

DOUBLE PLAY
INSTALLATION AND MAINTENANCE MANUAL

THE LELAND CORPORATATION
CINEMAT SYSTEM

1841 Friendship Drive
El Cajon, CA 92020-9981

Telex: CINTRON 4974293

FAX: 619-562-9468

FCC WARNING

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 devices 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.

POWER REQUIREMENT WARNING !

A power supply capable of supplying the following current (or greater) must be used for game conversion:

7 amps @ + 5.0 VDC
1 amp @ - 5.0 VDC
1 amp @ + 12.0 VDC

RECORD OF SERIAL NUMBERS

Record the game serial numbers and date purchased for future reference and/or game service.

Date purchased: _____

Main Circuit Board S/N: _____

Input/Output and Memory Expansion circuit board S/N: _____

Program part number (on EPROMs) : _____

Software serial number (on "attract mode" screen): _____

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
A. WARRANTY	6
B. HINTS FOR SUCCESSFUL GAME INSTALLATION	7
1. Inspect Your Kit	8
2. The Old Case of the Bent IC Pin	8
3. Attach the Ground	8
4. Which Pole is Which (Observing Polarity) ?	8
5. Marquee Blues (Marquee Installation)	10
6. Run Diagnostics (or Game Installaion Success or Failure)	11
7. Monitor Outputs	11
8. How Do I Turn Up the Sound ?	11
C. GAME MODULE INSTALLATION	12
D. UNIVERSAL GAME CONVERSION	19
C. BOOKKEEPING/DIAGNOSTIC FUNCTIONS	22
1. Invoking Diagnostics	23
2. Selecting The Desired Function	23
3. Bookkeeping	24
a. Period and Dollar Counters	24
b. Setting Coins/Tokens per Dollar	24
c. Example of Setting Tokens per Dollar	25
4. Diagnostics	26
a. Buttons And Controls Test	26
b. Processor Memory Test	27
c. Video Alignment Display	28

TABLE OF CONTENTS, cont'd

<u>SECTION</u>	<u>PAGE</u>
d. Video Memory Test	28
e. Viewing Background Screens and Background Test	29
10. Game Set Up	29
a. Coins per Credit / Credits per Coin	29
b. Extra Play	30
c. Attract Mode Sound	30
11. Game Play Statistics	31
12. Inning Duration Graphs	31
13. Erase All Player Statistics	32
D. SYSTEM TROUBLESHOOTING GUIDE	32
1. Input/Output Functions	32
2. Electronics	34
3. General Knowledge	35
4. Coin Counter Surge Protection Circuit	36
E. CONNECTOR PINOUT CHART	37

TABLE OF CONTENTS, cont'd

LIST OF ILLUSTRATIONS

<u>FIGURE</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
1	AC/DC Power Connection	9
2	Marquee Installation	10
3	Main Circuit Board Assembly	15
4	Input/Output and Memory Expansion Circuit Board Assembly	16
5	Control Panel Bolt and Ground Braid	17
6	Piggy-back Circuit Board Mating	18
7	Control Panel Mounting and Cable Routing	21
8	Coin Counter Surge Protection Circuit	36

A. WARRANTY

Seller warrants that its printed circuit boards, monitor and power supply, when furnished with the product and parts thereof are free from defects in material and workmanship under normal use and service for a period of ninety (90) days from date of shipment. Seller's warranty of above parts is subject to the normal use and service of its product. None of the seller's other products or parts thereof are warranted.

If the products described in this manual fail to conform to this warranty, seller's sole liability shall be, as mutually agreed, to replace or repair such products which are returned to seller during said warranty period provided.

CONDITIONS:

- a. Seller must be promptly notified in writing upon discovery by buyer that said products are defective.
- b. Products must be returned prepaid to seller plant.
- c. Seller's examination of said products discloses to seller's satisfaction that such alleged defects existed and were not caused by accident, misuse, neglect, alteration, improper repair, installation or improper testing.

Seller is not responsible for bent pins on ICs not installed by seller's employees. In no event shall seller be liable for loss of profits, loss of use, incidental or consequential damages.

Except for this express warranty, seller disclaims all other warranties, expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose, and all other obligations or liabilities on seller's behalf, and it neither assumes nor authorizes any other person to assume for seller any other liabilities in connection with the sale of products manufactured by seller.

NOTICE REGARDING THE USE OF NON-SELLER REPLACEMENT PARTS:

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

To obtain repair, contact seller at 619-562-7000 between 8 AM and 5 PM Pacific Standard Time to obtain an RMA return authorization number. Affix this number to the outside of the shipping container when returning goods. Return to the above address.

B. HINTS FOR SUCCESSFUL GAME INSTALLATION

B. HINTS FOR SUCCESSFUL GAME INSTALLATION

Take some advice from the game masters. Successful game installation can be simple if you take a minute and read the following hints. It is worth it's weight in aspirin!

1. INSPECT YOUR KIT

Inspect all received parts for shipping damage and to familiarize yourself with the parts. Inspect all integrated circuits (hereafter called "IC") for bent pins (being careful not to bend the pins).

2. THE OLD CASE OF THE BENT IC PIN

The #1 killer of a successful game installation, or for that matter, any other electronic device's proper operation, is bent pins. Avoid this plague and take the time (and patience) to make sure that all pins are in each hole and not bent.

Also, installing ICs with bent pins runs the risk of bending the pins even further and eventually breaking them.

If pins are bent, first, grip the group of pins lengthwise with long needle-nose pliers. This gripping action will straighten them in this direction. Next, if any pins are bent in the other direction, straighten each one individually with needle nose pliers being careful not to over-compensate. This overcompensation may break the pin.

3. ATTACH THE GROUND

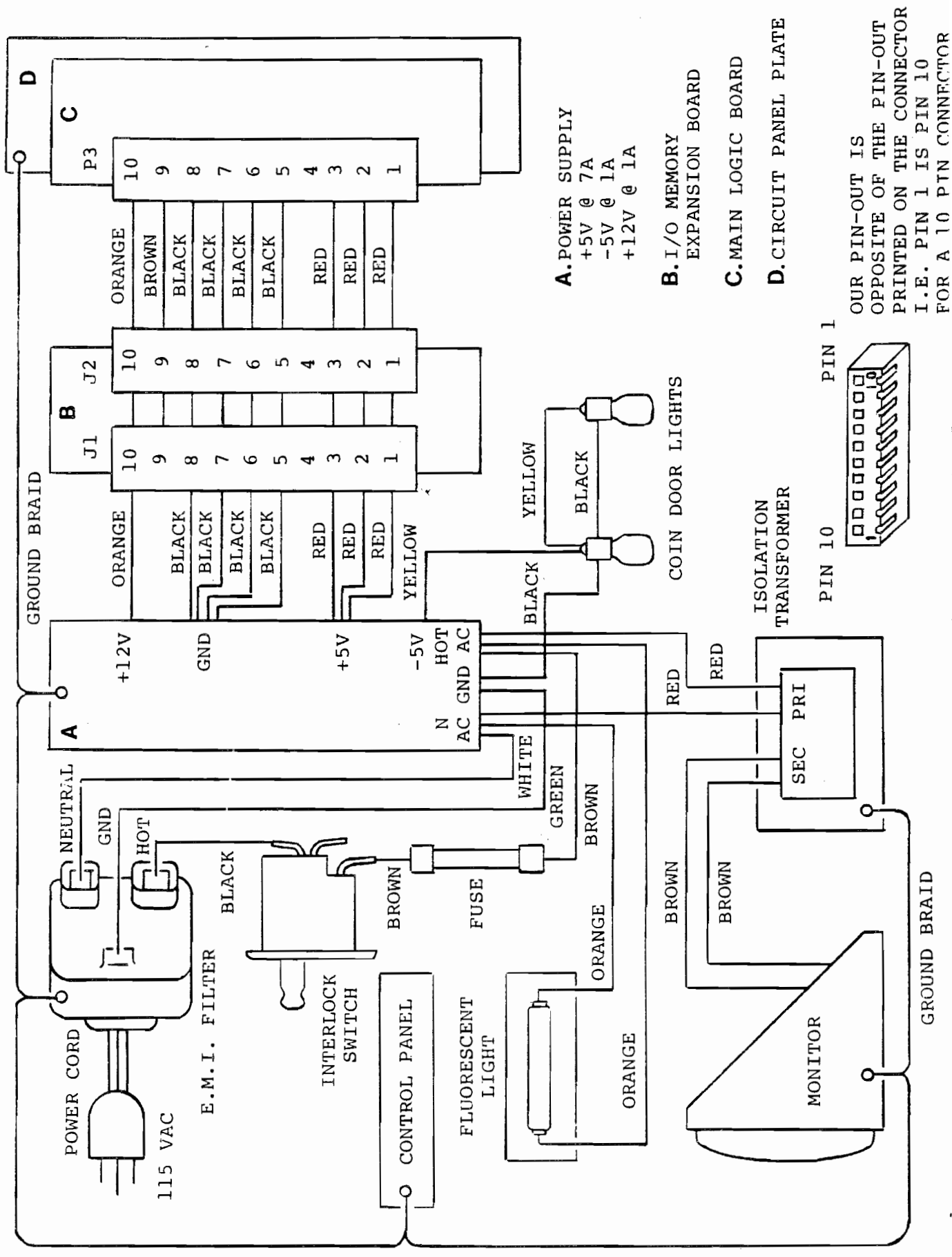
Make sure to attach the ground braid to the control panel. Players risk an electric shock if the control panel is not properly grounded.

