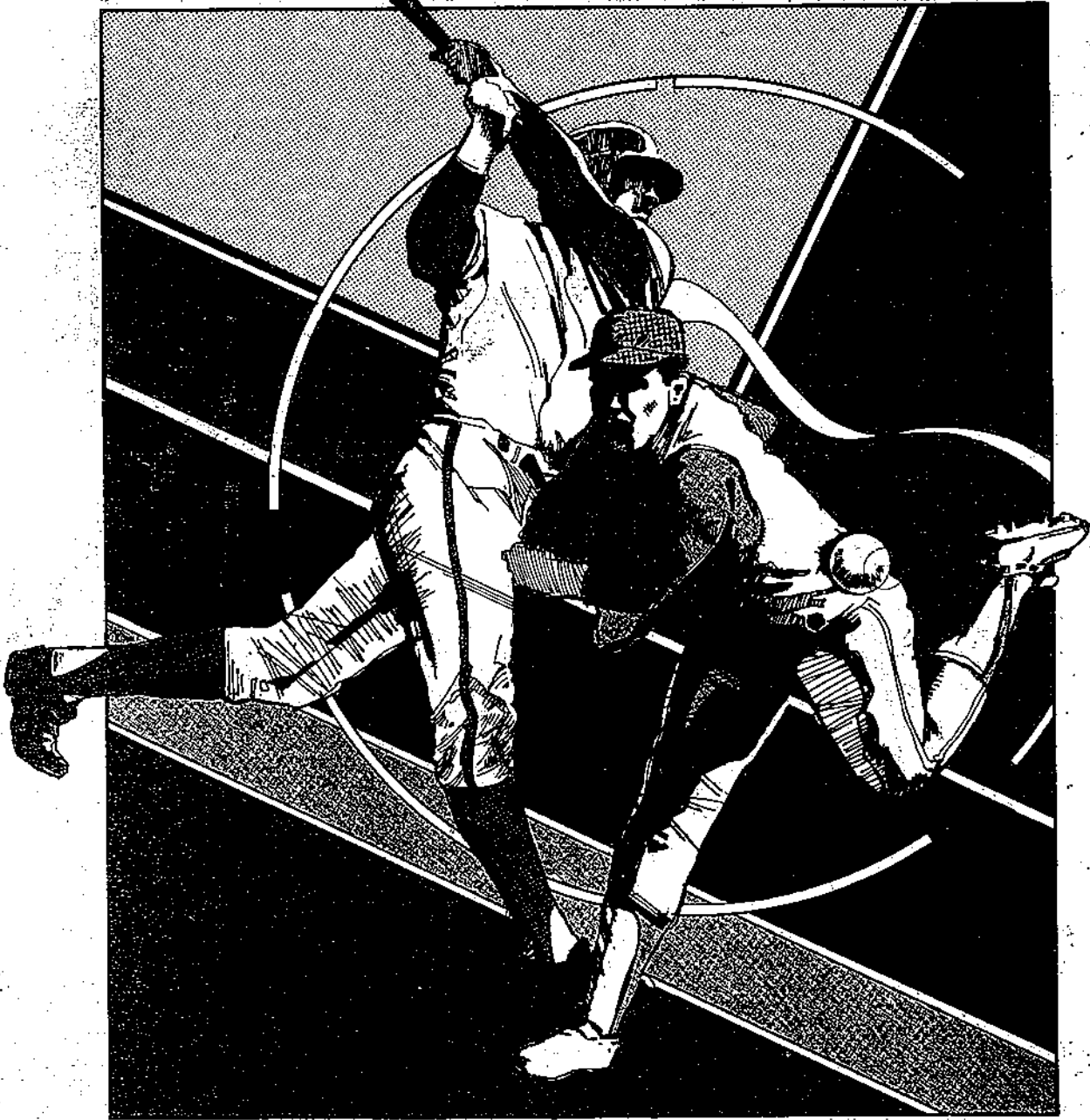


World Series

The Season



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W A R N I N G

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for class A computing device pursuant to subpart J of part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

INSTALLATION AND MAINTENANCE
MANUAL FOR
WORLD SERIES THE SEASON

CINEMATRONICS INCORPORATED
1841 Friendship Drive
El Cajon, California 92020

NOTICE REGARDING THE USE OF NON-CINEMATRONICS REPLACEMENT PARTS:

Cinematronics recommends the use of only Cinematronics parts when replacing any malfunctioning component or assembly in the Cinemat system. For safety and reliability, Cinematronics does not recommend or authorize any substitute parts or modifications of Cinematronics equipment. Such alterations may adversely affect game play, cause serious injury, and void your warranty. Unauthorized parts, modifications and non-Cinematronics game conversion kits may also void FCC compliance.

TABLE OF CONTENTS

1	SET-UP PROCEDURE	
	A. Shipping Bolt Removal.....	7
	B. Game Inspection.....	8
	C. Game Module Installation.....	9
2	BOOKKEEPING/DIAGNOSTIC FUNCTIONS	
	A. Calling Up The Main Menu.....	17
	1. Selecting The Desired Function.....	17
	B. Bookkeeping	18
	C. Diagnostics.....	20
	1. Controls Test.....	21
	2. Processor Memory Test.....	22
	3. Video Alignment Display.....	23
	4. Video Memory Test.....	25
	D. Game Set Up.....	26
	E. Game Play Statistics.....	28
	F. Inning Duration Graphs.....	29
	G. Erase All Player Statistics.....	30
3	DRAWINGS	
	A. Wiring Diagram, Control Panel.....	32
	B. Wiring Diagram, Complete.....	33
	C. Wiring Diagram, D.C. Power Detail.....	34
	D. Wire List World Series, Main Logic.....	35
	E. Wire List World Series, I/O Expansion.....	36

TABLE OF CONTENTS

CONTINUED

3

DRAWINGS

F.	Pitch Assembly.....	37
G.	Bat Assembly, Cinemat Control Panel.....	38
H.	Bat Assembly, Universal Control Panel.....	39
I.	Return Spring Detail.....	40
J.	Universal Control Panel Mounting.....	41
K.	Schematic, Memory And I/O Expander.....	42
L.	Schematic, Tag Board.....	47

SET-UP PROCEDURE

A. SHIPPING BOLT REMOVAL

The component, drawer of your Cinemat system is secured during shipment by means of a bolt located at the rear of the component drawer. (See figure 1)

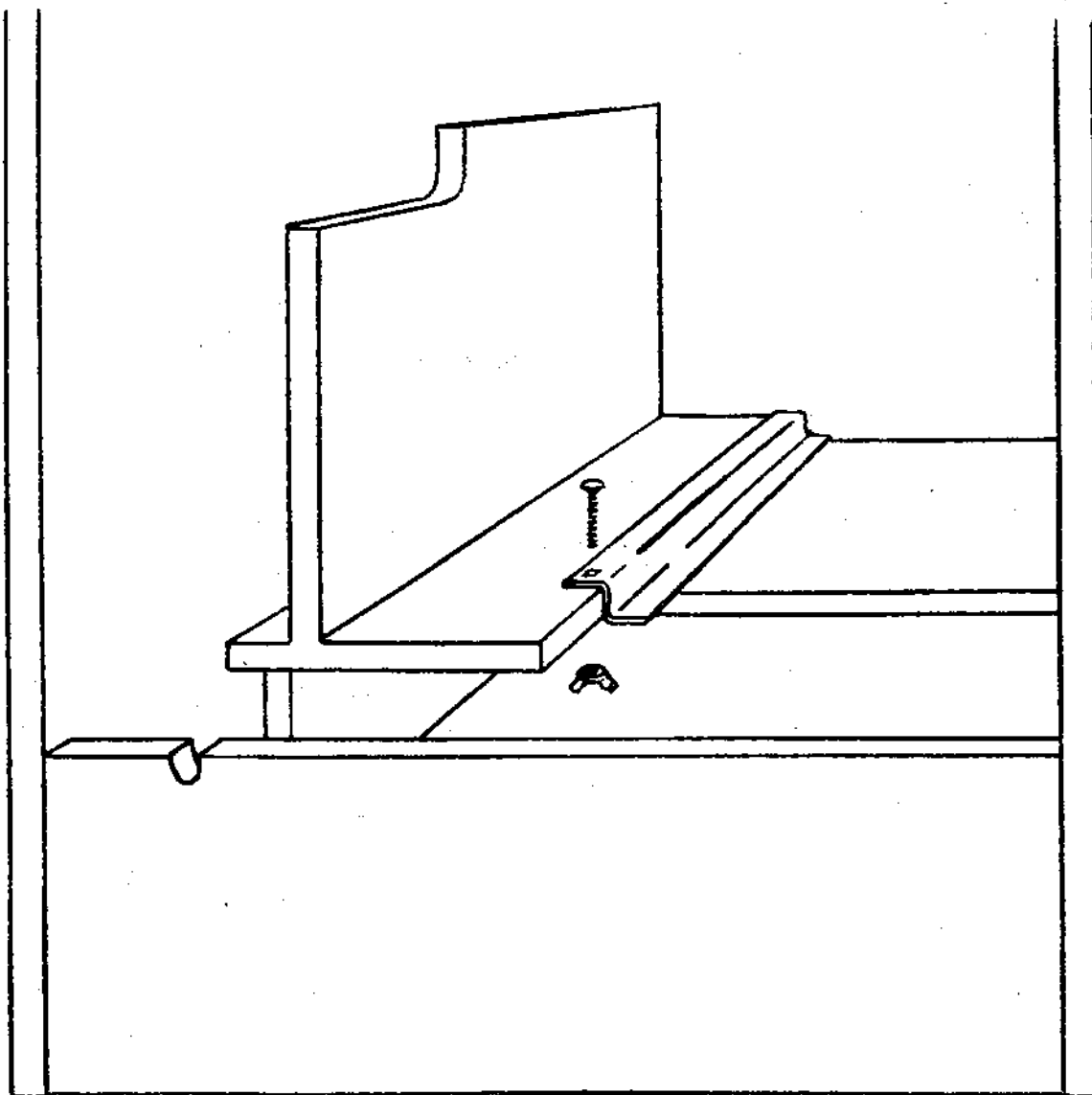


FIGURE 1

B. GAME INSPECTION

1. Examine the exterior of the game cabinet for dents, chips or broken parts.
2. Inspect the interior of the cabinet as follows:
 - a) Check that all plug in connectors are firmly seated. Re-plug any connectors found unplugged.
 - b) Check that all socketed components on the main logic board are firmly seated in their sockets.
3. Note the location of the serial number located on a tag affixed to the back of the cabinet and the main logic board serial number located near the lower right-hand corner of the board. Please make note of these numbers in the front of this manual for easy reference and mention them whenever you call your distributor or Cinematronics for service.

GAME MODULE INSTALLATION

Your WORLD SERIES game module should contain following items:

- (1) WORLD SERIES* Marquee Lexan Decal
- (1) Plexiglass Marquee
- (1) Cinemat I/O Expansion Board
- (22) ROMs
- (1) Custom Chip (U120)
- (1) 02-04 Custom Chip
- (1) Control Panel Assembly
- (4) 1 1/2" Carriage Bolts
- (4) Washers
- (2) 3/8" #10 Nuts
- (2) #10 Wingnuts
- (1) 40 Pin Ribbon Interconnect Harness
- (1) 10 Pin Power Interconnect Harness

To install a WORLD SERIES game module and enhancement module in your Cinemat system refer to the following steps:

- 1) Install the 22 WORLD SERIES eproms in the Cinemat main logic board noting the chip location ("U" number) printed on each chip and referring to Figure 2. Noting the location of pin 1 of both the eprom and socket, plug each eprom into the socket indicated. Be sure all eproms pins are aligned and the eproms are pressed firmly in place.
- 2) Install the custom chip U120 in the main logic board at location U120 and the 02-04 custom chip at U85 making sure Pin 1 of the chip and Pin 1 of the socket are aligned.
- 3) Recheck steps 1 and 2 for proper parts placement and orientation.
- 4) Remove the Z-80B microprocessor from location U99 of the main logic board and reinstall it at location U13 of the I/O expansion board. Install the I/O expansion board as shown in figure 4.
- 5) Locate the WORLD SERIES control panel assembly to the CINEMAT cabinet and attach using the 1 1/2" carriage bolts, washers, and 3/8" nuts provided. Install only the front-most bolt, washer, and nut on each side at this time. See Figure 5.
- 6) Route the control panel wiring harness. Locate the three connectors labeled P5, J4 and J5 at the end of the control panel harness. Plug connectors P5 into connector P5 located along the top edge of the main logic board. Similarly plug J4 into J4 and J5 into J5 of the I/O expansion board. Plug the remaining two wires (white and violet) of the control panel harness into connector P4 of the main board as shown in Figure 6.
- 7) Remove the protective plastic covering from the marquee plexi.

Now remove the paper backing from the self-adhesive decal. Attach the decal to the plexi and trim the excess with a sharp knife or razor blade. Install the marquee on the cabinet as shown in Figure 7.

8) Installation of the game module is now complete. We suggest you now use the Cinemat system's on board diagnostics to check the game. See the diagnostics section of this manual.

9) After testing the control panel, use the remaining two carriage bolts, washers and wing nuts to secure the control panel.

NOTE: Make sure to attach the ground braid to the control panel as shown in figure 3. Players may receive an electric shock if the control panel is not properly grounded.

