

Rinball Magic™



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OPERATORS MANUAL
PM00118
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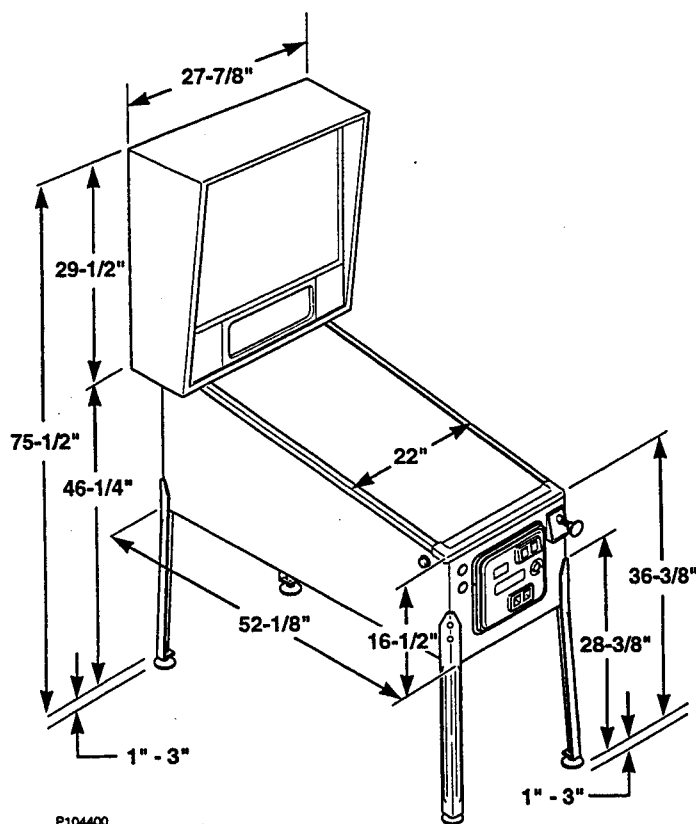
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GAME SPECIFICATIONS

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.

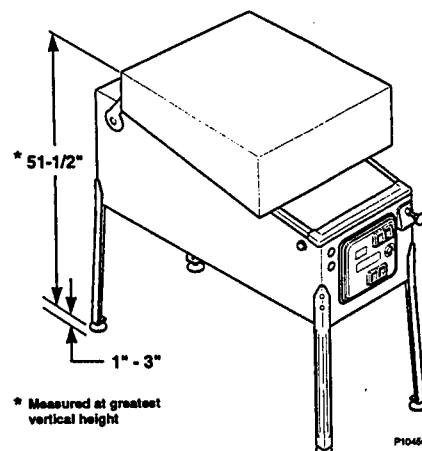


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INSTALLATION INSTRUCTIONS

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

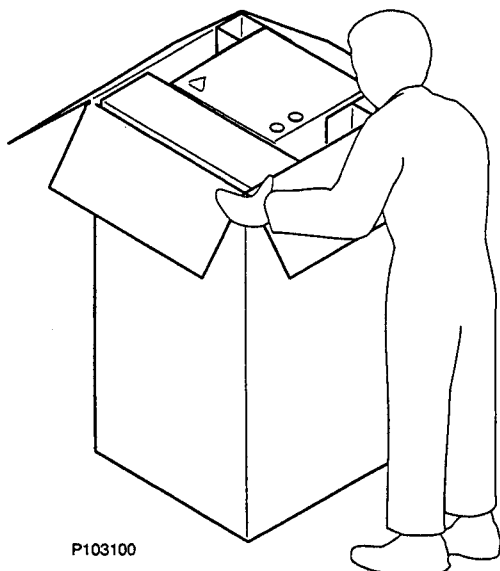


FIGURE 1: OPENING SHIPPING CARTON

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.

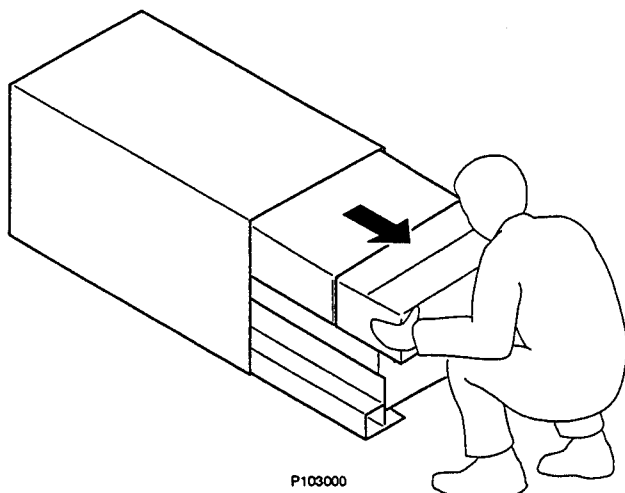


FIGURE 2: REMOVING GAME AND PARTS BOX

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).

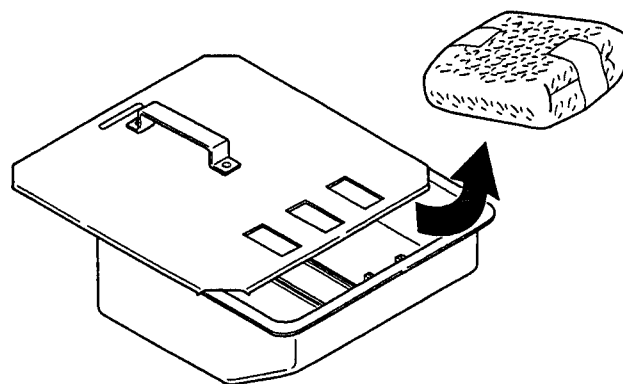


FIGURE 3: PARTS IN CASHBOX

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

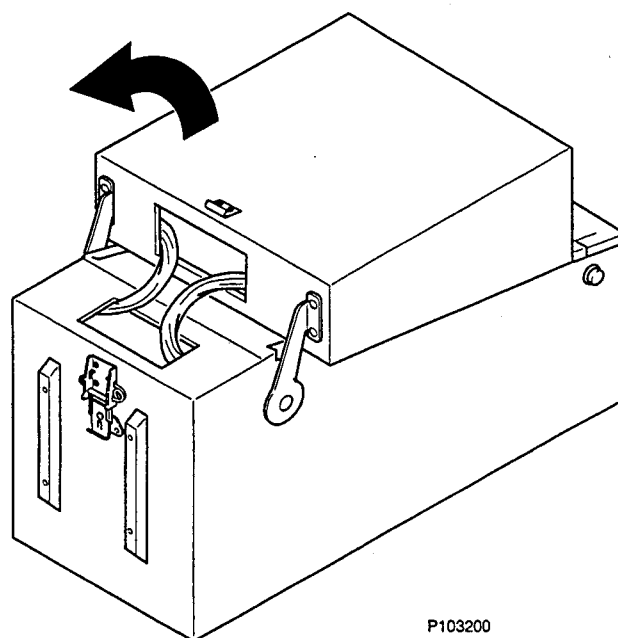


FIGURE 4: RAISING BACKBOX UPRIGHT

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).

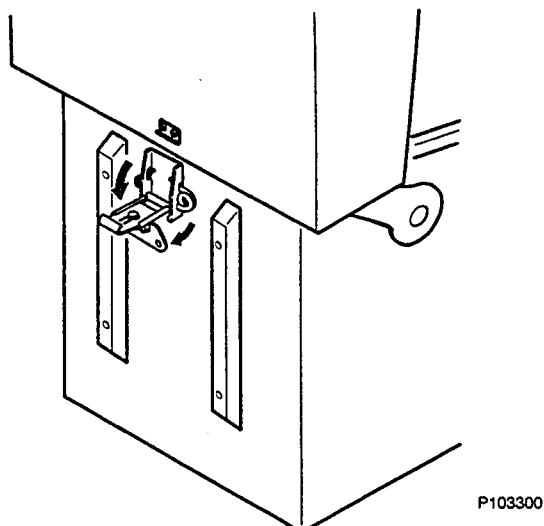


FIGURE 5: LATCH ON BACKBOX

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

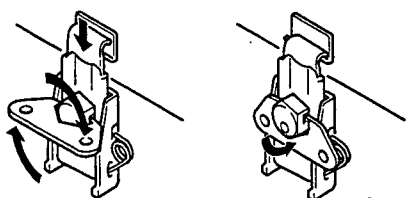


FIGURE 6: LOCKING THE LATCH

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

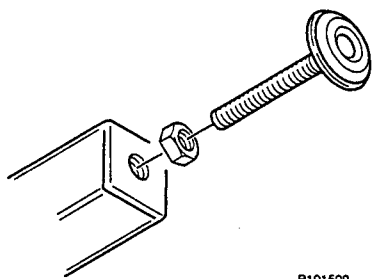


FIGURE 7: INSTALLING LEVELER ON LEG

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).

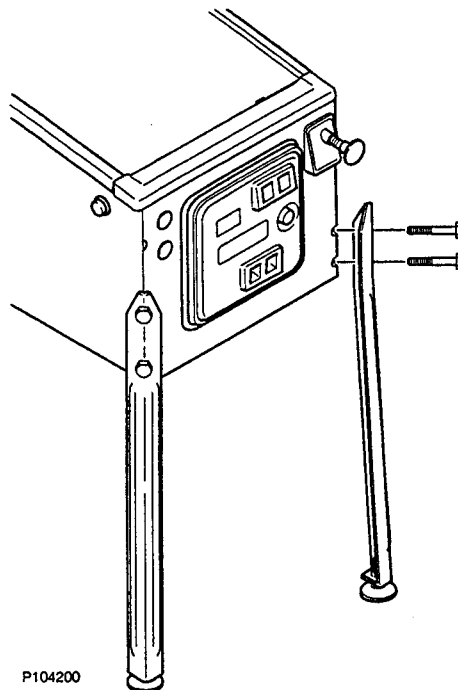


FIGURE 8: INSTALLING LEGS ON CABINET

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 fasteners, 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.

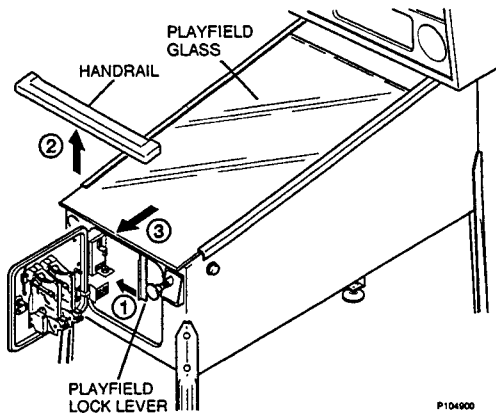


FIGURE 9: REMOVING PLAYFIELD GLASS

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).

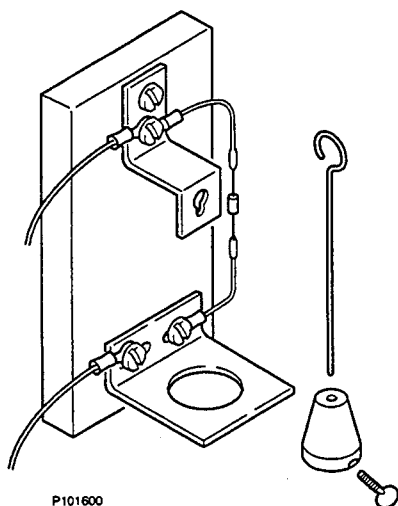


FIGURE 10: PLUMB BOB TILT ASSEMBLY

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

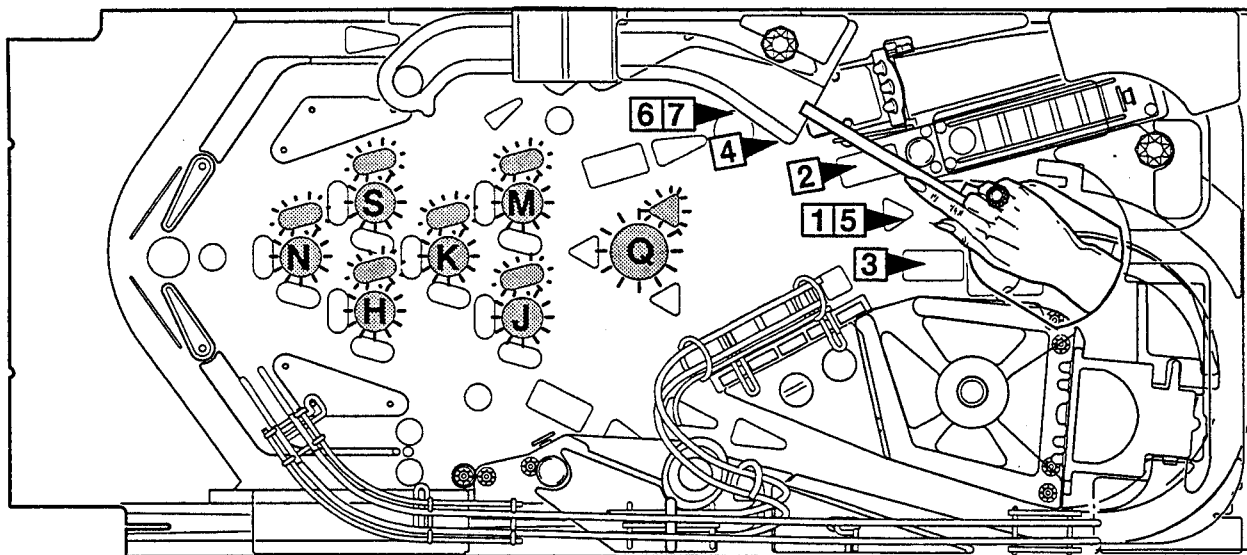
TRICK	DESCRIPTION
Bend the Spoon	A straight shot with a U- shaped result.
Swallow the Sword	If it's not straight, you cut your own throat.
Float the Ball	Test your stage presence with this shot. What makes it float?
Escape from the Locked Trunk	Getting into the trunk is easy. Getting out depends on several 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.

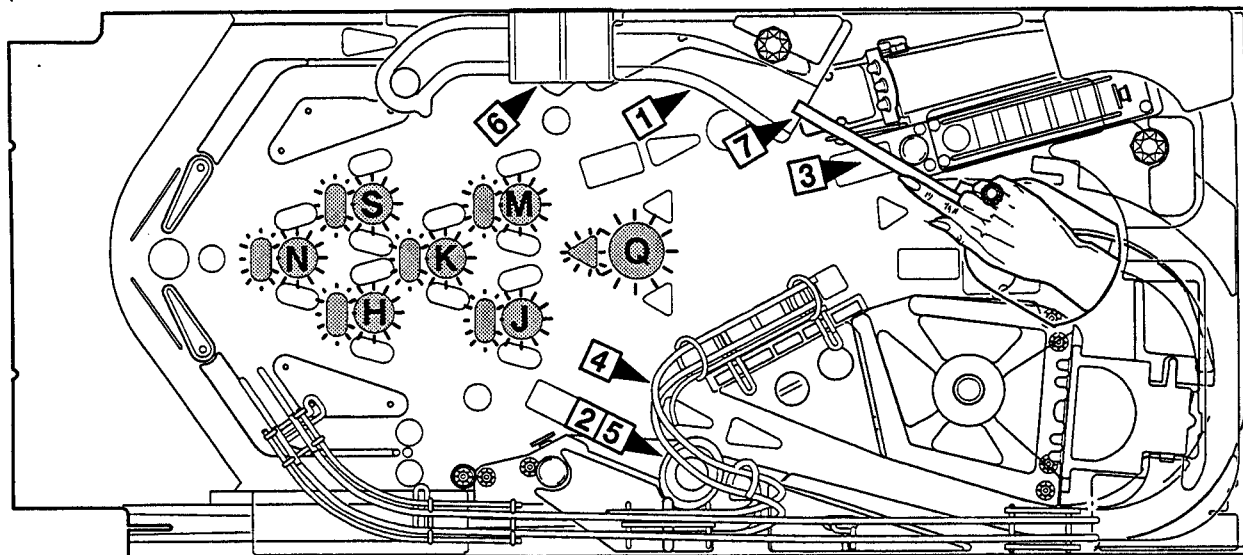
GAME RULES - ROUND #1



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

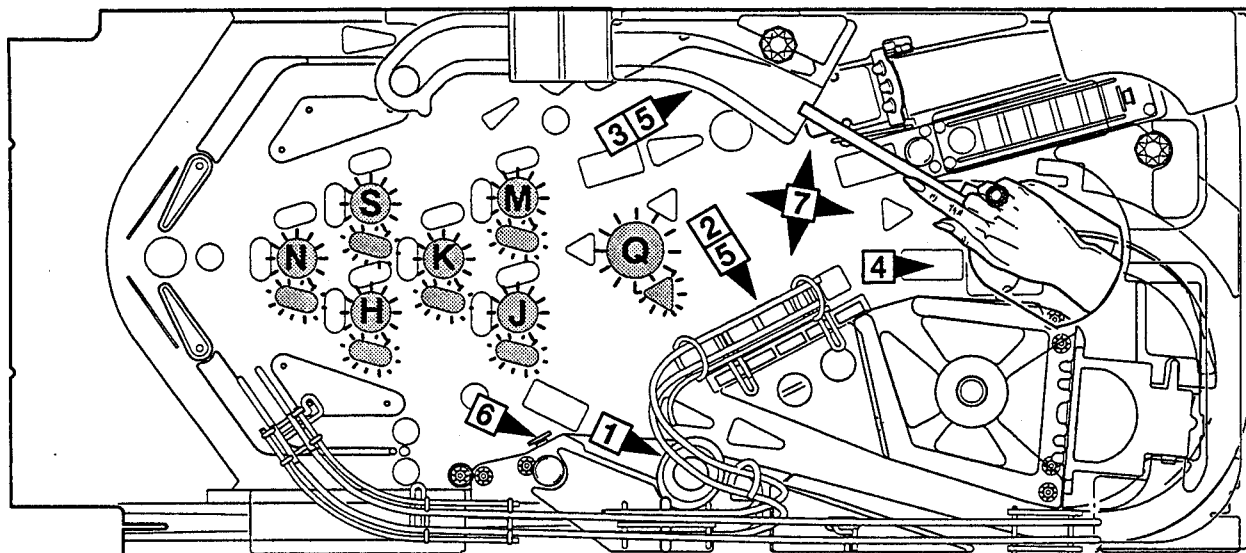
GAME RULES - ROUND #2



P1SM0500

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

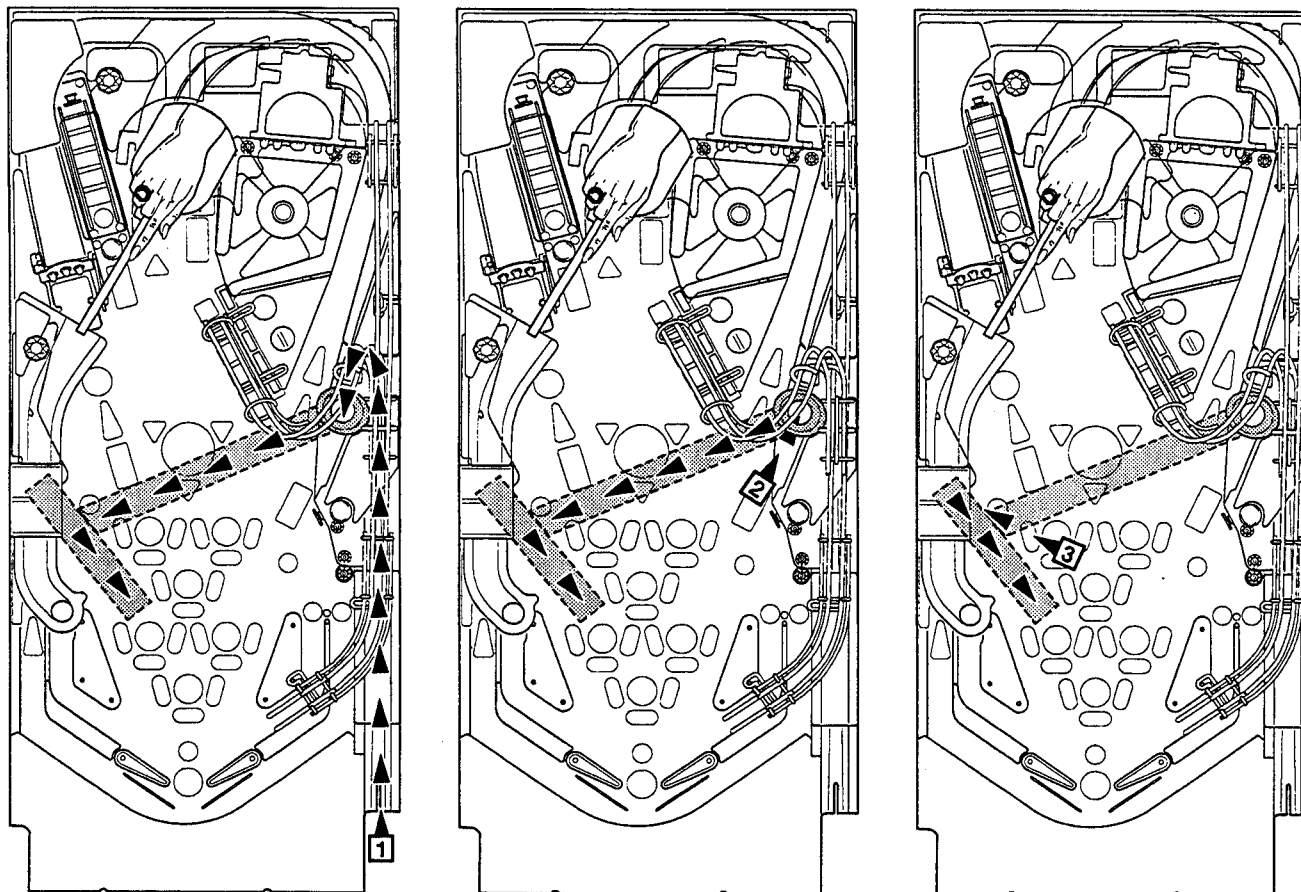
GAME RULES - ROUND #3



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

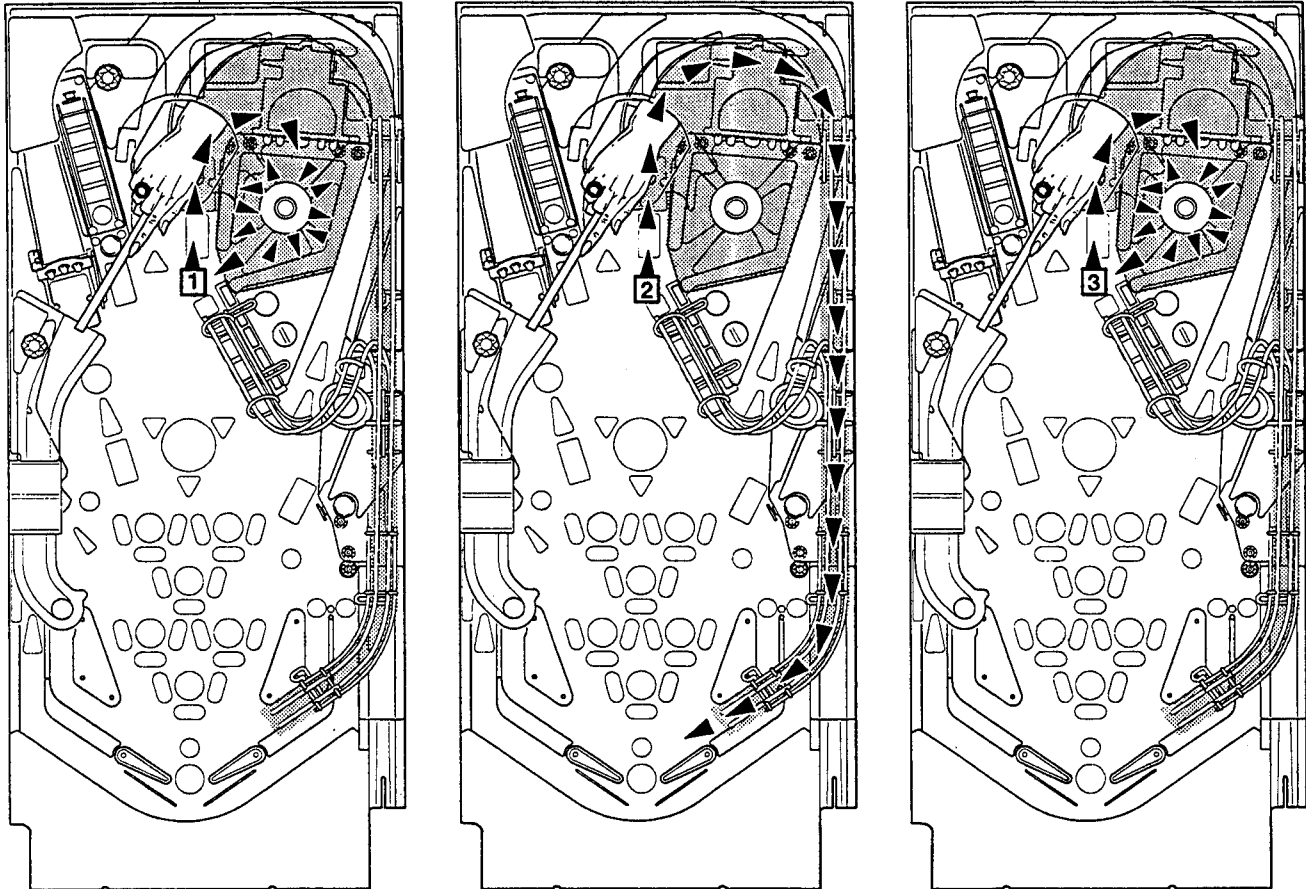
THE HIDDEN TUNNEL



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

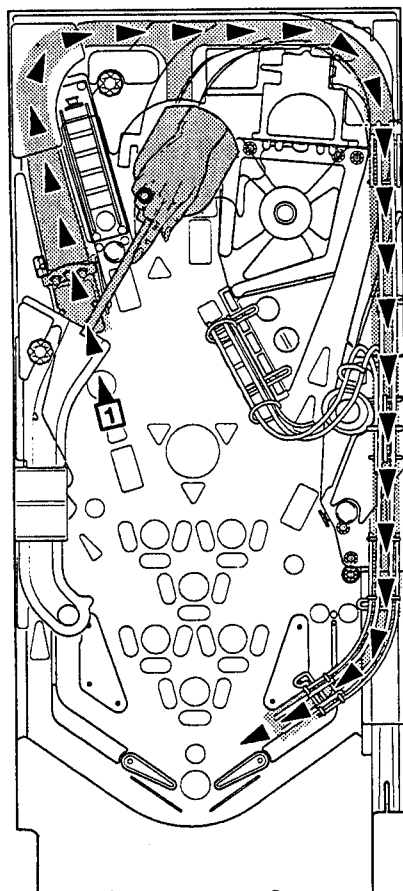


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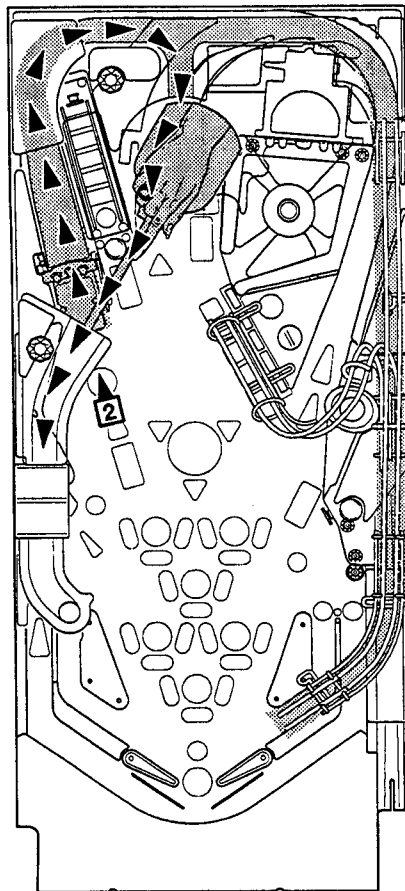
SHOWTIME PARAMETERS

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.

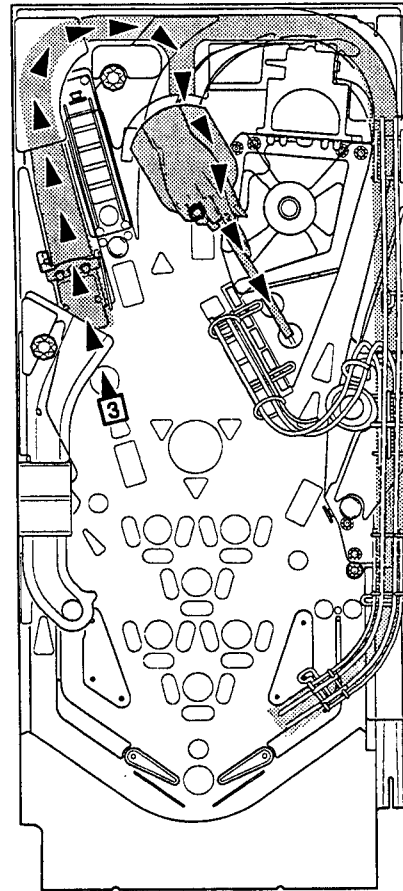
THE MAGIC CARPET RIDE



THE TRUNK ESCAPE



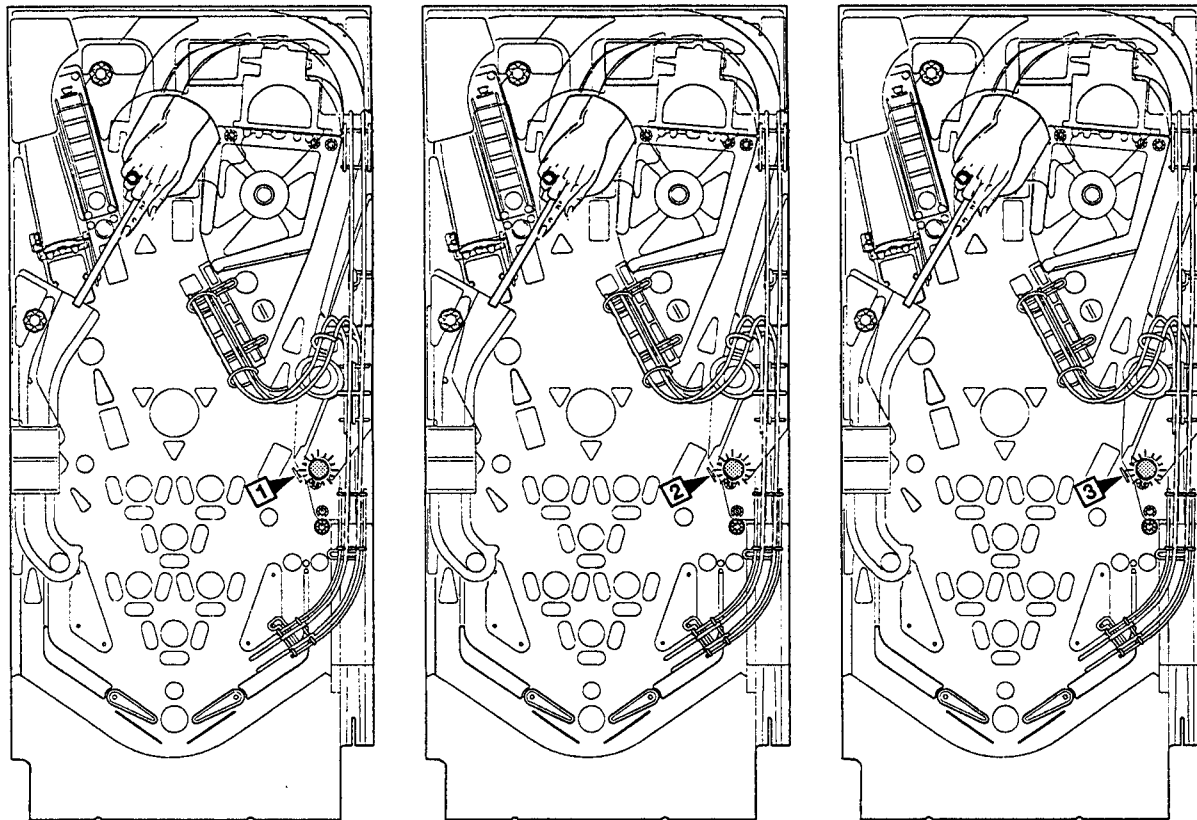
SILENCE THE CRITICS



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

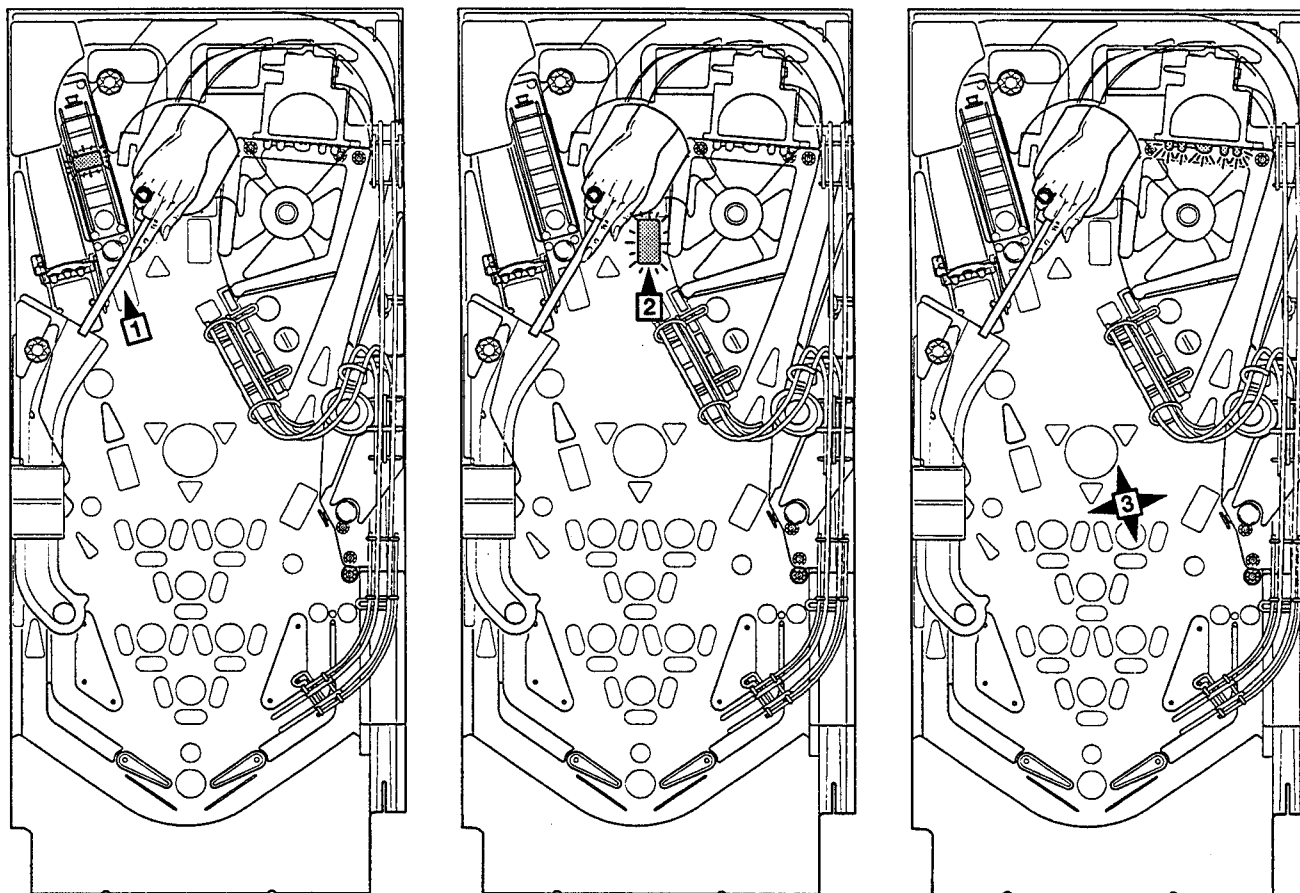


P1SM0800

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

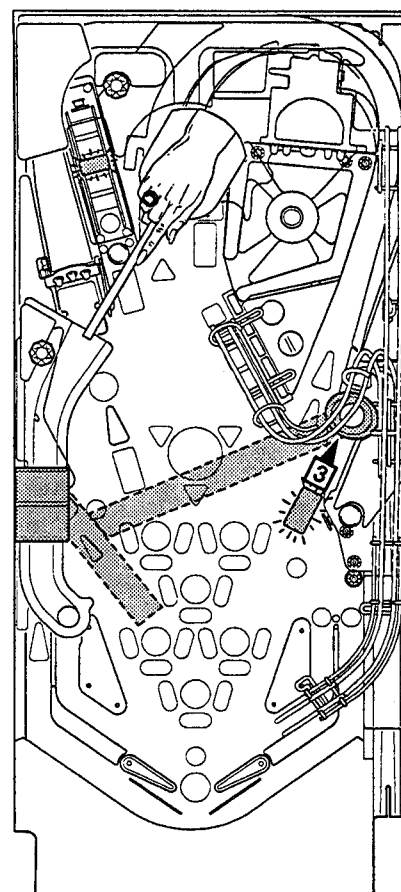
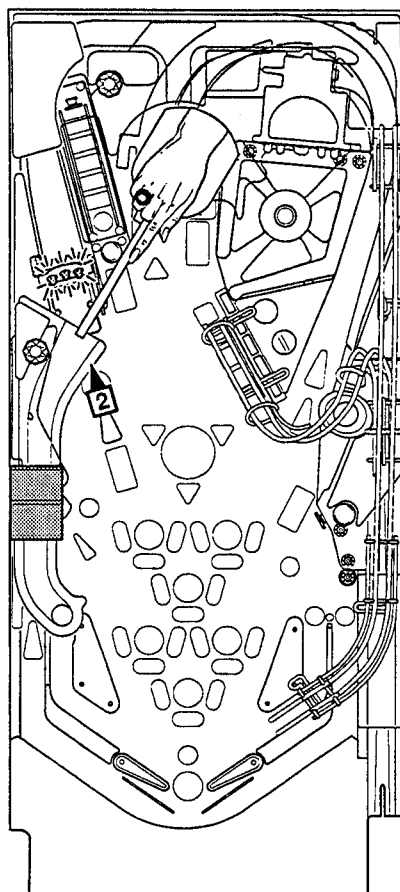
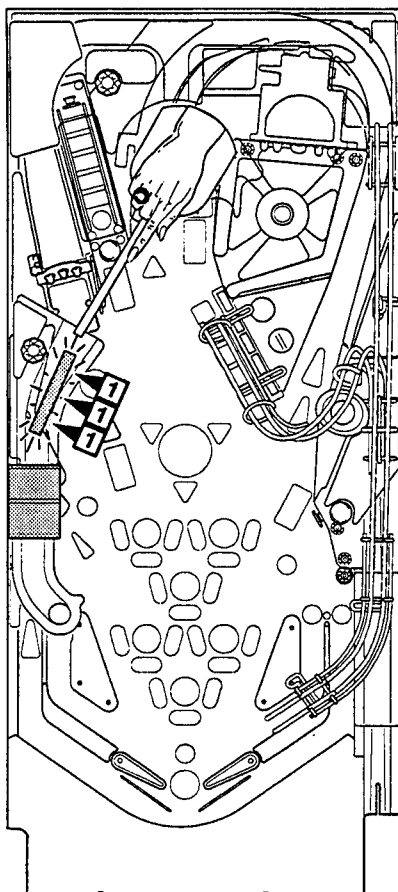


P1SM0900

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

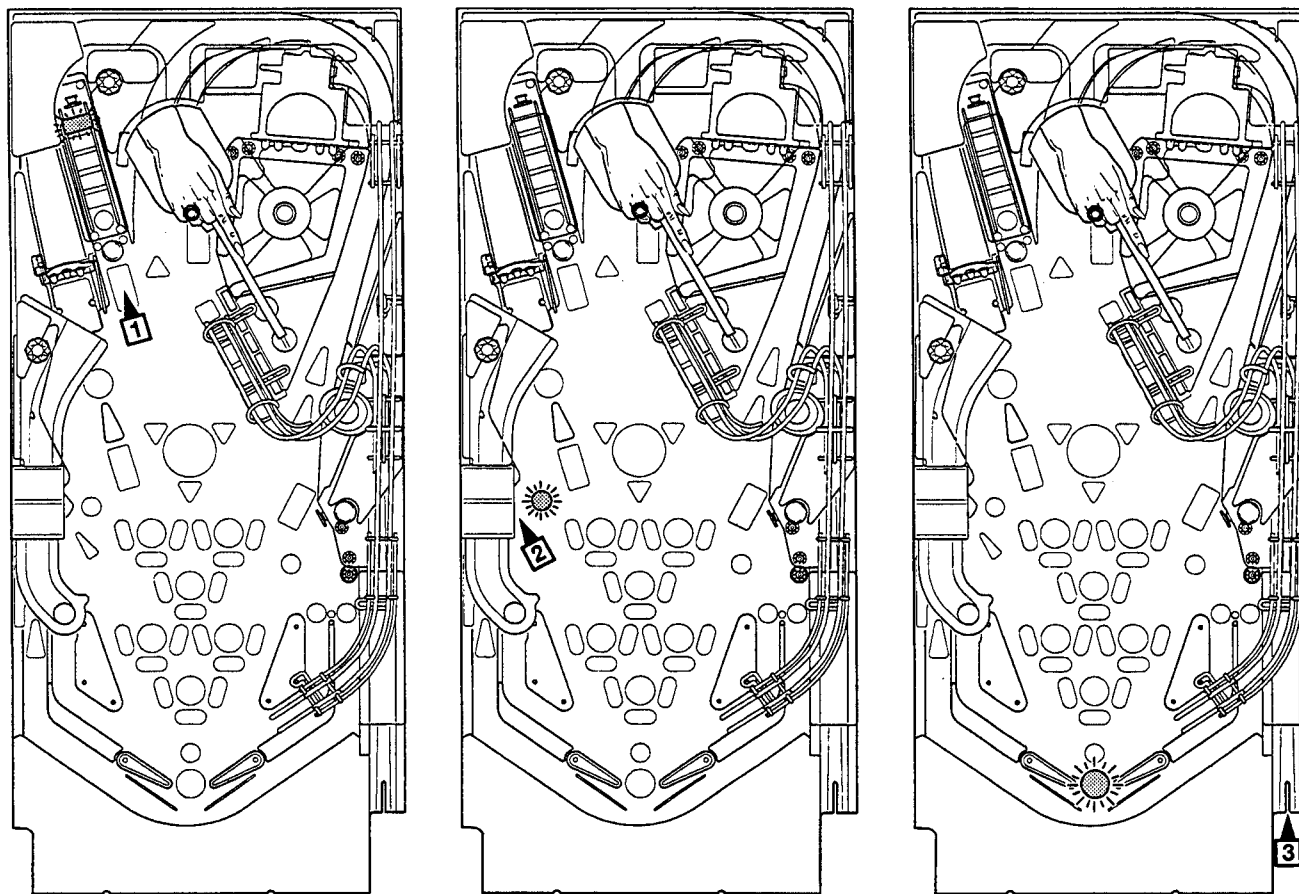


P1SM1000

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 Fiat, 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.

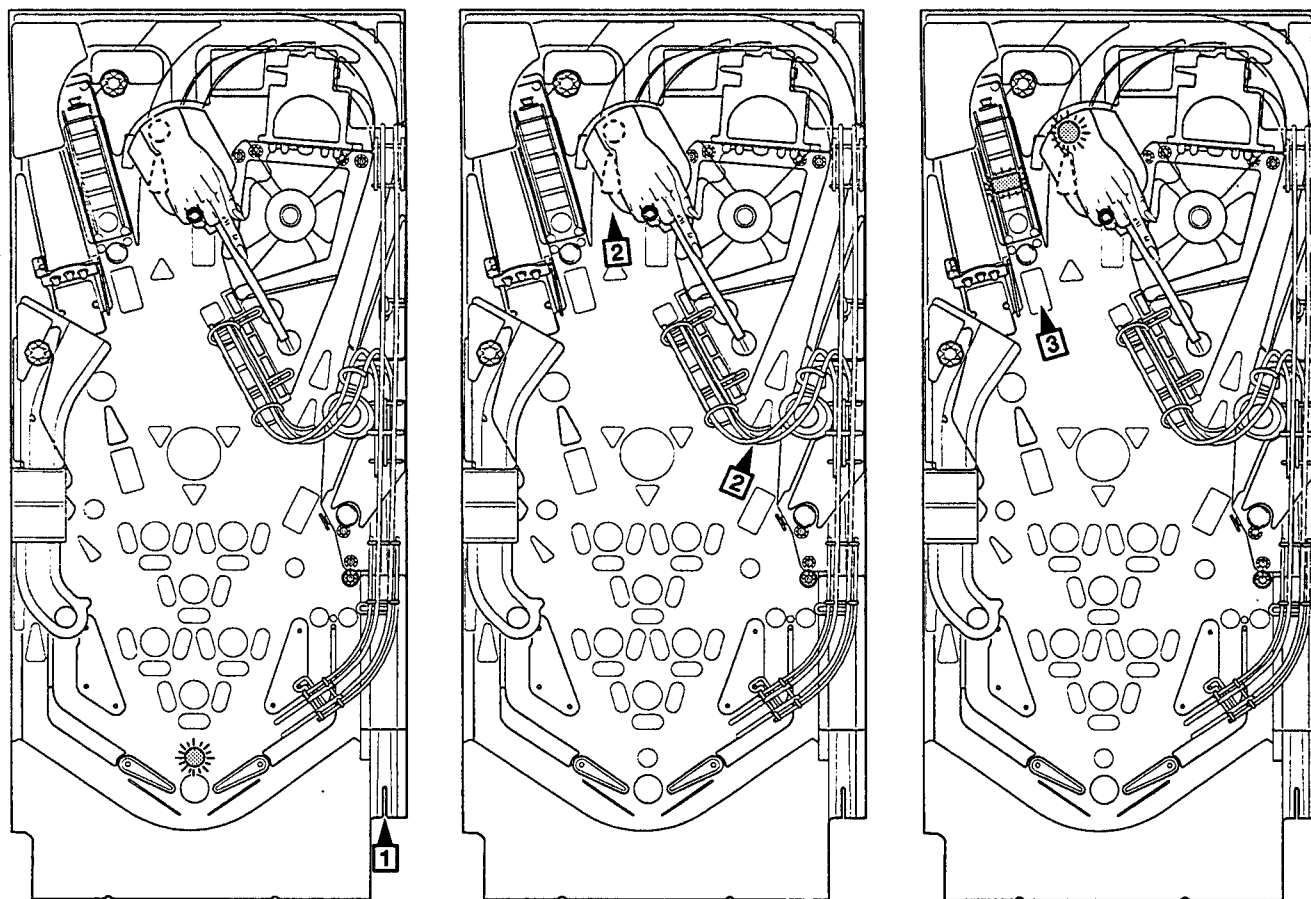
EXTRA BALL



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.

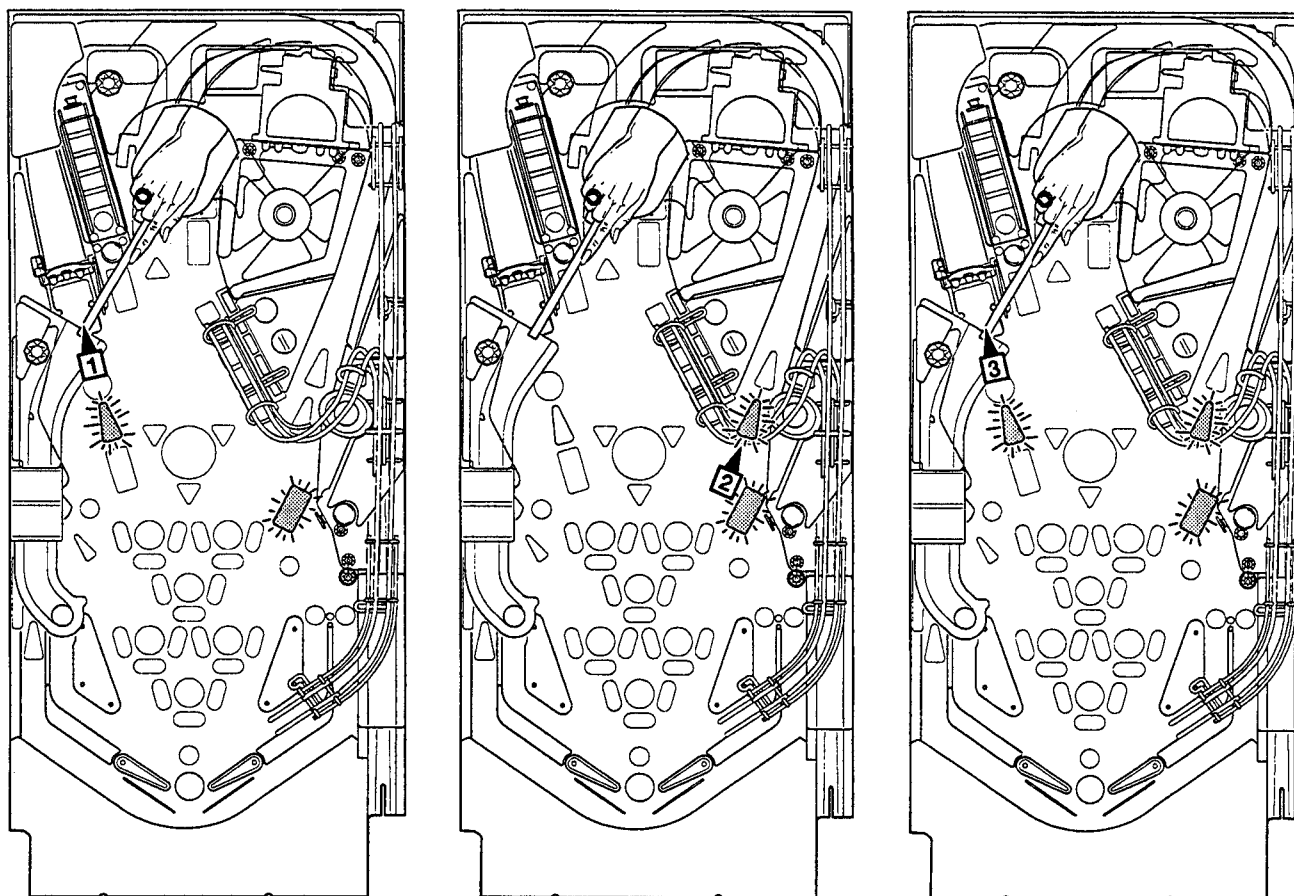
REAPPEARING BALL AND SPINNER



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.

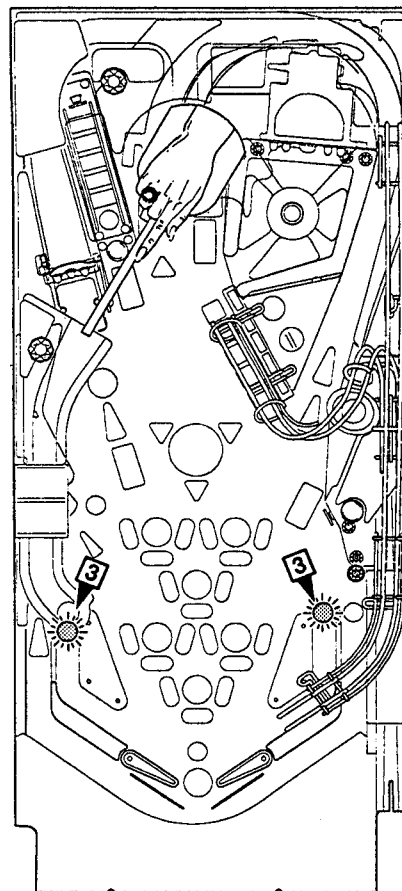
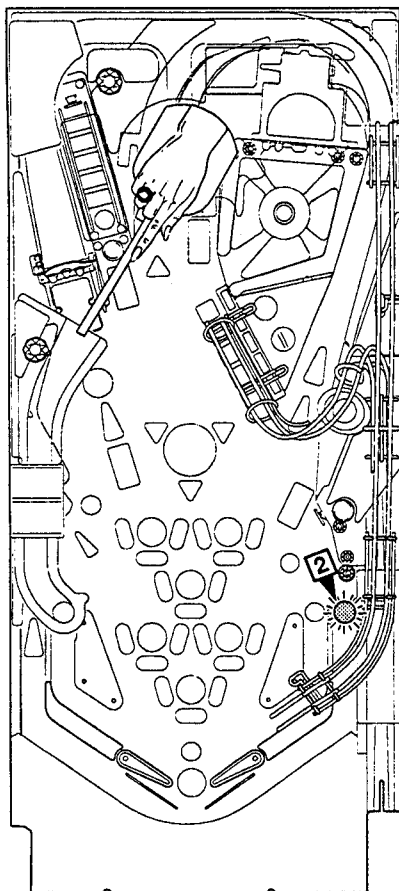
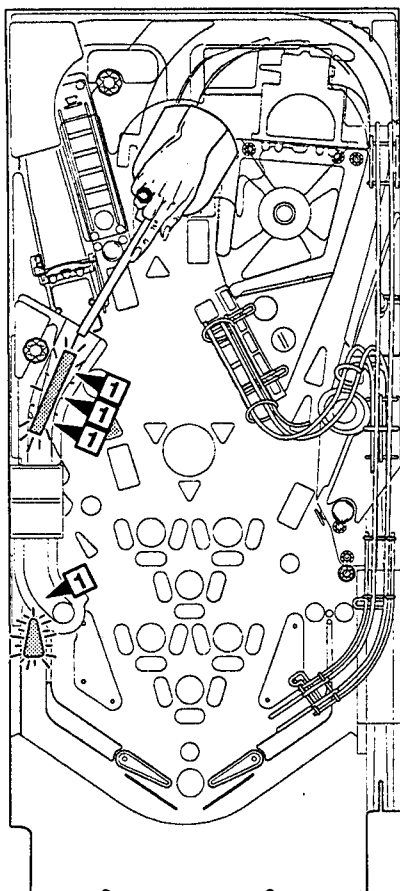
BUILD AND COLLECT JACKPOT



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



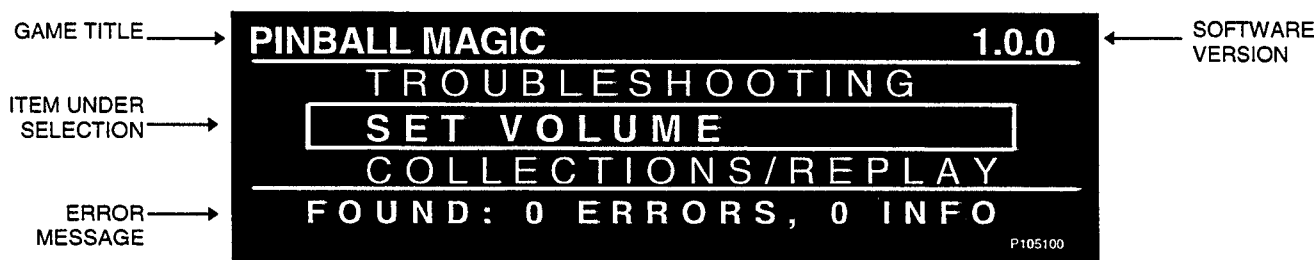
P1SM1400

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:



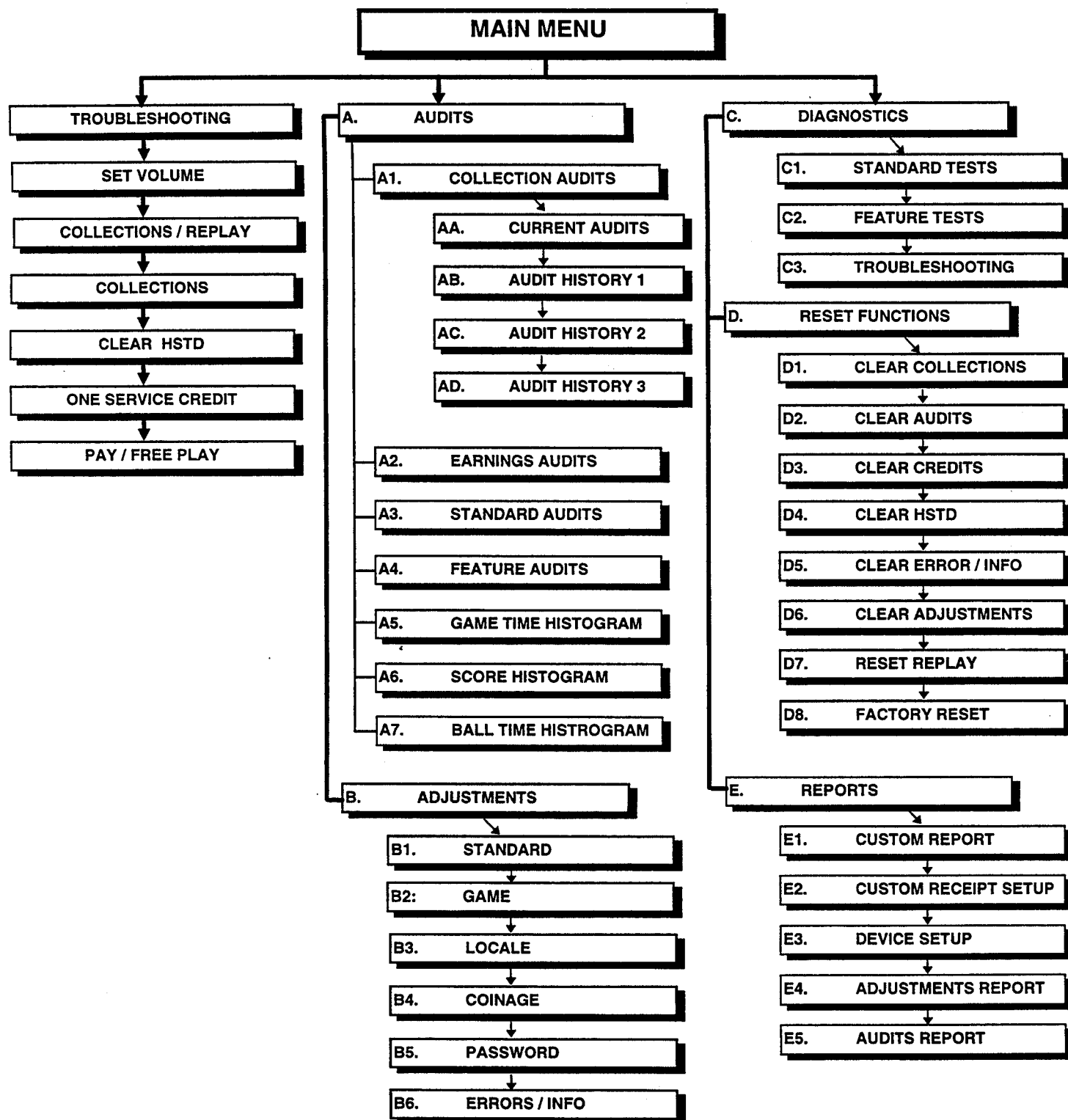
The start-up menu displays the number of **ERRORS** or problems that were found during game play or while in the Attract Mode. **ERRORS** are major problems, such as non-operative switches, that should be repaired/replaced before game play is resumed. **INFO** items are minor problems, such as burned-out 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 mechanical 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 <i>HSTD FIRST SCORE</i> AND THE <i>HSTD LAST SCORE</i> 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 <i>HSTD FIRST SCORE</i> AND THE <i>HSTD LAST SCORE</i> 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 <i>GRAND CHAMP</i> .
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 <i>REPLAY</i> IS EARNED BY THE PLAYER.
B1-08	EXTRA BALL AWARD	EXTRA BALL, POINTS	EXTRA BALL	THE TYPE OF AWARD ISSUED WHEN AN <i>EXTRA BALL</i> 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 <i>FREE PLAY</i> MODE. ALSO CONTROLS THE MAIN MENU SETTINGS FOR <i>PAY-TO-PLAY</i> AND <i>FREE PLAY</i> .
B1-11	PLAY MODE	NORMAL, TOURNAMENT	NORMAL	SELECT <i>NORMAL</i> OR <i>TOURNAMENT</i> MODE. <i>TOURNAMENT</i> 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.
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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 ELEC 1-5-10-20		
		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 1ST 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.

