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Williams / Bally
TEST FIXTURE
Instruction Manual

System 11

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INTRODUCTION

Your Williams/Bally System 11 Test Fixture gives you the ability to test and troubleshoot the CPU, Power Supply, Master Display and Sound Board to the circuit level. It's only a matter of attaching the same Master Display, Sound and CPU boards as they were used together in a game.

If game EPROMs are used, the test fixture will simulate the attract mode, test mode, audit table, and adjustment table of that game. The same master and sound boards used in that game must be installed in the fixture. If the test chip is used instead of U27 on the CPU, the fixture will simulate a generic test sequence and the standard D-10877 master and D-11581 sound boards can be used. The Test Chip is an EPROM that has a generic test program and not a program from a specific game copied into it. When using the Test Chip the D-18077 Master Display and the D-11581 Sound Board included with your fixture should be used

This fixture will test the following boards:

CPU	Power Supply	Master Display	Sound
D-10881	D-8345	D-10877	D-11029
D-11392	D-12246	D-11610	D11298
		D-11415	D-11581
		D-12232-1	
		D-12232-2	
		D-12502-1	
		D-12706	

Boards use the following number system for identification:

CPU - 1 Master Display - 4 Power Supply - 3 Sound Board - 10

SET-UP

Remove all packing material.

Your Test Fixture comes with a D-10877 Master Display, a D-11883 CPU, and a D-11581 Sound Board. A D-8345 Power Supply is mounted inside the fixture.

Prepare the fixture for operation by attaching the boards included with the Test Fixture. The fixture will not work without the boards attached. The D-10877 Master Display mounts on the left side of the Test Fixture top panel. On this board 4J4 should be turned toward the front of the Test Fixture, 4J12 should be turned toward the back. Three 20-pin ribbon cables extend out of holes on the left side of the top panel. These plug into 4J7 player 3, 4J6 player 4, and 4J4 c/match jacks on the Master Display. There are also three 26-pin ribbon cables extending out of holes on the left side of the top panel. Two of these plug into 4J10 player 1 and 4J8 player 2 jacks on the Master Display; the third is the data cable from the CPU, which plugs into 4J12. (On all ribbon cables, pin 1 has a red line).

The power cable for this board has the following wire colors, 1=black, 2=empty, 3=orange, 4=brown, 5=empty, 6=gray. This power cable is plugged into 4 J11. The cable for 4J1 has mostly blue wires; the cable for 4J2 has mostly brown wires; the cable for 4J3 has mostly violet wires.

The next board to connect is the Sound Board. It is attached to the far right side of the top panel. Jack 10J2 and 10J1 should be turned toward the front of the fixture. Jack 10J5 should face the back. The

cable that plugs into 10J1 is the jumper coming from 1J16 on the CPU. The cable that plugs into 10J2 is the volume control cable. This cable has black, red, and shield wires coming from it. Jack 10J3 provides a connection for the power cable with black and gray wires. Jack 10 J4 provides a connection on the Sound Board for the 20-pin ribbon cable coming from 1J21 of the CPU. Jack 10J5 is the speaker jack; its cable has all black wires.

The last board to connect is the CPU. It belongs in the middle of the top panel. Position the CPU so that the batteries are turned toward the front panel of the fixture. Continue clockwise around the board, start by connecting the 20-pin ribbon cable to 1J21 and the 26-pin ribbon cable to 1J22. The cable for 1J1 has brown wires; the cable for 1J2 has violet wires and the cable for 1J3 has blue wires. The cable for 1J18 has orange wires, the cable for 1J19 has a combination of orange and blue wires. The blue cable connects to 1J4; the black cable connects to 1J5. Jack 1J6 has a cable with red wires plugged into it; the cable for 1J7 has yellow wires; jack 1J8 has a green cable plugged into it and 1J10 has a cable with white wires plugged into it. Jack 1J11 has a gray cable plugged into it; jack 1J12 has a brown cable plugged into it; jack 1J13 has a cable with 4 black wires. Jack 1J14 has a cable with 3 different colors plugged into it. Depending on the Sound Board that is used, jack 1J15 may not be used. If the Sound Board has its own amplifier circuit 1J15 is not used; if the Sound Board does not have an amplifier circuit then, 1J15 is used. The cable for 1J16 is the jumper from the Sound Board. 1J17 is the connection for the power cable.

OPERATION

Locate the line cord in the right rear corner of the Test Fixture and plug into any 110V AC, 3-prong outlet. Do not use a cheater plug or cut the ground pin. Make sure the Memory Protect switch in the lower right side of front panel next to the volume control is in the up (ON) position. The ON-OFF switch is located in the lower right side of the front panel. Turn the fixture on. The displays should light. You may see the words "factory settings". This is because it is the first time the CPU has been turned on. If this happens, turn the fixture off, then on again. If you have game software in the CPU, the fixture will simulate that game's attract mode. If you are using the test ROM you will get a generic test sequence.

To enter the test mode, move the Auto-Up/Manual-Down switch to the down position. Press ADVANCE once, then move the switch to the Auto-Up position. Each time you press the ADVANCE switch you will move to the next test in the program. The test sequence depends on the software used. Generally, you'll enter the music test first, then the display test, sound test, all lamps, single lamps, solenoids, switch levels, switch edges. If the game has a unique device, such as the mystery wheel on CYCLONE, or the CB spinner on MILLIONAIRE, it will have its own test either at the beginning or the end of the test sequence.

If at any time during a test you want to focus on a particular test, move the Auto-Up/Manual- Down switch to the Manual-Down position and the selected test will remain active. Pressing the ADVANCE button will then allow you to manually move through the test program. For

example you could test each solenoid individually and allow it to pulse as many times as desired. To proceed to the next test in the program, move the switch back to the Auto-Up position and press ADVANCE.

MUSIC TEST

The C-11029 Sound Board has only one "song" is available; therefore, entering the Music Test automatically starts this "song". All other Sound Boards have a series of songs.

Enter the Music Test using the Auto-Up/Manual-Down switch in the down position and press ADVANCE once, your displays should read *00/Music Off*. Put the Auto-Up/Manual-Down switch in the up position and press the red CREDIT BUTTON button switch (#3 on the switch matrix). The program begins at song 01 and advances to the next song each time you press the CREDIT BUTTON.

DISPLAY TEST

With the Auto-Up/Manual-Down switch in the Auto-Up position press ADVANCE, to exit the Music Test and enter the Display Test. This test usually has three portions: 1) walking digits; 2) sequence numbers; 3) segments. To select and remain on any test, or to manually advance through the test, move the switch to Manual-Down.