WORLD SERIES

CINEMAT MAIN LOGIC
PRINTED CIRCUIT ASSEMBLY
COMPONENT SIDE

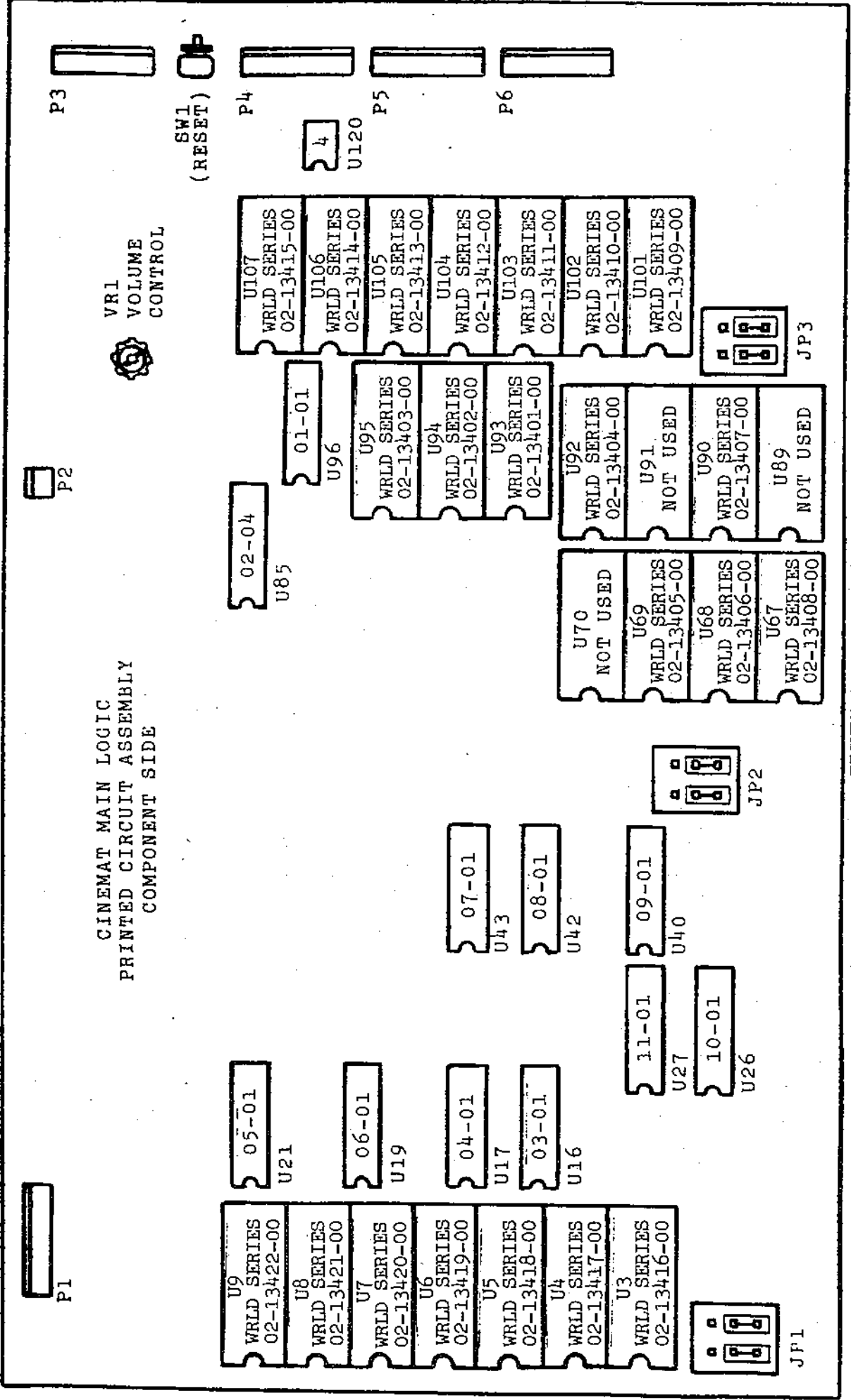


FIGURE 2

CINEMAT I/O EXPANSION
 PRINTED CIRCUIT ASSEMBLY
 COMPONENT SIDE
 WORLD SERIES

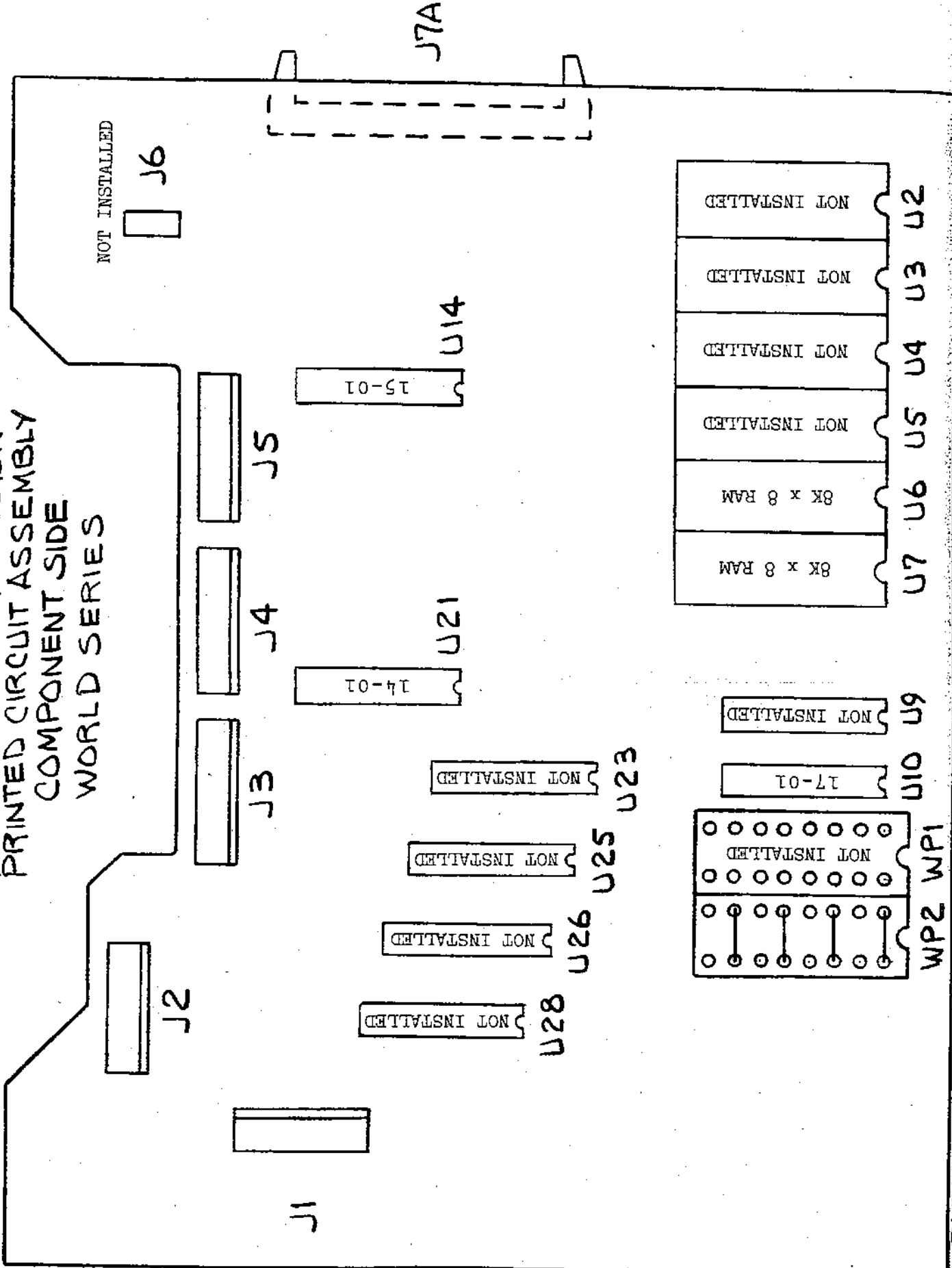


FIGURE 3

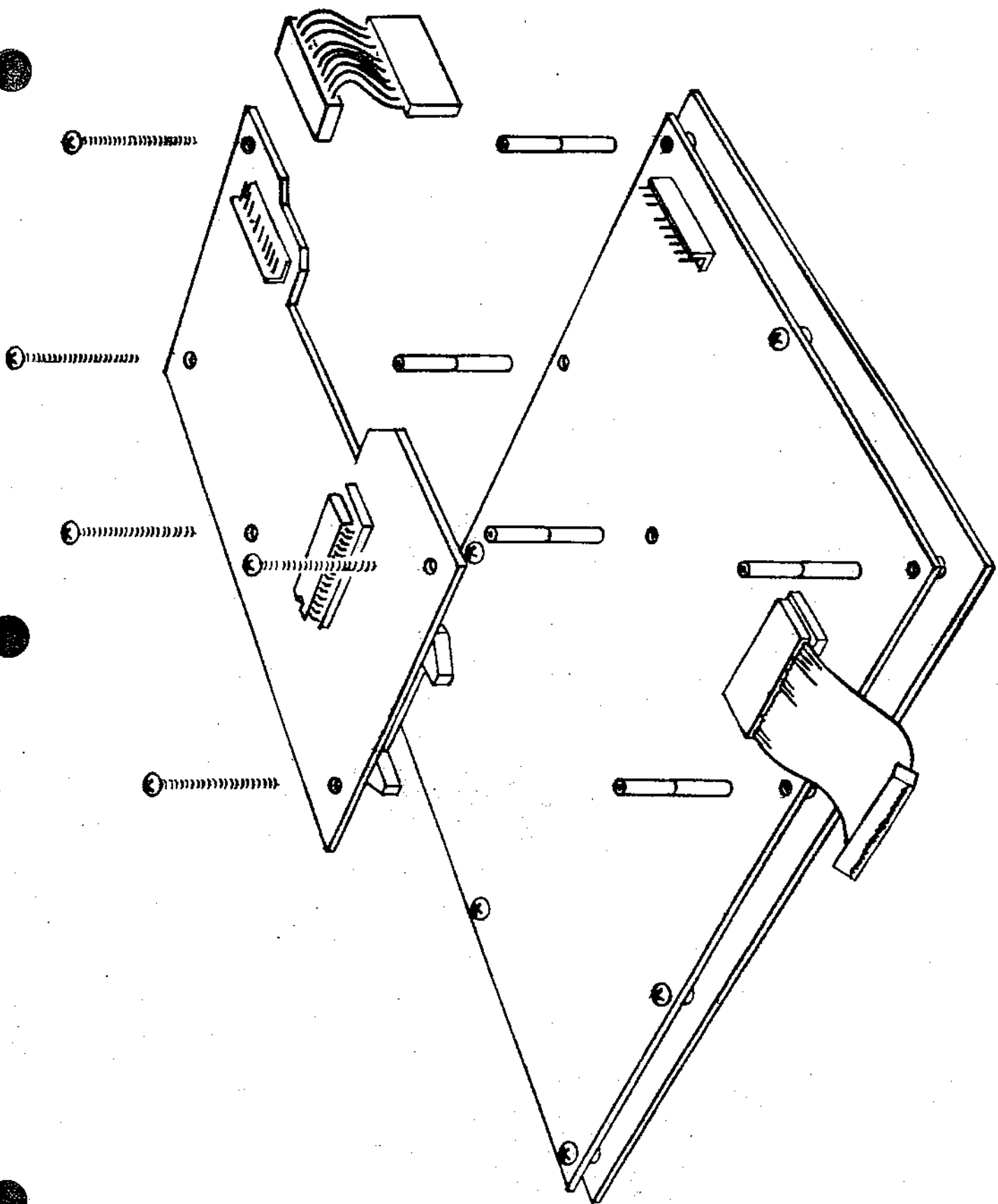


FIGURE 4

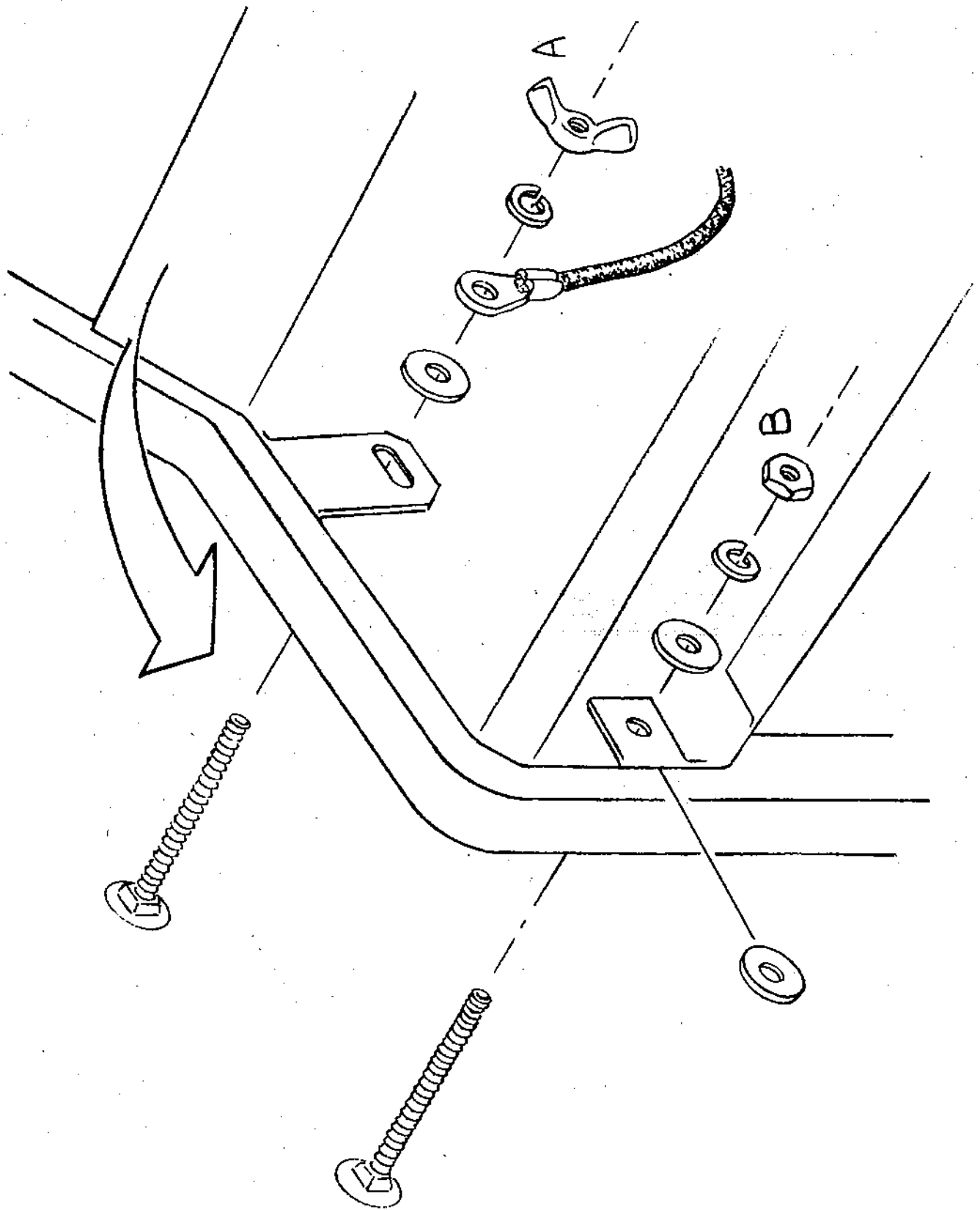
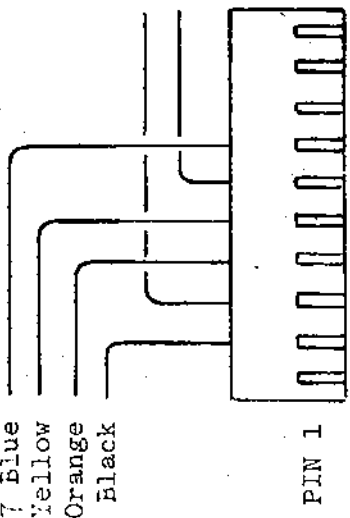


FIGURE 5

P4-7 Blue
P4-5 Yellow
P4-4 Orange
P4-2 Black

P4-3 Two Player Start (Violet)
P4-6 One Player Start (White)



System pin-out opposite of
pin-out molded on connector.

