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INSTRUCTION MANUAL

QUE BALL WIZARD



GAME #734

(3 BALL GAME)

INSTRUCTION MANUAL

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GAME PROM:	DISPLAY PROM:	SOUND PROMS:	
(TYPE 26C512)	(TYPE 27C020-25)	(TYPE 27C256)	(TYPE 27C020-25)
734/GPROM	734/DSPROM	734/DROM1	734/AROM1
		734/YROM1	734/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.



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ADDENDUM

ATTACH TO AND A PART OF
CUE BALL WIZARD (GAME #734)
INSTRUCTION MANUAL

GAME AS SHIPPED VARIES FROM THE INSTRUCTION MANUAL AS PRINTED.

CORRECTED PAGE 3

HORSESHOE

AWARD EXTRA BALL WHEN BOTH EXTRA BALL LAMPS HAVE BEEN LIT SOLID DURING HORSESHOE EXTRA BALL ROUND (WHEN THE CUE BALL IS OUT OF THE GAME OR WHEN THE CUE BALL IS IN THE GAME AND ADJUSTMENT #46 IS SET TO "VERY HARD").
AWARD EXTRA BALL WHEN EITHER EXTRA BALL LAMP IS LIT SOLID DURING HORSESHOE EXTRA BALL ROUND (WHEN THE CUE BALL IS IN THE GAME AND ADJUSTMENT #46 IS NOT SET TO "VERY HARD").

CORRECTED PAGE 12

ADD HEADINGS FOR STEP #54 AND #55 AS LISTED BELOW TO THE TEST MODE FLOWCHART.

CORRECTED PAGE 13

46 H.SHOE E.B. ROUND TIME VERY EASY EASY MEDIUM HARD VERY HARD

CORRECTED PAGE 14

46) HORSESHOE EXTRA BALL ROUND TIME
VERY EASY = 18 SEC.
EASY = 18 SEC.
MEDIUM = 15 SEC.
HARD = 10 SEC.
VERY HARD = 8 SEC. IF CUE BALL
IS OUT OF GAME
VERY HARD = 15 SEC. IF CUE BALL
IS IN GAME

ADDED TO PAGE 14

54) WAGON WHEEL
*** EASY = LEFT RAMP SHOT FLASHES
LEFT RAMP WAGON WHEEL IF
CORNER POCKET IS LIT FOR
'LITE RAMP'.
HARD = LEFT RAMP HAS NO EFFECT ON
FLASHING RAMP WAGON WHEEL
LAMP.

55) D-O-U-B-L-E
This adjustment determines whether or
not a letter is added to D-O-U-B-L-E
at the end of the game.
*** EASY - ADD A LETTER IF D-O-U-B-L
IS NOT ALREADY SPELLED.
MEDIUM - ADD A LETTER IF D-O-U IS
NOT ALREADY SPELLED.
HARD - DO NOT ADD A LETTER.

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 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.

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. Raise the playboard and pivot it 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 and set the pitch. Recommended pitch is 6°.
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).

D. TICKET DISPENSER (OPTIONAL)

This machine is equipped to easily interface to the Deltronic Labs #DL-4-S-S ticket dispenser with the outside mounting option. 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 1-1/4" 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. 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/Lightbox Schematic Diagram). The line voltage plug located inside the cabinet on the right side can be used for supplying power to the unit. The CENTER CHUTE SETTING adjustment can then be used to set the number of credits to be issued for each bill accepted.

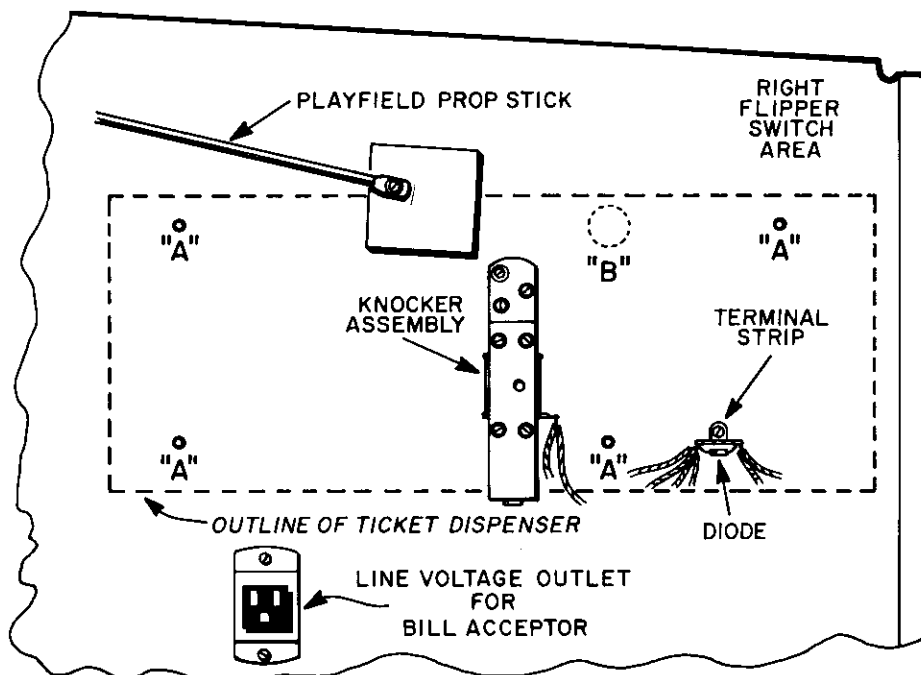


FIGURE 1.

II. GAME PLAY AND SCORING



HOW TO PLAY

POP BUMPERS

SCORE 3000.

CHANGE WAGON WHEEL ROUND WHEN CHANGE LAMP IS FLASHING.

WHEN NOT IN MULTIBALL, NOT IN A ROUND, AND NOT IN 9-BALL PLAY, CHANGE BANK SHOT HOLE LAMPS FROM FLASHING TO LIT SOLID FOR A TIME PERIOD.

TOP CENTER SPOT TARGETS (SWEET SPOT)

SCORE 1,000,000 OR 50,000,000 WHEN FLASHING.

ADD TO POOLBALL MANIA BONUS DURING POOLBALL MANIA.

UPPER SPOT TARGETS

SCORE 20,000 OR 5,000,000 WHEN FLASHING.

AWARD SPECIAL WHEN FLASHING.

ADD TO POOLBALL MANIA BONUS DURING POOLBALL MANIA.

BANK SHOT HOLES

SCORE 20,000.

COLLECT AND CONTINUE COUNTDOWN BONUS WHEN BANK SHOT LAMP IS FAST-FLASHING DURING COMBO SHOTS ROUND.

AWARD CLEAN BANK SHOT AWARD AND BANK SHOT (MYSTERY) AWARD WHEN BANK SHOT LAMP IS FLASHING OR JUST BANK SHOT (MYSTERY) AWARD WHEN BANK SHOT LAMP IS LIT SOLID.

LEFT SIDE SPOT TARGET

SCORE 20,000.

SCORE 5,000,000 WHEN FLASHING.

SCORE 10,000,000 WHEN FLASHING.

AWARD HURRY-UP SPECIAL WHEN FLASHING.

ADD TO POOLBALL MANIA BONUS DURING POOLBALL MANIA.

DROP TARGETS

SCORE 5,000 OR 500,000 WHEN LIT.

ADD TO POOLBALL MANIA BONUS DURING POOLBALL MANIA.

ADD 1,000,000 TO JACKPOT WHEN ADD JACKPOT LAMP IS FLASHING.

DURING 8-BALL PLAY, WHEN FLASHING DROP TARGET BANK IS COMPLETED, FLASH SIDE POCKET 8-BALL LAMP.

DURING 9-BALL PLAY, ADVANCE TO THE NEXT TARGET (BALL) WHEN FLASHING TARGET (BALL) HAS BEEN KNOCKED DOWN.

FOR 9-BALL TARGET, SCORE 1/2 BILLION WHEN FLASHING IN 9-BALL PLAY. RE-START 8-BALL PLAY IF 1/2 BILLION IS COLLECTED.

P-O-O-L ROLLOVERS

SCORE 20,000.

COMPLETING P-O-O-L LIGHTS RAMP FOR VIDEO MODE PLAY AND FLASHES SWEET SPOT LAMPS FOR 50,000,000.

II. GAME PLAY AND SCORING

KICKING RUBBERS

SCORE 90.

THE TOP SPECIAL LAMPS TOGGLE WHEN THE MULTIPLIER IS AT 7X.

THE SPELL WIZARD LAMP IS TOGGLED IF THE CUE BALL IS OUT OF THE GAME AND THE CUE BALL GAME ADJUSTMENT IS SET TO 'OUT'.

CORNER POCKET HOLE

SCORE 20,000.

COLLECT COUNTDOWN BONUS AND END COMBO SHOTS ROUND WHEN CORNER POCKET HOLE LAMP IS FAST-FLASHING DURING COMBO SHOTS ROUND.

ADVANCE MULTIPLIER WHEN FLASHING. WHEN MULTIPLIER REACHES 7X, THEN THE TWO TOP SPECIAL LAMPS ARE ACTIVATED.

ADD LETTER TO D-O-U-B-L-E WHEN FAST-FLASHING DURING SPELL DOUBLE ROUND.

LIGHT RAMP FOR ENTERING WAGON WHEEL ROUND WHEN 'LITE RAMP' LAMP IS LIT.

LOWER RIGHT SIDE TARGET

SCORE 20,000.

ADD TO POOLBALL MANIA BONUS DURING POOLBALL MANIA.

CHANGE WAGON WHEEL ROUND WHEN CHANGE LAMP IS FLASHING.

AWARD EXTRA BALL WHEN FLASHING.

HORSESHOE

See yellow sheet

SCORE 100,000.

SCORE 2,000,000 AND ADVANCE SCORING LAMPS WHEN 2M LAMPS ARE LIT.

SCORE AS INDICATED WHEN LAMP IS FLASHING AND HORSESHOE IS HIT FROM THAT SIDE. ADVANCE FLASHING SCORE LAMP AND REVERSE SIDES.

AWARD EXTRA BALL WHEN BOTH EXTRA BALL

LAMPS HAVE BEEN LIT SOLID DURING HORSESHOE EXTRA BALL ROUND.

ELEVATED GREEN SIDE POCKET SPOT TARGETS

THESE TARGETS ARE ONLY ACTIVE IF THE CUE BALL IS IN THE GAME AND THE CUE BALL GAME ADJUSTMENT IS SET TO 'IN'.

SCORE 5,000.

ADVANCE SCRATCH FEATURE IF NO OTHER FEATURE LAMPS ARE ACTIVE.

ADD TO POOLBALL MANIA BONUS DURING POOLBALL MANIA.

IF 8-BALL IS FLASHING IN 8-BALL PLAY, FLASH RAMP FOR MULTIBALL, ADVANCE RACKS, RESET SOLIDS OR STRIPES (DROP TARGETS) FOR CONTINUED 8-BALL PLAY.

IF 8-BALL IS FLASHING IN 9-BALL PLAY, FLASH 9-BALL DROP TARGET FOR 1/2 BILLION.

ADVANCE RACKS AND SCORE SIDE POCKET SCORE VALUE (10,000,000 IF CUE BALL ADJUSTMENT IS SET TO 'IN' AND 5,000,000 IF CUE BALL ADJUSTMENT IS SET TO 'OUT') WHEN SIDE POCKET LAMP IS FAST-FLASHING IN SIDE POCKET ROUND.

LAUNCH 8-BALL AND SCORE YELLOW, BLUE OR RED JACKPOT DURING MULTIBALL.

SIDE POCKET SPOT TARGETS

THESE TARGETS PERFORM THE SAME FUNCTION AS THE ELEVATED SIDE POCKET SPOT TARGETS IF THE CUE BALL IS OUT OF THE GAME AND THE CUE BALL GAME ADJUSTMENT IS SET TO 'OUT'.

SCORE 50,000.

SCORE 10,000,000 WHEN 10,000,000 IS FLASHING.

SCORE 30,000,000 WHEN 'NO WAY' LAMP IS FAST-FLASHING.

ADD LETTER TO W-I-Z-A-R-D WHEN LIT.

ADD TO POOLBALL MANIA BONUS DURING POOLBALL MANIA.

II. GAME PLAY AND SCORING

SIDE SPOT TARGETS (CENTER OF PLAYFIELD)

SCORE 3,000.

ADD TO POOLBALL MANIA BONUS DURING POOLBALL MANIA.

RAMP

SCORE 500,000.

ENTER VIDEO MODE WHEN LIT.

ENTER MULTIBALL WHEN FLASHING.

START CURRENT WAGON WHEEL ROUND WHEN FLASHING.

ADD LETTER TO D-O-U-B-L-E WHEN FAST-FLASHING DURING SPELL DOUBLE ROUND.

COLLECT AND CONTINUE COUNTDOWN BONUS WHEN RAMP LAMPS ARE STROBING DURING COMBO SHOTS ROUND.

RE-ACTIVATE AND RE-INITIALIZE YELLOW, BLUE, AND RED JACKPOTS DURING MULTIBALL WHEN SUPER JACKPOT LAMP IS FLASHING. SCORE 100,000,000.

BEGIN 9-BALL PLAY WHEN 9-BALL PLAY LAMP IS FAST-FLASHING.

YELLOW SPOT TARGETS (UPPER PLATFORM)

SCORE YELLOW JACKPOT DURING MULTIBALL.

BLUE SPOT TARGETS (UPPER PLATFORM)

SCORE 5,000,000 IF HIT BY 8-BALL ON OPENING PLUNGER SKILL SHOT.

FLASH LEFT HORSESHOE 10M LAMP IF WAGON WHEEL LAMP IS NOT FLASHING IF HIT BY 8-BALL ON OPENING PLUNGER SKILL SHOT.

SCORE BLUE JACKPOT DURING MULTIBALL.

RED SPOT TARGETS (UPPER PLATFORM)

SCORE RED JACKPOT DURING MULTIBALL.

OUTHOLE

IF THE CUE BALL IS IN THE GAME AND THE GAME IS SET TO 3 BALLS PER GAME, THEN THE STATE OF THE 8-BALL LAMP WILL BE REMEMBERED FROM BALL TO BALL FOR EACH PLAYER. THIS STATE WILL BE RESTORED UPON THE PLAYER'S NEXT BALL.

THE STATE OF THE VIDEO MODE LAMP WILL BE REMEMBERED FROM BALL TO BALL FOR EACH PLAYER. THIS STATE WILL BE RESTORED UPON THE PLAYER'S NEXT BALL.

COLLECT POOLBALL MANIA BONUS, IF ANY.

COLLECT 500,000 TIMES RACKS TIMES MULTIPLIER BONUS.

ADDITIONAL FEATURES

SCRATCH SHOT

THE PLAYER CAN ACCUMULATE SCRATCHES BY HITTING THE SIDE POCKET WHEN NO OTHER SIDE POCKET FEATURE IS ACTIVE. WHEN THE CUE BALL IS IN THE GAME, THE PLAYER SCORES 10,000,000 WHEN HE REACHES 3 SCRATCH SHOTS, 30,000,000 WHEN HE REACHES 8 SCRATCH SHOTS, 60,000,000 WHEN HE REACHES 15 SCRATCH SHOTS, AND 90,000,000 WHEN HE REACHES 30 SCRATCH SHOTS. WHEN THE CUE BALL IS OUT OF THE GAME, THE PLAYER SCORES 10,000,000 WHEN HE REACHES 6 SCRATCH SHOTS, 30,000,000 WHEN HE REACHES 16 SCRATCH SHOTS, 60,000,000 WHEN HE REACHES 30 SCRATCH SHOTS, AND 90,000,000 WHEN HE REACHES 60 SCRATCH SHOTS.

8-BALL PLAY

THE PLAYER MUST COMPLETE THE LEFT DROP TARGETS (SOLIDS) OR THE RIGHT DROP TARGETS (STRIPES) IN ORDER TO LIGHT THE 8-BALL. FLASHING LAMPS SHOW THE PLAYER WHETHER SOLIDS OR STRIPES ARE ACTIVE. HITTING THE 8-BALL TARGET WHEN IT IS FLASHING, ADVANCES THE RACKS AND RE-STARTS THE 8-BALL SEQUENCE.

POOLBALL MANIA

WHEN ALL WAGON WHEEL ROUNDS HAVE BEEN COMPLETED, A PLAYER IS THEN GIVEN THE OPPORTUNITY TO ENTER THE POOLBALL MANIA ROUND. POOLBALL MANIA IS 3 BALL

II. GAME PLAY AND SCORING

MULTIBALL AND THE ROUND LASTS AS LONG AS THE PLAYER KEEPS 2 OR 3 BALLS ON THE PLAYFIELD. HITTING VARIOUS TARGETS INCREASES THE POOLBALL MANIA BONUS, WHICH IS COLLECTED AT THE END OF THE BALL. WHEN ONLY 1 BALL IS LEFT ON THE PLAYFIELD, THE 9-BALL PLAY LAMP FLASHES FOR 99 SECONDS. IF THE PLAYER SHOOTS THE RAMP WHEN THIS LAMP IS FLASHING, HE THEN ENTERS 9-BALL PLAY.

ONE NOTE: IF PLAYER DOES NOT SHOOT THE SECOND BALL UP AND OVER THE RAMP SO THAT THE BALL COMES INTO PLAY DOWN THE RIGHT RAMP, THEN IT WILL BE JUST 2 BALL MULTIBALL, NOT 3 BALL MULTIBALL.

9-BALL PLAY

THE OBJECT OF 9-BALL IS TO SEQUENTIALLY 'SINK' (HIT THE CORRESPONDING DROP TARGET) BALLS NUMBERED 1 THROUGH 9. COMPLETING BALLS 1 THROUGH 7 SEQUENTIALLY FLASHES THE SIDE POCKET 8-BALL. SINKING THE 8-BALL IN THE SIDE POCKET FLASHES THE 9-BALL AND SINKING THE 9-BALL WILL THEN SCORE 1/2 BILLION POINTS AND RE-START THE 8-BALL PLAY SEQUENCE.

RACK ADVANCES

DEPENDING ON THE RACK ADVANCE EXTRA BALL ADJUSTMENT SETTING, ADVANCING THE RACKS CAN FLASH THE LOWER RIGHT SIDE TARGET EXTRA BALL FOR A TIME PERIOD.

EACH RACK ADVANCE AFTER 7 RACKS HAVE BEEN COMPLETED SCORES 500,000.

MULTIBALL AND JACKPOT COLLECT

COMPLETING SOLIDS OR STRIPES AND THEN SINKING THE 8-BALL FLASHES THE RAMP MULTIBALL LAMP. IF THE PLAYER THEN SHOOTS THE RAMP, HE ENTERS 2 BALL MULTIBALL PLAY. HITTING THE CENTER SIDE POCKET TARGETS LAUNCHES THE 8-BALL AND COLLECTS THE YELLOW, BLUE OR RED JACKPOTS. HITTING DROP TARGETS ADDS TO THE JACKPOTS. WHEN ALL 3 JACKPOTS HAVE BEEN COLLECTED, THE RAMP SUPER JACKPOT LAMP FLASHES. SHOOTING THE RAMP THEN SCORES 100,000,000 SUPER JACKPOT AND RE-INITIALIZES ALL THREE JACKPOTS.

D-O-U-B-L-E FEATURE

COMPLETING D-O-U-B-L-E AWARDS DOUBLE SCORE, DOUBLE AWARDS, AND DOUBLE JACKPOTS FOR THE REST OF THE BALL. LETTERS COMPLETED IN D-O-U-B-L-E ARE REMEMBERED FROM PLAYER TO PLAYER AND FROM GAME TO GAME, EVEN IF POWER IS TURNED OFF.

A LETTER IS ADDED TO D-O-U-B-L-E WHEN THE GAME IS OVER IF D-O-U-B-L IS NOT COMPLETE.

W-I-Z-A-R-D FEATURE

COMPLETING W-I-Z-A-R-D FLASHES THE THREE 5M LAMPS TO SCORE 5,000,000 WHEN HIT. THE CENTER 10M LAMP IS ALSO FLASHED FOR SCORING 10,000,000. THIS LAMP TIMES OUT IF THE CUE-BALL IS NOT IN THE GAME AND THE CUE BALL GAME ADJUSTMENT IS SET TO 'OUT'. LETTERS COMPLETED IN W-I-Z-A-R-D ARE REMEMBERED FOR EACH PLAYER FROM BALL TO BALL, BUT NOT FROM GAME TO GAME.

CLEAN BANK SHOT

A PLAYER RECEIVES HIGHER SCORES/AWARDS EACH TIME HE COLLECTS THE CLEAN BANK SHOT BY SHOOTING THE TOP BANK SHOT HOLES WHEN THE BANK SHOT LAMPS ARE FLASHING. THE AWARDS ARE 1,000,000 - 2,000,000 - 5,000,000 - EXTRA BALL - 7,000,000 - 10,000,000 - 15,000,000 - 20,000,000 - 20,000,000. A PLAYER CAN ONLY BE AWARDED ONE EXTRA BALL PER GAME FROM THE CLEAN BANK SHOT FEATURE. HITTING A POP BUMPER DISABLES THE CLEAN BANK SHOT FEATURE FOR A TIME PERIOD.

HORSESHOE

WHEN THE 2M LAMPS ARE LIT, THEN SHOOTING THE HORSESHOE FLASHES A 5M LAMP AND SHOOTING THAT SIDE OF THE HORSESHOE SCORES 5,000,000 AND FLASHES THE OPPOSITE 10M LAMP. SHOOTING THAT SIDE OF THE HORSESHOE SCORES 10,000,000 AND FLASHES THE OPPOSITE 20,000,000 LAMP. SHOOTING THAT SIDE OF THE HORSESHOE SCORES 20,000,000 AND FLASHES THE OPPOSITE 20,000,000 LAMP. THIS CONTINUES UNTIL A TIME PERIOD HAS EXPIRED (SEE HORSESHOE 20M TIMEOUT ADJUSTMENT).

II. GAME PLAY AND SCORING

HURRY-UP FEATURES

A HURRY-UP FEATURE IS A FEATURE THAT STAYS ACTIVE FOR A LIMITED AMOUNT OF TIME AND IS THEN DISABLED. THE HURRY-UP FEATURES ARE EXTRA BALL, SPECIAL, 10,000,000, 9-BALL PLAY, AND 1/2 BILLION.

BANK SHOT (MYSTERY)

A PLAYER RECEIVES A MYSTERY AWARD WHEN HE LANDS IN A TOP BANK SHOT HOLE. THE BANK SHOT (MYSTERY) AWARD COULD BE ANY OF THE FOLLOWING:

COMPLETE ALL SOLIDS or STRIPES.

SCORE 1,000,000.

START HURRY-UP 9-BALL PLAY.

FLASH HURRY-UP 10,000,000 LAMP.

AWARD EXTRA BALL, SPECIAL, CURRENT WAGON WHEEL ROUND, AND MULTIBALL.

ADVANCE MULTIPLIER.

ADVANCE RACKS.

ADVANCE LETTER IN D-O-U-B-L-E.

ADVANCE LETTER IN W-I-Z-A-R-D.

AWARD D-O-U-B-L-E.

AWARD W-I-Z-A-R-D.

ENABLE HURRY-UP EXTRA BALL.

ENABLE HURRY-UP SPECIAL.

AWARD EXTRA BALL.

START VIDEO MODE.

LIGHT RAMP ENTER ROUND LAMP.

ENABLE HURRY-UP SPECIAL, EXTRA BALL, AND 10,000,000.

ENTER CURRENT WAGON WHEEL ROUND.

SCORE 5,000,000.

SCORE 10,000,000.

ENABLE HURRY-UP 1/2 BILLION.

VIDEO MODE

THE PLAYER TRIES TO CATCH A FALLING POOL BALL BY MOVING THE POCKET ON THE DISPLAY LEFT OR RIGHT WITH THE LEFT AND RIGHT FLIPPERS. IF HE IS SUCCESSFUL, THEN HE SCORES POINTS ACCORDING TO THE GAME ADJUSTMENT #52 SETTING.

MULTIPLIER ADVANCES

ADVANCING THE MULTIPLIER TO 7X ENABLES THE TOP SPOT TARGET SPECIALS.

OPENING PLUNGER SKILL SHOT

UPON ANY NEW BALL IN PLAY WHEN NOT IN MULTIBALL OR POOLBALL MANIA, THE PLAYER SHOULD TRY TO TIME HIS SHOT SO THAT THE SHOT BALL PASSES THROUGH THE RIGHT RAMP OPTO SWITCH WHEN THE 8-BALL IS IN POSITION TO HIT THE CENTER BLUE TARGETS ON THE UPPER 8-BALL PLATFORM. WHEN THE BALL PASSES THROUGH THE RIGHT RAMP OPTO SWITCH, THE 8-BALL IS FIRED AT THE PLATFORM SPOT TARGETS. HITTING THE YELLOW OR RED TARGETS AWARDS NOTHING. HITTING THE BLUE TARGETS SCORES 5,000,000 AND STARTS THE HORSESHOE SCORING AT 10,000,000 IF THE ENTER ROUND LAMP IS NOT FLASHING.

LANE CHANGE

HITTING THE LEFT OR RIGHT FLIPPER ROTATES ALL LIT P-O-O-L LAMPS.

ROUNDS

COMPLETING ALL WAGON WHEEL ROUNDS ALLOWS THE PLAYER TO ENTER POOLBALL MANIA (3 BALL MULTIBALL).

ROWDY RAMP ROUND

CONSECUTIVE SHOTS UP THE RAMP INCREASE THE SCORE AWARDED. THE SCORES RANGE FROM 2,000,000 - 5,000,000 - 10,000,000 - 20,000,000 - 40,000,000 - 40,000,000.

II. GAME PLAY AND SCORING

HORSESHOE EXTRA BALL ROUND

IF CUE-BALL IS OUT, THEN COMPLETING THE HORSESHOE BY SHOOTING BOTH SIDES AWARDS AN EXTRA BALL.

IF CUE-BALL IS IN, THEN COMPLETING EITHER SIDE OF THE HORSESHOE AWARDS AN EXTRA BALL.

'NO WAY' ROUND

IF THE CUE-BALL IS IN, THEN EACH HIT OF THE ELEVATED TARGETS SCORES 30,000,000.

IF THE CUE-BALL IS OUT, THEN THE PLAYER MUST SHOOT THE HORSESHOE TO SCORE THE INDICATED VALUE AND ADVANCE THE SCORE LAMPS. COLLECTING THE 20,000,000 SCORE THEN FLASHES THE 'NO WAY' LAMP AND THE PLAYER MUST HIT THE CENTER SIDE POCKET SPOT TARGETS TO SCORE 30,000,000.

SIDE POCKET ROUND

SCORE EITHER 5,000,000 OR 10,000,000 WHEN THE SIDE POCKET TARGETS ARE HIT AND ADVANCE RACKS.

SPELL DOUBLE ROUND

PLAYER ADDS A LETTER TO D-O-U-B-L-E IF HE HITS THE CORNER POCKET WHEN ENABLED OR THE RAMP WHEN ENABLED. THE CORNER POCKET IS ENABLED FIRST, THEN THE RAMP, ONCE THE CORNER POCKET HAS BEEN HIT.

COMBO SHOTS ROUND

THIS ROUND FEATURES THREE SEPARATE COUNTDOWN BONUSES THAT THE PLAYER TRIES TO COLLECT. FIRST, THE RAMP IS ENABLED. IF THE PLAYER SHOOT THE RAMP, THEN THE RAMP COUNTDOWN BONUS IS COLLECTED AND THE TOP BANK SHOT HOLES ARE ENABLED. SHOOTING EITHER BANK SHOT HOLE COLLECTS ITS COUNTDOWN BONUS AND ENABLES THE CORNER POCKET. SHOOTING THE CORNER POCKET COLLECTS ITS COUNTDOWN BONUS AND THE ROUND ENDS.

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 Burn-In. 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 be given a choice as to which function he wants to access. Pressing the appropriate button will select that 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.

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. The Credit button can be used to restart this test.

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 the 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. The Credit button can be used to restart this test. Only one lamp at a time should flash during this test.

D. RELAY AND SOLENOID TEST

This test will allow the 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 inactive switches. If a switch has not been actuated in the course of the last 15 games the switch name and number will be displayed.

The second part of the test will allow the operator to test the operation of all the switches used in the game. If no switches are closed when this test is started, the message "ALL SWITCHES OPEN" will be displayed. If any switches are closed either before or after this test is started, the closed switch(s) name and number will 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. DISPLAY TEST

This test allows the operator to check the operation of the 128 x 32 dot matrix display. The right flipper button is used to advance this test. The first three 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. When all four blocks appear in the display at the same time, it is normal to see them slightly flicker. During the next four steps a diagonal pattern is stepped from left to right

III. TEST MODE

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. The Credit button can be used to restart this test.

H. SOUND TEST

This test allows the operator to test 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 from the Sound Board. 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.

I. FRONT DOOR TEST

This test allows the operator to check 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. The Credit button can be used to restart this test.

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 the first four steps (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 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.

III. TEST MODE

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

23) 1 COIN BUY-IN BONUS

At the end of a game a 10-second timer is initialized allowing each player that participated in the previous game a chance to purchase 1 credit for each coin inserted.

24) 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

III. TEST MODE

37) ATTRACT MESSAGE

This step is used to enable or disable an operator message during the attract mode (game over). This step is also used to enter a user message into memory. 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 Credit button is also used to select characters after they have been chosen using the left and right flipper buttons.

38) NOT USED

39) 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.

40) 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.



ADJUSTMENTS

OPERATOR ADJUSTMENT SETTINGS
 (***) = FACTORY DEFAULT SETTING

41) 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.

STEP				(ENG.)	(FR.)		
		VERY EASY	EASY	***	***	VERY HARD	
41	GAME DIFFICULTY	VERY EASY	EASY	MEDIUM	HARD	VERY HARD	
42	ROUND TIMING	VERY EASY	EASY	MEDIUM	HARD	VERY HARD	
43	EXTRA BALL %	VERY EASY	EASY	MEDIUM	HARD	VERY HARD	
44	HORSESHOE 20M TIMEOUT	EASY	EASY	MEDIUM	HARD	HARD	
45	POOLBALL MANIA	EASY	EASY	MEDIUM	MEDIUM	HARD	
46	H.SHOE E.B. ROUND TIME	EASY	EASY	MEDIUM	HARD	HARD	<i>Handwritten: HARD</i>
47	RACK ADVANCE E.B.	EASY	EASY	MEDIUM	MEDIUM	HARD	
48	CLEAN BANK SHOT	EASY	EASY	EASY	HARD	HARD	
49	HURRY-UP TIMING	EASY	EASY	MEDIUM	HARD	HARD	

III. TEST MODE

42) ROUND TIMING

VERY EASY = Slowest
EASY = Slow
MEDIUM = Average
HARD = Faster
VERY HARD = Fastest

43) EXTRA BALL PERCENTAGE

Controls how often an extra ball is awarded in bank shot (mystery). If actual extra ball percentage is less than the below setting, then bank shot (mystery) could award an extra ball.

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

44) HORSESHOE 20M TIMEOUT

EASY = 7 SEC.
MEDIUM = 4 SEC.
HARD = 3 SEC.

45) POOLBALL MANIA

Bonus score received for hitting each appropriate target while in poolball mania.

EASY = 10,000,000
MEDIUM = 5,000,000
HARD = 3,000,000

46) HORSESHOE EXTRA BALL ROUND TIME

EASY = 18 SEC.
MEDIUM = 15 SEC.
HARD = 10 SEC.

very hard = 8 Sec.

See yellow sheet

47) RACK ADVANCE EXTRA BALL

When the hurry-up extra ball is lit for the lower right side target.

EASY = After racks 2 and 6
MEDIUM = After rack 4
HARD = Never for racks completed

48) CLEAN BANK SHOT

EASY = Award carries over from ball to ball.
HARD = Award resets every ball.

49) HURRY-UP TIMING

Time that any hurry-up feature is active.

EASY = 15 SEC.
MEDIUM = 10 SEC.
HARD = 7 SEC.

50) AUTO-SKILL

Various game features become more difficult as game recognizes a

player's increased skill level.

OFF = Disabled

*** ON = Enabled

51) REPLAY LEVEL BOOST

Automatically raises the replay score level if player has won a replay and his skill level is determined to be at a high enough level.

OFF = Disabled

*** ON = Enabled

52) VIDEO MODE

Determines the scoring for each caught ball.

*** EASY = Score 2,000,000 for 1st ball caught.
Score 5,000,000 for 2nd ball caught.
Score 10,000,000 for 3rd ball caught.
Score 20,000,000 for 4th ball caught.

HARD = Score 1,000,000 for 1st ball caught.
Score 2,000,000 for 2nd ball caught.
Score 5,000,000 for 3rd ball caught.
Score 10,000,000 for 4th ball caught.

53) CUE-BALL

*** IN = Cue-ball is in the game.
OUT = Cue-ball out of the game.

54) See yellow sheet

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

IV. BURN-IN

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

III. TEST MODE

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) AUTO-SKILL disabled
- b) D-O-U always lit in D-O-U-B-L-E sequence
- c) Bank shot (Mystery) always awards hurry-up 10,000,000

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.

SERVICE SWITCH

This 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 step.

