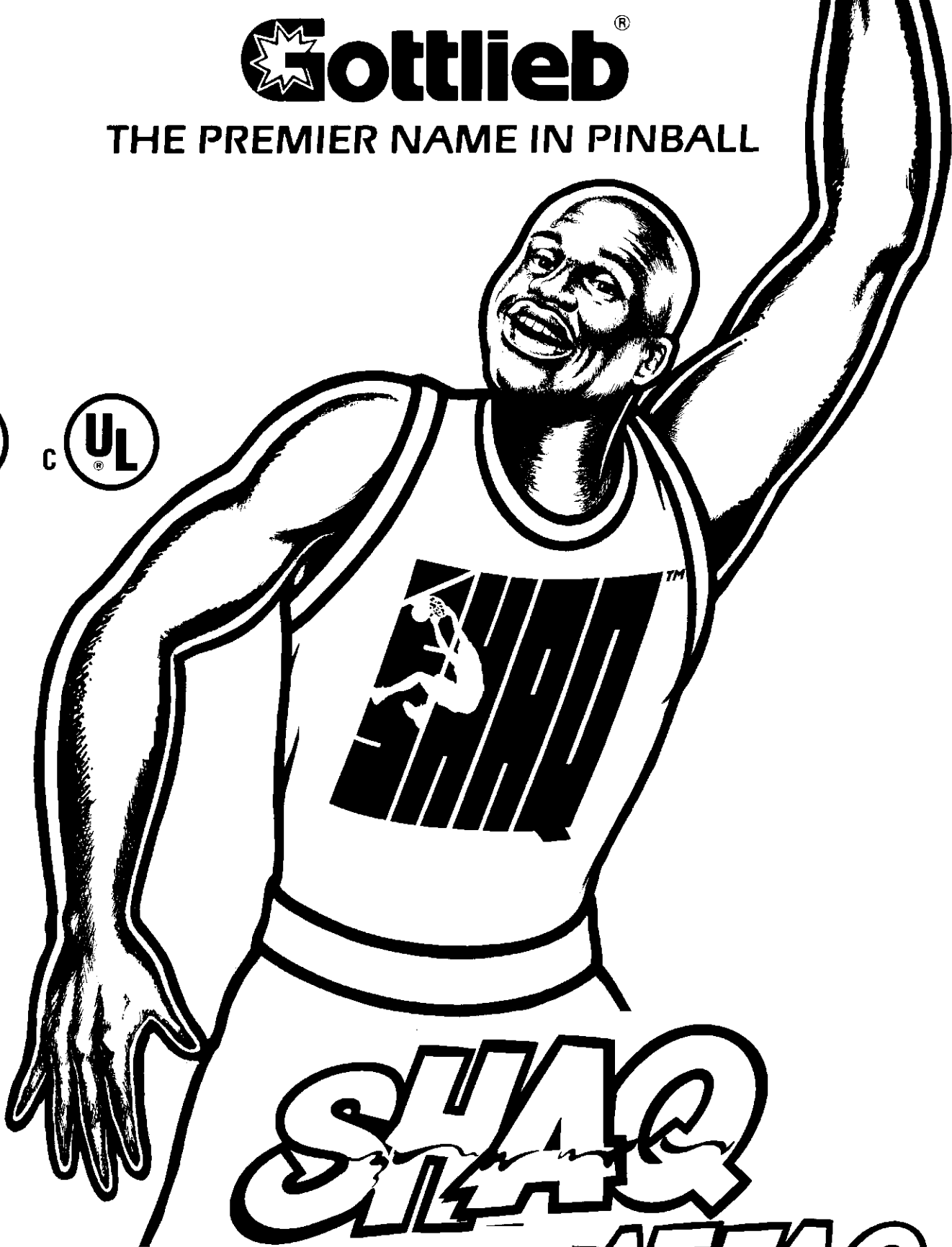


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Instruction Manual



GAME #743

(INSTALL 4 BALLS IN OUTHOLE)

INSTRUCTION MANUAL

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GAME PROM:	DISPLAY PROM:	SOUND PROM:
(TYPE 26C512)	(TYPE 27C040-25)	(TYPE 27C256)
743/GPROM	743/DSROM	743/DROM1
		743/YROM1
		(TYPE 27C020-25)
		743/AROM2

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.



759 INDUSTRIAL DRIVE
BENSENVILLE, IL 60106
1-708-350-0400
FAX: 1-708-350-1097

SUPPLEMENTAL ADDENDUM

ATTACH TO AND A PART OF
SHAQ ATTAQ (GAME #743)
INSTRUCTION MANUAL

GAME AS SHIPPED VARIES FROM THE INSTRUCTION MANUAL AS PRINTED.

CHANGED PAGE 2

"BEAT THE BUZZER" SHOULD READ "SHOT CLOCK" IN BASKET HOOP DESCRIPTION.

ADDED TO PAGE 7

K. LED DISPLAY TEST

This test checks the operation of the individual digits of the LED Display Board. Pressing the right flipper button will advance to the next step of the test. The digits 0-9 will appear in numerical order starting from the leftmost to rightmost digit position. Only one digit should light during each step of this test.

CHANGED PAGE 15

CHANGED STEP 68 (HIDDEN FEATURES BONUS) FACTORY DEFAULT TO HARD.

ADDED TO PAGE 17

ADD THE FOLLOWING SENTENCE TO THE POST ADJUSTMENTS SECTION.

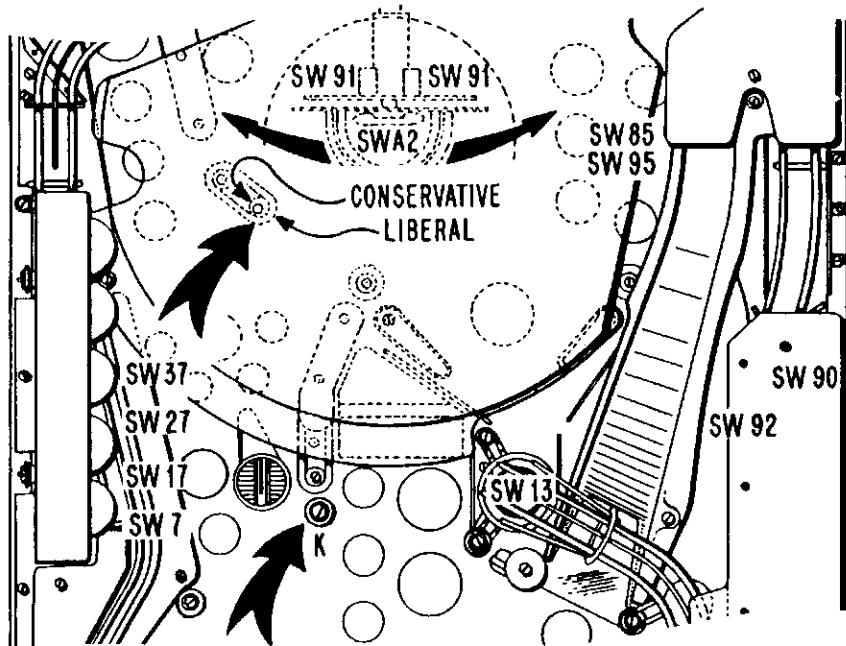
The playing time in the upper section of the playfield can be controlled by the position of the lower post of the island located just to the left of the spinning disc. The upper position is for conservative playing time and the lower position is for liberal playing time.

CHANGED PAGE 68

MA-1790C SHOULD BE MA-1790A, MA-1791C SHOULD BE MA-1791A

ADDED TO PAGE 65

SEE POST ADJUSTMENT ADDED IN ILLUSTRATION BELOW.



CHANGED PAGE 67

BUMPER TYPE "K" WAS BUMPER TYPE "A", SEE ILLUSTRATION ABOVE.

SYSTEM 3 OVERVIEW

System 3 contains many new features which improve game play and reliability. Some of these features are as follows:

- 1) New lithium battery provides data retention for a minimum of 5 years under normal operation and virtually eliminates battery leakage. Also a low battery warning is given in the displays when the voltage drops to the critical level.
- 2) New interlocking connector system for improved reliability.
- 3) Use of High Speed CMOS technology for low power consumption and cooler operation.
- 4) Improved solenoid driver reliability due to simplified circuitry and the use of Rugged Power MOSFETS.
- 5) Lamp short protection.
- 6) Switch matrix input protection.
- 7) Easy line voltage adjustment on location.
- 8) Improved bookkeeping functions.
- 9) New 128 x 32 Dot Matrix Display.
- 10) Capability for operators to enter their own messages in the attract mode.
- 11) Use of new SMART SWITCH(tm) technology which eliminates the use of contact points on switches. Therefore the need for cleaning dirty switches is eliminated.
- 12) Addition of a Tournament Mode switch which allows a quick and easy way to replace current adjustment settings with special settings. This switch also provides an easy way to set the game for free play.

This equipment has been found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

WARNING

**DO NOT TRANSPORT GAME WITH LIGHTBOX IN THE UPRIGHT (PLAYING) POSITION.
USE LATCH ONLY TO TEMPORARILY HOLD LIGHTBOX UPRIGHT WHILE ATTACHING THE LIGHTBOX TO THE CABINET.
SECURE THE LIGHTBOX TO THE CABINET WITH THE TWO BOLTS AND LOCKWASHERS PROVIDED.**

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 the insert lamp assembly, proceed as follows:

UNLOCK THE LIGHTBOX BY TURNING THE KEY A QUARTER TURN CLOCKWISE.

LIFT UP THE BACKGLASS RETAINING BOTTOM TRIM ABOUT 3/4" TO CLEAR THE "H" RETAINING CHANNEL ON THE TOP EDGE OF THE DISPLAY/SPEAKER PANEL, PIVOT OUT TOWARDS YOU AND SLIDE THE BACKGLASS DOWN AND OUT, CAREFULLY SET ASIDE.

REMOVE THE "H" RETAINING CHANNEL, SLIDE THE PLEXIGLASS INSERT UP AND OUT, SLIDE UP AND REMOVE THE DISPLAY/SPEAKER PANEL AND LAY FACE DOWN ON THE CABINET.

UNLOOSEN THE TWO WING NUTS ON THE LEFT SIDE AND PUSH THE LOCK SLIDE UPWARDS, THIS ALLOWS THE LIGHTBOX LAMP INSERT TO SWING OUT AND FOR GAINING ACCESS TO THE ELECTRONICS PANEL.

5. Secure the lightbox to the cabinet with the bolts and washers provided.

TO REPLACE THE BACKGLASS, INSERT THE DISPLAY/SPEAKER PANEL, ENSURE THAT THE METAL TABS ON THE PANEL MATE INTO THE WOOD RETAINERS, SLIDE IN THE PLEXIGLASS PANEL AND INSERT THE "H" RETAINING CHANNEL.

SLIDE THE BACKGLASS UP INTO THE LIGHTBOX, PIVOT INWARDS AND SLIDE DOWN INTO THE "H" CHANNEL, TURN THE KEY A QUARTER TURN COUNTER-CLOCKWISE TO LOCK THE LIGHTBOX.

6. Open the cabinet door and loosen the front moulding locking arm.
7. Remove the front moulding from the cabinet.
8. Slide the playfield glass toward you and remove it, carefully set aside.
9. Slide the playfield toward you, pivot upwards and back towards the lightbox,

hold in place and insert the prop stick into the countersunk hole on the underside of the playfield.

CAUTION!

Use prop stick when servicing under the playfield.

10. Unravel and straighten out the power line cord located at the rear of the 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 A12J5, 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. 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.
9. Lower the playfield into the cabinet. Using the leg adjusters, level the playfield. At this point, the pitch of the playfield should be approximately 6 degrees.
10. Plug the line-cord into a properly grounded 3-wire receptacle ONLY!
11. Refer to Section III to make all necessary game adjustments.
12. Re-install the playfield glass, front moulding and lock the cabinet door.
13. CAUTION! If this game has been subjected to extreme cold, allow to warm up to room temperature.

I. INSTALLATION

C. COIN METER (OPTIONAL)

A +12vdc mechanical coin meter may be installed by the operator to count total coins accepted by the machine. The coin meter leads should be soldered to the lugs on the terminal strip mounted inside the front door on the right side (see Figure 1). If the coin meter is polarized, the positive lead (red) should be attached to the lug that has the cathode (banded) side of the diode attached to it otherwise the leads may be attached in any order. The COIN METER adjustment must be set to on and the following four adjustments should be set to the number of pulses (counts) required for each coin denomination used.

NOTE: Make sure that the GAME MODE adjustment is not set to either REPLAY + TICKETS or TICKETS ONLY (see Game Adjustments section).

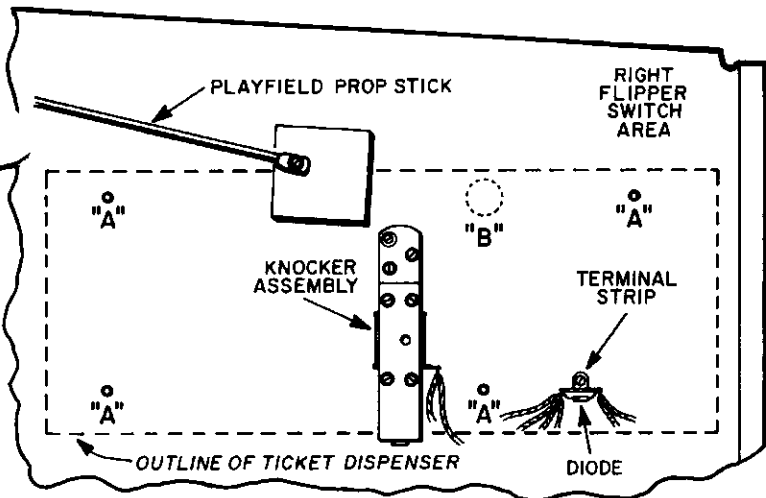


FIGURE 1.

D. TICKET DISPENSER (OPTIONAL)

This machine is equipped to easily interface to the Deltronic Labs TDOM-10-S-S ticket dispenser. To install the dispenser, first locate the five partially drilled holes on the inside of the cabinet on the right side (see Figure 1). The four "A" holes are for mounting the cabinet with #10 X 1-3/4" carriage bolts. The "B" hole is for cable access to the unit. Drill the "A" holes out from the inside of the cabinet using a 13/64"

drill bit. Drill the "B" hole out from the inside of the cabinet using a 1" drill bit. In the game envelope you will find template #30213 for a 1/2" plywood spacer to be used between the outside of the game cabinet and the dispenser cabinet so that the dispenser will clear the leg on the game when opened for loading tickets.

The GAME MODE adjustment is used to set whether to dispense a number of tickets along with each replay awarded (REPLAY + TICKETS) or to dispense a number of tickets in place of each replay awarded (TICKETS ONLY). The TICKETS TO AWARD adjustment is used to set the number of tickets to dispense for each replay awarded (see Game Adjustments section).

NOTE: Make sure that the COIN METER adjustment is set to off when using a ticket dispenser.

E. BILL ACCEPTOR (OPTIONAL)

A bill acceptor can be easily interfaced electrically to this machine. The two unused 522 (green-red-red) and 622 (blue-red-red) center chute switch wires should be attached to the switch output of the bill acceptor (see Cabinet/Front Door Schematic Diagram). The line voltage validator outlet located inside the cabinet on the right side can be used for supplying power to the unit. The CHUTE 3 UNITS adjustment can then be used to set the value of the bill being used. The bill acceptor models known to fit the door mechanically are Mars model VFM2 and Tekbilt model NV110. The Tekbilt model also requires an adapter plate.

F. COMMUNICATIONS ADAPTER (OPTIONAL)

A kit (MA-1940) may be purchased through your distributor which will allow the system to output Bookkeeping data to a serial printer.

II. GAME PLAY AND SCORING



*** PLAYFIELD FEATURES ***

UPPER LEFT SPOT TARGET:

* SCORE 500,000.

* SCORE 1 BASKET POINT TIMES MULTIPLIER & COLLECT BASKETBALL EVENT ICON IF LIT OR FLASHING.

LEFT UPKICKER:

* SCORE 500,000.

* RECEIVE TIP-OFF AWARD IF IN NORMAL 1 BALL PLAY.

* SCORE 1 BASKET POINT TIMES MULTIPLIER & COLLECT HORSE HEAD EVENT ICON IF LIT OR FLASHING.

DROP TARGETS:

* SCORE 5,000.

* SCORE 1 BASKET POINT TIMES MULTIPLIER.

* SCORE 1 BASKET POINT TIMES MULTIPLIER & COLLECT MVP CUP EVENT ICON IF LIT OR FLASHING.

* ADVANCE MULTIPLIER IF LIT & BANK COMPLETE.

* IF REBOUND LIT & BANK COMPLETE, LIGHT HIDDEN FEATURE #5 AND AWARD 1 GAME BALL, LIGHT REBOUND IN FEATURES COMPLETED CIRCLE, AND COLLECT THE REBOUND PROGRESSIVE SCORE VALUE. THE SEQUENCE GOES 5, 10, & 20 MILLION.

* IF MVP EVENT ACTIVE, COLLECT PROGRESSIVE AWARD. THE SEQUENCE IS EXTRA BALL, 50, 100, AND 300 MILLION.

SPINNER:

* SCORE 5,000.

* SCORE 1 BASKET POINT TIMES MULTIPLIER & COLLECT BASKETBALL EVENT ICON IF LIT OR FLASHING.

* IF #1 FLASHING, LIGHT #1 SOLID AND START FLASHING #2.

* IF #3 FLASHING, LIGHT #3 SOLID AND START FLASHING #4.

* IF SUPER SPINNER ACTIVE, SCORE AND ADVANCE PROGRESSIVE AWARD. THE SEQUENCE IS 5 MILLION, 10 MILLION, AND 3 BASKET POINTS.

* ADD A LETTER TO HORSE IF HORSE EVENT ACTIVE.

UPPER RIGHT SPOT TARGET:

* SCORE 500,000.

* ADVANCE A LETTER IN "SHAQUILLE" IF SPELL SHAQUILLE LIT.

* SCORE 1 BASKET POINT TIMES MULTIPLIER & COLLECT CLOCK EVENT ICON IF LIT OR FLASHING.

BASKET HOOP:

* SCORE 1,000,000.

* COLLECT JACKPOT OR SUPER JACKPOT IF FLASHING & LIGHT JACKPOT IN THE FEATURES COMPLETED CIRCLE.

* IF BEAT THE BUZZER IS ACTIVE, END THE BEAT THE BUZZER EVENT, AWARD 1 GAME BALL, AND BEGIN FLASHING OUT THE SPECIAL LAMP FOR THE BOTTOM RIGHT SPOT TARGET.

* IF ALLEY-OOP FLASHING OUT, AWARD BASKET POINTS (ADJUSTABLE) AND 1 GAME BALL. ALSO LIGHT ALLEY-OOP IN FEATURES COMPLETED CIRCLE.

* AWARD 2 OR 3 BASKET POINTS TIMES MULTIPLIER IF 2 POINTS OR 3 POINTS LIT SOLID.

* IN 1 BALL PLAY, START MULTIBALL FLASHING OR FLASHING OUT.

II. GAME PLAY AND SCORING

RIGHT UPKICKER:

* SCORE 500.

* IF #5 FLASHING, COLLECT 1 GAME BALL, LIGHT GAME BALL IN THE FEATURES COMPLETED CIRCLE, OFFER PLAYER THE CHANCE TO TRADE ALL OF HIS GAME BALLS FOR AN AWARD, AND RESTART THE 1-5 GAME BALL SEQUENCE.

* START SUPER SPINNER FLASHING OUT IF THE SPINNER BASKETBALL EVENT ICON UNLIT.

HOLE KICKER:

* SCORE 50,000.

* SCORE 1 BASKET POINT TIMES MULTIPLIER & COLLECT MVP CUP EVENT ICON IF LIT OR FLASHING.

* IF FREE THROW IS LIT, SCORE 1-10 BASKET POINTS, AND IF AN EVENT IS ACTIVE (ADJUSTABLE), LIGHT HIDDEN FEATURE #3 & RECEIVE 1 GAME BALL.

RIGHT SIDE ROLLOVER:

* SCORE 90.

* SCORE 1 BASKET POINT TIMES MULTIPLIER & COLLECT MVP CUP EVENT ICON IF LIT OR FLASHING.

* IF #2 FLASHING, LIGHT #2 SOLID AND START FLASHING #3.

* IF #4 FLASHING, LIGHT #4 SOLID AND START FLASHING #5.

* IF DRIBBLE LIT, START DRIBBLE FLASHING OUT.

CENTER SPOT TARGET:

* SCORE 30,000.

* SCORE 1 BASKET POINT TIMES MULTIPLIER & COLLECT CLOCK EVENT ICON IF LIT OR FLASHING.

* START DRIBBLE FLASHING OUT IF LIT.

* IF DRIBBLE FLASHING OUT, SPOT A DROP TARGET (UNLESS IN MVP EVENT) AND SCORE THE PROGRESSIVE DRIBBLE AWARD. THE SCORE SEQUENCE IS 5 MILLION, 10 MILLION, AND 3 BASKET POINTS.

VARI-TARGET (4 STEPS):

* SCORE 300,000, 1, 3, OR 5 MILLION DEPENDING UPON DEPTH OF HIT.

* SCORE 1 BASKET POINT TIMES MULTIPLIER & COLLECT BASKETBALL EVENT ICON IF LIT OR FLASHING.

* ADVANCE BONUS VALUE IF LIT. WHEN BONUS VALUE REACHES 20 MILLION, LIGHT BONUS 20M IN THE FEATURES COMPLETED CIRCLE.

* IF BONUS AT 20 MILLION, SPOT A DROP TARGET IF THE VARI-TARGET IS DRIVEN COMPLETELY BACK.

* IF BREAK THE BACKBOARD FLASHING OUT AND TARGET HIT BACK FAR ENOUGH (ADJUSTABLE), RECEIVE THE PROGRESSIVE BREAK THE BACKBOARD AWARD. THE SEQUENCE IS 10 MILLION, START HURRY-UP EB FLASHOUT, 10 BASKET POINTS, AND 1 GAME BALL.

RAMP TOP OPTO:

* LOCK BALL IF LOCK FLASHING.

* BEGIN ALL FLASHING EVENTS IF BEGIN EVENT FLASHING.

* SCORE 1 BASKET POINT TIMES MULTIPLIER & COLLECT CLOCK EVENT ICON IF LIT OR FLASHING.

* IF LIGHT ALLEY-OOP IS LIT OR SHOOTER LANE ALLEY-OOP IS FLASHING, BEGIN ALLEY-OOP FLASHOUT.

* IF IN MULTIBALL, HOLD BALL FOR 5 SECONDS. SHOOTING THE REMAINING BALL OR BALLS INTO THE RAMP WILL SCORE A JACKPOT OR SUPER JACKPOT AND THEN RELEASE ALL THE BALLS.

* SCORE 100 MILLION WHEN IN SUPERMODE.

LOWER LEFT SPOT TARGET:

* SCORE 30,000.

* AWARD AN EXTRA BALL IF LAMP FLASHING OR FLASHING OUT.

* SCORE 1 BASKET POINT TIMES MULTIPLIER & COLLECT HORSE HEAD EVENT ICON IF LIT OR FLASHING.

BOTTOM RIGHT SPOT TARGET:

* SCORE 30,000.

* AWARD SPECIAL IF FLASHING OUT.

* SCORE 1 BASKET POINT TIMES MULTIPLIER & COLLECT CLOCK EVENT ICON IF LIT OR FLASHING.

II. GAME PLAY AND SCORING

BOTTOM LEFT SPOT TARGET:

* ADVANCE MULTIPLIER WHEN LIT.

* UNLIT, SCORE 3,000.

BALL SHOOTER (PLUNGER SKILL SHOT):

* BALL LEAVING THE SHOOTER WILL FREEZE THE FLASHING SKILL SHOT LAMP.

KICKING RUBBERS:

* SCORE 30.

* WHILE IN 1 BALL PLAY, A HIT ON THE LEFT KICKING RUBBER FOLLOWED IMMEDIATELY BY A HIT ON THE RIGHT KICKING RUBBER WILL START THE DRAIN SHIELD FLASHING OUT.

* TOGGLE LIT EVENT ICON OBJECTIVES IF ALL EVENTS HAVE ALREADY BEEN PLAYED ONCE.

LEFT RETURN ROLLOVER:

* SCORE 30,000.

* SCORE 1 BASKET POINT TIMES MULTIPLIER & COLLECT HORSE HEAD EVENT ICON IF LIT OR FLASHING.

* START SUPER SPINNER FLASHING OUT IF SPINNER BASKETBALL EVENT ICON UNLIT.

RIGHT RETURN ROLLOVER:

* SCORE 30,000.

* SCORE 1 BASKET POINT TIMES MULTIPLIER & COLLECT BASKETBALL EVENT ICON IF LIT OR FLASHING.

* START SUPER SPINNER FLASHING OUT IF SPINNER BASKETBALL EVENT ICON UNLIT.

* START THE VARI-TARGET BREAK THE BACKBOARD LAMP FLASHING OUT.

LEFT OUTLANE:

* SCORE 3,000.

* RETURN BALL IF DRAIN SHIELD IS FLASHING OUT.

* SCORE 6 BASKET POINTS IF IN 1 BALL PLAY AND DRAIN SHIELD UNLIT.

RIGHT OUTLANE:

* SCORE 3,000.

* AWARD SPECIAL IF FLASHING OUT.

* SCORE 6 BASKET POINTS IF IN 1 BALL.

OUTHOLE:

* AT END OF BALL, SCORE ANY OUTHOLE BONUS TIMES MULTIPLIER, HIDDEN FEATURE BONUS IF ANY (ADJUSTABLE), & SLAMMIN' JAMMIN' BONUS (ADJUSTABLE) IF A SLAMMIN' JAMMIN MULTIBALL WAS PLAYED.

* AT END OF GAME, SCORE 100,000 FOR EACH BASKET POINT (ADJUSTABLE) AND 5 MILLION FOR EACH GAME BALL.

FLIPPERS:

* SELECT AWARD CHOICE FROM VARIOUS DISPLAYED OPTIONS.

* CRADLING THE BALL FOR 2 SECONDS WILL CHANGE THE BASKET VALUE LAMP FROM 3 POINTS TO 2 POINTS.

* PRESSING BOTH FLIPPERS WHILE COLLECTING OUTHOLE BONUSES WILL SPEED UP THE COLLECTION PROCESS.

II. GAME PLAY AND SCORING



*** GENERAL GAME FEATURES ***

GAME THEME:

* THE PLAYER TRIES TO SCORE THE MOST POINTS AND BASKET POINTS WHILE PLAYING 4 TIMED QUALIFYING EVENTS ON THE ROAD TO THE FINALS EVENT. EACH EVENT IS QUALIFIED BY COMPLETING ALL OF ITS ASSOCIATED EVENT ICONS. ALL FLASHING EVENTS BEGIN BY SHOOTING THE RAMP WHILE "BEGIN EVENT" IS FLASHING. MULTIPLE EVENTS CAN BE ACTIVE AT THE SAME TIME (MULTIMODE) FROM THE BEGINNING, OR A NEW EVENT CAN BE QUALIFIED WHILE PLAYING AN EVENT AND THEN SHOOTING THE RAMP AGAIN.

HORSE EVENT:

* QUALIFIED BY SHOOTING ALL THE HORSE HEAD EVENT ICONS. THE OBJECTIVE IS TO COMPLETE THE LETTERS OF H-O-R-S-E BY REPEATED SPINNER SHOTS BEFORE TIME EXPIRES. THE FIRST 4 LETTERS OF HORSE SCORE 10 BASKET POINTS EACH AND THE LAST LETTER AWARDS 3 GAME BALLS AND ENDS THE EVENT.

MVP EVENT:

* QUALIFIED BY SHOOTING ALL THE MVP CUP EVENT ICONS. THE OBJECTIVE IS TO SHOOT THE DROP TARGET AS MANY TIMES AS POSSIBLE BEFORE TIME EXPIRES. THE SCORING PROGRESSES FROM AN EXTRA BALL TO 50 MILLION, TO 100 MILLION, AND TO 300 MILLION & END THIS EVENT.

GAME BALLS EVENT:

* QUALIFIED BY SHOOTING ALL THE BASKETBALL EVENT ICONS. THE OBJECTIVE IS TO SHOOT THE VARI-TARGET AS MANY TIMES A POSSIBLE BEFORE TIME EXPIRES. SCORE 2 GAME BALLS FOR ANY HIT AND 3 GAME BALLS IF THE VARI-TARGET IS DRIVEN ALL THE WAY BACK.

SHOT CLOCK EVENT:

* QUALIFIED BY SHOOTING ALL THE CLOCK EVENT ICONS. THE OBJECTIVE IS TO

SHOOT THE BASKET HOOP ONCE BEFORE TIME EXPIRES. THE FIRST HOOP SHOT AWARDS 1 GAME BALL, STARTS THE BOTTOM RIGHT SPOT TARGET SPECIAL FLASHING OUT, AND ENDS THE EVENT.

FINALS EVENT:

* QUALIFIED BY PLAYING ALL 4 OF THE PREVIOUSLY DESCRIBED EVENTS. THE OBJECTIVE IS TO MAKE ALL THE STROBING SHOTS BEFORE TIME EXPIRES (ADJUSTABLE). COMPLETING ALL SHOTS SCORES THE POINT VALUE CHOSEN WHEN FINALS WAS ENTERED. WHEN TIME EXPIRES, THE BOARD IS RESET AND THE EVENT QUALIFICATION PROCESS BEGINS AGAIN.

MULTIBALL:

* 3 BALL MULTIBALL QUALIFIED BY MAKING THE RAMP SHOT WHILE MULTIBALL IS FLASHING OR FLASHING OUT. SHOOTING THE BASKET HOOP WHILE IN 1 BALL PLAY (EXCEPT DURING FINALS) STARTS THE MULTIBALL LAMP FLASHING OR FLASHING OUT. THE OBJECTIVE IS TO SCORE JACKPOTS OR SUPER JACKPOTS BY SHOOTING THE HOOP OR RELOCKING ALL BALLS BACK IN THE RAMP.

SHAQ ATTACK:

* 3 BALL MULTIBALL QUALIFIED BY FILLING THE FEATURES COMPLETED CIRCLE AND THEN SHOOTING THE RAMP. WHILE IN SHAQ ATTACK, ALL TARGETS SCORE 1 BASKET POINT TIMES MULTIPLIER. SHAQ ATTACK CONTINUES UNTIL ONLY 1 BALL REMAINS ON THE PLAYFIELD.

MULTIMODE:

* OCCURS AS A RESULT OF HAVING 2 OR MORE EVENTS ACTIVE AT THE SAME TIME. THE SPINNER AND RIGHT SIDE ROLLOVER NOW SCORE AN ADDITIONAL MILLION POINTS FOR EACH ACTIVE EVENT. MULTIMODE LEVEL 3 OR GREATER LIGHTS THE "LEVEL 3" LAMP IN THE FEATURES COMPLETED CIRCLE.

II. GAME PLAY AND SCORING

SUPERMODE:

- * ENABLED WHEN ALL 4 EVENTS, MULTIBALL, AND SHAQ ATTACK ARE ALL ACTIVE AT THE SAME TIME. IN ADDITION TO SCORING MULTIMODE AS PREVIOUSLY DESCRIBED, THE RAMP SCORES 100 MILLION.

SLAMMIN' JAMMIN':

- * QUALIFIED BY COMPLETING ALL LETTERS OF "SHAQUILLE" AND THEN CHOOSING TO PLAY THE FEATURE AFTER SHOOTING THE LEFT UPKICKER. SHAQUILLE LETTERS CAN BE ADVANCED BY HITTING THE LIT TOP RIGHT SPOT TARGET OR CHOOSING ADVANCE SHAQUILLE FROM TIP-OFF. SLAMMIN' JAMMIN' IS A 3 BALL MULTIBALL WHERE EVERY TARGET ADDS MILLIONS OF POINTS (ADJUSTABLE) TO A BONUS THAT WILL BE COLLECTED AT END OF BALL. THIS FEATURE REMAINS ACTIVE UNTIL 2 BALLS DRAIN.

SUPER SPINNER:

- * CAN ONLY BE ACTIVATED AFTER THE SPINNER BASKETBALL EVENT ICON HAS BEEN COLLECTED. SHOOTING THE SPINNER, RIGHT UPKICKER, AND EITHER RETURN ROLLOVER STARTS SUPER SPINNER FLASHING OUT. SHOOTING THE SPINNER NOW SCORES THE PROGRESSIVE AWARD OF 5 MILLION, 10 MILLION, AND 3 BASKET POINTS.

BREAK THE BACKBOARD:

- * THE RIGHT RETURN ROLLOVER STARTS THE VARI-TARGET BACKBOARD LAMP FLASHING OUT (ADJUSTABLE). A HIT (ADJUSTABLE) ON THE VARI-TARGET SCORES A PROGRESSIVE SEQUENCE OF 10 MILLION, START HURRY-UP EB, 10 BASKET POINTS, AND 1 GAME BALL.

ALLEY-OOP:

- * ENABLED FROM THE PLUNGER SKILL SHOT OR BY SHOOTING THE RAMP WITH A LIT LIGHT ALLEY-OOP LAMP. THE BASKET HOOP ALLEY-OOP LAMP BEGINS FLASHING OUT. SHOOTING THE HOOP SCORES SEVERAL BASKET POINTS (ADJUSTABLE), 1 GAME BALL, AND LIGHTS ALLEY-OOP IN THE FEATURES COMPLETED CIRCLE.

HIDDEN FEATURES:

- * 5 HIDDEN FEATURES ARE SCATTERED AROUND THE PLAYFIELD. DISCOVERING THEM LIGHTS A CORRESPONDING LAMP AND SCORES AN "END OF GAME" OR "END OF BALL" BONUS (ADJUSTABLE). THE HIDDEN-FEATURES ARE AS FOLLOWS:
 - #1 - PLAYING MULTIMODE LEVEL 5 OR SUPERMODE.
 - #2 - RELOCK ALL BALLS IN RAMP DURING MULTIBALL.
 - #3 - SHOOTING "FREE THROW" DURING AN EVENT (ADJUSTABLE).
 - #4 - TIP-OFF 5,000 POINTS CHOSEN 2 OR 3 TIMES (ADJUSTABLE).
 - #5 - SCORE A DROP TARGET REBOUND.
- * THE BONUS IS BASED ON TOTAL FOUND AND IS AS FOLLOWS:
 - 1 FOUND - 10 MILLION
 - 2 FOUND - 30 MILLION
 - 3 FOUND - 100 MILLION
 - 4 FOUND - 300 MILLION
 - 5 FOUND - 1 BILLION

GAME BALL:

- * THIS FEATURE REQUIRES ADVANCING THE FLASHING 1, 2, 3, AND 4 LAMPS BY SHOOTING THE SPINNER AND RIGHT LAMP ROLLOVER. COMPLETING THOSE 4 LAMPS WILL FLASH #5. SHOOTING THE RIGHT UPKICKER WILL THEN AWARD 1 GAME BALL AND LIGHT GAME BALL IN THE FEATURES COMPLETED CIRCLE. THE PLAYER IS THEN GIVEN THE OPTION OF TRADING ALL GAME BALLS FOR AN AWARD. THE MORE GAME BALLS ACCUMULATED - THE BETTER THE AWARD.

PLUNGER SKILL SHOT:

- * PLAYER WILL SOMETIMES BE GIVEN A CHOICE BETWEEN ENABLING ALLEY-OOP OR BEGINNING ALL QUALIFIED EVENTS. THIS IS INDICATED BY ALTERNATING THE FLASHING LAMPS IN THE SHOOTER LANE WHILE THE BALL IS SITTING AT THE PLUNGER. SHOOTING THE BALL WILL STOP THE LAMP MOVEMENT AND GIVE THE APPROPRIATE AWARD ONCE THE BALL REACHES THE RAMP.

TIP-OFF:

- * A MYSTERY AWARD ACTIVE DURING NORMAL 1 BALL PLAY AND ENABLED BY SHOOTING THE LEFT UPKICKER. THE PLAYER IS ALLOWED TO CHOOSE BETWEEN A POINT AWARD OR SOME OTHER AWARD.

III. TEST MODE

There are several functions accessible to the operator while in the test mode. These functions are Self-Test, Bookkeeping, Game Adjustments, and Utilities. Each of these functions will be explained in detail later in this section. To enter the test mode, the game must be in the attract mode (game over). Then depress the Test button located just inside the front door of the game. The operator will then be given a choice as to which function he wants to access. Use the left flipper button to choose (highlight) the function desired and then either the Test button or the right flipper button to enter the chosen function.

NOTE: The Test button may be held in to fast forward through the steps of a particular function.

To exit the test mode or change functions the Slam switch (front door) must be activated or the power must be turned off.

I. SELF-TEST

This function will allow the operator to test all the hardware related devices in the game. Each test is described below. In most cases the Credit button can be used to restart each test (see Testmode Flowchart).

A. MEMORY TEST

This function tests all memory devices on the Control Board (A1). If all the devices pass the test an "OK" will be displayed. If a failure occurs, a description of the faulty component will be displayed. Then after a short period of time the Game Prom check sum will be displayed.

B. LAMP CHECK

This function will flash all the controlled lamps and flasher lamps continuously. This will allow the operator to easily check for and replace any burned out light bulbs.

C. LAMP MATRIX TEST

This test will allow an operator to single step through and check the operation of each lamp in the game. The left flipper button will

decrement the active lamp number by one while the right flipper button will increment the active lamp number by one. The strobe number and the return number are combined to form the lamp number (strobe,return) which is shown in the display along with a description of the lamp. Only one lamp at a time should flash during this test.

D. RELAY AND SOLENOID TEST

This test will allow an operator to single step through and check the operation of each relay and solenoid driver in the game. The left and right flipper buttons are used to change the active driver number. The selected driver description and number will appear in the display. The Credit button is then used to activate the driver for a short time period. Solenoid #31 ("Q" relay) is always on during this test so as to provide power to devices such as the pop bumpers and kicking rubbers (see Playboard Schematic Diagram).

E. SWITCH MATRIX TEST

The first part of this test will report any switch(s) which have not been operated in the course of the last 15 games (INOPERATIVE SWITCHES). The second part of the test will report any switch(s) which are stuck closed. If no switches are closed when this test is started, the message "ALL SWITCHES OPEN" will be displayed. If any switches are closed, the closed switch(s) name and number will continuously be displayed. The strobe number and the return number are combined to form the switch number (strobe,return). The Credit button can be used to restart this test.

F. SWITCH EDGES TEST

This test will display the name and number of any switch that is actuated. When actuating each switch, a problem exists if either no switch is shown or any switch other than the one actuated is displayed.

G. DISPLAY TEST

This test checks the operation of the 128 x 32 dot matrix display. The right flipper button is used to advance this

III. TEST MODE

test. The first two steps check the different levels of display intensity. Each block that appears on the display should be of lesser intensity than the one to the left of it. During the next four steps a diagonal pattern is stepped from left to right in the display. While in this part of the test every fourth pixel only in each row of dots should be lit. During the next eight steps another diagonal pattern is stepped from left to right in the display. While in this part of the test every eighth pixel only in each row of dots should be lit.

H. SOUND TEST

This test checks the interface lines from the Control Board (A1) to the Sound Board (A6). Every time the right flipper button is pressed, a different tone should be heard. During each tone, the sound line connection which is being tested will be shown in the display. After the tone stops the sound line which is being tested will still be kept at a low level (<.8v) until the right flipper button is pressed again or the Credit button is used to restart the test.

J. FRONT DOOR TEST

This test checks the operation of the coin chutes used in the game. Utilizing this function will not affect any bookkeeping values. Each coin chute closure is categorized and shown in the display.

II. BOOKKEEPING

The Test button is used to step through bookkeeping. The display will contain a description of each step,

the step number, and two different bookkeeping values. The value in the leftmost column represents long term bookkeeping. The value in the rightmost column (in brackets) represents short term bookkeeping. These two values are provided so that the operator may compare recent performance with long term performance and then make any necessary game adjustments.

NOTE: The left column of steps 1 (earnings) and 17-20 (coin chute counts) will not be displayed unless the credit button is pressed during that active step number.

The left flipper button will allow the operator to reset all of the left (long term) and right (short term) bookkeeping values. The right flipper button will allow the operator to reset all of the right (short term) bookkeeping values only. If the R.BOOK AUTO-RESET adjustment is on, the right (short term) bookkeeping will automatically be reset after every 2000 plays (see Game Adjustments). Therefore, the operator does not need to reset the short term bookkeeping himself unless he prefers to follow his own procedure. Also, this feature will aid in adjusting the game payout percentage to the caliber of players in different locations. If there happens to be a major error in a long term bookkeeping value the word ERROR will appear to the right of that bookkeeping value. To correct this error the long term bookkeeping must be reset. A description of each bookkeeping step is given in the test mode flowchart.

III. GAME ADJUSTMENTS

This function allows the operator to make any adjustments to his game as necessary.

A. FACTORY SETTINGS

Upon entering the game adjustment section of bookkeeping, the operator is given a choice to load all factory settings or to single step through the game adjustments and adjust each section individually. If he chooses

III. TEST MODE

to enter the factory settings by depressing the Credit button, he will also be given a choice of what language to load. By using the right flipper button he may choose the appropriate language and then depress the Credit button again to enter the settings. After the settings are loaded the display should show the message "FACTORY SETTINGS LOADED" for a short time and then proceed to game adjustment step 1. At any time during the previous steps the operator may either exit the test mode or depress the Test button to proceed immediately to game adjustment step 1.

WARNING

Loading the factory settings will affect all previous game adjustment settings. Therefore be careful when selecting this feature.

B. GAME ADJUSTMENT STEPS

Each time the Test button is pressed a description of the next step appears in the display along with the step number and the current status of that step. Unless otherwise specified, the left and right flipper buttons are used to change the possible selections in each step.

- 1) SCORE REPLAY LEVEL 1
- 2) SCORE REPLAY LEVEL 2
- 3) SCORE REPLAY LEVEL 3

Each Score Replay Level may be set by using the left flipper button to decrement the score and the right flipper button to increment the score. The Credit button can be used to load the factory setting for each individual level if desired. If the Auto-Percentaging adjustment is on, Replay Levels 2 & 3 can only be set to on or off. If Replay Level 2 is on, the score level will be set to two times Replay Level 1. If Replay Level 3 is on, the score level will be set to three times Replay Level 1. This allows the operator several combinations of levels in the Auto-Percentaging mode (i.e. 1, 1 & 2, 1 & 3, or 1 & 2 & 3).

- 4) HIGH GAME TO DATE 1
- 5) HIGH GAME TO DATE 2
- 6) HIGH GAME TO DATE 3

7) HIGH GAME TO DATE 4

8) HIGH GAME TO DATE 5

Each High Game To Date may be set by using the left flipper button to decrement the score and the right flipper button to increment the score. The Credit button can be used to load the factory setting for the displayed level and all those below it.

9) GAME PRICING

This step provides a choice of loading a standard setting for a particular country or a custom setting. When a standard setting is selected, the following steps (10-17) are skipped.

10) CHUTE 1 UNITS (L)

11) CHUTE 2 UNITS (R)

12) CHUTE 3 UNITS (C)

13) CHUTE 4 UNITS

14) UNITS REQUIRED FOR CREDIT

15) UNITS REQUIRED FOR BONUS

16) BONUS CREDITS

17) MINIMUM UNITS REQUIRED FOR CREDIT

Steps 10-17 are used if a custom setting is selected in step 9 (GAME PRICING). Steps 10-13 select the number of units that each chute is worth when a coin is dropped into that particular chute. The value entered for step 14 determines how many units must be accumulated for a credit to be issued on the game. Steps 15 and 16 determine how many units must be accumulated for any bonus credits to be issued. A value of zero entered for step 15 will disable the bonus feature. Step 17 indicates the number of units required before any credits are issued (see Coin Chute Setting Table for examples).

18) COIN METER

If set to ON, the pulses to be given for each of the four coin chutes can be defined so that the number of pulses for a given chute are in relation to the currency denomination. If set to OFF, steps 19-22 will be skipped.

19) CHUTE 1 PULSES

20) CHUTE 2 PULSES

21) CHUTE 3 PULSES

22) CHUTE 4 PULSES

The four steps above are used to set

III. TEST MODE

COIN CHUTE SETTING TABLE														
Country	Coin Chutes				Plays/Coin(s)	Chute Adjustment Steps								
	Left 1	Right 2	Center 3	4		10	11	12	13	14	15	16	17	
USA	.25	.25	\$1		1/.50, 2/\$1	01	01	04	00	02	00	00	00	
USA (Custom)					1/.50, 5/\$2	01	01	04	00	02	08	01	00	
					1/.50, 2/.75, 3/\$1	03	03	12	00	04	00	00	00	
					1/.50, 3/\$1	01	01	04	00	02	04	01	00	
					1/.25, 4/\$1	01	01	04	00	01	00	00	00	
Australia	1	.20	\$1	\$2	-	1/3x.20, 2/\$1, 5/\$2	02	10	20	00	05	20	01	00
	2	.20	\$1	\$2	-	1/5x.20, 1/\$1, 3/\$2	01	05	10	00	05	10	01	00
	3	.20	\$1	\$2	-	1/5x.20, 1/\$1, 2/\$2	01	05	10	00	05	00	00	00
Belgium		5Fr	20Fr	50Fr	-	1/20Fr, 2/40Fr, 3/50Fr	01	04	10	00	04	10	01	00
Canada		.25	\$1	-	-	1/.50, 2/\$1	01	04	00	00	02	00	00	00
Denmark		1Kr	10Kr	-	-	1/3x1Kr, 4/10 Kroner	01	10	00	00	03	10	01	00
Finland		5Mka	1Mka	-	-	1/3x1 Markka, 2/5 Markkaa	10	02	00	00	05	00	00	00
France	1	1Fr	5Fr	10Fr	20Fr	1/3x1Fr, 2/5Fr, 5/10Fr	02	10	20	40	05	20	01	00
	2	1Fr	5Fr	10Fr	20Fr	2/5Fr, 4/10Fr, 9/20Fr	02	10	20	40	05	40	01	10
	3	1Fr	5Fr	10Fr	20Fr	1/5Fr, 3/10Fr, 7/20Fr	03	15	30	60	10	60	01	15
Germany	1	5DM	2DM	1DM	-	1/1DM, 2/2DM, 6/5 D-Mark	05	02	01	00	01	05	01	00
	2	5DM	2DM	1DM	-	1/2DM, 2/3DM, 3/4DM, 5/5DM	20	08	04	00	05	20	01	00
	3	5DM	2DM	1DM	-	1/2DM, 3/5DM	05	02	01	00	02	05	01	00
Greece		50D	50D	-	-	1/100 Drachma	01	01	00	00	02	00	00	00
Hungary		20F	20F	-	-	1/20 Forint	01	01	00	00	01	00	00	00
Italy		500L	500L	-	-	1/2x500L, 2/3x500L, 3/4x500L	03	03	00	00	04	00	00	00
Japan		100Y	100Y	-	-	1/100 Yen, 3/2x100 Yen	01	01	00	00	01	02	01	00
New Zealand		\$1	\$2	-	-	1/\$1, 3/\$2	01	02	00	00	01	02	01	00
Norway		5Kr	10Kr	-	-	1/5Kr, 2/10 Kroner	01	02	00	00	01	00	00	00
Singapore	1	-	.50	Token	-	1/.50 or 1/Token	00	01	01	00	01	00	00	00
	2	.20	-	-	-	1/2x.20	01	00	00	00	02	00	00	00
Spain		500P	100P	-	-	1/100P, 6/500 Pesetas	05	01	00	00	01	05	01	00
Sweden		10Kr	5Kr	-	1Kr	1/5x1Kr, 1/5Kr, 2/10Kr	10	05	00	01	05	00	00	00
Switzerland		1Fr	5Fr	2Fr	-	1/1Fr, 3/2Fr, 7/5 Francs	01	07	03	00	01	00	00	00
United Kingdom	1	1f	50P	20P	10P	1/3x10P, 2/50P, 4/1 Pound								
	2	1f	50P	20P	10P	1/50P, 3/1 Pound								
Universal		-	-	-	-	1/1 Coin	01	01	00	00	01	00	00	00

III. TEST MODE

the number of pulses to be issued for each of the four coin chutes.