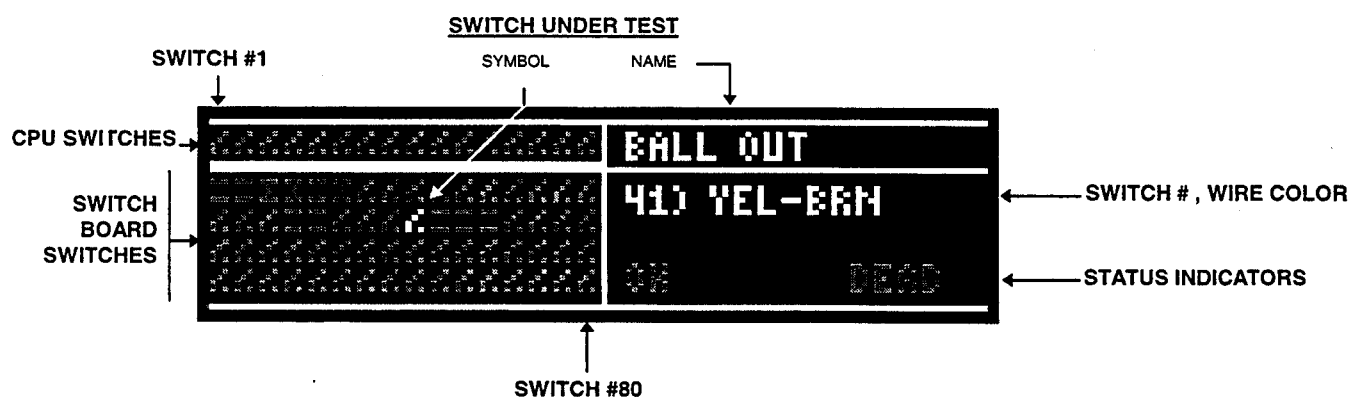
B6 : ERRORS/INFO

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 <i>INFO</i> MESSAGES ON-THE SCREEN DISPLAY.
B6-03	SOLENOID ERRORS	REPORT ALL, DISABLE MOMENTARIES, DISABLE ALL	REPORT ALL	SETS THE OPTION TO DISPLAY OR HIDE <i>ERROR</i> 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 <i>INFO</i> MESSAGES ON-THE SCREEN DISPLAY.
B6-05	LAMP ERRORS	REPORT ALL, DISABLE MOMENTARIES, DISABLE ALL	REPORT ALL	SETS THE OPTION TO DISPLAY OR HIDE <i>ERROR</i> 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 <i>INFO</i> MESSAGES ON THE SCREEN DISPLAY.

C. DIAGNOSTICS

C1: STANDARD TESTS

C1- 01 : SWITCH TEST

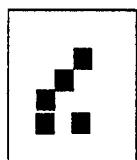


The Switch Test displays a graphical representation of the switch matrix, indicating which switches are seen as open and which are seen as closed. Also shown is information about the switch under test (name, number, wire color, and status indicators). The status indicators, when highlighted, show:

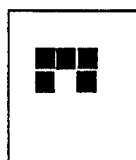
NRM - Normal operation; no problems are detected;

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

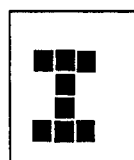
The Switch icons are:



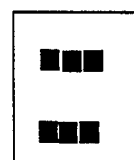
OPEN SWITCH



CLOSED SWITCH



OPTO WITH VERTICAL
BEAM OF LIGHT



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:

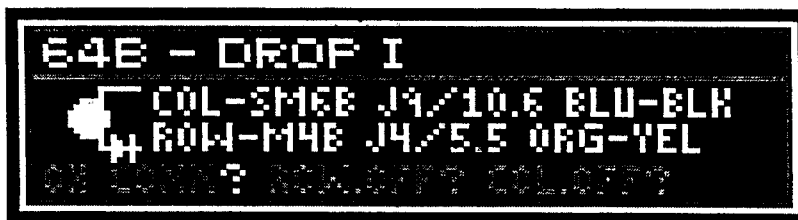
NRM	Normal operation; no problems are detected;
OFF	A short circuit is detected. The device may be in a cooling-down period and will automatically enable itself after reaching the proper operating temperature;
OFF?	Momentary short circuit (e.g. at some point the device had been detected as shorted, although 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 indicator 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 likely 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 usually 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 continuous 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 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.

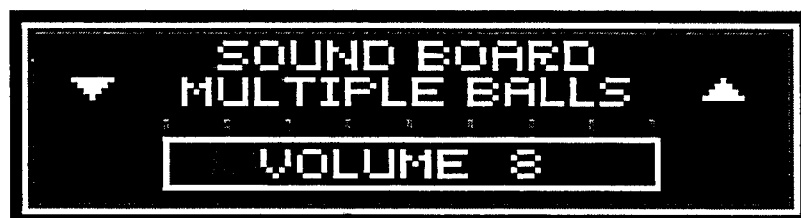
Press both flippers to exit the Display Test.

C1- 06 : SOUND BOARD RESET



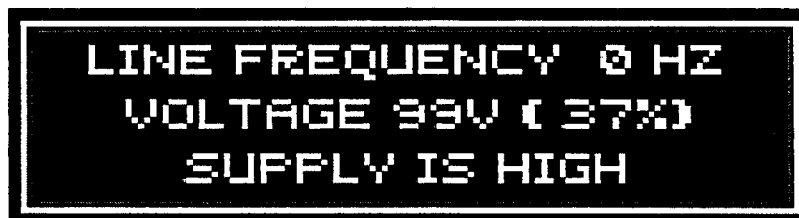
The Sound Board Test resets the sound board and causes it to report its powerup status. Press the start button to restart the test.

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 excellent 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

A rectangular display screen with a black background and white text. The text is arranged in three lines: "STARTING BURN-IN", "RUNNING FOR 24 HOURS", and "HOLD BOTH FLIPPERS TO STOP".

STARTING BURN-IN
RUNNING FOR 24 HOURS
HOLD BOTH FLIPPERS TO STOP

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 continuously 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 categories of troubleshooting, Errors and Information. Generally, Errors are considered important to game play and should be fixed at the earliest opportunity; Information messages (for example, a lamp behind the backglass is burned-out) are considered less critical and can be serviced as part of a routine maintenance 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 History 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 <i>CURRENT AUDITS</i> SHOULD APPEAR ON THE REPORT
E2-04B	AUDIT HISTORY 1	NO,YES	NO	SELECT WHETHER <i>AUDIT HISTORY 1</i> SHOULD APPEAR ON THE REPORT
E2-04C	AUDIT HISTORY 2	NO,YES	NO	SELECT WHETHER <i>AUDIT HISTORY 2</i> SHOULD APPEAR ON THE REPORT
E2-04D	AUDIT HISTORY 3	NO,YES	NO	SELECT WHETHER <i>AUDIT HISTORY 3</i> SHOULD APPEAR ON THE REPORT
E2-05	EARNINGS AUDITS	NO,YES	YES	SELECT WHETHER <i>EARNINGS AUDITS</i> SHOULD APPEAR ON THE REPORT
E2-06	STANDARD AUDITS	NO,YES	YES	SPECIFY WHETHER <i>STANDARD AUDITS</i> SHOULD APPEAR ON THE REPORT.
E2-07	FEATURE AUDITS	NO,YES	YES	SELECT WHETHER <i>FEATURE AUDITS</i> SHOULD APPEAR ON THE REPORT
E2-08	STANDARD ADJUSTMENTS	NO,YES	NO	SELECT WHETHER <i>STANDARD ADJUSTMENTS</i> SHOULD APPEAR ON THE REPORT
E2-09	GAME ADJUSTMENTS	NO,YES	NO	SELECT WHETHER <i>GAME ADJUSTMENTS</i> SHOULD APPEAR ON THE REPORT
E2-10	LOCALE ADJUSTMENTS	NO,YES	NO	SELECT WHETHER <i>LOCALE ADJUSTMENTS</i> SHOULD APPEAR ON THE REPORT
E2-11	PASSWORD ADJUSTMENTS	NO,YES	NO	SELECT WHETHER <i>PASSWORD ADJUSTMENTS</i> SHOULD APPEAR ON THE REPORT
E2-12	ERROR/INFO ADJUSTMENTS	NO,YES	NO	SELECT WHETHER <i>ERROR/INFO ADJUSTMENTS</i> SHOULD APPEAR ON THE REPORT
E2-13	COINAGE ADJUSTMENTS	NO,YES	NO	SELECT WHETHER <i>COINAGE ADJUSTMENTS</i> SHOULD APPEAR ON THE REPORT
E2-14	REPORT SETTINGS	NO,YES	NO	SELECT WHETHER <i>DEVICE SETTINGS</i> SHOULD APPEAR ON THE REPORT
E2-15	DEVICE SETTINGS	NO,YES	YES	SELECT WHETHER <i>DEVICE SETTINGS</i> 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. <i>DELIMITED</i> (TEXT) OUTPUT WILL GENERALLY BE CAPTURED BY A TERMINAL SOFTWARE PACKAGE AND IMPORTED INTO A SPREADSHEET APPLICATION, SUCH AS MICROSOFT EXCEL. <i>FORMATTED</i> DATA IS IN A PRINTER-READY, READABLE USER FORMAT, SUCH AS SEEN ON A RECEIPT.
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.

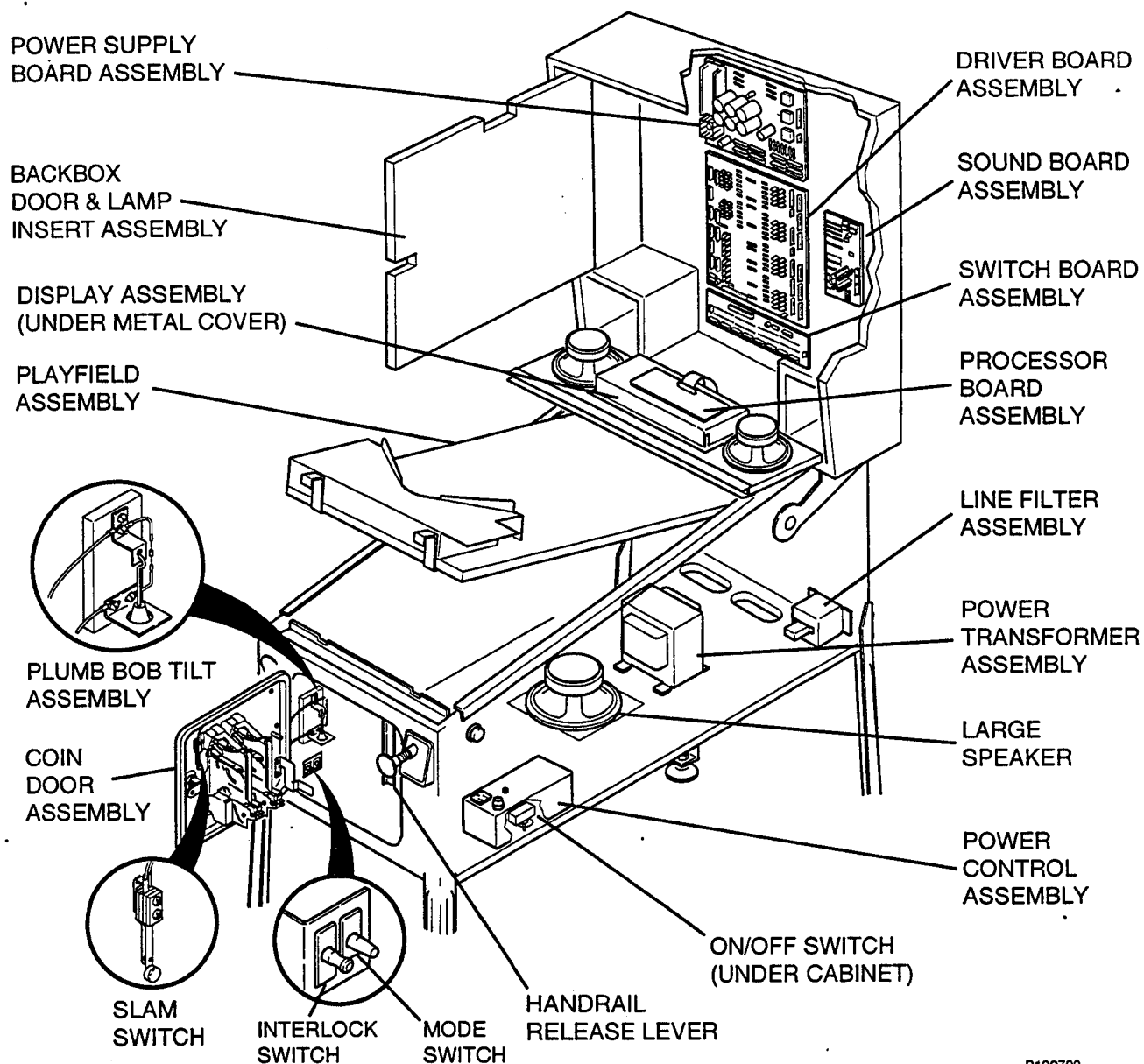
ERROR: PRINT JOB COULD NOT BE COMPLETED - This message will appear during a print job if an interruption occurs. The CPU will continue to poll the printer to try to restart the report, however, after the third retry, the print job is aborted.

PRINTERS CURRENTLY SUPPORTED

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

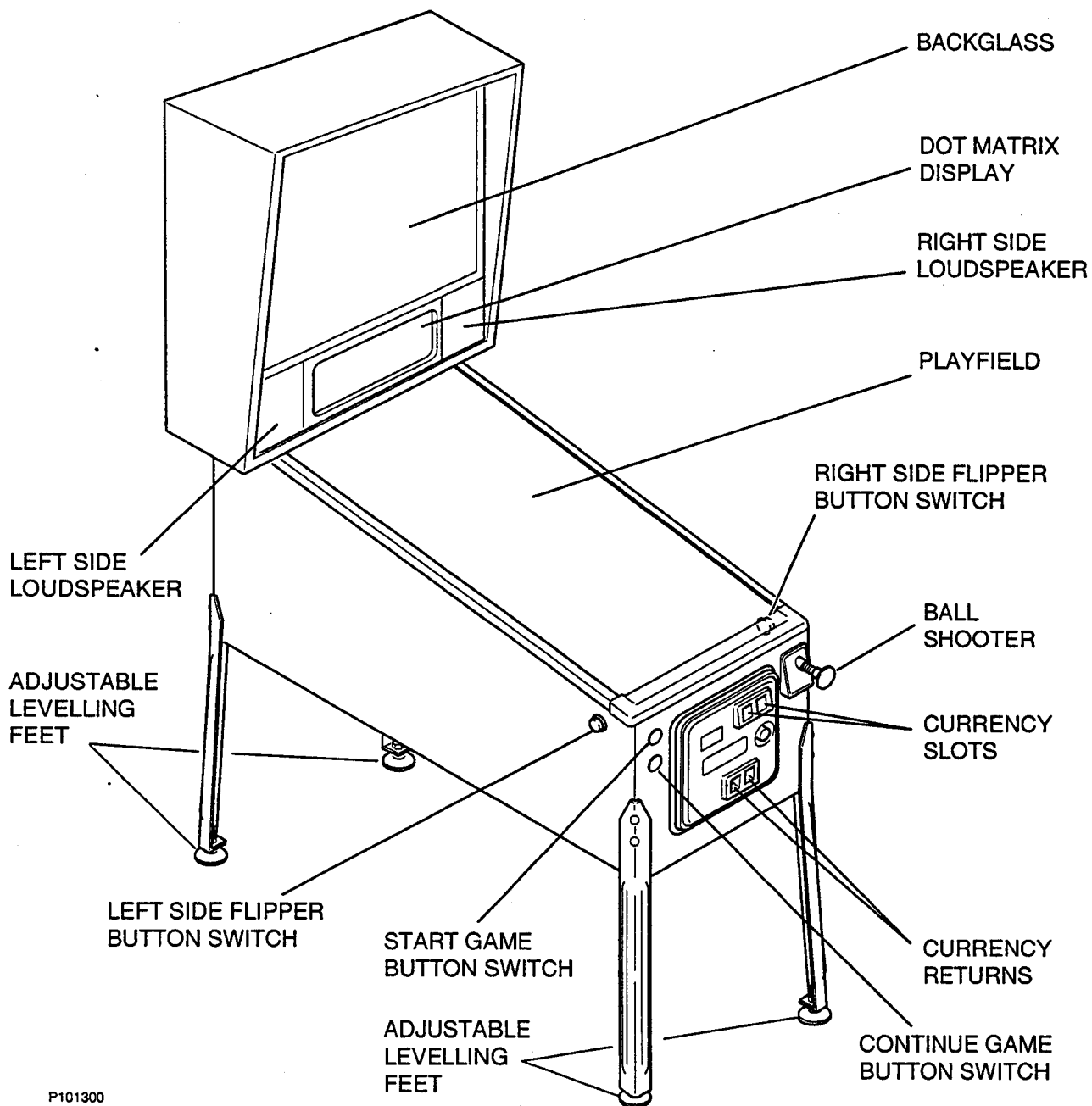
NOTES

CABINET & BACKBOX - COMPONENT IDENTIFICATION



P102700

CABINET & BACKBOX - COMPONENT IDENTIFICATION



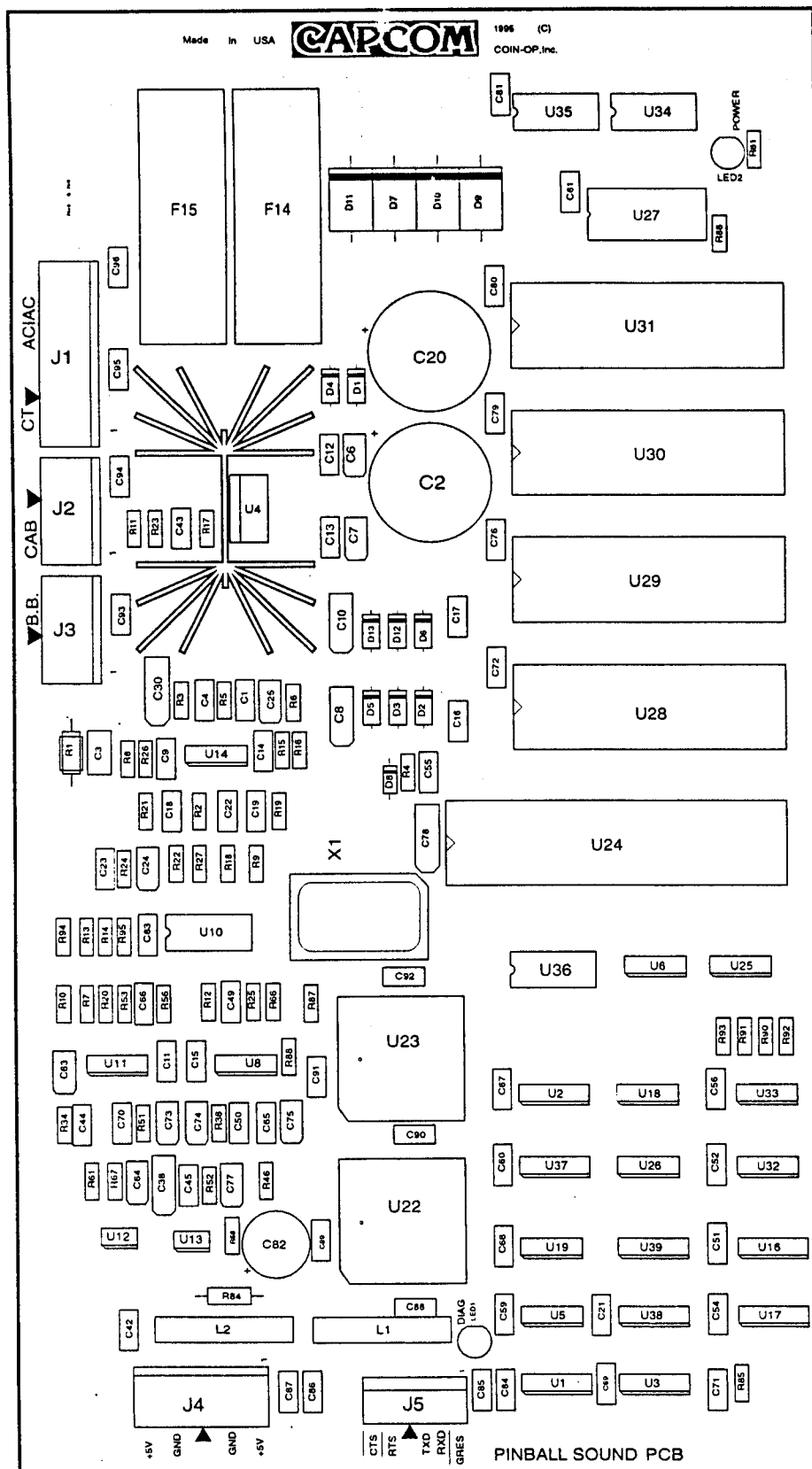
P101300

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

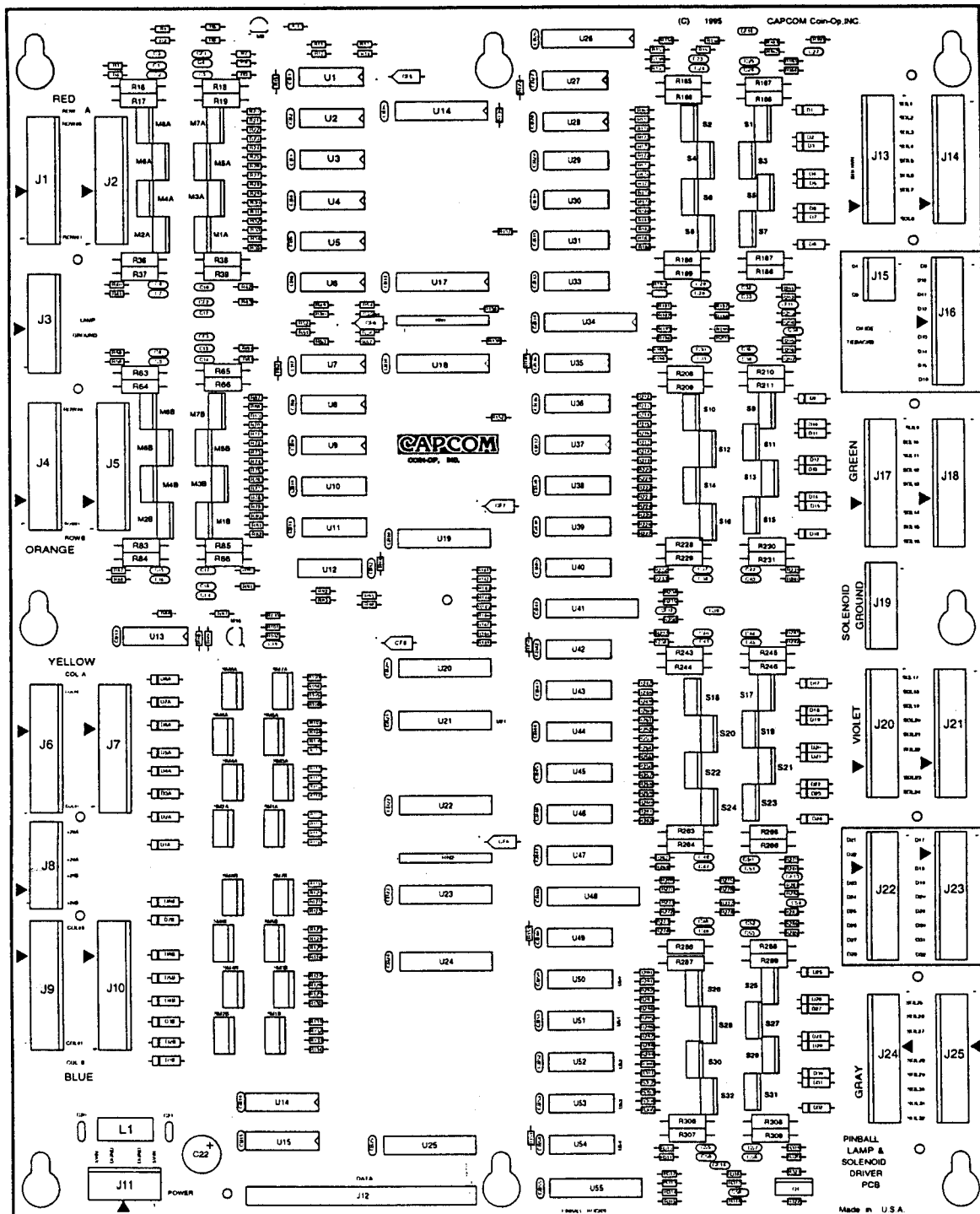
PARTS LIST

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 IN4004 RECTIFIER 1.0A 400VR	DI00100
D8	DIODE IN4148 SW 200MA 75VR	DI00104
LED1-2	LED LTL4201 RED 20MA T-1 70 DEG	DI00105
D7,D9-11	DIODE IN5402 RECTIFIER 3.0A 200VR	DI00106
F14-F15	FUSE HOLDER 3AG PC MTG	FS00101
U8,U11,U14	IC TLO84 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,U 55	IC 74LS244 OCT BFFR/LINE DR	IC00057
L1	IND 4.7UH 3.4A 15%AX	IN00100
R6,R15,R62,R94,R 102,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,R 27,R29,R31,R33,R 35,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,R234,R281,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,S M2A,SM2B,SM 3ASM3B,SM4A, SM4B, SM5A,S M5B, SM6A,S M6B, SM7A,S M7B,SM8A, SM8B-I	TRANSISTOR VN02N MOSFET RELAY	TR00105
M9-10	TRANSISTOR 2N7000 MOSFET N-CH	TR00109

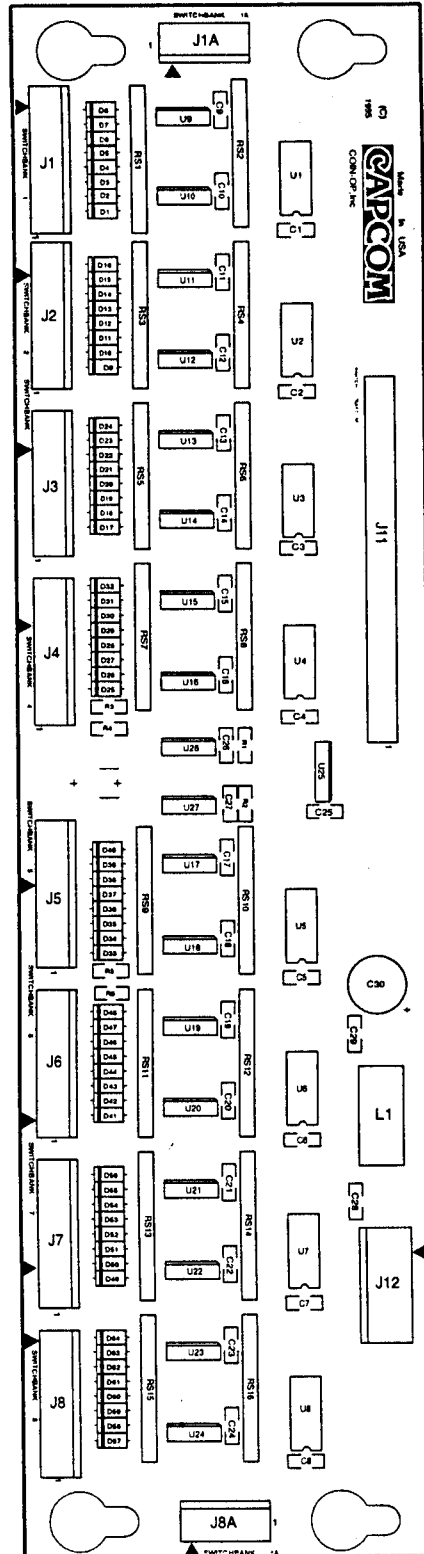
POWER BOARD ASSEMBLY A0015204 PARTS LIST

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 1N5402 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".

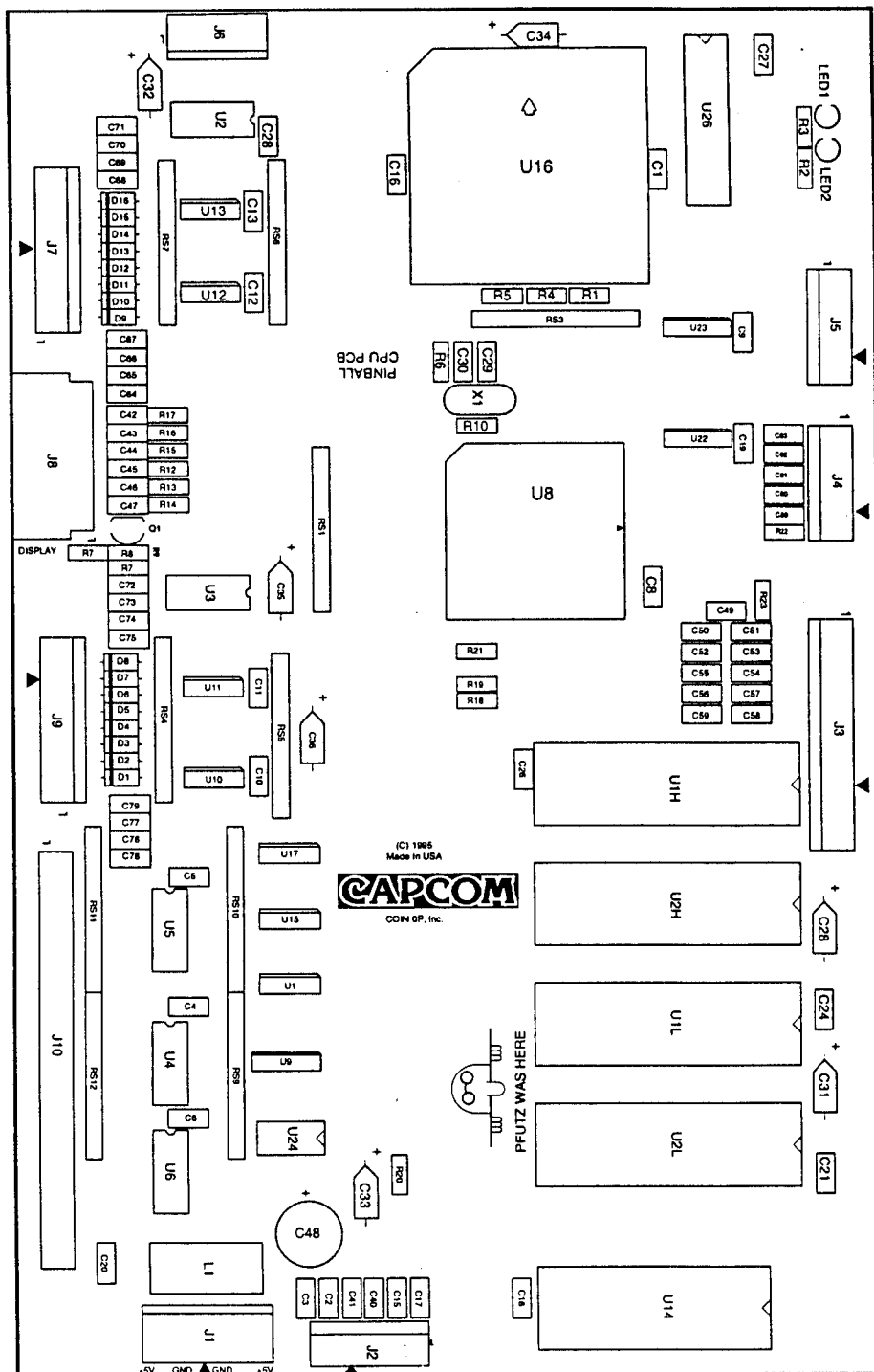
SWITCH BOARD ASSEMBLY A0015301



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 TRANSCIEVER 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



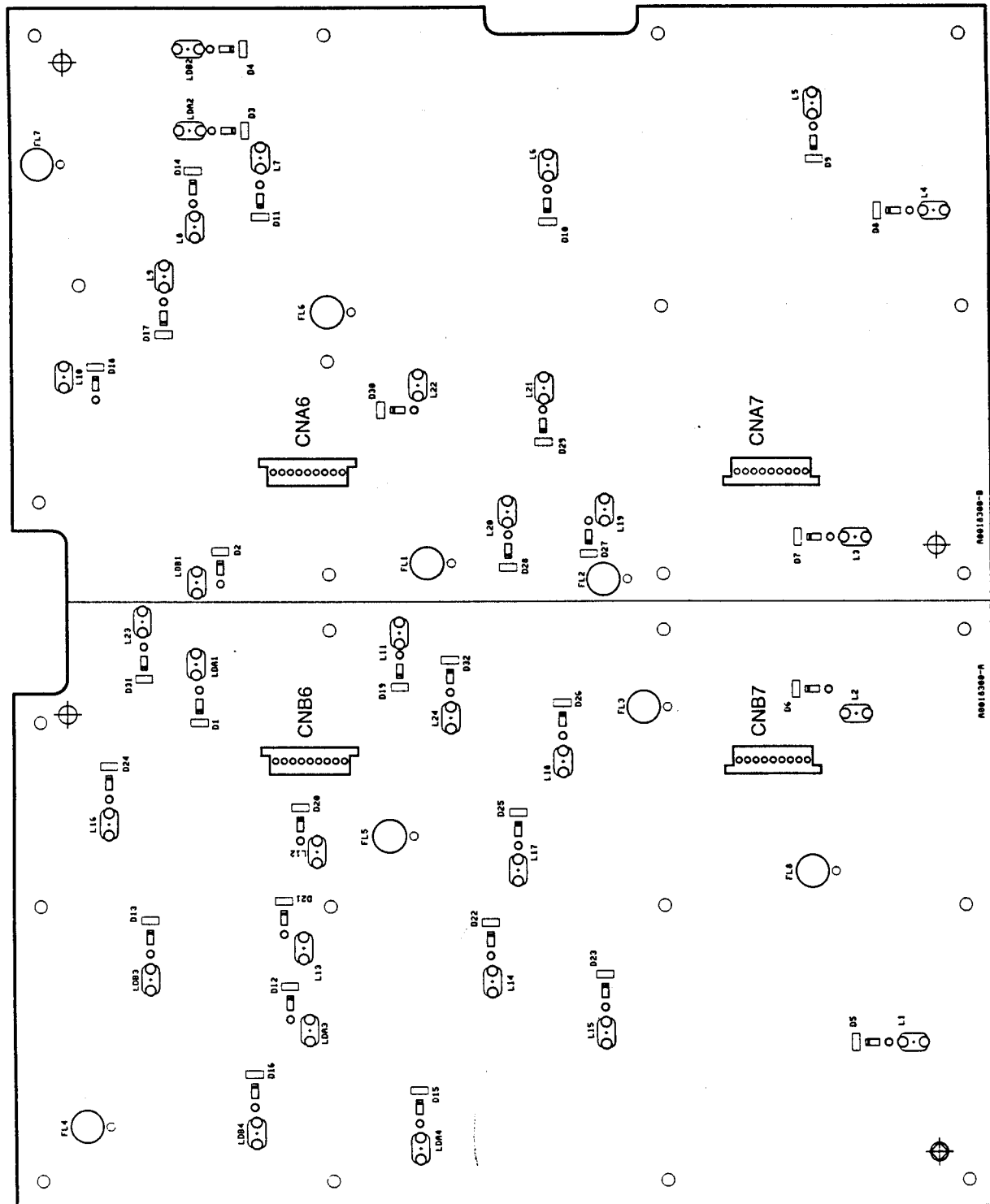
CPU BOARD ASSEMBLY A0015403

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

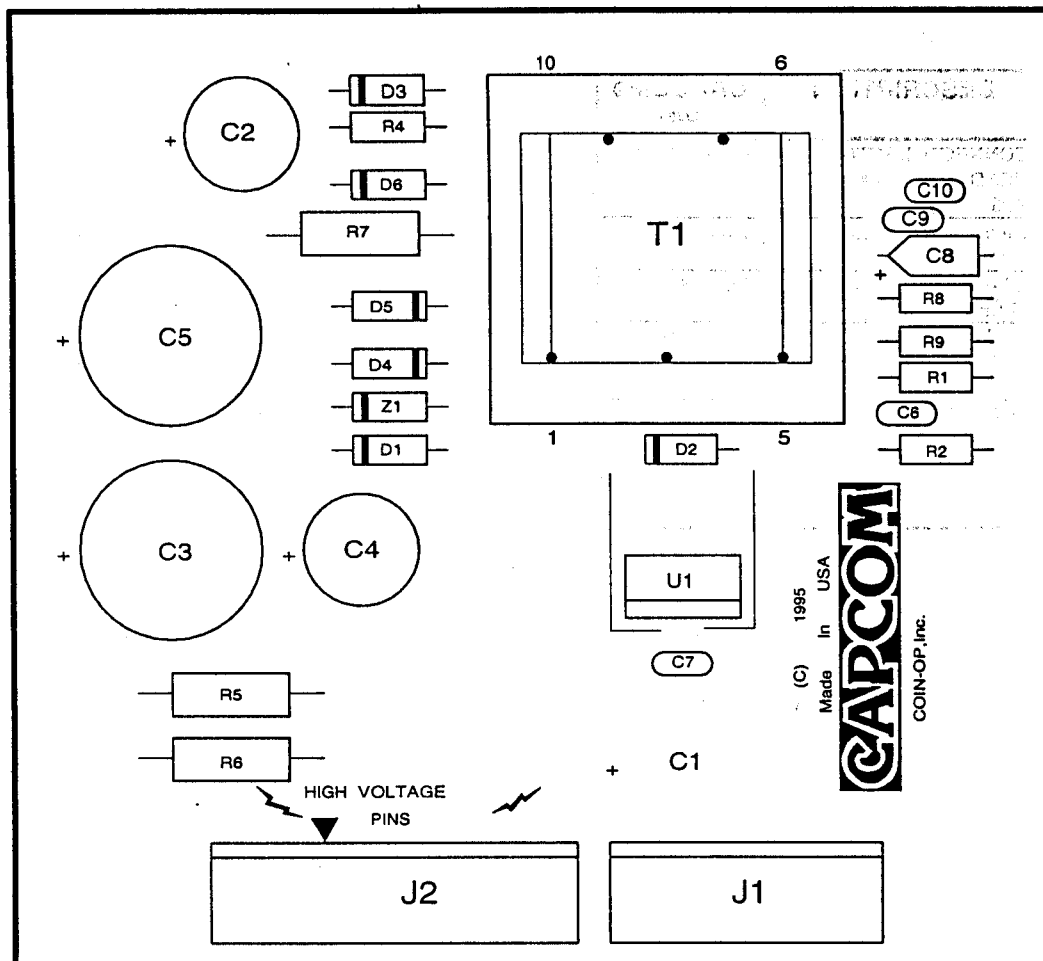


P1E03500

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

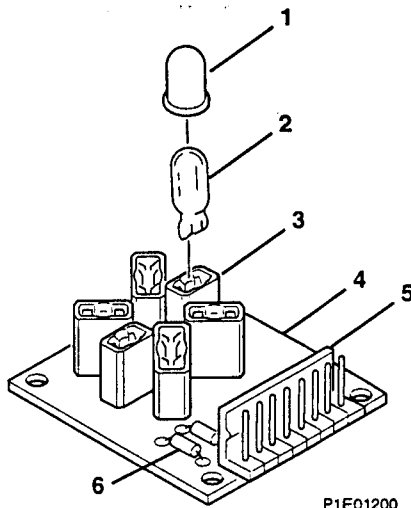


DISPLAY POWER SUPPLY BOARD A0015502 PARTS LIST

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

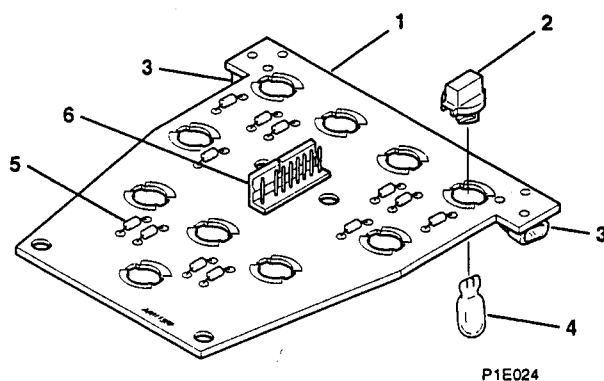
* CAPS: C1-C5 ARE SPECIAL CAPACITORS FOR SWITCHES POSER SUPPLIES, THEY ARE LOW IMPEDENCE, HIGH RIPPLE CURRENT CAPACITORS.

COLOR BALL ASSEMBLY A0010600



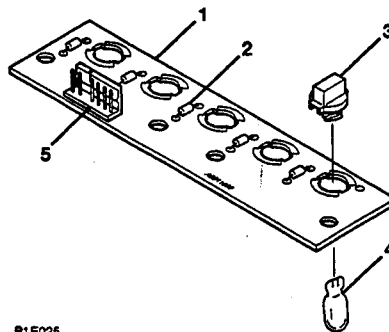
NO.	DESCRIPTION	CAPCOM® P/N
1	FILTER, LAMP, T 3 1/4", T/ AMBER	RB00116-AT
	FILTER, LAMP, T 3 1/4", T/ BLUE	RB00116-BT
	FILTER, LAMP, T 3 1/4", T/ GREEN	RB00116-GT
	FILTER, LAMP, T 3 1/4", T/ RED	RB00116-RT
	FILTER, LAMP, T 3 1/4", T/ YELLOW	RB00116-YT
2	LAMP #555 6.3V, WEDGE T 3/14"	LP00100
3	SOCKET 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	DIODE 1N4004 RECT 1.0A 400 VR	DI001000

MAGICIAN'S LAMP ASSEMBLY A0011500



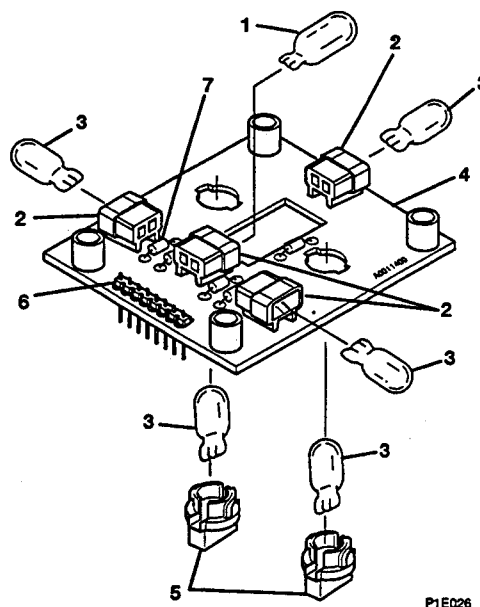
NO.	DESCRIPTION	CAPCOM® P/N
1	PCB, MAGICIAN'S LAMP	B0013500
2	SOCKET, LP WEDGE PCB T 3 1/4"	SK00102
3	SOCKET, LP WEDGE PCB 90° TERMINAL \S T 3 1/4", T 5 BULBS	SK00110
4	LAMP #555 6.3V, WEDGE T 3 1/4"	LP00100
5	DIODE 1N4004 RECT 1.0A 400 VR	DI00100
6	CONNECTOR HEADER 0.156 STRAIGHT P-PIN	GN00129-09

DROP TARGET LAMP PCB ASSEMBLY A0011600



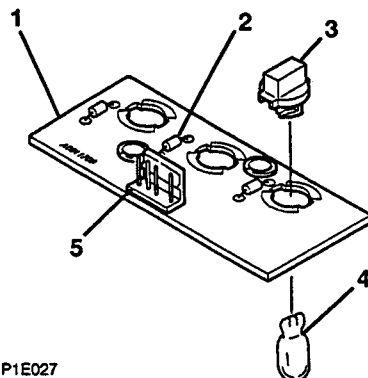
NO.	DESCRIPTION	CAPCOM® P/N
1	PCB, LAMP, 5 LP X 1.250	B0014800
2	DIODE 1N4004 RECT 1.0A 400VR	DI00100
3	SOCKET, LP WEDGE PCB T 3 1/4" TWIST	SK00102
4	LAMP # 555 6.3V WEDGE T 3 1/4"	LP00100
5	CONNECTOR HEADER 0.156 STRAIGHT 7-PIN LOCK	CN00100-07

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

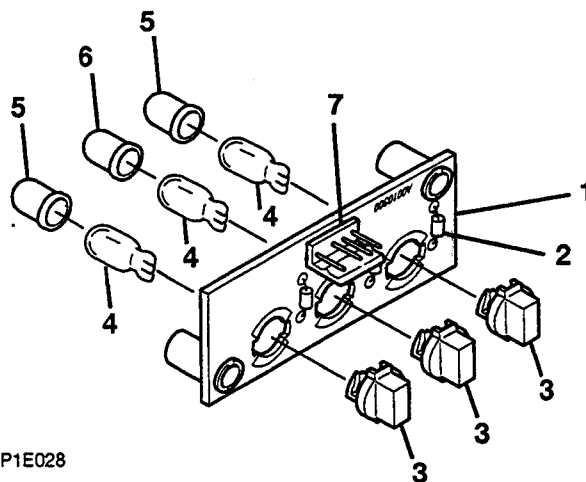
MORPH CHAMBER LAMP PCB ASSEMBLY A0011700



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

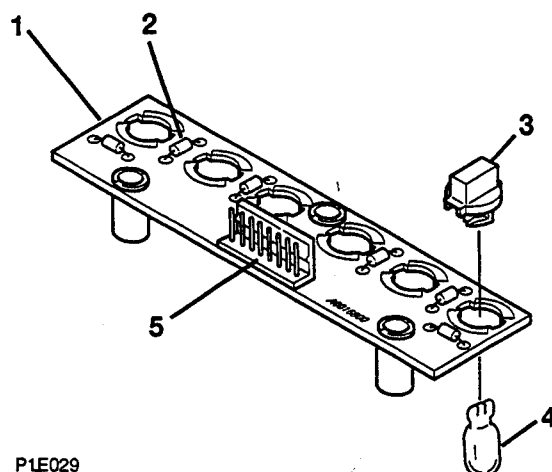
TRUNK ESCAPE LAMP ASSEMBLY A0010300



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

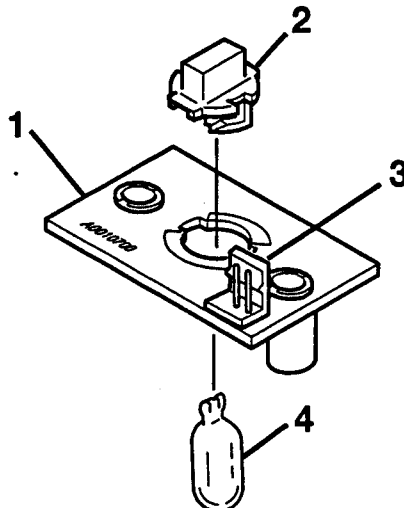
CAPTIVE BALL LAMP PCB ASSEMBLY A0016800



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

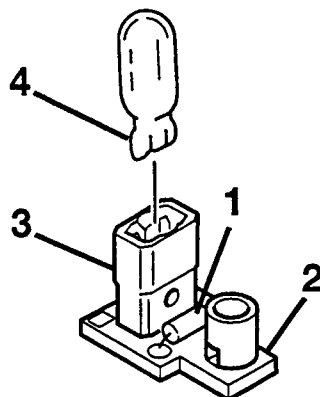
GEO DOME (2) FLASHER LAMP PCB ASSEMBLY A0010700



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

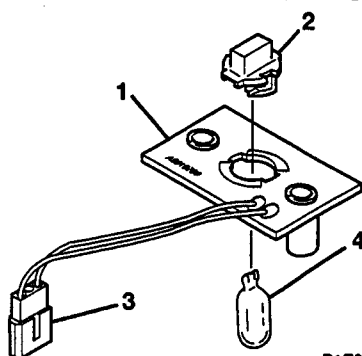
STAGE LAMP PCB ASSEMBLY A0016700



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

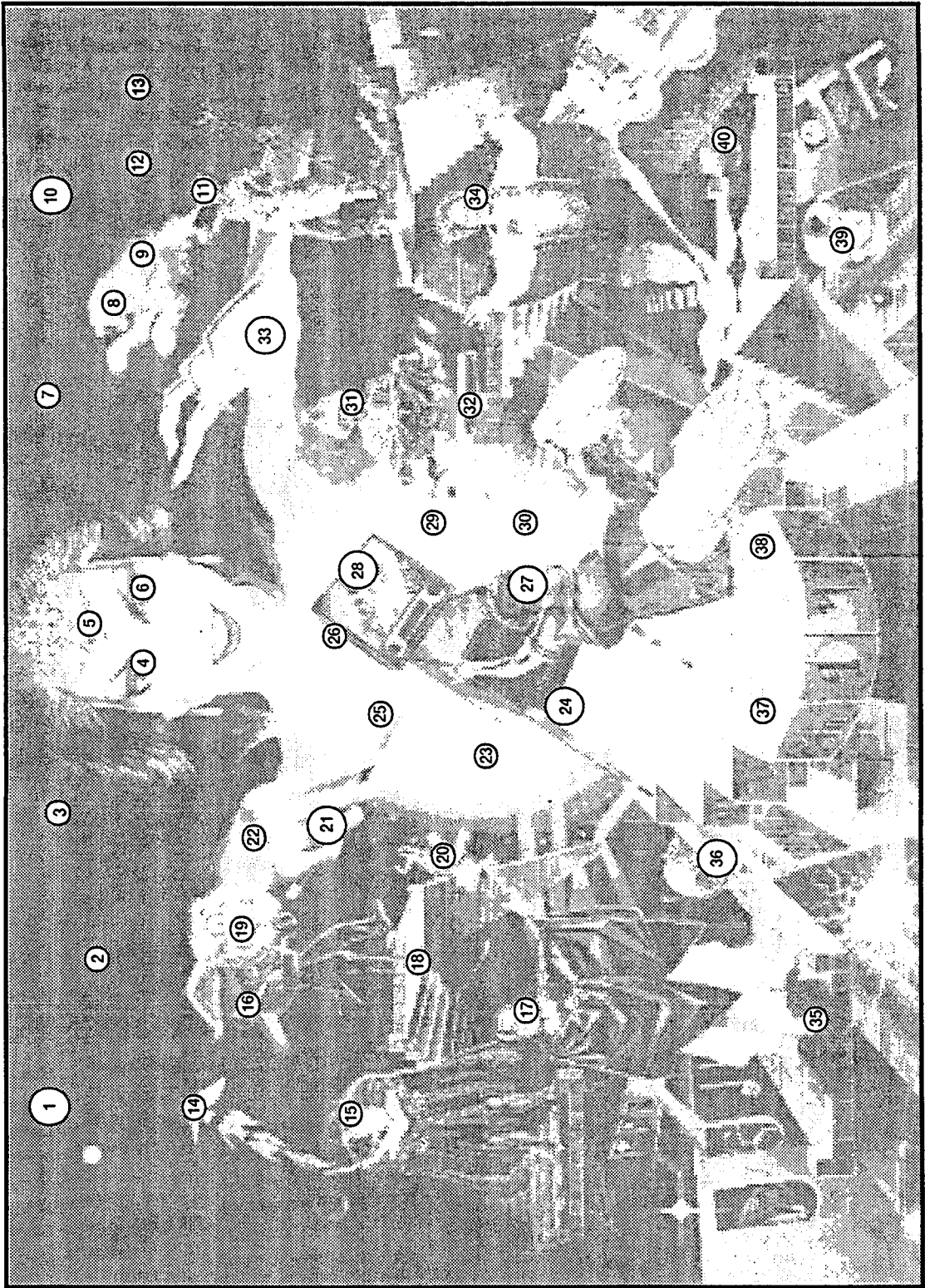


P1E030

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



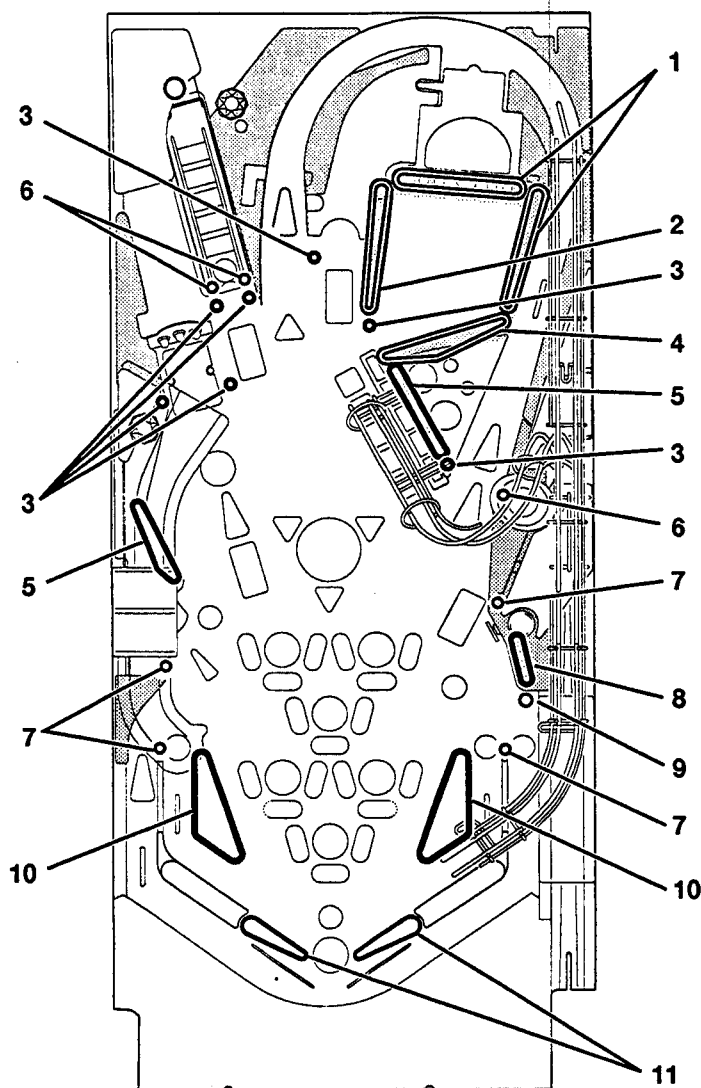
P1E0330

LAMP BOARD REFERENCE & PARTS LIST

BACKBOX LOCATION REFERENCE	BULB TYPE					ROW DRIVER  TO LAMP	
	CIRCUIT LAMP BOARD			HARDWIRED			DIODE REQUIRED
	*DES.	BULB #	CAPCOM® P/N	BULB #	CAPCOM® P/N		
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.

