BAD GIRLS™



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INSTRUCTION MANUAL

BAD GIRLS

(GAME #717)

(2 BALL GAME)

INSTRUCTION MANUAL

Applicable for all games.

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GAME PROMS:	SOUND PROMS:
717/PROM 1	717/DROM 1
717/PROM 2	717/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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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.

"**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."

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 and fluorescent lamp assembly, proceed as follows:

   Unlock the lightbox by turning the key a quarter turn counter-clockwise, the hinged speaker panel grill will swing out toward you.

   The backglass is held in place in the retaining groove at the bottom ledge of the lightbox and the wood retaining tabs on each side. Lift the backglass up about an inch, pull the bottom of the backglass toward you and slide it down past the two wood retaining tabs, carefully set aside.

   To replace the backglass, slide the backglass up behind the wood retaining tabs and set down into the bottom retaining groove.

   To secure the backglass, pivot the speaker panel grill towards the backglass and turn the key clockwise a quarter turn, the lightbox is now locked.

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".

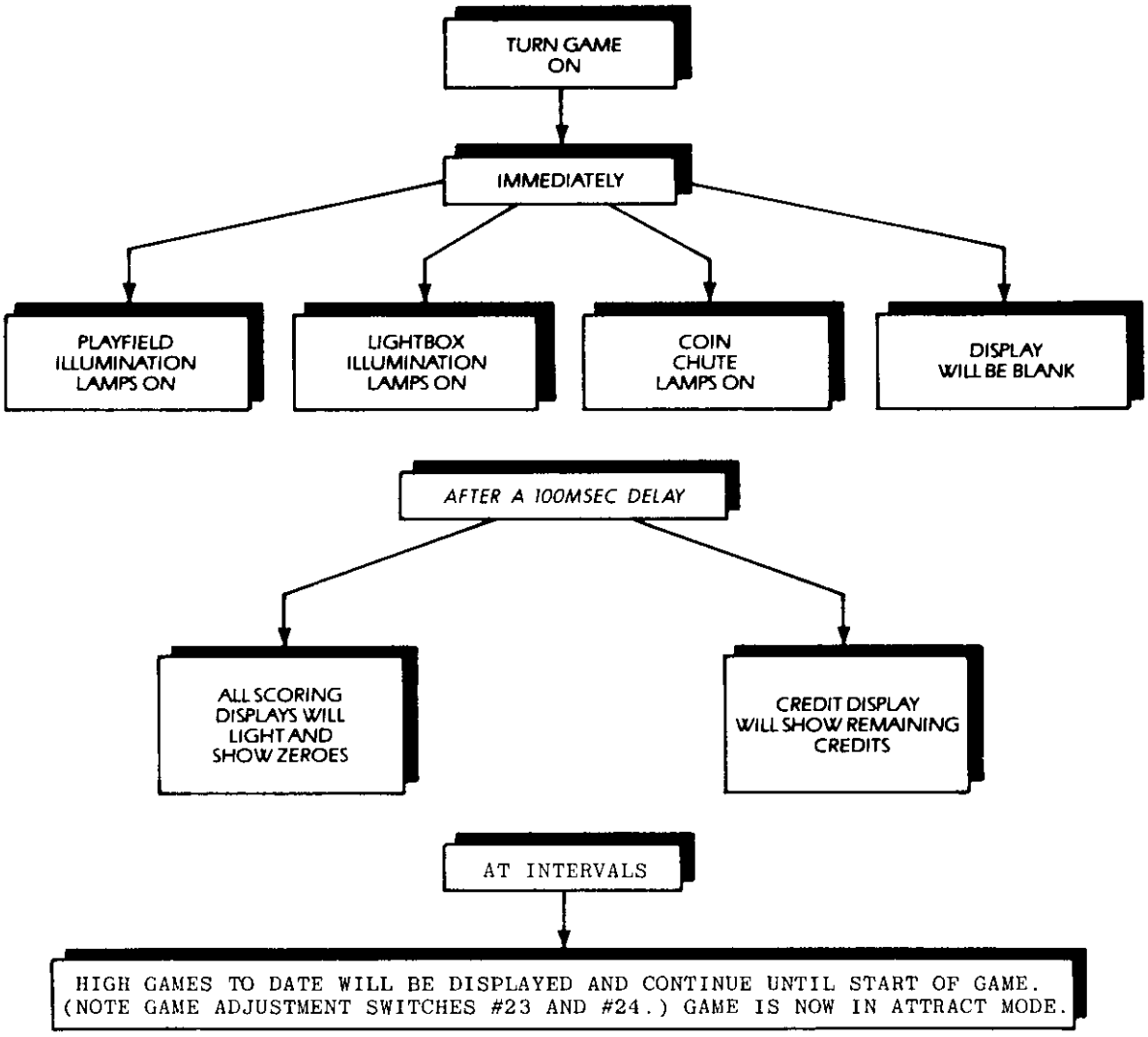
B. CHECK-OUT

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°.
9. The plumb-bob tilt can be adjusted by loosening the clip 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

II. INITIALIZATION



III. GAME OPERATION

A. GAME START

Two 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).

BAD GIRLS™

HOW TO PLAY

SHOOTER SKILL SHOT

- SCORES DISPLAYED AWARD IF THE BALL ROLLS OVER THE TOP LANE ROLLOVER AND BACK.

TOP LANE ROLLOVER

- SCORE 5,000.
- SCORE SKILL SHOT AWARD +100,000 IF THE SHOOTER SKILL SHOT MADE.
- SCORE 10,000 OR LIT VALUE IF NOT HIT FROM THE SKILL SHOT.
- ADVANCE THE TOP LANE ROLLOVER VALUE.
- SKIP OVER THE 150,000 ADVANCE STEP (3 BALL).

LEFT AND RIGHT KICKING RUBBERS

- SCORE 90.

STAR ROLLOVERS

- SCORE 90.

LEFT AND RIGHT SPINNERS

- SCORE 1,000 UNLIT, 20,000 LIT.

LEFT AND RIGHT OUT ROLLOVERS

- SCORE 50,000.
- ADD 150,000 TO THE JACKPOT VALUE.

POP BUMPERS

- SCORE 1,000 LIT OR UNLIT, 5,000 WHEN FLASHING.
- MAKING THE DISPLAYED NUMBER OF CONSECUTIVE POP HITS WHILE THE POP BUMPERS ARE FLASHING SCORES THE JACKPOT VALUE. THE POP BUMPERS BEGIN FLASHING AFTER ANY COMBINATION OF 40 SWITCH HITS. THEY WILL REMAIN FLASHING UNTIL A SWITCH OTHER THAN A POP, "POOL", RIGHT UP KICKER, OR KICKING RUBBER IS HIT OR THE JACKPOT IS AWARDED.
- ROTATES "POOL" LAMPS.

RIGHT FLIPPER

- DISPLAY JACKPOT VALUE AND CURRENT REPLAY LEVEL (AUTO-PERCENTAGING ONLY) WHEN BUTTON IS HELD.

P-O-O-L ROLLOVERS

- SCORE 5,000.
- COMPLETING "P-O-O-L" ADVANCES THE 8-BALL DROP TARGET VALUE.
- "P" SCORES AN EXTRA 100,000 WHEN LIT.
- "O" SCORES AN EXTRA 250,000 WHEN LIT.

IV. GAME PLAY AND SCORING

RIGHT UPKICKER

- SCORE 5,000.
- COLLECT BONUS X MULTIPLIER IF LIT.
- TRIP A DROP TARGET IF ANY STANDING.
- IF SWITCH #31 IS ON, SPOT A LETTER IN "P-O-O-L".

LEFT UPKICKER

- SCORE 5,000.
- COLLECT BONUS X MULTIPLIER IF LIT.
- LOCK BALL IF LIT.

VARI-TARGET

- SCORES 500 FOR EACH OF THE FIRST 3 OF THE 4 PROGRESSIVE POSITIONS.
- THE FOURTH POSITION SCORES 5,000 AND AWARDS AND ADVANCES THE LIT VALUE. THE FOURTH POSITION ALSO RESETS THE VARI-TARGET.
- AWARD STARTS AT 2X (3 BALL) OR 50,000 (5 BALL).

R-E-R-A-C-K SPOT TARGETS

- SCORE 3,000.
- WHEN FLASHING, ADD 250,000 TO THE RERACK BONUS COUNTDOWN IF ENABLED.
- IF ALL 6 ARE COMPLETED, SCORE SPECIAL IF LIT AND SCORE RERACK COUNTDOWN BONUS IF LIT AND RESET THE 7 DROP TARGET BANK.
- RESET THE 8-BALL DROP TARGET IF NOT IN MULTIBALL.

DROP TARGETS (7)

- SCORE 5,000.
- ALL 7 DOWN RESETS THE 8-BALL DROP TARGET AND FLASHES THE 8-BALL LAMP.

8-BALL DROP TARGET

- SCORE 5,000.
- LIGHT "LOCK" UNLESS IN MULTIBALL.
- SCORE 100,000 OR 200,000 OR SPECIAL IF LIT.
- IF THE 8-BALL IS FLASHING, ADVANCE THE "RACK" LAMPS AND ENTER THE "RERACK" MODE. THE "RERACK" MODE REMAINS ACTIVE UNTIL IT IS COLLECTED OR THE RERACK BONUS COUNTS DOWN TO ZERO.

OUTHOLE

- SCORE 5,000 X MULTIPLIER FOR EACH BALL MADE AND 50,000 X MULTIPLIER FOR EACH RACK COMPLETED.

SPECIAL FEATURE

- IF A PLAYER ACHIEVES 4 OR 5 SPECIALS FLASHING AT ONCE, HE IS IMMEDIATELY AWARDED 3 SPECIALS.

BOZO FEATURE

- AT THE BEGINNING OF A PLAYER'S LAST BALL, IF HE HAS NEVER COMPLETED A RACK, THE TOP LANE AWARD STARTS AT 100,000 OR 200,000 DEPENDING ON THE SETTING OF SWITCH #31.



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

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

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: BOZO FEATURE LIGHTS 100,000 LAMP. RIGHT UPKICKER SPOTS A P-O-O-L LETTER. VARI-TARGET AWARD ADVANCES FROM 10X TO SPECIAL. TOP LANE ROLLOVER SKIPS OVER 250,000 ADVANCE. ENTERING THE "RERACK" MODE FOR THE SECOND TIME FLASHES ONLY THE "RERACK" SPECIAL. (LIBERAL)
- OFF: BOZO FEATURE LIGHTS 200,000 LAMP. RIGHT UPKICKER DOES NOT SPOT A P-O-O-L LETTER. VARI-TARGET AWARD ADVANCES FROM 10X TO 50,000 TO SPECIAL. TOP LANE ROLLOVER INCLUDES 250,000 ADVANCE. ENTERING THE "RERACK" MODE FOR THE SECOND TIME FLASHES THE "RERACK" SPECIAL AND BONUS COUNTDOWN. (CONSERVATIVE)

SWITCH 32 — PLAYFIELD FEATURE CONTROL
- ON: RESTORE RACK LAMP STATUS FROM BALL TO BALL. START POP BUMPER JACKPOT HITS AT 8. "RACK" SPECIAL LIGHTS AFTER COMPLETING 4 RACKS. (LIBERAL)
- OFF: CLEAR RACK LAMP STATUS FROM BALL TO BALL. START POP BUMPER JACKPOT HITS AT 12. "RACK" SPECIAL LIGHTS AFTER COMPLETING 3 RACKS. (CONSERVATIVE)

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 outlane 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 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 coin chutes (Steps 1,2 and 3), 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.

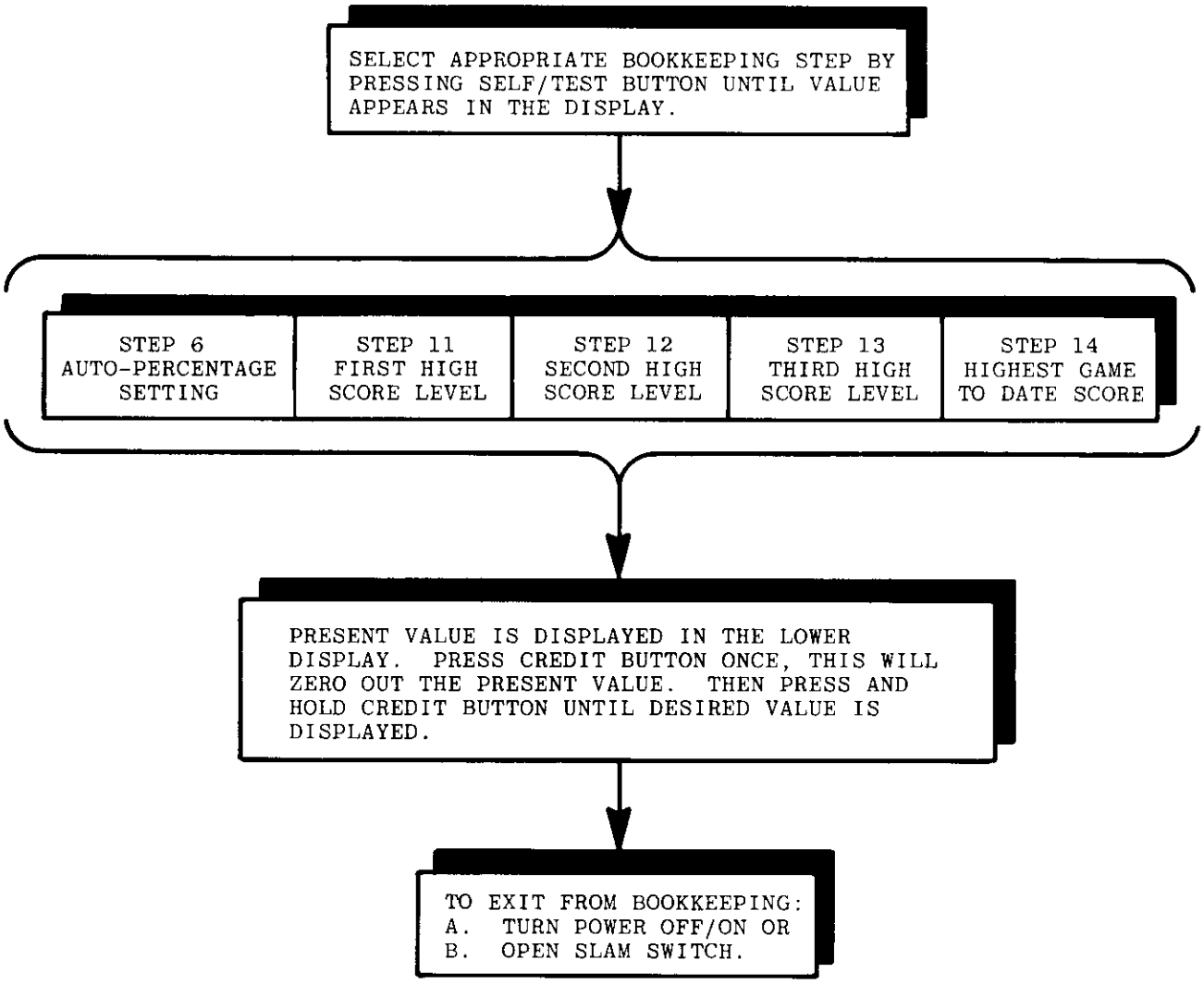
HOW TO USE AUTOMATIC REPLAY PERCENTAGING

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.

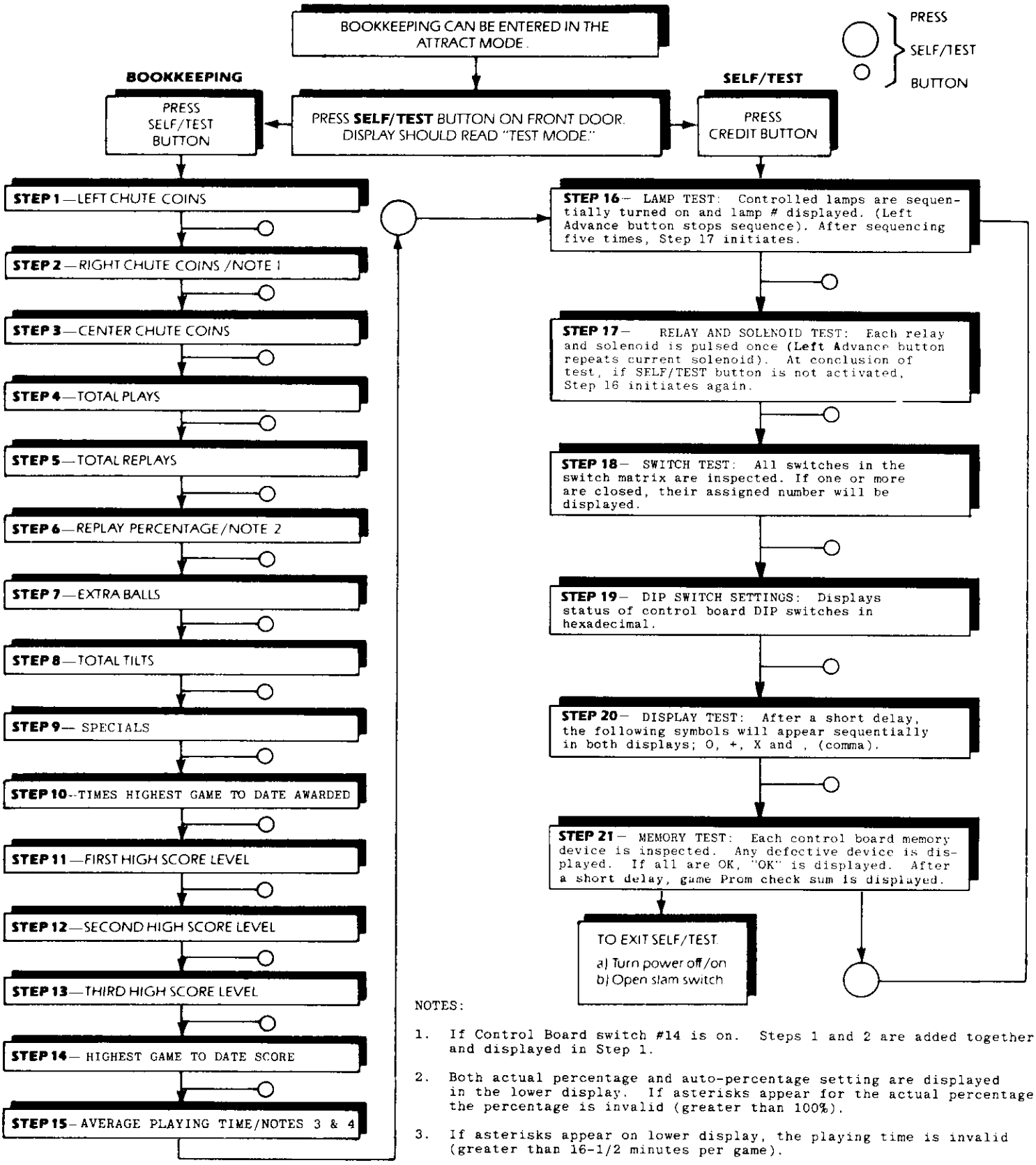
3. If Step 14 is reset, all High Games to Date scores are reset.

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:
   Steps 1 thru 3 - Coin chutes
   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	3 Pos. 7 Bank	Q60
Sol.2	Left Upkicker	Q57/Q58
Sol.3	Large Hat Lamps	Q54
Sol.4	Vari-Target Reset	Q55
Sol.5	4 Pos. 7 Bank	Q61/Q62
Sol.6	Right Upkicker	Q63/Q64
Sol.7	1 Pos. Bank	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

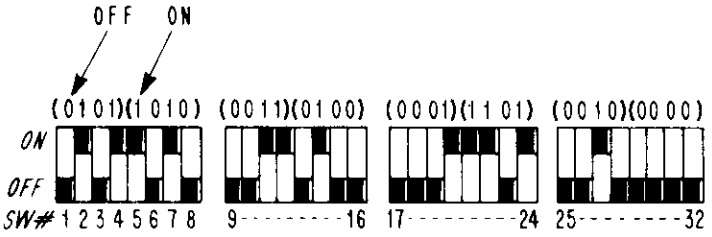
a. The status of the Control Board (A1) switches appears in the lower display.

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

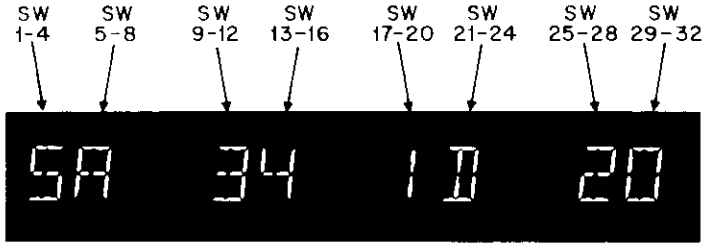
VII. BOOKKEEPING AND SELF TEST

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

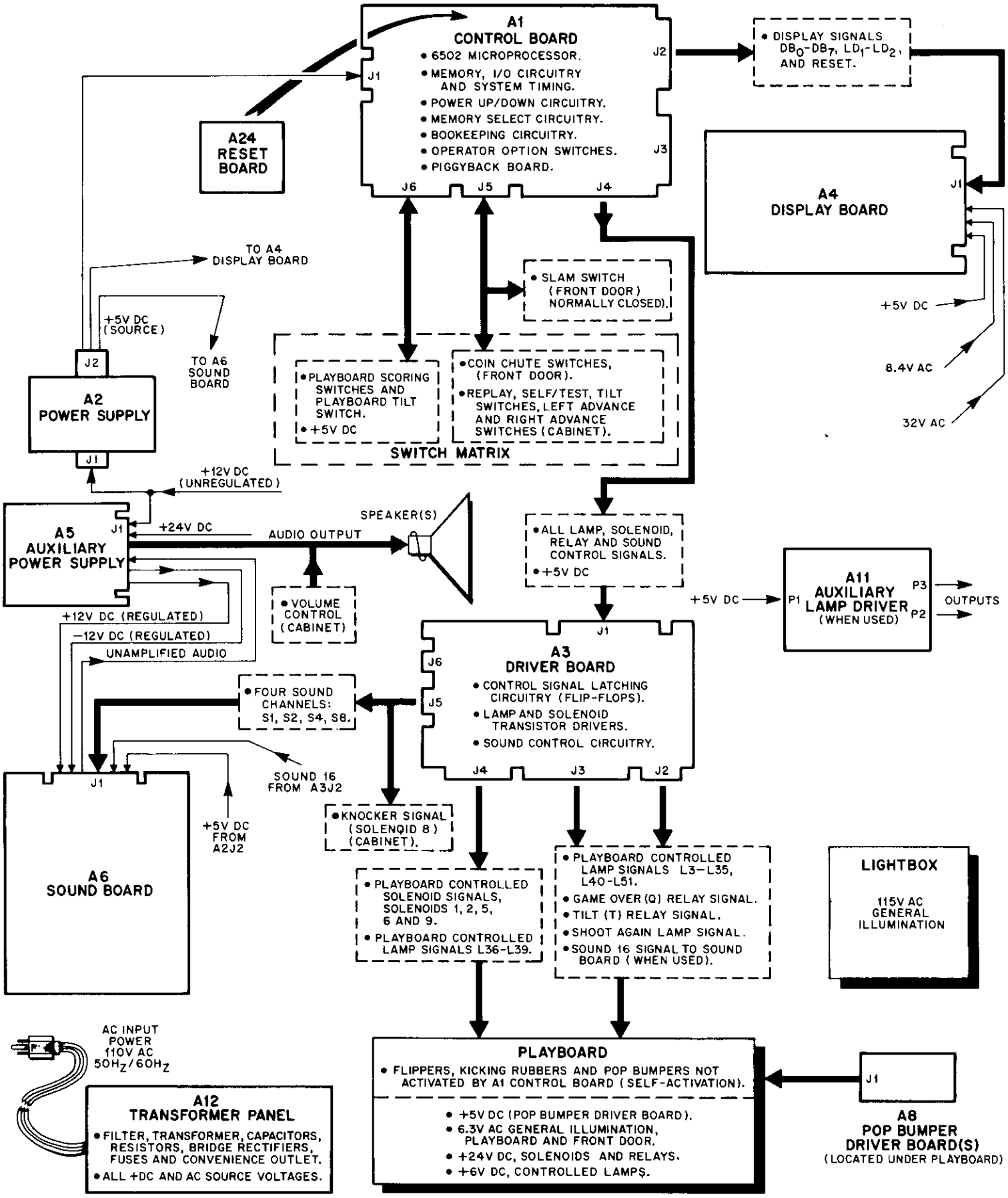


FIGURE 1. SYSTEM 80B BLOCK DIAGRAM

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 8.4V 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.

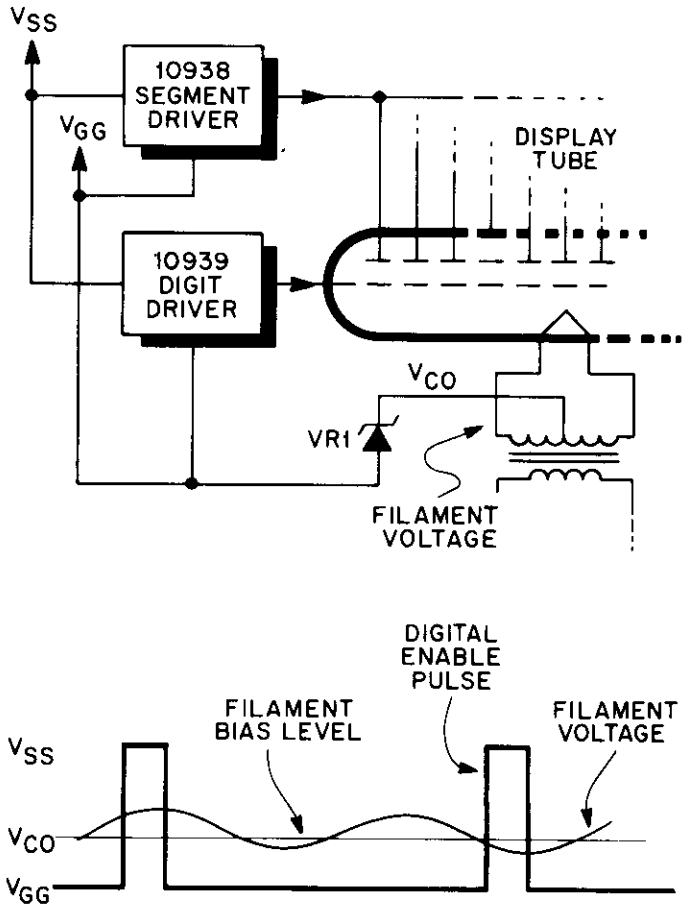


FIGURE 2. BASIC DRIVE CIRCUIT

D. SOUND BOARD (A6)

The MA-886-717 Sound Board consists of two 6502 microprocessor systems, a dual DAC, 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 processor's clock input, pin 37 of N1 and T3. 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.

