Pinball Magic™

PARTS: (708) 797-6320
SERVICE: (708) 797-6192
PARTS AND SERVICE FAX:
(708) 797-6306

CAPCOM®
COIN-OP, INC.

OPERATORS MANUAL
PM00118

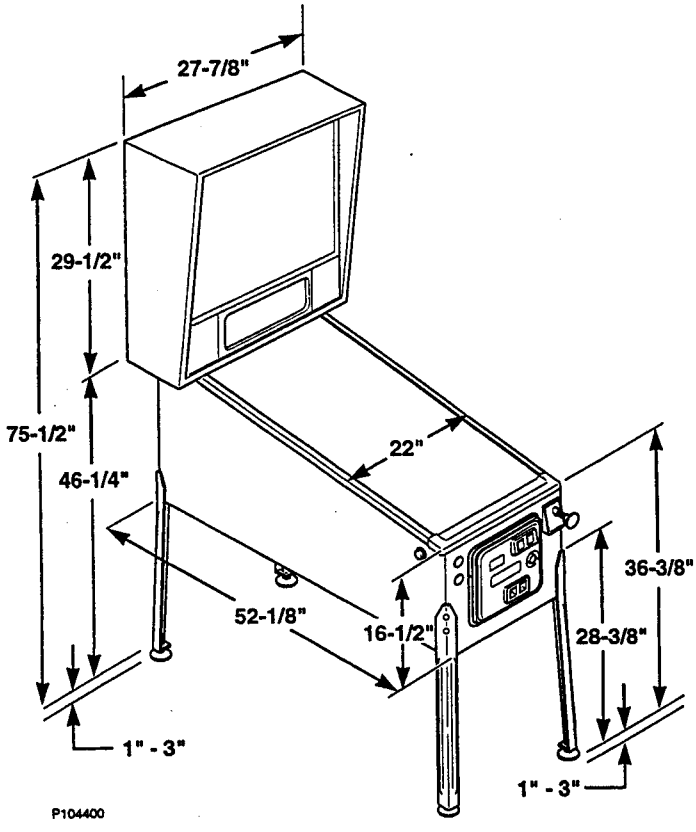
DISTRIBUTED BY: *Gottlieb electronics pty. ltd*

440-442 PUNCHBOWL ROAD, BELMORE SYDNEY N.S.W. 2192 AUSTRALIA
PHONE (02) 750 0444 FAX (02) 740 5792

GAME SPECIFICATIONS

CHARACTERISTIC	DESCRIPTION
ELECTRICAL INPUT RATINGS	100 to 115VAC 50/60HZ 6 AMPS 200 to 230VAC 50/60HZ 3 AMPS
CIRCUIT PROTECTION	Slow-Blo fuses, Varistor Surge Protection, IEC-Type Grounded Receptacle
SHIPPING CARTON INFORMATION	Height: 55-1/2"(1.41M) Width: 30-1/2"(0.77M) Depth: 30-1/2"(0.77M) Weight: 295 Pounds (133.3Kg)
REGULATORY APPROVAL(S)	FCC, Part 15, Class A Digital Device
AUDIO SYSTEM	MPEG Digital 3 Channel Mono Output (Left, Center, Right) Rated at 10Watts RMS • Two 4" 2-way Speakers for Mid & High Frequencies • One 8" Bass Speaker for Low Frequencies
DISPLAY	128 X 32 Character Dot Matrix
COIN DOOR	Standard: 2 Coin Acceptors Optional: Additional 2 Coin Acceptor or Bill Acceptor
OPERATOR ADJUSTABLES	Audio: Volume Control, Sound Effects Visual: Bright, Dim, or No Flash Lamps; Standard or Custom Display Messages Coinage: U. S. Standard; Custom Configuration for Foreign Currencies Play Mode: Free Play, Tournament, and Game Difficulty Level Game Play: Replay Percentage, Match Credits, Max. Extra Balls, Game Restart Password Protection: 3 Levels of Security
SPECIAL FEATURES	183 Individual Audits 39 Game Variables 11 Self-Test Modes 6 Internal Diagnostic Levels Automated Software Troubleshooting

CABINET DIMENSIONS



NOTE:

DIMENSIONS DO NOT INCLUDE CABINET PROTRUSIONS, SUCH AS THE BALL SHOOTER, COIN DOOR, FLIPPER BUTTONS, OR BACKBOX LATCH.

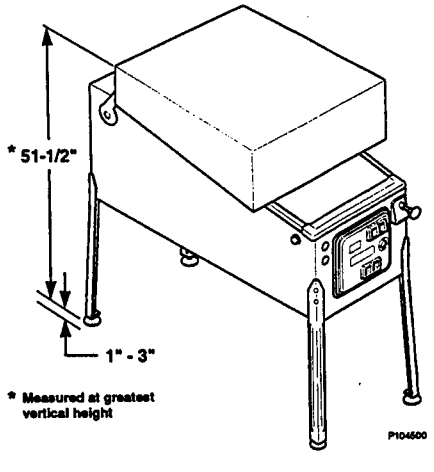


TABLE OF CONTENTS

DESCRIPTION PAGE

INSTALLATION INSTRUCTIONS

1) Remove strapping from carton. Remove staples and open top flaps (see Figure 1).

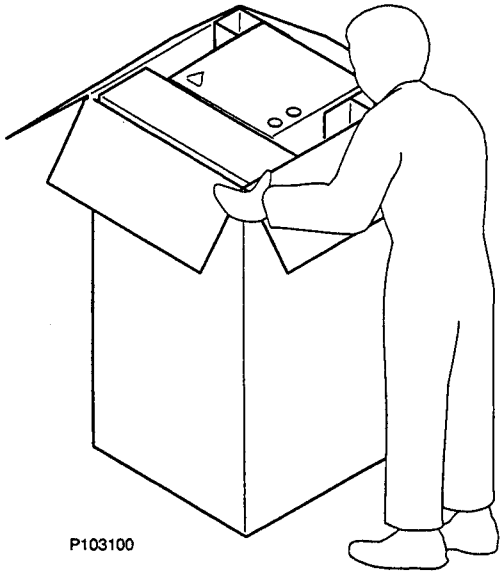


FIGURE 1: OPENING SHIPPING CARTON

2) Two or more people should lay the carton on its side. Slide game and packing materials out from carton (see Figure 2). Open the parts box.

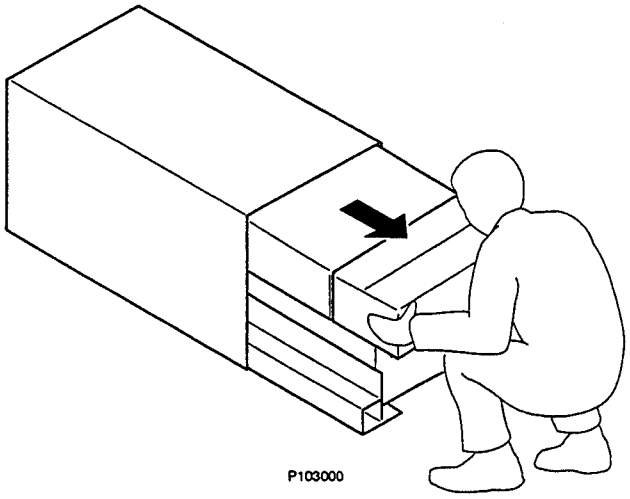


FIGURE 2: REMOVING GAME AND PARTS BOX

3) Keys are attached to the ball shooter. Open coin door and remove cash box. Remove parts and re-install cash box (see Figure 3).

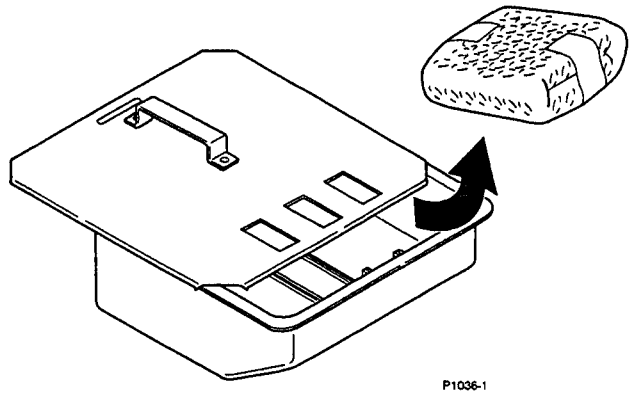


FIGURE 3: PARTS IN CASHBOX

4) Check loose parts against packing list. Report any damaged or missing parts.

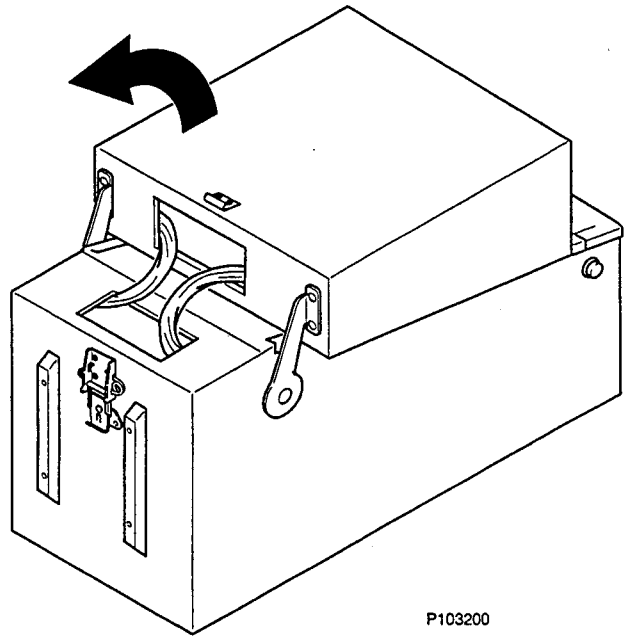


FIGURE 4: RAISING BACKBOX UPRIGHT

5) Raise the backbox to its upright position. Ensure that cables are not pinched (see Figure 4).

6) Lift the cabinet latch and flip key upwards to the upright position. Turn the key counterclockwise (to the left) (see Figure 5).

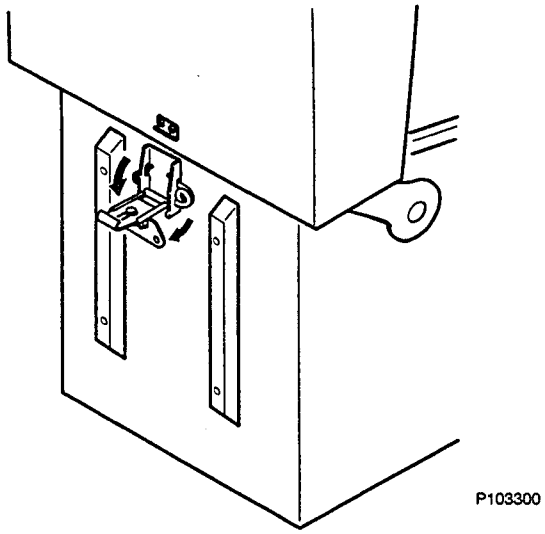


FIGURE 5: LATCH ON BACKBOX

7) Engage the latch and turn key fully clockwise (to the right). Flip the key down to lock (see Figure 6).

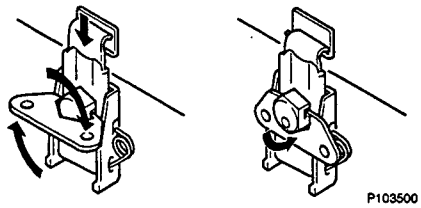


FIGURE 6: LOCKING THE LATCH

8) Install the hex nut half-way up on each leveler. Install leveler with nut onto each leg (see figure 7).

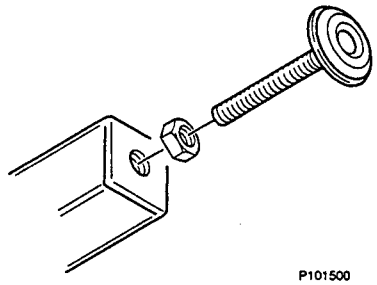


FIGURE 7: INSTALLING LEVELER ON LEG

9) Carefully lift the front of the cabinet and place on a sturdy support. Attach the front legs using two acorn-head bolts. Tighten bolts firmly (see Figure 8).

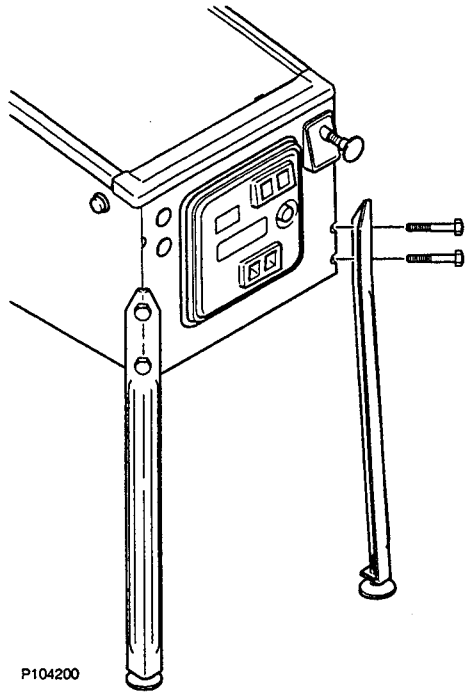


FIGURE 8: INSTALLING LEGS ON CABIINET

10) Carefully lift the rear of the cabinet, place on a sturdy support, and attach the legs using the supplied bolts. Tighten firmly.

11) Insert key into the lock at the top of the backbox and turn fully clockwise. Lift up on backglass and swing out towards front of game. CAREFULLY remove backglass and set aside.

12) Lift up on latch and open the lamp door. Swing door completely open. Open display panel by pushing latches, located above the speaker enclosures, out towards the sides of backbox.

13) Install the locking hardware to fasten the backbox to the cabinet. Install threaded fastners, lock washers, and flat washers through the backbox and into the cabinet tee nuts. Tighten firmly.

14) Check that all fuses, connectors, lamps, and wire harnesses are fully seated. Tighten any loose fasteners snugly. Do not overtighten.

15) Close and latch both sides of the display panel; then close and latch the lamp door. Re-install the backglass and lock the backbox.

16) Open the coin door. Locate lock lever and pull towards center of cabinet; remove handrail and set aside. Remove playfield glass by sliding down and out of armor guides. CAREFULLY set glass aside (see Figure 9). Remove foam packing from Captive Ball.

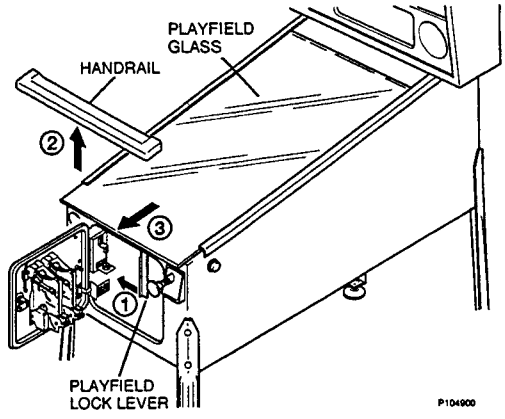


FIGURE 9: REMOVING PLAYFIELD GLASS

17) Lift playfield straight-up until it reaches the locked position. Verify that solenoids, connectors, lamps, and harnesses are fully seated. Tighten any loose fasteners snugly. Do not overtighten.

18) Locate plumb bob parts. Install thumbscrew into threaded hole on lead weight. Insert hook wire into tapered end of lead weight. Raise wire & weight up into bottom tilt bracket and hang from top bracket. Adjust and tighten screw firmly (see Figure 10).

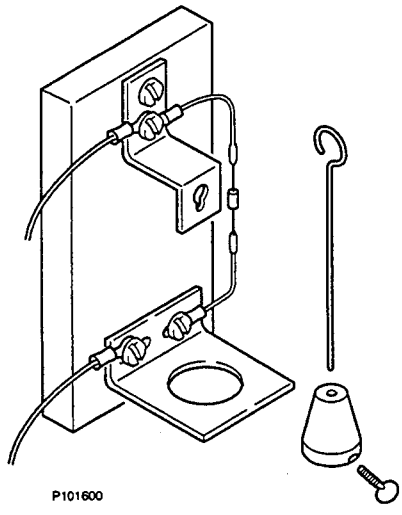


FIGURE 10: PLUM BOB TILT ASSEMBLY

19) Lower the playfield into the cabinet. Ensure that cables are not pinched when playfield is seated.

20) At the rear of the cabinet, remove the cover plate protecting the IEC receptacle. Connect AC line cord to receptacle. Re-install the cover plate.

21) Using two or more people lift the game and move to intended play area. Do not slide legs on floor.

22) Adjust levelers as required to distribute weight equally on all legs. Turn leveler nuts until they seat flush against bottom of legs. Tighten very firmly.

23) Connect AC line cord to power outlet. Route cord away from foot traffic. Turn the game power ON (switch is under cabinet near right front leg).

24) Open the coin door. Dot matrix display will show the system menu. Follow directions in this manual for changing factory settings.

25) Refer to the TROUBLESHOOTING GUIDE section of the manual for assistance in locating faults, clearing errors, etc.

26) Upon completion, system menu should report "FOUND: 0 ERRORS, 0 INFO" to indicate the game is ready for use.

27) Close the coin door. Insert currency or tokens as necessary. Press the START button. Game should begin.

28) "BALLS MISSING" message displays. Install the required number of balls. Do not play game at this time.

29) Clean both sides of playfield glass. Install glass. Install handrail. Ensure that lever snaps in and locks.

30) Open coin door and retrieve currency or tokens. Set custom messages, difficulty, pricing, replays, etc.

31) Reset all counters to zero. Close and lock coin door. Ensure that the backbox is locked.

PINBALL MAGIC begins!

NOTES

GAME DESCRIPTION, RULES & SHOTMAPS

PINBALL MAGIC takes place in a special universe: one whose boundaries are limited not by the physical edges of the game but by the player's imagination and knowledge of magic. The basic concept appears simple enough - there are magic tricks which must be completed in order to collect points and continue play. Each magician specializes in one area of magic - illusion, metamorphosis, ciphering, etc. - and the queen has more complex challenges. The player who masters all of the tricks will be accepted as a powerful magician, and this distinction will allow recognition among fellow players.

However, as any good student of magic can tell you, there is always more to each trick than meets the eye. Tricks must be accomplished in a specified sequence. Some of the tricks have short time limits, while others require multiple repetitions of a particular shot to collect points. At any time the ball may disappear from play, and then reappear at a different time, another location, or worse yet, in two or three places at once. In PINBALL MAGIC, what you see is not what you get!

THE REALM OF MAGIC

There exists in our universe a supernatural place somewhere in the gray area between the tangible and the ethereal, a hole in the line dividing reality from superreality. This place has become the domain of Matra Magna and her Society of Masters. Queen Magna was banished from the real world many years ago for unknown reasons, but she has never completely disappeared from her old haunts. Through the ages, she has managed to collect a band of magicians who have befallen a similar fate. The queen and her cabal periodically break through the barriers of time and space to cause trouble with the mortals. This time Magna and her crew have taken over a pinball game, turning an innocent form of entertainment into a way to separate the unsuspecting from their leisure time and money.

As word of Matra Magna's return spreads, there are those who will succumb to Her trickery; others will take the magic challenge and test their skills against each of the magicians in turn. Many will fall by the wayside, unable to figure out a particular trick, too slow to keep up, or unable to remember all that they have learned. The few who are able to beat all of the magicians will earn the chance to take on the queen herself, and her power is much greater than those of her subjects.

MAGICIANS

There are six magicians who present tricks to the player, one at a time. Each magician has three tricks, each different than the last. In addition, the queen has three challenges of her own. The player's task is to complete each trick or challenge in order without running out of pinballs or time.

Each of the members of the cabal has his or her own image on the playfield. The image is illuminated whenever a challenge is presented; in addition, one of the three trick indicators will be active. The

challenge will be explained verbally and some graphical displays will also be present. After a short time period, players are berated for being slow.

MAGICIAN	DESCRIPTION OF MAGICIAN
Nostradamus	Eternal soul known for his abilities as a soothsayer. His predictions are still coming true!
Shaman	Medicine man from an ancient tropical tribe. Prefers tricks with the letter "s": snakes, spelling, swords, etc.
The Great Hansen	Street smart American magician. His specialty is performing unique and unusual illusions.
Mr. Mystique	Graceful yet bombastic French master of stage magic. A truly impressive performance artist.
Kenzo	Shinto magician. Continues the Japanese traditions by teaching tricks to new generations.
Jadugar	Middle-Eastern manipulator of nature. His color ball can be a very colorful experience.
Matra Magna	Queen of the cabal. Her magic is stronger than any of her magicians. Easily irritated!

SEQUENCE

ROUND NO.	DESCRIPTION
1	Complete the first trick from each magician in order, then take on the queen's first challenge.
2	Complete the second trick from each magician in order, then take on the queen's second challenge.
3	Complete the third trick from each magician in order, then survive Matra Magna's Magic Wand.

Additional Rounds - Repeat the same 1-2-3 pattern with some changes to increase the skill level each time.

TRICKS

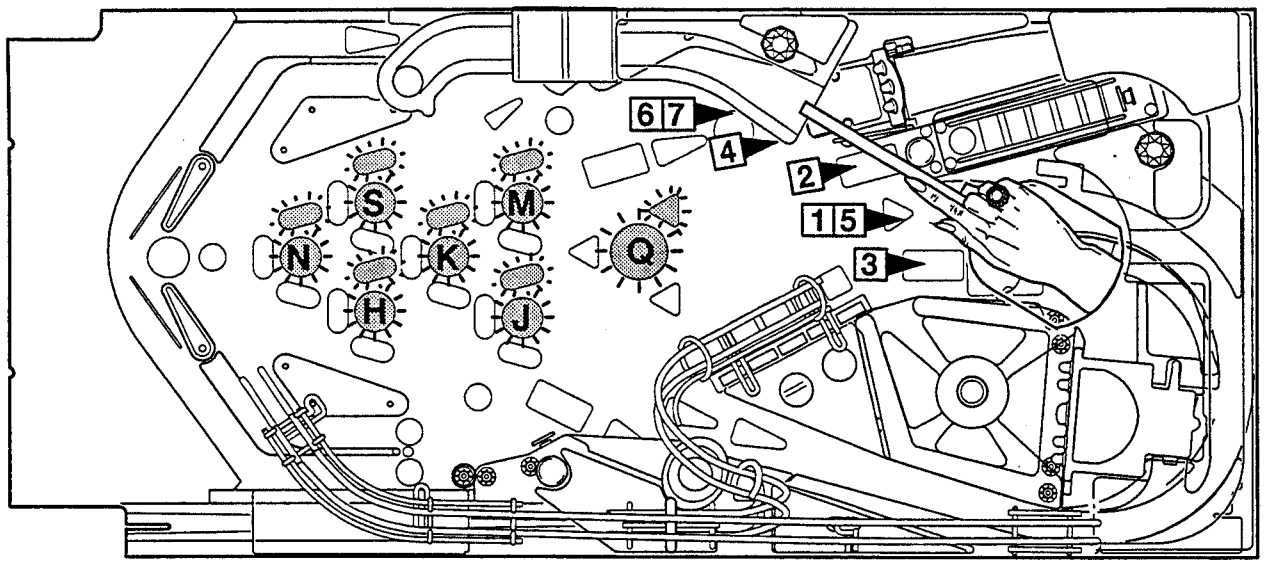
TRICK	DESCRIPTION
Bend the Spoon	A straight shot with a U- shaped result.
Swallow the Sword	If it's not straight, you cut your own throat.
Float the Ball	Test your stage presence with this shot. What makes it float?
Escape from the Locked Trunk	Getting into the trunk is easy. Getting out depends on several things...
Linking Rings	The first pass links the rings together. Don't forget to separate them.
Magic Carpet Ride	This could be a fast ride, so watch out for the landing.
Silence the Critics	Complain all you like, but sometimes you just have to know when to drop it.
Transform the Beasts	Fire up the chamber and make some changes.
Disappearing Snakes	Definitely a hat trick. Get rid of the snakes before they get rid of you.
Dangerous Sword Box	Looks easy, but there is more than one sword.
Nothing Up My Sleeve	The eye is quicker than the hand... or is it?
Vanishing Elephant	You can't put an elephant in a hat, but you could hide the elephant under it.
Make Three Wishes	Being corked up in a bottle for centuries makes the Genie throw things at you.
Triple Power Play	Look into the future to know what surprises the queen has for the player.
Make the World Go Away	Out of sight but not out of mind. A temporary vanishing act.
Spell the Secret Word	If you can spell, this trick is as easy as counting on one hand.
Locked Ball Trick	Figure out how to lock the trunk before you put the balls in.
Levitate the Ball	No strings attached, just your standard crowd-pleasing magic trick.
Magic Eight Trick	How quickly can you dispense with all eight of the targets?
Presto-Changeo	Turn off the color corresponding to each magician to tame the color ball.
Defeat the Magic Wand	Magna's defenses are down. Each shot you make weakens her more. Watch the display.

SPECIAL FEATURES

There are several special features to this game which are not immediately obvious. Some features are hidden by other structures on the playfield, some are related to specific tricks, and some seem to show up at random (remember, it is a game of magic). Most of these features can be used to advantage once they are discovered, but Matra Magna keeps a few tricks to herself.

FEATURE	DESCRIPTION
Extra Ball	It never hurts to have an extra ball; this one is available at any time during a game. Always carry a spare.
Reappearing Ball	Second chance. If a ball goes out of play very quickly, you get it back. Automatic help for the novice.
Miraculous Save	Turn this feature on to keep the ball in play longer. Active at any time during the game.
Bonuses	Every shot is worth points somewhere in the game. Bonus points are awarded when any ball goes out of play.
Secret Passageway	The paths behind the stage don't always come out in the same place. Where is easy; why is harder.
Hidden tunnel	When the balls drop below the playfield, they reappear suddenly. Don't blink or you will miss this one.
Showtime Stage	Getting on the stage is not too hard, but don't forget about the audience. You could get tossed around!
Box Office	After a stage appearance, ability to work the audience is rewarded by higher ratings on the marquee.
Critic's Triangle	It is next to impossible to get the critics without help from the Queen. A wave of the wand will do it.
Color Ball	Gaze deep into the color ball and find the reason those colors keep changing. How is your timing?
Genie Bottle	Both the Bottle and the Trunk can hold multiple balls. However, the Genie won't tell how many he's got.
Locked Trunk	Getting in and out is downhill all the way; knowing when to lock the Trunk is the tricky part.
Now Appearing	Hit the Captive Ball and change your luck. Five different choices, for when you're stuck. Poetic license.
Magic Mayhem	Answers the question, "How many things can you do at once?". Mini- and Full Power versions.
Jackpot	Take the fixed value or go for the gold by building it up. Jackpots are available during both types of Mayhem.

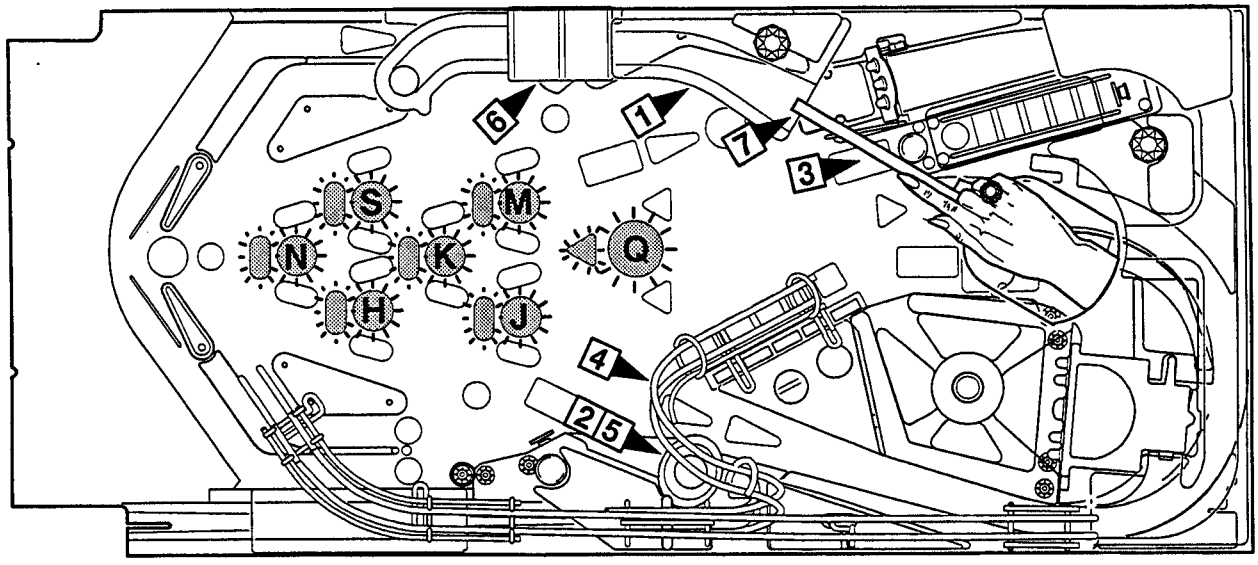
GAME RULES - ROUND #1



P1SM0400

MAGICIAN	SHOT LOCATION	SHOT DESCRIPTION
NOSTRADAMUS (N)	1 LEFT LOOP	BEND THE SPOON
SHAMAN (S)	2 CAPTIVE BALL	SWALLOW THE SWORD
GREAT HANSEN (H)	3 STAGE RAMP	SHOWTIME (FLOAT THE BALL)
MR. MYSTIQUE (M)	4 LEFT RAMP	TRUNK ESCAPE
KENZO (K)	5 LEFT LOOP	LINKING RINGS
JADUGAR (J)	6 LEFT RAMP	MAGIC CARPET RIDE
QUEEN MATRA MAGNA (Q)	7 LEFT RAMP	SILENCE THE CRITICS

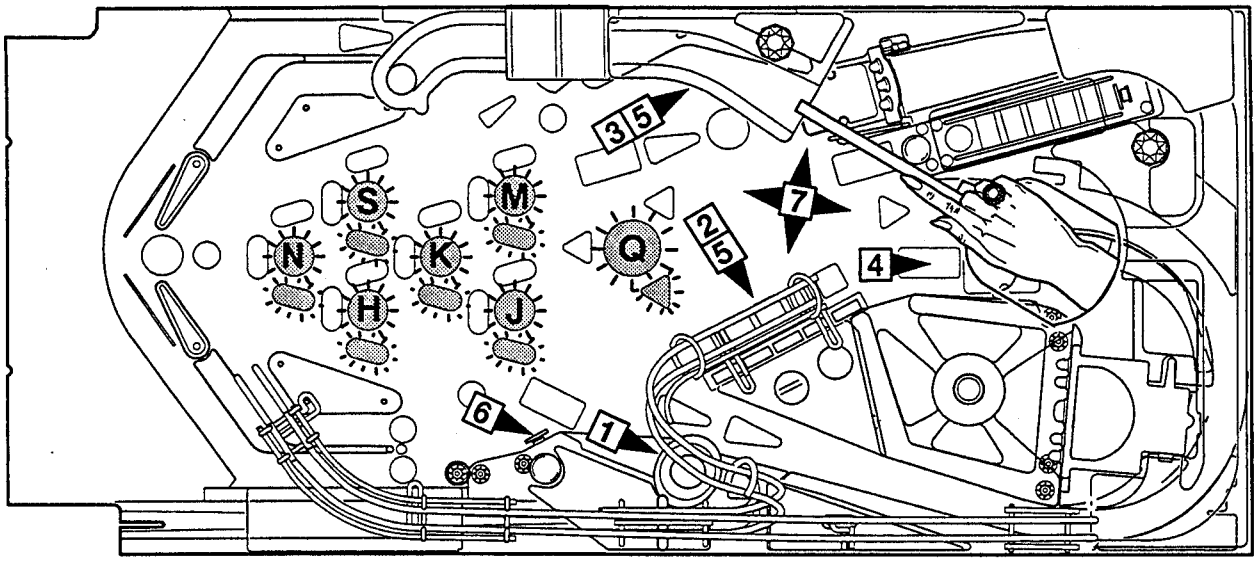
GAME RULES - ROUND #2



P1SM0500

MAGICIAN	SHOT LOCATION	SHOT DESCRIPTION
NOSTRADAMUS (N)	1 MORPH CHAMBER	TRANSFORM THE BEASTS (METAMORPHOSIS)
SHAMAN (S)	2 MAGIC HAT	VANISHING ACT (DISAPPEARING SNAKES)
GREAT HANSEN (H)	3 CAPTIVE BALL	SWORD TRICK
MR. MYSTIQUE (M)	4 RIGHT LOOP 2	NOTHING UP MY SLEEVE
KENZO (K)	5 UNDER MAGIC HAT	VANISHING ELEPHANT
JADUGAR (J)	6 GENIE BOTTLE	MAKE THREE WISHES
QUEEN MATRA MAGNA (Q)	7 TRUNK (THREE BALLS)	TRIPLE POWER PLAY

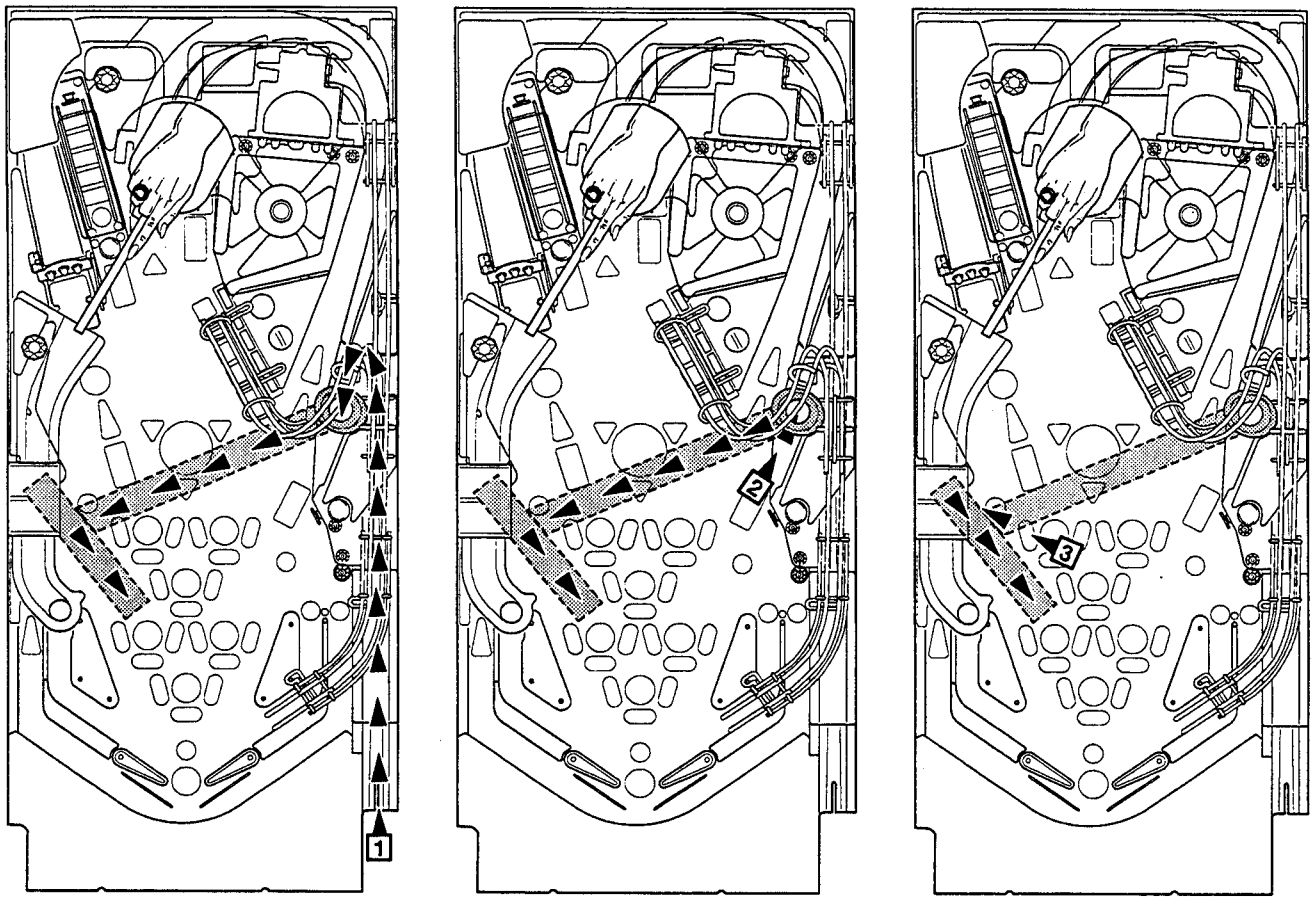
GAME RULES - ROUND #3



P1SM0600

MAGICIAN	SHOT LOCATION	TRICK DESCRIPTION
NOSTRADAMUS (N)	1 VANISHING ACT	VANISH THE WORLD
SHAMAN (S)	2 MAGIC TARGETS (FIVE BANK DROP)	SPELL THE SECRET WORD
GREAT HANSEN (H)	3 LEFT RAMP	LOCKED BALL TRICK
MR. MYSTIQUE (M)	4 SHOWTIME STAGE	LEVITATE THE BALL
KENZO (K)	5 MORPH / MAGIC TARGETS (THREE AND FIVE BANKS)	MAGIC EIGHT TRICK
JADUGAR (J)	6 COLOR BALL (COLOR MATCH)	PRESTO-CHANGO
QUEEN MATRA MAGNA (Q)	7 ENTIRE PLAYFIELD	DEFEAT MATRA'S POWER

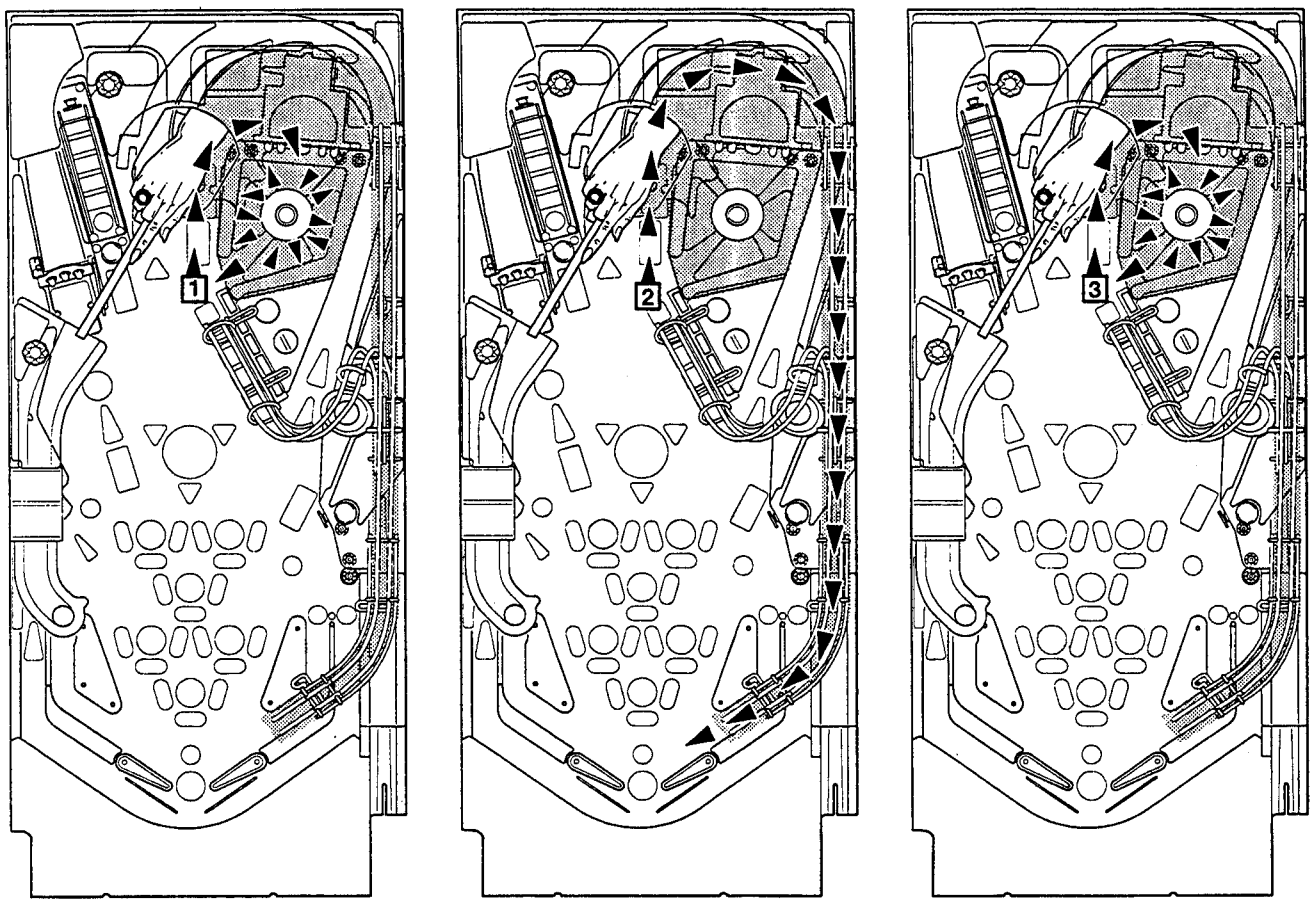
THE HIDDEN TUNNEL



P1SM0100

TUNNEL PARAMETERS				
PATH	**SHOT**	**SYSTEM CONTROLS**	**PLAYER ACTION**	**SCORING CONDITIONS**
Skill shot into Magic Hat, through Hidden Tunnel to Genie Bottle.	1	Genie Bottle is illuminated. Ball is ejected.	Launch stroke length determines whether ball drops or continues along wireform path.	Automatic for entering Genie Bottle.
Vanishing under Magic Hat, through Hidden Tunnel to Genie Bottle.	2	Genie Bottle is illuminated. Ball is ejected.	Right Flipper redirects balls ejected from Genie Bottle.	Additional points for each successive correct choice.
Into Genie Bottle under Trunk and back out again.	3	Genie Bottle is illuminated. Display offers player choices. Ball is ejected.	Hit either flipper to choose. A bad decision ends this session.	Automatic points for each successive correct choice.

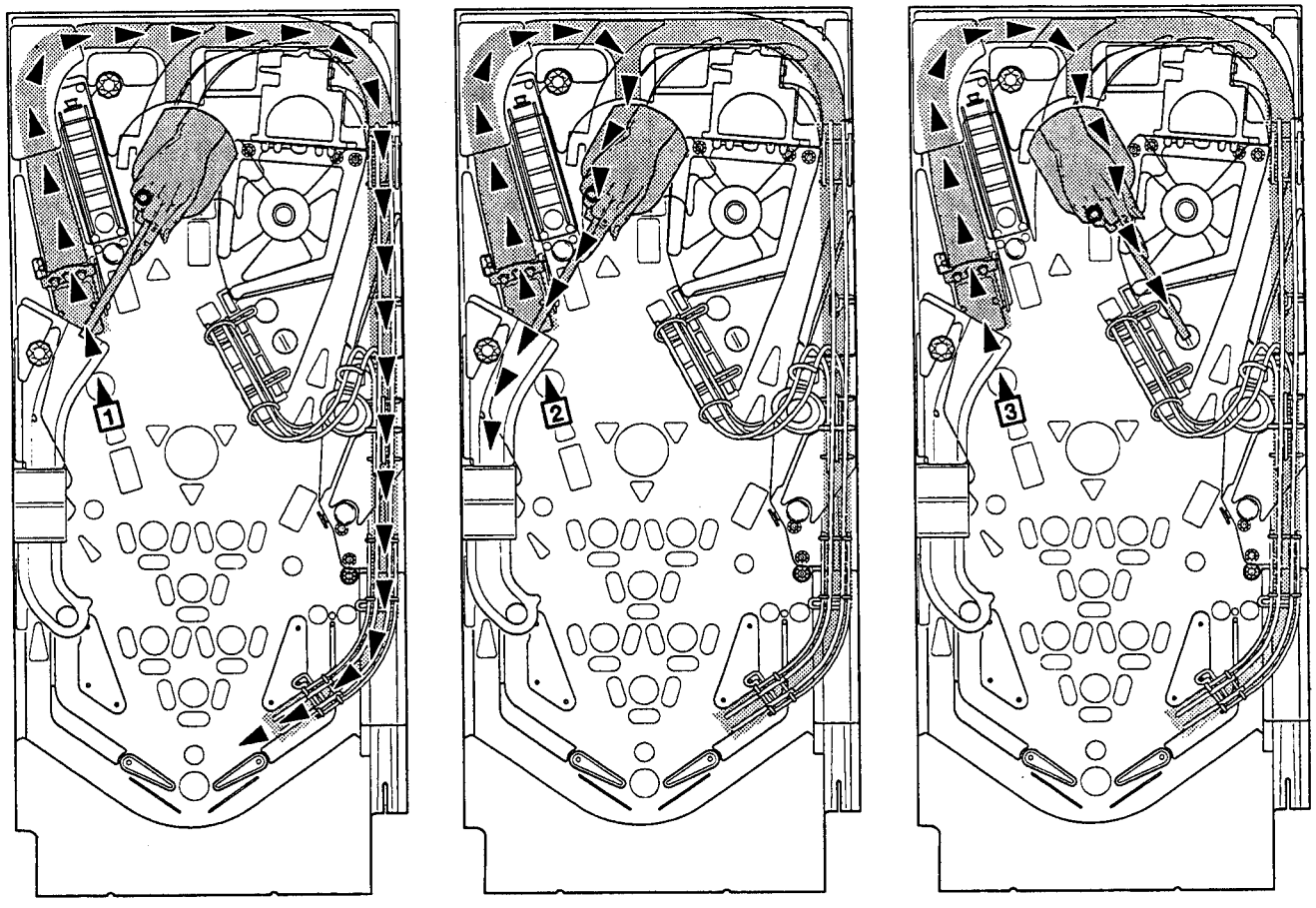
SHOWTIME STAGE



P1SM0200

SHOWTIME PARAMETERS				
PATH	**SHOT**	**SYSTEM CONTROLS**	**PLAYER ACTION**	**SCORING CONDITIONS**
Up Showtime ramp and onto Stage, then into Star Bumper.	1	Stage Diverter Gate open. Box Office is illuminated. Showtime not illuminated. Stage Doors open. One ball kicks out	Repeat the shot to build up the Box Office Value.	Automatic for going on to the Stage.
Up Showtime ramp, behind Stage, then down long wireform to flippers.	2	Stage Diverter Gate closed. Box Office is illuminated. Stage Doors open.	Continue to shoot until all of the Box Office is Illuminated.	Box Office point value is added to the score.
Up Showtime ramp and onto Stage, then into Star Bumper	3	Diverter Gate open Timer counts down.	Hit as many targets as possible before time runs out.	Hit X targets with each switch target hit: For big points.

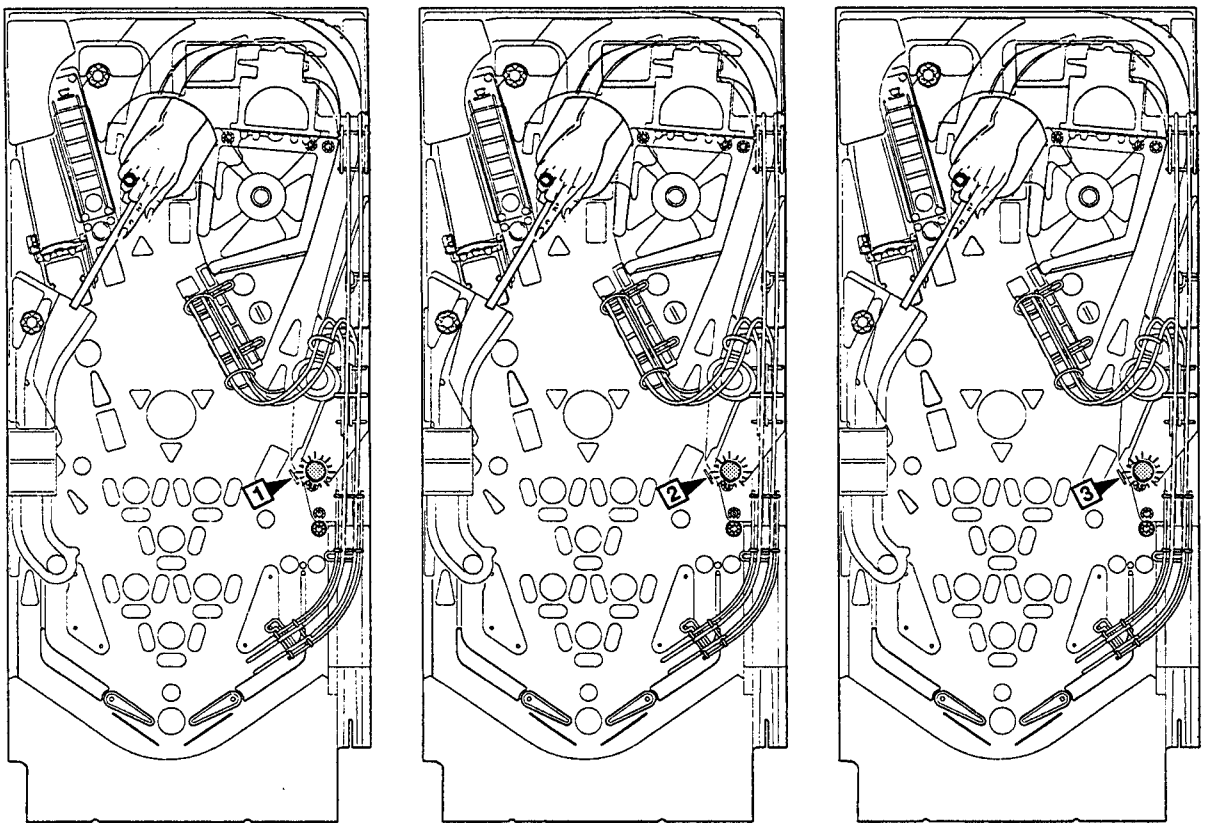
THE MAGIC CARPET RIDE THE TRUNK ESCAPE SILENCE THE CRITICS



P1SM0300

PASSAGEWAY PARAMETERS				
PATH	SHOT	SYSTEM CONTROLS	PLAYER ACTION	SCORING CONDITIONS
Up left ramp, behind Stage, down long wireform to flippers.	1	Diverter Gate open. Magic Wand magnets off. Ring Lamp extinguished.	Right Flipper redirects balls from long wireform.	Automatic for top of ramp.
Up left ramp, under hand, down Magic Wand to Locked Trunk.	2	Diverter Gate closed. Hand position left. Magic Wand magnets on. Ring Lamp illuminated.	Launch next ball.	Automatic for top of ramp.
Up left ramp, under hand, down Magic Wand to Critic's Triangle.	3	Diverter Gate closed. Hand position right. Magic Wand magnets on. Ring Lamp illuminated.	Right flipper drops ball from Magic Wand.	Additional points for each Critic when illuminated.

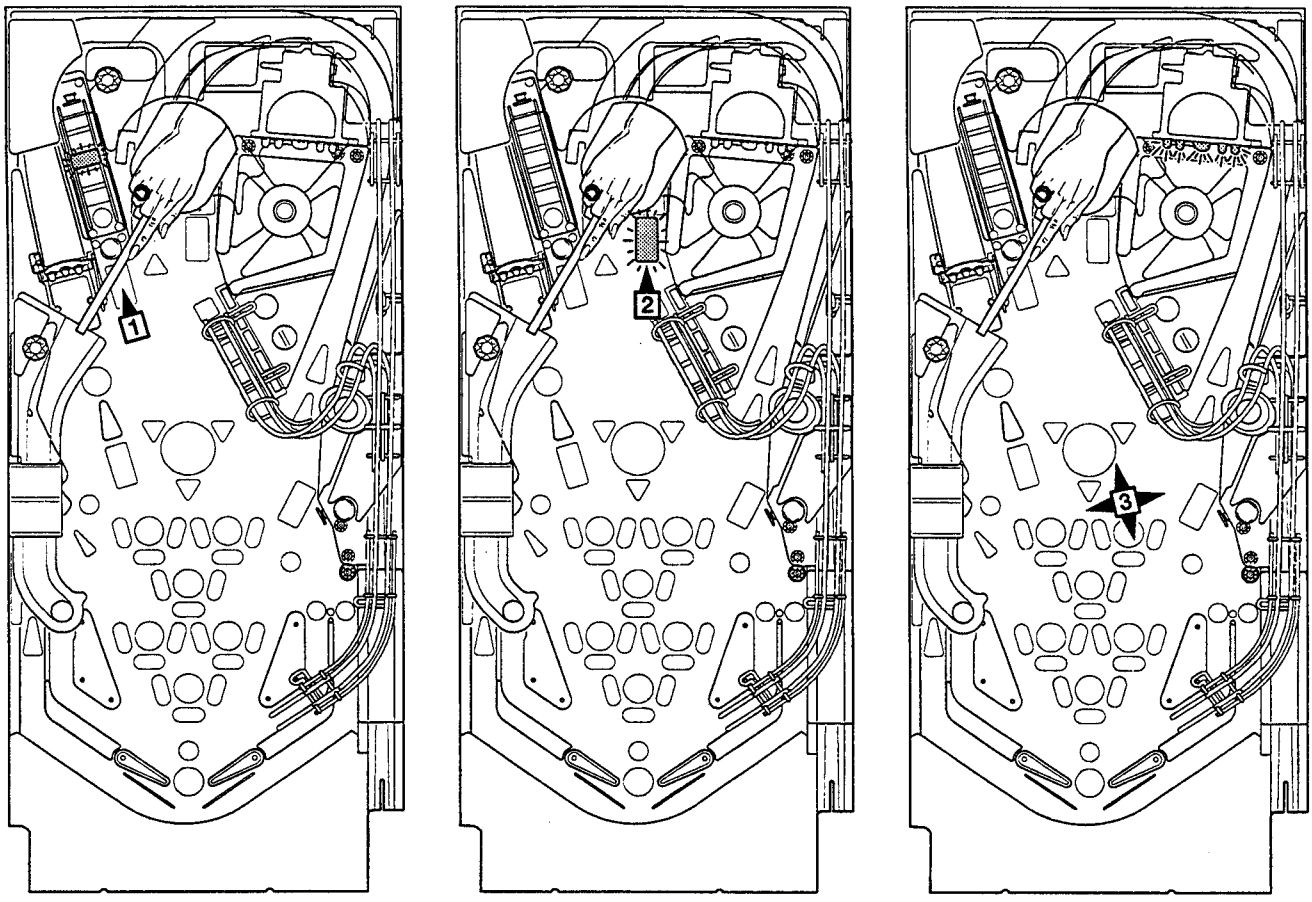
COLOR CHANGING BALL



P1SM0800

COLOR CHANGING BALL PARAMETERS				
PATH	SHOT	SYSTEM CONTROLS	PLAYER ACTION	SCORING CONDITIONS
Hit Color Change target switch at any time.	1	Ball color slowly changes. Display shows color needed. Colors remain illuminated.	Time shot to coincide with color change needed.	Points awarded for each hit on Color Ball target switch.
Hit Color Change target during a color match.	2	Ball color slowly changes. Display shows color needed. Colors remain illuminated.	Repeat shot before ball color changes.	Many points awarded for each hit on Color Ball target when colors match Magician's color
Hit Color Change target during a color match.	3	Ball color slowly changes. Display shows color needed. Presto Changeo illuminates. Colors extinguish when hit.	Time shot to coincide with color needed.	Turn off all colors to complete trick and collect full point value.

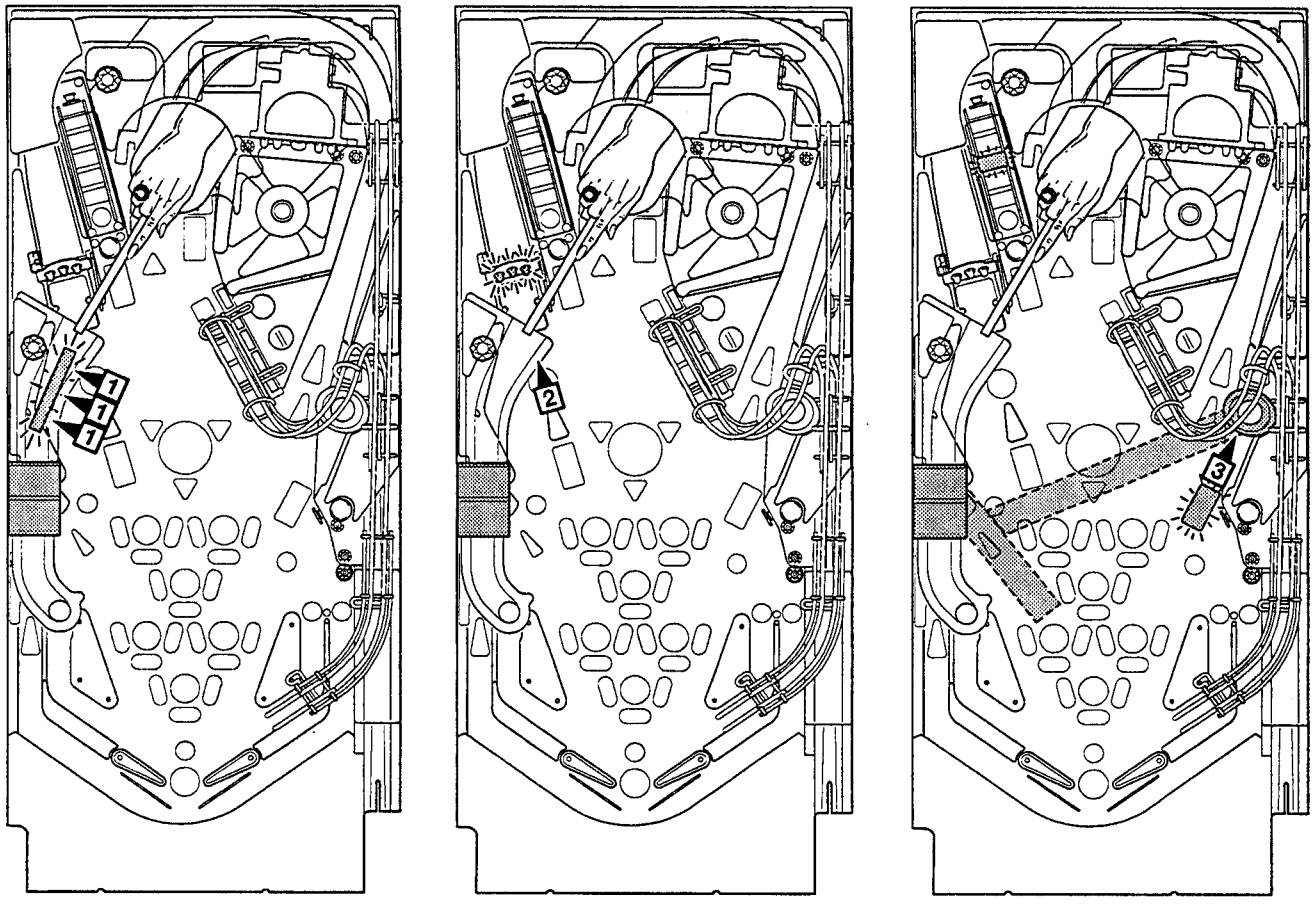
AMATEUR HOUR



P1SM0900

AMATEUR HOUR PARAMETERS				
PATH	**SHOT**	**SYSTEM CONTROLS**	**PLAYER ACTION**	**SCORING CONDITIONS**
Hit Captive Ball until Lite Showtime illuminates.	1	Stage Diverter Gate open. Showtime illuminates	Shoot up Showtime ramp to start the show.	Points awarded for going on to the Stage.
Up Showtime ramp and onto Stage, then into Star Bumper.	2	Stage Doors open. Ball is ejected. Showtime still illuminated.	Hit as many targets as possible.	Points awarded for each hit made before Amateur Hour timer runs out.
Hit any target to score before time is up or maximum number of targets is reached.	3	Stage Doors closed. Any Stage shot will be ejected. Showtime extinguishes	Resume normal game play.	Same as regular ball.

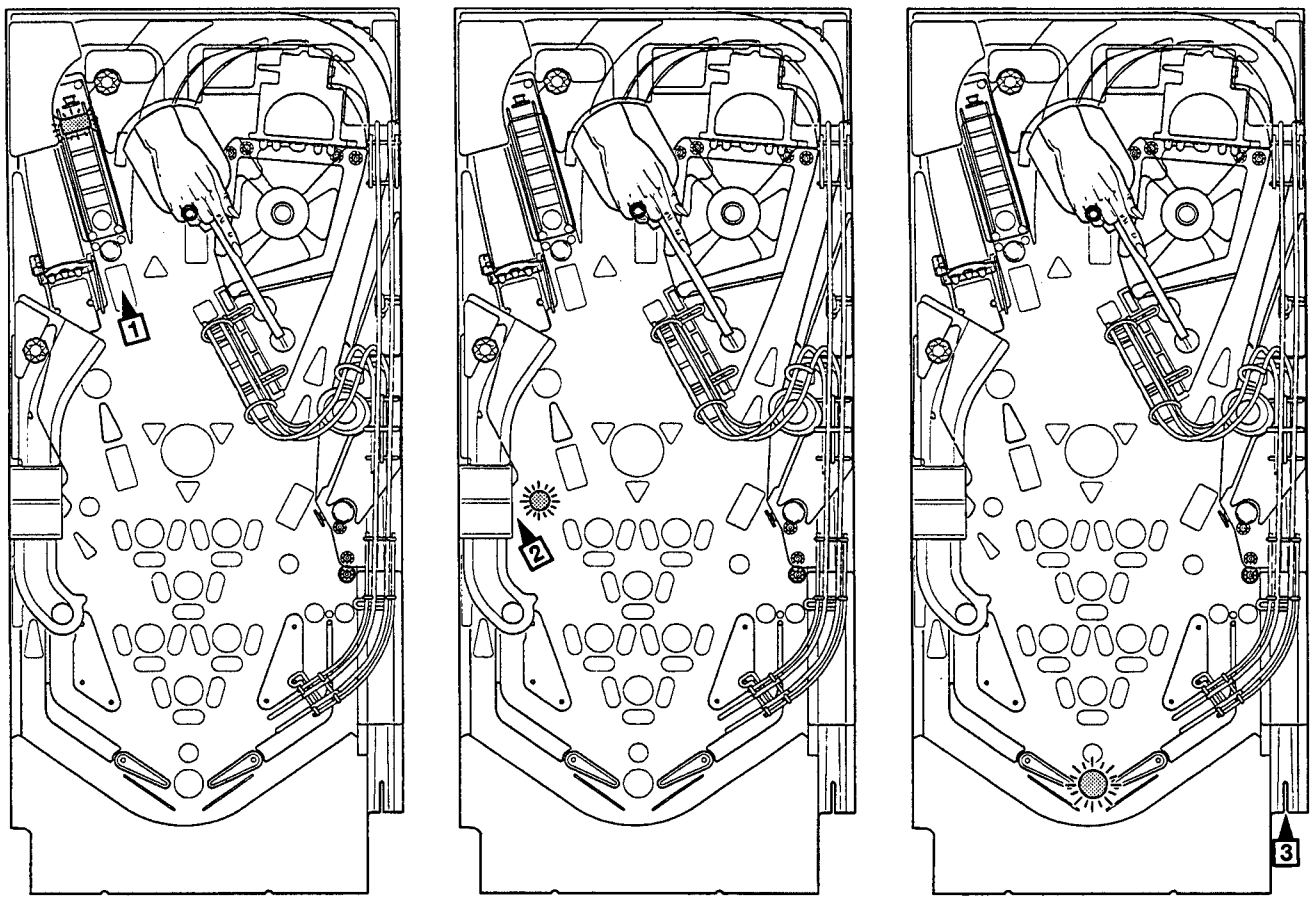
MAGIC MAYHEM



P1SM1000

MAGIC MAYHEM PARAMETERS				
PATH	**SHOT**	**SYSTEM CONTROLS**	**PLAYER ACTION**	**SCORING CONDITIONS**
Hit three bank target or five bank.	1	Lites Trunk to collect balls.	Get one or more balls into Trunk while it is lit.	Same as regular ball.
Up left ramp, under hand, down Magic Wand, and into Locked Trunk.	2	Diverter Gate closed. Hand position left. Magic Wand magnets on. Ball stays in Locked Trunk.	None.	Same as regular ball.
Under or into Magic Hat, through Hidden Tunnel to Genie Bottle.	3	Trunk unlocks. Genie Bottle opens up.	Shoot all shots until balls are all gone. Go for Jackpot at left ramp.	Same as regular ball.

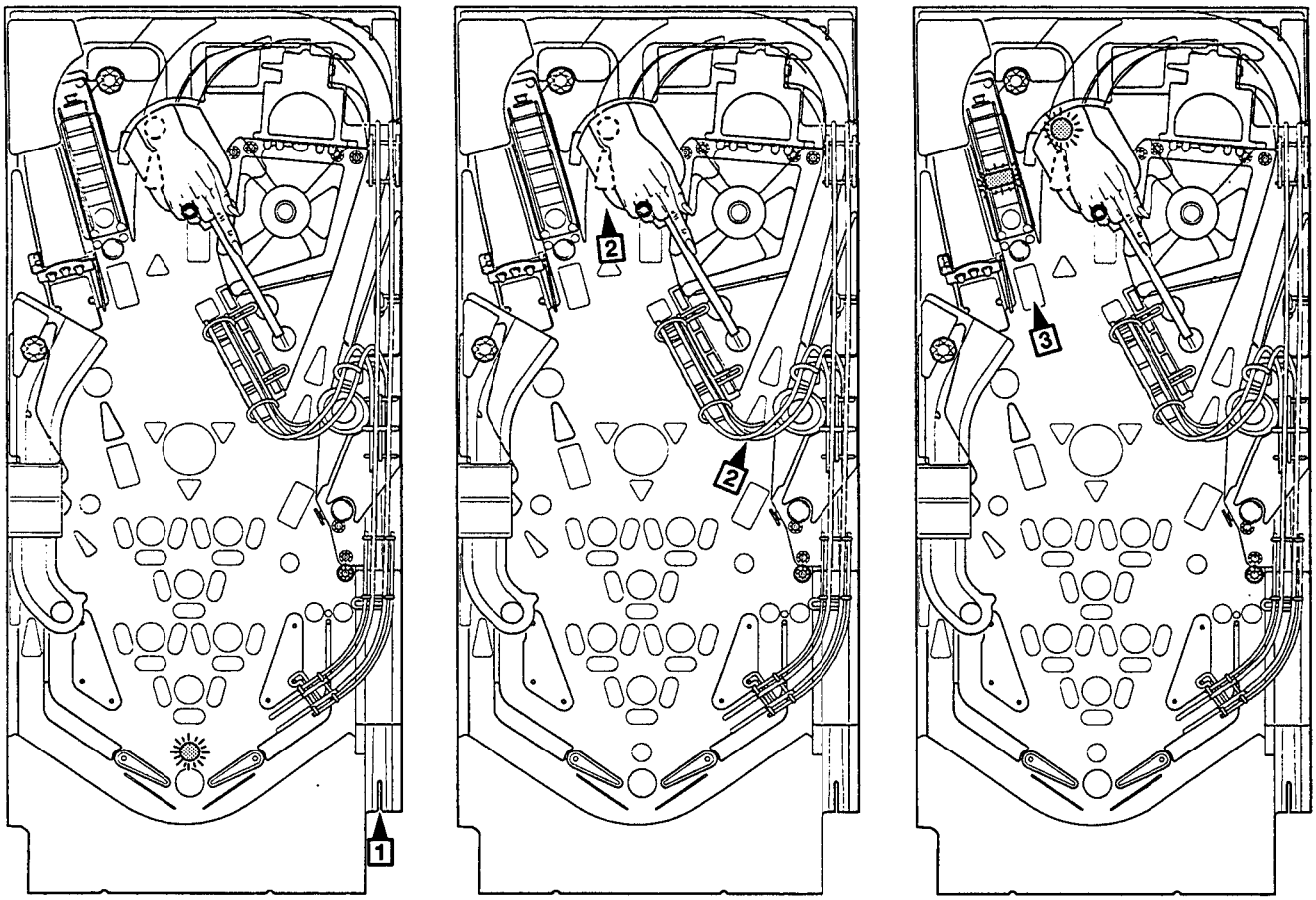
EXTRA BALL



P1SM1100

EXTRA BALL PARAMETERS				
PATH	**SHOT**	**SYSTEM CONTROLS**	**PLAYER ACTION**	**SCORING CONDITIONS**
Hit Captive Ball until Lite Extra Ball is illuminated.	1	Switch starts timer which is set by the difficulty level.	Shoot target when Lite Extra Ball is illuminated.	Same as regular ball.
Extra Ball target switch under Locked Trunk next to Genie Bottle.	2	Switch starts timer which is set by the difficulty level.	Shoot target when Extra Ball is illuminated.	Same as regular ball.
Launch Extra Ball to go on to next trick.	3	Additional ball is provided when the current ball is no longer in play.	Continue play when Encore is illuminated.	Same as regular ball.

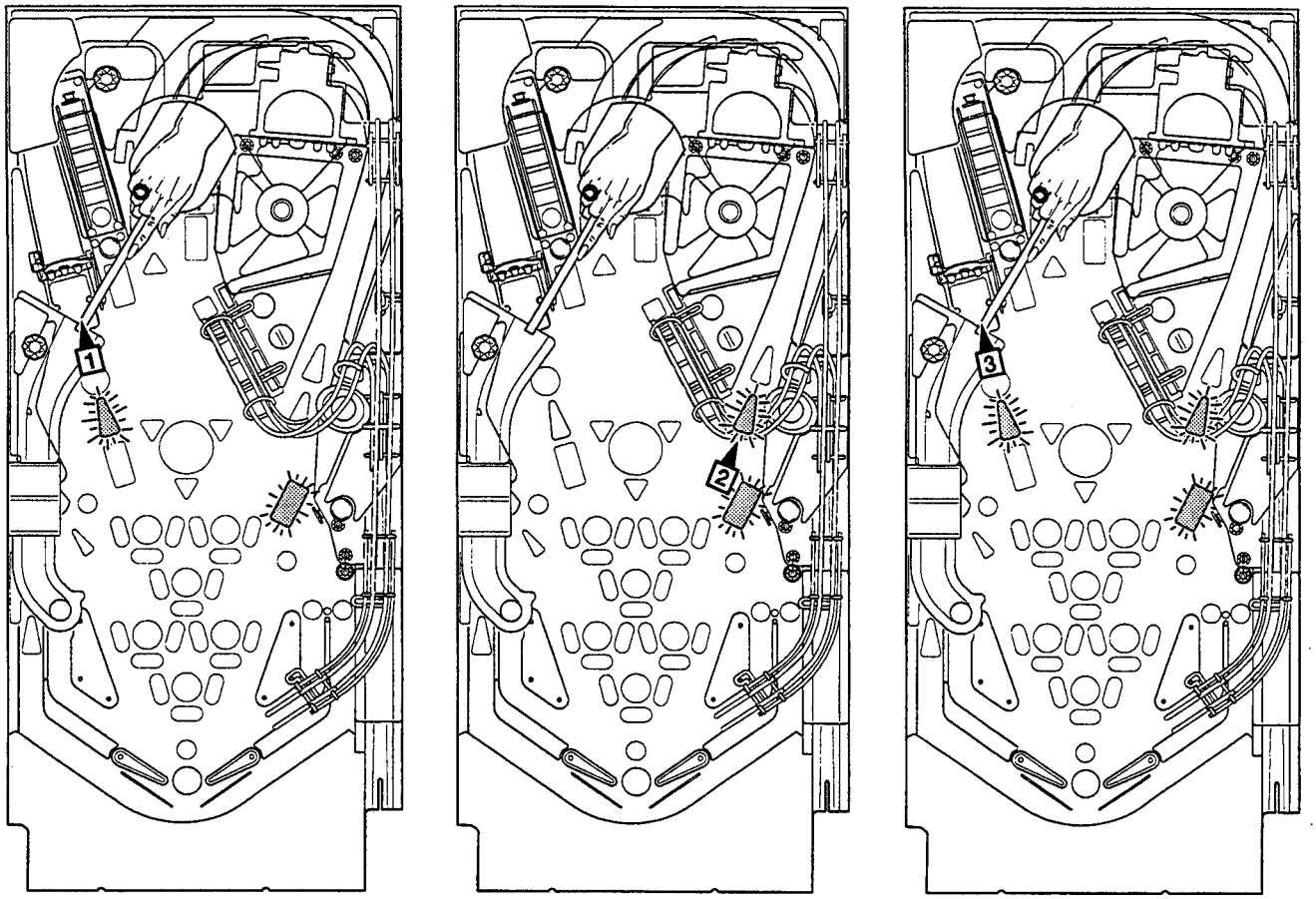
REAPPEARING BALL AND SPINNER



P1SM1200

REAPPEARING BALL AND SPINNER PARAMETERS				
PATH	**SHOT**	**SYSTEM CONTROLS**	**PLAYER ACTION**	**SCORING CONDITIONS**
Launch any ball in the game.	1	Launch starts timer which is set by the difficulty level. Reappearing Ball is illuminated.	Launch another ball when it shows up in the Shooter Lane.	None, but it does not go against the current ball count.
Up either Loop behind Stage down playfield to flippers.	2	Spinner is always active when game is in play.	Shoot ball hard to flip Spinner as long as possible.	Points awarded for each revolution of the Spinner.
Hit Captive Ball until Lite Spinner illuminates.	3	Super Spinner starts timer which is set by the difficulty level setting chosen.	Continue to shoot loops while Super Spinner is illuminated.	Higher value of points awarded for each revolution of the Sinner

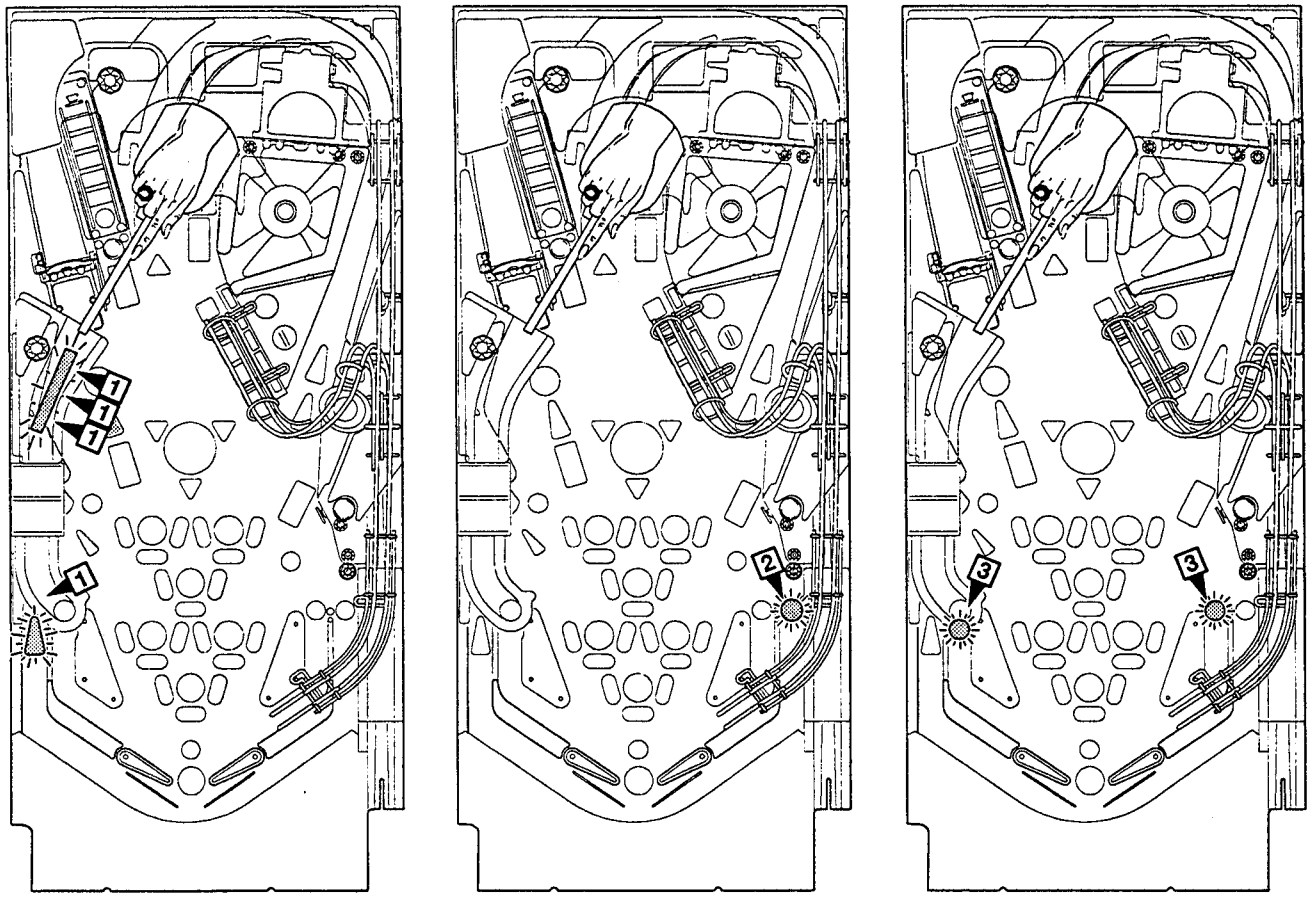
BUILD AND COLLECT JACKPOT



P1SM1300

JACKPOT PARAMETERS				
PATH	**SHOT**	**SYSTEM CONTROLS**	**PLAYER ACTION**	**SCORING CONDITIONS**
Up left ramp behind Stage down long wireform to flippers.	1	Diverter Gate open. Jackpot available only if illuminated.	Mini Mayhem must be going to get Mini Jackpot.	Awards fixed Jackpot value one time and resets.
Into right loop 2 behind Stage down playfield to flippers.	2	Diverter Gate open. First shot starts Build Jackpot timer. Timer counts down to zero, then switches on collect Jackpot timer.	Magic Mayhem must be going to get Jackpot.	Each completed loop adds more points to total Jackpot.
Up left ramp behind Stage down long wireform to flippers.	3	Diverter Gate open. Increased Jackpot available only if full Mayhem.	Magic Mayhem must be going to get Jackpot.	Awards total Jackpot value one time.

MIRACULOUS SAVE, JINX, AND LITE LOOPS



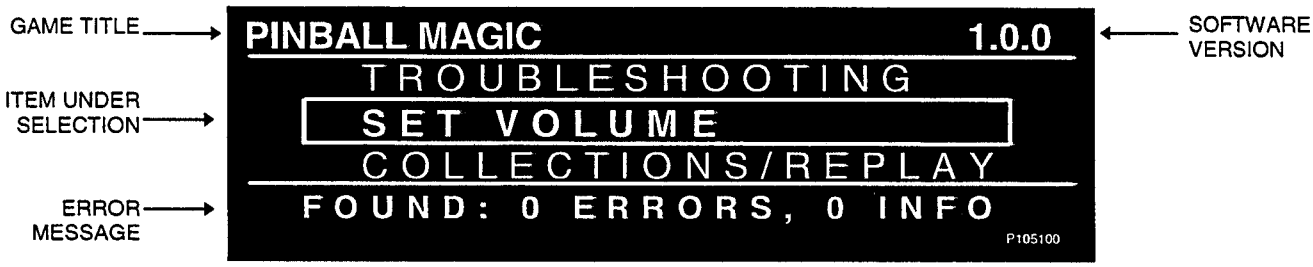
P1SM1400

LANE PARAMETERS				
PATH	**SHOT**	**SYSTEM CONTROLS**	**PLAYER ACTION**	**SCORING CONDITIONS**
Under locked trunk exit to left out lane	1	Kicker solenoid returns ball to playfield if SAVE is lit. Otherwise, ball is out of play	Hit three bank target switch to lite SAVE.	Varies with game difficulty level.
Past Presto Chango to right out lane.	2	None. Ball is out of play when it gets into this out lane.	Avoid this out lane as long as possible.	More points awarded if JINX is brightly illuminated.
Left or right in lane behind sling shot flippers.	3	None. Ball remains in play when in either in lane. Lit by making trick slings alternate.	Lite loops active.	Points awarded if player shoots LOOP 1 or LOOP 2 as indicated.

MENU SYSTEM

The menu system is started when the coin door is opened. When the coin door is closed, the game will return to the Attract mode. If a game is in progress when the coin door is opened, the game will be preserved and restored (if possible) when the coin door is closed again. A game in progress is ended if an adjustment (except the volume or service credit adjustments) is changed or if a diagnostic function is selected.

When the coin door is opened, the dot matrix display shows the following main menu:



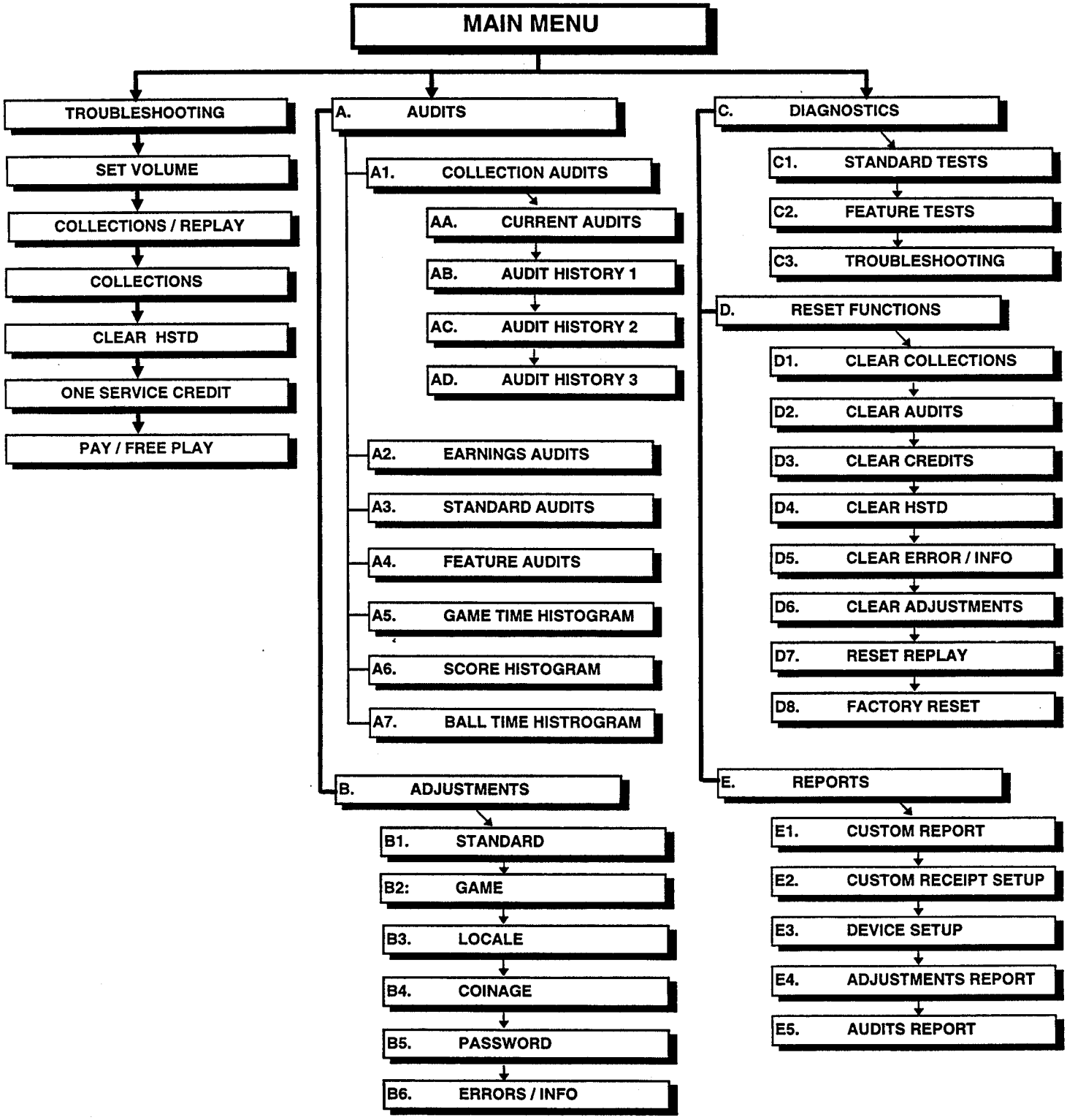
The start-up menu displays the number of ERRORS or problems that were found during game play or while in the Attract Mode. ERRORS are major problems, such as non-operative switches, that should be repaired/replaced before game play is resumed. INFO items are minor problems, such as burned-out lamps, that need repair/replacement during the next regular maintenance cycle.

The menu system is controlled by the use of the left & right flipper buttons and the Start button. Pressing these button(s) will result in the following menu actions:

1) Right Flipper button	increment, or move to the next field
2) Left Flipper button	decrement, or move to the previous field
3) Left & Right Flipper buttons together	cancel, back-up, or restore the original setting
4) Start button	accept, enter, or keep new setting

MENU SYSTEM LAYOUT

The menu system has the following main categories and sub-menus:



MAIN MENU FUNCTIONS

TROUBLESHOOTING:	Use this menu to start troubleshooting the game's electrical components. NOTE: Troubleshooting can also be accessed through the *DIAGNOSTICS* Menu.
SET VOLUME:	Plays a test tune so that the game volume can be adjusted.
COLLECTIONS/REPLAY:	Allows the operator to scroll through recent collections audits. The operator may optionally clear the audits and adjust the replay score to meet the target replay percentage (see Adjustment B1:04A, "Replay Percentage").
COLLECTIONS:	Same as COLLECTIONS/REPLAY, except the replay score is **not** adjusted when the collections audits are cleared.
ONE SERVICE CREDIT:	Issues one service credit to the game.
PAY / FREE PLAY:	Set the game mode to Pay-to-Play (disables Adjustment B1:10, *Free Play*) or to continuous Free Play (enables Adjustment B1:10, *Free Play*).
A. AUDITS:	Allows the operator to retrieve the games' earnings and performance information.
B. ADJUSTMENTS:	Operator adjustables are available for *STANDARD, GAME, LOCALE, COINAGE, PASSWORD,* and *ERRORS/INFO.*
C. DIAGNOSTICS:	Use *STANDARD TESTS, FEATURE TESTS, and TROUBLESHOOTING* to perform in-depth, automated testing of electrical and mechancal components.
D. RESET FUNCTIONS:	Allows the operator to individually clear certain *AUDITS* and *ADJUSTMENTS* data or elect to re-configure the game to the original factory settings.
E. REPORTS:	Allows the operator to output *AUDIT* and *ADJUSTMENTS* data to a serial communications device, such as a printer or laptop computer.

