

WPC
TEST FIXTURE
Instruction Manual

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Table of Contents

Section One - Operation

WPC Test Fixture Set-up.	2
WPC Menu System Operation.	4
Main Menu.	4
Adjustments Menu.	5
Bookkeeping Menu.	7
Printouts Menu	10
Test Menu.	11
Utilities Menu.	15

Section Two - Parts

Boards and Cables.	20
Cabinet Parts.	21

Section Three - Wiring Diagrams

Interface and Load Connect Board Wiring.	24
Cable Locations Diagram.	26
User Interface Board Schematic.	28
Load Connect Board Schematic.	30
Interboard Wire Colors.	31
Board Locations Diagram.	35

S E C T I O N

one



OPERATION

WPC Test Fixture Set-up

The WPC Test Fixture simulates the Attract Mode and Menu System Operations of the Game whose ROM you have installed in location U6 on the CPU Board. It has been designed to aid in testing and troubleshooting the following boards:

A-12742 CPU Board	A-12739-1, -2, or -3 Display Driver Board
A-12697 Power Driver Board	A-12794 Single Display
A-12738 Sound Board	A-12793 Dual Display

Do Not attempt to test the D-11581 Sound Board with the WPC Test Fixture. The voltage requirements are different and the D-11581 Sound Board will be damaged.

The Test Fixture comes with an A-12742-584 CPU Board, an A-12697 Power Driver Board, an A-12738-584 Sound Board, an A-12739 Display Driver, and an A-12793 Dual Driver Board. These boards must be mounted to the top panel of the fixture. NEVER force a connector onto a board. The A-13651 WPC User Interface Board is mounted behind the front panel, the A-13707 Load Connect and the A-14011 Power Interconnect Boards are mounted underneath the top panel (see Board Location Diagram on page 32). The User Interface, Load Connect and Power Interconnect Boards are only used in the Test Fixture, and not on any game.

Dual Display

Push the pointed end of the display support through the holes in the board from the back. Attach the 31 inch long ribbon cable to J401, the red line goes to pin one. Next attach the 23 inch long ribbon cable to J402, the red line goes to pin one. Peel the backing off of the adhesive on the display supports. Press the display into place next to the front panel. J401 and J402 must be on top, and the ribbon cables must run behind the display.

Display Driver Board

Place the Display Driver on the top panel so that J301, J302, J303, and J304 are on the left side, and J305, J306, and J307 are on the right side. The ribbon cable from J402 on the Dual Display Board goes to J304, the red line is pin one. The ribbon cable from J401 on the Dual Display Board goes to J301, the red line is pin one. J302 and J303 are only used when testing extended display glasses. Attach the 9 inch ribbon cable to J305, again the red line is pin one. The other end of this cable goes to the CPU. The +5V power cable from the Power Driver Board is connected at J306. The transformer secondary is connected at J307.

CPU Board

The CPU is located to the right of the Display Driver. J204 should be on the left side and J211 should be on the right. J201 is for future options. J206, J208, and J212 are not used when the CPU is mounted on the test fixture. J203 is not installed. J202 uses the 14 inch ribbon cable, the red line goes to pin one. The other end goes to the Sound Board. The ribbon cable from J305 on the Display Driver Board is connected to J204. Connect the harness with orange-color stripe wires to J205. Connect the harness with green-color stripe wires to J207. Connect the harness with white-color stripe wires to J209. Connect the power input to J210. J211 uses the 3 inch ribbon cable. The other end goes to the Power Driver Board.

Power Driver Board

Unused jacks (connectors) may have voltage present during testing. Extreme care should be taken to avoid contact with these jacks (connectors). The Power Driver Board is located to the right of the CPU. J113, J114, and J115 must be on the left side and J101, J102, and J103 must be on the right side. There are 21 connectors that are not used when the Power Driver is mounted on the Test Fixture. These are J103 thru J105, J107, J109, J111, J116, J118 thru J120, J122, J124, J126, J128, J129, J131 thru J134, J136, and J137.

Of the connectors that are used, connect the blue-white/solid red harness to J101. Connect the black-yellow/white-red harness to J102. Connect the violet-yellow/solid red harness to J106 and the violet-yellow (single wire) harness to J108. The orange-color stripe/blue-color stripe harness goes to J110. The white-green harness goes to J112. J113 has the ribbon cable from J211 on the CPU. Connect a black/gray/gray-yellow harness to J114. J115 has the yellow-white harness. J117 has another black/gray/gray-yellow harness connected to it. Connect the white-color stripe/solid color harness to J121. Connect the smaller blue-color stripe harness to J123 and the larger blue and black-color stripe harness to J125. Connect the brown-color stripe harness to J127. Connect the violet-color stripe harness to J130. Connect the red-color stripe harness to J135 and the yellow-color stripe harness to J138.

Sound Board (only connect the A-12738 Sound Board to the WPC Test Fixture).

The Sound Board is located above the Power Driver Board. J506 must be on the bottom, and J507 must be on the top. Connect the AC input to J501. This connector has gray, gray-yellow, and gray-white wires. Connect the gray and black +5VDC harness to J502. J503 is not used. The speaker harness has black and black-yellow wires, and can be connected to either J504 or J505. J506 has the ribbon cable from the CPU. J507 is for an optional analog volume control, if you choose to connect it. J508, and J509 are not used.

Locate the line cord in the back of the of the Test Fixture and plug into any 110VAC, 3 prong outlet. Do Not use a cheater plug or cut the ground. The On/Off switch is located on the right side of the front panel. The displays should light and the fixture simulate the attract mode of the game ROM in the CPU.

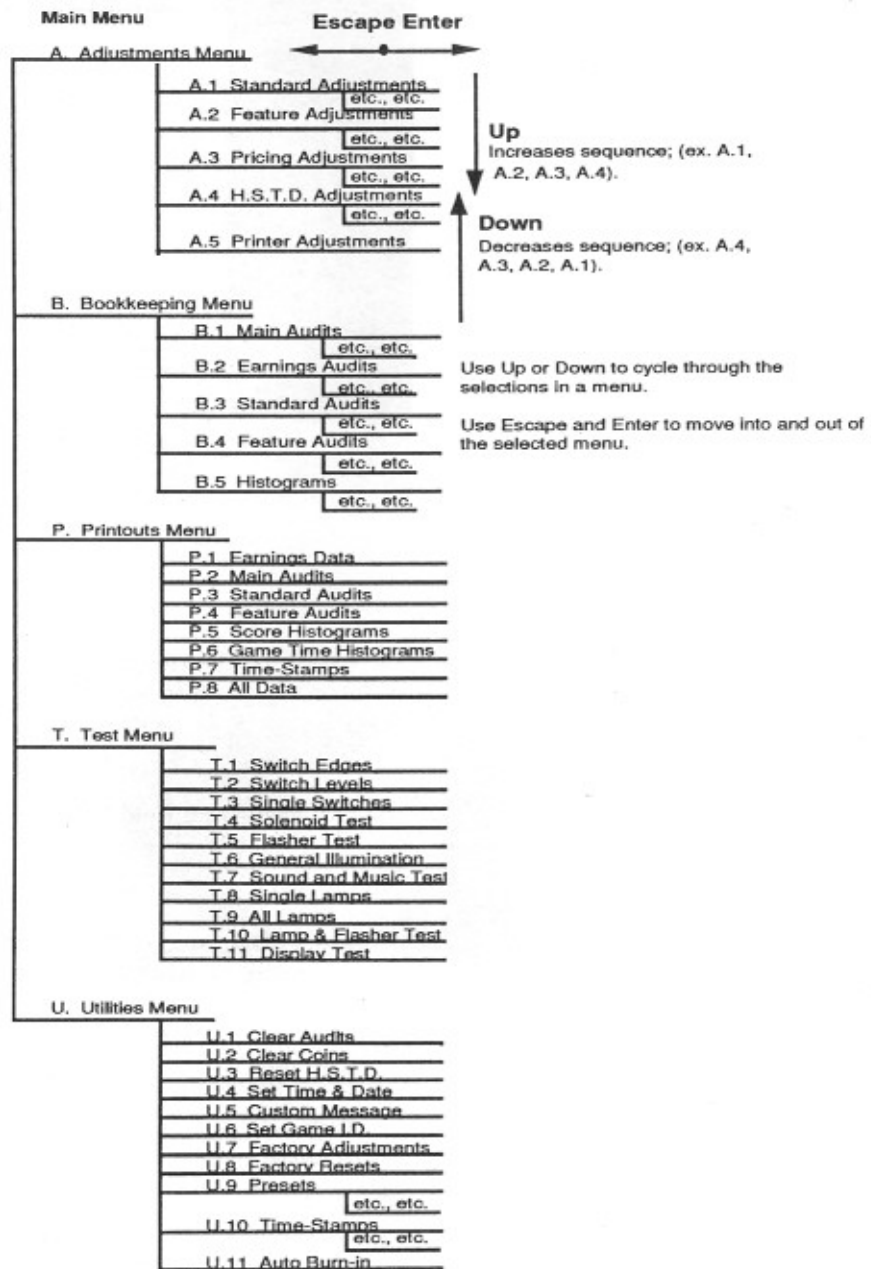
To adjust the volume, enter the Attract Mode, press and hold the Up or Down button until the desired volume level is reached.

Unused jacks (connectors) may have voltage present during testing. Extreme care should be taken to avoid contact with these jacks (connectors).

