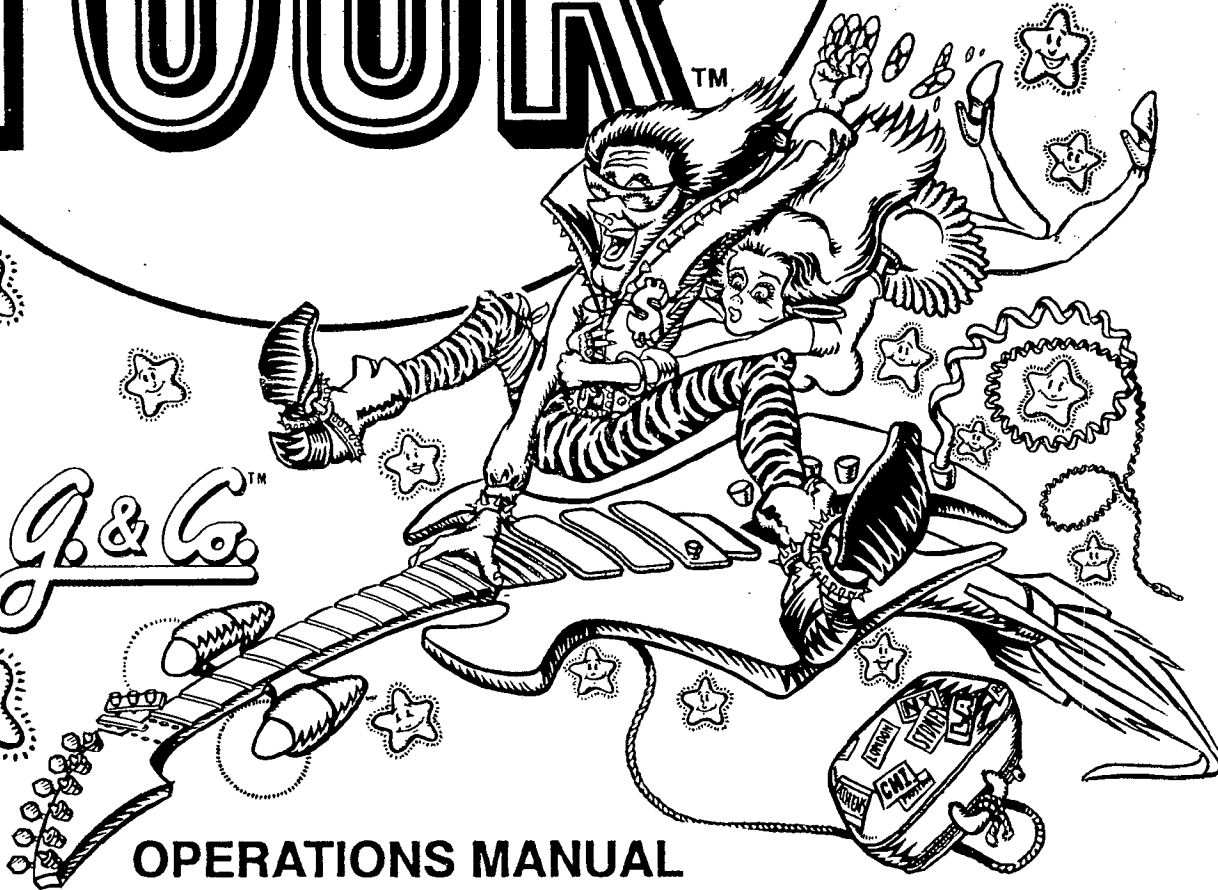


Alvin & the Chipmunks
Al's Garage Band Goes On!

WORLD TOUR™

Alvin G. & Co.™



OPERATIONS MANUAL

JAN. 1993

MAN-013

FOR "STATE OF THE ART" SERVICE CALL 1-800-858-FLIP

Al's Garage Band Goes On A **WORLD TOUR**

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WARNING!

The user is cautioned that any changes or modifications not expressly approved by Alvin G. & Co. who is responsible for compliance could void the user's authority to operate the equipment.

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

Part No. MAN-013

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Table of contents

Section 1	Assembly, Installation, & Operation	1-1
	Assembly	1-3
	Installation	1-4
	Operation	1-5
Section 2	Adjustments, Bookkeeping, & Testing	2-1
	Coin door switches	2-3
	Normal function	2-3
	Test function	2-3
	Menu system	2-4
	A. Adjustments	2-5
	B. Bookkeeping	2-10
	T. Tests	2-13
Section 3	Part locations & Matrixes	3-1
	Understanding the matrixes	3-3
	Lamp matrix	3-4
	Lamp location	3-5
	Switch matrix	3-6
	Switch location	3-7
	Coil table	3-8
	Coil location	3-9
	Ball guides, Plastics, Ramps, & Rubber rings	3-10
Section 4	Game preferences	4-1
	Game ROM summary	4-3
	Game jumper information	4-3
	Coil windings table	4-4
	Fuse identification table	4-4
	Pricing table	4-5
	Factory reset settings	4-6
Section 5	Parts	5-1
	C.P.U. / driver board	5-2
	Dot matrix controller board	5-5
	Flasher relay board	5-8
	Power supply board	5-10
	Sound board	5-12
	Back panel kicker	5-15
	Ball release	5-16
	Bump button (left)	5-17
	Bump button (right)	5-17
	Coin door	5-18
	Knocker assembly	5-19
	Kickback	5-19
	Flipper (left)	5-20
	Flipper (right)	5-20
	Outhole kicker	5-22
	Pop bumper	5-23
	Outhole switch	5-24
	Slingshot kicker	5-25

Plunger kicker	5-26
Vertical upkicker	5-27
Spinning ramp motor	5-28
Lamp sockets	5-30
Switches	5-31
Switches	5-32
Connectors	5-32
Miscellaneous parts	5-33
Parts not shown in this manual	5-34
Section 6 Troubleshooting & maintenance	6-1
Troubleshooting	6-3
Section 7 Wiring diagrams	7-1
C.P.U./ driver board	7-3
Dot matrix controller board	7-11
Flasher relay board	7-15
Power supply board	7-17
Sound board	7-19
Cabinet wiring diagram	7-23
Coil wiring diagram	7-25
Lamp wiring diagram	7-27
Switch wiring diagram	7-29
System wiring diagram	7-31

Section 1

**Assembly,
Installation,
&
Operation**

Assembly instructions for WORLD TOUR

- 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	3 - Pinballs
1 - Spare parts bag	
- 11.) Screw a leg leveler lock nut to the bottommost position of each leg leveler.
- 12.) Screw in a leg leveler into each of the legs approximately half 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 front 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.) Open lamp 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 wrench.
- 20.) Remove front molding from lock down channel.
- 21.) Pull glass out about two feet and install 3 pinballs.
- 22.) Replace front molding into lock down channel.
- 23.) Install cash box, & lock coin door.
- 24.) Allow game parts and electronics to warm to room temperature.
- 25.) Plug game in, turn it on, and let the money roll in!

Installation instructions for WORLD TOUR

World Tour requires a grounded outlet to prevent shock and to assure proper game operation. **Do not** use a cheater plug or cut the ground pin off the line cord.

Powering up - Perform the following routine upon completion of the assembly procedure. Initially this will confirm that the game is in proper operating condition.

With the coin door closed, plug the game in, and switch it ON, using the ON / OFF switch. The top Dot matrix display will show the game name, software revision, country the software was written for, and the date the game software was revised.

WORLD TOUR
AG03/R01U 12/1/92

Open the coin door and press the **Begin test** switch to begin the game test routine. The main menu message will be displayed when the begin test button is pressed.

MAIN MENU
A. ADJUSTMENTS

Perform the entire test menu routine to verify that the game is operating satisfactorily. Successful completion of these tests show that the game is ready to begin earning you a great investment return.

Game operation for World Tour

Game over - The display reads "Game over" in the Dot matrix display. The show high scores, playfield lamps blink, show game instructions, and a custom message.

Attract - The game will play music, flash lamps, and show high scores.

Credit posting - Insert coin(s). A sound is heard for each coin, and the Dot matrix display shows the number of credits purchased. The computer will only allow a player to purchase a certain amount of credits*.

Starting a game - Press the start button once for one player or twice for two players. A startup sound plays, and the credit amount in the player score display decreases by the amount of players that are currently playing. Another player, up to four, may enter the game by pressing the start button, assuming there are credits left, before the last player's first ball goes in the outhole.

Slam - Actuating the slam switch on the coin door inside the cabinet ends the current game. World Tour then proceeds to the game over mode.

Tilt - With the closure of the plumb bob tilt switch, the player may get a warning then will after the warning if it happens again he will lose the ball(s) that is / are in play.

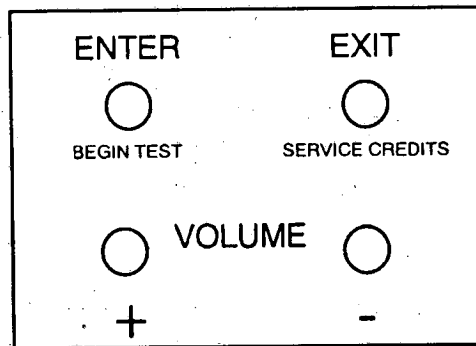
End of game - All bonuses are awarded. A credit may be received if the player's score exceeds a high score or replay value.

* - Operator adjustable feature. (A106)

Section 2

Adjustments, Bookkeeping, & Testing

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 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 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 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 system 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 Adjustments will appear on the Display. The 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 information obtained in Bookkeeping is from the total amount of games played. The adjustments may be reset to factory by using, A506 Reset to factory* which will reset everything to manufacturers suggested setting. To reset all 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 reset preferences. All adjustments with a * next to it denotes a factory setting.

Note: the asterisk * 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 asterisk *. The factory reset settings are listed on page 4-6.

A Adjustments

1 Standard

- 01 **Replay at** - The operator may choose the replay starting value. The range of this setting is Off to 990,000,000 in steps of 10,000,000.
* 150,000,000
- 02 **Award type** - The operator may choose the form of the award automatically provided when the player exceeds any replay level. The choices are:
* 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.
* 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%.
* 20%
- 05 **Text language** - The operator may choose what language the game displays. The choices are:
* English
French
German
- 06 **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
30 minutes
Off
- 07 **Max free games** - The operator may choose the number of free games that a player can receive. The range of this setting is 0 - 9 in steps of 1.
* 6 games
- 08 **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.
* 3 balls
- 09 **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.
* 3 extra balls
- 10 **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.
* 8%

- 11 Tilt warnings** - The operator may choose how many warnings a player may receive. When the player reaches the setting the game will tilt. The range of this setting is 0 to 3 in steps of 1.
- * 2 warnings
- 12 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.
- Yes - The game is set for tournament.
 - * No - The game is not set for tournament.

2 Feature

- 01 Guitar timer** - The operator may set the amount of time the guitar value will flash. The choices are:
- Easy
 - * Medium
 - Hard
- 02 Calling police sound** - The operator may set whether the player can hear the "I'm calling the police." sound at the end of each game. The choices are:
- Yes - The player can hear the sound.
 - * No - The player cannot hear the sound.
- 03 Recall MIX** - The operator may choose to have the currently lit M-I-X letter(s) saved in memory for the players next ball. The choices are:
- * Yes - Save current letter status.
 - No - Discard current letter status.
- 04 Recall target xball** - The operator may set the extra ball light to stay on when the player drains the ball.
- * Yes - Extra ball light stays lit for player's next ball.
 - No - Extra ball light does not stay lit for player's next ball.
- 05 Light lock** - The operator may set the difficulty to light the gig lock. The choices are:
- Easy - Must complete Delmore, Stitch, Dr. Skins targets, ramp shot spots 1 target.
 - * Medium - Must complete Delmore, Stitchy, Dr. Skins targets.
 - Hard - Must complete Delmore, Stitchy, Dr. Skins targets twice.
- 06 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.
- * 10 seconds
- 07 Kickback** - The operator may set the difficulty of the feedback kicker. The choices are:
- Easy - Feedback is lit at the start of every ball.
 - * Medium - Feedback is lit at the beginning of the game and is recalled until used.
 - Hard - Player must light feedback each ball.

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
- Netherlands
- Norway
- Spain
- Sweden
- Swiss
- U Kingdom
- USA 4/\$1
- * USA 3/\$1
- USA 2/\$1
- † Custom

† - *The custom setting requires a value of coin units in the left, center, right, and extra coin chute.
Items 01a - 01f can only be made if custom is selected in the pricing menu.*

- 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.
- 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 that are left. The choices are:

* Yes - The player can see how many credits are left.

No - The player cannot see how many credits are left. In this mode game will display "Credits."

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 the backup high scores. The range of this is OFF (disabled) 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 **Reset HSTD every** is reached. The range of this setting is 300,000,000 to 990,000,000 in steps of 10,000,000.

* 475,000,000

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 credits by pressing the enter button. The choices are:
 Yes - Clear earning audits.
 * No - Do not change audits.
- 03 Set backup hiscores** - The operator may choose to clear 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 on page 3-15. 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:

Adjustment	Easy	Medium	Hard
01 Guitar timer	Easy	Medium	Hard
03 Recall M•X	Recall	Recall	No recall
04 Recall xball target	Recall	Recall	No recall
05 Kickback	Easy	Medium	Hard
07 Locks on	Easy	Medium	Hard

- * Medium
- 08 Install country** - The operator may choose the language that is used in the menus and other features.
 France
 Germany
 * U.S.A.
- 09 Flasher intensity** - The operator may choose to set the intensity of the flashers. The choices are:
 Off
 Dimmer
 Dim
 * Normal

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 clear coin audits, A502 or Reset to factory A506.
- 02 Grand total coins** - The total amount of coins through each slot. May be reset by using Reset to factory A506.
- 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.

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.
- 07 Service credits** - The total amount of service credits.

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.

4 Feature

- 01 **Tour 3 million** - The total amount of times **Tour 3 million** has been awarded.
- 02 **Blazing bonus held** - The total amount of times the bonus has been held.
- 03 **Light video mode** - The total amount of times the **Video mode** has been played.
- 04 **Instant multiball** - The total amount of times the **Instant multiball** has been awarded.
- 05 **Brain damage** - The total amount of times the **Brain damage** has been awarded.
- 06 **Complete rock n roll** - The total amount of times the **Rock n Roll** has been completed.
- 07 **Feedback lit** - The total amount of times the **Feedback** has been lit.
- 08 **Feedback used** - The total amount of times **Feedback** has been used.
- 09 **Super skins active** - The total amount of times the **Super Skins** has been awarded.
- 10 **Trippin trgts active**- The total amount of times the **Trippin' Targets** has been reached.
- 11 **Rockin ramps active**- The total amount of times the **Rockin' Ramps** has been reached.
- 12 **Lightin loops active** - The total amount of times **Lightning Loops** have been made.

- 13 **Solo bonus award** - The total amount of times the **Solo bonus** has been awarded
- 14 **Cities visited** - The total amount of cities that have been reached.
- 15 **Locks lit** - The total amount of times the locks have been lit.
- 16 **Multiball earned** - The total amount of time multiball has been awarded.
- 17 **Skill shot 1 Million** - The total amount of times the 1 million skill shot has been made.
- 18 **Skill shot 2 Million** - The total amount of times the 2 million skill shot has been made.
- 19 **Skill jam jackpot** - The total amount of times the jackpot skill shot has been made.
- 20 **Skill shot 3 Million** - The total amount of times the 3 million skill shot has been made.
- 21 **Skill shot 4 Million** - The total amount of times the 4 million skill shot has been made
- 22 **M-I-X made** - The total amount of times the MIX letters have been completed.
- 23 **Top blast shot** - The total amount of times the top blast shot has been made.
- 24 **All piano keys made** - The total amount of times the Piano keys have been completed.
- 25 **Play again** - The total amount of times the Play again has been given.
- 26 **Left drain** - The total amount of times the ball has gone down the left drain.
- 27 **Right drain** - The total amount of times the ball has gone down the right drain.

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 mil** - 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 1-800 number is displayed. If there is a game problem or question give our service department a call. We are there to work with you to solve technical problems also answering any general game question you may have.
- 02 **Information** - The test aids in diagnosing problems by indicating a stuck switch or missing pinball. Reminder this game is a 3 ball game, 3 balls must be in the outhole. If the test finds no problem "All OK" will be displayed.
- 03 **Matrix lamps** - The 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 system 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 the "+" or "-" button to cycle through this test. If a set of "dots" are not displayed then the system has detected a error.
- 06 **Stuck switch** - This 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 tests 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.
- 08 **Cycle flashers** - This tests the flashlamp part of the coil circuit exclusively. 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. There should not be any flashlamp circuit on while pause is on, if any flashlamp is on during the pause the system has detected a problem in the flashlamp circuit. To restart the cycle press the enter button again.
- 09 **Cycle solenoids** - This tests the solenoid part of the coil circuit exclusively. The test will cycle through all the solenoid circuits one at a time.
- 10 **Single coils** - This tests a single coil (solenoid, flashlamp, or G.I. relay.) Press the "+" or "-" until the dot matrix display shows the circuit to be tested. Press enter and that circuit should work. If a different coil fires the system has detected a problem.
- 11 **Sound test** - This tests the sound board (voice, music sequence, or sound.) Press the "+" or "-" button until the dot matrix display show the sound to be tested. Press enter and listen for the proper noise. If a sound is not heard then the system has detected a problem.
- 12 **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: All lamps, solenoids, G.I.'s, Dot matrix display, Flashers, and sounds. If one of the preceding items does not work the systems has detected a problem.

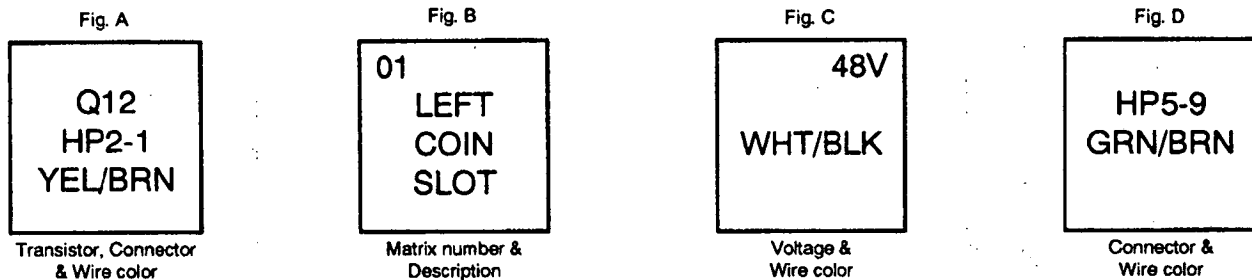
Section 3

Part locations & Matrixes

Understanding the Matrixes

The matrixes 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 use the exact same wording so there is no confusion on a given part. For example "Feedback" 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 & column boxes there are various abbreviations displayed (see illustration below.) Each abbreviation stands for one part of the description of that block.



Abbreviations that are centered or are in the upper left hand corner of the box will be displayed on the dot matrix display. Abbreviations that are 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 number being a pin number. For example 2-1 (as shown above) is connector HP2 pin 1. Notice all connectors in the coil, lamp, & 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 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 read the tracer which in turn makes it a solid red wire.

Numbers shown in the upper left hand corner are matrix numbers.

The numbers shown in the upper right hand corner are voltages and are **not** shown in the dot matrix display. These will only appear in the coil matrixes.

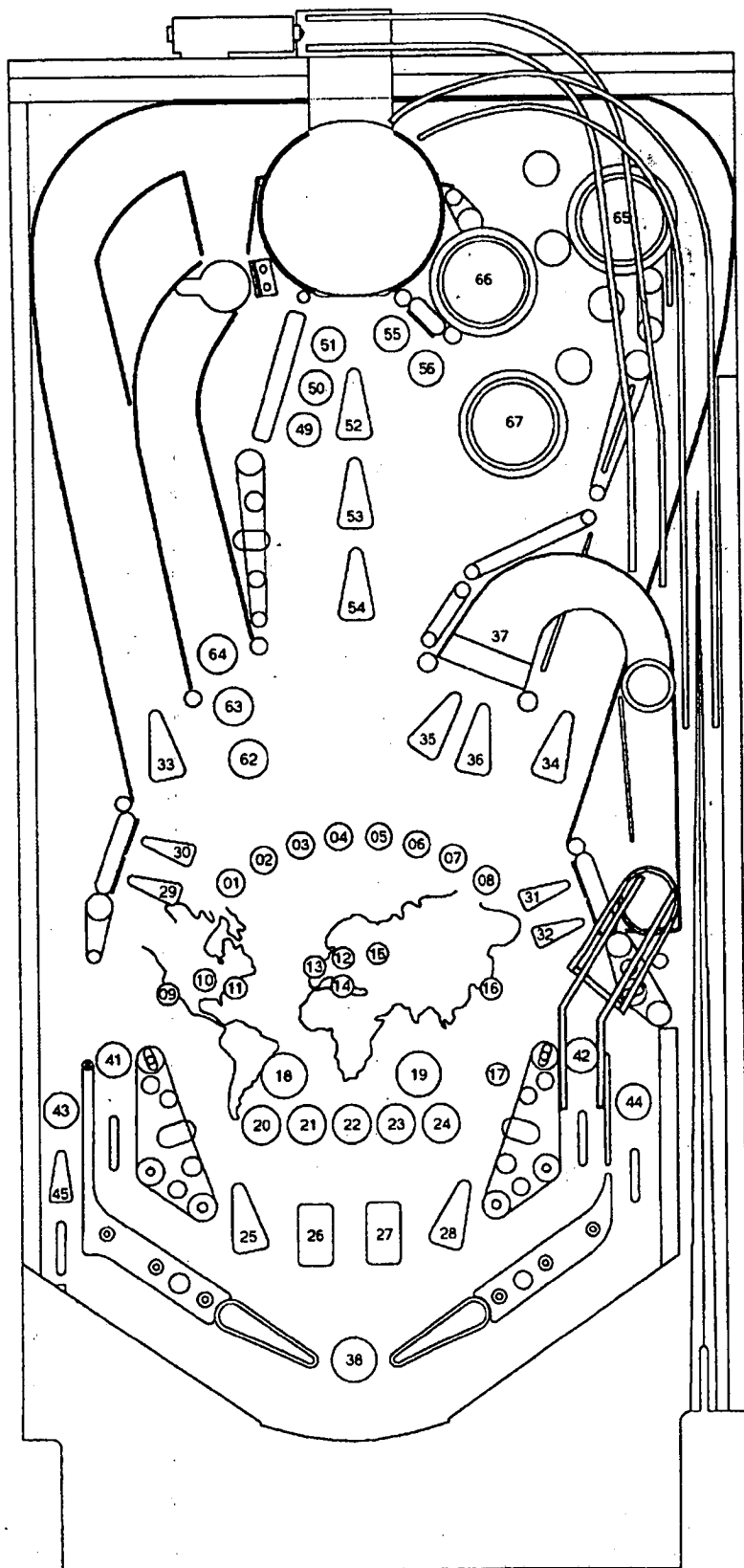
The abbreviations for the wire colors are as follows:

BLK = Black	ORG = Orange
BLU = Blue	RED = Red
BRN = Brown	VIO = Violet
GRN = Green	WHT = White
GRY = Grey	YEL = Yellow

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	01 R	02 O	03 C	04 K	05 R	06 O	07 L	08 L
Q11 HP9-11 RED/BLK	09 LOS ANGEES	10 CHICAGO	11 NEW YORK	12 PARIS	13 LONDON	14 ROME	15 MOSCOW	16 TOKYO
Q10 HP9-10 RED/ORG	17 SYDNEY	18 DOUBLE ALL SCORES	19 TRIPLE ALL SCORES	20 3 MILLION DOLLARS	21 BONUS HOLD	22 LIGHT MUSIC VIDEO	23 INSTANT MULTIBALL	24 BRAIN DAMAGE
Q9 HP9-9 RED/YEL	25 SUPER SKINS	26 TRIPPIN TARGETS	27 ROCKIN RAMPS	28 LIGHTNING LOOPS	29 TARGET 'T'	30 TARGET 'O'	31 TARGET 'U'	32 TARGET 'R'
Q8 HP9-8 RED/GRN	33 LEFT W TOUR ARROW	34 RIGHTW TOUR ARROW	35 RAMP LOCK	36 RAMP MULTIBALL	37 VIDEO READY	38 TOUR AGAIN	39 CREDIT BUTTON	40 SHOOTER BUTTON
Q7 HP9-7 RED/BLU	41 LEFT XBALL	42 RIGHT XBALL	43 LEFT SPECIAL	44 RIGHT SPECIAL	45 FEEDBACK	46 MIX 'M'	47 MIX 'I'	48 MIX 'X'
Q6 HP9-6 RED/VIO	49 LITE XBALL	50 3 MILLION	51 1 MILLION	52 LOCK CENTER	53 MULTIBALL CENTER	54 JACKPOT CENTER	55 TARGET XBALL	56 DRUM SOLO BONUS
Q5 HP9-5 RED/GRY	57	58	59	60	61	62 LAME	63 TWISTED	64 METAL MONSTER
Q4 HP9-4 GRY/RED	65 BUMPER TOP	66 BUMPER CENTER	67 BUMPER BOTTOM	68	69	70	71	72
Q3 HP9-3 GRY/BLK	73 LA (BACK)	74 CHICAGO (BACK)	75 NEW YORK (BACK)	76 LONDON (BACK)	77 PARIS (BACK)	78 ROME (BACK)	79 MOSCOW (BACK)	80 TOKYO (BACK)
Q2 HP9-2 GRY/YEL	81 SYDNEY (BACK)	82	83	84	85	86	87	88
Q1 HP9-1 GRY/GRN	89	90	91	92	93	94	95	96