AUDITS DATA TABLE

REF	AUDIT #	DESCRIPTION	TOTALS	PERCENTAGES	AVERAGE PER GAME
		A1 : COLLECTION AUDITS			
1	A1:AA:01	CURRENT : RECENT EARNINGS			
2	A1:AA:02	CURRENT : RECENT 1ST COIN CHUTE		% OF RECENT COINS	
3	A1:AA:03	CURRENT : RECENT 2ND COIN CHUTE		% OF RECENT COINS	
4	A1:AA:04	CURRENT : RECENT 3RD COIN CHUTE		% OF RECENT COINS	
5	A1:AA:05	CURRENT : RECENT 4TH COIN CHUTE		% OF RECENT COINS	
6	A1:AA:06	CURRENT : RECENT CREDITS			
7	A1:AA:07	CURRENT : RECENT COIN CREDITS		% OF RECENT CREDITS	
8	A1:AA:08	CURRENT : RECENT SERVICE CREDITS		% OF RECENT CREDITS	
9	A1:AA:09	CURRENT : RECENT FREE CREDITS		% OF RECENT CREDITS	
10	A1:AA:10	CURRENT : RECENT TOURNT CREDITS		% OF RECENT CREDITS	
11	A1:AB:01	HISTORY 1 : RECENT EARNINGS			
12	A1:AB:02	HISTORY 1 : RECENT 1ST COIN CHUTE		% OF RECENT COINS	
13	A1:AB:03	HISTORY 1 : RECENT 2ND COIN CHUTE		% OF RECENT COINS	
14	A1:AB:04	HISTORY 1 : RECENT 3RD COIN CHUTE		% OF RECENT COINS	
15	A1:AB:05	HISTORY 1 : RECENT 4TH COIN CHUTE		% OF RECENT COINS	
16	A1:AB:06	HISTORY 1 : RECENT EARNINGS			
17	A1:AB:07	HISTORY 1 : RECENT COIN CREDITS		% OF RECENT CREDITS	
18	A1:AB:08	HISTORY 1 : RECENT SERVICE CREDITS		% OF RECENT CREDITS	
19	A1:AB:09	HISTORY 1 : RECENT FREE CREDITS		% OF RECENT CREDITS	
20	A1:AB:10	HISTORY 1 : RECENT TOURNT CREDITS		% OF RECENT CREDITS	
21	A1:AC:01	HISTORY 2 : RECENT EARNINGS			
22	A1:AC:02	HISTORY 2 : RECENT 1ST COIN CHUTE		% OF RECENT COINS	
23	A1:AC:03	HISTORY 2 : RECENT 2ND COIN CHUTE		% OF RECENT COINS	
24	A1:AC:04	HISTORY 2 : RECENT 3RD COIN CHUTE		% OF RECENT COINS	
25	A1:AC:05	HISTORY 2 : RECENT 4TH COIN CHUTE		% OF RECENT COINS	
26	A1:AC:06	HISTORY 2 : RECENT EARNINGS			
27	A1:AC:07	HISTORY 2 : RECENT COIN CREDITS		% OF RECENT CREDITS	
28	A1:AC:08	HISTORY 2 : RECENT SERVICE CREDITS		% OF RECENT CREDITS	
29	A1:AC:09	HISTORY 2 : RECENT FREE CREDITS		% OF RECENT CREDITS	
30	A1:AC:10	HISTORY 2 : RECENT TOURNMT CREDITS		% OF RECENT CREDITS	
31	A1:AD:01	HISTORY 3 : RECENT EARNINGS			
32	A1:AD:02	HISTORY 3 : RECENT 1ST COIN CHUTE		% OF RECENT COINS	
33	A1:AD:03	HISTORY 3 : RECENT 2ND COIN CHUTE		% OF RECENT COINS	
34	A1:AD:04	HISTORY 3 : RECENT 3RD COIN CHUTE		% OF RECENT COINS	
35	A1:AD:05	HISTORY 3 : RECENT 4TH COIN CHUTE		% OF RECENT COINS	
36	A1:AD:06	HISTORY 3 : RECENT EARNINGS			
37	A1:AD:07	HISTORY 3 : RECENT COIN CREDITS		% OF RECENT CREDITS	
38	A1:AD:08	HISTORY 3 : RECENT SERVICE CREDITS		% OF RECENT CREDITS	
39	A1:AD:09	HISTORY 3 : RECENT FREE CREDITS		% OF RECENT CREDITS	
40	A1:AD:10	HISTORY 3 : RECENT TOURNT CREDITS		% OF RECENT CREDITS	
		A2 : EARNINGS AUDITS			
41	A2:01	TOTAL COINS-IN			
42	A2:02	TOTAL 1ST COIN CHUTE		% OF TOTAL COINS	
43	A2:03	TOTAL 2ND COIN CHUTE		% OF TOTAL COINS	
44	A2:04	TOTAL 3RD COIN CHUTE		% OF TOTAL COINS	
45	A2:05	TOTAL 4TH COIN CHUTE		% OF TOTAL COINS	
46	A2:06	TOTAL CREDITS			
47	A2:07	TOTAL COIN CREDITS		% OF TOTAL CREDITS	
48	A2:08	TOTAL SERVICE CREDITS		% OF TOTAL CREDITS	
49	A2:09	TOTAL FREE CREDITS		% OF TOTAL CREDITS	
50	A2:10	TOTAL TOURNAMENT CREDITS		% OF TOTAL CREDITS	
		A3 : STANDARD AUDITS			
51	A3:01	AVERAGE BALL TIME	HRS MIN SEC		
52	A3:02	1 PLAYER GAMES		% OF ALL GAMES	
53	A3:03	2 PLAYER GAMES		% OF ALL GAMES	
54	A3:04	3 PLAYER GAMES		% OF ALL GAMES	
55	A3:05	4 PLAYER GAMES		% OF ALL GAMES	
56	A3:06	TOTAL STARTED CREDITS			
57	A3:07	TOTAL FINISHED CREDITS			
58	A3:08	REPLAY AWARDS		% OF GAMES	
59	A3:09	TOTAL STARTED BALLS			

AUDITS DATA TABLE

REF	AUDIT #	DESCRIPTION	TOTALS	PERCENTAGES	AVERAGE PER GAME
60	A3:10	TOTAL FINISHED BALLS			
61	A3:11	MATCH AWARDS		% OF GAMES	
62	A3:12	EXTRA BALLS			
63	A3:13	LEFT DRAINS		% OF ALL DRAINS	
64	A3:14	RIGHT DRAINS		% OF ALL DRAINS	
65	A3:15	CENTER DRAINS		% OF ALL DRAINS	
66	A3:16	TILTS			
67	A3:17	SLAM TILTS			
68	A3:18	HSTD CREDITS		% OF GAMES	
69	A3:19	BUY-IN 1			
70	A3:20	BUY-IN 2			
71	A3:21	BUY-IN 3 +			
72	A3:22	HSTD RESET COUNT			
73	A3:23	TOTAL TIME ON	DAYS HRS MIN SEC		
74	A3:24	TOTAL GAME TIME	HRS MIN SEC	% OF TOTAL TIME ON	
75	A3:25	AVERAGE GAME TIME	HRS MIN SEC		
76	A3:26	TOTAL BURN-IN TIME	HRS MIN SEC		
		A4 : FEATURE AUDITS			
77	A4:01	GENIE			
78	A4:02	ALADDIN			
79	A4:03	LOCK 1			
80	A4:04	LOCK 2			
81	A4:05	MIRACULOUS SAVE			
82	A4:06	VANISH			
83	A4:07	NOT IMPLEMENTED			
84	A4:08	NOT IMPLEMENTED			
85	A4:09	SPOON			
86	A4:10	STAGE			
87	A4:11	SLEEVE			
88	A4:12	MAYHEM START			
89	A4:13	PRESTO			
90	A4:14	FLOAT			
91	A4:15	METAMORPHISIS			
92	A4:16	LOCK			
93	A4:17	COLOR MATCH			
94	A4:18	BALL OUT			
95	A4:19	SPELL M-A-G-I-C			
96	A4:20	LOCK KICK			
97	A4:21	LOCK RELEASE			
98	A4:22	MAYHEM END			
99	A4:23	SPINNER			
100	A4:24	VANISH BIRD			
101	A4:25	VANISH SNAKE			
102	A4:26	VANISH PERSON			
103	A4:27	VANISH PLAYER			
104	A4:28	VANISH ELEPHANT			
105	A4:29	VANISH SOL			
106	A4:30	VANISH WORLD			
107	A4:31	MAYHEM LOOP			
108	A4:32	JACKPOT			
109	A4:33	SKILL HAT			
110	A4:34	CRITIC 1			
111	A4:35	CRITIC 2			
112	A4:36	CRITIC BOTH			
113	A4:37	SWORD 1			
114	A4:38	SWORD 2			
115	A4:39	WAND POWER			
116	A4:40	3X POWER			
117	A4:41	PRESTO OFF			
118	A4:42	MAGIC 8			
119	A4:43	RINGS			
120	A4:44	TRUNK			
121	A4:45	LOOP			

AUDITS DATA TABLE

REF	AUDIT #	DESCRIPTION	TOTALS	PERCENTAGES	AVERAGE PER GAME
		A5:GAME TIME HISTOGRAM			
122	A5	GAME TIME HISTOGRAM 0.0 - 0.9 MINS			
123	A5	GAME TIME HISTOGRAM 1.0 - 1.9 MINS			
124	A5	GAME TIME HISTOGRAM 2.0 - 2.9 MINS			
125	A5	GAME TIME HISTOGRAM 3.0 - 3.9 MINS			
126	A5	GAME TIME HISTOGRAM 4.0 - 4.9 MINS			
127	A5	GAME TIME HISTOGRAM 5.0 - 5.9 MINS			
128	A5	GAME TIME HISTOGRAM 6.0 - 6.9 MINS			
129	A5	GAME TIME HISTOGRAM 7.0 - 7.9 MINS			
130	A5	GAME TIME HISTOGRAM 8.0 - 8.9 MINS			
131	A5	GAME TIME HISTOGRAM 9.0 - 9.9 MINS			
132	A5	GAME TIME HISTOGRAM 10 - 11 MINS			
133	A5	GAME TIME HISTOGRAM 11 - 12 MINS			
134	A5	GAME TIME HISTOGRAM 12 - MINS			
		A6: SCORE HISTOGRAM			
135	A6	SCORE HISTOGRAM 0 - 19 MILLION			
136	A6	SCORE HISTOGRAM 20 - 39 MILLION			
137	A6	SCORE HISTOGRAM 40 - 59 MILLION			
138	A6	SCORE HISTOGRAM 60 - 79 MILLION			
139	A6	SCORE HISTOGRAM 80 - 99 MILLION			
140	A6	SCORE HISTOGRAM 100 - 119 MILLION			
141	A6	SCORE HISTOGRAM 120 - 139 MILLION			
142	A6	SCORE HISTOGRAM 140 - 159 MILLION			
143	A6	SCORE HISTOGRAM 160 - 179 MILLION			
144	A6	SCORE HISTOGRAM 180 - 199 MILLION			
145	A6	SCORE HISTOGRAM 200 - 219 MILLION			
146	A6	SCORE HISTOGRAM 220 - 239 MILLION			
147	A6	SCORE HISTOGRAM 240 - 259 MILLION			
148	A6	SCORE HISTOGRAM 260 - 279 MILLION			
149	A6	SCORE HISTOGRAM 280 - 299 MILLION			
150	A6	SCORE HISTOGRAM 300 - 319 MILLION			
151	A6	SCORE HISTOGRAM 320 - 339 MILLION			
152	A6	SCORE HISTOGRAM 340 - 359 MILLION			
153	A6	SCORE HISTOGRAM 360 - 379 MILLION			
154	A6	SCORE HISTOGRAM 380 - 399 MILLION			
155	A6	SCORE HISTOGRAM 400 - 419 MILLION			
156	A6	SCORE HISTOGRAM 420 - 439 MILLION			
157	A6	SCORE HISTOGRAM 440 - 459 MILLION			
158	A6	SCORE HISTOGRAM 460 - 479 MILLION			
159	A6	SCORE HISTOGRAM 480 - 499 MILLION			
160	A6	SCORE HISTOGRAM 500 - MILLION			
		A7:BALL TIME HISTOGRAM			
161	A7	BALL TIME HISTOGRAM 0 - 9 SECS			
162	A7	BALL TIME HISTOGRAM 10 - 19 SECS			
163	A7	BALL TIME HISTOGRAM 20 - 29 SECS			
164	A7	BALL TIME HISTOGRAM 30 - 39 SECS			
165	A7	BALL TIME HISTOGRAM 40 - 49 SECS			
166	A7	BALL TIME HISTOGRAM 50 - 59 SECS			
167	A7	BALL TIME HISTOGRAM 60 - 69 SECS			
168	A7	BALL TIME HISTOGRAM 70 - 79 SECS			
169	A7	BALL TIME HISTOGRAM 80 - 89 SECS			
170	A7	BALL TIME HISTOGRAM 90 - 99 SECS			
171	A7	BALL TIME HISTOGRAM 100 - 109 SECS			
172	A7	BALL TIME HISTOGRAM 110 - 119 SECS			
173	A7	BALL TIME HISTOGRAM 120 - 129 SECS			
174	A7	BALL TIME HISTOGRAM 130 - 139 SECS			
175	A7	BALL TIME HISTOGRAM 140 - 149 SECS			
176	A7	BALL TIME HISTOGRAM 150 - 159 SECS			
177	A7	BALL TIME HISTOGRAM 160 - 169 SECS			
178	A7	BALL TIME HISTOGRAM 170 - 179 SECS			
179	A7	BALL TIME HISTOGRAM 180 - 189 SECS			
180	A7	BALL TIME HISTOGRAM 190 - 199 SECS			
181	A7	BALL TIME HISTOGRAM 200 - 209 SECS			
182	A7	BALL TIME HISTOGRAM 210 - SECS			

B. ADJUSTMENTS

B1: STANDARD ADJUSTMENTS

AUDIT REF.	AUDIT NAME	RANGE	FACTORY SETTING	DESCRIPTION
B1-01	BALLS PER GAME	1 - 10 BALLS	3 BALLS	THE NUMBER OF BALLS GIVEN IN A GAME.
B1-02	TILT WARNINGS	0 - 10	2	THE NUMBER OF TIMES THE GAME CAN "TILT" BEFORE ENDING THE CURRENT BALL IN PLAY.
B1-03	ATTRACT MODE SOUNDS	YES, NO	YES	SELECT WHETHER SOUNDS & MUSIC ARE PLAYED DURING ATTRACT MODE.
B1-04+	ALLOW REPLAY	YES, NO	YES	SELECT WHETHER REPLAY CREDITS ARE AWARDED. IF ***YES*** IS SELECTED, ADDITIONAL REPLAY ADJUSTMENTS CAN BE SET (SEE B1-04A,B,C,D).
B1-04A	REPLAY PERCENT	5 - 50 %	10%	THE "IDEAL" PERCENTAGE OF GAMES THAT RECEIVE A REPLAY. THIS VALUE IS THEN USED TO SUGGEST ACTUAL REPLAY SCORE VALUES ONCE A HISTORY OF GAME SCORES IS ACCUMULATED.
B1-04B	REPLAY START SCORE	0 - 4,000,000,000	100,000,000	THE INITIAL SCORE AT WHICH A REPLAY CREDIT IS AWARDED.
B1-04C	REPLAY MINIMUM	0 - 4,000,000,000	70,000,000	THE MINIMUM SCORE, DURING A REPLAY CREDIT GAME, THAT MUST BE ACCOMPLISHED BEFORE AN ADDITIONAL REPLAY CREDIT IS AWARDED.
B1-04D	REPLAY BUMP	0 - 4,000,000,000	10,000,000	THE AMOUNT BY WHICH THE REPLAY START SCORE IS INCREASED AFTER A REPLAY CREDIT IS AWARDED.
B1-05+	ALLOW HSTD	YES, NO	YES	SELECT WHETHER THE HIGH SCORE TO DATE FEATURE IS ENABLED. IF ***YES*** IS SELECTED, ADDITIONAL HSTD ADJUSTMENTS CAN BE SET (SEE B1-05A,B,C,D).
B1-05A	HSTD FIRST SCORE	0 - 42,999,000,000	500,000,000	THE HIGHEST SCORE WRITTEN TO THE HSTD TABLE **AFTER** THE TABLE IS CLEARED BY THE RESET FUNCTION (D4). THE GAME WILL AUTOMATICALLY GENERATE SCORES BETWEEN THE *HSTD FIRST SCORE* AND THE *HSTD LAST SCORE* TO FILL-IN MIDDLE ENTRIES IN THE TABLE.
B1-05B	HSTD LAST SCORE	0 - 42,999,000,000	250,000,000	THE LOWEST SCORE WRITTEN TO THE HSTD TABLE **AFTER** THE TABLE IS CLEARED BY THE RESET FUNCTION (D4). THE GAME WILL AUTOMATICALLY GENERATE SCORES BETWEEN THE *HSTD FIRST SCORE* AND THE *HSTD LAST SCORE* TO FILL-IN MIDDLE ENTRIES IN THE TABLE.
B1-05C	CREDITS FOR GRAND CHAMP	0 - 99 CREDITS	3 CREDITS	THE NUMBER OF CREDITS AWARDED FOR EXCEEDING THE *GRAND CHAMP.*
B1-05D	CREDITS FOR #1-4 SCORES	0 - 99 CREDITS	1 CREDIT	THE NUMBER OF CREDITS AWARDED FOR EXCEEDING THE #1 -#4 HIGH SCORES.
B1-06	MATCH PERCENT	0 - 95%	8%	THE PERCENTAGE OF GAMES THAT AWARD A MATCH CREDIT AT THE END OF THE GAME
B1-07	REPLAY AWARD	CREDIT, EXTRA BALL, POINTS	CREDIT	THE TYPE OF AWARD ISSUED WHEN A *REPLAY* IS EARNED BY THE PLAYER.
B1-08	EXTRA BALL AWARD	EXTRA BALL, POINTS	EXTRA BALL	THE TYPE OF AWARD ISSUED WHEN AN *EXTRA BALL* IS EARNED BY THE PLAYER.
B1-09	SET GAME LOCATION	0 - 99,999	0	A TRACKING NUMBER, AVAILABLE TO OPERATORS , TO INDICATE THE PHYSICAL LOCATION OF A GAME.
B1-10	FREE PLAY	YES, NO	NO	ENABLES / DISABLES *FREE PLAY* MODE. ALSO CONTROLS THE MAIN MENU SETTINGS FOR *PAY-TO- PLAY* AND *FREE PLAY*
B1-11	PLAY MODE	NORMAL, TOURNAMENT	NORMAL	SELECT *NORMAL* OR *TOURNAMENT* MODE. *TOURNAMENT* MODE EQUALIZES THE SCORING OF CERTAIN FEATURES AMONGST PLAYERS IN MULTI-PLAYER GAMES.

AUDIT REF.	AUDIT NAME	RANGE	FACTORY SETTING	DESCRIPTION
B1-12	SOL.(ENOID) VOLTAGE PERCENT	0 - 90%	10%	SELECT THE PERCENTAGE OF SOLENOID VOLTAGE REGULATION (FOR DISPLAY PURPOSES ONLY). **DOES NOT** ACTIVELY REGULATE THE GAMES' SOLENOIDS.
B1-13	SHOW MESSAGE OF THE DAY	NO, YES, VIEW/EDIT	NO	SELECT A MESSAGE FOR DISPLAY DURING ATTRACT MODE. THIS MESSAGE MAY BE CUSTOMIZED BY CHOOSING *VIEW/EDIT*.

NOTE: Further instructions and graphics for the *Message of the Day* will be released at a later date.

B1-14	FLIPPER STRENGTH	1 - 16	12	SELECT RELATIVE STRENGTH OF FLIPPER COILS. A SETTING OF *12* REPRESENTS 3/4 STRENGTH (12/16). MAY BE USED TO ADJUST THE AMOUNT OF BALL TRAVEL WHEN PLAYFIELD PITCH IS CHANGED.

B2: GAME ADJUSTMENTS

AUDIT REF.	AUDIT NAME	RANGE	FACTORY SETTING	DESCRIPTION
B2-01	GAME DIFFICULTY	EXTRA EASY, EASY, NORMAL, HARD, EXTRA HARD	NORMAL	SETS THE OVERALL DIFFICULTY OF THE GAME. THIS OPTION WILL ALSO CHANGE THE SETTINGS FOR B2-02,03,04
B2-02	BALL SAVER TIME	0-15 SECONDS	7 SECONDS	SETS A GRACE PERIOD FOR "QUICK DRAIN" BALLS. ANY BALL "LOST" BEFORE THE TIMER EXPIRES WILL BE RETURNED TO THE PLAYER.
B2-03	LOCK DIFFICULTY	EXTRA EASY, EASY, NORMAL, HARD, EXTRA HARD	NORMAL	SETS THE LEVEL OF GAME DIFFICULTY FOR THE RELEASE OF BALLS FROM THE *LOCKED TRUNK* FEATURE.
B2-04	CAPTIVE BALL DIFF	EXTRA EASY, EASY, NORMAL, HARD, EXTRA HARD	NORMAL	SETS THE LEVEL OF GAME DIFFICULTY FOR THE RELEASE OF BALLS FROM THE *CAPTIVE BALL* FEATURE.
B2-05	SAVE DIFFICULTY	EASY, NORMAL, HARD	NORMAL	SETS ADJUSTMENT FOR "MIRACULOUS SAVE" FEATURE
B2-06+	STAGE KICKOUT	AUTOMATIC, MANUAL OVERRIDE	AUTOMATIC	SETS THE "MAGIC STAGE" COIL TIMING REQUIREMENTS. IF ***MANUAL OVERRIDE*** IS SELECTED, FURTHER ADJUSTMENTS TO THE STAGE COIL CAN BE SET (SEE B2-06A,06B,06C.
B2-06A	STAGE PULL	1 - 20 MILLISECONDS	10 MILLISECONDS	SETS THE PULL-IN TIME OF COIL
B2-06B	STAGE HOLD	200 1000 MILLISECONDS	700 MILLISECONDS	SETS THE HOLD-IN TIME OF COIL
B2-06C	STAGE PULSE	1 - 16	2	SETS THE PULSE DUTY CYCLE (IN SIXTEENTHS).
B2-07	STAGE DELAY -UP	0 - 400 MILLISECONDS	265 MILLISECONDS	SETS THE AMOUNT OF UPWARD TRAVEL (*OVERSHOOT) OF THE STAGE ELEVATOR.
B2-08	STAGE DELAY-DOWN	0 - 400 MILLISECONDS	0 MILLISECONDS	SETS THE AMOUNT OF DOWNWARD TRAVEL (*OVERSHOOT) OF THE STAGE ELEVATOR.
B2-09	WAND DELAY-CRITIC	0 -400 MILLISECONDS	90 MILLISECONDS	SETS THE END OF TRAVEL (*OVERSHOOT) FOR THE WAND ASSEMBLY OVER THE *CRITICS TRIANGLE*.
B2-10	WAND DELAY-LOCK	0 -400 MILLISECONDS	50 MILLISECONDS	SETS THE END OF TRAVEL (*OVERSHOOT) FOR THE WAND ASSEMBLY OVER THE *LOCKED TRUNK* ENTRY RAMP.

*OVERSHOOT: THE AMOUNT OF ADDITIONAL TRAVEL OF THE MECHANISM *AFTER* SWITCH ACTIVATION.

B3: LOCALE ADJUSTMENTS

AUDIT REF.	AUDIT NAME	RANGE	FACTORY SETTING	DESCRIPTION
B3-01	COUNTRY	**UNITED STATES**, *FRANCE, GERMANY, SPAIN, MEXICO, CANADA (ENGLISH) , CANADA (FRENCH), SWITZERLAND (GERMAN), SWITZERLAND (FRENCH), SWITZERLAND (ITALIAN) ITALY, UNITED KINGDOM, NETHERLANDS*	UNITED STATES	SETS THE COUNTRY LOCATION OF THE GAME. THIS SETTING CONTROLS NUMBERS, TIMES, DATES, AND MONETARY VALUES SHOWN ON THE DOT MATRIX DISPLAY. THIS OPTION WILL ALSO CHANGE THE SETTINGS FOR B3-02 AND B3-03.
B3-02	TEXT LANGUAGE	**ENGLISH**, *FRENCH, GERMAN, SPANISH, ITALIAN, DUTCH*	ENGLISH	SETS THE LANGUAGE USED FOR TEXT SHOWN ON THE DOT MATRIX DISPLAY.
B3-03	SPEECH LANGUAGE	**ENGLISH**, *FRENCH, GERMAN, SPANISH, ITALIAN, DUTCH*	ENGLISH	SETS THE LANGUAGE USED FOR SOUND EFFECTS.
		NOTE: ONLY THE COUNTRIES/LANGUAGES IN **BOLD** ARE CURRENTLY IMPLEMENTED.		

B4: COINAGE ADJUSTMENTS

AUDIT REF.	AUDIT NAME	RANGE	FACTORY SETTING	DESCRIPTION
B4-01	CONFIGURE COINAGE TO	1/2 3/4 GAMES/COINS 1/2 2/3 3/4 1/2 2/4 3/6 5/8 USA, 50c, 5/$2.00 USA, 50c, 2/75c 3/$1.00 FR, 1/3 2/5 5/10 11/20 FRANCE, 1/5 3/10 7/20 FR, 1/3 2/5 4/10 9/20 FRANCE, 1/3 2/5 5/10 FRANCE, 1/6 2/10 5/20 GERMAN 1/2 2/3 3/4 5/5 GERMAN 1/4 2/6 3/8 5/10 SPAIN, 1/100 6/500 U. K., 1/50p 3/L1 SWISS, 1/1 2/2 6/5 CUSTOM PRICING 1 GAME / 1 COIN 1 GAME / 2 COINS 1 GAME / 3 COINS 2 GAMES / 1 COIN 1/1 3/2 GAMES/COINS	1/2 3/4 GAMES/COINS	SETS THE RATIO OF NUMBER OF COINS TO THE NUMBER OF CREDITS. SELECT THE ***CUSTOM PRICING*** FEATURE AND CHOOSE UP TO FOUR SEPARATE COIN/CREDIT CONFIGURATIONS.

AUDIT REF.	AUDIT NAME	RANGE	FACTORY SETTING	DESCRIPTION
B4-02+	COIN DOOR TYPE	ALL CHUTE UNITS 1 COIN	ALL CHUTE UNITS 1 COIN	SETS THE COIN DOOR TYPE AND THE COIN UNITS FOR EACH CHUTE. SELECT ***CUSTOM*** FOR INDIVIDUAL DOOR TYPE CONFIGURATIONS AND CHUTE UNITS (SEE B4-02A THRU B4-02I).
		USA 25-25		
		USA 25 W/MULTIPULSE DBV		
		FRANCE ELEC1-5-10-20		
		FRANCE MECH 5-10		
		GERMANY ELEC 1-2-5		
		GERMANY MECH 1-2-5		
		UK ELEC L1-50-20-10		
		ITALY MECH 500-500		
		N.Z. MECH 1-2		
		SPAIN MECH 100-500		
		JAPAN MECH 100-100		
		JAPAN MECH 100		
		PORT MECH 100-200		
		GREECE MECH 50-100		
		HUNGARY MECH 20-20		
		AUSTRIA MECH 5-10-10		
		AUSTRIA MECH 5-10		
		KOREA MECH 100-100		
		HONG KONG MECH 1-2		
		SWISS MECH 1-2-5		
		SWISS MECH 1-5		
		HOLLAND MECH 1-1		
		HOLLAND MECH 1-2, 5-5		
		CANADA MECH .25-1		
		CANADA MECH .25-.25-1		
		NORWAY MECH 5-10		
		NORWAY MECH 10-5-20		
		NORWAY ELEC 5-10-20		
		DENMARK ELEC 1-5-10-20		
		AUSTRALIA MECH .20-1		
		AUSTRALIA MECH 1-2		
		AUSTRALIA ELEC .20-1-2		
		FINLAND ELEC 1-5		
		FINLAND ELEC 5-1		
		BELGIUM MECH 20-20		
		BELGIUM ELEC 5-20-50		
		SWEDEN ELEC 1-5-10		
		SINGAPORE MECH 1-1		
		CUSTOM		
B4-02A	1ST COIN CHUTE UNITS	0 - 65,535	0	THE NUMBER OF COIN UNITS USED FOR THE IST CHUTE.
B4-02B	2ND COIN CHUTE UNITS	0 - 65,535	0	THE NUMBER OF COIN UNITS USED FOR THE 2ND CHUTE.
B4-02C	3RD COIN CHUTE UNITS	0 - 65,535	0	THE NUMBER OF COIN UNITS USED FOR THE 3RD CHUTE.
B4-02D	4TH COIN CHUTE UNITS	0 - 65,535	0	THE NUMBER OF COIN UNITS USED FOR THE 4TH CHUTE.
B4-02E	CHUTE 1 TYPE	MECHANICAL, ELECTRICAL	MECHANICAL	SELECT THE CHUTE TYPE.
B4-02F	CHUTE 2 TYPE	MECHANICAL, ELECTRICAL	MECHANICAL	SELECT THE CHUTE TYPE
B4-02G	CHUTE 3 TYPE	MECHANICAL, ELECTRICAL	MECHANICAL	SELECT THE CHUTE TYPE
B4-02H	CHUTE 4 TYPE	MECHANICAL, ELECTRICAL	MECHANICAL	SELECT THE CHUTE TYPE
B4-02I	COIN METER UNITS	0 - 65,535	1	SELECT THE NUMBER OF COIN CHUTE UNITS THAT ARE **EQUIVALENT TO** ONE PULSE OF THE *SOFTWARE-CONTROLLED COIN METER #5.

*NOTE: SOFT COIN METER #5 IS CURRENTLY NOT IMPLEMENTED IN HARDWARE.

NOTE: Further instructions and graphics for the *Custom* configuration will be released at a later date.

B5 : PASSWORD

AUDIT REF.	AUDIT NAME	RANGE	FACTORY SETTING	DESCRIPTION
B5-01+	PASSWORD	OFF, ON, CHANGE	OFF	SETS THE PASSWORD USED BY THE OPERATOR. SELECT ***CHANGE*** FOR A NEW OR REVISED PASSWORD; SELECT ***ON*** TO SET ADDITIONAL PASSWORD PROTECTION (SEE B5-01A,B). **CAUTION:** IF THE PASSWORD HAS BEEN SET **ON** AND CAN'T BE REMEMBERED BY THE OPERATOR, THE GAME MUST BE FACTORY RESET (SEE D7: FACTORY RESET). THIS ACTION DESTROYS ANY PREVIOUS AUDIT INFORMATION AND OPERATOR ADJUSTMENTS TO THE GAME.
B5-01A	HIDE EARNINGS	YES, NO	NO	ALLOW EARNINGS INFO (AUDITS MENU) TO APPEAR/NOT APPEAR ON THE DOT MATRIX DISPLAY.
B5-01B	PROTECT ADJUSTMENTS	YES, NO	NO	SELECT ***YES*** TO PROTECT OPERATOR-SET ADJUSTMENTS FROM RESET (D8:FACTORY RESET).

NOTE: Further instructions and graphics for the *Password* will be released at a later date.

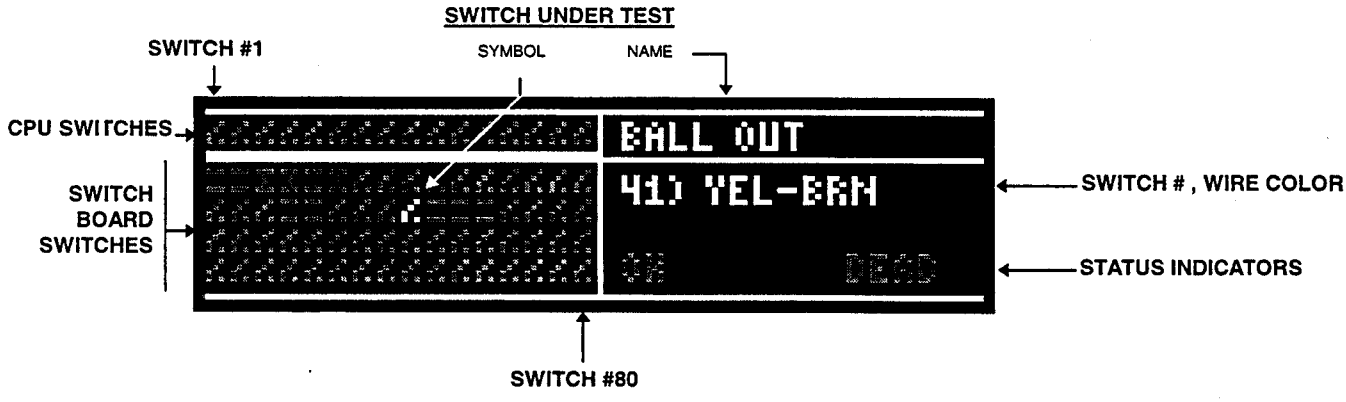
B6 : ERRORS/INFO

AUDIT REF.	AUDIT NAME	RANGE	FACTORY SETTING	DESCRIPTION
B6-01	SWITCH ERRORS	REPORT ALL, DISABLE MOMENTARIES, DISABLE ALL	REPORT ALL	SETS THE OPTION TO DISPLAY OR HIDE ERROR MESSAGES ON-THE SCREEN DISPLAY.
B6-02	SWITCH INFO MSG	REPORT ALL, DISABLE MOMENTARIES, DISABLE ALL	REPORT ALL	SETS THE OPTION TO DISPLAY OR HIDE *INFO* MESSAGES ON-THE SCREEN DISPLAY.
B6-03	SOLENOID ERRORS	REPORT ALL, DISABLE MOMENTARIES, DISABLE ALL	REPORT ALL	SETS THE OPTION TO DISPLAY OR HIDE *ERROR* MESSAGES ON-THE SCREEN DISPLAY.
B6-04	SOLENOID INFO MSG	REPORT ALL, DISABLE MOMENTARIES, DISABLE ALL	REPORT ALL	SETS THE OPTION TO DISPLAY OR HIDE *INFO* MESSAGES ON-THE SCREEN DISPLAY.
B6-05	LAMP ERRORS	REPORT ALL, DISABLE MOMENTARIES, DISABLE ALL	REPORT ALL	SETS THE OPTION TO DISPLAY OR HIDE *ERROR* MESSAGES ON-THE SCREEN DISPLAY.
B6-06	LAMP INFO MSG	REPORT ALL, DISABLE MOMENTARIES, DISABLE ALL	REPORT ALL	SETS THE OPTION TO DISPLAY OR HIDE *INFO* MESSAGES ON THE SCREEN DISPLAY.

C. DIAGNOSTICS

C1: STANDARD TESTS

C1- 01 : SWITCH TEST

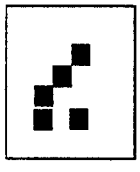


The Switch Test displays a graphical representation of the switch matrix, indicating which switches are seen as open and which are seen as closed. Also shown is information about the switch under test (name, number, wire color, and status indicators). The status indicators, when highlighted, show:

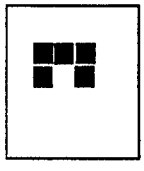
NRM - Normal operation; no problems are detected;

DEAD Indicates when a switch has not been activated in past games.

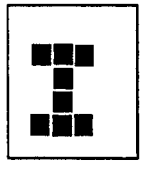
The Switch icons are:



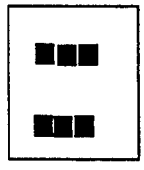
OPEN SWITCH



CLOSED SWITCH



OPTO WITH VERTICAL BEAM OFLIGHT

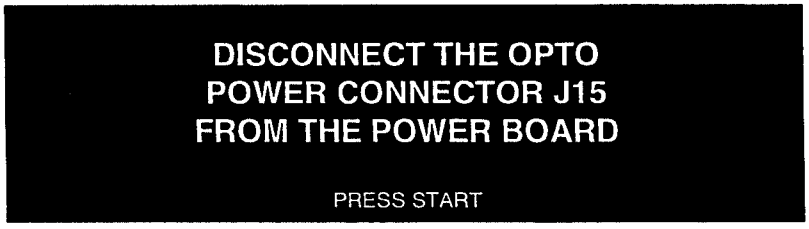


OPTO WITHOUT BEAM OF LIGHT (BLOCKED OPTO)

NOTE: If a status indicator is blinking, it is indicative of a problem area.

C1- 02 : OPTO TEST

The Opto Test is used to verify opto operation by blinking the controlled lamps and flashers. The dot matrix display screen is similar to the Switch Test (C1-01) above, however, when selected, the following screen appears:



Open the backbox and remove connector J15 from the Power Board. Then, when verifying each opto, check that the opto icon does NOT have a vertical line (representing a "triggered" receiver condition). In this case, make sure that all balls are secure in a ball holding device (since infrared light can be reflected off the game ball) and re-test. If the opto continues to fail this test, repair/replace as required.

NOTE: Reconnect J15 at the Power Board after completing this test.

C1- 03 : SOLENOID TEST

The Solenoid Test will test solenoids, motors, and flashers on the game. The screen displays information on the name of the device, a representative icon for the device, wire colors, driver board connector & pin number, power board wire color, and status indicators (NRM, OFF). For each test, the device will be energized and the icon will pulse.

The status indicators, when highlighted, represent the following conditions:

NRM	Normal operation; no problems are detected;
OFF	A short circuit is detected. The device may be in a cooling-down period and will automatically enable itself after reaching the proper operating temperature;
OFF?	Momentary short circuit (e.g. at some point the device had been detected as shorted, although it may be fine now). This is a good way to detect intermittent problems.

Use the flippers to cycle from solenoid to solenoid. Press both flippers to exit the Solenoid Test.

NOTE: If an indicator is blinking, there is a software-detected problem with this device.

ADDITIONAL NOTE: Graphics for the *Solenoid Test* will be released at a later date.

C1- 04 : LAMP TEST

The Lamp Test will start all game lamps flashing. The flippers can then be used to get detailed information about any individual lamp. This information includes the lamp name and number, row and column information from the lamp matrix, its' wire colors, and an icon indicating whether the lamp is active.

The lamp's indicators report:

NRM = If BRIGHT, no electrical problems have been detected.

CONN = If this indicator is BRIGHT, an electrical connection is detected. If this indictor is dim, there is a break in the wiring to the lamp.

CONN? = At some point the device had been detected as not connected, although it may be fine now. This is a good way to find intermittent problems.

ROW.OFF = A row driver is disabled from a ROW or BULB short circuit -- The device was shorted and is now inactive (may be in a 15 second cool-down period).

ROW.OFF? =Indicates a momentary row short. At some point the device had been detected as shorted, although it may be fine now. This is a good way to find intermittent problems.

COLUMN = A column driver can be overheated and thermally shutdown, most likley from a column short-to-ground or an entire column without lamps (i.e. loose or disconnected column wire at the driver board or burned-out lamps).

COLUMN? = Indicates a momentary column problem. At some point the device had a column problem, although it may be fine now. This is a good way to find intermittent problems.

NOTE: If an indicator is blinking, this is the the problem area. Use the flippers to cycle from lamp to lamp. Press both flippers to exit the Lamp Test.

ADDITIONAL NOTES ON LAMP INDICATORS:

CONN: A bright indicator shows that at least 1 bulb is connected and is lit. For 2 bulbs at a single location, both bulbs must be burned-out (or disconnected) before this indicator is made bright.

SERVICE TIP : Fix column problems *BEFORE* using this indicator to troubleshoot bulb problems.

ROW.OFF: A bright indicator reflects the drive is cooling from an unknown voltage short on the row side of a column/row matrix OR a short across the bulb. The "?"after this indicator helps to isolate either a bulb short or a row short. If all or multiple "?" are on the same row of the same matrix, then this would tend to indicate a row-short-to-power supply. **Row-shorts-to-ground are not detectable** (the only symptom is that all the bulbs in a particular row are extremely bright). If there is only one "?" in a row, then most likely a short exists at the bulb, socket, or terminals.

COLUMN: A bright indicator usuallly reflects a thermally-shutdown column driver caused by a short-to-ground condition, all lamps in the column are burned-out, or a loose/broken column wire. A column shorted to a power source (i.e. any 50 volt supply) usually just burns-out all the bulbs in the column or blows a fuse.

WARNING: TO AVOID RISK OF PERSONAL INJURY, DO NOT TOUCH A COLUMN DRIVER DURING A THERMAL SHUTDOWN.

C1- 05 : DISPLAY TEST

The Display Test can assist the operator in checking the dot matrix display for proper illumination of individual pixel elements. It has six continous test modes that move across the display:

1) A light diagonal bar illuminated against a dark background;
2) A light vertical bar illuminated against a dark background;
3) A light horizontal bar illuminated against a dark background;
4) A dark vertical bar illuminated against a light background;
5) A dark horizontal bar illuminated against a light background;
6) An intensity checker.

In the first five modes, use the flipper buttons to move the bar across the display. If you hold either flipper button "in" continuously, you will notice that the the bar will run off the screen and the display will show the next (or previous) mode. The start button can be used at any time to change the intensity of the bar from normal to medium, dim, and off..

will show the next (or previous) mode. The start button can be used at any time to change the intensity of the bar from normal to medium, dim, and off..

The sixth mode will light every pixel to full intensity. Pressing the flipper button will change the intensity to medium, dim, and off. After the sixth mode, the test cycles back to the first mode.

Press both flippers to exit the Display Test.

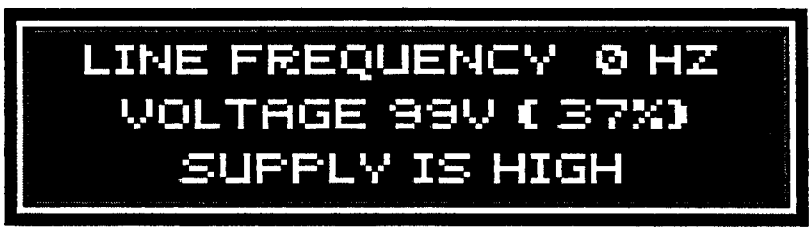
C1- 06 : SOUND BOARD RESET

The Sound Board Test resets the sound board and causes it to report its powerup status. Press the start button to restart the test.

C1- 07 : SOUND BOARD MUSIC TEST

The Sound Board Music Test plays several samples of music which fully tests the capabilities of the sound board hardware. The selection of the tune and its' volume level can be changed by the use of the flippers and start button.

C1- 08 : SOL(ENOID) VOLTAGE



This test will measure and display signal strength from the power board (connector J3) to the CPU board (connector J2). The zero cross detection circuit should report the correct non-zero line frequency

(top line of display) for this location . The second line of the display reports the flipper's 50 Volt A/D converter voltage to within ±2 volts along with the current percent tolerance.

CAUTION: If any of the following conditions exist, the message **"CHECK 50V INTERLOCK SW."** will be displayed:

1) the 50V coin door interlock switch is "off" (the stem is pushed-in instead of "out");
2) the 50V fuse (F6) on the Power Board is blown;
3) the connection from the Power Board to the CPU is disconnected;
4) a power circuit or cabling is not operating properly.

Since the solenoid voltage is unregulated and unloaded at the time of this particular test, this measurement is an excelent indicator of the actual line voltage. The bottom line can display:

"SUPPLY WITHIN 10%" (10% is user-selected in Adjustment B1-12)
"SUPPLY IS HIGH"
"SUPPLY IS LOW"

The normal range of tolerance for the line voltage (not solenoid voltage) is -15% to +10%, for example, 120VAC can measure between 102VAC to 132VAC. The solenoid voltage is dependent upon the line voltage, and the transformer "taps" convert certain line voltages to a nominal non-loaded solenoid voltage of about 76 Volts. If your game is not within the 10% range, you might consider re-tapping the transformer to a high-line or low-line tap (depending if your solenoid voltage is high or low). The extra "cushion" of 5% (for the -15% tolerance) is highly recommended for temporary low-line conditions.

C1- 09 : BURN-IN TEST

The Burn-In Test energizes all of the machine hardware in a sequenced pattern. All the solenoids are fired, motors run, and lamps flashed. The dot matrix display and sound system are also activated as well. This test is primarily intended for factory use to assure that all electronic and mechanical features are operating when the game leaves the factory.

To end the Burn-In test, press both flipper buttons at any time. Also, see Audit A3-30 for the total cumulative time that Burn-In Tests have been run on the game.

C2: FEATURE TESTS

C2- 01 : CLEAR OUT BALLS
C2- 02 : HIDDEN BALL TEST
C2- 03 : FLOATING BALL
C2- 04 : MAGIC WAND

NOTE: Notes and graphics for the *FEATURE TESTS* will be released at a later date.

C3: TROUBLESHOOTING

The Troubleshooting diagnostic is a shortcut tool to get to the games' troublespots as quickly and conveniently as possible. This diagnostic scans all the switches, solenoids, and lamps for problems and presents a summary of what was found. Use the flipper buttons to automatically step to the appropriate test for each error condition. The tests used (switch, lamp and solenoid) are described in Section C1, Standard Tests.

NOTE: The troubleshooting diagnostic continously gathers and updates information, in real time, about switches, lamps and solenoids. A sound is made when any of this information changes. This allows the operator to make repairs or find loose connections in the game and check his/her results by viewing the display.

There are two catagories of troubleshooting, Errors and Information. Generally, Errors are considered important to game play and should be fixed at the earliest opportunity; Infomation mesages (for example, a lamp behind the backglass is burned-out) are considered less critical and can be serviced as part of a routine maintainence schedule. Errors and Information messages can also be selectively disabled from viewing by Adjustment B6, Errors/Info. Additionally, all Errors and Information messages can be cleared by the reset function D5,Clear Errors/Info.

NOTE: Refer to the previous individual tests (C1-01 to C1-04) for information on indicator status and troubleshooting tips.

ADDITIONAL NOTE: Individual momentaries for a lamp, switch, or solenoid are always "forgotten" when you leave this test.

D. RESET FUNCTIONS

D1: CLEAR COLLECTIONS

This function clears all Collection Audits (A1) and moves all Histories down one level in the collections history log (Example: Current audits become History 1 audits, History 1 audits become Histor 2 audits, etc.).

D2: CLEAR AUDITS

This action clears all other audits, from A2:Earnings Audits to A7:Ball Time Histogram.

D3: CLEAR CREDITS

Reset the Credits counter to zero.

D4: CLEAR HIGH SCORE TO DATE (HSTD)

Used to reset the game's HSTD table based on the settings in Adjustments B1-05A: HSTD High Score and B1-05B: HSTD Last Score.

D5: CLEAR ERRORS/INFO

Clears all troubleshooting errors and info. Always use this after repair or replacement of PCB boards.

D6: CLEAR ADJUSTMENTS

Returns all B: Adjustments(6) to their factory-set defaults (A:Audits are not affected by this function).

D7: RESET REPLAY

Resets the replay score to meet the target replay percentage (see Adjustment B1-04A:Replay Percent).

D8: FACTORY REPLAY

Clears ALL audits and adjustments information and returns the game to the original factory default settings. The operator is prompted to select a country for which the locale, language, and coin door adjustments are set (default country is the *United States*, Adjustment B3-01)

E. REPORTS

SPECIAL NOTE: At the time of this publication, the printer capability of your game is not supported by hardware (interface board). Please contact your local CAPCOM® distributor for information regarding the availability of a printer retrofit kit for this game.

THEORY OF OPERATION

The Reports utility permits the operator the ability to "dump" all *Audits* and *Adjustments* data to a serial communications device, such as a printer or a laptop computer. The operator must configure the device (through this menu) for the mode of operation, communications protocol, and customization features of the report. For example, if the operator has elected to use the "Hot Plug" mode for his/her printer, the printer cable connector can then be installed to the the serial port of the interface PCB. The system will then automatically detect the presence of the printer when the coin door is opened. The report will then start printing automatically. The progress of the print job will be shown in the dot matrix display, along with any error messages. Once the print job is complete, the system will prompt the operator to remove the printer cable and resume normal operation of the menu system.

E1: Custom Report

The Collections Report is an operator-defined report which will be generated according to the settings defined in E2: Collections Report Setup utility. The operator has the option of generating this report automatically via the "Hot Plug" method, described above, or manually selecting the Printer section through the menu system. If the automatic feature is used, it is possible to also clear the current collection audits info as well as reset replay awards after the print job is finished (see E2:Collection Report Setup, items 02A and 02B).

E2 Custom Report Setup

This utility is used to configure the Custom Report. The printer will default to all factory settings or the user can customize the report according to the following chart:

REF.	NAME	RANGE	FACTORY SETTING	DESCRIPTION
E2-01	REPORT GENERATION	MANUAL, AUTOMATIC ("HOT PLUG")	AUTOMATIC	SELECT THE MODE OF OPERATION
E2-02	CURRENT AUDITS	NO,YES	YES	SELECT WHETHER CURRENT AUDITS (AA:01 THROUGH AA:07) SHOULD BE PRINTED ON REPORT
E2-03	RESET REPLAY	NO, LEAVE REPLAY YES, WHILE PRINTING	YES, WHILE PRINTING	SELECT WHETHER REPLAY AWARDS SHOULD BE RESET AFTER AUTOMATIC PRINT JOB IS COMPLETE

REF.	NAME	RANGE	FACTORY SETTING	DESCRIPTION
E2-04+	COLLECTION AUDITS	NO,YES	YES	SELECT WHETHER COLLECTION AUDITS SHOULD APPEAR ON THE REPORT. IF **YES**, COLLECTION AUDITS ARE SELECTED INDIVIDUALLY (E2-04A - E2-04D) FOR THE REPORT
E2-04A	CURRENT AUDITS	NO,YES	YES	SELECT WHETHER *CURRENT AUDITS* SHOULD APPEAR ON THE REPORT
E2-04B	AUDIT HISTORY 1	NO,YES	NO	SELECT WHETHER *AUDIT HISTORY 1* SHOULD APPEAR ON THE REPORT
E2-04C	AUDIT HISTORY 2	NO,YES	NO	SELECT WHETHER *AUDIT HISTORY 2* SHOULD APPEAR ON THE REPORT
E2-04D	AUDIT HISTORY 3	NO,YES	NO	SELECT WHETHER *AUDIT HISTORY 3* SHOULD APPEAR ON THE REPORT
E2-05	EARNINGS AUDITS	NO,YES	YES	SELECT WHETHER *EARNINGS AUDITS* SHOULD APPEAR ON THE REPORT
E2-06	STANDARD AUDITS	NO,YES	YES	SPECIFY WHETHER *STANDARD AUDITS* SHOULD APPEAR ON THE REPORT.
E2-07	FEATURE AUDITS	NO,YES	YES	SELECT WHETHER *FEATURE AUDITS* SHOULD APPEAR ON THE REPORT
E2-08	STANDARD ADJUSTMENTS	NO,YES	NO	SELECT WHETHER *STANDARD ADJUSTMENTS* SHOULD APPEAR ON THE REPORT
E2-09	GAME ADJUSTMENTS	NO,YES	NO	SELECT WHETHER *GAME ADJUSTMENTS* SHOULD APPEAR ON THE REPORT
E2-10	LOCALE ADJUSTMENTS	NO,YES	NO	SELECT WHETHER *LOCALE ADJUSTMENTS* SHOULD APPEAR ON THE REPORT
E2-11	PASSWORD ADJUSTMENTS	NO,YES	NO	SELECT WHETHER PASSWORD ADJUSTMENTS SHOULD APPEAR ON THE REPORT
E2-12	ERROR/INFO ADJUSTMENTS	NO,YES	NO	SELECT WHETHER *ERROR/INFO ADJUSTMENTS* SHOULD APPEAR ON THE REPORT
E2-13	COINAGE ADJUSTMENTS	NO,YES	NO	SELECT WHETHER *COINAGE ADJUSTMENTS* SHOULD APPEAR ON THE REPORT
E2-14	REPORT SETTINGS	NO,YES	NO	SELECT WHETHER DEVICE SETTINGS SHOULD APPEAR ON THE REPORT
E2-15	DEVICE SETTINGS	NO,YES	YES	SELECT WHETHER *DEVICE SETTINGS* SHOULD APPEAR ON THE REPORT

E3: Device Setup

This utility menu is used to configure the serial communications between the game and the output device.

REF.	NAME	RANGE	FACTORY SETTING	DESCRIPTION
E3-01	DEVICE TYPE	GENERIC ASCII, O'NEIL MICROFLASH	GENERIC ASCII	SELECT THE TYPE OF DEVICE CONNECTED TO THE SERIAL PORT.
E3-02	OUTPUT FORMAT	FORMATTED, DELIMITED	FORMATTED	SELECT THE FORMAT FOR DATA OUTPUT. *DELIMITED* (TEXT) OUTPUT WILL GENERALLY BE CAPTURED BY A TERMINAL SOFTWARE PACKAGE AND IMPORTED INTO A SPREADSHEET APPLICATION, SUCH AS MICROSOFT EXCEL. *FORMATTED* DATA IS IN A PRINTER-READY, READABLE USER FORMAT, SUCH AS SEEN ON A RECIEPT.
E3-03	BAUD RATE	300, 600, 1200, 2400, 4800, 9600, 19200	19200	SELECT THE BAUD RATE FOR THE SERIAL PORT

E4: Adjustments Report

Generates a complete listing of ALL of the games' adjustments information. Any sensitive adjustments which are password-protected will not be shown on the report (only the title of the adjustment will appear with the message "PASSWORD PROTECTED"). This report can only be generated in a *MANUAL* mode of operation (see section E2-01: Report Generation).

E5: Audits Report

Generates a complete listing of ALL of the games' audit information. Any sensitive audits which are password protected will not be shown on the report (only the title of the audit will appear with the message "PASSWORD PROTECTED"). This report can only be generated in a *MANUAL* mode of operation (see section E2-01: Report Generation).

STATUS MESSAGES

NOTE: All of the following Status Messages are shown on the dot matrix display and do not appear on the printed report:

PLEASE DISCONNECT PRINTER - This message appears after an automatic report has been completed using the "Hot Plug" method.

SEARCHING FOR PRINTER - This message appears at the beginning of each print job.

ONE MOMENT, PRINTING <type> - This message appears during a print job where <type> is the title or the section currently being printed.

ONE MOMENT, PRINTING ALL ADJUSTMENTS, <type> - This message appears during the Adjustments Report where <type> is the title of the section currently being printed.

ONE MOMENT, PRINTING ALL AUDITS, <type> - This message appears during the Audits Report where <type> is the title of the section currently being printed.

ONE MOMENT, PRINTING CUSTOM REPORT, <type> - This message appears during the Custom Report where <type> is the title of the section currently being printed.

PRINT JOB COMPLETE - This message appears after the completion of the current print job.

<n> RETRIES REMAINING - This message appears after the error message "PRINT JOB INTERRUPTED", where <n> is the number of retries remaining before the print job will abort.

RESET COLLECTION AUDITS COMPLETE - This message appears after the *COLLECTIONS* Audits have been cleared.

RESET REPLAY PERCENTAGE COMPLETE - This message appears after the replay setting has been changed to the recommended settings.

ERROR MESSAGES

NOTE: All of the following Error Messages are shown on the dot matrix display and do not appear on the printed report:

ERROR: PRINTER NOT RESPONDING, CHECK CONNECTION AND TRY AGAIN - This message appears after a print job is activated and the system is not able to detect the printer device. Check the printer cable for a loose connection and verify that it is the correct type of serial cable.

ERROR: PRINT JOB INTERRUPTED, CHECK PRINTER AND TRY AGAIN - This message will appear during a print job if the printer cable becomes disconnected, the printer goes off-line or runs out of paper, or an undetermined error occurs.

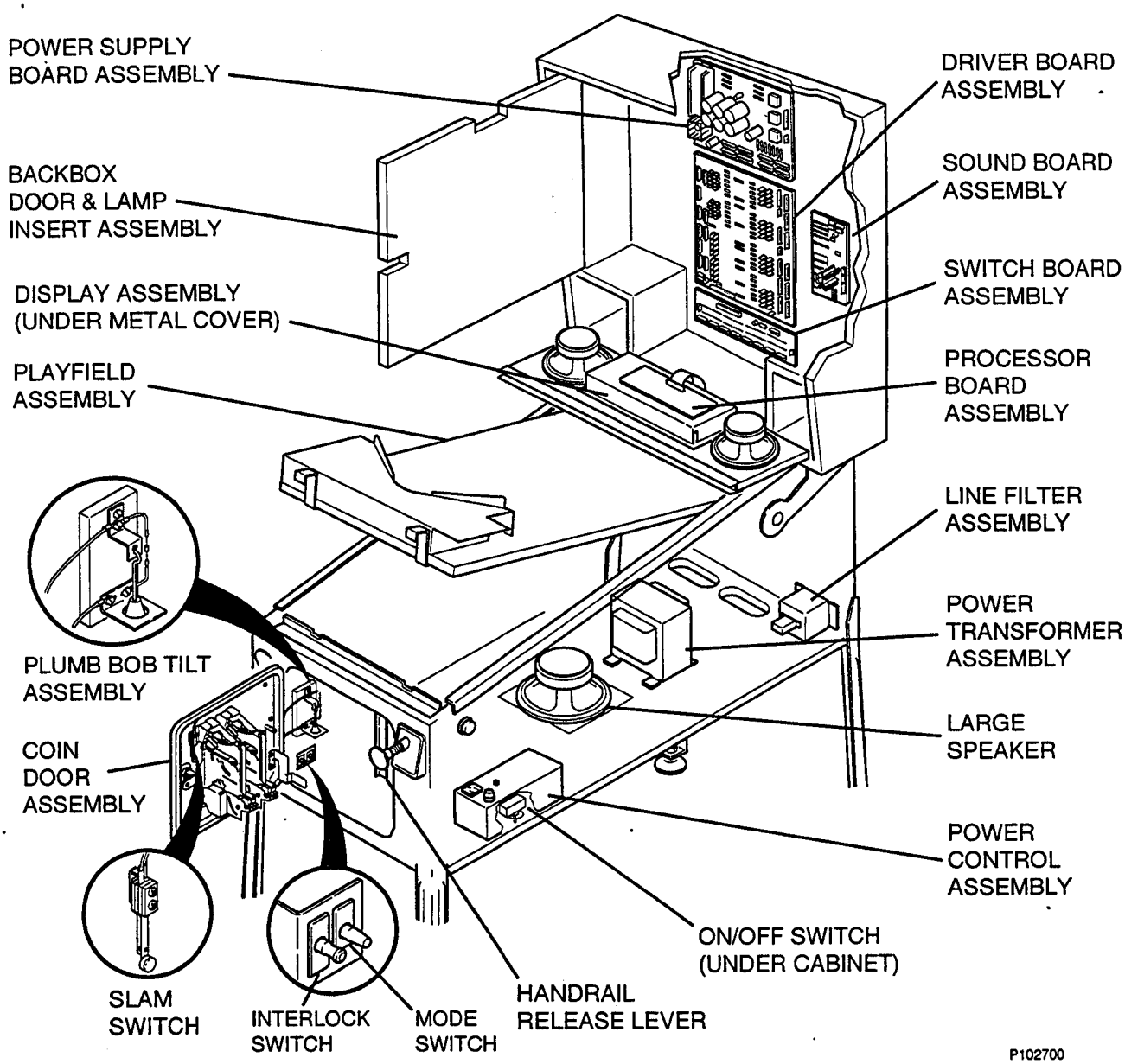
ERROR: PRINT JOB COULD NOT BE COMPLETED - This message will appear during a print job if an interruption occurs. The CPU will continue to poll the printer to try to restart the report, however, after the third retry, the print job is aborted.

PRINTERS CURRENTLY SUPPORTED

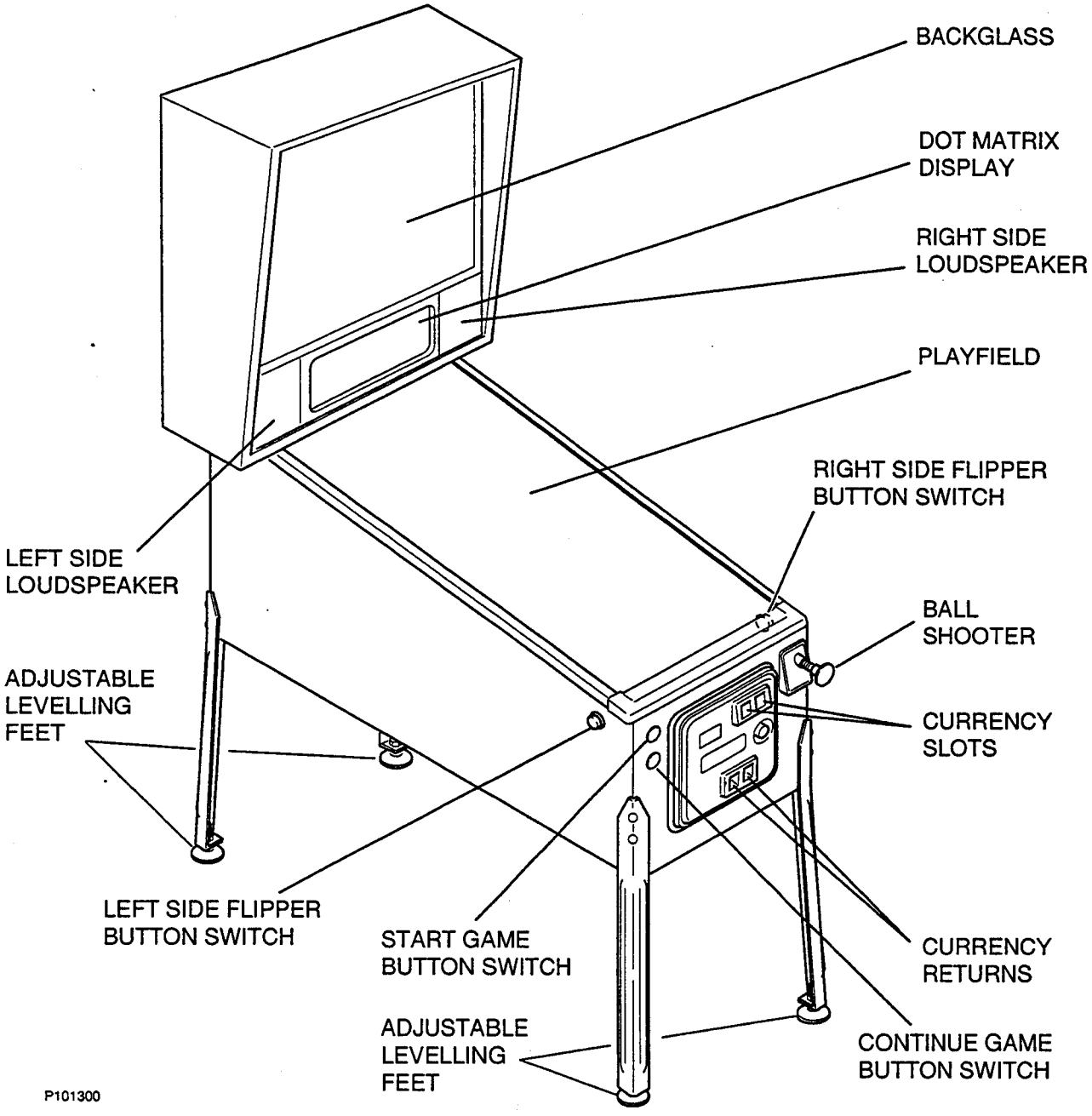
- O'Neil microFlash receipt printer.
- Any serial printer supporting generic ASCII format.

NOTES

CABINET & BACKBOX - COMPONENT IDENTIFICATION



CABINET & BACKBOX - COMPONENT IDENTIFICATION

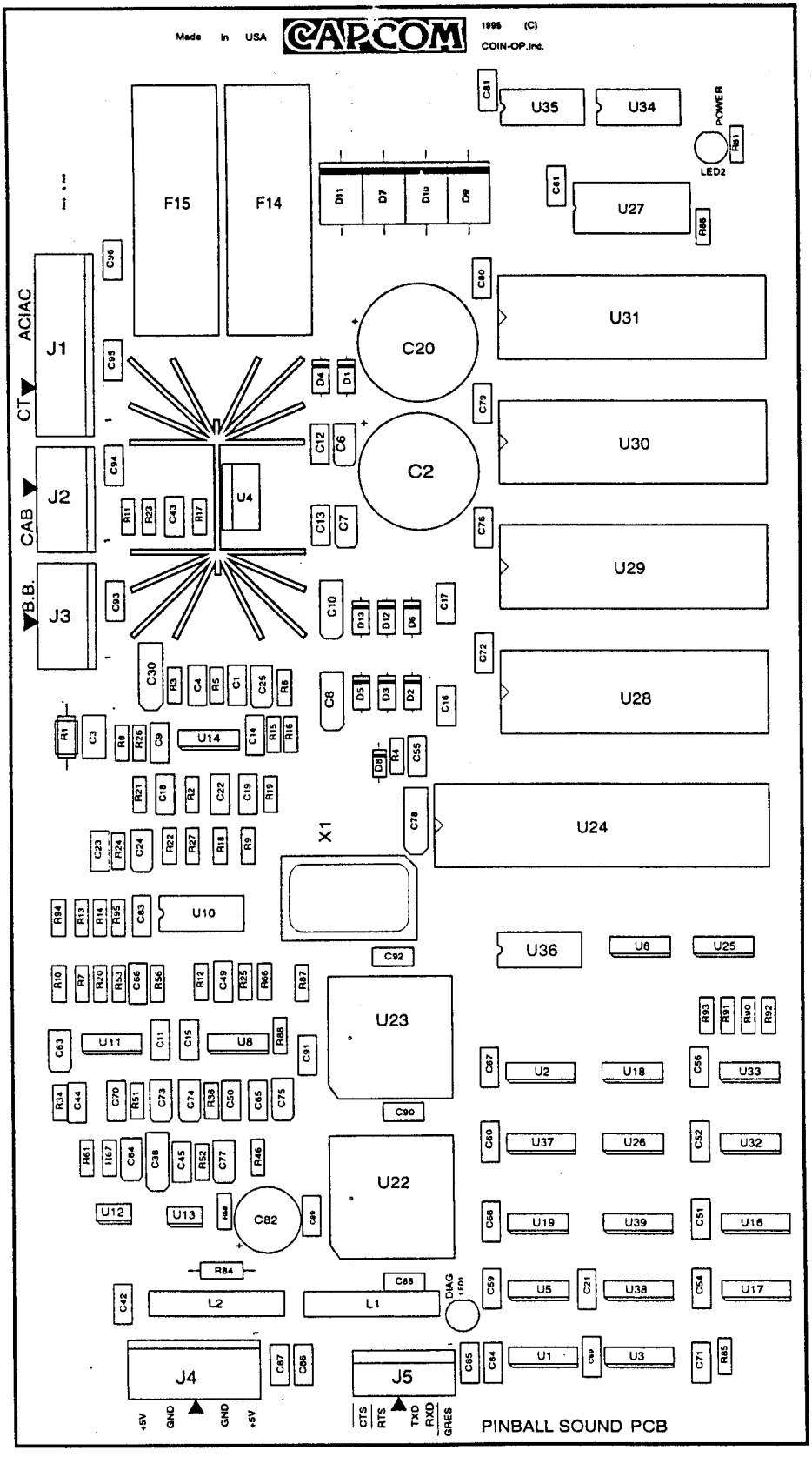


CABINET AND BACKBOX PARTS LIST

PART NO.	DESCRIPTION
A-0065	PLUMB BOB TILT ASSEMBLY
A-00492 - *	COIN DOOR ASSEMBLY
MT-00321 -1	METAL BRACKET
SW-00119	INTERLOCK SWITCH
SW-00132	MODE SWITCH
A-00192 - 01	BALL SHOOTER ASSEMBLY
A-00413	ON / OFF SWITCH (UNDER CABINET)
A-00414 - *	POWER CONTROL ASSEMBLY
SP00101	LARGE SPEAKER
XF00104 - *	POWER TRANSFORMER ASSEMBLY
LF00100	LINE FILTER ASSEMBLY
SP00100	LEFT AND RIGHT BACKBOX LOUDSPEAKERS
MS00101 -1	ADJUSTABLE LEVELING FEET
SW00130	START GAME BUTTON
SW00131	CONTINUE GAME BUTTON
SW00114	LEFT AND RIGHT FLIPPER BUTTON SWITCHES
AW00137	ARTWORK FILM FOR BACKGLASS
GL00106	BACKGLASS

*** WHEN ORDERING FOR SERVICE, PLEASE INDICATE COUNTRY OF ORIGIN OF YOUR GAME.**

SOUND BOARD ASSEMBLY A0015003



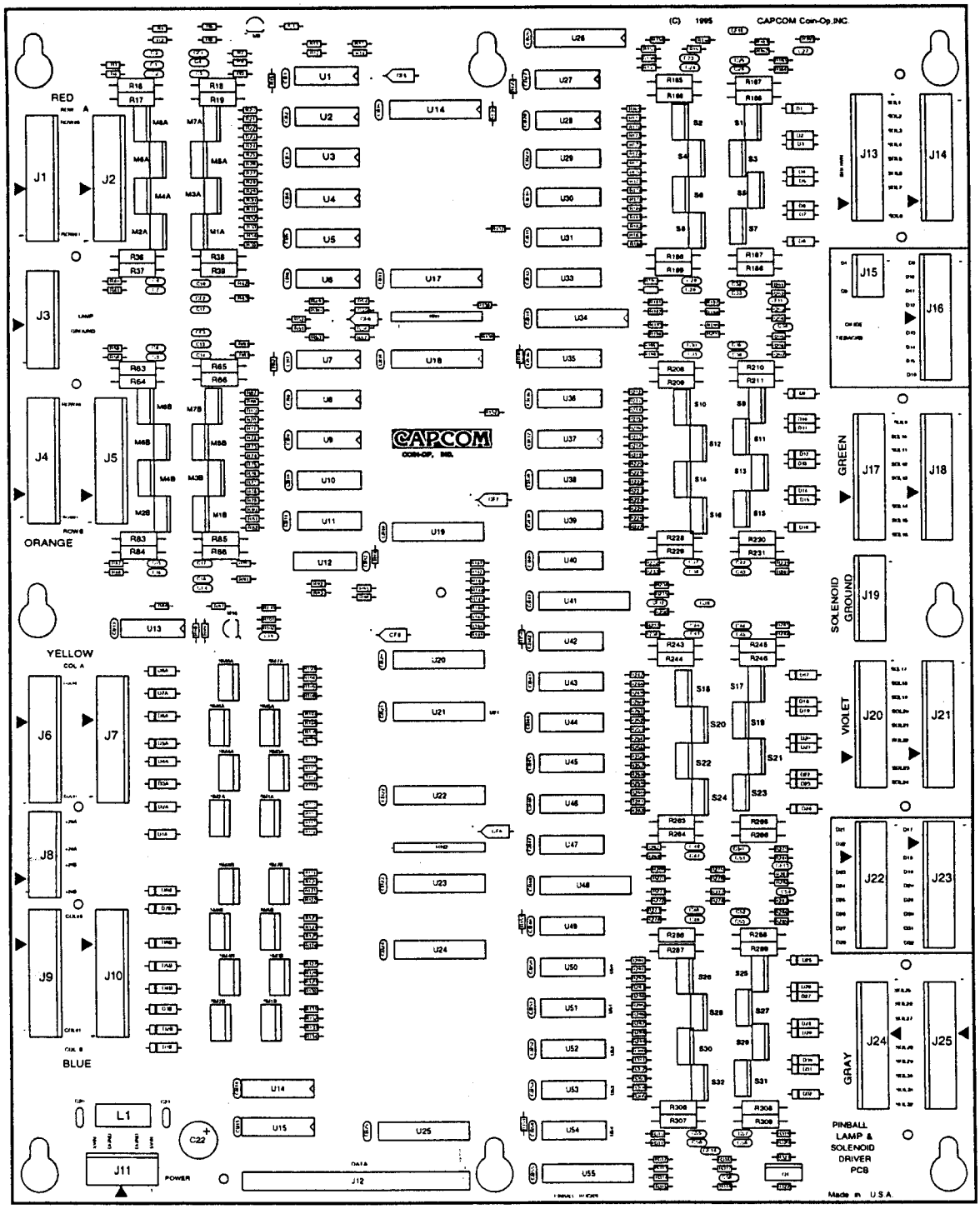
SOUND BOARD ASSEMBLY A0015003
PARTS LIST

DES.	DESCRIPTION	CAPCOM® P/N
J2,J3	CONNECTOR HEADER .156 STRAIGHT 4-PIN LOCK	CN00100-04
J4	CONNECTOR HEADER .156 STRAIGHT 5-PIN LOCK	CN00100-05
J1	CONNECTOR HEADER .156 STRAIGHT 7-PIN LOCK	CN00100-07
J5	CONNECTOR HEADER .100 STRAIGHT 6-PIN LOCK	CN00104-06
C6-7, C24-25, C63-64, C73-75, C77	CAPACITOR , TANTALUM 35V 1.0UF 10% SMT	CP00012-SMT
C9,C11-17 C21, C42, C45, C51-52, C54-56, C59-61, C67-C69, C71-72 C76, C79-81, C83,C88-C96	CAPACITOR, CERAMIC 50V .1UF 10% SMT 1206	CP00056-SMT
C2,C20	CAPACITOR , ELECTRIC 25V 4700UF 20% RAD	CP00020
C1,C4	CAPACITOR , CERAMIC 100V .001UF 10% SMT 1206	CP00055-SMT
C43	CAPACITOR , CERAMIC 100V 470PF 5% SMT 1206	CP00060-SMT
C30,C78	CAPACITOR , TANTALUM 16V 22UF 20% SMT	CP00045-SMT
C19,C22, C44, C50, C65, C70	CAPACITOR , CERAMIC 50V .033UF 5% SMT 1206	CP00061-SMT
C8,C10,C38	CAPACITOR , TANTALUM 25V 4.7UF 20% SMT	CP00050-SMT
C3	CAPACITOR , CERAMIC 50V .22UF 20% SMT 1210	CP00051-SMT
C18	CAPACITOR , CERAMIC 100V .022UF 20% SMT 1206	CP00063-SMT
C23,C49, C66	CAPACITOR , CERAMIC 100V 3300PF 20% SMT 1206	CP00064-SMT
C82	CAPACITOR , ELECTRIC 16V 470UF 20% RAD	CP00054
D1-6,D12-13	DIODE 1N4004 RECTIFIER 1.0A 400VR	DI00100
D8	DIODE 1N4148 SW 200MA 75VR	DI00104
LED1-2	LED LTL4201 RED 20MA T-1 70 DEG	DI00105
D7,D9-11	DIODE 1N5402 RECTIFIER 3.0A 200VR	DI00106
F14-F15	FUSE HOLDER 3AG PC MTG	FS00101
U8,U11,U14	IC TL084 OPERATIONAL AMP SMT	IC00037-SMT
U6	IC 74LS74 DUAL D-TYPE FF SMT	IC00042-SMT
U18-19	IC 74LS04 HEX INVERTER SMT	IC00048-SMT
U4	IC TDA2030A 18W HI-FI AMP	IC00056
U10	IC X9241U QUAD E2POT 50K SMT	IC00061-SMT
U24	IC87C52 MICOCONTROLLER	IC00073
U16-17, U38-39	IC 74LS161 4-BIT SYN BIN CTR SMT	IC00083-SMT
U33	IC 74LS00 QUAD 2-IN NAND GATE SMT	IC00084-SMT
U22-23	IC TMS320AV120 MPEG AUDIO DECODER SMT	IC00086-SMT

DES.	DESCRIPTION	CAPCOM® P/N
U5,U32	IC 74HC74 DUAL D-TYPE F/F SMT	IC00087-SMT
U25-26	IC 74LS08 QUAD 2-IN AND GATE SMT	IC00088-SMT
U2,U37	IC 74LS165 8-BIT SHIFT REGISTER SMT	IC00089-SMT
U27	IC SRAM32KX8 SMT	IC00090-SMT
U12-13	IC TDA1545 16-BIT DAC SMT	IC00091-SMT
U34-36	IC 74LS373 OCT D-TYPE LATCH SMT	IC00092-SMT
U1,U3	IC 74LS112 DUAL J-K F/F SMT	IC00093-SMT
L1-2	IND CHOKE 4.7UH 3A AXIAL	IN00100
X1	CLOCK OSCILLATOR 24MHZ	OS00101
R2	RESISTOR CARBON FILM 1/8W 5% 100 OHM SMT 1206	RS00102-02S
R81	RESISTOR CARBON FILM 1/8W 5% 270 OHM SMT 1206	RS00102-03S
R4,R85	RESISTOR CARBON FILM 1/8W 5% 1K OHM SMT 1206	RS00102-05S
R10,R12, R25, R53, R56,R66, R86,R90-R93	RESISTOR CARBON FILM 1/8W 5% 10K OHM SMT 1206	RS00102-07S
R34,R38, R46,R51	RESISTOR CARBON FILM 1/8W 5% 1.2K OHM SMT 1206	RS00102-08S
R84	RESISTOR CARBON FILM 1/4W 5% 0 OHM	RS00100-10
R18-19, R21-22		
R8-9,R11	RESISTOR CARBON FILM 1/8W 5% 680 OHM SMT 1206	RS00102-13S
R3,R5	RESISTOR CARBON FILM 1/8W 5% 12K OHM SMT 1206	RS00102-18S
R16	RESISTOR CARBON FILM 1/8W 5% 39K OHM SMT 1206	RS00102-19S
R15	RESISTOR CARBON FILM 1/8W 5% 47K OHM SMT 1206	RS00102-20S
R6,R17	RESISTOR CARBON FILM 1/8W 5% 22K OHM SMT 1206	RS00102-21S
R23	RESISTOR CARBON FILM 1/8W 5% 2.0K OHM SMT 1206	RS00102-22S
R1	RESISTOR CARBON FILM 1/4W 5% 1 OHM	RS00100-23
R24,R26-27	RESISTOR CARBON FILM 1/8W 5% 4.7K OHM SMT 1206	RS00102-26S
R7,R20,R88	RESISTOR CARBON FILM 1/8W 5% 3.3K OHM SMT 1206	RS00102-27S
R52,R61, R67-68	RESISTOR CARBON FILM 1/8W 5% 11K OHM SMT 1206	RS00102-38S
R13-14	RESISTOR CARBON FILM 1/8W 5% 27K OHM SMT 1206	RS00102-40S
R87	RESISTOR CARBON FILM 1/8W 5% 33 OHM SMT 1206	RS00102-41S
U28-31	ROM SOCKET 32PIN600	SK00112-32
U4	HEATSINK TO-220 W/KOOL CLIP	HS00102
U24	SOCKET 40-PIN DIP	SK00112-40
C84-87	CAPACITOR , CERAMIC 100V 100PF 10% SMT 1206	CP00058-SMT
F14,F15	FUSE SLO BLO 3.0A 250V 3AG	FS00100-03
PCB	PINBALL SOUND PCB	B0015001
R94,R95	RESISTOR CARBON FILM 1/8W 5% 2.2K OHM SMT 1206	RS00102-23S

NOTE: C57 & 58 are replaced with jumper wires.
C84-87, & R18-22 are not used.

DRIVER BOARD ASSEMBLY A0015105



DRIVER BOARD ASSEMBLY A0015105
PARTS LIST

DES.	DESCRIPTION	CAPCOM® P/N
J15	CONNECTOR HEADER .156 STR 3 PIN LOCK	CN00100-03
J11	CONNECTOR HEADER .156 STR 5-PIN LOCK	CN00100-05
J8,J19	CONNECTOR HEADER .156 STR 6-PIN LOCK	CN00100-06
J3	CONNECTOR HEADER .156 STR 7-PIN LOCK	CN00100-07
J1-2,J4-7,J9-10, J13-14, J16-18, 20-25	CONNECTOR HEADER .156 STR 9 PIN LOCK	CN00100-09
J12	CONNECTOR HEADER .100 STR 50-PIN 2X25	CN00101-50
CF5-9	CAPACITOR TANT 35V 1.0UF 5% AX	CP00012
C20-21,CB1 31, B33-55	CAPACITOR CER 50V.1UF 10% AX	CP00019
C1-11,C13-19, C23-59	CAPACITOR CER 50V.22UF 20% AX	CP00024
CF1-4, CF10-14	CAPACITOR CER 50V .01UF 10% AX	CP00048
C22	CAPACITOR ELECT 16V 470UF 20% RAD	CP00054
D1-32,D1A,D1B, D2A,D2B,D3A, D3B,D4A,D4B, D5A,D5B,D6A, D6B,D7A,D7B, D8A,D8B-1	DIODE 1N4004 RECT 1.0A 400VR	DI00100
U1,U6-7,U12, U27,U33,U35,U40 U42,U47,U49,U54	IC LM339 VOLTAGE COMPARATOR	IC00036
U21,U23	IC 74LS273 OCTAL D-TYPE FF	IC00041
U2-5,U8-11,U13, 28-31,U36-39,U43-46,	IC 74LS74 DUAL D-TYPE FF	IC00042
U14-15	IC 74LS138 3 OF 8 LINE DECODER	IC00047
U16-20,U22, U24-26,U34,U41,U48,U55	IC 74LS244 OCT BFFR/LINE DR	IC00057
L1	IND 4.7UH 3.4A 15%AX	IN00100
R6,R15,R62,R94,R102,R135,R140, R150-151,R153, R160, R205,R236, R283,R318	RESISTOR CF 1/4W 5% 100 OHM	RS00100-02
R103,R105,R107 R109,R111,R113 R115,R117,R119 R121,R123,R125 R127,R131,R133	RESISTOR CF 1/4W 5% 1K OHM	RS00100-05
R11-14,R49-50, R52-57,R92-93, R95-96,R104, R106,R108,R110, R112,R114,R116, R118,R120,R122, R124,R126,R128,	RESISTOR CF 1/4W 5% 10K OHM	RS00100-07

DES.	DESCRIPTION	CAPCOM® P/N
R130,R132,R134, R142,-149,R154-155,R158-159, R191-194,R197-200,R269-272, R275-278,R312-315		
R10,R99	RESISTOR CF 1/4W 5% 330 OHM	RS00100-12
R3-4,R8-9,R40-43,R58-61,R87-88,R90-91	RESISTOR CF 1/4W 5% 680 OHM	RS00100-13
R7,R21,R23,R25,R27,R29,R31,R33,R35,R51,R68,R70, R72,R74,R76,R78, R80,R82,R89,R98, R136-139,R141, 152, R169,R172-173,R176-177, R180-181,R184, R212,R215-216, R219-220,R223-224,R227,R247, R250-251,R254-255,R258-259, R262,R290, R293-294,R297-298, R301-302,R305, RR321-322	RESISTOR CF 1/4W 5% 4.7K OHM	RS00100-26
R156-157,R163-164,R189-190, R195-196,R201-202,R206-207, R232-233,R237-242,R267-268, R273-274,R279-280, R284-285, R310-311,R319-320	RESISTOR CF 1/4W 5% 56 OHM	RS00100-41
R20,R22,R24,R26, R28,R30,R32,R34, R67,R69,R71,R73, R75,R77,R79,R81, R170-171,R174-175, R178-179, R182-183,R213-214,R217-218, R221-222,R225-226,R248-249, R252-253,R256-257,R260-261, R291-292,R295-296,R299-300, R303-304	RESISTOR CF 1/4W 5% 750 OHM	RS00100-42
RN1-2	RESISTOR SIP 10K X 9R 2% BUSSED	RS00104

DRIVER BOARD ASSEMBLY A0015105
PARTS LIST (CONT.)