SOUND TEST

From the Display Test put the Auto-Up/Manual-Down switch in the Auto-Up position and press ADVANCE. This starts the Sound Test. This test activates various speech and background sounds (no music). It

sequences automatically from step 00 to 07 and repeats. To select and remain on any sound or to advance manually, move the switch to the Manual-Down position.

LAMP TEST

From the Sound Test, put the Auto-Up/Manual-Down switch in the Auto-Up position and press ADVANCE. This starts the Lamp Test.

All lamps in the matrix then blink. This test doesn't allow you to select and remain on any lamp or to advance manually.

SINGLE LAMP TEST

From Lamp Test, press ADVANCE. The bulb in the upper left corner will flash. Pressing the CREDIT BUTTON switch causes each bulb of the Test Fixture matrix to flash individually as its designated column and row Lamp names and numbers are shown in the displays. (This test is not available in all game software).

COIL TEST

From the Single Lamp Test, press ADVANCE. This starts the Coil Test. Notice that, for each solenoid name shown on the display, a corresponding LED flashes in the solenoid (top) section of the front panel. If the game uses a solenoid A/C select relay, its LED lights alternately when the pulse switches from "A" side to "C" side. To focus on any particular solenoid, or to advance manually, put the Auto-Up/Manual-Down switch in the Manual-Down position. Each time a coil name is shown without its related LED lighted or the LED stays on all the time,

you have detected a problem.

SWITCH LEVELS TEST

From the Solenoid Test, put the Auto-Up/Manual-Down switch in the Auto-Up position, and press ADVANCE. This starts the Switch Levels Test. This is a manual test only.

Press each button in the Switch Matrix section of your Test Fixture one at a time. You should observe one switch number and name for each button you press. If you press a button and see either no number, or more then one number you have detected a problem.

SWITCH EDGES TEST

Press the ADVANCE switch during the Switch Level Test to proceed to the Switch Edges Test. Press each button in the Test Fixture Switch Matrix section and verify that a switch name and number appears on the display. (This test is used in the game to test playfield function and has very little value for the Test Fixture).

BOARD TEST RELATIONSHIPS

CPU

The CPU boards that this test fixture is capable of testing are D-10881, D-11392, and D-11883. Each of these boards attaches to the fixture in the same way (see set-up). Be aware that the Master Display and Sound Board are going to have to be changed to be compatible with the type CPU used.

MASTER DISPLAY

The D-10881 CPU needs the D-10877 Master Display (which should already be attached to your fixture). The D-11392 CPU can use the D-10877 Master Display or you can attach the D-11610 Master Display.

To attach this display, disconnect the D-10877 Master Display. Put a piece of cardboard over it and lay the D-11610 Master Display on cardboard. Use the optional power connector coming out of the Test Fixture. This connector has the following wire colors: 1= orange; 2= empty; 3 =brown; 4= empty; 5 = black; 6=gray. Plug it into 4J2 on the D-11610 Master Display. Jack 4J1 of the Master Display should have the 26-pin ribbon cable coming from the CPU plugged into it. Jack 4J3 on the Master Display should have the cable that is connected to 1J1 on the CPU (brown wires) plugged into it. Jack 4J4 should have the cable connected to 1J2 on the CPU (violet wires) plugged into it. Jack 4J5 should have the cable that is connected to 1J3 on the CPU (blue wires) plugged into it. Please note that 4J5 is a 12-pin jack that has a 15-pin

connector plugged into it, therefore, pins 13-15, overflow to the right.

The D-11415 and D-11610 Master Displays are identical in operation and installation. The difference is the D-11415 has holes in it where bulbs can be installed.

The D-11883 CPU needs the D-12232-1 or D-12232-2 Master Display. These masters use the same power connector as the D-11610 does. The power cable is connected to Jack 4J7 on the Master Display. Jack 4J1 on the master has the brown cable connected to it, 4J2 on the Master Display has the violet cable connected to it, 4J3 has the 26-pin ribbon cable connected to it, and 4J5 on the Master Display has the blue cable plugged into it, pins 13-15 on the female plug that connect to 4J5 are not used and overflow to the right. Jack 4J4 and 4J5 are optional.

The D-12502-1 and D-12706 Master Displays connect to the D-11883 CPU. The cable, p/n H-12837 included with your Test Fixture is used to connect the D-12706 Master Display. The 12-pin plug of this cable connects to 4J5 on the Master Display, the 15-pin plug of thic cable connects to 1J3 on the CPU. This harness is used only by the D-12706 Master Display. The D-12502-1 Master Display uses the blue cable coming from the Test Fixture. Jack 4J7 on the Master Display is the power jack. The 26-pin ribbon cable from 1J22 on the CPU connects to 4J3 on the Master Display. Jack 4J2 on the Master Display has the violet cable connected to it and 4J1 on the Master Display has the brown cable connected to it. Jack 4J6 and 4J4 are optional. Only one master can be connected at a time you will see only one half of what is being displayed. If you wish to see all of what is being displayed at one time connect the D-12232-1 or D-12232-2 masters.

SOUND (MUSIC) BOARD

When changing sound boards, be careful not to touch the back of the board against support posts attached to Test Fixture.

The D-10881 CPU needs the D-11029 sound board. The cable for 10J1 on the Sound Board is your cable from 1J16 on the CPU. Jack 10J3 is the connector for the power input. Jack 10J2 is the volume control connector. The cable for 4J4 is the coming from the CPU at 1J21. The D-11197 Sound Board connects to the fixture exactly the same as the D-11029 does. These two boards do not contain an amplifier circuit; therefore, the speaker is connected to 1J15 of the D-10881 CPU.

D-11392 and D-11883 CPU's can use either D-11298 or D-11581 Sound Boards. The only exceptions are F-14 and Cyclone, which use a D-11581 with all the parts. There are two types of D-11581 Sound Boards: one uses all the componets that the board was originally designed for: the other is the same PC board but the amount of components used has been scaled down. On the D-11298 board, 10J1 is the connection for the jumper from the CPU, 10J2 is for the volume control cable, 10J3 is the connection for the power input, 10J4 is the connection for the ribbon cable from the CPU and 10J9 is the jack for your speaker. D-11581 is connected the same way, except the speaker jack is 10J5, not 10J9.