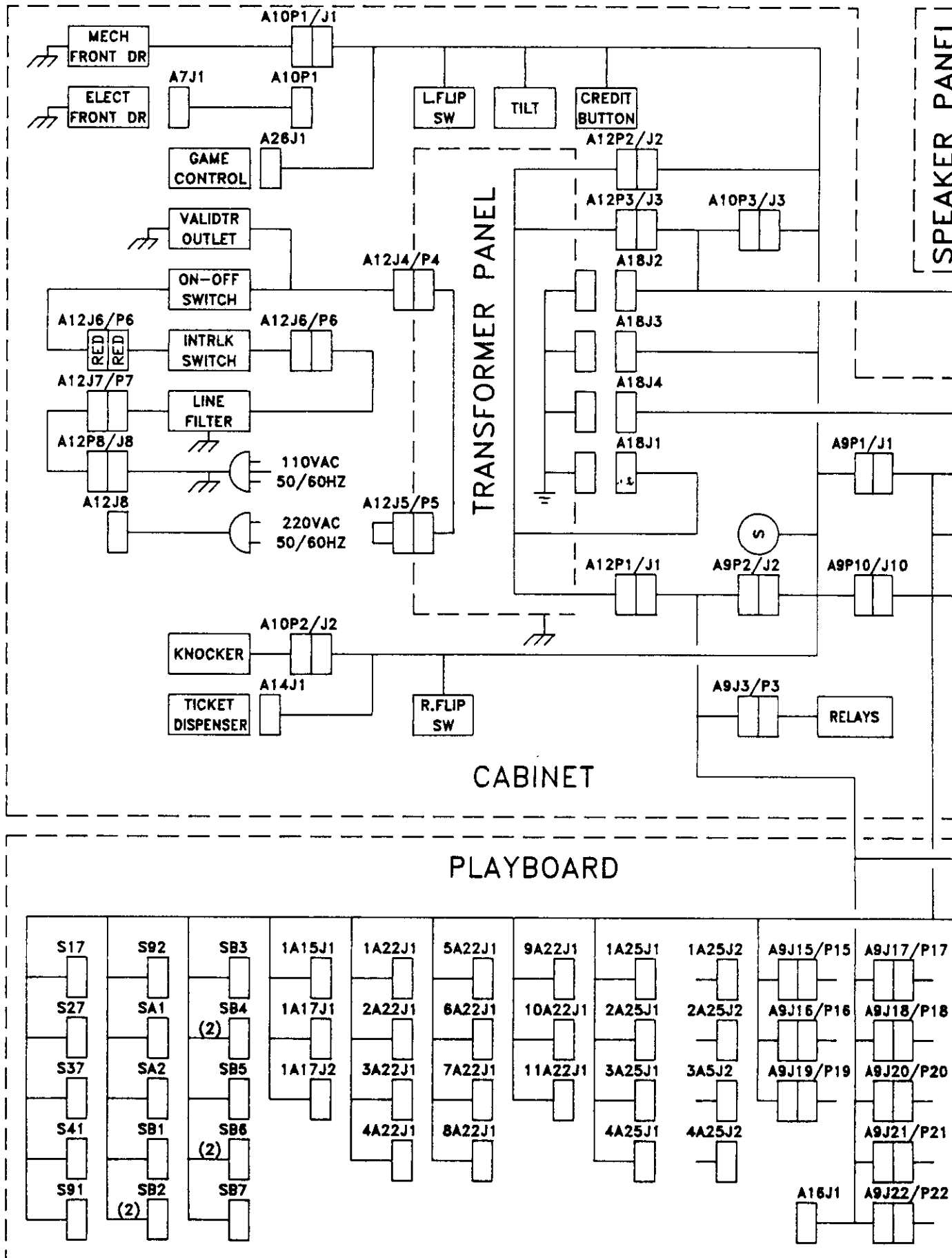
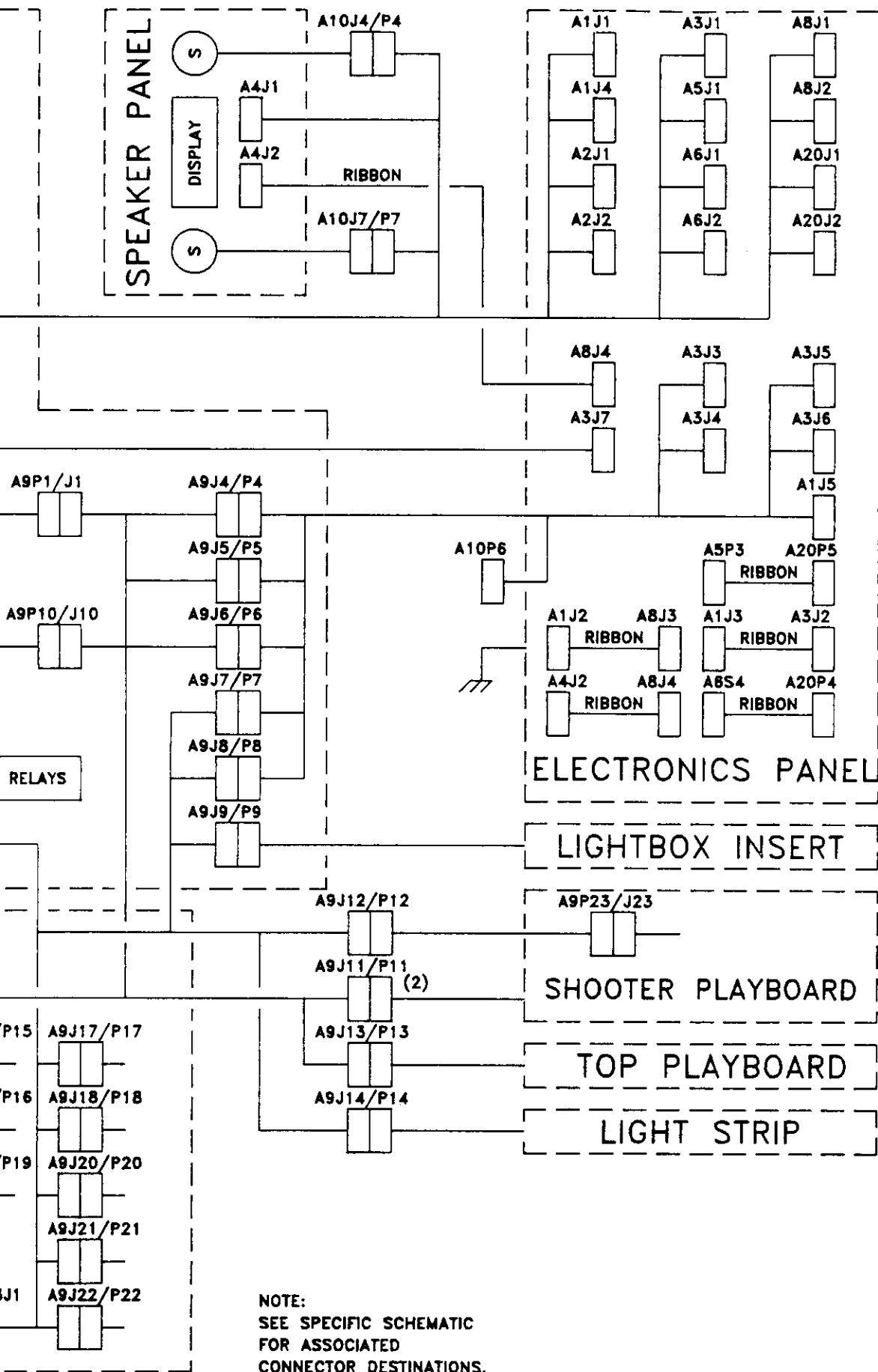


FIGURE 1. INTERCONNECTIO

OF OPERATION



NOTE:
SEE SPECIFIC SCHEMATIC
FOR ASSOCIATED
CONNECTOR DESTINATIONS.

CONNECTION DIAGRAM

IV. THEORY OF OPERATION

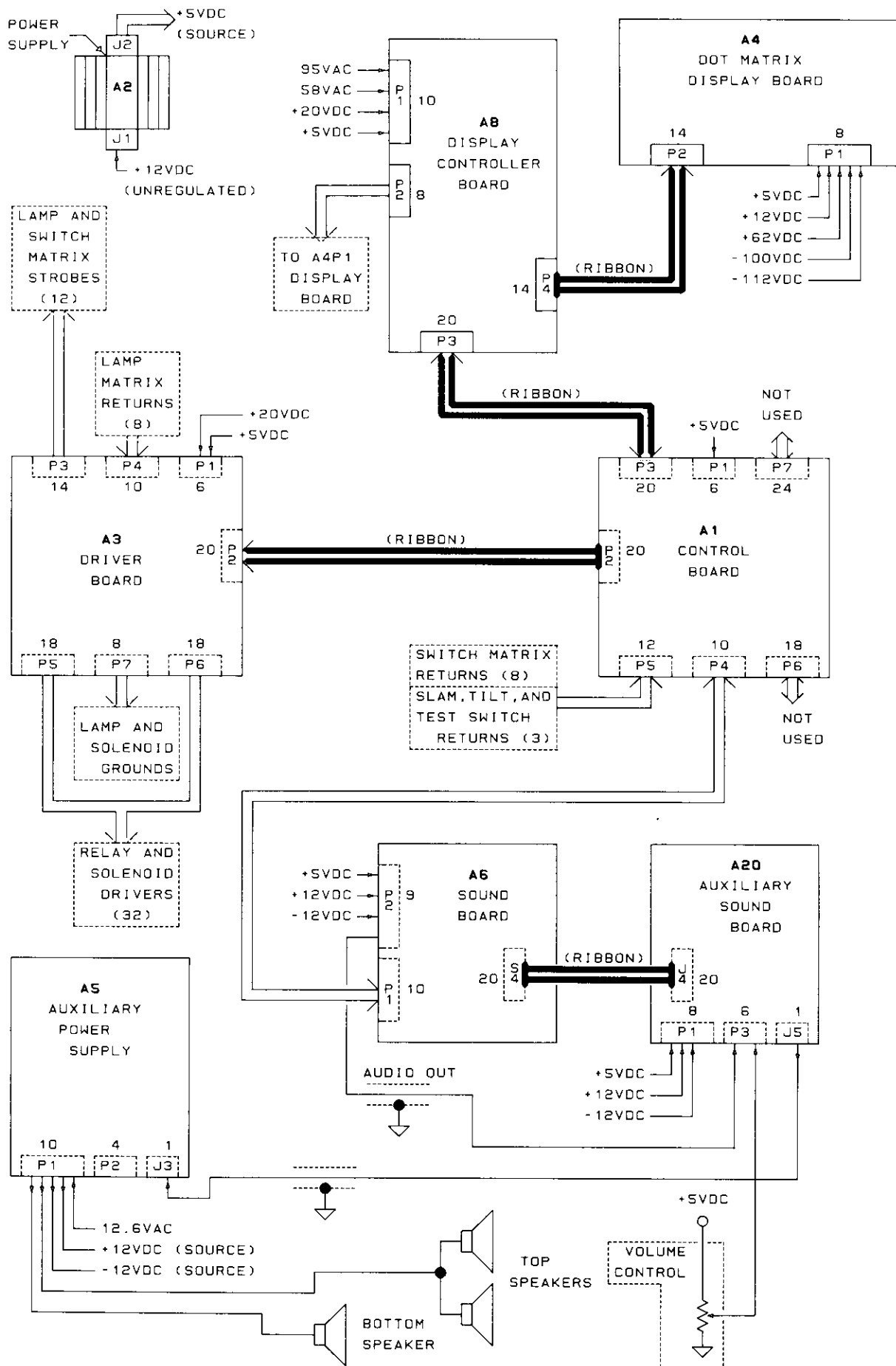


FIGURE 2. SYSTEM 3 BLOCK DIAGRAM

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 the normal contact point type switches used for rollovers and spot targets.

These switches do not require any adjustment. DO NOT ATTEMPT TO ADJUST THE WIDE CANTILEVER BEAM. 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.

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 Control Board

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.

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

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.....		2-1/2 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	SLO-BLO
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

USE	RATING	PART NO.	USAGE	COIL/COLOR	SLEEVE
F15	1-1/2 AMP SLO-BLO	EL-24	LEFT POP BUMPER	16570 (GREEN)	5064
F16	1-1/2 AMP SLO-BLO	EL-24	RIGHT POP BUMPER	16570 (GREEN)	5064
F17	1 AMP SLO-BLO	EL-6	TOP L. KICKING RUB.	17876 (TAN)	21411
F18	1 AMP SLO-BLO	EL-6	TOP R. KICKING RUB.	17876 (TAN)	21411
F19	1-1/2 AMP SLO-BLO	EL-24	BOT. L. KICKING RUB.	5195 (WHITE)	5064
F20	1-1/2 AMP SLO-BLO	EL-24	BOT. R. KICKING RUB.	5195 (WHITE)	5064
F21	2-1/2 AMP SLO-BLO	EL-21	BOTTOM LEFT FLIPPER	25959 (RED)	5065
F22	2-1/2 AMP SLO-BLO	EL-21	BOTTOM RIGHT FLIPPER	25959 (RED)	5065
F23	1/2 AMP SLO-BLO	EL-20	BALL RELEASE	26451 (YELLOW)	5065
			OUTHOLE	26451 (YELLOW)	5065
			TOP LEFT UPKICKER	26450 (PINK)	21411
			TOP RIGHT UPKICKER	26450 (PINK)	21411
F24	1 AMP SLO-BLO	EL-6	BOT. LEFT UPKICKER	17876 (TAN)	21411
F25	2 AMP SLO-BLO	EL-7	LEFT 3 BANK RESET	17876 (TAN)	21411
			RIGHT 3 BANK RESET	17876 (TAN)	21411
			LEFT 4 BANK RESET	16570 (GREEN)	5064
			RIGHT 4 BANK RESET	16570 (GREEN)	5064
F26	1/2 AMP SLO-BLO	EL-20	PLUNGER GATE	26451 (YELLOW)	5065
F27	2 AMP SLO-BLO	EL-7	BALL SHOOTER	19300 (ORANGE)	5064

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-26926	3-BANK RESET	32.8	2650	#27	BLUE
A-25959	FLIPPER (NEW UNIT)	3.85/202	445/1225	#22/#30	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-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

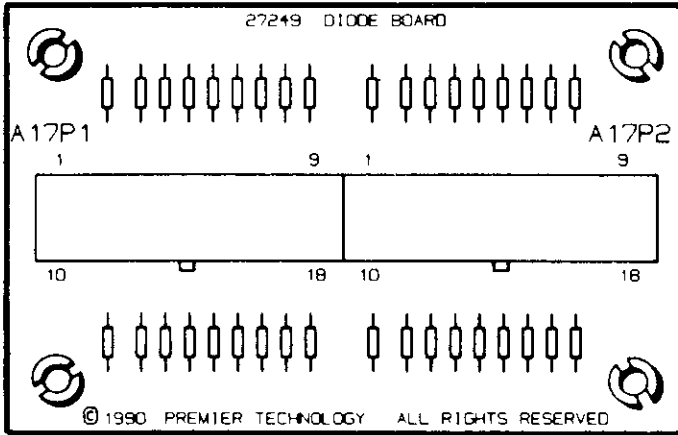
VI. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

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VI. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

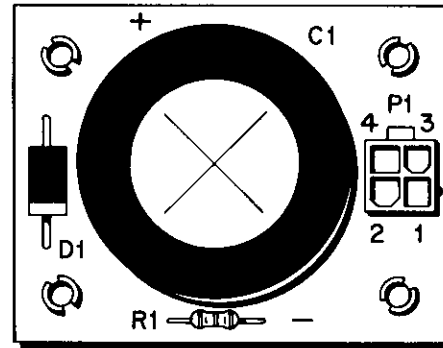
DIODE BOARD (A17) COMPONENT LOCATION



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

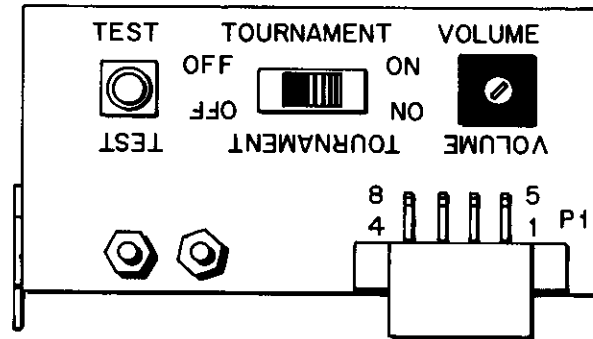
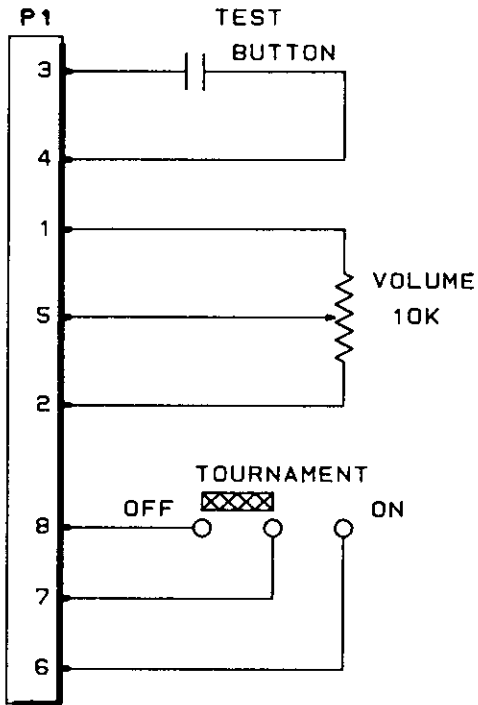
FILTER BOARD (A16) COMPONENT LOCATION



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

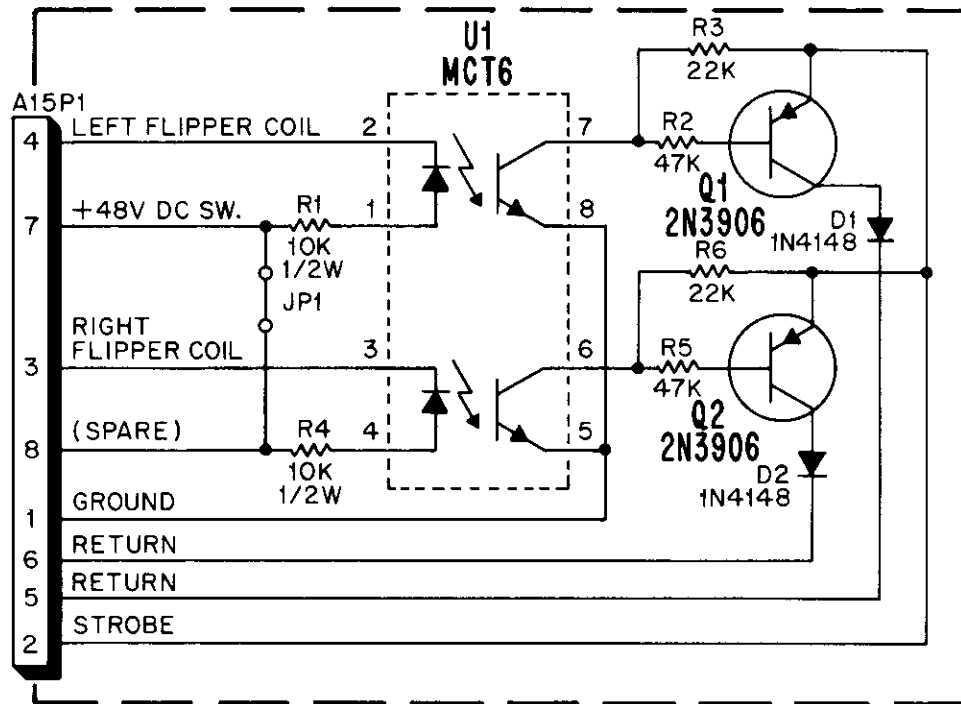
GAME CONTROLS BOARD (A26) COMPONENT LOCATION



GAME CONTROLS BOARD (A26) PARTS LIST

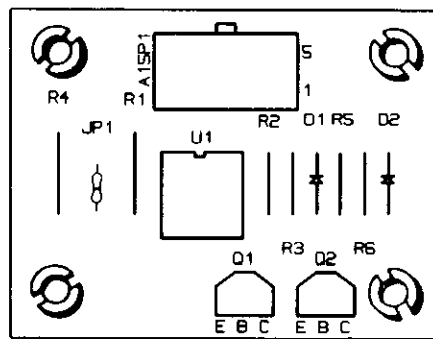
DESCRIPTION	PART NUMBER
Game Controls Board (A26)	MA-1851
Potentiometer, 10K OHM, 20%, 15W	XO-1194
Pushbutton Switch	XO-897
Slide Switch	XO-1193
Header, 8 Position	XO-920
Mounting Bracket	28619
Key Cap, Yellow	XO-1198

VI. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



Premier Technology			
TITLE			
SENSOR BOARD (A15)			
SCHEMATIC DIAGRAM			
DRAWN <i>R.P.S.</i>	APPROVED <i>RHM</i>	DATE 10-12-89	E-27041

SENSOR BOARD (A15) COMPONENT LOCATION

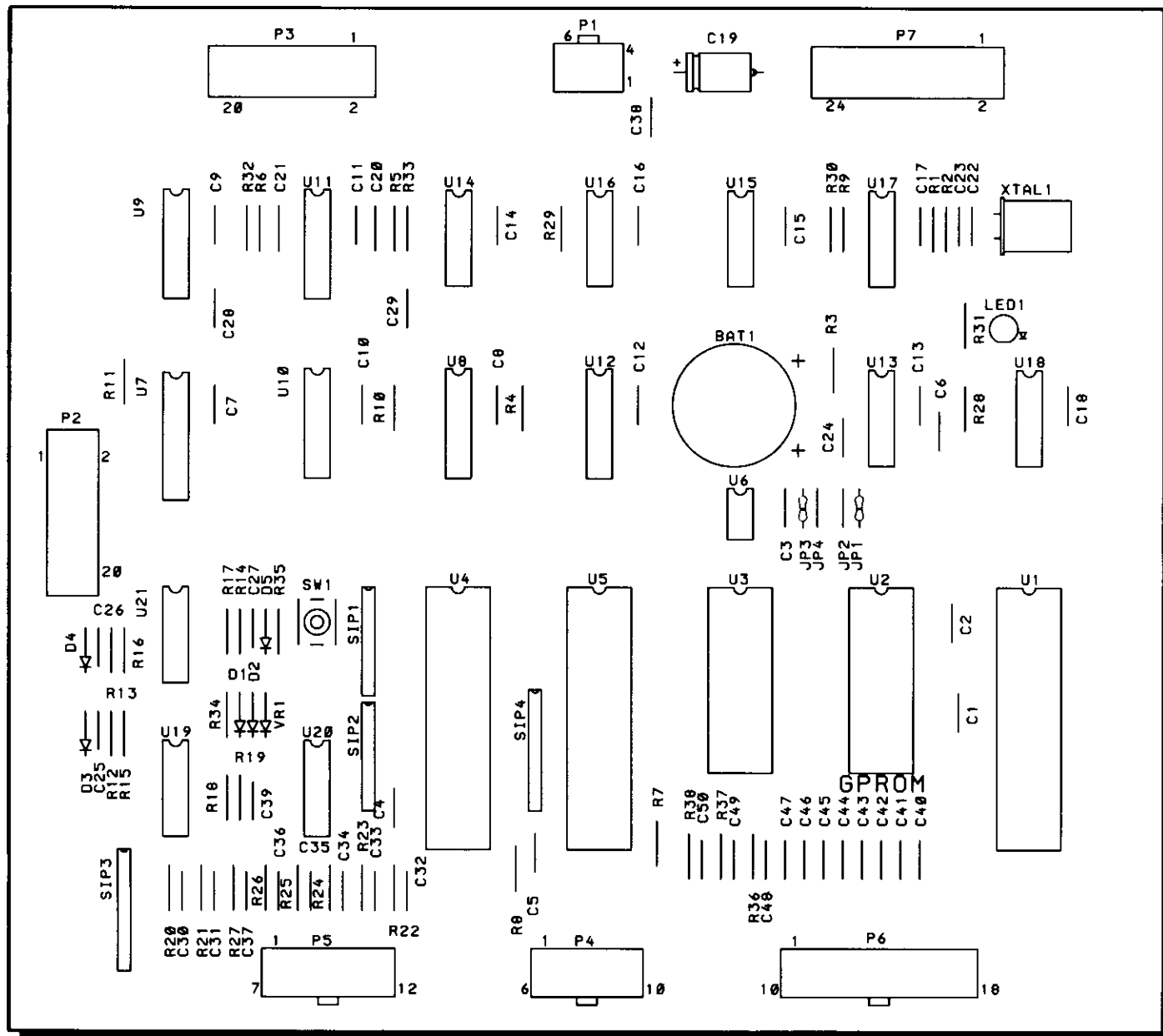


SENSOR BOARD (A15) PARTS LIST

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

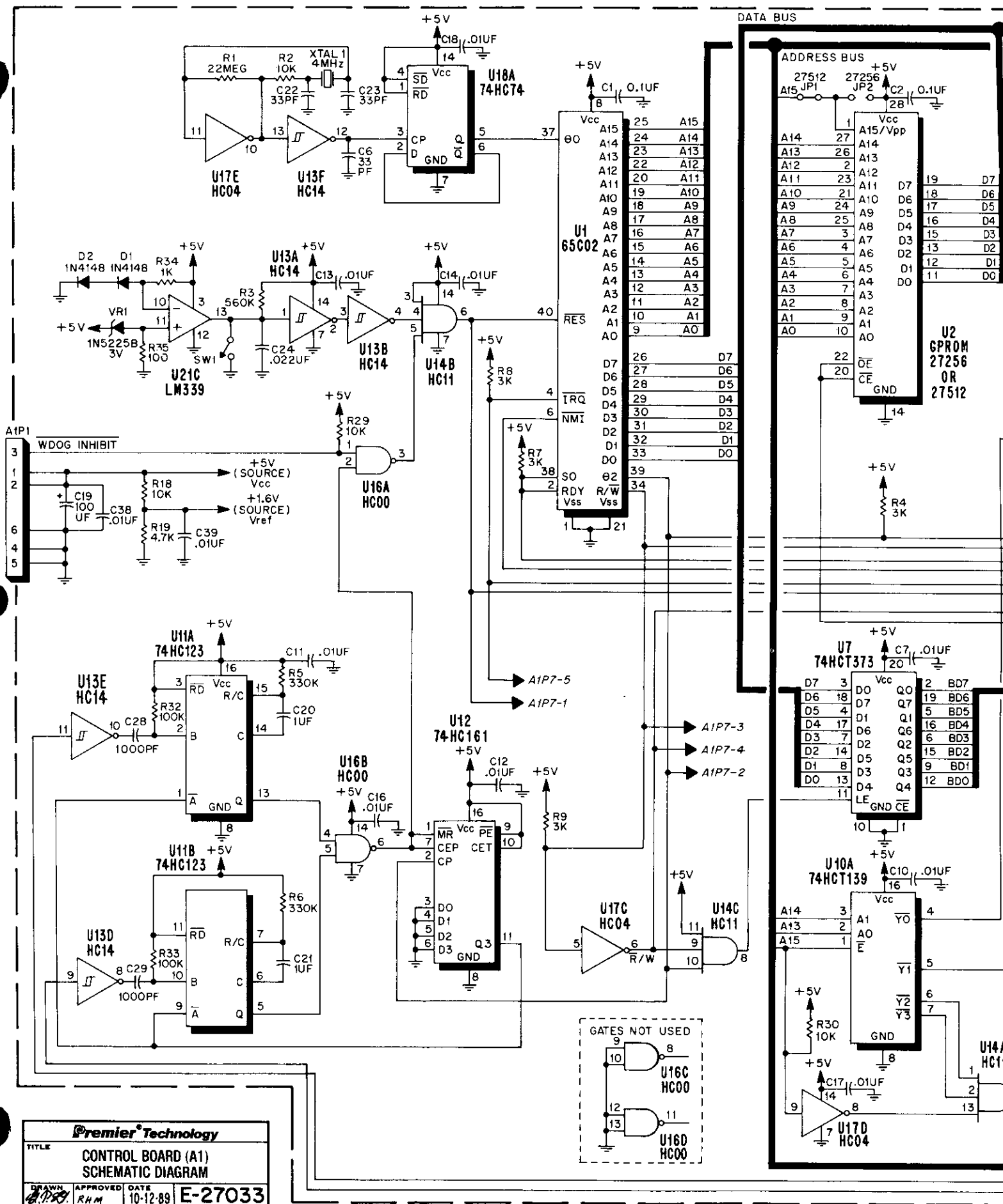
VI. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

CONTROL BOARD (A1) COMPONENT LOCATION



CONTROL BOARD (A1) PARTS LIST

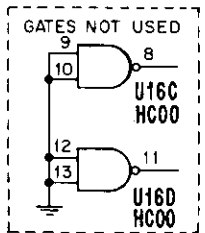
REFERENCE	DESCRIPTION	PART NUMBER	REFERENCE	DESCRIPTION	PART NUMBER
BAT 1	Control Board Assembly (A1)	MA-1423	SIP3,SIP4	Resistor Pack, 4.7K OHM X 8	XO-161
C3, C7-C18, C30-C50	Lithium Battery, LM2430, 3V	XO-925	SW1	Switch, N.O.	XO-897
C1, C2, C4	Capacitor, .01UF, +80% -20%, 50V	XO-229	U1	IC, 65CO2P2, CPU, 2MHZ	XO-927
C5, C25, C27	Capacitor, 0.1UF, +80% -20%, 50V	XO-230	U3	IC, 6116LP, 2K X 8, Static Ram	XO-928
C6, C22, C23	Capacitor, 33PF, 10%, 50V	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, 330K OHM, 5%, 1/4W	XO-47	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, 100 OHM, 5%, 1/4W	XO-28	A1P1	Header, 6 Position	XO-910
R31	Resistor, 1K OHM, 5%, 1/4W	XO-5	A1P2, A1P3	Header, 20 Position (Ribbon)	XO-940
R32-R33	Resistor, 100 OHM, 5%, 1/4W	XO-28	A1P4	Header, 10 Position	XO-912
R34	Resistor, 100 OHM, 5%, 1/4W	XO-28	A1P5	Header, 12 Position	XO-913
R35	Resistor, 100 OHM, 5%, 1/4W	XO-28	A1P6	Header, 18 Position	XO-916
SIP1, SIP2	Resistor Pack, 10K OHM X 7, 5%, 1/4W	XO-926		Jumper, Resistor, 0 OHM (2)	XO-469
				Socket, 28 Pin Dip	XO-536



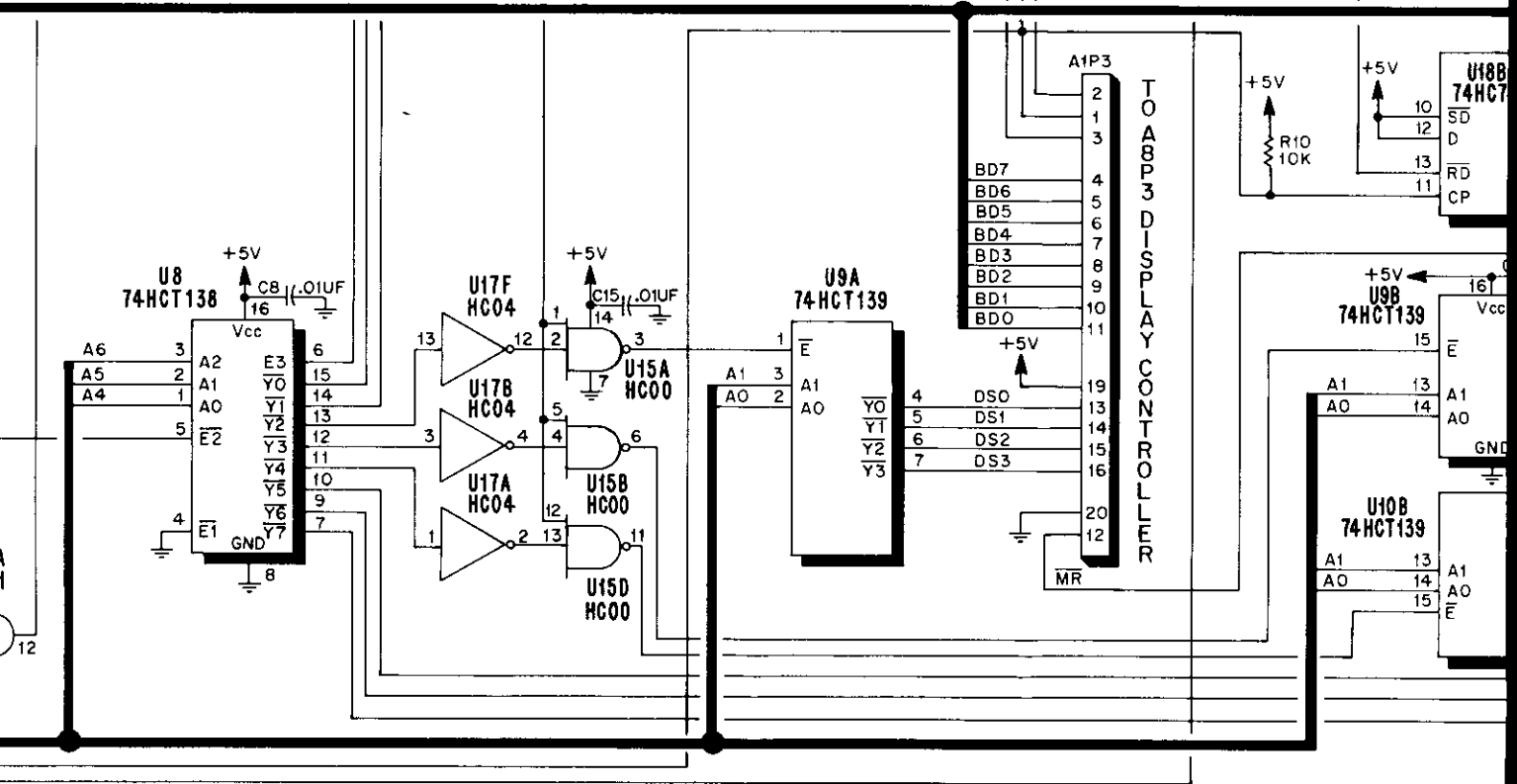
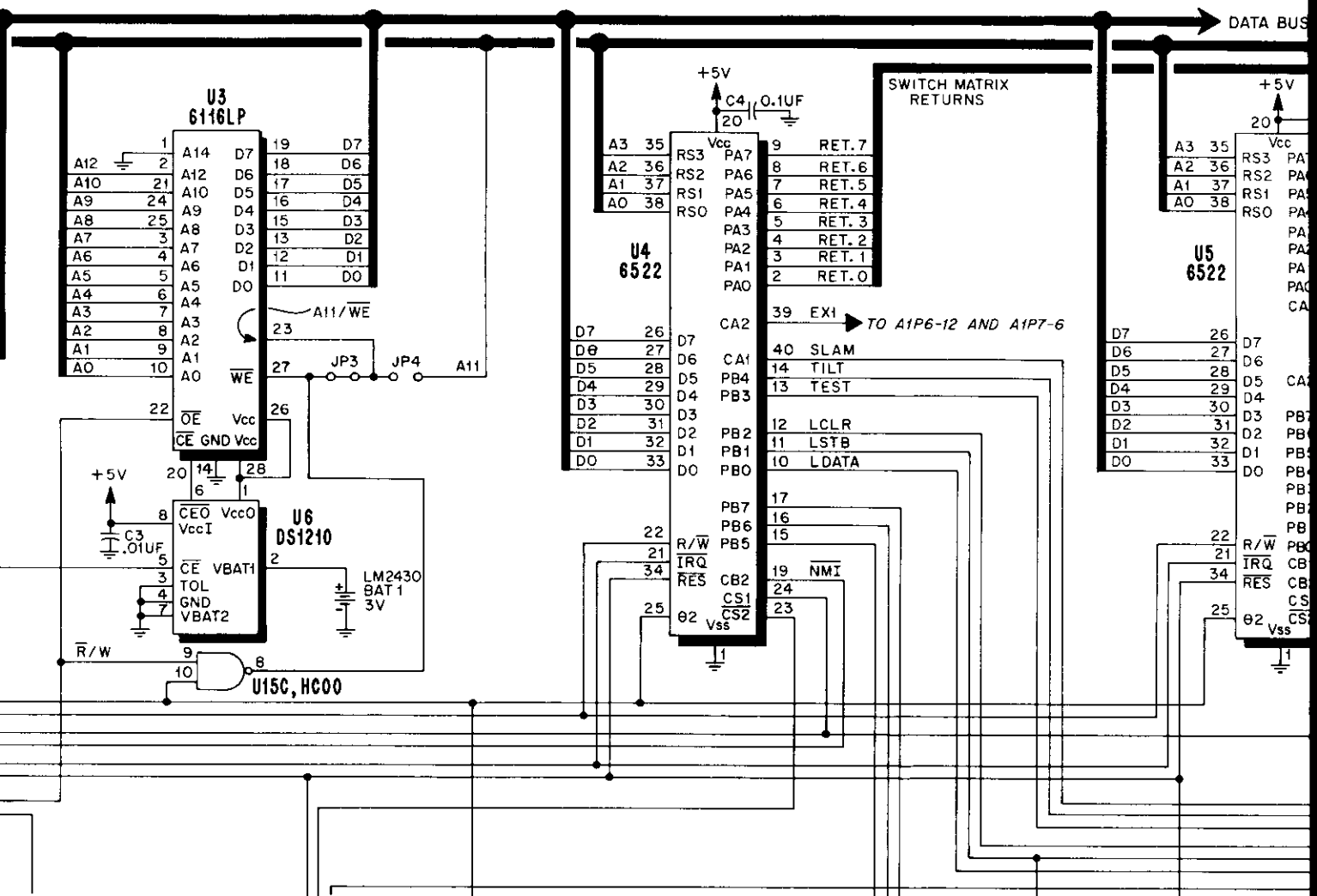
Premier Technology

