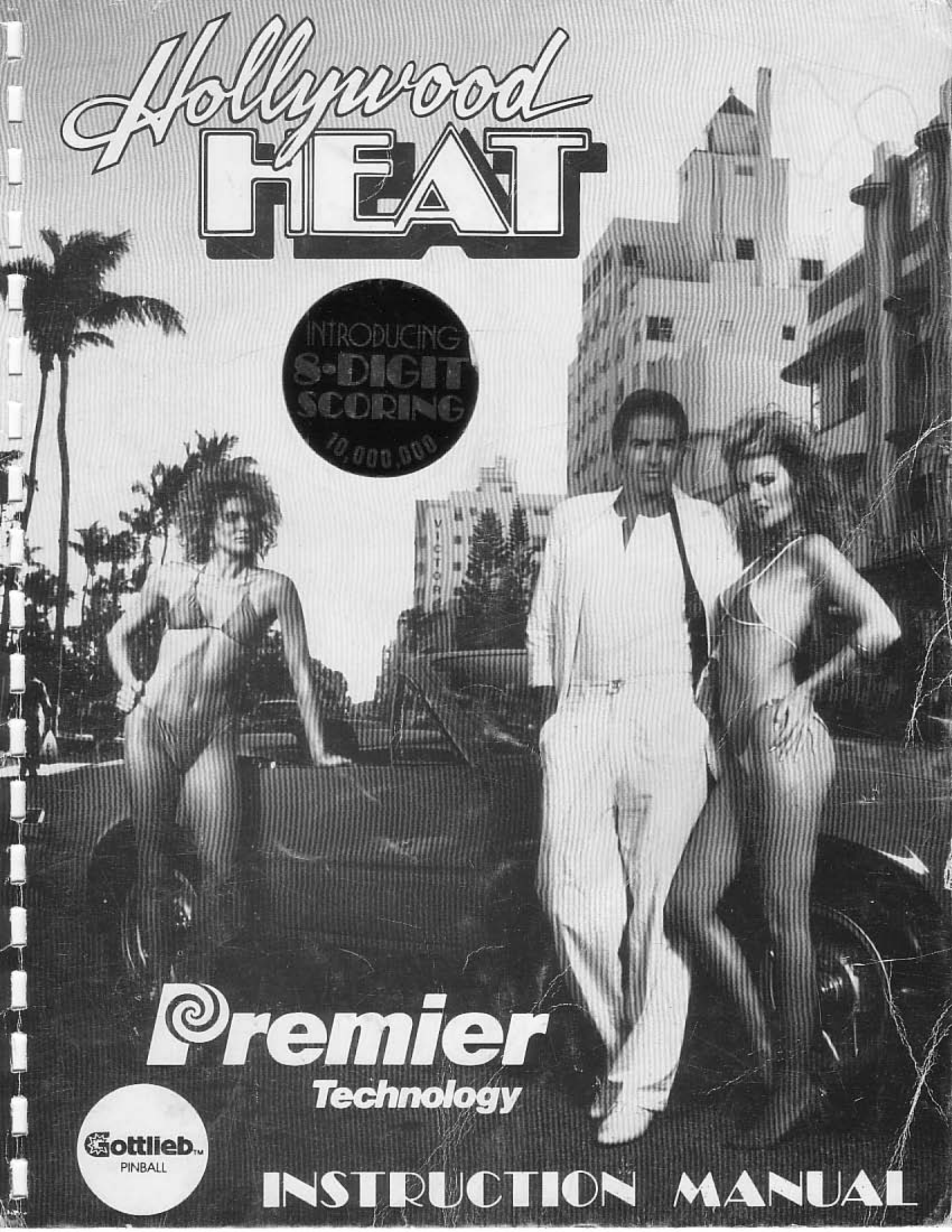
Hollywood HEAT



Premier Technology

Gottlieb™ PINBALL

INSTRUCTION MANUAL

HOLLYWOOD HEAT

(GAME #703)

INSTRUCTION MANUAL

Applicable for all games.

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HOLLYWOOD HEAT

GAME PROMS:
703/PROM 1
703/PROM 2

SOUND PROMS:
703/DROM 1
703/YROM 1
703/YROM 2

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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

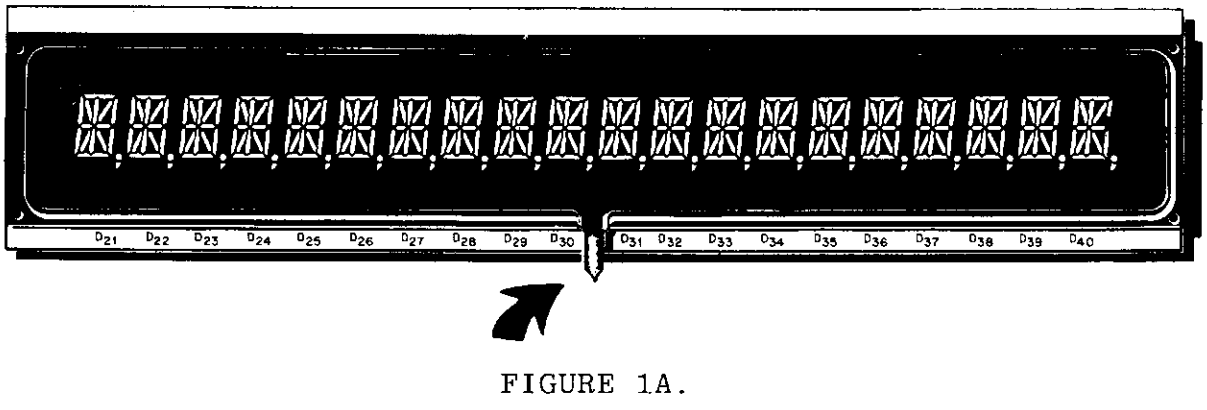


FIGURE 1A.

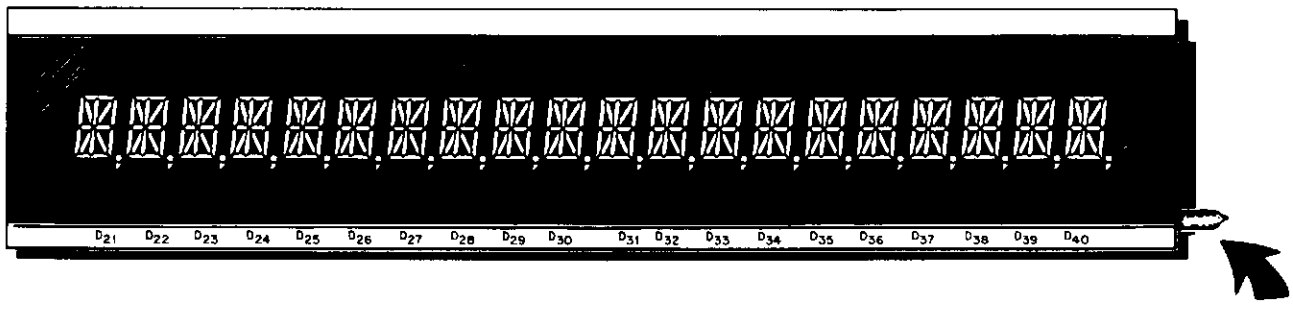


FIGURE 1B.

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.

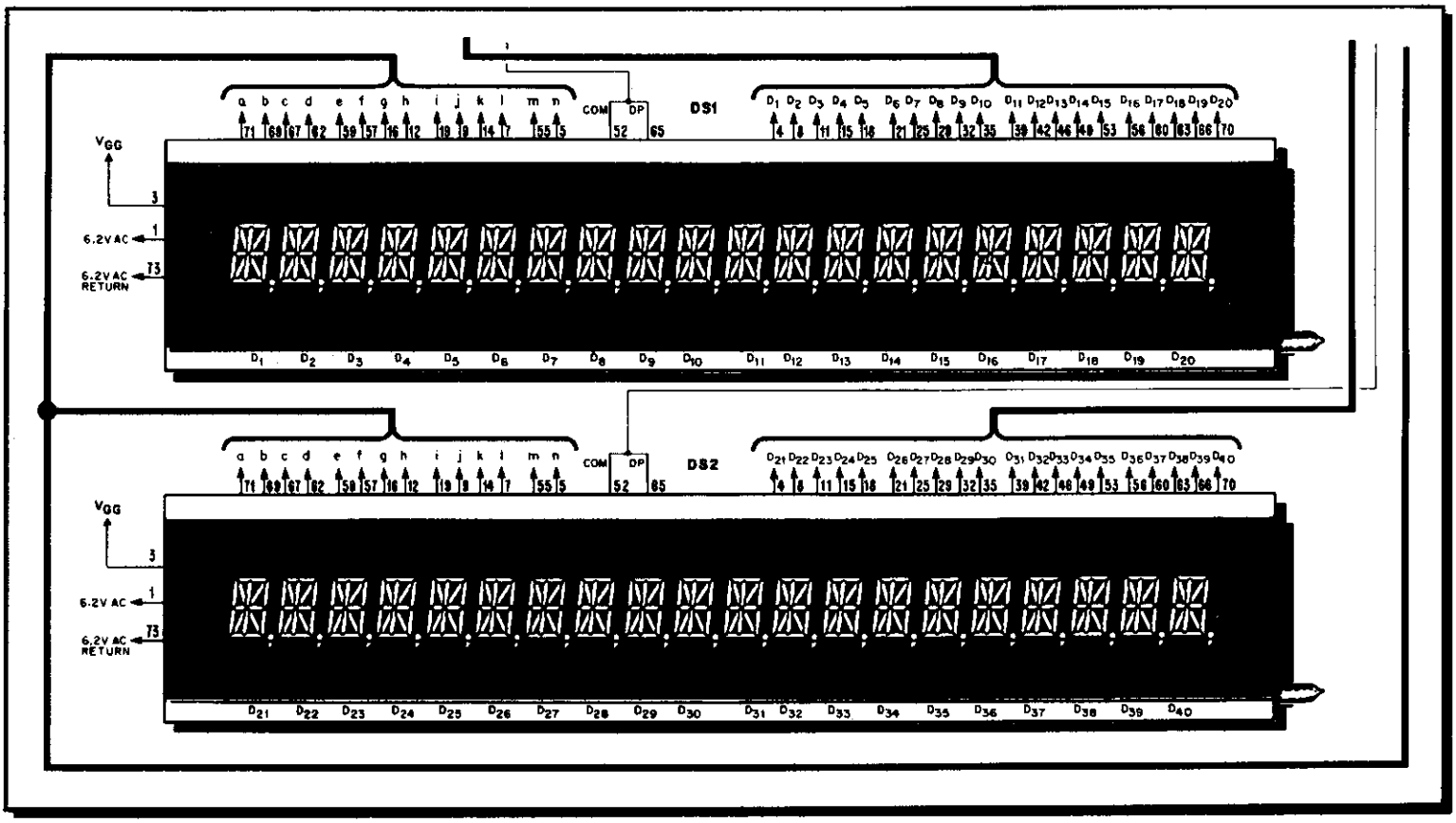


FIGURE 2.

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) and game Prom (PROM 1) 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.

"**WARNING:** This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference."

A-22670

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 and 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, fluorescent lamp assembly, speaker and the alphanumeric display board, proceed as follows:

   Unlock the lightbox, grasp the backglass lift trim, lift the backglass up and out carefully and set aside.

   To remove the speaker/alphanumeric display panel, grasp the upper portion of the panel, lift up about 1/2", swivel the top of the panel downwards and bring towards you, set down on the cabinet side mouldings. The acrylic display panel cover will also become detached at this stage.

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 4-1/2° - 5°.

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.

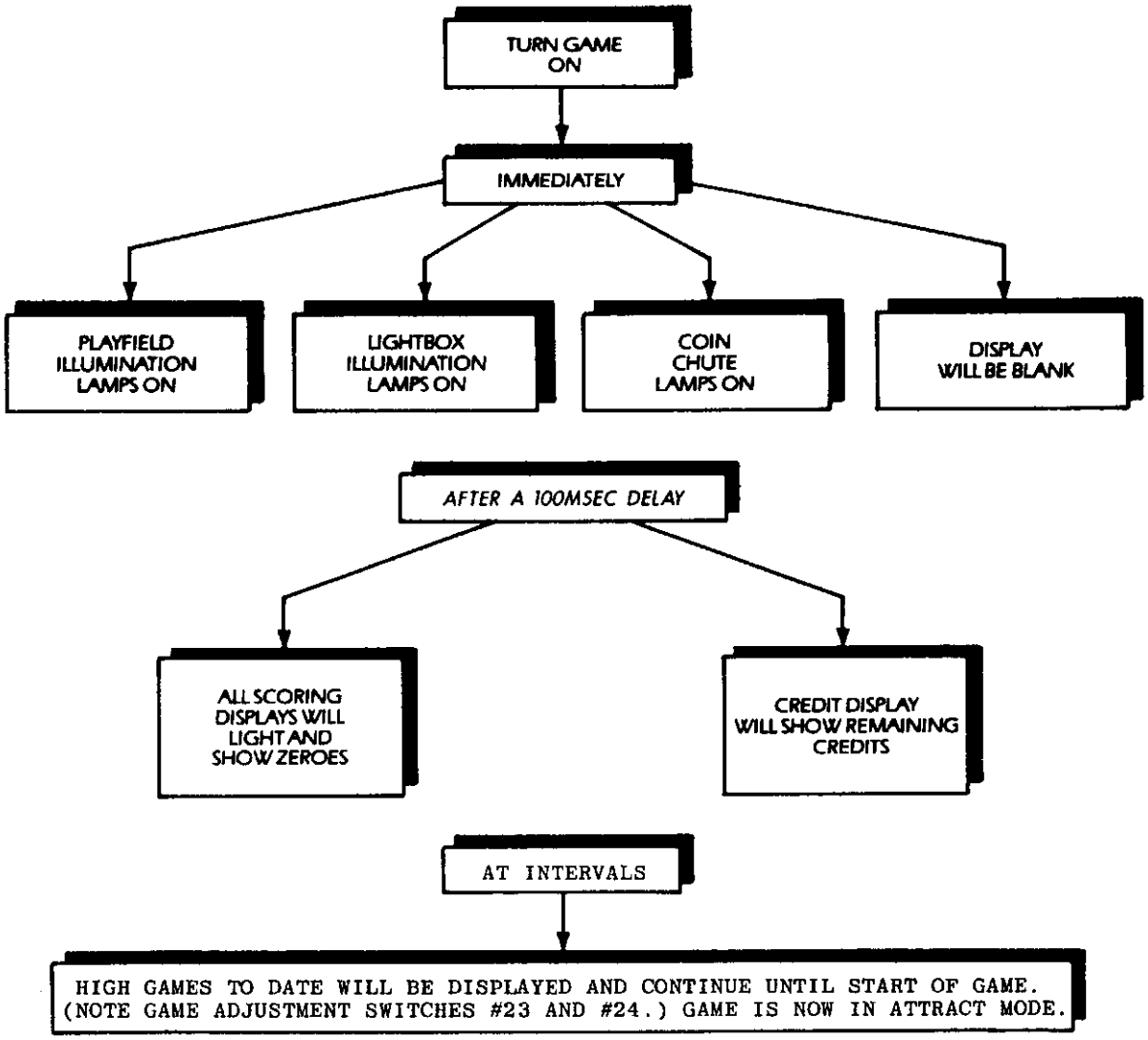
10. Reinstall the cabinet glass, front moulding and the lightbox assembly.

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. CAUTION If this game has been subjected to extreme cold, allow to warm up to room temperature.

II. INITIALIZATION



III. GAME OPERATION

A. GAME START

Three balls must be in the ball return trough, and a captive ball added to the pop bumper area 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



TOP ROLLOVERS

- SCORE 1000 UNLIT.
- SCORE 10,000 WHEN LIT.
- ADD A LETTER TO P-I-N-B-A-L-L BONUS WHEN LIT (IF SWITCH #31 = ON).
- COMPLETING TOP ROLLOVERS ADVANCES MULTIPLIER, ADDS A LETTER TO P-I-N-B-A-L-L BONUS (IF SWITCH #31 = OFF), AND RESETS THE SEQUENCE.
- COMPLETING P-I-N-B-A-L-L BONUS SCORES 10,000 X MULTIPLIER FOR EACH LETTER, RESETS THE SEQUENCE, AND LIGHTS THE LOWER ROLLUNDER (SPECIAL).

RIGHT FLIPPER SWITCH

- ROTATE TOP ROLLOVERS.
- DISPLAY MULTI-BONUS VALUE (PLAYER-UP) WHEN A BALL IS RELEASED TO SHOOTER.

UPPER AND LOWER DROP TARGETS

- SCORE 3000.
- COMPLETING EITHER BANK SCORES HIGHEST FLASHING OR LIT VALUE.
- COMPLETING BOTH BANKS INCREASES BANK VALUE.
- AWARD EXTRA BALL WHEN FLASHING (PURPLE).
- IN MULTI-BALL EACH UPPER OR LOWER TARGET TRIPS ITS CORRESPONDING TARGET.
- (5-BALL) SCORE 1000.

SPOT TARGETS

- SCORE 1000 UNLIT.
- SCORE 10,000 WHEN FLASHING.
- COMPLETING SEQUENCE ADVANCES MULTIPLIER.
- (5-BALL) SCORE 500 UNLIT.
- (5-BALL) SCORE 5000 WHEN LIT.

LEFT SIDE ROLLOVER

- SAME AS #4 SPOT TARGET.

UPPER ROLLUNDER

- SCORE 3000.
- AWARD SPECIAL WHEN LIT.

IV. GAME PLAY AND SCORING

LOWER ROLLUNDER

- SCORE 5000 UNLIT.
- SCORE 50,000 WHEN FLASHING(WHITE).
- AWARD SPECIAL WHEN LIT (RED).

LEFT AND RIGHT HOLES

- SCORE 10,000.
- CAPTURE BALL WHEN FLASHING.
- START RELEASE LAMPS FLASHING IF TWO BALLS CAPTURED.

RAMP ROLLOVER

- SCORE 50,000.
- ADD A LETTER TO P-I-N-B-A-L-L BONUS UNLIT.
- RELEASE CAPTURED BALLS WHEN FLASHING (MULTI-BALL).
- COMPLETING P-I-N-B-A-L-L BONUS SCORES 10,000 X MULTIPLIER FOR EACH LETTER, RESETS THE SEQUENCE, AND LIGHTS THE LOWER ROLLUNDER (SPECIAL).

LEFT OUTSIDE ROLLOVER

- SCORE 1000.

LEFT CENTER ROLLOVER

- SCORE 10,000.

RIGHT CENTER ROLLOVER

- SCORE 3000.

RIGHT RETURN ROLLOVER

- SCORE 3000.
- FLASH LOWER ROLLUNDER (WHITE) FOR A TIME PERIOD.

POP BUMPER

- SCORE 300.
- SCORE INCREASES BY 300 FOR EACH CONSECUTIVE HIT.
- COLLECT ACCUMULATED HEAT BUMPER SCORE AT END OF BALL.
- (5-BALL) SCORE 100. SCORE INCREASES BY 100 FOR EACH CONSECUTIVE HIT.

RUBBER SWITCHES

- SCORE 30.
- TOGGLE EXTRA BALL AND SPECIAL WHEN EITHER IS ENABLED.

SHOOTER LANE SWITCH

- FLASH PLAYFIELD LAMPS UNTIL THE BALL IS SHOT INTO PLAY.

OUTHOLE

- SCORE 10,000 X MULTIPLIER FOR EACH LIT LETTER IN P-I-N-B-A-L-L, ALSO COLLECT ACCUMULATED HEAT BUMPER SCORE.

MULTI-BONUS

- SCORE ADDITIONAL 1500 X MULTIPLIER FOR EVERY SWITCH HIT DURING MULTI-PLAY.
- VALUE IS COLLECTED AT THE END OF EACH PLAYER'S LAST BALL IN PLAY.
- (5-BALL) SCORE ADDITIONAL 800 X MULTIPLIER FOR EVERY SWITCH HIT DURING MULTI-BALL PLAY.



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 — SPARE

SWITCH 14 — COIN CHUTE LEFT AND RIGHT CONTROL
ON ..... Same
OFF ..... Separate

SWITCHES 15 16 — MAXIMUM CREDITS
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
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 ..... Yes
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 — SPECIAL ADJUSTMENT
ON ... Top rollovers add a letter to P-I-N-B-A-L-L bonus when lit (LIBERAL).
OFF .. Top rollovers add a letter to P-I-N-B-A-L-L bonus when completed (CONSERVATIVE).

SWITCH 32 — EXTRA BALL ADJUSTMENT
ON ... Drop target lamps memorized ball to ball (LIBERAL).
OFF .. Drop target lamps reset 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.

SWITCH BANK SETTINGS:

DIP SWITCH

Position 1.....Not Used
Position 2.....Not Used
Position 3.....Off
Position 4.....On

C. POST ADJUSTMENTS

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

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 re-entered 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

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

   b. Press the credit button. Notice information replaced by zeros. Note: Step 6 (Replay Percentage) cannot be zeroed using the credit button.