Refer to figure 5 for ground braid connection.

4. WHICH POLE IS WHICH (OBSERVING POLARITY)?

Electronic circuits are quite sensitive to polarity and can easily lose their sense of humor when the polarity is reversed. A fuse may not be all they blow! Experienced electronic engineers check the polarity two times before applying power! You should probably check it three times.

Refer to figure 1 on the next page for proper 115 VAC and DC power connections.



A. POWER SUPPLY
 +5V @ 7A
 -5V @ 1A
 +12V @ 1A

B. I/O MEMORY
 EXPANSION BOARD

C. MAIN LOGIC BOARD

D. CIRCUIT PANEL PLATE

OUR PIN-OUT IS
 OPPOSITE OF THE PIN-OUT
 PRINTED ON THE CONNECTOR
 I.E. PIN 1 IS PIN 10
 FOR A 10 PIN CONNECTOR

AC/DC POWER CONNECTION

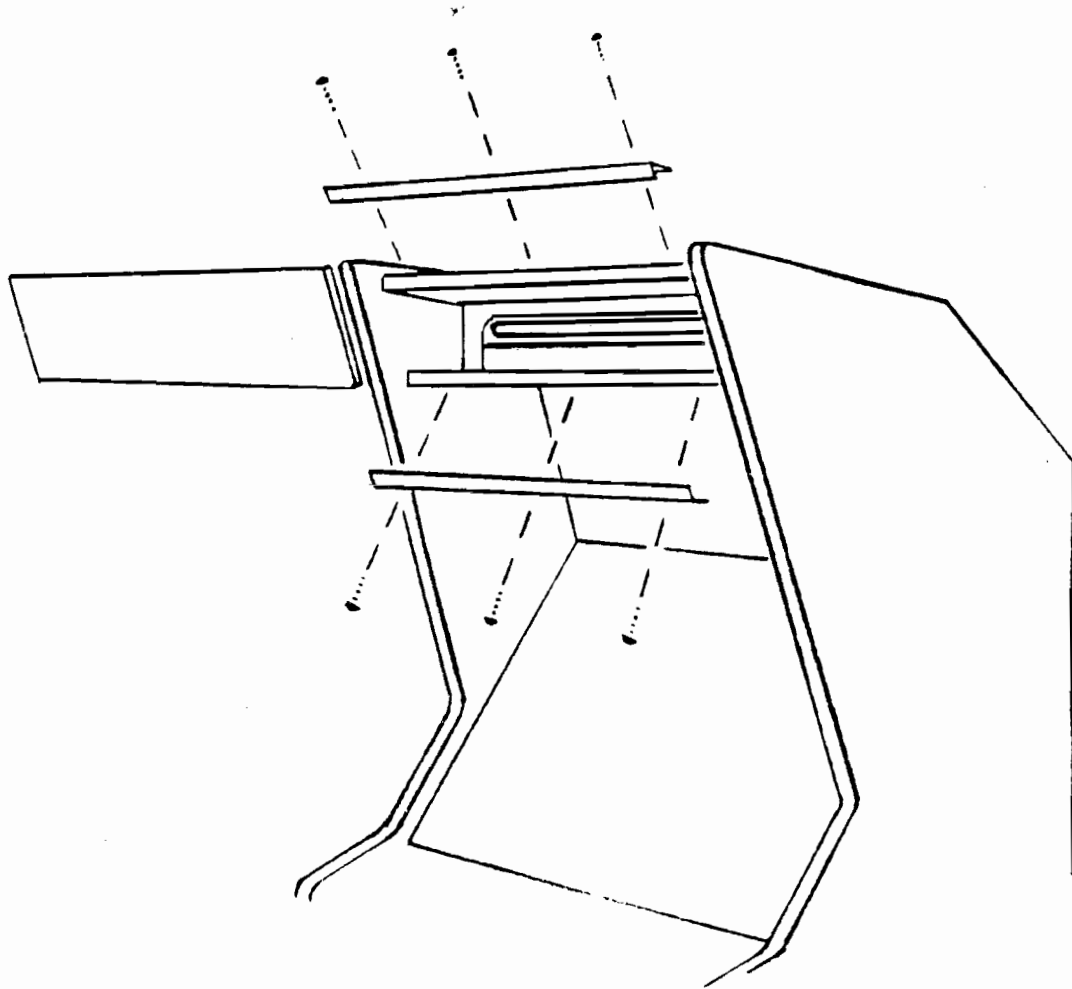
FIG. 1

5. MARQUEE BLUES (MARQUEE INSTALLATION)

Your game is a money making investment! Why compromise by installing a crooked marquee? Avoid this and follow these instructions for installing:

First, place the plexiglass on a table. Next, center the decal on the plexiglass, getting an idea of the general location (before peeling off the back). Now, carefully peel off the back and place the far edge (lengthwise) on the plexiglass first, centering the remaining un-stuck (important) decal. Finally, "roll" down the rest of the decal, slowly, squeezing the air bubbles out with your hand.

Pictured is the marquee on a Cinemat System Cabinet.



MARQUEE INSTALLATION

FIG. 2

6. RUN DIAGNOSTICS (OR GAME INSTALLATION SUCCESS OR FAILURE)

Five minutes of diagnostics may save an hour of frustration wondering why a feature does not work. Our software department is the best in the business. They labored long and hard to write diagnostics to thoroughly check out your game. Take the time to follow the diagnostics section and prove to yourself that the entire game is working properly.

Next, play the game a couple of times to verify that all is well.

7. MONITOR OUTPUTS

The outputs from our system to the monitor are red, green and blue with negative horizontal and negative vertical sync.