R16-19,R36-39,R63-66,R83-86,R165-168, R185-188,R208-211,R228-231, R243-246,R263-266,R286-289, R306-309	RESISTOR CF 1W 5% .020 OHM	RS00112-01
R161,R203,R234R281,R316	RESISTOR MF 1/4W 1% 470 OHM	RS00113-06
R2,R101,R162, R204,R235, R282,R317	RESISTOR MF 1/4W 1% 7.50K OHM	RS00113-08
R1,R100	RESISTOR MF 1/4W 1% 200 OHM	RS00113-11
R5,R97	RESISTOR MF 1/4W 1% 270 OHM	RS00113-12
M1A,M1B,M2A, M2B,M3A,M3B, M4A,M4B,M5A, M5B,M6A,M6B, M7A,M7B,M8A, M8B,S1-32	TRANSISTOR STP20N10L MOSFET N-CH	TR00101
Q1	TRANSISTOR TIP102 NPN	TR00102
SM1A,SM1B,SM2A,SM2B,SM3ASM3B.SM4A, SM4B, SM5A,SM5B, SM6A,SM6B, SM7A,SM7B,SM8A, SM8B-1	TRANSISTOR VN02N MOSFET RELAY	TR00105
M9-10	TRANSISTOR 2N7000 MOSFET N-CH	TR00109

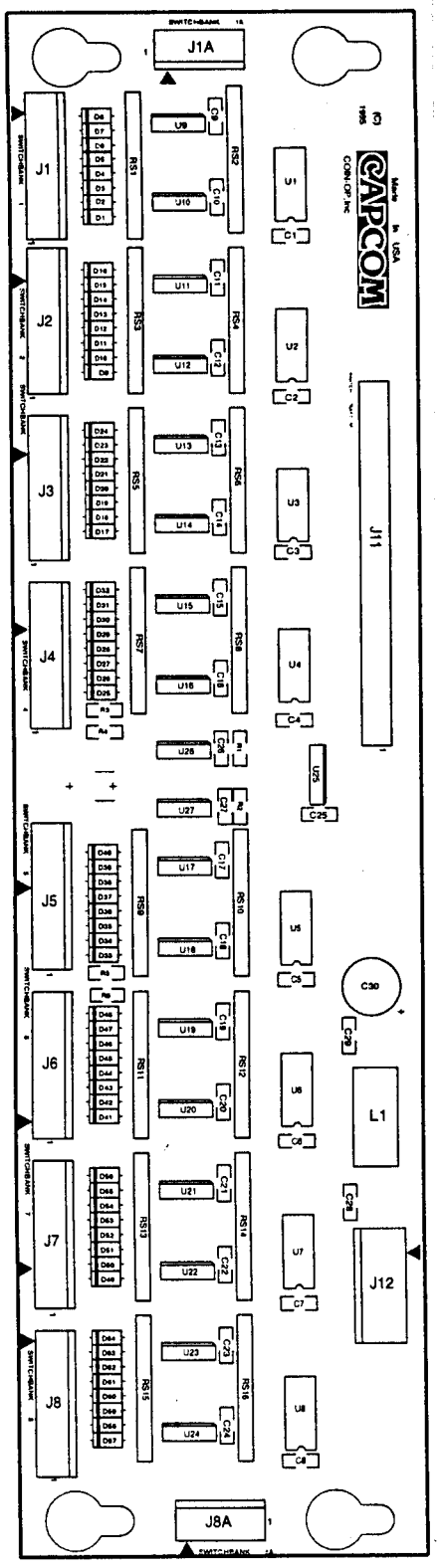
POWER BOARD ASSEMBLY A0015204
PARTS LIST

DES.	DESCRIPTION	CAPCOM® P/N
R38	RESISTOR CF 1/4W 5% 27K OHM	RS00100-40
Q1	VOLTAGE REGULATOR 5A LOW DROP ADJ	*VR00100
R8,R21,R5	RESISTOR CF 1/2W 5% 1.2K OHM	RS00102-11
R25	RESISTOR MF 1/4W 1% 374 OHM	RS00113
C12-13	CAPACITOR ELECT 100V 2200UF 20% RAD	CP00046
R4,R9,R18-20,R22-23	RESISTOR MOF 2W 5% 5.6K OHM	RS00114
C10	CAPACITOR ELECT 100V 100UF 20% RAD	CP00011-01
R24	RESISTOR MF 1/4W 1% 121 OHM	RS00113-01
R30,R42-43	RESISTOR MF 1/4W 1% 11K OHM	RS00113-02
R2-3	RESISTOR CF 1/2W 5% 1.5K OHM	RS00101-09
C31	CAPACITOR CER 50V .033UF 5% AX	CP00047
C1,C5-6, C8-9,C11	CAPACITOR ELECT 35V 15000UF 20% RAD	CP00065
R33	RESISTOR MF 1/4W 1% 2K OHM	RS00113-03
J9-11	CONNECTOR HEADER .156 STR 3 PIN LOCK	CN00100-03
J12-14	CONNECTOR HEADER .156 STR 4-PIN LOCK	CN00100-04
J2,J4-5, J7,J19	CONNECTOR HEADER.156 STR 5-PIN LOCK	CN00100-05
J6,J18	CONNECTOR HEADER .156 STR 7-PIN LOCK	CN00100-07
J8,J17	CONNECTOR HEADER .156 STR 9 PIN LOCK	CN00100-09
J15-16	CONNECTOR HEADER .156 STR 11-PIN LOCK	CN00100-11
J1,J20	CONNECTOR HEADER .156 STR 13-PIN LOCK	CN00100-13
J3	CONNECTOR HEADER .100 STR 6-PIN LOCK	CN00104-06
C32	CAPACITOR CER 50V .01UF 10% AX	CP00048
C33-34	CAPACITOR CER 100V .001UF 10% AX	CP00066
C2-3	CAPACITOR TANT 35V 1.0UF 5% AX	CP00012
C4	CAPACITOR ELECT 10V 470UF 20% RAD	CP00016
C7	CAPACITOR ELECT 35V 4700UF 20% RAD	CP00035
D30-31	DIODE 1N4004 RECT 1.0A 400VR	DI00100
BR1-6	RECT MB352W BRIDGE 35A 200V	+ *DI00101

DES.	DESCRIPTION	CAPCOM® P/N
LED1-14	LED LTL4501 RED 20MA T-1 70DEG	DI00105
D1-4	DIODE IN5402 RECT 20MA T-1 70 DEG	DI00106
FH1-13	FUSE HLDR 3AG PC MTG	FS00101
U30	IC LM339 VOLTAGE COMPARATOR	IC00036
R41	RESISTOR CF 1/4W 5% 1K OHM	RS00100-05
HS1	HEAT SINK TO-3 HEAVY DUTY 2"	*HS00106
----	MS 6-32x1/2 PPH SEMS ZC	SC00100-04
---	NUT 6-32 HEX KEPS	NT00101-06
----	HEAT SINK 1.5 X 4.5 EXTRUSION	*HS00105
----	POWER BOARD PCB	B0015204
R10-11	RESISTOR MOF 2W 5% 620 OHM	RS00114-01
R12,R14	RESISTOR MOF 2W 5% 6.2K OHM	RS00114-02
R13	RESISTOR MOF 2W 5% 270 OHM	RS00114-03
C30	CAPACITOR CER 50V .1UF 10% AX	CP00019
----	MS 6-32 X 3/4 PPH SEMS ZC	SC00100-06
R1	RESISTOR CF 1/4W 5% 330 OHM	RS00100-12
R31	RESISTOR MF 1/4W 1% 56.2K OHM	RS00113-10
F9-13	FUSE SLO-BLO 4.0A 250V 3AG	FS00100-04
F5,F7-8	FUSE SLO-BLO 3.0A 250V 3AG	FS00100-03
F4	FUSE SOL-BLO 8.0A 250V 3AG	FS00100-08
F1-2,6	FUSE SLO-BLO 10.0A 250V 3AG	FS00100-10
F3	FUSE SLO-BLO 7.0A 250V 3AG	FS00100-07
----	CIRCUIT BOARD SUPPORT	PL00287-05
R36,R32, R44	RESISTOR CF 1/4W 5% 3.3K OHM	RS00100-27
R6	RESISTOR CF 1/4W 5% 820 OHM	RS00100-30

*** NOTE: Heat sink compound should be applied to ALL heat sink/semi-conductor surfaces**
+ Spacing between the bottom of the bridge and the PCB shall be 1/4".

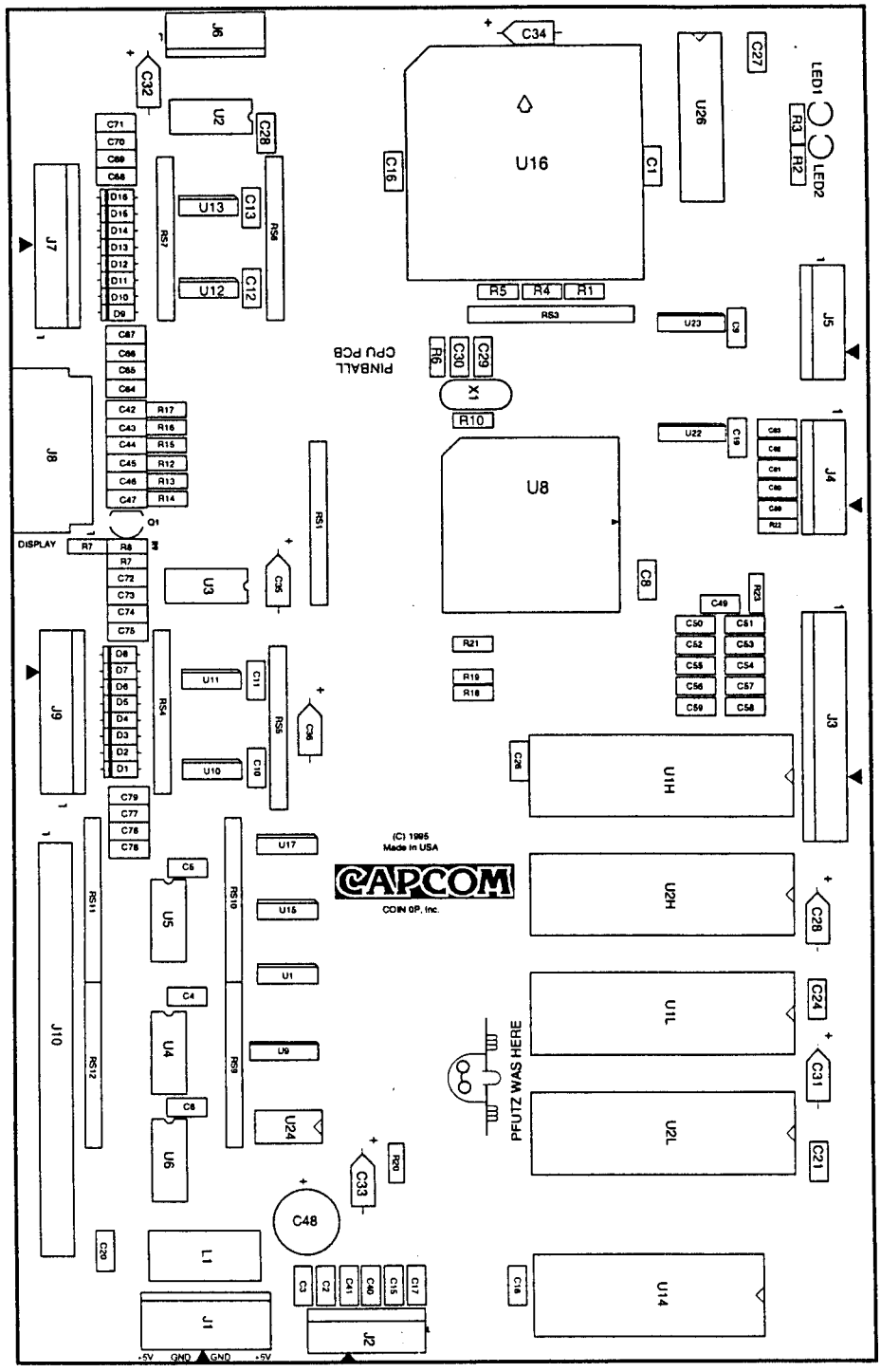
SWITCH BOARD ASSEMBLY A0015301



SWITCH BOARD ASSEMBLY A0015301
PARTS LIST

DES.	DESCRIPTION	CAPCOM® P/N
J12	CONNECTOR HEADER.156 STR 5-PIN LOCK	CN00100-05
J11	CONNECTOR HEADER.100 STR 50-PIN 2X25	CN00101-50
J1A,J8A-1	CONNECTOR HEADER.100 STR 6-PIN LOCK	CN00104-06
J1-8	CONNECTOR HEADER.100 STR 10-PIN LOCK	CN00104-10
C1-29	CAPACITOR CER 50V 0.1UF 10% SMT	CP00019-SMT
C30	CAPACITOR ELECT 16V 470UF 20% RAD	CP00054
D1-64	DIODE 1N4148 SW 200MA 75VR	DI00104
U9-24	IC LM339 VOLTAGE COMPARATOR SMT	IC00036-SMT
U26	IC 74LS74 DUAL D-TYPE FF SMT	IC00042-SMT
U1-8	IC 74LS245 OCT BUS TRANSCEIVER SMT	IC00044-SMT
U25	IC 74LS138 3 OF 8 LINE DECODER SMT	IC00047-SMT
U27	IC 74LS126 QUAD 3-STATE BUFFER SMT	IC00099-SMT
L1	IND 4.7UH 3.4A 15%AX	IN00100
R1-2,R4,R6	RESISTOR CF 1/8W 5% 3.3K OHM SMT 1206	RS00102-27S
R3,R5	RESISTOR CF 1/8W 5% 620 OHM SMT 1206	RS00102-XXX
RS1,RS3, RS5,RS7, RS9, RS11, RS13,RS15	RESISTOR SIP 2.2K X 9R 2% BUSSED	RS00103
RS2,RS4, RS6,RS8, RS10,RS12 RS14,RS16	RESISTOR SIP 10K X 9R 2% BUSSED	RS00104

CPU BOARD ASSEMBLY A0015403

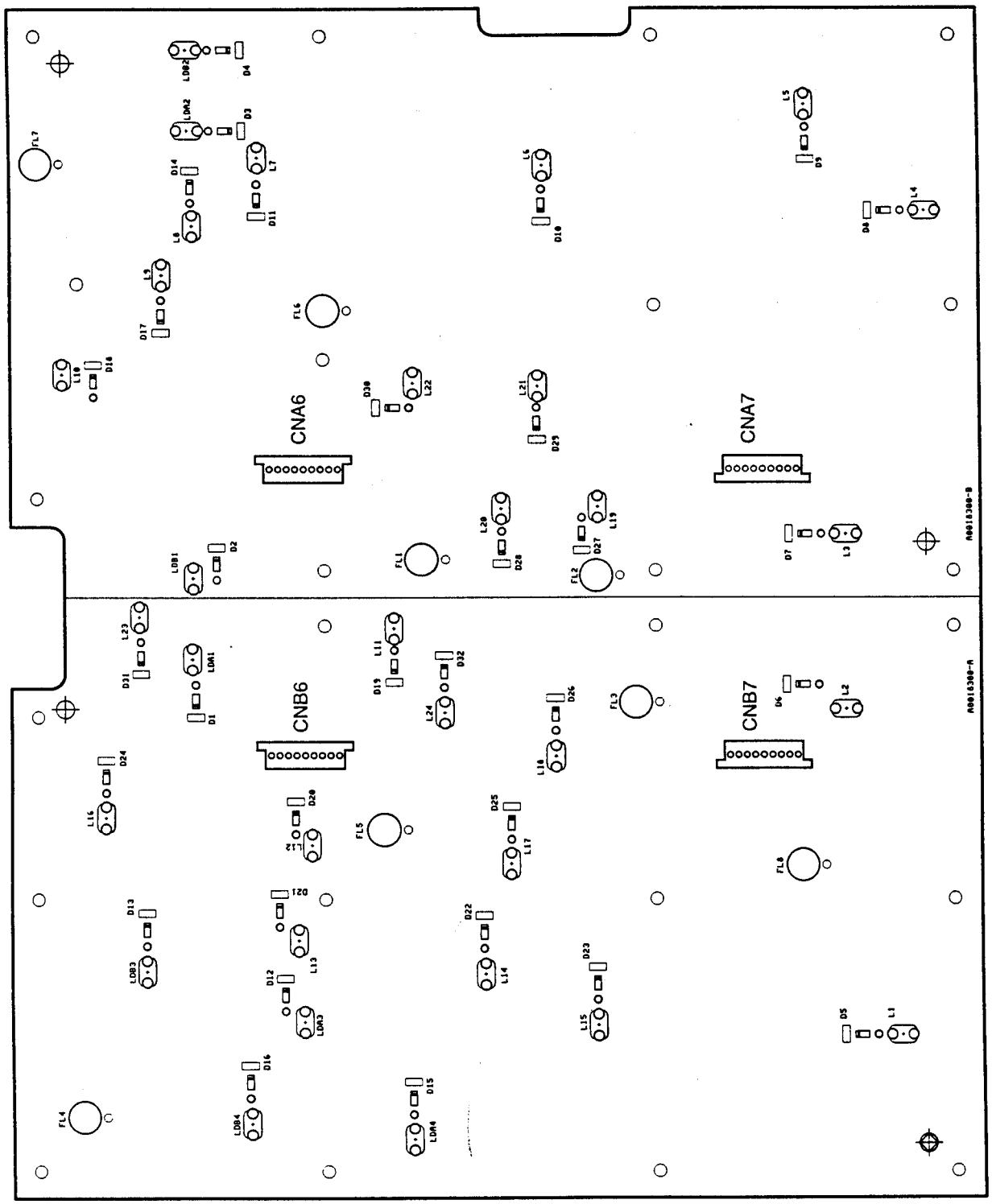


CPU BOARD ASSEMBLY A0015403
PARTS LIST

DES.	DESCRIPTION	CAPCOM® P/N
J1	CONNECTOR HEADER .156 STR 5-PIN LOCK	CN00100-05
J10	CONNECTOR HEADER .100 STR 50-PIN 2X25	CN00101-50
J6	CONNECTOR HEADER .100 STR 6-PIN LOCK	CN00104-06
J2,J4	CONNECTOR HEADER .100 STR 7-PIN LOCK	CN00104-07
J7,J9	CONNECTOR HEADER .100 STR 10-PIN LOCK	CN00104-10
J3	CONNECTOR HEADER .100 STR 14-PIN LOCK	CN00104-14
J8	CONNECTOR HEADER .100 RT 14-PIN 2X7 4W	CN00137-14
C28,C31-36	CAPACITOR TANT 35V 1.0UF 5% AX	CP00012
C29-30, C42-47	CAPACITOR CER 100V 10PF 10% SMT 1206	CP00017-SMT
C2-6, C9, C19,C23, C24,C64-79	CAPACITOR CER 50V .01UF 10% SMT 1206	CP00048-SMT
C48	CAPACITOR ELECT 16V 470UF 20% RAD	CP00054
C10-13	CAPACITOR CER 50V .001UF 10% SMT 1206	CP00055-SMT
C1,C8,C16, C18,C20-21, C24,C26-27	CAPACITOR CER 50V .1UF 10% SMT 1206	CP00056-SMT
C15,C17, C40-41, C49-63,C80	CAPACITOR CER 100V 100PF 10% SMT 1206	CP00058-SMT
X1	CRYSTAL 16.67 MHZ	CR00103
D1-16	DIODE 1N4148 SW 200MA 75VR	DI00104
LED1-2	LED LTL4201 RED 20MA T-1 70 DEG	DI00105
U14	IC SRAM 8K X 8 100NS BAT	IC00035
U10-13	IC LM339 VOLTAGE COMPARATOR SMT	IC00036-SMT
U17	IC 74LS74 DUAL D-TYPE FF SMT	IC00042-SMT
U2-6	IC 74LS245 OCT BUS TRANSCEIVER SMT	IC00044-SMT
U22-23	IC 74LS257 QUAD 2-IN MUX SMT	IC00045-SMT
U8	IC XC68306 MPU 16-BIT	IC00046
U9	IC 74LS139 DUAL 2-4 DECODER SMT	IC00062-SMT
U15	IC 74LS14 HEX SCHMITT TRIG SMT	IC00063-SMT
U25	IC DRAM 256K X 16 100NS	IC00074-SMT
U24	IC MAX699 RESET CHIP	IC00097
U1	IC 74LS02 QUAD NOR SMT	IC00098-SMT

DES.	DESCRIPTION	CAPCOM® P/N
L1	IND 4.7UH 3.4A 15% AX	IN00100
R12-17	RESISTOR CF 1/8W 5% 100 OHM SMT 1206	RS00102-02S
R2-3	RESISTOR CF 1/8W 5% 270 OHM SMT 1206	RS00102-03S
R8	RESISTOR CF 1/8W 5% 1K OHM SMT 1206	RS00102-05S
R22-23	RESISTOR CF 1/8W 5% 10K OHM SMT 1206	RS00102-07S
R9	RESISTOR CF 1/8W 5% 1.2K OHM SMT 1206	RS00102-08S
R4-7	RESISTOR CF 1/8W 5% 4.7K OHM SMT 1206	RS00102-26S
R18-21	RESISTOR CF 1/8W 5% 3.3K OHM SMT 1206	RS00102-27S
R1,R10	RESISTOR CF 1/8W 5% 33 OHM SMT 1206	RS00102-41S
RS5-6, RS9-12	RESISTOR SIP 10K X 9R 2% BUSSED	RS00104
RS1,RS3	RESISTOR SIP 4.7K X 9R 2% BUSSED	RS00111
RS4,RS7	RESISTOR SIP 1.2K X 9R 2% BUSSED	RS00103
U16	SOCKET IC 84-PIN PLCC	SK00101-84
U1H,U1L, U2H,U2L-1	SOCKET 32 PIN .600 DUAL WIPE	SK00112-32
Q1	TRANSISTOR 2N3904 NPN G.P. AMP	TR00106
U16	ACTEL 1020 PROGRAMMED	IC00106

LAMP BOARD ASSEMBLY A0018300

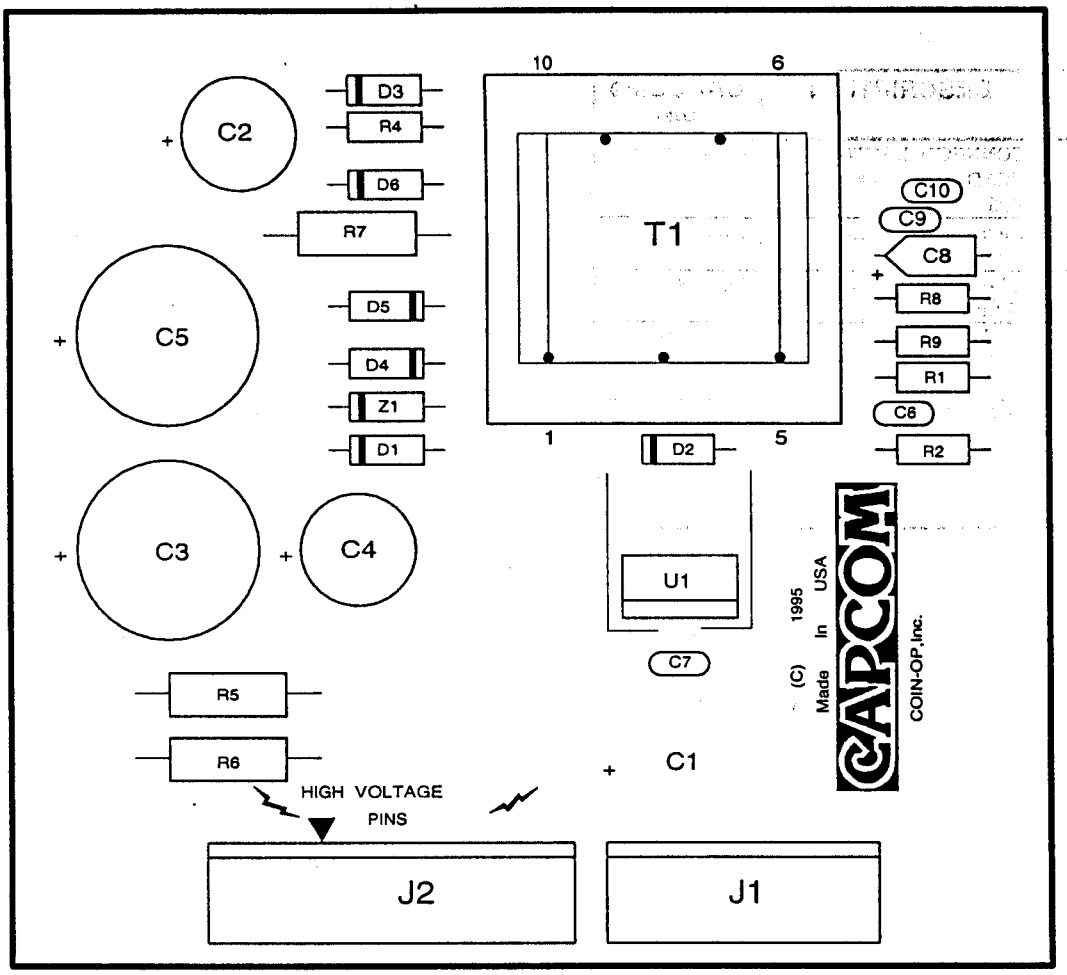


P1E03500

LAMP BOARD ASSEMBLY A0018300
PARTS LIST

DES.	DESCRIPTION	CAPCOM® P/N
CNB6,CNA 6CNB7,CN A7	CONNECTORECTOR HEADR .156 R/A PIN 9 POS	CN00138-09
D1-D32	DIODE 1N4002 RECT 1.0A 100V	DI00111
FL1-FL8	SPACER #8 X 1/4 " SELF-RET	PL0108-01
H1-H24	SOCKET LP WEDGE PCB 1/4" STRAIGHT TERMINALS	SK00118
LDB1,LDA1 LDB2,LDA2 LDB3,LDA3 LDB4,LDA, L1-L24	SOCKET LP WEDGE PCB 15/32" BRACKET	SK00119

DISPLAY POWER BOARD A0015502

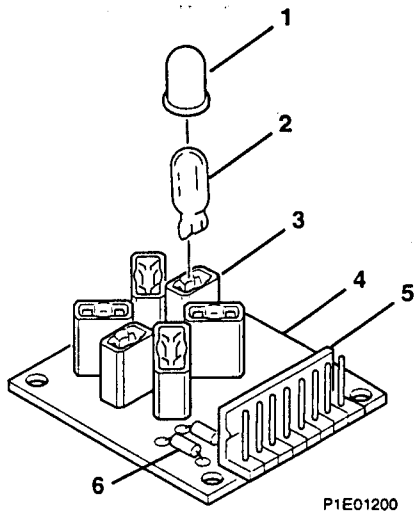


DISPLAY POWER SUPPLY BOARD A0015502
PARTS LIST

DES.	DESCRIPTION	CAPCOM® P/N
J1	CONNECTOR HEADER .156 STR 6-PIN LOCK	CN00100-06
J2	CONNECTOR HEADER .156 STR 8 PIN LOCK	CN00100-08
C8	CAPACITOR TANT 35V 1.0UF 5% AX	CP00012
C7	CAPACITOR CER 50V .1UF 10% AX	CP00019
*C3,C5	CAPACITOR ELECT 160V 47UF 20% RAD	CP00034
*C1	CAPACITOR ELECT 25V 330UF 20% RAD	CP00040
*C4	CAPACITOR ELECT 200V 6.8UF 20% RAD	CP00042
*C2	CAPACITOR ELECT 25V 220UF 20% RAD	CP00041
C6	CAPACITOR CER 100V 6800PF 10% AX	CP00044
D1-3	DIODE 1N5819 1A 40V SCHOTTKY	DI00108
D4-6	DIODE 1N4936 1A 400V FAST RECOVERY	DI00109
Z1	DIODE 1N4748 ZENER 1W 22V	DI00110
U1	SWITCHING REG LT1271CT HI EFF	IC00082
R4	RESISTOR CF 1/4W 5% 1.5K OHM	RS00100-09
R8	RESISTOR CF 1/4W 5% 330 OHM	RS00100-12
R7	RESISTOR CF 1/2W 5% 12K OHM	RS00100-18
R5-6	RESISTOR CF 1/2W 5% 47K OHM	RS00100-20
R1	RESISTOR MF 1/4W 1% 64.9K OHM	RS00113-04
R2	RESISTOR MF 1/4W 1% 1.24K OHM	RS00113-05
T1	XFMR FLYBACK 47UH 30VA 13-23VDC	XF00103
HS1	HEAT SINK TO220 0.5 X 0.75W	HS00103
	SWITCHING POWER SUPPLY PCB	B0015502

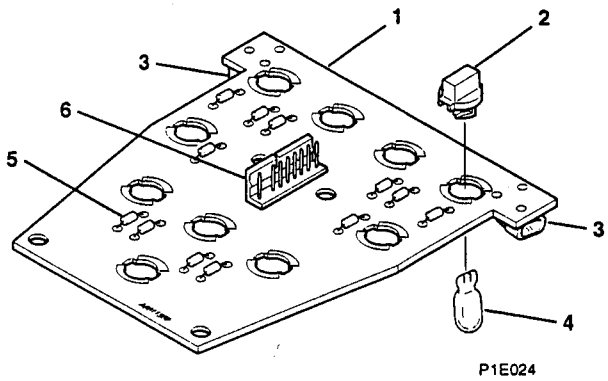
*** CAPS: C1-C5 ARE SPECIAL CAPACITORS FOR SWITCHES POSER SUPPLIES, THEY ARE LOW IMPEDENCE, HIGH RIPPLE CURRENT CAPACITORS.**

COLOR BALL ASSEMBLY A0010600



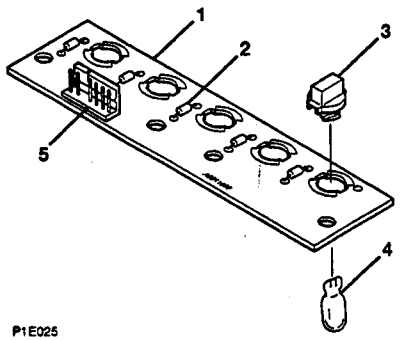
NO.	DESCRIPTION	CAPCOM® P/N
1	FILTER, LAMP, T 3 1/4", T/ AMBER	RB00116-AT
	FILTER, LAMP, T 3 1/4", T/ BLUE	RB00116-BT
	FILTER, LAMP, T 3 1/4", T/ GREEN	RB00116-GT
	FILTER, LAMP, T 3 1/4", T/ RED	RB00116-RT
	FILTER, LAMP, T 3 1/4", T/ YELLOW	RB00116-YT
2	LAMP #555 6.3V, WEDGE T 3/14"	LP00100
3	SOCKET LP WEDGE WITH OUT BRACKET	SK00104
4	PCB, SIX LAMP, 0.5000 2.0 SQ	B0013600
5	CONNECTOR HEADER 0.156 STRAIGHT 8-PIN LOCK	CN00100-08
6	DIADE 1N4004 RECT 1.0A 400 VR	DI001000

MAGICIAN'S LAMP ASSEMBLY A0011500



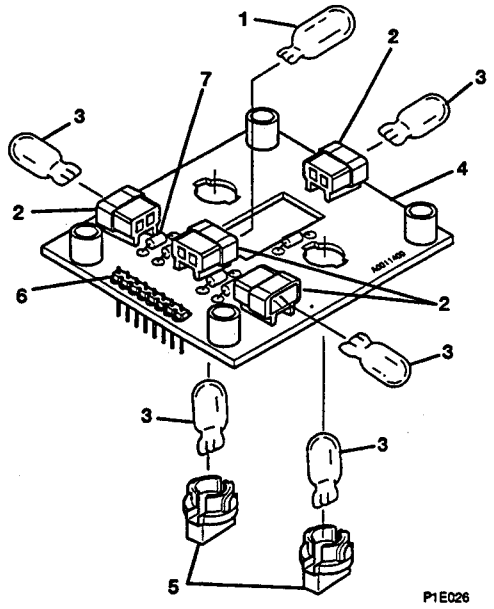
NO.	DESCRIPTION	CAPCOM® P/N
1	PCB, MAGICIAN'S LAMP	B0013500
2	SOCKET, LP WEDGE PCB T 3 1/4"	SK00102
3	SOCKET, LP WEDGE PCB 90° TERMINAL \S T 3 1/4", T 5 BULBS	SK00110
4	LAMP #555 6.3V, WEDGE T 3 1/4"	LP00100
5	DIODE 1N4004 RECT 1.0A 400 VR	DI00100
6	CONNECTOR HEADER 0.156 STRAIGHT P-PIN	GN00129-09

DROP TARGET LAMP PCB ASSEMBLY A0011600



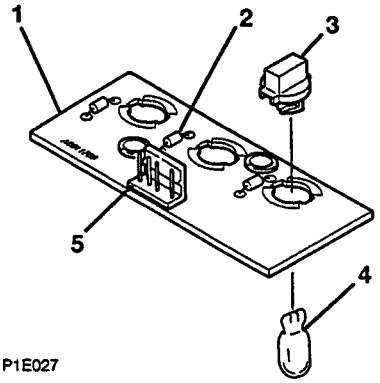
NO.	DESCRIPTION	CAPCOM® P/N
1	PCB, LAMP, 5 LP X 1.250	B0014800
2	DIODE 1N4004 RECT 1.0A 400VR	DI00100
3	SOCKET, LP WEDGE PCB T 3 1/4" TWIST	SK00102
4	LAMP # 555 6.3V WEDGE T 3 1/4"	LP00100
5	CONNECTOR HEADER 0.156 STRAIGHT 7-PIN LOCK	CN00100-07

MATRA MAGNA LAMP ASSEMBLY A0011400



NO.	DESCRIPTION	CAPCOM® P/N
1	LAMP, #906 13V WEDGE T-5	LP00101
2	SOCKET, LP WEDGE PCB, 90° TERMINALS, T 3 1/4", T-5 BULBS	SK00110
3	LAMP #555 6.3V, WEDGE T 3 1/4"	LP00100
4	PCB, SHE LAMP	B14600
5	SOCKET, LP WEDGE PCB T 3 1/4" TWIST	SK00102
6	CONNECTOR HEADER 0.156 STRAIGHT 8-PIN	CN00129-08
7	DIODE 1N4004 RECT 1.0A 400V	DI00100

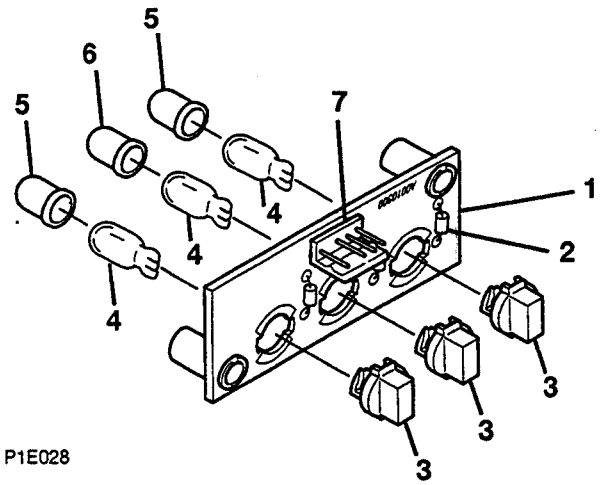
MORPH CHAMBER LAMP PCB ASSEMBLY A0011700



P1E027

NO.	DESCRIPTION	CAPCOM® P/N
1	PCB, LAMP, 3 LP X 1.375	B0014900
2	DIODE 1N4004 RECT 1.0A 400VR	DI00100
3	SOCKET, LP WEDGE PCB T 3 1/4" TWIST	SK00102
4	LAMP #555 6.3V, WEDGE T 3 1/4"	LP00100
5	CONNECTOR HEADER 0.156 STRAIGHT 5-PIN LOCK	CN00100-05

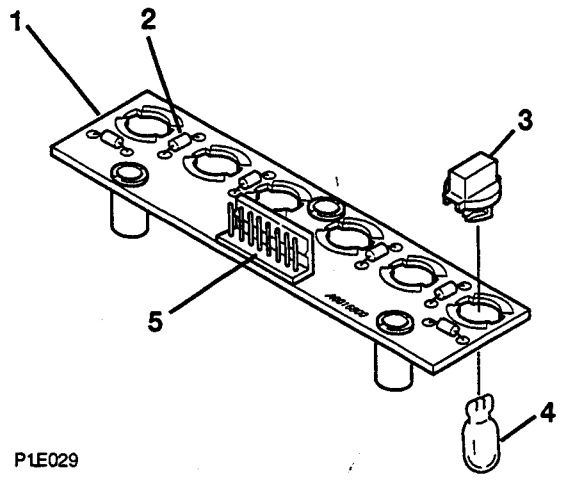
TRUNK ESCAPE LAMP ASSEMBLY A0010300



P1E028

NO.	DESCRIPTION	CAPCOM® P/N
1	PCB, LAMP, 3 LPX 0.875	B0014100
2	DIODE 1N4004 RECT 1.0A 400VR	DI00100
3	SPCKET LP WEDGE T 3 1/4" TWIST	SK00102
4	LAMP #555 6.3V WEDGE T 3 1/4"	LP00100
5	FILTER, LAMP, T 3 1/4" T/GREEN	RB00116-GT
6	FILTER, LAMP, T 3 1/4" T/WHITE	RB00116-WT
7	CONNECTOR HEADER .156 STRAIGHT 5-PIN LOCK	CN00100-05

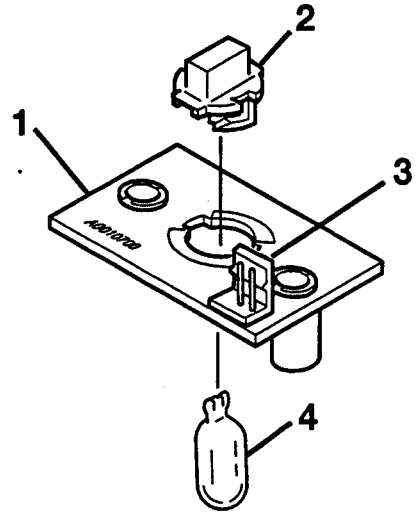
CAPTIVE BALL LAMP PCB ASSEMBLY A0016800



P1E029

NO.	DESCRIPTION	CAPCOM® P/N
1	PCB, LAMP, 6 LP X 1.562	B0016800
2	DIODE 1N4004 RECT 1.0A 400VR	DI00100
3	SOCKET LP WEDGE PCB T 3 1/4" TWIST	SK00102
4	LAMP #555 6.3V WEDGE T 3 1/4"	LP00100
5	CONNECTOR HEADER 0.156 STRAIGHT 8-PIN LOCK	CN00100-08

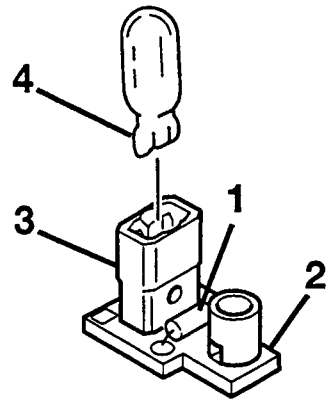
GEO DOME (2) FLASHER LAMP PCB ASSEMBLY A0010700



P1E030

NO.	DESCRIPTION	CAPCOM® P/N
1	PCB, LAMP, 1 LP FLASHER	B001440
2	SOCKET, LP WEDGE PCB T-5 TWIST	SK00103
3	CONNECTOR HEADER 0.156 STRAIGHT 3-PIN LOCK	CN00100-03
4	LAMP #906 13V, WEDGE T-5	LP00101

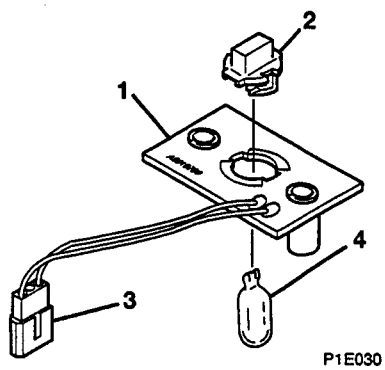
STAGE LAMP PCB ASSEMBLY A0016700



P1E034E

NO.	DESCRIPTION	CAPCOM® P/N
1	DIODE 1N4004 RECT 1.0A 400VR	DI00100
2	PCB, LAMP, 1 LP DEEP	PC00130
3	SOCKET, LP WEDGE ITH OUT BRACKET	SK00104
4	LAMP #555 6.3V, WEDGE T 3 1/4"	LP00100

STAR BUMPER FLASHER LAMP ASSEMBLY A-00427

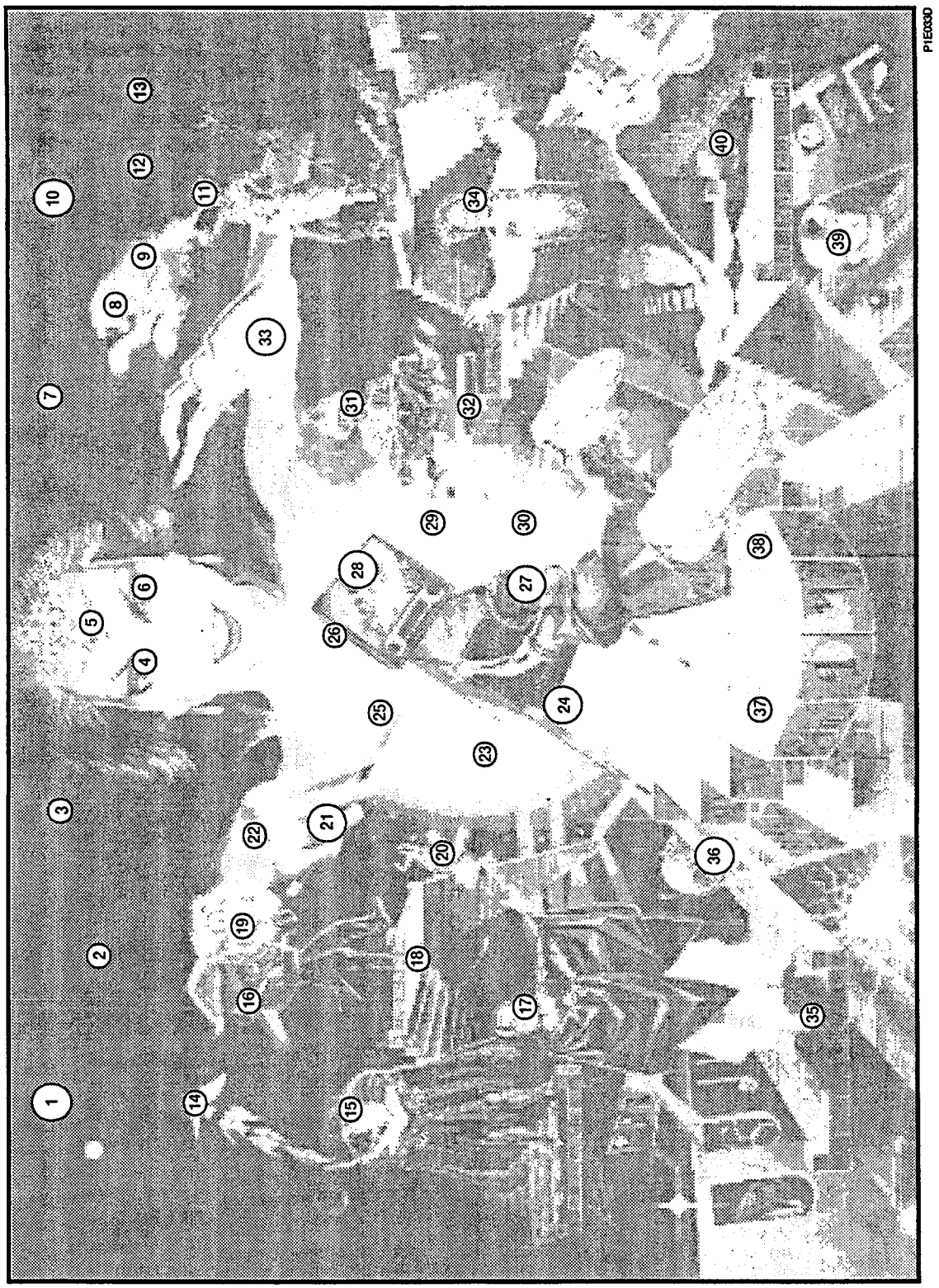


P1E030

NO.	DESCRIPTION	CAPCOM® P/N
1	PCB, LAMP, 1 LP FLASHER	B0014400
2	SOCKET, LP WEDGE PCB T-5 TWIST	SK00103
3	CABLE, LAMP	C-00149
4	LAMP #906 13V, WEDGE T-5	LP00101

NOTES

BACKBOX LAMP LOCATION

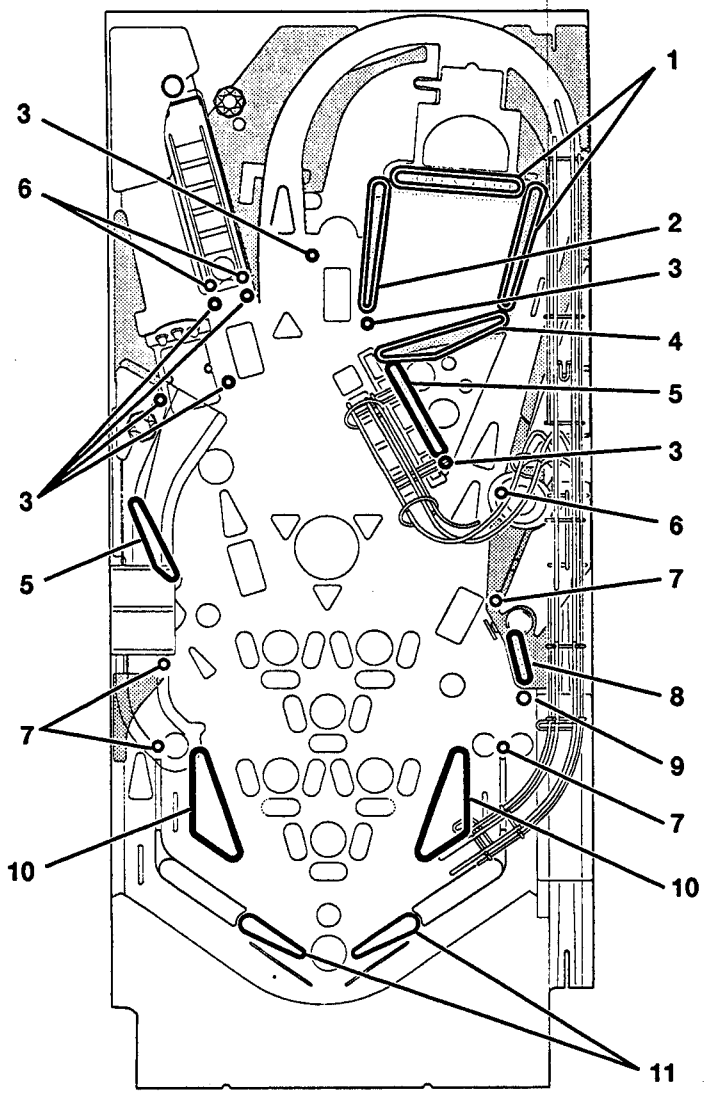


LAMP BOARD REFERENCE & PARTS LIST

BACKBOX LOCATION REFERENCE	BULB TYPE					ROW DRIVER — TO LAMP
	CIRCUIT LAMP BOARD			HARDWIRED		
	*DES.	BULB #	CAPCOM® P/N	BULB #	CAPCOM® P/N	DIODE REQUIRED
1	FL4	906	LP00101	89	LP00103	NO
2	LBD3	555	LP00100	44	LP00104	YES
3	L16	555	LP00100	44	LP00104	YES
4	LDA1	555	LP00100	44	LP00104	YES
5	L23	555	LP00100	44	LP00104	YES
6	LBD1	555	LP00100	44	LP00104	YES
7	L10	555	LP00100	44	LP00104	YES
8	L9	555	LP00100	44	LP00104	YES
9	L8	555	LP00100	44	LP00104	YES
10	FL7	906	LP00101	89	LP00103	NO
11	L7	555	LP00100	44	LP00104	YES
12	LDA2	555	LP00100	44	LP00104	YES
13	LDB2	555	LP00100	44	LP00104	YES
14	LDB4	555	LP00100	44	LP00104	YES
15	LDA4	555	LP00100	44	LP00104	YES
16	LDA3	555	LP00100	44	LP00104	YES
17	L15	555	LP00100	44	LP00104	YES
18	L14	555	LP00100	44	LP00104	YES
19	L13	555	LP00100	44	LP00104	YES
20	L17	555	LP00100	44	LP00104	YES
21	FL5	906	LP00101	89	LP00103	NO
22	L12	555	LP00100	44	LP00104	YES
23	L18	555	LP00100	44	LP00104	YES
24	FL3	906	LP00101	89	LP00103	NO
25	L24	555	LP00100	44	LP00104	YES
26	L11	555	LP00100	44	LP00104	YES
27	FL2	906	LP00101	89	LP00103	NO
28	FL1	906	LP00101	89	LP00103	NO
29	L20	555	LP00100	44	LP00104	YES
30	L19	555	LP00100	44	LP00104	YES
31	L22	555	LP00100	44	LP00104	YES
32	L21	555	LP00100	44	LP00104	YES
33	FL6	906	LP00101	89	LP00103	NO
34	L6	555	LP00100	44	LP00104	YES
35	L1	555	LP00100	44	LP00104	YES
36	FL8	906	LP00101	89	LP00103	NO
37	L2	555	LP00100	44	LP00104	YES
38	L3	555	LP00100	44	LP00104	YES
39	L4	555	LP00100	44	LP00103	YES
40	L5	555	LP00100	44	LP00103	YES

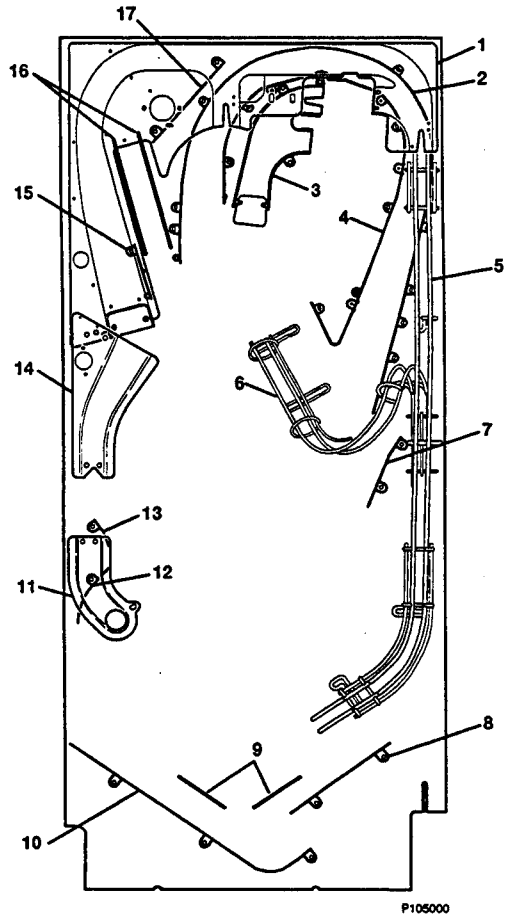
*** NOTE: IF YOUR GAME IS EQUIPPED WITH A PRINTED CIRCUIT LAMP BOARD; THESE REFERENCE DESIGNATORS (DES.) CAN BE SEEN ON THE BOARD WITH THE BACKBOX DOOR OPEN.**

LOCATION OF RUBBER RINGS & BUMPERS



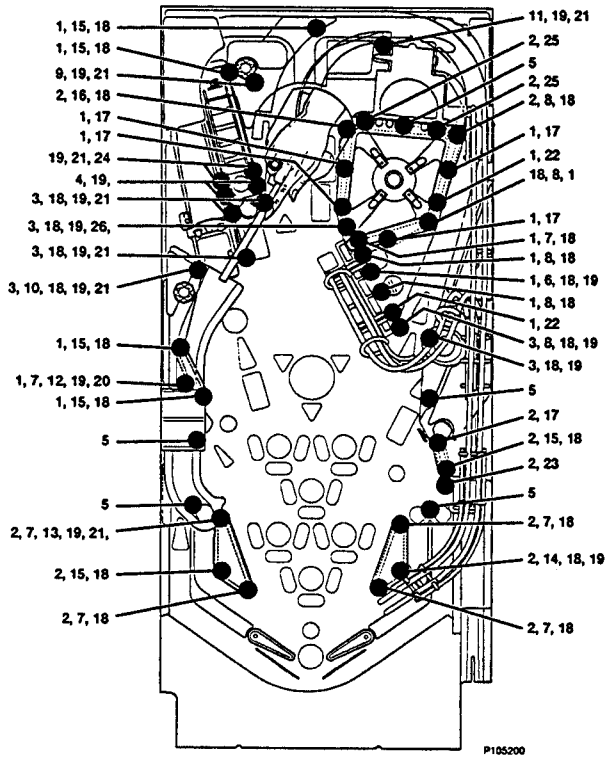
NO.	DESCRIPTION	CAPCOM® P/N
1	RUBBER RING-3" ID, WHITE	RB00108-12W
2	RUBBER RING-2 1/2" ID, WHITE	RB00108-10W
3	BUMPER RUBBER-1/4" ID, 1/2" OD, 7/8" LONG, BLACK	RB00105
4	RUBBER RING-2 3/4" ID, WHITE	RB108-11W
5	RUBBER RING-2" BLACK	RB00108-09
6	BUMPER RUBBER-1/4" ID, 7/16" OD, 1" LONG, BLACK	RB00113
7	RUBBER RING-7/16" OD,BLACK	RB00117-02
8	RUBBER RING-1 /14" ID, BLACK	RB00108-07
9	RUBBER RING-5/16" ID, BLACK	RB00108-02
10	RUBBER RING-3" ID, BLACK	RB00108-12
11	FLIPPER RUBBER RING, BLACK	RB00114-BK

LOCATION OF RAMPS & BALL GUIDES



NO.	DESCRIPTION	CAPCOM® P/N
1	BACK RAMP	A-00304-1
2	BALL GUIDE/ OUTER ORBIT	A-00171
3	STAGE RAMP	A-00168
4	BALL GUIDE/ INNER ORBIT	A-00172
5	WIREFORM FROM STAGE	WF00105
6	WIREFORM FROM START	WF00107
7	BALL GUIDE/ HAT ASSY	A-00173
8	BALL GUIDE/ BOTTOM ARCH LEFT	MT00186-L
9	FLIPPER BALL GUIDES	WF00121
10	BALL GUIDE/ BOTTOM ARCH RIGHT	MT00186-R
11	BALL TROUGH/ EXIT FROM LOCKED TRUNK	PL00180
12	BALL GUIDE/ LEFT DRAIN ASSY	A-00175
13	BALL GUIDE/ GENIE LEFT ASSY	A-00417
14	RAMP INTO LOCKED TRUNK	A-0010700
15	BALL GUIDE/ RAMP - RIGHT ASSY	A-00418
16	BALL GUIDES/ CAPTIVE BALL	WF00112-48
17	BALL GUIDE/ CAPTIVE BALL	MT00278

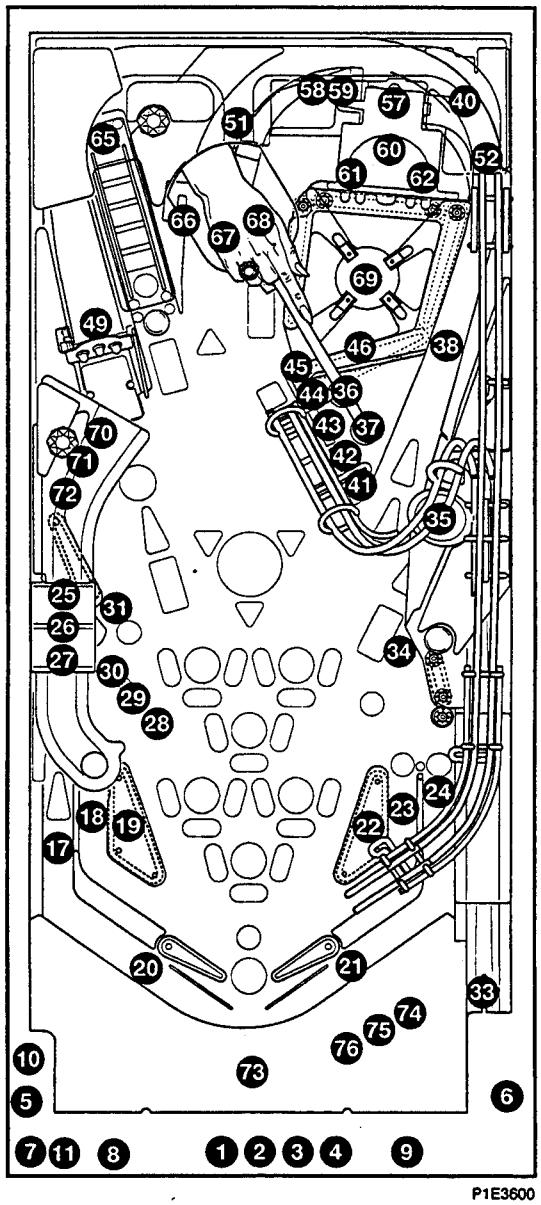
LOCATION OF PLAYFIELD POSTS



NO.	DESCRIPTION	CAPCOM® P/N
1	POST, SINGLE, 1.000, #8 HOLE, TRANS-BLUE	PL00164-BT
2	POST, BUMPER, 1.000, DIAMOND BURST, BT	PL00197-BT
3	POST, BUMPER, 1.125, M-F, 8-32 (7/8 X 1/2)	SM00145-04
4	POST, BUMPER, 1.125, M-F, 8-32 (7/8 X OMIT)	SM00145-05
5	POST, BUMPER, MINI, #8	SM00151
6	SCREW, POST, 1.125, 8-32 (1/2 X 1/2)	SM00152-02
7	SCREW, POST, 1.125, 8-32 (1/2 X 3/8)	SM00152-03
8	SCREW, POST, 1.125, 8-32 (1/2 X 7/8)	SM00152-04
9	POST, HEX, M-F, 8-32 (.50 X 5.19)	SM00154-03
10	POST, HEX, M-F, 8-32 (.50 X 1.82)	SM00154-04
11	POST, HEX, M-F, 8-32 (.50 X 1.58)	SM00154-05
12	POST, HEX, M-F, 8-32 X .612	SM00155-01
13	POST, HEX, M-F, 8-32 X 1.25	SM00155-02
14	SCREW, POST, 1.125, #8 (1/2 X 1/2) WS	SM00176-02
15	SCREW, POST, 1.125, #8 (1/2 X 3/8) WS	SM00176-03
16	SCREW, POST, 1.125, #8 (1/2 X 1.0) WS	SM00176-01
17	STS #8 X 1-1/2 PPH "AB" ZC	SC00104-12
18	NUT 8-32 STOP NYLON INS ZC	NT00104-08
19	WASHER FLAT #8 .375 "OD .032" T ZC	WS00105-05
20	MS 8-32 X 3/8 PFH ZC	SC0107-03
21	MS 8-32 X 3/8 PTH	SC00165-03
22	MS 8-32 X 1-1/2 PTH	SC00165-12
23	MS 8-32 X 2.0 PTH	SC00165-16
24	POST, HEX, M-F, 8-32 (.625 X 1.36)	SM00154-07
25	MS8-32 X1-1/2 PPH SEMS ZC	SC00101-12
26	MS 8-32 X 3/4 PTH	SC00165-06

LOCATION OF SWITCHES & OPTOS

REF. NO.	DESCRIPTION	CAPCOM® P/N
*1	COIN DOOR-CHUTE 1	**
*2	COIN DOOR-CHUTE 2	**
*3	COIN DOOR-CHUTE 3	**
*4	COIN DOOR-CHUTE 4	**
*5	LEFT FLIPPER BUTTON	SW00127
*6	RIGHT FLIPPER BUTTON	SW00127
*7	"START" BUTTON	SW00130
*8	COIN DOOR OPEN (MODE)	SW-00132
*9	COIN DOOR - SLAM TILT	SW00121
*10	TILT BOB	A-00065
*11	"CONTINUE" BUTTON	SW00131
12-16	NOT USED	----------
17	MIRACULOUS SAVE	SW00111
18	LEFT INLANE	SW00111



P1E3600

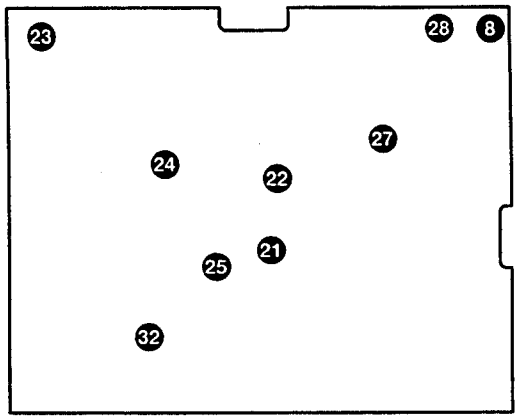
REF. NO.	DESCRIPTION	CAPCOM® P/N
19	LEFT SLINGSHOT	SW00120
20	LEFT FLIPPER EOS	SW00127
21	RIGHT FLIPPER EOS	SW00127
22	RIGHT SLINGSHOT	SW00120
23	RIGHT INLANE	SW00111
24	RIGHT OUTLANE	SW00111
25	LOCK TRUNK 1 (OPTO)	TR00104
26	LOCK TRUNK 2 (OPTO)	TR00104
27	LOCK TRUNK 3 (OPTO)	TR00104
28	GENIE 1 (OPTO)	TR00104
29	GENIE 2 (OPTO)	TR00104
30	GENIE 3 (OPTO)	TR00104
31	BONUS	SW00115
32	NOT USED	----------
33	BALL SHOOTER	SW00112
34	PRESTO CHANGO	SW00115
35	VANISH (OPTO)	TR00104
36	CRITICS TRIANGLE-TOP	SW00112
37	CRITICS TRIANGLE-BOTTOM	SW00112
38	ORBIT-RIGHT	SW00111
39	NOT USED	----------
40	ORBIT-CENTER	SW00111
41	DROP TARGET "C"	SW00106
42	DROP TARGET "I"	SW00106
43	DROP TARGET "G"	SW00106
44	DROP TARGET "A"	SW00106
45	DROP TARGET "M"	SW00106
46	STAR S	SW00126
47-48	NOT USED	----------
49	RAMP ENTRY	SW00117
50	NOT USED	----------
51	WAND ENTRY	SW00117
52	WIREFORM ENTRY	SW00117
53-56	NOT USED	----------
57	ELEVATOR LIFT-ENTRY	SW00136
58	ELEVATOR LIFT-UP	SW00136
59	ELEVATOR LIFT-DOWN	SW00136
60	STAGE (OPTO)	TR00104
61	STAGE DOOR L (OPTO)	TR00104
62	STAGE DOOR R (OPTO)	TR00104
63-64	NOT USED	TR00104
65	CAPTIVE BALL	SW00115
66	SPINNER	SW00107
67	WAND L	SW00136
68	WAND R	SW00136
69	STAR BUMPER	SW00126
70	STAND-UP TARGET 3	A00437
71	STAND-UP TARGET 2	A00437
72	STAND-UP TARGET 1	A00437
73	OUT HOLE	SW00113
74	BALL TROUGH 3 (OPTO)	TR00104
75	BALL TROUGH 2 (OPTO)	TR00104
76	BALL TROUGH 1 (OPTO)	TR00104
77-80	NOT USED	----------

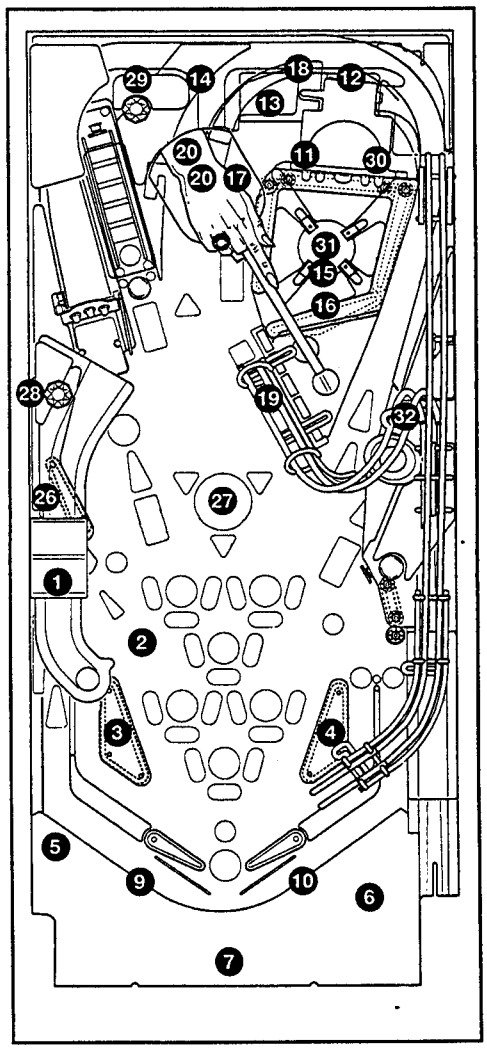
*** NOTE: SWITCH IS LOCATED IN CABINET**

**** NOTE: NOT SERVICED SEPERATELY**

LOCATION OF SOLENOIDS, MOTORS, & FLASHERS

REF NO.	DESCRIPTION	CAPCOM® P/N
1	PACKING BOX	CL00109
2	GENIE BOTTLE	CL00109
3	LEFT SLINGSHOT	CL00109
4	RIGHT SLINGSHOT	CL00109
5	MIRACULOUS SAVE	CL00109
6	TROUGH EJECT	CL00109
7	TROUGH OUTHOLE	CL00109
8	KNOCKER (BB*)	CL00109
9	LEFT FLIPPER	CL00111
10	RIGHT FLIPPER	CL00111
11	STAGE DOOR	CL00109
12	STAGE KICKER	CL00109
13	STAGE DIVERTER	CL00109
14	WAND DIVERTER	CL00109
15	STAR BUMPER	CL00109
16	UPPER SLINGSHOT	CL00109
17	WAND MOTOR	MR00106
18	STAGE MOTOR	MR00106
19	DROP TARGET RESET	CL00109
20	WAND MAGNET	CL00109
21	BACK 2 (BB*)	**
22	BACK 1 (BB*)	**
23	PINBALL (BB*)	**
24	WAND (BB*)	**
25	BACK 3 (BB*)	**
26	GENIE	**
27	MATRA MAGNA (PF*) / HAND (BB*)	**
28	PACK (PF*) / MAGIC (BB*)	**
29	SPINNER	**
30	STAGE	**
31	STAR BUMPER	**
32	SKILL (PF*) / CHAM (BB*)	**



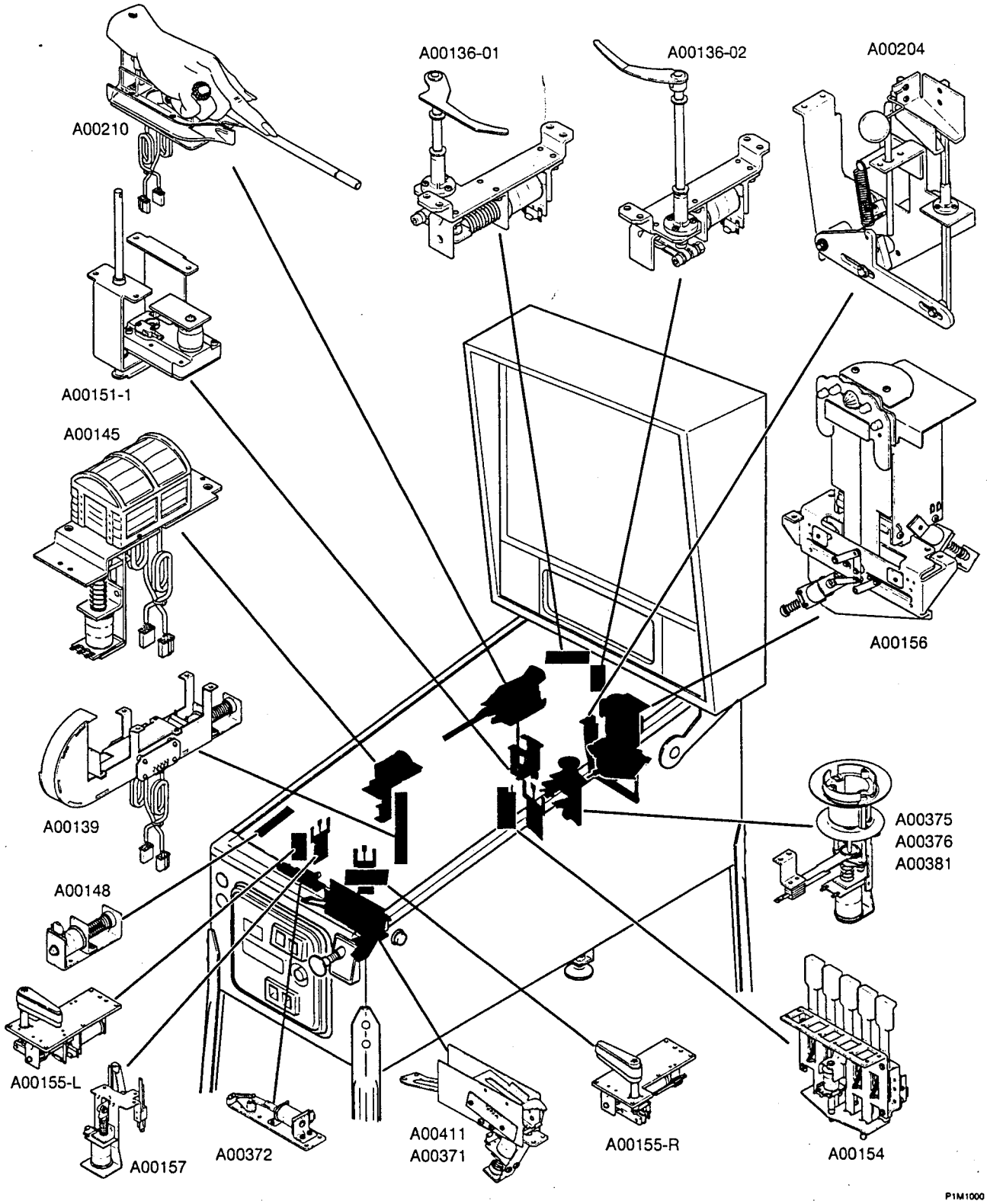


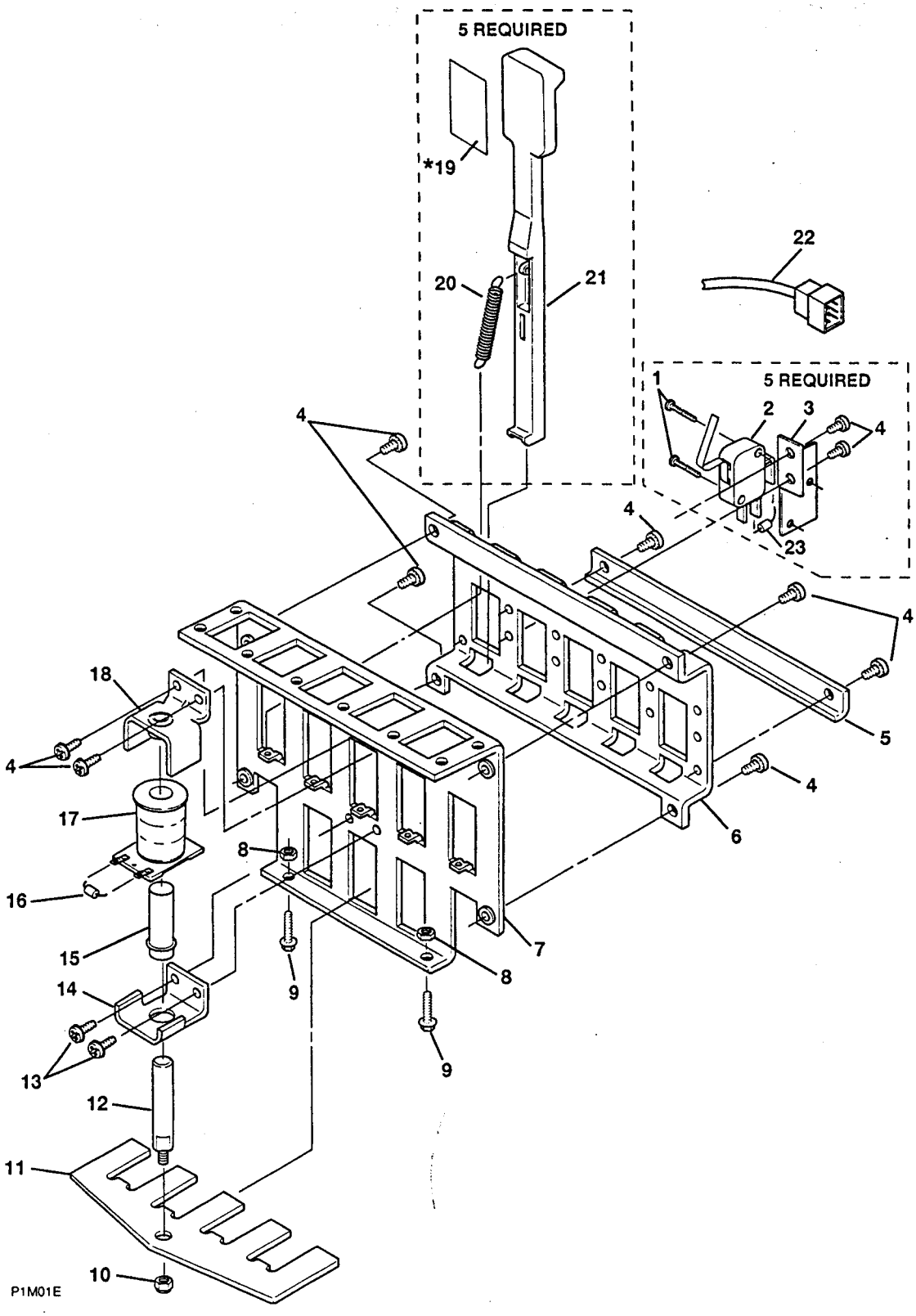
P1E3700

*NOTE: BB= BACKBOX, PF= PLAYFIELD

** LP00101 (WEDGE BASE 906) IS USED ON LAMP CIRCUIT BOARD.
LP00103 (BAYONET BASE 89) IS USED ON HARDWIRED

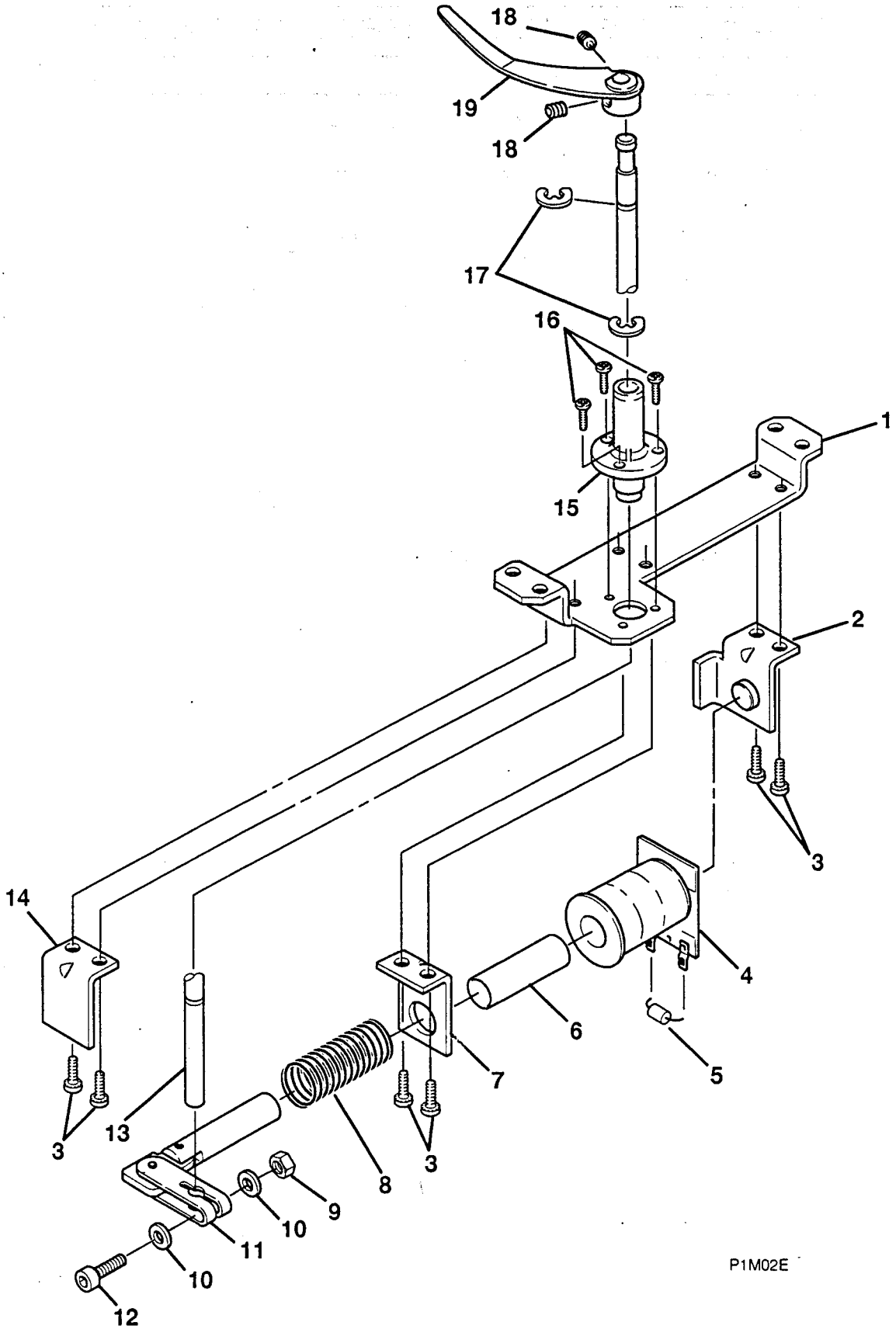
COMPONENT IDENTIFICATION - PLAYFIELD MECHANISMS





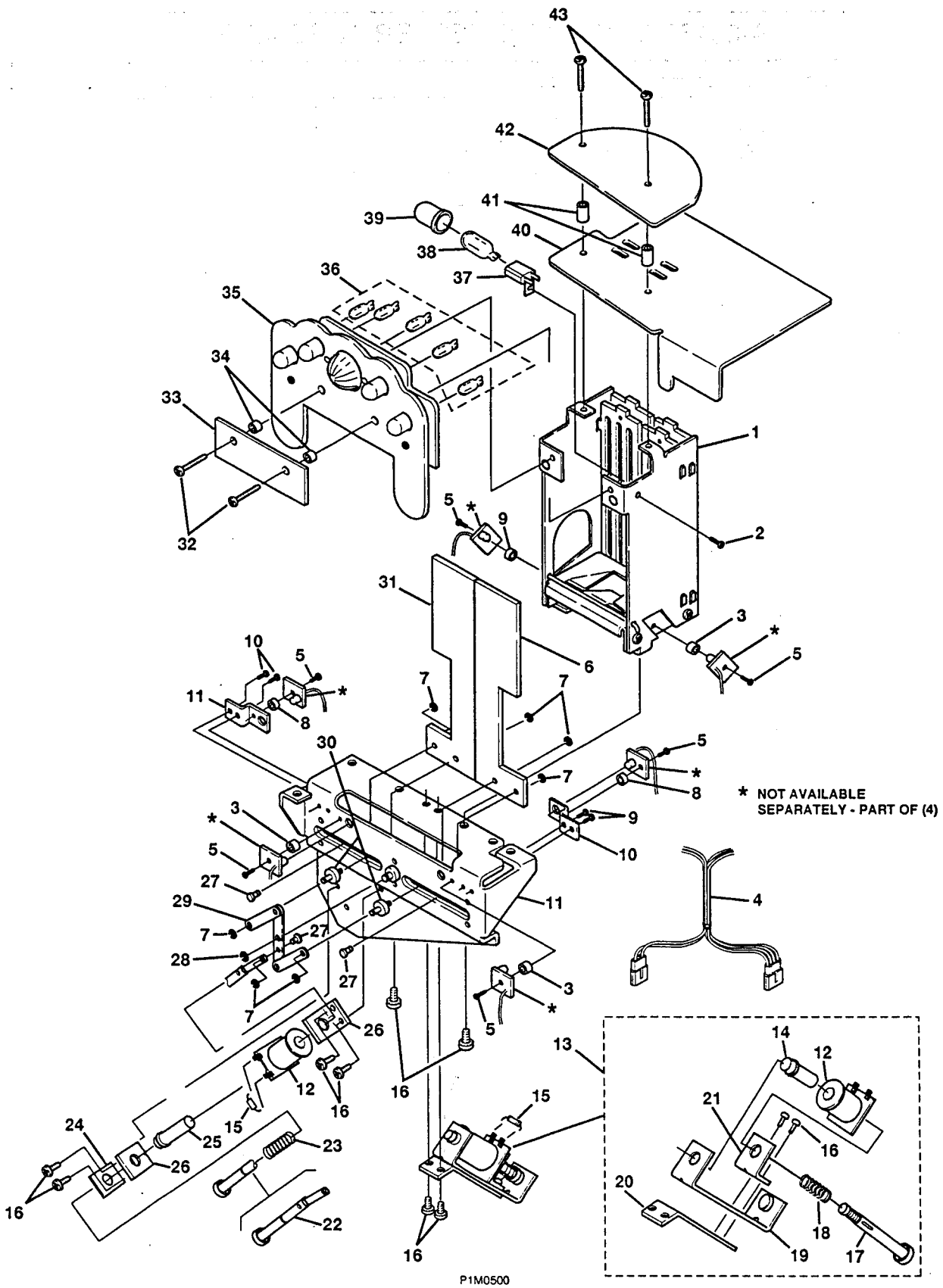
A-00154 FIVE BALL DROP TARGET ASSEMBLY			
No.	Part Number	Description	Req.
	A-00154	5B DROP TARGET ASSEMBLY	
1	SC00120-05	MS 4-40 x 5/8 PPH SEMS ZC	10
2	SW00106	SWITCH, MICRO, W/ACTUATOR	5
3	MT00212	BRKT, MICRO SWITCH MTG.	5
4	SC00101-02	MS 8-32 x 1/4 PPH SEMS ZC	18
5	MT00219	RETAINING BRKT, 5B DROP TARGET	1
6	MT00220	GUIDE BRKT, 5B DROP TARGET	1
7	A-00161	MAIN BRKT SUB ASSEMBLY	1
8	NT00101-08	NUT 8-32 KEPS HEX	2
9	SC00146-05	MS 8-32 x 5/8 PPH ZC	2
10	NT00104-11	NUT 10-32 STOP NYLON INS ZC	1
11	MT00218	LIFTER PLATE, 5B DROP TARGET	1
12	SM00118	PLUNGER W/STUD, 2.47" L	1
13	SC00102-03	MS 10-32 x 3/8 PPH SEMS ZC	2
14	MT00208	BRKT, COIL MTG.	1
15	PL00133-03	SLEEVE, COIL, 2.094" L W/.188" EXT.	1
16	DI00100	DIODE 1N4004 RECT 1.0A 400VR	1
17	CL00109	COIL 800T #23	1
18	MT00214	BRKT, PLUNGER STOP	1
*19	AW00138-1	DECAL (OPEN MOUTH)	1
20	SG00118	SPRING, EXT., .250 x .440 .016" D. WIRE	5
21	PL00148	DROP TARGET, WHITE	5
22	C00158	CABLE, 5B DROP TARGET	1
23	RS00100-34	RESISTOR 2.2K 1/4 W 5%	1

*** NOTE: DECAL NOT SUPPLIED WITH THIS ASSEMBLY.**
ORDER DECALS SEPARATELY.



A-00136-02 WAND DIVERTER ASSEMBLY

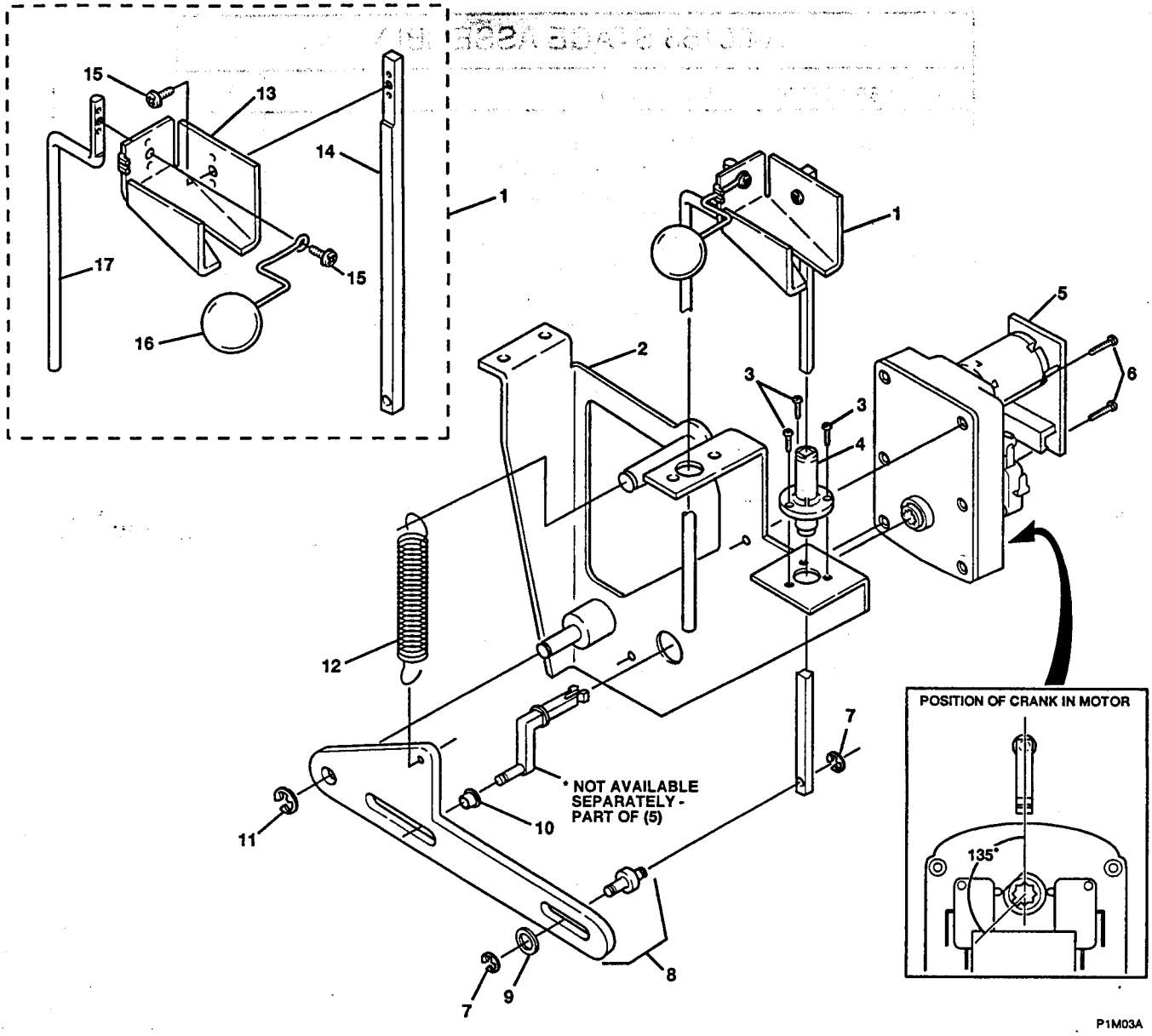
No.	Part Number	Description	Req.
	A-00136-02	WAND DIVERTER ASSEMBLY	
1	MT00181-L	BRKT, DIVERTER, R	1
2	A-00134	BRKT, COIL STOP ASSEMBLY	1
3	SC00101-02	MS 8-32 x 1/4 PPH SEMS ZC	6
4	CL00109	COIL 800T #23	1
5	DI00100	DIODE 1N4004 RECT 1.0A 400VR	1
6	PL00132-03	SLEEVE, COIL	1
7	MT00185	BRKT, COIL RETAINING	1
8	SG00104	SPRING, COMP.	1
9	NT00104-11	NUT, 10-32 STOP NYLON INS ZC	1
10	WS00100-06	WASHER, #10 FLAT	2
11	A-00135	PLUNGER/LINK & CLAMP ASSEMBLY	1
12	SC00135-07	CS 10-32 x 7/8 SH ALLOY	1
13	SM00117-02	SHAFT, DIVERTER	1
14	MT00323	BRKT, LINK STOP	1
15	PL00149	BUSHING, FLIPPER	1
16	SC00100-03	MS 6-32 x 3/8 PPH SEMS ZC	3
17	RR00100-25	E-RING FOR 0.250 D. SHAFT	2
18	SC00168	SS 1/4-20 x 1/4 SH KNURL CUP PT SL	2
19	MT00426	PADDLE ASSEMBLY	1