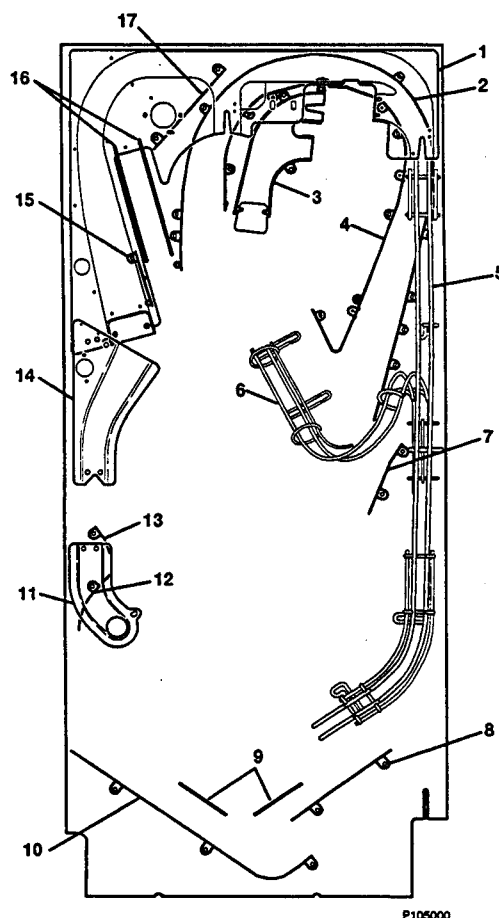
LOCATION OF RUBBER RINGS & BUMPERS



P101000

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 1/4" 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

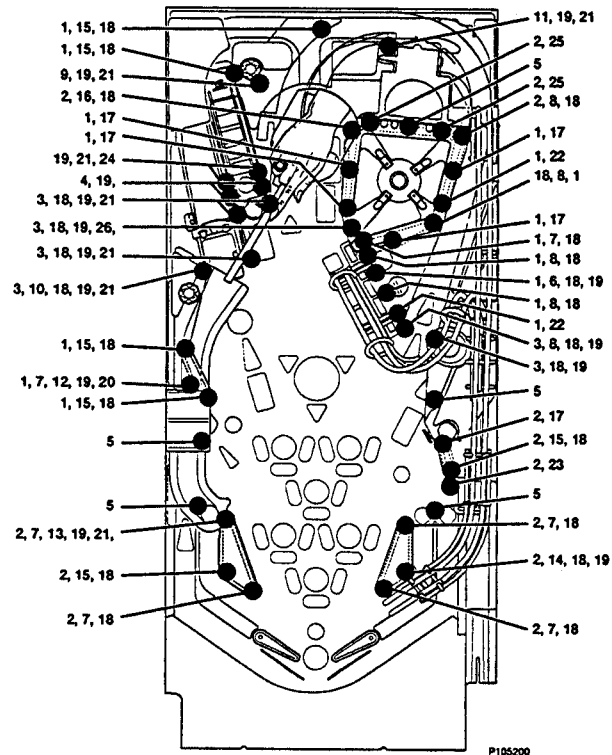
LOCATION OF RAMPS & BALL GUIDES



P105000

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

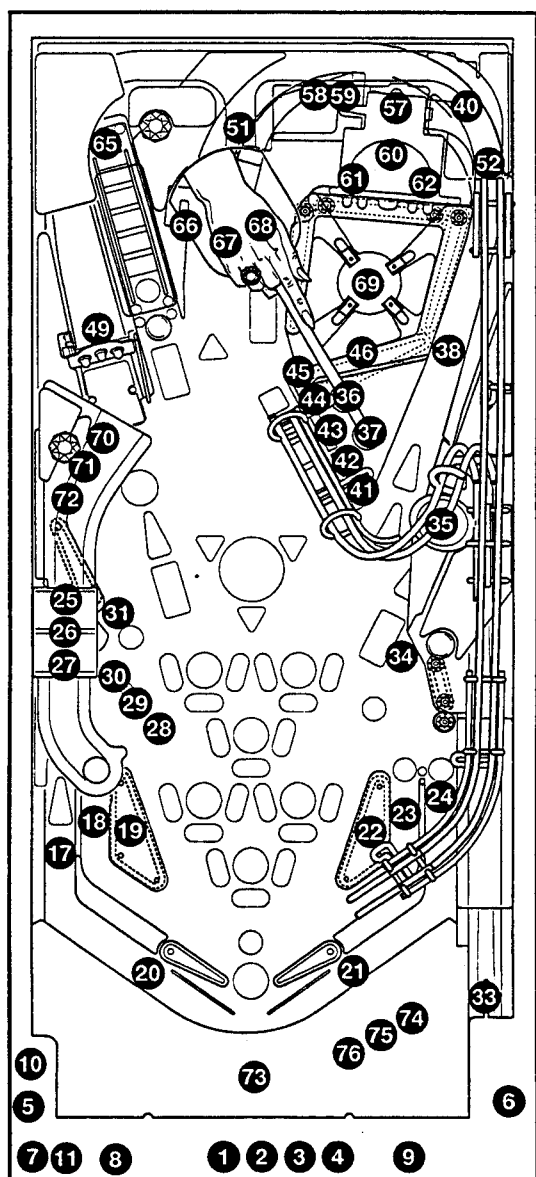


P105200

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

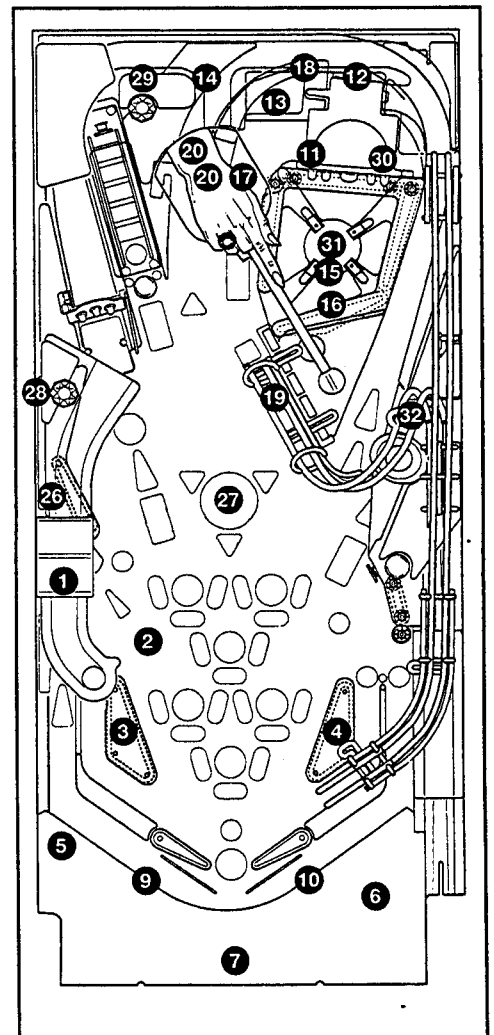
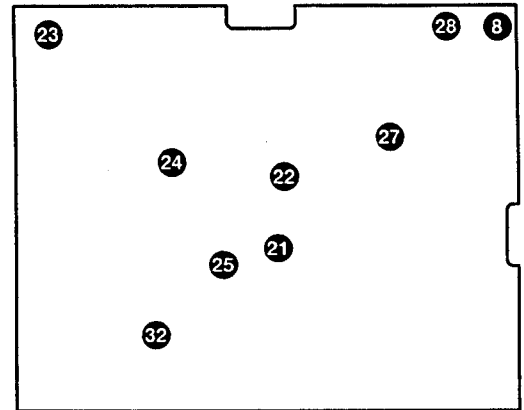
** NOTE: NOT SERVICED SEPERATELY

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*)	**

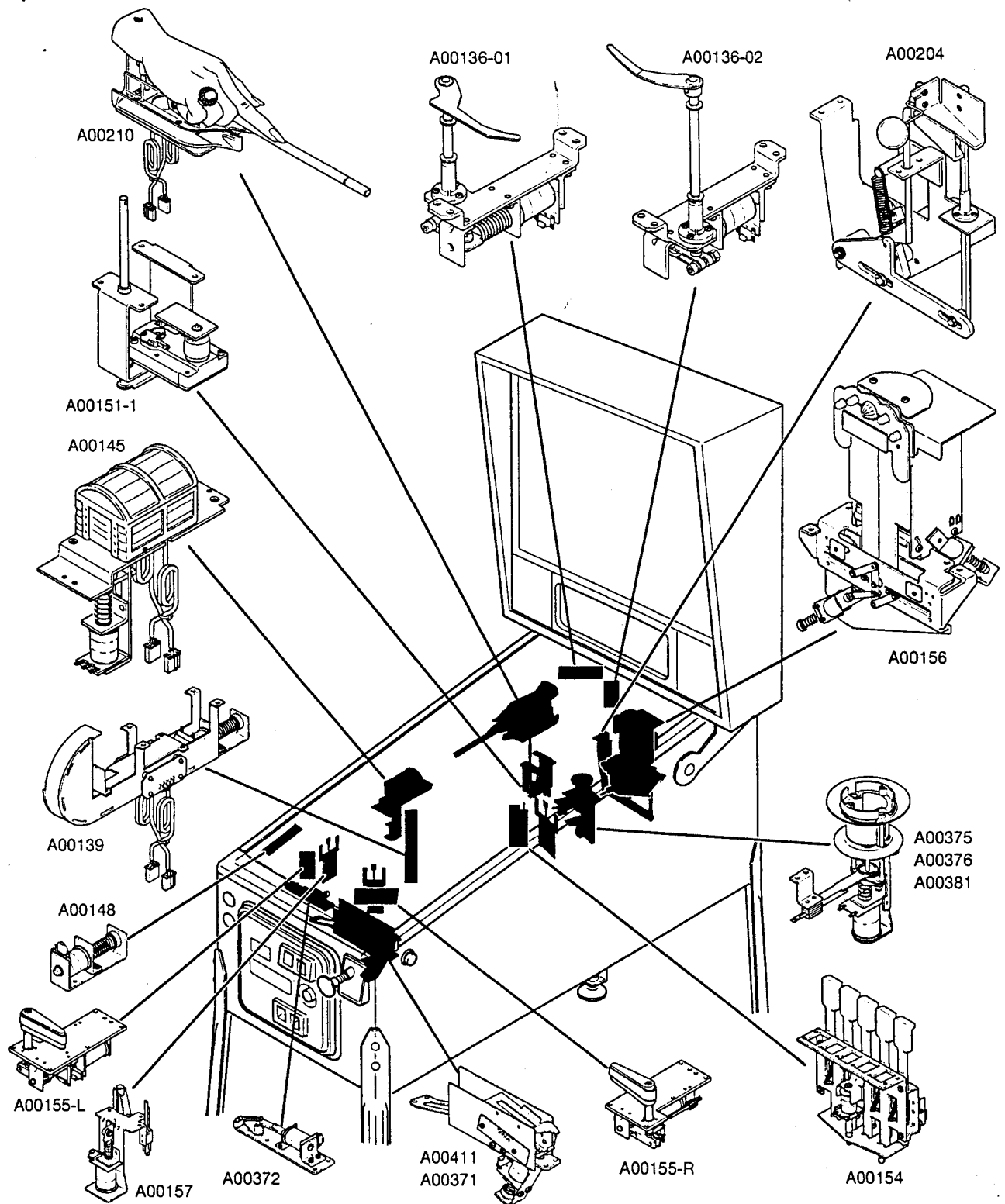
*NOTE: BB= BACKBOX, PF= PLAYFIELD

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

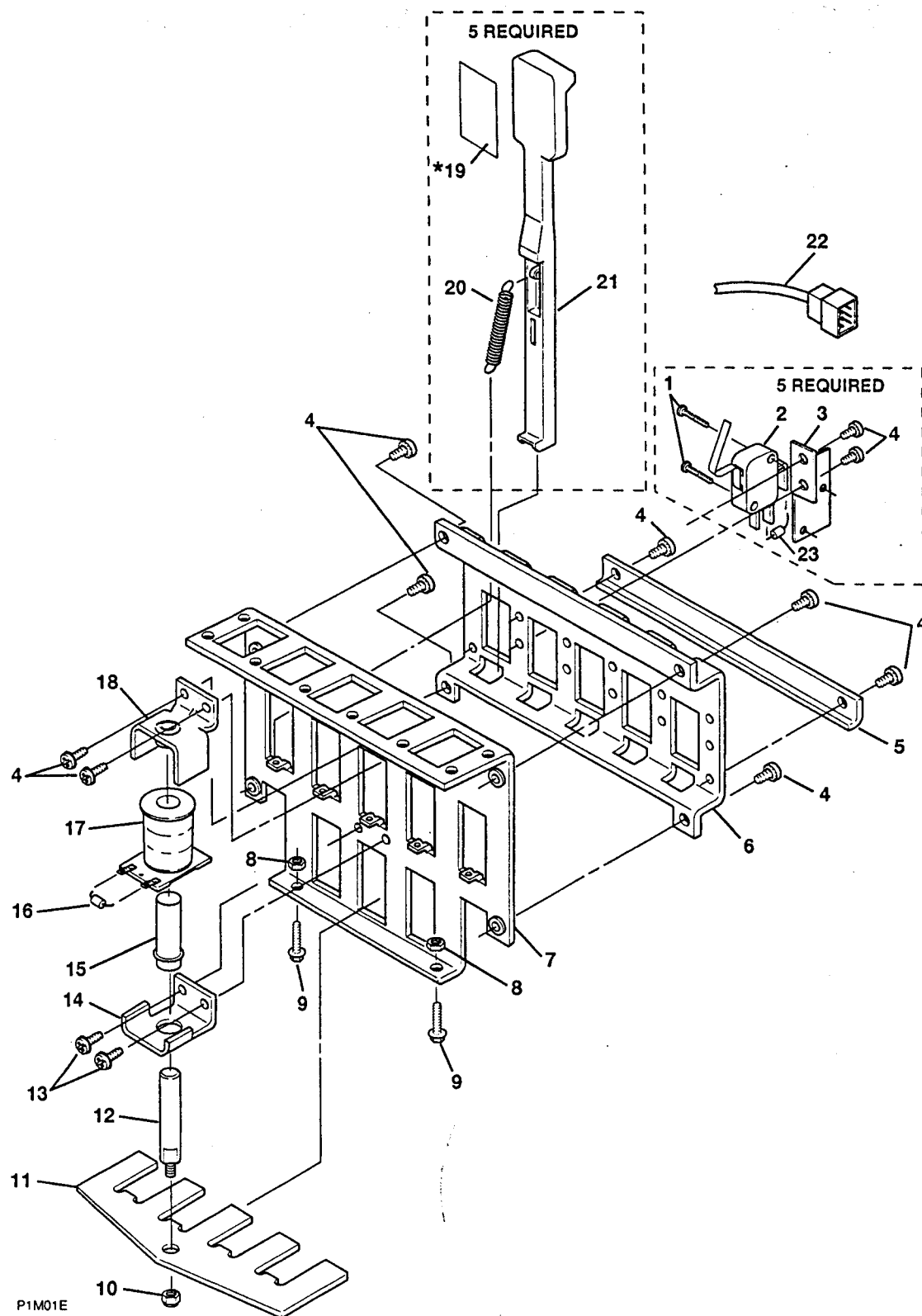


P1E3700

COMPONENT IDENTIFICATION - PLAYFIELD MECHANISMS



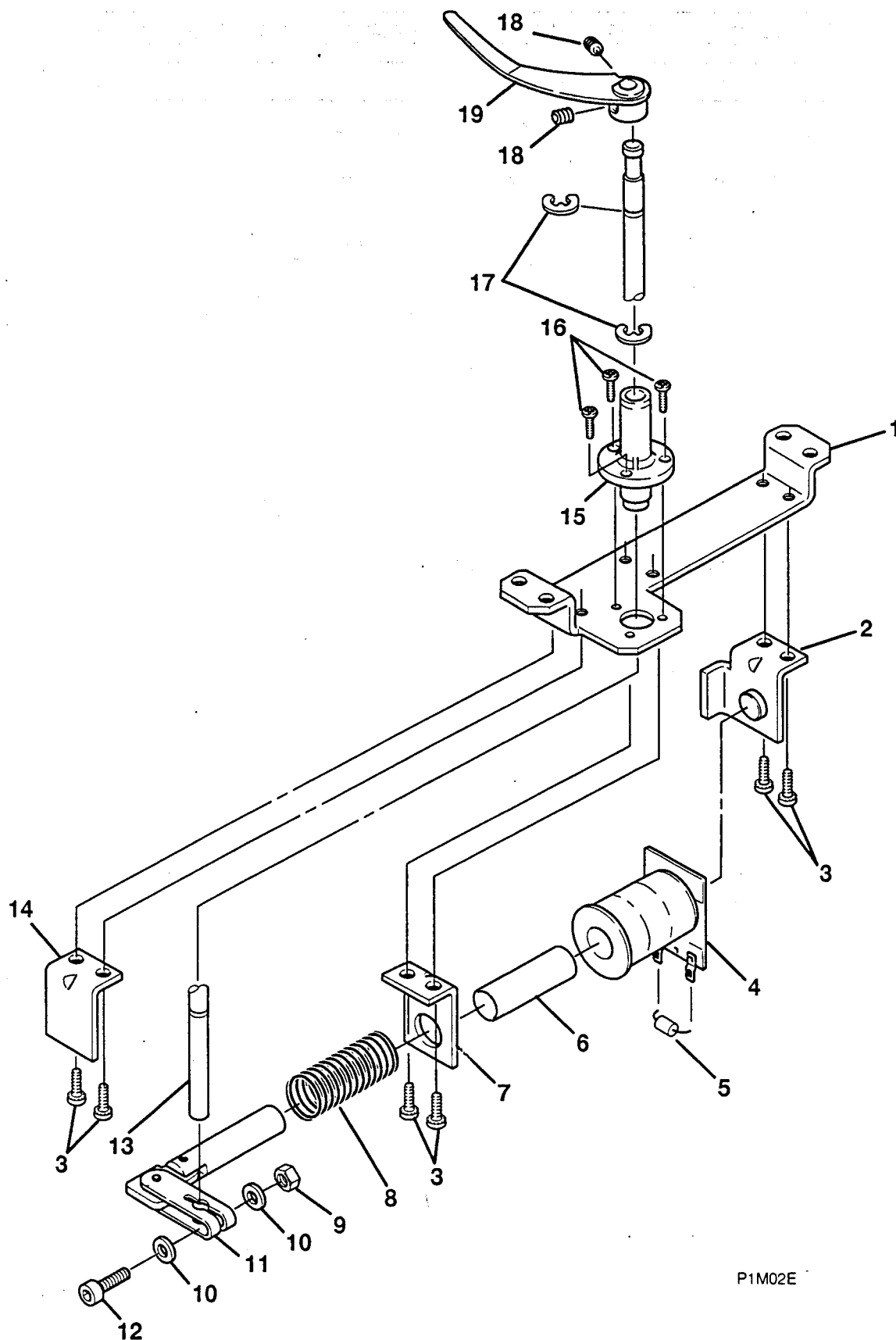
P1M1000



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

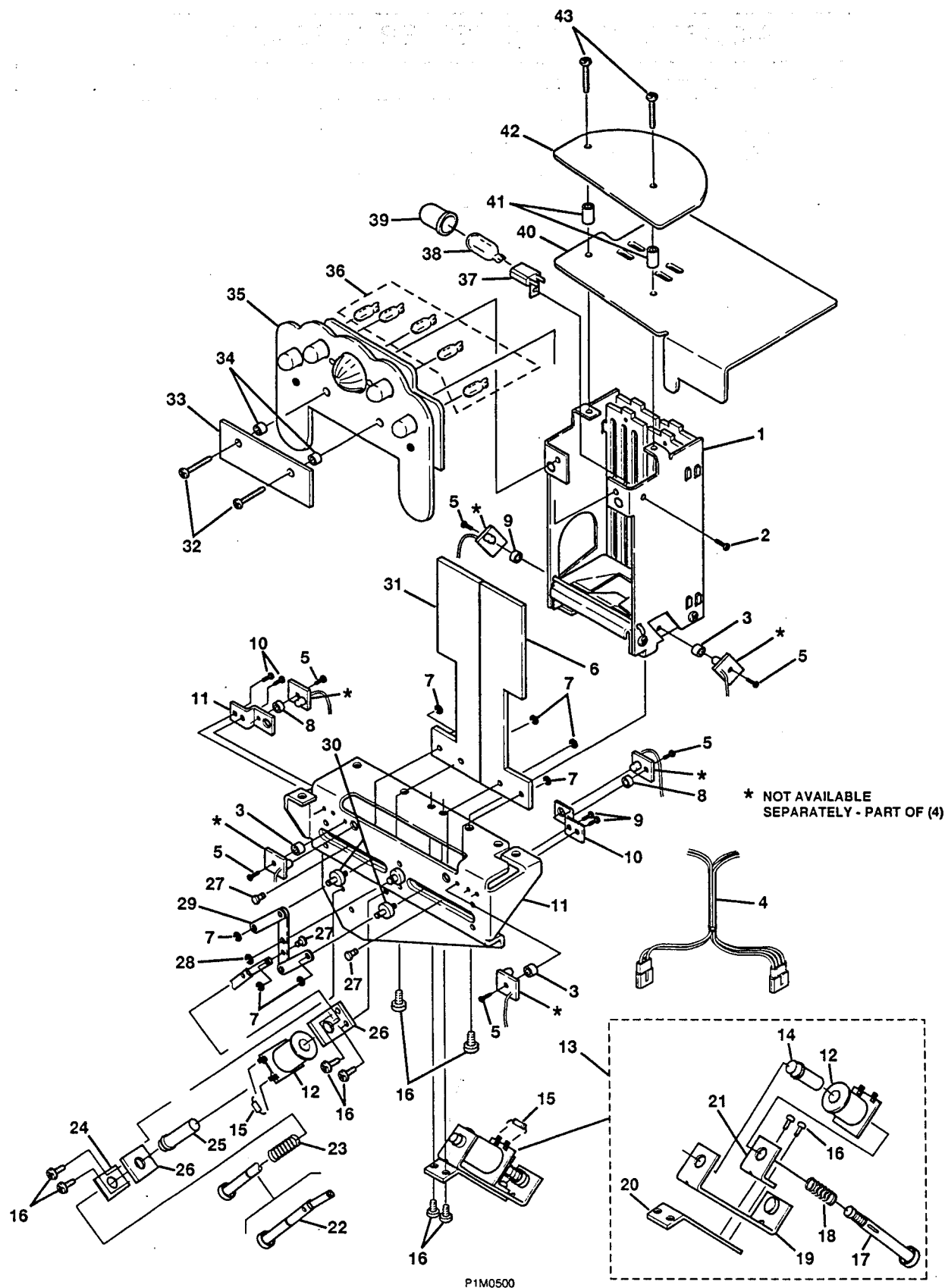
* NOTE: DECAL NOT SUPPLIED WITH THIS ASSEMBLY.

ORDER DECALS SEPARATELY.

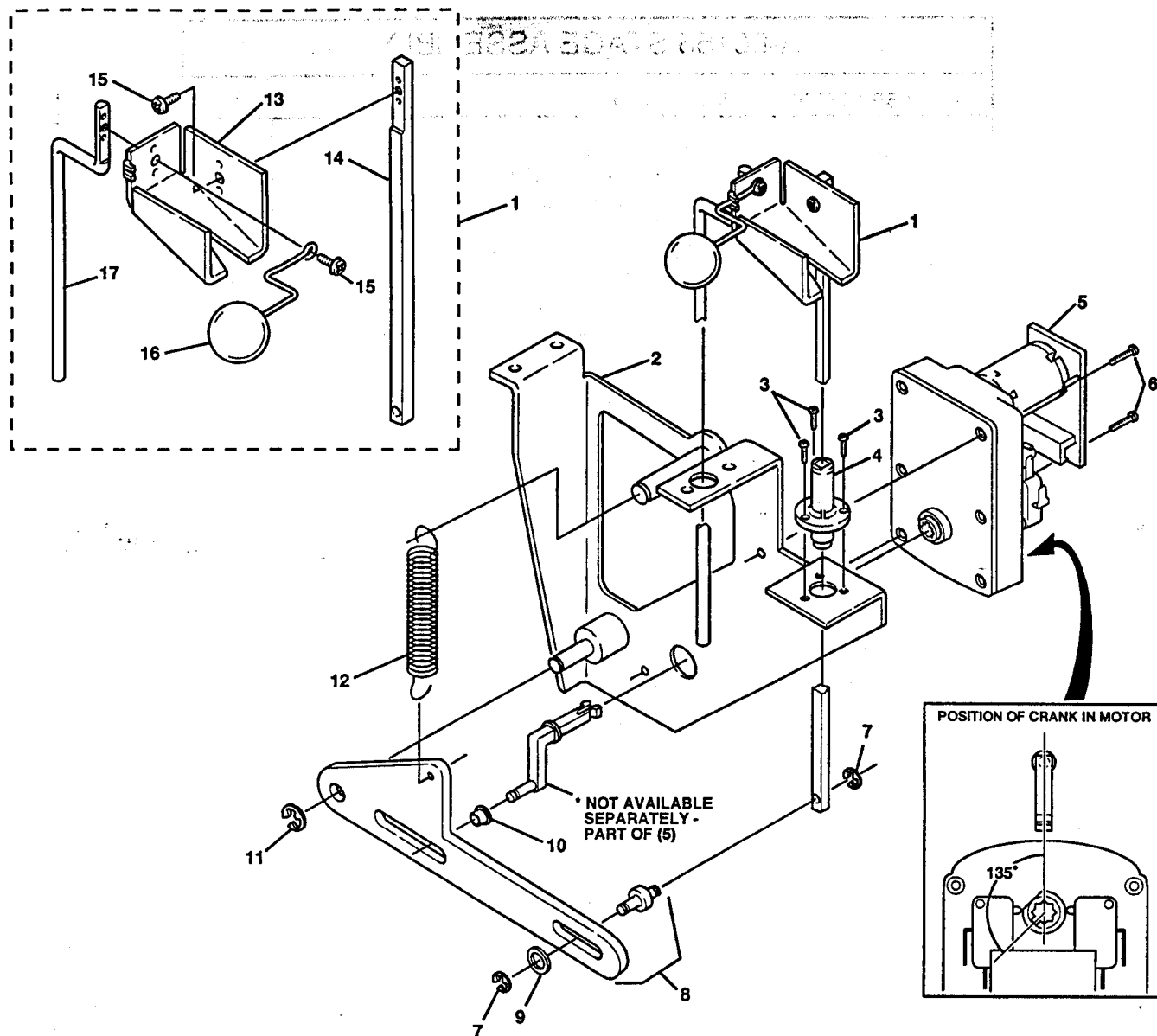


P1M02E

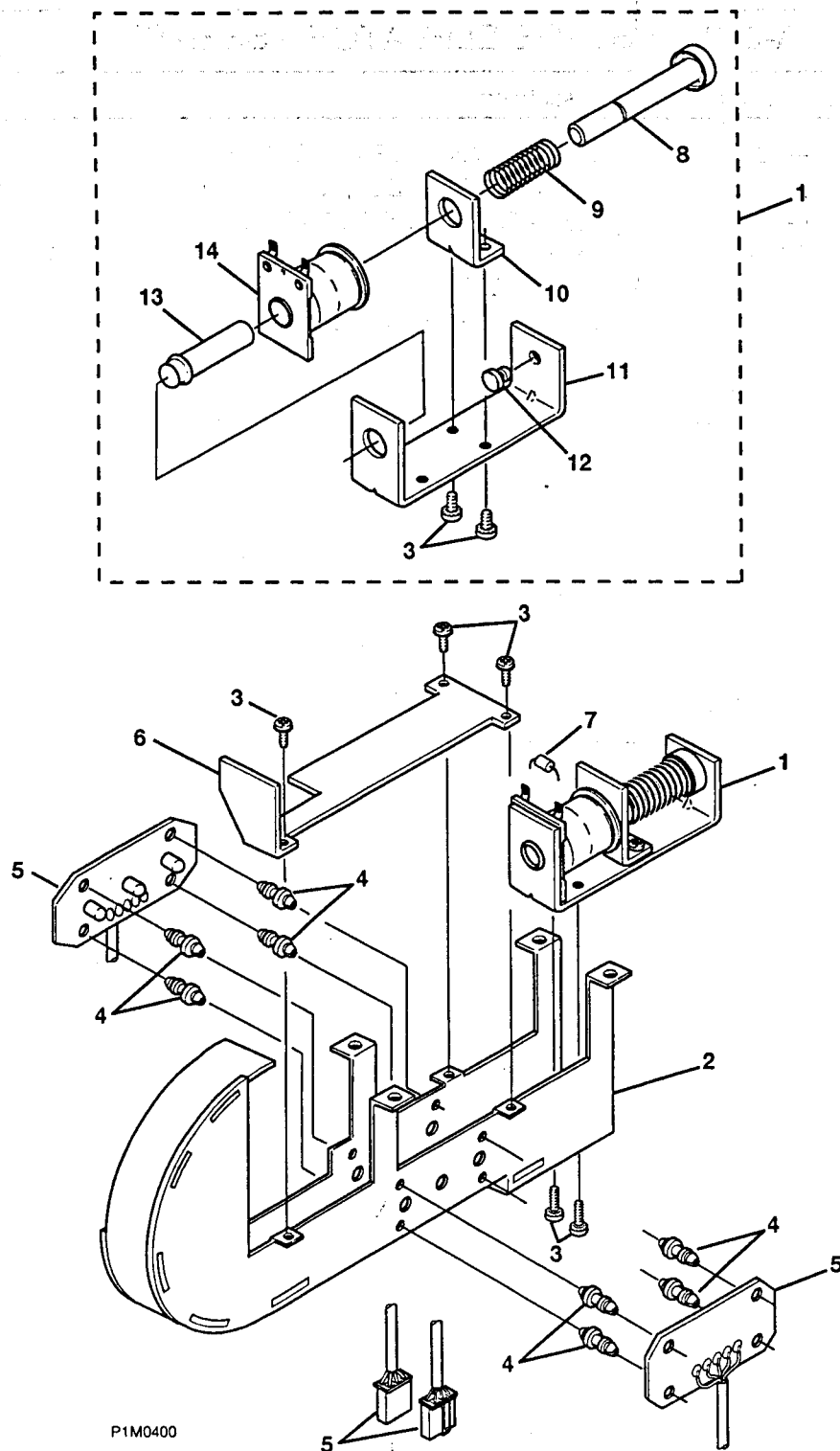
A-00136-02 WAND DIVERTER ASSEMBLY			
No.	Part Number	Description	Req.
	A-00136-02	WAND DIVERTER ASSEMBLY	
1	MT00181-L	BRKT, DIVERTER, R	1
2	A-00134	BRKT, COIL STOP ASSEMBLY	1
3	SC00101-02	MS 8-32 x 1/4 PPH SEMS ZC	6
4	CL00109	COIL 800T #23	1
5	DI00100	DIODE 1N4004 RECT 1.0A 400VR	1
6	PL00132-03	SLEEVE, 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



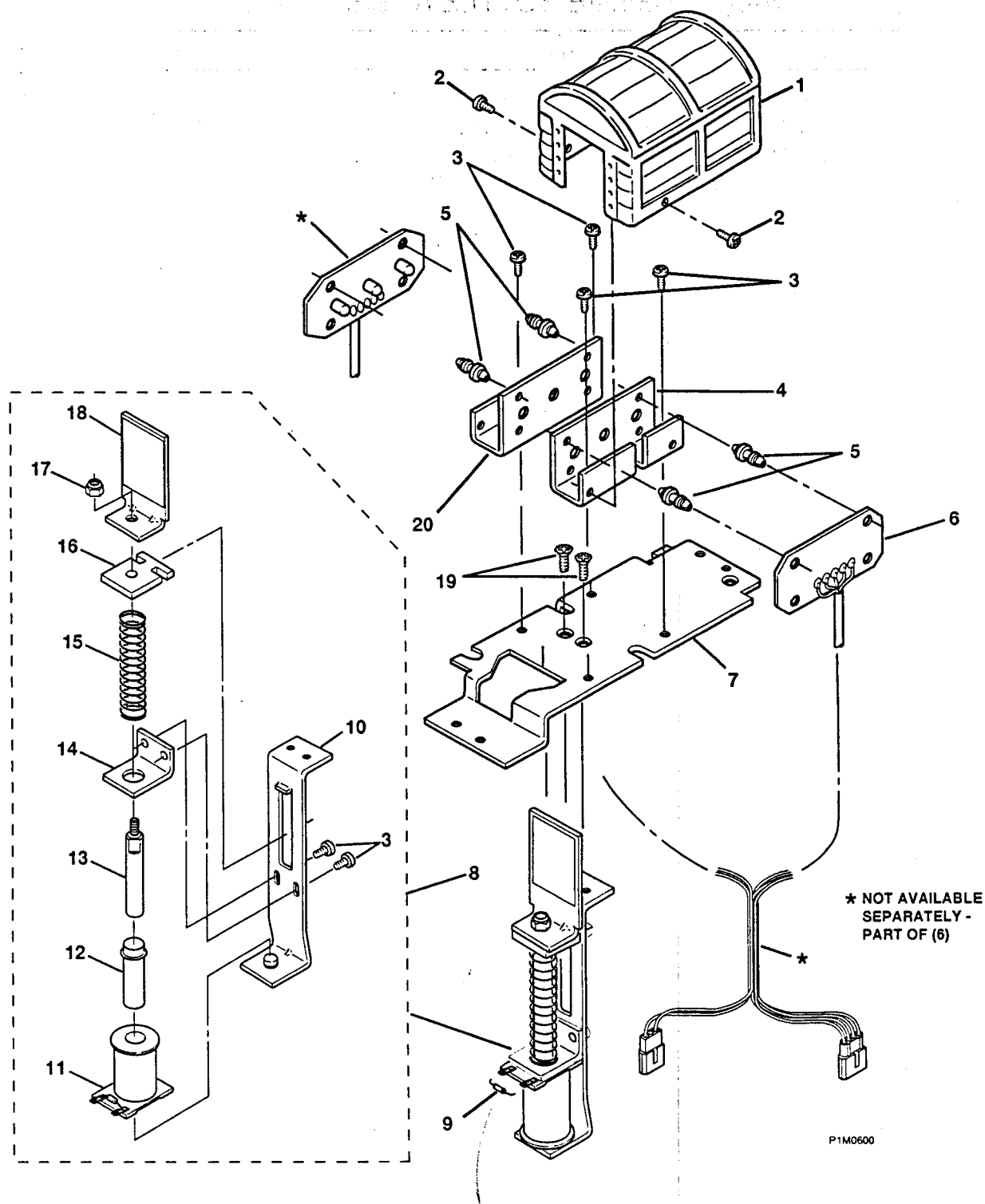
A-00156 STAGE ASSEMBLY			
No.	Part Number	Description	Req.
	A-00156	STAGE ASSEMBLY	
1	A-00184	STAGEBOX ASSEMBLY	1
2	SC00100-02	MS 6-32 x 1/4 PPH SEMS ZC	1
3	PL00181-03	SPACER #4 x 1/4 SELF RET	3
4	A-00431	OPTO & CABLE ASSEMBLY	1
5	SC00120-04	MS 4-40 x 1/2 PPH SEMS ZC	6
6	AW00123-32	STAGE DOOR, L	1
7	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



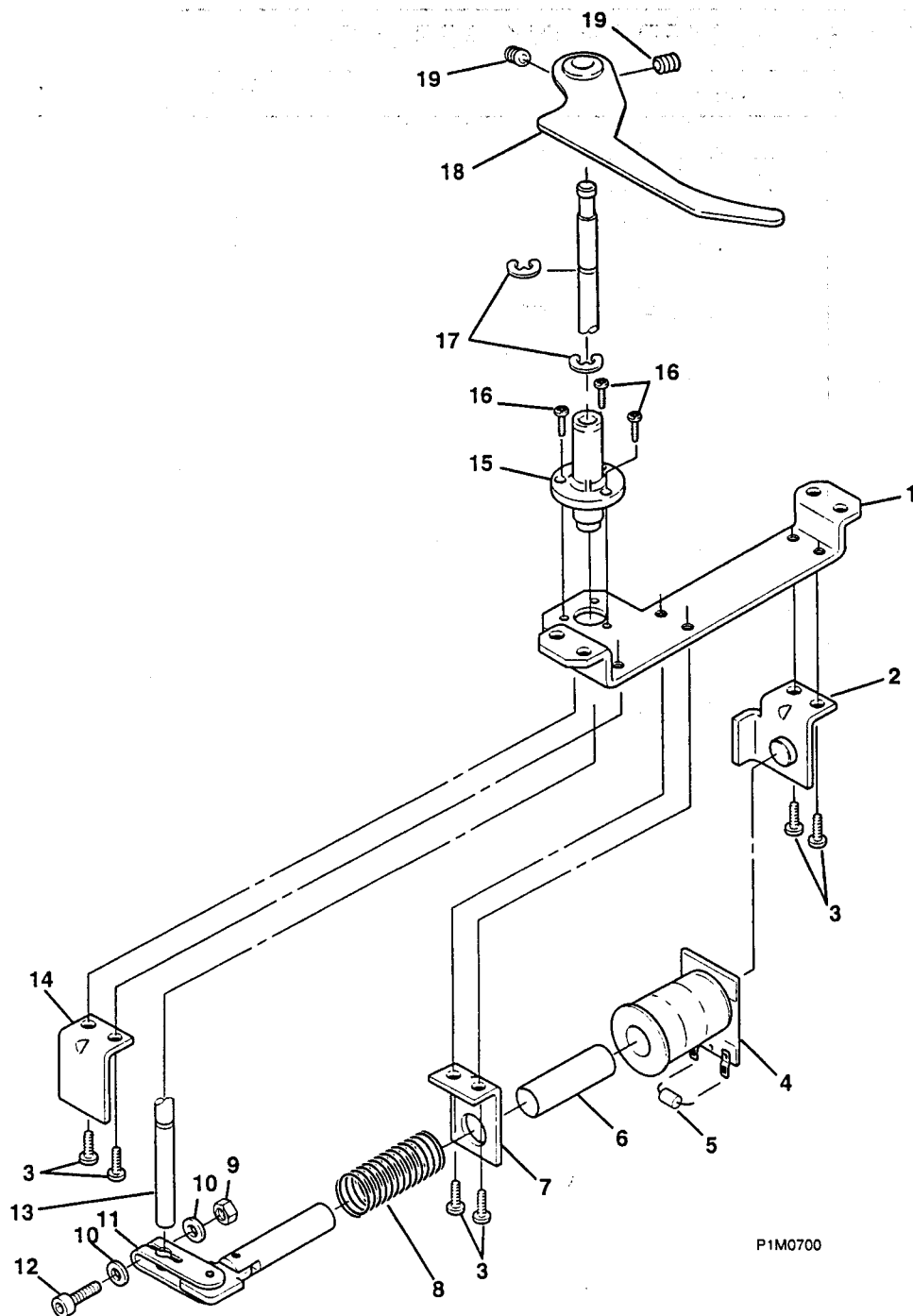
A-002041 STAGE ELEVATOR ASSEMBLY			
No.	Part Number	Description	Req.
	A-002041	STAGE ELEVATOR ASSEMBLY	
1	A-00385	BUCKET ASSEMBLY, ELEVATOR	1
2	A-00205	ELEVATOR MTG BRKT ASSEMBLY	1
3	SC00100-02	MS 8-32 x 1/4 PPH SEMS ZC	3
4	PL00149	BUSHING	1
5	MR00106	MOTOR, GEAR, MOLON	1
6	SC00101-06	MS 8-32 x 3/4 PPH 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

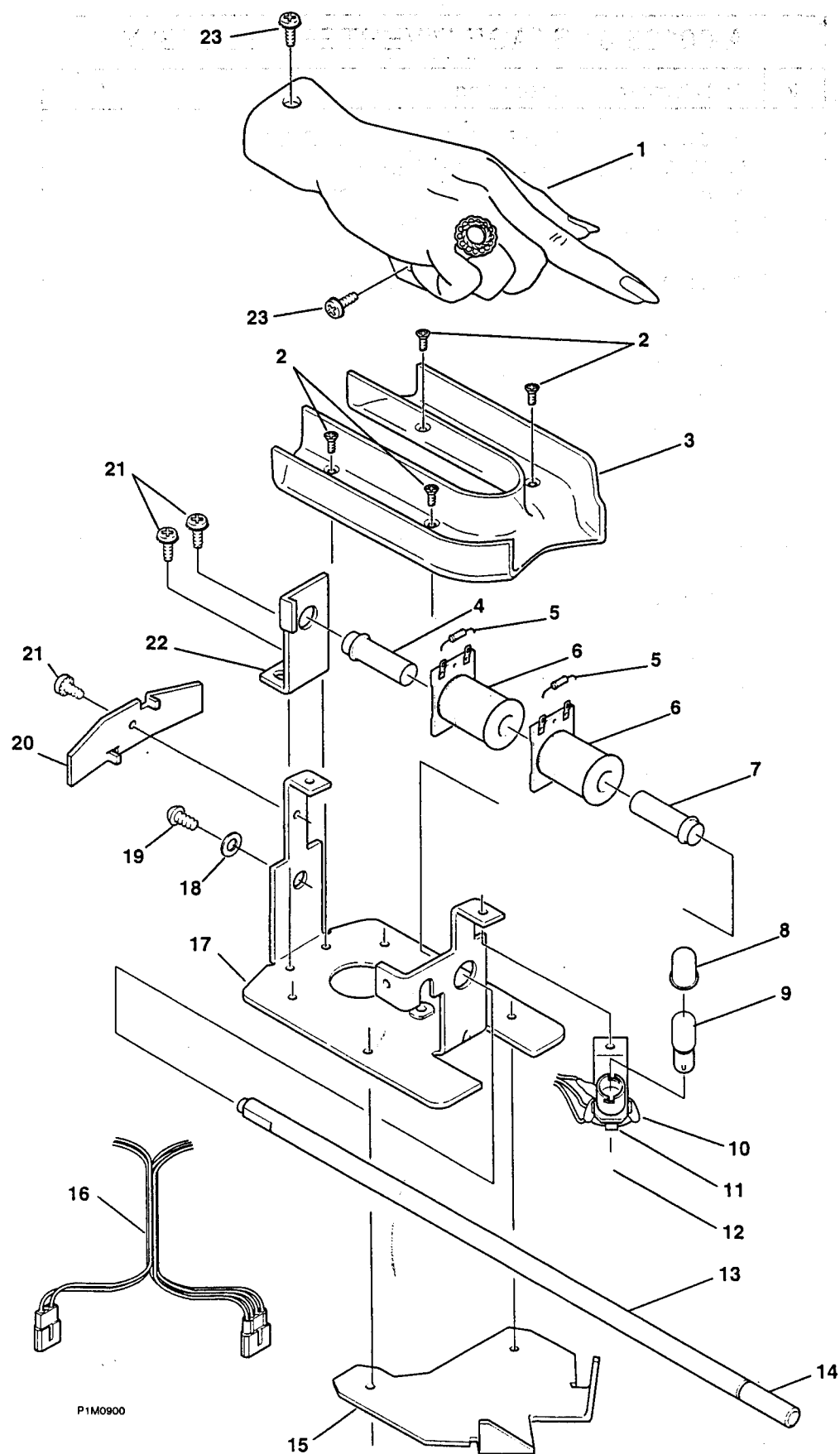


A-00145-1 LOCKED TRUNK ASSEMBLY			
No.	Part Number	Description	Req.
	A-00145	LOCKED TRUNK ASSEMBLY	
1	PL00151	TRUNK PLASTIC	1
2	SC00127-01B	MS 6-32 x 1/8 PPH BLK	2
3	SC00101-02	MS 8-32 x 1/4 PPH SEMS ZC	4
4	MT00202-R	OPTO MTG. BRKT - R	1
5	PL00242-03	POST, SUPPORT PCB 5/16"	4
6	A-00390-1	OPTO & CABLE 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

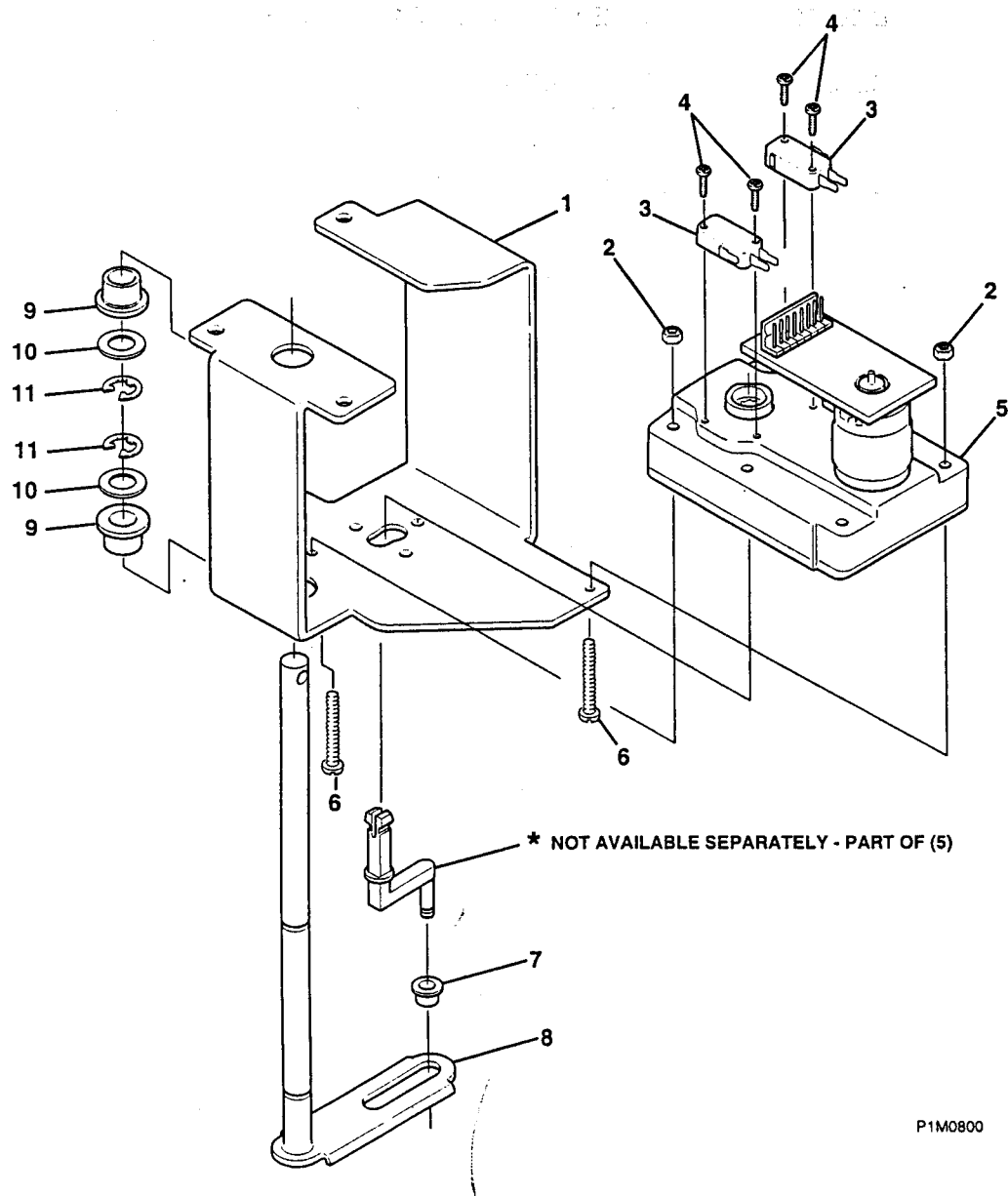


P1M0700

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

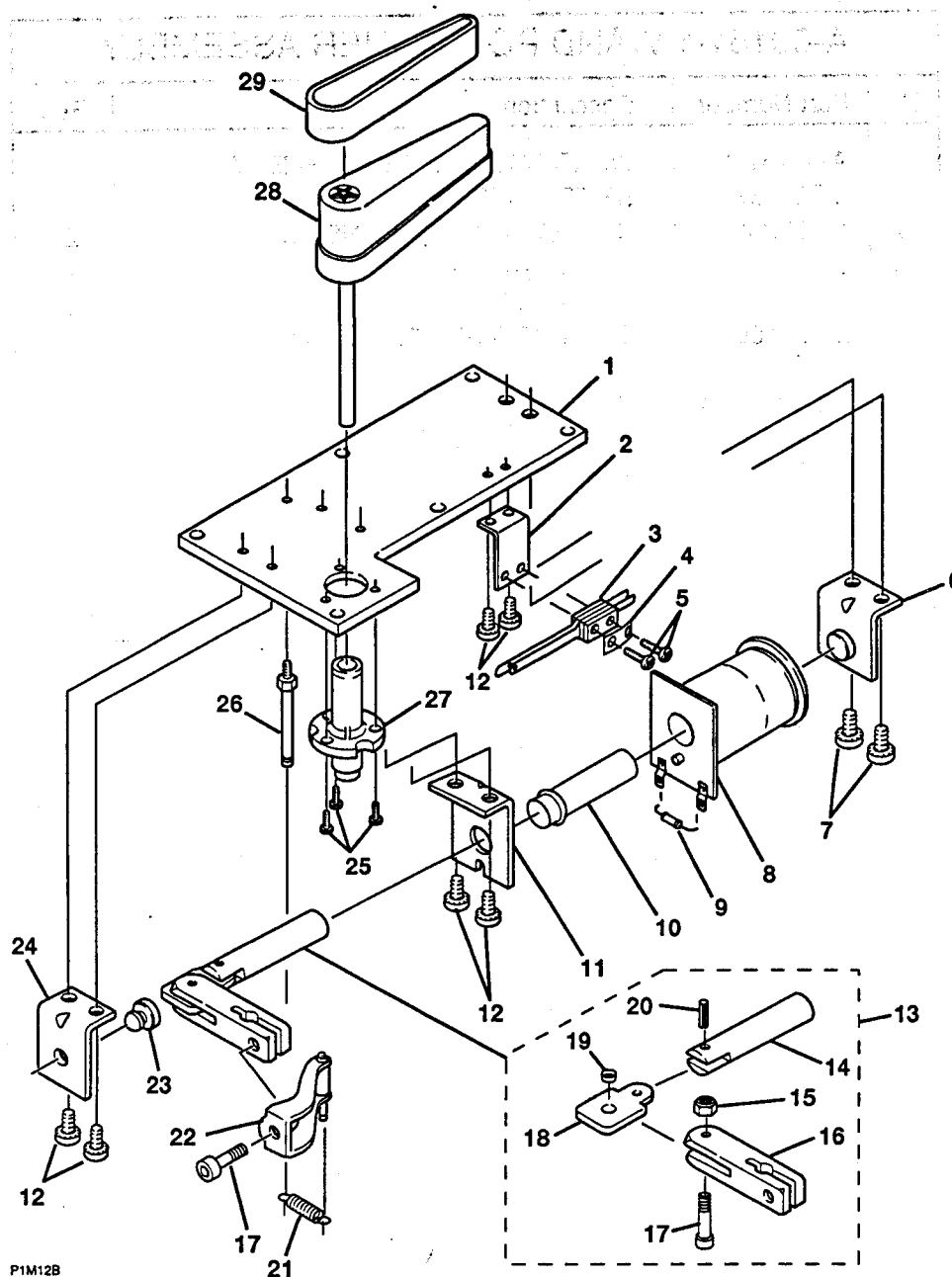


A-00210 WAND ASSEMBLY			
No.	Part Number	Description	Req.
	A-00210	WAND ASSEMBLY	
1	PL00207	HAND, WAND	1
2	SC00107-02	MS 8-32 x 1/4 PFH ZC	4
3	A-00426	RAMP, WAND ISLAND	1
4	PL00154-02	SLEEVE, 1.500 L W/.250 EXT	1
5	DI00100	DIODE 1N4004 RECT 1.0A 400VR	2
6	CL00100	COIL, 1200T #26	2
7	PL00133-02	SLEEVE, 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 1N4004 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