8. HOW DO I TURN UP THE SOUND ?

Volume adjustment is easy. Refer to figure 3 and locate VR1 (on main circuit board). Now look at the main board (largest board). Clockwise rotation increases the volume.

C. GAME MODULE INSTALLATION

C. GAME MODULE INSTALLATION

1. Parts for the DOUBLE PLAY game module are as follows. Please inspect and check off:

<u>QTY</u>	<u>DESCRIPTION</u>
------------	--------------------

1	Manual, DOUBLE PLAY
1	DOUBLE PLAY Marquee Lexan Decal
1	Plexiglass Marquee
1	Cinemat I/O Expansion Board
26	EPROMs (Game Software)
1	Custom Chip (U120)
1	02-14 Custom Chip
1	Control Panel Assembly
4	1 1/2" Carriage Bolts
4	#10 Flat Washers
2	#10-24 Hex Nuts
2	#10-24 Wingnuts
5	5/16"x 1" Spacers
5	6/32"x 1-1/2" Bolts
1	40 Pin Ribbon Interconnect Harness
1	10 Pin Power Interconnect Harness

2. Install the 26 DOUBLE PLAY EPROMS in the main board noting the chip location ("U" number) printed on each chip and referring to Figure 3. Match 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.
3. Install the custom chip U120 in the main logic board at location U120 and the 02-14 custom chip at U85 making sure Pin 1 of the chip and Pin 1 of the socket are aligned.
4. Recheck steps 2 and 3 for proper parts placement and orientation.
5. Remove the Z-80B microprocessor from location U99 of the main logic board and reinstall it at location U13 of the I/O and Memory Expansion board. Install the I/O and Memory Expansion board ribbon cables as shown in figure 6.
6. Position the DOUBLE PLAY control panel assembly on the cabinet and attach using the 1 1/2" carriage bolts, washers and 10-24 hex nuts provided. Install only the front-most bolt, washer, and nut on each side at this time. See figure 5.

7. 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 and Memory Expansion board. Plug the remaining two wires (white and violet) of the control panel harness into connector P4 of the main board. Refer to Connector Pinout Chart in back of manual.
8. Attach the marquee to the plexiglass using the procedure in section B above.
9. Installation of the game module is now complete. We suggest you now use the system's "on board" diagnostics to inspect the game. See the diagnostics section of this manual.
10. After testing the control panel, use the remaining two carriage bolts, washers and wing nuts to secure the control panel.

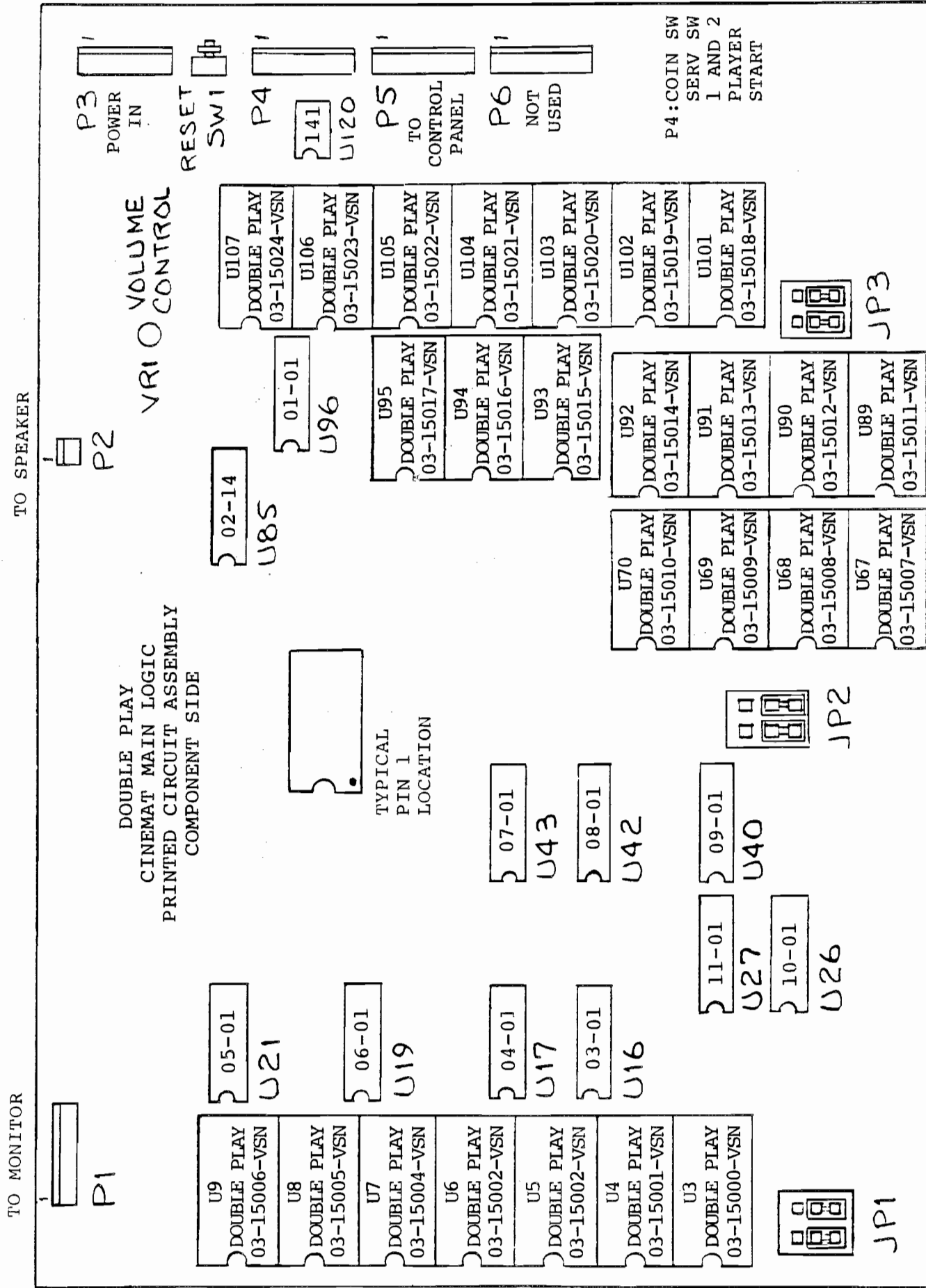
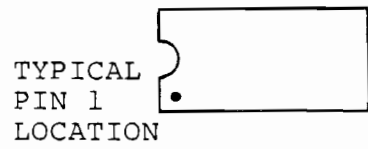
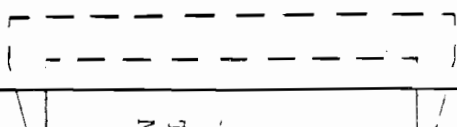
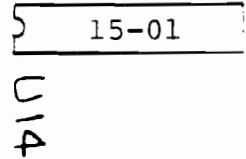
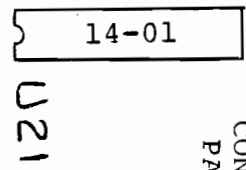
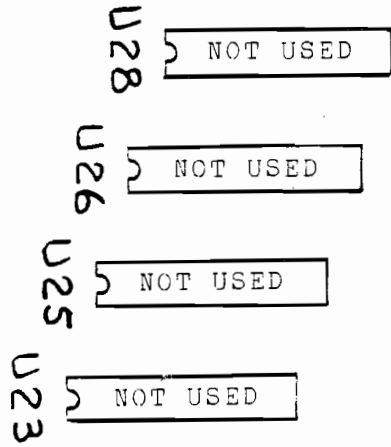
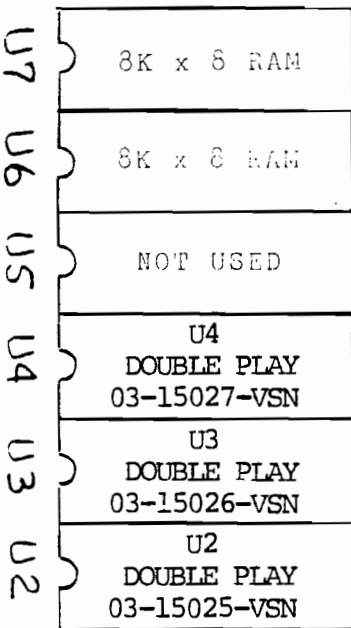
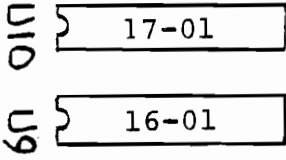
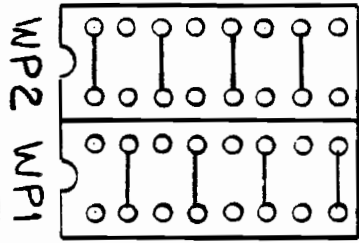


