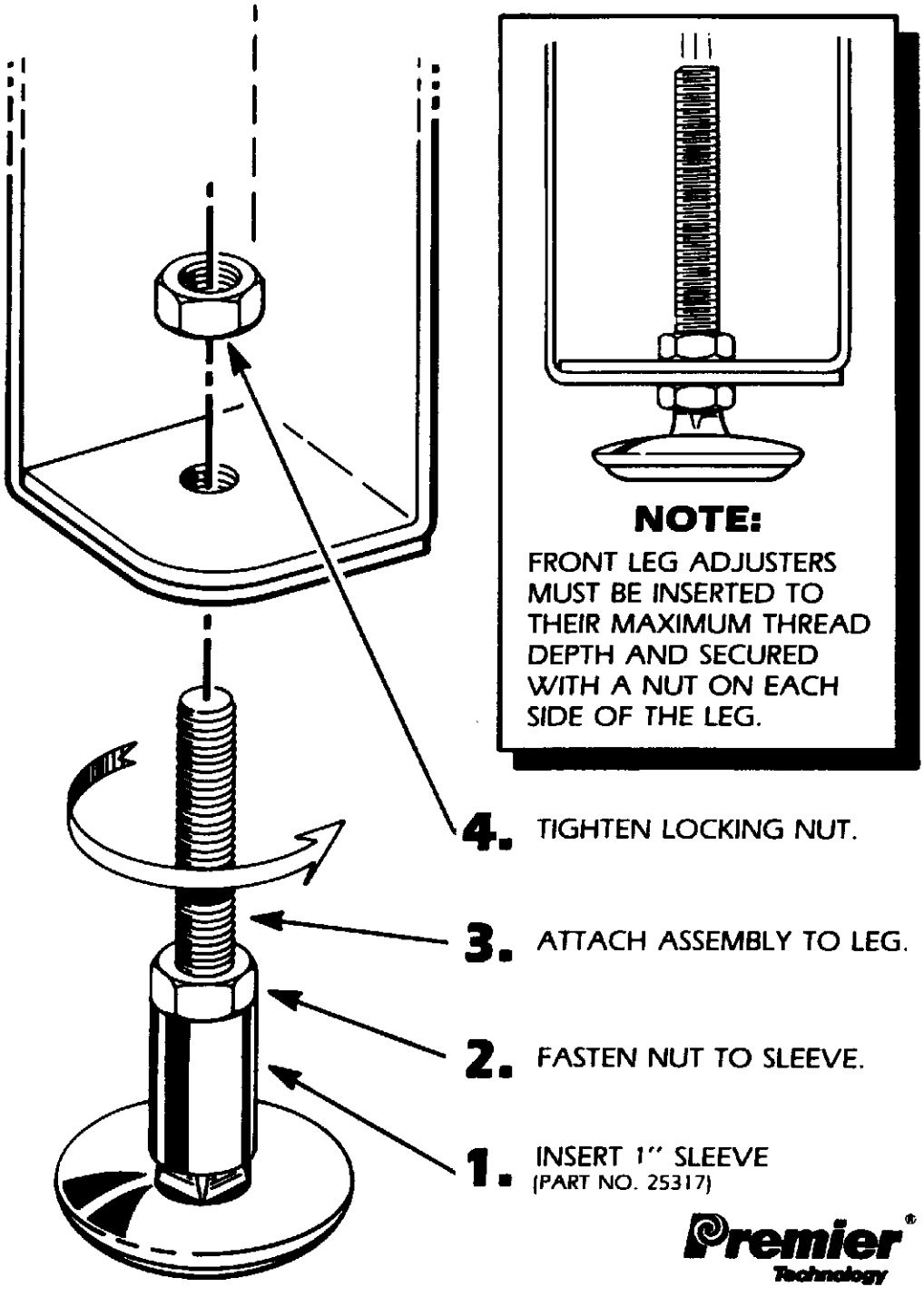
System 80B contains three new circuit boards. These are the Alphanumeric Display, the Power Supply, and the Control Board Piggyback which is attached to the Control Board. The Alphanumeric Display takes the place of the Four and Seven Digit Displays used in System 80A games. The new Power Supply takes the place of the System 80A Power Supply. The Control Board Piggyback takes the place of ROMS (U2-U3) used in System 80A games.

Some of the new features of System 80B are:

1) Capability to display messages.
2) Enhanced bookkeeping and self-test.
3) Players can enter their initials if they achieve a high score.
4) Top five high scores are displayed in the attract mode.
5) Automatic Replay percentaging.

SET-UP PROCEDURE

TO ADJUST PLAYFIELD PITCH ANGLE (6°)
(REAR LEGS ONLY)



NOTE:

FRONT LEG ADJUSTERS MUST BE INSERTED TO THEIR MAXIMUM THREAD DEPTH AND SECURED WITH A NUT ON EACH SIDE OF THE LEG.

4. TIGHTEN LOCKING NUT.

3. ATTACH ASSEMBLY TO LEG.

2. FASTEN NUT TO SLEEVE.

1. INSERT 1" SLEEVE
(PART NO. 25317)

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I. INSTALLATION

A. SET-UP

1. Bolt the legs to the cabinet.
2. Lift lightbox into an upright position. Be sure none of the cables are crimped in between the lightbox an cabinet.
3. Engage the snap in the rear of the lightbox to the cabinet.
4. To remove the lightbox backglass and gain servicing access to the electronics panel and fluorescent lamp assembly, proceed as follows:

   Unlock the lightbox, lift the bottom edge of the speaker(s) and the Alphanumeric Display Board and disengage the top of the backglass from the groove in the bottom of the display panel. Rest the display panel on the two wooden retaining tabs.

   Lift the backglass up about an inch, pull the bottom of the backglass towards you and slide it down past the two wood retaining tabs, carefully set aside.

   To replace the backglass and the display panel, slide the backglass up behind the wood retaining tabs and slide down into the bottom retaining groove. Lift the display panel and slide it to the top of the lightbox and at the same time, engage the top of the backglass to the retaining groove in the bottom of the display panel. Lock the lightbox.
5. Secure the lightbox to the cabinet with the bolts and washers provided.
6. Open the cabinet door and loosen the front moulding locking arm.
7. Remove the moulding from the playfield.
8. Slide the cabinet glass toward you and remove it.
9. Raise the playboard, slide it forward and rest it on its support.
10. Unravel and straighten out the power line cord located at the rear of the pinball cabinet.
11. Proceed to "B. CHECK-OUT".

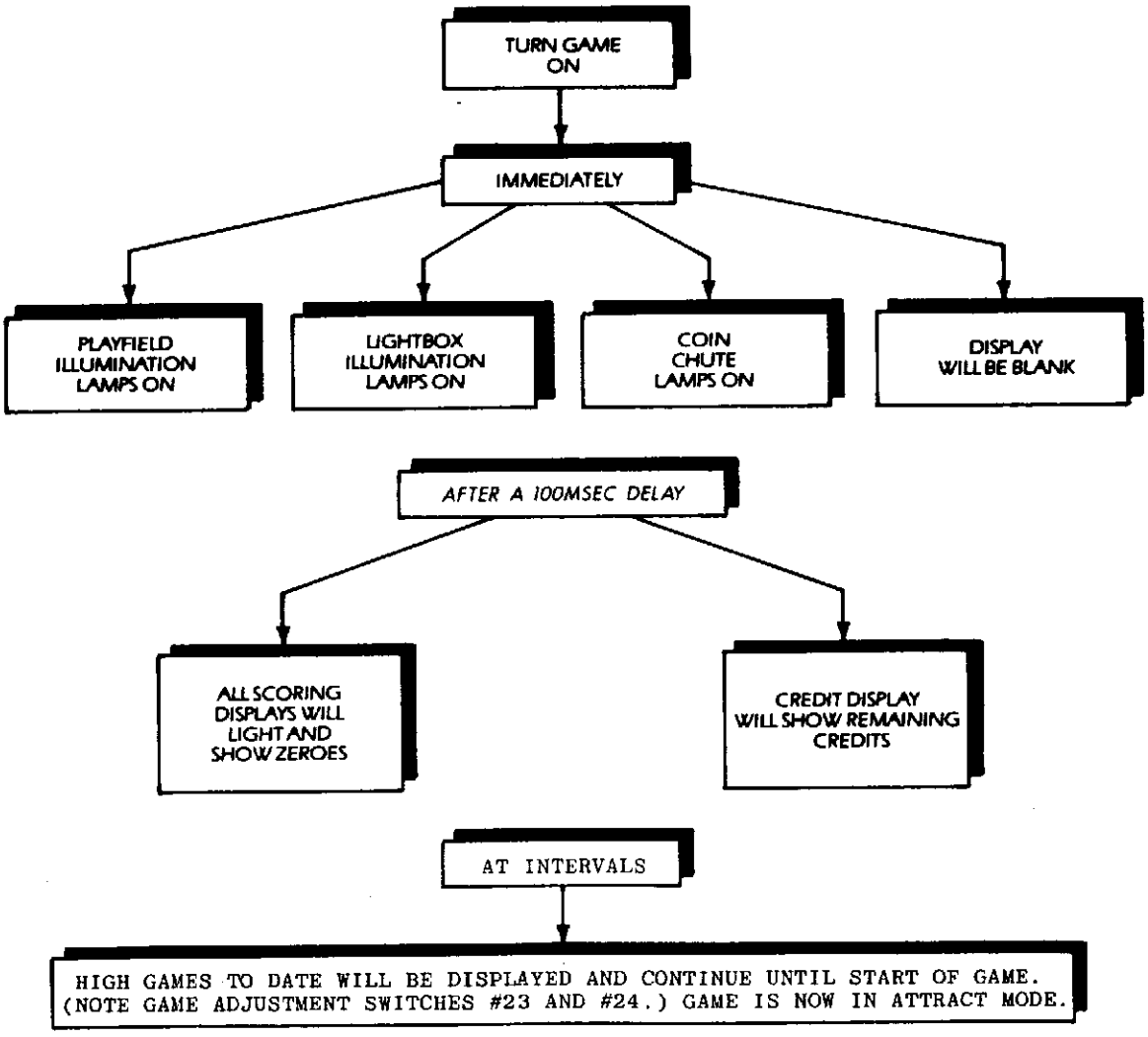
B. CHECK-OUT

1. Check that all cables are clear of moving parts.
2. Check for any loose wires.
3. Check switches for loose solder or other foreign matter.
4. Be certain all fuses are firmly seated.
5. Check transformer for any foreign matter across terminals.
6. Be sure that the Transformer Panel power input connector A12J7, corresponds to the supply voltage.
7. Check the setting of the normally open tilt switch on the underside of the playfield. One blade should be free-floating with a weight on the end.
8. Lower the playfield into the cabinet. Using the leg adjusters, level the playfield and set the pitch. Recommended pitch is 5-1/2°-6°, <u>SEE ILLUSTRATION AT LEFT</u>.
9. The plumb-bob tilt can be adjusted by loosening the wing nut and raising the plumb-bob to increase its sensitivity, or lowering it to decrease its sensitivity.

   The ball-roll tilt can be adjusted by loosening the front screw and raising the tilt bracket to increase sensitivity, or lowering it to decrease its sensitivity.
10. Reinstall the cabinet glass, front moulding and the lightbox assembly.
11. Plug the line-cord into a properly grounded 3-wire receptacle ONLY!
12. Refer to Section VI to make all necessary game adjustments.
13. <u>CAUTION!</u> If this game has been subjected to extreme cold, allow to warm up to room temperature.

II. INITIALIZATION, III. GAME OPERATION

II. INITIALIZATION



III. GAME OPERATION

A. GAME START

Three balls must be in the ball return trough to start a game.

1. Insert coins into coin chute.
   a. Coin chute tune is played.
   b. Total credits are displayed in the center of the lower display.
2. Press Credit Button to start game.
   a. Credit tune is played.
   b. Total credits displayed decrease by one.
3. All playfield features reset.
4. The first player score display flashes two zeros.

B. FIRST PLAYER

1. First player's score display flashes two zeros.
2. The other player's displays are now blank.
3. The ball-in-play is displayed in the center of the upper display.

4. When the ball enters the outhole, any bonus earned is scored.

C. ADDITIONAL PLAYERS

1. Additional players are indicated by two zeros (not flashing) in each corresponding player's display.

2. After the maximum number of players are added, or no more credits remain, the Credit Button has no effect.

3. Additional players can be added anytime during the first ball in play.

D. EXTRA BALLS

1. When the SHOOT AGAIN lamp is lit, neither the player-up nor the ball-in-play changes when the ball enters the outhole.

2. Only one extra ball per ball-in-play is given.

E. TILT MODE

1. Tilting the game results in a loss of ball in play.

2. When the game is tilted, all the playfield lamps go off.

3. All accumulated bonus and bonus multipliers are lost.

F. SLAM MODE

1. If the normally closed slam switch (located inside front door) is opened, the entire game is ended for all players.

2. The entire switch matrix is inactive for three seconds.

3. If the match feature exists (dependent on Switch #26), a replay can be won even if the game is slammed.

4. Game returns to the attract mode.

G. GAME OVER

1. A random match number appears in the ball-in-play display. If this number matches the last two digits in any player's score, a replay (dependent on SWITCH #26) is awarded.

2. The High Games To Date are periodically displayed, dependent on Switches #23 and #24. When the Highest Game To Date is beaten, an award (dependent on Switches #23 and #24) is given.

3. All of the drop targets will reset (when used).

IV. GAME PLAY AND SCORING

HOW TO PLAY

DROP TARGETS

- SCORE 3000.
- COMPLETING THE TOP OR RIGHT BANK SCORES 10,000 TIMES LIT "X" VALUE, ADVANCES ENERGY LEVEL BONUS BY THE LIT "X" VALUE, AND RESETS THE OPPOSITE BANK WHEN FLASHING.
- ALL TARGETS DOWN ONCE ON BOTH BANKS ADVANCES THE "X" VALUE.
- ALL TARGETS DOWN ON BOTH BANKS LIGHTS SPECIAL BASED ON SWITCH #31.
- (5-BALL) SCORE 1000.

TOP RIGHT HOLE

- SCORE 10,000 UNLIT.
- SCORE 10,000 TIMES TELEPORT MULTIPLIER PLUS 10,000 TIMES TELEPORT MULTIPLIER FOR EACH LIT ENERGY LEVEL WHEN LIT FOR TELEPORT.

LOWER RIGHT HOLE

- NO SCORE.
- ACTIVATE TELEPORT IF A BALL IS CAPTURED IN THE LOWER LEFT HOLE.
- COLLECT ENERGY LEVEL BONUS AND CAPTURE IF ENERGY LEVEL BONUS IS AT THE TOP.

TOP LEFT HOLE

- SAME AS TOP RIGHT HOLE.

LOWER LEFT HOLE

- NO SCORE.
- ACTIVATE TELEPORT IF A BALL IS CAPTURED IN THE LOWER RIGHT HOLE.
- COLLECT ENERGY LEVEL BONUS AND CAPTURE IF ENERGY LEVEL BONUS IS AT THE TOP.

LEFT AND RIGHT SPOT TARGETS

- SCORE 1000 UNLIT.
- SCORE 10,000 AND ADVANCE ENERGY LEVEL BONUS 1X WHEN LIT (AMBER).
- AWARD EXTRA BALL WHEN LIT (PURPLE).
- AWARD SPECIAL WHEN LIT (RED).

TOP SPOT TARGET

- SCORE 1000.
- ADVANCE ENERGY LEVEL BONUS 2X.

ROLLOVER DROP TARGET

- SCORE 10,000.
- ENABLE LEFT RAMP FOR TELEPORT IF A BALL IS CAPTURED IN THE LOWER LEFT HOLE.
- ENABLE TELEPORT MULTIPLIER COUNDOWN IN THE DISPLAY.

SHOOTER RAMP ROLLUNDER

- ACTIVATE MULTIBALL AND LIGHT EXTRA BALL WHEN TWO BALLS ARE CAPTURED.

LEFT RETURN ROLLOVER

- SCORE 3000.
- LIGHT RIGHT SPINNER.
- (5-BALL) SCORE 1000.

RIGHT RETURN ROLLOVER

- SCORE 3000.
- LIGHT LEFT SPINNER.
- TRIP ROLLOVER DROP TARGET IF A BALL IS CAPTURED IN THE LOWER LEFT HOLE.
- (5-BALL) SCORE 1000.

IV. GAME PLAY AND SCORING

LEFT AND RIGHT SPINNERS

- SCORE 1000 UNLIT.
- SCORE 10,000 WHEN LIT.
- ROTATE POP BUMPER LAMPS.

POP BUMPERS

- SCORE 1000 UNLIT.
- SCORE 10,000 WHEN LIT.
- ROTATE POP BUMPER LAMPS.
- ALTERNATE EXTRA BALL LAMPS WHEN ENABLED.

LEFT AND RIGHT OUTLANE ROLLOVERS

- SCORE 30,000.

LEFT AND RIGHT RAMP ROLLUNDERS

- NO SCORE.

KICKING TARGETS AND RUBBER SWITCHES

- SCORE 30.
- ALTERNATE LEFT AND RIGHT SPOT TARGETS (AMBER).
- ALTERNATE EXTRA BALL LAMPS WHEN ENABLED.
- ALTERNATE SPECIAL LAMPS WHEN ENABLED.

OUTHOLE

- SCORE 10,000 FOR EACH LIT ENERGY LEVEL BONUS LAMP.
- SCORE 100,000 FOR EACH TIME THAT THE ENERGY LEVEL BONUS HAS BEEN AT MAXIMUM.
- DISABLE LEFT AND RIGHT EXTRA BALL LAMPS WHEN RETURNING TO SINGLE BALL PLAY.

MULTI-BALL

- ACHIEVED WHEN THE ENERGY LEVEL BONUS IS AT THE TOP AND A BALL IS SHOT INTO THE FLASHING TELEPORT.

V. SOUND, VI. GAME ADJUSTMENTS

V. SOUND

The Sound Board installed in this game has been programmed for sound only.

VI. GAME ADJUSTMENTS

A. CONTROL BOARD SWITCH ADJUSTMENTS

NOTE: The following switch adjustments pertaining to **SYSTEM 80B** only. There are 32 switches on the control board which permit adjustment of the game parameters. These switches are contained in four packages of eight switches each, as shown below.

COIN CHUTE COMBINATIONS
SYSTEM 80B

SWITCHES					COIN CHUTE ADJUSTMENTS
S1	S2	S3	S4	S5	Left Coin Chute
S9	S10	S11	S12	S13	Right Coin Chute
S17	S18	S19	S20	S21	Center Coin Chute

					CREDITS/COINS
OFF	OFF	OFF	OFF	OFF	1/1
OFF	OFF	OFF	OFF	ON	2/1
OFF	OFF	OFF	ON	OFF	3/1
OFF	OFF	OFF	ON	ON	4/1
OFF	OFF	ON	OFF	OFF	5/1
OFF	OFF	ON	OFF	ON	6/1
OFF	OFF	ON	ON	OFF	7/1
OFF	OFF	ON	ON	ON	8/1
OFF	ON	OFF	OFF	OFF	9/1
OFF	ON	OFF	OFF	ON	10/1
OFF	ON	OFF	ON	OFF	1/2
OFF	ON	OFF	ON	ON	2/2
OFF	ON	ON	OFF	OFF	3/2
OFF	ON	ON	OFF	ON	4/2
OFF	ON	ON	ON	OFF	5/2
OFF	ON	ON	ON	ON	6/2
ON	OFF	OFF	OFF	OFF	7/2
ON	OFF	OFF	OFF	ON	8/2
ON	OFF	OFF	ON	OFF	9/2
ON	OFF	OFF	ON	ON	10/2
ON	OFF	ON	OFF	OFF	1/3
ON	OFF	ON	OFF	ON	2/3
ON	OFF	ON	ON	OFF	1/4
ON	OFF	ON	ON	ON	3/4
ON	ON	OFF	OFF	OFF	1/5

*All of the above do not give credits until the last coin is inserted.

SWITCH 6 — HIGH GAMES TO DATE CONTROL
- ON: RESET HIGH GAMES #2-#5 ON POWER OFF
- OFF: NO EFFECT

SWITCH 7 — ATTRACT MODE SOUND
- ON: ENABLED
- OFF: DISABLED

SWITCH 8 — AUTO-PERCENTAGE CONTROL
- ON: ENABLED
- OFF: DISABLED (NORMAL HIGH SCORE MODE)

SWITCH 14 — COIN CHUTE LEFT AND RIGHT CONTROL
- ON: SAME
- OFF: SEPARATE

SWITCHES 15, 16 — MAXIMUM CREDITS

15	16	
OFF	OFF	8
OFF	ON	10
ON	OFF	15
ON	ON	20

SWITCH 22 — PLAYFIELD SPECIAL
- ON: EXTRA BALL
- OFF: SPECIAL

SWITCHES 23, 24 — HIGHEST GAME TO DATE AWARDS

23	24	
OFF	OFF	NONE (NOT DISPLAYED)
OFF	ON	NONE
ON	OFF	2 REPLAY
ON	ON	3 REPLAY

SWITCH 25 — BALLS/GAME
- ON: 3
- OFF: 5

SWITCH 26 — MATCH
- ON: ON
- OFF: OFF

SWITCH 27 — REPLAY LIMIT
- ON: 1
- OFF: NO LIMIT

SWITCH 28 — NOVELTY
- ON: SCORE 500,000 IN PLACE OF EXTRA BALL AND SPECIAL
- OFF: NORMAL

SWITCH 29 — GAME MODE
- ON: EXTRA BALL
- OFF: REPLAY

SWITCH 30 — 3RD COIN CHUTE CREDIT CONTROL
- ON: ADD 9
- OFF: NO EFFECT

SWITCH 31 — PLAYFIELD SPECIAL CONTROL
- ON.....LIGHT SPECIAL AFTER BANKS ARE COMPLETED TWICE (LIBERAL)
- OFF.....LIGHT SPECIAL AFTER BANKS ARE COMPLETED THREE TIMES (CONSERVATIVE)

SWITCH 32 — EXTRA BALL CONTROL
- ON...MEMORIZE ENERGY LEVEL BONUS BALL TO BALL.....(LIBERAL)
- OFF..RESET ENERGY LEVEL BONUS BALL TO BALL....(CONSERVATIVE)

ADDITIONAL COIN CHUTE COMBINATIONS
CREDIT INCENTIVES

ALL OF THE BELOW CANNOT HAVE 9 CREDITS ADDED BASED ON SWITCH 30

SWITCHES

S1	S2	S3	S4	S5 -	Left Coin Chute
S9	S10	S11	S12	S13 -	Right Coin Chute
S17	S18	S19	S20	S21 -	Center Coin Chute

					COIN/CREDIT GIVEN	COIN/CREDIT GIVEN	COIN/CREDIT GIVEN	COIN/CREDIT GIVEN	COIN/CREDIT GIVEN		TOTAL COIN/ TOTAL CREDIT
ON	ON	OFF	OFF	ON	1st/1	2nd/2				=	2/3
ON	ON	OFF	ON	OFF	1st/0	2nd/1	3rd/1	4th/1		=	4/3
ON	ON	OFF	ON	ON	1st/0	2nd/1	3rd/0	4th/2		=	4/3
ON	ON	ON	OFF	OFF	1st/1	2nd/1	3rd/1	4th/2		=	4/5
ON	ON	ON	OFF	ON	1st/1	2nd/2	3rd/1	4th/3		=	4/7
ON	ON	ON	ON	OFF	1st/1	2nd/2	3rd/2	4th/2		=	4/7
ON	ON	ON	ON	ON	1st/0	2nd/0	3rd/1	4th/0	5th/1	=	5/2

VI. GAME ADJUSTMENTS

B. SOUND ADJUSTMENTS

The speaker(s) output is controlled by the potentiometer mounted on a bracket located inside the cabinet next to the front door hinge.

Turning the potentiometer counter clockwise will decrease the volume. Turning it clockwise will increase the volume.

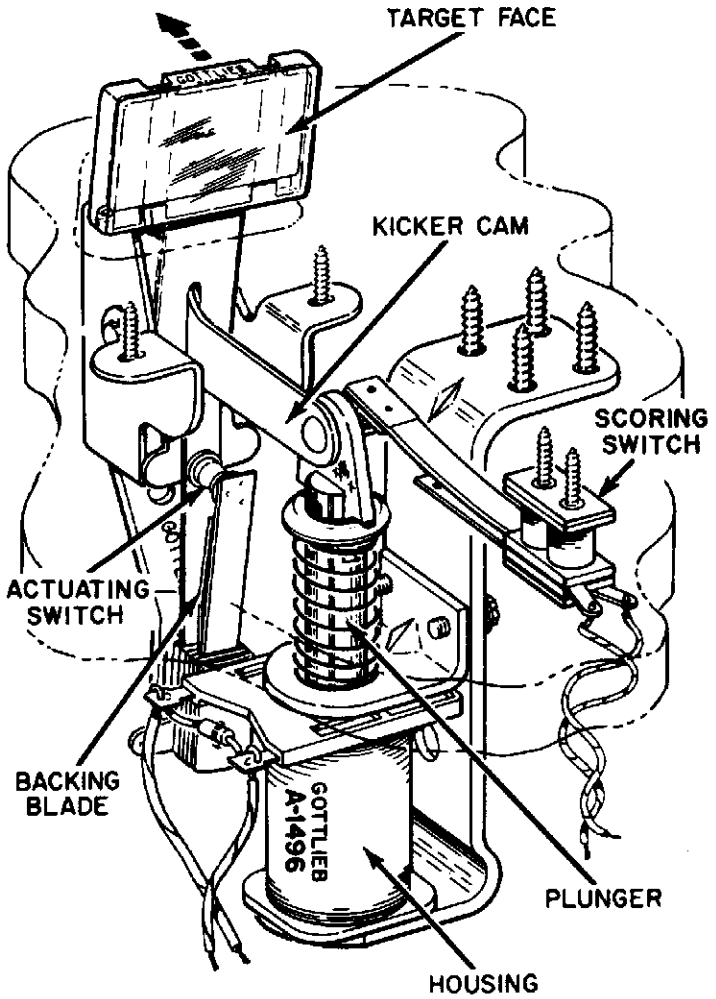
C. POST ADJUSTMENTS

The post at the mouth of the right and left side outlanes can be positioned for liberal/conservative play. The smaller opening produces a more liberal game.

D. KICKING TARGET ADJUSTMENT

Push the PLUNGER down until it "bottoms out" in the coil HOUSING. Push the TARGET FACE in the direction of the arrow shown until it makes contact with the vertical leg of the KICKER CAM. The vertical leg of the cam is located behind the kicking target and is not shown.

Observe that the gap between the ACTUATING SWITCH contacts is at least 1/32nd of an inch. If not, bend the switch's BACKING BLADE in the proper direction.



VII. BOOKKEEPING AND SELF TEST

The circuitry in this game helps the Operator perform many Bookkeeping and Self/Test functions. These functions are accessed by the Self/Test Switch inside the front door.

Section VII A., details the Bookkeeping system, while Section VII B., details the Self/Test operation. The Flow Chart in Section VII D., gives the general order and function of both Bookkeeping and Self/Test steps.

A. BOOKKEEPING SYSTEM 80B

- See Flow Chart for Bookkeeping Assignments (1-15).

I. STEPPING THROUGH BOOKKEEPING

1. Press the SELF-TEST button inside the front door.

"TEST MODE" should appear in the upper display.

2. Press the SELF-TEST button again. Step 1 and its information will be displayed.

3. Pressing the SELF-TEST button will increment the bookkeeping step number and appropriate information will be displayed.

Pressing the SELF-TEST button after Step 15 will start the SELF-TEST function (Step 16-21). At this point Bookkeeping cannot be reentered by pressing the SELF-TEST button. To reenter, turn the game OFF/ON or open the slam switch. The game will return to the attract mode. Then press the SELF-TEST button.

4. To exit from Bookkeeping at any time:

   a. Turn power OFF/ON or
   b. Open slam switch.

II. HOW TO SET BOOKKEEPING INFORMATION TO ZERO

1. For a Particular Bookkeeping Step

   Applicable only to:
   Step 1 - Left chute coins
   Step 2 - Right chute coins
   Step 3 - Center chute coins

   a. Advance Bookkeeping so the step to be zeroed is displayed.

   b. Press the credit button. Notice information replaced by zeros.

2. Zeroing All Bookkeeping Steps

   Except Auto-Percentaging setting (Step 6), Replay Levels (Steps 11-13), and Highest Game To Date Score (Step 14).

   a. Go to Step 15 (average playing time).

   b. Press the credit button. The message "Bookkeeping Cleared" will be displayed.

   c. Zeroing is complete.