WPC Menu System Operations

WPC operates on a Menu System. The Main Menu allows you to choose from several main categories, which in turn lead to other menus to choose from.

To enter the Menu System, press the Begin Test button. The displays show the Game I.D. Mode. Press the Enter button and the Main Menu appears. To cycle through the Main Menu selections press either the Up or Down button. Activate any selection by pressing the Enter button when the desired selection appears in the displays. To return to the Attract Mode while viewing the Main Menu, press the Escape button.



MAIN MENU

- A. Adjustments
- B. Bookkeeping
- P. Printouts
- T. Tests
- U. Utilities

The game Adjustments are the first category available from the Main Menu. Press the Enter button to activate the Adjustments Menu. Press the Up or Down button to cycle through the Adjustment Menu selections. Press the Enter button to activate the desired Adjustment Group when that group appears in the displays.

A. ADJUSTMENTS MENU

- A.1 Standard Adjustments
- A.2 Feature Adjustments
- A.3 Pricing Adjustments
- A.4 H.S.T.D Adjustments
- A.5 Printer Adjustments

Once you have entered the adjustment group desired, press the Up or Down button to cycle through the available adjustments in that group. When the desired adjustment appears press the Enter button to activate that adjustment. When an adjustment is activated, the setting value begins to flash. Use the Up or Down button to raise or lower the setting value. When the desired value is displayed press Enter to lock in the value. IF you realize you have made an error, press the Escape button while "Saving Adjustment Value" is displayed. The new value is ignored and the original value is retained.

A.1 Standard Adjustments *For Auto % Replay. ** For Fixed Replay

A.1	01	Balls Per Game	1 to 10
A.1	02	Tilt Warnings	1 to 10
A.1	03	Max. Extra Balls	1 to 10
A.1	04	Max. Extra Balls/Ball in Play	OFF, 1 to 10
A.1	05	Replay System*	Auto% or Fixed
A.1	06	Replay Percent*	5% to 50%
A.1	07	Replay Start*	1, 000, 000 to 15, 000, 000
A.1	08	Replay Levels*	1 to 4
A.1	09	Replay Level 1**	00 to 25, 000, 000
A.1	10	Replay Level 2**	00 to 25, 000, 000
A.1	11	Replay Level 3**	00 to 25, 000, 000
A.1	12	Replay Level 4**	00 to 25, 000, 000
A.1	13	Replay Boost	ON or OFF
A.1	14	Replay Award	Credit, Ticket, Ex. Ball, or Audit
A.1	15	Special Award	Credit, Ticket, Ex. Ball, or Points

A.1	16	Match Award	Credit or Ticket
A.1	17	Extra Ball Ticket	NO or YES
A.1	18	Max. Ticket/Player	00 to 100
A.1	19	Match Feature	OFF, 1% to 50%
A.1	20	Custom Message	ON or OFF
A.1	21	Language	English, French, or German
A.1	22	Clock Style	AM/PM or 24 Hours
A.1	23	Date Style	Month, Date, Year/Date, Month, Year
A.1	24	Show Date and Time	NO or YES
A.1	25	Allow Dim Illumination	NO or YES

Press the Escape button to return to the Adjustments Menu. Press the Up button to advance to the next desired Adjustments Group, (or press the Down button to return to a previous Adjustment Group). Press the Enter button to activate that group. Press the Up or Down button to cycle through the available adjustments in that group.

A.2 Feature Adjustments

These adjustments are game specific, and are only available in game software.

Press the Up button to advance to the next desired Adjustment Group, (or press the Down button to return to a previous Adjustment Group). Press the Enter button to activate that group. Press the Up or Down button to cycle through the available adjustments in that group.

A.3 Pricing Adjustments

A.3	01	Game Pricing (if set to custom, then 02 to 09 are available)
A.3	02	Left Coin Units
A.3	03	Center Coin Units
A.3	04	Right Coin Units
A.3	05	4th Slot Units
A.3	06	Units/Credits
A.3	07	Units/Bonus
A.3	08	Bonus Credits
A.3	09	Minimum Units
A.3	10	Coin Door Type (if set to custom, then 11 to 15 are available)
A.3	11	Collection Text
A.3	12	Left Slot Value
A.3	13	Center Slot Value
A.3	14	Right Slot Value
A.3	15	4th Slot Value
A.3	16	Maximum Credits
A.3	17	Free Play
A.3	18	Hide Coin Audits

Press the Escape button to return to the Adjustment Menu. Press the Up button to advance to the next desired Adjustment Group, (or press the Down button to return to a previous Adjustment Group). Press the Enter button to activate that group. Press the Up or Down button to cycle through the available adjustments in that group.

A.4 H.S.T.D. Adjustments

A.4	01	Highest Scores	ON or OFF
A.4	02	H.S.T.D. Award	Credit or Ticket
A.4	03	Champion H.S.T.D.	ON or OFF
A.4	04	Champion Credits	00 to 10
A.4	05	H.S.T.D. 1 Credits	00 to 10
A.4	06	H.S.T.D. 2 Credits	00 to 10
A.4	07	H.S.T.D. 3 Credits	00 to 10
A.4	08	H.S.T.D. 4 Credits	00 to 10
A.4	09	High Score Reset Every	OFF, 250 to 20,000
A.4	10	Backup Champion	00 to 99,900,000
A.4	11	Backup H.S.T.D. 1	00 to 99,900,000
A.4	12	Backup H.S.T.D. 2	00 to 99,900,000
A.4	13	Backup H.S.T.D. 3	00 to 99,900,000
A.4	14	Backup H.S.T.D.4	00 to 99,900,000

Press the Up button to advance to the next desired Adjustment Group, (or press the Down button to return to the previous Adjustment Group). Press the Enter button to activate that group. Press the Up or Down button to cycle through the available adjustments in that group.

A.5 Printer Adjustments

A.5	01	Column Width
A.5	02	Lines per Page
A.5	03	Pause Every Page

Press the Escape button to return to the Adjustments Menu. Then, press the Escape button again to return to the Main Menu. Once in the Main Menu press the Up button to advance to the next menu selection, the Bookkeeping Menu. Press the Enter button to activate the Bookkeeping Menu, then use the Up or Down button to cycle through the Bookkeeping Menu selections. Press the Enter button to activate the desired Bookkeeping Group when that group appears in the displays.

B. BOOKKEEPING MENU

- B.1 Main Audits**
- B.2 Earning Audits**
- B.3 Standard Audits**
- B.4 Feature Audits**
- B.5 Histograms**

Once you have entered the desired bookkeeping group, press the Up or Down button to cycle through the available audits in that group. Audits cannot be set, they can only be cleared. Information from the Bookkeeping Menu is obtainable from the Attract Mode. Continually pressing the Enter button, while in the Attract Mode, cycles through all of the game audits.

B.1 Main Audits These audits (which also appear in other groups) are the most important, and are grouped here for easier access.

B.1	01	Total Earnings	00
B.1	02	Recent Earnings	00
B.1	03	Free Play Percent	00
B.1	04	Average Ball Time	00
B.1	05	Average Game Time	00
B.1	06	Games Completed	00
B.1	07	Replay Awards	00
B.1	08	Percent Replays	00
B.1	09	Extra Balls	00
B.1	10	Percent Extra Ball	00

Press the Escape button to return to the Bookkeeping Menu. Press the Up button to advance to the next desired Bookkeeping Group, (or press the Down button to return to a previous group). Press the Enter button to activate that group. Press the Up or Down button to cycle through the available audits in that group.

B.2 Earning Audits

B.2	01	Recent Earnings	00
B.2	02	Recent Left Slot	00
B.2	03	Recent Center Slot	00
B.2	04	Recent Right Slot	00
B.2	05	Recent 4th Slot	00
B.2	06	Recent Paid Credits	00
B.2	07	Recent Service Credits	00
B.2	08	Total Earnings*	00
B.2	09	Total Left Slot*	00
B.2	10	Total Center Slot*	00
B.2	11	Total Right Slot*	00
B.2	12	Total 4th Slot*	00
B.2	13	Total Paid Credits*	00
B.2	14	Total Service Credits*	00

* Note: These Audits are NOT Resetable. They are a record of the earnings of the game since the "CLOCK 1ST SET" Time -Stamp.

Press the Escape button to return to the Bookkeeping Menu. Press the Up button to advance to the next desired Bookkeeping Group, (or the Down button to return to a previous Bookkeeping Group). Press the Enter button to activate that group. Press the Up or Down button to cycle through the available audits in that group.

B.3 Standard Audits

B.3	01	Games Started	00	• Games Completed is a new feature in WPC. A game is considered completed when the final ball begins. Audit information from an incomplete game is ignored. Therefore operation for test
B.3	02	Games Completed*	00	
B.3	03	Total Free Play	00	
B.3	04	Free Play Percent	00	
B.3	05	Replay Awards	00	
B.3	06	Percent Replays	00	
B.3	07	Special Awards	00	

B.3	08	Percent Special	00	and service do not affect the
B.3	09	Match Awards	00	Audits.
B.3	10	Percent Match	00	
B.3	11	H.S.T.D. Credits	00	
B.3	12	Percent H.S.T.D	00	
B.3	13	Extra Ball	00	
B.3	14	Percent Extra Ball	00	
B.3	15	Tickets Awarded	00	
B.3	16	Percent Tickets	00	
B.3	17	Left Drains	00	
B.3	18	Right Drains	00	
B.3	19	Average Ball Time	00	
B.3	20	Average Game Time	00	
B.3	21	Minutes of Play	00	
B.3	22	Minutes On	00	
B.3	23	Balls Played	00	
B.3	24	Tilts	00	
B.3	25	Replay 1 Awards	00	
B.3	26	Replay 2 Awards	00	
B.3	27	Replay 3 Awards	00	
B.3	28	Replay 4 Awards	00	
B.3	29	1 Player Games	00	
B.3	30	2 Player Games	00	
B.3	31	3 Player Games	00	
B.3	32	4 Player Games	00	
B.3	33	H.S.T.D. Reset Count	00	
B.3	34	Burn-in Cycles	00	

Press the Escape button to return to the Bookkeeping Menu. Press the Up button to advance to the next desired Bookkeeping Group, (or press the Down button to return to a previous group). Press the Enter button to activate that group. Press the Up or Down button to cycle through the available audits in that group.

