

*Alvin G. & Co.™*

# MASTER CASTLE



**OPERATIONS MANUAL  
JULY 1993 MAN-019**

# **MYSTERY CASTLE OF DOOM**

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# SECTION 1

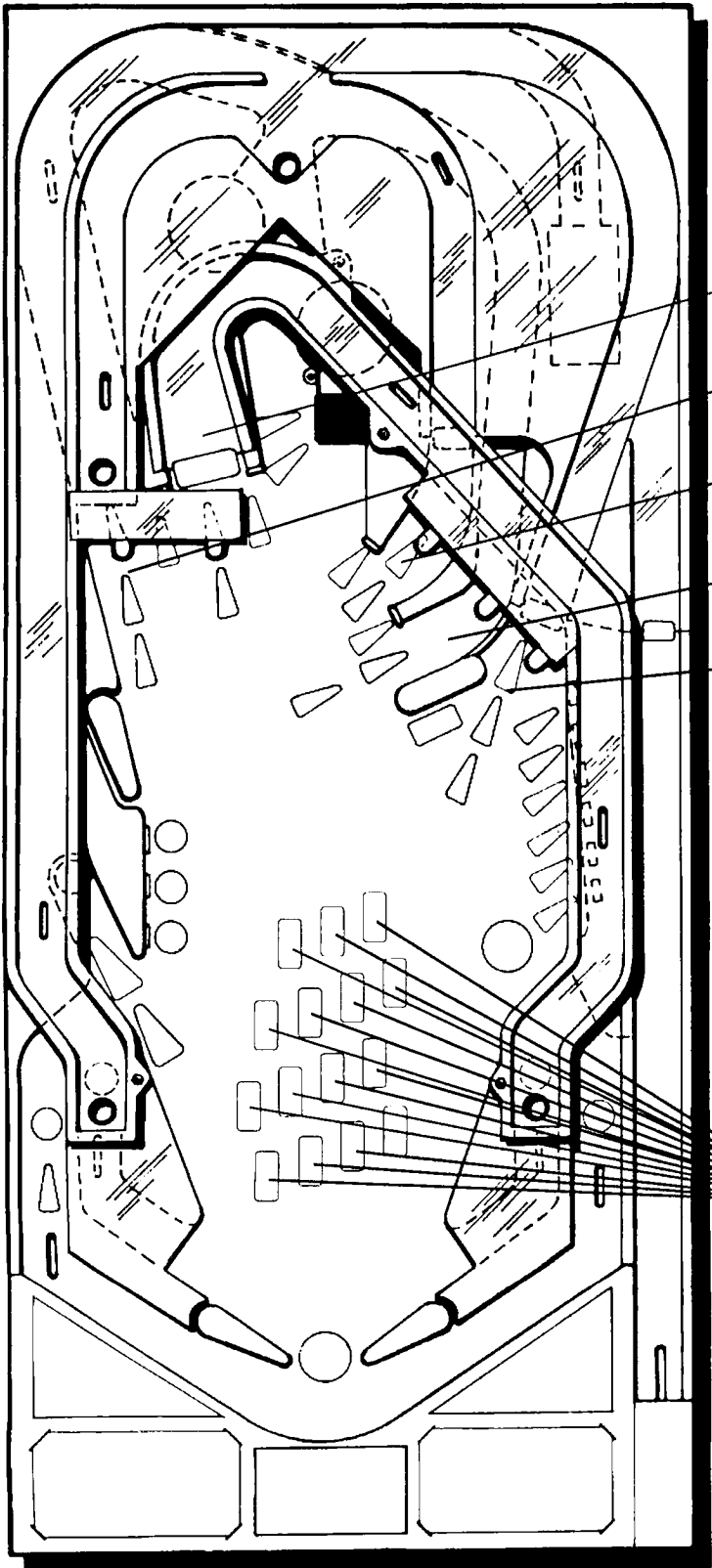
## GAME OPERATION

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# ASSEMBLY INSTRUCTIONS FOR MYSTERY CASTLE

- 1.) OPEN SHIPPING CONTAINER AND REMOVE STAPLES. (TO PREVENT STAPLES FROM SCRATCHING THE SIDE OF THE CABINET.)
- 2.) PULL GAME OUT BY THE BLACK HOLD DOWN STRAP.
- 3.) REMOVE LEG BOX FROM IN FRONT OF THE BACKBOX.
- 4.) SLIDE GAME OUT OF SHIPPING CONTAINER.
- 5.) SET SHIPPING CONTAINER ASIDE.
- 6.) REMOVE COIN DOOR KEYS FROM BEHIND MASKING TAPE ON THE COIN DOOR.
- 7.) OPEN COIN DOOR.
- 8.) CUT CABLE TIE HOLDING THE CASH BOX TO THE LOCK PLATE.
- 9.) REMOVE THE CASH BOX.
- 10.) IN THE CASH BOX PLEASE FIND:

4 - LEG LEVELERS	4 - LEG LEVELER LOCK NUTS
8 - LEG BOLTS	2 - BACKBOX BOLTS
2 - BACKBOX BOLT WASHERS	2 - PINBALLS
1 - SPARE PARTS BAG	
- 11.) SCREW A LEG LEVELER LOCK NUT TO THE BOTTOMMOST PORTION OF EACH LEG LEVELER.
- 12.) SCREW IN A LEG LEVELER INTO EACH OF THE LEGS APPROXIMATELY 2/3 THE LENGTH OF THE SCREW.
- 13.) PLACE THE CABINET ON A SUPPORT AND ATTACH THE FRONT LEGS USING THE LEG BOLTS.
- 14.) REMOVE SUPPORT AND ATTACH THE REAR LEGS USING THE LEG BOLTS.
- 15.) PUT BACKBOX INTO THE UPRIGHT POSITION AND HOLD IN PLACE WITH THE BACKBOX CLAMP.
- 16.) REMOVE BACKGLASS BY UNLOCKING IT WITH THE KEYS LOCATED ON THE COIN DOOR KEY RING.
- 17.) REMOVE SPEAKER AND DISPLAY MOUNT BY LIFTING UP AND PULLING TOWARDS THE COIN DOOR.
- 18.) USING THE TWO BACKBOX BOLTS AND WASHERS SCREW IN A BOLT IN BOTH HOLES IN THE BACKBOX.
- 19.) TIGHTEN EACH BOLT USING A 9/16" WRENCH.
- 20.) REMOVE FRONT MOLDING OUT OF LOCK DOWN CHANNEL.
- 21.) PULL GLASS OUT ABOUT TWO FEET AND INSTALL 2 PINBALLS.
- 22.) PUSH GLASS BACK TO OPERATING POSITION.
- 23.) REPLACE FRONT MOLDING INTO LOCK DOWN CHANNEL.
- 24.) ALLOW GAME PARTS AND ELECTRONICS TO WARM TO ROOM TEMPERATURE.
- 25.) PLUG GAME IN, TURN IT ON, AND LET THE MONEY ROLL IN!



BRIDGE

DUNGEON

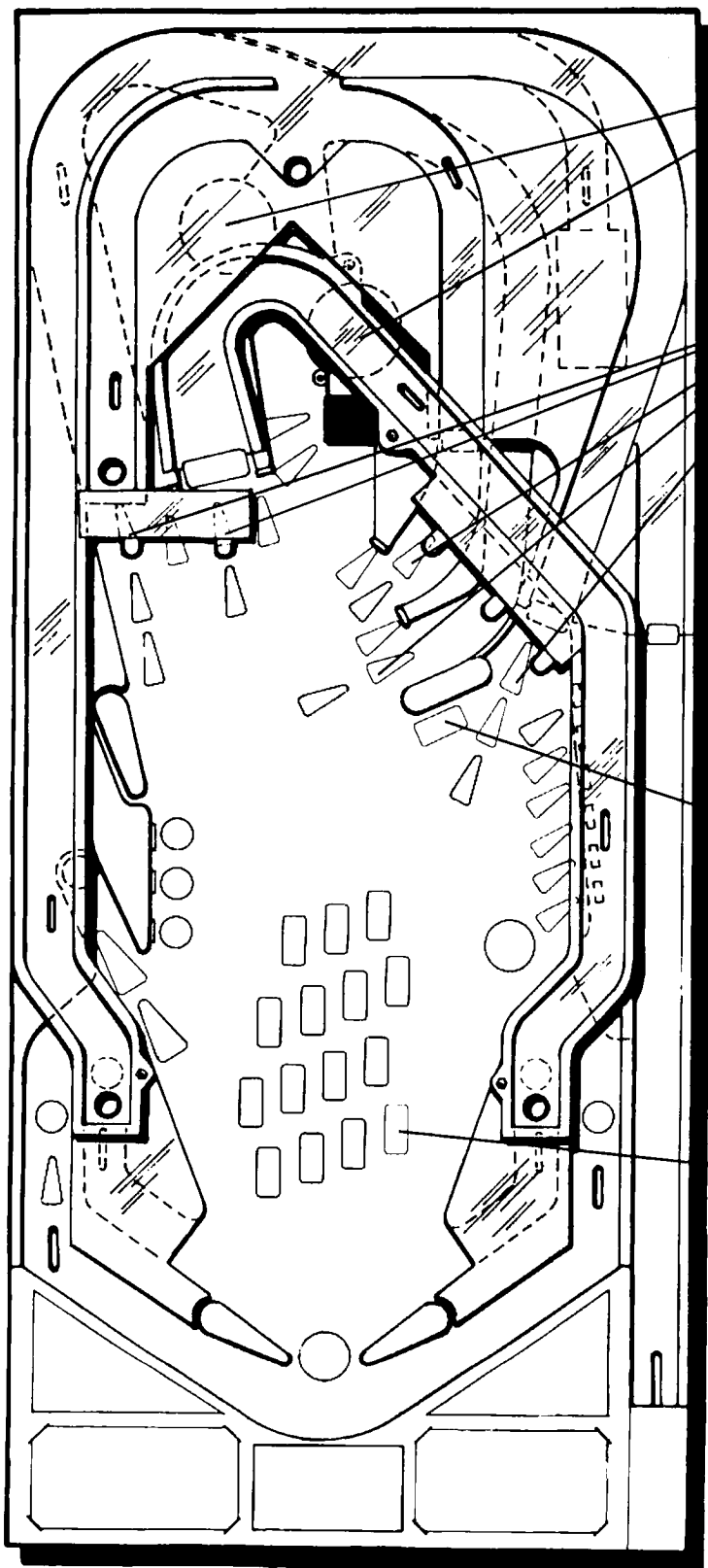
TOWER

BALLROOM

CATWALK

COLLECT ALL 14 ITEMS  
TO LIGHT CROWN.





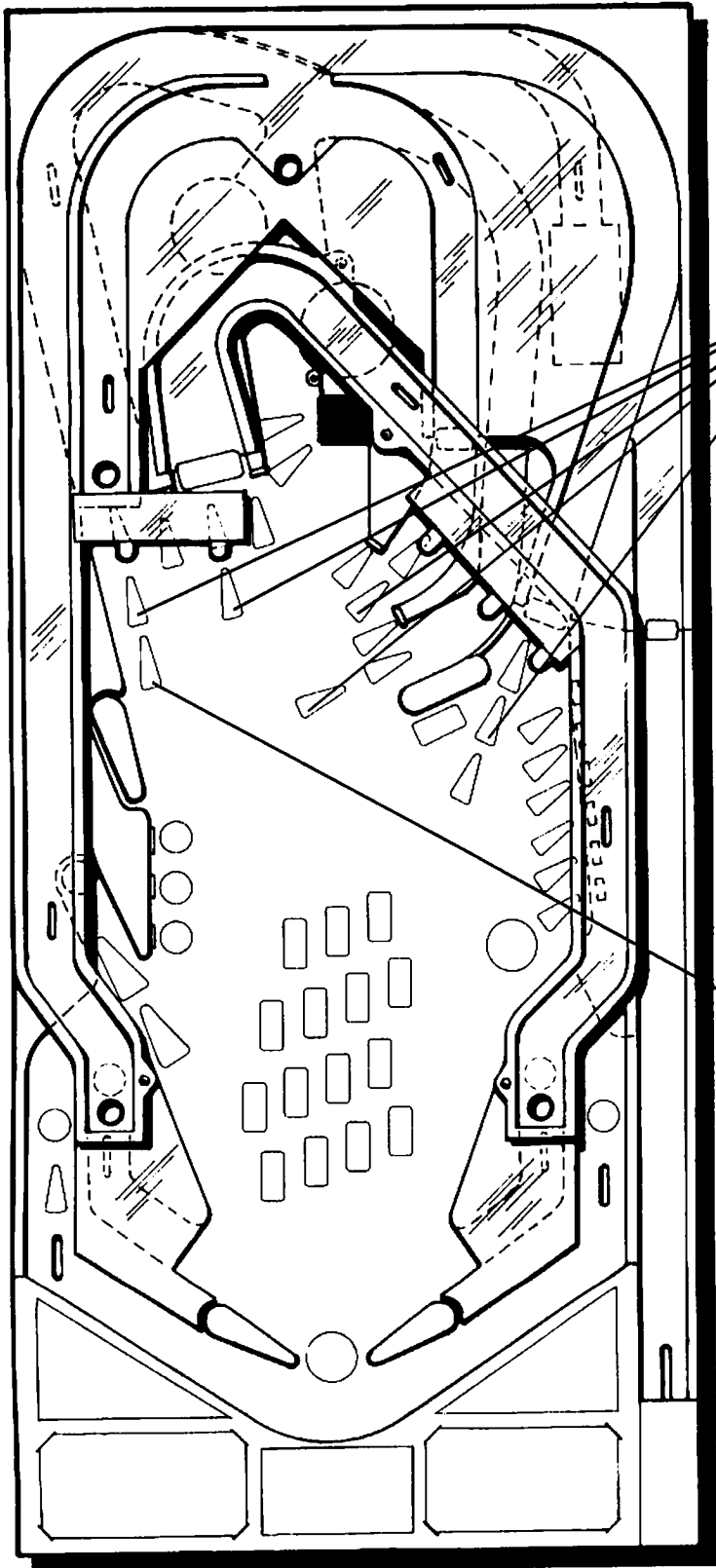
HIT POP BUMPERS TO  
CHANGE ITEM.

SHOOT LANE WHEN  
FLASHING TO AWARD  
FLASHING ITEM.

HIT CHANGE ITEM TAR-  
GET WHEN FLASHING TO  
CHANGE ITEM.

HIT CHANGE ITEM TAR-  
GET WHEN LIT TO MOVE  
ITEM LOCATION.

FINDING THE CROWN  
ITEM WILL START THE  
ULTIMATE EXPERIENCE!

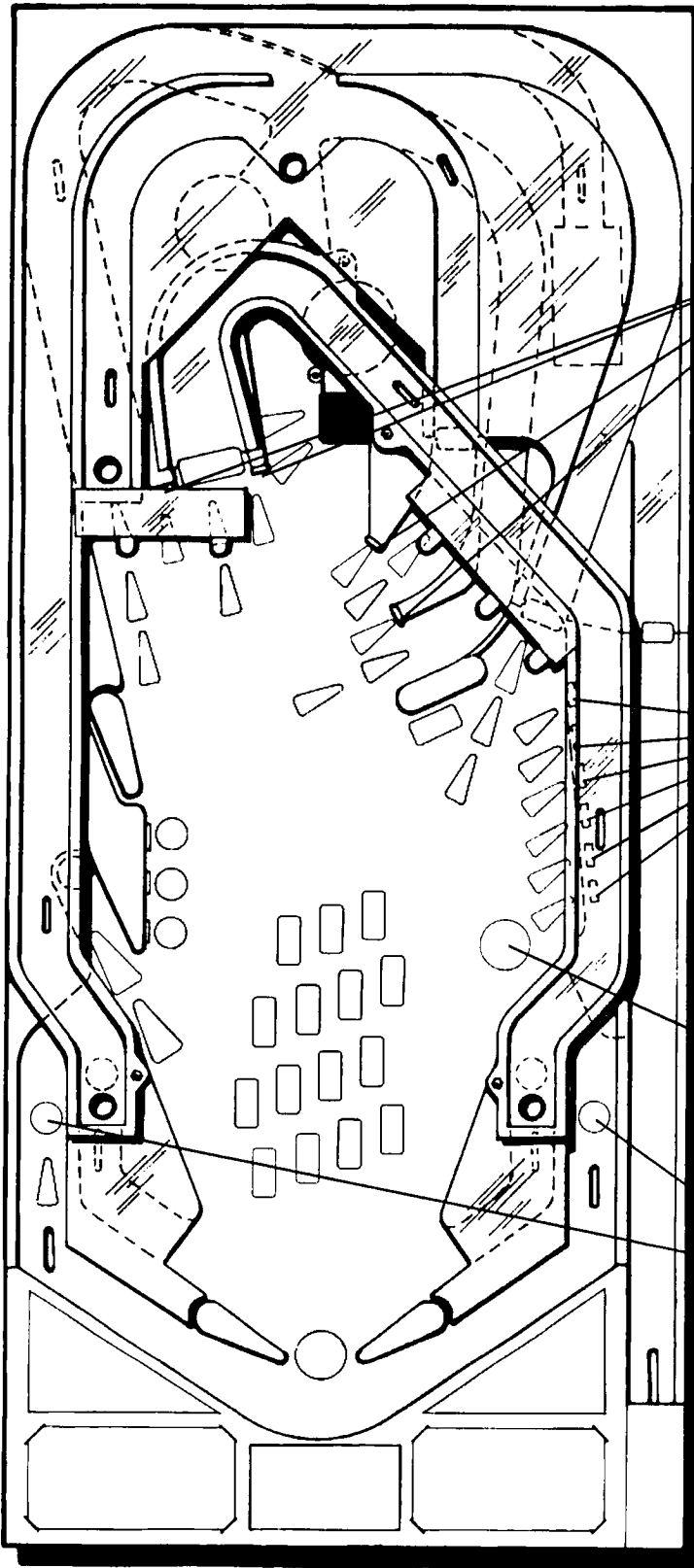


SHOOT LANE WHEN  
FLASHING TO AWARD  
JACKPOT.

SECRET DOOR IS OPEN  
WHEN LIT.

SHOOT SECRET DOOR TO  
COLLECT COUNTDOWN  
BONUS DURING POTION  
COUNTDOWN.

SHOOT SECRET DOOR TO  
START SKULL MODE.



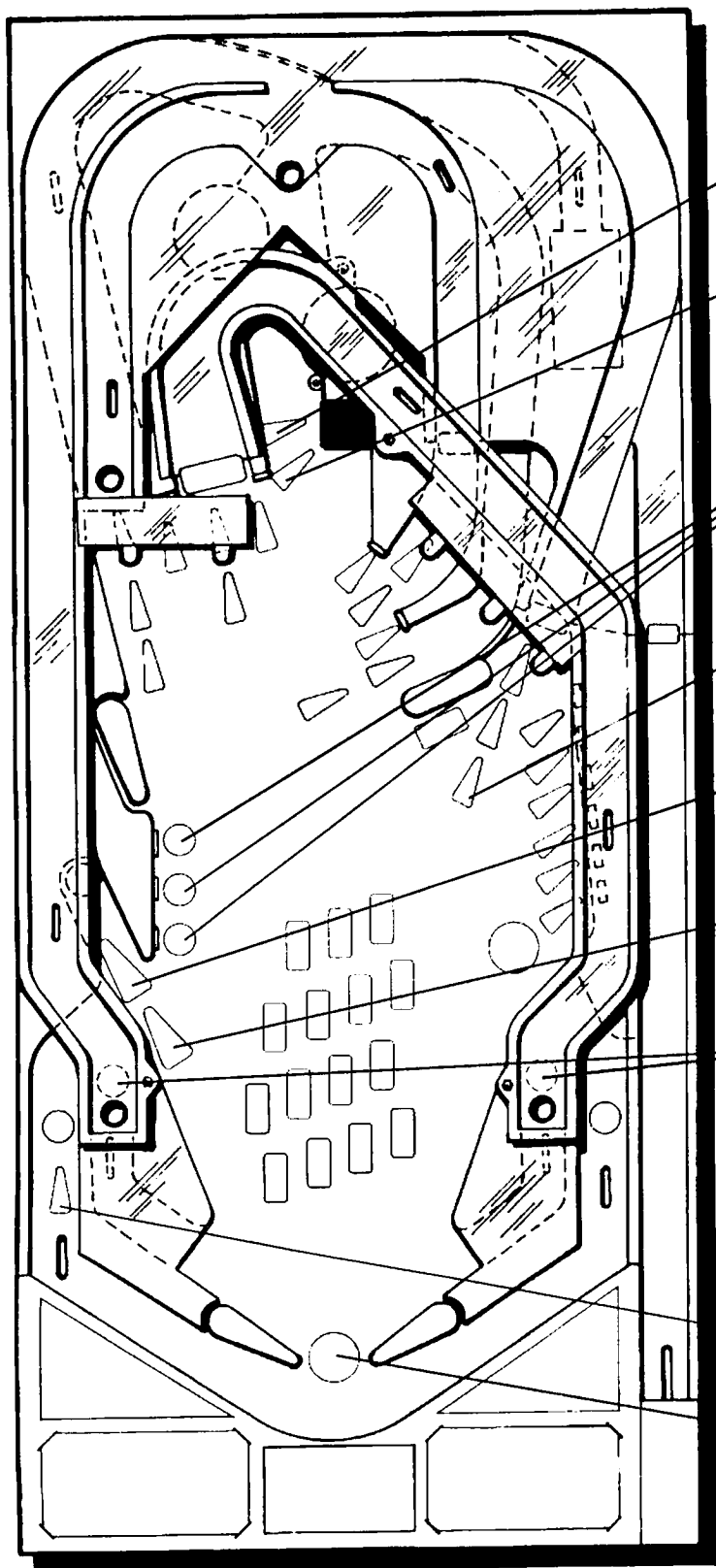
HIT T-R-A-P TO LIGHT  
MYSTERY BONUS "?".

HIT T-R-A-P TO LIGHT  
BOULDER BONUS AND  
CHOPPING BLOCK BONUS.

COMPLETING C-A-S-T-L-E  
ADDS BONUS MULTIPLIER.

HIT MOVING LIT  
C-A-S-T-L-E ARROW TO  
AWARD SPECIAL WHEN  
LIT.

OUTLANES AWARD CHOP-  
PING BLOCK BONUS OR  
BOULDER BONUS WHEN  
LIT. OUTLANES ARE  
CONTROLLED BY FLIP-  
PER BUTTONS.



SHOOT BALL INTO TRAP TO START MEGAMODE WHEN LIT.

SHOOT BALL INTO TRAP TO AWARD MYSTERY VALUE WHEN LIT.

COMPLETE STATUE TARGET BANK TO LIGHT CATAPULT KICKBACK.

SHOOT LANE WHEN LIT TO AWARD EXTRA BALL.

SHOOT BALL INTO PIT TO START MEGAMODE WHEN LIT.

SHOOT BALL INTO PIT TO AWARD MYSTERY VALUE WHEN LIT.

RETURN LANES LIGHT EXTRA BALL RAMP WHEN LIT. RETURN LANES ARE CONTROLLED BY FLIPPER BUTTONS.

KICKBACK WHEN CATAPULT IS LIT.

MERCY BALL WHEN FLASHING.

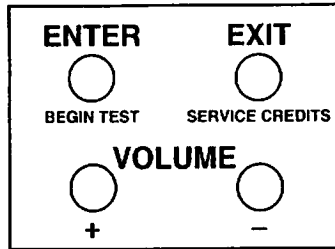
EXTRA BALL WHEN LIT.

# SECTION 2

## ADJUSTMENTS, BOOKKEEPING, & TESTING

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# COIN DOOR SWITCHES



## NORMAL FUNCTION

**BEGIN TEST** - THIS SWITCH CHANGES THE FUNCTION OF THE COIN DOOR SWITCH FROM NORMAL TO TEST AND STARTS THE OPERATOR CONTROL MENU SYSTEM.

**SERVICE CREDITS** - THIS SWITCH ADDS A CREDIT TO THE GAME. THIS WILL BE RECORDED AS A SERVICE CREDIT AND NOT BE RECORDED AS A PLAYER CREDIT.

**VOLUME +** - THIS SWITCH RAISES THE SOUND LEVEL OF THE GAME.

**VOLUME -** - THIS SWITCH LOWERS THE SOUND LEVEL OF THE GAME.

FOR EACH CLOSURE OF THE CORRESPONDING VOLUME BUTTON THE VOLUME WILL INCREASE OR DECREASE ACCORDINGLY ONE VOLUME UNIT.

## TEST FUNCTION

**ENTER** - THIS SWITCH ALLOWS THE OPERATOR TO GO TO A SUB-MENU OR LOCK IN AN ADJUSTMENT CHOICE.

**EXIT** - THIS SWITCH ALLOWS THE OPERATOR TO GO BACK ONE SUB-MENU OR EXIT THE TEST FUNCTION.

**VOLUME +** - THIS SWITCH ALLOWS THE OPERATOR TO CYCLE FORWARD THROUGH THE MENU SELECTION OR ADJUSTMENT.

**VOLUME -** - THIS SWITCH ALLOWS THE OPERATOR TO CYCLE BACKWARD THROUGH THE MENU SELECTION OR ADJUSTMENT.

## MENU SYSTEM

THE MENU IS DIVIDED INTO THREE MAIN CATEGORIES, ADJUSTMENTS, BOOKKEEPING, AND TESTING. THE FIRST CATEGORY IS ADJUSTMENTS. ADJUSTMENTS ALLOW THE OPERATOR TO CONFORM THE OPERATION OF THE PINBALL GAME WITH THE GAME ROOM. THE SECOND CATEGORY IS BOOKKEEPING. BOOKKEEPING ALLOWS THE OPERATOR TO GET VITAL INFORMATION SUCH AS EARNINGS, PLAYER STATISTICS, AND HIGH SCORE INFORMATION. THE LAST CATEGORY IS TESTS. TESTS ALLOW THE OPERATOR TO TROUBLESHOOT THE GAME IF A PROBLEM OCCURS.