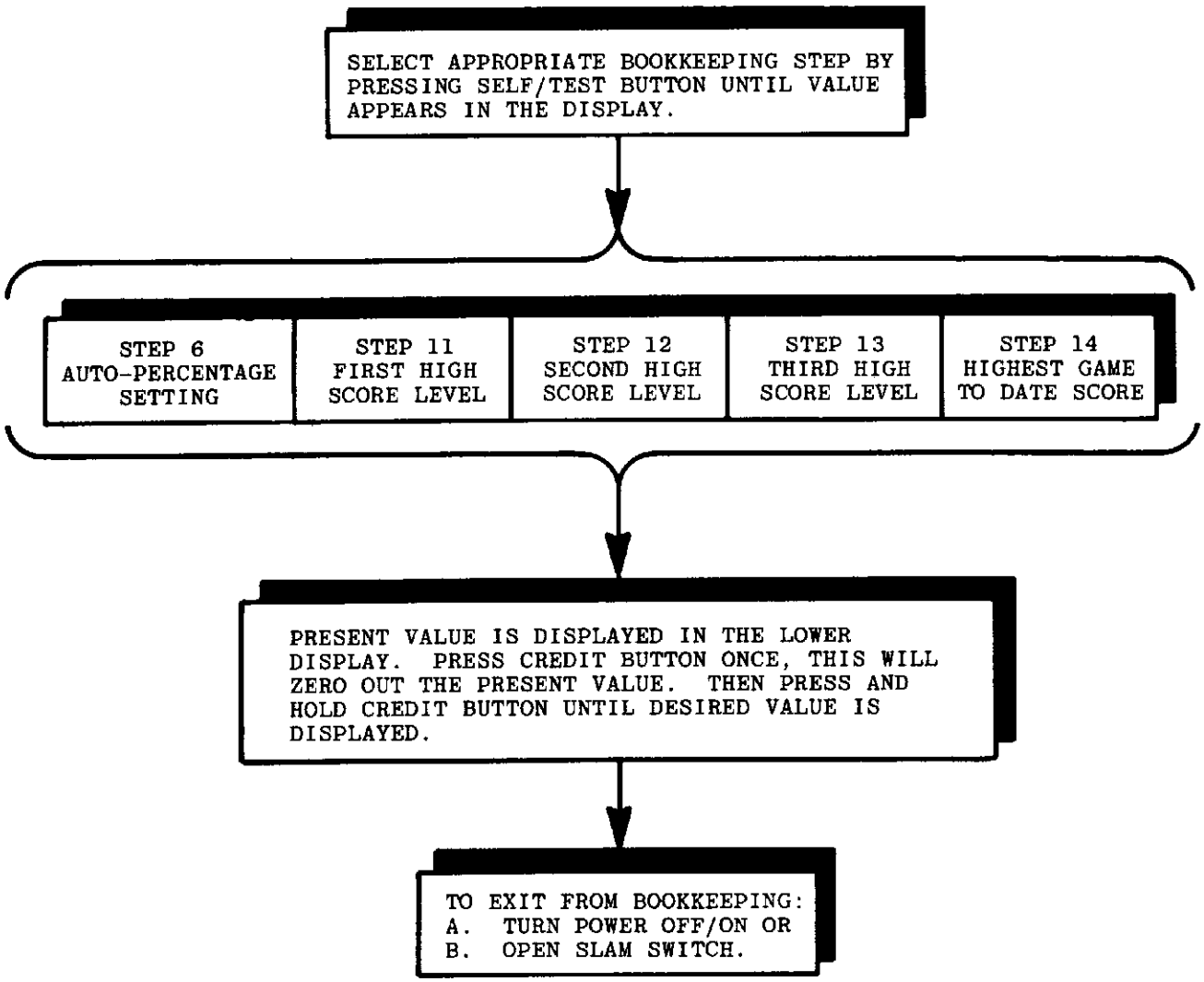
HOW TO USE AUTOMATIC REPLAY PERCENTAGING

Move Control Board switch #8 to the on position to enable Auto-Percentaging. Set the desired percent payout while in Step 6 of bookkeeping (See Page 9). When Auto-Percentaging is enabled, only the first High Score Replay Level is used. The second and third levels are ignored.

Periodically the first Replay Level will be adjusted by 100,000 points at a time. After 10,000 games have been played, the Total Plays (Step 4), Total Replays (Step 5), and Game Time (Step 15) bookkeeping values are reset to 0 (Refer to Page 10).

VII. BOOKKEEPING AND SELF TEST

III. HOW TO SET/RESET AUTO-PERCENTAGE SETTING, HIGH SCORE LEVELS OR HIGH GAME TO DATE SCORES.



NOTES:

1. Step 11 must be a lower score than Step 12. Step 12 must have a lower score than Step 13. Otherwise, the scores will not be recognized.

2. If Step 12 or Step 13 is not desired, set those scores to zero.

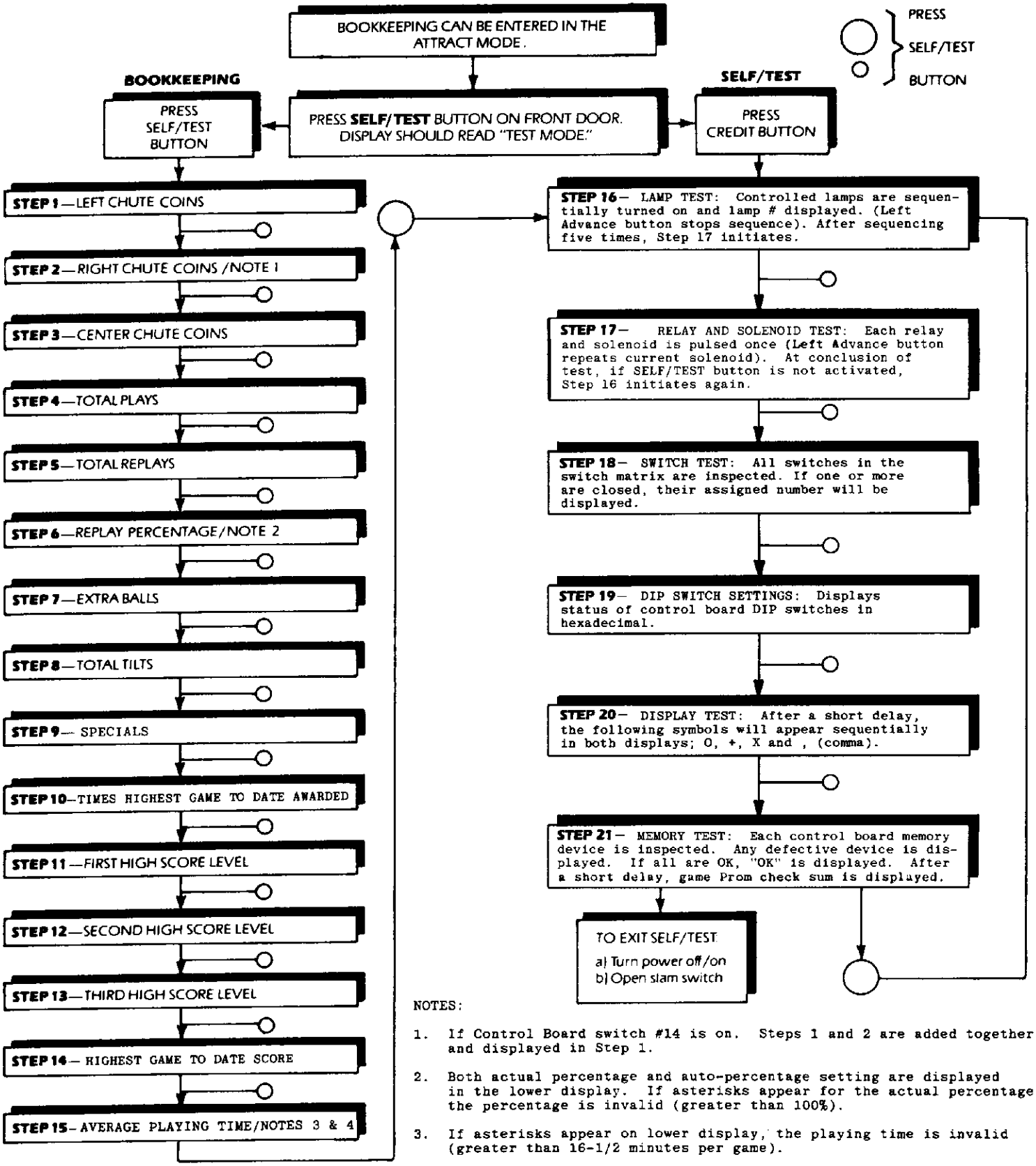
3. If Step 14 is reset, all High Games to Date scores are reset.

4. High Score Levels may range from 100,000 to 9,900,000 in increments of 100,000.

5. Only the first High Score Level is used when auto-percentaging (switch 8) is enabled.

VII. BOOKKEEPING AND SELF TEST

B. FLOW CHART



NOTES:

1. If Control Board switch #14 is on. Steps 1 and 2 are added together and displayed in Step 1.
2. Both actual percentage and auto-percentage setting are displayed in the lower display. If asterisks appear for the actual percentage, the percentage is invalid (greater than 100%).
3. If asterisks appear on lower display, the playing time is invalid (greater than 16-1/2 minutes per game).
4. Pressing the credit button during this step will reset all bookkeeping information except:
   Step 6 - Auto-percentage setting
   Steps 11 thru 13 - Replay levels
   Step 14 - Highest game to date

VII. BOOKKEEPING AND SELF TEST

C. SELF/TEST

- Steps 16 through 21 are SELF/TEST or game tests the operator can use for quick troubleshooting.
- All the tests are explained in the flow chart.
- To advance to the next test, press the SELF/TEST switch.
- Each test can be repeated by pressing the credit button.

STEP 16—LAMP TEST

a. Lamp Test-Lamps are sequentially strobed. Lamp assignment numbers appear in the lower display.

The Left Advance button stops lamp sequencing for repeated flashing of active lamp. (Single Step Mode).

Lamp number (L9, L16, etc.) can be referenced to the Driver Board Schematic where the specific transistor for each lamp can be identified.

STEP 17—RELAY AND SOLENOID TEST

a. Relay Test-All relays are pulsed in the following order with their corresponding lamp driver number appearing in the lower display.

The left advance button stops sequencing for repeated activation of relay or solenoid. (Single Step Mode).

A3 Driver Board Transistor Assignment (See Schematic)

Q (Game Over) Relay.....A3J3 PIN-$\bar{A}$(Q1)
T (Tilt) Relay.....A3J3 PIN-$\bar{B}$(Q2)
(Any other relays which may be used).

b. Solenoid Test-Each solenoid on the playfield is sequentially pulsed. The solenoid number displayed identifies which solenoid is being tested. The following chart lists solenoid assignments.

NUMBER DISPLAYED	ASSIGNMENT	A3 DRIVER BOARD TRANSISTOR ASSIGN. SEE SCHEMATIC
Sol.1	Switching Diode	Q60
Sol.2	Switching Diode	Q57/Q58
Sol.3	Right 4 Bank Reset	Q54
Sol.4	Top 4 Bank Reset	Q55
Sol.5	Switching Diode	Q61/Q62
Sol.6	Switching Diode	Q63/Q64
Sol.7	1 Bank Reset	Q56
Sol.8	Knocker Assembly	Q53
Sol.9	Outhole	Q59

STEP 18—SWITCH TEST

a. If all switches are open, "ALL SWITCHES OPEN" appears in the lower display. (Note: Slam switch is not part of this test.)

b. If any switch(es) are closed, their corresponding matrix location will appear sequentially in the lower display.

STEP 19—DIP SWITCH SETTINGS

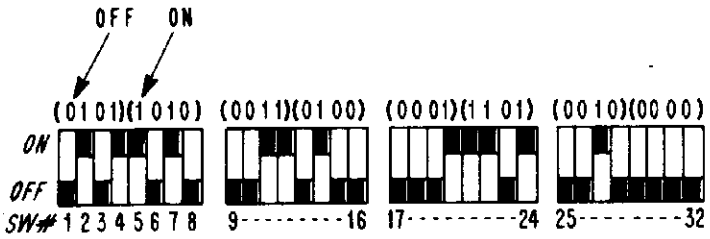
a. The status of the Control Board (A1) switches appears in the lower display.

DISPLAYED HEXADECIMAL	DECIMAL	BINARY
0	0	0000
1	1	0001
2	2	0010
3	3	0011
4	4	0100
5	5	0101
6	6	0110
7	7	0111
8	8	1000
9	9	1001
A	10	1010
B	11	1011
C	12	1100
D	13	1101
E	14	1110
F	15	1111

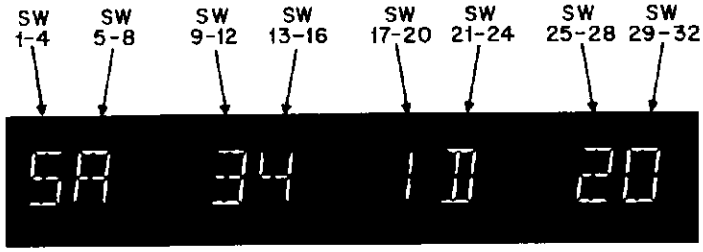
VII. BOOKKEEPING AND SELF TEST

CONTROL BOARD (A1) SWITCHES

EXAMPLE

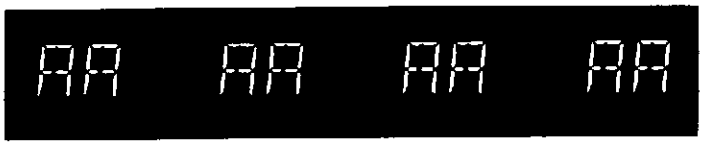


DISPLAYED



Checking Switches

1) Switch all odd number switches to the ON position, and all even switches to the OFF position. Press credit button. Display should now show:



2) Switch all even numbered switches to the ON position and all odd switches to the OFF position. Press credit button. Display should now show:

STEP 20—DISPLAY TEST

After a short delay, the following characters will appear sequentially in all digit positions; 0, +, X and , (comma).

STEP 21—MEMORY TEST

Each control based memory device is checked. If all are good, an "OK" will be displayed.

If a memory chip located on the A1 Control Board is defective, its number will be displayed. If no devices are found to be defective, "OK" is displayed in the lower display. Then after a short delay the Game Prom check sum will be displayed.

VIII. THEORY OF OPERATION

This section will cover only the differences between System 80A and System 80B. Figure 1 is a block diagram indicating the interconnections between the modules of System 80B.

A. CONTROL BOARD (A1)

The Piggyback Board eliminates the need for the ROMS (U2-U3) and the game prom (PROM 1) used in System 80A. The new game prom for each game is a 2764 EPROM labeled with the game number. This device is plugged into the Piggyback Board which is soldered into the Control Board.

The use of the Alphanumeric Display eliminates the need for Z19, Z21, Z22, Z23, Z24, Z25 (System 80A Display Control), and connector A1J3. The Control Board transmits information to the Display Board via a data bus (DATA 0 - DATA 7) and control lines (LD1, LD2, and RESET) from A1J2 to 1A4J1. The state of the LD1 and LD2 lines determine whether the upper or lower display tube receives the information on the data bus.

B. POWER SUPPLY (A2)

The new Power Supply develops a regulated +5V DC only and supplies it to the Control Board (VCC), Display Board (VSS), and Sound Board (VCC).

C. DISPLAY BOARD (A4)

This board takes the place of the four and seven digit displays used in System 80A games. During game play the upper display contains the scores of players one and two along with the ball in play (center). The lower display contains the scores of players three and four along with the amount of credits remaining (center). During Game Over the display information alternates between the scores from the previous game and the current High Games To Date.

The Display Board incorporates two vacuum fluorescent display tubes and three display controllers (U1-U2-U3). Each tube consists of a filament, grids (digits), and anodes (segments). U1 controls the digits of the upper display tube. U2 controls the digits of the lower display tube. U3 controls the segments of both tubes. When power is supplied to the game, the Control Board sends a negative going reset pulse to the base of Q1. This resets the display system. The digit information is multiplexed using an internal clock in U1 to control the refresh rate. This makes it appear as if all the digits are being enabled at once.

VIII. THEORY OF OPERATION

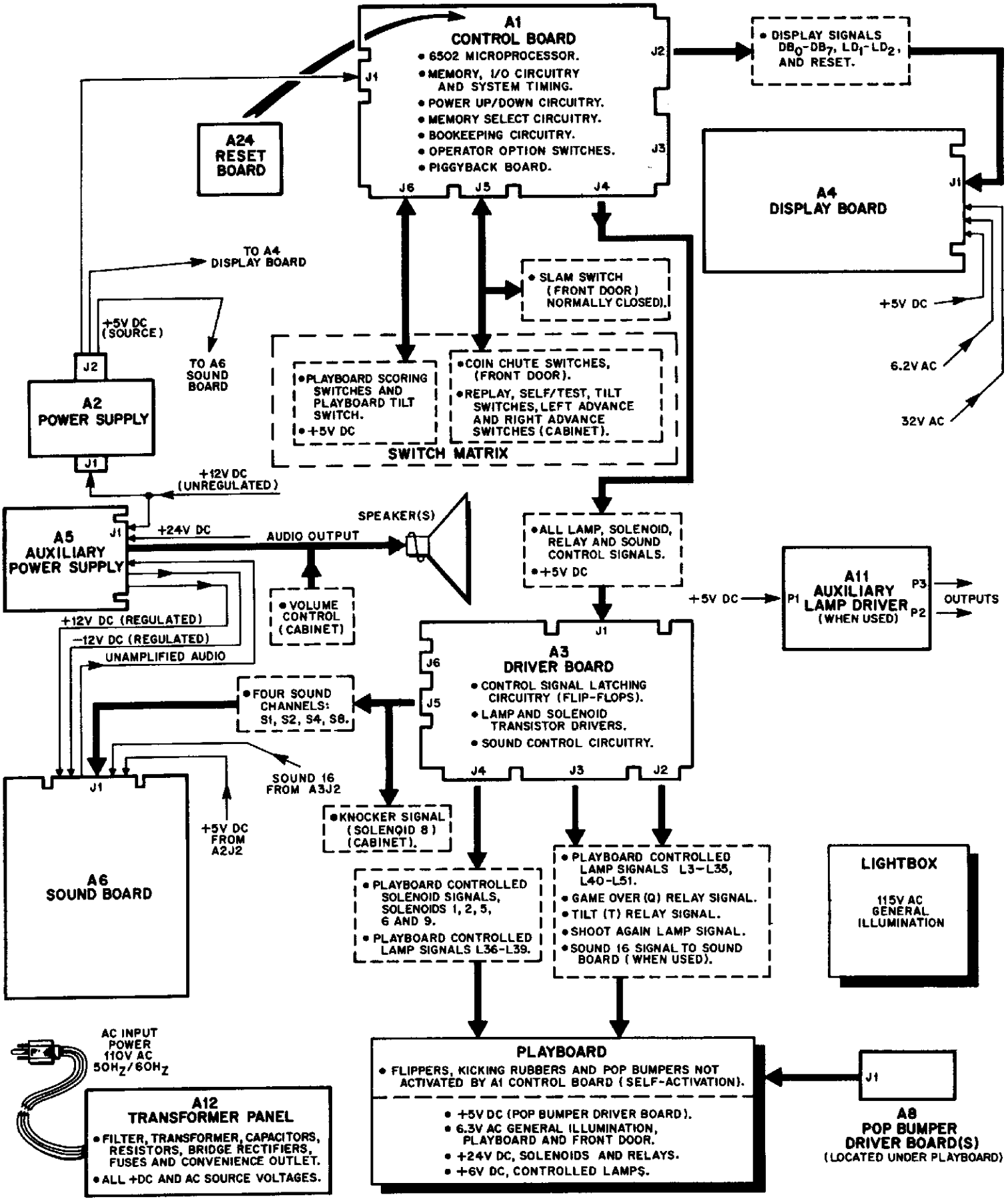


FIGURE 1. SYSTEM 80B BLOCK DIAGRAM

VIII. THEORY OF OPERATION

The Display Board is supplied with 32V AC from the transformer panel. Voltages VGG, VDD, and VCO are then developed from this input. The transformer panel also supplies 6.2V AC to the display tube filaments..

The filaments are biased 7.5V DC above VGG (VCO) by the zener diode VR1. Figure 2 shows the basic drive circuitry and waveform for a single digit and segment of the display.

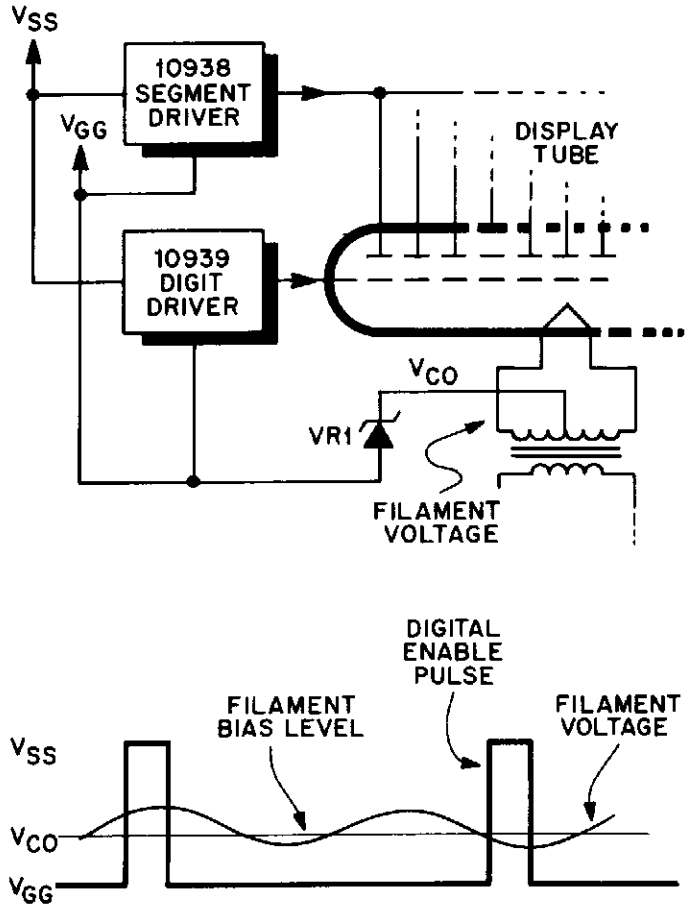


FIGURE 2. BASIC DRIVE CIRCUIT

D. SOUND BOARD (A6)

The MA-886 Sound Board consists of two 6502 microprocessor systems, a dual DAC, a programmable switched capacitor filter, two programmable sound generators, input ports to receive commands from the game Control Board, and a low level audio output, which is sent to the MA-767 Auxiliary Power Supply Board for amplification.

The Sound Board requires three supply voltages:+5V DC, +12V DC and -12V DC. In addition a power up reset signal is required from the Control Board.

SYSTEM CLOCK

A 4 MHz oscillator is configured with R11, R12, C14, C15, C22, XTAL-1 and T1. This 4 MHz clock is divided by 4 to a 1 or 2 MHz clock for both processors' clock input, pin 37 of N1 and T3. A 2 MHz clock from S1 pin 14 is presented to the two AY-3-8913 Programmable Sound Generators, H4 and K4, at pin 20. A 250 KHz signal from S1 pin 11 is the clock for the programmable timer section consisting of N5, H5, T5 and K5, pin 2.

INPUT CODE LATCH SYSTEM

Eight input lines from the Control Board come in on A6P1 and are pulled up by S1P1 and sent to the two input code latches A3 and B2, one for each microprocessor system. A2, pin 8, becomes a logic high when any of it's inputs are low. This output is connected to pin 11 of the input code latches (A3 and B2). A positive edge at pin 11 causes A3 and B2 to latch the data at their inputs. A2 pin 8 is also connected to the clock inputs of two flip flops, A4 pin 3 and A4 pin 11. When A2 pin 8 goes high, both flip flops are clocked, setting both $\bar{Q}$ outputs low. The $\bar{Q}$ outputs, A4 pin 6 and pin 8, are connected to both of the 6502's active low interrupt request lines, T3 and N1, pin 4. The $\bar{Q}$ outputs of A4 will stay low until the associated 6502 reads its input port therefore clearing the interrupt.

VIII. THEORY OF OPERATION

SYSTEM EPROMS

The sound board is designed to accommodate different types of EPROMS. Jumpers JP1, 2, 3 and 4 should be set to the proper position based on the EPROM being used, (See Schematic Diagram).

RESET

The Sound Board receives an external reset signal from A1J2 pin 24. This active low reset signal is pulled up by R34 and sent to G5, pin 1 (2-input AND gate). However, if a manual reset is desired, pushing switch SW2 will reset the processor.

MAIN SUMMER

The main summer consists of R13 through R17 and B1, pins 12, 13 and 14. B1 pin 14 is the main output from the Sound Board, at A6P2 pin 9, and will swing plus or minus 5V peak to peak.

IX. GENERAL INFORMATION

A. PRINTED CIRCUIT BOARDS ARE DESIGNATED AS FOLLOWS:

A1 - Control Board
A2 - Power Supply
A3 - Driver Board
A4 - Display Board
A5 - Auxiliary Power Supply
A6 - Sound Board
A7 - Diode Board
A8 - Pop Bumper Driver Board
A11 - Auxiliary Lamp Driver
A13 - Resistor Board
A16 - Transistor Driver Board
A17 - Diode Board
A19 - Switching Diode Board
A24 - Reset Board

Printed circuit board connectors will be labeled AX-JX. For example, A3-J4 is the connector J4 on the driver board (A3).

B. WIRE COLORS ARE SHOWN AS NUMBERS:

0 Black
1 Brown
2 Red
3 Orange
4 Yellow
5 Green
6 Blue
7 Violet
8 Gray
9 White

For example, 688 is a BLUE-GRAY-GRAY striped wire.

C. FUSES

TRANSFORMER PANEL FUSES

F1	Sound/Speech Power Supply (A6)...	12V AC	1/2 Amp
F2	Power Supply (A2).....	10V AC	6-1/4 Amp SLO-BLO
F3	Display.....	32V AC	1/4 Amp SLO-BLO
F4	Solenoids (+24V DC).....	28V AC	8 Amp SLO-BLO
F5	Controlled Lamps.....	8V AC	8 Amp SLO-BLO
F6	Playboard Illumination.....	6.3V AC	5 Amp SLO-BLO
F7	Lightbox Illumination.....	115V AC	1/2 Amp SLO-BLO
F8	Primary Power.....	110V AC	5 Amp SLO-BLO
		220V AC	2-1/2 Amp SLO-BLO
F9	Display Filament.....	6.2V AC	1 Amp
F9A	Display Filament.....	6.2V AC	1 Amp
F20	Input Line.....	110V AC	8 Amp SLO-BLO
		220V AC	4 Amp SLO-BLO

PLAYBOARD FUSES

F10	Ball Release.....	1 Amp SLO-BLO
F11	All Ball Holes (4).....	1 Amp SLO-BLO
F12	Single Bank Trip, Single Bank Reset.....	1 Amp SLO-BLO
F13	Top 4 Bank Reset, Right 4 Bank Reset.....	2 Amp SLO-BLO
F14	Top Left Pop Bumper.....	2 Amp SLO-BLO
F15	Top Right Pop Bumper.....	2 Amp SLO-BLO
F16	Bottom Pop Bumper.....	2 Amp SLO-BLO

IX. GENERAL INFORMATION

D. COIL CHART

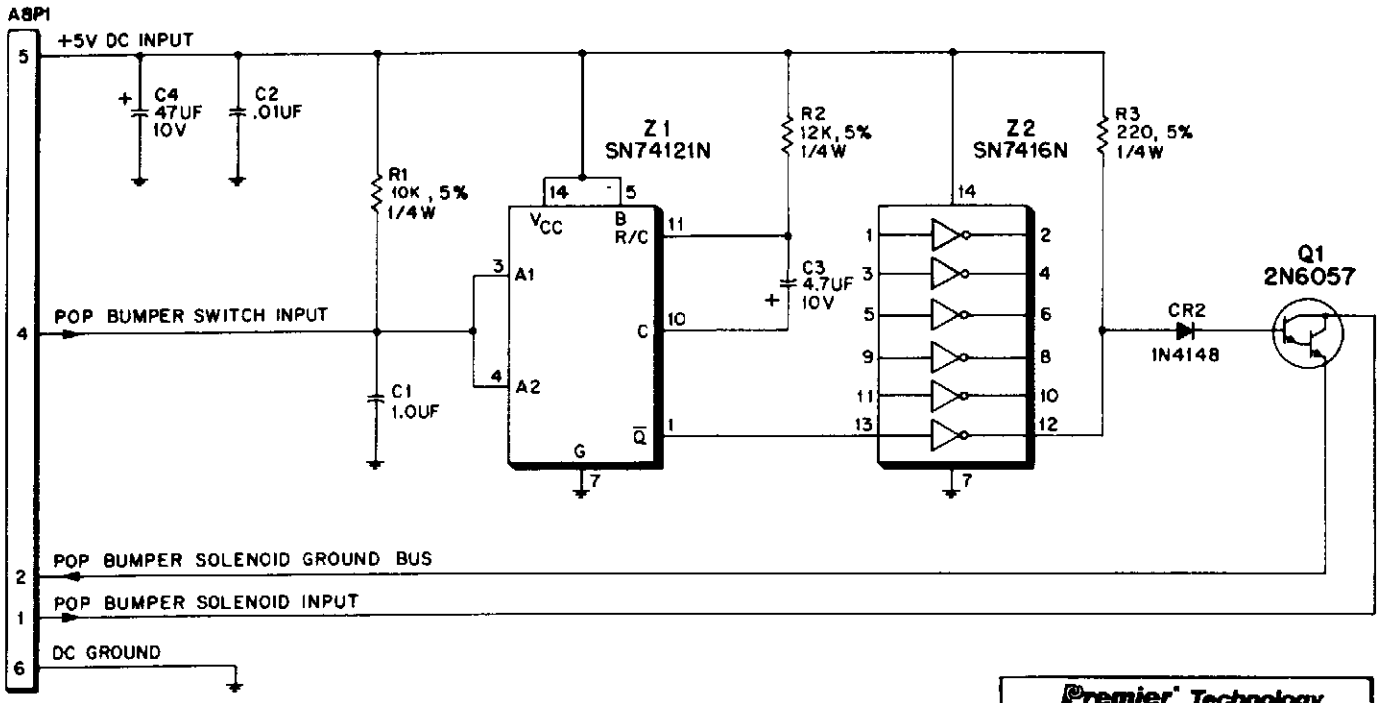
SOLENOID COILS					
PART NUMBER	GENERAL USAGE	RESISTANCE (OHMS)	NUMBER OF TURNS	WIRE GAUGE	WRAPPER COLOR
A-1496	KICKING TARGET KICKING RUBBERS POP BUMPERS	2.95	635	#23	Yellow
A-4893	UP KICKER POP BUMPERS BALL KICKER	2.1	535	#22	Red
A-5194	UP KICKER GONG KICKING TARGETS POP BUMPERS	4.5	780	#24	Blue
A-5195	CONTACT KICKER KNOCKER HOLE KICKER	11.6	1305	#26	White
A-16570	HOLE KICKER, OUTHOLE	15.5	1450	#27	Green
A-17875	FLIPPERS	2.8/40	560/1100	#24/31	Yellow
A-17891	5 BANK RESET	3.35	850	#22	White
A-18102	3 BANK RESET, 7 BANK RESET USES 2	9.0	1430	#24	Red
A-18318	4 BANK RESET	6.7	1130	#24	Orange
A-19300	BALL KICKER	7.8	1075	#25	Orange
A-20095	SUPER FLIPPER	1.55/35.5	450/900	#22/31	Red
A-21741	UP KICKER	2.5	575	#23	Orange
A-24161	INTERMEDIATE FLIPPER	2.2/40	520/1050	#23/31	Blue
RELAY COILS					
A-16890	Q, T, AND COIN LOCKOUT RELAYS	231.0	4000	#35	Orange
A-20558	GATE RELAY	156.0	3400	#34	White
A-18642	MEMORY/ DROP TARGETS	58.0	1590	#33	White
A-19508	MEMORY/ DROP TARGETS	35.0	1250	#32	YELLOW

*Coils may vary from game to game. Check game manual for exact coil usage.