2. Zeroing All Bookkeeping Steps Except #11, 12, 13 and 14.

   (These are the replay level and high game to date scores)

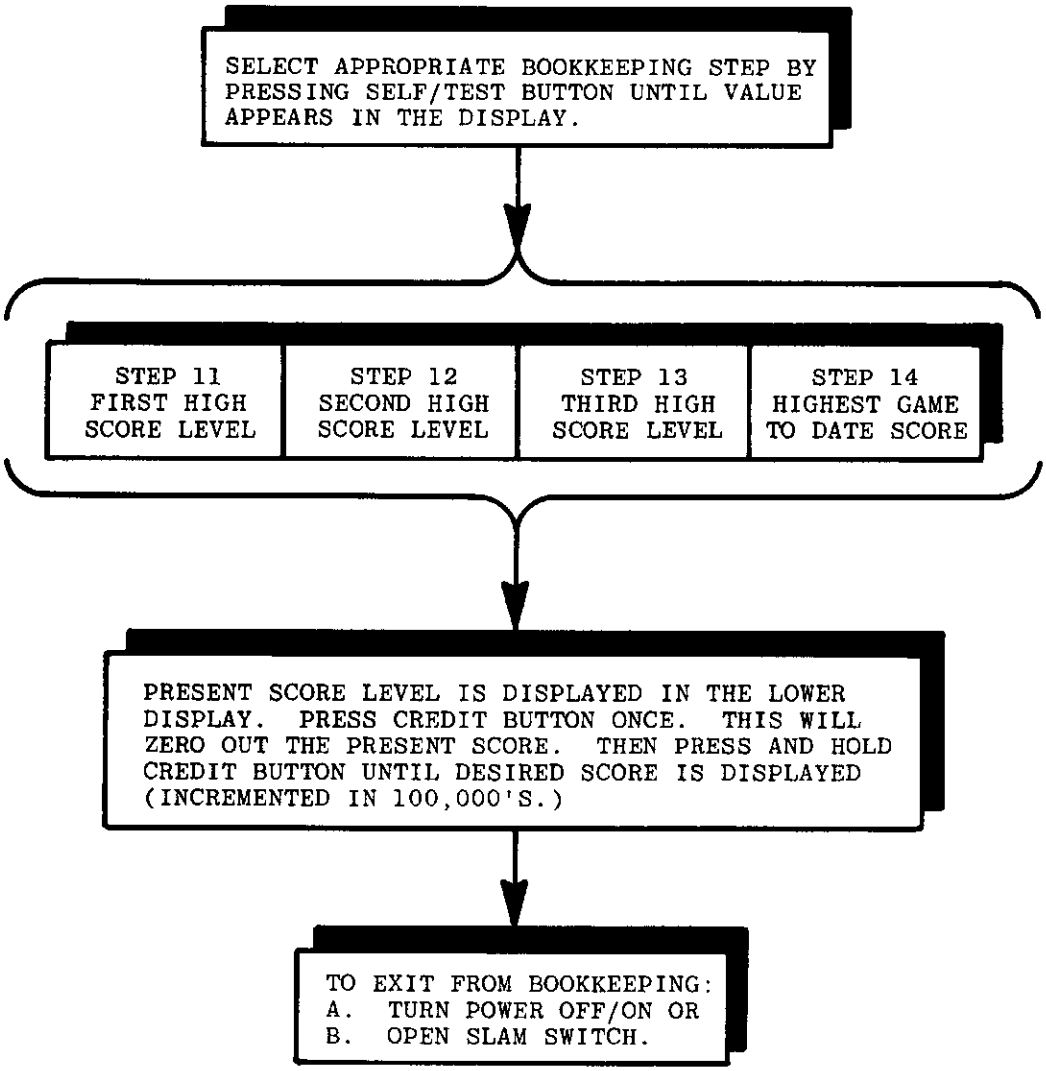
   a. Go to Step #15.

   b. Press the credit button. A message will be displayed.

   c. Zeroing is complete.

VII. BOOKKEEPING AND SELF TEST

III. HOW TO RESET 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.

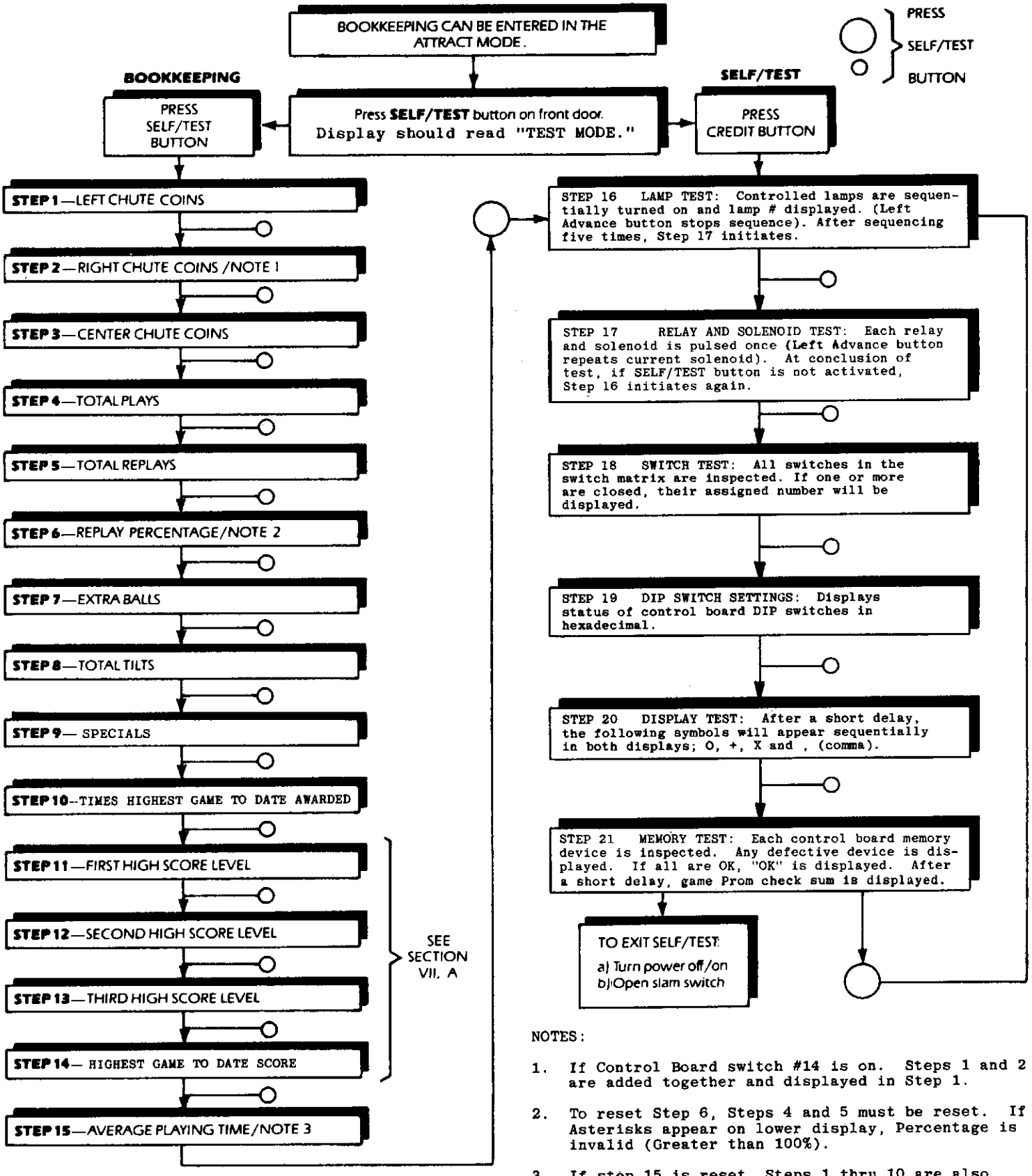
2. If Step 12 or Step 13 is not desired, set those scores to zero.

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.

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. To reset Step 6, Steps 4 and 5 must be reset. If Asterisks appear on lower display, Percentage is invalid (Greater than 100%).
3. If step 15 is reset, Steps 1 thru 10 are also reset. If Asterisks appear on lower display, Time is invalid (Greater than 16½ minutes per game).

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	Left Hole	Q60
Sol.2	Right Hole	Q57/Q58
Sol.3	Not Used	Q54
Sol.4	#2 Trip (L And R)	Q55
Sol.5	Left Bank Reset	Q61/Q62
Sol.6	Right Bank Reset	Q63/Q64
Sol.7	#3 Trip (L And R)	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

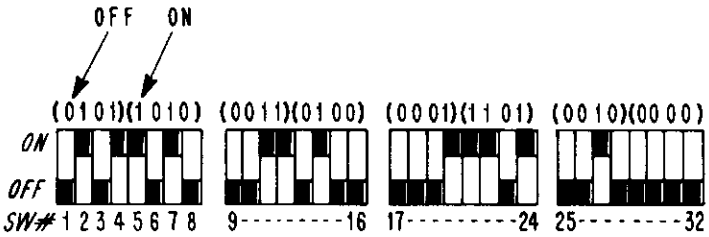
a. The status of the Control Board (A1) switches appears in the lower display.

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

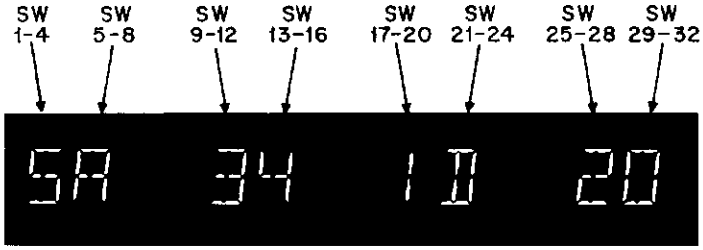
VII. BOOKKEEPING AND SELF TEST

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; O, +, 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

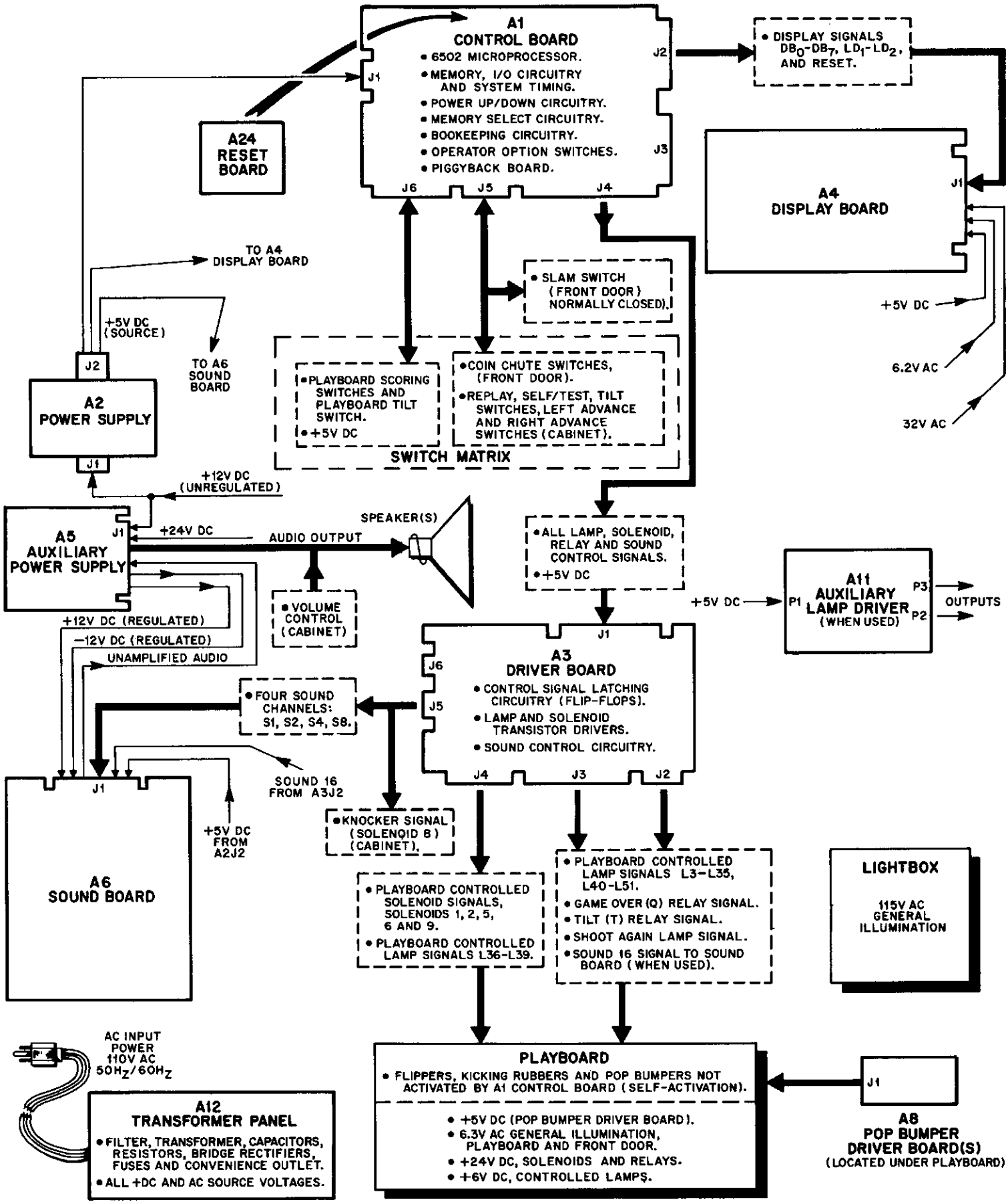


FIGURE 1. SYSTEM 80B BLOCK DIAGRAM

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.

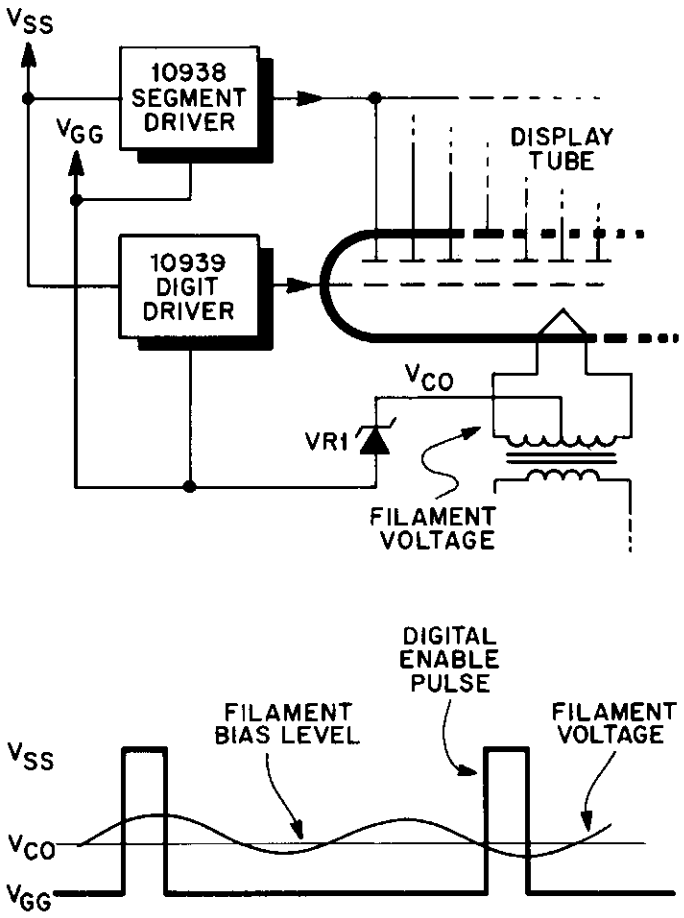


FIGURE 2. BASIC DRIVE CIRCUIT

D. SOUND BOARD (A6)

The MA-766 Sound Board consists of two 6502 microprocessor systems, a dual DAC, an L.P.C. speech generator, 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, C21, XTAL-1 and T1. R21 and C22 are optional. This 4 MHz clock is divided by 4 to a 1 MHz clock for both processors' clock input, pin 37 of N1 and T3. A 2 Mhz clock from S1 pin 14 is sent to the two AY-3-8913 Programmable Sound Generator, H4 and K4, 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.

NOTE: DIP Switch 3 should remain off and DIP Switch 4 should remain on. This prevents the S4 input from generating an interrupt.

VIII. THEORY OF OPERATION

SYSTEM RAM

The sound board is designed to accomodate different types of RAM. JP1 and JP3 should be connected if HM6116's or 2158A's are used. JP2 and JP4 should be connected if 2158B's are used.

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.

INPUT PORT

Input Port B3 reads the test switch SW1 and two option switches, DIP switches 1 and 2. Pressing test switch SW1 will produce a tone.

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 A6P1 pin 18, 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 Boards
A8 - Pop Bumper Driver Boards
A11- Auxiliary Lamp Driver
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	10 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
F20	Input Line	110V AC	8 Amp SLO-BLO
		220V AC	4 Amp SLO-BLO

PLAYBOARD FUSES

F9	Ball Release	1 Amp SLO-BLO
F10	Left Hole, Right Hole, Outhole	1 Amp SLO-BLO
F11	Left Target Bank, Right Target Bank	1 Amp SLO-BLO
F12	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

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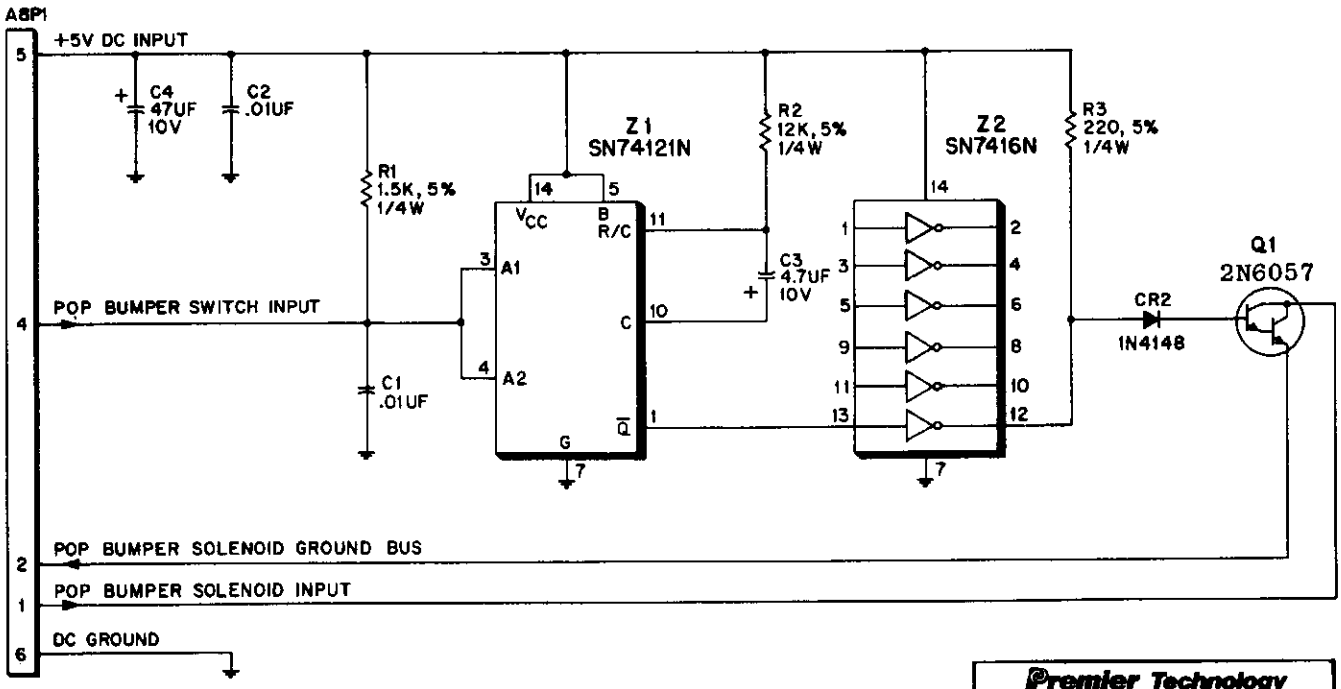
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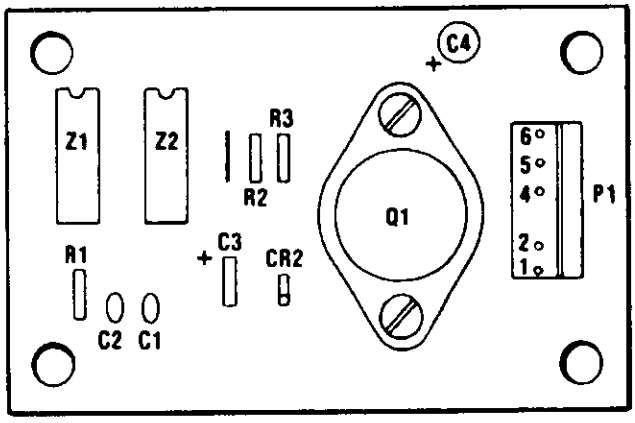
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X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