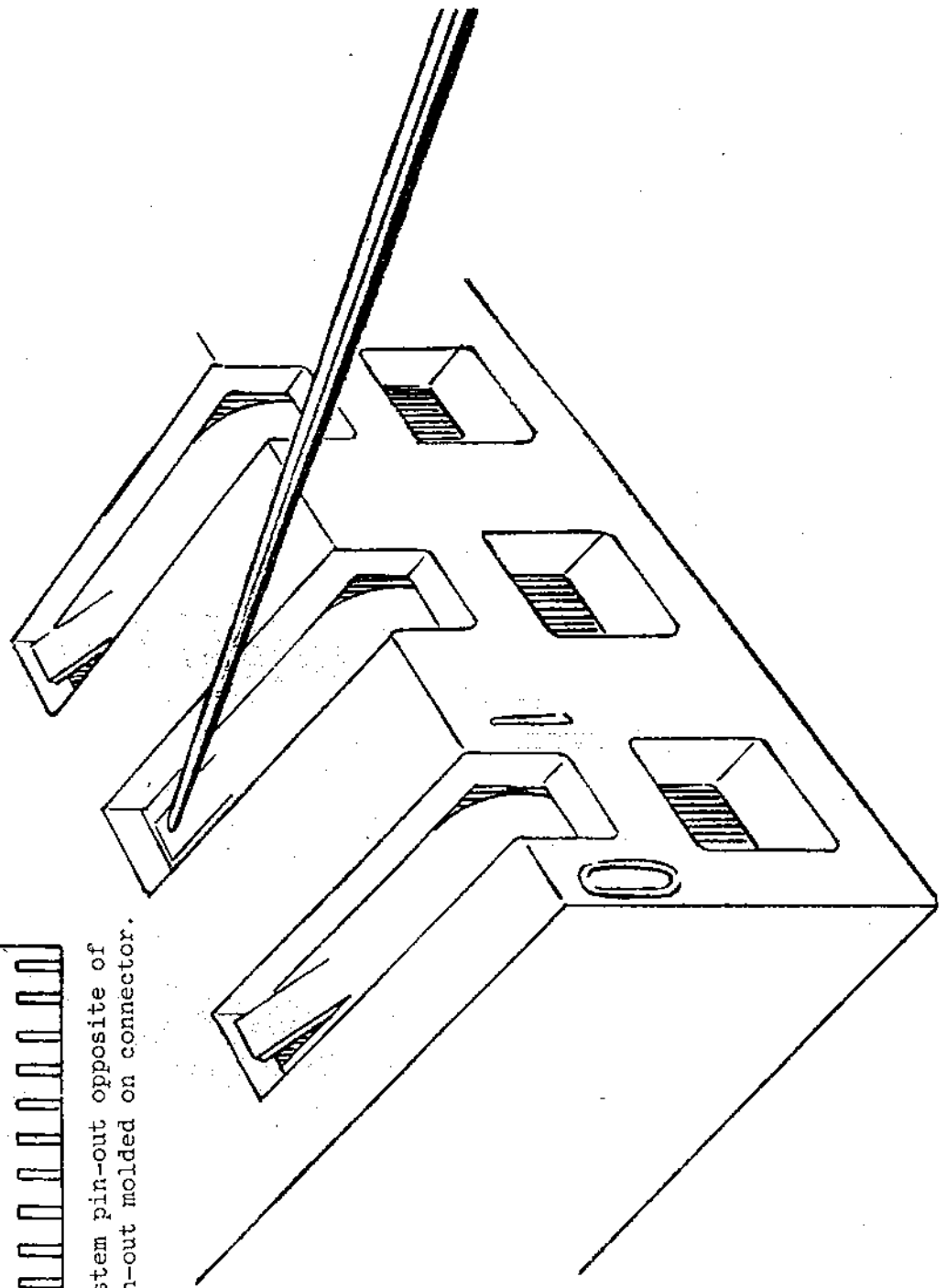


FIGURE 6

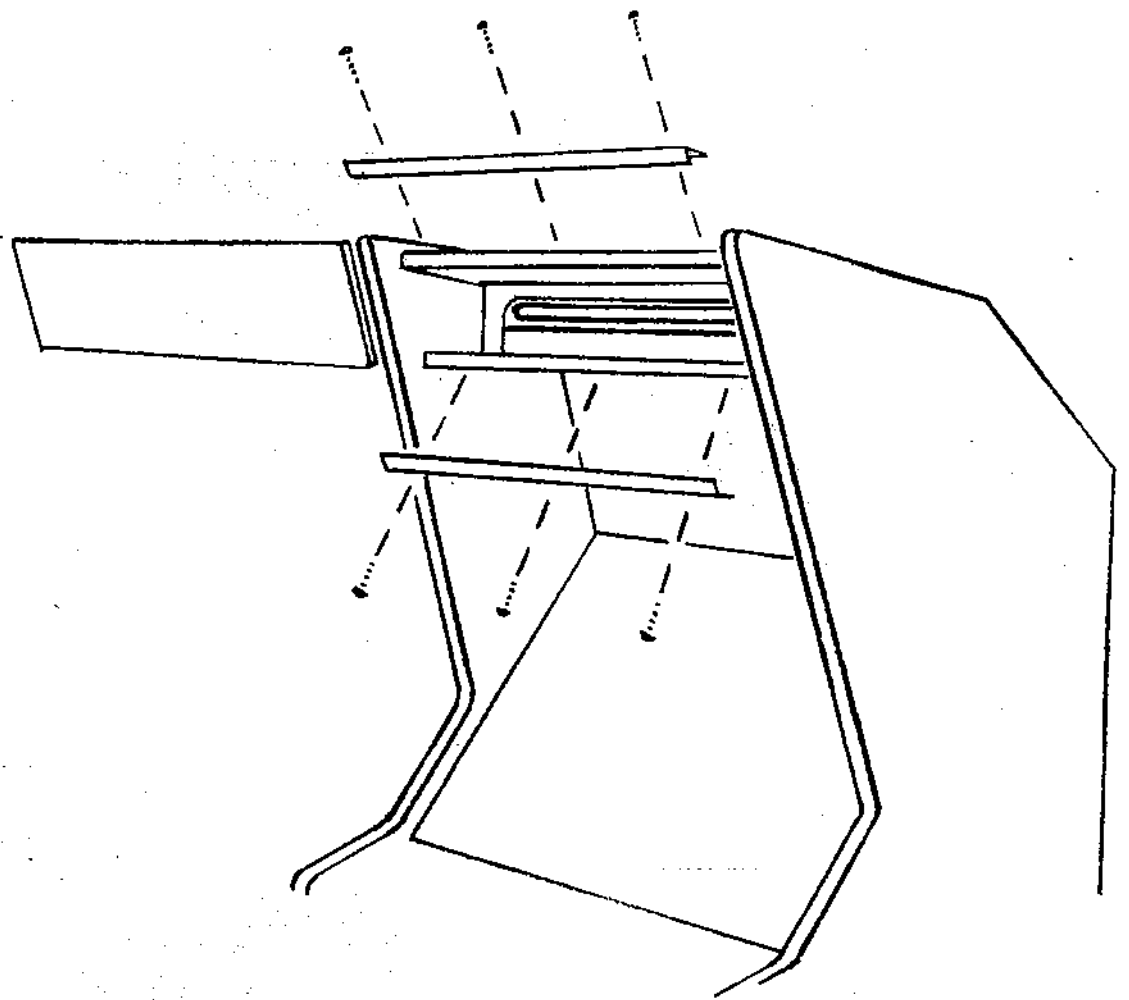


FIGURE 7

BOOKKEEPING / DIAGNOSTIC FUNCTIONS

Your WORLD SERIES game includes extensive bookkeeping and diagnostic functions. These functions are explained in the following chapter. To gain access to the bookkeeping and diagnostic section of your WORLD SERIES game you must first call up the main menu.

CALLING UP THE MAIN MENU

With the game running in the attract mode follow these steps:

1. Press and hold the one player start button while...
2. Pressing and releasing the service button (found inside the coin door mounted to the top of the coin box).
3. Release the player one start button.

The game screen should now appear as shown in figure 8. Instructions for selecting and entering the listed functions are displayed at the top of the screen with the five selectable options below them. The game's software serial number is shown in the lower right-hand corner of the screen.

SELECTING THE DESIRED FUNCTION

The one player start button selects the desired function. The function has been selected when it's color changes from red to yellow. Pressing the two player start button now enters the selected function. Selecting the RESTART THE GAME function returns the game to normal operation.

MAIN MENU

SELECT FUNCTION WITH ONE PLAYER START BUTTON
ENTER FUNCTION WITH TWO PLAYER START BUTTON

BOOKKEEPING
DIAGNOSTICS
GAME SET-UP
GAME STATISTICS
INNING DURATION GRAPHS
ERASE ALL PLAYER STATISTICS

RESTART GAME

FIGURE 8

BOOKKEEPING

The bookkeeping screen (see figure 9) is displayed when that option is selected and entered from the main menu.

Five lifetime counters are shown. These counters are set to zero at the factory and are not resettable by the operator. The counters are:

COINS DROPPED MECH 1 - This counter shows the total number of coins that have dropped through the LEFT coin mech.

COINS DROPPED MECH 2 - This counter shows the total number of coins that have dropped through the RIGHT coin mech.

TOTAL COINS DROPPED - This is the total number of coins dropped through BOTH mechs.

SERVICE BUTTON PRESSED - The number of times that the service button has been pressed to put credits on the game is displayed by this counter. Note: Pressing the service button to enter the bookkeeping / diagnostic section does not effect this counter.

TOTAL CREDITS GIVEN - The total number of credits the game has given in it's lifetime is shown on this counter. (See the game set-up options section of this manual for information on setting the number of coins per credit)

PERIOD AND DOLLAR COUNTERS

Three resettable counters, located to the right of the lifetime counters are provided to aid the operator in tracking the games intake over a period of time. These counters are presented in two forms, coins dropped and dollars collected for each coin mech. A total for both mechs is also shown.

RESETTING THE PERIOD AND DOLLAR COUNTERS

As in the main menu, an option is selected by pressing the one player start button and entered or executed pressing the player two start button. To reset the period and dollar counters for coin mech 1, press the one player start button until the message "RESET COIN MECH 1 DOLLARS COLLECTED" is highlighted (turns from red to yellow) and then press the player two start button. The period and dollar counters for mech 2 are reset in the same manner.

BOOKKEEPING, CONTINUED

SETTING COINS/TOKENS PER DOLLAR

To calculate dollars collected the bookkeeping system needs to know how many coins/tokens are required to make a dollar. Normally this number would be 4 for quarter operation. However, if you operate a location where for example 6 tokens equal one dollar, the dollar multiplier should be changed to 6 so that the dollars collected counters will reflect accurately what the game has earned. To change the coin "multiplier" use the player one start button to highlight the COINS PER DOLLAR message for the desired coin mech then use the player two start button to change the multiplier.

EXAMPLE: An arcade giving 10 tokens per dollar should have the coins/tokens per dollar multipliers set as shown below:

```
10 COINS PER DOLLAR COIN MECH 1
10 COINS PER DOLLAR COIN MECH 2
```

NOTE: THE COINS PER DOLLAR MULTIPLIER DOES NOT AFFECT THE NUMBER OF COINS PER CREDIT OR CREDITS PER COIN. SEE THE GAME SET-UP OPTIONS SECTION OF THIS MANUAL FOR THAT INFORMATION.

BOOKKEEPING

SELECT FUNCTION WITH ONE PLAYER START BUTTON
ENTER FUNCTION WITH TWO PLAYER START BUTTON

	LIFETIME COINS	PERIOD COINS/DOLLARS
COINS DROPPED MECH 1	0	0 \$ 0.00
COINS DROPPED MECH 2	0	0 \$ 0.00
TOTAL COINS DROPPED	0	0 \$ 0.00
SERVICE BUTTON PRESSED	0	
TOTAL CREDITS GIVEN	0	

```
RESET COIN MECH 1 DOLLARS COLLECTED
RESET COIN MECH 2 DOLLARS COLLECTED
```

```
SET COINS/TOKENS PER DOLLAR=
4 COINS PER DOLLAR COIN MECH 1
4 COINS PER DOLLAR COIN MECH 2
```

RETURN TO MAIN MENU

FIGURE 9

DIAGNOSTICS

The diagnostic menu is displayed upon entering diagnostics from the main menu. See figure 10.

DIAGNOSTICS

SELECT FUNCTION WITH ONE PLAYER START BUTTON
ENTER FUNCTION WITH TWO PLAYER START BUTTON

BUTTONS AND CONTROL TEST
PROCESSOR MEMORY TEST
VIDEO ALIGNMENT SCREENS
VIDEO MEMORY TEST
VIEW BACKGROUND SCREENS

RETURN TO MAIN MENU

FIGURE 10

DIAGNOSTICS, CONTINUED

BUTTONS AND CONTROLS TEST

This test allows the operator to check the game controls and switches. Pressing a button or activating a control causes the description of that button or control to turn from green to red on the video screen and will remain colored red as long as the switch contacts are closed. The word GOOD will appear to the right of the control's description the first time that the switch contacts close and will remain on the screen for the duration of the test. Pressing the player two start or service buttons twice will end the test and return you to the diagnostic menu.

BUTTONS AND CONTROL TEST

PLEASE PRESS THE FOLLOWING BUTTONS=

1 PLAYER START
2 PLAYER START
MECH 1 COIN BUTTON
MECH 2 COIN BUTTON
SERVICE SWITCH

GO BACK BUTTON
EXTRA BASE BUTTON
AIM BUTTONS

BATTERS JOYSTICK HORIZONTAL=|
BATTERS JOYSTICK VERTICAL=|

PITCHING JOYSTICK HORIZONTAL=|
PITCHING JOYSTICK VERTICAL=|

PRESS PLAYER 2 OR SERVICE SWITCH TWICE TO EXIT

FIGURE 11

DIAGNOSTICS, CONTINUED

PROCESSOR MEMORY TEST

The processor memory test checks all on-board RAM and PROM memory with the exception of the video memory. The messages TESTING MASTER ROM, TESTING MASTER RAM, TESTING COLOR RAM, TESTING SLAVE PROM, TESTING SLAVE RAM will each appear on the left side of the screen as each of those tests are performed. The result of each test (good or bad) is displayed on right side of the screen next to the description of that test. In the case of a failure the location (U number) of the suspected part is shown on the screen. See figure 12.

PROCESSOR MEMORY TEST		
TESTING MASTER ROM	MASTER ROM	BAD
	CHIP 07	SUSPECT
TESTING MASTER RAM	MASTER RAM	GOOD
TESTING COLOR RAM	COLOR RAM	GOOD
TESTING SLAVE ROM	SLAVE ROM	GOOD
TESTING SLAVE RAM	SLAVE RAM	GOOD

PRESS THE PLAYER TWO START OR SERVICE BUTTON TO EXIT

FIGURE 12. EXAMPLE OF DISPLAY INDICATING
CHIP U7 FAILURE

DIAGNOSTICS, CONTINUED

VIDEO ALIGNMENT SCREENS

Three video alignment screens are provided to aid in adjusting the game's video monitor for maximum picture quality. Video monitor technical information including adjustment instructions can be found in your Cinemat system manual.

The first screen consists of a white crosshatch pattern (figure 13). This should be used to adjust screen position, horizontal size, vertical size and focus. Pressing the player two start button advances the display to the next alignment screen.

The second alignment screen is used to adjust the red and green intensity. An eight level (0-7) color scale is shown for each red and green. The monitor should be adjusted so that level zero is black and one through seven appear as seven distinct levels. See figure 14.

The third alignment screen shows a four level blue color scale. Adjust the blue intensity so that level zero is black and levels one through three show as three distinct levels of blue. Eight other colors are also displayed for reference, they are from 0-7: blue, green, red, cyan, magenta, yellow, gray and white. See figure 15.