B.4 Feature Audits

These audits are game specific, and are only available in game software.

Press the Up button to the advance to the next desired Bookkeeping Group, (or press the Down button to return to a previous Bookkeeping Group). Press the Enter button to activate that group. Press the Up or Down button to cycle through the available audits in that group.

B.5 Histograms

B.5	01	0.0-0.5 Million Scores	00%	00
B.5	02	0.5-1.0 Million Scores	00%	00
B.5	03	1.0-1.5 Million Scores	00%	00
B.5	04	1.5-2.0 Million Scores	00%	00
B.5	05	2.0-3.0 Million Scores	00%	00
B.5	06	3.0-4.0 Million Scores	00%	00

B.5	07	4.0-5.0 Million Scores	00%	00
B.5	08	5.0-6.0 Million Scores	00%	00
B.5	09	6.0-8.0 Million Scores	00%	00
B.5	10	8.0-10 Million Scores	00%	00
B.5	11	10-15 Million Scores	00%	00
B.5	12	15-20 Million Scores	00%	00
B.5	13	Over 20 Million	00%	00
B.5	14	Game Time 0.0-1.0 Mins	00%	00
B.5	15	Game Time 1.0-1.5 Mins	00%	00
B.5	16	Game Time 1.5-2.0 Mins	00%	00
B.5	17	Game Time 2.0-2.5 Mins	00%	00
B.5	18	Game Time 2.5-3.0 Mins	00%	00
B.5	19	Game Time 3.0-3.5 Mins	00%	00
B.5	20	Game Time 3.5-4.0 Mins	00%	00
B.5	21	Game Time 4-5 Mins	00%	00
B.5	22	Game Time 5-6 Mins	00%	00
B.5	23	Game Time 6-8 Mins	00%	00
B.5	24	Game Time 8-10 Mins	00%	00
B.5	25	Game Time 10-15 Mins	00%	00
B.5	26	Game Time Over 15 Mins	00%	00

Press the Escape button to return to the Bookkeeping Menu. Press the Escape button to return to the Main Menu. Once in the Main Menu press the Up button to advance to the next menu selection, the Printouts Menu. Press the Enter button to activate the Printouts Menu. Use the Up or Down buttons to cycle through the Printouts Menu selections. Press the Enter button to activate the desired Printouts Group when that group appears in the displays. "Waiting for Printer" appears if no printer is attached.

P. PRINTOUTS MENU

- P.1 Earnings Data**
- P.2 Main Audits**
- P.3 Standard Audits**
- P.4 Feature Audits**
- P.5 Histograms**
- P.6 Dated Audits**
- P.7 Adjustments**
- P.8 Time-Stamps**
- P.9 Print All Data**

The Printouts Menu is a combination of the other menus. This Menu allows you to access and printout information in the available menu selections by using a modem.

Press the Escape button to return to the Printouts Menu. Press the Escape button again to return to the Main Menu. Once in the Main Menu press the Up button to advance to the next menu selection, the Test Menu. Press the Enter button to activate the Test Menu, the use the Up or Down button to cycle through the Test Menu selections. Press the Enter button to activate the desired Test Group when that group appears in the displays.

Once you enter the Test Menu, both flipper L.E.D.s light and stay lit for the entire time the Test Menu is activated. To test the Left and Right Flippers, enter a switch test, press the L or R buttons, the flipper name and switch number should show in the displays. Any other results indicate the system has detected a problem.

T. TEST MENU

- T.1 Switch Edges**
- T.2 Switch Levels**
- T.3 Single Switch**
- T.4 Solenoid Test**
- T.5 Flasher Test**
- T.6 General Illumination**
- T.7 Sound & Music Test**
- T.8 Single Lamps**
- T.9 All Lamps**
- T.10 Lamp & Flasher Tests**
- T.11 Display Test**

T.1 Switch Edges

For all switches, the number on the left indicates the column, the number on the right indicates the row. Example- Switch 23 means 2nd column, 3rd row.

To activate the Switch Edges Test, from the Test Menu, press the Enter button. The name and number of each switch that is pressed is shown in the displays. If any other switch, or no switch at all is indicated, the system has detected a problem with the switch circuit. Press Escape to return to the Test Menu. Press the Up button to display the next test, the Switch Levels Test.

T.2 Switch Levels

Once the test name is shown under the Main Menu, press the Enter Button. The name and number of each switch that is activated is shown in the displays. This test cycles through all switches that are detected closed. Press the Escape button to return to the Test Menu. Press the Up button to display the next test, the Single Switch Test

T.3 Single Switches

Once the test name is shown under the Main Menu, press the Enter Button. The Single Switch Test isolates a particular switch by blocking signals from all other switches. Use the Up or Down buttons to select the Switch to be tested. Either Open or Closed appears in the displays to indicate the state of the switch at the present time. When the switch is activated, an "A" appears during the active state. Press the Start button to obtain the wire color, connector, and fuse information. Press the Escape button to return to the Test Menu. Press the Up button to display the next test, the Solenoid Test.

T.4 Solenoid Test

Once the test name is shown under the Main Menu, press the Enter Button. The Solenoid Test has three modes, Repeat, Stop, and Running. Only one solenoid L.E.D. (excluding the Flippers which are both On), should flash at a time. The system has detected a problem if, more than one L.E.D. flashes, an L.E.D. comes on and stays on, or no L.E.D. flashes during the Repeat or Running Tests. Press the Start button to see the wire color, driver number, connector, and fuse information of any coil, when that coil is displayed.

- Repeat - This test allows you to stop and pulse a single coil or flashlamp. Once you have entered the Solenoid Test, coil 1 shows in the displays and the corresponding L.E.D. flashes on the panel. Press the Up or Down button to cycle through the solenoids, one at a time, manually. The same solenoid pulses until you press the Up or Down button to move to the next one. Either press the Escape button to return to the Test Menu, or press the Enter button to move to the next test mode.
- Stopped - This test allows you to stop the Solenoid Test at any point. Press Enter during the Repeat Test. The Solenoid Test stops. There should not be any L.E.D.s flashing while the test is stopped. Either press the Escape button to return to the Test Menu, or the Enter button to move to the next test mode.
- Running - This test allows you to cycle through the solenoids automatically. Press the Enter button during the Stopped Test mode. The displays show you the name and number of the solenoid currently being pulsed, and the corresponding L.E.D. flashes on the panel.

Either press the Escape button to return to the Test Menu, or press the Enter button to return to the Repeat Test mode. Once in the Test Menu press, the Up button to display the next test, the Flasher Test.

T.5 Flasher Test

Once the test name is shown under the Main Menu, press the Enter Button. This test allows you to test the flashlamp part of the solenoid circuit exclusively. There are three test modes Repeat, Stop, and Running. During this test, only one L.E.D. should flash at a time. If, more than one L.E.D. flashes, or an L.E.D. stays on (excluding the Flippers, which are On all the time), or no L.E.D. flashes at all the system has detected a problem. Press the Start button to see the wire color, driver number, connector, and fuse information when the flasher appears in the displays.

- Repeat - Press the Enter button to activate this test. The name and number of the first flashlamp shows in the displays and the corresponding L.E.D. flashes on the panel. Press the Up or Down button to cycle through all of the flashlamps on at a time, manually. The same flashlamp pulses until you press the Up or Down button to move to the next one. Either, press the Escape button to return to the Test Menu, or press the Enter button to advance to the next test mode.

- Stopped -** This test allow you to stop the Flasher Test at any time without losing your place. Press the Enter button during the Repeat Test. The Flasher Test stops. There should not be any flashing L.E.D.s during this test mode. Either press the Escape button to return to the Test Menu, or press the Enter button to advance to the next test mode.
- Running -** This test allows you to cycle through the flashlamps automatically. Press the Enter button during the Stopped Test mode. The displays show you the name and number of the flashlamp currently being pulsed, and the corresponding L.E.D. flashes on the panel.

Either press the Escape button to return to the Test Menu, or press the Enter button to return to the Repeat Test mode. Once in the Test Menu, press the Up button to display the next test, the General Illumination Test.

T.6 General Illumination

Once the test name is shown under the Main Menu, press the Enter Button. This test allows you to check all of the General Illumination circuits. This test has two modes of operation, Stop and Run. To obtain wire color, connector, and fuse information, press the Start button when the desired circuit appears in the displays.

- Stop -** Press the Up or Down buttons to cycle through the General Illumination Test manually. All illumination is tested first, followed by an individual circuit test. The circuit name and number shows in the displays while the corresponding lamp lights on the panel. If any other results occur the system has detected an error.
- Run -** Press the Enter button any time during manual testing and the General Illumination Test cycles through automatically. For each circuit that is shown in the displays a corresponding bulb should light on the panel. If any other results occurs the system has detected a problem.