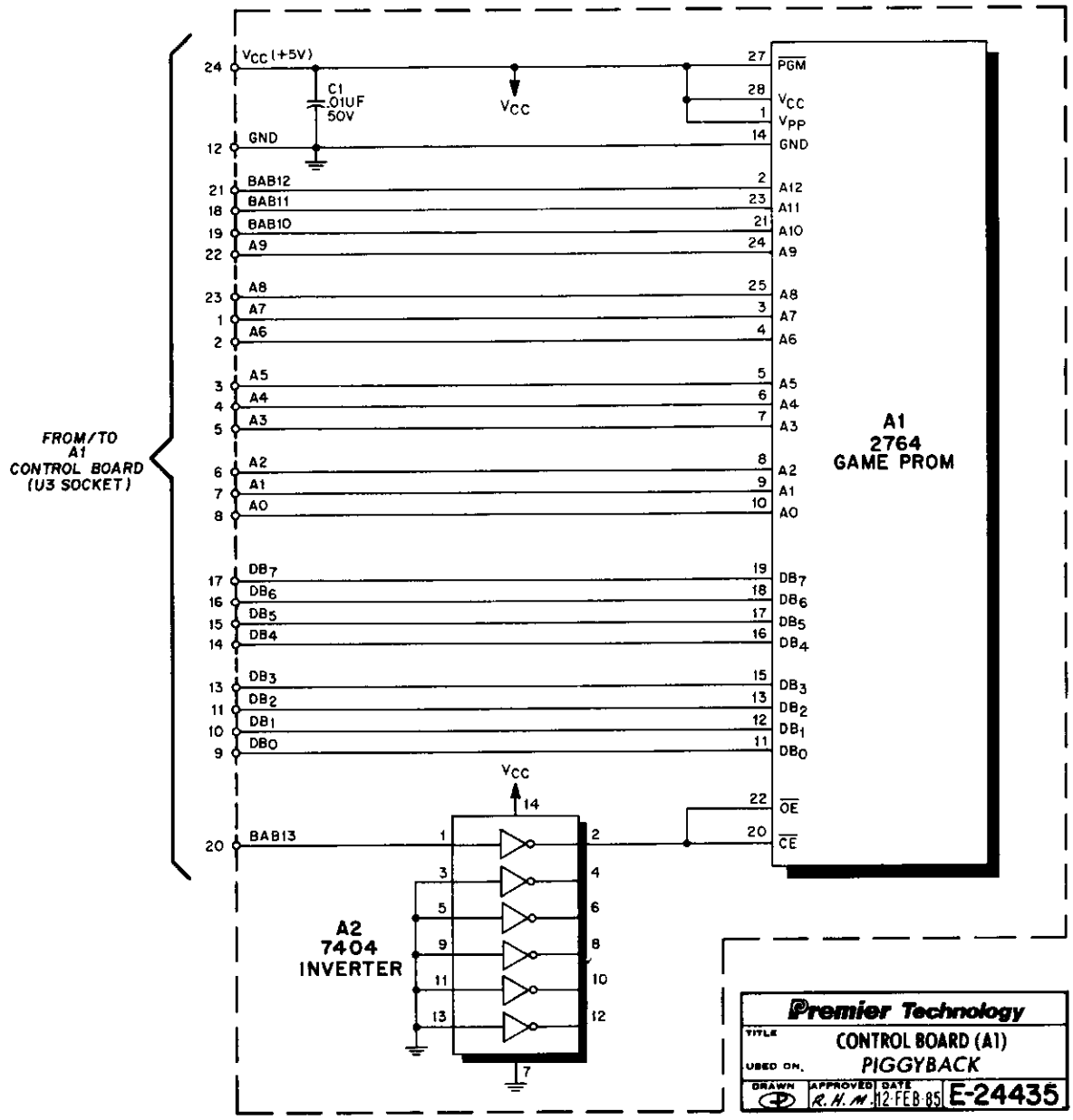
POP BUMPER DRIVER BOARD (A8) COMPONENT LOCATION



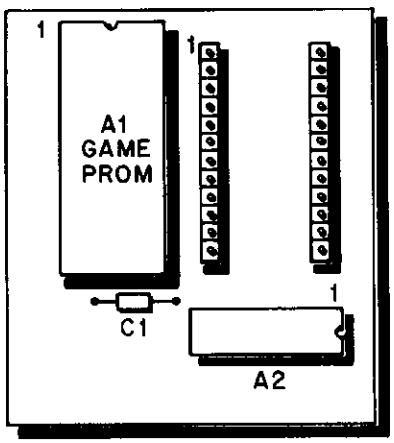
POP BUMPER DRIVER BOARD (A8) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	POP BUMPER DRIVER BOARD	A-19741
C1, C2	Capacitor, .01 mfd., 100V	XO-202
C3	Capacitor, 4.7 mfd., 10%, 10V, Tantalum, Axial	XO-226
C4	Capacitor, 47 mfd., 10V	XO-227
CR2	Diode 1N4148	XO-261
P1	Connector 09-65-1061	XO-868
R1	Resistor, 1.5K ohm, 5%, ¼W	XO-20
R2	Resistor, 12K ohm, 5%, ¼W	XO-9
R3	Resistor, 220 ohm, 5% ¼W	XO-21
Q1	Transistor, Darlington 2N6057	XO-311
Z1	IC SN7412IN	XO-417
Z2	IC SN7416N	XO-405

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



CONTROL BOARD (A1), PIGGYBACK COMPONENT LOCATION

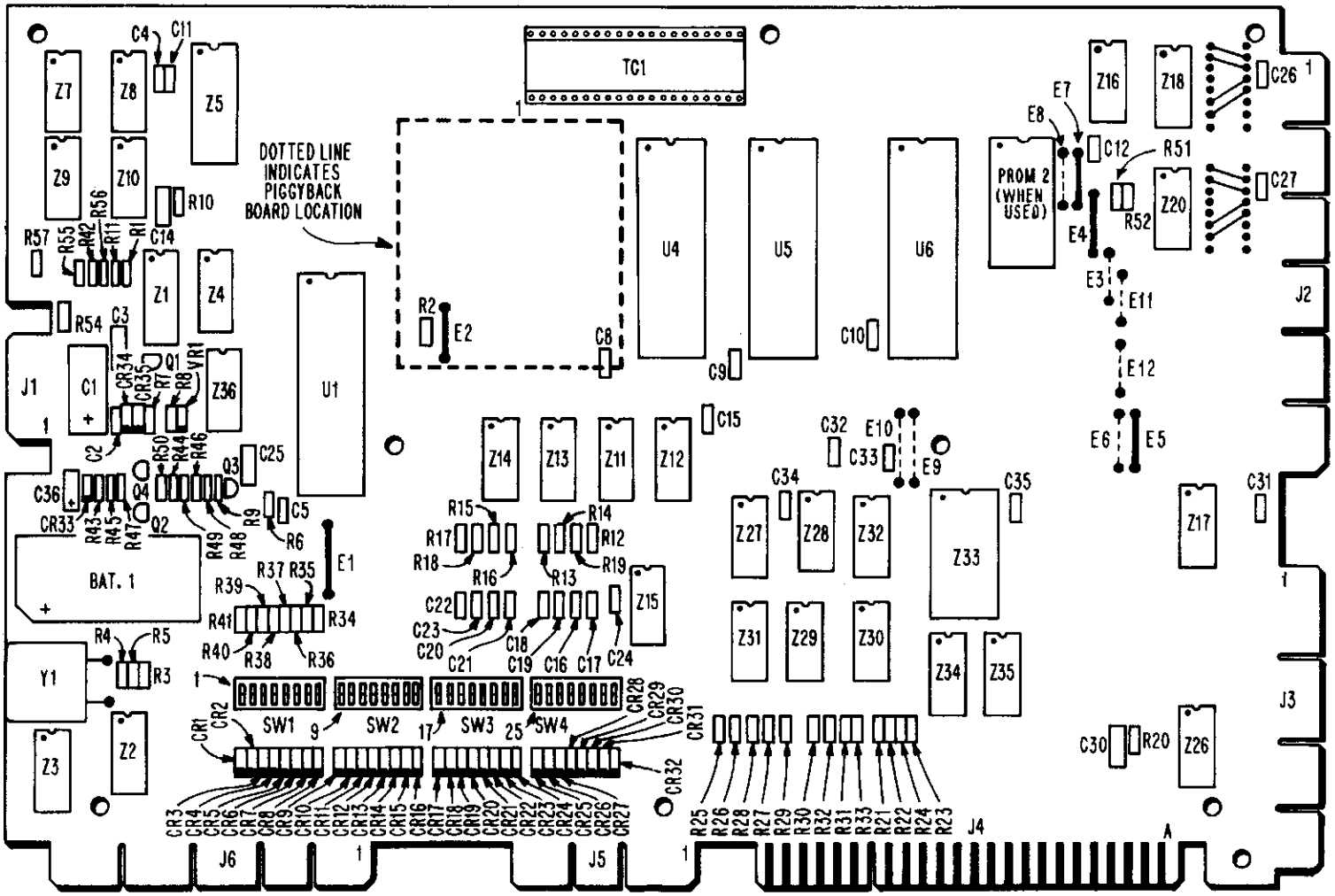


CONTROL BOARD (A1), PIGGYBACK PARTS LIST

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 326R10-002	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 1N4148	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

REFERENCE	DESCRIPTION	PART NUMBER
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% 1N5225B or 1N5987B	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 SCL40698	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 — Z30 7416
Z12 7404 — Z32 7417
Z27 7404 — Z32 7417
Z29 7416 — Z9 7400
Z29 7416 — Z9 7400
Z36 4069 — Z36 4069
Z36 4069 — Z36 4069

CLOCK LOGIC

Y1, R4 2K, R5 2K, R3 5.6K, Z3 7404, Z2 7474, E2

DELAY CIRCUIT

CR33, R43 5.6K, R45 3K, R47 24K, R46 3K, R48 3K, R49 5.6K, R44 2K, R50 180, C36 10UF 10V, Q2 2N4400, Q3 2N4400, Q4 MPS-A70

UP/DOWN MEMORY PROTECT LOGIC

A1J1, +5VDC, SPARE, GND, C1 100UF 10V, C2, CR34, CR35, V_B SOURCE, R8 180, Q1 MPS-A70, R7 62, C3 0.1UF, VR1 3V ±5%, V_B 3.6V, R9 1K, C25 0.1UF, Z1 4528 CMOS ONE SHOT, R10 2.7MEG, C14 0.1UF

INPUT/OUTPUT DEVICE SELECTION

AB7, AB8, Z7 74LS04, Z8 7402, C4, U5-38, U4-38, U6-38

U1 6502

TC1

RESET, CR1 1N270, LOCATED ON A24P2

R1 3K, R2 4.7K, R1 3K 5% 1/4W, LOCATED ON A24P2

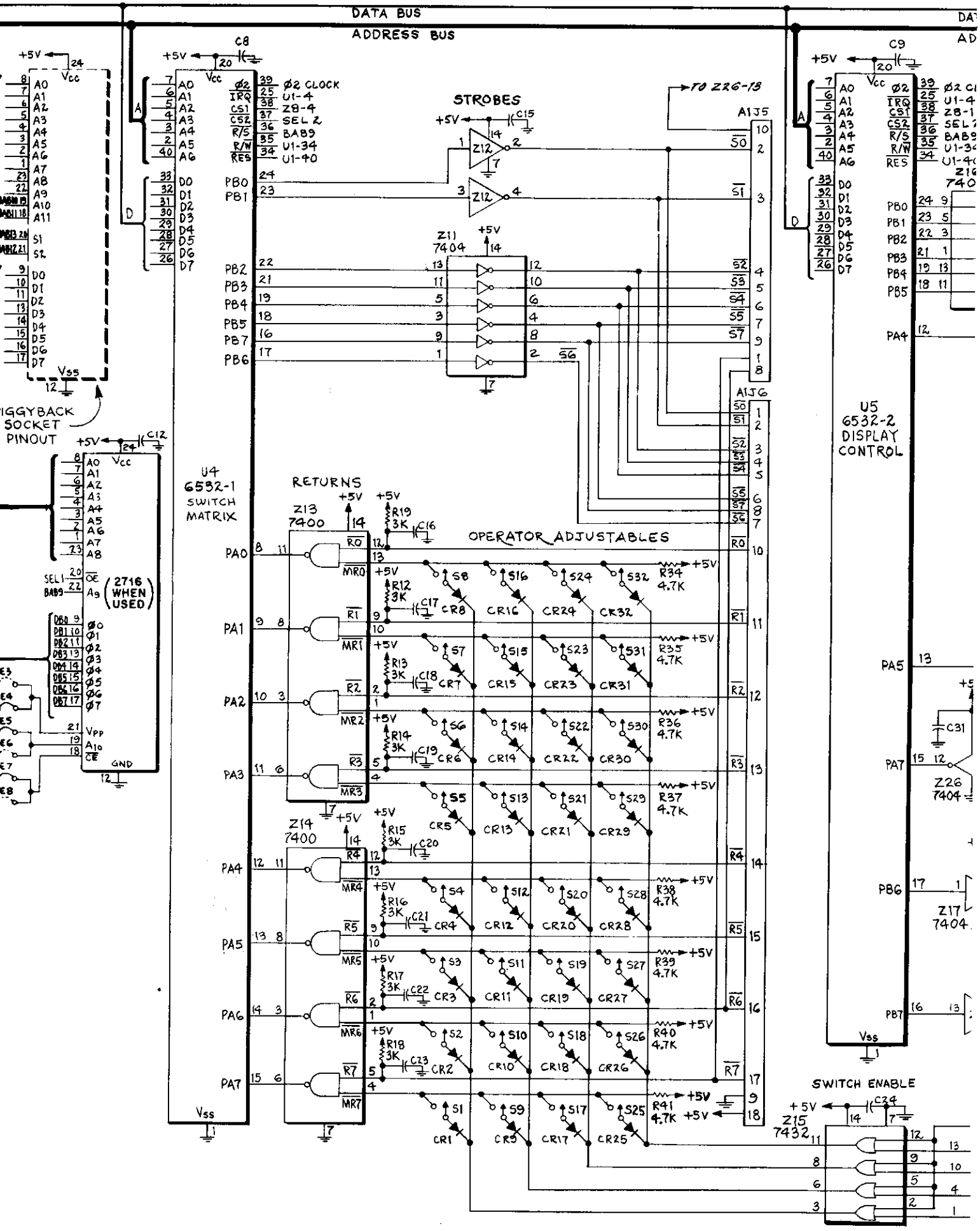
ADDRESS BUS, DATA BUS

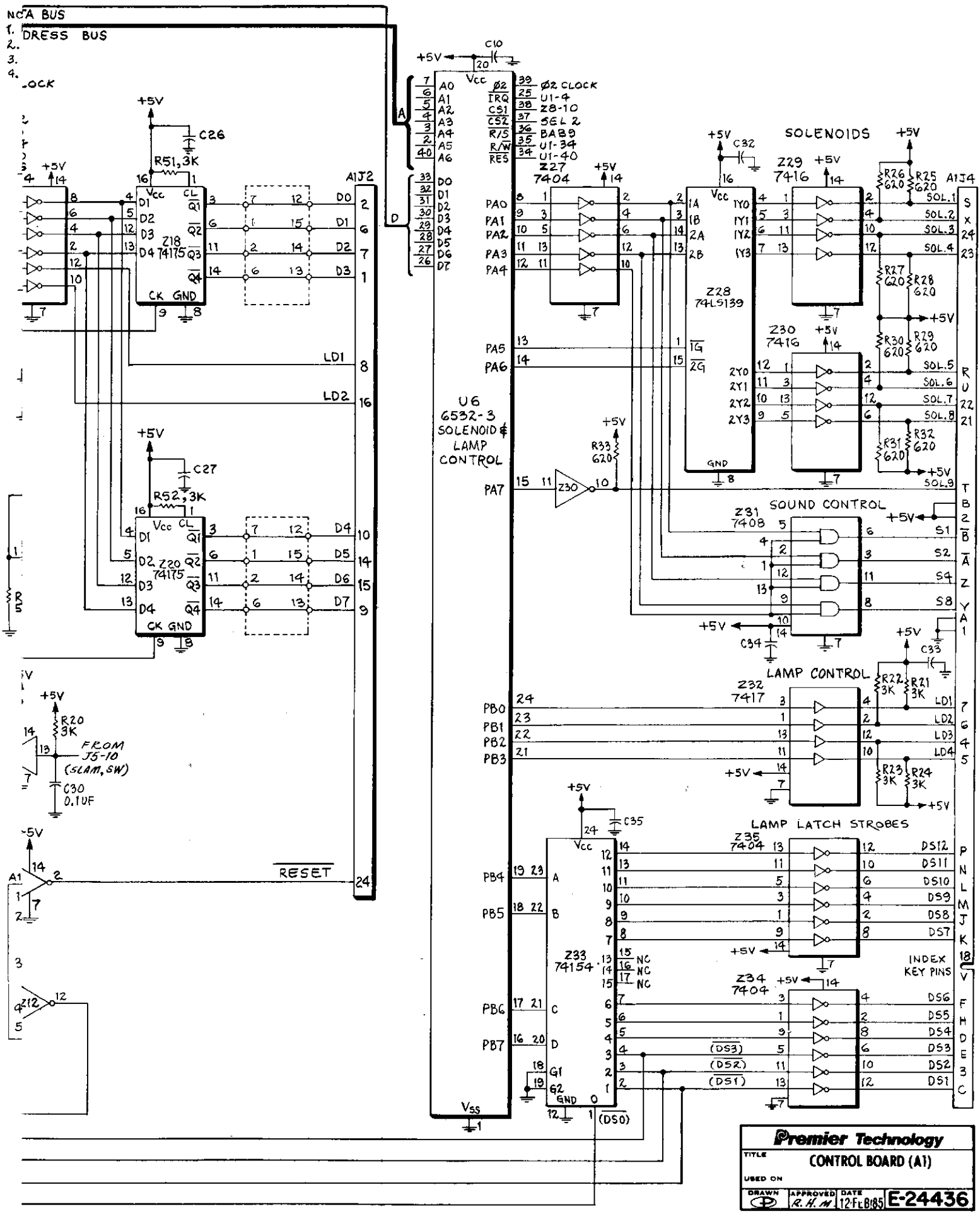
Z5 5101L-1 BK RAM

PROM SELECTION

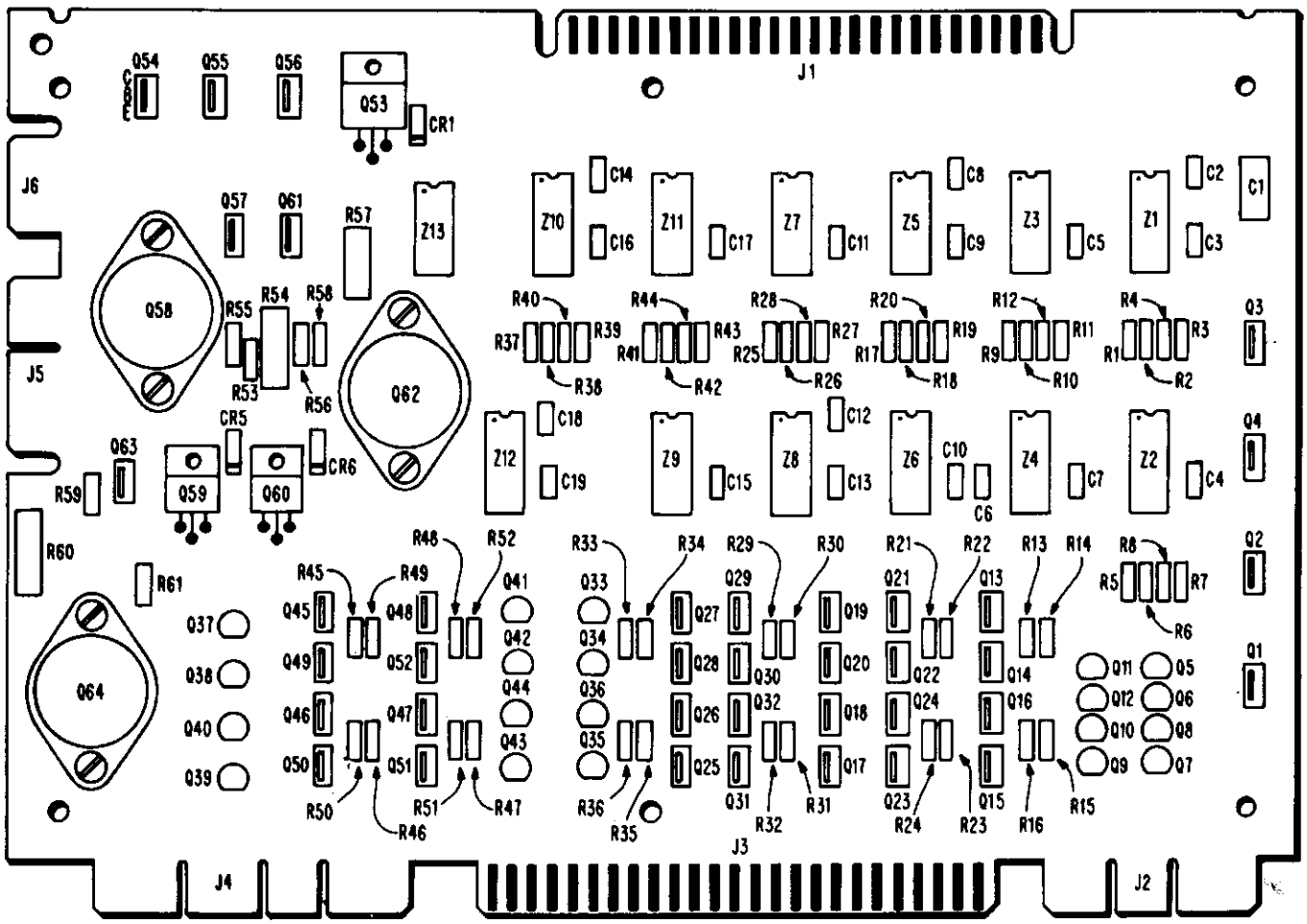
Z10 74LS05, Z12 7404, Z7 74LS04, Z8 7402, Z9 7400

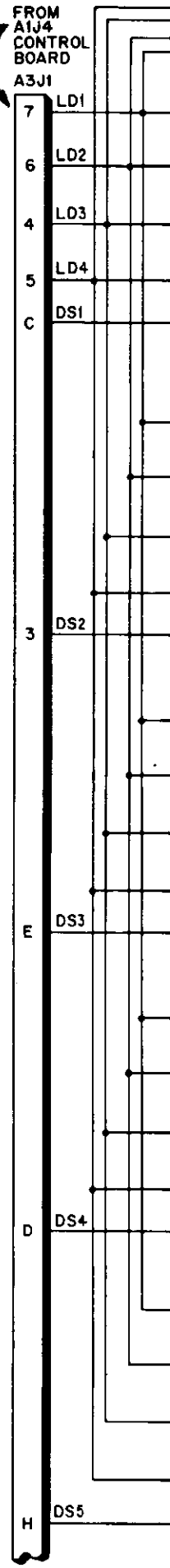
BAB9, BAB10, BAB11, BAB12, BAB13, SEL 2, SEL 1


DATA BUS
ADDRESS BUS
STROBES
TO Z26-13
A1J5
A1J6
U4
6532-1
SWITCH
MATRIX
RETURNS
OPERATOR ADJUSTABLES
U5
6532-2
DISPLAY
CONTROL
PIGGYBACK
SOCKET
PINOUT
2716
WHEN
USED
SWITCH ENABLE
Z13
7400
Z14
7400
Z11
7404
Z12
Z26
7404
Z17
7404
Z15
7432
Vcc
Vss
GND


ADDRESS BUS
CLOCK
U6
6532-3
SOLENOID & LAMP CONTROL
SOLENOIDS
SOUND CONTROL
LAMP CONTROL
LAMP LATCH STROBES
INDEX KEY PINS
RESET
FROM J5-10 (SLAM SW)
A1J2
A1J4
Z18 74175
Z20 74175
Z27 7404
Z28 74LS139
Z29 7416
Z230 7416
Z231 7408
Z232 7417
Z233 74154
Z234 7404
Z235 7404
Premier Technology
TITLE
CONTROL BOARD (A1)
USED ON
DRAWN
APPROVED R.H.M
DATE 12-FEB-85
E-24436