Lamp location

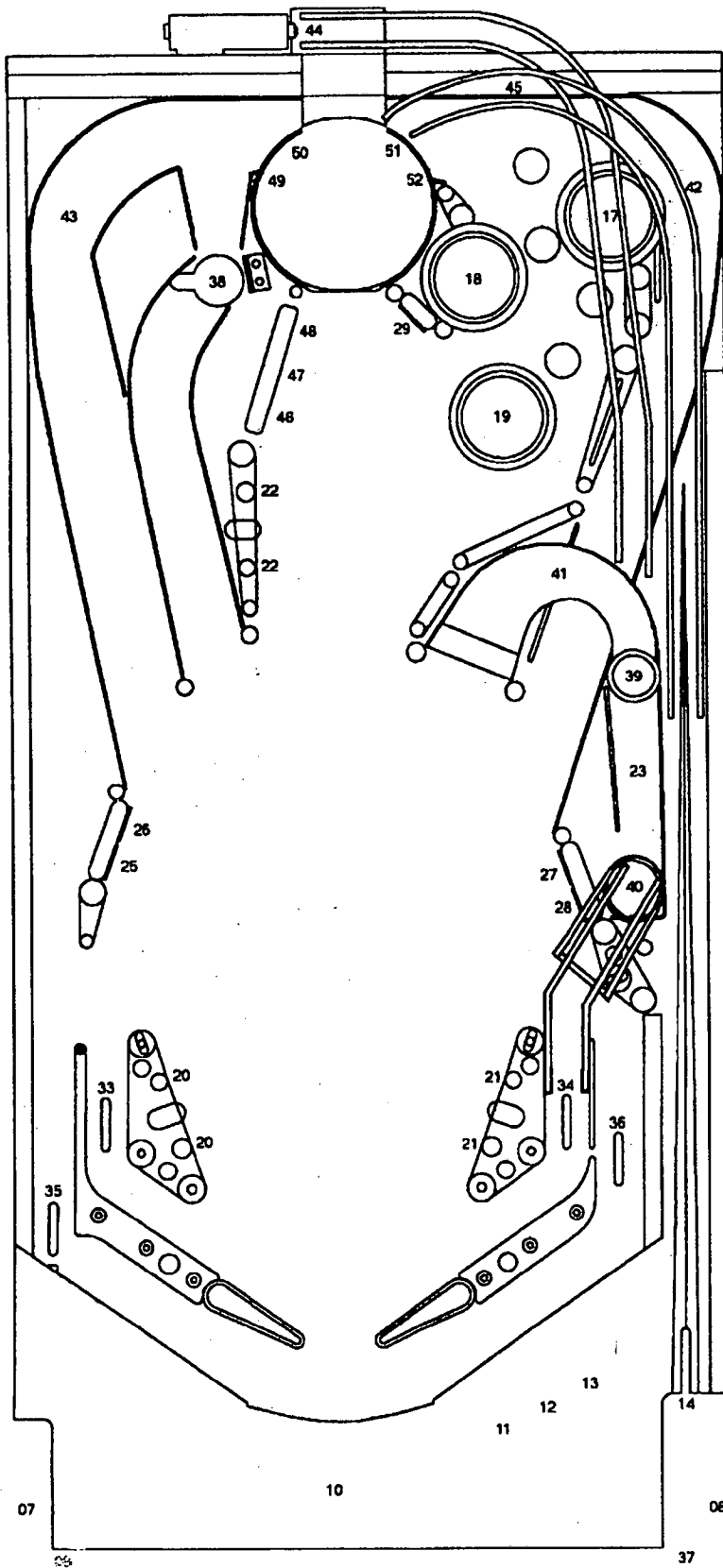


ID#	Description	Socket	Bulb
01	R	PCA-015	LMP-003
02	O	PCA-015	LMP-003
03	C	PCA-015	LMP-003
04	K	PCA-015	LMP-003
05	R	PCA-015	LMP-003
06	O	PCA-015	LMP-003
07	L	PCA-015	LMP-003
08	L	PCA-015	LMP-003
09	Los Angeles	PCA-016	LMP-003
10	Chicago	PCA-016	LMP-003
11	New York	PCA-016	LMP-003
12	Paris	PCA-016	LMP-003
13	London	PCA-016	LMP-003
14	Rome	PCA-016	LMP-003
15	Moscow	PCA-016	LMP-003
16	Tokyo	LBK-010	LMP-002
17	Sydney	LBK-010	LMP-002
18	Double all scores	PCA-014	LMP-003
19	Triple all scores	PCA-014	LMP-003
20	3 Million dollars	PCA-014	LMP-003
21	Bonus held	PCA-014	LMP-003
22	Light music video	PCA-014	LMP-003
23	Instant multiball	PCA-014	LMP-003
24	Brain damage	PCA-014	LMP-003
25	Super skins	LBK-004	LMP-002
26	Trippin targets	LBK-004	LMP-002
27	Rockinramps	LBK-004	LMP-002
28	Lightning loops	LBK-004	LMP-002
29	Target 'T'	LBK-010	LMP-002
30	Target 'O'	LBK-010	LMP-002
31	Target 'U'	LBK-010	LMP-002
32	Target 'P'	LBK-010	LMP-002
33	Left W Tour arrow	LBK-010	LMP-002
34	Right W Tour arrow	PCA-018	LMP-003
35	Ramp lock	PCA-018	LMP-003
36	Ramp multiball	PCA-018	LMP-003
37	Video ready	LBK-010	LMP-002
38	Tour again	LBK-004	LMP-002
39	Credit button	CCB-001	
40	Plunger button	SHB-001	
41	Left Xball	LBK-010	LMP-002
42	Right Xball	LBK-010	LMP-002
43	Left special	LBK-010	LMP-002
44	Right special	LBK-010	LMP-002
45	Feedback	LBK-004	LMP-002
46	Mix 'M'	LBK-004	LMP-002
47	Mix 'I'	LBK-004	LMP-002
48	Mix 'X'	LBK-004	LMP-002
49	Lite xball	LBK-004	LMP-002
50	3 million	LBK-004	LMP-002
51	1 million	LBK-004	LMP-002
52	Lock center	LBK-010	LMP-002
53	Multiball center	LBK-010	LMP-002
54	Jackpot center	LBK-010	LMP-002
55	Target Xball	LBK-010	LMP-002
56	Drum solo bonus	LBK-010	LMP-002
62	Lame	PCA-017	LMP-003
63	Twisted	PCA-017	LMP-003
64	Metal monster	PCA-017	LMP-003
65	Bumper top	LBK-014	LMP-004
66	Bumper center	LBK-014	LMP-004
67	Bumper bottom	LBK-014	LMP-004
73	LA (back)	LBK-016	LMP-002
74	Chicago (back)	LBK-016	LMP-002
75	New York (back)	LBK-016	LMP-002
76	London (back)	LBK-016	LMP-002
77	Paris (back)	LBK-016	LMP-002
78	Rome (back)	LBK-016	LMP-002
79	Moscow (back)	LBK-016	LMP-002
80	Tokyo (back)	LBK-016	LMP-002
81	Sydney (back)	LBK-016	LMP-002

Switch matrix

Column Row	HP5-9 GRN/BRN	HP5-7 GRN/RED	HP5-6 GRN/ORG	HP5-5 GRN/YEL	HP5-4 GRN/BLK	HP5-3 GRN/BLU	HP5-2 GRN/VIO	HP5-1 GRN/GRY
HP4-1 WHT/BRN	01 LEFT COIN SLOT	02 RIGHT COIN SLOT	03 CENTER COIN SLOT	04 EXTRA COIN SLOT	05 SLAM	06 TILT	07 LEFT FLIPPER BUTTON	08 RIGHT FLIPPER BUTTON
HP4-2 WHT/RED	09 GAME START	10 OUTHOLE	11 TROUGH LEFT	12 TROUGH CENTER	13 TROUGH RIGHT	14 SHOOTER LANE	15 TEST PLUS	16 TEST MINUS
HP4-3 WHT/ORG	17 BUMPER TOP	18 BUMPER CENTER	19 BUMPER BOTTOM	20 SLING LEFT	21 SLING RIGHT	22 SLING TOP	23 LOCK MIDDLE	24
HP4-4 WHT/YEL	25 TARGET 'T'	26 TARGET 'O'	27 TARGET 'U'	28 TARGET 'R'	29 SOLO TARGET	30 MIX 'M'	31 MIX 'I'	32 MIX 'X'
HP4-5 WHT/GRN	33 LEFT RETURN	34 RIGHT RETURN	35 LEFT OUTLANE	36 RIGHT OUTLANE	37 PLUNGER BUTTON	38 EJECT TO GUITAR	39 TOP LOCK	40 BOTTOM LOCK
HP4-6 WHT/BLU	41 SIDE RAMP	42 WORLD TOUR LEFT	43 WORLD TOUR RIGHT	44 TOP BLAST	45 SKILL SHOT	46 DT DRSKINS	47 DT DELMORE	48 DT STITCHY
HP4-7 WHT/VIO	49 PIANO KEY BLUE	50 PIANO KEY RED	51 PIANO KEY GREEN	52 PIANO KEY ORANGE	53	54	55	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 location



ID#	Description	Switch	Diode
01	Left coin slot		
02	Right coin slot		
03	Center coin slot		
04	Extra coin slot		
05	Slam	SLM-001	1N4004
06	Tilt	PLB-001	1N4004
07	Left flipper button	MSA-L04	1N4004
08	Right flipper button	MSA-R04	1N4004
09	Game start	CCB-001	1N4004
10	Outlane	MSA-004	1N4004
11	Trough left	MSW-008	1N4004
12	Trough center	MSW-008	1N4004
13	Trough right	MSW-008	1N4004
14	Shooter Lane	SBA-001	1N4004
15	Test plus	TOG-001	1N4004
16	Test minus	TOG-001	1N4004
17	Bumper top		
18	Bumper center		
19	Bumper bottom		
20	Sling left	STR-001	1N4004
21	Sling right	STR-001	1N4004
22	Sling top	STR-001	1N4004
23	Lock middle	SBA-001	1N4004
24			
25	Target T	STR-004	1N4004
26	Target O	STR-004	1N4004
27	Target U	STR-004	1N4004
28	Target R	STR-004	1N4004
29	Solo target	STR-002	1N4004
30	Mix - M	AMS-002	1N4004
31	Mix - I	AMS-002	1N4004
32	Mix - X	AMS-003	1N4004
33	Left return	SBA-001	1N4004
34	Right return	SBA-001	1N4004
35	Left outlane	SBA-001	1N4004
36	Right outlane	SBA-001	1N4004
37	Plunger button	SHB-001	1N4004
38	Eject to gulfar	MSW-004	1N4004
39	Top lock	MSW-004	1N4004
40	Bottom lock	MSW-004	1N4004
41	Side ramp	AMS-002	1N4004
42	World tour left	SBA-001	1N4004
43	World tour right	SBA-001	1N4004
44	Back panel kicker	RSA-005	1N4004
45	Skill shot	MSW-007	1N4004
46	Dr. Skins	ADS-001	1N4004
47	Delmore	ADS-001	1N4004
48	Stitchy	ADS-001	1N4004
49	Piano key blue	STR-005	1N4004
50	Piano key red	STR-005	1N4004
51	Piano key green	STR-005	1N4004
52	Piano key orange	STR-005	1N4004

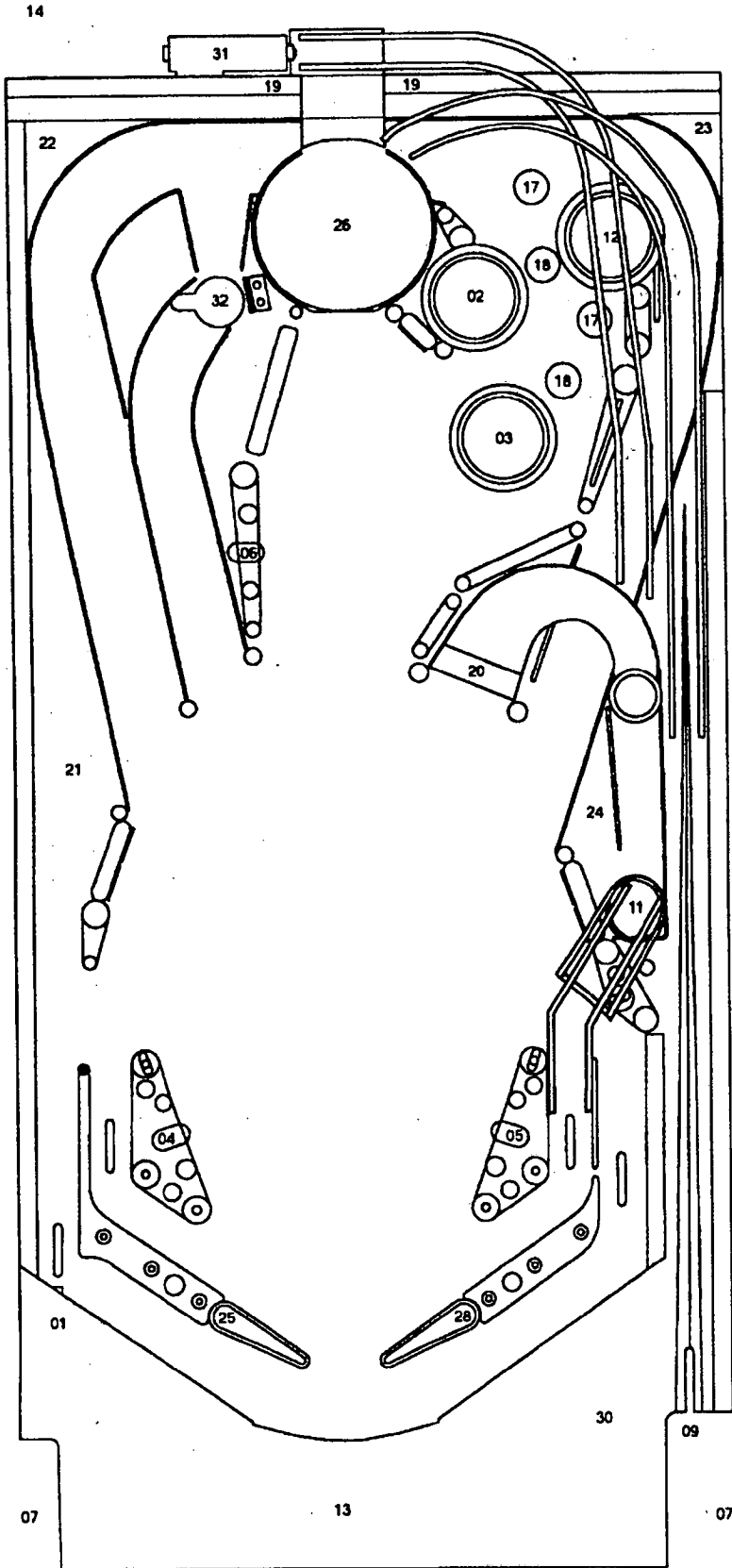
Coil table

Fuse	Coil No	Description	Transistor	Power	Return	Connector
F17	1	Kickback	Q21	VIO/ORG	VIO/GRY	H6-9
F15	2	Bumper center	Q22	VIO/GRN	VIO/RED	H6-8
F15	3	Bumper bottom	Q23	VIO/GRN	VIO/ORG	H6-7
F15	4	Sling left	Q24	VIO/GRN	VIO/YEL	H6-5
F15	5	Sling right	Q25	VIO/GRN	VIO/GRN	H6-4
F15	6	Sling top	Q26	VIO/GRN	VIO/BLU	H6-3
F13	7	Bump button	Q27	VIO/BLK	VIO/BLK	H6-2
	8	(Not used)				
F17	9	Plunger kicker	Q29	VIO/ORG	BRN/BLK	H6-17
	10	(Not used)				
F16	11	Lock bottom	Q31	VIO/YEL	BRN/ORG	H6-15
F15	12	Bumper top	Q32	VIO/GRN	BRN/YEL	H6-14
F15	13	Outhole	Q33	VIO/GRN	BRN/GRN	H6-13
F16	14	Knocker	Q34	VIO/YEL	BRN/BLU	H6-12
F20	15	Flasher relay	Q35	RED/VIO	BRN/VIO	H6-11
F18	16	Playfield GI relay	Q36	RED/GRN	BRN/GRY	H6-10
F20	17	Flashers bumpers 1(4)	Q37	VIO/WHT	BLK/BRN	H7-8
F20	18	Flashers bumpers 2(4)	Q38	VIO/WHT	BLK/RED	H7-7
F20	19	Flasher top(2)	Q39	VIO/WHT	BLK/ORG	H7-6
F20	20	Flasher Video ramp(1)	Q40	VIO/WHT	BLK/YEL	H7-5
F20	21	Flasher left side(3)	Q41	VIO/WHT	BLK/GRN	H7-4
F20	22	Flasher left top(3)	Q42	VIO/WHT	BLK/BLU	H7-3
F20	23	Flasher right top(3)	Q43	VIO/WHT	BLK/VIO	H7-2
F20	24	Flasher right side(3)	Q44	VIO/WHT	BLK/GRY	H7-1
	25	(Not used)				
F19	26	Motor relay	Q46	RED/ORN	BLU/BLK	H7-16
F17	27	Flipper relay	Q47	RED/RED	BLU/VIO	H7-15
	28	(Not used)				
F18	29	Backbox relay	Q49	RED/GRN	BLU/BRN	H7-12
F18	30	Ball release	Q50	RED/GRN	BLU/RED	H7-11
F16	31	Top blast	Q51	VIO/YEL	BLU/ORG	H7-10
F16	32	Eject to guitar	Q52	VIO/YEL	BLU/YEL	H7-9

Fuse identification table

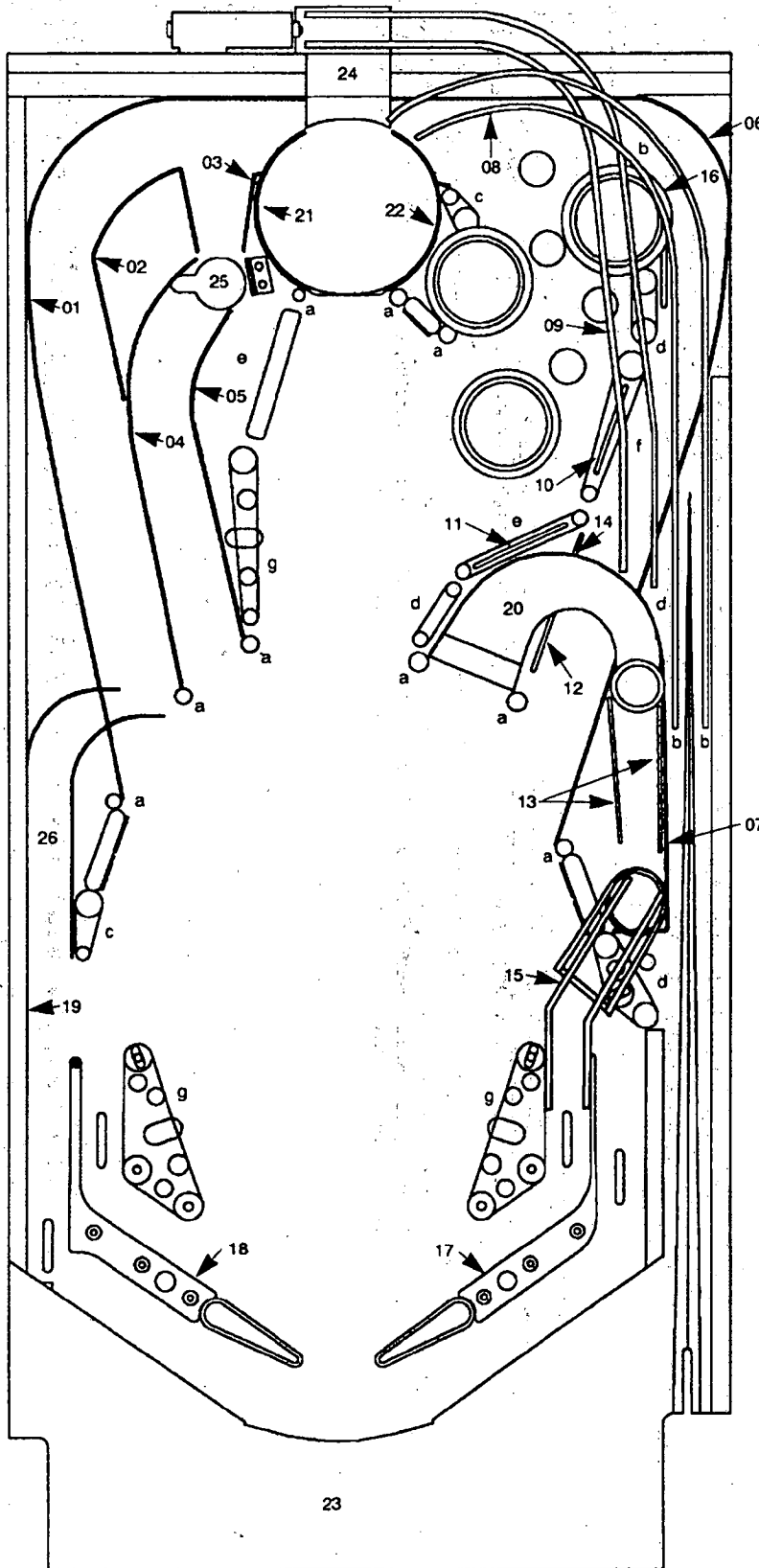
F-7 = 8A Slo-Blo	F17 = 4A Slo-Blo
F13 = .25A Slo-Blo	F18 = .25A Slo-Blo
F15 = 1.5A Slo-Blo	F19 = 1A Slo-Blo
F16 = 2A Slo-Blo	F20 = 4A Slo-Blo

Coil location



ID#	Description	Assembly	Coil
01	Feedback	CKA-003	CLL-008
02	Bumper center	ABM-004	CLL-008
03	Bumper bottom	ABM-004	CLL-006
04	Sling left	ABK-006	CLL-006
05	Sling right	ABK-006	CLL-008
06	Sling top	ABK-006	CLL-008
07	Bump buttons	AVB-002	CLL-001
08		AVB-002	CLL-001
09	Plunger kicker	CKA-002	CLL-009
10			
11	Lock bottom	AKN-001	CLL-007
12	Bumper top	ABM-004	CLL-006
13	Outhole	ABR-001	CLL-006
14	Knocker	AKN-001	CLL-007
15	Flasher relay	REL-001	
16	Playfield GI relay	REL-001	
17	Flasher bumpers 1	LBK-007	LMP-004
18	Flasher bumpers 2	LBK-007	LMP-004
19	Flasher top	LBK-009	LMP-004
20	Flasher video ramp	LBK-014	LMP-004
21	Flasher left side	LBK-009	LMP-004
22	Flasher left top	LBK-014	LMP-004
23	Flasher right top	LBK-014	LMP-004
24	Flasher right side	LBK-014	LMP-004
25	Left flipper	AFF-L02	CLL-015
26	Motor relay	REL-001	
27			
28	Right flipper	AFF-R02	CLL-015
29	Backbox GI relay	REL-001	
30	Ball release	ABR-002	CLL-004
31	Top blast	AKN-002	CLL-007
32	Eject to gutter	AKN-033	CLL-007

Ball guides, Plastics, Ramps, & Rubber rings



ID#	Description	Assembly	Qty
01	Ball guide flat #19	BGF-019	1
02	Ball guide #16	BGF-016	1
03	Ball guide #13	BGF-013	1
04	Ball guide #14	BGF-014	1
05	Ball guide #17	BGF-017	1
06	Ball guide #15	BGF-015	1
07	Ball guide #16	BGF-018	1
08	Ramp, shooter lane	WFR-001	1
09	Ramp, kicker	WFR-002	1
10	Wire guide 2 1/2"	WGS-020	1
11	Wire guide 2"	WGS-013	1
12	Wire guide 2 1/2"	WGS-020	1
13	Wire guide 4"	WGS-032	2
14	Wire guide 3/4"	WGS-006	1
15	Ramp, return lane	WFR-003	1
16	Wire guide special	WGB-005	1
17	Ball return guide short	BSF-022	1
18	Ball return guide long	BSF-023	1
19	Outlane plate	BSF-030	1
20	Plastic ramp assembly	ARM-001	1
21	Shroud assembly (right)	ASS-009	1
22	Shroud assembly (left)	ASS-010	1
23	Card holder	ABA-002	1
24	Ball collector assembly	ABC-002	1
25	Chute assembly	ACH-003	1
26	Feedback ramp	ARM-002	1
Guitar assembly		ARM-003	1
a	Black rubber post	RBR-012	9
b	Mini rubber ring	RBR-002	6
c	3/4" rubber ring	RBR-004	2
d	1" rubber ring	RBR-010	4
e	1 1/2" rubber ring	RBR-011	2
f	2" rubber ring	RBR-009	1
g	2 1/2" rubber ring	RBR-005	3
Decal set (World Tour)		DCL-005	1
FCC Decal (World Tour)		FCC-001	1
Plastic set 1		BUT-003B	1
* Lock cover		BUT-AA3	1
* Stage bottom		BUT-Z03	1
* Left ramp		BUT-X03	1
* Pop bumper cap		BUT-U03	1
* Stage top		BUT-V03	1
* Guitar (small)		BUT-Y03	1
* Pop bumper cap		BUT-AC3	1
* Pop bumper cap		BUT-AD3	1
* Video Mode sign		BUT-W03	1
* Left lane cover		BUT-T03	1
* Pop bumper trap cover		BUT-AF3	1
* Video ramp trap cover		BUT-AM3	1
* Loop cover (left rear)		BUT-AB3	1
* Guitar (large)		BUT-A03	1
* Guitar guide (left rear)		BUT-B03	1
* Drum set cymbals		BUT-C03	1
* Drum		BUT-D03	1
* Drums		BUT-E03	1
* Dr. Skins		BUT-F03	1
* Starchy		BUT-G03	1
* Delmore		BUT-H03	1
* Al		BUT-I03	1
* Cloud		BUT-J03	1
* Pop bumper trap cover		BUT-K03	1
* Guitar guide (right)		BUT-L03	1
* Guitar guide (left front)		BUT-M03	1
* Right lane cover		BUT-N03	1
* Left ramp cover		BUT-O03	1
* Pop bumper guide cover		BUT-P03	1
* Loop cover (left front)		BUT-Q03	1
* Old lady		BUT-R03	1
Plastic set 2		BUT-003A	1
* Video ramp light		BUT-AE3	1
* Speaker		BUT-AG3	1
* Video ramp cover		BUT-AH3	1
* Ball trap cover		BUT-AI3	1
* Ball trap cover		BUT-AJ3	1
* Red & Blue keys		BUT-AK3	1
* Orange & Green keys		BUT-AL3	1
* Overhead sign		BUT-S03	1

* - Not procurable from main assembly.