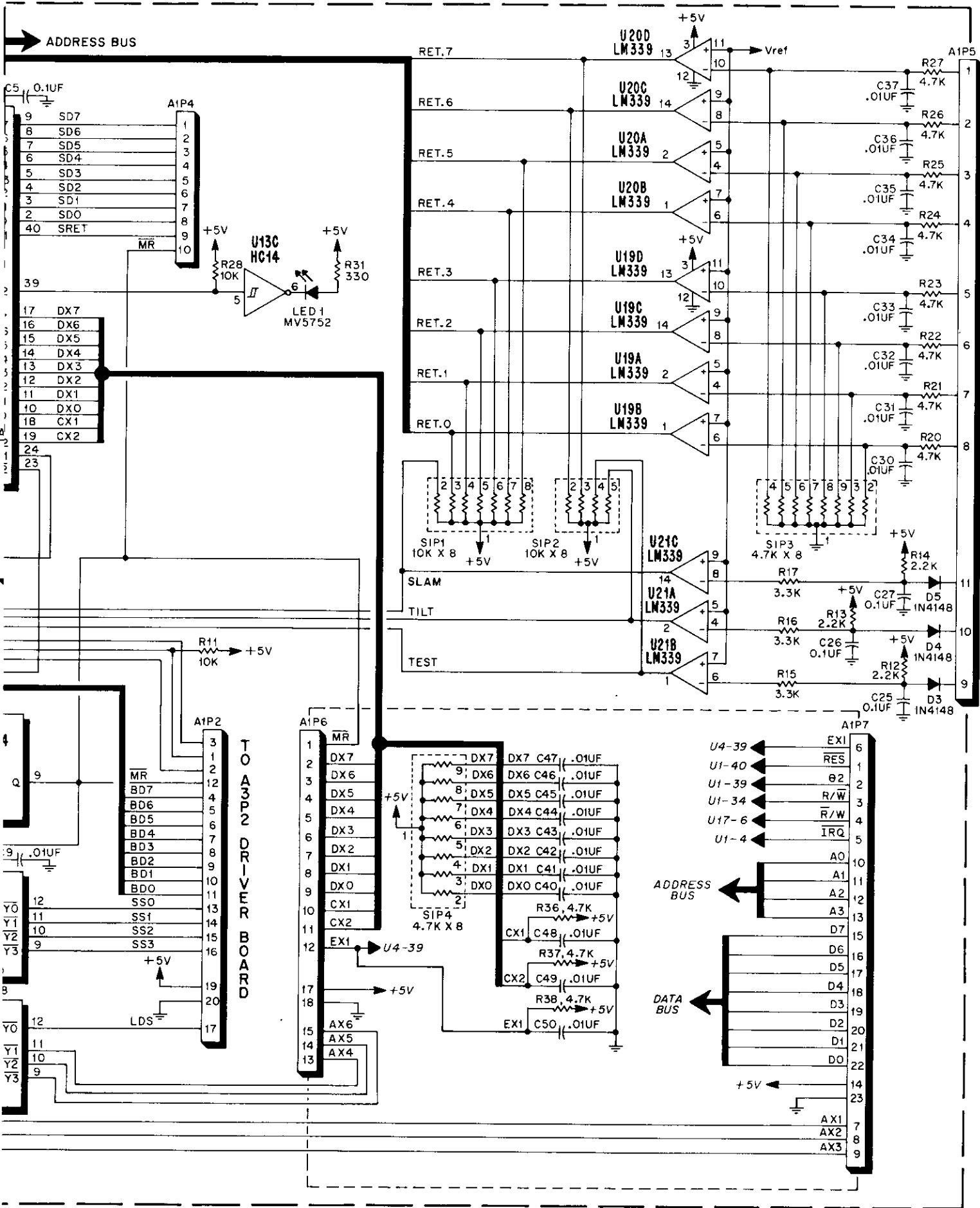
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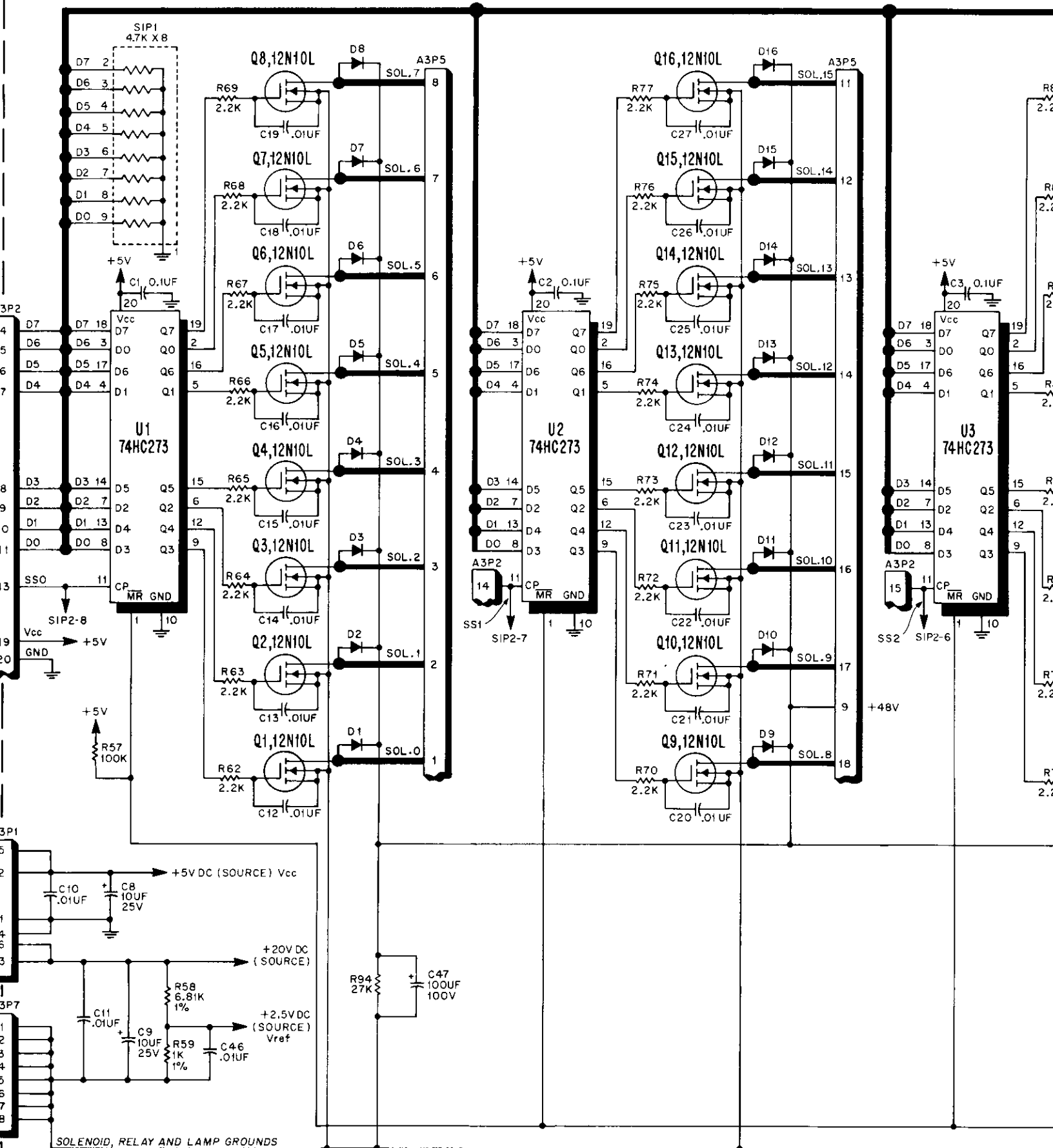
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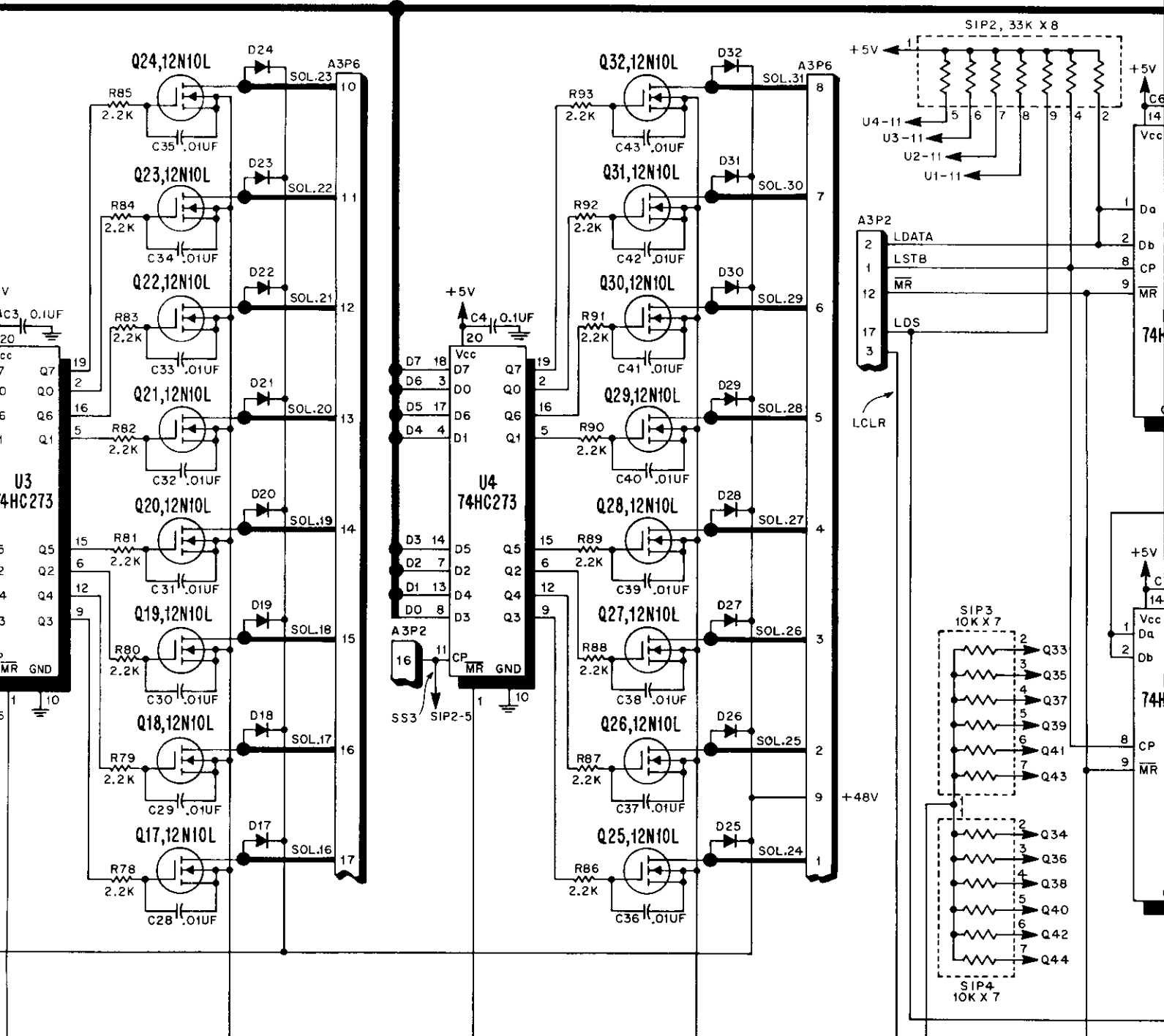
VI. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



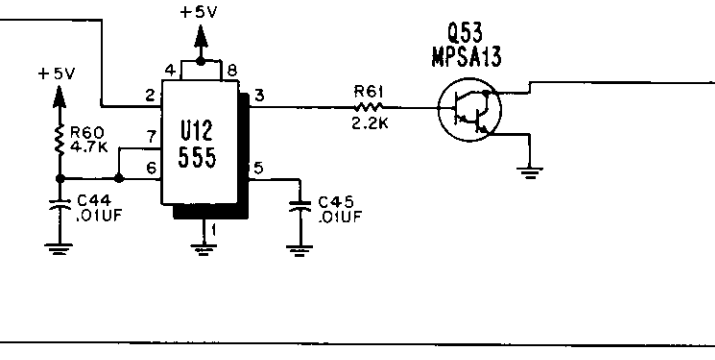
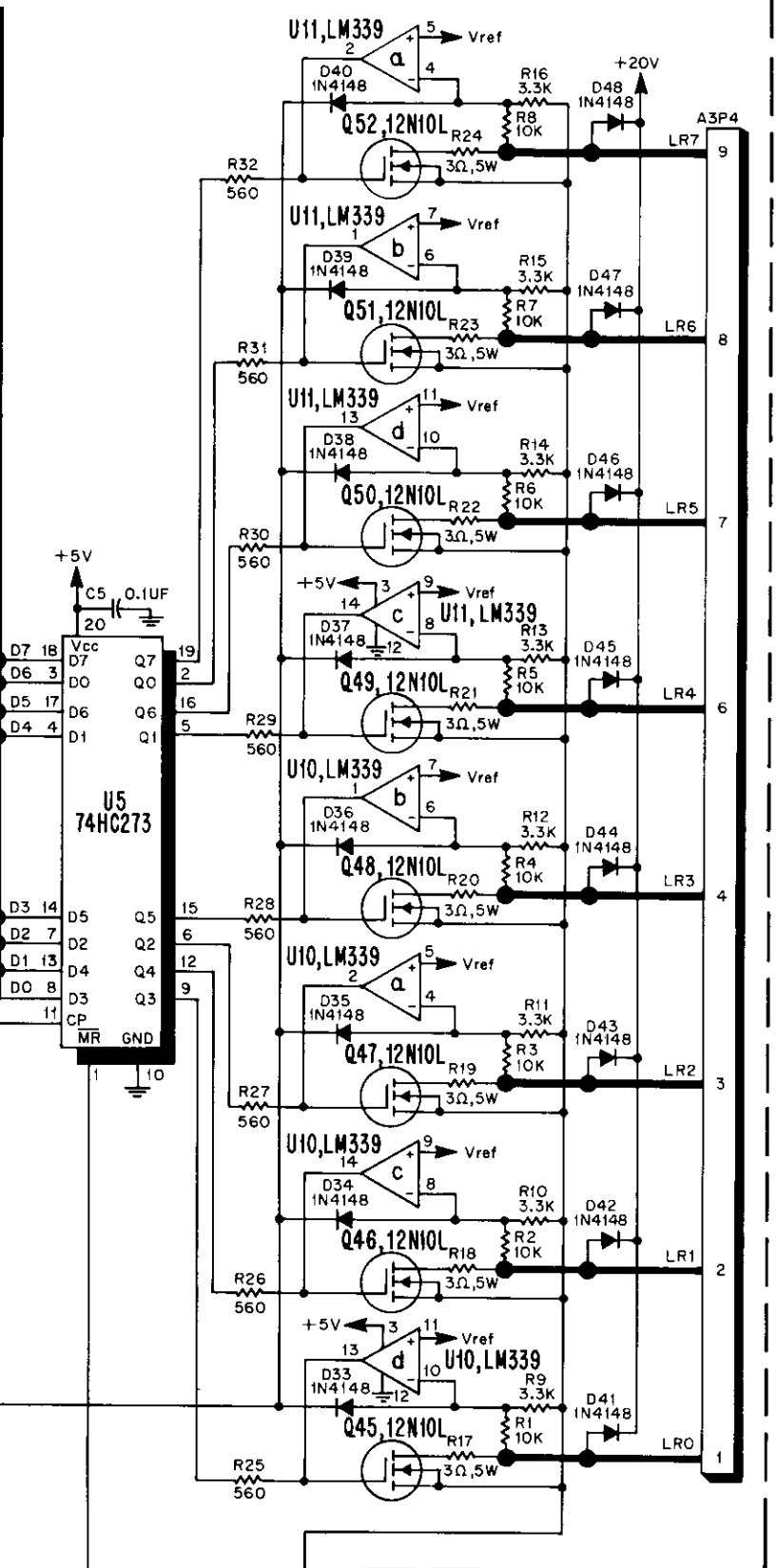
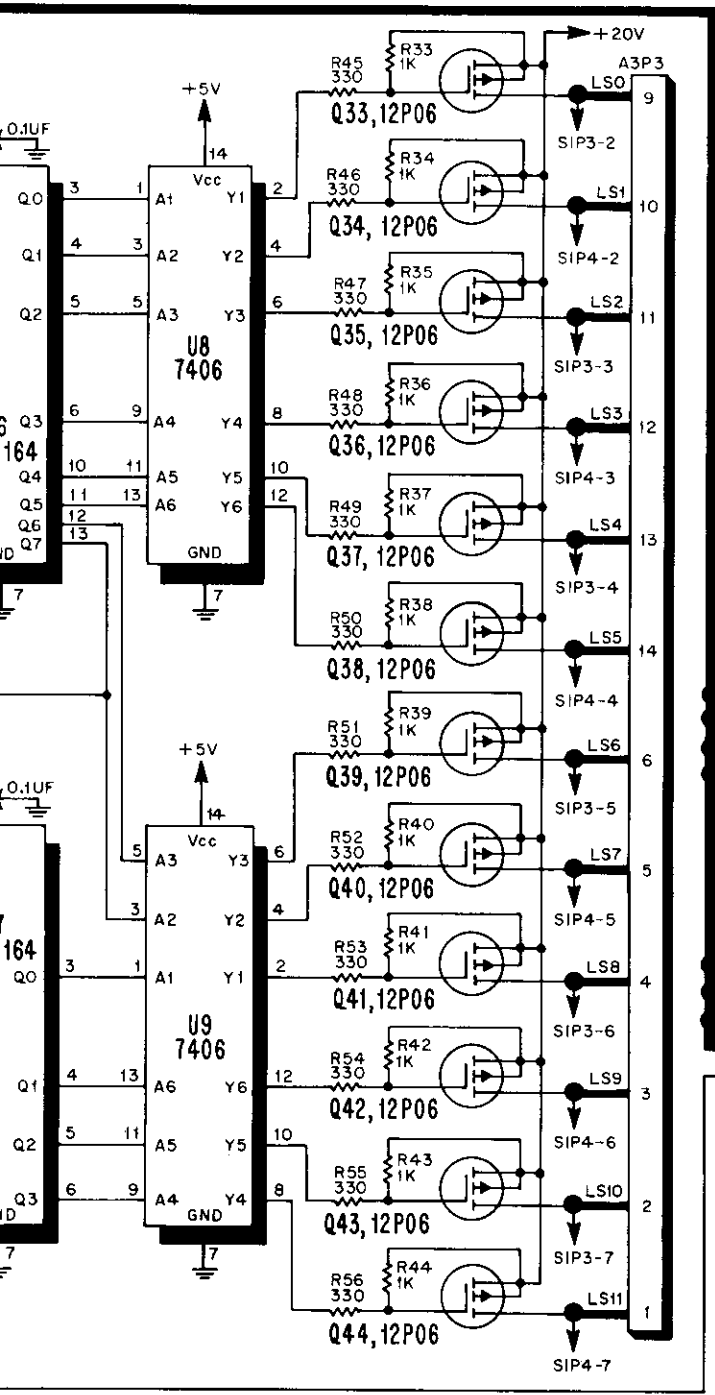




VI. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



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



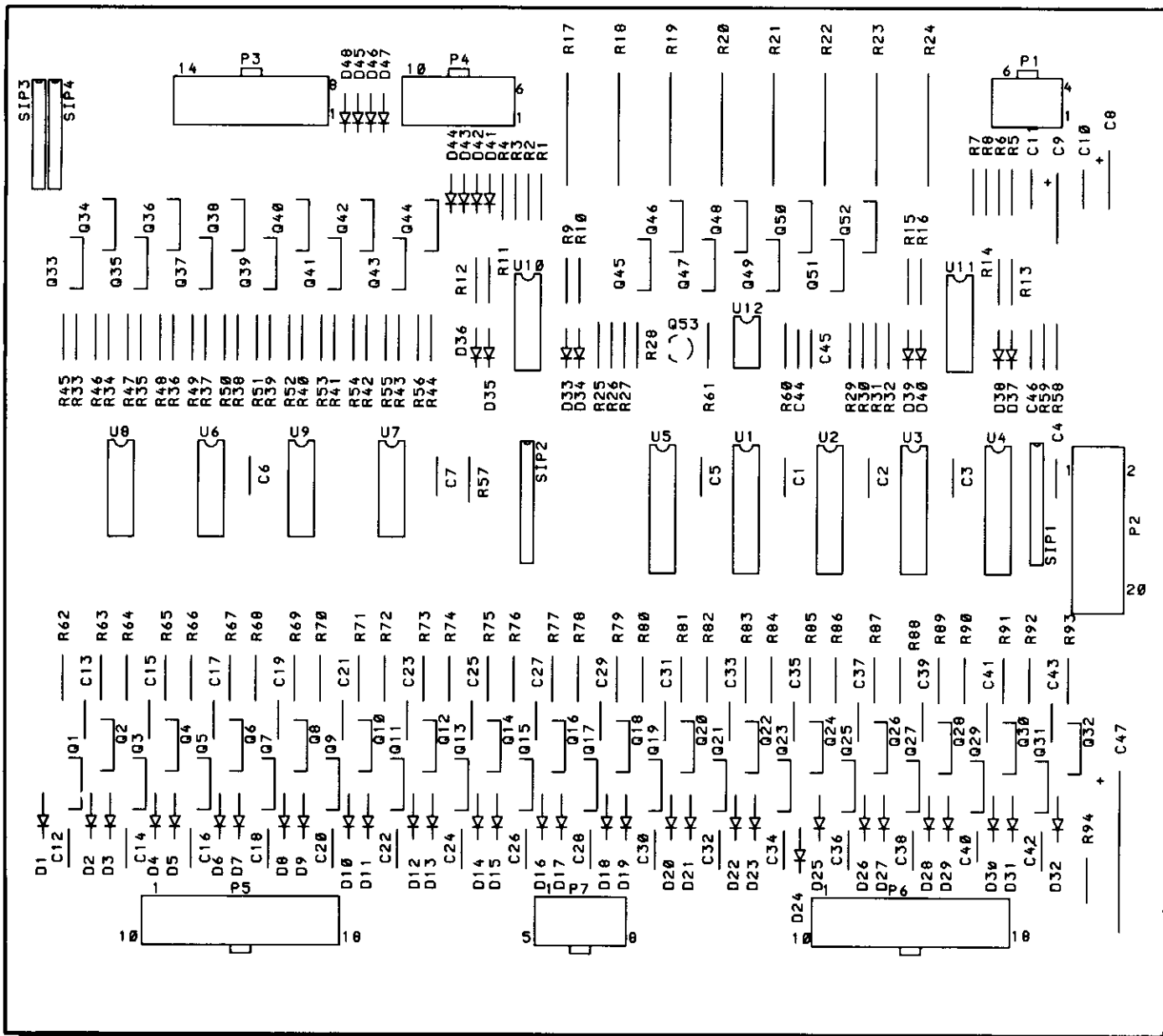
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TITLE
**DRIVER BOARD (A3)
SCHEMATIC DIAGRAM**

DRAWN <i>APB</i>	APPROVED <i>RHM</i>	DATE 10-12-89	E-27034
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VI. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

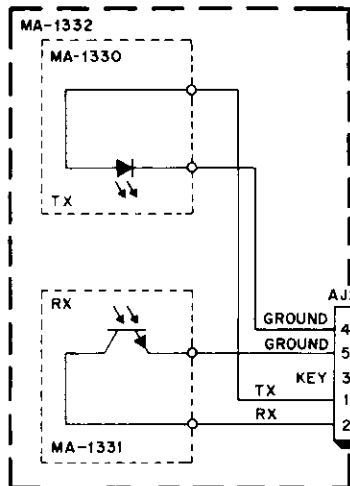
DRIVER BOARD (A3) COMPONENT LOCATION



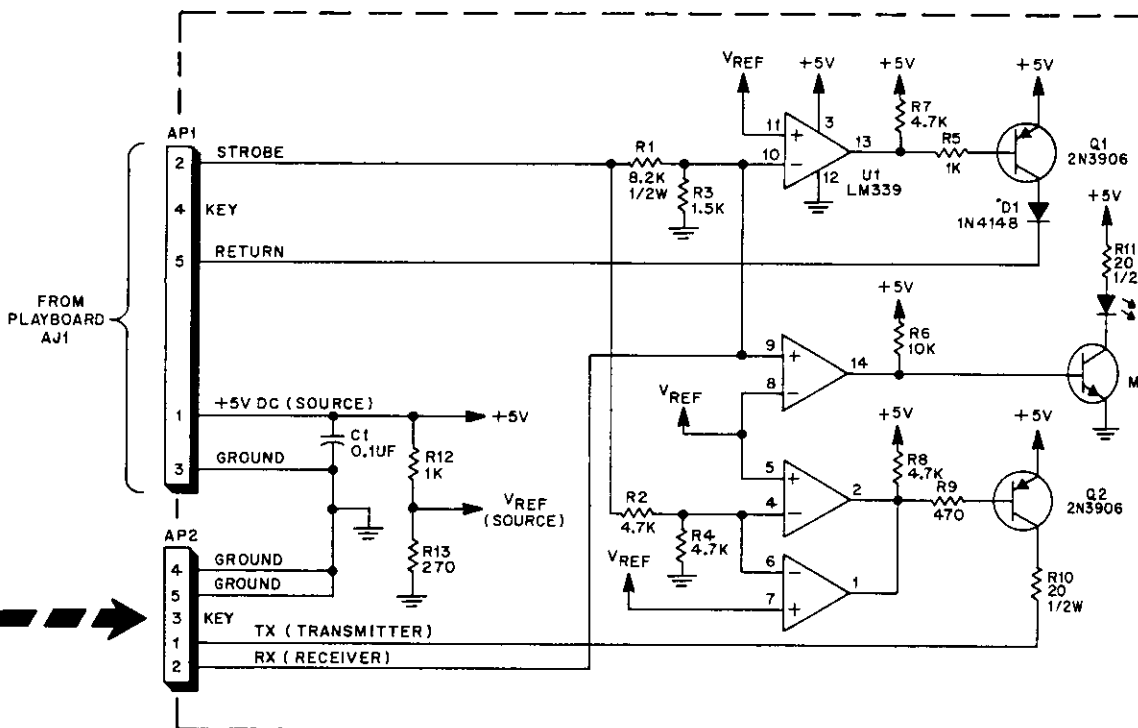
DRIVER BOARD (A3) PARTS LIST

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 <i>NTE66</i>	XO-947	U1-U5	IC, Octal "D" Flip-Flops, 74HC273	XO-949
Q33-Q44	Transistor, RFP12P06, OR IRF9531,	XO-948	U6-U7	IC, Shift Register, 74HC164	XO-950
	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, NR555	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

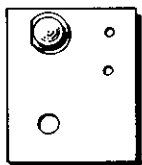


OPTO PHOTOTRANSISTOR RECEIVER BOARD SCHEMATIC DIAGRAM



OPTICAL INTERFACE BOARD SCHEMATIC DIAGRAM

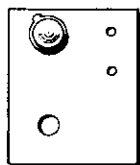
OPTO LED TRANSMITTER BOARD COMPONENT LOCATION



OPTO LED TRANSMITTER BOARD PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	Opto LED Transmitter Assembly	MA-1330
	Plastic Transmitter LED	XO-994
DESCRIPTION		PART NUMBER
	Bracket And Optic Boards Assembly	MA-1667
	Optical Switch Bracket	28038

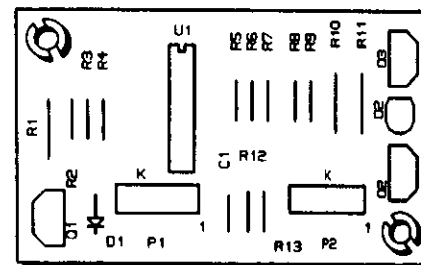
OPTO PHOTOTRANSISTOR RECEIVER BOARD COMPONENT LOCATION



OPTO PHOTOTRANSISTOR RECEIVER BOARD PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	Opto Phototransistor Receiver Assembly	MA-1331
RX	Plastic Phototransistor	XO-993

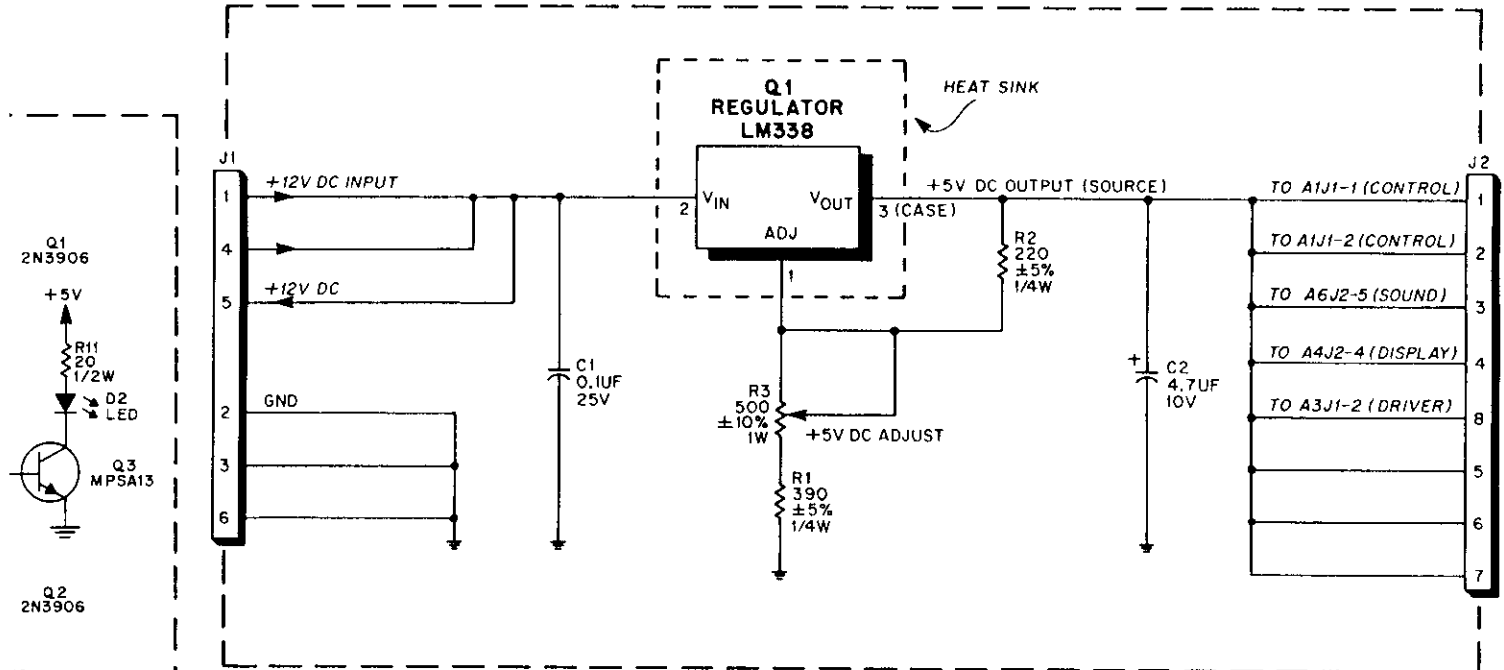
OPTICAL INTERFACE BOARD (A) COMPONENT LOCATION



OPTICAL INTERFACE BOARD (A) PARTS LIST

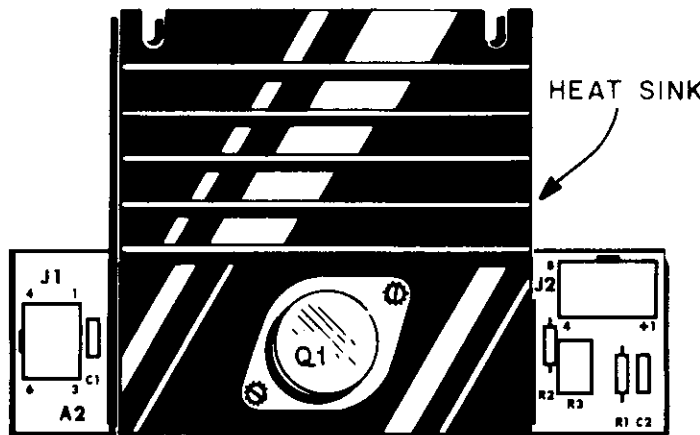
REFERENCE	DESCRIPTION	PART NUMBER
AP1, AP2	Optical Interface Board Assembly	
	5 Pin Header	
C1	Capacitor, 0.1uF, +80% -20%, 50V	
D1	Diode, 1N4148	
D2	Diode, MV5752 (LED, Red)	
Q1, Q2	Transistor, PNP, 2N3906	
Q3	Transistor, NPN, MPSA13	
R1	Resistor, 8.2K Ohm, 5%, 1/2W	
R2, R4, R7, R8	Resistor, 4.7K Ohm,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