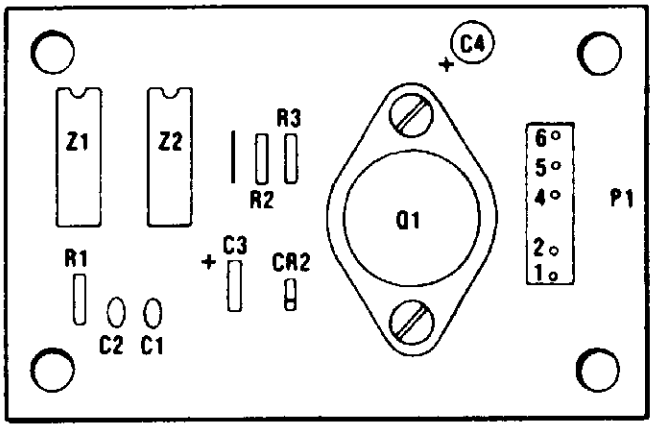
X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

TABLE OF CONTENTS

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



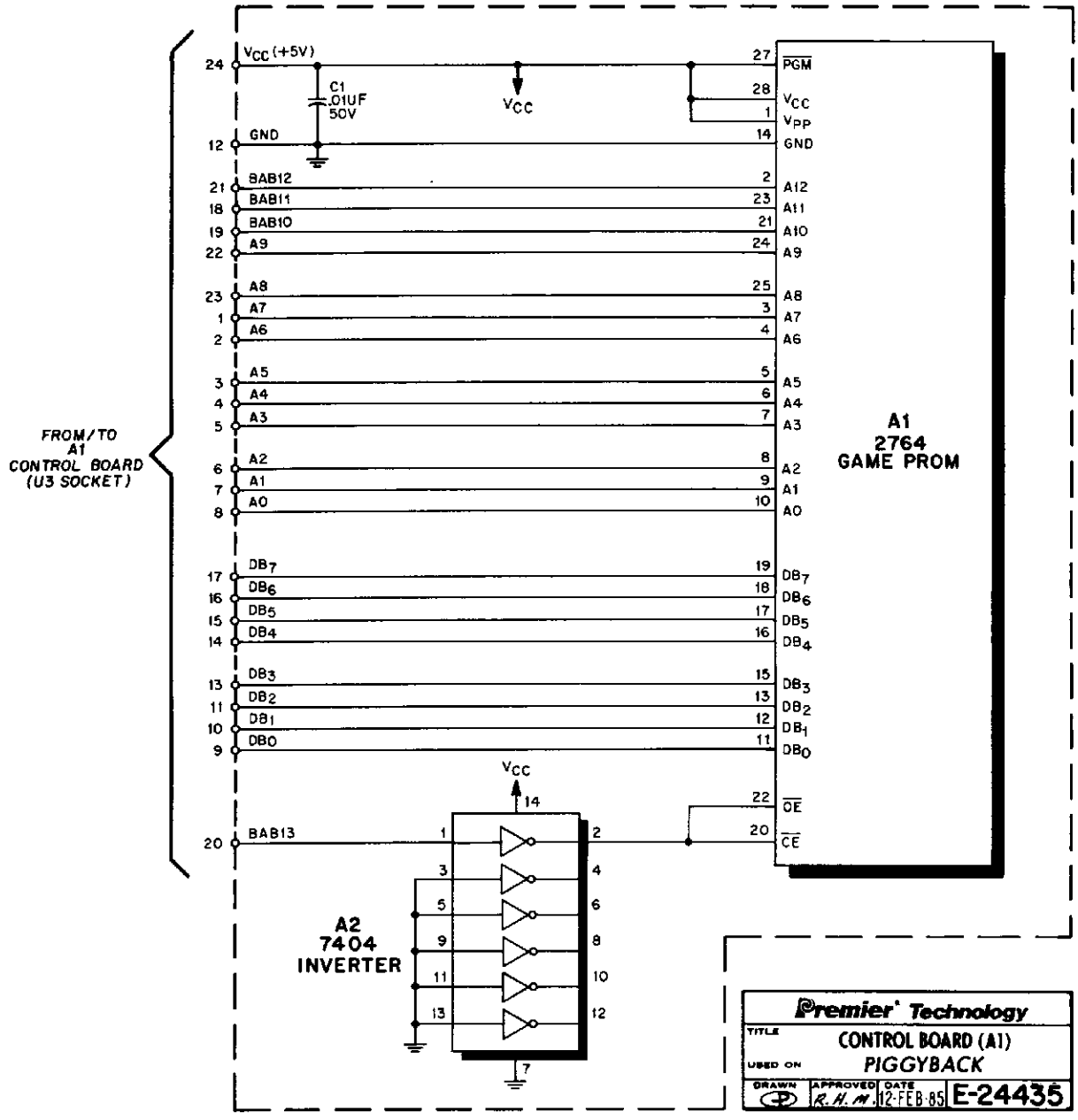
POP BUMPER DRIVER BOARD (A8) COMPONENT LOCATION



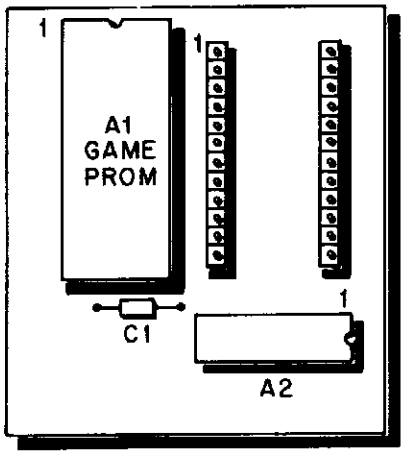
POP BUMPER DRIVER BOARD (A8) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	POP BUMPER DRIVER BOARD	A-19741
C1	Capacitor, 1 UF, 50V, Non-Polarized	XO-294
C2	Capacitor, .01 UF, 100V	XO-202
C3	Capacitor, 4.7 UF, 10%, 10V Tantalum, Axial	XO-226
C4	Capacitor, 47 UF, 10V	XO-227
CR2	Diode 1N4148	XO-261
P1	Connector	XO-879
R1	Resistor, 10K ohm, 1/4W, 5%	XO-18
R2	Resistor, 12K ohm, 1/4W, 5%	XO-9
R3	Resistor, 220 ohm, 1/4W, 5%	XO-21
Q1	Transistor, Darlington 2N6057	XO-311
Z1	IC SN74121N	XO-417
Z2	IC SN7416N	XO-405

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



CONTROL BOARD (A1), PIGGYBACK COMPONENT LOCATION

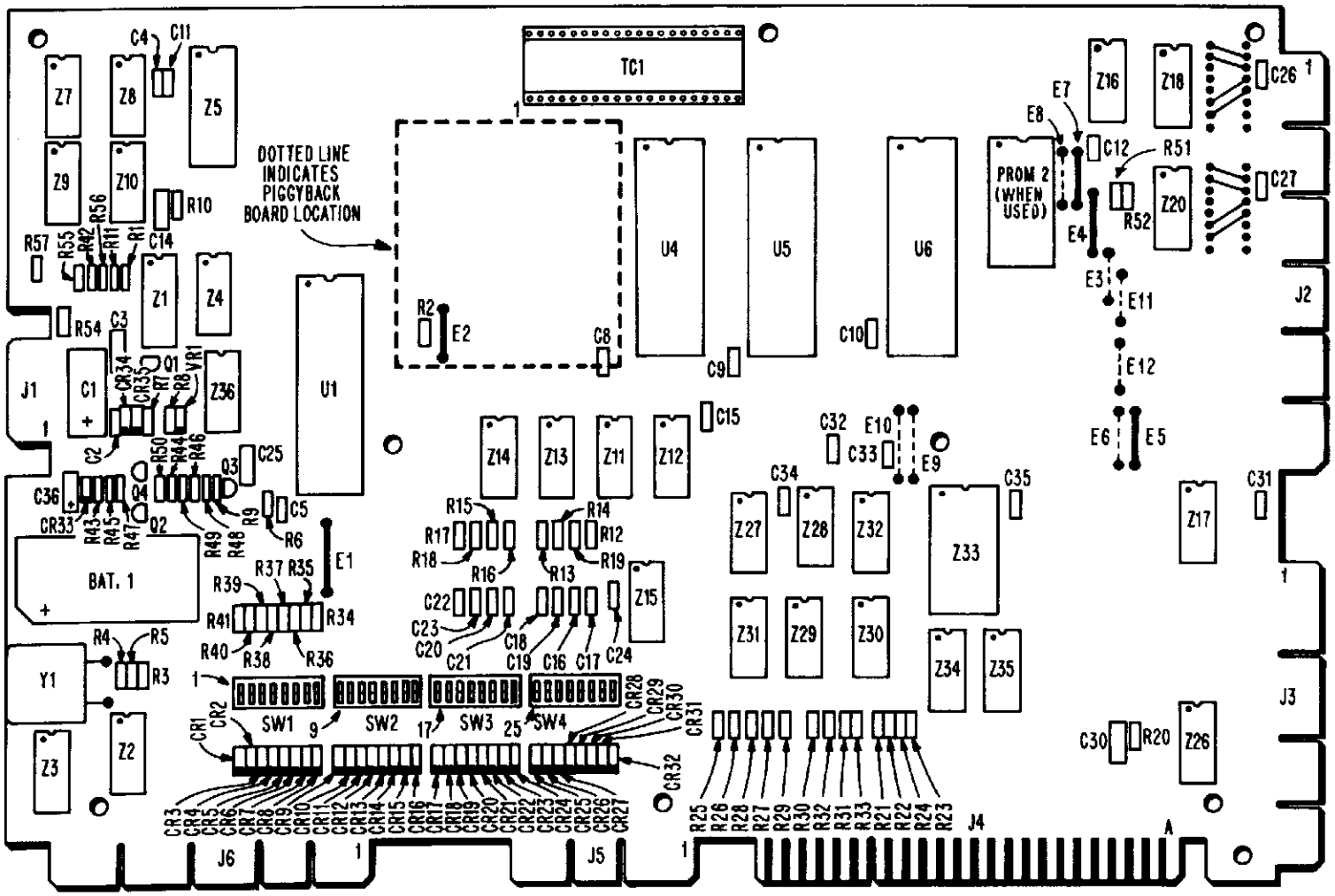


CONTROL BOARD (A1), PIGGYBACK PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	Control Board (A1), Piggyback	MA689
A1	Game Prom, 2764	XO-489
A2	IC, 7404 Inverter	XO-402
C1	Capacitor, .01UF, +80% -20%, 50V	XO-229
	Socket, 28 Pin	XO-536

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

CONTROL BOARD (A1) COMPONENT LOCATION



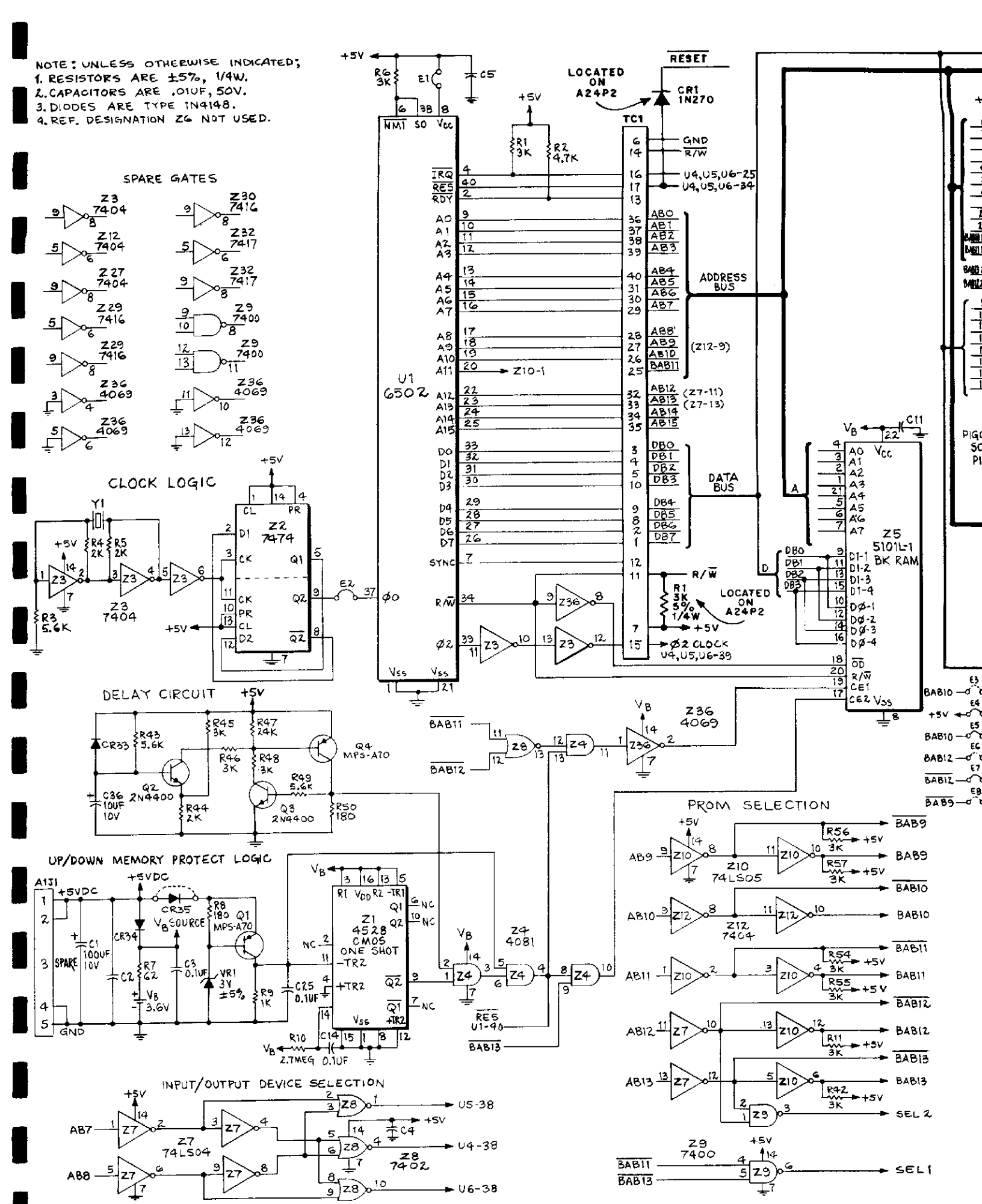
CONTROL BOARD (A1) PARTS LIST

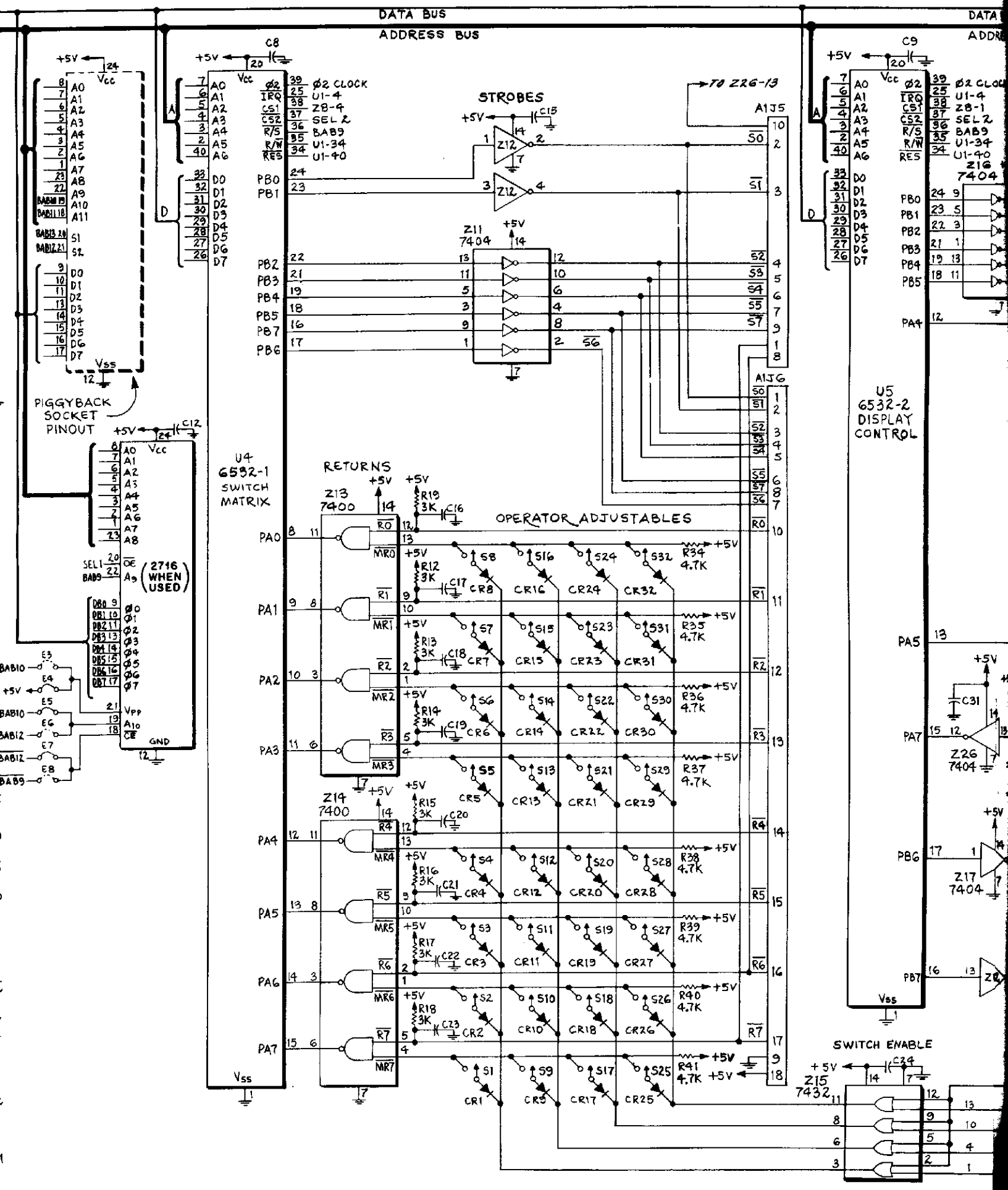
REFERENCE	DESCRIPTION	PART NUMBER
	CONTROL BOARD	MA-774
Bat 1	Battery-3.6V NI-CAD	XO-458
C1	Capacitor, 100 mfd., 10V	XO-211
C2, C4, C5, C8-C12, C15-C24, C26, C27, C31-C35	Capacitor, .01 mfd., 50V	XO-229
C3, C14, C25, C30	Capacitor, .1 mfd., 50V	XO-230
C36	10 mfd., 10V, TNT-AX CAP	XO-209
CR1-CR35	Diode, GP IN4148	XO-261
Q1, Q4	Transistor-PNP MPS-A70	XO-309
Q2, Q3	Transistor, NPN (Motorola 2N4400	XO-313
R1, R6 R11-R24 R42, R45, R46, R48, R51, R52, R54-R57	Resistor, 3.0K ohm, 5%, ¼W	XO-23
R2, R34-R41	Resistor, 4.7K ohm, 5%, ¼W	XO-7
R3, R43, R49	Resistor, 5.6K ohm, 5%, ¼W	XO-19
R4, R5, R44	Resistor, 2.0K ohm, 5%, ¼W	XO-14
R7	Resistor, 62 ohm, 5%, ¼W	XO-3
R8, R50	Resistor, 180 ohm, 5%, ¼W	XO-24
R9	Resistor, 1K ohm, 5%, ¼W	XO-5
R10	Resistor, 2.7M ohm, 5%, ¼W	XO-13
R25-R33	Resistor, 620 ohm, 5%, ¼W	XO-4
R47	Resistor, 24K ohm, 5%, ¼W	XO-10
SW1-SW4	Dip Switch 1008-692	XO-505
TC1	Socket, 40 Pin 640379-3	XO-530
U1	CPU R6502P	XO-360
U4, U5, U6	PRIOT R6532P	XO-361
VR1	Diode-3.0V, 5% IN5225B or IN5987B	XO-269
Y1	Crystal, 3.579545 MHZ	XO-456
Z1	IC-Cmos-Dual 1 Shot SCL4528BE	XO-414
Z2	IC-Dual Flip Flop SN7474N	XO-423
Z3, Z11, Z12, Z16, Z17, Z26, Z27, Z34, Z35	IC-Hex Inverter SN7404N	XO-402
Z4	IC-Cmos-Quad 2 Input "And" SCL4081BE	XO-401
Z5	IC-Static Ram 5101-L	XO-356
Z7	IC-Hex Inverter SN74LS04N	XO-418
Z8	IC-2 Input "Nor" SN7402N	XO-421
Z9, Z13, Z14	IC-2 Input "Nand" SN7400N	XO-420
Z10	IC-Open Collector Inverter SN74LS05N	XO-411
Z15	IC-2 Input "Or" SN7432N	XO-407
Z18, Z20	IC-"D" Flip Flop SN74175N	XO-410
Z33	IC-4-16 Decoder SN74154N	XO-409
Z28	IC-2 to 4 Decoder SN74LS139N	XO-419
Z29, Z30	IC-Hex Inverter—OC/HV SN7416N	XO-405
Z31	IC-2 Input "And" SN7408N	XO-404
Z32	IC-Hex Buffer—OC SN7417N	XO-406
Z36	IC-Cmos SCL4069B	XO-424
	Socket 24 Pin 640361-3	XO-529
	CONTROL BOARD (A1),PIGGYBACK	MA689

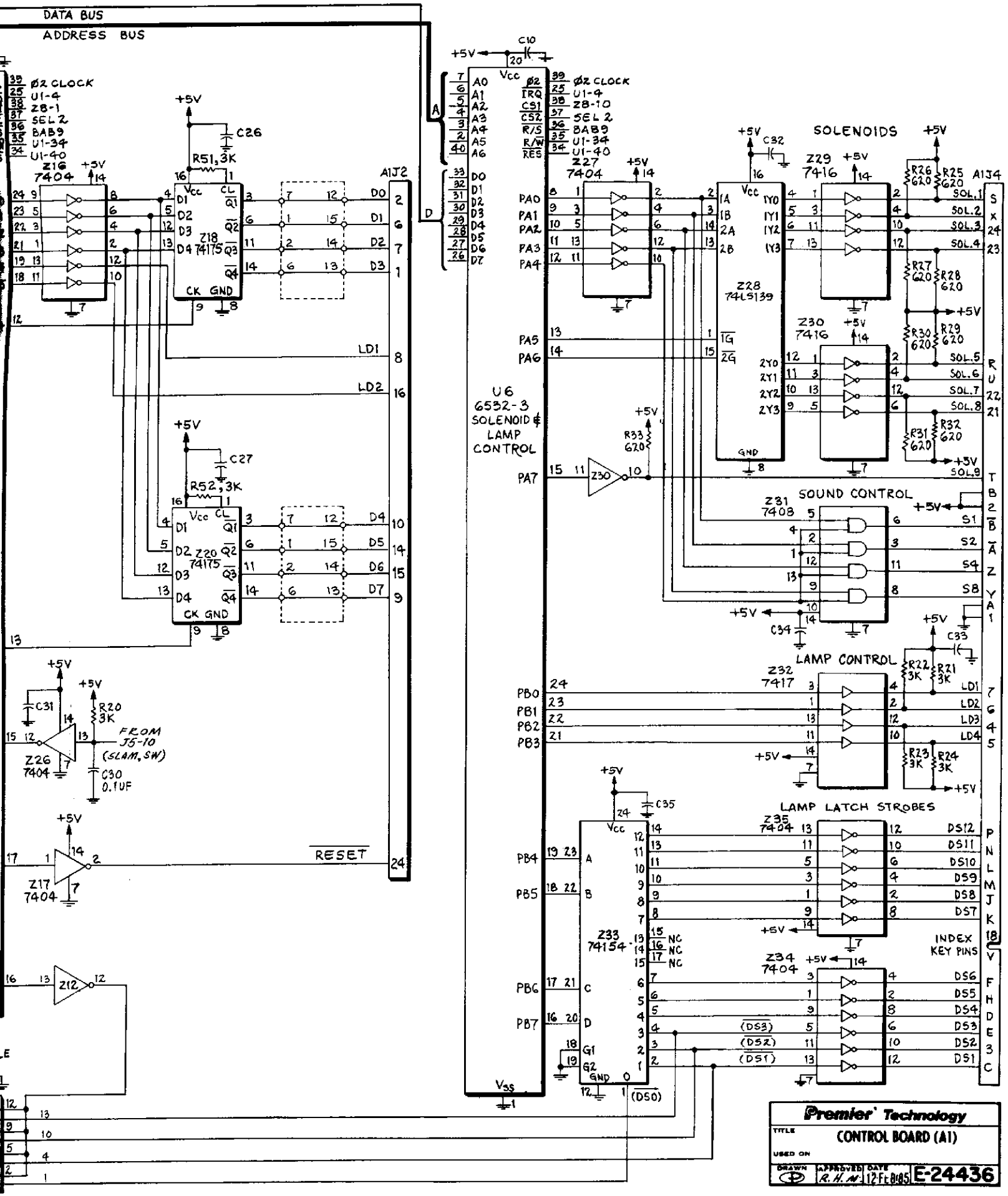
NOTE: UNLESS OTHERWISE INDICATED;
1. RESISTORS ARE ±5%, 1/4W.
2. CAPACITORS ARE .01UF, 50V.
3. DIODES ARE TYPE 1N4148.
4. REF. DESIGNATION Z6 NOT USED.