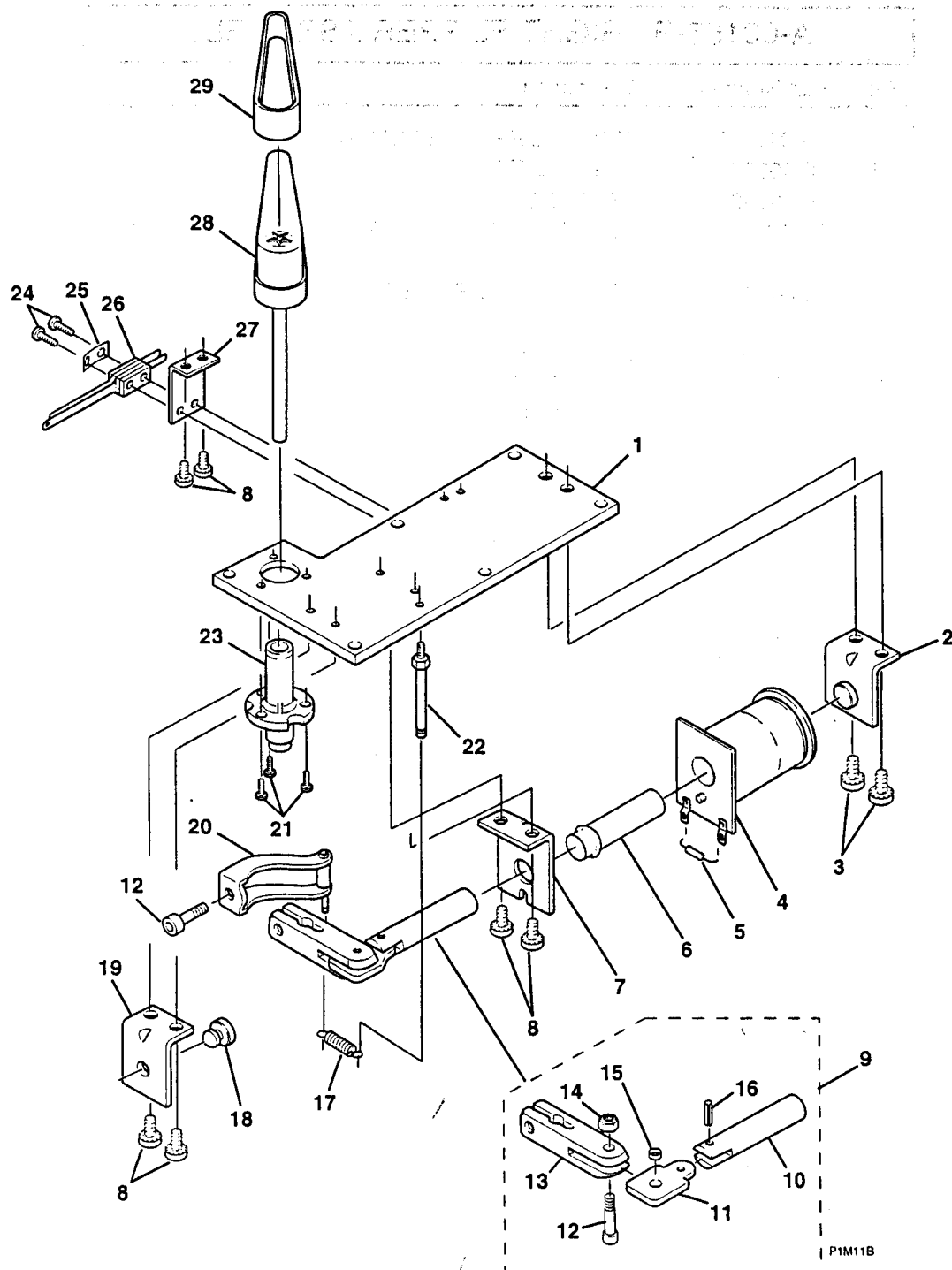


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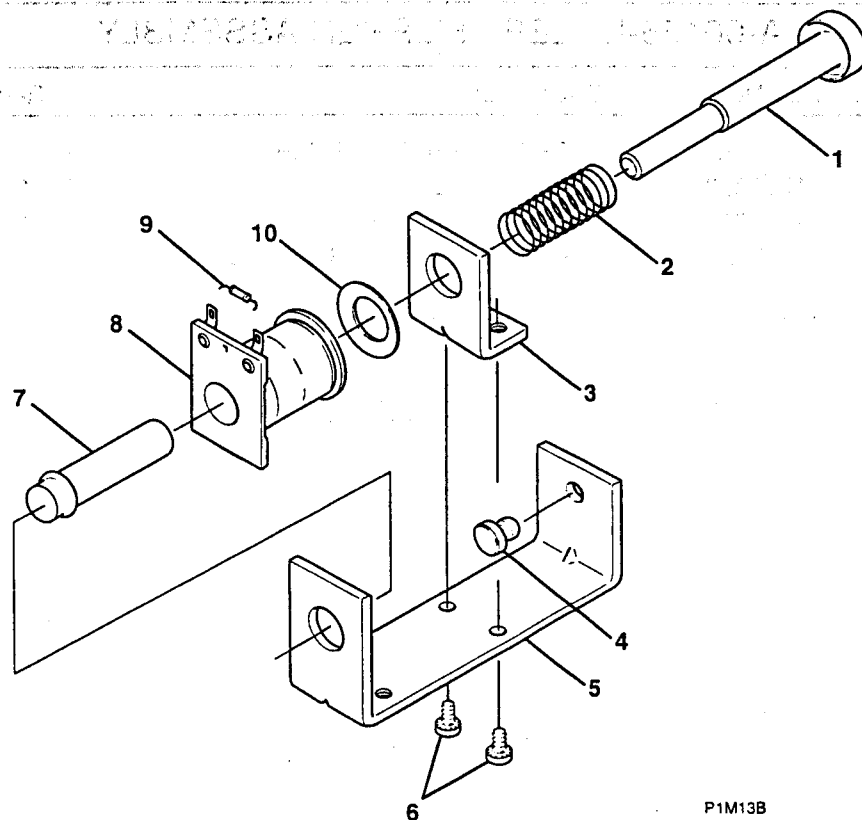
A-00151-1 WAND POSITIONER ASSEMBLY			
No.	Part Number	Description	Req.
	A-00151-1	WAND POSITIONER ASSEMBLY	
1	MT00387	BRKT, MOTOR MOUNTING	1
2	NT00104-04	NUT, STOP 4-40 NYL INS ZC	2
3	SW00136	MICRO SWITCH	2
4	SC00117-04	MS 4-40 x 1/2 PFH	2
5	MR00106	GEAR MOTOR, DC, MOLON	1
6	SC00120-04	MS 4-40 x 7/8 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



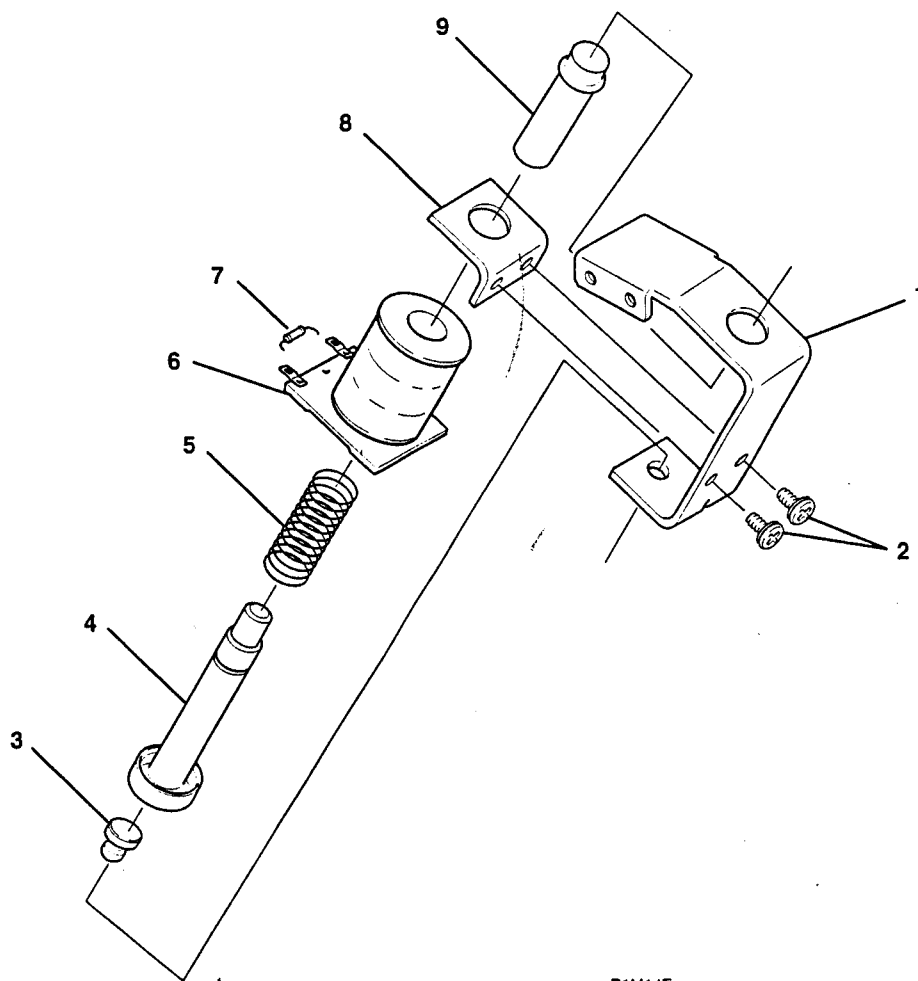
A-00155-R RIGHT FLIPPER ASSEMBLY			
No.	Part Number	Description	Req.
	A-00155-R	RIGHT FLIPPER ASSEMBLY	
1	MT00388	BASE PLATE	1
2	MT00392	BRKT. SWITCH MTG	1
3	SW00127	LEAF SWITCH, FLIPPER	1
4	MT00461-1	PLATE, SWITCH	2
5	SC00100-05	MS 6-32 x 5/8 PPH SEMS ZC	2
6	A-00378	BRKT. COIL STOP	1
7	SC00160-26	MS 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

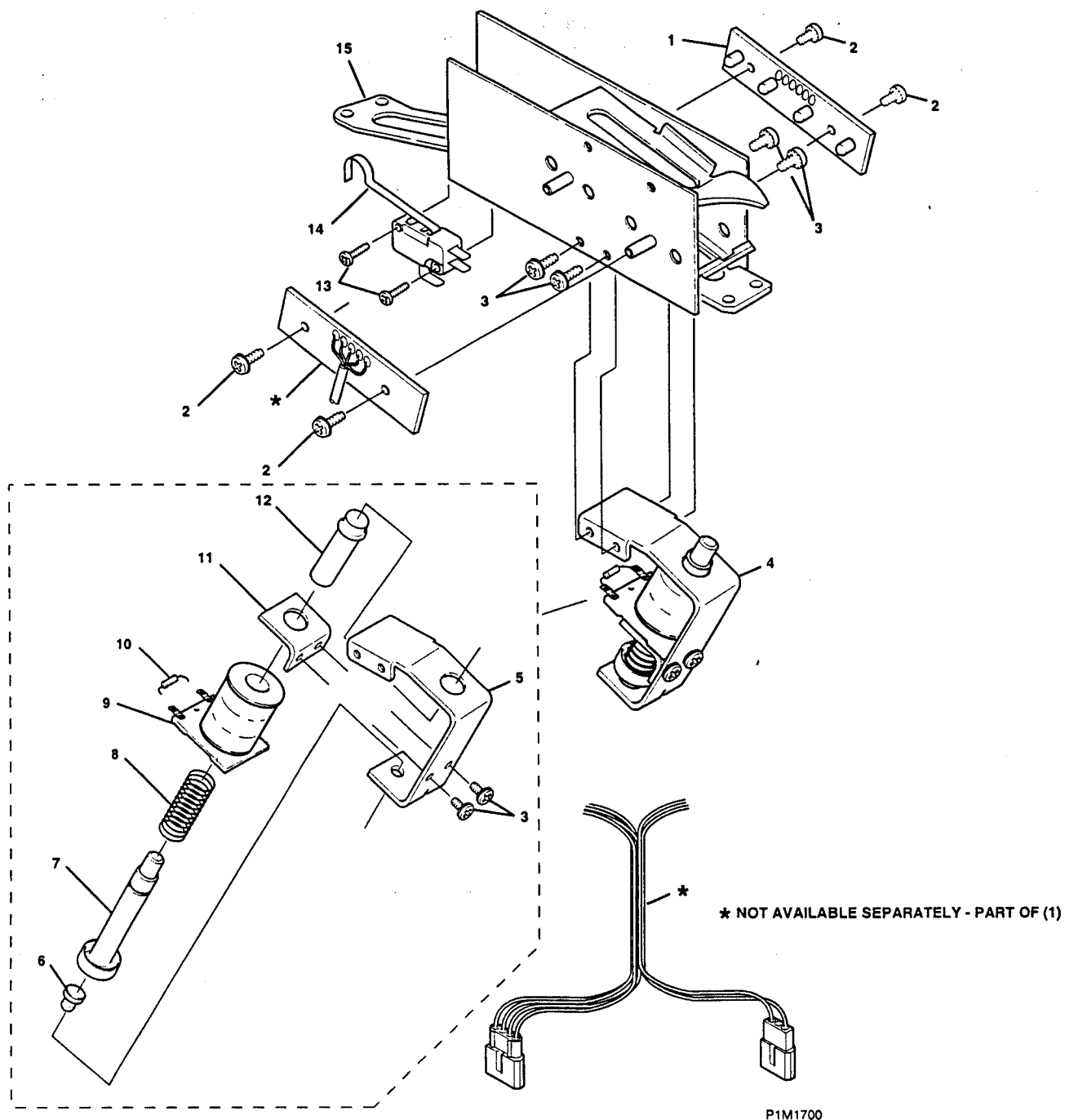


A-00148 KICKBACK ASSEMBLY			
No.	Part Number	Description	Req.
	A-00148	KICKBACK ASSEMBLY	
1	A-00147	PLUNGER & TIP ASSEMBLY	1
2	SG00105	SPRING COMP. 0.700 x 1.625	1
3	MT00136	BRKT, COIL RETAINING	1
4	RB00110	BUTTON, BUMPER	1
5	MT00203	BRKT, COIL MTG.	1
6	SC00101-02	MS 8-32 x 1/4 PPH SEMS ZC	2
7	PL00154	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

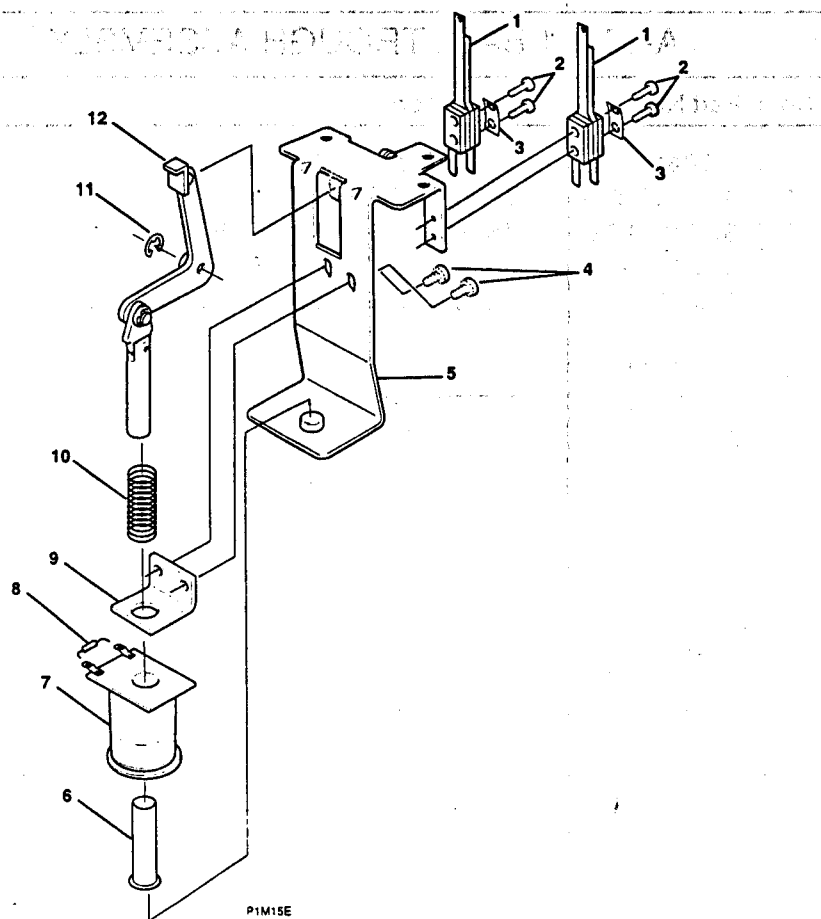


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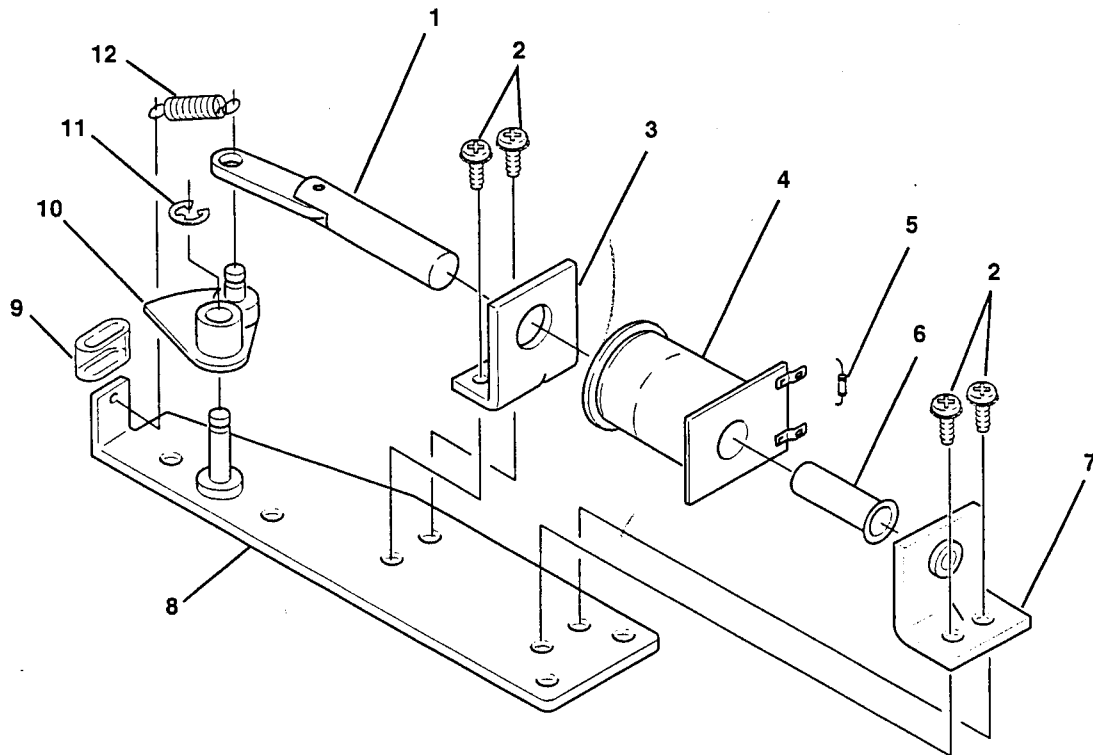
A-00371 BALL KICKER ASSEMBLY			
No.	Part Number	Description	Req.
	A-00371	BALL KICKER ASSEMBLY	
1	MT00378	BRKT, BALL KICKER	1
2	SC00101-02	MS 8-32 x 1/4 PPH SEMS ZC	2
3	RB00103	BUTTON, BUMPER	1
4	A-00369	PLUNGER & TIP ASSEMBLY	1
5	SG00103	SPRING, COMP. 0.625 x 2.000 L	1
6	CL00109	COIL 800T #23	1
7	DI00100	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



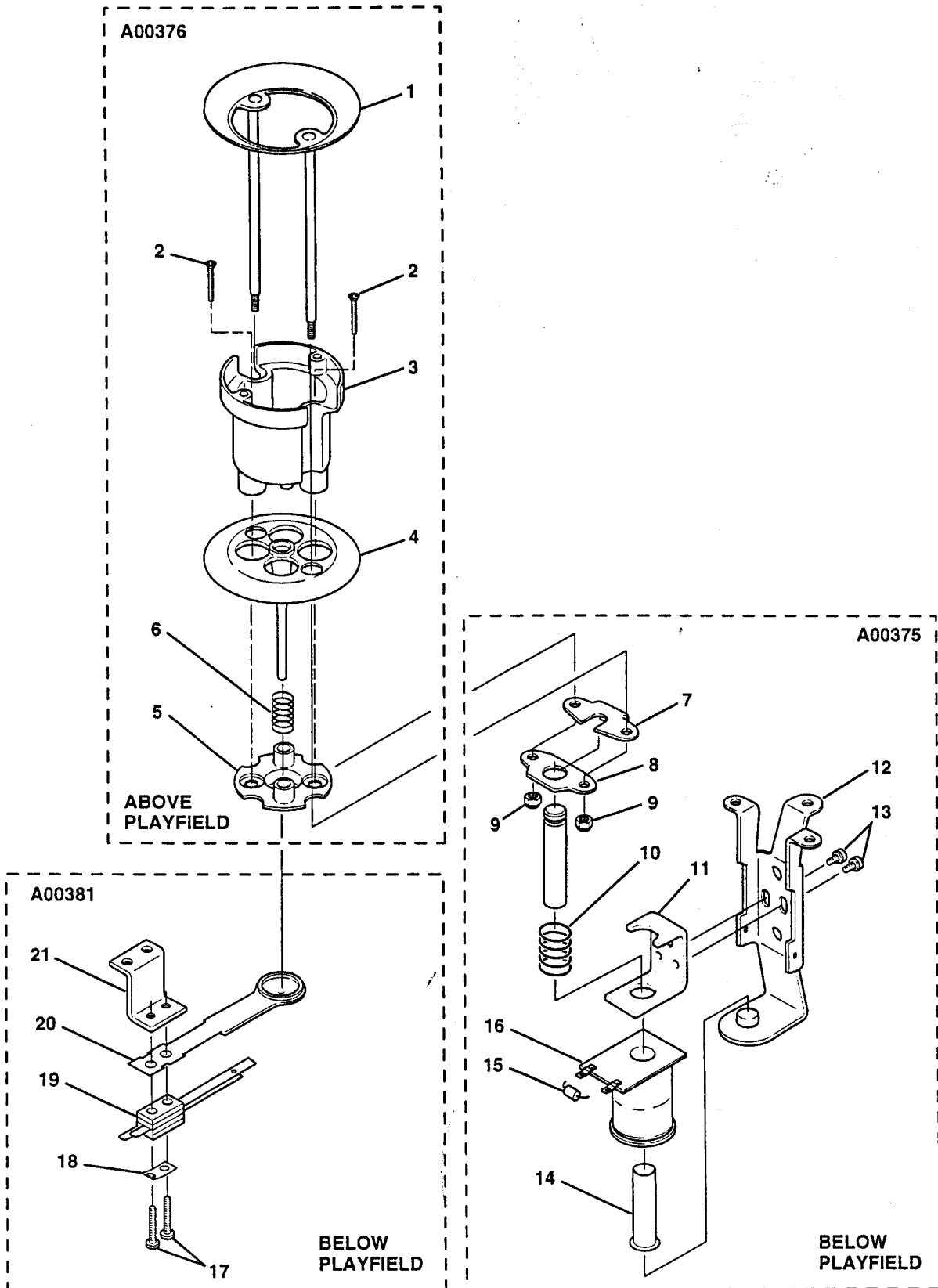
A-00157 SLINGSHOT ASSEMBLY			
No.	Part Number	Description	Req.
	A-00157	SLINGSHOT ASSEMBLY	
1	SW00120	SWITCH, LEAF, SLINGSHOT	2
2	SC00120-04	MS 4-40 x 1/2 PPH SEMS ZC	4
3	MT00461-1	PLATE, SWITCH	2
4	SC00100-02	MS 8-32 x 1/4 PPH SEMS ZC	2
5	MT00338	BRKT, COIL MOUNTING	1
6	PL00132	SLEEVE, COIL 1.75" L	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 <i>Standard Tests</i> and go to the <i>Switches</i> 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 <i>Standard Tests</i> and go to <i>Voltage</i> 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 reseal 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 <i>factory</i> 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 triggers 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

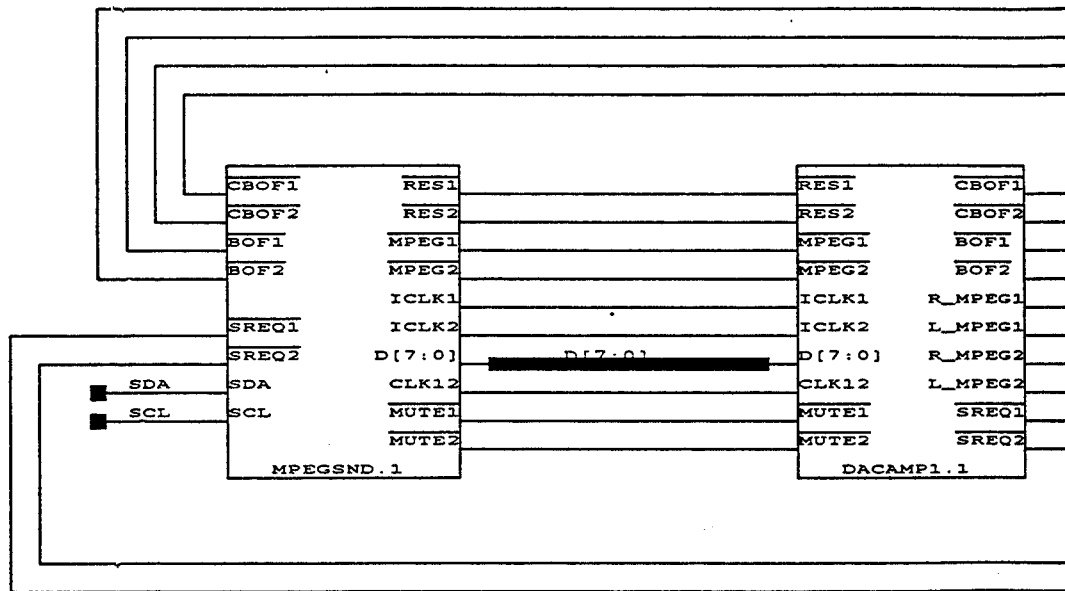
The Processor must send an enable signal to the Driver Board before any of the circuits will respond. This signal allows control data to pass through flip-flop circuits and into the driver devices. Lamp data from the microprocessor is decoded and turned into signals for rows and columns. In addition 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.

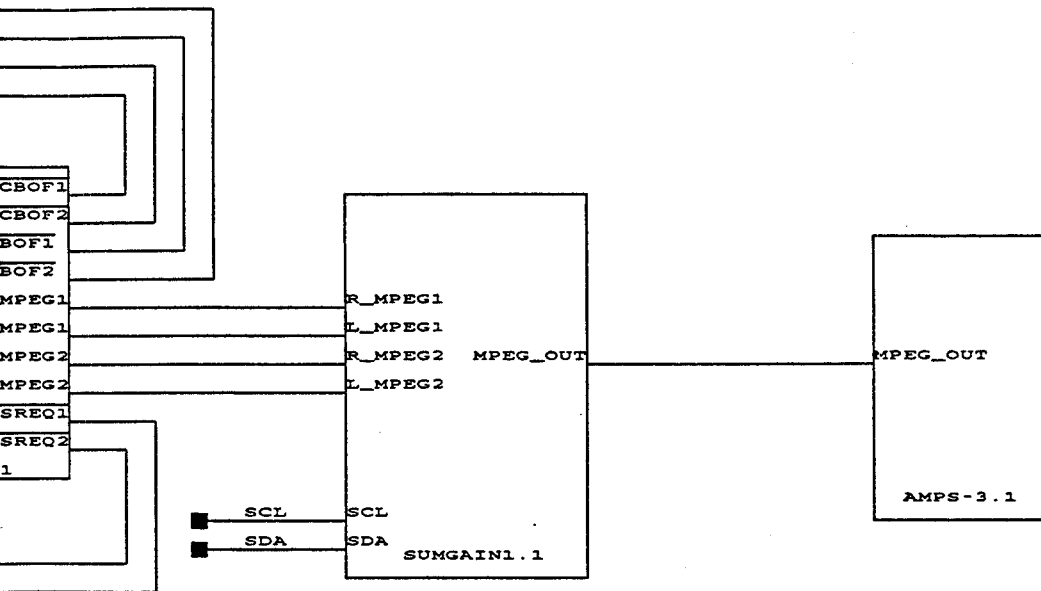
Power for each matrix is delivered by eight row drivers and eight column drivers. The lamp row drives use conventional devices with comparator circuits to sense excessive current and provide circuit protection. So called Smart Power Solid State Relays are used for the lamp columns and the independent 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.

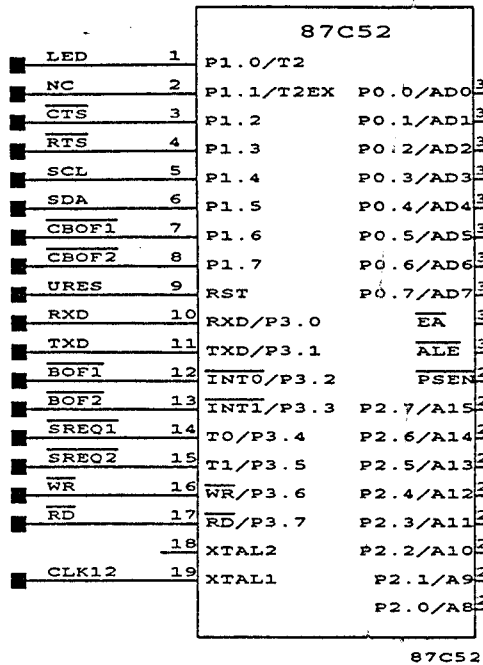




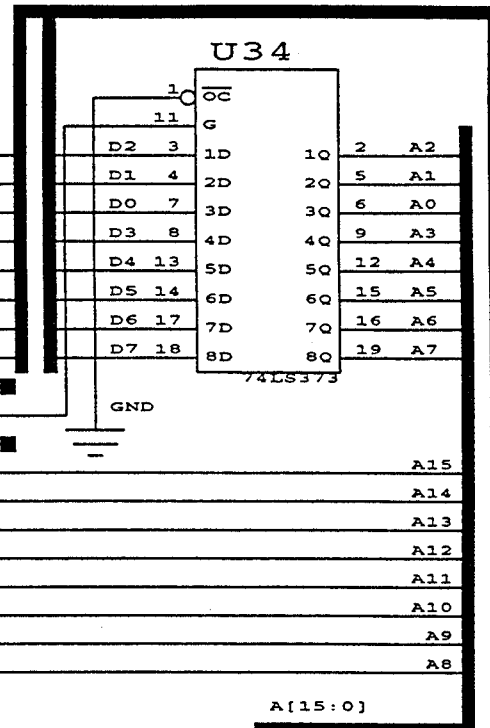
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J. BOYDSTON		A0015002
DATE		SHEET # REV
03/21/95		TOP -

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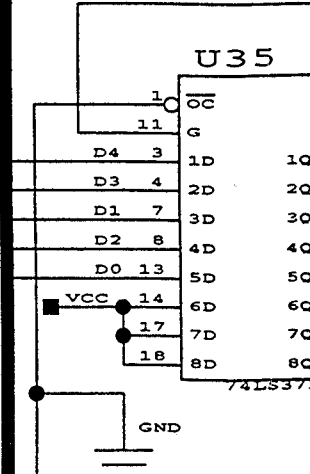
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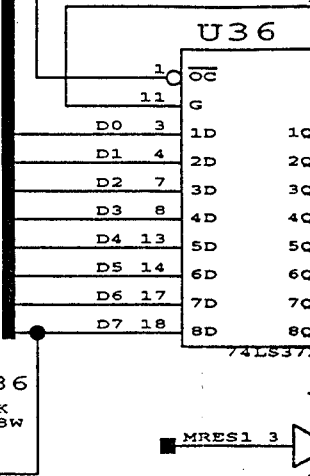
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U35



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D8

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C78

22UF

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1K

1/8W

GND

J5

STR .100

GRES

RXD

TXD

KEY

RTS

CTS

GND

+5V

C85

100PF

C84

100PF

C86

100PF

C87

100PF

C71

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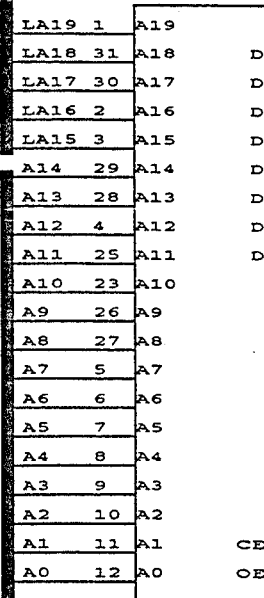
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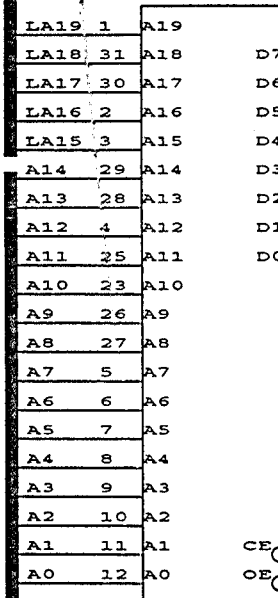
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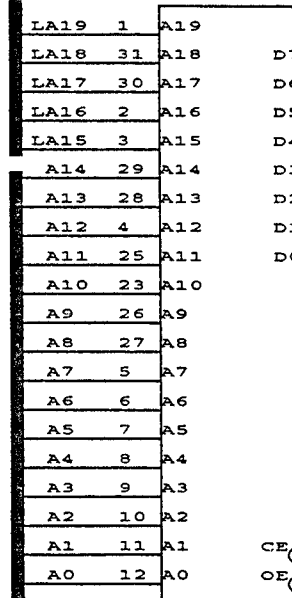
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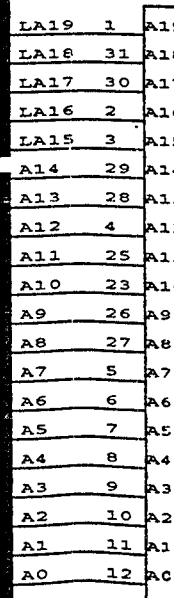


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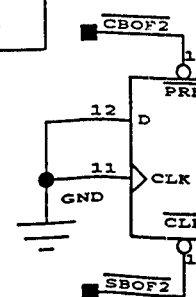
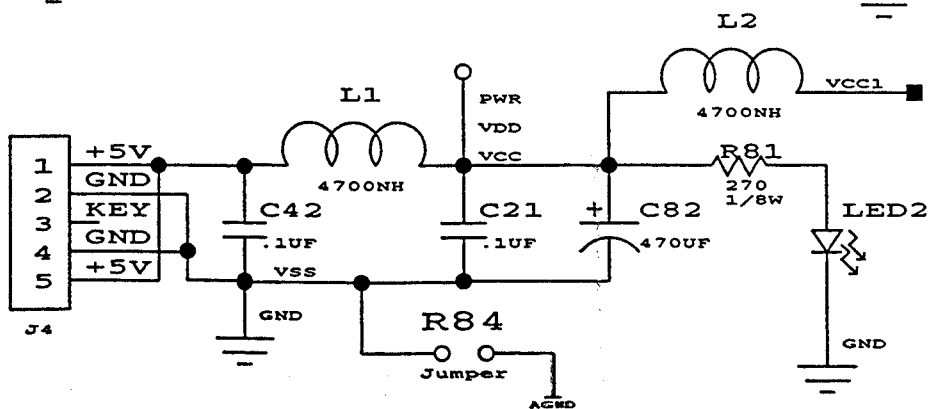
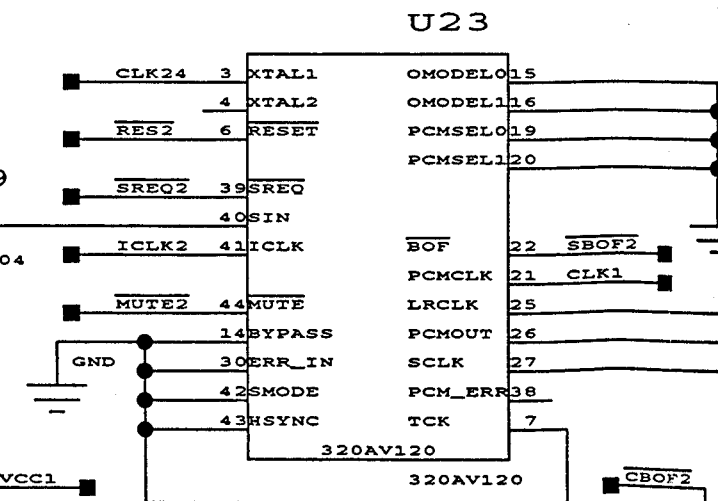
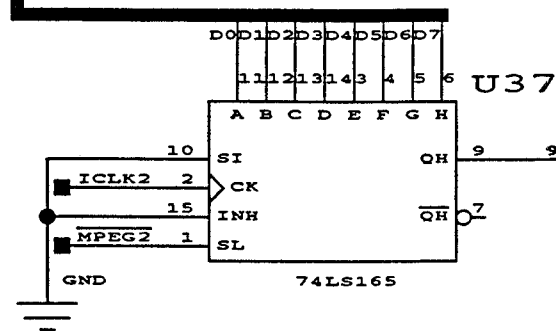
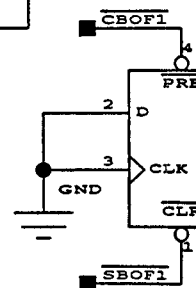
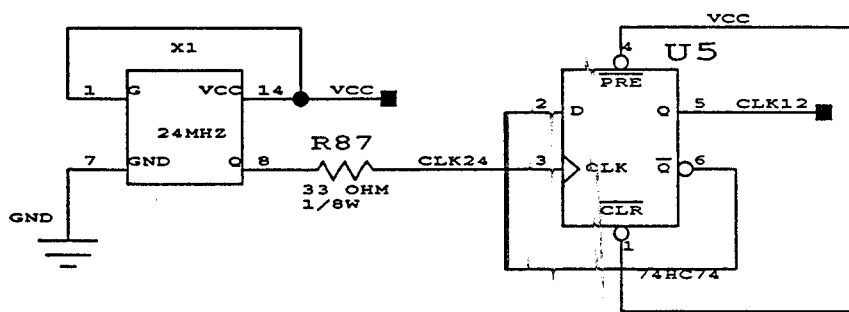
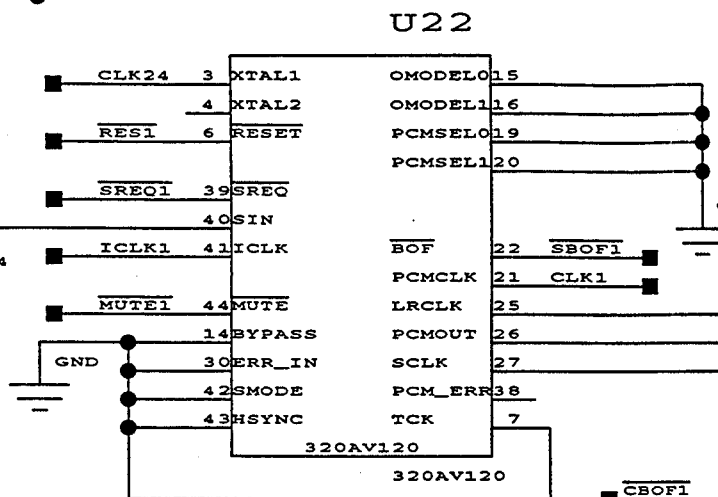
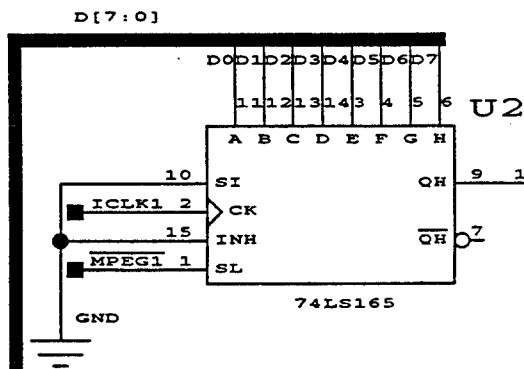
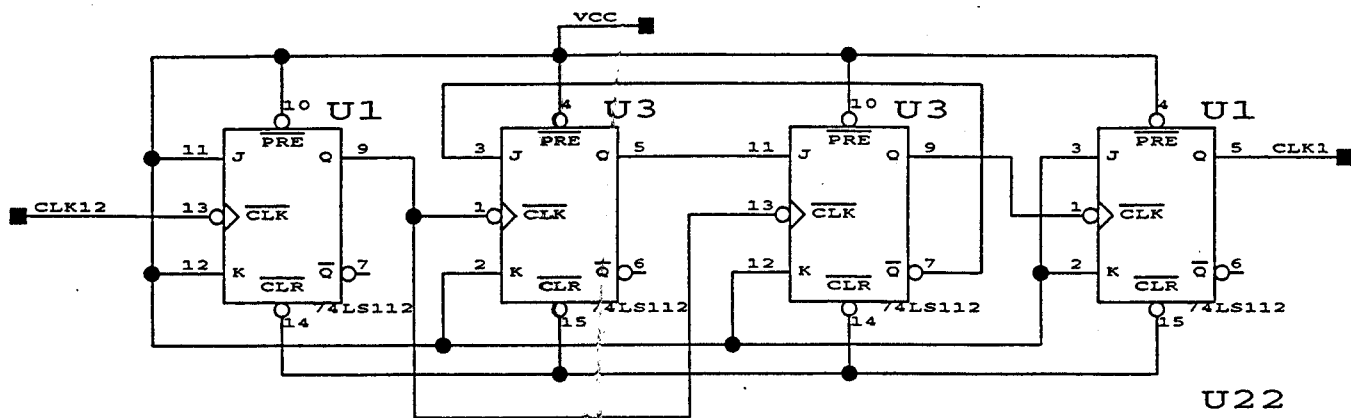
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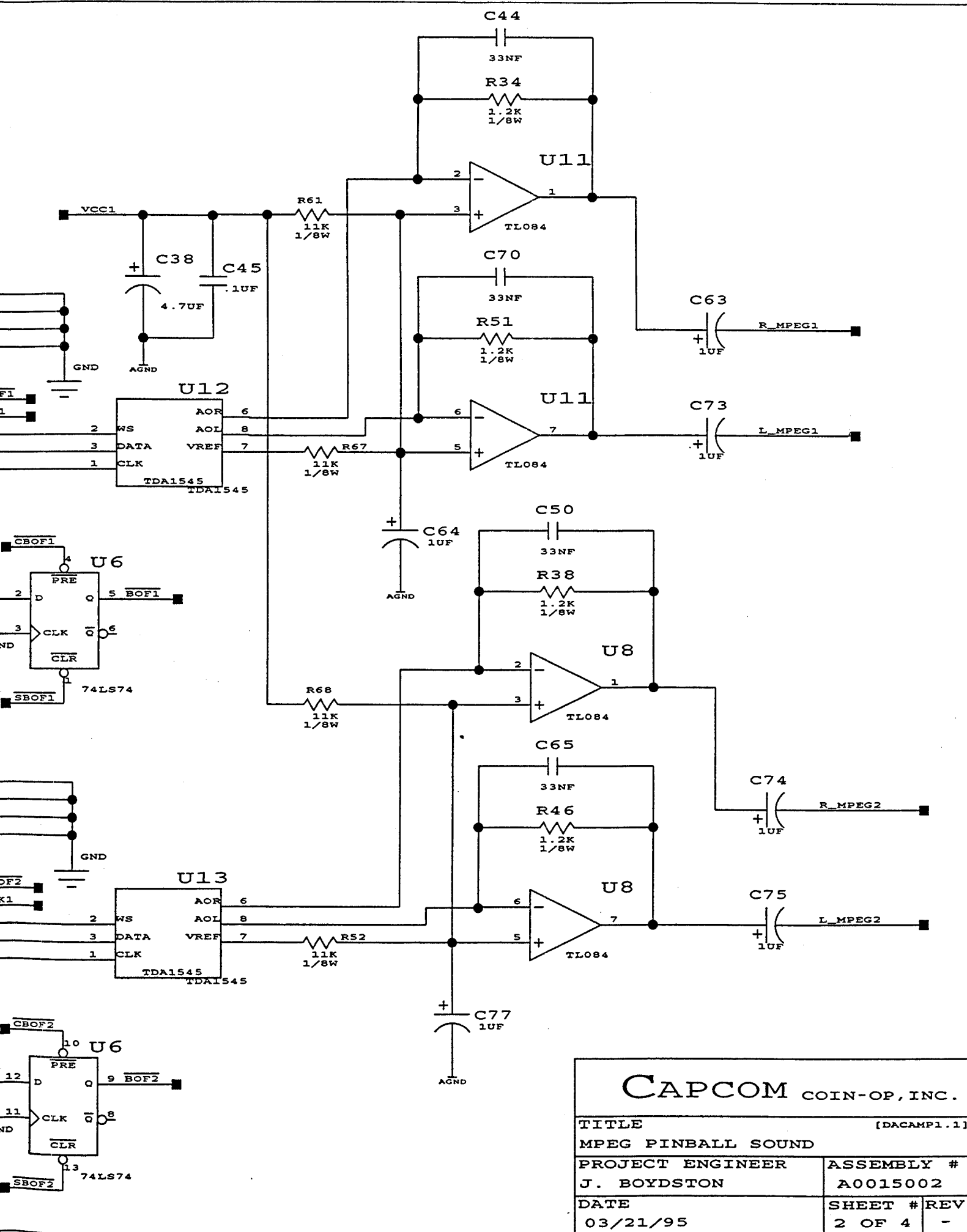


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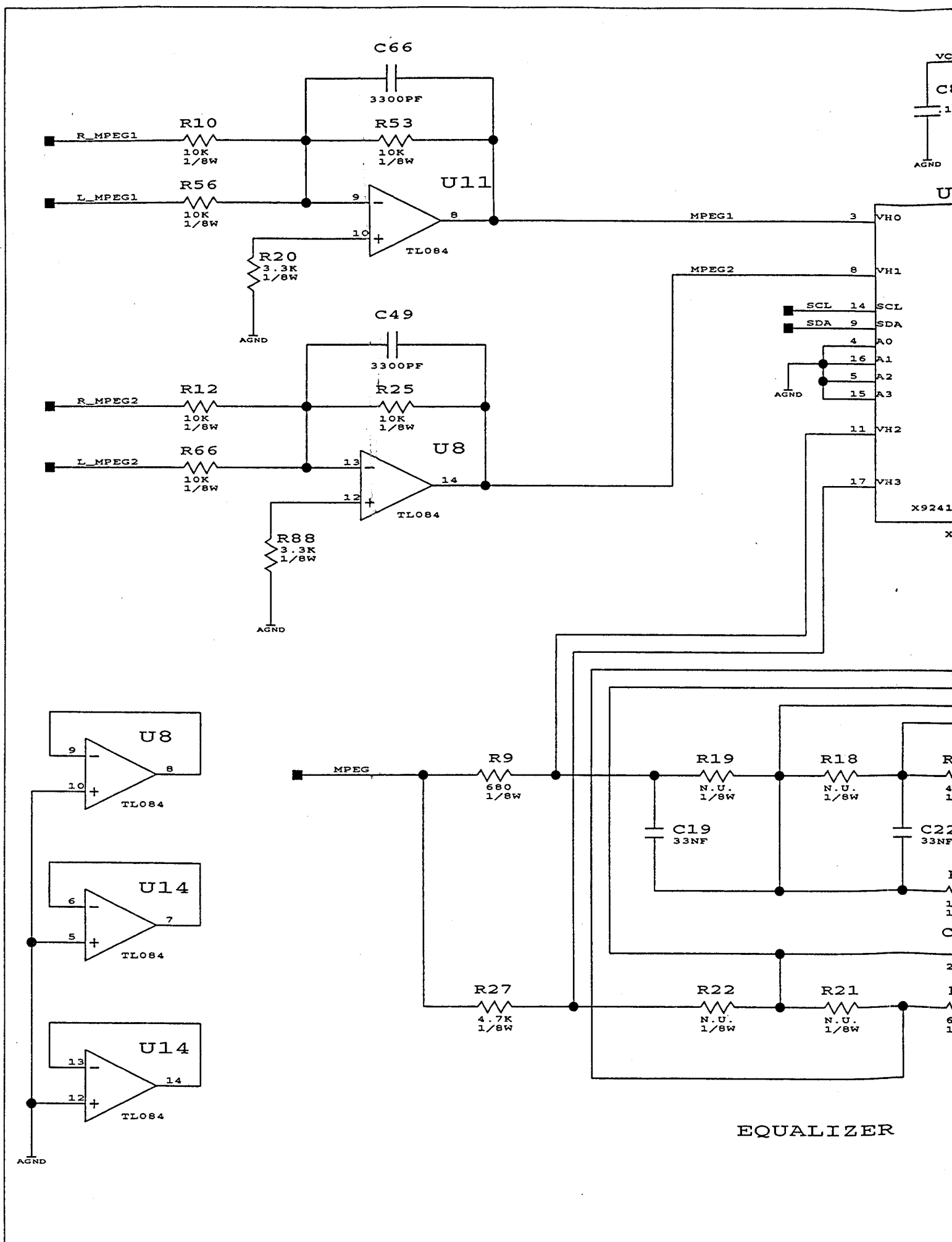
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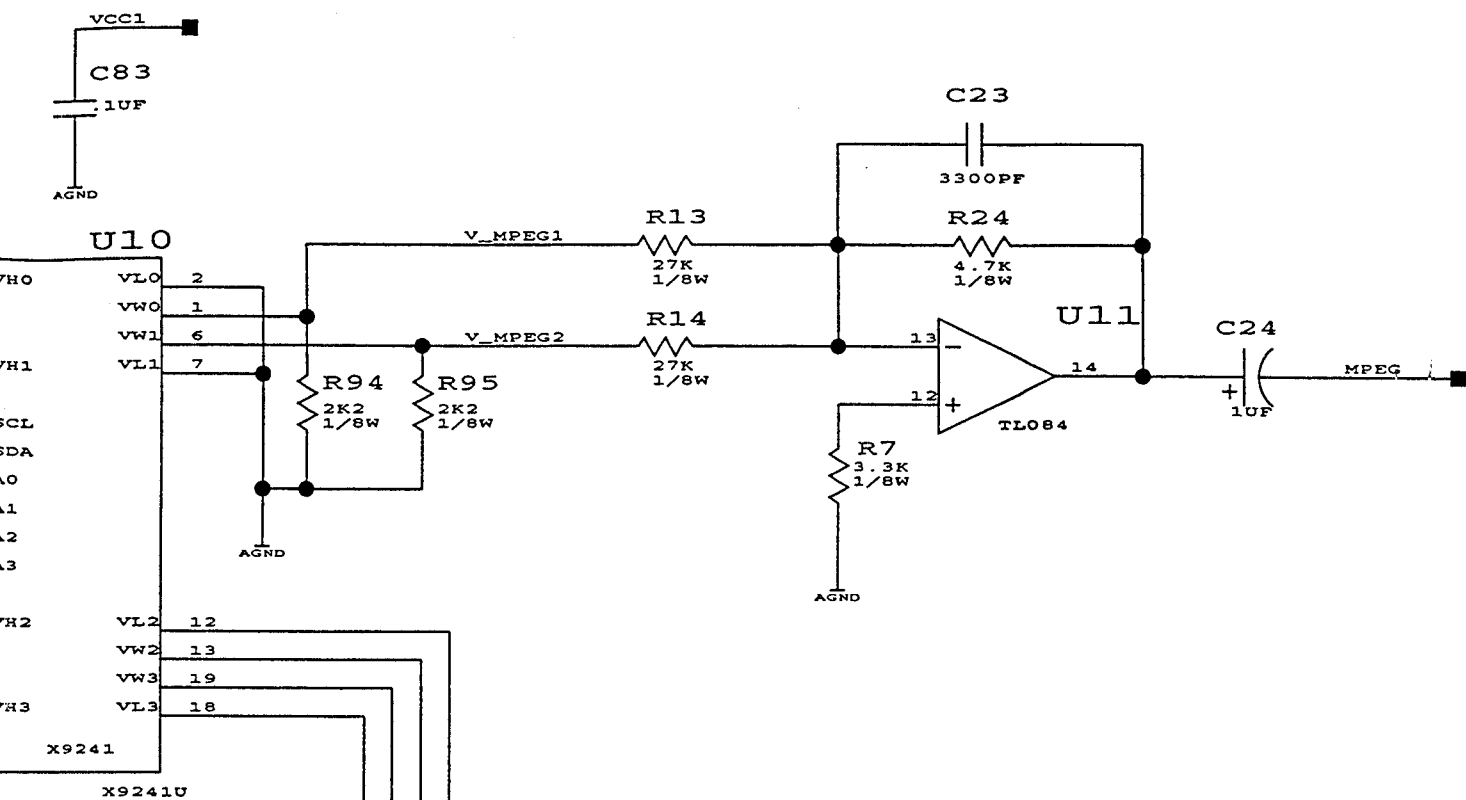




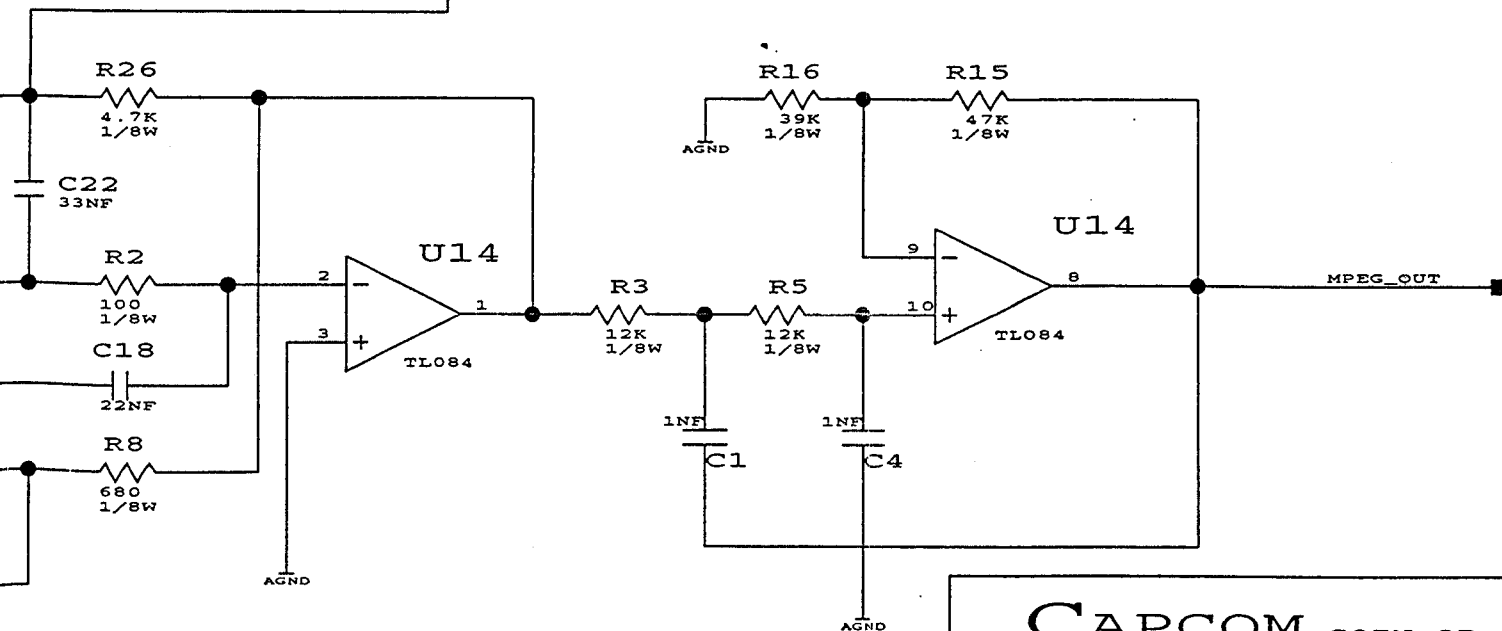
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J. BOYDSTON		A0015002
DATE		SHEET # REV
03/21/95		2 OF 4 -