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.

E. AUXILIARY SOUND BOARD (A20)

The Auxiliary Sound Board MA-1033 consists of a YM2151 (U1) sound generator, a YM3014 (U2) DAC, and a LM324 op-amp (U3). The master sound board (A6), controls the YM2151(U1) sound chip by sending commands via the data bus of the master sound board's T3 micro-processor. The YM2151 responds to these commands and serially sends sound data to the YM3014 DAC by means of the CLK, SD, and SH2 lines. The DAC converts this serial data into an analog signal which is buffered and amplified by U3, a LM324 op-amp. This analog signal is then sent back to the main summer of the master sound board (A6).

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
A20 - Auxiliary Sound Board
A22 -
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
F9	Display Filament.....	8.4V AC	1 Amp
F9A	Display Filament.....	8.4V AC	1 Amp
F20	Input Line.....	110V AC	8 Amp SLO-BLO
		220V AC	4 Amp SLO-BLO

PLAYBOARD FUSES

F10	(8) Trip Coils.....	1/2 Amp SLO-BLO
F11	Outhole, Ball Release.....	1 Amp SLO-BLO
F12	1 Pos. bank, Vari-Target Reset Large Hat Lamps.....	1 Amp SLO-BLO
F13	3 Pos. 7 Bank, 4 Pos. 7 Bank, Left Upkicker, Right Upkicker.....	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

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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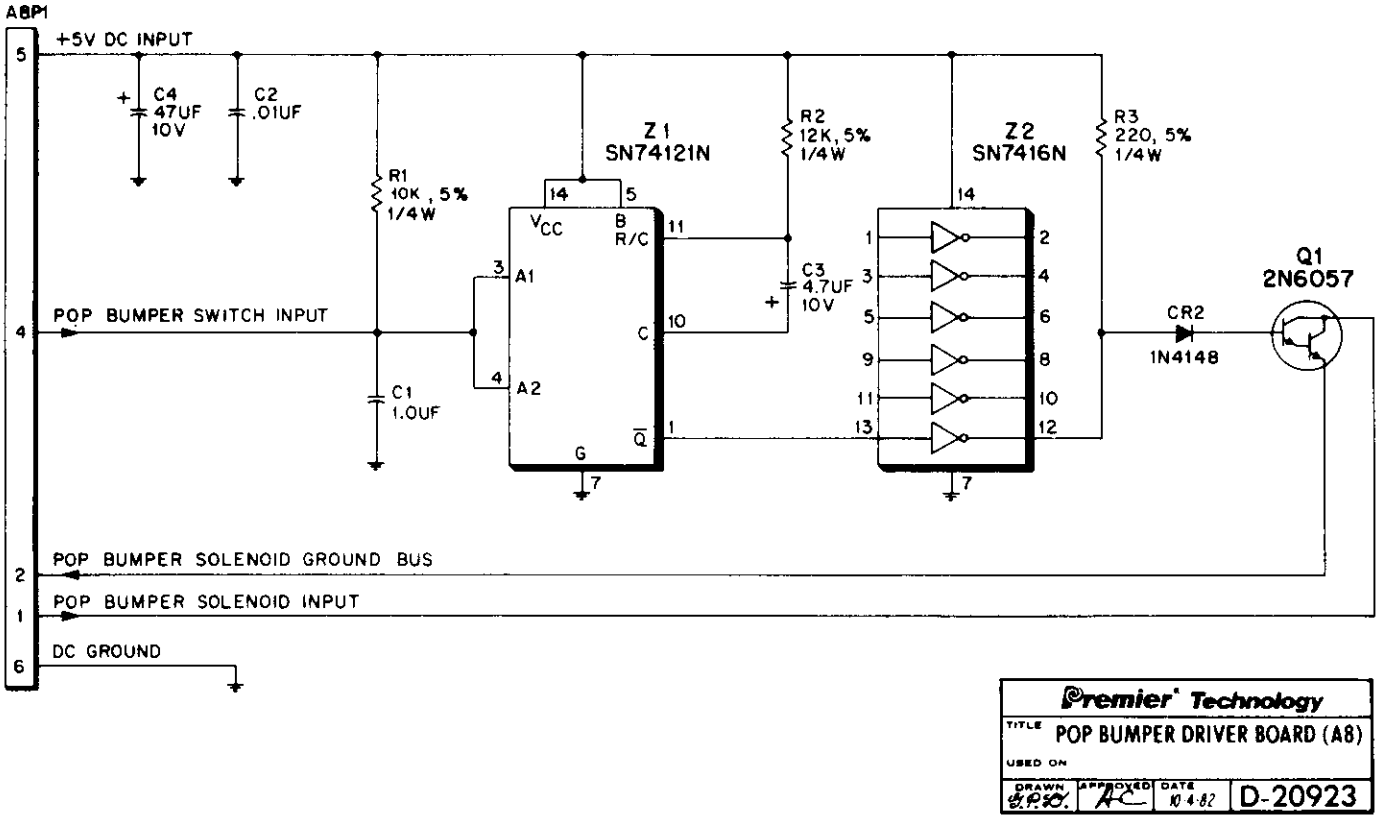
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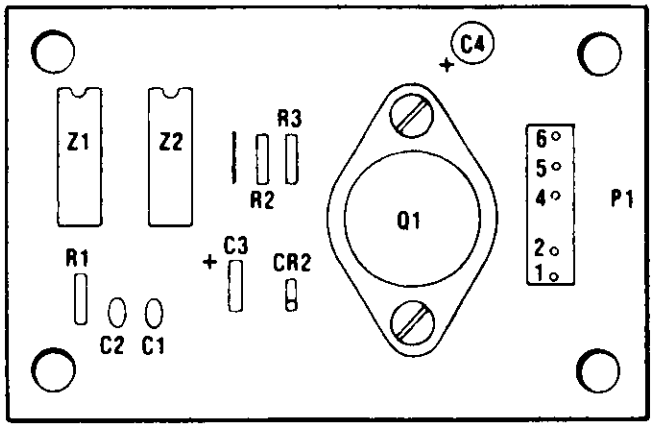
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X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



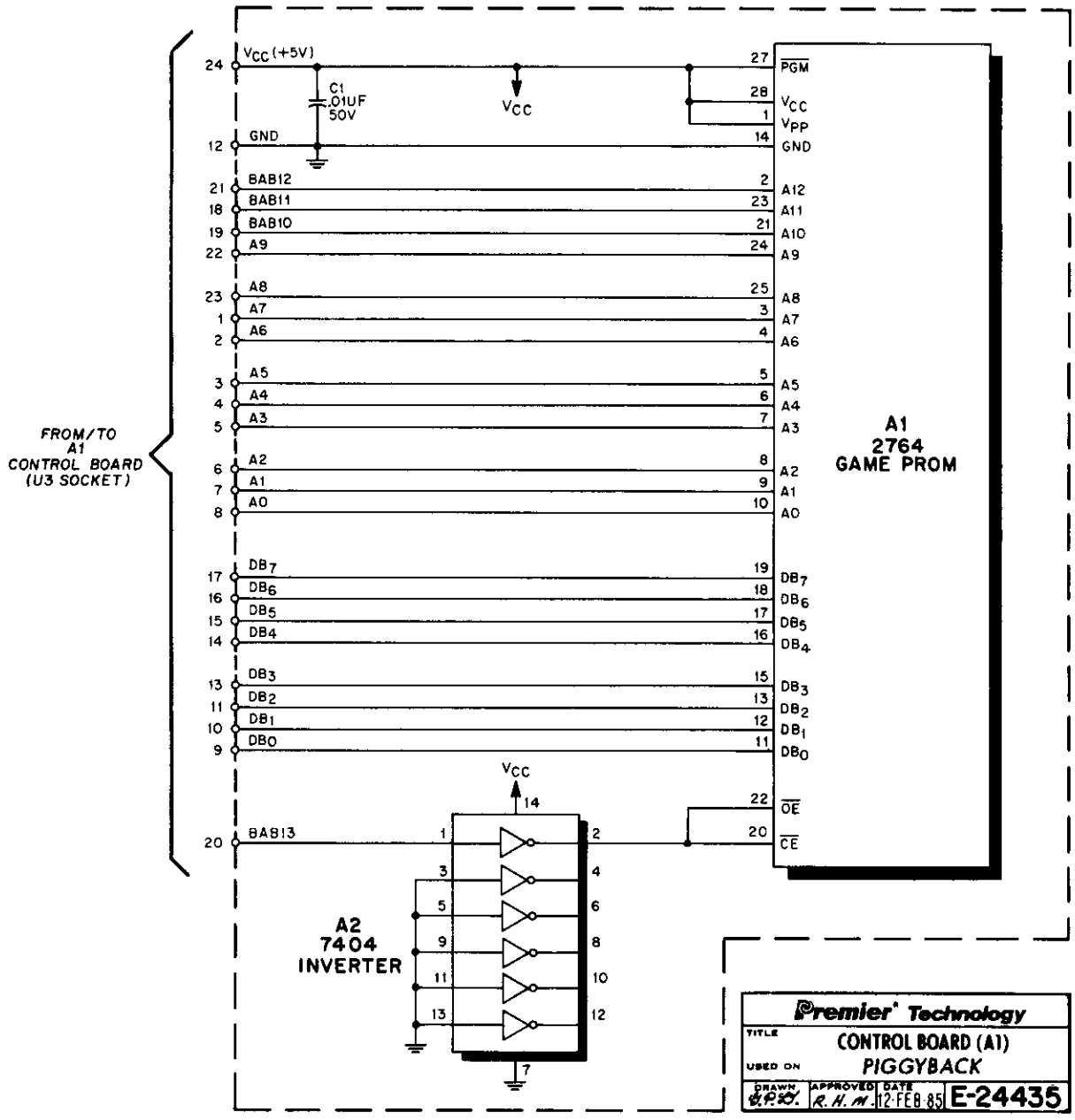
POP BUMPER DRIVER BOARD (A8) COMPONENT LOCATION



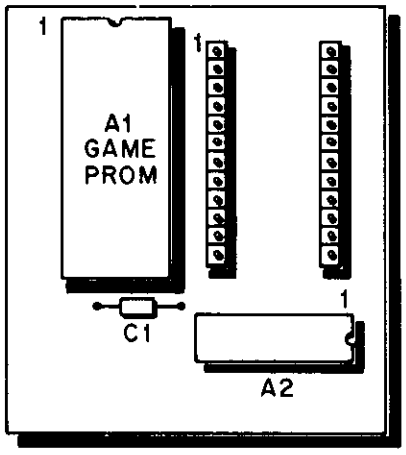
POP BUMPER DRIVER BOARD (A8) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	POP BUMPER DRIVER BOARD	A-19741
C1	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

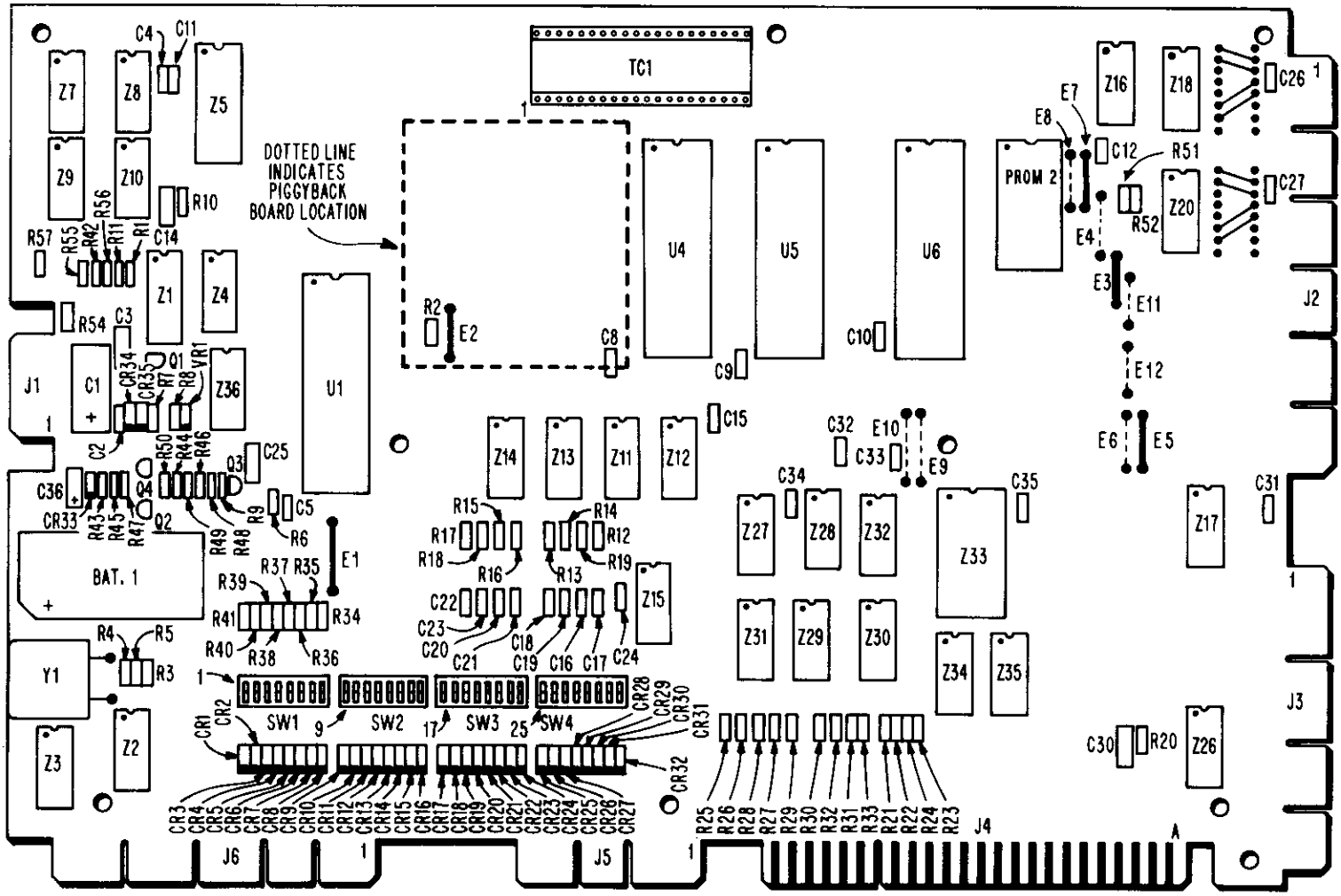


CONTROL BOARD (A1), PIGGYBACK PARTS LIST

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-1133
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 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% 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

CLOCK LOGIC

Y1 · +5V · R4 2K · R5 2K · R3 5.6K · Z3 7404 · Z2 7474 · E2 · Φ0

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 · C1 100UF 10V · CR34 · CR35 · R8 180 · Q1 MPS-A70 · V_B SOURCE · R7 62 · C2 · C3 0.1UF · VR1 3V ±5% · V_B -3.6V · R9 1K · C25 0.1UF · GND

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

RESET · CR1 1N270 · LOCATED ON A24P2 · TC1 · GND · R/W · U4,U5,U6-25 · U4,U5,U6-34

R1 3K · R2 4.7K · IRQ · RES · RDY · NMI · SO · V_{CC} · V_{SS}

ADDRESS BUS: AB0–AB7 · AB8–AB11 (Z12-9) · AB12 (Z7-11) · AB13 (Z7-13) · AB14–AB15 (E3)

DATA BUS: DB0–DB7

SYNC · R/W · Φ2 · Z10-1 · Z36 4069

R1 3K 5% 1/4W · LOCATED ON A24P2 · +5V · Φ2 CLOCK U4,U5,U6-39

V_B · C11 · Z5 5101L-1 BK RAM · D1-1 · D1-2 · D1-3 · D1-4 · DØ-1 · DØ-2 · DØ-3 · DØ-4 · OD · R/W · CE1 · CE2

BAB11 · BAB12 · Z8 · Z4 · Z36 4069

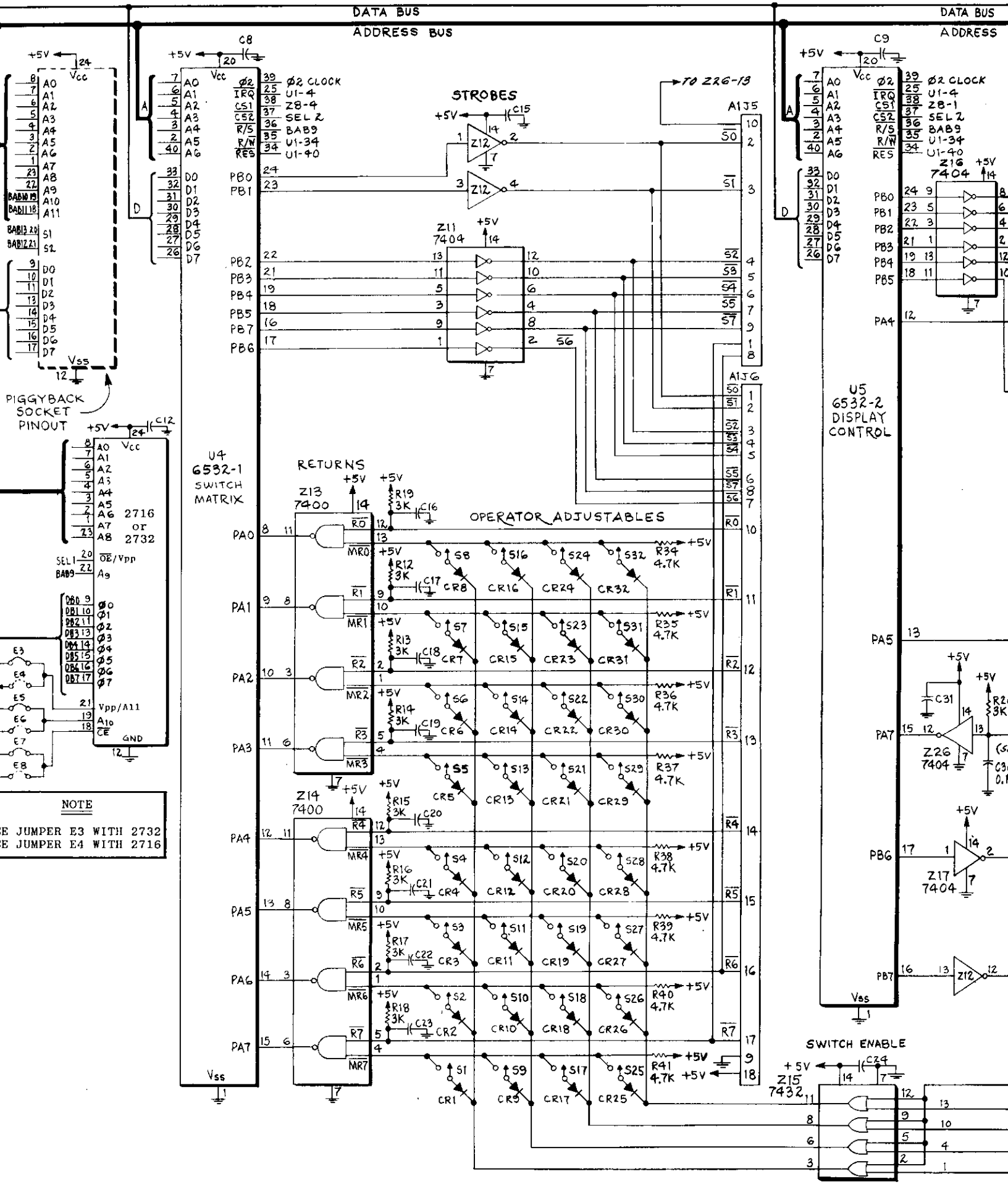
PROM SELECTION

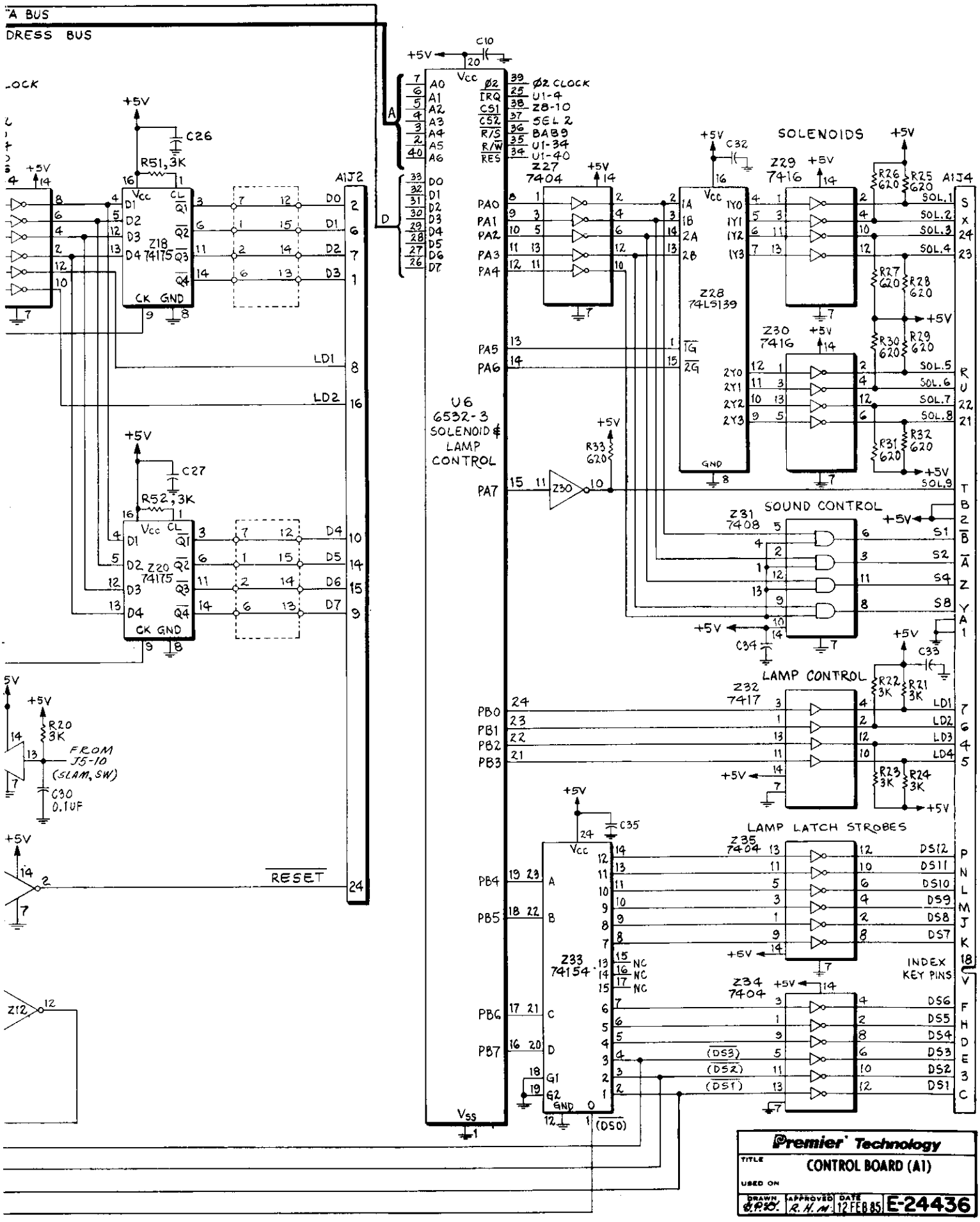
AB9 · AB10 · AB11 · AB12 · AB13 · Z10 74LS05 · Z12 7404 · Z7 · Z9 7400