Section 4

Game preferences

Game ROM summary

Board identification	Socket #	Type	Part #
C.P.U. / Driver board	U2	(Program)	27C512 EPM-G01
Dot matrix controller	U4	(Program)	27C512 EPM-D01
	U5	(Graphics)	27C020 EPM-D02
	U6	(Graphics)	27C020 EPM-D03
Sound board	U102	(Program)	25C512 EPM-S01
	AROM0	(Samples)	27C020 EPM-S02
	AROM1	(Samples)	27C020 EPM-S03
	AROM2	(Samples)	27C020 EPM-S04
	AROM3	(Samples)	27C020 EPM-S05

To order a replacement CPU, Dot matrix, or Sound ROM(S) from an authorized Alvin G. & CO. distributor, specify the part number & information indicated on the ROM label.

The C.P.U. EPROM reads AG03/R01 it is divided into two separate parts.

AG03 = World Tour
R01 = Revision 1

Game jumper summary

Board identification	Jumper #	Factory setting
Dot matrix controller	EPSEL1	Pin 1 & Pin 2
	EPSEL2	Pin 1 & Pin 2
	SEL 64	Pin 2 & Pin 3
	S1	Pin 1 & Pin 2
Sound board	JP101	Open
	JP102	Open
	JP103	Jumpered
	JP104	Open
	JP105	Open
	JP106	Jumpered

Coil windings table

Part No.	Coil description
CLL-001	Magnet coil
CLL-004	Eject kicker
CLL-006	Outhole, Pop bumper, & Slingshot
CLL-007	Knocker, Upkicker
CLL-008	Kickback
CLL-009	Plunger kicker
CLL-015	Flippers

Coil Part No.	Pull				Hold				Core	Label Color
	AWG	Turns	Diode	DCR	AWG	Turns	Diode	DCR		
CLL-001	34	3400	1N4004	152Ω						White
CLL-004	28	1750	1N4004	24Ω						White
CLL-006	26	1305	1N4004	11.8Ω						White
CLL-007	25	1075	1N4004	7.95Ω						White
CLL-008	23	800	1N4004	4Ω						Light Blue
CLL-009	21	950	1N4004	3.5Ω						Light Blue
CLL-015	22	700	1N4004	2.7Ω	30	2600		87Ω		Red

Fuse identification table

Fuse identification		Backbox		Power supply	
F1	Line fuse	F13	.25 A Slo-Blo	F1	5 Amp Slo-Blo
F3	60 VAC	F15	1.5A Slo-Blo	F3	1 Amp Slo-Blo
F4	60 VAC	F16	2A Slo-Blo	F4	1 Amp Slo-Blo
F5	98 VAC	F17	4A Slo-Blo	F5	1 Amp Slo-Blo
F6	9 VAC	F18	.25A Slo-Blo	F6	3 Amp Slo-Blo
F7	16 VAC	F19	1A Slo-Blo	F7	8 Amp Slo-Blo
F8	51 VAC	F20	4A Slo-Blo	F8	8 Amp Slo-Blo
F9	6VAC (playfield)	F21	4A Slo-Blo	F9	8 Amp Slo-Blo
F10	6VAC (backbox insert)	F22	4A Slo-Blo	F10	8 Amp Slo-Blo
F11	13.5 VAC	F25	8A Slo-Blo	F11	3 Amp Slo-Blo
F12	13.5 VAC			F12	3 Amp Slo-Blo
F13	07				
F15	2, 3, 4, 5, 6, 12, 13				
F16	11, 14, 31, 32				
F17	1, 9, 27				
F18	16, 29, 30				
F19	26				
F20	15, 17, 18, 19, 20, 21, 22, 23, 24				
F21	Left Playfield Gls'				
F22	Right Playfield Gls'				
F23	Top Insert Gls'				
F24	Bottom Insert Gls'				
F25	16 VAC (external)				

Insert	
F23	4 A Slo-Blo
F24	4 A Slo-Blo

Pricing table

Country	Left	Center	Right	Extra	Games / Coin	Display	
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		1/2X5 Sch, 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¢				1/50¢, 2/75¢, 3/\$1	CANADA 2	03 12 03 00 04 00
Chille	Token		Token		1/1 Token	CHILE	01 04 01 00 01 00
Denmark	1Kr	5Kr	10Kr		1/2X1 Kr, 3/5 Kr, 7/10 Kr	DENMARK	03 15 30 00 05 30
Finland	1Mk		5Mk		1/2X1 Mka, 3/5 Markka	FINLAND	03 00 15 00 05 00
France 1	1Fr	5Fr	10Fr		1/3X1F, 2/5F, 5/10Fr	FR 5/10 FR	02 10 20 00 05 20
France 2	1Fr	5Fr	10Fr		1/2 F, 3/5F, 7/10 Franc	FR 7/10 FR	03 15 30 00 05 30
France 3	5Fr	10Fr	10Fr		1/5F, 3/10F, 7/2X10F	FR 7/20 FR	03 06 12 00 02 12
France 4	5Fr	10Fr	10Fr		2/5F, 4/10F, 9/2X10F	FR 9/20 FR	02 04 08 00 01 08
France 5	5Fr	10Fr	10Fr		2/5F, 5/10F, 11/2X10F	FR 11/20 FR	05 10 20 00 02 20
Germany 1	1DM	2DM	5DM		1/1 DM, 2/2DM, 6/5DM	GER 6/5 DM	06 12 30 00 05 00
Germany 2	1DM	2DM	5DM		1/1 DM, 2/2DM, 7/5DM	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		1/1 Hfl, 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		1/25P, 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		1/1Fr, 3/2Fr, 7/5Fr	SWISS	01 02 05 00 01 00
United Kingdom	10P	50P	1£		1/2X10P, 3/50P, 7/1£	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¢		1/50¢, 2/\$1	USA 2/\$1	01 04 01 00 02 00
Custom						CUSTOM	01 01 01 00 01 00

Factory reset settings

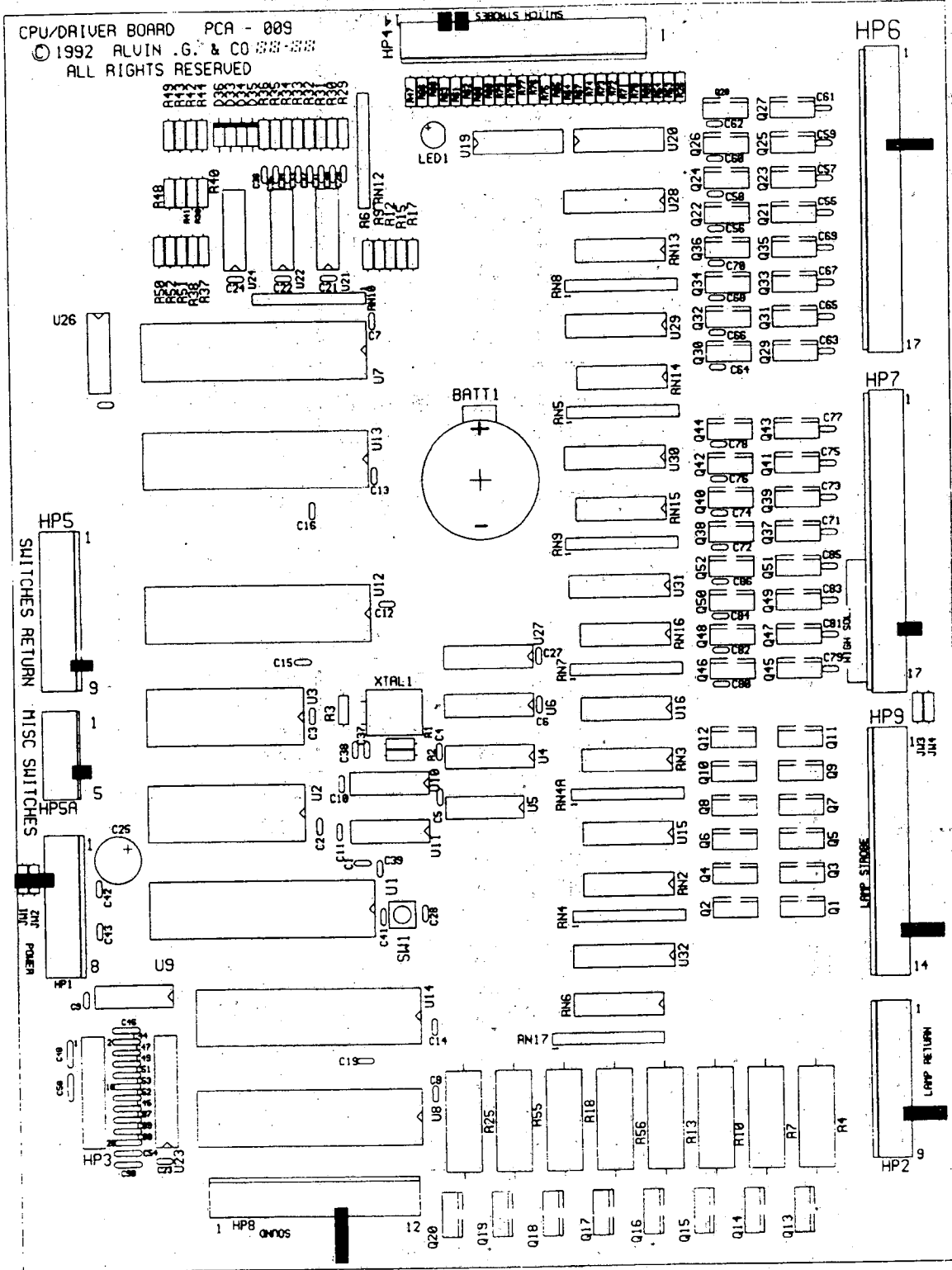
Menu #	Adjustment descriptions	Setting
A101	Replay at	150,000,000
A102	Award type	Credit
A103	Replay percent	10%
A104	Replay boost	20%
A105	Text language	English
A106	Game over attract	10 Min
A107	Max free games	06
A108	Balls per game	03
A109	Max xballs/game	03
A110	Match percent	8%
A111	Tilt warnings	02
A112	Tournament mode	No
A201	Guitar timer	Medium
A202	Calling police sound	No
A203	Recall MIX	Yes
A204	Recall target xball	Yes
A205	Flipper bump buttons	Yes
A206	Auto shooter timer	10 Seconds
A207	Tour values	Medium
A301	Game pricing	USA 3/\$1
A302	Maximum credits	20
A303	Free play	No
A304	Display credits	Yes
A401	HSTD allowed	Yes
A402	Credits for top HSTD	03
A403	Credits for 2nd HSTD	02
A404	Reset HSTD every	0700
A405	Backup top highscores	475,000,000
A501	Clear audits	No
A502	Clear coins audits	No
A503	Set backup highscores	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

Section 5

Parts

PCA-009 C.P.U. / DRIVER BOARD

CPU/DRIVER BOARD PCA - 009
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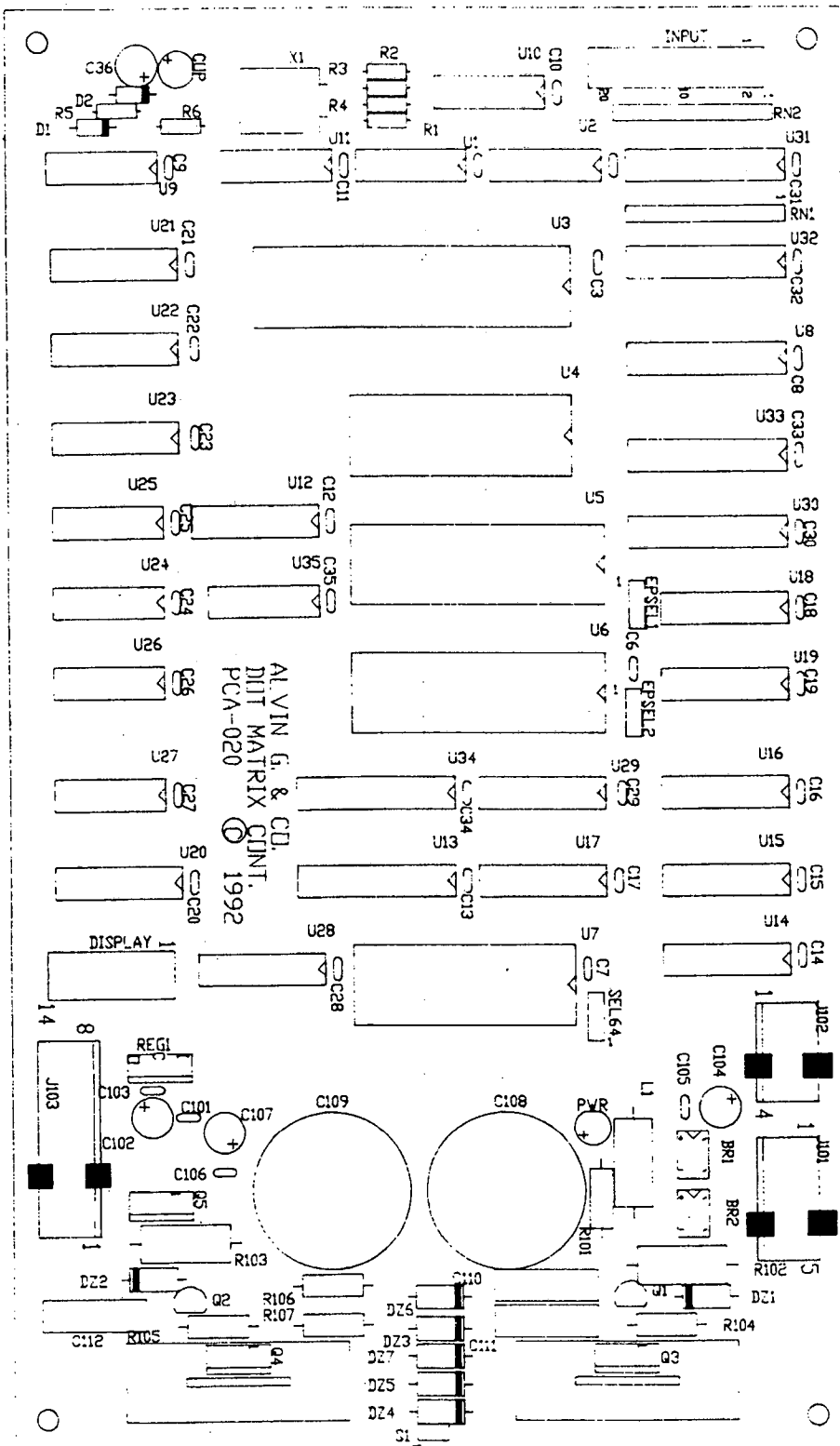
PCA-009 CPU / DRIVER BOARD

Item No.	Description	Qty.	Part No.
B1	Battery, 3.0V	1	BAT-001
C1-C24	Capacitor, 0.1 μ F	24	CAP-010
C25	Capacitor, 100 μ F	1	CAP-003
C26-C28	Capacitor, 0.1 μ F	3	CAP-010
C29-C36	Capacitor, 470pF	8	CAP-009
C37	Capacitor, 33pF	1	CAP-012
C38	Capacitor, 33pF	1	CAP-012
C39	Capacitor, 200pF	1	CAP-015
C41	Capacitor, 100pF	1	CAP-016
C42	Capacitor, 0.1 μ F	1	CAP-010
C43	Capacitor, 0.1 μ F	1	CAP-010
C44-C54	Capacitor, 470pF	10	CAP-009
C55-C86	Capacitor, 0.01 μ F	32	CAP-011
C87-C90	Capacitor, 470pF	4	CAP-009
D33-D36	Diode, 1N4154	4	DDS-007
LED1	Light emitting diode, Red	1	DDS-003
HP1	Header, Molex .156" 8 Pin	1	HDR-003
HP2	Header, Molex .156" 9 Pin	1	HDR-010
HP3	Header, Double row 20 Pin (2X10)	1	RBC-001
HP4	Header, Molex .156" 14 Pin	1	HDR-005
HP5	Header, Molex .156" 9 Pin	1	HDR-010
HP5A	Header, Molex .156" 5 Pin	1	HDR-009
HP6-HP7	Header, Molex .156" 17 Pin	2	HDR-008
HP8	Header, Molex .156" 12 Pin	1	HDR-011
HP9	Header, Molex .156" 14 Pin	1	HDR-005
Q1-Q12	IRF9530, MOSFET P Channel	12	TRZ-011
Q13-Q28	IRF530, MOSFET N Channel	16	TRZ-001
Q29	IRF540, MOSFET N Channel	1	TRZ-002
Q30-Q44	IRF530, MOSFET N Channel	15	TRZ-001
Q45	IRF540, MOSFET N Channel	1	TRZ-002
Q46-Q47	IRF530, MOSFET N Channel	2	TRZ-001
Q48	IRF540, MOSFET N Channel	1	TRZ-002
Q49-Q52	IRF530, MOSFET N Channel	4	TRZ-001
R1	Resistor, 15K Ω	1	RST-008
R2	Resistor, 3.3K Ω	1	RST-014
R3	Resistor, 3.9K Ω	1	RST-015
R4	Resistor, 3 Ω 5W	1	RST-013
R6	Resistor, 4.7K Ω	1	RST-005
R7	Resistor, 3 Ω 5W	1	RST-013
R9	Resistor, 4.7K Ω	1	RST-005
R10	Resistor, 3 Ω 5W	1	RST-013

PCA-009 CPU / DRIVER BOARD

Item No.	Description	Qty.	Part No.
R12	Resistor, 4.7K Ω	1	RST-005
R13	Resistor, 3 Ω 5W	1	RST-013
R15, R17	Resistor, 4.7K Ω	2	RST-005
R18, R25	Resistor, 3 Ω 5W	2	RST-013
R26	Resistor, 2.2K Ω	1	RST-010
R29-R36	Resistor, 3.9K Ω	8	RST-015
R37-R38	Resistor, 4.7K Ω	2	RST-005
R39-R41	Resistor, 2.2K Ω	3	RST-010
R42-R44	Resistor, 3.3K Ω	3	RST-014
R47-R48	Resistor, 2.2K Ω	2	RST-010
R49	Resistor, 3.3K Ω	1	RST-014
R50-R52	Resistor, 4.7K Ω	3	RST-005
R53-R54	Resistor, 2.2K Ω	2	RST-010
R55-R56	Resistor, 3 Ω 5W	2	RST-013
R60-R80	Resistor, 2.2K Ω	21	RST-010
RN2-RN3	Resistor sip, pack 8, 2k Ω	2	SSR-003
RN4-RN5	Resistor sip, pack 9, 2.7K Ω	2	SSR-002
RN6	Resistor sip, pack 8, 2k Ω	1	SSR-003
RN7-RN12	Resistor sip, pack 9, 2.7K Ω	6	SSR-002
RN13-RN16	Resistor sip, pack 8, 2k Ω	4	SSR-004
RN17	Resistor sip, pack 9, 2.7K Ω	1	SSR-002
SW1	Switch	1	RST-000
U1	65C02 - C-MOS 8 Bit Microprocessor	1	EC-0009
U2	27C512 - UV Erasable PROM 64KX8	1	EC-0007
U3	6164 - 8K X 8 Static RAM	1	EC-0008
U4	74LS138 - LS TTL 3/8 Decoder	1	EC-0014
U5	74LS30 - LS TTL 8 Input NAND Gate	1	EC-0016
U6	74LS138 - LS TTL 3/8 Decoder	1	EC-0014
U7-U8	65C22 - Versatile Interface Adapter (VIA)	2	EC-0010
U9-U10	74LS04 - LS TTL HEX Inverter	2	EC-0012
U11	74LS74 - LS TTL Dual D-type F/F	1	EC-0017
U12-U14	8255 - Programmable peripheral interface	3	EC-0018
U15-U20	ULN2003A - H-V, H-C Darlington array	6	EC-0021
U21-U22	LM339 - Low power quad voltage comp.	2	EC-0019
U23	74LS373 - LS TTL Octal trans. latch	1	EC-0023
U24	LM339 - Low power quad voltage comp.	1	EC-0019
U26	74LS00 - LS TTL Quad two input NAND	1	EC-0024
U27	MAX691 - Microprocessor supervisor	1	EC-0022
U28-U32	UDN6118 - High voltage display driver	5	EC-0020
XTAL1	Crystal, 4Mhz	1	CRY-001

PCA-020 DOT MATRIX CONTROLLER BOARD



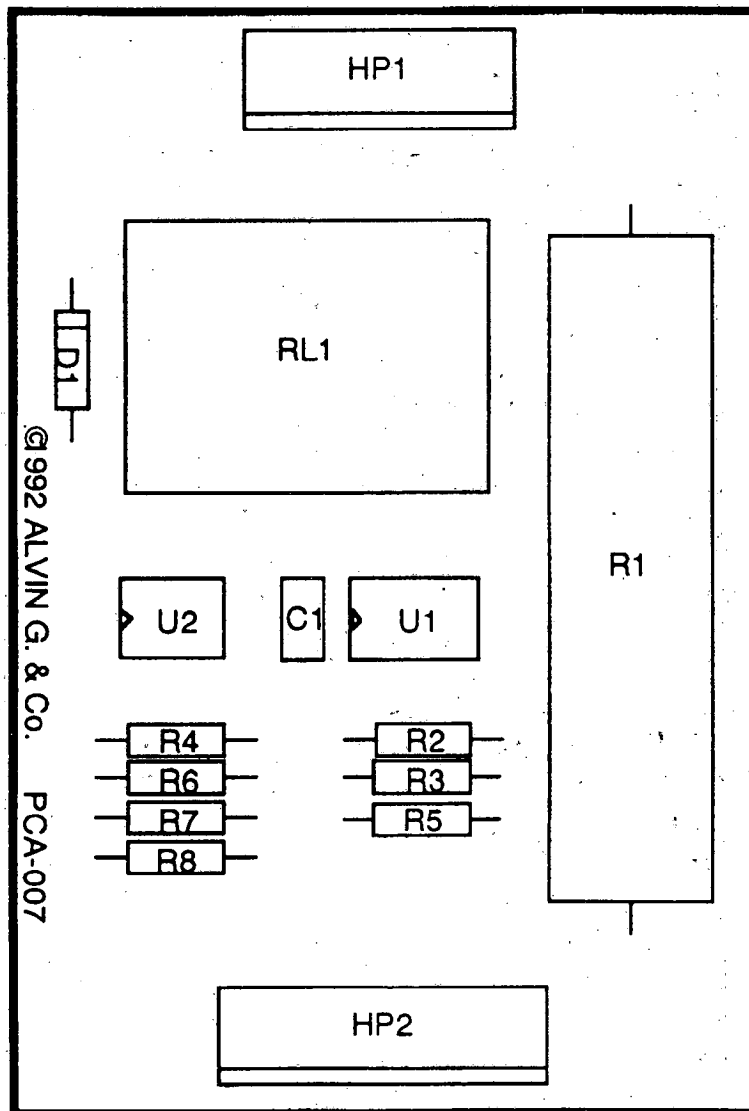
PCA-020 DOT MATRIX CONTROLLER BOARD

Item No.	Description	Qty.	Part No.
BR1-BR2	Full wave bridge rectifier, 200V 1A	2	REC-002
C1-C35	Capacitor, 0.1 μ f	35	CAP-010
C36	Capacitor, 10 μ f	1	CAP-007
C101	Capacitor, 0.01 μ f	1	CAP-011
C102	Capacitor, 22 μ f	1	CAP-002
C103	Capacitor, 0.01 μ f	1	CAP-011
C104	Capacitor, 220 μ f	1	CAP-017
C105-C106	Capacitor, 0.01 μ f	2	CAP-011
C107	Capacitor, 22 μ f	1	CAP-002
C108-C109	Capacitor, 150 μ f	2	CAP-018
C110-C112	Capacitor, 0.22 μ f	3	CAP-019
DZ1- DZ2	Zener, 3.9V	2	ZEN-004
DZ3	Zener, 68V	1	ZEN-005
DZ4	Zener, 13V	1	ZEN-003
DZ5	Zener, 112V	1	ZEN-002
DZ6	Zener, 13V	1	ZEN-003
D1- D2	Diode, 1N4154	2	DDS-007
EPSEL1	Sip male header 3 pin	1	SPH-001
EPSEL2	Sip male header 3 pin	1	SPH-001
SEL64	Sip male header 3 pin	1	SPH-001
INPUT	Header, Double row 20 pin (2X10)	1	RBC-001
J101	Header, molex .156" 5 pin	1	HDR-009
J102	Header, molex .156" 4 pin	1	HDR-012
J103	Header, molex .156" 8 pin	1	HDR-003
LED1-LED2	Light emitting diode	2	DDS-003
L1	Inductor, 3A coil	1	CLL-020
Q1	Transistor, PNP, 2N5401	1	TRZ-009
Q2	Transistor, NPN, 2N5551	1	TRZ-006
Q3	Transistor, NPN, MJE15050	1	TRZ-008
Q4	Transistor, PNP, MJE15031	1	TRZ-010
Q5	Transistor, NPN, BU407	1	TRZ-007
REG1	Voltage regulator positive, 7812	1	
RN1- RN2	Resistor, sip pack 8, 10K	2	SSR-005
R1- R2	Resistor, 200 Ω	2	RST-024
R3	Resistor, 560 Ω	1	RST-025
R4	Resistor, 1K Ω	1	RST-026
R5	Resistor, 4.7K Ω	1	RST-005
R6	Resistor, 47K Ω	1	RST-028
R101	Resistor, 470 Ω	1	RST-029
R102-R103	Resistor, 47K Ω 1 W	2	RST-027
R104-R105	Resistor, 1.5K Ω 1/2 W	2	RST-030