C DIAGRAMS, PARTS LISTS



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

POWER SUPPLY (A2) COMPONENT LOCATION

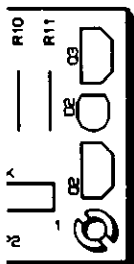


POWER SUPPLY (A2) PARTS LIST

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

AM

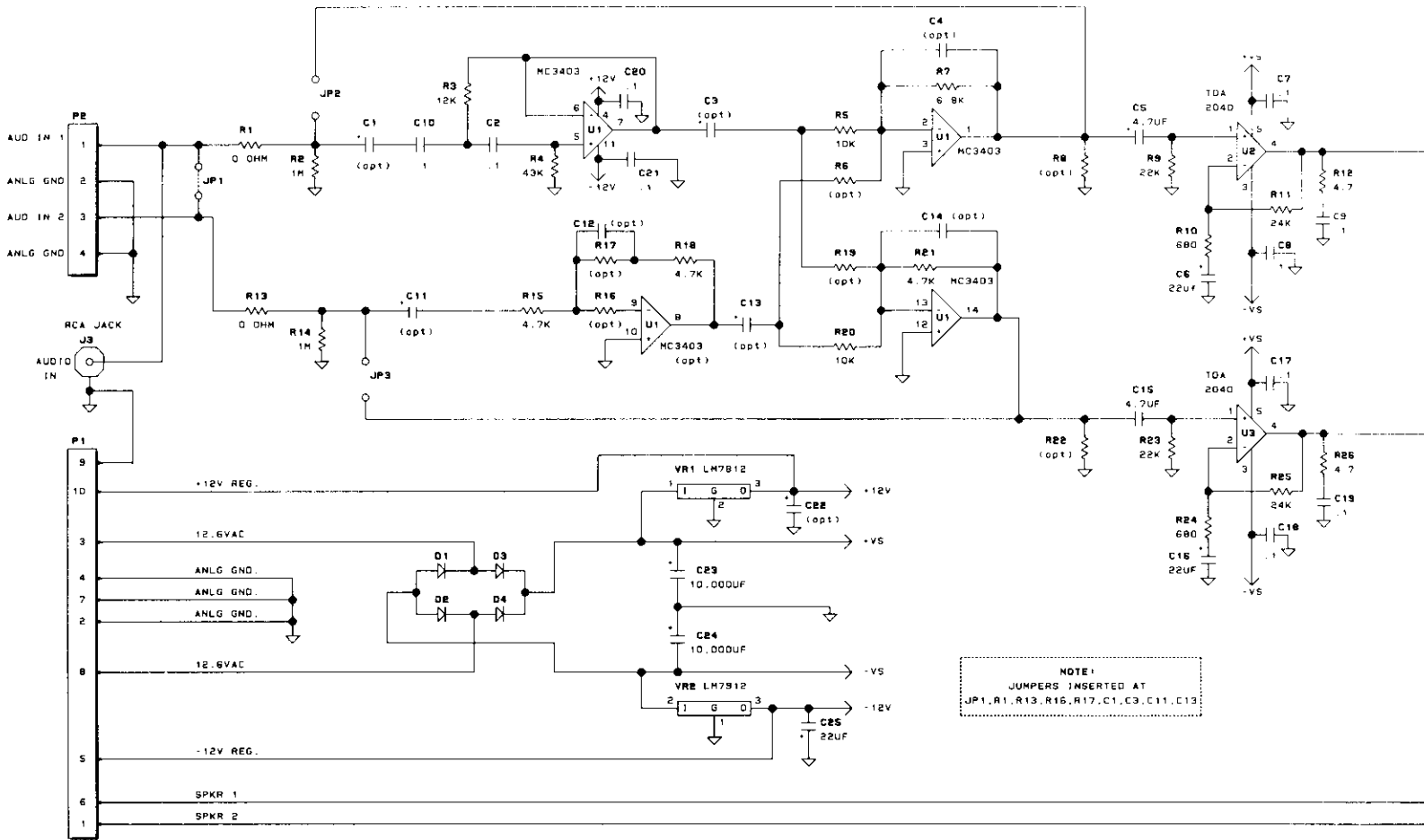
BOARD (A25)
LOCATION



BOARD (A25)

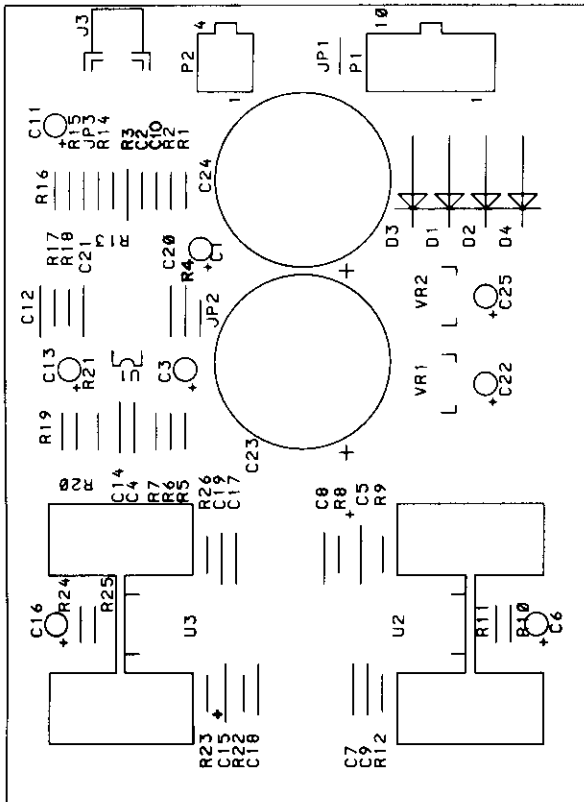
	PART NUMBER
Assembly	MA-1558
	XO-1002
50V	XO-230
	XO-261
	XO-270
	XO-588
	XO-304
1/2W	XO-1022
1/4W	XO-7
1/4W	XO-20
W	XO-5
4W	XO-18
4W	XO-35
W	XO-65
4W	XO-68
39	XO-583
	23984

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

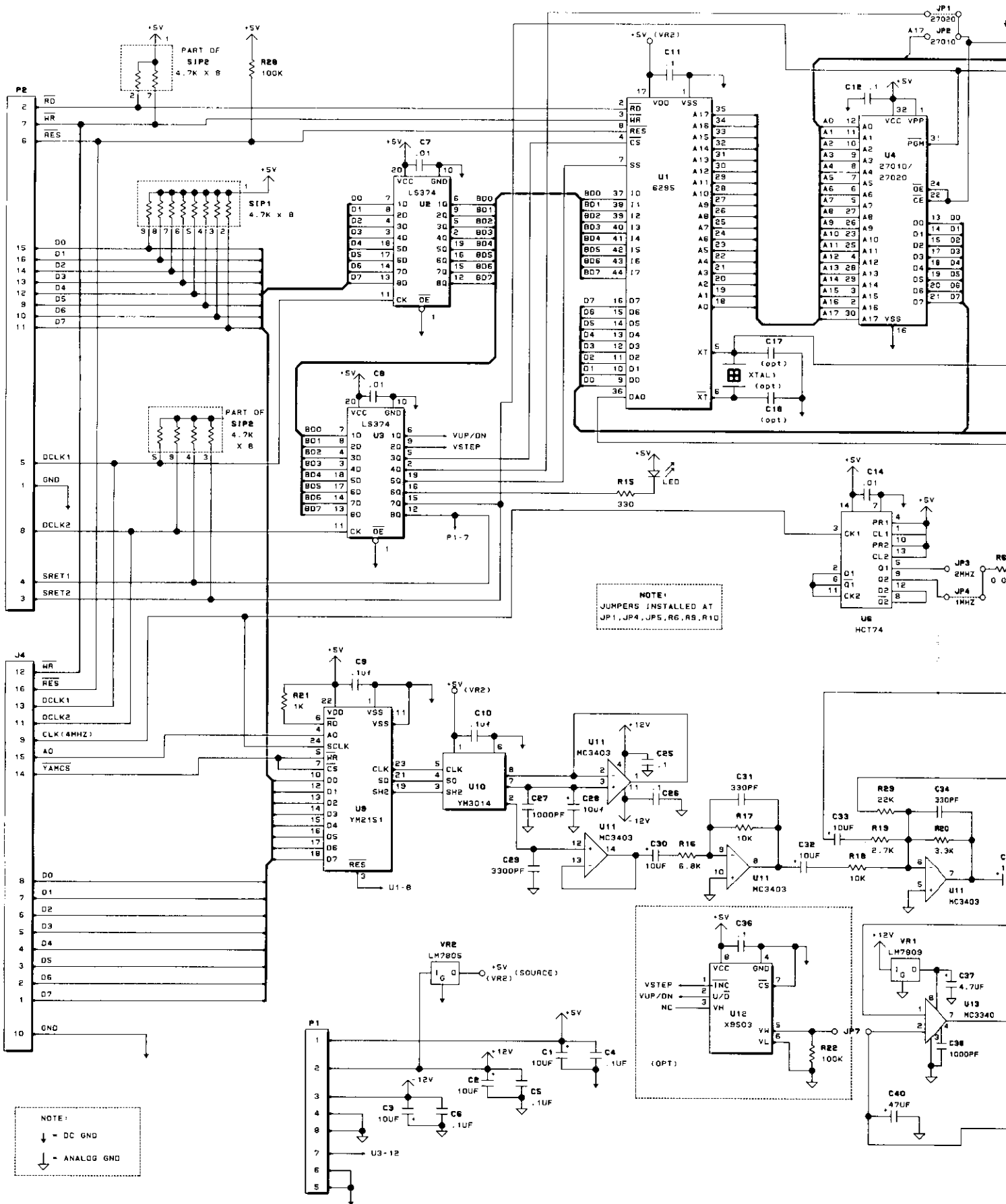


Premier Technology			
TITLE AUXILIARY POWER SUPPLY (A5) SCHEMATIC DIAGRAM			
DRAWN J.B.	APPROVED RHM	DATE 4-8-92	MA-1772

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, 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 DIA



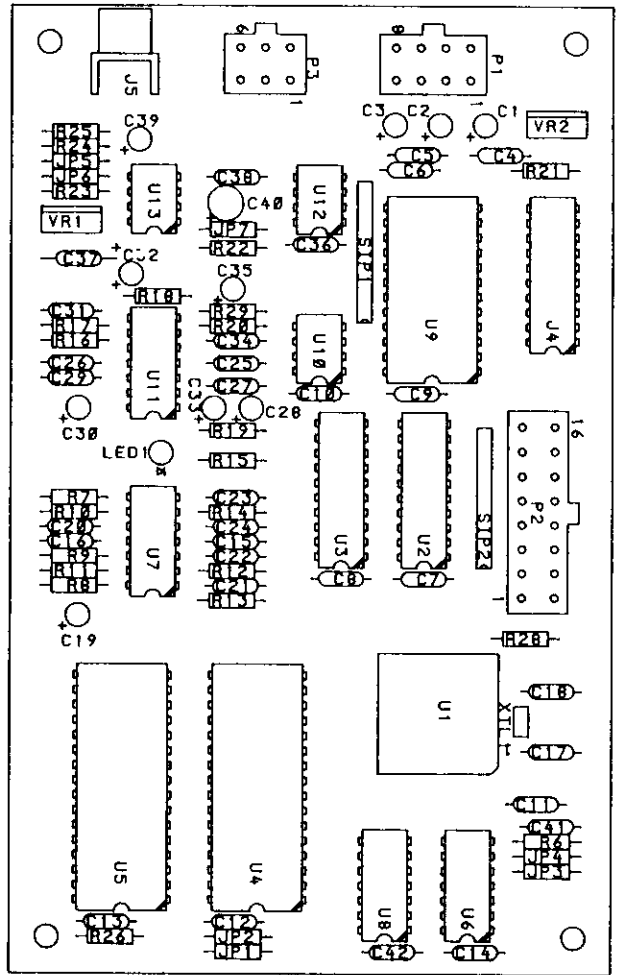
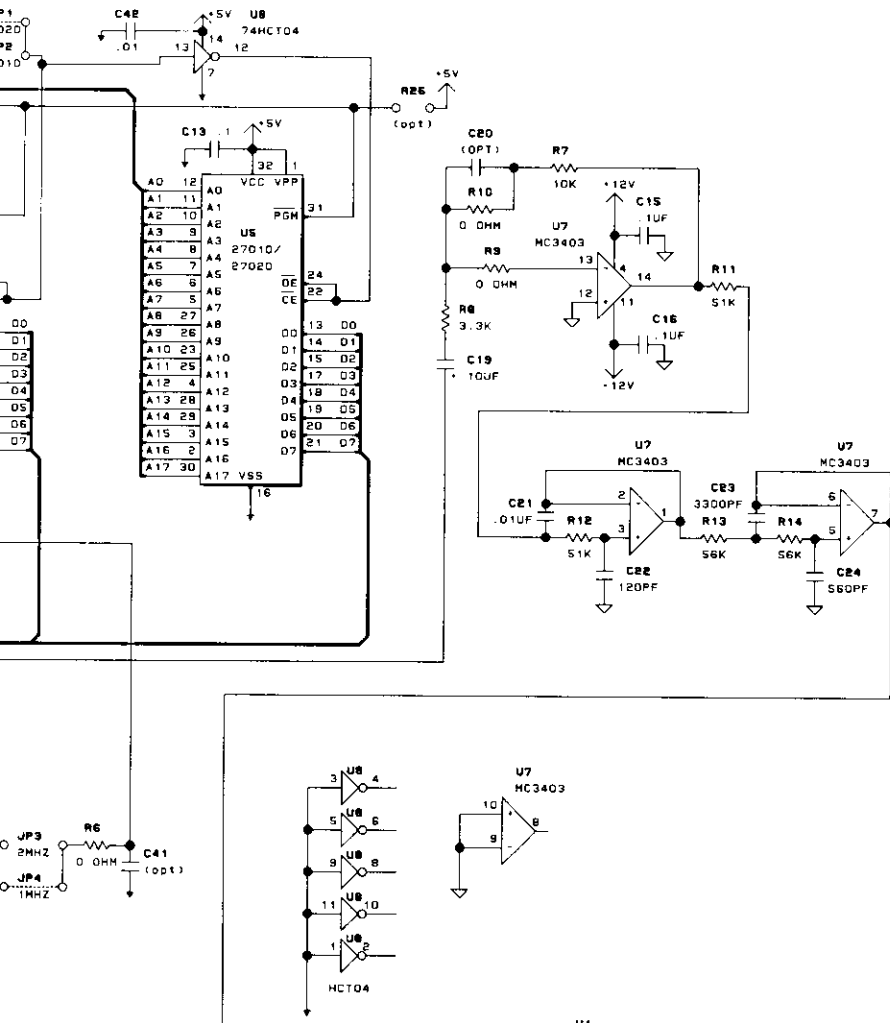
NOTE:
JUMPERS INSTALLED AT
JP1, JP4, JP5, JP6, JP8, JP10

NOTE:
↓ - DC GND
↓ - ANALOG GND

Premier Technology

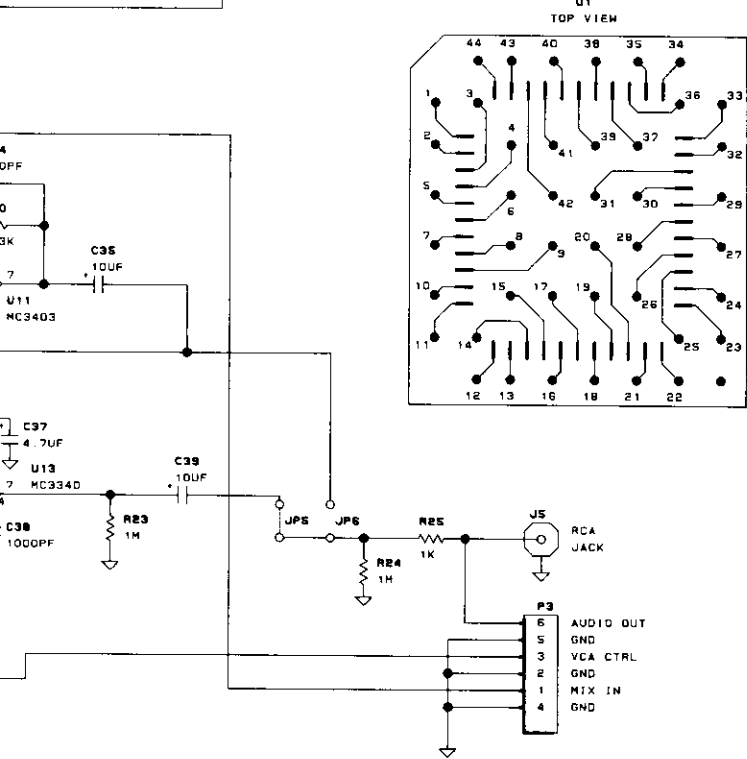
TITLE
**AUXILIARY SOUND BOARD (A20)
SCHEMATIC DIAGRAM**

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



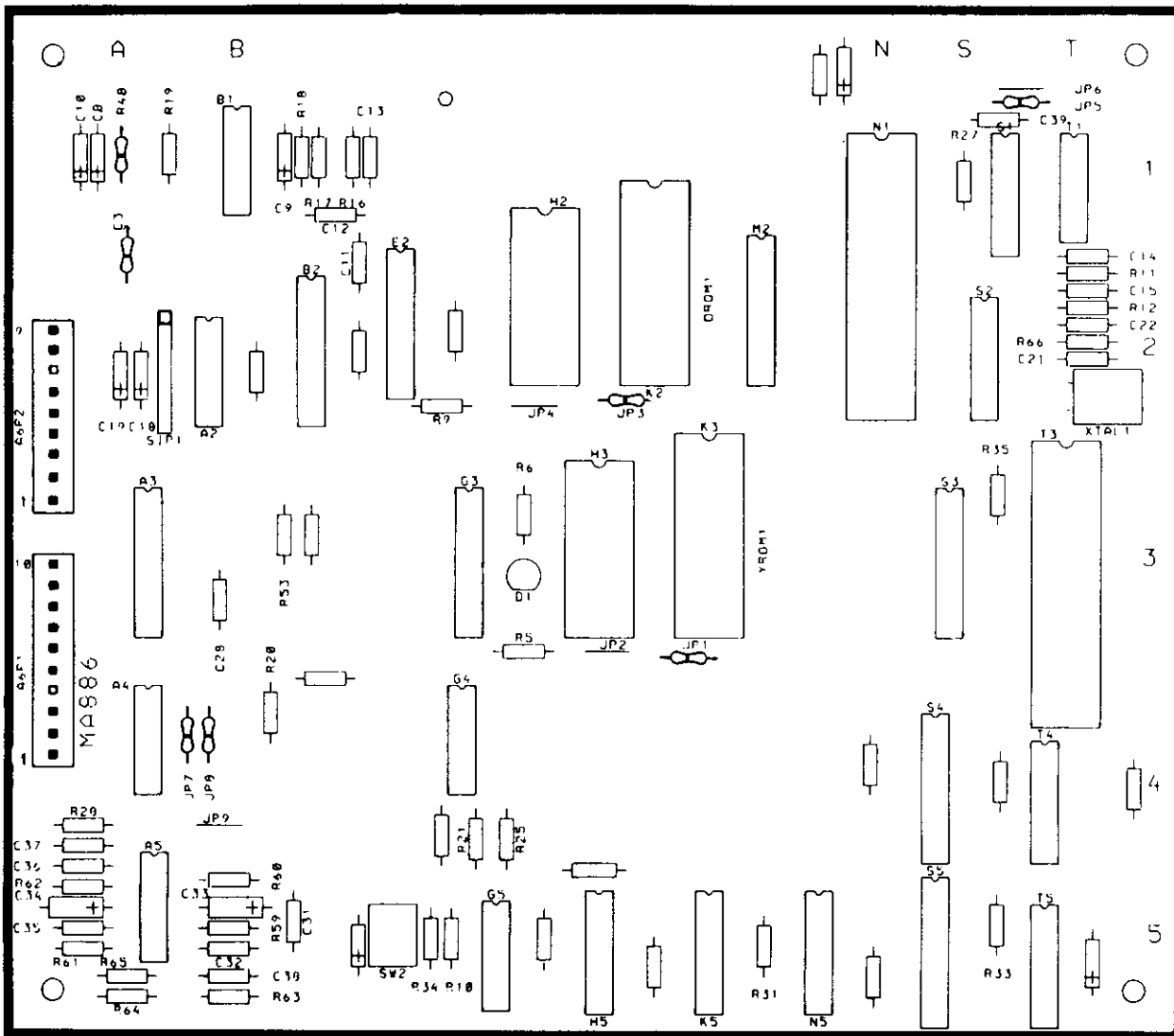
AUXILIARY SOUND BOARD (A20)
PARTS LIST

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
C17	CAPACITOR, 4.7UF, 10%, 10V	XO-226
C18	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, 56K OHM, 5%, 1/4W	XO-771
R15	RESISTOR, 330 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, MSM6295, SPEECH CHIP	*XO-1023
U2, U3	IC, 74LS374, OCTAL "D" FLIP-FLOP	XO-96
U4, U5	IC, 27C010 (SPECIFIED PER GAME)	XO-96
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-1037
	IC, 5V REGULATOR	XO-663



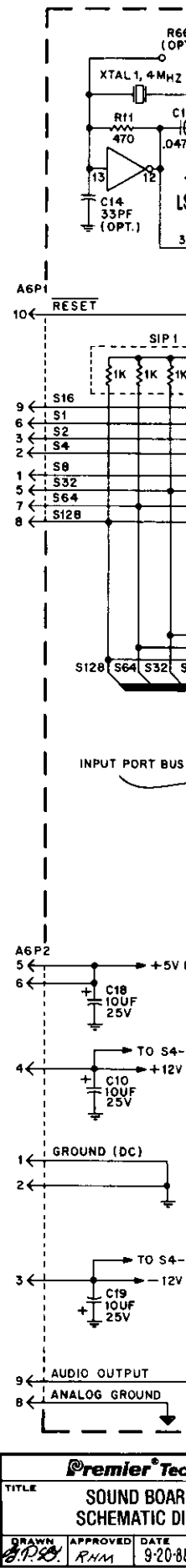
VI. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

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, 10UF, 20%, 50V (Non-polar)	XO-746	R61-R64	Resistor, 33K Ohm, 5%, 1/4W	XO-43
AND THREE UNMARKED CAPACITORS	Capacitor, 100UF, 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, S5	IC, 74LS374, Octal "D" Flip Flop	XO-96
C21	Capacitor, 22PF, 10%, 50V	XO-633	A4	IC, 74LS74, 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-296	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	K2, K3	IC, Specified Per Game	XO-79
R6	Resistor, 240 Ohm, 5%, 1/4W	XO-173	M2	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-419
R21, R25	Resistor, 3K Ohm, 5%, 1/4W	XO-23	S2	IC, 74LS139, Dual 1 of 4 Decoder	XO-891
R16, R17	Resistor, 10K Ohm, 5%, 1/4W	XO-18	S3	IC, 74HCT245, Octal Bus Transceiver	XO-1043
R18	Resistor, 6.8K Ohm, 5%, 1/4W	XO-8	T4	IC, 74F138, 1 of 8 Decoder	XO-493
			SIP 1	Resistor Pack 1K Ohm X 8	XO-897
			SW2	Switch, Pushbutton	XO-366
			XTAL 1	Crystal, 4 MHz	XO-879
			A6P1, A6P2	Connector (2)	XO-536
				28 Pin Dip Socket (2)	XO-469
				Jumper, Resistor, 0 OHM (7)	XO-491
				20 Pin Dip Socket	

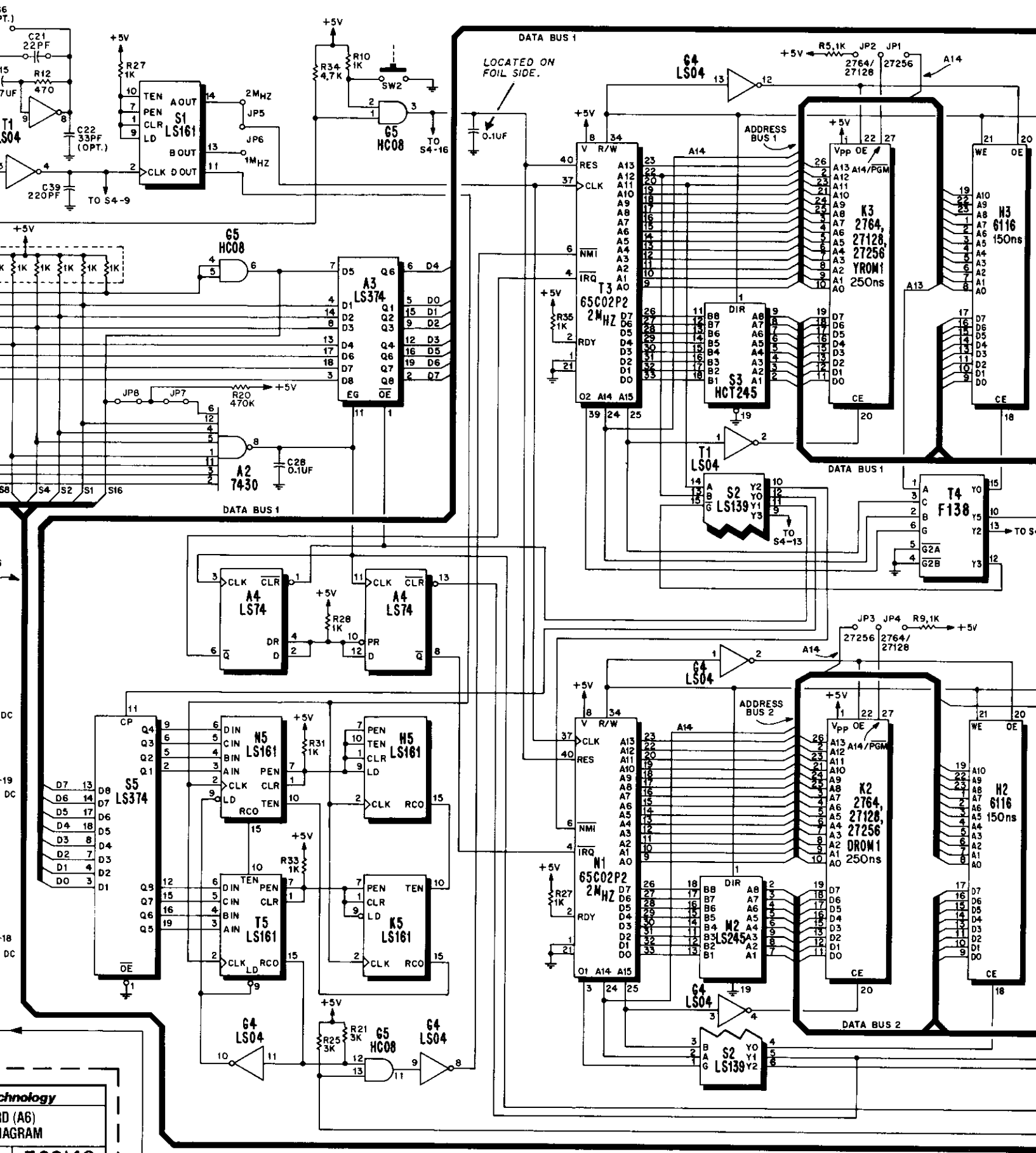


Premier Tec

TITLE: SOUND BOARD SCHEMATIC DI

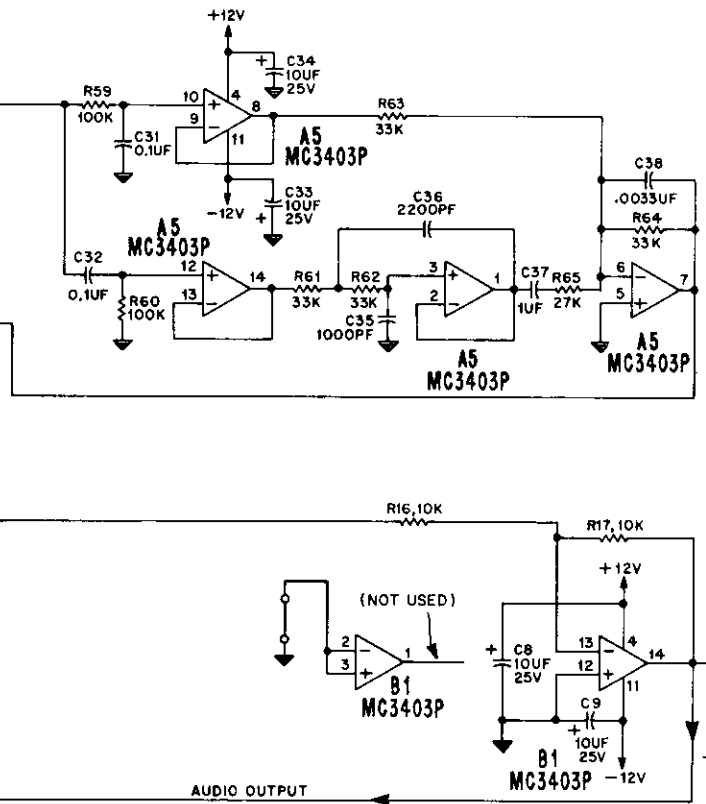
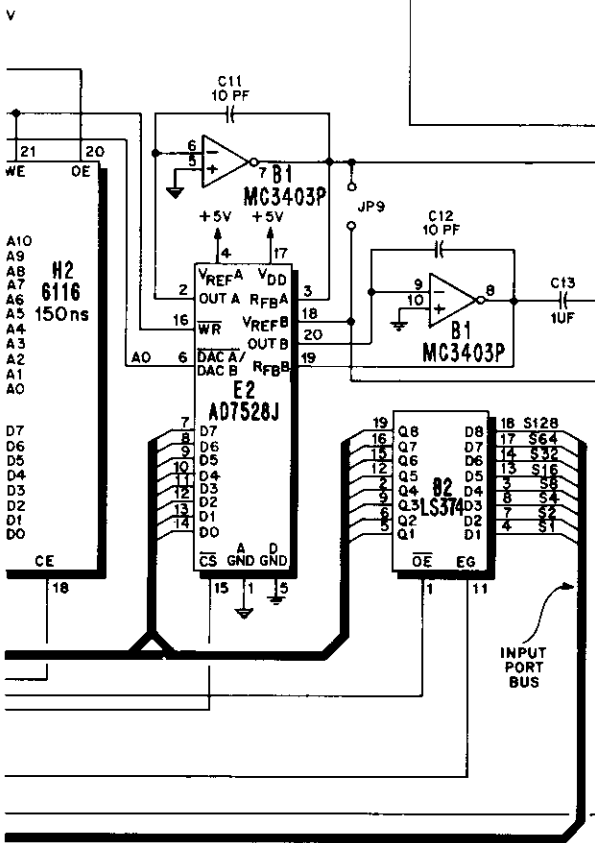
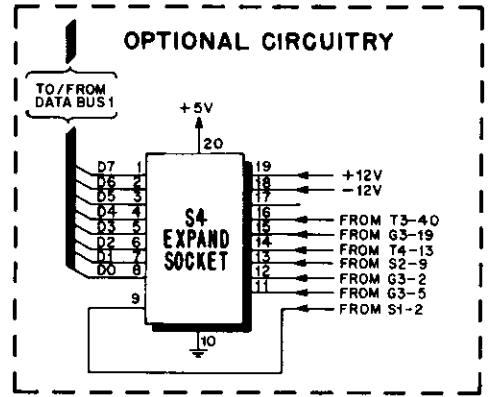
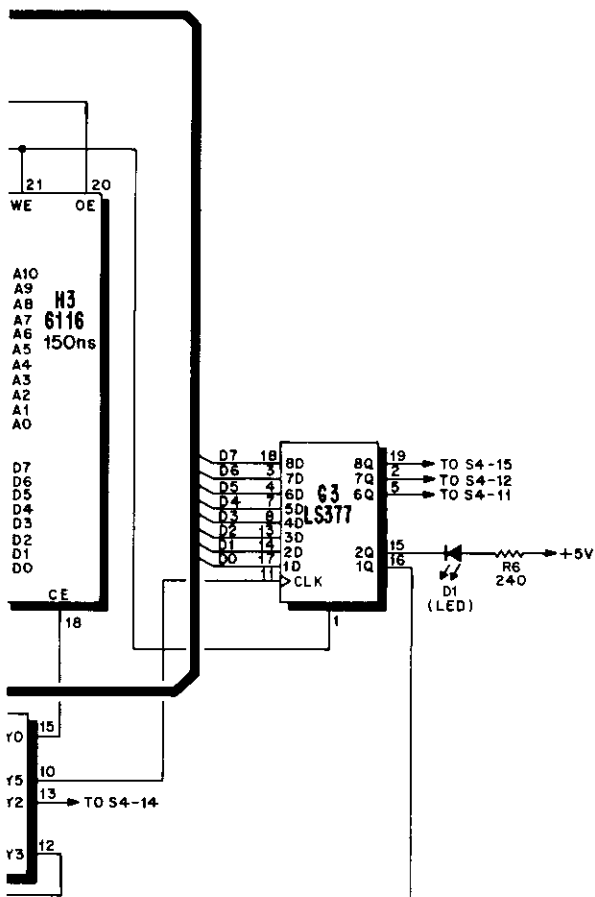
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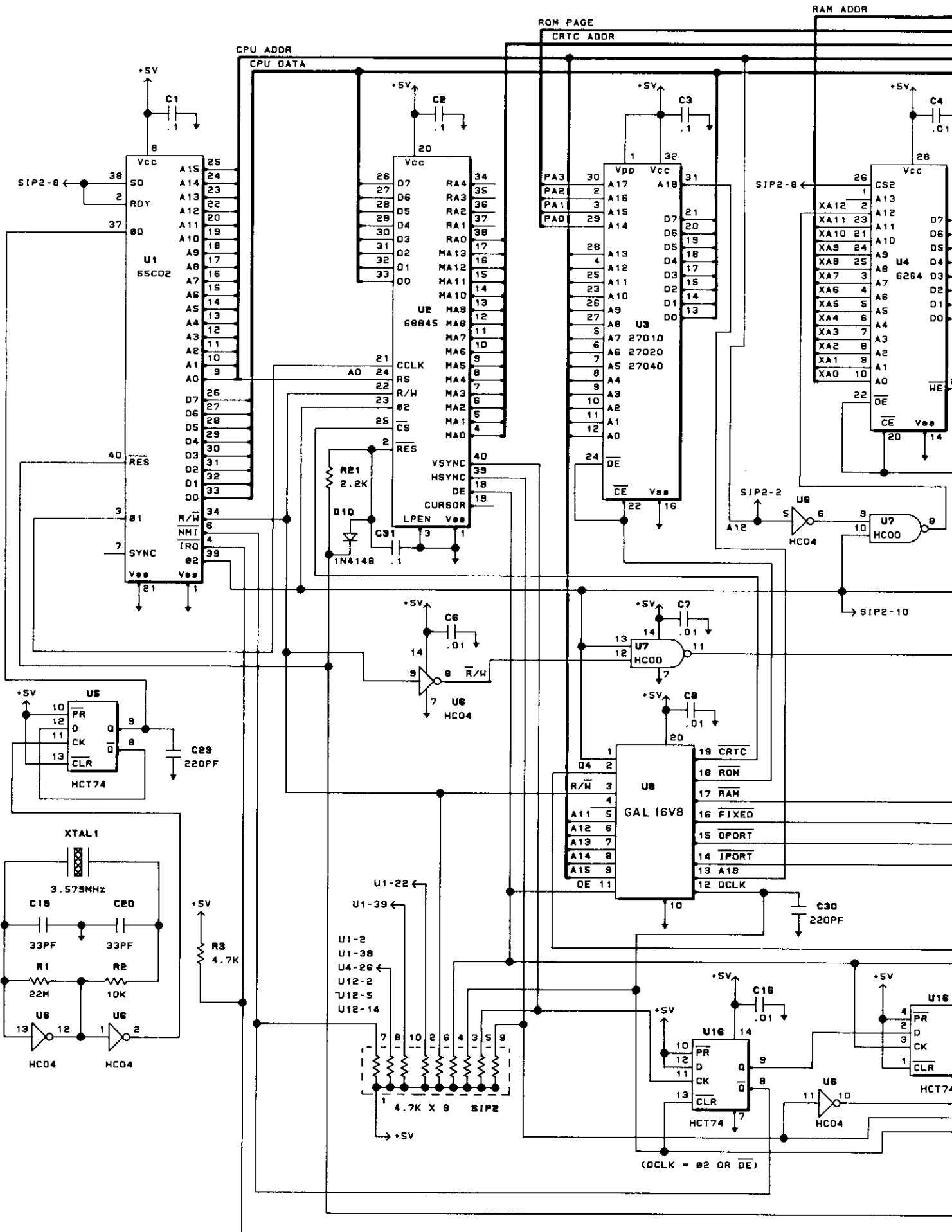
VI. WIRING AND SCHEMATIC DI