* NOT AVAILABLE SEPARATELY - PART OF (4)

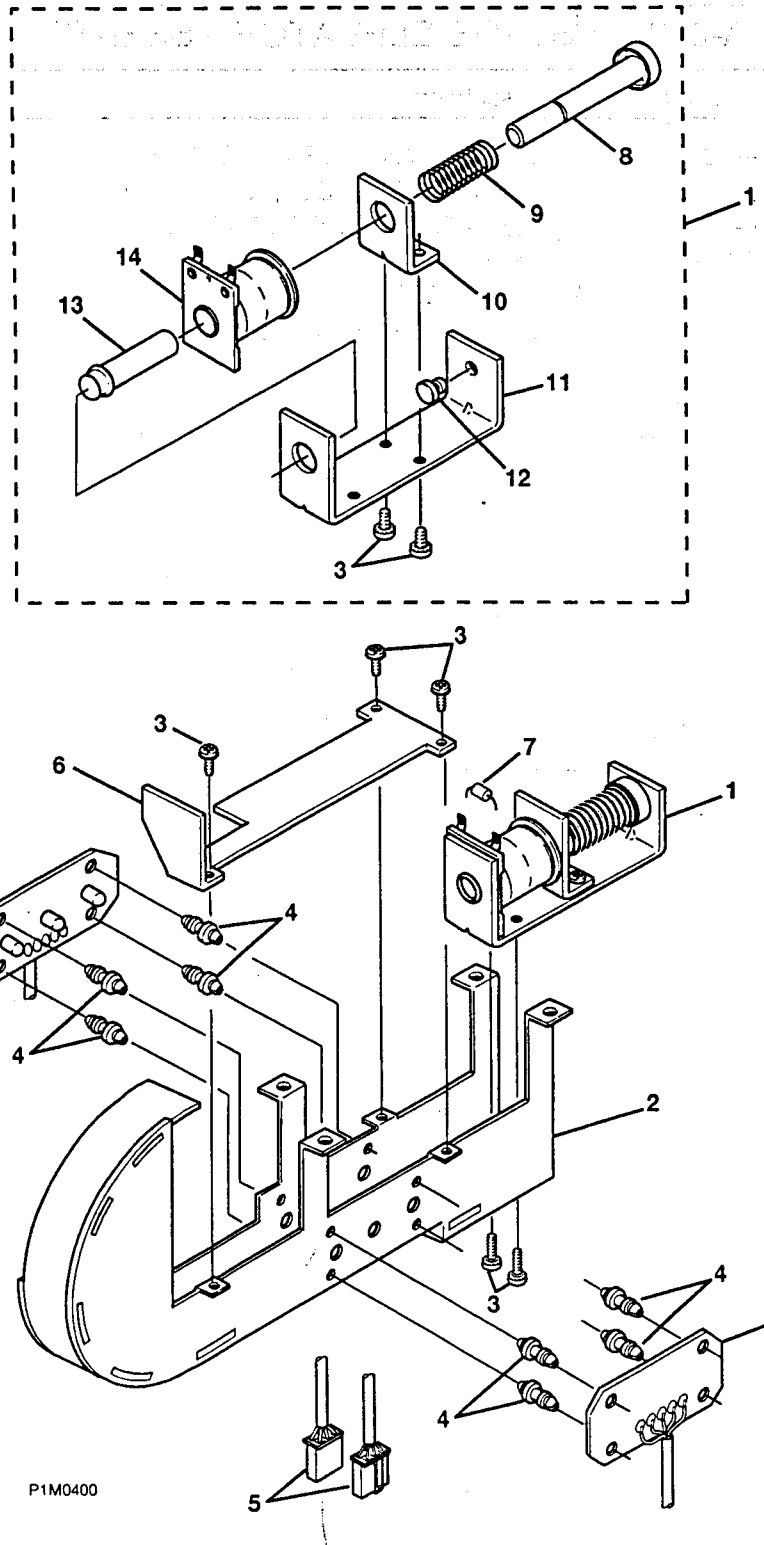
A-00156 STAGE ASSEMBLY

No.	Part Number	Description	Req.
	A-00156	STAGE ASSEMBLY	
1	A-00184	STAGEBOX ASSEMBLY	1
2	SC00100-02	MS 6-32 x 1/4 PPH SEMS ZC	1
3	PL00181-03	SPACER #4 x 1/4 SELF RET	3
4	A-00431	OPTO & CABLE ASSEMBLY	1
5	SC00120-04	MS 4-40 x 1/2 PPH SEMS ZC	6
6	AW00123-32	STAGE DOOR, L	1
7	PR00100-12	E-RING, EXT, .125" D. SHAFT	7
8	PL00181-02	SPACER #4 x 3/16 SELF RET	4
9	SC00120-02	MS 4-40 x 1/4 PPH SEMS ZC	4
10	MT00243	OPTO MOUNTING BRKT	2
11	A00188	MAIN BRKT ASSY, STAGE	1
12	CL00109	COIL 800T #23	2
13	A-00183	STAGE POPPER ASSY	1
14	PL00133-05	SLEEVE, COIL	1
15	DI00100	DIODE 1N4004 RECT 1.0A 400VR	2
16	SC00101-02	MS 8-32 x 1/4 PPH SEMS ZC	8
17	A-00821	PLUNGER & STOP ASSEMBLY	1
18	SG00103	SPRING, COMP, .63 x 2.0" L	1
19	MT00236	COIL MTG BRKT	1
20	MT00237	POPPER MTG BRKT	1
21	MT00191	COIL RET BRKT	1
22	A-00189	PLUNGER & LINK ASSY, STAGE DOOR	1
23	SG00118	SPRING, COMP, 0.600 x 1.75" CNCL	1
24	RB00112	PAD, RUBBER, 1" x 1" x 1/16" W/ADH.	1
25	PL00133-05	SLEEVE, COIL, 1.880 "L W/.188" EXT	1
26	MT00242	BRKT, COIL STOP	2
27	SM00124	SUPPORT PIN, STAGE DOOR	3
28	PR00100-18	E-RING, EXT, .188 D. SHAFT	1
29	A-00186	OPENER ASSY, STAGE DOOR	1
30	SM00126	OPENING PIN, STAGE DOOR	2
31	AW00123-33	STAGE DOOR, R	1
32	SC00100-07	MS 6-32 x 7/8 PPH SEMS ZC	2
33	AW00123-35	VALANCE, STAGE	1
34	PL00237	SPACER #4 x 1/4 SELF RET	2
35	A-00410	STAGE LIGHT PANEL ASSY	1
36	LP00106	LAMP, #555, WEDGE, 6.3 V	5
37	SK00114	SOCKET, L-BRKT, WEDGE LAMP	1
38	LP00106	LAMP, #921, WEDGE, 12.8 V	1
39	RB00122BT	FILTER, LAMP T-BLUE	1
40	AW00123-30	TOP, STAGE	1
41	PL00237-04	SPACER, #6 x 1/2 SELF RET	2
42	AW00123-31	COVER, STAGE TOP	1
43	SC00100-08	MS 6 -32 x 1.0 PPH SEMS ZC	2

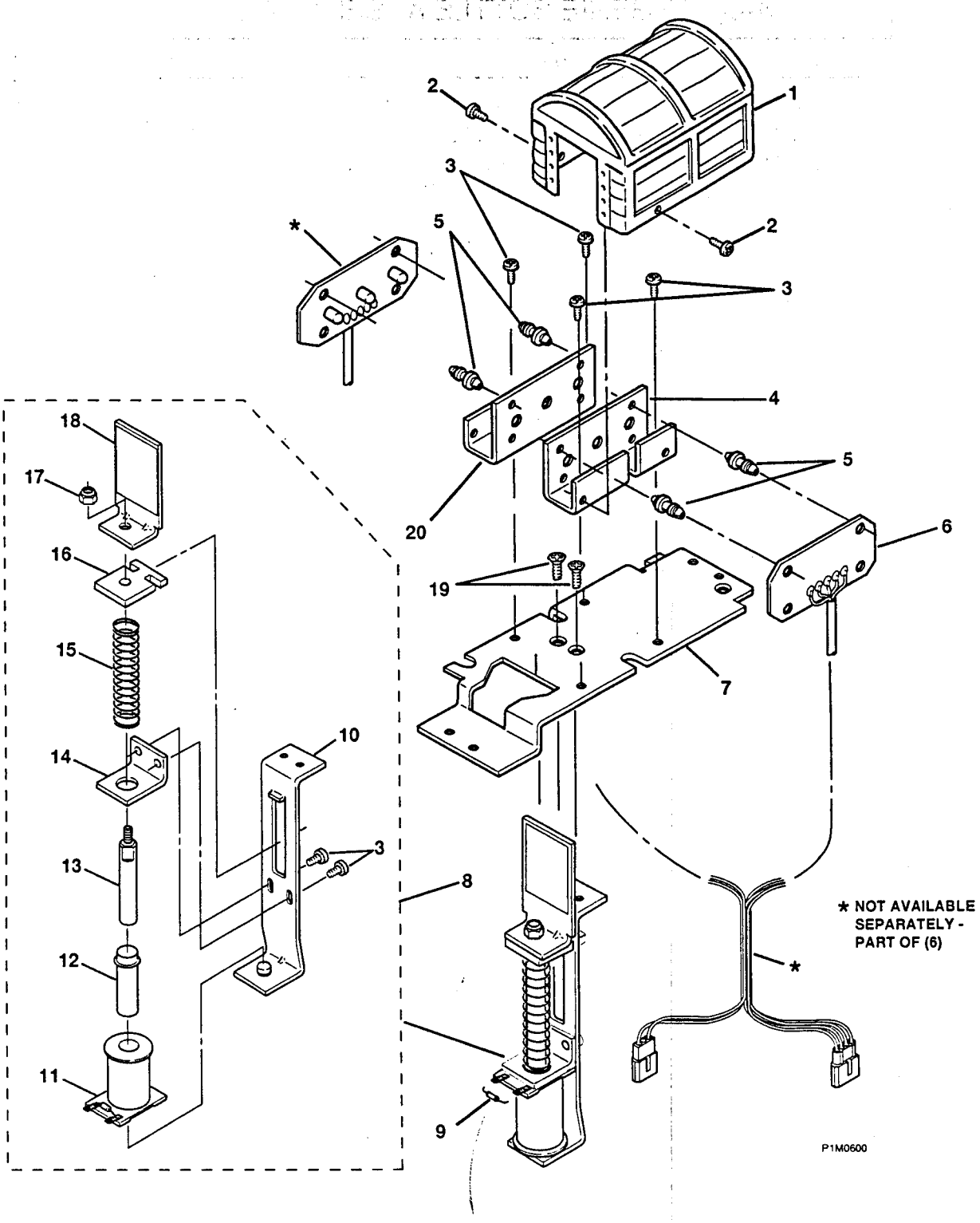


P1M03A

A-002041 STAGE ELEVATOR ASSEMBLY			
No.	Part Number	Description	Req.
	A-002041	STAGE ELEVATOR ASSEMBLY	
1	A-00385	BUCKET ASSEMBLY, ELEVATOR	1
2	A-00205	ELEVATOR MTG BRKT ASSEMBLY	1
3	SC00100-02	MS 8-32 x 1/4 PPH SEMS ZC	3
4	PL00149	BUSHING	1
5	MR00106	MOTOR, GEAR, MOLON	1
6	SC00101-06	MS 8-32 x 3/4 PPH SEMS ZC	2
7	RR00100-18	E-RING EXT .188 DIA SHAFT	2
8	A-00459-1	LIFTING ARM ASSEMBLY, ELEVATOR	1
9	WS00100-05	WASHER, FLAT .375 OD .17 ID .032 THK	1
10	PL00268	BUSHING, FLANGED, .250 I.D. x .375 L	1
11	RR00100-25	E-RING EXT .250 DIA SHAFT	1
12	SG00120	SPRING, EXT, .375 O.D. x 2.5 L	1
13	MT00254-1	BUCKET, ELEVATOR	1
14	MT00449	LIFT ROD, ELEVATOR	1
15	SC00101-03	MS 8-32 x 3/8 PPH SEMS ZC	2
16	A-00206-1	FLOATING BALL ASSEMBLY	1
17	MT00255-1	GUIDE ROD	1

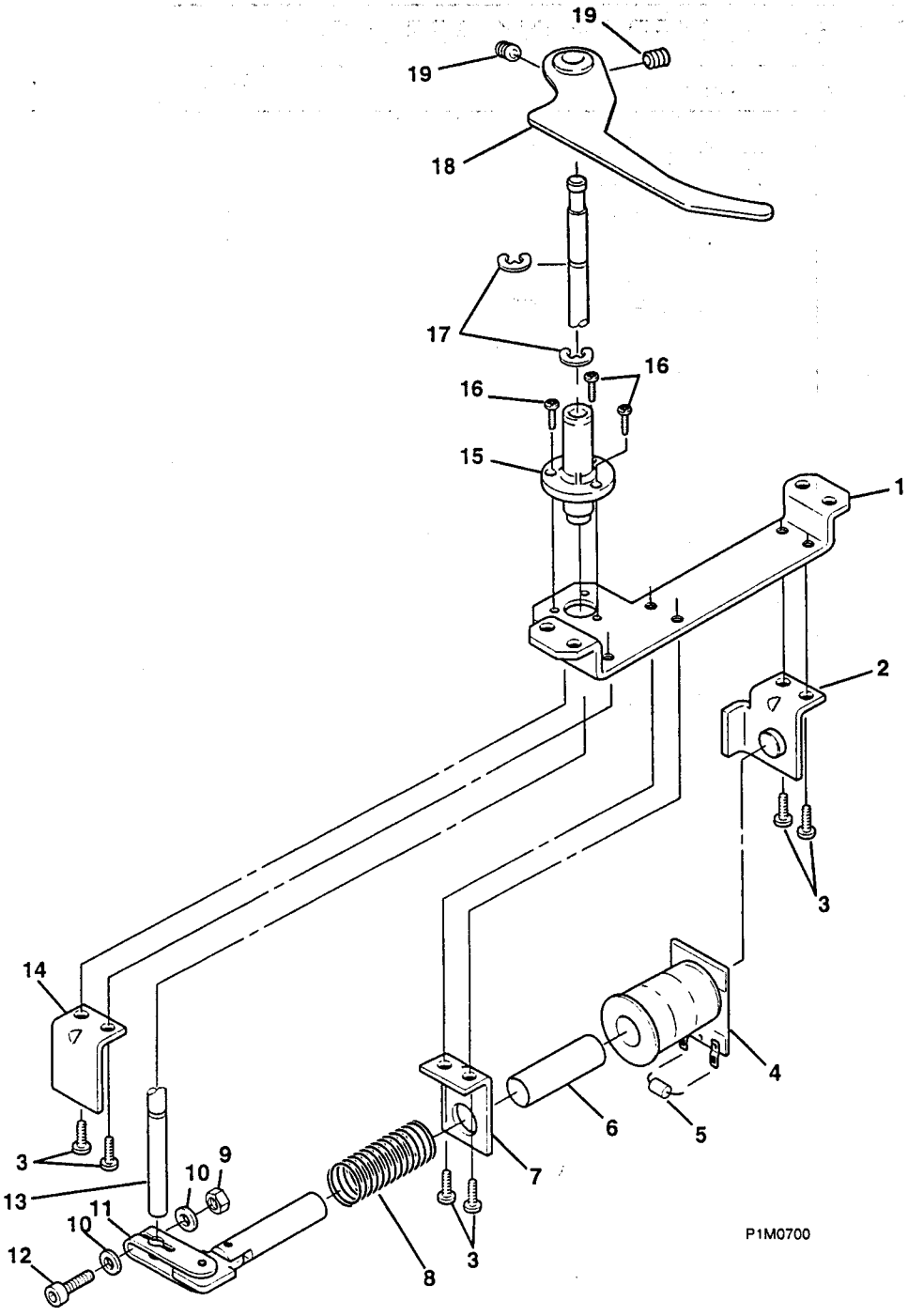


A-00139 GENIE BOTTLE ASSEMBLY			
No.	Part Number	Description	Req.
	A-00139	ASSEMBLY, GENIE BOTTLE	
1	A-00138	POPPER ASSEMBLY	1
2	A-00137	RAMP ASSEMBLY	1
3	SC00101-02	MS 8-32 x 1/4 PPH SEMS ZC	7
4	PL00242-03	SUPPORT POST, PCB, 5/16" L.	8
5	A-00390-02	OPTO & CABLE ASSEMBLY	1
6	MT00226	COVER, RAMP	1
7	DI00100	DIODE 1N4004 RECT 1.0A 400VR	1
8	A-00082	PLUNGER ASSEMBLY	1
9	SG00103	SPRING, COMP. 0.625 x 2.000	1
10	MT00191	BRKT, COIL RETAINING	1
11	MT00190	BRKT, COIL MOUNTING	1
12	RB00103	BUMPER BUTTON 5/8" D x 1/8" H	1
13	PL00133-02	SLEEVE, COIL 1.656" L	1
14	CL00109	COIL 800T #23	1

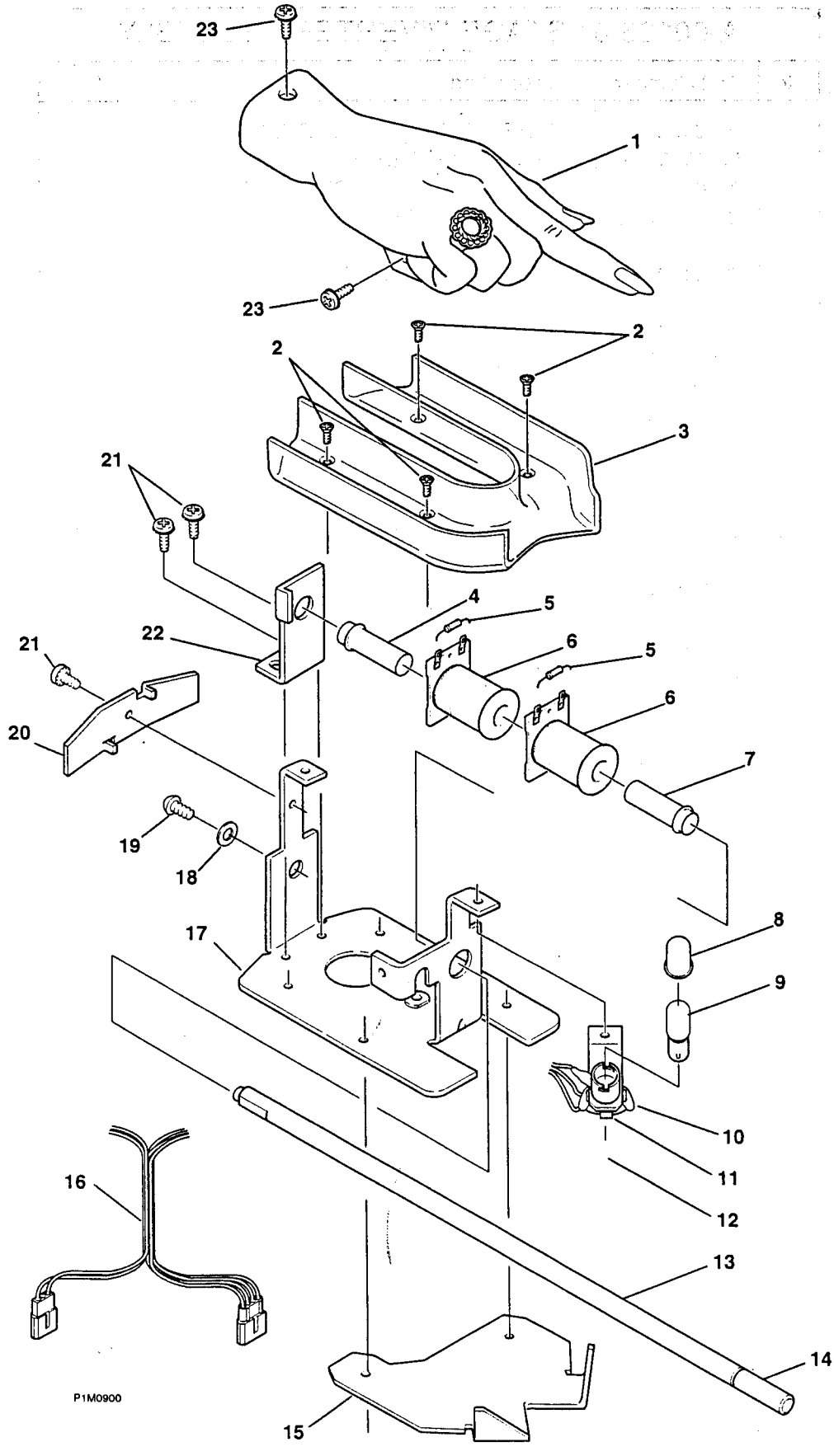


A-00145-1 LOCKED TRUNK ASSEMBLY

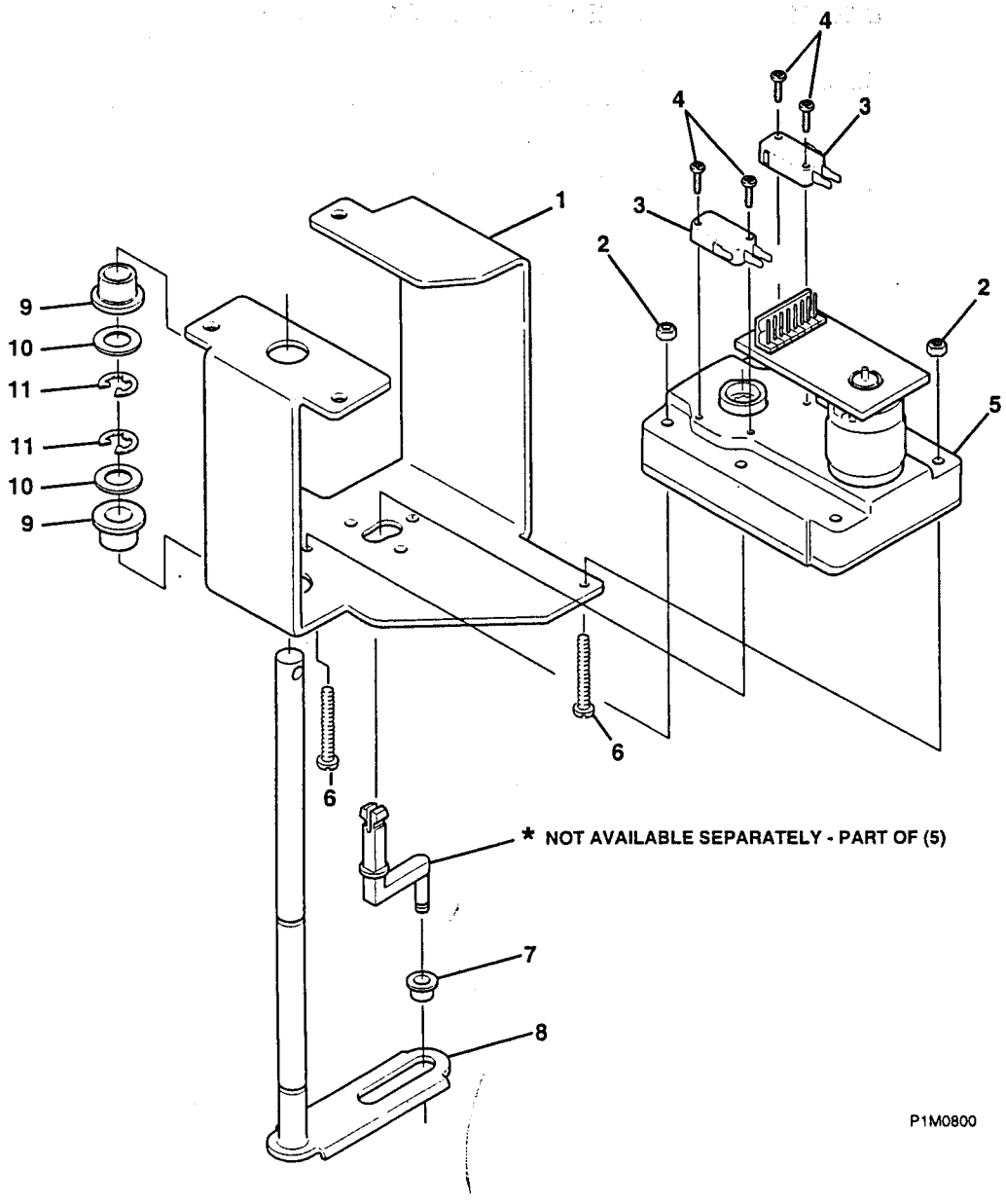
No.	Part Number	Description	Req.
	A-00145	LOCKED TRUNK ASSEMBLY	
1	PL00151	TRUNK PLASTIC	1
2	SC00127-01B	MS 6-32 x 1/8 PPH BLK	2
3	SC00101-02	MS 8-32 x 1/4 PPH SEMS ZC	4
4	MT00202-R	OPTO MTG. BRKT - R	1
5	PL00242-03	POST, SUPPORT PCB 5/16"	4
6	A-00390-1	OPTO & CABLE ASSEMBLY	1
7	MT00200	TRUNK MOUNTING BRKT	1
8	A-00144	TRUNK SUB-ASSEMBLY	1
9	DI00100	DIODE 1N4004 RECT 1.0A 400VR	1
10	A-00142-1	COIL MTG. BRKT.	1
11	CL00109	COIL 800T #23	1
12	PL00132-01	SLEEVE, COIL 1.75" L	1
13	SM00118	PLUNGER W/ STUD	1
14	MT00198	COIL RET. BRKT	1
15	SG00104	SPRING, COMP. .625 x 2.5"	1
16	PL00306	SLIDE, DOOR	1
17	NT00104-08	NUT, STOP NYL INS ZC	1
18	MT00245-1	DOOR BRKT.	1
19	SC00127-06	MS 8-32 x 5/16 PFH ZC	2
20	MT00202-L	OPTO MTG. BRKT - L	1



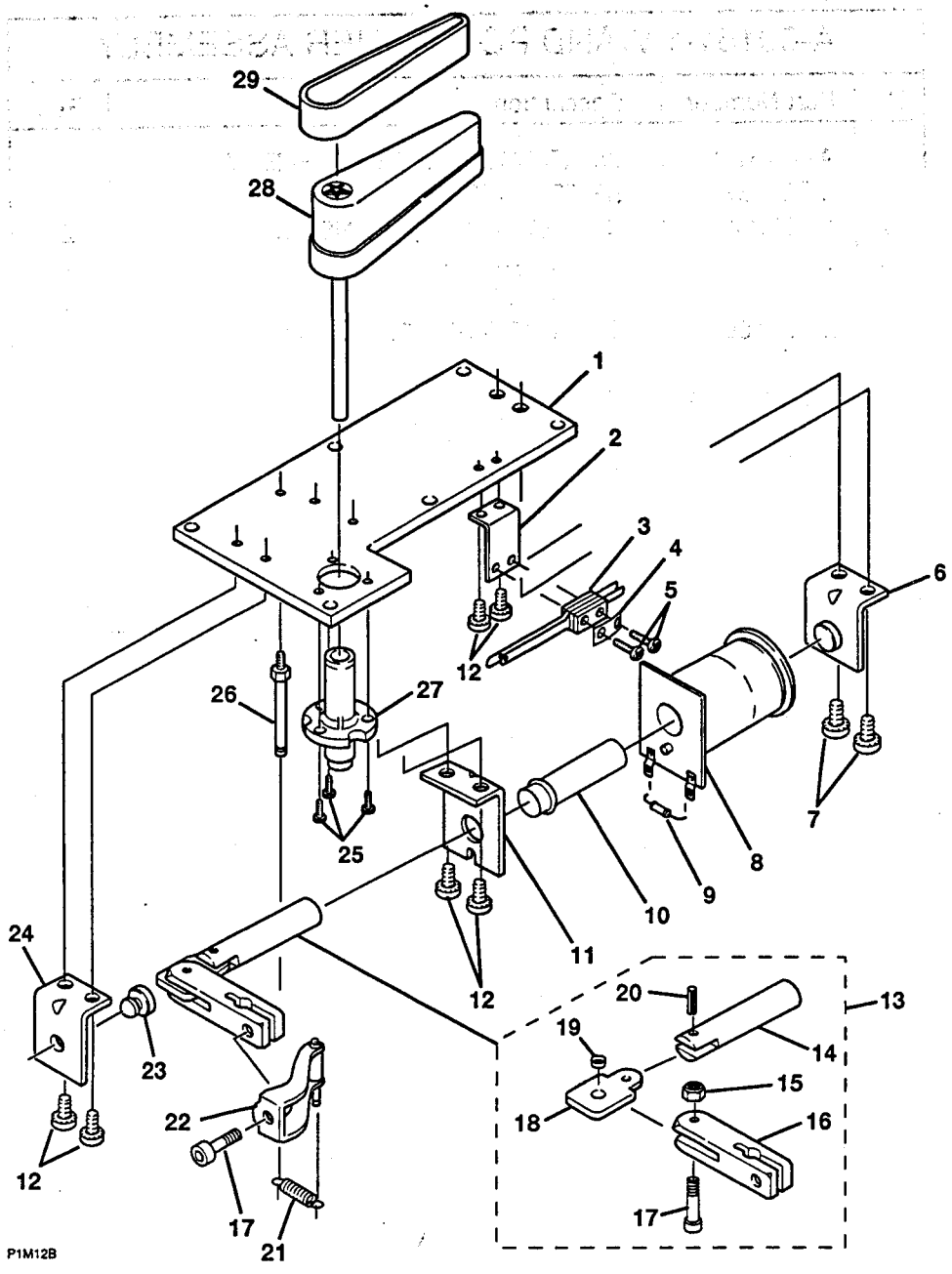
A-00136-01 STAGE DIVERTER ASSEMBLY			
No.	Part Number	Description	Req.
	A-00136-01	STAGE DIVERTER ASSEMBLY	
1	MT00181-R	BRKT, DIVERTER, R	1
2	A-00134	BRKT, COIL STOP ASSEMBLY	1
3	SC00101-02	MS 8-32 x 1/4 PPH SEMS ZC	6
4	CL00109	COIL 800T #23	1
5	DI00100	DIODE 1N4004 RECT 1.0A 400VR	1
6	PL00132-03	SLEEVE, COIL	1
7	MT00185	BRKT, COIL RETAINING	1
8	SG00104	SPRING, COMP.	1
9	NT00104-11	NUT, 10-32 STOP NYLON INS ZC	1
10	WS00100-06	WASHER, #10 FLAT	2
11	A-00135	PLUNGER/LINK & CLAMP ASSEMBLY	1
12	SC00135-07	CS 10-32 x 7/8 SH ALLOY	1
13	SM00117-01	SHAFT, DIVERTER	1
14	MT00323	BRKT, LINK STOP	1
15	PL00149	BUSHING, FLIPPER	1
16	SC00100-03	MS 6-32 x 3/8 PPH SEMS ZC	3
17	RR00100-25	E-RING FOR 0.250 D. SHAFT	2



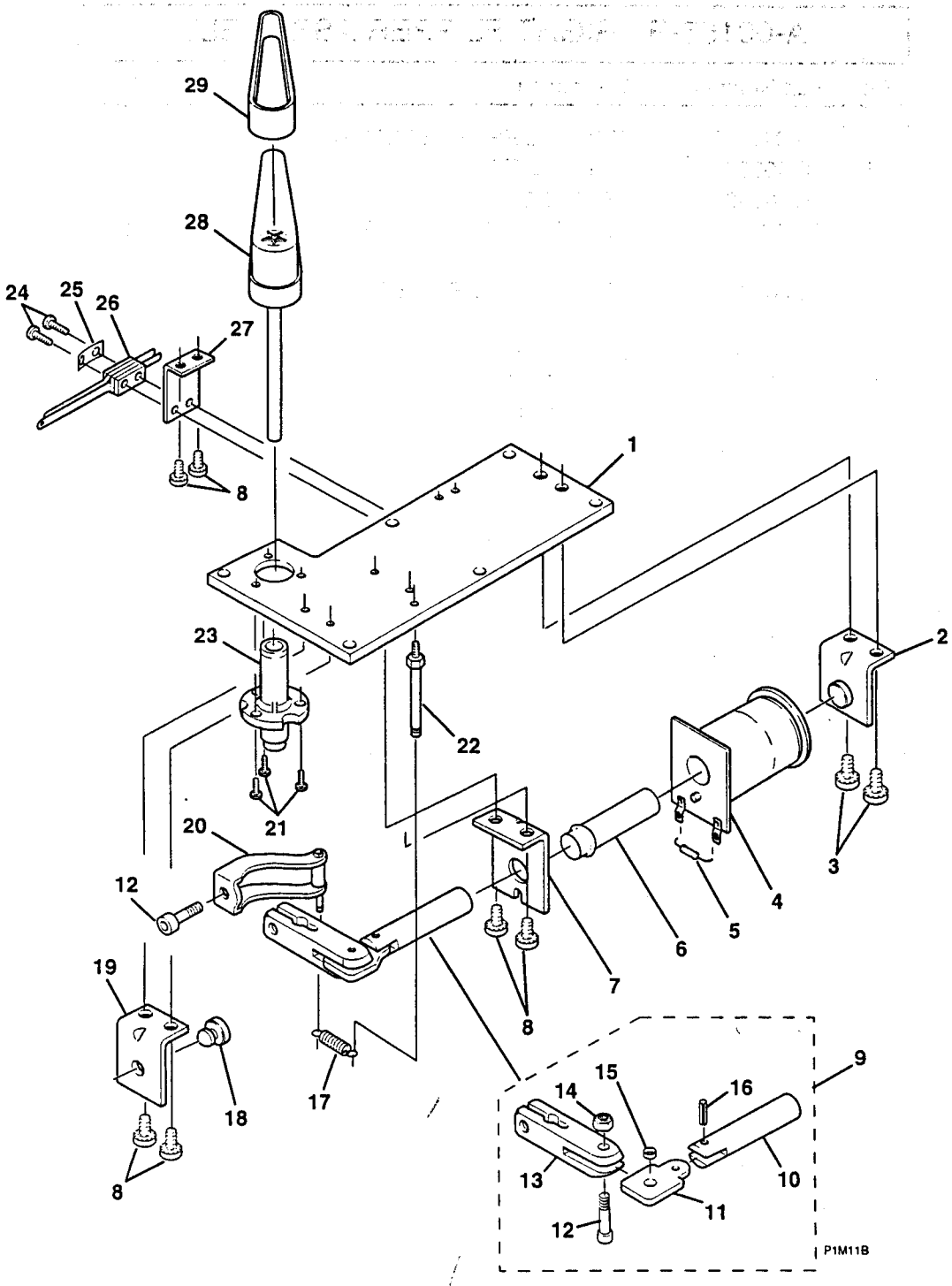
A-00210 WAND ASSEMBLY			
No.	Part Number	Description	Req.
	A-00210	WAND ASSEMBLY	
1	PL00207	HAND, WAND	1
2	SC00107-02	MS 8-32 x 1/4 PFH ZC	4
3	A-00426	RAMP, WAND ISLAND	1
4	PL00154-02	SLEEVE, 1.500 L W/.250 EXT	1
5	DI00100	DIODE 1N4004 RECT 1.0A 400VR	2
6	CL00100	COIL, 1200T #26	2
7	PL00133-02	SLEEVE, 1.656 L W/.188 EXT	1
8	RB00116-GT	FILTER, LAMP T-3, 1/4, T-GREEN	1
9	LP00104	LAMP #44 6.3V MINI BAY, T-3 1/4	1
10	SK00109	SOCKET LP MINI BAY, BENT	1
11	DI00100	DIODE IN4004 RECT 1.0A 400VR	1
12	SC00100-02	MS 6-32 x 1/4 PPH SEMS ZC	1
13	SM00138	ROD, WAND	1
14	PL00128	INSERT	1
15	MT00457-1	PLATE, EXIT RAMP	1
16	C00141	CABLE, WAND	1
17	A-00209	BASE PLATE, WAND	1
18	WS00100-05	WASHER, FLAT #8 .375 OD .032 T	1
19	SC00144-03	MS 8-32 x 3/8 PPH NYLOCK ZC	1
20	MT00459	PLATE, BALL DEFLECTOR	1
21	SC00101-02	MS 8-32 x 1/4 PPH SEMS ZC	3
22	MT00262	BRKT, COIL MTG	1
23	SC00101-04	MS 8-32 x 1/2 PPH SEMS ZC	2



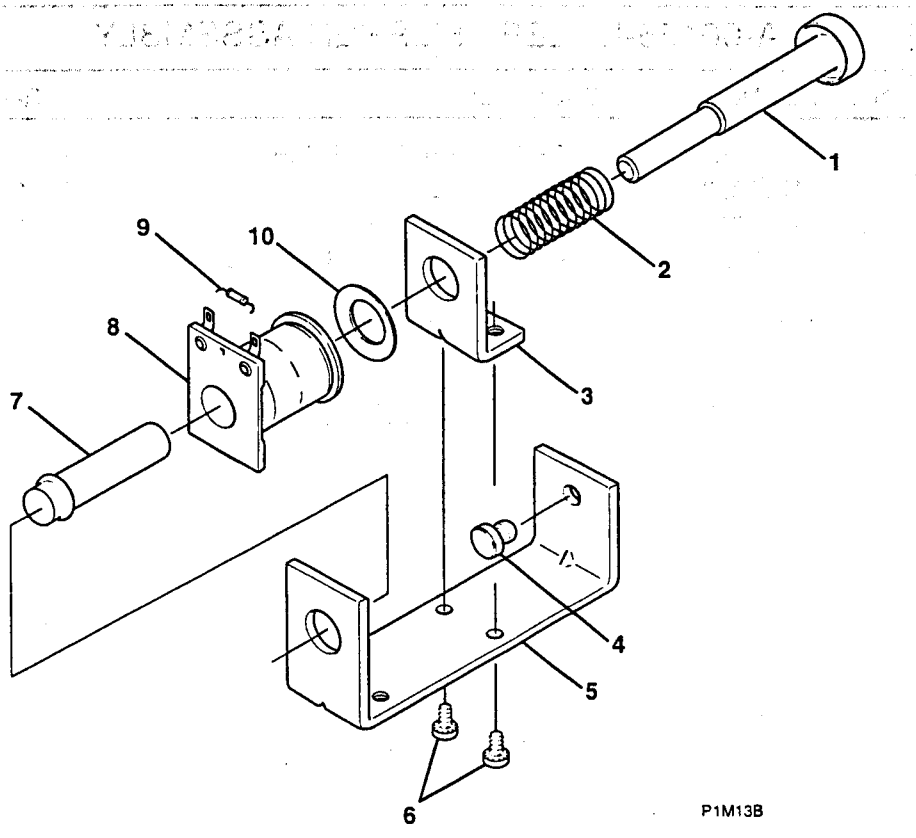
A-00151-1 WAND POSITIONER ASSEMBLY			
No.	Part Number	Description	Req.
	A-00151-1	WAND POSITIONER ASSEMBLY	
1	MT00387	BRKT, MOTOR MOUNTING	1
2	NT00104-04	NUT, STOP 4-40 NYL INS ZC	2
3	SW00136	MICRO SWITCH	2
4	SC00117-04	MS 4-40 x 1/2 PFH	2
5	MR00106	GEAR MOTOR, DC, MOLON	1
6	SC00120-04	MS 4-40 x 7/8 PPH SEMS ZC	2
7	PL00268	BUSHING, FLANGED .250 ID x .375L	1
8	A-00382-1	ARM & SHAFT ASSEMBLY	1
9	PL00269	BUSHING, FLANGED .375 ID x .500L	2
10	WS00100-19	WASHER, 3/8 SAE 16 GA.	2
11	RR00100-37	E-RING, EXT .375 DIA SHAFT	2



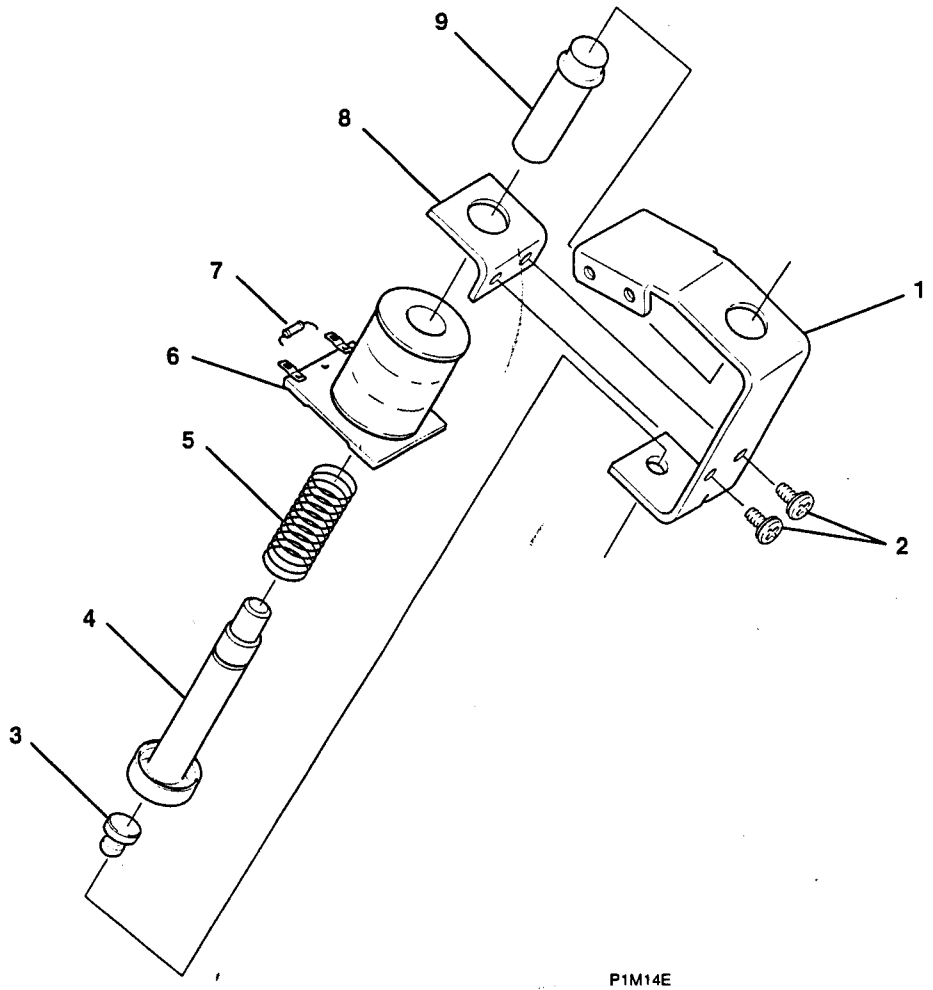
A-00155-R RIGHT FLIPPER ASSEMBLY			
No.	Part Number	Description	Req.
	A-00155-R	RIGHT FLIPPER ASSEMBLY	
1	MT00388	BASE PLATE	1
2	MT00392	BRKT. SWITCH MTG	1
3	SW00127	LEAF SWITCH, FLIPPER	1
4	MT00461-1	PLATE, SWITCH	2
5	SC00100-05	MS 6-32 x 5/8 PPH SEMS ZC	2
6	A-00378	BRKT. COIL STOP	1
7	SC00160-26	MS 8-32 x 5/16 PPH SEMS ZC	2
8	CL00111	COIL 1100T #22	1
9	DI00100	DIODE 1N4004 1.0 A 400VR	1
10	PL00132-05	SLEEVE, COIL 2.218 L	1
11	MT00390	BRKT. COIL RETAINING	1
12	SC00101-02	MS 8-32 x 1/4 PPH SEMS ZC	6
13	A-00429-R	PLUNGER/LINK/CLAMP ASSEMBLY - R	1
14	SM00183	PLUNGER	1
15	NT00104-11	NUT, 10-32 STOP, NYLON ZC	1
16	MT00394	CLAMP, SHAFT	1
17	SC00135-06	CS 10-32 x 3/4 SH ALLOY ZC	2
18	PL00202	LINK, PLUNGER	1
19	SM00184	BUSHING, PLUNGER LINK	1
20	RP00102-01	ROLL PIN, 5/32 x 3/8	1
21	SG00111	SPRING, EXT. 0.200 x 1.063 L	1
22	A-00425-R	ACTUATOR ASSEMBLY - R	1
23	RB00103	BUMPER, BUTTON 5/8 D x 1/8 H	1
24	MT00389	BRKT. PLUNGER SUPPORT.	1
25	SC00100-26	MS 6-32 x 5/16 PPH SEMS ZC	3
26	SM00191	POST, SPRING MTG	1
27	PL00264	BUSHING, FLIPPER	1
28	A-00217-Y	PADDLE, FLIPPER, YELLOW	1
29	RB00114-BK	RUBBER, PADDLE, BLACK	1



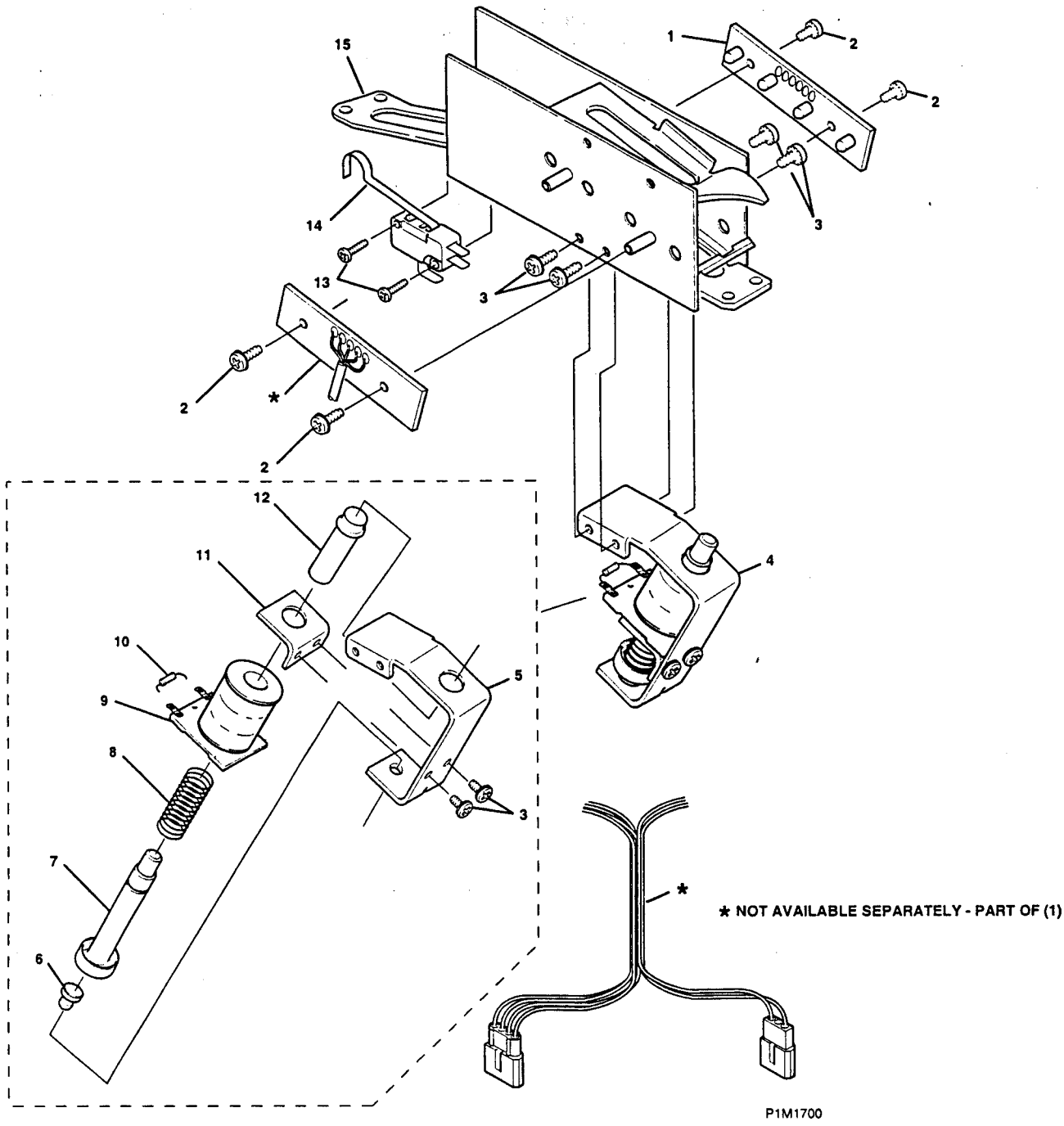
A-00155-L LEFT FLIPPER ASSEMBLY			
No.	Part Number	Description	Req.
	A-00155-L	RIGHT FLIPPER ASSEMBLY	
1	MT00388	BASE PLATE	1
2	A-00378	BRKT. COIL STOP	1
3	SC00160-26	MS 8-32 x 5/16 PPH SEMS ZC	2
4	CL00111	COIL 1100T #22	1
5	DI00100	DIODE 1N4004 1.0 A 400VR	1
6	PL00132-05	SLEEVE, COIL 2.218 L	2
7	MT00390	BRKT. COIL RETAINING	1
8	SC00101-02	MS 8-32 x 1/4 PPH SEMS ZC	6
9	A-00429-L	PLUNGER/LINK/CLAMP ASSEMBLY - L	1
10	SM00183	PLUNGER	1
11	PL00202	LINK, PLUNGER	1
12	SC00135-06	CS 10-32 x 3/4 SH ALLOY ZC	2
13	MT00394	CLAMP, SHAFT	2
14	NT00104-11	NUT, 10-32 STOP, NYLON ZC	1
15	SM00184	BUSHING, PLUNGER LINK	1
16	RP00102-01	ROLL PIN, 5/32 x 3/8	1
17	SG00111	SPRING, EXT. 0.200 x 1.063 L	1
18	RB00103	BUMPER, BUTTON 5/8 D x 1/8 H	1
19	MT00389	BRKT. PLUNGER SUPPORT	1
20	A-00425-L	ACTUATOR ASSEMBLY - L	1
21	SC00100-26	MS 6-32 x 5/16 PPH SEMS ZC	3
22	SM00191	POST, SPRING MTG.	1
23	PL00264	BUSHING, FLIPPER	1
24	SC00100-05	MS 6-32 x 5/8 PPH SEMS ZC	2
25	MT00461-1	PLATE, SWITCH	1
26	SW00127	LEAF SWITCH, FLIPPER	1
27	MT00392	BRKT. SWITCH MTG	1
28	A-00217-Y	PADDLE, FLIPPER, YELLOW	1
29	RB00114-BK	RUBBER, PADDLE, BLACK	1



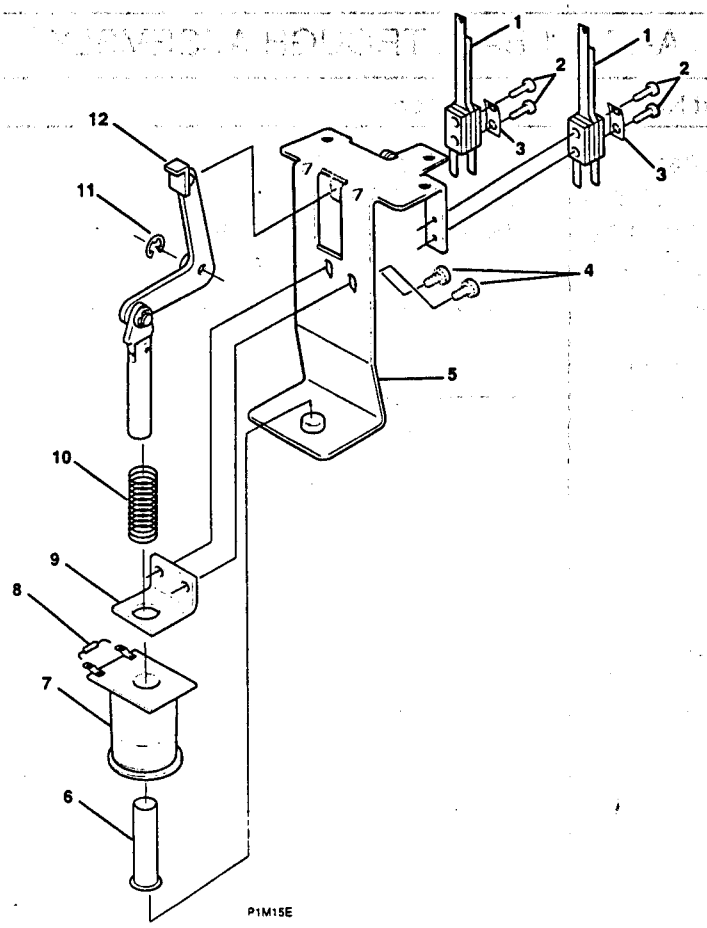
A-00148 KICKBACK ASSEMBLY			
No.	Part Number	Description	Req.
	A-00148	KICKBACK ASSEMBLY	
1	A-00147	PLUNGER & TIP ASSEMBLY	1
2	SG00105	SPRING COMP. 0.700 x 1.625	1
3	MT00136	BRKT, COIL RETAINING	1
4	RB00110	BUTTON, BUMPER	1
5	MT00203	BRKT, COIL MTG.	1
6	SC00101-02	MS 8-32 x 1/4 PPH SEMS ZC	2
7	PL00154	SLEEVE, COIL 1.810 L W/.250 EXT.	1
8	CL00109	COIL 800T #23	1
9	DI00100	DIODE 1N4004 RECT 1.0A 400VR	1
10	WS00107-02	SPRING WASHER	1



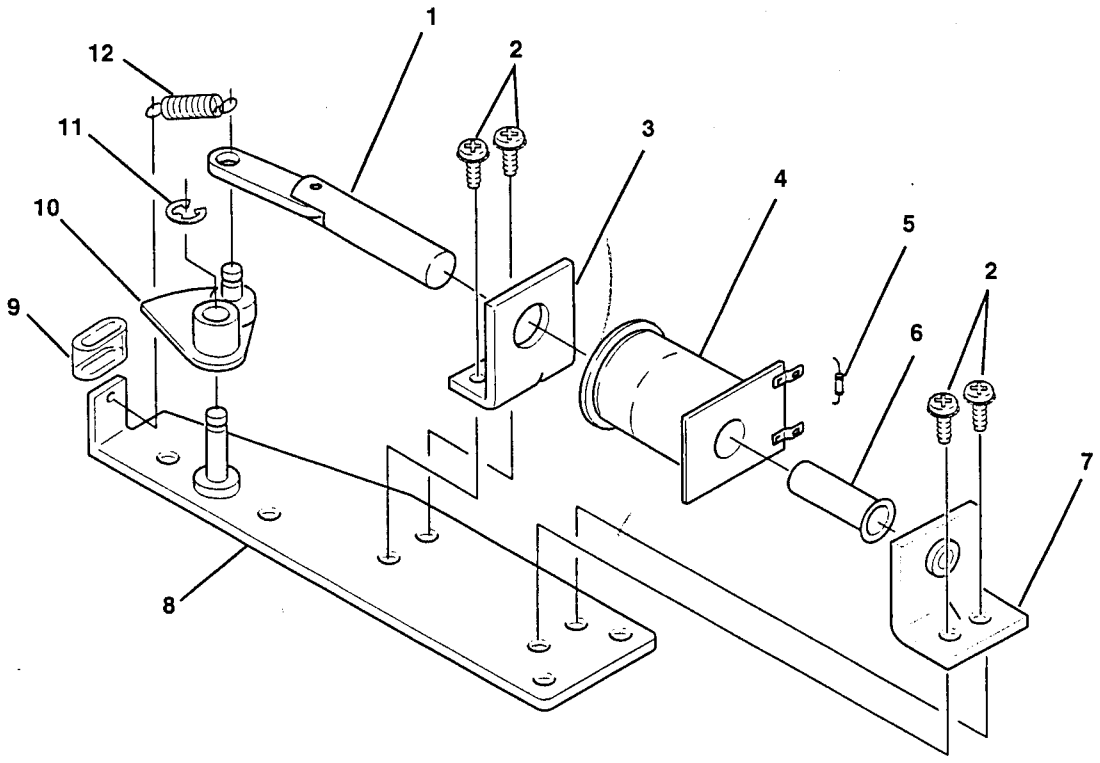
A-00371 BALL KICKER ASSEMBLY			
No.	Part Number	Description	Req.
	A-00371	BALL KICKER ASSEMBLY	
1	MT00378	BRKT, BALL KICKER	1
2	SC00101-02	MS 8-32 x 1/4 PPH SEMS ZC	2
3	RB00103	BUTTON, BUMPER	1
4	A-00369	PLUNGER & TIP ASSEMBLY	1
5	SG00103	SPRING, COMP. 0.625 x 2.000 L	1
6	CL00109	COIL 800T #23	1
7	DI00100	DIODE 1N4004 RECT 1.0A 400VR	1
8	MT00191	BRKT, COIL RETAINING	1
9	PL00133	SLEEVE, COIL W/ 0.188 EXT.	1



A-00411 BALL TROUGH ASSEMBLY			
No.	Part Number	Description	Req.
	A-00411	BALL TROUGH ASSEMBLY	
1	A-0015700-3	OPTO ASSEMBLY	1
2	SC00100-02	MS 6-32 x 1/4 PPH SEMS ZC	4
3	SC00100-03	MS 8-32 x 3/8 PPH SEMS ZC	4
4	A-00371	KICKER ASSEMBLY, BALL TROUGH	1
5	MT00378	BRKT, KICKER ASSEMBLY	1
6	RB00103	BUTTON, BUMPER	1
7	A00369	PLUNGER/TIP ASSEMBLY	1
8	SG00103	SPRING, COMP	1
9	CL00109	COIL, 800 #23	1
10	DI00100	DIODE 1N4004 RECT 1.0A 400VR	1
11	MT00191	BRKT, COIL RETAINING	1
12	PL00133-05	SLEEVE, COIL 1.880" L W/ .188 EXT	1
13	SC00120-06	MS 4-40 x 3/4 PPH SEMS ZC	2
14	SW00113	MICRO SWITCH W/ ACTIVATOR	1
15	A-00370	TROUGH WELDMENT SUB ASSEMBLY	1

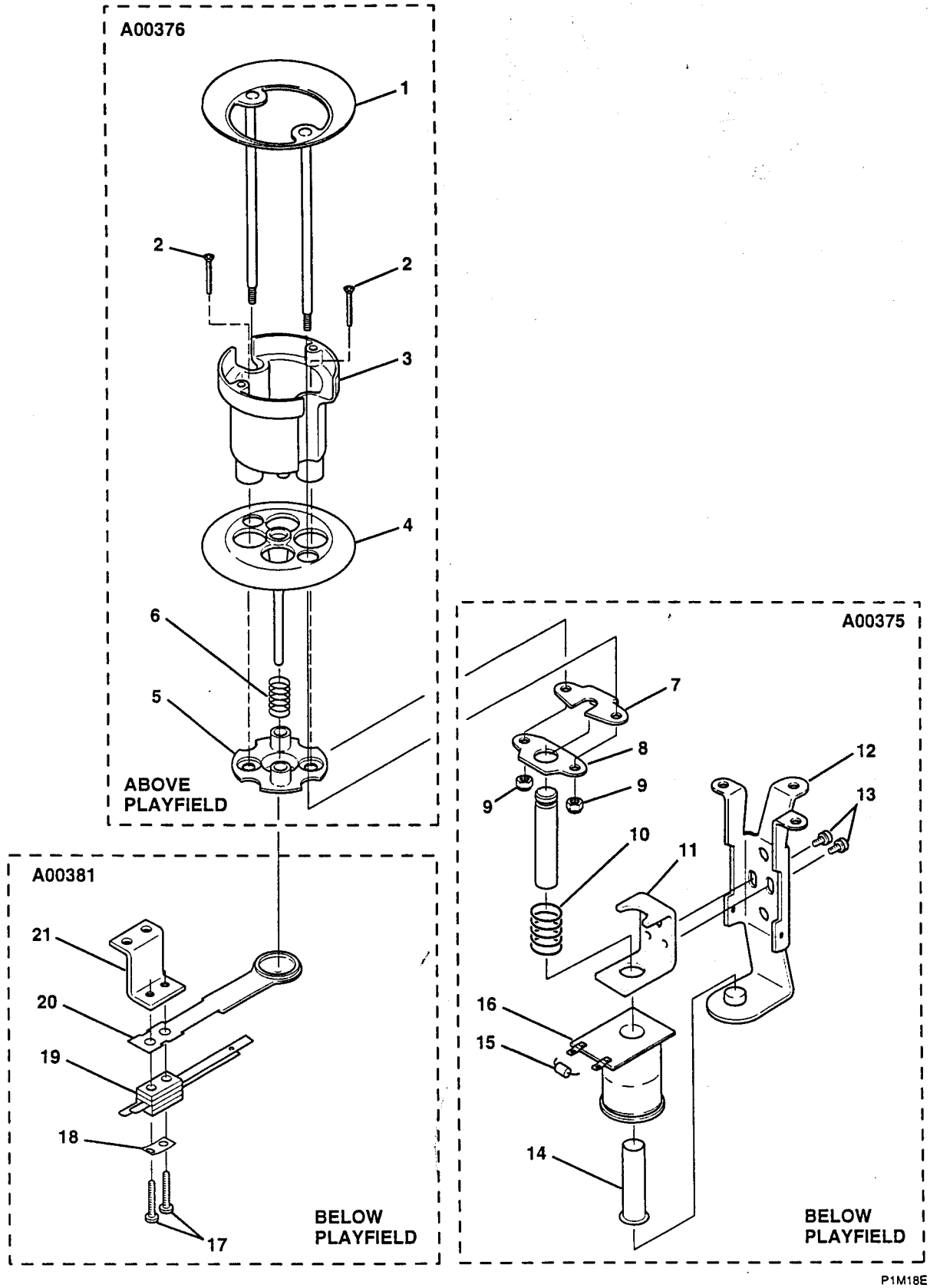


A-00157 SLINGSHOT ASSEMBLY			
No.	Part Number	Description	Req.
	A-00157	SLINGSHOT ASSEMBLY	
1	SW00120	SWITCH, LEAF, SLINGSHOT	2
2	SC00120-04	MS 4-40 x 1/2 PPH SEMS ZC	4
3	MT00461-1	PLATE, SWITCH	2
4	SC00100-02	MS 8-32 x 1/4 PPH SEMS ZC	2
5	MT00338	BRKT, COIL MOUNTING	1
6	PL00132	SLEEVE, COIL 1.75" L	1
7	CL00109	COIL 800T #23	1
8	DI00100	DIODE 1N4004 RECT 1.0A 400VR	1
9	MT00136	BRKT, COIL SUPPORT	1
10	SG00101	SPRING, COMP .625 x 1.562	1
11	RR00100-25	E-CLIP, EXT. 1/4" D SHAFT	1
12	A-00328	ARM ASSEMBLY, SLINGSHOT	1



P1M1600

A-00372 OUT HOLE KICKER ASSEMBLY			
No.	Part Number	Description	Req.
1	SM00216	PLUNGER, BALL RETURN, OUTHOLE	1
2	SC00100-02	#6-32 X 1/4 PPHS EXT/SEMS	4
3	MT00494	BRKT, COIL RETURN, .625 #6 x .375	1
4	CL00109	ASSEMBLY, COIL	1
5	DI00100	DIODE 1N4004 RECT 1.0A 400VR	1
6	PL00132-03	PLASTIC SLEEVE	1
7	A-00523	ASSEMBLY, BRKT, PLUNGER STOP, #6 x .375	1
8	A-00522	ASSEMBLY, PLATE, MTG, BALL RETURN, OUTHOLE	1
9	MS00164	BUMPER, CAM ARM, BALL RETURN, OUTHOLE	1
10	A-00524	ASSEMBLY, CAM ARM, BALL RETURN, OUTHOLE	1
11	RR00100-25	RETAINING RING .25DIA SHAFT	1
12	SG00125	SPRING, EXT, BALL RETURN, OUTHOLE	1



P1M18E

A-00375, A-00376, A-00381 STAR BUMPER ASSEMBLY			
No.	Part Number	Description	Req.
	A-00375	COIL & BRKT ASSEMBLY, STAR BUMPER	
	A-00376	STAR BUMPER ASSEMBLY	
	A-00381	SWITCH ASSEMBLY, STAR BUMPER	
1	A-00374	RING ASSEMBLY, STAR BUMPER	1
* 2	SC00130-06	MS 4-40 x 3/4 PFH ZC	2
3	PL00265	BODY, STAR BUMPER	1
4	PL00229-W	SKIRT, STAR BUMPER, WHITE	1
5	PL00261	WAFER, STAR BUMPER	1
6	SG00115	SPRING, 6 TURNS	1
7	MT00379	PLUNGER LINK, METAL	1
8	FB00104	PLUNGER LINK, FIBER	1
* 9	NT00104-06	NUT 6-32 STOP NYL INS ZC	2
10	SG00114	SPRING, 5 TURNS	1
11	MT00380	BRKT, COIL RETAINING	1
12	A-00373	COIL BRKT SUB ASSEMBLY	1
13	SC00131-02	MS 6-32 x 1/4 SLHWH ZC	2
14	PL00132-01	SLEEVE, COIL, 1.745" L	1
15	DI00100	DIODE 1N4004 RECT 1.0A 400VR	1
16	CL00109	COIL 800T #23	1
17	SC00100-06	MS 6-32 x 3/4 PPH SEMS ZC	2
18	MT00461-1	PLATE, SWITCH	1
19	SW00126	LEAF SWITCH	1
20	PL00263	ACTUATOR, LEAF SWITCH	1
21	MT00384	BRKT, SWITCH MTG	1

* NOTE: REFERENCE ONLY - NOT INCLUDED IN ASSEMBLIES SHOWN

NOTES

TROUBLESHOOTING GUIDE

POWER-UP PROBLEMS

SYMPTOM	POSSIBLE CAUSE	PROBABLE SOLUTION
Game Is Completely Dead -No Lights, No Sound, No Pushbuttons, No Display	Main Power Switch not set to ON position.	1. Set Main Power Switch to the ON position. (Switch located under cabinet near right front leg.)
	Broken Plug or Power Cord.	1. Inspect Cord and Plug for defects and repair or replace the entire cord set. 2. Check Plug for loose wires and tighten as required.
	No AC Power.	1. Connect Plug to AC power outlet. 2. Check building circuit breakers or fuses. 3. Check Power Transformer, Line Filter assemblies.
	Main Power Fuse defective.	1. Replace fuse with another of the exact same type. 2. Check Power Transformer, Line Filter assemblies. (Fuse located inside cabinet near right front leg.)
	Low Voltage AC Fuse defective.	1. Replace fuse with another of the exact same type. 2. Check Low Voltage DC Power rectifiers. (Fuse located inside backbox on top circuit board.)
	Low Voltage DC Fuse defective.	1. Replace fuse with another of the exact same type. 2. Check Low Voltage DC Voltage Regulator.
	Low Voltage DC Wiring Harness unplugged or damaged.	1. Check Low Voltage DC Wiring Harness Connectors. 2. Test Low Voltage DC Wiring Harness for continuity.
	Game set up for incorrect AC Line Voltage.	1. Check Power Transformer Line Voltage Wiring (Connector located near transformer in cabinet.)
Game Accepts Currency Or Tokens, But Does Not Start.	Acceptor Mechanism not seated fully on its own mounting bracket.	1. Open Coin Door and check each Acceptor by hand to ensure proper mounting. Ensure that each of the release latches is in the closed and locked position. 2. Check for switch activation when known good token or currency is inserted into Acceptor. Adjust switch or carefully bend lever to improve alignment if necessary.
	Faulty or intermittent Coin Door Wiring Harness connections.	1. Open coin door to enter System Menu, then select *Standard Tests* and go to the *Switches* routine. Check each device independently to locate trouble. 2. Look for pinched or cut wires where harness touches moving parts. Repair and reroute wires away from area.
Game Accepts Currency Or Tokens And Gives Players Instructions, But Does Not Produce A Ball To Begin Play.	High Voltage DC Power disabled.	1. Open coin door to enter System Menu, then select *Standard Tests* and go to *Voltage* to look for Check Interlock report. Pull out on switch actuator to reset. (Interlock Switch is located at left side of Coin Door.) 2. Switch damaged or broken. Replace Interlock Switch. (NOTE: The Switch routine will not test this switch!)
	High Voltage AC Fuse defective.	1. Replace fuse with another of the exact same type. 2. Check High Voltage DC Power rectifiers.
	High Voltage DC Fuse defective.	1. Replace fuse with another of the exact same type. 2. Check High Voltage DC Power filter capacitor.
	High Voltage DC Wiring Harness unplugged or damaged.	1. Check all High Voltage DC Power Wiring Connectors. 2. Check High Voltage DC Wiring Harness for continuity.

COIN DOOR PROBLEMS

SYMPTOM	POSSIBLE CAUSE	PROBABLE SOLUTION
Game Will Not Start When Coins, Bills, Tokens, Etc. Are Inserted Into Acceptors.	Coin Door Wiring Harness unplugged or damaged.	1. Check Coin Door Wiring Harness Connectors. 2. Test Coin Door Wiring Harness for continuity.
	Acceptor Mechanism is jammed.	1. Open Coin Door, unlatch and remove Acceptor Mechanism, inspect and clear currency path as needed. 2. Object in cabinet blocking currency at Cash Box.
	Acceptor not level.	1. Repair or replace Coin Door if bent or damaged. 2. Adjust Game using internal Bubble Level.
	Cash Box filled to maximum capacity.	1. Check Cash Box for presence of counterfeit currency. 2. Remove currency from game more frequently.
	Acceptor Switch defective.	1. Open Coin Door to enter System Menu, then select Standard Tests and go to Switches to look for Dead reports. If manual switch activation does not change the Dead report then there is an electrical problem.
	Acceptor Assembly defective.	1. Clean and lubricate Acceptor Mechanism following specific manufacturer's detailed instructions. 2. Substitute known good Acceptor to verify that problem is not external to Acceptor.
Acceptor Mechanism Rejects Known Good Currency, Tokens, Etc.	Dirt or Debris in Acceptor Mechanism.	1. Open Coin Door, unlatch and remove Acceptor Mechanism, inspect and clear currency path as needed 2. Clean and lubricate Acceptor Mechanism following specific manufacturer's detailed instructions.
	Acceptor Mechanism out of adjustment.	1. Ensure that all removable parts are installed correctly and fully seated against the chassis of the Acceptor. 2. Clean and adjust Acceptor Mechanism following specific manufacturer's detailed instructions.
	Acceptor Mechanism defective.	1. Substitute known good unit to verify that problem is not external to Acceptor. 2. Repair or replace Acceptor assembly.
External Acceptor Indicators (Pricing, Flashing Arrows, Etc.) Not Illuminated.	No DC Power to indicator circuits.	1. Check Coin Door Wiring Connectors. 2. Test Coin Door Wiring Harness for continuity.
	Defective indicator lamp.	1. Go to System Menu and perform Lamp Test. 2. Substitute known good lamp to verify that problem is not external to Acceptor.
Acceptor Takes Known Good Currency But Game Will Not Start Or Continue.	Acceptor Switch out of adjustment.	1. Go to System Menu and perform Switch Test. 2. Clean and adjust Acceptor Switch following specific manufacturer's detailed instructions.
	Acceptor Switch defective.	1. Open Coin Door to enter System Menu, then select Standard Tests and go to Switches to look for Dead reports. If manual switch activation does not change the Dead report then there is an electrical problem. 2. Substitute known good switch to verify that problem is not external to Acceptor.

DOT MATRIX DISPLAY PROBLEMS

SYMPTOM	POSSIBLE CAUSE	PROBABLE SOLUTION
Game Plays But Message Center (Dot Matrix Display) Is Completely Blank.	System Communication failure.	1. Check Communication Wiring Harness Connectors. 2. Test Communication Wiring Harness for continuity.
	Display Power Harness unplugged or damaged.	1 Check Display Power Wiring Harness Connectors. 2. Test Display Power Wiring Harness for continuity.
	Display Power AC Fuse defective.	1. Replace fuse with another of exact same type. 2. Check Display Power DC rectifiers, decoupling diode. (Fuse located inside backbox on top circuit board.)
	Display Board Assembly defective.	1. Check if any dot matrix display pixels are illuminated. 2. Inspect display glass for cracks, chips, darkened areas.
	Display Power Supply Board Assembly defective.	1. Test Display Power Supply diodes, transformer, caps. 2. Check Display Power Supply Switching Regulator IC.
Game Plays But Part Of Message Center Is Blank Or Illuminated All The Time.	System Communication failure.	1. Check Communication Wiring Harness Connectors. 2. Test Communication Wiring Harness for continuity.
	Display Board Assembly defective.	1. Inspect display glass for cracks, chips, darkened areas. 2. Check soldered connections between glass panel and printed circuit board, and resolder using minimum heat.
Random Patterns On Message Center (Some Images May Be Correct While Others Are Corrupted).	Incorrect Display Program.	1. Game or Image Memory IC installed in wrong order. 2. Music or Voice Memory IC installed on Processor Board Assembly (i.e., right chip, wrong socket). 3. Display or Game Memory IC defective. 4. Custom Control (FPGA) IC defective. 5. Microprocessor (MPU) IC defective.
	Display Board Assembly defective.	1. Open Coin Door to enter System Menu, then select Standard Tests and go to the Display routine. Check each pixel independently to locate trouble.
Checkerboard Pattern On Message Center (Display Never Changes).	No Display Program.	1. Game or Image Memory IC removed from socket. 2. Game or Image Memory IC defective.
Messages Appear Normal, Then Display Locks Up In The Same Place Every Time.	Corrupt Display Program.	1. Bent, broken, shorted pins on Memory IC. 2. Game or Image Memory IC defective.
Message Center Always In Game Menu And Troubleshooting Mode; Will Not Return To Game Play.	Coin Door open.	1. Close and lock Coin Door to go to normal game play.
	Mode Switch defective.	1. Switch Mounting Bracket bent, loose, or missing. 2. Mode Switch Wiring Harness may be faulty.
	Dirty or intermittent Mode circuit connection.	1. Check Mode Switch Wiring Harness Connectors. 2. Check Mode Switch Wiring Harness for continuity.
Game Will Not Retain Audit Information Or Custom Settings When Turned OFF. (An Error Message May Be Displayed).	Memory Back Up Battery or Memory IC defective.	1. Set Main Power Switch to the OFF position for one minute, then restore power to game. If RAM ERROR message appears, replace Processor Board Assembly. NOTE: The battery is integrated onto the Memory IC; it cannot be repaired or replaced separately.

SOUND PROBLEMS

SYMPTOM	POSSIBLE CAUSE	PROBABLE SOLUTION
Game Plays But No Sound Is Heard At Any Time.	Volume set to zero loudness.	1. Open Coin Door to enter System Menu, then select SET VOLUME from the menu and use Flipper Buttons to adjust the sound to a comfortable loudness.
	Loudspeaker Wiring Harness unplugged or damaged.	1. Check Loudspeaker Wiring Connectors. 2. Test Loudspeaker Wiring Harnesses for continuity.
	Audio Power AC Fuse defective.	1. Replace fuse with another of exact same type. 2. Check Audio Power DC rectifiers. (Fuse located inside backbox on right side circuit board.)
	Faulty Loudspeaker.	1. Test each Loudspeaker for continuity. 2. Check each Loudspeaker for voice coil binding.
	System Communication failure.	1. Check Communication Wiring Harness Connectors. 2. Test Communication Wiring Harness for continuity.
	Sound Board Assembly defective.	1. Verify that the Light Emitting Diodes are functional. 2. Check Spike Protection Diodes, Audio Amplifier IC.
Game Plays But Sound Is Limited To Hum (Low Frequency Buzzing Noise) From All Loudspeakers.	Audio Power AC Fuse defective.	1. Replace fuse with another of exact same type. 2. Check Audio Power DC rectifiers, Filter Capacitors.. (Fuse located inside backbox on right side circuit board.)
	Sound Board Assembly defective.	1. Check Audio Amplifier IC.
Weak Or Distorted Sound From One Or Two Loudspeakers.	Faulty Loudspeaker.	1. Check Loudspeakers for torn paper, liquid spills, etc. 2. Inspect speaker boxes for loose screws, dirt or debris
	Dirty or intermittent audio connections.	1. Carefully unplug and reseat each loudspeaker wire. 2. Check Loudspeaker Wiring Harnesses for continuity.
Little Or No High Frequency (Treble), Muffled Or Distant Sound Quality.	Loudspeakers disconnected.	1. Check small Loudspeakers in backbox for operation. 2. Test each small Loudspeaker for continuity. 3. Check Loudspeaker Wiring Harnesses for continuity.
Little Or No Low Frequency (Bass), Weak Or Hollow Sound Quality.	Loudspeakers disconnected or wired out of phase.	1. Check large Loudspeaker in cabinet for operation. 2. Connectors on small Loudspeakers installed in reverse. 3. Check Loudspeaker Wiring Harnesses for continuity.
Unintelligible Voice Messages, Strange Noises, Unrecognizable Music.	Incorrect Sound Program.	1. Music or Voice Memory ICs installed in wrong order. 2. Display or Game Memory ICs installed on audio board. 3. Defective Voice or Music Memory IC.
Continuous Medium Pitch Tone (Middle Frequency).	No Sound Program (1khz Self Test Tone is active).	1. Music or Voice Memory ICs removed from sockets. 2. Defective Music or Voice Memory IC.

PLAYFIELD PROBLEMS - MECHANICAL

SYMPTOM	PROBABLE CAUSE	PROBABLE SOLUTION
Game Plays But One Or More Balls Continually Stick In One Area Of The Playfield.	Build up of dirt or debris.	1. Clean the playfield to remove any spills or sticky substances. Check for depressions on playfield surface. 2. Replace cracked cabinet glass or other sources of leaks.
	Loose screws cause parts to shift out of alignment.	1. Reposition parts and retighten screws firmly. 2. Apply removable threadlocking adhesive to fasteners.
	Damaged or broken guides, troughs, forms, etc.	1. Cracked or deformed items should be replaced. 2. Broken joints may be brazed or welded as a repair.
	Binding trip lever on position detection switch.	1. Move wiring harness out of lever path. 2. Loosen mounting screws and adjust switch position. 3. Carefully bend trip lever to improve alignment. 4. Repair or replace detection switch.
	Insufficient solenoid force to eject ball from assembly.	1. Clean and lubricate assembly linkages, bearings, etc. 2. Ensure that correct solenoid return spring is installed. 3. Open Coin Door to enter System Menu, then select Standard Tests and go to Sol. Volts to look for Low Voltage report. Check Power Transformer Line Voltage Wiring. (Connector located near transformer in cabinet.) 4. Check playfield angle using built-in bubble level.
Game Plays OK But Balls Hit Hard And Bounce Too Much.	Excessive solenoid force.	1. Rubber bumper button damaged or missing from one or more solenoid assemblies. 2. Ensure that correct solenoid return spring is installed. 3. Open Coin Door to enter System Menu, then select Standard Tests and go to Sol. Volts to look for Hi Voltage report. Check Power Transformer Line Voltage Wiring. (Connector located near transformer in cabinet.) 4. Check playfield angle using a protractor or level.
Premature Breakage Of Posts, Targets, Buttons, Or Other Plastic Parts.	Aftermarket replacement parts installed during previous game repair.	1. Use only new *factory* parts and assemblies for repairs. Other parts may fit and function but they will not last. 2. Fasteners tightened excessively, cracking parts during installation. Do not use too much force when tightening.
Ball Floats When It Shouldn't	Bucket switch out-of-adjustment	Adjust switch
	When bucket is lowered, it closes switch	Make sure that when the bucket is down, the switch fits freely in the slot in the bucket
Ball Doesn't Float	Bucket switch out-of-adjustment	Adjust switch.
	Stage Diverter defective	Replace Diverter assembly.
	Elevator stuck in up position	Check motor and motor crank alignment.
Wand Diverter Doesn't Activate	Broken coil wire	Resolder wire to coil.
	Loose Diverter clamp	Adjust Diverter and tighten clamp.

PLAYFIELD PROBLEMS - MECHANICAL (CONT.)

SYMPTOM	PROBABLE CAUSE	POSSIBLE SOLUTION
One Or More Balls Are Missing When The Game Is Started Or In Play	Mechanical part failure or poor alignment (ball dropped in cabinet, stuck somewhere on the playfield, etc.)	1. Game will automatically initiate its own "ball search" by cycling through each solenoid and motor assembly a few times to dislodge a ball stuck on the playfield. 2. After an unsuccessful attempt at freeing a missing ball, the game will resume operation with fewer balls. A game will continue with only one ball.
	Ball removed from game or placed in cabinet during service.	1. Locate missing ball in cabinet and return to playfield. Game will accept ball and return to normal operation. 2. Check your pockets!
Ball Trough Is Inoperative (Jams, Not Able To Eject A Ball For The Shooter, Etc.)	Binding trip lever on position detection switch.	1. Check harness for wires caught in lever path. Relocate wires so they can not get into switch lever path again. 2. Loosen mounting screws and adjust switch position. Carefully bend lever to improve alignment if necessary. 3. Repair or replace detection switch.
	Loose part caught in Ball Trough Assembly.	1. Remove Bottom Arch from playfield to expose the interior of the Ball Trough Assembly. Extract loose part and realign as necessary to restore proper operation. 2. Reinstall Bottom Arch and loose part onto playfield.
Showtime Stage Is Inoperative (Jams, Doors Stuck, Elevator Stuck, Etc.)	Binding trip lever on position detection switch.	1. Check harness for wires caught in lever path. Relocate wires so they can not get into switch lever path again. 2. Loosen mounting screws and adjust switch position. Carefully bend lever to improve alignment if necessary. 3. Repair or replace detection switch.
	Loose part caught in Assembly mechanism.	1. Open Coin Door to enter System Menu, then select Feature Tests and go to the Stage routine. Check each function independently to locate the problem. 2. Extract loose part and reinstall on playfield.
Genie Bottle Is Inoperative (Jams, Balls Stuck, Misalignment, Etc.)	External light leakage is enough to prevent normal activation of switch.	1. Open Coin Door to enter System Menu, then select Standard Tests and go to Switches to look for Dead reports. If manual switch path blockage changes the report to OK then leakage is the cause of this condition. 2. Check for missing light shields or misalignment.
	Loose part caught in Assembly mechanism.	1. Open Coin Door to enter System Menu, then select Feature Tests and go to the Genie routine. Check each function independently to locate the problem. 2. Extract loose part and reinstall on playfield.
Tilt Or Slam Switches Are Stuck, Causing Constant Game Tilt	An item in the cabinet is pressing against the switch, causing a false Tilt or Slam indication.	1. Open Coin Door to enter System Menu, then select Standard Tests and go to the Switches routine. Check each device independently to locate trouble. 2. Look for objects that can touch either switch when the Coin Door would be in its closed and locked position.
	Loose part caught in mechanism.	1. Check Tilt Switch Assembly for loose thumbscrew on weight or hookwire separated from hanger bracket. 2. Make sure that playfield bottom assemblies do not contact either switch. Realign and tighten fasteners.

PLAYFIELD PROBLEMS - SOLENOIDS & MOTORS

SYMPTOM	PROBABLE CAUSE	POSSIBLE SOLUTION
Solenoids Firing Randomly, Sometimes Two At One Time.	Faulty or intermittent solenoid connections.	1. Open coin door to enter System Menu, then select Standard Tests and go to the Solenoids routine. Check each device independently to locate trouble. 2. Look for pinched or cut wires where harness touches moving parts. Repair and reroute wires away from area. 3. Damaged or missing diodes on solenoid coils. 4. Test Communication Wiring Harness for continuity.
	Driver Board Assembly defective.	1. Damaged or missing diodes on Driver Board Assembly. Repair or replace Driver Board Assembly.
Motors Running Too Long Or Not Long Enough When Game Assembly Is Active.	Limit Switches not activated at the correct time.	1. Check motorized assembly for dirt and debris blocking motion. Clean and lubricate linkages, bearings, etc. 2. Open coin door to enter System Menu, then select Feature Tests and go to the Wand or Stage routine. Check each device independently to locate trouble. 3. Carefully bend trip lever to improve alignment.
	Gearmotor Assembly defective.	1. Gears worn or teeth broken. Replace entire assembly.
Flippers Respond Too Slowly Or Do Not Reset Quickly.	Flipper Assembly binding or defective.	1. Clean and lubricate assembly linkages, bearings, etc. 2. Ensure that correct solenoid return spring is installed. 3. Open coin door to enter System Menu, then select Standard Tests and go to the Solenoids routine. Check each device independently to locate trouble.
None Of The Solenoids Work.	High Voltage DC Power disabled.	1. Open coin door to enter System Menu, then select Standard Tests and go to Voltage to look for Check Interlock report. Pull out on switch actuator to reset. (Interlock Switch is located at left side of Coin Door.) 2. Switch damaged or broken. Replace Interlock Switch. (NOTE: The Switch routine will not test this switch!)
	High Voltage AC Fuse defective.	1. Replace fuse with another of the exact same type. 2. Check High Voltage DC Power rectifiers.
	High Voltage DC Fuse defective.	1. Replace fuse with another of the exact same type. 2. Check High Voltage DC Power filter capacitor.
	High Voltage DC Wiring Harness unplugged or damaged.	1. Check all High Voltage DC Power Wiring Connectors. 2. Check High Voltage DC Wiring Harness for continuity.
	System Communication failure.	1. Check Communication Wiring Harness Connectors. 2. Test Communication Wiring Harness for continuity.
	Driver Board Assembly defective.	1. Check Low Voltage DC Power filter capacitor and coil.
Game Plays But A Small Group Of Solenoids Do Not Operate.	Solenoid Assembly Wiring Harness unplugged or damaged.	1. Check Solenoid Assembly Wiring Harness Connectors. 2. Test Solenoid Assembly Wiring Harnesses for continuity.
	System Communication failure.	1. Check Communication Wiring Harness Connectors. 2. Test Communication Wiring Harness for continuity.

PLAYFIELD PROBLEMS - SOLENOIDS & MOTORS (CONT.)

SYMPTOM	PROBABLE CAUSE	POSSIBLE SOLUTION
One Or More Solenoids, Lamps, Or Motors Is Always On When Main Power Is ON.	Cross connection between two DC Voltage sources.	1. Look for pinched or cut wires where harness touches moving parts. Repair and reroute wires away from area.
	Driver Board Assembly defective.	1. Check Smart Solid State Relays (Power IC devices).
Solenoids Or Motors Repeatedly Burn Out.	System Communication failure.	1. Check Communication Wiring Harness Connectors. 2. Test Communication Wiring Harness for continuity.