POWER SUPPLY

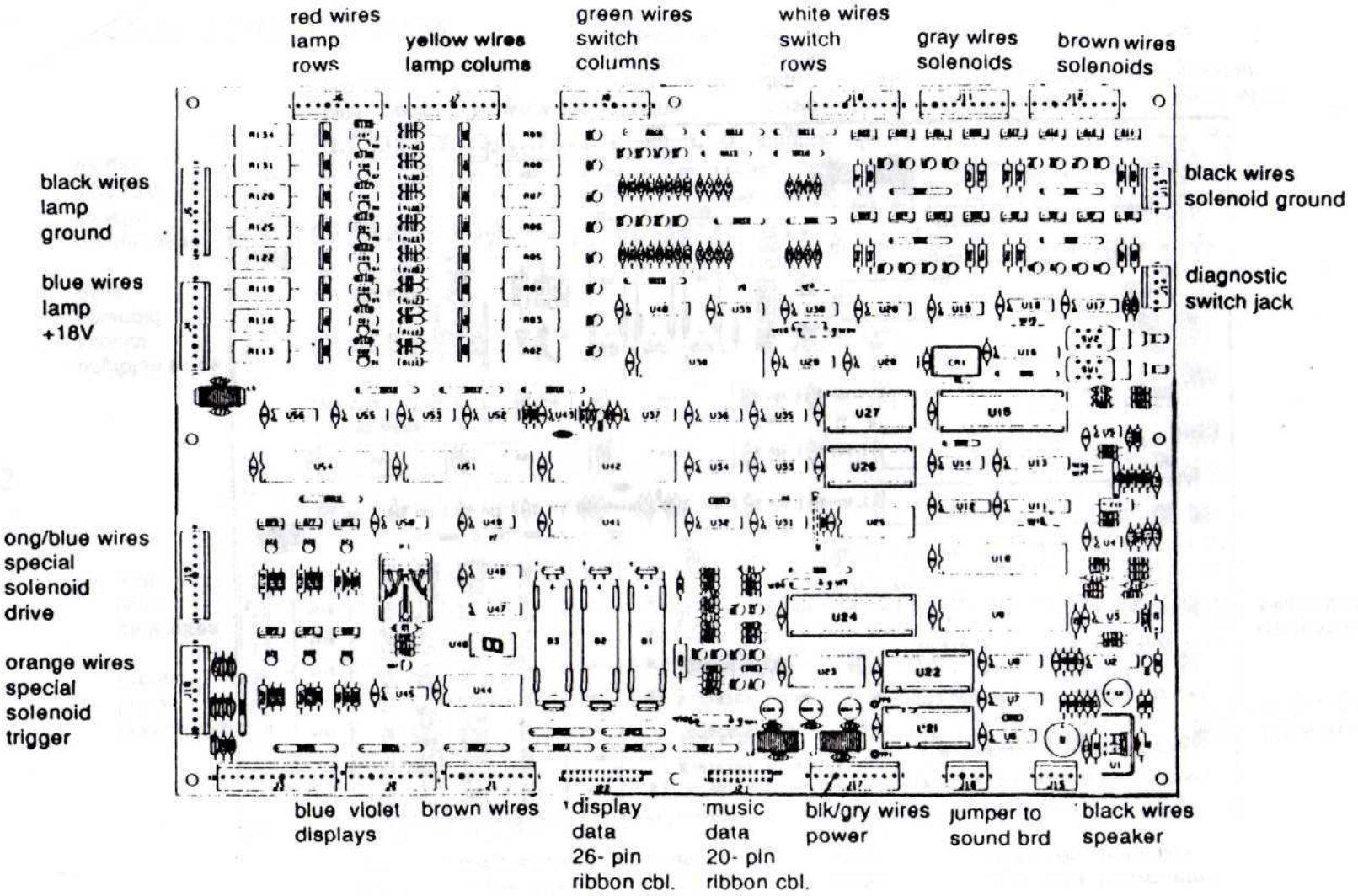
This Test Fixture can test both D-8345 and D-12246 Power Supplies. One adapter cable, p/n H-10642, is included with you Test

Fixture. The cable plugs into the jack in the upper left corner of the Test Fixture. This cable brings theTest Fixture transformer voltage to the Power Supply being tested, to enable you to check the output voltages. On the D-8345 Power Supply, 3J1 is the power input, while on the D-12246 Power Supply, 3J3 is the power input. Notice that they each use a different input connector. The D-8345 Power Supply uses a12-pin header connector, while the D-12246 Power Supply uses the 9-pin header connector.