23) COIN DOOR TYPE

This step provides a choice of loading a standard setting for a particular country or a custom setting. When a standard setting is selected, the following steps (24-28) are skipped.

24) COLLECTION TEXT

25) CHUTE 1 VALUE

26) CHUTE 2 VALUE

27) CHUTE 3 VALUE

28) CHUTE 4 VALUE

Step 24 is used to enter the name of the currency in use. The remaining four steps are used to set the monetary value of each coin chute.

29) GAME BUY-IN BONUS

At the end of a game, if enabled, a 10-second timer is initialized allowing each player that participated in the previous game a chance to purchase 1 credit for either 1 or 2 coins.

30) EXTENDED PLAY

At the end of a player's last ball in play, if enabled, a 10-second timer is initialized allowing the player to continue playing his current game by inserting either 1 or 2 coins for one extra ball.

31) EXTENDED PLAY MAXIMUM

This step sets the maximum number of extra balls a player may purchase in any one game when the EXTENDED PLAY feature is enabled. In a multiple player game, each player can only purchase one ball so this step will have no effect.

32) EXTENDED PLAY CHUTE(S)

This step sets which coin chute(s) will be enabled toward purchasing a game if step 29 is enabled and/or an extra ball if step 30 is enabled. A coin dropped in any other chute will be used toward purchasing a new game.

33) GAME PERCENT PAYOUT

This step is used to set the game payout percentage used when the Auto-Percentaging adjustment is on. The value entered for this step is compared to the value calculated by

dividing total replays by total plays (see Bookkeeping section). Total replays include all replays won from beating the score replay level, achieving a new high game to date, winning a playfield special, and all match replays.

When the GAME MODE adjustment is set to Add a Ball this setting refers to extra ball percentage rather than replay percentage. The value entered in this case will be compared to the value calculated by dividing total extra balls won by total plays (see Bookkeeping section).

34) MATCH PERCENT PAYOUT

This step is used to set the match payout percentage. If this step is set to zero, the match will be disabled.

NOTE: The MATCH PERCENT PAYOUT value is included in the value entered for GAME PERCENT PAYOUT (step #33). Therefore in order to retain the same payout percentage for the other payout features in the game such as score level replays, the GAME PERCENT PAYOUT will be automatically adjusted by the same amount as this step when changed.

35) HIGH GAME REPLAYS

This step is used to set the number of replays to award when the highest game to date has been beaten.

36) MAXIMUM CREDITS

This step sets the maximum number of credits allowed on the game.

37) TILT WARNINGS

This step sets the number of tilts allowed before the current player's ball in play is terminated.

38) BALLS PER GAME

This step sets the number of balls per game to 1-5.

39) GAME MODE

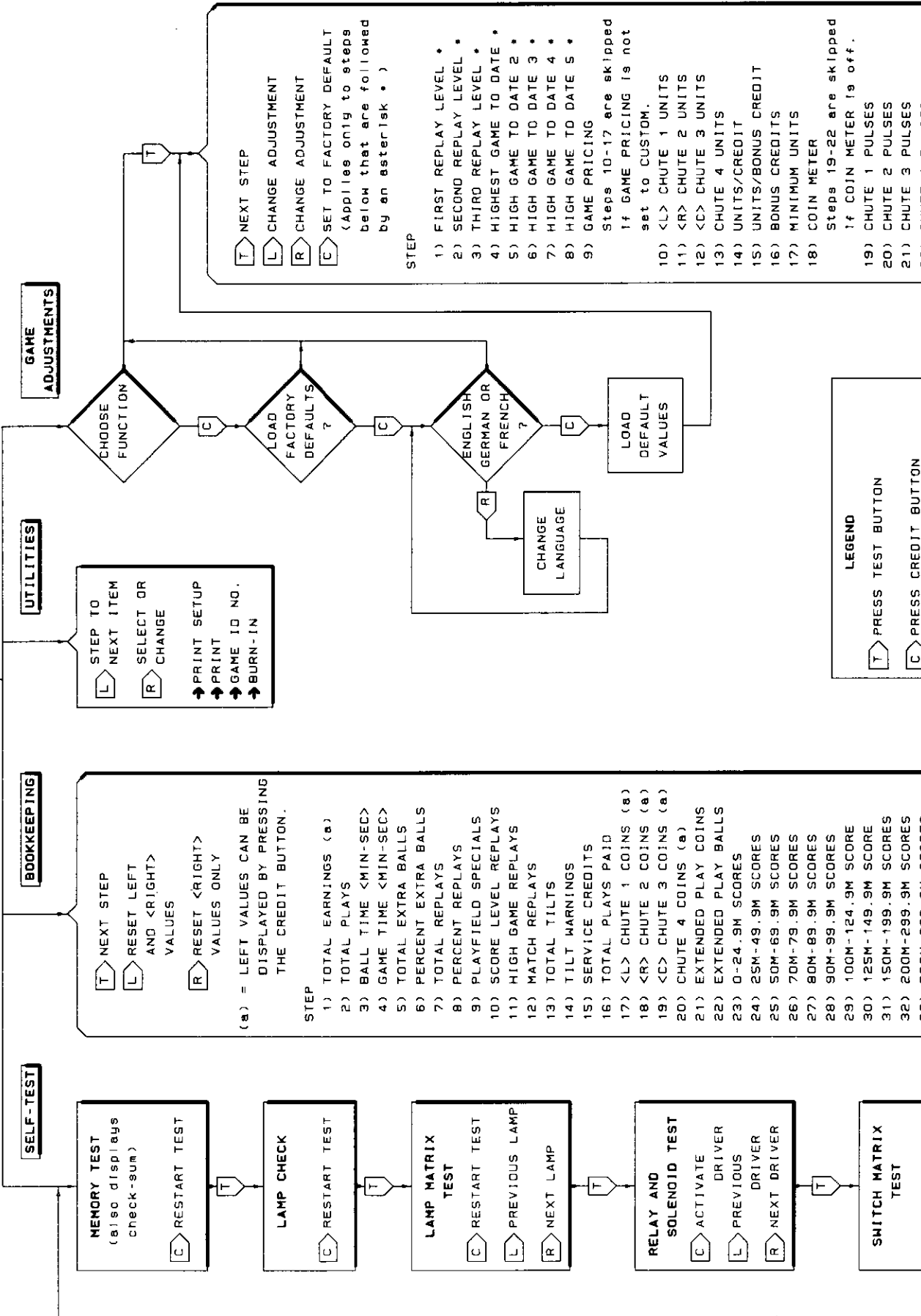
This step allows the game to be played in Replay, Replay + Tickets, Tickets Only, Add a Ball, or Novelty mode. In Replay mode all Specials and replays are allowed. Replay + Tickets mode is the same as Replay mode with the addition of one or more tickets to be issued (TICKETS TO AWARD) along

NOTE:

THE TEST MODE CAN ONLY BE ACCESSED DURING THE ATTRACT MODE (GAME OVER).
 THE TEST MODE MAY BE EXITED BY EITHER ACTUATING THE SLAM SWITCH ON THE FRONT DOOR OR TURNING THE POWER OFF.

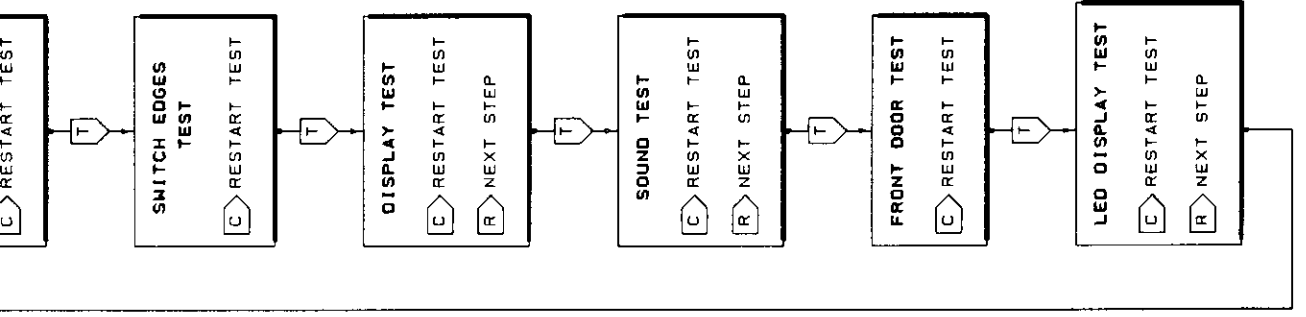
TEST MODE

STEP TO NEXT ITEM
 or SELECT
MAIN MENU
 BOOKKEEPING
 GAME ADJUSTMENTS
 SELF-TEST
 UTILITIES



L PRESS LEFT FLIPPER BUTTON
R PRESS RIGHT FLIPPER BUTTON

- 34) 400+ SCORES
- 35) FIRST REPLAY LEVEL
- 36) HIGHEST GAME TO DATE
- 37) 1-15 SEC. BALL TIME
- 38) 16-30 SEC. BALL TIME
- 39) 31-45 SEC. BALL TIME
- 40) 46-60 SEC. BALL TIME
- 41) 61 SEC.+ BALL TIME
- 42) % L OUTLANE DRAINS
- 43) % R OUTLANE DRAINS
- 44) HORSE EVENTS
- 45) MVP EVENTS
- 46) GAME BALLS EVENTS
- 47) SHOT CLOCK EVENTS
- 48) SHAD ATTAD EVENTS
- 49) SLAMMIN JAMMIN MODE
- 50) FINALS EVENTS
- 51) LEVEL 3 REACHED
- 52) LEVEL 5 REACHED
- 53) SUPER MODE REACHED
- 54) GAME BALLS WON
- 55) GAME BALLS TRADED
- 56) MULTIBALL EVENTS
- 57) JACKPOTS WON
- 58) SUPER JACKPOTS WON
- 59) MIN TIME EXTRA BALLS
- 60) SUPER SPINNER POINTS
- 61) MULTI-MODE POINTS (M)
- 62) 0-24 BASKET POINTS
- 63) 25-49 BASKET POINTS
- 64) 50-99 BASKET POINTS
- 65) 100-149 BASKET POINTS
- 66) 150-199 BASKET POINTS
- 67) 200+ BASKET POINTS
- 68) HORSE EVENTS COMPLETE
- 69) HIDDEN FEATURES FOUND
- 70) SHOT CLOCK SPEC LIT
- 71) TOTAL HOOP SHOTS
- 72) TOTAL BACKBOARD HITS
- 73) HOOP BASKET POINTS
- 74) FREE THROW BASKET PTS
- 75) TIP OFF BASKET POINTS
- 76) LIT ICON BASKET PTS
- 77) SHAD ATTAD BASKET PTS
- 78) DROP TARG BASKET PTS
- 79) MVP EXTRA BALLS
- 80) GAME BALL EXTRA BALLS
- 81) LEFT TARG EXTRA BALLS
- 82) TIP OFF EXTRA BALLS
- 83) ALLEY-OOP FEATURE WON
- 84) OUTLANE SPECIALS
- 85) RIGHT TARGET SPECIALS



- 23) COIN DOOR TYPE
Steps 24-28 are skipped if COIN DOOR TYPE is not set to CUSTOM.
- 24) COLLECTION TEXT
- 25) CHUTE 1 VALUE
- 26) CHUTE 2 VALUE
- 27) CHUTE 3 VALUE
- 28) CHUTE 4 VALUE
- 29) GAME BUY-IN BONUS
- 30) EXTENDED PLAY
- 31) EXTENDED PLAY MAXIMUM
- 32) EXTENDED PLAY CHUTE(S)
- 33) GAME PERCENT PAYOUT
- 34) MATCH PERCENT PAYOUT
- 35) HIGH GAME REPLAYS
- 36) MAXIMUM CREDITS
- 37) TILT WARNINGS
- 38) BALLS PER GAME
- 39) GAME MODE
- 40) TICKETS TO AWARD
- 41) LANGUAGE
- 42) AUTO PERCENTAGING
- 43) REPLAY LIMIT
- 44) HIGH GAMES 2-5
- 45) ATTRACT SOUND
- 46) ATTRACT MESSAGE 1
Use the credit button to enter a message.
- 47) ATTRACT MESSAGE 2
- 48) RIGHT BOOK AUTO-RESET
- 49) PLAYFIELD SPECIAL
- 50) REPLAY LEVEL BOOST
- 51) GAME RESTART
- 52) GAME INACTIVITY TIMER
- 53) GAME DIFFICULTY
- 54) EVENT TIMING
- 55) BACKBOARD LAMP TIMING
- 56) BREAK THE BACKBOARD
- 57) HURRY-UP EB TIMING
- 58) HURRY-UP EB START
- 59) FINALS EVENT TIMER
- 60) TIP OFF EXTRA BALL %
- 61) SUPER JACKPOT
- 62) GAME BALL TRADE VALUE
- 63) SLAMMIN JAMMIN BONUS
- 64) LAST BALL SPECIAL
- 65) HIGH BASKETS SPECIAL
- 66) HURRY-UP SPECIAL TIME
- 67) HIDDEN FEATURES
- 68) HIDDEN FEATURES BONUS
- 69) SHAD ATTAD CIRCLE ADV
- 70) ALLEY-OOP AWARD
- 71) SHAQUILLE FEATURE
- 72) BALL TIME SAFETY
- 73) REDUCED SCORING
- 74) HIGH BASKET POINTS
- 75) MINIMUM GAME TIME
- 76) REDUCED COACH SPEECH

III. TEST MODE

with each replay. In Tickets Only mode one or more tickets will be issued in place of each replay won. In Add a Ball mode all Score Level Replays and Playfield Specials award an extra ball in place of a replay. Also the Match and High Game To Date awards are disabled. However, after the Add a Ball mode is selected, the PLAYFIELD SPECIAL, MATCH PERCENT PAYOUT, and HIGH GAME REPLAYS adjustments may be individually set to whatever setting may be desired. In Novelty mode all Specials award 50,000,000 points, Extra Balls award 20,000,000 points and the Score Replay Levels, Match, and High Game to Date awards are disabled.

NOTE: If either the Replay + Tickets or Tickets Only setting is selected do not set the COIN METER setting to on.

40) TICKETS TO AWARD

This step allows the operator to set the number of tickets to award when a replay has been won. This setting will only apply when the GAME MODE is set to either Replay + Tickets, or Tickets Only.

41) LANGUAGE

This step allows the Test Mode steps to be displayed in English, German, or French.

42) AUTO-PERCENTAGING

If this step is set to on, the Score Replay Levels will be adjusted periodically so that the Game Percent Payout setting will match the actual Replay Percentage displayed in Bookkeeping.

NOTE: If the GAME MODE is set to Add a Ball, the Extra Ball Percentage in bookkeeping is used in place of the Replay Percentage.

43) REPLAY LIMIT

This step may be set to no limit or one per player per game.

44) HIGH GAMES 2-5

This step will determine if High Games to Date (2-5) will be saved or erased when power is turned off.

45) ATTRACT SOUND

This step determines whether or not sounds are enabled during the attract mode (game over).

46) ATTRACT MESSAGE 1

This step is used to enter, enable, or disable an operator message. The message is permanently stored in memory and will be periodically displayed during the attract mode (game over). To enter a message press the Credit button. The current message will be displayed and the cursor position will be indicated by the flashing character. If the current position is blank, a flashing directional arrow will appear. This type of arrow will indicate which direction the cursor will move if the Credit button is pressed. The characters are chosen using the left and right flipper buttons and then entered into memory by pressing the Credit button.

47) ATTRACT MESSAGE 2

This step is used to enter, enable, or disable a second operator message. See step 43 above for details. When both messages are enabled they will be displayed consecutively.

48) RIGHT BOOKKEEPING AUTO-RESET

If this step is set to on, all the short term bookkeeping steps (in brackets) will reset after 2000 plays. Otherwise they will not reset until 10,000 games have been played on the machine.

49) PLAYFIELD SPECIAL

When a playfield special is won, either a replay or an extra ball is awarded to the player based on the setting of this step.

50) REPLAY LEVEL BOOST

This step may be set anywhere from 0 to 990,000,000 in increments of 10,000,000. If set to zero, the boost is disabled. Otherwise the Replay Level will be increased by the boost value after completing a game where a player has won a replay and his skill level has been determined to be above average. The Replay Level will return back to its base level once all of the replays won have been played.

III. TEST MODE

51) GAME RESTART

This step is used to enable or disable the credit button from starting a new game while currently in a game. If set to ON, a new game will begin when the credit button is pressed if there are any remaining credits. If set to OFF, a new game cannot be started until the current game has ended.

52) GAME INACTIVITY TIMER

This timer can be used to cause a game to go to game over automatically if there is no activity on the playfield for a specified time period. This period can be set from one to nine minutes. Setting this step to zero disables the timer.

OPERATOR ADJUSTMENT SETTINGS
 (***) = ENGLISH & GERMAN FACTORY DEFAULT SETTING)
 (** = FRENCH FACTORY DEFAULT SETTING)

53) GAME DIFFICULTY

THE ADJUSTMENTS LISTED IN THE TABLE BELOW ARE AUTOMATICALLY SET AS INDICATED IN THE TABLE UNLESS FINE-TUNE IS SELECTED USING THE RIGHT FLIPPER BUTTON. IF FINE-TUNE IS SELECTED, EACH STEP IN THE TABLE CAN BE ADJUSTED INDIVIDUALLY. OTHERWISE THESE STEPS ARE SKIPPED. WHEN FINE-TUNE IS SELECTED, ALL SETTINGS REVERT BACK TO THE FACTORY DEFAULT SETTINGS AS SHOWN IN THE TABLE BELOW.

STEP		VERY EASY	EASY	***	**	VERY HARD
53	GAME DIFFICULTY	VERY EASY	EASY	MEDIUM	HARD	VERY HARD
54	EVENT TIMING	VERY EASY	EASY	MEDIUM	HARD	VERY HARD
55	BACKBOARD LAMP TIMING	EASY	EASY	MEDIUM	HARD	HARD
56	BREAK THE BACKBOARD	EASY	EASY	MEDIUM	MEDIUM	HARD
57	HURRYUP EB TIMING	EASY	EASY	MEDIUM	MEDIUM	HARD
58	HURRYUP EB START	EASY	MEDIUM	MEDIUM	MEDIUM	HARD
59	FINALS EVENT TIMER	EASY	MEDIUM	MEDIUM	MEDIUM	HARD
60	TIP OFF EXTRA BALL %	VERY EASY	EASY	MEDIUM	HARD	VERY HARD
61	SUPER JACKPOT	EASY	MEDIUM	MEDIUM	MEDIUM	HARD

54) EVENT TIMING

Sets the speed of the timer during feature events.

VERY EASY - Slowest
 EASY
 MEDIUM
 HARD
 VERY HARD - Fastest

58) HURRY-UP EB START

Sets the basket point levels where the HURRY-UP EXTRA BALL lamp starts flashing out.

EASY - 50, 200, 700
 MEDIUM - 100, 200, 700
 HARD - 200, 700

55) BACKBOARD LAMP TIMING

Sets the speed of the flashout timer for the BREAK THE BACKBOARD lamp.

EASY - Slowest
 MEDIUM
 HARD - Fastest

59) FINALS EVENT TIMER

Selects the starting time value for the FINALS event.

EASY - 40
 MEDIUM - 30
 HARD - 20

56) BREAK THE BACKBOARD

Sets the distance the Vari-target must travel to score BREAK THE BACKBOARD.

EASY - Any hit
 MEDIUM - Half way
 HARD - All the way back

60) TIP OFF EXTRA BALL %

Filters EXTRA BALL out of the TIP OFF award when the EB% exceeds the following:

VERY EASY - 50%
 EASY - 40%
 MEDIUM - 30%
 HARD - 20%
 VERY HARD - 10%

57) HURRY-UP EB TIMING

Sets the speed of the flashout timer for the EXTRA BALL lamp.

EASY - Slowest
 MEDIUM
 HARD - Fastest

61) SUPER JACKPOT

Sets the difficulty for scoring a SUPER JACKPOT during multiball by selecting the time the SUPER JACKPOT lamp flashes out.

EASY - Slowest
 MEDIUM
 HARD - Fastest

III. TEST MODE

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- 62) GAME BALL TRADE VALUE
Selects the worth of each game ball in millions of points should the player be offered a trade.
EASY - 30 million
*** MEDIUM - 20 million
HARD - 10 million
- 63) SLAMMIN' JAMMIN' BONUS
Sets the points added to the bonus during SLAMMIN' JAMMIN' multiball.
EASY - 10 million
*** MEDIUM - 5 million
HARD - 3 million
- 64) LAST BALL SPECIAL
Starts SPECIAL lamps flashing out on last ball if score is under 30,000,000.
** OFF - No
*** ON - Yes
- 65) HIGH BASKETS SPECIAL
Award a special when HIGH BASKETS has been beaten?
OFF - No
*** ON - Yes
- 66) HURRY-UP SPECIAL TIME
Sets the speed of the flashout timer for the spot target SPECIAL lamp.
EASY - Slowest
*** MEDIUM
HARD - Fastest
- 67) HIDDEN FEATURES
Selects the difficulty for completing HIDDEN FEATURES #3 and #4.
*** EASY - Shoot FREE THROW during any event.
Choose 5,000 twice.
HARD - Shoot FREE THROW during only MVP.
Choose 5,000 three times.
- 68) HIDDEN FEATURES BONUS
Determines when the HIDDEN FEATURE BONUS is collected.
*** EASY - Collected for each ball
** HARD - Collected on last ball only.
- 69) SHAQ ATTACK CIRCLE ADVANCE
Affects the difficulty of completing the SHAQ ATTACK circle.
*** EASY - Another lamp lit at game over.
** HARD - No lamps added.
- 70) ALLEY-OOP AWARD
Selects the basket points value for shooting the hoop when ALLEY-OOP is flashing.
EASY - 10
*** MEDIUM - 8
HARD - 5
- 71) SHAQUILLE FEATURE
Sets the difficulty in completing all letters of SHAQUILLE.
*** EASY - Carry over letters from previous ball.
HARD - Start fresh on every ball.
- 72) BALL TIME SAFETY
Should a ball drain very quickly, it will be returned to the shooter based upon setting.
VERY EASY - 20 Seconds
EASY - 15 Seconds
*** MEDIUM - 10 Seconds
HARD - 5 Seconds
** VERY HARD - No safety time
- 73) REDUCED SCORING
*** OFF - JACKPOT scores 20 Million.
SUPER JACKPOT scores 100 Million.
Multiplier set to 3X at start of last ball.
Bonus 3 Million lit at start of ball.
Collect bonus for basket points at end of game.
ON - JACKPOT scores 10 Million.
SUPER JACKPOT scores 50 Million.
Multiplier always starts at 1X.
No bonus lamps lit at start of ball.
No end of game bonus for basket points.
- 74) HIGH BASKET POINTS
This step adjusts the "HIGH BASKETS" to date. (40-999).
- 75) MINIMUM GAME TIME
This step allows for continuing play up to an adjusted minimum time. (0 - 4 minutes)
- 76) REDUCED COACH SPEECH
Reduces the amount of coaching background speech.
*** OFF - Normal
ON - Reduced speech

III. TEST MODE

IV. UTILITIES

Use the left flipper button to choose (highlight) a function and then the right flipper button to select or change the value of the function. Each utility is described below.

A. PRINT

Bookkeeping - all values
Short Bookkeeping - first 8 values

B. PRINTER SET-UP

Type - NSM DATA or SERIAL
Baud Rate - 1200, 2400, 4800, 9600
Data - 7 bit or 8 bit
Parity - none, even, or odd

C. ID NUMBERS

Two six digit numbers can be entered in permanent memory during this step. One is a GAME ID and the other is an ARCADE ID. These two ID's appear on all printouts. Also the GAME ID number will appear in the display on power-up. The left and right flipper buttons alter the digit value and the credit button enters the displayed value into memory and then proceeds to the next digit position.

D. BURN-IN

This function can be used to continuously exercise all the lamps and solenoids in the game.

V. TOURNAMENT MODE

The Tournament Mode switch provides a simple way to alter some of the normal game settings in order to provide for tournament play. The switch is located on a circuit board just inside the front door of the game to the lower left. The game must be in a game over condition in order to recognize the switch changing states. When the switch is moved to the "ON" position with the front door open, four Tournament Mode adjustments will appear on the display. These adjustments can be altered by using the left flipper button to select the function and the right flipper button to alter the current setting. Once these settings have been chosen they will remain in permanent memory so that all that has to be done each subsequent time that tournament play is desired is to move the switch to the "ON" position. When the Tournament Mode settings are in effect they

override the normal Game Adjustment settings. When the switch is moved to the "OFF" position, all the normal Game Adjustment settings are back in effect.

NOTE: Even if the game will not be used for tournament play, this switch can be used to provide an easy way to set the game for FREE PLAY without affecting any other game settings by setting the remaining three Tournament Mode adjustments to "NORMAL".

Each Tournament Mode adjustment is described below.

*** = Factory Default Setting

1) FREE PLAY

*** OFF = Credits are required to start a game.
ON = A game may be started without any credits posted.

2) GAME FEATURES

*** NORMAL = Normal play.
TOURNAMENT =

Various game features are altered as described below in order to provide the same odds for all players.

- a) Reset "Shaq Attack" circle lamps to Jackpot, Bonus 20M, and Level 3 lit at start of each ball.
- b) Mystery always alternates award choices between 5,000 or 5,000,000 and 2 basket points.
- c) No short ball time safety.

3) SPECIAL/REPLAY

*** NORMAL = Normal play.
POINTS =
Playfield Special awards 50,000,000 points. Match, High Game to Date, and Score Replay Level payouts are disabled.

4) EXTRA BALL

*** NORMAL = Normal play.
POINTS =
Extra Ball awards 20,000,000 points.

III. TEST MODE

SERVICE SWITCH

The switch is actuated when the front door is closed. With the front door closed, all bookkeeping steps are incremented normally. When the front door is opened all bookkeeping steps are frozen at their current values. Any credits that are added with the front door open are recorded in the SERVICE CREDITS bookkeeping steps.

AUTO-PRINT FEATURE

If there is a Communications Adapter installed in the game, the printer will immediately begin printing the first eight bookkeeping values as soon as it is plugged in during game over. If a different printout option is required the Test Mode must be entered first before plugging the printer in so that the immediate printout process does not begin.

SOUND ADJUSTMENTS

The speaker(s) output is controlled by the volume control located on a circuit board just inside the front door of the game to the lower left.

Turning the volume control counter-clockwise will decrease the volume. Turning it clockwise will increase the volume.

POST ADJUSTMENTS

The post at the mouth of the left outline and the post at the mouth of the right outline can be positioned for liberal/conservative play. The smaller openings produce a more liberal game.

IV. THEORY OF OPERATION

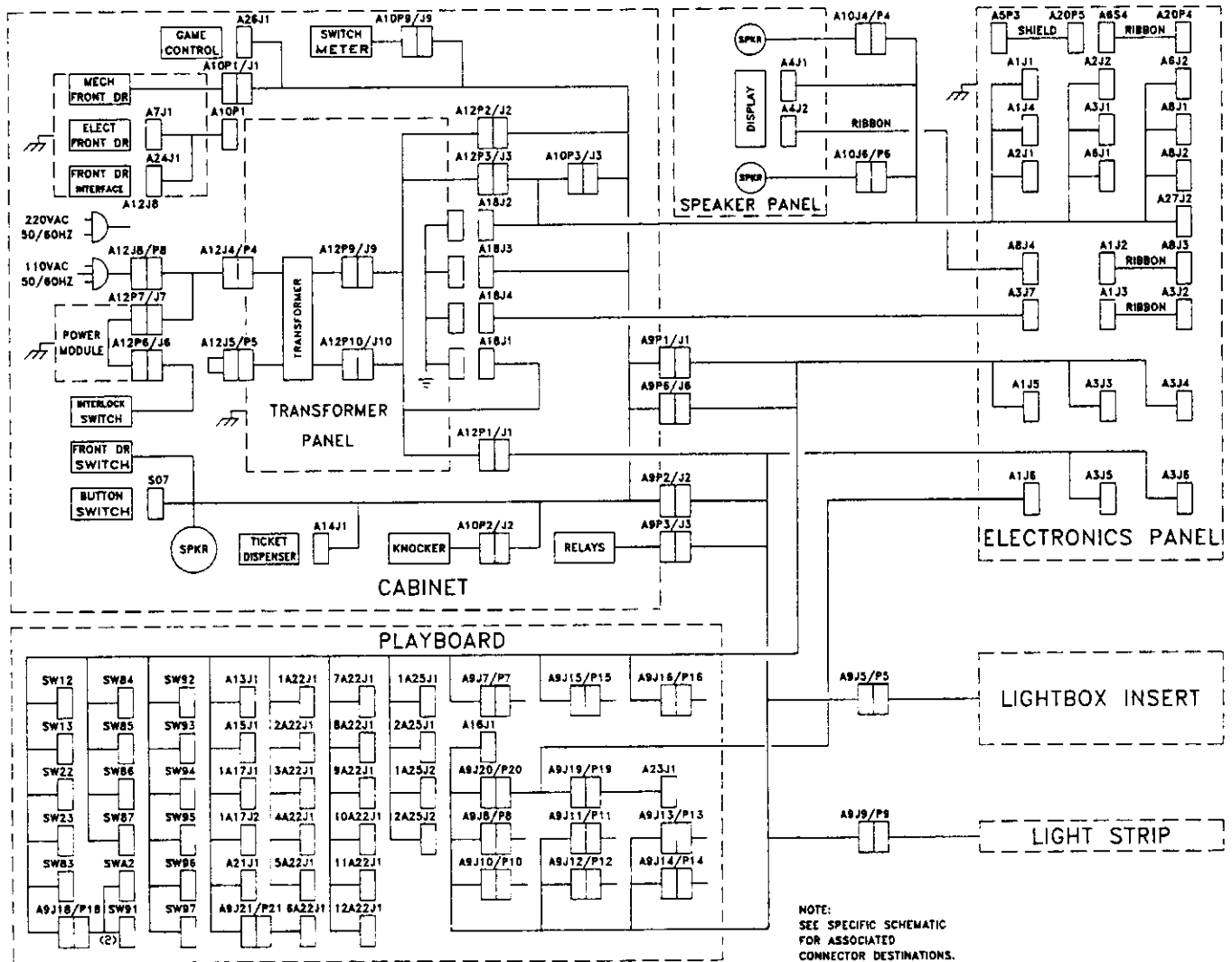


FIGURE 1. INTERCONNECTION DIAGRAM

IV. THEORY OF OPERATION

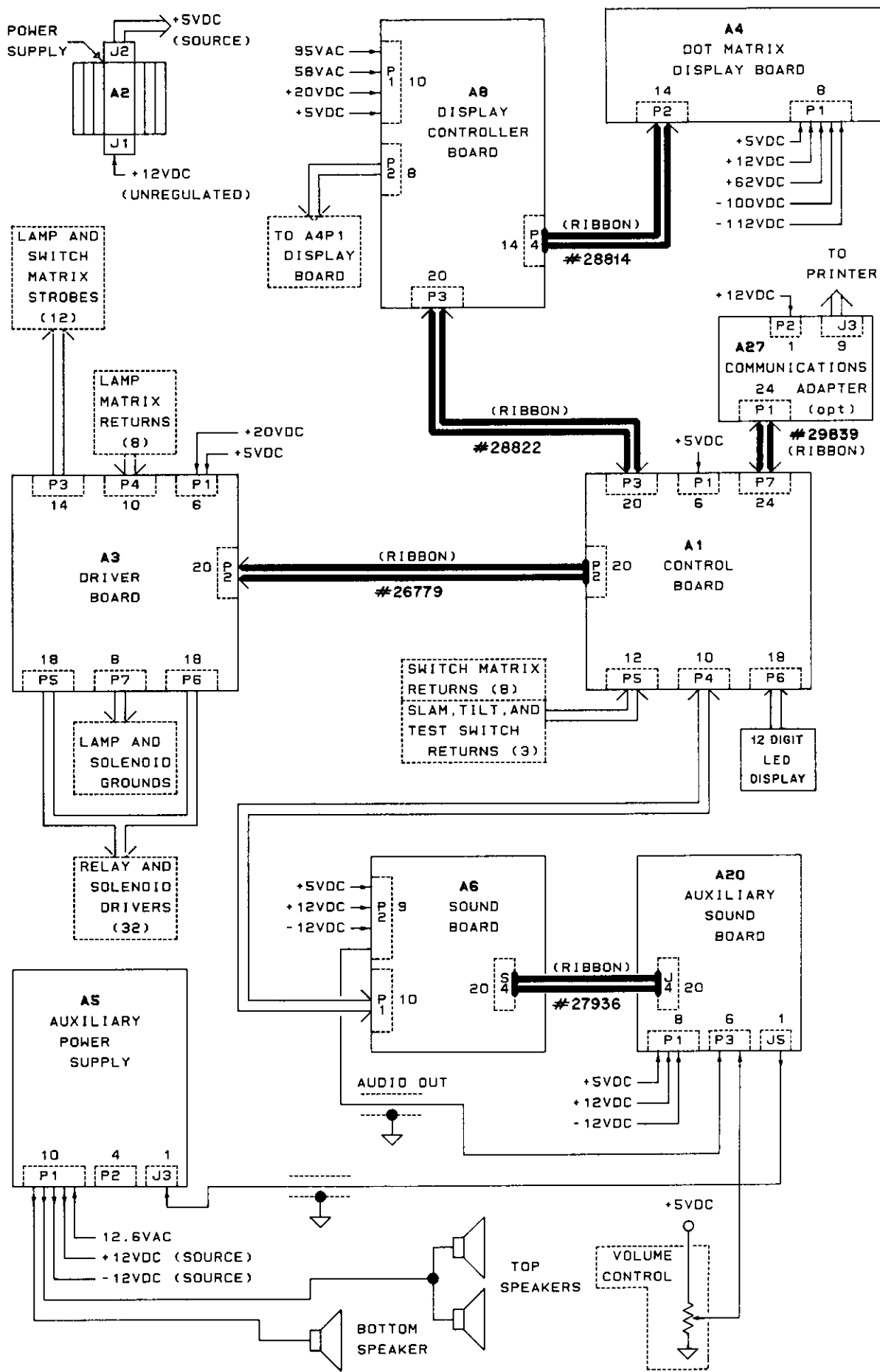


FIGURE 2. SYSTEM 3 BLOCK DIAGRAM

IV. THEORY OF OPERATION

A. CONTROL BOARD (A1)

The Control Board is supplied with 5vdc (A1P1) from the Power Supply (A2P2). The data contained in ram (U3) is kept valid when power is turned off by the lithium battery (BAT1) and controller (U6).

NOTE: When replacing either the battery, ram, or the controller there may be a message that appears in the display on power up the first time that indicates a low battery condition. If this occurs, turn the power off and back on again. The board should power up normally this time. If not, there is another problem on the board.

The Control Board can accommodate either a 27512 or a 27256 Eprom. JP1 must be installed for a 27512 or JP2 for a 27256 Game Prom. A 4 Mhz oscillator is configured using U17, R1, R2, C22, C23, and XTAL1. The oscillator output is then divided by 2 to a 2Mhz clock by U18 which is used as the input clock to the 65C02 (U1) microprocessor. The clock output of U1 (pin 39) is used as a sync signal for reading from or writing to the peripheral devices.

Two versatile interface adapters (U4, U5) are used to develop the necessary control signals for the system. The display connector (A1P3) is comprised of several signals. U4-15 and U4-17 are used as inputs to receive data from the Display Controller Board. Data is output to the Display Controller Board by U7 (BD0-BD7) and then latched by pulsing the DS0 line at U9-4. The output at DS1 (U9-5) is used to reset the Display Controller Board if it does not respond to data output by the Control Board.

The Driver Board connector (A1P2) contains all the signals necessary to operate the lamp and switch matrix strobes, the lamp matrix returns, and the solenoids. The lamp clear (LCLR), lamp strobe (LSTB), and lamp strobe data (LDATA) are generated by U4-12, U4-11, and U4-10 respectively. The appropriate lamp return data

during each active lamp strobe is output by U7 and latched into U5 on the Driver Board by the lamp return data strobe (LDS). The solenoid data is output by U7 (BD0-BD7) and latched into the appropriate Driver Board device (U1-U4) by the solenoid strobes (SS0-SS3).

The switch matrix returns are input at A1P5, buffered by U19 and U20 and then input to U4. Discrete inputs are provided at A1P5 for the slam, tilt, and test switches.

The connection to the Sound Board (A1P4) is made up of eight sound data lines (SD0-SD7), a return line (SRET), and a reset line (MR).

A reset circuit is configured using U13, U14, R3, and C24. When power is applied to the system, the microprocessor reset pin (U1-40) is held low for approximately 10 milliseconds. The system can also be reset by pressing the switch (SW1) on the board. Whenever a reset occurs the master reset signal (MR) (U18-9) is held low until the display strobe (DSTB) becomes active. At this point the master reset goes high which enables the peripheral IC's on the Display Board and Driver Board to accept data.

A watchdog circuit is employed to monitor both the display digit strobe and the lamp strobe. This circuit is made up of U11, U12, U13, U16, R5, R6, R29, R32, R33, C20, C21, C28, and C29. If either the display strobe (DSTB) or the lamp strobe (LSTB) is missing for 330 milliseconds the system will be reset. The system will also be reset if the supply voltage drops below 4vdc. This voltage monitor is configured using U21, VR1, D1, D2, R34, and R35.

B. POWER SUPPLY (A2)

The transformer panel delivers 12vdc to the input of the power supply. The regulated output voltage should be set to 5vdc by using potentiometer R3. This voltage is then supplied to the Control Board (A1), Driver Board (A3), Display Board (A4), Sound Board

IV. THEORY OF OPERATION

(A6), Display Controller Board (A8), and any other auxiliary board which may require it.

C. DRIVER BOARD (A3)

Two voltages are supplied to this board at A3P1. The 5vdc is supplied from the Power Supply (A2) and the 20vdc is supplied from the transformer panel. The 20vdc is used to source the controlled lamps and the switch matrix. The Driver Board receives its data at A3P2 from the Control Board (A1P2). Solenoid data is latched into U1-U4. Lamp return data is latched into U5. Lamp and switch strobe data is shifted through U6 and U7. The comparators (U10,U11) are used to protect the MOSFETS (Q33-Q49). If a sensed input voltage exceeds the reference voltage (Vref), the corresponding MOSFET is turned off immediately following the lamp clear pulse (LCLR) supplied by U12 thus limiting the duty cycle. If the master reset signal (MR) is held low all lamps and solenoids will be disabled.

D. DISPLAY CONTROLLER (A8)

This board is comprised of the power supply section and the digital section. The power supply is used to generate the necessary voltages that are required to power the Display Board. All voltages are input at A8P1 and then output to the Display Board at A8P2.

The digital section controls the information which appears in the display and also the refresh of the display information. The clock circuit runs at 3.579 MHz and is divided by two through U5 and then fed to the microprocessor (U1-37) as the master clock. The LED on the board will flash if the microprocessor (U1) is running properly. A controller chip (U2) is used to refresh the Display Board independent from the code which is being executed by the microprocessor (U1). U1 uses the data bus during the phase 2 portion of the clock while U2 uses it during the phase 1 portion. The address lines from both U1 and U2 are multiplexed through U9-U11 to determine which device has control of

the ram (U4). The necessary data is then output to the Display Board at A8P4. Data is both transmitted and received from the Control Board at A8P3. If the Control Board cannot successfully communicate with the Display Controller Board it will attempt to reset the Controller Board by sending a negative going signal on A8P3-14 (DS1).

E. DISPLAY BOARD (A4)

The Display Board consists of a 128 column X 32 row gas plasma display. The drive electronics located on the backside of the board convert low voltage serial data in to high voltage parallel data out for driving the display. The column drivers contain output latches so that column data for the following row can be entered while the present row is being displayed. All voltages required by the display are input at A4P1. All control signals needed to multiplex the display are input at A4P2. The Display Controller Board sends 128 bits of serial column data on the SDATA line for every row of display information. The data is shifted through the driver IC's by the dot clock signal (DCLK). The column data for a particular row is then latched by the column latch (CLATCH) signal. The row clock (RCLK) signal is used to clock the row driver data (RDATA) through the row driver IC. There is only one active row at a time. Between rows the display enable (DE) signal is used to prevent the display from flickering.

F. SOUND BOARD (A6)

The Sound Board consists of two 6502 microprocessor systems, a dual DAC, an input port to receive commands from the system Control Board, and a low level audio output at A6P2-9 which is sent to the summing amplifier located on the Auxiliary Sound Board (A20) for amplification.

The Sound Board requires three supply voltages +5vdc, +12vdc, and -12vdc. In addition, a power-up reset signal is required from the Control Board. If a manual reset is desired, pressing SW2 will reset both processors.

IV. THEORY OF OPERATION

A 4MHz oscillator is configured with R11, R12, C14, C15, C22, XTAL1, and T1. This clock is then divided down by S1 into either a 2MHz or 1MHz clock signal for the processors N1 and T3. A 250 KHz clock signal from S1-11 is used by the programmable timer section consisting of N5, H5, T5, and K5.

Eight lines from the Control Board are input at A6P1 on the Sound Board and sent to the two input code latches A3 and B2. When any of these inputs goes low (except for A6P1-9 when JP7 is not installed) A2-8 goes high which causes the input code data to be latched into A3 and B2. Also at the same time the flip-flops contained in A4 are clocked which cause the IRQ input of each microprocessor to go low. The outputs of A4 will remain in the low state until each flip-flop is cleared by a signal from its associated microprocessor after each IRQ is processed.

The Sound Board is designed to accommodate different types of Eproms. Jumpers JP1, JP2, JP3, and JP4 should be set to their proper positions based on the density of the Eproms being used.

G. AUXILIARY SOUND BOARD (A20)

The Auxiliary Sound Board contains a sound generator YM2151 (U9) and a sound/speech generator MSM6295 (U1). Both of these IC's operate under the control of the T3 microprocessor on the master Sound Board (A6). The sound generator YM2151 responds to its commands by sending serial data to the YM3014 DAC (U10). The DAC then converts this data into an analog signal which is filtered through a series of op-amps and then sent to the main summing amplifier (U11).

A 74HCT74 IC (U6) is used to divide the 4 MHz clock signal present at A20P4-9 into both a 1 MHz and 2 MHz signal which is selectable via JP3 (2 MHz) or JP4 (1 MHz). This signal is then used as the master clock for the speech generator (U1). When the speech generator (U1) receives a command, it then retrieves its data from the Eproms (U4, U5). The analog output at pin 36 (DA0) is then sent

through an active filter network and then to the main summing amplifier (U11).

The output of the main summing amplifier (U11-7) is input to a voltage controlled amplifier (VCA) (U13). The volume is controlled by a potentiometer located just inside the front door of the game. The potentiometer acts as a resistor divider which supplies a 0 to 5 volt signal to the VCA at U13-2. The output of the VCA is then sent to Auxiliary Power Supply (A5) for amplification.

H. SENSOR BOARD (A15)

This board is used to detect if any flipper is energized and then inputs the data to the Control Board to be processed. This board therefore eliminates the need for a second switch to be used on the flipper assembly itself. U1 is an optocoupler device which converts the input signal from the flipper circuit when energized to a signal which can be recognized by the Control Board as a valid switch closure.

I. OPTICAL INTERFACE (A25)

The optical interface assembly generates and receives the infrared light pulses needed to optically detect the ball breaking an infrared light beam. It also provides a visual indication that the interface assembly is functioning properly.

This method of detection transmits infrared light pulses from an opto LED to an opto phototransistor receiver. The LED light pulses are generated from a switch strobe that is buffered and current amplified by two sections of the LM339 voltage comparator (output pins 1 & 2) and transistor Q2.