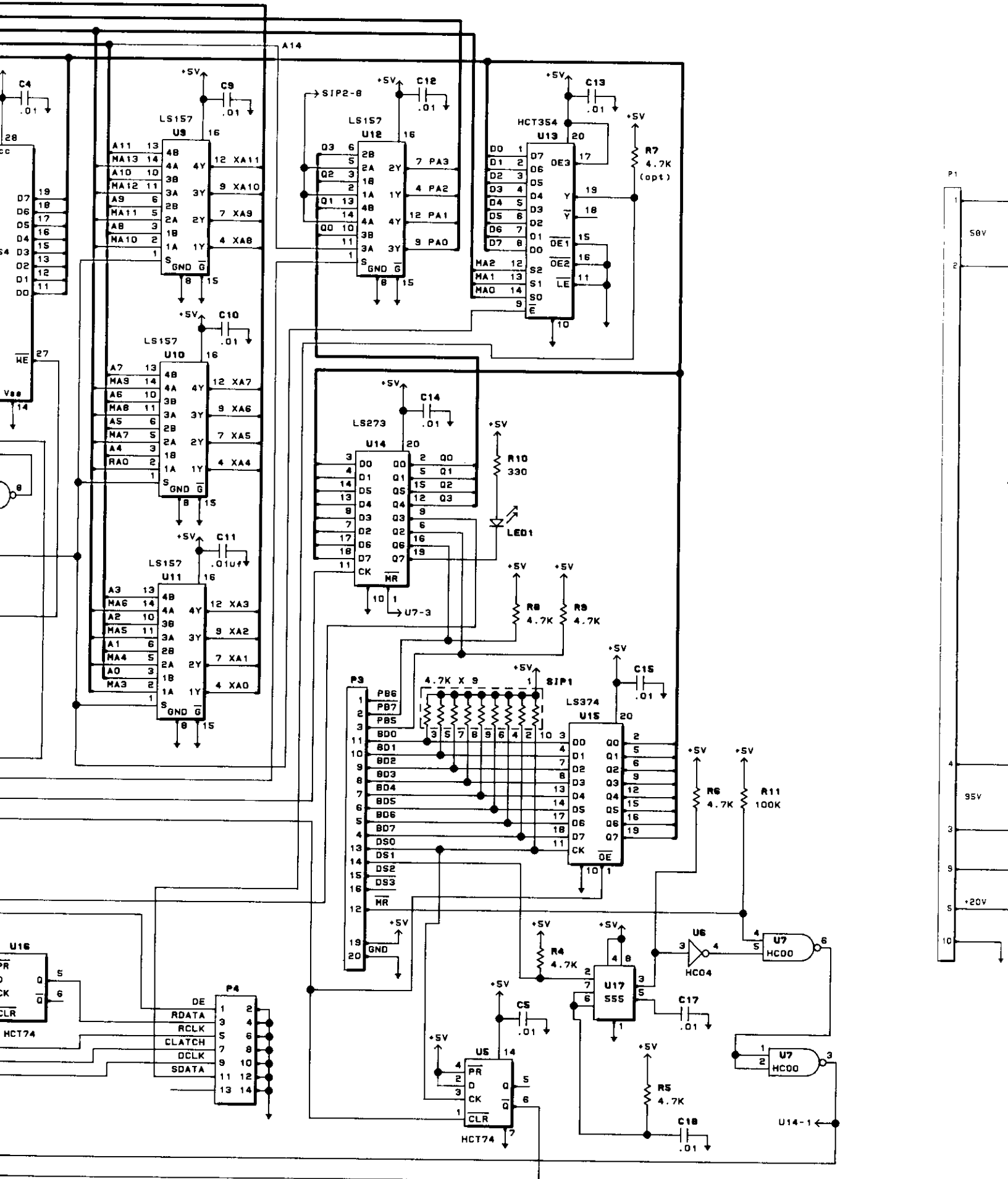
Technology
 ID (A6)
 DIAGRAM
 E-26146

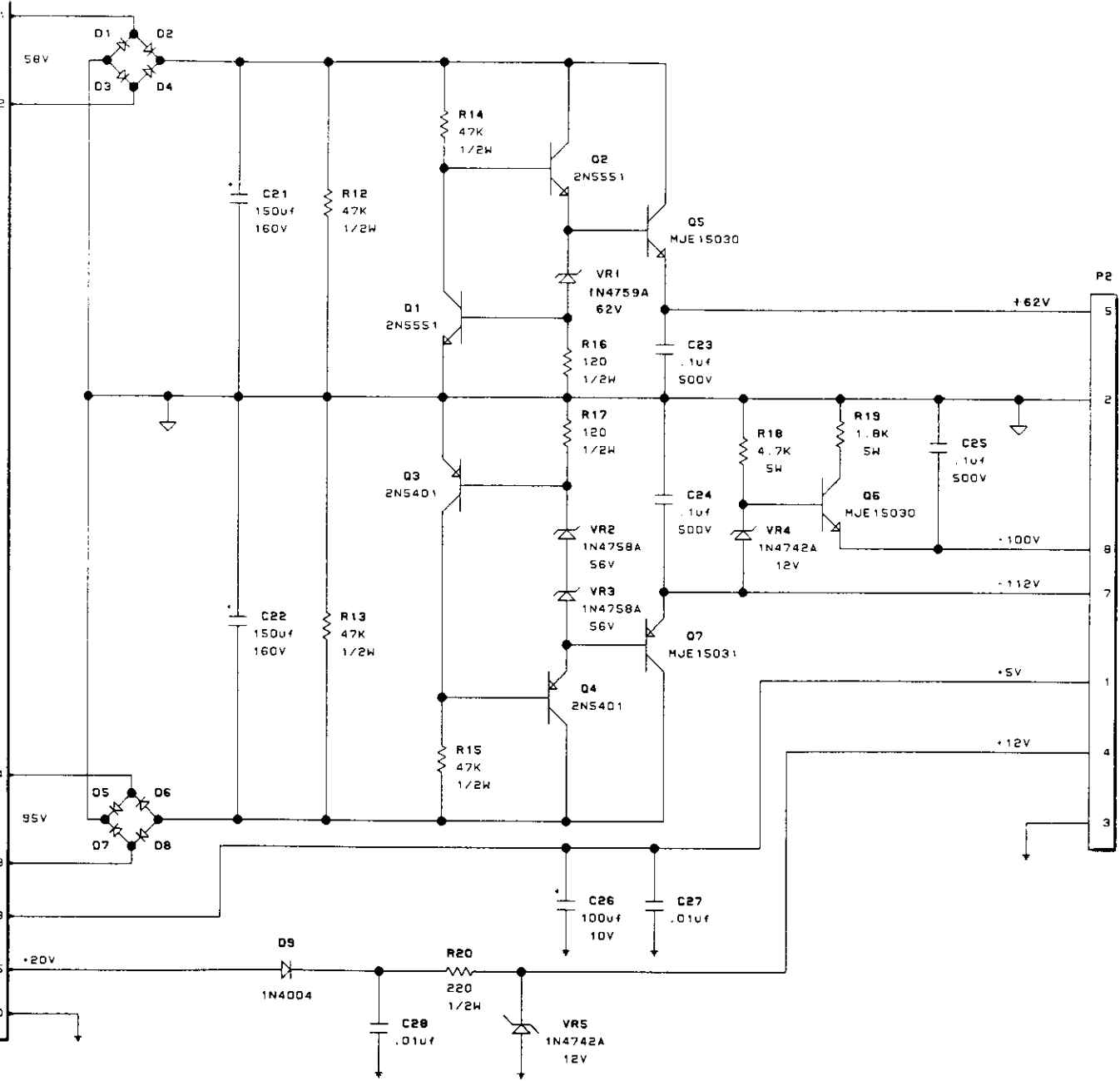
IC DIAGRAMS, PARTS LISTS





VI. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



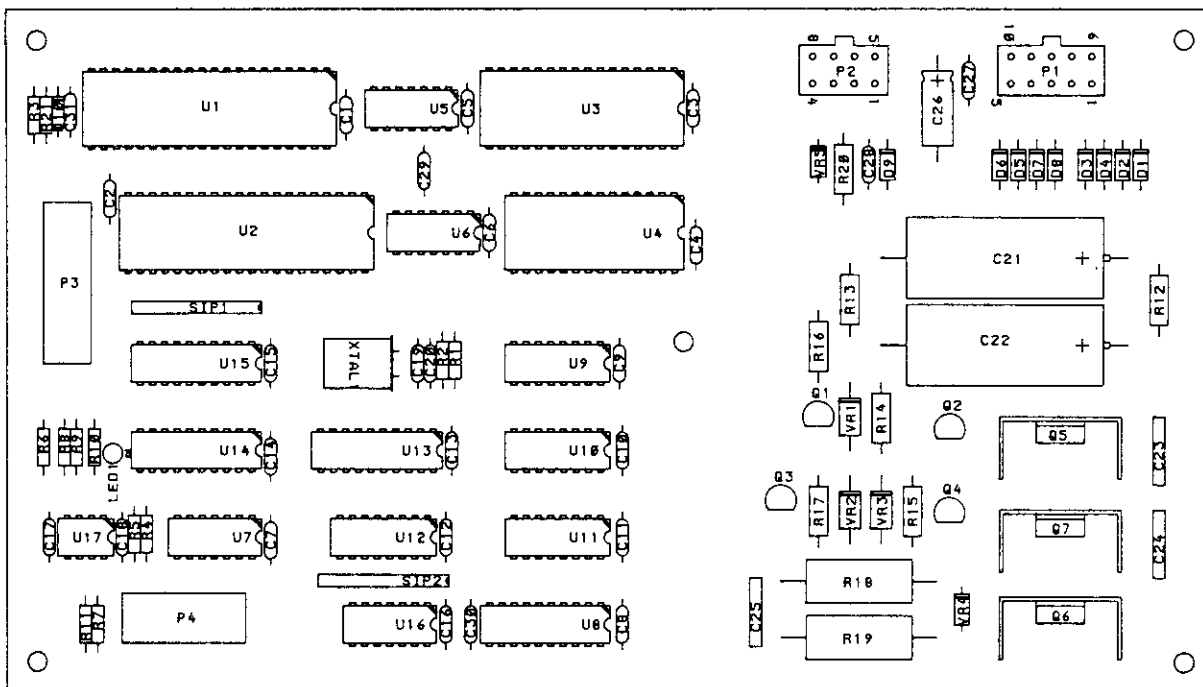


Premier Technology			
TITLE			
DISPLAY CONTROLLER (A8)			
SCHEMATIC DIAGRAM			
DRAWN	APPROVED	DATE	
C.B.	RHM	4-8-92	MA-1739

VI. WIRING AND SCHEMATIC DIAGRAMS, PARTS I

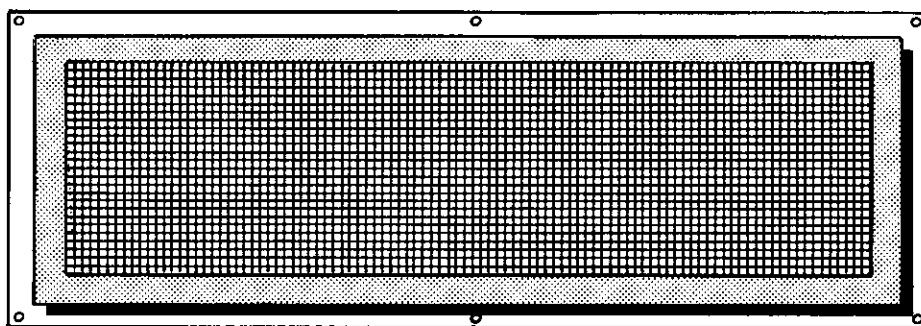
DISPLAY CONTROLLER (A8) COMPONENT LOCATION

DISPLA

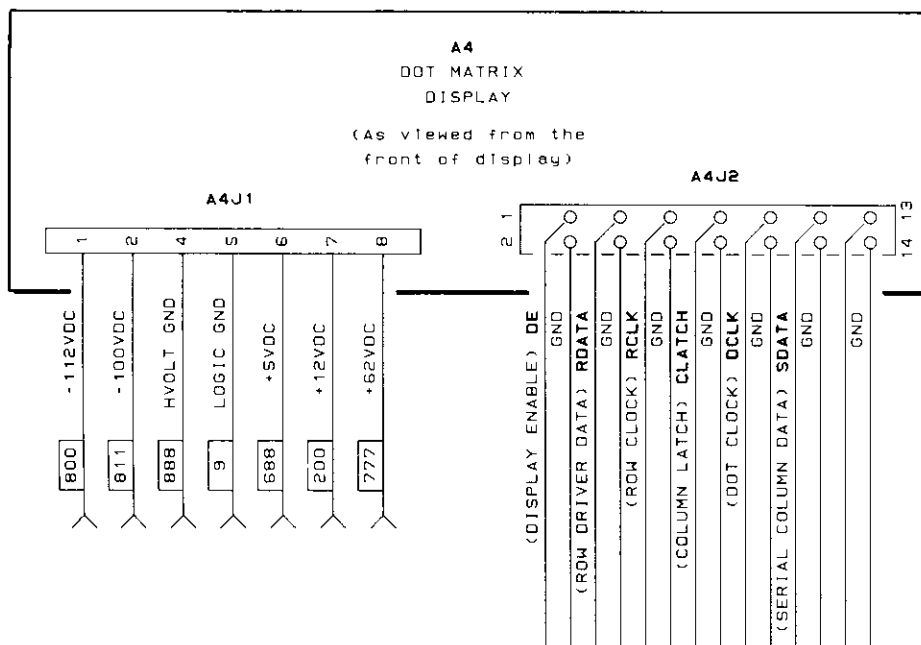


REFERENCE	DESCRIPTION
A8	DISPLAY CO
C1-C3	CAPACITOR,
C4-C18	CAPACITOR,
C27, C28	CAPACITOR,
C19, C20	CAPACITOR,
C21, C22	CAPACITOR,
C23, C25	CAPACITOR,
C26	CAPACITOR,
C29, C30	CAPACITOR,
C31	CAPACITOR,
D1-D9	DIODE, 1N4
D10	DIODE, 1N4
LED 1	DIODE, LED
Q1, Q2	TRANSISTOR
Q3, Q4	TRANSISTOR
Q5, Q6	TRANSISTOR
Q7	TRANSISTOR
R1	RESISTOR,
R2	RESISTOR,
R3-R6,	RESISTOR,
R8, R9	RESISTOR,
R10	RESISTOR,
R11	RESISTOR,
R12-R15	RESISTOR,
R16-R17	RESISTOR,
R18	RESISTOR,
R19	RESISTOR,
R20	RESISTOR,
R21	RESISTOR,
SIP1, SIP2	RESISTOR P
U1	IC, 65C02P
U2	IC, 68B45,
U4	IC, 6264LP
U5, U16	IC, 74HCT7
U6	IC, 74HC04
U7	IC, 74HC00
U8	IC, GAL16V
U9-U12	IC, 74LS15
U13	IC, 74HCT3
U14	IC, 74LS27
U15	IC, 74LS37
U17	IC, NE555,
VR1	DIODE, ZEN
VR2, VR3	DIODE, ZEN
VR4, VR5	DIODE, ZEN
XTAL1	CRYSTAL, 3
P1	HEADER, 10
P2	HEADER, 8
P3	HEADER, 20
P4	HEADER, 14
	HEATSINK, 32
	SOCKET, 20

DOT MATRIX DISPLAY (A4)

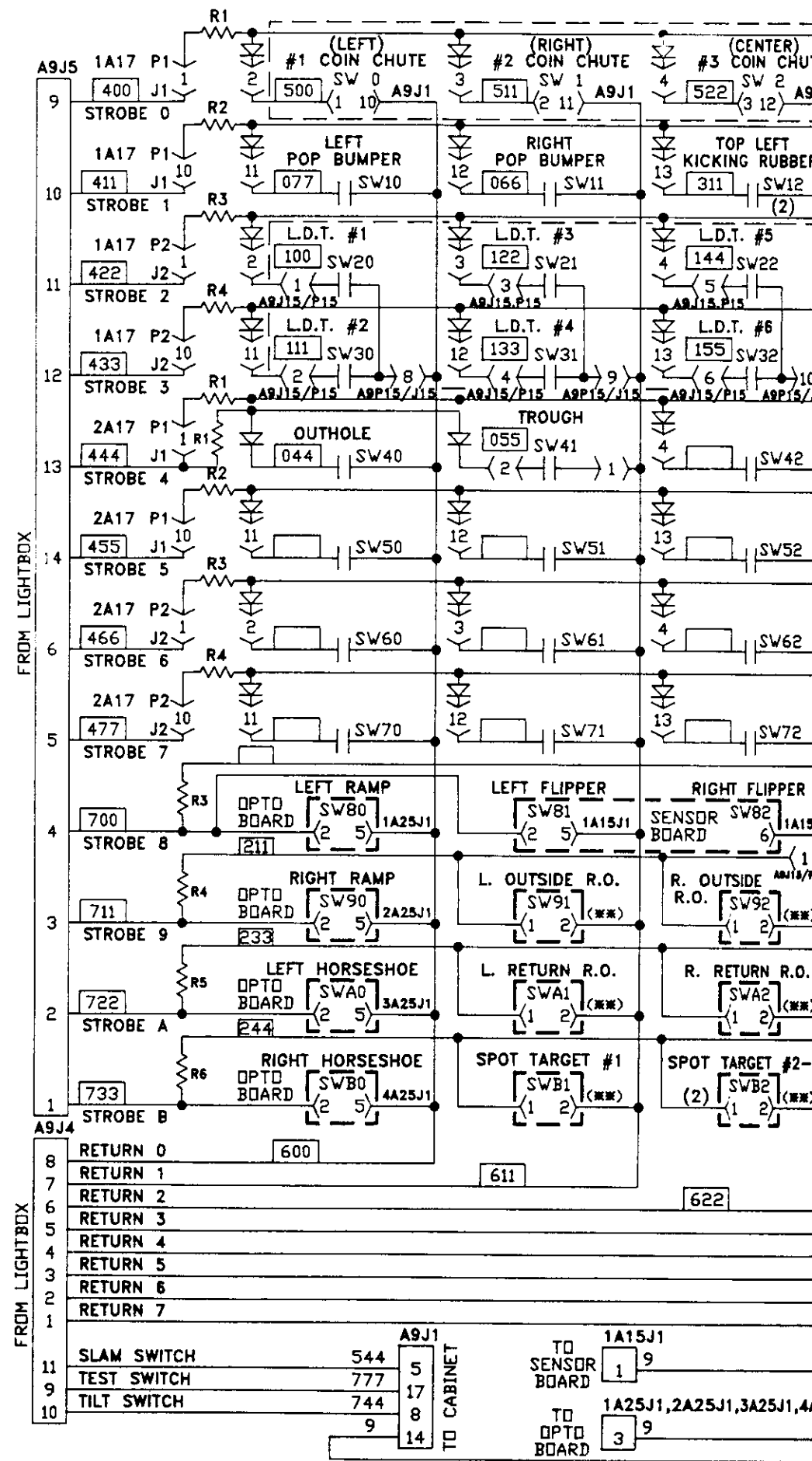


DESCRIPTION	PART NUMBER
DOT MATRIX DISPLAY	29151

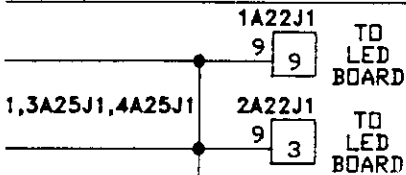
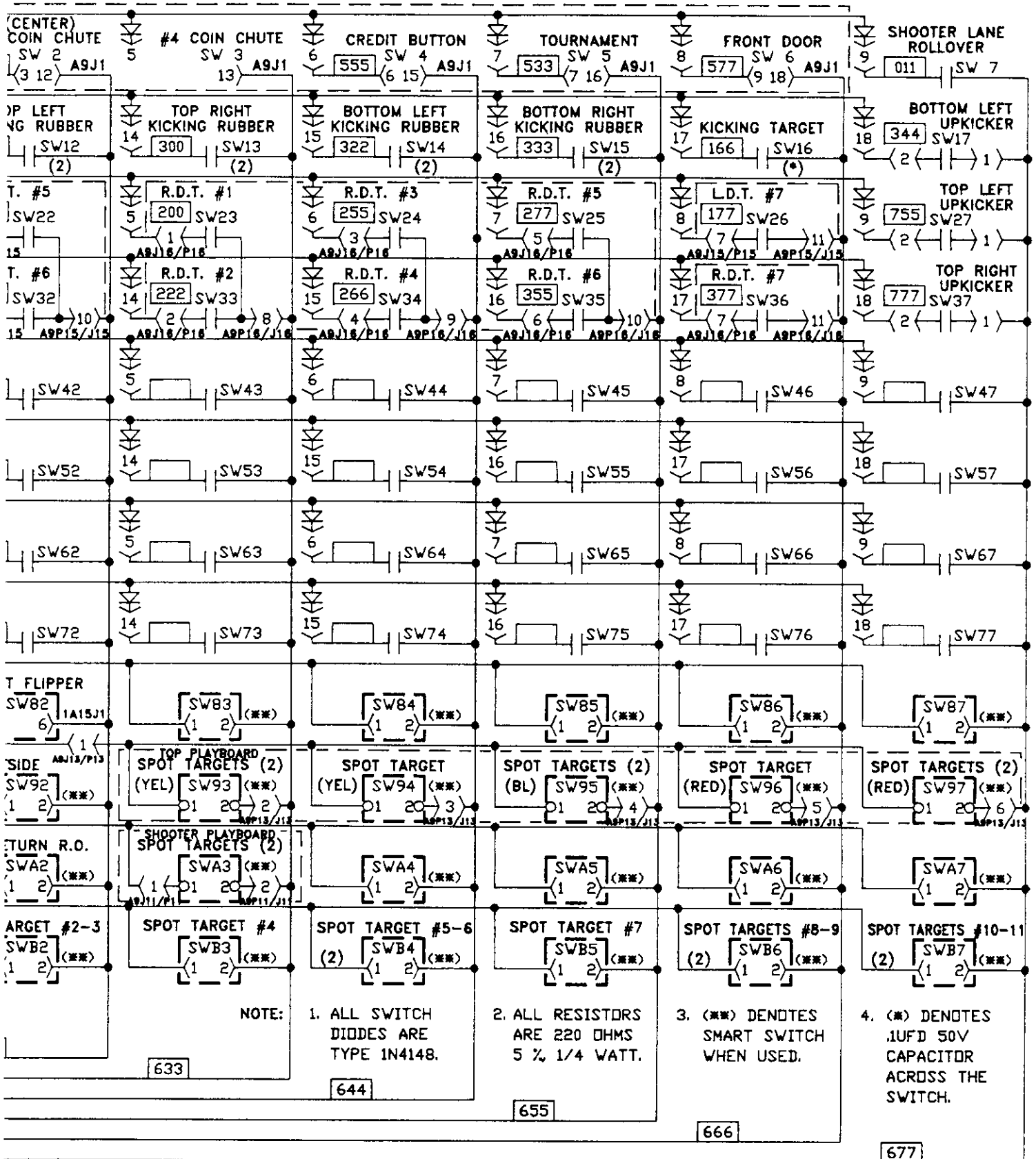


RAY CONTROLLER (A8)
PARTS LIST

DESCRIPTION	PART NUMBER
CONTROLLER	MA-1739
0.1UF, +80%-20%	XO-230
.01UF, +80%-20%	XO-229
33PF, 10%, 100V	XO-896
150UF, 160V	XO-1133
0.1UF, 500V	XO-886
100UF, 10V	XO-211
220PF, 10%, 100V	XO-694
0.1UF, 100V	XO-784
004	XO-254
148	XO-261
RED, MV5752	XO-270
NPN, 2N5551	XO-1141
PNP, 2N5401	XO-1142
NPN, MJE15030	XO-1143
PNP, MJE15031	XO-1144
22 MEGOHM, 5%, 1/4W	XO-74
10K OHM, 5%, 1/4W	XO-18
4.7K OHM, 5%, 1/4W	XO-7
330 OHM, 5%, 1/4W	XO-34
100K OHM, 5%, 1/4W	XO-45
47K OHM, 5%, 1/4W	XO-1135
120 OHM, 5%, 1/4W	XO-1136
4.7K OHM, 5%, 5W	XO-1137
1.8K OHM, 5%, 1/4W	XO-1138
220 OHM, 5%, 1/4W	XO-185
2.2K OHM, 5%, 1/4W	XO-27
ACK, 4.7 OHM	XO-906
CPU, 2MHZ	XO-927
CONTROLLER	XO-1139
RAM STAT 8K X 8	XO-781
DUAL "D" FLIP-FLOP	XO-889
INVERTER	XO-888
QUAD "NAND" GATES	XO-782
8-25L	U8-G
QUAD 1 OF 2 MULTIPLEXER	XO-390
1 OF 8 MULTIPLEXER	XO-1140
OCTAL DATA LATCH	XO-94
OCTAL "D" FLIP-FLOP	XO-96
TIMER	XO-631
ER, 1N4759A, 62V, 5%	XO-267
ER, 1N4758A, 56V, 5%	XO-1164
ER, 1N4742A, 12V, 5%	XO-257
.579MHZ	XO-1166
POSITION	XO-912
POSITION	XO-911
POSITION, RIBBON	XO-940
POSITION, RIBBON	XO-1134
6038	XO-472
PIN	XO-1036
PIN	XO-491



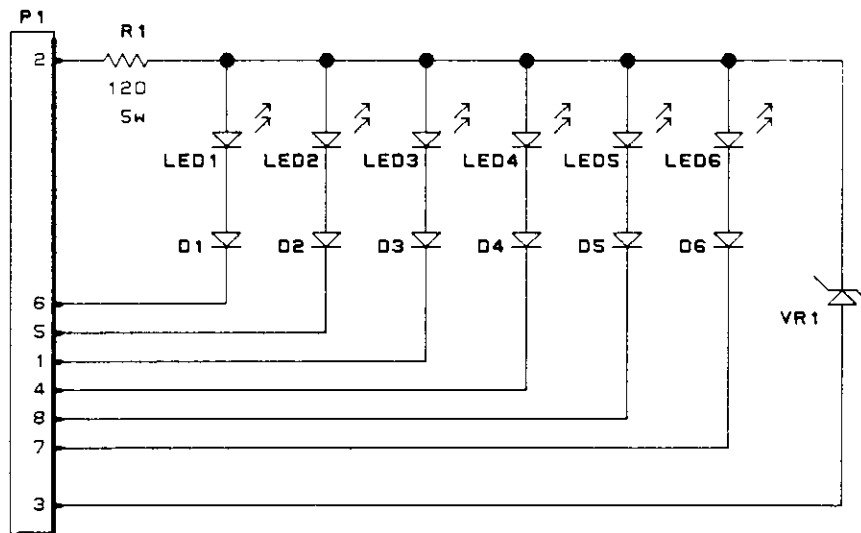
ND SCHEMATIC DIAGRAMS, PARTS LISTS



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

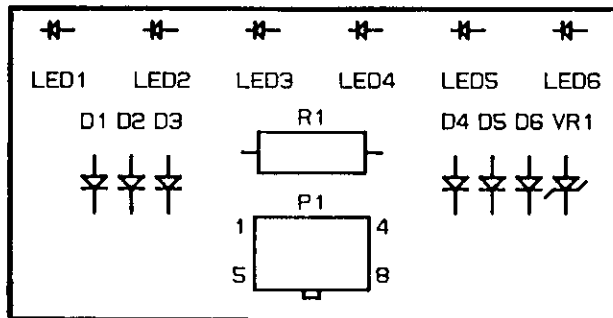
Premier Technology			
TITLE SWITCH MATRIX SCHEMATIC DIAGRAM			
USED IN #734	DRAWN RLM	DATE 09-01-92	29294

VI. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



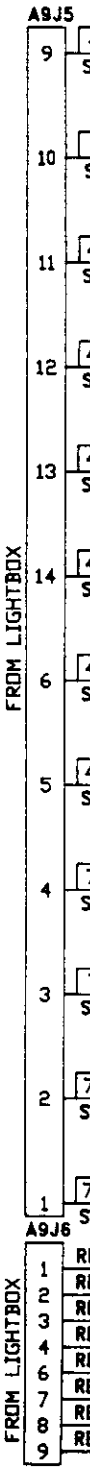
Premier Technology			
TITLE LED BOARD (A22) SCHEMATIC DIAGRAM			
DRAWN R.W.	APPROVED R.W.	DATE 7-15-92	MA-1870

LED BOARD (2A22) COMPONENT LOCATION

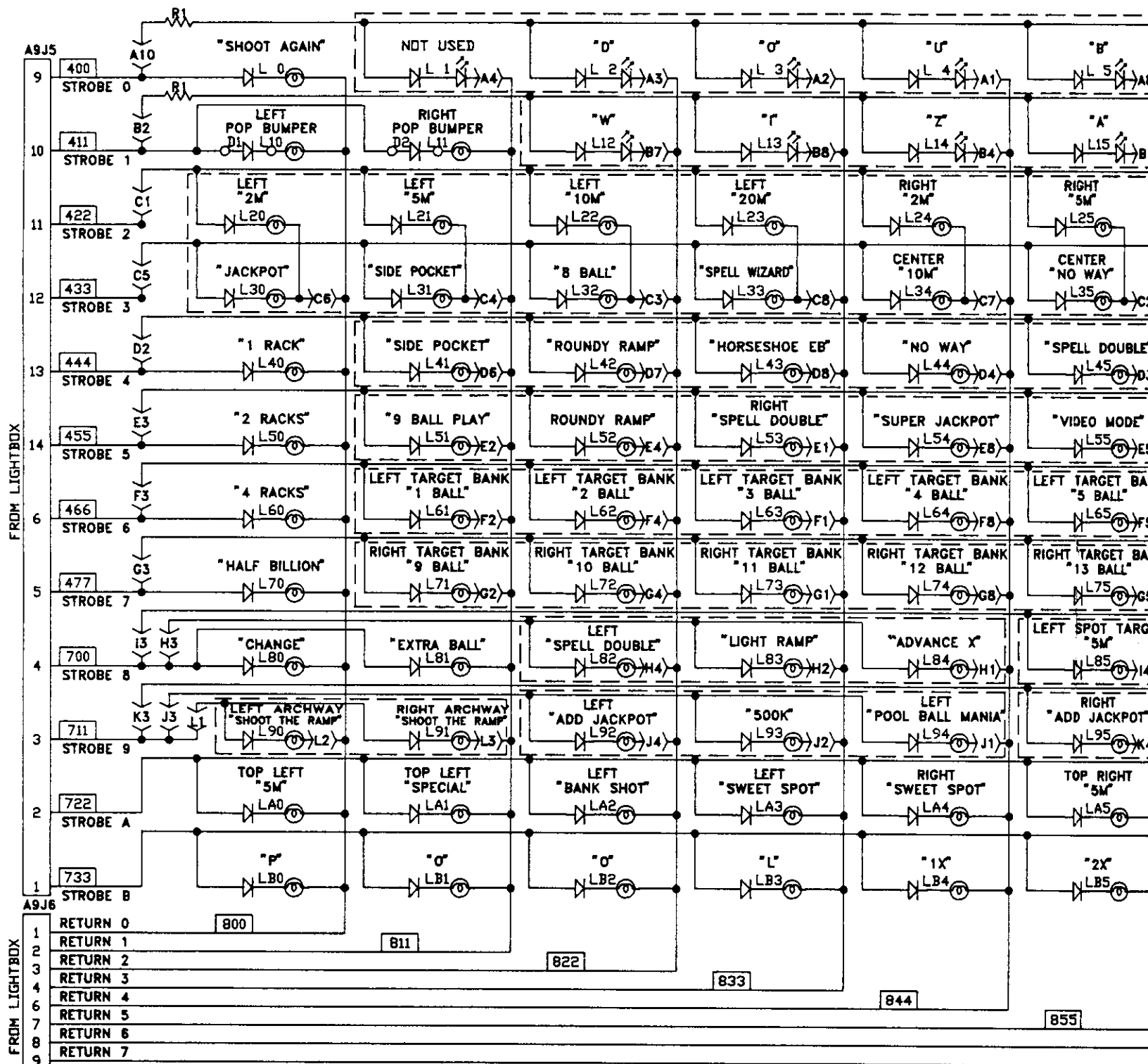


LED BOARD (2A22) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	LED Board Assembly (2A22)	MA-1870
D1-D6	Diode, 1N4004	XO-254
LED 1- LED 6	Diode, LED, Red	XO-865
R1	Resistor, 120 OHM, 5%, 5W	XO-1042
VR1	Diode, Zener, 1N4737A, 7.5V	XO-844
P1	Header, 10 Position	XO-911