DRIVER BOARD (A3) COMPONENT LOCATION



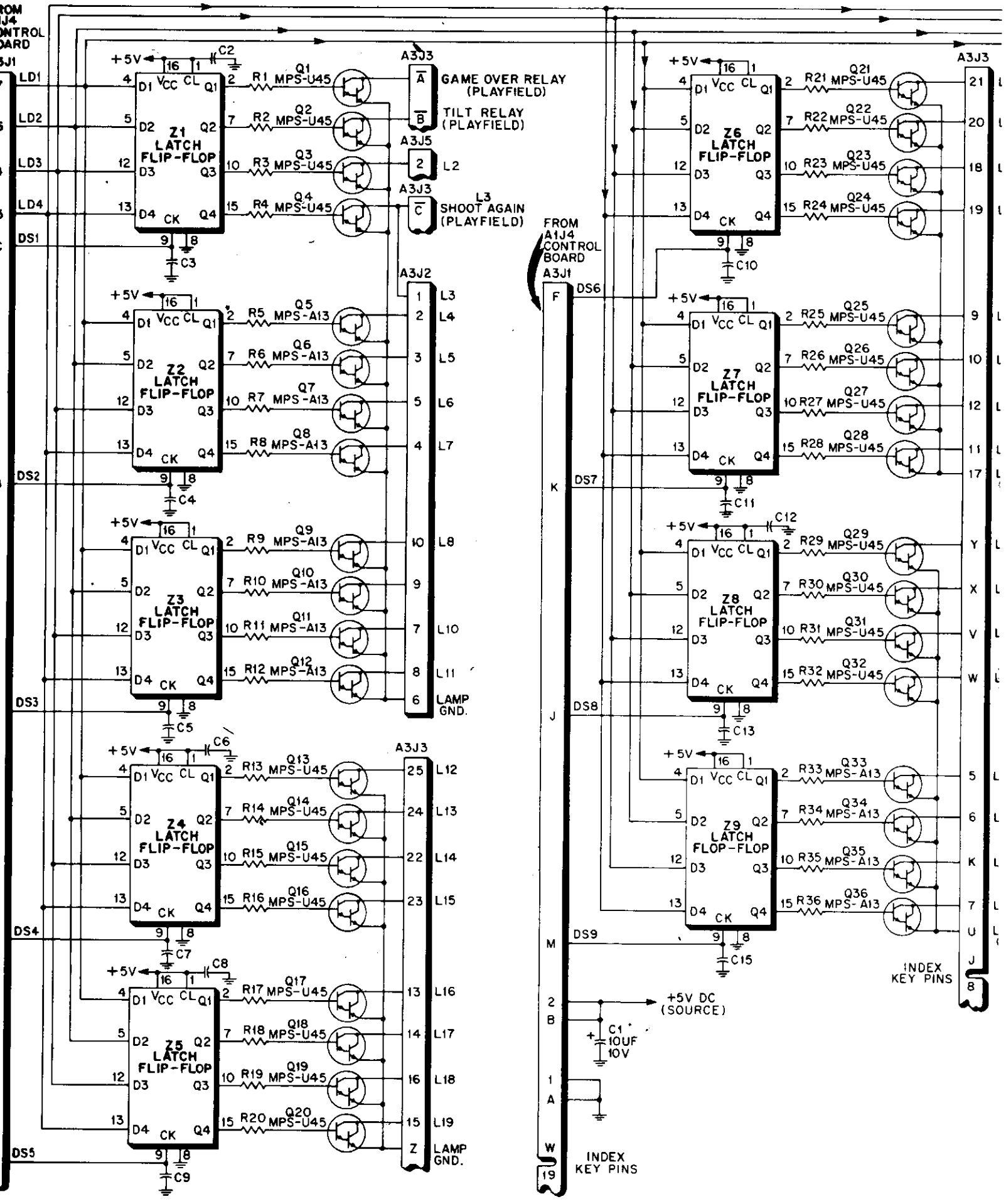


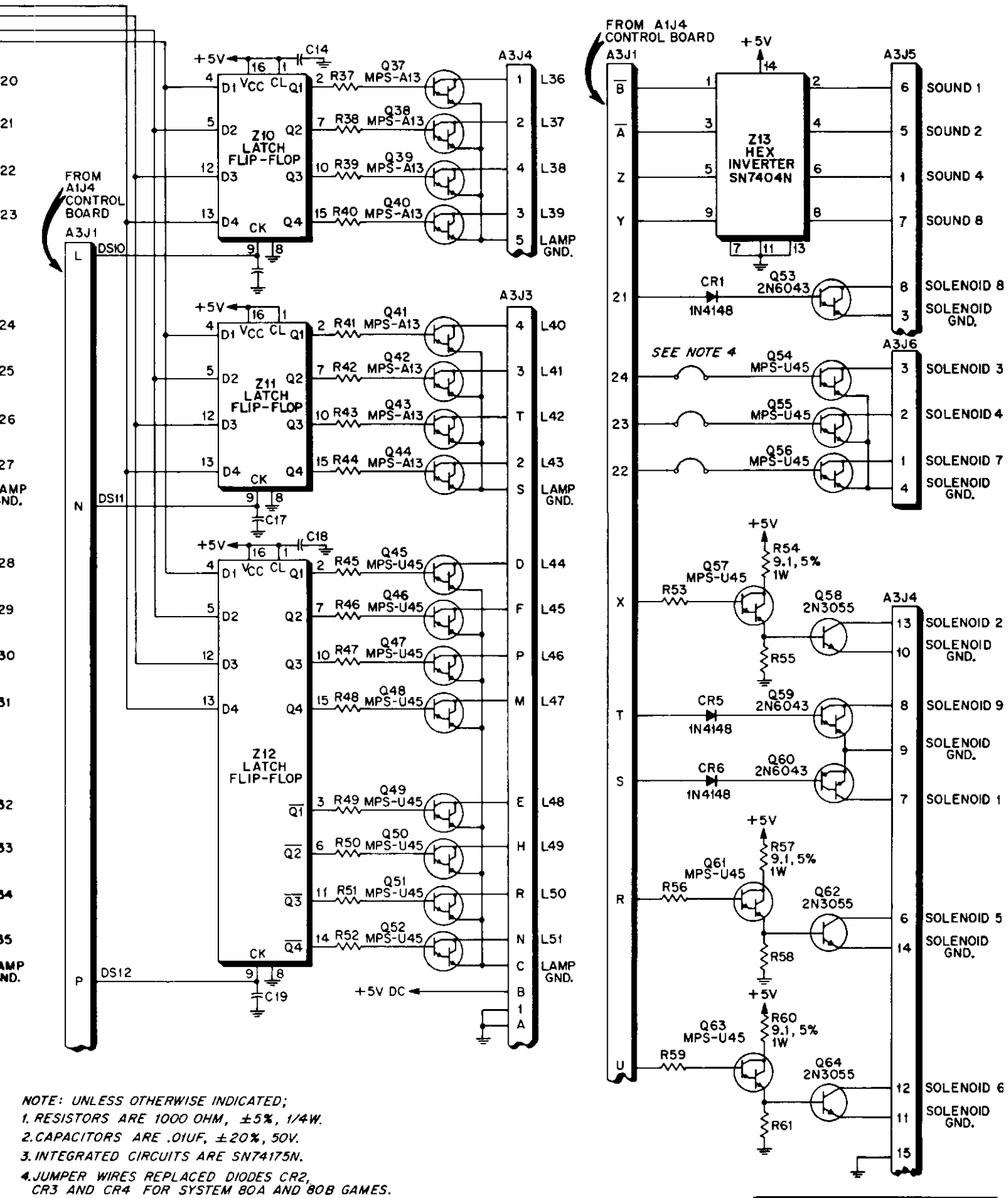
DRIVER BOARD (A3) PARTS LIST

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 NDS-U45 ARE INTERCHANGEABLE.*


FROM A1J4 CONTROL BOARD
A3J1
LD1
LD2
LD3
LD4
DS1
DS2
DS3
DS4
DS5
+5V
C2
C3
C4
C5
C6
C7
C8
C9
Z1 LATCH FLIP-FLOP
Z2 LATCH FLIP-FLOP
Z3 LATCH FLIP-FLOP
Z4 LATCH FLIP-FLOP
Z5 LATCH FLIP-FLOP
Q1 MPS-U45
Q2 MPS-U45
Q3 MPS-U45
Q4 MPS-U45
Q5 MPS-A13
Q6 MPS-A13
Q7 MPS-A13
Q8 MPS-A13
Q9 MPS-A13
Q10 MPS-A13
Q11 MPS-A13
Q12 MPS-A13
Q13 MPS-U45
Q14 MPS-U45
Q15 MPS-U45
Q16 MPS-U45
Q17 MPS-U45
Q18 MPS-U45
Q19 MPS-U45
Q20 MPS-U45
R1 R2 R3 R4
R5 R6 R7 R8
R9 R10 R11 R12
R13 R14 R15 R16
R17 R18 R19 R20
A3J3
GAME OVER RELAY (PLAYFIELD)
TILT RELAY (PLAYFIELD)
A3J5
L2
A3J3
L3 SHOOT AGAIN (PLAYFIELD)
A3J2
L3
L4
L5
L6
L7
L8
L10
L11
LAMP GND.
A3J3
L12
L13
L14
L15
L16
L17
L18
L19
LAMP GND.
FROM A1J4 CONTROL BOARD
A3J1
DS6
DS7
DS8
DS9
F
K
J
M
2
B
1
A
W
19
INDEX KEY PINS
+5V DC (SOURCE)
C1 10UF 10V
Z6 LATCH FLIP-FLOP
Z7 LATCH FLIP-FLOP
Z8 LATCH FLIP-FLOP
Z9 LATCH FLOP-FLOP
Q21 MPS-U45
Q22 MPS-U45
Q23 MPS-U45
Q24 MPS-U45
Q25 MPS-U45
Q26 MPS-U45
Q27 MPS-U45
Q28 MPS-U45
Q29 MPS-U45
Q30 MPS-U45
Q31 MPS-U45
Q32 MPS-U45
Q33 MPS-A13
Q34 MPS-A13
Q35 MPS-A13
Q36 MPS-A13
R21 R22 R23 R24
R25 R26 R27 R28
R29 R30 R31 R32
R33 R34 R35 R36
C10
C11
C12
C13
C15
A3J3
INDEX KEY PINS



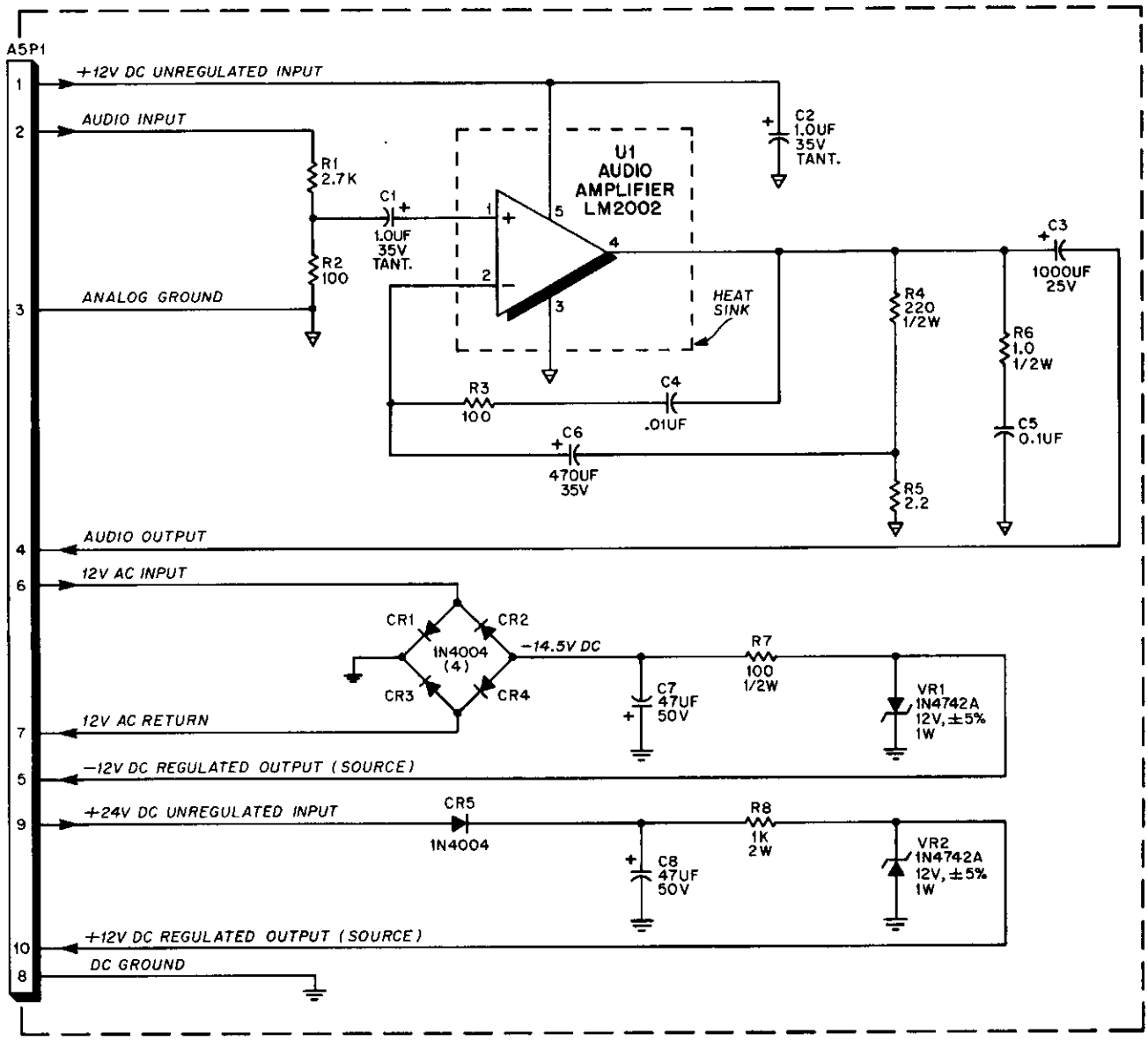
NOTE: UNLESS OTHERWISE INDICATED;

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.*

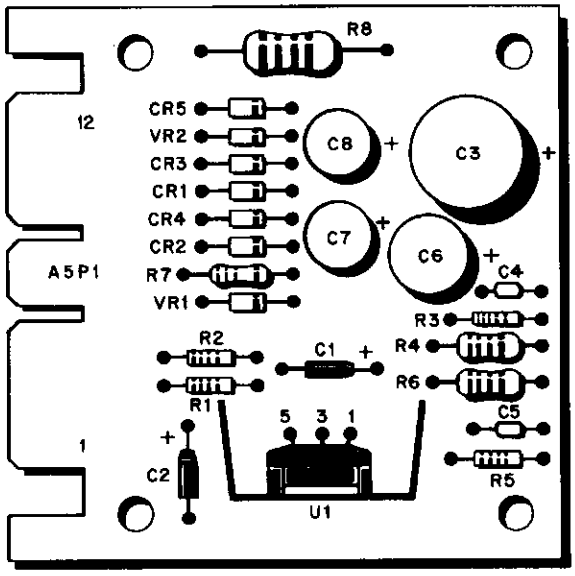
Premier Technology			
TITLE: DRIVER BOARD (A3)			
USED ON			
DRAWN	APPROVED	DATE	E-20915
CD	BAM	12-12-80	

SERVICE NOTES

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



AUXILIARY POWER SUPPLY (A5) COMPONENT LOCATION



Premier Technology

TITLE AUXILIARY POWER SUPPLY (A5)

USED ON

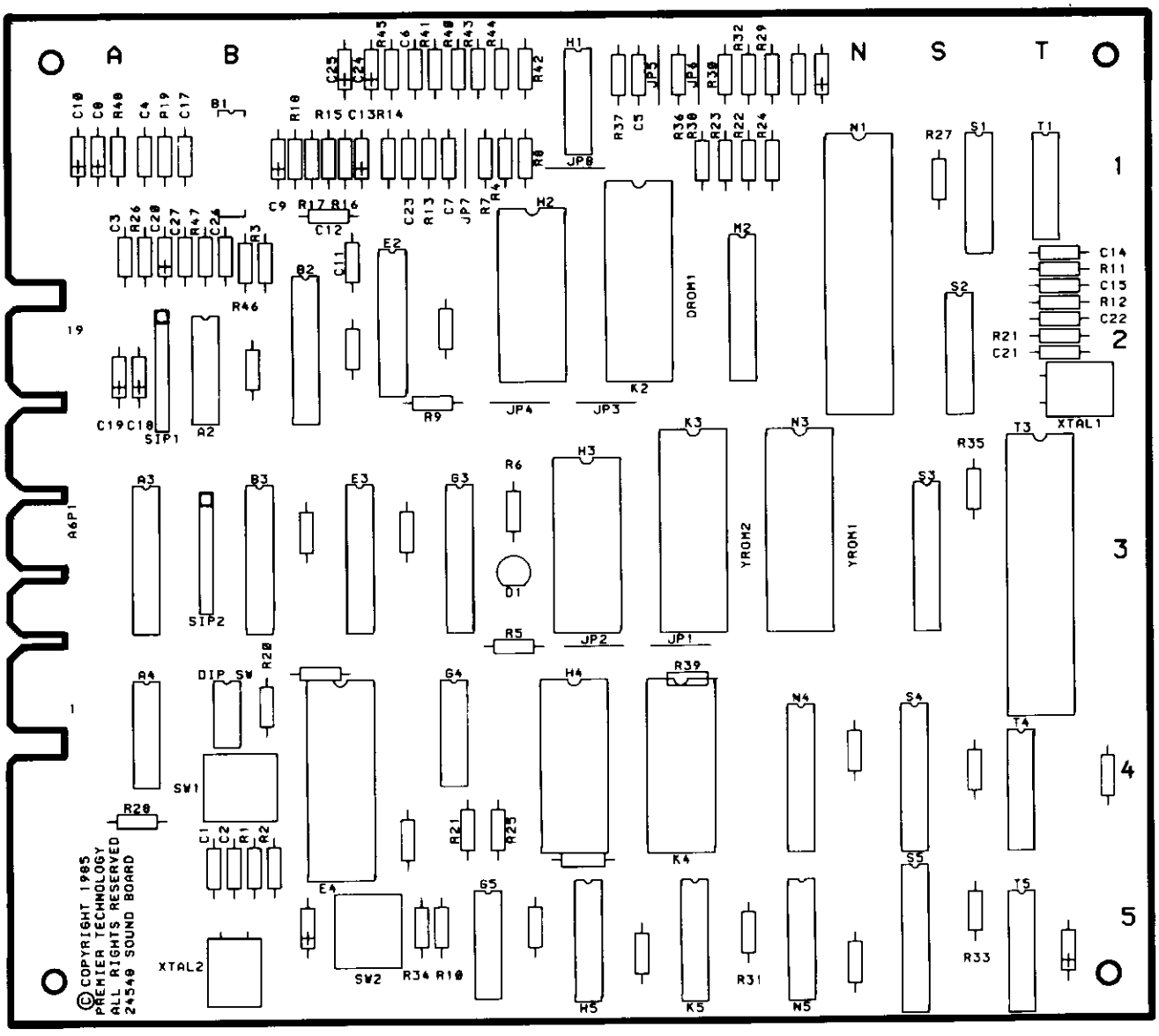
DRAWN	APPROVED	DATE	E-24715
	R.H.M.	9-OCT-85	