Either press the Escape button to return to the Test Menu, or the Enter button to return to Repeat Test. Once in the Test Menu press the Up button to advance to the next test, the Sound and Music Test.

T.7 Sound and Music Test (A-12738 Sound Board only)

Once the test name is shown under the Main Menu, press the Enter Button. The Sound and Music Test allows you to check the audio circuits. This test has three modes for testing the sound and music circuits, Running, Repeat and Stop.

- Running -** Press the Enter button when Sound and Music Test is displayed. This test steps through a sequence of sounds and music. Pressing the Up or Down button allows you to advance to a particular sound or tune without having to wait for the program to play all the sounds available in the test. For each name and number that appear in the displays a sound or tune should be heard. Any other results indicates the system has detected a problem.

- Repeat - Pressing the Enter button at any time during the Running portion of the Sound and Music Test causes the program to stop and repeat a particular sound or tune. The same sound should repeat continuously until the Up or Down button is pressed. Any other results indicates the system has detected a problem.
- Stop - Press the Enter button at any time during the Repeat test to stop this test altogether. Nothing should be heard. Any other results indicates the system has detected a problem.

Use the Escape button to return to the Test Menu, or the Enter button to return to the Run test. Once in the Test Menu press the Up button to display the next test, the Single Lamp Test.

T.8 Single Lamp Test

For all lamps, the number on the left indicates the column, the number on the right indicates the row. Example- Lamp 23 means 2nd column, 3rd row.

Once the test name is shown under the Main Menu, press the Enter Button. This test allows you to test each lamp circuit individually. Press the Up or Down button to cycle through this test. For each name and number that is shown in the displays the corresponding column lamp should light on the panel. The only time a row lamp should light is when the column and row are the same number. Any other results indicates the system has detected a problem. Press the Start button to see the wire color, connector and fuse information when the desired lamp appears in the displays. Press the Escape button to return to the Test Menu. Press the Up button to display the next test, the All Lamps Test.

T.9 All Lamps Test

Once the test name is shown under the Main Menu, press the Enter Button. This test causes all the controlled lamps to flash at the same time. Every controlled lamp should flash. Any other results indicates the system has detected a problem. Press the Escape button to return to the Test Menu. Press the Up button to display the next test, the Lamp and Flasher Test.

T.10 Lamp and Flasher Test

Once the test name is shown under the Main Menu, press the Enter Button. This test causes all the flashlamps and the controlled lamps to flash at the same time. The controlled lamps blink, while the flashlamps cycle from highest to lowest. Any other results indicates the system has detected a problem. Press the Escape button to return to the Test Menu. Press the Up button to display the next test, the Display Test.

T.11 Display Test

Once the test name is shown under the Main Menu, press the Enter Button. This test allows you to test all of the display circuits. Each segment and digit should light in its turn. If a segment or digit never lights, or stays lit all the time, the system has detected a problem. There are two modes for testing the displays, Run and Stop.

- Run - Press the Enter button when the Display Test is shown. The test cycles through several phases automatically. Each phase is designed to test either an entire digit or an specific segment.
- Stop - Press the Enter button at any time during the Run portion of the Display Test and the test stops. Once the test stops use the Up or Down buttons to cycle through the test manually. Press the Enter button again to resume the running test automatically.

Press the Escape button to return to the Test Menu. Then, press the Escape button again to return to the Main Menu. Once in the Main Menu press the Up button to advance to the next menu selection, the Utilities Menu. Press the Enter button to activate the Utilities Menu, then use the Up or Down button to cycle through the Utilities Menu selections. Press the Enter button to activate the desired individual Utility or Utilities Group when it appears in the displays. If you change a utility setting and realize you have made a mistake, press the Escape button while the "Saving New Value" notice is still in the displays. The new setting is ignored.

U. UTILITIES MENU

- U.1 Clear Audits**
- U.2 Clear Coins**
- U.3 Reset H.S.T.D.**
- U.4 Set Time & Date**
- U.5 Custom Message**
- U.6 Set Game I.D.**
- U.7 Factory Adjustments**
- U.8 Factory Resets**
- U.9 Presets**
- U.10 Time-Stamps**
- U.11 Auto Burn-in**

U.1 Clear Audits

Press the Enter button to clear the Standard Audits, Feature Audits, and Histograms. Press the Up button to display the next utility.

U.2 Clear Coins

Press the Enter button to clear the Earnings Audits. Press the Up button to display the next utility.

U.3 Reset H.S.T.D.

Press the Enter button to clear the High Score to Date Table and the Grand Champion. Press the Up button to display the next utility.

U.4 Set Time and Date

Press the Enter button to activate the time and date. Use the Up or Down button to change the value, then press the Enter button to lock in that value. If you make a mistake press the Escape button while the "change" notice is displayed. Press the Up button to move to the next utility.

U.5 Custom Message

U.6 Set Game I.D.

U.7 Factory Adjustment

Press the Enter button to restore the adjustments to factory settings, then press the Up button to display the next utility.

U.8 Factory Reset

Press the Enter button to restore the adjustments to their factory setting, clear the Audits, H.S.T.D Table, and Custom Message/Game I.D. Press the Up button to display the next utility.

U.9 Presets

Press the Enter button to activate the Presets Group. Use the Up or Down buttons to cycle through the available Presets. When the desired preset is displayed, press the Enter button to lock in that Preset. If you realize you have made a mistake, press the Escape button while the "Saving Nwe Value" notice is displayed. The new value is ignored and the original value is retained.

- | | | | |
|-----|----|----------------------|--|
| U.9 | 01 | Install Extra Easy | |
| U.9 | 02 | Install Easy | |
| U.9 | 03 | Install Medium | |
| U.9 | 04 | Install Hard | |
| U.9 | 05 | Install Extra Hard | |
| U.9 | 06 | Install 5 Ball | |
| U.9 | 07 | Install 3 Ball | |
| U.9 | 08 | Install Add -A -Ball | |
| U.9 | 09 | Install Ticket | |
| U.9 | 10 | Install Novelty | |
| U.9 | 17 | Install German 1• | • For German Jumpered CPU Boards only. |

U.9	18	Install German 2•
U.9	19	Install German 3•
U.9	20	Install German 4•
U.9	21	Install German 5•
U.9	22	Install German 6•
U.9	23	Install French 1*
U.9	24	Install French 2*
U.9	25	Install French 3*
U.9	26	Install French 4*
U.9	27	Install French 5*
U.9	28	Install French 6*

*For French Jumpered CPU Boards only.

Press the Escape button to return to the Presets menu. Then press the Up button to display the next utility.

U.10 Time-Stamps

Press the Enter button to activate the Time-Stamps Menu. Use the Up or Down button to cycle through the available Time-Stamps. The Time-Stamps Menu allows you to view dates and times that are important to game software.

U.10	01	Current Time
U.10	02	Clock 1st Set
U.10	03	Clock Last Set
U.10	04	Audits Cleared
U.10	05	Coins Cleared
U.10	06	Factory Setting
U.10	07	Last Game Start
U.10	08	Last Replay
U.10	09	Last H.S.T.D. Reset
U.10	10	Champion Reset

U.11 Auto Burn-in

Press the Enter button to activate Auto Burn-in. This utility allows you to automatically cycle through several tests. This helps in finding intermittent problems. The tests that Auto Burn-in cycles through are the Display Test, the Sound and Music Test, the All Lamps Test, the Solenoid Test, the Flashers Test, and the General Illumination Test.

Press the Escape button to return to the Utilities Menu. Then, either press the Up or Down button to return to a previous Utilities Menu Group, or Press the Escape button again to return to the Main Menu. Once in the Main Menu either use the Up or Down buttons to return to a previous menu selection, or press the Escape button again to return to the Attract Mode.

NOTES

S E C T I O N
two



PARTS

Boards

A-12697-1	Power Driver Board
A-12738	Sound Board
A-12739-1	Display Driver Board
A-12742-584	CPU Board
A-12793	Dual Display Driver
A-13651	User Interface Assembly
A-13707	Load Interconnect Board
A-14011	Power Interconnect Board

Cables

H-10978-1	AC Line Filter Cable
H-13750	WPC Load Resistor Cable
H-13870	Black Jumper Cable
H-14103-1	Solenoid 1-16 Cable
H-14103-2	Solenoid 1-16 Interconnect Cable
H-14103-3	Solenoid 17-28 Cable
H-14103-4	Solenoid 17-28 Interconnect Cable
H-14103-5	Lamp Matrix Cable
H-14103-6	Lamp Matrix Interconnect Cable
H-14103-7	G.I. Cable
H-14103-8	G.I. Interconnect Cable
H-14103-9	Switch Matrix Cable
H-14103-10	Switch Matrix Interconnect Cable
H-14103-11	Direct Switch Cable
H-14103-12	Direct Switch Cable
H-14103-13	Ground Cable
H-14103-14	Flipper Interconnect Cable
H-14103-15	Secondary Cable
H-14103-16	Speaker Cable
H-14103-17	Logic Power Cable
H-14103-18	Power Bus Cable