R56 3K · R57 3K · R54 3K · R55 3K · R11 3K · R42 3K

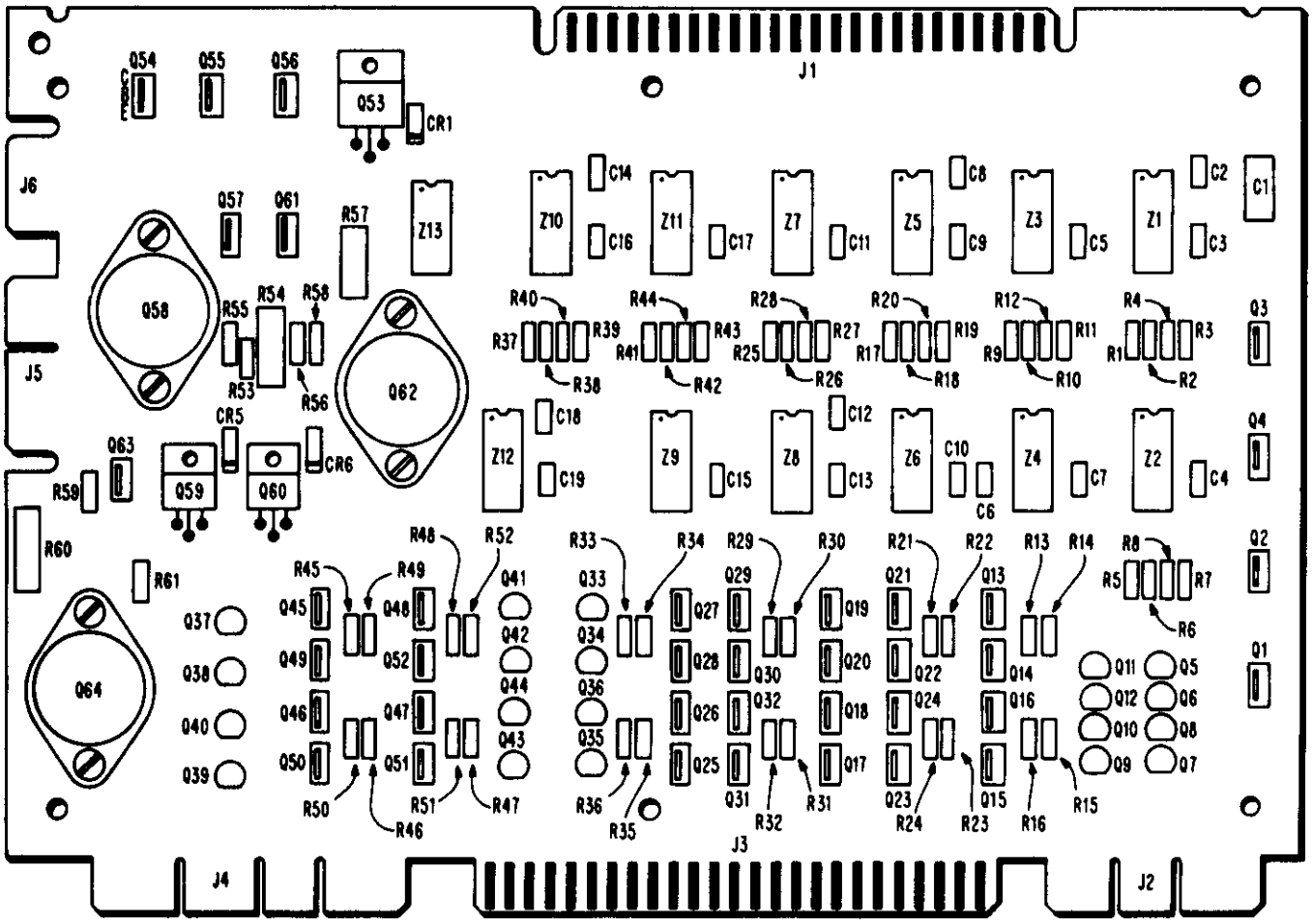
BAB9 · BAB10 · BAB11 · BAB12 · BAB13 · SEL 2 · SEL 1

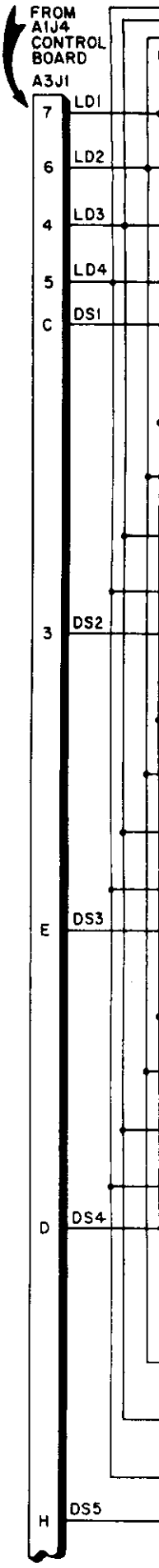
RES U1-40


DATA BUS
ADDRESS BUS
DATA BUS
ADDRESS
STROBES
TO Z26-13
U4
6532-1
SWITCH
MATRIX
RETURNS
OPERATOR ADJUSTABLES
U5
6532-2
DISPLAY
CONTROL
PIGGYBACK
SOCKET
PINOUT
2716
or
2732
SWITCH ENABLE
NOTE
E JUMPER E3 WITH 2732
E JUMPER E4 WITH 2716


A BUS
DRESS BUS
LOCK
+5V
C10
C26
R51,3K
Z18
74175
A1J2
LD1
LD2
C27
R52,3K
Z20
74175
R20
3K
FROM
J5-10
(SLAM SW)
C30
0.1UF
RESET
Z12
U6
6532-3
SOLENOID &
LAMP
CONTROL
Z27
7404
Z28
74LS139
Z29
7416
Z30
7416
SOLENOIDS
A1J4
SOL.1
SOL.2
SOL.3
SOL.4
SOL.5
SOL.6
SOL.7
SOL.8
SOL.9
R26 620
R25 620
R27 620
R28 620
R30 620
R29 620
R31 620
R32 620
R33 620
Z31
7408
SOUND CONTROL
S1
S2
S4
S8
C34
C33
LAMP CONTROL
Z32
7417
R22 3K
R21 3K
R23 3K
R24 3K
LD1
LD2
LD3
LD4
C35
LAMP LATCH STROBES
Z35
7404
Z33
74154
Z34
7404
INDEX
KEY PINS
DS12
DS11
DS10
DS9
DS8
DS7
DS6
DS5
DS4
DS3
DS2
DS1
Premier Technology
TITLE
CONTROL BOARD (A1)
USED ON
DRAWN
APPROVED
DATE
12 FEB 85
E-24436

DRIVER BOARD (A3) COMPONENT LOCATION



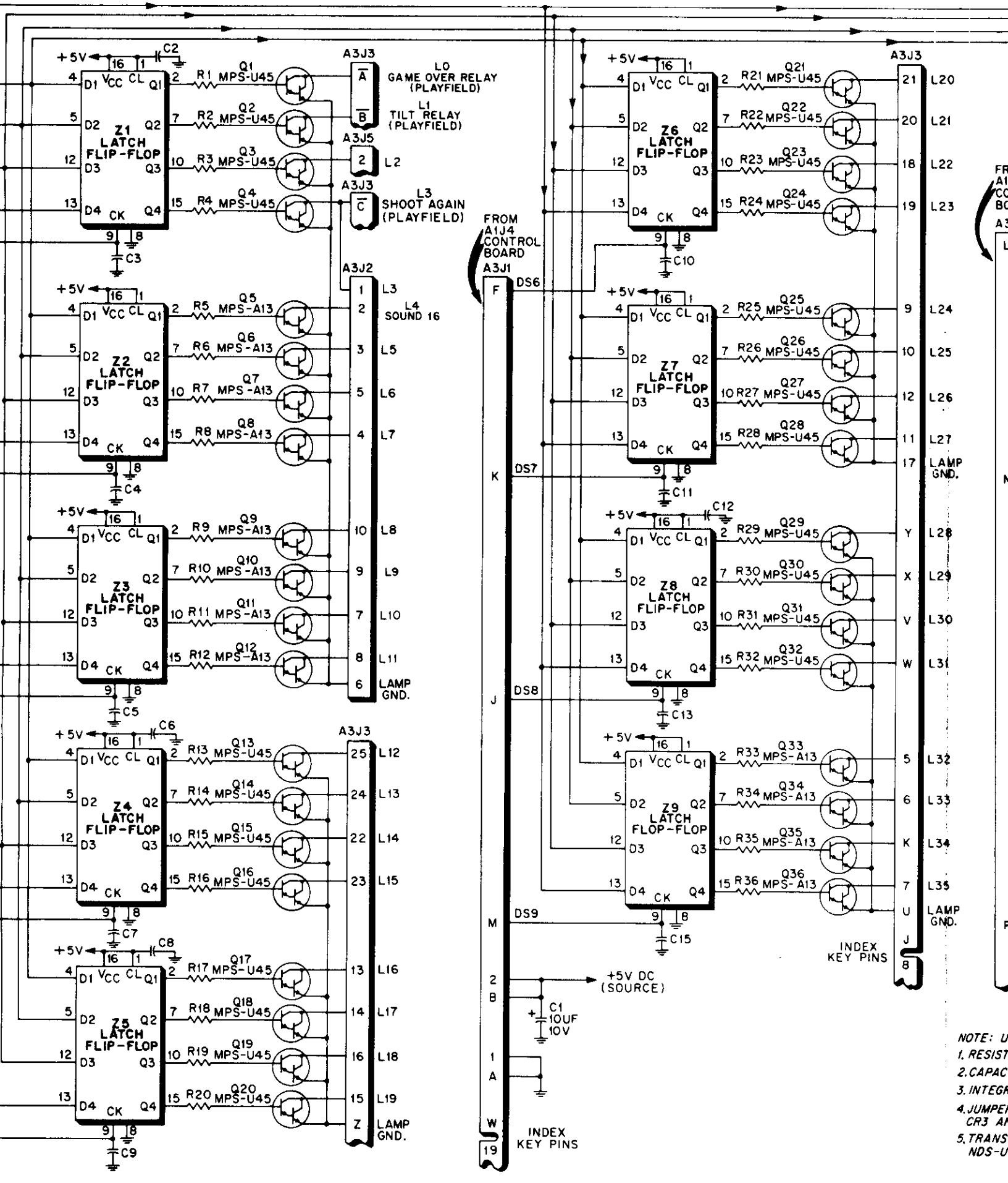


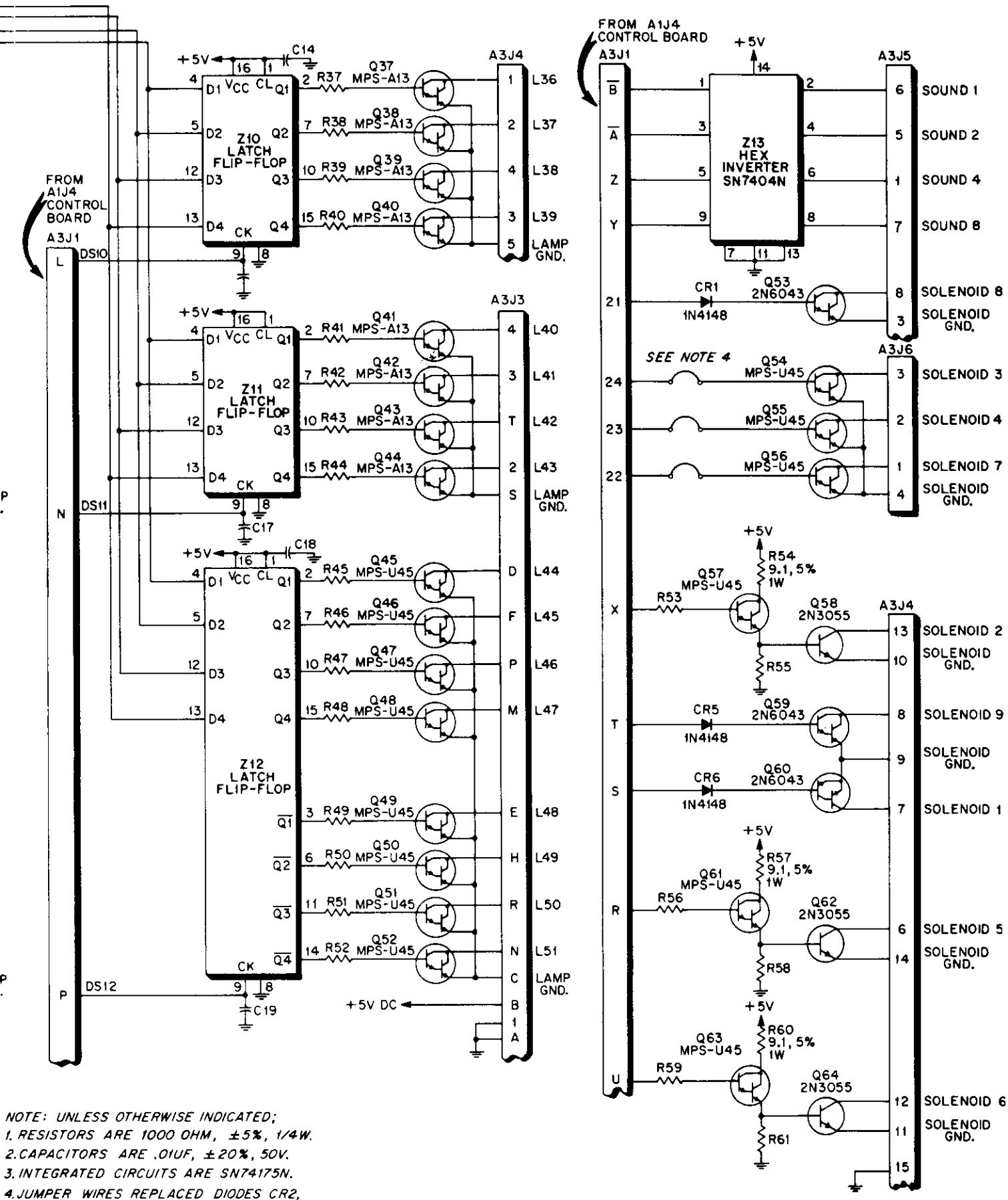
DRIVER BOARD (A3) PARTS LIST

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 1N4148	XO-261
R1-R53, R61, R55, R56, R58, R59	Resistor 10K 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.*


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 FLOP-FLOP
+5V
A3J3
A3J5
A3J2
A3J1
L0 GAME OVER RELAY (PLAYFIELD)
L1 TILT RELAY (PLAYFIELD)
L2
L3 SHOOT AGAIN (PLAYFIELD)
L4 SOUND 16
LAMP GND.
FROM A1J4 CONTROL BOARD
INDEX KEY PINS
+5V DC (SOURCE)
C1 10UF 10V
DS6
DS7
DS8
DS9

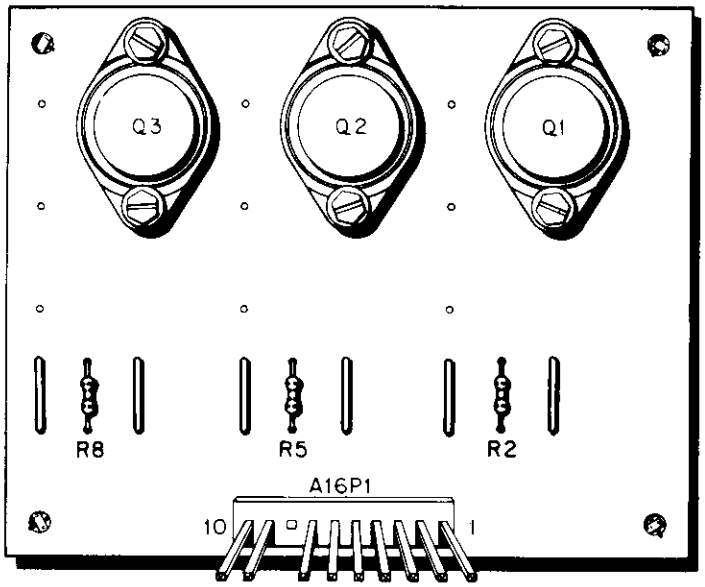


NOTE: UNLESS OTHERWISE INDICATED;

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: G.P.D.	APPROVED: B.A.M.	DATE: 12-12-80	E-20915

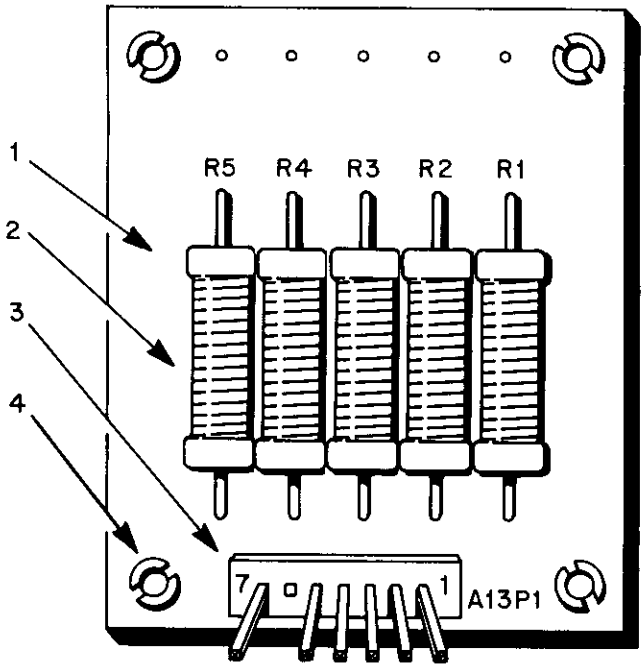
TRANSISTOR DRIVER BOARD (A16) COMPONENT LOCATION



TRANSISTOR DRIVER BOARD (A16) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	Transistor Driver Board Assembly (2A16)	MA-1013
Q1-Q3	Transistor, MJ2955	XO-799
R2,R5,R8	Resistor, 4.7K Ohm, 5%, 1/4W	XO-7
P1	10 Position Connector	XO-879
	Circuit Board Support (4)	MP-40

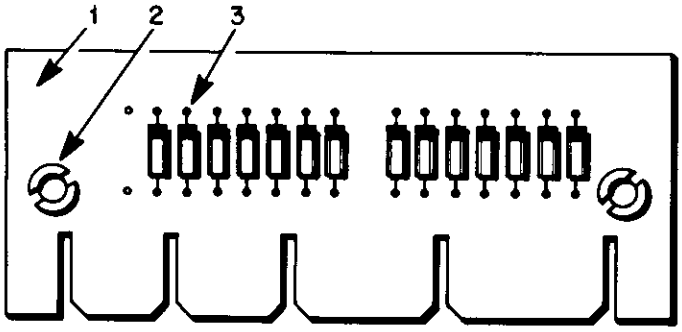
RESISTOR BOARD (A13)



RESISTOR BOARD (A13) PARTS LIST

ITEM	DESCRIPTION	PART NO.
1	Resistor Board Assembly (A13)	MA-1123
2	Resistor, 4 Ohn, 7W, 5%, WW (5)	XO-878
3	7 Position Connector (A13P1)	XO-879
4	Spacer (4)	23984

DIODE BOARD (A7)

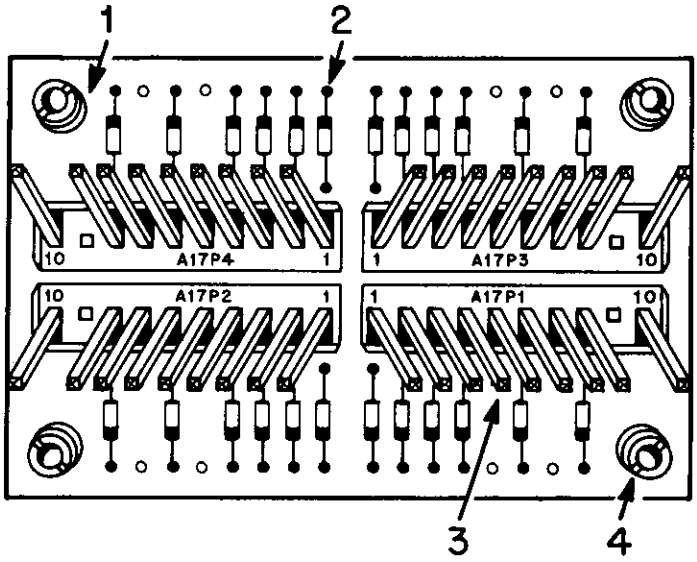


DIODE BOARD (A7) PARTS LIST

ITEM	DESCRIPTION	PART NO.
1	Diode Board Assembly (A7)	26091
2	Spacer (2)	23984
3	Diode, 1N270 (14)	XO-265

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

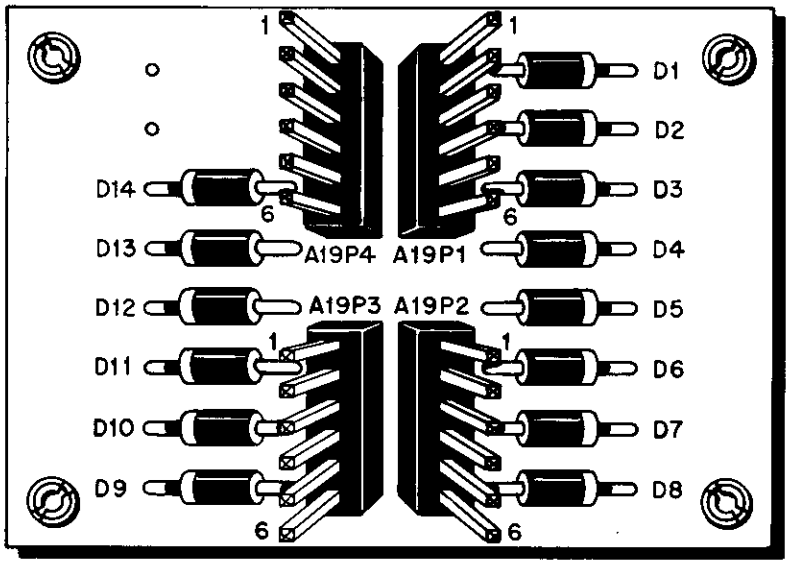
DIODE BOARD (A17)



DIODE BOARD (A17)

ITEM	DESCRIPTION	PART NO.
1	Diode Board Assembly (1A17)	MA-1165
2	Diode, 1N270 (24)	XO-265
3	10 Position Connector (4)	XO-879
4	Spacer (4)	23984

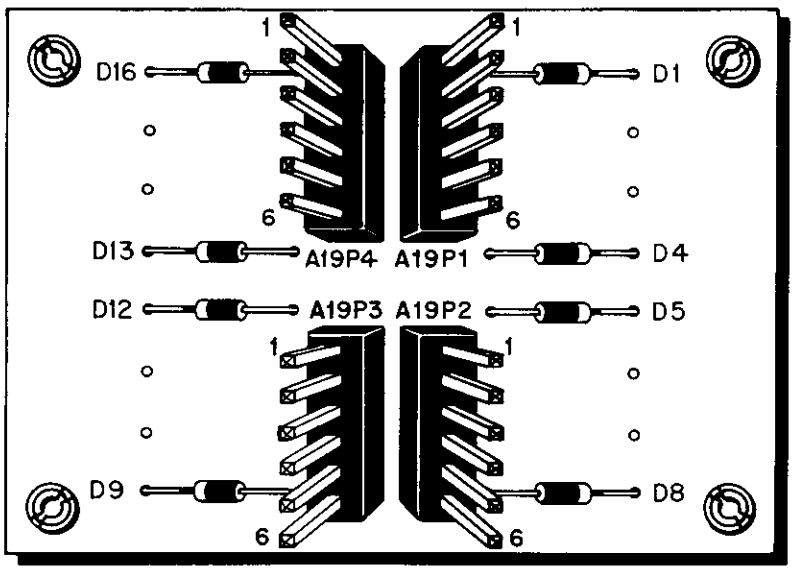
SWITCHING DIODE BOARD (A19)



SWITCHING DIODE BOARD (A19)

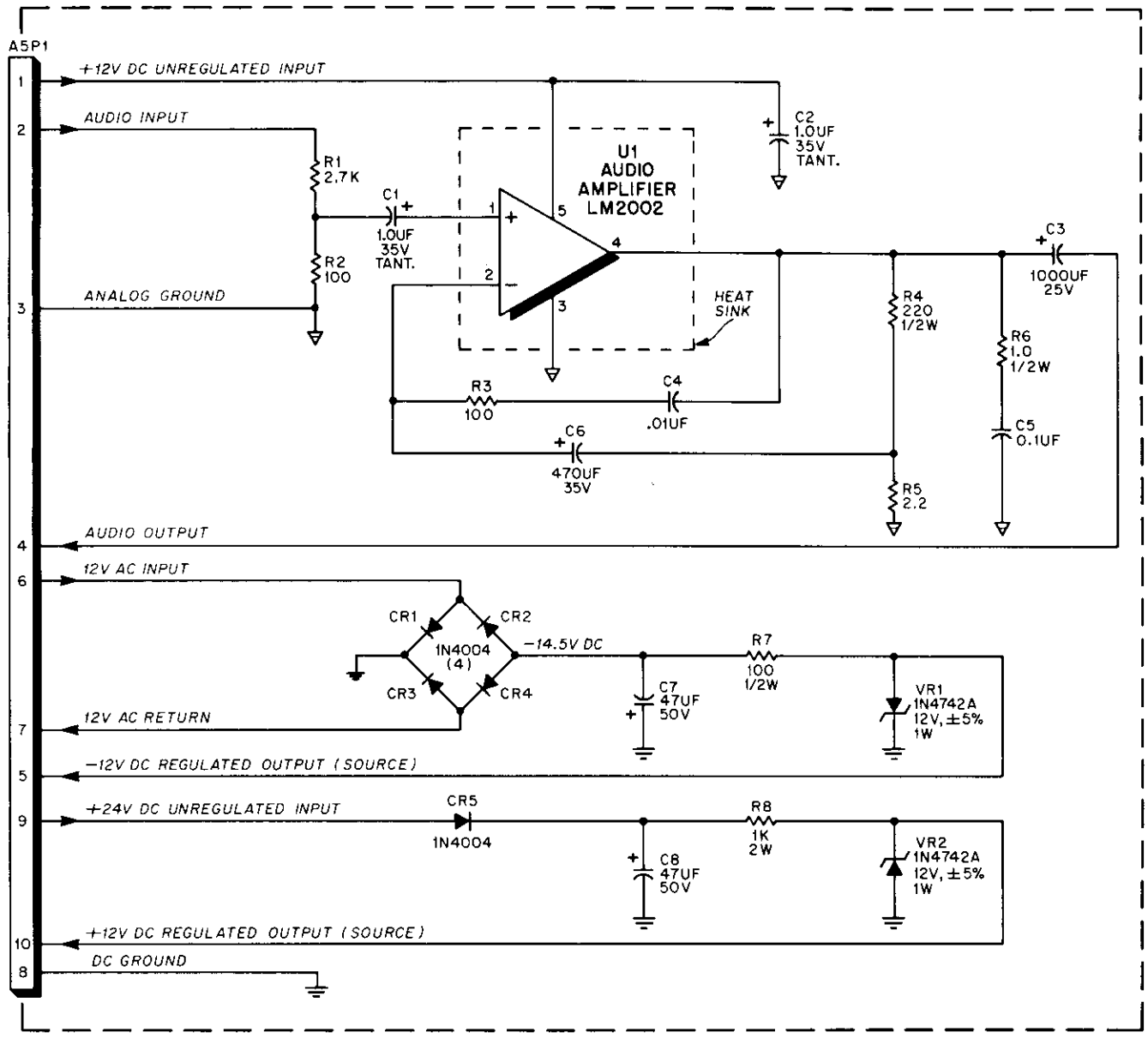
ITEM	DESCRIPTION	PART NO.
	Switching Diode Assembly (1A19)	MA-1122
D1-D14	Diode, 1N5401 (14)	XO-263
A19P1-A19P4	6 Position Connector (4)	XO-897
	Spacer (4)	23984