PLAYFIELD PROBLEMS - SWITCHES

SYMPTOM	PROBABLE CAUSE	POSSIBLE SOLUTION
Premature Failure Of A Few Switches, Causing Irregular Scoring Or Inability To Complete All Steps In Game.	Excessive solenoid force.	1. Use only new factory parts and assemblies for repairs. Other parts may fit and function but they will not last. 2. Fasteners tightened excessively, cracking parts during installation. Do not use too much force when tightening. 3. Open Coin Door to enter System Menu, then select Standard Tests and go to Sol. Volts to look for Hi Voltage report. Check Power Transformer Line Voltage Wiring. (Connector located near transformer in cabinet.) 4. Check playfield angle using built-in bubble level.
Switches Firing Randomly, Sometimes Two At One Time.	Faulty or intermittent switch connections.	1. Open coin door to enter System Menu, then select Standard Tests and go to the Switches routine. Check each device independently to locate trouble. 2. Look for pinched or cut wires where harness touches moving parts. Repair and reroute wires away from area. 3. Test Communication Wiring Harness for continuity.
Too Many Or Not Enough Tilt Or Slam Detections.	Incorrect switch adjustment.	1. Slam Switch caught on clothing or cash box and bent. Refer to Slam Switch Sensitivity Adjustment instructions. 2. Tilt Switch caught on wiring or aligned incorrectly. Refer to Tilt Switch Sensitivity Adjustment instructions.
A Standard Switch Has Not Been Activated In Several Games.	Players are concentrating on other shots or not skilled enough to activate switch.	1. Open Coin Door to enter System Menu, then select Standard Tests and go to Switches to look for Dead reports. If manual switch activation changes the report to OK then players are the cause of this condition.
	Switch defective.	1. Open Coin Door to enter System Menu, then select Standard Tests and go to Switches to look for Dead reports. If manual switch activation does not change the Dead report then there is an electrical problem.

PLAYFIELD PROBLEMS - SWITCHES (CONT.)

SYMPTOM	PROBABLE CAUSE	POSSIBLE SOLUTION
An Optical Switch Has Not Been Activated In Several Games.	External light leakage is enough to prevent normal activation of switch.	1. Open Coin Door to enter System Menu, then select Standard Tests and go to Switches to look for Dead reports. If manual switch path blockage changes the report to OK then leakage is the cause of this condition. 2. Check for missing light shields or misalignment.
	Switch defective.	1. Open Coin Door to enter System Menu, then select Standard Tests and go to Switches to look for Dead reports. If manual switch activation does not change the Dead report then there is an electrical problem. 2. Ensure that Optodetector Board Assembly is oriented properly
	Faulty or intermittent switch connections.	1. Open Coin Door to enter System Menu, then select Standard Tests and go to the Switches routine. Check each device independently to locate trouble. 2. Look for pinched or cut wires where harness touches moving parts. Repair or reroute wires away from area.
None Of The Switches Work.	Low Voltage DC Wiring Harness unplugged or damaged.	1. Check Low Voltage DC Power Wiring Connectors. 2. Test Low Voltage DC Wiring Harness for continuity.
	System Communication failure.	1. Check Communication Wiring Harness Connectors. 2. Test Communication Wiring Harness for continuity.
	Switch Board Assembly defective.	1. Check Low Voltage DC Power filter capacitor and coil. 2. Repair or replace Switch Board Assembly.
System Menu Is Not Displayed When Opening Coin Door.	Cabinet Switch Wiring Harness unplugged or damaged.	1. Check Cabinet Switch Wiring Harness Connectors. 2. Test Cabinet Switch Wiring Harness for continuity.
	Switch defective.	1. Temporarily jumper switch to get into System Menu. 2. Test System Menu Switch for continuity.
	Processor Board Assembly defective.	1. Check signal diodes for rectification and leakage.

PLAYFIELD & BACKBOX PROBLEMS - ILLUMINATION

SYMPTOM	PROBABLE CAUSE	POSSIBLE SOLUTION
Premature Burn Out Of Many Lamps (Bulbs May Or May Not Appear Excessively Bright).	Higher than normal line voltage or excessive temperature stresses bulbs.	1. Open coin door to enter System Menu, then select Standard Tests and go to Sol. Volts to look for Hi Line report. Check Power Transformer Line Voltage Wiring. (Connector located near transformer in cabinet.) 2. Move game away from sources of heat such as heat registers and high intensity lighting. Ensure that air flows freely around cabinet and backbox ventilation holes.
	Incorrect bulbs used as a replacement during a previous game repair.	1. Use only new factory parts and assemblies for repairs. Other parts may fit and function but they will not last.

PLAYFIELD & BACKBOX PROBLEMS - ILLUMINATION (CONT.)

SYMPTOM	PROBABLE CAUSE	POSSIBLE SOLUTION
Lamps Firing Randomly, Sometimes Two At One Time.	Faulty or intermittent lamp connections.	1. Open coin door to enter System Menu, then select Standard Tests and go to the Lamps routine. Check each device independently to locate trouble. NOTE: Some lamps are wired in pairs; refer to Lamp Matrix charts. 2. Look for pinched or cut wires where harness touches moving parts. Repair and reroute wires away from area. 3. Damaged or missing diodes on lamp sockets. 4. Test Communication Wiring Harness for continuity.
	Driver Board Assembly defective.	1. Damaged or missing diodes on Driver Board Assembly. Repair or replace Driver Board Assembly.
	Medium Voltage DC Wiring Harness unplugged or damaged.	1. Check Medium Voltage DC Wiring Harness Connectors. 2. Test Medium Voltage DC Wiring Harness for continuity.
Game Plays But About Half Of The Lamps Are Not Illuminated.	Medium Voltage AC Fuse defective.	1. Replace fuse with another of the exact same type. 2. Check Medium Voltage DC Power rectifiers.
	Medium Voltage DC Fuse defective.	1. Replace fuse with another of the exact same type. 2. Check Medium Voltage DC Power filter capacitor.
Game Plays But A Small Group Of Lamps Are Not Illuminated.	Lamp Matrix Row or Column Wiring Harness unplugged or damaged.	1. Check Lamp Matrix Wiring Harness Connectors. 2. Test Lamp Matrix Wiring Harnesses for continuity.
	System Communication failure.	1. Check Communication Wiring Harness Connectors. 2. Test Communication Wiring Harness for continuity.
Game Plays But A Small Group Of Lamps Are Constantly Illuminated.	One Lamp Matrix Row or Column stuck ON (continuously powered).	1. Look for pinched or cut wires where harness touches moving parts. Repair and reroute wires away from area.
	Driver Board Assembly defective.	1. Check Smart Solid State Relays (Power IC devices). 2. Check Field Effect Transistors (Power Transistors).
One Or More Lamps Very Dim But Still Illuminated.	Incorrect bulbs used as a replacement during a previous game repair.	1. Use only new factory parts and assemblies for repairs. Other parts may fit and function but they will not last.
	Blackened glass, weak or old bulb filament, etc.	1. Replace bulb with another of the exact same type. 2. Test lamp diode for rectification and leakage.
Several Lamps Illuminate When Only One Or Two Should Be On ("Phantom" Effect).	Lamp Matrix defective.	1. Open coin door to enter System Menu, then select Standard Tests and go to Lamps routine. Check each device independently to locate trouble. 2. Test lamp diode for rectification and leakage.
	Lamp Wiring Harness damaged.	1. Look for pinched or cut wires where harness touches moving parts. Repair and reroute wires away from area.
One Or More Large Lamps ("Flashers") Are Constantly Illuminated.	Lamp Wiring Harness damaged.	1. Look for pinched or cut wires where harness touches moving parts. Repair and reroute wires away from area.
	Driver Board Assembly defective.	1. Check Field Effect Transistors (Power Transistors). 2. Test lamp diode for rectification and leakage.

THEORY OF OPERATION

POWER SUPPLY CIRCUIT AND RELATED COMPONENTS

AC POWER CIRCUITS

The AC line cord may be any one of several domestic or international grounding type cordsets. Power enters the machine through a shielded I.E.C. (International Electrotechnical Commission) connector and passes through an electromagnetic interference filter. This filter reduces both common mode and differential conducted noise on the AC power wires. Power then travels through the main fuse to the unswitched convenience outlet and the OFF/ON switch. Both sides of the line are switched to prevent shock hazard during machine maintenance. The power transformer has dual tapped primary windings which must be connected in parallel for AC voltages less than 200 and in series for voltages more than 200. Multiple secondary windings provide low, medium, and high voltage power to the power supply circuit board for rectification, filtering, regulation, and protection. The high voltage power goes through a standard interlock switch to protect against shock or accidental equipment damage during routine maintenance or service. Note that the main fuse must be changed when switching between series and parallel configuration.

DC POWER CIRCUITS

All power sources are fused at their point of entry onto this board. Each power source is rectified by a full wave diode bridge and filtered by an electrolytic capacitor and a bleeder resistor to discharge the voltages during equipment service. Immediately following the capacitor is a light emitting diode with a current limiting resistor which indicates the presence of voltage. Additional fuses and LED indicators are used for branch circuits, and the low and medium voltage sources have series diodes to protect against power cross with higher voltages. All power supply voltages are positive with respect to ground to reduce noise sensitivity.

The lowest voltage source is the most critical since it runs the system microprocessors, the digital logic circuits, memory, and the interface circuits, so it gets its own three-terminal voltage regulator and filter capacitors. A voltage divider is used to provide the minimum load for regulator operation and at the same time set the output to five volts. This regulator has thermal shutdown to avoid damage due to overheating. Short-circuit protection is automatic, so there is no separate fuse required for the regulated low voltage.

DC SIGNAL CIRCUITS

Four voltage comparators are used to monitor the critical power supply characteristics. Two of the devices act as detectors for Alternating Current. One tiggers on positive voltages, the other on negative voltages. The output of the circuit is a series of narrow pulses at twice the frequency of the AC Line Voltage. These pulses are used by the processor to determine the AC frequency and zero cross points.

The remaining two voltage comparators are used to check analog voltages against a processor generated reference signal. One circuit monitors regulated low voltage; the other an unregulated high voltage source. Since the high voltage power supply is not regulated, it will rise or fall with changes in the AC Line Voltage. The microprocessor varies the reference signal to determine the value of these DC voltage sources.

AUDIO CIRCUITS AND RELATED COMPONENTS

All audio information is compressed using the MPEG digital signal processing standard and stored in Read Only Memory.

Once the digital signals have been expanded and converted to analog audio signals, the remainder of the circuitry is used to amplify the sound and provide volume and tone control functions.

PROCESSOR BOARD AND RELATED COMPONENTS

A MC68306 Microprocessor is used to control the game functions, the diagnostics, the adjustable features, and the system communications. In addition, this processor has indirect control of display functions through a Programmable Logic Device and sound (the Sound Board has its own dedicated microprocessor). This 16-bit device was selected because it has common elements with the well known MC68000 family of integrated processors. The MC68306 is optimized for use with memory and communications.

INPUT / OUTPUT CIRCUITS

Each time power is applied to the game, a timer circuit generates a reset signal to start the microprocessor. The DC signals from the Power Supply circuit generate interrupt messages, allowing the processor to identify the AC power line characteristics. Cabinet switches create input signals used to control game play, system operating mode, menu item selection, etc. The remainder of the input signals are collected from other boards through a mixture of serial and parallel communications channels.

One output from the microprocessor is used for the display. The characters and images are stored in Read Only Memory. The Field Programmable Gate Array temporarily saves this data to Random Access Memory and converts this information to row and column signals for the display dot matrix. The Sound Board receives data commands from the processor and then generates the voices, music, and sound effects to go along with the display images and messages. Lamp, motor, and solenoid drive circuits receive control signals from the processor through a parallel communication port.

In system diagnostic mode, more circuits become active. The microprocessor sends test signals through the drive and switch circuits to determine the state (normal operation, fault conditions, etc.) of the switches, lamps, motors, and solenoids. The processor is also able to recognize cable disconnections, communication errors, switch related problems, etc., and issues messages or reports as necessary.

MEMORY CIRCUITS

Game parameters, custom messages, adjustable features, intermittent conditions, etc., are saved in Static Random Access Memory. This circuit has a built-in back up battery to prevent data corruption or loss.

INDICATOR CIRCUITS

There are two Light Emitting Diodes located on the Processor Board. One LED indicates the presence of regulated low voltage DC power. The other LED serves as a low level status indicator for the microprocessor. Internal fault conditions generate an error code which can be useful when the display circuits malfunction or system diagnostics are not available.

POWER CIRCUITS

Two types of filter circuits are used on the Processor Board. Small bypass capacitors are used on the data lines to reduce the effects of noise. The regulated low voltage DC power source uses a more complex filter network (two capacitors and an inductor) to eliminate interference present on the power supply wiring.

SWITCH BOARD AND RELATED COMPONENTS

The Switch Board has two main functions. Switches close and open very rapidly in the course of a pinball game, and there are instances where several switches may operate simultaneously. During game play, momentary switch connections are tracked and turned into signals which the microprocessor uses to determine the location of the balls. These input signals allow interaction with the players by increasing point score, illuminating indicator lamps, activating solenoids or motors, and by triggering images or sounds at the appropriate times. When the diagnostics routines are in use, the Switch Board circuits test the continuity of each switch device and its associated wiring. This permits the system to locate faults and provide service information on demand.

SWITCH SENSE CIRCUITS

Each switch has its own dedicated line to the Switch Board. The inputs have series diodes to protect against power cross with higher voltages. Each comparator has one switch input signal and one from a fixed DC voltage obtained from a voltage divider on the low voltage regulated power source. Any switch closure causes one comparator to change its output state; this signal is then buffered before being sent off board. Independent output lines prevent a single fault from disabling more than one switch signal.

One contact of each switch is connected to system ground. This is done to reduce the effects of noise on the switch and processor circuits when a switch is activated.

The addition of a resistor directly to each set of switch contacts allows the switch circuits to detect the difference between a normal circuit path and a faulty condition. This resistor forms a voltage divider with others located on the circuit board. This resistor has no effect on the normal operation of the switch.

When the system is operating in its Diagnostic or Troubleshooting modes, the microprocessor sends a digital message to the Switch Board to activate the test circuits. This message is decoded and turned into two signals, one for each switch group. These test signals go through flip-flop circuits wired as latches and then on to individual driver circuits. The outputs of the drivers effectively bypass one of the resistors in the voltage divider, changing the value of the reference voltage to a higher threshold during switch tests. Under this condition, the processor can detect whether a switch is normally open or the circuit is defective.

POWER CIRCUITS

Two types of filter circuits are used on the Switch Board. Small bypass capacitors are used on the integrated circuits to reduce the effects of noise caused by solenoids and motors operating. The regulated low voltage DC power source uses a more complex filter network consisting of two capacitors and an inductor to eliminate any interference which might be present on the power supply wiring.

DRIVER BOARD AND RELATED COMPONENTS

Two types of drive circuits are used on this board. Low power loads (indicator and illuminator lamps) are connected in a typical row and column matrix configuration to reduce the number of components and wires needed. High power loads (flashing lamps, motors, or solenoids) have individual independent control circuitry. Both circuit types feature protection from electrical noise, thermal overload, and short circuits.

The majority of the lamps used in the game are connected in two identical matrices. Each matrix has eight rows and eight columns for a total of sixty four controlled positions; however, some of the positions have two lamps wired in parallel. The maximum number of lamps supported by one matrix is eighty.

Motors, solenoids, and flashing lamps have their own dedicated drive devices. By maintaining separate circuit paths many loads can operate simultaneously, but interaction with other game functions is eliminated.

INPUT / OUTPUT CIRCUITS

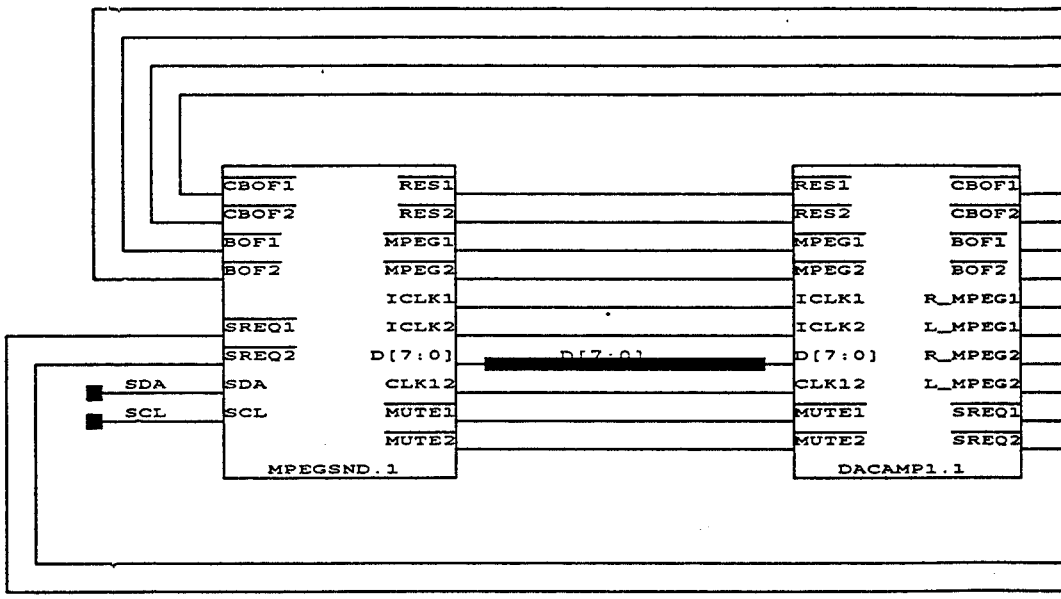
The Processor must send an enable signal to the Driver Board before any of the circuits will respond. This signal allows control data to pass through flip-flop circuits and into the driver devices. Lamp data from the microprocessor is decoded and turned into signals for rows and columns. In addition to lamp location, the program changes lamp brightness independently by varying how long each selected position is active. A lamp warming routine in the program keeps each location continuously powered at a very low level to reduce filament inrush current, turn on time, and voltage fluctuations on the power supply circuits.

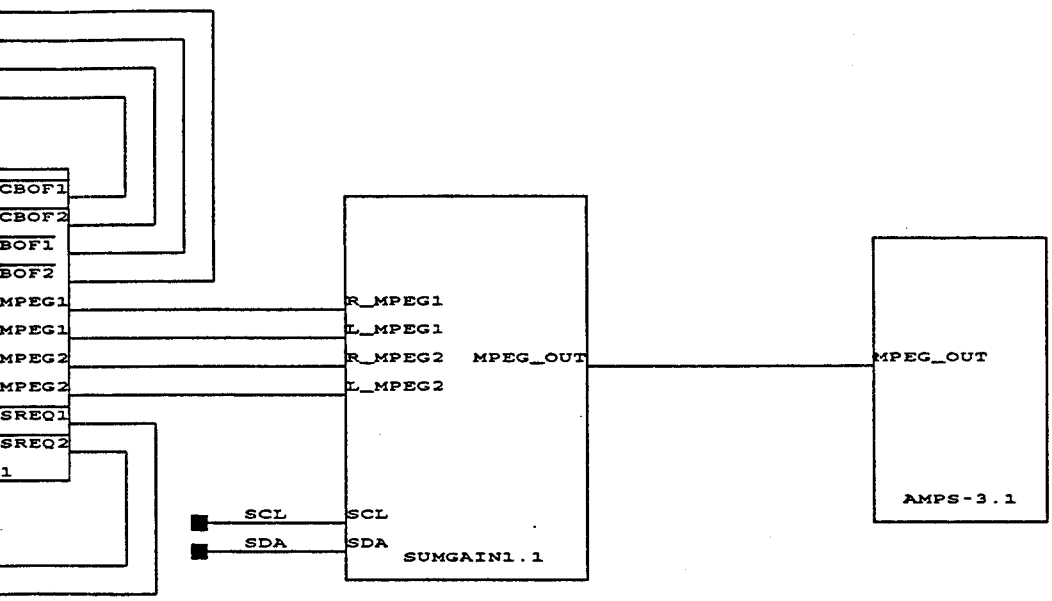
Power for each matrix is delivered by eight row drivers and eight column drivers. The lamp row drives use conventional devices with comparator circuits to sense excessive current and provide circuit protection. So called Smart Power Solid State Relays are used for the lamp columns and the independent drive circuits. These devices have built-in overtemperature protection circuitry and a status output signal. Diodes are connected in series with these output circuits to prevent damage from power cross with higher voltages.

At the end of each complete pass through all of the lamps in a matrix, the microprocessor sends a digital message to the Driver Board to activate the test circuits. This message is decoded and turned into two signals, one for each lamp group. These test signals go through flip-flop circuits wired as latches and then on to individual driver circuits. The outputs of the drivers effectively bypass one of the resistors in the voltage divider, changing the value of the reference voltage to a lower threshold during lamp tests. Under this condition, the processor can detect whether a lamp is shorted or the circuit is defective.

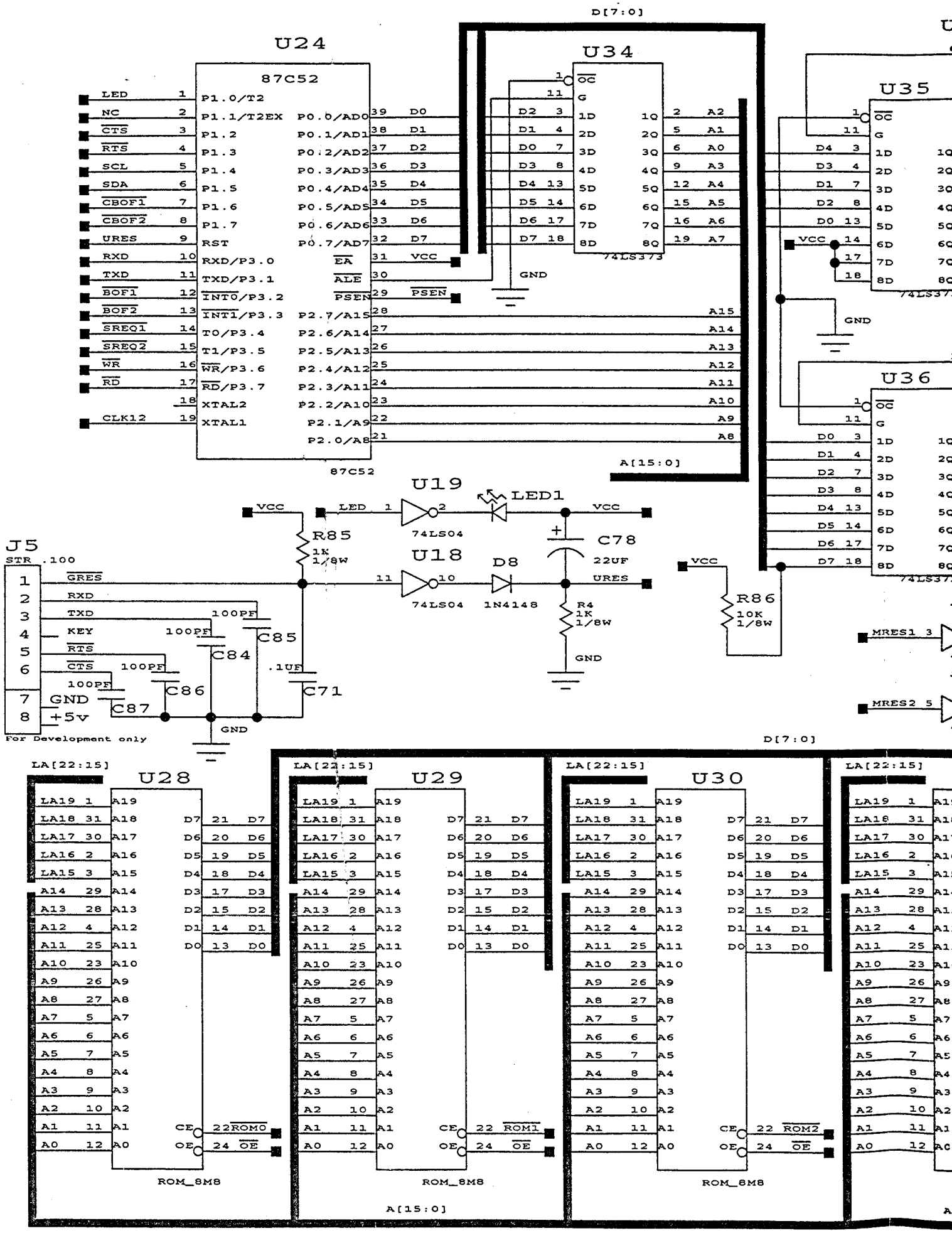
POWER CIRCUITS

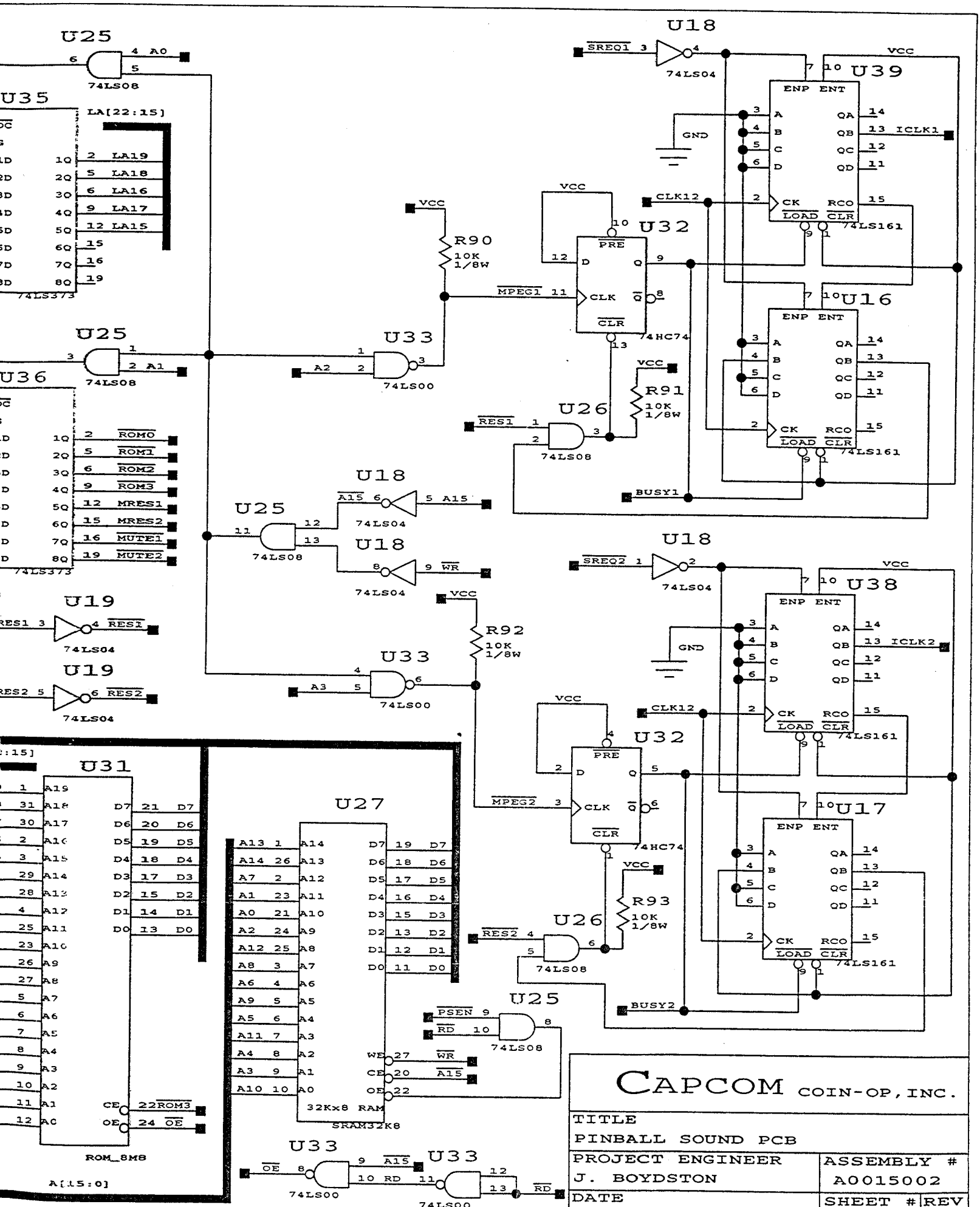
Two types of filter circuits are used on the Switch Board. Small bypass capacitors are used on the integrated circuits to reduce the effects of noise caused by solenoids and motors operating. The regulated low voltage DC power source uses a more complex filter network consisting of two capacitors and an inductor to eliminate any interference which might be present on the power supply wiring.


CBOF1
CBOF2
BOF1
BOF2
SREQ1
SREQ2
SDA
SCL
SDA
SCL
RES1
RES2
MPEG1
MPEG2
ICLK1
ICLK2
D[7:0]
CLK12
MUTE1
MUTE2
MPEGSND.1
D[7:0]
RES1
RES2
MPEG1
MPEG2
ICLK1
ICLK2
D[7:0]
CLK12
MUTE1
MUTE2
CBOF1
CBOF2
BOF1
BOF2
R_MPEG1
L_MPEG1
R_MPEG2
L_MPEG2
SREQ1
SREQ2
DACAMP1.1



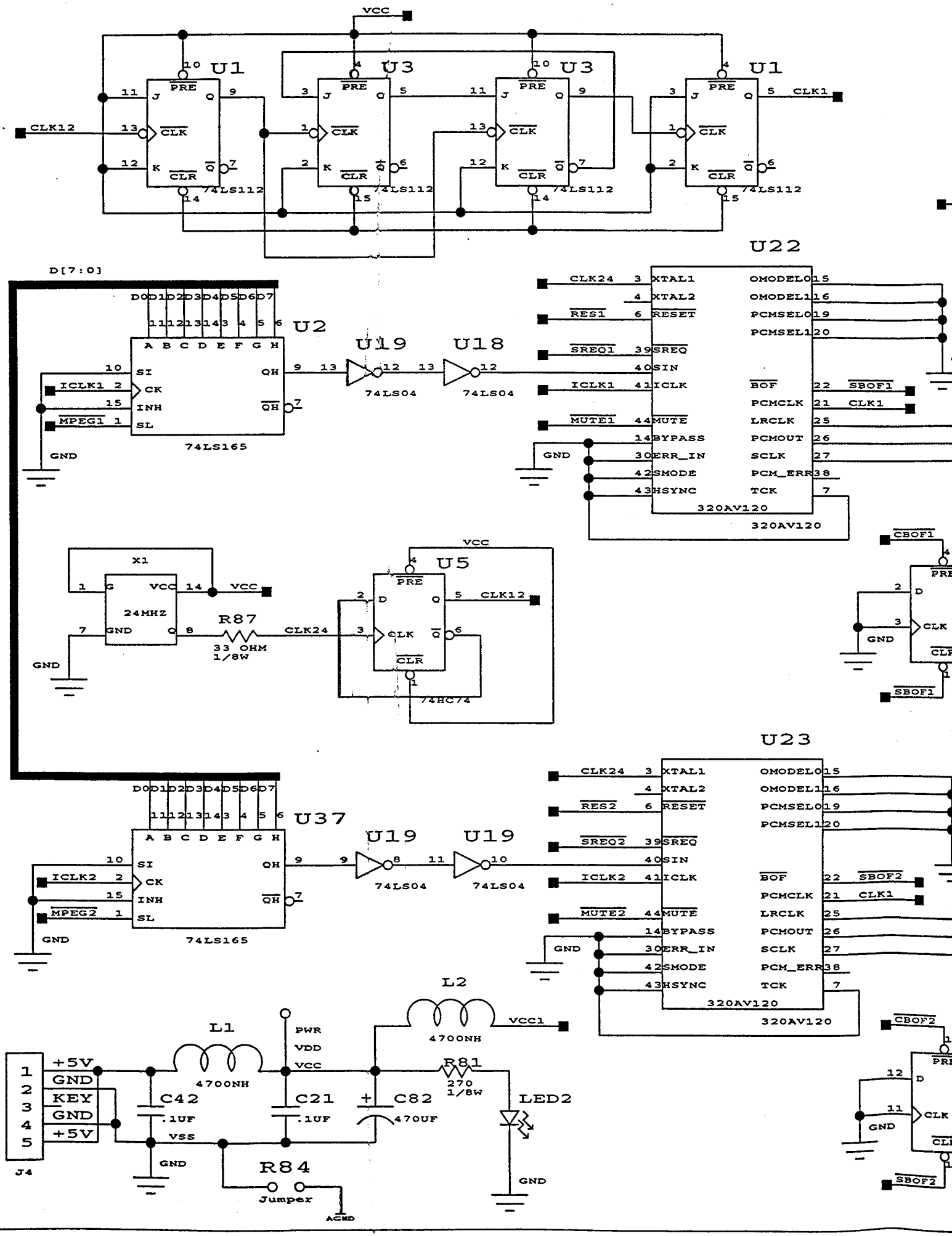
CAPCOM COIN-OP, INC.		
TITLE [MPSNDTOP.1] PINBALL SOUND PCB		
PROJECT ENGINEER J. BOYDSTON	ASSEMBLY # A0015002	
DATE 03/21/95	SHEET # TOP	REV -

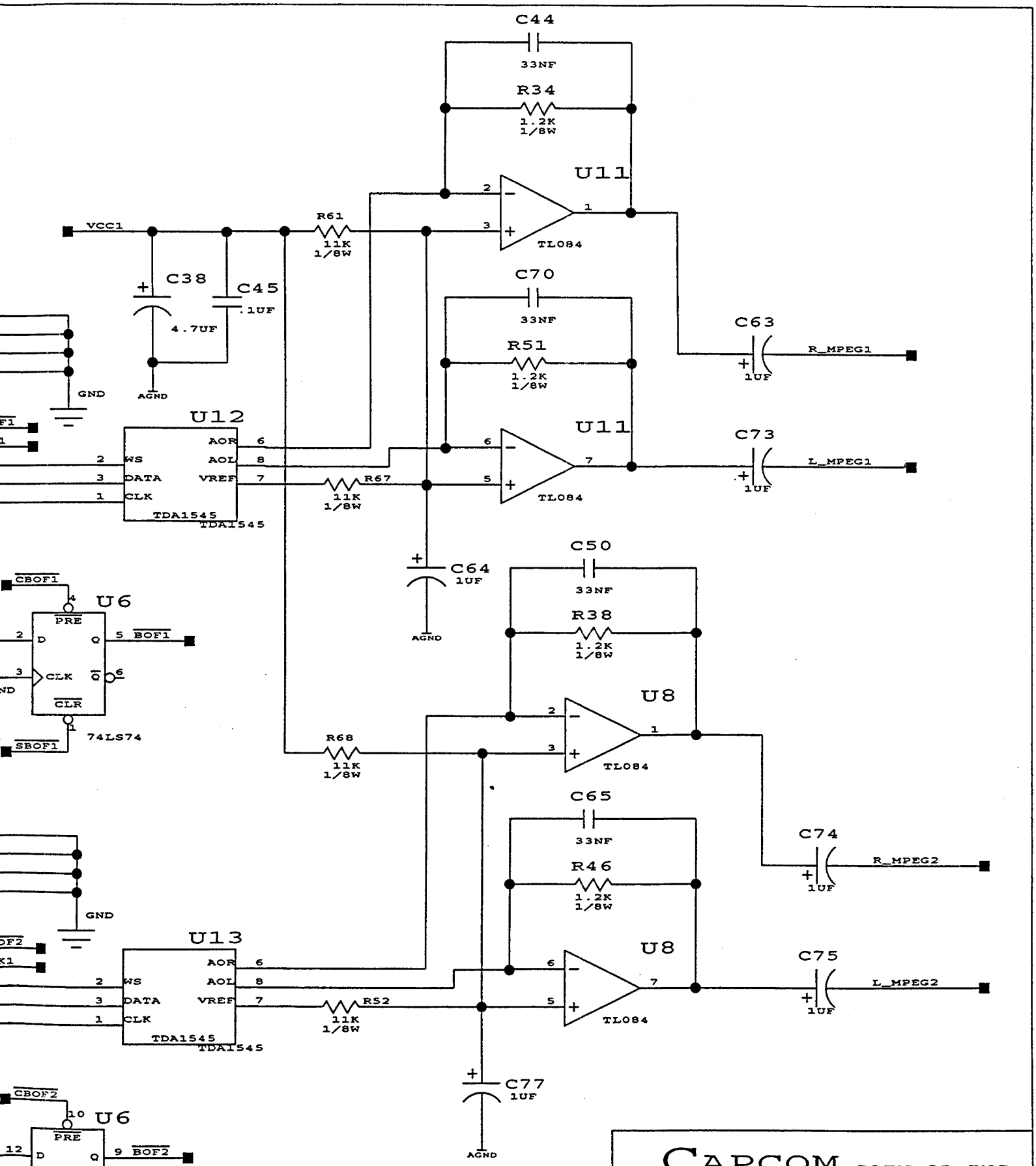

U24
87C52
U34
74LS373
U35
U36
D[7:0]
A[15:0]
U19
74LS04
U18
74LS04
LED1
D8
1N4148
R85
1K
1/8W
R86
10K
1/8W
R4
1K
1/8W
C78
22UF
C85
C84
C86
C87
C71
100PF
.1UF
J5
STR .100
For Development only
GND
+5v
VCC
MRES1
MRES2
U28
U29
U30
ROM_8M8
LA[22:15]
ROM0
ROM1
ROM2



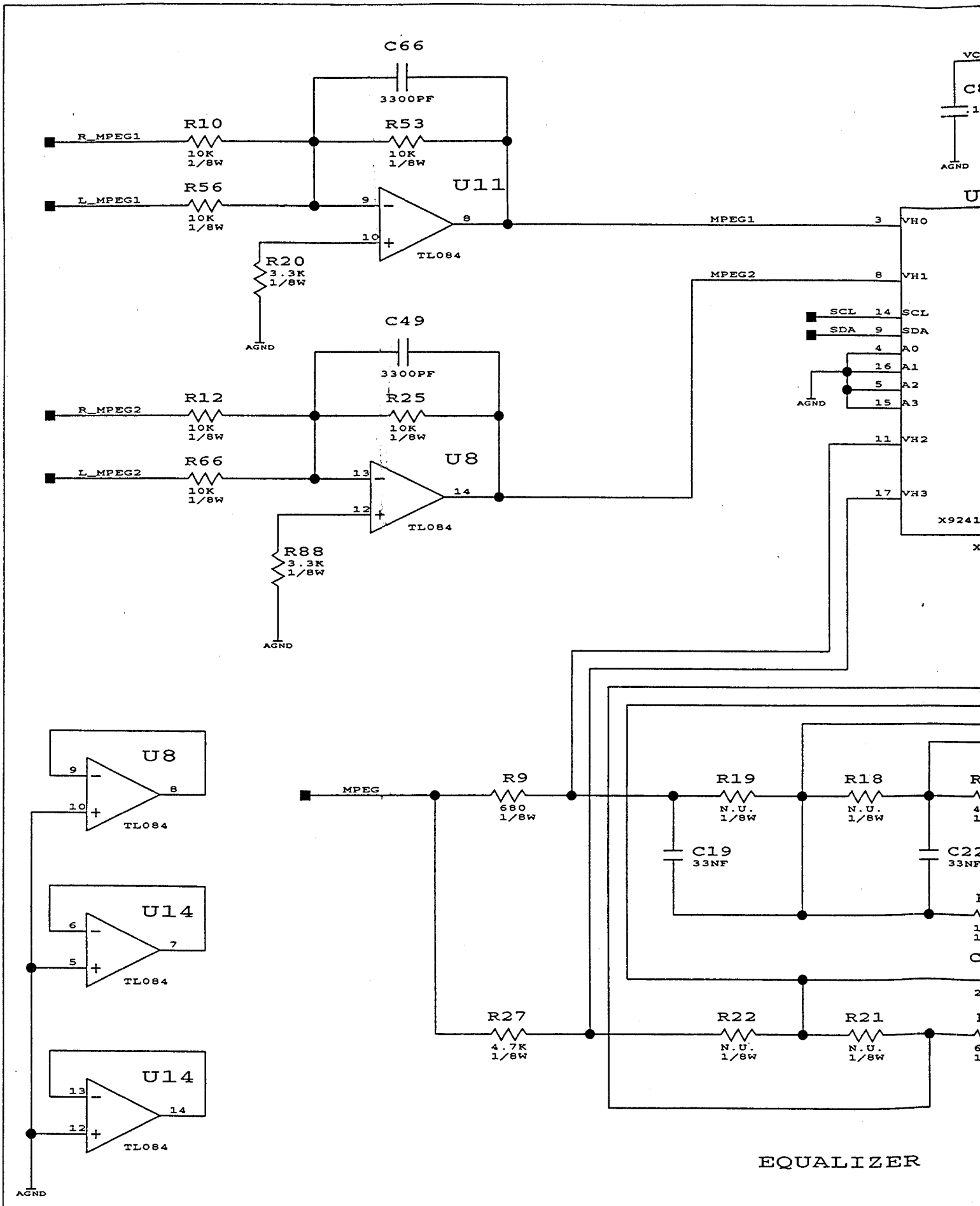
CAPCOM COIN-OP, INC.

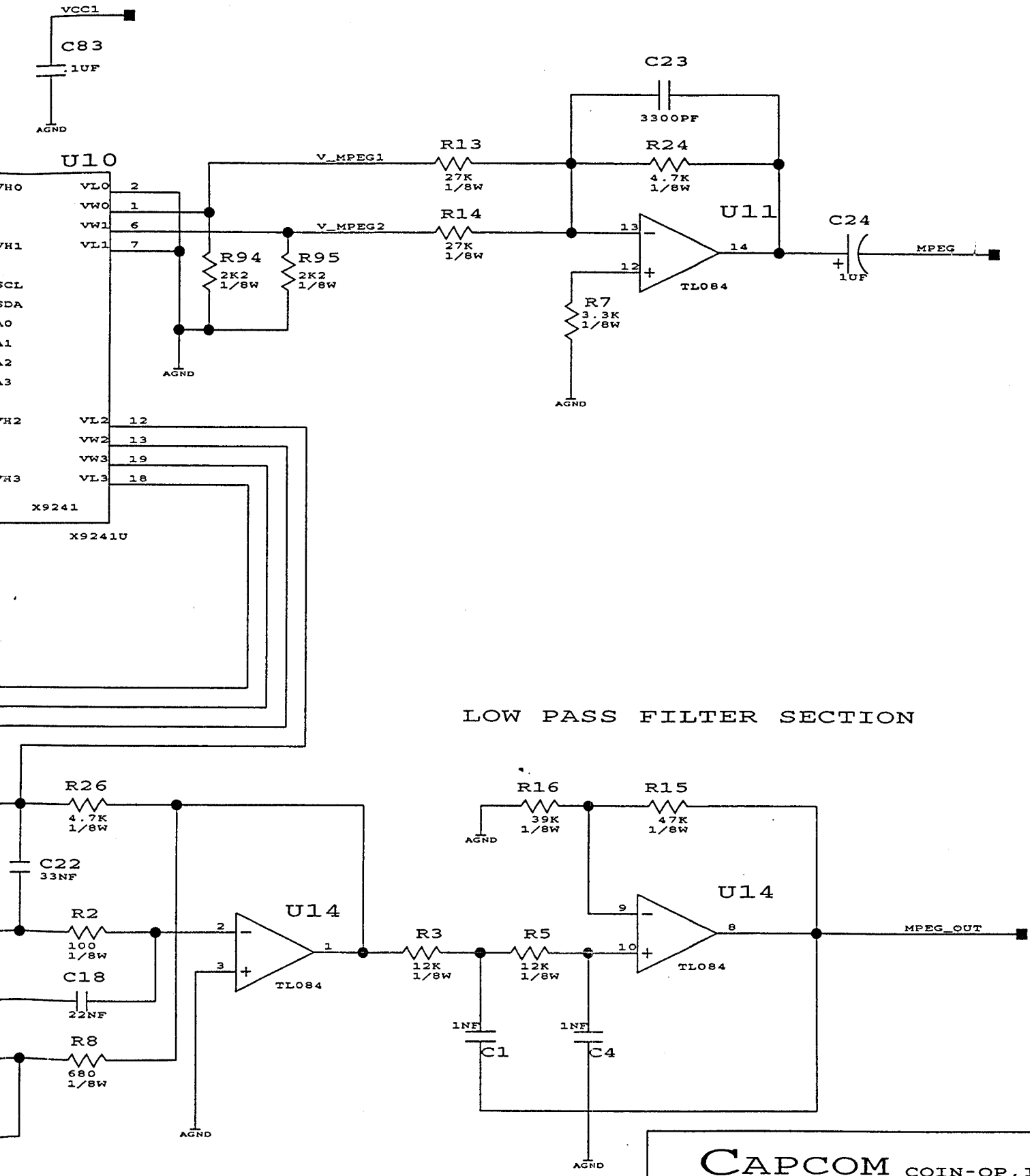
TITLE: PINBALL SOUND PCB	
PROJECT ENGINEER: J. BOYDSTON	ASSEMBLY #: A0015002
DATE: 03/21/95	SHEET #: 1 OF 4 / REV: -


VCC
U1
U3
U3
U1
PRE
CLK
CLR
74LS112
CLK12
CLK1
D[7:0]
U2
74LS165
U19
U18
74LS04
74LS04
U22
320AV120
ICLK1
MPEG1
RES1
SREQ1
MUTE1
CLK24
CLK1
SBOF1
CBOF1
GND
X1
24MHZ
R87
33 OHM
1/8W
U5
74HC74
U37
74LS165
U19
U19
74LS04
74LS04
U23
320AV120
ICLK2
MPEG2
RES2
SREQ2
MUTE2
SBOF2
CBOF2
L1
4700NH
L2
4700NH
VCC1
PWR
VDD
VCC
VSS
+5V
GND
KEY
J4
C42
.1UF
C21
.1UF
C82
470UF
R81
270
1/8W
LED2
R84
Jumper
AGND

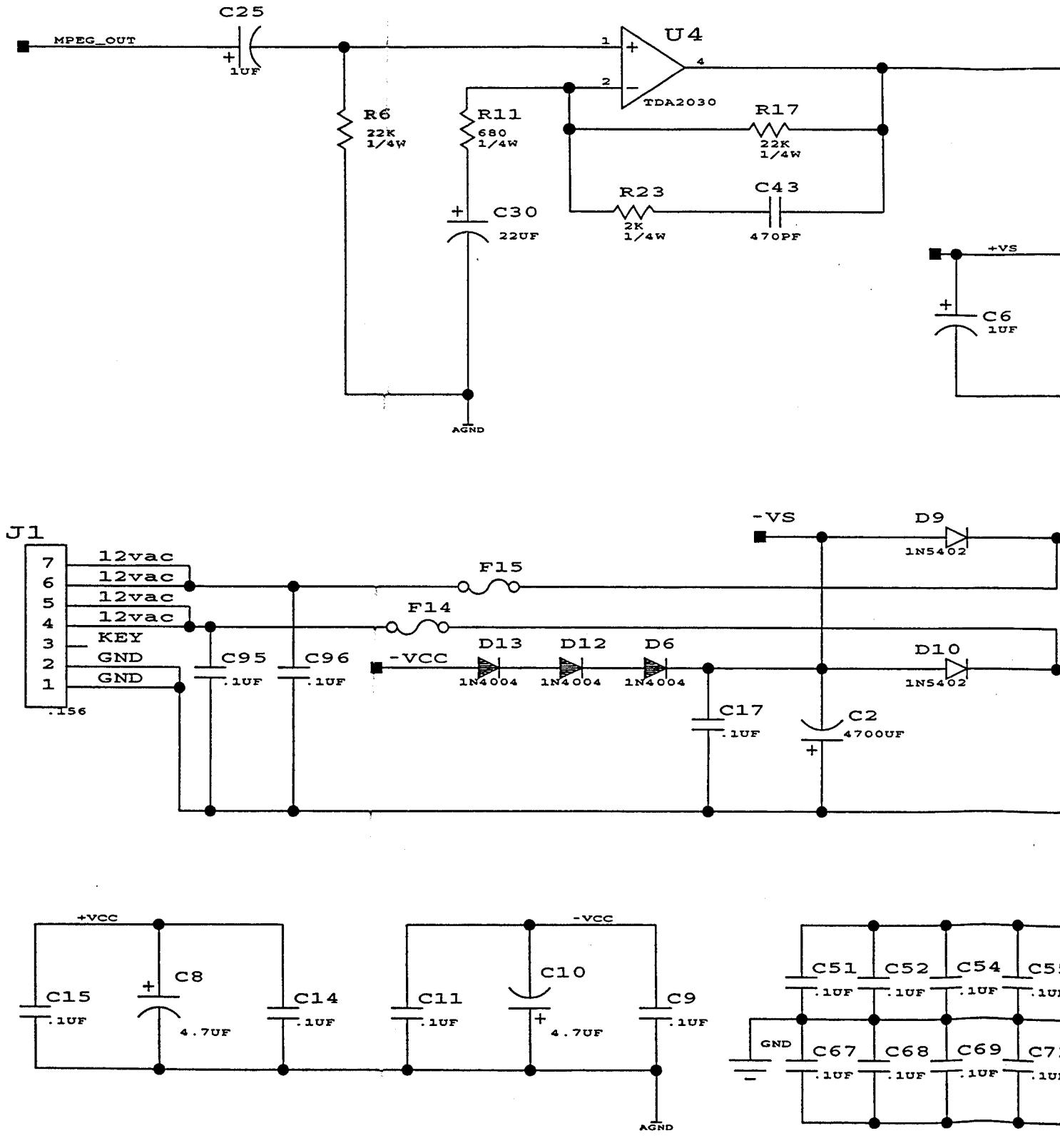


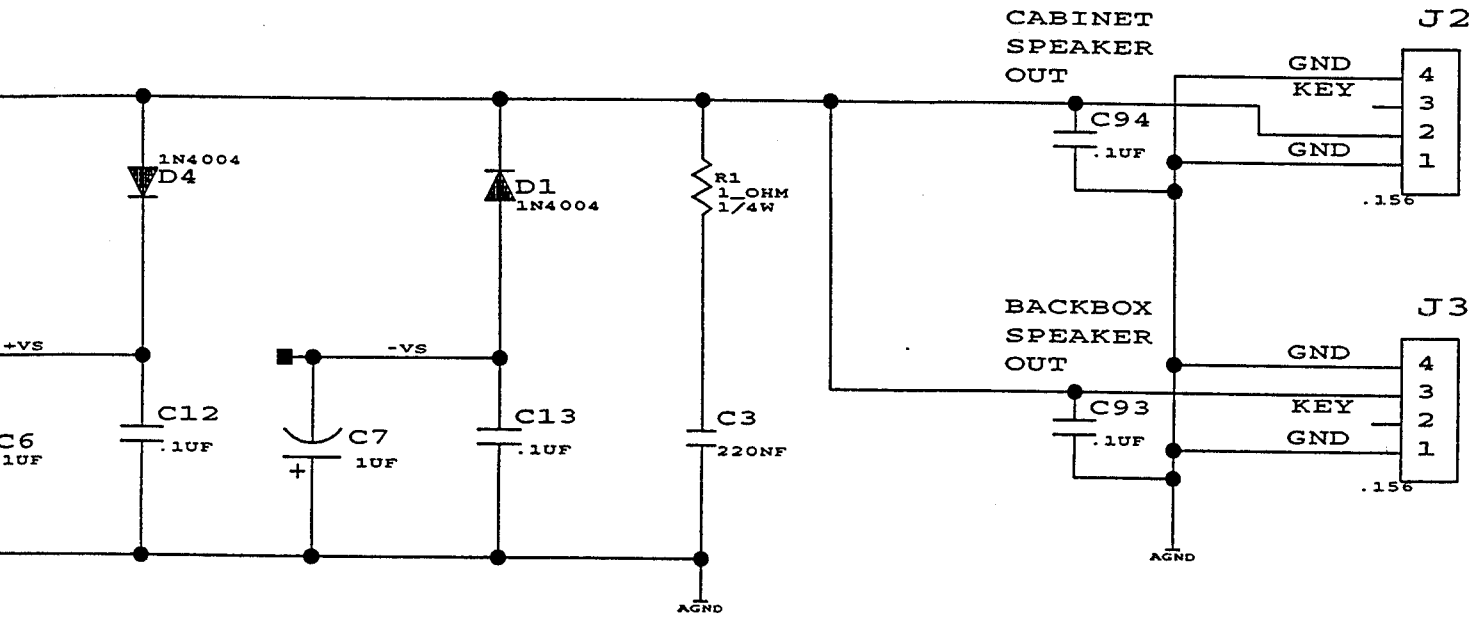
CAPCOM COIN-OP, INC.		
TITLE [DACAMP1.1] MPEG PINBALL SOUND		
PROJECT ENGINEER J. BOYDSTON	ASSEMBLY # A0015002	
DATE 03/21/95	SHEET # 2 OF 4	REV -

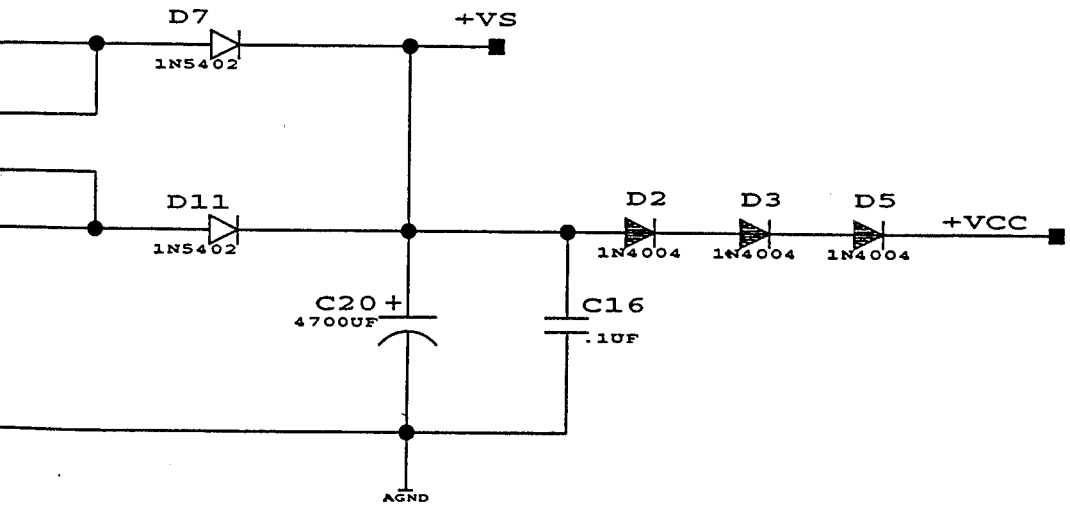

C66
3300PF
R10
10K
1/8W
R53
10K
1/8W
R_MPEG1
R56
10K
1/8W
L_MPEG1
U11
TL084
R20
3.3K
1/8W
AGND
MPEG1
MPEG2
C49
3300PF
R12
10K
1/8W
R25
10K
1/8W
R_MPEG2
R66
10K
1/8W
L_MPEG2
U8
TL084
R88
3.3K
1/8W
AGND
VH0
VH1
VH2
VH3
SCL
SDA
A0
A1
A2
A3
X9241
MPEG
R9
680
1/8W
R19
N.U.
1/8W
R18
N.U.
1/8W
C19
33NF
R27
4.7K
1/8W
R22
N.U.
1/8W
R21
N.U.
1/8W
U8
U14
U14
TL084
AGND
EQUALIZER

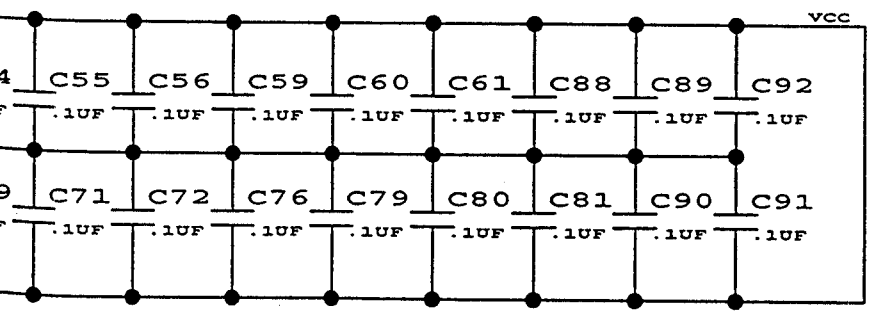


CAPCOM COIN-OP, INC.		
TITLE [SUM_GAIN.1] PINBALL SOUND PCB		
PROJECT ENGINEER J. BOYDSTON	ASSEMBLY # A0015002	
DATE 03/21/95	SHEET # 3 OF 4	REV -


C25
MPEG_OUT
1UF
U4
TDA2030
R6
22K
1/4W
R11
680
1/4W
R17
22K
1/4W
R23
2K
1/4W
C43
470PF
C30
22UF
AGND
+VS
C6
1UF
J1
7
6
5
4
3
2
1
12vac
12vac
12vac
12vac
KEY
GND
GND
.156
C95
.1UF
C96
.1UF
F15
F14
-VCC
D13
D12
D6
1N4004
1N4004
1N4004
-VS
D9
1N5402
D10
1N5402
C17
.1UF
C2
4700UF
+VCC
C15
.1UF
C8
4.7UF
C14
.1UF
C11
.1UF
C10
4.7UF
C9
.1UF
AGND
C51
C52
C54
.1UF
.1UF
.1UF
GND
C67
C68
C69
.1UF
.1UF
.1UF

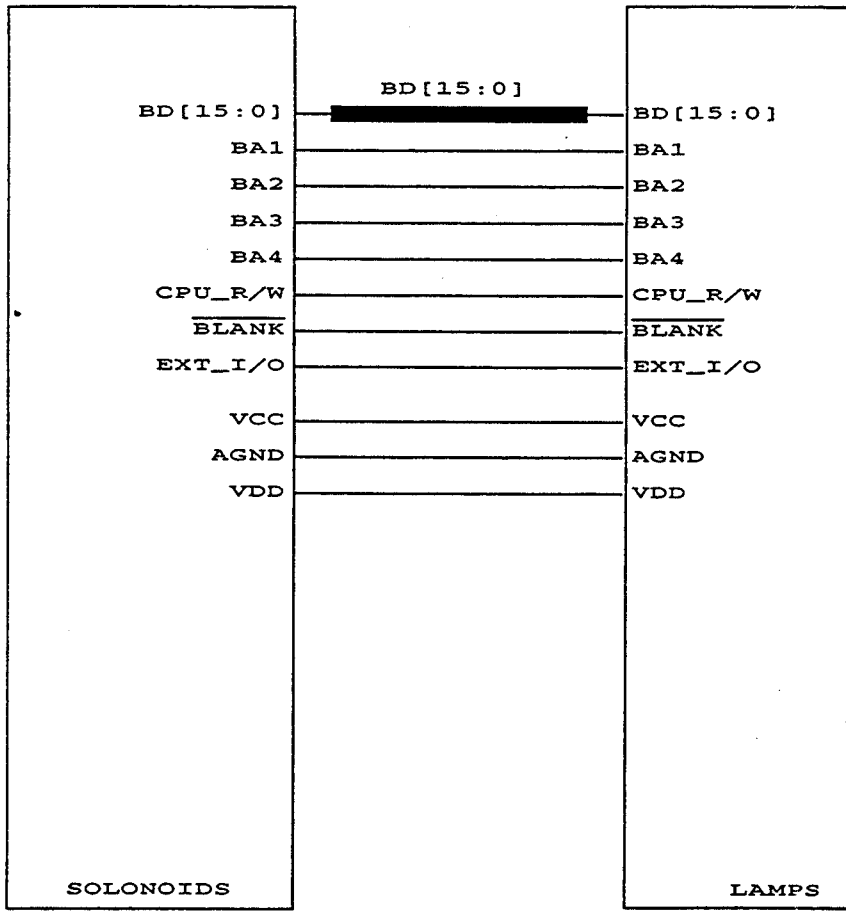






CAPCOM COIN-OP, INC.

TITLE [AMP-3.1] PINBALL SOUND PCB	
PROJECT ENGINEER J. BOYDSTON	ASSEMBLY # A0015002
DATE 3/28/95	SHEET # 4 OF 4 / REV --


BD[15:0]
BD[15:0]
BA1
BA2
BA3
BA4
CPU_R/W
BLANK
EXT_I/O
VCC
AGND
VDD
BD[15:0]
BA1
BA2
BA3
BA4
CPU_R/W
BLANK
EXT_I/O
VCC
AGND
VDD
SOLONOIDS
LAMPS

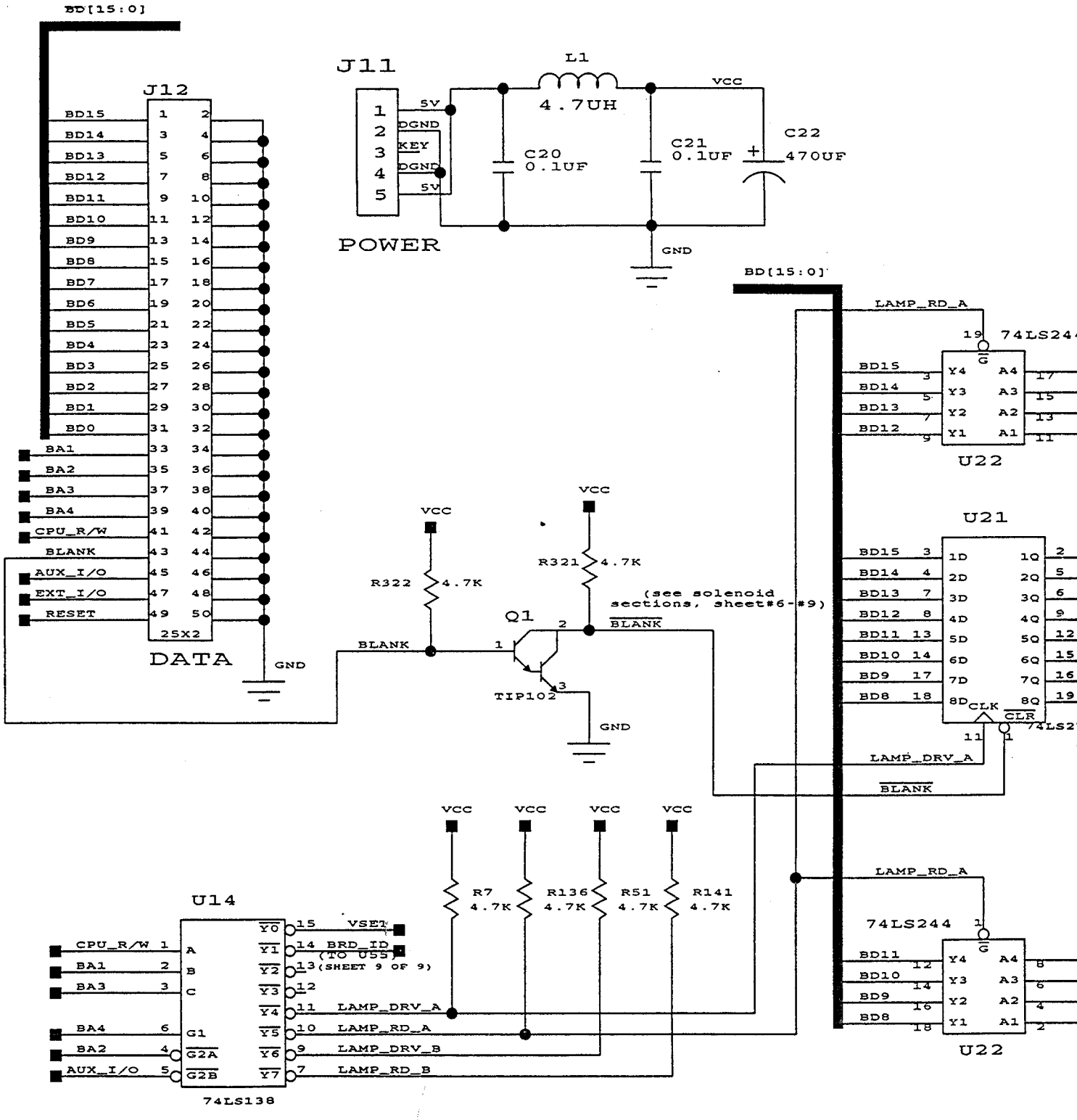
:0]

/W

/O

LAMPS

CAPCOM COIN-OP, INC.		
TITLE (MAIN.1) DRIVER BOARD/PINBALL SYSTEM		
PROJECT ENGINEER GREG TOPEL	ASSEMBLY # A0015105	
DATE AUGUST 16, 1995	SHEET # 1 OF 9	REV 05

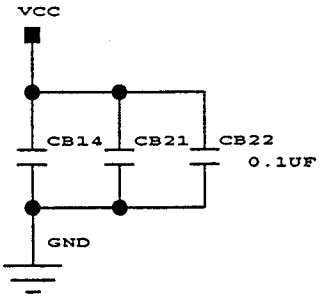


REFERENCE DESIGNATORS

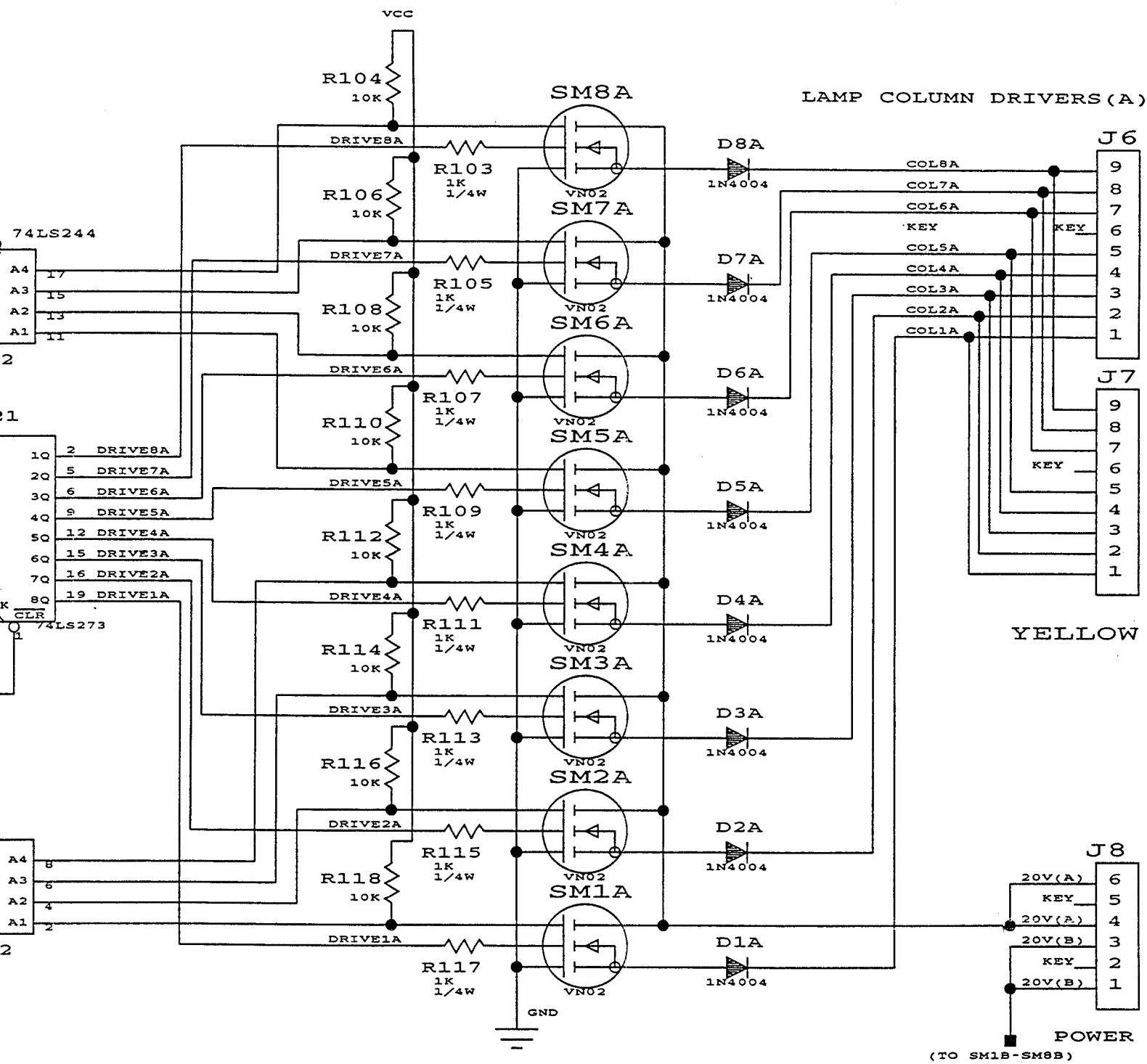
LAST USED	DESIGNATORS SKIPPED
C59	C12
CB55	CB32
CF14	
D32	
D8A	
D8B	
J25	
L1	
M10	M1-8
Q1	
R322	R44-R48
RN2	
S32	
SM8A	
SM8B	
U55	U32

IC POWER/GROUND PINS

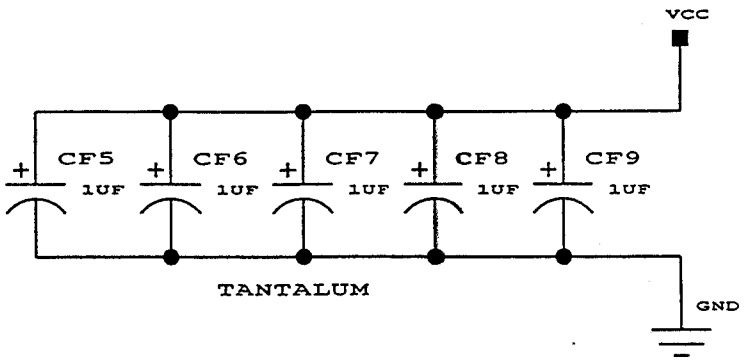
INTERGRATED CIRCUIT	GROUND PIN	POWER PIN
U1,6,7,12,27,33, 35,40,42,47,49,54.	12	3
U2-5,8-11,13, 28-31,36-39,43-46, 50-53.	7	14
U14-15	8	16
U16-26,34,41,48,55	10	20

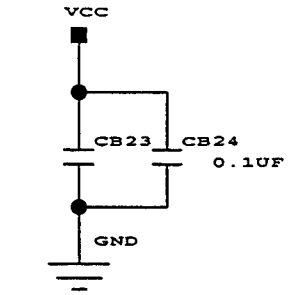


ALL CAPS ARE 0.1uF
UNLESS OTHERWISE STATED

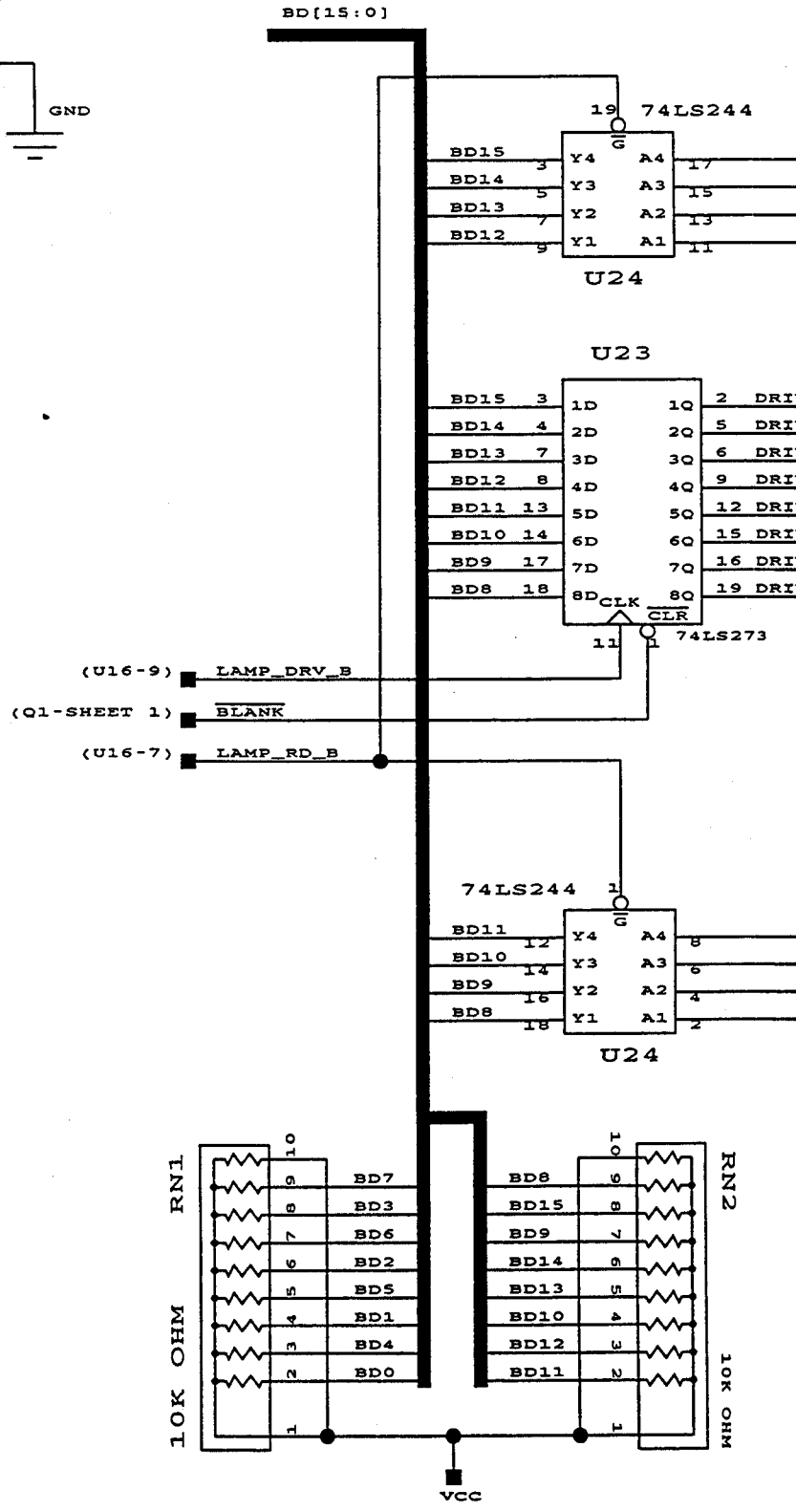


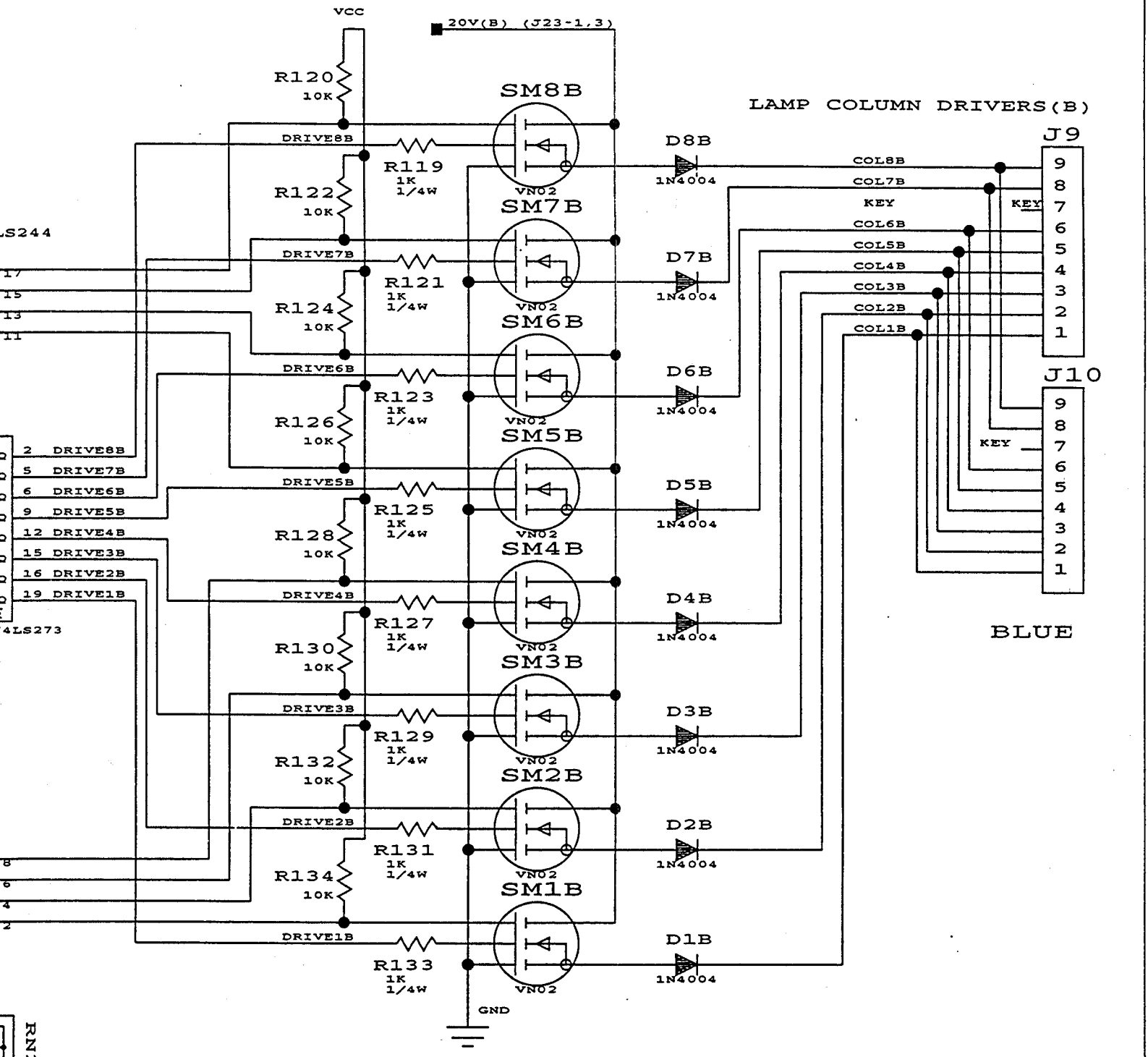
CAPCOM COIN-OP, INC.	
TITLE (LAMP_PB.1)	
DRIVER BOARD(LAMP COLUMN A)	
PROJECT ENGINEER	ASSEMBLY #
GREG TOPEL	A0015105
DATE	SHEET # / REV
AUGUST 16, 1995	2 OF 9 / 05



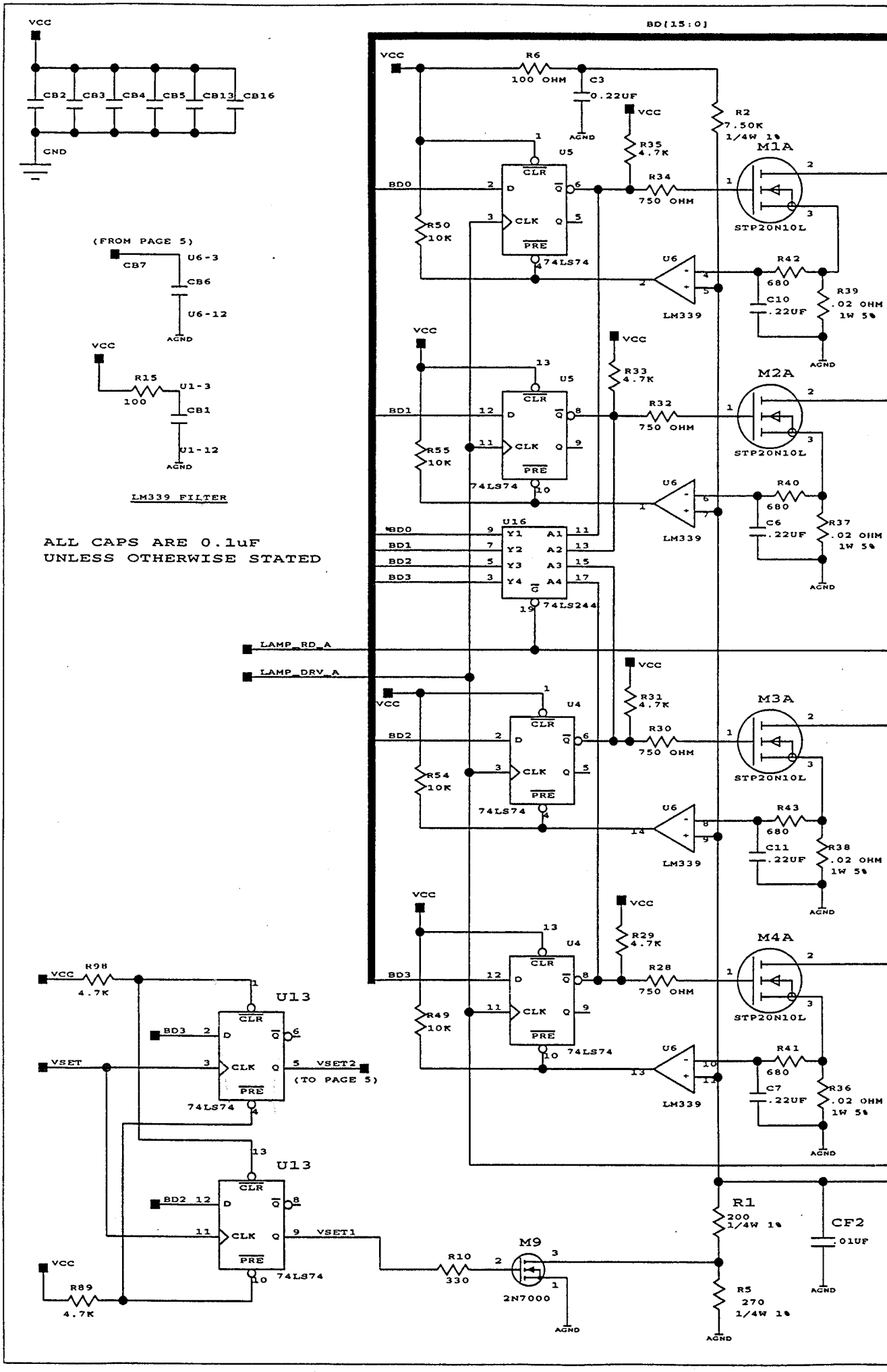


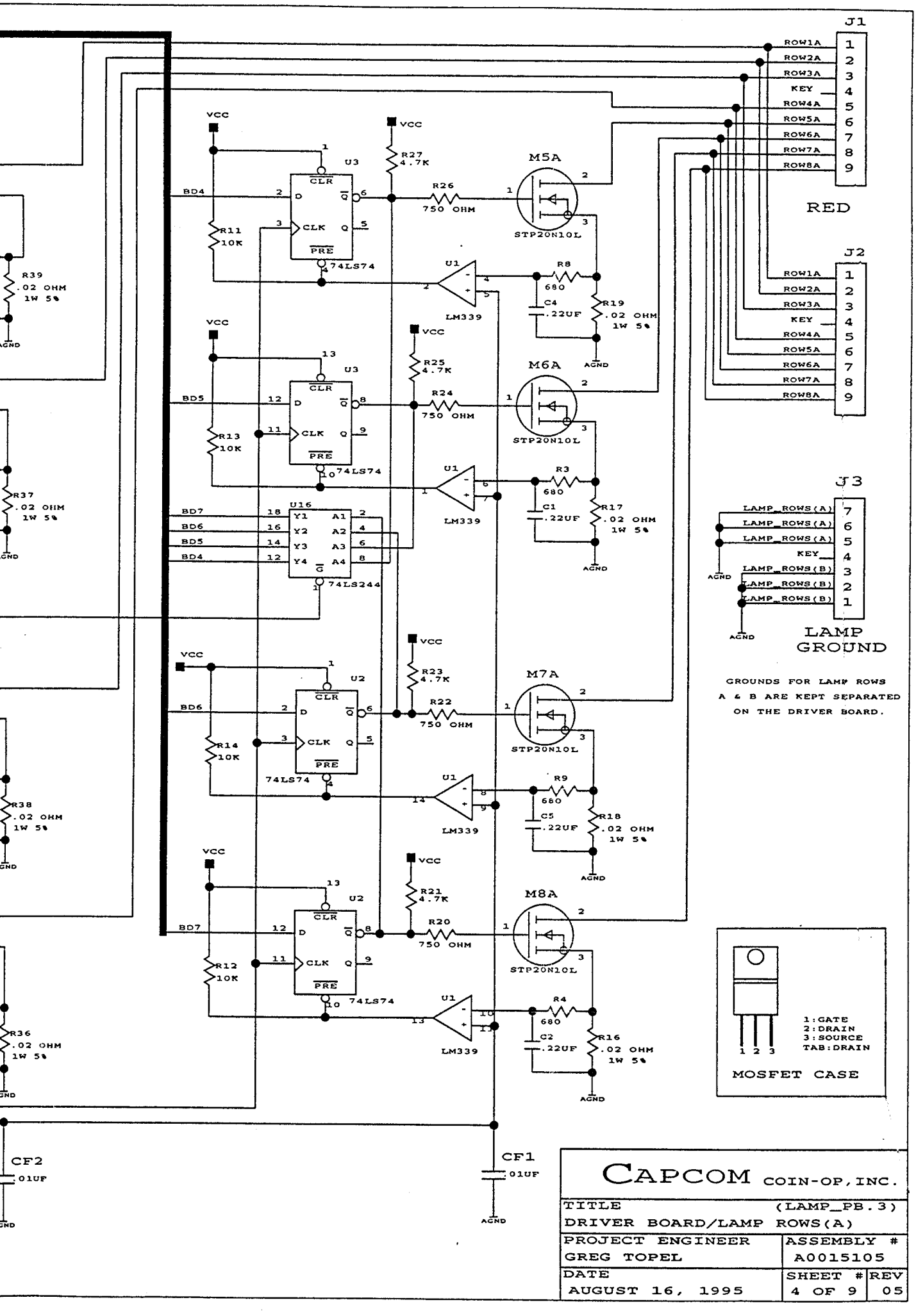
ALL CAPS ARE 0.1uF
UNLESS OTHERWISE STATED





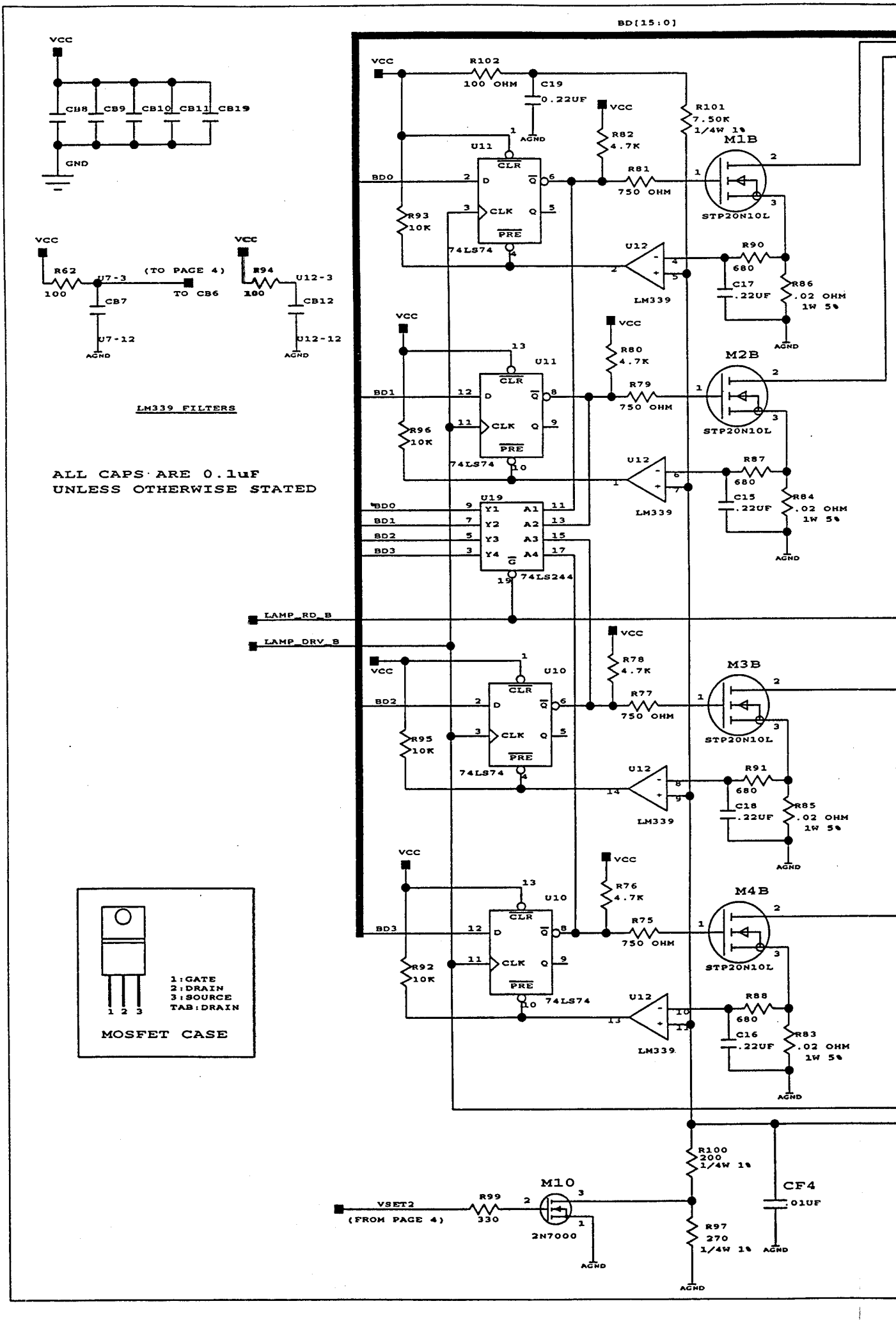
CAPCOM COIN-OP, INC.		
TITLE (LAMP_PB.2) DRIVER BOARD/LAMP COLUMN B		
PROJECT ENGINEER GREG TOPEL	ASSEMBLY # A0015105	
DATE AUGUST 16, 1995	SHEET # 3 OF 9	REV 05

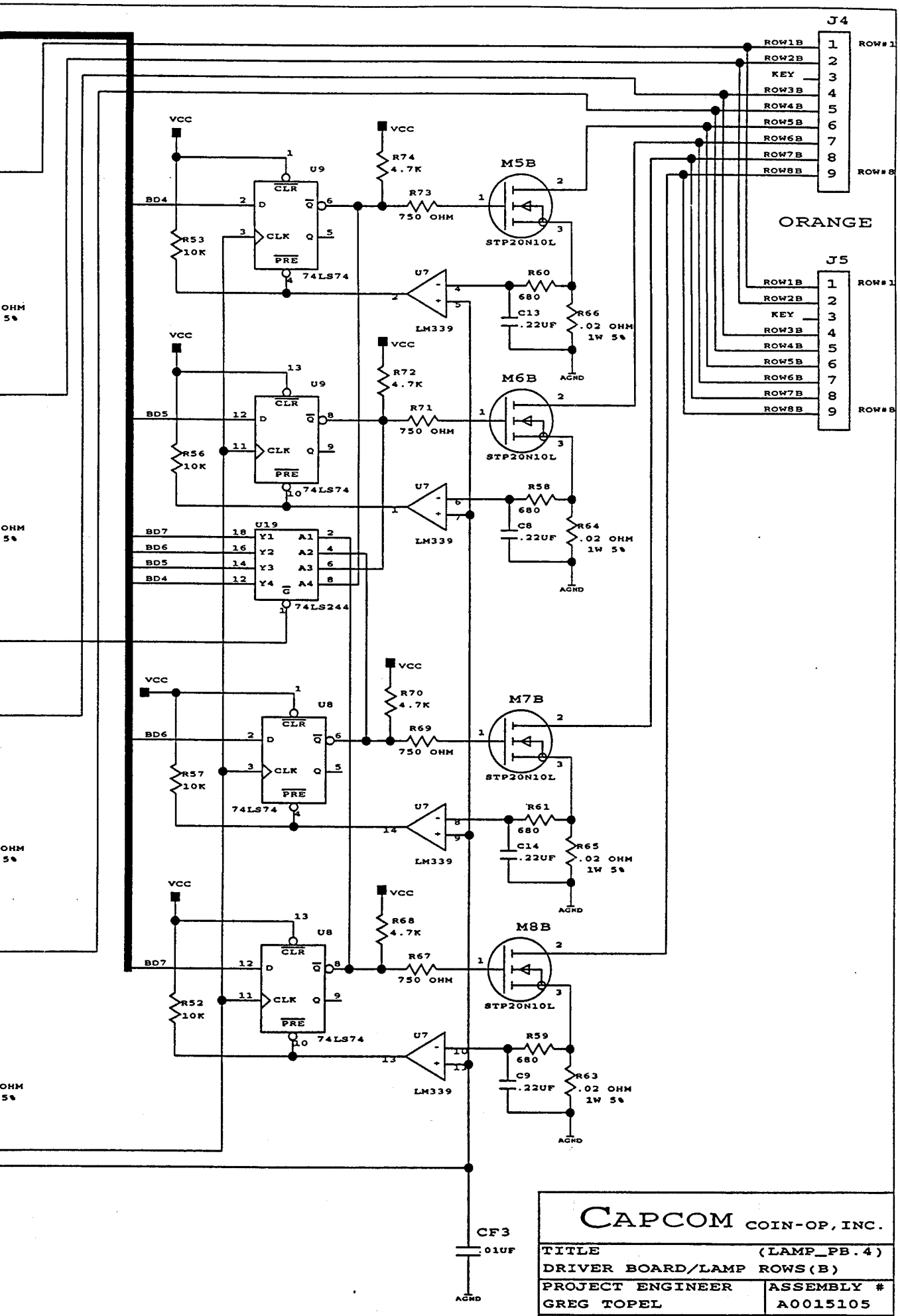

VCC
CB2
CB3
CB4
CB5
CB13
CB16
GND
(FROM PAGE 5)
CB7
U6-3
CB6
U6-12
AGND
VCC
R15
100
U1-3
CB1
U1-12
AGND
LM339 FILTER
ALL CAPS ARE 0.1uF
UNLESS OTHERWISE STATED
BD[15:0]
VCC
R6
100 OHM
C3
0.22UF
AGND
R2
7.50K
1/4W 1%
M1A
U5
BD0
R50
10K
R35
4.7K
R34
750 OHM
STP20N10L
74LS74
U6
LM339
R42
680
C10
.22UF
R39
.02 OHM
1W 5%
R33
4.7K
M2A
BD1
R55
10K
R32
750 OHM
R40
680
C6
.22UF
R37
.02 OHM
1W 5%
U16
BD0
BD1
BD2
BD3
74LS244
LAMP_RD_A
LAMP_DRV_A
R31
4.7K
M3A
U4
BD2
R54
10K
R30
750 OHM
R43
680
C11
.22UF
R38
.02 OHM
1W 5%
R29
4.7K
M4A
BD3
R49
10K
R28
750 OHM
R41
680
C7
.22UF
R36
.02 OHM
1W 5%
R98
4.7K
U13
VSET
VSET2
(TO PAGE 5)
BD2
VSET1
R89
4.7K
R10
330
M9
2N7000
R1
200
1/4W 1%
CF2
.01UF
R5
270
1/4W 1%



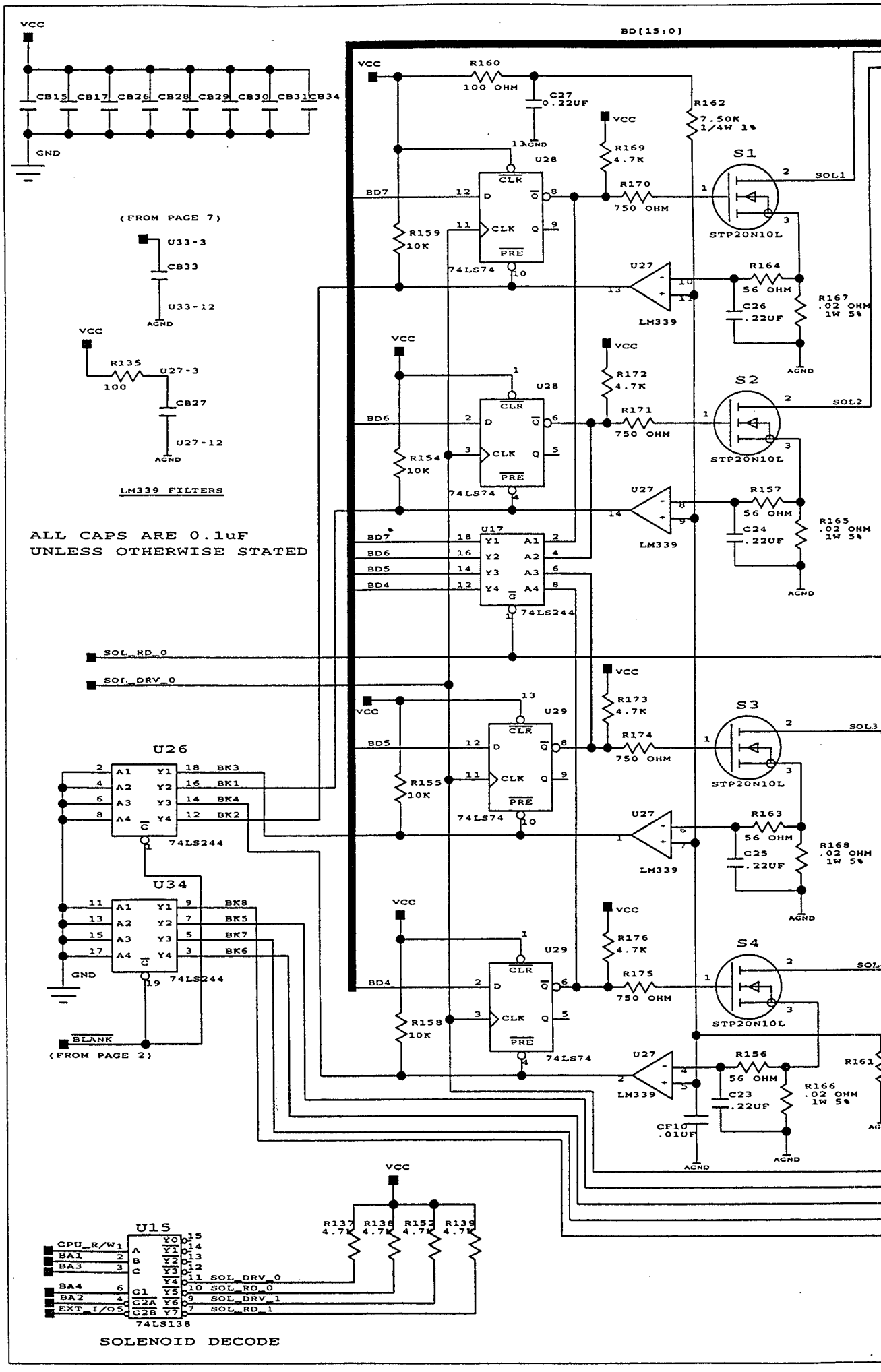
CAPCOM COIN-OP, INC.