TO START THE MENU PRESS **ENTER** AND "MAIN MENU A ADJUSTMENTS" WILL APPEAR ON THE DISPLAY. PRESS THE + OR - BUTTON TO CYCLE FORWARD OR BACKWARD THROUGH THE MAIN CATEGORIES. ONCE THE CATEGORY IS DISPLAYED ON THE DISPLAY PRESS **ENTER** TO SELECT THAT SUB-MENU. IF THE WRONG SUB-MENU HAS BEEN SELECTED PRESS **EXIT** TO GO BACK TO THE MAIN MENU. USE THE + OR - BUTTON TO CYCLE FORWARD OR BACKWARD THROUGH THE SUB-MENU. ONCE THE CORRECT CHOICE IS DISPLAYED. PRESS **ENTER** TO "ADJUST" OR "TEST" THE CHOICE DEPENDING ON THE SUB-MENU THAT WAS SELECTED BEFORE. BOOKKEEPING IS INFORMATION THAT CANNOT BE SET. THE ADJUSTMENTS MAY BE RESET TO FACTORY BY USING, **A506 RESET TO FACTORY\*** WHICH WILL RESET EVERYTHING TO MANUFACTURERS SUGGESTED SETTING. TO RESET ALL BOOKKEEPING AUDITS EXCEPT FOR COINS USE **A501 CLEAR AUDITS**, THIS WILL RESET ALL AUDITS TO 0 EXCEPT FOR THE COINS WHICH WILL BE LEFT UNCHANGED.

\* - SEE SECTION 4 FOR FACTORY SETTINGS.

# A ADJUSTMENTS

*NOTE: THE POINTER  $\Rightarrow$  BY EACH ADJUSTMENT DENOTES THE FACTORY SETTING. IF A506 RESET TO FACTORY IS ENABLED THE SETTING WILL EQUAL THE ITEM TO THE RIGHT OF THE POINTER. THE FACTORY RESET SETTINGS ARE LISTED IN SECTION 4 ON PAGE 6.*

## A ADJUSTMENTS

### I STANDARD

- 01 REPLAY AT** - THE OPERATOR MAY CHOOSE THE REPLAY STARTING VALUE. THE RANGE OF THIS SETTING IS 0 TO 990,000,000 IN STEPS OF 10,000,000.  
 $\Rightarrow$  300,000,000
- 02 AWARD TYPE** - THE OPERATOR MAY CHOOSE THE FORM OF THE AWARD AUTOMATICALLY PROVIDED WHEN THE PLAYER EXCEEDS THE REPLAY LEVEL. THE CHOICES ARE:
  - $\Rightarrow$  CREDIT - REACHING EACH REPLAY LEVEL AWARDS A CREDIT.
  - NONE - NO AWARD IS GIVEN.
  - XBALL - REACHING EACH REPLAY LEVEL AWARDS AN EXTRA BALL.
- 03 REPLAY PERCENT** - THE OPERATOR MAY CHOOSE THE PERCENTAGE OF REPLAYS THE PLAYER CAN EARN WHEN AUTO REPLAY IS USED. THE RANGE OF THIS SETTING IS FIXED OR 1 TO 50 IN STEPS OF 1.  
 $\Rightarrow$  10%
- 04 REPLAY BOOST** - THE OPERATOR MAY CHOOSE IF THE REPLAY SCORE CAN BE TEMPORARILY BOOSTED BY THE SELECTED AMOUNT EACH TIME THE PLAYER REACHES OR EXCEEDS THE REPLAY SCORE. THIS TEMPORARY BOOST IS CANCELLED WHEN CREDITS = 0. THE RANGE OF THIS SETTING IS OFF, 10% - 50% IN STEPS OF 10%.  
 $\Rightarrow$  20%
- 05 GAME OVER ATTRACT** - THE OPERATOR MAY SET THE GAME TO ATTEMPT TO ATTRACT A PERSON TO PLAY THE GAME EVERY TIME THE SETTING HAS BEEN REACHED. THE CHOICES ARE:
  - 10 MINUTES
  - 20 MINUTES
  - $\Rightarrow$  30 MINUTES
  - OFF
- 06 MAX FREE GAMES** - THE OPERATOR MAY CHOCSE THE NUMBER OF FREE GAMES THAT A PLAYER CAN RECEIVE. THE RANGE OF THIS SETTING IS 0 - 9 IN STEPS OF 1.  
 $\Rightarrow$  6 GAMES
- 07 BALLS PER GAME** - THE OPERATOR MAY CHOOSE HOW MANY BALLS THE PLAYER WILL HAVE DURING ONE GAME. THE RANGE OF THIS SETTING IS 2 TO 5 IN STEPS OF 1.  
 $\Rightarrow$  3 BALLS
- 08 MAX XBALLS / GAME** - THE OPERATOR MAY CHOOSE THE AMOUNT OF EXTRA BALLS A PLAYER MAY RECEIVE DURING ONE GAME. THE RANGE OF THIS SETTING IS 0 - 9 IN STEPS OF 1.  
 $\Rightarrow$  3 EXTRA BALLS.
- 09 MATCH PERCENT** - THE OPERATOR MAY CHOOSE THE PERCENTAGE OF MATCHES GIVEN DURING THE TOTAL AMOUNT OF GAMES PLAYED. THE RANGE OF THIS SETTING IS 0 TO 10 IN STEPS OF 1.  
 $\Rightarrow$  10%
- 10 TILT WARNINGS** - THE OPERATOR MAY CHOOSE HOW MANY WARNINGS A PLAYER MAY RECEIVE BEFORE THE GAME TILTS. THE RANGE OF THIS SETTING IS 0 TO 3 IN STEPS OF 1.  
 $\Rightarrow$  2 WARNINGS.



- A 1 11 **TOURNAMENT MODE** - THE OPERATOR MAY SET THE GAME FOR TOURNAMENT MODE THAT WILL NOT ALLOW THE PLAYER TO GET A REPLAY, EXTRA BALL, OR SPECIAL. ALL RANDOM VALUES ARE FIXED.
  - YES - THE GAME IS SET FOR TOURNAMENT.
  - ☞ NO - THE GAME IS NOT SET FOR TOURNAMENT.

**A 2 FEATURE**

- 01 **CATAPULT**- THE OPERATOR MAY CHOOSE WHEN THE CATAPULT LIGHTS. THE CHOICES ARE:
  - EASY - ALL 3 TARGETS FLASHING, CAN BE HIT IN ANY ORDER TO COMPLETE.
  - ☞ MEDIUM - TARGETS MUST BE HIT IN SEQUENCE. NO TIMER.
  - HARD - TARGETS MUST BE HIT IN SEQUENCE. TIMER BEGINS WITH FIRST TARGET HIT. IF TIMER RUNS OUT, PREVIOUS TARGET STARTS TO FLASH.
  
- 02 **AUTO SHOOTER TIMER** - THE OPERATOR MAY SET THE TIME A PLAYER HAS TO SHOOT THE BALL INTO PLAY OR THE COMPUTER WILL DO IT FOR THE PLAYER. THE RANGE OF THIS SETTING IS OFF, 1-20 SECONDS IN STEPS OF 1 SECOND.
  - ☞ OFF
  
- 03 **CATWALK SHOT AWARD** - THE OPERATOR MAY SET THE NUMBER OF SHOTS NEEDED TO AWARD CATWALK AWARD. THE RANGE OF THIS SETTING IS 1 TO 7 IN STEPS OF 1.
  - ☞ 3 SHOTS
  
- 04 **ITEMS TIMER** - THE OPERATOR MAY SET THE AMOUNT OF TIME ALL OF THE TIMED ITEM ROUNDS ARE LIT. THE CHOICES ARE:



	EASY	MEDIUM	HARD
CANDELABRUM	18 SECONDS	15 SECONDS	12 SECONDS
PANDORA'S BOX	24 SECONDS	20 SECONDS	16 SECONDS
COAT OF ARMS	24 SECONDS	20 SECONDS	16 SECONDS
DRAGON IDOL	18 SECONDS	15 SECONDS	12 SECONDS
PAINTING	36 SECONDS	30 SECONDS	24 SECONDS

## A 3 PRICING

**01 GAME PRICING** - THE OPERATOR MAY CHOOSE THE COST OF A GAME FROM A STANDARD PRICING MENU OR BY INSTALLING CUSTOM PRICING. THE CHOICES ARE:

- ANTILLES
- ARGENTINA
- AUSTRALIA
- AUSTRIA
- BELGIUM
- CANADA 1
- CANADA 2
- CHILE
- DENMARK
- FINLAND
- FR 5/10 FR
- FR 7/10 FR
- FR 7/20 FR
- FR 9/20 FR
- FR 11/20 FR
- GER 6/5 DM
- GER 7/5 DM
- GREECE
- HOLLAND
- HUNGARY
- ITALY
- JAPAN
- N ZEALAND
- NETHERLAND
- NORWAY
- SPAIN
- SWEDEN
- SWISS
- UK
- USA 4/31
- ☞ USA 3/31
- USA 2/31
- + CUSTOM

+ - THE CUSTOM SETTING REQUIRES A VALUE OF COIN UNITS IN THE LEFT, CENTER, RIGHT, AND EXTRA COIN CHUTES.

*ITEMS 01A - 01F CAN ONLY BE MADE IF CUSTOM IS SELECTED IN THE PRICING MENU. THE ENTER BUTTON IN THIS MENU SAVES THE CURRENT INFORMATION DISPLAYED. THE EXIT BUTTON WILL EXIT OUT OF THE SUBMENU AND USE ALL CURRENTLY SAVED INFORMATION. CHANGES TO PREVIOUS ITEMS MAY ONLY BE MADE BY EXITING BACK TO CUSTOM AND PRESSING ENTER TO EDIT CHOICES.*

**01A LEFT COIN UNITS** - THE OPERATOR MAY SPECIFY THE NUMBER OF UNITS PURCHASED BY A COIN PASSING THROUGH THE LEFT COIN SLOT. THE RANGE OF THIS SETTING IS 0 TO 99 IN STEPS OF 1.

**01B CENTER COIN UNITS** - THE OPERATOR MAY SPECIFY THE NUMBER OF UNITS PURCHASED BY A COIN PASSING THROUGH THE CENTER COIN SLOT. THE RANGE OF THIS SETTING IS 0 TO 99 IN STEPS OF 1.

**01C RIGHT COIN UNITS** - THE OPERATOR MAY SPECIFY THE NUMBER OF UNITS PURCHASED BY A COIN PASSING THROUGH THE RIGHT COIN SLOT. THE RANGE OF THIS SETTING IS 0 TO 99 IN STEPS OF 1.

- A 3 01D EXTRA COIN UNITS** - THE OPERATOR MAY SPECIFY THE NUMBER OF UNITS PURCHASED BY A COIN PASSING THROUGH THE EXTRA COIN SLOT. THE RANGE OF THIS SETTING IS 0 TO 99 IN STEPS OF 1.
- 01E COIN UNITS / CREDITS** - THE OPERATOR MAY SPECIFY HOW MANY UNITS IT TAKES TO AWARD ONE CREDIT. THE RANGE OF THIS SETTING IS 0 - 99 IN STEPS OF 1.
- 01F COIN UNITS / BONUS** - THE OPERATOR MAY SPECIFY HOW MANY UNITS ARE AWARDED WHEN THE BONUS IS REACHED. THE RANGE OF THIS SETTING IS 0 - 99 IN STEPS OF 1.
- 02 MAXIMUM CREDITS** - THE OPERATOR MAY SPECIFY THE MAXIMUM ALLOWED CREDITS IN THE GAME. THE RANGE OF THIS SETTING IS 4 - 40 IN STEPS OF 1.  
 20 CREDITS
- 03 FREE PLAY** - THE OPERATOR MAY SPECIFY IF A PLAYER NEEDS TO PAY TO PLAY. THE CHOICES ARE:  
 YES - THE PLAYER DOES NOT NEED TO PAY TO PLAY.  
 NO - THE PLAYER NEEDS TO PURCHASE A CREDIT TO PLAY.
- 04 DISPLAY CREDITS** - THE OPERATOR MAY SPECIFY IF THE PLAYER CAN VIEW THE AMOUNT OF CREDITS. THE CHOICES ARE:  
 YES - THE PLAYER CAN SEE THE AMOUNT OF CREDITS.  
 NO - THE PLAYER CANNOT SEE THE AMOUNT OF CREDITS.
- 05 COIN METER COUNTS** - THE OPERATOR MAY SPECIFY IF THE GAME RECORDS EARNINGS OR COINS. THE CHOICES ARE:  
 COINS - THE GAME RECORDS TOTAL COINS THROUGH COIN CHUTES.  
 EARNINGS - THE GAME RECORDS TOTAL EARNINGS THROUGH CHUTES.

**A 4 HIGH SCORES**

- 01 HSTD ALLOWED** - THE OPERATOR SPECIFIES WHETHER THE GAME ALLOWS ENTRY OF H.S.T.D. AND INITIALS. THE CHOICES ARE:  
 YES - GAME ALLOWS INITIALS ENTRY FOR H.S.T.D.  
 NO - NO HIGH SCORES ARE RECORDED.
- 02 CREDITS FOR TOP HSTD** - THE OPERATOR SELECTS THE NUMBER OF CREDITS AWARDED WHENEVER A PLAYER EXCEEDS THE HIGHEST SCORE. THE RANGE OF THIS SETTING IS 0-3 IN STEPS OF 1.  
 3 CREDITS
- 03 CREDITS FOR 2ND HSTD** - THE OPERATOR SELECTS THE NUMBER OF CREDITS AWARDED WHENEVER A PLAYER EXCEEDS THE SECOND HIGHEST SCORE. THE RANGE OF THIS SETTING IS 0-2 IN STEPS OF 1.  
 2 CREDITS
- 04 RESET HSTD EVERY** - THE OPERATOR MAY SPECIFY THAT THE GAME WILL PROVIDE AN AUTOMATIC RESET OF THE DISPLAY "HIGHEST SCORES," AND THE NUMBER OF GAMES TO BE PLAYED BEFORE THE RESET OCCURS. THE VALUES PROVIDED UPON RESET ARE THOSE SELECTED BY THE OPERATOR IN **A405 BACKUP TOP HISCORES**. THE RANGE OF THIS IS 0 TO 5,000 IN STEPS OF 100.  
 700 GAMES
- 05 BACKUP TOP HISCORES** - THE OPERATOR MAY SET THE BACKUP HIGH SCORE VALUE. THE GAME AUTOMATICALLY RESTORES THIS VALUE WHEN THE **A404 RESET HSTD EVERY** IS REACHED OR **A503 SET BACKUP HISCORES** IS ENABLED. THE RANGE OF THIS SETTING IS 300,000,000 TO 990,000,000 IN STEPS OF 10,000,000.  
 600,000,000

## A 5 UTILITY

- 01 CLEAR AUDITS** - THE OPERATOR MAY CHOOSE TO CLEAR AUDITS BY PRESSING THE ENTER BUTTON. THE CHOICES ARE:  
 YES - CLEAR ALL AUDITS. (NOTE THIS WILL NOT CLEAR **B102 GRAND TOTAL COINS** OR **B2 EARNING AUDITS**.  
 NO - DO NOT CHANGE AUDITS.
- 02 CLEAR COINS AUDITS** - THE OPERATOR MAY CHOOSE TO CLEAR COINS BY PRESSING THE ENTER BUTTON. *NOTE ENABLING THIS CHOICE WILL NOT RESET GRAND TOTAL COINS.* THE CHOICES ARE:  
 YES - CLEAR EARNING AUDITS.  
 NO - DO NOT CHANGE AUDITS.
- 03 SET BACKUP HISCORES** - THE OPERATOR MAY CHOOSE TO INSTALL BACKUP HIGH SCORES TO DATE BY PRESSING THE ENTER BUTTON. THE CHOICES ARE:  
 YES - CLEAR HIGH SCORES TO DATE.  
 NO - DO NOT CHANGE AUDITS.
- 04 CLEAR CREDITS** - THE OPERATOR MAY CHOOSE TO CLEAR CREDITS BY PRESSING THE ENTER BUTTON. THE CHOICES ARE:  
 YES - CLEAR CREDITS  
 NO - DO NOT CLEAR CREDITS.
- 05 CUSTOM MESSAGE** - THE OPERATOR MAY CHANGE THE MESSAGE THAT APPEARS IN THE DISPLAY DURING THE GAME OVER MODE. THE CHOICES ARE:  
 OFF - FACTORY MESSAGE DISPLAYED.  
 ON - CUSTOM MESSAGE DISPLAYED AND START NEW DISPLAY.  
 CHANGE - EDIT THE OLD DISPLAY.

PRESS THE ENTER BUTTON WHEN "ON" OR "CHANGE" APPEARS IN THE DISPLAY TO START THE CUSTOM MESSAGE PROCESSOR. USE THE "+" OR "-" BUTTON TO ROTATE LETTERS. THE ">" SHOWS A SPACE. PRESS THE ENTER BUTTON TO LOCK IN THE DESIRED LETTERS. WHEN FINISHED PUSH ENTER AT THE LAST SPACE; THIS WILL LOCK IN THE MESSAGE. IF AT ANY TIME THE EXIT KEY IS PRESSED THE LAST MESSAGE THAT WAS SAVED WILL BE DISPLAYED.

- 06 RESET TO FACTORY** - THE OPERATOR MAY CHOOSE TO DO A FACTORY RESET. THE FACTORY RESET SETTINGS ARE LOCATED IN SECTION 4 ON PAGE 6. THE CHOICES ARE:  
 YES - SET TO FACTORY SETTINGS.  
 NO - DO NOT SET TO FACTORY SETTINGS.

- 07 GAME DIFFICULTY** - THE OPERATOR MAY SELECT THE LEVEL OF GAME DIFFICULTY. THE CHOICES ARE:

	EASY	MEDIUM	HARD
A201 CATAPULT	EASY	MED	HARD
A203 CATWALK SHOT AWARD	01	03	05
A204 ITEMS TIMER	EASY	MEDIUM	HARD

**A 5 08 INSTALL COUNTRY** - THE OPERATOR MAY CHOOSE THE LANGUAGE THAT IS USED IN THE MENUS AND OTHER FEATURES.

- FRANCE
- GERMANY
- USA
- UK

**09 FLASHER INTENSITY** - THE OPERATOR MAY CHOOSE TO SET THE INTENSITY OF THE FLASHERS. THE CHOICES ARE:

- OFF
- DIMMER
- DIM
- NORMAL

**10 COIL STRENGTH** - THIS ADJUSTS HOW HARD EACH COIL HITS THE BALL. THIS ADJUSTS ALL THE COILS IN THE GAME. THE CHOICES ARE:

- SOFTER
- NORMAL
- HARDER

## **B BOOKKEEPING**

**1 MAIN** - THESE AUDITS ALSO WILL APPEAR IN OTHER GROUPS BUT ARE THE MOST IMPORTANT, AND ARE GROUPED HERE FOR EASIER ACCESS.

**01 RECENT COINS** - THE TOTAL AMOUNT OF COINS THROUGH EACH SLOT SINCE LAST **A502 CLEAR COIN AUDITS**, OR **A506 RESET TO FACTORY**.

**02 GRAND TOTAL COINS** - THE TOTAL AMOUNT OF COINS THROUGH EACH SLOT. MAY BE RESET BY USING **A506 RESET TO FACTORY**.

**03 FREE PERCENT** - THE PERCENT OF THE AMOUNT OF FREE GAMES OVER TOTAL GAMES PLAYED.

**04 AV GAME TIME** - THE AVERAGE TIME OF ONE GAME.

**05 AV BALL TIME** - THE AVERAGE TIME OF ONE BALL.

**06 REPLAY PERCENT** - THE PERCENT OF THE TOTAL AMOUNT OF REPLAYS AWARDED OVER TOTAL GAMES PLAYED.

## **B 2 EARNING**

**01 COINS LEFT SLOT** - THE TOTAL AMOUNT OF COINS THAT PASSED THROUGH THE LEFT COIN SLOT.

**02 COINS CENTER SLOT** - THE TOTAL AMOUNT OF COINS THAT PASSED THROUGH THE CENTER COIN SLOT.

**03 COINS RIGHT SLOT** - THE TOTAL AMOUNT OF COINS THAT PASSED THROUGH THE RIGHT COIN SLOT.

**04 COINS EXTRA SLOT** - THE TOTAL AMOUNT OF COINS THAT PASSED THROUGH THE EXTRA COIN SLOT.

**05 COIN NO CREDIT** - THE TOTAL AMOUNT OF COINS THAT DID NOT RECEIVE A CREDIT. NO CREDIT MEANS "THE PURCHASE OF A 1/2" CREDIT" NOT "A COIN THAT THE COIN ACCEPTOR WOULD NOT ACCEPT."

**06 PAID CREDITS** - THE TOTAL AMOUNT OF CREDITS GIVEN OUT.

**B 2 07 SERVICE CREDITS - THE TOTAL AMOUNT OF SERVICE CREDITS.**

**B 3 STANDARD**

**01 TOTAL GAMES - THE TOTAL AMOUNT OF GAMES PLAYED.**

**02 FREE GAMES - THE TOTAL AMOUNT OF FREE GAMES GIVEN.**

**03 FREE PERCENT - THE PERCENT OF THE TOTAL AMOUNT OF FREE GAMES PLAYED OVER TOTAL GAMES PLAYED.**

**04 REPLAY AWARDS - THE TOTAL AMOUNT OF REPLAYS AWARDED.**

**05 REPLAY PERCENT - THE PERCENT OF THE TOTAL AMOUNT OF REPLAYS AWARDED OVER TOTAL GAMES PLAYED.**

**06 SPECIAL AWARDS - THE TOTAL AMOUNT OF SPECIALS AWARDED.**

**07 SPECIAL PERCENT - THE PERCENT OF THE TOTAL AMOUNT OF SPECIALS AWARDED OVER TOTAL GAMES PLAYED.**

**08 HSTD AWARDS - THE TOTAL TIMES THE TOP TWO HIGH SCORES REACHED.**

**09 HSTD PERCENT - THE PERCENT OF THE TOTAL AMOUNT OF HIGH SCORES REACHED OVER TOTAL GAMES PLAYED.**

**10 MATCH AWARDS - THE TOTAL AMOUNT OF MATCHES AWARDED.**

**11 MATCH PERCENT - THE PERCENT OF THE TOTAL AMOUNT OF MATCHES AWARDED OVER TOTAL GAMES PLAYED.**

**12 BALLS PLAYED - THE TOTAL AMOUNT OF BALLS PLAYED.**

**13 EXTRA BALLS - THE TOTAL AMOUNT OF EXTRA BALLS AWARDED.**

**14 XBALL PERCENT - THE PERCENT OF THE TOTAL AMOUNT OF EXTRA BALLS AWARDED OVER TOTAL BALLS PLAYED.**

**15 1 PLAYER GAMES - THE TOTAL AMOUNT OF ONE PLAYER GAMES PLAYED.**

**16 2 PLAYER GAMES - THE TOTAL AMOUNT OF TWO PLAYER GAMES PLAYED.**

**17 3 PLAYER GAMES - THE TOTAL AMOUNT OF THREE PLAYER GAMES PLAYED.**

**18 4 PLAYER GAMES - THE TOTAL AMOUNT OF FOUR PLAYER GAMES PLAYED.**

**19 TIME HSTD RESET - THE TOTAL AMOUNT OF TIMES THE H.S.T.D. HAS BEEN RESET.**

**20 BURNIN CYCLES - THE TOTAL AMOUNT OF BURNIN CYCLES.**

**B 4 FEATURE**

**01 CATAPULT LIT - THE TOTAL AMOUNT OF TIMES THE CATAPULT HAS BEEN LIT.**

**02 CATAPULT USED - THE TOTAL AMOUNT OF TIMES THE CATAPULT HAS BEEN USED.**

- B 4 03 MEGAMODE EARNED** - THE TOTAL AMOUNT OF TIMES THE MEGAMODE HAS BEEN EARNED.
- 04 PLAY AGAIN** - THE TOTAL AMOUNT OF TIMES THE FIRST BALL OF EACH ROUND HAS BEEN LOST AND REPLAYED BEFORE BALL SAVE HAS GONE OUT.
- 05 LEFT DRAIN** - THE TOTAL AMOUNT OF TIMES THE BALL HAS DRAINED OUT THE LEFT OUTLANE.
- 06 RIGHT DRAIN** - THE TOTAL AMOUNT OF TIMES THE BALL HAS DRAINED OUT THE RIGHT OUTLANE.
- 07 SCEPTER** - THE TOTAL AMOUNT OF TIMES THE SPECTER HAS BEEN AWARDED.
- 08 CRYSTAL BALL** - THE TOTAL AMOUNT OF TIMES THE CRYSTAL BALL HAS BEEN AWARDED.
- 09 BELL** - THE TOTAL AMOUNT OF TIMES THE BELL HAS BEEN AWARDED.
- 10 GOBLET** - THE TOTAL AMOUNT OF TIMES THE GOBLET HAS BEEN AWARDED.
- 11 POTION** - THE TOTAL AMOUNT OF TIMES THE POTION HAS BEEN AWARDED.
- 12 CANDELABRUM** - THE TOTAL AMOUNT OF TIMES THE CANDELABRUM HAS BEEN AWARDED.
- 13 PANDORA'S BOX** - THE TOTAL AMOUNT OF TIMES PANDORA'S BOX HAS BEEN AWARDED.
- 14 GOLD COINS** - THE TOTAL AMOUNT OF TIMES THE GOLD COINS HAVE BEEN AWARDED.
- 15 JESTER'S HAT** - THE TOTAL AMOUNT OF TIMES THE JESTER'S HAT HAS BEEN AWARDED.
- 16 COAT OF ARMS** - THE TOTAL AMOUNT OF TIMES THE COAT OF ARMS HAS BEEN AWARDED.
- 17 MIRROR** - THE TOTAL AMOUNT OF TIMES THE MIRROR HAS BEEN AWARDED.
- 18 DRAGON IDOL** - THE TOTAL AMOUNT OF TIMES THE DRAGON IDOL HAS BEEN AWARDED.
- 19 SKULL** - THE TOTAL AMOUNT OF TIMES THE SKULL HAS BEEN AWARDED.
- 20 PAINTING** - THE TOTAL AMOUNT OF TIMES THE PAINTING HAS BEEN AWARDED.
- 21 CROWN** - THE TOTAL AMOUNT OF TIMES THE CROWN HAS BEEN AWARDED.
- 22 BALLROOM SHOTS** - THE TOTAL AMOUNT OF TIMES THE BALLROOM HAS BEEN SHOT.
- 23 BRIDGE SHOTS** - THE TOTAL AMOUNT OF TIMES THE BRIDGE HAS BEEN SHOT.
- 24 CATWALK SHOTS** - THE TOTAL AMOUNT OF TIMES THE CATWALK HAS BEEN SHOT.
- 25 DUNGEON SHOTS** - THE TOTAL AMOUNT OF TIMES THE DUNGEON HAS BEEN SHOT.
- 26 TOWER SHOTS** - THE TOTAL AMOUNT OF TIMES THE TOWER HAS BEEN SHOT.
- 27 CASTLE COMPLETED** - THE TOTAL AMOUNT OF TIMES THE C-A-S-T-L-E DROP TARGETS HAVE BEEN COMPLETED.
- 28 RETURN LANES ON** - THE TOTAL AMOUNT OF TIMES THE RETURN LANES HAVE BEEN LIT.