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

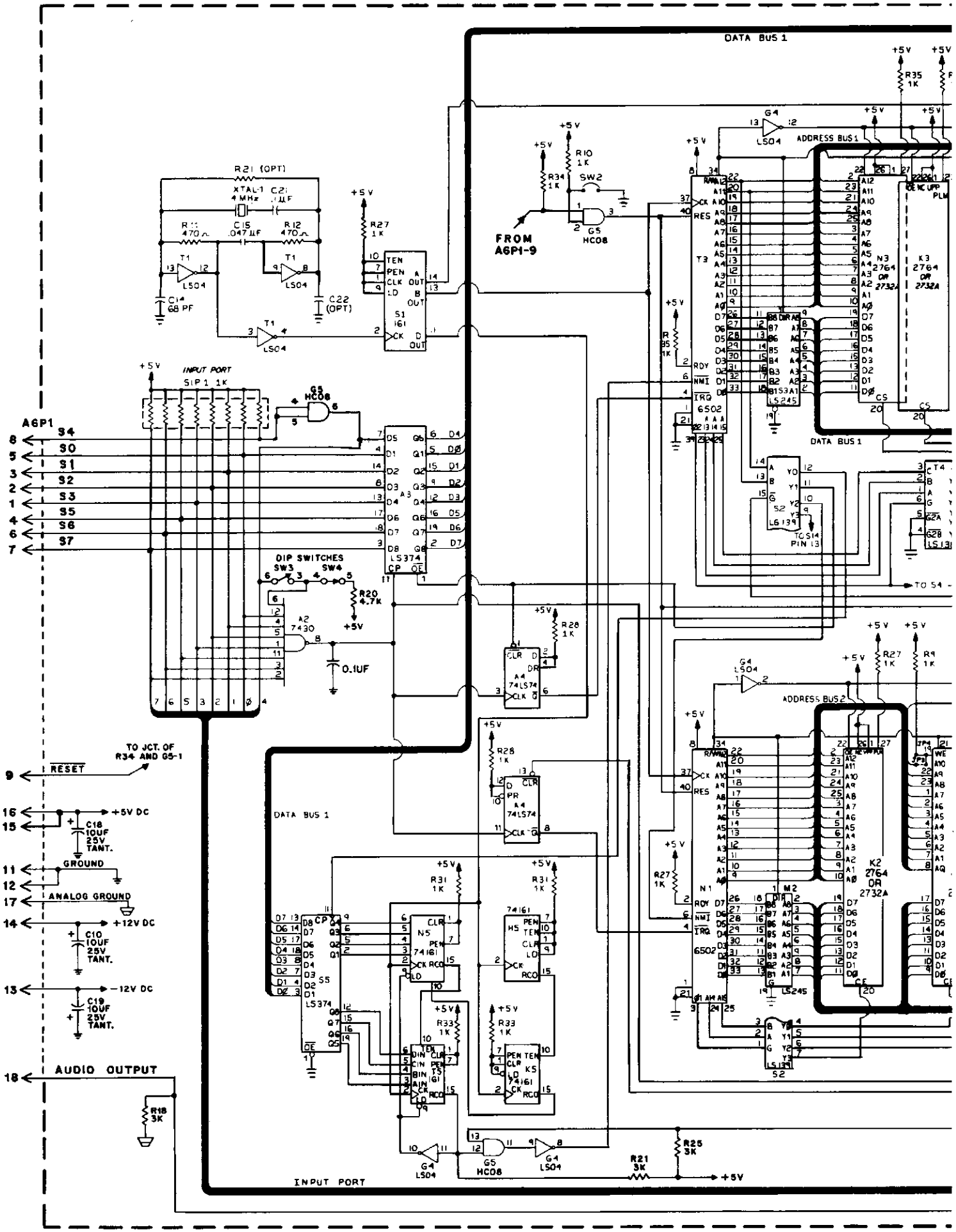
SOUND BOARD (A6) COMPONENT LOCATION

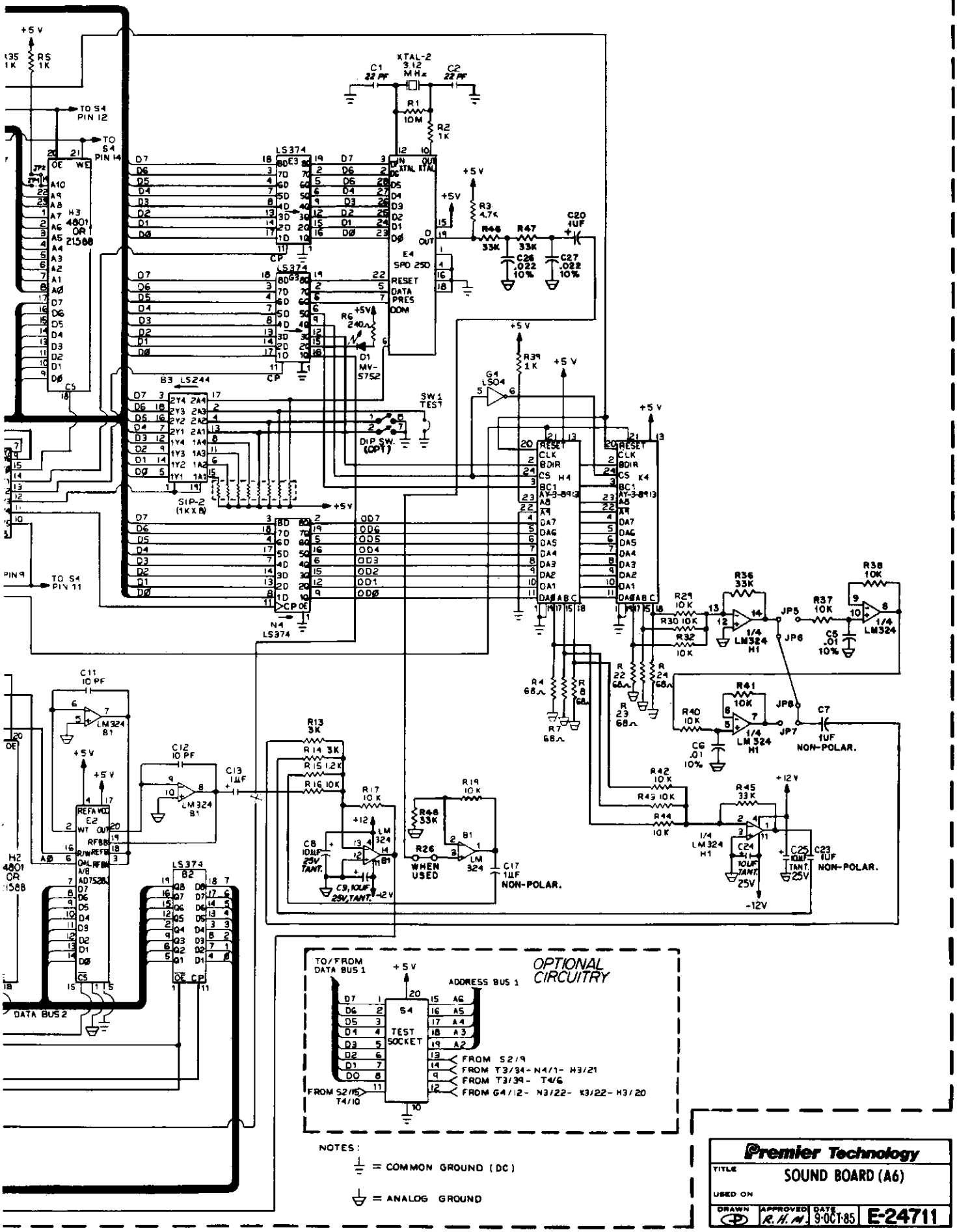


SOUND BOARD (A6) PARTS LIST

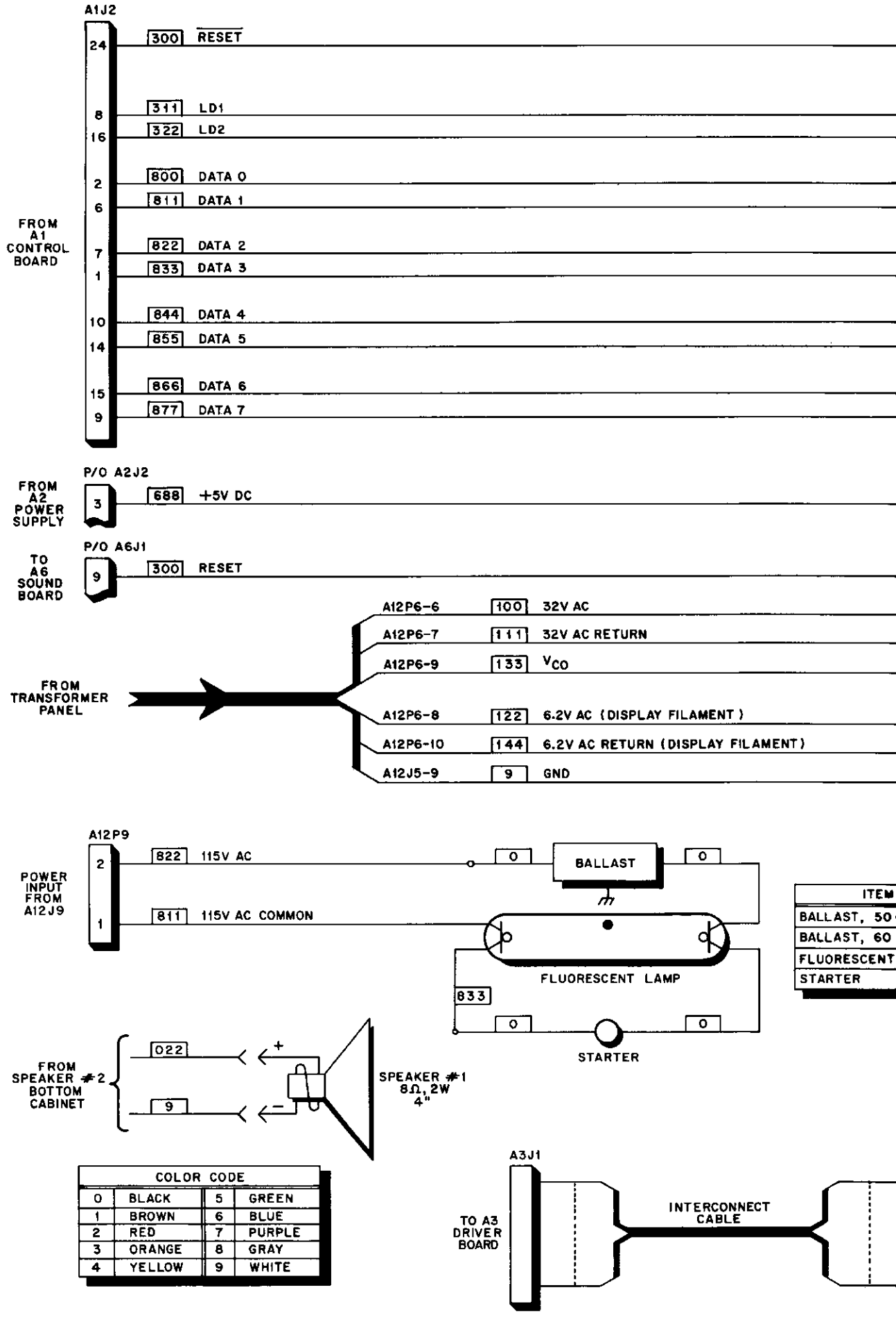
REFERENCE	DESCRIPTION	PART NUMBER
	Sound Board Assembly (A6)	MA766
C1,C2	Capacitor, 22PF, 50V MONO AX-CM, 10%	XO-633
C5,C6	Capacitor, .01UF, 50V AX-CM, 10%	XO-696
C7,C17,C23	Capacitor, 1UF, 50V CM-RD Non-Polarized	XO-294
C8,C9,C10, C18,C19,C24, C25,and ALL UNMARKED POLARIZED CAPACITORS	Capacitor, 10UF, 25V TANT-AX, 10%, Polarized	XO-127
C11,C12	Capacitor, 10PF, 50V AX-CM +80%-20%	XO-635
C13,C20	Capacitor, 1UF, 35V TANT-AX, 10%	XO-715
C14	Capacitor, 68PF, 50V MONO AX-CM, 10%	XO-636
C15	Capacitor, .047UF, 50V MONO AX-CM, 20%	XO-638
C21,and ALL UNMARKED CAPACITORS	Capacitor, 0.1UF, 50V AX-CM, +80%-20%	XO-230
C26,C27	Capacitor, .022UF, 50V AX-CM, 10%	XO-873
D1	Diode, MV5752	XO-270
DIP SW	Dip Switch, 4 Position, 8 Pin	XO-640
R1	Resistor, 10M Ohm, 5%, 1/4W	XO-73
R2,R5,R9 R10,R27,R28, R31,R33-R35, R39	Resistor, 1K Ohm, 5%, 1/4W	XO-5
R3,R20	Resistor, 4.7K Ohm, 5%, 1/4W	XO-7
R4,R7,R8 R22-R24	Resistor, 68 Ohm, 5%, 1/4W	XO-748

REFERENCE	DESCRIPTION	PART NUMBER
R6	Resistor, 240 Ohm, 5%, 1/4W	XO-173
R11,R12	Resistor, 470 Ohm, 5%, 1/4W	XO-35
R13,R14,R18, R21,R25	Resistor, 3K Ohm, 5%, 1/4W	XO-23
R15	Resistor, 1.2K Ohm, 5%, 1/4W	XO-175
R16,R17,R19 R29,R30,R32, R37,R38,R40-R44	Resistor, 10K Ohm, 5%, 1/4W	XO-18
R36,R45-R48	Resistor, 33K Ohm, 5%, 1/4W	XO-43
SIP1,SIP2	Resistor Pack, SIP, 1K Ohm, 9 Pin	XO-493
SW1,SW2	Switch, Push Button, N.O.	XO-365
XTAL 1	Crytsal, 4.0 MHZ	XO-366
XTAL 2	Crystal, 3.12 MHZ	XO-639
A2	7430 8-input "NAND" gate	XO-643
A3,B2	74LS374 Octal D-type flip flop	XO-96
A4	74LS74 Dual D-type flip flop	XO-434
B1,H1	LM324 Quad op-amp	XO-644
B3	74LS244 Octal buffer/driver	XO-117
E2	AD7528J DAC	XO-647
E3,G3,N4,S5	74LS374 Octal D-type flip flop	XO-96
E4	SP0250 Speech generator	XO-645
G4,T1	74LS04 Hex Inverter	XO-418
G5	74HC08 Quad 2-input "AND" gate	XO-872
H2,H3	2K x 8 RAM (6116) (200NS)	XO-191
H4,K4	AY-3-8913 Sound generator	XO-646
H5,K5,N5, S1,T5	74161 Synchronous presettable binary counter	XO-192
K2,K3,N3	2764 EProm	XO-489
N1,T3	R6502-13 CPU	XO-360
M2,S3	74LS245 Octal bus transceiver	XO-79
S2	74LS139 Dual 1 of 4 decoder	XO-419
T4	74LS138 1 of 8 decoder/ demultiplexor	XO-437
	28 Pin Dip Socket (4)	XO-536
	Jumper, 22 GA (5)	XO-469

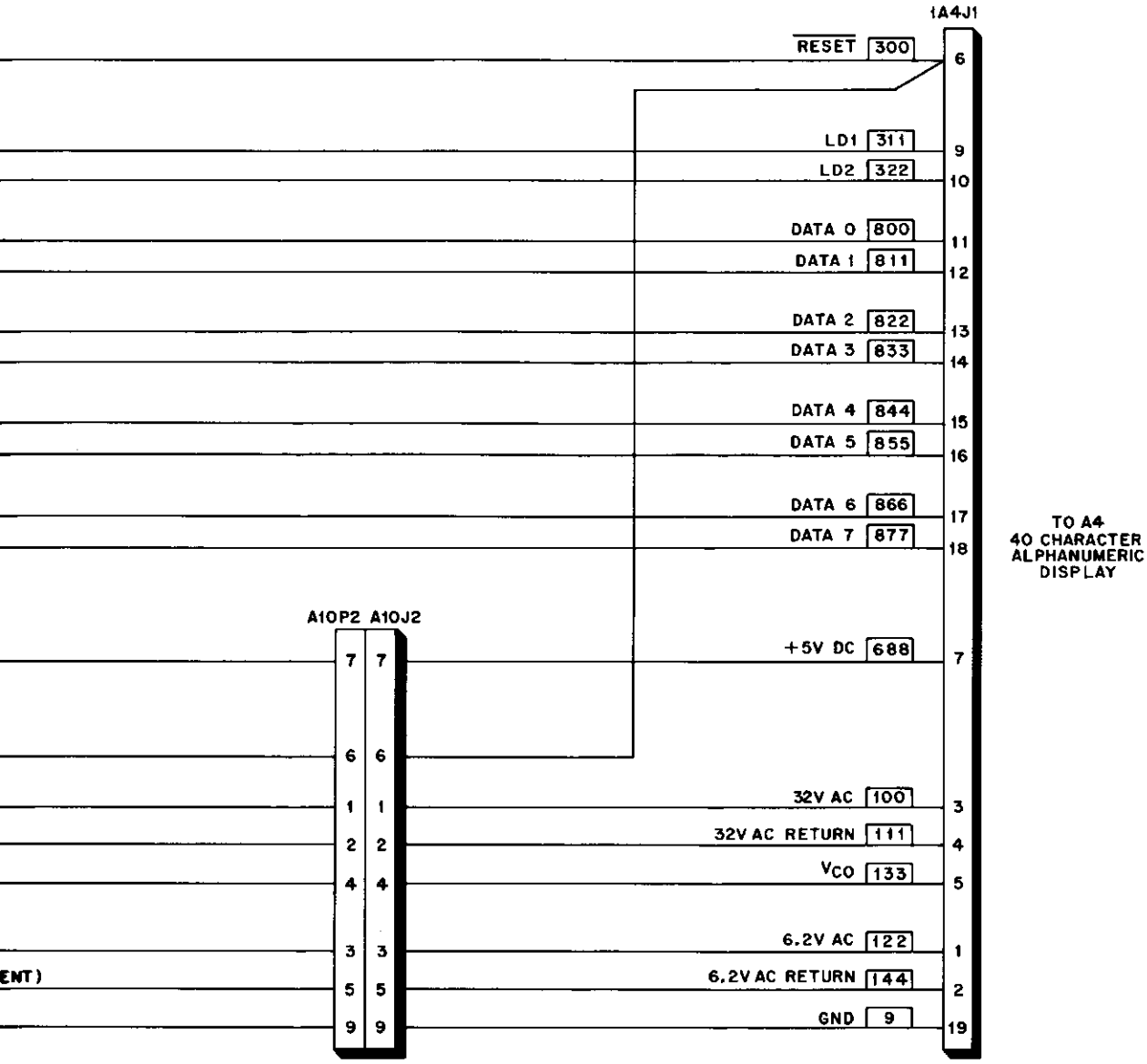

DATA BUS 1
ADDRESS BUS 1
ADDRESS BUS 2
INPUT PORT
FROM A6P1-9
A6P1
TO JCT. OF R34 AND G5-1
RESET
+5V DC
GROUND
ANALOG GROUND
+12V DC
-12V DC
AUDIO OUTPUT
DIP SWITCHES SW3 SW4
TO S4
TO S14 PIN 13



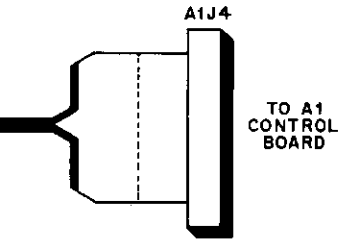
Premier Technology			
TITLE: SOUND BOARD (A6)			
USED ON			
DRAWN	APPROVED R.H.M.	DATE 9-OCT-85	E-24711



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



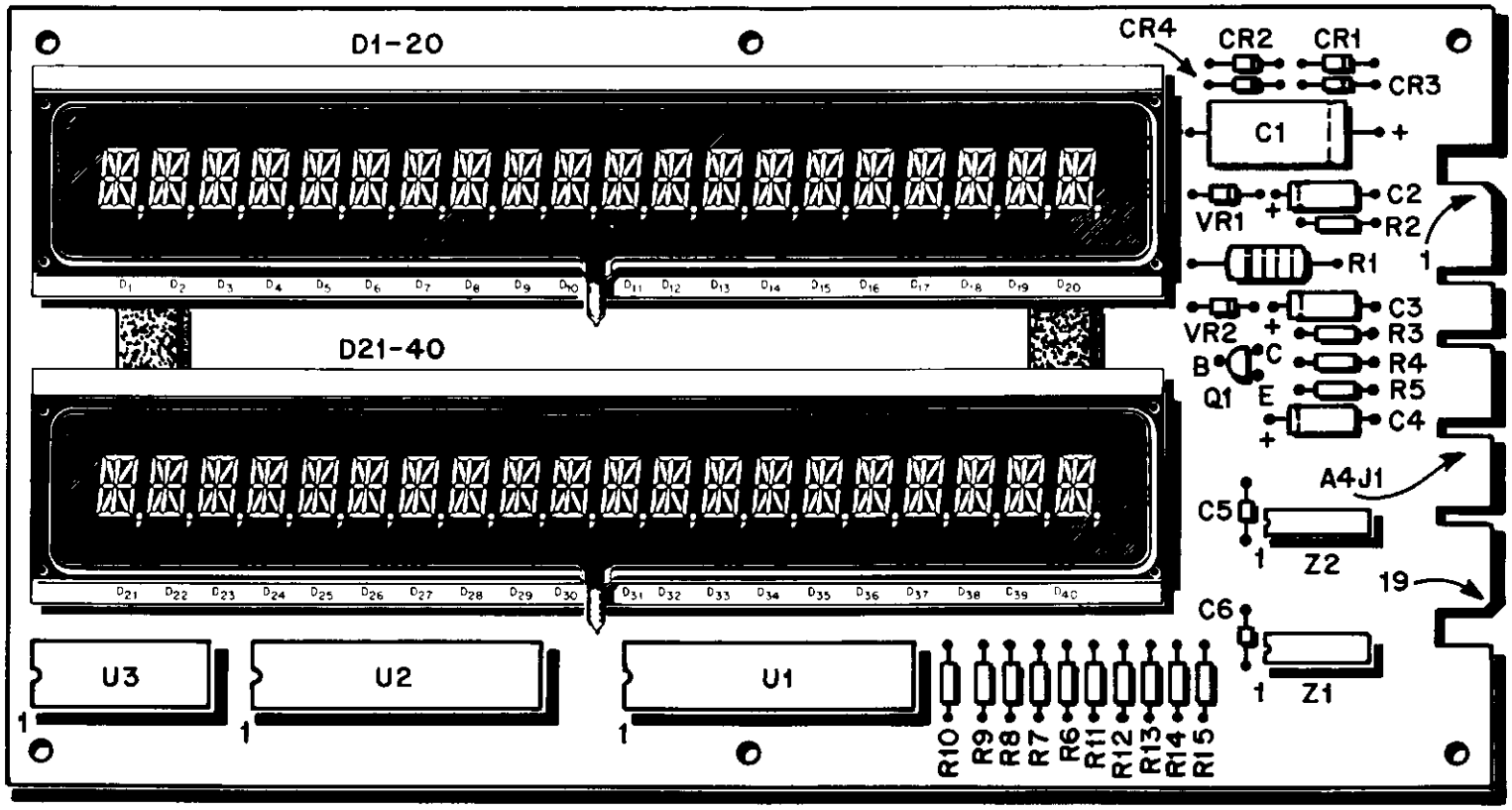
ITEM	PART NO.
BALLAST, 50 CYCLE	24672
BALLAST, 60 CYCLE	24673
FLUORESCENT LAMP	24674
STARTER	24675