PCA-020 DOT MATRIX CONTROLLER BOARD

Item No.	Description	Qty.	Part No.
R106	Resistor, 47K Ω	1	RST-028
R107	Resistor, 10K Ω	1	RST-007
S1	Header, sip male 2 pin	1	
U1	7404, Hex inverter	1	EC-0011
U2	74LS74, LS TTL Dual D-type F/F	1	EC-0017
U3	8031, 8 Bit microprocessor	1	EC-0031
U4	27C256, UV erasable prom 32K X 8	1	EPM-004
U5, U6	27C040, CMOS UV erasable prom 512K X 8	2	EPM-003
U7	62256, CMOS Static RAM	1	EC-0026
U8	74LS373, LS TTL Octal transparent latch	1	EC-0023
U9	74LS08, LS TTL QUAD 2 input AND gate	1	EC-0013
U10	74LS32, LS TTL QUAD 2 input OR gate	1	EC-0003
U11	74LS04, LS TTL Hex inverter	1	EC-0012
U12	74LS138, LS TTL 3/8 Decoder	1	EC-0014
U13	74LS245, LS TTL Octal Bus transceiver	1	EC-0015
U14-U17	74LS157, LS TTL QUAD 2 to 1 multiplexer	4	EC-0028
U18	74LS191, LS TTL Binary up/down counter	1	EC-0029
U19	74LS191, LS TTL Binary up/down counter	1	EC-0029
U20	74LS151, LS TTL 8 to 1 multiplexer	1	EC-0027
U21-U23	4520, CMOS binary dual up counter	3	EC-0025
U24	74LS08, LS TTL QUAD 2 input AND gate	1	EC-0013
U25	74LS04, LS TTL Hex inverter	1	EC-0012
U26	74LS74, LS TTL DUAL D-Type F/F	1	EC-0017
U27	74LS32, LS TTL QUAD 2 input OR gate	1	EC-0003
U28-U29	74LS191, LS TTL binary up/down counter	2	EC-0029
U30-U34	74LS374, LS TTL Octal F/F	5	EC-0030
U35	74LS08, LS TTL QUAD 2 input AND gate	1	EC-0013
X1	Crystal, 12Mhz	1	CRY-002

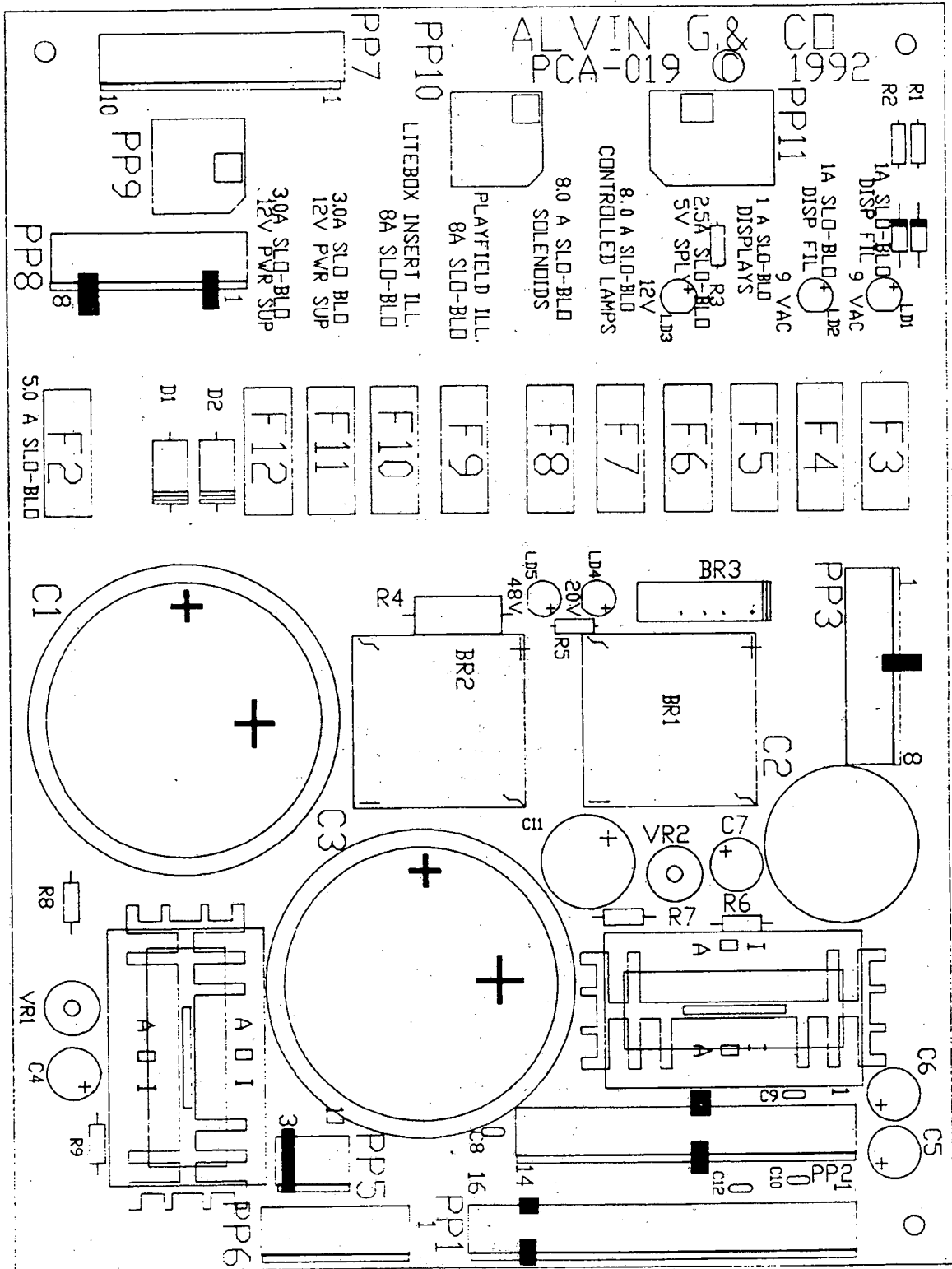
PCA-007 FLASHER RELAY BOARD



PCA-007 FLASHER RELAY BOARD

Item No.	Description	Qty.	Part No.
C1	Capacitor, .1 μ F 50V	1	CAP-010
D1	Diode, 1N4004	1	DDS-001
HP1	Panduit header .156" 4 pin	1	HDR-012
HP2	Panduit header .156" 5 pin	1	HDR-009
R1	Resistor, .47 Ω , 10W, 5%	1	RST-016
R2	Resistor, 681 Ω , 1%	1	RST-021
R3	Resistor, 5.62K Ω , 1%	1	RST-020
R4	Resistor, 100K Ω , 5%	1	RST-018
R5	Resistor, 2.2K Ω , 5%	1	RST-010
R6	Resistor, 5.62K Ω , 1%	1	RST-020
R7	Resistor, 562 Ω , 1%	1	RST-019
R8	Resistor, 82.5 Ω , 1%	1	RST-017
RL1	Relay, 24V coil	1	REL-002
U1	LM358; Dual op amp	1	EC-0030
U2	H11G3; OPTO isolator darlington output	1	EC-0031

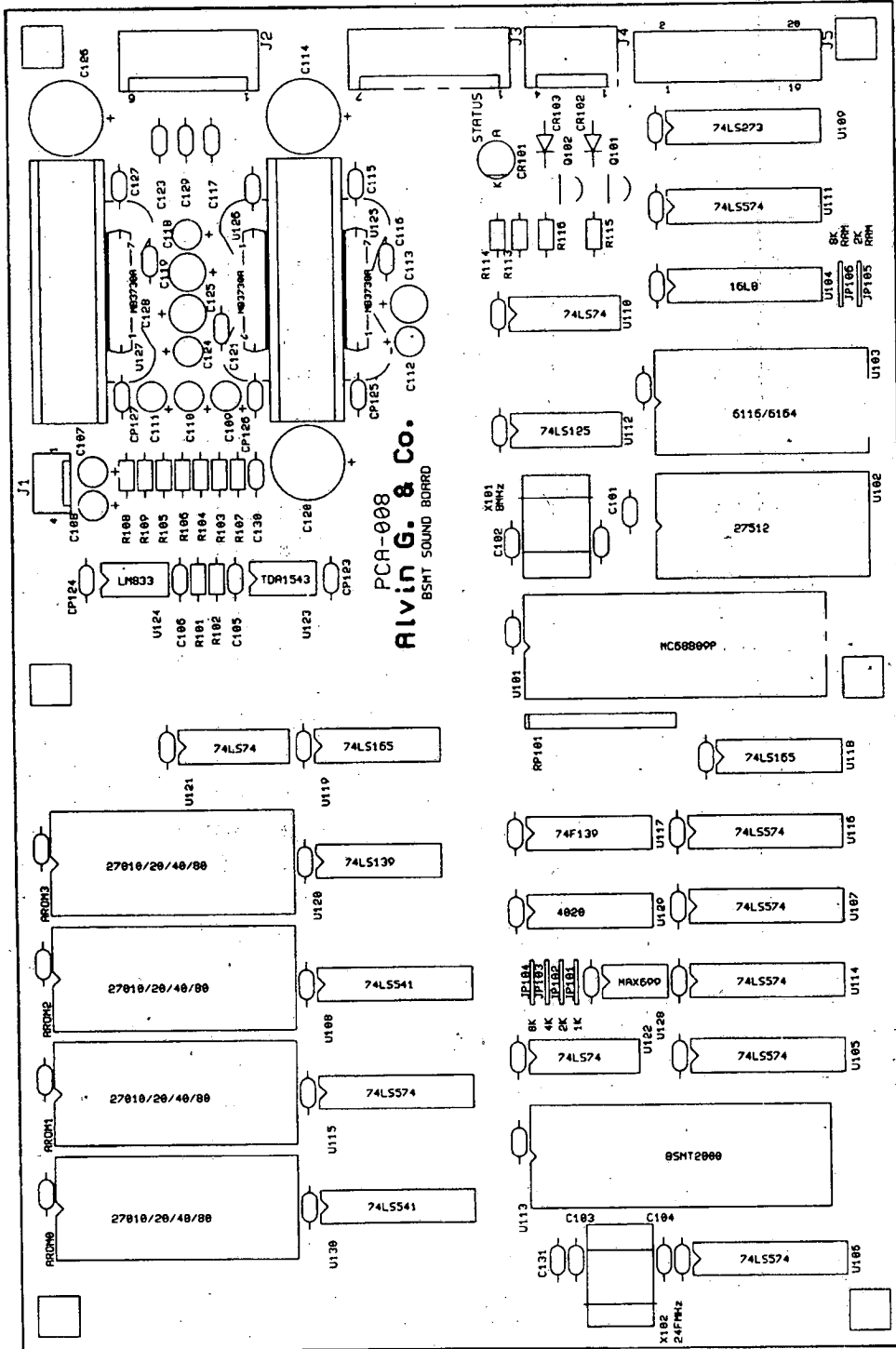
PCA-019A POWER SUPPLY BOARD



PCA-019A

Item No.	Description	Qty.	Part No.
BR1, BR2	Full wave bridge rectifier, 25 Amp	2	REC-001
BR3	Full wave bridge rectifier, 4 Amp	1	REC-004
C1	Capacitor, 33,000 μ F	1	CAP-005
C2	Capacitor, 10,000 μ F	1	CAP-004
C3	Capacitor, 33,000 μ F	1	CAP-005
C4	Capacitor, 22 μ F	1	CAP-002
C5, C6	Capacitor, 100 μ F	2	CAP-003
C7	Capacitor, 22 μ F	1	CAP-002
D1, D2	Diode, 1N4004	2	DDS-001
D3, D4	Diode, 1N5404	2	DDS-002
F1	5 Amp, Slo-Blo	1	FUS-001
F2	5 Amp, Slo-Blo	1	FUS-001
F3	1 Amp, Slo-Blo	1	FUS-004
F4	1 Amp, Slo-Blo	1	FUS-004
F5	0.5 Amp, Slo-Blo	1	FUS-005
F6	2.5 Amp, Slo-Blo	1	FUS-010
F7	15 Amp, Slo-Blo	1	FUS-006
F8	8 Amp, Slo-Blo	1	FUS-002
F9	8 Amp, Slo-Blo	1	FUS-002
F10	8 Amp, Slo-Blo	1	FUS-002
F11	3 Amp, Slo-Blo	1	FUS-008
F12	3 Amp, Slo-Blo	1	FUS-008
LD1, LD2	Light emitting diode	2	DDS-003
LD3, LD4	Light emitting diode	2	DDS-003
LD5	Light emitting diode	1	DDS-003
REG1, REG2	Positive voltage regulator - LM3507	2	PVR-001
PP1	Header, Molex .156" 16 pin	1	HDR-006
PP2	Header, Molex .156" 14 pin	1	HDR-005
PP3, PP4	Header, Molex .156" 8 pin	2	HDR-003
PP5	Header, Molex .156" 3 pin	1	HDR-001
PP6	Header, Molex .156" 6 pin	1	HDR-002
PP7	Header, Molex .156" 10 pin	1	HDR-004
PP8	Header, Molex .156" 8 pin	1	HDR-003
PP9, PP10	Molex connector 9 pin	2	CNN-M05
PP11	Molex connector 12 pin	1	CNN-M04
R1, R2	Resistor, 330 Ω	2	RST-003
R3	Resistor, 820 Ω	1	RST-006
R4	Resistor, 4.7K Ω	1	RST-005
R5	Resistor, 1.5K Ω	1	RST-001
R6	Resistor, 220 Ω	1	RST-002
R7	Resistor, 390 Ω	1	RST-004
R8	Resistor, 1.5K Ω	1	RST-001
R9	Resistor, 220 Ω	1	RST-002
VR1, VR2	Potentiometer, 1K Ω	2	PTM-001

PCA-008 SOUND BOARD



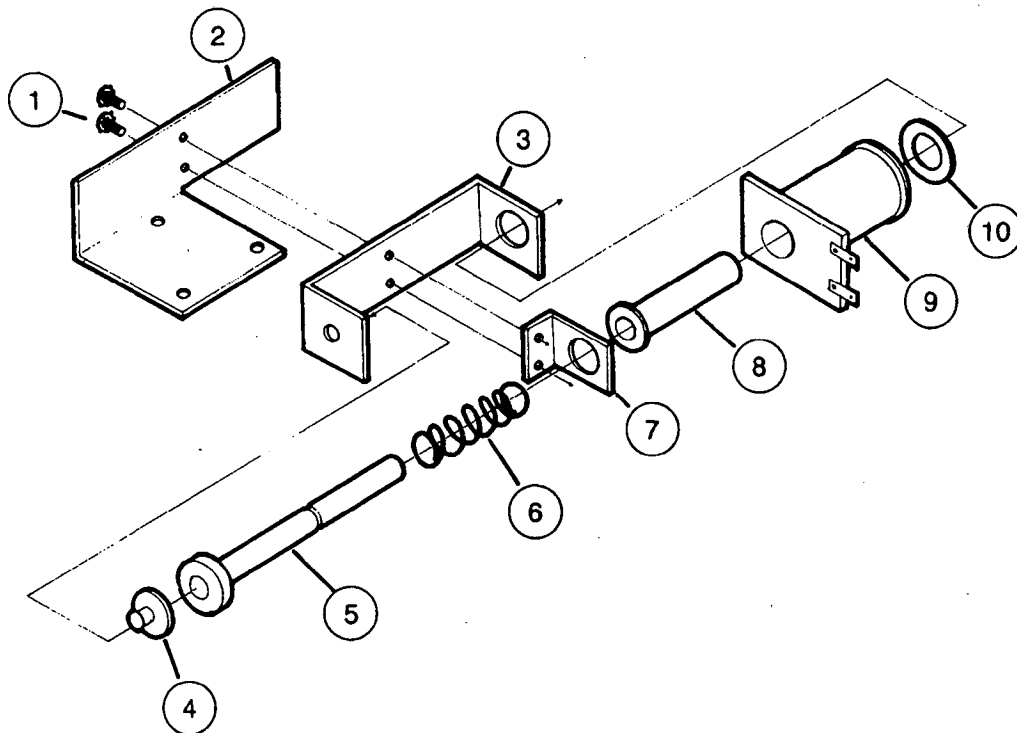
PCA-008 SOUND BOARD

Item No.	Description	Qty.	Part No.
AROM1	2 Meg EPROM	1	EMP-003
AROM2	2 Meg EPROM	1	EMP-003
AROM3	2 Meg EPROM	1	EMP-003
AROM0	2 Meg EPROM	1	EMP-003
C101-C104	Capacitor, 18pF, 50WVDC, AX., CER.	4	CAP-015
C105-C106	Capacitor, 2200pF, 50WVDC, AX., CER.	2	CAP-016
C107-C111	Capacitor, 4.7μF, 25WVDC, RAD., ELEC.	5	CAP-017
C112	Capacitor, 22μF, 16WVDC, RAD., ELEC.	1	CAP-018
C113	Capacitor, 220μF, 10WVDC, RAD., ELEC.	1	CAP-019
C114	Capacitor, 1000μF, 25WVDC, RAD., ELEC.	1	CAP-020
C115-C117	Capacitor, 0.1μF, 50WVDC, AX., CER.	3	CAP-014
C118	Capacitor, 22μF, 16WVDC, RAD., ELEC.	1	CAP-018
C119	Capacitor, 220μF, 10WVDC, RAD., ELEC.	1	CAP-019
C120	Capacitor, 1000μF, 25WVDC, RAD., ELEC.	1	CAP-020
C121-C123	Capacitor, 0.1μF, 50WVDC, AX., CER.	3	CAP-014
C124	Capacitor, 22μF, 16WVDC, RAD., ELEC.	1	CAP-018
C125	Capacitor, 220μF, 10WVDC, RAD., ELEC.	1	CAP-019
C126	Capacitor, 1000μF, 25WVDC, RAD., ELEC.	1	CAP-020
C127-C130	Capacitor, 0.1μF, 50WVDC, AX., CER.	4	CAP-014
C131	Capacitor, 82pF, 50WVDC, AX., CER.	1	CAP-021
CPAR0	Capacitor, 0.1μF, 50WVDC, AX., CER.	1	CAP-014
CPAR1	Capacitor, 0.1μF, 50WVDC, AX., CER.	1	CAP-014
CPAR2	Capacitor, 0.1μF, 50WVDC, AX., CER.	1	CAP-015
CPAR3	Capacitor, 0.1μF, 50WVDC, AX., CER.	1	CAP-016
CP101-CP130	Capacitor, 0.1μF, 50WVDC, AX., CER.	30	CAP-014
CR101	Light emitting diode	1	LED-001
CR102-CR103	Diode, 1N4001	2	DDS-001
JP103	Jumper	1	JMP-001
JP106	Jumper	1	JMP-001
J1	Header, Molex .100" 4 pin	1	HDR-012
J2	Header, Molex .156" 6 pin	1	HRD-002
J3	Header, Molex .156" 7 pin	1	HDR-014
J4	Header, Molex .156" 4 pin	1	HDR-015
J5	Header, Molex .100" 20 pin (2X10)	1	HDR-013
Q101-Q102	Transistor, NPN 2N3904	2	NPN-001
RP101	Resistor, 4.7KΩ	1	RPA-001
R101-R102	Resistor, 1.2KΩ	2	CRF-001
R103	Resistor, 1KΩ	1	CRF-005
R104	Resistor, 100Ω	1	CRF-002
R105	Resistor, 1KΩ	1	CRF-005
R106	Resistor, 100Ω	1	CRF-002
R107-R108	Resistor, 2.2KΩ	2	CRF-003
R109	Resistor, 100Ω	1	CRF-002
R113-R114	Resistor, 220Ω	2	CRF-004

PCA-008 SOUND BOARD

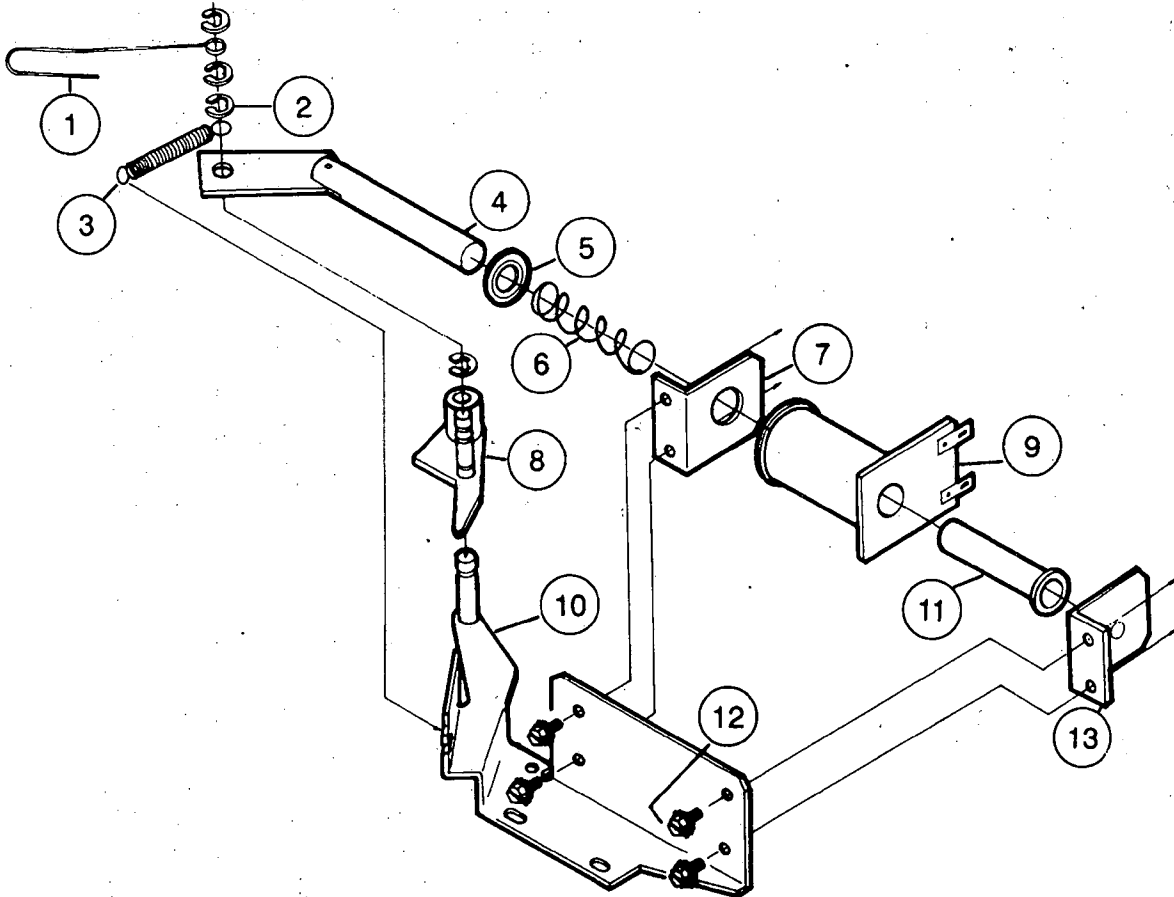
Item No.	Description	Qty.	Part No.
R115-R116	Resistor, 1K Ω	2	CRF-005
U101	MC68B09P,	1	MCV-001
U102	27C512	1	EC-0007
U103	6164	1	EC-0008
U104	16L8	1	EC-0025
U105-U107	74LS574	3	EC-0026
U108	74LS541	1	EC-0027
U109	74LS273	1	EC-0002
U110	74LS74	1	EC-0017
U111	74LS541	1	EC-0027
U112	74LS125	1	EC-0028
U113	BSMT2000	1	EC-0029
U114-U116	74LS574	3	EC-0026
U117	74F139	1	EC-0030
U118-U119	74LS165	2	EC-0031
U120	74LS139	1	EC-0032
U121-U122	74LS74	2	EC-0017
U123	TDA1543	1	EC-0033
U124	LM833	1	EC-0034
U125-U127	MB3730A	3	EC-0035
U128	MAX699	1	MAX-001
U129	4020	1	EC-0036
U130	74LS541	1	EC-0027
X101	Crystal, 8MHz	1	CRY-002
X102	Crystal, 24FMHz	1	CRY-003