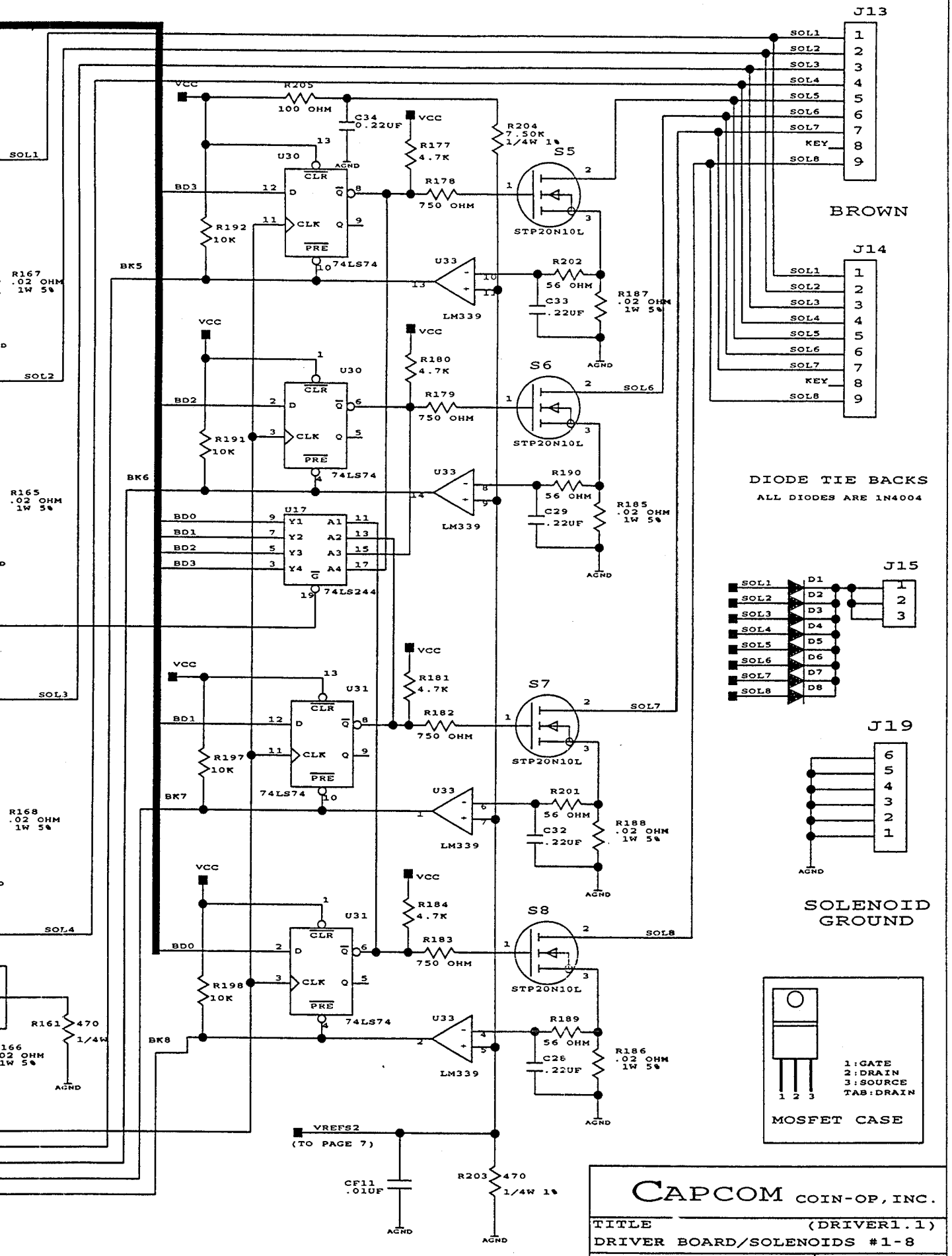
TITLE (LAMP_PB.3) DRIVER BOARD/LAMP ROWS(A)		
PROJECT ENGINEER GREG TOPEL	ASSEMBLY # A0015105	
DATE AUGUST 16, 1995	SHEET # 4 OF 9	REV 05


BD[15:0]
VCC
CB8
CB9
CB10
CB11
CB19
GND
R62
100
U7-3
(TO PAGE 4)
TO CB6
CB7
U7-12
AGND
R94
100
U12-3
CB12
U12-12
LM339 FILTERS
ALL CAPS ARE 0.1uF
UNLESS OTHERWISE STATED
R102
100 OHM
C19
0.22UF
R101
7.50K
1/4W 1%
M1B
U11
CLR
D
CLK
PRE
Q
74LS74
BD0
R93
10K
R82
4.7K
R81
750 OHM
STP20N10L
U12
LM339
R90
680
C17
.22UF
R86
.02 OHM
1W 5%
BD1
R96
10K
R80
4.7K
R79
750 OHM
M2B
R87
680
C15
.22UF
R84
.02 OHM
1W 5%
U19
74LS244
BD2
BD3
LAMP_RD_B
LAMP_DRV_B
R78
4.7K
R77
750 OHM
M3B
R95
10K
R91
680
C18
.22UF
R85
.02 OHM
1W 5%
R76
4.7K
R75
750 OHM
M4B
R92
10K
R88
680
C16
.22UF
R83
.02 OHM
1W 5%
1:GATE
2:DRAIN
3:SOURCE
TAB:DRAIN
1 2 3
MOSFET CASE
R100
200
1/4W 1%
CF4
01UF
M10
2N7000
VSET2
(FROM PAGE 4)
R99
330
R97
270
1/4W 1%



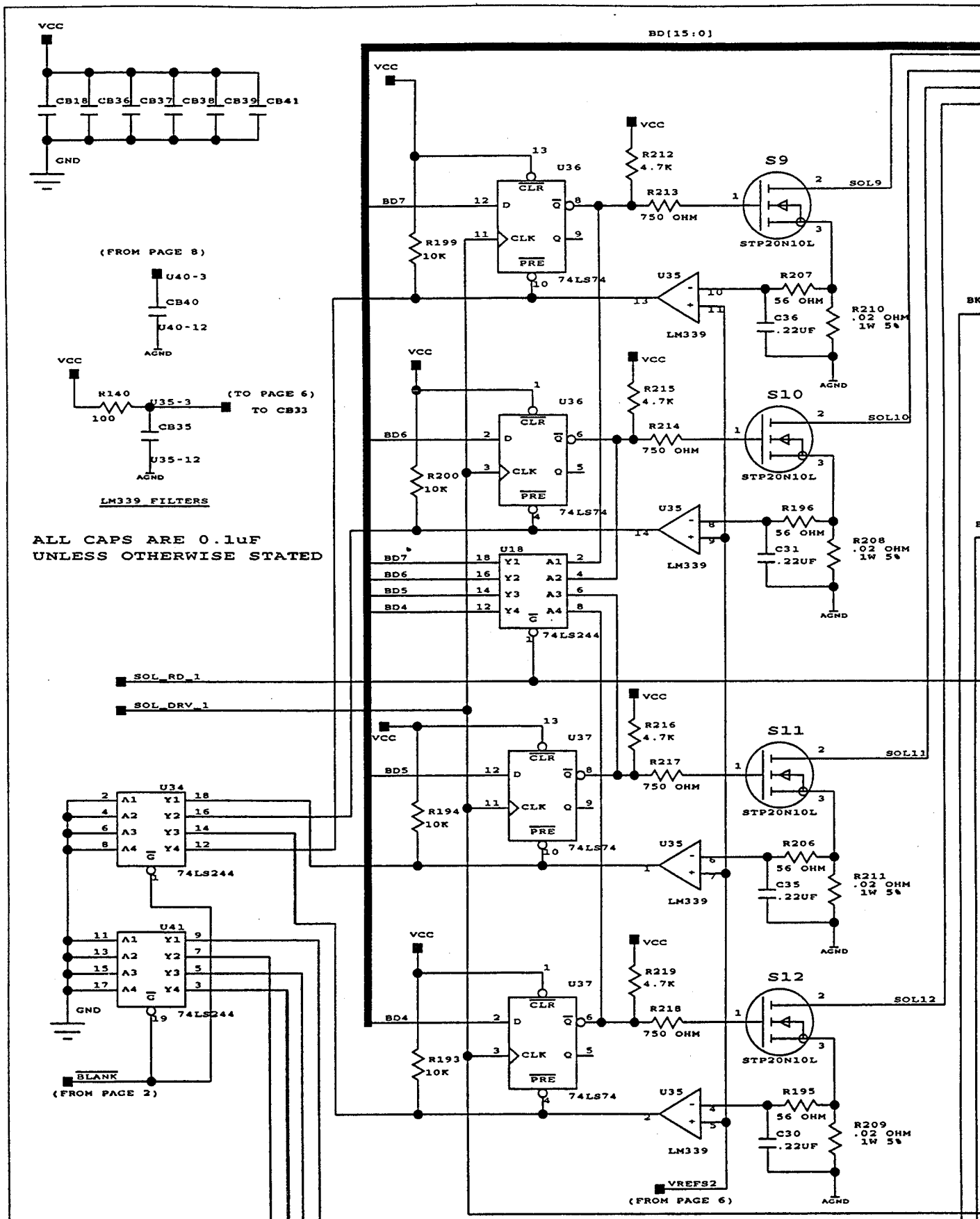
CAPCOM COIN-OP, INC.		
TITLE (LAMP_PB.4) DRIVER BOARD/LAMP ROWS(B)		
PROJECT ENGINEER GREG TOPEL	ASSEMBLY # A0015105	
DATE AUGUST, 16, 1995	SHEET # 5 OF 9	REV 05

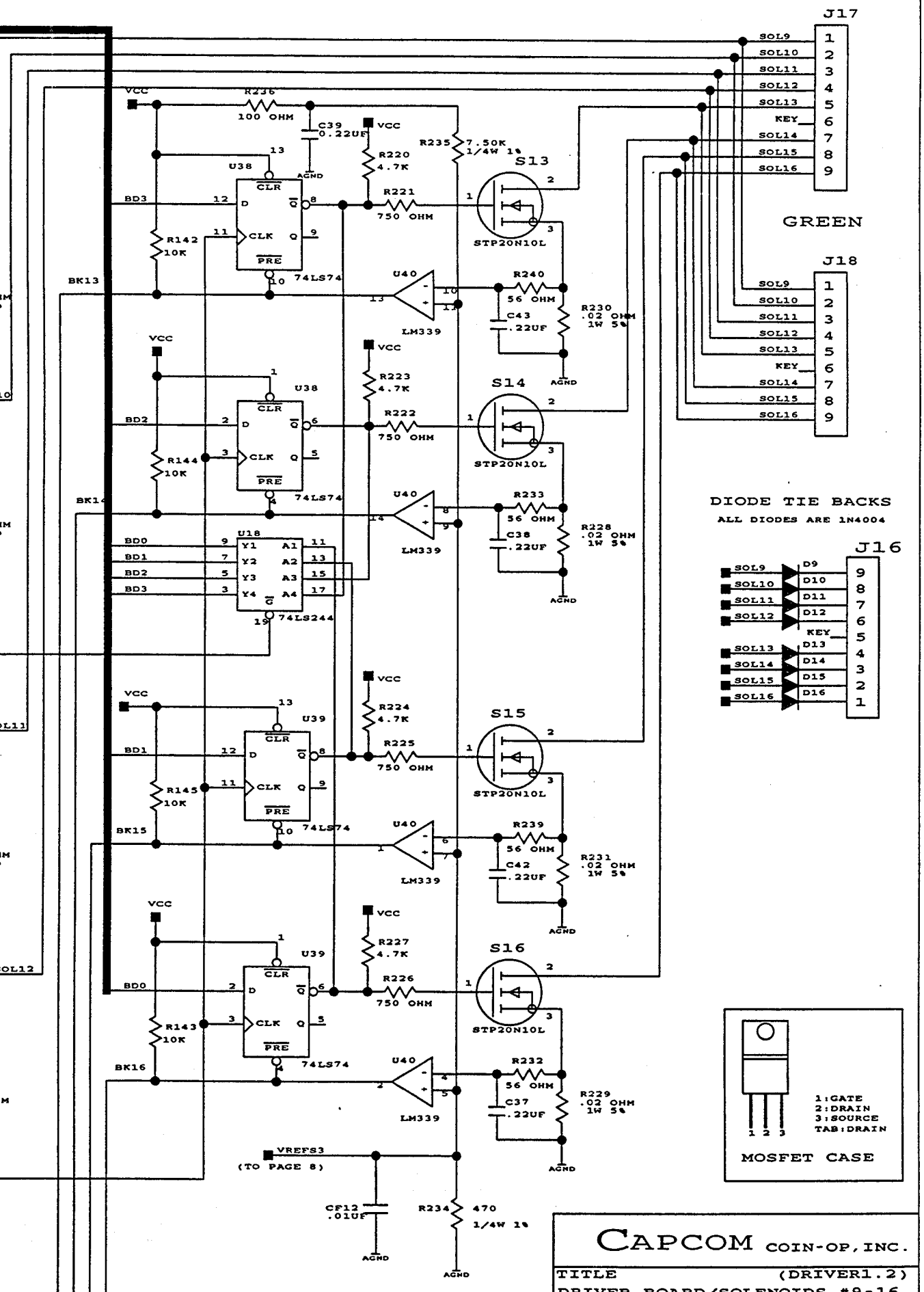

VCC
CB15 CB17 CB26 CB28 CB29 CB30 CB31 CB34
GND
(FROM PAGE 7)
U33-3
CB33
U33-12
AGND
VCC
R135
100
U27-3
CB27
U27-12
AGND
LM339 FILTERS
ALL CAPS ARE 0.1uF
UNLESS OTHERWISE STATED
BD[15:0]
VCC
R160
100 OHM
C27
0.22UF
AGND
U28
CLR
D
CLK
PRE
Q
74LS74
BD7
R159
10K
R169
4.7K
R170
750 OHM
R162
7.50K
1/4W 1%
S1
STP20N10L
SOL1
U27
LM339
R164
56 OHM
C26
.22UF
R167
.02 OHM
1W 5%
BD6
R154
10K
R172
4.7K
R171
750 OHM
S2
SOL2
R157
56 OHM
C24
.22UF
R165
.02 OHM
1W 5%
U17
74LS244
BD7
BD6
BD5
BD4
SOL_RD_0
SOL_DRV_0
U29
BD5
R155
10K
R173
4.7K
R174
750 OHM
S3
SOL3
R163
56 OHM
C25
.22UF
R168
.02 OHM
1W 5%
U26
BK3
BK1
BK4
BK2
U34
BK8
BK5
BK7
BK6
GND
BLANK
(FROM PAGE 2)
BD4
R158
10K
R176
4.7K
R175
750 OHM
S4
R156
56 OHM
C23
.22UF
R166
.02 OHM
1W 5%
CF10
.01UF
R137 4.7K
R138 4.7K
R152 4.7K
R139 4.7K
U15
74LS138
CPU_R/W
BA1
BA3
BA4
BA2
EXT_I/O
SOL_DRV_0
SOL_RD_0
SOL_DRV_1
SOL_RD_1
SOLENOID DECODE



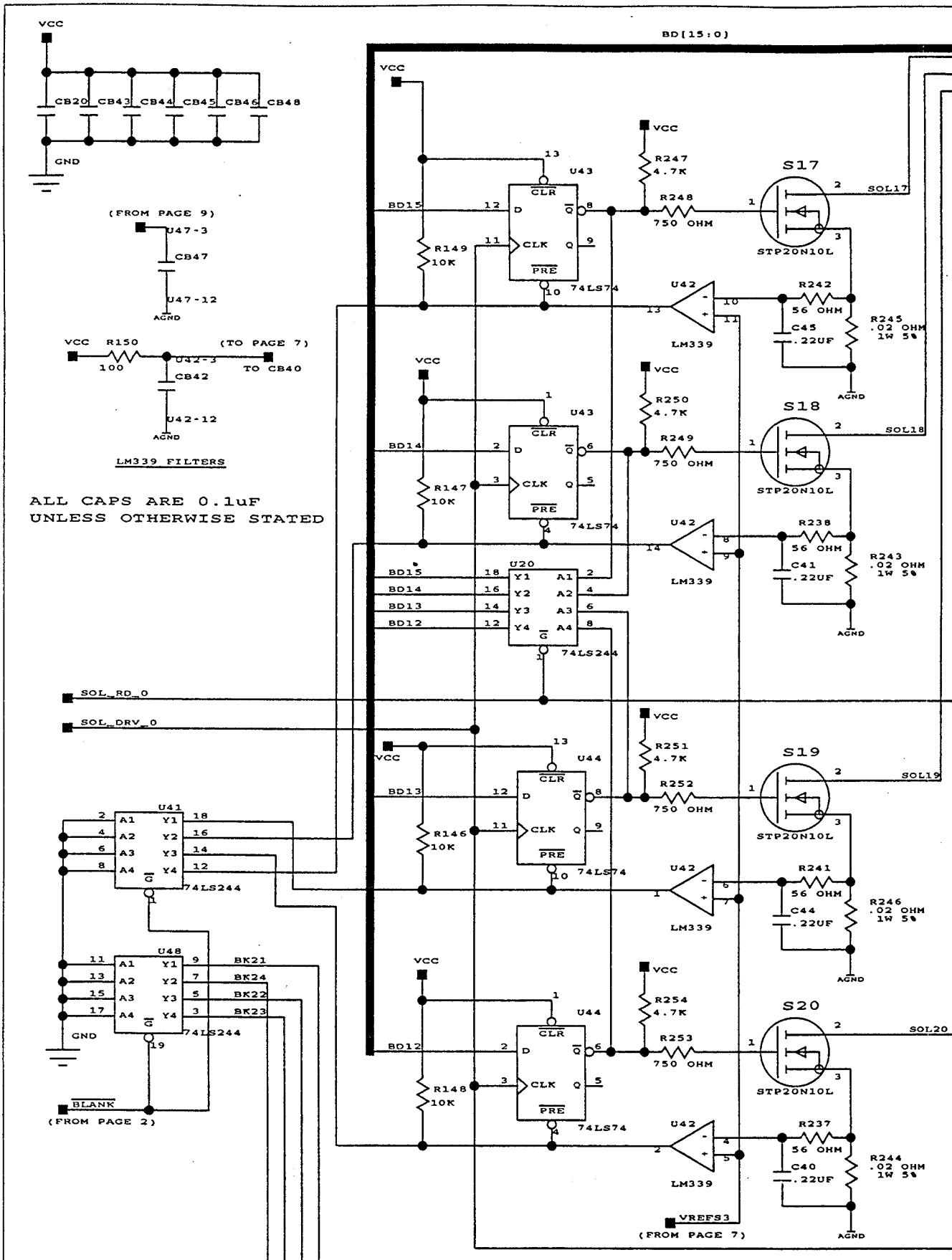
CAPCOM COIN-OP, INC.

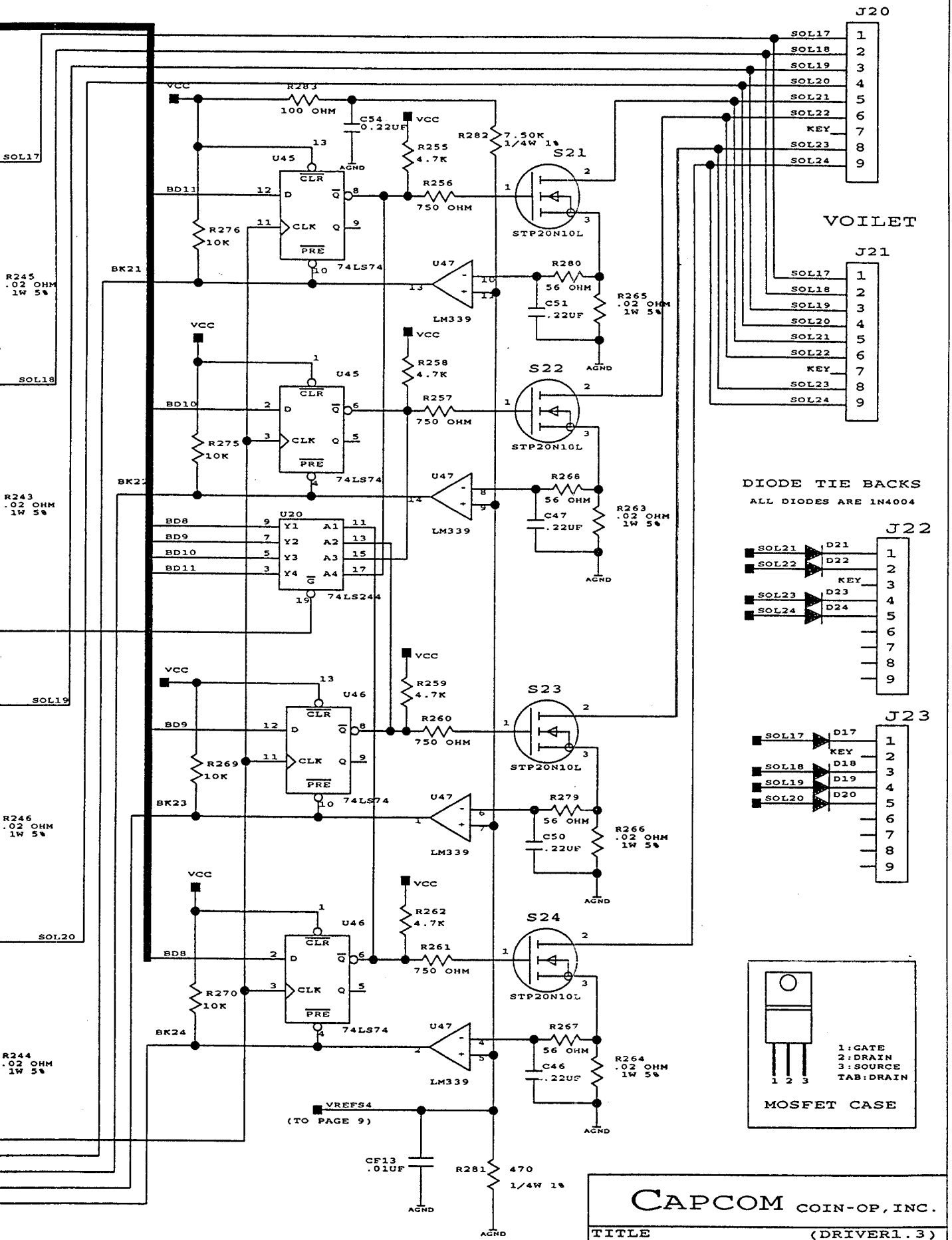
TITLE (DRIVER1.1)	
DRIVER BOARD/SOLENOIDS #1-8	
PROJECT ENGINEER	ASSEMBLY #
GREG TOPEL	A0015105
DATE	SHEET # / REV
AUGUST 16, 1995	6 OF 9 / 05


VCC
CB18 CB36 CB37 CB38 CB39 CB41
GND
(FROM PAGE 8)
U40-3
CB40
U40-12
AGND
VCC
R140
100
U35-3
(TO PAGE 6)
TO CB33
CB35
U35-12
AGND
LM339 FILTERS
ALL CAPS ARE 0.1uF
UNLESS OTHERWISE STATED
BD[15:0]
U36
U37
U18
U34
U41
74LS74
74LS244
LM339
STP20N10L
S9
S10
S11
S12
R212 4.7K
R213 750 OHM
R215 4.7K
R214 750 OHM
R216 4.7K
R217 750 OHM
R219 4.7K
R218 750 OHM
R199 10K
R200 10K
R194 10K
R193 10K
R207 56 OHM
C36 .22UF
R210 .02 OHM 1W 5%
R196 56 OHM
C31 .22UF
R208 .02 OHM 1W 5%
R206 56 OHM
C35 .22UF
R211 .02 OHM 1W 5%
R195 56 OHM
C30 .22UF
R209 .02 OHM 1W 5%
SOL9
SOL10
SOL11
SOL12
SOL_RD_1
SOL_DRV_1
BLANK
(FROM PAGE 2)
VREFS2
(FROM PAGE 6)

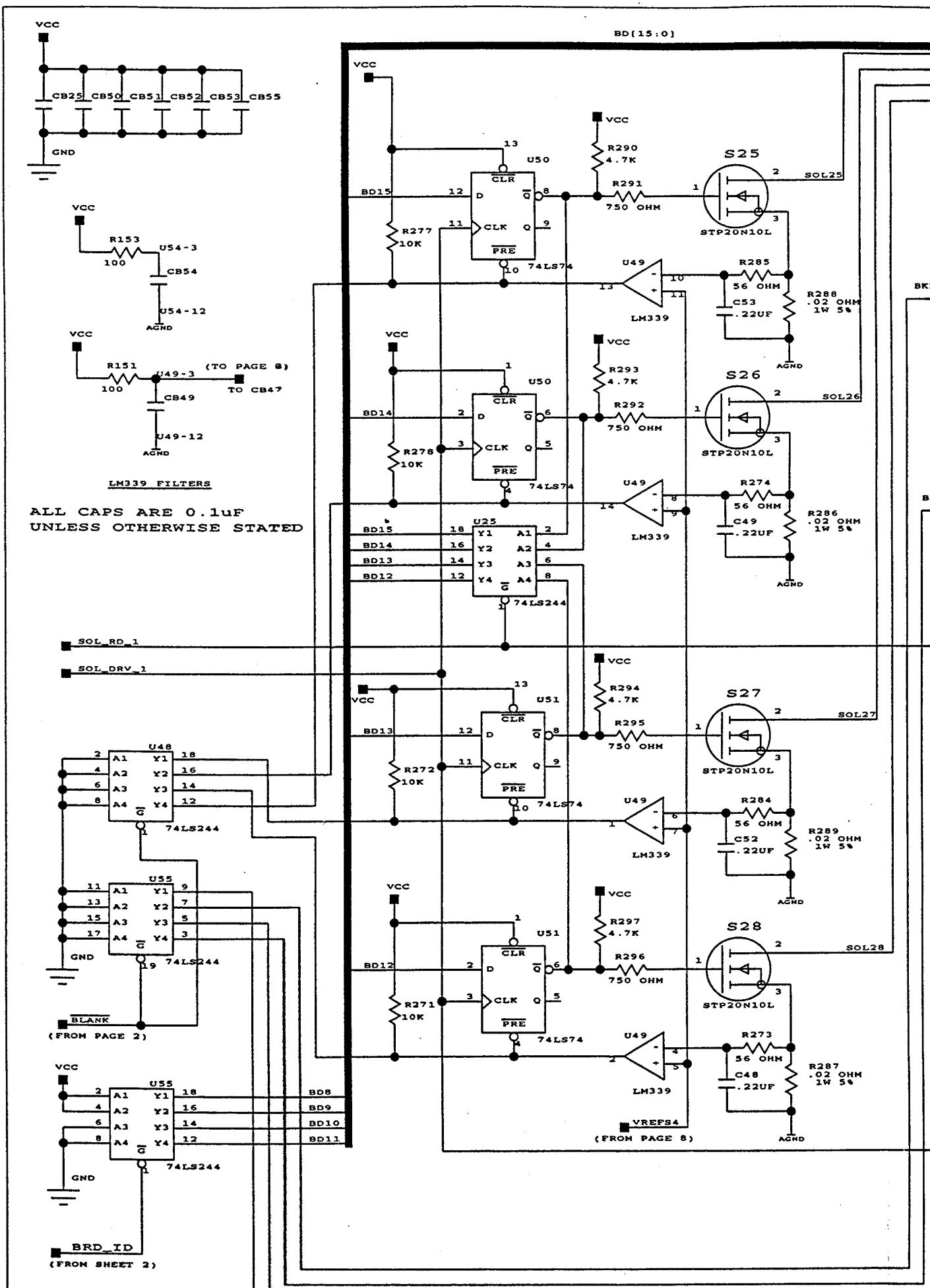


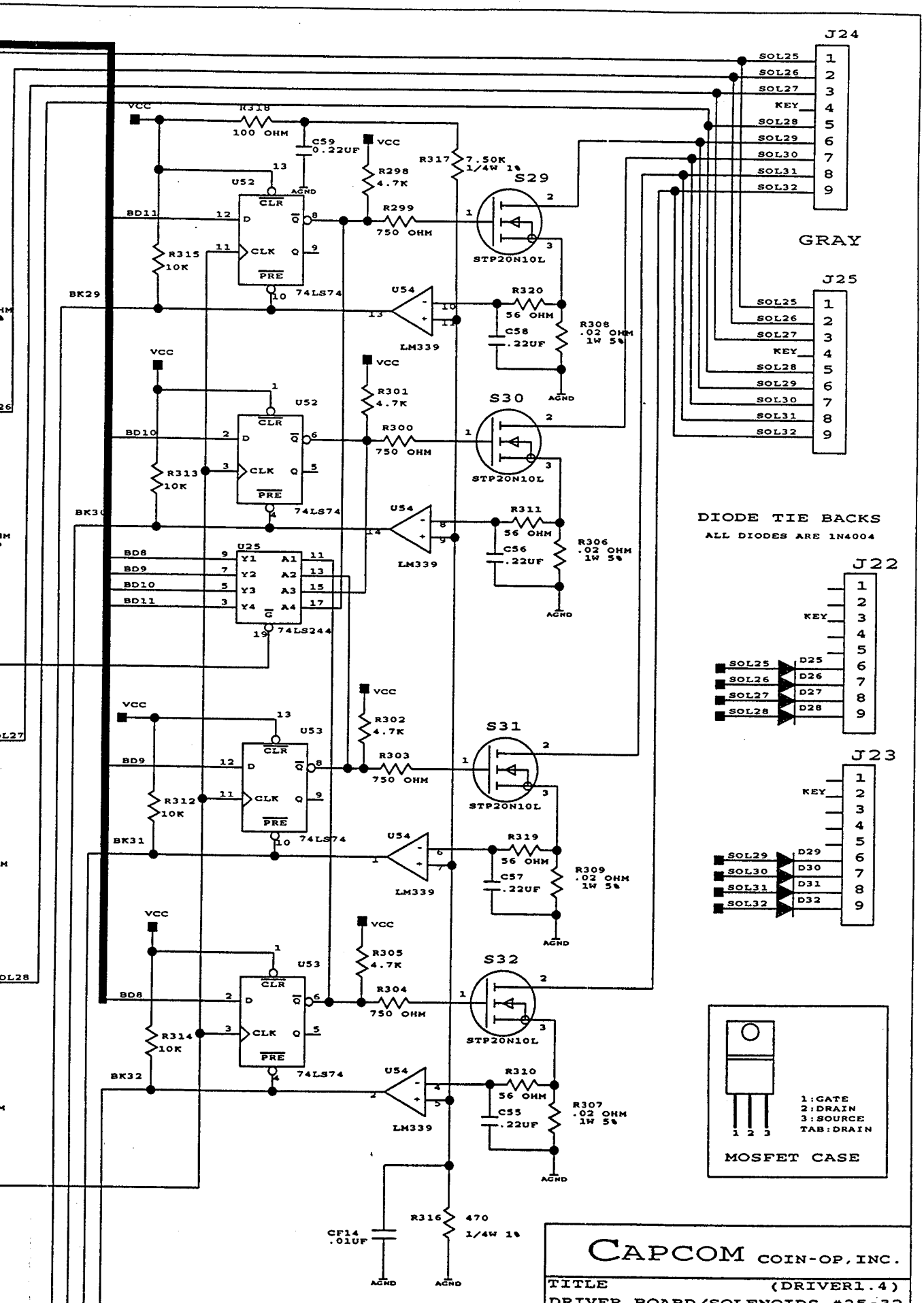
CAPCOM COIN-OP, INC.		
TITLE (DRIVER1.2)		
DRIVER BOARD/SOLENOIDS #9-16		
PROJECT ENGINEER	ASSEMBLY #	
GREG TOPEL	A0015105	
DATE	SHEET #	REV
AUGUST 16, 1995	7 OF 9	05


VCC
CB20 CB43 CB44 CB45 CB46 CB48
GND
(FROM PAGE 9)
U47-3
CB47
U47-12
AGND
VCC R150 (TO PAGE 7)
100
U42-3
TO CB40
CB42
U42-12
AGND
LM339 FILTERS
ALL CAPS ARE 0.1uF
UNLESS OTHERWISE STATED
BD[15:0]
U43
74LS74
R247 4.7K
R248 750 OHM
R149 10K
S17
STP20N10L
SOL17
U42
LM339
R242 56 OHM
C45 .22UF
R245 .02 OHM 1W 5%
R250 4.7K
R249 750 OHM
R147 10K
S18
SOL18
R238 56 OHM
C41 .22UF
R243 .02 OHM 1W 5%
U20
74LS244
SOL_RD_0
SOL_DRV_0
U44
R251 4.7K
R252 750 OHM
R146 10K
S19
SOL19
R241 56 OHM
C44 .22UF
R246 .02 OHM 1W 5%
U41
U48
BK21
BK24
BK22
BK23
BLANK
(FROM PAGE 2)
R254 4.7K
R253 750 OHM
R148 10K
S20
SOL20
R237 56 OHM
C40 .22UF
R244 .02 OHM 1W 5%
VREFS3
(FROM PAGE 7)



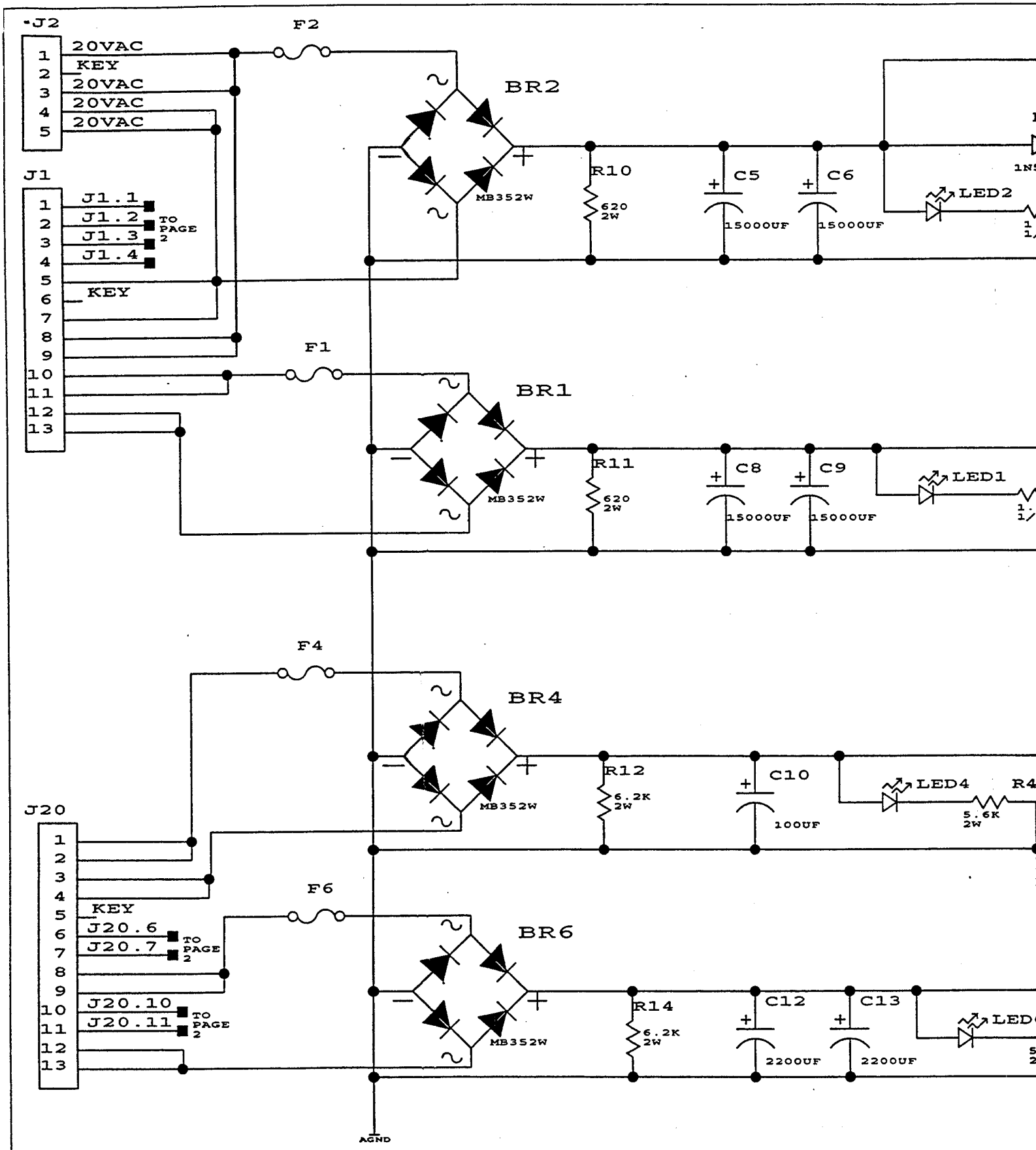
CAPCOM COIN-OP, INC.		
TITLE (DRIVER1.3)		
DRIVER BOARD/SOLENOIDS #17-24		
PROJECT ENGINEER	ASSEMBLY #	
GREG TOPEL	A0015105	
DATE	SHEET #	REV
AUGUST 16, 1995	8 OF 9	05

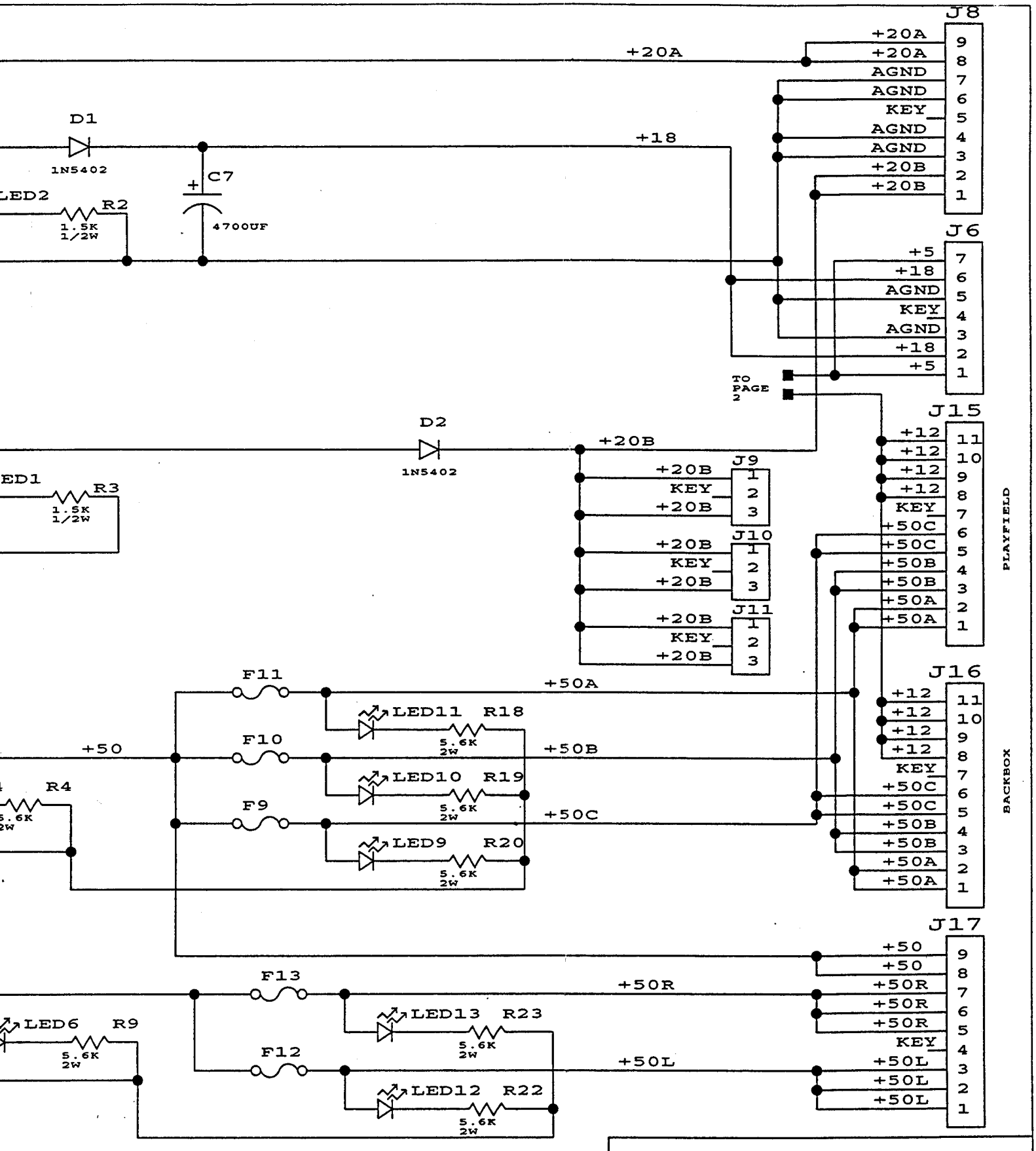

VCC
CB25 CB50 CB51 CB52 CB53 CB55
GND
VCC
R153
100
U54-3
CB54
U54-12
AGND
VCC
R151
100
U49-3
(TO PAGE 8)
TO CB47
CB49
U49-12
AGND
LM339 FILTERS
ALL CAPS ARE 0.1uF
UNLESS OTHERWISE STATED
BD[15:0]
VCC
U50
CLR
D
CLK
PRE
Q
74LS74
BD15
R277
10K
R290
4.7K
R291
750 OHM
S25
STP20N10L
SOL25
U49
LM339
R285
56 OHM
C53
.22UF
R288
.02 OHM
1W 5%
AGND
BD14
R278
10K
R293
4.7K
R292
750 OHM
S26
SOL26
R274
56 OHM
C49
.22UF
R286
.02 OHM
1W 5%
U25
74LS244
BD15
BD14
BD13
BD12
SOL_RD_1
SOL_DRV_1
U51
BD13
R272
10K
R294
4.7K
R295
750 OHM
S27
SOL27
R284
56 OHM
C52
.22UF
R289
.02 OHM
1W 5%
U48
U55
GND
BLANK
(FROM PAGE 2)
BD12
R271
10K
R297
4.7K
R296
750 OHM
S28
SOL28
R273
56 OHM
C48
.22UF
R287
.02 OHM
1W 5%
VREFS4
(FROM PAGE 8)
BD8
BD9
BD10
BD11
BRD_ID
(FROM SHEET 2)

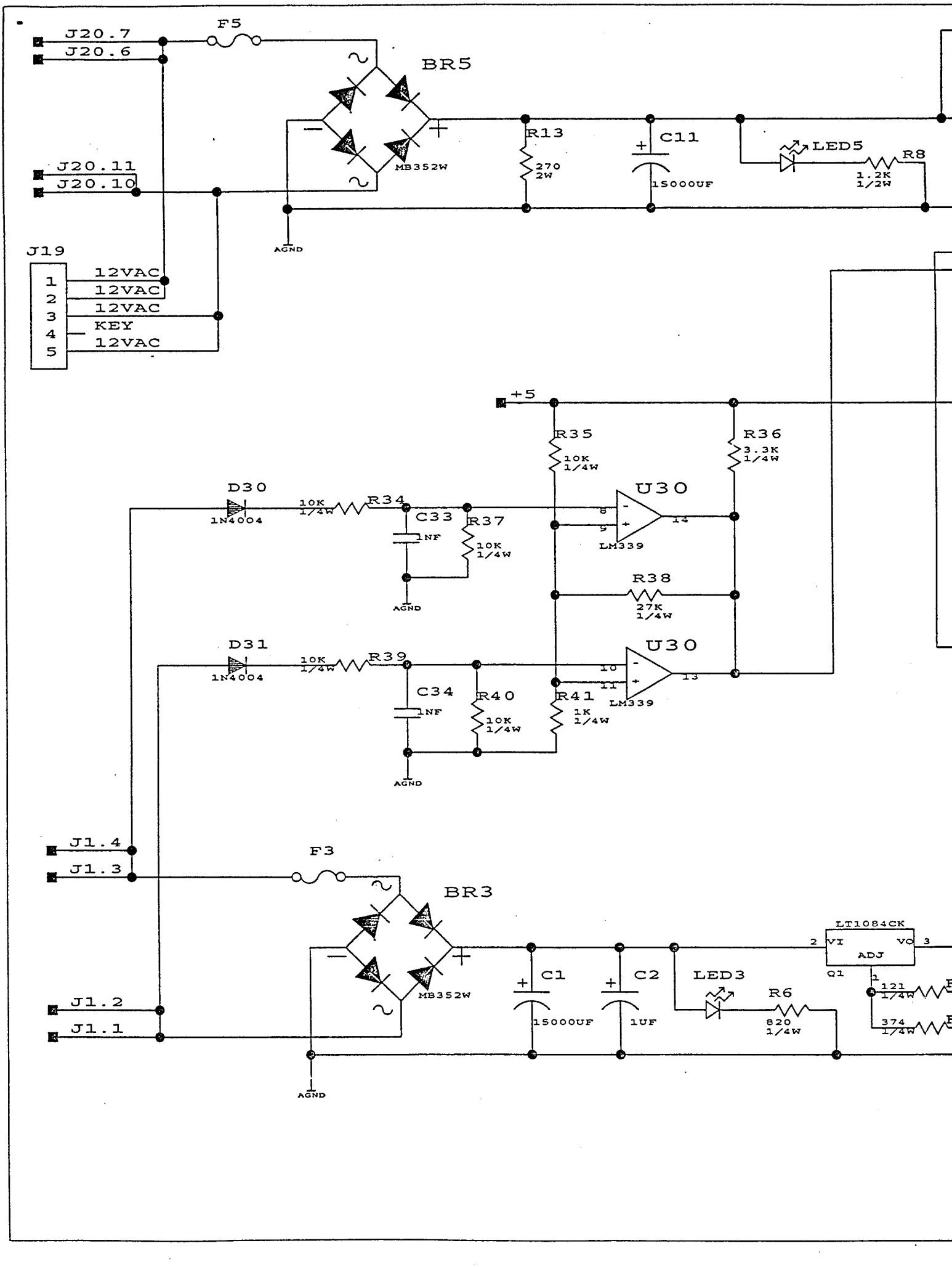


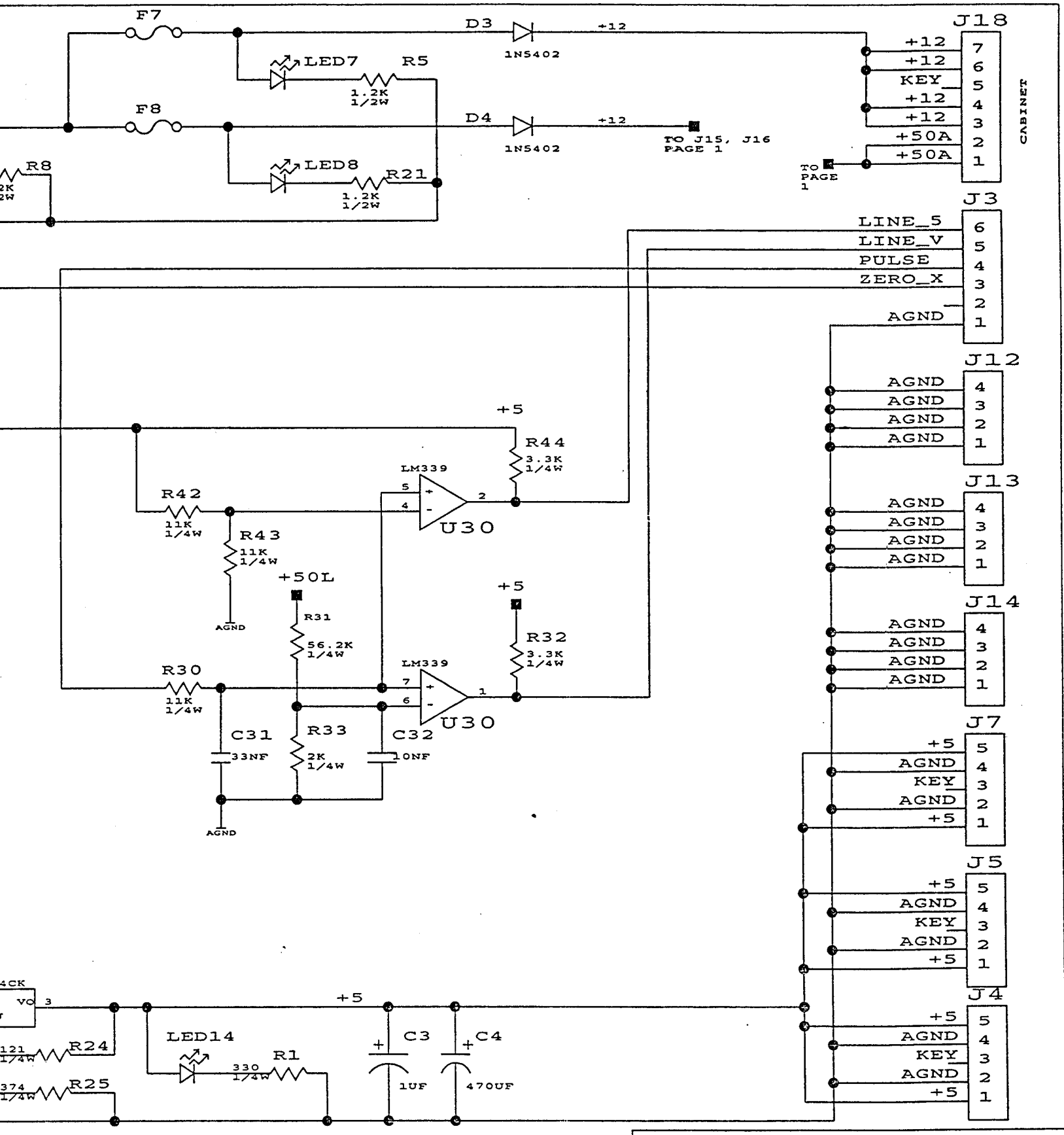
CAPCOM COIN-OP, INC.

TITLE (DRIVER1.4) DRIVER BOARD/SOLENOIDS #25-32		
PROJECT ENGINEER GREG TOPEL	ASSEMBLY # A0015105	
DATE AUGUST 16, 1995	SHEET # 9 OF 9	REV 05


J2
1
2
3
4
5
20VAC
KEY
20VAC
20VAC
20VAC
F2
BR2
MB352W
R10
620
2W
C5
15000UF
C6
15000UF
LED2
J1
1
2
3
4
5
6
7
8
9
10
11
12
13
J1.1
J1.2
J1.3
J1.4
TO
PAGE
2
KEY
F1
BR1
MB352W
R11
620
2W
C8
15000UF
C9
15000UF
LED1
F4
BR4
MB352W
R12
6.2K
2W
C10
100UF
LED4
5.6K
2W
J20
1
2
3
4
5
6
7
8
9
10
11
12
13
KEY
J20.6
J20.7
J20.10
J20.11
TO
PAGE
2
F6
BR6
MB352W
R14
6.2K
2W
C12
2200UF
C13
2200UF
AGND

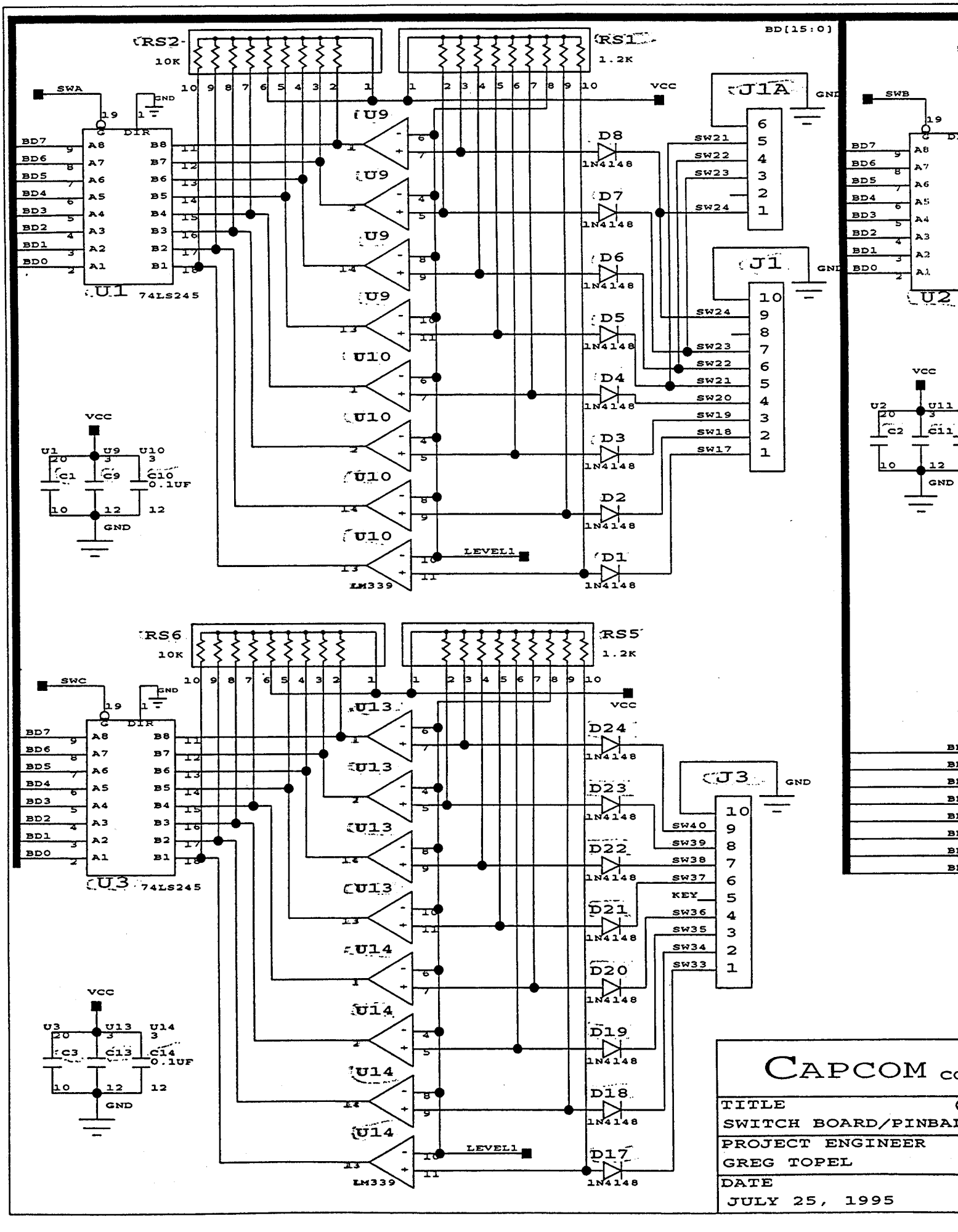

J8
+20A
+20A
AGND
AGND
KEY
AGND
AGND
+20B
+20B
9
8
7
6
5
4
3
2
1
+20A
+18
D1
1N5402
C7
4700UF
LED2
R2
1.5K
1/2W
J6
+5
+18
AGND
KEY
AGND
+18
+5
7
6
5
4
3
2
1
TO
PAGE
2
D2
1N5402
+20B
J9
J10
J11
+20B
KEY
+20B
1
2
3
J15
+12
+12
+12
+12
KEY
+50C
+50C
+50B
+50B
+50A
+50A
11
10
9
8
7
6
5
4
3
2
1
PLAYFIELD
ED1
R3
1.5K
1/2W
F11
F10
F9
+50A
+50B
+50C
+50
LED11 R18
LED10 R19
LED9 R20
5.6K
2W
J16
+12
+12
+12
+12
KEY
+50C
+50C
+50B
+50B
+50A
+50A
11
10
9
8
7
6
5
4
3
2
1
BACKBOX
R4
5.6K
2W
J17
+50
+50
+50R
+50R
+50R
KEY
+50L
+50L
+50L
9
8
7
6
5
4
3
2
1
F13
F12
+50R
+50L
LED13 R23
LED12 R22
LED6 R9
5.6K
2W
CAPCOM COIN-OP, INC.
TITLE
POWER BOARD
PROJECT ENGINEER
STEVE MILEWSKI
ASSEMBLY #
A0015204
DATE
7/17/95
SHEET #
1 OF 2
REV
-

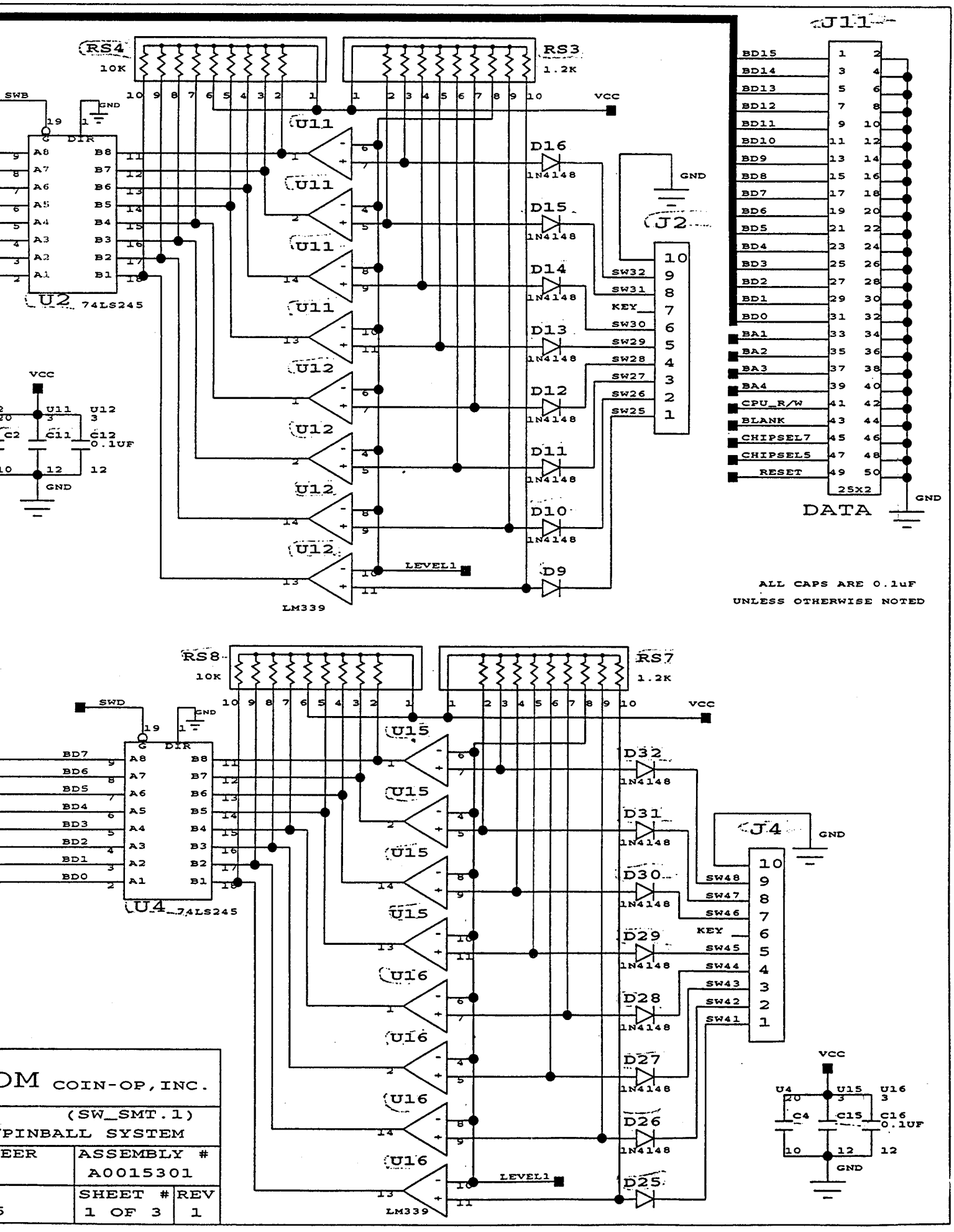

J20.7
J20.6
F5
BR5
MB352W
R13
270
2W
C11
15000UF
LED5
R8
1.2K
1/2W
J20.11
J20.10
AGND
J19
1
2
3
4
5
12VAC
12VAC
12VAC
KEY
12VAC
+5
R35
10K
1/4W
R36
3.3K
1/4W
D30
1N4004
10K
1/4W
R34
C33
1NF
R37
10K
1/4W
U30
LM339
R38
27K
1/4W
D31
1N4004
10K
1/4W
R39
C34
1NF
R40
10K
1/4W
R41
1K
1/4W
U30
LM339
J1.4
J1.3
F3
BR3
MB352W
J1.2
J1.1
C1
15000UF
C2
1UF
LED3
R6
820
1/4W
LT1084CK
VI
VO
ADJ
Q1
121
1/4W
374
1/4W
AGND



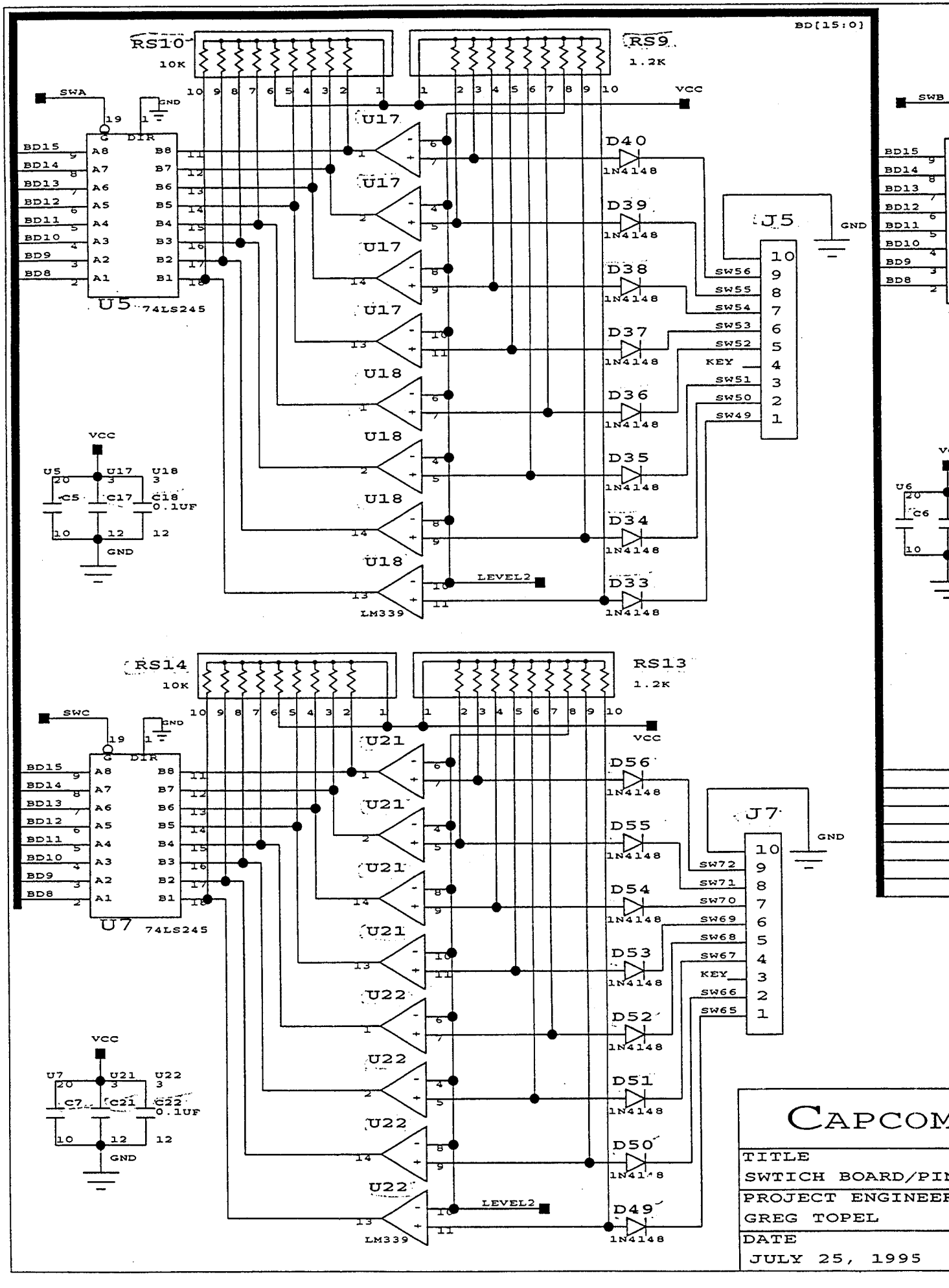
CAPCOM COIN-OP, INC.

