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THE PREMIER NAME IN PINBALL

INSTRUCTION MANUAL

VICTORY
(GAME #710)
(2 BALL GAME)

INSTRUCTION MANUAL
Applicable for all games.

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GAME PROMS: SOUND PROMS:
710/PROM 1 710/DROM 1
710/PROM 2 710/YROM 1

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

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SUPPLEMENTAL ADDENDUM

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

DISPLAY BOARD(A4)

1. THE ALPHANUMERIC DISPLAY BOARD(A4) IN THIS GAME MAY BE DIFFERENT THAN THE ONE AS ILLUSTRATED ON PAGE(S) 34 AND 35-36.
2. THE DIFFERENT DISPLAY BOARD (A4), PART NO. MA-644F, CONTAINS DISPLAYS DS1 AND DS2, PART NOS. XO-870.
3. THE DISPLAY BOARDS AS AN ASSEMBLY ARE INTERCHANGEABLE; HOWEVER, THE DISPLAY(S) DS1 AND DS2 ARE NOT INTERCHANGEABLE FROM ONE ASSEMBLY TO ANOTHER.
4. TO QUICKLY DETERMINE WHICH DISPLAY BOARD (A4) IS USED IN THIS GAME, OBSERVE THE LOCATION OF THE VACUUM EXHAUST TIP.

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

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



FIGURE 1A.

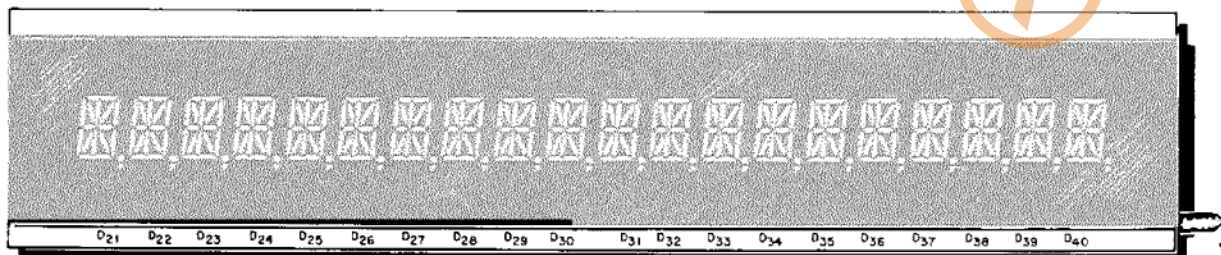


FIGURE 1B.

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

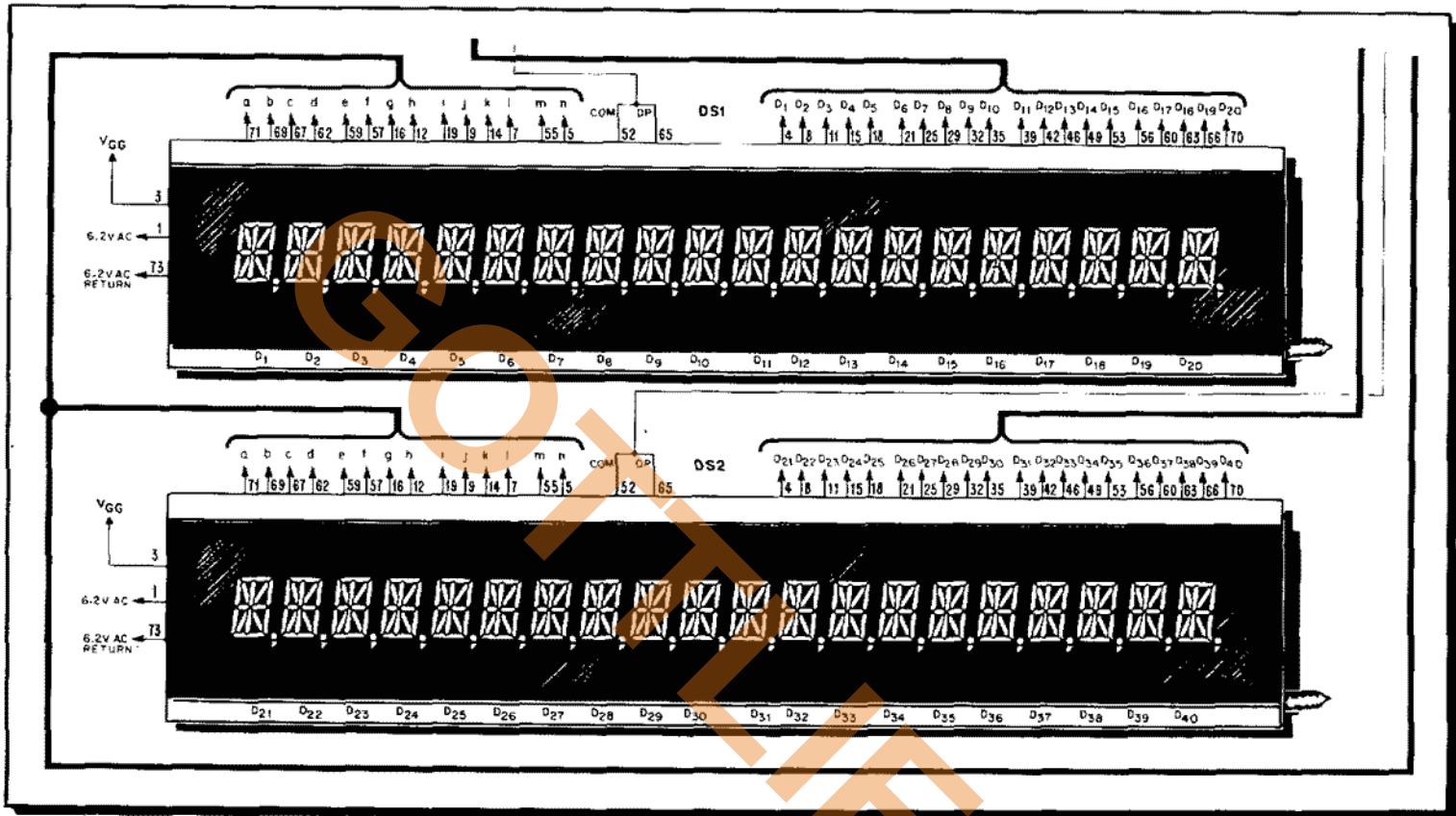


FIGURE 2.

SYSTEM 80B OVERVIEW

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

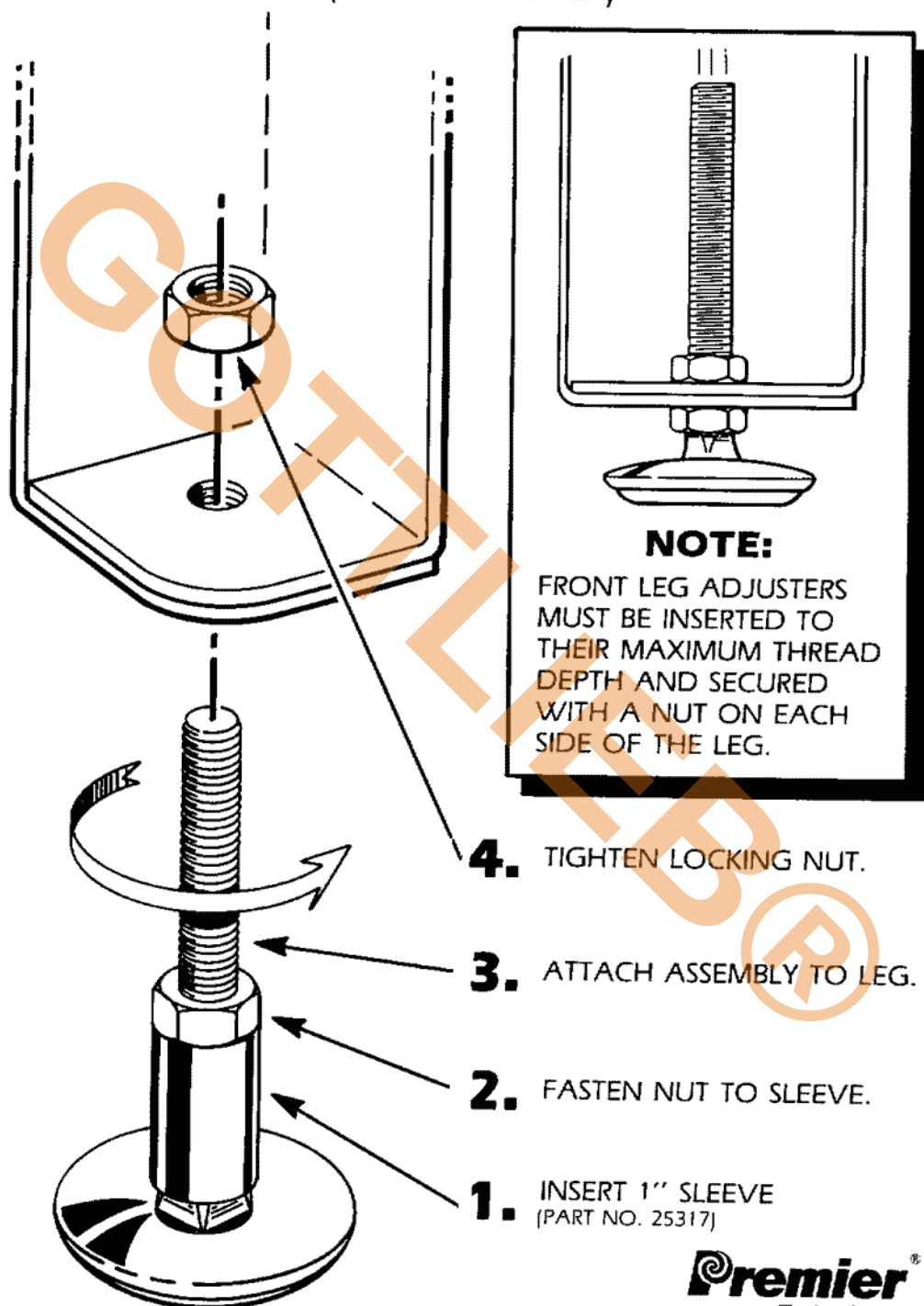
Some of the new features of System 80B are:

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

“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.”

SET-UP PROCEDURE

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



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I. INSTALLATION

A. SET-UP

1. Bolt the legs to the cabinet.
2. Lift lightbox into an upright position. Be sure none of the cables are crimped in between the lightbox 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".

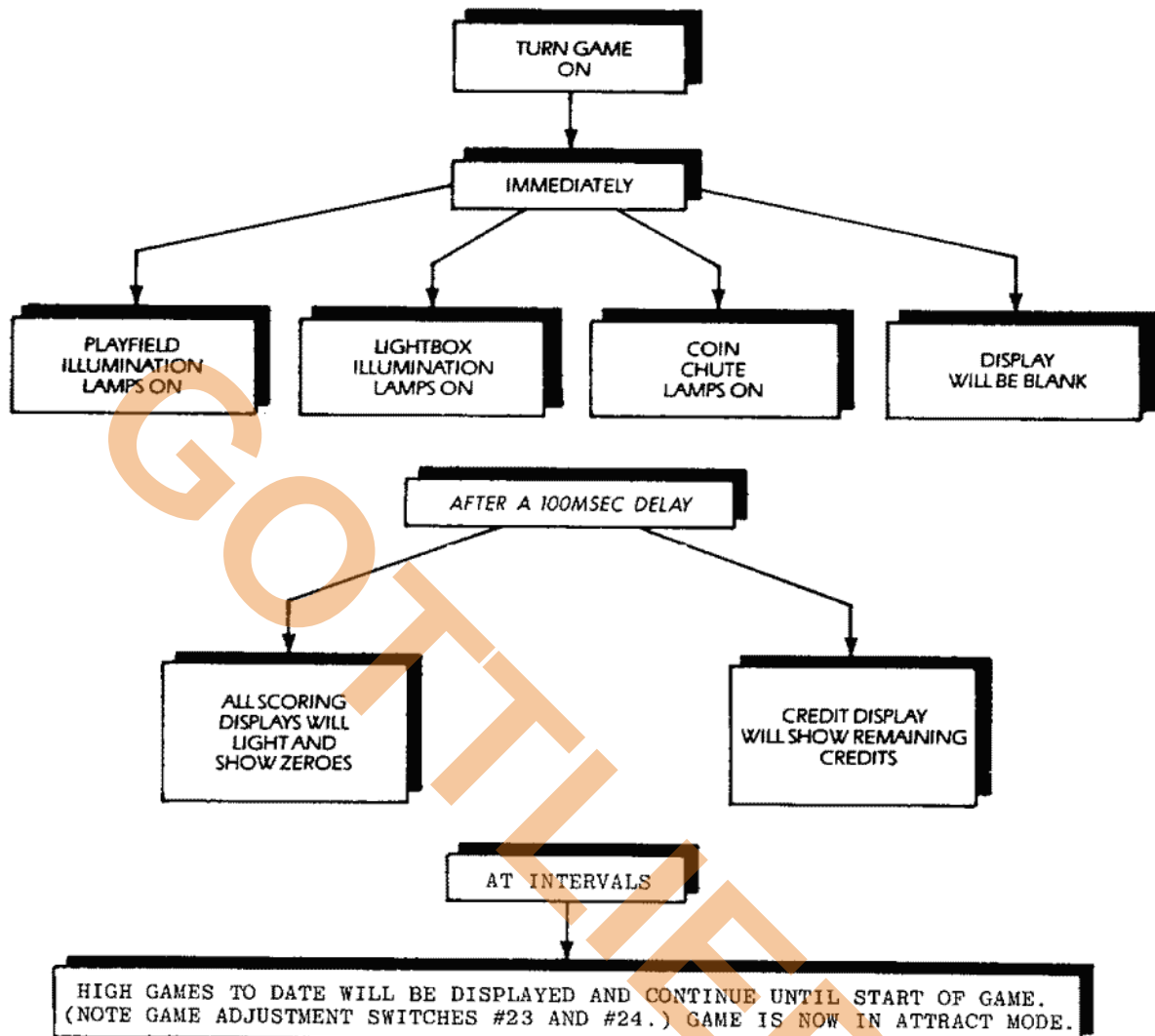
B. CHECK-OUT

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 5-1/2°-6°, SEE ILLUSTRATION AT LEFT.
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

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.

III. GAME OPERATION

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

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HOW TO PLAY

DROP TARGETS

- SCORE 500 UNLIT OR WHEN LIT.
- SCORE 3000 WHEN FLASHING.
- COMPLETING THE SEQUENCE (F-U-E-L) SCORES LIT VALUE (50,000-100,000-200,000) AND ADVANCE DROP TARGET SEQUENCE VALUE.
- AWARD SPECIAL WHEN FLASHING AND RESET SEQUENCE VALUE.
- (5-BALL) SCORE 100 UNLIT OR WHEN LIT.
- (5-BALL) SCORE 1000 WHEN FLASHING.
- (5-BALL) COMPLETING THE SEQUENCE SCORES 10,000 UNLIT.

SPOT TARGETS (6)

- SCORE 500 WHEN LIT.
- SCORE 3000 WHEN FLASHING.
- COMPLETING THE SEQUENCE (F-I-N-I-S-H) ADVANCES THE MULTIPLIER.
- (5-BALL) SCORE 100 WHEN LIT.
- (5-BALL) SCORE 1000 WHEN FLASHING.

LEFT SIDE SPOT TARGET

- SCORE 1000 UNLIT.
- SCORE 10,000 WHEN LIT.
- AWARD CHECKPOINT #6 WHEN FLASHING.

RIGHT SIDE SPOT TARGET

- SCORE 1000 UNLIT
- SCORE 10,000 WHEN LIT.
- AWARD CHECKPOINT #5 WHEN FLASHING

TOP CENTER KICKER

- SCORE 1000 UNLIT.
- SCORE 100,000 WHEN LIT (YELLOW).
- SCORE "RACE BONUS" WHEN FLASHING (CLEAR).
- LIGHT AN OUTLANE FOR SPECIAL (BASED ON SWITCH #32), SCORE CHECKPOINT BONUS (IF ANY), AND RESET ALL PLAYERS TO FIRST CHECKPOINT WHEN LIT (AMBER) (FINISH LINE).

RIGHT KICKER

- SCORE 1000.
- SCORE "RACE BONUS" WHEN FLASHING (CLEAR).
- AWARD CHECKPOINT #2 WHEN FLASHING.

HOLE

- SCORE LIT VALUE (50,000-100,000-150,000-200,000) AND ADVANCE HOLE VALUE.
- AWARD EXTRA BALL AND CAPTURE BALL WHEN FLASHING.
- AWARD CHECKPOINT #1 WHEN FLASHING.
- (5-BALL) SCORE 10,000 WHEN UNLIT.

IV. GAME PLAY AND SCORING

TOP ROLLOVER

- SCORE 1000.
- AWARD EXTRA BALL WHEN FLASHING (PURPLE).
- AWARD CHECKPOINT #3 WHEN FLASHING.

LEFT SIDE ROLLUNDER

- SCORE 1000.
- AWARD CHECKPOINT #1 WHEN FLASHING

LEFT RETURN ROLLOVER

- SCORE 500.
- AWARD CHECKPOINT #4 WHEN FLASHING.

RIGHT RETURN ROLLOVER

- SCORE 500.
- AWARD CHECKPOINT #7 WHEN FLASHING.
- FLASH LEFT SPINNER (WHITE) FOR A TIME PERIOD (DOUBLE SCORE).

TOP RIGHT RAMP ENTRANCE ROLLUNDER

- NO SCORE.

TOP LEFT RAMP ENTRANCE ROLLUNDER

- SCORE 300.

LEFT TRACK EXIT ROLLUNDER

- SCORE 3000 UNLIT.
- SCORE 100,000 WHEN LIT (YELLOW).

LEFT SPINNER

- SCORE 500 UNLIT.
- SCORE 10,000 WHEN LIT (AMBER).
- SCORE DOUBLE WHEN FLASHING (WHITE).

RIGHT SPINNER

- SCORE 500 UNLIT.
- SCORE 10,000 WHEN LIT (AMBER).

LEFT AND RIGHT OUTSIDE ROLLOVERS

- SCORE 10,000.
- AWARD SPECIAL WHEN LIT.

RUBBER SWITCHES

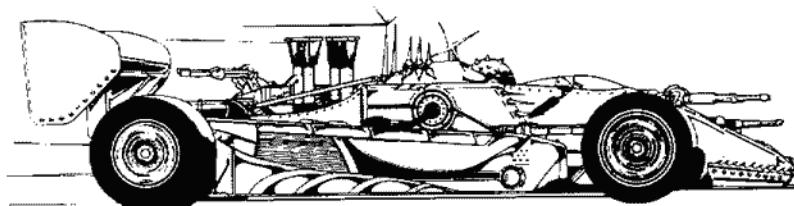
- SCORE 30.
- TOGGLE LEFT AND RIGHT OUT ROLLOVERS (SPECIAL) WHEN ENABLED.
- TOGGLE HOLE AND TOP ROLLOVER (EXTRA BALL) WHEN ENABLED.
- TOGGLE LEFT AND RIGHT SPINNERS (10,000).
- TOGGLE TOP CENTER KICKER AND RIGHT RAMP ENTRANCE (100,000).

OUTHOLE

- SCORE 10,000 X MULTIPLIER (RACE BONUS) FOR EACH CHECKPOINT POSITION ACHIEVED.

CHECKPOINT BONUS

- SCORE VALUE IN DISPLAY WHEN THE ACTIVE CHECKPOINT TARGET HAS BEEN HIT.



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 located just above the left outlane can be positioned for liberal/conservative play. The smaller opening produces a more liberal game.

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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

Applicable only to:

- Step 1 - Left chute coins
- Step 2 - Right chute coins
- Step 3 - Center chute coins

- a. Advance Bookkeeping so the step to be zeroed is displayed.
- b. Press the credit button. Notice information replaced by zeros.

2. Zeroing All Bookkeeping Steps

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

- a. Go to Step 15 (average playing time).
- b. Press the credit button. The message "Bookkeeping Cleared" will be displayed.
- c. Zeroing is complete.

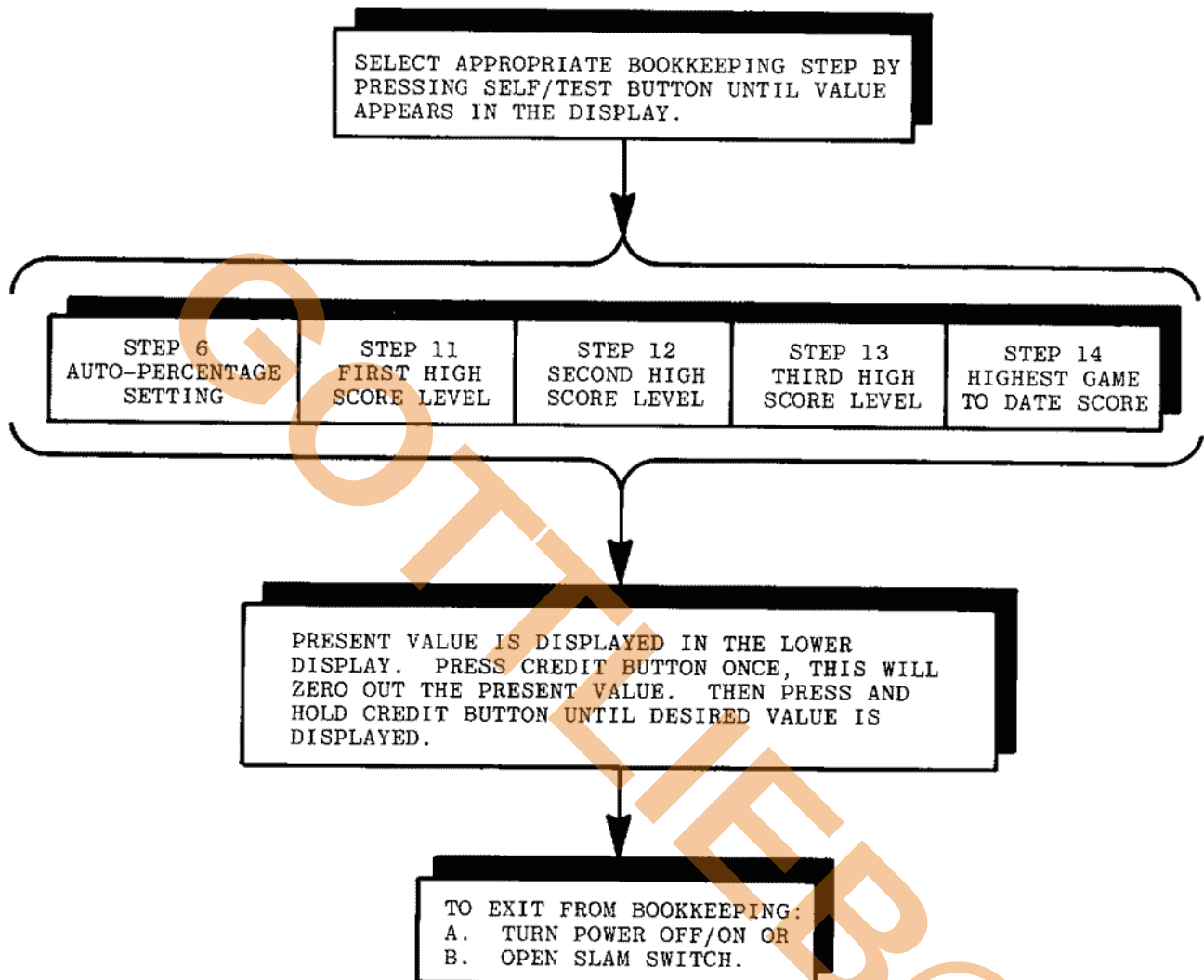
HOW TO USE AUTOMATIC REPLAY PERCENTAGING