AKN-002 BACK PANEL KICKER ASSEMBLY



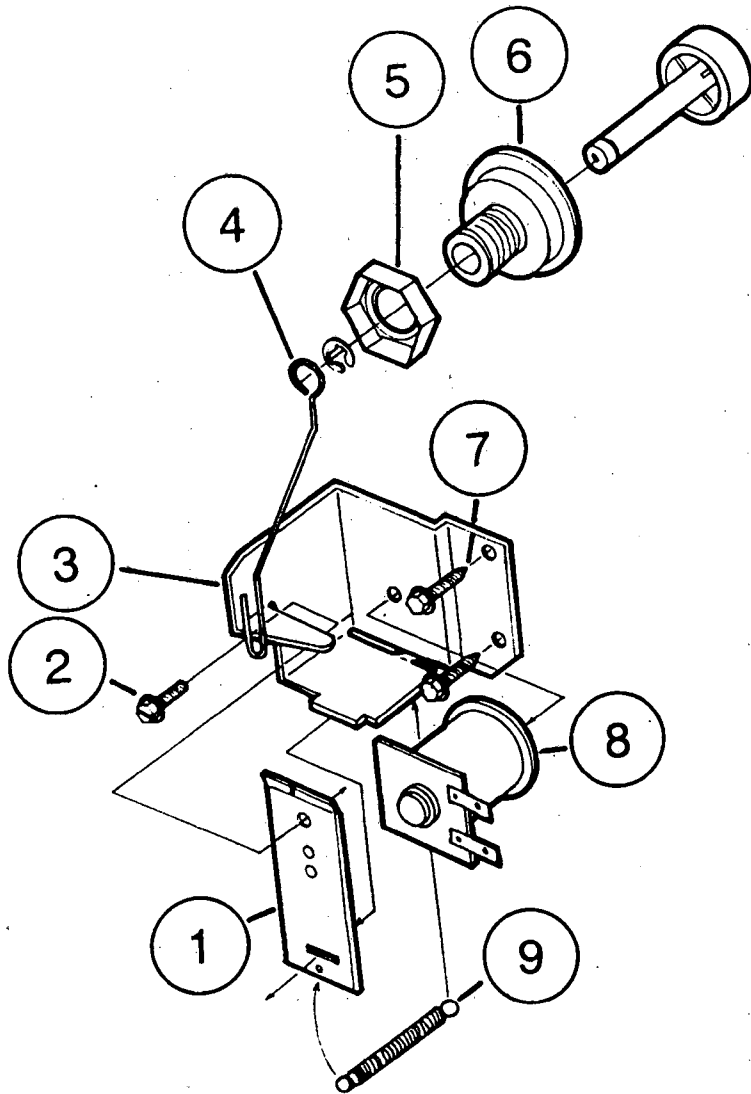
Item No.	Description	Qty.	Part No.
1	#8-32 X 5/16 PPH W/SEMS MS	2	HSM-017
2	Kicker bracket	1	BSL-056
3	Coil stop bracket	1	BSL-055
4	Bumper grommet	1	RBR-001
5	Plunger	1	PLN-006
6	Spring	1	SRG-005
7	Coil mounting bracket	1	BSL-031
8	Sleeve	1	SLC-004
9	Coil kicker	1	CLL-007
10	Washer, spring	1	SPW-001

ABR-002 BALL RELEASE ASSEMBLY



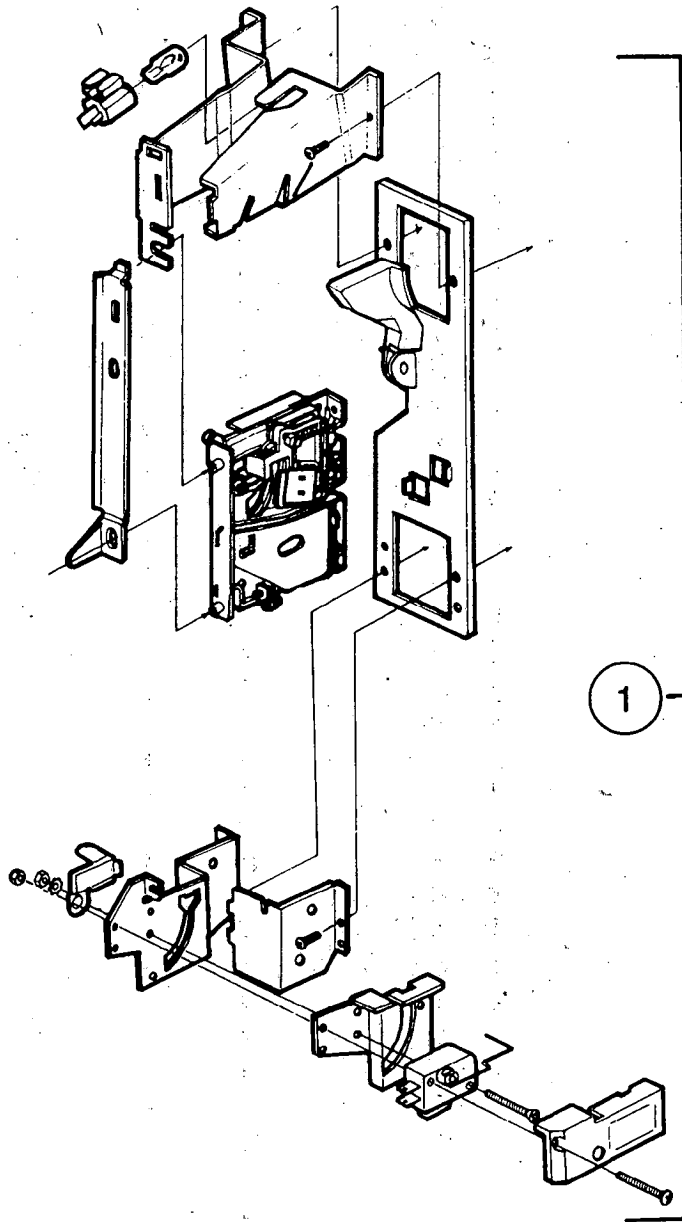
Item No.	Description	Qty.	Part No.
1	Wireform	1	WRE-006
2	E-Ring	4	HRG-005
3	Spring	1	SDT-001
4	Link & plunger assembly	1	LAP-006
5	Cup washer	1	CWH-003
6	Spring	1	SRG-007
7	Bracket mounting	1	BSL-031
8	Gate assembly	1	AGT-001
9	Coil	1	CLL-004
10	Base assembly	1	ABP-002
11	Sleeve	4	SLC-006
12	#8-32 X 1/4 HWH SEMS	1	HSM-018
13	Stop stud assembly	1	ASS-005

AVB-001 (LEFT) BUMP BUTTON ASSEMBLY
AVB-002 (RIGHT) BUMP BUTTON ASSEMBLY



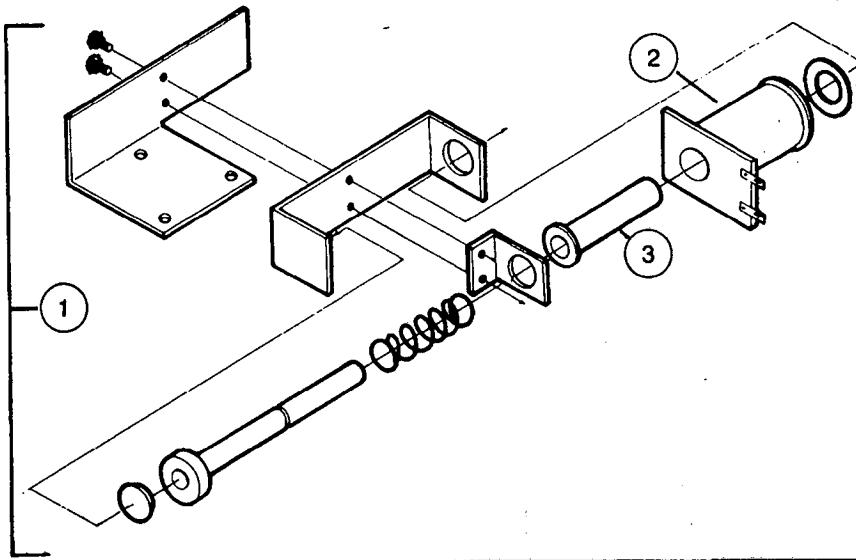
Item No.	Description	Qty.	Part No.
1	Armature plate assembly	1	AAP-001
2	#8-32X1/2 PPH MS	1	HMS-015
3	Coil mount	1	BSS-053
4	Wire form flipper button	1	WRE-010
5	Pal nut	1	PNT-001
6	Flipper button assembly	1	FBT-009
7	#6 X 1/2 HEX Wash HD (type AB)	2	HST-004
8	Coil	1	CLL-001
9	Spring	1	SPR-001

FDR-050 COIN DOOR ASSEMBLY



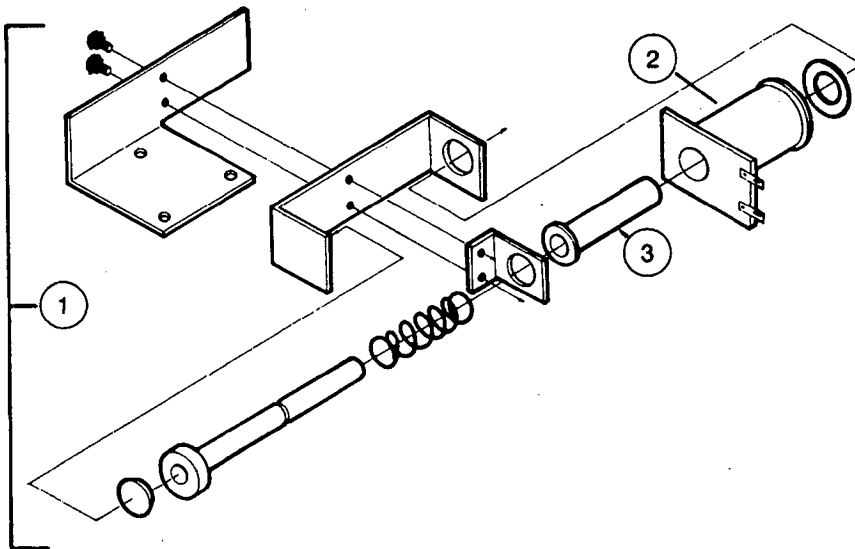
Item No.	Description	Qty.	Part No.
1	Coin door assembly including hinge and Frame Note: Cash box is not included with this part	1	FDR-050

AKN-001 KNOCKER ASSEMBLY



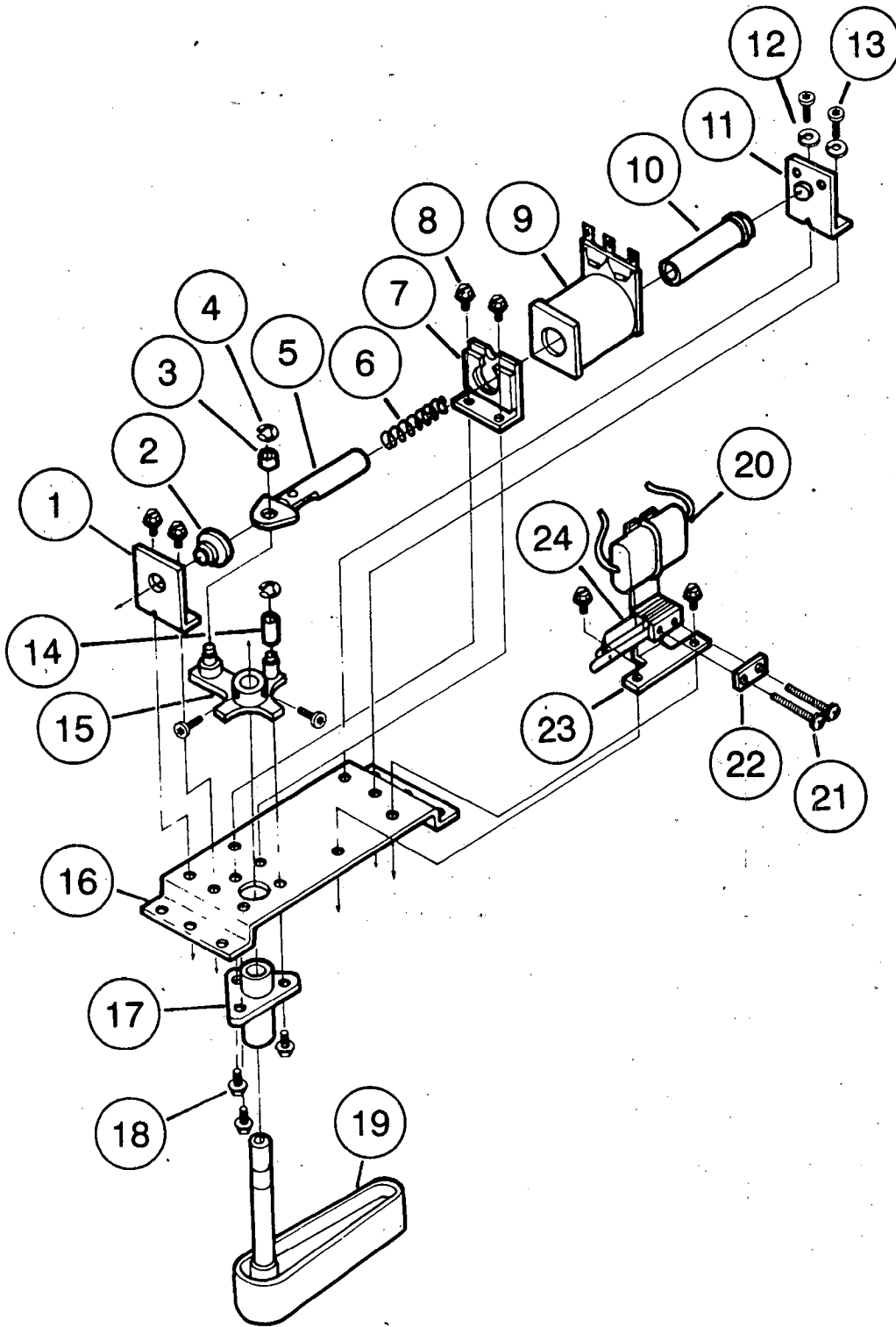
Item No.	Description	Qty.	Part No.
1	Knocker	1	AKN-001
2	Coil	1	CLL-006
3	Sleeve	1	SLC-008

CKA-003 KICKBACK ASSEMBLY



Item No.	Description	Qty.	Part No.
1	Kickback assembly	1	CKA-003
2	Coil	1	CLL-008
3	Sleeve	1	SLC-008

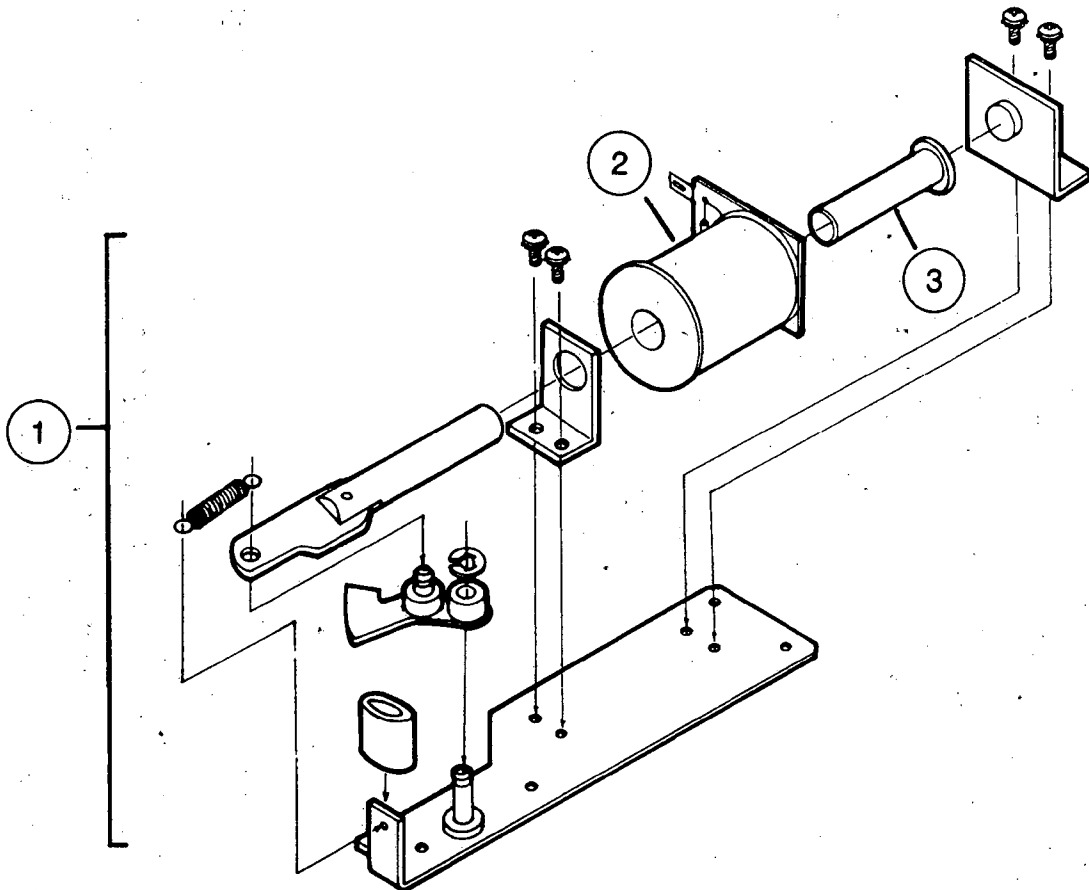
AFF-L02 (LEFT) FLIPPER ASSEMBLY
AFF-R02 (RIGHT) FLIPPER ASSEMBLY



AFF-L02 FLIPPER (LEFT) ASSEMBLY

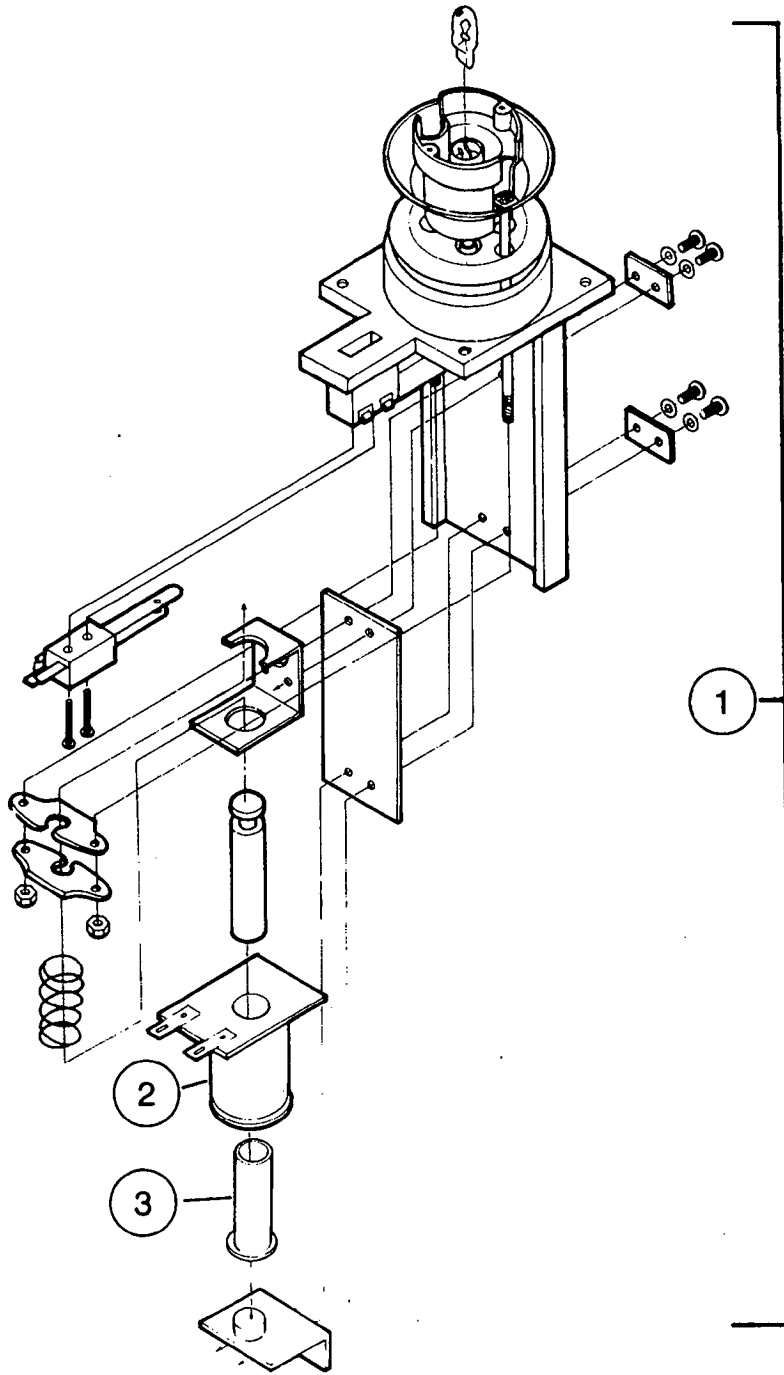
Item No.	Description	Qty.	Part No.
1	Plunger stop bracket	1	BSL-027
2	Bumper grommet	1	RBR-001
3	Bushing	1	BRG-001
4	E-Ring 5144-18	2	HRG-001
5	Link & Plunger assembly	1	LAP-001
6	Spring	1	SRG-001
7	Coil mount bracket assembly	1	CBA-001
8	#8-32 X 3/8 HEX Washer HD (type B)	6	HTT-005
9	Coil	1	CLL-015
10	Sleeve	1	SLC-001
11	Stop stud assembly	1	ASS-002
12	#10 Split lock washer	2	HLW-010
13	#10-32 X 3/8 Socket HD CAP	4	HSP-003
14	Actuator bearing	1	SLV-001
15-L	Pivot yoke (left)	1	PYA-L01
15-R	Pivot yoke (right)	1	PYA-R01
16-L	Flipper base assembly (left)	1	FBA-L01
16-R	Flipper base assembly (right)	1	FBA-R01
17	Flipper shaft bushing	1	FSB-001
18	#6-32 X 3/8 HEX Washer HD (type B)	3	HTT-004
19	Flipper bat assembly	1	FBB-005
20	Capacitor (TI 2.2K 250VDC)	1	CAP-001
21	#5-40 X 5/8 PPH MS	2	HMS-004
22	Clamp plate	1	SWP-001
23	Mounting bracket	1	BSL-032
24	Switch (End of stroke)	1	FLS-002

ABR-001 OUTHOLE KICKER ASSEMBLY



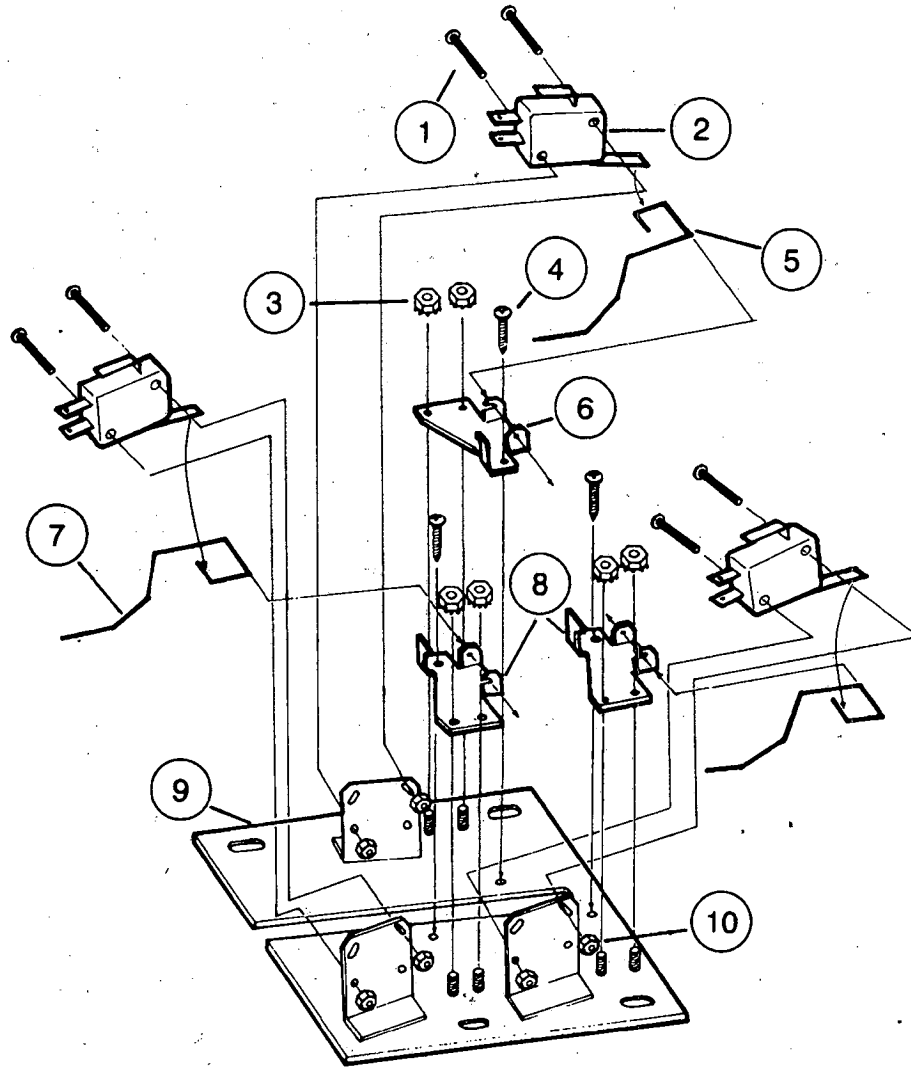
Item No.	Description	Qty.	Part No.
1	Outhole kicker	1	ABR-001
2	Coil	1	CLL-006
3	Sleeve	1	SLC-008