- B 4 29 JACKPOT CATWALK** - THE TOTAL AMOUNT OF TIMES THE CATWALK HAS AWARDED JACKPOT.
- 30 JACKPOT TOWER** - THE TOTAL AMOUNT OF TIMES THE TOWER HAS AWARDED JACKPOT.
- 31 JACKPOT BRIDGE** - THE TOTAL AMOUNT OF TIMES THE BRIDGE HAS AWARDED JACKPOT.
- 32 JACKPOT DUNGEON** - THE TOTAL AMOUNT OF TIMES THE DUNGEON HAS AWARDED JACKPOT.
- 33 JACKPOT BALLROOM** - THE TOTAL AMOUNT OF TIMES THE BALLROOM HAS AWARDED JACKPOT.
- 34 4X** - THE TOTAL AMOUNT OF TIMES 4X HAS BEEN AWARDED.
- 35 6X** - THE TOTAL AMOUNT OF TIMES 6X HAS BEEN AWARDED.
- 36 8X** - THE TOTAL AMOUNT OF TIMES 8X HAS BEEN AWARDED.
- 37 10X** - THE TOTAL AMOUNT OF TIMES 10X HAS BEEN AWARDED.
- 38 MYSTERY XBALL** - THE TOTAL AMOUNT OF TIMES THE MYSTERY XBALL HAS BEEN AWARDED.

#### **B 5 HISTORIOGRAPHY**

- 01 GAMES UNDER 100 MIL** - THE TOTAL AMOUNT OF SCORES UNDER 100,000,000 POINTS.
- 02 GAMES 100 - 199 MIL** - THE TOTAL AMOUNT OF SCORES BETWEEN 100,000,000 - 199,000,000 POINTS.
- 03 GAMES 200 - 299 MIL** - THE TOTAL AMOUNT OF SCORES BETWEEN 200,000,000 - 299,000,000 POINTS.
- 04 GAMES 300 - 399 MILL** - THE TOTAL AMOUNT OF SCORES BETWEEN 300,000,000 - 399,000,000 POINTS.
- 05 GAMES 400 - 499 MIL** - THE TOTAL AMOUNT OF SCORES BETWEEN 400,000,000 - 499,000,000 POINTS.
- 06 GAMES OVER 500 MIL** - THE TOTAL AMOUNT OF SCORES OVER 500,000,000 POINTS.

#### **T TESTS**

- 01 SERVICE PHONE** - A CONTIGUOUS UNITED STATES TOLL FREE NUMBER IS DISPLAYED. IF THERE IS A GAME PROBLEM OR QUESTION GIVE OUR SERVICE DEPARTMENT A CALL. WE ARE HERE TO WORK WITH YOU TO SOLVE TECHNICAL PROBLEMS IN ANY ALVIN G. & CO. PRODUCT. WE WILL ALSO BE ABLE TO ANSWER ANY GENERAL GAME QUESTION YOU MAY HAVE.
- 02 INFORMATION** - THIS TEST AIDS IN DIAGNOSING PROBLEMS BY INDICATING A STUCK SWITCH OR MISSING PINBALL. IF THE TEST FINDS NO PROBLEMS "ALL OK" WILL BE DISPLAYED.
- 03 MATRIX LAMPS** - THIS TEST CAUSES ALL THE CONTROLLED LAMPS TO FLASH SIMULTANEOUSLY. THE DOT MATRIX DISPLAY WILL READ ON AND OFF ALTERNATIVELY. ALL CONTROLLED LAMPS SHOULD FLASH. IF ANY OTHER RESULT IS INDICATED THE SYSTEMS HAS DETECTED A PROBLEM.
- 04 SINGLE LAMP** - THIS TESTS EACH LAMP CIRCUIT INDIVIDUALLY. PRESS THE "+" OR "-" BUTTON TO CYCLE THROUGH THIS TEST. THE DOT MATRIX DISPLAY WILL TELL THE OPERATOR WHICH LAMP SHOULD BE LIT. REFER TO SECTION 3 PAGE 3 ON "UNDERSTANDING THE MATRIXES."



- 05 DISPLAY TEST** - THIS TESTS THE DISPLAY CIRCUIT. PRESS ENTER BUTTON TO START THIS TEST. IF A SET OF "DOTS" ARE NOT DISPLAYED THEN THE SYSTEM HAS DETECTED AN ERROR.
- 06 STUCK SWITCH** - THIS TEST FINDS ALL SWITCHES THAT ARE DETECTED CLOSED. THE NAME, NUMBER, AND WIRE COLOR OF EACH SWITCH THAT IS STUCK WILL BE DISPLAYED IN THE DOT MATRIX DISPLAY AND FOR EACH CLOSURE A BEEP WILL BE HEARD. IF THERE ARE NO SWITCHES CLOSED THE DOT MATRIX DISPLAY WILL FLASH "NONE."
- 07 INACTIVE SWITCH** - THIS DISPLAYS EACH SWITCH ON THE GAME THAT HAS NOT BEEN ACTIVATED WITHIN THE PAST 25 GAMES.
- 08 SWITCH TEST** - THIS TEST ISOLATES A PARTICULAR SWITCH BY BLOCKING SIGNALS FROM ALL OTHER SWITCHES. WHEN A SWITCH IS CLOSED IT WILL SHOW ON THE DISPLAY THE NAME, NUMBER, AND WIRE COLOR FOR APPROXIMATELY 2 SECONDS.
- 09 CYCLE FLASHERS** - THIS TESTS THE FLASHLAMP CIRCUITRY. THE TEST WILL CYCLE THROUGH ALL THE FLASHLAMP CIRCUITS ONE AT A TIME. TO PAUSE FLASHLAMP TEST PRESS THE ENTER BUTTON, ALL FLASHLAMPS SHOULD BE OFF. IF A FLASHLAMP IS ON THE SYSTEM HAS DETECTED AN ERROR.
- 10 CYCLE SOLENOIDS** - THIS TESTS THE SOLENOID CIRCUITRY. THE TEST WILL CYCLE THROUGH ALL THE SOLENOID CIRCUITS ONE AT A TIME.
- 11 SINGLE COILS** - THIS TESTS EACH COIL IN THE COIL TABLE. USE THE "+" OR "-" BUTTON TO SELECT THE COIL YOU WISH TO CHECK. PRESS THE ENTER BUTTON TO CHECK. FOR EACH CLOSURE OF THE ENTER BUTTON A FLASHLAMP OR SOLENOID SHOULD ACTIVATE.
- 12 SOUND TEST** - THIS TESTS THE SOUND BOARD. USE THE "+" OR "-" BUTTON TO SELECT THE SOUND YOU WISH TO CHECK. THE CHOICES ARE: MUSIC 1, MUSIC 2, MUSIC 3, VOICE 1, VOICE 2, VOICE 3, SOUND 1, SOUND 2, SOUND 3, LEFT SPEAKER, RIGHT SPEAKER, SYNC PULSE.
- 13 BURNIN CYCLES** - THIS TESTS THE LIFE OF ALL THE WORKING PARTS IN THE GAME. THIS HELPS IN FINDING INTERMITTENT PROBLEMS. THE BURNIN CYCLE ALTERNATES ON AND OFF OF: ALL LAMPS, SOLENOIDS, G.I.S', DOT MATRIX DISPLAY, FLASHERS, AND SOUNDS. IF ONE OF THE PRECEDING ITEMS DOES NOT WORK THE SYSTEM HAS DETECTED A PROBLEM.
- 14 CATAPULT** - THIS TESTS THE DELAY BETWEEN THE CATAPULT SWITCH AND THE KICKER PLUNGER.

# SECTION 3

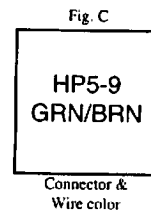
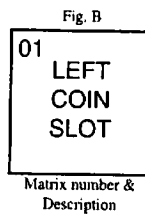
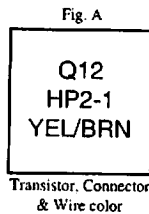
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# UNDERSTANDING THE MATRICES

THE MATRICES ON THE FOLLOWING PAGES ARE WRITTEN FOR MAXIMUM UNDERSTANDING. MOST OF THE WORDS HAVE BEEN ABBREVIATED IN ORDER TO ALLOW SPACE FOR ALL THE NECESSARY COMPONENT IDENTIFICATIONS. EACH MATRIX, PLAYFIELD LOCATION DIAGRAM, SCHEMATIC DRAWING, AND DOT MATRIX DISPLAY USES THE EXACT SAME WORDING SO THERE IS NO CONFUSION ON A GIVEN PART. FOR EXAMPLE "CATAPULT" IS USED IN THE COIL MATRIX, PLAYFIELD LOCATION DIAGRAM, SCHEMATIC DIAGRAM AND DISPLAYED ON THE DOT MATRIX DISPLAY. ALL OF THESE WHEN DISPLAYED OR READ WILL BE SEEN EXACTLY THE SAME (SPELLING, WORD USAGE, AND ORDER.)

IN THE MATRIX ROW AND COLUMN BOXES THERE ARE VARIOUS ABBREVIATIONS DISPLAYED (SEE ILLUSTRATION BELOW.) EACH ABBREVIATION STANDS FOR ONE PART OF THE DESCRIPTION OF THAT BLOCK.



INFORMATION THAT IS CENTERED OR IS IN THE UPPER LEFT HAND CORNER OF THE BOX WILL BE DISPLAYED ON THE DOT MATRIX DISPLAY. INFORMATION THAT IS NOT IN ONE OF THOSE POSITIONS WILL NOT APPEAR ON THE DOT MATRIX DISPLAY.

THE MOSFET (TRANSISTOR) NUMBER IS ABBREVIATED BY A Q21, WHICH EQUALS MOSFET (TRANSISTOR) NUMBER 21 ON THE C.P.U. / DRIVER BOARD.

THE CONNECTOR IDENTIFICATION NUMBER IS ABBREVIATED INTO TWO NUMBERS THE FIRST BEING A CONNECTOR NUMBER AND THE SECOND BEING A PIN NUMBER. FOR EXAMPLE IN FIG. A 2-1 (AS SHOWN ABOVE) IS CONNECTOR HP2 PIN 1. NOTICE ALL CONNECTORS IN THE COIL, LAMPS, & SWITCH MATRICES USE THE HP PREFIX WHICH IS ONLY USED TO IDENTIFY THE C.P.U. / DRIVER BOARD CONNECTORS.

THE WIRE COLOR IS ALWAYS DISPLAYED WITH THE SOLID COLOR AND THEN THE TRACER. FOR EXAMPLE WHT/BLK IS A WHITE WIRE WITH A BLACK TRACER. A SOLID WIRE HAS THE SAME COLOR FOR THE WIRE COLOR AND THE TRACER. FOR EXAMPLE RED/RED IS A SOLID RED WIRE. THIS MEANS THAT THE WIRE COLOR IS RED AND THE TRACER COLOR IS RED. BEING THAT BOTH OF THE COLORS ARE RED IT IS IMPOSSIBLE TO IDENTIFY THE TRACER WHICH IN TURN MAKES IT A SOLID RED WIRE.

NUMBERS SHOWN IN THE UPPER LEFT HAND CORNER ARE MATRIX NUMBERS.

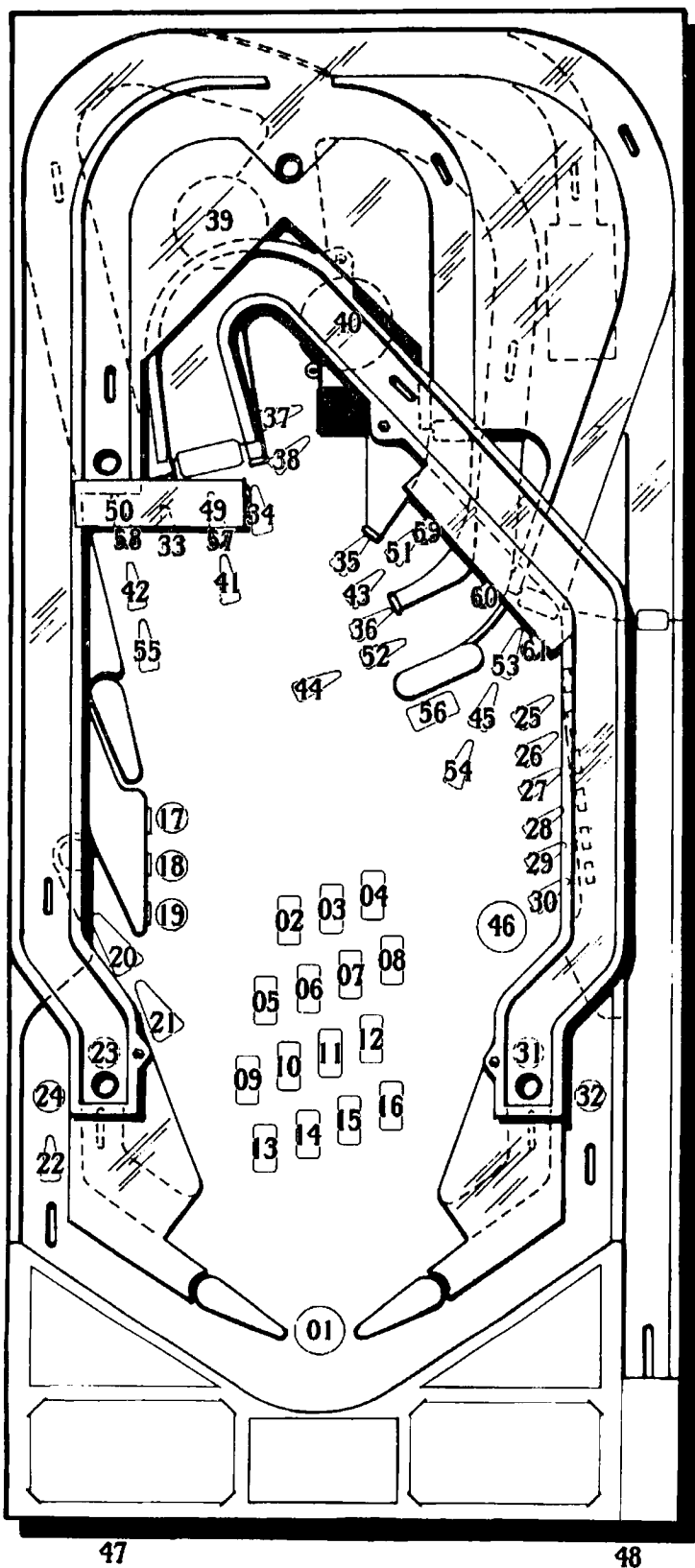
THE ABBREVIATIONS FOR THE WIRE COLORS ARE AS FOLLOWS:

BRN = BROWN	BLU = BLUE
RED = RED	VIO = VIOLET
ORG = ORANGE	GRY = GRAY
YEL = YELLOW	WHT = WHITE
GRN = GREEN	BLK = BLACK

# LAMP MATRIX

COLUMN \ ROW	Q13 HP2-1 YEL / BRN	Q14 HP2-2 YEL / RED	Q15 HP2-3 YEL / ORG	Q16 HP2-4 YEL / BLK	Q17 HP2-5 YEL / GRN	Q18 HP2-6 YEL / BLU	Q19 HP2-8 YEL / VIO	Q20 HP2-9 YEL / GRY
Q12 HP9-13 RED / BRN	1 HUNT AGAIN	2 SCEPTER	3 CRYSTAL BALL	4 BELL	5 GOBLET	6 POTION	7 CANDELABRUM	8 PANDORA'S BOX
Q11 HP9-11 RED / BLK	9 GOLD COINS	10 JESTER'S HAT	11 COAT OF ARMS	12 MIRROR	13 DRAGON IDOL	14 SKULL	15 PAINTING	16 CROWN
Q10 HP9-10 RED / ORG	17 STATUE TOP	18 STATUE MIDDLE	19 STATUE BOTTOM	20 MEGAMODE BOTTOM	21 ? BOTTOM	22 CATAPULT	23 LEFT RETURN	24 LEFT OUTLANE
Q9 HP9-9 RED / YEL	25 CASTLE C	26 CASTLE A	27 CASTLE S	28 CASTLE T	29 CASTLE L	30 CASTLE E	31 RIGHT RETURN	32 RIGHT OUTLANE
Q8 HP9-8 RED / GRN	33 TRAP T	34 TRAP R	35 TRAP A	36 TRAP P	37 MEGAMODE TUNNEL	38 ? TUNNEL	39 BUMPER LEFT	40 BUMPER RIGHT
Q7 HP9-7 RED / BLU	41 JACKPOT BRIDGE	42 JACKPOT DUNGEON	43 JACKPOT TOWER	44 JACKPOT BALLROOM	45 JACKPOT CATWALK	46 SPECIAL	47 GAME START	48 SHOOTER BUTTON
Q6 HP9-6 RED / VIO	49 ITEM BRIDGE	50 ITEM DUNGEON	51 ITEM TOWER	52 ITEM BALLROOM	53 ITEM CATWALK	54 EXTRA BALL	55 SECRET DOOR	56 CHANGE ITEM
Q5 HP9-5 RED / GRY	57 BBOARD BRIDGE	58 BBOARD DUNGEON	59 BBOARD TOWER	60 BBOARD BALLROOM	61 BBOARD CATWALK	62	63	64
Q4 HP9-4 GRY / RED	65	66	67	68	69	70	71	72
Q3 HP9-3 GRY / BLK	73	74	75	76	77	78	79	80
Q2 HP9-2 GRY / YEL	81	82	83	84	85	86	87	88
Q1 HP9-1 GRY / GRN	89	90	91	92	93	94	95	96

# LAMP LOCATIONS



	DESCRIPTION	LAMP NO.	SOCKET PART NO.
01	HUNT AGAIN	#44	LBK-004
02	SCEPTOR	#555	LBK-011
03	CRYSTAL BALL	#555	LBK-011
04	BELL	#555	LBK-011
05	GOBLET	#555	LBK-011
06	POTION	#555	LBK-011
07	CANDELABRUM	#555	LBK-011
08	PANDORA'S BOX	#555	LBK-011
09	GOLD COINS	#555	LBK-011
10	JESTER	#555	LBK-011
11	COAT OF ARMS	#555	LBK-011
12	MIRROR	#555	LBK-011
13	DRAGON IDOL	#555	LBK-011
14	SKULL	#555	LBK-011
15	PAINTING	#555	LBK-011
16	CROWN	#555	LBK-011
17	STATUE TOP	#555	LBK-011
18	STATUE MID	#555	LBK-011
19	STATUE BOT	#555	LBK-011
20	MEGAMODE BOTTOM	#44	LBK-010
21	? BOTTOM	#44	LBK-010
22	CATAPULT	#44	LBK-010
23	LEFT RETURN	#44	LBK-010
24	LEFT OUTLANE	#44	LBK-010
25	CASTLE C	#555	LBK-011
26	CASTLE A	#555	LBK-011
27	CASTLE S	#555	LBK-011
28	CASTLE T	#555	LBK-011
29	CASTLE L	#555	LBK-011
30	CASTLE E	#555	LBK-011
31	RIGHT RETURN	#44	LBK-010
32	RIGHT OUTLANE	#44	LBK-010
33	TRAP T	#44	LBK-010
34	TRAP R	#44	LBK-010
35	TRAP A	#44	LBK-010
36	TRAP P	#44	LBK-010
37	MEGAMODE TUNNEL	#44	LBK-010
38	? TUNNEL	#44	LBK-010
39	BUMPER LEFT	#555	
40	BUMPER RIGHT	#555	
41	JACKPOT BRIDGE	#44	LBK-010
42	JACKPOT DUNGEON	#44	LBK-004
43	JACKPOT TOWER	#44	LBK-010
44	JACKPOT BALLROOM	#44	LBK-010
45	JACKPOT CATWALK	#44	LBK-010
46	SPECIAL	#44	LBK-010
47	GAME START	#555	
48	SHOOTER BUTTON	#555	
49	ITEM BRIDGE	#44	LBK-010
50	ITEM DUNGEON	#44	LBK-010
51	ITEM TOWER	#44	LBK-010
52	ITEM BALLROOM	#44	LBK-010
53	ITEM CATWALK	#44	LBK-010
54	EXTRA BALL	#44	LBK-010
55	SECRET DOOR	#44	LBK-004
56	CHANGE ITEM	#44	LBK-010
57	BB BRIDGE	#44	LBK-005
58	BB DUNGEON	#44	LBK-005
59	BB TOWER	#44	LBK-005
60	BB BALLROOM	#44	LBK-005
61	BB CATWALK	#44	LBK-005

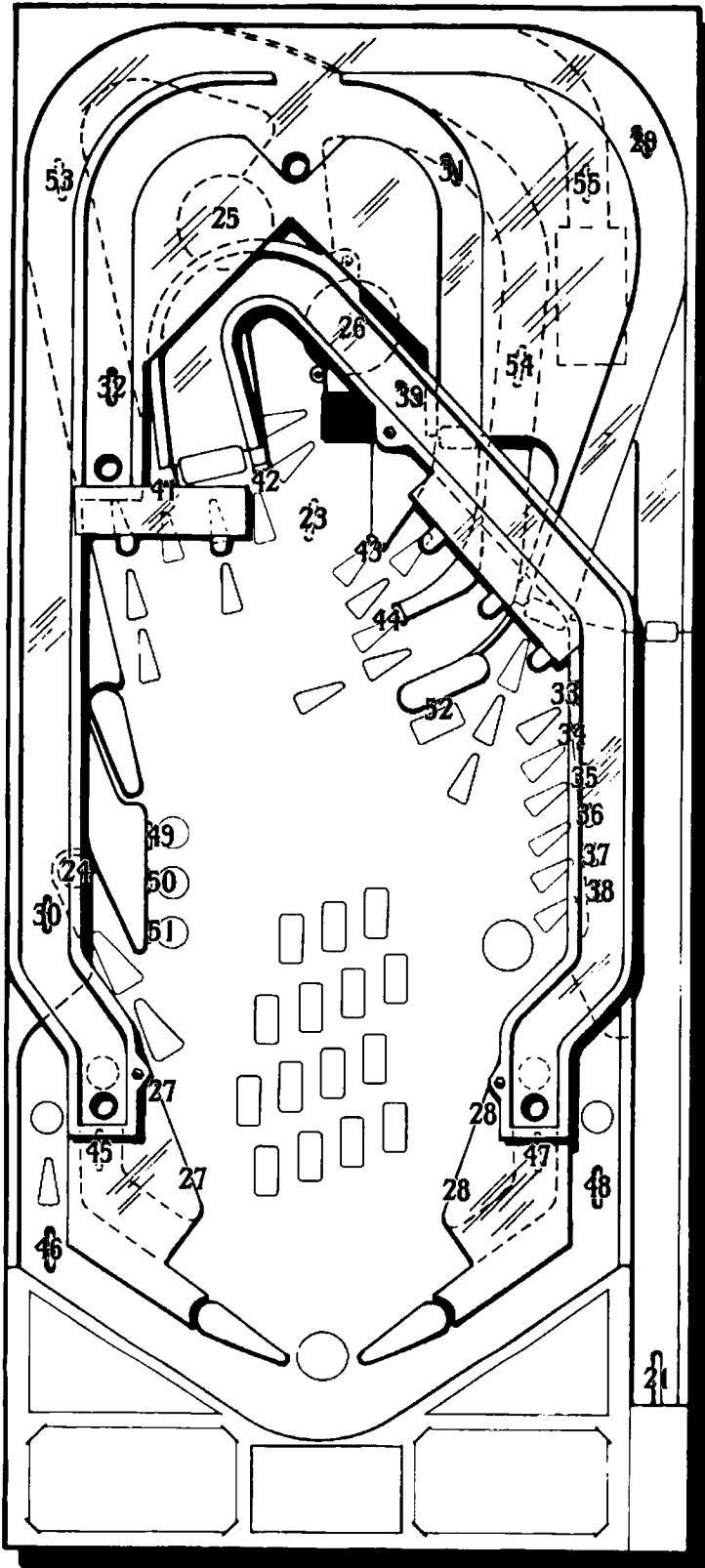
#44 LAMP, BAYONET BASE  
#555 LAMP, WEDGE BASE

LMP-002  
LMP-003

# SWITCH MATRIX

COLUMN ROW	HP5-9 GRN / BRN	HP5-7 GRN / RED	HP5-6 GRN / ORG	HP5-5 GRN / YEL	HP 5.4 GRN / YEL	HP5-3 GRN / BLU	HP5-2 GRN / VIO	HP5-1 GRN / GRY
HP4-1 WHT / BRN	1 LEFT COIN CHUTE	2 RIGHT COIN CHUTE	3 CENTER COIN CHUTE	4 EXTRA COIN CHUTE	5 SLAM	6	7 L FLIPPER BUTTON	8 R. FLIPPER BUTTON
HP4-2 WHT / RED	9 GAME START	10 TILT	11	12	13	14 SHOOTER BUTTON	15 TEST PLUS	16 TEST MINUS
HP4-3 WHT / ORG	17 OUTHOLE	18 BALL TROUGH	19	20	21 SHOOTER LANE	22	23 TUNNEL	24 MEGAMODE
HP4-4 WHT / YEL	25 BUMPER LEFT	26 BUMPER RIGHT	27 SLING LEFT	28 SLING RIGHT	29 CATWALK ENTER	30 CATWALK EXIT	31 TOWER ENTER	32 TOWER EXIT
HP4-5 WHT / GRN	33 CASTLE C	34 CASTLE A	35 CASTLE S	36 CASTLE T	37 CASTLE L	38 CASTLE E	39 BRIDGE	40
HP4-6 WHT / BLU	41 TRAP T	42 TRAP R	43 TRAP A	44 TRAP P	45 LEFT RETURN	46 LEFT OUTLANE	47 RIGHT RETURN	48 RIGHT OUTLANE
HP4-7 WHT / VIO	49 STATUE TOP	50 STATUE MIDDLE	51 STATUE BOTTOM	52 CHANGE ITEM	53 DUNGEON	54 BALLROOM	55 SECRET DOOR	56
HP4-8 WHT / GRY	57	58	59	60	61	62	63	64
HP4-9 ORG / RED	65	66	67	68	69	70	71	72
HP4-10 ORG / BLK	73	74	75	76	77	78	79	80
HP4-13 ORG / YEL	81	82	83	84	85	86	87	88
HP4-14 ORG / GRN	89	90	91	92	93	94	95	96