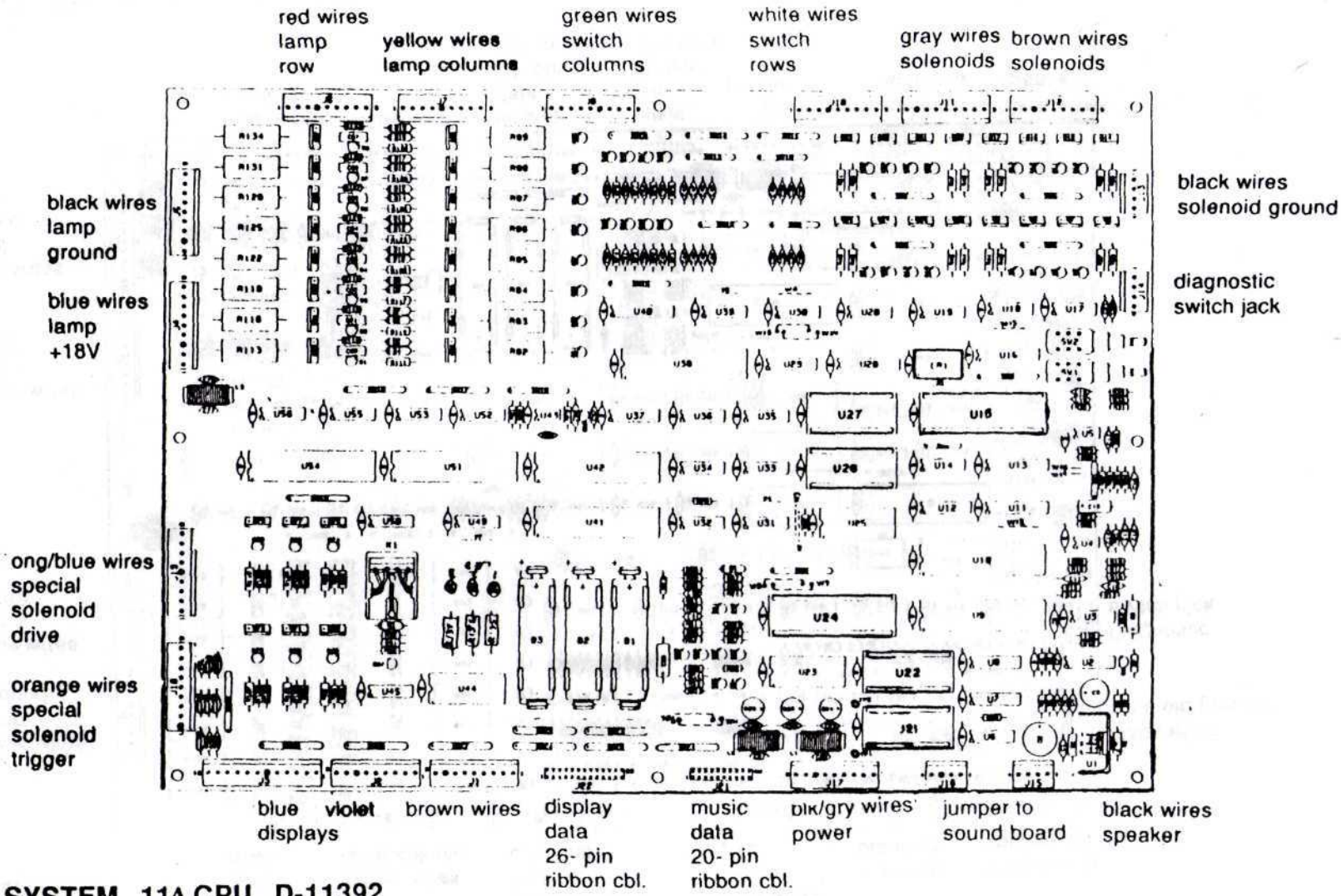
CIRCUIT BOARD DIAGRAMS

The following diagrams show the parts layout of various PC boardsthis test fixture is capable of testing.

In addition, the diagrams show the connections to be made tothe Test Fixture using wire-color descriptions.