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

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

VII. BOOKKEEPING AND SELF TEST

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

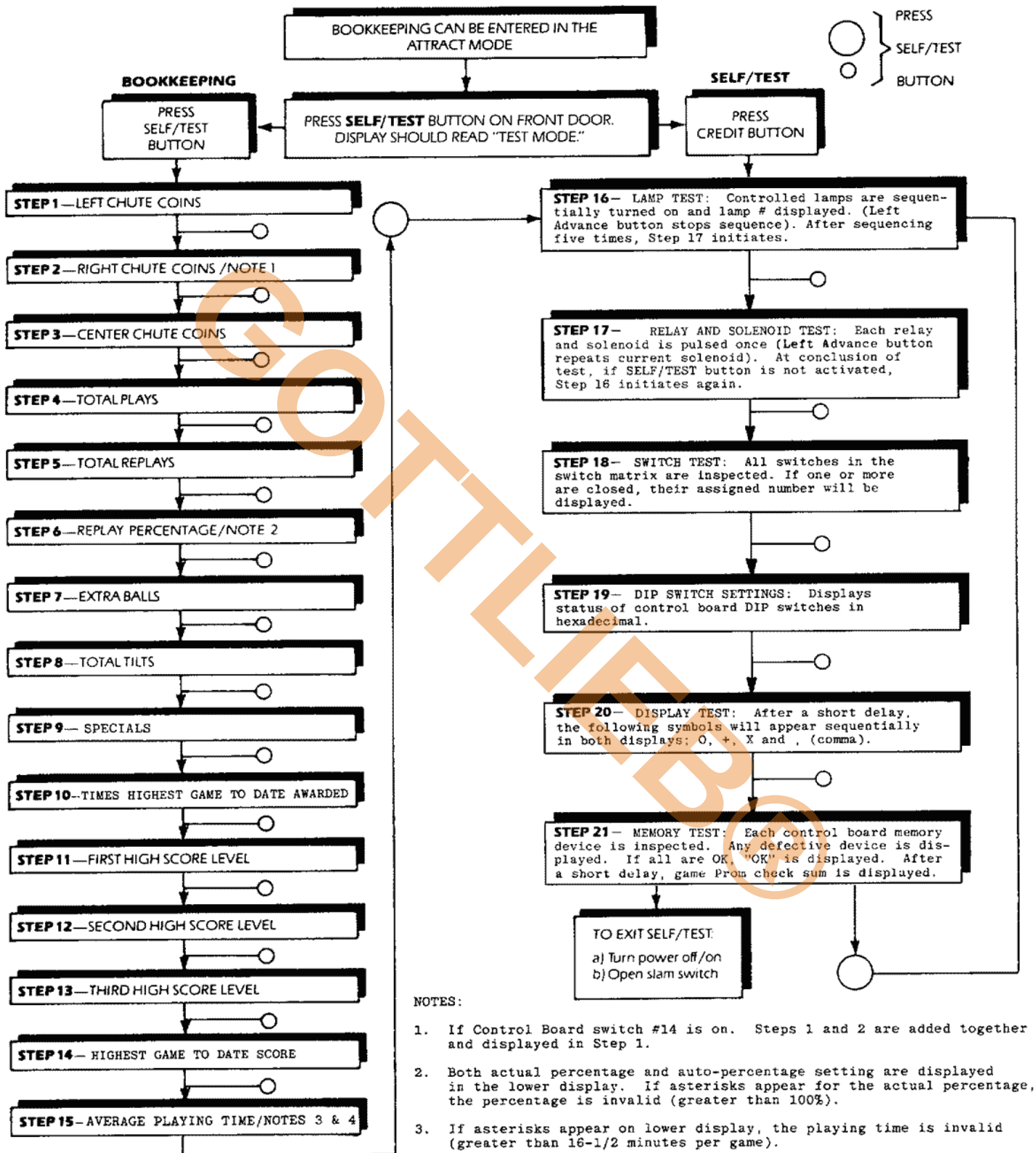


NOTES:

1. Step 11 must be a lower score than Step 12.
Step 12 must have a lower score than Step 13.
Otherwise, the scores will not be recognized.
2. If Step 12 or Step 13 is not desired, set those scores to zero.
3. If Step 14 is reset, all High Games to Date scores are reset.
4. High Score Levels may range from 100,000 to 9,900,000 in increments of 100,000.
5. Only the first High Score Level is used when auto-percentaging (switch 8) is enabled.

VII. BOOKKEEPING AND SELF TEST

B. FLOW CHART



NOTES:

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

VII. BOOKKEEPING AND SELF TEST

C. SELF/TEST

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

STEP 16—LAMP TEST

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

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

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

STEP 17—RELAY AND SOLENOID TEST

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

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

A3 Driver Board Transistor
Assignment (See Schematic)

Q (Game Over) Relay.....A3J3 PIN-A(Q1)
T (Tilt) Relay.....A3J3 PIN-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	Hole	Q60
Sol.2	Bank Reset	Q57/Q58
Sol.3	R./L. Center Lamps	Q54
Sol.4	Right Domes	Q55
Sol.5	Right Ball Kicker	Q61/Q62
Sol.6	Display Light Show	Q63/Q64
Sol.7	Left Domes	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

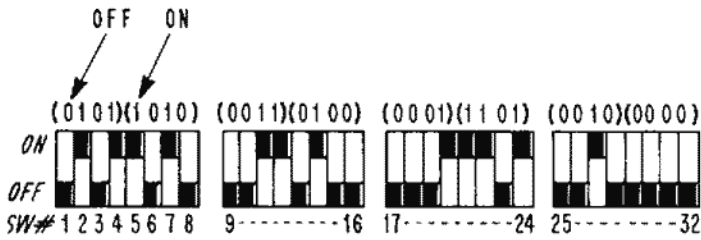
- a. The status of the Control Board (A1) switches appears in the lower display

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

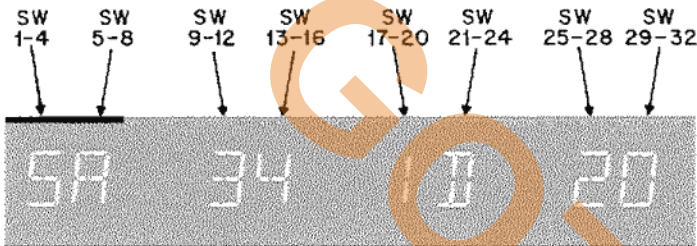
VII. BOOKKEEPING AND SELF TEST

CONTROL BOARD (A1) SWITCHES

EXAMPLE



DISPLAYED

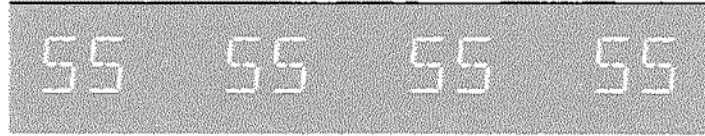


Checking Switches

- 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

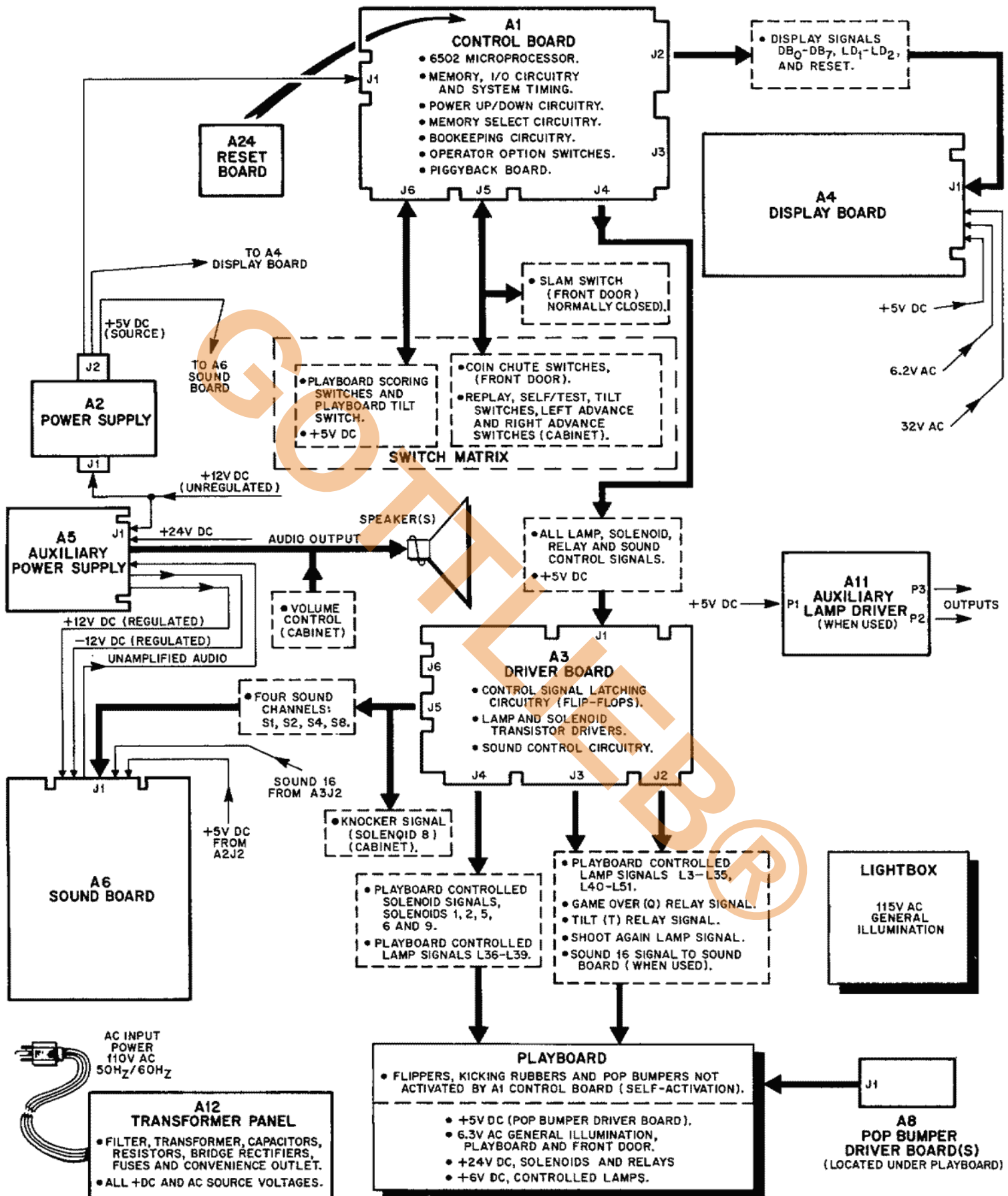


FIGURE I. SYSTEM 80B BLOCK DIAGRAM

VIII. THEORY OF OPERATION

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

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

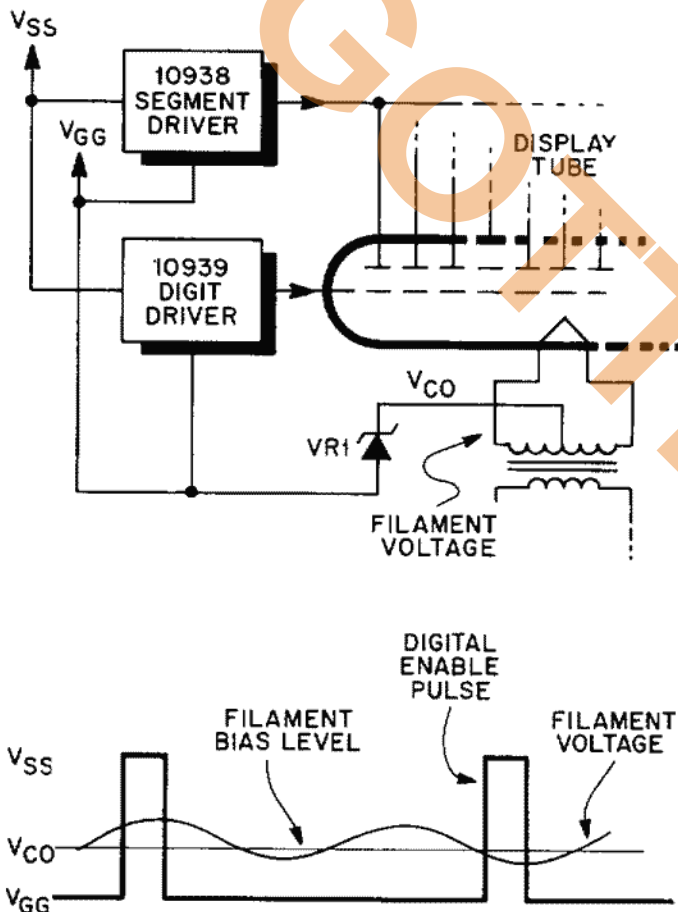


FIGURE 2. BASIC DRIVE CIRCUIT

D. SOUND BOARD (A6)

The MA-886 Sound Board consists of two 6502 microprocessor systems, a dual DAC, a programmable switched

capacitor filter, two programmable sound generators, input ports to receive commands from the game Control Board, and a low level audio output, which is sent to the MA-767 Auxiliary Power Supply Board for amplification.

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

SYSTEM CLOCK

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

INPUT CODE LATCH SYSTEM

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

VIII. THEORY OF OPERATION

SYSTEM EPROMS

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

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.

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.

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 - Kicker Driver Board
A11 - Auxiliary Lamp Driver
A13 - Resistor Board
A16 - Transistor Driver Board
A17 - Diode Board
A24 - Reset Board

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

B. WIRE COLORS ARE SHOWN AS NUMBERS:

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

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

C. FUSES

TRANSFORMER PANEL FUSES

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

PLAYBOARD FUSES

F10	Ball Release	1 Amp	SLO-BLO
F11	Hole, Outhole	1 Amp	SLO-BLO
F12	Bank Reset	2 Amp	SLO-BLO
F13	Right Ball Kicker	3 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

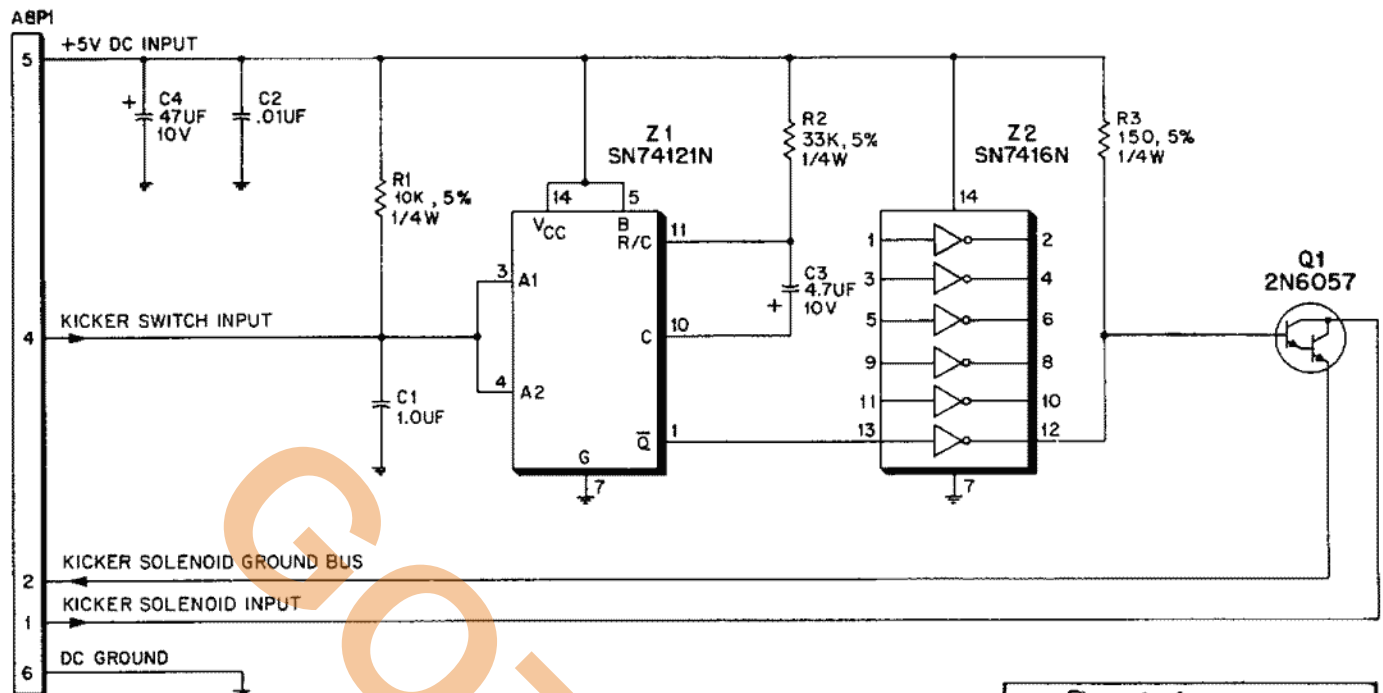
*Coils may vary from game to game. Check game manual for exact coil usage.

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

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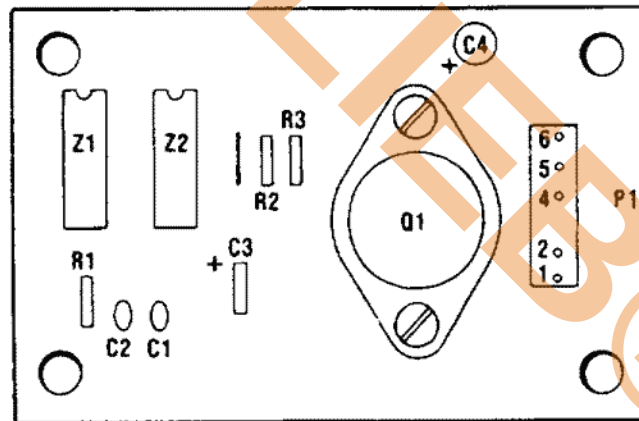
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X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



Premier Technology			
TITLE	KICKER DRIVER BOARD (A8)		
USED ON			
DRAWN	APPROVED	DATE	E-25548
P	R.H.M.	6 AUG 87	

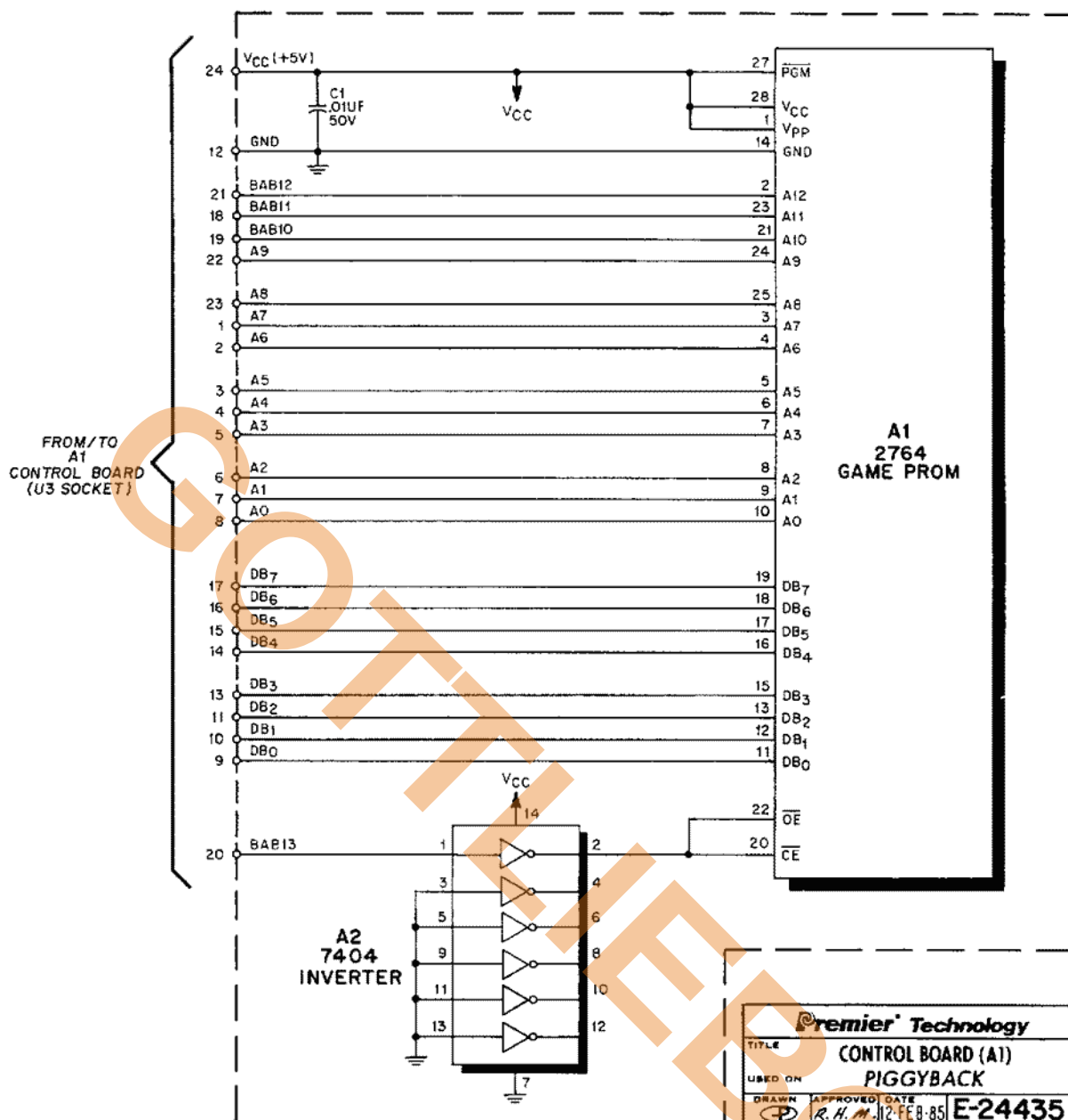
KICKER DRIVER BOARD (A8) COMPONENT LOCATION



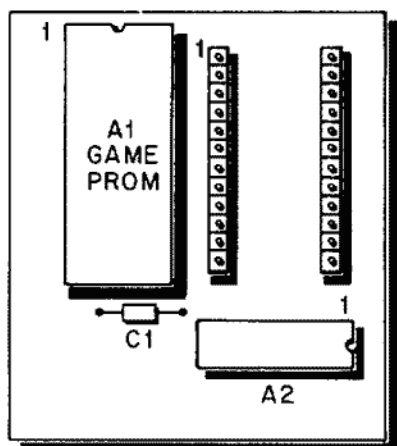
KICKER DRIVER BOARD (A8) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	Kicker Driver Board	MA-992
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
P1	Connector	XO-879
R1	Resistor, 10K Ohm, 1/4W, 5%	XO-18
R2	Resistor, 33K Ohm, 1/4W, 5%	XO-43
R3	Resistor, 150 Ohm, 1/4W, 5%	XO-374
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



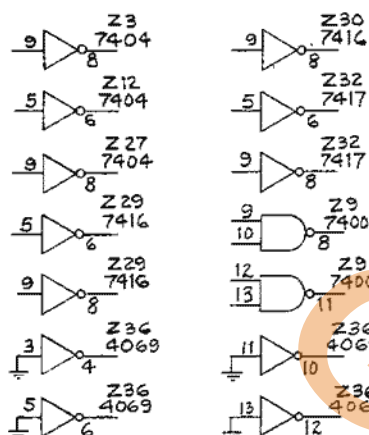
CONTROL BOARD (A1), PIGGYBACK PARTS LIST