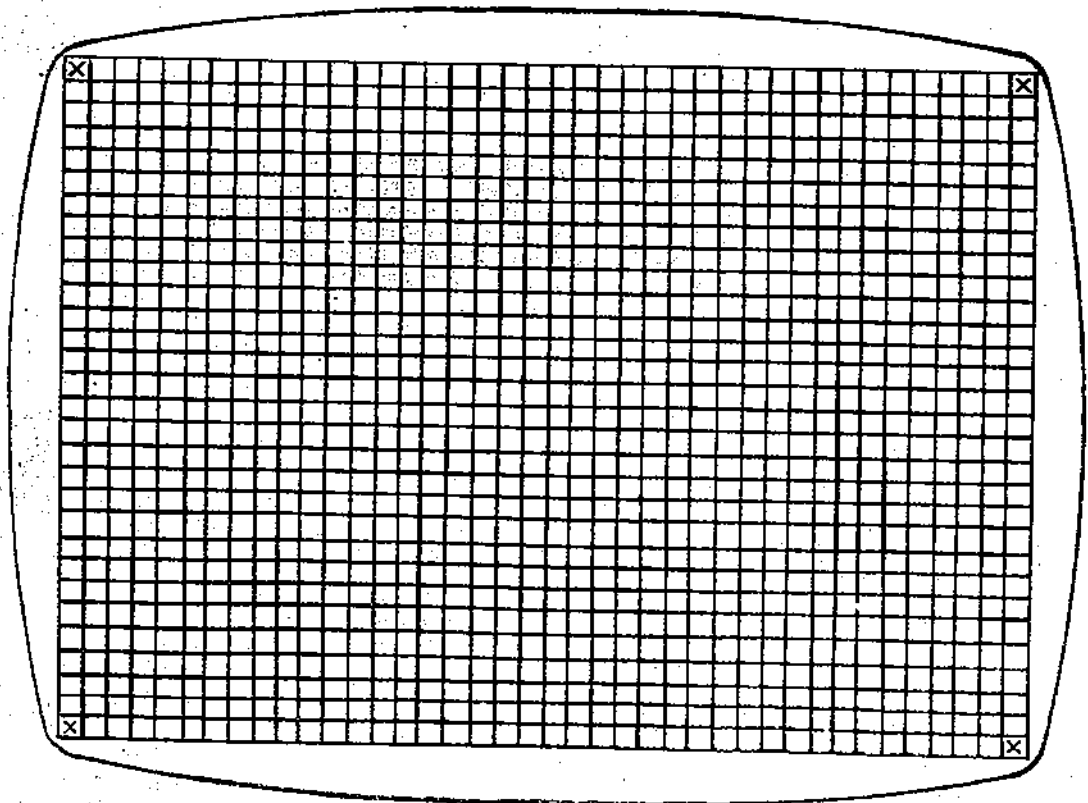


Figure 13 Video Alignment
Screen 1

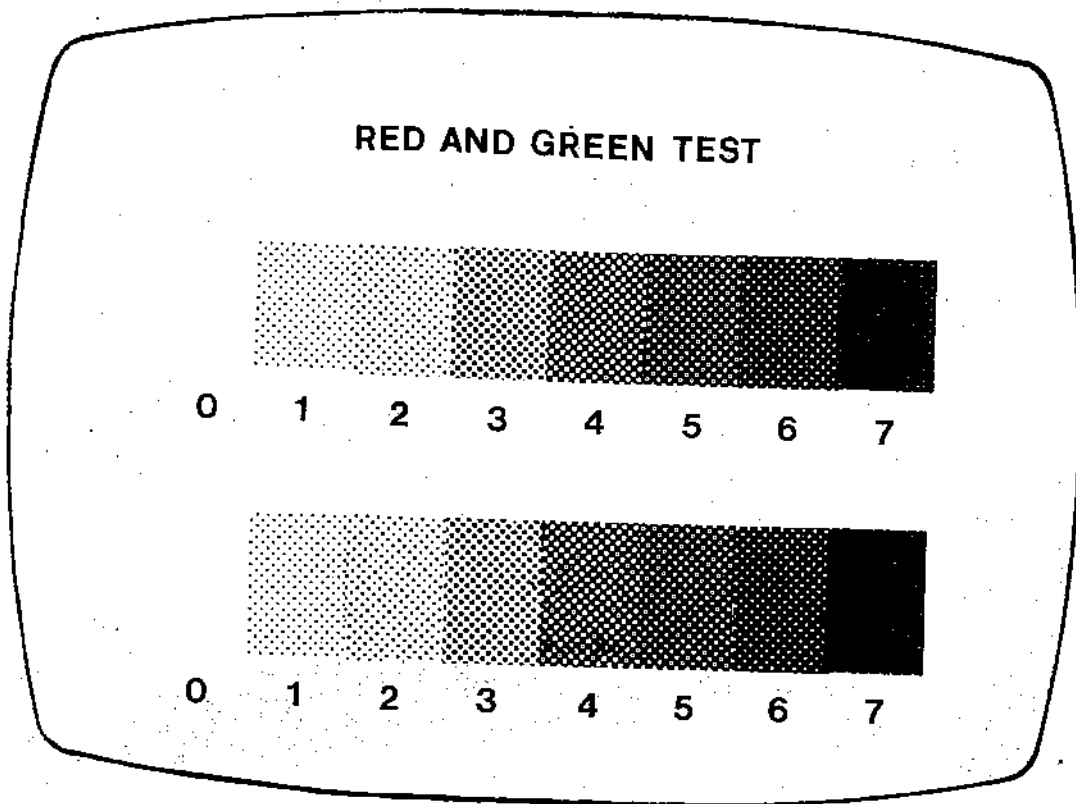


Figure 14 Video Alignment
Screen 2

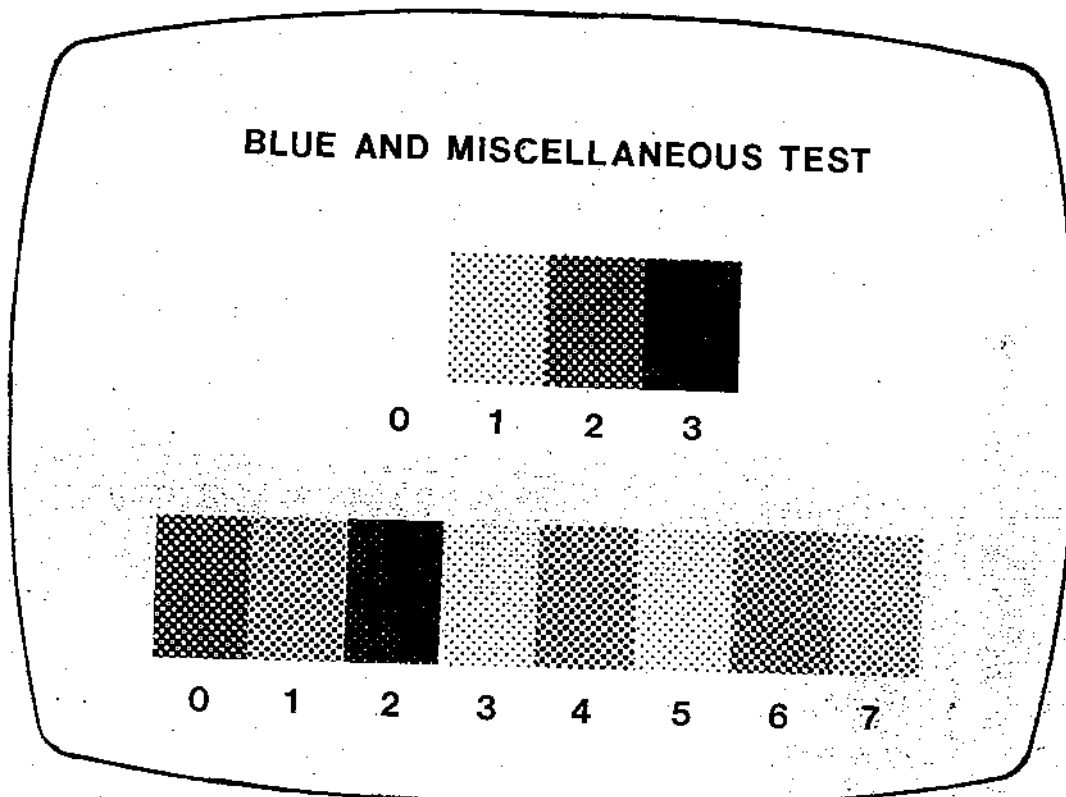


Figure 15 Video Alignment
Screen 3

DIAGNOSTICS, CONTINUED

VIDEO MEMORY TEST

The video memory test checks the foreground video memory. The test appears as a series of colored bars moving across the screen (figure 16). After each pass (about 15 seconds) the results of the test will be displayed on the screen. If the pass was successful (all RAMs good) the message "VIDEO RAM CHECKS OK" will be displayed for about 5 seconds and the test will be repeated. Pressing the two player start button anytime during the test will abort the test and return you to the diagnostic menu. If the memory test fails the message "VIDEO RAM TEST FAILED" will be displayed along with the location (U number) of the suspect RAM. In the event that the video error display is unreadable, a series of tones will also indicate the suspect chip (see table below).

1	Tone(s)	U36
2	"	U35
3	"	U34
4	"	U33
5	"	U49
6	"	U48
7	"	U47
8	"	U46

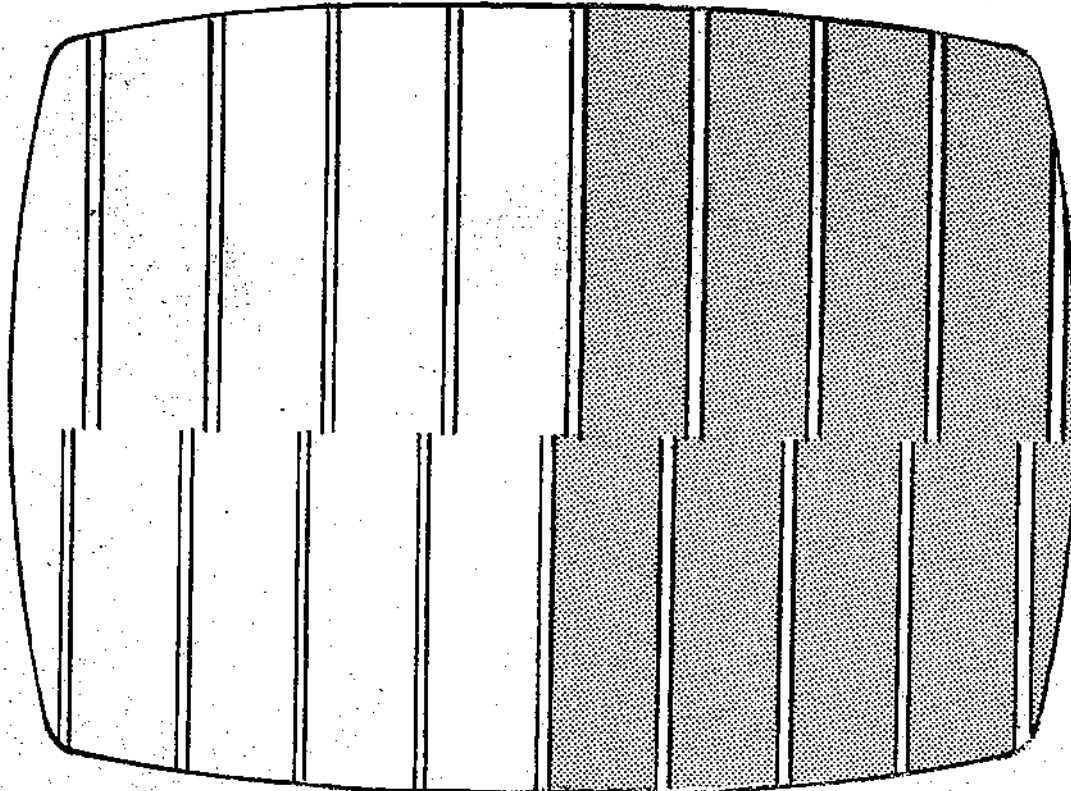


Figure 16 Video Memory

GAME SET-UP

The game option set-up section allows the operator to change various game options. As in previous sections, the one player start button selects and highlights the desired function and the two player start button enters or executes the function.

COINS PER CREDIT / CREDITS PER COIN

The coinage of each mech may be set to require multiple coins for each credit or give multiple credits for each coin. To do this follow the examples below: (all examples assume 1 coin=25 cents)

For 25 cent play: 1 COIN FOR
 1 CREDIT

For 50 cent play: 2 COINS FOR
 1 CREDIT

Two plays for 25 cents: 1 COIN FOR
 2 CREDITS

EXTRA PLAY

An option is included to award an extra play for the insertion of multiple coins before the game is started. For example; if the coinage is set as follows:

1 COIN FOR
1 CREDIT
EXTRA PLAY FOR 2 CREDITS

The result will be, 1 coin will give 1 credit and 2 coins will give 3 credits. Each additional coin will add one credit.

ATTRACT MODE SOUND

This option when selected enables the game sounds during the attract mode.

GAME SET-UP

SELECT FUNCTION WITH ONE PLAYER START BUTTON
ENTER FUNCTION WITH TWO PLAYER START BUTTON

COIN MECH 1
1 COIN FOR
1 CREDIT
NO EXTRA PLAY

COIN MECH 2
1 COIN FOR
1 CREDIT
NO EXTRA PLAY

TWO PLAYER FOR 1 CREDIT ----- NO
ATTRACT MODE SOUND ----- YES

RETURN TO MAIN MENU

GAME STATISTICS

Game play statistics are provided to aid the operator in setting up his game for maximum profit. See figure 17.

The operator may reset the game statistic counters by selecting the reset game statistics function.

GAME PLAY STATISTICS

SELECT FUNCTION WITH ONE PLAYER START BUTTON
ENTER FUNCTION WITH TWO PLAYER START BUTTON

NUMBER OF ONE PLAYER INNINGS= 0
PLAYER WINS= 0
COMPUTER WINS= 0

NUMBER OF TWO PLAYER INNINGS= 0
COMPLETE GAMES BOUGHT= 0

RESET GAME STATISTICS

RETURN TO MAIN MENU

FIGURE 17

INNING DURATION GRAPHS

Graphs are provided which indicate the duration of one and two player innings. Average play time is also displayed. These graphs may be reset by selecting the reset options located at the bottom of the screen.

INNING DURATION GRAPHS

SELECT FUNCTION WITH ONE PLAYER START BUTTON
ENTER FUNCTION WITH TWO PLAYER START BUTTON

ONE PLAYER INNINGS=

0=00-1=00	0
1=00-1=30	0
1=31-3=00	0
3=01-5=00	0
5=01-10=00	0
10=01-15=00	0
15=01-20=00	0
20=01-25=00	0
25=01-30=00	0
30=01-UP	0

AVERAGE TIME= 0:00

TWO PLAYER INNINGS=

0=00-1=00	0
1=01-3=00	0
3=01-5=00	0
5=01-10=00	0
10=01-15=00	0
15=01-20=00	0
20=01-25=00	0
25=01-30=00	0
30=01-UP	0

AVERAGE TIME= 0:00

RESET ONE PLAYER INNINGS AND BAR GRAPHS

RESET TWO PLAYER INNINGS AND BAR GRAPHS

RETURN TO MAIN MENU

ERASE ALL PLAYER STATISTICS

WORLD SERIES will store player statistics for 300 players in battery backed-up memory. To clear these statistics select the ERASE ALL PLAYER STATISTICS option from the menu shown below. Similarly the top player lists may be erased by selecting that option.