FIG. 3

MAIN CIRCUIT BOARD ASSEMBLY

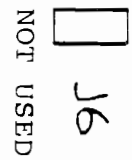
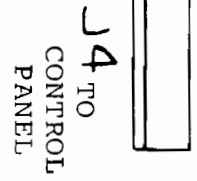
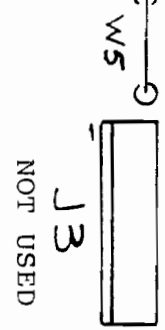
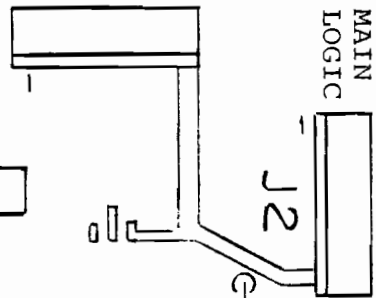
DOUBLE PLAY
MEMORY AND I/O EXPANSION
PRINTED CIRCUIT ASSEMBLY
COMPONENT SIDE



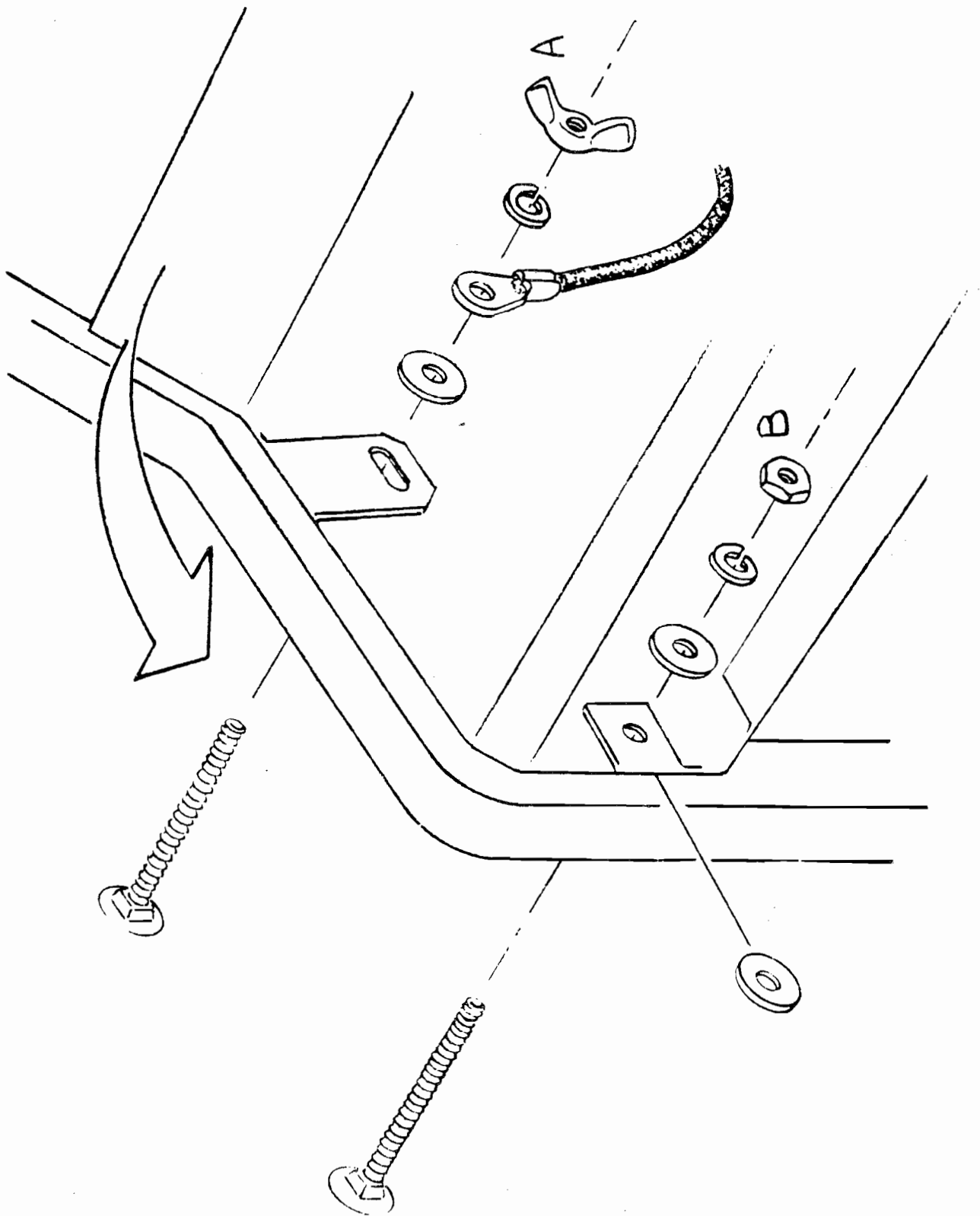
J7A
TO U99
MAIN LOGIC

J1
POWER
FROM
POWER
SUPPLY

POWER
TO
MAIN
LOGIC

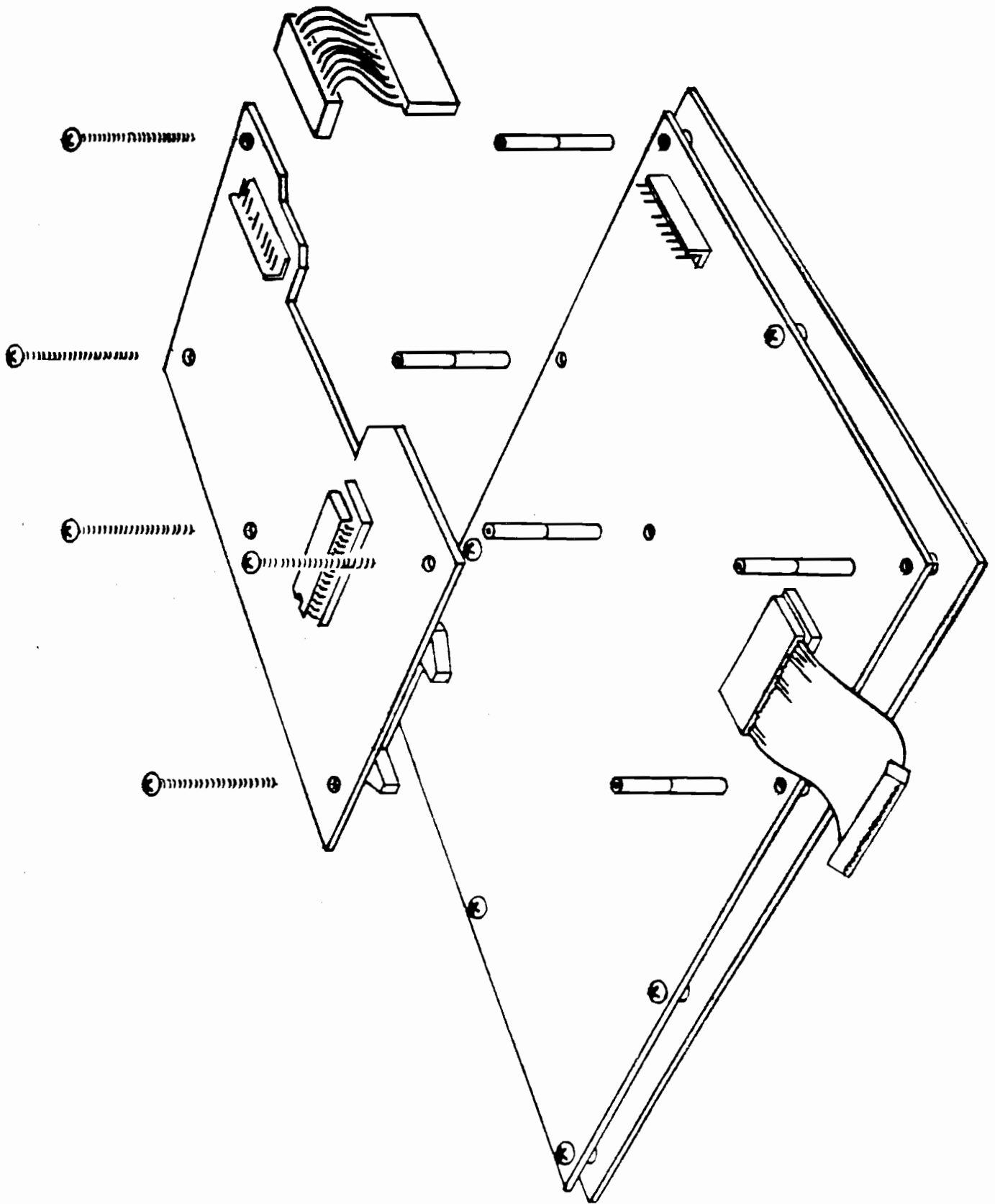


INPUT/OUTPUT AND
MEMORY EXPANSION
CIRCUIT BOARD ASSEMBLY
FIG. 4



CONTROL PANEL BOLT AND GROUND BRAID

FIG. 5



PIGGYBACK CIRCUIT BOARD MATING

FIG. 6

D. UNIVERSAL GAME CONVERSION

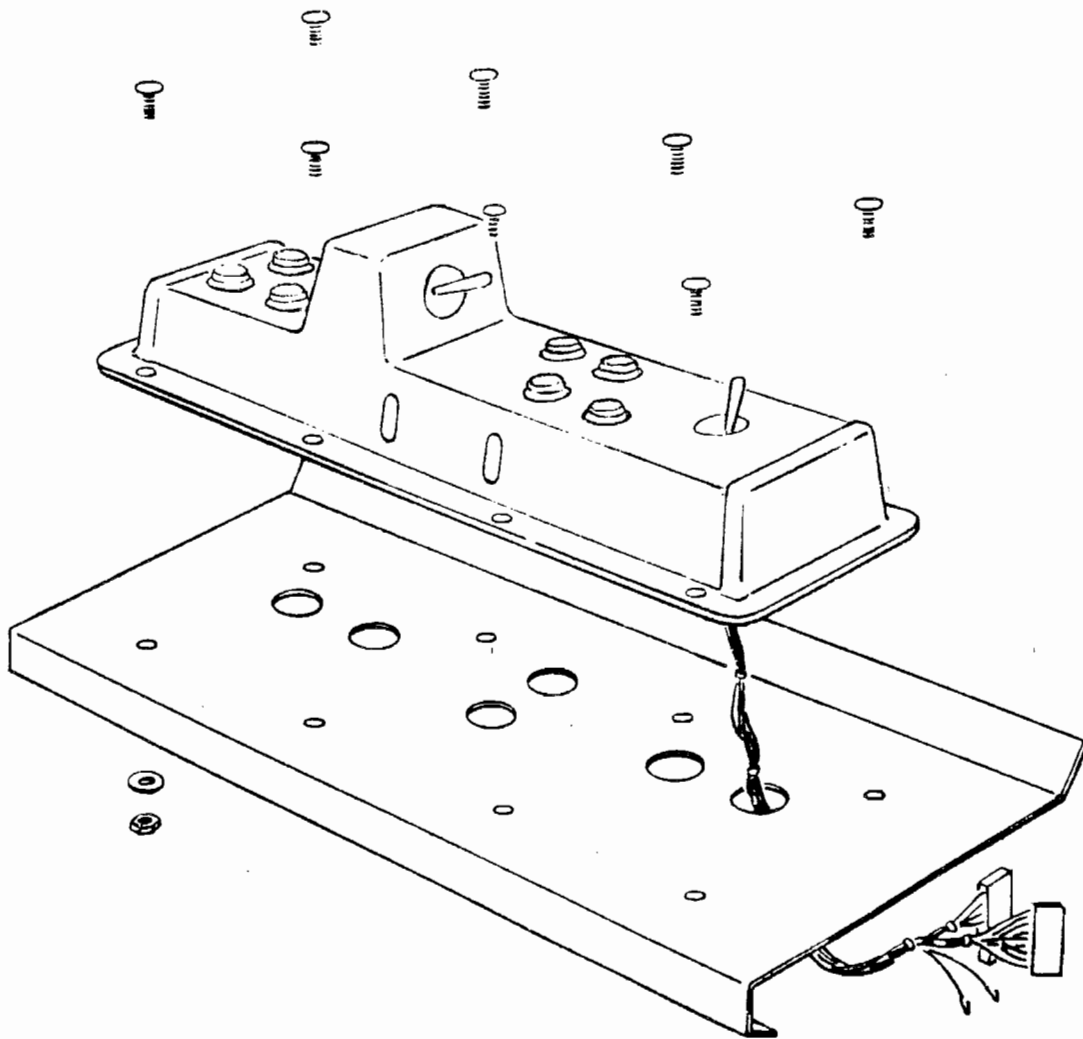
D. UNIVERSAL GAME CONVERSION

1. Parts for the DOUBLE PLAY conversion kit are as follows. Please inspect and check off:

QTY DESCRIPTION

1	Plexi, Marquee
1	Decal, Marquee
10	Ty-Wrap w/eyelet
1	Control Panel Assembly, DOUBLE PLAY
1	Circuit Board Assembly, DOUBLE PLAY
1	Manual, DOUBLE PLAY
1	Harness, Video
1	Harness, Coin Service
1	Harness, Speaker
2	Decals, Cinemat
1	DC Power Harness

2. Remove existing game control panel, and all buttons or joystick controls associated with it. Position the universal control panel above the control panel intended for conversion. Feed the harness through a convenient hole large enough for the harness connectors. Refer to Figure 7.
3. Securely mount the universal control panel with a bolt or screw not easily removed from the exterior of the cabinet. Avoid pinching the wires. Secure using the ty-wraps included with your kit.
3. When routing the harness, leave enough slack so that servicing of the control panel and circuit board assembly can be accomplished with relative ease. Place a wire ty-wrap as close to the circuit board connectors as possible to relieve strain on the connector pins.
4. Mount the circuit board in an area of the cabinet that receives ample ventilation. Make sure the circuit board can be removed easily for service.
5. Refer to the D.C. power wiring diagram, making all the power connections as shown. Be sure to hook up the ground braid. Also, observe proper polarity. Careful with this one!
6. The last order of business is the Marquee and Plexiglass. See section B above for this procedure.
7. The conversion process is now complete. It is recommended at this point, to go into diagnostics to test the performance of the new kit.