Cabinet

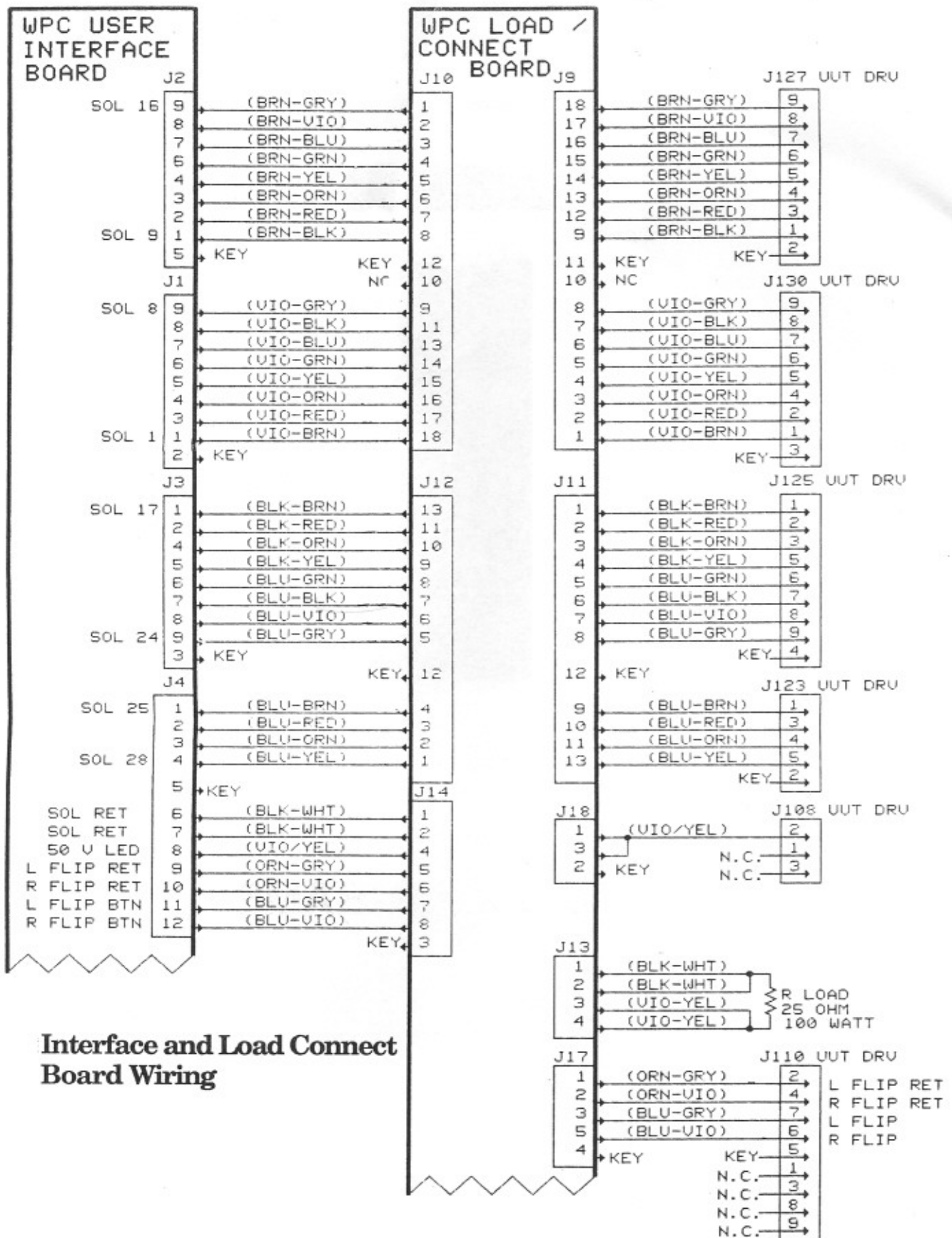
A-13747	WPC Load Resistor Assembly
5016-12663-00	Resistor 25 Ω 100W
A-14008-1	Front Panel Assembly
A-13651	User Interface Assembly
03-8422-1	Key Caps
24-8767	PCB Twist Lamp Socket
24-8768	#555 Bulb, 6.3V, .25A
5010-09034-00	Resistor, 10K Ω , 1/4W, 5%
5070-09045-00	Diode, MR501, 3.0A
5641-12648-00	Momentary Keyboard Switch
5671-12403-00	Red LED
31-1570-584	Screened Front Panel
C-11026-1	Line Filter Assembly
5017-09044-00	Var, 130V, 10J
5102-10313-00	Line Filter Assembly
5640-10932-00	Toggle Switch, DPST
01-6733	Speaker Grille
03-8088-1	Display Support
16-584T-101	Instruction Manual
5555-12015-00	Speaker 8 Ω , 6", 20W
5610-12718-00	Transformer 115/230

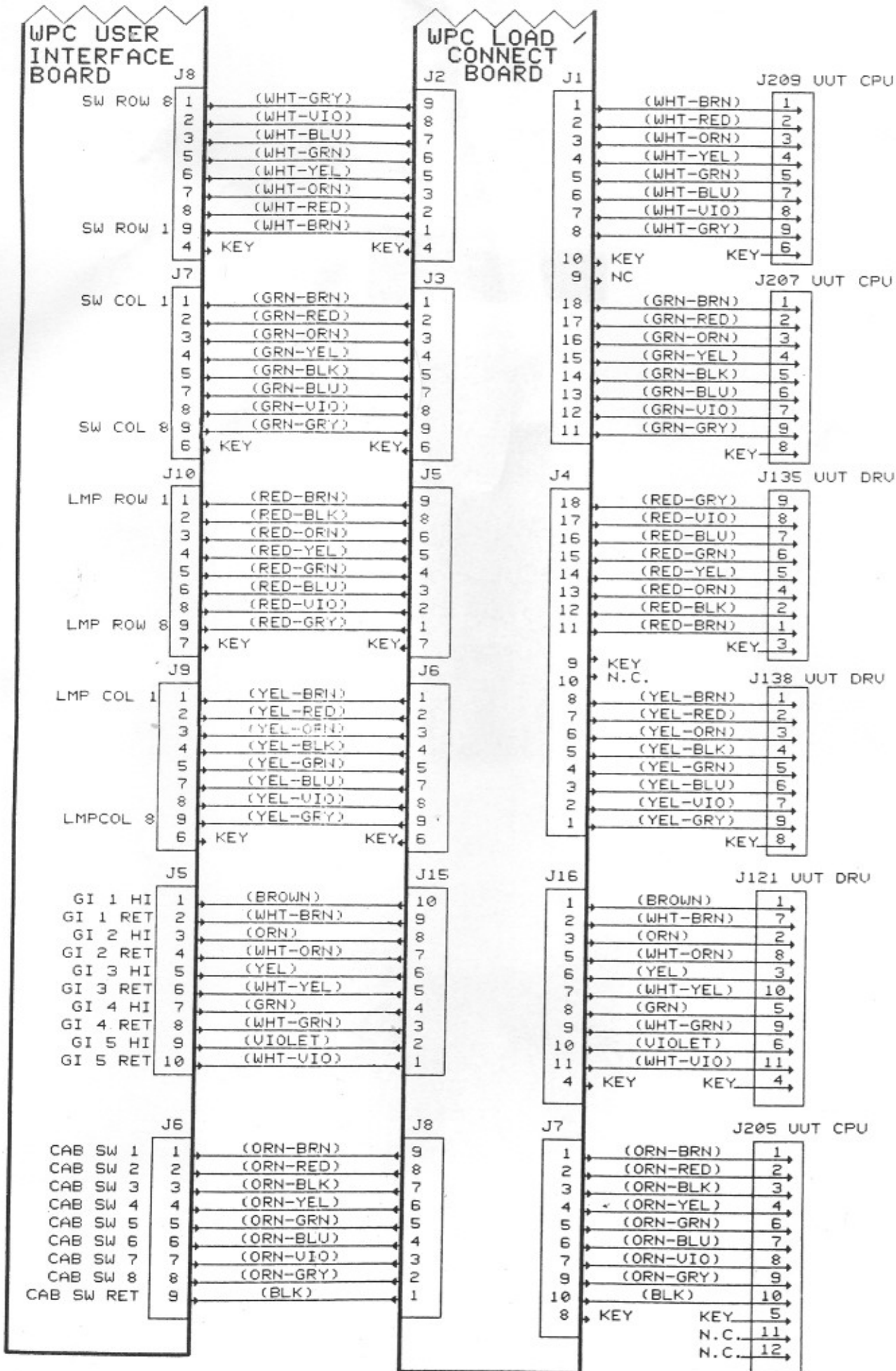
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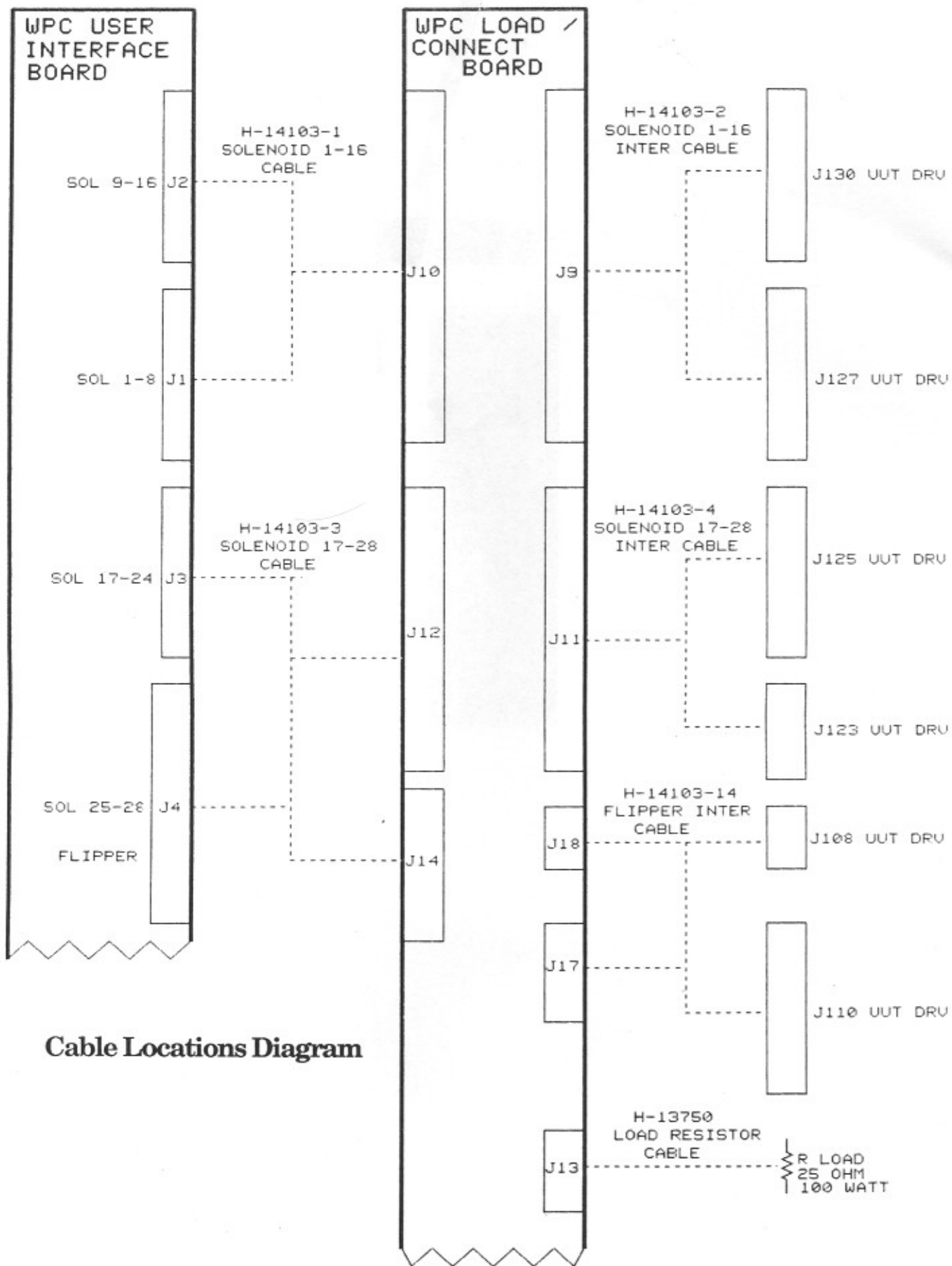
S E C T I O N
three