SWITCHING DIODE BOARD (A19)

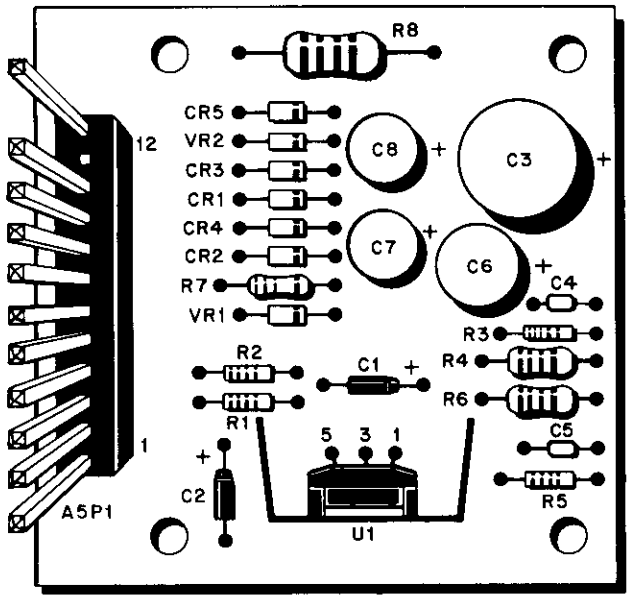


SWITCHING DIODE BOARD (A19)

ITEM	DESCRIPTION	PART NO.
	Switching Diode Assembly (2A19)	MA-1168
D1-D16	Diode, 1N4004 (8)	XO-254
A19P1-A19P4	6 Position Connector (4)	XO-897
	Spacer (4)	23984



AUXILIARY POWER SUPPLY (A5) COMPONENT LOCATION



Premier Technology

TITLE AUXILIARY POWER SUPPLY (A5)

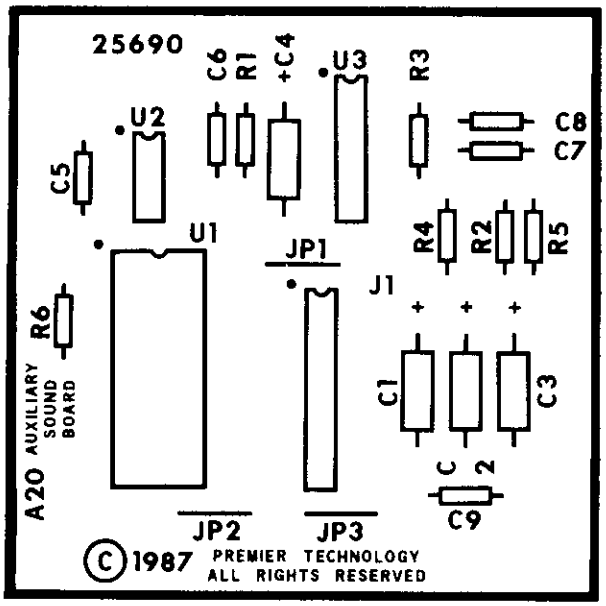
USED ON

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

AUXILIARY POWER SUPPLY (A5) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	Auxiliary Power Supply	MA-1017
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
	12 Position Connector	XO-879

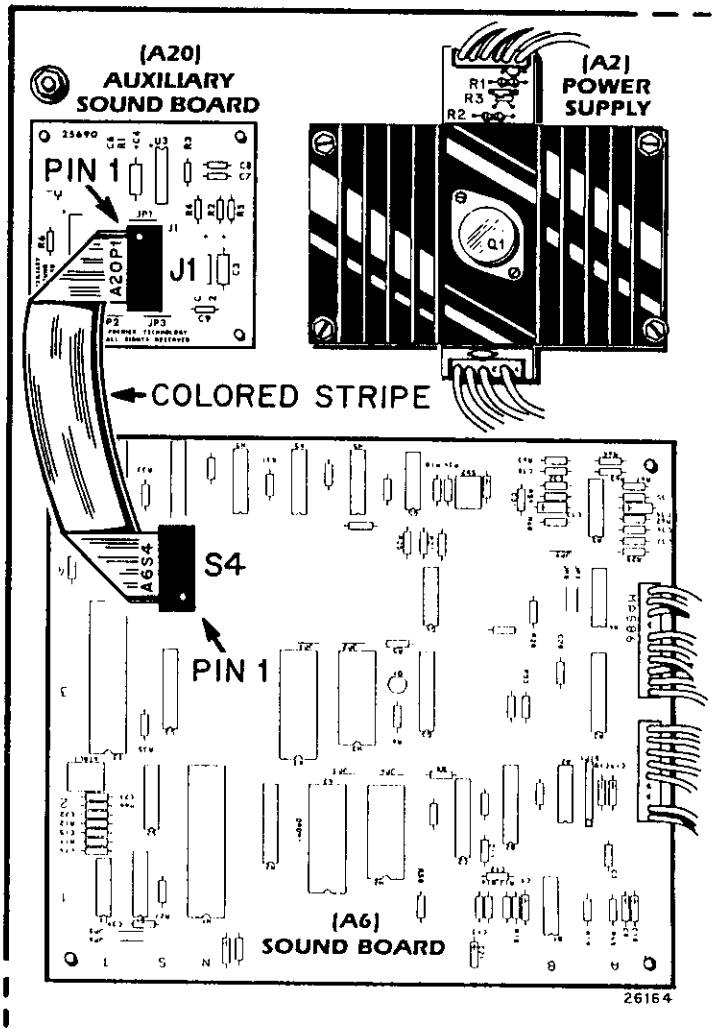
AUXILIARY SOUND BOARD (A20) COMPONENT LOCATION



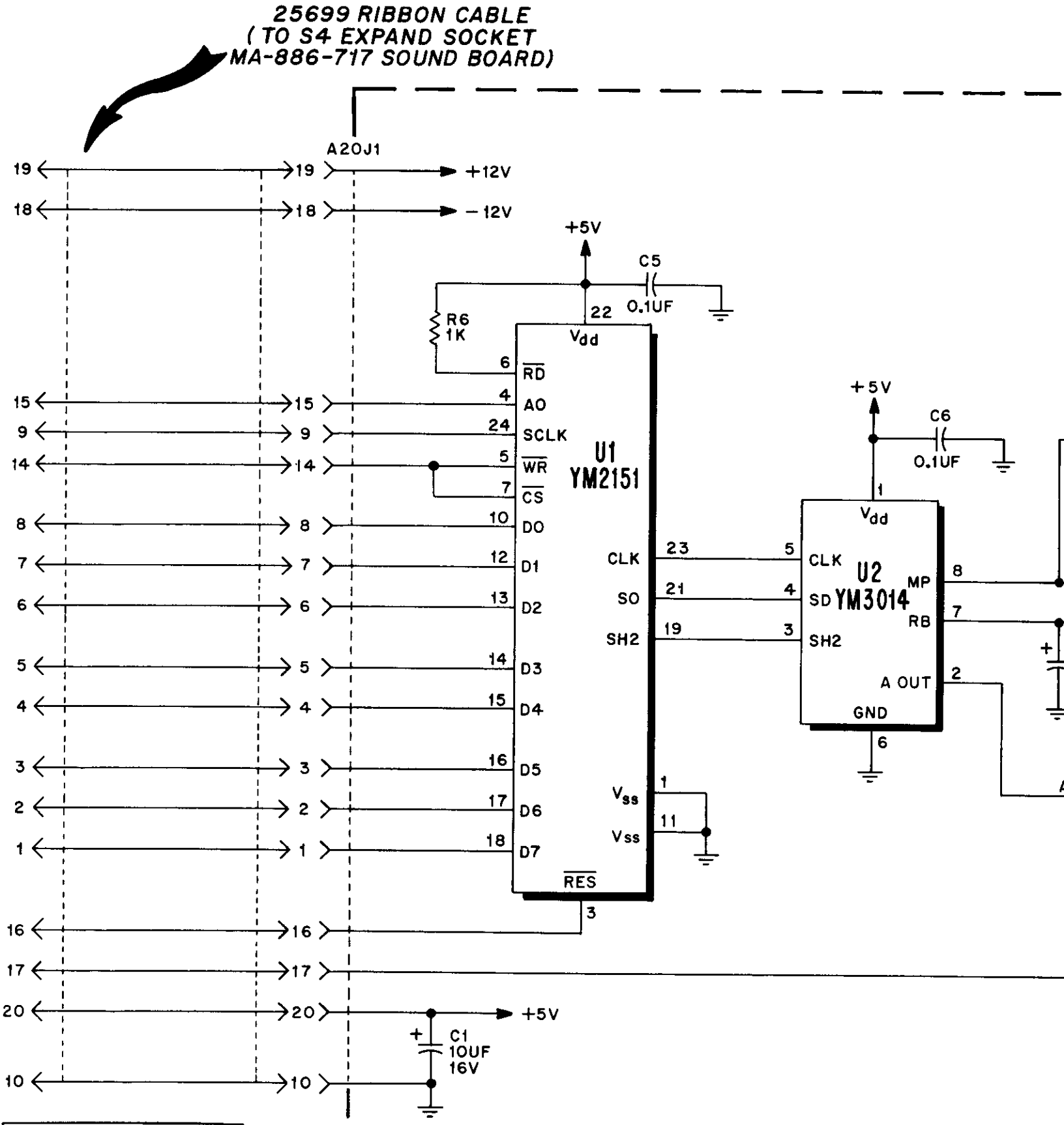
AUXILIARY SOUND BOARD (A20) PARTS LIST

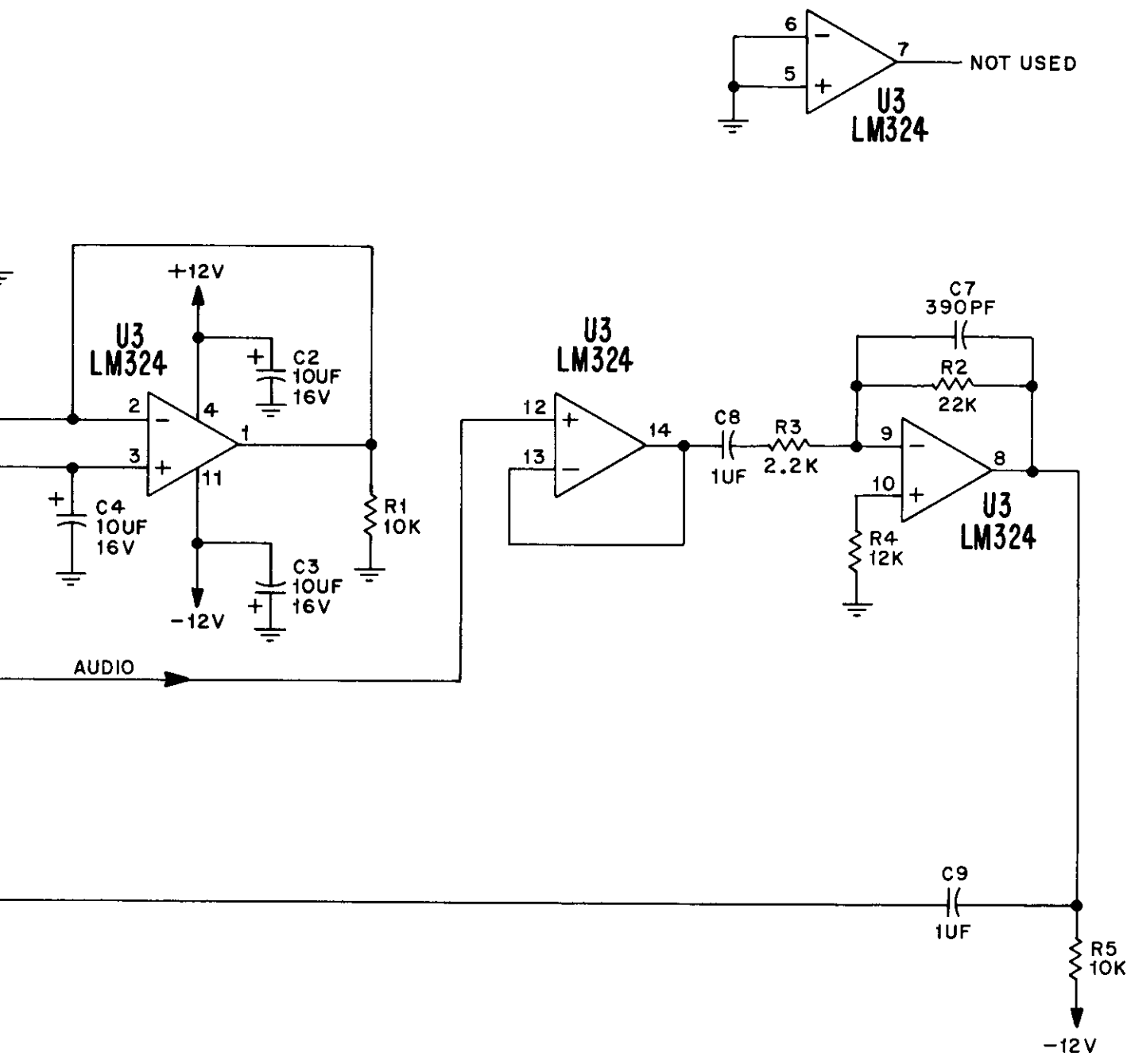
REFERENCE	DESCRIPTION	PART NUMBER
	AUXILIARY SOUND BOARD	MA-1033
C1-C4	CAPACITOR, 10UF, +80%-20%, 16V	XO-846
C5,C6	CAPACITOR, 0.1UF, +80%-20%	XO-230
C7	CAPACITOR, 390PF, 50V	XO-684
C8,C9	CAPACITOR, 1UF, 50V, NON-POLARIZED	XO-746
R1,R5	RESISTOR, 10K OHM, 5%, 1/4W	XO-18
R2	RESISTOR, 22K OHM, 5%, 1/4W	XO-42
R3	RESISTOR, 2.2K OHM, 5%, 1/4W	XO-27
R4	RESISTOR, 12K OHM, 5%, 1/4W	XO-9
R6	RESISTOR, 1K OHM, 5%, 1/4W	XO-5
U1	IC, SOUND CHIP, YM2151	XO-882
U2	IC, SERIAL DAC, YM3014	XO-883
U3	IC, QUAD AMP, LM324	XO-644
	JUMPER, 22 GAUGE (3)	XO-469
	SOCKET, 20 PIN DIP	XO-491
	SOCKET, 24 PIN DIP	XO-529
	RIBBON CABLE	25699

RIBBON CABLE ORIENTATION



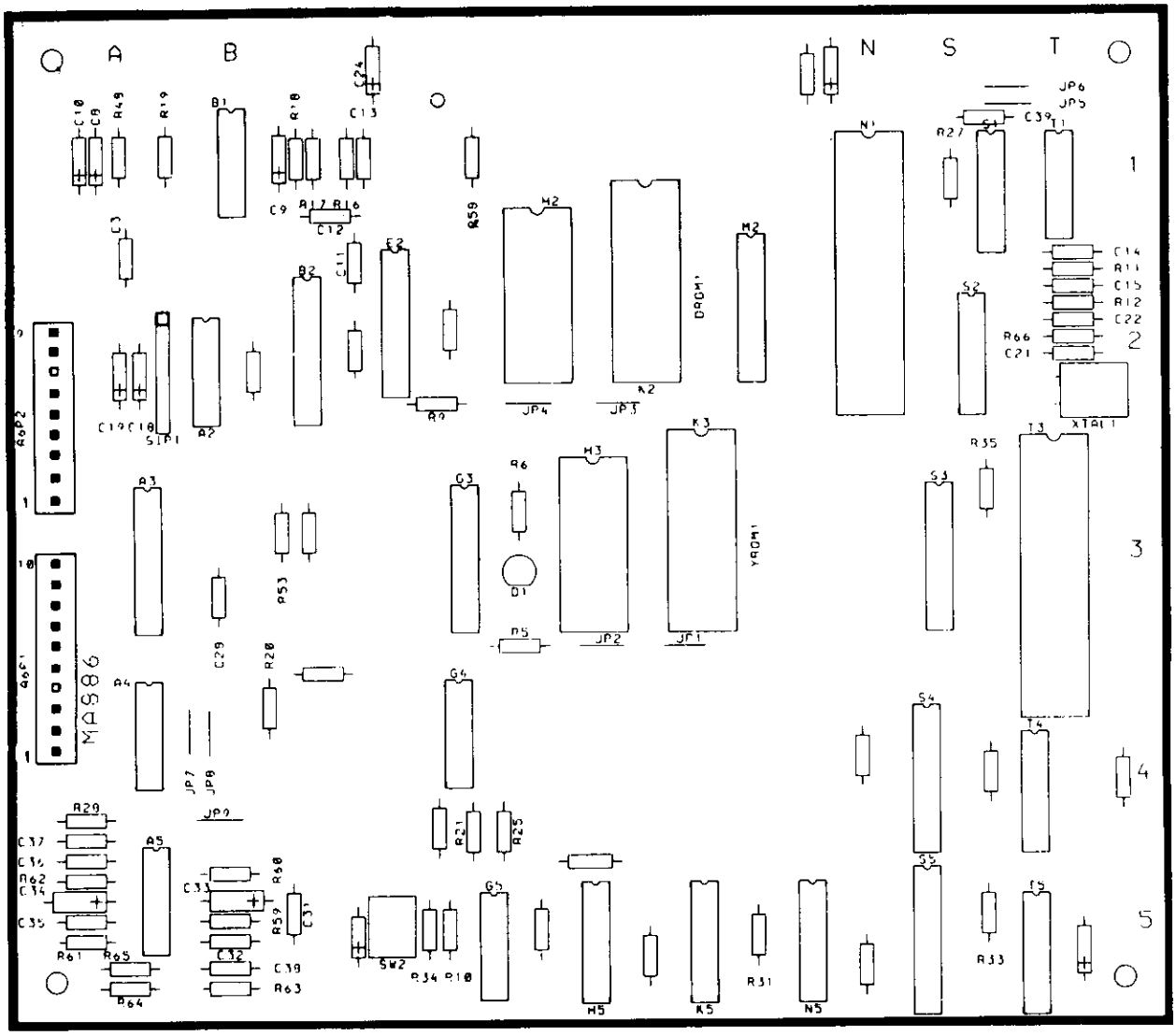
19 ←
18 ←
15 ←
9 ←
14 ←
8 ←
7 ←
6 ←
5 ←
4 ←
3 ←
2 ←
1 ←
16 ←
17 ←
20 ←
10 ←


25699 RIBBON CABLE
(TO S4 EXPAND SOCKET
MA-886-717 SOUND BOARD)
A20J1
19
18
+12V
-12V
+5V
C5
0.1UF
R6
1K
22
Vdd
6
RD
15
4
AO
9
24
SCLK
14
5
WR
7
CS
U1
YM2151
8
10
DO
7
12
D1
6
13
D2
5
14
D3
4
15
D4
3
16
D5
2
17
D6
1
18
D7
RES
3
16
17
20
10
CLK
23
SO
21
SH2
19
Vss
1
Vss
11
+5V
C6
0.1UF
1
Vdd
U2
YM3014
MP
CLK
5
SD
4
SH2
3
RB
8
7
A OUT
2
GND
6
+5V
C1
10UF
16V
Premier Technology
TITLE
AUXILIARY SOUND BOARD (A20)
USED ON
DRAWN
APPROVED
DATE
9-20-88
E-26145


6
5
7
NOT USED
U3
LM324
+12V
U3
LM324
C2
10UF
16V
2
4
1
3
11
C4
10UF
16V
R1
10K
C3
10UF
16V
-12V
AUDIO
U3
LM324
12
13
14
C8
1UF
R3
2.2K
C7
390PF
R2
22K
9
10
8
R4
12K
U3
LM324
C9
1UF
R5
10K
-12V

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

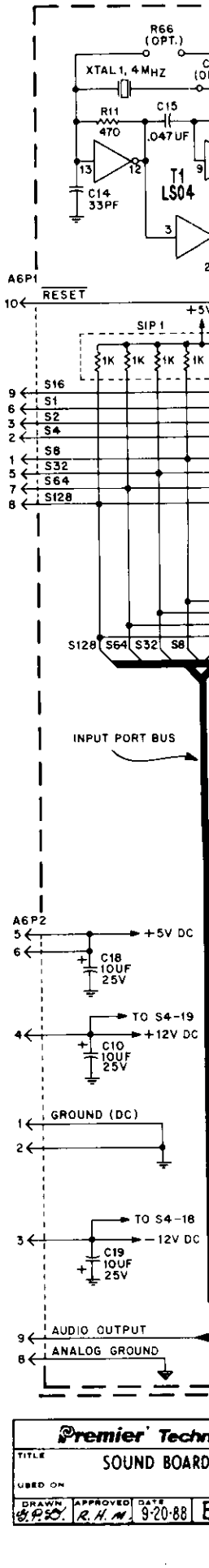
SOUND BOARD (A6) COMPONENT LOCATION



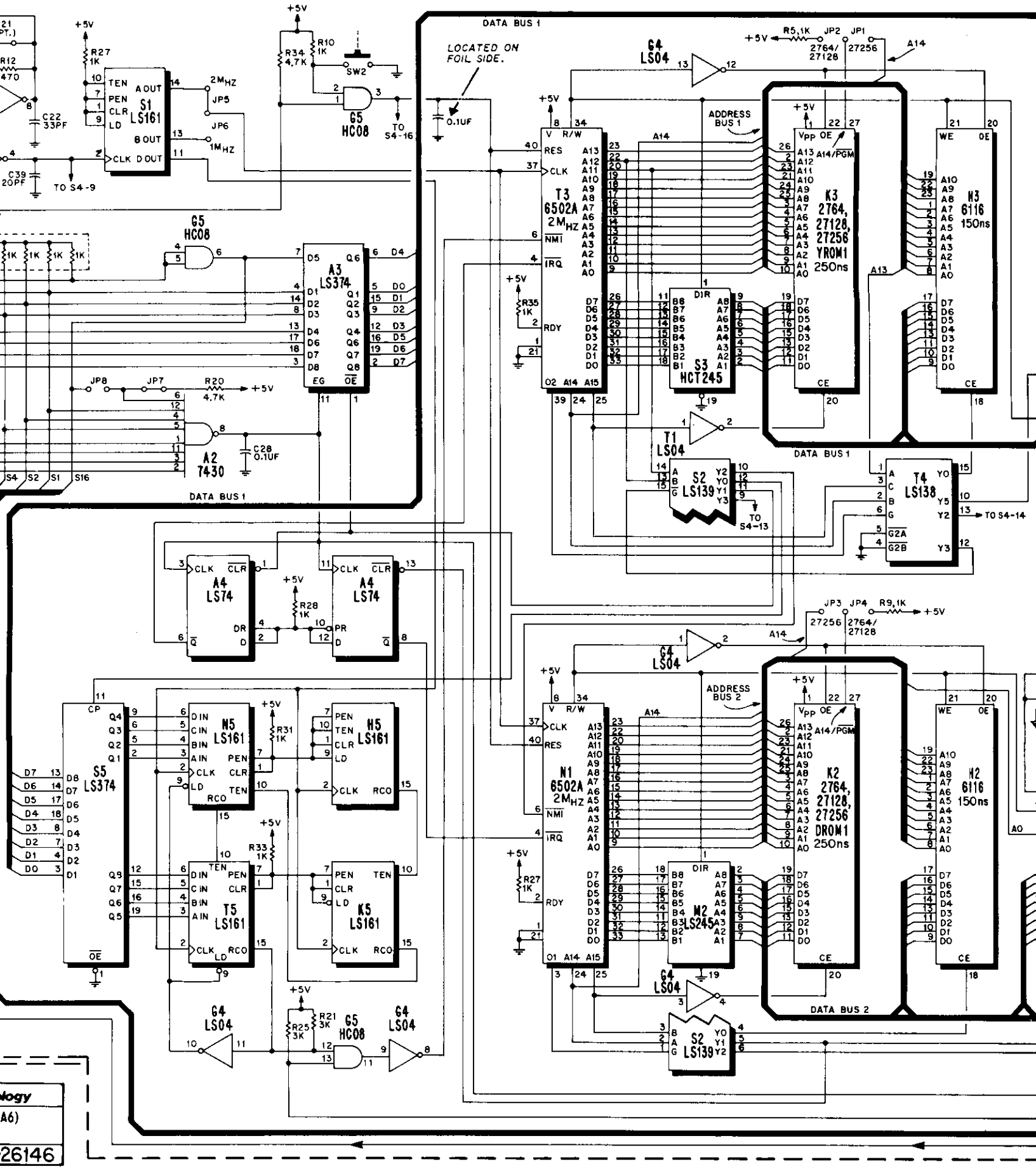
SOUND BOARD (A6) PARTS LIST

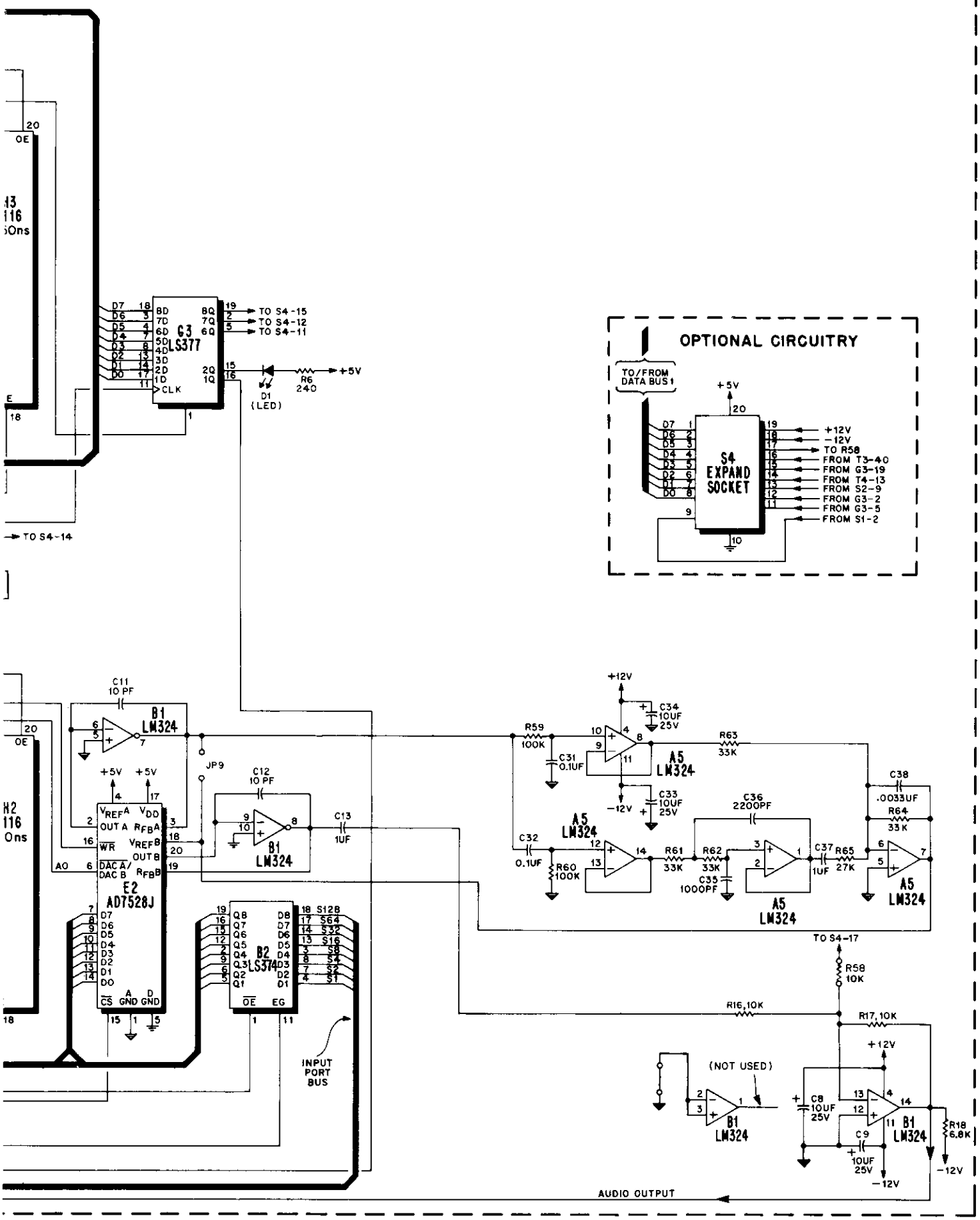
REFERENCE	DESCRIPTION	PART NUMBER
	Sound Board Assembly	MA-886-717
C13,C37	Capacitor, 1UF, 20%, 50V (Non-Polarized)	XO-746
C8,C9,C10 C18,C19,C24, C33,C34, AND THREE UNMARKED CAPACITORS	Capacitor, 10UF, 20%, 25V (Tantalum)	XO-127
C11,C12	Capacitor, 10PF,+80%-20%, 50V	XO-635
C14,C22	Capacitor, 33PF, 10%, 100V	XO-896
C15	Capacitor, .047UF, 20%, 50V	XO-638
C28 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
R5,R9,R10, R27,R28,R31, R33,R35	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
R21,R25	Resistor, 3K Ohm, 5%, 1/4W	XO-23
R16,R17,R58	Resistor, 10K Ohm, 5%, 1/4W	XO-18
R18	Resistor, 6.8K Ohm, 5%, 1/4W	XO-8
R20,R34	Resistor, 4.7K Ohm, 5%, 1/4W	XO-7