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

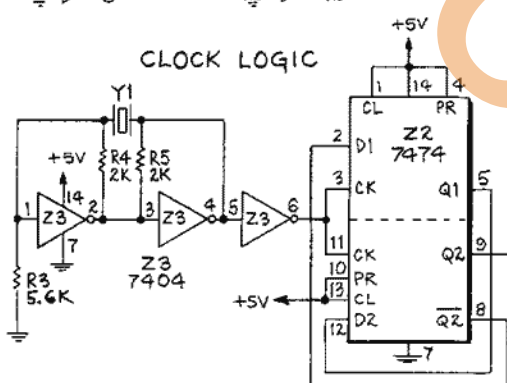
CONTROL BOARD (A1) COMPONENT LOCATION

CONTROL BOARD (A1), PIGGYBACK MA689

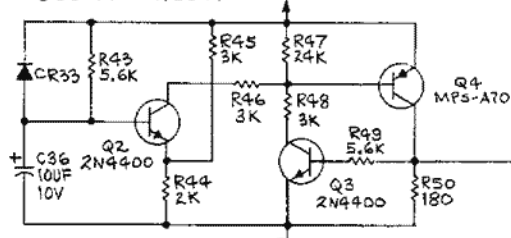
SPARE GATES



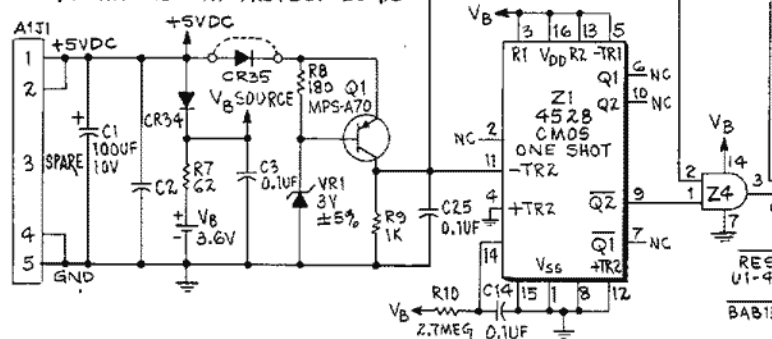
CLOCK LOGIC



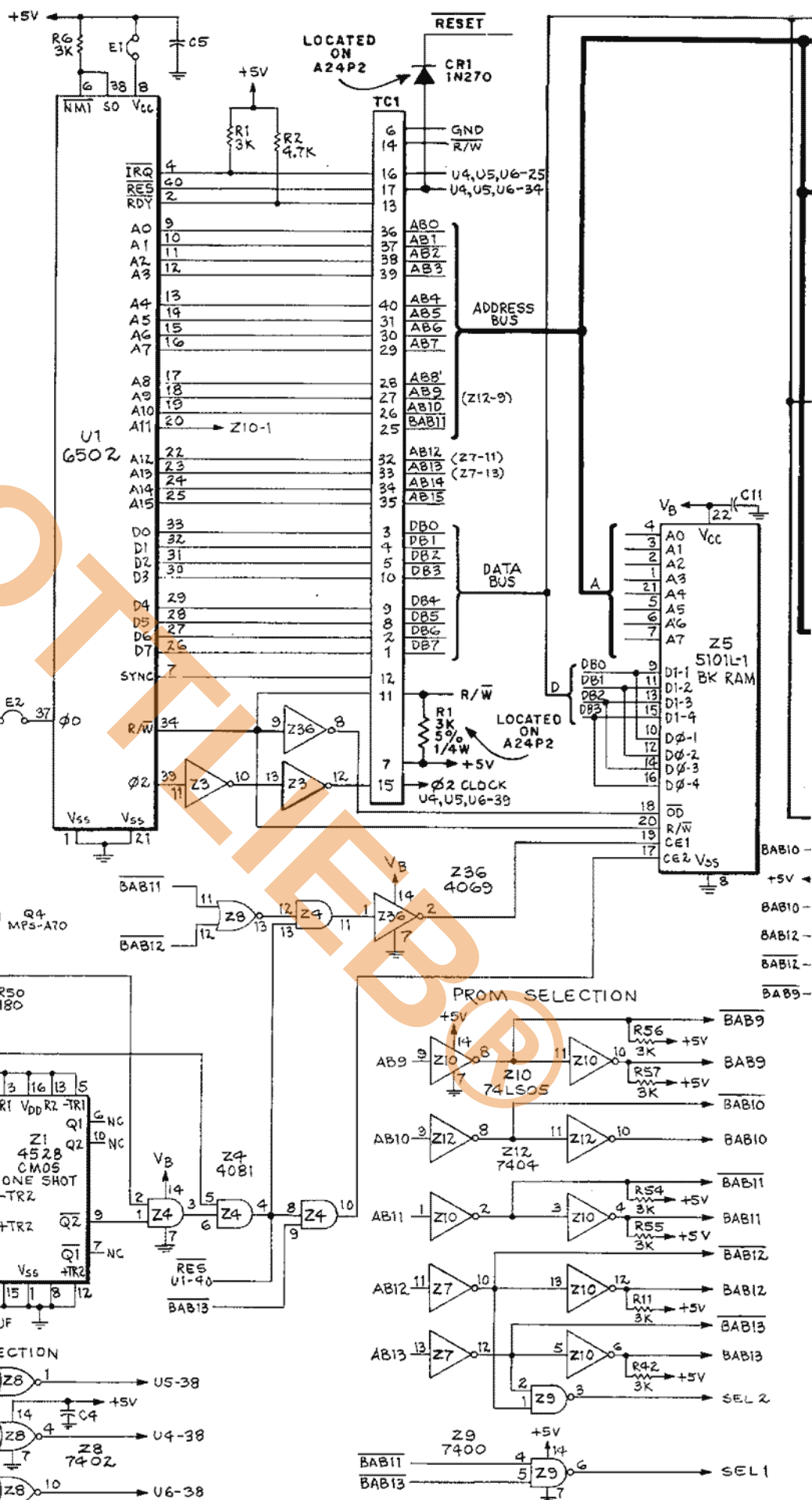
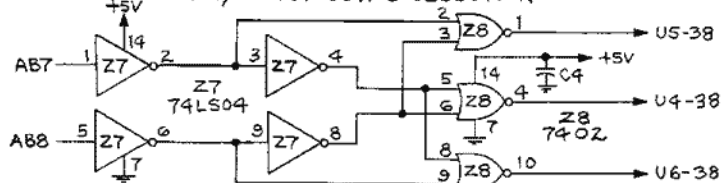
DELAY CIRCUIT



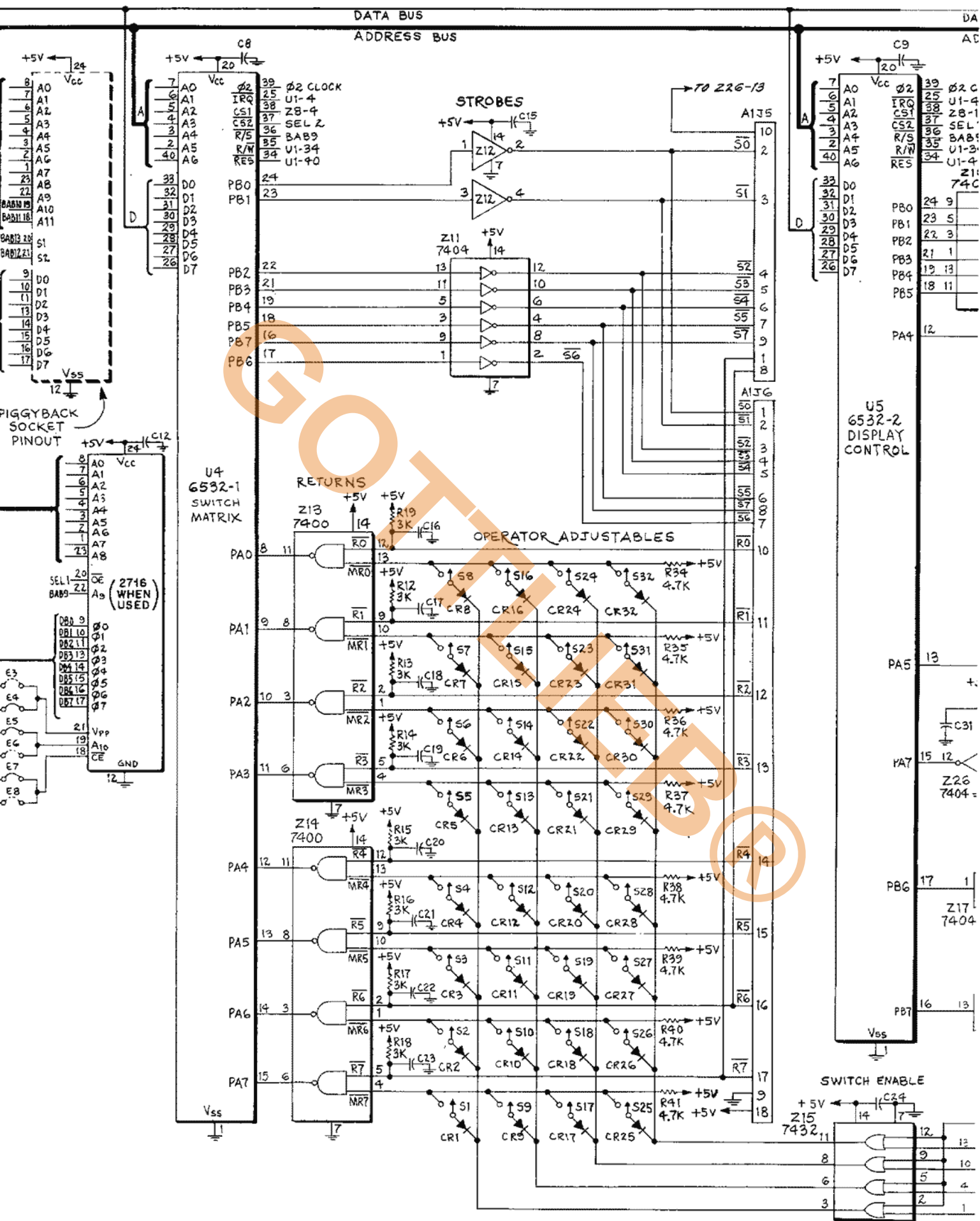
UP/DOWN MEMORY PROTECT LOGIC



INPUT/OUTPUT DEVICE SELECTION

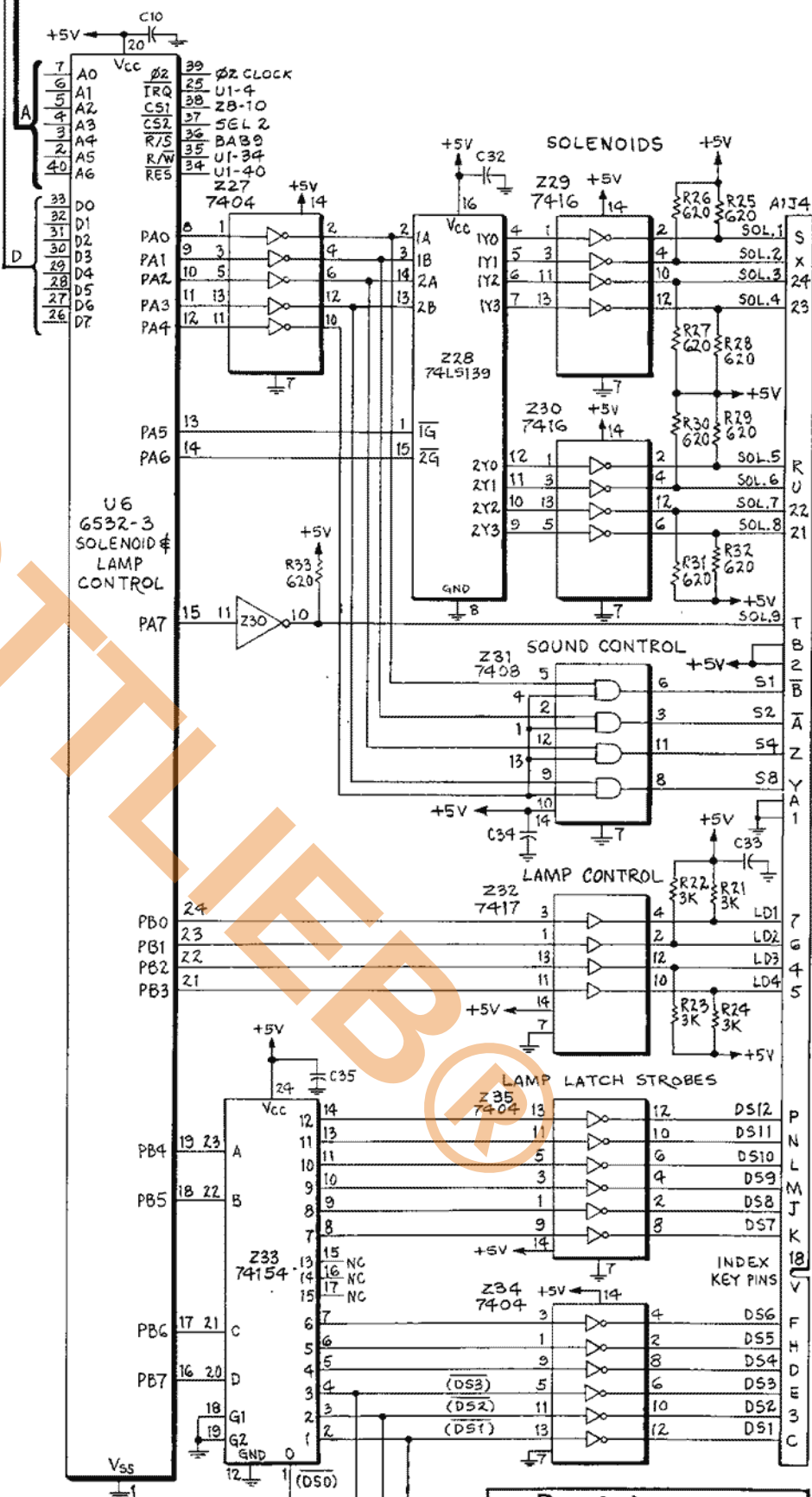
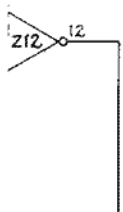
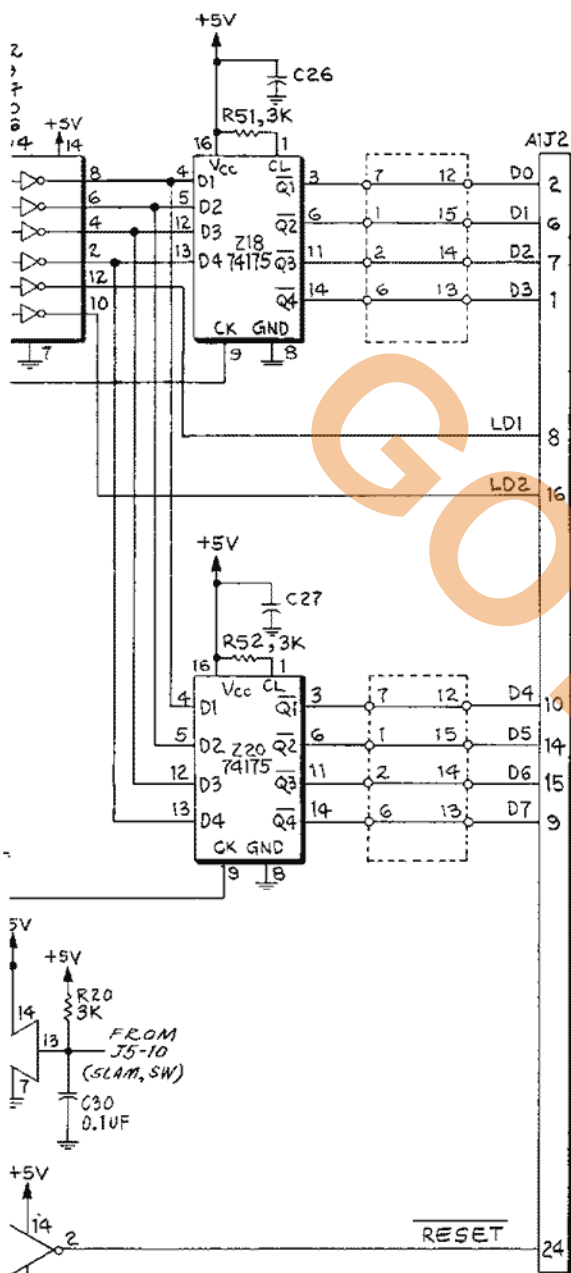


X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



FA BUS
DRESS BUS

LOCK



Premier Technology

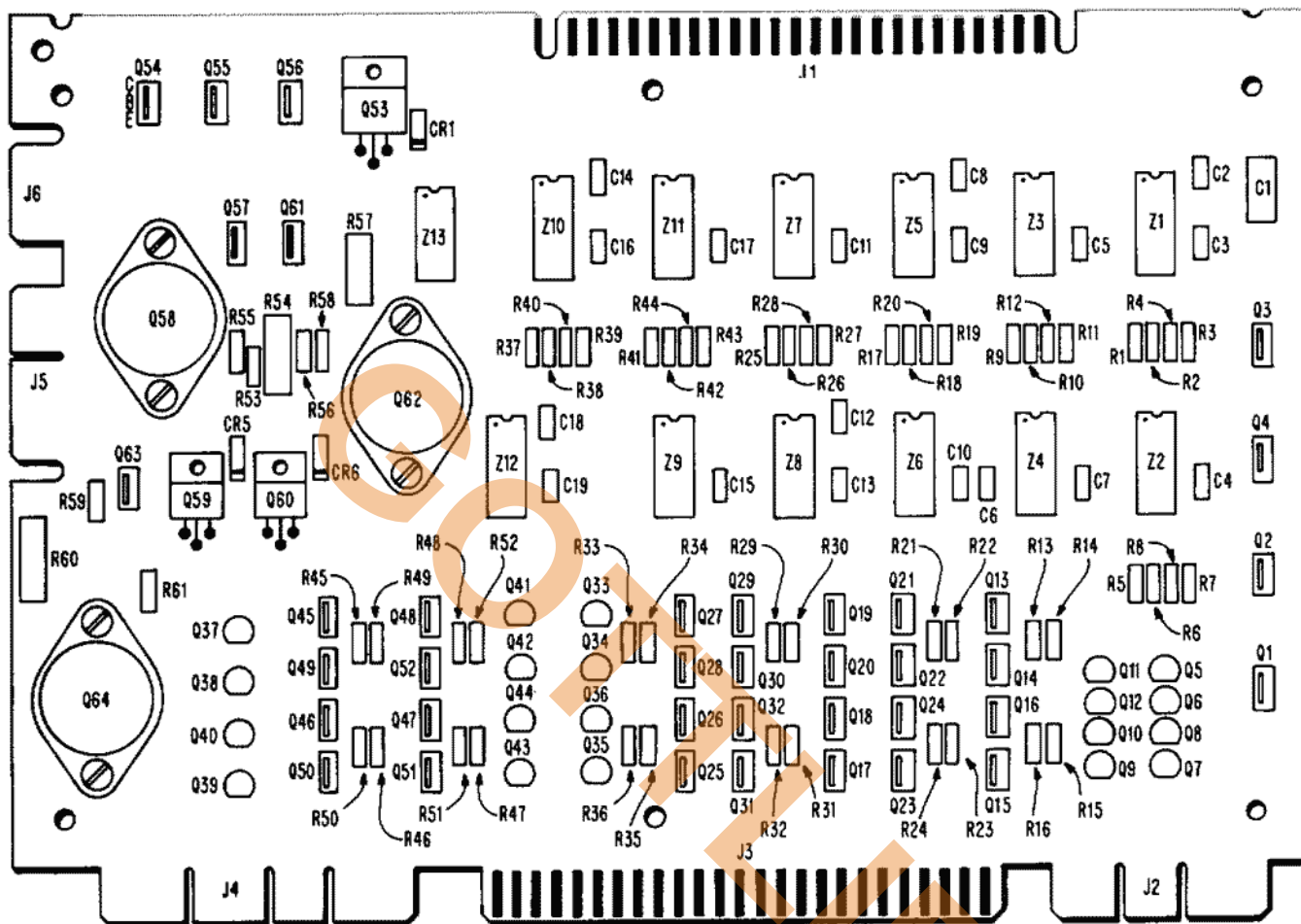
TITLE
CONTROL BOARD (A1)