Premier Technology			
TITLE	LIGHTBOX, SCHEMATIC/ WIRING DIAGRAM		
DRAWN	APPROVED	DATE	E-24712
	R.H.M.	9-OCT-85	

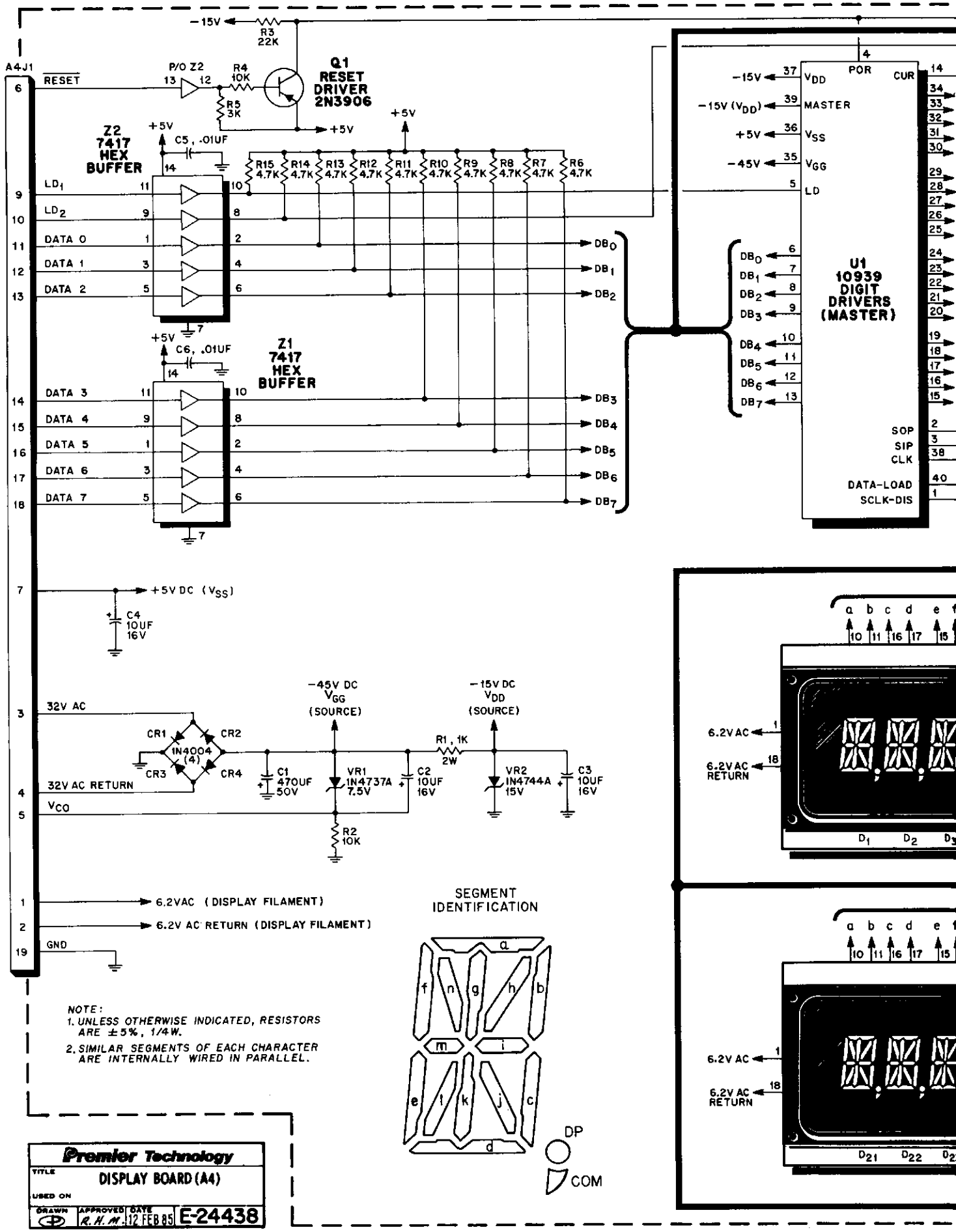
X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

DISPLAY BOARD (A4) COMPONENT LOCATION



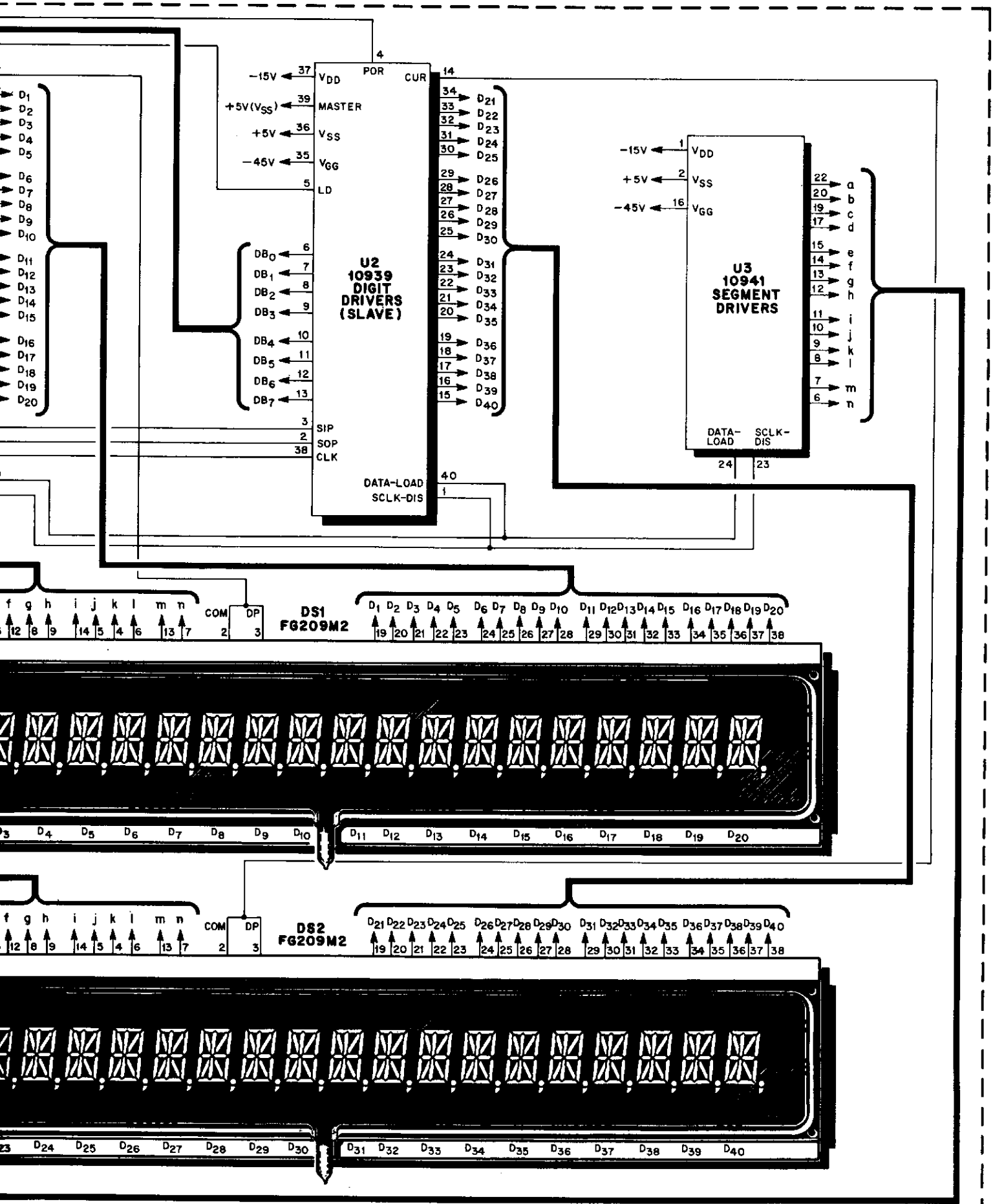
DISPLAY BOARD (A4) PARTS LIST

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
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

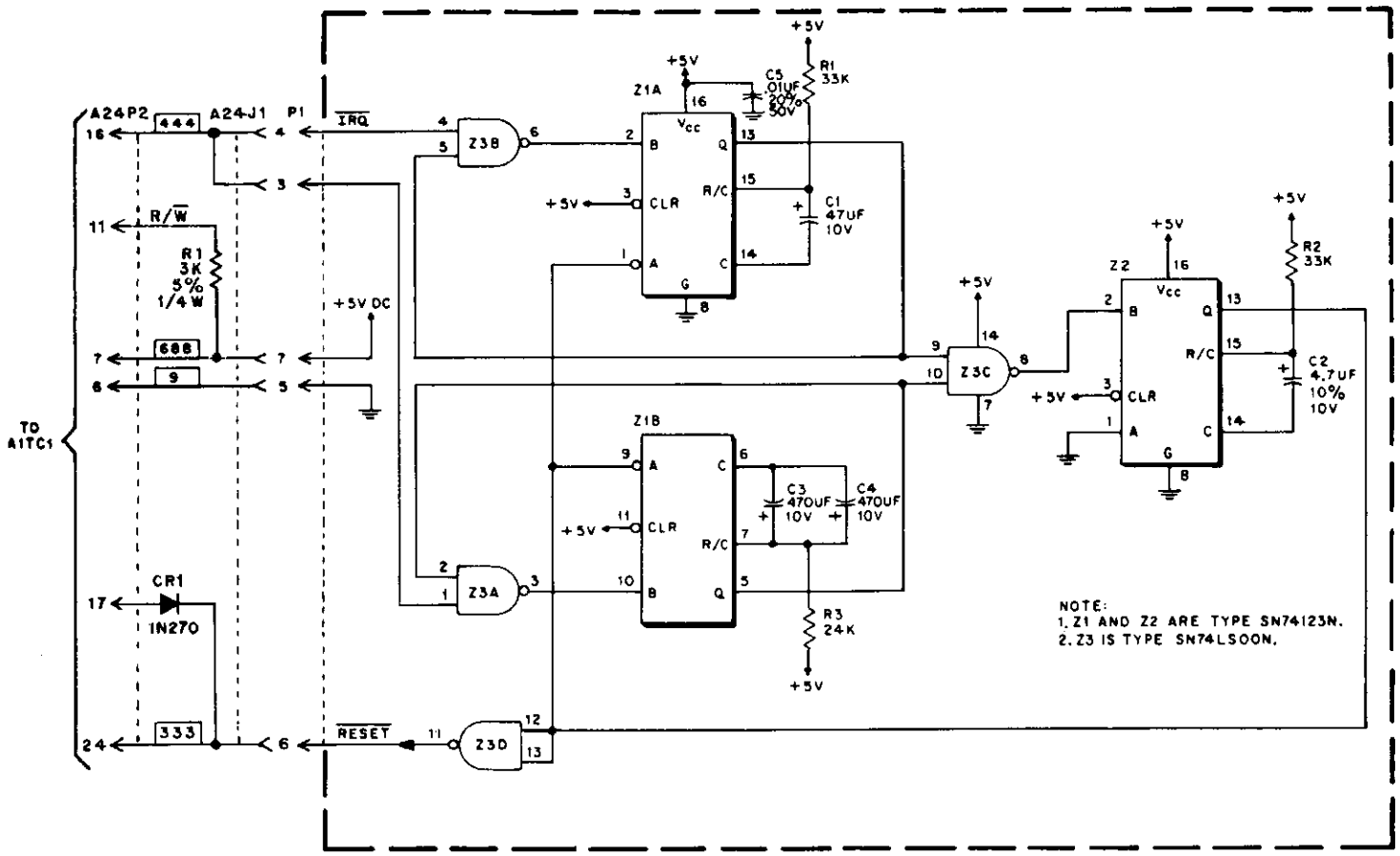


NOTE:
1. UNLESS OTHERWISE INDICATED, RESISTORS ARE ±5%, 1/4W.
2. SIMILAR SEGMENTS OF EACH CHARACTER ARE INTERNALLY WIRED IN PARALLEL.

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

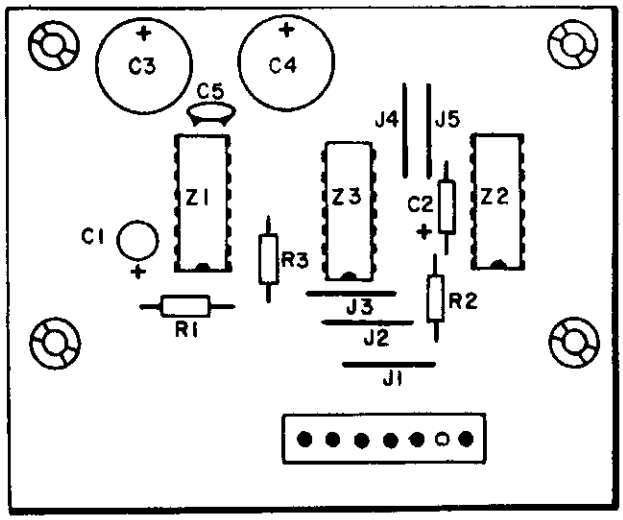

U2
10939
DIGIT
DRIVERS
(SLAVE)
U3
10941
SEGMENT
DRIVERS
DS1
FG209M2
DS2
FG209M2
POR
CUR
MASTER
LD
SIP
SOP
CLK
DATA-LOAD
SCLK-DIS
COM
DP
−15V
+5V(VSS)
+5V
−45V
VDD
VSS
VGG

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



Premier Technology			
TITLE: RESET CIRCUIT BOARD			
USED ON			
DRAWN	APPROVED: BAM	DATE: 4-2-81	C-21063

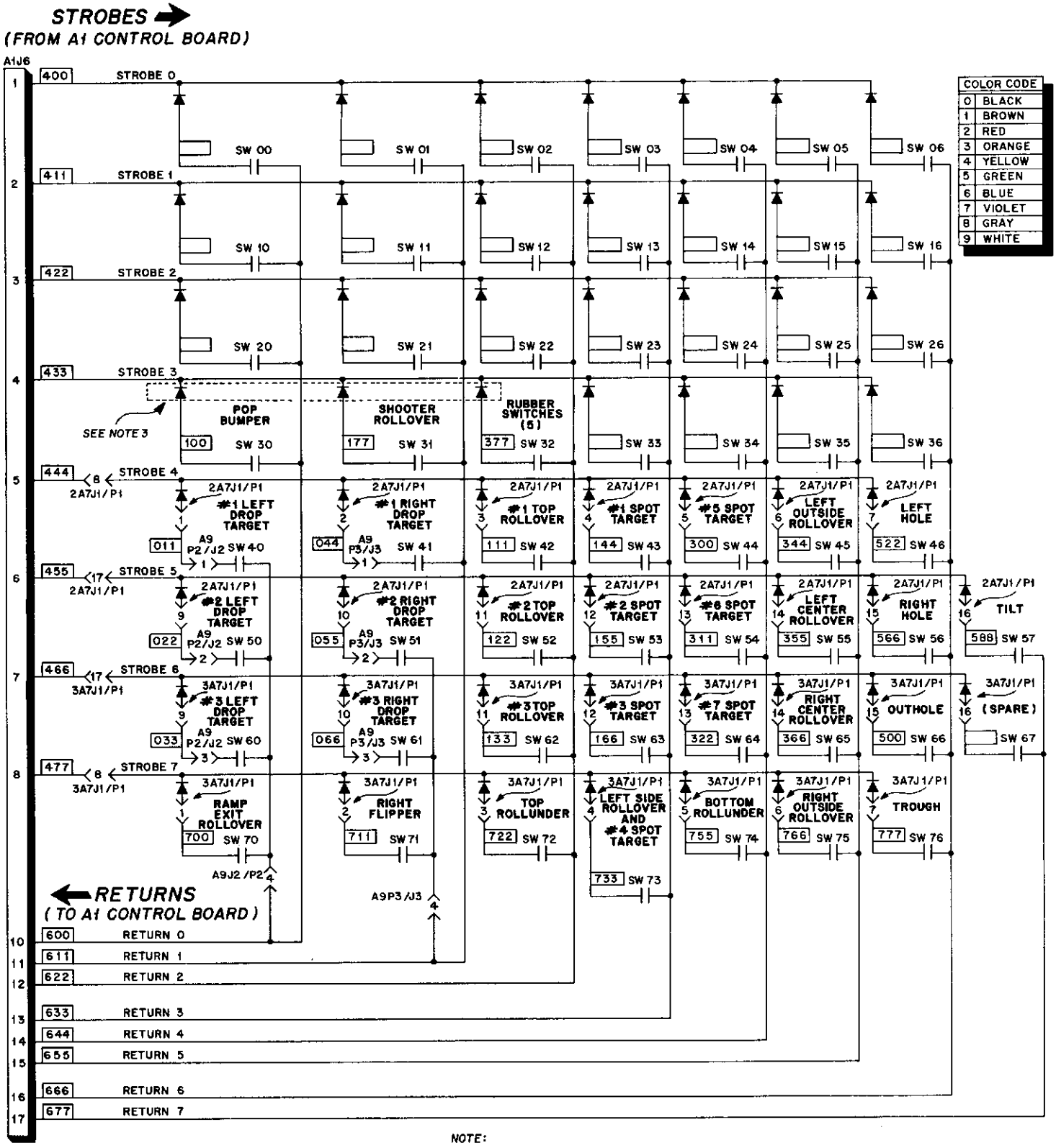
RESET BOARD (A24) COMPONENT LOCATION



RESET BOARD (A24) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	RESET BOARD	MA-164
R1, R2	Resistor 33K ohm, 5%, ¼W.	XO-43
R3	Resistor 24K ohm, 5%, ¼W.	XO-10
C1	Capacitor 47 µfd., 10V.	XO-227
C2	Capacitor 4.7 µfd., 10V.	XO-226
C3, C4	Capacitor 470 µfd., 16V.	XO-214
C5	Capacitor .01 µfd.	XO-202
Z1, Z2	IC 74123N	XO-398
Z3	IC 74LS00N	XO-427
	7 Pin Connector	XO-526

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

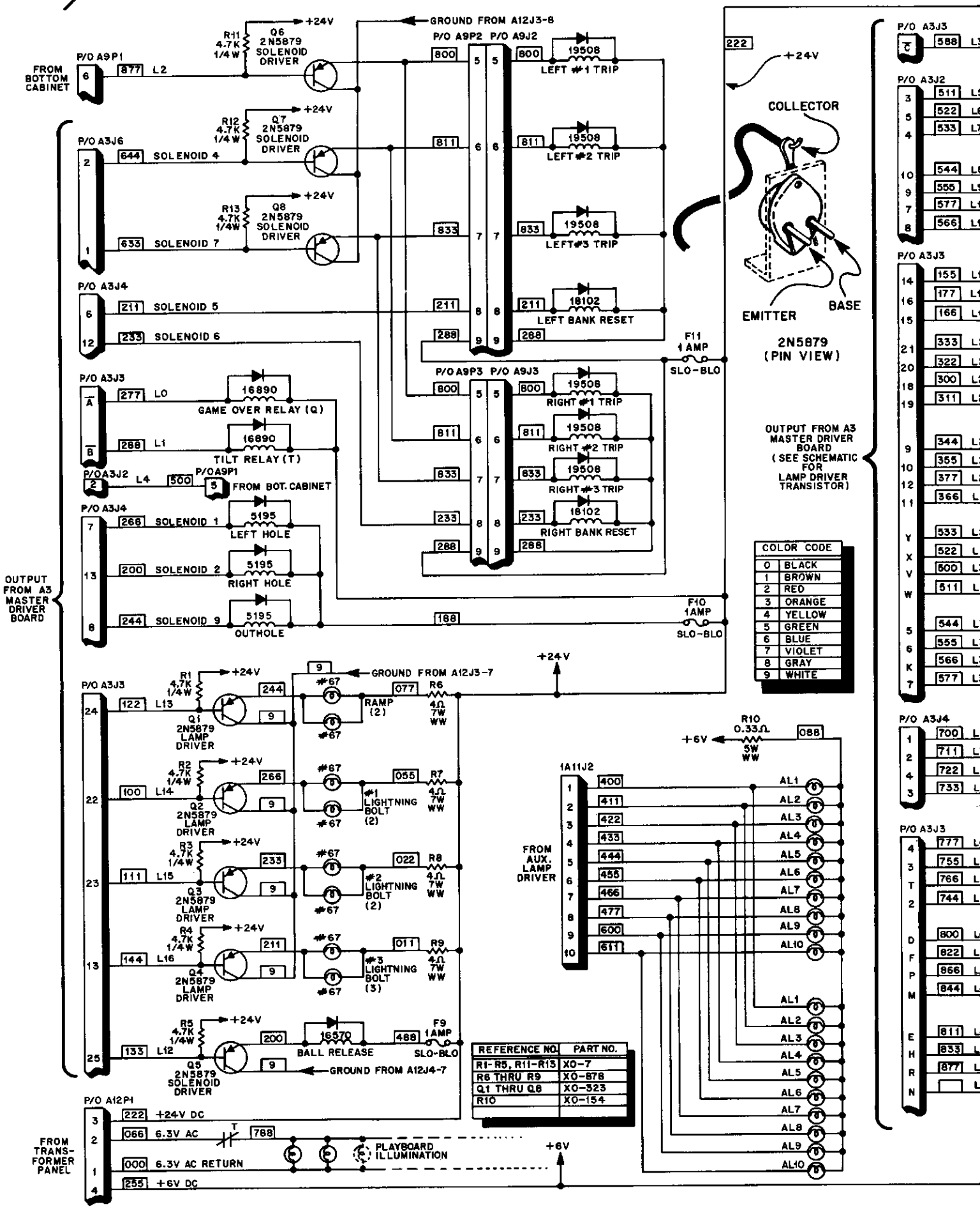


NOTE:

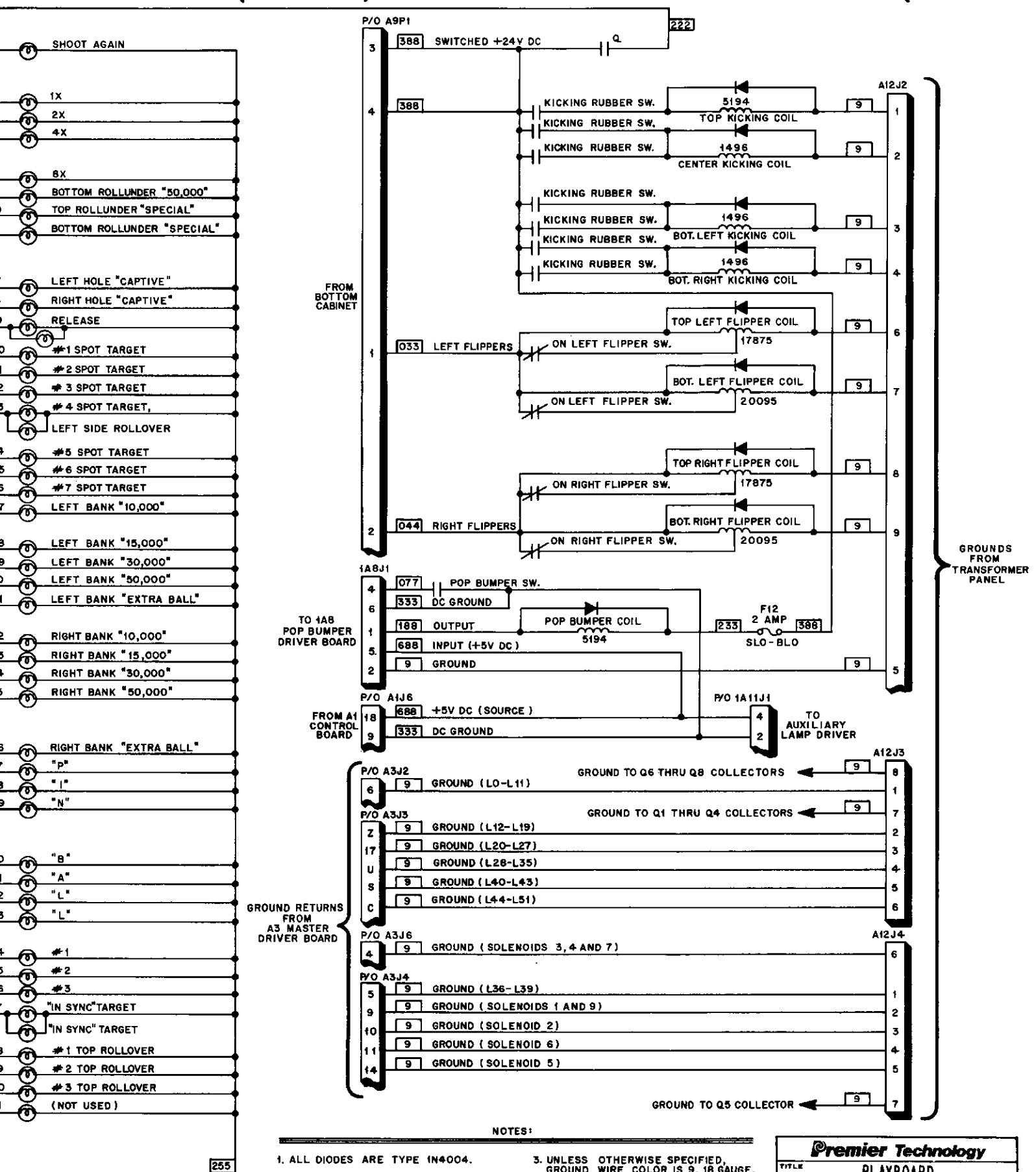
1. DIODES USED ARE TYPE 1N270.
2. DIODE BOARDS 2A7 AND 3A7; PART NO.S 24030.
3. DIODES ASSOCIATED WITH SW 30, SW 31 AND SW 32 ARE MOUNTED ON TERMINAL STRIP; PART NO. 24959.