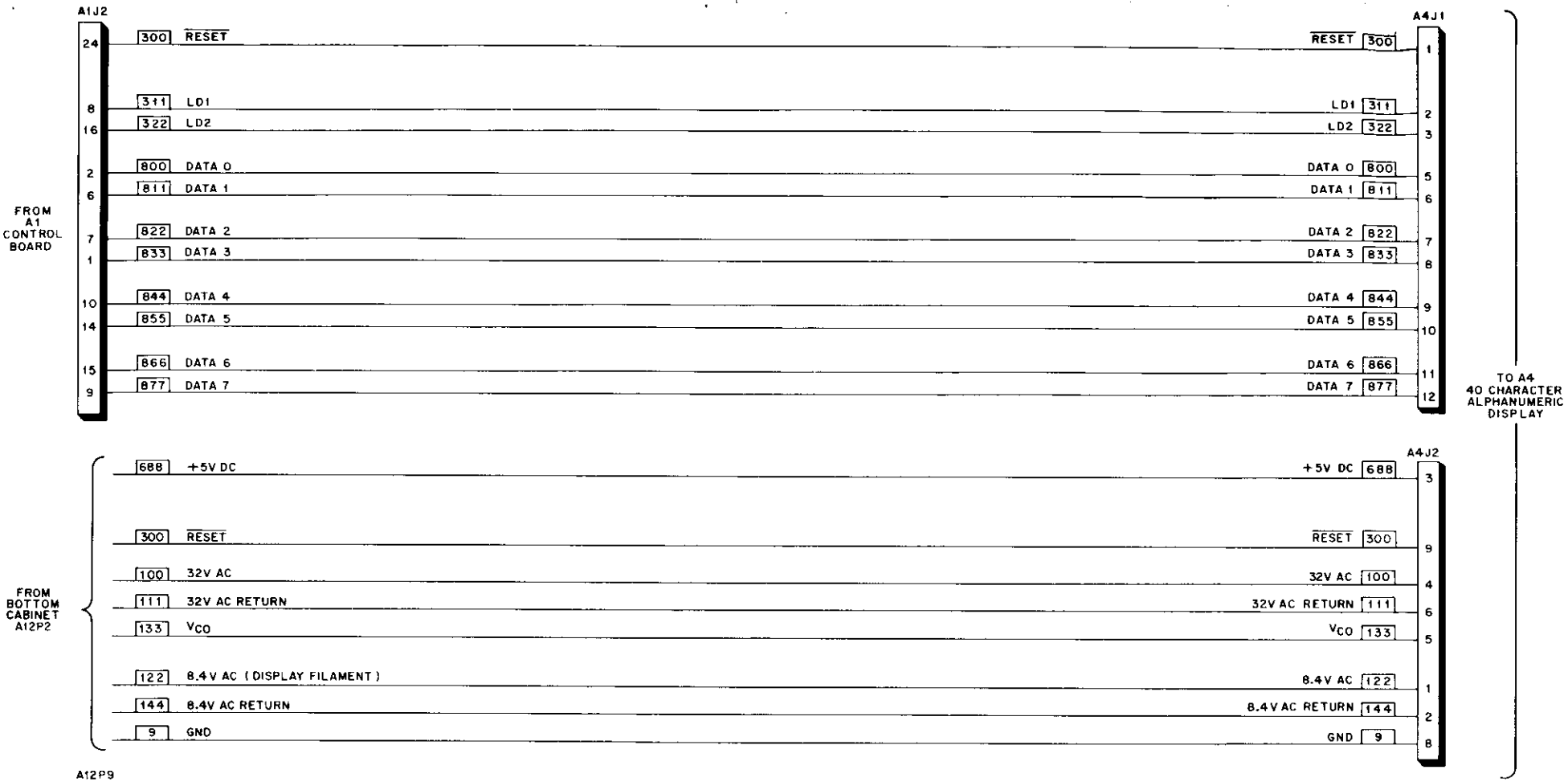
REFERENCE	DESCRIPTION	PART NUMBER
R61,R62,R63, R64	Resistor, 33K Ohm, 5%, 1/4W	XO-43
R59,R60	Resistor, 100K Ohm, 5%, 1/4W	XO-45
R65	Resistor, 27K Ohm, 5%, 1/4W	XO-11
A2	IC, 7430, 8 Input NAND Gate	XO-643
A3,B2,S5	IC, 74LS374, Octal "D" Flip Flop	XO-96
A4	IC, 74LS74, Dual "D" Flip Flop	XO-434
A5,B1	IC, LM324, Quad Op-Amp	XO-644
E2	IC, AD7528J, Multiplier DAC	XO-647
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
H5,K5,N5	IC, 74LS161, Synchronous Presettable Binary Counter	XO-440
S1,T5	IC, Specified Per Game	
K2,K3		
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 Transceiver	XO-891
T4	IC, 74LS138, 1 of 8 Decoder	XO-437
SIP 1	Resistor Pack 8 x 1K Ohm	XO-493
SW2	Switch, Pushbutton	XO-897
XTAL 1	Crystal, 4 MHZ	XO-366
A6P1,A6P2	Connector (2)	XO-879
	28 Pin Dip Socket (2)	XO-536
	Jumper, 22 Guage (7)	XO-469
	20 Pin Dip Socket	XO-491



Premier Techn			
TITLE	SOUND BOARD		
USED ON			
DRAWN G.P.S.	APPROVED R.H.M.	DATE 9-20-88	E


DATA BUS 1
LOCATED ON FOIL SIDE.
ADDRESS BUS 1
ADDRESS BUS 2
DATA BUS 2
T3 6502A 2MHZ
N1 6502A 2MHZ
K3 2764, 27128, 27256 YROM1 250ns
K2 2764, 27128, 27256 DROM1 250ns
M3 6116 150ns
M2 6116 150ns
S3 HCT245
M2 LS245
S2 LS139
T4 LS138
T1 LS04
G4 LS04
G5 HC08
A3 LS374
S5 LS374
A2 7430
A4 LS74
S1 LS161
N5 LS161
H5 LS161
T5 LS161
K5 LS161
R5,1K
R9,1K
R10 1K
R27 1K
R28 1K
R31 1K
R33 1K
R34 4.7K
R35 1K
R20 4.7K
R21 3K
R25 3K
C22 33PF
C39 20PF
C28 0.1UF
0.1UF
SW2
JP1
JP2
JP3
JP4
JP5
JP6
JP7
JP8
2MHZ
1MHZ
TO S4-16
TO S4-9
TO S4-13
TO S4-14
+5V


OPTIONAL CIRCUITRY
TO/FROM DATA BUS 1
S4 EXPAND SOCKET
+12V
-12V
TO R58
FROM T3-40
FROM G3-19
FROM T4-13
FROM S2-9
FROM G3-2
FROM G3-5
FROM S1-2
G3 LS377
TO S4-15
TO S4-12
TO S4-11
TO S4-14
D1 (LED)
R6 240
+5V
B1 LM324
C11 10 PF
C12 10 PF
JP9
C13 1UF
E2 AD7528J
B2 LS374
INPUT PORT BUS
A5 LM324
R59 100K
C31 0.1UF
C34 10UF 25V
C33 10UF 25V
R63 33K
C32 0.1UF
R60 100K
R61 33K
R62 33K
C35 1000PF
C36 2200PF
C37 1UF
R65 27K
C38 .0033UF
R64 33K
TO S4-17
R58 10K
R16, 10K
R17, 10K
(NOT USED)
C8 10UF 25V
C9 10UF 25V
R18 6.8K
AUDIO OUTPUT



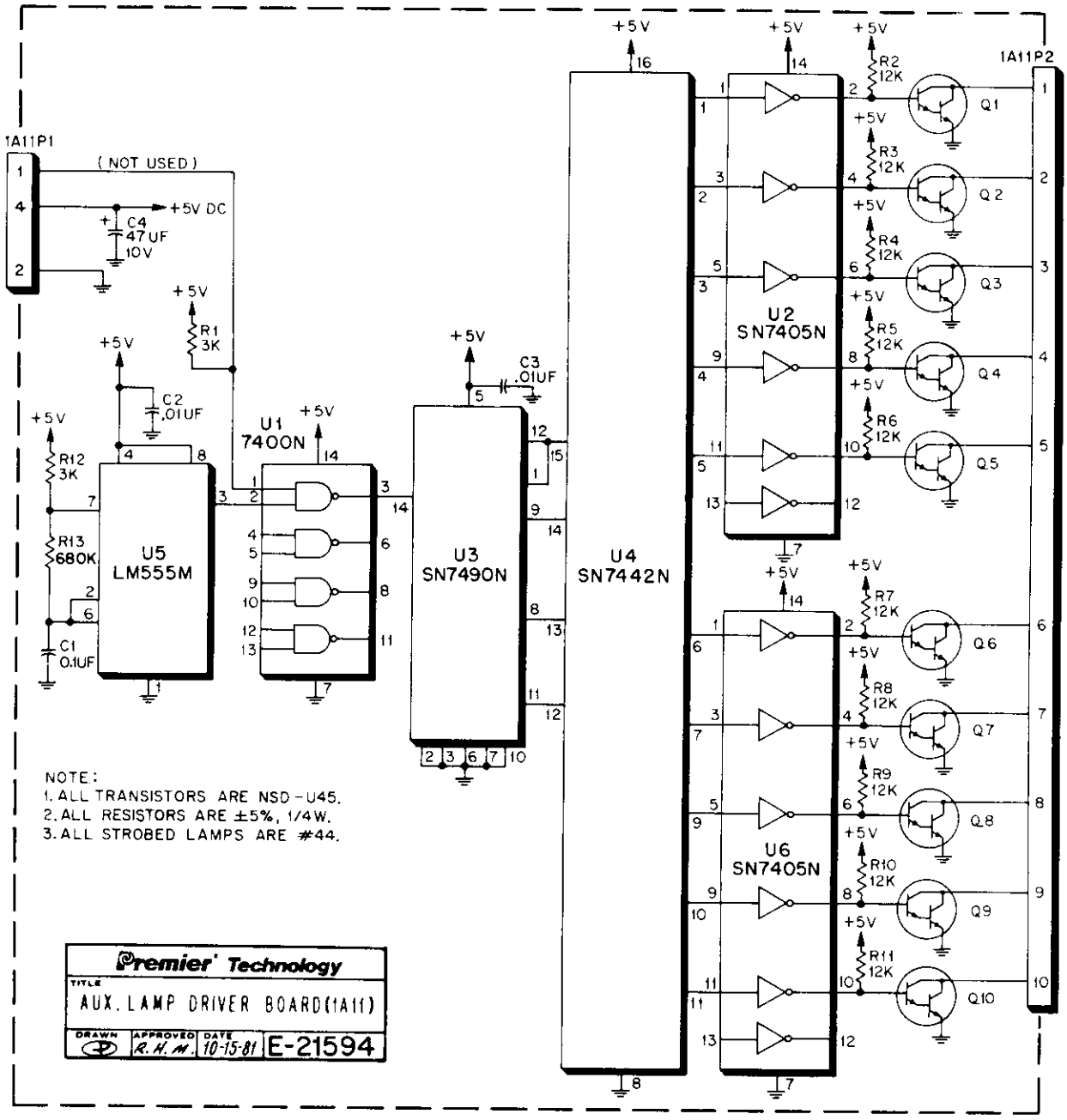
ITEM	PART NO.
BALLAST, 50/60Hz	25228
STARTER	24675
FLUORESCENT LAMP	24674

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

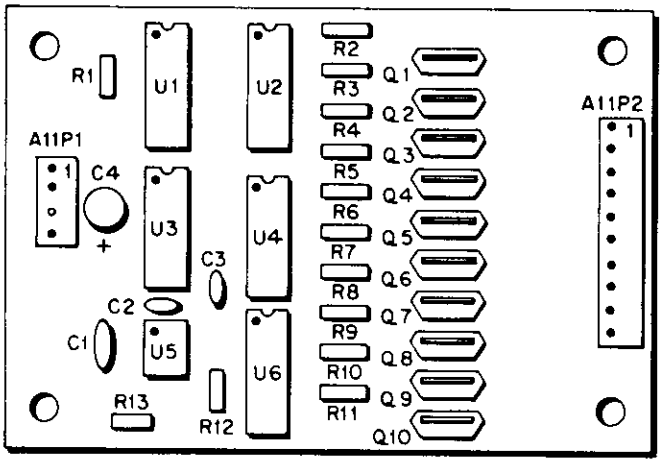
Premier Technology

TITLE: LIGHTBOX, SCHEMATIC/ WIRING DIAGRAM

DRAWN	APPROVED	DATE	
P.S.	R.H.	MAY 9 88	E-26000



AUXILIARY LAMP DRIVER BOARD (A11) COMPONENT LOCATION

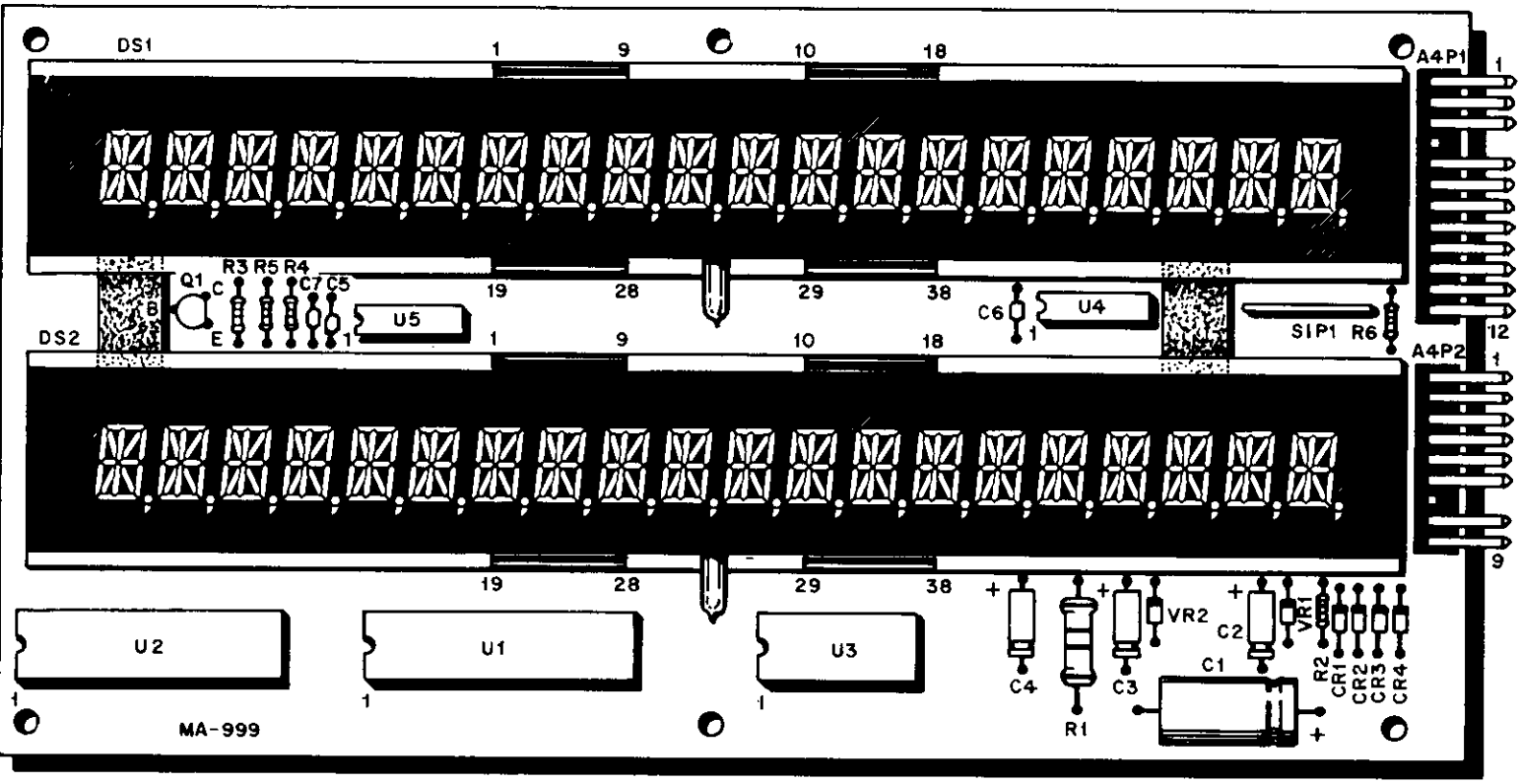


AUXILIARY LAMP DRIVER BOARD (A11) PARTS LIST

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

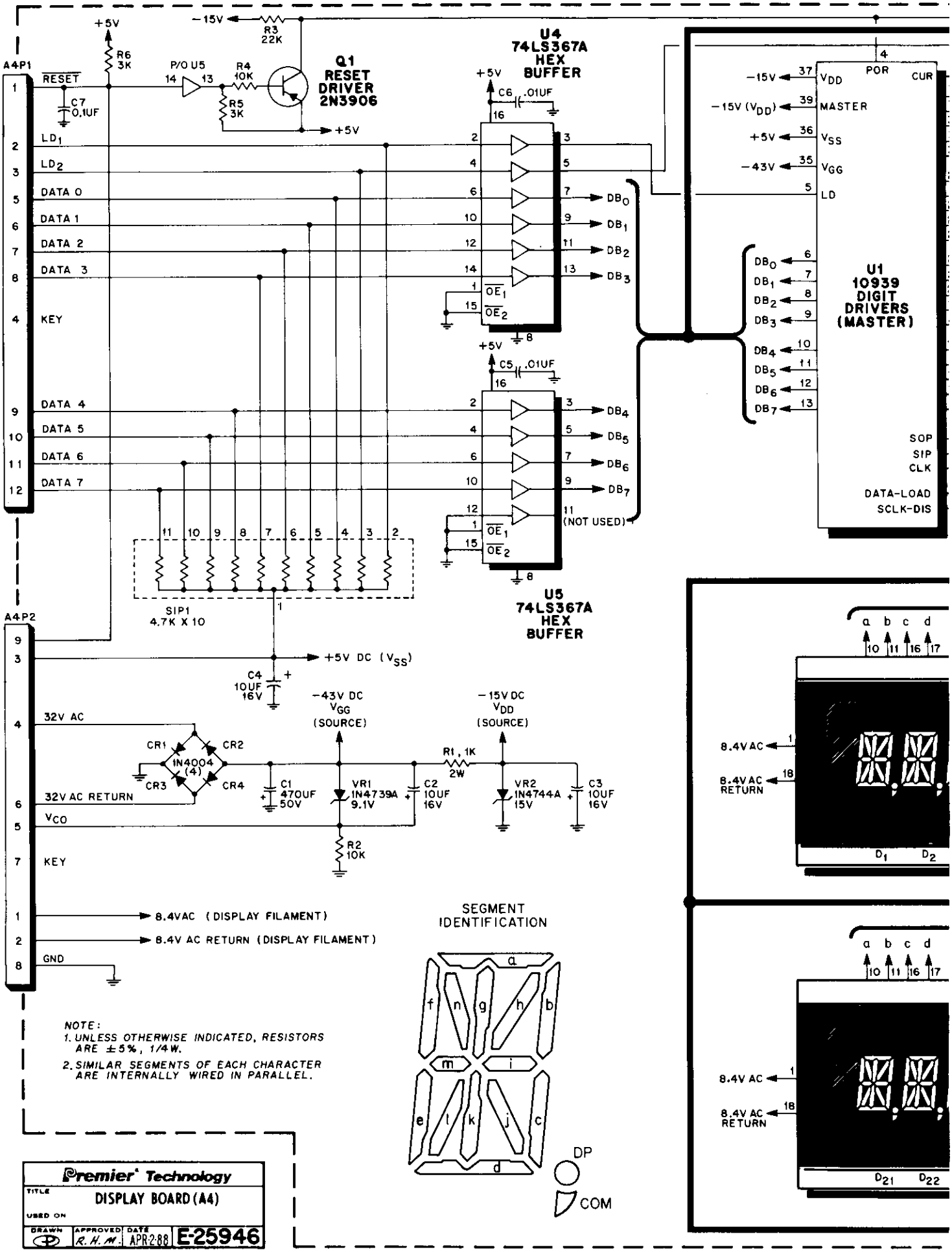
X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