USED ON

DRAWN APPROVED DATE 12-FEB-85 **E-24436**

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

DRIVER BOARD (A3) COMPONENT LOCATION

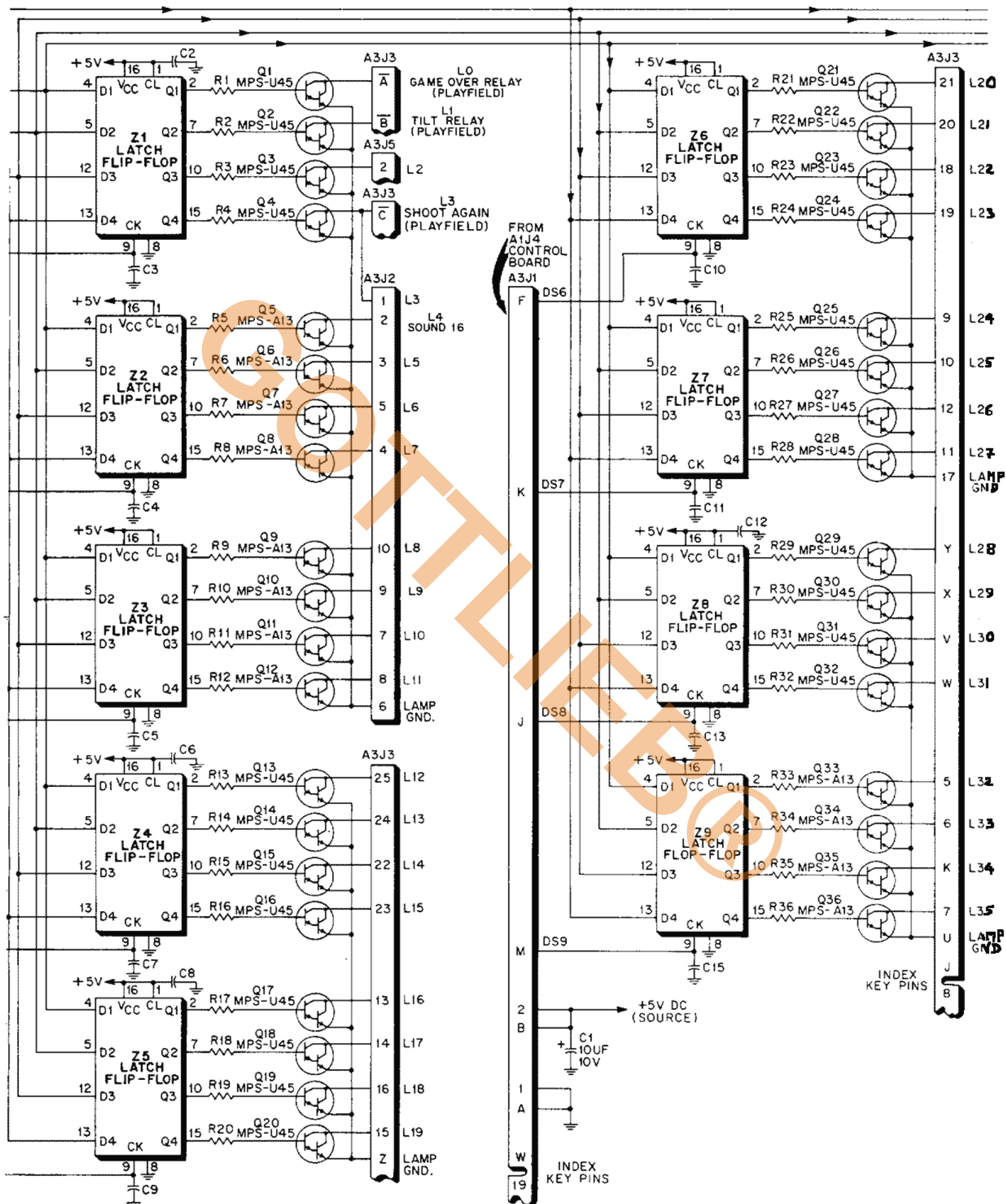


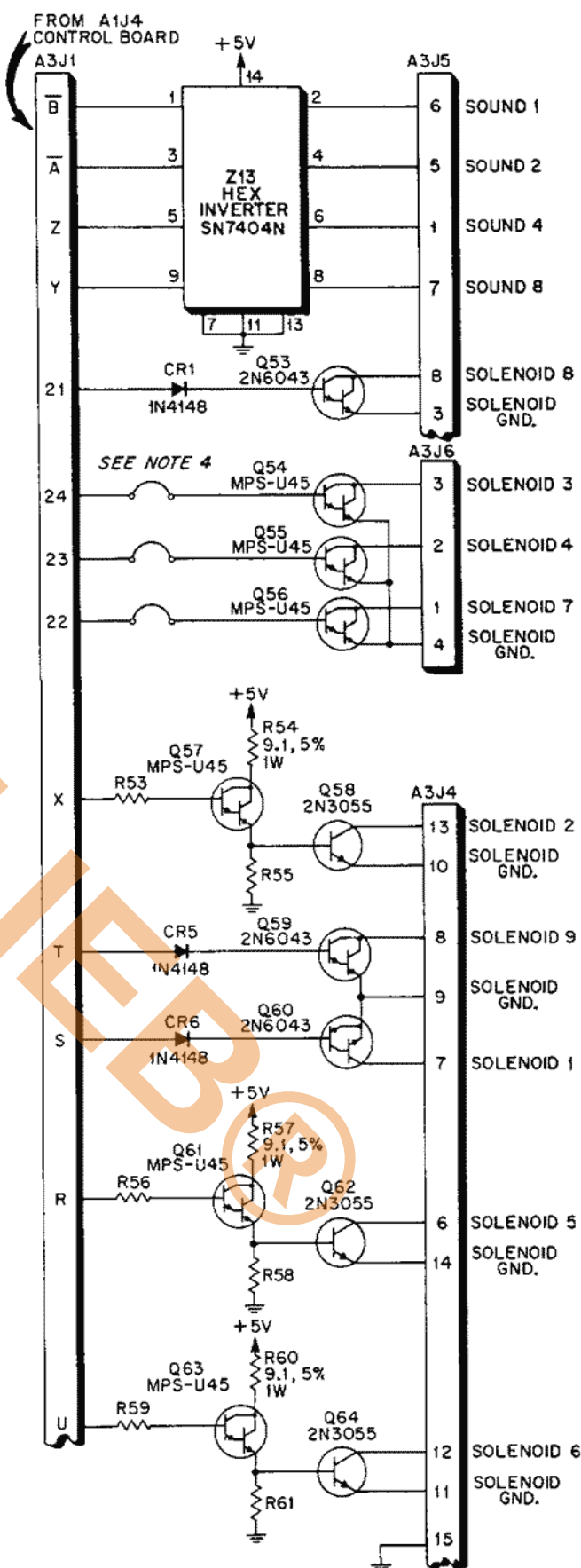
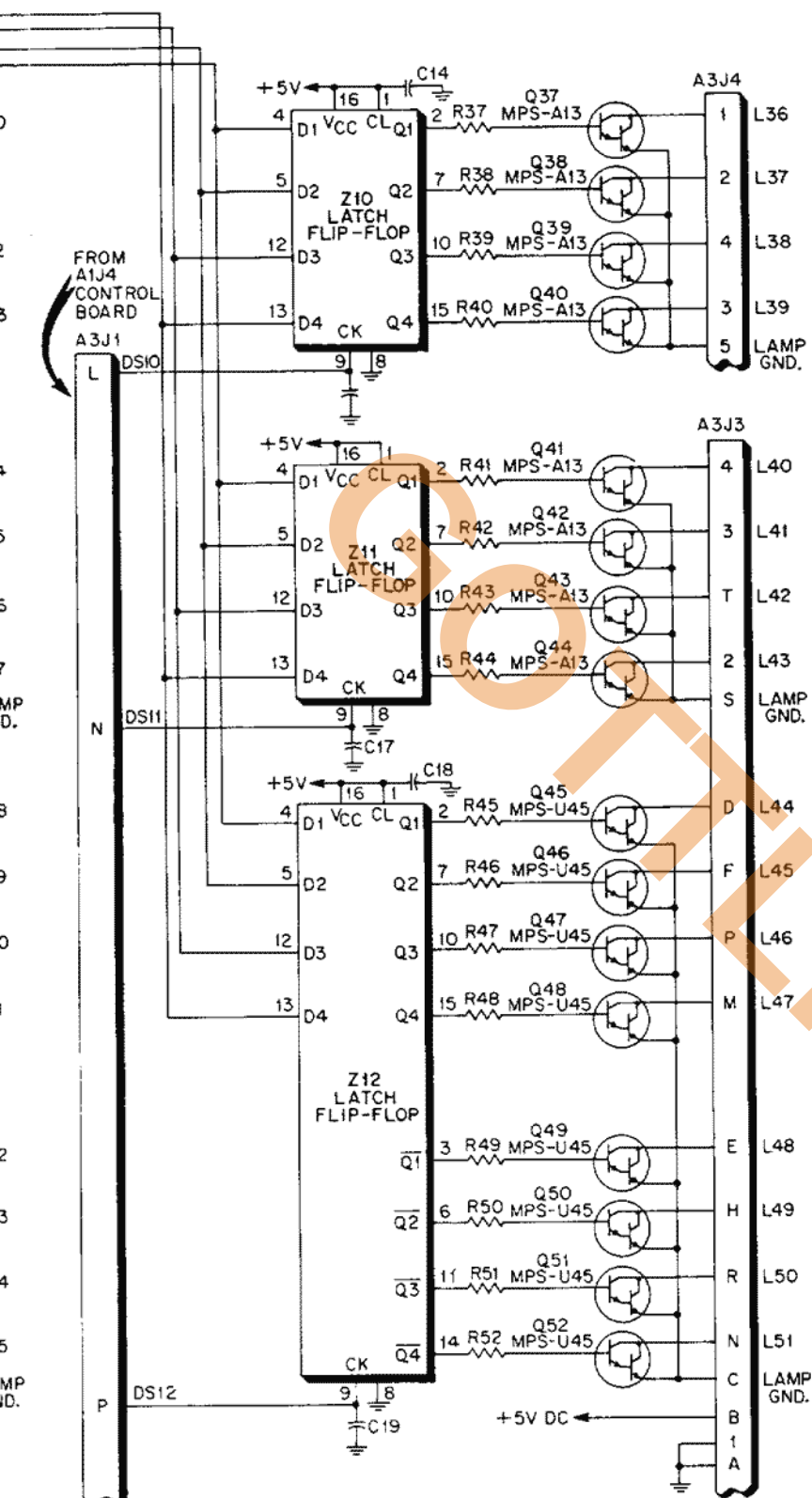
DRIVER BOARD (A3) PARTS LIST

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%, 1/4W	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 BOA AND BOB GAMES.
2. TRANSISTOR TYPES MPS-U45 AND MSD-U45 ARE INTERCHANGEABLE.

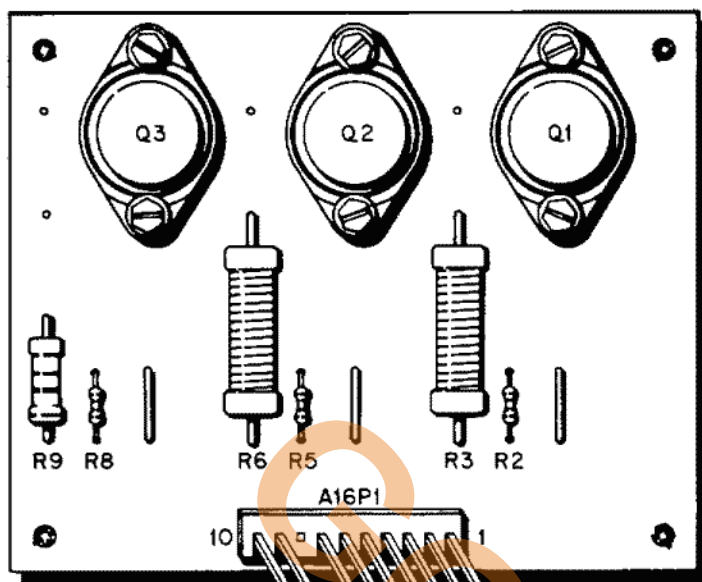




Premier Technology				
TITLE DRIVER BOARD (A3)				
USED ON				
DRAWN	APPROVED	DATE	E-20915	
BAW		12-12-80		

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

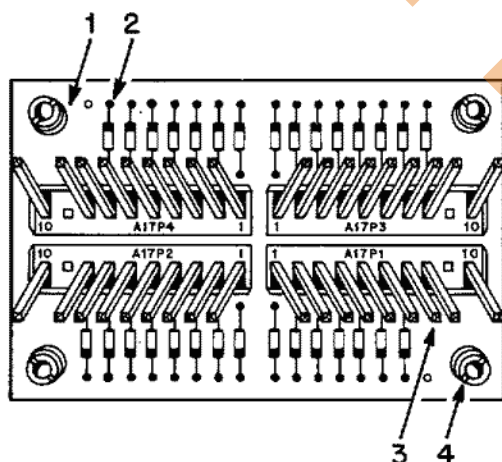
TRANSISTOR DRIVER BOARD (A16) COMPONENT LOCATION



TRANSISTOR DRIVER BOARD (A16) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	Transistor Driver Board Assembly (1A16 and 2A16)	MA985
Q1-Q3	Transistor, MJ2955	XO-799
R2, R5, R8	Resistor, 4.7K Ohm, 5%, 1/4W	XO-7
R3, R6	Resistor, 4 Ohm, 5%, 7W	XO-878
R9	Resistor, 30 Ohm, 5%, 2W	XO-155
P1	10 Position Connector	XO-879
	Circuit Board Support (4)	MP-40

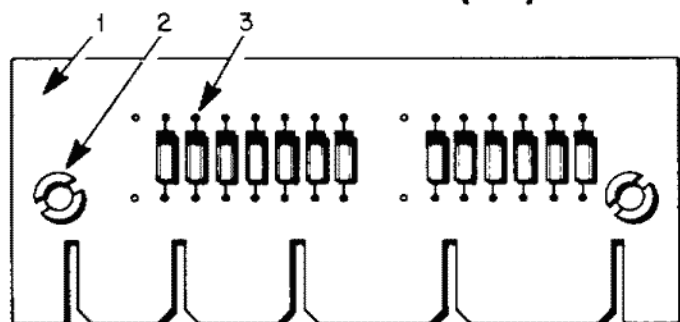
DIODE BOARD (A17)



DIODE BOARD (A17)

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

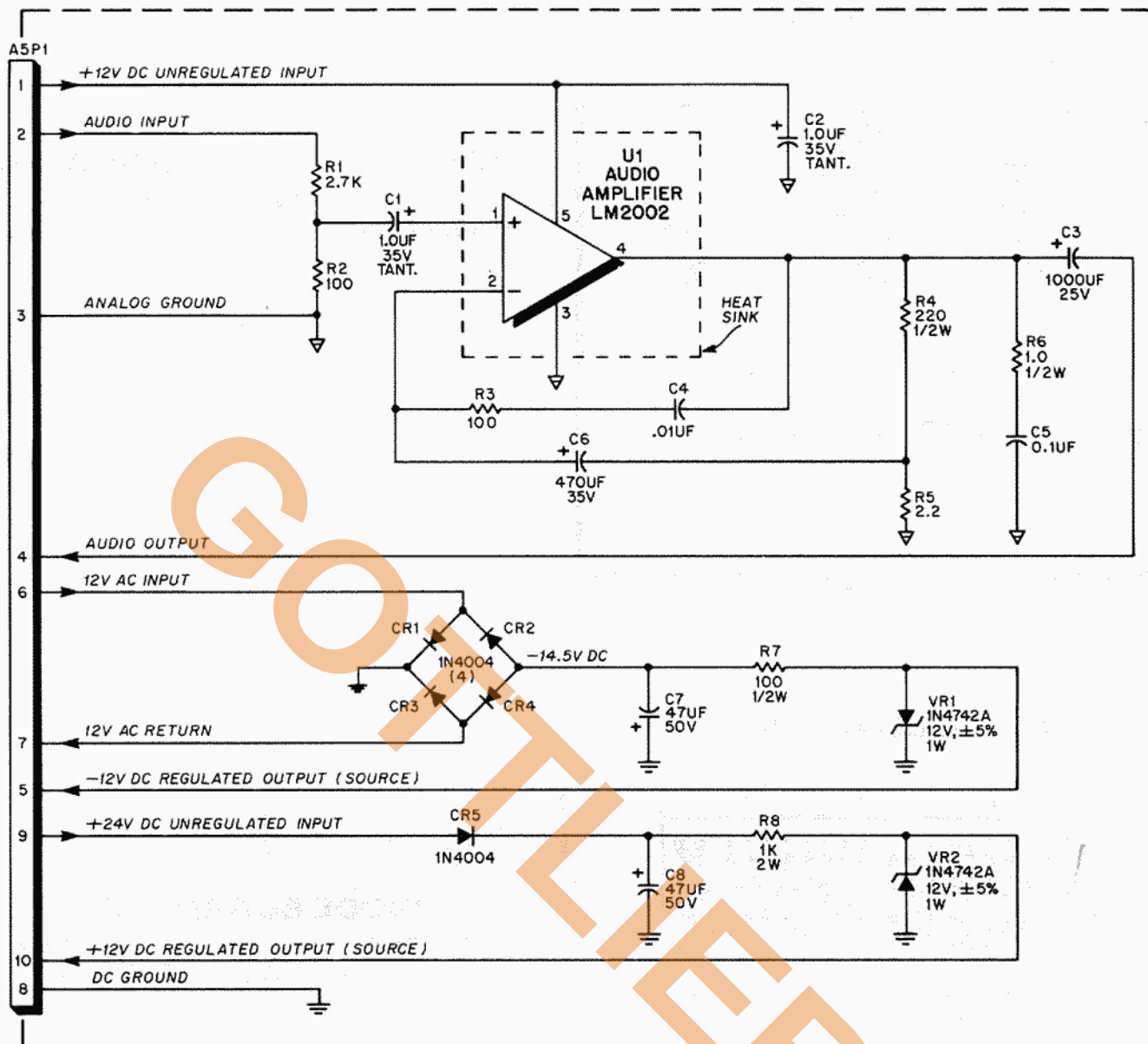
DIODE BOARD (A7)



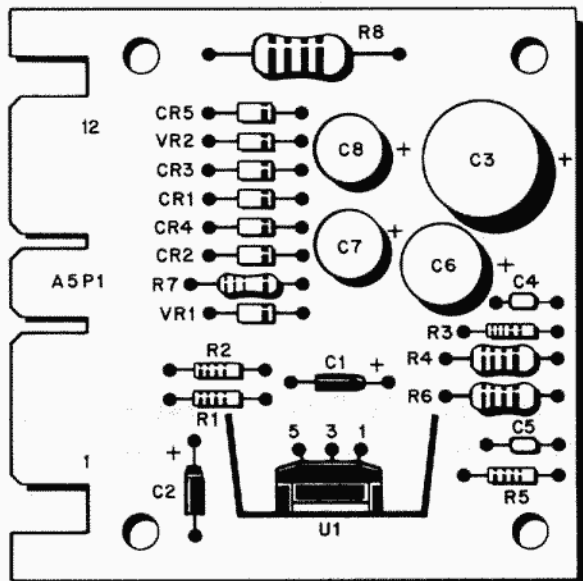
DIODE BOARD (A7) PARTS LIST

ITEM	DESCRIPTION	PART NO.
1	Diode Board Assembly (A7)	23941
2	Spacer (2)	23984
3	Diode, 1N270 (13)	XO-265

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



AUXILIARY POWER SUPPLY (A5) COMPONENT LOCATION



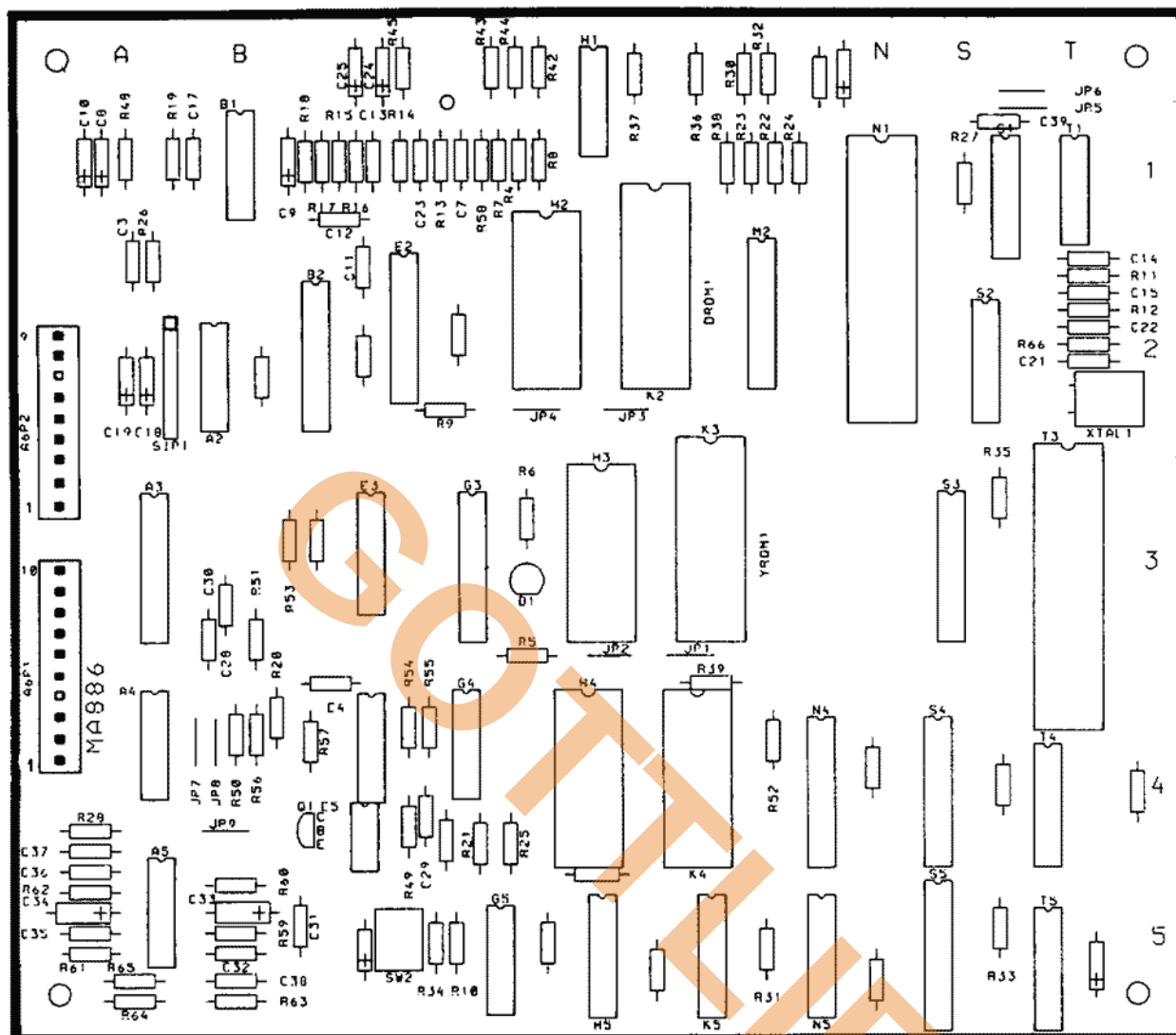
Premier Technology			
TITLE	AUXILIARY POWER SUPPLY (A5)		
USED ON			
DRAWN	APPROVED	DATE	E-24715
R. H. M.		9-OCT-85	

AUXILIARY POWER SUPPLY (A5) PARTS LIST

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

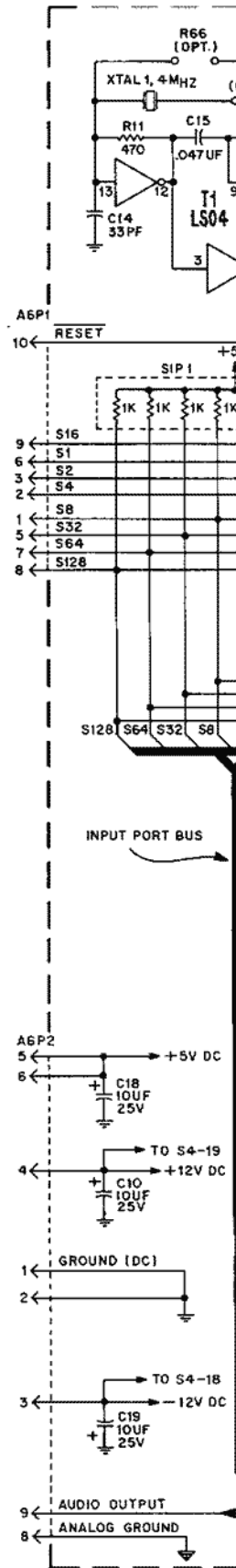
X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