SPARE GATES

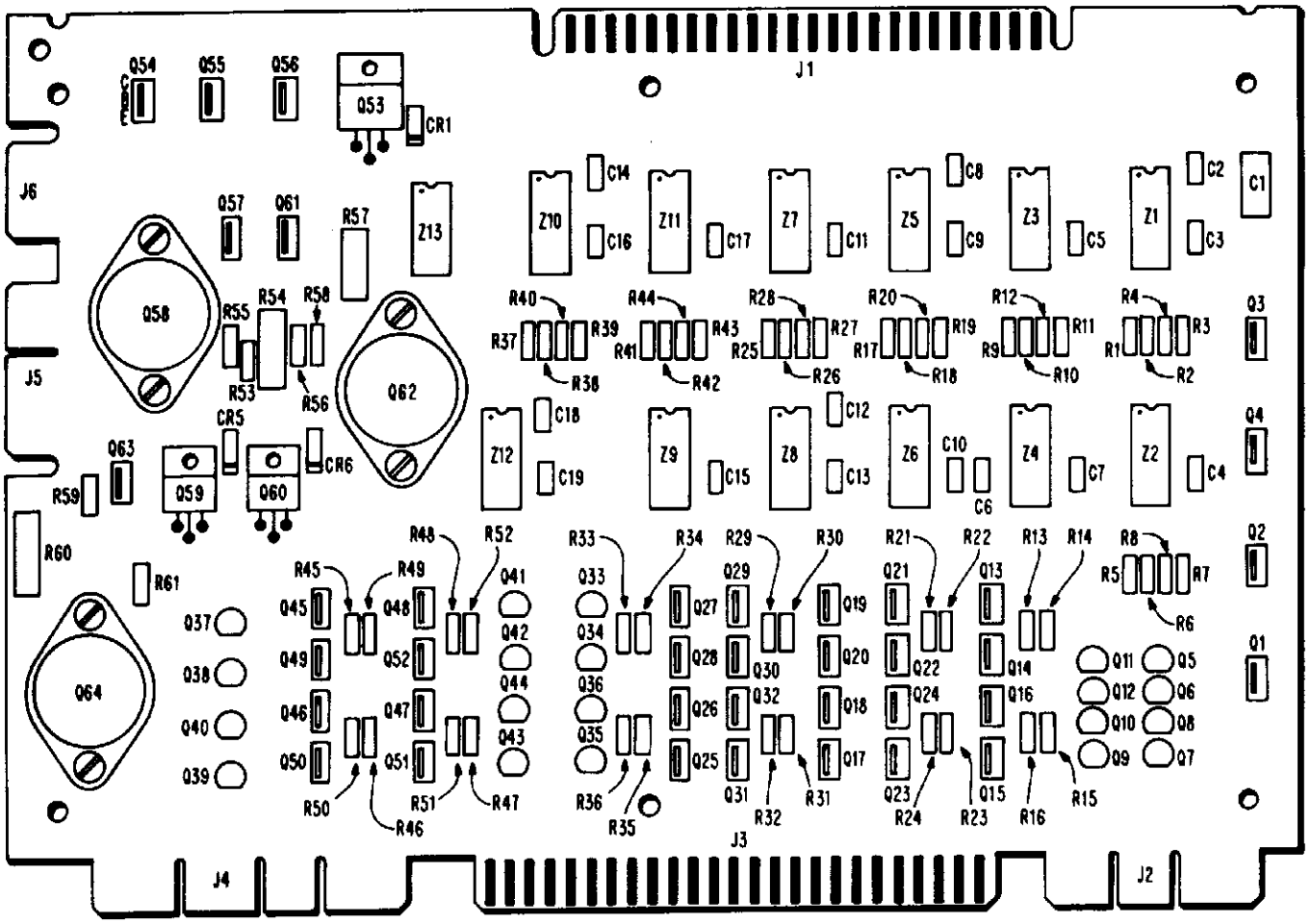
Z3 7404
Z12 7404
Z27 7404
Z29 7416
Z29 7416
Z36 4069
Z36 4069
Z30 7416
Z32 7417
Z32 7417
Z9 7400
Z9 7400
Z36 4069
Z36 4069

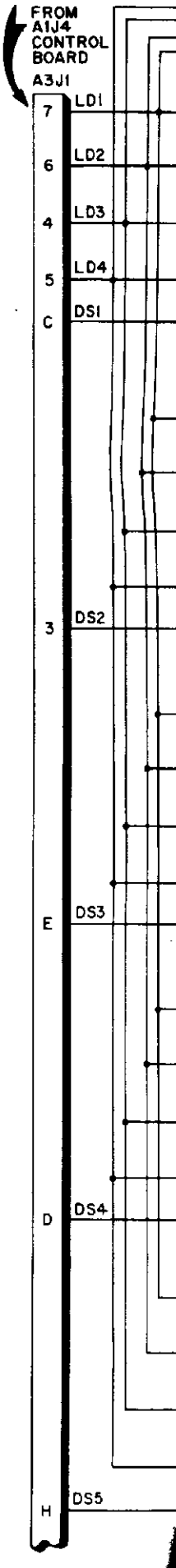



DATA BUS
ADDRESS BUS
U4
6532-1
SWITCH
MATRIX
U5
6532-2
DISPLAY
CONTROL
STROBES
RETURNS
OPERATOR ADJUSTABLES
SWITCH ENABLE
PIGGYBACK
SOCKET
PINOUT
2716
WHEN
USED
Z11 7404
Z12
Z13 7400
Z14 7400
Z15 7432
Z16 7404
Z17 7404
Z26 7404
TO Z26-13
Vcc
Vss
GND
+5V


DATA BUS
ADDRESS BUS
Ø2 CLOCK
U1-4
Z8-1
SEL 2
BA89
U1-34
U1-40
Z16 7404
+5V
C26
R51, 3K
Z18 74175
CK GND
A1J2
LD1
LD2
C27
R52, 3K
Z20 74175
D0
D1
D2
D3
D4
D5
D6
D7
C31
R20 3K
FROM J5-10 (SLAM SW)
Z26 7404
C30 0.1UF
RESET
Z17 7404
Z12
C10
U6 6532-3 SOLENOID & LAMP CONTROL
A0
A1
A2
A3
A4
A5
A6
IRQ
CS1
CS2
R/S
R/W
RES
PA0
PA1
PA2
PA3
PA4
PA5
PA6
PA7
PB0
PB1
PB2
PB3
PB4
PB5
PB6
PB7
Vss
Z27 7404
Z28 74LS139
SOLENOIDS
Z29 7416
Z30 7416
R26 620
R25 620
R27 620
R28 620
R30 620
R29 620
R32 620
R31 620
R33 620
SOL.1
SOL.2
SOL.3
SOL.4
SOL.5
SOL.6
SOL.7
SOL.8
SOL.9
A1J4
SOUND CONTROL
Z31 7408
C34
S1
S2
S4
S8
LAMP CONTROL
Z32 7417
C33
R22 3K
R21 3K
R23 3K
R24 3K
LD1
LD2
LD3
LD4
LAMP LATCH STROBES
Z35 7404
C35
Z33 74154
NC
(DS3)
(DS2)
(DS1)
(DS0)
Z34 7404
DS12
DS11
DS10
DS9
DS8
DS7
DS6
DS5
DS4
DS3
DS2
DS1
INDEX KEY PINS
Premier Technology
TITLE
CONTROL BOARD (A1)
USED ON
DRAWN
APPROVED R.H.N.
DATE 12 Feb 85
E-24436

DRIVER BOARD (A3) COMPONENT LOCATION





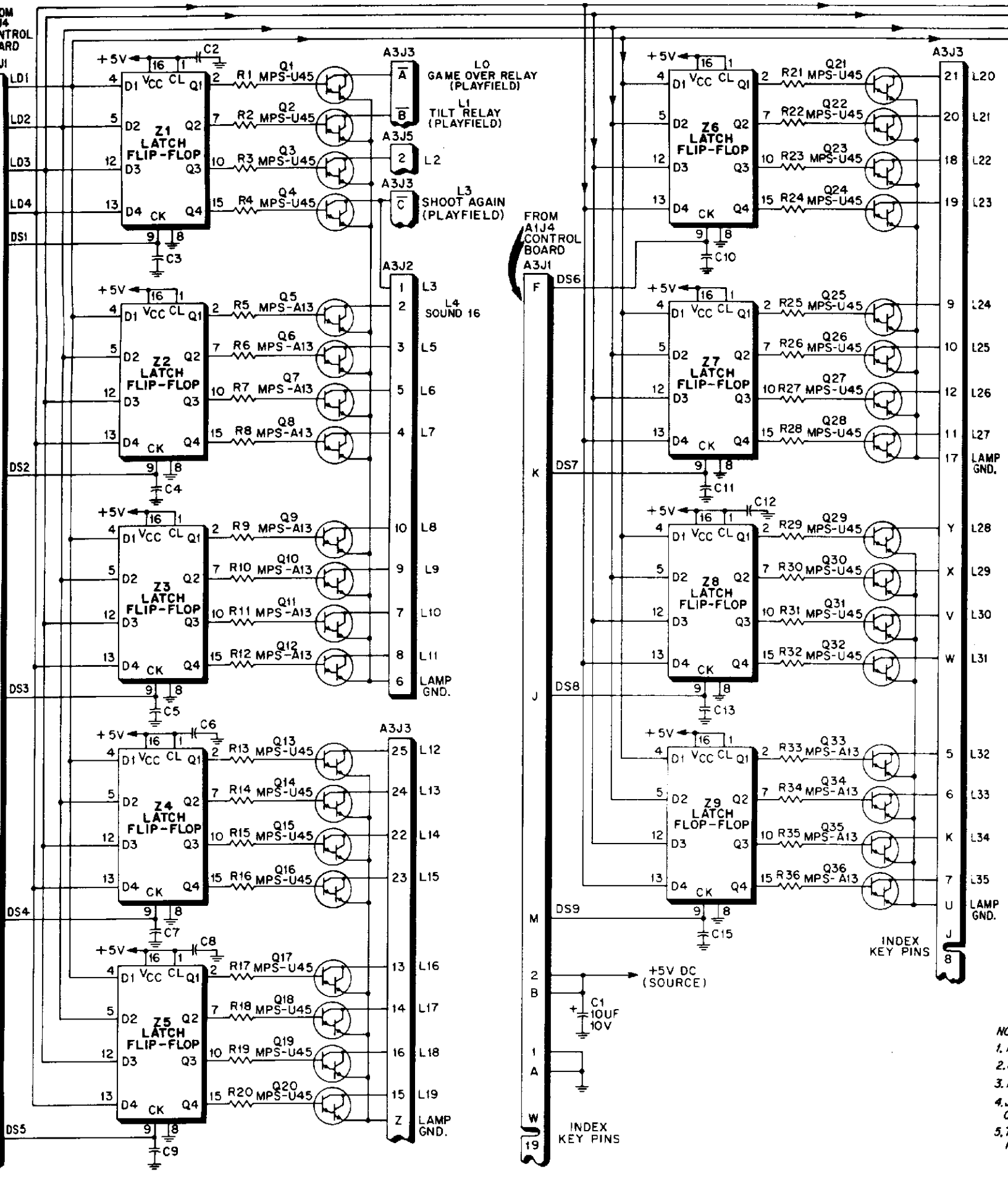
DRIVER BOARD (A3) PARTS LIST

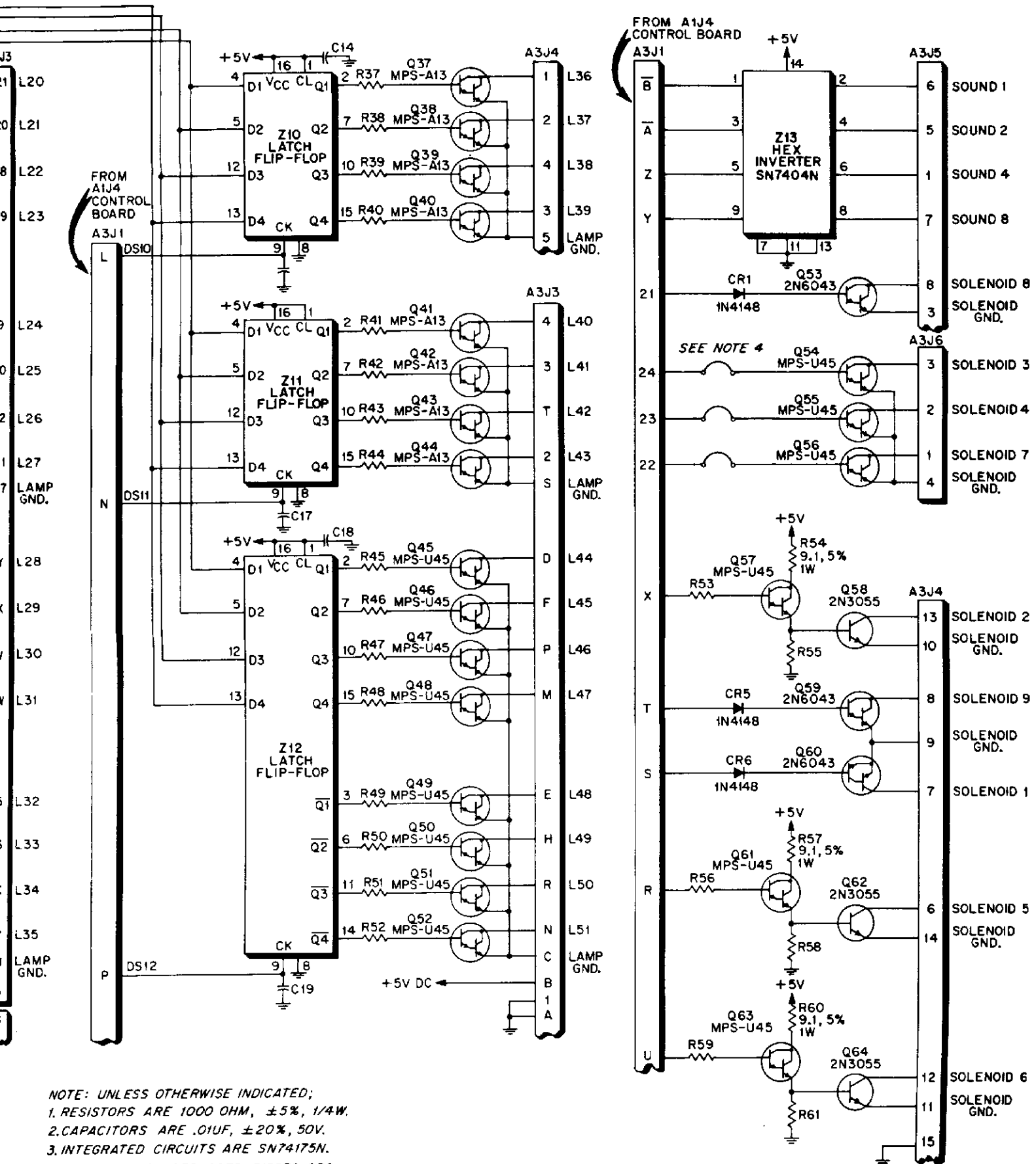
REFERENCE	DESCRIPTION	PART NUMBER
	DRIVER BOARD	MA-295
C1	Capacitor, 10 mfd., 10V Tantalum	XO-209
C2-C19	Capacitor, .01 mfd., 50V Ceramic	XO-229
CR1-CR6	Diode—Silicon IN4148	XO-261
R1-R53, R61, R55, R56, R58, R59	Resistor 1.0K ohm, 5%, ¼W	XO-5
R54, R57, R60	Resistor, 91 ohm, 5%, 1W	XO-158
Q1-Q4, Q13-Q32, Q45-Q52, Q54-Q57, Q61, Q63	Transistor, NPN, Darlington MPS-U45	XO-306
Q5-Q12, Q33-Q44	Transistor, NPN, Darlington MPS-A13	XO-304
Q53, Q59, Q60	Transistor, NPN, Darlington 2N6043	XO-303
Q58, Q62, Q64	Transistor, NPN, 2N3055	XO-301
Z1-Z12	IC-Quad "D" Latch Flip Flop SN74175N	XO-410
Z13	IC-Hex Inverter SN7404N	XO-402
	Insulator-Thermalloy 43-03-4	XO-512

NOTE:

1. JUMPER WIRES REPLACED DIODES CR2, CR3 AND CR4 FOR SYSTEM 80A AND 80B GAMES.

2. TRANSISTOR TYPES MPS-U45 AND NSD-U45 ARE INTERCHANGEABLE.


FROM A1J4 CONTROL BOARD
A3J1
A3J2
A3J3
A3J5
Z1 LATCH FLIP-FLOP
Z2 LATCH FLIP-FLOP
Z3 LATCH FLIP-FLOP
Z4 LATCH FLIP-FLOP
Z5 LATCH FLIP-FLOP
Z6 LATCH FLIP-FLOP
Z7 LATCH FLIP-FLOP
Z8 LATCH FLIP-FLOP
Z9 LATCH FLIP-FLOP
LO GAME OVER RELAY (PLAYFIELD)
LI TILT RELAY (PLAYFIELD)
L2
L3 SHOOT AGAIN (PLAYFIELD)
L4 SOUND 16
LAMP GND.
+5V DC (SOURCE)
C1 10UF 10V
INDEX KEY PINS
DS1
DS2
DS3
DS4
DS5
DS6
DS7
DS8
DS9
LD1
LD2
LD3
LD4

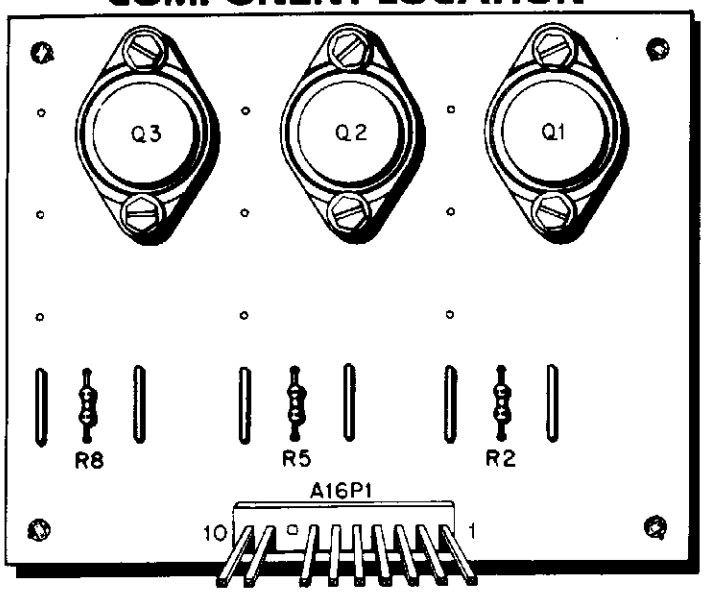


NOTE: UNLESS OTHERWISE INDICATED;

1. *RESISTORS ARE 1000 OHM, ±5%, 1/4W.*
2. *CAPACITORS ARE .01UF, ±20%, 50V.*
3. *INTEGRATED CIRCUITS ARE SN74175N.*
4. *JUMPER WIRES REPLACED DIODES CR2, CR3 AND CR4 FOR SYSTEM 80A AND 80B GAMES.*
5. *TRANSISTOR TYPES MPS-U45 AND NDS-U45 ARE INTERCHANGEABLE.*

Premier Technology			
TITLE: DRIVER BOARD (A3)			
USED ON:			
DRAWN: CP	APPROVED: BAM	DATE: 12-12-80	E-20915

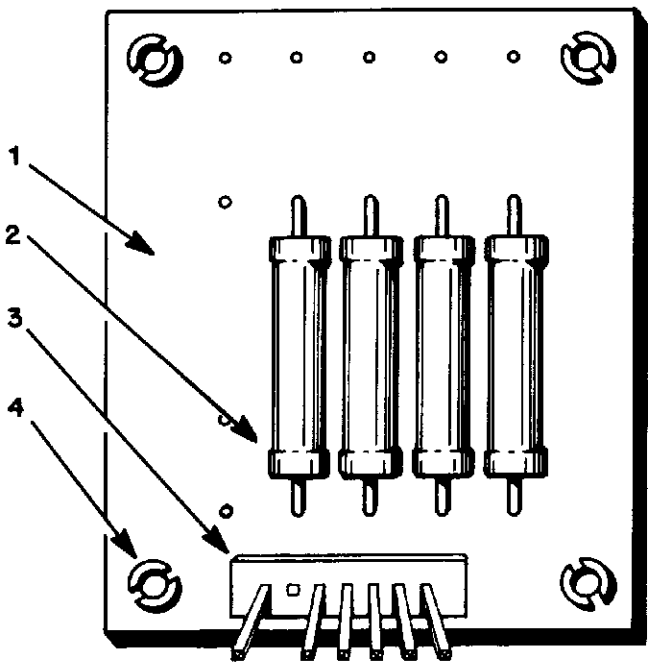
TRANSISTOR DRIVER BOARD (A16) COMPONENT LOCATION



TRANSISTOR DRIVER BOARD (A16) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	Transistor Driver Board Assembly (1A16)	MA-1051
Q1	Transistor, MJ2955	XO-799
Q2,Q3	Transistor, 2N5879	XO-323
R2,R5,R8	Resistor, 4.7K Ohm, 5%, 1/4W	XO-7
P1	10 Position Connector	XO-879
	Circuit Board Support (4)	MP-40

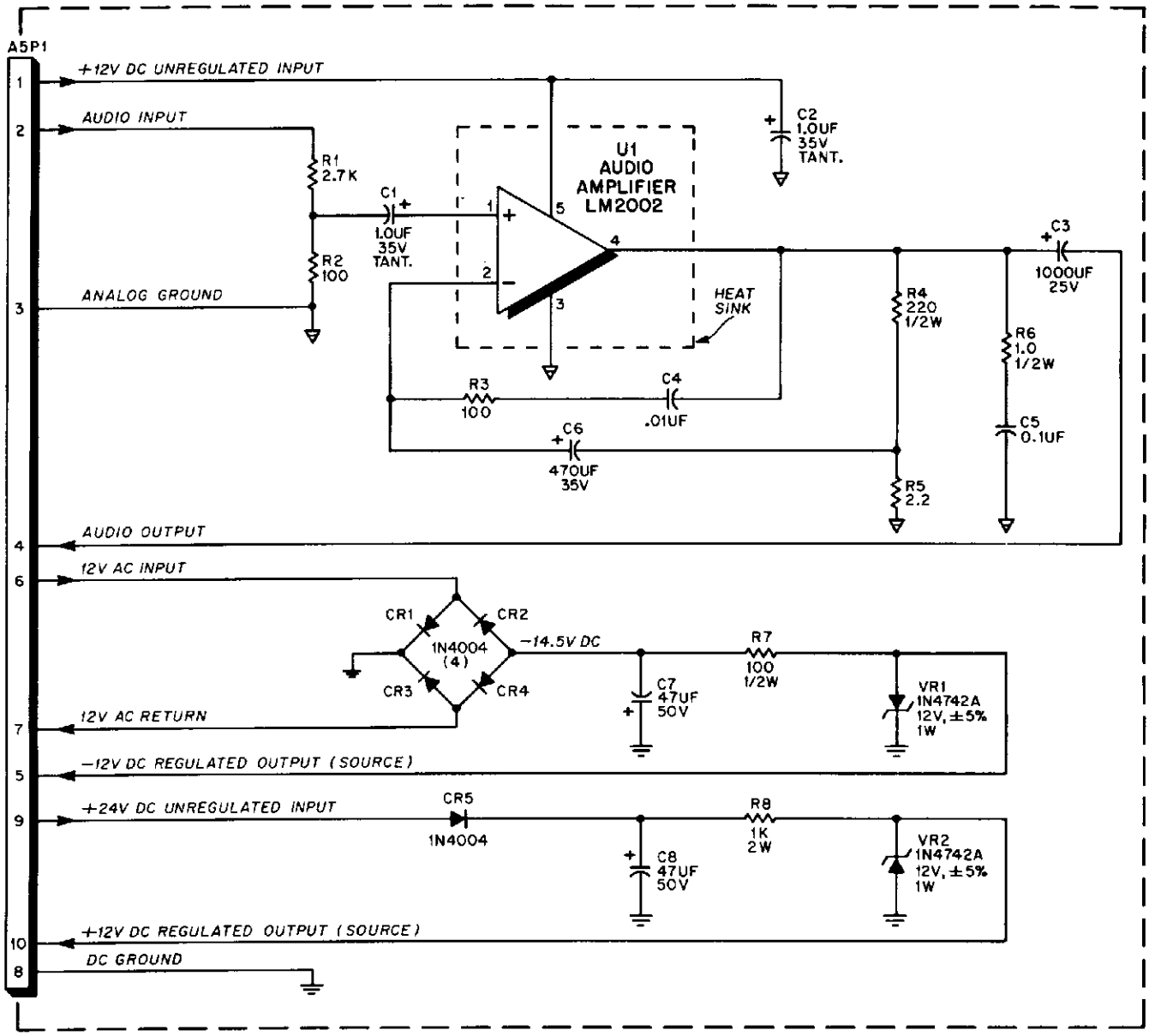
RESISTOR BOARD (A13)



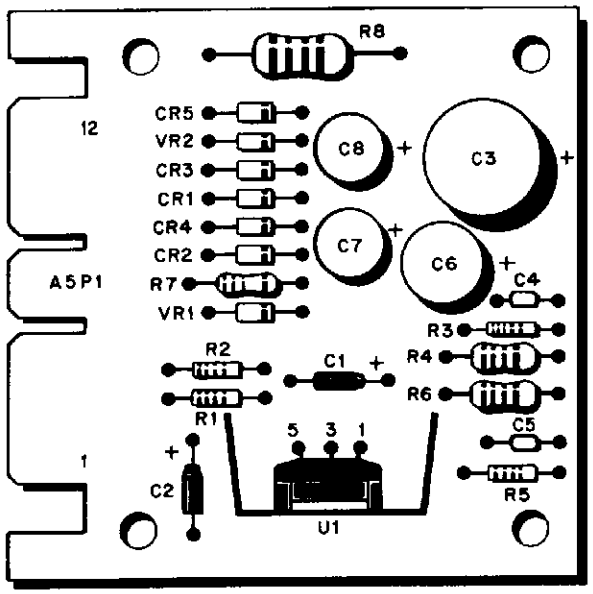
RESISTOR BOARD (A13) PARTS LIST

ITEM	DESCRIPTION	PART NO.
1	RESISTOR BOARD ASSEMBLY (A13)	25231
2	RESISTOR, 4 OHM, 7W, WW, (4)	XO-878
3	7 POSITION CONNECTOR (A13P1)	XO-879
4	SPACER (4)	23984

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



AUXILIARY POWER SUPPLY (A5) COMPONENT LOCATION



Premier Technology

TITLE AUXILIARY POWER SUPPLY (A5)

USED ON

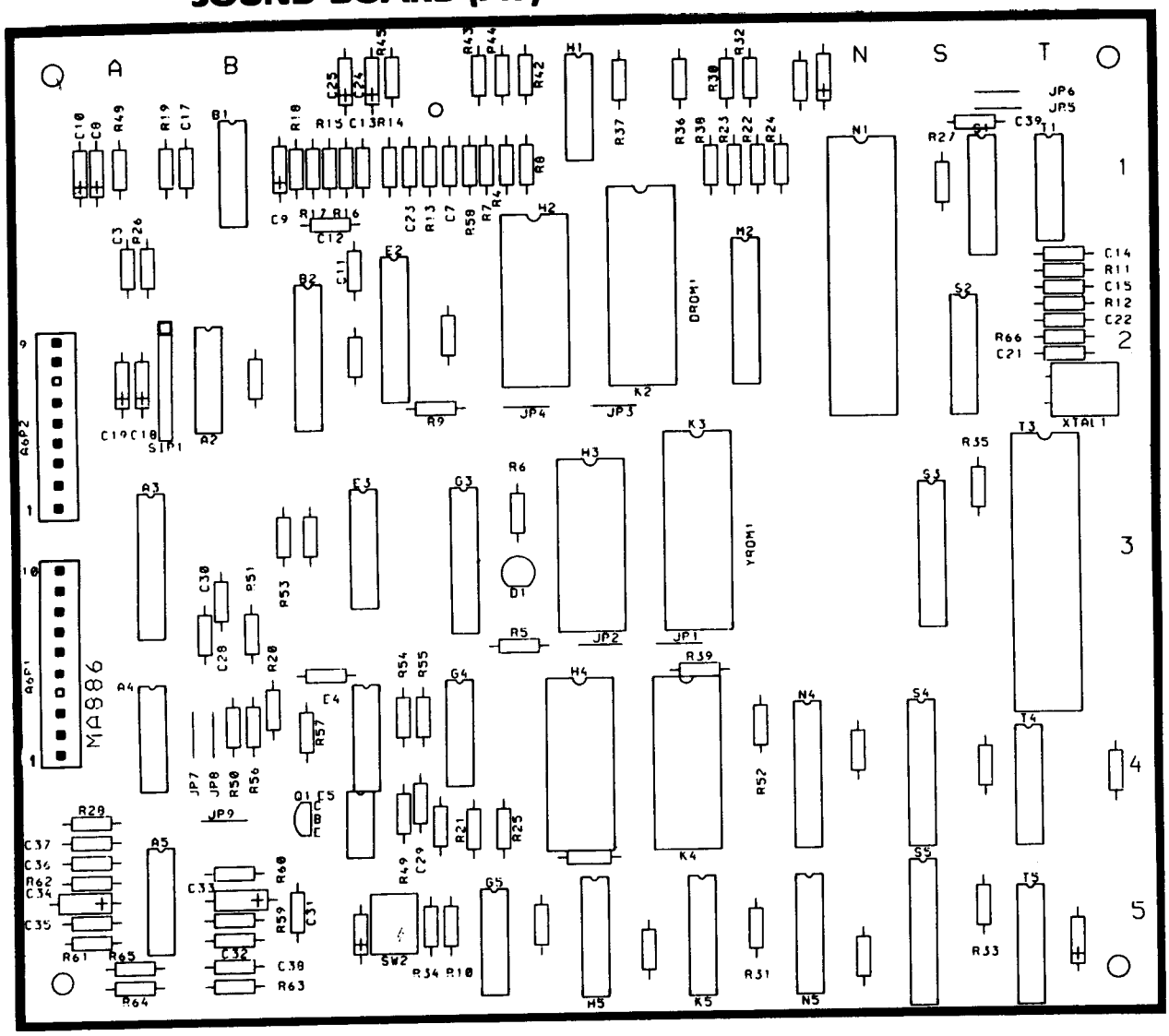
DRAWN	APPROVED	DATE	E-24715
	R.H.M.	9-OCT-85	