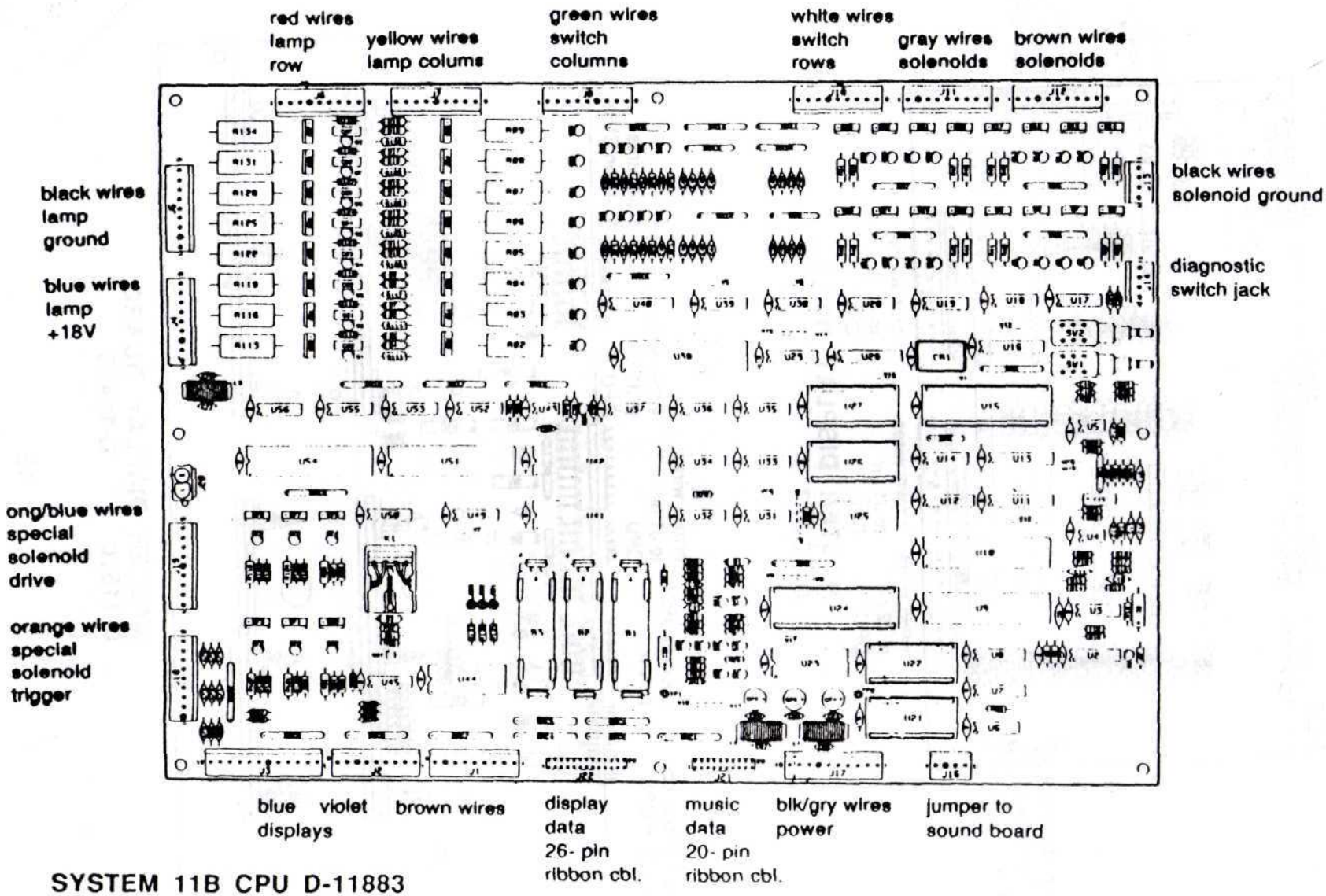


SYSTEM 11 CPU D-10881

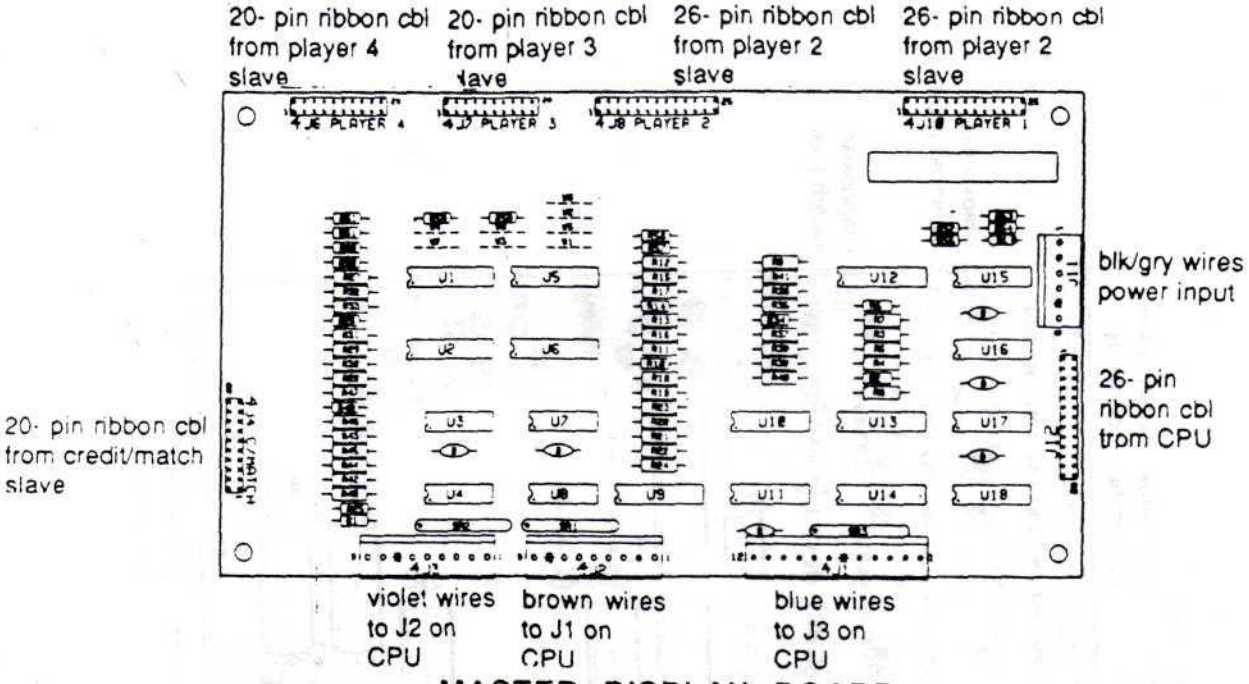


SYSTEM 11A CPU D-11392

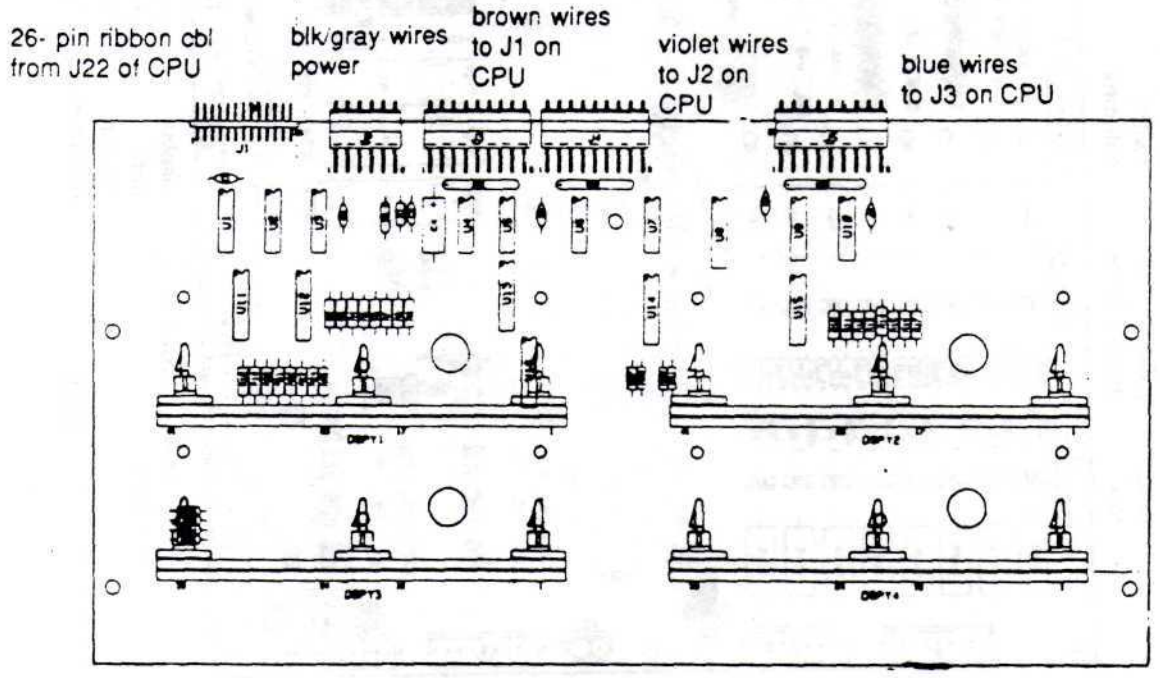
Note: No connection on J15 when Sound (music) Board D-11298 is used.