DISPLAY BOARD (A4) COMPONENT LOCATION



DISPLAY BOARD (A4) PARTS LIST

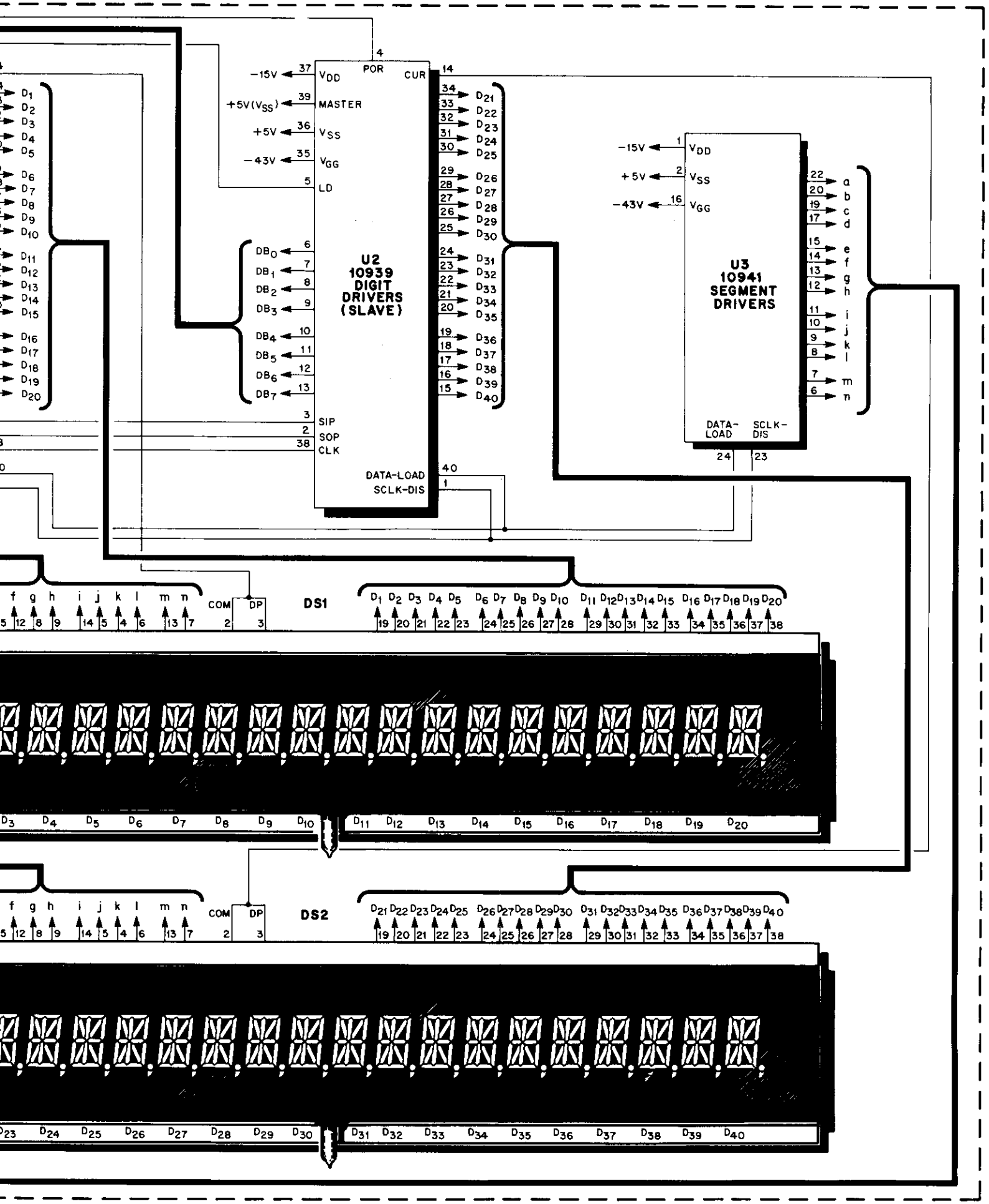
REFERENCE	DESCRIPTION	PART NUMBER
	Display Board Assembly	MA-999
C1	Capacitor, 470UF, 50V	XO-847
C2,C3,C4	Capacitor, 10UF, 16V, +80%-20%	XO-846
C5,C6	Capacitor, .01UF, +80%-20%	XO-229
C7	Capacitor, 0.1UF, +80%-20%	XO-230
CR1-CR4	Diode, 1N4004	XO-254
DS1,DS2	Display, Alphanumeric	XO-901
Q1	Transistor, PNP, Reset Driver, 2N3906	XO-588
R1	Resistor, 1K Ohm, 5%, 2 W, WW	XO-627
R2,R4	Resistor, 10K Ohm, 5%, 1/4 W	XO-18
R3	Resistor, 22K Ohm, 5%, 1/14 W	XO-42
R5,R6	Resistor, 3K Ohm, 5%, 1/4 W	XO-23
SIP1	Resistor Pack, 11 Pin SIP, 4.7K Ohm x 10	XO-869
U1,U2	IC, Digit Drivers, 10939P	XO-841
U3	IC, Segment Drivers, 10941P	XO-842
U4,U5	IC; Hex Buffer, 74LS367A	XO-444
VR1	Diode, Zener, 9.1V, 1N4739A	XO-881
VR2	Diode, Zener, 15V, 1N4744A	XO-843
A4P1	12 Position Connector	XO-880-124
A4P2	9 Position Connector	XO-880-097
	Tape, Neoprene (2)	24290



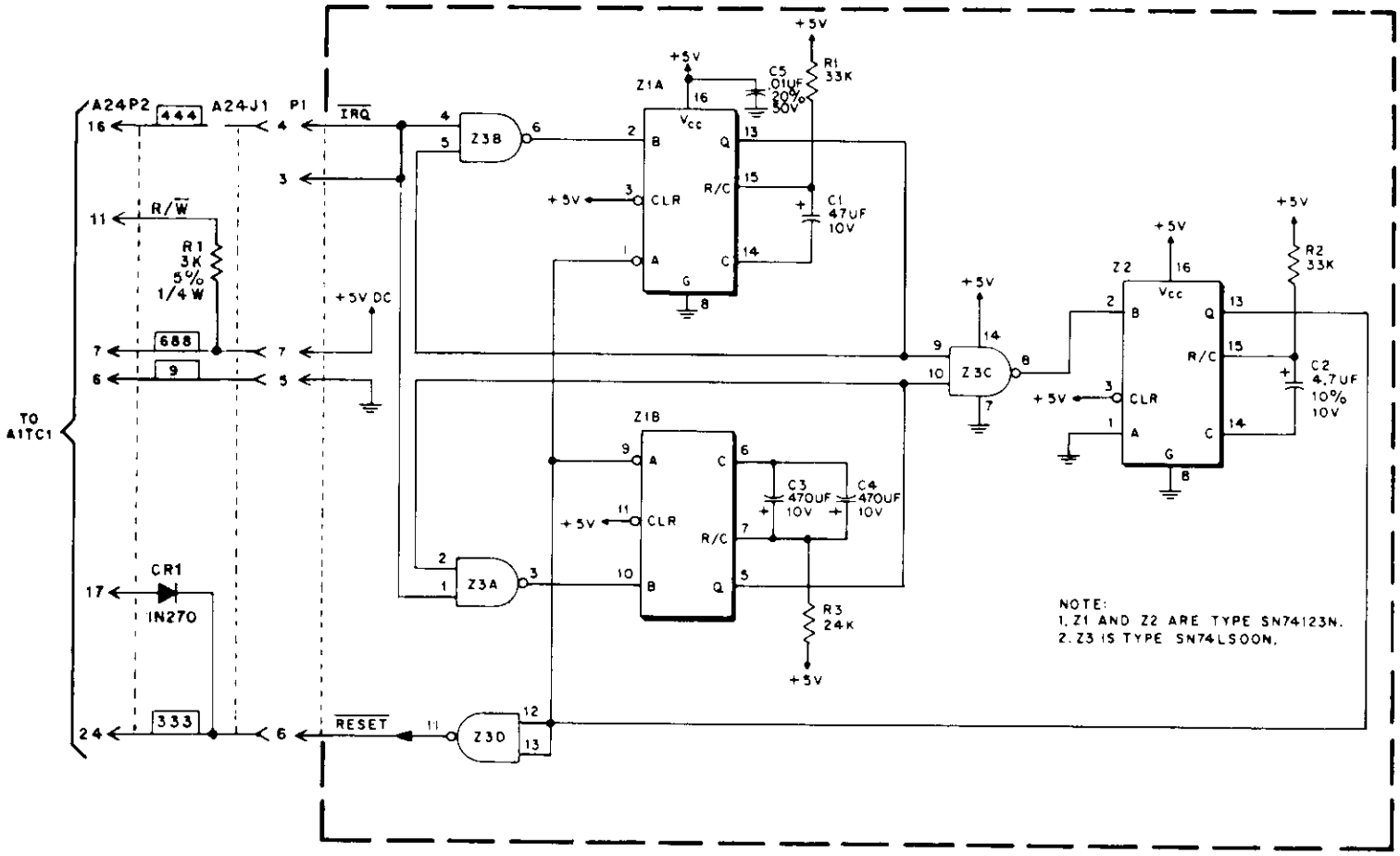
SEGMENT IDENTIFICATION

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-25946
	R. H. M.	APR-2-88	

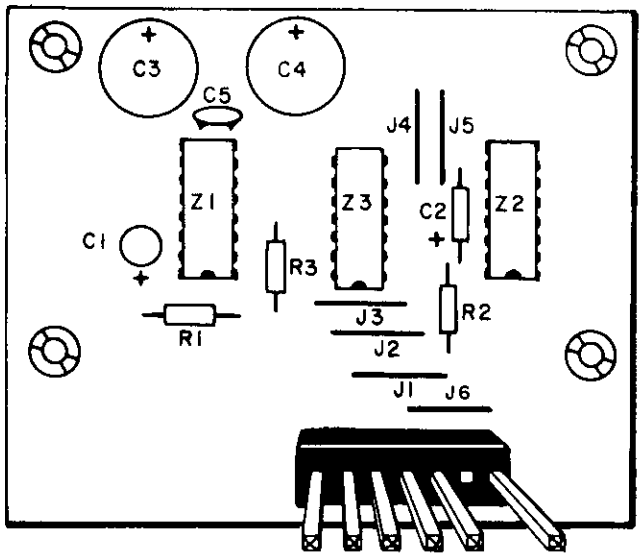

U2
10939
DIGIT
DRIVERS
(SLAVE)
U3
10941
SEGMENT
DRIVERS
DS1
DS2
POR
CUR
MASTER
LD
SIP
SOP
CLK
DATA-LOAD
SCLK-DIS
COM
DP

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



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

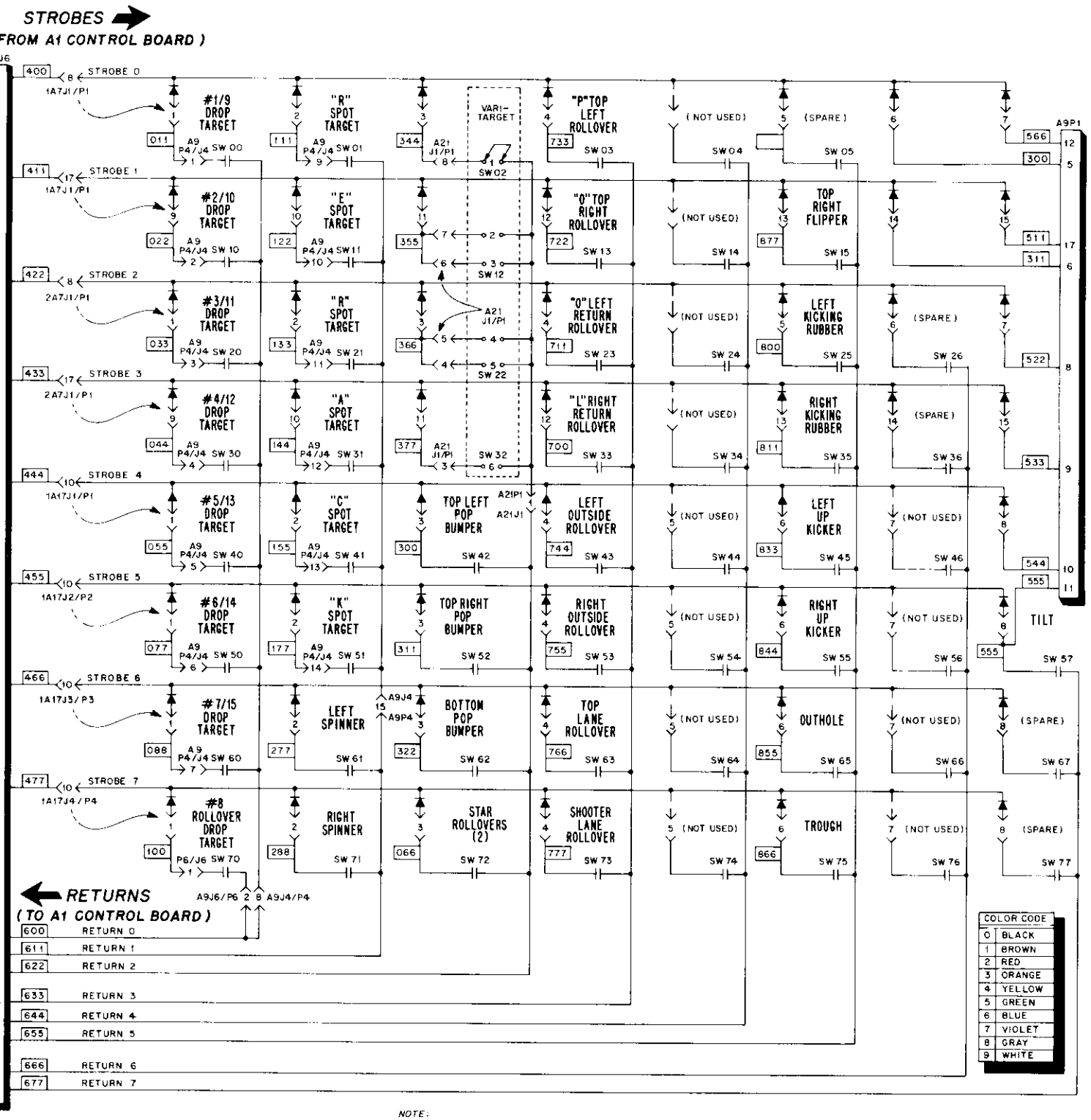
RESET BOARD (A24) COMPONENT LOCATION



RESET BOARD (A24) PARTS LIST

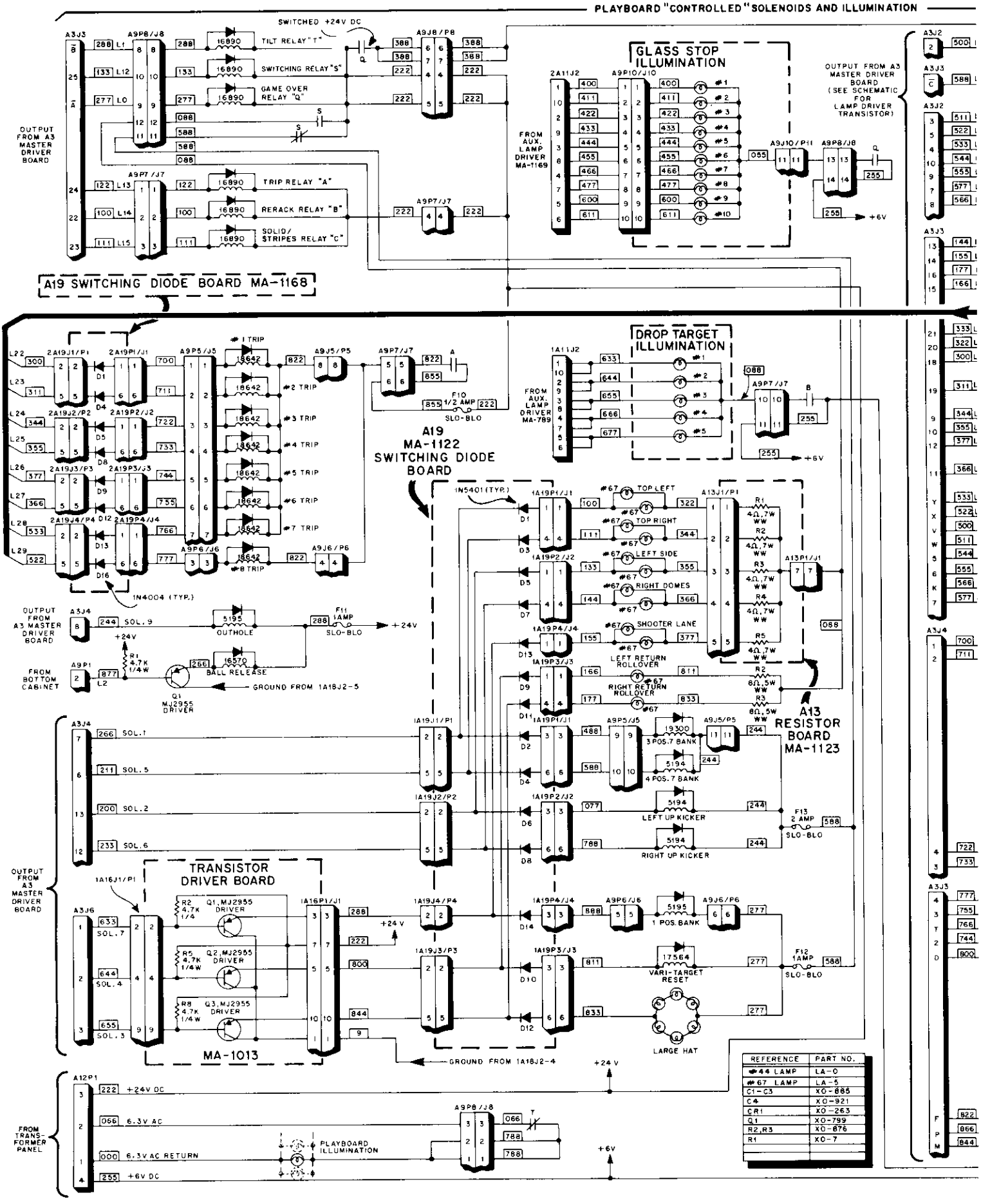
REFERENCE	DESCRIPTION	PART NUMBER
	Reset Board Assembly	MA-980
R1, R2	Resistor 33K Ohm, 5%, 1/4W	XO-43
R3	Resistor 24K Ohm, 5%, 1/4W	XO-10
C1	Capacitor 47UF, 10V	XO-227
C2	Capacitor 4.7UF, 10V	XO-226
C3, C4	Capacitor 470UF, 10V	XO-214
C5	Capacitor .01UF	XO-202
Z1, Z2	IC, 74123N	XO-398
Z3	IC, 74LS00N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

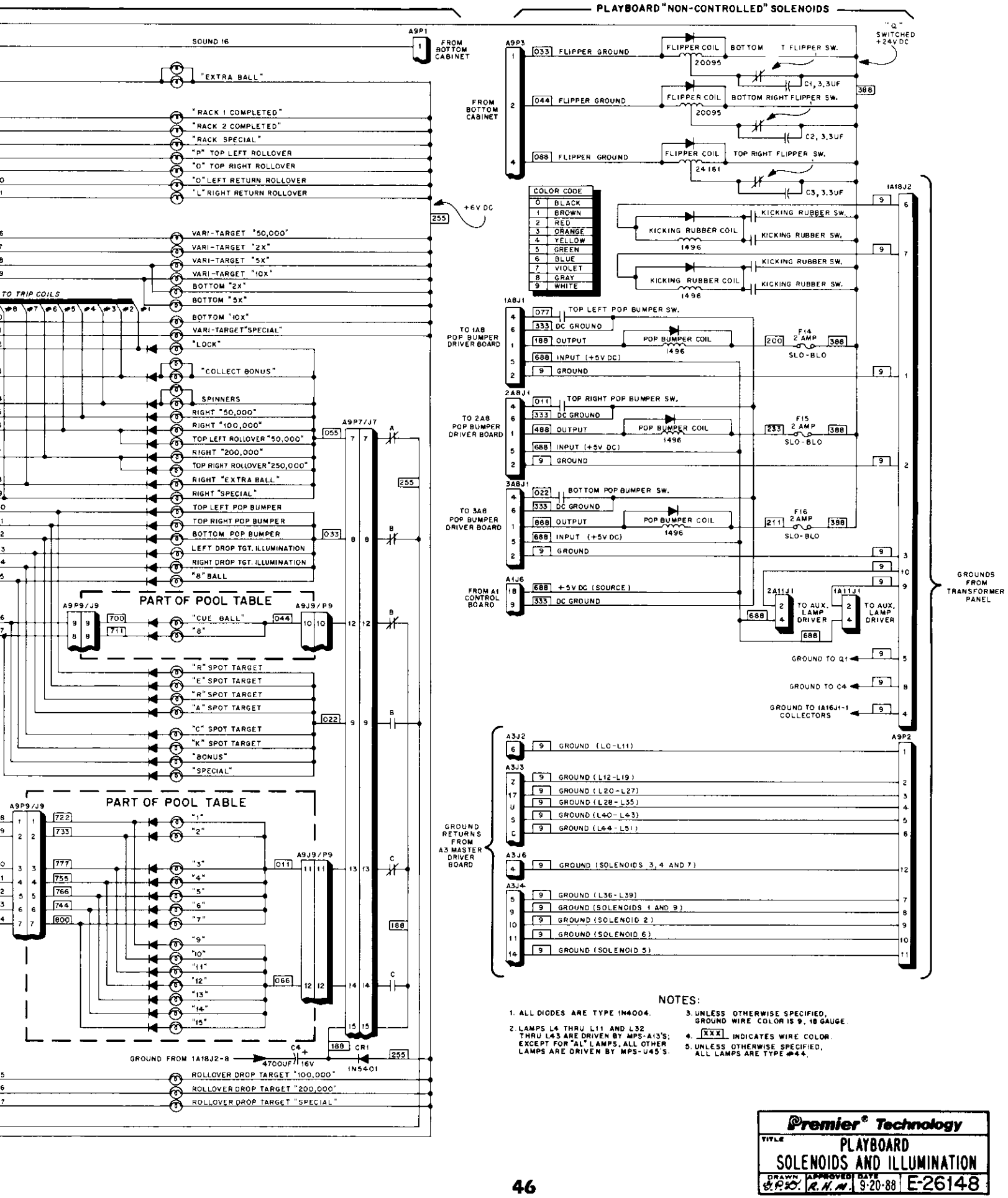
X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



NOTE:
1. DIODES USED ARE TYPE 1N270.
2. DIODE BOARD ASSEMBLIES;
   1A7 AND 2A7 PART NO. 26091
   1A17 PART NO. MA-1165

Premier Technology			
TITLE: SWITCH MATRIX			
USED ON: GAME #717			
DRAWN: G.P.S.	APPROVED: R.H.M.	DATE: 9-20-88	E-26147


PLAYBOARD "CONTROLLED" SOLENOIDS AND ILLUMINATION
SWITCHED +24V DC
TILT RELAY "T"
SWITCHING RELAY "S"
GAME OVER RELAY "Q"
TRIP RELAY "A"
RERACK RELAY "B"
SOLID/STRIPES RELAY "C"
OUTPUT FROM A3 MASTER DRIVER BOARD
GLASS STOP ILLUMINATION
FROM AUX. LAMP DRIVER MA-1169
OUTPUT FROM A3 MASTER DRIVER BOARD (SEE SCHEMATIC FOR LAMP DRIVER TRANSISTOR)
A19 SWITCHING DIODE BOARD MA-1168
DROP TARGET ILLUMINATION
FROM AUX. LAMP DRIVER MA-789
A19 MA-1122 SWITCHING DIODE BOARD
1N4004 (TYP.)
1N5401 (TYP.)
TOP LEFT
TOP RIGHT
LEFT SIDE
RIGHT DOMES
SHOOTER LANE
LEFT RETURN ROLLOVER
RIGHT RETURN ROLLOVER
A13 RESISTOR BOARD MA-1123
3 POS. 7 BANK
4 POS. 7 BANK
1 POS. BANK
LEFT UP KICKER
RIGHT UP KICKER
VARI-TARGET RESET
LARGE HAT
OUTHOLE
BALL RELEASE
Q1 MJ2955 DRIVER
GROUND FROM 1A18J2-5
TRANSISTOR DRIVER BOARD
MA-1013
GROUND FROM 1A18J2-4
FROM TRANSFORMER PANEL
6.3V AC
6.3V AC RETURN
+6V DC
PLAYBOARD ILLUMINATION
REFERENCE | PART NO.
#44 LAMP | LA-0
#67 LAMP | LA-5
C1-C3 | XO-885
C4 | XO-921
CR1 | XO-263
Q1 | XO-799
R2,R3 | XO-876
R1 | XO-7



NOTES:

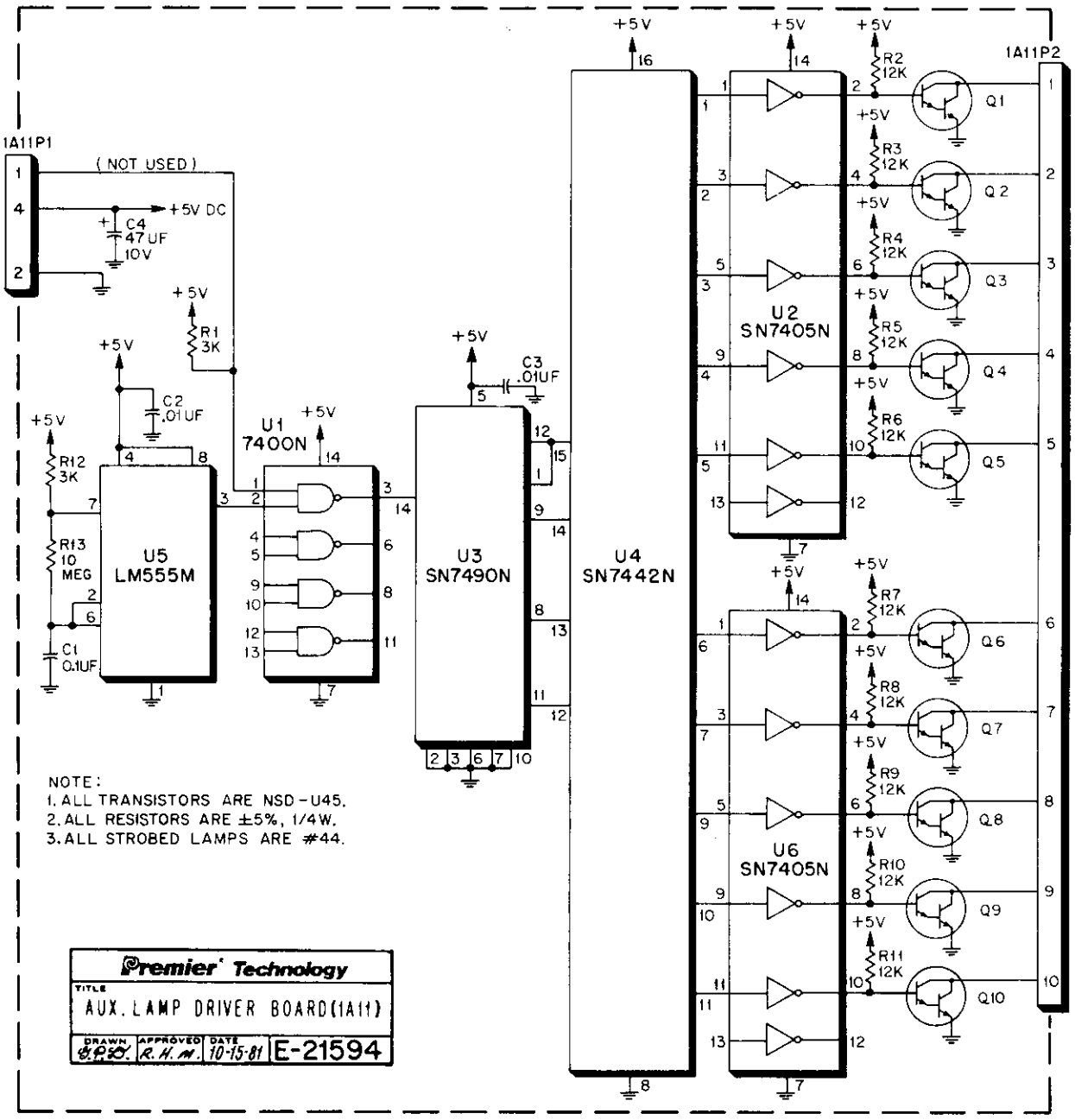
1. ALL DIODES ARE TYPE 1N4004.
2. LAMPS L4 THRU L11 AND L32 THRU L43 ARE DRIVEN BY MPS-A13'S; EXCEPT FOR "AL" LAMPS, ALL OTHER LAMPS ARE DRIVEN BY MPS-U45'S.
3. UNLESS OTHERWISE SPECIFIED, GROUND WIRE COLOR IS 9, 18 GAUGE.
4. [XXX] INDICATES WIRE COLOR.
5. UNLESS OTHERWISE SPECIFIED, ALL LAMPS ARE TYPE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