# SWITCH LOCATIONS



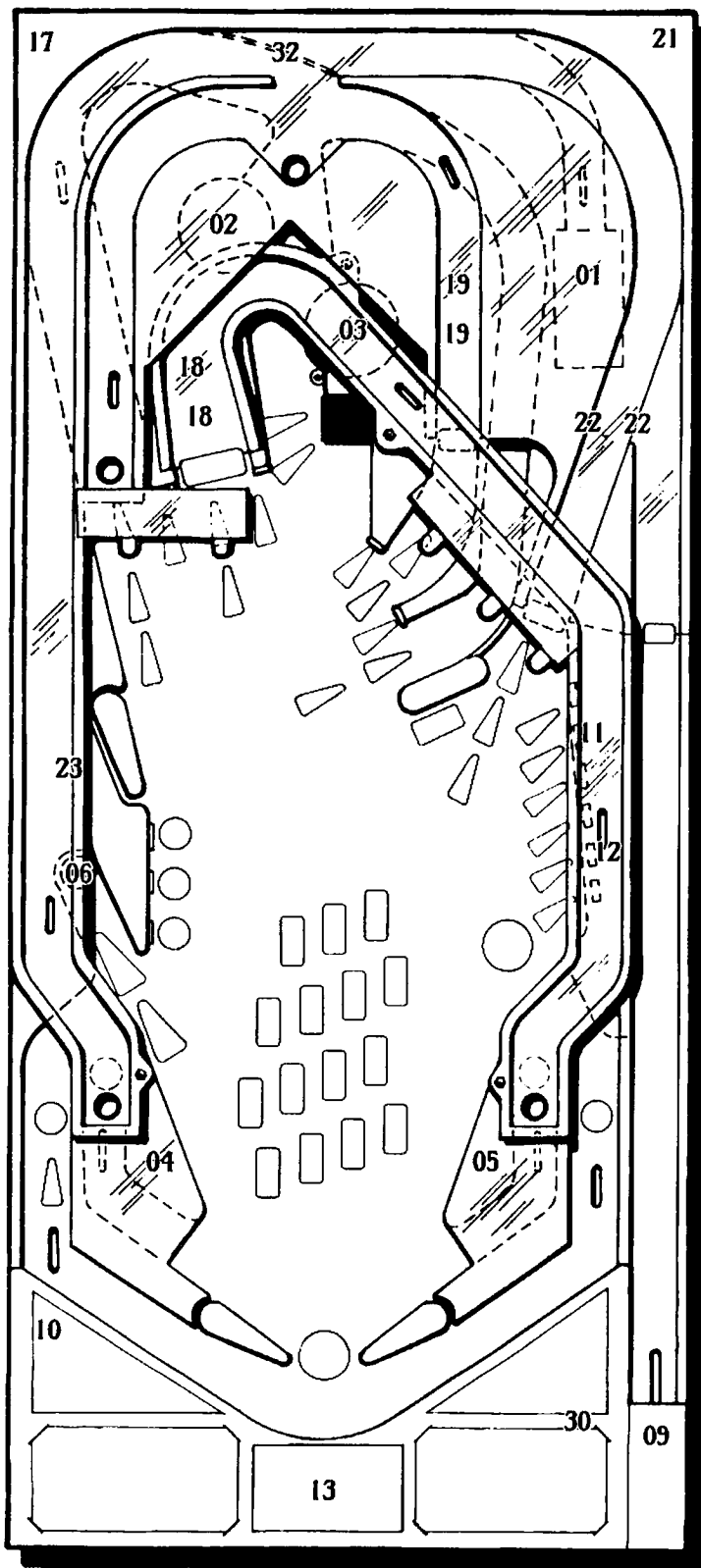
DESCRIPTION	PART NO.
01 LEFT COIN CHUTE	
02 RIGHT COIN CHUTE	
03 CENTER COIN CHUTE	
04 EXTRA COIN CHUTE	
05 SLAM	SLM-001
06	
07 L FLIPPER BUTTON	LSW-001
08 R FLIPPER BUTTON	LSW-001
09 GAME START	CBB-001
10 TILT	PLM-001
11	
12	
13	
14 SHOOTER BUTTON	SHB-001
15 TEST MINUS	TSW-001
16 TEST MINUS	TSW-001
17 OUTHOLE	MSW-011
18 BALL TROUGH	MSW-013
19	
20	
21 SHOOTER LANE	SBA-001
22	
23 TUNNEL	MSW-009
24 MEGAMODE EJECT	MSA-009
25 BUMPER LEFT	CBB-001
26 BUMPER RIGHT	CBB-001
27 SLING LEFT	DTR-001
28 SLING RIGHT	DTR-001
29 CATWALK ENTER	MSW-009
30 CATWALK EXIT	MSW-009
31 TOWER ENTER	MSW-009
32 TOWER EXIT	MSW-009
33 CASTLE C	DTS-001
34 CASTLE A	DTS-001
35 CASTLE S	DTS-001
36 CASTLE T	DTS-001
37 CASTLE L	DTS-001
38 CASTLE E	DTS-001
39 BRIDGE	MSW-009
40	
41 TRAP T	STS-002
42 TRAP R	STS-002
43 TRAP A	STS-002
44 TRAP P	STS-002
45 LEFT RETURN	SBA-001
46 LEFT OUTLANE	SBA-001
47 RIGHT RETURN	SBA-001
48 RIGHT OUTLANE	SBA-001
49 STATUE TOP	STS-001
50 STATUE MID	STS-001
51 STATUE BOT	STS-001
52 CHANGE ITEM	STR-004
53 DUNGEON	SBA-001
54 BALLROOM	SBA-001
55 SECRET DOOR	SBA-001

## COIL TABLE

FUSE	COIL NO.	DESCRIPTION	TRANSISTOR	POWER	RETURN	CONNECTOR	PART NO.
F13	1	SECRET DOOR	Q21	VIO/BLU	VIO/GRY	H6-9	CLL-004
F14	2	BUMPER LEFT	Q22	VIO/GRN	VIO/RED	H6-8	CLL-006
F14	3	BUMPER RIGHT	Q23	VIO/GRN	VIO/ORG	H6-7	CLL-006
F15	4	SLING LEFT	Q24	VIO/BLK	VIO/YEL	H6-5	CLL-007
F15	5	SLING RIGHT	Q25	VIO/BLK	VIO/GRN	H6-4	CLL-007
F16	6	MEGAMODE	Q26	VIO/YEL	VIO/BLU	H6-3	CLL-007
	7		Q27				
	8		Q28				
F17	9	PLUNGER	Q29	VIO/ORG	BRN/BLK	H6-17	CLL-009
F14	10	CATAPULT	Q30	VIO/GRN	BRN/RED	H6-16	CLL-006
F13	11	DTS C-A-S	Q31	VIO/BLU	BRN/ORG	H6-15	CLL-004
F13	12	DTS T-L-E	Q32	VIO/BLU	BRN/YEL	H6-14	CLL-004
F14	13	OUTHOLE	Q33	VIO/GRN	BRN/GRN	H6-13	CLL-006
F15	14	KNOCKER	Q34	VIO/BLK	BRN/BLU	H6-12	CLL-007
F19	15	FLASHER RELAY	Q35	RED/VIO	BRN/VIO	H6-11	
F18	16	FIELD RELAY BOT	Q36	RED/GRN	BRN/GRY	H6-10	
F19	17	FLASHER DUNGEON	Q37	VIO/WHT	BLK/BRN	H7-8	
F19	18	FLASHER BRIDGE	Q38	VIO/WHT	BLK/RED	H7-7	
F19	19	FLASHER TOWER	Q39	VIO/WHT	BLK/ORG	H7-6	
F19	20	FLASHER BALLROOM	Q40	VIO/WHT	BLK/YEL	H7-5	
F19	21	FLASHER SECRET	Q41	VIO/WHT	BLK/GRN	H7-4	
F19	22	FLASHER CATWALK	Q42	VIO/WHT	BLK/BLU	H7-3	
F19	23	FLASHER PIT	Q43	VIO/WHT	BLK/VIO	H7-2	
F19	24	FLASHER BACKBOX	Q44	VIO/WHT	BLK/GRY	H7-1	
	25		Q45				
F18	26	FIELD RELAY TOP	Q46	RED/GRN	BLU/BLK	H7-16	
F18	27	FLIPPER RELAY	Q47	RED/GRN	BLU/VIO	H7-15	
	28		Q48				
F18	29	BOX RELAY NORM	Q49	RED/GRN	BLU/BRN	H7-12	
F26	30	EJECT 2 PLAYFIELD	Q50	RED/GRN	BLU/RED	H7-11	CLL-004
F18	31	BACK RELAY DOOM	Q51	RED/GRN	BLU/ORG	H7-10	
F18	32	GATE	Q52	RED/GRN	BLU/YEL	H7-09	CLL-006

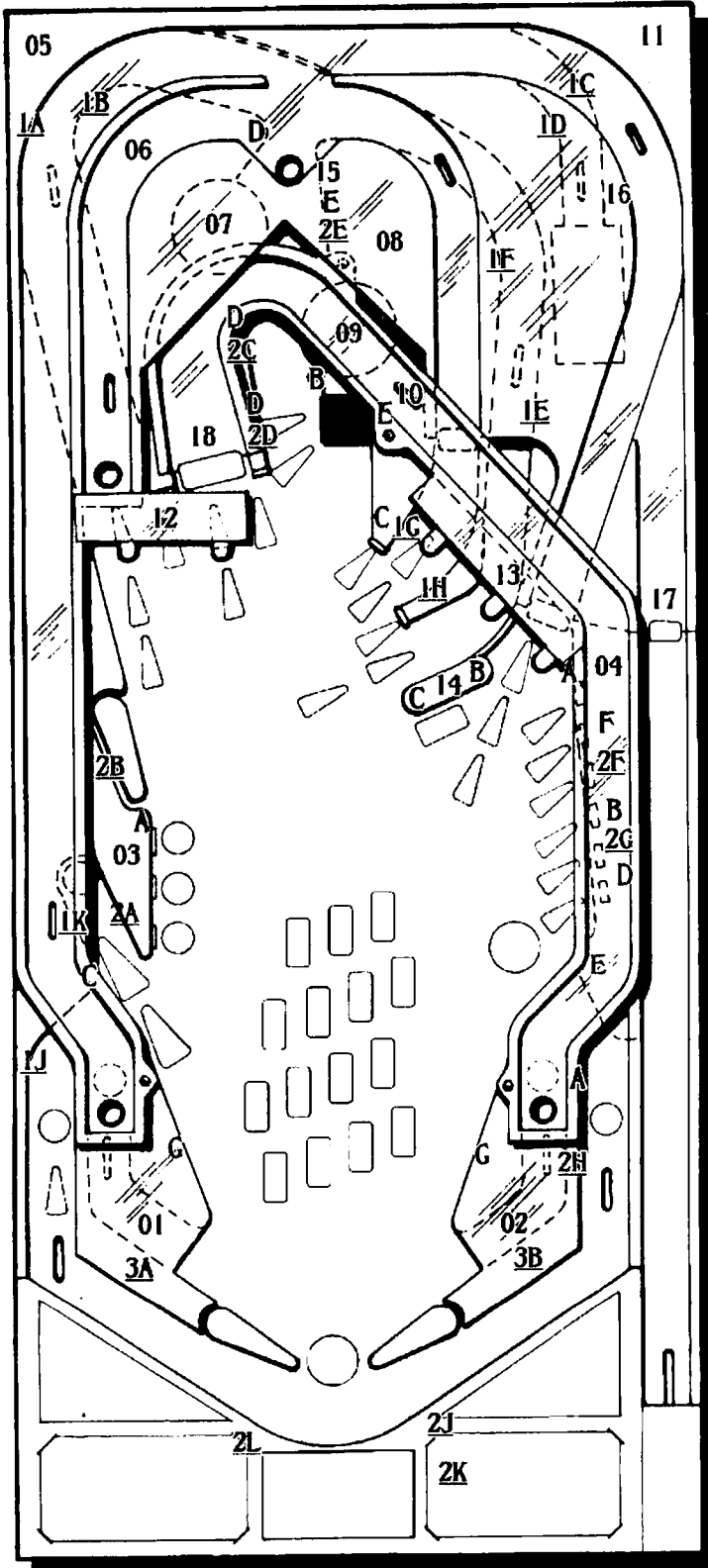


# COIL LOCATION



DESCRIPTION	ASSEMBLY PART NO.
01 SECRET DOOR	AKN-001
02 BUMPER LEFT	ABM-004
03 BUMPER RIGHT	ABM-004
04 SLING LEFT	ABK-008
05 SLING RIGHT	ABK-008
06 MEGAMODE	AVK-001
07	
08	
09 PLUNGER	CKA-002
10 CATAPULT	AKN-001
11 DTS C-A-S	ADT-006
12 DTS T-L-E	ADT-007
13 OUTHOLE	ABR-001
14 KNOCKER	AKN-001
15 FLASHER RELAY	
16 FIELD RELAY BOT	
17 FLASHER DUNGEON	
18 FLASHER BRIDGE	
19 FLASHER TOWER	
20 FLASHER BALLROOM	
21 FLASHER SECRET	
22 FLASHER CATWALK	
23 FLASHER PIT	
24 FLASHER BACKBOX	
25	
26 FIELD RELAY TOP	
27 FLIPPER RELAY	
28	
29 BACK RELAY NORM	
30 EJECT 2 PLAYFIELD	ABR-002
31 BACK RELAY DOOM	
32 GATE	ADV-001

# BALL GUIDES, BALL RAMPS, PLASTICS, & RUBBER RING LOCATIONS



DESCRIPTION	PART NO.	QTY.
A MINI RUBBER BUMPER	RBR-017	3
B BLACK RUBBER BUMPER	RBR-012	3
C 5/16" RUBBER RING	RBR-025	3
D 3/4" RUBBER RING	RBR-019	4
E 1 1/2" RUBBER RING	RBR-022	3
F 2" RUBBER RING	RBR-023	1
G 2 1/2" RUBBER RING	RBR-024	2
01 CARGOYLE LEFT	BUT-L08	
02 CARGOYLE RIGHT	BUT-K08	
03 CARGOYLE TOP	BUT-N08	
04 C-A-S-T-L-E TARGETS	BUT-M08	
05 LEFT CORNER	BUT-D08	
06 DRAGON	BUT-I08	
07 LEFT BELL	BUT-G08	
08 CHANDELIER	BUT-J08	
09 RIGHT BELL	BUT-H08	
10 BRIDGE COVER	BUT-T08	
11 RIGHT CORNER	BUT-A08	
12 BRIDGE BILLBOARD	BUT-C08	
13 CATWALK BILLBOARD	BUT-B08	
14 CHANGE ITEM COVER	BUT-P08	
15 BALL DEFLECTOR	BUT-R08	
16 BALL DEFLECTOR	BUT-S08	
17 CATWALK ASSEMBLY	ARM-022	
18 BRIDGE ASSEMBLY	ARM-020	
1A BALL GUIDE #28	ABG-028	
1B BALL GUIDE #29	ABG-027	
1C BALL GUIDE #22	ABG-022	
1D BALL GUIDE #23	ABG-023	
1E BALL GUIDE #24	ABG-024	
1F BALL GUIDE #25	ABG-025	
1G BALL GUIDE #26	ABG-026	
1H BALL GUIDE #27	ABG-027	
1J BALL GUIDE #30	ABG-030	
1K BALL GUIDE #31	ABG-031	
2A WIRE GUIDE 2 1/2"	WGS-020	
2B WIRE GUIDE 3 1/8"	WGS-025	
2C WIRE GUIDE 3"	WGS-024	
2D WIRE GUIDE 3"	WGS-024	
2E WIRE GUIDE 2"	WGS-016	
2F WIRE GUIDE	WGS-004	
2G WIRE GUIDE 3/4"	WGS-006	
2H WIRE GUIDE 2 1/2"	WGS-020	
2J WIRE GUIDE 1"	WGB-008	
2K WIRE GUIDE 2 1/2"	WGS-020	
2L WIRE GUIDE 3/4"	WGS-006	
3A BALL RETURN GUIDE LONG	BSF-023	

# SECTION 4

## GAME PREFERENCES

<b>SECTION 4</b>	<b>GAME PREFERENCES</b>	<b>1</b>
	GAME ROM SUMMARY	3
	EPROM ORDERING INFORMATION	3
	GAME JUMPER SUMMARY	3
	COIL USAGE TABLE	4
	COIL WINDINGS TABLE	4
	FUSE IDENTIFICATION TABLE	4
	PRICING TABLE	5
	FACTORY SETTINGS	6

## GAME ROM SUMMARY

BOARD IDENTIFICATION	SOCKET #	TYPE	PART#
CPU / DRIVER BOARD	U2 (PROGRAM)	27C512	EPC-081
DOT MATRIX CONTROLLER	U4 (PROGRAM)	27C512	EPD-081
	U5 (GRAPHICS)	27C020	EPD-082
	U6 (GRAPHICS)	27C020	EPD-083
SOUND BOARD	U102 (PROGRAM)	27C512	EPS-081
	AROM0 (SAMPLES)	27C020	EPS-082
	AROM1 (SAMPLES)	27C020	EPS-083
	AROM2 (SAMPLES)	27C020	EPS-084
	AROM3 (SAMPLES)	27C020	EPS-085

TO ORDER A REPLACEMENT CPU, DOT MATRIX, OR SOUND ROM(S) FROM AN AUTHORIZES ALVIN G. & CO. DISTRIBUTOR, SPECIFY THE PART NUMBER & INFORMATION INDICATED ON THE ROM LABEL.

FOR EXAMPLE THE CPU EPROM READS AG08/R01 WHICH IS DIVIDED INTO TWO SEPERATE PARTS.

AG08 = MYSTERY CASTLE  
R01 = REVISION 1

## GAME JUMPER SUMMARY

BOARD IDENTIFICATION	JUMPER#	FACTORY SETTING
DOT MATRIX CONTROLLER	EPSEL1	PIN 1 & PIN 2
	EPSEL2	PIN 1 & PIN 2
	SEL64	PIN 2 & PIN 3
	SI	PIN 1 & PIN 2
SOUND BOARD	JP101	OPEN
	JP102	OPEN
	JP103	JUMPERED
	JP104	OPEN
	JP105	OPEN
	JP106	JUMPERED

## COIL USAGE

PART NO	DESCRIPTION
CLL-003	GENERAL COIL
CLL-004	GENERAL COIL
CLL-006	GENERAL COIL
CLL-007	GENERAL COIL
CLL-009	GENERAL COIL
CLL-015	FLIPPER COIL

## COIL WINDINGS TABLE

PART NO.	AWG	TURNS	DIODE	DCR	AWG	TURNS	DIODE	DCR	COLOR
CLL-003	25	1350	1N4004	9.5Ω	30	2600	1N4004	90Ω	BLUE
CLL-004	28	1750	1N4004	24Ω					WHITE
CLL-006	26	1305	1N4004	11.8Ω					WHITE
CLL-007	25	1075	1N4004	7.95Ω					WHITE
CLL-009	21	950	1N4004	3.5Ω					WHITE
CLL-015	22	700	1N4004	2.7Ω	30	2600	1N4004	87Ω	RED

## FUSE IDENTIFICATION TABLE

FUSE	PROTECTS	RATING
F1	LINE FUSE	5A SLO-BLO
F3	60 VAC	1A SLO-BLO
F4	60 VAC	1A SLO-BLO
F5	98 VAC	1A SLO-BLO
F6	9 VAC	3A SLO-BLO
F7	16 VAC	8A SLO-BLO
F8	51 VAC	8A SLO-BLO
F9	6 VAC	8A SLO-BLO
F10	6 VAC	8A SLO-BLO
F11	13.5 VAC	3A SLO-BLO
F12	13.5 VAC	3A SLO-BLO
F13	1, 11, 12	1A SLO-BLO
F14	2, 3, 10, 13	1 1/2A SLO-BLO
F15	4, 5, 14	2A SLO-BLO
F16	6	2A SLO-BLO
F17	9,	4A SLO-BLO
F18	16, 26, 27, 29, 30, 31, 32	1/2A SLO-BLO
F19	15	4A SLO-BLO
F20	PLAYFIELD GIS'	4A SLO-BLO
F21	PLAYFIELD GIS'	4A SLO-BLO
F22	16 VAC (EXTERNAL)	8A SLO-BLO
F23	INSERT GIS'	4A SLO-BLO
F24	INSERT GIS'	4A SLO-BLO
F25	INSERT GIS'	4A SLO-BLO
F26	30	1/4A SLO-BLO

THE NUMBERS IN THE FIRST COLUMN ARE THE FUSE IDENTIFICATION NUMBERS. IN THE SECOND COLUMN THE NUMBERS ARE SPECIFIC COIL NUMBERS, VOLTAGES, AND PLAYFIELD & BACKBOX AREAS. THE THIRD COLUMN DENOTES THE PROPER FUSE RATING THAT SHOULD BE INSTALLED.

## PRICING TABLE

Country	Left	Center	Right	Extra	Games / Coin	Display	a	b	c	d	e	f
Antilles	25¢		1G		1/25¢, 4/1 Guilder	ANTILLES	01	01	04	00	01	00
Argentina	10¢	10¢	10¢		1/1 token	ARGENTINA	01	01	01	00	01	00
Australia	20¢		\$1		1/3 X 20¢, 2/\$1	AUSTRALIA	02	00	10	00	05	00
Austria	5Sch	10Sch	10Sch		1/2X5Sch, 3/2X10Sch	AUSTRIA	01	02	02	00	02	04
Belgium	20BF	20BF	20BF		3/20 Franc	BELGIUM	03	03	03	00	01	00
Canada 1	25¢		25¢		1/25¢, 4/\$1	CANADA 1	01	04	01	00	01	00
Canada 2	25¢		25¢		1/50¢, 2/75¢, 3/\$1	CANADA 2	03	12	03	00	04	00
Chile	Token		Token		1/1 Token	CHILE	01	04	01	00	01	00
Denmark	1Kr	5Kr	10Kr		1/2X1Kr, 3/5Kr, 7/10Kr	DENMARK	03	15	30	00	05	30
Finland	1Mk		5Mk		1/2X1Mka, 3/5Markka	FINLAND	03	00	15	00	05	00
France 1	1Fr	5Fr	10Fr		1/3X1Fr, 2/5Fr, 5/10Fr	FR 5/10 FR	02	10	20	00	05	20
France 2	1Fr	5Fr	10Fr		1/2Fr, 3/5Fr, 7/10Fr	FR 7/10 FR	03	15	30	00	05	30
France 3	5Fr	10Fr	10Fr		1/5Fr, 3/10Fr, 7/2X10Fr	FR 7/20 FR	03	06	12	00	02	12
France 4	5Fr	10Fr	10Fr		2/5Fr, 4/10Fr, 9/2X10Fr	FR 9/20 FR	02	04	08	00	01	08
France 5	5Fr	10Fr	10Fr		2/5Fr, 5/10Fr, 11/2X10Fr	FR 11/20 FR	05	10	20	00	02	20
Germany 1	1DM	2DM	5DM		1/1 DM, 2/2 DM, 6/5 DM	GER 6/5 DM	06	12	30	00	05	00
Germany 2	1DM	2DM	5DM		1/1 DM, 2/2 DM, 7/5 DM	GER 7/5 DM	06	12	30	00	05	30
Greece	10D	20D	50D		1/2X10D, 1/20D, 3/50 1/1	GREECE	03	06	15	00	05	00
Holland	1G		1G		1/Guilder	HOLLAND	01	00	01	00	01	00
Hungary	10F		20F		1/1X20F 1/2X10F 3/2X20F	HUNGARY	01	00	02	00	02	04
Italy	500L	500L	500L		1/500 Lire	ITALY	01	01	01	00	01	00
Japan	100¥		100¥		1/100¥	JAPAN	01	00	01	00	01	00
New Zealand	20¢		20¢		1/3X20¢	N ZEALAND	01	00	01	00	03	00
Netherlands	1Fl	2.5Fl	2.5Fl		1/1Hfl, 3/2.5 Holland	NETHERLAND	06	15	15	00	05	00
Norway	1Kr		1Kr		1/2X1 Kr, 3/5X1 Krone	NORWAY	01	00	01	00	02	05
Spain	25Pta		100Pta		1/25 P, 5/100 Peseta	SPAIN	05	00	20	00	04	00
Sweden	5Kr	5Kr	5Kr		1/5 Krona	SWEDEN	01	01	01	00	01	00
Swiss	1Sfr	2Sfr	5Sfr		1/1 Fr, 3/2 Fr, 7/5 Fr	SWISS	01	02	05	00	01	00
United Kingdom	10P	50P	£1	20P	1/5 X 10P, 1/50P, 3/£1	U Kingdom	07	35	17	00	10	00
United States 1	25¢		25¢		1/25, 4/\$1	USA 4/\$1	01	04	01	00	01	00
United States 2	25¢		25¢		1/50¢, 2/75¢, 3/\$1	USA 3/\$1	03	12	03	00	04	00
United States 3	25¢		25¢		1/75¢, 2/\$1	USA 2/\$1	01	04	01	00	02	00
Custom						CUSTOM	01	01	01	00	01	00

COLUMNS MARKED a, b, c, d, e, & f REPRESENT THE SETTINGS FOR THE PARTICULAR SELECTION. THESE CAN BE USED AS A REFERENCE TO SET THE CUSTOM PRICING MENU CHOICE. YOU MAY FIND THE LETTERED COLUMNS ON PAGE 7 & 8 OF SECTION 2.

## FACTORY SETTINGS

USING A506 RESET TO FACTORY WILL RESET ALL THE ADJUSTMENTS TO THE SETTINGS SHOWN BELOW. NOTE THIS ALSO RESETS ALL THE BOOKKEEPING FEATURES TO 0 INCLUDING B 2 EARNINGS, AND B102 GRAND TOTAL COINS.