SOUND BOARD (A6) COMPONENT LOCATION

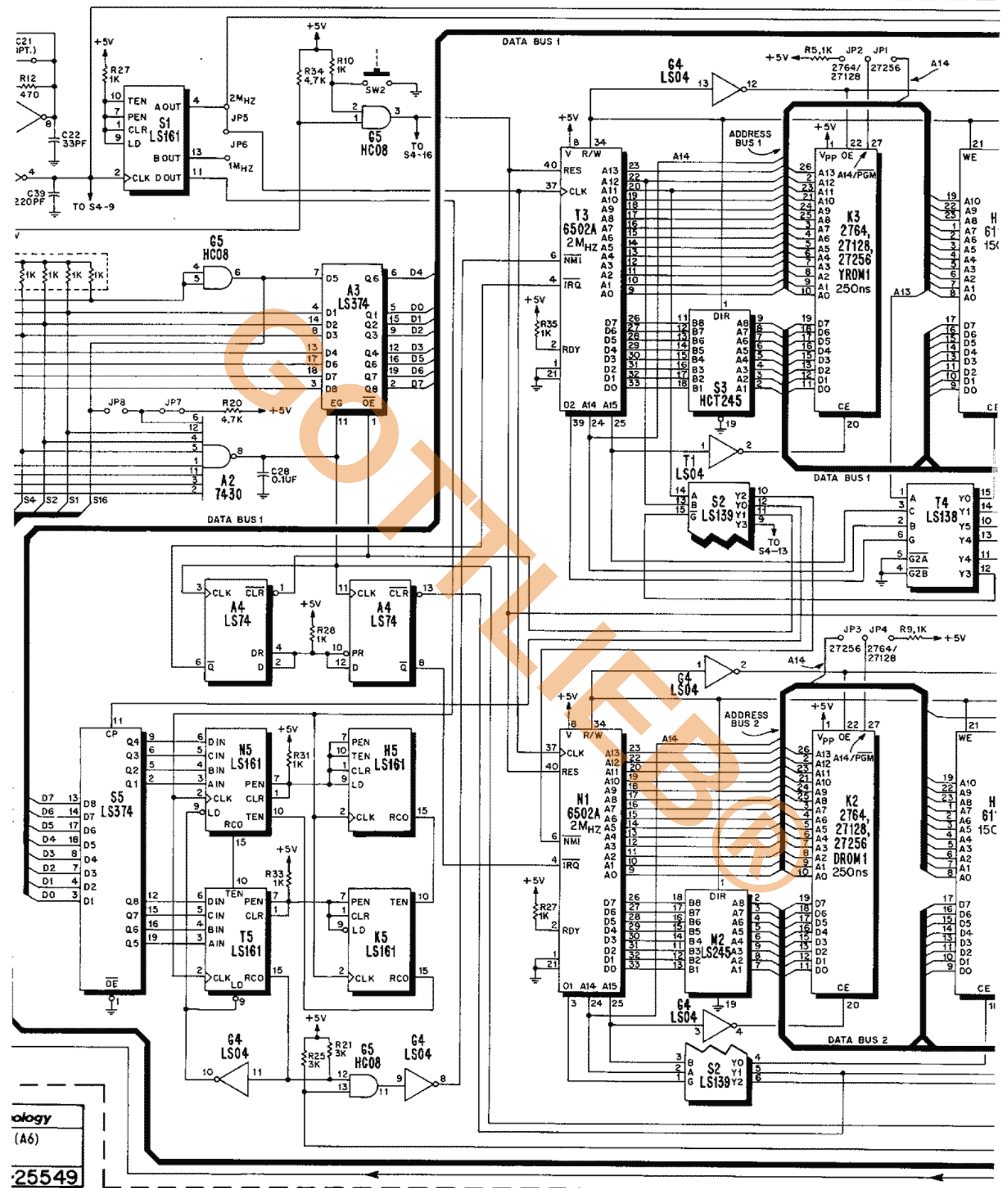


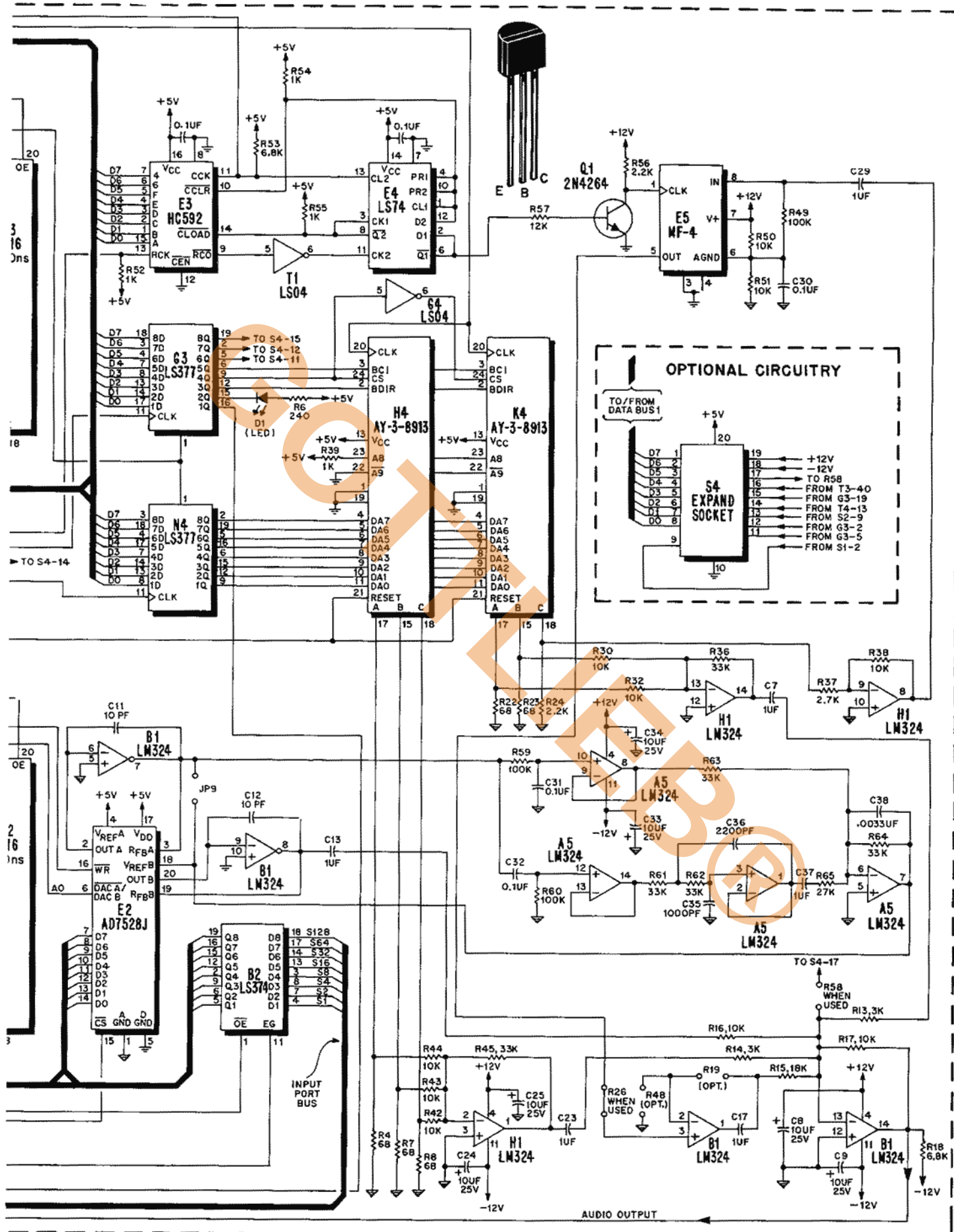
SOUND BOARD (A6) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER	REFERENCE	DESCRIPTION	PART NUMBER
C7, C13, C17, C23, C29, C37	Sound Board Assembly	MA-886	R20, R34	Resistor, 4.7K Ohm, 5%, 1/4W	XO-7
C8, C9, C10, C18, C19, C24, C25, C33, C34	Capacitor, 10UF, 20%, 50V (Non-Polarized)	XO-746	R24, R56	Resistor, 2.2K Ohm, 5%, 1/4W	XO-27
AND THREE UNMARKED CAPACITORS	Capacitor, 10UF, 20%, 25V (Tantalum)	XO-127	R36, R45, R61, R62, R63, R64	Resistor, 33K Ohm, 5%, 1/4W	XO-43
C11, C12	Capacitor, 10PF, +80%-20%, 50V	XO-635	R37	Resistor, 2.7K Ohm, 5%, 1/4W	XO-6
C14, C22	Capacitor, 33PF, 10%, 100V	XO-896	R49, R59, R60	Resistor, 100K Ohm, 5%, 1/4W	XO-45
C15	Capacitor, .047UF, 20%, 50V	XO-638	R57	Resistor, 12K Ohm, 5%, 1/4W	XO-9
C28, C30, AND FOURTEEN UNMARKED CAPACITORS	Capacitor, 0.1UF, +80%-20%, 50V	XO-230	R65	Resistor, 27K Ohm, 5%, 1/4W	XO-11
C31, C32	Capacitor, 0.1UF, 10%, 50V	XO-784	A2	IC, 7430, 8 Input NAND Gate	XO-643
C35	Capacitor, 1000PF, 10%, 100V	XO-296	A3, B2, S5	IC, 74LS374, Octal "D" Flip Flop	XO-96
C36	Capacitor, 2200PF, 10%, 100V	XO-289	A4, E4,	IC, 74LS74, Dual "D" Flip Flop	XO-424
C38	Capacitor, .0033UF, 10%, 100V	XO-600	A5, B1, H1	IC, LM324, Quad Op-Amp	XO-644
C39	Capacitor, 220PF, 10%, 100V	XO-694	E2	IC, AD7528J, Multiplier DAC	XO-647
D1	Diode, MV5752, (LED, Red)	XO-270	E3	IC, 74HC592, 8 Bit Counter	XO-892
R4, R7, R8, R22, R23	Resistor, 68 Ohm, 5%, 1/4W	XO-748	E5	IC, MF-4CN-50, Switched Capacitor Filter	XO-894
R5, R9, R10, R27, R28, R31, R33, R35, R39, R52, R54, R55	Resistor, 1K Ohm, 5%, 1/4W	XO-5	G3, N4	IC, 74LS377, Octal "D" Flip Flop	XO-97
R6	Resistor, 240 Ohm, 5%, 1/4W	XO-173	G4, T1	IC, 74LS04, Hex Inverter	XO-418
R11, R12	Resistor, 470 Ohm, 5%, 1/4W	XO-35	G5	IC, 74HC08, Quad 2 Input "AND" Gate	XO-872
R13, R14, R21, R25	Resistor, 3K Ohm, 5%, 1/4W	XO-23	H2, H3	IC, 6116P-3, 2K x 1 RAM	XO-193
R15	Resistor, 18K Ohm, 5%, 1/4W	XO-762	H4, K4	IC, AY-3-8913, Sound Generator	XO-646
R16, R17, R30, R32, R38, R42, R43, R44, R50, R51	Resistor, 10K Ohm, 5%, 1/4W	XO-18	H5, K5, N5, S1, T5	IC, 74LS161, Synchronous Presettable Binary Counter	XO-440
R18, R53	Resistor, 6.8K Ohm, 5%, 1/4W	XO-8	K2, K3	IC, Specified Per Game	
			M2	IC, 74LS245, Octal Bus Transceiver	XO-79
			N1, T3	IC, 6502A, CPU	XO-893
			S2	IC, 74LS139, Dual 1 of 4 Decoder	XO-419
			S3	IC, 74HCT245, Octal Bus Transceiver	XO-891
			T4	IC, 74LS138, 1 of 8 Decoder	XO-437
			Q1	Transistor, 2N4264, Level Shifter	XO-895
			SIP 1	Resistor Pack 8 x 1K Ohm	XO-493
			SW2	Switch, Pushbutton	XO-897
			XTAL 1	Crystal, 4 MHz	XO-366
			A6P1, A6P2	Connector (2)	XO-879
				Jumper, 22 Gauge (7)	XO-536
					XO-469

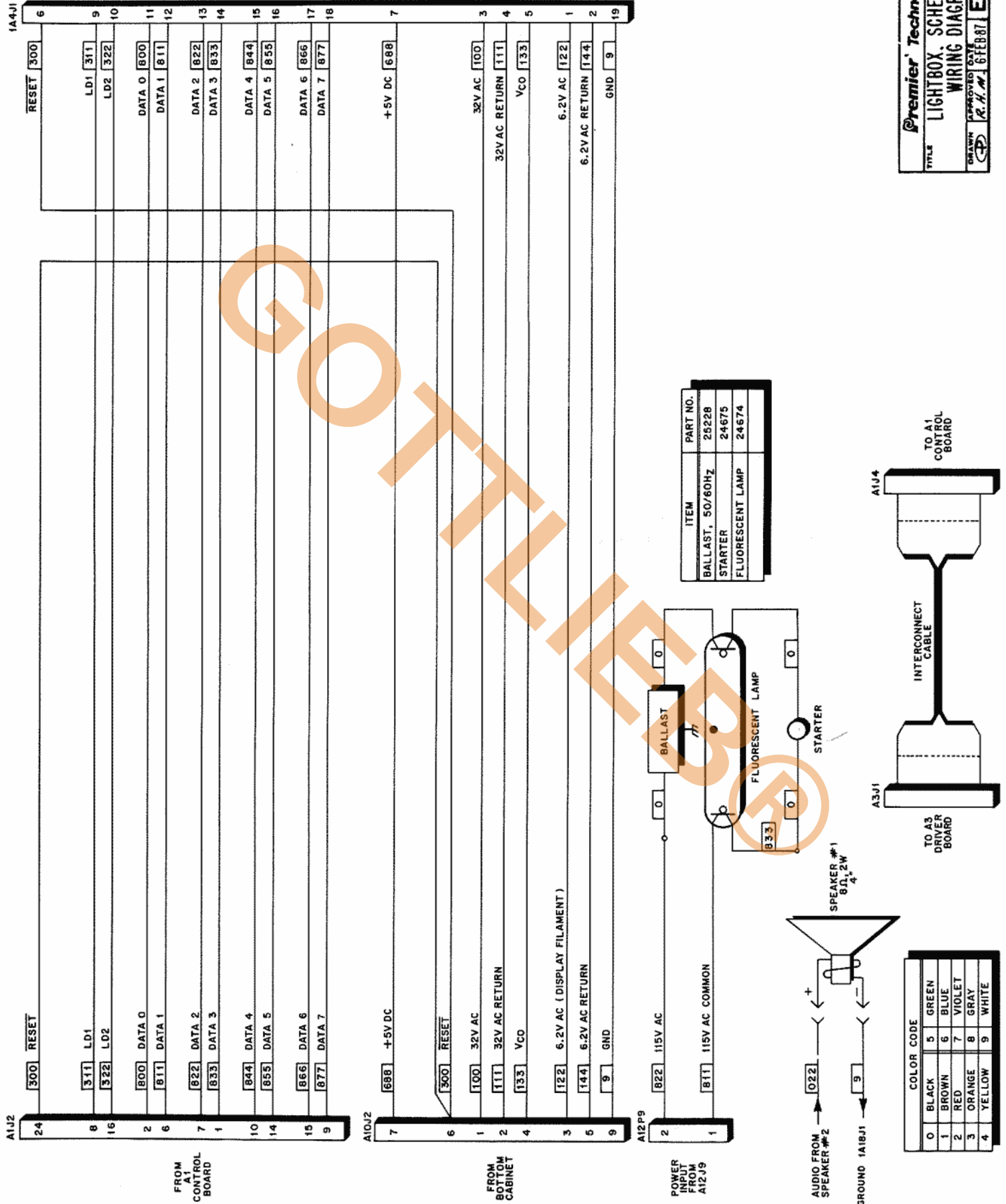


Premier Techn.	
TITLE SOUND BOARD	
USED ON	
DRAWN R.H.M.	APPROVED DATE 6 AUG 87



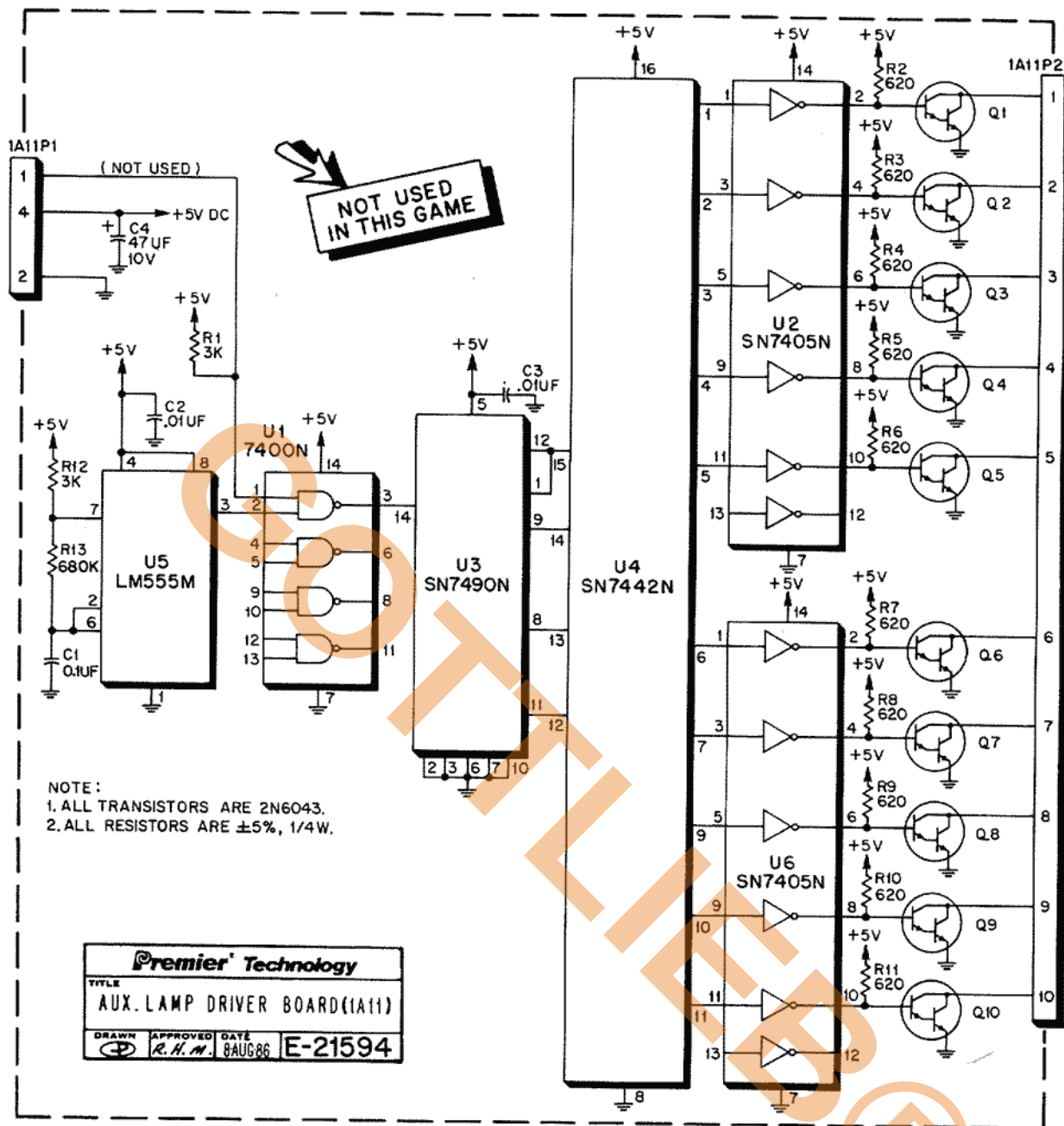


Premier Technology	
TITLE	LIGHTBOX, SCHEMATIC/ WIRING DIAGRAM
DRAWN	R.H.H.
APPROVED DATE	6 FEB 87
E-25335	

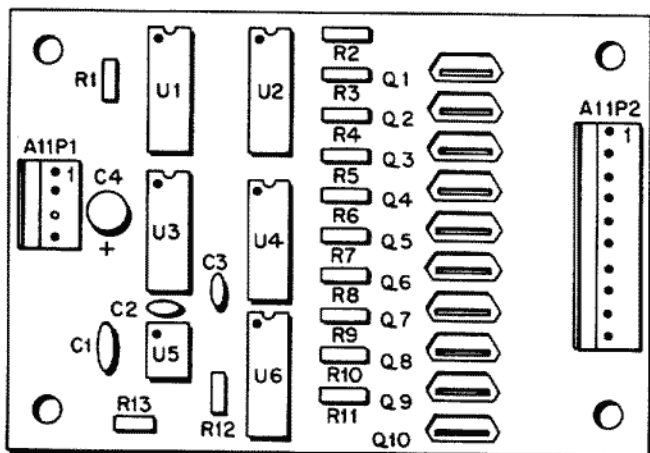


COLOR CODE	
0	BLACK
1	BROWN
2	RED
3	ORANGE
4	YELLOW
5	GREEN
6	BLUE
7	VIOLET
8	GRAY
9	WHITE

C DIAGRAMS, PARTS LISTS



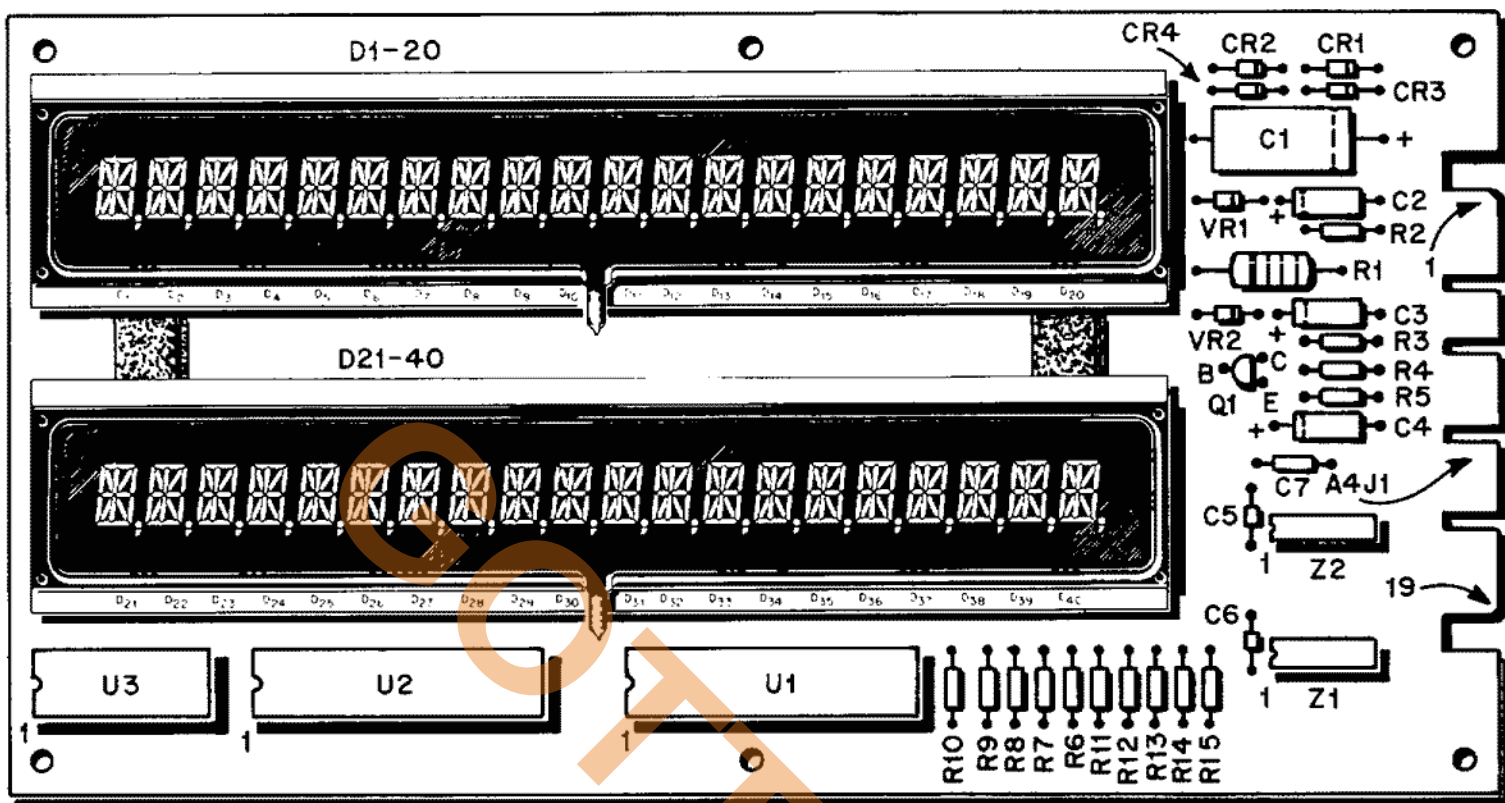
AUXILIARY LAMP DRIVER BOARD (A11) COMPONENT LOCATION



AUXILIARY LAMP DRIVER BOARD (A11) PARTS LIST

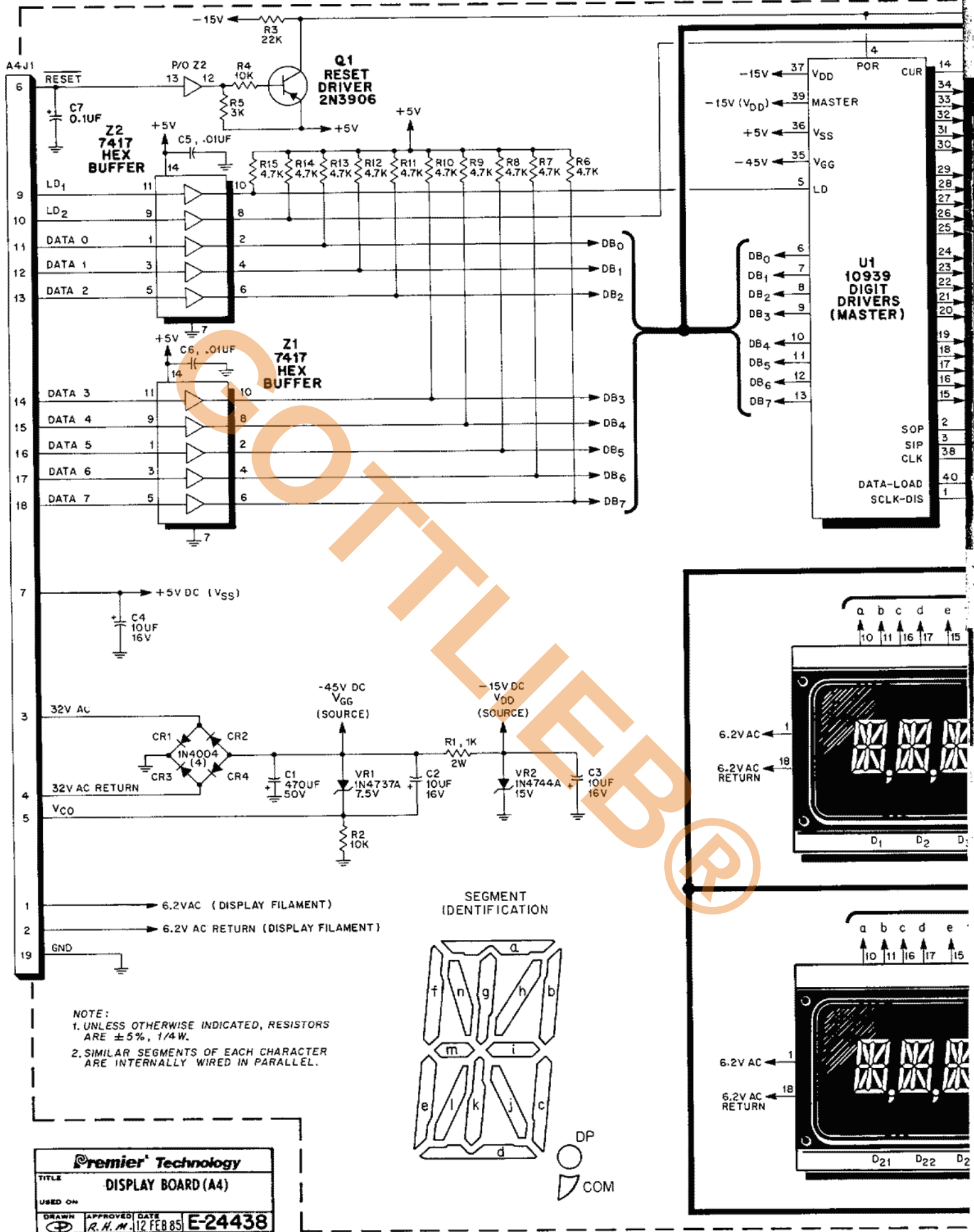
REFERENCE	DESCRIPTION	PART NUMBER
	AUXILIARY LAMP DRIVER ASSEMBLY	MA-866
C1	CAPACITOR, .1 MFD, 100V	XO-626
C2-C3	CERAMIC RADIAL LEAD CAPACITOR, .01 MFD, 100V	XO-202
C4	CAPACITOR, 47 MFD, 10V	XO-227
Q1-Q10	ELECTROLYTIC RADIAL LEAD TRANSISTOR, 2N6043 NPN DARLINGTON	XO-303
R1, R12	RESISTOR, 3K OHM, 5%, 1/4 W	XO-23
R2-R11	RESISTOR, 620 OHM, 5%, 1/4W	XO-4
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