WIRING DIAGRAMS



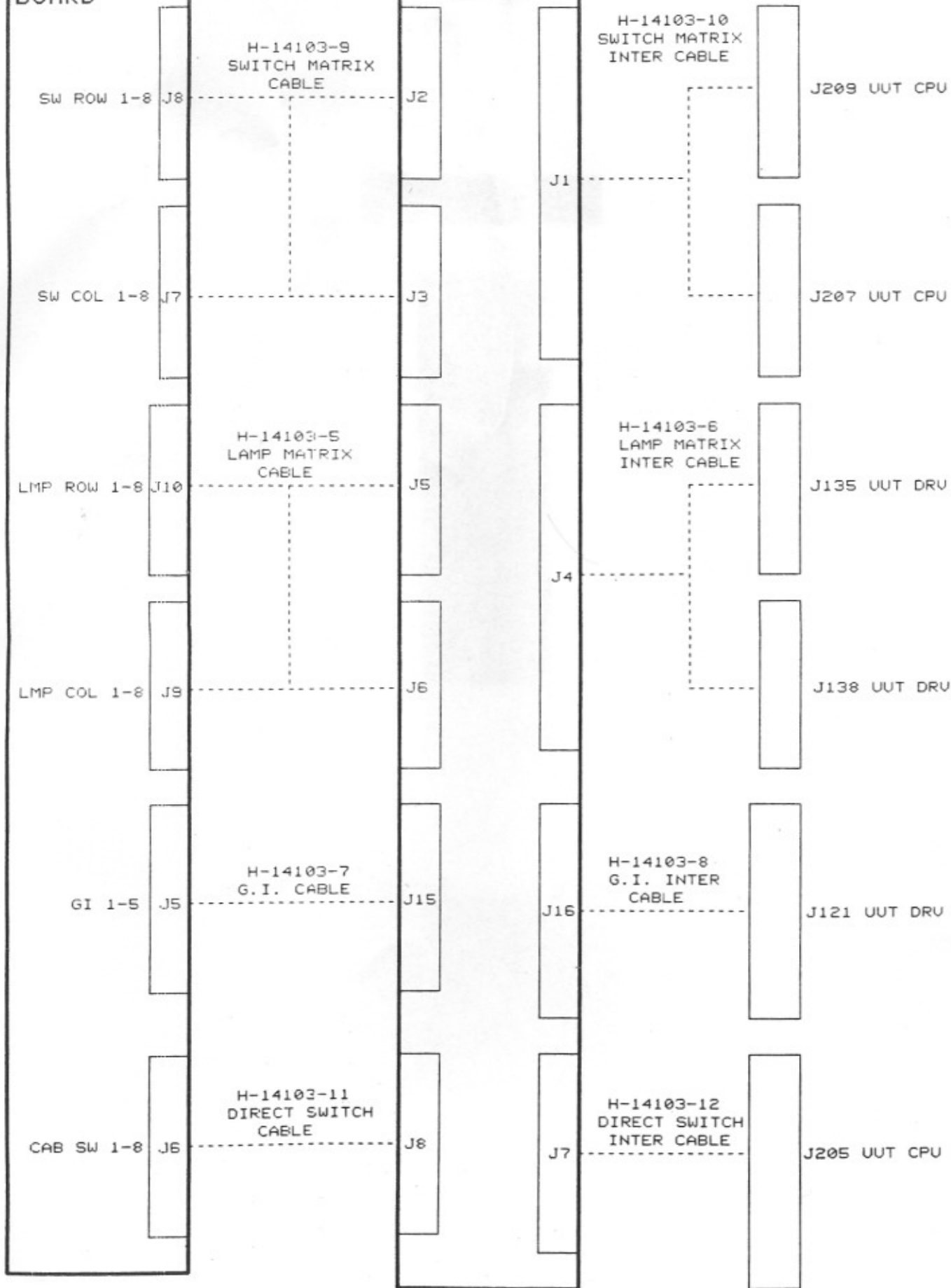




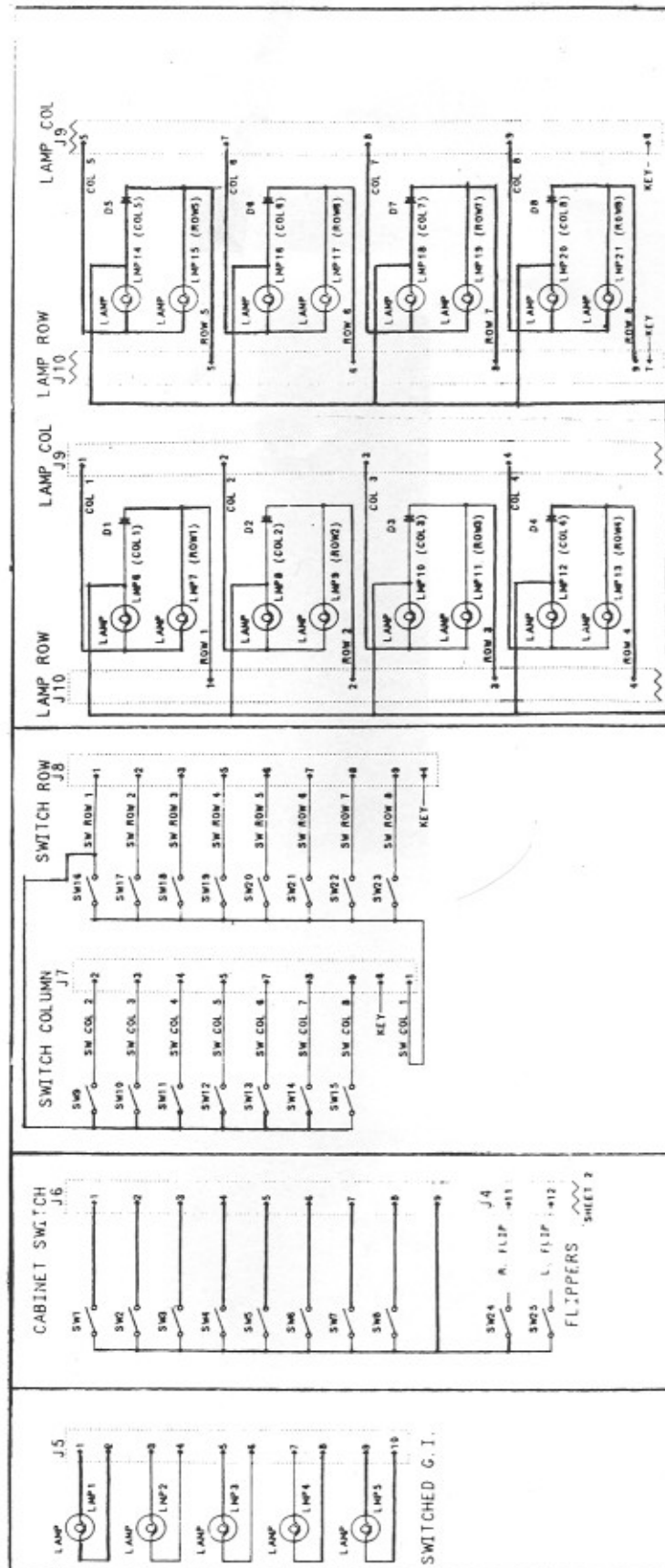
Cable Locations Diagram

WPC USER
INTERFACE
BOARD

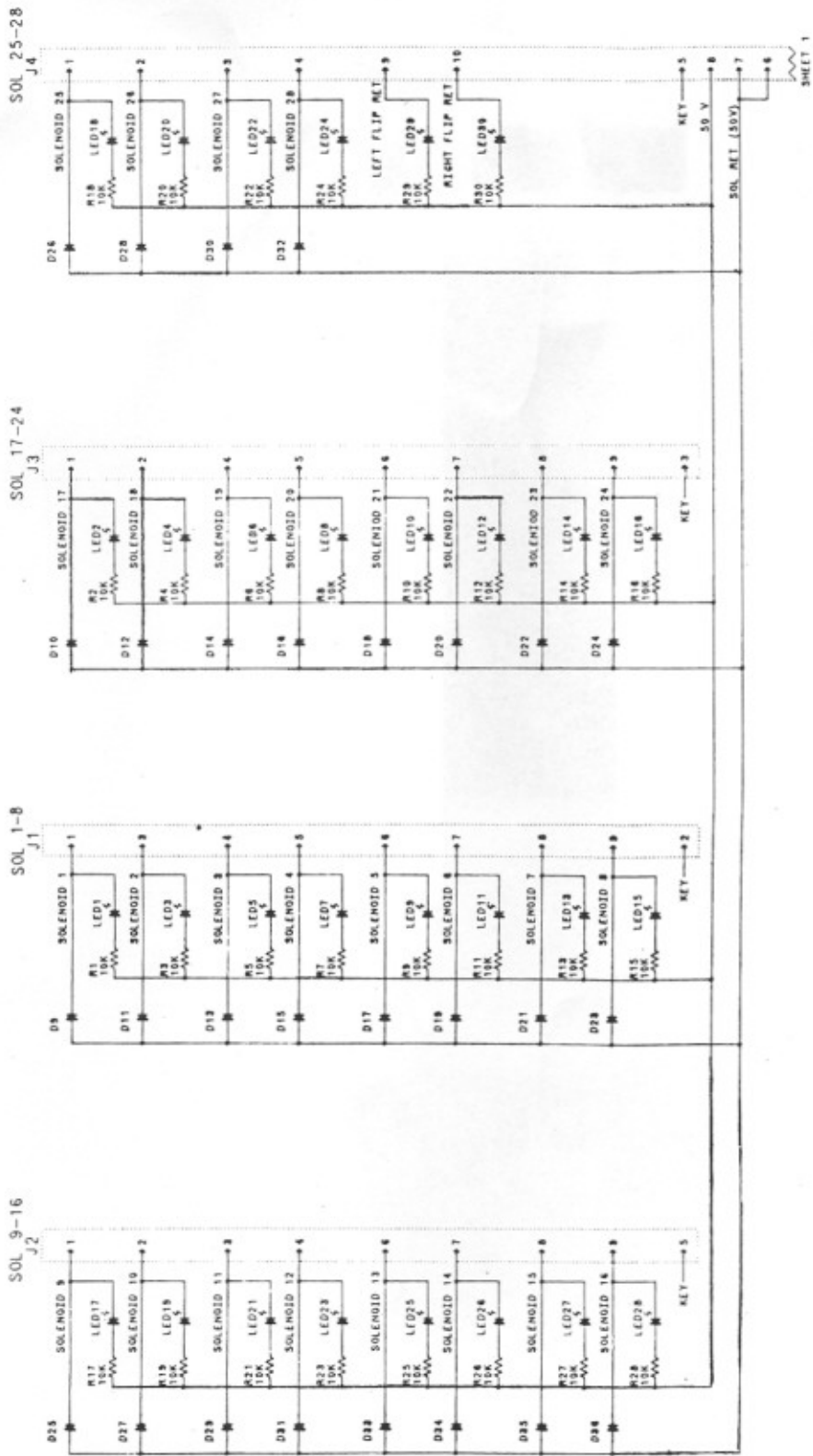
WPC LOAD
CONNECT
BOARD



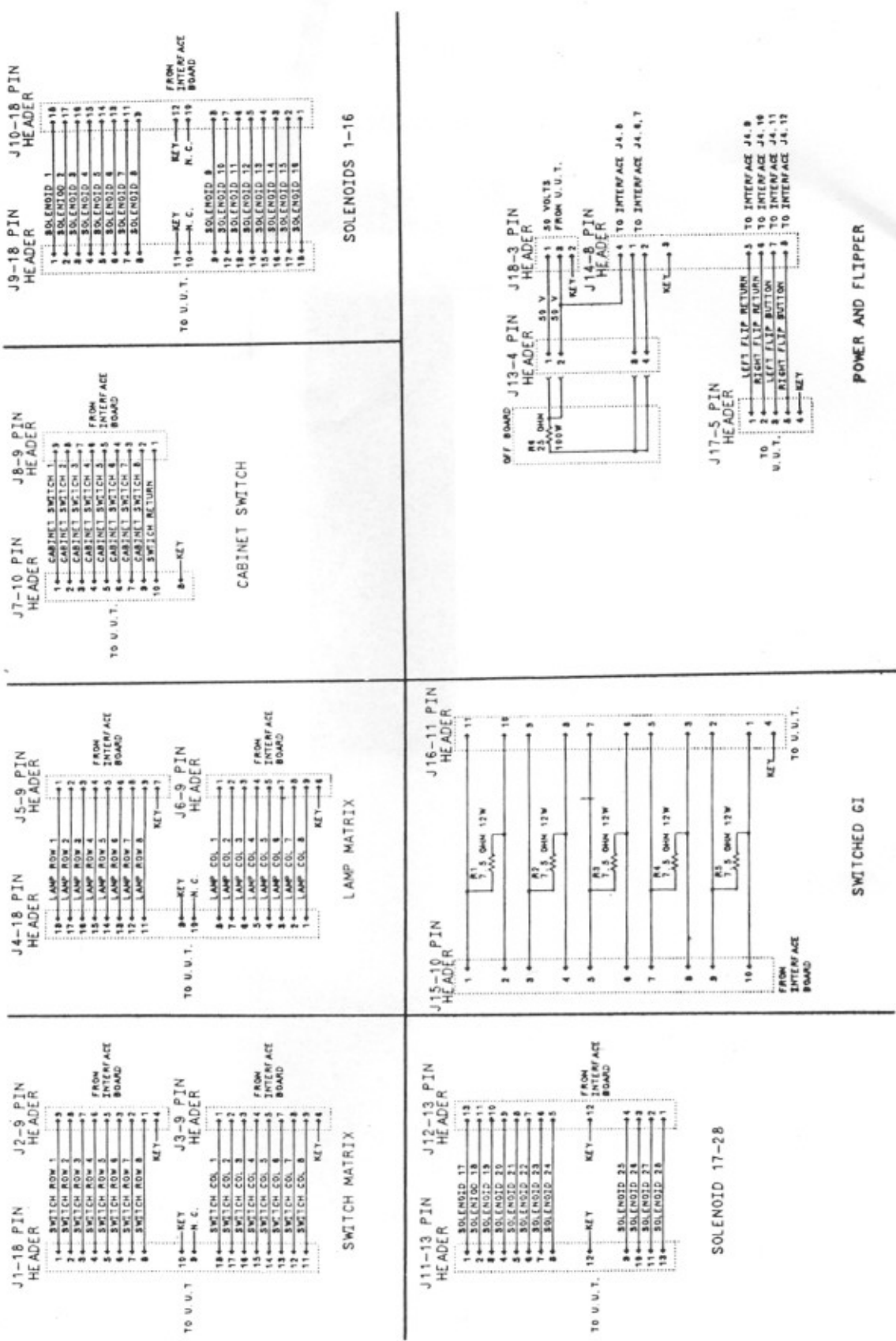
User Interface Board Schematic Sheet 1



User Interface Board Schematic Sheet 2



Load Connect Board Schematic



SOLENOIDS 1-16

SOLENOIDS 17-28

POWER AND FLIPPER

SWITCHED G1

Interboard Wire Colors

Power Driver Board

<p>J101 From Transformer Secondary Pin 1 Red Pin 2 Red Pin 3 NC Pin 4 Blue-White Pin 5 Blue-White Pin 6 Blue-White Pin 7 Blue-White</p> <p>J102 From Transformer Secondary Pin 1 Red-White Pin 2 Red-White Pin 3 Red-White Pin 4 Red-White Pin 5 Black-Yellow Pin 6 Black-Yellow Pin 7 NC Pin 8 Black-Yellow</p> <p>J103 NC J104 NC J105 NC</p> <p>J106 To Power Interconnect Board Pin 1 Violet-Yellow Pin 2 NC Pin 3 NC Pin 4 Red</p> <p>J107 NC</p> <p>J108 To J13 on Load Connect Board Pin 1 NC Pin 2 Violet-Yellow Pin 3 NC</p> <p>J109 NC</p> <p>J110 To J17 on Load Connect Board Pin 1 NC Pin 2 Orange -Gray Pin 3 NC Pin 4 Orange-Violet Pin 5 NC Pin 6 Blue-Violet Pin 7 Blue-Gray Pin 8 NC Pin 9 NC</p>	<p>J111 NC</p> <p>J112 From Transformer Secondary Pin 1 White-Green Pin 2 White-Green Pin 3 White-Green Pin 4 White-Green</p> <p>J113 Ribbon Cable to J211 on CPU Board</p> <p>J114 +12V, +5V & Ground to CPU and Display Driver Pin 1 Gray-Yellow, +12 V Pin 2 Gray-Yellow, +12V Pin 3 Gray, +5V Pin 4 Gray, +5V Pin 5 Black, Ground Pin 6 NC Pin 7 Black, Ground</p> <p>J115 From Transformer Secondary, AC for G.I. Circuit Pin 1 Yellow-White Pin 2 Yellow Pin 3 Yellow Pin 4 Yellow Pin 5 Yellow Pin 6 Yellow Pin 7 Yellow-White Pin 8 Yellow-White Pin 9 NC Pin 10 Yellow-White Pin 11 Yellow-White Pin 12 Yellow-White</p> <p>J116 NC</p> <p>J117 To Power Interconnect Board Pin 1 NC Pin 2 Gray-Yellow, +12V Pin 3 Black, Ground Pin 4 Gray, +5V</p> <p>J118 NC J119 NC J120 NC</p>
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- J121** To J16 on Load Connect Board,G.I. Power
Pin 1 Brown
Pin 2 Red
Pin 3 Yellow
Pin 4 NC
Pin 5 Green
Pin 6 Violet
Pin 7 White-Brown, Q18
Pin 8 White-Red
Pin 9 White-Yellow, Q14
Pin 10 White-Green, Q12
Pin 11 White-Violet, Q10
- J122** NC
- J123** To J11 on Load Connect Board