MENU #	ADJUSTMENT DESCRIPTIONS	SETTING
A101	REPLAY AT	300,000,000
A102	AWARD TYPE	CREDIT
A103	REPLAY PERCENT	10%
A104	REPLAY BOOST	20%
A105	GAME OVER ATTRACT	30 MINUTES
A106	MAX FREE GAMES	6 GAMES
A107	BALL PER GAMES	3 BALLS
A108	MAX XBALL / GAME	3 EXTRA BALLS
A109	MATCH PERCENT	10%
A110	TILT WARNINGS	2 WARNINGS
A111	TOURNAMENT MODE	NO
A201	CATAPULT	MEDIUM
A202	AUTO SHOOTER TIMER	OFF
A203	CATWALK SHOT AWARD	3 SHOTS
A204	ITEMS TIMER	MEDIUM
A301	GAME PRICING	USA 3/31
A302	MAXIMUM CREDITS	20 CREDITS
A303	FREE PLAY	NO
A304	DISPLAY CREDITS	YES
A305	COIN METER COUNTS	COINS
A401	HSTD ALLOWED	YES
A402	CREDITS FOR TOP HSTD	3 CREDITS
A403	CREDITS FOR 2ND HSTD	2 CREDITS
A404	RESET HSTD EVERY	700 GAMES
A405	BACKUP TOP HISCORES	600,000,000
A501	CLEAR AUDITS	NO
A502	CLEAR COINS AUDITS	NO
A503	SET BACKUP HISCORES	NO
A504	CLEAR CREDITS	NO
A505	CUSTOM MESSAGE	ON
A506	RESET TO FACTORY	NO
A507	GAME DIFFICULTY	MEDIUM
A508	INSTALL COUNTRY	USA
A509	FLASHER INTENSITY	NORMAL
A510	COIL STRENGTH	NORMAL

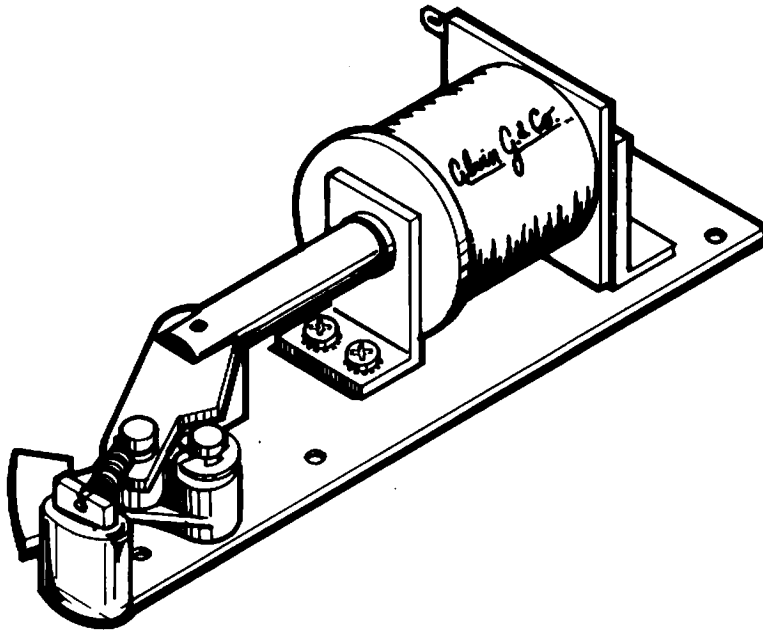
# SECTION 5

## UNIQUE PARTS

<b>SECTION 5 UNIQUE PARTS</b> .....	<b>1</b>
OUTHOLE KICKER ASSEMBLY .....	2
TROUGH SWITCH ASSEMBLY .....	2
VERTICAL UPKICKER ASSEMBLY .....	3
POP BUMPER ASSEMBLY .....	3
KNOCKER ASSEMBLY .....	4
DIVERTER ASSEMBLY .....	4
FLIPPER ASSEMBLY .....	5
DROP TARGET ASSEMBLY .....	6
SLINGSHOT ASSEMBLY .....	7
FLASHER RELAY BOARD .....	8
SOUND BOARD #2 .....	9 - 10
CPU / COMB BOARD .....	11 - 13
POWER SUPPLY BOARD .....	14
DOT MATRIX CONTROLLER .....	15-16
UNIQUE PARTS FOR MYSTERY CASTLE OF DOOM .....	17

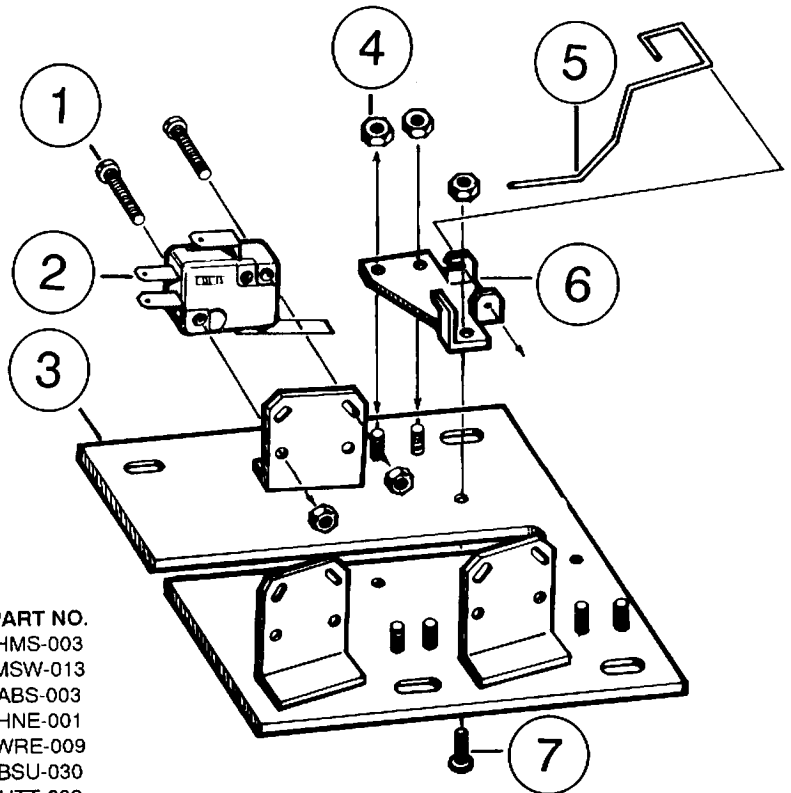


## ABR-001 OUTHOLE KICKER ASSEMBLY



ITEM	DESCRIPTION	QTY	PART NO.
1	Outhole kicker assembly	1	ABR-001
2	Sleeve	1	SLC-006
3	Coil	1	CLL-006

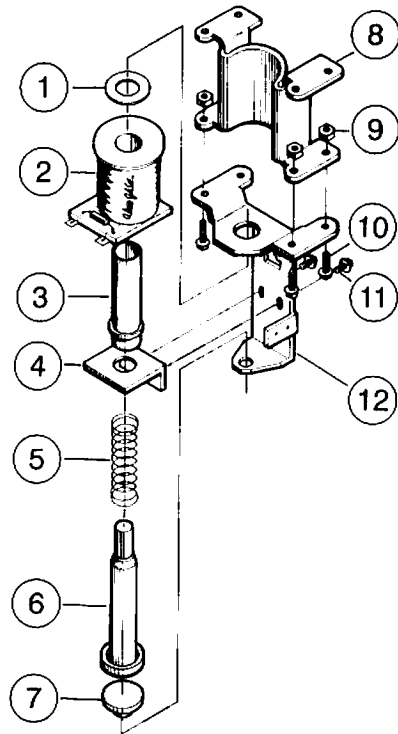
## AMS-001 TROUGH SWITCH ASSEMBLY



ITEM	DESCRIPTION	QTY	PART NO.
1	#4-40 X 5/8" PPH MS	2	HMS-003
2	Micro switch	1	MSW-013
3	Playfield mounting bracket	1	ABS-003
4	#4-40 Elastic Stop Nut (ESN)	5	HNE-001
5	Switch actuator wire	1	WRE-009
6	Wire fulcrum	1	BSU-030
7	#4-40 X 1/4 PPH MS	1	HTT-002

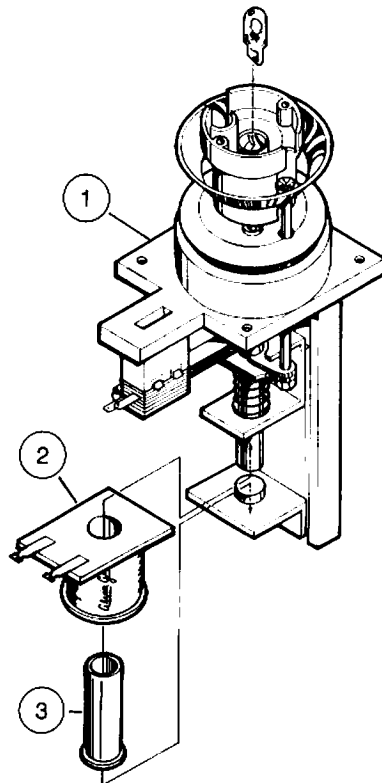
## AVK-001 VERTICAL UPKICKER ASSEMBLY

ITEM	DESCRIPTION	QTY	PART NO.
1	Spring washer	1	SPW-001
2	Coil	1	CLL-004
3	Sleeve	1	SLC-008
4	Coil mounting bracket	1	BSL-042
5	Spring	1	SRG-005
6	Plunger assembly	1	PLN-006
7	Bumper grommet	1	RBR-001
8	Support bracket	1	BSS-069
9	#8-32 ESN	4	HNE-002
10	#8-32 X 1/2 HWH MS	4	HMS-014
11	#8-32 X 5/16 HWH MS	2	HSM-017
12	Playfield mounting bracket	1	BSL-043



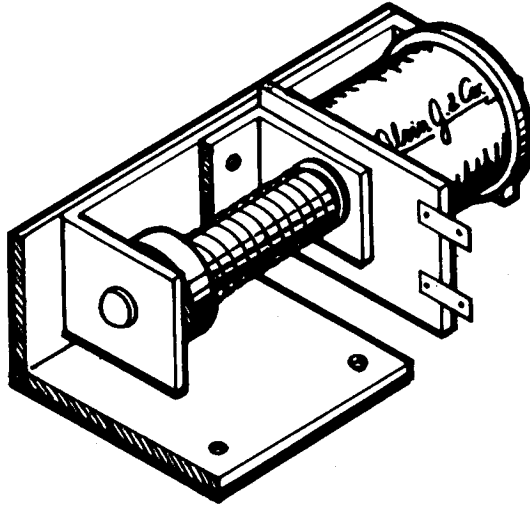
## ABM-004 POP BUMPER ASSEMBLY

ITEM	DESCRIPTION	QTY	PART NO.
1	Pop bumper assembly	1	ABM-004
2	Coil	1	CLL-006
3	Sleeve	1	SLC-008
	Wedge base bulb #555	1	LMP-003



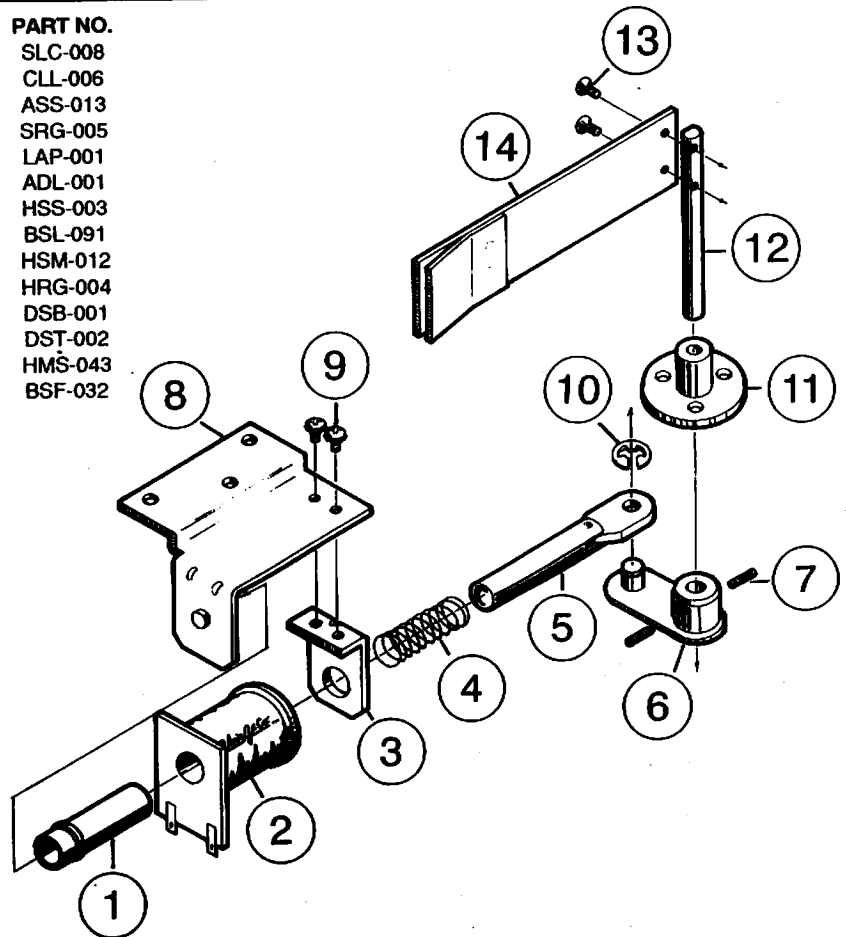
## AKN-001 KNOCKER ASSEMBLY

ITEM	DESCRIPTION	QTY	PART NO.
1	Knocker assembly	1	AKN-001
2	Sleeve	1	SLC-008
3	Coil	1	CLL-007

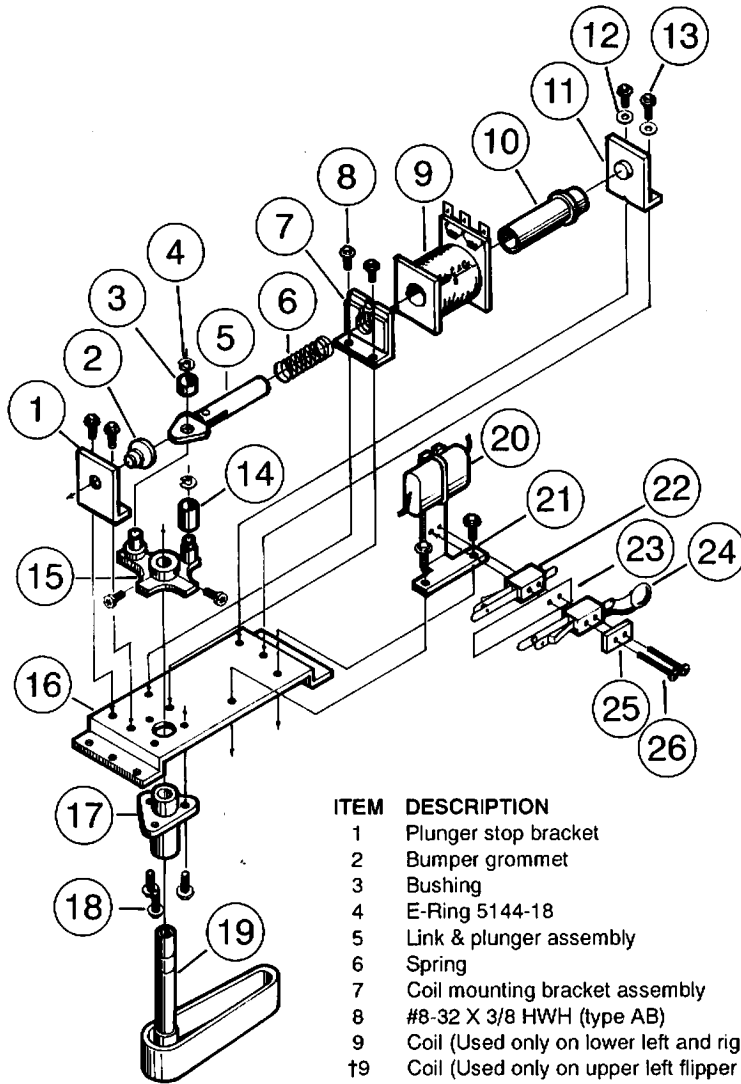


## ADV-001 DIVERTER ASSEMBLY

ITEM	DESCRIPTION	QTY	PART NO.
1	Sleeve	1	SLC-008
2	Coil	1	CLL-006
3	Diverter stop stud assembly	1	ASS-013
4	Spring	1	SRG-005
5	Link & plunger	1	LAP-001
6	Diverter link assembly	1	ADL-001
7	#8-32 X 1/4 SS under cut	1	HSS-003
8	Coil mounting bracket	1	BSL-091
9	#8-32 X 1/4 PPH sems	2	HSM-012
10	E-Ring 5133-25	1	HRG-004
11	Diverter bushing	1	DSB-001
12	Diverter shaft	1	DST-002
13	#4-40 X 1/4 PFH MS	2	HMS-043
14	Diverter gate	1	BSF-032

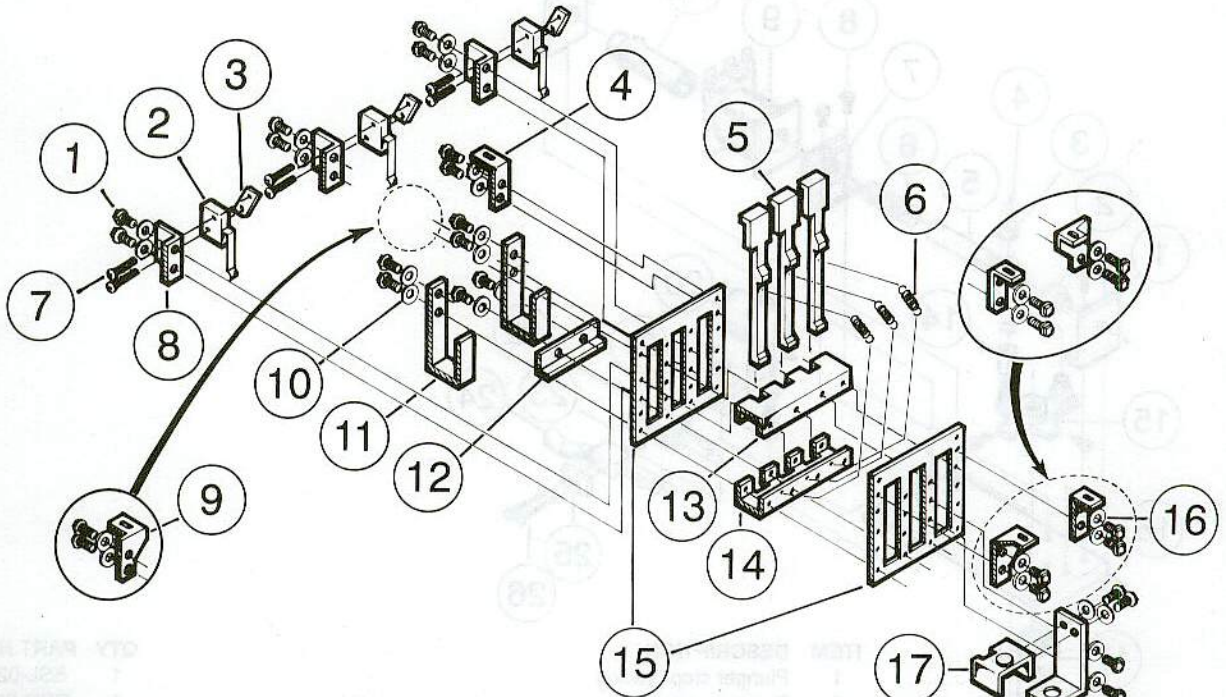


# AFF-L03, AFF-L05, AFF-R02 FLIPPER ASSEMBLY

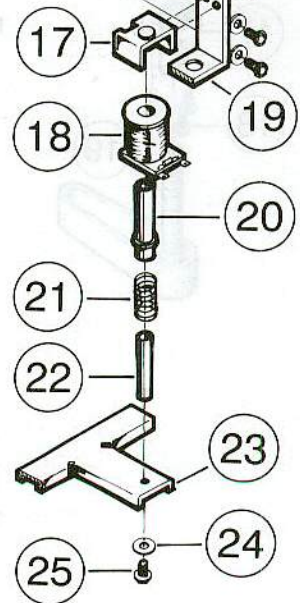


ITEM	DESCRIPTION	QTY	PART NO.
1	Plunger stop bracket	1	BSL-027
2	Bumper grommet	1	RBR-001
3	Bushing	1	BRG-001
4	E-Ring 5144-18	2	HRG-001
5	Link & plunger assembly	1	LAP-001
6	Spring	1	SRG-001
7	Coil mounting bracket assembly	1	CBA-001
8	#8-32 X 3/8 HWH (type AB)	6	HTT-005
9	Coil (Used only on lower left and right flipper assemblies.)	1	CLL-015
10	Sleeve	1	SLC-001
11	Stop stud assembly	1	ASS-002
12	#10 SLW	2	HLW-010
13	#10-32 X 3/8 SHC	4	HSP-003
14	Actuator bearing	1	SLV-001
15-L	Pivot yoke left (Used only on left flipper assemblies.)	1	PYA-L01
15-R	Pivot yoke right (Used only on right flipper assemblies.)	1	PYA-R01
16-L	Flipper base assembly left (Used only on left flipper assemblies.)	1	FBA-L01
16-R	Flipper base assembly right (Used only on right flipper assemblies.)	1	FBA-R01
17	Flipper shaft bushing	1	FSB-001
18	#6-32 X 3/8 HWH (type B)	3	HTT-004
19	Flipper bat assembly	1	AFT-004
20	Capacitor T12.2K 250VDC	1	CAP-001
21	Mounting bracket	1	BSL-032
22	Switch normally open (Upper Flipper Activator)	1	FLS-002
23	Insulator	1	FPN-004
24	Switch normally closed (End Of Stroke)	1	FLS-002
25	0.1µF, 500V, Capacitor	1	CAP-021
26	100Ω, 1/2W, Resistor	1	RST-031
27	#5-40 X 5/8 PPH MS	2	HSM-003
28	Clamp plate	1	SWP-001

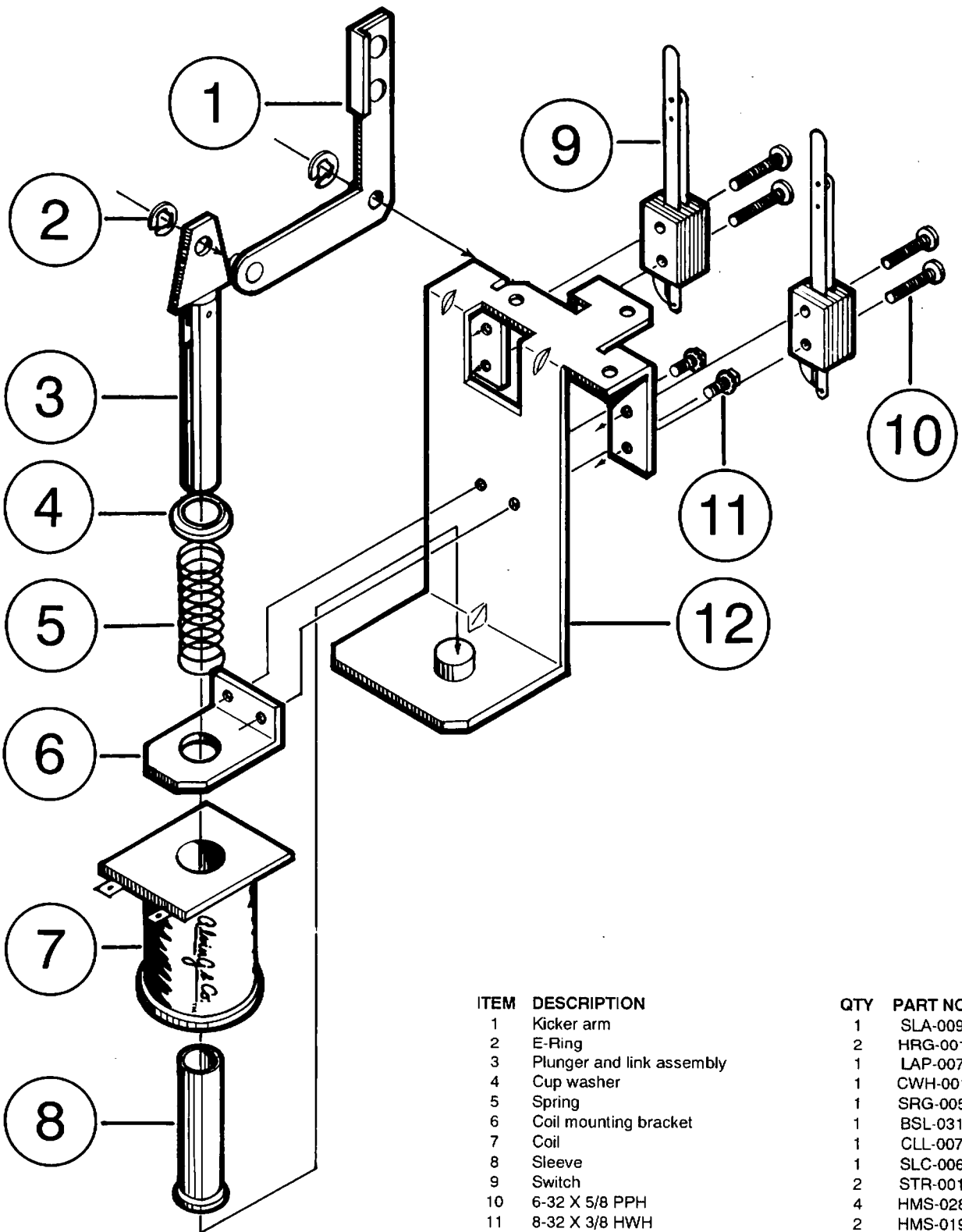
# ADT-006, ADT-007 DROP TARGET ASSEMBLY



ITEM	DESCRIPTION	QTY	PART NO.
1	#8-32 X 3/8 HWH SEMS	4	HSM-013
2	Switch	3	DTS-001
3	Nut Plate	3	BSF-012
4	Mounting bracket	2	BSL-038
5	Rollover drop targets	3	DTP-001
6	Spring	3	SDT-001
7	#2 - 56 X 5/8 PPH INT Sems MS	6	HSM-002
8	Drop target switch mounting bracket	3	BSL-041
9	Mounting plate - Right	1	BSL-036
10	Mounting plate - Left	2	BSL-037
11	#8 X 1/2 X 13/32 FW	4	HWA-003
12	Reset guide	2	BSU-009
13	Target retainer	1	BSL-040
14	Top plate	1	BSU-006
15	Bottom plate	1	BSU-007
16	Side bracket	2	BSL-034
17	Stop stud assembly	1	ASS-001
18	Coil	1	CLL-004
19	Mounting bracket	1	BSS-008
20	Sleeve	1	TRC-001
21	Spring	1	SRC-001
22	Plunger	1	PRC-001
23	Reset bracket	1	BSS-007
24	#8 X 7/16 X 1/32 WB	1	HWA-002
25	#8-32 X 3/8 HHB	1	HMS-018
26	#8-32 X 3/8 HWH MS	20	HMS-019
	#8 XSLW	20	HLW-007