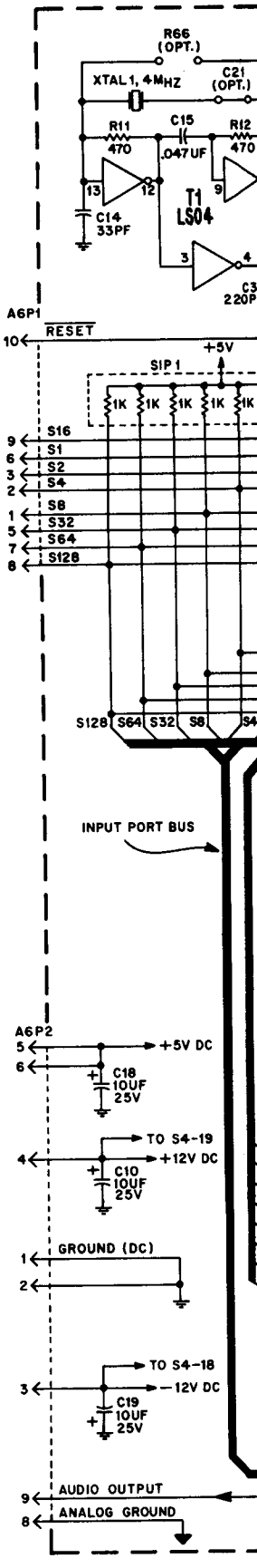
AUXILIARY POWER SUPPLY (A5) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	Auxiliary Power Supply	MA-767
C1,C2	Capacitor, 1UF, 10%, 35V, TANT	XO-715
C3	Capacitor, 1000UF, 25V	XO-874
C4	Capacitor, .01UF, +80% -20%, 50V	XO-229
C5	Capacitor, 0.1UF, +80% -20%, 50V	XO-230
C6	Capacitor, 470UF, 35V	XO-284
C7,C8	Capacitor, 47UF, 50V	XO-210
CR1-CR5	Diode, 1N4004	XO-254
R1	Resistor, 2.7K Ohm, 5%, 1/4W	XO-6
R2,R3	Resistor, 100 Ohm, 5%, 1/4W	XO-28
R4	Resistor, 220 Ohm, 5%, 1/2W	XO-185
R5	Resistor, 2.2 Ohm, 5%, 1/4W	XO-595
R6	Resistor, 1 Ohm, 5%, 1/2W	XO-593
R7	Resistor, 100 Ohm, 5%, 1/2W	XO-52
R8	Resistor, 1K Ohm, 5%, 2W	XO-627
U1	Audio Amplifier, LM2002	XO-550
VR1,VR2	Diode, Zener, 1N4742A, 12V, ±5%, 1W	XO-257
	Heat Sink	XO-472

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

SOUND BOARD (A6) COMPONENT LOCATION





SOUND BOARD (A6) PARTS LIST

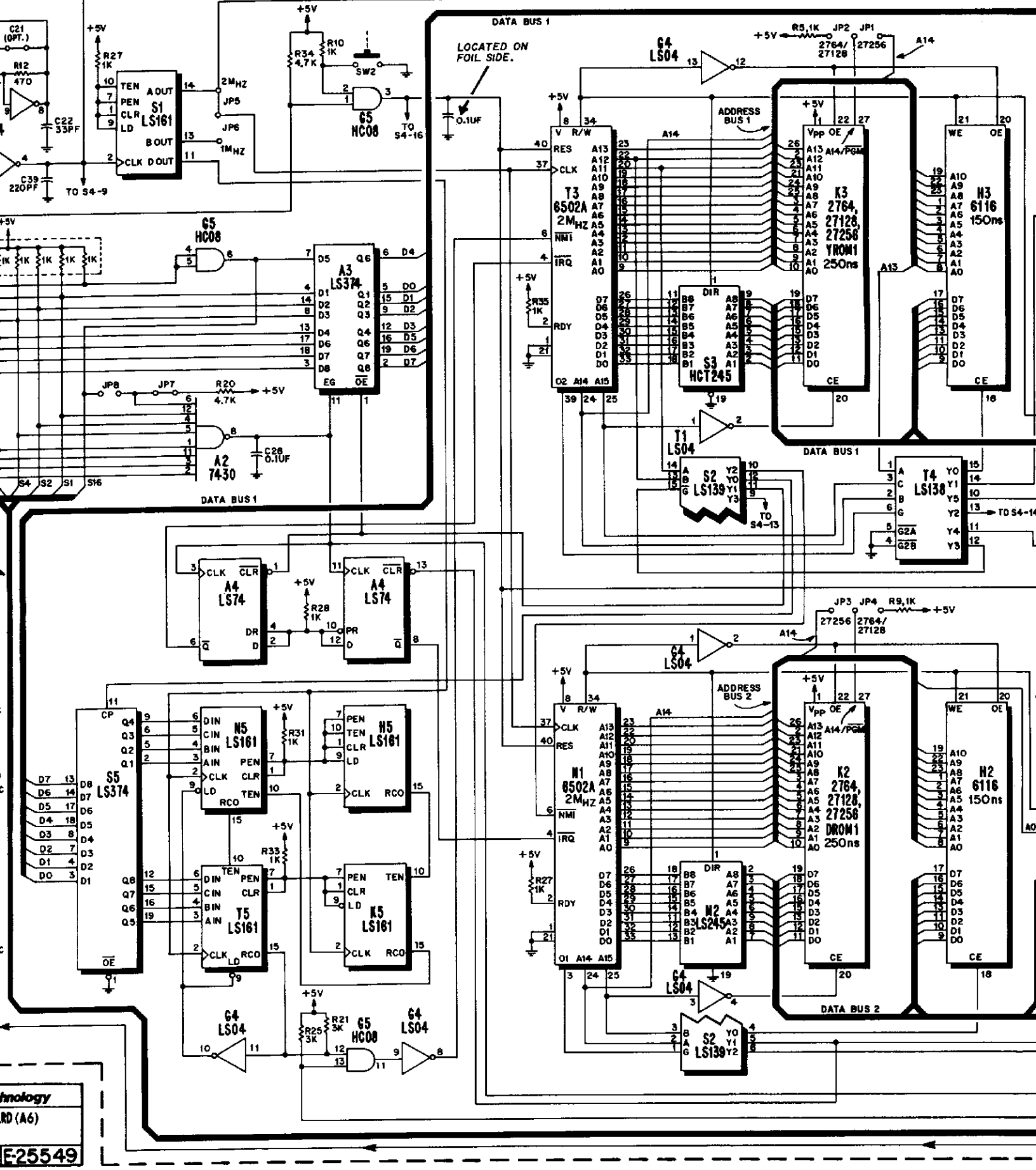
REFERENCE	DESCRIPTION	PART NUMBER
	Sound Board Assembly	MA-886
C7,C13,C17, C23,C29,C37	Capacitor, 1UF, 20%, 50V (Non-Polarized)	XO-746
C8,C9,C10, C18,C19,C24, C25,C33,C34 AND THREE UNMARKED CAPACITORS	Capacitor, 10UF, 20%, 25V (Tantalum)	XO-127
C11,C12	Capacitor, 10PF, +80%-20%, 50V	XO-635
C14,C22	Capacitor, 33PF, 10%, 100V	XO-896
C15	Capacitor, .047UF, 20%, 50V	XO-638
C28,C30,AND FOURTEEN UNMARKED CAPACITORS	Capacitor, 0.1UF, +80%-20%, 50V	XO-230
C31,C32	Capacitor, 0.1UF, 10%, 50V	XO-784
C35	Capacitor, 1000PF, 10%, 100V	XO-296
C36	Capacitor, 2200PF, 10%, 100V	XO-289
C38	Capacitor, .0033UF, 10%, 100V	XO-600
C39	Capacitor, 220PF, 10%, 100V	XO-694
D1	Diode, MV5752, (LED, Red)	XO-270
R4,R7,R8, R22,R23	Resistor, 68 Ohm, 5%, 1/4W	XO-748
R5,R9,R10, R27,R28,R31, R33,R35,R39, R52,R54,R55	Resistor, 1K Ohm, 5%, 1/4W	XO-5
R6	Resistor, 240 Ohm, 5%, 1/4W	XO-173
R11,R12	Resistor, 470 Ohm, 5%, 1/4W	XO-35
R13,R14, R21,R25	Resistor, 3K Ohm, 5%, 1/4W	XO-23
R15	Resistor, 18K Ohm, 5%, 1/4W	XO-762
R16,R17,R30, R32,R38,R42, R43,R44, R50,R51	Resistor, 10K Ohm, 5%, 1/4W	XO-18
R18,R53	Resistor, 6.8K Ohm, 5%, 1/4W	XO-8
R20,R34	Resistor, 4.7K Ohm, 5%, 1/4W	XO-7
R24,R56	Resistor, 2.2K Ohm, 5%, 1/4W	XO-27
R36,R45,R61, R62,R63,R64	Resistor, 33K Ohm, 5%, 1/4W	XO-43
R37	Resistor, 2.7K Ohm, 5%, 1/4W	XO-6
R49,R59,R60	Resistor, 100K Ohm, 5%, 1/4W	XO-45
R57	Resistor, 12K Ohm, 5%, 1/4W	XO-9
R65	Resistor, 27K Ohm, 5%, 1/4W	XO-11
A2	IC, 7430, 8 Input NAND Gate	XO-643
A3,B2,S5	IC, 74LS374, Octal "D" Flip Flop	XO-96
A4,E4,	IC, 74LS74, Dual "D" Flip Flop	XO-434
A5,B1,H1	IC, LM324, Quad Op-Amp	XO-644
E2	IC, AD7528J, Multiplier DAC	XO-647
E3	IC, 74HC592, 8 Bit Counter	XO-892
E5	IC, MF-4CN-50,Switched Capacitor Filter	XO-894
G3,N4	IC, 74LS377, Octal "D" Flip Flop	XO-97
G4,T1	IC, 74LS04, Hex Inverter	XO-418
G5	IC, 74HC08, Quad 2 Input "AND" Gate	XO-872
H2,H3	IC, 6116P-3, 2K x 1 RAM	XO-193
H4,K4	IC, AY-3-8913, Sound Generator	XO-646
H5,K5,N5, S1,T5	IC, 74LS161, Synchronous Presettable Binary Counter	XO-440
K2,K3	IC, Specified Per Game	
M2	IC, 74LS245, Octal Bus Transceiver	XO-79
N1,T3	IC, 6502A, CPU	XO-893
S2	IC, 74LS139, Dual 1 of 4 Decoder	XO-419
S3	IC, 74HCT245, Octal Bus Tranceiver	XO-891
T4	IC, 74LS138, 1 of 8 Decoder	XO-437
Q1	Transistor, 2N4264, Level Shifter	XO-895
SIP 1	Resistor Pack 8 x 1K Ohm	XO-493
SW2	Switch, Pushbutton	XO-897
XTAL 1	Crystal, 4 MHZ	XO-366
A6PI,A6P2	Connector (2)	XO-879
	28 Pin Dip Socket (2)	XO-536
	Jumper, 22 Gauge (7)	XO-469

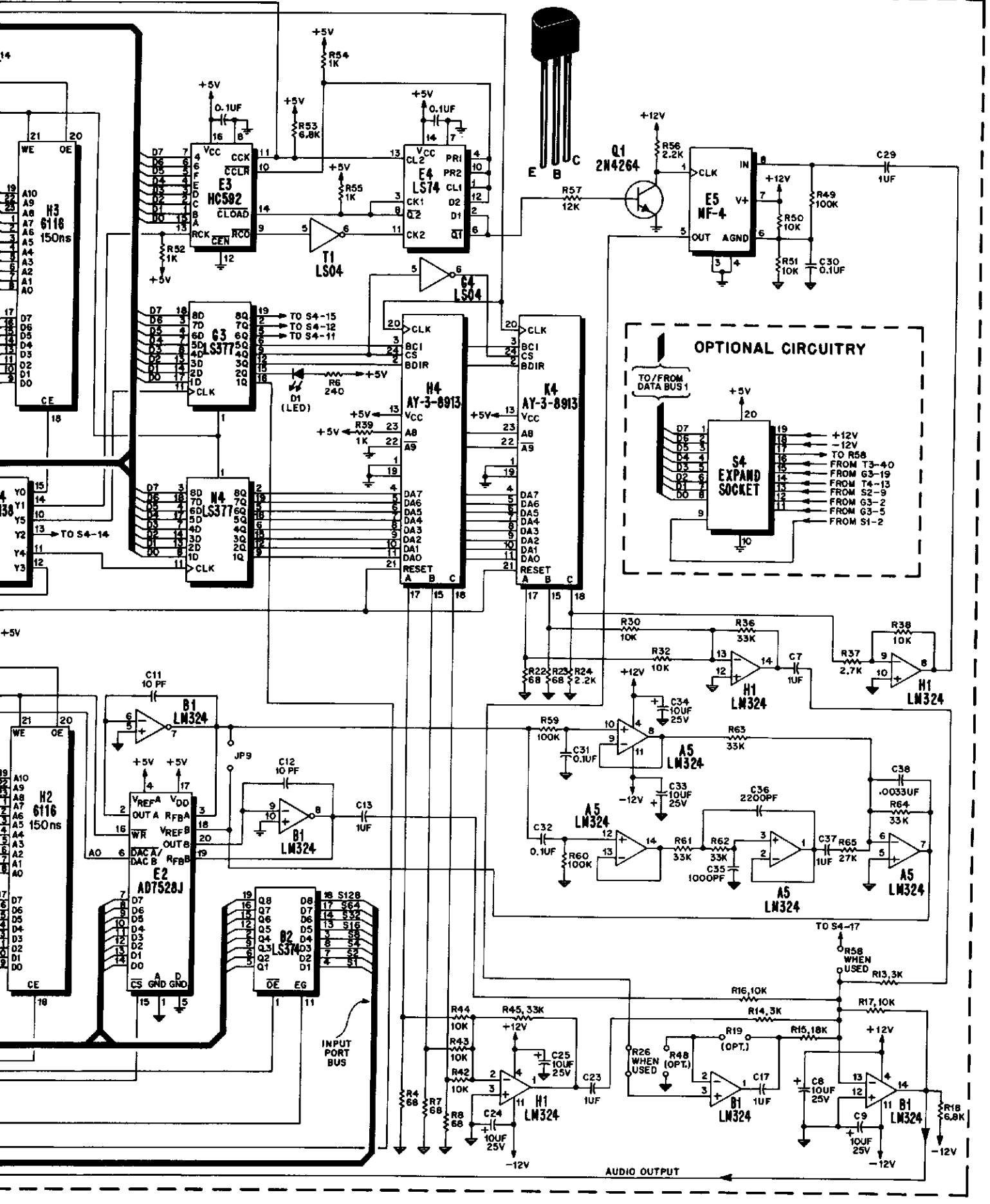
Premier Technol

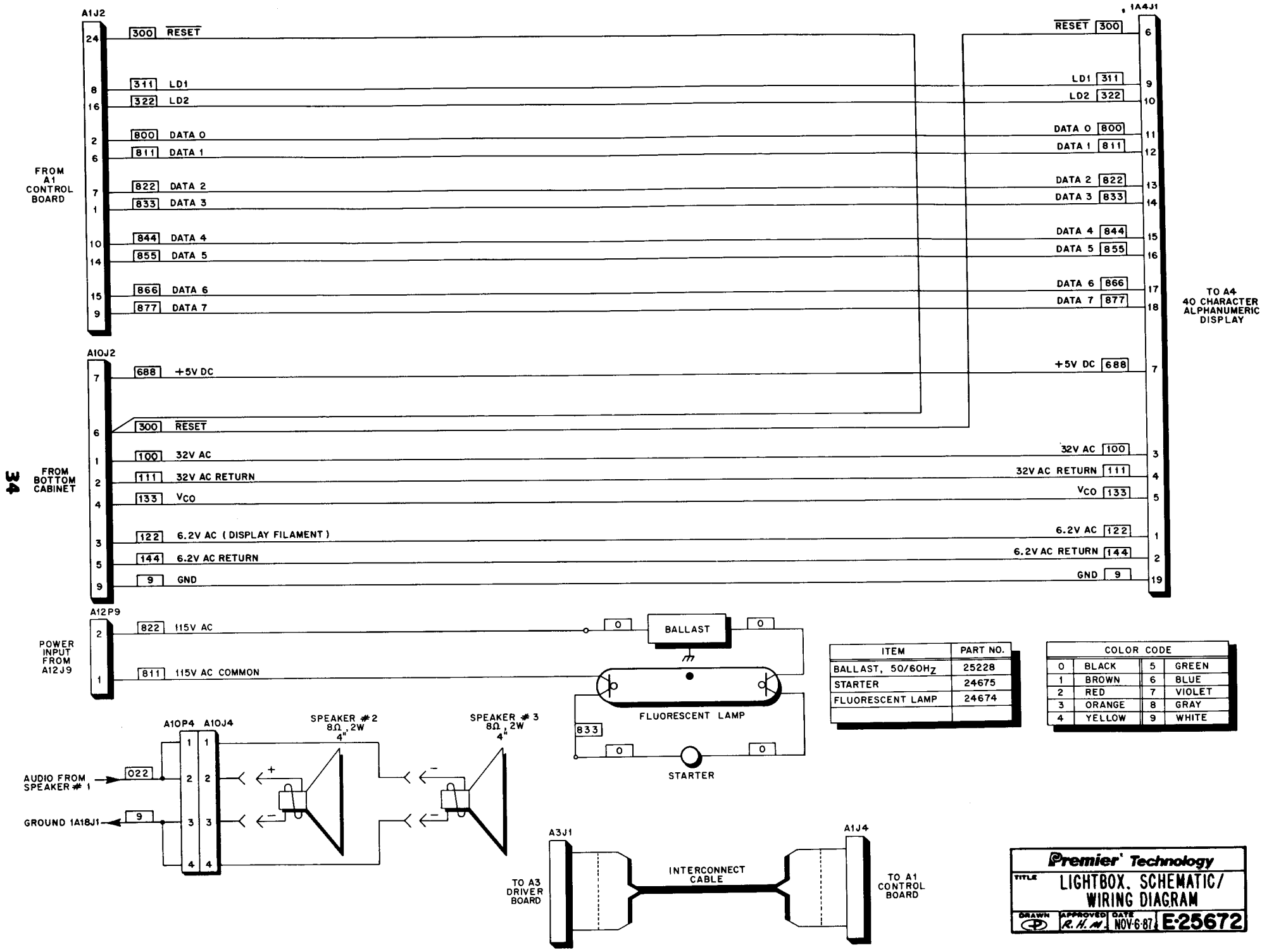
TITLE SOUND BOARD (A

USED ON

DRAWN	APPROVED	DATE	
	R.H.M.	6-AUG-87	E-2


DATA BUS 1
LOCATED ON FOIL SIDE.
C21 (OPT.)
R12 470
C22 33PF
C39 220PF
R27 1K
S1 LS161
TEN PEN CLR LD
AOUT BOUT CLK DOUT
2MHZ
1MHZ
JP5
JP6
TO S4-9
R34 4.7K
R10 1K
SW2
G5 HC08
TO S4-16
0.1UF
G4 LS04
R5,1K
JP2
JP1
2764/ 27128
27256
A14
ADDRESS BUS 1
T3 6502A 2MHZ
V R/W
RES
CLK
NMI
IRQ
RDY
A13 A12 A11 A10 A9 A8 A7 A6 A5 A4 A3 A2 A1 A0
D7 D6 D5 D4 D3 D2 D1 D0
Ø2 A14 A15
R35 1K
S3 HCT245
DIR
CE
K3 2764, 27128, 27256 YROM1 250ns
H3 6116 150ns
WE OE
T1 LS04
S2 LS139
T4 LS138
TO S4-13
TO S4-14
G5 HC08
A3 LS374
D5 D6 D7 D8 EG OE
Q6 Q1 Q2 Q3 Q4 Q6 Q7 Q8
D4 D0 D1 D2 D3 D4 D5 D6 D7
JP8 JP7 R20 4.7K
A2 7430
C26 0.1UF
S4 S2 S1 S16
A4 LS74
CLK CLR D Q PR
R28 1K
JP3 JP4 R9,1K
ADDRESS BUS 2
M1 6502A 2MHZ
K2 2764, 27128, 27256 DROM1 250ns
H2 6116 150ns
M2 LS245
R27 1K
S5 LS374
N5 LS161
T5 LS161
H5 LS161
K5 LS161
DIN CIN BIN AIN PEN CLR LD CLK RCO TEN
R31 1K
R33 1K
R21 3K
R25 3K
G4 LS04
G5 HC08
DATA BUS 2
hnology
RD (A6)
E-25549


OPTIONAL CIRCUITRY
TO/FROM DATA BUS1
S4 EXPAND SOCKET
FROM T3-4,0
FROM G3-19
FROM T4-13
FROM S2-9
FROM G3-2
FROM G3-5
FROM S1-2
TO R58
+12V
-12V
Q1 2N4264
E3 HC592
E4 LS74
E5 MF-4
T1 LS04
G4 LS04
G3 LS377
N4 LS377
H4 AY-3-8913
K4 AY-3-8913
H3 6116 150ns
H2 6116 150ns
E2 AD7528J
B2 LS374
B1 LM324
H1 LM324
A5 LM324
D1 (LED)
JP9
TO S4-14
TO S4-15
TO S4-12
TO S4-11
TO S4-17
R58 WHEN USED
INPUT PORT BUS
AUDIO OUTPUT



ITEM	PART NO.
BALLAST, 50/60Hz	25228
STARTER	24675
FLUORESCENT LAMP	24674

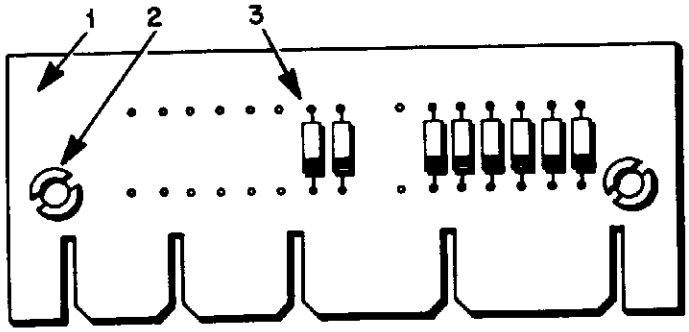
COLOR CODE			
0	BLACK	5	GREEN
1	BROWN	6	BLUE
2	RED	7	VIOLET
3	ORANGE	8	GRAY
4	YELLOW	9	WHITE

Premier Technology

TITLE: LIGHTBOX, SCHEMATIC/ WIRING DIAGRAM

DRAWN	APPROVED	DATE	
CP	R.H.M.	NOV-6-87	E-25672

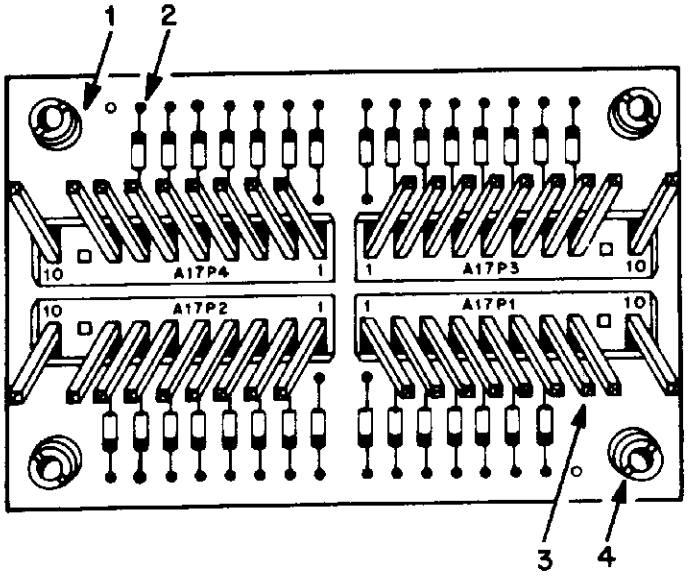
DIODE BOARD (A7)



DIODE BOARD (A7)

ITEM	DESCRIPTION	PART NO.
1	Diode Board Assembly (A7)	24252
2	Spacer (2)	23984
3	Diode, 1N270 (8)	XO-265

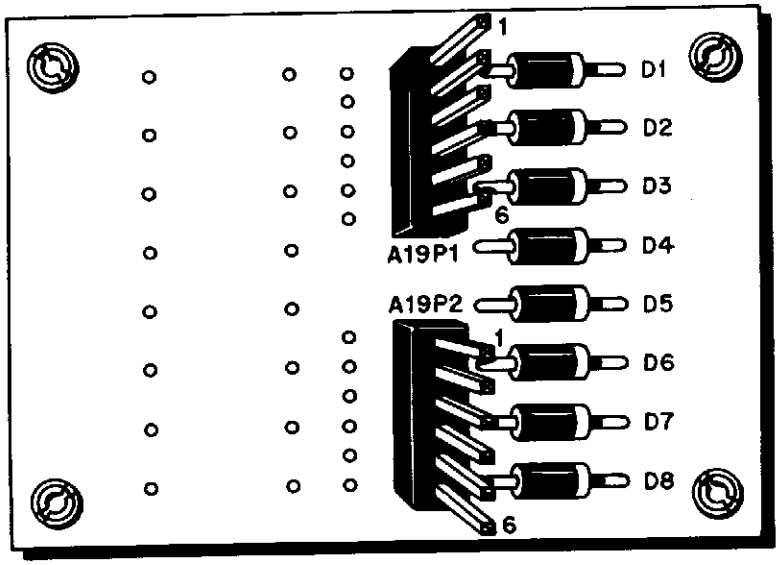
DIODE BOARD (A17)



DIODE BOARD (A17)

ITEM	DESCRIPTION	PART NO.
1	Diode Board Assembly (1A17)	MA-987
2	Diode, 1N270 (30)	XO-265
3	10 Position Connector (4)	XO-879
4	Spacer (4)	23984

SWITCHING DIODE BOARD (A19)

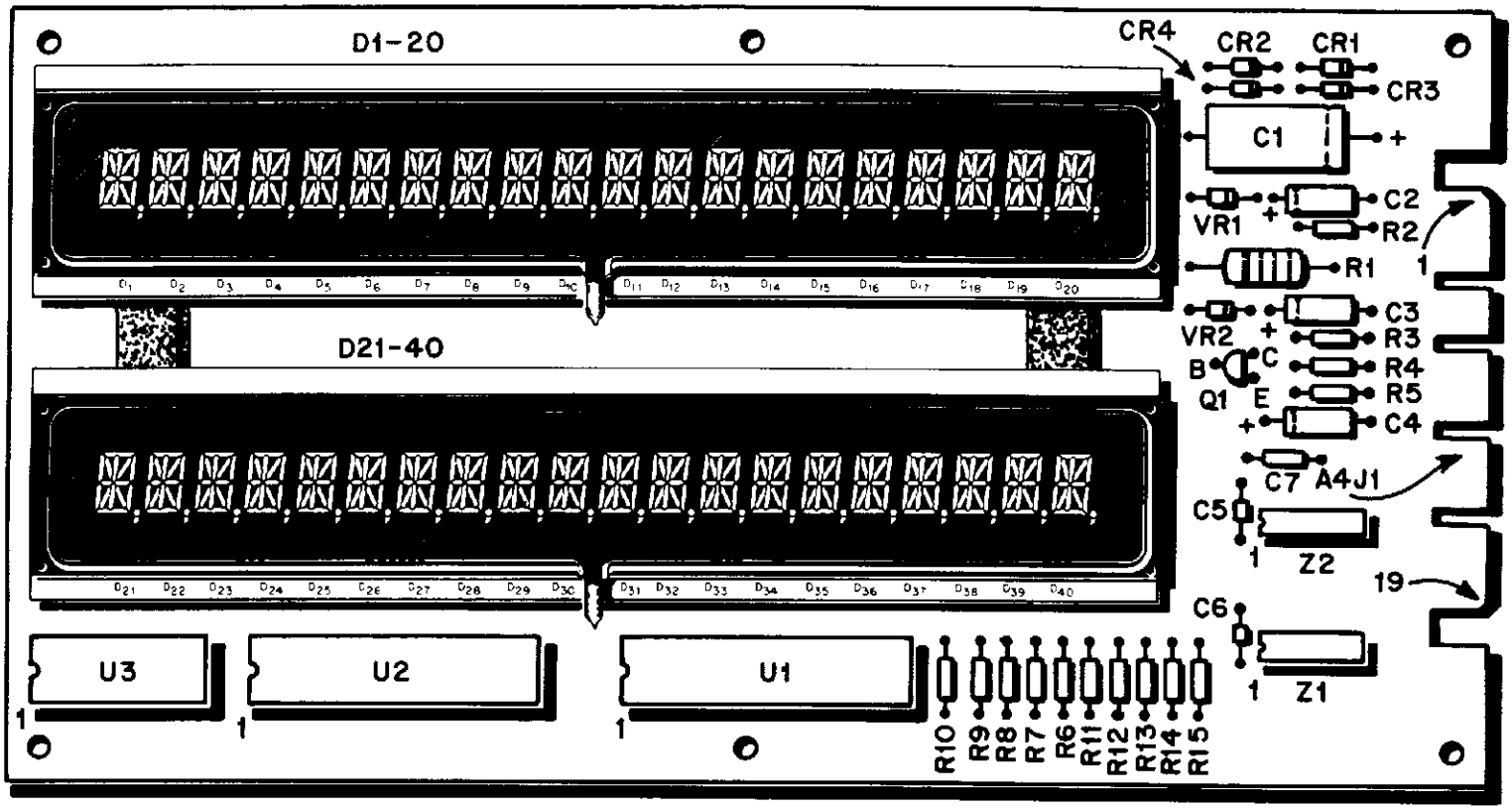


SWITCHING DIODE BOARD (A19)

ITEM	DESCRIPTION	PART NO.
	Switching Diode Assembly (A19)	MA-1050
D1-D8	Diode, 1N5401 (8)	XO-263
A19P1, A19P2	6 Position Connector (2)	XO-879
	Spacer (4)	23984