Premier® Technology

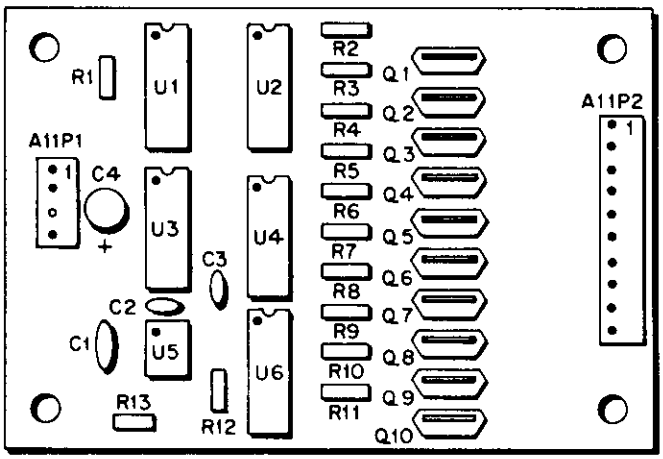
TITLE: PLAYBOARD SOLENOIDS AND ILLUMINATION

DRAWN	APPROVED	DATE	
JPO	R.N.M.	9-20-88	E-26148

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



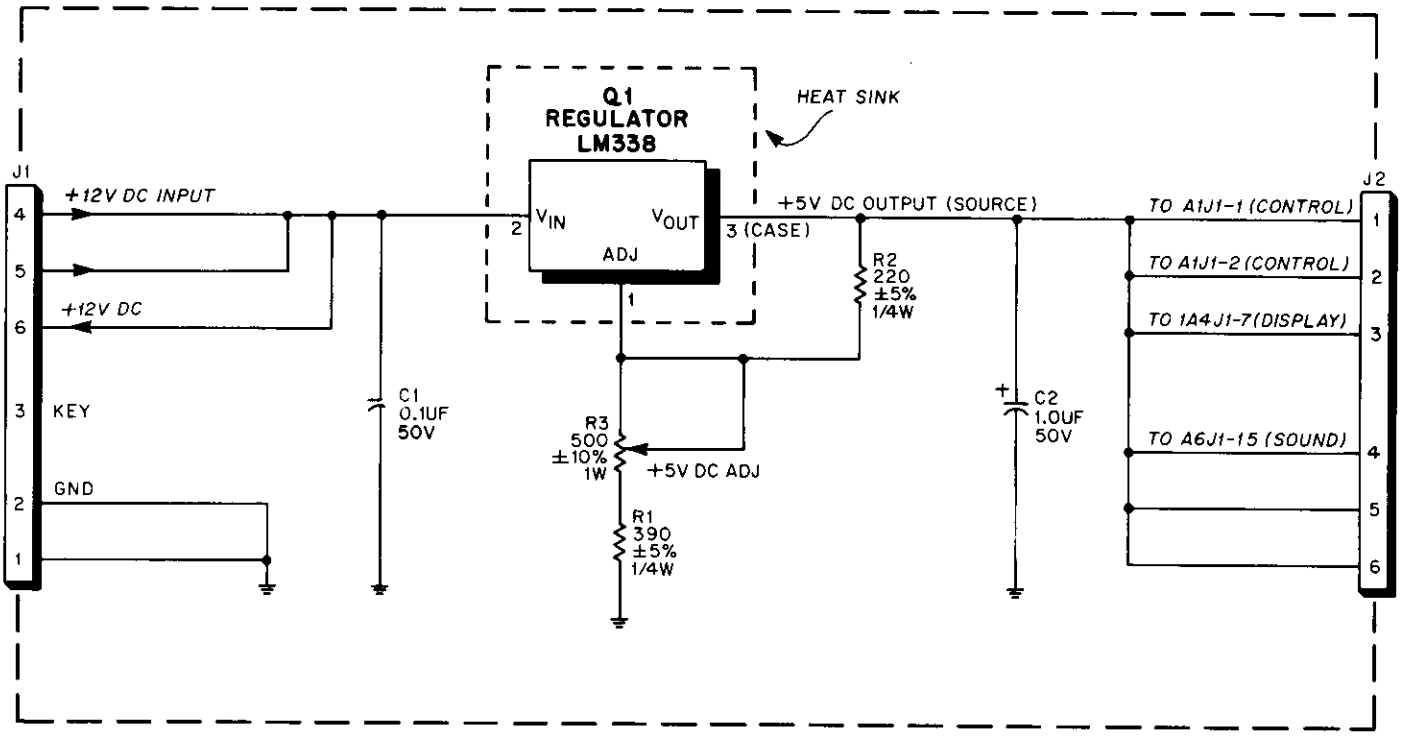
AUXILIARY LAMP DRIVER BOARD (A11) COMPONENT LOCATION



AUXILIARY LAMP DRIVER BOARD (A11) PARTS LIST

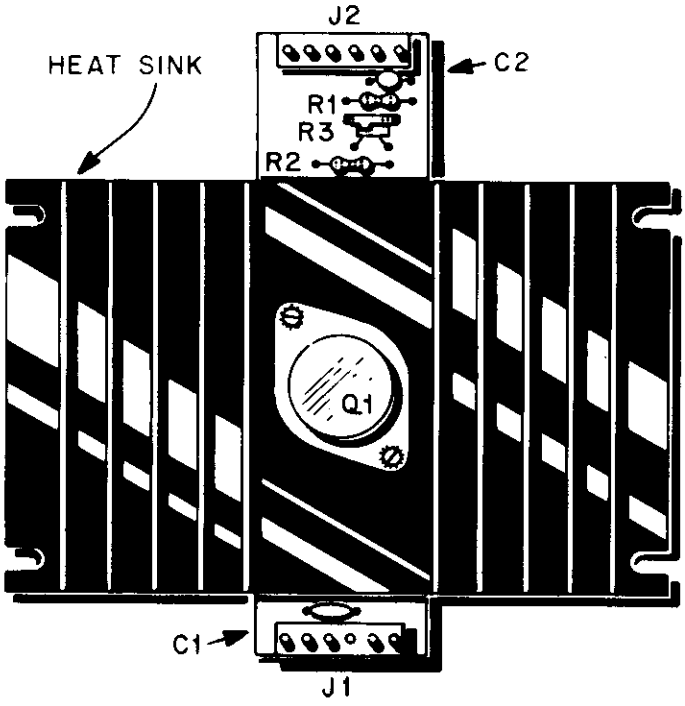
REFERENCE	DESCRIPTION	PART NUMBER
	AUXILIARY LAMP DRIVER ASSEMBLY	MA-1169
C1	CAPACITOR, .1 MFD, 100V CERAMIC RADIAL LEAD	XO-626
C2-C3	CAPACITOR, .01 MFD, 100V RADIAL LEAD	XO-202
C4	CAPACITOR, 47 MFD, 10V ELECTROLYTIC RADIAL LEAD	XO-227
Q1-Q10	TRANSISTOR, NSD-U45 NPN DARLINGTON	XO-146
R1,R12	RESISTOR, 3K OHM, 5%, 1/4 W	XO-23
R2-R11	RESISTOR, 12K OHM, 5%, 1/4W	XO-9
R13	RESISTOR, 10Meg Ohm, 5%, 1/4W	XO-73
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



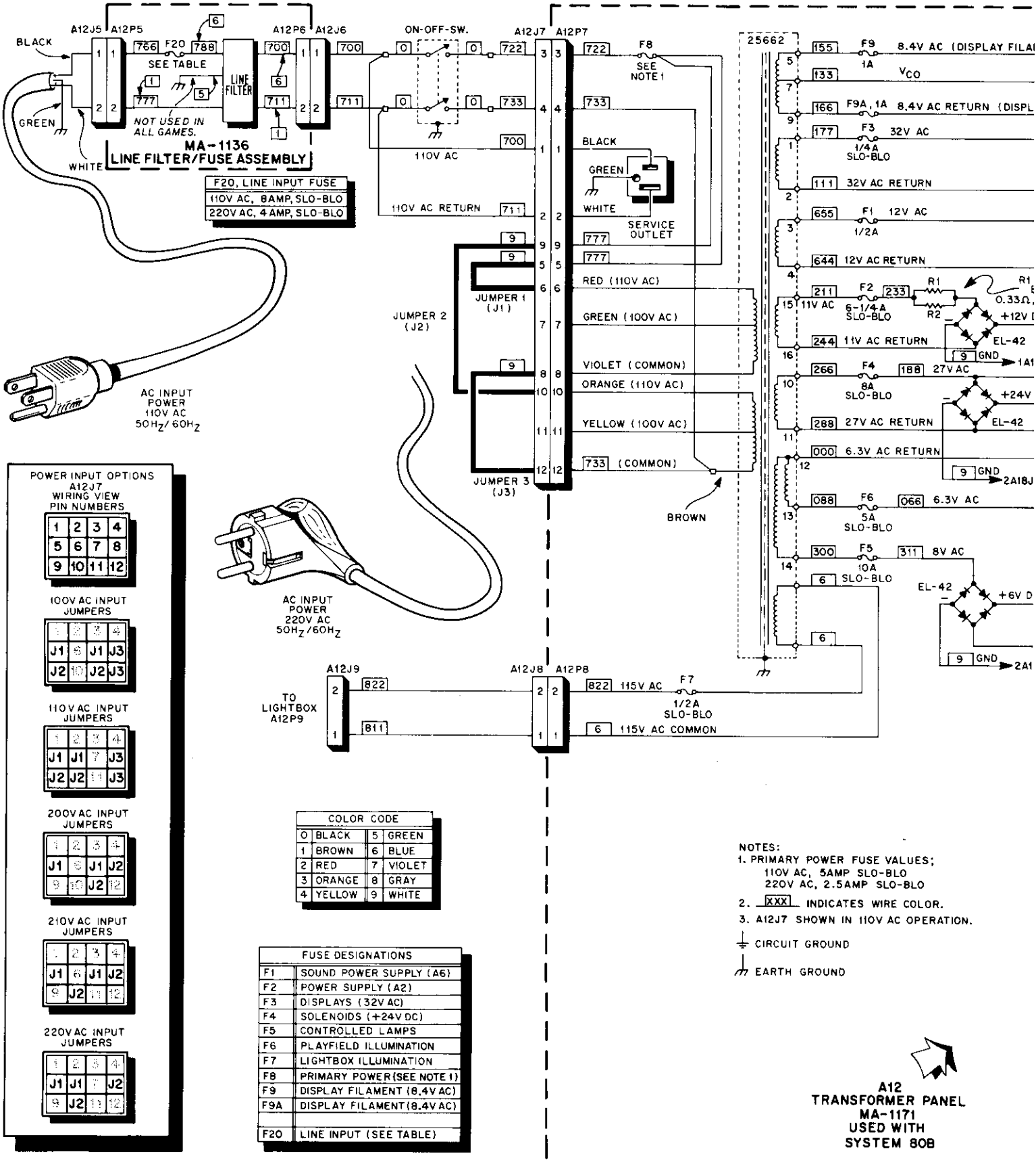
Premier Technology			
TITLE: POWER SUPPLY (A2)			
USED ON			
DRAWN	APPROVED	DATE	E-24441
	R.H.M.	12 FEB 85	

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



POWER INPUT OPTIONS
A12J7
WIRING VIEW
PIN NUMBERS

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

100V AC INPUT JUMPERS

J1		J1	J3
J2		J2	J3

110V AC INPUT JUMPERS

J1	J1		J3
J2	J2		J3

200V AC INPUT JUMPERS

J1		J1	J2
		J2	

210V AC INPUT JUMPERS

J1		J1	J2
	J2		

220V AC INPUT JUMPERS

J1	J1		J2
	J2		

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 (8.4V AC)
F9A	DISPLAY FILAMENT (8.4V 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-1171
USED WITH
SYSTEM 80B

Premier Technology

TITLE	
TRANSFORMER PANEL/CABINET SCHEMATIC/WIRING DIAGRAM	
DRAWN	G.P.S.
APPROVED	R.H.M.
DATE	9-20-88
	E-26149

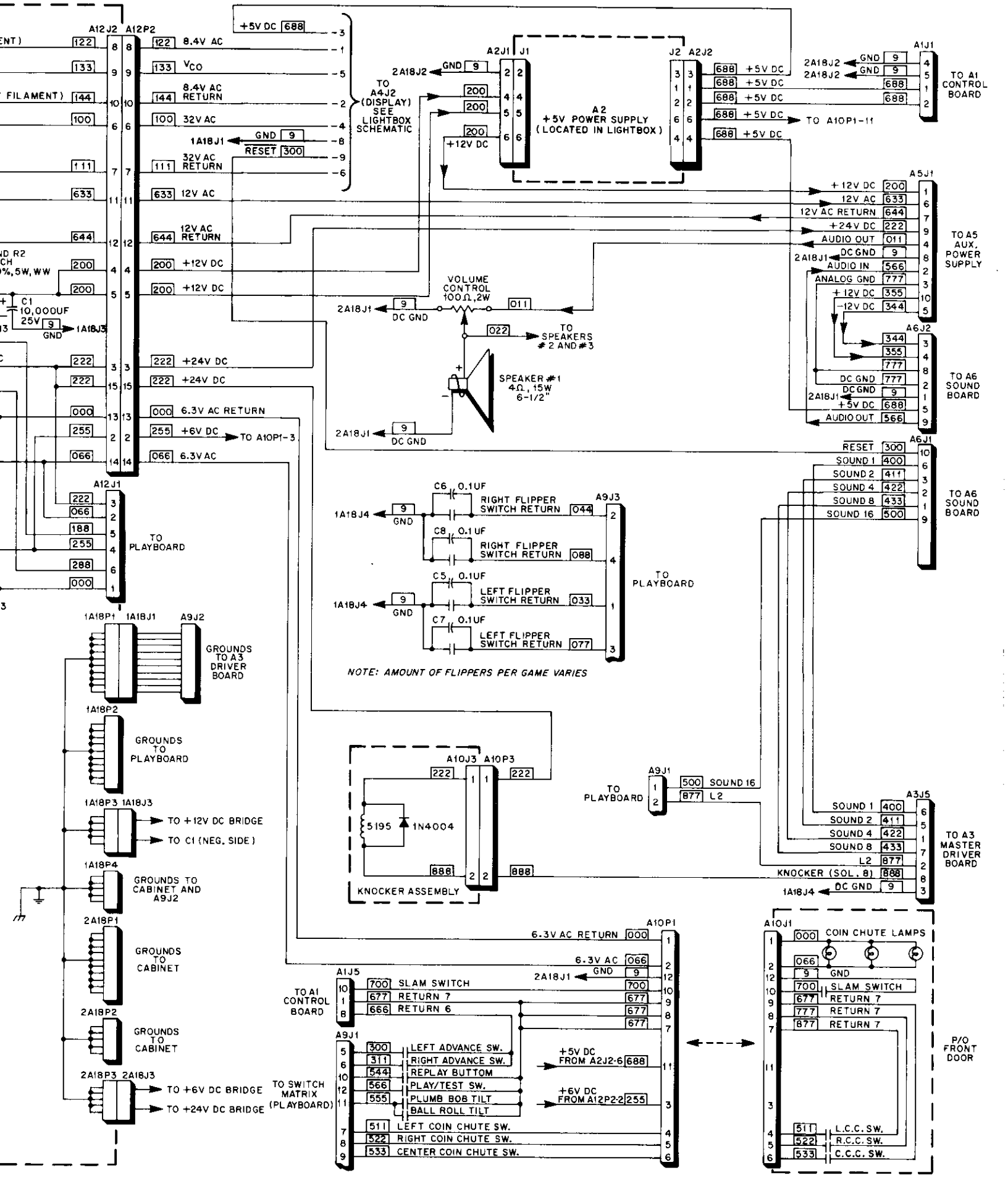

A12J2 A12P2
+5V DC 688
8.4V AC
VCO
8.4V AC RETURN
32V AC
GND 9
RESET 300
32V AC RETURN
12V AC
12V AC RETURN
+12V DC
+24V DC
6.3V AC RETURN
+6V DC
6.3V AC
TO A4J2 (DISPLAY) SEE LIGHTBOX SCHEMATIC
A2J1 J1
J2 A2J2
A2 +5V POWER SUPPLY (LOCATED IN LIGHTBOX)
TO A10P1-11
A1J1
TO A1 CONTROL BOARD
A5J1
TO A5 AUX. POWER SUPPLY
A6J2
TO A6 SOUND BOARD
VOLUME CONTROL 100Ω,2W
TO SPEAKERS #2 AND #3
SPEAKER #1 4Ω, 15W 6-1/2"
C1 10,000UF 25V
A12J1
TO PLAYBOARD
A6J1
RESET
SOUND 1
SOUND 2
SOUND 4
SOUND 8
SOUND 16
C6 0.1UF
RIGHT FLIPPER SWITCH RETURN 044
C8 0.1UF
RIGHT FLIPPER SWITCH RETURN 088
C5 0.1UF
LEFT FLIPPER SWITCH RETURN 033
C7 0.1UF
LEFT FLIPPER SWITCH RETURN 077
A9J3
NOTE: AMOUNT OF FLIPPERS PER GAME VARIES
1A18P1 1A18J1 A9J2
GROUNDS TO A3 DRIVER BOARD
1A18P2
GROUNDS TO PLAYBOARD
1A18P3 1A18J3
TO +12V DC BRIDGE
TO C1 (NEG. SIDE)
1A18P4
GROUNDS TO CABINET AND A9J2
2A18P1
GROUNDS TO CABINET
2A18P2
GROUNDS TO CABINET
2A18P3 2A18J3
TO +6V DC BRIDGE
TO +24V DC BRIDGE
A10J3 A10P3
5195 1N4004
KNOCKER ASSEMBLY
A9J1
SOUND 16
L2
A3J5
TO A3 MASTER DRIVER BOARD
KNOCKER (SOL. 8)
A10P1
A1J5
TO A1 CONTROL BOARD
SLAM SWITCH
RETURN 7
RETURN 6
A9J1
LEFT ADVANCE SW.
RIGHT ADVANCE SW.
REPLAY BUTTOM
PLAY/TEST SW.
PLUMB BOB TILT
BALL ROLL TILT
+5V DC FROM A2J2-6
+6V DC FROM A12P2-2
TO SWITCH MATRIX (PLAYBOARD)
LEFT COIN CHUTE SW.
RIGHT COIN CHUTE SW.
CENTER COIN CHUTE SW.
A10J1
COIN CHUTE LAMPS
L.C.C. SW.
R.C.C. SW.
C.C.C. SW.
P/O FRONT DOOR

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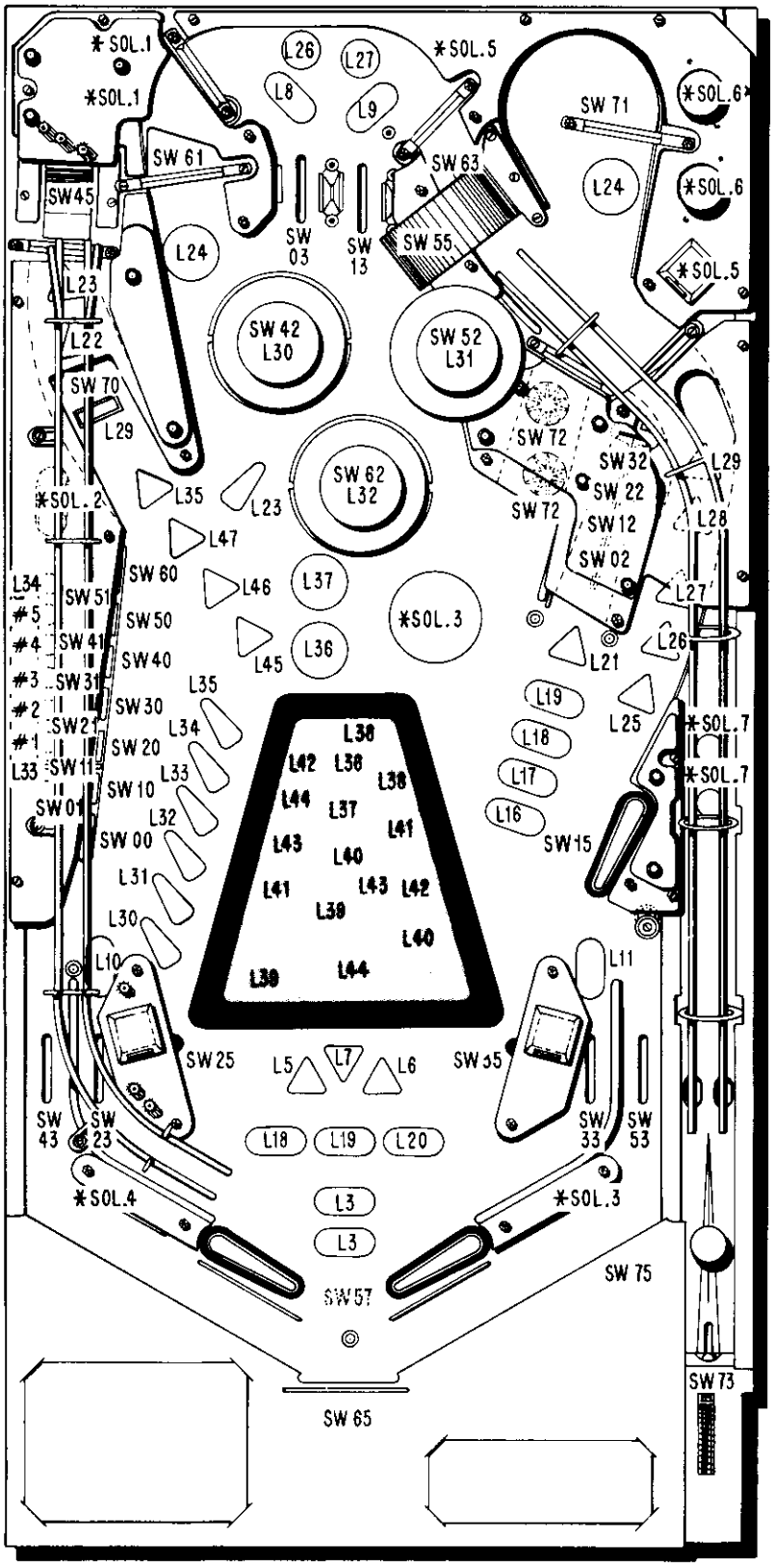
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RIGHT AND LEFT UPKICKERS
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UNIQUE PARTS..... 57

XI. PARTS INFORMATION



NOTE:

1. L0 Enables Relay "Q", L1 Enables relay "T", L2 Enables Ball Release, L12 Enables Relay "S", L13 Enables Relay "A", L14 Enables Relay "B", L15 Enables Relay "C".