TITLE POWER BOARD	
PROJECT ENGINEER STEVE MILEWSKI	ASSEMBLY # A0015204
DATE 7/14/95	SHEET # 2 OF 2 / REV --


BD[15:0]
RS2
10K
RS1
1.2K
SWA
SWB
SWC
VCC
GND
DIR
U1
74LS245
U2
U3
U9
U10
U13
U14
LM339
LEVEL1
J1A
J1
J3
D8
D7
D6
D5
D4
D3
D2
D1
D24
D23
D22
D21
D20
D19
D18
D17
1N4148
SW21
SW22
SW23
SW24
SW19
SW18
SW17
SW40
SW39
SW38
SW37
KEY
SW36
SW35
SW34
SW33
C1
C9
C10
C2
C11
C3
C13
C14
0.1UF
CAPCOM
TITLE
SWITCH BOARD/PINBA
PROJECT ENGINEER
GREG TOPEL
DATE
JULY 25, 1995



DM COIN-OP, INC.		
(SW_SMT.1) PINBALL SYSTEM		
EER	ASSEMBLY # A0015301	
5	SHEET # 1 OF 3	REV 1

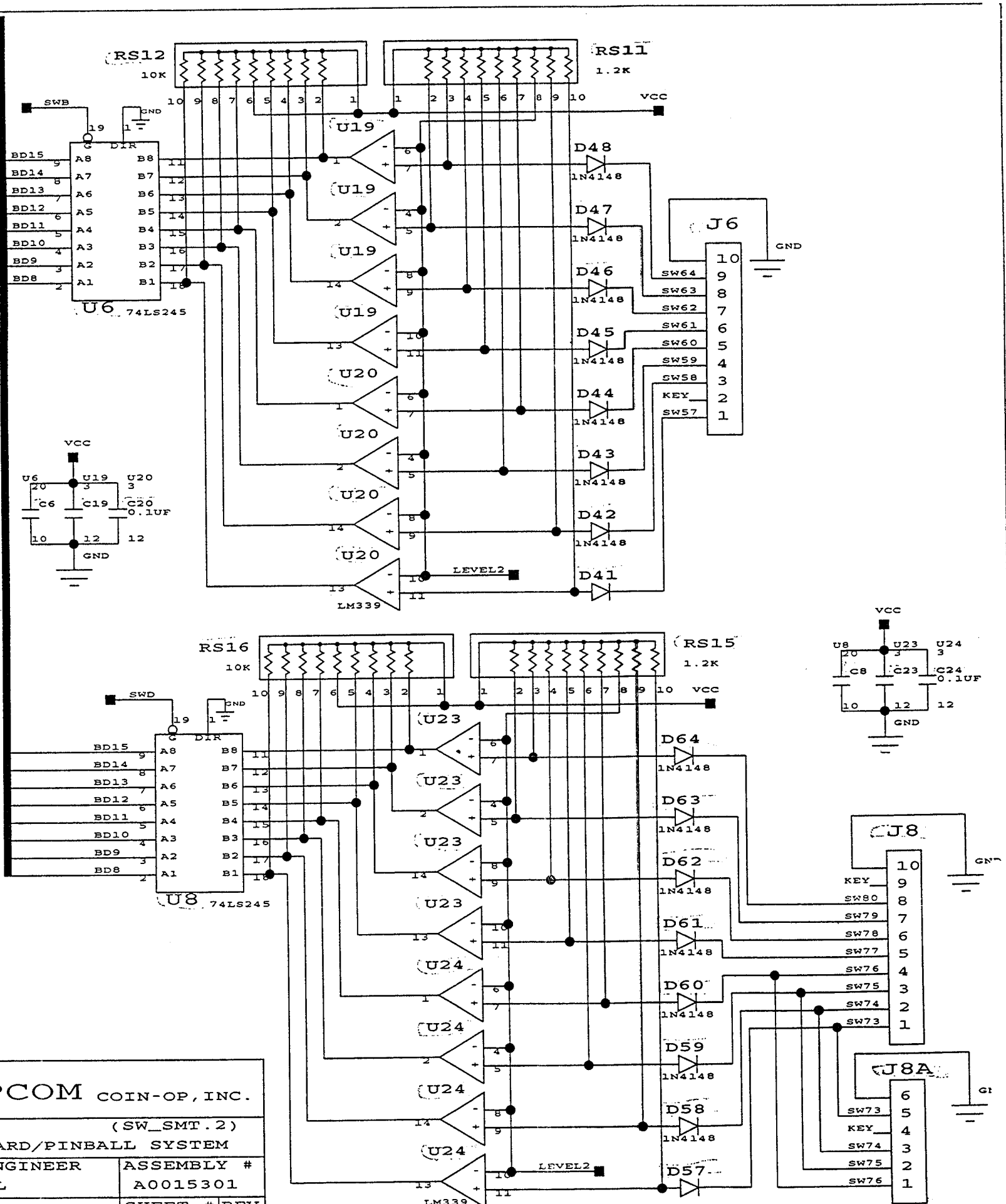


CAPCOM

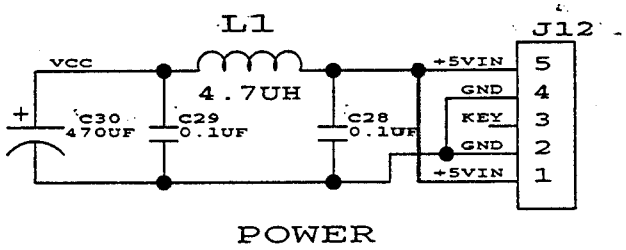
TITLE
SWTICH BOARD/PI

PROJECT ENGINEE
GREG TOPEL

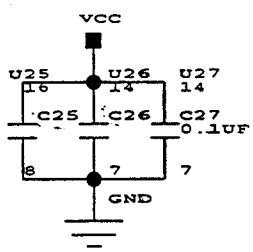
DATE
JULY 25, 1995



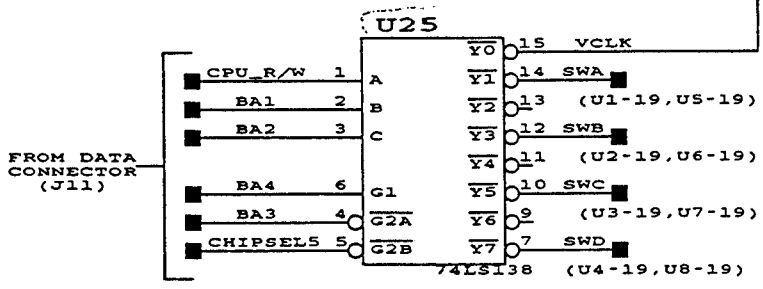
PCOM COIN-OP, INC.		
(SW_SMT.2)		
ARD/PINBALL SYSTEM		
NGINEER	ASSEMBLY # A0015301	
L		
1995	SHEET # 2 OF 3	REV 1



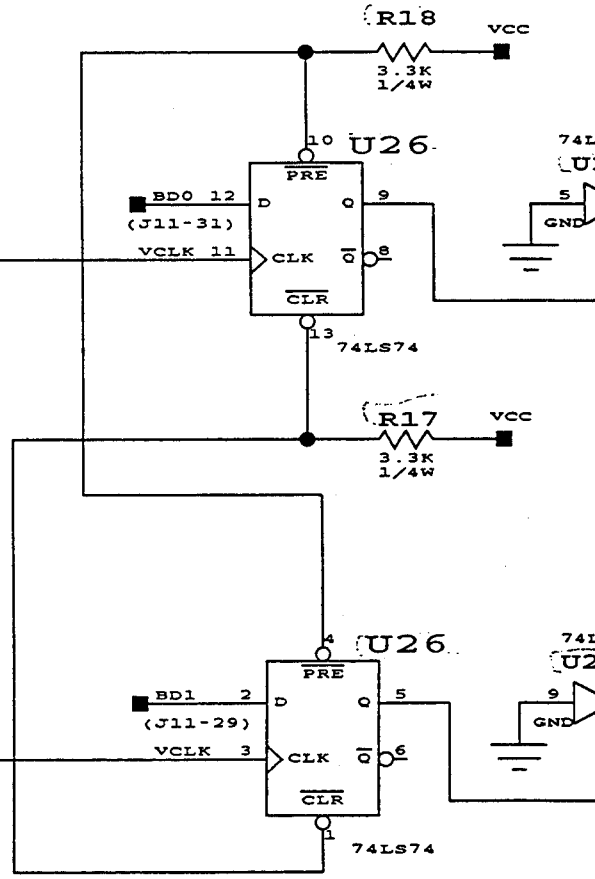
POWER

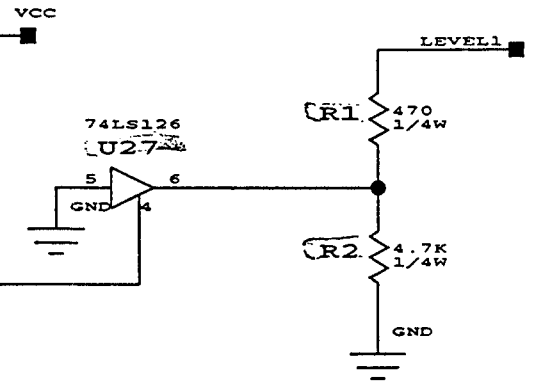


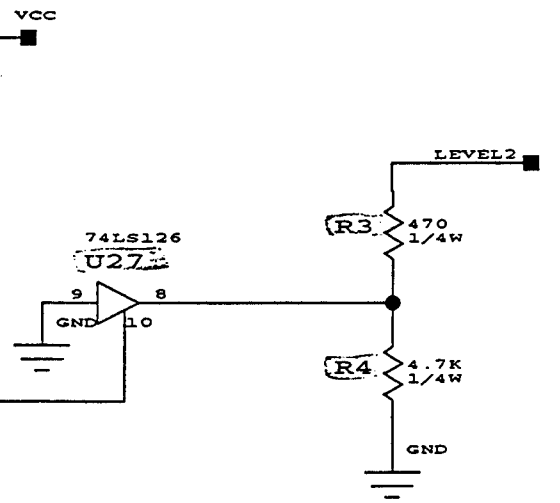
CAPS FOR DECODER CIRCUITRY

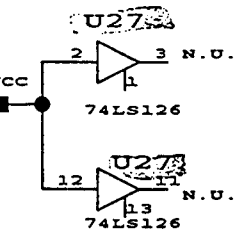


DECODE CIRCUITRY

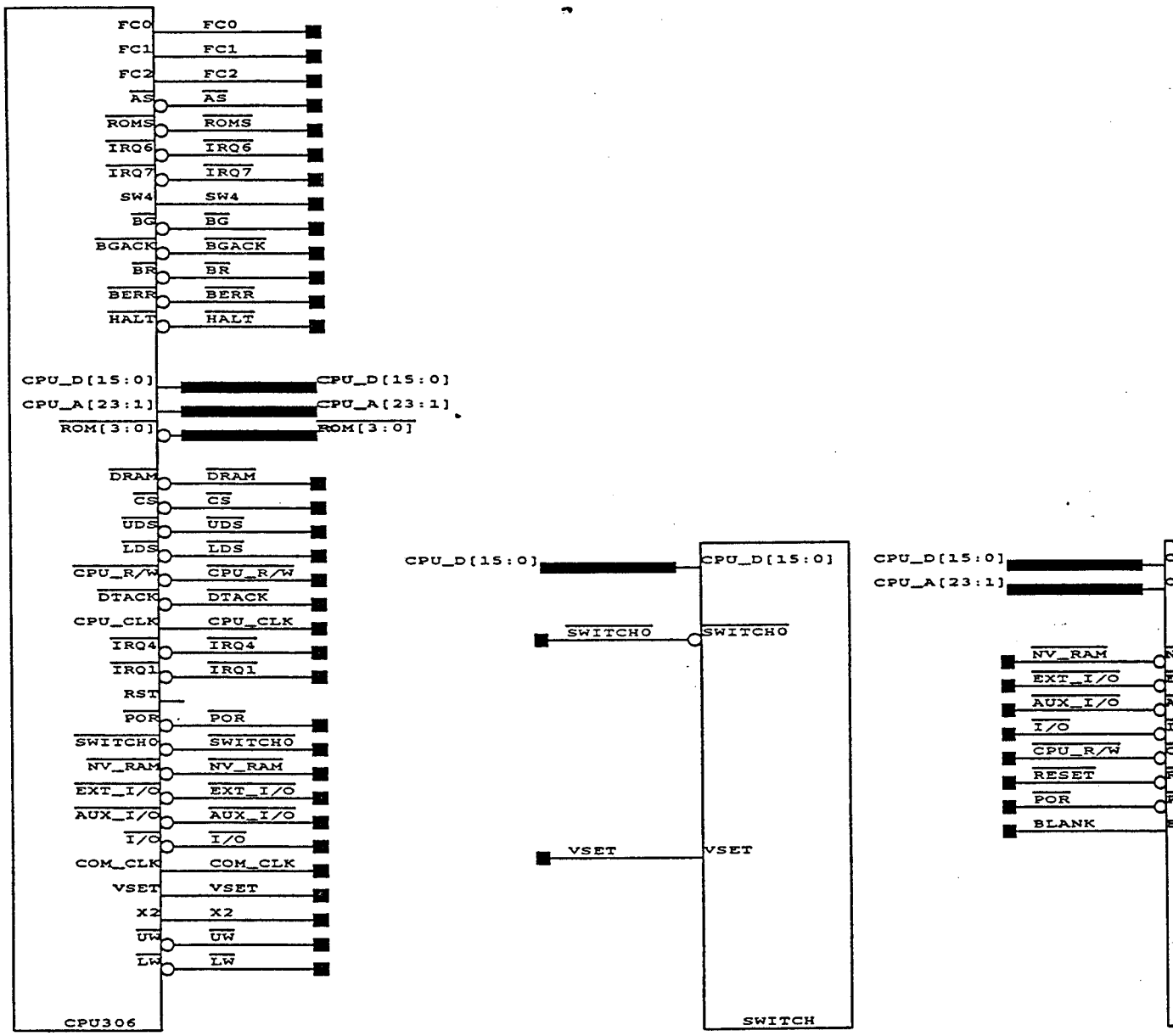


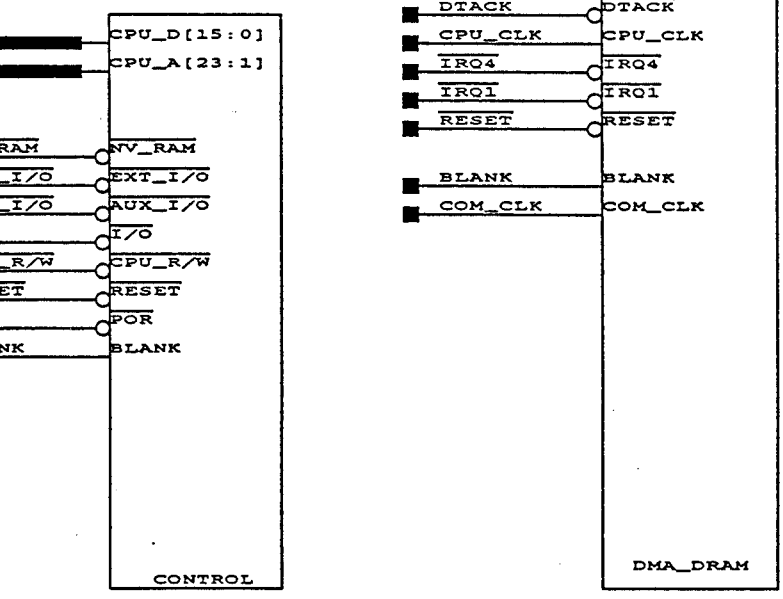


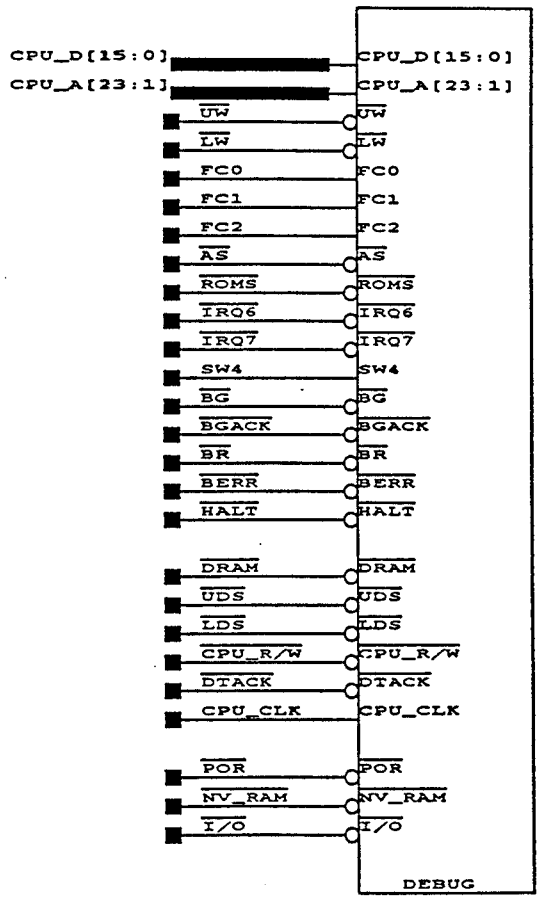




CAPCOM COIN-OP, INC.		
TITLE (SW_SMT.3) SWITCH BOARD/PINBALL SYSTEM		
PROJECT ENGINEER GREG TOPEL	ASSEMBLY # A0015301	
DATE JULY 25, 1995	SHEET # 3 OF 3	REV 1

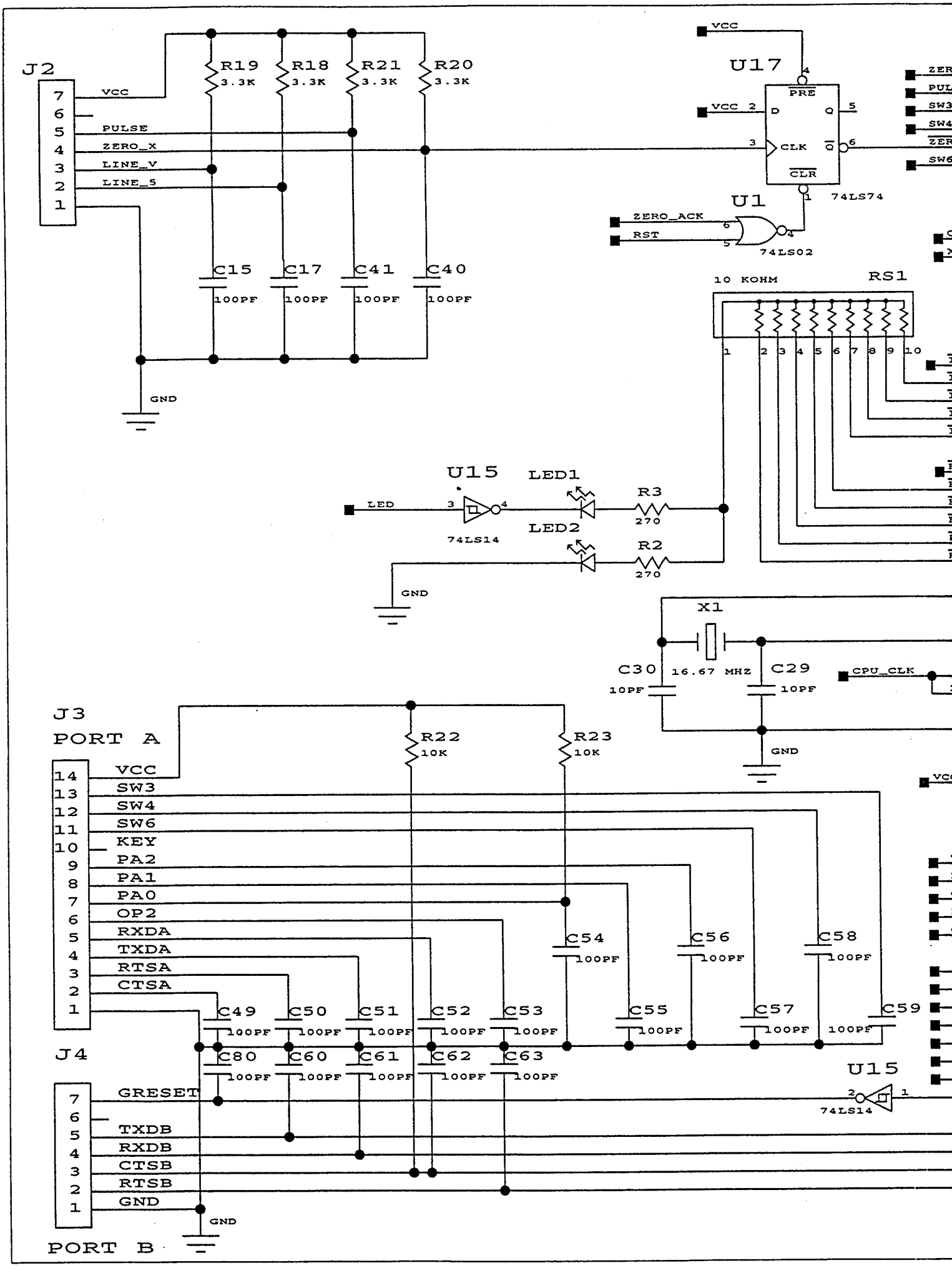

FC0
FC1
FC2
AS
ROMS
IRQ6
IRQ7
SW4
BG
BGACK
BR
BERR
HALT
CPU_D[15:0]
CPU_A[23:1]
ROM[3:0]
DRAM
CS
UDS
LDS
CPU_R/W
DTACK
CPU_CLK
IRQ4
IRQ1
RST
POR
SWITCH0
NV_RAM
EXT_I/O
AUX_I/O
I/O
COM_CLK
VSET
X2
UW
LW
CPU306
SWITCH0
VSET
SWITCH
RESET
BLANK

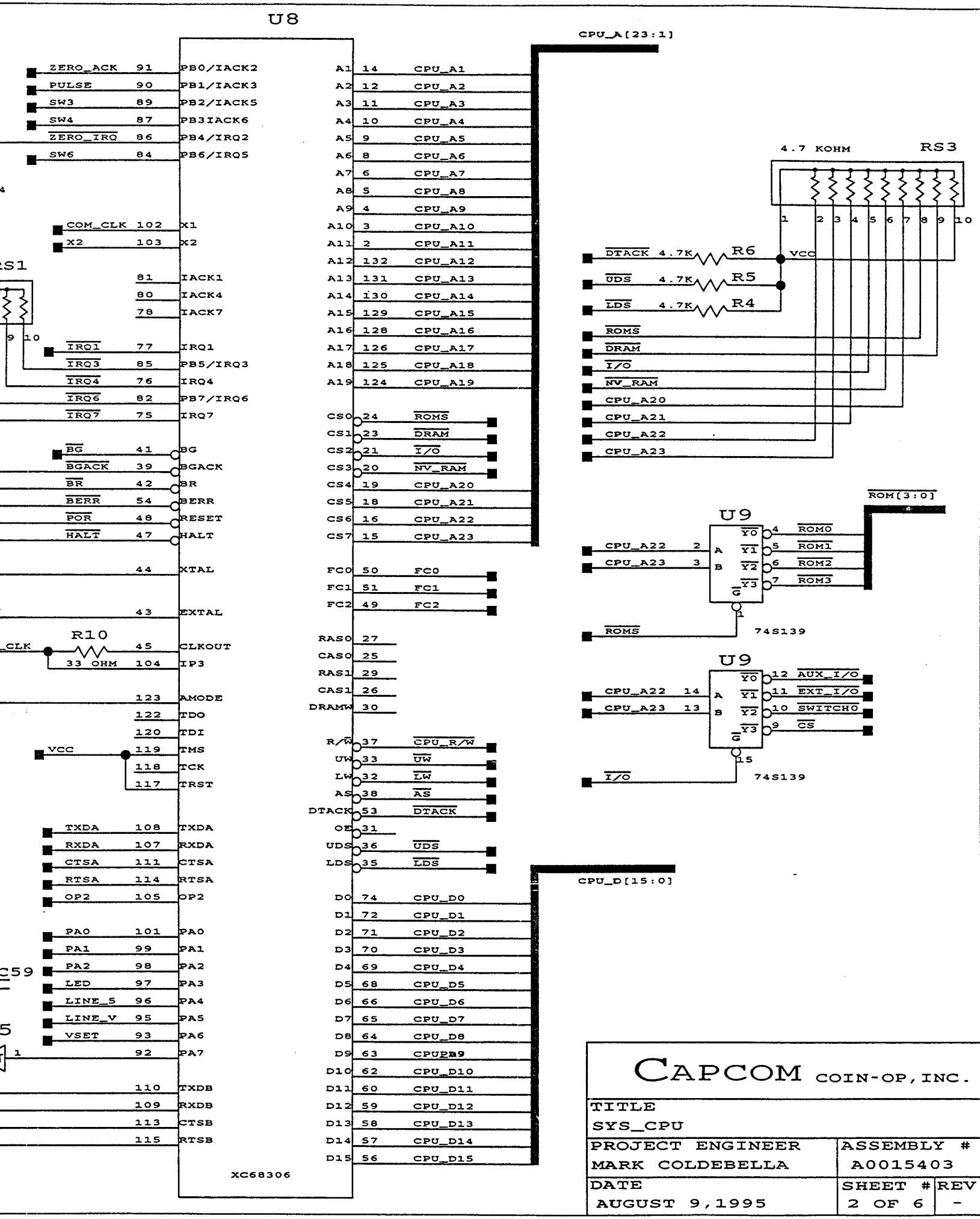




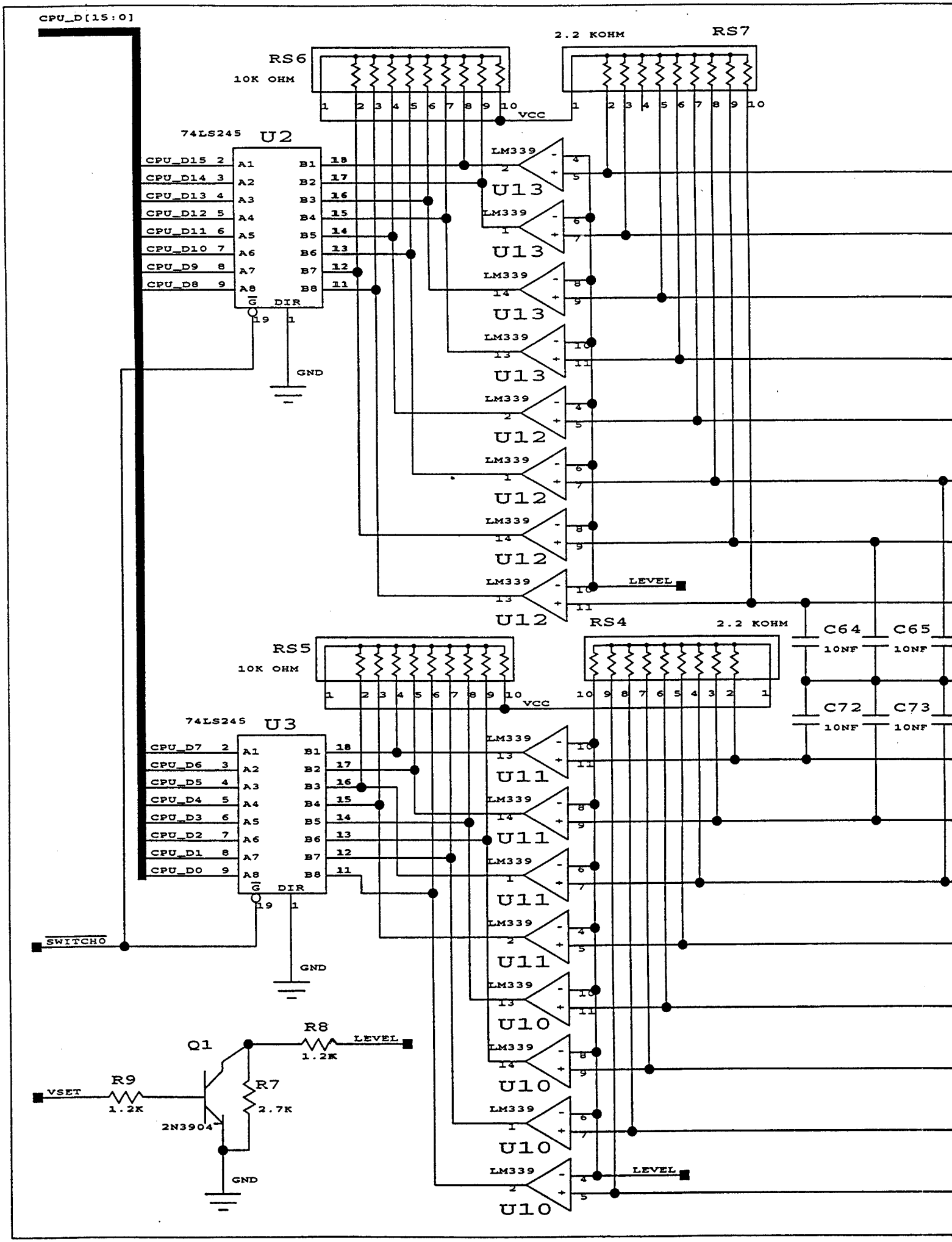
511199

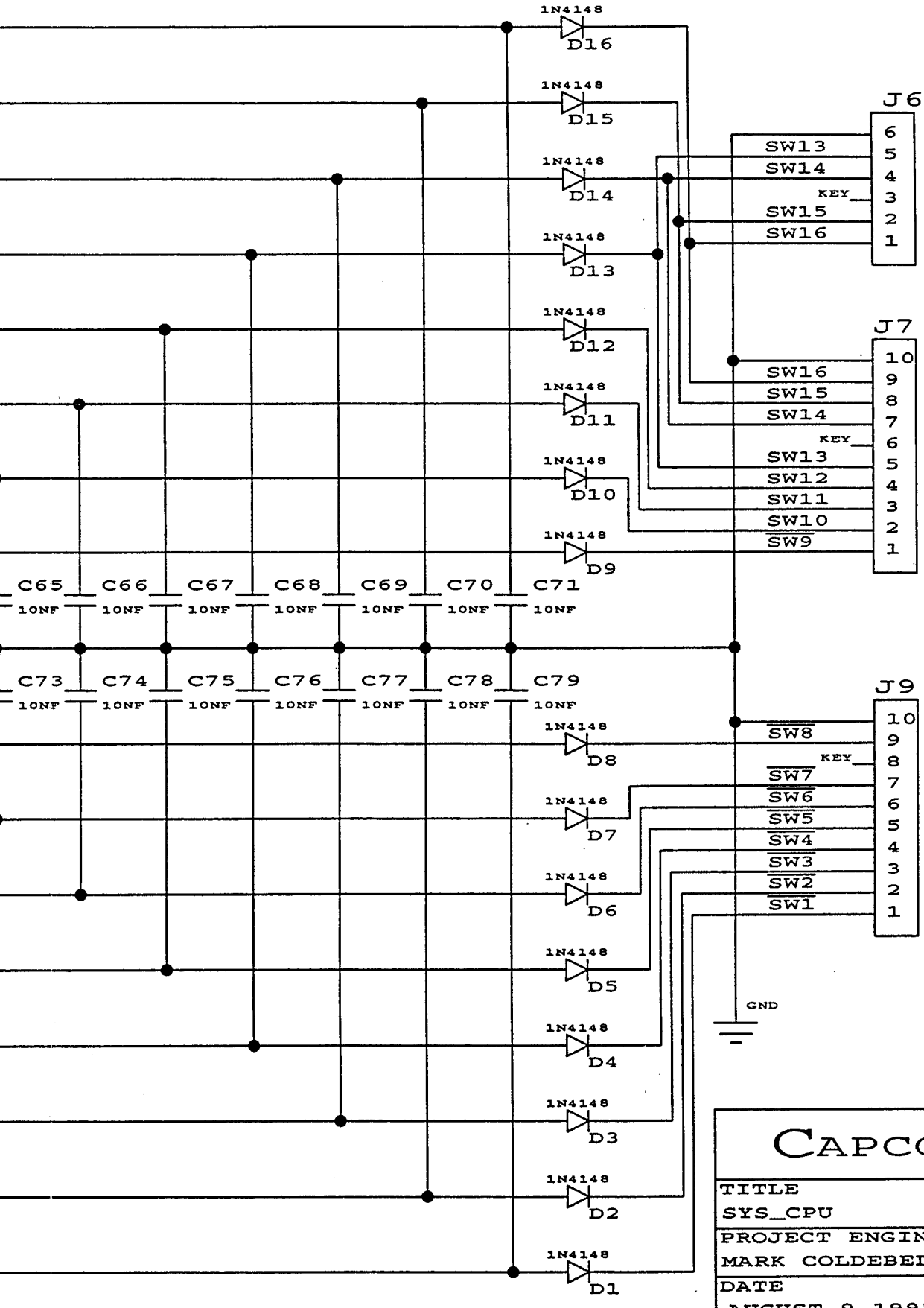
CAPCOM COIN-OP, INC.		
TITLE SYS_CPU		
PROJECT ENGINEER MARK COLDEBELLA	ASSEMBLY # A0015403	
DATE AUGUST 9,1995	SHEET # 1 OF 6	REV -


J2
VCC
PULSE
ZERO_X
LINE_V
LINE_S
R19 3.3K
R18 3.3K
R21 3.3K
R20 3.3K
C15 100PF
C17 100PF
C41 100PF
C40 100PF
GND
U17
74LS74
U1
74LS02
ZERO_ACK
RST
10 KOHM
RS1
U15
74LS14
LED1
LED2
LED
R3 270
R2 270
X1
16.67 MHZ
C30 10PF
C29 10PF
CPU_CLK
J3
PORT A
R22 10K
R23 10K
SW3
SW4
SW6
KEY
PA2
PA1
PA0
OP2
RXDA
TXDA
RTSA
CTSA
C49 100PF
C50 100PF
C51 100PF
C52 100PF
C53 100PF
C54 100PF
C55 100PF
C56 100PF
C57 100PF
C58 100PF
C59 100PF
C80 100PF
C60 100PF
C61 100PF
C62 100PF
C63 100PF
J4
GRESET
TXDB
RXDB
CTSB
RTSB
PORT B



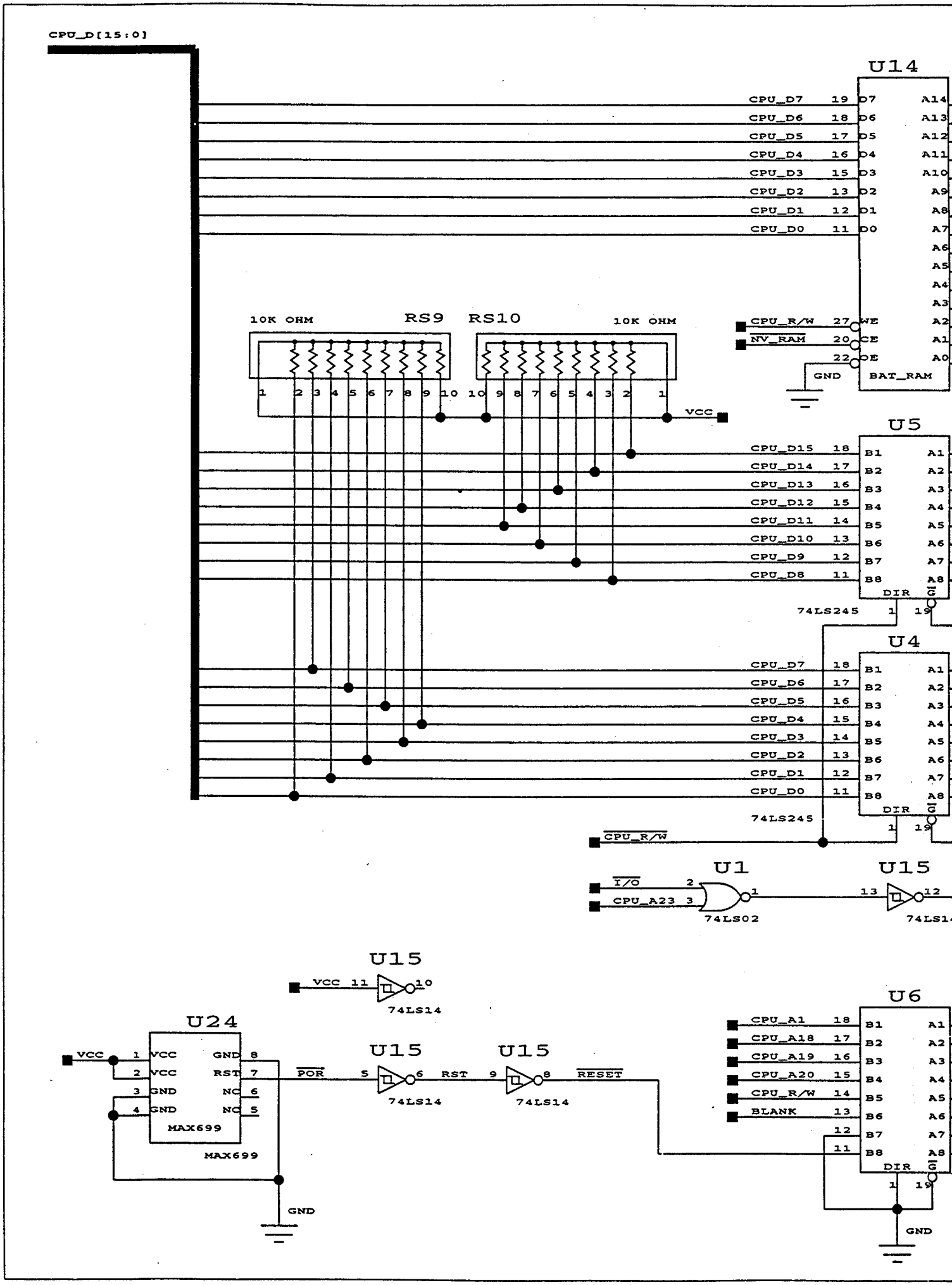
CAPCOM COIN-OP, INC.	
TITLE SYS_CPU	
PROJECT ENGINEER MARK COLDEBELLA	ASSEMBLY # A0015403
DATE AUGUST 9, 1995	SHEET # 2 OF 6 / REV --

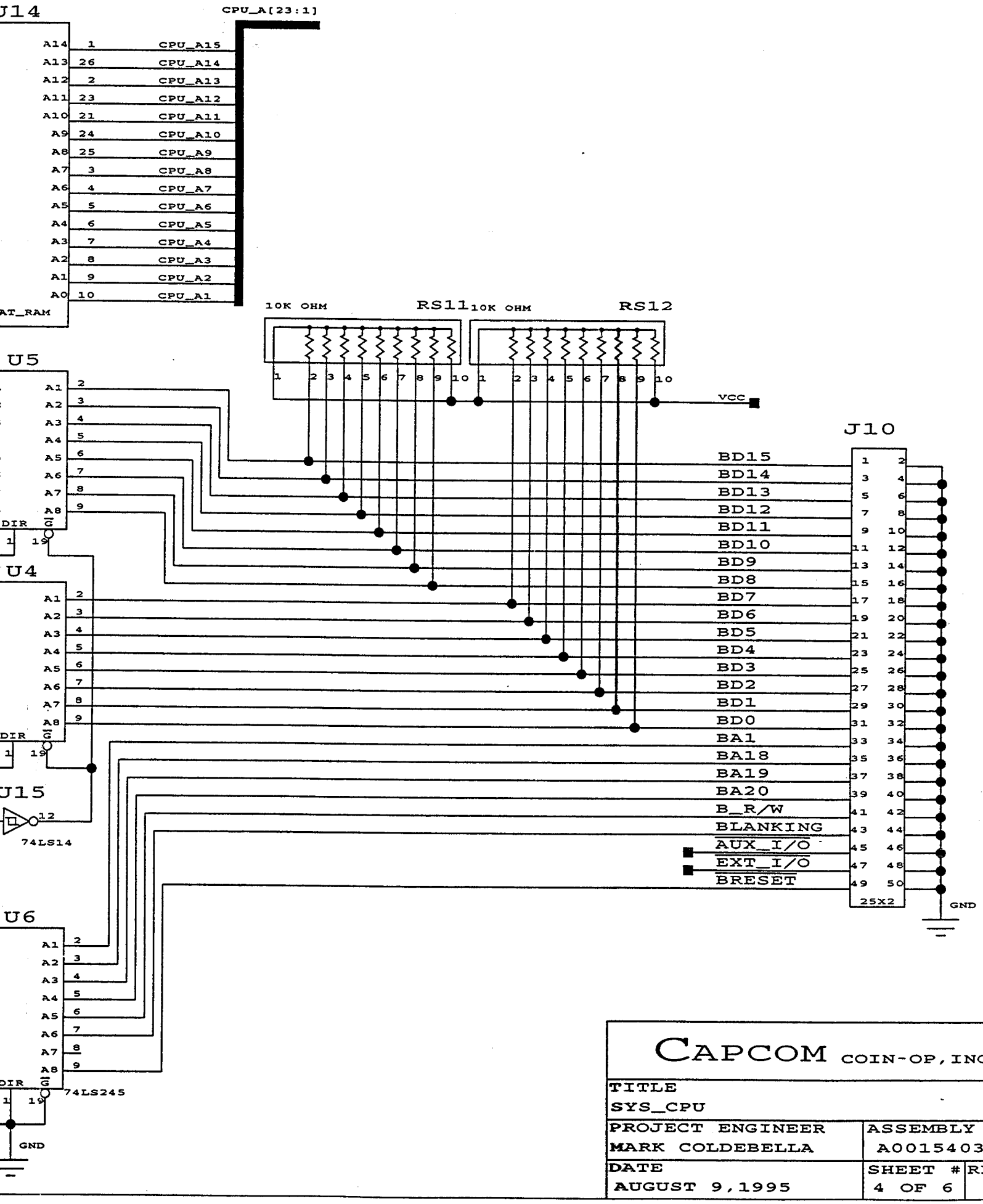

CPU_D[15:0]
RS6
10K OHM
2.2 KOHM
RS7
VCC
74LS245
U2
CPU_D15
CPU_D14
CPU_D13
CPU_D12
CPU_D11
CPU_D10
CPU_D9
CPU_D8
A1
A2
A3
A4
A5
A6
A7
A8
B1
B2
B3
B4
B5
B6
B7
B8
G
DIR
GND
LM339
U13
U12
LEVEL
RS5
RS4
C64
C65
C72
C73
10NF
74LS245
U3
CPU_D7
CPU_D6
CPU_D5
CPU_D4
CPU_D3
CPU_D2
CPU_D1
CPU_D0
U11
U10
SWITCH0
R8
1.2K
Q1
LEVEL
R9
VSET
R7
2.7K
2N3904



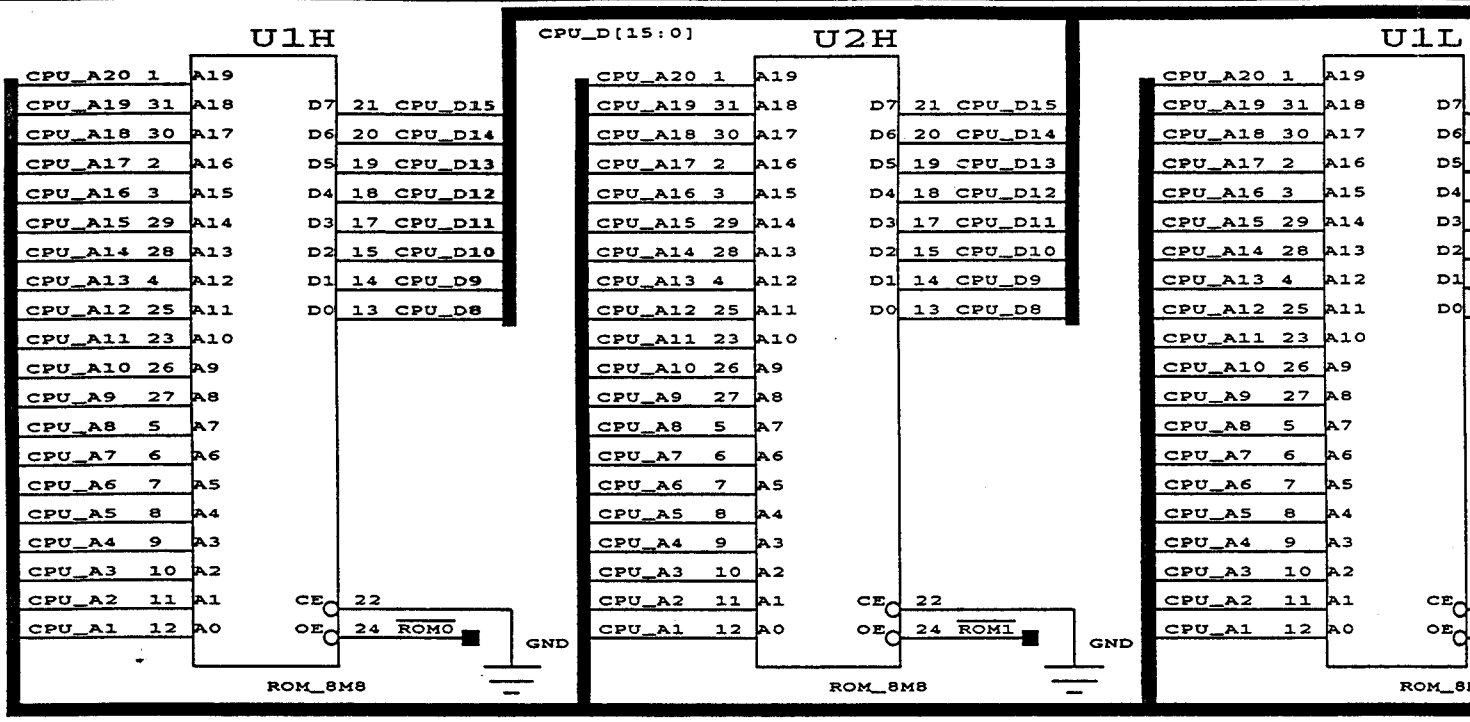
CAPCOM COIN-OP, INC.

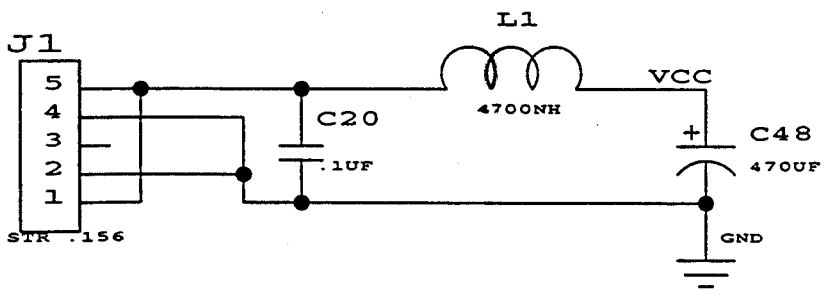
TITLE SYS_CPU		
PROJECT ENGINEER MARK COLDEBELLA	ASSEMBLY # A0015403	
DATE AUGUST 9,1995	SHEET # 3 OF 6	REV -

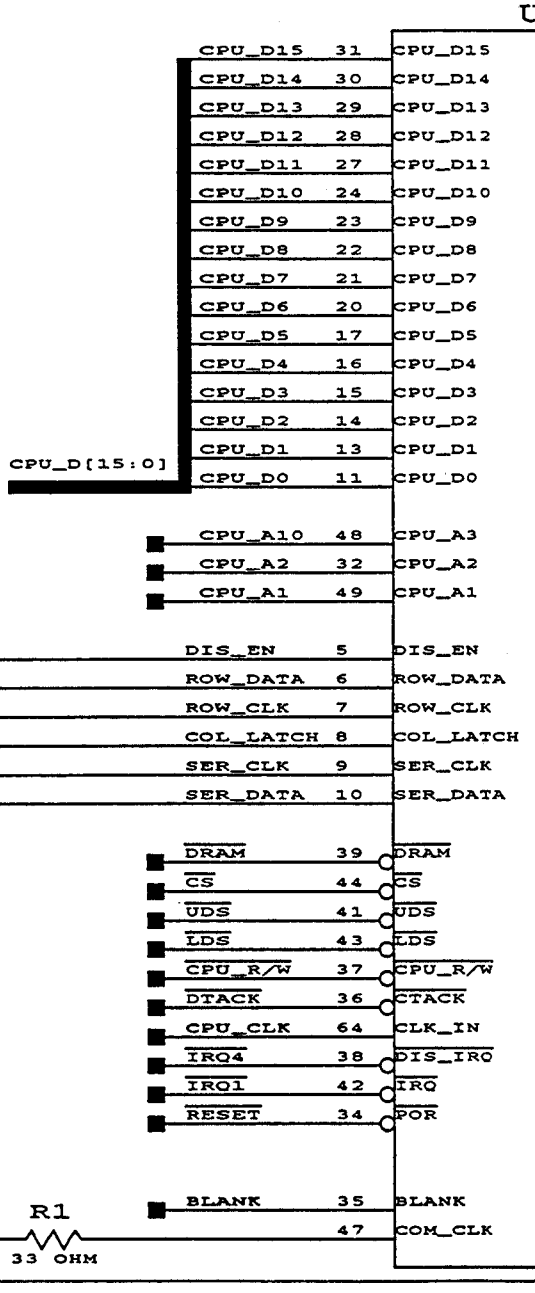

CPU_D[15:0]
U14
CPU_D7 19 D7 A14
CPU_D6 18 D6 A13
CPU_D5 17 D5 A12
CPU_D4 16 D4 A11
CPU_D3 15 D3 A10
CPU_D2 13 D2 A9
CPU_D1 12 D1 A8
CPU_D0 11 D0 A7
A6
A5
A4
A3
CPU_R/W 27 WE A2
NV_RAM 20 CE A1
22 OE A0
GND BAT_RAM
10K OHM
RS9
RS10
10K OHM
1 2 3 4 5 6 7 8 9 10 10 9 8 7 6 5 4 3 2 1
VCC
U5
CPU_D15 18 B1 A1
CPU_D14 17 B2 A2
CPU_D13 16 B3 A3
CPU_D12 15 B4 A4
CPU_D11 14 B5 A5
CPU_D10 13 B6 A6
CPU_D9 12 B7 A7
CPU_D8 11 B8 A8
DIR G
74LS245 1 19
U4
CPU_D7 18 B1 A1
CPU_D6 17 B2 A2
CPU_D5 16 B3 A3
CPU_D4 15 B4 A4
CPU_D3 14 B5 A5
CPU_D2 13 B6 A6
CPU_D1 12 B7 A7
CPU_D0 11 B8 A8
DIR G
74LS245 1 19
CPU_R/W
U1
I/O 2
CPU_A23 3 1
74LS02
U15
13 12
74LS14
U15
VCC 11 10
74LS14
U24
VCC 1 VCC GND 8
2 VCC RST 7
3 GND NC 6
4 GND NC 5
MAX699
MAX699
GND
POR 5 6 RST 9 8 RESET
U15
74LS14
U15
74LS14
U6
CPU_A1 18 B1 A1
CPU_A18 17 B2 A2
CPU_A19 16 B3 A3
CPU_A20 15 B4 A4
CPU_R/W 14 B5 A5
BLANK 13 B6 A6
12 B7 A7
11 B8 A8
DIR G
1 19
GND

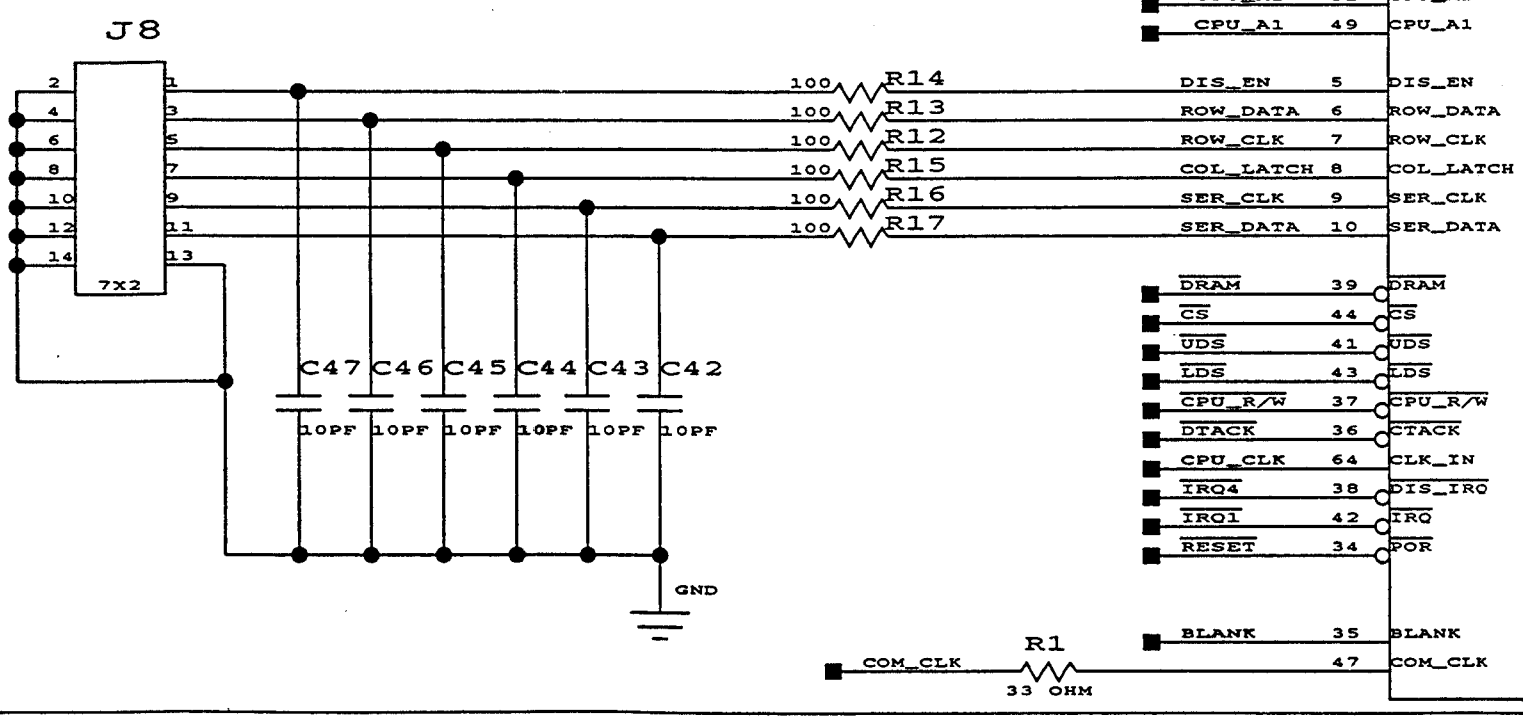


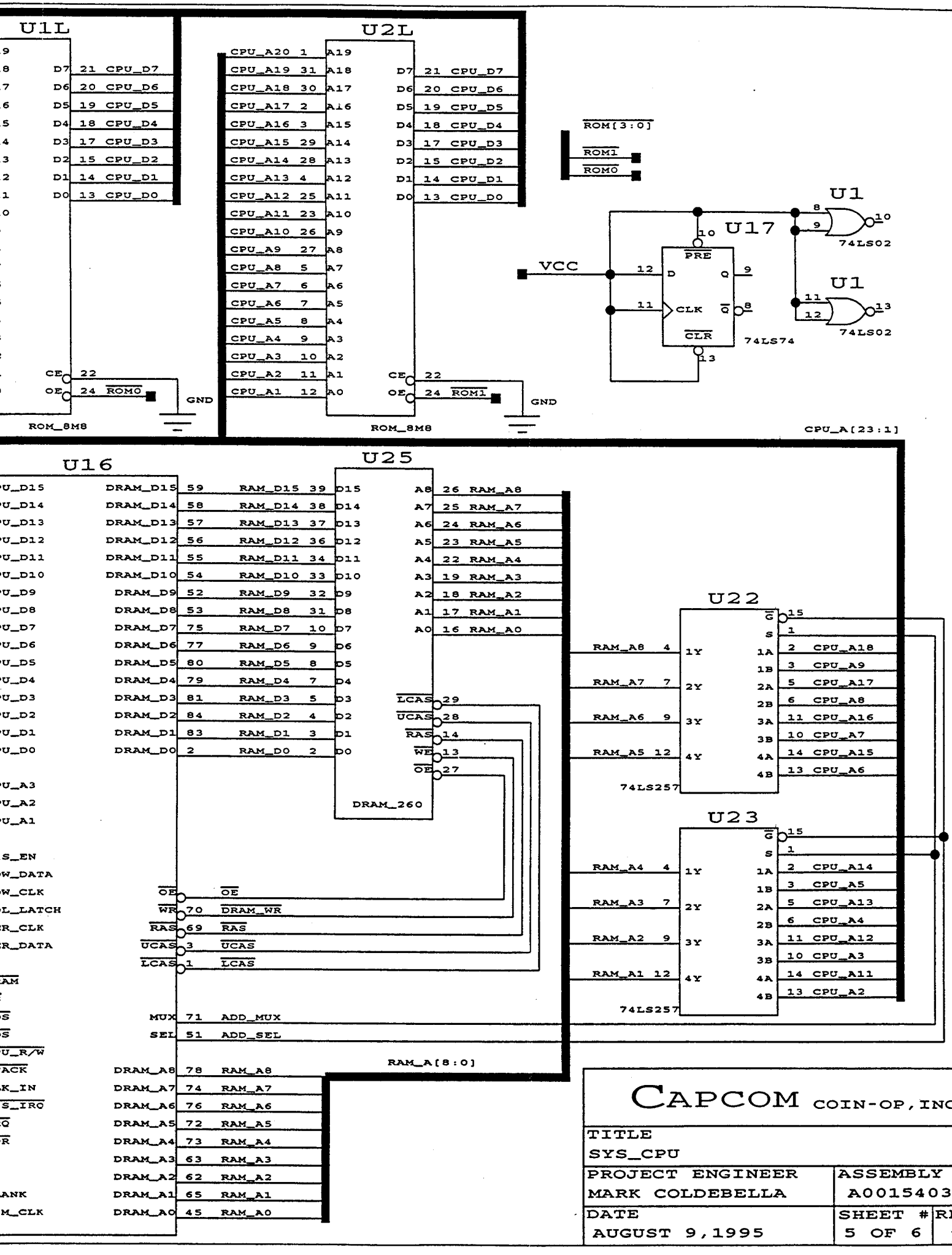
CAPCOM COIN-OP, INC.		
TITLE SYS_CPU		
PROJECT ENGINEER MARK COLDEBELLA	ASSEMBLY # A0015403	
DATE AUGUST 9,1995	SHEET # 4 OF 6	REV -


U1H
U2H
U1L
CPU_D[15:0]
ROM_8M8
ROMO
ROM1
GND


J1
L1
4700NH
VCC
C20
.1UF
C48
470UF
GND
STR .156

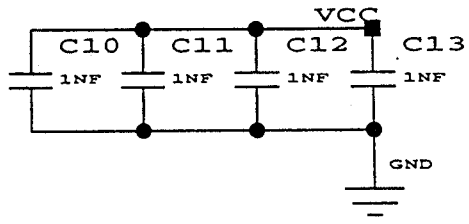

CPU_D[15:0]
CPU_D15
CPU_D14
CPU_D13
CPU_D12
CPU_D11
CPU_D10
CPU_D9
CPU_D8
CPU_D7
CPU_D6
CPU_D5
CPU_D4
CPU_D3
CPU_D2
CPU_D1
CPU_D0
CPU_A10
CPU_A2
CPU_A1
CPU_A3

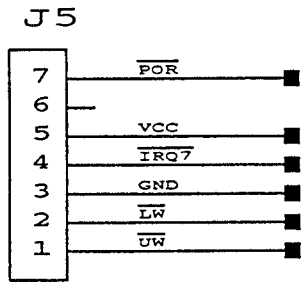

J8
7X2
R14
R13
R12
R15
R16
R17
100
DIS_EN
ROW_DATA
ROW_CLK
COL_LATCH
SER_CLK
SER_DATA
C47
C46
C45
C44
C43
C42
10PF
GND
DRAM
CS
UDS
LDS
CPU_R/W
DTACK
CPU_CLK
IRQ4
IRQ1
RESET
BLANK
COM_CLK
R1
33 OHM



CAPCOM COIN-OP, INC.

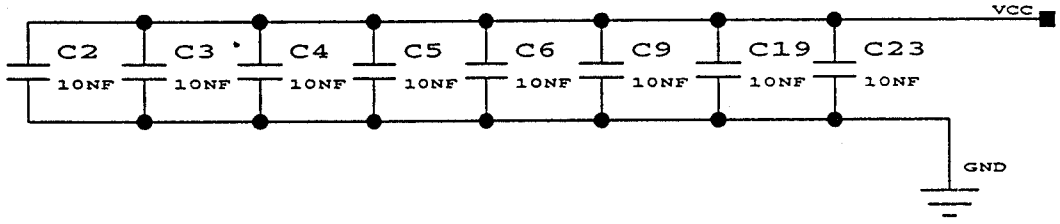
TITLE SYS_CPU	
PROJECT ENGINEER MARK COLDEBELLA	ASSEMBLY # A0015403
DATE AUGUST 9,1995	SHEET # 5 OF 6 / REV - -

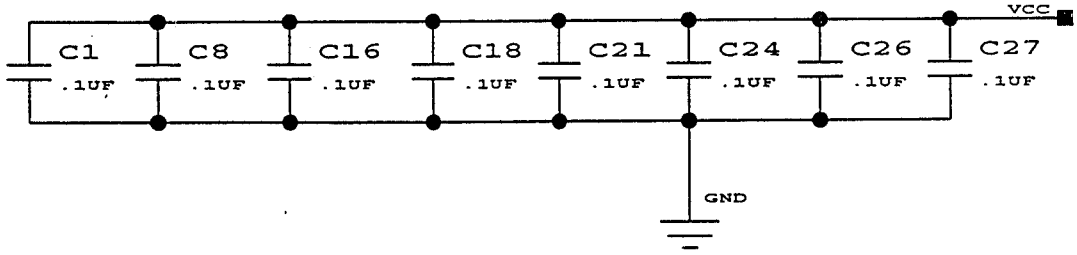


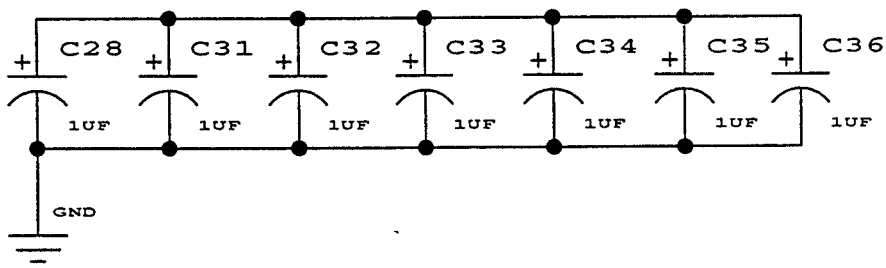


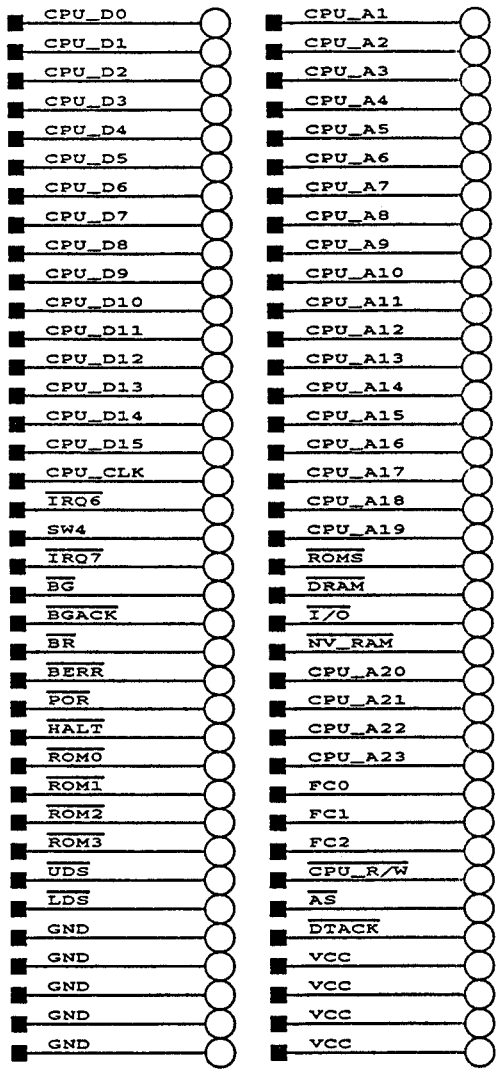
CPU_D[15:0]

CPU_A[23:1]

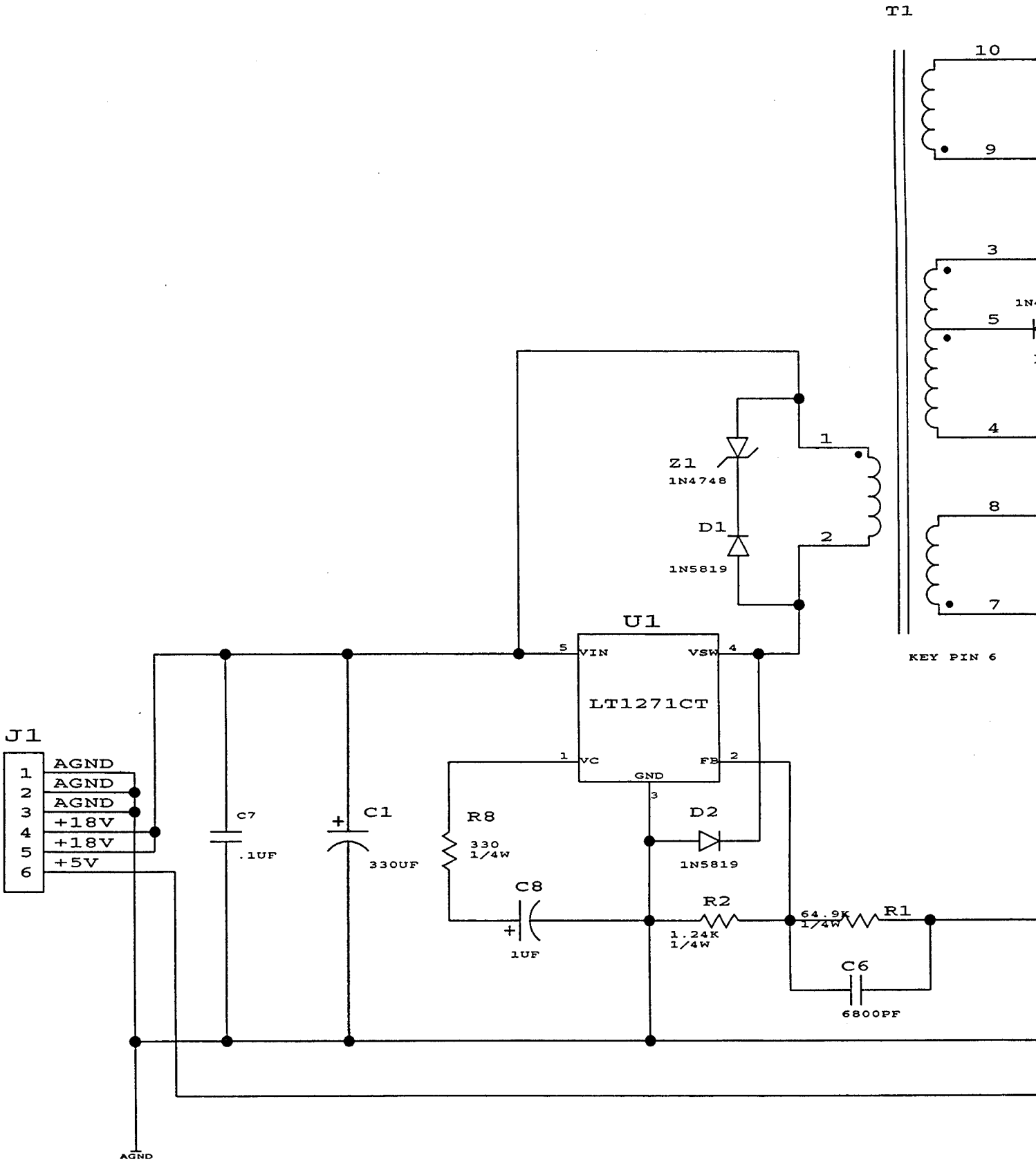


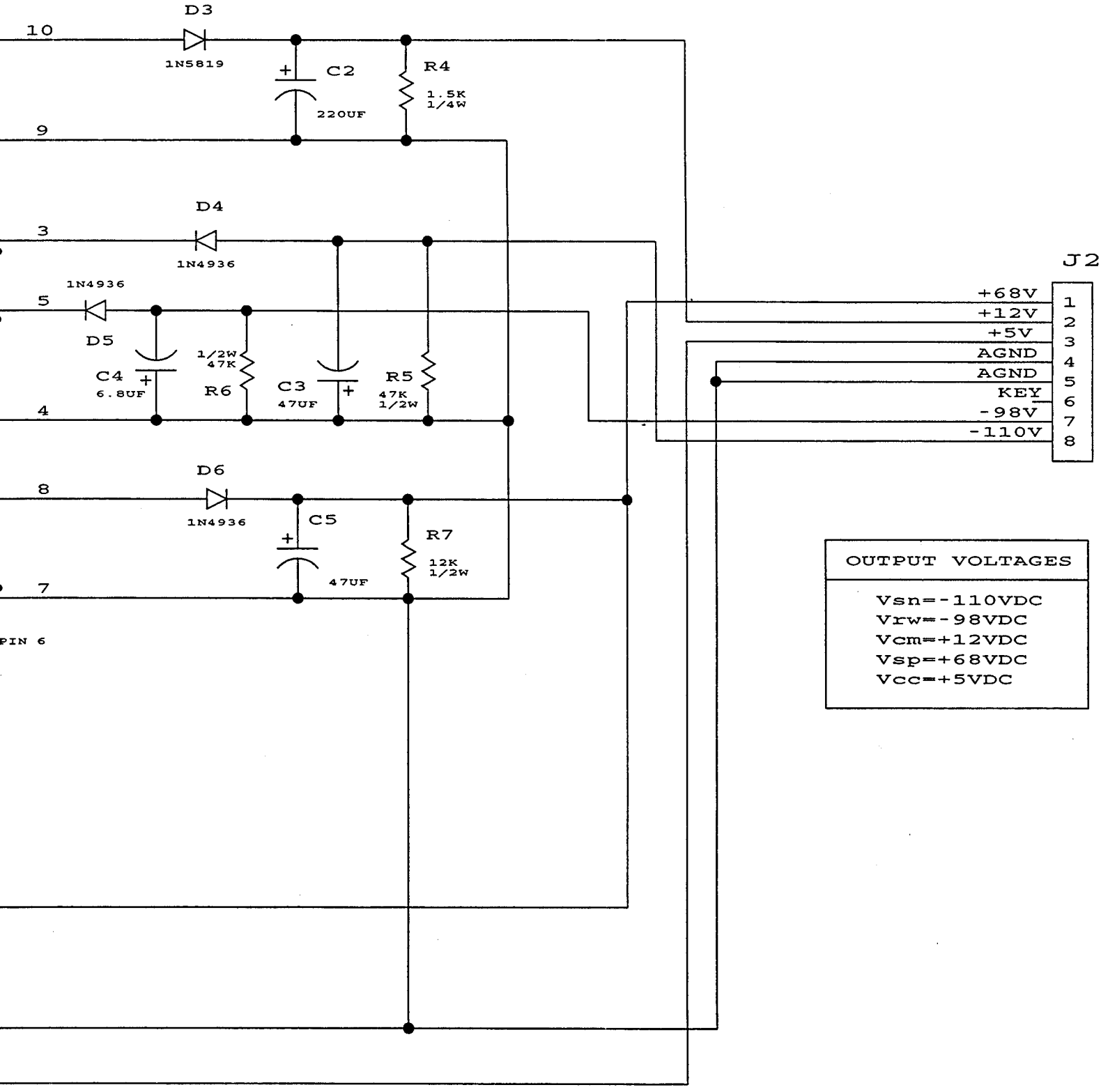






CAPCOM COIN-OP, INC.		
TITLE SYS_CPU		
PROJECT ENGINEER MARK COLDEBELLA	ASSEMBLY # A0015403	
DATE AUGUST 9, 1995	SHEET # 6 OF 6	REV -

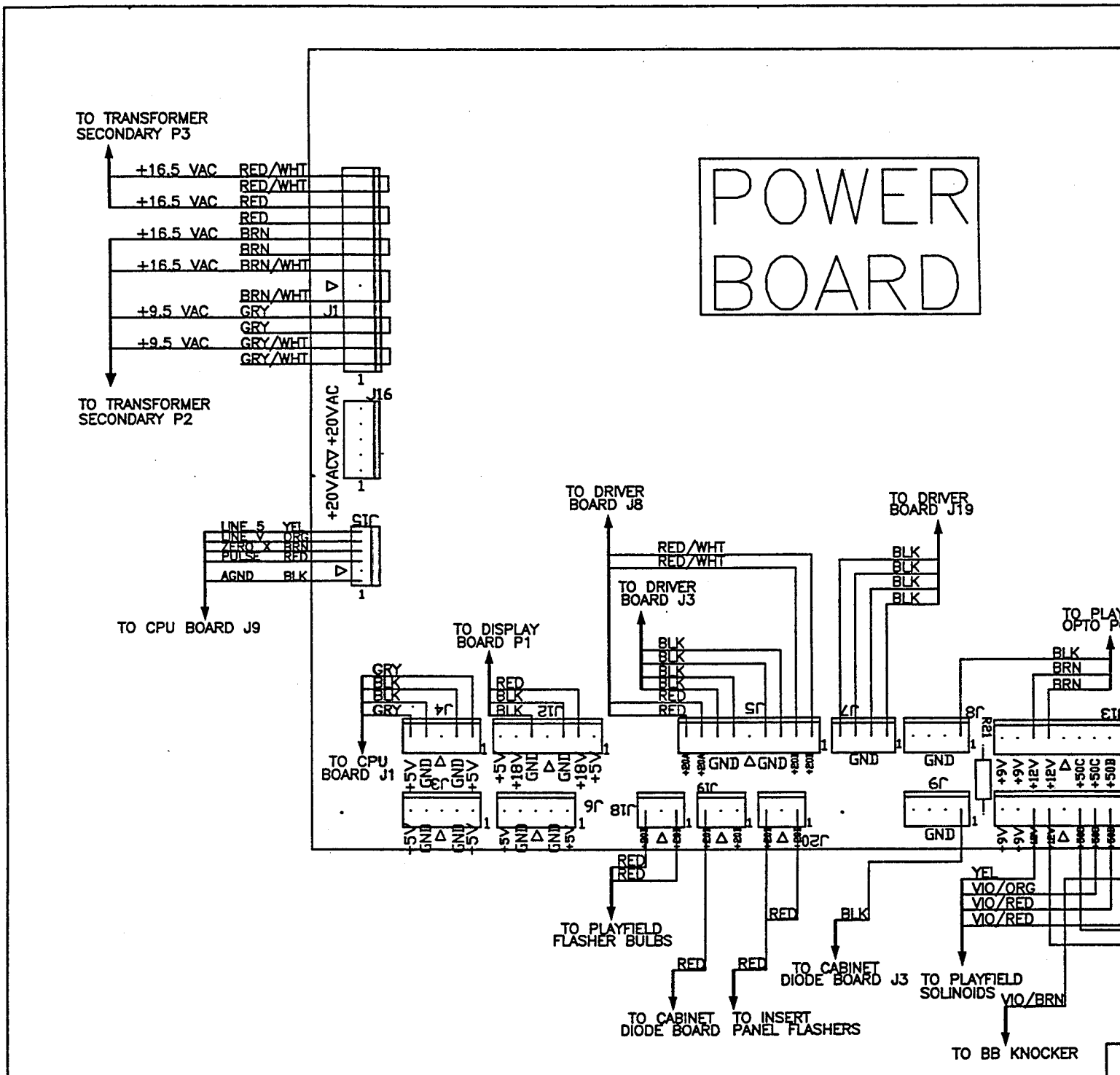

T1
10
9
3
5
4
8
7
KEY PIN 6
Z1
1N4748
D1
1N5819
1
2
U1
LT1271CT
5
VIN
VSW
4
1
VC
FB
2
GND
3
J1
1
2
3
4
5
6
AGND
AGND
AGND
+18V
+18V
+5V
C7
.1UF
C1
330UF
R8
330
1/4W
D2
1N5819
C8
1UF
R2
1.24K
1/4W
64.9K
1/4W
R1
C6
6800PF
AGND

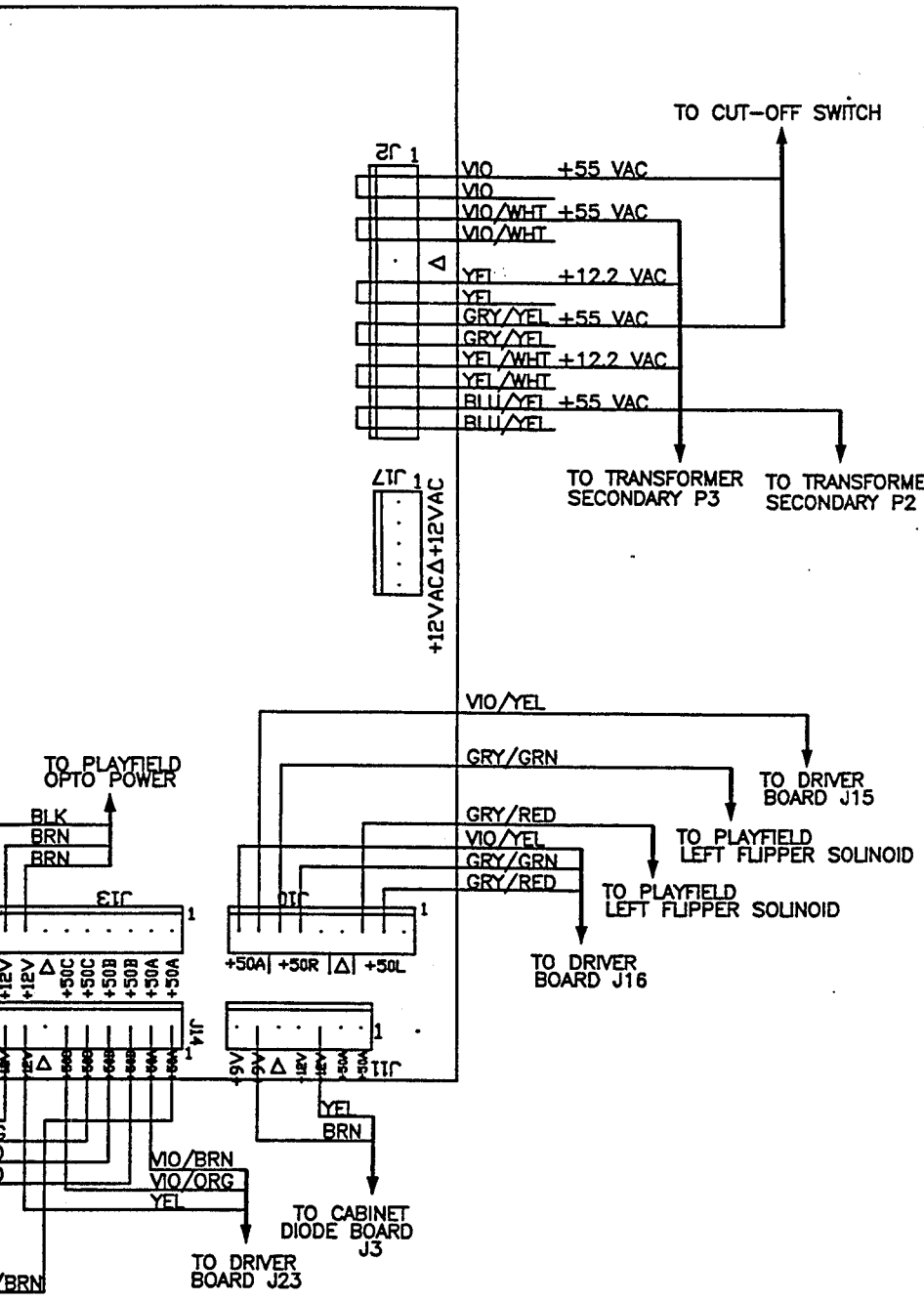


OUTPUT VOLTAGES
Vsn=-110VDC
Vrw=-98VDC
Vcm=+12VDC
Vsp=+68VDC
Vcc=+5VDC

CAPCOM COIN-OP, INC.

TITLE DOT DISPLAY SWITCHING POWER SUPPLY		
PROJECT ENGINEER STEVE MILEWSKI/KD	ASSEMBLY # A0015502	
DATE 6/2/95	SHEET # 1 OF 1	REV -


POWER
BOARD
TO TRANSFORMER
SECONDARY P3
+16.5 VAC RED/WHT
RED/WHT
+16.5 VAC RED
RED
+16.5 VAC BRN
BRN
+16.5 VAC BRN/WHT
BRN/WHT
+9.5 VAC GRY
GRY
+9.5 VAC GRY/WHT
GRY/WHT
J1
TO TRANSFORMER
SECONDARY P2
J16
+20VAC +20VAC
J15
LINE 5 YEL
LINE 0 ORG
ZERO X BRN
PULSE RED
AGND BLK
TO CPU BOARD J9
TO DISPLAY
BOARD P1
TO DRIVER
BOARD J8
TO DRIVER
BOARD J19
TO DRIVER
BOARD J3
TO CPU
BOARD J1
TO PLAYFIELD
FLASHER BULBS
TO CABINET
DIODE BOARD
TO INSERT
PANEL FLASHERS
TO CABINET
DIODE BOARD J3
TO PLAYFIELD
SOLINOIDS
TO BB KNOCKER



ITEM	CAD FILE NO.	PART NO.	VENDOR NO.	DESCRIPTION	QTY.

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

FRACTIONAL		±.015
TWO PLACE	.XX	±.010
THREE PLACE	.XXX	±.005
ANGULAR		±.5°

DO NOT SCALE DRAWING

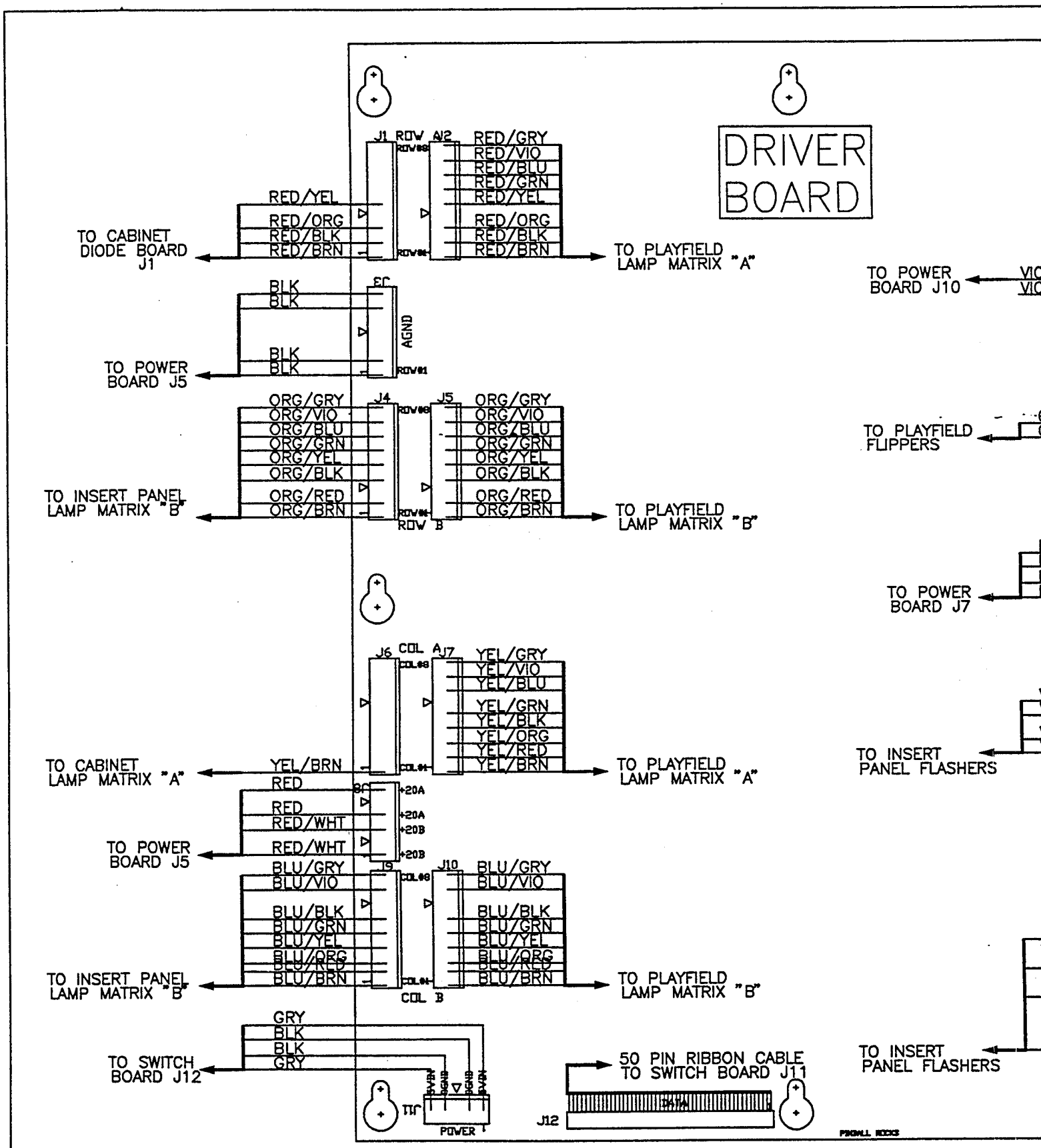
GAME DESIGNER: BRYAN HANSEN
PROJECT ENG.: RICK MORGAN
PROJECT NO.: PB-1
DRAWN: BILL ZIEGLER — DATE: 8/23/95
CHECKED: DAVE ROSE — DATE: 8/23/95
APPROVED — DATE
FILE NAME: C:\ACADWIN\PMPWR

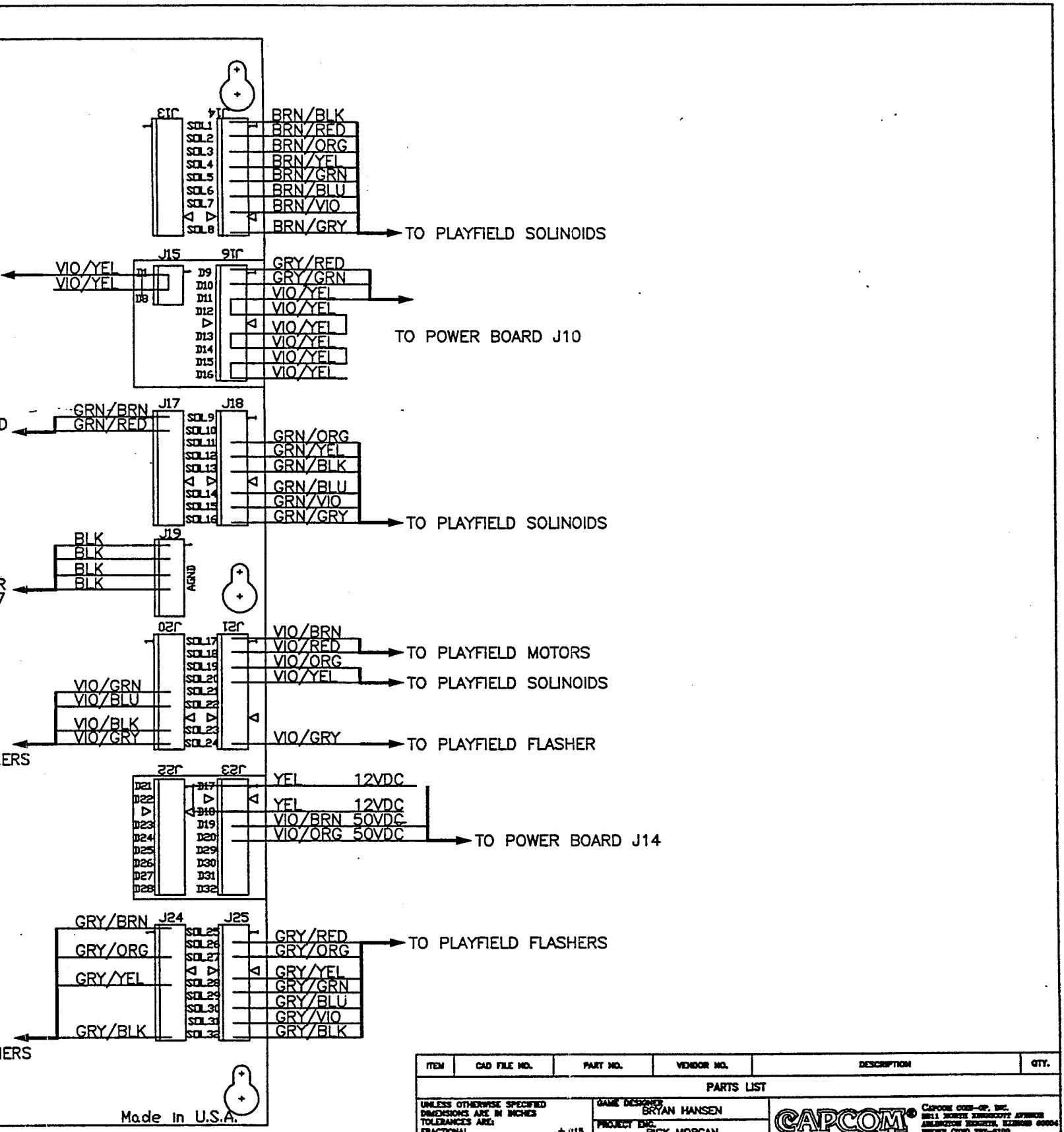
CAPCOM® COIN-OP, INC.
CAPCOM COIN-OP, INC.
3311 NORTH KENNICOTT AVENUE
ARLINGTON HEIGHTS, ILLINOIS 60004
PHONE (708) 797-6100
FAX (708) 797-6119

TITLE
DIAGRAM, POWER BOARD WIRING

SIZE	PART NO.	REV.
B	PB-1 WIRING	

SCALE	USAGE	ECN NO:	SHEET
		327	1 OF 10


DRIVER BOARD
J1 ROW A
J2
RED/GRY
RED/VIO
RED/BLU
RED/GRN
RED/YEL
RED/ORG
RED/BLK
RED/BRN
RED/YEL
RED/ORG
RED/BLK
RED/BRN
TO CABINET DIODE BOARD J1
TO PLAYFIELD LAMP MATRIX "A"
TO POWER BOARD J10
BLK
BLK
BLK
BLK
AGND
TO POWER BOARD J5
J4
J5
ORG/GRY
ORG/VIO
ORG/BLU
ORG/GRN
ORG/YEL
ORG/BLK
ORG/RED
ORG/BRN
TO PLAYFIELD FLIPPERS
TO INSERT PANEL LAMP MATRIX "B"
TO PLAYFIELD LAMP MATRIX "B"
ROW B
TO POWER BOARD J7
J6 COL A
J7
YEL/GRY
YEL/VIO
YEL/BLU
YEL/GRN
YEL/BLK
YEL/ORG
YEL/RED
YEL/BRN
TO CABINET LAMP MATRIX "A"
TO PLAYFIELD LAMP MATRIX "A"
TO INSERT PANEL FLASHERS
RED
RED
RED/WHT
RED/WHT
+20A
+20A
+20B
+20B
TO POWER BOARD J5
J9
J10
BLU/GRY
BLU/VIO
BLU/BLK
BLU/GRN
BLU/YEL
BLU/ORG
BLU/RED
BLU/BRN
TO INSERT PANEL LAMP MATRIX "B"
TO PLAYFIELD LAMP MATRIX "B"
COL B
GRY
BLK
BLK
GRY
TO SWITCH BOARD J12
50 PIN RIBBON CABLE TO SWITCH BOARD J11
TO INSERT PANEL FLASHERS
J11
POWER
J12



ITEM	CAD FILE NO.	PART NO.	VENDOR NO.	DESCRIPTION	QTY.