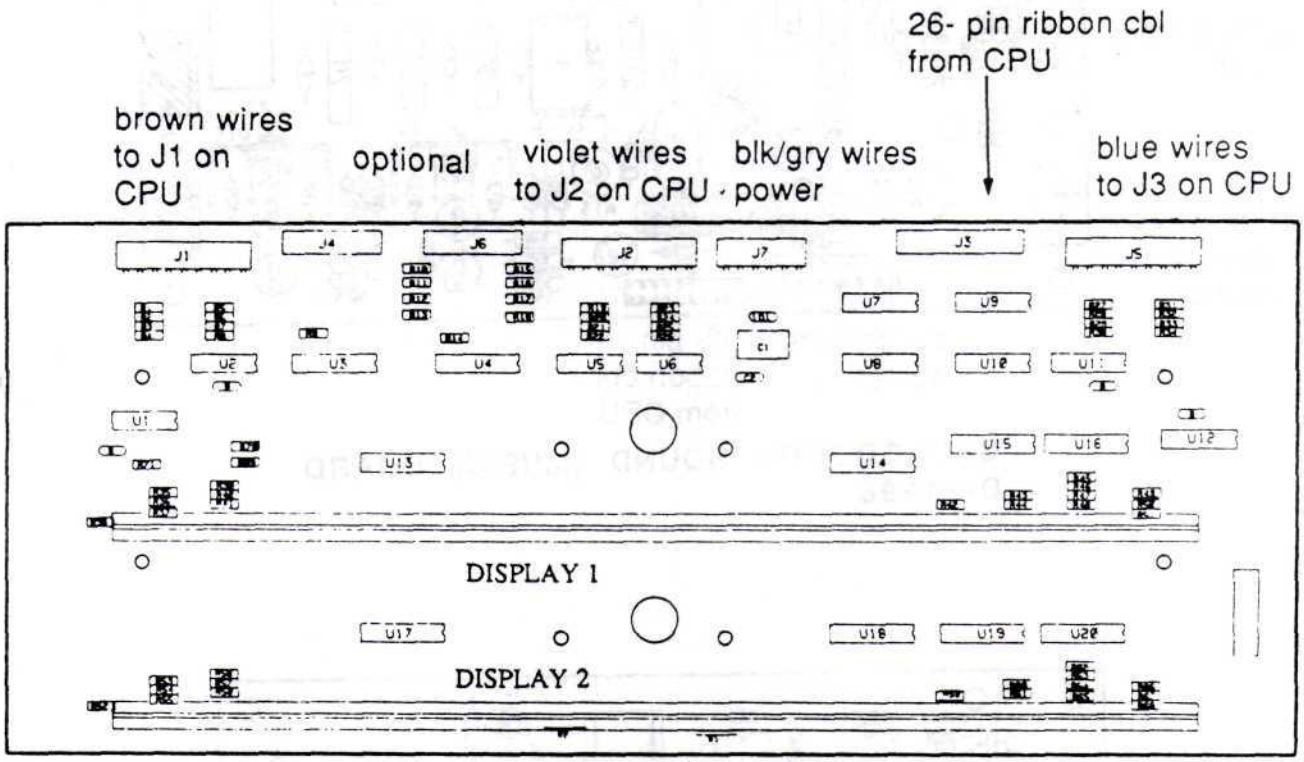
SYSTEM 11B CPU D-11883



MASTER DISPLAY BOARD
D-10877

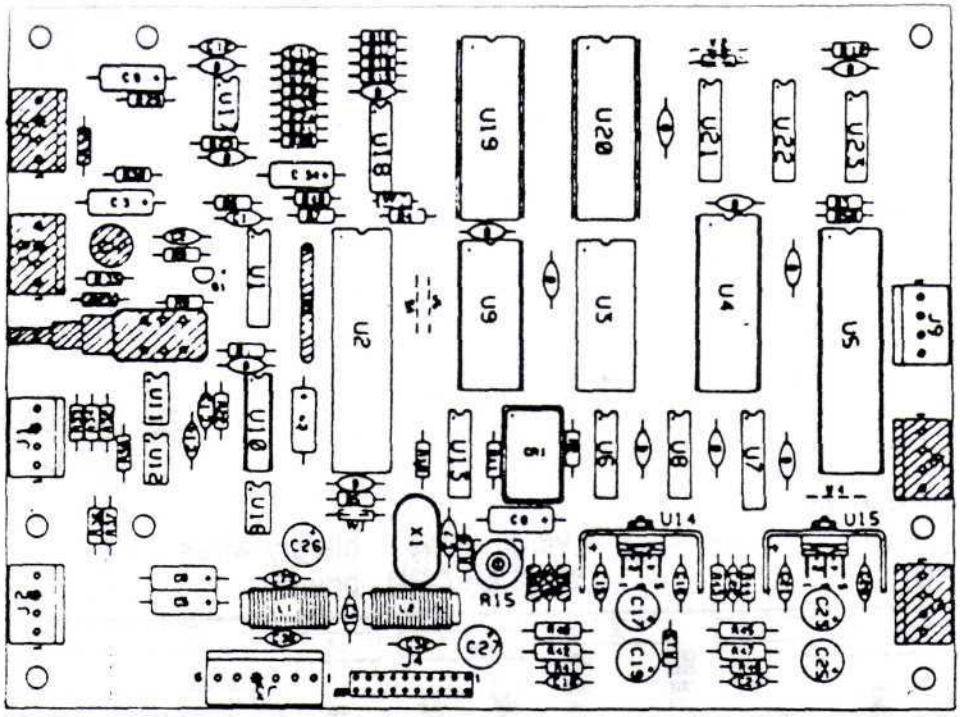


MASTER DISPLAY BOARD
D-11610 D-11415

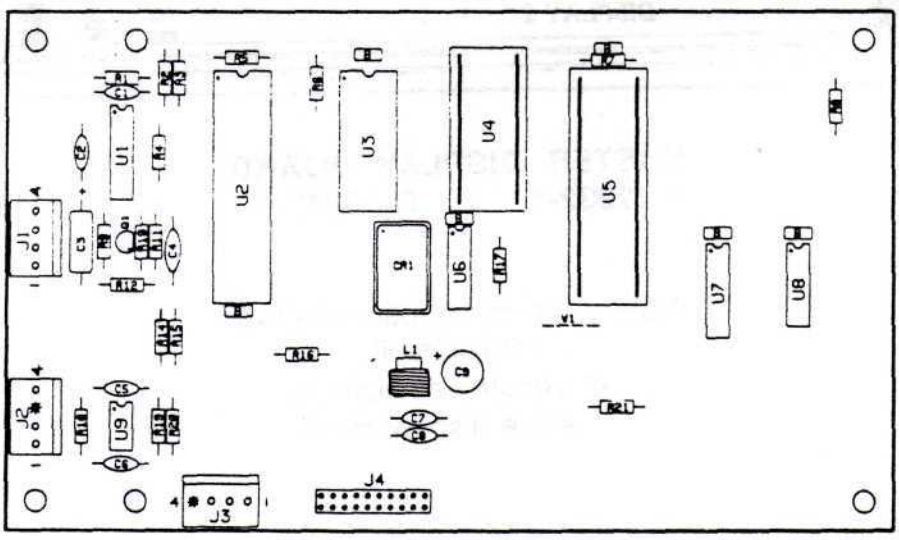


MASTER DISPLAY BOARD
D-12232-1 D-12232-2

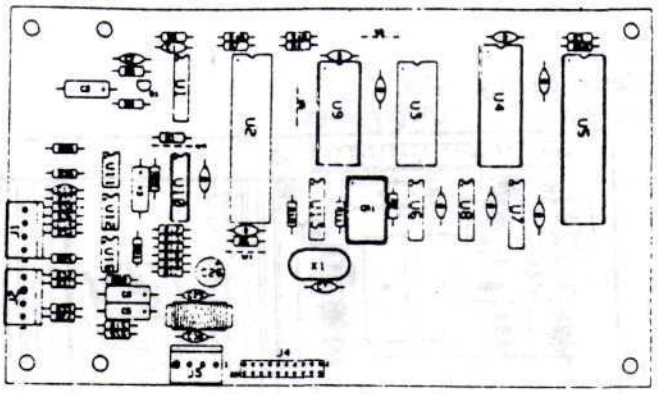
Note:-1 denotes optional slave
display circuit.
-2 denotes no optional
slave display circuit