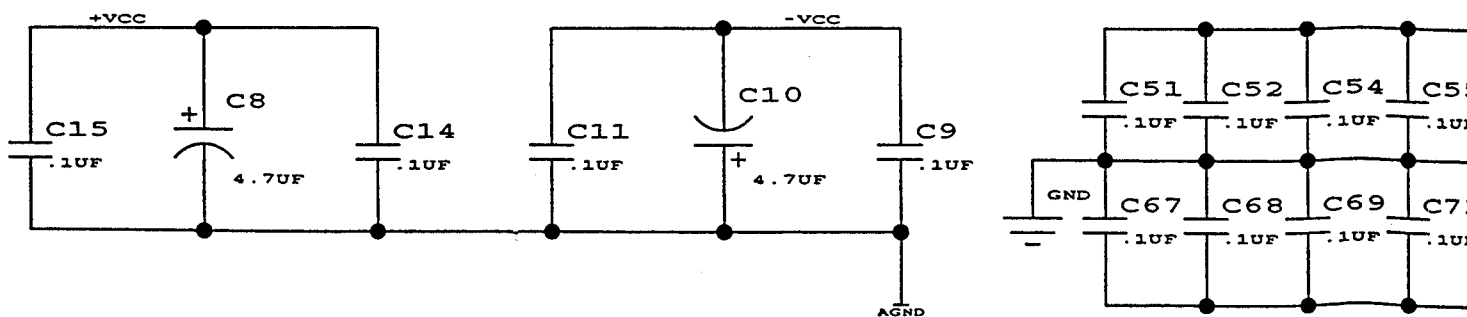
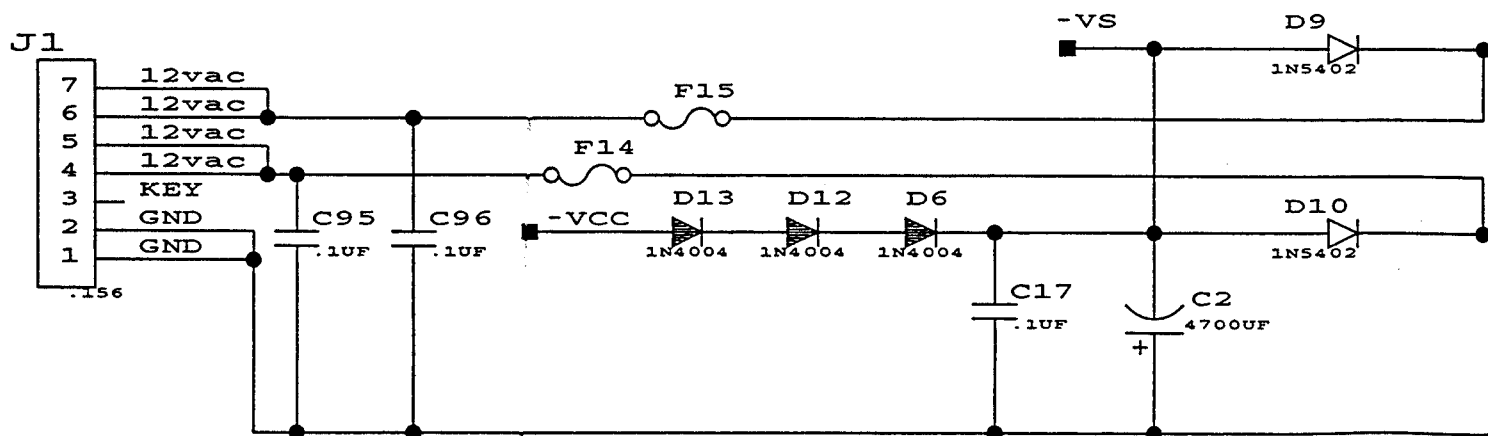
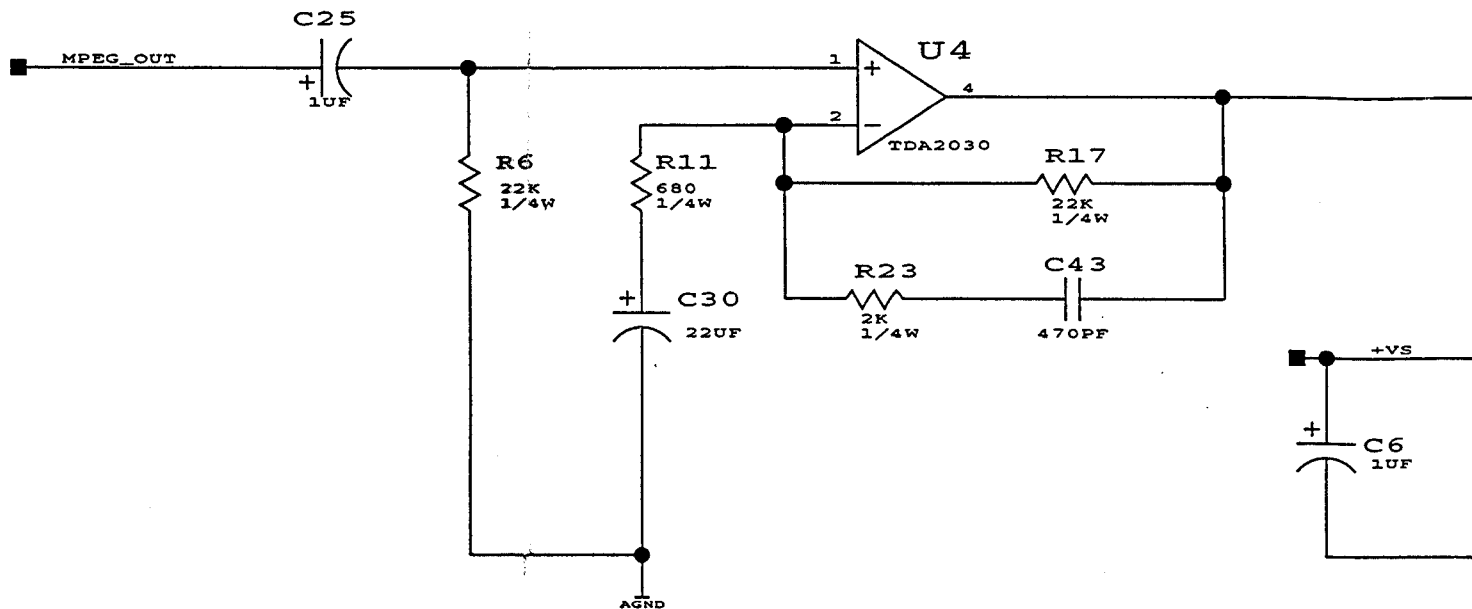


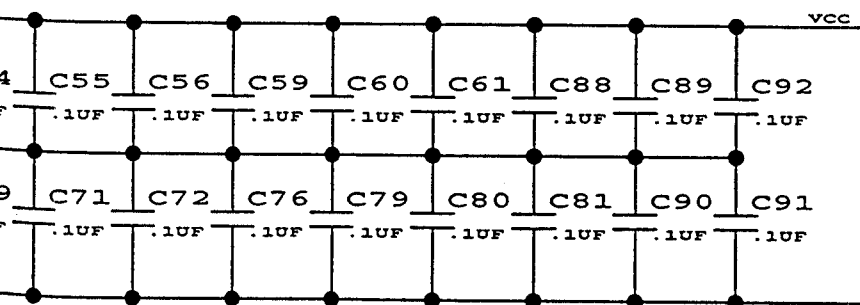
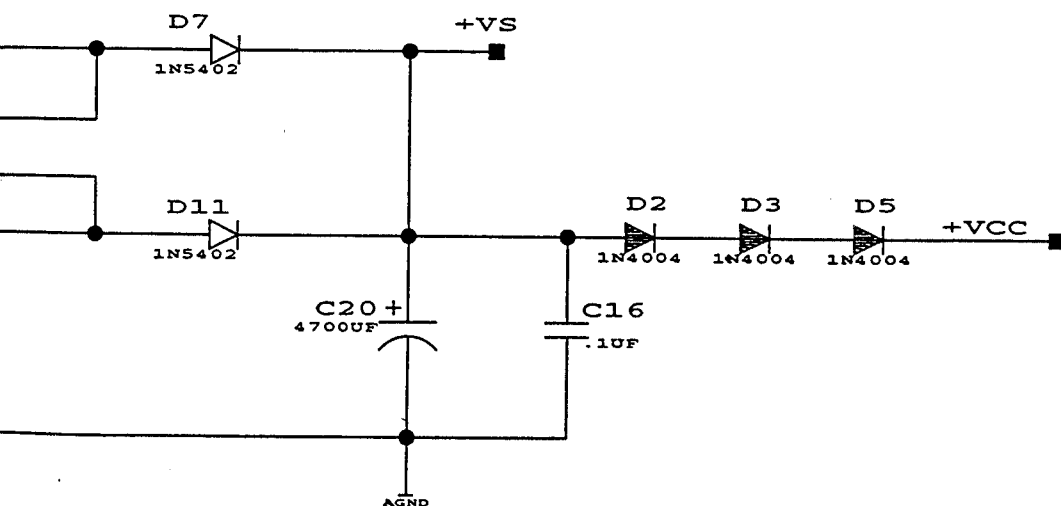
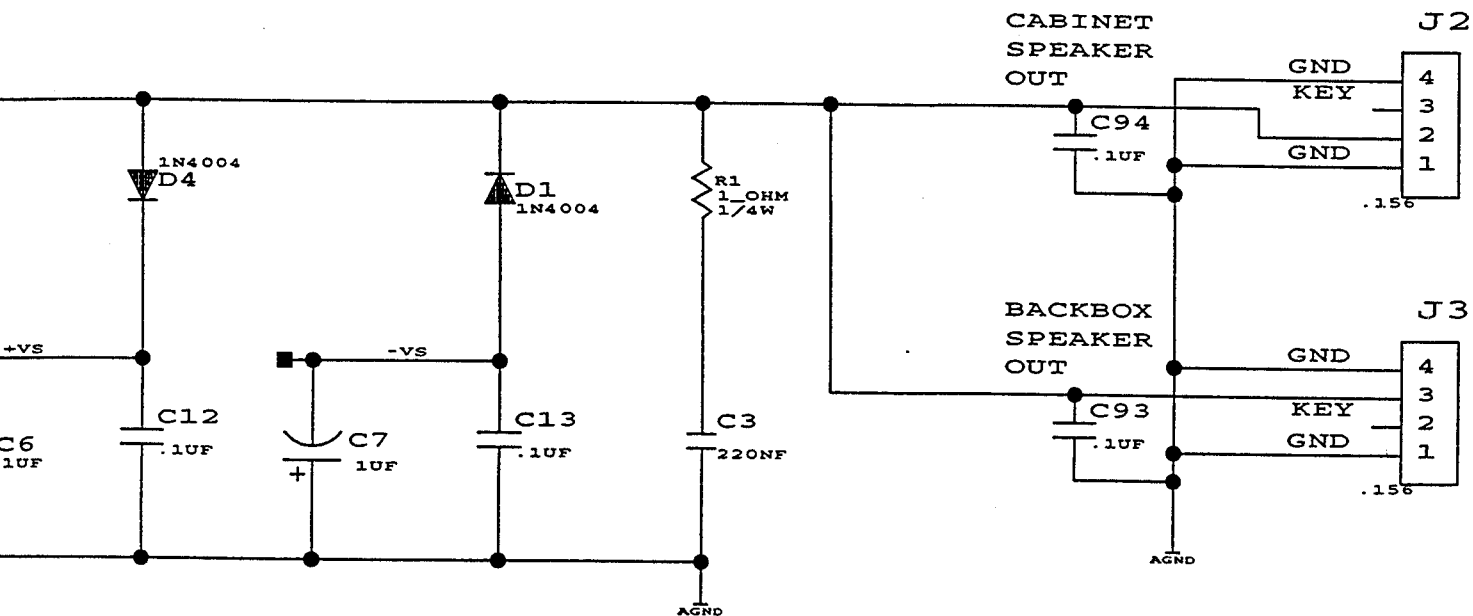
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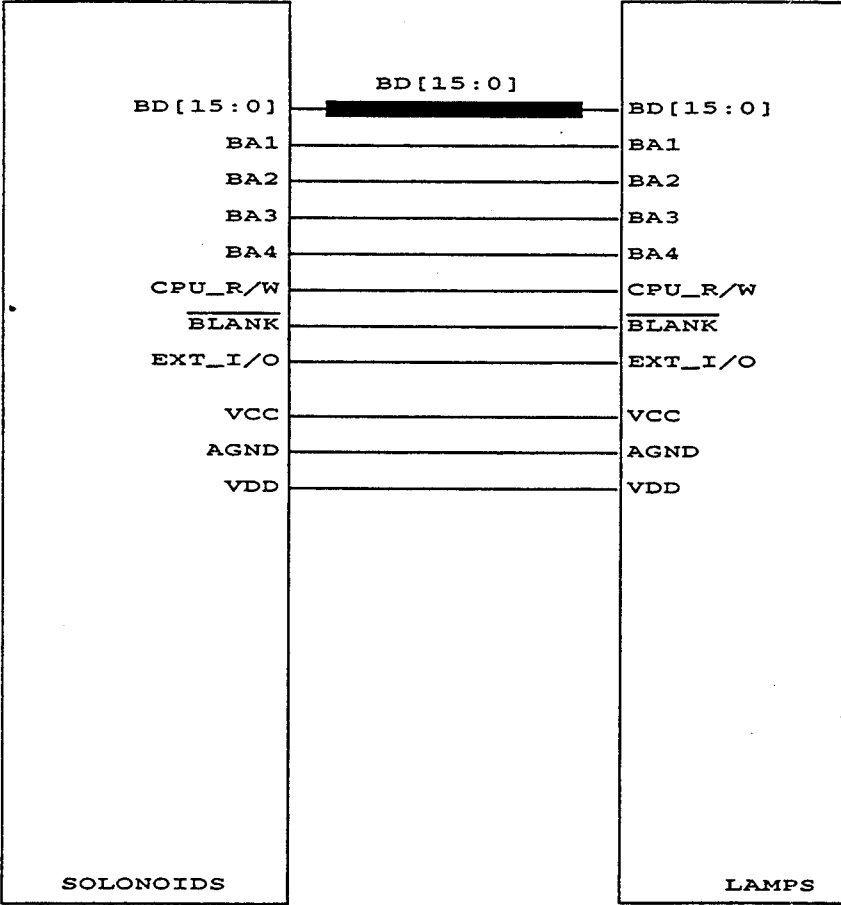
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J. BOYDSTON	A0015002
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CAPCOM COIN-OP, INC.		
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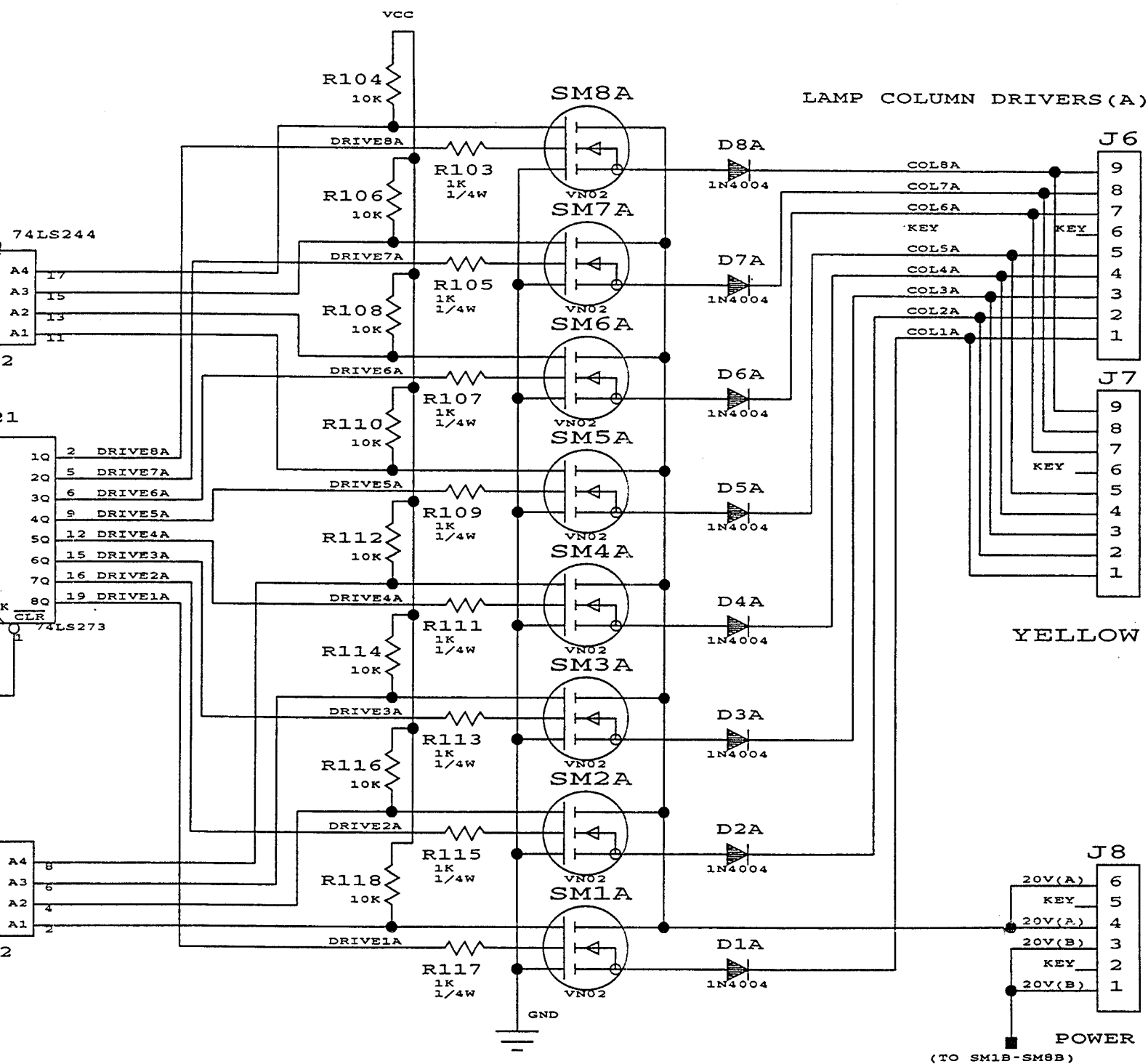
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LAMPS

CAPCOM COIN-OP, INC.

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GREG TOPEL	A0015105	
DATE	SHEET #	REV
AUGUST 16, 1995	1 OF 9	05

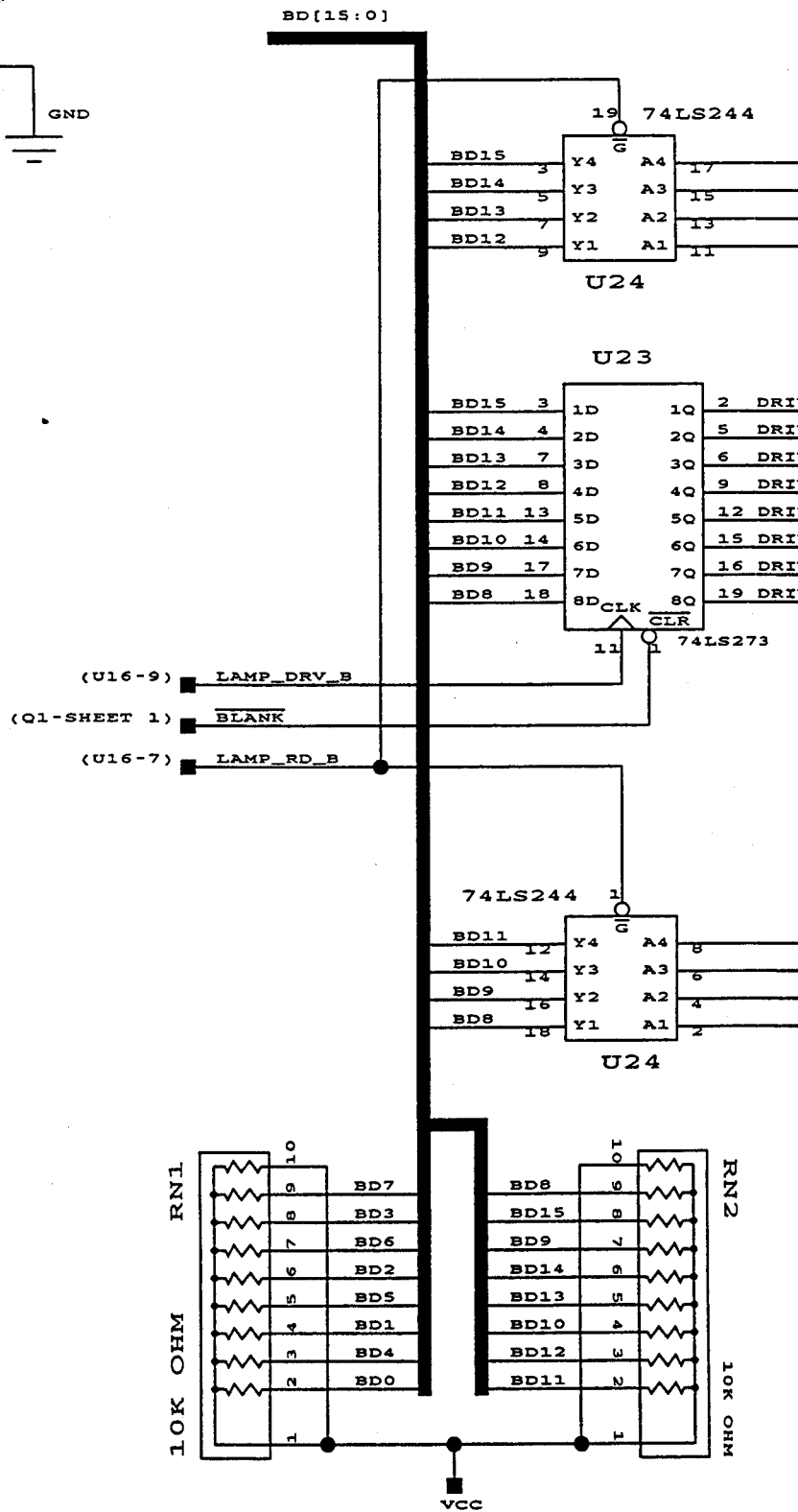
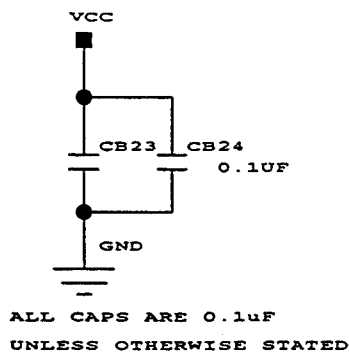
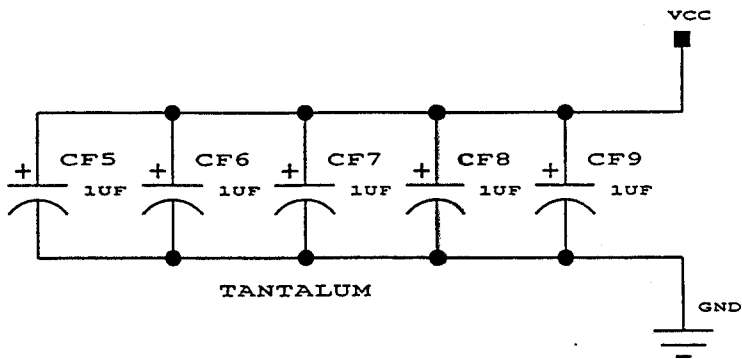


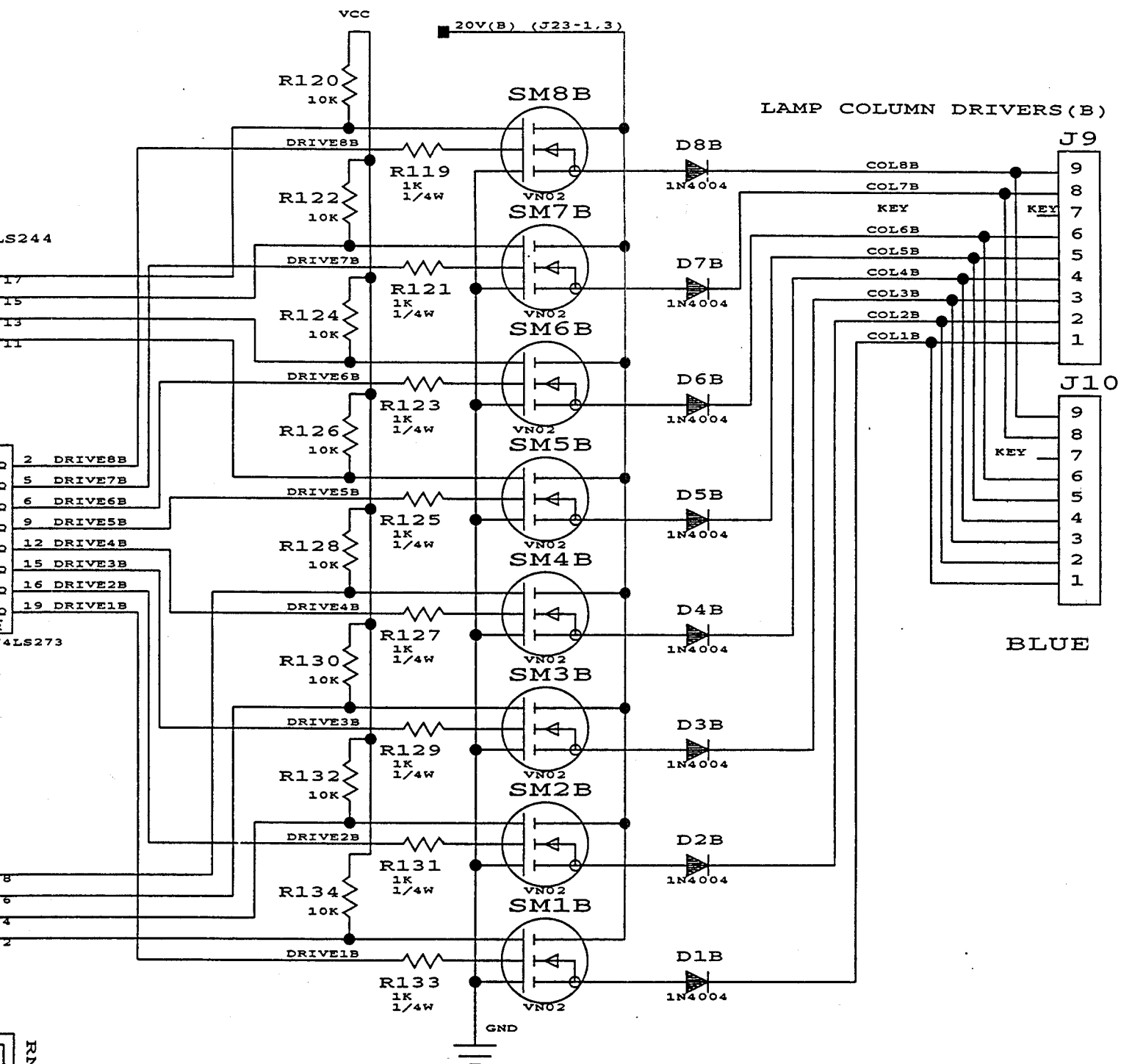
CB22
0.1UF

1uF
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



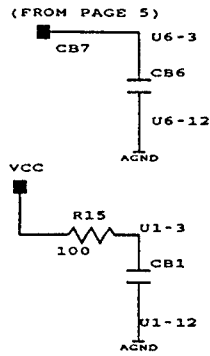
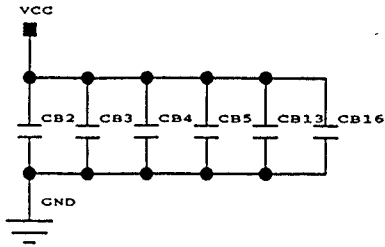


CAPCOM COIN-OP, INC.

TITLE (LAMP_PB.2)
DRIVER BOARD/LAMP COLUMN B

PROJECT ENGINEER ASSEMBLY #
GREG TOPEL A0015105

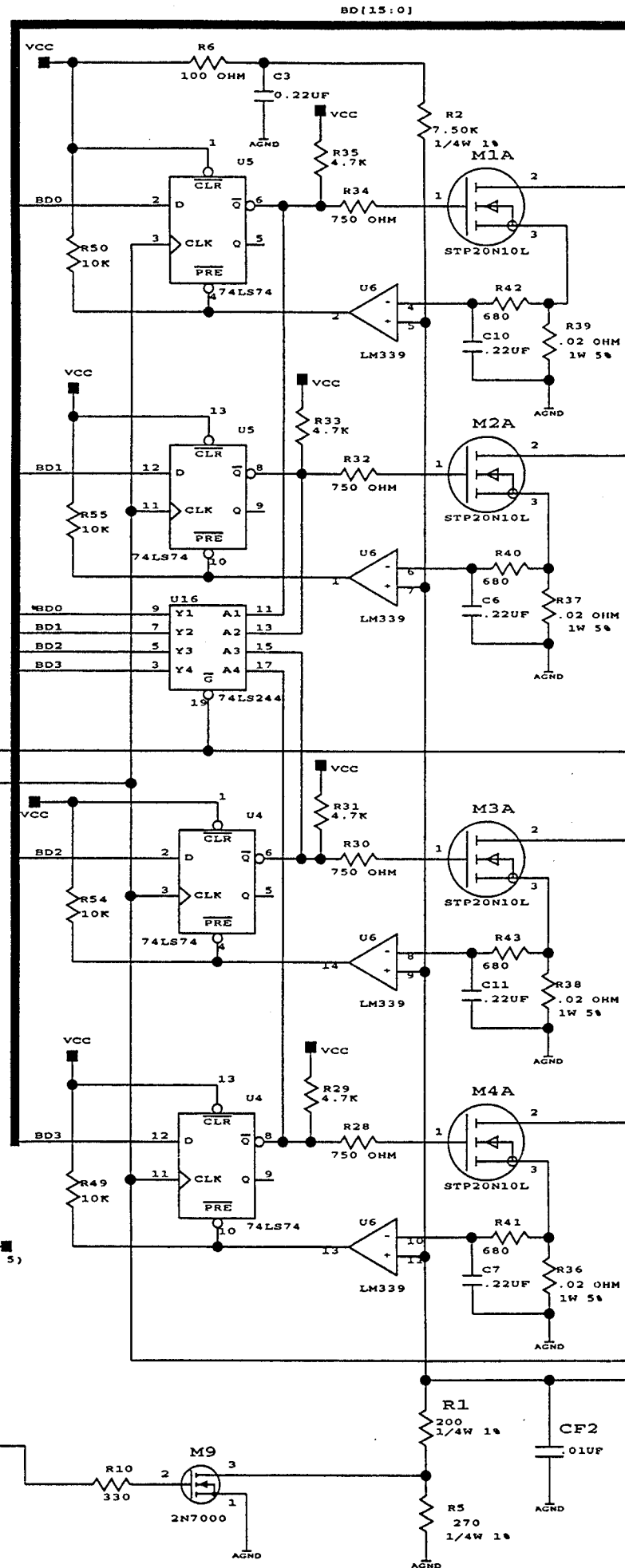
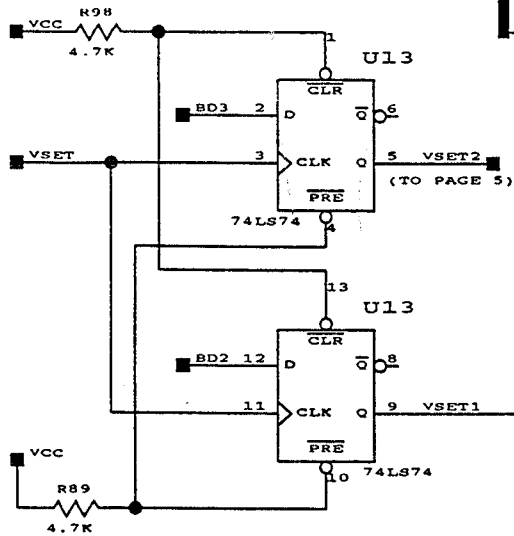
DATE SHEET # REV
AUGUST 16, 1995 3 OF 9 05

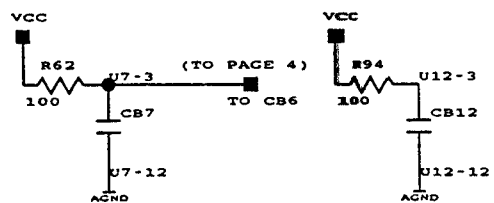
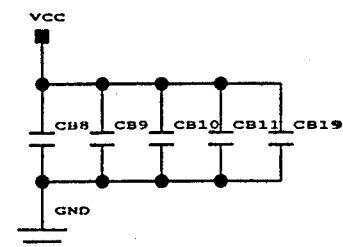


LM339 FILTER

ALL CAPS ARE 0.1uF
UNLESS OTHERWISE STATED

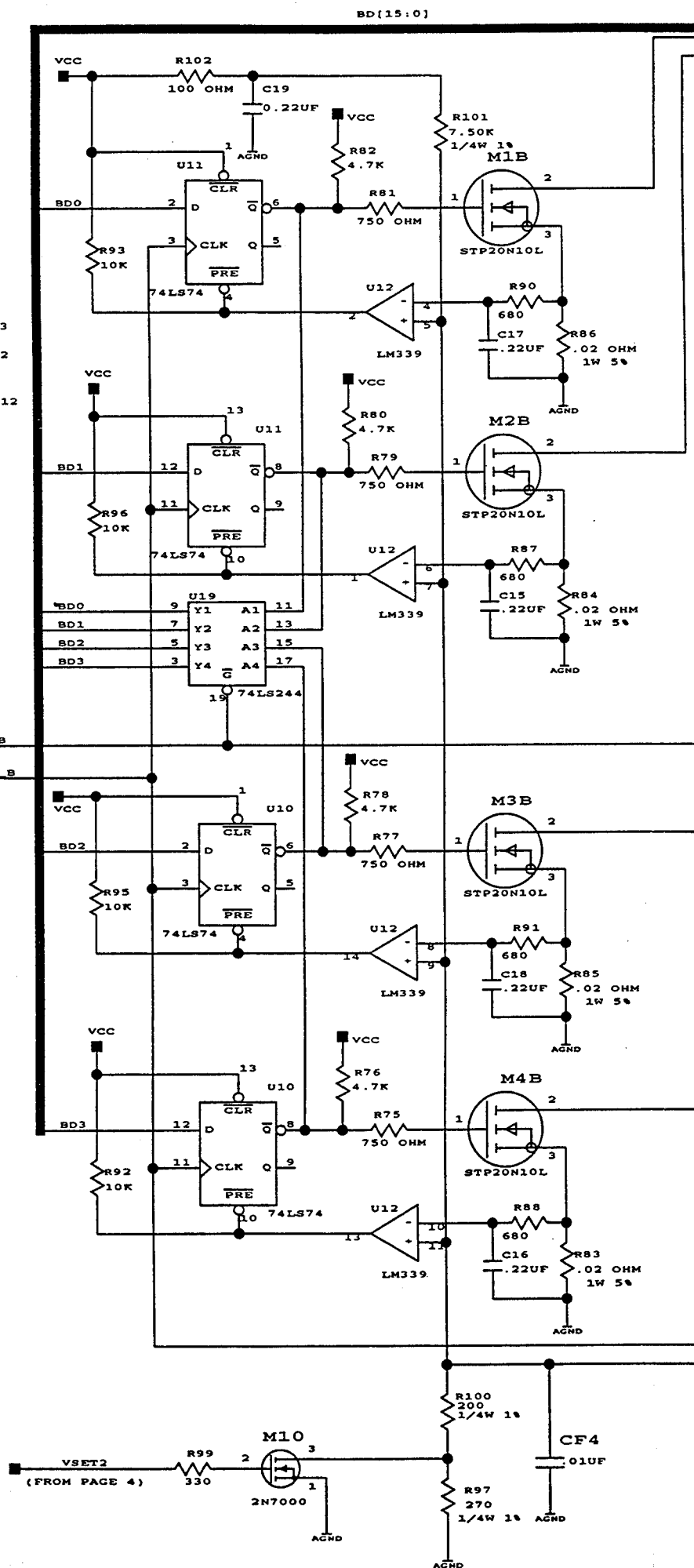
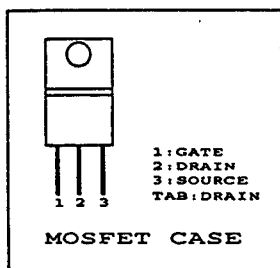
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LAMP_DRV_A

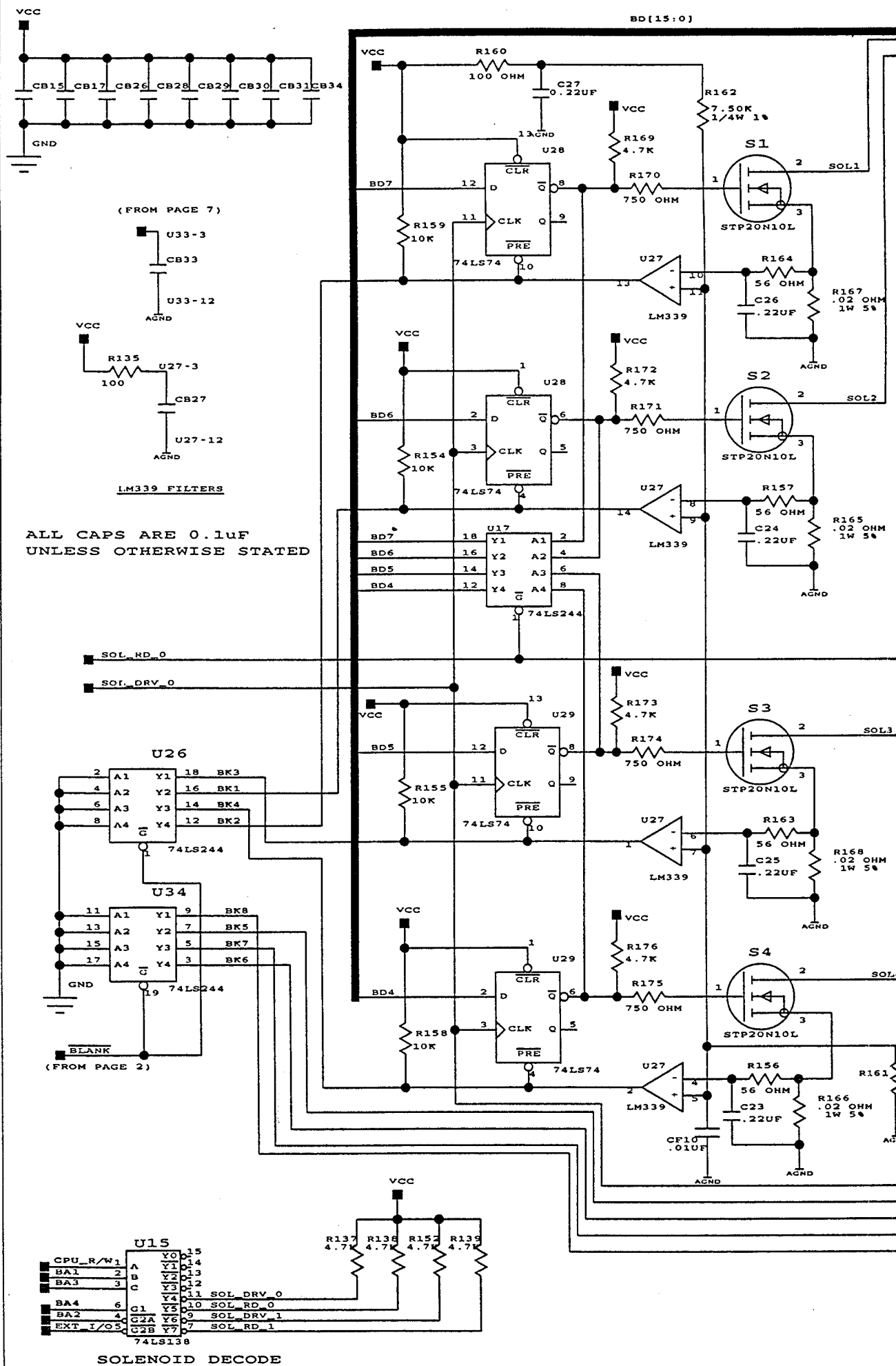


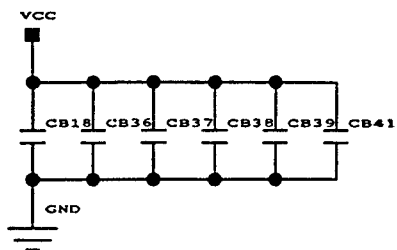


LM339 FILTERS

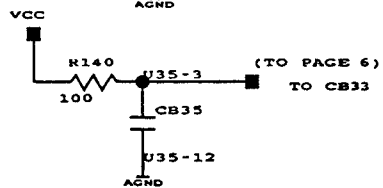
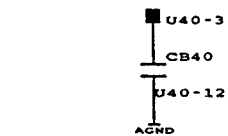
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UNLESS OTHERWISE STATED





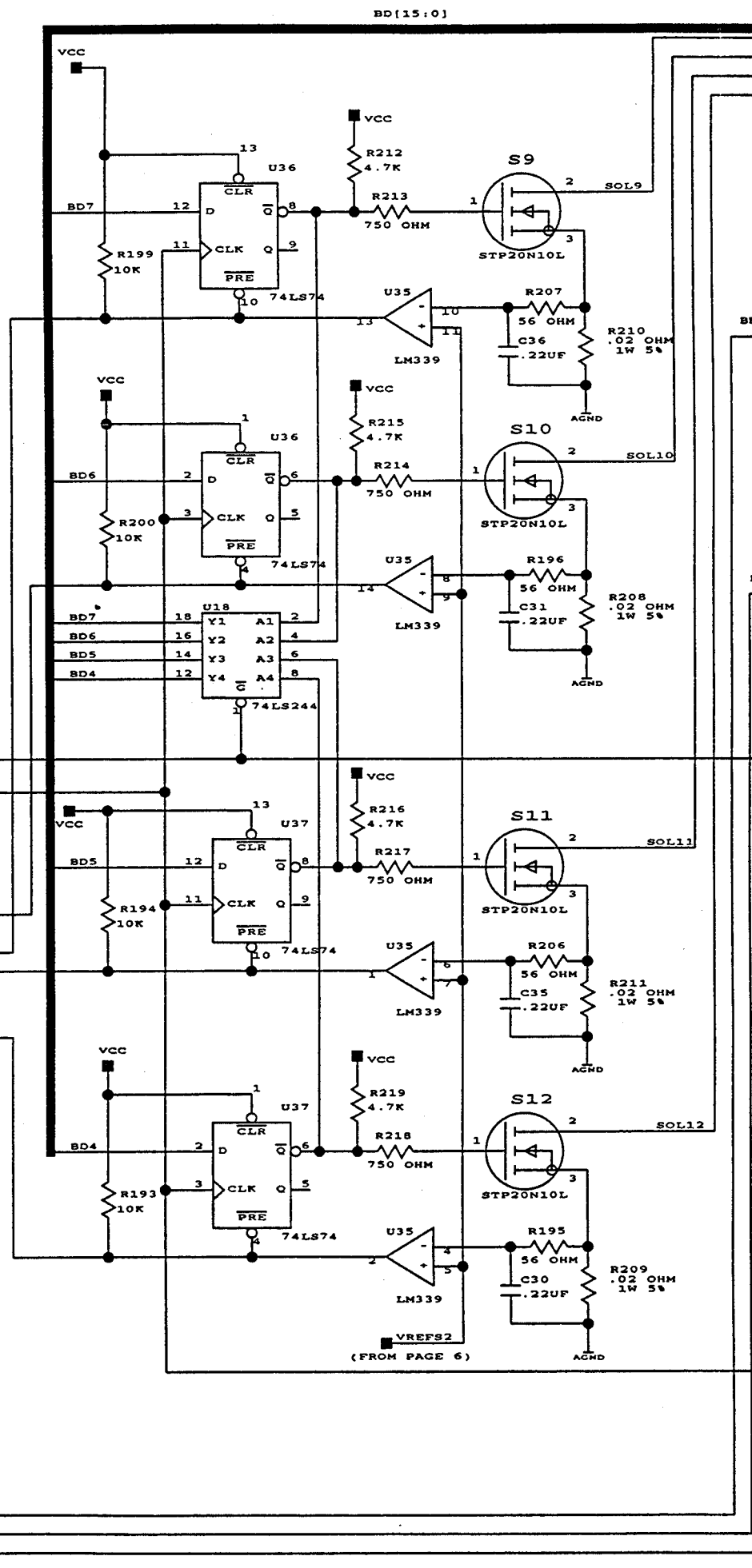
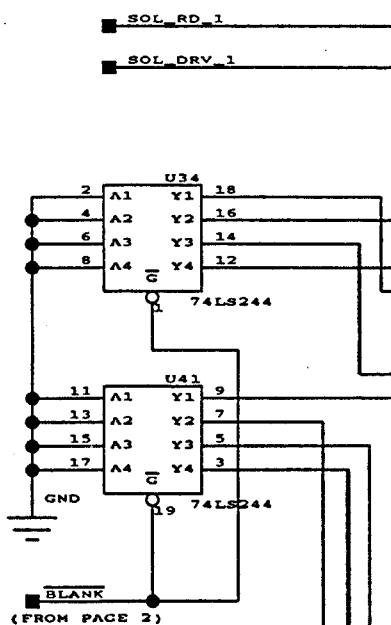


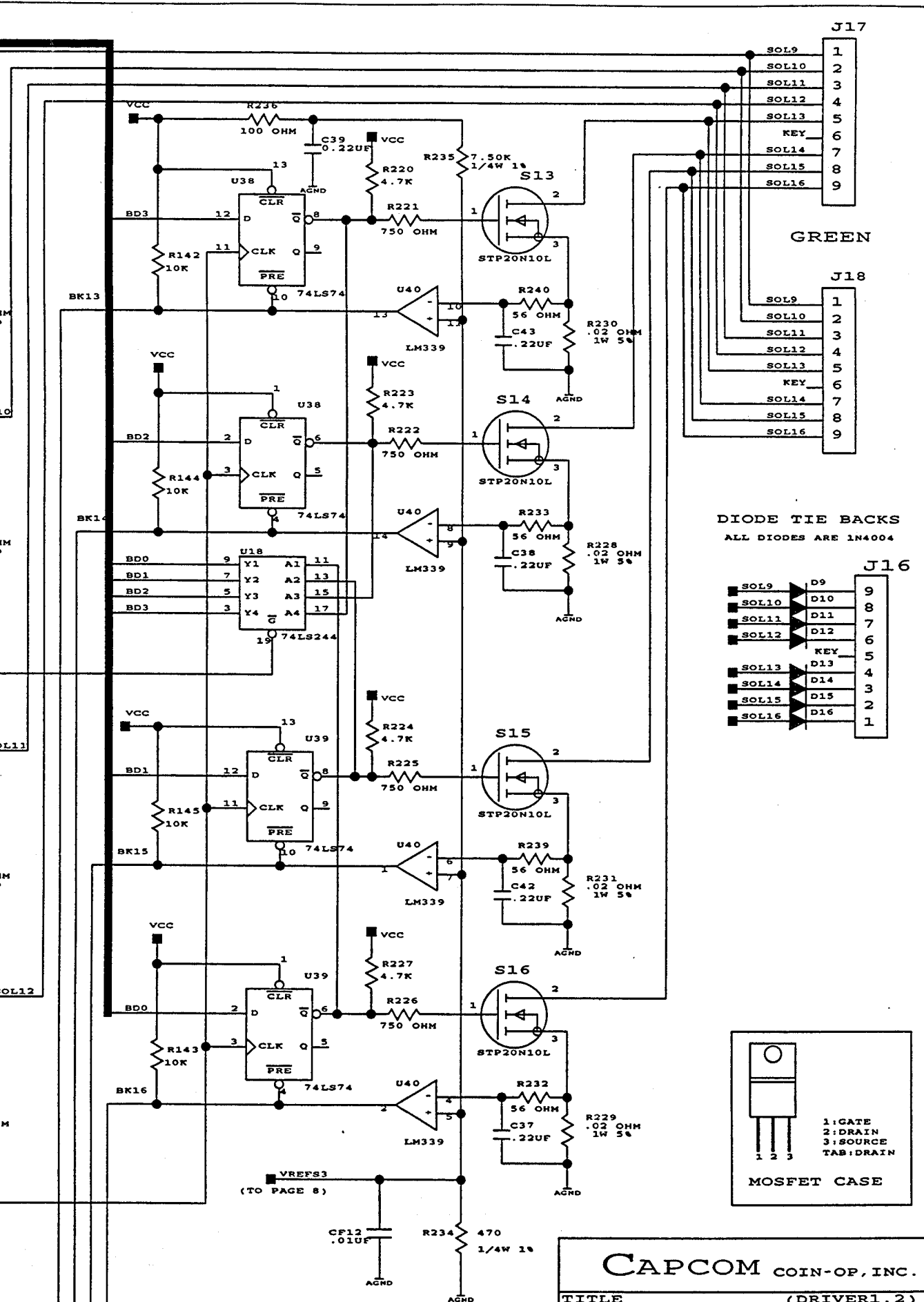
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LM339 FILTERS

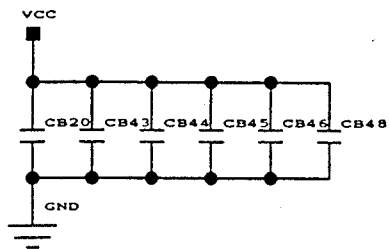
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UNLESS OTHERWISE STATED



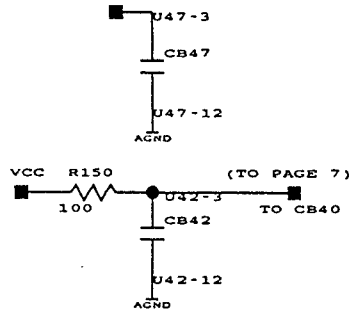


CAPCOM COIN-OP, INC.