DISPLAY BOARD (A4) COMPONENT LOCATION

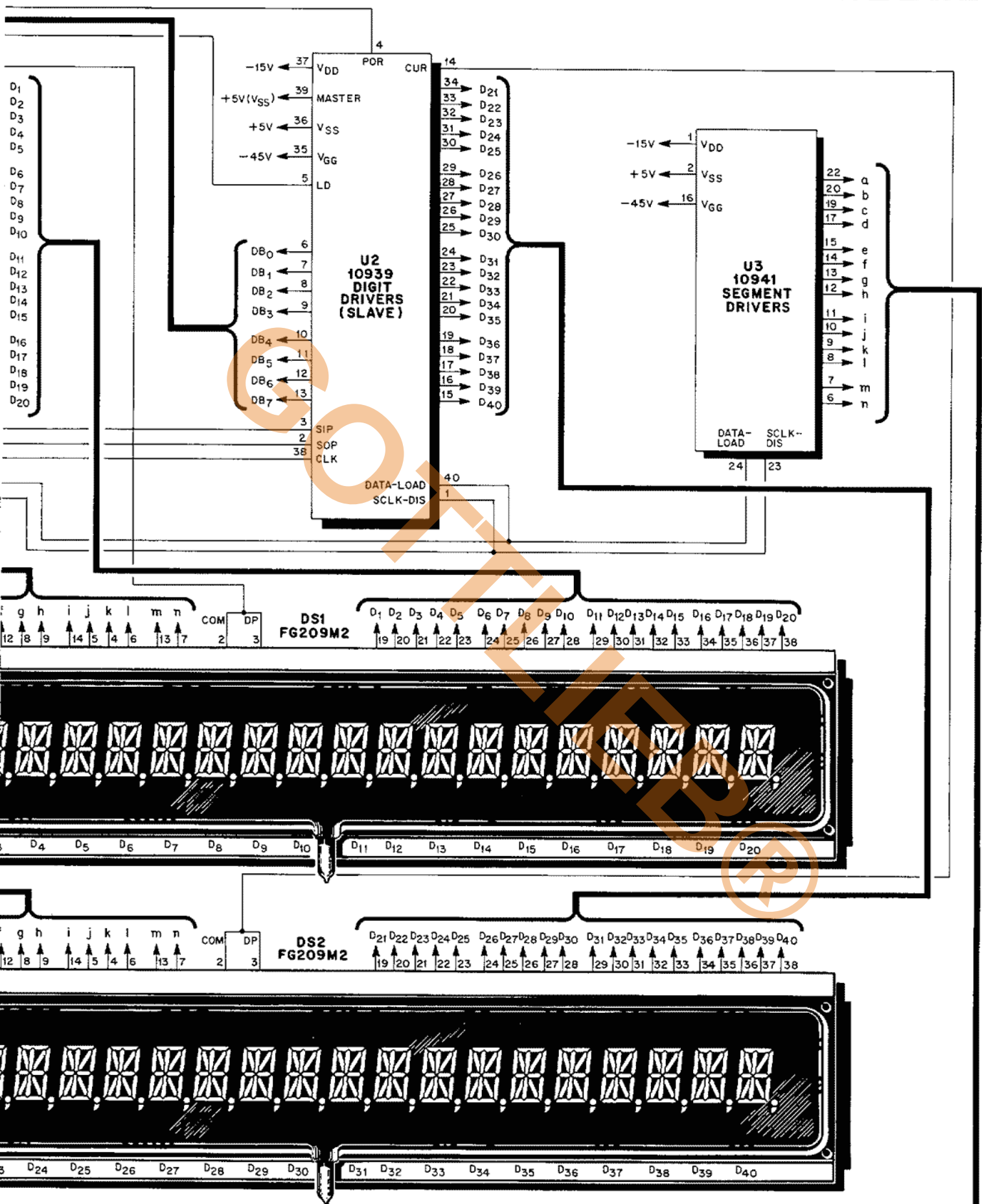


DISPLAY BOARD (A4) PARTS LIST

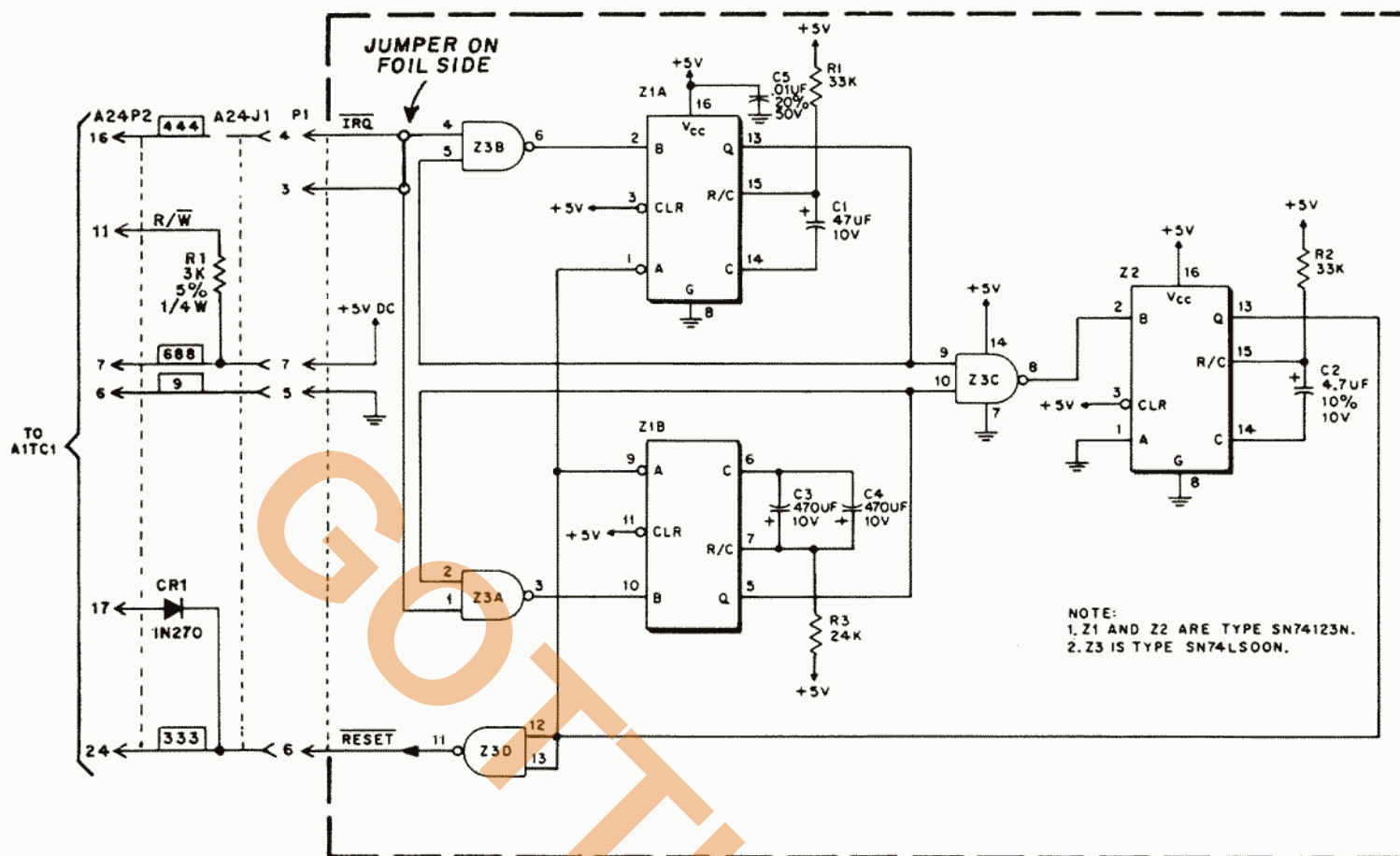
REFERENCE	DESCRIPTION	PART NUMBER
	Display Board (A4)	MA644
C1	Capacitor, 470UF, 50V	XO-847
C2, C3, C4	Capacitor, 10UF, 16V	XO-846
C5, C6	Capacitor, .01UF, +80% -20%	XO-229
C7	Capacitor, 0.1UF, 50V	XO-230
CR1-CR4	Diode, 1N4004	XO-254
DS1, DS2	Display, Alphanumeric	XO-840
Q1	Transistor, PNP, 2N3906	XO-588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



DIAGRAMS, PARTS LISTS

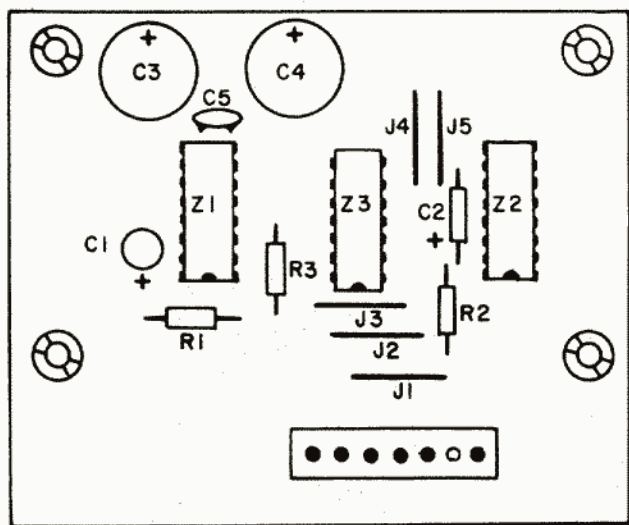


X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



Premier Technology			
TITLE RESET CIRCUIT BOARD			
USED ON			
DRAWN	APPROVED	DATE	C-21063
3AM		6-AUG-87	

**RESET BOARD (A24)
COMPONENT LOCATION**

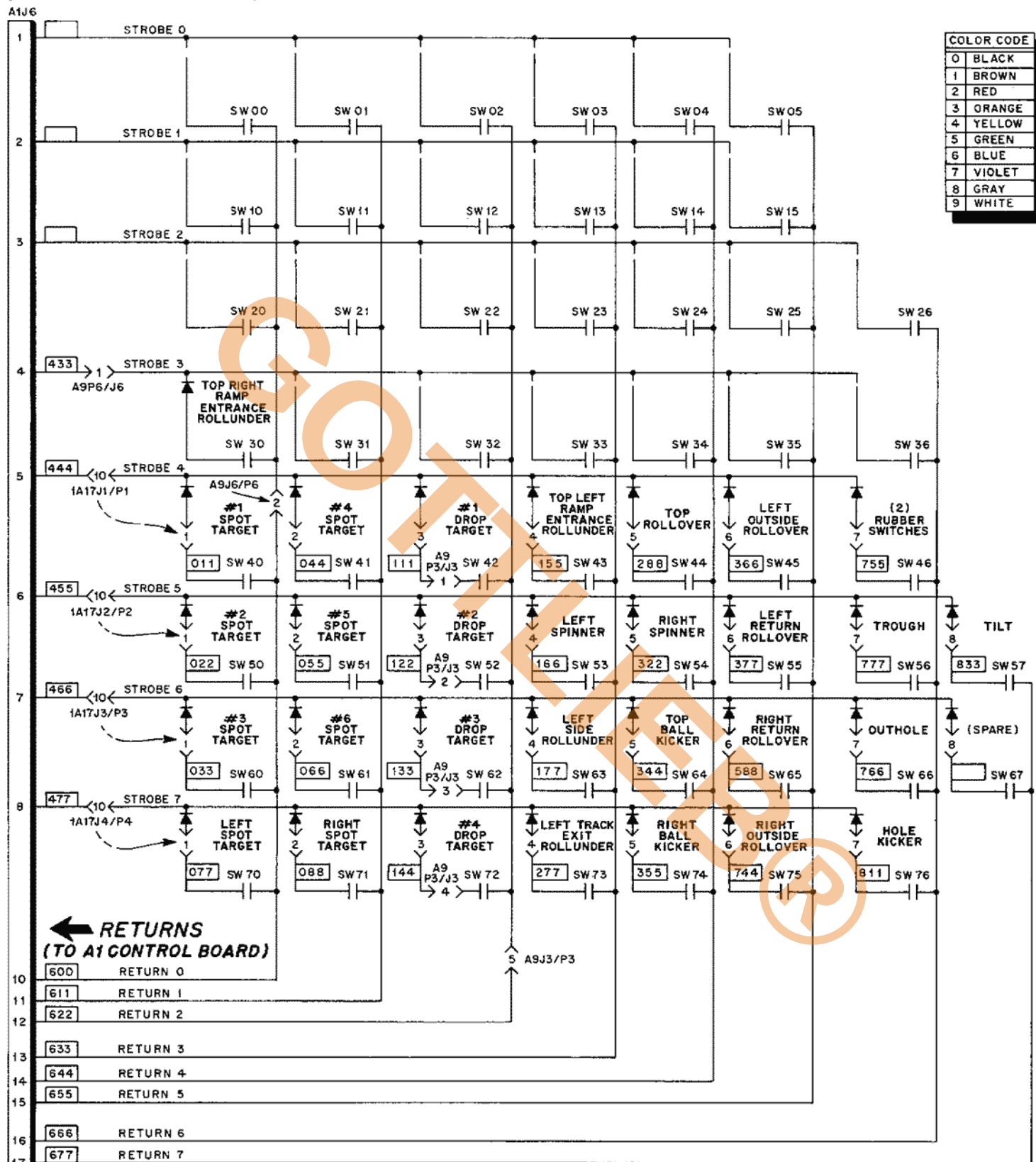


RESET BOARD (A24) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
R1, R2	Reset Board Assembly	MA-980
R3	Resistor 33K Ohm, 5%, 1/4W	XO-43
R4	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

STROBES →
(FROM A1 CONTROL BOARD)



Premier Technology			
TITLE SWITCH MATRIX			
USED ON GAME #710			
DRAWN	APPROVED	DATE	E-25550
Ⓟ	R.H.N.	6-AUG-87	

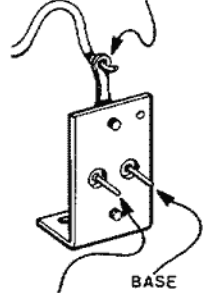
X. WIRING AND SCHEMATIC

PLAYBOARD "CONTROLLED" SOLENOIDS AND ILLUMINATION

NOTES:

1. ALL DIODES ARE TYPE IN4004.
2. LAMPS L4 THRU L11 AND L32 THRU L43 ARE DRIVEN BY MPS-A13'S; EXCEPT FOR "ALL" LAMPS, ALL OTHER LAMPS ARE DRIVEN BY MPS-U4'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.

COLLECTOR



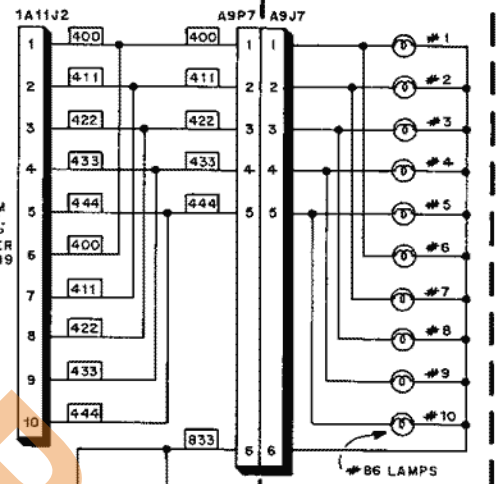
EMITTER
MJ2955
(PIN VIEW)

REFERENCE	PART NO.
#44 LAMP	LA-0
#67 LAMP	LA-5
#86 LAMP	LA-6
Q1	XO-799
R1	XO-7
R2	XO-878
C1	XO-290
CR1	XO-263

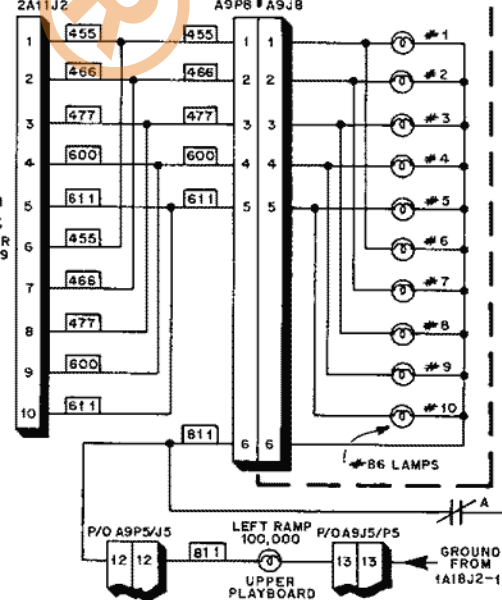
COLOR CODE
0 BLACK
1 BROWN
2 RED
3 ORANGE
4 YELLOW
5 GREEN
6 BLUE
7 VIOLET
8 GRAY
9 WHITE

OUTPUT FROM A3
MASTER DRIVER
BOARD
(SEE SCHEMATIC
FOR
LAMP DRIVER
TRANSISTOR)

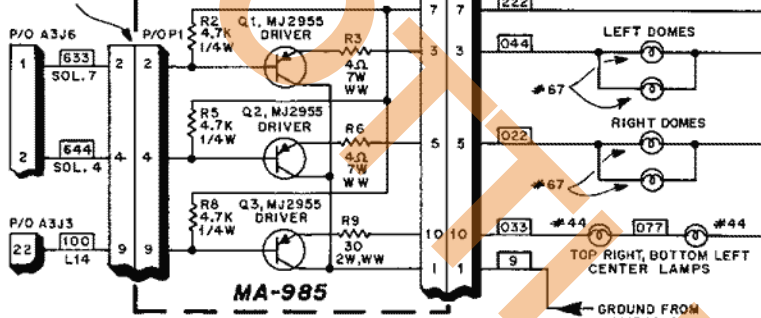
RIGHT RAMP SHOW



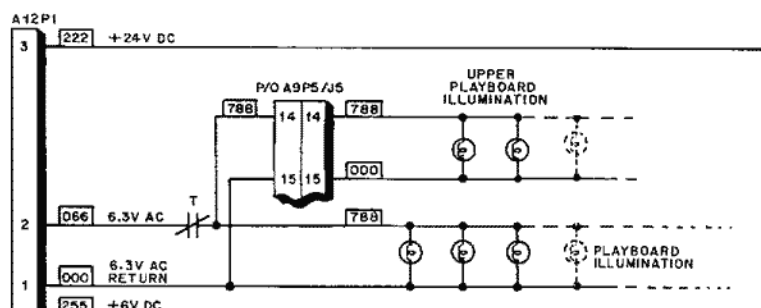
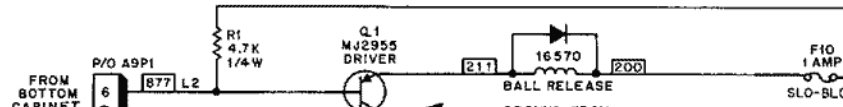
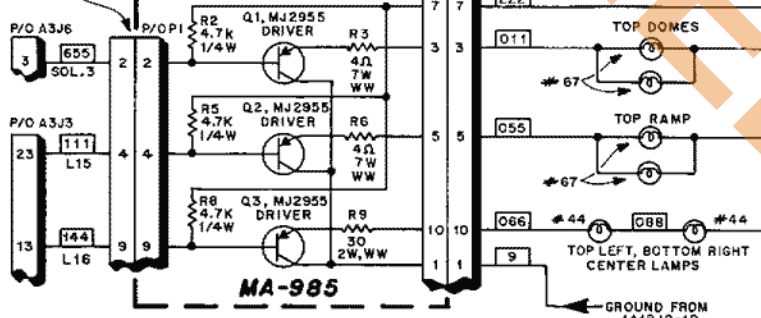
LEFT RAMP SHOW



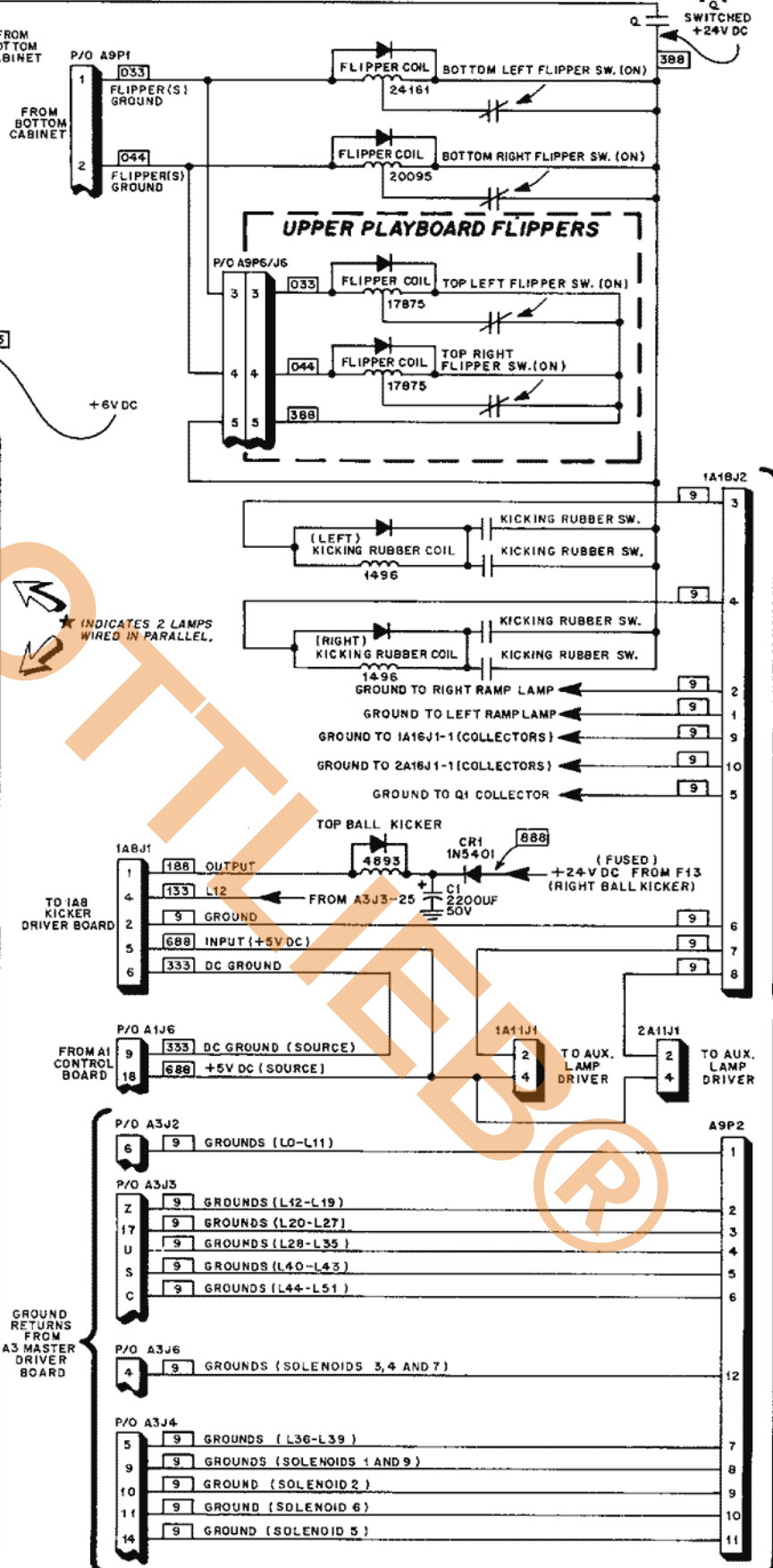
TRANSISTOR DRIVER BOARD (A16)