ABM-004 POP BUMPER ASSEMBLY



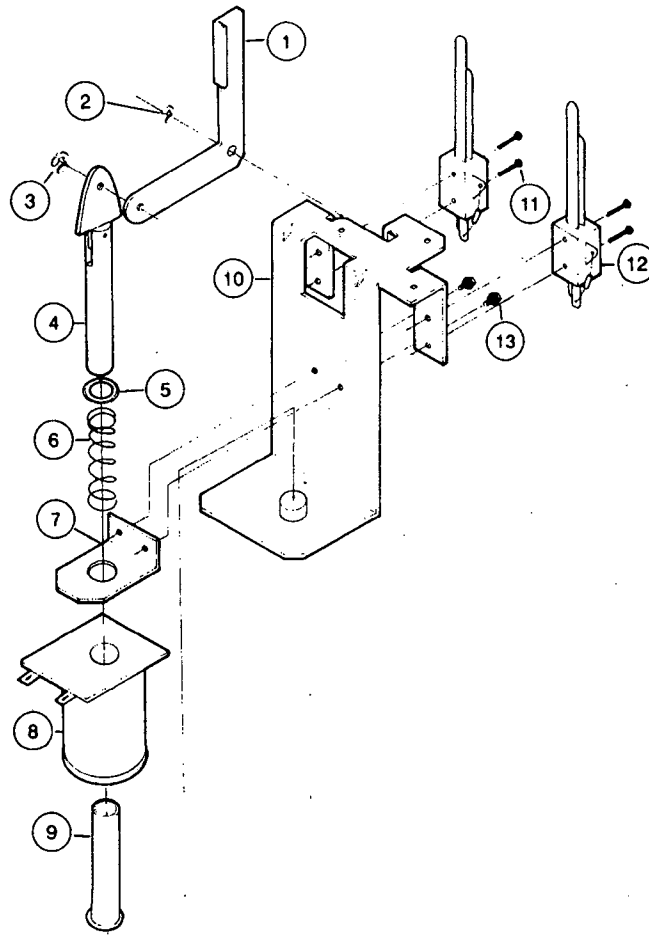
Item No.	Description	Qty.	Part No.
1	Pop Bumper	1	ABM-004
2	Coil	1	CLL-006
3	Sleeve	1	SLC-008

AMS-001 OUTHOLE SWITCH ASSEMBLY



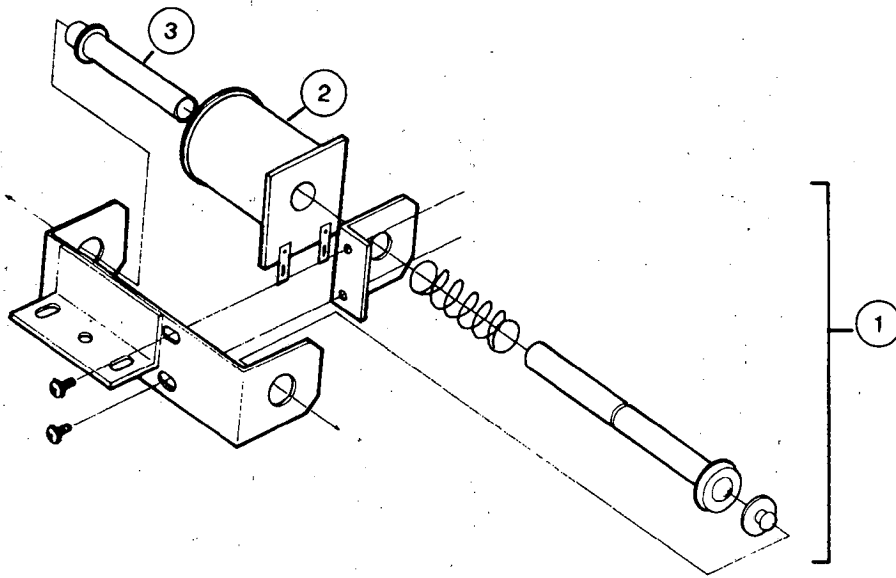
Item No.	Description	Qty.	Part No.
1	#4-40 X 5/8 PPH MS	6	HMS-003
2	Micro switch	3	MSW-008
3	#6-32 Hex nut keps	6	HNK-001
4	#6 X 1/4 PPH (Type AB)	3	HST-005
5	Switch actuator right	1	WRE-009
6	Wire fulcrum right	1	BSU-030
7	Switch actuator left	2	WRE-008
8	Wire fulcrum left	2	BSU-029
9	Mounting bracket	1	ABS-003
10	#4-40 Elastic stop nut	6	HNE-001

ABK-006 SLINGSHOT KICKER ASSEMBLY



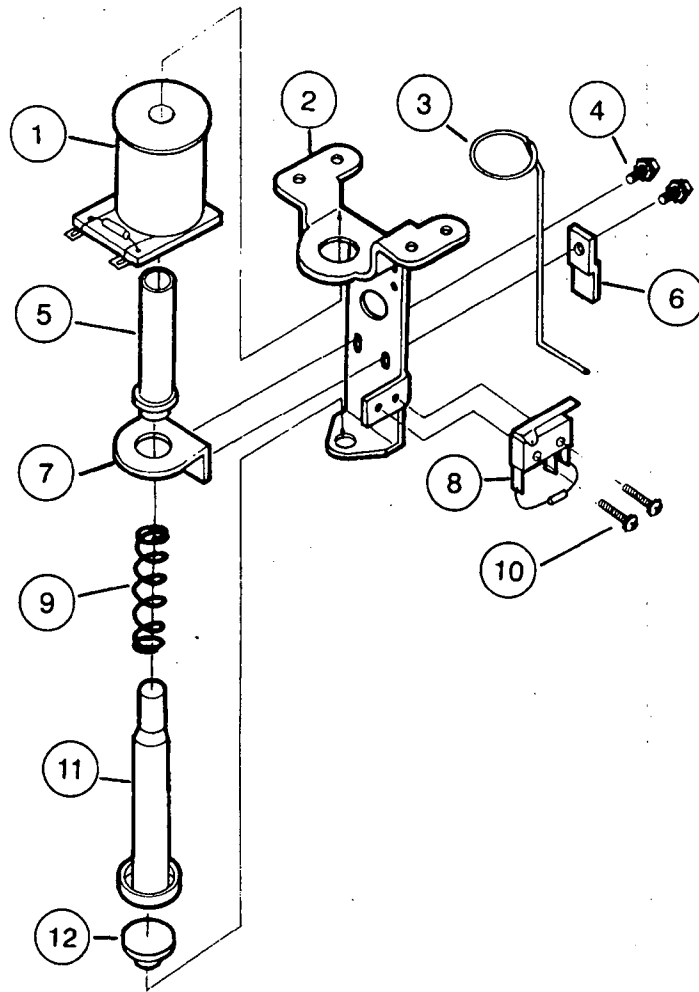
Item No.	Description	Qty.	Part No.
1	Kicker arm assembly	1	SLA-009
2	E-Ring 5144-18	1	HRG-001
3	E-Ring 5144-21	1	HRG-002
4	Link & plunger assembly	1	LAP-001
5	Cup washer	1	CWH-001
6	Spring	1	SRG-005
7	Stop stud assembly	1	ASS-004
8	Coil	1	CLL-006
9	Sleeve	1	SLC-006
10	Mounting bracket	1	BSL-031
11	#8-32 X 3/8 HEX Washer HD MS	2	HMS-019
12	Standup switch assembly	1	STR-001
13	#6-32 X 5/8 PPH MS	1	HMS-028

CKA-002 PLUNGER KICKER ASSEMBLY



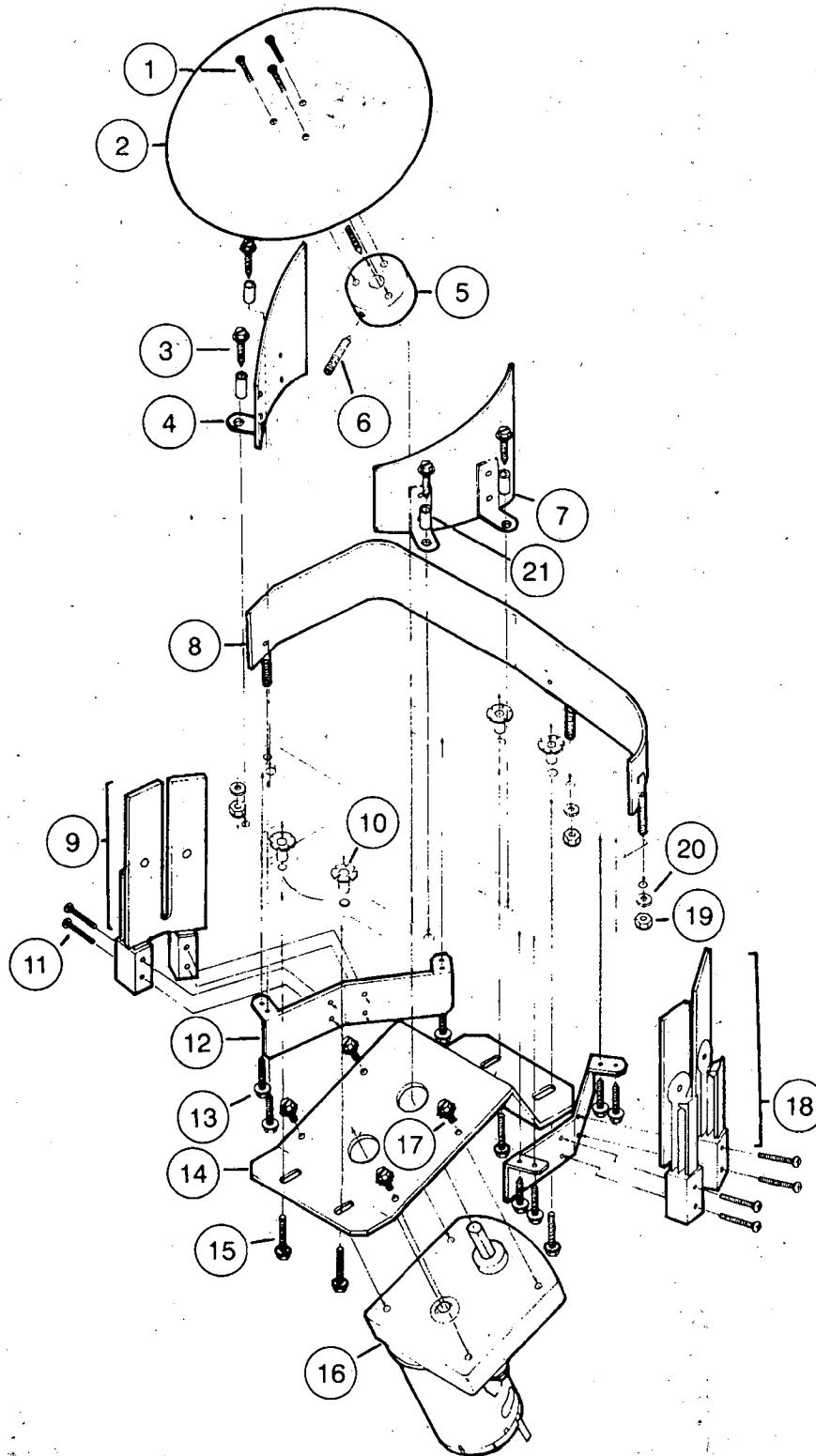
Item No.	Description	Qty.	Part No.
1	Plunger kicker assembly	1	CKA-002
2	Coil	1	CLL-009
3	Sleeve	1	SLC-005

AKN-001 VERTICAL UPKICKER ASSEMBLY



Item No.	Description	Qty.	Part No.
1	Coil	1	CLL-007
2	Mounting bracket	1	BSL-043
3	Actuator wire	1	WRE-011
4	#8-32 X 5/16 HWH W/INT. SEMS MS	2	HSM-017
5	Sleeve	1	SLC-003
6	Wire guide	1	BSZ-018
7	Bracket mounting	1	BSL-042
8	Micro switch	1	MSW-004
9	Spring	1	SRG-005
10	#2-56 X 3/8 PPH W/INT. SEMS MS	2	HSM-001
11	Plunger assembly	1	PLN-006
12	Rubber grommet	1	RBR-001

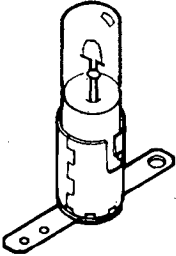
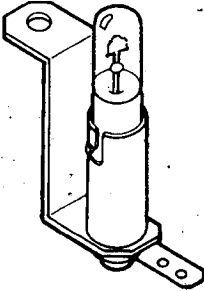
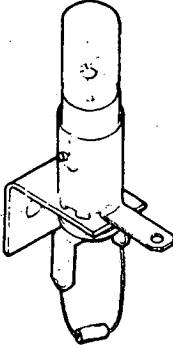
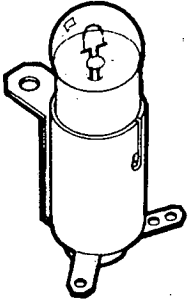
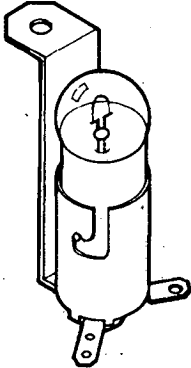
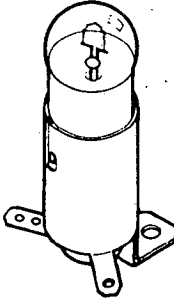
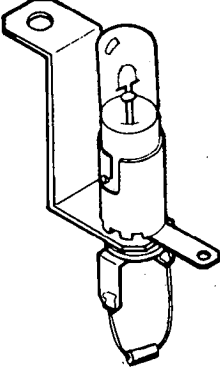
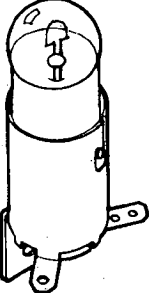
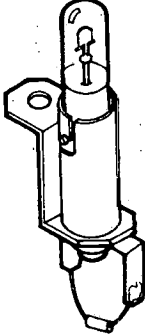
ASS-006 SPINNING RAMP MOTOR ASSEMBLY



ASS-006 SPINNING RAMP MOTOR ASSEMBLY

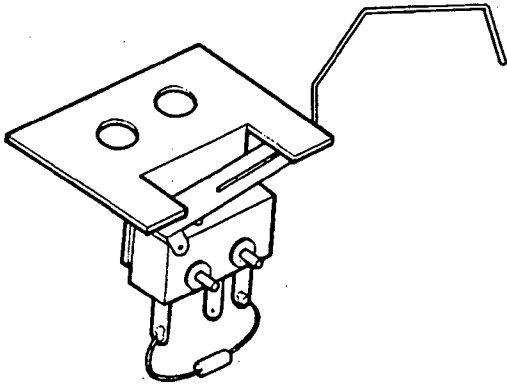
Item No.	Description	Qty.	Part No.
1	#8-32 X 3/8 Flat HD MS	3	HMS-037
2	Disk	1	BSF-019
3	#8 X 1/2 Hex Wash HD WS	4	HST-016
4	Schroud (left)	1	ASS-009
5	Bushing	1	PVB-002
6	#8 Cone PT (W/Locking nylon)	1	HSS-002
7	Schroud (right)	1	ASS-010
8	Ball guide assembly	1	ABG-013
9	Standup target assembly (left)	1	ASS-012
10	#8 T-nut	4	HTN-003
11	#5-40 X 5/8 Phil Pan HD MS	8	HMS-005
12	Standup target bracket	2	BSS-064
13	#6 X 1/2 HEX Washer HD	8	HST-004
14	Motor bracket	1	BSS-036
15	#8 -32 X 5/8 HEX Washer HD MS	4	HMS-036
16	Motor	1	MTR-001
17	#8-32 X 3/8 HEX Wash HD W/EXT.SEMS	4	HSM-013
18	Standup target assembly (right)	1	ASS-011
19	#8-32 Elastic stop nut	3	HNE-002
20	#8 Washer	3	HWA-003
21	Spacer 1 3/4" (#6 Hole)	4	SPA-001

LAMP SOCKETS

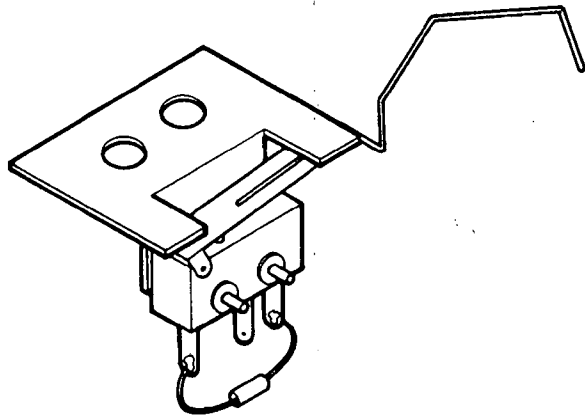
LBK-002	LBK-003	LBK-004
 A technical drawing of a cylindrical lamp socket with a central screw-in bulb base. It features a mounting bracket on the side with two screw holes and a base with two screw holes.	 A technical drawing of a lamp socket with a central bulb base. It has a large, L-shaped mounting bracket on the side with a hole at the top and a base with two screw holes.	 A technical drawing of a lamp socket with a central bulb base. It features a mounting bracket on the side with a hole and a base with two screw holes.
LBK-006	LBK-007	LBK-009
 A technical drawing of a lamp socket with a central bulb base. It has a mounting bracket on the side with a hole and a base with two screw holes.	 A technical drawing of a lamp socket with a central bulb base. It features a large, L-shaped mounting bracket on the side with a hole at the top and a base with two screw holes.	 A technical drawing of a lamp socket with a central bulb base. It has a mounting bracket on the side with a hole and a base with two screw holes.
LBK-010	LBK-014	LBK-016
 A technical drawing of a lamp socket with a central bulb base. It has a large, L-shaped mounting bracket on the side with a hole at the top and a base with two screw holes.	 A technical drawing of a lamp socket with a central bulb base. It has a mounting bracket on the side with a hole and a base with two screw holes.	 A technical drawing of a lamp socket with a central bulb base. It features a mounting bracket on the side with a hole and a base with two screw holes.

SWITCHES

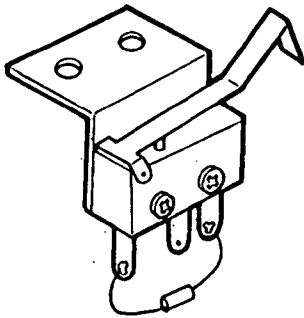
MSA-005



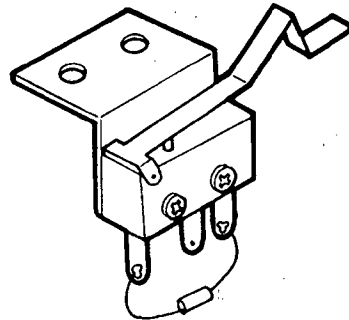
MSA-006



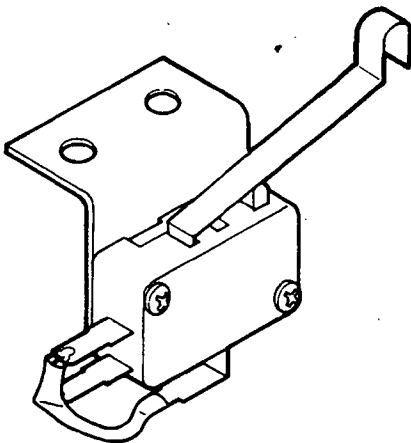
MSW-007



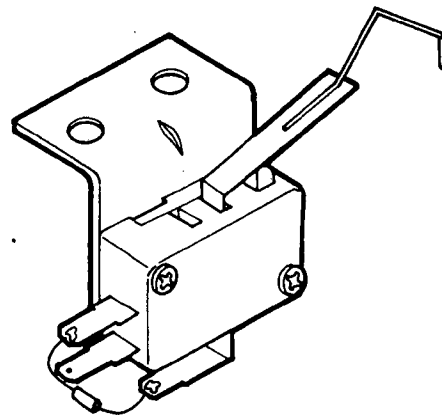
MSW-009



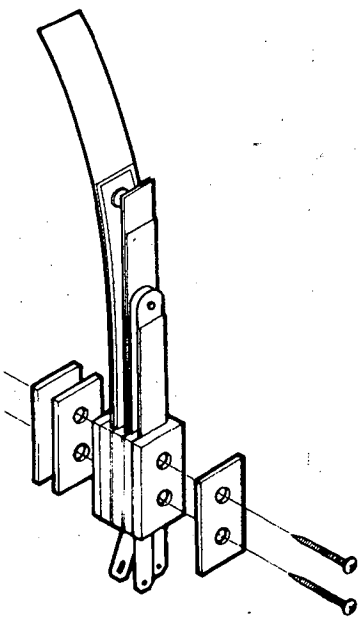
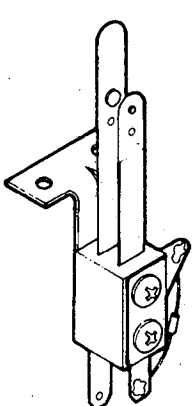
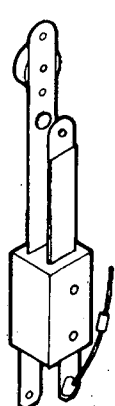
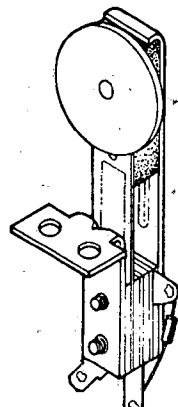
MSW-011



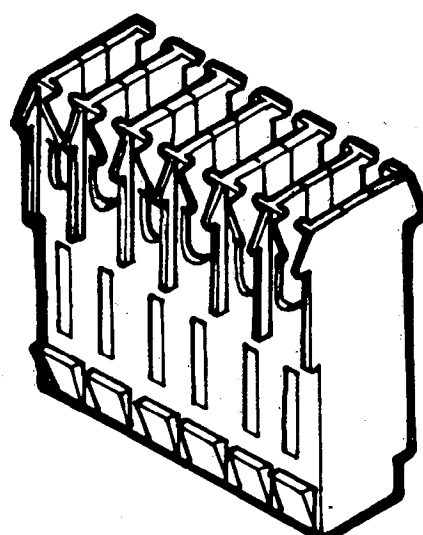
MSW-013



SWITCHES

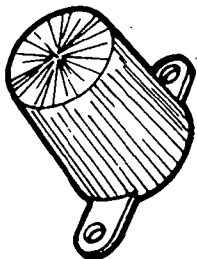
LSW-001	STR-001	STR-005	STR-004 (YELLOW) STR-002 (RED)
			

CONNECTORS

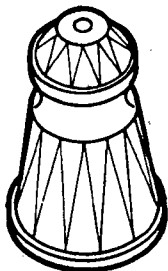
	Description	Qty.	Part No.
	.156" End 4 pin	1	C18-E04
	.156" End 5 pin	1	C18-E05
	.156" End 8 pin	4	C18-E08
	.156" End 16 pin	1	C18-E16
	.156" Thru 2 pin	1	C18-T02
	.156" Thru 4 pin	2	C18-T04
	.156" Thru 7 pin	1	C18-T07
	.156" Thru 14 pin	1	C18-T14
	.156" End 5 pin	2	C22-E05
	.156" End 6 pin	3	C22-E06
	.156" End 9 pin	2	C22-E09
	.156" End 12 pin	1	C22-E12
	.156" End 14 pin	2	C22-E14
	.156" End 16 pin	2	C22-E16
	.156" End 17 pin	2	C22-E17
	.100" Center 15 pin	1	C22-F15
.156" Thru 10 pin	1	C22-T10	
.156" Thru 16 pin	1	C22-T16	

MISCELLANEOUS PARTS

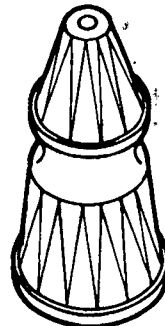
MLT-012



PFP-002



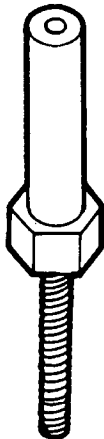
PFP-027



PST-001



PST-002



PST-003



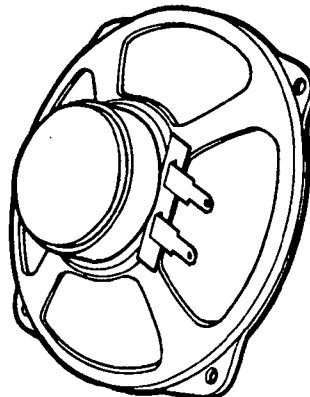
PST-004



MPT-001



SPK-003
SPK-005



PARTS NOT SHOWN

Description	Qty.	Part No.
Back box bolt 3/8" - 24 X 2 1/2"	1	HCB-012
Back box hinge (left)	1	BSL-049
Back box hinge (right)	1	BSL-050
Back glass	1	GTD-004
Cash box	1	CAS-001
Cash box cover	1	CBC-002
Cash box lock plate	1	BSF-008
Flipper button	2	FBT-009
Front molding assembly	1	AFM-002
Glass (must be tempered) 21" X 43" X 3/16"	1	GLC-004
Leg	4	LEG-001
Leg bolt 3/8" - 16 X 2 1/2"	8	HCB-007
Leg levelers (long)	2	LEV-001
Leg leveler (short)	2	LEV-002
Lock down channel	1	LKD-002
On / Off switch assembly	1	ANF-001
Pinball	3	BAL-001
Plum bob w/screw	1	PLM-001
Power transformer	1	TRN-003
Side molding (left side)	1	MAS-005
Side molding (right side)	1	MAS-004
Shooter button	1	SHB-001
Speaker grill 6" X 6"	1	SGS-004
Speaker grill 8" X 8"	1	SGS-006
Start button	1	CBB-001
Test switch assembly	1	AST-001

Section 6

Troubleshooting & maintenance

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 flashes and stops - U8, 6522

1 No flash - 5V missing or 20V missing

On all the time - EPROM missing or Bad

Coil not energizing

First check to see if the coil and driver is in working condition. To check coil and driver use test T.10 and find the corresponding coil in the sub-menu of coils. If the coil does not energize, using a jumper try grounding out the corresponding transistor using a quick tap to the drain which is the large metal part of the transistor to see if the coil energizes. Do not hold the jumper to the drain (large metal part) there is a good possibility of burning up the coil. If the coil energizes replace transistor or C.P.U. If it does not energize & wiring has good continuity, replace the coil.

If the coil and driver function properly, check to see if the control switch for that corresponding coil works. To check for a bad switch use test T.6 and close the switch with a pinball to see if it reads properly. If there is no continuity replace the switch. If there is continuity check to see if the pinball is actually closing the switch. Tweak wire form or switch arm to get a proper closure.

Switch not being read

To check for a bad switch use test T.6 and close the switch with a pinball to see if it reads properly. If there is no continuity replace the switch.