When no ball is present, the light pulses reach the opto receiver which passes the pulses 180 degrees out of phase with the switch strobe on to two additional sections of the comparator (pins 9 & 10). Because the strobe pulses and receive pulses are out of phase, they cancel at resistors R1 & R3 and keep comparator

IV. THEORY OF OPERATION

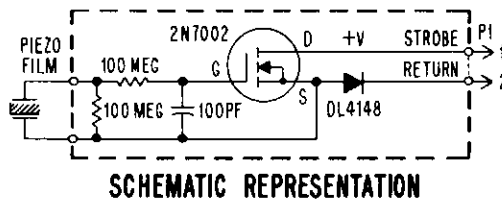
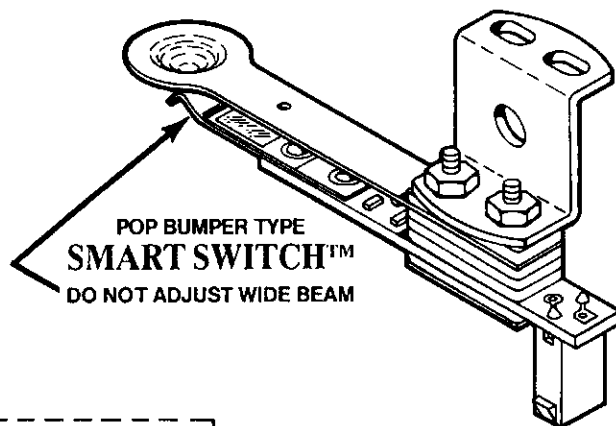
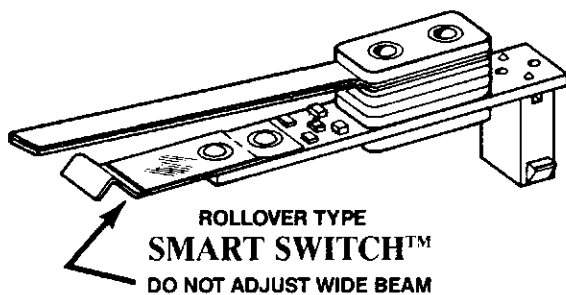
output pin 13 high therefore preventing Q1 from passing strobes on to the switch return line.

As a ball passes between the opto transmitter and receiver, the light beam is broken. Now, with no out of phase pulses coming from the receiver, the strobe appears at comparator inputs 9 & 10. Comparator output pin 13 begins pulsing low and passes the strobes through Q1 to the return line to signal a closed switch. Also positive strobe pulses at output pin 14 of the comparator turn Q3 on and light LED D2. D2 lit indicates a broken light beam and a closed optical switch.

J. SMART SWITCH™ (Piezo Film Sensor)

These devices take the place of the normal contact point type switches used for sensing the ball on various different devices in the game. These devices should not require any adjustment. DO NOT ATTEMPT TO ADJUST THE WIDE CANTILEVER BEAM used in a switch assembly. This could cause permanent damage to the device. The lifetime of these switches has been determined to be over 10 million

cycles. The main advantage of these switches is the fact that they cannot be contaminated by such elements as moisture, dust, or smoke. Each switch assembly consists of a wide cantilever beam which has a piezo film sensor element laminated to its surface. When this beam is deflected, it induces a strain on the laminated piezo film sensor element. As the beam is returning to its rest position it generates an output voltage which triggers the on board circuit. This circuit then generates a momentary output which resembles that of contact points being closed. The switch design used in rollover and spot target applications generates an output signal as the beam which contains the piezo film returns to its rest position after it is actuated. The switch design used for pop bumpers generates an output signal as the beam is deflected in order to provide an immediate response by the pop bumper solenoid. This immediate response type of switch can be distinguished from the other because either the film itself or the printed circuit board will be colored blue. BE CAREFUL not to interchange these two different types of switches.



V. GENERAL INFORMATION

A. PRINTED CIRCUIT BOARDS ARE DESIGNATED AS FOLLOWS:

A1 - Control Board
A2 - Power Supply
A3 - Driver Board
A4 - Dot Matrix Display
A5 - Auxiliary Power Supply
A6 - Sound Board
A8 - Display Controller
A11 - Auxiliary Driver Board
A13 - Resistor Board
A15 - Sensor Board
A16 - Filter Board
A17 - Diode Board
A20 - Auxiliary Sound Board
A22 - LED Board
A25 - Optical Interface Board
A26 - Game Controls Board
A27 - Communications Adapter (Optional)
A28 - Interface Board (Miscellaneous)

Printed circuit board connectors will be labeled AX-JX. For example, A3-J4 is the connector J4 to 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. FUSE AND COIL INFORMATION

TRANSFORMER PANEL

F1	Line Input.....	110V AC....	8 Amp	SLO-BLO
		220V AC....	4 Amp	SLO-BLO
F2	Primary Power.....	110V AC....	5 Amp	SLO-BLO
		220V AC....	2-1/2 Amp	SLO-BLO
F3	Display.....		3/8 Amp	SLO-BLO
F4	Display.....		3/8 Amp	SLO-BLO
F5	Power Supply.....		4 Amp	SLO-BLO
F6	Controlled Lamps and Switches.....		10 Amp	SLO-BLO
F7	Solenoids.....		8 Amp	SLO-BLO
F8	Lightbox Illumination.....		15 Amp	
F9	Playfield Illumination.....		10 Amp	
F10	Auxiliary Power Supply.....		3 Amp	SLO-BLO
F11	Auxiliary Power Supply.....		3 Amp	SLO-BLO

NOTE:

FUSE DESIGNATIONS F12 THRU F14 NOT USED.

V. GENERAL INFORMATION

PLAYBOARD FUSES, COILS/COLORS/SLEEVES

FUSE	RATING	PART NO.	USAGE	COIL/COLOR	SLEEVE
F15	1-1/2 AMP SLO-BLO	EL-24	LEFT KICKING RUBBER (Q1)	5195 (WHITE)	5064
F16	1-1/2 AMP SLO-BLO	EL-24	RIGHT KICKING RUBBER (Q2)	5195 (WHITE)	5064
F17	4 AMP SLO-BLO	EL-33	BOTTOM LEFT FLIPPER	29876 (ORANGE)	5065
F18	2 AMP SLO-BLO	EL-7	TOP LEFT FLIPPER	26646 (BLUE)	5065
F19	4 AMP SLO-BLO	EL-33	BOTTOM RIGHT FLIPPER	29876 (ORANGE)	5065
F20	2 AMP SLO-BLO	EL-7	TOP RIGHT FLIPPER	26646 (BLUE)	5065
F21	1/2 AMP SLO-BLO	EL-20	BALL RELEASE (Q28)	26451 (YELLOW)	5065
			OUTHOLE (Q29)	26451 (YELLOW)	5065
			HOLE KICKER (Q6)	26450 (PINK)	5064
			#1 TRIP (Q8)	26452 (PINK)	----
			#2 TRIP (Q9)	26452 (PINK)	----
			#3 TRIP (Q10)	26452 (PINK)	----
			#4 TRIP (Q11)	26452 (PINK)	----
			#5 TRIP (Q12)	26452 (PINK)	----
F22	1/2 AMP SLO-BLO	EL-20	PLUNGER GATE (Q7)	26451 (YELLOW)	5065
F23	2 AMP SLO-BLO	EL-7	5 BANK RESET (Q3)	19300 (ORANGE)	25605
F24	1-1/2 AMP SLO-BLO	EL-24	TOP UPKICKER (Q4)	16570 (GREEN)	21411
F25	1 AMP SLO-BLO	EL-6	BOTTOM UPKICKER (Q5)	17876 (TAN)	21411

V. GENERAL INFORMATION

D. COIL CHART

SOLENOID COILS					
PART NUMBER	WHERE USED	RESISTANCE (OHMS)	NUMBER OF TURNS	WIRE GAUGE	WRAPPER COLOR
A-19300	GENERAL PURPOSE	7.8	1075	#25	ORANGE
A-5195	GENERAL PURPOSE	12.3	1305	#26	WHITE
A-16570	GENERAL PURPOSE	15.5	1450	#27	GREEN
A-17876	GENERAL PURPOSE	24	1750	#28	TAN
A-26450	GENERAL PURPOSE	42	2400	#29	PINK
A-26451	GENERAL PURPOSE	65.8	3000	#30	YELLOW
A-30297	GENERAL PURPOSE	66.5	2750	#30	BLUE
A-26926	3-BANK RESET	32.8	2650	#27	BLUE
A-29876	FLIPPER (NEW UNIT)	2.36/202	560/3325	#23/#33	ORANGE
A-25959	FLIPPER (NEW UNIT)	3.85/202	720/3325	#24/#33	RED
A-26646	FLIPPER (NEW UNIT)	4.57/201	725/3470	#25/#33	BLUE
A-28740	FLIPPER (NEW UNIT)	6.02/207	790/3600	#26/#33	TAN
A-27642	FLIPPER (NEW UNIT)	9.1/203	950/3700	#27/#33	YELLOW
A-27643	FLIPPER (OLD UNIT)	11.4/202	960/3670	#28/#33	GREEN
A-30468	FLIPPER (OLD UNIT)	11.59/269	960/4700	#28/#33	WHITE
A-27926	GENERAL PURPOSE	64.7	3475	#29	BLUE
RELAY COILS					
PART NUMBER	WHERE USED	RESISTANCE (OHMS)	NUMBER OF TURNS	WIRE GAUGE	WRAPPER COLOR
A-26452	DROP TAR. TRIP	137	2450	#35	PINK
A-16890	GENERAL PURPOSE	231	4000	#35	ORANGE

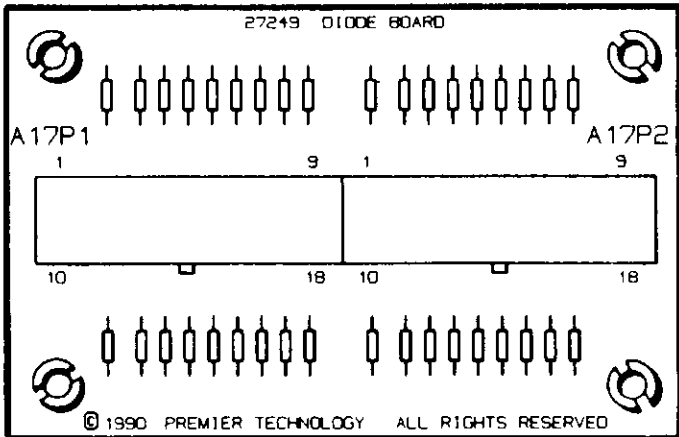
VI. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

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VI. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

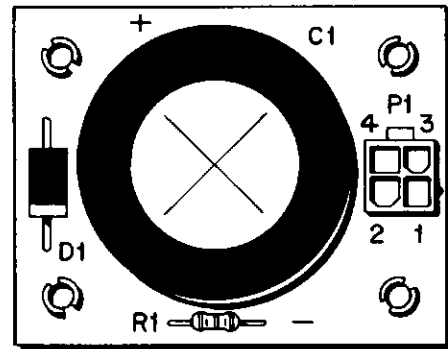
DIODE BOARD (A17) COMPONENT LOCATION



DIODE BOARD (A17) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
1A17	Diode Matrix Assembly	MA-1448
D1-D32	Diode, 1N4148	XO-261
P1, P2	Header, 18 Position	XO-916
R1-R4	Resistor, 220 OHM, 5%, 1/4W	XO-21
	Circuit Board Support (4)	23984

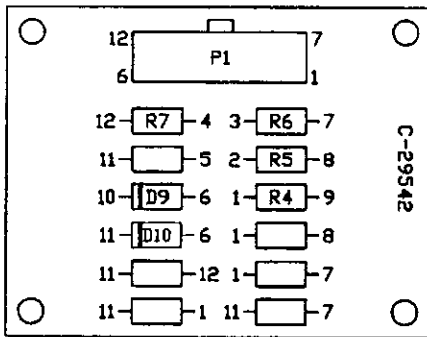
FILTER BOARD (A16) COMPONENT LOCATION



FILTER BOARD (A16) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	FILTER BOARD ASSEMBLY	MA-1745
C1	CAPACITOR, 2200UF, 100V	XO-923
D1	DIODE, 1N5401	XO-263
R1	RESISTOR, 24K OHM, 5%, 1/4W	XO-10
P1	HEADER, 4 POSITION	XO-909
	CIRCUIT BOARD SUPPORT (4)	23984

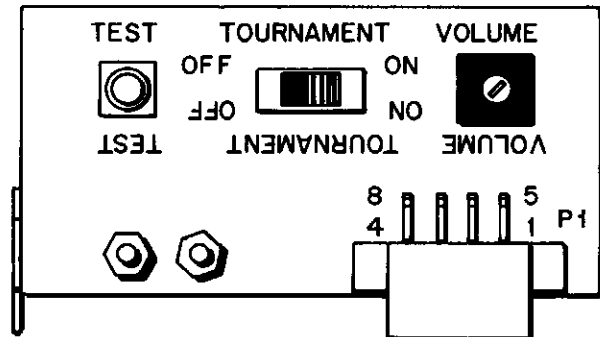
RESISTOR BOARD (A13) COMPONENT LOCATION



RESISTOR BOARD (A13) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	RESISTOR BOARD (A13)	30987
D9, D10	DIODE, 1N4004	XO-254
R4-R7	RESISTOR, 220 OHM, 5%, 1/4W	XO-21
P1	HEADER, 12 POSITION	XO-913
	SPACER, (4)	23984

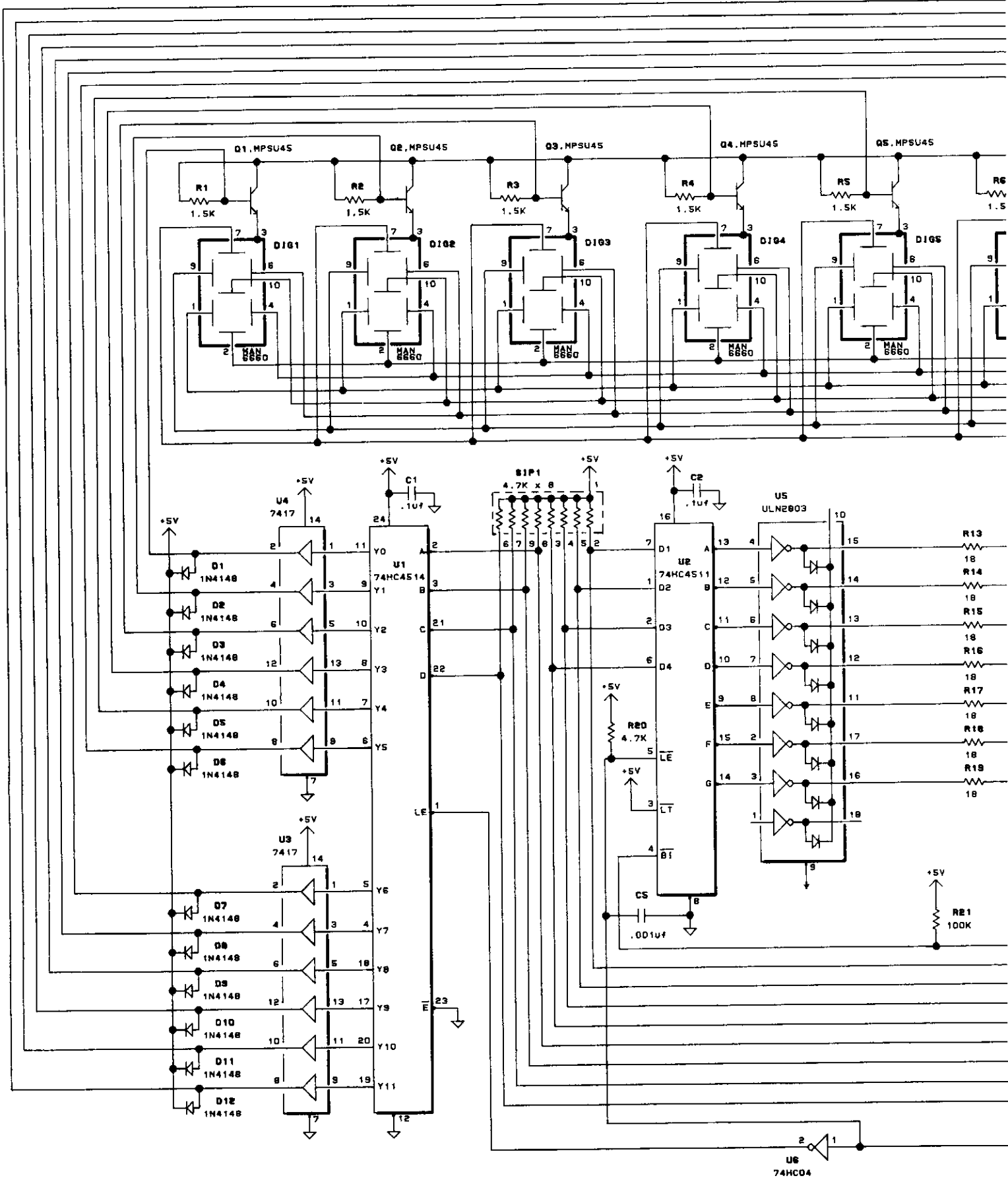
GAME CONTROLS BOARD (A26) COMPONENT LOCATION

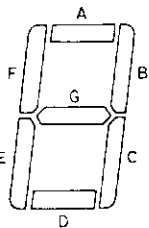
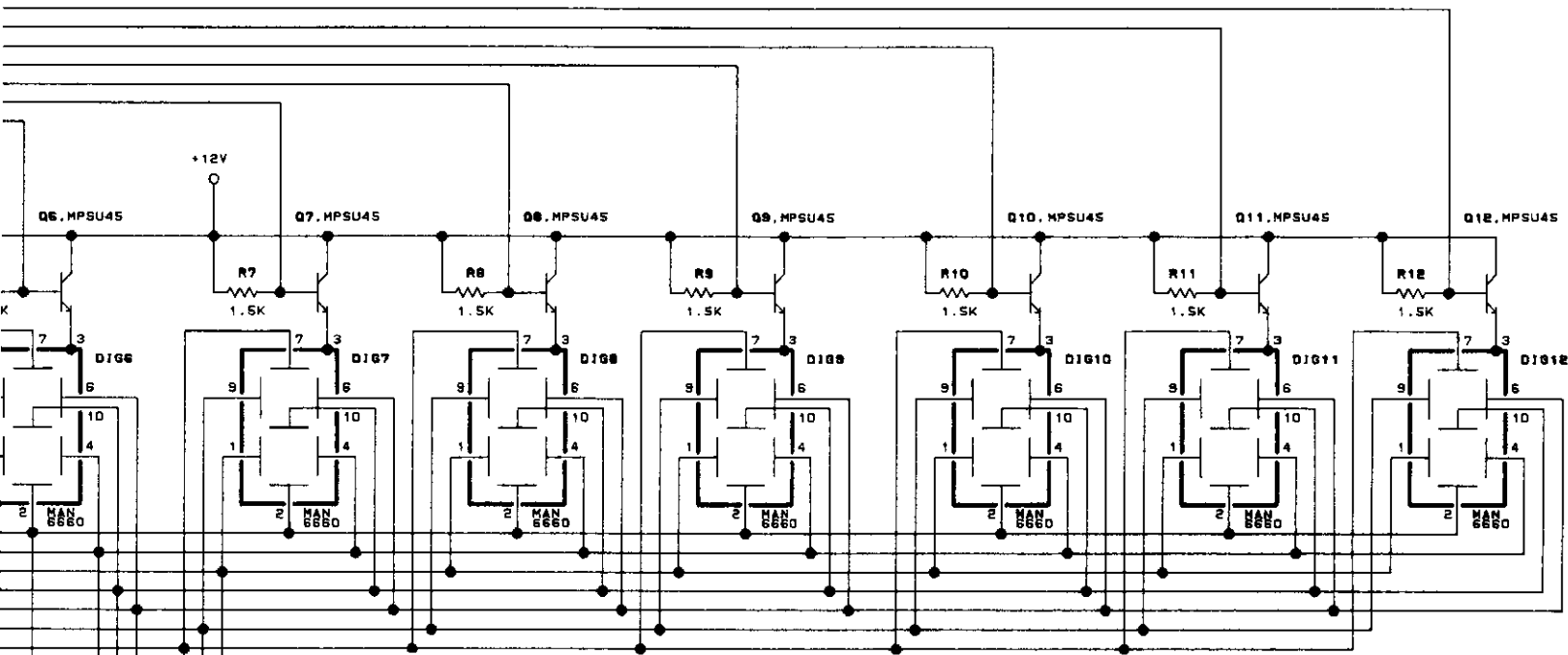


GAME CONTROLS BOARD (A26) PARTS LIST

DESCRIPTION	PART NUMBER
Game Controls Board (A26)	MA-1851
Potentiometer, 10K OHM, 20%, 15W	XO-1194
Pushbutton Switch	XO-897
Slide Switch	XO-1193
Header, 8 Position	XO-920
Mounting Bracket	28619
Key Cap, Yellow	XO-1198

VI. WIRING AND SCHEMATIC

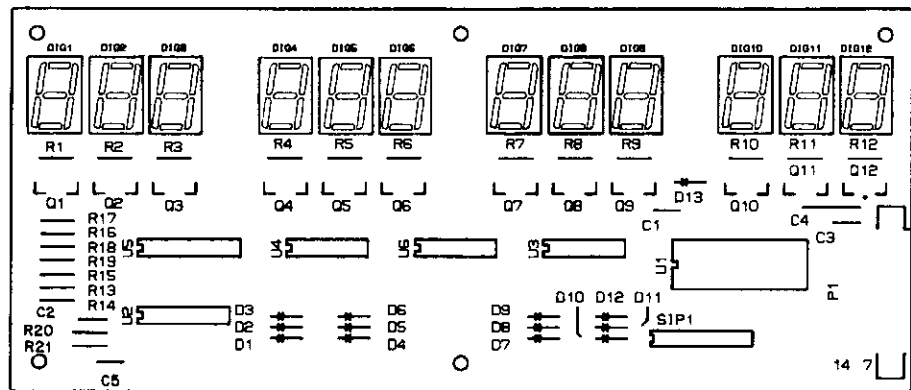




SEGMENT IDENTIFICATION

Premier Technology			
TITLE LED DISPLAY BOARD (A23) SCHEMATIC DIAGRAM			
DRAWN J.B.	APPROVED RHM	DATE 12-7-90	E-27856

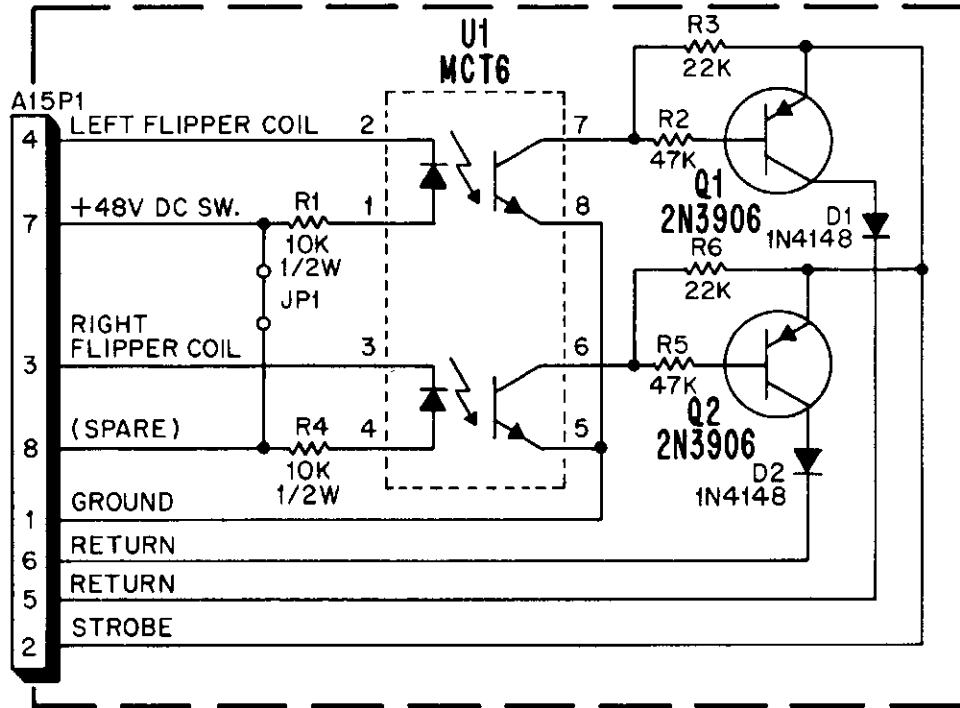
LED DISPLAY BOARD (A23) COMPONENT LOCATION



LED DISPLAY BOARD (A23) PARTS LIST

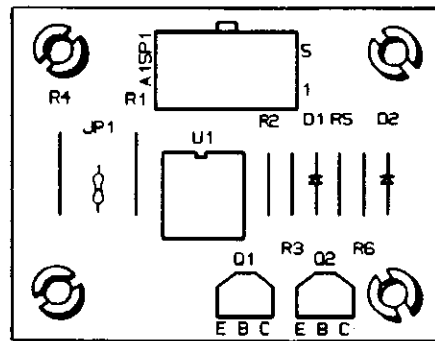
REFERENCE	DESCRIPTION	PART NUMBER
	LED Display Board Assembly (A23)	MA-1568
C1, C2, C3	Capacitor, 0.1UF, +80-20%, 50V	XO-230
C4	Capacitor, 10UF, +80-20%, 16V	XO-846
C5	Capacitor, .001UF, 100V	XO-296
D1-D12	Diode, 1N4148	XO-261
D13	Diode, 1N4004	XO-254
D1-D12	Diode, 1N4148	XO-261
D13	Diode, 1N4004	XO-254
DIG1-DIG12	7 Segment LED, MAN6660	XO-1016
Q1-Q12	Transistor, NPN Darlington, MPS-U45	XO-306
R1-R12	Resistor, 1.5K OHM, 5%, 1/4W	XO-20
R13-R19	Resistor, 18 OHM, 1%, 1/4W	XO-1003
R20	Resistor, 4.7K OHM, 5%, 1/4W	XO-7
R21	Resistor, 100K OHM, 5%, 1/4W	XO-45
SIP1	Resistor Pack, 4.7K OHM, 5% x 8	XO-161
U1	IC, 4 to 16 Decoder, 74HC4514	XO-1017
U2	IC, BCD to 7 Segment, 74HC4511	XO-1005
U3, U4	IC, Buffer, 7417	XO-406
U5	IC, Darlington Driver, ULN2803	XO-1006
U6	IC, Hex Inverter, 74HC04	XO-888
A23P1	14 Pin Right Angle Header	XO-1008

VI. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



Premier[®] Technology			
TITLE			
SENSOR BOARD (A15) SCHEMATIC DIAGRAM			
DRAWN P.P.S.	APPROVED R.N.M.	DATE 10-12-89	E-27041

SENSOR BOARD (A15) COMPONENT LOCATION

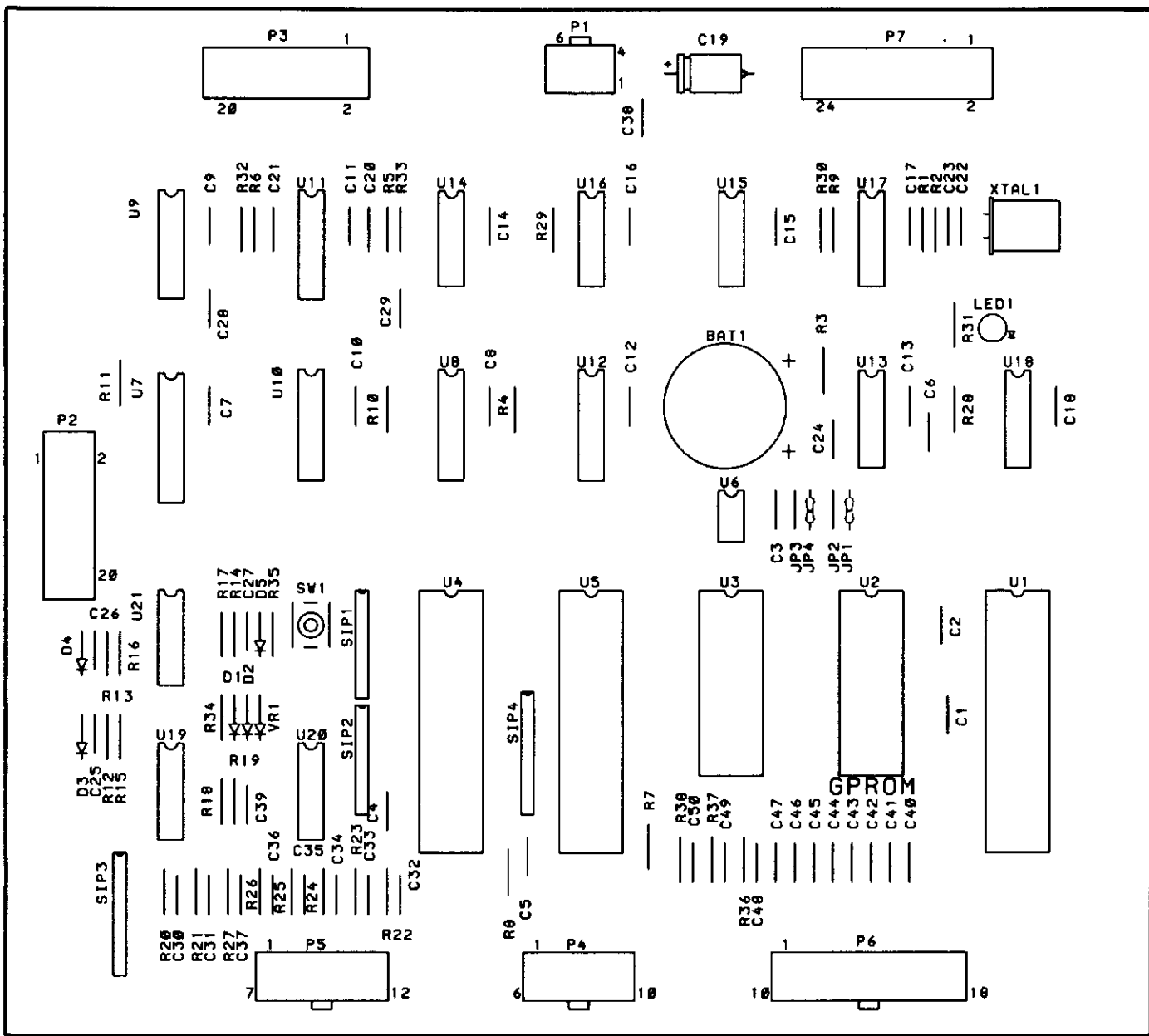


SENSOR BOARD (A15) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	Sensor Board Assembly (A15)	MA-1334
D1, D2	Diode, 1N4148	XO-261
JP1	Jumper, Resistor, 0 OHM	XO-469
Q1, Q2	Transistor, 2N3906 (PNP)	XO-588
R1, R4	Resistor, 10K Ohm, 5%, 1/2W	XO-62
R2, R5	Resistor, 47K Ohm, 5%, 1/4W	XO-30
R3, R6	Resistor, 22K Ohm, 5%, 1/4W	XO-42
U1	IC, Optocoupler, MCT6	XO-1000
A15P1	Header, 8 Position	XO-911
	Spacer (4)	23984

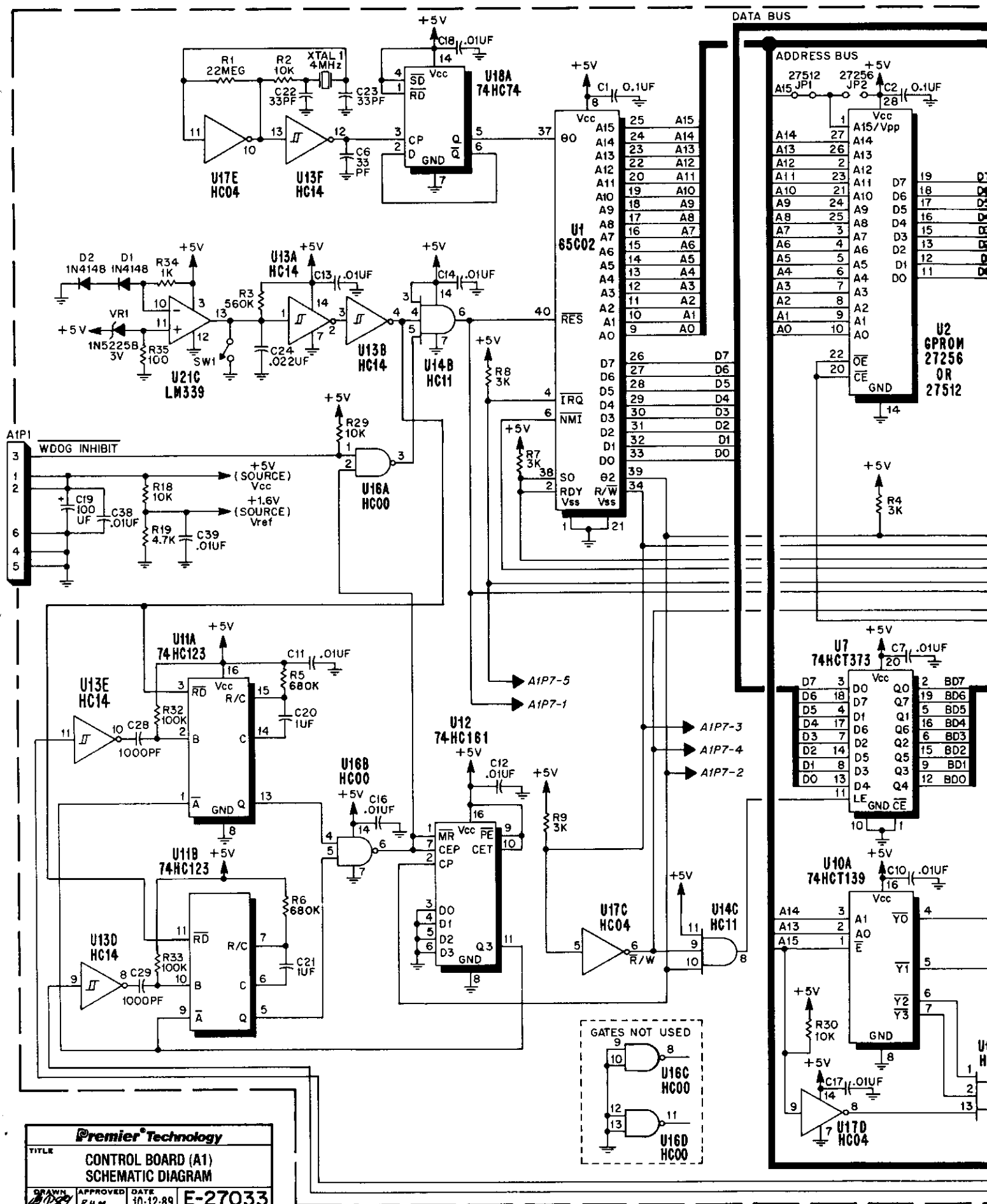
VI. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

CONTROL BOARD (A1) COMPONENT LOCATION



CONTROL BOARD (A1) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER	REFERENCE	DESCRIPTION	PART NUMBER
BAT 1	Control Board Assembly (A1)	MA-1934	SIP3,SIP4	Resistor Pack, 4.7K OHM X 8	XO-161
C3, C7-C18, C30-C50	Lithium Battery, LM2430, 3V	XO-925	SW1	Switch, N.O.	XO-897
C1,C2,C4	Capacitor, .01UF, +80% -20%, 50V	XO-229	U1	IC, 65C02P2, CPU, 2MHZ	XO-927
C5,C25,C27	Capacitor, 0.1UF, +80% -20%, 50V	XO-230	U3	IC, 6264LP, 8K X 8, Static Ram	XO-781
C6,C22,C23	Capacitor, 33PF, 10%, 100V	XO-896	U4,U5	IC,6522AP, Versatile Interface Adaptor (VIA)	XO-929
C19	Capacitor, 100UF, +80% -20%, 10V	XO-211	U6	IC, DS1210, Non-Volatile Controller	XO-930
C20,C21	Capacitor, 1UF, 20%, 50V	XO-746	U7	IC, 74HCT373, Octal Latch	XO-931
C24	Capacitor, .022UF, 10%, 50V	XO-873	U8	IC, 74HCT138, Decoder	XO-932
C28,C29	Capacitor, 1000PF, 10%, 100V	XO-296	U9,U10	IC, 74HCT139, Dual Decoder	XO-933
D1-D5	Diode, 1N4148	XO-261	U11	IC, 74HC123, Dual Multivibrator	XO-934
LED 1	LED, MV5752 (Red)	XO-270	U12	IC, 74HC161, Binary Counter	XO-935
R1	Resistor, 22 MEGOHM, 5%, 1/4W	XO-74	U13	IC, 74HC14, Schmitt Hex Inverters	XO-936
R2,R10,R11	Resistor, 10K OHM, 5%, 1/4W	XO-18	U14	IC, 74HC11, Triple "And" Gates	XO-937
R18,R28,R30	Resistor, 560K OHM, 5%, 1/4W	XO-169	U15,U16	IC, 74HC00, Quad "Nand" Gates	XO-782
R3	Resistor, 680K OHM, 5%, 1/4W	XO-669	U17	IC, 74HC04, Hex Inverters	XO-888
R5,R6	Resistor, 3K OHM, 5%, 1/4W	XO-23	U18	IC, 74HC74, Dual "D" Flip-Flop	XO-939
R4,R7-R9	Resistor, 2.2K OHM, 5%, 1/4W	XO-27	U19,U20,U21	IC, LM339, Quad Comparators	XO-583
R12-R14	Resistor, 3.3K OHM, 5%, 1/4W	XO-38	VR1	Zener Diode, 1N5225B, 3V, 5%	XO-269
R15-R17	Resistor, 4.7K OHM, 5%, 1/4W	XO-7	XTAL1	Crystal, 4MHZ	XO-366
R19-R27, R36-R38	Resistor, 1K OHM, 5%, 1/4W	XO-5	A1P1	Header, 6 Position	XO-910
R31	Resistor, 100 OHM, 5%, 1/4W	XO-28	A1P2,A1P3	Header, 20 Position (Ribbon)	XO-940
R32-R33	Resistor, 330 OHM, 5%, 1/4W	XO-34	A1P4	Header, 10 Position	XO-912
R34	Resistor, 100K OHM, 5%, 1/4W	XO-45	A1P5	Header, 12 Position	XO-913
R35	Resistor, 1K OHM, 5%, 1/4W	XO-5	A1P6	Header, 18 Position	XO-916
SIP1,SIP2	Resistor Pack, 10K OHM X 7, 5%, 1/4W	XO-926	A1P7	Header, 24 Position	XO-1201
				Jumper, Resistor, 0 OHM (2)	XO-469
				Socket, 28 Pin Dip	XO-536

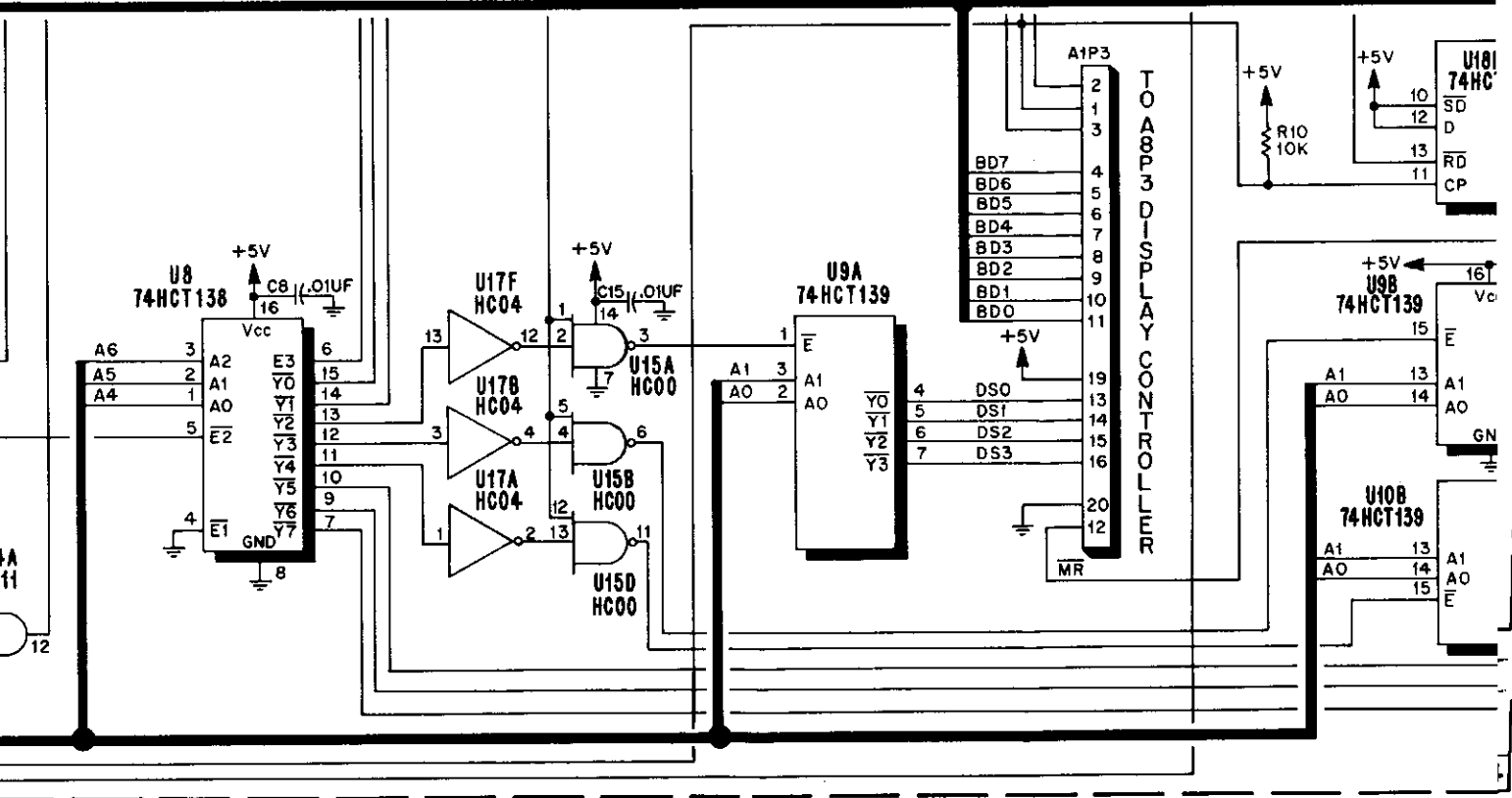
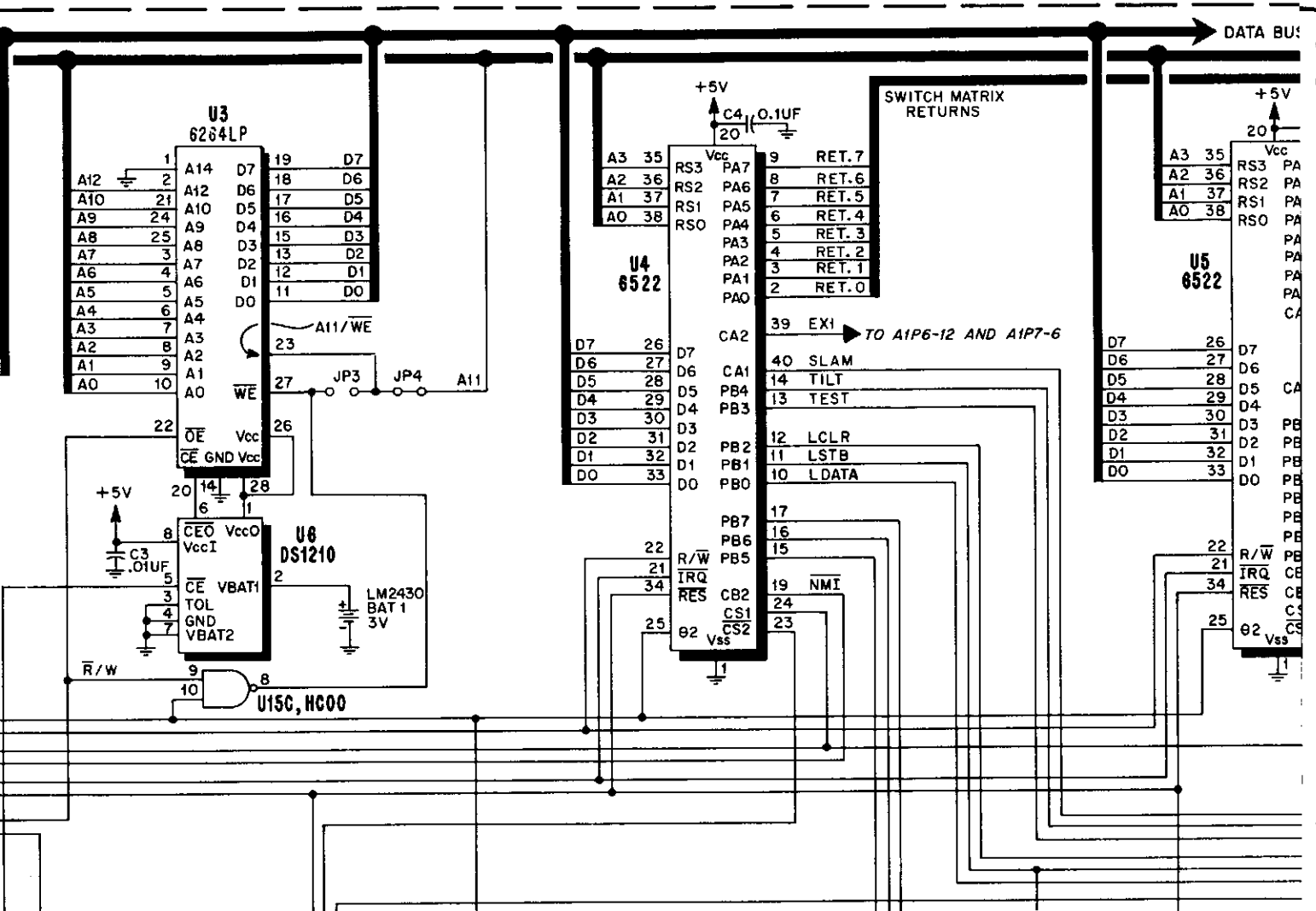