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

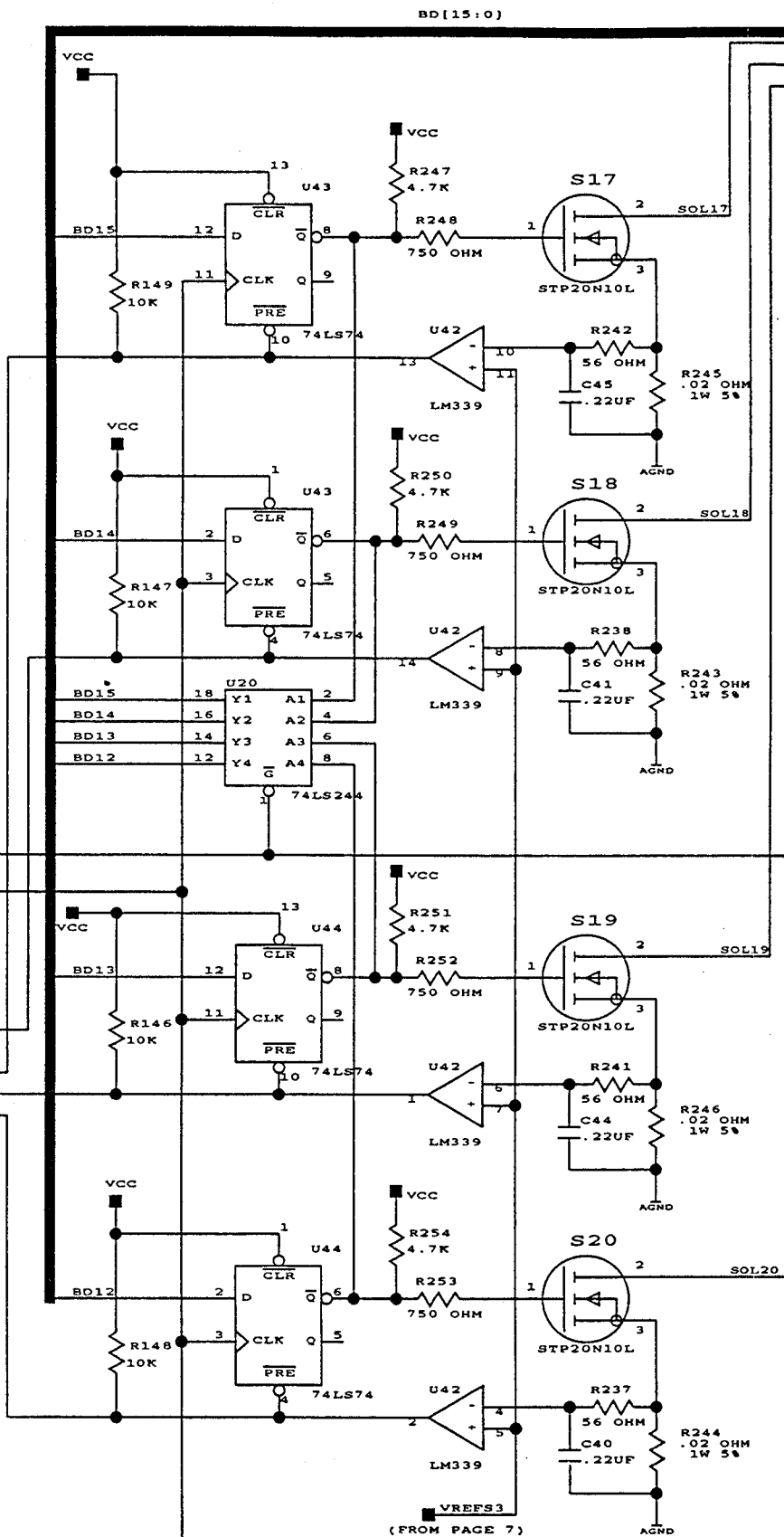
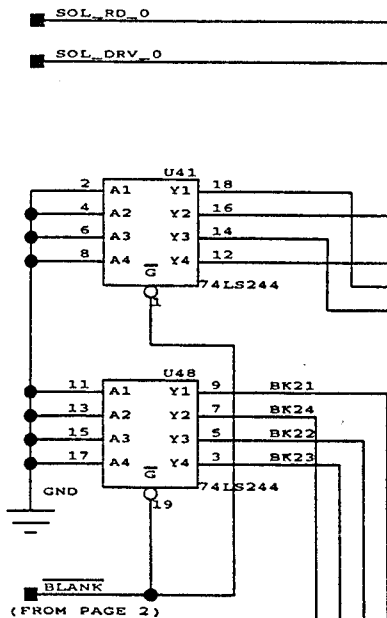


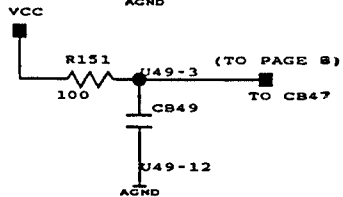
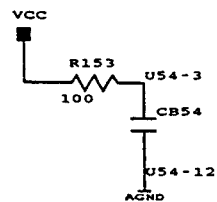
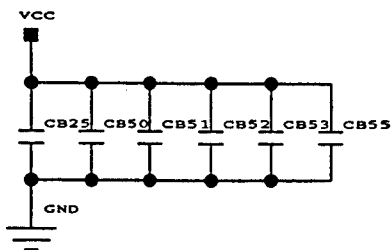
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LM339 FILTERS

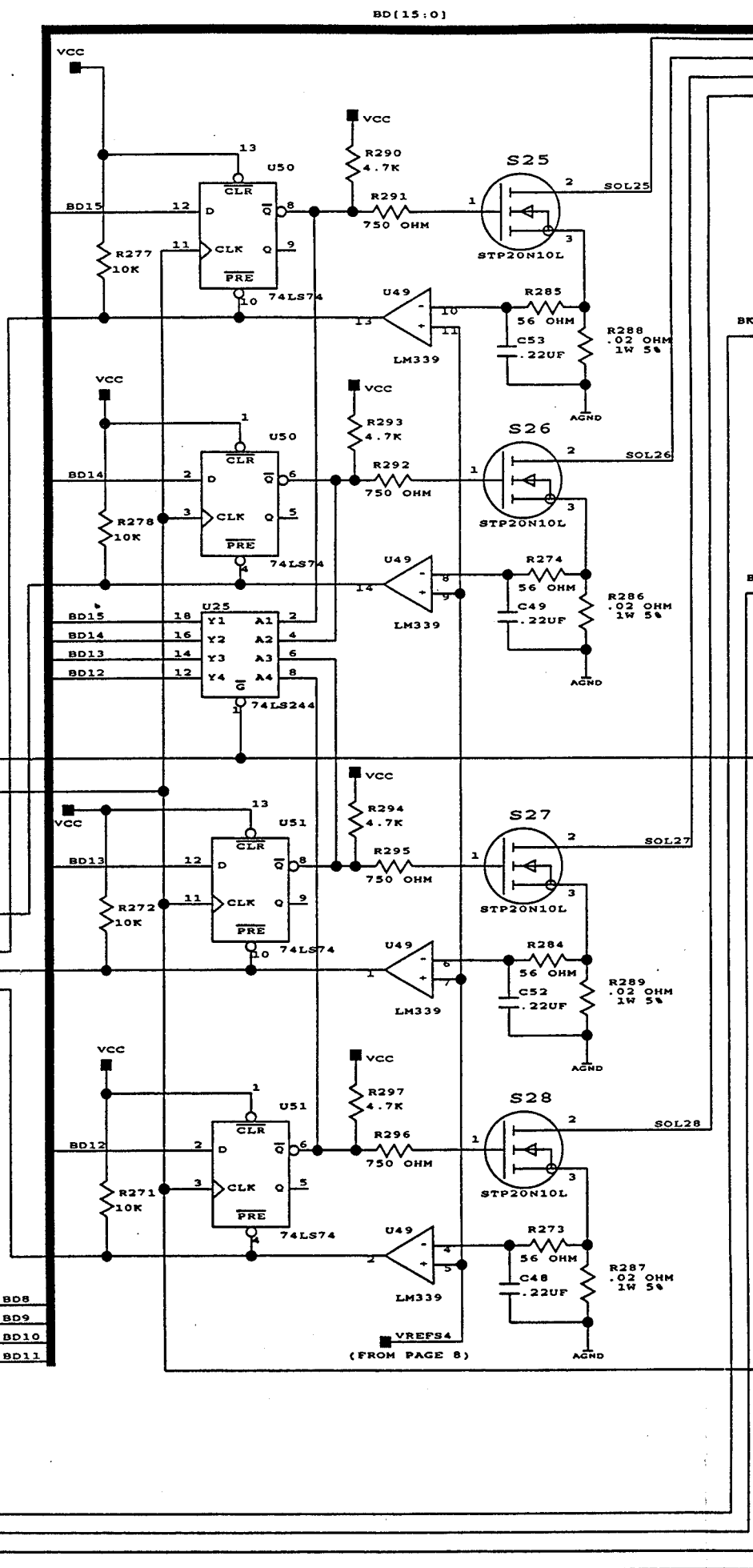
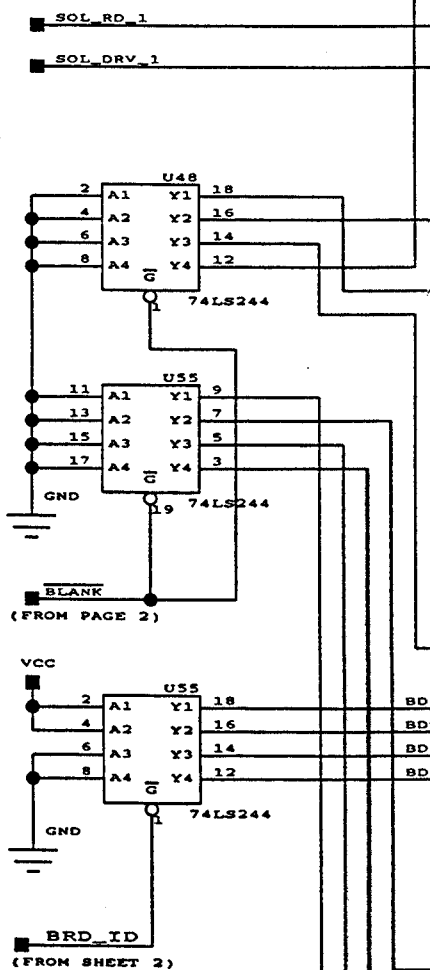
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UNLESS OTHERWISE STATED

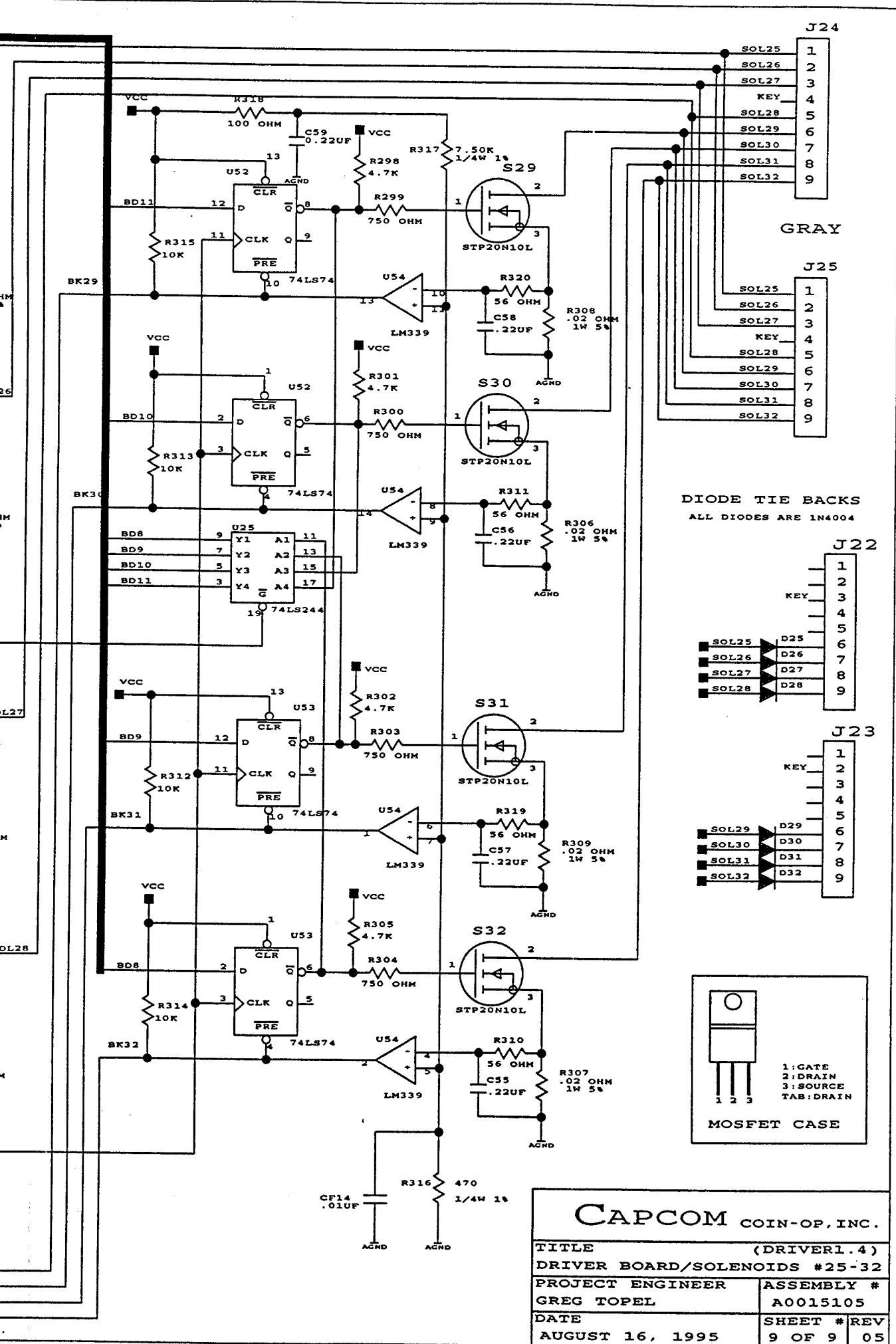


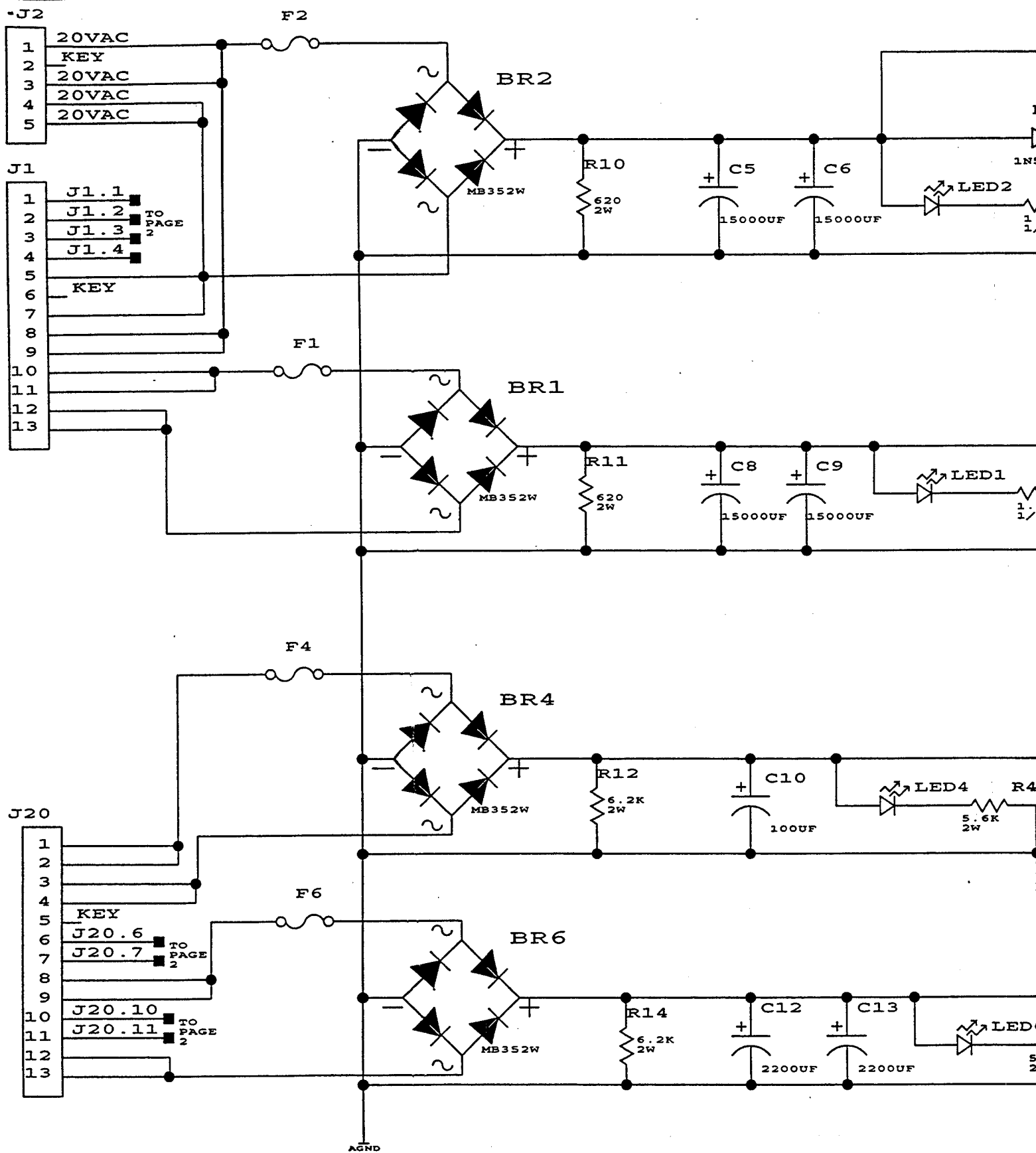


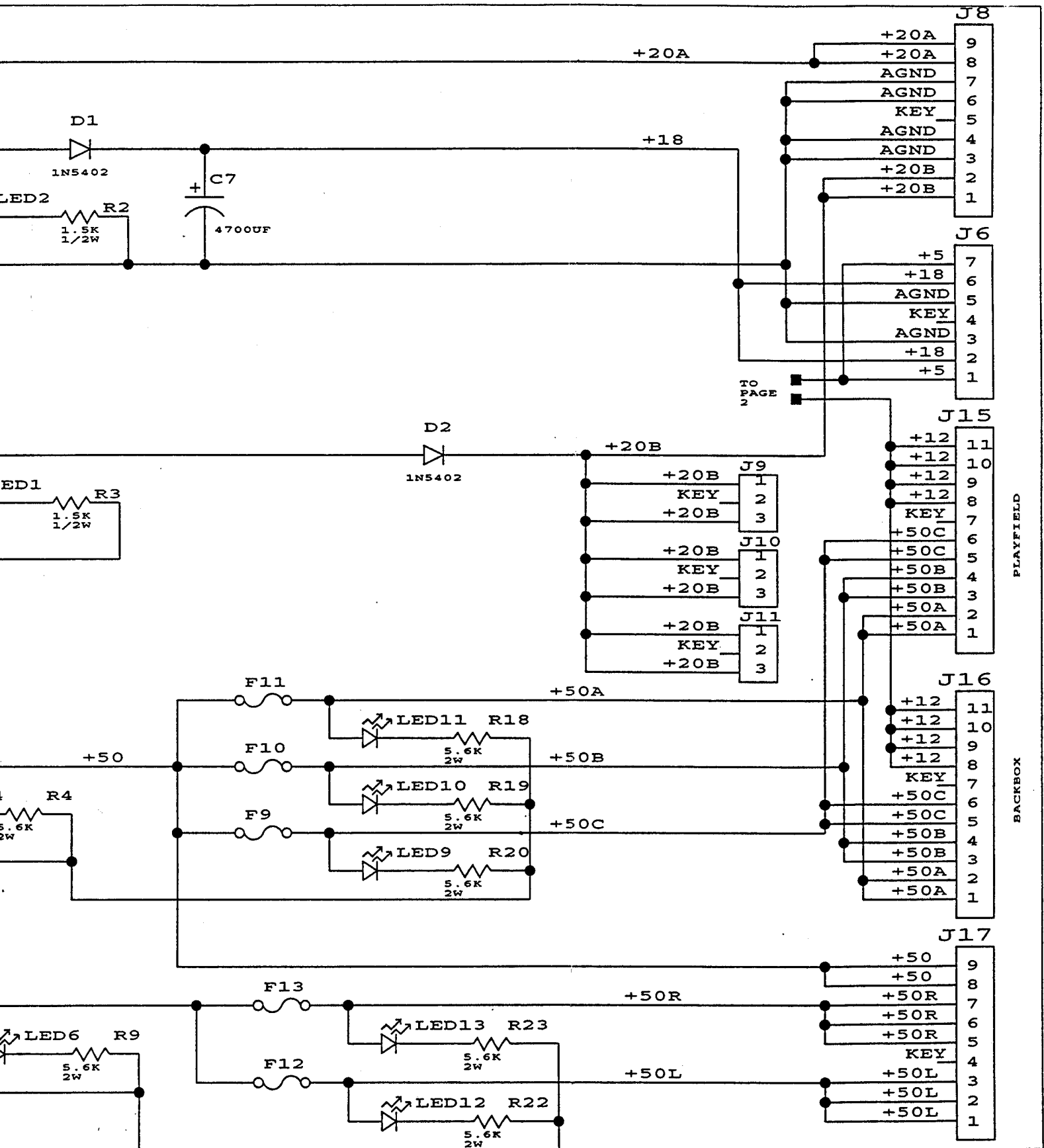
LM339 FILTERS

ALL CAPS ARE 0.1uF
UNLESS OTHERWISE STATED









CAPCOM COIN-OP, INC.

TITLE

POWER BOARD

PROJECT ENGINEER

STEVE MILEWSKI

DATE

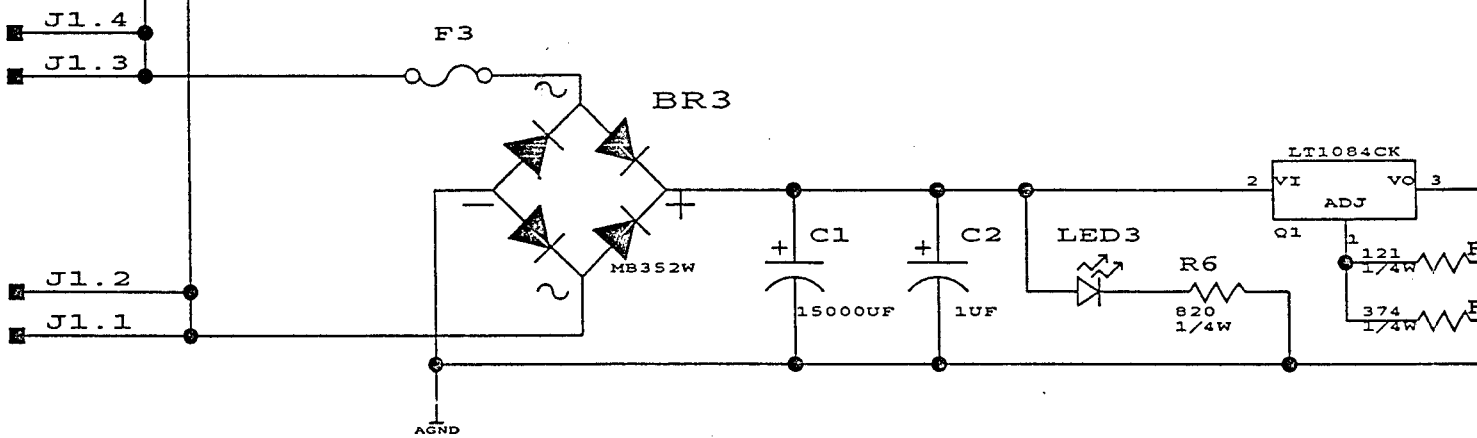
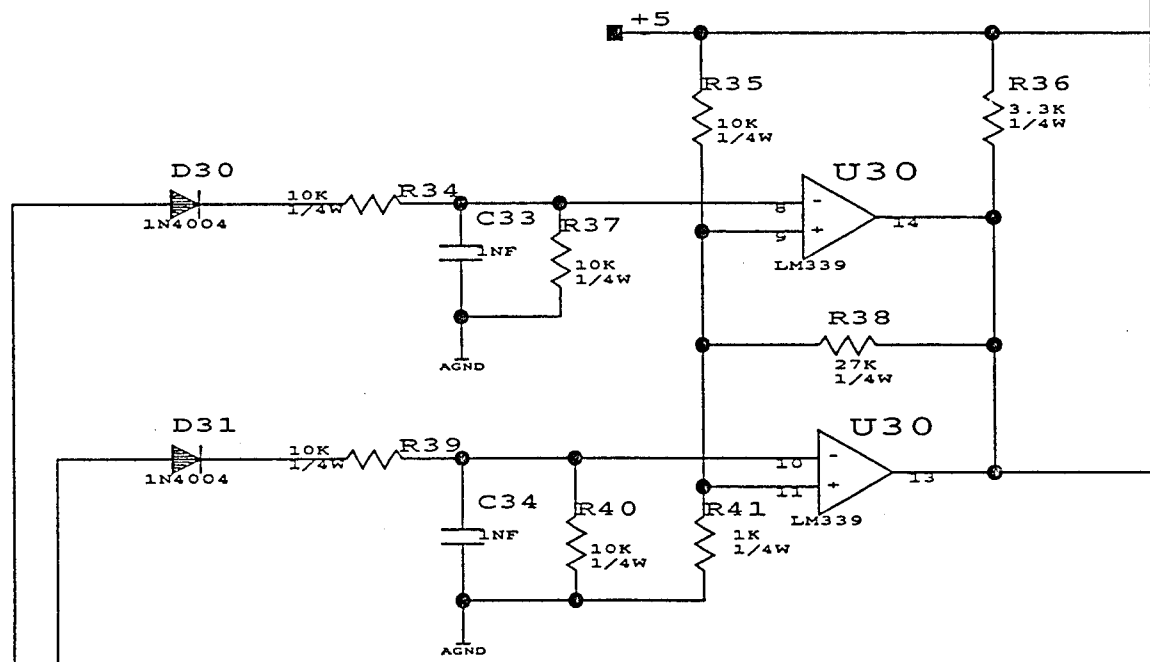
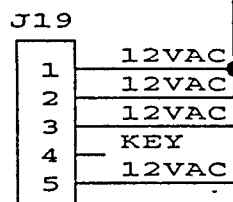
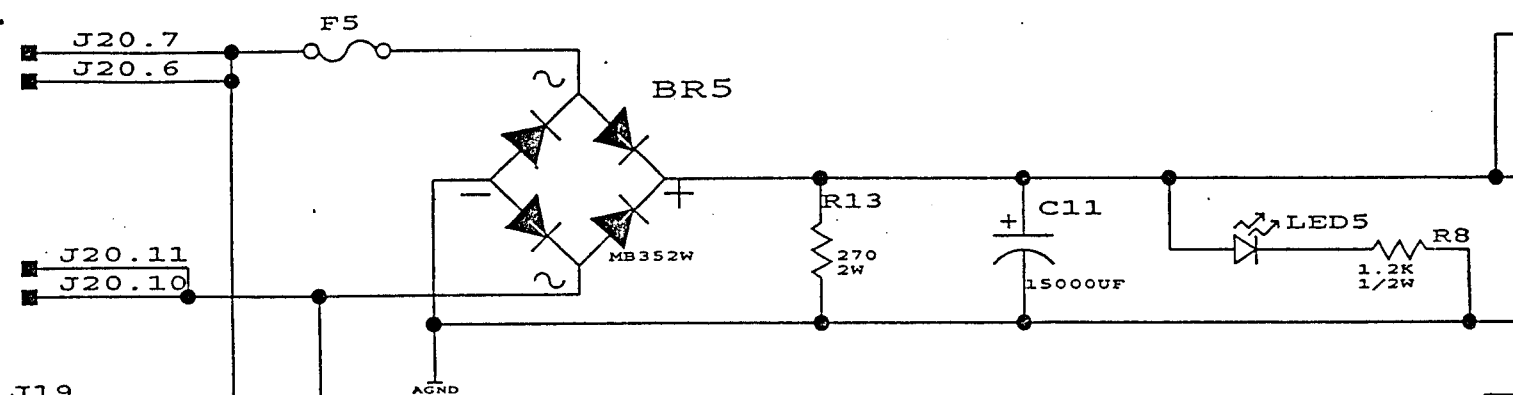
7/17/95

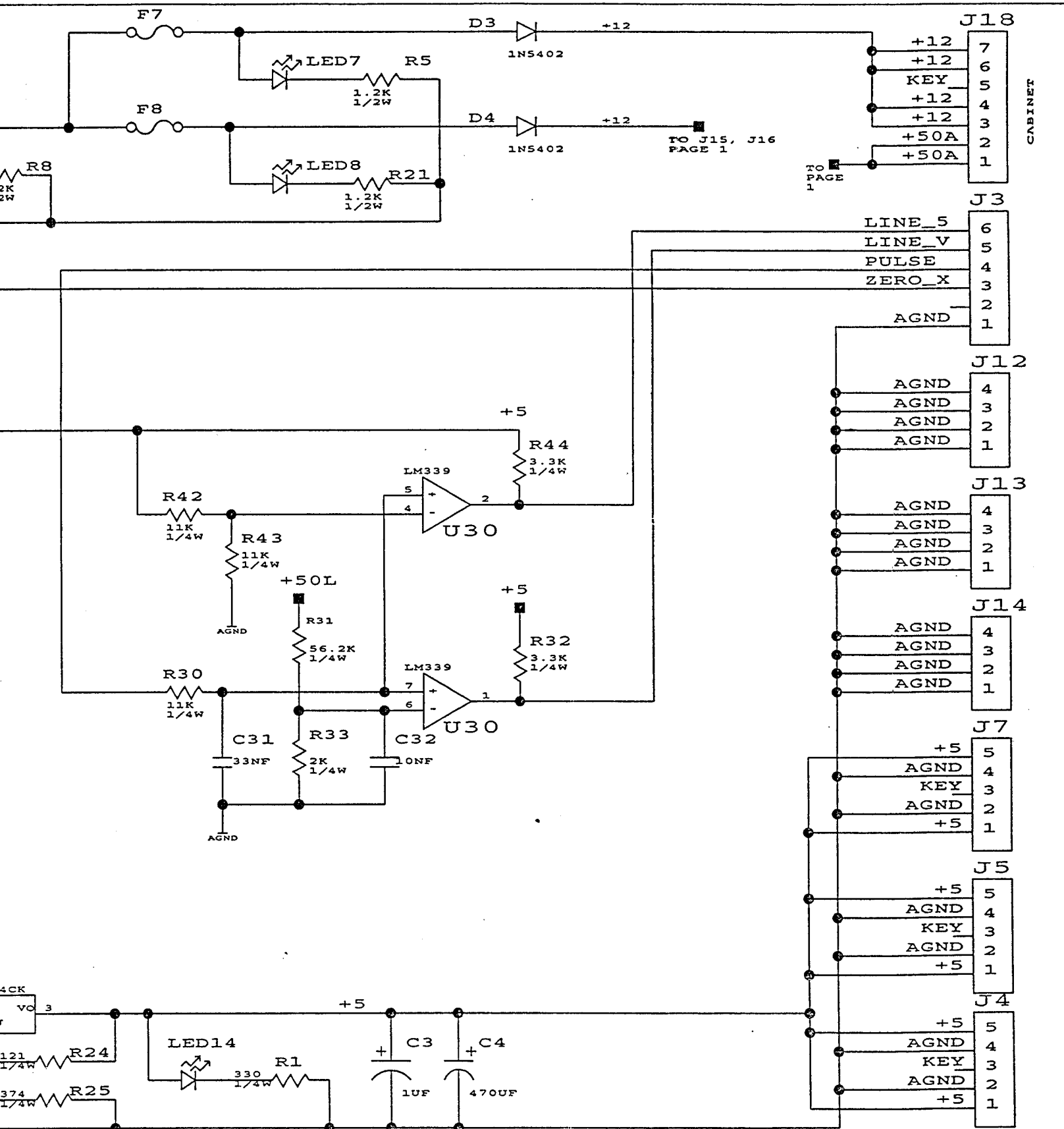
ASSEMBLY #

A0015204

SHEET # REV

1 OF 2 -





CAPCOM COIN-OP, INC.

TITLE

POWER BOARD

PROJECT ENGINEER

STEVE MILEWSKI

DATE

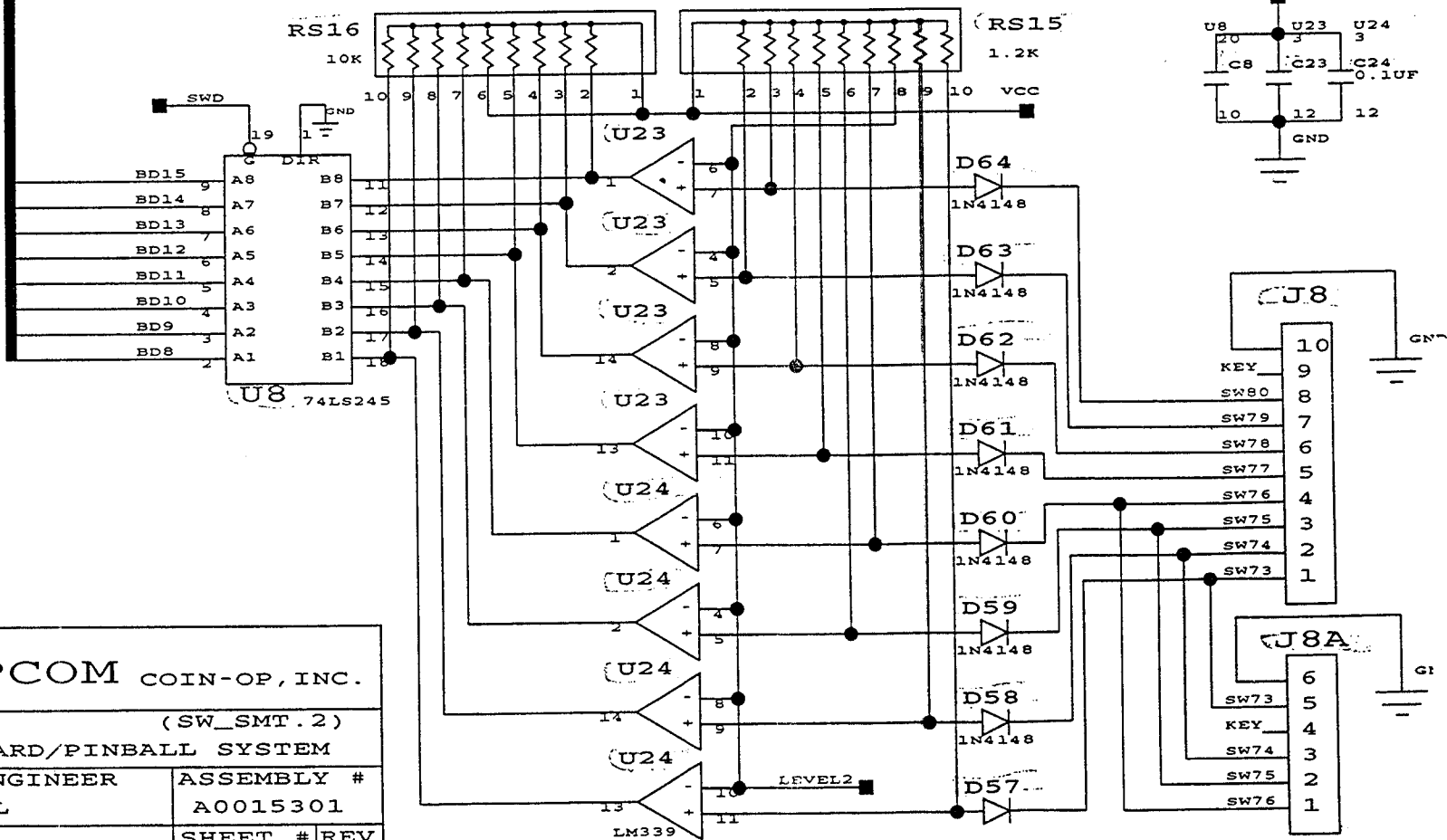
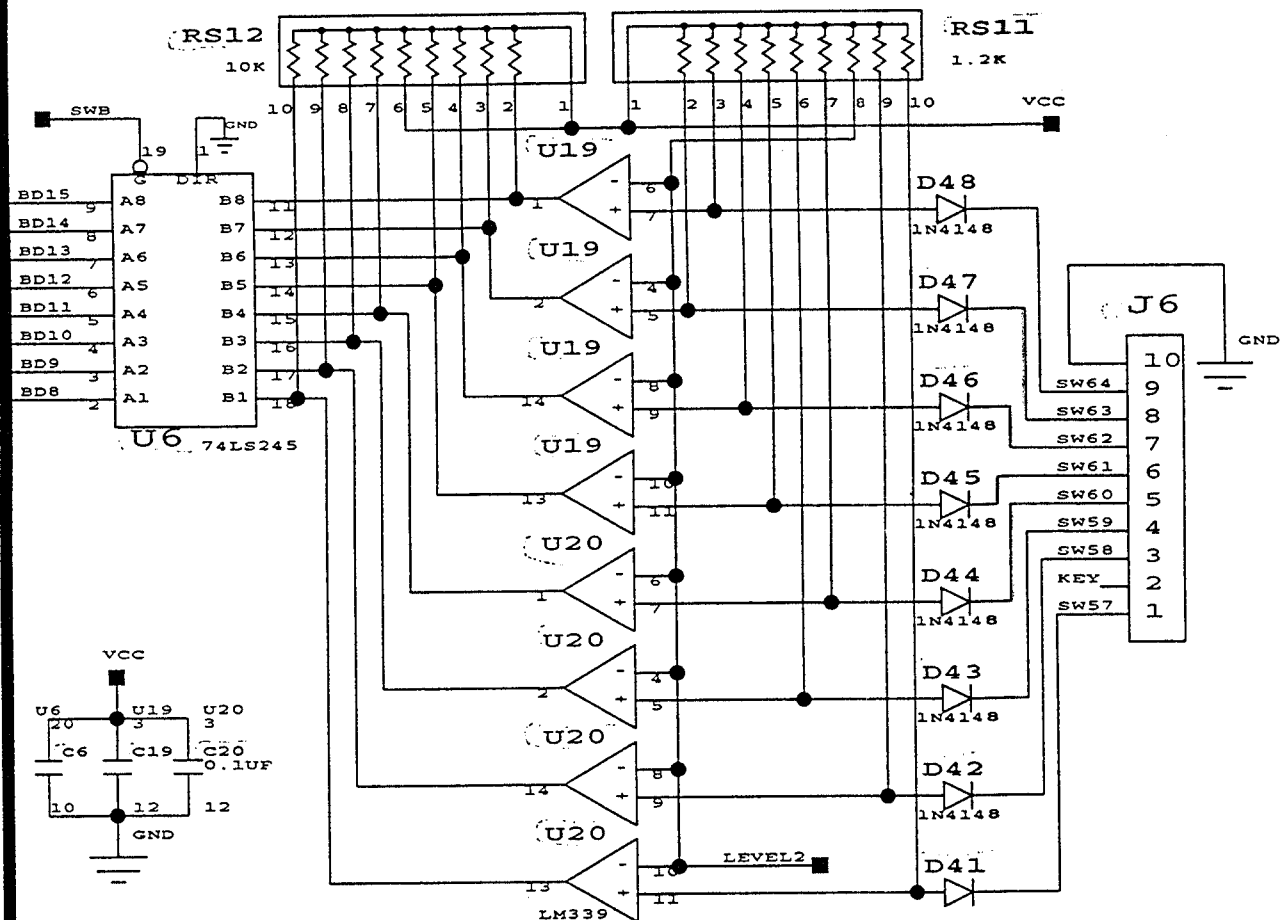
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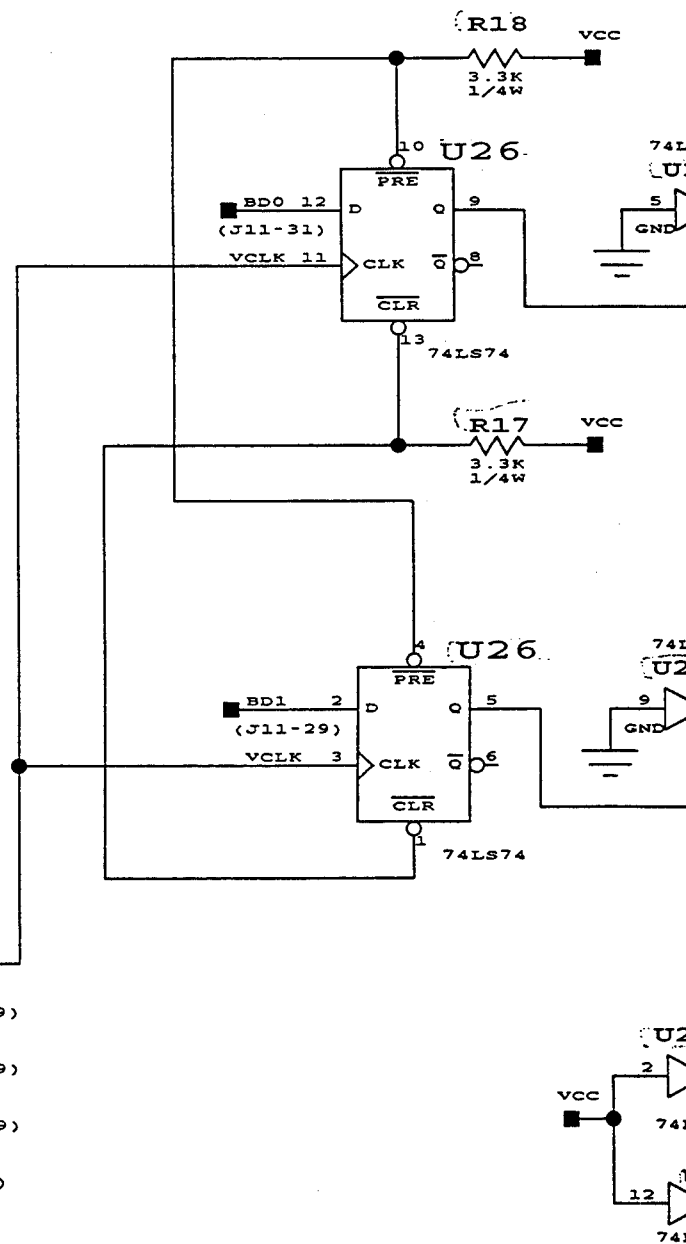
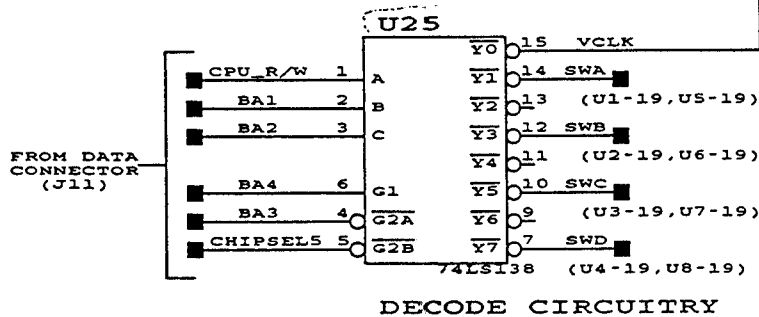
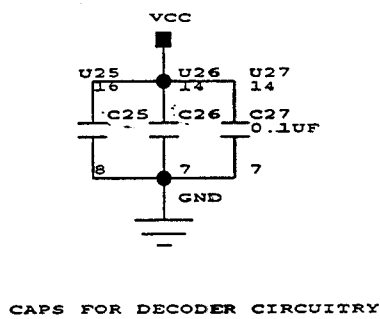
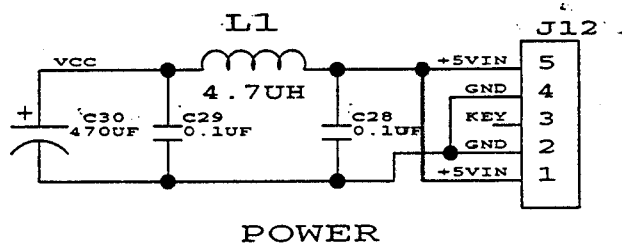
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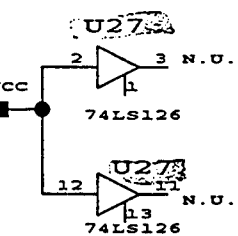
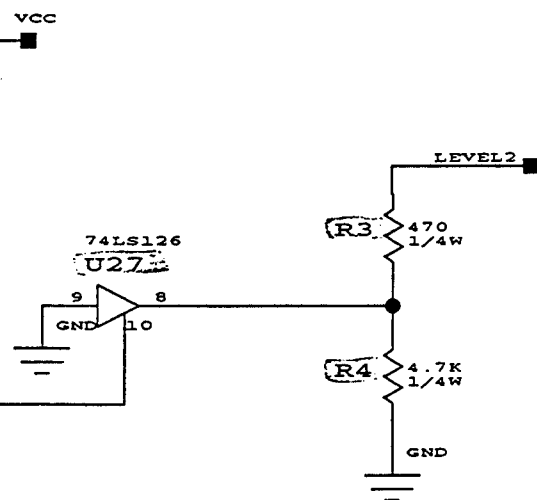
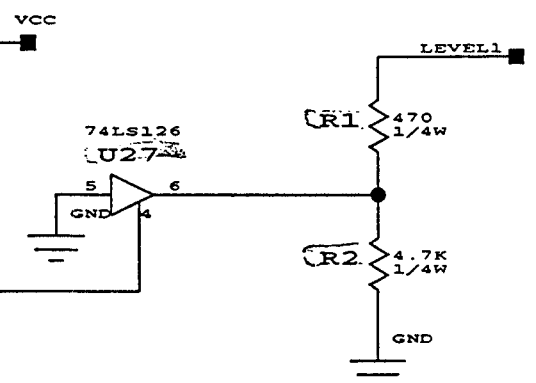
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SHEET # REV

2 OF 2 -





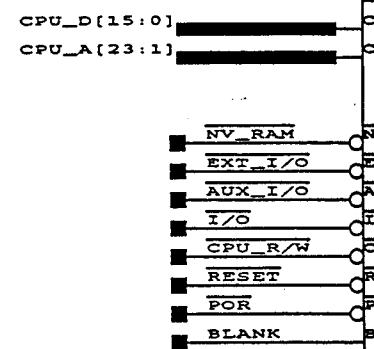
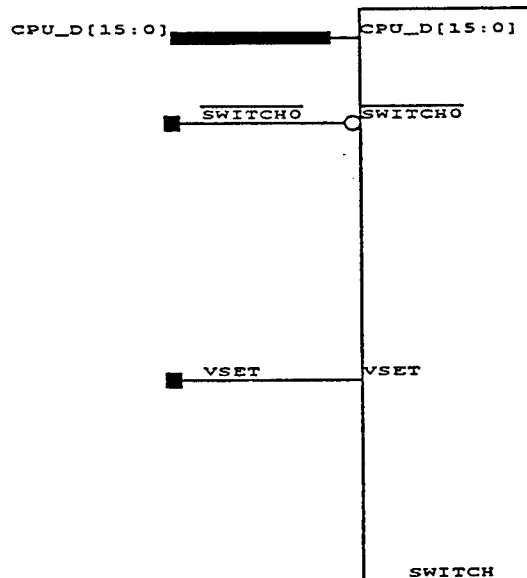
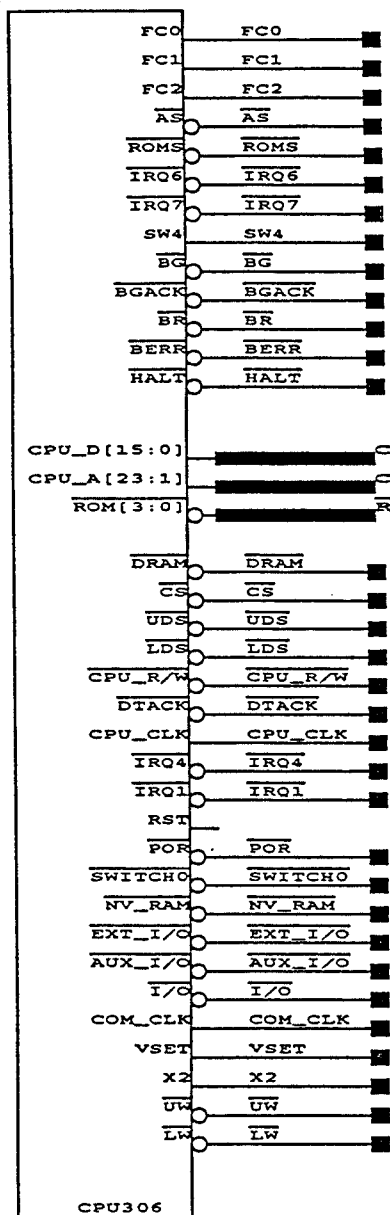


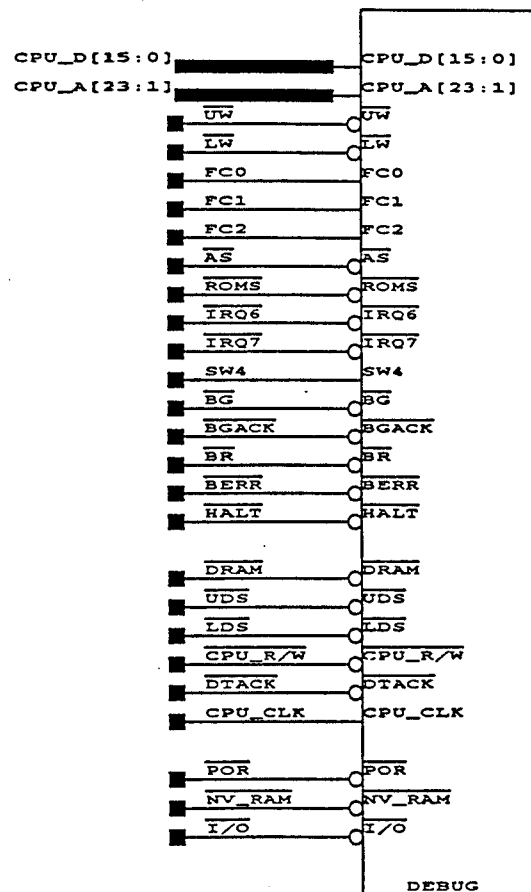
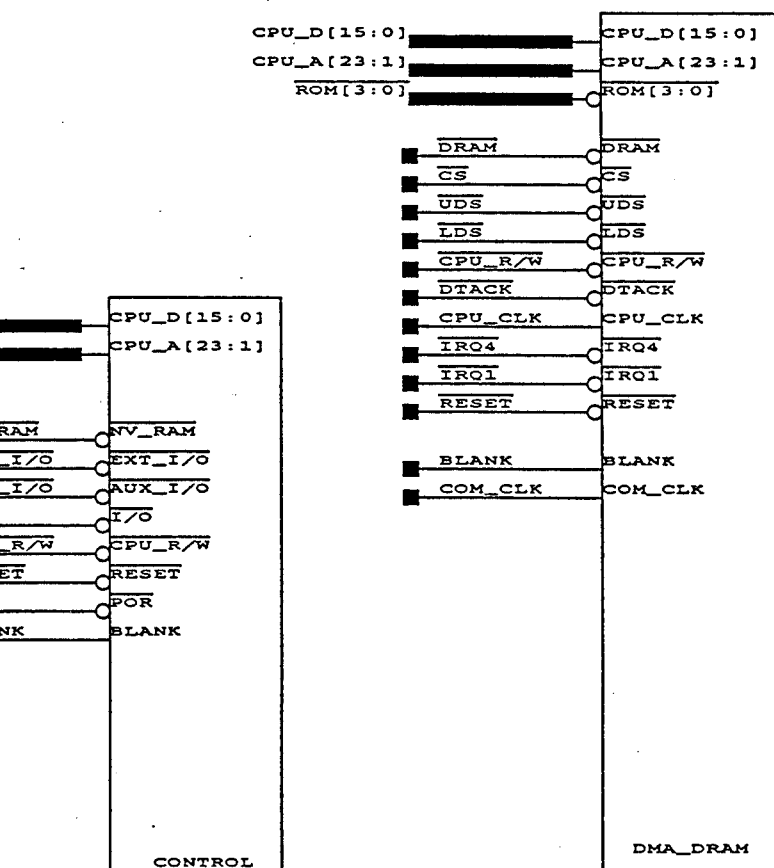
CAPCOM COIN-OP, INC.

TITLE (SW_SMT.3)
SWITCH BOARD/PINBALL SYSTEM

PROJECT ENGINEER GREG TOPEL	ASSEMBLY # A0015301
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DATE JULY 25, 1995	SHEET # 3 OF 3	REV 1
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511199

CAPCOM COIN-OP, INC.

TITLE

SYS_CPU

PROJECT ENGINEER

MARK COLDEBELLA

DATE

AUGUST 9, 1995

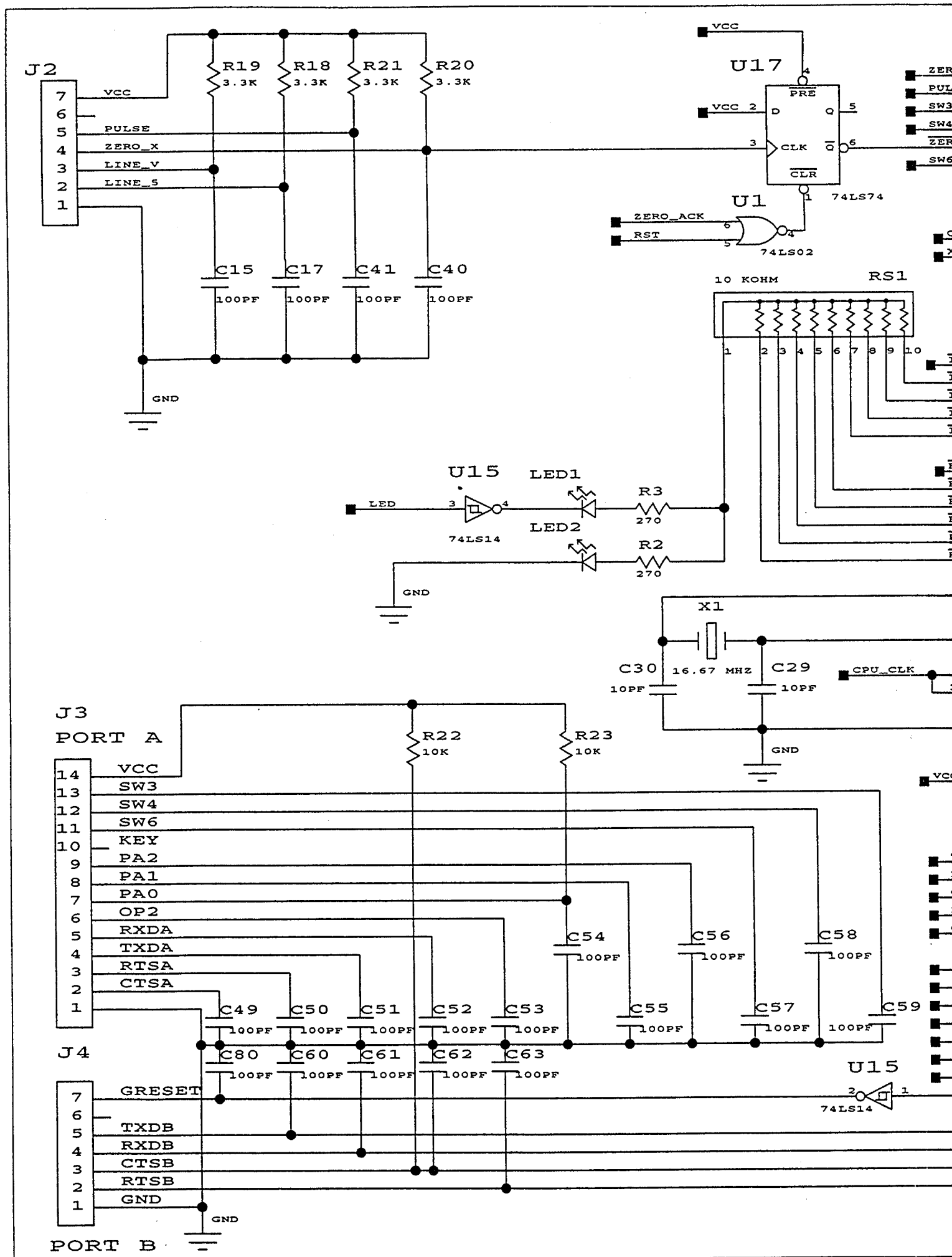
ASSEMBLY #

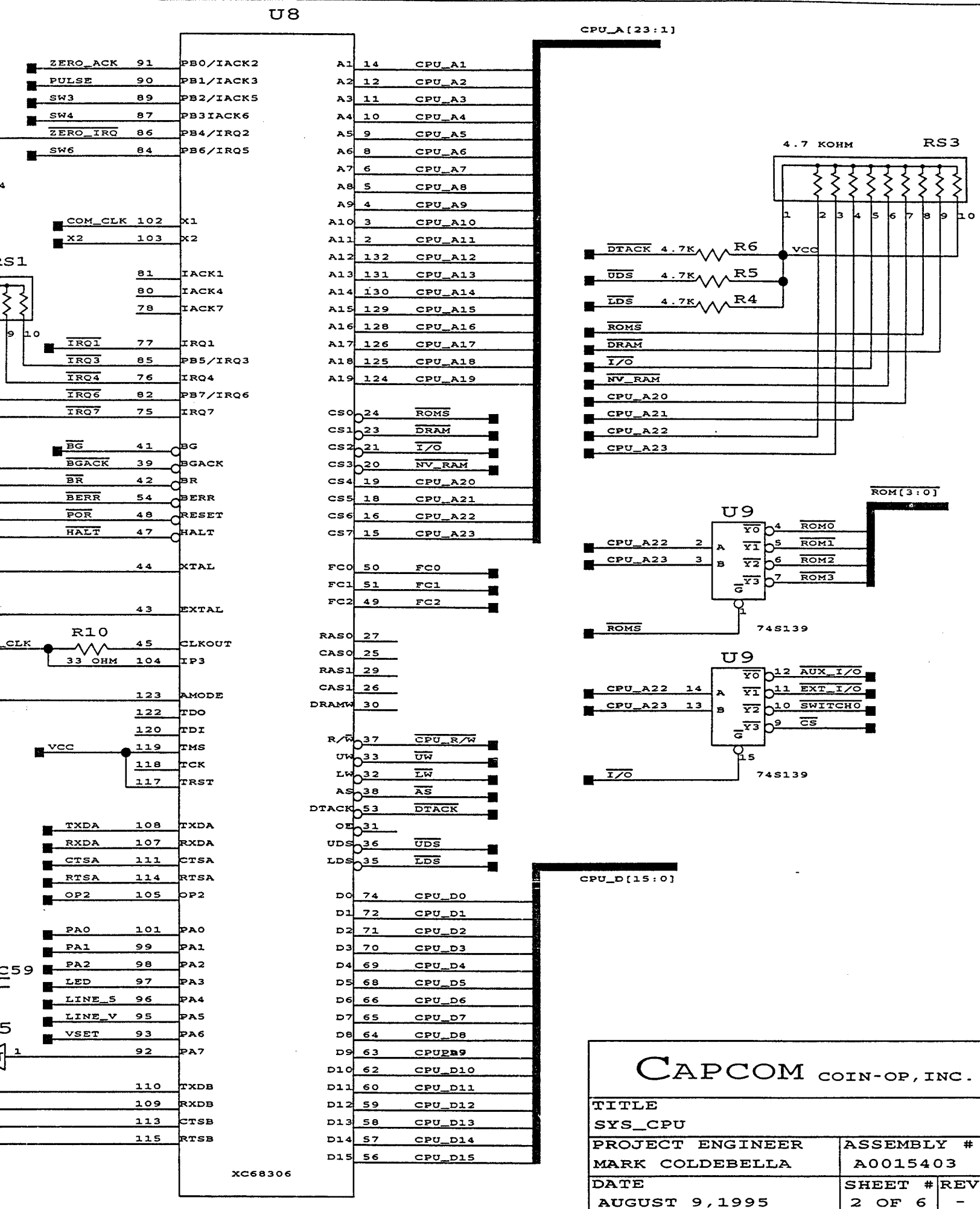
A0015403

SHEET # REV

1 OF 6

-





CAPCOM COIN-OP, INC.