TRANSISTOR DRIVER BOARD (2A16)



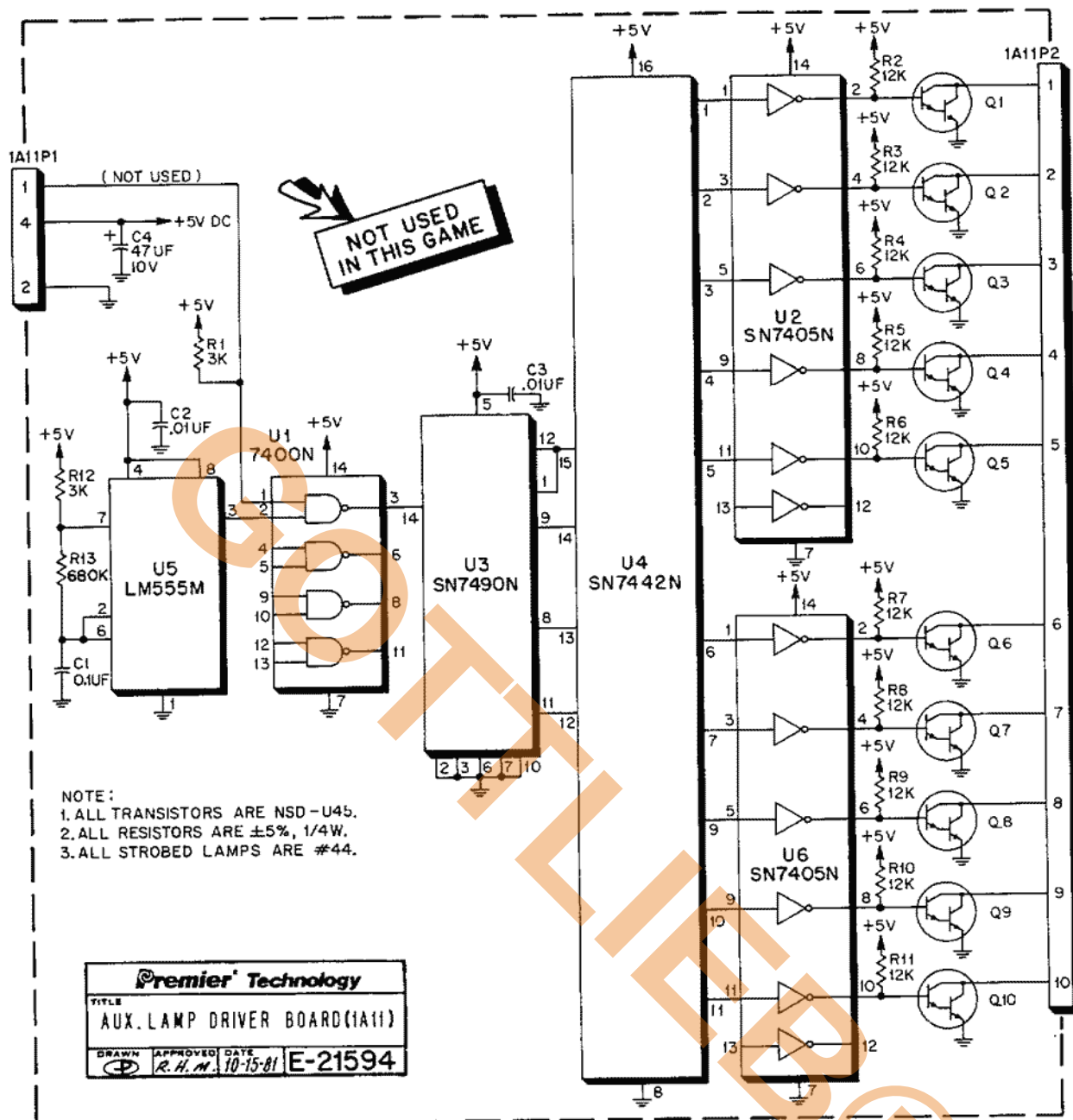
- PLAYBOARD "NON-CONTROLLED" SOLENOIDS



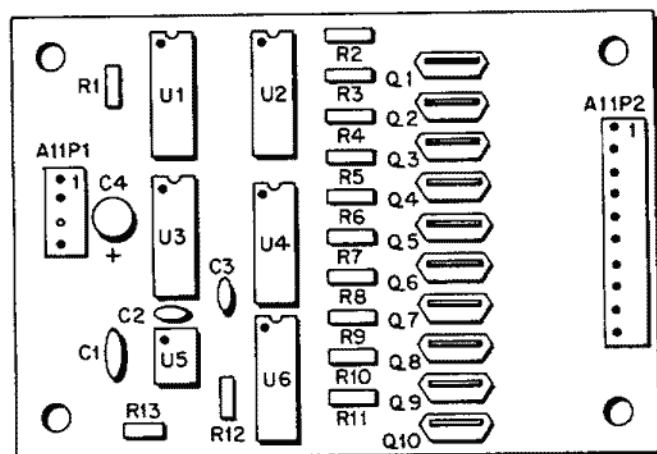
GROUNDS
 FROM .
 TRANSFORMER
 PANEL

Premier® Technology			
TITLE PLAYBOARD SOLENOIDS AND ILLUMINATION			
DRAWN P	APPROVED R.H.M.	DATE 6-8-87	E-25551

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



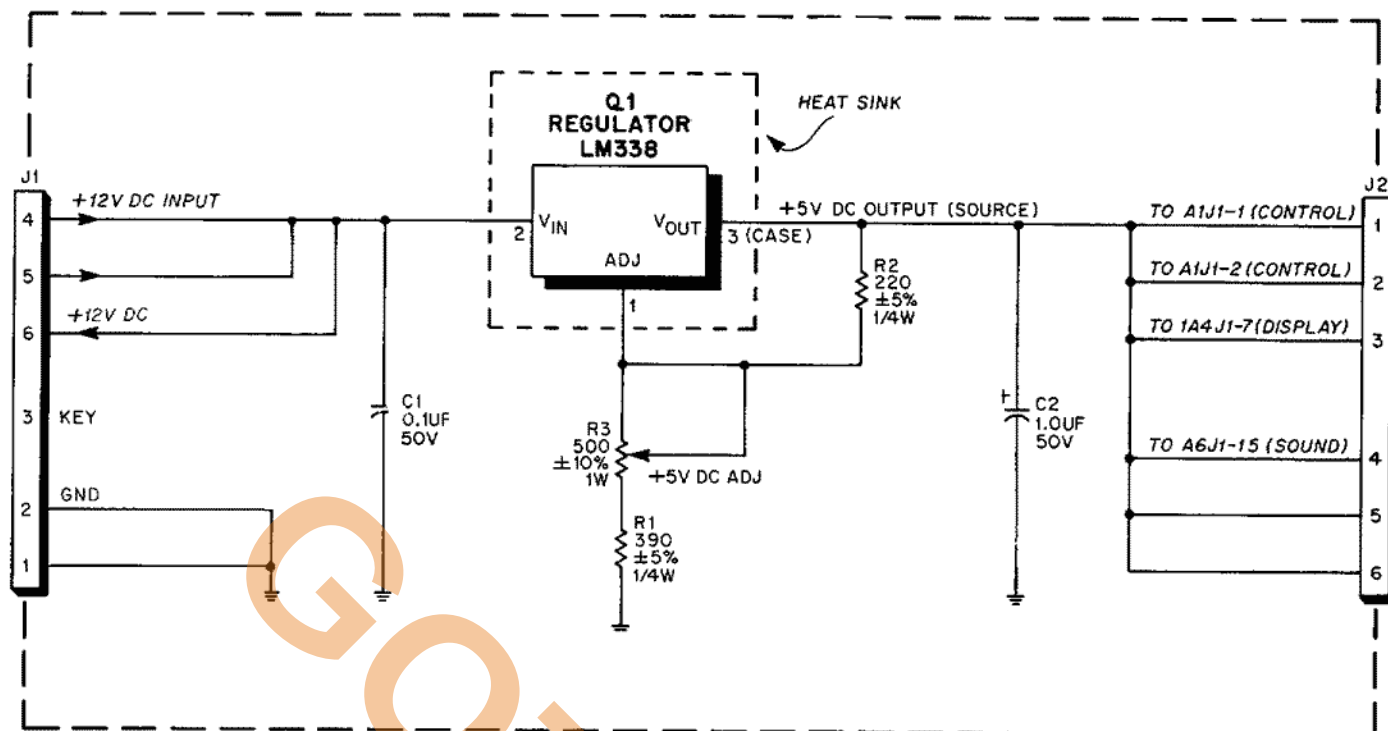
AUXILIARY LAMP DRIVER BOARD (A11) COMPONENT LOCATION



AUXILIARY LAMP DRIVER BOARD (A11) PARTS LIST

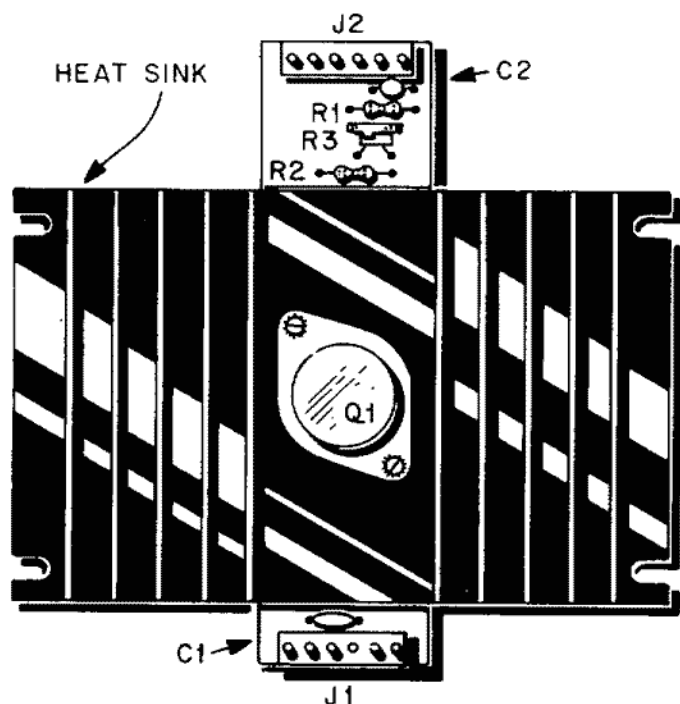
REFERENCE	DESCRIPTION	PART NUMBER
	AUXILIARY LAMP DRIVER ASSEMBLY	MA-789
C1	CAPACITOR, .1 MFD, 100V CERAMIC RADIAL LEAD	XO-626
C2-C3	CAPACITOR, .01 MFD, 100V RADIAL LEAD	XO-202
C4	CAPACITOR, 47 MFD, 10V ELECTROLYTIC RADIAL LEAD	XO-227
Q1-Q10	TRANSISTOR, NSD-U45 NPN DARLINGTON	XO-146
R1, R12	RESISTOR,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

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



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

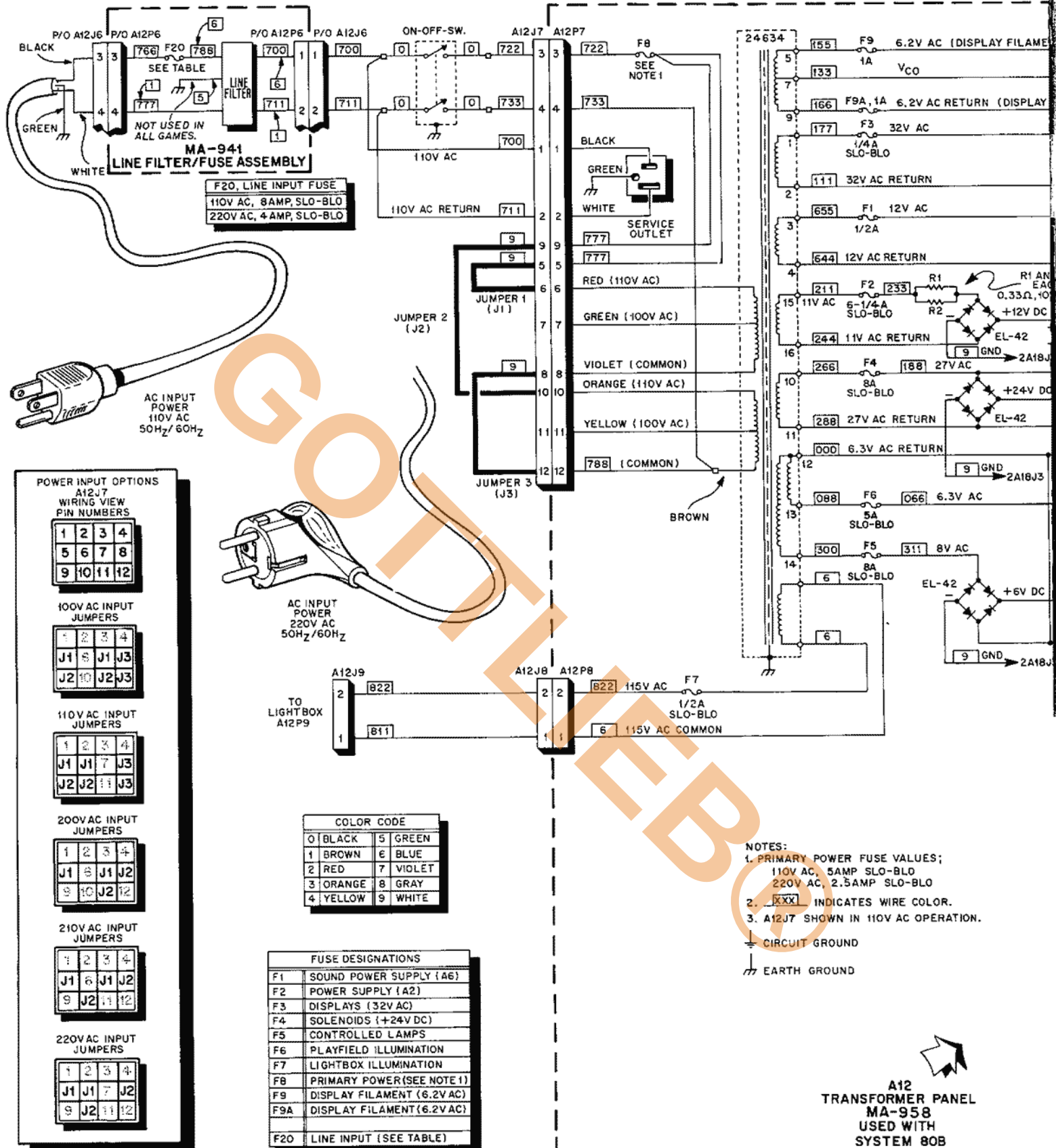
POWER SUPPLY (A2) COMPONENT LOCATION

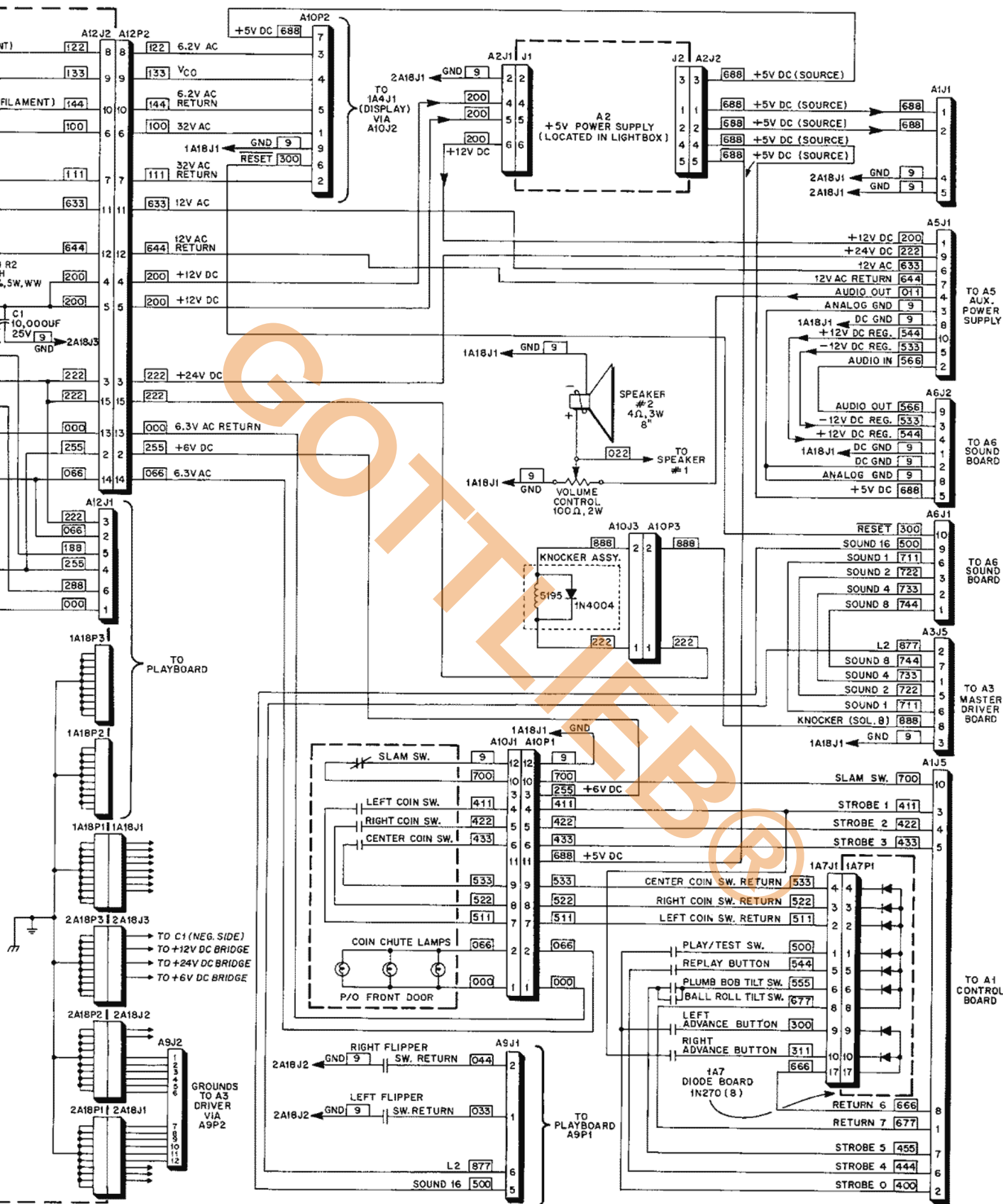


POWER SUPPLY (A2) PARTS LIST

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

X. WIRING AND SCHEMATIC





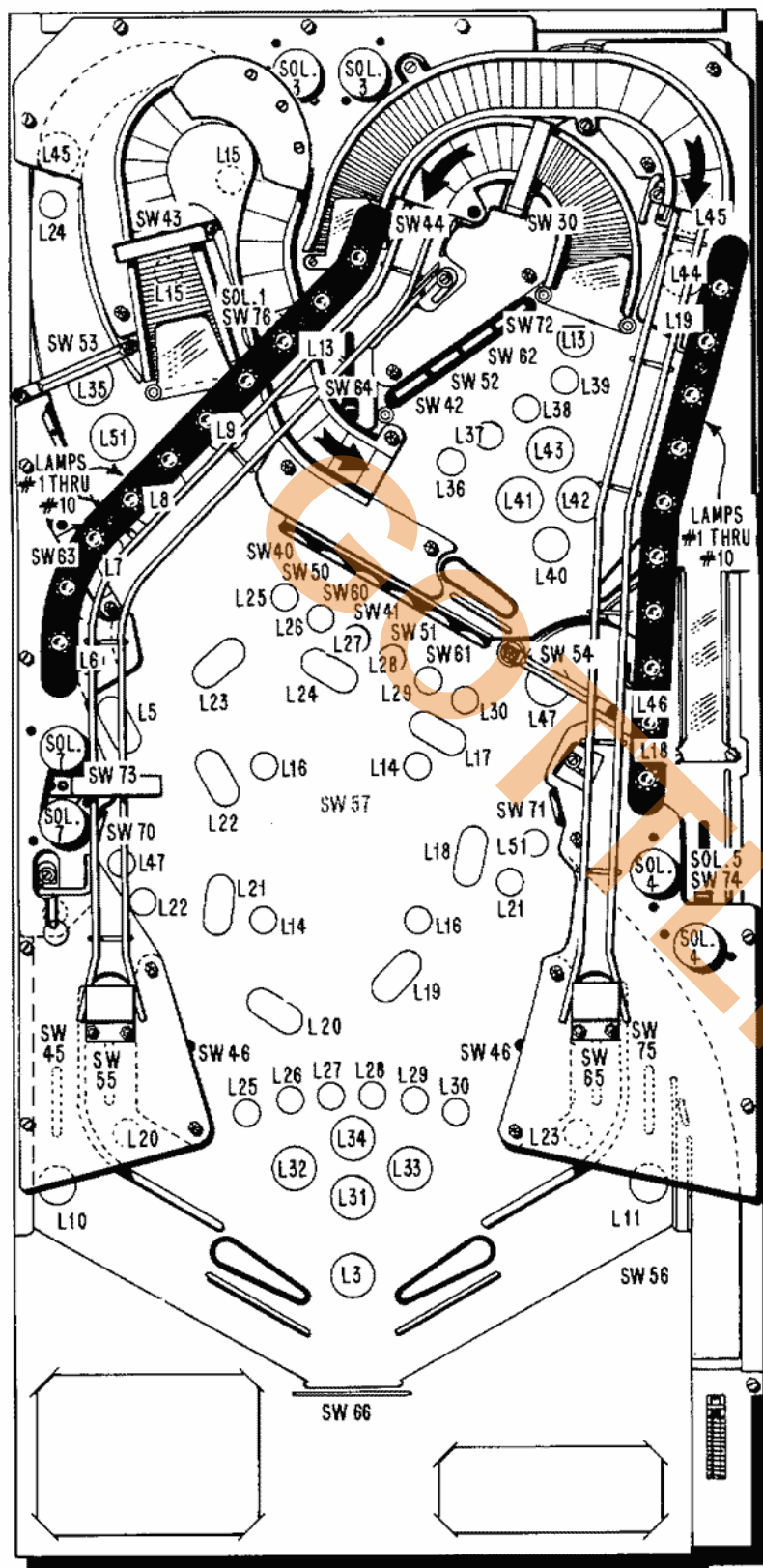
XI. PARTS INFORMATION

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PLAYBOARD PARTS	
RUBBER RINGS AND MISCELLANEOUS PARTS.....	50
BALL HOLE KICKER PARTS	
EXPLODED VIEW.....	51

XI. PARTS INFORMATION

PLAYBOARD SWITCH AND LAMP ASSIGNMENTS



NOTE:

- NOTE:
1. RIGHT RAMP AND LEFT RAMP LIGHT SHOWS DRIVEN BY AUXILLIARY LAME DRIVERS MA-789
 2. SOLENOIDS 3, 4, AND 7 ENABLE ALL DOME LAMPS (#67).
 3. L13 LAMPS CONTROLLED BY RELAY "A"