2. The following Devices Are Dependent Upon The State of the "S" Relay. (Identified by * in illustration).

DEVICE	"S" ON	"S" OFF
Sol. 1	3 Position, 7 Bank	Top Left #67 (2)
Sol. 2	Left Up Kicker	Left Side #67 (2)
Sol. 3	Large Hat Lamps	Right Return #67
Sol. 4	Vari-Target Reset	Left Return #67
Sol. 5	4 Position, 7 Bank	Top Right #67 (2)
Sol. 6	Right Up Kicker	Right Domes #67 (2)
Sol. 7	1 Position Bank	Shooter Lane #67 (2)

PLAYBOARD SWITCH AND LAMP ASSIGNMENTS

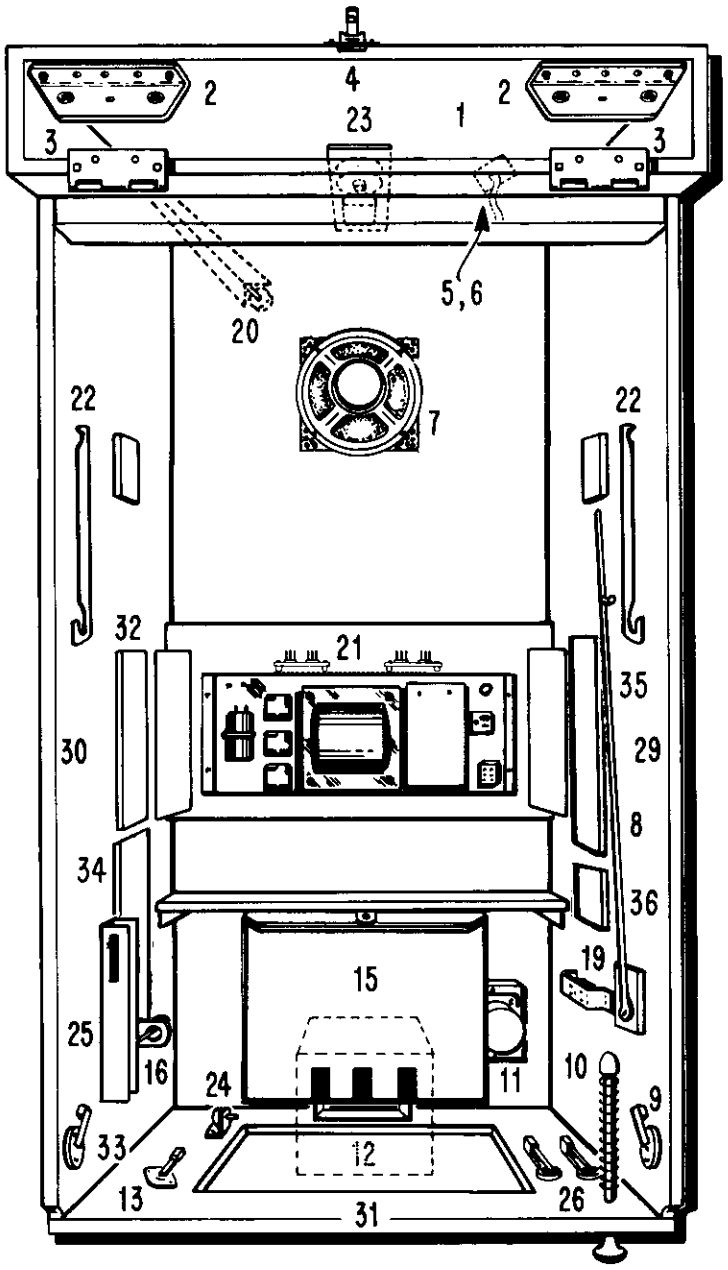
LAMP NUMBER	LAMP ASSIGNMENT
L3	"Extra Ball"
L4	Sound 16
L5	"Rack 1 Completed"
L6	"Rack 2 Completed"
L7	"Rack Special"
L8	"P" Top Left Rollover
L9	"O" Top Right Rollover
L10	"O" Left Return Rollover
L11	"L" Right Return Rollover
L16	Vari-Target "50,000"
L17	Vari-Target "2X"
L18	Vari-Target "5X", Bottom "2X"
L19	Vari-Target "10X", Bottom "5X"
L20	Bottom "10X"
L21	Vari-Target "Special"
L22	"Lock"
L23	"Collect Bonus"
L24	Spinners
L25	Right "50,000"
L26	Right "100,000", Top Left Rollover "50,000"
L27	Right "200,000", Top Right Rollover "250,000"
L28	Right "Extra Ball"
L29	Right "Special"
L30	Top Left Pop Bumper, "R" Spot Target
L31	Top Right Pop Bumper, "E" Spot Target
L32	Bottom Pop Bumper, "R" Spot Target
L33	Left Drop Target Illumination, "A" Spot Target
L34	Right Drop Target Illumination, "C" Spot Target
L35	"8" Ball, "K" Spot Target
L36	"Cue Ball", "Bonus"
L37	"8","Special"
L38	"1", "9"
L39	"2", "10"
L40	"3", "11"
141	"4", "12"
L42	"5", "13"
L43	"6", "14"
L44	"7", "15"
L45	Rollover Drop Target "100,000"
L46	Rollover Drop Target "200,000"
L47	Rollover Drop Target "Special"

SWITCH MATRIX NUMBER	SWITCH ASSIGNMENT	PART NO.
SW 00	#1/9 Drop Target	25894
SW 01	"R" Spot Target Assembly, White	25628Z
SW 02	Vari-Target, Position 1	P/O MA-1163
SW 03	"P" Top Left Rollover	25824
SW 10	#2/10 Drop Target	25894
SW 11	"E" Spot Target Assembly, White	25628Z
SW 12	Vari-Target, Positions 2 and 3	P/O MA-1163
SW 13	"O" Top Right Rollover	25824
SW 15	Top Right Flipper	26056
SW 20	#3/11 Drop Target	25894
SW 21	"R" Spot Target Assembly, White	25628Z
SW 22	Vari-Target, Positions 4 and 5	P/O MA-1163
SW 23	"O" Left Return Rollover	25933
SW 25	Left Kicking Rubber (Scoring)	18808
	Actuating Switch and Bracket(2)	22225
SW 30	#4/12 Drop Target	25894
SW 31	"A" Spot Target Assembly, White	25628Z
SW 32	Vari-Target, Position 6	P/O MA-1163
SW 33	"L" Right Return Rollover	25824
SW 35	Right Kicking Rubber (Scoring)	18808
	Actuating Switch and Bracket	22225
SW 40	#5/13 Drop Target	25894
SW 41	"C" Spot Target Assembly, White	25628Z
SW 42	Top Left Pop Bumper	21352
SW 43	Left Outside Rollover	25933
SW 45	Left Upkicker	21415
SW 50	#6/14 Drop Target	25894
SW 51	"K" Spot Target Assembly, White	25628Z
SW 52	Top Right Pop Bumper	21352
SW 53	Right Outside Rollover	25824
SW 55	Right Upkicker	21415
SW 57	Tilt (With Bracket)	9141
SW 60	#7/15 Drop Target	25894
SW 61	Left Spinner	19353
SW 62	Bottom Pop Bumper	21352
SW 63	Top Lane Rollover	25824
SW 65	Outhole (Assembly)	25825
SW 70	#8 Rollover Drop Target	25650
SW 71	Right Spinner	19353
SW 72	Star Rollover (2)	12881
SW 73	Shooter Lane Rollover	25933
SW 75	Trough	25824

XI. PARTS INFORMATION

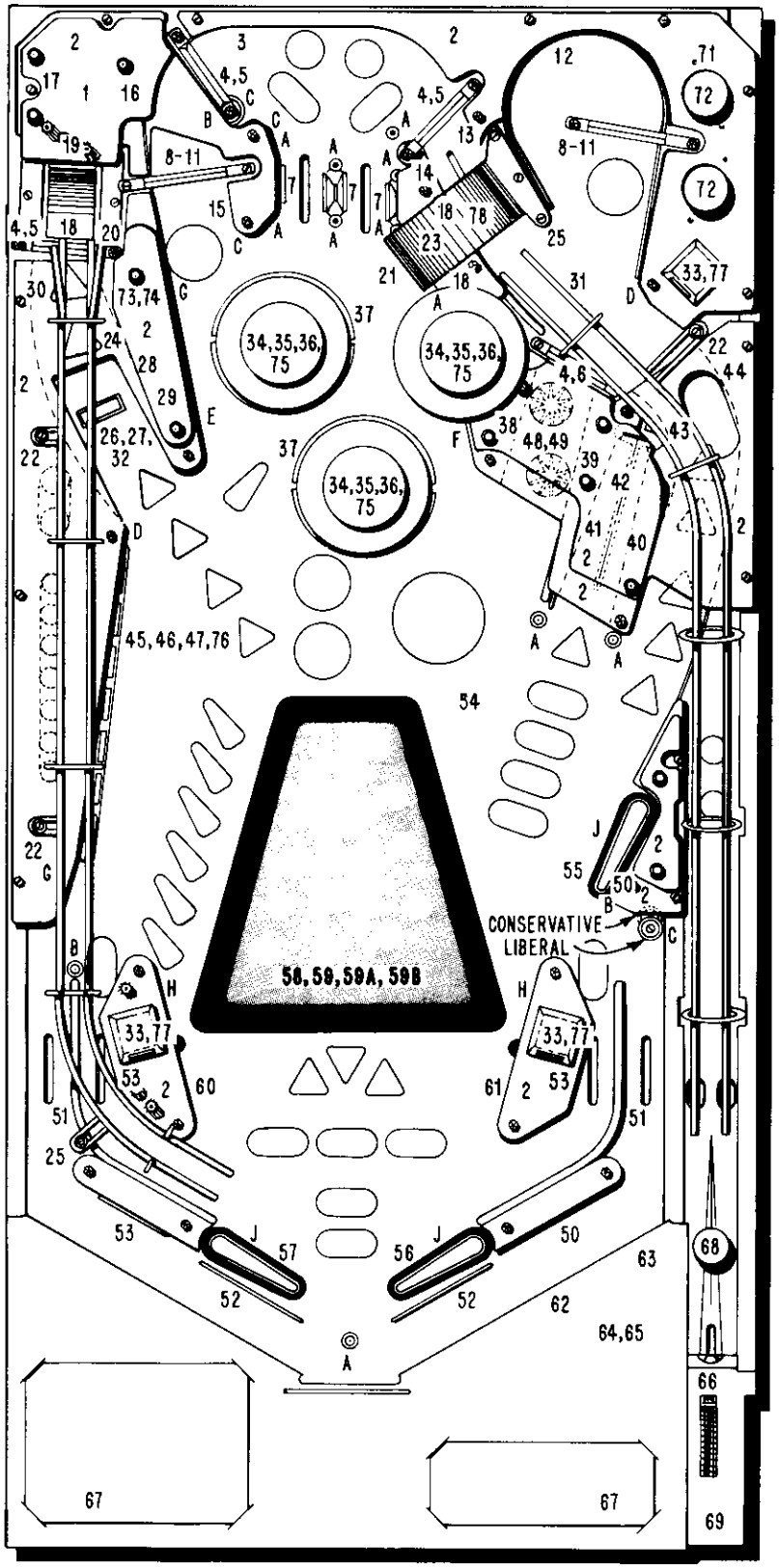
CABINET PARTS

ITEM	DESCRIPTION	PART NO.
1.	Cabinet	26097-717
2.	Lightbox Mounting Bracket (2)	19916
	Attaching Capscrew (2), Not Shown	FA-151
	Lockwasher (2), Not Shown	FA-641
3.	Butt Hinge, (Shown For Reference Only, P/O Lighbox 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	23364
7.	Speaker, 4 Ohm, 15W, 6-1/2"	EL-83
	Speaker Guard	20931
8.	Prop Stick, Playfield	23940
9.	Right Flipper Switch	26055
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 (N/O)	26130
	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
	Clip	14653
19.	Knocker Assembly	MA-12
	Bell Assembly (Gong)(When Used)	MA-352
20.	Cabinet Leg (4)	4337
	Leg Bolt (8)	3775
	3" Leg Adjuster (4)	MH-21
	3/8-16, Jam Nut (8)	FA-665
21.	Transformer Panel Assembly	MA-1171
	Bridge Rectifier (3)	EL-42
	Cable Assembly (Secondary)	MA-1038
	Capacitor, 10,000UF, 25V	XO-830
	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, 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
	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	25662
22.	Cabinet Pivot Bracket (Left)	25658
	Cabinet Pivot Bracket (Right)	25657



ITEM	DESCRIPTION	PART NO.
23.	Line Filter Assembly	MA-1136
	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)	24293
28.	Lightbox (Not Shown)	26082-717
29.	Right Moulding (Not Shown)	22735
30.	Left Moulding (Not Shown)	22736
31.	Front Moulding (Not Shown)	16951
32.	Mounting Board Assembly	MA-1166
	A11 Aux. Lamp Driver Board	MA-789
	A13 Resistor Board	MA-1123
	A19 Switching Diode Board	MA-1122
33.	Left Flipper Switch	26075
34.	Mounting Board Assembly	MA-1167
	A11 Aux. Lamp Driver Board	MA-1169
	A19 Switching Diode Board	MA-1168
35.	Mounting Board Assembly	MA-1054
	A8 Pop Bumper Driver Board (3)	19741
36.	1A16 Transistor Driver Board	MA-1013

XI. PARTS INFORMATION



PLAYBOARD PARTS INFORMATION

PARTS LIST

ITEM	DESCRIPTION	PART NO.
1	Ball Snubber	21532
2	Plastic Shield Set	26141
3	Flat Rail	26123
4	Gate Shield (4)	17300
5	Wireform Gate (3)	21696
6	Wireform Gate	22112
7	Rollover Guide, White (3)	15646Z
8	Target Shield (2)	14043
9	Swinging Target (2)	24494
10	Nylon Washer	20407
11	Switch Rod (2)	20406
12	Flat Rail	26131
13	Ball Guide Rail	25902
14	Ball Guide Rail	26124
15	Ball Guide Rail	6612
16	Bracket Support (Right)	26089
17	Bracket Support (Left)	26090
18	Ball Deflector	21421
19	Left Upkicker Assembly	21418
20	Ball Guide Rail (3)	18070
21	Ball Deflector	26132
22	Ramp Spacer (3)	25907
23	Right Upkicker Assembly	21418
24	Wireform Ramp	26087
25	Spacer (4)	25906
26	Rollover Drop Target Assembly See Exploded View Illustration	MA-1016
27	Rollover Drop Target Arm, Black	20892Y
28	Ball Guide Rail	13833
29	Ball Guide Rail	3722
30	Flat Rail	26115
31	Wireform Ramp	26088
32	Rollover Drop Target Decal	26155
33	TV Monitor (3)	26111
34	Pop Bumper Cap, White (3)	10434Z
35	Pop Bumper Cap, White (3)	10433Z
36	Pop Bumper Body And Socket, Metalized (3)	MA-27B
37	Pop Bumper Trim Platter (4)	25732
38	Ball Guide Rail	17106
39	Ball Guide Rail	26106
40	Ball Guide Rail	13782
41	Ball Guide Rail	5977
42	Vari-Target Assembly	MA-1163
43	Ball Guide Rail	26108
44	Flat Rail	26116
45	Drop Target Assembly (7 Position, 7 Trip Coils)	MA-1158
46	Target Arm, White (7)	11905Z
47	Spot Target Assembly, White (6)	25628Z
48	Star Rollover Insert, Clear (2)	11966P
49	Rollover Button, White (20	11968Z
50	Ball Guide Rail (2)	6612
51	Ball Guide Rail (2)	23833
52	Ball Snubber (2)	13798
53	Ball Guide Rail (3)	4831
54	Mylar Overlay	26139
55	Top Right Flipper Assembly	MA-1140E
	Flipper Coil	24161
	Flipper Switch	26056
56	Bottom Right Flipper Assembly	MA-1140A
	Flipper Coil	20095
	Flipper Switch	26058
57	Bottom Left Flipper Assembly	MA-1139A
	Flipper Coil	20095
	Flipper Switch	26059
58	Playboard Window	26137
59	Pool Table Assembly	MA-1194
59A	Pool Table Mounting Bracket (3)	26127
59B	Hexagon Nut, 10-32, Nylon (18)	FA-657
60	Kicker Assembly	MA-135A
61	Kicker Assembly	MA-135
62	Ball Return Unit Assembly	21622
63	Ball Return Gate Assembly	20607
64	Ball Return Gate Fence	23856
65	Ball Return Fence	23855
66	Ball Shooter Gauge	9767-717
67	Playboard Rest Brackets (2) (Located on Playboard Bottom)	21194
68	1-1/16" Steel Ball (2)	21864
69	Ball Shooter Assembly	8835
70	Cardholder	13647-717
71	Plastic Rivets (4)	MP-10
72	Plastic Dome Hat, Clear (2)	25147P
73	Base Post (12)	14487Z
74	Split Post Cap (12)	14488Z
75	Pop Bumper Decal (3)	26162
76	Drop Target Decal (7)	26163
77	TV Monitor Decal (3)	26154
78	Ball Deflector Decal	26169

RUBBER RINGS

ITEM	DESCRIPTION	PART NO.
A	Mini-Post (11)	15705
B	Small Mini-Post (3)	14793
C	5/16" (4)	10217
D	Siamese (2)	17493
E	1-1/2"	10220
F	3/4"	10218
G	1" (2)	10219
H	2-1/2" (2)	10222
J	Flipper, Red (3)	13151

MISCELLANEOUS PARTS

DESCRIPTION	PART NO.
"Q" Relay	MA-1172
"T" Relay	MA-25
"S" Relay	MA-1052
"A" Relay	MA-995
"B" Relay	MA-1160
"C" Relay	MA-1161
Mini-Post Screw	14792
Plastic Support Post	20635P
Plastic Post 1"	11561P
Mini-Post Screw	25161

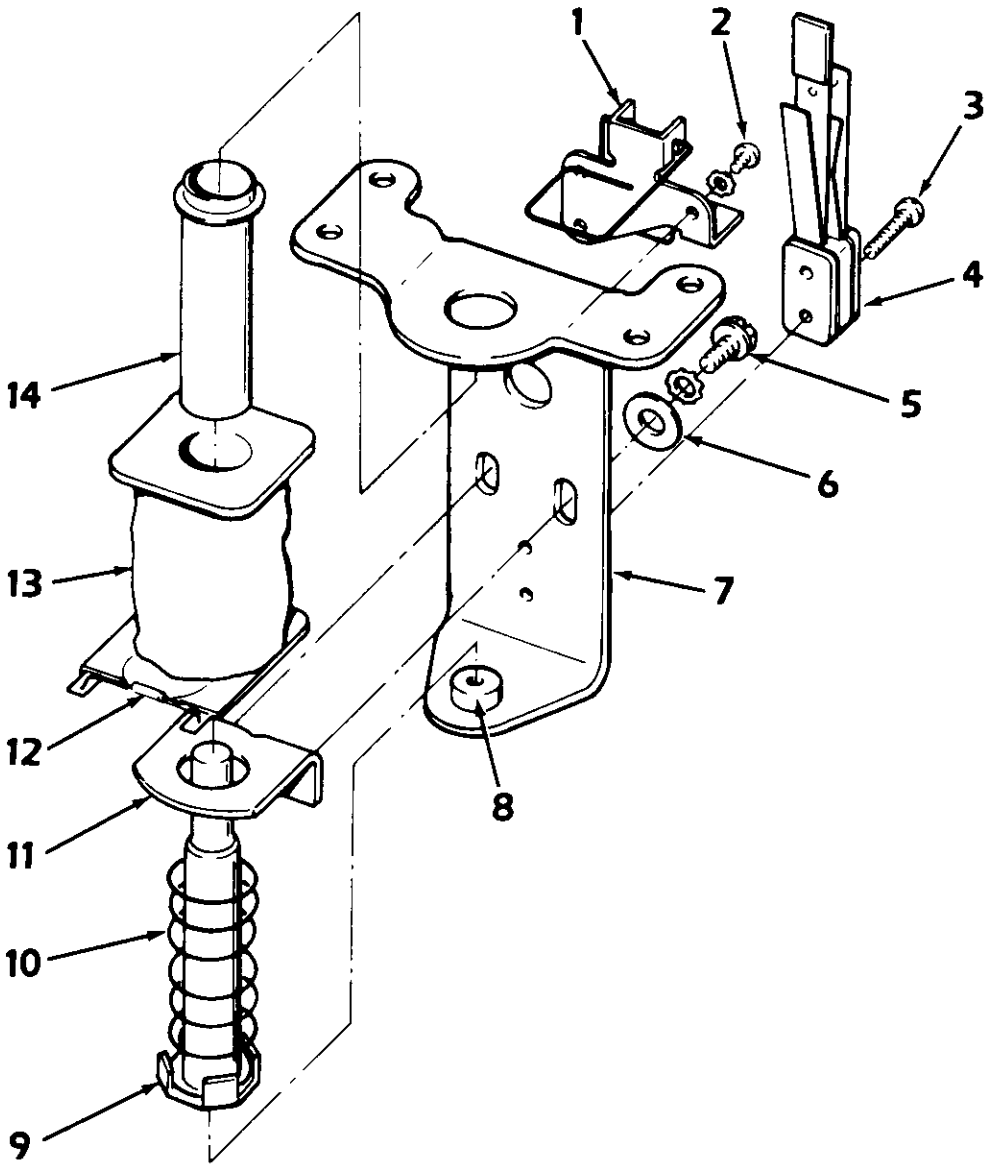
XI. PARTS INFORMATION
DROP TARGET PARTS

DROP TARGETS	WITHOUT TRIP COIL				WITH TRIP COIL	
	ITEM 14	ITEM 18	ITEM 22	ITEM 30	ITEM 48	ITEM 51
	COIL PLATE	GUIDE PLATE	RESET ARM	SWITCH PLATE	COIL PLATE	GUIDE PLATE
1	25618-1	25621-1	25615-2	25617-1	-----	-----
1 (WITH TRIP COIL)	-----	25621-1	25615-2	25617-1	25619-1	25623-1
2	25618-2	25621-2 (2)	25615-2	25617-2	-----	-----
2 (WITH TRIP COIL)						
3	25618-3	25621-2	25615-3	25617-3	-----	-----
3 (WITH TRIP COIL)						
4	25618-4	25621-4 2 Used	25615-4	25617-4	-----	-----
4 (WITH TRIP COIL)	25618-4	25621-4 2 Used	25615-4	25617-4	25619-4	25623-4
5						
5 (WITH TRIP COIL)	-----	25621-5	25615-5	25617-5	25619-5	25623-5
6						
6 (WITH TRIP COIL)						
7						
7 (WITH TRIP COIL)	-----	25621-7	25615-3 25615-4	25617-7	25619-7	25623-7

ITEM	DESCRIPTION	PART NO.
	PARTS FOR SINGLE DROP TARGET	
1	Coil Stop Mounting Bracket	16193
2	Spacer	25609
3	Coil Assembly (Includes Diode)	Specify Game
4	Drive Coil Housing	16192
5	#8-32 X 1/4" Socket Head Cap Screw	FA-65
6	#8 External Lockwasher	FA-632
7	Teflon Slip In Core 2-1/4"	25605
8	#8-32 X 1/4" RHMS	FA-62
9	Mounting Bracket	12180
10	Reset Adjust Bracket (Left)	25613
11	#8-32 X 3/8" RHMS SEMS	FA-68
12	#8 Internal Lockwasher	FA-635
13	#8-32 X 1/4" RHMS SEMS	FA-62
14	Coil Plate	See Chart
15	#8-32 X 1/2" HWHMS SEMS	FA-73
16	Spring Retaining Washer	22233
17	Deflector Return Spring	1942
18	Guide Plate	See Chart
19	#5-40 X 1/4" RHMS	FA-8
20	#5 External Lockwasher	FA-630
21	#5 Washer	FA-622
22	Reset Arm	See Chart
23	Plunger Arm	25610
24	Plunger Guide	25611
25	Plunger	25607
26	Spring	25604
27	Spacer	2883
28	Clamp	MP-39
29	#8-32 X 5/8" HWHMS	FA-79
30	Switch Plate	See Chart
31	#5-40 X 1/2" RHMS	FA-1
32	Switch Cover	FA-645
33	Switch	Specify Game
34	Plunger Stop Adjust Bracket	25608
35	Drop Target	Specify Game
36	Drop Target	Specify Game
37	Retainer Clip	25935
	PARTS FOR DROP TARGET WITH TRIP COIL	
45	Armature Retainer Clip	18644
46	Armature	18643
47	Coil	18642
48	Guide Plate	See Chart
49	Mounting Bracket (Formed)	25612
50	#8-32 Hex Nut	FA-652
51	Coil Plate	See Chart

XI. PARTS INFORMATION

VERTICAL UPKICKER PARTS



ITEM	DESCRIPTION	PART NO.
	Right and Left Upkicker Assemblies	21418
1	Wire Form and Bracket	21414
2	Screw - RHMS 6-32 X 3/16" Lg. (3)	FA-30
3	Screw - RHMS 5-40 x 5/8" Lg.	FA-2
4	Switch	21415
5	Slotted Hex - WHMS 8-32 X 5/16" Lg.	FA-67
6	Standard Washer #8	FA-617
7	Coil Mounting Bracket	21416
8	Rubber Grommet	5240
9	Plunger	21412
10	Spring	1942
11	Coil Mounting Bracket	15409
12	Diode, 1N4004	XO-254
13	Coil	5194
14	Sleeve	21411

XI. PARTS INFORMATION

UNIQUE PARTS

The following listing denotes new parts and assemblies unique to BAD GIRLS, Game #717. Part Numbers prefixed with an asterisk (*) will be illustrated or can be located on pages 29, 30, and 52 thru 56. Numbers in parenthesis ( ) indicate multiple quantities.

PLAYBOARD

DESCRIPTION	PART NO.
WIREFORM RAMP	*26087
WIREFORM RAMP	*26088
BRACKET SUPPORT, RIGHT	*26089
BRACKET SUPPORT, LEFT	*26090
BALL GUIDE RAIL	*26106
BALL GUIDE RAIL	*26108
FLAT RAIL	*26115
FLAT RAIL	*26123
FLAT RAIL	*26124
POOL TABLE MOUNTING BRACKETS (3)	*26127
FLAT RAIL	*26131
BALL DEFLECTOR	*26132
PLAYBOARD WINDOW	*26137
MYLAR OVERLAY	*26139
PLASTIC SHIELD SET	*26141
HEXAGON NUT, 10-32, NYLON (18)	*FA-657
POP BUMPER ASSEMBLY (3)	*MA-27B
VARI-TARGET ASSEMBLY	*MA-1163
POOL TABLE ASSEMBLY	*MA-1194
LEFT UPKICKER ASSEMBLY	*21418
RIGHT UPKICKER ASSEMBLY	*21418
Rollover Drop Target Decal	*26155
TV Monitor (3)	*26111
Flat Rail	*26116
Drop Target Assembly (7 Position, 7 Trip Coils)	*MA-1158
Pop Bumper Decal (3)	*26162
Drop Target Decal (7)	*26163
TV Monitor (3)	*26154
Ball Deflector Decal	*26169

LIGHTBOX

DESCRIPTION	PART NO.
FRONT PANEL GLASS	26084
STYRENE (BACKGLASS ART)	26085-717
GLASS TRIM PLASTIC (2)	26086
LOCK BAR	26094
DISPLAY MOUNTING BRACKET	26103
SPEAKER PANEL GRILL	26119
REVERSIBLE LOCK, DOUBLE BIT	26126
ALPHANUMERIC DISPLAY COVER, BLUE	26135W
LIGHT SHIELD	26138
SOUND BOARD	MA-886-717
AUXILIARY SOUND BOARD	MA-1033
SPEAKER MOUNTING ASSEMBLY	MA-1192

CABINET

DESCRIPTION	PART NO.
GLASS STOP REFLECTOR (10)	25827
GLASS STOP PLEXIGLASS	26101
SLAM SWITCH (P/O FRONT DOOR)	26130
SWITCHING DIODE BOARD	MA-1168
AUXILIARY LAMP DRIVER BOARD	MA-1169
GLASS STOP ASSEMBLY	MA-1195