Premier Technology			
TITLE	SWITCH MATRIX		
USED ON	GAME #703		
DRAWN	APPROVED R.H.M.	DATE 2APR86	E-24954

PLAYBOARD "CONTROLLED" SOLENOIDS AND ILLUMINATION



PLAYBOARD "NON-CONTROLLED" SOLENOIDS AND ILLUMINATION



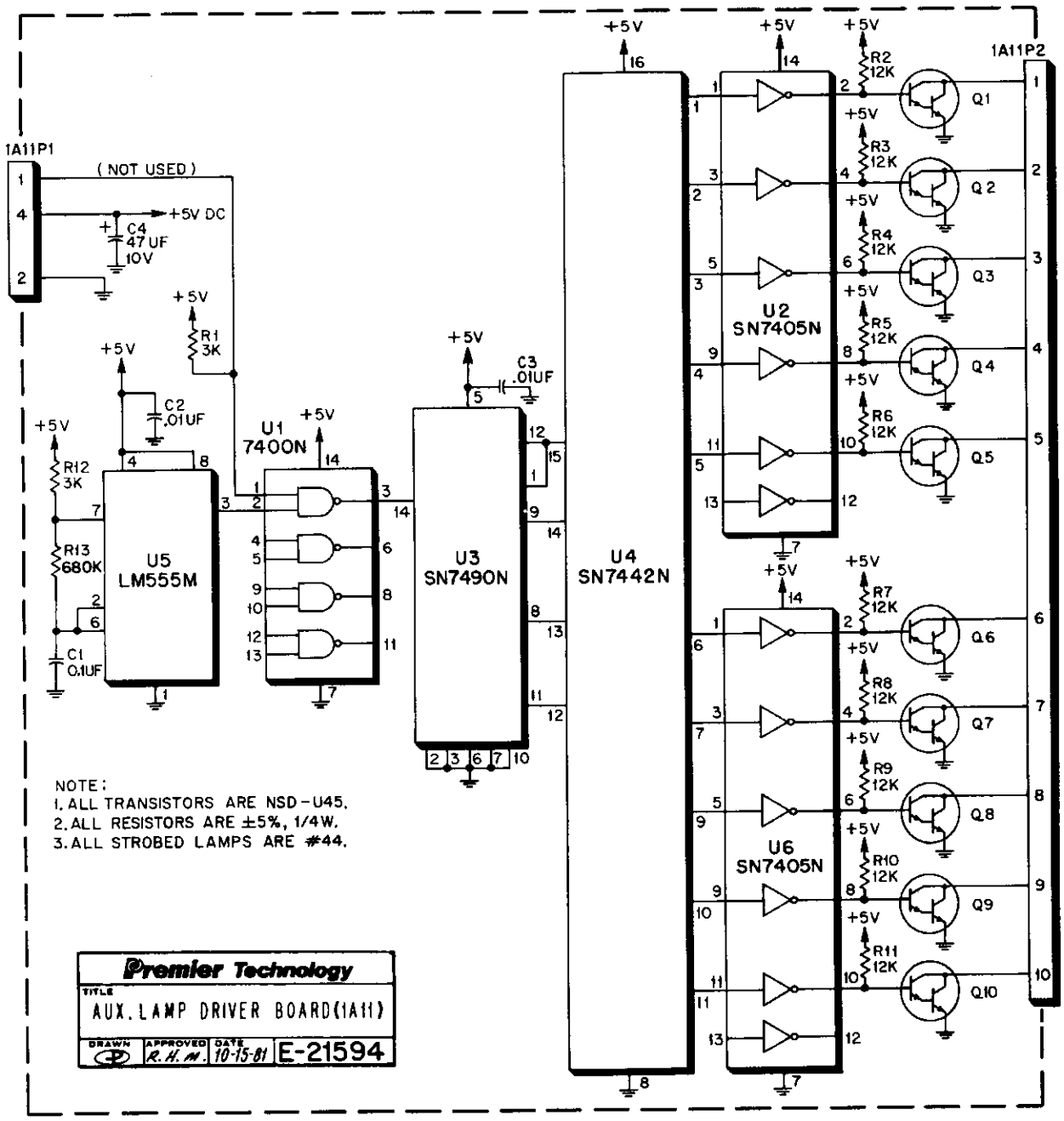
NOTES:

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-45'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.

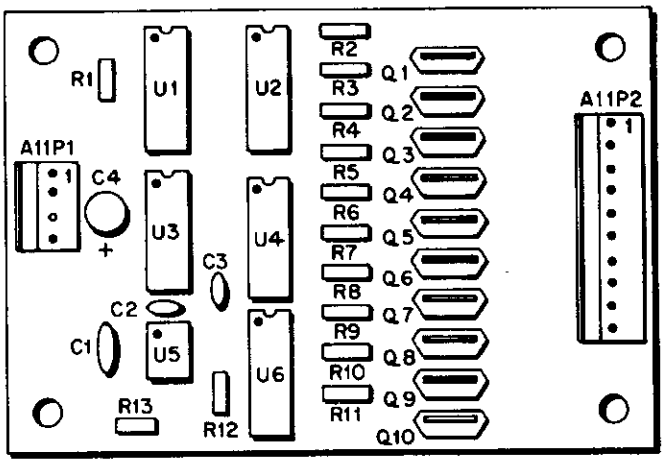
Premier Technology

TITLE	DRAWN	APPROVED	DATE	
PLAYBOARD SOLENOIDS AND ILLUMINATION	P	R.H.M.	2-APR-86	E-24953

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



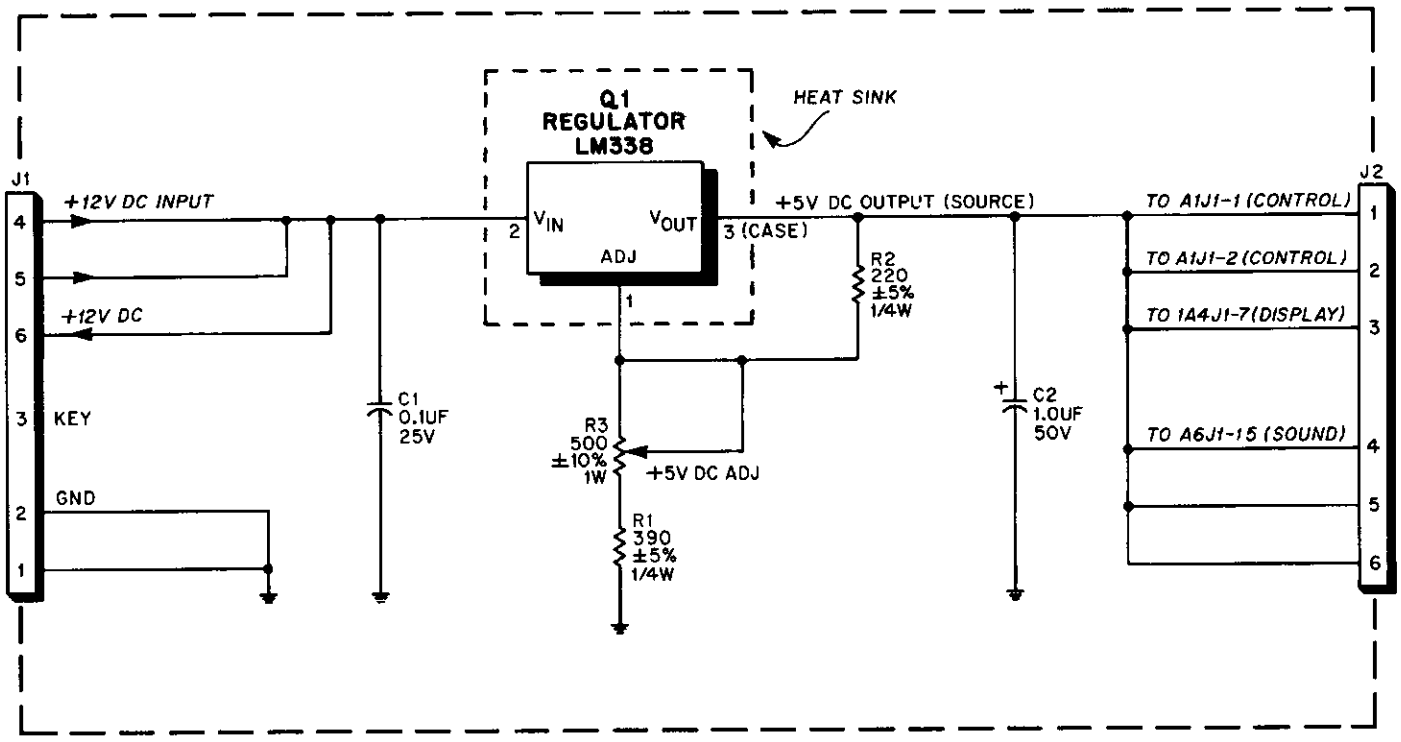
AUXILIARY LAMP DRIVER BOARD (A11) COMPONENT LOCATION



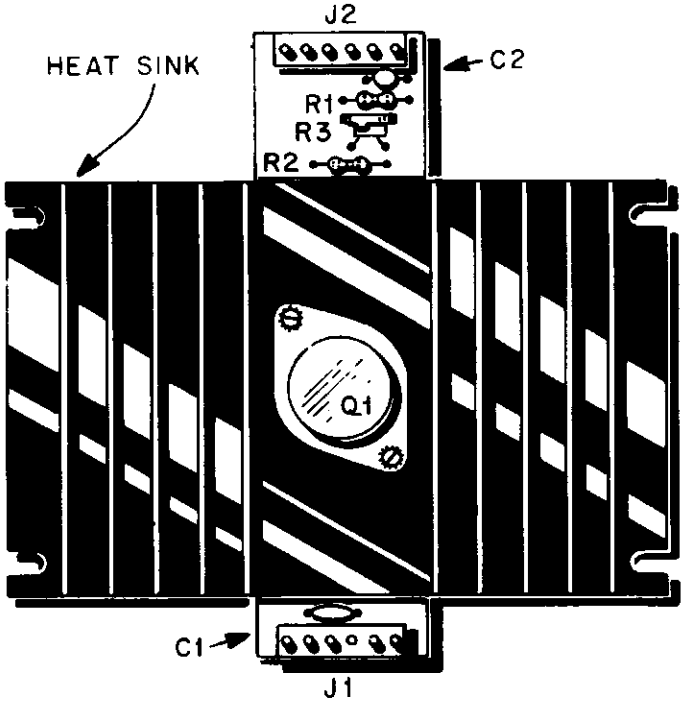
AUXILIARY LAMP DRIVER BOARD (A11) PARTS LIST

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	XO-420
U2,U6	I.C. INVERTER	XO-403
U3	I.C. DECADE COUNTER	XO-425
U4	I.C. DECODER	XO-426
U5	I.C. TIMER	XO-631
P2	10 POS. CONNECTOR	XO-531
P1	4 POS. CONNECTOR	XO-532

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

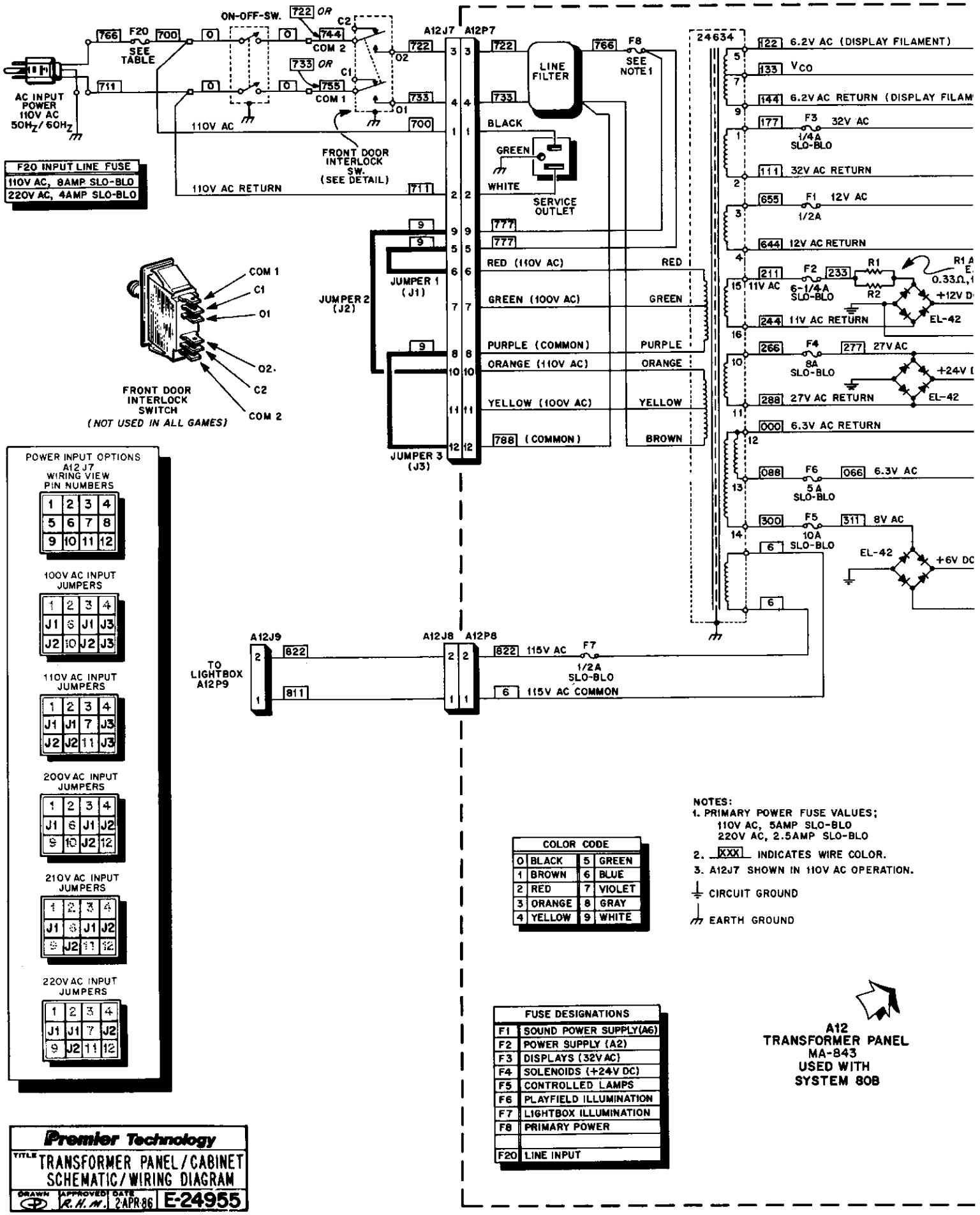


POWER SUPPLY (A2) COMPONENT LOCATION



POWER SUPPLY (A2) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	Power Supply (A2)	MA-831
C1	Capacitor, 0.1UF, +80% -20%, 25V	XO-248
C2	Capacitor, 1UF, 10%, 50V	XO-217
J1, J2	Connector, 6 Pin, Molex	XO-373
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



F20 INPUT LINE FUSE
110V AC, 8AMP SLO-BLO
220V AC, 4AMP SLO-BLO

POWER INPUT OPTIONS
A12J7 WIRING VIEW PIN NUMBERS

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

100V AC INPUT JUMPERS

1	2	3	4
J1	6	J1	J3
J2	10	J2	J3

110V AC INPUT JUMPERS

1	2	3	4
J1	J1	7	J3
J2	J2	11	J3

200V AC INPUT JUMPERS

1	2	3	4
J1	6	J1	J2
9	10	J2	12

210V AC INPUT JUMPERS

1	2	3	4
J1	6	J1	J2
9	J2	11	12

220V AC INPUT JUMPERS

1	2	3	4
J1	J1	7	J2
9	J2	11	12

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

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

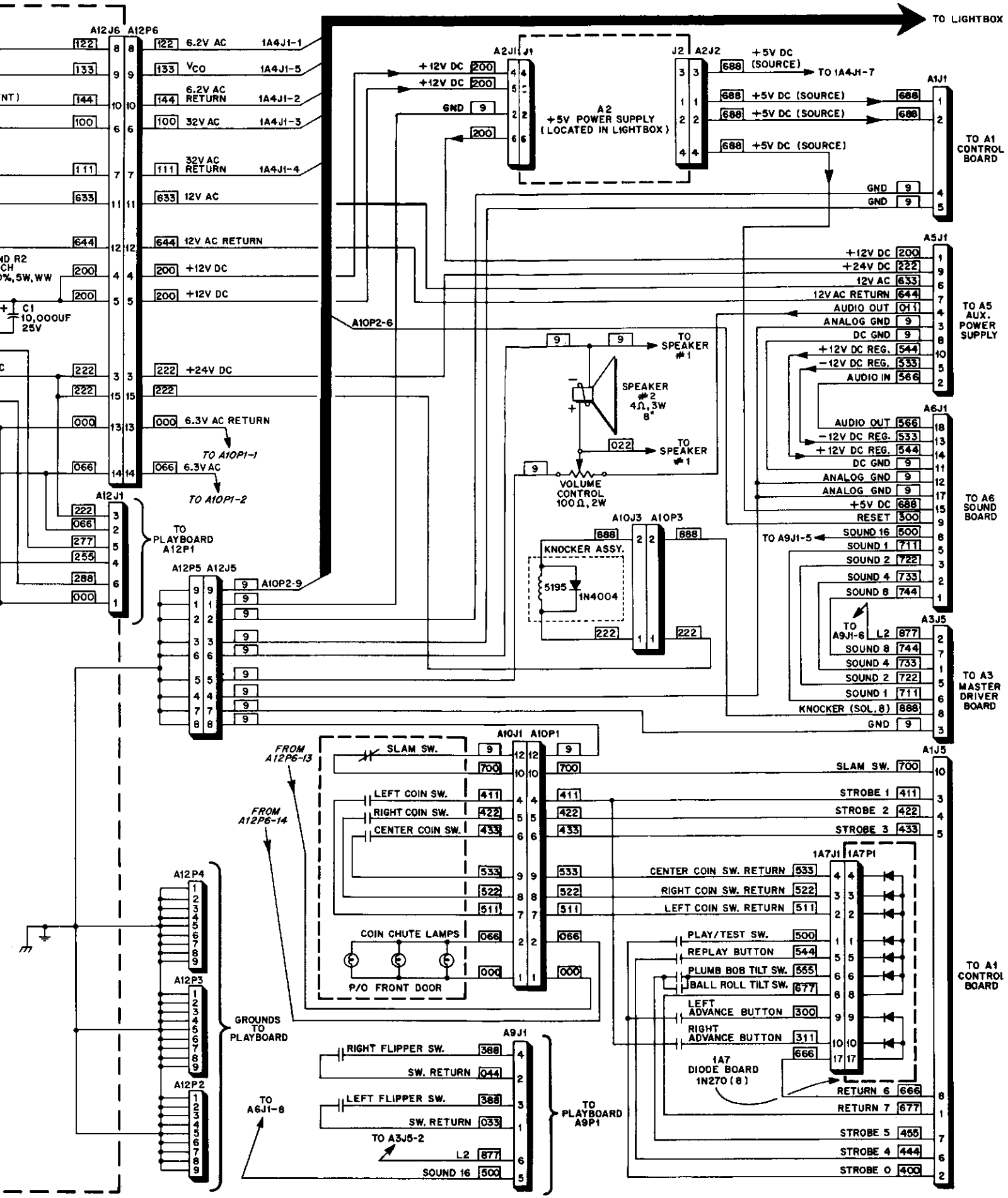
⏚ EARTH GROUND

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
F20	LINE INPUT

A12
TRANSFORMER PANEL
MA-843
USED WITH
SYSTEM 808

Premier Technology

TITLE	
TRANSFORMER PANEL/CABINET SCHEMATIC/WIRING DIAGRAM	
DRAWN	APPROVED / DATE: R.H.M. 2-APR-86
	E-24955


TO LIGHTBOX
A12J6 A12P6
122 6.2V AC 1A4J1-1
133 VCO 1A4J1-5
144 6.2V AC RETURN 1A4J1-2
100 32V AC 1A4J1-3
111 32V AC RETURN 1A4J1-4
633 12V AC
644 12V AC RETURN
200 +12V DC
200 +12V DC
222 +24V DC
222
000 6.3V AC RETURN
TO A10P1-1
066 6.3V AC
TO A10P1-2
C1 10,000UF 25V
A12J1
TO PLAYBOARD A12P1
A12P5 A12J5
A10P2-9
A10P2-6
A2J1 J1
+12V DC 200
+12V DC 200
GND 9
200
A2 +5V POWER SUPPLY (LOCATED IN LIGHTBOX)
J2 A2J2
688 (SOURCE)
TO 1A4J1-7
688 +5V DC (SOURCE)
688 +5V DC (SOURCE)
688 +5V DC (SOURCE)
A1J1
TO A1 CONTROL BOARD
GND 9
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
A6J1
AUDIO OUT 566
-12V DC REG. 533
+12V DC REG. 544
DC GND 9
ANALOG GND 9
ANALOG GND 9
+5V DC 688
RESET 300
SOUND 16 500
SOUND 1 711
SOUND 2 722
SOUND 4 733
SOUND 8 744
TO A6 SOUND BOARD
TO A9J1-5
A3J5
TO A9J1-6 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
TO SPEAKER #1
SPEAKER #2 4Ω, 3W 8"
022
TO SPEAKER #1
VOLUME CONTROL 100Ω, 2W
A10J3 A10P3
888
KNOCKER ASSY.
5195
1N4004
222
A10J1 A10P1
FROM A12P6-13
FROM A12P6-14
SLAM SW.
LEFT COIN SW.
RIGHT COIN SW.
CENTER COIN SW.
COIN CHUTE LAMPS
P/O FRONT DOOR
A1J5
SLAM SW. 700
STROBE 1 411
STROBE 2 422
STROBE 3 433
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
666
1A7 DIODE BOARD 1N270 (8)
RETURN 6 666
RETURN 7 677
STROBE 5 455
STROBE 4 444
STROBE 0 400
TO A1 CONTROL BOARD
A12P4
A12P3
A12P2
GROUNDS TO PLAYBOARD
A9J1
RIGHT FLIPPER SW. 388
SW. RETURN 044
LEFT FLIPPER SW. 388
SW. RETURN 033
TO A3J5-2
L2 877
SOUND 16 500
TO A6J1-8
TO PLAYBOARD A9P1