VI. WIRING AND SCHEMATIC DIA

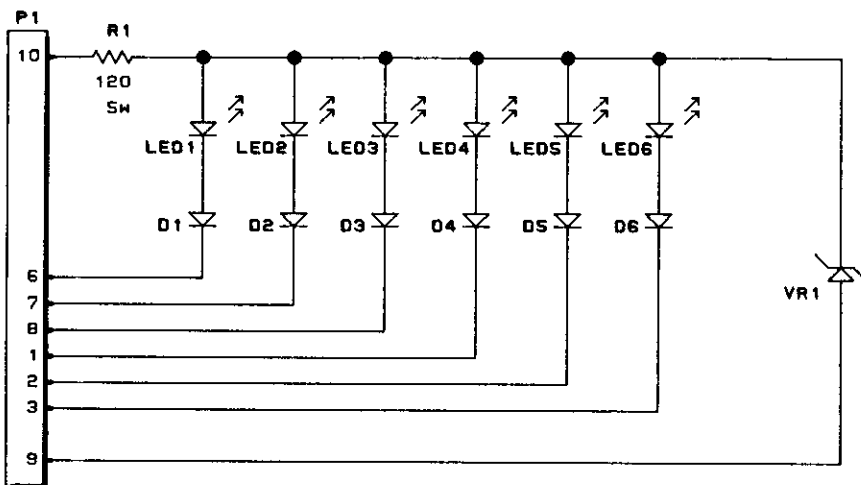
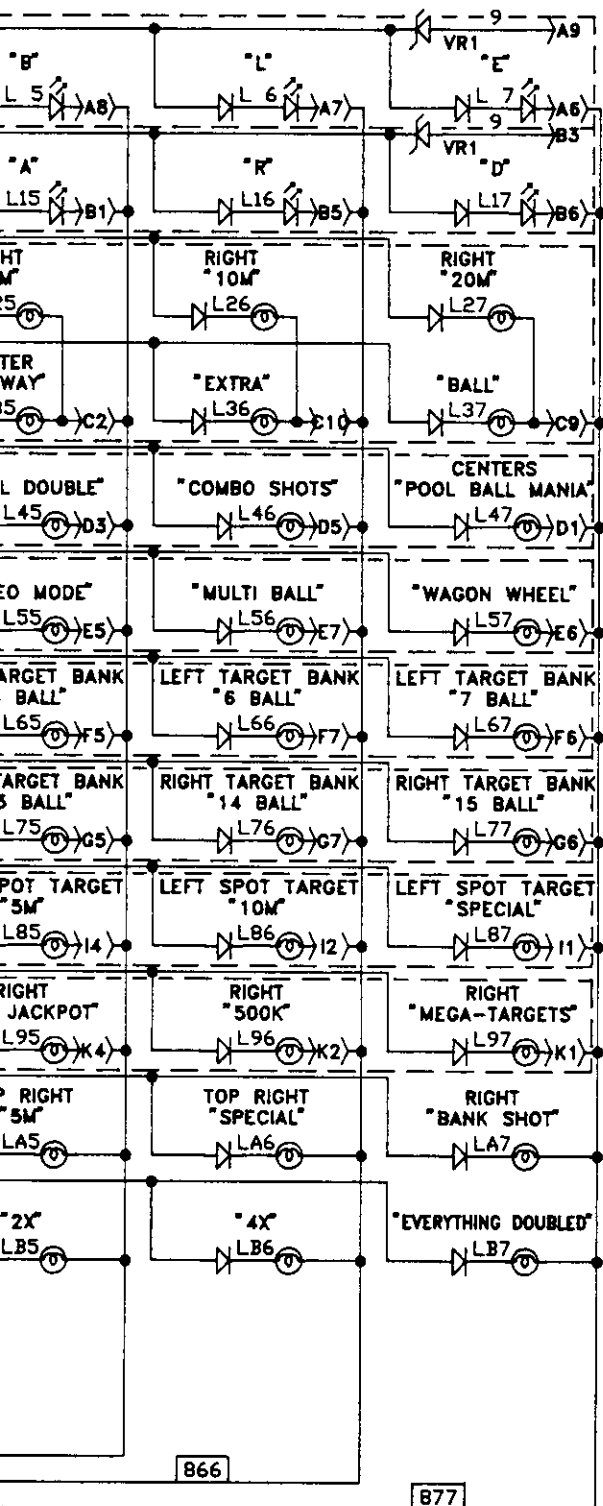


NOTE: 1. ALL LAMPS ARE TYPE #44
 ALL LAMP DIODES ARE TYPE 1N4004
 ALL ZENER DIODES ARE TYPE 1N4737A
 ALL RESISTORS ARE 120 OHMS 5 WATT

2 A = 1A22J1 E = 5A22J1 I = 9A22J1
 B = 2A22J1 F = 6A22J1 J = 10A22J1
 C = 3A22J1 G = 7A22J1 K = 11A22J1
 D = 4A22J1 H = 8A22J1 L = A9J19/P19

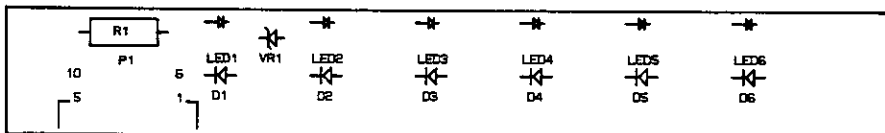
COLOR CO	
0	BLACK 5
1	BROWN 6
2	RED 7
3	ORANGE 8
4	YELLOW 9

C DIAGRAMS, PARTS LISTS



Premier Technology			
TITLE LED BOARD (A22) SCHEMATIC DIAGRAM			
DRAWN J.B.	APPROVED J.B.	DATE 7-15-92	MA-1843

LED BOARD (1A22) COMPONENT LOCATION



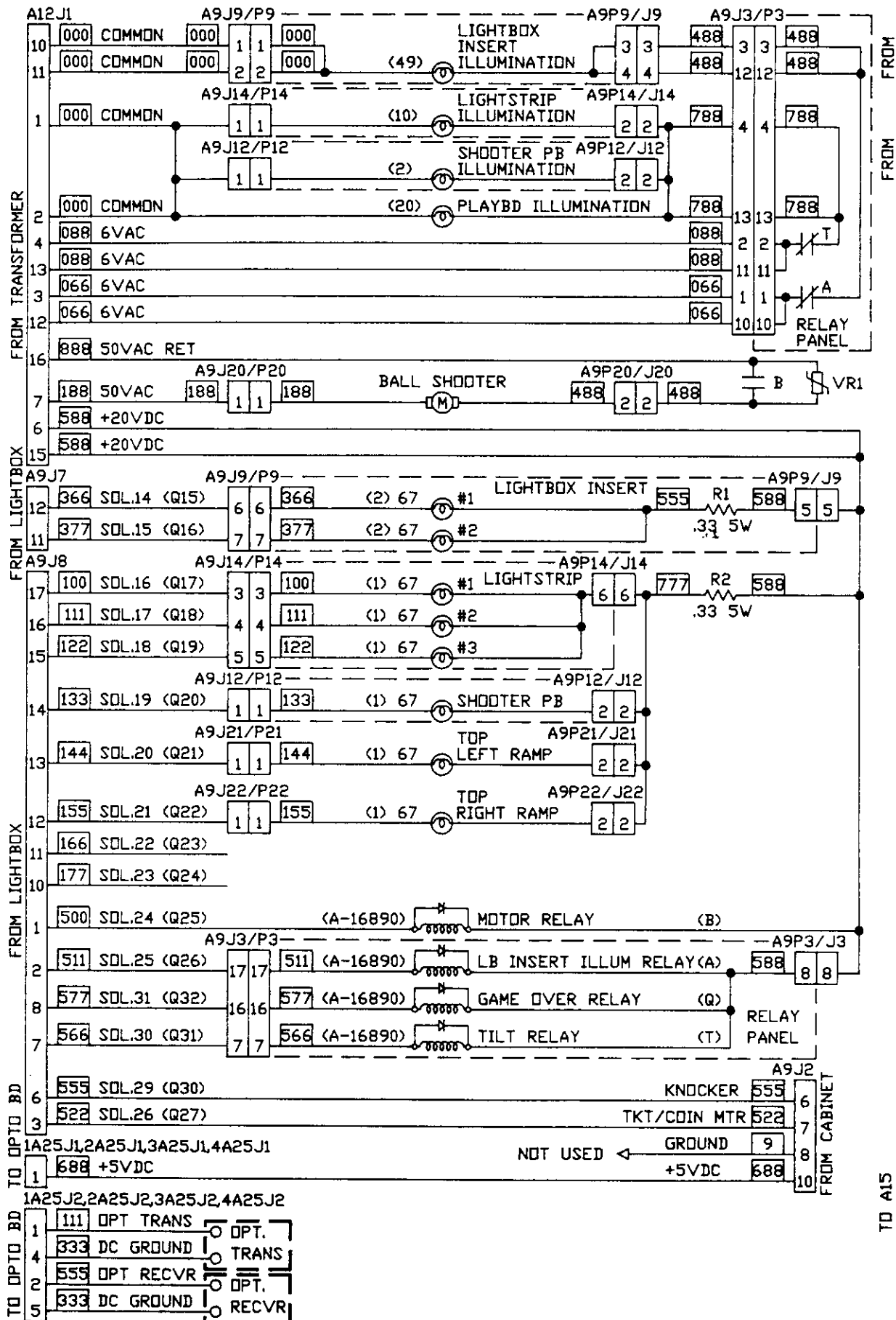
LED BOARD (1A22) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
D1-D6	LED Board Assembly (1A22)	MA-1843
LED 1 - LED 6	Diode, 1N4004	XO-254
	Diode, LED, Green	XO-866
R1	Resistor, 120 OHM, 5%, 5W	XO-1042
VR1	Diode, Zener, 1N4737A, 7.5V	XO-844
P1	Header, 10 Position	XO-998

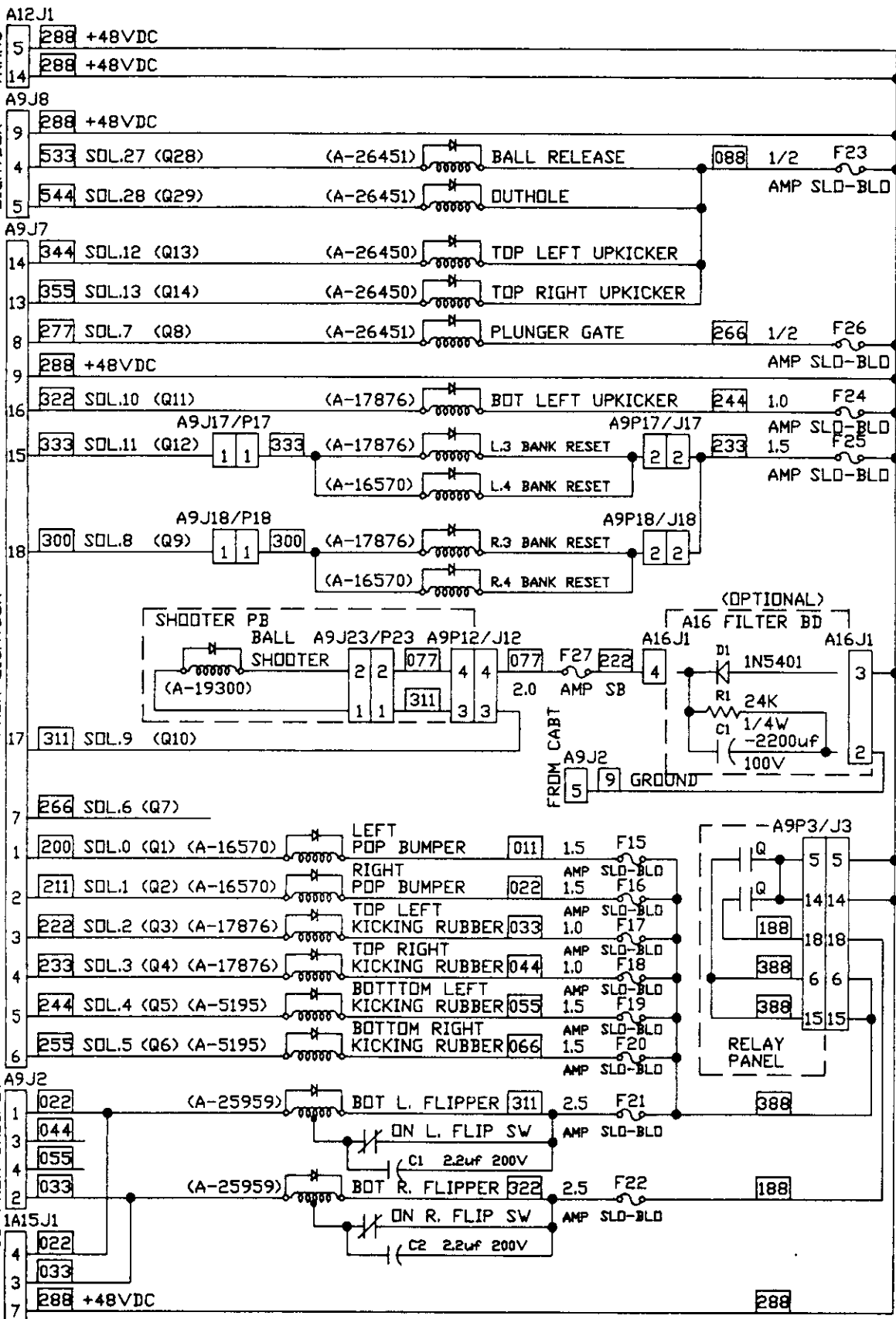
COLOR CODE	
BLACK 5	GREEN
BROWN 6	BLUE
RED 7	VIOLET
ORANGE 8	GRAY
YELLOW 9	WHITE

Premier Technology			
TITLE LAMP MATRIX SCHEMATIC DIAGRAM			
USED BY #734	DRAWN RLM	DATE 08-10-92	29295

VI. WIRING AND SCHEMAT



C DIAGRAMS, PARTS LISTS



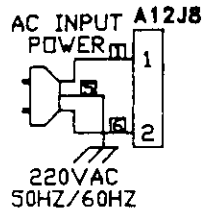
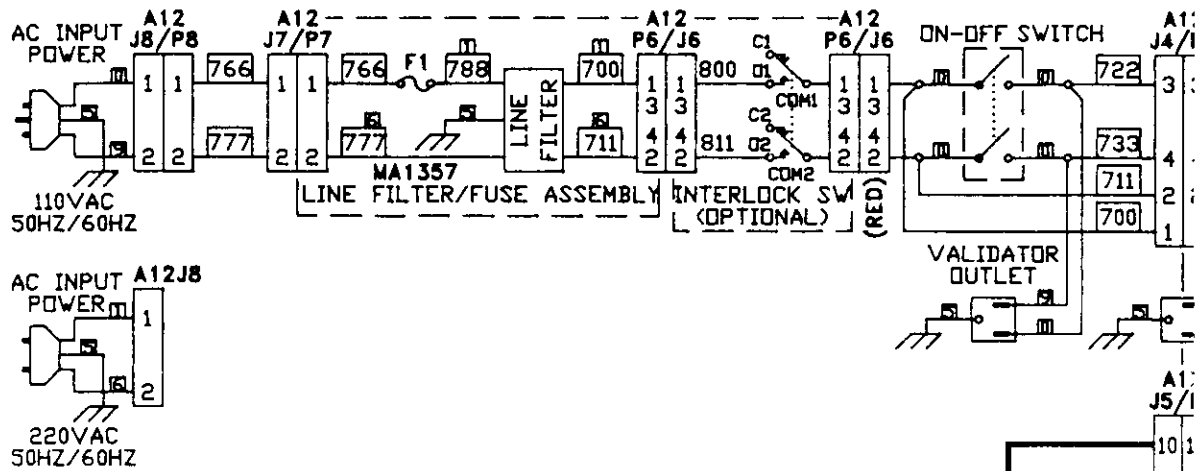
NOTE:

1. ALL DIODES ARE TYPE 1N4004.
2. UNLESS OTHERWISE SPECIFIED ALL LAMPS ARE TYPE #44.

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		PLAYBOARD	
SCHEMATIC DIAGRAM			
USED ON	DRAWN	DATE	
#734	RLM	09-08-92	29296

VI. WIRING AND SCHEMATIC



A12J5 WIRING VIEW PIN NUMBERS

10	9	8	7	6
5	4	3	2	1

100VAC INPUT JUMPERS

J2	9	8	J2	J3	JUMPER WIRE	111
J1	4	3	J1	J3	COLORS	

110VAC INPUT JUMPERS

J2	9	J2	7	J3	JUMPER WIRE	222
J1	4	J1	2	J3	COLORS	

120VAC INPUT JUMPERS

J2	J2	8	7	J3	JUMPER WIRE	333
J1	J1	3	2	J3	COLORS	

200VAC INPUT JUMPERS

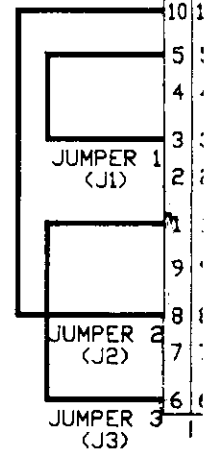
10	9	8	J2	6	JUMPER WIRE	444
J1	4	3	J1	J2	COLORS	

220VAC INPUT JUMPERS

10	9	J2	7	6	JUMPER WIRE	555
J1	4	J1	2	J2	COLORS	

240VAC INPUT JUMPERS

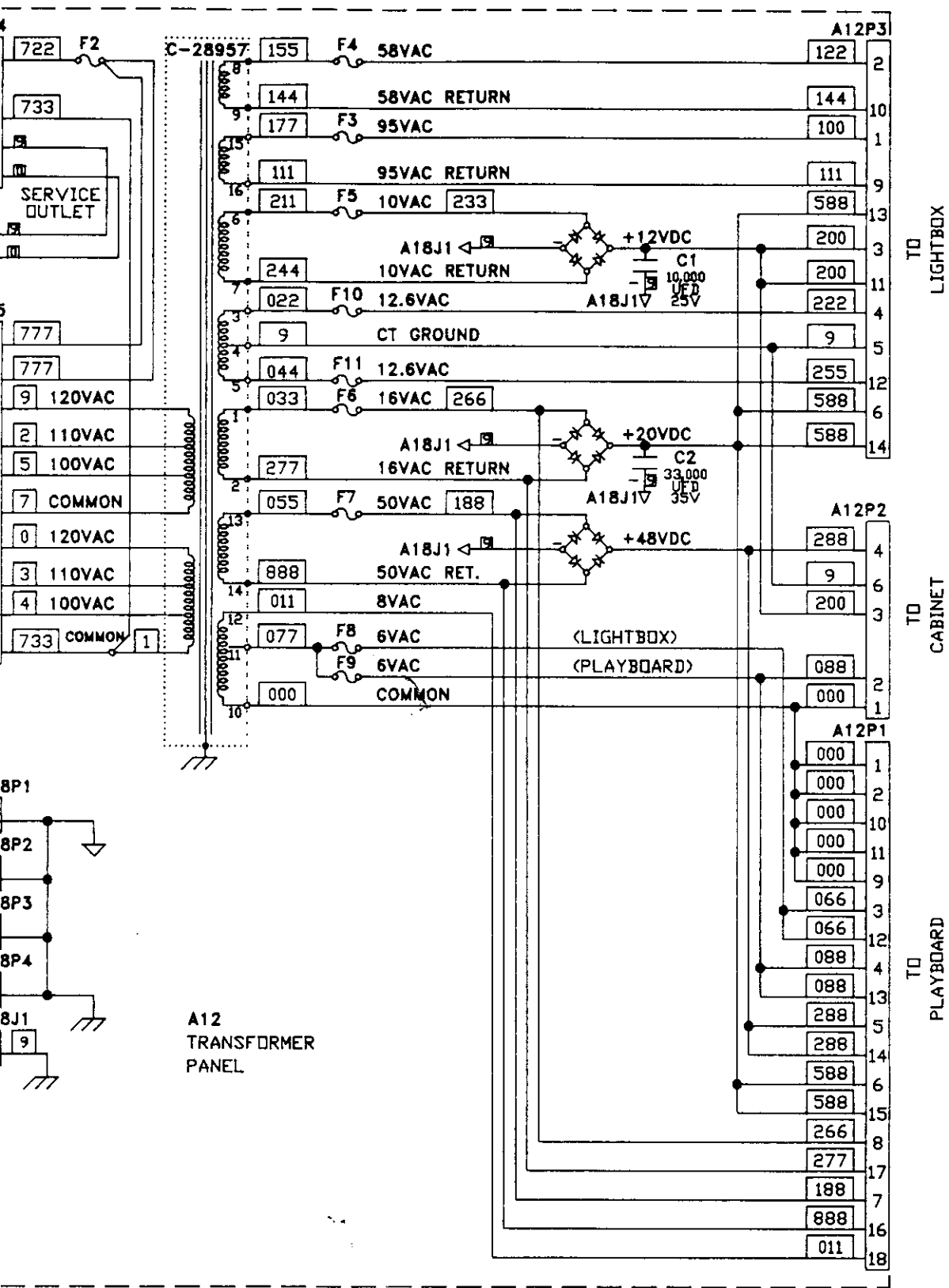
10	J2	8	7	6	JUMPER WIRE	666
J1	J1	3	2	J2	COLORS	



GROUNDS TO TRANSFORMER
GROUNDS TO LIGHTBOX
GROUNDS TO CABINET
GROUNDS TO LIGHTBOX

FUSE DESIGNATIONS TABLE					
FUSE	RATING	PART NO.	USAGE		
F1	8.0A SLD-BLD	EL26	LINE INPUT		110VAC
	4.0A SLD-BLD	EL33	LINE INPUT		220VAC
F2	5.0A SLD-BLD	EL8	PRIMARY POWER		110VAC
	2.5A SLD-BLD	EL21	PRIMARY POWER		220VAC
F3	3/8A SLD-BLD	EL31	DISPLAY		95VAC
F4	3/8A SLD-BLD	EL31	DISPLAY		58VAC
F5	2.5A SLD-BLD	EL21	POWER SUPPLY		10VAC
F6	10A SLD-BLD	EL36	CONTROLLED LAMPS		16VAC
F7	8.0A SLD-BLD	EL26	SOLENOIDS		51VAC
F8	15A	EL25	LIGHTBOX INSERT ILLUMINATION		6VAC
F9	10A SLD-BLD	EL36	PLAYFIELD ILLUMINATION		6VAC
F10	3.0A SLD-BLD	EL9	AUXILLIARY POWER SUPPLY		12.6VAC
F11	3.0A SLD-BLD	EL9	AUXILLIARY POWER SUPPLY		12.6VAC
F12					

DIAGRAMS, PARTS LISTS



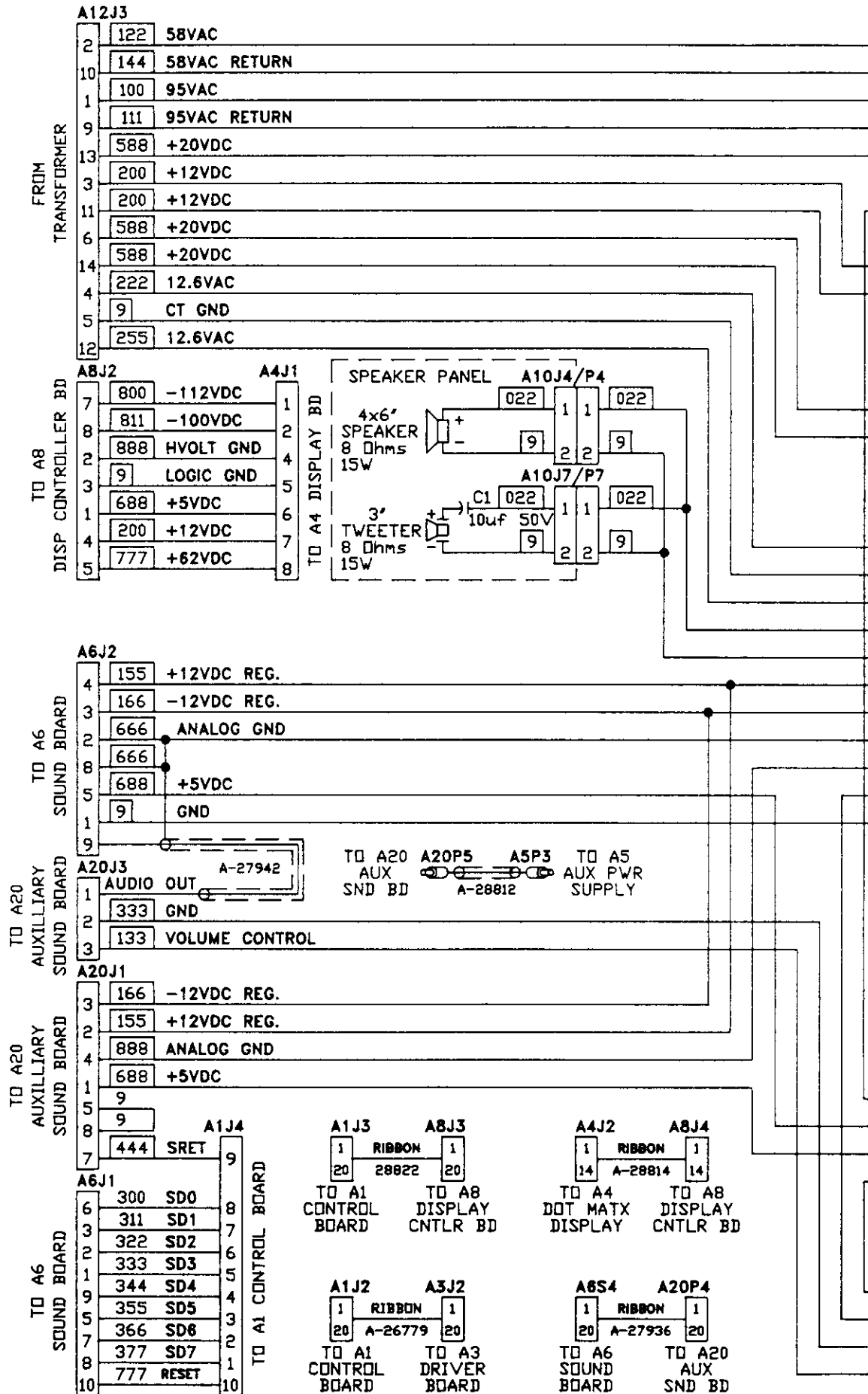
NOTES:
 XXX INDICATES WIRE COLOR.
 A12J5 SHOWN IN 110VAC OPERATION.
 ↓ CIRCUIT GROUND
 ⏏ EARTH GROUND

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

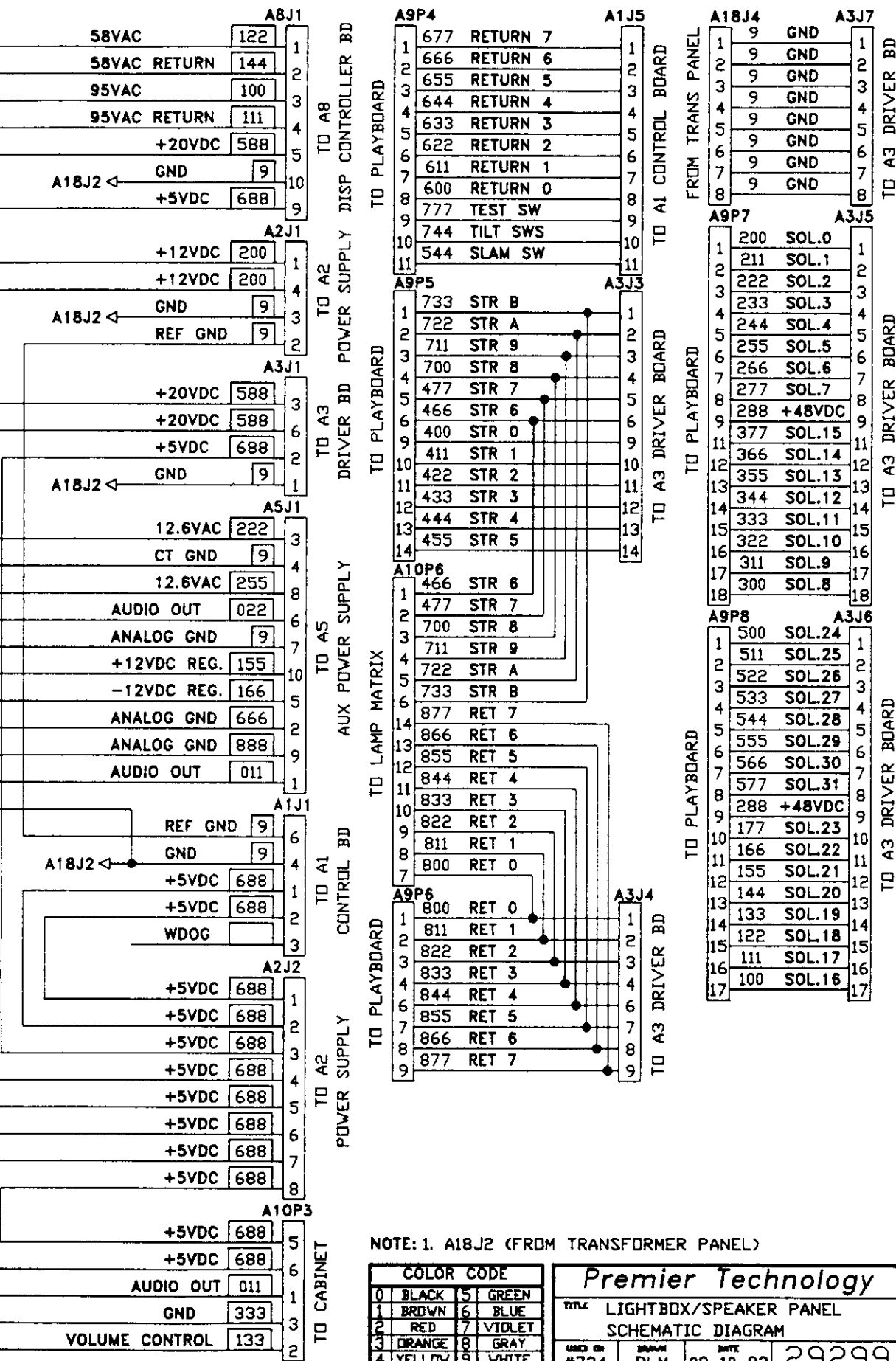
Premier Technology

TITLE TRANSFORMER PANEL			
SCHEMATIC DIAGRAM			
WORK ON #734	DRAWN RLM	DATE 06-23-92	29297

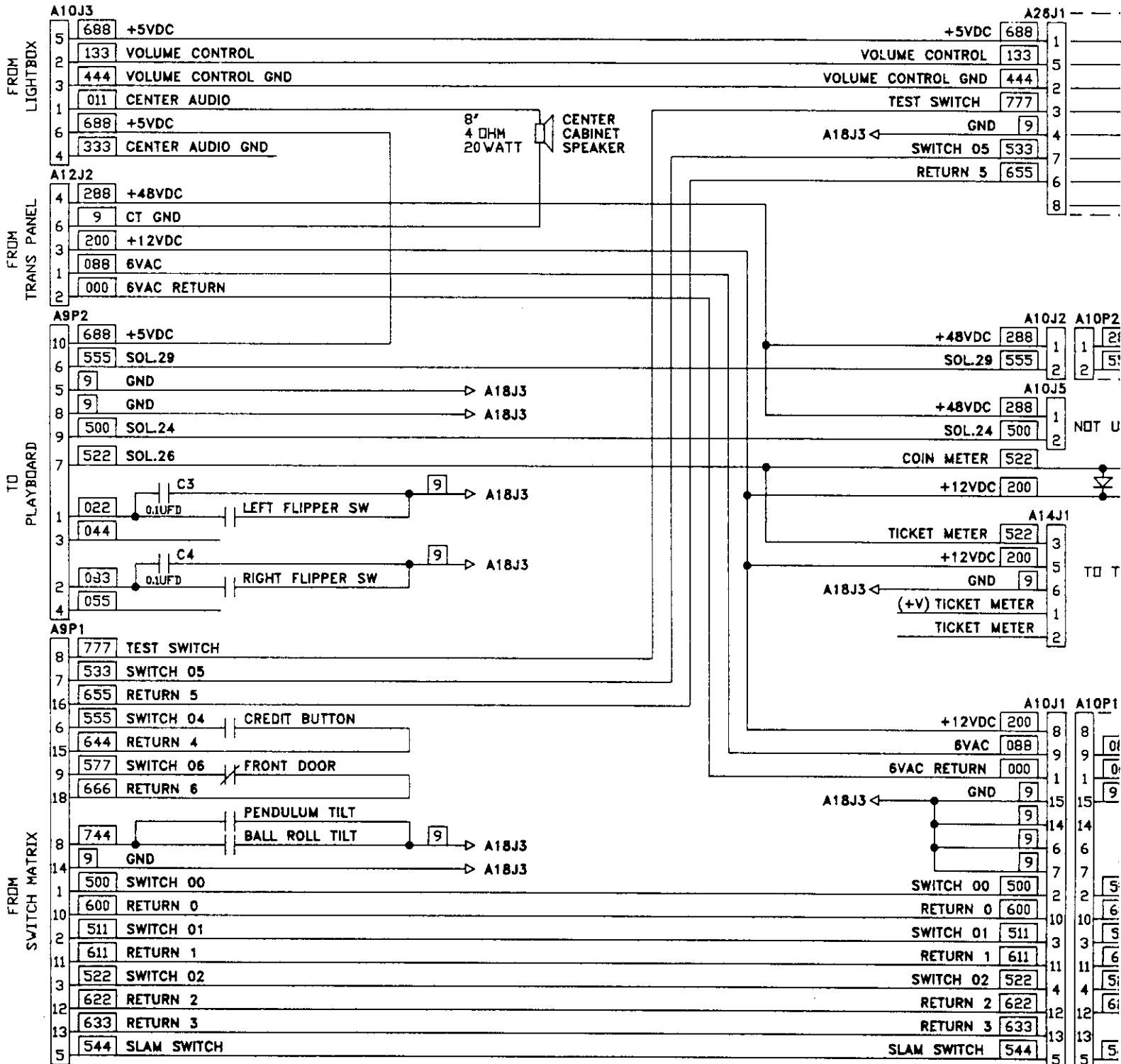
VI. WIRING AND SCHEMA



TIC DIAGRAMS, PARTS LISTS



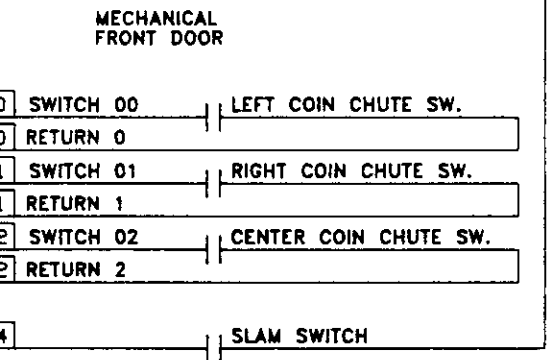
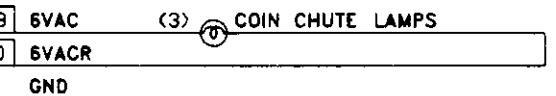
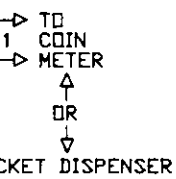
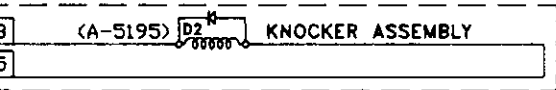
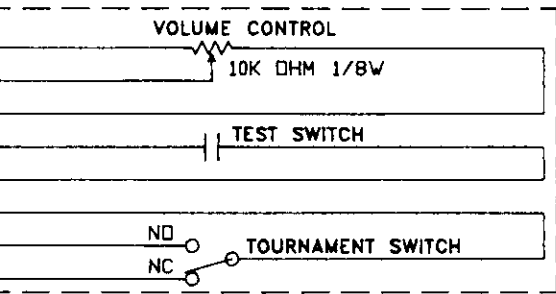
VI. WIRING AND SCHEMATIC



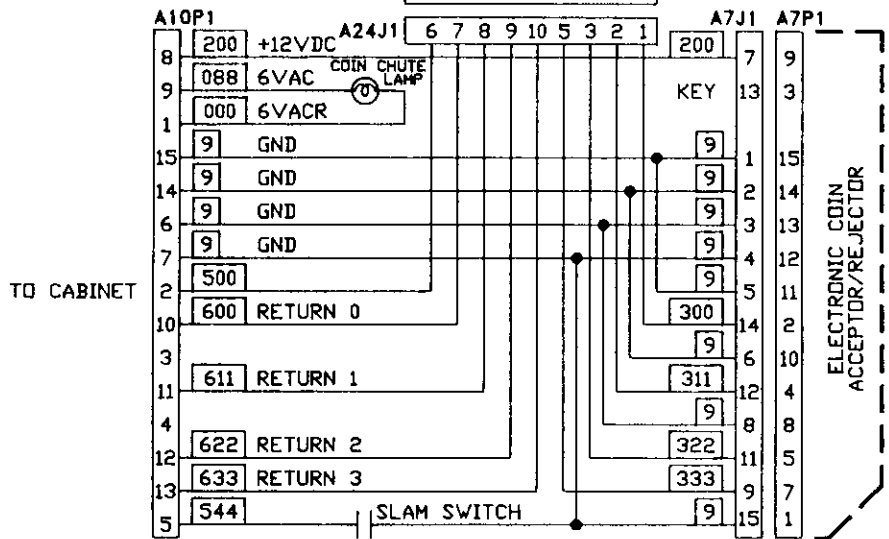
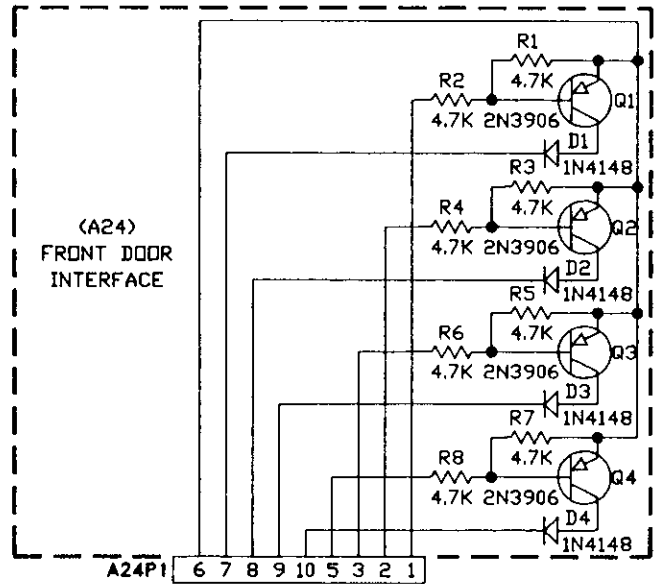
NOTE:
 1. AMOUNT OF PARTS VARIES PER GAME.
 2. ALL DIODES ARE TYPE IN4004.
 3. A18J3 (FROM TRANSFORMER PANEL).