Flasher not flashing

The flasher is protected by the Flasher relay board which turns off power to all flasher sections in the case of a short. First check the F7 fuse on the power supply. Unplug the flashers to the backbox. If the flashers on the playfield work then the flashers in the backbox may have a short. If they still don't work there may be a short in the playfield flashers. Check each flasher section to see if there is a short and repair as needed. If no short is found replace Flasher relay board.

If additional assistance please feel free to call our service staff at 1-800-858-F L I P.

Section 7

Wiring diagrams & schematics

C.P.U. / DRIVER BOARD

Page 1 of 4

C.P.U. / DRIVER BOARD
Page 1 of 4

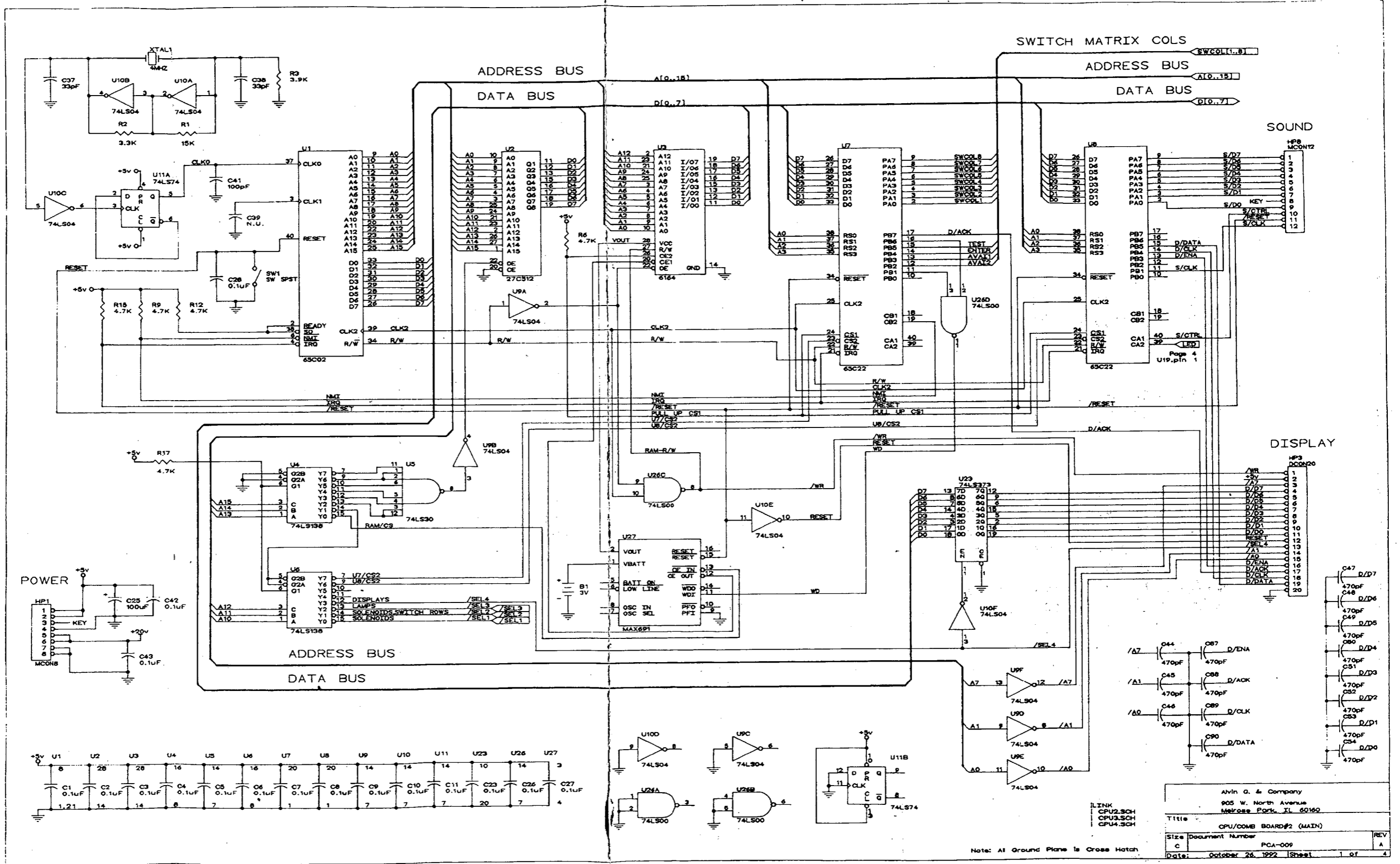
Game ROM summary

Board identification	Socket #	Type	Part #
C.P.U. / Driver board	U2	27C512	EPM-G01

To order a replacement CPU, Dot matrix, or Sound ROM(S) from an authorized Alvin G. & CO. distributor, specify the part number & information indicated on the ROM label.

The C.P.U. EPROM reads AG03/R01 it is divided into two separate parts.

AG03 = World Tour
R01 = Revision 1

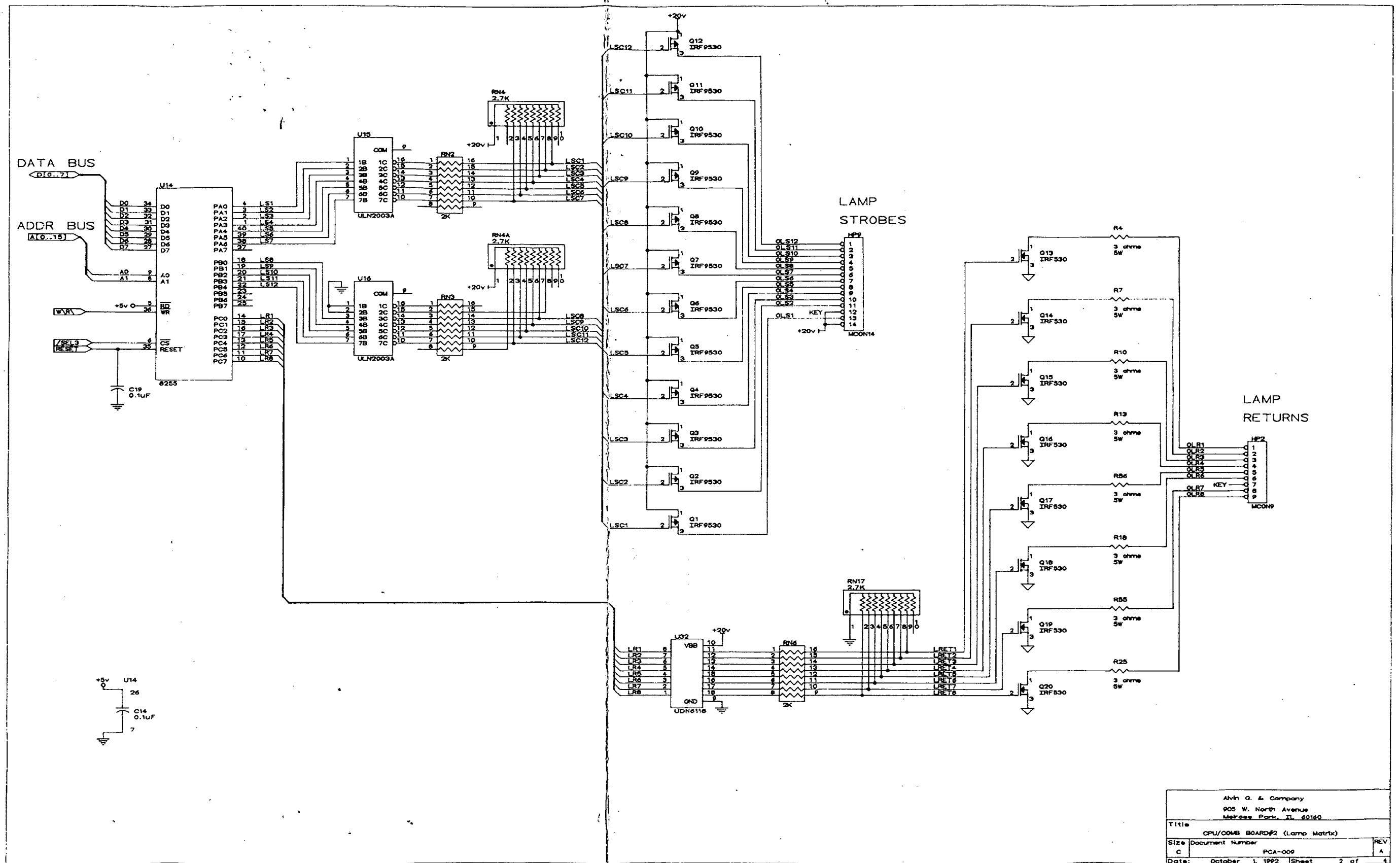


C.P.U. / DRIVER BOARD

Page 2 of 4

C.P.U. / DRIVER BOARD

Page 2 of 4



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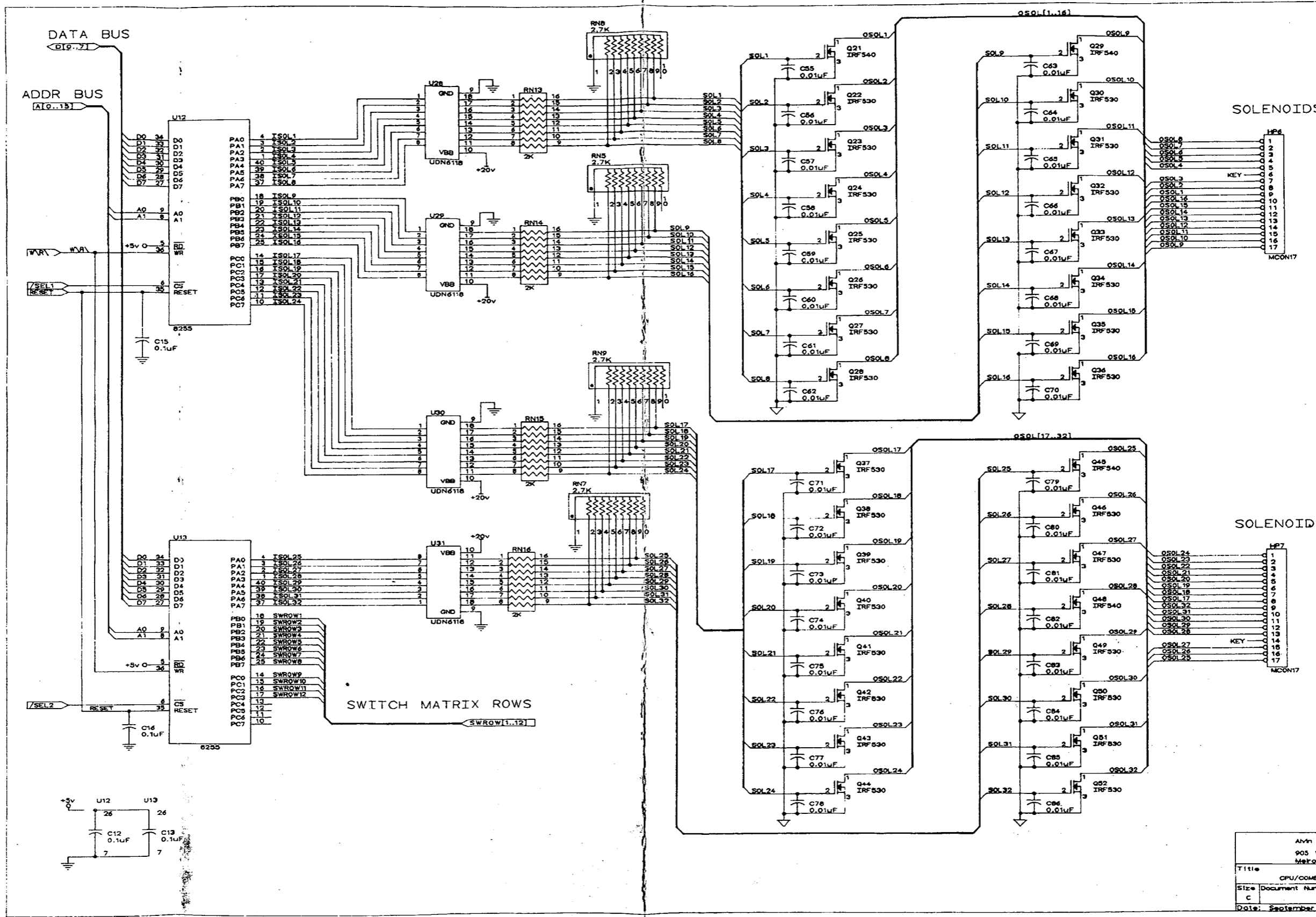
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Size	Document Number	PCA-009	A
C	Date:	October 1, 1992	Sheet 2 of 4

C.P.U. / DRIVER BOARD

Page 3 of 4

C.P.U. / DRIVER BOARD

Page 3 of 4



SOLENOIDS

SOLENOIDS

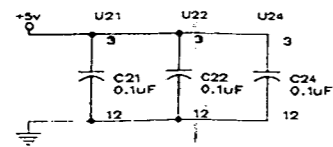
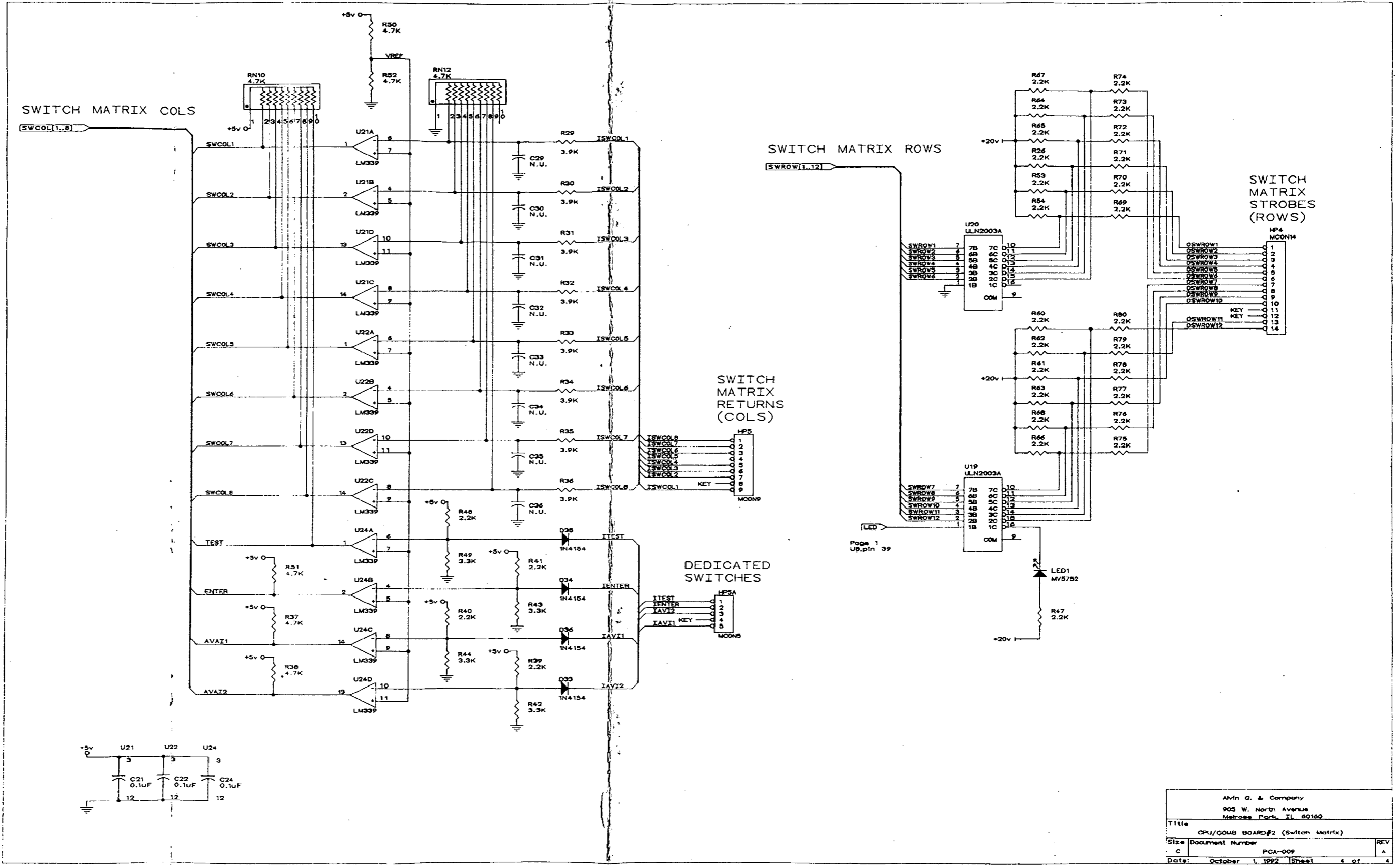
Avn G. & Company		
905 W. North Avenue		
Merrill Park, IL 60160		
Title CPU/COMB BOARD#2 (SOLENOIDS)		
Size	Document Number	REV
C	PCA-009	A
Date: September 18, 1992 Sheet 3 of 4		

C.P.U. / DRIVER BOARD

Page 4 of 4

C.P.U. / DRIVER BOARD

Page 4 of 4



Page 1
Up, pin 39

Alvin G. & Company 905 W. North Avenue Melrose Park, IL 60160		
Title CPU/COMB BOARD#2 (Switch Matrix)		
Size Document Number	PCA-009	REV A
Date: October 1, 1992	Sheet	4 of 4

DOT MATRIX CONTROLLER BOARD

Page 1 of 2

DOT MATRIX CONTROLLER BOARD
Page 1 of 2

Game ROM summary

Board identification	Socket #	Type	Part #
Dot matrix controller	U4	27C512	EPM-D01
	U5	27C020	EPM-D02
	U6	27C020	EPM-D03

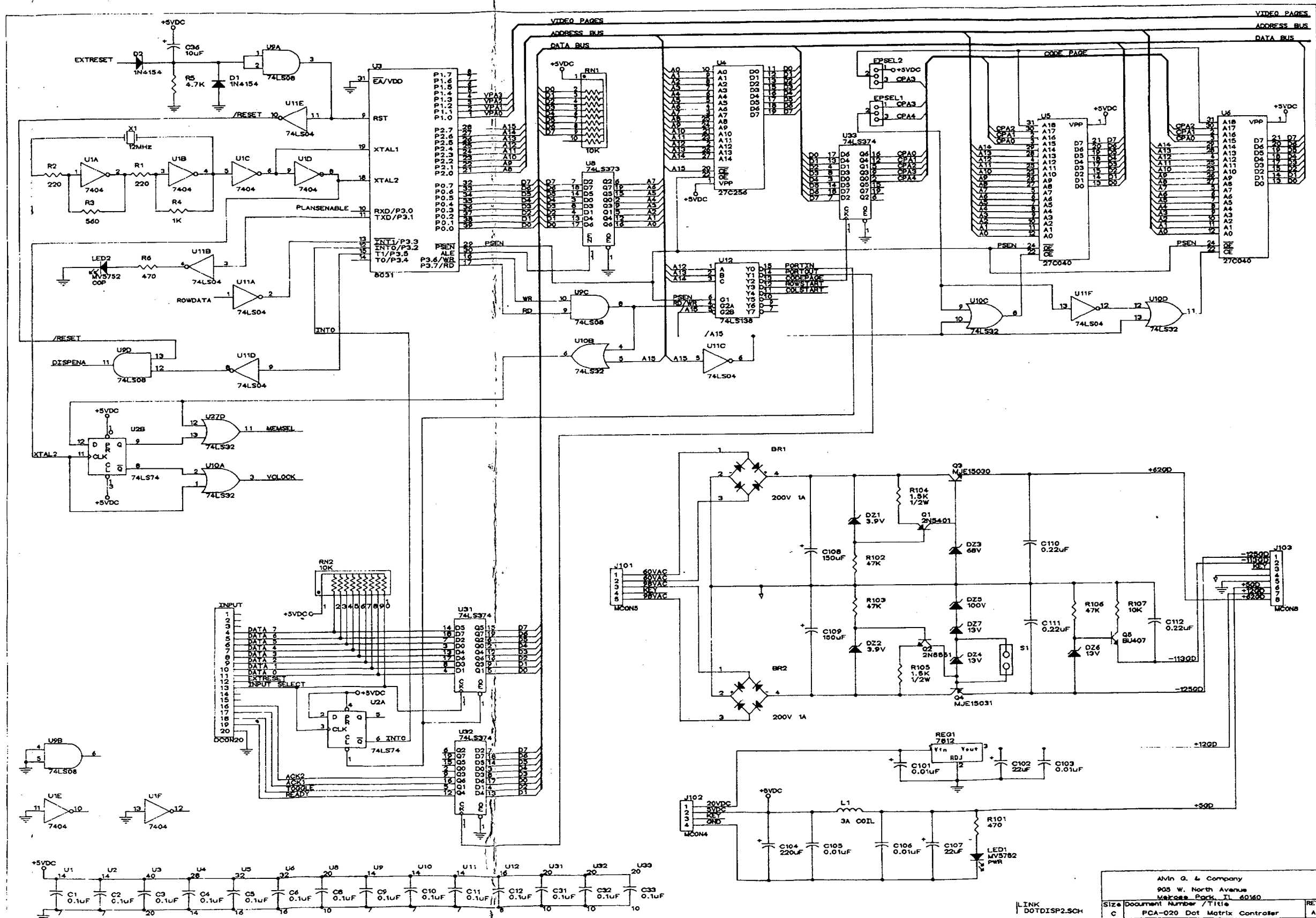
To order a replacement CPU, Dot matrix, or Sound ROM(S) from an authorizes Alvin G. & CO. distributor, specify the part number & information indicated on the ROM label.

The C.P.U. EPROM reads AG03/R01 it is divided into two seperate parts.

AG03 = World Tour
R01 = Revision 1

Game jumper summary

Board identification	Jumper #	Factory setting
Dot matrix controller	EPSEL1	Pin 1 & Pin 2
	EPSEL2	Pin 1 & Pin 2
	SEL 64	Pin 2 & Pin 3
	S1	Pin 1 & Pin 2