LAMP NUMBER	LAMP ASSIGNMENT
L3	SHOOT AGAIN
L5	#1 LEFT 50,000
L6	#2 LEFT 50,000
L7	#3 LEFT 50,000
L8	#4 LEFT 50,000
L9	LEFT EXTRA BALL AND CAPTURE
L10	LEFT OUTSIDE ROLLOVER SPECIAL
L11	RIGHT OUTSIDE ROLLOVER SPECIAL
L14	TOP RIGHT, BOTTOM LEFT CENTER LAMPS (2)
L15	TOP RAMP
L16	TOP LEFT, BOTTOM RIGHT CENTER LAMPS (2)
L17	#1 CHECKPOINT CAR AND TARGET (2)
L18	#2 CHECKPOINT CAR AND TARGET (2)
L19	#3 CHECKPOINT CAR, #3 CHECKPOINT TARGET
L20	#4 CHECKPOINT CAR AND TARGET (2)
L21	#5 CHECKPOINT CAR AND TARGET (2)
L22	#6 CHECKPOINT CAR AND TARGET (2)
L23	#7 CHECKPOINT CAR AND TARGET (2)
L24	FINISH LINE CAR AND TARGET (2)
L25	#1 SPOT TARGET AND PLAYBOARD (2)
L26	#2 SPOT TARGET AND PLAYBOARD (2)
L27	#3 SPOT TARGET AND PLAYBOARD (2)
L28	#4 SPOT TARGET AND PLAYBOARD (2)
L29	#5 SPOT TARGET AND PLAYBOARD (2)
L30	#6 SPOT TARGET AND PLAYBOARD (2)
L31	1X MULTIPLIER
L32	2X MULTIPLIER
L33	4X MULTIPLIER
L34	8X MULTIPLIER
L35	LEFT SPINNER DOUBLE SCORE
L45	LEFT TOP RACE
L46	RIGHT BOTTOM RACE
L47	LEFT SPOT TARGET AND RIGHT SPINNER (2)
L51	RIGHT SPOT TARGET AND LEFT SPINNER (2)

UPPER PLAYBOARD LAMPS

```
L36      #1 DROP TARGET
L37      #2 DROP TARGET
L38      #3 DROP TARGET
L39      #4 DROP TARGET
L40      DROP TARGET VALUE 50,000
L41      DROP TARGET VALUE 50,000
L42      DROP TARGET VALUE 50,000
L43      DROP TARGET VALUE 50,000
L44      RIGHT EXTRA BALL
L45      RIGHT TOP RACE,
```

SWITCH
MATRIX
NUMBER

SERIAL NUMBER	SWITCH ASSIGNMENT	PART NO.
SW 30	Top Right Ramp Entrance Rollunder	21137
SW 40	#1 Spot Target Assembly (RED)	25460U
SW 41	#4 Spot Target Assembly (RED)	26460U
SW 42	#1 Drop Target	18094
SW 43	Top Left Ramp Entrance Rollunder	24622
SW 44	Top Rollover	18892
SW 45	Left Outside Rollover	18892
SW 46	Kicking Rubber	
	Scoring Switch (2)	18808
	Actuating Switch And Bracket (4)	22224
SW 50	#2 Spot Target Assembly (RED)	25460U
SW 51	#5 Spot Target Assembly (RED)	25460U
SW 52	#2 Drop Target	18095
SW 53	Left Spinner	18627
SW 54	Right Spinner	19354
SW 55	Left Return Rollover	18892
SW 56	Trough	18892
SW 57	Tilt (With Bracket)	9141
SW 60	#3 Spot Target Assembly (RED)	25460U
SW 61	#6 Spot Target Assembly (RED)	25460U
SW 62	#3 Drop Target	18093
SW 63	Left Side Rollunder	21137
SW 64	Top Ball Kicker	19754
SW 65	Right Return Rollover	18892
SW 66	Outhole	18892
SW 70	Left Spot Target Assembly (RED)	25460U
SW 71	Right Spot Target Assembly (RED)	25460U
SW 72	#4 Drop Target	18093
SW 73	Left Track Exit Rollunder	24622
SW 74	Right Ball Kicker	19754
SW 75	Right Outside Rollover	18892
SW 76	Hole Kicker	18085

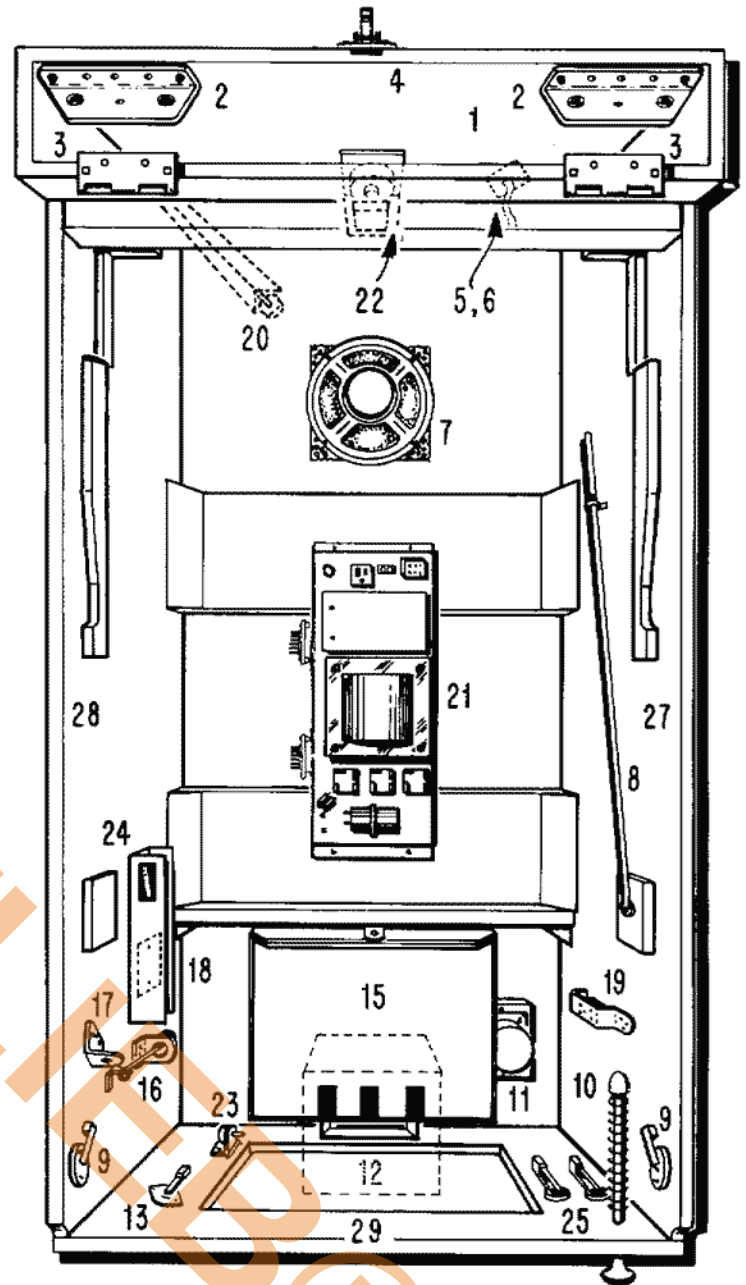
XI. PARTS INFORMATION

CABINET PARTS

ITEM DESCRIPTION

PART NO.

1. Cabinet 25270-710
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
5. Cable Assembly, Domestic (High Voltage) 21969
6. Line Cord (Domestic) MA-794
7. Line Cord Cover Plate 23365
8. Speaker, 4 Ohm, 3W, 8" 21955
9. Speaker Guard EL-83
10. Prop Stick, Playfield 20931
11. Flipper Switch Assembly (2) 23940
12. Ball Shooter Assembly 17838-3
13. Switch, On/Off 8835
14. Switch Plate (2) 23799
15. Switch Housing 18769
16. Front Door Assembly (Universal) 15163
17. Cable Assembly MA-688
18. Slam Switch MA-676
19. 6V DC Lamp, Wedge Base 24567
20. Frame, Door FD-2
21. Three Chute Door FD-13
22. Black Button Bezel 24160
23. Entry/Reject Button FD-14
24. Button Spring FD-15
25. Reject Flap FD-16
26. Clamp, Frame FD-17
27. Flat Lock and Cam Assembly FD-18
28. Base Plate with Pivot and Stud FD-19
29. Microswitch Bracket FD-20
30. Clear Plastic Cover for Microswitch FD-21
31. Coin Microswitch with Wire FD-22
32. Lampholder FD-23
33. Black Reject Bezel FD-24
34. Replay Switch Assembly FD-26
35. Cashbox 18092
36. Cover 25309
37. Liner (Small) (3) 25315
38. Liner (Large) (2) 24870
39. Plumb Bob Tilt Switch Assembly 24871
40. Strike Plate 358
41. Carbon, Tilt Bob MH-30
42. Rod, Tilt 357
43. Bracket 22043
44. Locator Bracket 18578
45. Diode Assembly 24252
46. Diode, 1N270 (8) XO-265
47. Klocker Assembly MA-12
48. Bell Assembly (Gong) (When Used) MA-352
49. Cabinet Leg (4) 4337
50. (Black) (4) (When Used) 4337Y
51. (Gold) (4) (When Used) 4337T
52. Leg Bolt (8) 3775
53. 3" Leg Adjuster (4) MH-21
54. 1" Sleeve (2) 25317
55. 3/8-16, Jam Nut (8) FA-665
56. Transformer Panel Assembly MA-958
57. Bridge Rectifier (3) EL-42
58. Cable Assembly (Secondary) MA-948
59. Capacitor, 10,000UF, 25V XO-830
60. Filter, Line EL-50
61. Fuse Block (8 Pos.) EL-10
62. Fuse Cover 23805
63. Fuse Holder (F7 and F8) (2) EL-78
64. Fuses
65. F1, 1/2 Amp EL-28
66. F2, 6-1/4 Amp, SLO-BLO EL-29
67. F3, 1/4 Amp, SLO-BLO EL-5
68. F4, 8 Amp, SLO-BLO EL-26
69. F5, 8 Amp SLO-BLO EL-26
70. F6, 5 Amp SLO-BLO EL-8
71. F7, 1/2 Amp SLO-BLO EL-20
72. F8, 5 Amp, SLO-BLO (110V AC) EL-8
73. F8, 2.5 Amp, SLO-BLO (220V AC) EL-21
74. F9, 1 Amp EL-3
75. F9A, 1 Amp EL-3
76. Ground Bus Assembly (2) 25374
77. Outlet, Service 18133
78. Resistor, 0.33 Ohm, 10% XO-154
79. 5W, Wire-Wound (2) 24634
80. Transformer



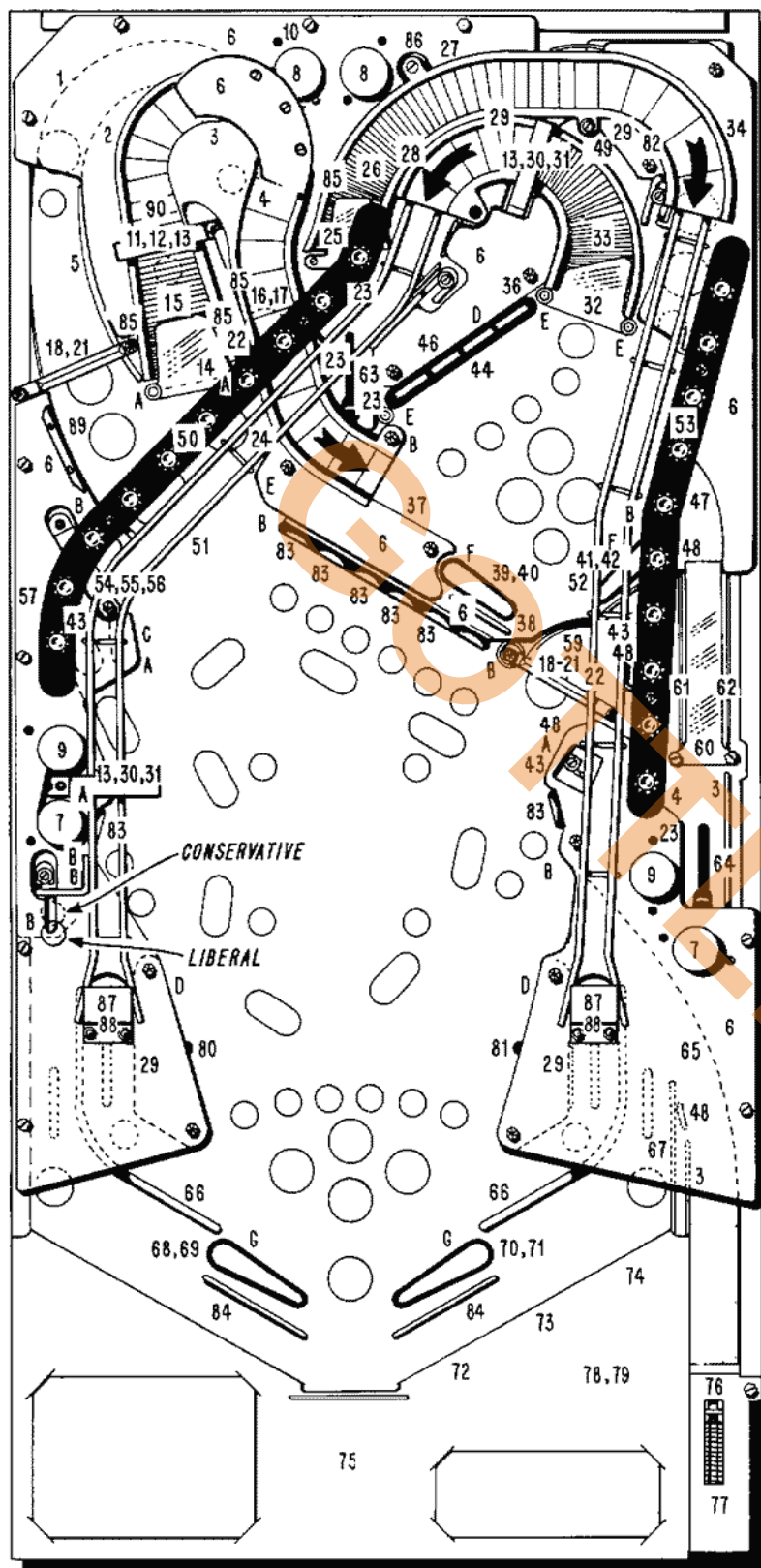
ITEM DESCRIPTION

PART NO.

22. Line Filter Assembly MA-941
23. Fuse Holder EL-78
24. F20, 8 Amp, SLO-BLO (110V AC) EL-26
25. F20, 4 Amp, SLO-BLO (220V AC) EL-33
26. Line Filter EL-50
27. Line Filter (Germany) EL-51
28. Mounting Bracket 24149
29. Control, Volume, 100 Ohm, 2W XO-199
30. Switch, PLAY/TEST EL-57
31. Ball Roll Tilt 24394
32. Housing and Switch Assembly 24393
33. Switch 23503
34. Button Holder and Switch (2) 24293Y
35. Pushbutton (2) (Black) 25181-710
36. Lightbox (Not Shown) 22735
37. Right Moulding (Not Shown) (Black) (When Used) 22735Y
38. (Gold) (When Used) 22735T
39. Left Moulding (Not Shown) (Black) (When Used) 22736
40. (Gold) (When Used) 22736Y
41. Front Moulding (Not Shown) (Black) (When Used) 22736T
42. (Gold) (When Used) 16951
43. 16951Y
44. 16951T

XI. PARTS INFORMATION

PLAYBOARD PARTS INFORMATION



PARTS LIST

ITEM	DESCRIPTION	PART NO.
1	Flat Rail	25530
2	Ball Guide Rail	17106
3	Ball Guide Rail (3)	13782
4	Ball Guide Rail (2)	6612
5	Ball Guide Rail	18764
6	Plastic Shield Set	25554
7	Plastic Dome Hat, Amber, (2)	25147N
8	Plastic Dome Hat, Blue, (2)	25147W
9	Plastic Dome Hat, Red, (2)	25147U
10	Plastic Rivet (12)	MP-10
11	Metal Shield	25245
12	Gate Wireform	25259
13	Rollunder Spring (2)	25247
14	Ramp Flap	25056
15	Molded Ramp	25492
16	Ball Hole Kicker Assembly (See Exploded View Illustration)	MA-998
17	Ball Snubber	21532
18	Target Shield (2)	14043
19	Swinging Target Assembly (2)	24494
20	Switch Rod (2)	20406
21	Nylon Washers (4)	20407
22	Ball Guide Rail (2)	17650
23	Ball Guide Rail (5)	3722
24	Flat Rail	25526
25	Ramp Flap	25523
26	Molded Ramp	25491
27	Flat Rail	25528
28	Ball Guide Rail	4832
29	Ball Guide Rail (4)	4831
30	Gate Shield (2)	25442
31	Gate Wireform (2)	25443
32	Ramp Flap	25568
33	Molded Ramp	25490
34	Flat Rail	25529
35	Ball Guide Rail	8514
36	Ramp Mounting Bracket	25567
37	Ball Guide Rail	18563
38	Ball Guide Rail	6612
39	Top Left Flipper Assembly	MA-937
40	Top Left Flipper Switch	17875
41	Top Right Flipper Assembly	MA-938
42	Top Right Flipper Switch	17875
43	Ball Guide Rail (3)	6931
44	Target Bank Assembly	MA-42A
45	Target Arm, White, (4)	11905Z
45A	Target Decal (4)	25573
46	Ball Guide Rail	17106
47	Flat Rail	25524
48	Ball Guide Rail (3)	18070
49	Ramp Spacer	25395
50	Light Strip Assembly Wedge Base Socket (with wires)(10)	MA-974 25545
51	#86 Lamps (10)	LA-6
52	Wireform Ramp	25493
53	Light Strip Assembly Wedge Base Socket (with wires)(10)	MA-975 25545
54	Gate Shield	4705
55	Gate Wireform	21958
56	Rollunder Spring	14236
57	Flat Rail	25527
58	Ball Guide Rail (3)	6931
59	Flat Rail	25525
60	Ramp Flap	25538
61	Ramp Fence	22122
62	Ramp Fence	22123
63	Kicker Assembly	MA-997
64	Kicker Assembly	MA-176A
65	Flat Rail	25531
66	Ball Guide Rail (2)	23833
67	Ball Guide Rail	4833
68	Left Flipper Assembly	MA-937B
69	Left Flipper Switch	24161
70	Right Flipper Assembly	MA-938A
71	Right Flipper Switch	20095
72	1-1/16" Steel Ball (2)	21864
73	Ball Return Unit Assembly	21622
74	Ball Return Gate Assembly	20607
75	Cardholder	13657-710
76	Ball Shooter Gauge	9767-710
77	Ball Shooter Assembly	8835
78	Ball Return Fence	23855
79	Ball Return Gate Fence	23856
80	Contact Kicker Assembly	MA-135A
81	Contact Kicker Assembly	MA-135
82	Ball Guide Rail	8514
83	Spot Target Assembly, Red (8)	25460U
84	Ball Snubber (2)	13798
85	Ball Deflector (4)	21158
86	Ramp Spacer	25086
87	Ball Snubber (2)	21159
88	Velcro Strip (2)	MP-13
89	Ball Deflector	25594
90	Ramp Decal	25596

RUBBER RINGS

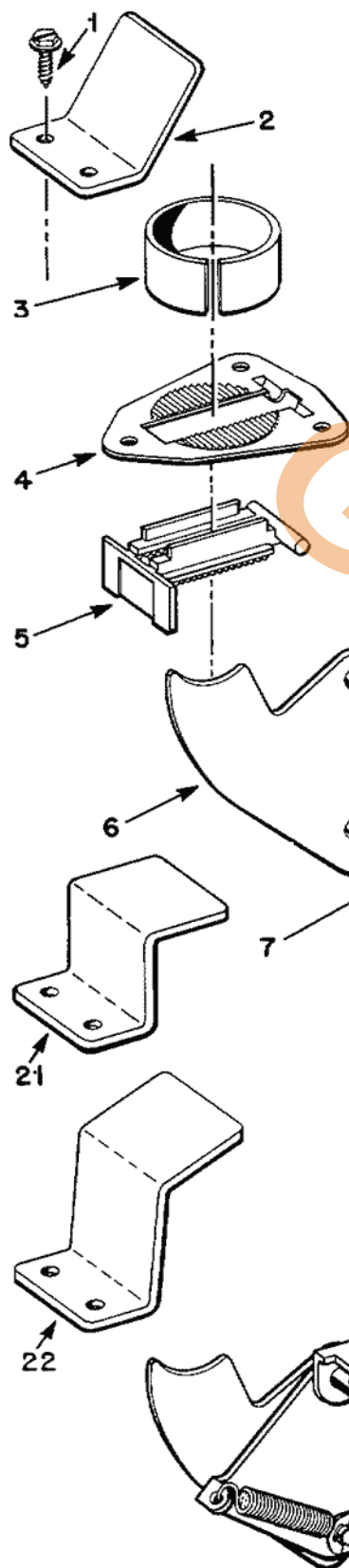
ITEM	DESCRIPTION	PART NO.
A	Mini-Post (5)	15705
B	5/16" (8)	10217
C	3/4"	10218
D	2-1/2" (2)	10222
E	Sm. Mini-Post (4)	14793
F	Flipper, Red (2)	13149
G	Flipper, Red (2)	13151

MISCELLANEOUS PARTS

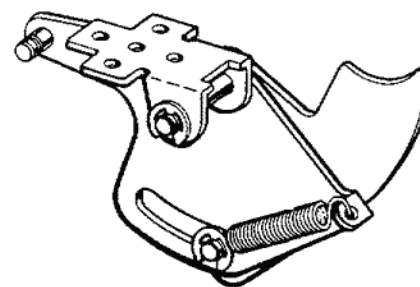
DESCRIPTION	PART NO.
Mini-Post Screw	14792
Siamese Post	17492
Plastic 1" Post	11561P
Plastic Support Post	20635
"A" Relay Assembly	MA-995
"T" Relay Assembly	MA-25
"Q" Relay Assembly	MA-23

XI. PARTS INFORMATION

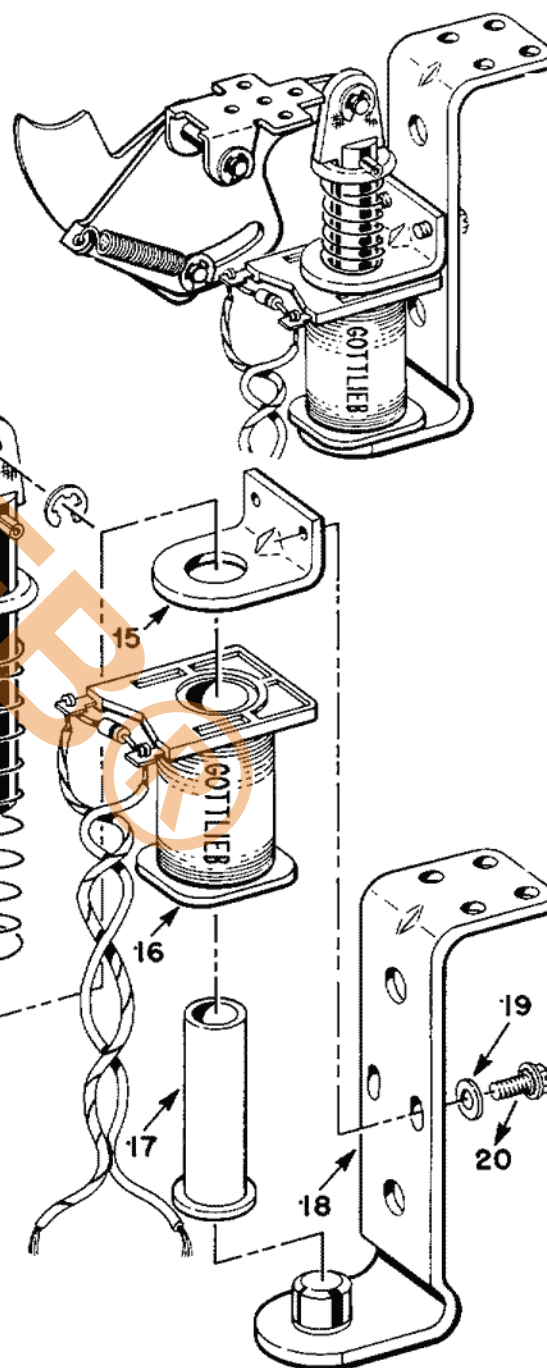
BALL HOLE KICKER PARTS



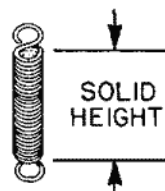
ITEM	DESCRIPTION	PART NO.
1	6 x 1/2" HWHMS (2)	FA-270
2	Ball Snubber	16038
3	Metal Hole Liner	11151
4	Hole Base Plate (Specify Color)	15707
5	Hole Switch Arm (Specify Color)	15708
6	Ball Cam (See Tables)	
7	Nylon Washer	6443
8	Spring Cam (See Tables)	
9	Spring (See Tables)	
10	Fulcrum	15819
11	E-Ring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



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



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



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