CONTROL PANEL MOUNTING AND CABLE ROUTING

FIG. 7

E. BOOKKEEPING / DIAGNOSTIC FUNCTIONS

E. BOOKKEEPING / DIAGNOSTIC FUNCTIONS

DOUBLE PLAY has extensive bookkeeping and diagnostic functions. These functions are explained in the following sections:

1. INVOKING DIAGNOSTICS

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

- a. Press and hold the one-player start button while pressing and releasing the service button (found inside the coin door mounted to the top of the coin box). Concerning Kits, connect the appropriate pins to ground referring to the Connector Pinout Chart in the back of the manual.
- b. Release the one-player start button.
- c. The game screen should now appear as shown on the next page. 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 version number is shown in the lower left-hand corner of the screen.

2. SELECTING THE DESIRED FUNCTION

The one-player start button selects the desired function. The function has been selected when the display color for that particular function changes. Pressing the two player start button enters the selected function. Selecting the RESTART THE GAME function returns the game to normal operation.

An example of the display is as follows:

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 THE GAME

S/N: xxxxxxxx

3. BOOKKEEPING

The bookkeeping screen 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 resetable by the operator. These 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. Pressing the service button to enter the bookkeeping / diagnostic section does not affect 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 setup section of this manual for information on setting the number of coins per credit).

a. PERIOD AND DOLLAR COUNTERS

Three resetable counters, located to the right of the lifetime counters are provided to aid the operator in tracking the games' cash intake over a period of time. These counters are:

1. coins dropped
2. dollars collected

As in the main menu, these options are selected by pressing the one-player start button and entered by pressing the player two start button. To reset the period and dollar counters for either coin mech, press the one-player start button until the message "RESET COIN MECH 1 (or 2) DOLLARS COLLECTED" changes color. Then press the two-player start button.

b. 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. If you operate a location where, for example, 6 tokens equal one dollar, then 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 one-player start button to highlight the COINS PER DOLLAR message for the desired coin mech then use the two-player start button to change the multiplier.