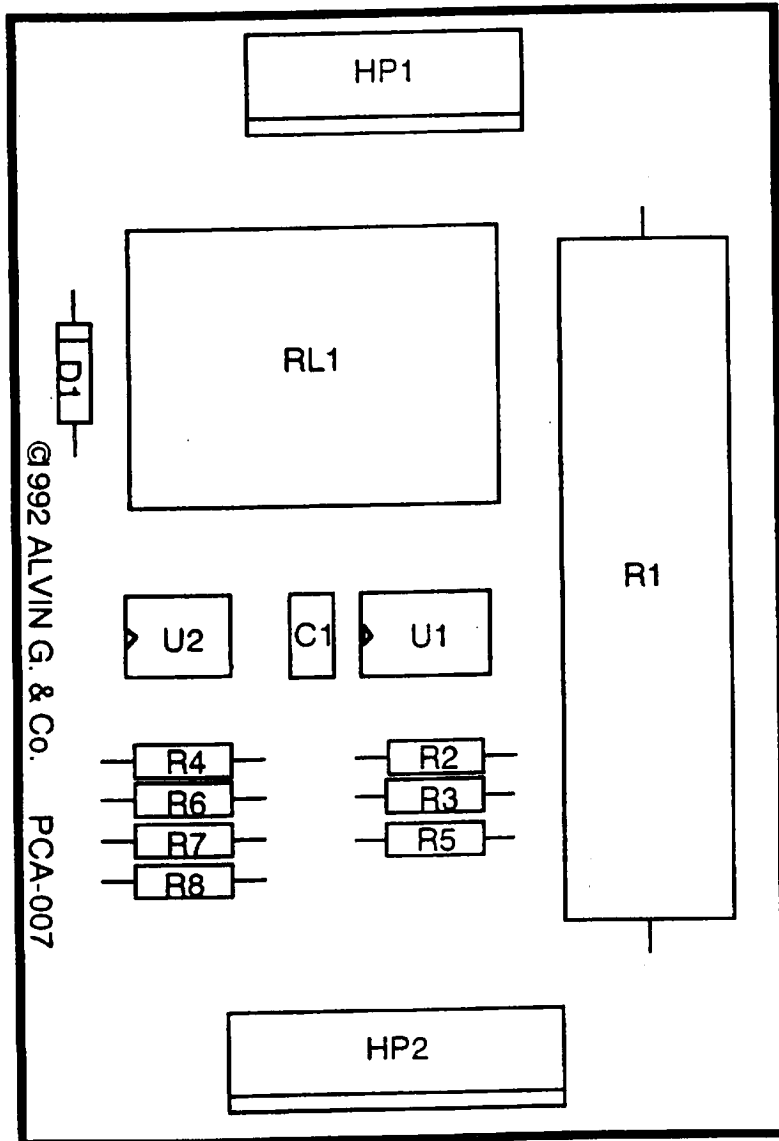


# ABK-008 SLINGSHOT ASSEMBLY



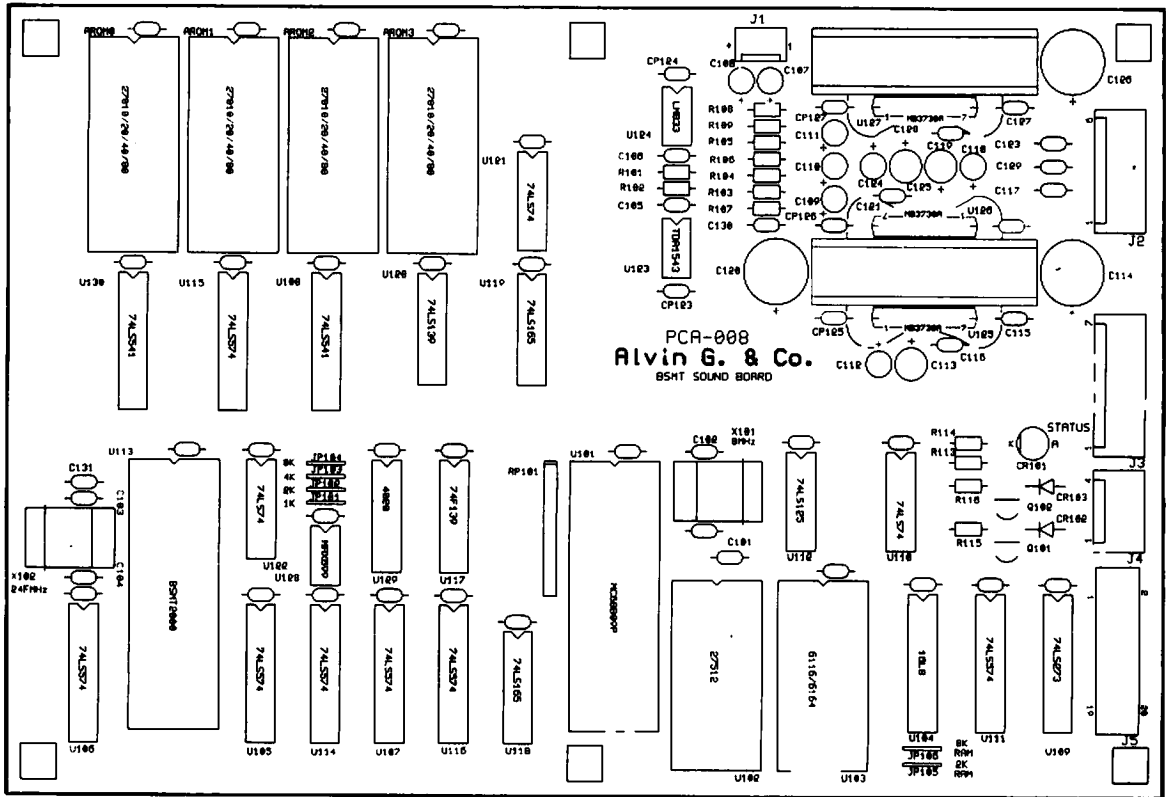
ITEM	DESCRIPTION	QTY	PART NO.
1	Kicker arm	1	SLA-009
2	E-Ring	2	HRG-001
3	Plunger and link assembly	1	LAP-007
4	Cup washer	1	CWH-001
5	Spring	1	SRG-005
6	Coil mounting bracket	1	BSL-031
7	Coil	1	CLL-007
8	Sleeve	1	SLC-006
9	Switch	2	STR-001
10	6-32 X 5/8 PPH	4	HMS-028
11	8-32 X 3/8 HWH	2	HMS-019
12	Playfield mounting assembly	1	ASS-004

# PCA-007 FLASHER RELAY BOARD



ITEM	DESCRIPTION	QTY	PART NO.
C1	0.1 $\mu$ F, 50V, Capacitor	1	CAP-010
D1	1N4004, Diode	1	DDS-001
HP1	4 position header .156"	1	HDR-012
HP2	5 position header .156"	1	HDR-009
R1	.47 $\Omega$ , 10W, 5%, Resistor	1	RST-036
R2	681 $\Omega$ , 1%, Resistor	1	RST-021
R3	5.62K $\Omega$ , 1%, Resistor	1	RST-020
R4	100K $\Omega$ , 1%, Resistor	1	RST-018
R5	2.2K $\Omega$ , 5%, Resistor	1	RST-010
R6	82.5 $\Omega$ , 1%, Resistor	1	RST-017
R7	562 $\Omega$ , 1%, Resistor	1	RST-019
R8	5.62K $\Omega$ , 1%, Resistor	1	RST-020
RL1	24V, Relay	1	REL-002
U1	LM358	1	EC-0031
U2	H11G3	1	EC-0032

# PCA-008 SOUND BOARD #2



ITEM	DESCRIPTION	QTY	PART NO.	ITEM	DESCRIPTION	QTY	PART NO.
AROM0	2 Meg EPROM	1	EPS-082	C116	0.1µF, 50WVDC, Axial, Ceramic	1	CAP-014
AROM0	32 pin DIP socket	1	SKT-032	C117	0.1µF, 50WVDC, Axial, Ceramic	1	CAP-014
AROM1	2 Meg EPROM	1	EPS-083	C118	22µF, 16WVDC, Radial, Elect.	1	CAP-018
AROM0	32pin DIP socket	1	SKT-032	C119	220µF, 10WVDC, Radial, Elect.	1	CAP-019
AROM2	2 Meg EPROM	1	EPS-084	C120	1000µF, 25WVDC, Radial, Elect.	1	CAP-020
AROM2	32 pin DIP socket	1	SKT-032	C121	0.1µF, 50WVDC, Axial, Ceramic	1	CAP-014
AROM3	2 Meg EPROM	1	EPS-085	C122	0.1µF, 50WVDC, Axial, Ceramic	1	CAP-014
AROM3	32 pin DIP socket	1	SKT-032	C123	0.1µF, 50WVDC, Axial, Ceramic	1	CAP-014
C101	18PF, 50WVDC, Axial, Ceramic	1	CAP-015	C124	22µF, 16WVDC, Radial, Elect.	1	CAP-018
C102	18PF, 50WVDC, Axial, Ceramic	1	CAP-015	C125	220µF, 10WVDC, Radial, Elect.	1	CAP-019
C103	18PF, 50WVDC, Axial, Ceramic	1	CAP-015	C126	1000µF, 25WVDC, Radial, Elect.	1	CAP-020
C104	18PF, 50WVDC, Axial, Ceramic	1	CAP-015	C127	0.1µF, 50WVDC, Axial, Ceramic	1	CAP-014
C105	2200PF, 50WVDC, Axial, Ceramic	1	CAP-016	C128	0.1µF, 50WVDC, Axial, Ceramic	1	CAP-014
C106	2200PF, 50WVDC, Axial, Ceramic	1	CAP-016	C129	0.1µF, 50WVDC, Axial, Ceramic	1	CAP-014
C107	4.7µF, 25WVDC, Radial, Elect.	1	CAP-017	C130	0.1µF, 50WVDC, Axial, Ceramic	1	CAP-014
C108	4.7µF, 25WVDC, Radial, Elect.	1	CAP-017	C131	82pF, 50WVDC, Axial, Ceramic	1	CAP-021
C109	4.7µF, 25WVDC, Radial, Elect.	1	CAP-017	CPAR0	0.1µF, 50WVDC, Axial, Ceramic	1	CAP-014
C110	4.7µF, 25WVDC, Radial, Elect.	1	CAP-017	CPAR1	0.1µF, 50WVDC, Axial, Ceramic	1	CAP-014
C111	4.7µF, 25WVDC, Radial, Elect.	1	CAP-017	CPAR2	0.1µF, 50WVDC, Axial, Ceramic	1	CAP-014
C112	22µF, 16WVDC, Radial, Elect.	1	CAP-018	CPAR3	0.1µF, 50WVDC, Axial, Ceramic	1	CAP-014
C113	220µF, 10WVDC, Radial, Elect.	1	CAP-019	CP101	0.1µF, 50WVDC, Axial, Ceramic	1	CAP-014
C114	1000µF, 25WVDC, Radial, Elect.	1	CAP-020	CP102	0.1µF, 50WVDC, Axial, Ceramic	1	CAP-014
C115	0.1µF, 50WVDC, Axial, Ceramic	1	CAP-014	CP103	0.1µF, 50WVDC, Axial, Ceramic	1	CAP-014



## PCA-008 SOUND BOARD #2

ITEM	DESCRIPTION	QTY	PART NO.	ITEM	DESCRIPTION	QTY	PART NO.
CP104	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U108	74LS541 / 75ALS541	1	EC-0027
CP105	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U109	74LS273 / 74HCT273	1	EC-0002
CP106	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U110	74LS74 / 74HCT74	1	EC-0017
CP107	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U111	74LS541 / 75ALS541	1	EC-0027
CP108	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U112	74LS125 / 74HCT125	1	EC-0028
CP109	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U113	40 pin DIP socket	1	SKT-040
CP110	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U113	BSMT2000	1	EC-0029
CP111	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U114	74LS574 / 74ALS574	1	EC-0026
CP112	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U115	74LS574 / 74ALS574	1	EC-0026
CP113	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U116	74LS574 / 74ALS574	1	EC-0026
CP114	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U117	74F139	1	EC-0030
CP115	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U118	74LS165 / 74HCT165	1	EC-0031
CP116	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U119	74LS165 / 74HCT165	1	EC-0031
CP117	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U120	74LS139 / 74HCT139	1	EC-0032
CP118	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U121	74LS74 / 74HCT74	1	EC-0017
CP119	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U122	74LS74 / 74HCT74	1	EC-0017
CP120	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U123	TDA1543	1	EC-0033
CP121	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U124	LM833	1	EC-0034
CP122	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U125	Heat sink, Double mount	1	HSB-004
CP123	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U125	MB3730A	1	EC-0035
CP124	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U126	Heat sink, Double mount	1	HSB-004
CP125	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U126	MB3730A	1	EC-0035
CP126	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U127	Heat sink, Double mount	1	HSB-004
CP127	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U127	MB3730A	1	EC-0035
CP128	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U128	MAX699	1	MAX-001
CP129	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U129	4020	1	EC-0036
CP130	0.1μF, 50WVDC, Axial, Ceramic	1	CAP-014	U130	74LS541 / 75ALS541	1	EC-0027
CR101	LED, T1-3/4", Red	1	LED-001	X101	Crystal, 8MHz	1	CRY-002
CR102	Diode, 1N4001	1	DDS-001	X102	Crystal, 24FMHz	1	CRY-003
CR103	Diode, 1N4001	1	DDS-001	Hardware Mounting hardware for heatsink #4-40 X 1/4" PPH w/ ext. sems MS 4			
JP103	Jumper, zero Ω	1	JMP-001				
JP106	Jumper, zero Ω	1	JMP-001				
J1	4 Position header .100" ctr.	1	HDR-012				
J2	6 Position header .156" ctr.	1	HDR-002				
J3	7 Position header .156" ctr.	1	HDR-014				
J4	4 position header .156" ctr.	1	HDR-015				
J5	2 X 10 header .100" ctr.	1	HDR-013				
Q101	Transistor, NPN, 2N3904	1	NPN-001				
Q102	Transistor, NPN, 2N3904	1	NPN-001				
R101	1.2K, 5%, 1/4W, Carbon film	1	CRF-001				
R102	1.2K, 5%, 1/4W, Carbon film	1	CRF-001				
R103	1K, 5%, 1/4W, Carbon film	1	RST-026				
R104	100, 5%, 1/4W, Carbon film	1	CRF-002				
R105	1K, 5%, 1/4W, Carbon film	1	RST-026				
R106	100, 5%, 1/4W, Carbon film	1	CRF-002				
R107	2.2K, 5%, 1/4W, Carbon film	1	RST-010				
R108	2.2K, 5%, 1/4W, Carbon film	1	RST-010				
R109	100, 5%, 1/4W, Carbon film	1	CRF-002				
R113	220, 5%, 1/4W, Carbon film	1	RST-002				
R114	220, 5%, 1/4W, Carbon film	1	RST-002				
R115	1K, 5%, 1/4W, Carbon film	1	RST-026				
R116	1K, 5%, 1/4W, Carbon film	1	RST-026				
RP101	RPAKB9, 4.7K	1	RPA-001				
U101	40 pin DIP socket	1	SKT-040				
U101	MC68B09P	1	MCV-001				
U102	28 pin DIP socket	1	SKT-028				
U102	27512	1	EPS-081				
U103	28 pin DIP socket	1	SKT-028				
U103	6164	1	EC-0008				
U104	16L8	1	EC-0025				
U105	74LS574 / 74ALS574	1	EC-0026				
U106	74LS574 / 74ALS574	1	EC-0026				
U107	74LS574 / 74ALS574	1	EC-0026				



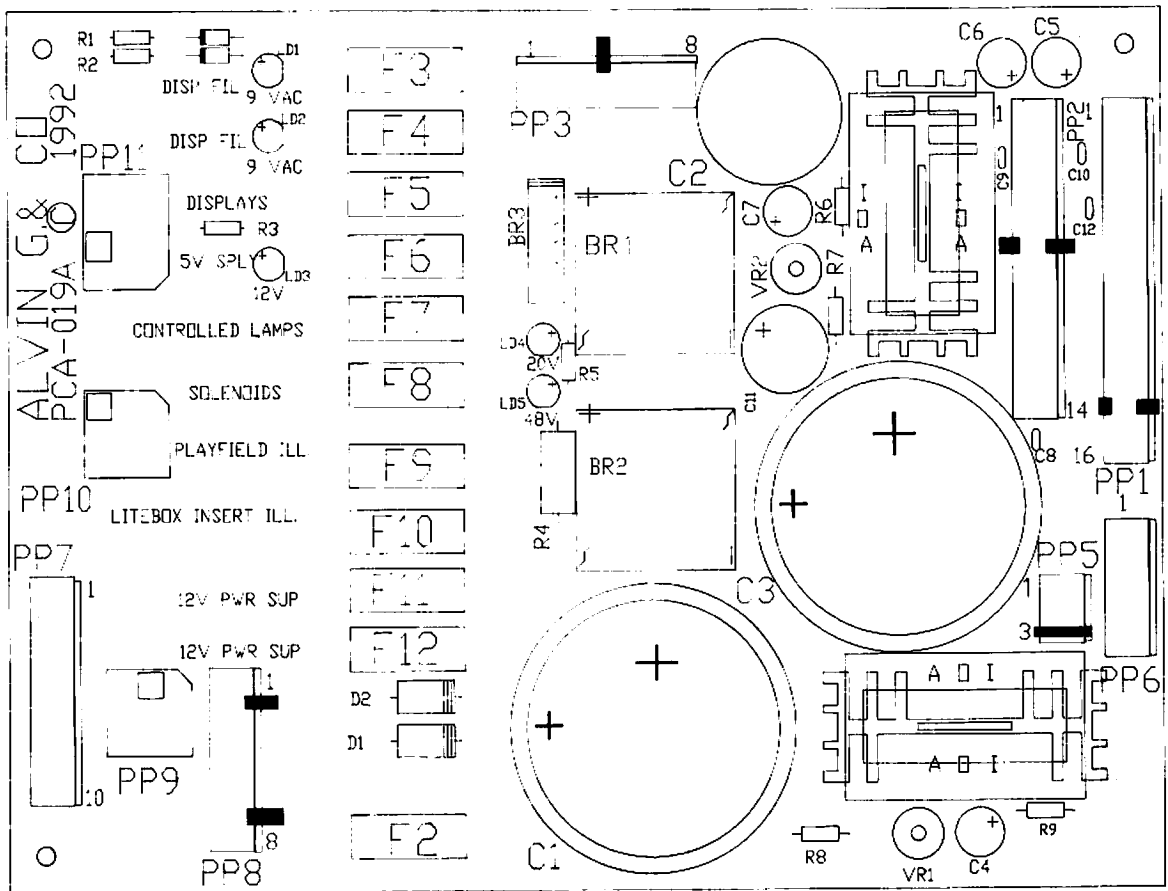
## PCA-009 CPU/COMB BOARD #2

ITEM	DESCRIPTION	QTY	PART NO.	ITEM	DESCRIPTION	QTY	PART NO.
C43	0.1μF, 50V, 10%, Radial	1	CAP-010	Q2	IRF9530	1	TRZ-003
C44	470pF, 50V, 10%, Radial	1	CAP-009	Q3	IRF9530	1	TRZ-003
C45	470pF, 50V, 10%, Radial	1	CAP-009	Q4	IRF9530	1	TRZ-003
C46	470pF, 50V, 10%, Radial	1	CAP-009	Q5	IRF9530	1	TRZ-003
C47	470pF, 50V, 10%, Radial	1	CAP-009	Q6	IRF9530	1	TRZ-003
C48	470pF, 50V, 10%, Radial	1	CAP-009	Q7	IRF9530	1	TRZ-003
C49	470pF, 50V, 10%, Radial	1	CAP-009	Q8	IRF9530	1	TRZ-003
C50	470pF, 50V, 10%, Radial	1	CAP-009	Q9	IRF9530	1	TRZ-003
C51	470pF, 50V, 10%, Radial	1	CAP-009	Q10	IRF9530	1	TRZ-003
C52	470pF, 50V, 10%, Radial	1	CAP-009	Q11	IRF9530	1	TRZ-003
C53	470pF, 50V, 10%, Radial	1	CAP-009	Q12	IRF9530	1	TRZ-003
C54	470pF, 50V, 10%, Radial	1	CAP-009	Q13	IRF530	1	TRZ-001
C55	0.01μF, 50V, 10%, Radial	1	CAP-011	Q14	IRF530	1	TRZ-001
C56	0.01μF, 50V, 10%, Radial	1	CAP-011	Q15	IRF530	1	TRZ-001
C57	0.01μF, 50V, 10%, Radial	1	CAP-011	Q16	IRF530	1	TRZ-001
C58	0.01μF, 50V, 10%, Radial	1	CAP-011	Q17	IRF530	1	TRZ-001
C59	0.01μF, 50V, 10%, Radial	1	CAP-011	Q18	IRF530	1	TRZ-001
C60	0.01μF, 50V, 10%, Radial	1	CAP-011	Q19	IRF530	1	TRZ-001
C61	0.01μF, 50V, 10%, Radial	1	CAP-011	Q20	IRF530	1	TRZ-001
C62	0.01μF, 50V, 10%, Radial	1	CAP-011	Q21	IRF540	1	TRZ-002
C63	0.01μF, 50V, 10%, Radial	1	CAP-011	Q22	IRF530	1	TRZ-001
C64	0.01μF, 50V, 10%, Radial	1	CAP-011	Q23	IRF530	1	TRZ-001
C65	0.01μF, 50V, 10%, Radial	1	CAP-011	Q24	IRF530	1	TRZ-001
C66	0.01μF, 50V, 10%, Radial	1	CAP-011	Q25	IRF530	1	TRZ-001
C67	0.01μF, 50V, 10%, Radial	1	CAP-011	Q26	IRF530	1	TRZ-001
C68	0.01μF, 50V, 10%, Radial	1	CAP-011	Q27	IRF530	1	TRZ-001
C69	0.01μF, 50V, 10%, Radial	1	CAP-011	Q28	IRF530	1	TRZ-001
C70	0.01μF, 50V, 10%, Radial	1	CAP-011	Q29	IRF540	1	TRZ-002
C71	0.01μF, 50V, 10%, Radial	1	CAP-011	Q30	IRF530	1	TRZ-001
C72	0.01μF, 50V, 10%, Radial	1	CAP-011	Q31	IRF530	1	TRZ-001
C73	0.01μF, 50V, 10%, Radial	1	CAP-011	Q32	IRF530	1	TRZ-001
C74	0.01μF, 50V, 10%, Radial	1	CAP-011	Q33	IRF530	1	TRZ-001
C75	0.01μF, 50V, 10%, Radial	1	CAP-011	Q34	IRF530	1	TRZ-001
C76	0.01μF, 50V, 10%, Radial	1	CAP-011	Q35	IRF530	1	TRZ-001
C77	0.01μF, 50V, 10%, Radial	1	CAP-011	Q36	IRF530	1	TRZ-001
C78	0.01μF, 50V, 10%, Radial	1	CAP-011	Q37	IRF530	1	TRZ-001
C79	0.01μF, 50V, 10%, Radial	1	CAP-011	Q38	IRF530	1	TRZ-001
C80	0.01μF, 50V, 10%, Radial	1	CAP-011	Q39	IRF530	1	TRZ-001
C81	0.01μF, 50V, 10%, Radial	1	CAP-011	Q40	IRF530	1	TRZ-001
C82	0.01μF, 50V, 10%, Radial	1	CAP-011	Q41	IRF530	1	TRZ-001
C83	0.01μF, 50V, 10%, Radial	1	CAP-011	Q42	IRF530	1	TRZ-001
C84	0.01μF, 50V, 10%, Radial	1	CAP-011	Q43	IRF530	1	TRZ-001
C85	0.01μF, 50V, 10%, Radial	1	CAP-011	Q44	IRF530	1	TRZ-001
C86	0.01μF, 50V, 10%, Radial	1	CAP-011	Q45	IRF540	1	TRZ-002
C87	470pF, 50V, 10%, Radial	1	CAP-009	Q46	IRF530	1	TRZ-001
C88	470pF, 50V, 10%, Radial	1	CAP-009	Q47	IRF530	1	TRZ-001
C89	470pF, 50V, 10%, Radial	1	CAP-009	Q48	IRF540	1	TRZ-002
C90	470pF, 50V, 10%, Radial	1	CAP-009	Q49	IRF530	1	TRZ-001
D33	1N4154	1	DDS-007	Q50	IRF530	1	TRZ-001
D34	1N4154	1	DDS-007	Q51	IRF530	1	TRZ-001
D35	1N4154	1	DDS-007	Q52	IRF530	1	TRZ-001
D36	1N4154	1	DDS-007	R1	1.5KΩ, 1/4W, 5%, Resistor	1	RST-001
HP1	8 position header locking	1	HDR-003	R2	3.3KΩ, 1/4W, 5%, Resistor	1	RST-014
HP2	9 position header locking	1	HDR-010	R3	15KΩ, 1/4W, 5%, Resistor	1	RST-008
HP3	20 position shrouded header	1	RBC-001	R4	3Ω, 5W, 5%, Resistor	1	RST-013
HP4	14 position header locking	1	HDR-005	R6	4.7K, 1/4W, 5%, Resistor	1	RST-005
HP5	9 position header locking	1	HDR-010	R7	3Ω, 5W, 5%, Resistor	1	RST-013
HP5A	5 position header locking	1	HDR-009	R9	4.7K, 1/4W, 5%, Resistor	1	RST-005
HP6	17 position header locking	1	HDR-008	R10	3Ω, 5W, 5%, Resistor	1	RST-013
HP7	17 position header locking	1	HDR-008	R12	4.7K, 1/4W, 5%, Resistor	1	RST-005
HP8	12 position header locking	1	HDR-011	R13	3Ω, 5W, 5%, Resistor	1	RST-013
HP9	14 position header locking	1	HDR-005	R15	4.7K, 1/4W, 5%, Resistor	1	RST-005
LED1	Light emitting diode	1	DDS-003	R17	4.7K, 1/4W, 5%, Resistor	1	RST-005
Q1	IRF9530	1	TRZ-003	R18	3Ω, 5W, 5%, Resistor	1	RST-013