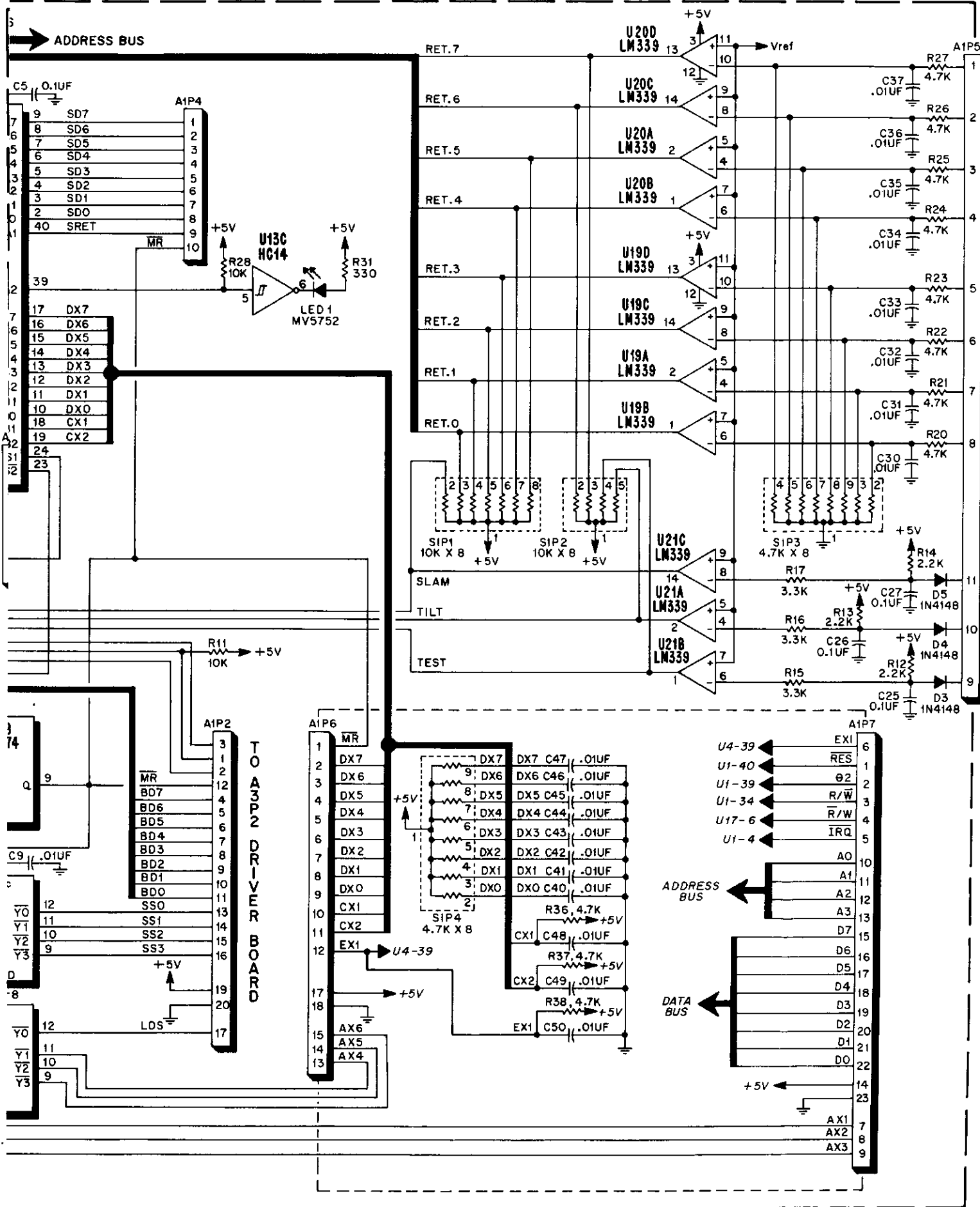
Premier Technology

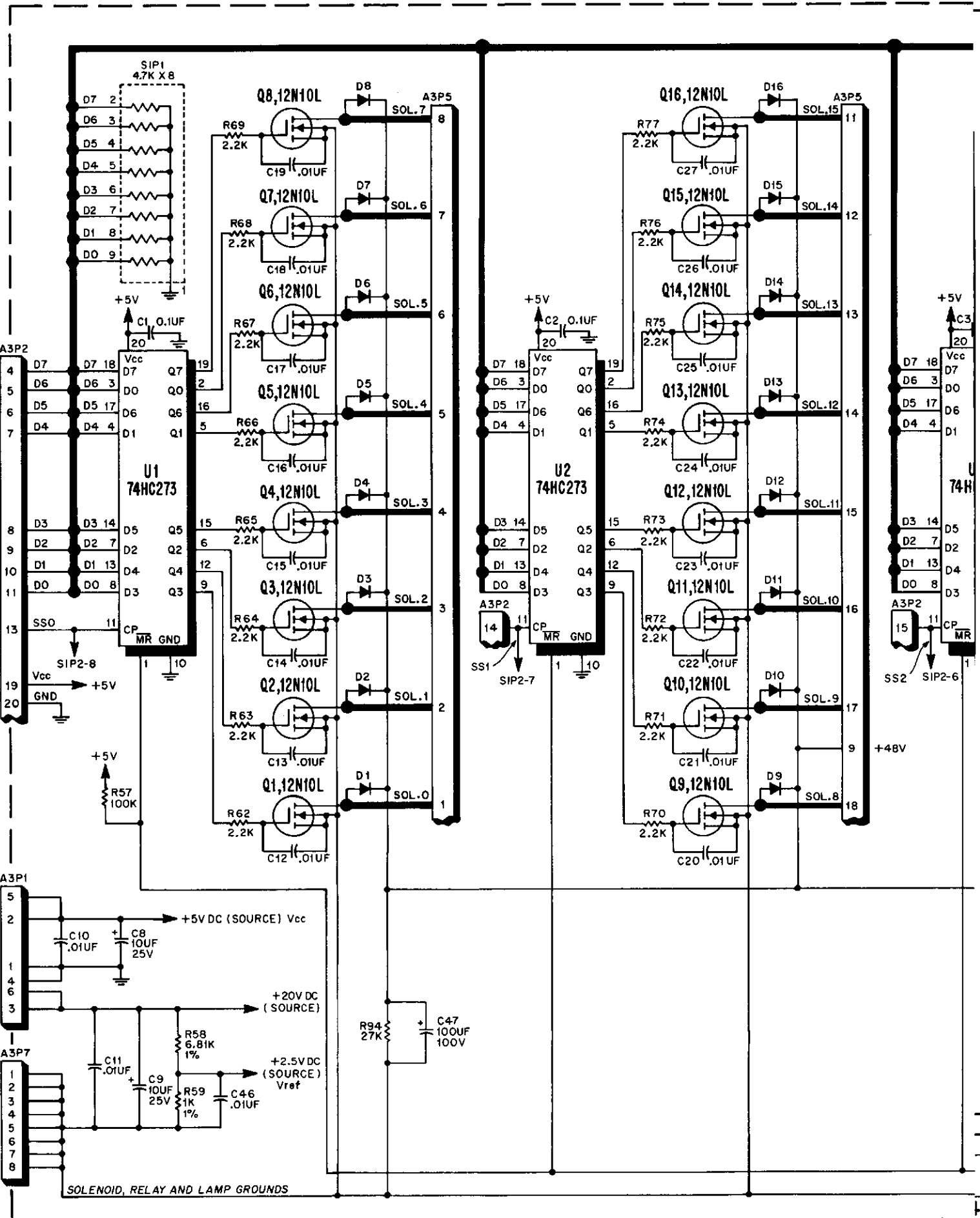
TITLE
**CONTROL BOARD (A1)
 SCHEMATIC DIAGRAM**

DRAWN BY: *[Signature]* APPROVED BY: *[Signature]* DATE: 10-12-89 E-27033

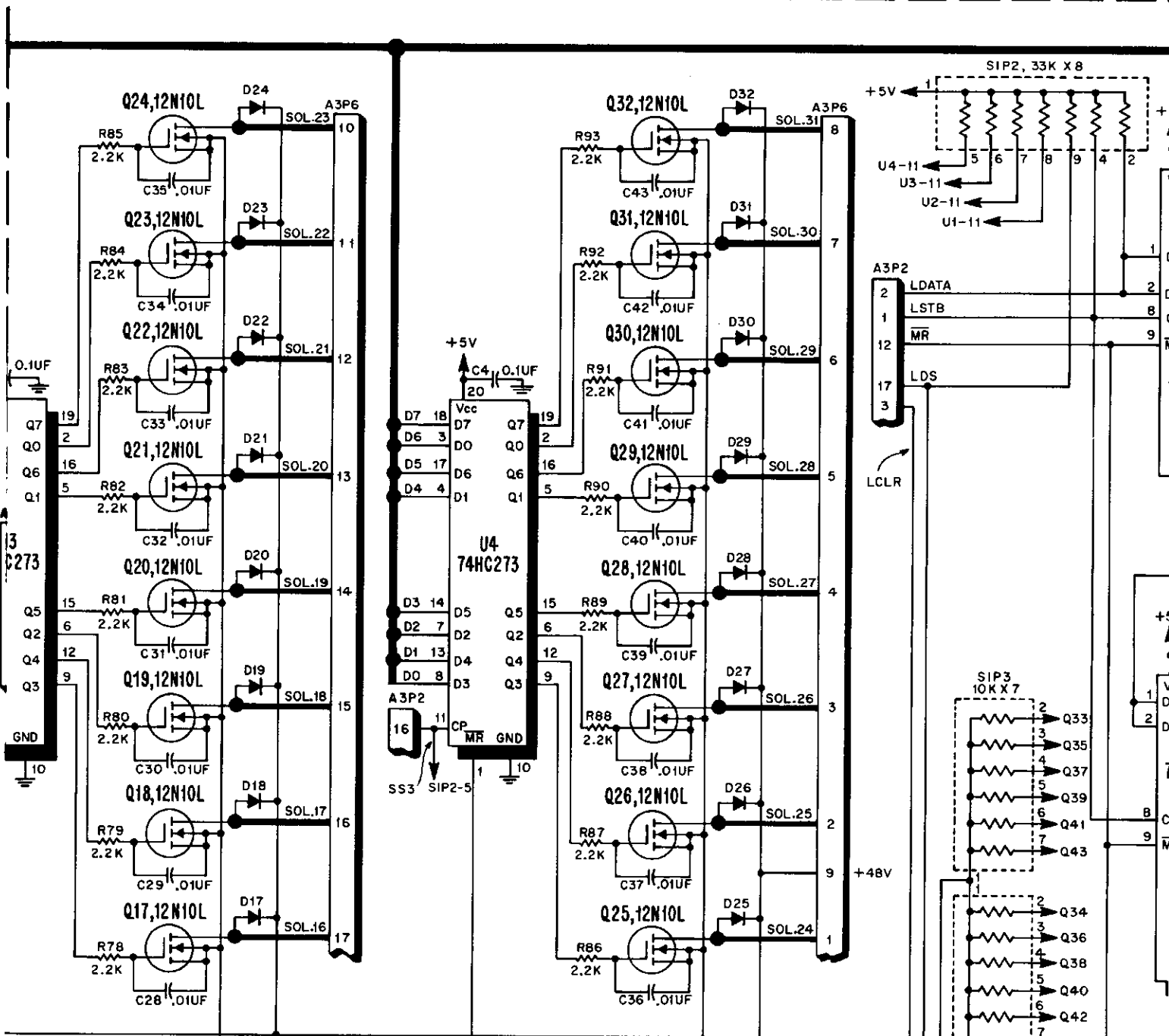
VI. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



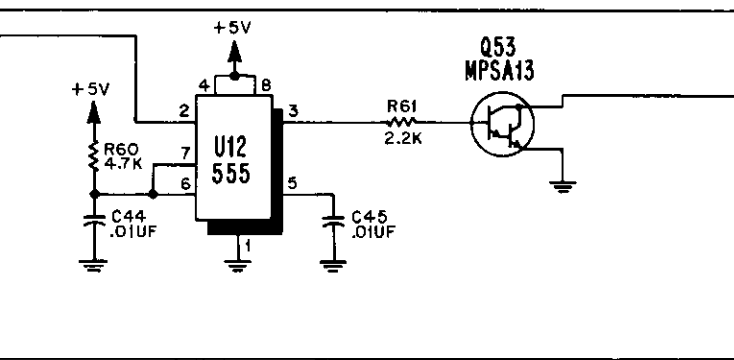
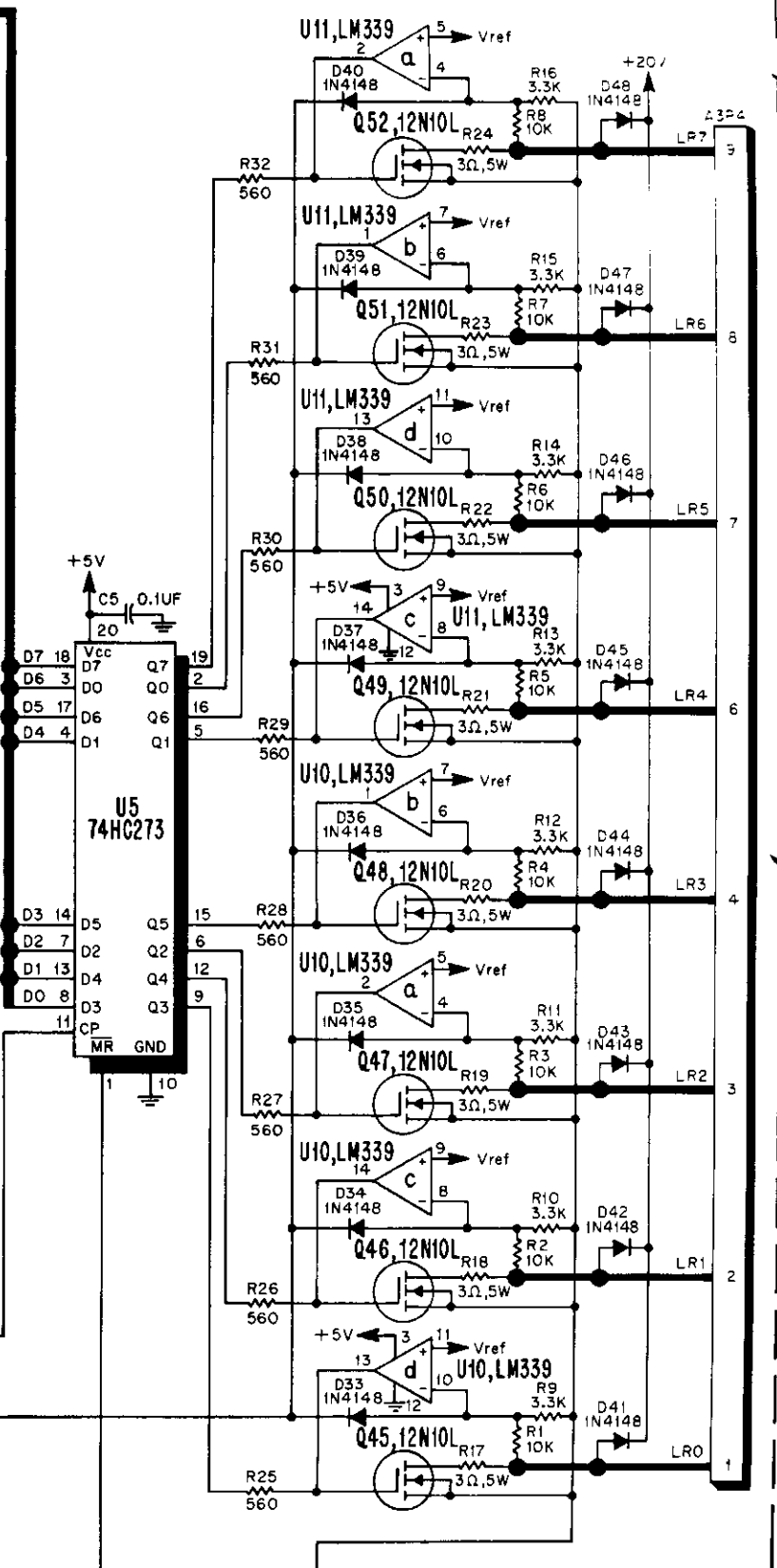
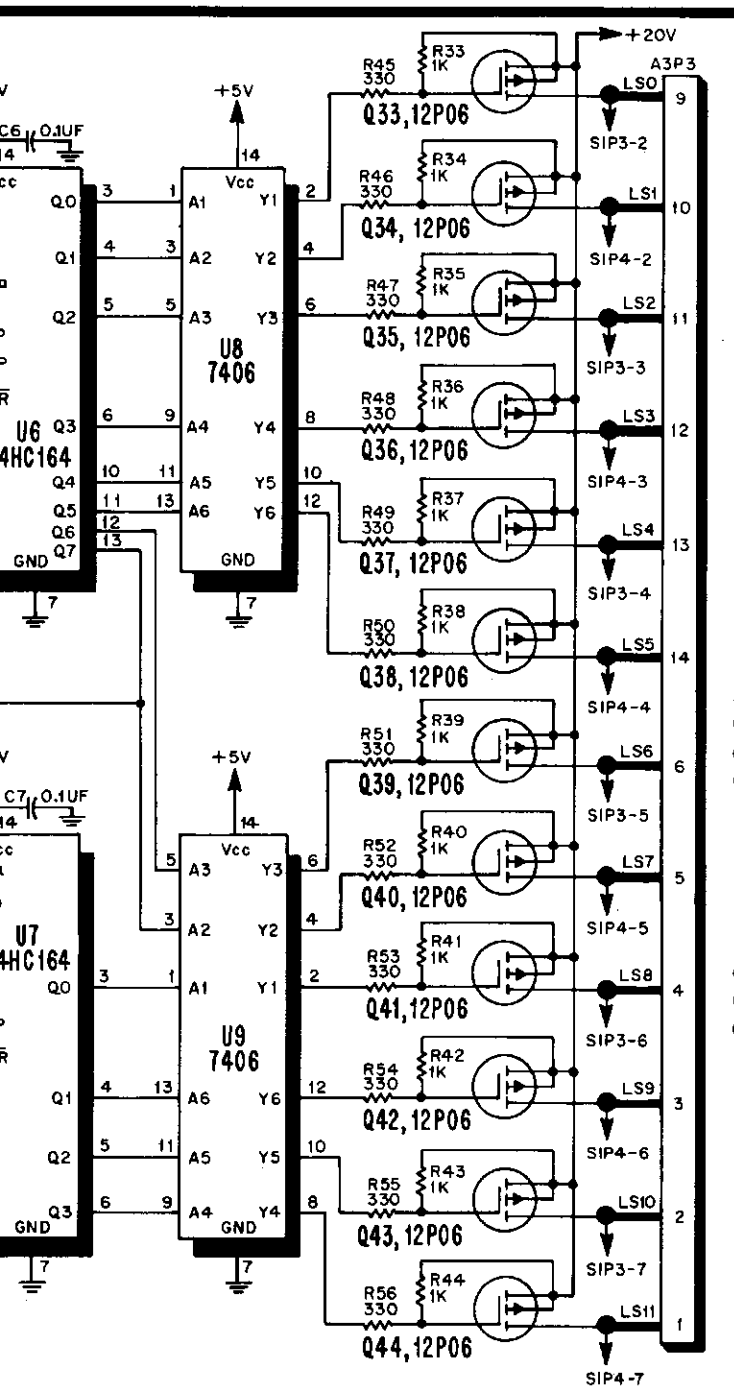




VI. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



NOTE:
DIODES D1 THRU D32 INCLUSIVE
ARE SHOWN BUT NOT USED.



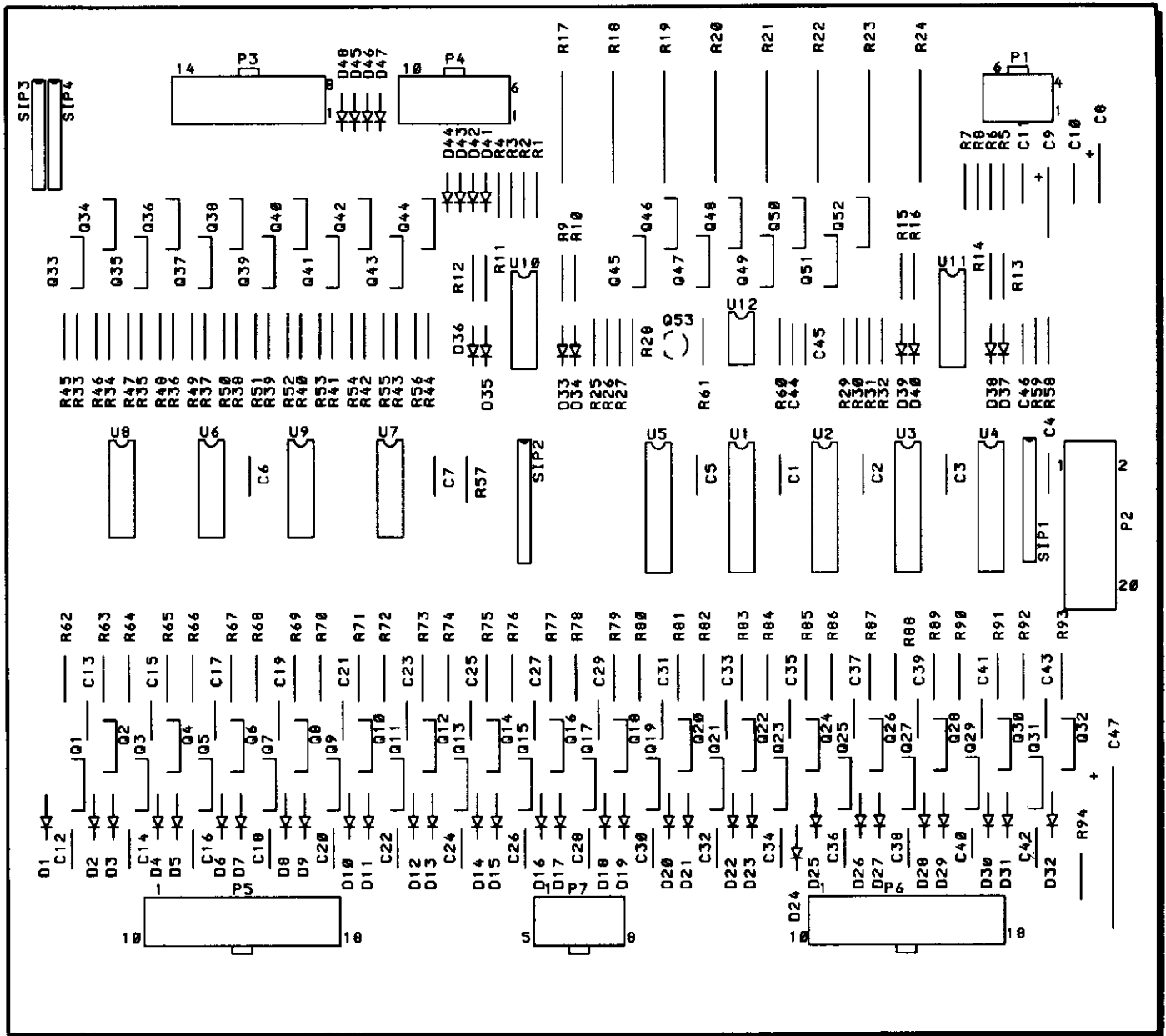
Premier Technology

TITLE DRIVER BOARD (A3)
SCHEMATIC DIAGRAM

DRAWN APPROVED DATE
P.P.S. RHM 10-12-89 E-27034

VI. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

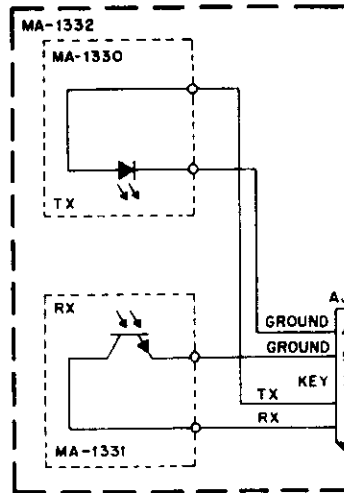
DRIVER BOARD (A3) COMPONENT LOCATION



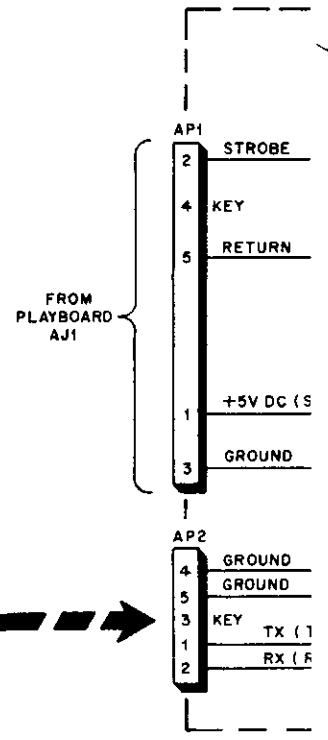
DRIVER BOARD (A3) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER	REFERENCE	DESCRIPTION	PART NUMBER
C1-C7	Driver Board Assembly (A3)	MA-1358	R58	Resistor, 6.81K Ohm, 1%, 1/4W	XO-943
C8	Capacitor, 0.1 UF, +80% -20%, 50V	XO-230	R59	Resistor, 1K Ohm, 1%, 1/4W	XO-944
C9	Capacitor, 10UF, 20%, 25V	XO-127	R60	Resistor, 4.7K Ohm, 5%, 1/4W	XO-7
C10,C11	Capacitor, 10UF, +80% -20%, 25V	XO-225	R61-R93	Resistor, 2.2K Ohm, 5%, 1/4W	XO-27
C45,C46	Capacitor, .01UF, +80% -20%, 50V	XO-229	R94	Resistor, 27K Ohm, 5%, 1/4W	XO-11
C12-C44	Capacitor, .01UF, 10%, 50V	XO-696	SIP1	Resistor Pack, 4.7K Ohm X 8.5%, 1/4W	XO-161
C47	Capacitor, 100UF, 20%, 100V	XO-958	SIP2	Resistor Pack, 33K Ohm X 8.5%, 1/4W	XO-945
D33-D48	Diode, 1N4148	XO-261	SIP3	Resistor Pack, 10K Ohm X 7.5%, 1/4W	XO-926
Q1-Q32,	Transistor, RFP12N10L, OR IRL530,	XO-947	SIP4		
Q45-Q52,Q54	N-Channel MOSFET		U1-U5	IC, Octal "D" Flip-Flops, 74HC273	XO-949
Q33-Q44	Transistor, RFP12P06, IRF9531 OR	XO-948	U6-U7	IC, Shift Register, 74HC164	XO-950
	MT2955 P-Channel MOSFET		U8-U9	IC, Buffer, 7406	XO-85
Q53	Transistor, MPSA13, Darlington	XO-304	U10-U11	IC, Quad Comparator, LM339	XO-583
R1-R8	Resistor, 10K Ohm, 5%, 1/4W	XO-18	U12	IC, Timer, NE555	XO-631
R9-R16	Resistor, 3.3K Ohm, 5%, 1/4W	XO-38	A3P1	Header, 6 Position	XO-910
R17-R24	Resistor, 3 Ohm, 5%, 5W	XO-942	A3P2	Header, 20 Position (Ribbon)	XO-940
R25-R32	Resistor, 560 Ohm, 5%, 1/4W	XO-36	A3P3	Header, 14 Position	XO-914
R33-R44	Resistor, 1K Ohm, 5%, 1/4W	XO-5	A3P4	Header, 10 Position	XO-912
R45-R56	Resistor, 330 Ohm, 5%, 1/4W	XO-34	A3P5,	Header, 18 Position	XO-916
R57	Resistor, 100K Ohm, 5%, 1/4W	XO-45	A3P6		
			A3P7	Header, 8 Position	XO-911

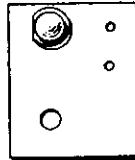
**OPTO LED TRANSMITTER BOARD
SCHEMATIC DIAGRAM**



**OPTO PHOTOTRANSISTOR
RECEIVER BOARD
SCHEMATIC DIAGRAM**



**OPTO LED TRANSMITTER BOARD
COMPONENT LOCATION**



**OPTO LED TRANSMITTER BOARD
PARTS LIST**

REFERENCE	DESCRIPTION	PART NUMBER
TX	Opto LED Transmitter Assembly	MA-1330
	Plastic Transmitter LED	XO-994

**OPTO PI
REC
COMPC**

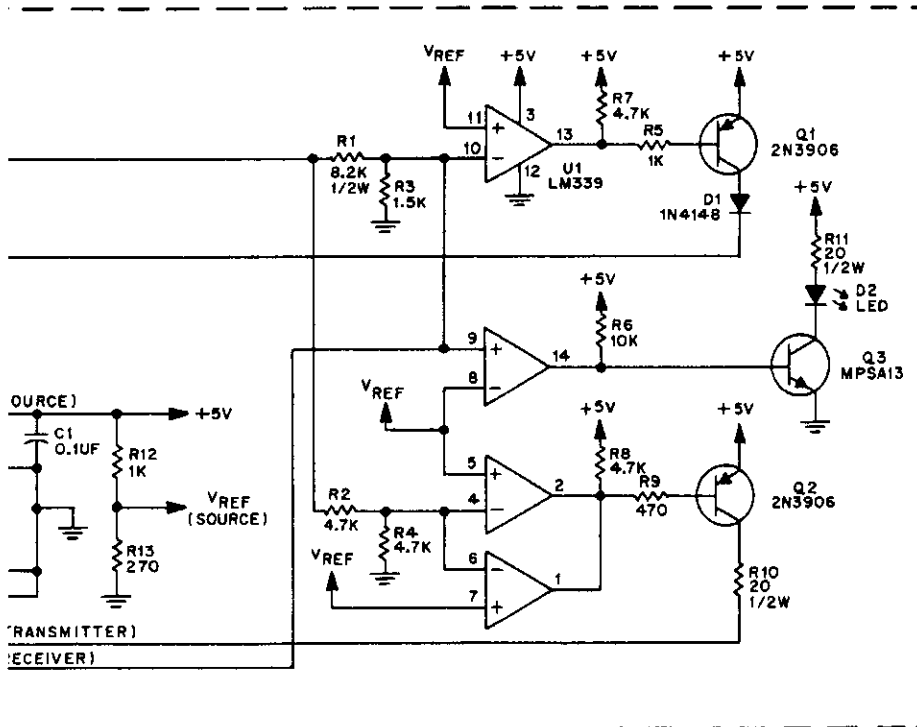
**OPTO PI
REC**

REFERENCE	DESCRIPTION
RX	Opto Phototransistor Receiver Assembly
	Plastic

BRACKET AND OPTIC BOARD ASSEMBLIES REFERENCED			
ASSEMBLY	CONNECTOR NO.	PLATE AND SUPPORT	
30893	A9P16	29662	RIGHT
30893	A9P15	29662	RIGHT

NOTE: BRACKET AND OPTIC BOARD ASSEMBLY DOES NOT INCLUDE WIRING HARNESS.

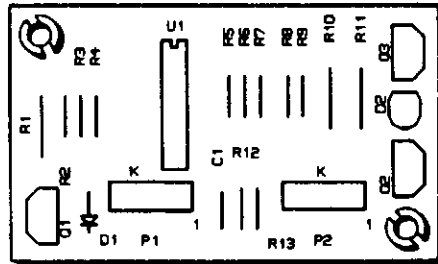
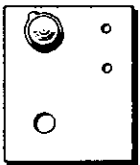
ATIC DIAGRAMS, PARTS LISTS



OPTICAL INTERFACE BOARD SCHEMATIC DIAGRAM

**OPTICAL INTERFACE BOARD (A25)
COMPONENT LOCATION**

**PHOTOTRANSISTOR
RECEIVER BOARD
COMPONENT LOCATION**



**OPTICAL INTERFACE BOARD (A25)
PARTS LIST**

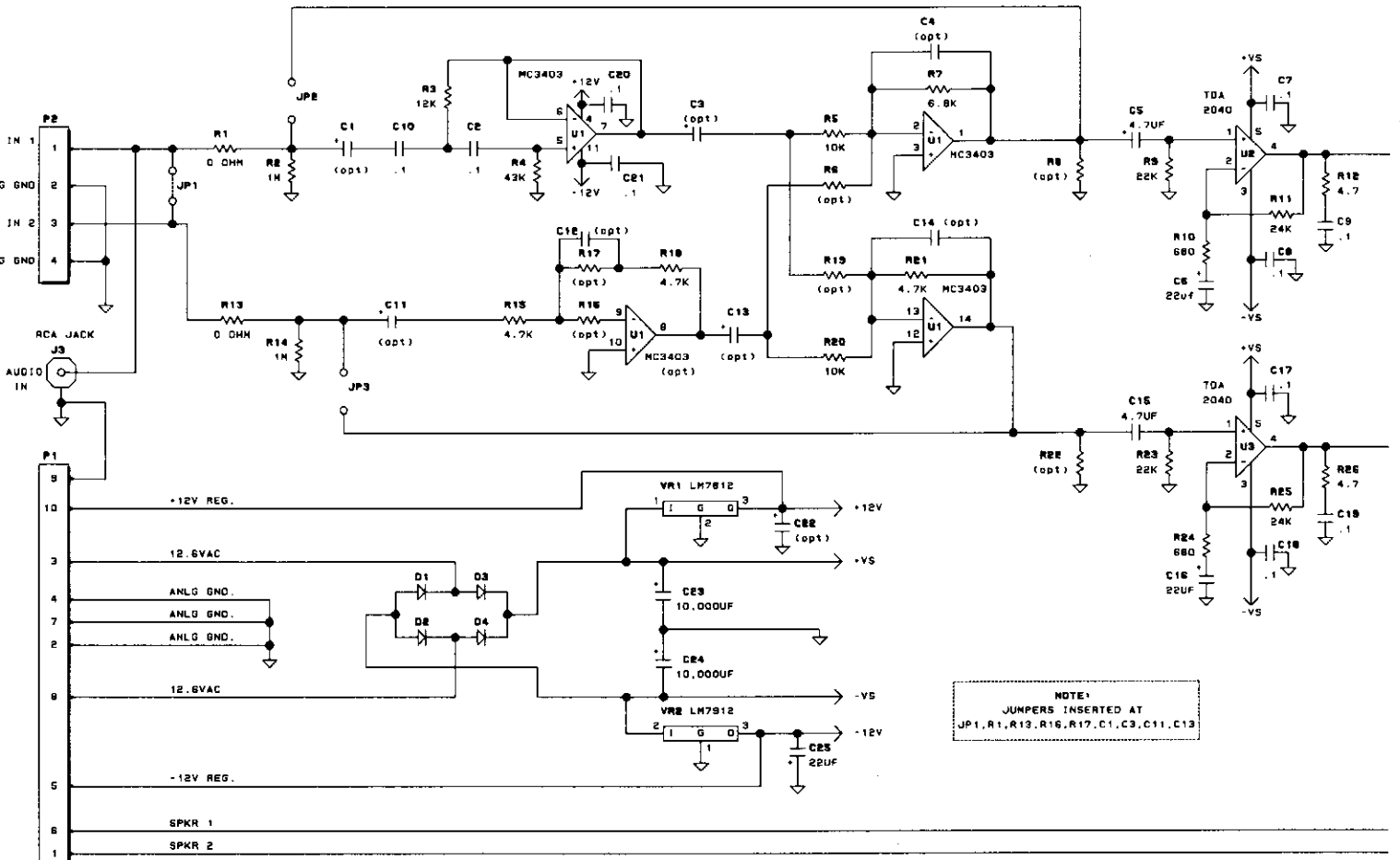
**PHOTOTRANSISTOR
RECEIVER BOARD
PARTS LIST**

DESCRIPTION	PART NUMBER
Phototransistor	MA-1331
Receiver Assembly	XO-993

REFERENCE	DESCRIPTION	PART NUMBER
AP1,AP2	Optical Interface Board Assembly	MA-1558
C1	5 Pin Header	XO-1002
C1	Capacitor, 0.1UF, +80% -20%, 50V	XO-230
D1	Diode, 1N4148	XO-261
D2	Diode, MV5752 (LED, Red)	XO-270
Q1,Q2	Transistor, PNP, 2N3906	XO-588
Q3	Transistor, NPN, MPSA13	XO-304
R1	Resistor, 8.2K Ohm, 5%, 1/2W	XO-1022
R2,R4,R7,R8	Resistor, 4.7K Ohm, 5%, 1/4W	XO-7
R3	Resistor, 1.5K Ohm, 5%, 1/4W	XO-20
R5,R12	Resistor, 1K Ohm, 5%, 1/4W	XO-5
R6	Resistor, 10K Ohm, 5%, 1/4W	XO-18
R9	Resistor, 470 Ohm, 5%, 1/4W	XO-35
R10,R11	Resistor, 20 Ohm, 5%, 1/2W	XO-65
R13	Resistor, 270 Ohm, 5%, 1/4W	XO-68
U1	IC, Quad Comparators, LM339	XO-583
	Support, SRS-8-6N, (2)	23984

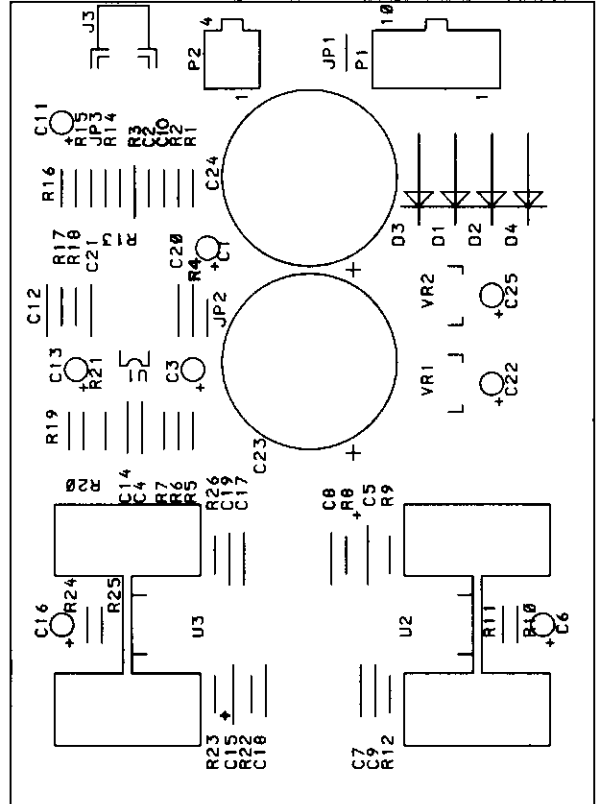
LOCATION
UPPER RAMP (UPPER)
UPPER RAMP (LOWER)

VI. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



NOTE:
JUMPERS INSERTED AT
JP1, R1, R13, R16, R17, C1, C3, C11, C13

AUXILIARY POWER SUPPLY (A5) COMPONENT LOCATION



Premier Technology

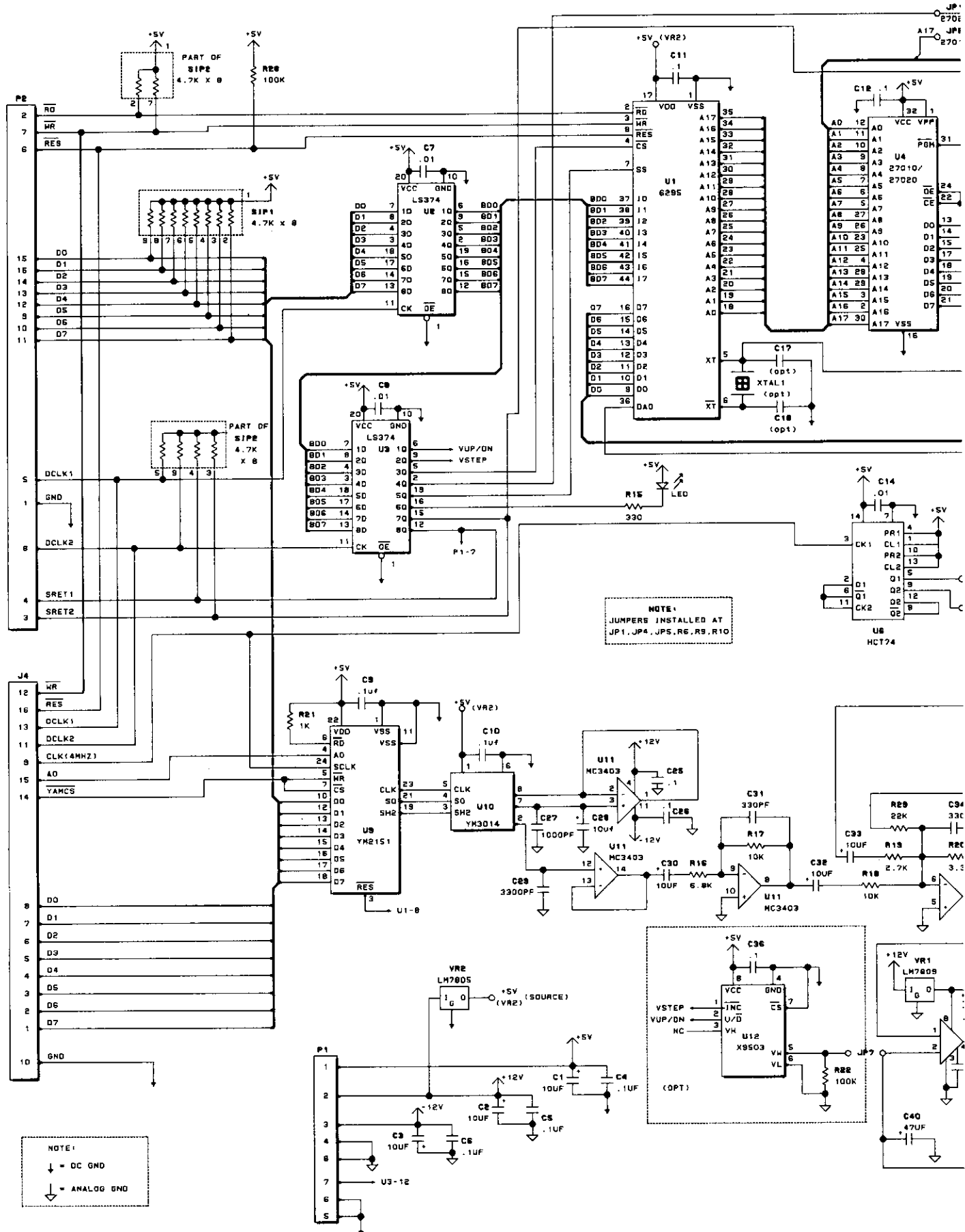
TITLE
AUXILIARY POWER SUPPLY
SCHEMATIC DIAGRAM

DRAWN J.B.	APPROVED RMM	DATE 4-8-92	MA-
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AUXILIARY POWER SUPPLY (A5) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
A5	AUXILIARY POWER SUPPLY	MA-1772
C1, C3, C11, C13	CAPACITOR, 4.7UF, 10%, 10V	XO-469A
C2, C10	CAPACITOR, 0.1UF, 10%, 100V	XO-784
C5, C15	CAPACITOR, 4.7UF, 10%, 10V	XO-226
C6, C16, C25	CAPACITOR, 22UF, +80%-20%, 16V	XO-293
C7, C8, C9, C17, C18, C19, C20, C21	CAPACITOR, 0.1UF, +80%-20%, 50V	XO-230
C23, C24	CAPACITOR, 10,000UF, +80%-20%, 25V	XO-830
D1-D4	DIODE, 1N5401	XO-263
R1, R13, JP1, R16, R17	RESISTOR, 0 OHM, JUMPER	XO-469
R2, R14	RESISTOR, 1 MEGOHM, 5%, 1/4W	XO-604
R3	RESISTOR, 12K OHM, 5%, 1/4W	XO-9
R4	RESISTOR, 43K OHM, 5%, 1/4W	XO-15
R5, R20	RESISTOR, 10K OHM, 5%, 1/4W	XO-18
R7	RESISTOR, 6.8K OHM, 5%, 1/4W	XO-8
R8	RESISTOR, 2.2K OHM, 5%, 1/4W	XO-27
R9, R23	RESISTOR, 22K OHM, 5%, 1/4W	XO-42
R10, R24	RESISTOR, 680 OHM, 5%, 1/4W	XO-139
R11, R25	RESISTOR, 24K OHM, 5%, 1/4W	XO-10
R12, R26	RESISTOR, 4.7 OHM, 5%, 1/4W	XO-800
R15, R18, R21	RESISTOR, 4.7K OHM, 5%, 1/4W	XO-7
U1	IC, QUAD AMP, MC3403P	XO-953
U2, U3	IC, AUDIO AMPLIFIER, TDA2040	XO-1038
VR1	REGULATOR, +12V, LM7812CT	XO-1039
VR2	REGULATOR, -12V, LM7912CT	XO-130
J3	CONNECTOR, RCA	XO-1035
P1	HEADER, 10 POSITION	XO-912
	HEAT SINK	XO-1040

VI. WIRING AND SCHEMATIC

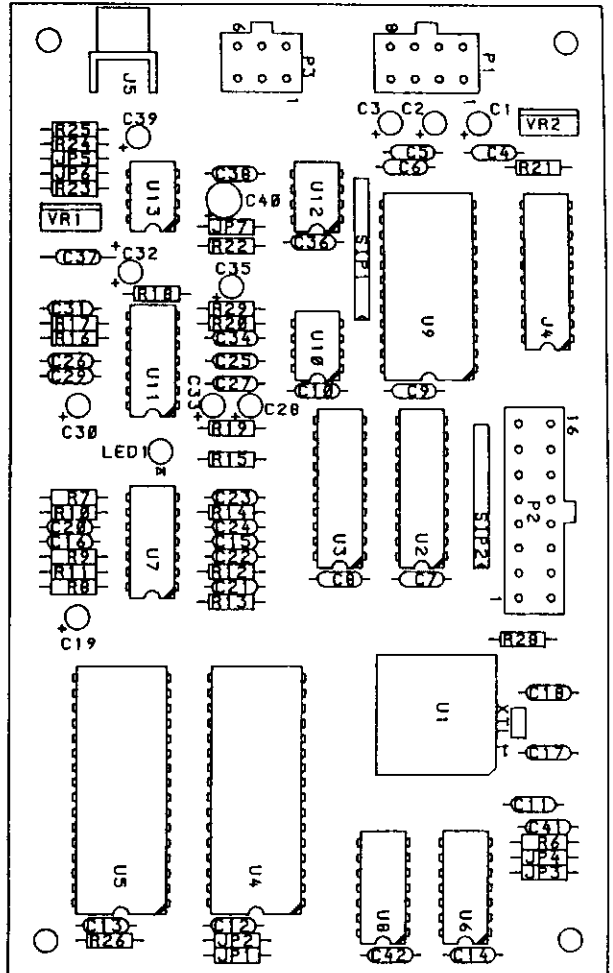
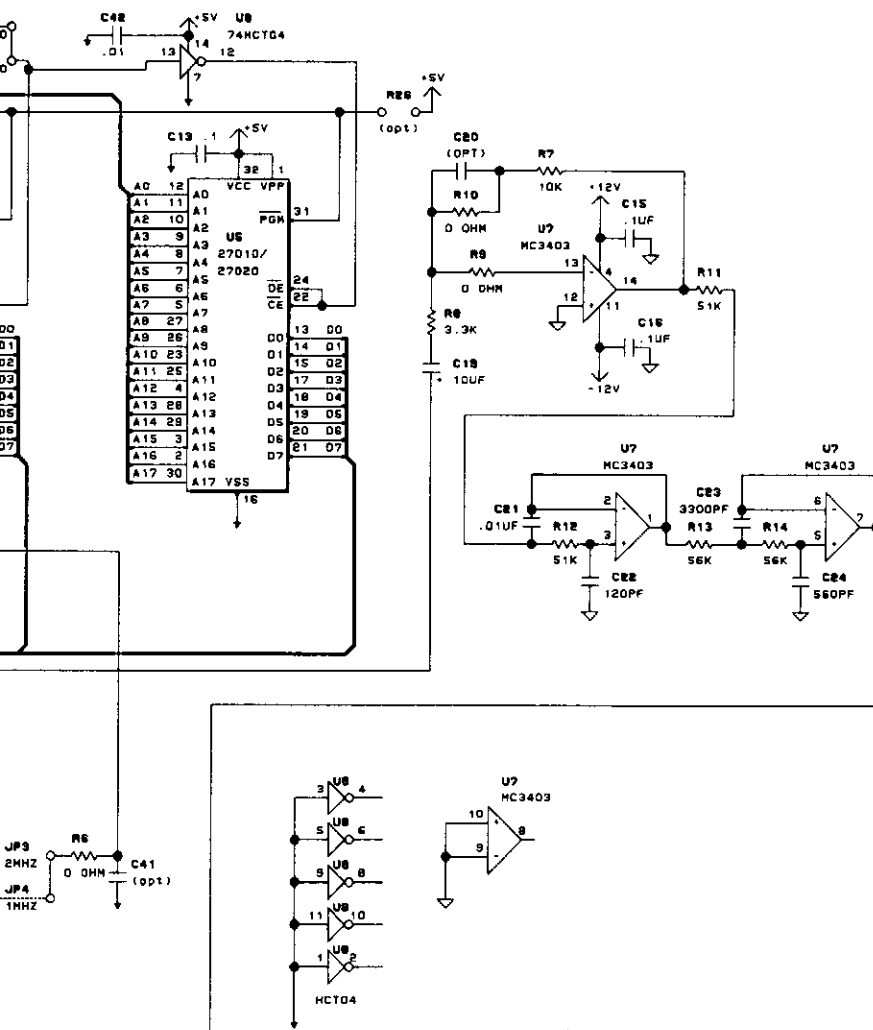