TITLE

SYS_CPU

PROJECT ENGINEER

MARK COLDEBELLA

DATE

AUGUST 9, 1995

ASSEMBLY #

A0015403

SHEET # REV

2 OF 6

-

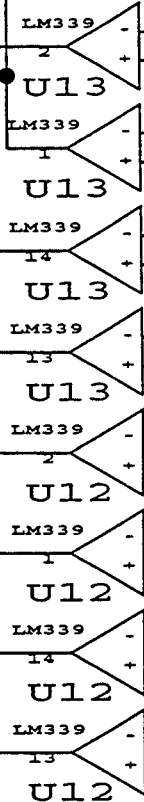
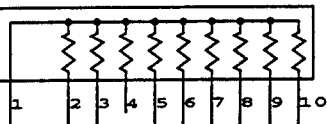
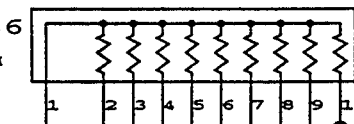
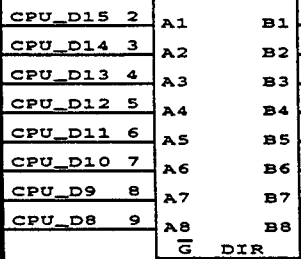
CPU_D[15:0]

RS6
10K OHM

2.2 KOHM

RS7

74LS245 U2

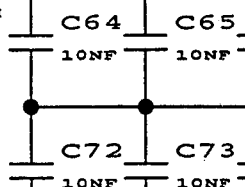
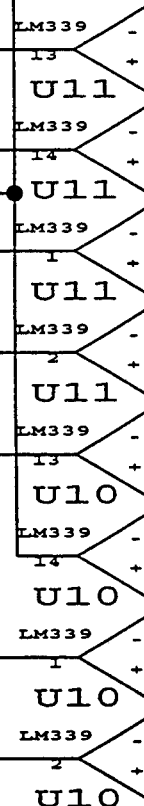
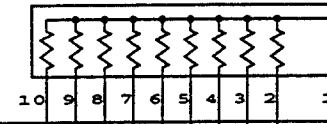
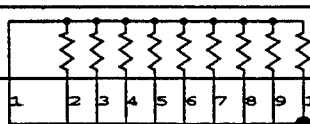
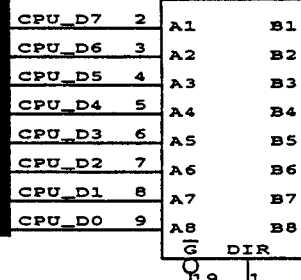


RS5
10K OHM

RS4

2.2 KOHM

74LS245 U3



SWITCH0

GND

Q1

R8

1.2K

LEVEL

R9

1.2K

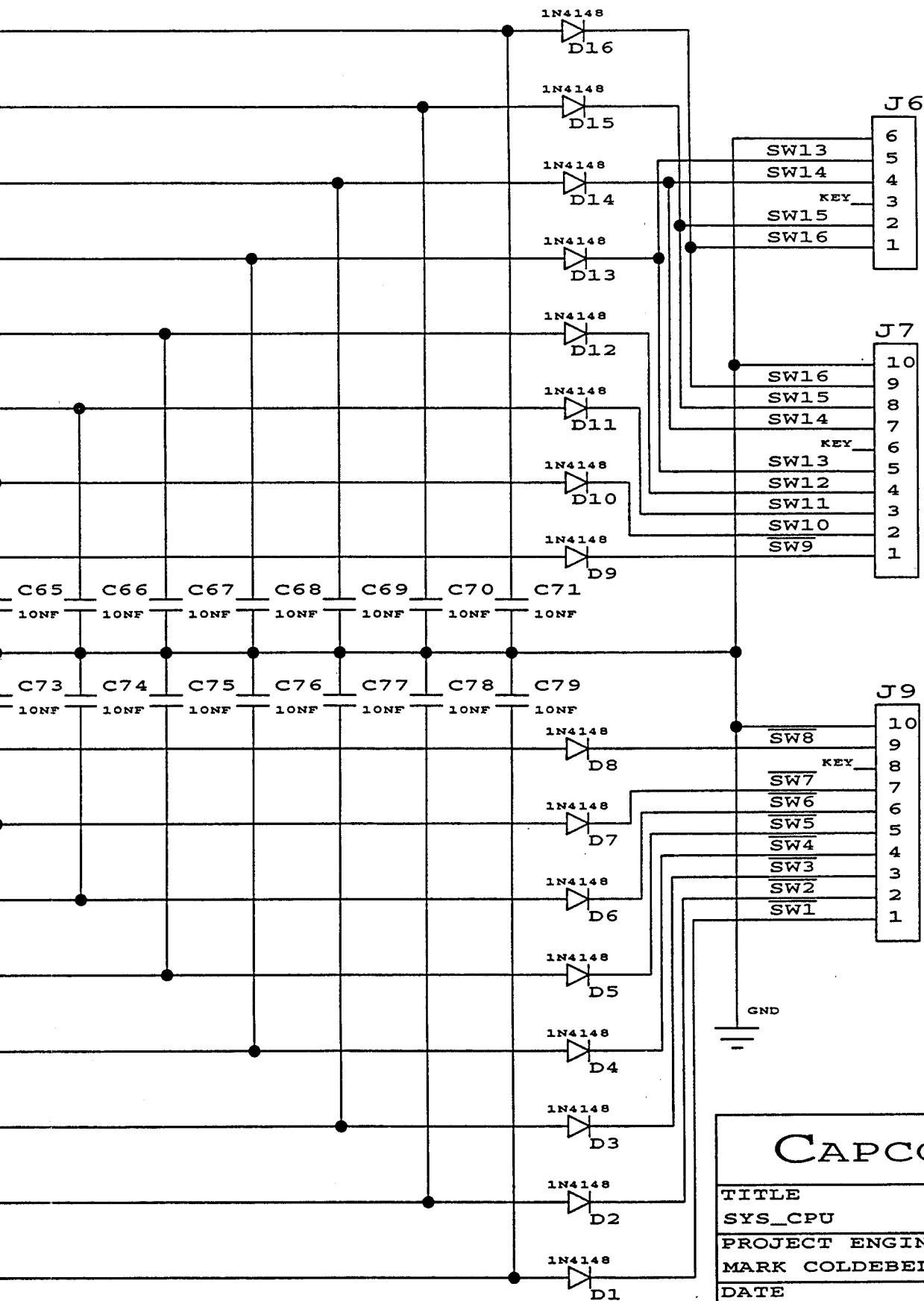
2N3904

R7

2.7K

GND

VSET



CAPCOM COIN-OP, INC.

TITLE
SYS_CPU

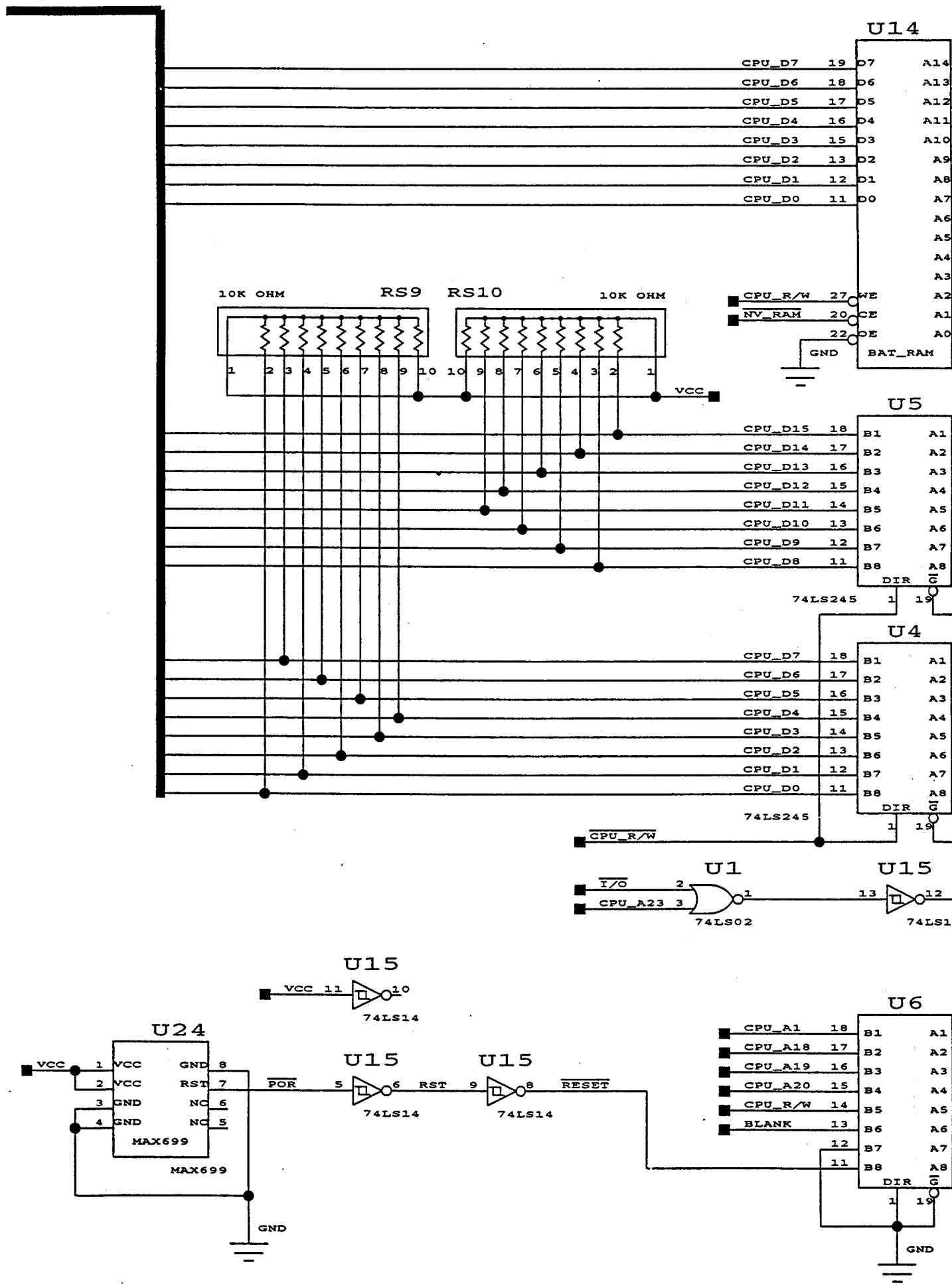
PROJECT ENGINEER
MARK COLDEBELLA

ASSEMBLY #
A0015403

DATE
AUGUST 9, 1995

SHEET # REV
3 OF 6 -

CPU_D[15:0]



J14

CPU_A[23:1]

A14	1	CPU_A15
A13	26	CPU_A14
A12	2	CPU_A13
A11	23	CPU_A12
A10	21	CPU_A11
A9	24	CPU_A10
A8	25	CPU_A9
A7	3	CPU_A8
A6	4	CPU_A7
A5	5	CPU_A6
A4	6	CPU_A5
A3	7	CPU_A4
A2	8	CPU_A3
A1	9	CPU_A2
A0	10	CPU_A1

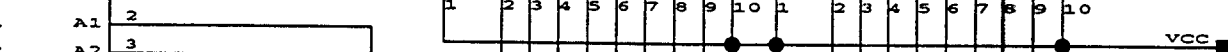
AT_RAM

10K OHM

RS11 10K OHM

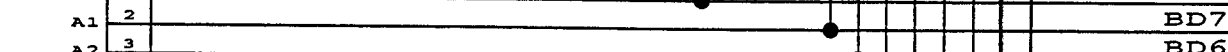
RS12

U5



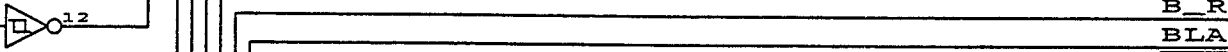
DIR

U4



DIR

U15



74LS14

U6



DIR

74LS245

GND

J10

BD15

BD14

BD13

BD12

BD11

BD10

BD9

BD8

BD7

BD6

BD5

BD4

BD3

BD2

BD1

BD0

BA1

BA18

BA19

BA20

B_R/W

BLANKING

AUX_I/O

EXT_I/O

BRESET

25X2

GND

CAPCOM COIN-OP, INC.

TITLE

SYS_CPU

PROJECT ENGINEER

MARK COLDEBELLA

ASSEMBLY #

A0015403

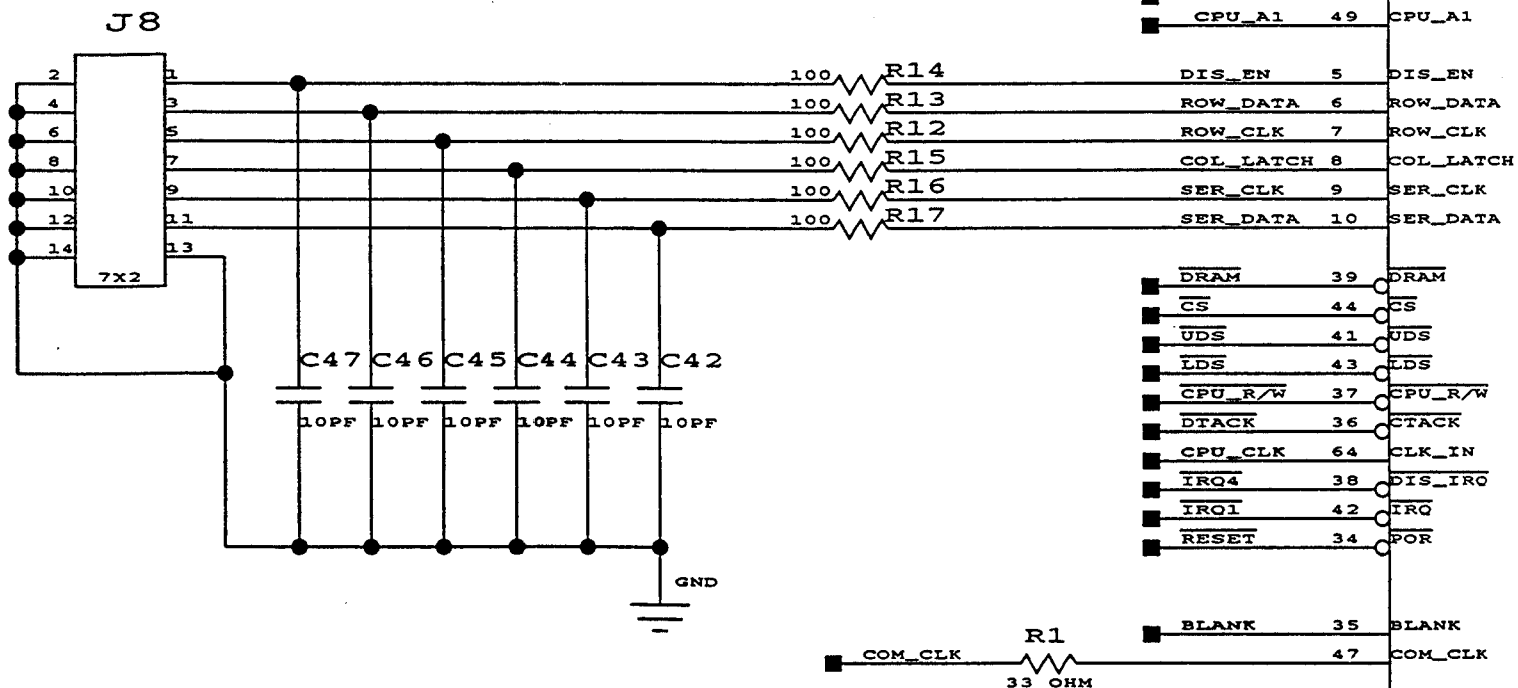
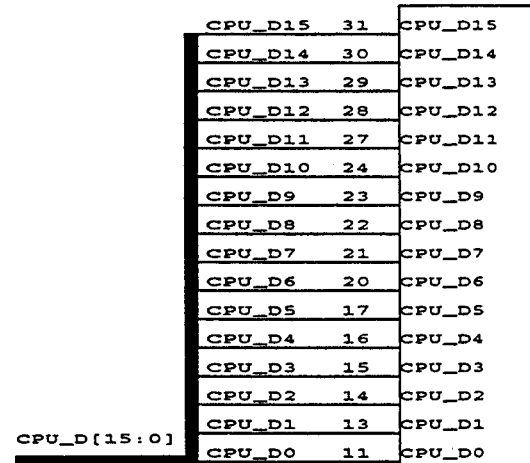
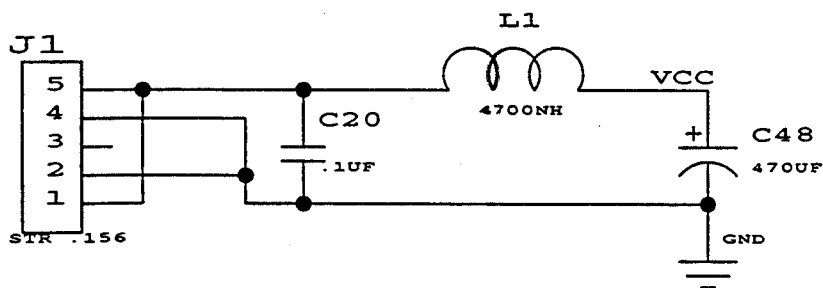
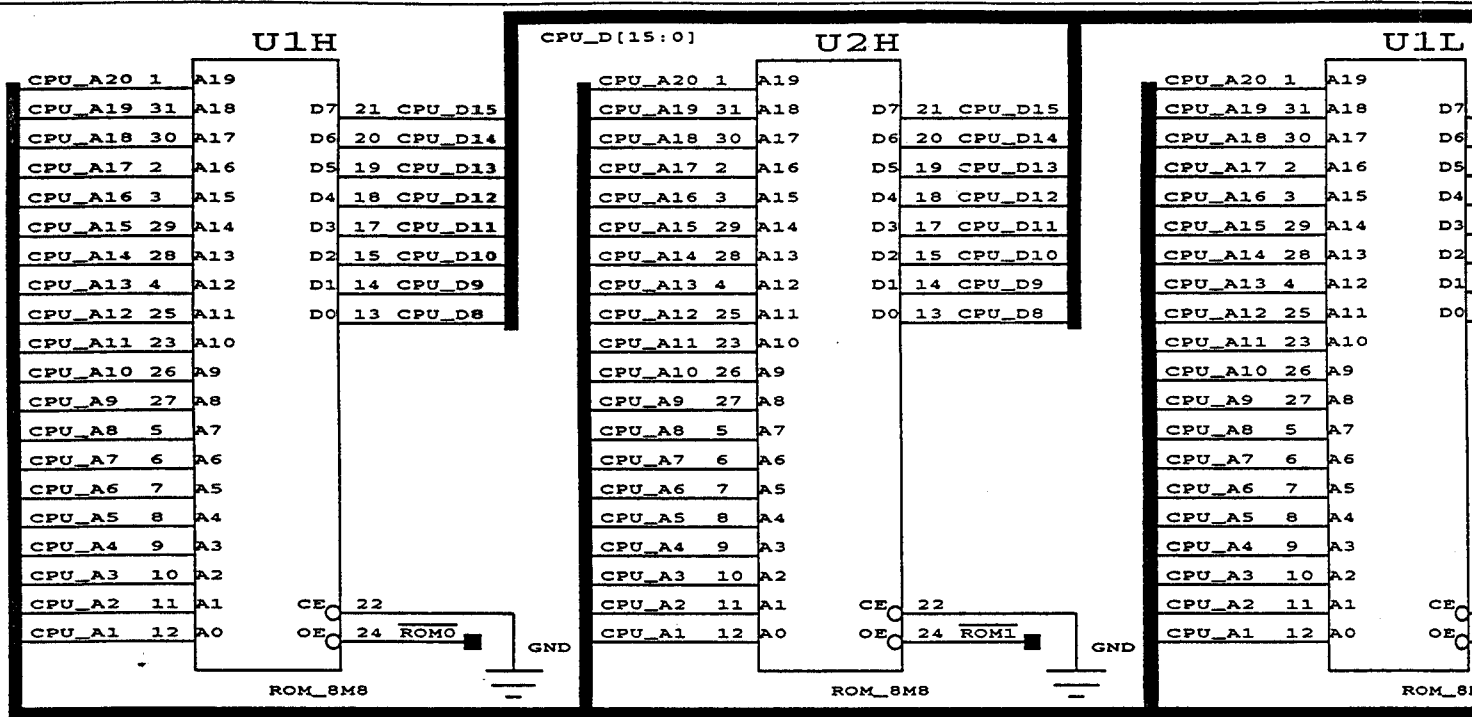
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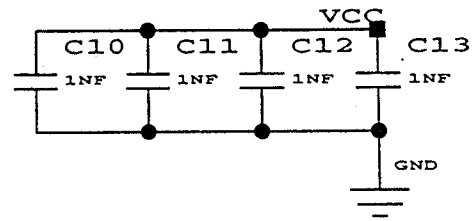
AUGUST 9, 1995

SHEET # REV

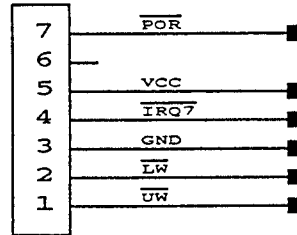
4 OF 6

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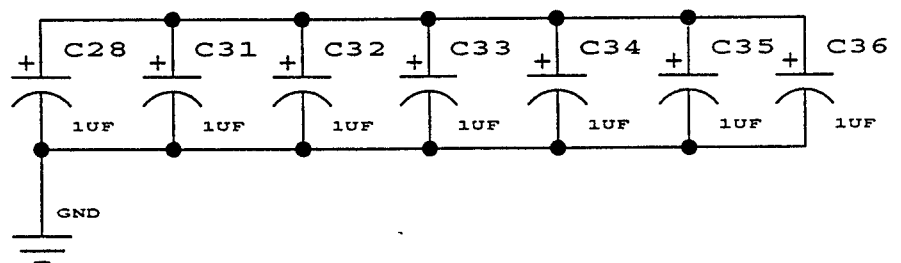
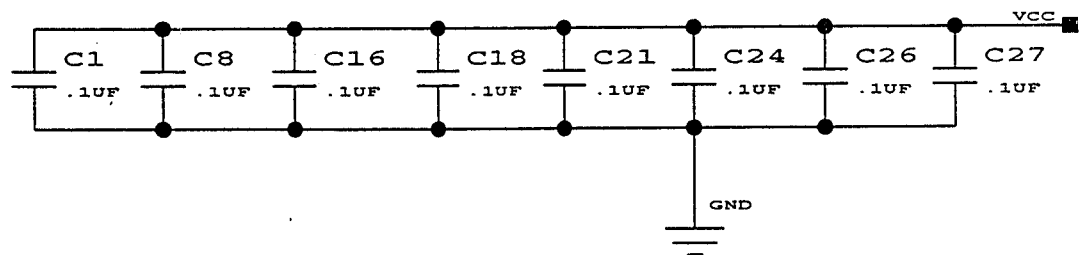
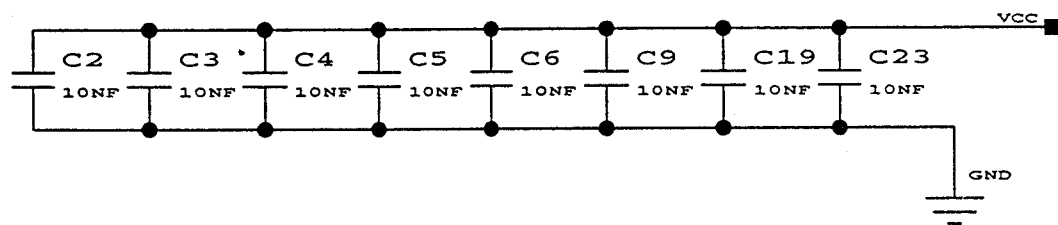


J5



CPU_D[15:0]

CPU_A[23:1]



CPU_D0	CPU_A1
CPU_D1	CPU_A2
CPU_D2	CPU_A3
CPU_D3	CPU_A4
CPU_D4	CPU_A5
CPU_D5	CPU_A6
CPU_D6	CPU_A7
CPU_D7	CPU_A8
CPU_D8	CPU_A9
CPU_D9	CPU_A10
CPU_D10	CPU_A11
CPU_D11	CPU_A12
CPU_D12	CPU_A13
CPU_D13	CPU_A14
CPU_D14	CPU_A15
CPU_D15	CPU_A16
CPU_CLK	CPU_A17
IRQ6	CPU_A18
SW4	CPU_A19
IRQ7	ROMS
BG	DRAM
BGACK	I/O
BR	NV_RAM
BERR	CPU_A20
POR	CPU_A21
HALT	CPU_A22
ROM0	CPU_A23
ROM1	FC0
ROM2	FC1
ROM3	FC2
UDS	CPU_R/W
LDS	AS
GND	DTACK
GND	VCC
GND	VCC
GND	VCC
GND	VCC

CAPCOM COIN-OP, INC.

TITLE

SYS_CPU

PROJECT ENGINEER
MARK COLDEBELLA

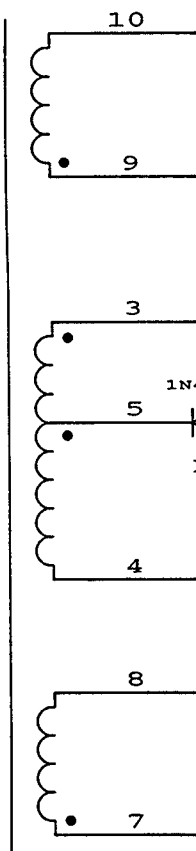
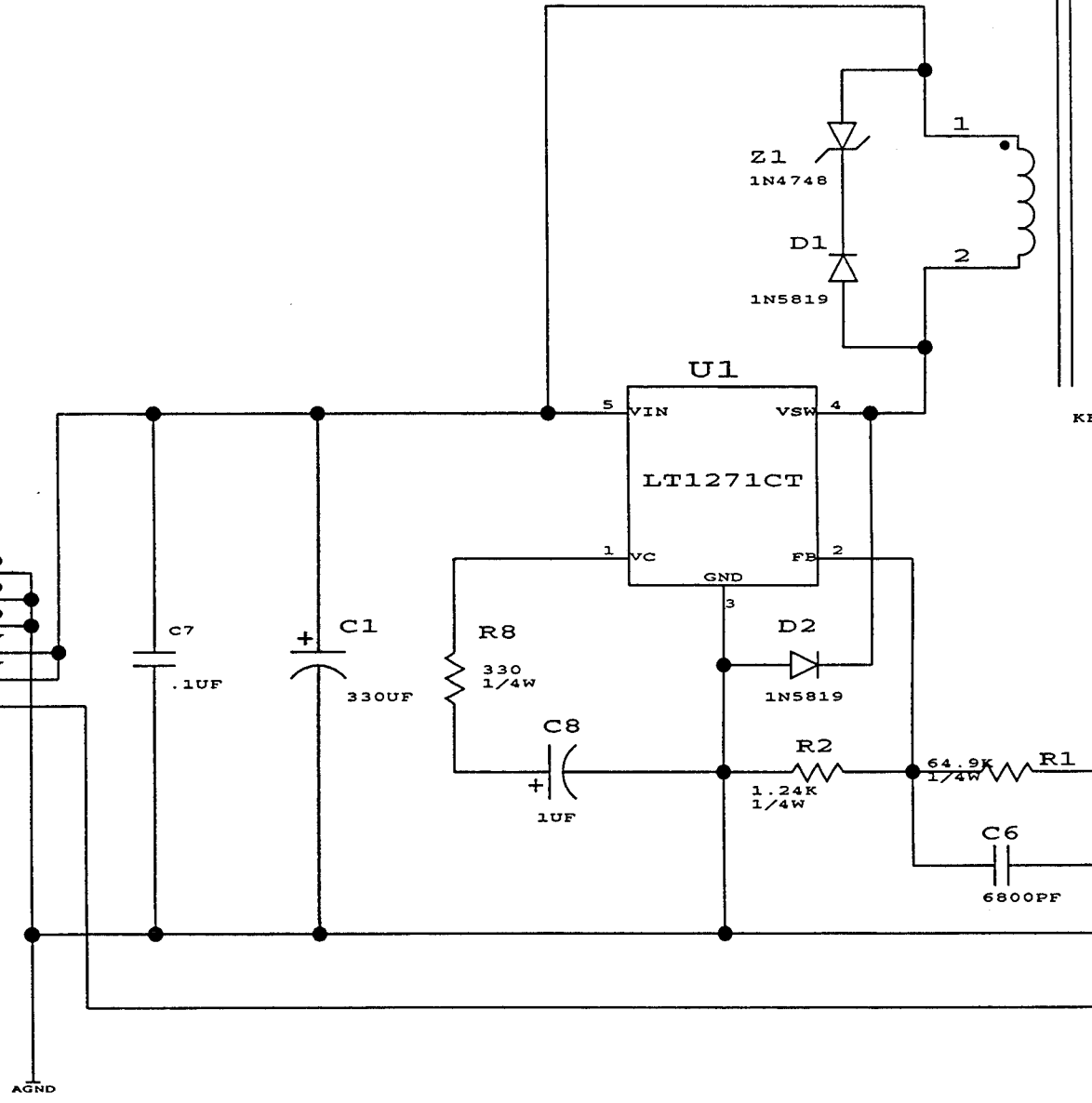
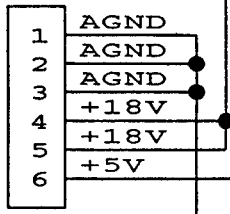
ASSEMBLY #
A0015403

DATE
AUGUST 9, 1995

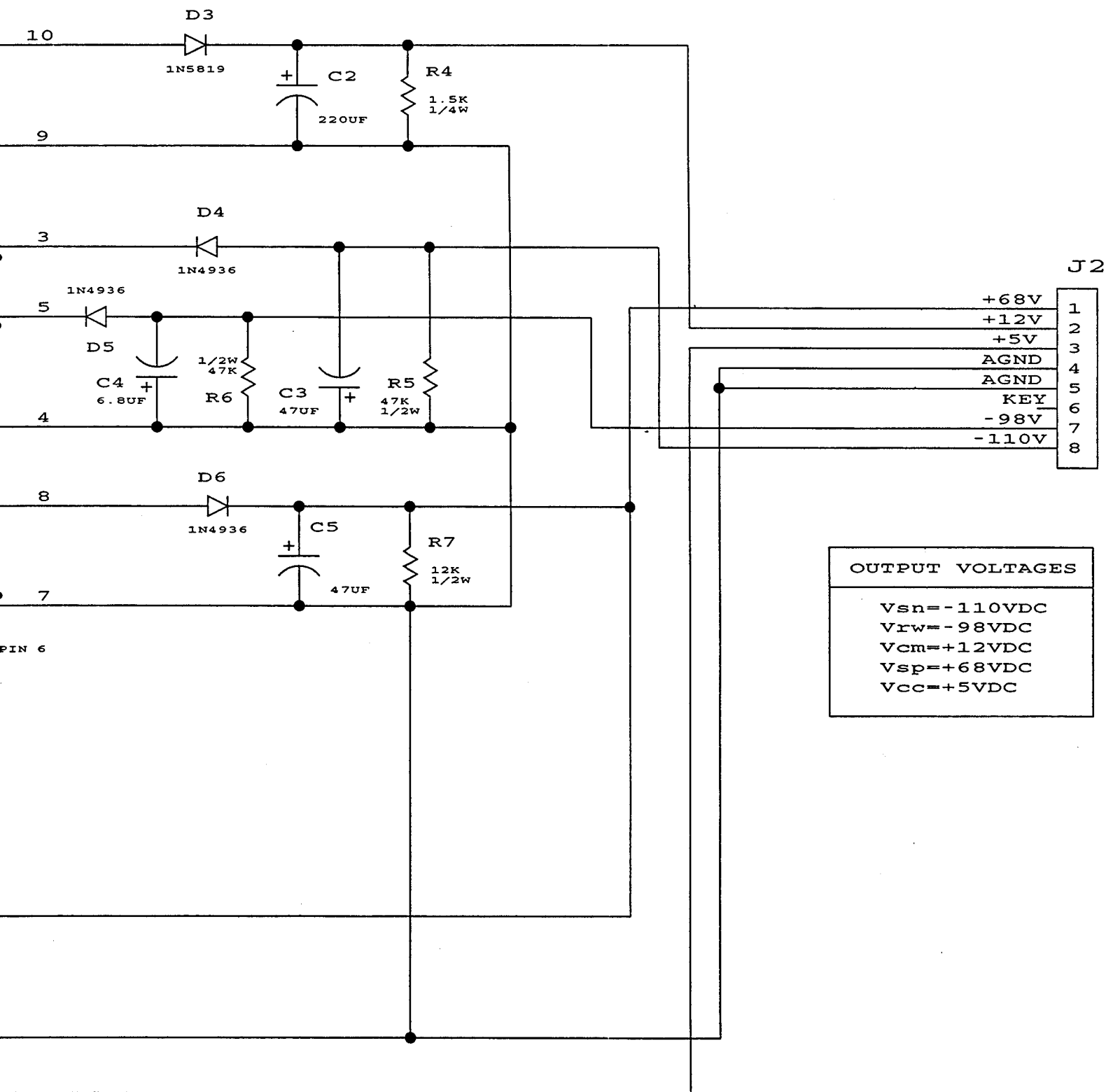
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6 OF 6 -

T1

J1



KEY PIN 6



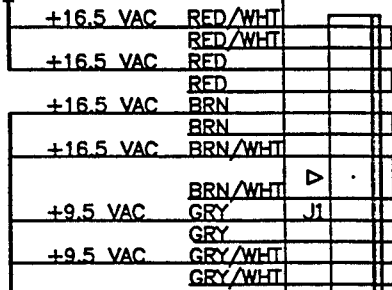
CAPCOM COIN-OP, INC.

TITLE DOT DISPLAY SWITCHING
POWER SUPPLY

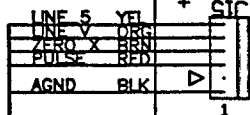
PROJECT ENGINEER ASSEMBLY #
STEVE MILEWSKI/KD A0015502

DATE SHEET # REV
6/2/95 1 OF 1 -

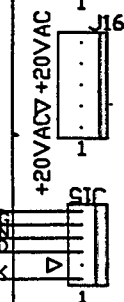
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SECONDARY P3



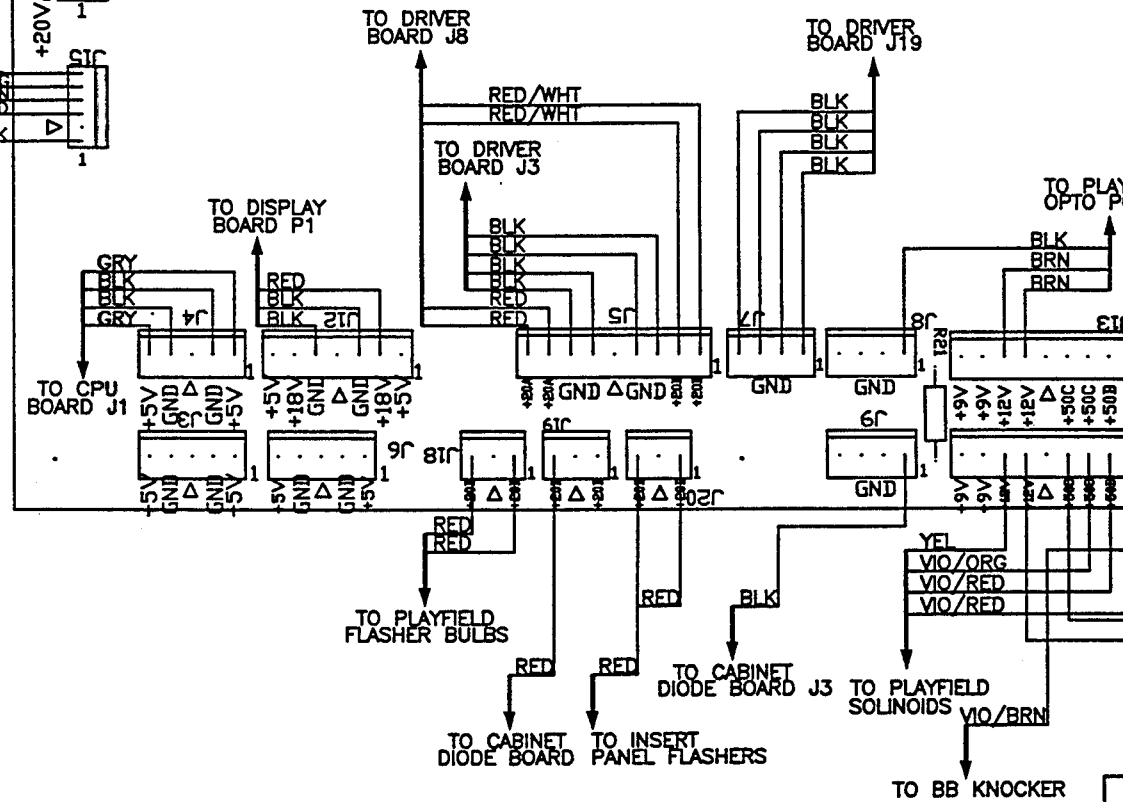
TO TRANSFORMER
SECONDARY P2

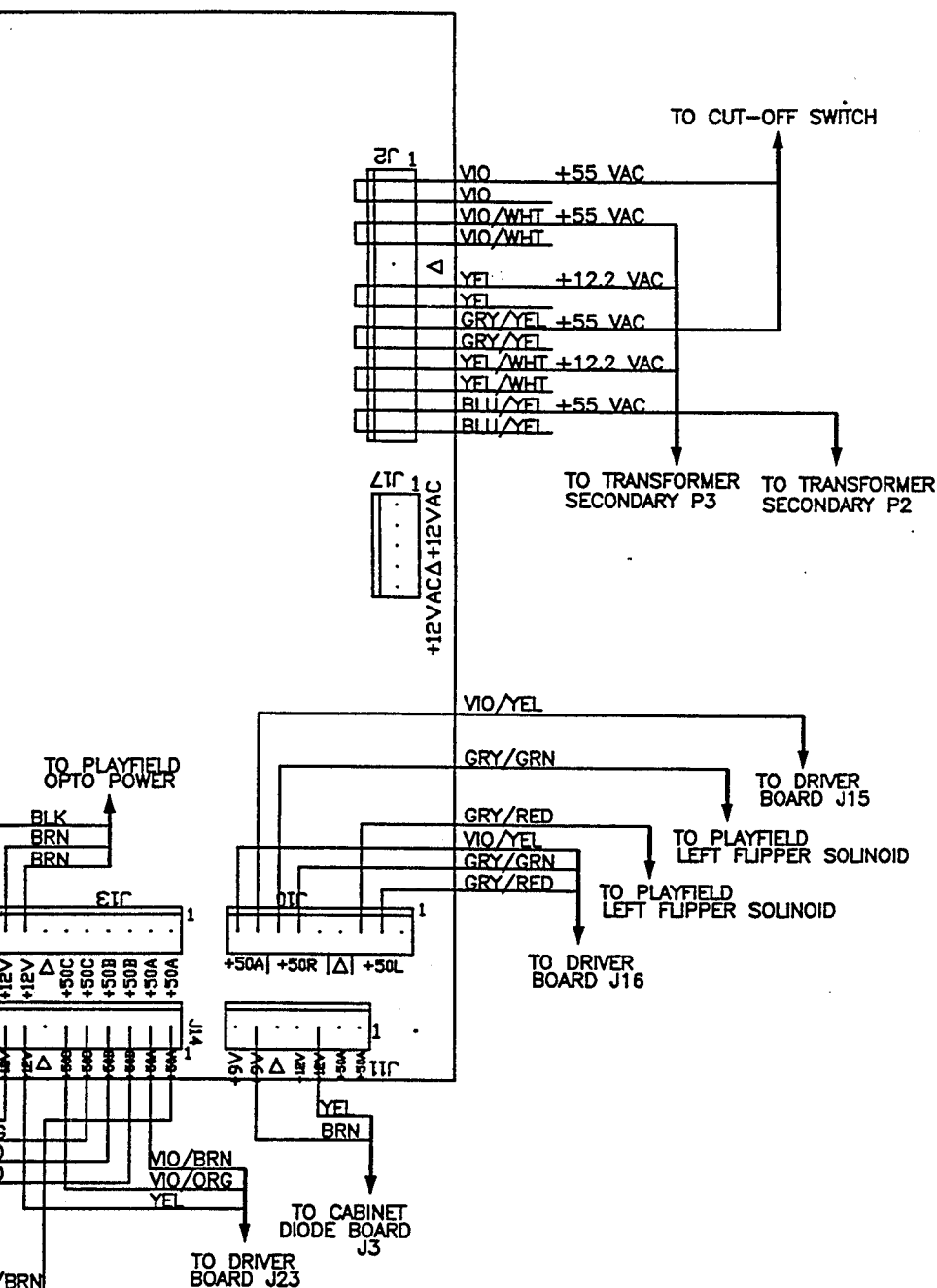


TO CPU BOARD J9



POWER BOARD

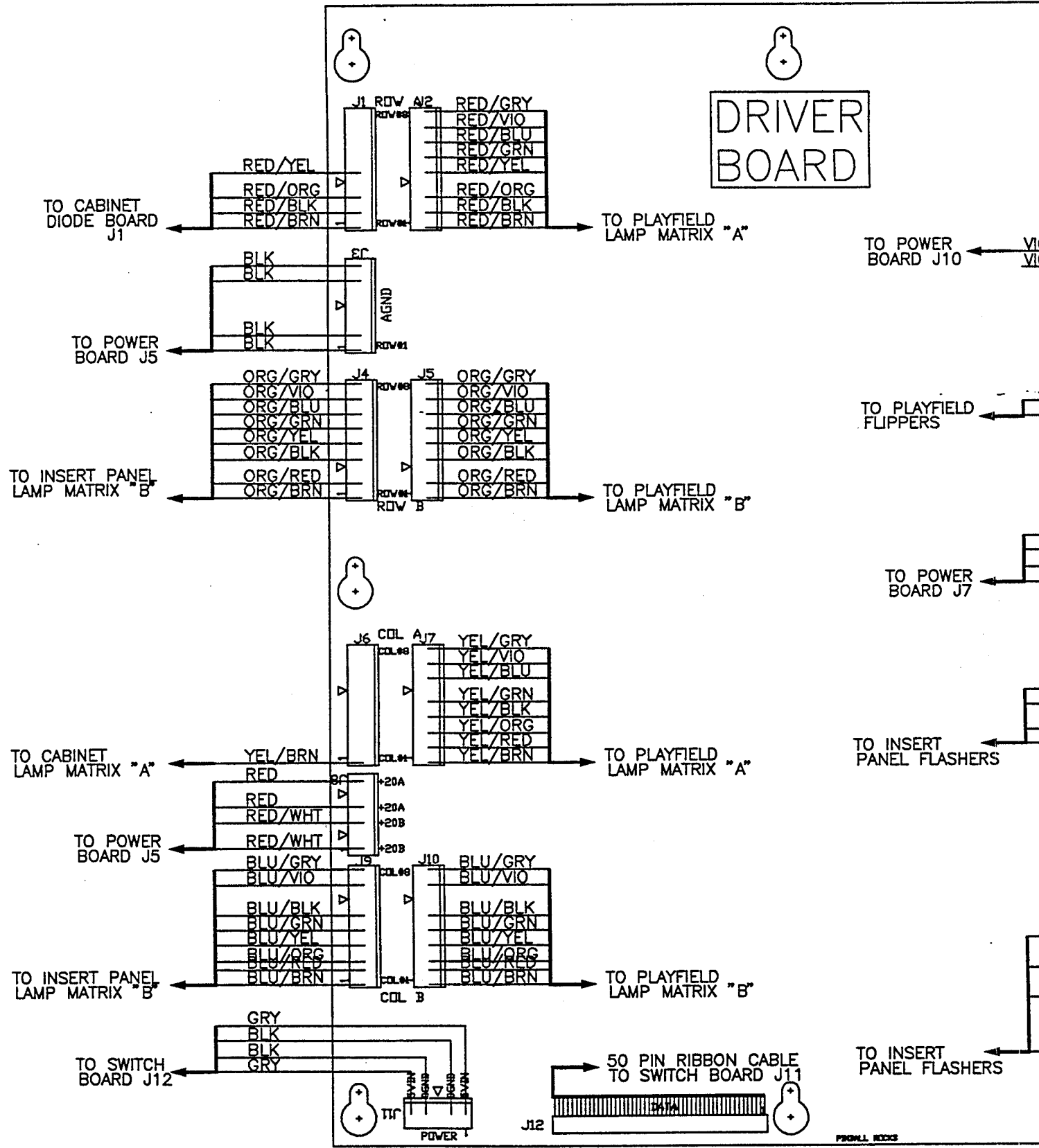


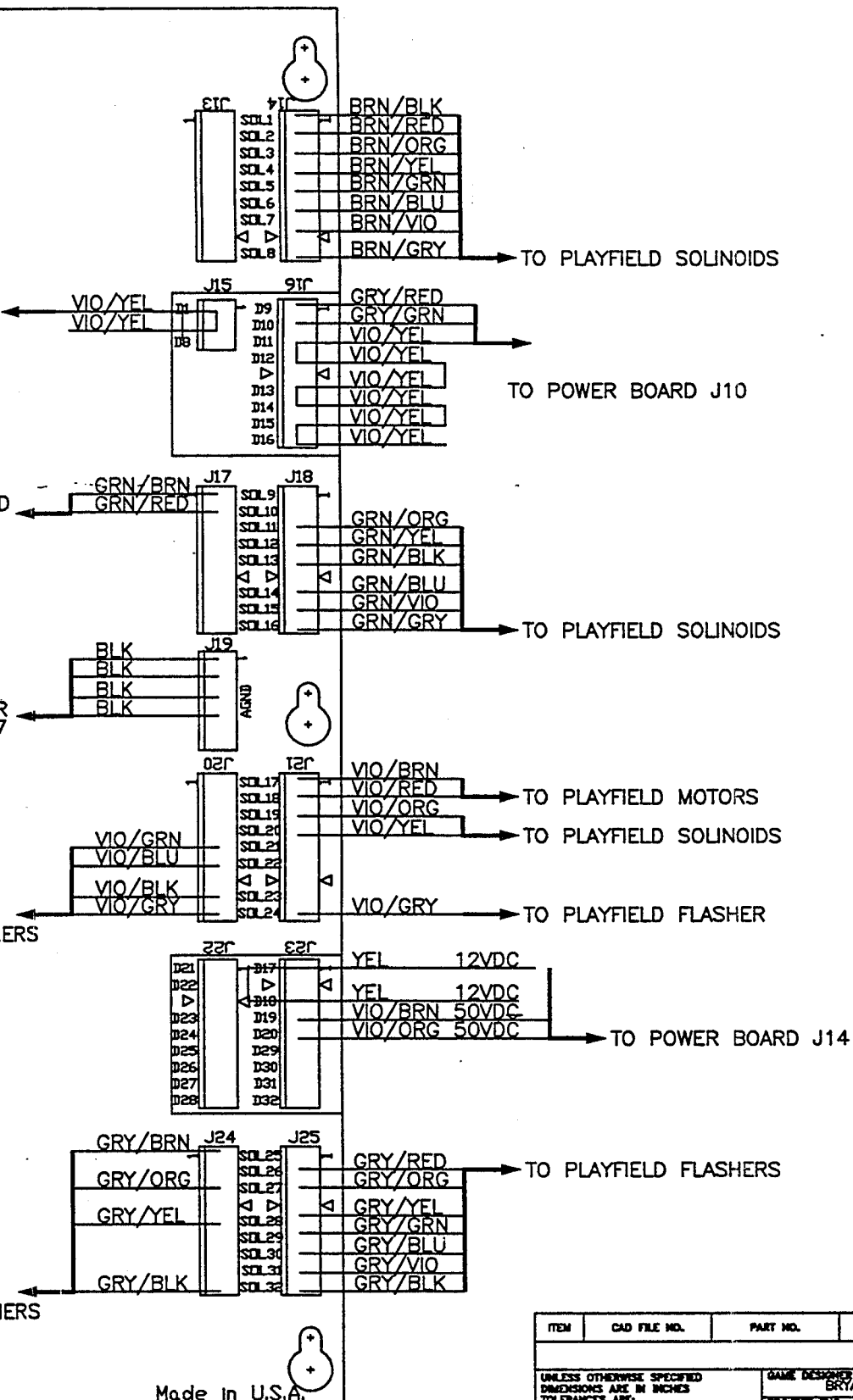


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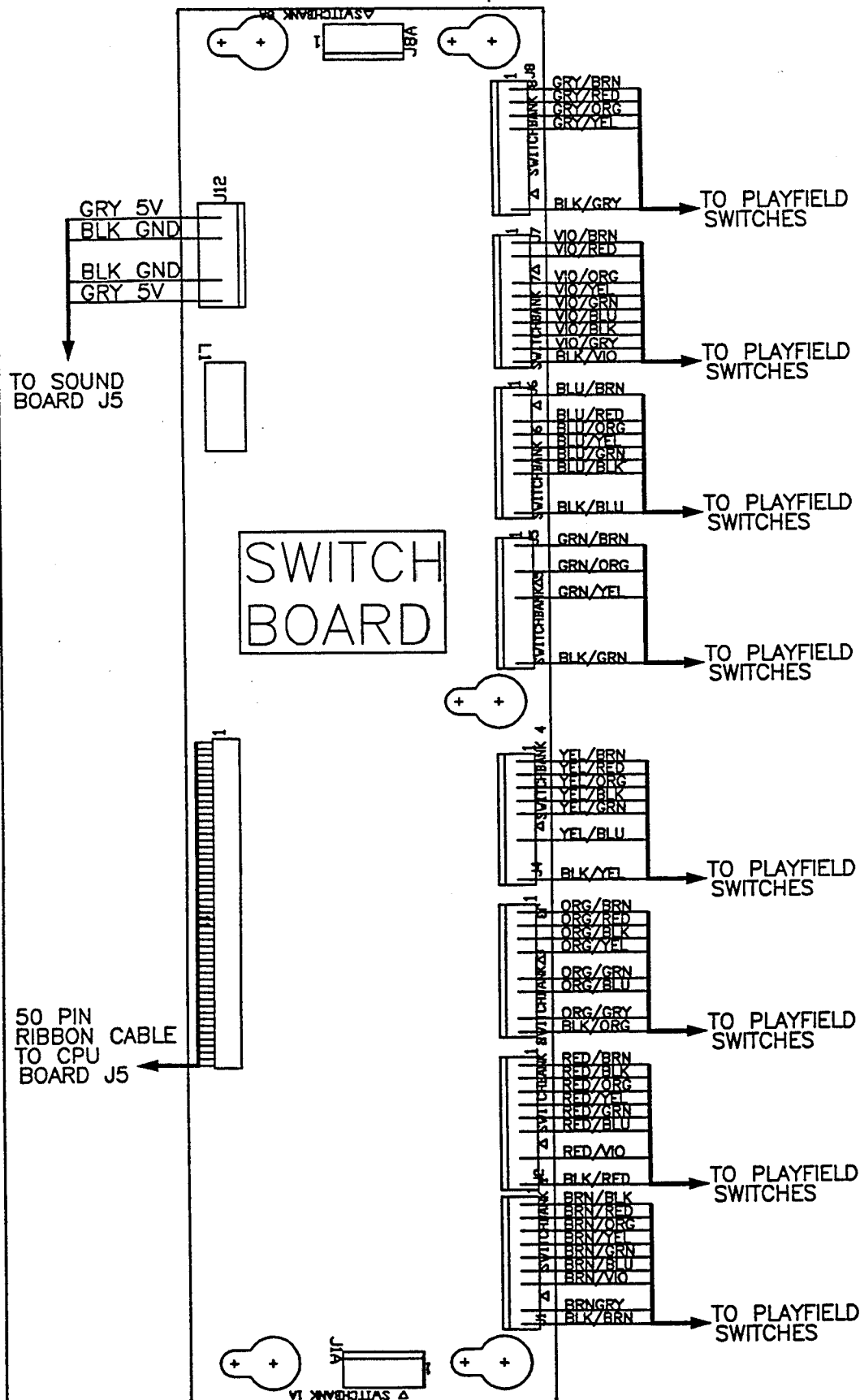
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PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:			GAME DESIGNER BRYAN HANSEN PROJECT ENG. RICK MORGAN PROJECT NO. PB-1		
FRACTIONAL TWO PLACE .XX ±.015 THREE PLACE .XXX ±.010 ANGULAR .XXX ±.005 ±.5			 CAPCOM COIN-OP, INC. 3311 NORTH KENNICOTT AVENUE ARLINGTON HEIGHTS, ILLINOIS 60004 PHONE (708) 797-8100 FAX (708) 797-6119		
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DO NOT SCALE DRAWING			SIZE B	PART NO. PB-1 WIRING	REV.
FILE NAME C:\ACADWIN\PMPPWR			SCALE	USAGE	ECN NO: 327
					SHEET 1 OF 10

DRIVER BOARD

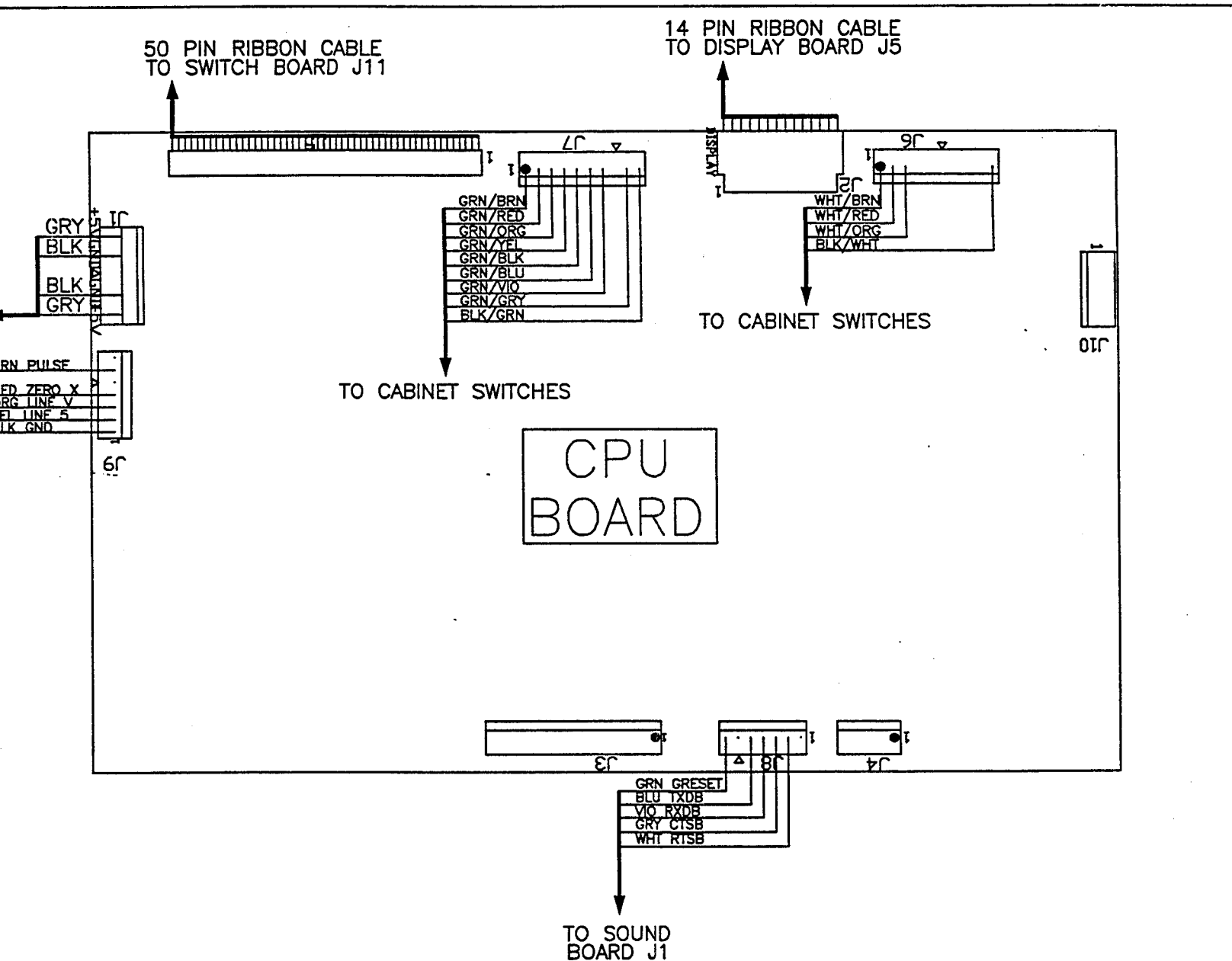




ITEM	CAD FILE NO.	PART NO.	VENDOR NO.	DESCRIPTION	QTY.
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONAL TWO PLACE THREE PLACE ANGULAR		GAME DESIGNER BRYAN HANSEN		 CAPCOM CORP., INC. 9811 NORTH KENNEDY AVENUE ARLINGTON HEIGHTS, ILLINOIS 60004 PHONE (708) 797-0100 FAX (708) 797-0120	
		PROJECT ENG. RICK MORGAN			
	±.015 ±.010 ±.006 ±.3°	PROJECT NO. PB-1			
	±.003				
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		CHECKED DAVE ROSE	DATE 8/23/95		
		APPROVED	DATE		
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					SHEET 2 of 10

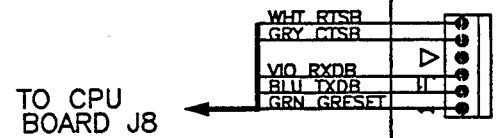
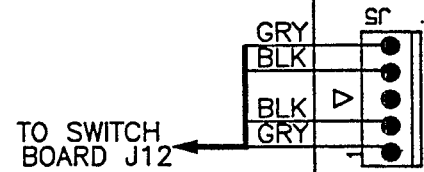
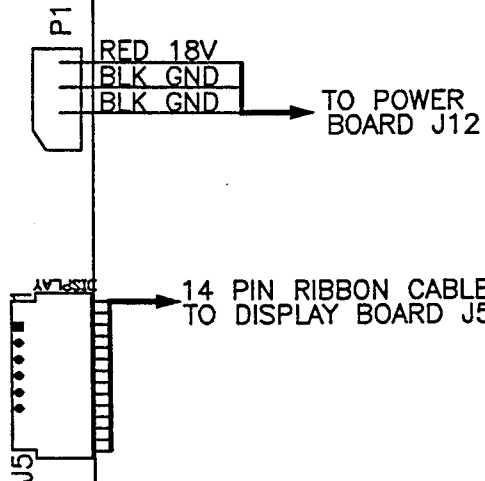