## PCA-009 CPU/COMB BOARD #2

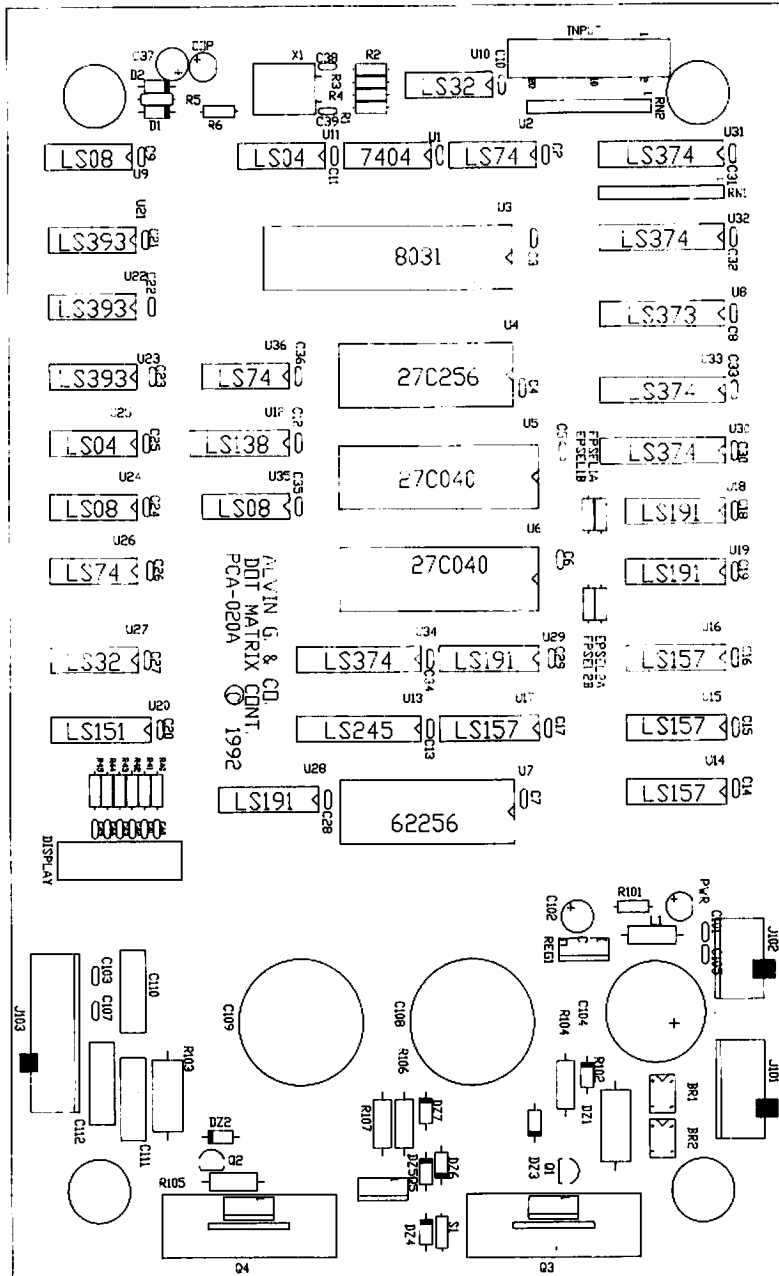
ITEM	DESCRIPTION	QTY	PART NO.	ITEM	DESCRIPTION	QTY	PART NO.
R25	3Ω, 5W, 5%, Resistor	1	RST-013	RN17	2.7KΩ, Resistor, Dip package	1	SSR-002
R26	2.2KΩ, 1/4W, 5%, Resistor	1	RST-010	SW1	Switch, SPST	1	RST-000
R29	4.7K, 1/4W, 5%, Resistor	1	RST-005	U1	40 pin socket	1	SKT-040
R30	4.7K, 1/4W, 5%, Resistor	1	RST-005	U1	65C02	1	EC-0009
R31	4.7K, 1/4W, 5%, Resistor	1	RST-005	U2	28 pin socket	1	SKT-028
R32	4.7K, 1/4W, 5%, Resistor	1	RST-005	U2	27C512	1	EPC-081
R33	4.7K, 1/4W, 5%, Resistor	1	RST-005	U3	28 pin socket	1	SKT-028
R34	4.7K, 1/4W, 5%, Resistor	1	RST-005	U3	6164	1	EC-0008
R35	4.7K, 1/4W, 5%, Resistor	1	RST-005	U4	74LS138 / 74HCT138	1	EC-0014
R36	4.7K, 1/4W, 5%, Resistor	1	RST-005	U5	74LS30 / 74HCT30	1	EC-0016
R37	4.7K, 1/4W, 5%, Resistor	1	RST-005	U6	74LS138 / 74HCT138	1	EC-0014
R38	4.7K, 1/4W, 5%, Resistor	1	RST-005	U7	40 pin socket	1	SKT-040
R39	2.2KΩ, 1/4W, 5%, Resistor	1	RST-010	U7	65C22	1	EC-0010
R40	2.2KΩ, 1/4W, 5%, Resistor	1	RST-010	U8	40 pin socket	1	SKT-040
R41	2.2KΩ, 1/4W, 5%, Resistor	1	RST-010	U8	65C22	1	EC-0010
R42	3.9KΩ, 1/4W, 5%, Resistor	1	RST-015	U9	74LS14	1	EC-0001
R43	3.9KΩ, 1/4W, 5%, Resistor	1	RST-015	U10	74HCT04	1	EC-0025
R44	3.9KΩ, 1/4W, 5%, Resistor	1	RST-015	U11	74LS74 / 74HCT74	1	EC-0017
R47	2.2KΩ, 1/4W, 5%, Resistor	1	RST-010	U12	40 pin socket	1	SKT-040
R48	2.2KΩ, 1/4W, 5%, Resistor	1	RST-010	U12	8255	1	EC-0018
R49	3.9KΩ, 1/4W, 5%, Resistor	1	RST-015	U13	40 pin socket	1	SKT-040
R50	4.7K, 1/4W, 5%, Resistor	1	RST-005	U13	8255	1	EC-0018
R51	4.7K, 1/4W, 5%, Resistor	1	RST-005	U14	40 pin socket	1	SKT-040
R52	3.3KΩ, 1/4W, 5%, Resistor	1	RST-014	U14	8255	1	EC-0018
R53	2.2KΩ, 1/4W, 5%, Resistor	1	RST-010	U15	ULN2003A	1	EC-0021
R54	2.2KΩ, 1/4W, 5%, Resistor	1	RST-010	U16	ULN2003A	1	EC-0021
R55	3Ω, 5W, 5%, Resistor	1	RST-013	U19	ULN2003A	1	EC-0021
R56	3Ω, 5W, 5%, Resistor	1	RST-013	U20	ULN2003A	1	EC-0021
R60	2.2KΩ, 1/4W, 5%, Resistor	1	RST-010	U21	LM339	1	EC-0019
R61	2.2KΩ, 1/4W, 5%, Resistor	1	RST-010	U22	LM339	1	EC-0019
R62	2.2KΩ, 1/4W, 5%, Resistor	1	RST-010	U23	74LS373 / 74HCT373	1	EC-0023
R63	2.2KΩ, 1/4W, 5%, Resistor	1	RST-010	U24	LM339	1	EC-0019
R64	2.2KΩ, 1/4W, 5%, Resistor	1	RST-010	U26	74LS00	1	EC-0024
R65	2.2KΩ, 1/4W, 5%, Resistor	1	RST-010	U27	MAX691	1	EC-0022
R66	2.2KΩ, 1/4W, 5%, Resistor	1	RST-010	U28	UDN6118	1	EC-0020
R67	2.2KΩ, 1/4W, 5%, Resistor	1	RST-010	U29	UDN6118	1	EC-0020
R68	2.2KΩ, 1/4W, 5%, Resistor	1	RST-010	U30	UDN6118	1	EC-0020
R69	560Ω, 1/4W, 5%, Resistor	1	RST-025	U31	UDN6118	1	EC-0020
R70	560Ω, 1/4W, 5%, Resistor	1	RST-025	U32	UDN6118	1	EC-0020
R71	560Ω, 1/4W, 5%, Resistor	1	RST-025	XTAL1	4MHz	1	CRY-001
R72	560Ω, 1/4W, 5%, Resistor	1	RST-025	BATT1	Battery Holder	1	BHD-001
R73	560Ω, 1/4W, 5%, Resistor	1	RST-025	JW1	Zero ohm jumper	1	JMP-001
R74	560Ω, 1/4W, 5%, Resistor	1	RST-025	JW2	Zero ohm jumper	1	JMP-001
R75	560Ω, 1/4W, 5%, Resistor	1	RST-025	JW3	Zero ohm jumper	1	JMP-001
R76	560Ω, 1/4W, 5%, Resistor	1	RST-025	JW4	Zero ohm jumper	1	JMP-001
R77	560Ω, 1/4W, 5%, Resistor	1	RST-025				
R78	560Ω, 1/4W, 5%, Resistor	1	RST-025				
R79	560Ω, 1/4W, 5%, Resistor	1	RST-025				
R80	560Ω, 1/4W, 5%, Resistor	1	RST-025				
RN2	2KΩ, Resistor, Dip package	1	SSR-003				
RN3	2KΩ, Resistor, Dip package	1	SSR-003				
RN4	2.7KΩ, Resistor, Dip package	1	SSR-002				
RN4A	2.7KΩ, Resistor, Dip package	1	SSR-002				
RN5	2.7KΩ, Resistor, Dip package	1	SSR-002				
RN6	2KΩ, Resistor, Dip package	1	SSR-003				
RN7	2.7KΩ, Resistor, Dip package	1	SSR-002				
RN8	2.7KΩ, Resistor, Dip package	1	SSR-002				
RN9	2.7KΩ, Resistor, Dip package	1	SSR-002				
RN10	4.7KΩ, Resistor, Dip package	1	SSR-004				
RN12	4.7KΩ, Resistor, Dip package	1	SSR-004				
RN13	2KΩ, Resistor, Dip package	1	SSR-003				
RN14	2KΩ, Resistor, Dip package	1	SSR-003				
RN15	2KΩ, Resistor, Dip package	1	SSR-003				
RN16	2KΩ, Resistor, Dip package	1	SSR-003				

# PCA-019A POWER SUPPLY BOARD



ITEM	DESCRIPTION	QTY	PART NO.	ITEM	DESCRIPTION	QTY	PART NO.
BR1	25A. Bridge rectifier	1	REC-001	F11	3A. Slo-Blo	1	FUS-008
BR2	25A. Bridge rectifier	1	REC-001	F12	3A. Slo-Blo	1	FUS-008
BR3	4A. Bridge rectifier	1	REC-004	LD1	Light emitting diode	1	DDS-003
C1	33,000 $\mu$ F. Capacitor	1	CAP-005	LD2	Light emitting diode	1	DDS-003
C2	15,000 $\mu$ F. Capacitor	1	CAP-024	LD3	Light emitting diode	1	DDS-003
C3	33,000 $\mu$ F. Capacitor	1	CAP-005	LD4	Light emitting diode	1	DDS-003
C4	22 $\mu$ F. Capacitor	1	CAP-002	LD5	Light emitting diode	1	DDS-003
C5	100 $\mu$ F. Capacitor	1	CAP-003	REG1	LM350. Voltage regulator	1	PVR-001
C6	100 $\mu$ F. Capacitor	1	CAP-003	REG2	LM350. Voltage regulator	1	PVR-001
C7	22 $\mu$ F. Capacitor	1	CAP-002	PP1	16 position header .156"	1	HDR-006
C8	0.1 $\mu$ F. Capacitor	1	CAP-010	PP2	14 position header .156"	1	HDR-005
C9	0.1 $\mu$ F. Capacitor	1	CAP-010	PP3	8 position header .156"	1	HDR-003
C10	0.1 $\mu$ F. Capacitor	1	CAP-010	PP5	3 position header .156"	1	HDR-001
C11	330 $\mu$ F. Capacitor	1	CAP-025	PP6	6 position header .156"	1	HDR-002
C12	0.1 $\mu$ F. Capacitor	1	CAP-010	PP10	9 position Molex connector	1	CNN-M05
D1	1N5404. Diode	1	DDS-002	PP11	12 position	1	CNN-M04
D2	1N5404. Diode	1	DDS-002	R1	330 $\Omega$ . Resistor	1	RST-003
D3	1N4004. Diode	1	DDS-001	R2	8.2K $\Omega$ . Resistor	1	RST-034
D4	1N4004. Diode	1	DDS-001	R3	820 $\Omega$ . Resistor	1	RST-006
F3	1A. Slo-Blo	1	FUS-004	R4	12K $\Omega$ . 1W. Resistor	1	RST-022
F4	1A. Slo-Blo	1	FUS-004	R5	1.5K $\Omega$ . Resistor	1	RST-001
F5	3A. Slo-Blo	1	FUS-008	R6	220 $\Omega$ . Resistor	1	RST-002
F6	8A. Slo-Blo	1	FUS-002	R7	390 $\Omega$ . Resistor	1	RST-004
F7	8A. Slo-Blo	1	FUS-002	R8	1.5K $\Omega$ . Resistor	1	RST-001
F8	8A. Slo-Blo	1	FUS-002	R9	220 $\Omega$ . Resistor	1	RST-002
F9	8A. Slo-Blo	1	FUS-002	R10	0.47 $\Omega$ . 3W. Resistor	1	RST-035
F10	8A. Slo-Blo	1	FUS-002	VR1	1K $\Omega$ . Potentiometer	1	PTM-001
				VR2	1K $\Omega$ . Potentiometer	1	PTM-001

# PCA-020A DOT MATRIX CONTROLLER



ITEM	DESCRIPTION	QTY	PART NO.	ITEM	DESCRIPTION	QTY	PART NO.
BR1	200V, 1A, Bridge rectifier	1	REC-002	C10	0.1μF, Capacitor	1	CAP-010
BR2	200V, 1A, Bridge rectifier	1	REC-002	C11	0.1μF, Capacitor	1	CAP-010
C1	0.1μF, Capacitor	1	CAP-010	C12	0.1μF, Capacitor	1	CAP-010
C2	0.1μF, Capacitor	1	CAP-010	C13	0.1μF, Capacitor	1	CAP-010
C3	0.1μF, Capacitor	1	CAP-010	C14	0.1μF, Capacitor	1	CAP-010
C4	0.1μF, Capacitor	1	CAP-010	C15	0.1μF, Capacitor	1	CAP-010
C5	0.1μF, Capacitor	1	CAP-010	C16	0.1μF, Capacitor	1	CAP-010
C6	0.1μF, Capacitor	1	CAP-010	C17	0.1μF, Capacitor	1	CAP-010
C7	0.1μF, Capacitor	1	CAP-010	C18	0.1μF, Capacitor	1	CAP-010
C8	0.1μF, Capacitor	1	CAP-010	C19	0.1μF, Capacitor	1	CAP-010
C9	0.1μF, Capacitor	1	CAP-010	C20	0.1μF, Capacitor	1	CAP-010

## PCA-020A DOT MATRIX CONTROLLER

ITEM	DESCRIPTION	QTY	PART NO.	ITEM	DESCRIPTION	QTY	PART NO.
C21	0.1 $\mu$ F, Capacitor	1	CAP-010	R40	0 $\Omega$ , Resistor (Jumper)	1	RST-032
C22	0.1 $\mu$ F, Capacitor	1	CAP-010	R41	0 $\Omega$ , Resistor (Jumper)	1	RST-032
C23	0.1 $\mu$ F, Capacitor	1	CAP-010	R42	0 $\Omega$ , Resistor (Jumper)	1	RST-032
C24	0.1 $\mu$ F, Capacitor	1	CAP-010	R43	0 $\Omega$ , Resistor (Jumper)	1	RST-032
C25	0.1 $\mu$ F, Capacitor	1	CAP-010	R44	0 $\Omega$ , Resistor (Jumper)	1	RST-032
C26	0.1 $\mu$ F, Capacitor	1	CAP-010	R45	0 $\Omega$ , Resistor (Jumper)	1	RST-032
C27	0.1 $\mu$ F, Capacitor	1	CAP-010	R101	470 $\Omega$ , Resistor	1	RST-029
C28	0.1 $\mu$ F, Capacitor	1	CAP-010	R102	47K $\Omega$ , 1W, Resistor	1	RST-027
C29	0.1 $\mu$ F, Capacitor	1	CAP-010	R103	47K $\Omega$ , 1W, Resistor	1	RST-027
C30	0.1 $\mu$ F, Capacitor	1	CAP-010	R104	1.5K, 1/2W, Resistor	1	RST-030
C31	0.1 $\mu$ F, Capacitor	1	CAP-010	R104	1.5K, 1/2W, Resistor	1	RST-030
C32	0.1 $\mu$ F, Capacitor	1	CAP-010	R106	47K, 1/2W, Resistor	1	RST-033
C33	0.1 $\mu$ F, Capacitor	1	CAP-010	R107	10K, 1/2W, Resistor	1	RST-034
C34	0.1 $\mu$ F, Capacitor	1	CAP-010	RN1	10K, SIP, 9 pack, Resistor	1	SSR-006
C35	0.1 $\mu$ F, Capacitor	1	CAP-010	RN2	10K, SIP, 9 pack, Resistor	1	SSR-006
C36	0.1 $\mu$ F, Capacitor	1	CAP-010	U1	7404	1	EC-0011
C37	10 $\mu$ F, Capacitor	1	CAP-007	U2	74LS74	1	EC-0017
C38	33pF, Capacitor	1	CAP-012	U3	8031 Microprocessor	1	EC-0036
C39	33pF, Capacitor	1	CAP-012	U4	27C256	1	EPD-081
C40	200pF, Capacitor	1	CAP-015	U5	27C020	1	EPD-082
C41	220pF, Capacitor	1	CAP-022	U6	27C020	1	EPD-083
C42	220pF, Capacitor	1	CAP-022	U7	62256	1	EC-0026
C43	220pF, Capacitor	1	CAP-022	U8	74LS373	1	EC-0023
C44	220pF, Capacitor	1	CAP-022	U9	74LS08	1	EC-0013
C45	220pF, Capacitor	1	CAP-022	U10	74LS32	1	EC-0034
C101	0.1 $\mu$ F, Capacitor	1	CAP-010	U11	74LS04	1	EC-0012
C102	22 $\mu$ F, Capacitor	1	CAP-002	U12	74LS138	1	EC-0014
C103	0.1 $\mu$ F, Capacitor	1	CAP-010	U13	74LS245	1	EC-0015
C104	1000 $\mu$ F, Capacitor	1	CAP-023	U14	74LS157	1	EC-0028
C105	0.1 $\mu$ F, Capacitor	1	CAP-010	U15	74LS157	1	EC-0028
C106	0.1 $\mu$ F, Capacitor	1	CAP-010	U16	74LS157	1	EC-0028
C108	150 $\mu$ F, Capacitor	1	CAP-018	U17	74LS157	1	EC-0028
C109	150 $\mu$ F, Capacitor	1	CAP-018	U18	74LS191	1	EC-0029
C110	0.22 $\mu$ F, Capacitor	1	CAP-019	U19	74LS191	1	EC-0029
C111	0.22 $\mu$ F, Capacitor	1	CAP-019	U20	74LS151	1	EC-0027
C112	0.22 $\mu$ F, Capacitor	1	CAP-019	U21	74LS393	1	EC-0035
COP	MV5752, Red LED	1	DDS-003	U22	74LS393	1	EC-0035
D1	1N4154, Diode	1	DDS-007	U23	74LS393	1	EC-0035
D2	1N4154, Diode	1	DDS-007	U24	74LS08	1	EC-0013
DZ1	3.9V Zener diode	1	ZEN-004	U25	74LS04	1	EC-0012
DZ2	3.9V Zener diode	1	ZEN-004	U26	74LS74	1	EC-0017
DZ3	68V Zener diode	1	ZEN-005	U27	74LS32	1	EC-0034
DZ4	13V Zener diode	1	ZEN-003	U28	74LS191	1	EC-0029
DZ5	100V Zener diode	1	ZEN-006	U29	74LS191	1	EC-0029
DZ6	13V Zener diode	1	ZEN-003	U30	74LS374	1	EC-0030
DZ7	13V Zener diode	1	ZEN-003	U31	74LS374	1	EC-0030
HED14	Header, 2X7	1	RBC-002	U32	74LS374	1	EC-0030
INPUT	Header, 2X10	1	RBC-001	U33	74LS374	1	EC-0030
J101	Header, 5 pin, .156"	1	HDR-009	U34	74LS374	1	EC-0030
J102	Header, 4 pin, .156"	1	HDR-012	U35	74LS08	1	EC-0013
J103	Header, 8 pin, .156"	1	HDR-003	U36	74LS74	1	EC-0017
PWR	MV5752 Red LED	1	DDS-003	X1	12Mhz, Crystal	1	CRY-002
Q1	2N5401	1	TRZ-009				
Q2	2N5551	1	TRZ-006				
Q3	MJE15030	1	TRZ-012				
Q4	MJE15031	1	TRZ-010				
Q5	MJE15030	1	TRZ-012				
REG1	7812, 12 Volt regulator	1	PVR-012				
R1	220 $\Omega$ , Resistor	1	RST-002				
R2	220 $\Omega$ , Resistor	1	RST-002				
R3	560 $\Omega$ , Resistor	1	RST-025				
R4	1K $\Omega$ , Resistor	1	RST-026				
R5	4.7K $\Omega$ , Resistor	1	RST-005				
R6	470 $\Omega$ , Resistor	1	RST-029				

## UNIQUE PARTS FOR MYSTERY CASTLE OF DOOM

ITEM	DESCRIPTION	QTY	PART NO.
	Diverter link assembly	1	ADL-001
	Diverter gate	1	BSF-032
	Diverter shaft	1	DST-002
	Diverter shaft bushing	1	DSB-001
	Post mounting plate	1	BSF-036
	Bridge ramp assembly	1	ARM-019
	Catwalk ramp assembly	1	ARM-021
	#22 Flat ball guide	1	ABG-022
	#23 Flat ball guide	1	ABG-023
	#24 Flat ball guide	1	ABG-024
	#25 Flat ball guide	1	ABG-025
	#26 Flat ball guide	1	ABG-026
	#27 Flat ball guide	1	ABG-027
	#28 Flat ball guide	1	ABG-028
	#29 Flat ball guide	1	ABG-029
	#30 Flat ball guide	1	ABG-030
	#31 Flat ball guide	1	ABG-031
	Ball scoop	1	BSS-055
	Support bracket, vertical upkicker	1	BSS-069
	Playfield lock bracket	1	BSZ-028
	Game 008 plastics	1	BUT-008
	Game 008 decals	1	DCL-008
	Ramp decals	1	DCL-008-A
	Plastic back panel	1	BUT-008-A
	Lane kicker assembly (top)	1	CKA-004
	Kickback assembly (left)	1	CKA-005
	Dot matrix glass screened	1	DMC-008
	Game 008 instruction card	1	GMC-011
	Back Glass (screened)	1	GTD-005
	Lamp cover (yellow)	1	LPC-003
	Game 008 manual (english)	1	MAN-019
	Vertical upkicker micro-switch	1	MSA-009
	Lamp board (4 position)	1	PCA-025
	Lamp board (6 position)	1	PCA-026
	Playfield mylar stickers	1	PMS-001
	Shooter button sticker	1	SHS-002
	Welded steel ramp assembly	1	ASR-001
	Steel ramp	1	WSR-001



# SECTION 6

## TROUBLESHOOTING & MAINTENANCE

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## **BASIC MAINTENANCE**

REGULAR MAINTENANCE IS NECESSARY TO PROLONG THE LIFE, QUALITY AND EARNINGS OF YOUR ALVIN G. & CO. PINBALL MACHINE.

**CLEANING** - THE PINBALL MACHINE SHOULD BE CLEANED DURING EVERY COLLECTION FOR GREAT GAME ACTION, PLAYFIELD LIFE AND RETURN ON INVESTMENT.

THE PLAYFIELD SHOULD BE FULLY CHECKED OVER FOR NICKS OR SCRATCHES AND REPAIRED IMMEDIATELY TO RESIST FURTHER DAMAGE TO PLAYFIELD. THE PLAYFIELD SHOULD BE WIPED DOWN AT EACH COLLECTION TO REMOVE ANY DUST BUILD UP WITH A LINT FREE CLOTH.

THE PINBALLS SHOULD BE CLEANED AND LOOKED OVER FOR ANY NICKS OR CHIPS. IF PRESENT, REPLACE DAMAGED PINBALLS IMMEDIATELY TO PREVENT ANY DAMAGE TO THE PLAYFIELD SURFACE.

THE PLAYFIELD SHOULD BE WAXED WITH A NON PETROLEUM DISTILLATE PLAYFIELD WAX. A CARNAUBA BASED WAX IS ACCEPTABLE.

THE PLAYFIELD GLASS SHOULD BE CLEANED THOROUGHLY WITH A LEMON BASE GLASS CLEANER (DO NOT USE ANY AMMONIA BASED CLEANERS.)

THE PLAYFIELD PLASTICS CAN BE CLEANED WITH THE SAME WAX WHICH IS USED FOR THE PLAYFIELD.

THE RUBBER RINGS CAN BE CLEANED WITH THE PLAYFIELD WAX. REPLACE RUBBER RINGS IF WORN, CRACKED, OR DAMAGED.

GAME LEGS AND CABINET SHOULD BE CLEANED WITH A DAMP CLOTH.

**LEAF SWITCH CONTACTS** - LEAF SWITCH CONTACT ARE COATED WITH A GOLD FLASHING MATERIAL TO RESIST CORROSION. IF CORROSION IS PRESENT, THE LEAF SWITCH SHOULD BE REPLACED.

CONTACTS MAY BE CLEANED BY USING A BUSINESS CARD OR COARSE PAPER BETWEEN CLOSED CONTACTS AND PULLING THE PAPER FROM THE CONTACTS.

PROPER GAP FOR THESE SWITCHES IS 1/16", .0625" OR 1.5875MM.