NOTE:
 ↓ = DC GND
 ↓ = ANALOG GND

Premier Technology

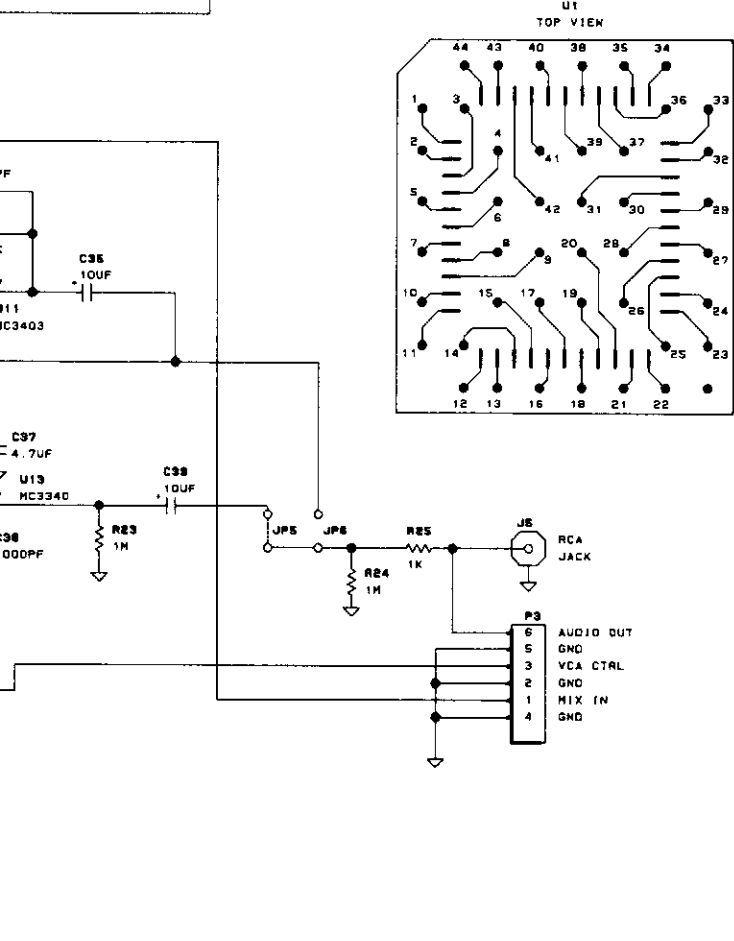
TITLE: **AUXILIARY SOUND BOARD (A20) SCHEMATIC DIAGRAM**

DRAWN: J.B. APPROVED: RHM DATE: 4-8-92 MA-1770



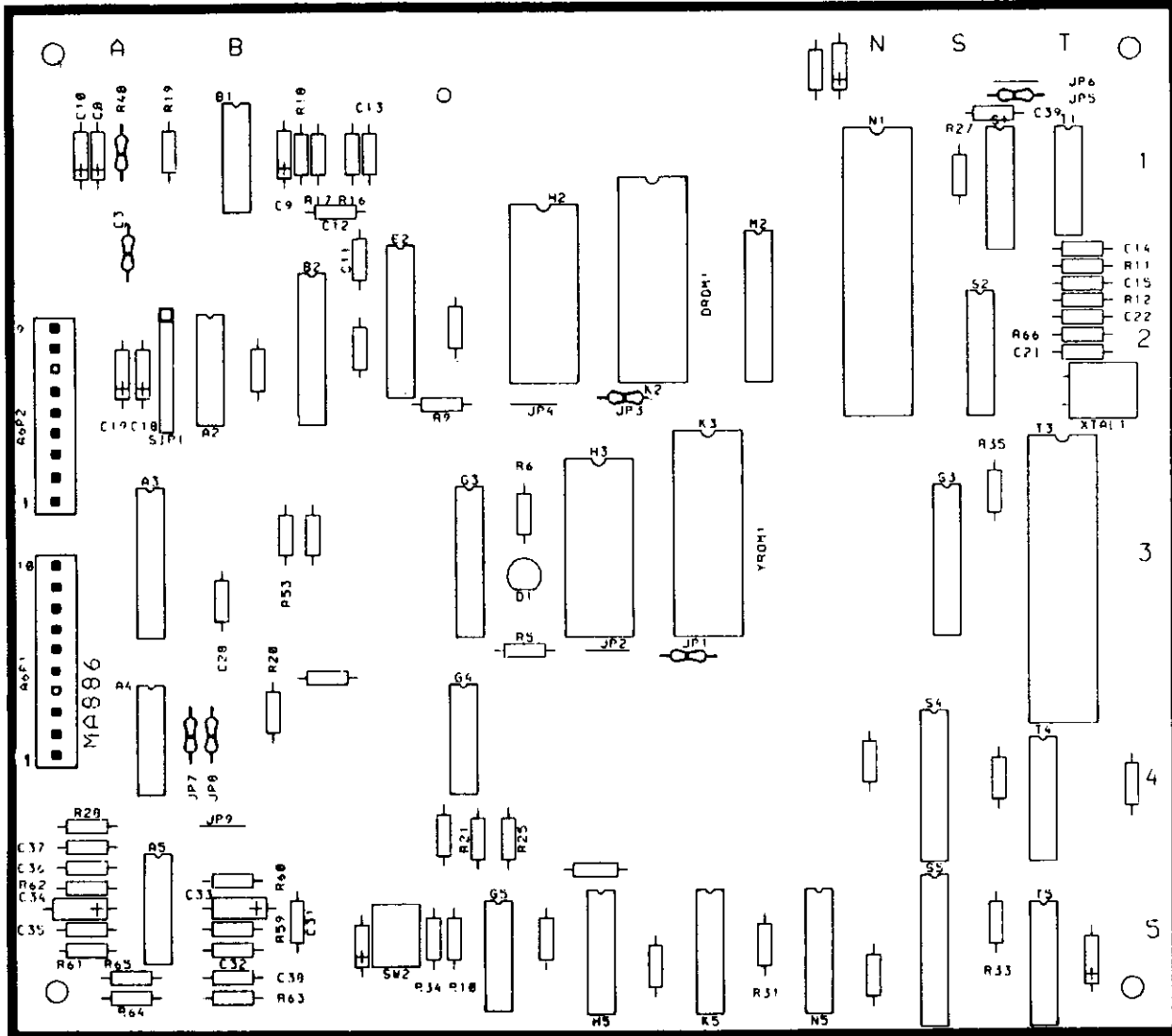
AUXILIARY SOUND BOARD (A20)
PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
A20	AUXILIARY SOUND BOARD	MA-1770
C1, C2, C3, C19, C28, C30, C32, C33, C35, C39	CAPACITOR, 10UF, +80%-20%, 16V	XO-1030
C4-C6, C9-C13, C15, C16, C25, C26, C36	CAPACITOR, 0.1UF, +80%-20%, 50V	XO-230
C7, C8, C14, C42	CAPACITOR, .01UF, +80%-20%, 50V	XO-229
C21	CAPACITOR, .01UF, 10%, 50V	XO-696
C22	CAPACITOR, 120PF, 10%, 50V	XO-1032
C23, C29	CAPACITOR, 3300PF, 10%, 100V	XO-600
C24	CAPACITOR, 560PF, 10%, 50V	XO-681
C31, C34	CAPACITOR, 330PF, 10%, 50V	XO-1033
C37	CAPACITOR, 4.7UF, 10%, 10V	XO-226
C38	CAPACITOR, 1000PF, 10%, 100V	XO-296
C40	CAPACITOR, 47UF, 10V	XO-227
LED	DIODE, MV5752, RED	XO-270
R7, R17, R18	RESISTOR, 10K OHM, 5%, 1/4W	XO-18
R8, R20	RESISTOR, 3.3K OHM, 5%, 1/4W	XO-38
R6, R9, R10, JP1, JP4, JP5	RESISTOR, 0 OHM, JUMPER	XO-469
R11, R12	RESISTOR, 51K OHM, 5%, 1/4W	XO-44
R13, R14	RESISTOR, 330 OHM, 5%, 1/4W	XO-771
R15	RESISTOR, 56K OHM, 5%, 1/4W	XO-34
R16	RESISTOR, 6.8K OHM, 5%, 1/4W	XO-8
R19	RESISTOR, 2.7K OHM, 5%, 1/4W	XO-6
R21, R25	RESISTOR, 1K OHM, 5%, 1/4W	XO-5
R23	RESISTOR, 1MEGOHM, 5%, 1/4W	XO-604
R28	RESISTOR, 100K OHM, 5%, 1/4W	XO-45
R29	RESISTOR, 22K OHM, 5%, 1/4W	XO-42
U1	IC, MSN6295, SPEECH CHIP	*XO-1023
U2, U3	IC, 74LS374, OCTAL "D" FLIP-FLOP	XO-96
U4, U5	IC, 27C010 (SPECIFIED PER GAME)	
U6	IC, 74HCT74, "D" FLIP-FLOP	XO-889
U7, U11	IC, MC3403P, QUAD AMP	XO-953
U8	IC, 74HCT04, HEX INVERTER	XO-1026
U9	IC, YM2151, SOUND CHIP	XO-882
U10	IC, YM3014, SERIAL DAC	XO-883
U13	IC, MC3340P, VCA, AMPLIFIER	XO-1028
J4	SOCKET, 20 PIN	XO-491
J5	JACK, RCA	XO-1035
P1	HEADER, 8 POSITION	XO-911
P3	HEADER, 6 POSITION	XO-910
U4, U5	SOCKET, 32 PIN	XO-1036
U9	SOCKET, 24 PIN	XO-529
VR1	PCB ASSEMBLY, P/O *XO-1023	27922
VR2	IC, LM7809CT, REGULATOR	XO-1017
	IC, 5V REGULATOR	XO-663



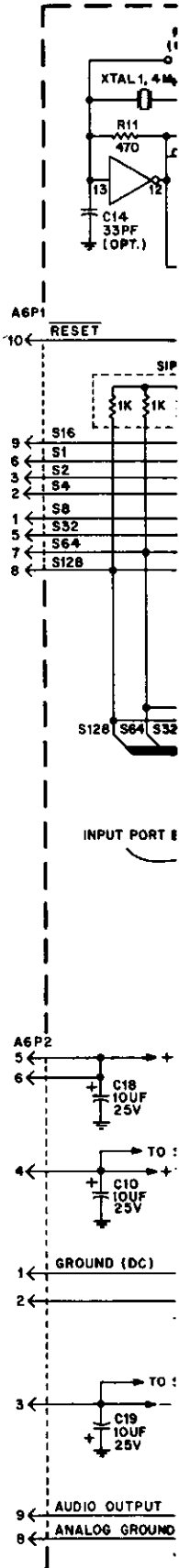
VI. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

SOUND BOARD (A6) COMPONENT LOCATION



SOUND BOARD (A6) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER	REFERENCE	DESCRIPTION	PART NUMBER
C13, C37	Sound Board Assembly (1A6)	MA-1629	R20, R34	Resistor, 4.7K Ohm, 5%, 1/4W	XO-7
C8, C9, C10, C18, C19, C33, C34	Capacitor, 1UF, 20%, 50V (Non-polar)	XO-746	R61-R64	Resistor, 33K Ohm, 5%, 1/4W	XO-43
AND THREE UNMARKED CAPACITORS	Capacitor, 10UF, 20%, 25V (Tantalum)	XO-127	R59, R60	Resistor, 100K Ohm, 5%, 1/4W	XO-45
C11, C12	Capacitor, 10PF, +80%-20%, 50V	XO-635	R65	Resistor, 27K Ohm, 5%, 1/4W	XO-11
C14, C22	Capacitor, 33PF, 10%, 100V	XO-896	A2	IC, 7430, 8 Input NAND Gate	XO-643
C15	Capacitor, .047UF, 20%, 50V	XO-638	A3, B2, B5	IC, 74LS374, Octal "D" Flip Flop	XO-96
C21	Capacitor, 22PF, 10%, 50V	XO-633	A4	IC, 74LS374, Dual "D" Flip Flop	XO-434
C28 AND FIFTEEN UNMARKED CAPACITORS	Capacitor, 0.1UF, +80%-20%, 50V	XO-230	A5, B1	IC, MC3403P, Quad Op-Amp	XO-953
C31, C32	Capacitor, 0.1UF, 10%, 100V	XO-784	E2	IC, AD7528J, Multiplier DAC	XO-647
C35	Capacitor, 1000PF, 10%, 100V	XO-896	G3	IC, 74LS377, Octal "D" Flip Flop	XO-97
C36	Capacitor, 2200PF, 10%, 100V	XO-289	G4, T1	IC, 74LS04, Hex Inverter	XO-418
C38	Capacitor, .0033UF, 10%, 100V	XO-600	G5	IC, 74HC08, Quad 2 Input "AND" Gate	XO-872
C39	Capacitor, 220PF, 10%, 100V	XO-694	H2, H3	IC, 6116LP-15, 2K X 8 RAM	XO-928
D1	Diode, MV5752, (LED, Red)	XO-270	H5, K5, N5	IC, 74LS161, Synchronous Presettable Binary Counter	XO-440
R5, R9, R10, R27, R28, R31, R33, R35	Resistor, 1K Ohm, 5%, 1/4W	XO-5	S1, T5	IC, Specified Per Game	XO-79
R6	Resistor, 240 Ohm, 5%, 1/4W	XO-173	K2, K3	IC, 74LS245, Octal Bus Transceiver	XO-893
R11, R12	Resistor, 470 Ohm, 5%, 1/4W	XO-35	N1, T3	IC, 65C02P2 or 6502A, CPU	XO-927 or XO-893
R21, R25	Resistor, 3K Ohm, 5%, 1/4W	XO-23	S2	IC, 74LS139, Dual 1 of 4 Decoder	XO-419
R16, R17	Resistor, 10K Ohm, 5%, 1/4W	XO-18	S3	IC, 74HCT245, Octal Bus Transceiver	XO-891
R18	Resistor, 6.8K Ohm, 5%, 1/4W	XO-8	T4	IC, 74F138, 1 of 8 Decoder	XO-1041
			SIP 1	Resistor Pack 1K Ohm X 8	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, Resistor, 0 OHM (7)	XO-469
				20 Pin Dip Socket	XO-491

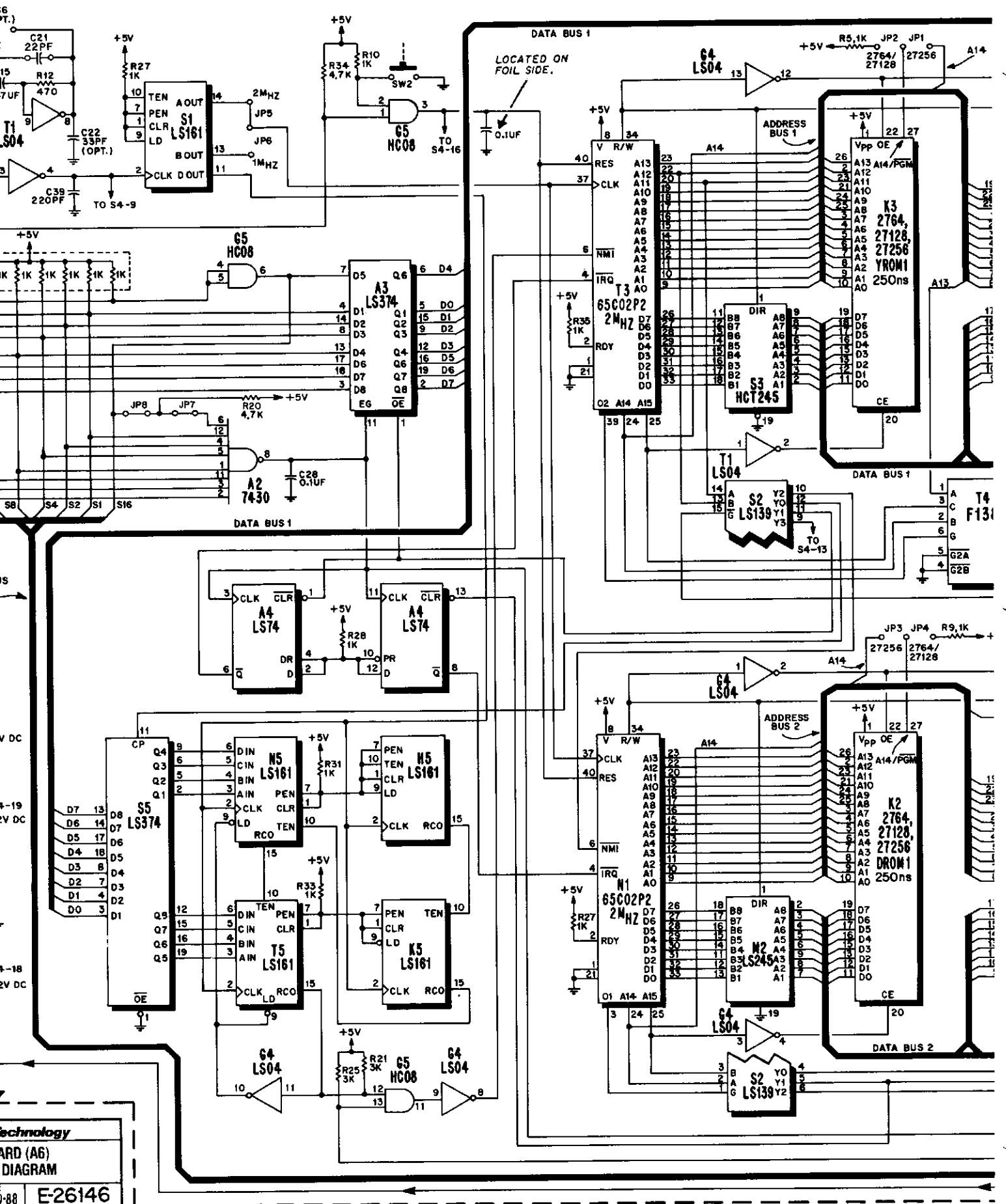


Premier

TITLE: SOUND BOARD SCHEMATIC

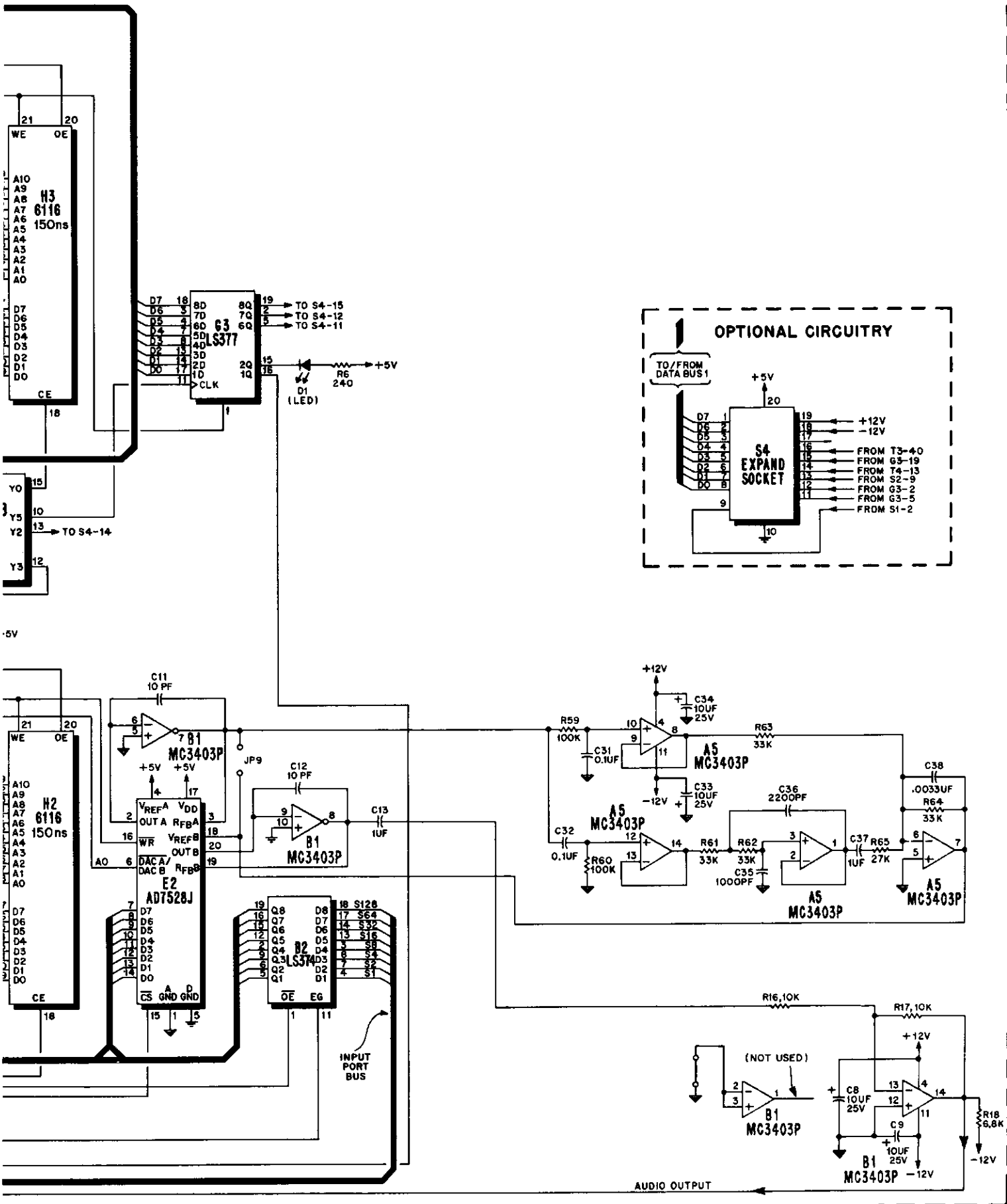
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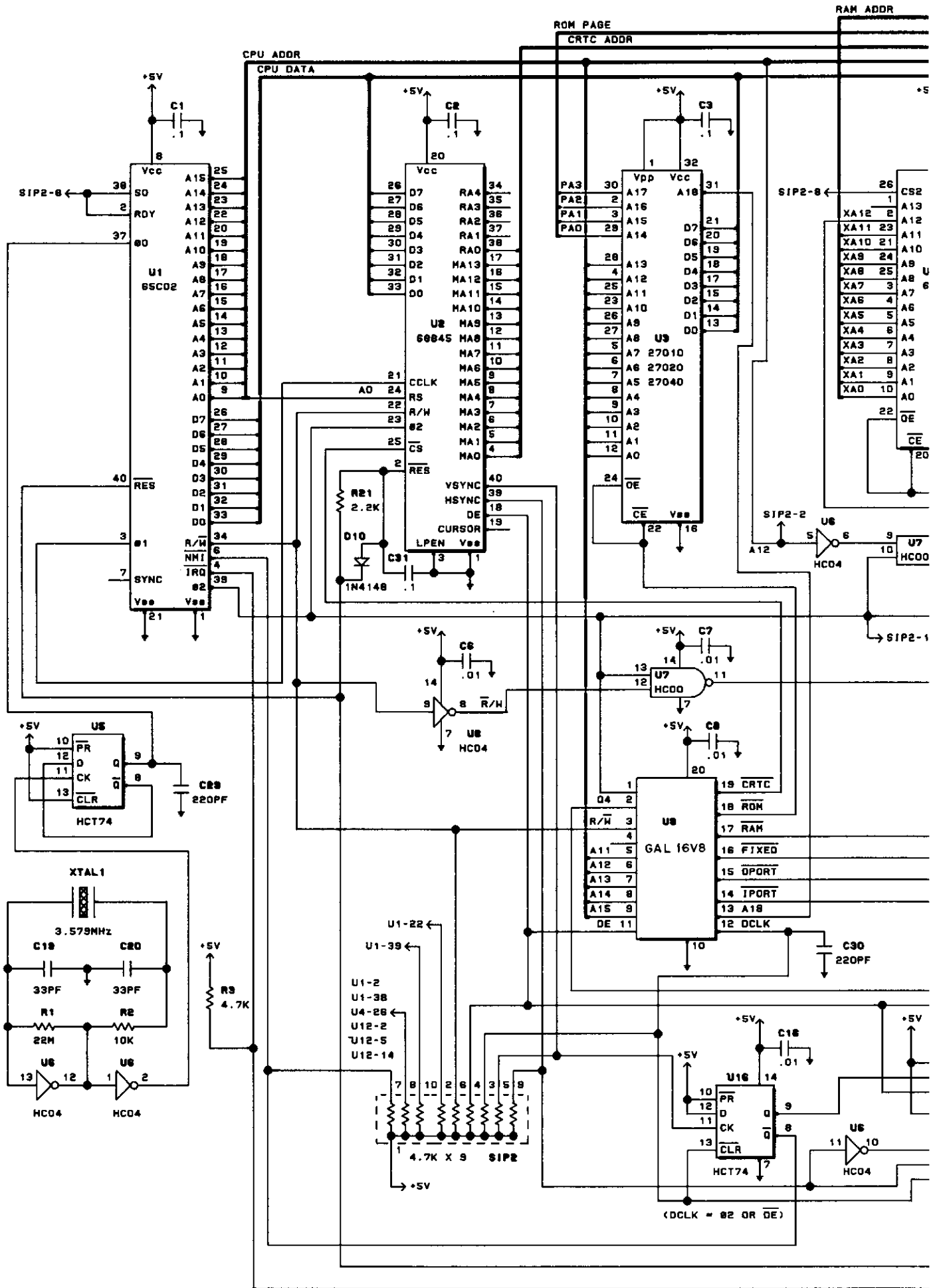
VI. WIRING AND SCHEMATIC



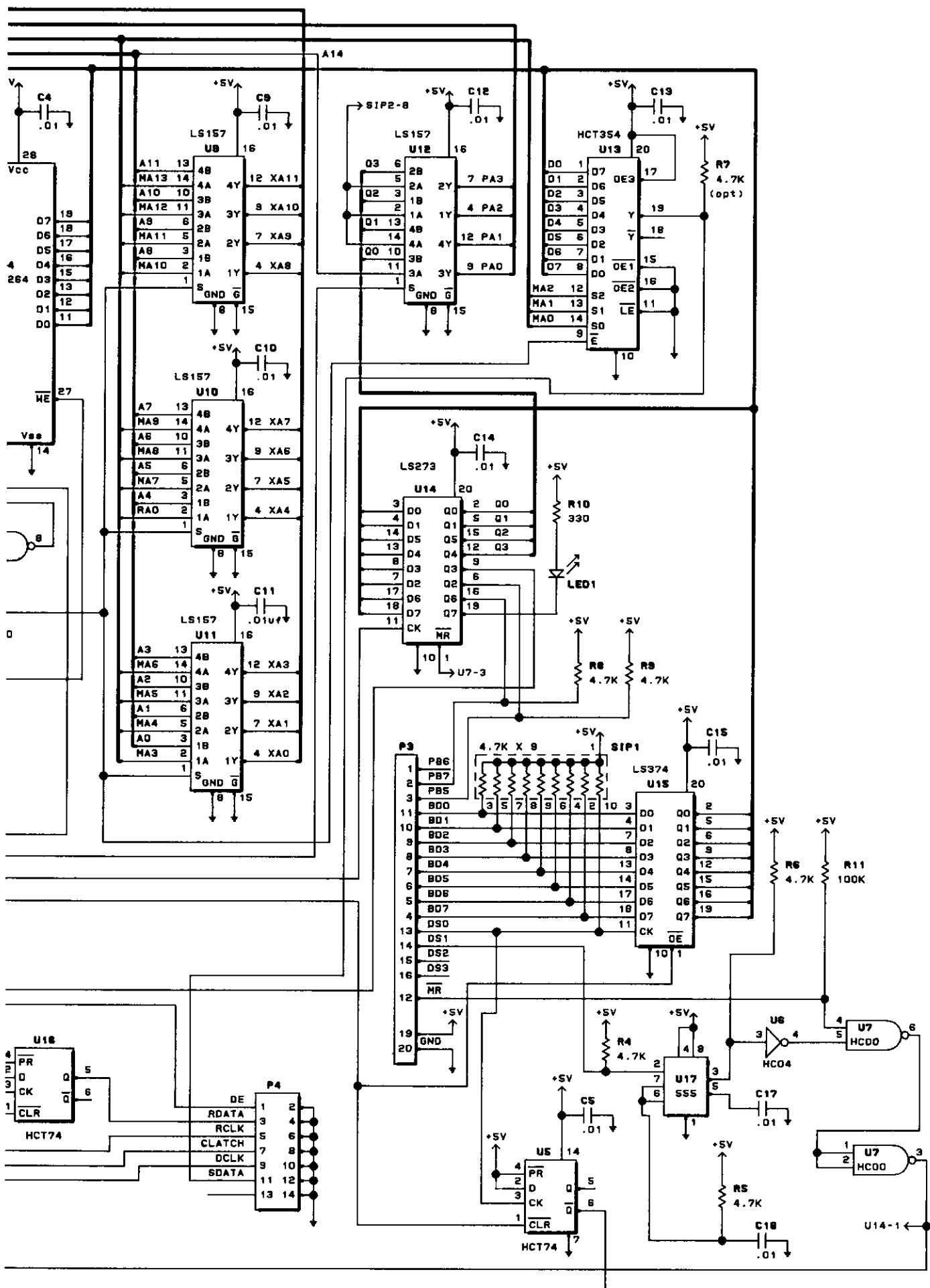
technology
 BOARD (A6)
 DIAGRAM
 E-26146

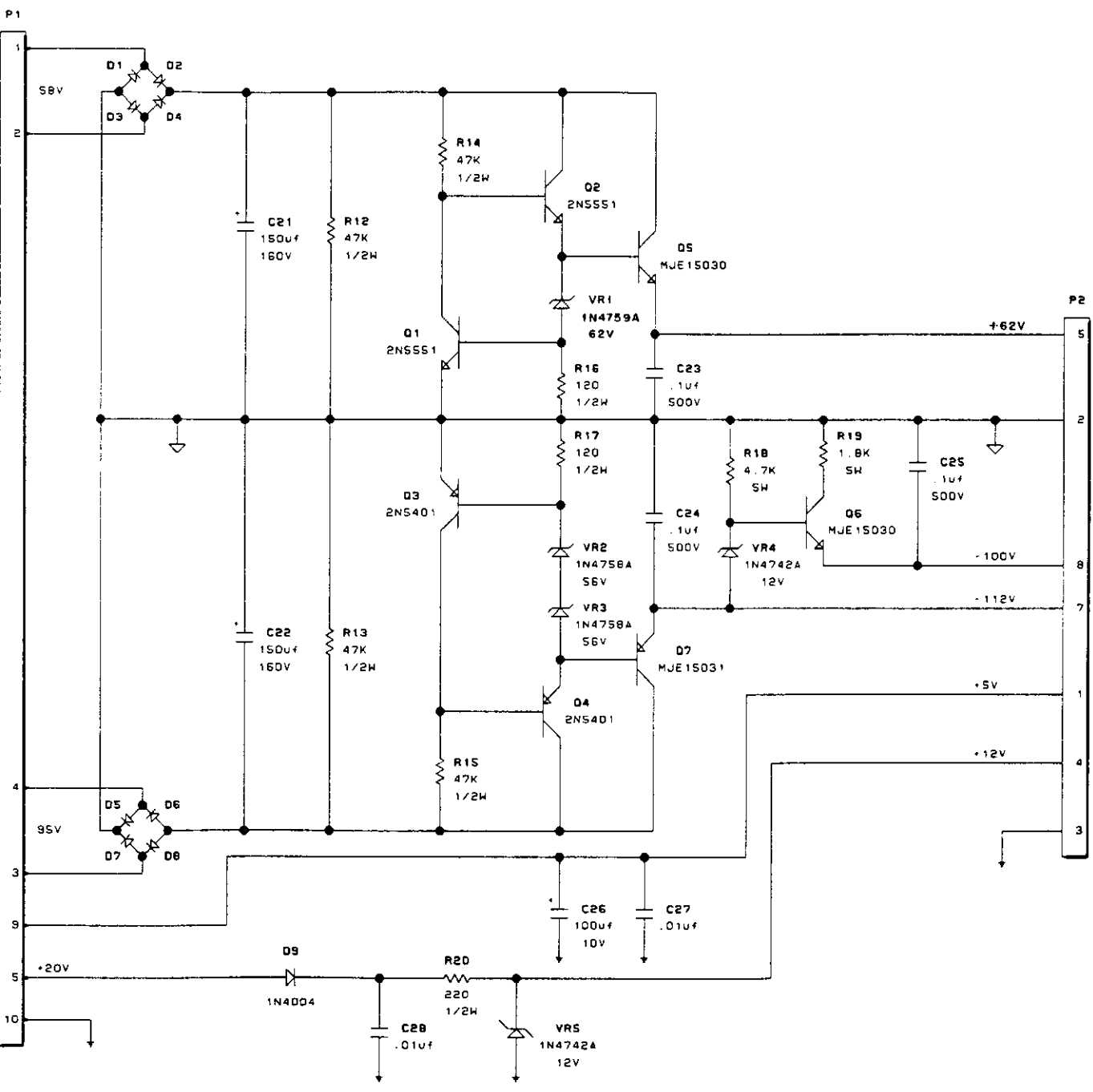
IC DIAGRAMS, PARTS LISTS





VI. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



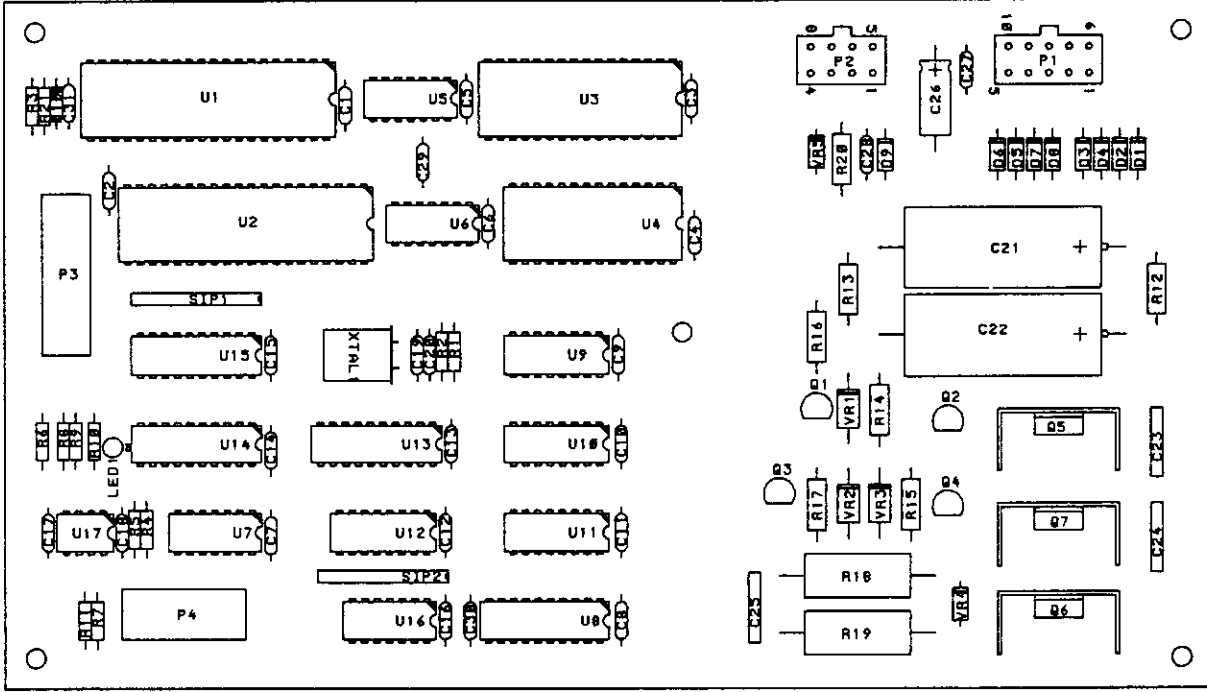


Premier Technology			
TITLE DISPLAY CONTROLLER (A8) SCHEMATIC DIAGRAM			
DRAWN C.B.	APPROVED RHM	DATE 4-8-92	MA-1739

VI. WIRING AND SCHEMATIC DIAGRAMS, PARTS

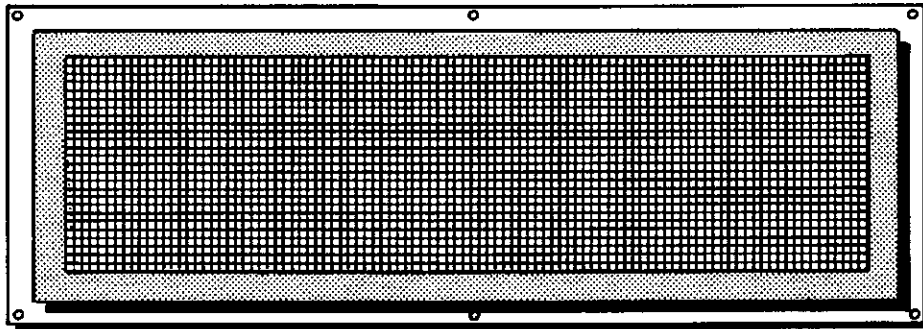
DISPLAY CONTROLLER (A8) COMPONENT LOCATION

DISPI

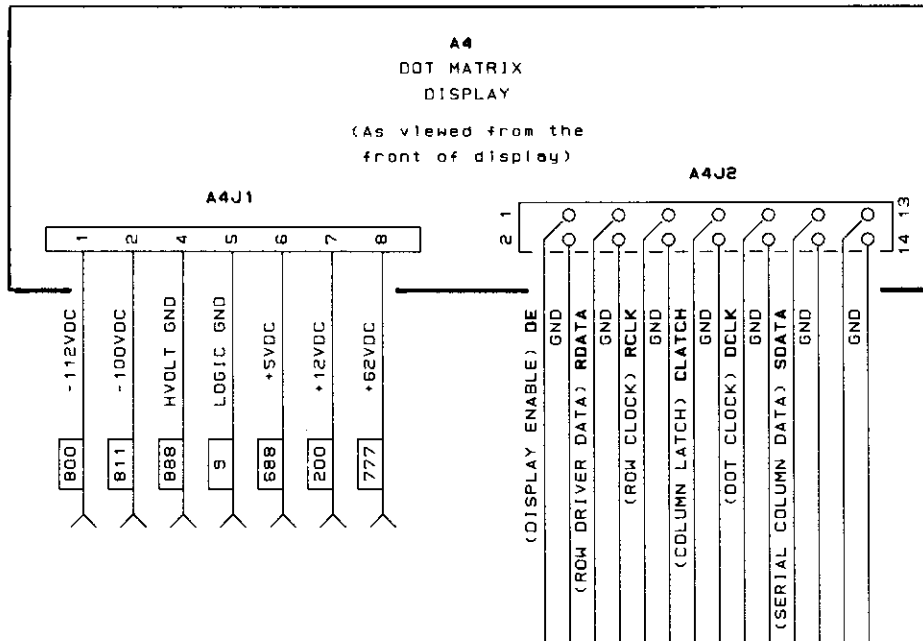


REFERENCE	DESCRIPTION
A8	DISPLAY CONTROLLER
C1-C3	CAPACITOR
C4-C18	CAPACITOR
C27, C28	CAPACITOR
C19, C20	CAPACITOR
C21, C22	CAPACITOR
C23, C25	CAPACITOR
C26	CAPACITOR
C29, C30	CAPACITOR
C31	CAPACITOR
D1-D9	DIODE, 1N4148
D10	DIODE, 1N4001
LED 1	DIODE, 1N4148
Q1, Q2	TRANSISTOR, 2N2222
Q3, Q4	TRANSISTOR, 2N2222
Q5, Q6	TRANSISTOR, 2N2222
Q7	TRANSISTOR, 2N2222
R1	RESISTOR, 10K
R2	RESISTOR, 10K
R3-R6, R8, R9	RESISTOR, 10K
R10	RESISTOR, 10K
R11	RESISTOR, 10K
R12-R15	RESISTOR, 10K
R16-R17	RESISTOR, 10K
R18	RESISTOR, 10K
R19	RESISTOR, 10K
R20	RESISTOR, 10K
R21	RESISTOR, 10K
SIP1, SIP2	RESISTOR, 10K
U1	IC, 65CC
U2	IC, 68B4
U4	IC, 6264
U5, U16	IC, 74HC
U6	IC, 74HC
U7	IC, 74HC
U8	IC, GAL16V1
U9-U12	IC, 74LS
U13	IC, 74HC
U14	IC, 74LS
U15	IC, 74LS
U17	IC, NE555
VR1	DIODE, 1N4148
VR2, VR3	DIODE, 1N4148
VR4, VR5	DIODE, 1N4148
XTAL1	CRYSTAL, 32.768K
P1	HEADER, 25 PIN
P2	HEADER, 25 PIN
P3	HEADER, 25 PIN
P4	HEADER, 25 PIN

DOT MATRIX DISPLAY (A4)