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONAL ±.015
TWO PLACE .XX ±.010
THREE PLACE .XXX ±.005
ANGULAR ±.5°

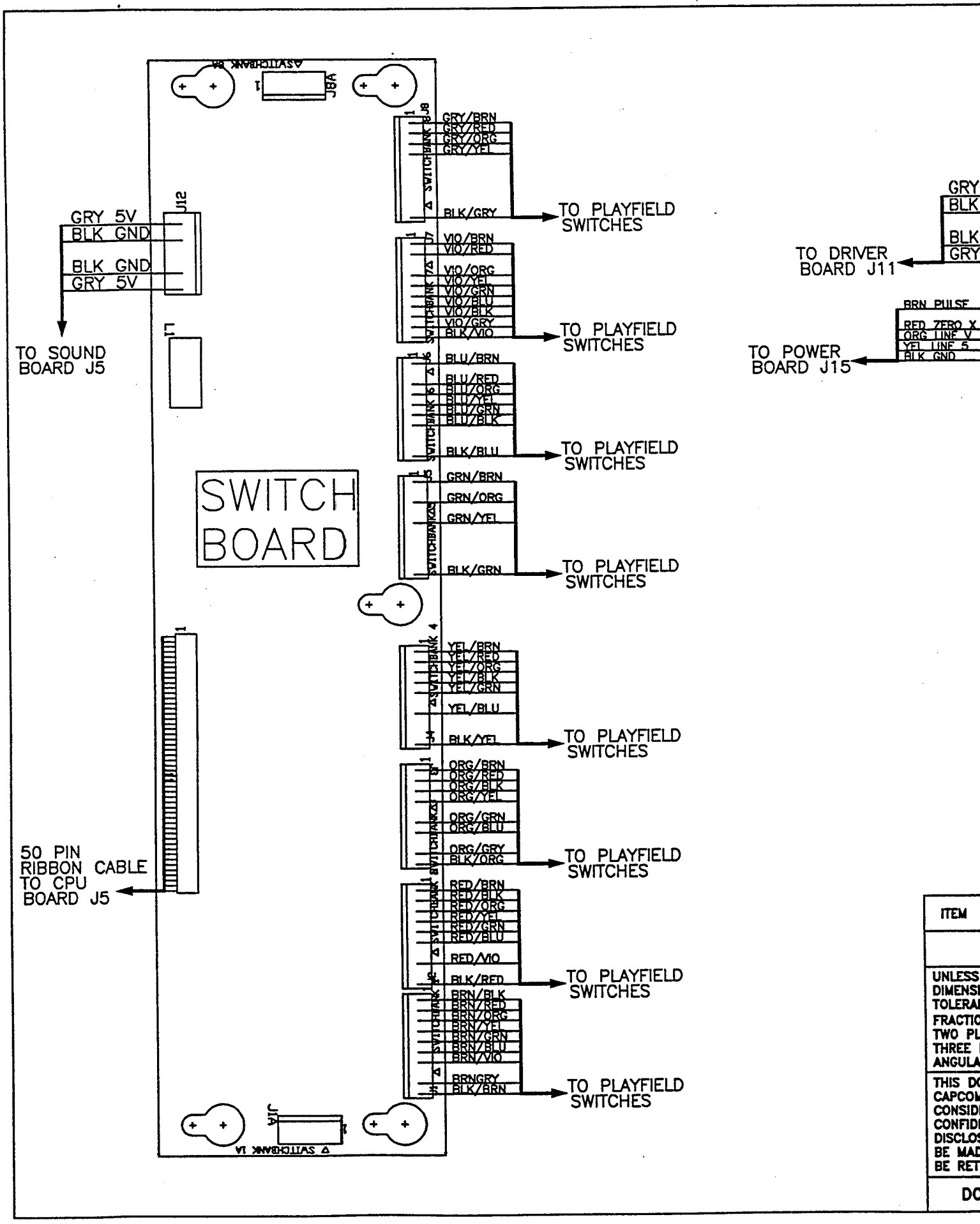
DO NOT SCALE DRAWING

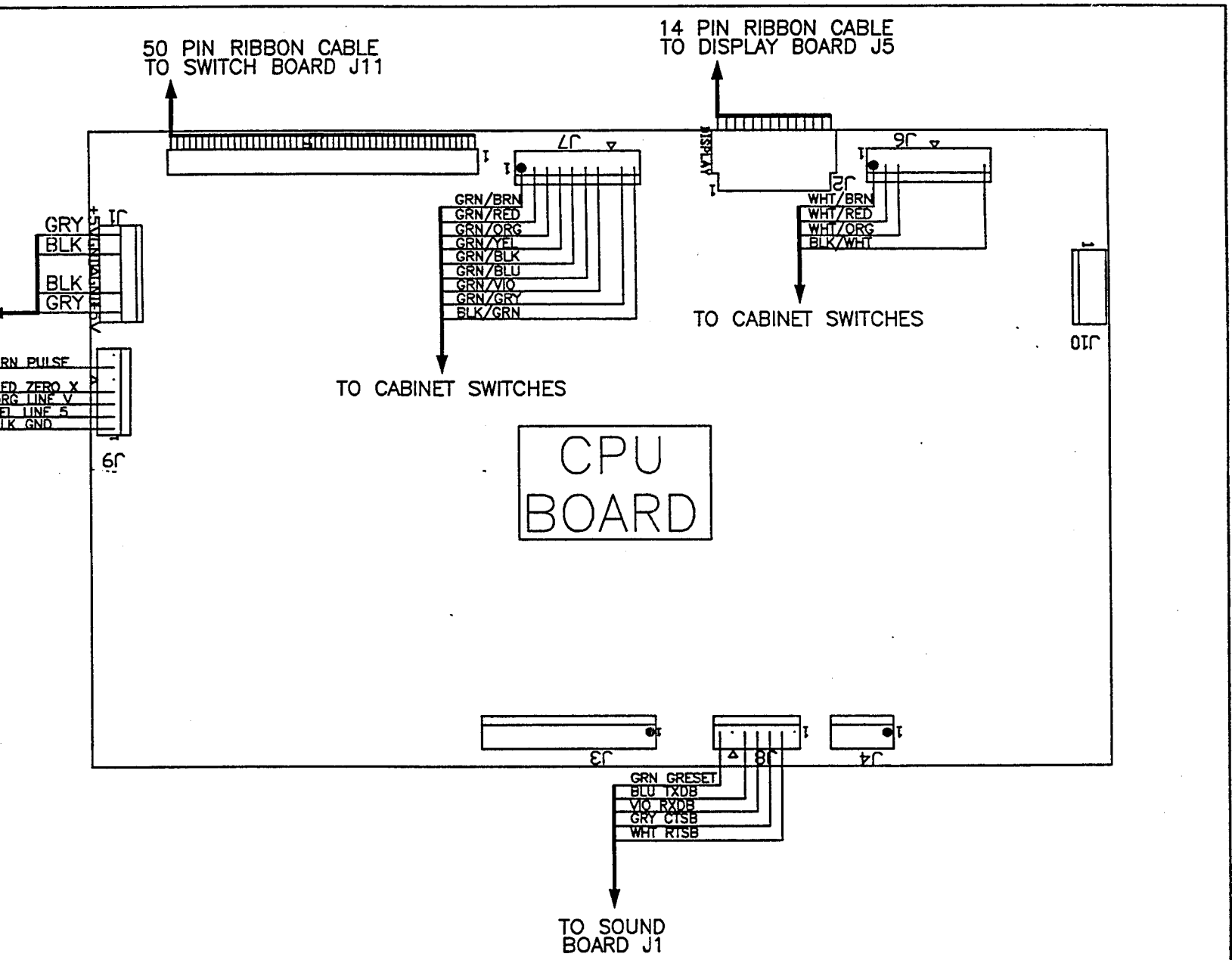
GAME DESIGNER: BRYAN HANSEN
PROJECT ENG.: RICK MORGAN
PROJECT NO.: PB-1
DRAWN: BILL ZIEGLER DATE: 8/23/95
CHECKED: DAVE ROSE DATE: 8/23/95
APPROVED: DATE:
FILE NAME: C:\ACADWIN\PMDRIVER

CAPCOM® CAPCOM COIN-OP, INC.
3311 NORTH KENNICOTT AVENUE
ARLINGTON HEIGHTS, ILLINOIS 60004
PHONE (708) 797-0100
FAX (708) 797-0119

TITLE: DIAGRAM, DRIVER BOARD WIRING

SIZE: B
PART NO.: PB1 WIRING
REV.:
SCALE:
USAGE:
ECN NO.: 327
SHEET 2 OF 10


SWITCH BOARD
GRY 5V
BLK GND
BLK GND
GRY 5V
J12
TO SOUND BOARD J5
50 PIN RIBBON CABLE TO CPU BOARD J5
GRY/BRN
GRY/RED
GRY/ORG
GRY/YEL
BLK/GRY
TO PLAYFIELD SWITCHES
VIO/BRN
VIO/RED
VIO/ORG
VIO/YEL
VIO/GRN
VIO/BLU
VIO/BLK
VIO/GRY
BLK/VIO
TO PLAYFIELD SWITCHES
BLU/BRN
BLU/RED
BLU/ORG
BLU/YEL
BLU/GRN
BLU/BLK
BLK/BLU
TO PLAYFIELD SWITCHES
GRN/BRN
GRN/ORG
GRN/YEL
BLK/GRN
TO PLAYFIELD SWITCHES
YEL/BRN
YEL/RED
YEL/ORG
YEL/BLK
YEL/GRN
YEL/BLU
BLK/YEL
TO PLAYFIELD SWITCHES
ORG/BRN
ORG/RED
ORG/BLK
ORG/YEL
ORG/GRN
ORG/BLU
ORG/GRY
BLK/ORG
TO PLAYFIELD SWITCHES
RED/BRN
RED/BLK
RED/ORG
RED/YEL
RED/GRN
RED/BLU
RED/VIO
BLK/RED
TO PLAYFIELD SWITCHES
BRN/BLK
BRN/RED
BRN/ORG
BRN/YEL
BRN/GRN
BRN/BLU
BRN/VIO
BRNGRY
BLK/BRN
TO PLAYFIELD SWITCHES
TO DRIVER BOARD J11
TO POWER BOARD J15
BRN PULSE
RED ZERO X
ORG LINE V
YEL LINE 5
BLK GND
ITEM



ITEM	CAD FILE NO.	PART NO.	VENDOR NO.	DESCRIPTION	QTY.

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

FRACTIONAL		±.015
TWO PLACE	.XX	±.010
THREE PLACE	.XXX	±.005
ANGULAR		±.5°

DO NOT SCALE DRAWING

GAME DESIGNER	BRYAN HANSEN	
PROJECT ENG.	RICK MORGAN	
PROJECT NO.	PB-1	
DRAWN	BILL ZIEGLER	DATE 8/23/95
CHECKED	DAVE ROSE	DATE 8/23/95
APPROVED		DATE
FILE NAME	C:\ACADWIN\PMSW-CPU	

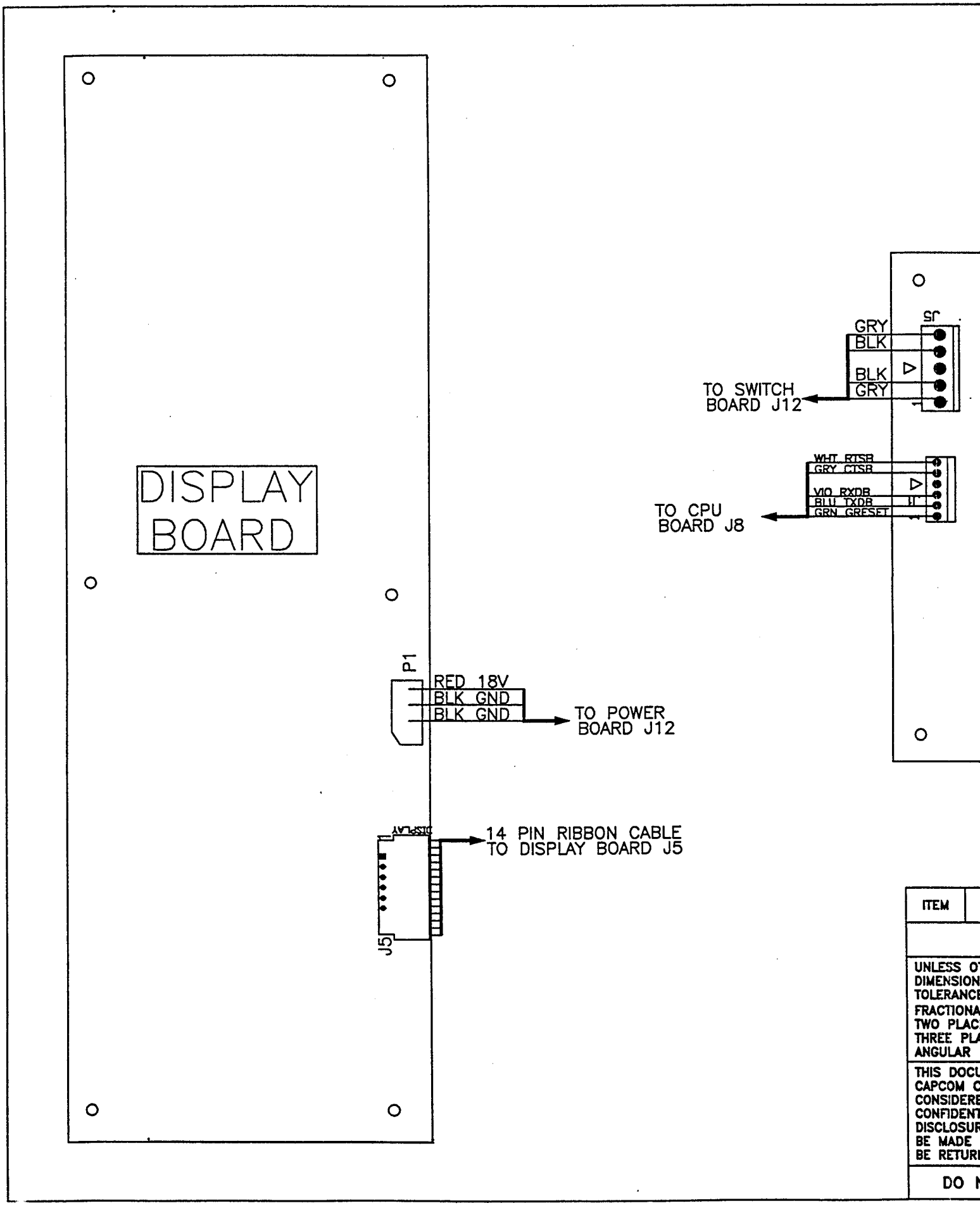
CAPCOM® COIN-OP, INC.
CAPCOM COIN-OP, INC.
3311 NORTH KENNICOTT AVENUE
ARLINGTON HEIGHTS, ILLINOIS 60004
PHONE (708) 797-6100
FAX (708) 797-6119

TITLE

DIAGRAM SWITCH & CPU WIRING

SIZE	PART NO.	REV.
B	PB-1 WIRING	

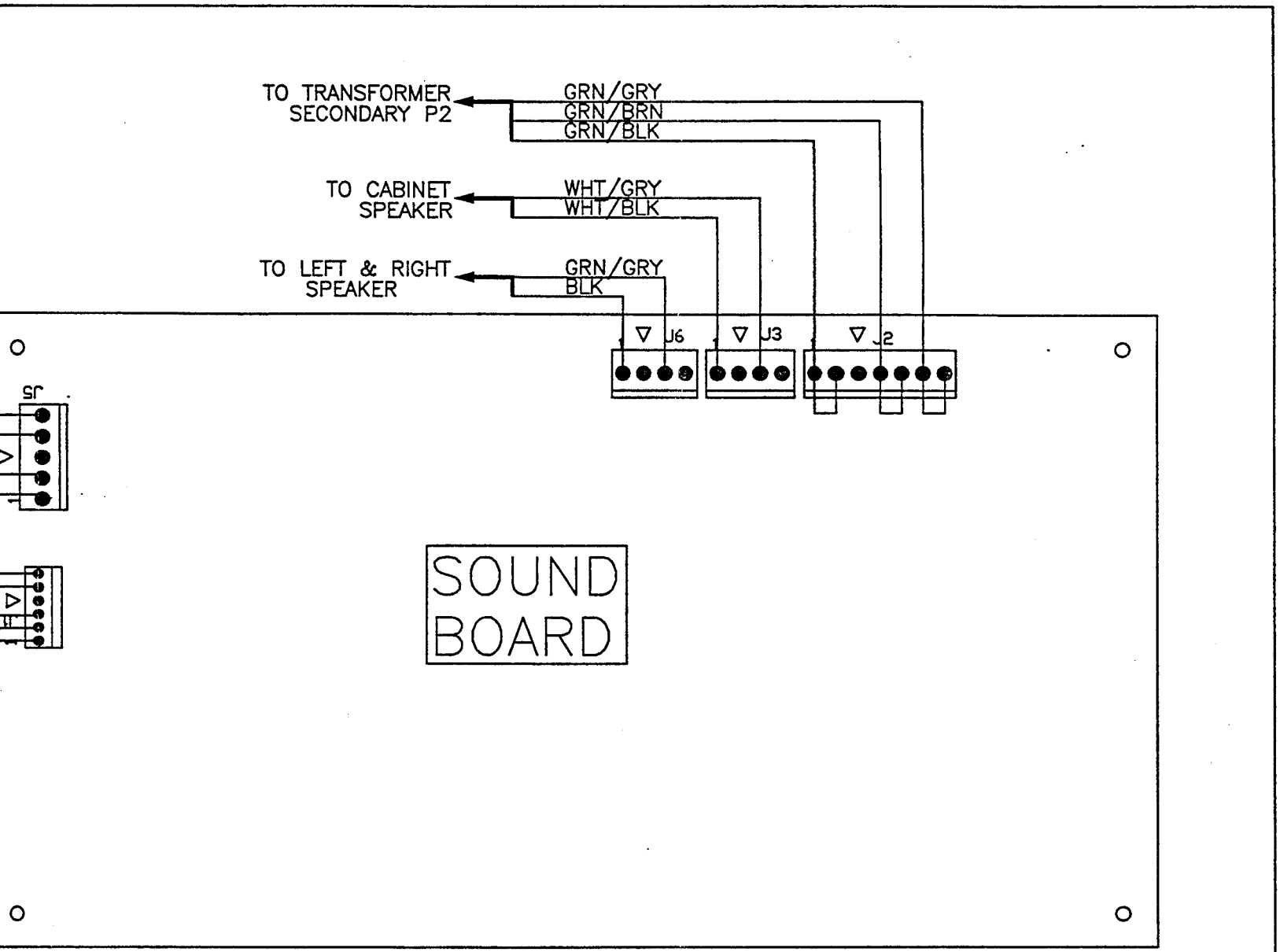
SCALE	USAGE	ECN NO:	SHEET
		327	3 OF 10



ITEM	

UNLESS O
DIMENSION
TOLERANCE
FRACTIONA
TWO PLAC
THREE PLA
ANGULAR

DO N



ITEM	CAD FILE NO.	PART NO.	VENDOR NO.	DESCRIPTION	QTY.

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

FRACTIONAL		±.015
TWO PLACE	.XX	±.010
THREE PLACE	.XXX	±.005
ANGULAR		±.5°

DO NOT SCALE DRAWING

GAME DESIGNER: BRYAN HANSEN
PROJECT ENG.: RICK MORGAN
PROJECT NO.: PB-1

DRAWN	BILL ZIEGLER	DATE 8/23/95
CHECKED	DAVE ROSE	DATE 8/23/95
APPROVED		DATE

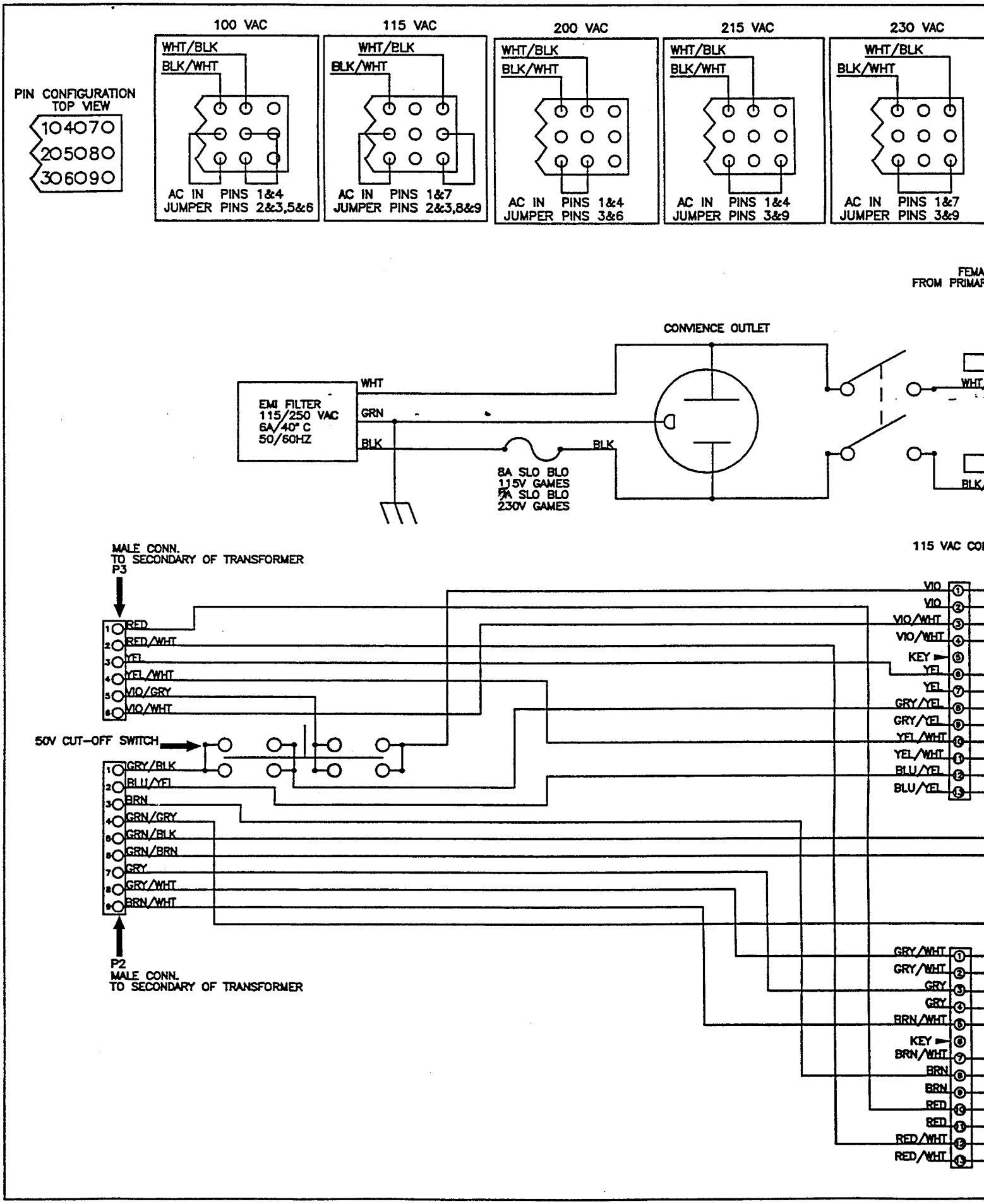
FILE NAME: C:\ACADWIN\PMSNDBD

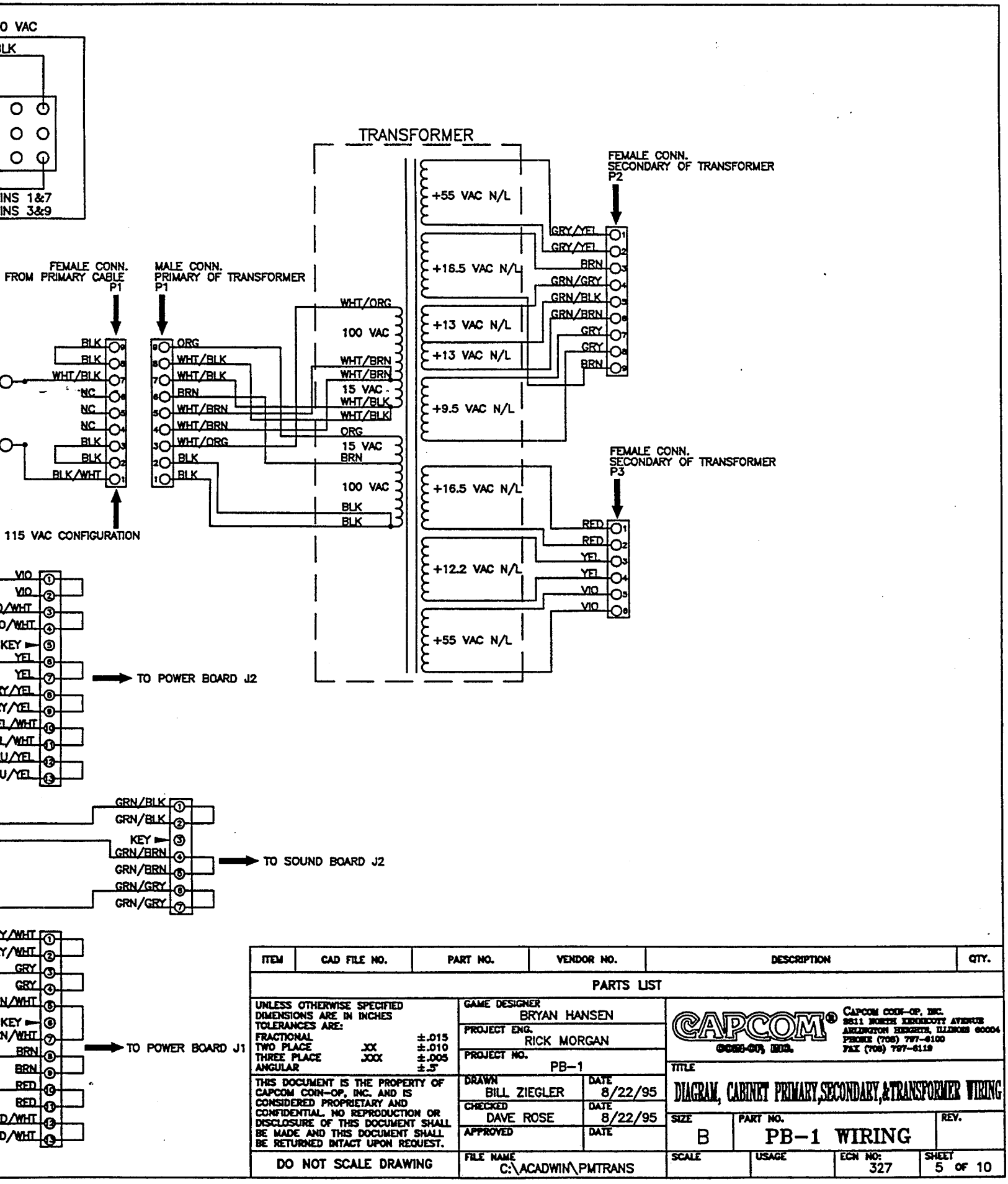
CAPCOM® COIN-OP, INC.
CAPCOM COIN-OP, INC.
3311 NORTH KENNICOTT AVENUE
ARLINGTON HEIGHTS, ILLINOIS 60004
PHONE (708) 797-6100
FAX (708) 797-6119

TITLE: DIAGRAM, DISPLAY & SOUND BOARD WIRING

SIZE	PART NO.	REV.
B	PB-1 WIRING	

SCALE	USAGE	ECN NO:	SHEET
		327	4 OF 10


PIN CONFIGURATION
TOP VIEW
104070
205080
306090
100 VAC
WHT/BLK
BLK/WHT
AC IN PINS 1&4
JUMPER PINS 2&3,5&6
115 VAC
WHT/BLK
BLK/WHT
AC IN PINS 1&7
JUMPER PINS 2&3,8&9
200 VAC
WHT/BLK
BLK/WHT
AC IN PINS 1&4
JUMPER PINS 3&6
215 VAC
WHT/BLK
BLK/WHT
AC IN PINS 1&4
JUMPER PINS 3&9
230 VAC
WHT/BLK
BLK/WHT
AC IN PINS 1&7
JUMPER PINS 3&9
CONVIENCE OUTLET
EMI FILTER
115/250 VAC
6A/40° C
50/60HZ
WHT
GRN
BLK
8A SLO BLO
115V GAMES
5A SLO BLO
230V GAMES
MALE CONN.
TO SECONDARY OF TRANSFORMER
P3
RED
RED/WHT
YEL
YEL/WHT
VIO/GRY
VIO/WHT
50V CUT-OFF SWITCH
GRY/BLK
BLU/YEL
BRN
GRN/GRY
GRN/BLK
GRN/BRN
GRY
GRY/WHT
BRN/WHT
P2
MALE CONN.
TO SECONDARY OF TRANSFORMER
VIO
VIO
VIO/WHT
VIO/WHT
KEY
YEL
YEL
GRY/YEL
GRY/YEL
YEL/WHT
YEL/WHT
BLU/YEL
BLU/YEL
GRY/WHT
GRY/WHT
GRY
GRY
BRN/WHT
KEY
BRN/WHT
BRN
BRN
RED
RED
RED/WHT
RED/WHT



ITEM	CAD FILE NO.	PART NO.	VENDOR NO.	DESCRIPTION	QTY.

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONAL ±.015
TWO PLACE .XX ±.010
THREE PLACE .XXX ±.005
ANGULAR ±.5°

DO NOT SCALE DRAWING

GAME DESIGNER: BRYAN HANSEN
PROJECT ENG.: RICK MORGAN
PROJECT NO.: PB-1
DRAWN: BILL ZIEGLER — DATE: 8/22/95
CHECKED: DAVE ROSE — DATE: 8/22/95
APPROVED — DATE
FILE NAME: C:\ACADWIN\PMTRANS

CAPCOM®
CAPCOM COIN-OP, INC.
2811 NORTH KENNICOTT AVENUE
ARLINGTON HEIGHTS, ILLINOIS 60004
PHONE (708) 797-6100
FAX (708) 797-6119

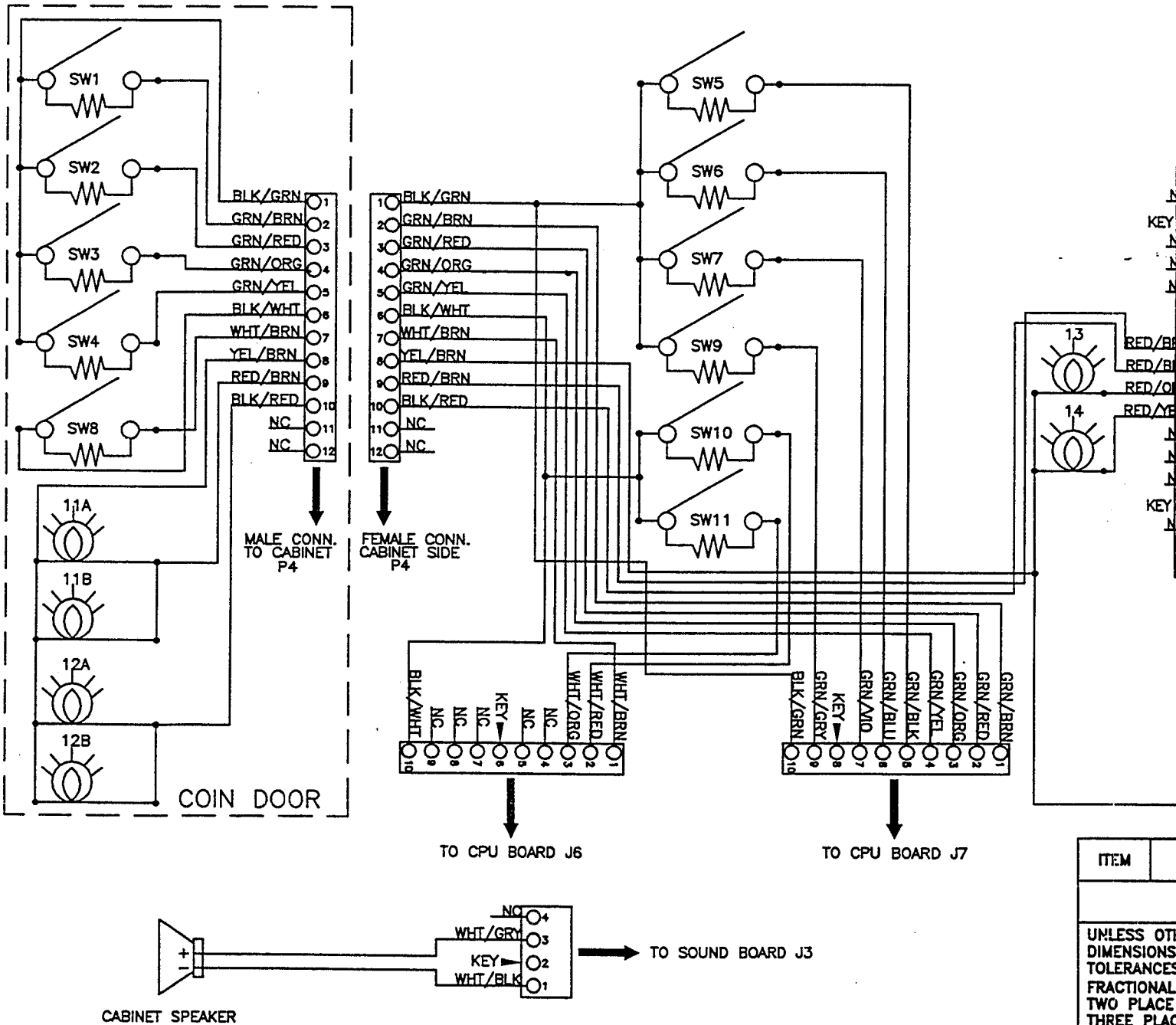
TITLE: DIAGRAM, CABINET PRIMARY,SECONDARY,&TRANSFORMER WIRING

SIZE	PART NO.	REV.
B	PB-1 WIRING	

SCALE	USAGE	ECN NO:	SHEET
		327	5 OF 10

LAMP # & DESCRIPTION	
11	COIN DOOR 1&2
12	COIN DOOR 3&4
13	START
14	BUY-IN (CONTINUE)

SWITCH # &	
1	COIN 1
2	COIN 2
3	COIN 3
4	COIN 4
5	LEFT FL
6	RIGHT F
7	START
8	COIN DO



CABINET SPEAKER
8 INCH 4 OHM 20 WATT

ITEM	

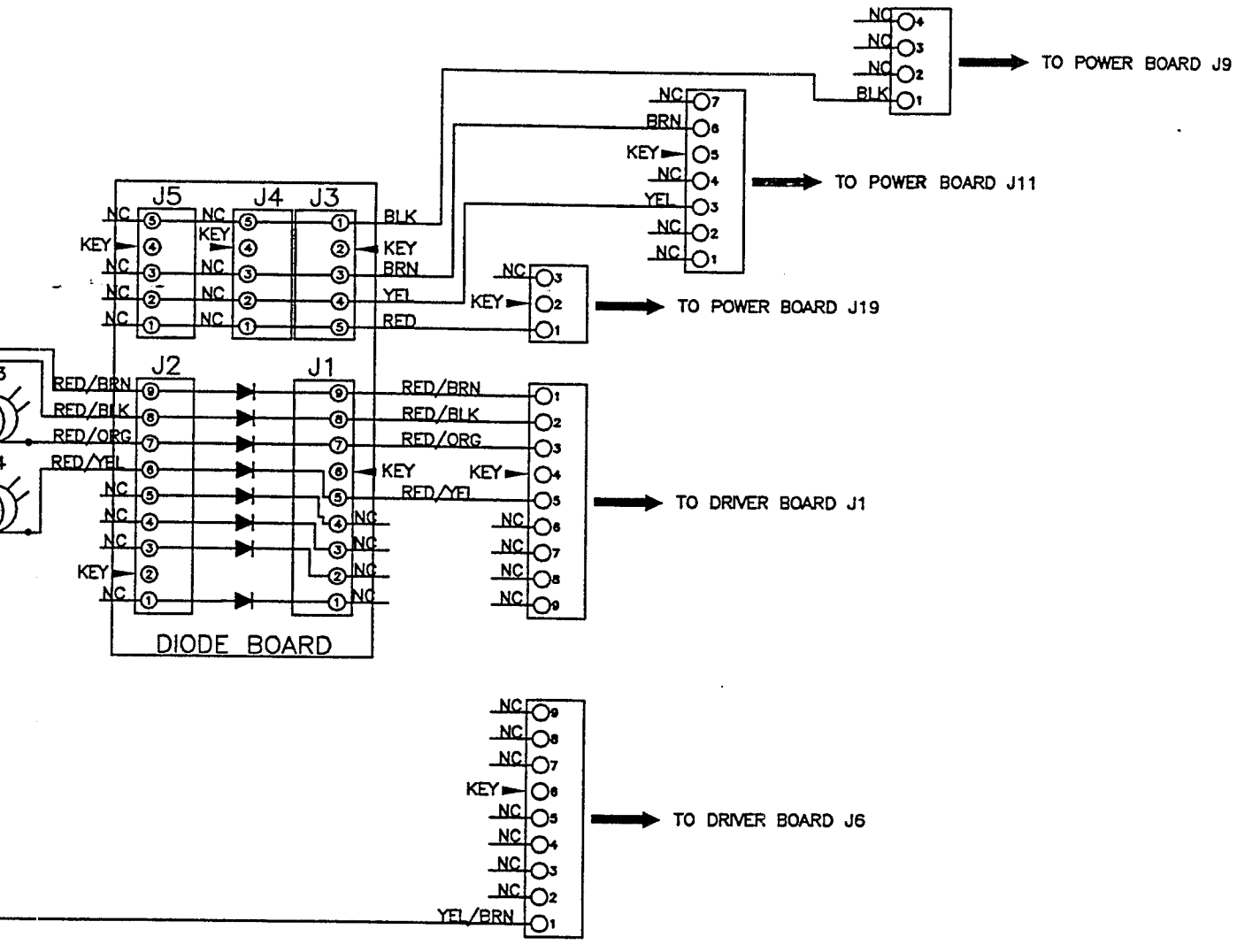
UNLESS OTI
DIMENSIONS
TOLERANCES
FRACTIONAL
TWO PLACE
THREE PLAC
ANGULAR

THIS DOCUM
CAPCOM CO
CONSIDERED
CONFIDENTIA
DISCLOSURE
BE MADE A
BE RETURNE

DO NO

SWITCH # & DESCRIPTION	
1	COIN 1
2	COIN 2
3	COIN 3
4	COIN 4
5	LEFT FLIPPER
6	RIGHT FLIPPER
7	START
8	COIN DOOR OPEN

SWITCH # & DESCRIPTION	
9	SLAM TILT
10	TILT BOB
11	BUY-IN (CONTINUE)



ITEM	CAD FILE NO.	PART NO.	VENDOR NO.	DESCRIPTION	QTY.

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

FRACTIONAL		±.015
TWO PLACE	.XX	±.010
THREE PLACE	.XXX	±.005
ANGULAR		±.5°

DO NOT SCALE DRAWING

GAME DESIGNER: BRYAN HANSEN
PROJECT ENG.: RICK MORGAN
PROJECT NO.: PB-1
DRAWN: BILL ZIEGLER — DATE: 8/22/95
CHECKED: DAVE ROSE — DATE: 8/22/95
APPROVED — DATE
FILE NAME: C:\ACADWIN\PMCABSW

CAPCOM® COIN-OP, INC.
CAPCOM COIN-OP, INC.
3311 NORTH KENNICOTT AVENUE
ARLINGTON HEIGHTS, ILLINOIS 60004
PHONE (708) 797-6100
FAX (708) 797-8119

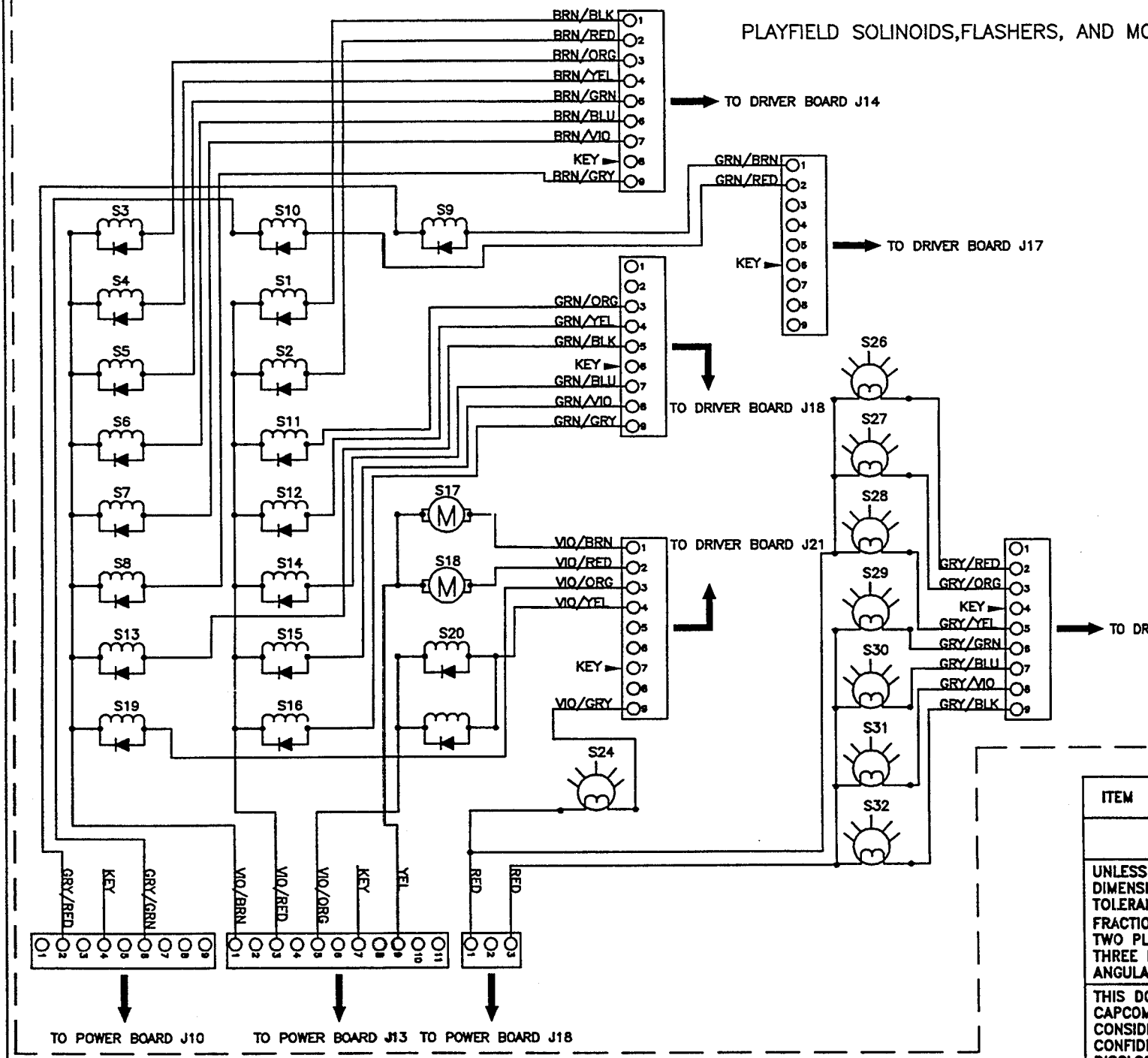
TITLE: DIAGRAM, CABINET SWITCHES.LAMPS,&COINDOOR WIRING

SIZE	PART NO.	REV.
B	PB-1 WIRING	

SCALE	USAGE	ECN NO:	SHEET
		327	6 OF 10

SOLINOID # & DESCRIPTION	
S1	PACKING BOX
S2	GENIE BOTTLE
S3	LEFT SLINGSHOT
S4	RIGHT SLINGSHOT
S5	MIRACULOUS SAVE
S6	TROUGH EJECT
S7	TROUGH OUTHOLE
S8	KNOCKER

SOLINNOID # & DESCRIPTION	
S9	LEFT FLIPPER
S10	RIGHT FLIPPER
S11	STAGE DOOR
S12	STAGE KICKER
S13	STAGE DIVERTER
S14	WAND DIVERTER
S15	BUMPER
S16	UPPER SLINGSHOT

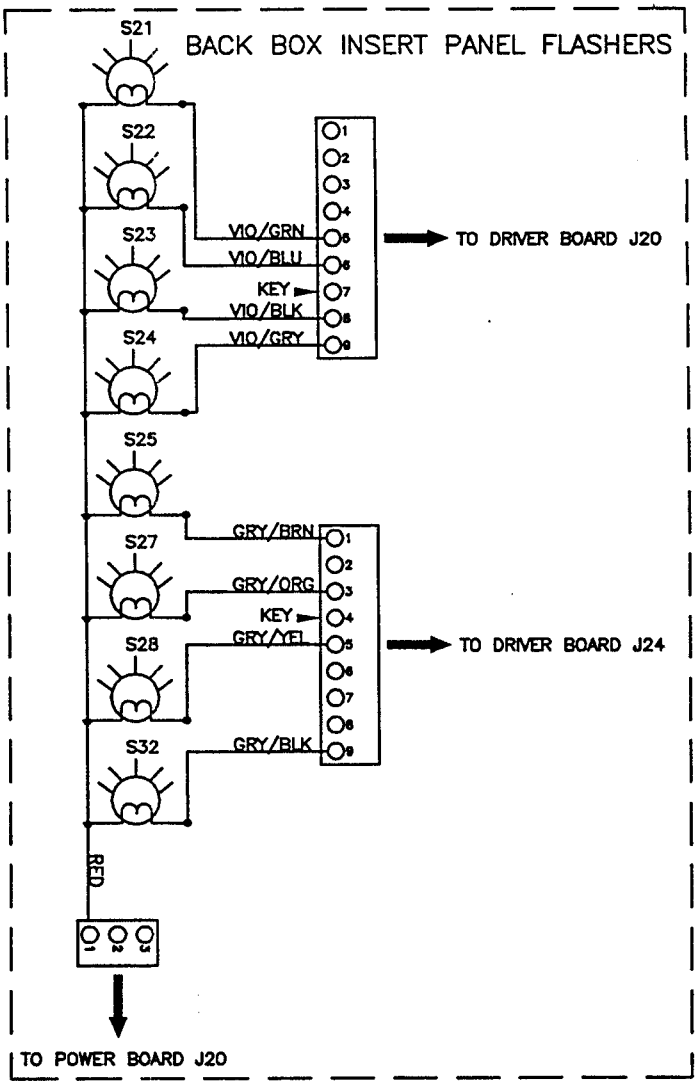


SOLINOID # & DESCRIPTION	
S17	WAND MOTOR
S18	STAGE MOTOR
S19	DROP TARGET RESET
S20	WAND MAGNET
S21	BACK 2 (BACKBOX)
S22	BACK 1 (BACKBOX)
S23	PINBALL (BACKBOX)
S24	WAND (BACKBOX)

SOLINOID # & DESCRIPTION	
S25	BACK 3 (BACKBOX)
S26	GENIE
S27	SHE (PLFD) / HAND (BB)
S28	PACK (PLFD) / MAGIC(BB)
S29	SPINNER
S30	STAGE
S31	BUMPER
S32	SKILL (PLFD) / CHAM(BB)

, AND MOTORS

TO DRIVER BOARD J25



ITEM	CAD FILE NO.	PART NO.	VENDOR NO.	DESCRIPTION	QTY.

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

FRACTIONAL		±.015
TWO PLACE	.XX	±.010
THREE PLACE	.XXX	±.005
ANGULAR		±.5°

DO NOT SCALE DRAWING

GAME DESIGNER: BRYAN HANSEN
PROJECT ENG.: RICK MORGAN
PROJECT NO.: PB-1
DRAWN: BILL ZIEGLER — DATE: 8/22/95
CHECKED: DAVE ROSE — DATE: 8/22/95
APPROVED — DATE
FILE NAME: C:\ACADWIN\PMCL-FL

CAPCOM® COIN-OP, INC.
CAPCOM COIN-OP, INC.
3311 NORTH KENNICOTT AVENUE
ARLINGTON HEIGHTS, ILLINOIS 60004
PHONE (708) 797-6100
FAX (708) 797-6119

TITLE: BB INSERT PNL FLASHERS & PLFD SOLINOIDS,FLASHERS

SIZE: B
PART NO.: PB-1 WIRING
REV.:

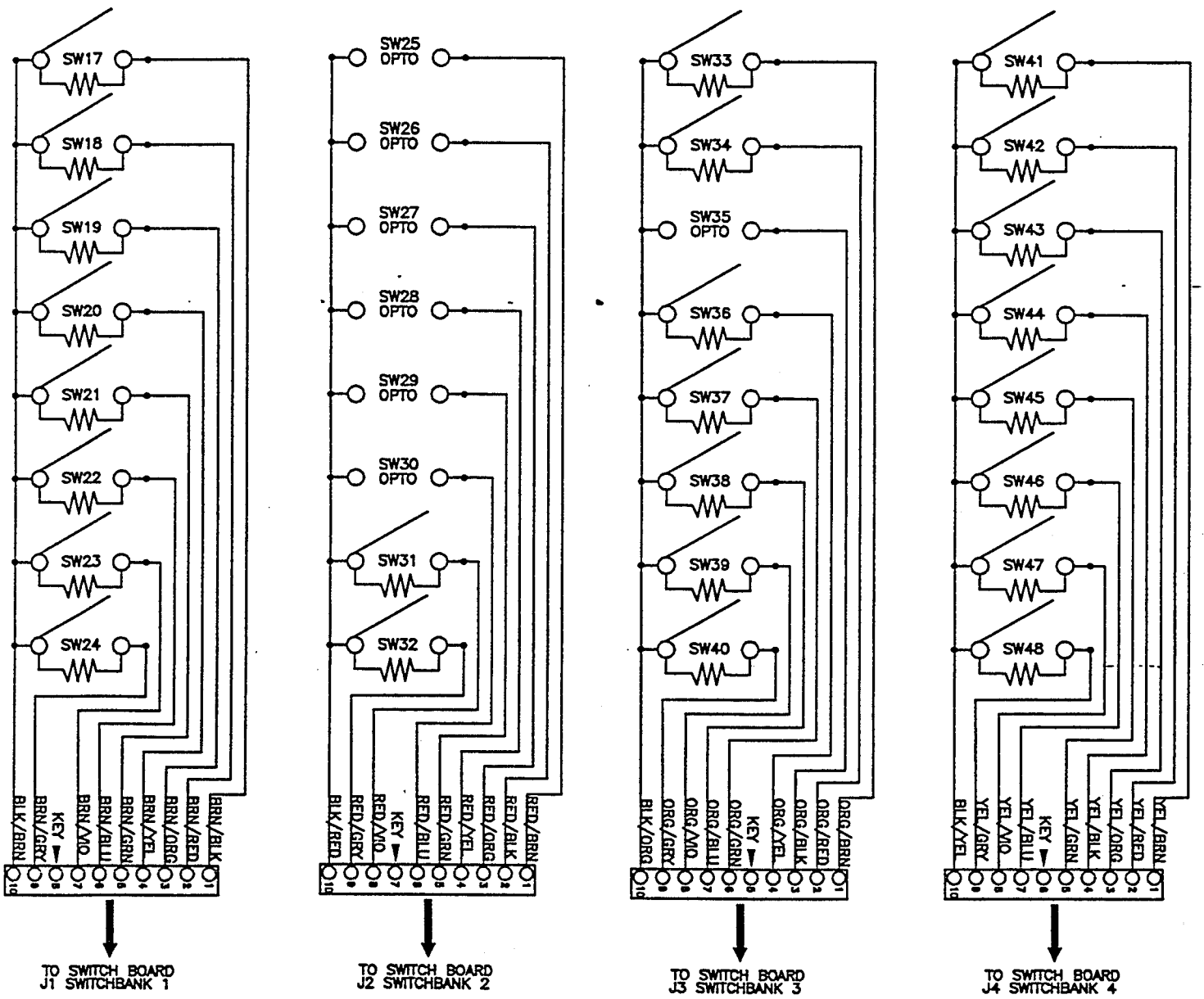
SCALE | USAGE | ECN NO: 327 | SHEET 7 OF 10

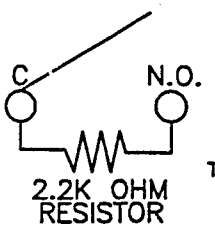
SWITCH # & DESCRIPTION	
17	MIRACULOUS SAVE
18	L INLANE
19	L SLINGSHOT
20	L FLPR EOS
21	R FLPR EOS
22	R SLINGSHOT
23	R INLANE
24	R OUTLANE

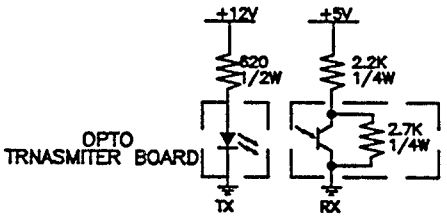
SWITCH # & DESCRIPTION	
25	LOCK 1 (OPTO)
26	LOCK 2 (OPTO)
27	LOCK 3 (OPTO)
28	GENIE 1 (OPTO)
29	GENIE 2 (OPTO)
30	GENIE 3 (OPTO)
31	BONUS
32	UNUSED

SWITCH # & DESCRIPTION	
33	SHOOTER
34	PRESTO
35	VANISH (OPTO)
36	DROPHOLE TOP
37	DROPHOLE BOT
38	ORBIT-RIGHT
39	UNUSED
40	ORBIT-CENTER

SWITCH # & DESCRIPTION	
41	DROP C
42	DROP I
43	DROP G
44	DROP A
45	DROP M
46	UPPER SLINGSHOT
47	UNUSED
48	UNUSED







NOTE: THIS IS A TYPICAL OPTO CIRCUIT THE COMPONE
IN THE DASHED LINES ARE THE ACTUAL BOARDS

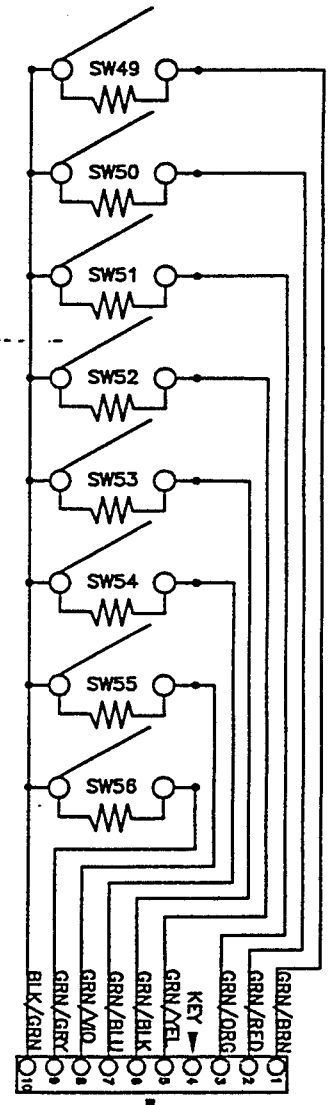
NOTE: ALL OPTOS SHOWN ARE RECEIVER SIDE ONLY
TRANSMITTER POWER COMES FROM POWER BOARD J13

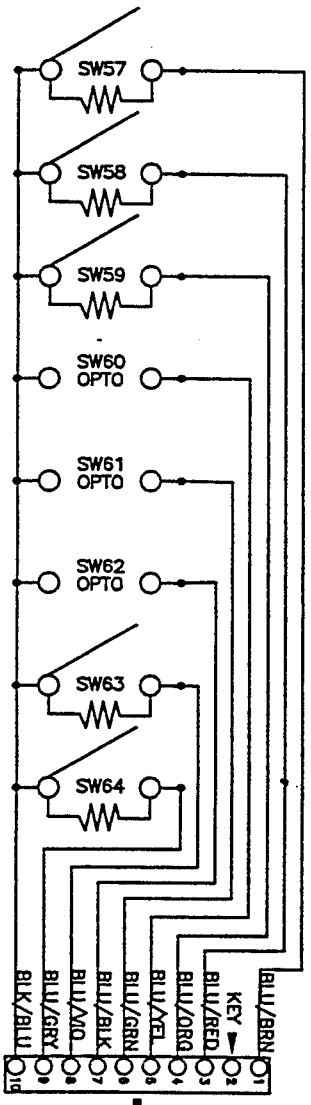
SWITCH # & DESCRIPTION	
49	RAMP N
50	UNUSED
51	WAND N
52	WIREFORM N
53	UNUSED
54	UNUSED
55	UNUSED
56	UNUSED

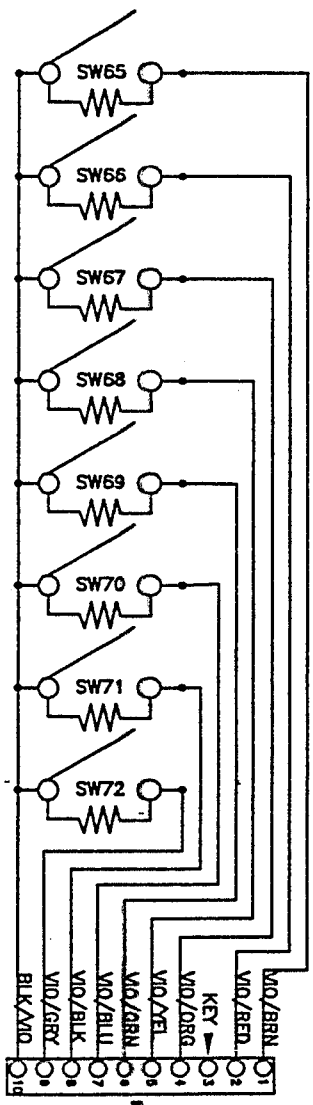
SWITCH # & DESCRIPTION	
57	LIFT N
58	LIFT UP
59	LIFT DOWN
60	STAGE (OPTO)
61	DOOR L (OPTO)
62	DOOR R (OPTO)
63	UNUSED
64	UNUSED

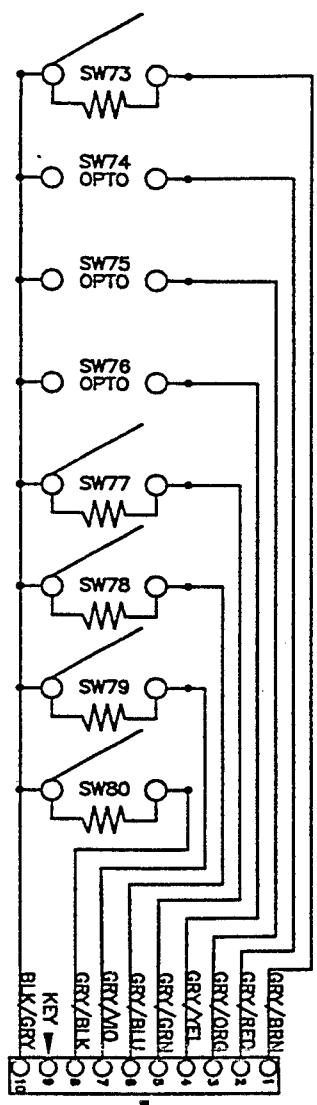
SWITCH # & DESCRIPTION	
65	CAPTIVE BALL
66	SPINNER
67	WAND L
68	WAND R
69	BUMPER
70	STANDUP 3
71	STANDUP 2
72	STANDUP 1

SWITCH # & DESCRIPTION	
73	BALL OUT
74	TROUGH 3 (OPTO)
75	TROUGH 2 (OPTO)
76	TROUGH 1 (OPTO)
77	UNUSED
78	UNUSED
79	UNUSED
80	UNUSED









TO SWITCH BOARD
J5 SWITCHBANK 5

TO SWITCH BOARD
J6 SWITCHBANK 6

TO SWITCH BOARD
J7 SWITCHBANK 7

TO SWITCH BOARD
J8 SWITCHBANK 8

ITEM	CAD FILE NO.	PART NO.	VENDOR NO.	DESCRIPTION	QTY.

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONAL ±.015
TWO PLACE .XX ±.010
THREE PLACE .XXX ±.005
ANGULAR ±.5°

DO NOT SCALE DRAWING

GAME DESIGNER: BRYAN HASEN
PROJECT ENG.: RICK MORGAN
PROJECT NO.: PB-1
DRAWN: BILL ZIEGLER — DATE: 8/22/95
CHECKED: DAVE ROSE — DATE: 8/22/95
APPROVED — DATE
FILE NAME: C:\ACADWIN\PMSWA

CAPCOM® COIN-OP, INC.
3311 NORTH KENNICOTT AVENUE
ARLINGTON HEIGHTS, ILLINOIS 60004
PHONE (708) 797-0100
FAX (708) 797-0119

TITLE
DIAGRAM, PLAYFIELD SWITCHES WIRING

SIZE: B — PART NO.: PB-1 WIRING — REV.
SCALE — USAGE — ECN NO: 327 — SHEET 8 OF 10

COMPONENTS
DS

E ONLY
OARD J13 PINS 8-9

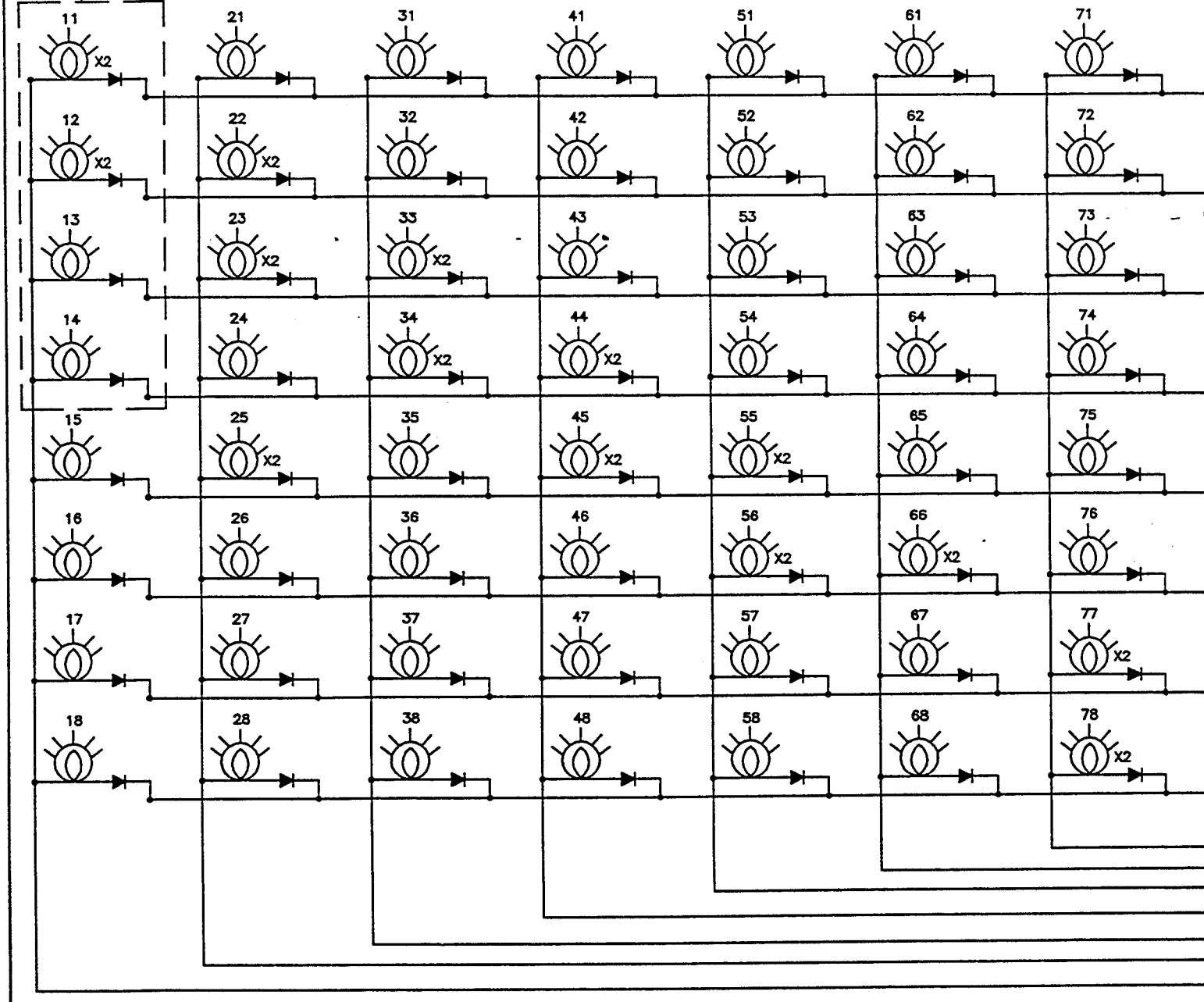
LAMP	NUMBER & DESCRIPTION
11	COIN DOOR 1&2
12	COIN DOOR 3&4
13	START
14	BUY-IN (CONTIUE)
15	LEFT INLANE
16	MIRACULOUS SAVE
17	GENIE (BOTTLE)
18	EXTRA BALL

LAMP	NUMBER & DESCRIPTION
21	RIGHT OUTLANE (JINX)
22	GI 1 A&B
23	GI 2 A&B
24	RIGHT INLANE
25	SHE A&B (MAGNA MARTA)
26	SHE 3 (MAGNA MARTA)
27	SHE 2 (MAGNA MARTA)
28	SHE 1 (MAGNA MARTA)

LAMP	NUMBER & DESCRIPTION
31	CB 6 (LITE EXTRA BALL)
32	CB 5 (ADVANCE TRICK)
33	GI 3 A&B
34	GI 4 A&B
35	CB 4 (LITE SHOWTIME)
36	CB 3 (LITE SPINNER)
37	CB 2 (LITE LOOPS)
38	CB 1 (RED)

LAMP	NUMBER & DESCRIPTION
41	CABALL BLUE
42	CABALL GREEN
43	CABALL WHITE
44	GI 5 A&B
45	GI 6 A&B
46	CABALL ORANGE
47	CABALL YELLOW
48	CABALL RED

COIN DOOR / CABINET



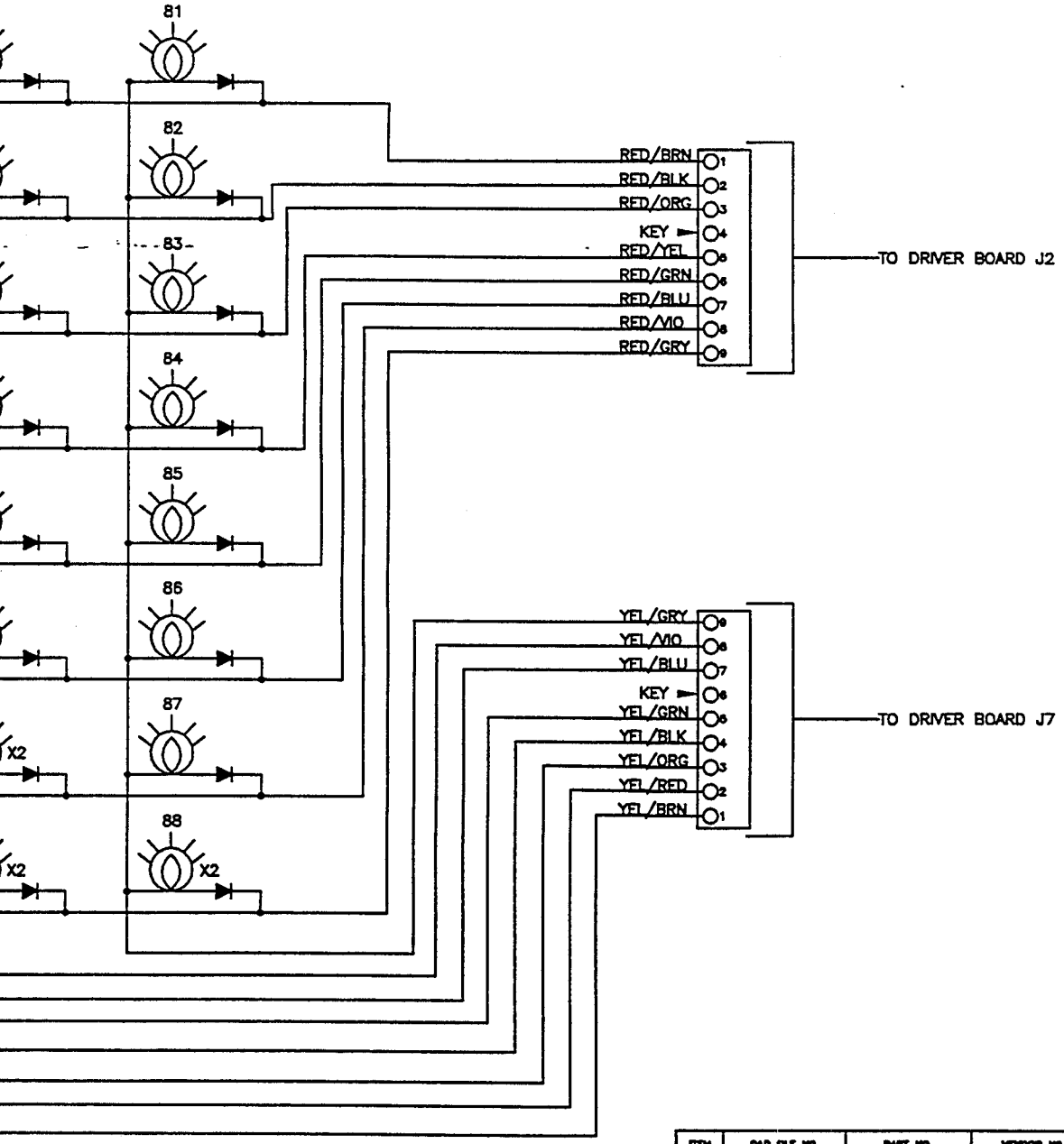
CRIPTION

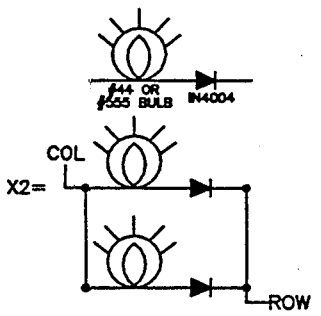
LAMP NUMBER & DESCRIPTION	
51	HANSEN 3
52	HANSEN 2
53	HANSEN 1
54	HANSEN H
55	GI 7 A&B
56	GI 8 A&B
57	NOST 3
58	NOST H

LAMP NUMBER & DESCRIPTION	
61	SHAMAN 1
62	SHAMAN 2
63	SHAMAN 3
64	SHAMAN H
65	SHOOT AGAIN
66	GI 9 A&B
67	NOST 1
68	NOST 2

LAMP NUMBER & DESCRIPTION	
71	JADUGAR 3
72	JADUGAR 2
73	JADUGAR 1
74	JADUGAR H
75	MYST 3
76	MYST H
77	GI 10 A&B
78	GI 11 A&B

LAMP NUMBER & DESCRIPTION	
81	KENZO 1
82	KENZO 2
83	KENZO 3
84	KENZO H
85	MYST 1
86	MYST 2
87	BALL SAVER
88	GI 12 A&B





ITEM	CAD FILE NO.	PART NO.	VENDOR NO.	DESCRIPTION	QTY.

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONAL ±.015
TWO PLACE .XX ±.010
THREE PLACE .XXX ±.005
ANGULAR ±.5°

DO NOT SCALE DRAWING

GAME DESIGNER: BRYAN HANSEN
PROJECT ENG.: RICK MORGAN
PROJECT NO.: PB-1
DRAWN: BILL ZIEGLER — DATE: 8/22/95
CHECKED: DAVE ROSE — DATE: 8/22/95
APPROVED — DATE
FILE NAME: C:\ACADWIN\PMLAMPA

CAPCOM COIN-OP, INC.

TITLE: DIAGRAM, LAMP MATIX "A" WIRING

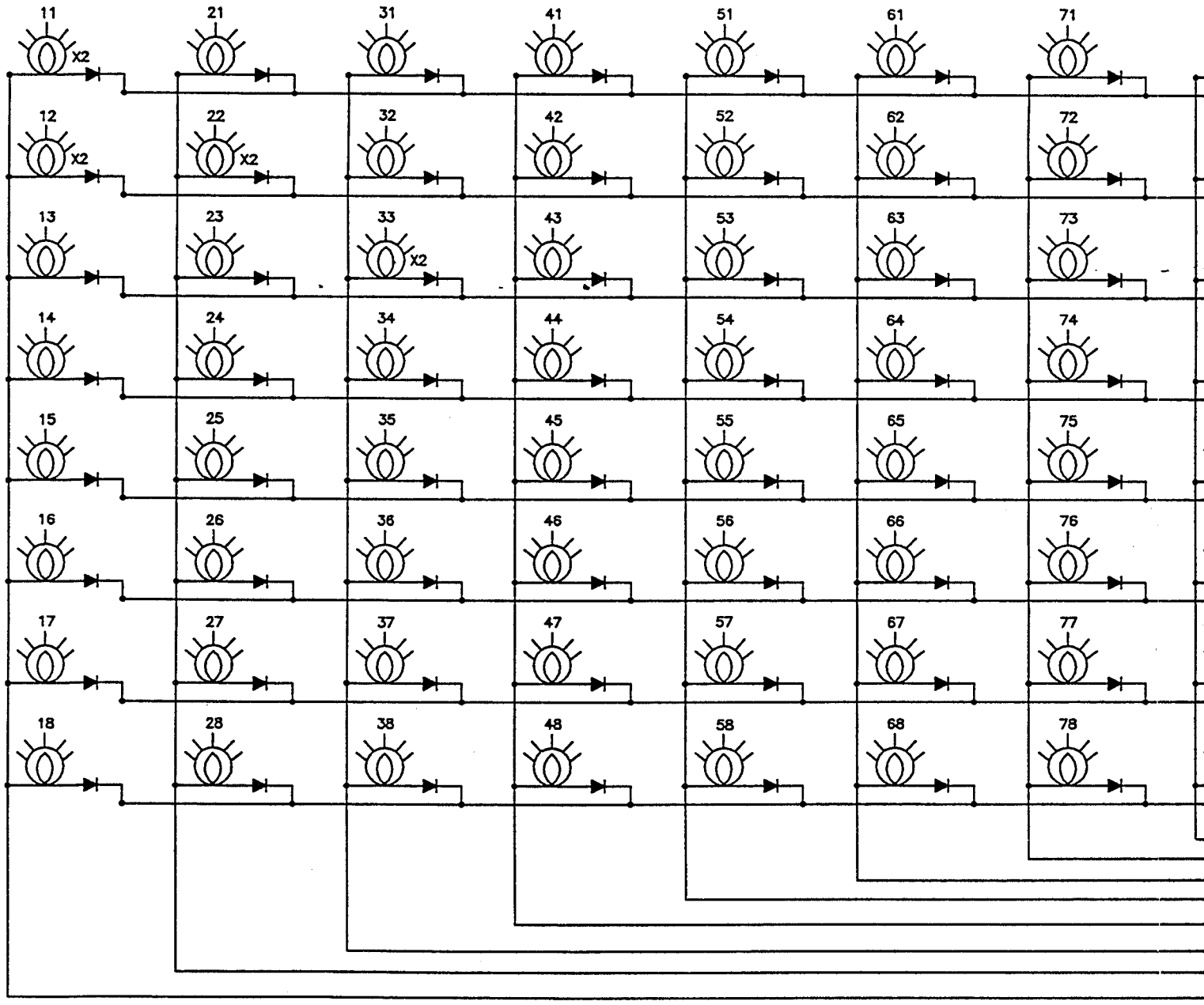
SIZE: B | PART NO.: PB-1 WIRING | REV.
SCALE | USAGE | DSN NO.: 327 | SHEET 9 OF 10

LAMP	NUMBER & DESCRIPTION
11	BB 1 A&B
12	BB 2 A&B
13	BB 1
14	BB 2
15	BB 3
16	BB 4
17	BB 5
18	BB 6

LAMP	NUMBER & DESCRIPTION
21	BB 7
22	BB 3 A&B
23	BB 8
24	DROP M
25	DROP A
26	DROP G
27	DROP I
28	DROP C

LAMP	NUMBER & DESCRIPTION
31	MAYHEM
32	VANISH
33	BB 4 A&B
34	BB 9
35	LITE JACKPOT
36	SLEEVE
37	CRITIC TOP
38	CRITIC BOT

LAMP	NUMBER & DESCRIPTION
41	ALADDIN
42	JACKPOT
43	CRITIC
44	BB 10
45	BB 11
46	STANDUP 3
47	STANDUP 2
48	STANDUP 1

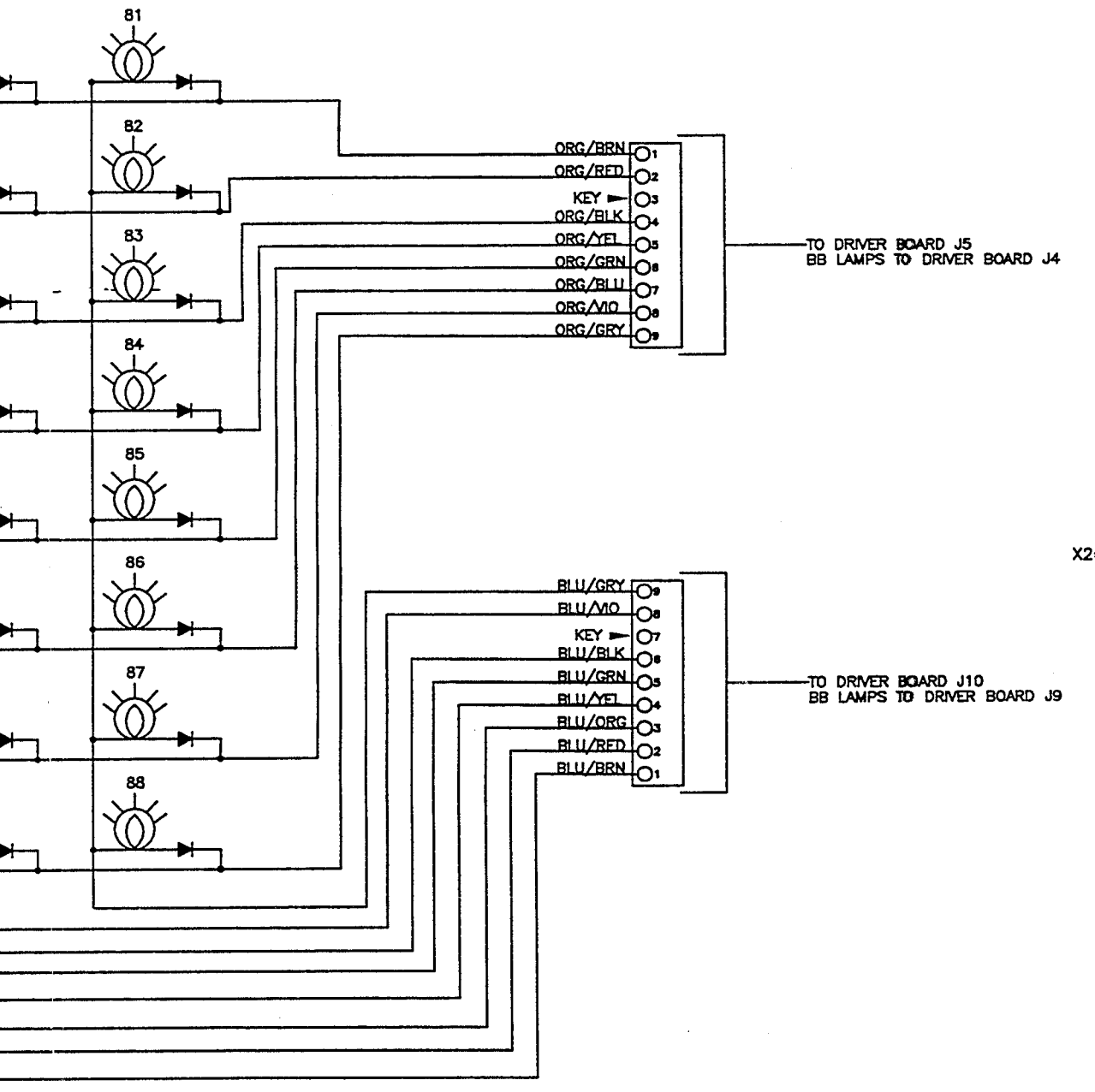


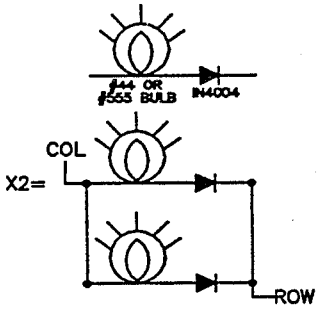
LAMP NUMBER & DESCRIPTION	
51	RAMP LOCK 2
52	ESCAPE
53	RAMP LOCK 1
54	SWORD TRICK
55	BB 12
56	BB 13
57	SPINNER
58	RINGS

LAMP NUMBER & DESCRIPTION	
61	MAIN RAMP GI 1
62	MAIN RAMP GI 2
63	PRESTO CHANGEO GI
64	UNUSED
65	SHOWTIME
66	BB 14
67	BB 15
68	SPOON

LAMP NUMBER & DESCRIPTION	
71	SIGN 1
72	SIGN 3
73	SIGN 5
74	SIGN 4
75	SIGN 2
76	WAND RING
77	BB 16
78	BB 17

LAMP NUMBER & DESCRIPTION	
81	PRESTO
82	BB 18
83	BB 19
84	BB 20
85	BB 21
86	BB 22
87	BB 23
88	BB 24





ITEM	CAD FILE NO.	PART NO.	VENDOR NO.	DESCRIPTION	QTY.

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONAL ±.016
TWO PLACE .XX ±.010
THREE PLACE .XXX ±.005
ANGULAR ± .5°

DO NOT SCALE DRAWING

GAME DESIGNER: BRYAN HANSEN
PROJECT ENG.: RICK MORGAN
PROJECT NO.: PB-1
DRAWN: BILL ZIEGLER — DATE: 8/22/95
CHECKED: DAVE ROSE — DATE: 8/22/95
APPROVED — DATE
FILE NAME: C:\ACADWIN\PM\LAMPB

CAPCOM® COIN-OP, INC.
3811 NORTH KENNICOTT AVENUE
ARLINGTON HEIGHTS, ILLINOIS 60004
PHONE (708) 797-0360
FAX (708) 797-0110

TITLE: DIAGRAM, LAMP MATRIX "B" WIRING

SIZE: B — PART NO.: PB-1 WIRING — REV.
SCALE — USAGE — ECN NO.: 327 — SHEET: 10 OF 10

FUSE INFORMATION

LOCATION	COMPONENT	REF.	FUSE TYPE	CAPCOM® P/N
BACKBOX	POWER BOARD	F1	SLO-BLO 7.0A 250V 3AG	FS00100-07
BACKBOX	POWER BOARD	F2,F3,F6	SLO-BLO 10.0A 250V 3AG	FS00100-10
BACKBOX	POWER BOARD	F4	SLO-BLO 8.0A 250V 3AG	FS00100-08
BACKBOX	POWER BOARD	F5,F7,F15	SLO-BLO 3.0A 250V 3AG	FS00100-03
BACKBOX	POWER BOARD	F12-14	SLO-BLO 4.0A 250V 3AG	FS00100-04
BACKBOX	SOUND BOARD	F1, F2	SLO-BLO 3.0A 250V 3AG	FS00100-03
*CABINET	LINE FUSE	-----	SLO-BLO 5.0 A 250V 3AG	FS00100-05
**CABINET	LINE FUSE	-----	SLO-BLO 8.0A 250V 3AG	FS00100-08

* NOTE: FOR GAMES CONFIGURED FOR 100V AC OR 115V AC SOURCE VOLTAGES.
** NOTE: FOR GAMES CONFIGURED FOR 200V AC, 215V AC, OR 230V AC SOURCE VOLTAGES.

QUICK REFERENCE GUIDE TO INTEGRATED CIRCUITS

COMPONENT	DESIGNATOR	FUNCTION	CAPCOM® P/N
SOUND BOARD	U22 (44 PIN)	MPEG / DECODE COMPRESSED AUDIO	A-00471-U22
SOUND BOARD	U23 (44 PIN)	MPEG / DECODE COMPRESSED AUDIO	A-00471-U23
SOUND BOARD	U24 (40 PIN)	MICROCONTROLLER 87C52	IC00073
SOUND BOARD	U28 (32 PIN)	MUSIC / SOUND / SPEECH	A-00471-U28
SOUND BOARD	U29 (32 PIN)	MUSIC / SOUND / SPEECH	A-00471-U29
SOUND BOARD	U30 (32 PIN)	MUSIC / SOUND / SPEECH	A-00471-U30
SOUND BOARD	U31 (32 PIN)	MUSIC / SOUND / SPEECH	A-00471-U31
CPU BOARD	U1H (32 PIN)	BOOT, GAME, IMAGES	A-00472-U1H
CPU BOARD	U1L (32 PIN)	BOOT, GAME, IMAGES	A-00472-U1L
CPU BOARD	U2H (32 PIN)	IMAGES FOR GAME	A-00472-U2H
CPU BOARD	U2L (32 PIN)	IMAGES FOR GAME	A-00472-U2L
CPU BOARD	U8 (132 PIN)	MICROPROCESSOR MC68306	A-00472-U8
CPU BOARD	U14 (28 PIN)	RAM W/ BATTERY BACKUP	A-00472-U14
CPU BOARD	U16 (84 PIN)	DISPLAY CONTROLLER	IC00106

LAMP MATRIX "A"

Column / Row	1 J10-Pin 1 Yel/Brn	2 J10-Pin 2 Yel/Red	3 J10-Pin 3 Yel/Org	4 J10-Pin 4 Yel/Blk	5 J10-Pin 5 Yel/Grn	6 J10-Pin 6 Yel/Blu	7 J10-Pin 7 Yel/Vio	8 J10-Pin 8 Yel/Gry
1 Red/Brn J11-Pin 1	Coin Door 1 and 2	Jinx	Captive Ball #1 Red	Spectrum Ball #1	Jadugar #1	The Great Hansen #3	Kenzo #1	Shaman #3
2 Red/Blk J11-Pin 2	Coin Door 3 and 4	General Illumination 1 A&B	Captive Ball #2 Light Loops	Spectrum Ball #2	Jadugar #2	The Great Hansen #2	Kenzo #2	Shaman #2
3 Red/Org J11-Pin 3	Start Button	General Illumination 2 A&B	General Illumination 3 A&B	Spectrum Ball #3	Jadugar #3	The Great Hansen #1	Kenzo #3	Shaman #1
4 Red/Yel J11-Pin 4	Continue Button	Inlane Right	General Illumination 4 A&B	General Illumination 5 A&B	Jadugar #4	The Great Hansen #4	Kenzo #4	Shaman #4
5 Red/Grn J11-Pin 5	Inlane Left	Matra Magna A&B	Captive Ball #3 Lite Spinner	General Illumination 6 A&B	General Illumination 7 A&B	Encore	Mister Mystique #1	Mister Mystique #3
6 Red/Blu J11-Pin 6	Miraculous Save	Matra Magna #1	Captive Ball #4 Light Showtime	Spectrum Ball #4	General Illumination 8 A&B	General Illumination 9 A&B	Mister Mystique #4	Mister Mystique #2
7 Red/Vio J11-Pin 7	Genie Bottle	Matra Magna #2	Captive Ball #5 Advance Trick	Spectrum Ball #5	Nostradamus #1	Nostradamus #3	General Illumination 10 A&B	Reappearing Ball
8 Red/Gry J11-Pin 8	Extra Ball	Matra Magna #3	Captive Ball #6 Light Extra Ball	Spectrum Ball #6	Nostradamus #4	Nostradamus #2	General Illumination 11 A&B	General Illumination 12 A&B
PLAYFIELD								

LAMP MATRIX "B"

Column / Row	1 J10-Pin 1 Blu/Brn	2 J10-Pin 2 Blu/Red	3 J10-Pin 3 Blu/Org	4 J10-Pin 4 Blu/Yel	5 J10-Pin 5 Blu/Grn	6 J10-Pin 6 Blu/Blk	7 J10-Pin 7 Blu/Vio	8 J10-Pin 8 Blu/Gry
1 Org/Brn J11-Pin1	General Illumination 1 D	General Illumination #7	Magic Mayhem	Magic Carpet Ride	Ramp #1 Lock 1	Not Used	Stage #1 1 Million	Presto Chango
2 Org/Red J11-Pin2	General Illumination 2 D	General Illumination 3 D	Vanishing Act	Collect Jackpot	Ramp #2 Trunk Escape	Not Used	Stage #3 10 Million	General Illumination 18
3 Org/Blk J11-Pin 3	General Illumination 1	General Illumination 8	General Illumination 4 D	Silence the Critics	Ramp #3 Lock 2	Not Used	Stage #5 2 Million	General Illumination 19
4 Org/Yel J11-Pin 4	General Illumination 2	Drop Target "M"	General Illumination 9	General Illumination 10	Sword Trick	Not Used	Stage #4 4 Million	General Illumination 20
5 Org/Grn J11-Pin 5	General Illumination 3	Drop Target "A"	Build Jackpot	General Illumination 11	General Illumination 12	Showtime	Stage #2 3 Million	General Illumination 21
6 Org/Blu J11-Pin 6	General Illumination 4	Drop Target "G"	Nothing Up My Sleeve Loop 2	Stand Up Target; Morph Chamber #1	General Illumination 13	General Illumination 14	Hand Ring	General Illumination 22
7 Org/Vio J11-Pin 7	General Illumination 5	Drop Target "I"	Critic #1	Stand Up Target; Morph Chamber #2	Spinner Super Spinner	General Illumination 15	General Illumination 16	General Illumination 23
8 Org/Gry J11-Pin 8	General Illumination 6	Drop Target "C"	Critic #2	Stand Up Target; Morph Chamber #3	Linking Rings Loop 1	Bend the Spoon	General Illumination 17	General Illumination 24
BACKBOX	PLAYFIELD							