**LAMPS** - ALL BURNT OUT LAMPS SHOULD BE REPLACED IMMEDIATELY WITH THE APPROPRIATE REPLACEMENT LAMP.

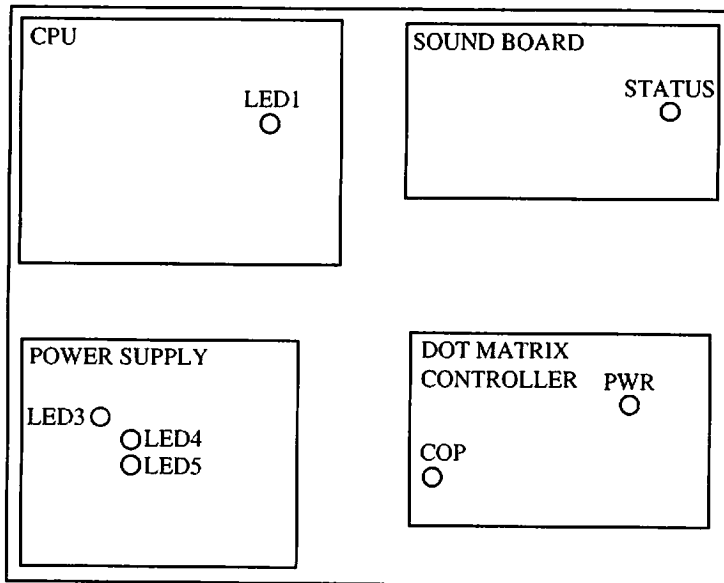
# L.E.D. LOCATION AND OPERATION

C.P.U. LED 1 = 1 FLASH PER SECOND

DOT MATRIX LED PWR = ON ALL THE TIME  
LED COP = 1 FLASH PER SECOND

POWER SUPPLY LED 3 = ON ALL THE TIME +5VDC  
LED 4 = ON ALL THE TIME +20VDC  
LED 5 = ON ALL THE TIME +48VDC

SOUND BOARD LED STATUS = 1 FLASH PER SECOND



## C.P.U. L.E.D. FLASHES INTERMITTENTLY

TO HELP IN DIAGNOSING ERRORS IN THE C.P.U. THE L.E.D. WILL FLASH A CODE TO HELP DETERMINE WHERE THE PROBLEM IS COMING FROM. IF THE L.E.D. IS FLASHING AT A NORMAL RATE OF 1 FLASH PER SECOND THE C.P.U. IS FUNCTIONING PROPERLY.

2 QUICK FLASHES AND STOPS - R.O.M. ERROR

3 QUICK FLASHES AND STOPS - SWITCH RETURNS OR U7, 6522

4 QUICK FLASHES AND STOPS - 4 DIRECT SWITCHES OR U7, 6522

5 QUICK FLAHERS AND STOPS - U8, 6522

ON ALL THE TIME - EPROM MISSING OR BAD.

## SMART DOT™ MESSAGES

THIS ALVIN G. & CO. GAME PROGRAM INCLUDES SMART DOT™ WHICH ALERTS THE SERVICEPERSON OR COLLECTOR THAT A PROBLEM EXISTS IN THE PINBALL MACHINE. THIS IS ACHIEVED WITHOUT LETTING THE PLAYER KNOW THAT A PROBLEM EXISTS.

SMART DOT™ WORKS BY DISPLAYING A "DOT" IN THE LOWER LEFT OR RIGHT CORNER OF THE DOT MATRIX DISPLAY ONLY WHEN THE "CREDITS" ARE DISPLAYED DURING THE ATTRACT MODE.

**LEFT "SMART DOT™":** A DOT APPEARING IN THE LOWER LEFT CORNER OF THE DISPLAY MEANS A PINBALL IS MISSING OR PINBALLS ARE MISSING. TO VERIFY THIS PROBLEM USE TEST "T2 INFORMATION" AND PRESS ENTER IN THE DIAGNOSTIC MODE. THE DISPLAY WILL READ "MISSING PINBALL". THIS MESSAGE INFORMS THE SERVICEMAN THAT A BALL IS TRAPPED OR AN OUTHOLE, TROUGH, OR SHOOTER LANE SWITCH IS MALFUNCTIONING.

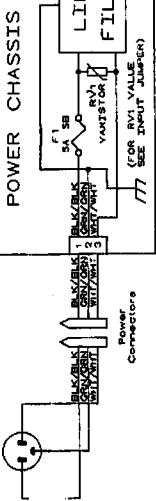
**RIGHT "SMART DOT™":** A DOT APPEARING IN THE LOWER RIGHT CORNER OF THE DISPLAY MEANS A PLAYFIELD SWITCH IS STUCK CLOSED OR HAS NOT BEEN ACTIVATED FOR THE PAST 25 GAMES. THIS MESSAGE IS FOR PLAYFIELD SWITCHES ONLY. TO VERIFY A SPECIFIC PROBLEM, USE TEST "T2 INFORMATION" AND PRESS ENTER IN THE DIAGNOSTIC MODE. THE DISPLAY WILL READ CHECK FOR BAD SWITCH. USE TEST "T6 STUCK SWITCH" OR "T7 INACTIVE SWITCH" TO DETERMINE SPECIFIC SWITCH PROBLEMS.

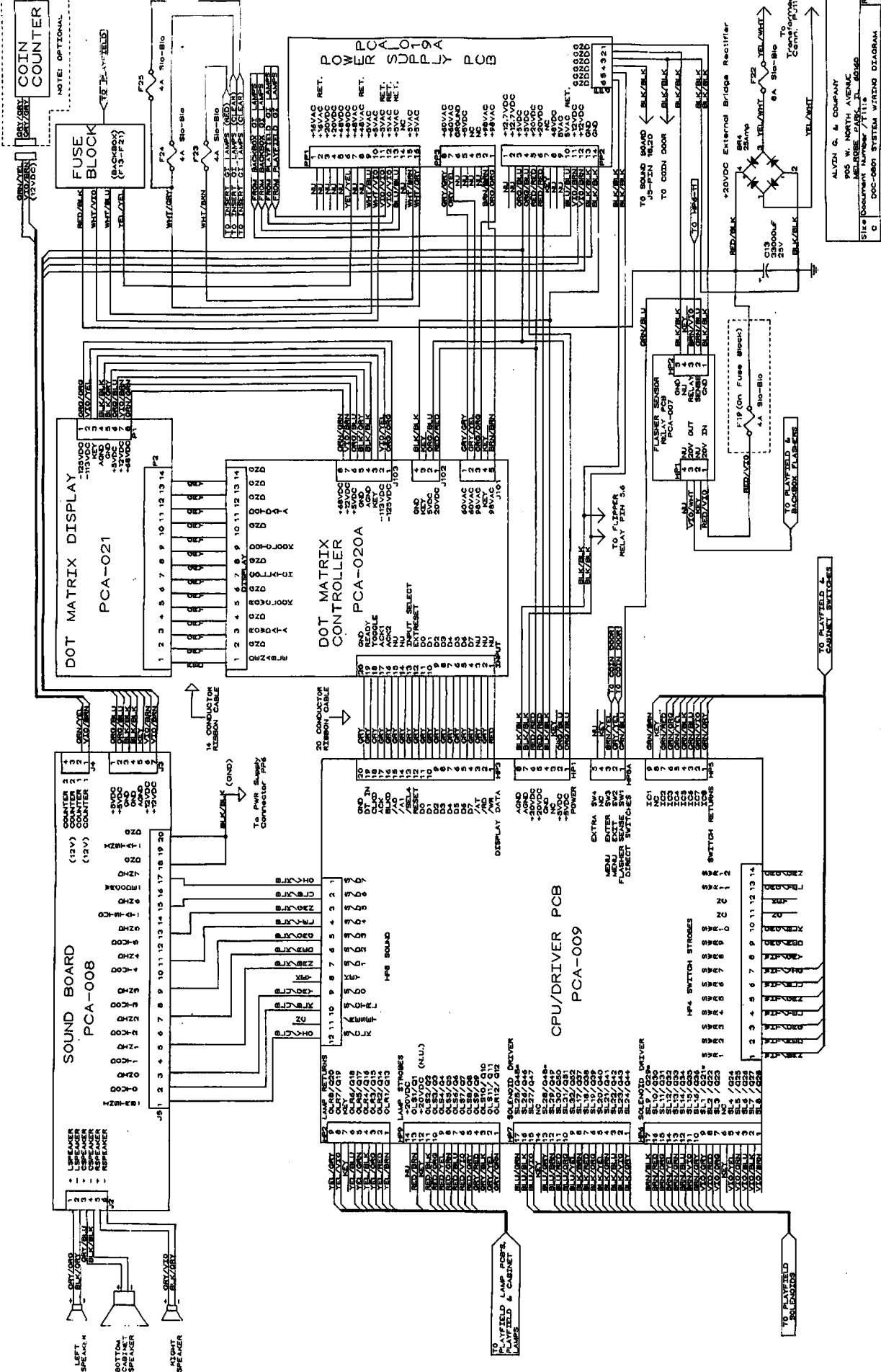
# SECTION 7

## WIRING DIAGRAMS

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POWER SUPPLY BOARD .....	16

PLUG AC MALE





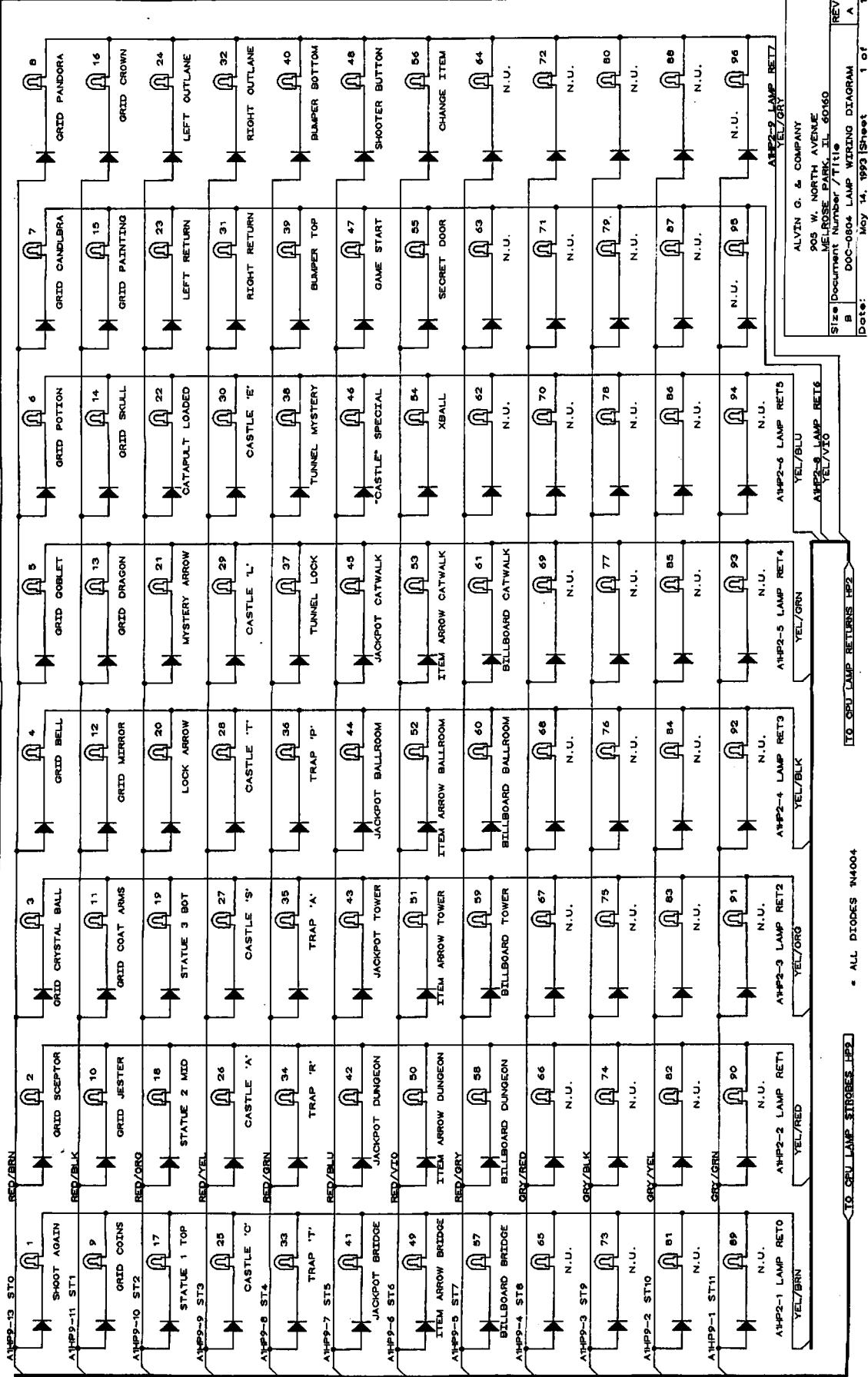
ALVIN G. & COMPANY  
 305 W. NORTH AVENUE  
 MELROSE PARK, IL 60136  
 Size Document Number / Title  
 C DOC-000 SYSTEM WIRING DIAGRAM REV. A  
 DATE REV. 05, 1991 BHS:ms 1 of 1











ALVIN G. & COMPANY  
 905 W. NORTH AVENUE  
 MELROSE, CALIF. 90160  
 Size Document Number 7111  
 B DOC-0804 LAMP WIRING DIAGRAM  
 Date: May 14, 1993 Sheet 1 of 1

• ALL DIODES N4004

TO CPU LAMP STROBES LP2

TO CPU LAMP RETURNS LP2

YEL/BLU  
YEL/VIO  
YEL/GRN  
YEL/BLK

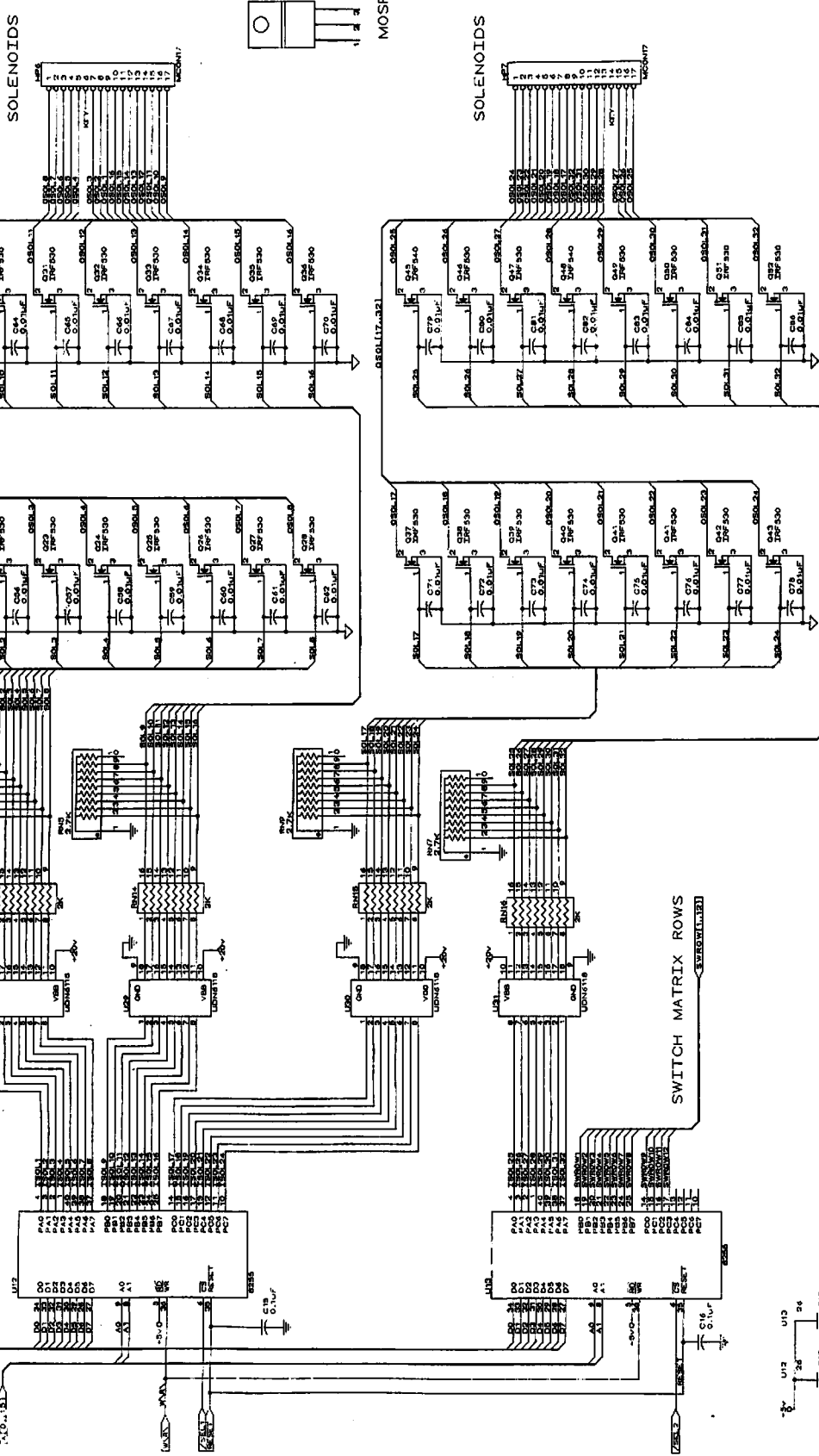
AHP2-9 LAMP RET5  
 AHP2-8 LAMP RET6  
 AHP2-5 LAMP RET4  
 AHP2-4 LAMP RET3  
 AHP2-3 LAMP RET2  
 AHP2-2 LAMP RET1  
 AHP2-1 LAMP RET0  
 AHP2-9 LAMP RET7  
 AHP2-8 LAMP RET8





DATA BUS

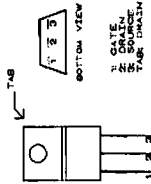
ADDR BUS



SOLENOIDS

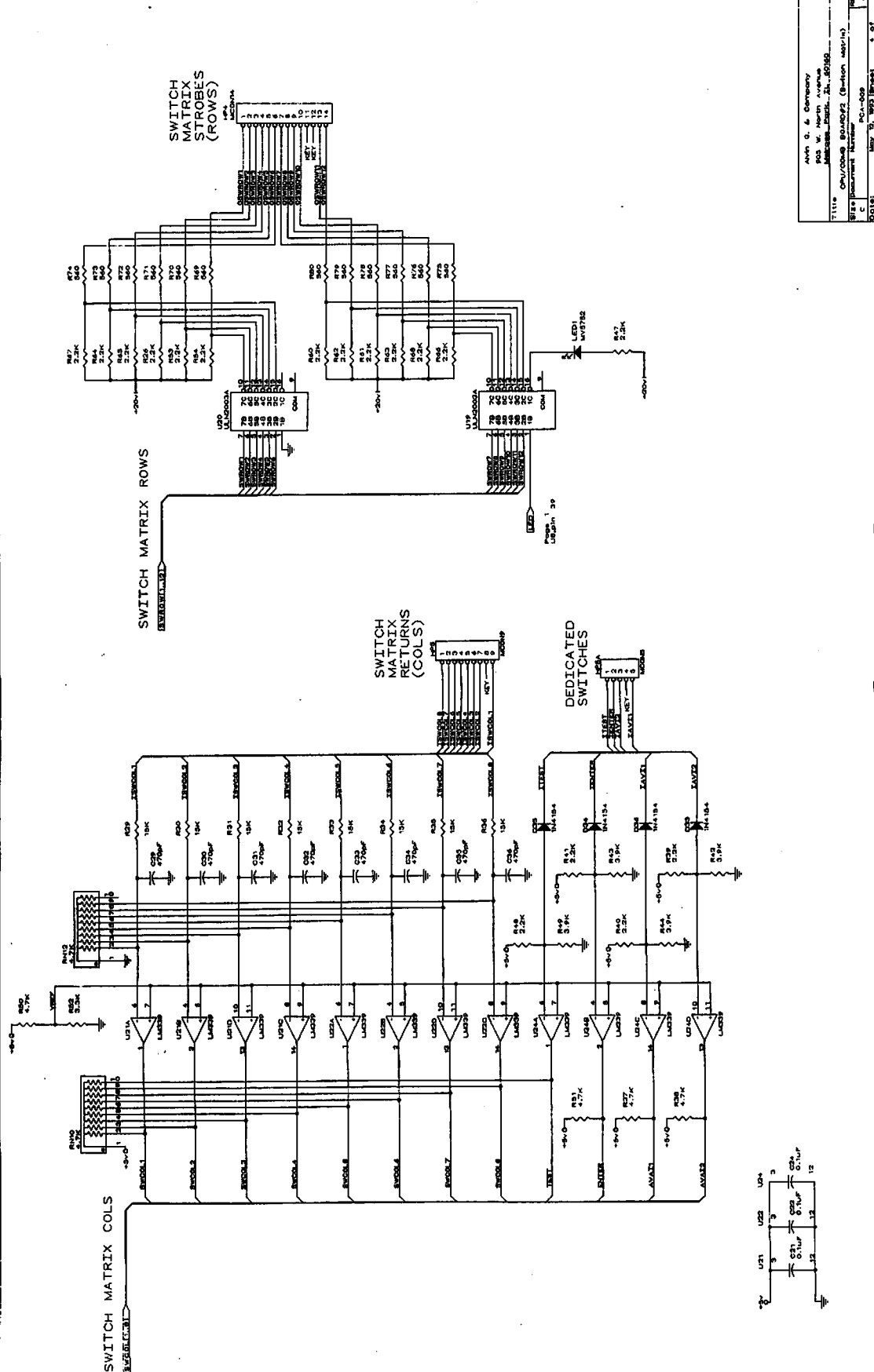
SOLENOIDS

MOSFET CASE



Avim G. & Company  
 905 W. North Avenue  
 MARIETTA, PA, 15760  
 Title: CPU/COMB SOLENOIDS (SOLENOIDS)  
 Size: Document Number: 157  
 A  
 Date: February 3, 1993 (Rev. 1) 3 of 3





SWITCH MATRIX COLS

SWITCH MATRIX ROWS

SWITCH MATRIX RETURNS (COLS)

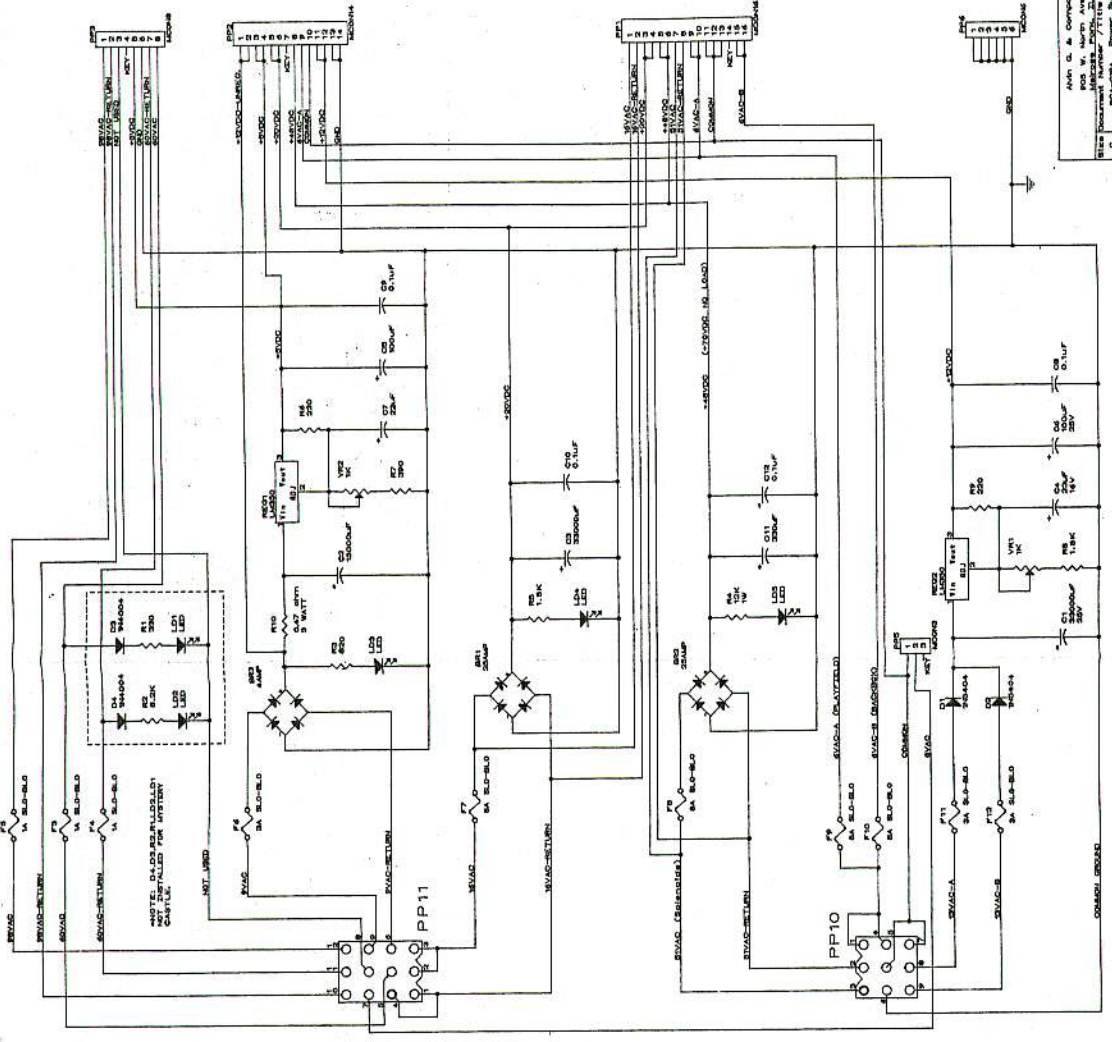
DEDICATED SWITCHES

SWITCH MATRIX STROBES (ROWS)

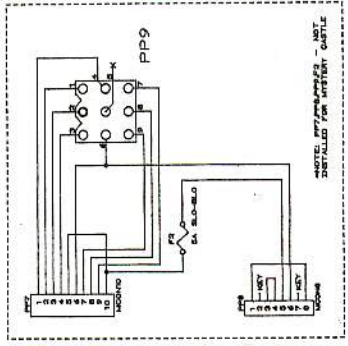
Page 1 of 39  
 USBin 39







NOTE: DIODES LABELLED "D1" THROUGH "D11" ARE INSTALLED FOR INTERRY CABLE.



NOTE: DIODES LABELLED "D1" THROUGH "D11" ARE INSTALLED FOR INTERRY CABLE.

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