ERASE ALL PLAYER STATISTICS

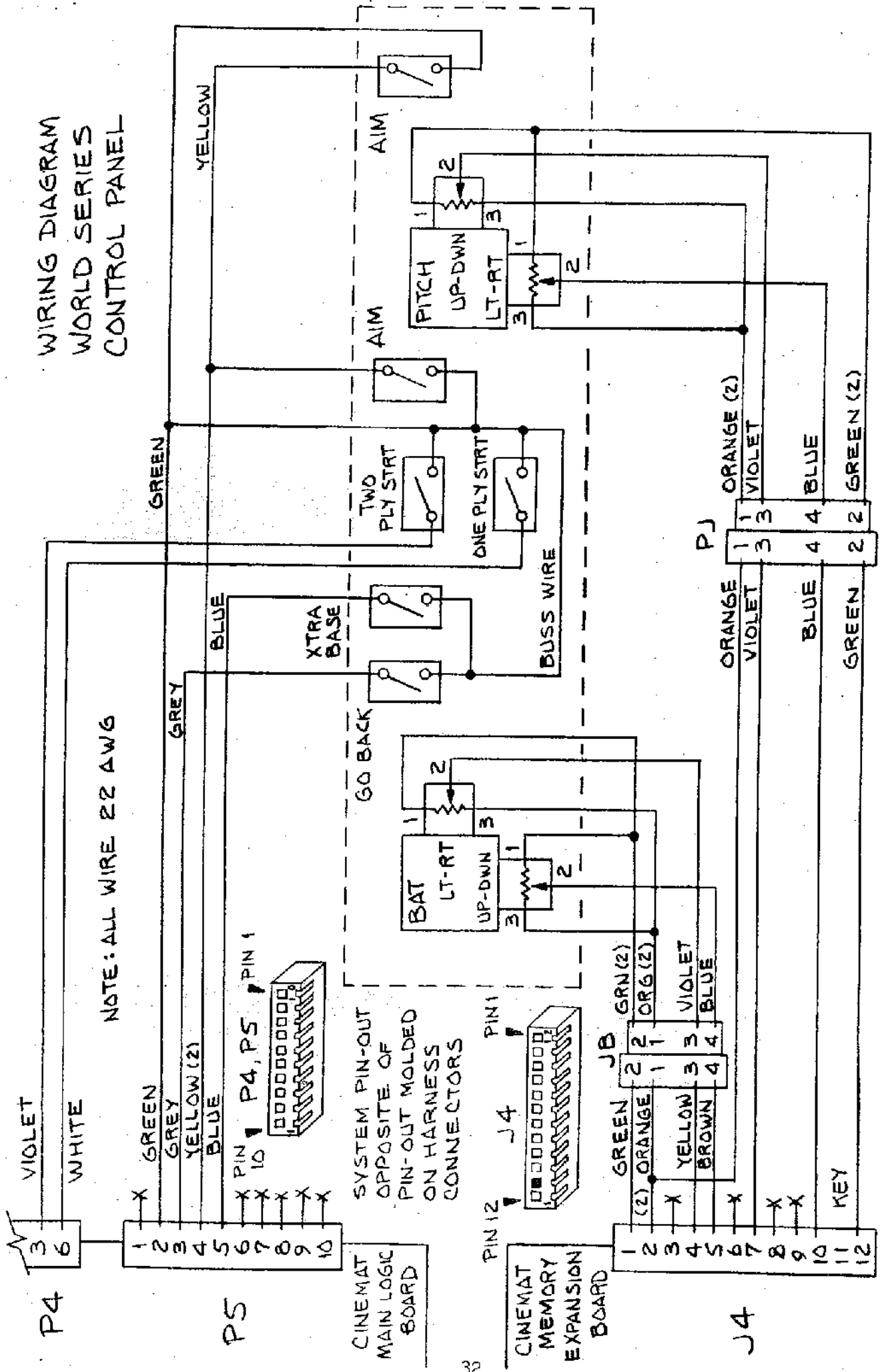
SELECT FUNCTION WITH ONE PLAYER START BUTTON
ENTER FUNCTION WITH TWO PLAYER START BUTTON

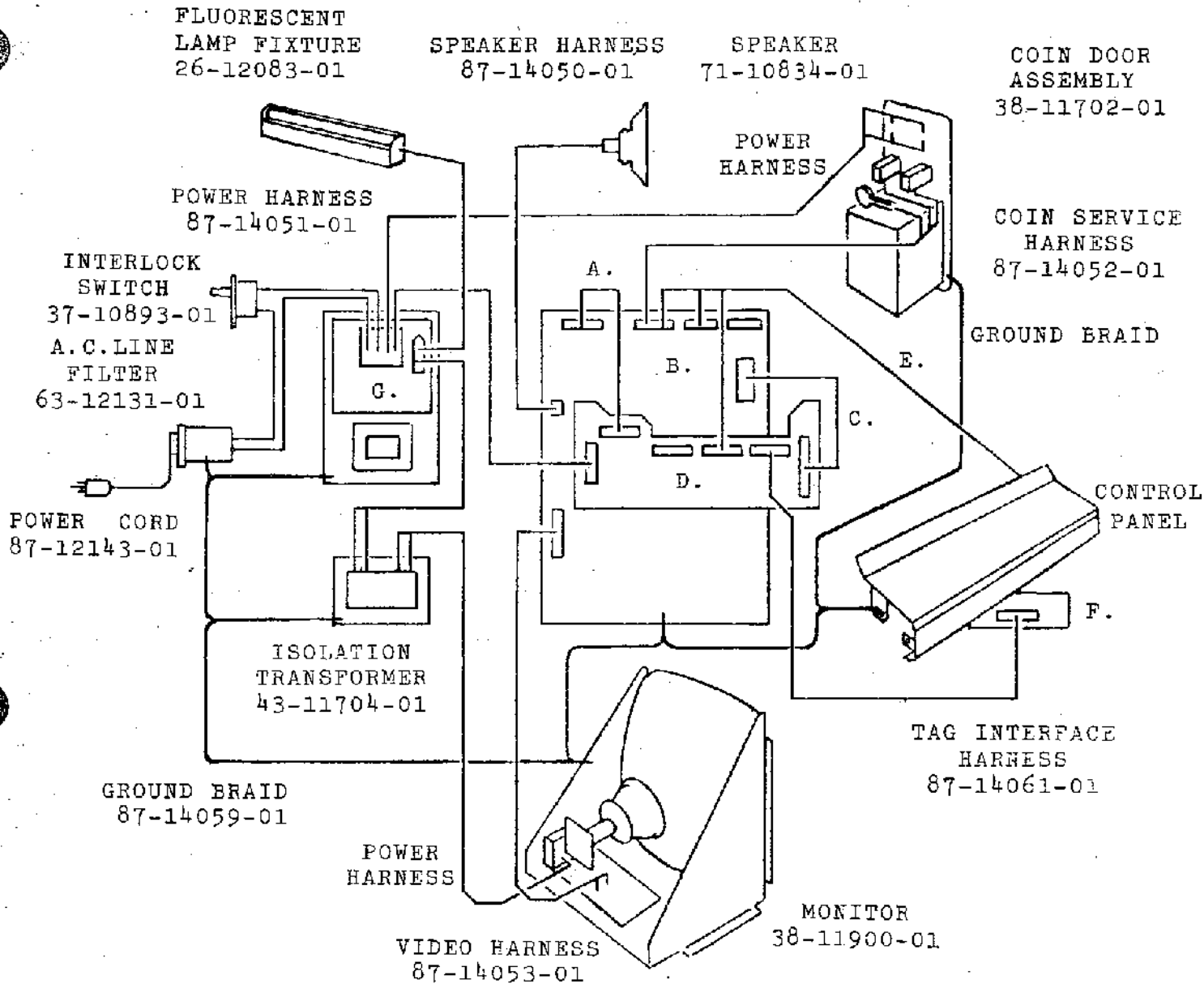
ERASE ALL STATS ON EXIT? NO
ERASE TOP PLAYER LISTS ON EXIT? NO

RETURN TO MAIN MENU

DRAWINGS

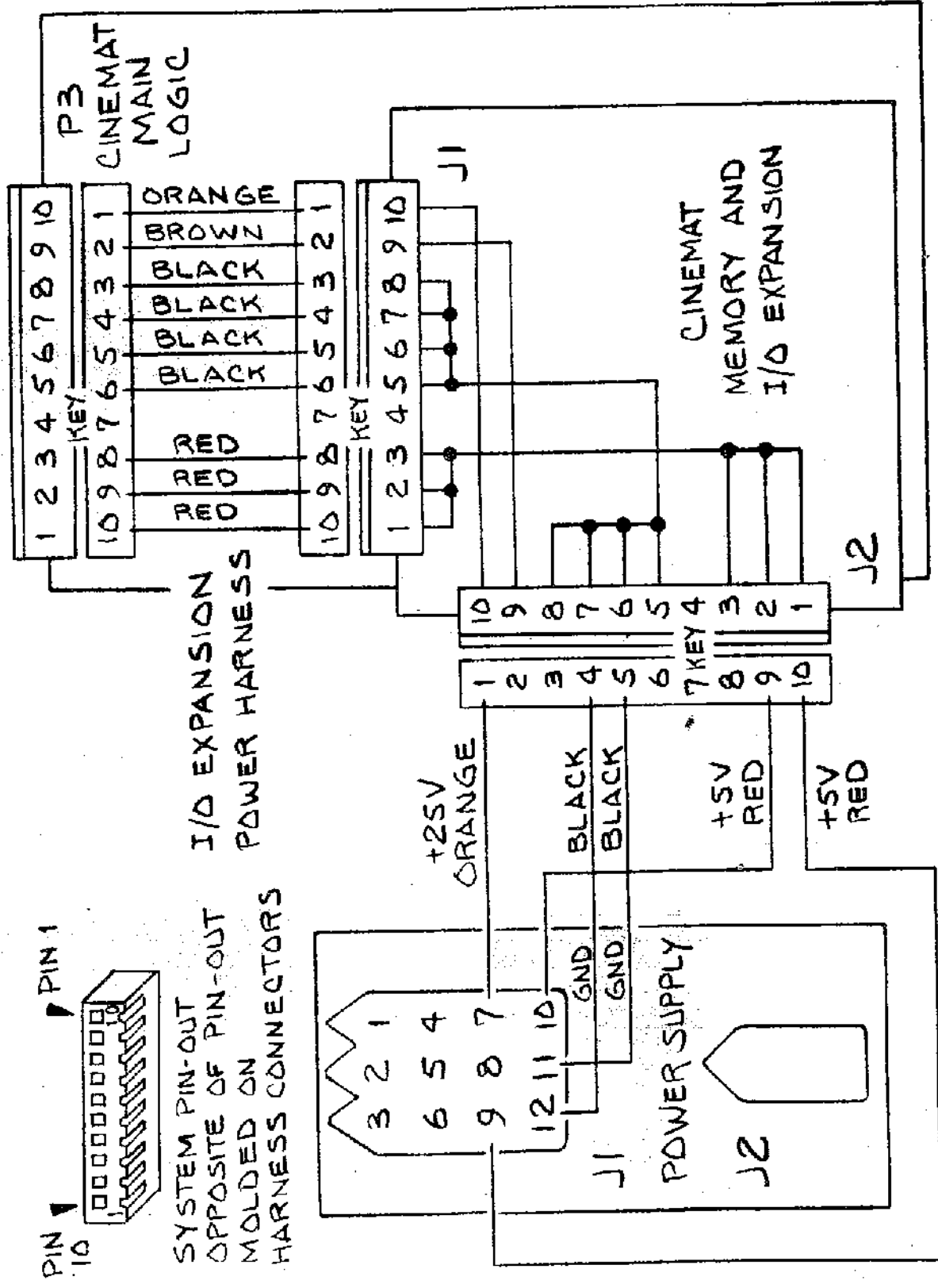
WIRING DIAGRAM
WORLD SERIES
CONTROL PANEL



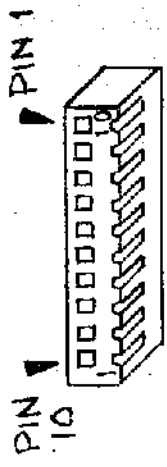


- | | |
|--|--|
| <p>A. I/O EXPANSION
POWER HARNESS
87-14041-01</p> <p>B. CINEMAT MAIN LOGIC
PRINTED CIRCUIT ASSEMBLY
81-12170-01</p> <p>C. I/O EXPANSION
INTERCONNECT HARNESS
87-14040-01</p> | <p>D. CINEMAT I/O EXPANSION
PRINTED CIRCUIT ASSEMBLY
81-13300-01</p> <p>E. CONTROL PANEL HARNESS</p> <p>F. CINEMAT TAG
PRINTED CIRCUIT ASSEMBLY
81-13100-01</p> <p>G. POWER SUPPLY
82-10842-50</p> |
|--|--|