XI. PARTS INFORMATION

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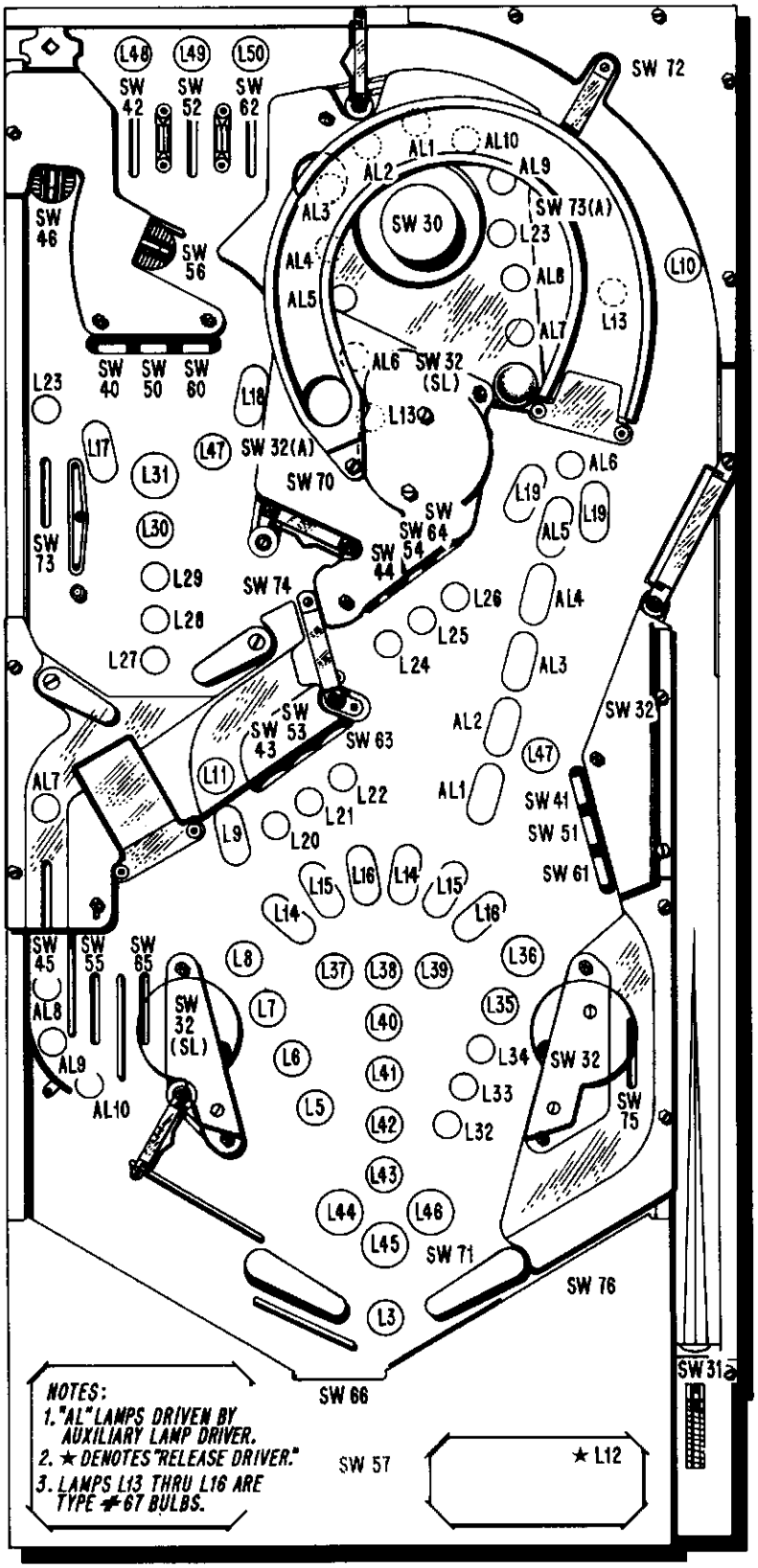
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XI. PARTS INFORMATION



PLAYBOARD SWITCH AND LAMP ASSIGNMENTS

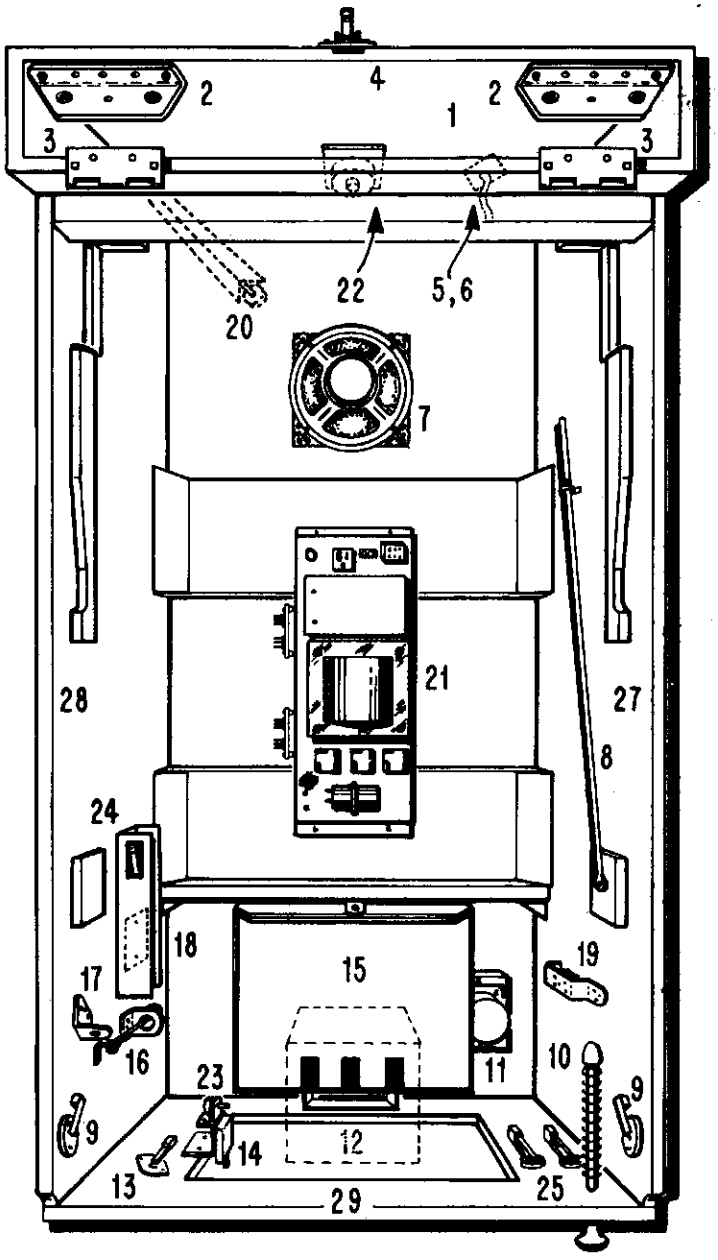
LAMP NUMBER	LAMP ASSIGNMENT
L3	Shoot Again
L5	1X
L6	2X
L7	4X
L8	8X
L9	Bottom Rollunder "50,000"
L10	Top Rollunder "Special"
L11	Bottom Rollunder "Special"
L13-L16	(LAMPS DRIVEN BY Q1-Q4)
L17	Left Hole "Captive"
L18	Right Hole "Captive"
L19	Release (2 Lamps)
L20	#1 Spot Target
L21	#2 Spot Target
L22	#3 Spot Target
L23	#4 Spot Target
L23	Left Side Rollover
L24	#5 Spot Target
L25	#6 Spot Target
L26	#7 Spot Target
L27	Left Bank "10,000"
L28	Left Bank "15,000"
L29	Left Bank "30,000"
L30	Left Bank "50,000"
L31	Left Bank "Extra Ball"
L32	Right Bank "10,000"
L33	Right Bank "1,000"
L34	Right Bank "30,000"
L35	Right Bank "50,000"
L36	Right Bank "Extra Ball"
L37	"P"
L38	"I"
L39	"N"
L40	"B"
L41	"A"
L42	"L"
L43	"L"
L44	#1
L45	#2
L46	#3
L47	"In Sync" Target (2 Lamps)
L48	#1 Top Rollover
L49	#2 Top Rollover
L50	#3 Top Rollover

SWITCH MATRIX NUMBER	SWITCH ASSIGNMENT	PART NO.
SW 30	Pop Bumper (With Bracket)	21356
SW 31	Shooter Rollover	19754
SW 32	Rubber Switch (4)	
	Contact Kicker and Bracket (8)	22224
	Contact Kicker (2)	18808
	Contact Kicker (2),(Side Lugs)	18086
SW 32(A)	Rubber Switch (With Bracket)	22227
SW 40	#1 Left Drop Target	19209
SW 41	#1 Right Drop Target	19209
SW 42	#1 Top Rollover	18892
SW 43	#1 Spot Target (With Bracket)	20867
SW 44	#5 Spot Target (With Bracket)	20867
SW 45	Left Outside Rollover	19999
SW 46	Left Hole	19857
SW 50	#2 Left Drop Target	19211
SW 51	#2 Right Drop Target	19211
SW 52	#2 Top Rollover	18892
SW 53	#2 Spot Target (With Bracket)	20867
SW 54	#6 Spot Target (With Bracket)	20867
SW 55	Left Center Rollover	18892
SW 56	Right Hole	19857
SW 57	Tilt (With Bracket)	9141
SW 60	#3 Left Drop Target	19292
SW 61	#3 Right Drop Target	19292
SW 62	#3 Top Rollover	18892
SW 63	#3 Spot Target (With Bracket)	20867
SW 64	#7 Spot Target (With Bracket)	20867
SW 65	Right Center Rollover	18892
SW 66	Outhole (Assembly)	18688
SW 70	Ramp Exit Rollover	20325
SW 71	Right Flipper	22398
SW 72	Top Rollunder	21137
SW 73	Left Side Rollover	18892
SW 73(A)	#4 Spot Target (With Bracket)	20867
SW 74	Bottom Rollunder	21137
SW 75	Right Outside Rollover	18892
SW 76	Trough	18892

XI. PARTS INFORMATION

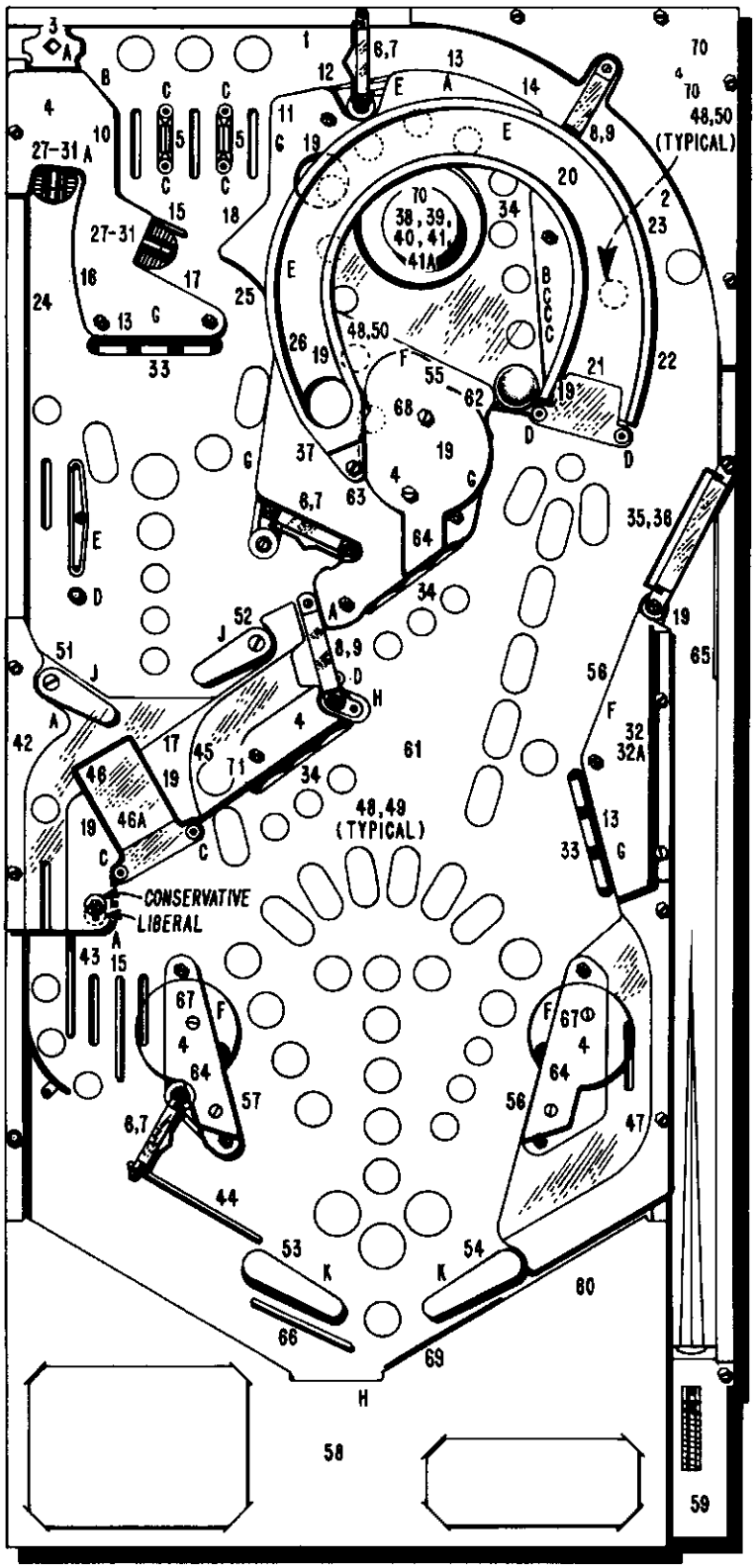
CABINET PARTS

ITEM	DESCRIPTION	PART NO.
1.	Cabinet	24928-703
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-794
6.	Line Cord (Domestic)	23365
	Line Cord Cover Plate	21955
7.	Speaker, 4 Ohm, 3W, 8"	EL-83
	Speaker Guard	20931
8.	Prop Stick, Playfield	23940
9.	Flipper Switch Assembly (2)	17838
10.	Ball Shooter Assembly	8835
11.	Switch, On/Off	23799
	Switch Plate	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	24160
	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
14.	Interlock Switch Assembly (When Used)	24148
	Switch	EL-66
	Switch Cover	21888
15.	Cashbox	24867
	Cover	24868
	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
17.	Locator Bracket	18578
18.	Diode Assembly	24252
	Diode, 1N270 (8)	XO-265
19.	Knocker Assembly	MA-12
20.	Cabinet Leg (4) (Black)	4337Y
	Leg Bolt (8)	3775
	3" Leg Adjuster (4)	MH-21
21.	Transformer Panel Assembly	MA-843
	Bridge Rectifier (3)	EL-42
	Cable Assembly (Secondary)	MA-812
	Capacitor, 10,000UF, 25V	XO-830
	Filter, Line	EL-50
	Fuse Block (6 Pos.)	EL-12
	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, 10 Amp, SLO-BLO	EL-36
	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
	Ground Bus Assembly (2)	24542
	Outlet, Service	18133
	Resistor, 0.33 Ohm, 10% 5W, Wire-Wound (2)	XO-154
	Transformer	24634
22.	Fuse Holder	EL-78
	F20, 8 Amp, SLO-BLO (110V AC)	EL-26
	F20, 4 Amp, SLO-BLO (220V AC)	EL-33



ITEM	DESCRIPTION	PART NO.
23.	Mounting Bracket	24149
	Control, Volume, 100 Ohm, 2W	XO-199
	Switch, PLAY/TEST	EL-57
24.	Ball Roll Tilt	
	Housing and Switch Assembly	24394
	Switch	24393
25.	Button Holder and Switch (2)	23503
	Pushbutton (2)(Black)	24293Y
26.	Lightbox (Not Shown)	24645-703
27.	Right Moulding, (Black) (Not Shown)	22735Y
28.	Left Moulding, (Black) (Not Shown)	22736Y
29.	Front Moulding, (Black) (Not Shown)	16951Y

XI. PARTS INFORMATION



PLAYBOARD PARTS INFORMATION

RUBBER RINGS

ITEM	DESCRIPTION	PART NO.
A	5/16" (5)	10217
B	3/4" (2)	10218
C	Mini-Post (9)	15705
D	Mini-Post (4)(Small)	14793
E	1" (4)	10219
F	2-1/2" (4)	10222
G	1-1/2" (5)	10220
H	7/16" (1)	17493
J	Flipper-Red (2)	13149
K	Flipper-Red (2)	13151

PARTS LIST

ITEM	DESCRIPTION	PART NO.
1	Flat Rail	24956
2	Flat Rail	24957
3	Arch Gate	19645
4	Plastic Shield Set	24975
5	Rollover Guide (White) (2)	15646Z
6	Metal Shield (3)	17300
7	Gate Wireform (3)	21696
8	Metal Shield (2)	4869
9	Gate Wireform (2)	22118
10	Guide Rail (White)	9393Z
11	Guide Rail (White)	9395Z
12	Ball Guide Rail	13782
13	Ball Guide Rail (3)	6612
14	Ball Guide Rail	17650
15	Ball Guide Rail (2)	17106
16	Ball Guide Rail	24951
17	Ball Guide Rail (2)	4832
18	Ball Guide Rail	6931
19	Ball Guide Rail (7)	18070
20	Molded Ramp	24974
21	Ramp Flap	24988
22	Ball Guide Rail	3722
23	Ball Guide Rail	21720
24	Flat Rail	24950
25	Flat Rail	24949
26	Ball Guide Rail	4831
27	Ball Snubber (2)	16038
28	Hole Base Plate (White) (2)	15707Z
29	Hole Liner (2)	11151
30	Hole Kicker Assembly (2)	MA-853
31	Hole Switch Arm (White) (2)	15708Z
32	Flat Guard Rail	25020
32A	Flat Guard Rail Decal	25022
33	Plastic Target (White) (6) With Decal	25007
34	Spot Target (White) (7) With Stamping	25005
35	Metal Shield	1673
36	Gate Wireform	1674
37	Flat Rail	24947
38	Pop Bumper Cap (White)	10434Z
39	Pop Bumper Skirt (White)	10433Z
40	Pop Bumper Body And Socket (White)	MA-27
41	Pop Bumper Trim Platter	8246
41A	Pop Bumper Decal	25006
42	Flat Rail	24952
43	Ball Guide Rail	5977
44	Ball Guide Rail	4833
45	Flat Rail	24948
46	Ramp	24967
46A	Ramp Decal	25019
47	Flat Rail	24570
48	#67 Lamp (8)	LA5
49	#67 Lamp Socket (6)	24965
50	#67 Lamp Socket (2)	24881
51	Left Flipper Unit (Top)	MA-228
52	Right Flipper Unit (Top)	MA-228A
53	Left Flipper Unit (Bottom)	MA-656
54	Right Flipper Unit (Bottom)	MA-657
55	Kicker Assembly	MA-176A
56	Kicker Assembly (2)	MA-135
57	Kicker Assembly	MA-135A
58	Cardholder	13647-703
59	Ball Shooter Gauge	9767-703
60	Ball Return Unit Assembly	21622
61	Mylar Overlay	24971
62	1-1/16" Steel Ball (4)	21864
63	Spacer	24706
64	Plastic Shield Set (Auxiliary)	25000
65	Flat Rail	25021
66	Ball Snubber Rail	13798
67	Spacer, 1/4" (4)	MP16
68	Spacer, 1-1/4" (2)	MP17
69	Velcro Strip	MP18
70	Light Shield (Red) (3)	24875
71	Flat Rail	25036
	Siamese Post (3)	17492
	1" Plastic Post (37)	11561P
	Plastic Support Post (12)	20635P



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