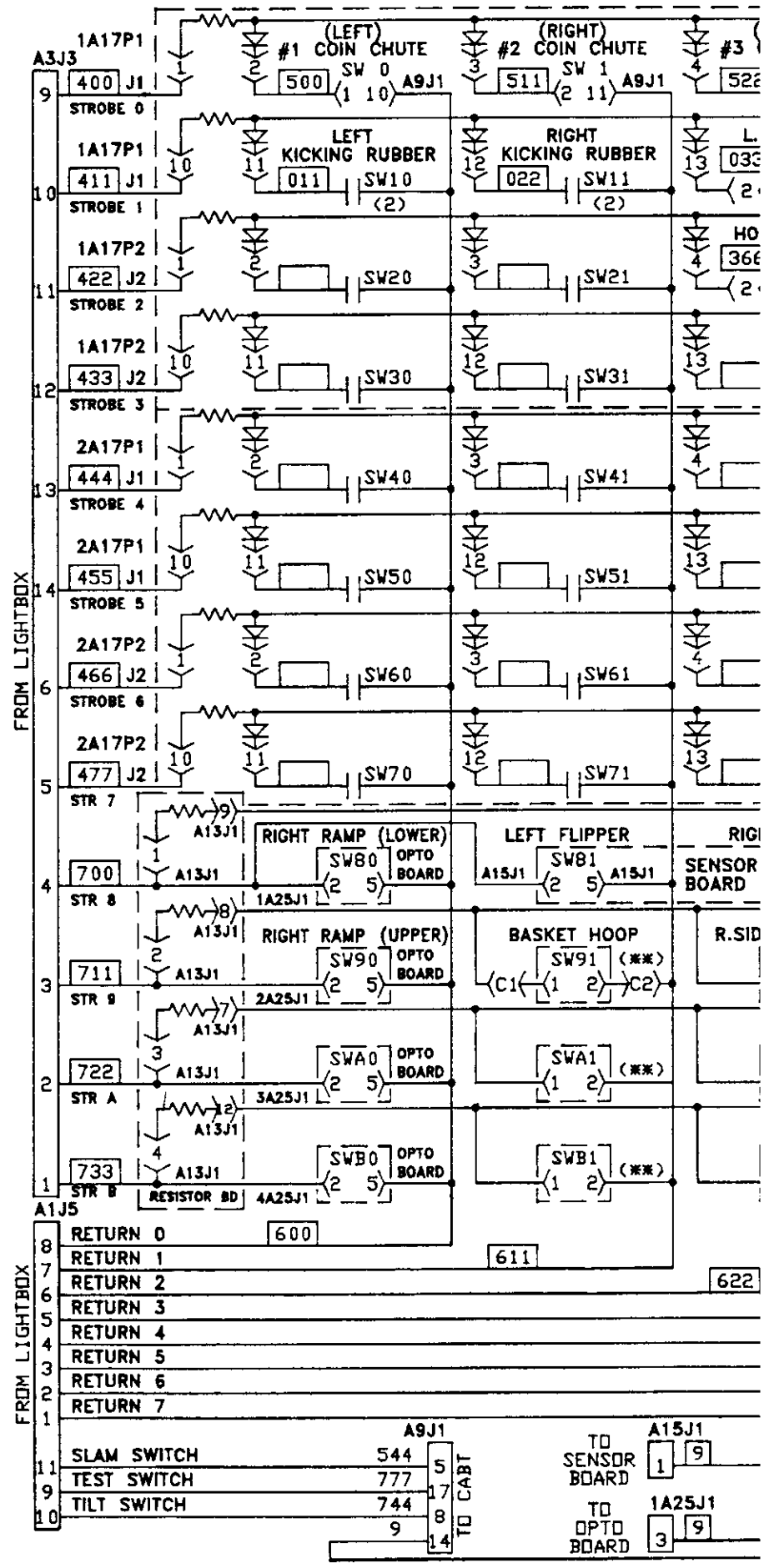


DESCRIPTION	PART NUMBER
DOT MATRIX DISPLAY	29151

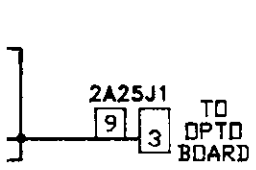
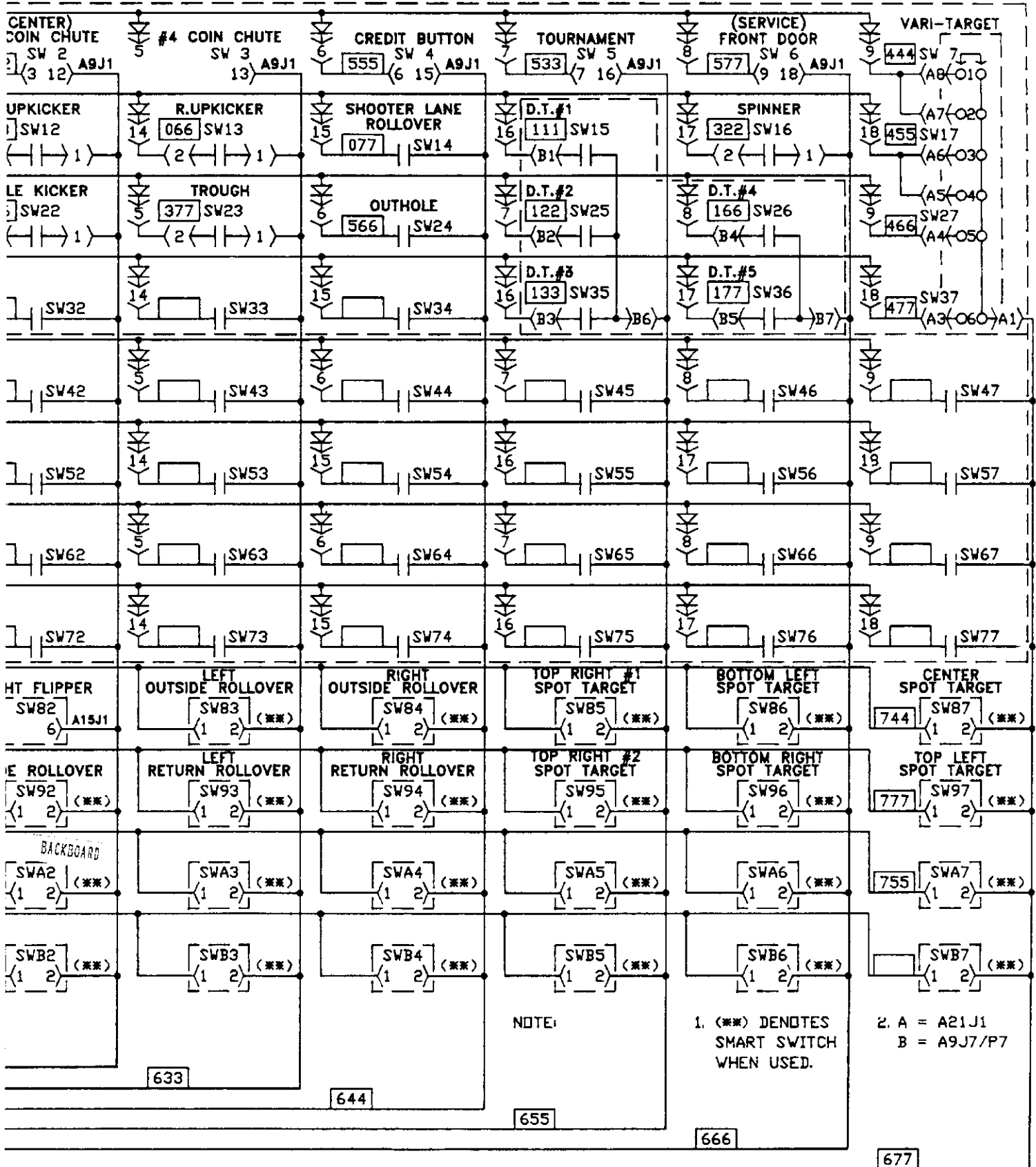


**SLAMMATIC CONTROLLER (A8)
PARTS LIST**

DESCRIPTION	PART NUMBER
SLAMMATIC CONTROLLER	MA-1739
RESISTOR, 0.1UF, +80%-20%	XO-230
RESISTOR, .01UF, +80%-20%	XO-229
RESISTOR, 33PF, 10%, 100V	XO-896
RESISTOR, 150UF, 160V	XO-1133
RESISTOR, 0.1UF, 500V	XO-886
RESISTOR, 100UF, 10V	XO-211
RESISTOR, 220PF, 10%, 100V	XO-694
RESISTOR, 0.1UF, 100V	XO-784
DIODE, 4004	XO-254
DIODE, 4148	XO-261
DIODE, RED, MV5752	XO-270
DIODE, NPN, 2N5551	XO-1141
DIODE, PNP, 2N5401	XO-1142
DIODE, NPN, MJE15030	XO-1143
DIODE, PNP, MJE15031	XO-1144
RESISTOR, 22 MEGOHM, 5%, 1/4W	XO-74
RESISTOR, 10K OHM, 5%, 1/4W	XO-18
RESISTOR, 4.7K OHM, 5%, 1/4W	XO-7
RESISTOR, 330 OHM, 5%, 1/4W	XO-34
RESISTOR, 100K OHM, 5%, 1/4W	XO-45
RESISTOR, 47K OHM, 5%, 1/4W	XO-1135
RESISTOR, 120 OHM, 5%, 1/4W	XO-1136
RESISTOR, 4.7K OHM, 5%, 5W	XO-1137
RESISTOR, 1.8K OHM, 5%, 1/4W	XO-1138
RESISTOR, 220 OHM, 5%, 1/4W	XO-185
RESISTOR, 2.2K OHM, 5%, 1/4W	XO-27
RESISTOR, PACK, 4.7 OHM	XO-906
IC, 7418, CPU, 2MHZ	XO-927
IC, 7415, CONTROLLER	XO-1139
IC, 7416, RAM STAT 8K X 8	XO-781
IC, 7417, DUAL "D" FLIP-FLOP	XO-889
IC, 7414, INVERTER	XO-888
IC, 7410, QUAD "NAND" GATES	XO-782
IC, 7415, 7418, 7415L	U8-G
IC, 7415, QUAD 1 OF 2 MULTIPLEXER	XO-390
IC, 7415, 1 OF 8 MULTIPLEXER	XO-1140
IC, 7417, OCTAL DATA LATCH	XO-94
IC, 7417, OCTAL "D" FLIP-FLOP	XO-96
IC, 7418, TIMER	XO-631
DIODE, 1N4759A, 62V, 5%	XO-267
DIODE, 1N4758A, 56V, 5%	XO-1164
DIODE, 1N4742A, 12V, 5%	XO-257
RESISTOR, 3.579MHZ	XO-1166
RESISTOR, 10 POSITION	XO-912
RESISTOR, 3 POSITION	XO-911
RESISTOR, 20 POSITION, RIBBON	XO-940
RESISTOR, 14 POSITION, RIBBON	XO-1134
RESISTOR, 6038	XO-472
RESISTOR, 32 PIN	XO-1036
RESISTOR, 20 PIN	XO-491



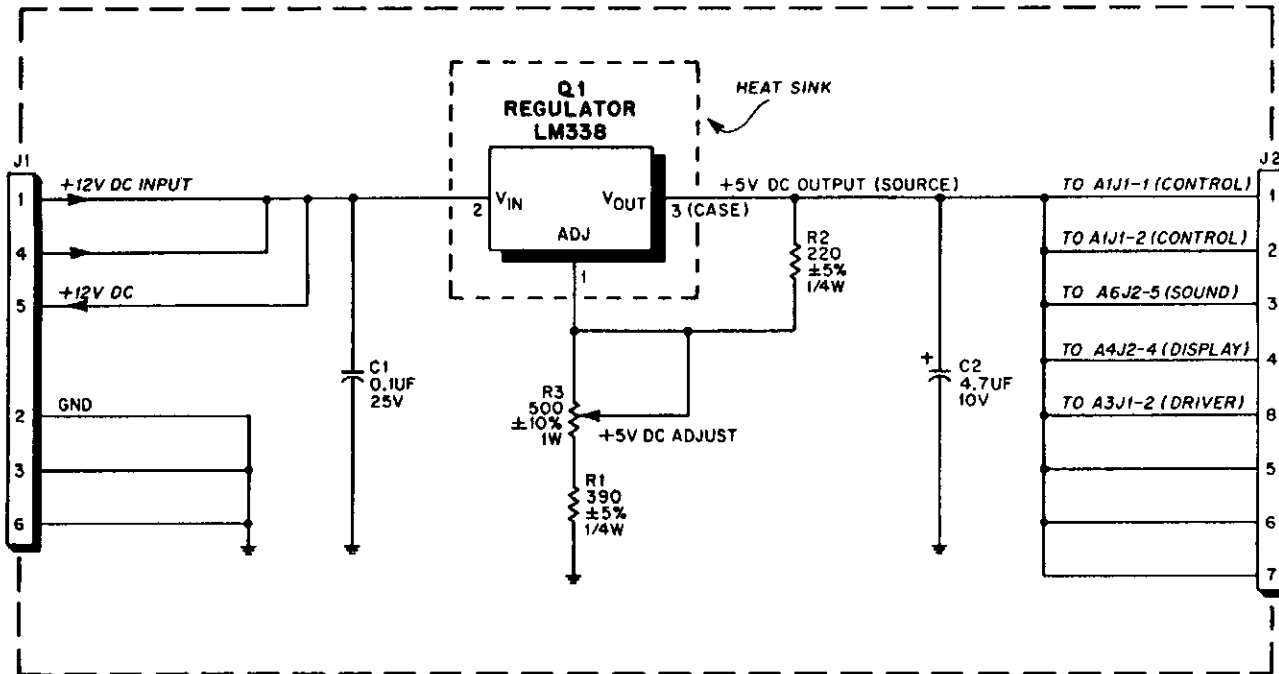
AND SCHEMATIC DIAGRAMS, PARTS LISTS



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

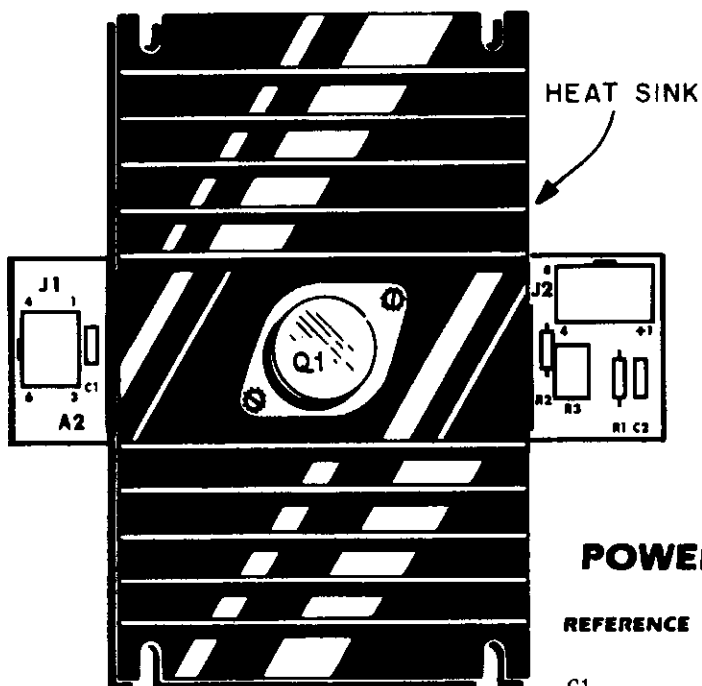
Premier Technology			
TITLE SWITCH MATRIX SCHEMATIC DIAGRAM			
USED BY #743	DRAWN RLM	DATE 10-06-94	30848

VI. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



Premier Technology			
TITLE POWER SUPPLY (A2) SCHEMATIC DIAGRAM			
DRAWN <i>A.P.S.</i>	APPROVED <i>K.H.M.</i>	DATE 12 FEB 85	E-24441

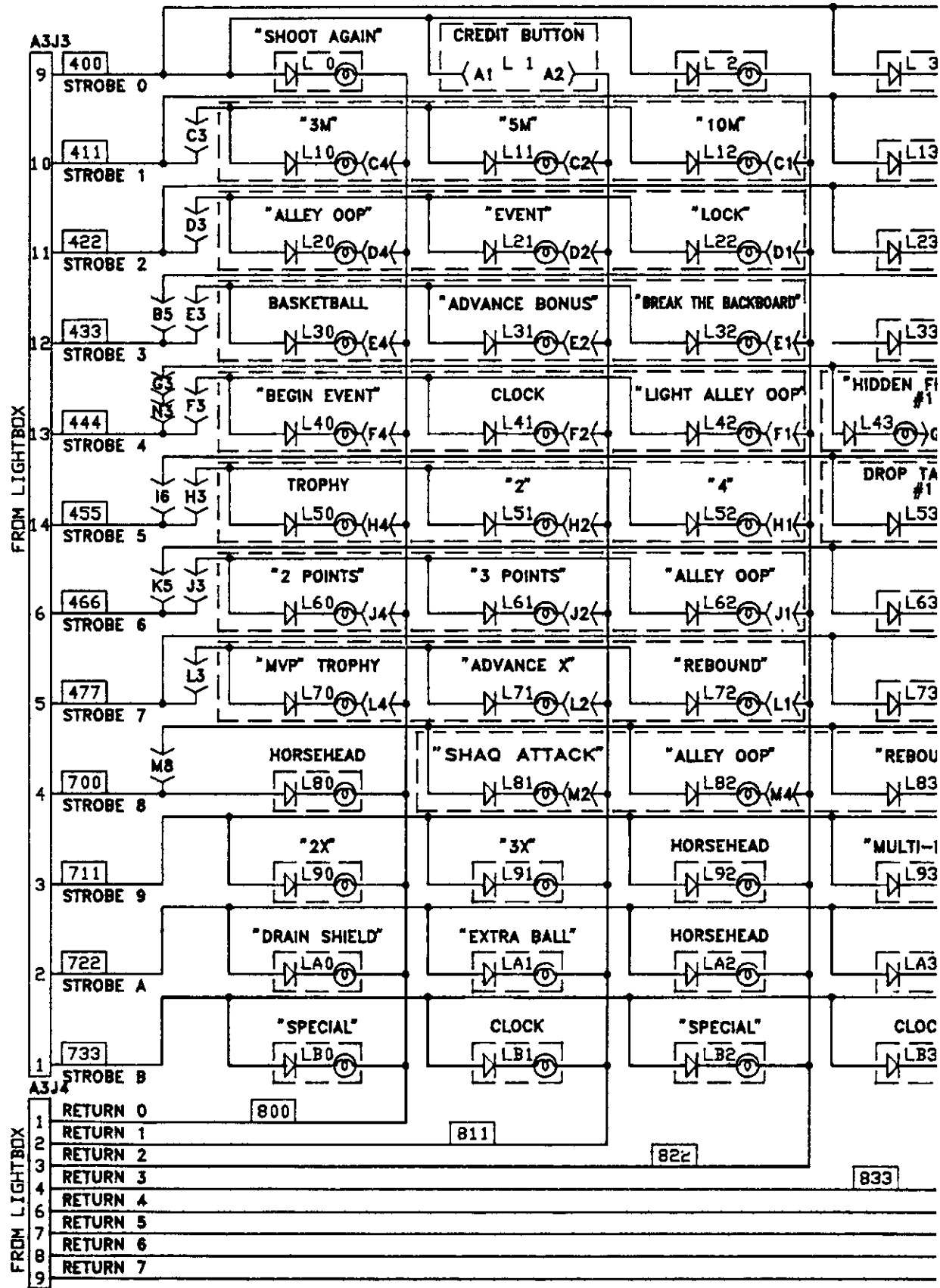
POWER SUPPLY (A2) COMPONENT LOCATION



POWER SUPPLY (A2) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	Power Supply (A2)	MA-1359
C1	Capacitor, 0.1uF, +80% -20%, 50V	XO-230
C2	Capacitor, 4.7uF, 10% 10V	XO-226
J1	Header, 6 Position	XO-910
J2	Header, 8 Position	XO-911
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

VI. WIRING AND SCHEMATIC I



NOTE: 1. ALL LAMP
DIODES ARE
TYPE 1N4004.

2. ALL LAMPS
ARE TYPE #44.

2. A = A9J6
N = A9J21/P21

B = 1A22J1
C = 2A22J1
D = 3A22J1
E = 4A22J1

DIAGRAMS, PARTS LISTS



- F = 5A22J1 J = 9A22J1
- G = 6A22J1 K = 10A22J1
- H = 7A22J1 L = 11A22J1
- I = 8A22J1 M = 12A22J1

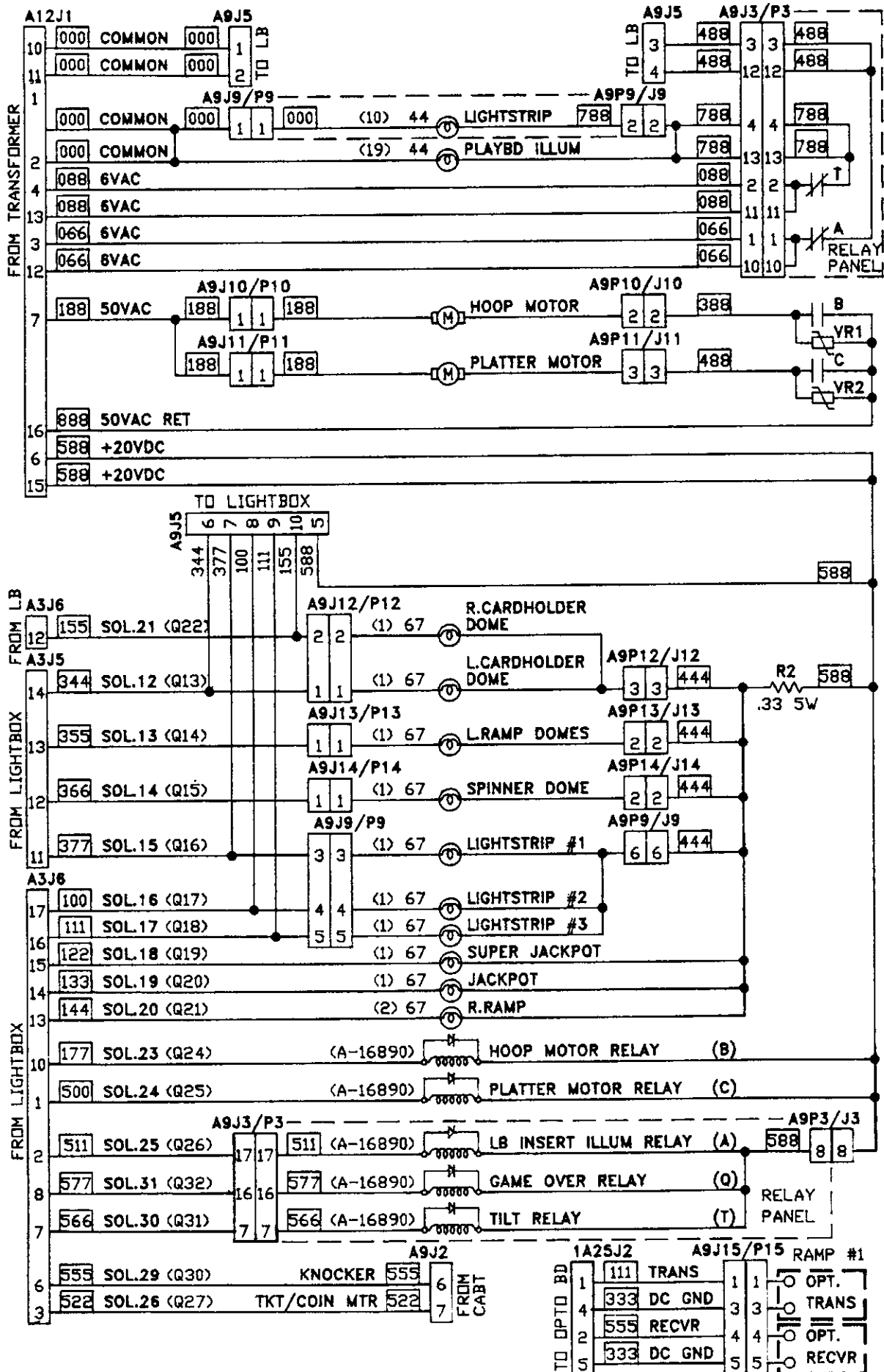
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2	RED	7	VIOLET
3	DRANGE	8	GRAY
4	YELLOW	9	WHITE

Premier Technology

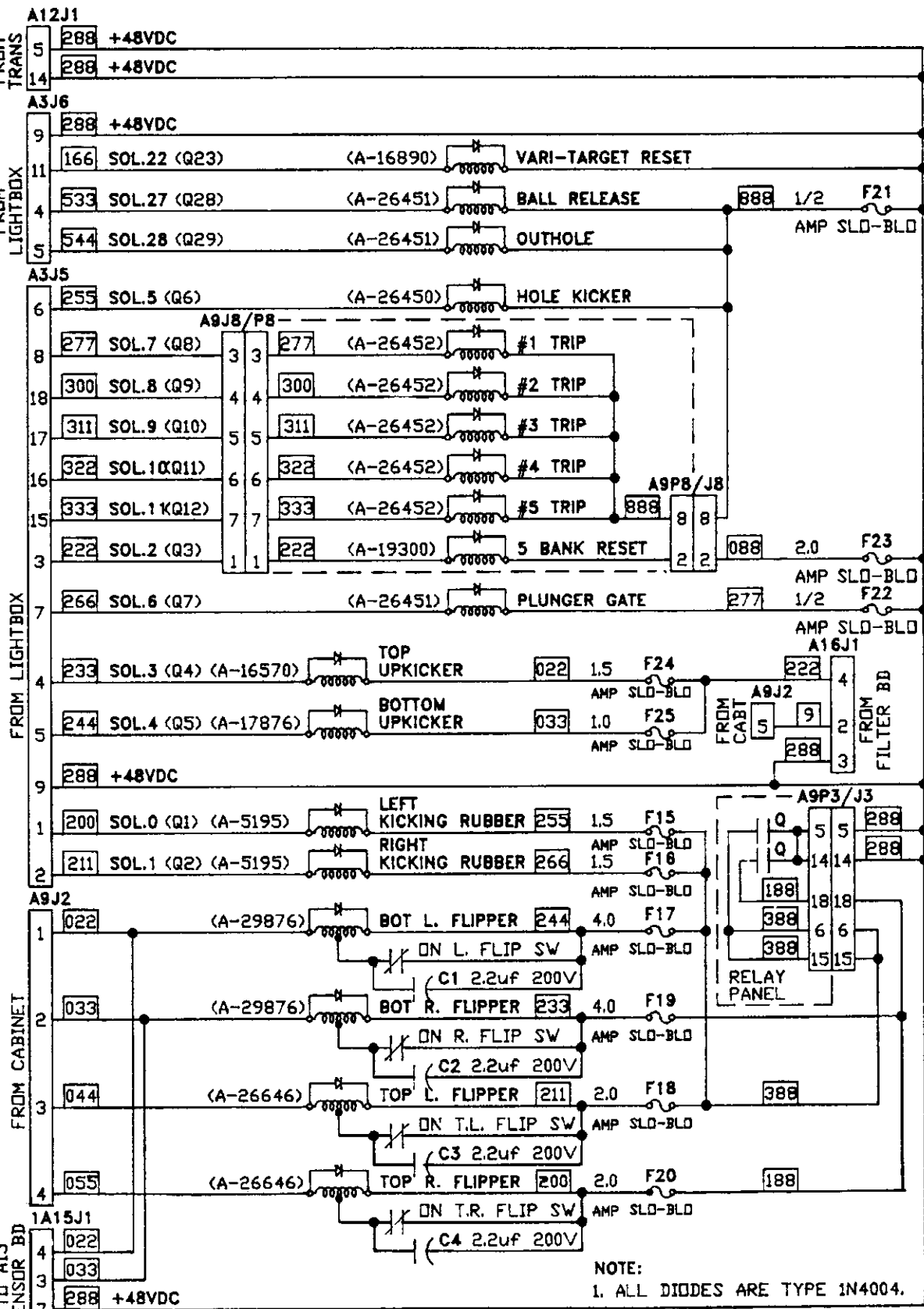
TITLE LAMP MATRIX
SCHEMATIC DIAGRAM

USED BY	DRAWN	DATE	30849
#743	RLM	10-06-94	

VI. WIRING AND SCHEMAT



SCHEMATIC DIAGRAMS, PARTS LISTS

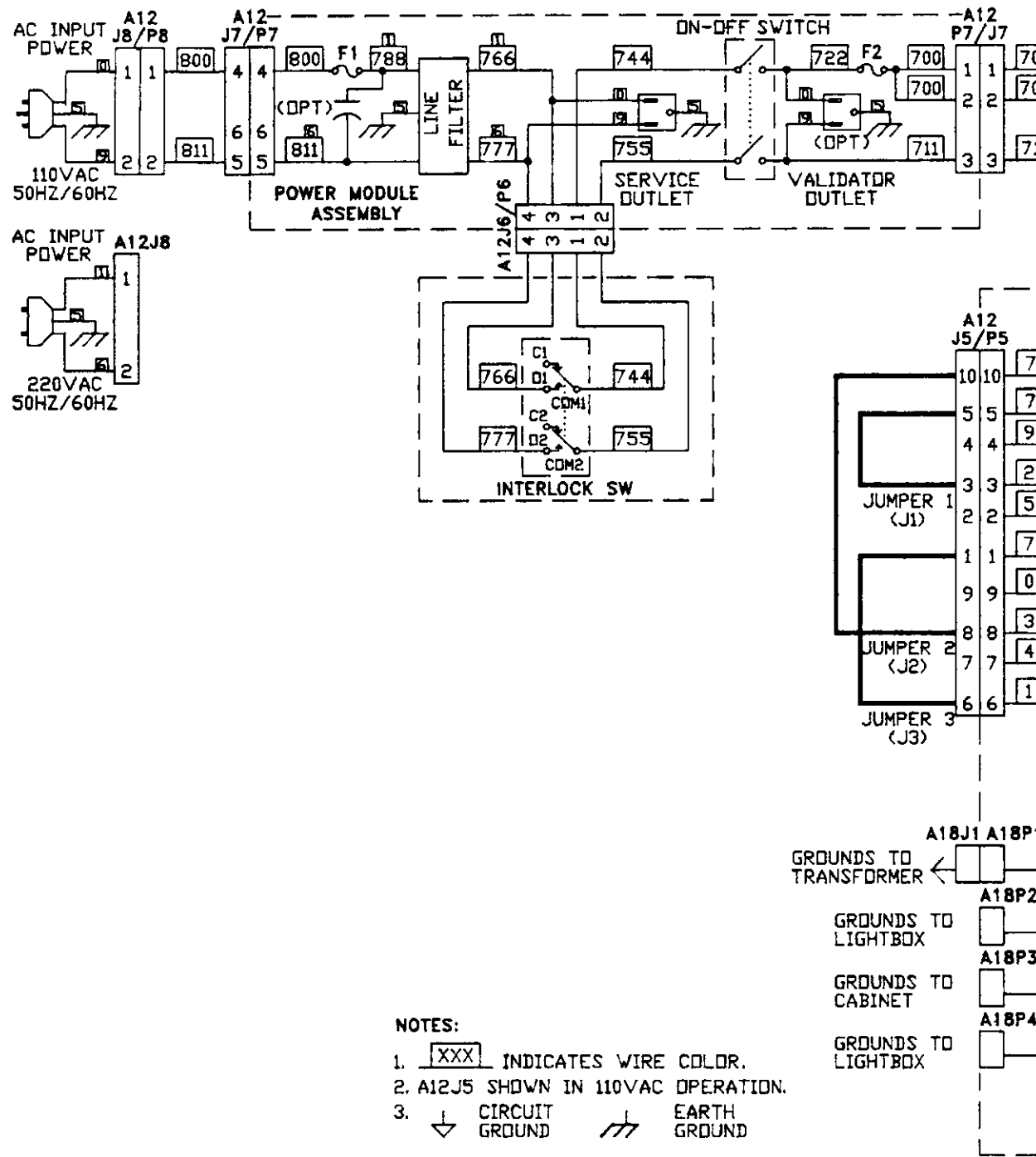


TO OPTO BD	1	111	TRANS	1	1	OPT.
	4	333	DC GND	2	2	TRANS
	2	555	RECVR	4	4	OPT.
	5	333	DC GND	5	5	RECVR

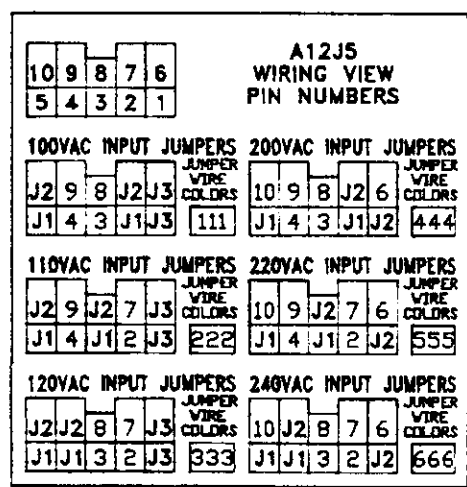
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Premier Technology			
TITLE PLAYBOARD			
SCHEMATIC DIAGRAM			
USED ON #743	DRAWN RLM	DATE 10-06-94	30851

VI. WIRING AND SCHEMATIC

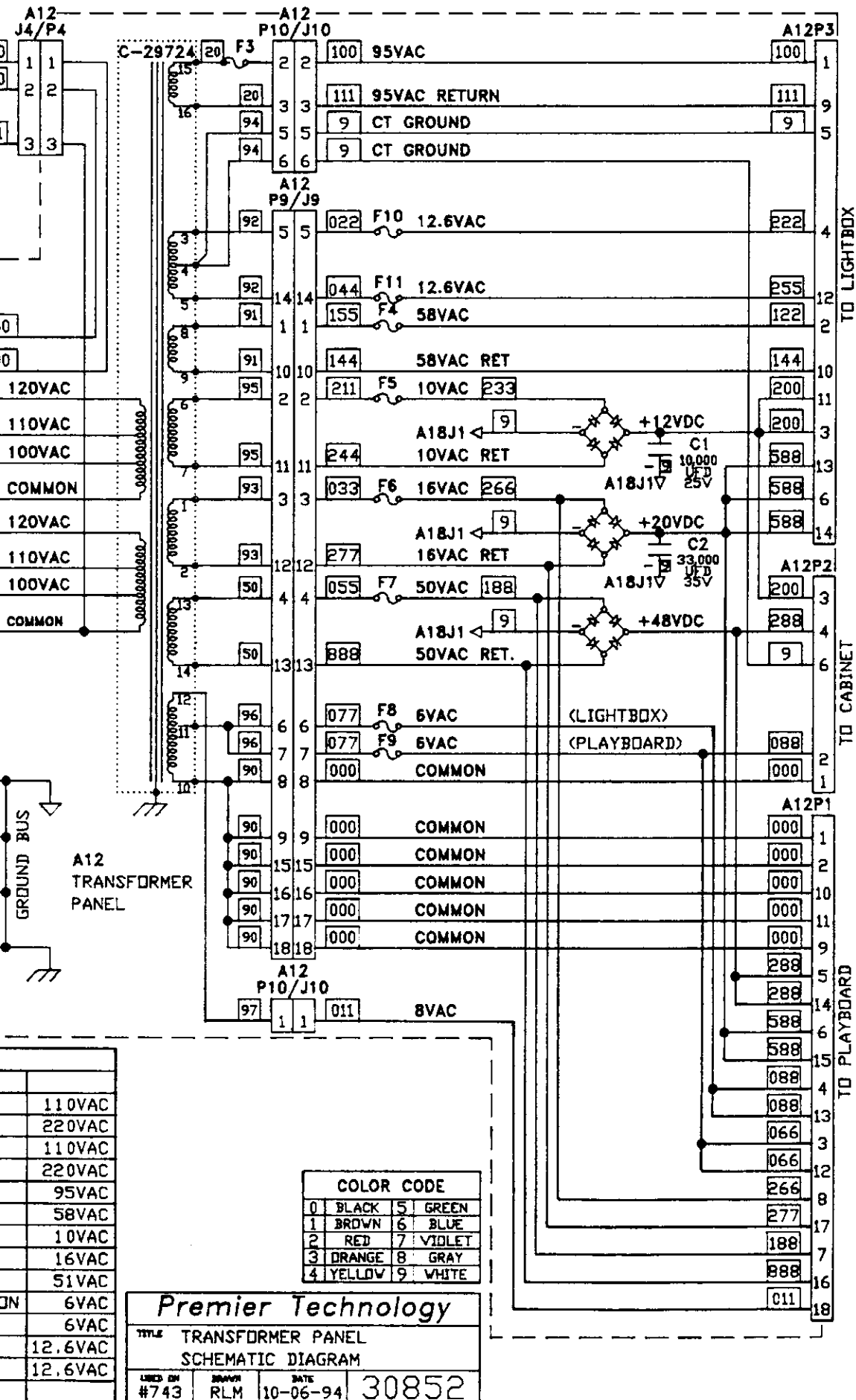


- NOTES:**
1. XXX INDICATES WIRE COLOR.
 2. A12J5 SHOWN IN 110VAC OPERATION.
 3. CIRCUIT GROUND EARTH GROUND



FUSE DESIGNATIONS TABLE				
FUSE	RATING	PART NO.	USAGE	
F1	8.0A SLD-BLD	EL26	LINE INPUT	
	4.0A SLD-BLD	EL33	LINE INPUT	
F2	5.0A SLD-BLD	EL 8	PRIMARY POWER	
	2.5A SLD-BLD	EL21	PRIMARY POWER	
F3	3/8A SLD-BLD	EL31	DISPLAY	
F4	3/8A SLD-BLD	EL31	DISPLAY	
F5	4.0A SLD-BLD	EL33	POWER SUPPLY	
F6	10A SLD-BLD	EL36	CONTROLLED LAMPS	
F7	8.0A SLD-BLD	EL26	SOLENDIDS	
F8	15A	EL25	LIGHTBOX INSERT ILLUMINATION	
F9	10A	EL23	PLAYBOARD ILLUMINATION	
F10	3.0A SLD-BLD	EL 9	AUXILLIARY POWER SUPPLY	
F11	3.0A SLD-BLD	EL 9	AUXILLIARY POWER SUPPLY	
F12				

C DIAGRAMS, PARTS LISTS



110VAC
220VAC
110VAC
220VAC
95VAC
58VAC
10VAC
16VAC
51VAC
6VAC
6VAC
12.6VAC
12.6VAC

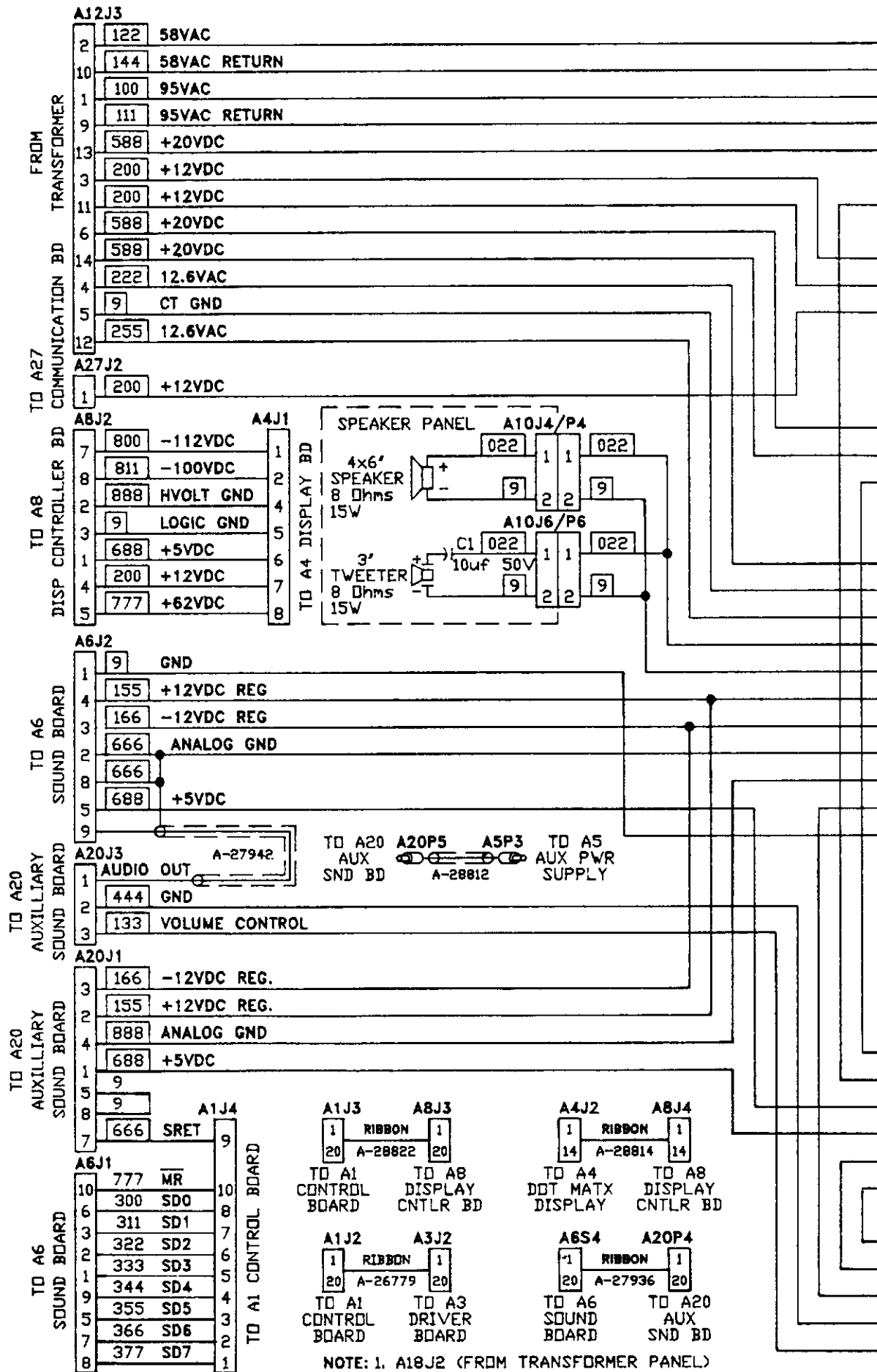
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1	BROWN	6	BLUE
2	RED	7	VIOLET
3	ORANGE	8	GRAY
4	YELLOW	9	WHITE

Premier Technology

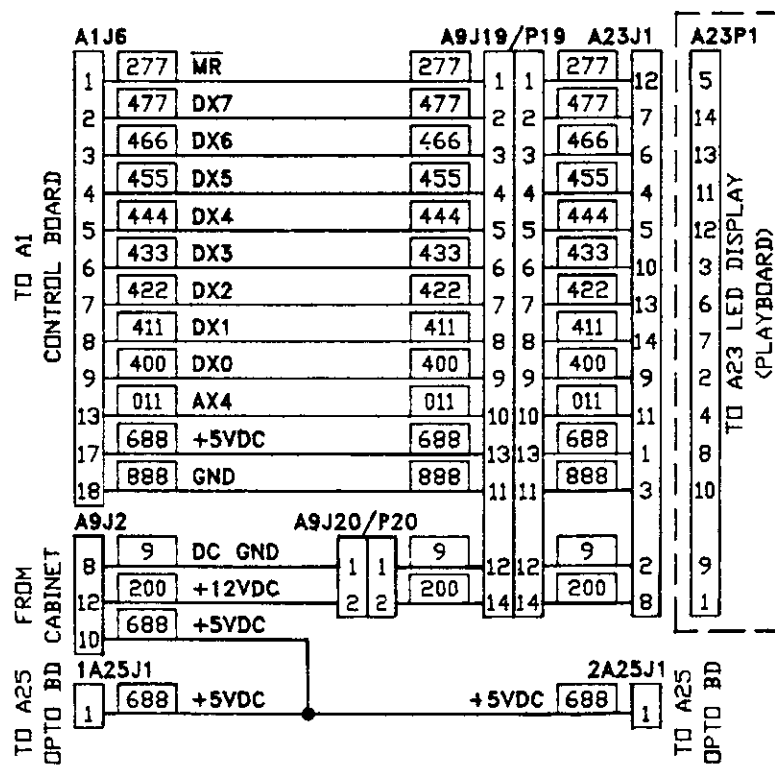
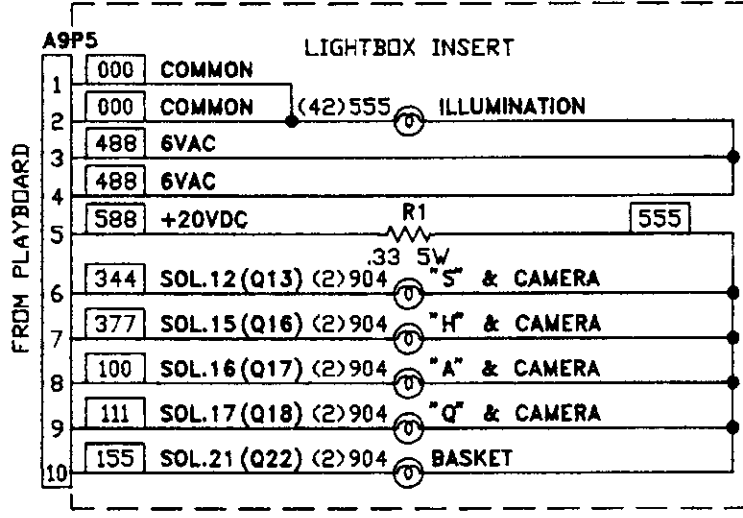
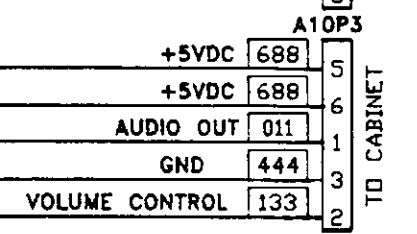
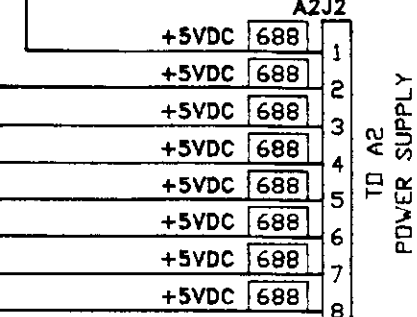
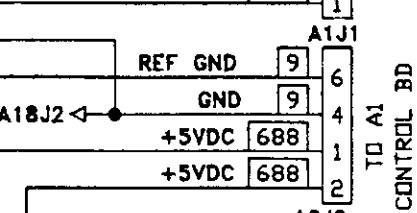
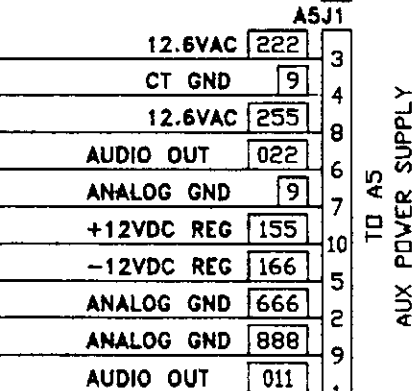
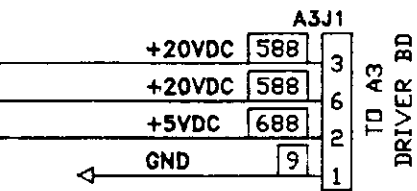
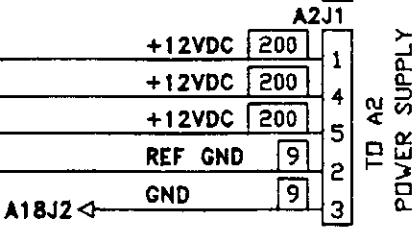
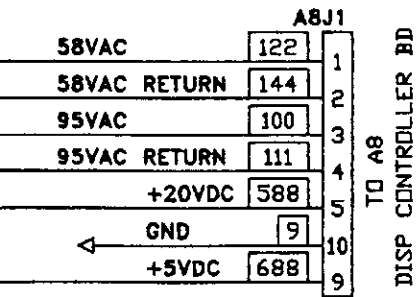
TITLE TRANSFORMER PANEL
SCHEMATIC DIAGRAM