COL	
0	BLK
1	BROV
2	RED
3	ORAN
4	YELL

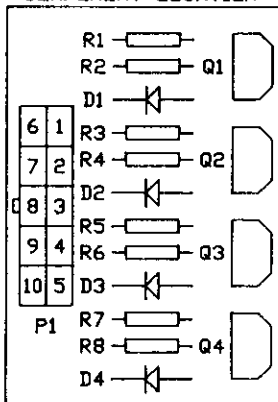
DIAGRAMS, PARTS LISTS



R CODE		Premier Technology	
5	GREEN	TITLE CABINET/FRONT DOOR	
6	BLUE	SCHEMATIC DIAGRAM	
7	VIOLET	USED ON #734	DATE 08-10-92
8	GRAY	DRAWN RLM	29298
9	WHITE		



(A24) FRONT DOOR INTERFACE COMPONENT LOCATION



(A24) FRONT DOOR INTERFACE PARTS LIST

REFERENCE DESCRIPTION	PART NO.
FRONT DOOR INTERFACE ASSEMBLY	MA1645
DIODE, 1N4148	X0-261
TRANSISTOR, PNP, 2N3906	X0-588
RESISTOR, 4.7K OHM, 1/4W, 5%	X0-7
HEADER, 10 POSITION	X0-912
SPACER (4)	23984

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	DATE 09-20-91
DRAWN RLM	28541

VII. PARTS INFORMATION

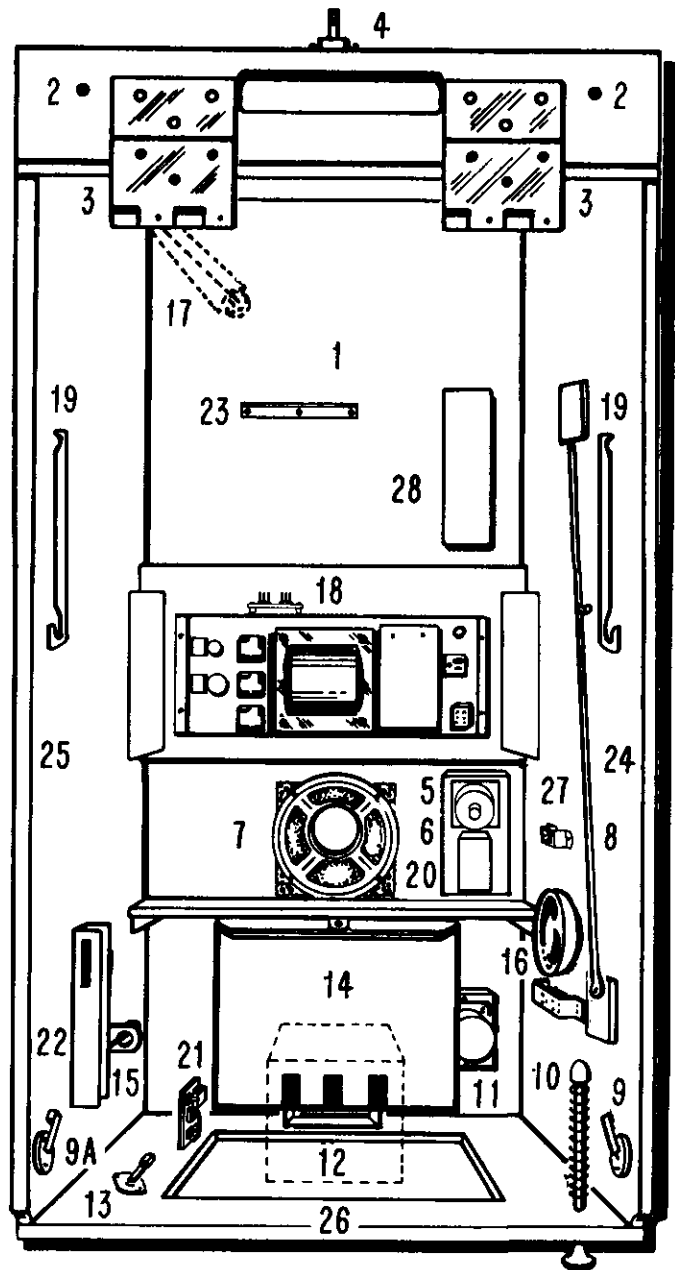
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VII. PARTS INFORMATION

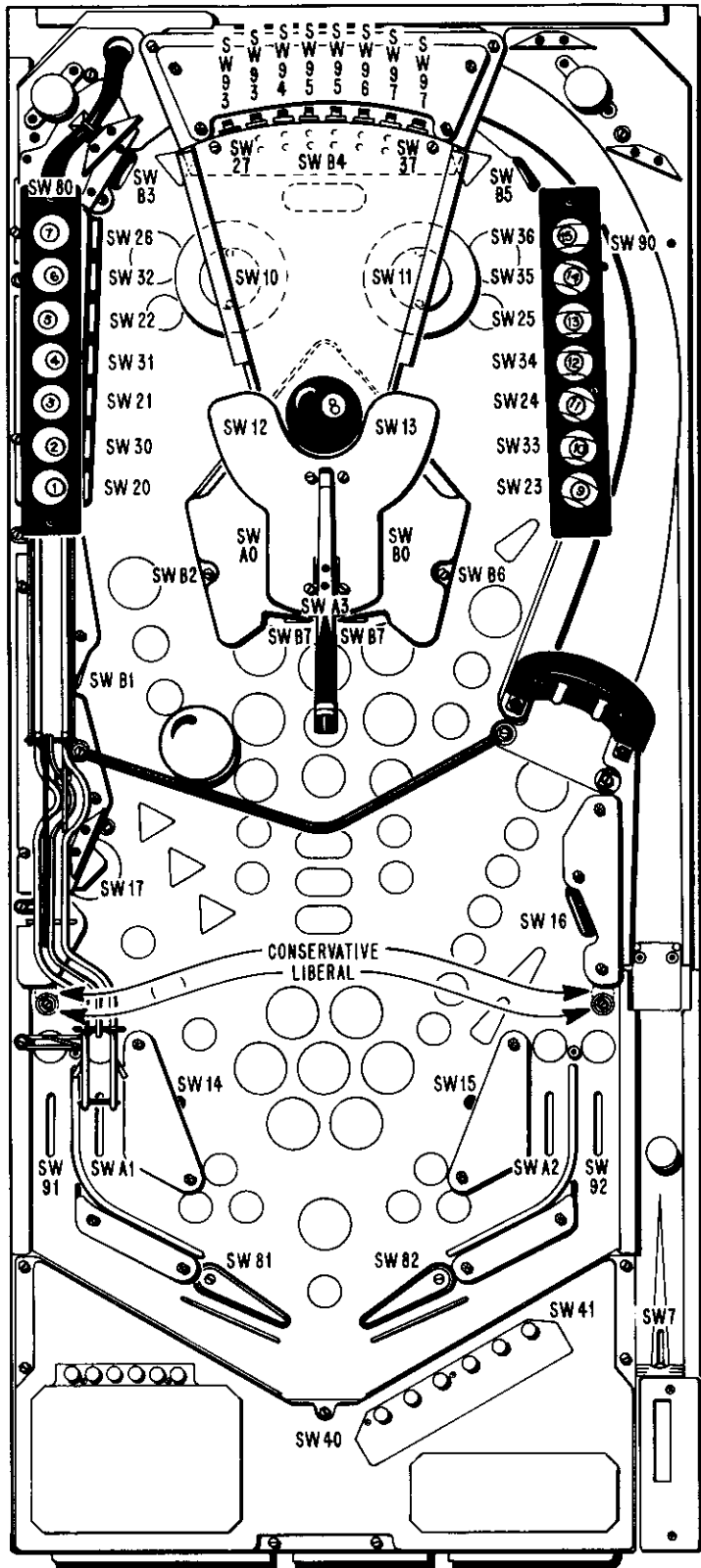
CABINET PARTS

ITEM	DESCRIPTION	PART NO.
1	Cabinet	29410-734
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) Latch Assembly (P/O Cabinet)	24659 21969
5	Cable Assembly, Domestic (High Voltage)	MA-1775
6	Line Cord (Domestic) Line Cord Cover Plate	23365 23364
7	Speaker, 4 Ohm, Speaker Grille	28934 28935
8	Prop Stick, Playfield	23940
9	Right Flipper Switch	28693
9A	Left Flipper Switch	28690
10	Ball Shooter Assembly	26314
11	Switch, On/Off Switch Plate (2) Switch Housing	13799 18769 15163
12	Front Door Assembly (Universal) Cable Assembly Slam Switch (N/O) 6V DC Lamp, Wedge Base Lampholder	24159 MA-1709 26130 FD-2 FD-24
13	Replay Switch Assembly	18092
14	Cashbox Cover	28032 28062
15	Plumb Bob Tilt Switch Assembly Strike Plate Carbon, Tilt Bob Rod, Tilt Bracket Clip	358 MH-30 357 22043 14653
16	Knocker Assembly 5" Bell Assembly (When Used)	MA-12 27591
17	Cabinet Leg (4) Leg Bolt (8) 3" Leg Adjuster (4) 3/8-16", Jam Nut (8)	4337 3775 MH-21 FA-665
18	Transformer Panel Assembly Bridge Rectifier (3) Cable Assembly (Secondary) Capacitor, (10,000UF), 25V Capacitor, (33,000UF), 35V Fuse Block (8 Pos.) Fuse Cover Fuse Holder and Cap (F2), F3 Fuse Holder (1 Pos.) F2, 5 Amp, SLO-BLO (110V AC) F2, 2.5 Amp, SLO-BLO (220V AC) F3, 3/8 Amp, SLO-BLO F4, 3/8 Amp, SLO-BLO F5, 2.5 Amp, SLO-BLO F6, 10 Amp, SLO-BLO F7, 8 Amp, SLO-BLO F8, 15 Amp F9, 10 Amp, SLO-BLO F10, 3 Amp, SLO-BLO F11, 3 Amp, SLO-BLO	MA-1848 EL-42 MA-1779 XO-830 XO-957 EL-10 23805 EL-78 EL-17 EL-8 EL-21 EL-31 EL-31 EL-21 EL-36 EL-26 EL-25 EL-36 EL-9 EL-9
	Ground Bus Assembly Outlet, Service Transformer	27153 18133 28957
19	Cabinet Pivot Bracket (Right) Cabinet Pivot Bracket (Left)	25658 25657
20	Line Filter Assembly Fuse Holder F1, 8 Amp, SLO-BLO (110V AC) F1, 4 Amp, SLO-BLO (220V AC) Line Filter Line Filter (Germany)	MA-1386 EL-78 EL-26 EL-33 EL-50 EL-51 24149
21	Game Control Board (A26)	MA-1851
22	Ball Roll Tilt Housing and Switch Assembly Switch	24394 24393
23	Connector Mounting Plate	28746
24	Right Moulding (Not Shown)	28700
25	Left Moulding (Not Shown)	28701
26	Front Moulding (Not Shown)	16951
27	Bracket, Voltage Outlet (Bill Acceptor)	18104
28	Relay Strip Assembly "Q" Relay "T" Relay "A" Relay	MA-1872 MA-1172 MA-25 MA-1023



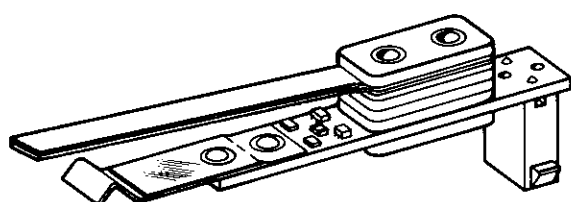
VII. PARTS INFORMATION

PLAYBOARD SWITCH ASSIGNMENTS



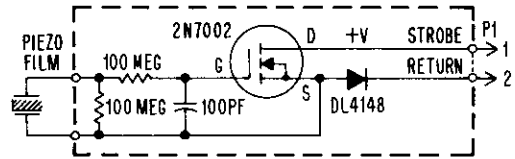
SWITCH MATRIX NUMBER	SWITCH ASSIGNMENT	PART NO.
SW 0	LEFT COIN CHUTE (#1)	P/O FRONT DOOR
SW 1	RIGHT COIN CHUTE (#2)	P/O FRONT DOOR
SW 2	CENTER COIN CHUTE (#3)	P/O FRONT DOOR
SW 3	COIN CHUTE (#4)	P/O ELECTRONIC DOOR
SW 4	START (CREDIT) BUTTON	P/O CABINET
SW 5	TOURNAMENT	XO-1193
SW 6	FRONT DOOR	29305
SW 7	SHOOTER LANE ROLLOVER	25938
SW 10	LEFT POP BUMPER	22705
SW 11	RIGHT POP BUMPER	22705
SW 12	TOP LEFT KICKING RUBBER	27702
SW 13	TOP RIGHT KICKING RUBBER	27702
SW 14	BOTTOM LEFT KICKING RUBBER	27702
SW 15	BOTTOM RIGHT KICKING RUBBER	27702
SW 16	KICKING TARGET	28511
SW 17	BOTTOM LEFT UPKICKER	27667A
SW 20	LEFT DROP TARGET #1	25896
SW 21	LEFT DROP TARGET #3	25896
SW 22	LEFT DROP TARGET #5	25896
SW 23	RIGHT DROP TARGET #1	25896
SW 24	RIGHT DROP TARGET #3	25896
SW 25	RIGHT DROP TARGET #5	25896
SW 26	LEFT DROP TARGET #7	25896
SW 27	TOP LEFT UPKICKER	27667A
SW 30	LEFT DROP TARGET #2	25897
SW 31	LEFT DROP TARGET #4	25897
SW 32	LEFT DROP TARGET #6	25897
SW 33	RIGHT DROP TARGET #2	25897
SW 34	RIGHT DROP TARGET #4	25897
SW 35	RIGHT DROP TARGET #6	25897
SW 36	RIGHT DROP TARGET #7	25895
SW 37	TOP RIGHT UPKICKER	27667A
SW 40	OUTHOLE	26927
SW 41	TROUGH	26485
SW 80	LEFT RAMP	
	TRANSMITTER	MA-1330
	RECEIVER	MA-1331
	OPTICAL INTERFACE	MA-1558
SW 81	LEFT FLIPPER (SENSOR BOARD A15)	P/O MA-1334
SW 82	RIGHT FLIPPER (SENSOR BOARD A15)	P/O MA-1334
SW 90	RIGHT RAMP	
	TRANSMITTER	MA-1330
	RECEIVER	MA-1331
	OPTICAL INTERFACE	MA-1558
*SW 91	LEFT OUTSIDE ROLLOVER	28625
*SW 92	RIGHT OUTSIDE ROLLOVER	28625
*SW 93	TOP PLAYBOARD SPOT TARGET (2)	29432T
*SW 94	TOP PLAYBOARD SPOT TARGET	29432T
*SW 95	TOP PLAYBOARD SPOT TARGET (2)	29432W
*SW 96	TOP PLAYBOARD SPOT TARGET	29432U
*SW 97	TOP PLAYBOARD SPOT TARGET (2)	29432U
SW A0	LEFT HORSESHOE	
	TRANSMITTER	MA-1330
	RECEIVER	MA-1331
	OPTICAL INTERFACE	MA-1558
*SW A1	LEFT RETURN ROLLOVER	28625
*SW A2	RIGHT RETURN ROLLOVER	28625
*SW A3	SHOOTER PLAYBOARD SPOT TARGET (2)	29104Z
SW B0	RIGHT HORSESHOE	
	TRANSMITTER	MA-1330
	RECEIVER	MA-1331
	OPTICAL INTERFACE	MA-1558
*SW B1	SPOT TARGET #1	29099T
*SW B2	SPOT TARGET #2, #3 (2)	29403Z
*SW B3	SPOT TARGET #4	29099U
*SW B4	SPOT TARGET #5, #6 (2)	29104Z
*SW B5	SPOT TARGET #7	29099U
*SW B6	SPOT TARGET #8, #9 (2)	29403Z
*SW B7	SPOT TARGET #10, #11 (2)	29428S

*SMART SWITCH™



**ROLLOVER TYPE
SMART SWITCH™**
DO NOT ADJUST WIDE BEAM

SEE PAGE 22



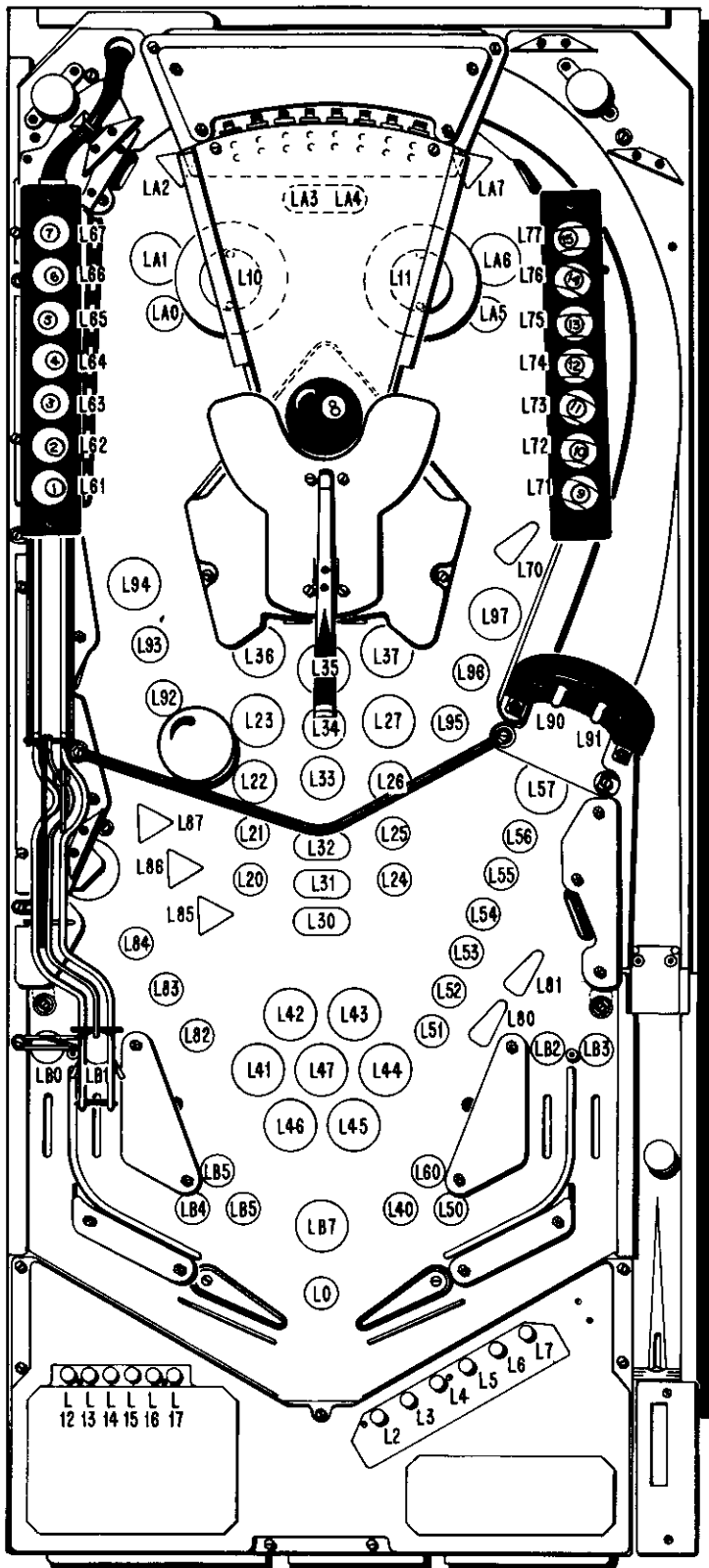
SCHEMATIC REPRESENTATION

VII. PARTS INFORMATION

PLAYBOARD LAMP ASSIGNMENTS

LAMP NUMBER	LAMP ASSIGNMENT
L0	"SHOOT AGAIN"
L1	(Not Used)
L2	"D"
L3	"O"
L4	"U"
L5	"B"
L6	"L"
L7	"E"
L10	Left Pop Bumper
L11	Right Pop Bumper
L12	"W"
L13	"I"
L14	"Z"
L15	"A"
L16	"R"
L17	"D"
L20	Left "2M"
L21	Left "5M"
L22	Left "10M"
L23	Left "20M"
L24	Right "2M"
L25	Right "5M"
L26	Right "10M"
L27	Right "20M"
L30	"JACKPOT"
L31	"SIDE POCKET"
L32	"8 BALL"
L33	"SPELL WIZARD"
L34	Center "10M"
L35	Center "NO WAY"
L36	"EXTRA"
L37	"BALL"
L40	"1 RACK"
L41	"SIDE POCKET"
L42	"ROWDY RAMP"
L43	"HORSESHOE EB"
L44	"NO WAY"
L45	"SPELL DOUBLE"
L46	"COMBO SHOTS"
L47	Centers "POOL BALL WIZARD"
L50	"2 RACKS"
L51	"9 BALL PLAY"
L52	"ROWDY RAMP"
L53	Right "SPELL DOUBLE"
L54	"SUPER JACKPOT"
L55	"VIDEO MODE"
L56	"MULTI-BALL"
L57	"WAGON WHEEL"
L60	"4 RACKS"
L61	Left Target Bank "1 BALL"
L62	Left Target Bank "2 BALL"
L63	Left Target Bank "3 BALL"
L64	Left Target Bank "4 BALL"
L65	Left Target Bank "5 BALL"
L66	Left Target Bank "6 BALL"
L67	Left Target Bank "7 BALL"
L70	"HALF BILLION"
L71	Right Target Bank "9 BALL"
L72	Right Target Bank "10 BALL"
L73	Right Target Bank "11 BALL"
L74	Right Target Bank "12 BALL"
L75	Right Target Bank "13 BALL"
L76	Right Target Bank "14 BALL"
L77	Right Target Bank "15 BALL"
L80	"CHANGE"
L81	"EXTRA BALL"
L82	Left "SPELL DOUBLE"
L83	"LIGHT RAMP"
L84	"ADVANCE X"
L85	Left Spot Target "5M"
L86	Left Spot Target "10M"
L87	Left Spot Target "SPECIAL"
L90	Left Archway "SHOOT THE RAMP"
L91	Right Archway "SHOOT THE RAMP"
L92	Left "ADD JACKPOT"
L93	"500K"
L94	Left "POOL BALL MANIA"
L95	Right "ADD JACKPOT"
L96	Right "500K"
L97	Right "POOL BALL MANIA"
LA0	Top Left "5M"
LA1	Top Left "SPECIAL"
LA2	Left "BANK SHOT"
LA3	Left "SWEET SPOT"
LA4	Right "SWEET SPOT"
LA5	Top Right "5M"
LA6	Top Right "SPECIAL"
LA7	Right "BANK SHOT"
LB0	"P"
LB1	"O"
LB2	"O"
LB3	"L"
LB4	"1X"
LB5	"2X"
LB6	"4X"
LB7	"EVERYTHING DOUBLED"

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



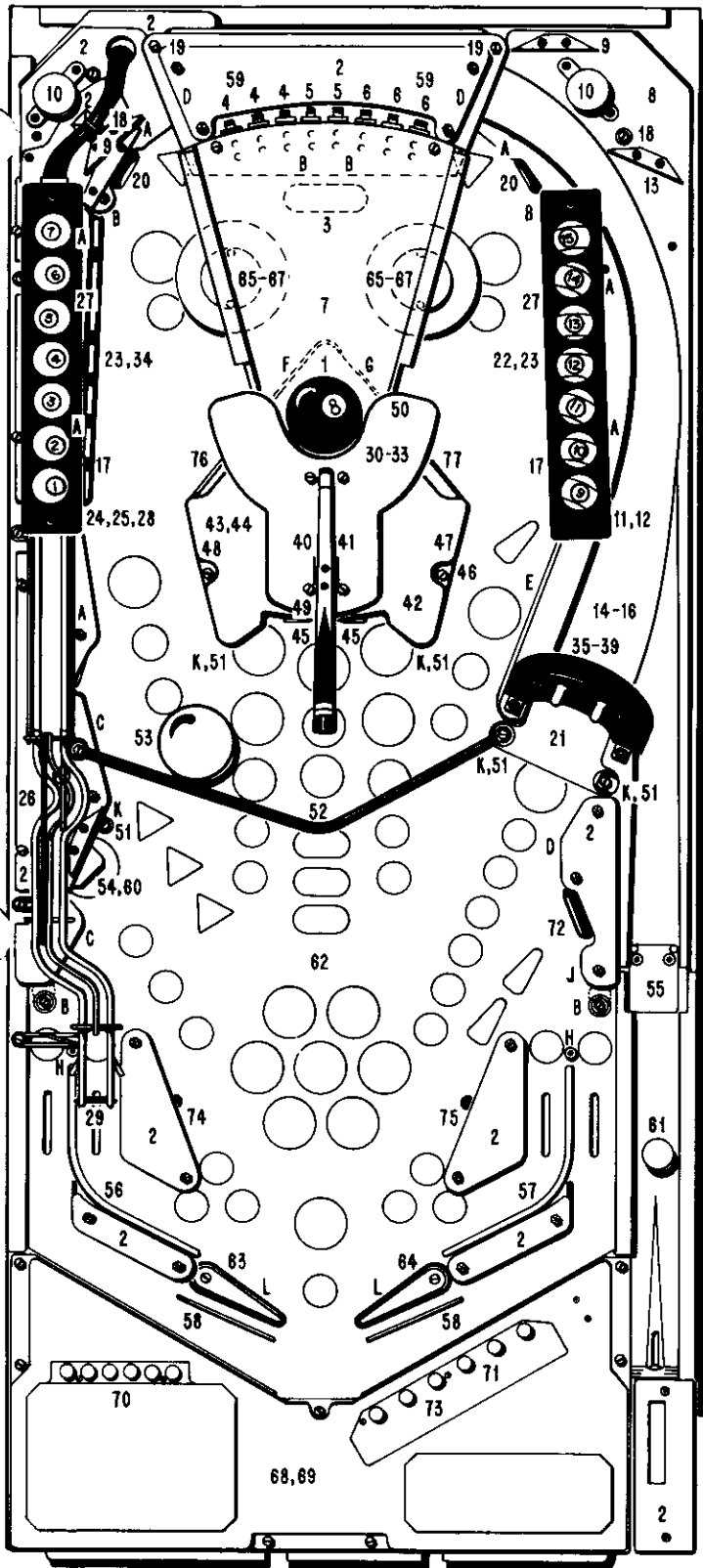
SOLENOID FUNCTIONS/LOCATIONS

SOL. 0	LEFT POP BUMPER	SOL. 16	LIGHTSTRIP #1, #67
SOL. 1	RIGHT POP BUMPER	SOL. 17	LIGHTSTRIP #2, #67
SOL. 2	TOP LEFT KICKING RUBBER	SOL. 18	LIGHTSTRIP #3, #67
SOL. 3	TOP RIGHT KICKING RUBBER	SOL. 19	SHOOTER PLAYBOARD, #67
SOL. 4	BOTTOM LEFT KICKING RUBBER	SOL. 20	TOP LEFT RAMP, #67
SOL. 5	BOTTOM RIGHT KICKING RUBBER	SOL. 21	TOP RIGHT RAMP, #67
SOL. 6	(NOT USED)	SOL. 22	(NOT USED)
SOL. 7	PLUNGER GATE	SOL. 23	(NOT USED)
SOL. 8	RIGHT 3 AND 4 BANK RESET	SOL. 24	MOTOR RELAY (B)
SOL. 9	BALL SHOOTER	SOL. 25	LIGHTBOX INSERT ILLUM. RELAY (A)
SOL. 10	BOTTOM LEFT UPKICKER	SOL. 26	TICKET/COIN METER ENABLE
SOL. 11	LEFT 3 AND 4 BANK RESET	SOL. 27	BALL RELEASE
SOL. 12	TOP LEFT UPKICKER	SOL. 28	OUTHOLE
SOL. 13	TOP RIGHT UPKICKER	SOL. 29	KNOCKER
*SOL. 14	LIGHTBOX INSERT, #67 (2)	SOL. 30	TILT RELAY (T)
*SOL. 15	LIGHTBOX INSERT, #67 (2)	SOL. 31	GAME OVER RELAY (Q)

Note:
*Lamps mounted on lightbox insert,
see page 72 for locations.