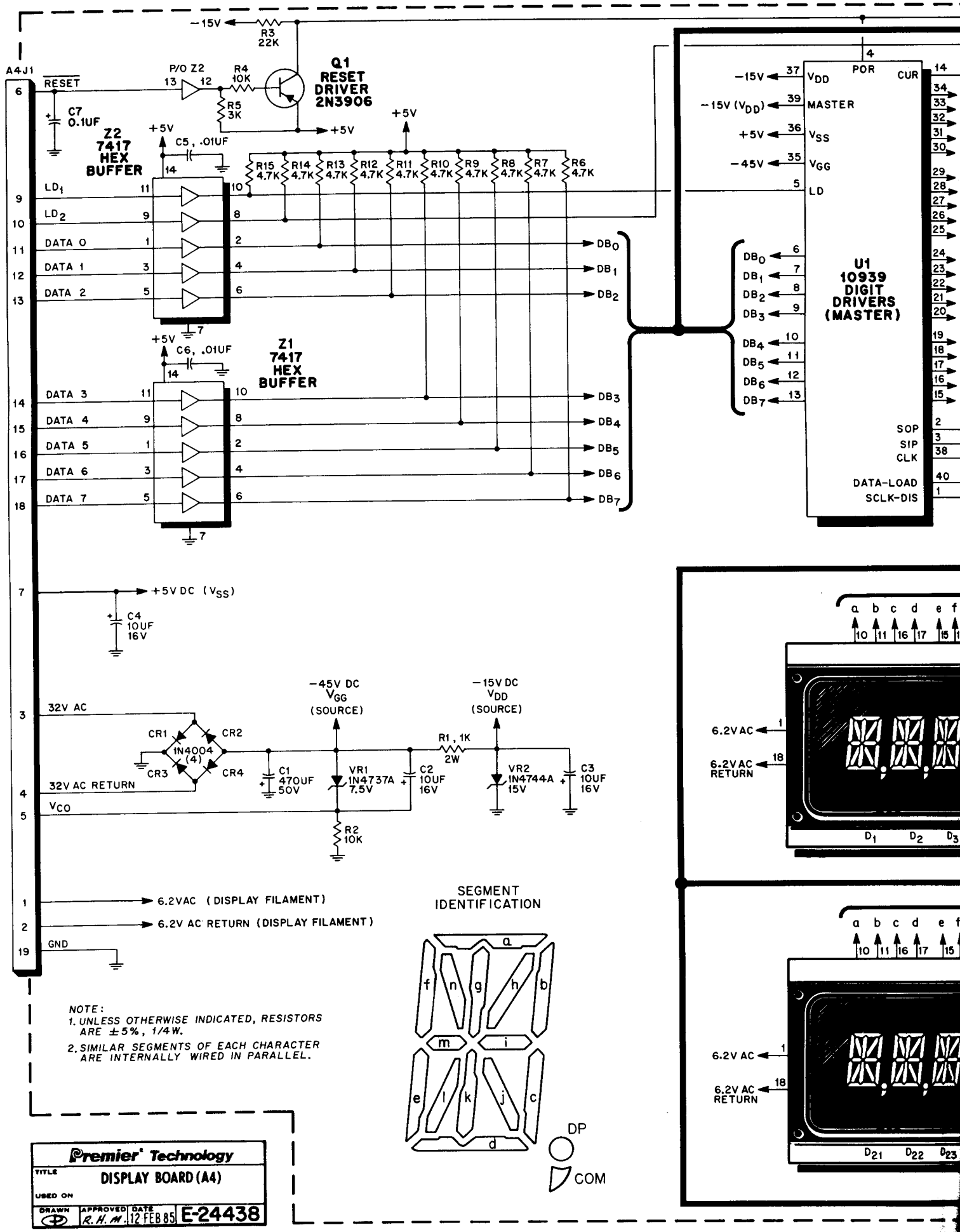
X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

DISPLAY BOARD (A4) COMPONENT LOCATION



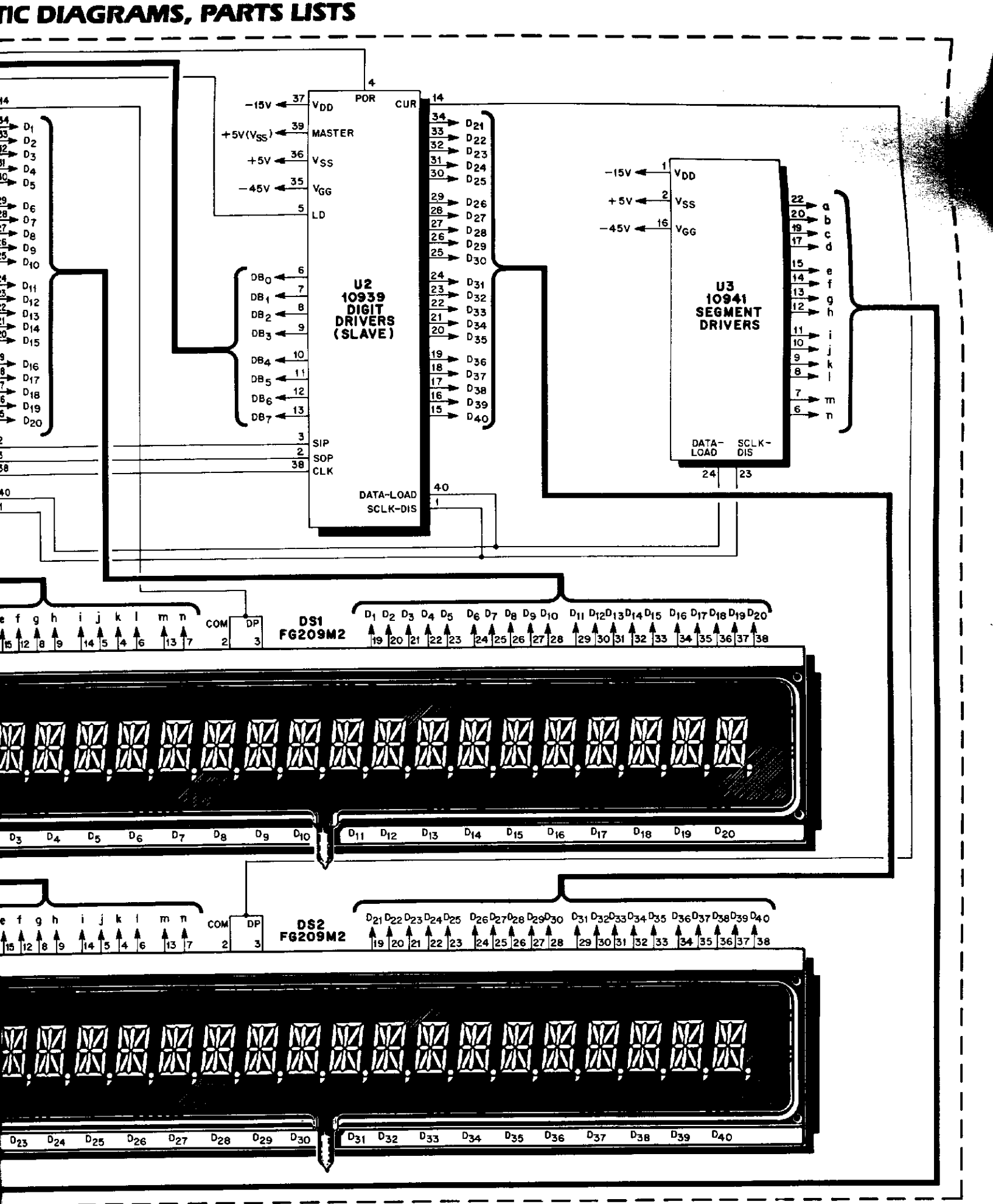
DISPLAY BOARD (A4) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	Display Board (A4)	MA644
C1	Capacitor, 470UF, 50V	XO-847
C2, C3, C4	Capacitor, 10UF, 16V	XO-846
C5, C6	Capacitor, .01UF, +80% -20%	XO-229
C7	Capacitor, 0.1UF, 50V	XO-230
CR1-CR4	Diode, 1N4004	XO-254
DS1, DS2	Display, Alphanumeric	XO-840
Q1	Transistor, PNP, 2N3906	XO-588
R1	Resistor, 1K, 5%, 2W	XO-627
R2, R4	Resistor, 10K, 5%, 1/4W	XO-18
R3	Resistor, 22K, 5%, 1/4W	XO-42
R5	Resistor, 3K, 5%, 1/4W	XO-23
R6-R15	Resistor, 4.7K, 5%, 1/4W	XO-7
U1, U2	IC, Digit Drivers, 10939	XO-841
U3	IC, Segment Drivers, 10941	XO-842
VR1	Diode, Zener, 1N4737A, 7.5V	XO-844
VR2	Diode, Zener, 1N4744A, 15V	XO-843
Z1, Z2	IC, Hex Buffer, 7417	XO-406
	Tape, Vinyl Foam	24127-1

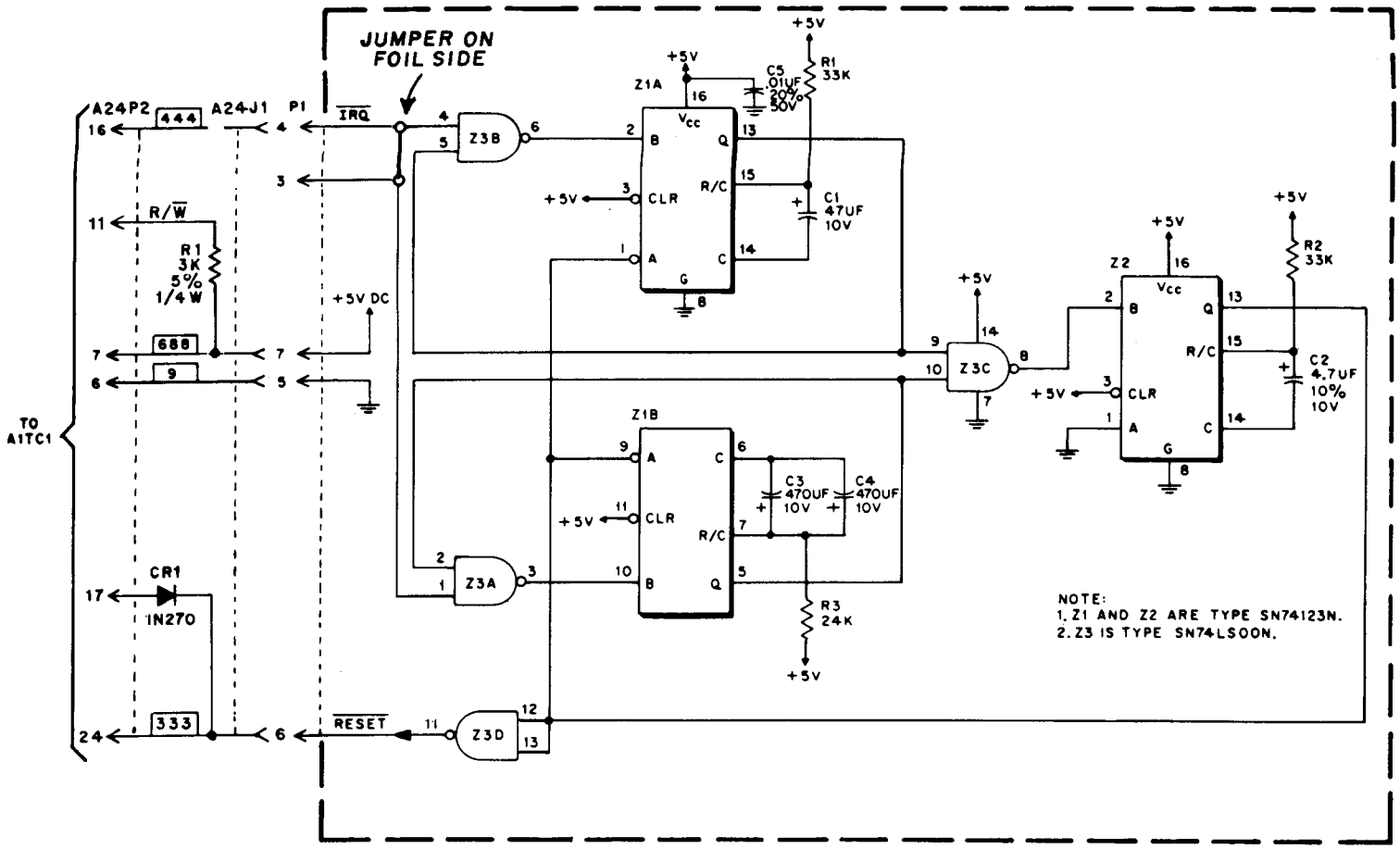


NOTE:
1. UNLESS OTHERWISE INDICATED, RESISTORS ARE ±5%, 1/4W.
2. SIMILAR SEGMENTS OF EACH CHARACTER ARE INTERNALLY WIRED IN PARALLEL.

Premier® Technology			
TITLE: DISPLAY BOARD (A4)			
USED ON			
DRAWN	APPROVED	DATE	E-24438
	R.H.M.	12 FEB 85	

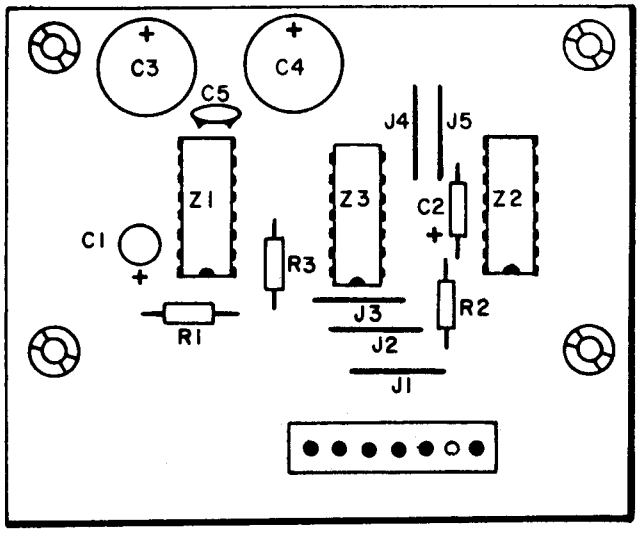

U2
10939
DIGIT
DRIVERS
(SLAVE)
POR
CUR
−15V
+5V(VSS)
+5V
−45V
MASTER
LD
SIP
SOP
CLK
DATA-LOAD
SCLK-DIS
U3
10941
SEGMENT
DRIVERS
DATA-LOAD
SCLK-DIS
DS1
FG209M2
DS2
FG209M2
COM
DP

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



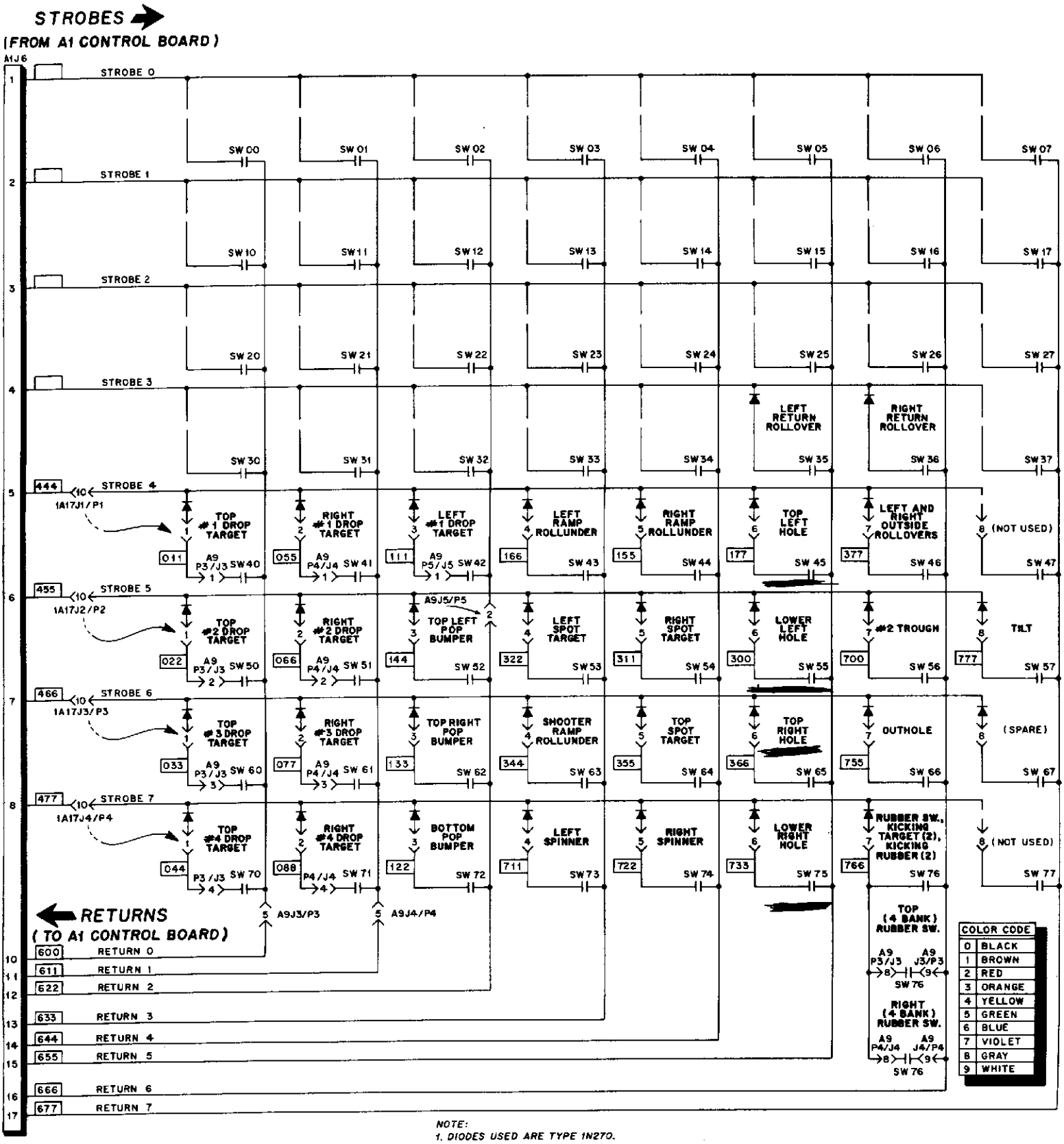
Premier® Technology			
TITLE: RESET CIRCUIT BOARD			
USED ON			
DRAWN	APPROVED: BAM	DATE: 6-AUG-87	C-21063

RESET BOARD (A24) COMPONENT LOCATION



RESET BOARD (A24) PARTS LIST

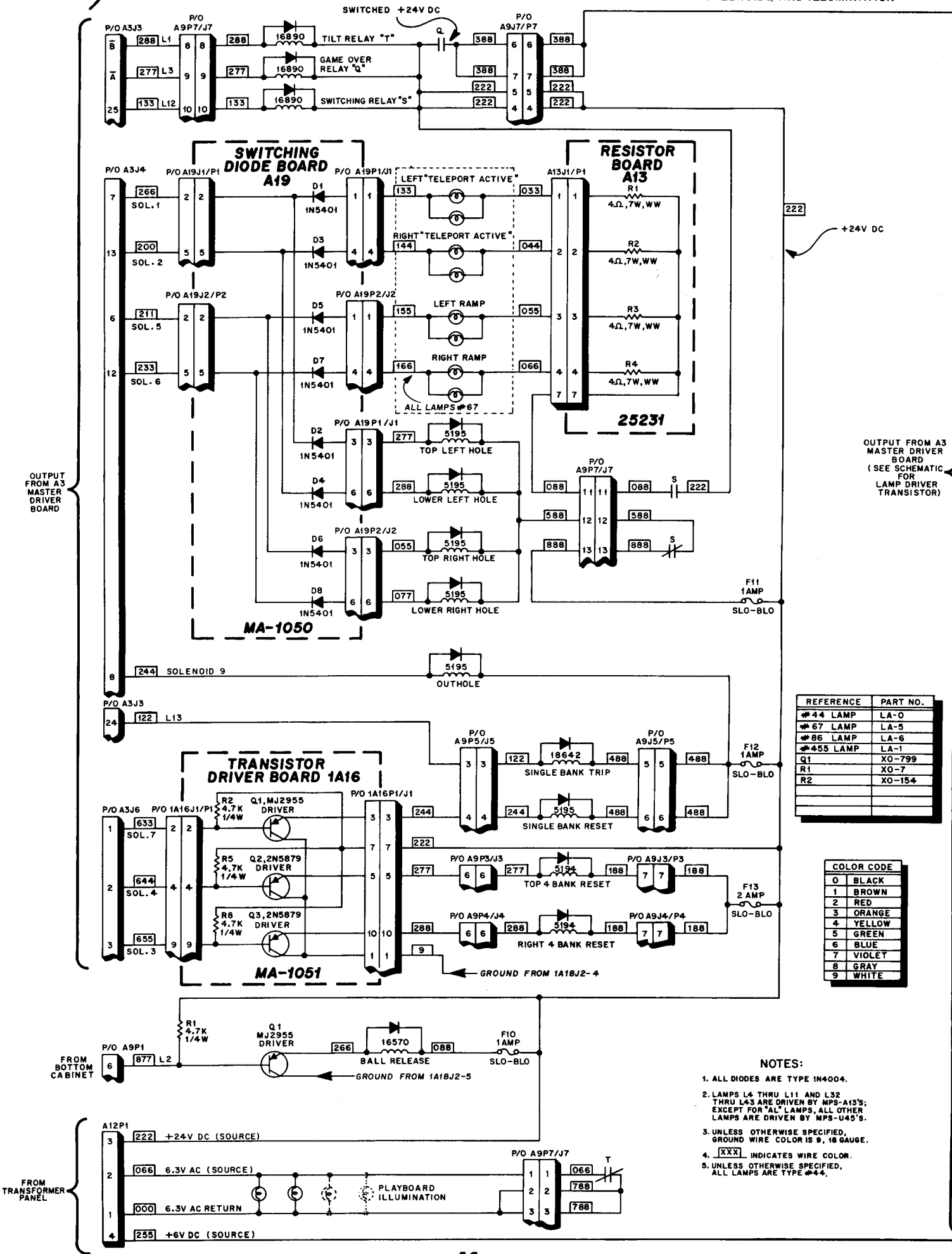
REFERENCE	DESCRIPTION	PART NUMBER
	Reset Board Assembly	MA-980
R1, R2	Resistor 33K Ohm, 5%, 1/4W	XO-43
R3	Resistor 24K Ohm, 5%, 1/4W	XO-10
C1	Capacitor 47UF, 10V	XO-227
C2	Capacitor 4.7UF, 10V	XO-226
C3, C4	Capacitor 470UF, 10V	XO-214
C5	Capacitor .01UF	XO-202
Z1, Z2	IC, 74123N	XO-398
Z3	IC, 74LS00N	XO-427
A24P2/ A24J2	Cable Assembly	MA-796
	7 Pin Connector	XO-879



NOTE:
1. DIODES USED ARE TYPE 1N270.
2. DIODE BOARD ASSEMBLY;
1A17 PART NO. MA-987

Premier Technology			
TITLE	SWITCH MATRIX		
USED ON	GAME #712		
DRAWN	APPROVED R.H.M.	DATE JAN-6-88	E-25803

PLAYBOARD "CONTROLLED" SOLENOIDS AND ILLUMINATION

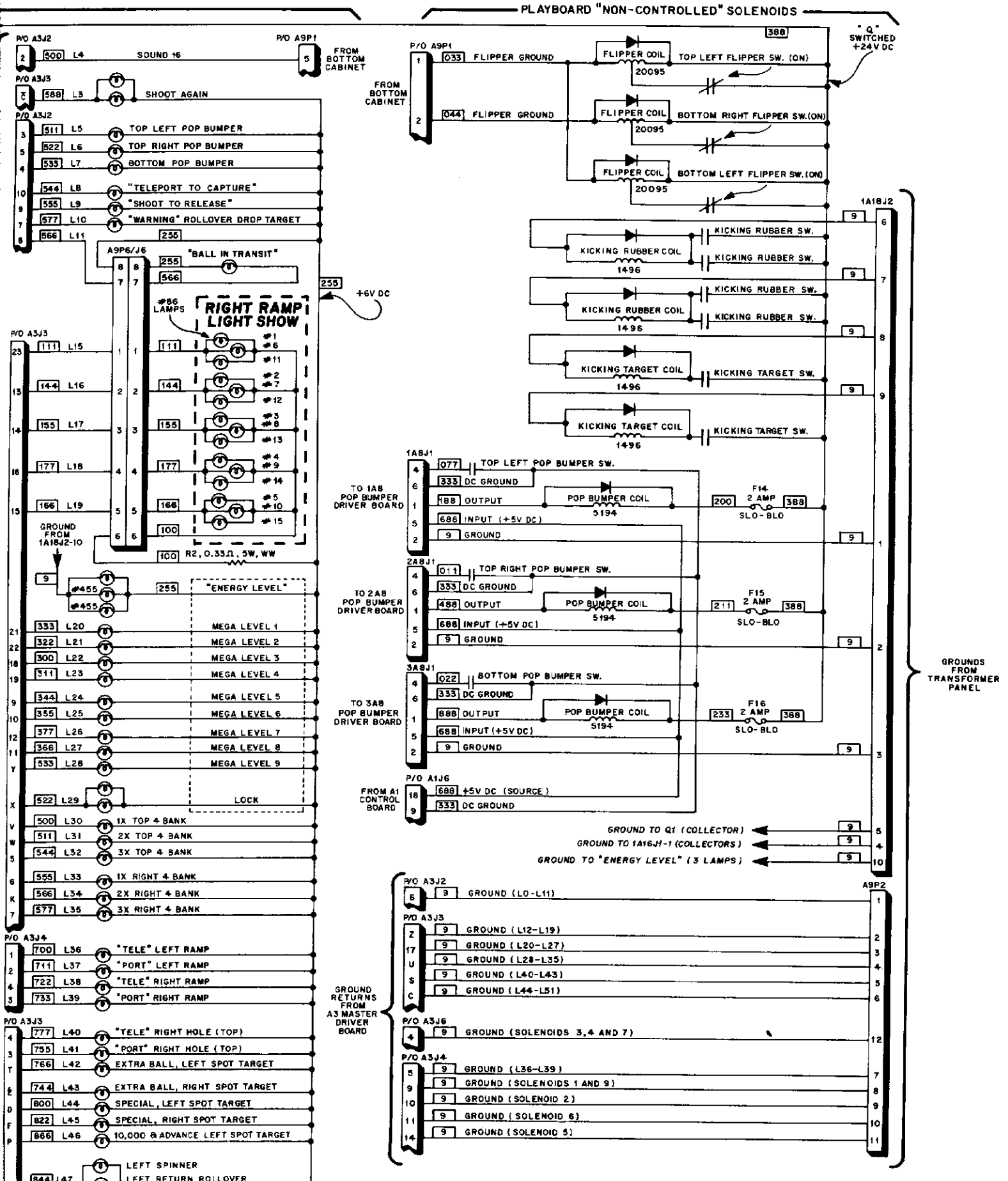


REFERENCE	PART NO.
#44 LAMP	LA-0
#67 LAMP	LA-5
#86 LAMP	LA-6
#455 LAMP	LA-1
Q1	XO-799
R1	XO-7
R2	XO-154

COLOR CODE	
0	BLACK
1	BROWN
2	RED
3	ORANGE
4	YELLOW
5	GREEN
6	BLUE
7	VIOLET
8	GRAY
9	WHITE

NOTES:

1. ALL DIODES ARE TYPE 1N4004.
2. LAMPS L4 THRU L11 AND L32 THRU L43 ARE DRIVEN BY MPS-A13'S; EXCEPT FOR "AL" LAMPS, ALL OTHER LAMPS ARE DRIVEN BY MPS-U45'S.
3. UNLESS OTHERWISE SPECIFIED, GROUND WIRE COLOR IS 9, 18 GAUGE.
4. [XXX] INDICATES WIRE COLOR.
5. UNLESS OTHERWISE SPECIFIED, ALL LAMPS ARE TYPE #44.