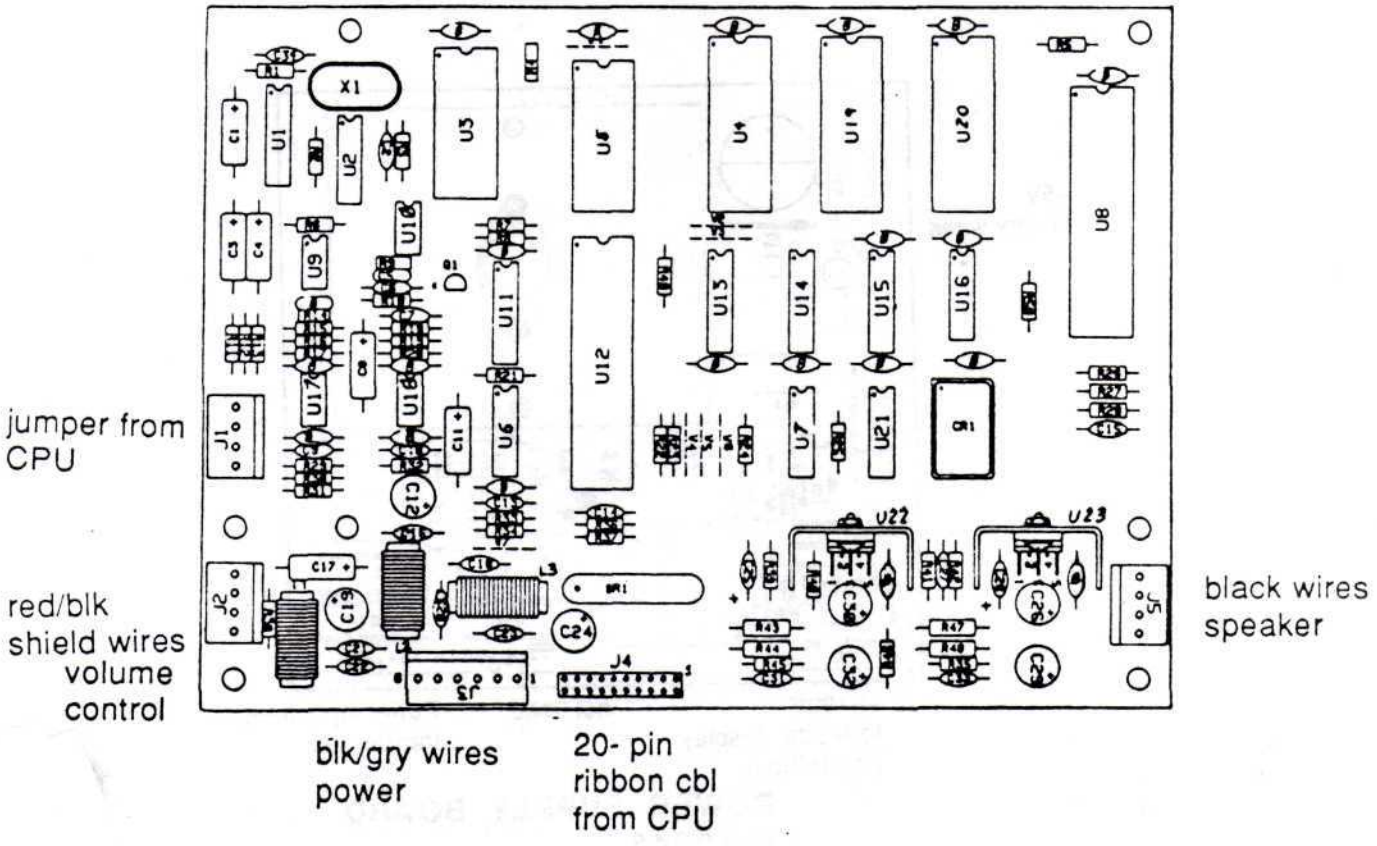
BACKGROUND SOUND (MUSIC) BOARD D-11298



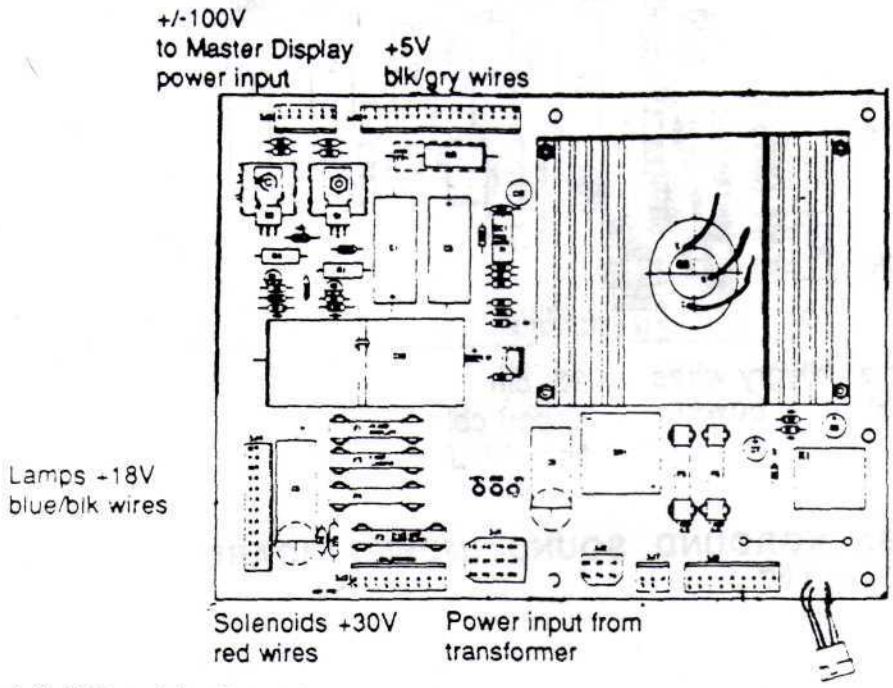
BACKGROUND SOUND (MUSIC) BOARD D-11029



BACKGROUND SOUND (MUSIC) BOARD D-11197

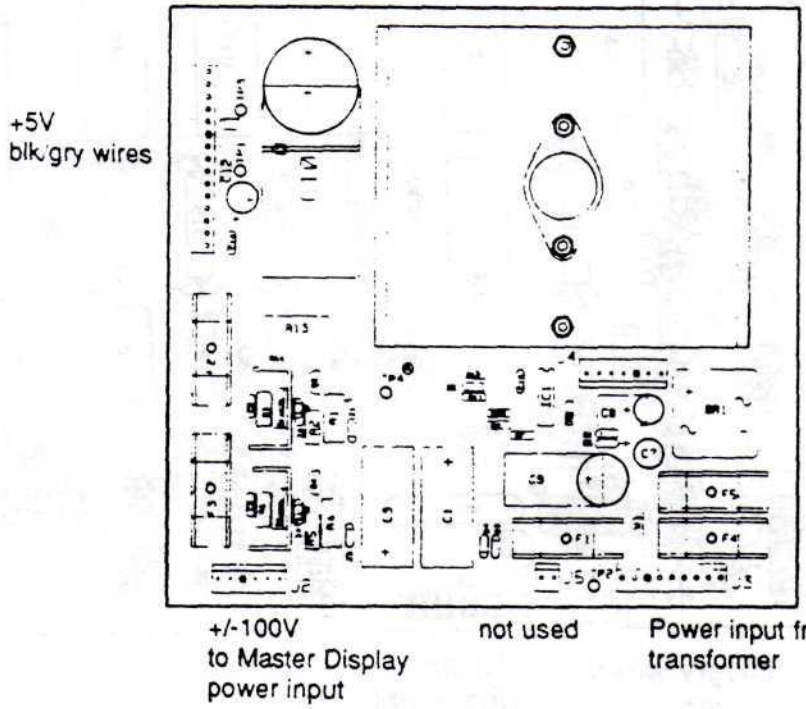


BACKGROUND SOUND (MUSIC) BOARD D-11581



Note: 3J7, 3J8, and the General Illumination connector are not used when connecting a board on the Test Fixture.

POWER SUPPLY BOARD D-8345



POWER SUPPLY BOARD D-12246

ELECTRICAL PARTS:

CABLES

Fount Panel Cable	H-10638
Fount Panel AC Cable	H-10639
Volume Control Cable	H-10649-2
20-pin Ribbon Cable	H-5795-10703-60
539 AC Line Cable	H-10637
Main Harness	H-10640
Adapter Cable	H-10642
Line Cord Cable	H-10644
588 T-Main Harness	H-12165
Display Cable	H-12837
50-inch Ribbon Cable	5795-10868-50
22-inch Ribbon Cable	5795-10938-22

BOARDS

Master Display	D-10877
7-Digit Alpha Display	C-10866
1)7-digit alpha glass	5670-10873-00
2) PCB 7D alpha display	5769-10874-00
7-Digit Numeric Display	C-8364-1
1) 7-digit numeric glass	5760-09439-00
2)PCB 7D numeric display	5762-10933-00
Credit /Match Display	C-8365-1
1)display 2/2 split	5670-9448-00
2) PCB 2/2 split	5767-10934-00
Bally Display-Right	D-12502-1
Bally Display-Left	D-12706
1) 16 digit alpha/numeric display	5670-12308-00
System 11 CPU Assembly	D-11883-2008
Sound Board Assembly	D-11581-00
Power Supply Assembly	D-8345-1914
Load PCB Assembly	C-10634
1)diode MR501	5070-09045-00
2)resistor 470Ω 5w	5012-10781-00
3) load PCB	5768-10780-00

POTS and SWITCHES

Pot 5K ohm 1W 10%	5014-09170-00
Toggle Switch SPDT 125V 6A	5640-09115-00
Toggle Switch DPDT 125V 6A	5640-10783-00
Push Button Switch SPDT 125V 5A	5640-09114-00

MISC. PARTS

Power Xformer 115V/230V	A-5610-12136
Cap. and Bracket Assembly	B-8551
1)metal clamp	20-9213
2) cap 30KM 25V +/- 20%	5040- 09051-00
Line Filter 5VK1	5102-10310-00