WIRING DIAGRAM
CINEMAT MEMORY AND I/O EXPANSION POWER



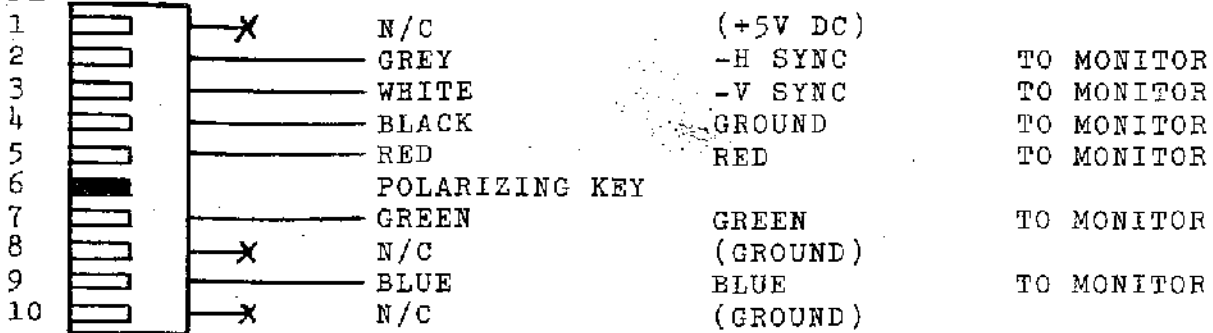
NOTE:
ALL WIRE
18 GAUGE



SYSTEM PIN-OUT
OPPOSITE OF PIN-OUT
MOLDED ON
HARNESS CONNECTORS

WIRE LIST, WORLD SERIES, MAIN LOGIC

P1



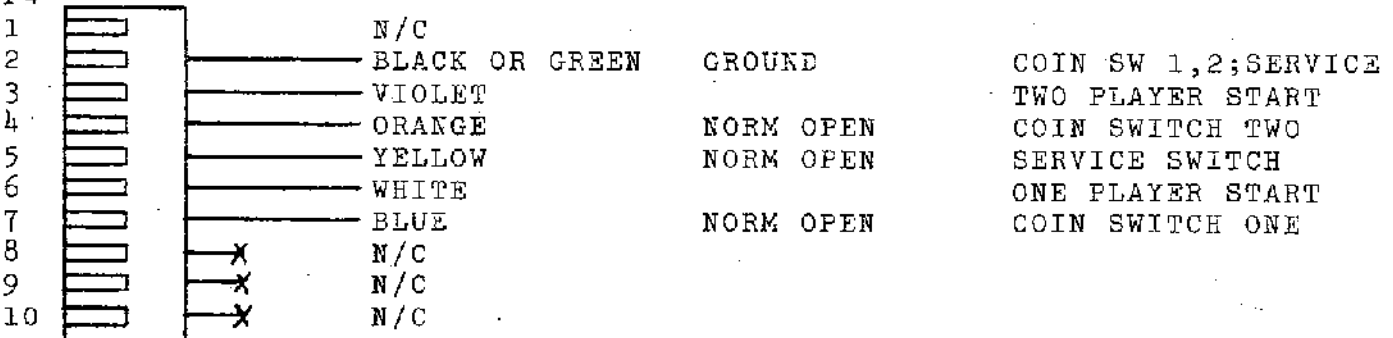
P2



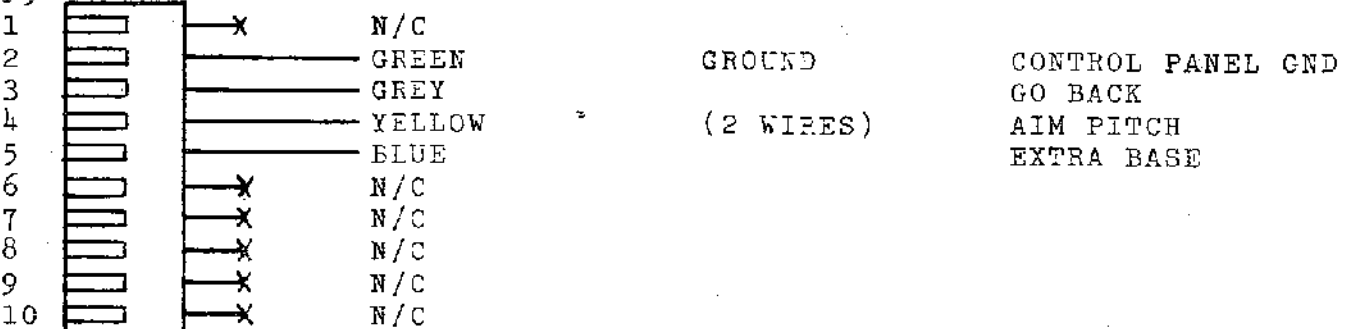
P3

I/O EXPANSION POWER HARNESS (87-14041-01)
TO J2 OF MEMORY EXPANSION BOARD

P4



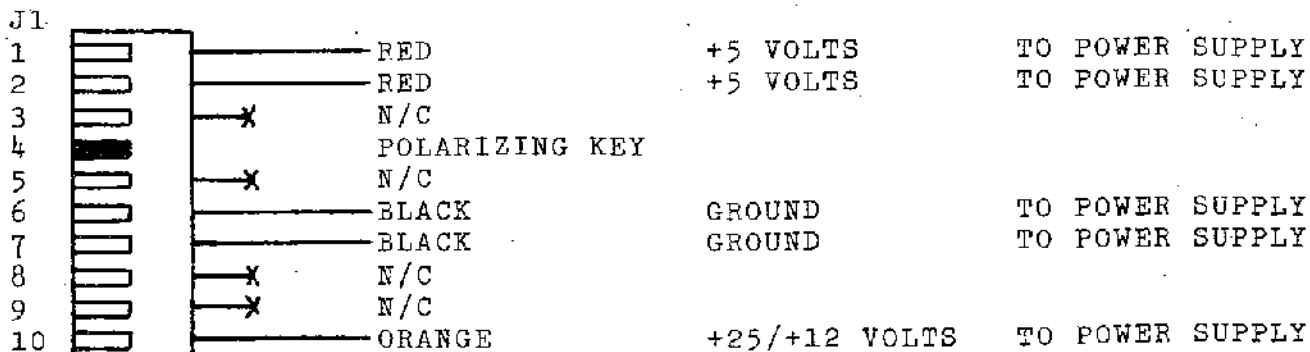
P5



P6

NOT USED

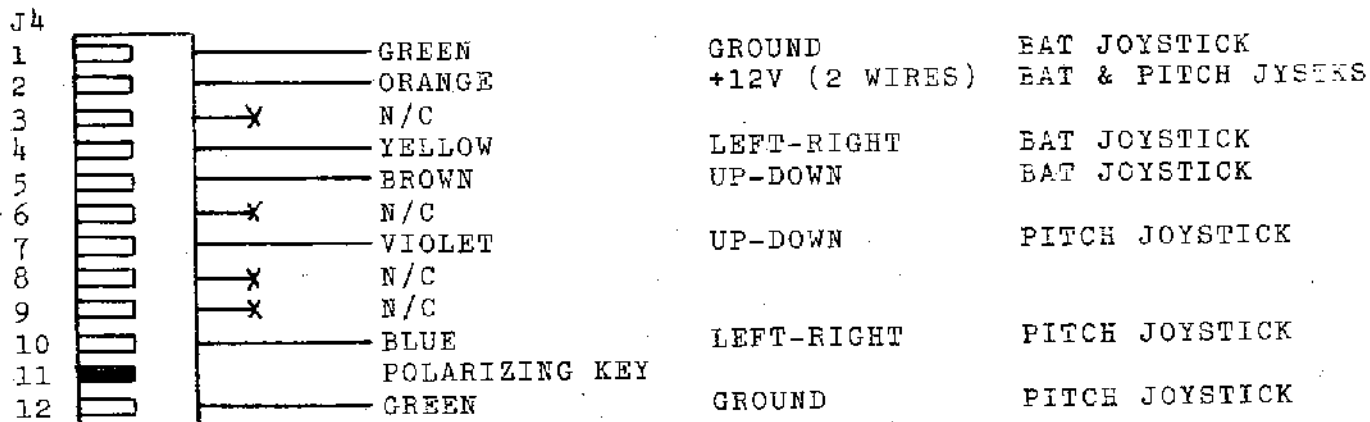
WIRE LIST, WORLD SERIES, MEMORY AND I/O EXPANSION



~~(+12V)~~

J2 I/O EXPANSION POWER HARNESS (87-14041-01)
TO P3 OF MAIN LOGIC BOARD

J3 NOT USED

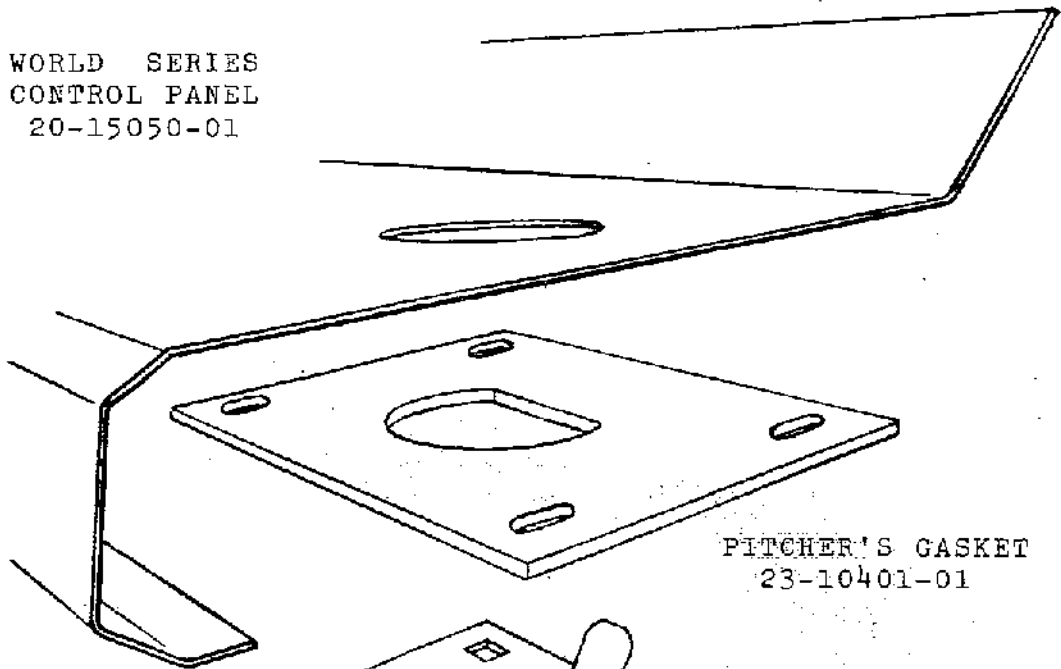


J5 TAG INTERFACE HARNESS (87-14061-01)
TO J1 OF TAG BOARD (MOUNTED ON CONTROL PANEL)

J6 NOT USED

J7A I/O EXPANSION INTERCONNECT HARNESS (87-14040-01)
TO U99 OF MAIN LOGIC BOARD

WORLD SERIES
CONTROL PANEL
20-15050-01

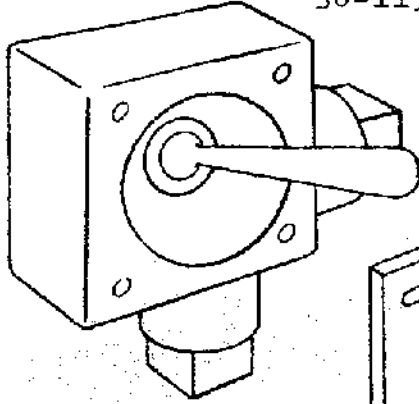


PITCHER'S GASKET
23-10401-01

JOYSTICK ADAPTER
PLATE (PITCHER)
20-15102-00

JOYSTICK ASSEMBLY
38-11500-01

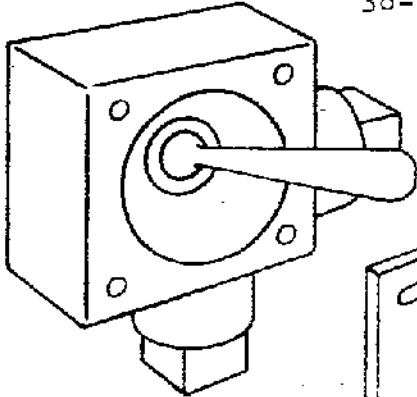
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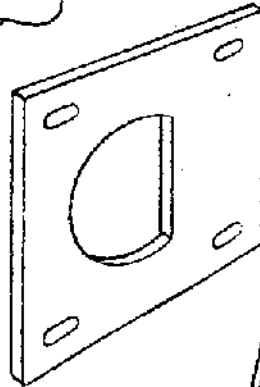
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RIGHT ANGLE
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(CINEMAT
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20-15103-00

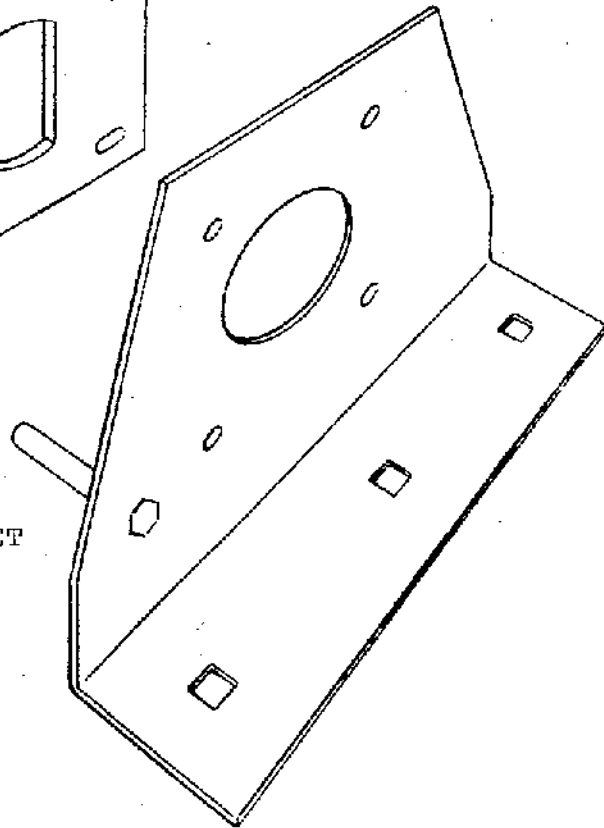
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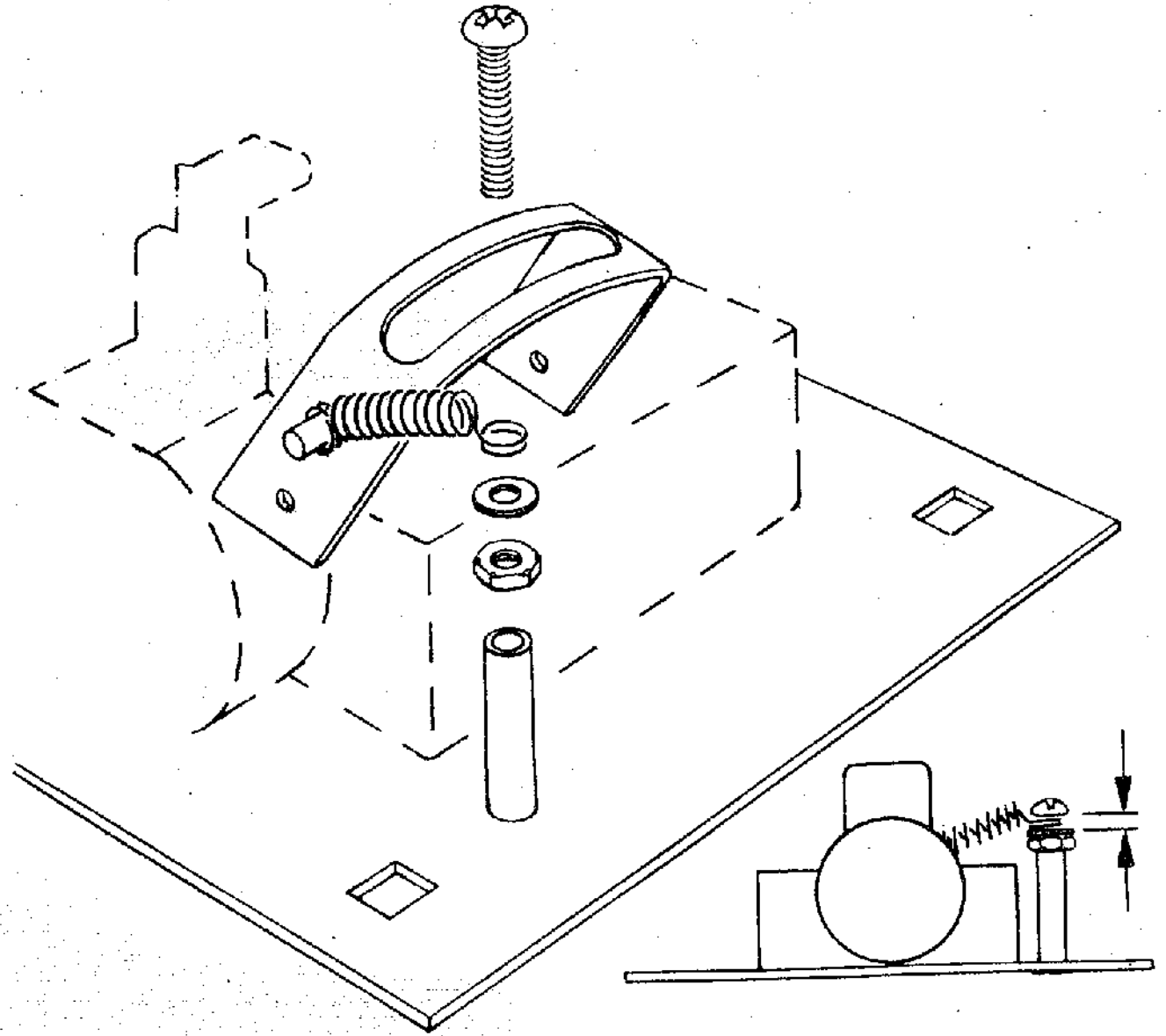