Drive for Solenoids 25 to 28
Pin 1 Blue-Brown, Solenoid 25, Q26
Pin 2 NC
Pin 3 Blue-Red, Solenoid 26, Q24
Pin 4 Blue-Orange, Solenoid 28, Q22
Pin 5 Blue-Yellow, Solenoid 28, Q20
- J124** NC
- J125** To J11 on Load Connect Board
Drive for Solenoids 17 to 24
Pin 1 Black-Brown, Solenoid 17, Q42
Pin 2 Black-Red, Solenoid 18, Q40
Pin 3 Black-Orange, Solenoid 19, Q38
Pin 4 NC
Pin 5 Black-Yellow, Solenoid 20, Q36
Pin 6 Blue-Green, Solenoid 21, Q28
Pin 7 Blue-Black, Solenoid 22, Q30
Pin 8 Blue-Violet, Solenoid 23, Q34
Pin 9 Blue-Gray, Solenoid 24, Q32
- J126** NC
- J127** To J9 on Load Connect Board
Drive for Solenoids 9 to 16
Pin 1 Brown-Black, Solenoid 9, Q58
Pin 2 NC
Pin 3 Brown-Red, Solenoid 10, Q56
Pin 4 Brown-Orange, Solenoid 11, Q54
Pin 5 Brown-Yellow, Solenoid 12, Q52
Pin 6 Brown-Green, Solenoid 13, Q50
Pin 7 Brown-Blue, Solenoid 14, Q48
Pin 8 Brown-Violet, Solenoid 15, Q46
Pin 9 Brown-Gray, Solenoid 16, Q44
- J128** NC
- J129** NC
- J130** To J9 on Load Connect Board, Drive
for Solenoids 1 to 8
Pin 1 Violet-Brown, Solenoid 1, Q82
Pin 2 Violet-Red, Solenoid 2, Q80
Pin 3 NC
Pin 4 Violet-Ornge, Solenoid 3, Q78
Pin 5 Violet-Yellow, Solenoid 4, Q76
Pin 6 Violet-Green, Solenoid 5, Q64
Pin 7 Violet-Blue, Solenoid 6, Q66
Pin 8 Violet-Black, Solenoid 7, Q68
Pin 9 Violet-Gray, Solenoid 8, Q70
- J131** NC
J132 NC
J133 NC
J134 NC
- J135** To J4 on Load Connect Board,
Drives for Lamp Rows 1 to 8
Pin 1 Red-Brown, Lamp Row 1, Q90
Pin 2 Red-Black, Lamp Row 2, Q89
Pin 3 NC
Pin 4 Red-Ornge, Lamp Row 3, Q84
Pin 5 Red-Yellow, Lamp Row 4, Q85
Pin 6 Red-Green, Lamp Row 5, Q86
Pin 7 Red-Blue, Lamp Row 6, Q85
Pin 8 Red-Violet, Lamp Row 7, Q84
Pin 9 Red-Gray, Lamp Row 8, Q83
- J136** NC
J137 NC
- J138** To J4 on Load Connect Board
Drives for Lamp Columns 1 to 8
Pin 1 Yellow-Brown, Lmp Col 1, Q98
Pin 2 Yellow-Red, Lmp Col 2, Q97
Pin 3 Yellow-Ornge, Lmp Col 3, Q96
Pin 4 Yellow-Black, Lmp Col 4, Q95
Pin 5 Yellow-Green, Lmp Col 5, Q94
Pin 6 Yellow-Blue, Lmp Col 6, Q93
Pin 7 Yellow-Violet, Lmp Col 7, Q92
Pin 8 NC
Pin 9 Yellow-Gray, Lmp Col 8, Q91

CPU Board

- J201** NC
- J202** Ribbon Cable to Sound Board J506
- J203** Not Installed
- J204** Ribbon Cable to J305 on Display Driver
- J205** To J7 on Load Connect Board
Drives for Direct Drive Switches 1 to 8