USED BY #743	DRAWN RLM	DATE 10-06-94	30852
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VI. WIRING AND SCHEMATA



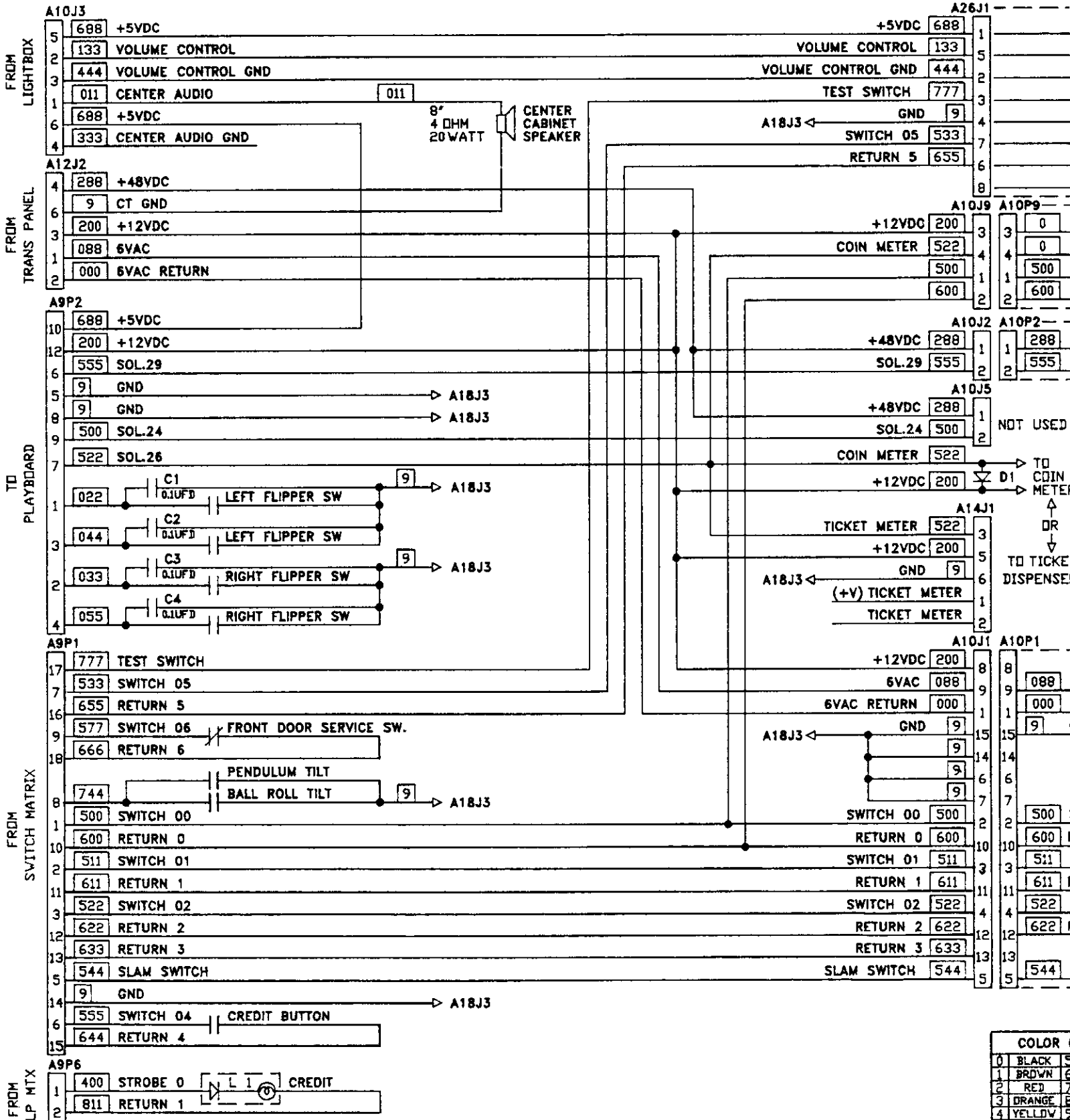
WIRING DIAGRAMS, PARTS LISTS

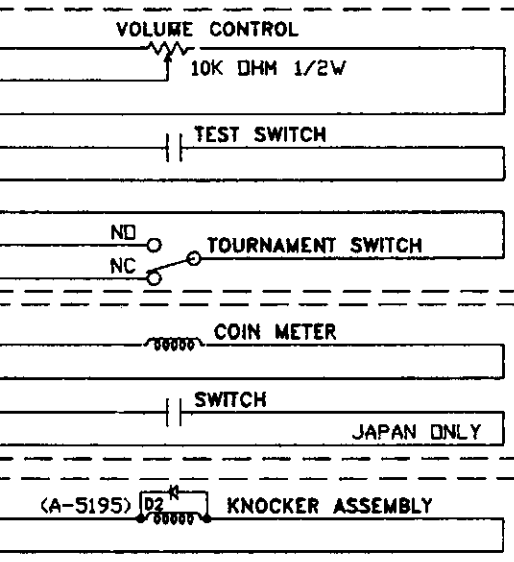


COLOR CODE			
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1	BROWN	6	BLUE
2	RED	7	VIOLET
3	ORANGE	8	GRAY
4	YELLOW	9	WHITE

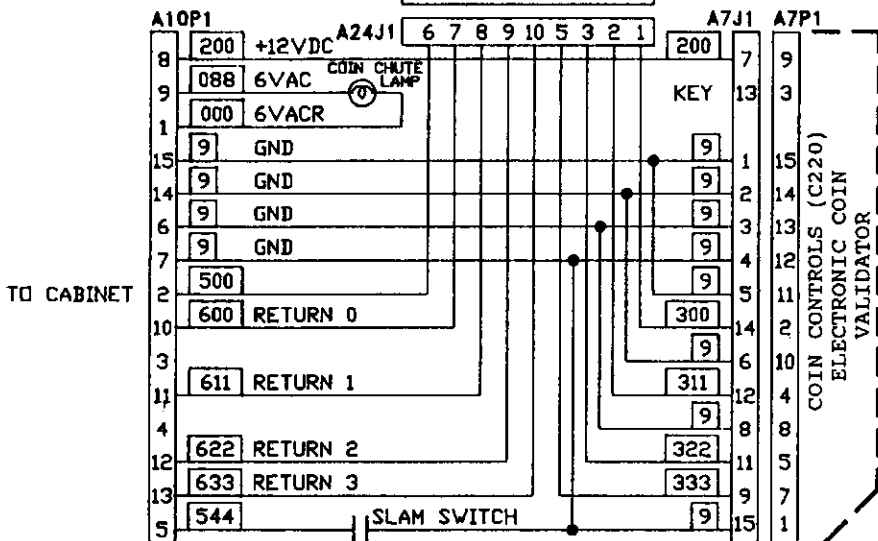
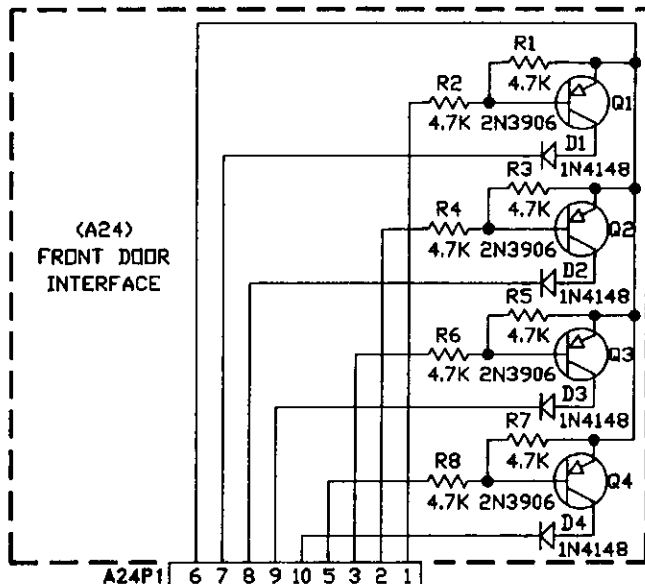
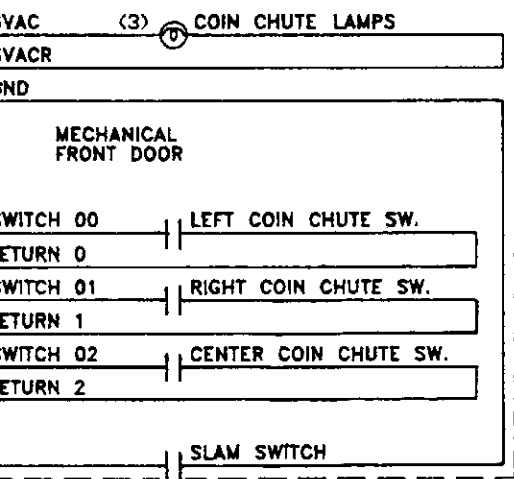
Premier Technology			
TITLE LIGHTBOX/PLAYBOARD			
SCHEMATIC DIAGRAM			
USED IN #743	DRAWN RLM	DATE 10-06-94	30854

VI. WIRING AND SCHEMATIC

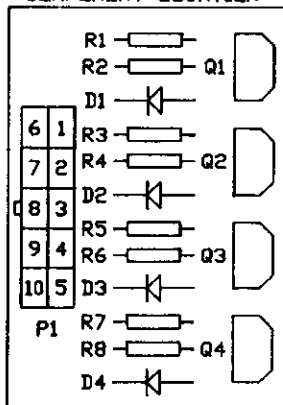




NOTE:
 1. AMOUNT OF PARTS VARIES PER GAME.
 2. ALL DIODES ARE TYPE 1N4004.
 3. A18J3 (FROM TRANSFORMER PANEL).



(A24)
 FRONT DOOR INTERFACE
 COMPONENT LOCATION



(A24)
 FRONT DOOR INTERFACE
 PARTS LIST

REFERENCE DESCRIPTION	PART NO.
FRONT DOOR INTERFACE ASSEMBLY	MA1645
D1-D4 DIODE, 1N4148	XD-261
Q1-Q4 TRANSISTOR, PNP, 2N3906	XD-588
R1-R8 RESISTOR, 4.7K OHM, 1/4W, 5%	XD-7
A24P1 HEADER, 10 POSITION	XD-912
SPACER (4)	23984

CODE	Premier Technology			
GREEN	TITLE CABINET/FRONT DOOR			
BLUE	SCHEMATIC DIAGRAM			
VIOLET	USED ON	DRAWN	DATE	30853
GRAY	#743	RLM	10-06-94	
WHITE				

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 SCHEMATIC DIAGRAM			
ELECTRONIC FRONT DOOR-4 OUTPUT			
USED ON	DRAWN	DATE	28541
	RLM	09-20-91	

VII. PARTS INFORMATION

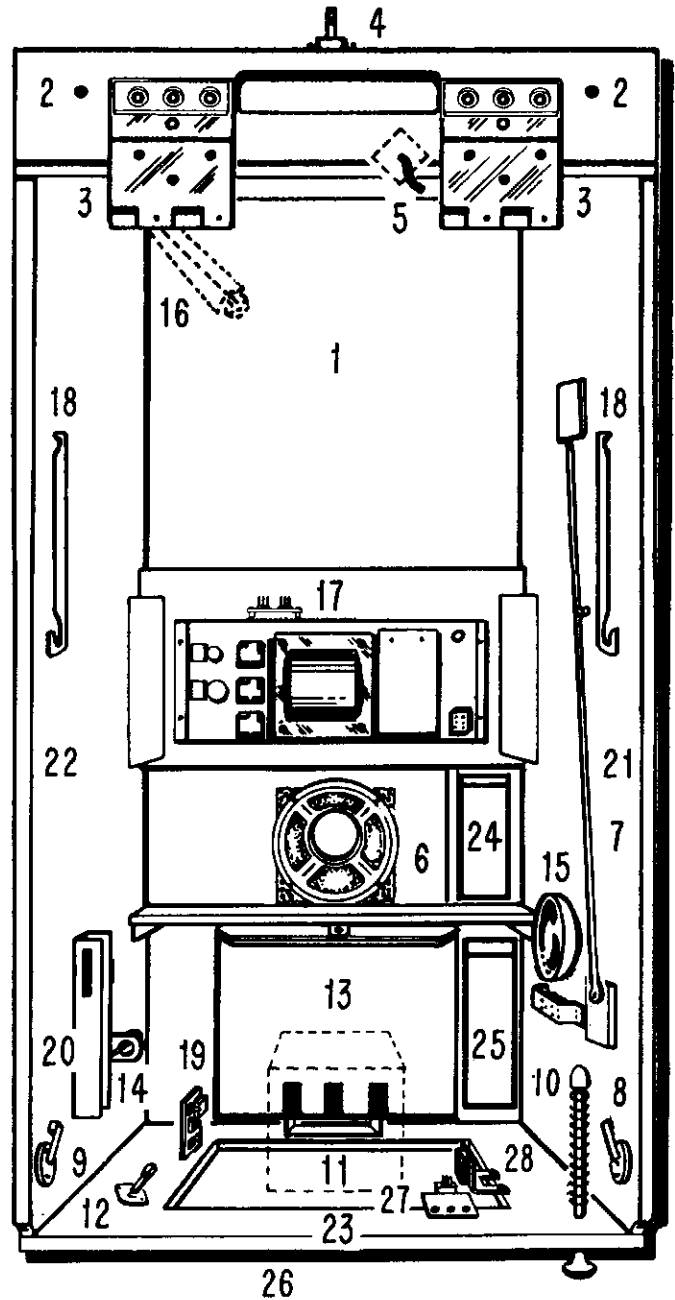
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VII. PARTS INFORMATION

CABINET PARTS

ITEM	DESCRIPTION	PART NO.
1	Cabinet	30520-743
2	Lightbox Mounting Thumb Screw (2) (Not Shown for Reference Only, Part of Lightbox Assembly)	FA-162
3	Butt Hinge (2) (Attached to Lightbox)	26449
4	"U" Bolt (P/O Lightbox)	24659
	Latch Assembly (P/O Cabinet)	21969
5	Line Cord (Domestic)	23365
	Line Cord Cover Plate	23364
6	Speaker, 4 Ohm, 8"	28934
	Speaker Grille	28935
7	Prop Stick, Playfield	23940
8	Right Flipper Switch Assembly (Switch with Bracket)	28693
	(Switch Only)	28668
9	Left Flipper Switch Assembly (Switch with Bracket)	28973
	(Switch Only)	28962
10	Ball Shooter Assembly	26314
11	Front Door Assembly (Universal)	29106
	Cable Assembly	MA-1938
	Slam Switch (N/O)	26130
	6V DC Lamp, Wedge Base, #555	LA-2
	Lampholder	FD-24
12	Replay Switch Assembly	18092
13	Cashbox	28032
	Cover	*SEE NOTE
14	Plumb Bob Tilt Switch Assembly	
	Strike Plate	358
	Carbon, Tilt Bob	30879
	Rod, Tilt	357
	Bracket	22043
	Clip	14653
15	Knocker Assembly	MA-12
16	5" Bell Assembly (When Used)	27591
17	Cabinet Leg (4), 31"	3768
	Leg Bolt (8)	3775
	1-1/2" Leg Adjuster (4)	30121
	3/8-16", Jam Nut (8)	FA-665
18	Transformer Panel Assembly	MA-2067
	Bridge Rectifier (3)	EL-42
	Capacitor, (10,000UF), 25V	XO-830
	Capacitor, (33,000UF), 35V	XO-957
	Fuse Holder and Cap	EL-78
	Fuse Block (8 Pole)	EL-10
	F3, 3/8 Amp, SLO-BLO	EL-31
	F4, 3/8 Amp, SLO-BLO	EL-31
	F5, 4 Amp, SLO-BLO	EL-33
	F6, 10 Amp, SLO-BLO	EL-36
	F7, 8 Amp, SLO-BLO	EL-26
	F8, 15 Amp	EL-25
	F9, 10 Amp	EL-23
	F10, 3 Amp, SLO-BLO	EL-9
	F11, 3 Amp, SLO-BLO	EL-9
	Transformer	29724
18	Cabinet Pivot Bracket (Left)	25658
	Cabinet Pivot Bracket (Right)	25657
19	Game Controls Board (A26)	MA-1851
20	Ball Roll Tilt	
	Housing and Switch Assembly	24394
	Switch	24393
21	Right Moulding (Not Shown)	28700
22	Left Moulding (Not Shown)	28701
23	Front Moulding (Not Shown)	16951
24	Relay Strip Assembly	MA-1872
	"Q" Relay	MA-1172
	"T" Relay	MA-25
	"A" Relay	MA-1021
25	Power Module Assembly (110V AC)	MA-1928
	Double Throw Switch	23799
	Fuse Holder And Cap (2)	EL-78
	Line Filter	EL-50
	Power Module Assembly (FRANCE)	30255A
	Power Module Assembly (GERMANY)	30255B
	Power Module Assembly (JAPAN)	30255C
	Power Module Assembly (220V AC)	30255D
	F1, 8 Amp SLO-BLO, 110V AC	EL-26
	4 Amp SLO-BLO, 220V AC	EL-33
	F2, 5 Amp SLO-BLO, 110V AC	EL-8
	2.5 Amp SLO-BLO, 220V AC	EL-21



ITEM	DESCRIPTION	PART NO.
26	Lock Bar (Not Shown)	29759
	Lock Bracket (Not Shown)	29760
	Lock Bar Bracket (Not Shown)	29761
27	Front Door Service Switch Assembly	
	Switch Bracket	29451
	Switch	29305
28	Interlock Switch Assembly	
	Switch Bracket	29148
	Switch Cover	29145
	Switch	EL-66
	Insulator	24145

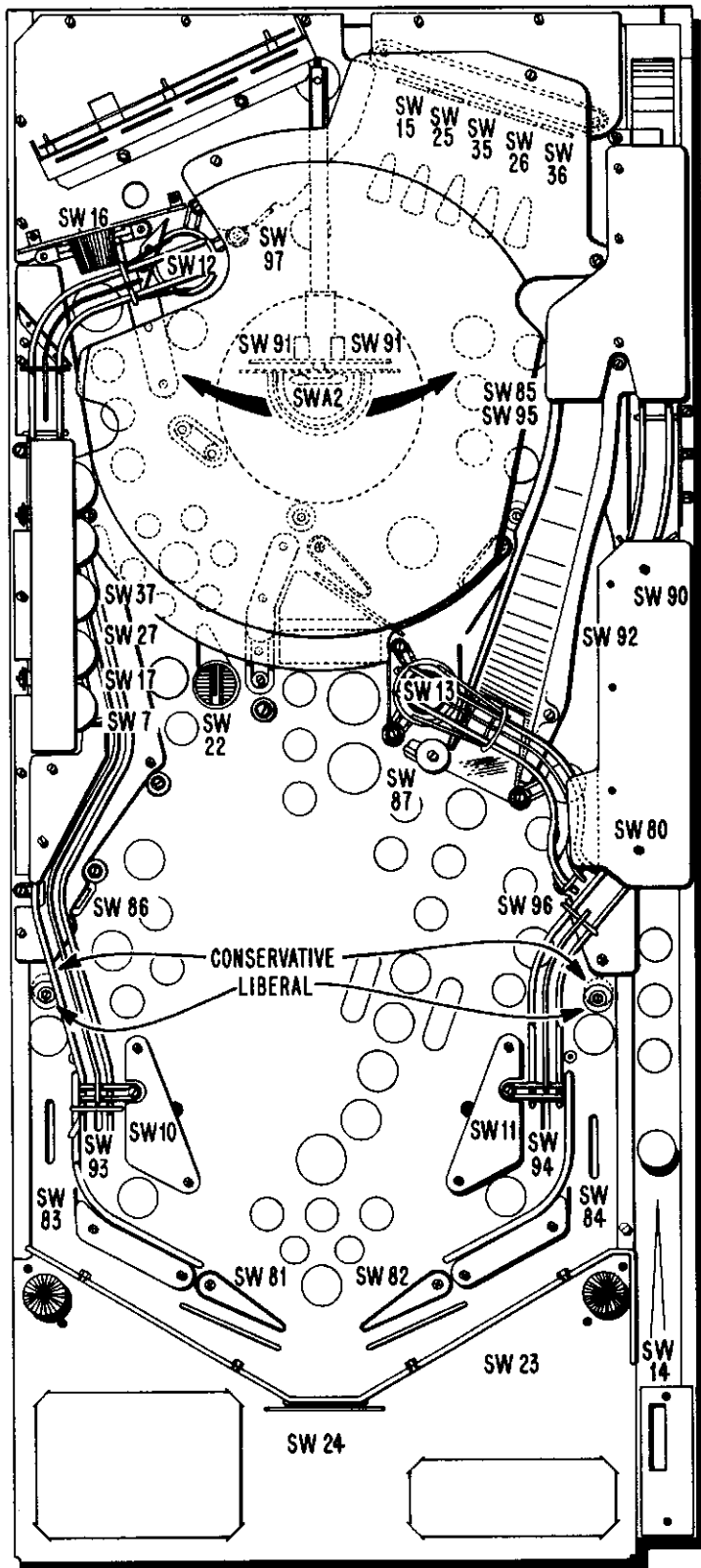
***NOTE:**

COVER USED WITH ELECTRONIC DOOR
OR 3 CHUTE DOOR, PART NO. 28062

COVER USED WITH 2 CHUTE DOOR WITH
\$1.00 ACCEPTOR SLOT, PART NO. 30002

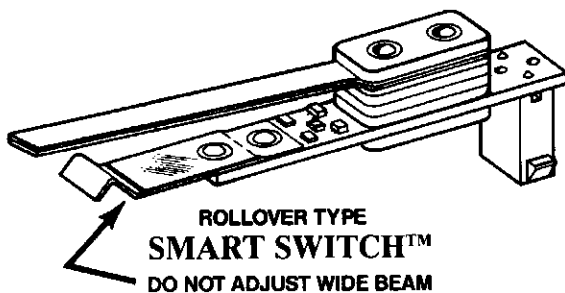
VII. PARTS INFORMATION

PLAYBOARD SWITCH ASSIGNMENTS

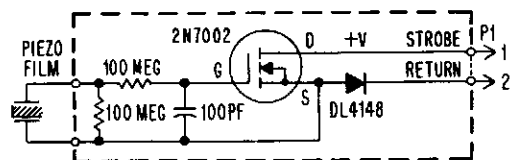


SWITCH MATRIX NUMBER	SWITCH ASSIGNMENT	PART NO.
SW 0	LEFT COIN CHUTE (#1)	P/O FRONT DOOR
SW 1	RIGHT COIN CHUTE (#2)	P/O FRONT DOOR
SW 2	CENTER COIN CHUTE (#3)	P/O FRONT DOOR
SW 3	COIN CHUTE (#4)	P/O ELECTRONIC DOOR
SW 4	START (CREDIT) BUTTON	18092
SW 5	TOURNAMENT	X0-1193
SW 6	FRONT DOOR (SERVICE)	29305
SW 7	VARI TARGET #1, #2	P/O 30917
SW 10	LEFT KICKING RUBBER (2)	27702
SW 11	RIGHT KICKING RUBBER (2)	27702
SW 12	LEFT UPKICKER	27667A
SW 13	RIGHT UPKICKER	27667A
SW 14	SHOOTER LANE ROLLOVER	25824
SW 15	DROP TARGET #1	25896
SW 16	SPINNER	27171
SW 17	VARI TARGET #3, #4	P/O 30917
SW 20	(NOT USED)	
SW 21	(NOT USED)	
SW 22	HOLE KICKER	28078
SW 23	TROUGH	29346
SW 24	OUTHOLE	26927
SW 25	DROP TARGET #2	27306
SW 26	DROP TARGET #4	25897
SW 27	VARI TARGET #5	P/O 30917
SW 30	THRU	(NOT USED)
SW 34	THRU	(NOT USED)
SW 35	DROP TARGET #3	25896
SW 36	DROP TARGET #5	25895
SW 37	VARI TARGET #6	P/O 30917
SW 40	THRU	(NOT USED)
SW 77	THRU	(NOT USED)
SW 80	RIGHT RAMP (LOWER), (OPTICAL INTERFACE)	P/O MA-1558
SW 81	LEFT FLIPPER (SENSOR BOARD)	P/O MA-1334
SW 82	RIGHT FLIPPER (SENSOR BOARD)	P/O MA-1334
*SW 83	LEFT OUTSIDE ROLLOVER	28625
*SW 84	RIGHT OUTSIDE ROLLOVER	28625
*SW 85	TOP RIGHT #1 SPOT TARGET (WHITE)	29099Z
*SW 86	BOTTOM LEFT SPOT TARGET (WHITE)	29099Z
*SW 87	CENTER SPOT TARGET (YELLOW)	29430T
SW 90	RIGHT RAMP (UPPER), (OPTICAL INTERFACE)	P/O MA-1558
*SW 91	BASKET HOOP (2)	30878
*SW 92	RIGHT SIDE ROLLOVER	28625
*SW 93	LEFT RETURN ROLLOVER	28625
*SW 94	RIGHT RETURN ROLLOVER	28625
*SW 95	TOP RIGHT #2 SPOT TARGET (WHITE)	29099Z
*SW 96	BOTTOM RIGHT SPOT TARGET (YELLOW)	29430T
*SW 97	TOP LEFT SPOT TARGET (WHITE)	29099Z
SW A0	THRU	(NOT USED)
SW A1	THRU	(NOT USED)
*SW A2	BACKBOARD	30779
SW A3	THRU	(NOT USED)
SW B7	THRU	(NOT USED)

* SMART SWITCH™



SEE PAGE 22



SCHEMATIC REPRESENTATION

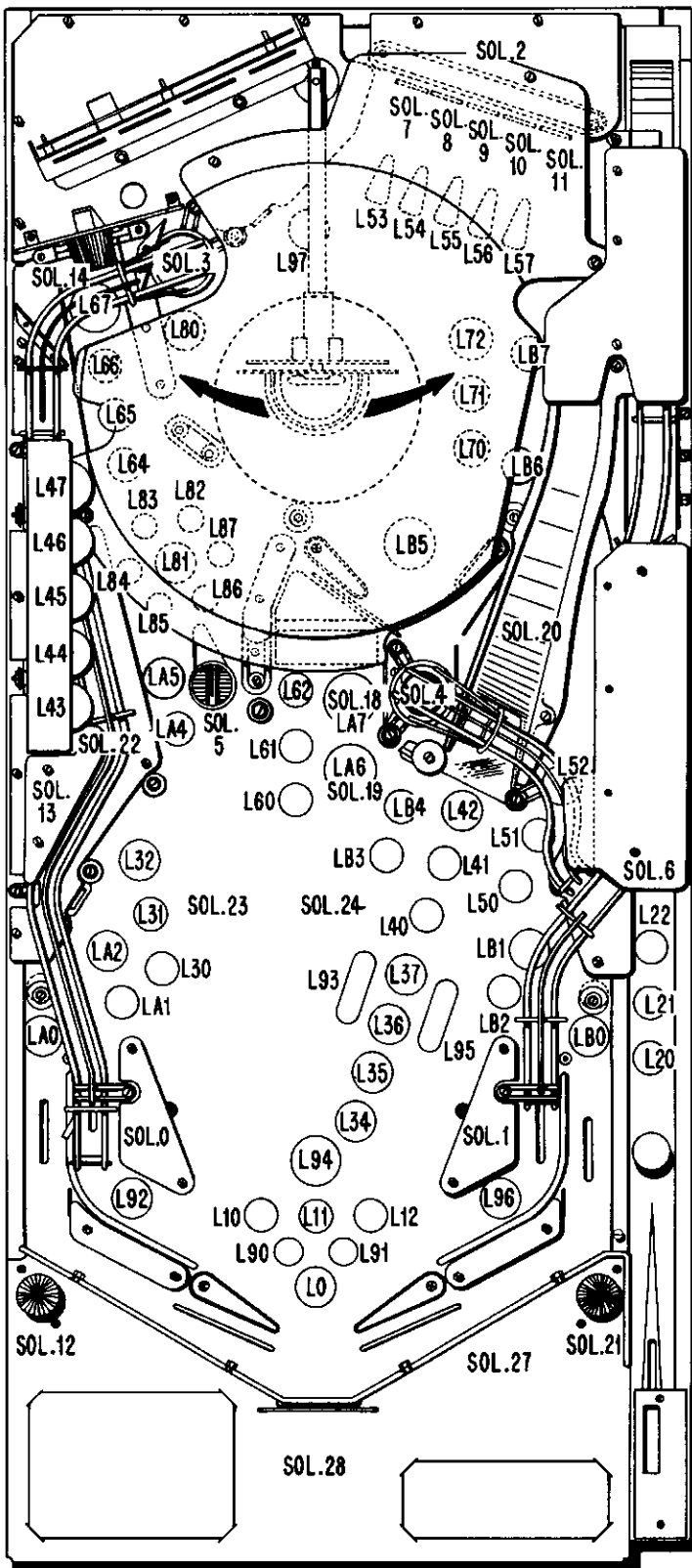
VII. PARTS INFORMATION

PLAYBOARD LAMP ASSIGNMENTS

LAMP NUMBER LAMP ASSIGNMENT

L0	"SHOOT AGAIN"
L1	Credit Button
L2	
THRU	(Not Used)
L7	
L10	"3M"
L11	"5M"
L12	"10M"
L13	
THRU	(Not Used)
L17	
L20	"ALLEY OOP"
L21	"EVENT"
L22	"LOCK"
L23	
THRU	(Not Used)
L27	
L30	Basketball
L31	"ADVANCE BONUS"
L32	"BREAK THE BLACKBOARD"
L33	(Not Used)
L34	Horsehead
L35	"MVP" Trophy
L36	Basketball
L37	Clock
L40	Begin Event
L41	Clock
L42	"LIGHT ALLEY OOP"
L43	"HIDDEN FEATURE" #1
L44	"HIDDEN FEATURE" #2
L45	"HIDDEN FEATURE" #3
L46	"HIDDEN FEATURE" #4
L47	"HIDDEN FEATURE" #5
L50	"MVP" Trophy
L51	"2"
L52	"4"
L53	Drop Target #1
L54	Drop Target #2
L55	Drop Target #3
L56	Drop Target #4
L57	Drop Target #5
L60	"2 POINTS"
L61	"3 POINTS"
L62	"ALLEY OOP"
L63	(Not Used)
L64	Basketball
L65	"1"
L66	"3"
L67	"SUPER SPINNER"
L70	"MVP" Trophy
L71	"ADVANCE X"
L72	"REBOUND"
L73	
THRU	(Not Used)
L77	
L80	Horsehead
L81	"SHAQ ATTACK"
L82	"ALLEY OOP"
L83	"REBOUND"
L84	"JACKPOT"
L85	"BONUS 20M"
L86	"GAME BALL"
L87	"LEVEL 3"
L90	"2X"
L91	"3X"
L92	Horsehead
L93	"MULTI-BALL"
L94	"20M"
L95	"FINALS"
L96	Basketball
L97	Basketball
LA0	Drain Shield
LA1	"EXTRA BALL"
LA2	Horsehead
LA3	(Not Used)
LA4	"FREE THROW"
LA5	"MVP" Trophy
LA6	"JACKPOT"
LA7	"SUPER JACKPOT"
LB0	"SPECIAL"
LB1	Clock
LB2	"SPECIAL"
LB3	Clock
LB4	"DRIBBLE"
LB5	"5"
LB6	"SPELL SHAQUILLE"
LB7	Clock

LAMP SOCKETS WITH DIODE BOARD	
TYPE	PART NO.
1-1/8" BRACKET	26621
1/2" BRACKET	26622
LAYDOWN	26623



SOLENOID FUNCTIONS/LOCATIONS

SOL. 0	LEFT KICKING RUBBER	SOL. 17	LIGHTSTRIP #3, #67;
SOL. 1	RIGHT KICKING RUBBER	SOL. 18	*LIGHTBOX, #904, "Q" AND CAMERA
SOL. 2	5 BANK RESET	SOL. 19	SUPER JACKPOT, #67
SOL. 3	TOP UPKICKER	SOL. 20	JACKPOT, #67
SOL. 4	BOTTOM UPKICKER	SOL. 21	RIGHT RAMP, #67 (2)
SOL. 5	HOLE KICKER	SOL. 22	CARDHOLDER, RIGHT DOME, #67;
SOL. 6	PLUNGER GATE	SOL. 23	*LIGHTBOX, #904, BASKET
SOL. 7	#1 TRIP	SOL. 24	VARI-TARGET RESET
SOL. 8	#2 TRIP	SOL. 25	HOOP MOTOR RELAY (B)
SOL. 9	#3 TRIP	SOL. 26	PLATTER MOTOR RELAY (C)
SOL. 10	#4 TRIP	SOL. 27	LIGHTBOX ILLUM. RELAY (A)
SOL. 11	#5 TRIP	SOL. 28	TICKET/COIN METER ENABLE
SOL. 12	CARDHOLDER, LEFT DOME, #67;	SOL. 29	BALL RELEASE
SOL. 13	*LIGHTBOX, #904, "S" AND CAMERA	SOL. 30	OUTHOLE
SOL. 14	LEFT RAMP DOME, #67	SOL. 31	KNOCKER
SOL. 15	SPINNER DOME, #67		
SOL. 16	LIGHTSTRIP #1, #67;		
	*LIGHTBOX, #904, "H" AND CAMERA		
	LIGHTSTRIP #2, #67;		
	*LIGHTBOX, #904, "A" AND CAMERA		

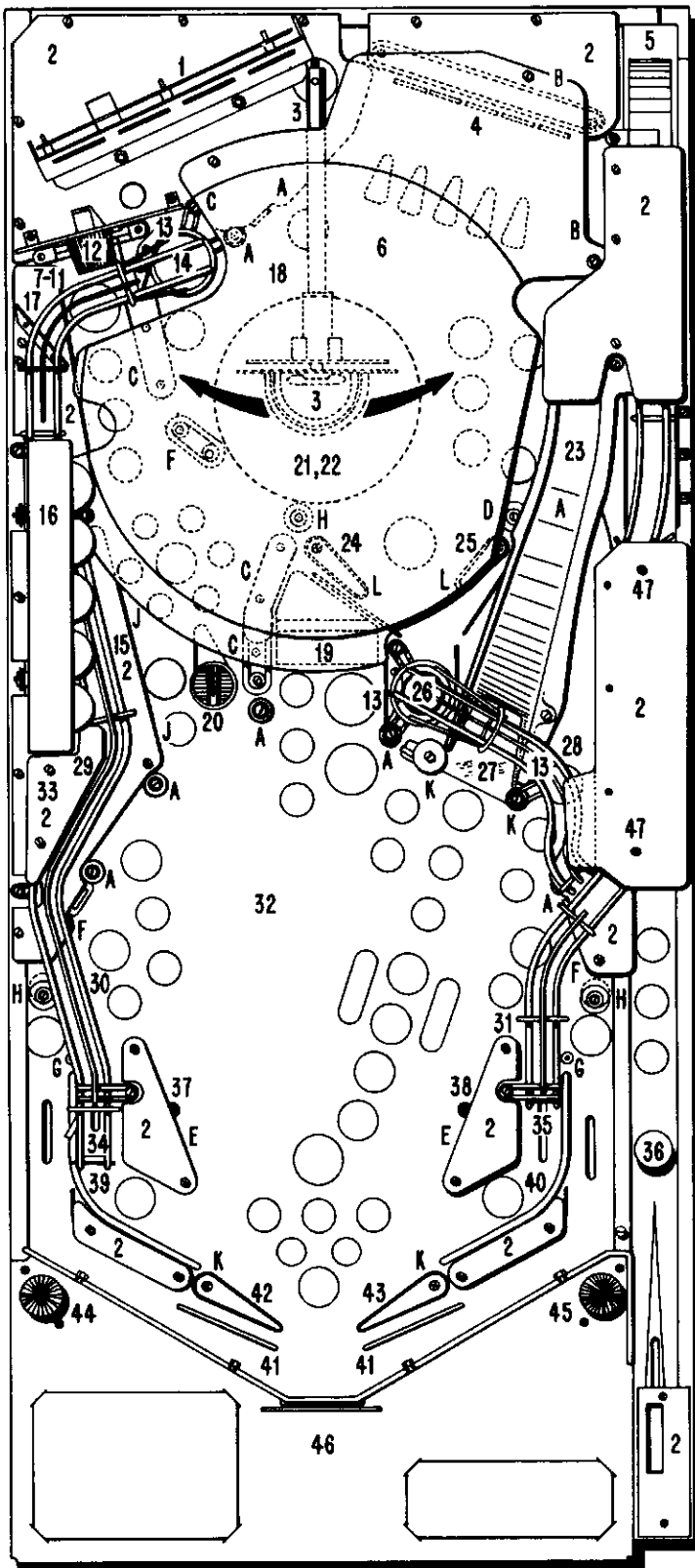
NOTE:
*LAMPS MOUNTED ON LIGHTBOX INSERT,
SEE PAGE 72 FOR LOCATION.

VII. PARTS INFORMATION

PLAYBOARD PARTS INFORMATION

PARTS LIST

ITEM	DESCRIPTION	PART NO.
1	12 DIGIT DISPLAY AND BRACKET	MA-2075
2	PLASTIC SHIELD SET	31049
3	BASKET AND BACKBOARD ASSEMBLY (SEE ASSEMBLY ILLUSTRATION)	30778
4	TARGET BANK ASSEMBLY, 5 POSITION (SEE EXPLODED VIEW ILLUSTRATION)	MA-1838
4A	DROP TARGET DECAL (5)	30903
5	BALL SCOOP ASSEMBLY	30763
6	VACUUM FORM DOME	30755
7	TARGET SHIELD	14043
8	SWINGING TARGET ASSEMBLY	24494
9	SWITCH ROD	20406
10	NYLON WASHER (2)	20407
11	SPINNER SPACER	27244
12	PLASTIC DOME, 1-1/4", RED	25147U
13	BALL DEFLECTOR (3)	21158
14	UPKICKER ASSEMBLY (SEE EXPLODED VIEW ILLUSTRATION)	MA-1743
15	BALL GUIDE RAIL	17106
16	LIGHT STRIP ASSEMBLY	30786
17	BALL DEFLECTOR	25594
18	MYLAR OVERLAY (UPPER)	31038
19	BALL RAMP	30769
20	BALL HOLE KICKER (SEE EXPLODED VIEW ILLUSTRATION)	MA-1985
21	SPINNING DISC MAT	31070
22	SPINNER AND MOTOR ASSEMBLY (SEE ASSEMBLY ILLUSTRATION)	26048
23	RAMP, DECALS AND SPACERS ASSEMBLY	31080
24	TOP LEFT FLIPPER ASSEMBLY (SEE EXPLODED VIEW ILLUSTRATION)	MA-1790A
	COIL AND DIODE ASSEMBLY	26646
	FLIPPER SWITCH ASSEMBLY	26439
25	TOP RIGHT FLIPPER ASSEMBLY (SEE EXPLODED VIEW ILLUSTRATION)	MA-1791A
	COIL AND DIODE ASSEMBLY	26646
	FLIPPER SWITCH ASSEMBLY	26438
26	UPKICKER ASSEMBLY (SEE EXPLODED VIEW ILLUSTRATION)	MA-1789
27	RAMP FLAP	30781
28	WIREFORM RAMP	30753
29	VARI TARGET ASSEMBLY (SEE ASSEMBLY ILLUSTRATION)	30971
30	WIREFORM RAMP	30754
31	WIREFORM RAMP	30752
32	MYLAR OVERLAY (LOWER)	31037
33	PLASTIC DOME, 1-1/4", AMBER	25147N
34	CELLULAR BUMPER	29974
35	CELLULAR BUMPER	28274
36	STEEL BALL, 1-1/16" DIAMETER	21864
37	KICKER ASSEMBLY	MA-1083
38	KICKER ASSEMBLY	MA-1373
39	BALL GUIDE RAIL	27916
40	BALL GUIDE RAIL	27915
41	SNUBBER RAIL (2)	13798
42	BOTTOM LEFT FLIPPER ASSEMBLY (SEE EXPLODED VIEW ILLUSTRATION)	MA-1790E
	COIL AND DIODE ASSEMBLY	29876
	FLIPPER SWITCH ASSEMBLY	26439
43	BOTTOM RIGHT FLIPPER ASSEMBLY (SEE EXPLODED VIEW ILLUSTRATION)	MA-1791E
	COIL AND DIODE ASSEMBLY	29876
	FLIPPER SWITCH ASSEMBLY	26438
44	PLASTIC DOME, 1-1/4", WHITE	25147Z
45	PLASTIC DOME, 1-1/4", YELLOW	25147T
46	CARDHOLDER ASSEMBLY	30894
47	OPTO SWITCH AND BRACKET ASSEMBLY (2)	30893



RUBBER RINGS

ITEM	DESCRIPTION	PART NO.
A	BUMPER, TAPERED (BLK)	30003Y
B	3"	10223
C	1"	10219
D	1-1/2"	10220
E	2-1/2"	10222
F	3/4"	10218
G	MINI-POST, SMALL	14793
H	5/16"	10217
J	2"	10221
K	BUMPER, (BLK)	26648Y

MISCELLANEOUS PARTS

DESCRIPTION	PART NO.
RUBBER GROMMET	5240
HAIRPIN CLIP	6947
MINI-POST SCREW	14792
HEX POST WITH GRIP	26531
PLASTIC RIVET	MP-10
PLASTIC POST, 1" (RED)	11561U
PLASTIC POST, 1-3/16" (RED)	11562U
PLASTIC POST (RED)	20635U

VII. PARTS INFORMATION

FLIPPER PARTS

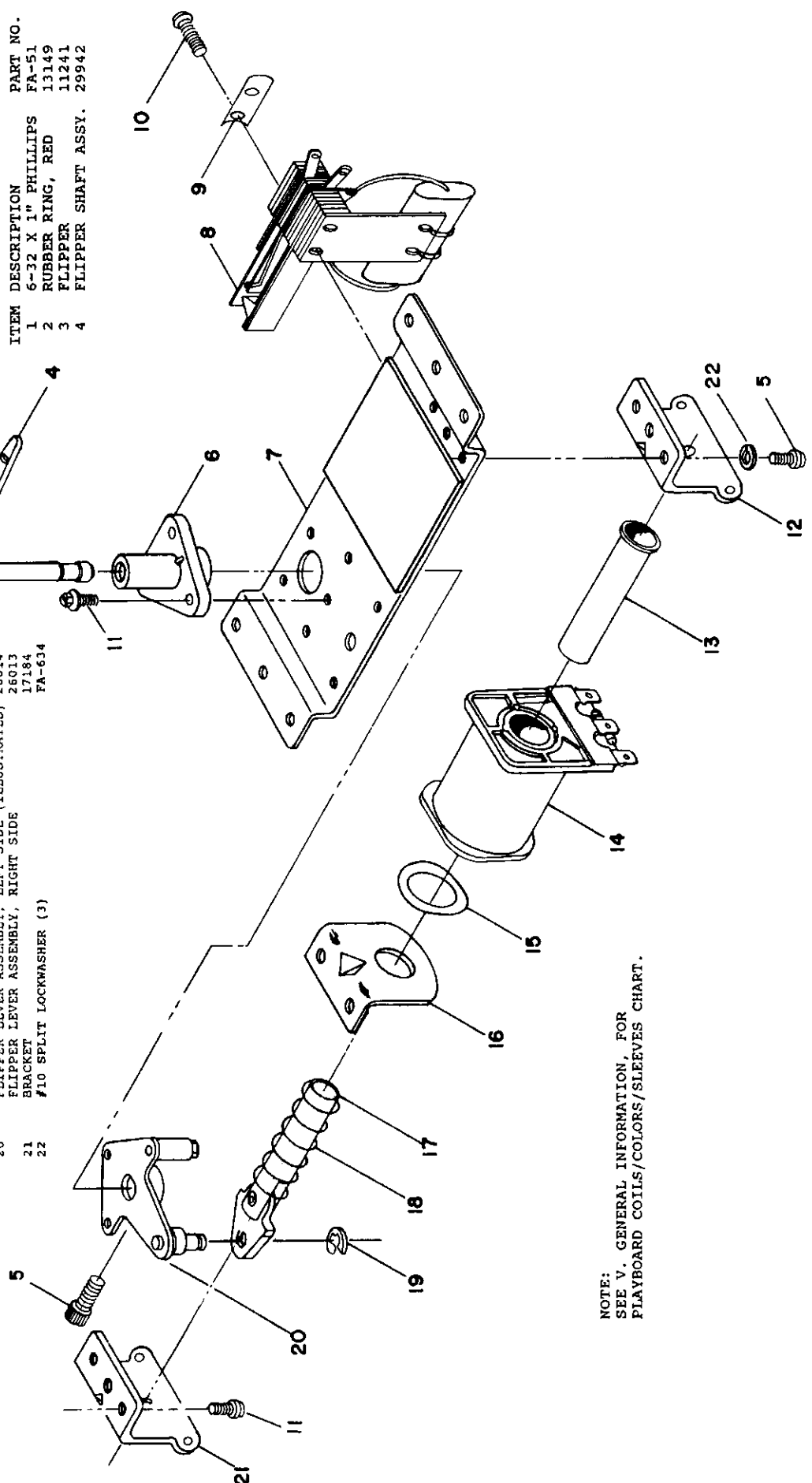
REPAIR NOTE:
BEFORE INSERTING ITEM 1,
PLACE ONE DROP OF SAF-T-LOK
T70 THREAD LOCKING COMPOUND
INTO THE THREADED HOLE OF ITEM 4.

ITEM	DESCRIPTION	PART NO.
1	FLIPPER ASSEMBLY, LEFT SIDE (ILLUSTRATED)	MA-1790C, MA-1790E
2	FLIPPER ASSEMBLY, RIGHT SIDE	MA-1791C, MA-1791E
3	8-32 X 1/2" OVAL HEAD MS	FA-77
4	FLAT RUBBER RING, RED OR BLACK	13151 OR 28546
5	FLIPPER SHAFT ASSEMBLY	25972F
6	10-32 X 3/8" UNBRAKO (3)	26497
7	FLIPPER SHAFT BEARING	FA-90
8	FRAME, LEFT SIDE (ILLUSTRATED)	25961
9	FRAME, RIGHT SIDE	29158
10	SWITCH ASSEMBLY, LEFT SIDE (ILLUSTRATED)	29157
11	SWITCH ASSEMBLY, RIGHT SIDE	26439
12	CAPACITOR, 2.2UF, 200V	26438
13	SWITCH COVER	XO-995
14	5-40 X 3/4" RHMS SEMS (2)	465
15	8-32 X 3/8" HWMS SEMS (7)	FA-3
16	STOP STUD AND BRACKET ASSEMBLY	FA-69
17	SLIP-IN CORE	29154
18	COIL WITH DIODE (SEE SCHEMATIC DIAGRAM)	5065
19	SPRING WASHER	FA-605
20	COIL MOUNTING BRACKET	16356
21	LINK AND FLINGER ASSEMBLY	25956
22	FLIPPER SPRING	3232
23	RETAINING RING	FA-682
24	FLIPPER LEVER ASSEMBLY, LEFT SIDE (ILLUSTRATED)	26014
25	FLIPPER LEVER ASSEMBLY, RIGHT SIDE	26013
26	BRACKET	17184
27	#10 SPLIT LOCKWASHER (3)	FA-634

NOTE:
ITEMS 1 THRU 4 ARE NOT PART
OF THE FLIPPER ASSEMBLY.