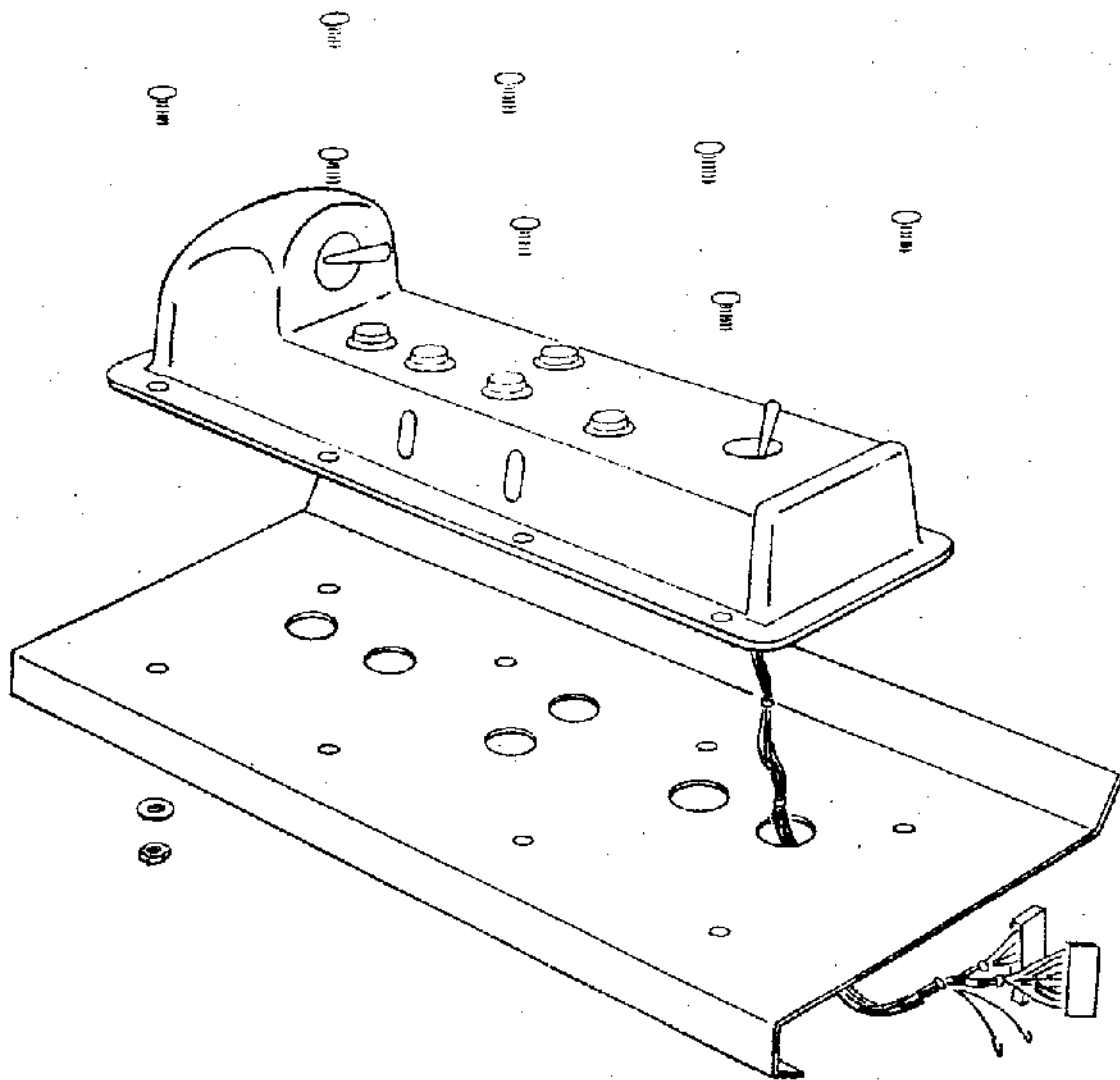
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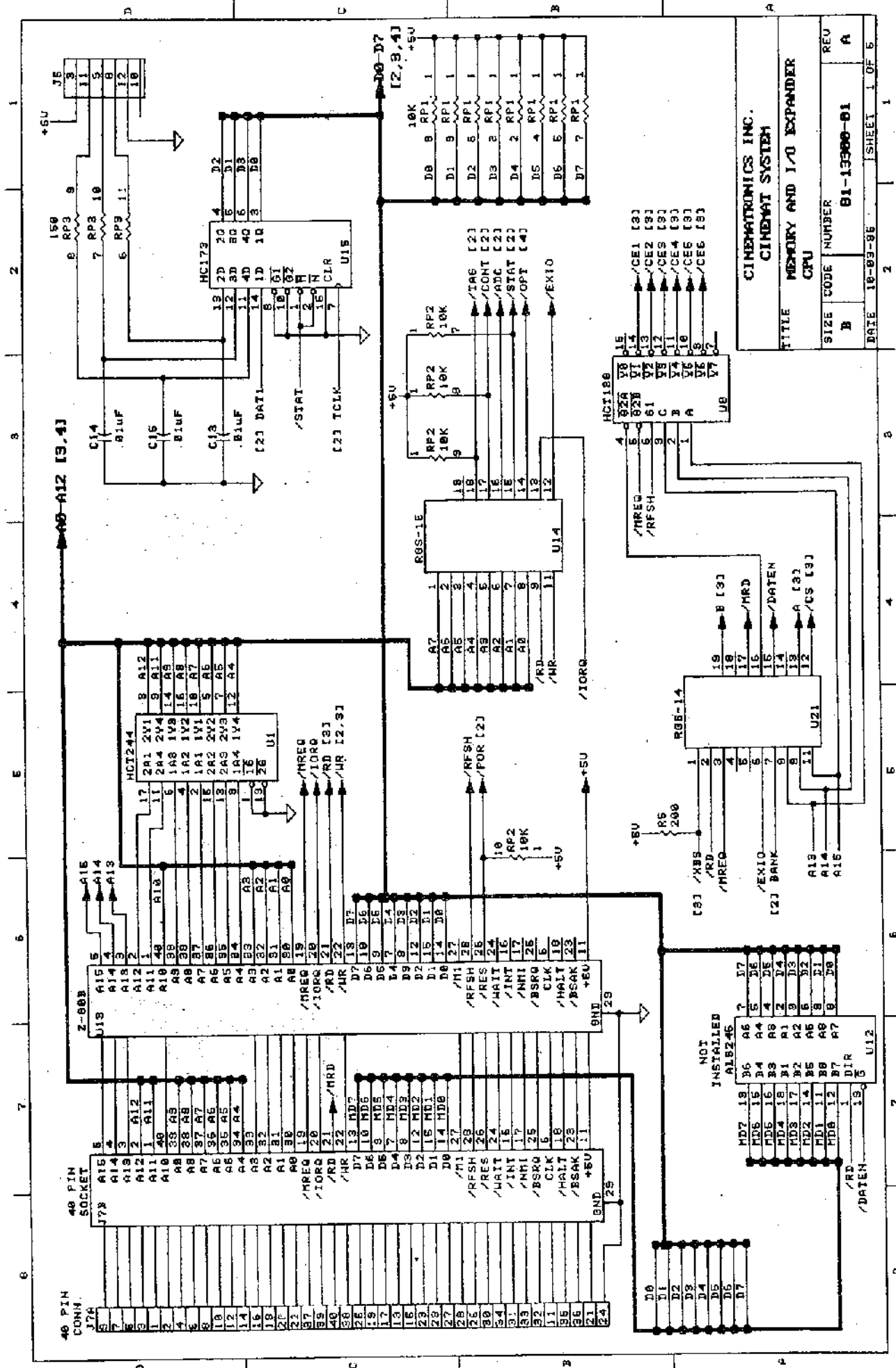


RIGHT ANGLE
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(UNIVERSAL
CONTROL PANEL)
20-17041-01









CINEMATRONICS INC.
CINEMAT SYSTEM

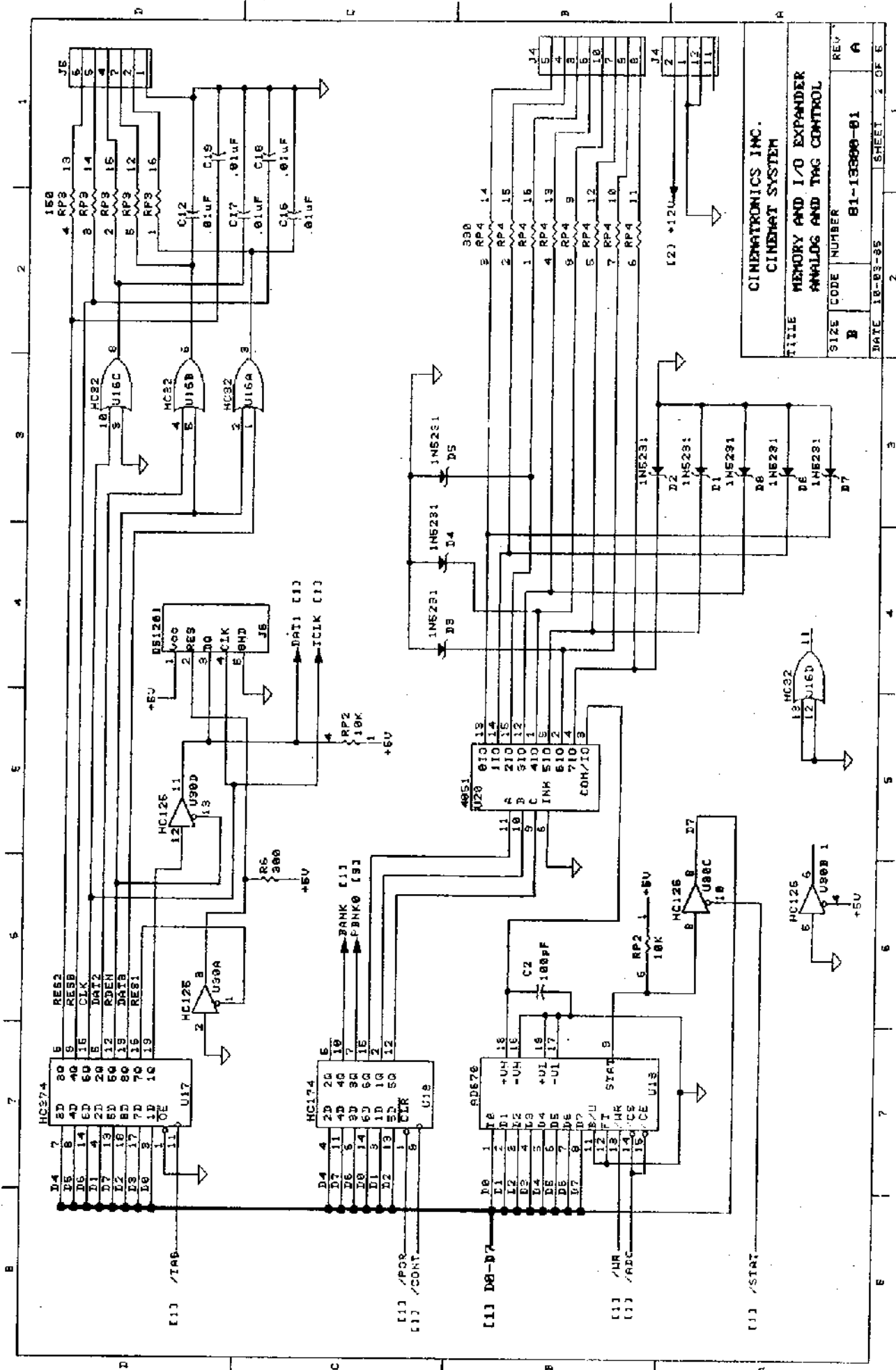
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DATE 10-09-95