ITEM
UNLESS DIMENSIONS TOLERANCES FRACTIONS TWO PLACES THREE ANGULAR
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ITEM	CAD FILE NO.	PART NO.	VENDOR NO.	DESCRIPTION	QTY.
PARTS LIST					
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		PROJECT ENG. RICK MORGAN			
		PROJECT NO. PB-1			
		TITLE DIAGRAM SWITCH & CPU WIRING			
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		CHECKED DAVE ROSE	DATE 8/23/95		
		APPROVED	DATE		
		DO NOT SCALE DRAWING			
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				ECN NO: 327	SHEET 3 OF 10

DISPLAY
BOARD

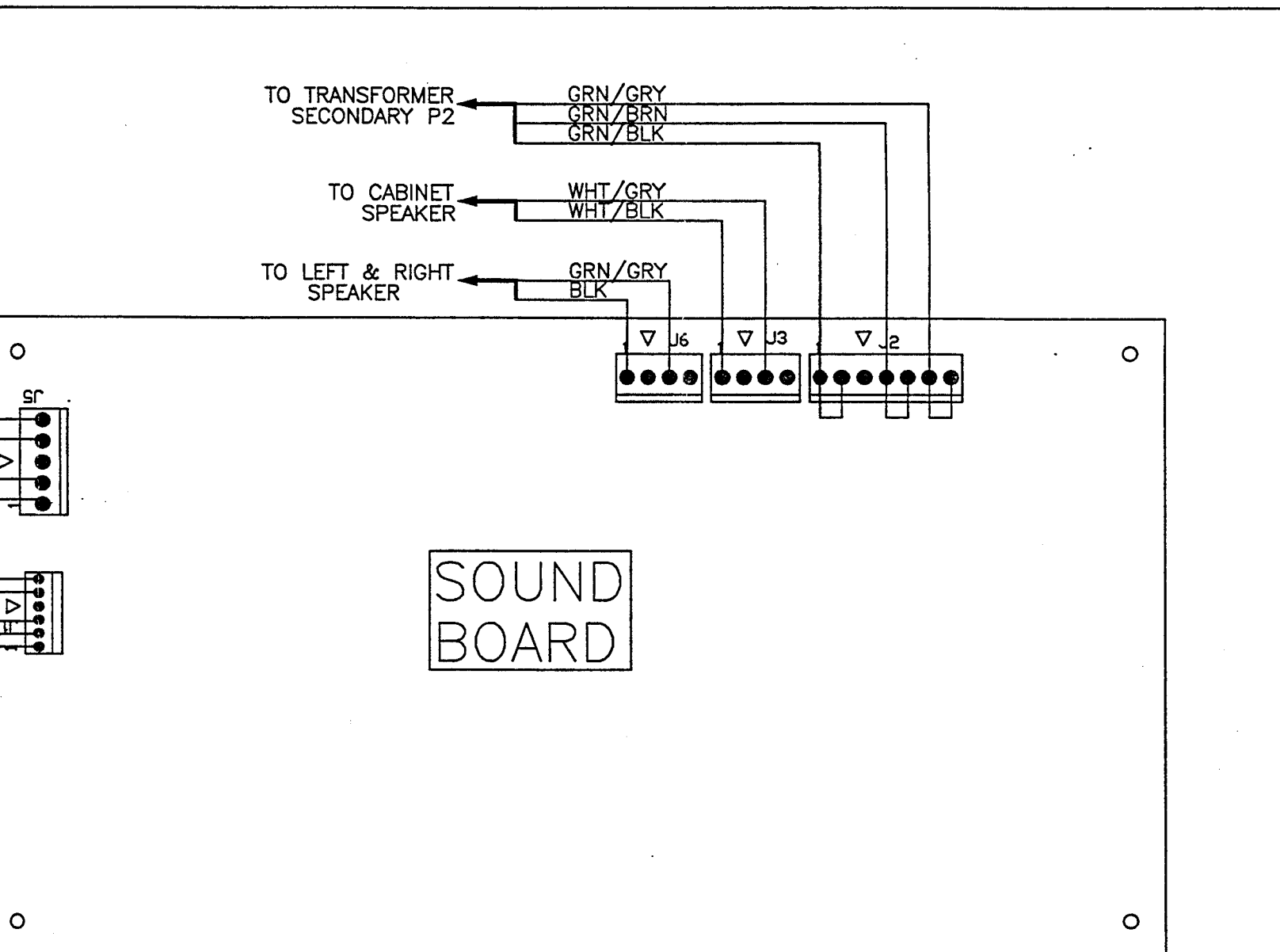


ITEM

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONAL
TWO PLACES
THREE PLACES
ANGULAR

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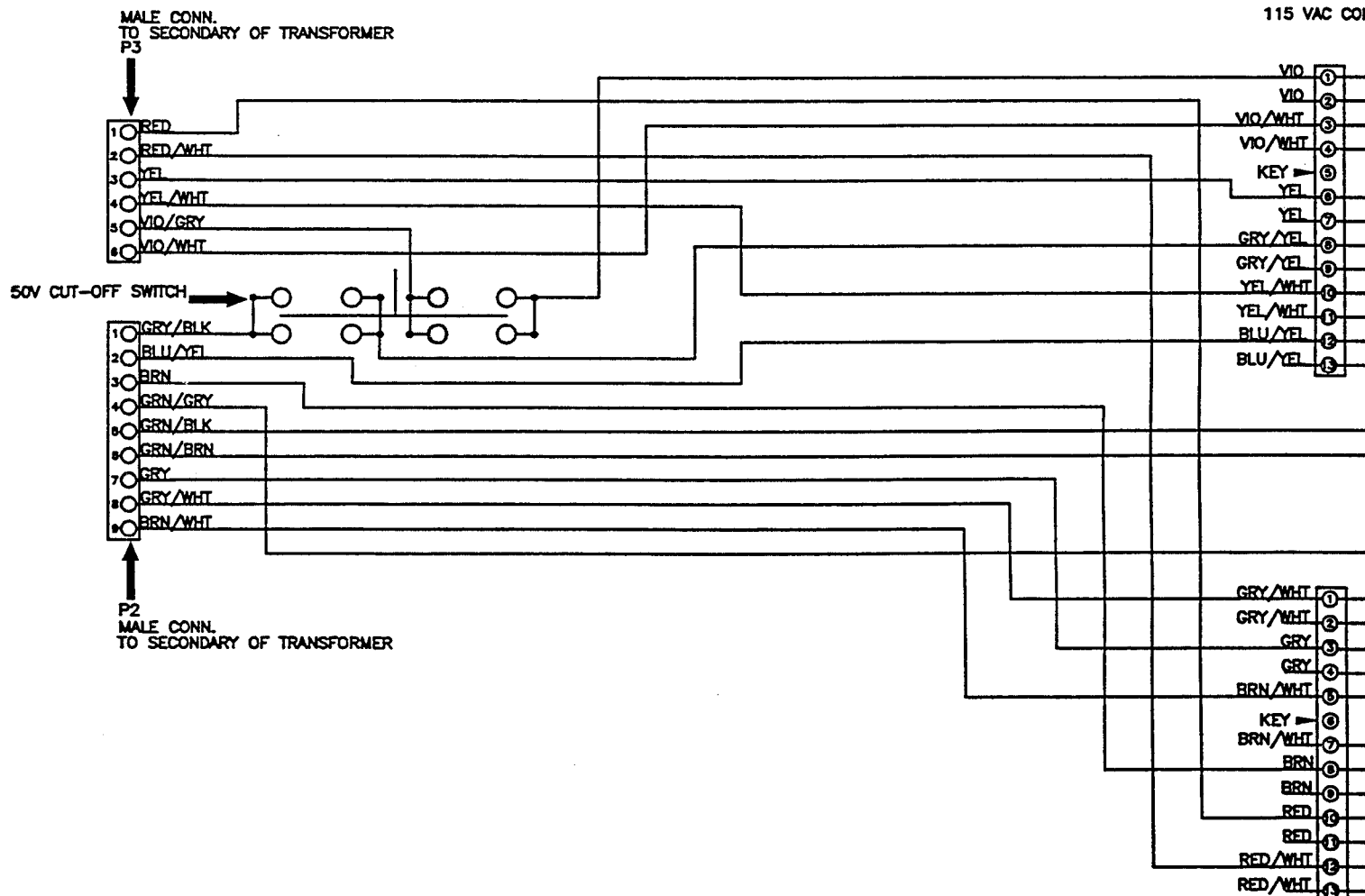
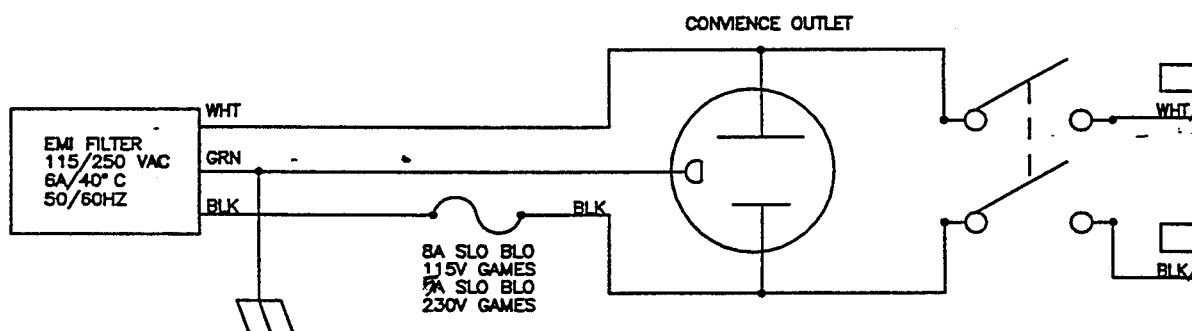
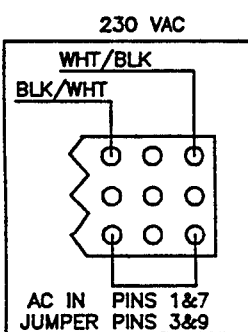
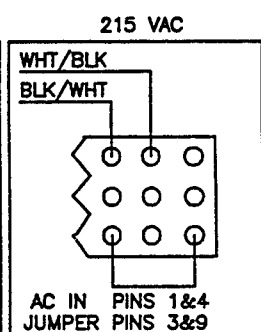
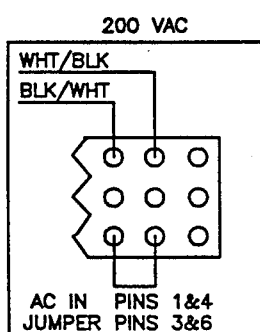
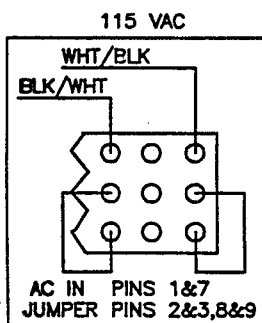
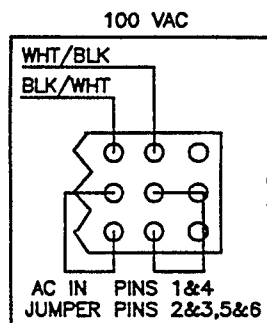
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ITEM	CAD FILE NO.	PART NO.	VENDOR NO.	DESCRIPTION	QTY.
PARTS LIST					
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		PROJECT NO. PB-1			
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APPROVED				DATE	
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				SHEET 4 OF 10	

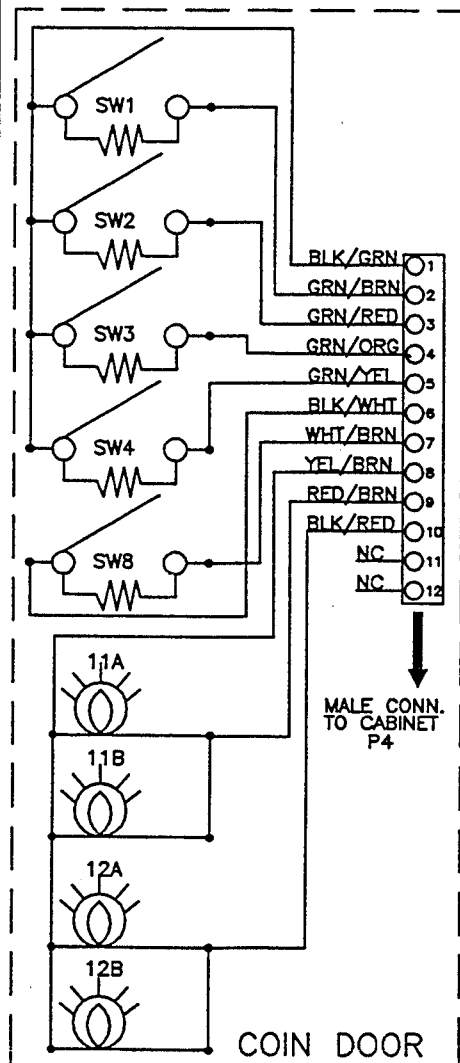
PIN CONFIGURATION
TOP VIEW

104070
205080
306090

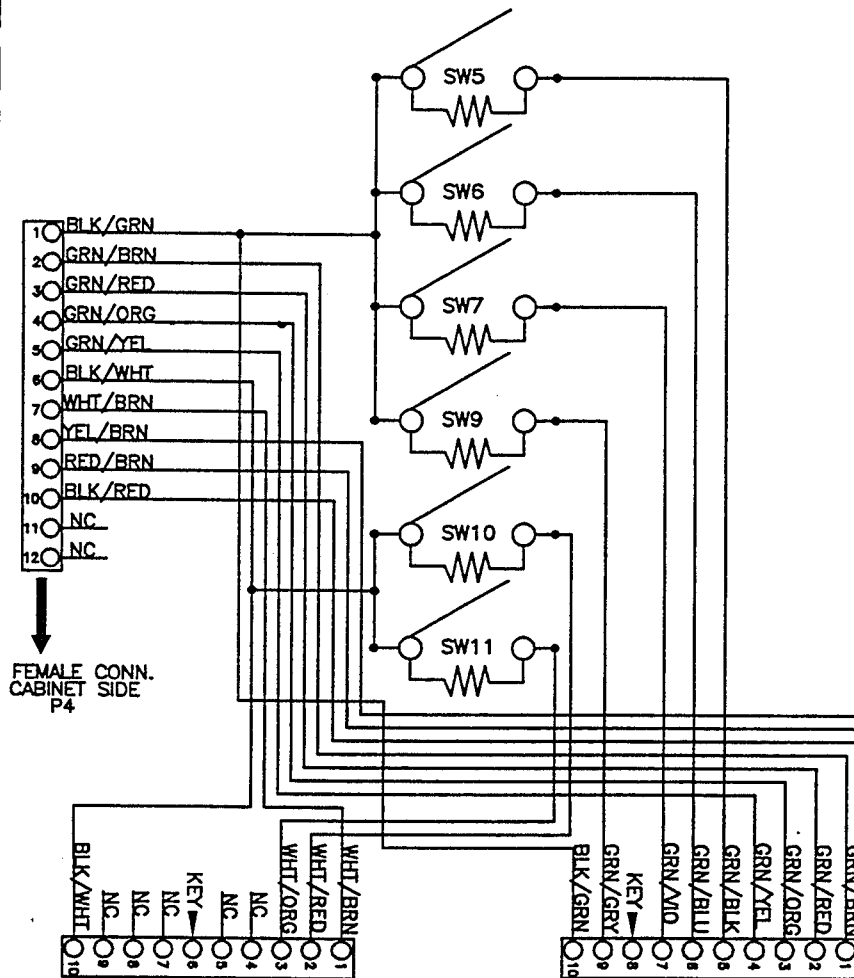


LAMP # & DESCRIPTION	
11	COIN DOOR 1&2
12	COIN DOOR 3&4
13	START
14	BUY-IN (CONTINUE)

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



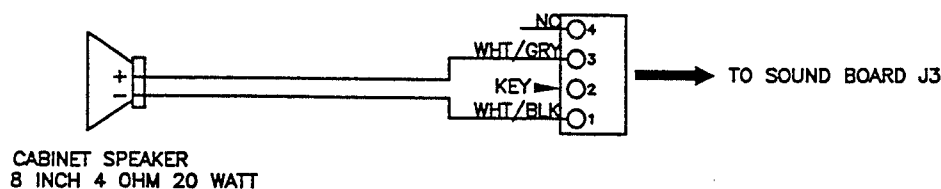
MALE CONN.
TO CABINET
P4



FEMALE CONN.
CABINET SIDE
P4

TO CPU BOARD J6

TO CPU BOARD J7

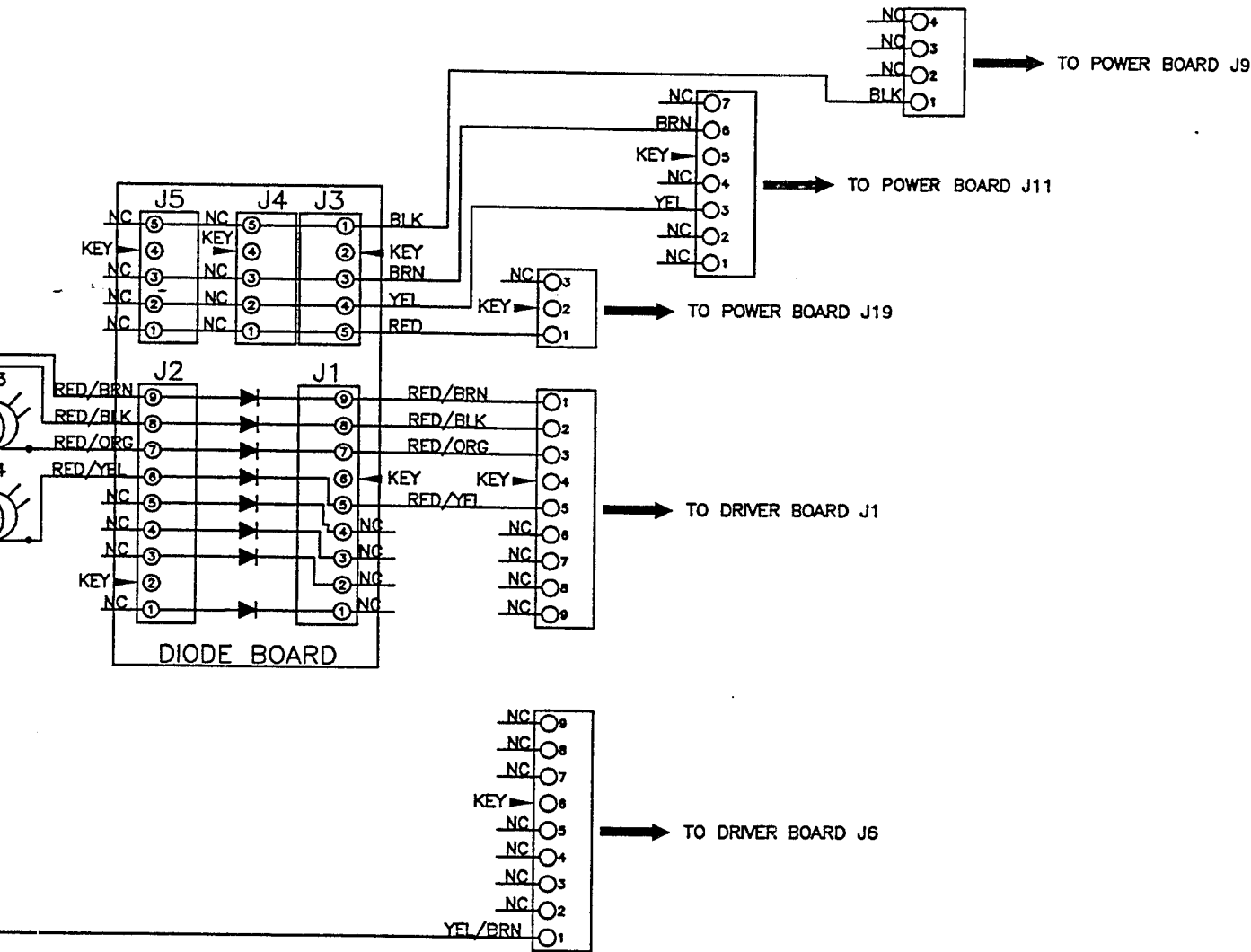


CABINET SPEAKER
8 INCH 4 OHM 20 WATT

ITEM	
	UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES. TOLERANCES ARE FRACTIONAL. TWO PLACE DECIMALS. THREE PLACE DECIMALS. ANGULAR.
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	DO NOT

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)

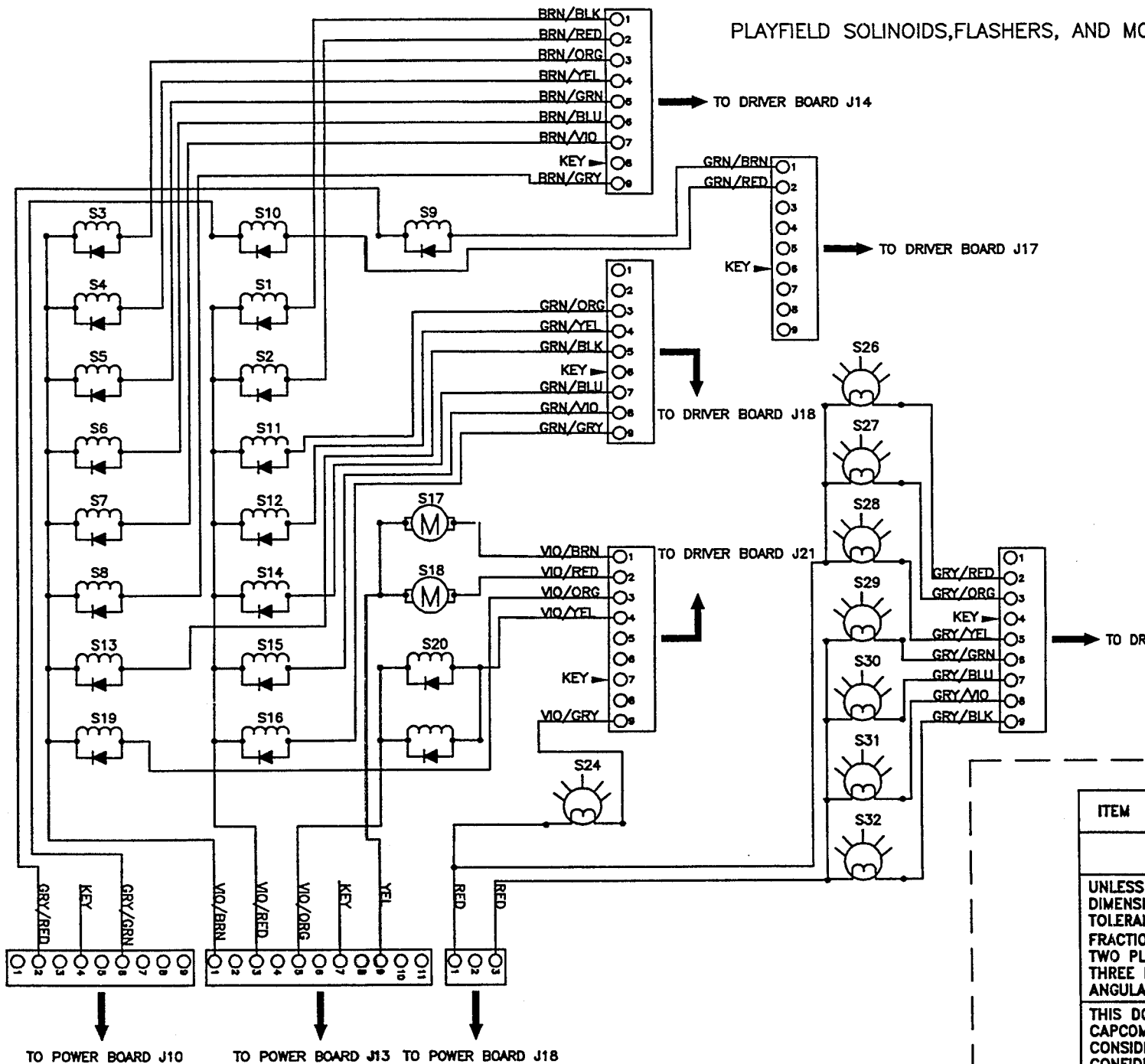


ITEM	CAD FILE NO.	PART NO.	VENDOR NO.	DESCRIPTION	QTY.	
PARTS LIST						
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONAL TWO PLACE .XX ±.015 THREE PLACE .XXX ±.005 ANGULAR ±.5°		GAME DESIGNER BRYAN HANSEN		 CAPCOM COIN-OP, INC. 3311 NORTH KENNICOTT AVENUE ARLINGTON HEIGHTS, ILLINOIS 60004 PHONE (708) 797-6100 FAX (708) 797-6119		
		PROJECT ENG. RICK MORGAN				
		PROJECT NO. PB-1				
		DRAWN BILL ZIEGLER				DATE 8/22/95
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		APPROVED		DATE		
		SIZE B		PART NO. PB-1 WIRING		REV.
		DO NOT SCALE DRAWING		FILE NAME C:\ACADWIN\PMCABSW		SCALE

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

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

PLAYFIELD SOLINOID,FLASHERS, AND MO



ITEM

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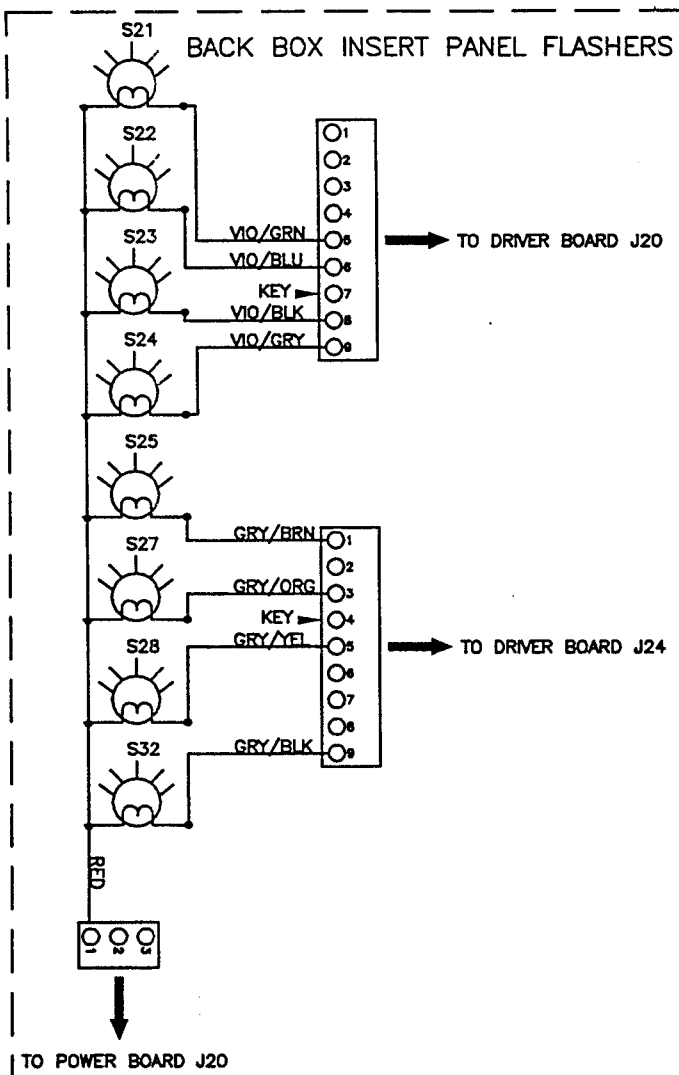
DESCRIPTION

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



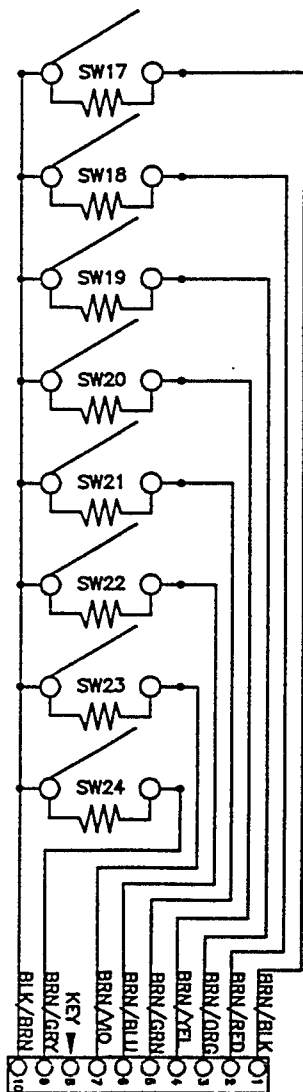
ITEM	CAD FILE NO.	PART NO.	VENDOR NO.	DESCRIPTION	QTY.
PARTS LIST					
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		PROJECT ENG. RICK MORGAN			
		PROJECT NO. PB-1			
		TITLE BB INSERT PNL FLASHERS & PLFD SOLINIODS,FLASHERS			
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		CHECKED DAVE ROSE	DATE 8/22/95	REV.	
		APPROVED	DATE		
DO NOT SCALE DRAWING		FILE NAME C:\ACADWIN\PMCL-FL		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

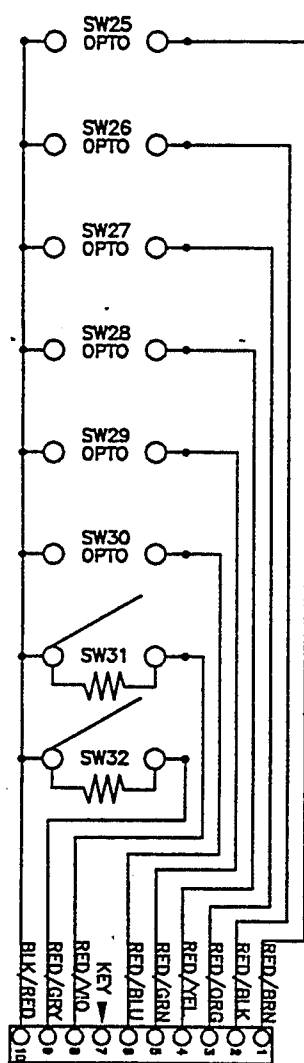
SWITCH # & DESCRIPTION
25 LOCK 1 (OPTO)
26 LOCK 2 (OPTO)
27 LOCK 3 (OPTO)
28 GENIE 1 (OPTO)
29 GENIE 2 (OPTO)
30 GENIE 3 (OPTO)
31 BONUS
32 UNUSED

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

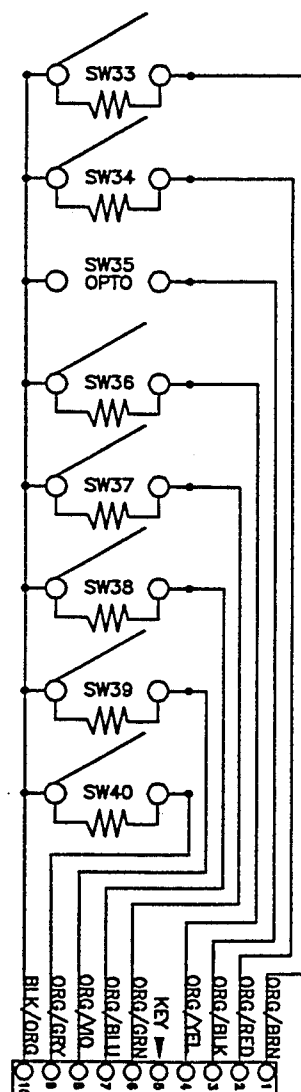
SWITCH # & DESCRIPTION
41 DROP C
42 DROP I
43 DROP G
44 DROP A
45 DROP M
46 UPPER SLINGSHOT
47 UNUSED
48 UNUSED



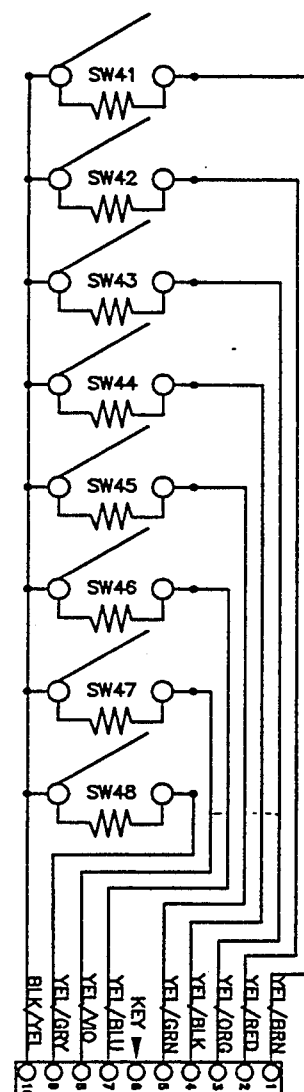
TO SWITCH BOARD
J1 SWITCHBANK 1



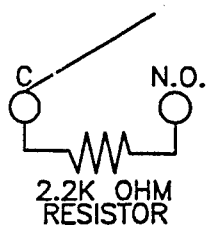
TO SWITCH BOARD
J2 SWITCHBANK 2



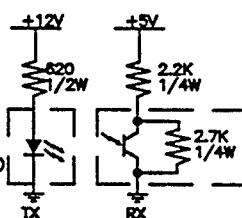
TO SWITCH BOARD
J3 SWITCHBANK 3



TO SWITCH BOARD
J4 SWITCHBANK 4



OPTO
TRANSMITTER BOARD



OPTO
RECEIVER BOARD

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

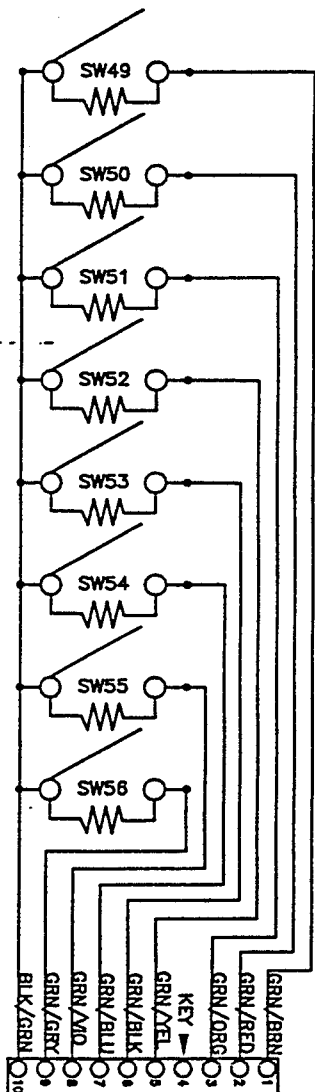
NOTE: ALL OPTOS SHOWN ARE RECEIVER SIDE ONLY
TRANSMITTER POWER COMES FROM POWER BOARD J13

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

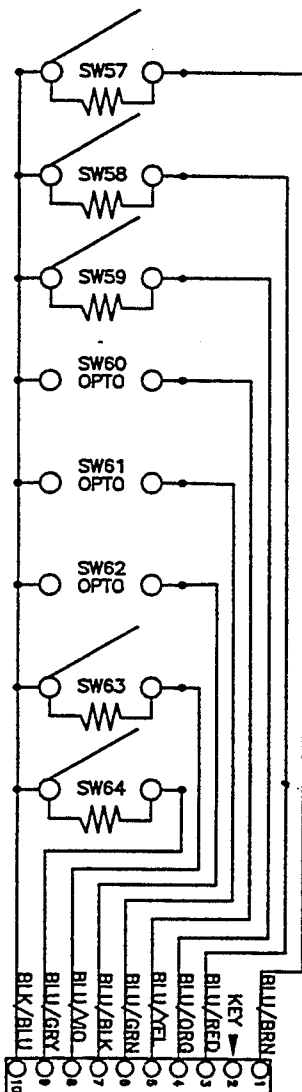
SWITCH # & DESCRIPTION
57 LIFT N
58 LIFT UP
59 LIFT DOWN
60 STAGE (OPTO)
61 DOOR L (OPTO)
62 DOOR R (OPTO)
63 UNUSED
64 UNUSED

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

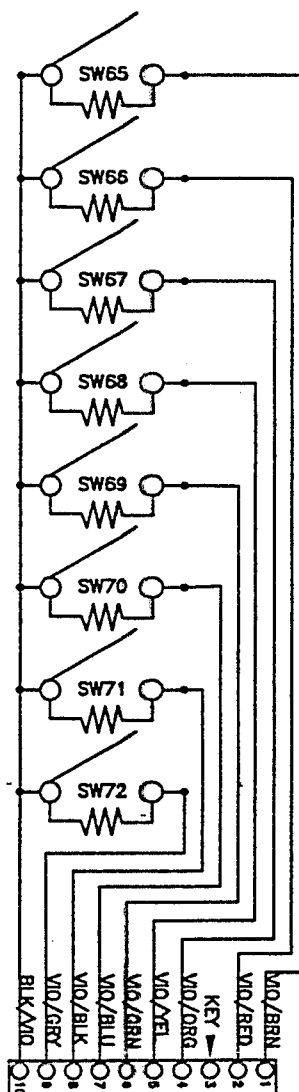
SWITCH # & DESCRIPTION
73 BALL OUT
74 TROUGH 3 (OPTO)
75 TROUGH 2 (OPTO)
76 TROUGH 1 (OPTO)
77 UNUSED
78 UNUSED
79 UNUSED
80 UNUSED



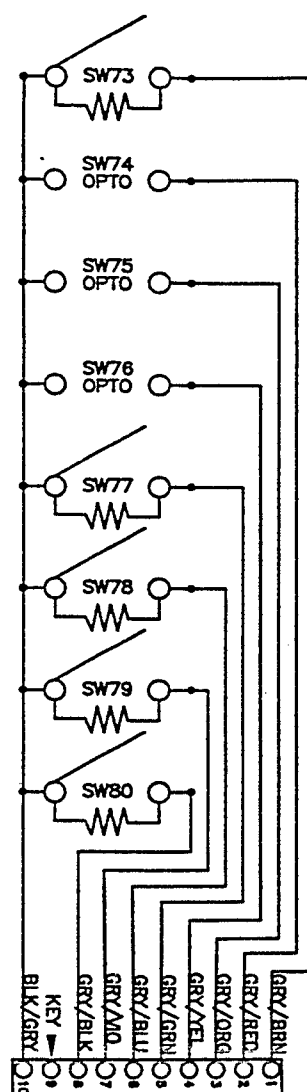
TO SWITCH BOARD
J5 SWITCHBANK 5



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 .XX ±.015 TWO PLACE .XX ±.010 THREE PLACE .XXX ±.005 ANGULAR .5 ±.5		GAME DESIGNER BRYAN HASEN PROJECT ENG. RICK MORGAN PROJECT NO. PB-1		CAPCOM® CAPCOM COIN-OP, INC. 3511 NORTH KENNEDY AVENUE ARLINGTON HEIGHTS, ILLINOIS 60004 PHONE (708) 797-6100 FAX (708) 797-6119	
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DO NOT SCALE DRAWING		FILE NAME C:\ACADWIN\PMSWA		SCALE USAGE ECH NO: 327	

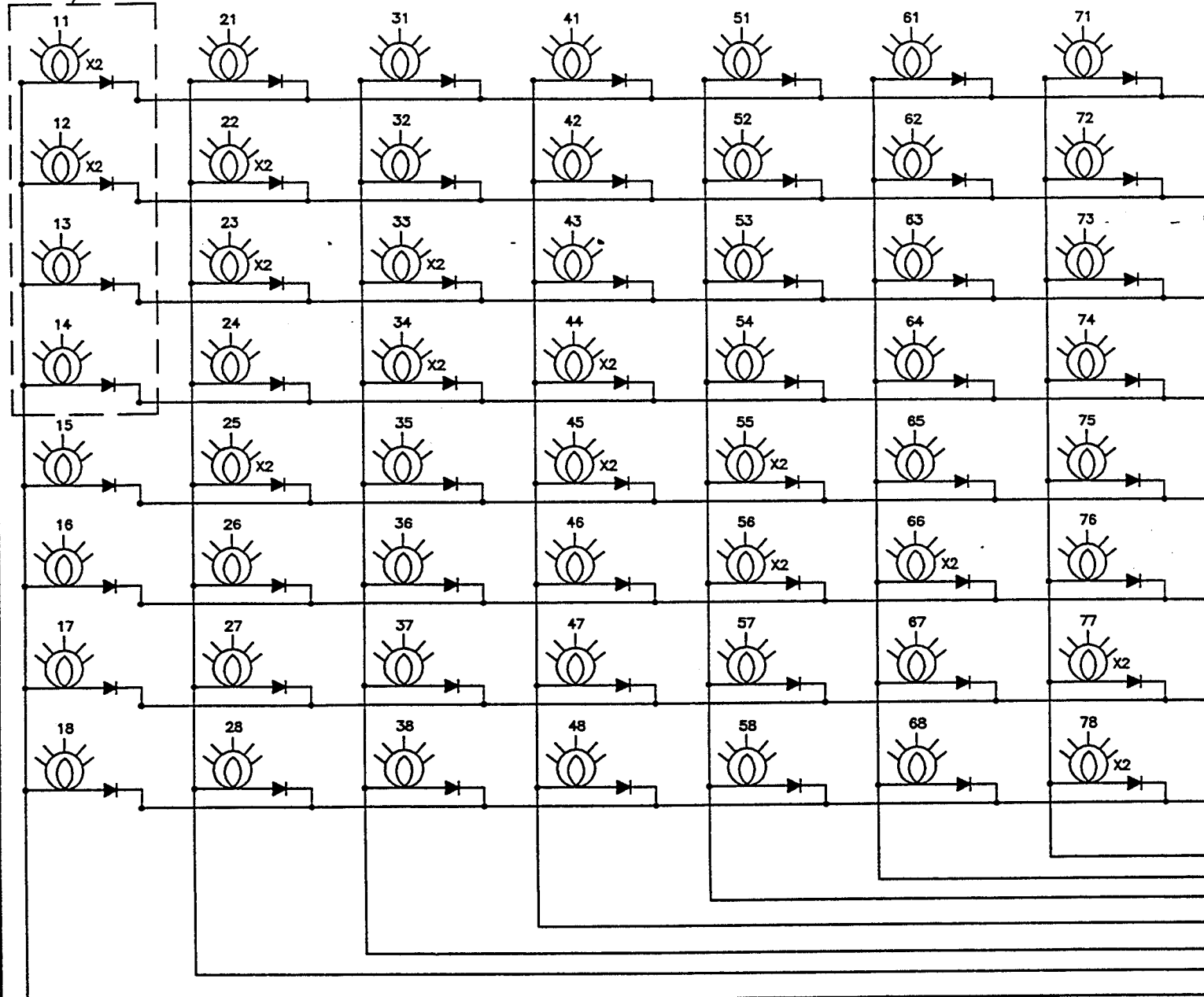
LAMP NUMBER & DESCRIPTION	
11	COIN DOOR 1&2
12	COIN DOOR 3&4
13	START
14	BUY-IN (CONTINUE)
15	LEFT INLANE
16	MIRACULOUS SAVE
17	GENIE (BOTTLE)
18	EXTRA BALL

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



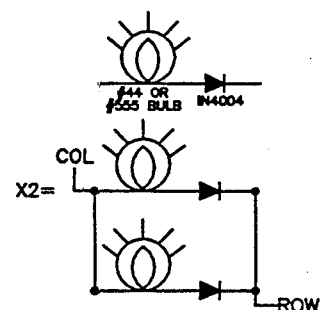
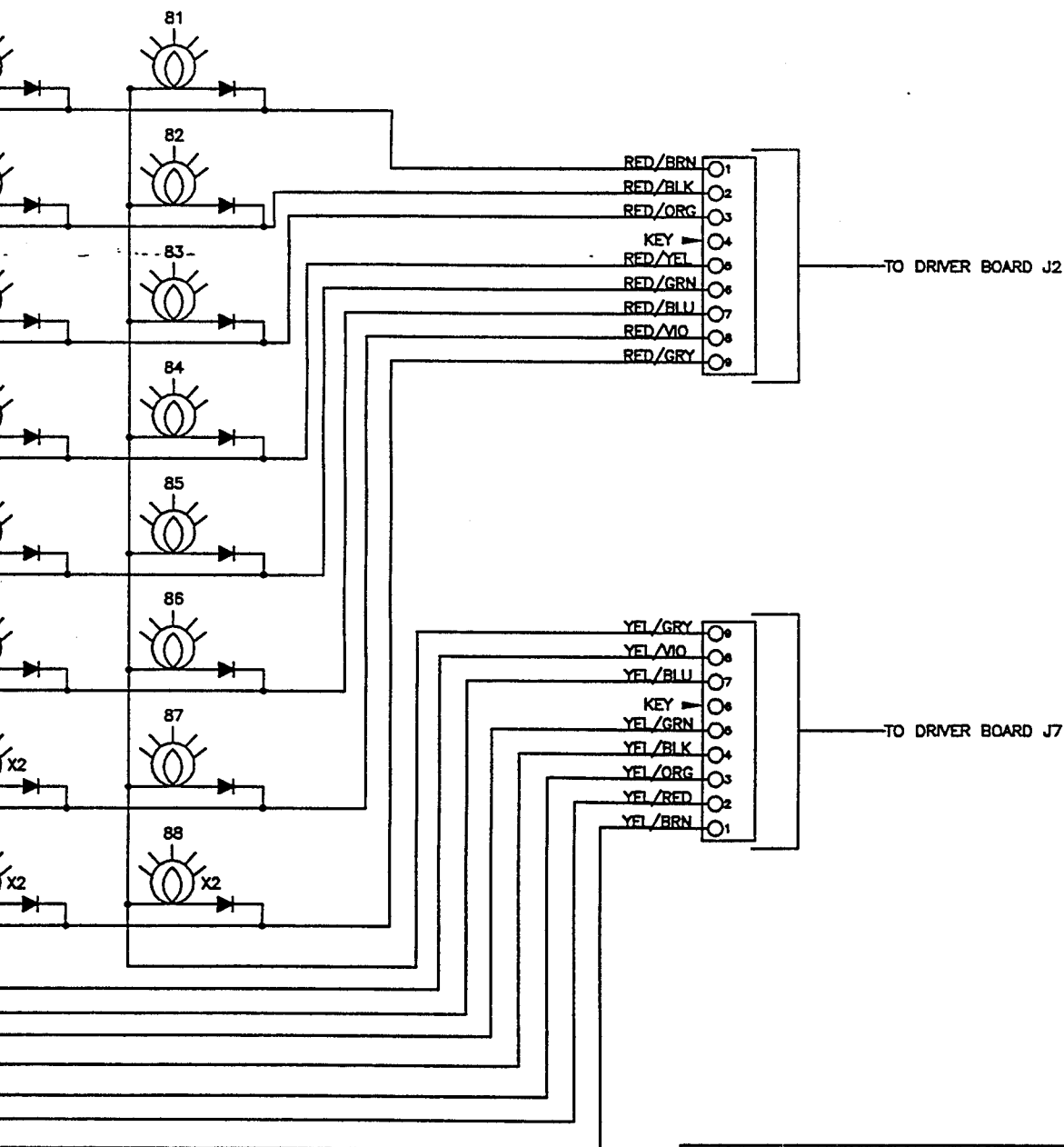
DESCRIPTION

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



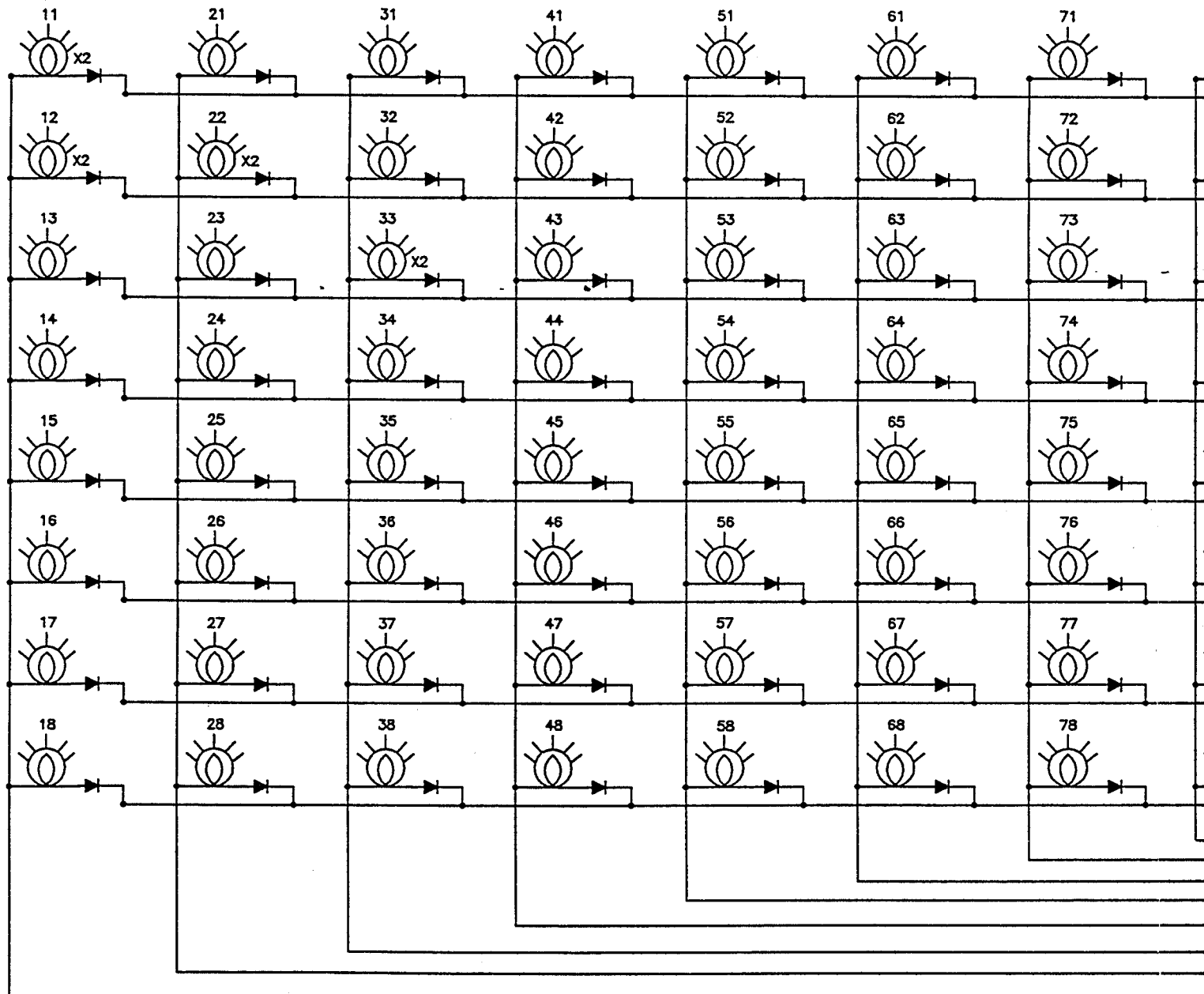
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PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES AND FRACTIONAL TWO PLACE THREE PLACE ANGULAR		GAME DESIGNER BRYAN HANSEN PROJECT ENG. RICK MORGAN PROJECT NO. PB-1		CAPCOM CORP., INC. 8811 BIRCH CREEK DRIVE ALBANY, NEW YORK 12209 PHONE (518) 799-0100 FAX (518) 799-0120	
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DO NOT SCALE DRAWING		FILE NAME C:\ACADWIN\PLM\PLA		TITLE DIAGRAM, LAMP MATRIX "A" WIRING	
		SCALE B		PART NO. PB-1 WIRING	
		USAGE		REV. 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



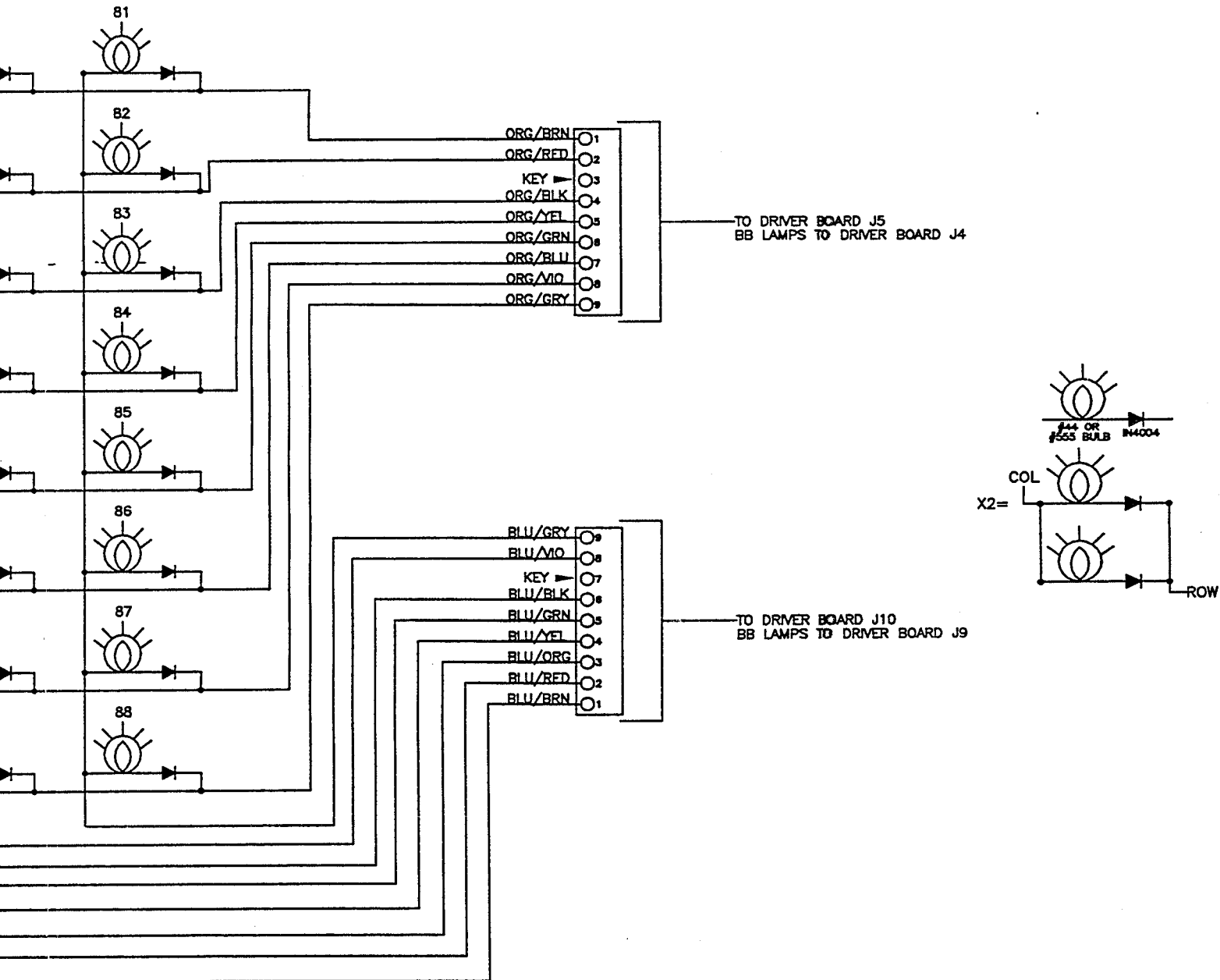
DESCRIPTION

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 CHANGED 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 ±.015 TWO PLACE .XX ±.010 THREE PLACE .XXX ±.003 ANGULAR ±.5° THIS DOCUMENT IS THE PROPERTY OF CAPCOM CORP., INC. AND IS CONSIDERED PROPRIETARY AND CONFIDENTIAL. NO REPRODUCTION OR DISCLOSURE OF THIS DOCUMENT SHALL BE MADE AND THIS DOCUMENT SHALL BE RETURNED INTACT UPON REQUEST.			GAME DESIGNER BRYAN HANSEN		 CAPCOM CORP., INC. 3111 NORTH KENNEDY AVENUE JACKSONVILLE, FLORIDA 32216 PHONE (704) 797-0200 FAX (704) 797-0210
			PROJECT ENG. RICK MORGAN		
			PROJECT NO. PB-1		
			TITLE DIAGRAM, LAMP MATRIX "B" WIRING		
			SIZE B PART NO. PB-1 WIRING REV.		
DO NOT SCALE DRAWING			FILE NAME C:\ACADWIN\PHLAMPS	SCALE	USAGE
			REV. 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/Bm	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/Bm 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/Bm	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/Bm J11-Pin 1	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-Pin 2	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								