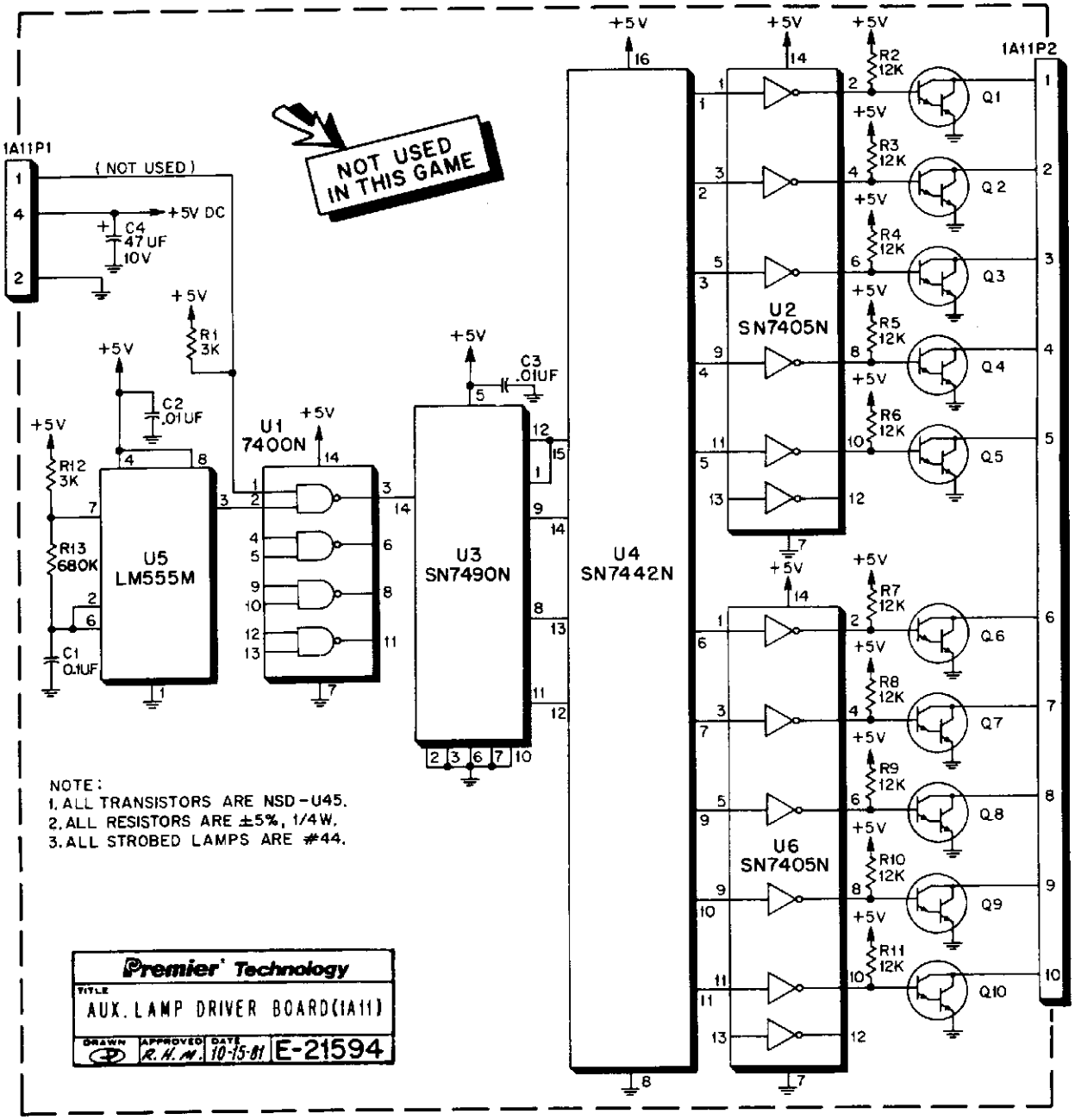


Premier® Technology

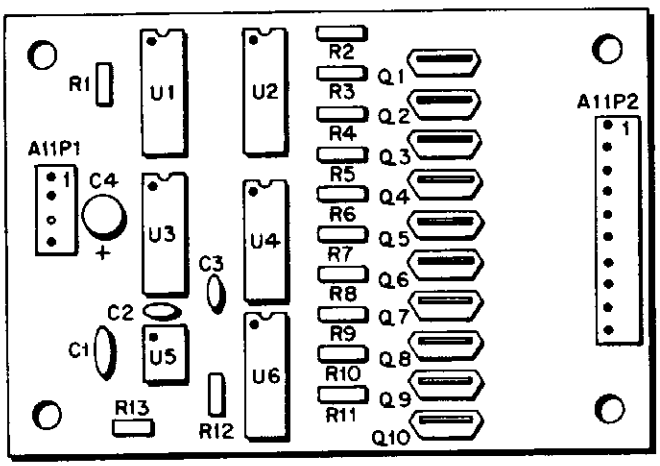
TITLE: PLAYBOARD SOLENOIDS AND ILLUMINATION

DRAWN: CP | APPROVED: R.M.M. | DATE: JAN-6-88 | E-25804

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



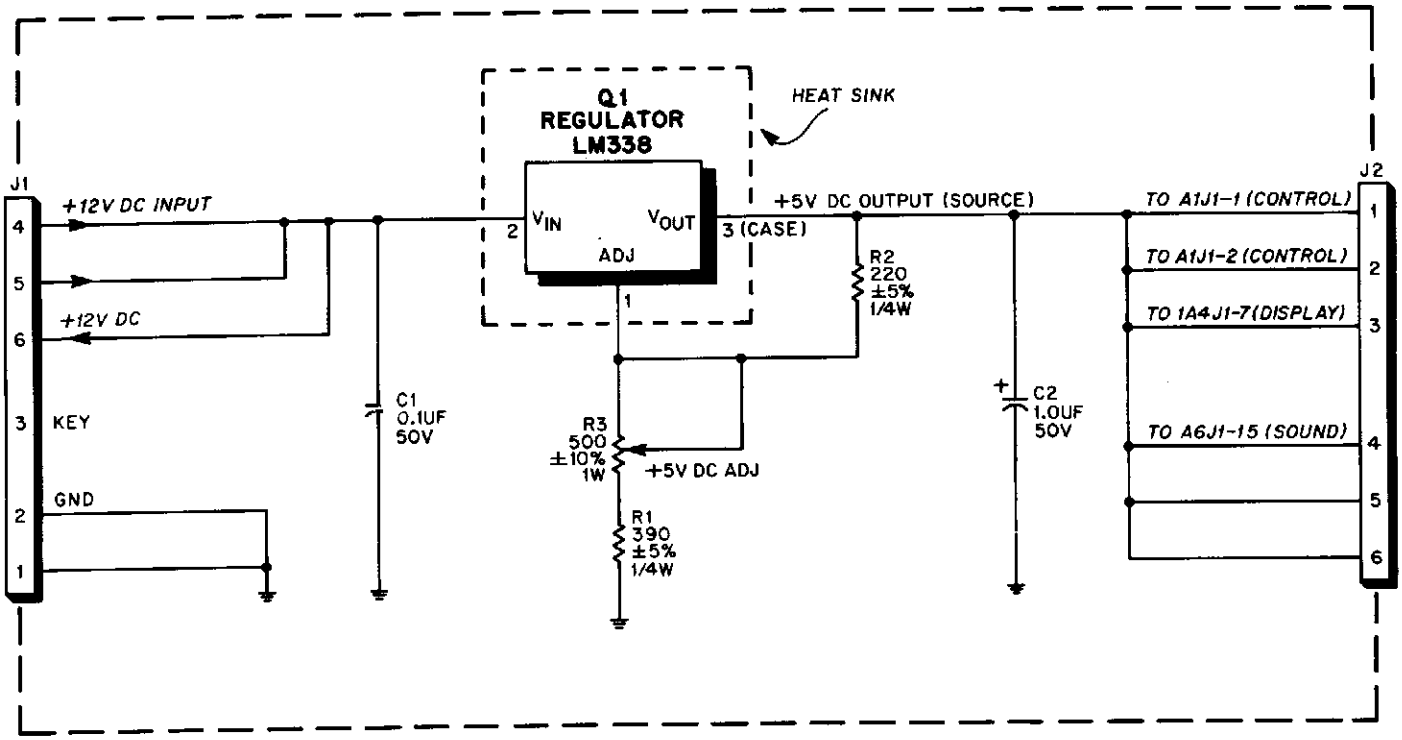
AUXILIARY LAMP DRIVER BOARD (A11) COMPONENT LOCATION



AUXILIARY LAMP DRIVER BOARD (A11) PARTS LIST

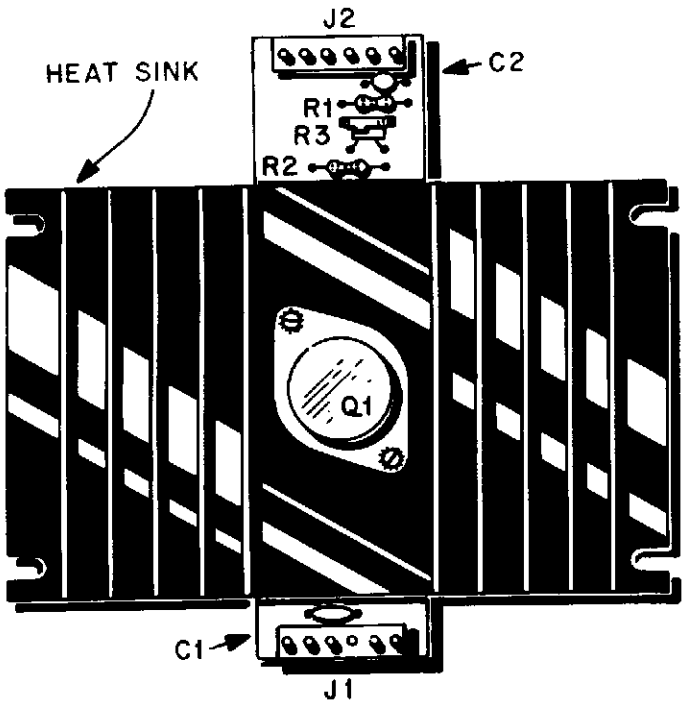
REFERENCE	DESCRIPTION	PART NUMBER
	AUXILIARY LAMP DRIVER ASSEMBLY	MA-789
C1	CAPACITOR, .1 MFD, 100V CERAMIC RADIAL LEAD	XO-626
C2-C3	CAPACITOR, .01 MFD, 100V RADIAL LEAD	XO-202
C4	CAPACITOR, 47 MFD, 10V ELECTROLYTIC RADIAL LEAD	XO-227
Q1-Q10	TRANSISTOR, NSD-U45 NPN DARLINGTON	XO-146
R1,R12	RESISTOR, 3K OHM, 5%, 1/4 W	XO-23
R2-R11	RESISTOR, 12K OHM, 5%, 1/4W	XO-9
R13	RESISTOR, 680K OHM, 5%, 1/4W	XO-669
U1	I.C. 2-INPUT NAND, 7400	XO-420
U2,U6	I.C. INVERTER, 7405	XO-403
U3	I.C. DECADE COUNTER, 7490	XO-425
U4	I.C. DECODER, 7442	XO-426
U5	I.C. TIMER, NE555	XO-631
P2	10 POS. CONNECTOR	XO-879
P1	4 POS. CONNECTOR	XO-879

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



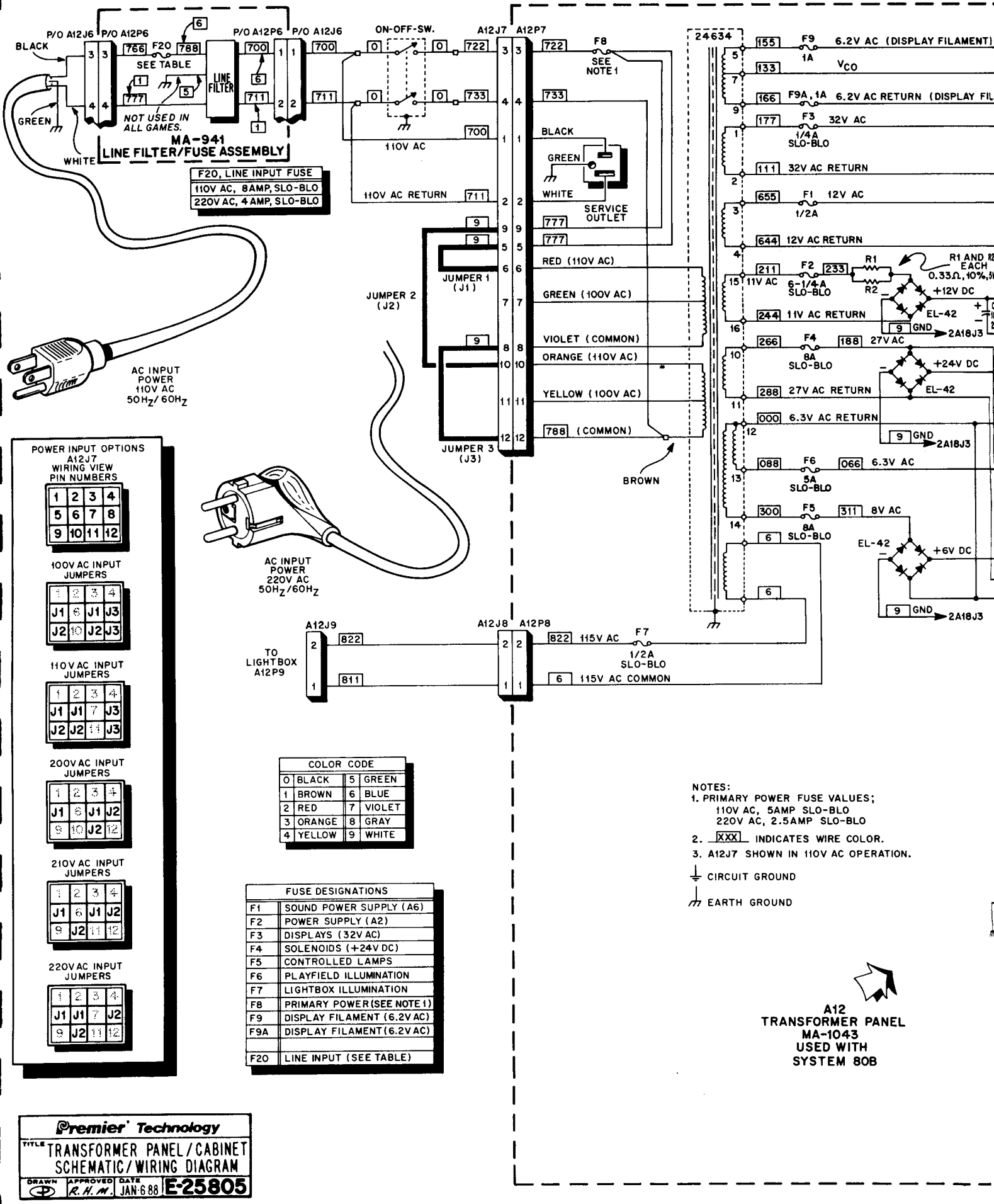
Premier® Technology			
TITLE: POWER SUPPLY (A2)			
USED ON:			
DRAWN:	APPROVED: R.H.M.	DATE: 12 FEB 85	E-24441

POWER SUPPLY (A2) COMPONENT LOCATION



POWER SUPPLY (A2) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	Power Supply (A2)	MA-831
C1	Capacitor, 0.1UF, +80% -20%, 50V	XO-230
C2	Capacitor, 1UF, 10%, 50V	XO-217
J1, J2	Connector, 6 Pin	XO-879
Q1	Regulator, LM338, (5 Amp)	XO-839
R1	Resistor, 390 ohm, 5%, 1/4W	XO-845
R2	Resistor, 220 ohm, 5%, 1/4W	XO-21
R3	Resistor, (Pot) 500 ohm, 10%, 1W	XO-112
	Heat Sink	XO-534
	Insulator, (Regulator)	XO-522
	Insulator, (Regulator)	XO-523



COLOR CODE			
0	BLACK	5	GREEN
1	BROWN	6	BLUE
2	RED	7	VIOLET
3	ORANGE	8	GRAY
4	YELLOW	9	WHITE

FUSE DESIGNATIONS	
F1	SOUND POWER SUPPLY (A6)
F2	POWER SUPPLY (A2)
F3	DISPLAYS (32V AC)
F4	SOLENOIDS (+24V DC)
F5	CONTROLLED LAMPS
F6	PLAYFIELD ILLUMINATION
F7	LIGHTBOX ILLUMINATION
F8	PRIMARY POWER (SEE NOTE 1)
F9	DISPLAY FILAMENT (6.2V AC)
F9A	DISPLAY FILAMENT (6.2V AC)
F20	LINE INPUT (SEE TABLE)

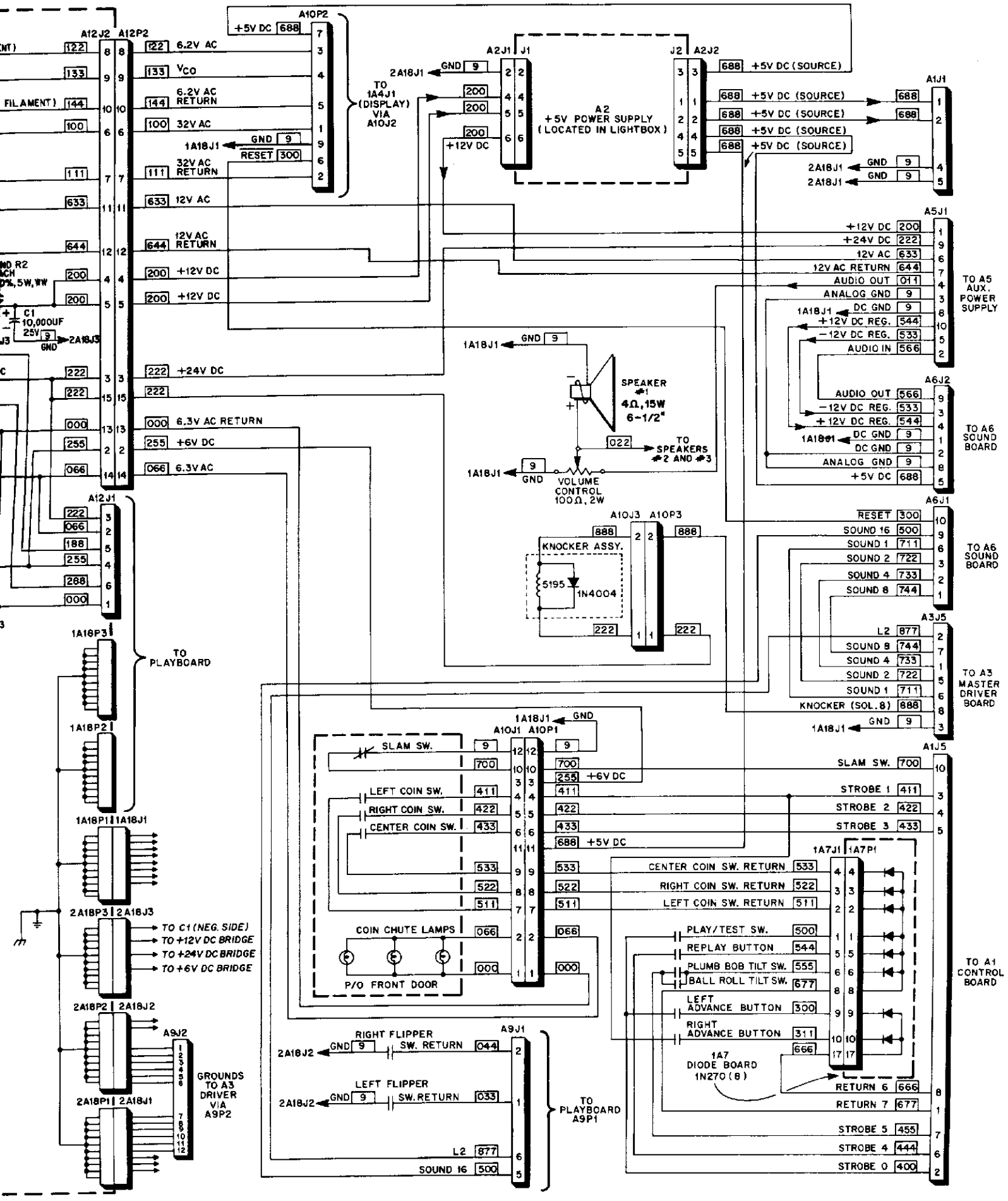
NOTES:
1. PRIMARY POWER FUSE VALUES;
   110V AC, 5AMP SLO-BLO
   220V AC, 2.5AMP SLO-BLO
2. XXX INDICATES WIRE COLOR.
3. A12J7 SHOWN IN 110V AC OPERATION.

⏚ CIRCUIT GROUND

EARTH GROUND

A12 TRANSFORMER PANEL MA-1043 USED WITH SYSTEM 80B

Premier Technology			
TITLE: TRANSFORMER PANEL/CABINET SCHEMATIC/WIRING DIAGRAM			
DRAWN	APPROVED	DATE	E-25805
	R.H.M.	JAN-6 88	


A12J2 A12P2
A10P2
+5V DC 688
6.2V AC
VCO
6.2V AC RETURN
32V AC
GND 9
RESET 300
32V AC RETURN
12V AC
12V AC RETURN
+12V DC
+12V DC
+24V DC
6.3V AC RETURN
+6V DC
6.3V AC
TO 1A4J1 (DISPLAY) VIA A10J2
A2J1 J1
A2J2 J2
2A18J1 GND 9
+12V DC
A2 +5V POWER SUPPLY (LOCATED IN LIGHTBOX)
+5V DC (SOURCE)
A1J1
2A18J1 GND 9
A5J1
+12V DC 200
+24V DC 222
12V AC 633
12V AC RETURN 644
AUDIO OUT 011
ANALOG GND 9
DC GND 9
+12V DC REG. 544
-12V DC REG. 533
AUDIO IN 566
TO A5 AUX. POWER SUPPLY
C1 10,000UF 25V
2A18J3
1A18J1 GND 9
SPEAKER #1 4Ω, 15W 6-1/2"
022 TO SPEAKERS #2 AND #3
VOLUME CONTROL 100Ω, 2W
A6J2
AUDIO OUT 566
-12V DC REG. 533
+12V DC REG. 544
DC GND 9
ANALOG GND 9
+5V DC 688
TO A6 SOUND BOARD
A12J1
A10J3 A10P3
888
KNOCKER ASSY.
5195
1N4004
222
A6J1
RESET 300
SOUND 16 500
SOUND 1 711
SOUND 2 722
SOUND 4 733
SOUND 8 744
TO A6 SOUND BOARD
A3J5
L2 877
SOUND 8 744
SOUND 4 733
SOUND 2 722
SOUND 1 711
KNOCKER (SOL.8) 888
GND 9
TO A3 MASTER DRIVER BOARD
1A18P3
1A18P2
TO PLAYBOARD
1A18P1 1A18J1
A1J5
SLAM SW. 700
STROBE 1 411
STROBE 2 422
STROBE 3 433
A10J1 A10P1
SLAM SW.
LEFT COIN SW.
RIGHT COIN SW.
CENTER COIN SW.
+6V DC
+5V DC
COIN CHUTE LAMPS
P/O FRONT DOOR
1A7J1 1A7P1
CENTER COIN SW. RETURN 533
RIGHT COIN SW. RETURN 522
LEFT COIN SW. RETURN 511
PLAY/TEST SW. 500
REPLAY BUTTON 544
PLUMB BOB TILT SW. 555
BALL ROLL TILT SW. 677
LEFT ADVANCE BUTTON 300
RIGHT ADVANCE BUTTON 311
1A7 DIODE BOARD 1N270 (8)
RETURN 6 666
RETURN 7 677
STROBE 5 455
STROBE 4 444
STROBE 0 400
TO A1 CONTROL BOARD
2A18P3 2A18J3
TO C1 (NEG. SIDE)
TO +12V DC BRIDGE
TO +24V DC BRIDGE
TO +6V DC BRIDGE
2A18P2 2A18J2
A9J2
2A18P1 2A18J1
GROUNDS TO A3 DRIVER VIA A9P2
A9J1
RIGHT FLIPPER SW. RETURN 044
LEFT FLIPPER SW. RETURN 033
L2 877
SOUND 16 500
TO PLAYBOARD A9P1

XI. PARTS INFORMATION

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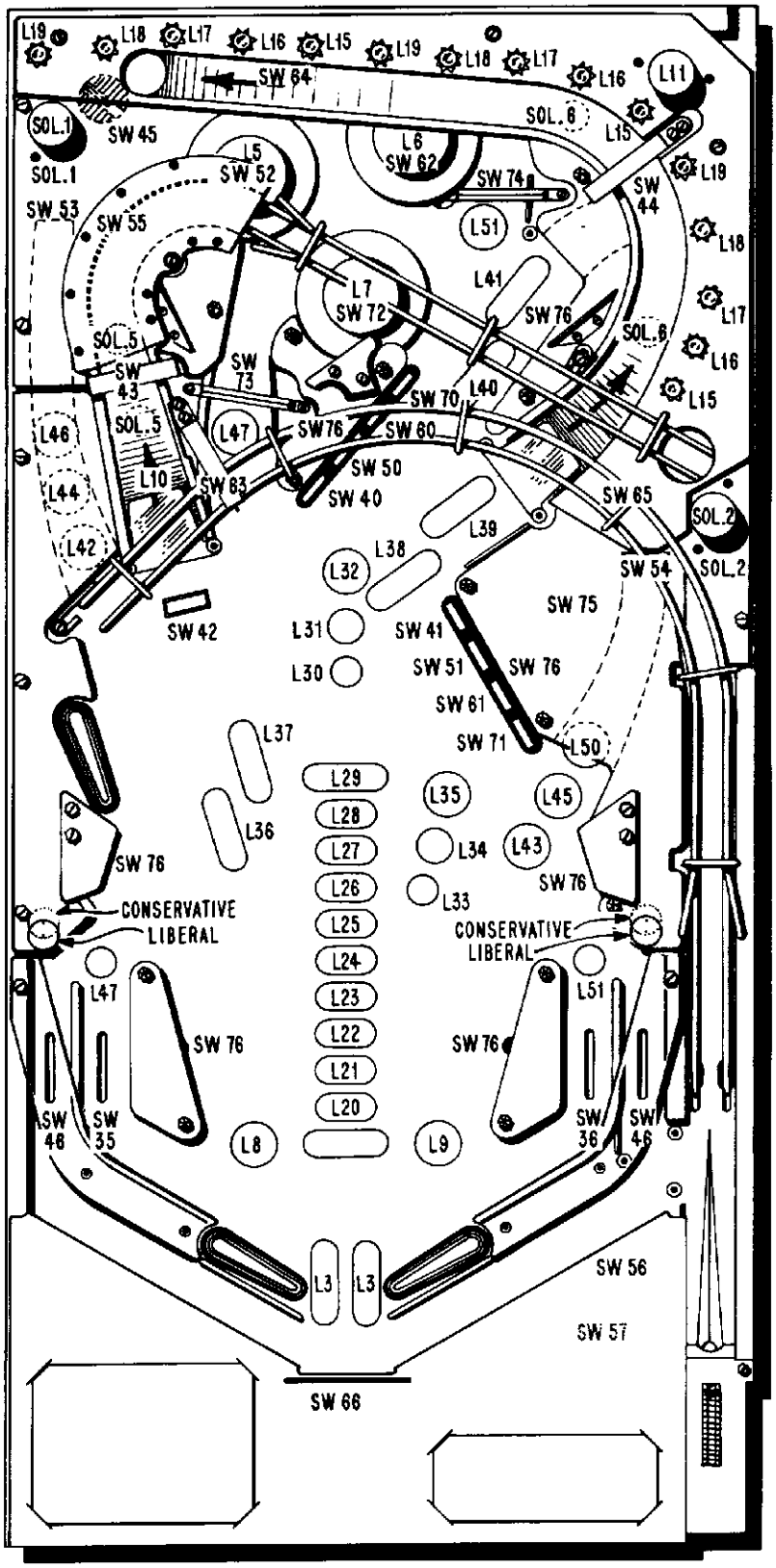
XI. PARTS INFORMATION



NOTE:

1. L1 ENABLES RELAY "T", L2 ENABLES BALL RELEASE COIL, L3 ENABLES RELAY "Q", L12 ENABLES RELAY "S", L13 ENABLES SINGLE BANK TRIP COIL
2. THE FOLLOWING DEVICES ARE DEPENDENT UPON THE STATE OF THE "S" RELAY.

DEVICE	"S" ON	"S" OFF
SOL. 1	TOP LEFT HOLE	LEFT DOME (2) #67'S
SOL. 2	LOWER LEFT HOLE	RIGHT DOME (2) #67'S
SOL. 5	TOP RIGHT HOLE	LEFT RAMP (2) #67'S
SOL. 6	LOWER RIGHT HOLE	RIGHT RAMP (2) #67'S

3. *NEW SWITCHES USED (UNIQUE).