VII. PARTS INFORMATION

PLAYBOARD PARTS INFORMATION



PARTS LIST

ITEM	DESCRIPTION	PART NO.
1	#8 Pool Ball	29340
2	Plastic Shield Set	29254
3	Spot Target And Plate Assembly	MA-1875
4	Spot Target Assembly, Yellow (3)	29432T
5	Spot Target Assembly, Blue (2)	29432W
6	Spot Target Assembly, Red (3)	29432U
7	Plate, Switch and Vacuum Form Support	29397
8	Upper Right Ramp Assembly	29309
9	Ball Deflector (2)	21158
10	Plastic Dome, Yellow (2)	25147T
11	Molded Light Cover, (9-15)	29228A
12	7 Position Light Strip	MA-1867
13	Ball Deflector	25594
14	Decal	29469
15	Decal	29485
16	Decal	29490
17	Decal	29509
18	Stud and Hole Spacer, 3-1/8" x 8-32 (2)	28115
19	Stud and Hole Spacer, 3-5/8" x 8-32 (2)	28744
20	Spot Target Assembly, Red (2)	29099U
21	Ramp Flap	29276
22	7 Position Drop Target Assembly (See Exploded View Illustration)	MA-1858
23	Drop Target Decal (14)	29474
23A	Drop Target Arm, White (14)	11905Z
24	Wireform and Light Strip Assembly, (1-7)	MA-1885
25	Molded Light Cover, (1-7)	29228
26	Wireform Ramp	29190
27	Decal	29509
28	7 Position Light Strip	MA-1860
29	Polyurethane Rubber	28274
30	Motor and Support Assembly	MA-1890
31	Motor, 24 rpm, 50V AC	29242
32	Motor Support	29377
33	Plastic Guard	29085
34	7 Position Drop Target Assembly (See Exploded View Illustration)	MA-1883
35	Billboard Assembly	MA-1874
36	Molded Shroud	29421
37	Bulb Shield, Red (2)	24875U
38	Support Bracket (2)	26488
39	Decal	29468
40	Cue Stick	29510
41	#8 Ball Kicker Assembly	MA-1857
42	Molded Cover-Shooter	29253
43	Upper Playfield Assembly	MA-1887
44	Molded Form Cover	29376
45	Spot Target Assembly, Green (2)	29428S
46	Upper Playfield (Wood)	29246
47	Decal	29470
48	Decal	29471
49	Decal	29473
50	Decal	29556
51	Hex Post With Grip (5)	26531
52	Ball Guide Rail	29202
53	White Cue Ball	29339
54	Ball Snubber	29247
55	Ramp Flap	29399
56	Ball Guide Rail	27916
57	Ball Guide Rail	27915
58	Ball Snubber (2)	13798
59	Upkicker Assembly (2) (See Exploded View Illustration)	MA-1747
60	Upkicker Assembly (See Exploded View Illustration)	MA-1789
61	Steel Ball, 1-1/16" Diameter (3)	21864
62	Mylar Overlay	29484
63	Flipper Assembly Flipper Coil Flipper Switch Assembly (See Exploded View Illustration)	MA-1790 25959 26439
64	Flipper Assembly Flipper Coil Flipper Switch Assembly (See Exploded View Illustration)	MA-1791 25959 26438
65	Pop Bumper Cap, Yellow, Transparent (2)	26635T
66	Pop Bumper Body, Socket, White (2)	MA-1467
67	Pop Bumper Bracket and Coil Assembly (2) (See Exploded View Illustration)	MA-1375
68	Cardholder	29316-734
69	Molded Cardholder Cover	29195
70	LED Board Assembly	MA-1870
71	LED Board Assembly	MA-1843
72	Kicking Target Assembly	29250
73	Upper Playfield (Wood)	29472
74	Kicker Assembly	MA-1373
75	Kicker Assembly	MA-1083
76	Kicker Assembly	MA-1849
77	Kicker Assembly	MA-1888

RUBBER RINGS

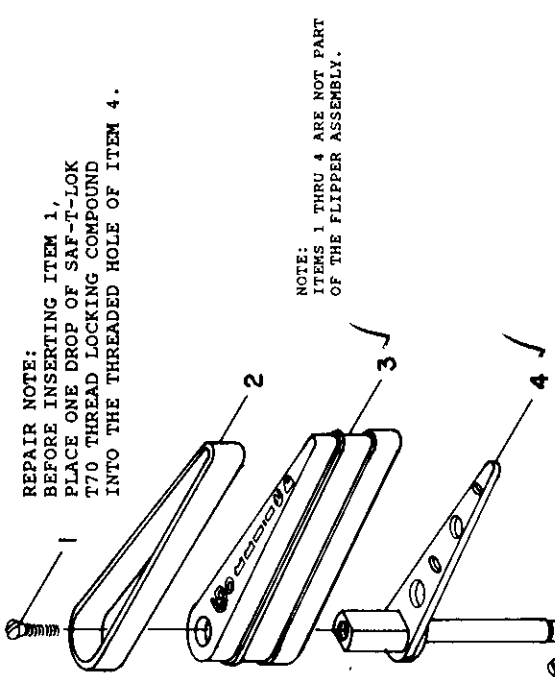
ITEM	DESCRIPTION	PART NO.
A	2" (7)	10221
B	3/8" (6)	10217
C	1-1/2" (2)	10220
D	1" (3)	10219
E	3-1/2"	10224
F	2-1/2" (3)	10222
G	3"	10223
H	MINI-POST, SMALL (2)	14793
J	7/16"	17493
K	BUMPER RUBBER, BLK (5)	26648Y
L	FLIPPER, BLACK (2)	28546

MISCELLANEOUS PARTS

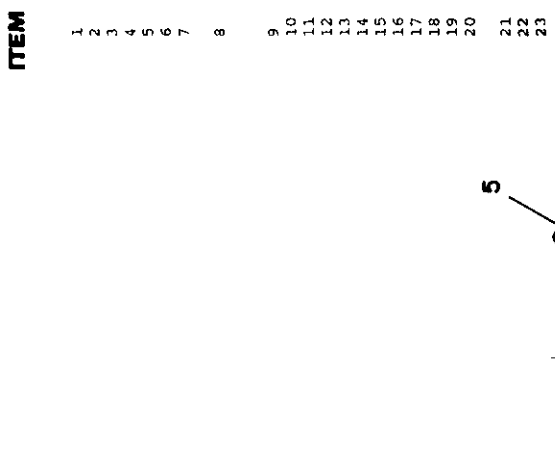
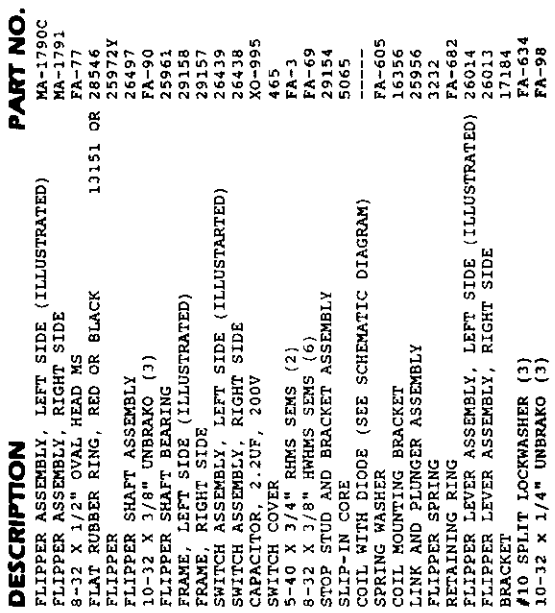
DESCRIPTION	PART NO.
PLASTIC RIVET, BLACK	MP-10
MINI-POST SCREW	14792
YELLOW POST, 1"	11561T
YELLOW POST, 1-3/16"	11562T
"B" RELAY ASSEMBLY	MA-1738
SIAMESE POST, RED	17492U

VII. PARTS INFORMATION

FLIPPER PARTS



ITEM	DESCRIPTION	PART NO.
1	FLIPPER ASSEMBLY, LEFT SIDE (ILLUSTRATED)	MA-1790C
2	FLIPPER ASSEMBLY, RIGHT SIDE	MA-1791
3	8-32 X 1/2" OVAL HEAD MS	FA-77
4	FLAT RUBBER RING, RED OR BLACK	13151 OR 25972Y
5	FLIPPER SHAFT ASSEMBLY	26457
6	10-32 X 3/8" UNBRAKO (3)	FA-90
7	FLIPPER SHAFT BEARING	25961
8	FRAME, LEFT SIDE (ILLUSTRATED)	29158
9	FRAME, RIGHT SIDE	29157
10	SWITCH ASSEMBLY, LEFT SIDE (ILLUSTRATED)	26439
11	SWITCH ASSEMBLY, RIGHT SIDE	26438
12	CAPACITOR, 2.2UF, 200V	XO-995
13	SWITCH COVER	465
14	5-40 X 3/4" RHMS SEMS (2)	FA-3
15	8-32 X 3/8" HWMS SEMS (6)	FA-69
16	STOP STUD AND BRACKET ASSEMBLY	29154
17	SLIP-IN CORE	5065
18	COIL WITH DIODE (SEE SCHEMATIC DIAGRAM)	-----
19	SPRING WASHER	FA-605
20	COIL MOUNTING BRACKET	16356
21	LINK AND PLUNGER 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
28	10-32 X 1/4" UNBRAKO (3)	FA-98



68

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

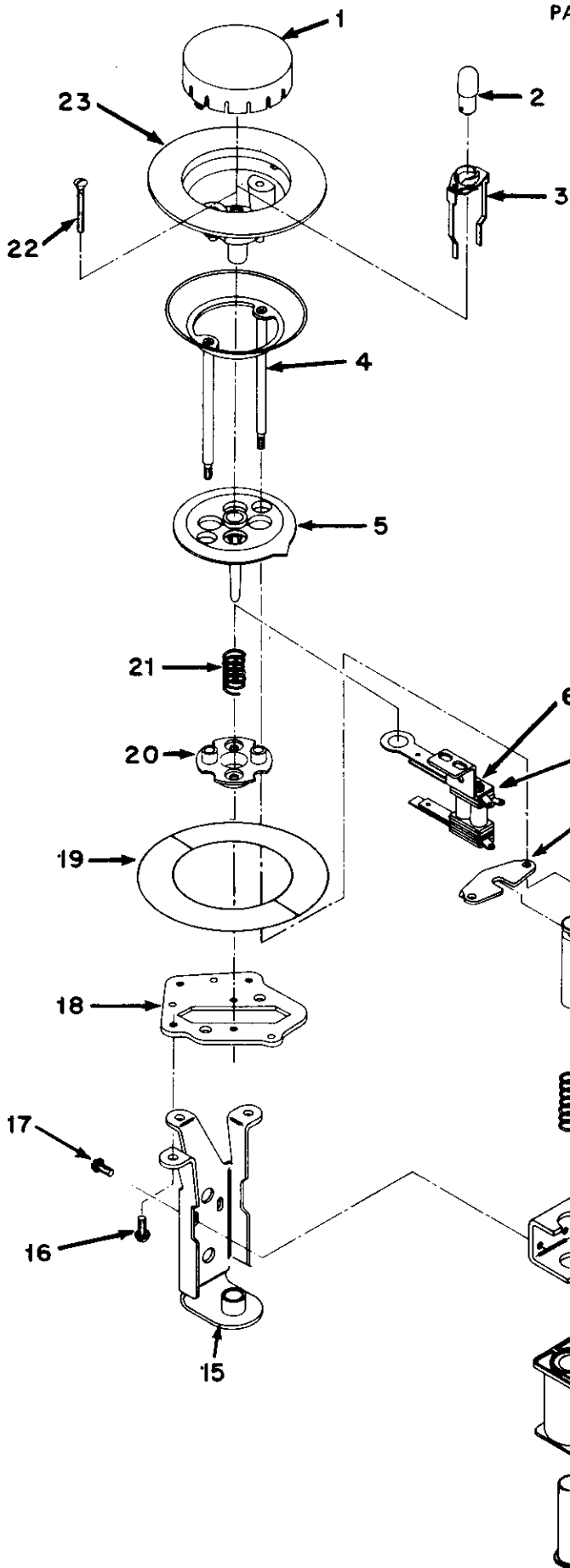
NOTE:
ITEMS 1 THRU 4 ARE NOT PART
OF THE FLIPPER ASSEMBLY.

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

VII. PARTS INFORMATION

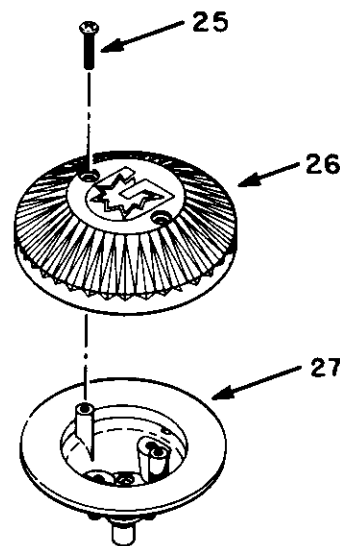
POP BUMPER PARTS

PAT. NO. 213,981



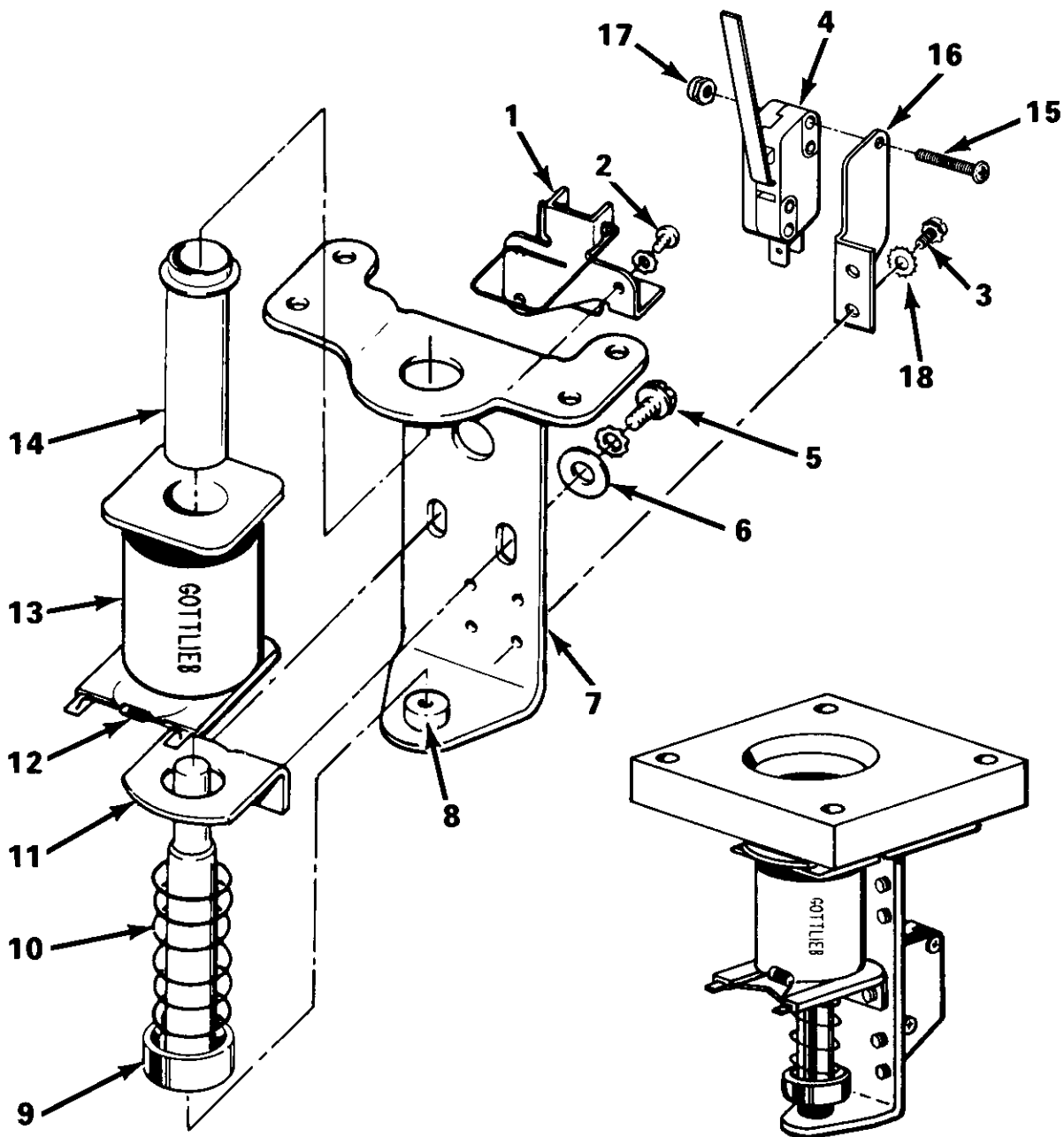
ITEM	DESCRIPTION	PART NO.
1	Pop Bumper Assembly	Specify Game
2	Pop Bumper Cap (Specify Color)	10434
3	Lamp, #44	LA-0
4	Socket	PS-0
5	Tie Rods and Ring	16634
6	Pop Bumper Skirt (Specify Color)	10433
7	Switch Assembly	Specify Game
8	Slotted Yoke	12149
9	Plunger	2663
10	Insulating Yoke	2662
11	Elastic Stop Nut, 6-32	FA-660
12	Kicker Return Spring	21643
13	Stop Bracket	8571
14	Coil	Specify Game
15	Coil Sleeve	5064
16	Coil Mounting Bracket and Stop	17906
17	8-32 x 1/4 HHMS SEMS	FA-64
18	6-32 x 1/4 HHMS SEMS	FA-53
19	Pop Bumper Pad	16632
20	Pop Bumper Trim Platter	25732
21	Pop Bumper Base	10432
22	Pop Bumper Spring	10430
23	6-32 x 1-1/8 Oval HMS	FA-43
24	Pop Bumper Body (Specify Color)	10435
25	Bracket	16647
26	4-40 x 1/2 Pan Head Phillips	FA-108
27	Pop Bumper Cap, Clear, (Specify Color)	26635
	Pop Bumper Body (Specify Color)	26860

NOTE:
ITEMS 23 AND 27 ARE INTERCHANGEABLE.



VII. PARTS INFORMATION

UPKICKER PARTS



ITEM DESCRIPTION

ITEM	DESCRIPTION
	UPKICKER ASSEMBLY
1	WIREFORM AND BRACKET
2	RHMS-SEMS 6-32 X 3/16" (3)
3	RHMS 5-40 X 1/4" SEMS (2)
4	MICROSWITCH WITH ACTUATOR
5	HWHMS-SEMS 8-32 X 5/16" (2)
6	#8 WASHER (2)
7	FRAME
8	RUBBER GROMMET
9	PLUNGER AND TIP ASSEMBLY
10	SPRING
11	COIL MOUNTING BRACKET
12	DIODE, 1N4004
13	COIL
14	SLIP-IN-CORE
15	PAN HEAD 4-40 X 5/8" (2)
16	MICROSWITCH MOUNTING BRACKET
17	ELASTIC STOP NUT, 4-40 (2)
18	#5 EXTERNAL LOCKWASHER (2)

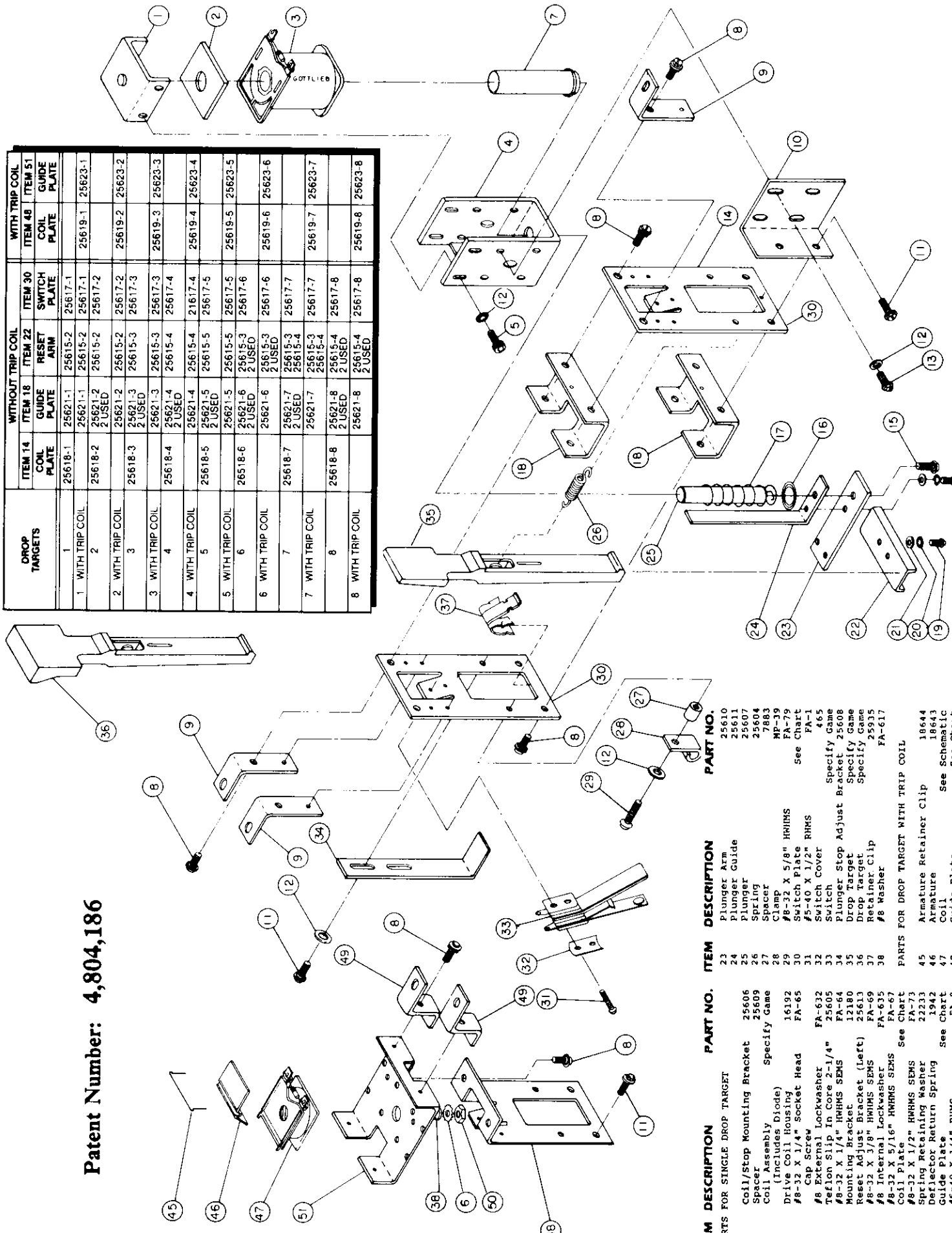
PART NO.

PART NO.
MA-1747 OR MA-1789
28953
FA-30
FA-10
27667A
FA-67
FA-617
21416
5240
21412
26739
15409
XO-254
(SEE SCHEMATIC)
21411
FA-107
27870
FA-648
FA-630

VII. PARTS INFORMATION

DROP TARGET PARTS

Patent Number: 4,804,186

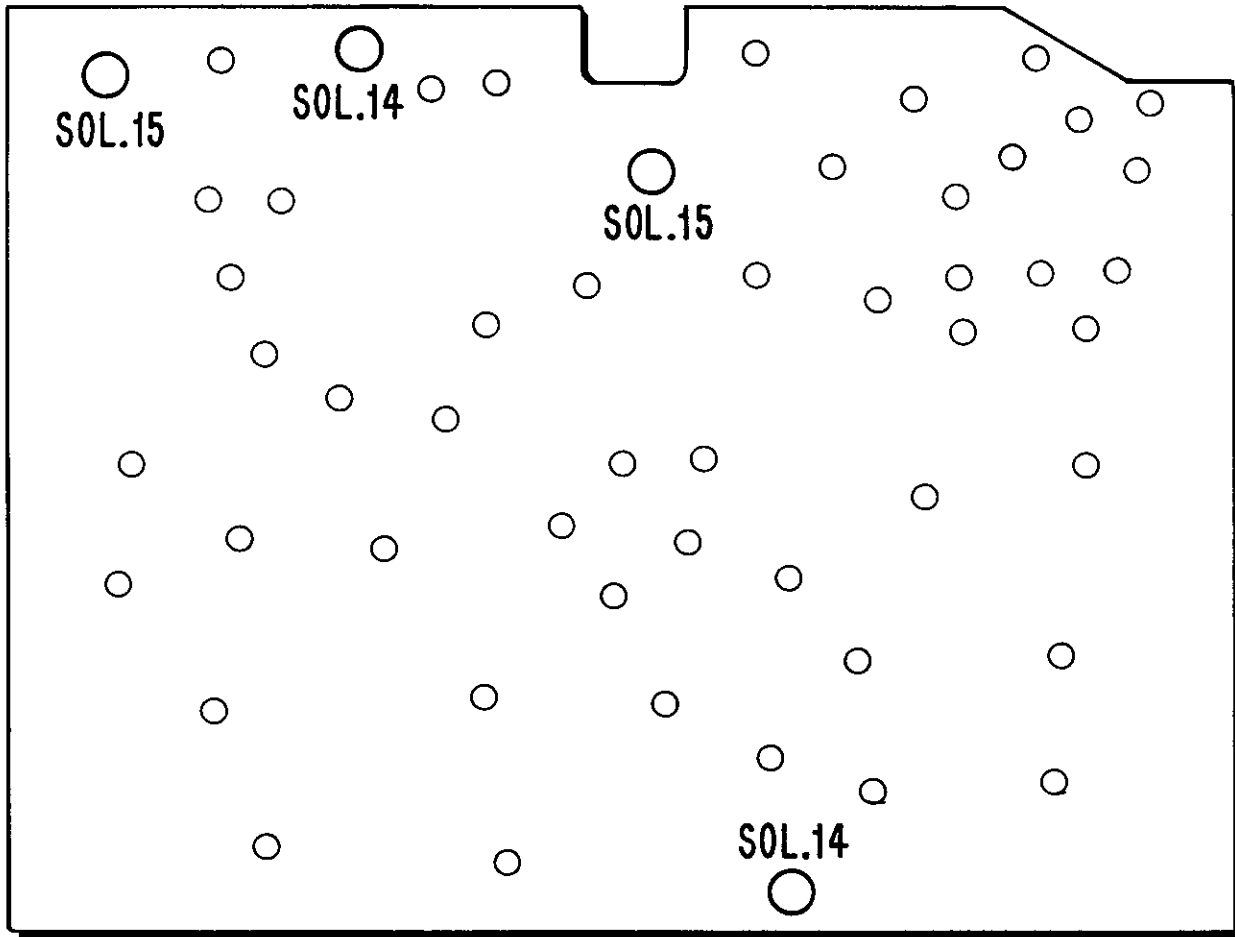


DROP TARGETS	WITHOUT TRIP COIL			WITH TRIP COIL		
	ITEM 14 COIL PLATE	ITEM 18 GUIDE PLATE	ITEM 22 RESET ARM	ITEM 30 SWITCH PLATE	ITEM 48 COIL PLATE	ITEM 51 GUIDE PLATE
1 WITH TRIP COIL	25618-1	25621-1	25615-2	25617-1	25619-1	25623-1
2 WITH TRIP COIL	25618-2	25621-2 2 USED	25615-2	25617-2		
3 WITH TRIP COIL	25618-3	25621-3 2 USED	25615-3	25617-3	25619-3	25623-3
4 WITH TRIP COIL	25618-4	25621-4 2 USED	25615-4	25617-4	25619-4	25623-4
5 WITH TRIP COIL	25618-5	25621-5 2 USED	25615-5	25617-5	25619-5	25623-5
6 WITH TRIP COIL	25618-6	25621-6 2 USED	25615-6	25617-6	25619-6	25623-6
7 WITH TRIP COIL	25618-7	25621-7 2 USED	25615-7	25617-7	25619-7	25623-7
8 WITH TRIP COIL	25618-8	25621-8 2 USED	25615-8	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 (Includes Diode)	Specify Game	25 Plunger	25604
4 Drive Coil Housing	16192	26 Spring	2883
5 #8-15 X 1/4" Socket Head Cap Screw	FA-65	27 Spacer	2883
6 #8 External Lockwasher	FA-632	28 Clamp	MP-39
7 Teflon Slip In Core 2-1/4"	25605	29 #8-32 X 5/8" RHMS Switch Plate	FA-79
8 #8-32 X 1/8" RHMS SEMS	FA-604	30 #5-40 X 1/2" RHMS Switch Cover	FA-1
9 Mounting Bracket	12160	31 Switch	465
10 Reset Adjust Bracket (Left)	25603	32 Plunger Stop Adjust Bracket	25608
11 #8-32 X 1/8" RHMS SEMS	FA-609	33 Drop Target	Specify Game
12 #8 Internal Lockwasher	FA-635	34 Retainer Clip	Specify Game
13 #8-32 X 5/16" RHMS SEMS	FA-627	35 #8 Washer	FA-617
14 Coil Plate	See Chart	PARTS FOR DROP TARGET WITH TRIP COIL	
15 #8-32 X 1/2" RHMS SEMS	FA-671	36 Armature Retainer Clip	1644
16 Spring Retaining Washer	12233	37 Armature	1643
17 Deflector Return Spring	1942	38 Coil	See Schematic
18 Guide Plate	See Chart	39 Guide Plate	See Chart
19 #5-46 X 1/4" RHMS	FA-620	40 Mounting Bracket (Formed)	FA-652
20 #5 External Lockwasher	FA-622	41 Hex Nut	See Chart
21 #5 Washer	FA-622	42 Coil Plate	See Chart
22 Reset Arm	See Chart	43	

VII. PARTS INFORMATION

LIGHTBOX INSERT LAMP IDENTIFICATION



SOLENOID FUNCTIONS

SOLENOID 14	SKULL, #67
SOLENOID 14	CUE BALL, #67
SOLENOID 15	BARTENDER, #67
SOLENOID 15	COWGIRL, #67

NOTE:

1. LAMPS NOT DESIGNATED ARE GENERAL ILLUMINATION, TYPE#44.

VII. PARTS INFORMATION

UNIQUE PARTS

The following listing denotes new parts and assemblies unique to Cue Ball Wizard, Game #734. Part Number prefixed with an asterisk (*) will be illustrated or can be located on pages 28 thru 72. Numbers in parenthesis () indicates multiple quantities.

PLAYBOARD

ITEM/DESCRIPTION	PART NO.
WIREFORM RAMP.....	*29190
MOLDED CARDHOLDER COVER.....	*29195
BALL GUIDE RAIL.....	*29202
MOLDED LIGHT COVER, (1-7).....	*29228
MOLDED LIGHT COVER, (9-15).....	*29228A
MOTOR 24 RPM 50V AC.....	*29242
UPPER PLAYFIELD (WOOD).....	*29246
BALL SNUBBER.....	*29247
KICKING TARGET ASSEMBLY.....	*29250
MOLDED COVER-SHOOTER.....	*29253
PLASTIC SHIELD SET.....	*29254
RAMP FLAP.....	*29276
UPPER RIGHT RAMP ASSEMBLY.....	*29309
CARDHOLDER.....	*29316-734
WHITE CUE BALL.....	*29339
#8 POOL BALL.....	*29340
MOLDED FORM COVER.....	*29376
MOTOR SUPPORT.....	*29377
PLATE, SWITCH AND VACUUM FORM ASSEMBLY.....	*29397
MOLDED SHROUD.....	*29421
SPOT TARGET ASSEMBLY, GREEN (2).....	*29428S
SPOT TARGET ASSEMBLY, YELLOW (3).....	*29432T
SPOT TARGET ASSEMBLY, RED (3).....	*29432U
SPOT TARGET ASSEMBLY, BLUE (2).....	*29432W
DECAL.....	*29469
DECAL.....	*29470
DECAL.....	*29471
DECAL.....	*29472
DECAL.....	*29473
DECAL (14).....	*29474
MYLAR OVERLAY.....	*29484
DECAL.....	*29490
DECAL.....	*29509
CUE STICK.....	*29510
DECAL.....	*29556
LED BOARD ASSEMBLY.....	*MA-1843
GAME CONTROL BOARD (A26).....	*MA-1851
#8 BALL KICKER ASSEMBLY.....	*MA-1857
7 POSITION DROP TARGET ASSEMBLY.....	*MA-1858
7 POSITION LIGHT STRIP.....	*MA-1860
7 POSITION LIGHT STRIP.....	*MA-1867
LED BOARD ASSEMBLY.....	*MA-1870
BILLBOARD ASSEMBLY.....	*MA-1874
SPOT TARGET AND PLATE ASSEMBLY.....	*MA-1875
7 POSITION DROP TARGET ASSEMBLY.....	*MA-1883
WIREFORM AND LIGHT STRIP ASSEMBLY.....	*MA-1885
UPPER PLAYFIELD ASSEMBLY.....	*MA-1887
MOTOR AND SUPPORT ASSEMBLY.....	*MA-1890

702-
829-
2080

Plunger tip
cup washer & B&T
29252
9.40

CABINET

CABINET (SCREENED).....	*29410-734
TRANSFORMER PANEL ASSEMBLY.....	*MA-1848

LIGHTBOX

STYRENE (BACKGLASS ART).....	28833-734
LIGHTBOX (SCREENED).....	28750-734
SPEAKER PANEL PLEXI (SCREENED).....	28827-734

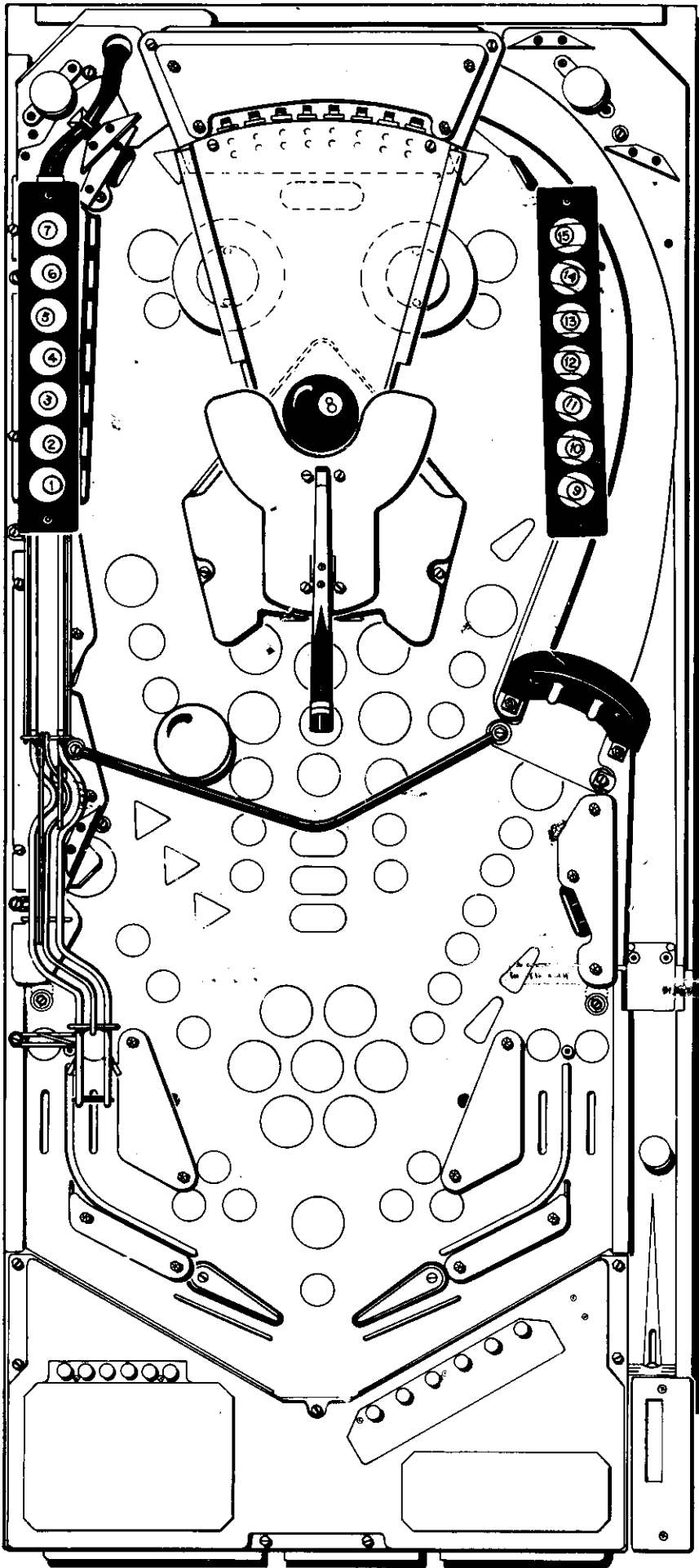
BASIC TROUBLESHOOTING GUIDE

CONDITION	POSSIBLE CAUSE
Game does not power up	<ul style="list-style-type: none"> * Line fuse (F1) blown * Primary fuse (F2) blown
Game does not power up but general illumination lamps light	<ul style="list-style-type: none"> * Power supply fuse (F5) blown
SWITCH SHORT message appears in display on power up	<ul style="list-style-type: none"> * 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	<ul style="list-style-type: none"> * Fuse (F8) blown
Playfield illumination lamps do not light	<ul style="list-style-type: none"> * Fuse (F9) blown
All controlled lamps, flash lamps, relays, and switches not working	<ul style="list-style-type: none"> * Fuse (F6) blown * Bad Driver Board (A3)
All controlled lamps work but some switches do not work	<ul style="list-style-type: none"> * Bad diode associated with the switch (contact point type switch only)
Some controlled lamps and some switches do not work	<ul style="list-style-type: none"> * 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	<ul style="list-style-type: none"> * 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	<ul style="list-style-type: none"> * 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	<ul style="list-style-type: none"> * Bad Dot Matrix Controller Board (A8)
A solenoid operated device does not work. (Pop Bumper, Kicker, etc.)	<ul style="list-style-type: none"> * Associated fuse on playfield is blown * Bad Driver Board (A3)
All flippers and solenoids do not work	<ul style="list-style-type: none"> * Solenoid fuse (F7) blown
A flipper coil overheats and burns	<ul style="list-style-type: none"> * 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	<ul style="list-style-type: none"> * Open hold winding (small diameter wire) on flipper coil
No sound or speech	<ul style="list-style-type: none"> * 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	<ul style="list-style-type: none"> * Bad Auxiliary Sound Board (A20) * Bad Sound Board (A6)
An optical switch does not work or works intermittently	<ul style="list-style-type: none"> * 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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