PARTS DIFFERENCES
FLIPPER ASSEMBLY MA-1791B

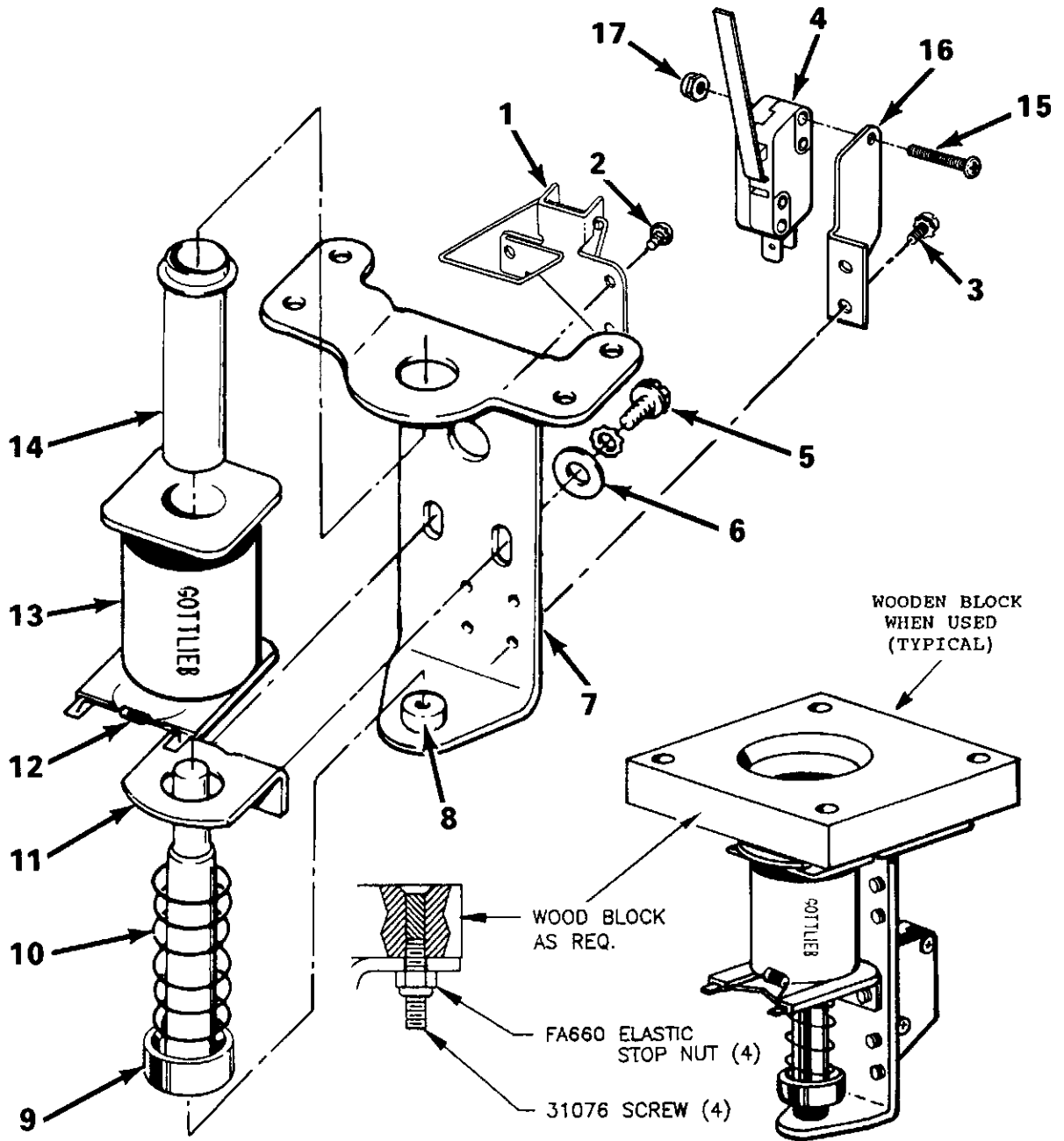
ITEM	DESCRIPTION	PART NO.
1	6-32 X 1" PHILLIPS	FA-51
2	RUBBER RING, RED	13149
3	FLIPPER	11241
4	FLIPPER SHAFT ASSY.	29942



NOTE:
SEE V. GENERAL INFORMATION, FOR
PLAYBOARD COILS/SLEEVES CHART.

VII. PARTS INFORMATION

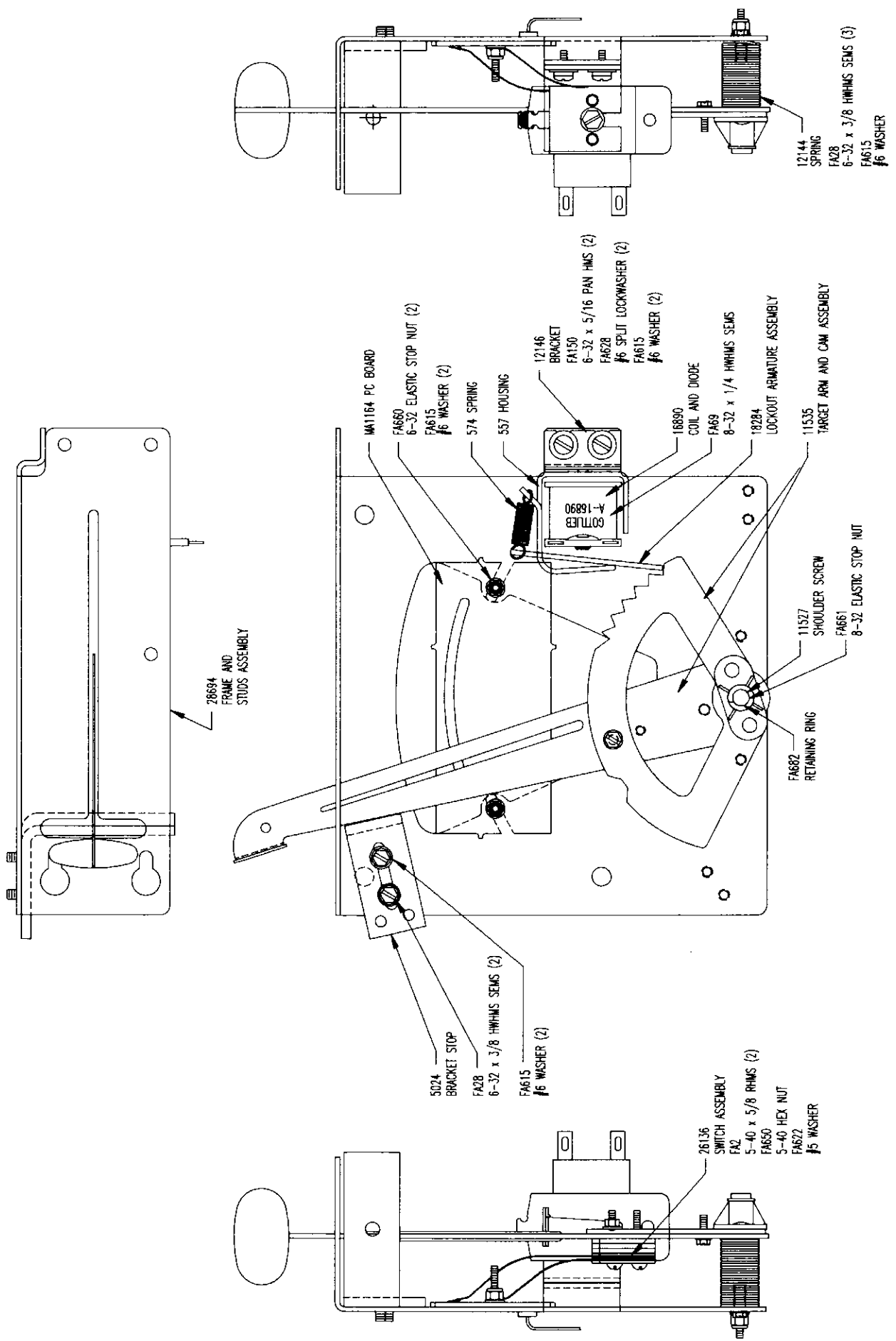
UPKICKER PARTS



ITEM	DESCRIPTION	PART NO.
	UPKICKER ASSEMBLIES WITH ASSOCIATED COILS	MA-1743, 16570 COIL MA-1747, 26450 COIL MA-1789, 17876 COIL
1	WIREFORM AND BRACKET	28953
2	RHMS-SEMS 6-32 X 3/16" (3)	FA-30
3	RHMS 5-40 X 1/4" SEMS (2)	FA-10
4	MICROSWITCH WITH ACTUATOR	27667A
5	HHMS-SEMS 8-32 X 5/16" (2)	FA-67
6	#8 WASHER (2)	FA-617
7	FRAME	21416
8	RUBBER GROMMET	5240
9	PLUNGER AND TIP ASSEMBLY	21412
10	SPRING	26739
11	COIL MOUNTING BRACKET	15409
12	DIODE, 1N4004	XO-254
13	COIL	(SEE SCHEMATIC)
14	SLIP-IN-CORE	21411
15	PAN HEAD 4-40 X 5/8" (2)	FA-107
16	MICROSWITCH MOUNTING BRACKET	27870
17	ELASTIC STOP NUT, 4-40 (2)	FA-648

VII. PARTS INFORMATION

VARI TARGET ASSEMBLY, 30917

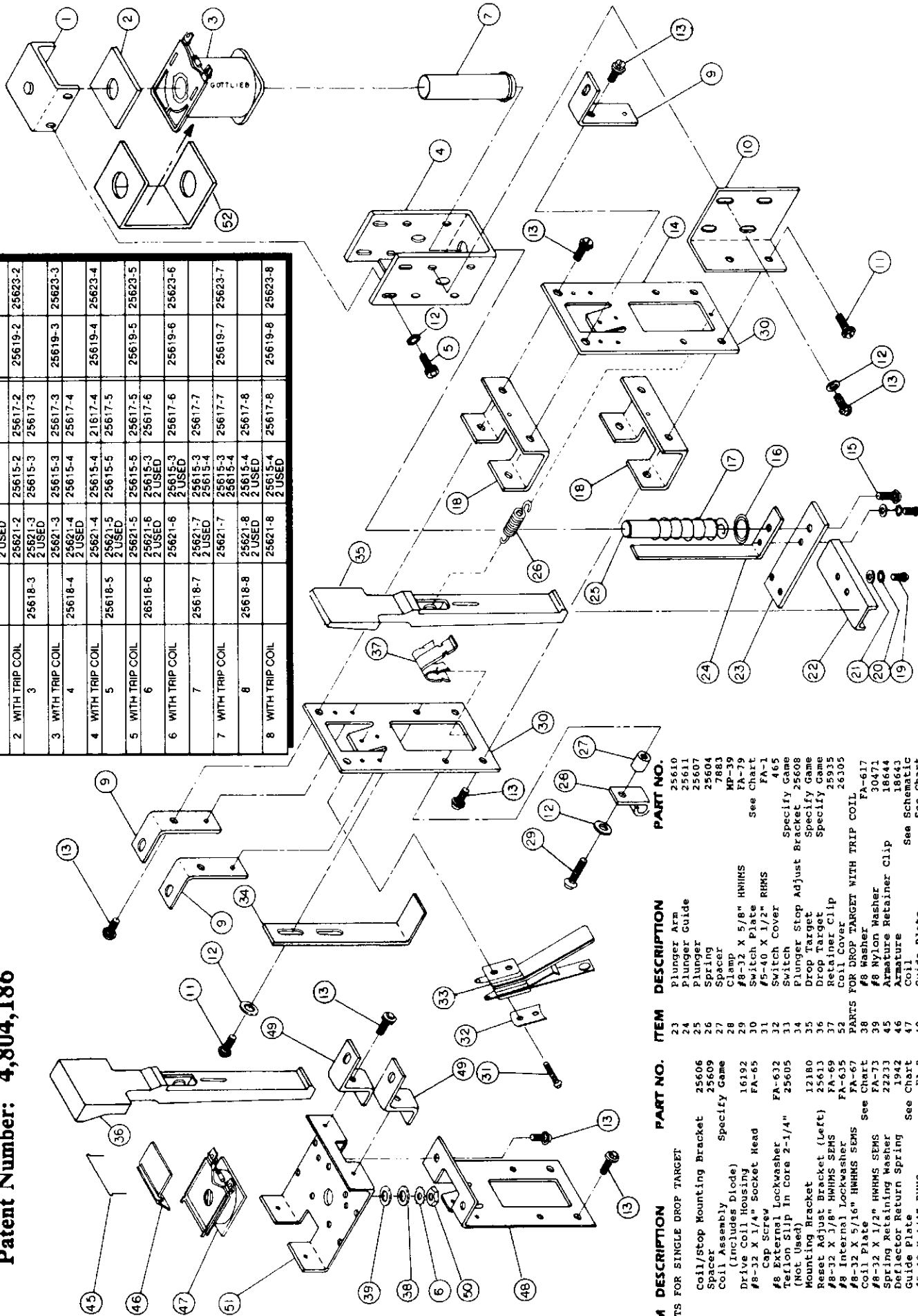


VII. PARTS INFORMATION

DROP TARGET PARTS

Patent Number: 4,804,186

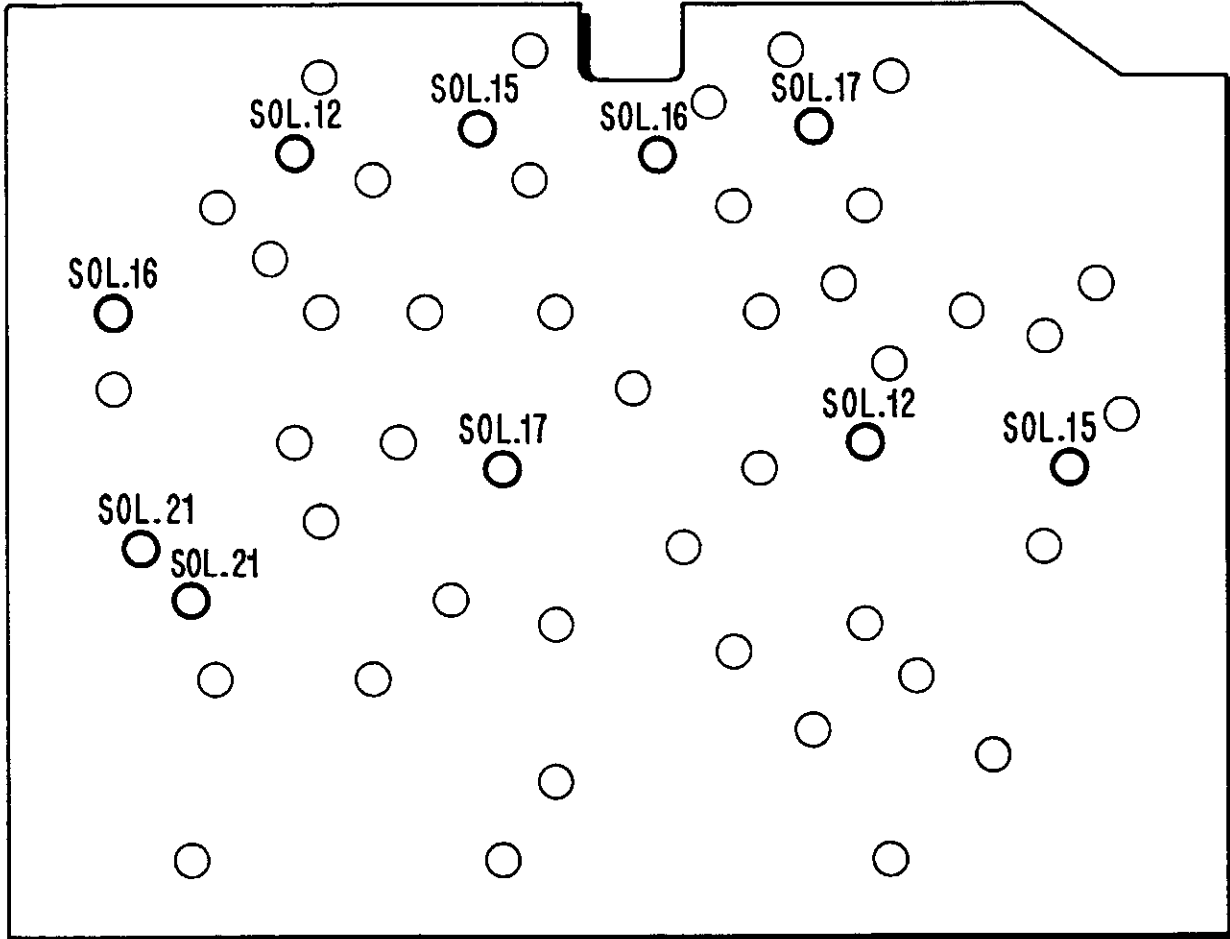
DROPTARGETS	WITHOUT TRIP COIL			WITH TRIP COIL		
	ITEM 14 COIL PLATE	ITEM 18 GUIDE PLATE	ITEM 22 RESET ARM	ITEM 30 SWITCH PLATE	ITEM 48 COIL PLATE	ITEM 51 GUIDE PLATE
1 WITH TRIP COIL	25618-1	25621-1	25615-2	25617-1	25619-1	25623-1
2 WITH TRIP COIL	25618-2	25621-2 2 USED	25615-2	25617-2		
3 WITH TRIP COIL	25618-3	25621-2 2 USED	25615-2	25617-3	25619-2	25623-2
4 WITH TRIP COIL	25618-4	25621-3	25615-3	25617-3	25619-3	25623-3
5 WITH TRIP COIL	25618-4	25621-4	25615-4	25617-4	25619-4	25623-4
6 WITH TRIP COIL	25618-5	25621-5	25615-5	25617-5	25619-5	25623-5
7 WITH TRIP COIL	25618-6	25621-6	25615-3 2 USED	25617-6	25619-6	25623-6
8 WITH TRIP COIL	25618-7	25621-7	25615-3 2 USED	25617-7	25619-7	25623-7
	25618-8	25621-8 2 USED	25615-4 2 USED	25617-8	25619-8	25623-8
		25621-8	25615-4 2 USED	25617-8	25619-8	25623-8



ITEM DESCRIPTION	PART NO.	ITEM DESCRIPTION	PART NO.
PARTS FOR SINGLE DROP TARGET			
1 Coil/stop Mounting Bracket	25606	23 Plunger Arm	25610
2 Spacer	25609	24 Plunger Guide	25611
3 Coil Assembly Blade	Specify Game	25 Spring	25607
4 Drive Coil Housing	16192	26 Spring	25604
5 #8-32 X 1/4" Socket Head	FA-65	27 Spacer	7883
6 Cap Screw	FA-632	28 Clamp	MP-39
7 External Lockwasher	12180	29 #8-32 X 5/8" HHMS	FA-79
8 External Lockwasher	25605	30 #5-40 X 1/2" RHMS	See Chart
9 Mounting Bracket	12180	31 Switch Cover	FA-1
10 Reset Adjust Bracket (Left)	25613	32 Switch Cap	415
11 #8-32 X 3/8" HHMS SEMS	FA-95	33 Plunger Stop Adjust Bracket	25608
12 #8 Internal Lockwasher	FA-95	34 Drop Target	Specify Game
13 #8-32 X 5/16" HHMS SEMS	FA-67	35 Retain Clip	Specify Game
14 Coil Plate	See Chart	36 Coil Cover	25935
15 #8-32 X 1/2" HHMS SEMS	See Chart	37 #8 Washer	26103
16 Spring Retaining Washer	27273	38 #8 Nylon Washer	FA-617
17 Deflector Return Spring	1942	39 Armature Retainer Clip	18644
18 Guide Plate	See Chart	40 Armature	18643
19 #5-40 X 1/4" RHMS	FA-68	41 Coils Plate	See Schematic
20 #5 External Lockwasher	FA-620	42 Mounting Bracket (Formed)	See Chart
21 #5 Washer	FA-622	43 #8-32 Hex Nut	25612
22 Reset Arm	See Chart	44 Coil Plate	FA-652
			See Chart

VII. PARTS INFORMATION

LIGHTBOX INSERT LAMP IDENTIFICATION



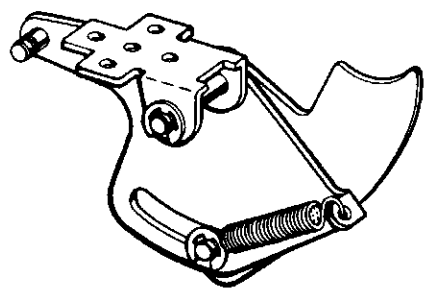
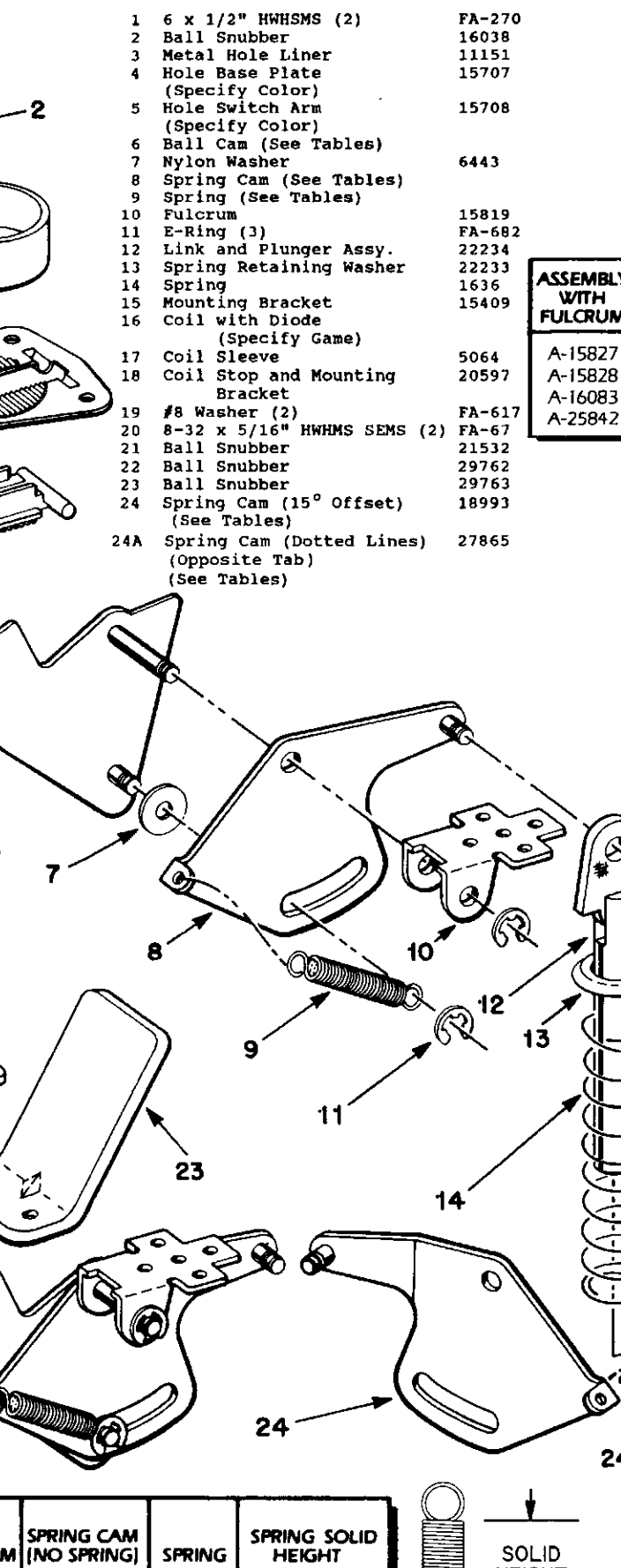
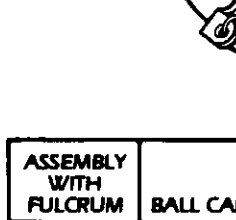
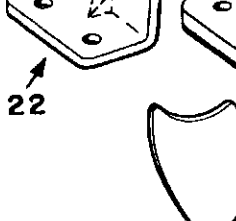
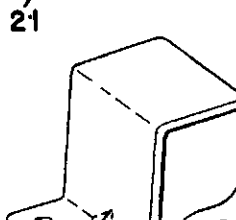
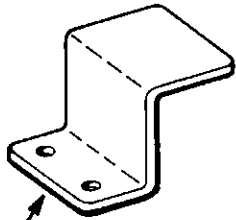
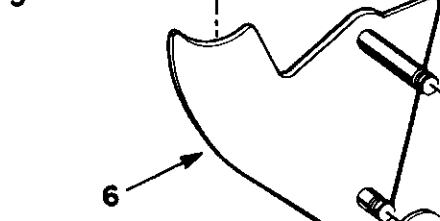
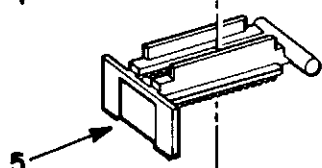
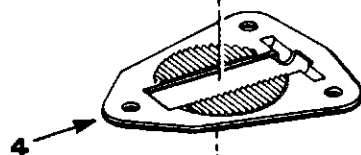
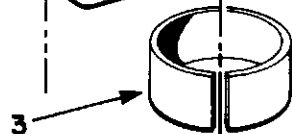
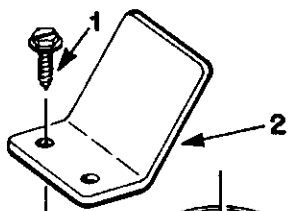
NOTE:

1. DESIGNATED LAMPS ARE TYPE #904 WEDGE BASE, LAMPS NOT DESIGNATED ARE GENERAL ILLUMINATION, TYPE #555 WEDGE BASE.

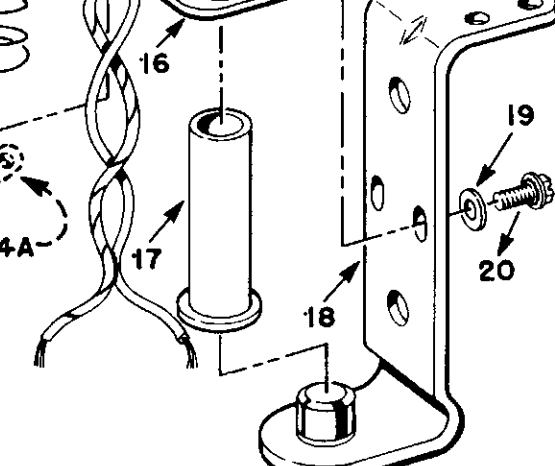
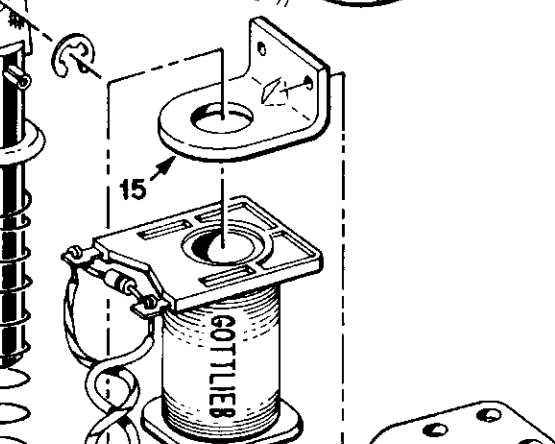
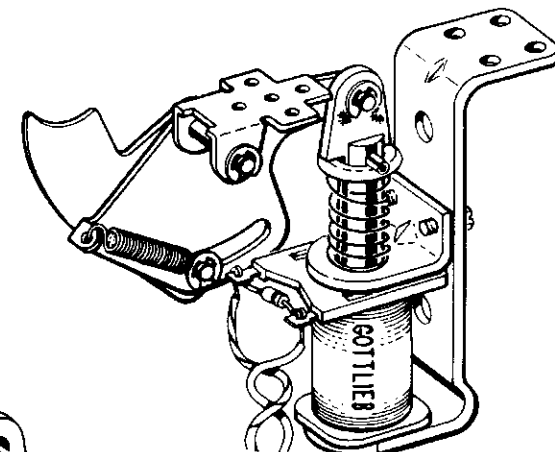
VII. PARTS INFORMATION

BALL HOLE KICKER PARTS

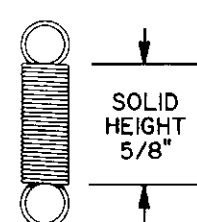
ITEM	DESCRIPTION	PART NO.
1	6 x 1/2" HHWSMS (2)	FA-270
2	Ball Snubber	16038
3	Metal Hole Liner	11151
4	Hole Base Plate	15707
5	Hole Switch Arm (Specify Color)	15708
6	Ball Cam (See Tables)	
7	Nylon Washer	6443
8	Spring Cam (See Tables)	
9	Spring (See Tables)	
10	Fulcrum	15819
11	E-Ring (3)	FA-682
12	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" HHWS SEMS (2)	FA-67
21	Ball Snubber	21532
22	Ball Snubber	29762
23	Ball Snubber	29763
24	Spring Cam (15° Offset) (See Tables)	18993
24A	Spring Cam (Dotted Lines) (Opposite Tab) (See Tables)	27865



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

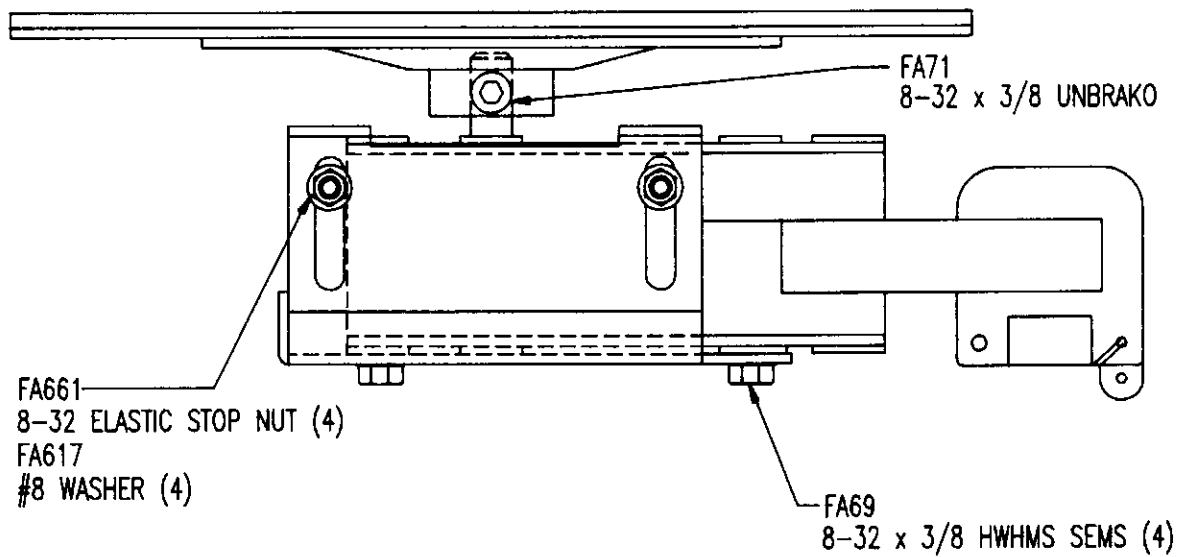
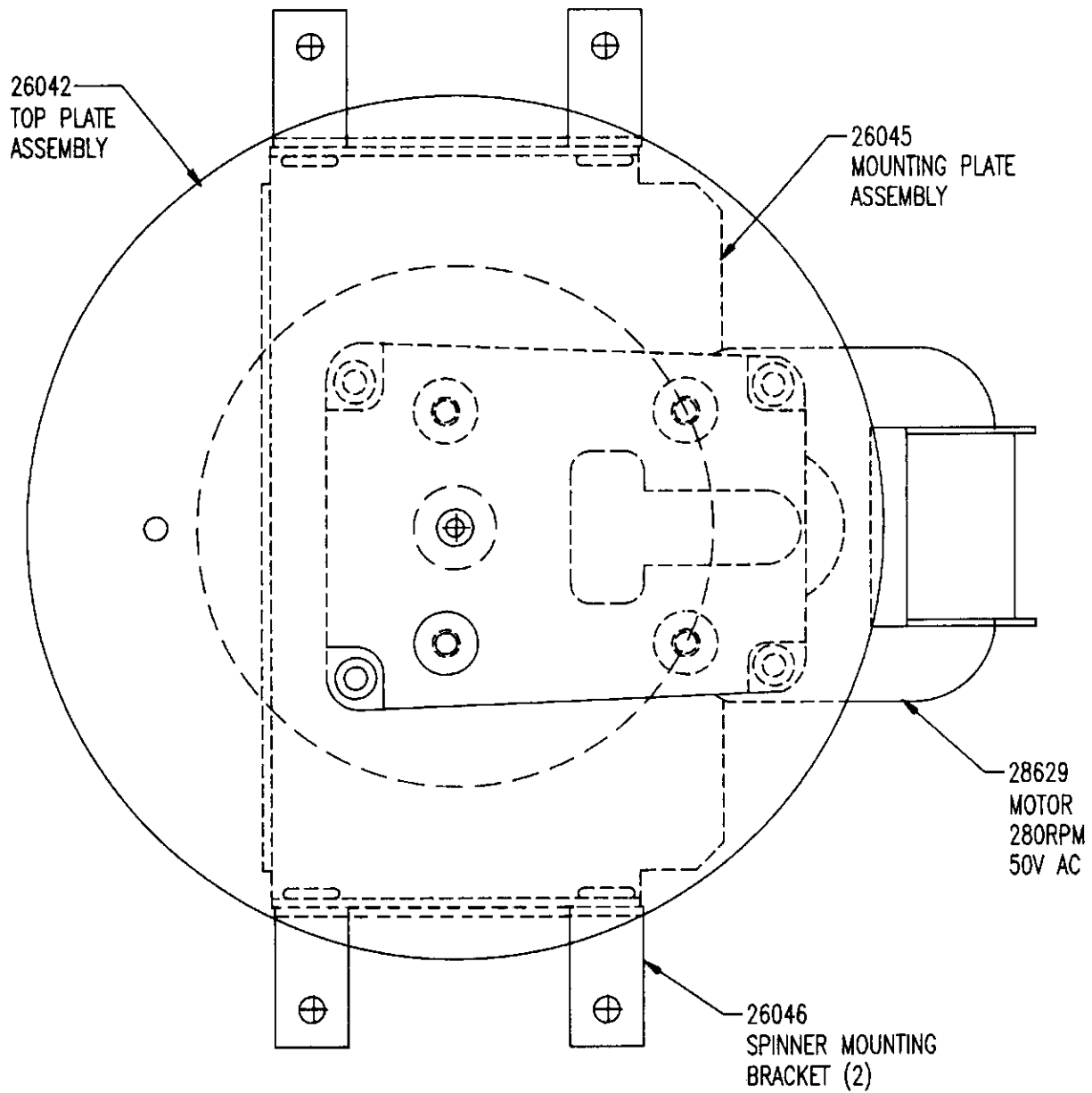


ASSEMBLY WITH FULCRUM	BALL CAM	SPRING CAM (NO SPRING)	SPRING	SPRING SOLID HEIGHT
A-16045	A-16044	A-16043	A-9758	5/8"
A-16085	A-16044	A-16043	A-8727	7/8"
A-16086	A-16044	A-16043	A-15598	11/16"
A-27866	A-15822	A-27865	A-9758	5/8"



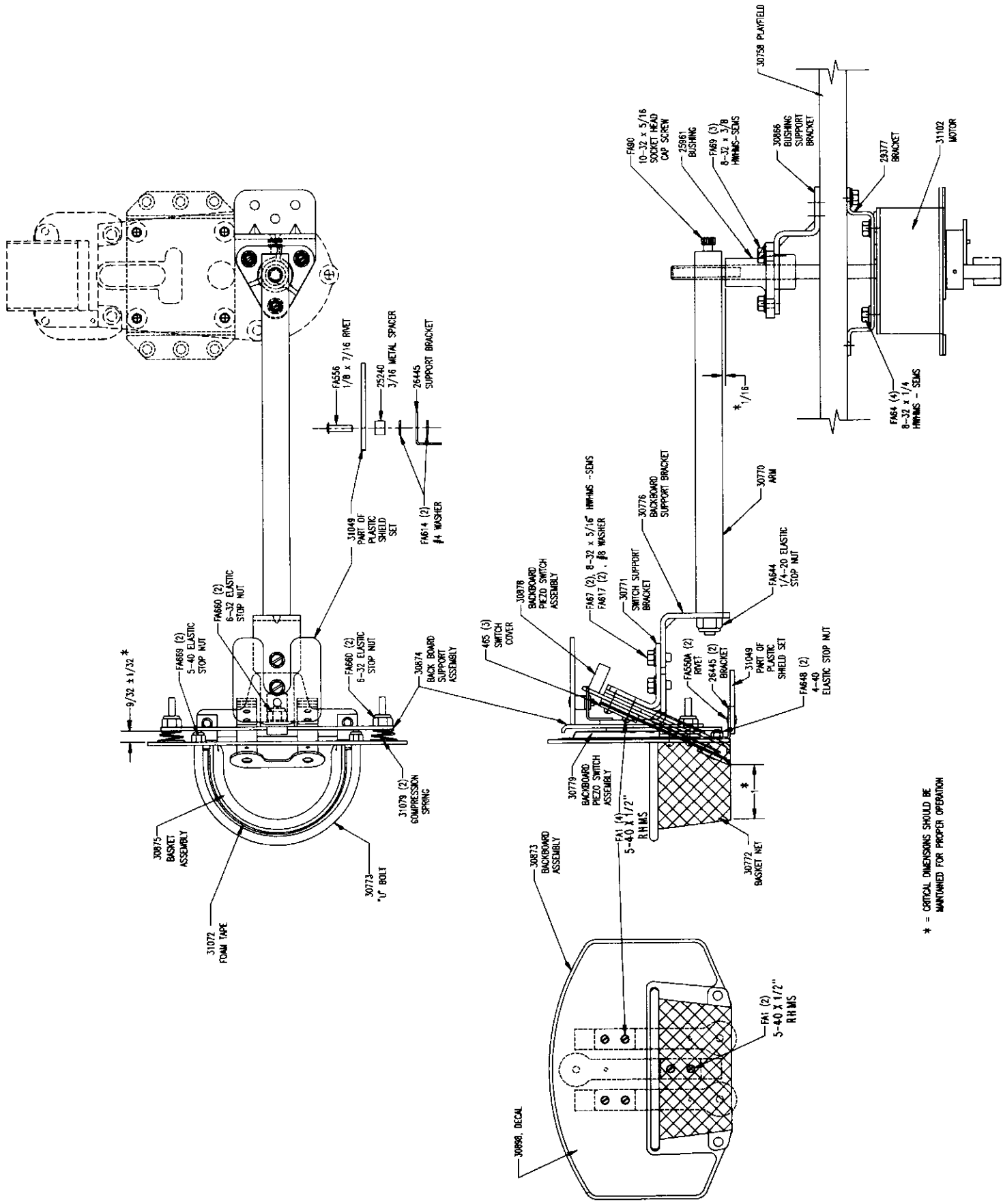
VII. PARTS INFORMATION

SPINNER ASSEMBLY, 26048



VII. PARTS INFORMATION

BASKET AND BACKBOARD ASSEMBLY, 30778



* = CRITICAL DIMENSIONS SHOULD BE MAINTAINED FOR PROPER OPERATION

VII. PARTS INFORMATION

UNIQUE PARTS

The following denotes new parts and assemblies unique to SHAQ ATTAQ, GAME #743. Part numbers prefixed with an asterisk (*) will be illustrated or can be located on pages 28 thru 75. Numbers in parenthesis () indicates multiple quantities.

PLAYBOARD

ITEM/DESCRIPTION	PART NO.
WIREFORM RAMP.....	*30752
WIREFORM RAMP.....	*30753
WIREFORM RAMP.....	*30754
VACUUM FORM DOME.....	*30755
BALL SCOOP ASSEMBLY.....	*30763
BALL RAMP.....	*30769
BASKET AND BACKBOARD ASSEMBLY.....	*30778
LIGHT STRIP ASSEMBLY.....	*30786
RAMP FLAP.....	*30781
OPTO SWITCH AND BRACKET ASSEMBLY.....	*30893
CARDHOLDER ASSEMBLY.....	*30894
VARI TARGET ASSEMBLY.....	*30971
MYLAR OVERLAY (LOWER).....	*31037
MYLAR OVERLAY (UPPER).....	*31038
PLASTIC SHIELD SET.....	*31049
SPINNING DISC MAT.....	*31070
RAMP, DECALS AND SPACERS ASSEMBLY.....	*31080

CABINET

CABINET SCREENED.....	*30520-743
TRANSFORMER PANEL.....	*MA-2067

LIGHTBOX

LIGHTBOX SCREENED.....	28750-743
SPEAKER PANEL, PLEXI SCREENED.....	28827-743
STYRENE (BACKGLASS ART).....	28833-743

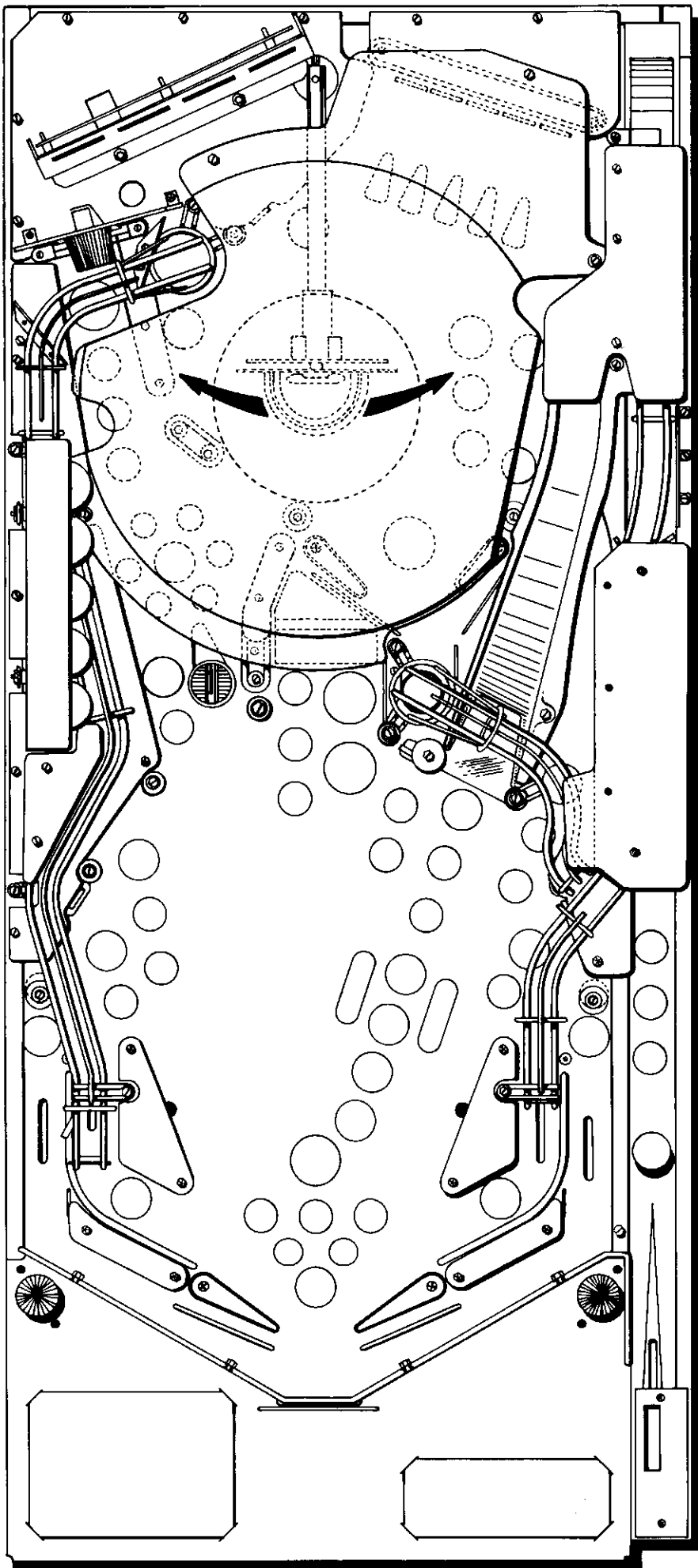
BASIC TROUBLESHOOTING GUIDE

CONDITION	POSSIBLE CAUSE
Game does not power up	* Line fuse (F1) blown * Primary fuse (F2) blown
Game does not power up but general illumination lamps light	* Power supply fuse (F5) blown
SWITCH SHORT message appears in display on power up	* Check for a voltage >0v shorted to switch return number shown in display * Bad Control Board (A1) * Bad Driver Board (A3)
Lightbox illumination lamps do not light	* Fuse (F8) blown
Playfield illumination lamps do not light	* Fuse (F9) blown
All controlled lamps, flash lamps, relays, and switches not working	* Fuse (F6) blown * Bad Driver Board (A3)
All controlled lamps work but some switches do not work	* Bad diode associated with the switch (contact point type switch only)
Some controlled lamps and some switches do not work	* Short circuit on associated strobe line on playfield * Bad Driver Board (A3)
Display not working (blank) but LED on Dot Matrix Controller Board (A8) is flashing	* Display fuse (F3) or (F4) blown * Bad Dot Matrix Display Board (A4) * Bad Display Controller Board (A8)
Display not working and LED on Control Board is flickering rapidly	* Bad Dot Matrix Controller Board (A8) * Bad Control Board (A1)
Display not working and LED on Dot Matrix Controller Board (A8) is glowing bright to dim	* Bad Dot Matrix Controller Board (A8)
A solenoid operated device does not work. (Pop Bumper, Kicker, etc.)	* Associated fuse on playfield is blown * Bad Driver Board (A3)
All flippers and solenoids do not work	* Solenoid fuse (F7) blown
A flipper coil overheats and burns or fuse keeps blowing	* End of stroke switch on flipper unit not opening when the flipper button is held in. * Shorted capacitor on flipper unit
Flipper chatters when flipper button is held in	* Open hold winding (small diameter wire) on flipper coil
No sound or speech	* Bad Auxiliary Power Supply fuse (F10 or F11) * Bad Auxiliary Power Supply Board (A5) * Bad Auxiliary Sound Board (A20) * Bad Sound Board (A6)
Some sounds or speech missing	* Bad Auxiliary Sound Board (A20) * Bad Sound Board (A6)
An optical switch does not work or works intermittently	* Misalignment of LED transmitter to receiver * Bad LED transmitter and/or receiver * Bad Optical Interface Board (A25)

IMPORTANT NOTICE

THIS SHIPMENT HAS BEEN CAREFULLY INSPECTED AND PROPERLY PACKED BEFORE LEAVING THE FACTORY.

WE CANNOT ASSUME RESPONSIBILITY FOR BREAKAGE THAT MAY OCCUR IN TRANSPORTATION. IF THIS SHIPMENT IS DAMAGED IN ANY WAY, IMMEDIATELY NOTIFY THE CARRIER AND FILE DAMAGE REPORT SO THAT A SATISFACTORY ADJUSTMENT CAN BE MADE BY THEM.



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759 INDUSTRIAL DRIVE
BENSENVILLE, IL 60106
1-708-350-0400
FAX: 1-708-350-1097

THE PREMIER HOTLINE
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