c. EXAMPLE OF SETTING TOKENS PER DOLLAR

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

An example of the display is as follows:

```
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 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
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

4. DIAGNOSTICS

The diagnostic menu is displayed upon entering diagnostics from the main menu. The player can then select the desired function.

An example of the display is as follows:

DIAGNOSTICS

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

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

RETURN TO MAIN MENU

a. 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 change color on the video screen.

The word GOOD will appear to the right of the control's description when the switch contacts close and will remain on the screen until the button is released.

Pressing the two-player start or service button twice will end the test and return you to the diagnostic menu.

An example of the display is as follows:

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
LEFT RUN/STEAL BUTTON
RIGHT RUN/STEAL BUTTON
RUN/CUTOFF BUTTON

RUN/AIM BUTTON

BATTERS JOYSTICK HORIZONTAL: xxH
xxxxxxxxx bar graph xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

BATTERS JOYSTICK VERTICAL: xxH
xxxxxxxxx bar graph xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

PITCHING JOYSTICK HORIZONTAL: xxH
xxxxxxxxx bar graph xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

PITCHING JOYSTICK VERTICAL: xxH
xxxxxxxxx bar graph xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

PRESS THE PLAYER 2 OR SERVICE SWITCH BUTTON TWICE TO EXIT

b. PROCESSOR MEMORY TEST

The processor memory test checks all on-board RAM and EPROM memory with the exception of the video memory. The messages TESTING MASTER ROM, TESTING MASTER RAM, TESTING COLOR RAM and TESTING SLAVE MEMORY will each appear on the left side of the screen as each of those tests are performed. The result of each test (pass or fail) is displayed on right side of the screen next to the description of that test.

Two error messages may appear during slave memory test, these are COMMUNICATION ERROR and SLAVE NOT RESPONDING. ICs to be checked, in order of priority, are listed below:

- COMMUNICATIN ERROR - a. U19
 b. U21 through U23
 c. U45
 d. U60
 e. U62
 f. U64

- SLAVE NOT RESPONDING - a. U10 (slave RAM)
 b. U3 (EPROM)
 c. U1 (Z80 CPU)
 d. U2
 e. U20, U18
 f. U61, U63

In the case of a failure of a ROM or RAM, the location (U number) of the suspected part is shown on the screen.

The following is an example of the display indicating a U107 failure.

PROCESSOR MEMORY TEST

TESTING MASTER ROM	MASTER ROM	BAD
	CHIP 107	SUSPECT
TESTING MASTER RAM	MASTER RAM	GOOD
TESTING COLOR RAM	COLOR RAM	GOOD
TESTING SLAVE MEMORY	SLAVE ROM	
	SLAVE RAM	

PRESS 2-PLAYER START TO EXIT TESTING

c. VIDEO ALIGNMENT DISPLAY

Three video alignment screens are provided to aid in adjusting the game's video monitor for maximum picture quality. Refer to the video monitor technical manual (not supplied) for technical information and adjustment instructions.

The first screen consists of a white crosshatch pattern. This should be used to adjust screen position, horizontal size, vertical size and focus. Pressing the two-player 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.

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 shades of blue. Eight other colors are also displayed for reference, they are, from 0 through 7 respectively: blue, green, red, cyan, magenta, yellow, gray and white.

d. 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. After each pass (about 5 seconds), the results of the test will be displayed on the screen.

If the test was successful (all RAMs good), the message "VIDEO RAM CHECKS OK" will be displayed for about 1 second 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).

<u>NUMBER OF</u> <u>AUDIBLE BEEPS</u>	<u>SUSPECT ICs</u>
2	U35 and U36
4	U33 and U34
6	U48 and U49
8	U46 and U47

e. VIEWING BACKGROUND SCREENS AND BACKGROUND TEST

This test is set up to view all the background screens by pressing the one-player start button to advance the screens. Pressing the two-player start button exits the program.

An example of the display is as follows:

BACKGROUND PROM TEST

PRESS 1-PLAYER START TO ADVANCE.
OR PRESS 2-PLAYER START TO EXIT.

10. GAME SET-UP

The game option set-up section allows the operator to change various game options. As explained 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.

a. 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 change coinage, follow the example screens 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

b. 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

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

c. ATTRACT MODE SOUND

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

An example of the display is as follows:

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 INNING FOR 1 CREDIT _ _ _ _ NO
ATTRACT MODE SOUND _ _ _ _ _ YES

RETURN TO MAIN MENU

11. GAME STATISTICS

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

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

An example of the display is as follows:

GAME STATISTICS

SELECT FUNCTION WITH 1-PLAYER START BUTTON
ENTER FUNCTION WITH 2-PLAYER START BUTTON

NUMBER OF 1-PLAYER INNINGS: 0
PLAYER WINS: 0
COMPUTER WINS: 0

NUMBER OF 2-PLAYER INNINGS: 0
COMPLETE GAMES BOUGHT: 0

RESET GAME STATISTICS

RETURN TO MAIN MENU

12. 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.

An example of the display is as follows:

INNING DURATION GRAPHS

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

ONE PLAYER INNINGS: AVERAGE TIME: 0:00

0:00-1:00	0	xxxx bar graphs follow xxx
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	

TWO PLAYER INNINGS:

AVERAGE TIME: 0:00

0:00-1:00	0	xxxx bar graphs follow xxx
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	

RESET 1-PLAYER INNINGS AND BAR GRAPHS
RESET 2-PLAYER INNINGS AND BAR GRAPHS
RETURN TO MAIN MENU

13. ERASE ALL PLAYER STATISTICS

DOUBLE PLAY 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.

An example of the display is as follows:

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

D. SYSTEM TROUBLESHOOTING GUIDE

The entire Cinemat game system can be broken down into major groups. A brief guide to troubleshooting each section follows:

1. Input/Output functions:

a. Monitor

1. No raster (i.e. black screen)

- a. Check AC supply to monitor. If there is no power at the monitor, trace the

wiring back to the isolation transformer and/or verify that power is reaching the transformer.

- b. Check monitor fuses.
2. Display scrolls (apparent synchronization problem).
 - a. Check monitor alignment adjustments.
 - b. Check RGB and synchronization signals on PCB connector and trace through to the monitor.
3. Black screen
 - a. Check for +5.0 VDC at circuit boards.
 - b. Check connectors are securely seated and in the proper position.
4. White or checkerboard screen.
 - a. Check for +5.0 VDC on P4 - 3 through 7. If any of these signals are low, replace U114 (74LS08). If this fails, replace U119 (74LS257).
 - b. Check the clock signal on the master Z80 (U99-6), DOUBLE PLAY I/O and Memory Expansion Board (U13), REDLINE RACER Sound Board (U14).
 - c. Check reset on the Z80 (U99-26). This signal should normally be high and go low when the reset button is pressed.
5. White or red vertical lines close together on entire screen or half of screen.
 - a. Check video RAMs U33 through U36 and U46 through U49. Refer to sheet 11 and 18 on schematic.
6. Vertical lines on playing field (background).
 - a. Check signals on U81 through U83 (74LS166's).