Pin 1 Orange-Brown, Sw 1, U17A
Pin 2 Orange-Red, Sw 2, U17B
Pin 3 Orange-Black, Sw 3, U17D
Pin 4 Orange-Yellow, Sw 4, U17C
Pin 5 NC
Pin 6 Orange-Green, Sw 5, U16C
Pin 7 Orange-Blue, Sw 6, U16D
Pin 8 Orange-Violet, Sw 7, U16B
Pin 9 Orange-Gray, Sw 8, U16A
Pin 10 Black, Switch Return (Ground)
- J206** NC
- J207** To J1 on Load Connect Board
Drives for Switch Columns
Pin 1 Green -Brown, Sw Col 1, U20A
Pin 2 Green-Red, Sw Col 2, U20B
Pin 3 Green-Orange, Sw Col 3, U20C
Pin 4 Green-Yellow, Sw Col 4, U20D
Pin 5 Green-Black, Sw Col 5, U20E
Pin 6 Green-Blue, Sw Col 6, U20F
Pin 7 Green-Violet, Sw Col 7, U20G
Pin 8 NC
Pin 9 Green-Gray, Sw Col 8, U20H
- J208** NC
- J209** To J1 on Load Connect Board
Drives for Switch Rows
Pin 1 White-Brown, Sw Row 1, U18D
Pin 2 White-Red, Sw Row 2, U18C
Pin 3 White-Orange, Sw Row 3, U18A
Pin 4 White-Yellow, Sw Row 4, U18B
Pin 5 White-Green, Sw Row 5, U19D
Pin 6 NC
Pin 7 White-Blue, Sw Row 6, U19C
Pin 8 White-Violet, Sw Row 7, U19A
Pin 9 White-Gray, Sw Row 8, U19B
- J210** Power from Power Driver Board
Pin 1 Black, Ground
Pin 2 NC
Pin 3 Black, Ground
Pin 4 NC
Pin 5 Gray, +5V
Pin 6 NC
Pin 7 Gray-Yellow, +12V
- J211** Ribbon Cable to J113 Power Driver Board

Display Driver

- J301** Ribbon Cable from J401 on Dual Display
- J302** Not installed
- J303** Not Installed
- J304** Ribbon Cable from J402 On Dual Display
- J305** Ribbon Cable from J204 on CPU (Data)
- J306** Power From Power Driver Board
 - Pin 1 Gray, +5V
 - Pin 2 NC
 - Pin 3 Black, Ground
- J307** From Transformer Secondary Power for Display Glasses

Sound Board

- | | |
|---|---|
| <ul style="list-style-type: none">J501 AC Power from Transformer<ul style="list-style-type: none">Pin 1 Gray-GreenPin 2 Gray-GreenPin 3 KeyPin 4 GrayPin 5 GrayPin 6 Gray-WhitePin 7 Gray WhiteJ502 +5VDC from Power Driver Board<ul style="list-style-type: none">Pin 1 Gray, +5VPin 2 KeyPin 3 Gray, +5VPin 4 Black, GroundPin 5 Black, GroundJ503 Not UsedJ504 or J505 Speaker (Speaker connector are identical.)<ul style="list-style-type: none">Pin 1 Black-YellowPin 2 Black-yellowPin 3 BlackPin 4 BlackJ506 Ribbon cable from CPU J202 | <ul style="list-style-type: none">J507 Optional Volume ControlJ508 Not UsedJ509 Not Used |
|---|---|

Board Location Diagram