PLAYBOARD SWITCH AND LAMP ASSIGNMENTS

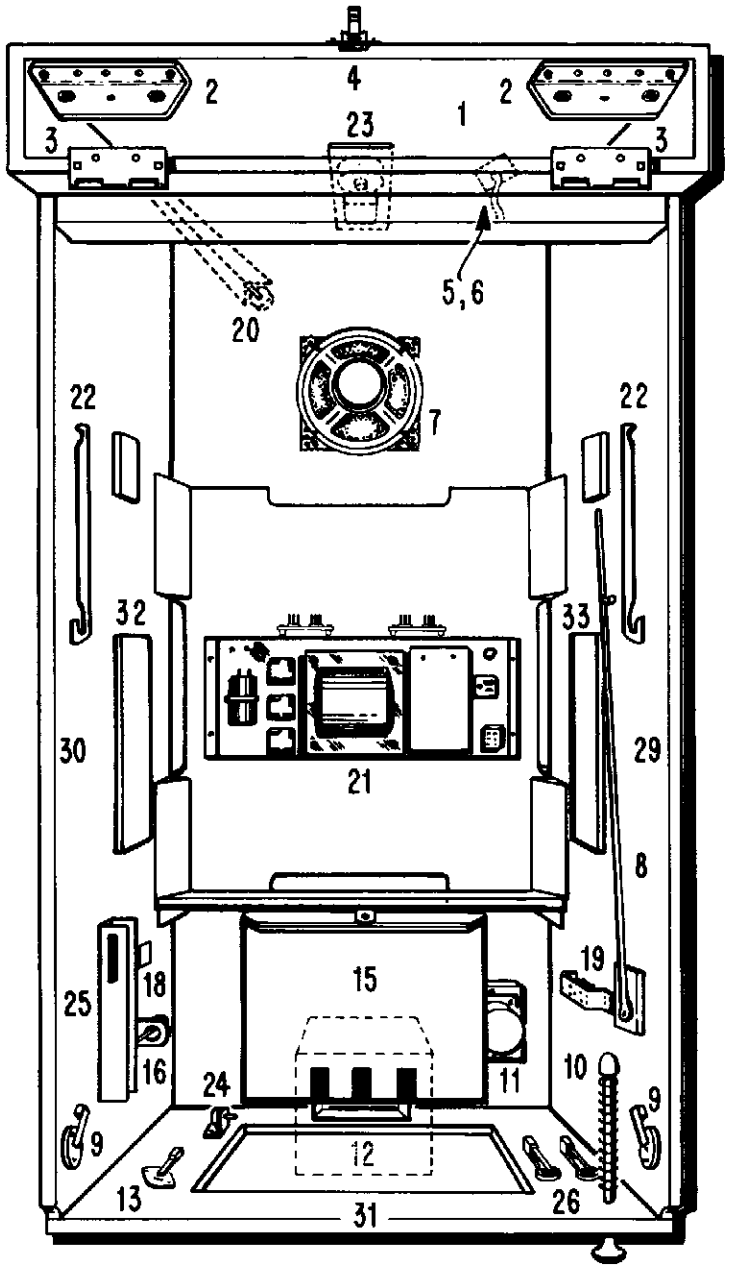
LAMP NUMBER	LAMP ASSIGNMENT
L4	Sound 16
L3	Shoot Again
L5	Top Left Pop Bumper
L6	Top Right Pop Bumper
L7	Bottom Pop Bumper
L8	"Teleport to Capture"
L9	"Shoot to Release"
L10	"Warning" Rollover Drop Target
L11	"Ball in Transit"
	RIGHT RAMP LIGHT SHOW
L15	#1, #6, #11
L16	#2, #7, #12
L17	#3, #8, #13
L18	#4, #9, #14
L19	#5, #10, #15
	"ENERGY LEVEL"
L20	Mega Level 1
L21	Mega Level 2
L22	Mega Level 3
L23	Mega Level 4
L24	Mega Level 5
L25	Mega Level 6
L26	Mega Level 7
L27	Mega Level 8
L28	Mega Level 9
L29	Lock
L30	1X Top 4 Bank
L31	2X Top 4 Bank
L32	3X Top 4 Bank
L33	1X Right 4 Bank
L34	2X Right 4 Bank
L35	3X Right 4 Bank
L36	"Tele" Left Ramp
L37	"Port" Left Ramp
L38	"Tele" Right Ramp
L39	"Port" Right Ramp
L40	"Tele" Right Hole (Top)
L41	"Port" Right Hole (Top)
L42	Extra Ball, Left Spot Target
L43	Extra Ball, Right Spot Target
L44	Special, Left Spot Target
L45	Special, Right Spot Target
L46	10,000 And Advance Left Spot Target
L47	Left Spinner, Left Return Rollover
L50	10,000 And Advance Right Spot Target
L51	Right Spinner, Right Return Rollover

SWITCH MATRIX NUMBER	SWITCH ASSIGNMENT	PART NO.
SW 35	Left Return Rollover	*25824
SW 36	Right Return Rollover	*25824
SW 40	Top #1 Drop Target	*25682
SW 41	Right #1 Drop Target	*25682
SW 42	Left #1 Rollover Drop Target	*25817
SW 43	Left Ramp Rollunder	22672
SW 44	Right Ramp Rollunder	21137
SW 45	Top Left Hole	18085
SW 46	Left and Right Outside Rollovers	*25824
SW 50	Top #2 Drop Target	*25682
SW 51	Right #2 Drop Target	*25682
SW 52	Top Left Pop Bumper	21356
SW 53	Left Spot Target	25460Z
SW 54	Right Spot Target	25460Z
SW 55	Lower Left Hole	18085
SW 56	#2 Trough	*25824
SW 57	Tilt (With Bracket)	9141
SW 60	Top #3 Drop Target	*25683
SW 61	Right #3 Drop Target	*25683
SW 62	Top Right Pop Bumper	21353
SW 63	Shooter Ramp Rollunder	21137
SW 64	Top Spot Target	25460Z
SW 65	Top Right Hole	18085
SW 66	Outhole	*25825
SW 70	Top #4 Drop Target	*25681
SW 71	Right #4 Drop Target	*25681
SW 72	Bottom Pop Bumper	21353
SW 73	Left Spinner	18627
SW 74	Right Spinner	18627
SW 75	Lower Right Hole	18085
SW 76	Kicking Rubber; Scoring Switch (2)	18808
	Actuating Switch and Bracket(4)	22224
	Kicking Target (Left)	18808
	Kicking Target (Right)	16029
	Top (4 Bank) Rubber Switch,	20089
	Right (4 Bank) Rubber Switch	20089
	Top Right Rubber Switch	22227

XI. PARTS INFORMATION

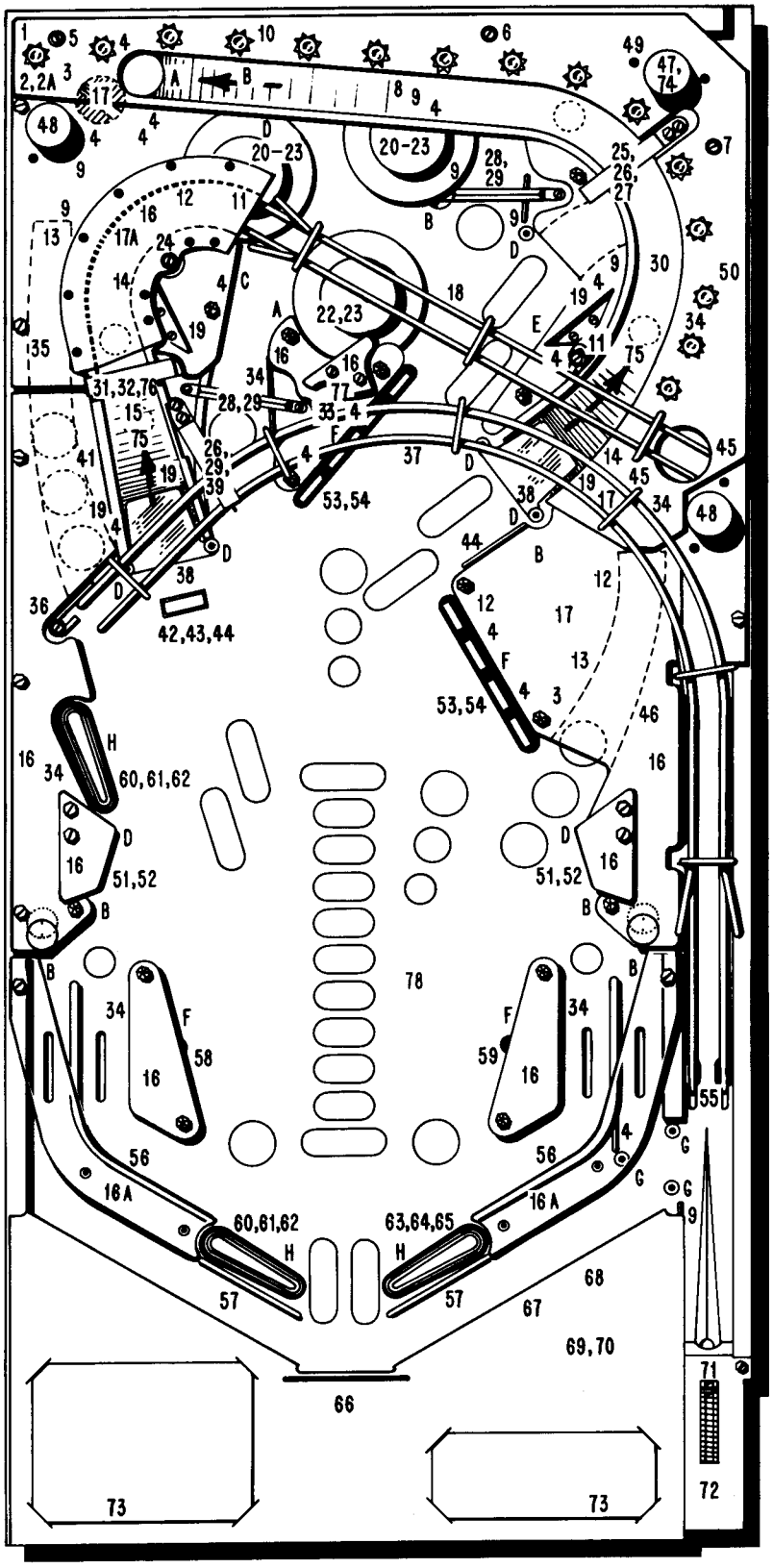
CABINET PARTS

ITEM	DESCRIPTION	PART NO.
1.	Cabinet	25694-712
2.	Lightbox Mounting Bracket (2)	19916
3.	Butt Hinge, (Shown For Reference Only, P/O Lightbox Assy.) (2)	22734
4.	"U" Bolt (P/O Lightbox)	24659
	Latch Assembly (P/O Cabinet)	21969
5.	Cable Assembly, Domestic (High Voltage)	MA-1007
6.	Line Cord (Domestic)	23365
	Line Cord Cover Plate	21955
7.	Speaker, 4 Ohm, **15W, 6-1/2"**	EL-83
	Speaker Guard	20931
8.	Prop Stick, Playfield	23940
9.	Flipper Switch Assembly (2)	17838-3
10.	Ball Shooter Assembly	8835
11.	Switch, On/Off	23799
	Switch Plate (2)	18769
	Switch Housing	15163
12.	Front Door Assembly (Universal)	MA-688
	Cable Assembly	MA-676
	Slam Switch	24567
	6V DC Lamp, Wedge Base	FD-2
	Frame, Door	FD-13
	Three Chute Door	24159
	Black Button Bezel	FD-14
	Entry/Reject Button	FD-15
	Button Spring	FD-16
	Reject Flap	FD-17
	Clamp, Frame	FD-18
	Flat Lock and Cam Assembly	FD-19
	Base Plate with Pivot and Stud	FD-20
	Microswitch Bracket	FD-21
	Clear Plastic Cover for Microswitch	FD-22
	Coin Microswitch with Wire	FD-23
	Lampholder	FD-24
	Black Reject Bezel	FD-26
13.	Replay Switch Assembly	18092
15.	Cashbox	25309
	Cover	25315
	Liner (Small) (3)	24870
	Liner (Large) (2)	24871
16.	Plumb Bob Tilt Switch Assembly	
	Strike Plate	358
	Carbon, Tilt Bob	MH-30
	Rod, Tilt	357
	Bracket	22043
18.	Diode Assembly	24252
	Diode, 1N270 (8)	XO-265
19.	Knocker Assembly	MA-12
	Bell Assembly (Gong)(When Used)	MA-352
20.	Cabinet Leg (4)	4337
	(Black) (4) (When Used)	4337Y
	(Gold) (4) (When Used)	4337T
	Leg Bolt (8)	3775
	3" Leg Adjuster (4)	MH-21
	1" Sleeve (2)	25317
	3/8-16, Jam Nut (8)	FA-665
21.	Transformer Panel Assembly	MA-1043
	Bridge Rectifier (3)	EL-42
	Cable Assembly (Secondary)	MA-1038
	Capacitor, 10,000UF, 25V	XO-830
	Filter, Line	EL-50
	Fuse Block (8 Pos.)	EL-10
	Fuse Cover	23805
	Fuse Holder (F7 and F8) (2)	EL-78
	Fuses	
	F1, 1/2 Amp	EL-28
	F2, 6-1/4 Amp, SLO-BLO	EL-29
	F3, 1/4 Amp, SLO-BLO	EL-5
	F4, 8 Amp, SLO-BLO	EL-26
	F5, **8 Amp SLO-BLO**	EL-26
	F6, **5 Amp SLO-BLO**	EL-8
	F7, **1/2 Amp SLO-BLO**	EL-20
	F8, 5 Amp, SLO-BLO (110V AC)	EL-8
	F8, 2.5 Amp, SLO-BLO (220V AC)	EL-21
	F9, 1 Amp	EL-3
	F9A, 1 Amp	EL-3
	Ground Bus Assembly (2)	25374
	Outlet, Service	18133
	Resistor, 0.33 Ohm, 10% 5W, Wire-Wound (2)	XO-154
	Transformer	24634
22.	Cabinet Pivot Bracket (Left)	25658
	Cabinet Pivot Bracket (Right)	25657



ITEM	DESCRIPTION	PART NO.
23.	Line Filter Assembly	MA-941
	Fuse Holder	EL-78
	F20, 8 Amp, SLO-BLO (110V AC)	EL-26
	F20, 4 Amp, SLO-BLO (220V AC)	EL-33
	Line Filter	EL-50
	Line Filter (Germany)	EL-51
24.	Mounting Bracket	24149
	Control, Volume, 100 Ohm, 2W	XO-199
	Switch, PLAY/TEST	EL-57
25.	Ball Roll Tilt	
	Housing and Switch Assembly	24394
	Switch	24393
26.	Button Holder and Switch (2)	23503
	Pushbutton (2) (Black)	24293Y
28.	Lightbox (Not Shown)	25635-712
29.	Right Moulding (Not Shown)	22735
30.	Left Moulding (Not Shown)	22736
31.	Front Moulding (Not Shown)	16951
32.	Mounting Board Assembly	MA-1053
	A13 Resistor Board	25231
	A19 Switching Diode Board	MA-1050
33.	Mounting Board Assembly	MA-1054
	Pop Bumper Driver Board (3)	19741

XI. PARTS INFORMATION



PLAYBOARD PARTS INFORMATION

PARTS LIST

ITEM	DESCRIPTION	PART NO.
1	Molded Ramp	25678
2	Wedge Base Socket (15)	25545
2A	#86 Lamps (15)	LA-6
3	Ball Guide Rail (2)	3722
4	Ball Guide Rail (13)	18070
5	Ramp Spacer	24880
6	Ramp Spacer	25705
7	Ramp Spacer	25089
8	Flat Rail	25707
9	Ball Guide Rail (8)	17650
10	Spot Target Assembly, White (3)	25460Z
11	Ramp Spacer (2)	25701
12	Ball Guide Rail (3)	6612
13	Ball Snubber Rail (2)	25706
14	Ball Guide Rail (2)	13782
15	Molded Ramp	25676
16	Plastic Shield Set	25812
16A	Part Of Plastic Shield Set	25812A
17	Ball Hole Kicker Assembly (3), (See Exploded View Illustration)	MA-1049
17A	Ball Hole Kicker Assembly, (See Exploded View Illustration)	MA-1061
18	Wireform Ramp	25677
19	Ball Deflector (5)	21158
20	Pop Bumper Cap, White (3)	10434Z
21	Pop Bumper Decal (3)	25836
22	Pop Bumper Skirt, White (3)	10433Z
23	Pop Bumper Body And Socket,White (3)	MA-27
24	Ramp Spacer	25702
25	Wireform Gate	25246
26	Rollunder Spring (2)	25807
27	Gate Shield (2)	25729
28	Target Shield (2)	14043
29	Swinging Target Assembly (2)	24494
	Swinging Target Rod (2)	20406
	Nylon Washer (4)	20407
30	Ball Guide Rail	6931
31	Wireform Gate	25730
32	Gate Shield	25731
33	Ramp Post	25395
34	Ball Guide Rail (6)	4832
35	Flat Rail	25733
36	Ramp Spacer	25695
37	Wireform Ramp	25679
38	Ramp Flap (2)	25056
39	Wireform Gate	25727
40	Ball Guide Rail	18764
41	Ball Guide Rail	8514
42	Rollover Drop Target Assembly	MA-1058
43	Rollover Drop Target,(White)	20892Z
44	Rollover Target Decal	25837
45	Ball Guide Rail (2)	4831
46	Flat Rail	25711
47	Plastic Dome Hat, Clear	25147P
48	Plastic Dome Hat, Amber (2)	25147N
49	Plastic Rivets	MP-10
50	Flat Rail	25710
51	Kicking Target Assembly (2), (See Exploded View Illustration)	MA-205A
52	Kicking Target Decal (2)	25835
53	Drop Target Assembly (2)	MA-1047
54	Drop Target Decal (8)	25834
55	Ramp Mounting Bracket	25746
56	Ball Guide Rail (2)	23833
57	Ball Snubber Rail (2)	13798
58	Contact Kicker Assembly	MA-135A
59	Contact Kicker Assembly	MA-135
60	Left Flipper Assembly (2)	MA-937A
61	Left Flipper Coil (2)	20095
62	Left Flipper Switch (2)	25743
63	Right Flipper Assembly	MA-938A
64	Right Flipper Coil	20095
65	Right Flipper Switch	25434
66	Cardholder	13657-712
67	Ball Return Unit Assembly	21622
68	Ball Return Gate Assembly	20607
69	Ball Return Fence	23855
70	Ball Return Gate Fence	23856
71	Ball Shooter Gauge	9767-712
72	Ball Shooter Assembly	8835
73	Playfield Rest Brackets (2), (Located on Playboard Bottom)	21194
74	Plastic Dome Hat Decal	25839
75	Ramp Decal (2)	25838
76	Rollunder Spring	25301
77	Post Base (2),	14487Z
	Post Cap (2)	14488Z
78	Mylar Overlay	25855

RUBBER RINGS

ITEM	DESCRIPTION	PART NO.
A	Siamese (2)	17493
B	5/16" (7)	10217
C	1"	10219
D	Mini-Post (8)	15705
E	2"	10221
F	2-1/2" (4)	10222
G	Small Mini-Post(3)	14793
H	Flipper, Red (3)	13151

MISCELLANEOUS PARTS

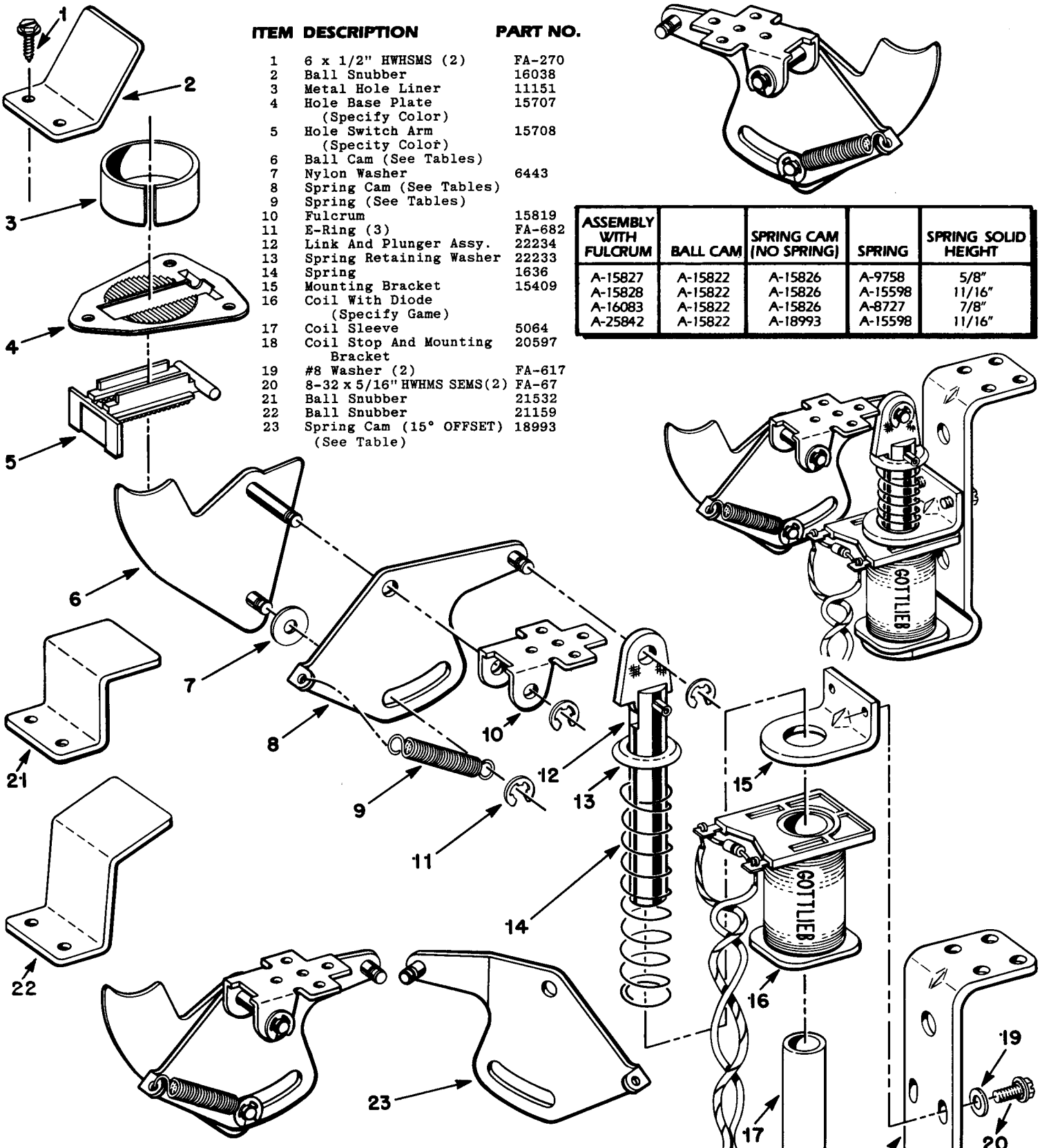
DESCRIPTION	PART NO.
Mini-Post Screw	14792
Siamese Post	17492
Plastic Post 1"	11561P
Plastic Post 1-3/16"	11562P
Plastic Support Post	20635
"Q" Relay	MA-23
"T" Relay	MA-25
"S" Relay	MA-1052

XI. PARTS INFORMATION

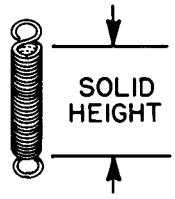
BALL HOLE KICKER PARTS

ITEM	DESCRIPTION	PART NO.
1	6 x 1/2" HWHSMS (2)	FA-270
2	Ball Snubber	16038
3	Metal Hole Liner	11151
4	Hole Base Plate (Specify Color)	15707
5	Hole Switch Arm (Specity Color)	15708
6	Ball Cam (See Tables)	
7	Nylon Washer	6443
8	Spring Cam (See Tables)	
9	Spring (See Tables)	
10	Fulcrum	15819
11	E-Ring (3)	FA-682
12	Link And Plunger Assy.	22234
13	Spring Retaining Washer	22233
14	Spring	1636
15	Mounting Bracket	15409
16	Coil With Diode (Specify Game)	
17	Coil Sleeve	5064
18	Coil Stop And Mounting Bracket	20597
19	#8 Washer (2)	FA-617
20	8-32 x 5/16" HWHMS SEMS(2)	FA-67
21	Ball Snubber	21532
22	Ball Snubber	21159
23	Spring Cam (15° OFFSET) (See Table)	18993

ASSEMBLY WITH FULCRUM	BALL CAM	SPRING CAM (NO SPRING)	SPRING	SPRING SOLID HEIGHT
A-15827	A-15822	A-15826	A-9758	5/8"
A-15828	A-15822	A-15826	A-15598	11/16"
A-16083	A-15822	A-15826	A-8727	7/8"
A-25842	A-15822	A-18993	A-15598	11/16"

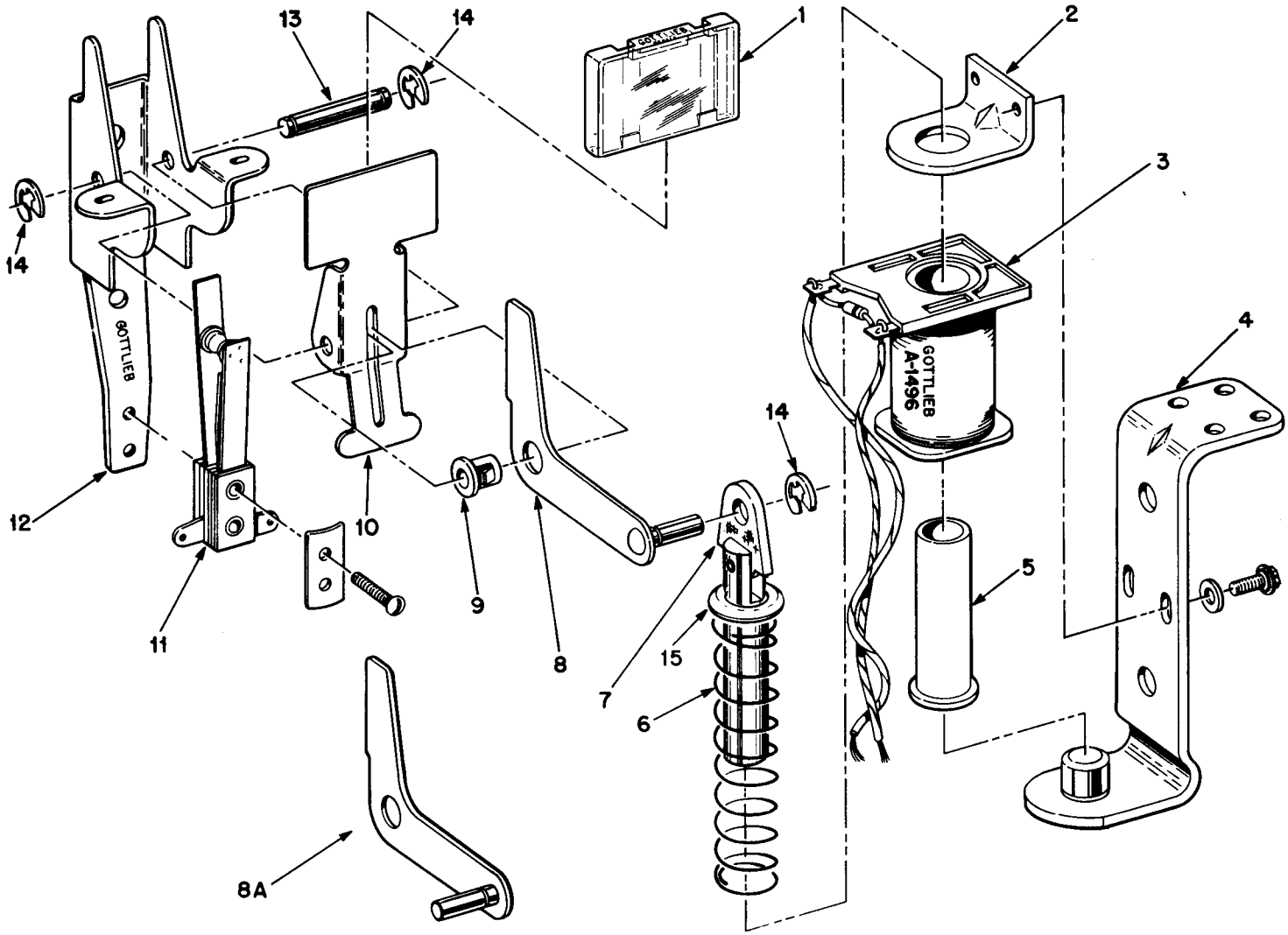


ASSEMBLY WITH FULCRUM	BALL CAM	SPRING CAM (NO SPRING)	SPRING	SPRING SOLID HEIGHT
A-16045	A-16044	A-16043	A-9758	5/8"
A-16085	A-16044	A-16043	A-8727	7/8"
A-16086	A-16044	A-16043	A-15598	11/16"



XI. PARTS INFORMATION

KICKING TARGET ASSEMBLY



ITEM	DESCRIPTION	PART NO.
	Kicking Target Assembly	MA-205A
1	Plastic Shield	20210
2	Mounting Bracket	15409
3	Coil	1496
4	Coil Stop And Mtg. Bracket	20597
5	Coil Sleeve	5064
6	Spring	1636
7	Link and Plunger Assembly	20212
8	Target Kicker Cam	20209 (ILLUSTRATED)
8A	Target Kicker Cam	20494 (USED)
9	Snap Bushing	MP-15
10	Target Arm	20207
11	Actuating Switch	20227
12	Target Housing	20206
13	Target Shaft	20211
14	E-Ring	FA-682
15	Spring Retaining Washer	22233
	Target Face Decal	25835

XI. PARTS INFORMATION

UNIQUE PARTS

The following listing denotes new parts and assemblies unique to TX-SECTOR, Game #712. Part Numbers prefixed with an asterisk *, will be illustrated or can be located on pages 48, 49, 50, 51 or 52. Numbers in parenthesis ( ) indicate multiple quantities.

PLAYBOARD

DESCRIPTION	PART NO.
MOLDED RAMP	* 25676
WIREFORM RAMP	* 25677
MOLDED RAMP	* 25678
WIREFORM RAMP	* 25679
RAMP SPACER	* 25695
RAMP SPACER (2)	* 25701
RAMP SPACER	* 25702
RAMP SPACER	* 25705
SNUBBER RAIL (2)	* 25706
FLAT RAIL	* 25707
FLAT RAIL	* 25710
FLAT RAIL	* 25711
ROLLUNDER GATE WIREFORM	* 25727
GATE SHIELD (2)	* 25729
ROLLUNDER GATE WIREFORM	* 25730
GATE SHIELD	* 25731
FLAT RAIL	* 25733
LEFT FLIPPER SWITCH (2)	* 25743
RAMP MOUNTING BRACKET	* 25746
ROLLUNDER GATE SPRING (2)	* 25807
PLASTICS SET	* 25812
RELAY STRIP ASSEMBLY, "T", "Q" AND "S"	MA-1046
FOUR POSITION TARGET BANK ASSEMBLY (2)	* MA-1047
DROP TARGET DECAL (8)	* 25834
KICKING TARGET DECAL (2)	* 25835
POP BUMPER CAP DECAL (3)	* 25836
ROLLOVER TARGET DECAL	* 25837
RAMP DECAL (2)	* 25838
PLASTIC DOME HAT DECAL	* 25839
BALL HOLE KICKER ASSEMBLY	* MA-1061
ASSEMBLY WITH FULCRUM	* 25842
SPRING CAM (15° OFFSET)	* 18993
"S" RELAY	MA-1052
MYLAR OVERLAY	* 25855

LIGHTBOX

DESCRIPTION	PART NO.
STYRENE ARTWORK (BACKGLASS)	24747-712
DISPLAY PANEL (SCREENED)	25670
TRANSISTOR DRIVER BOARD (1A16)	MA-1051

CABINET

DESCRIPTION	PART NO.
SWITCHING DIODE BOARD (A19)	* MA-1050

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