 - b. Regarding other background problems, check the position of JP2 Jumpers, swap U56, (74LS461) with U60, see if problem disappears.
7. White vertical bars, usually on half of screen

sometimes with an audio buzz.

- a. Caused by excessive temperature. Swap U45 with U23 and/or U60 with U22 (74LS461's).
8. Intermittent flashing video or color changes.
 - a. Check for +5.0 VDC at circuit boards. TP1 and TP2 (+5 VDC)
9. Picture freezes.
 - a. Check for +5.0 VDC at circuit boards. TP1 and TP2 (+5 VDC)
 - b. Check Z80s (U1 and U99). They should be Zilog Mostek devices with a "B" suffix (6 MHz). If not call for replacement.
 - c. Check for damaged sockets on master EPROMs and master CPU.
10. Drifting pattern (any color).
 - a. Check connector and signals on P1.
 - b. Sign of synchronization problems. Check DCLK.
 - c. Check U40 (RGS09), U42 (RGS07), and U43 (RGS08).
- b. Buttons, joysticks and coin counters.
 1. A careful visual inspection of the buttons, harnesses and connectors is advised.
 - a. Inspect harness crimps.
 - b. Check for broken wires.
 - c. Check for broken solder joints at the termination point.
 2. Trace signals through back to the input IC on the PCB.

2. Electronics

- a. Main board electronics.
 1. Problems can sometimes be traced to a bad CPU or crystal. Check the master and slave CPU's and their associated components.
 2. Check EPROMs for background and foreground display and the associated video timing logic.

3. Check power at the ICs.
- b. Add on board(s) that control game specific functions.
 1. Again, check for functions specific to the board.
 2. Check all ICs for proper socket installation.
 - c. Check power at the ICs.
3. General Knowledge
 - a. Proper voltage input jumpering on the board is critical! Follow the instructions on this carefully. A symptom of improper jumpering is an audio buzz or no audio. Check for 12.0 to 15.0 VDC at U122-5 (audio amp). Refer to Power Supply Modification section of manual. NOTE: If your speaker is not connected, you will not hear any sound! Seriously, try adjusting the audio volume control pot (VP1). See section B above on adjusting the volume.
 - b. Game powers up with garbage on the screen - no buttons function - audio may buzz
 1. Remove P4 and P5 and reset system (push button on main board). If picture appears, the problem may be a stuck coin switch, button or bad harness or ground connection.
 2. Visually inspect connector crimps and wire colors.
 3. Check for + 5.0 VDC at board.
 - c. A word about coin counters:

Do not use mechanical coin counters in any kit or dedicated game. These devices produce an inductive "kick" that will damage components on the circuit board(s). Problems caused by this are checkerboard video. A quick check to see if this is your problem is look at the "NMI not" signal on both Z80s (pin 17). If a low output is observed, try replacing U114 (74LS08) or if needed, U119 (74LS157).

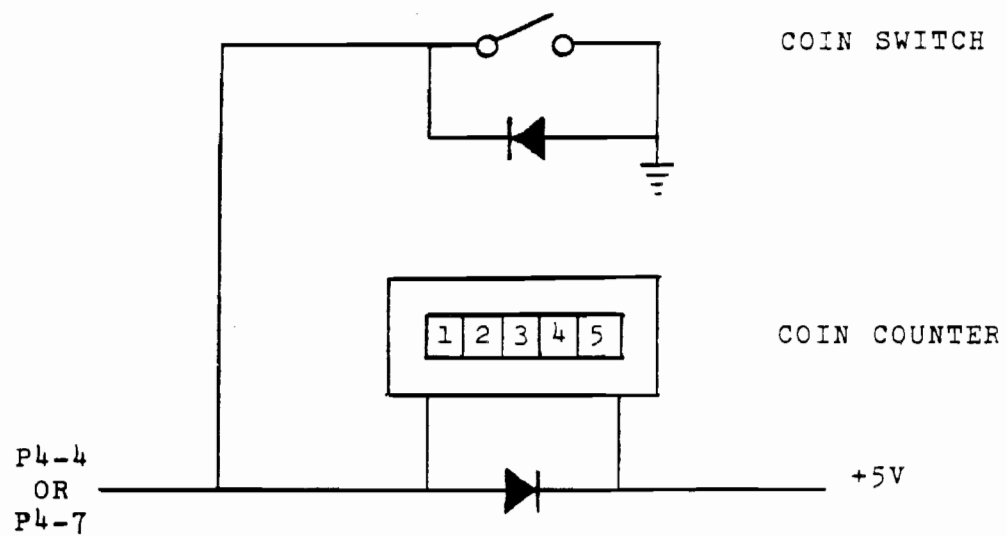
The bookkeeping on our games is very accurate and includes number of coins dropped and dollars earned.

If you must install a coin counter, the next page shows a simple hookup using diode protection.

COIN COUNTER SURGE PROTECTION CIRCUIT

FIG. 8

* IF YOU MUST INSTALL A COIN COUNTER



DIODE MAY BE 1N4001 THROUGH 1N4003

DOUBLE PLAY, CONNECTOR PINOUT CHART

FROM CONNECTOR PIN #	SIGNAL DESCRIPTION	TO CONNECTOR PIN #	WIRE COLOR
----------------------------	-----------------------	--------------------------	---------------

=====

MAIN LOGIC BOARD CONNECTORS:

P1-1	NOT USED		
P1-2	MONITOR, -H SYNC		GRAY
P1-3	MONITOR, -V SYNC		WHITE
P1-4	MONITOR, GROUND		BLACK
P1-5	MONITOR, RED		RED
P1-6	POLARIZING KEY		
P1-7	MONITOR, GREEN		GREEN
P1-8	NOT USED		
P1-9	MONITOR, BLUE		BLUE
P1-10	NOT USED		

P2-1	SPEAKER GROUND	SPEAKER	GRAY
P2-2	SPEAKER GROUND	SPEAKER	WHITE

P3-1	+5 VOLTS	J2-1	RED
P3-2	+5 VOLTS	J2-2	RED
P3-3	+5 VOLTS	J2-3	RED
P3-4	POLARIZING KEY (OPTIONAL)	J2-4	
P3-5	GROUND	J2-5	BLACK
P3-6	GROUND	J2-6	BLACK
P3-7	GROUND	J2-7	BLACK
P3-8	GROUND	J2-8	BLACK
P3-9		J2-9	BROWN
P3-10	+12 OR 25 VOLTS	J2-10	ORANGE

P4-1	NOT USED		
P4-2	GND, COIN, SERVICE	COIN DOOR	BLACK OR GREEN
P4-3	TWO PLAYER START	CONTROL PANEL	VIOLET
P4-4	NORMALLY OPEN	COIN SWITCH 2	ORANGE
P4-5	NORMALLY OPEN	SERVICE SWITCH	YELLOW
P4-6	ONE PLAYER START	CONTROL PANEL	WHITE
P4-7	NORMALLY OPEN	COIN SWITCH 1	BLUE
P4-8	NOT USED		
P4-9	NOT USED		
P4-10	NOT USED		

P5-1	NOT USED		
P5-2	GROUND	CONTROL PANEL	GREEN
P5-3	GO BACK (N.O.)	CONTROL PANEL	GRAY
P5-4	RUN/CUTOFF (N.O.)	CONTROL PANEL	BROWN
P5-5	EXTRA BASE (N.O.)	CONTROL PANEL	BLUE
P5-6	RUN/AIM (N.O.)	CONTROL PANEL	YELLOW
P5-7	RUN/STEAL OUTER (N.O.)	CONTROL PANEL	ORANGE
P5-8	NOT USED		
P5-9	RUN/STEAL INNER (N.O.)	CONTROL PANEL	RED
P5-10			

P6 NOT USED

XX

INPUT/OUTPUT AND MEMORY EXPANSION BOARD CONNECTORS:

DOUBLE PLAY, CONNECTOR PINOUT CHART

FROM CONNECTOR PIN #	SIGNAL DESCRIPTION	TO CONNECTOR PIN #	WIRE COLOR
J1-1	+5 VOLTS	POWER SUPPLY	RED
J1-2	+5 VOLTS	POWER SUPPLY	RED
J1-3	+5 VOLTS	POWER SUPPLY	RED
J1-4	POLARIZING KEY		
J1-5	GROUND	POWER SUPPLY	BLACK
J1-6	GROUND	POWER SUPPLY	BLACK
J1-7	GROUND	POWER SUPPLY	BLACK
J1-8	GROUND	POWER SUPPLY	BLACK
J1-9	NOT USED		
J1-10	+12 OR +25 VOLTS	POWER SUPPLY	ORANGE
J2-1	+5 VOLTS	P3-1 (MAIN	RED
J2-2	+5 VOLTS	P3-2 LOGIC	RED
J2-3	+5 VOLTS	P3-3 BOARD)	RED
J2-4	POLARIZING KEY	P3-4	
J2-5	GROUND	P3-5	BLACK
J2-6	GROUND	P3-6	BLACK
J2-7	GROUND	P3-7	BLACK
J2-8	GROUND	P3-8	BLACK
J2-9		P3-9	BROWN
J2-10	+12 OR +25 VOLTS	P3-10	ORANGE
J3	NOT USED		
J4-1	GROUND	BATTERS JOYSTICK	GREEN
J4-2	+12 VOLTS	BATTERS JOYSTICK	ORANGE
J4-2	+12 VOLTS	PITCHERS JOYSTICK	ORANGE
J4-3	NOT USED		
J4-4	SWING	BATTERS JOYSTICK	YELLOW
J4-5	UP-DOWN	BATTERS JOYSTICK	BROWN
J4-6	NOT USED		
J4-7	BALL SPEED	PITCHERS JOYSTICK	VIOLET
J4-8	NOT USED		
J4-9	NOT USED		
J4-10	CURVE	PITCHERS JOYSTICK	BLUE
J4-11	POLARIZING KEY		
J4-12	GROUND	PITCHERS JOYSTICK	GREEN
J5-1	GROUND	TAG PCB J1-2	GREEN
J5-2	DATA LINE 13	TAG PCB J1-7	BROWN
J5-3	+5 VOLTS	TAG PCB J1-1	RED
J5-4	CLOCK	TAG PCB J1-5	BLACK
J5-5	RES 3	TAG PCB J1-4	VIOLET
J5-6	RES 2	TAG PCB J1-3	ORANGE
J5-7	DATA LINE 12	TAG PCB J1-6	GRAY
J5-8	DATA LINE 3	TAG PCB J1-10	YELLOW
J5-9	DATA LINE 2	TAG PCB J1-9	BLUE
J5-10	POLARIZING KEY		
J5-11	SPARE	TAG PCB J1-8	WHITE
J5-12	NOT USED		

DOUBLE PLAY, CONNECTOR PINOUT CHART

FROM CONNECTOR PIN #	SIGNAL DESCRIPTION	TO CONNECTOR PIN #	WIRE COLOR
----------------------------	-----------------------	--------------------------	---------------

J6 NOT USED

XX

INPUT/OUTPUT AND MEMORY EXPANSION BOARD

40 PIN RIBBON CABLE CONNECTOR:

J7A-1	MASTER ADDRESS LINE 11	U99-1 (MAIN
J7A-2	MASTER ADDRESS LINE 12	U99-2 LOGIC
J7A-3	MASTER ADDRESS LINE 13	U99-3 BOARD)
J7A-4	MASTER ADDRESS LINE 14	U99-4
J7A-5	MASTER ADDRESS LINE 15	U99-5
J7A-6	CLOCK	U99-6
J7A-7	MASTER DATA LINE 4	U99-7
J7A-8	MASTER DATA LINE 3	U99-8
J7A-9	MASTER DATA LINE 5	U99-9
J7A-10	MASTER DATA LINE 6	U99-10
J7A-11	+5 VOLTS	U99-11
J7A-12	MASTER DATA LINE 2	U99-12
J7A-13	MASTER DATA LINE 7	U99-13
J7A-14	MASTER DATA LINE 0	U99-14
J7A-15	MASTER DATA LINE 1	U99-15
J7A-16	INT	U99-16
J7A-17	MNMI	U99-17
J7A-18	NOT USED	U99-18
J7A-19	MREQ	U99-19
J7A-20	I/O REQ	U99-20
J7A-21	RD	U99-21
J7A-22	WR	U99-22
J7A-23	NOT USED	U99-23
J7A-24	WAIT	U99-24
J7A-25	+5 VOLTS	U99-25
J7A-26	POR	U99-26
J7A-27	M1	U99-27
J7A-28	RFSH	U99-28
J7A-29	GROUND	U99-29
J7A-30	MASTER ADDRESS LINE 0	U99-30
J7A-31	MASTER ADDRESS LINE 1	U99-31
J7A-32	MASTER ADDRESS LINE 2	U99-32
J7A-33	MASTER ADDRESS LINE 3	U99-33
J7A-34	MASTER ADDRESS LINE 4	U99-34
J7A-35	MASTER ADDRESS LINE 5	U99-35
J7A-36	MASTER ADDRESS LINE 6	U99-36
J7A-37	MASTER ADDRESS LINE 7	U99-37
J7A-38	MASTER ADDRESS LINE 8	U99-38
J7A-39	MASTER ADDRESS LINE 9	U99-39
J7A-40	MASTER ADDRESS LINE 10	U99-40

J7B NOT USED