LINK DOTDISP2.SCH

DOT MATRIX CONTROLLER BOARD

Page 2 of 2

DOT MATRIX CONTROLLER BOARD

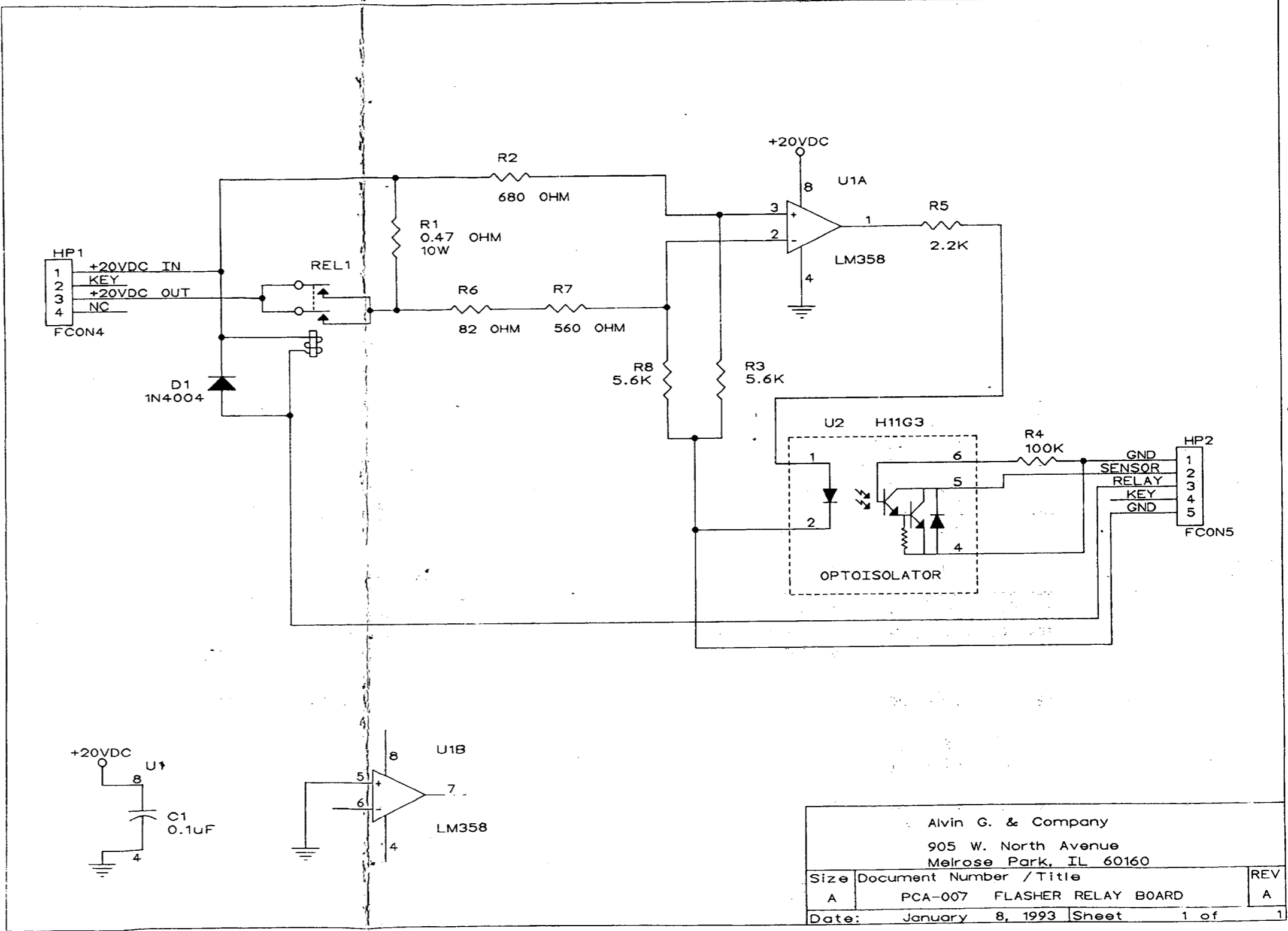
Page 2 of 2

FLASHER RELAY BOARD

Page 1 of 1

FLASHER RELAY BOARD

Page 1 of 1



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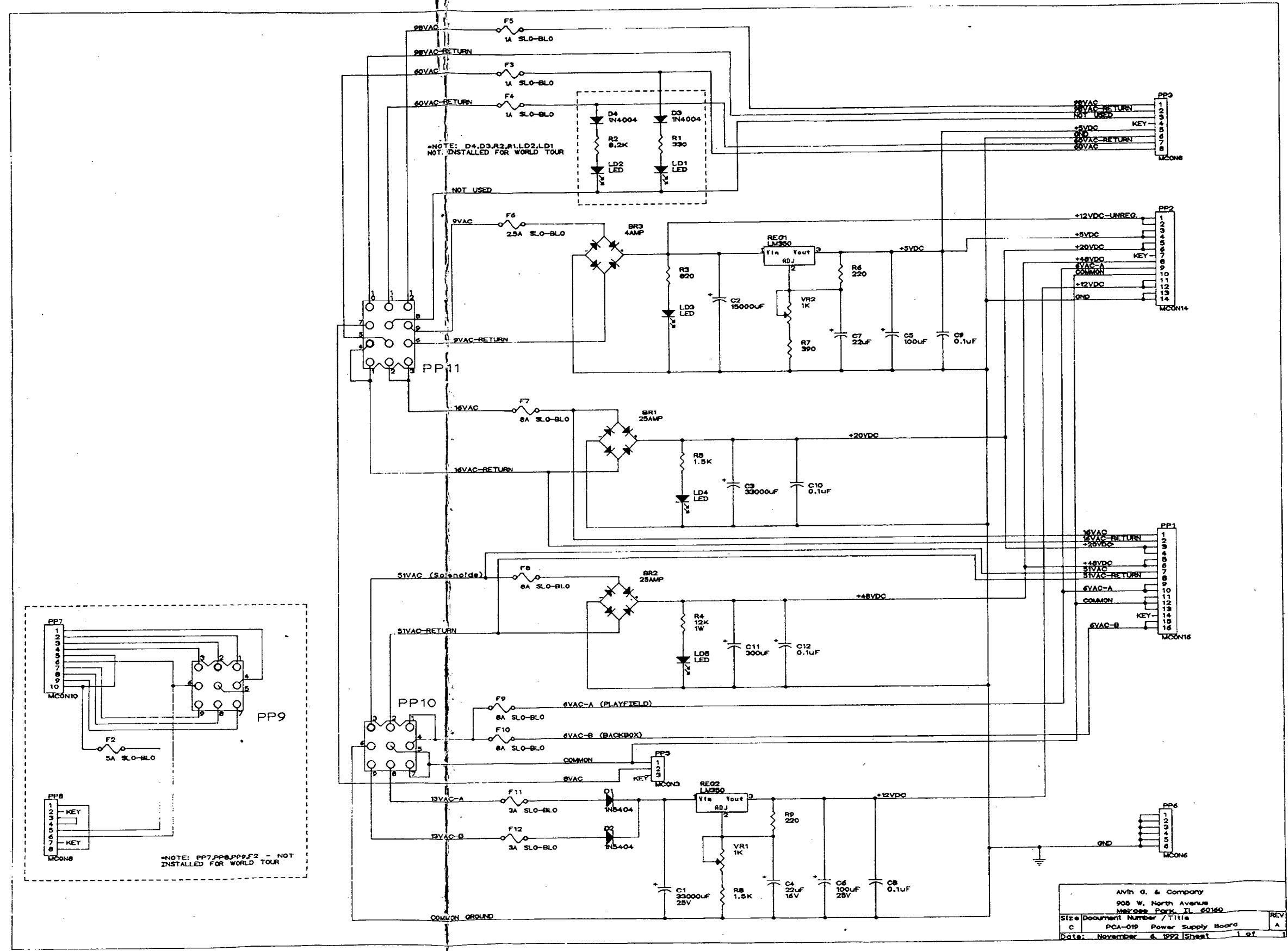
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A	PCA-007 FLASHER RELAY BOARD	A
Date:	January 8, 1993	Sheet 1 of 1

POWER SUPPLY BOARD

Page 1 of 1

POWER SUPPLY BOARD

Page 1 of 1



SOUND BOARD

Page 1 of 2

Game ROM summary

Board identification	Socket #	Type	Part #
Sound board	U102	25C512	EPM-S01
	AROM0	27C020	EPM-S02
	AROM1	27C020	EPM-S03
	AROM2	27C020	EPM-S04
	AROM3	27C020	EPM-S05

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.

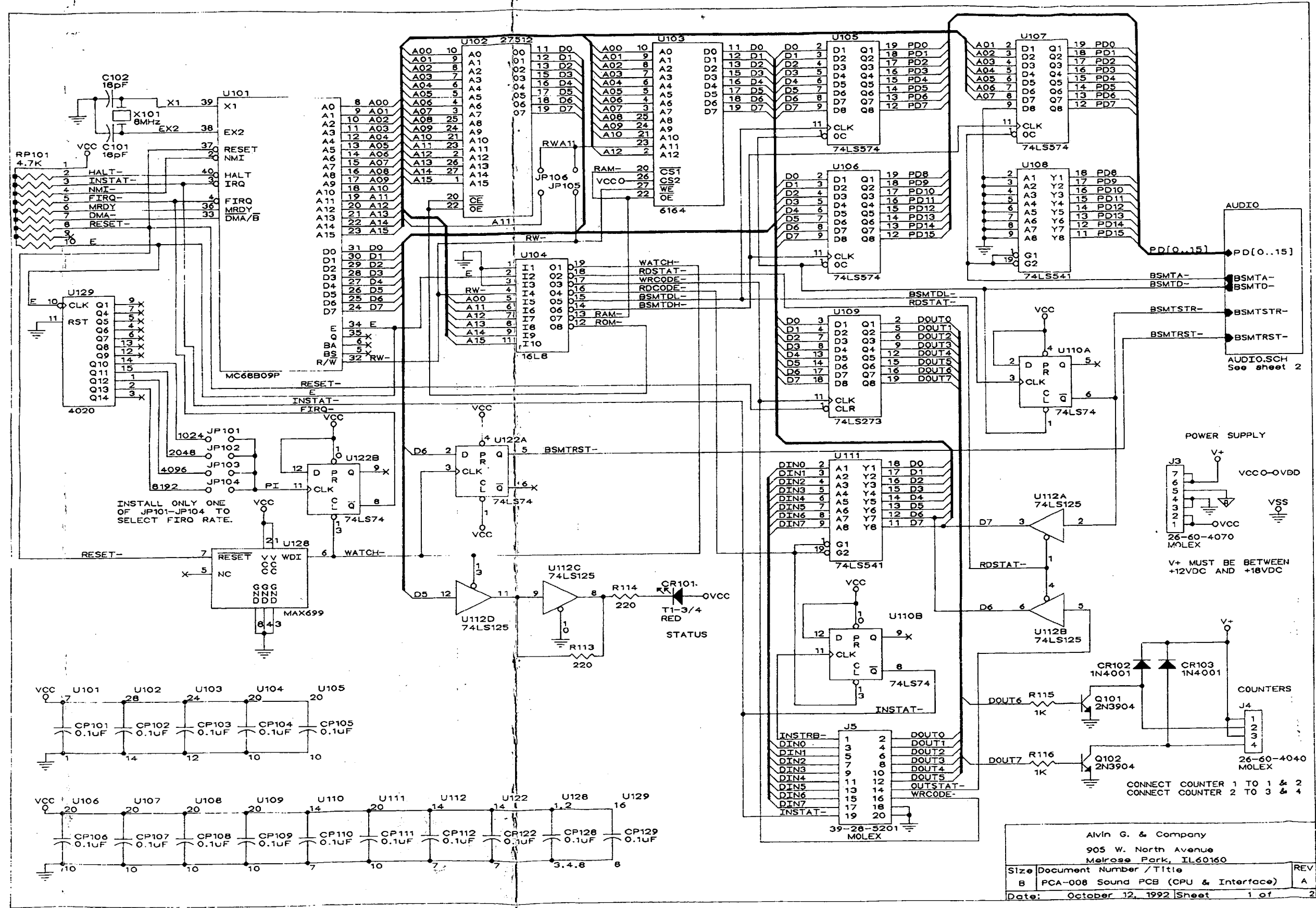
The C.P.U. EPROM reads AG03/R01 it is divided into two separate parts.

AG03 = World Tour
R01 = Revision 1

Game jumper summary

Board identification	Jumper #	Factory setting
Sound board	JP101	Open
	JP102	Open
	JP103	Jumpered
	JP104	Open
	JP105	Open
	JP106	Jumpered

SOUND BOARD
Page 1 of 2



INSTALL ONLY ONE OF JP101-JP104 TO SELECT FIRQ RATE.

POWER SUPPLY
 VCC-OVDD
 VSS
 OVCC
 26-60-4070 MOLEX
 V+ MUST BE BETWEEN +12VDC AND +18VDC

COUNTERS
 26-60-4040 MOLEX
 CONNECT COUNTER 1 TO 1 & 2
 CONNECT COUNTER 2 TO 3 & 4

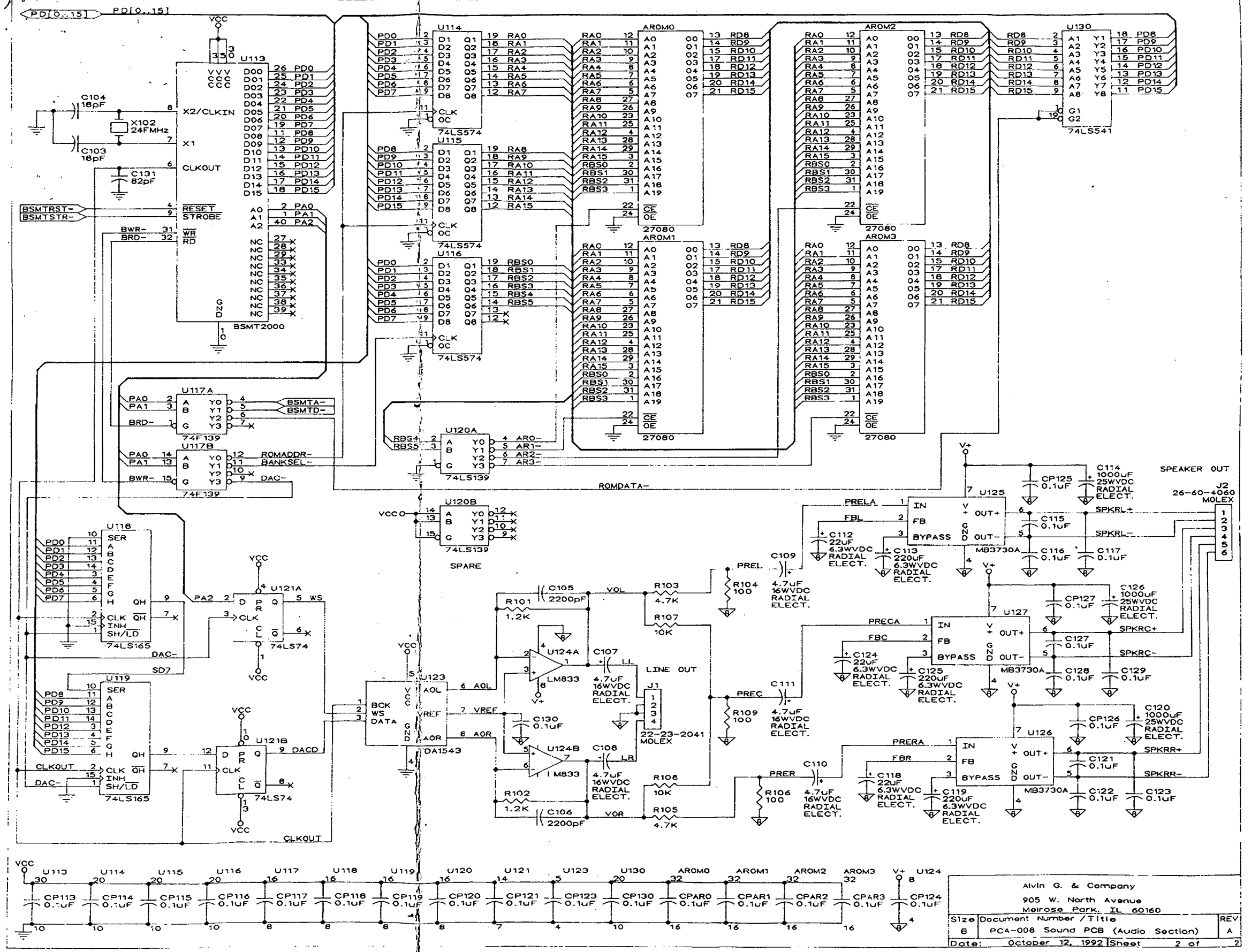
Alvin G. & Company
 905 W. North Avenue
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 Size Document Number / Title REV
 B PCA-008 Sound PCB (CPU & Interface) A
 Date: October 12, 1992 Sheet 1 of 2

SOUND BOARD

Page 2 of 2

SOUND BOARD

Page 2 of 2



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Size	Document Number / Title	REV
B	PCA-008 Sound PCB (Audio Section)	A

Date: October 12, 1992 Sheet 2 of 2

CABINET WIRING DIAGRAM

Page 1 of 1

CABINET WIRING DIAGRAM

Page 1 of 1

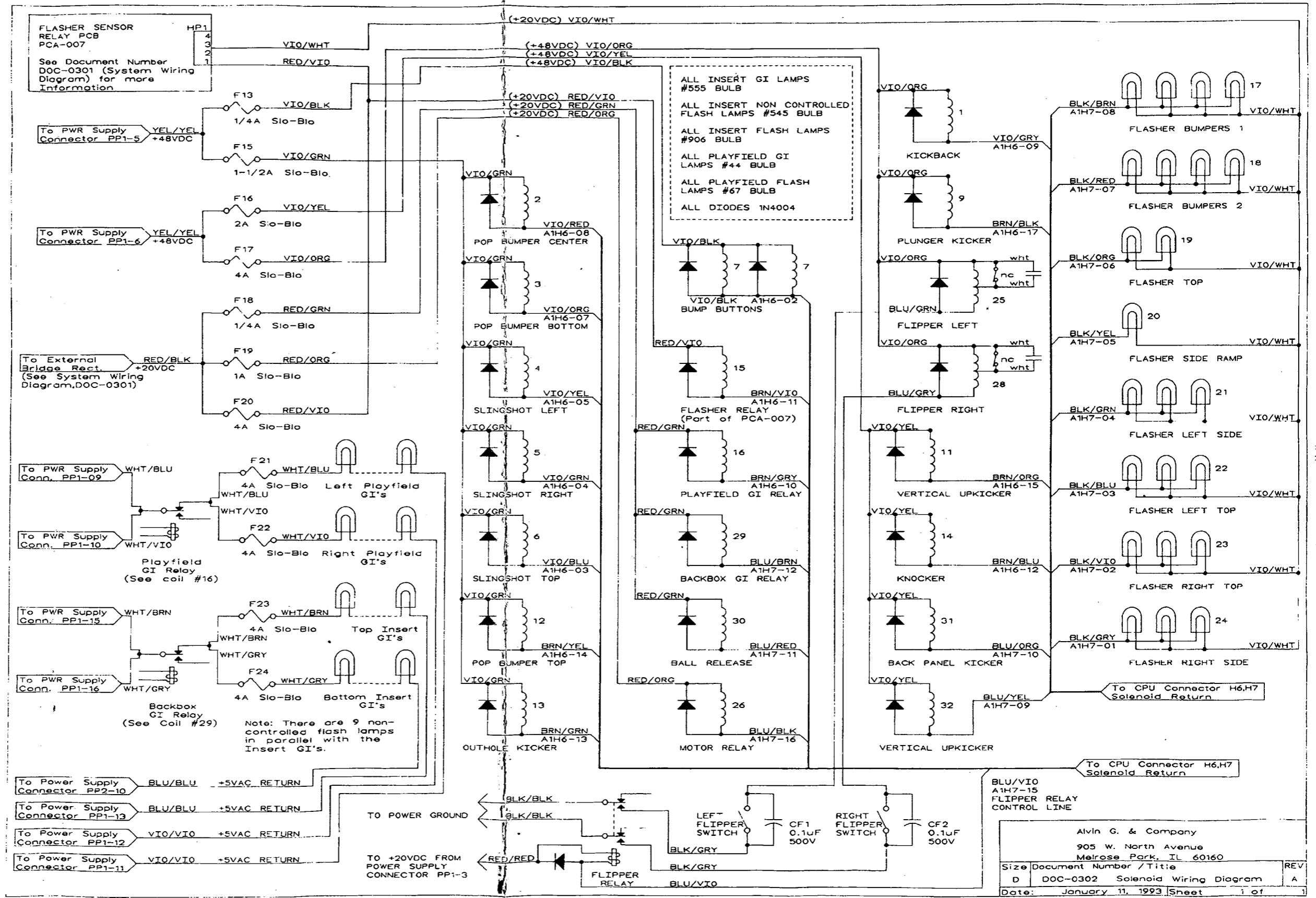
7-23

COIL WIRING DIAGRAM

Page 1 of 1

COIL WIRING DIAGRAM

Page 1 of 1

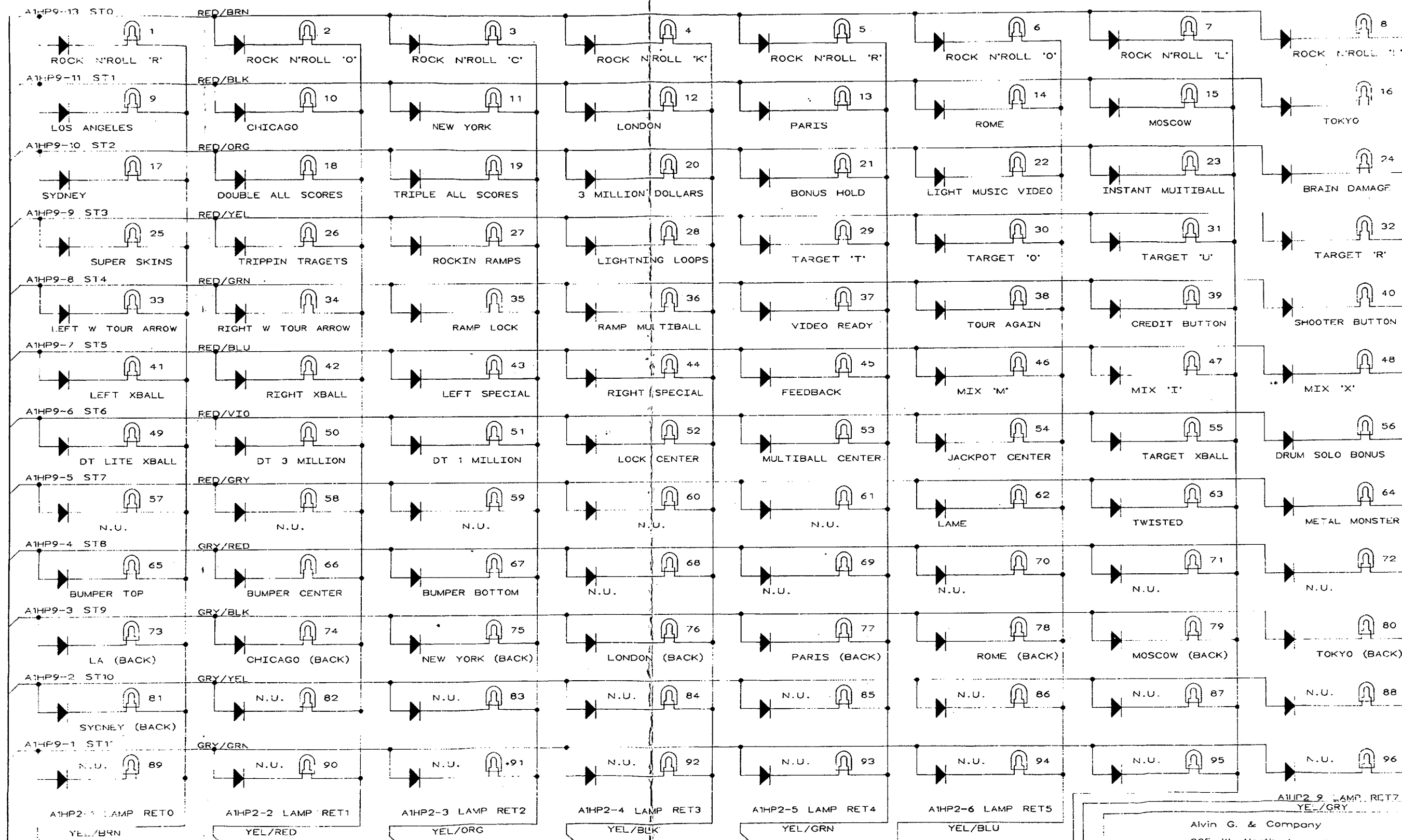


LAMP WIRING DIAGRAM

Page 1 of 1

LAMP WIRING DIAGRAM

Page 1 of 1



TO CPU LAMP STROBES HP9

ALL DIODES 1N4004

TO CPU LAMP RETURNS HP2

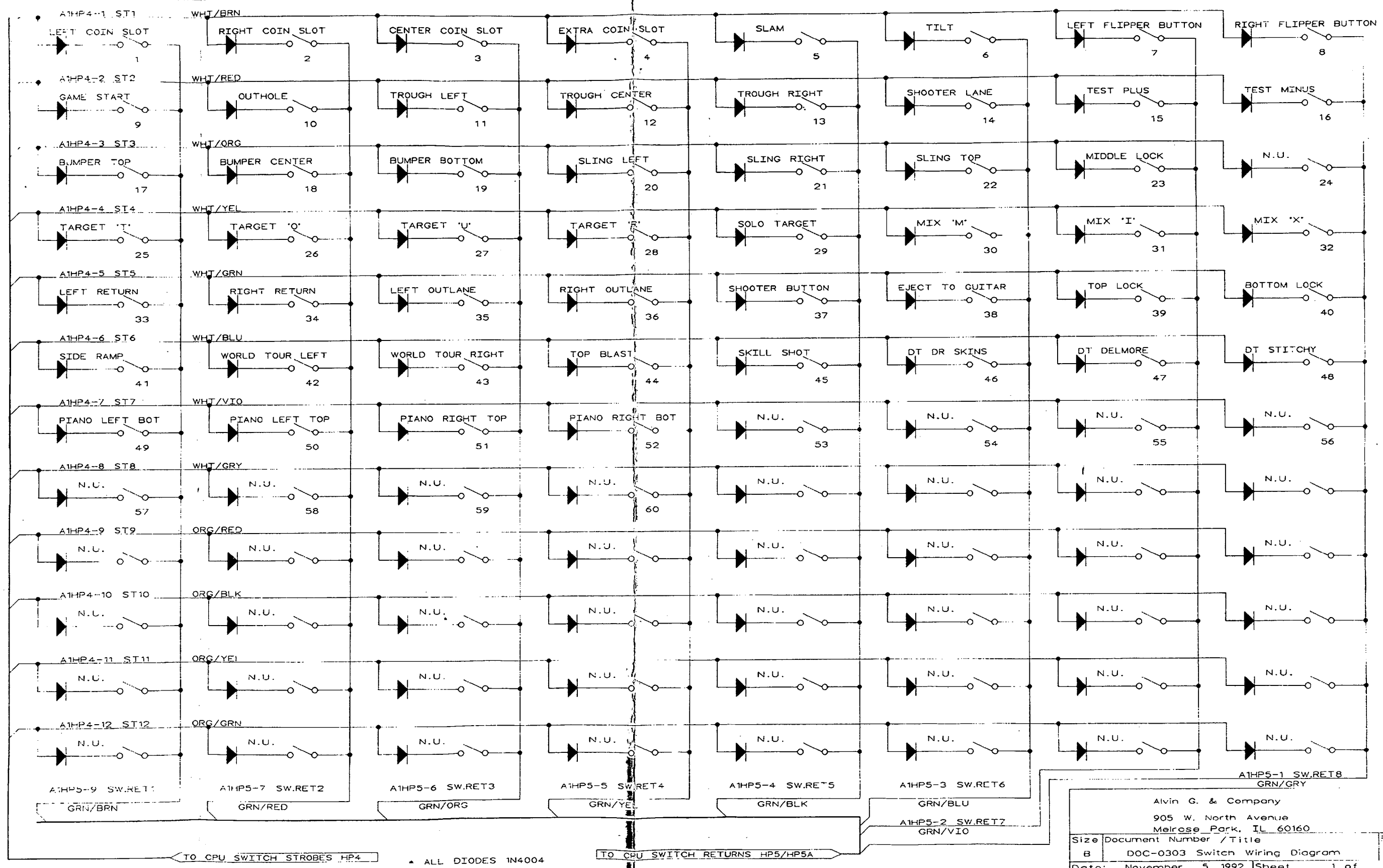
Alvin G. & Company
 905 W. North Avenue
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 Size Document Number / Title
 B D0C-0304 Lamp Wiring Diagram
 Date: November 9, 1992 Sheet 1 of 1

SWITCH WIRING DIAGRAM

Page 1 of 1

SWITCH WIRING DIAGRAM

Page 1 of 1



TO CPU SWITCH STROBES HP4

ALL DIODES 1N4004

TO CPU SWITCH RETURNS HP5/HP5A

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Size	Document Number / Title	REV
B	DOC-0303 Switch Wiring Diagram	A
Date:	November 5, 1992	Sheet 1 of 1

SYSTEM WIRING DIAGRAM

Page 1 of 1

SYSTEM WIRING DIAGRAM

Page 1 of 1