Bridge Rectifier 35A 200V	5100-09690-00
Varistor 130V 10J	5017-09044-00
Speaker 4 ohm 6" RD 10W	5555-12015-00
#44 Light Bulb	24-6549
Red LED Display	5671-09271-00
Test Rom Rev. 1	A-5343-10821

HARDWARE PARTS:

MAJOR and SUB ASSY

Test Cabinet	11-804
Top Panel	D-11528
Fount Panel Assy	D-10629

METAL and WOOD PARTS

Capacitor Clamp	20-9213
Fount Panel	01-8064
Top Panel	11-846
12-pin Recpt mtg Bracket	01-8072
T/F PCB Mtg Post	02-4220
Harness Clip -3/4"	03-7655-12
Harness Clip -1/4"	03-7655-4
Harness Clip -1/2"	03-7655-8
Test Bed Hinge	20-9461
Vent Hole Screen 13"	01-6645-2
Speaker Grille	01-6733
Top Panel Support Bracket	01-6762
1/4" Braided Ground Wire	20-9223

WARNINGS AND NOTICES

Warning

For Safety and Reliability, Williams/Bally does not recommend or authorize any substitute parts or modifications of Williams/Bally equipment.

Use of Non-Williams/Bally Parts and modifications of game circuitry may adversely affect operation of your test fixture, of may cause injuries.

Substitute Parts or Equipment Modifications may void FCC type-acceptance.

Since this Game is protected by Federal copyright, Trademark and patent laws, unauthorized game-conversions may be illegal under Federal law.

This "CONVERSION" Principle also applies to unauthorized facsimiles of Williams/Bally equipment, logos, designs, publications, assemblies and game (or game features not deemed to be in the public domain), whether manufactured with Williams/Bally components or not.

Warning

Three-Wire-Plug. This game must be plugged into a properly-grounded outlet to prevent shock hazard and to assure proper game operation. DO NOT use a "cheater" plug to defeat the ground pin on the power cord, and DO NOT cut off the ground pin.

Warning

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a 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 correct the interference.