SHEET 1 OF 5



CINEMATRONICS INC.
CINEMAT SYSTEM

TITLE MEMORY AND I/O EXPANDER
ANALOG AND TAG CONTROL

SIZE CODE NUMBER B1-13888-01

REV A

DATE 18-03-85 SHEET 1 OF 6

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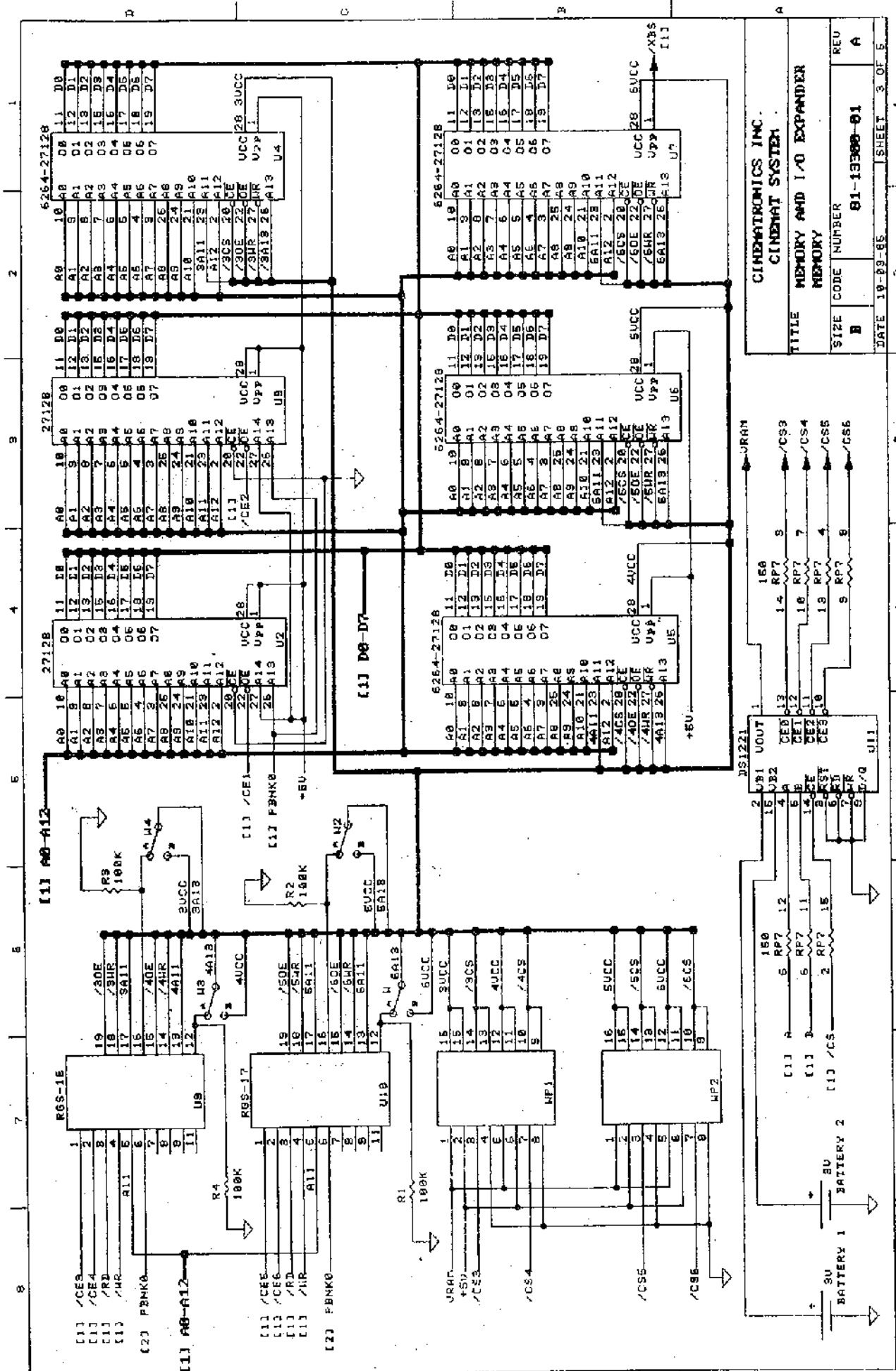
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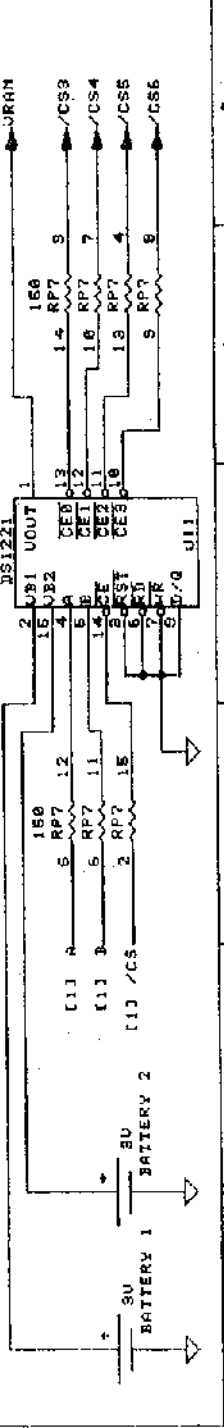
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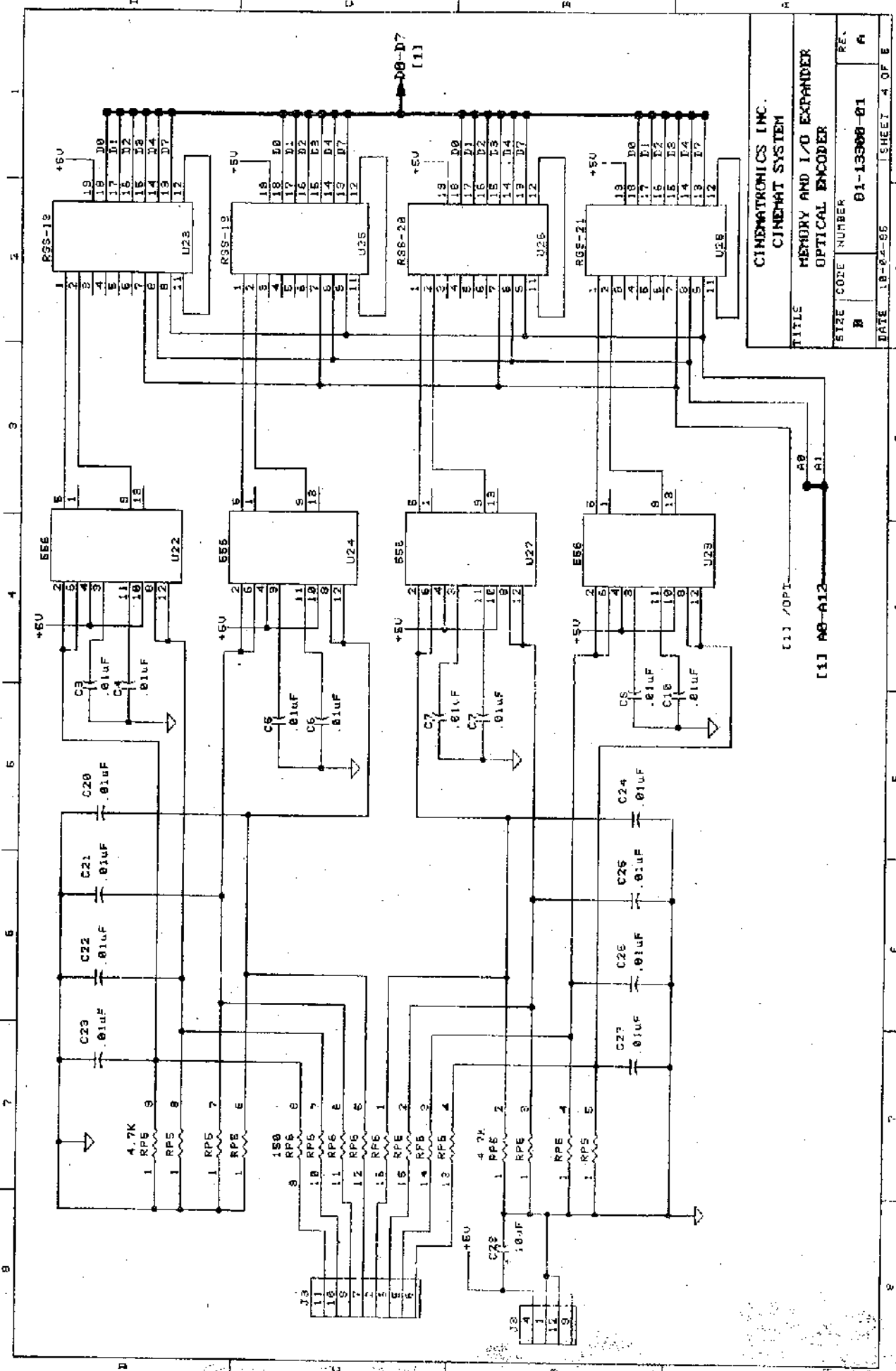


CINEMATRONICS INC.
CINEMAT SYSTEM

TITLE	MEMORY AND I/O EXPANDER
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CODE NUMBER	81-19388-01
REV	A

DATE 10-09-85 SHEET 3 OF 5



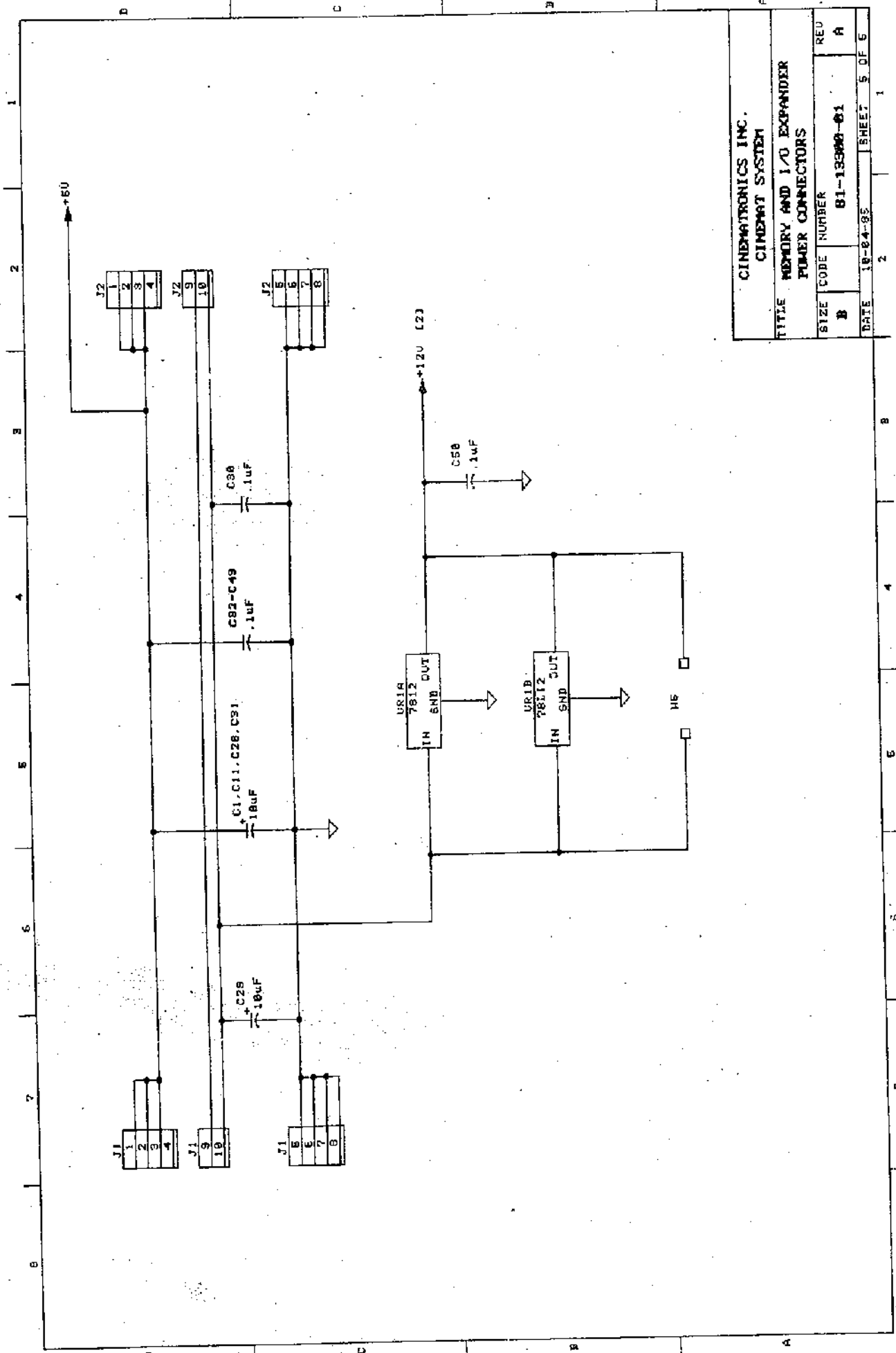


CINEMATRONICS INC.
CINEMAT SYSTEM

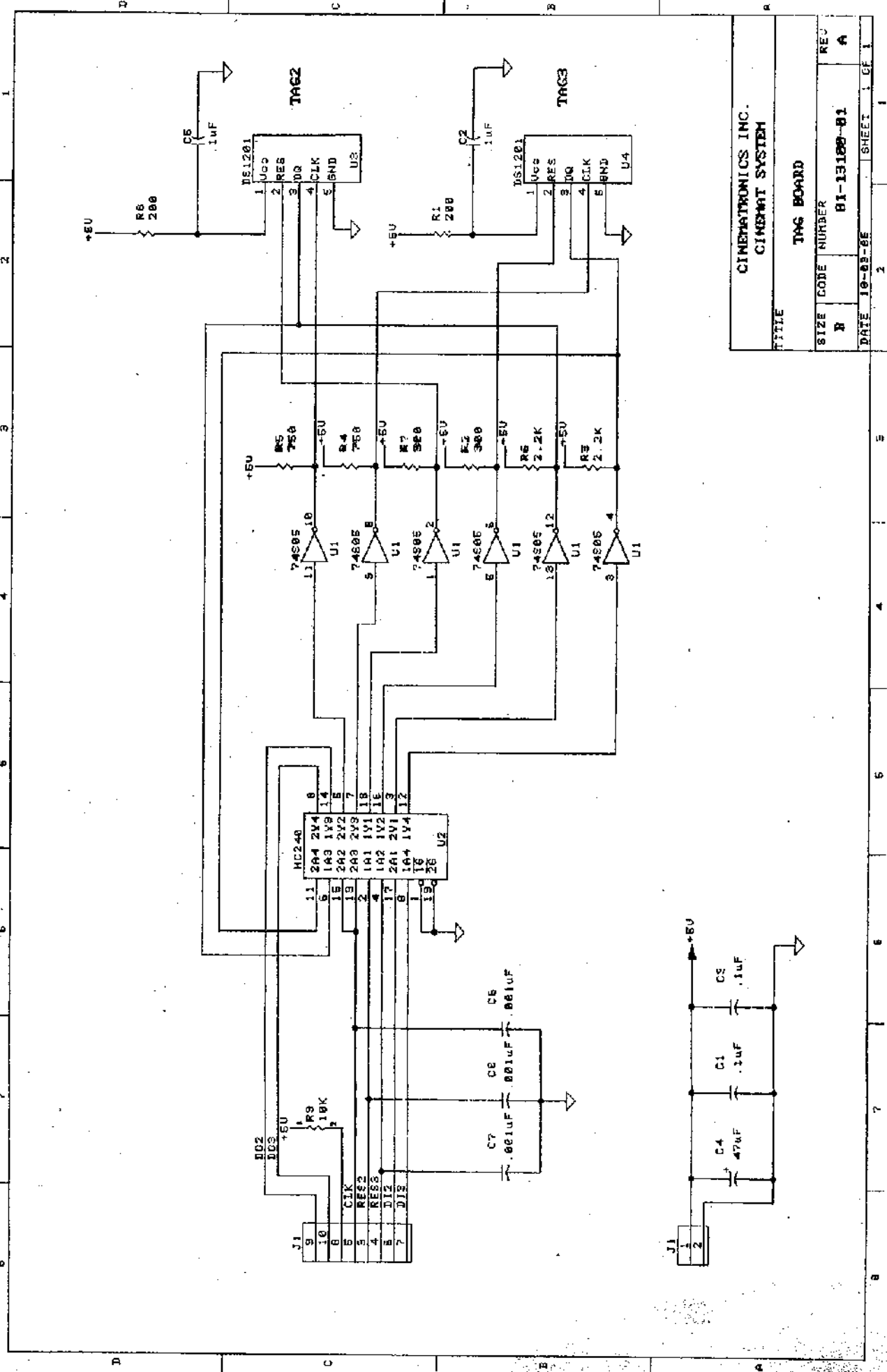
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CINEMATRONICS INC.	
CINEMAT SYSTEM	
TITLE MEMORY AND I/O EXPANDER	
PUMPER CONNECTORS	
SIZE	REV
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DATE	81-13300-01
18-04-85	SHEET 5 OF 5



CINEMATRONICS INC.		TAG BOARD	
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