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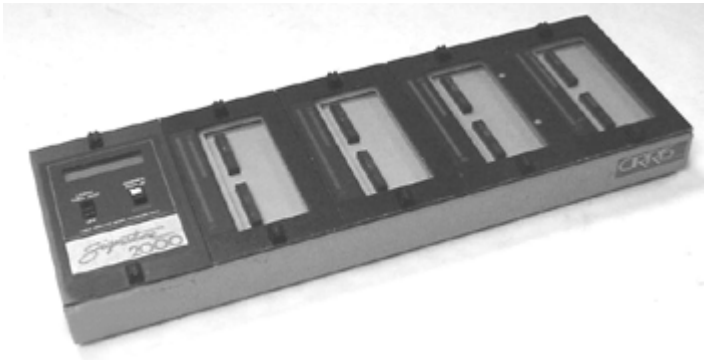
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Signature 2000 Cable Analyzer
User's Guide

Version 3.0
Major Revision
7 October, 1999



CIRRIS
An ISO 9001 Certified Company

Signature 2000 Cable Analyzer User's Guide
Version 3.0

Major Revision
7 October, 1999

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I Need Your Help!

As Senior Editor, it's my responsibility to constantly improve the manuals and other documentation we include with our equipment. We try hard, but we know we'll never please everyone. If you were in my chair, how would you change the documentation to make it better? Here's your chance to take gripes, suggestions and (we hope) praise directly to the guy who can change things. Please fax or mail this form to me, or contact me by e-mail.

Thanks!

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2000 User's Guide

Attach more pages if needed

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Introduction to the Cirris Signature 2000

Lets get started!

The Cirris Signature 2000 cable analyzer is an easy-to-use machine that will allow you to test cables quickly, and with little fuss. In simple terms, the process of using your Signature 2000 goes like this:

1. Install connector adapters to match the cables you want to test (see page 9 for details).

2. Check the test option settings; reset the options if you need to (see page 17 for details).

3. Either:

    - Learn a Sample Cable (a cable you know is built correctly) of the kind you want to test (see page 21 for details), or...

    - Retrieve the wirelist data for the kind of cable you want to test from the analyzer's memory (see page 27 for details).

This completes programming the analyzer for testing cables. If you have connected a Sample Cable to learn it, disconnect it now.

4. Connect the first cable you want to test.

5. Test the cable (see page 25 for details).

6. Record and/or or print the test results (see page 26 for details).

That's it! We'll show you how to do each of these steps in this manual.

What your order should contain

Your order should contain these things in addition to this manual:

- Signature 2000 main unit, including a wall transformer with cord, to provide power for the analyzer.

- Hand-held test probe.

- Whatever connector adapters you have ordered (usually shipped in a 3 x 5-inch card file). You may also have ordered an optional tilt stand, or an optional frame stand. If so, these should be included.

Section 1: Work With the Hardware

The Cirris Signature Signature 2000 can be used to test many different types of cables. To connect the cables you want to test to the analyzer, you use connector adapters which match the connectors on the cable you want to test.

In this section, we will explain how to work with the hardware. We will show you how to install your connector adapters, and how to disassemble the analyzer in case you need to replace one of its subassemblies, or its EPROM.

How to install connector adapters

To install connector adapters onto the Cirris Signature Signature 2000, follow these steps:

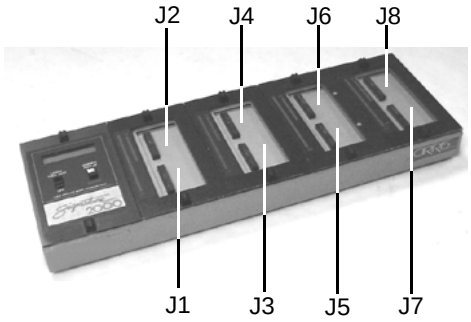
1. Turn the two twistlock fasteners on each adapter cover plate to unlock them, and remove the cover plates.



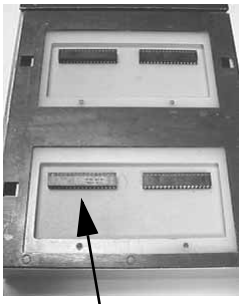
Twistlock fastener locked



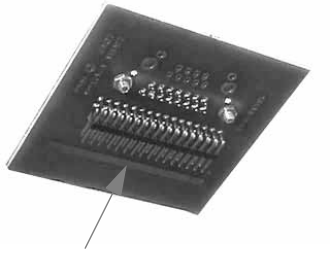
Twistlock fastener unlocked



2. Plug in the connector adapters. Be sure the pins on the bottom of each adapter are lined up properly, so they don't bend as they are inserted into the sockets. To line the pins up properly, press the adapter against the inside edge of the metal frame, and have the bottom of the adapter card resting on the plastic adapter support.

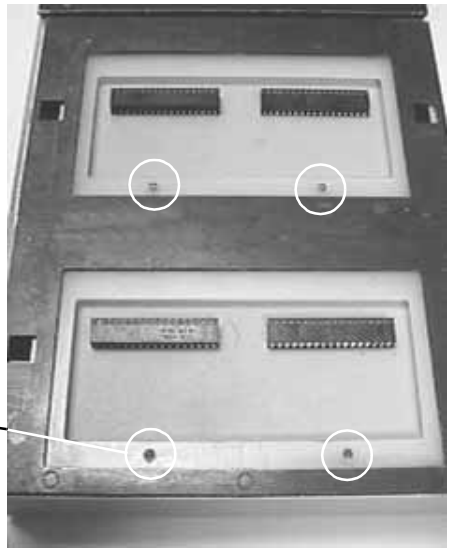


These horizontal pin sockets...



accept the adapter connector pins on the bottom of each adapter

3. Replace the cover plates, making sure the small alignment pins on their undersides fit into the corresponding holes on the scanner's upper surface.



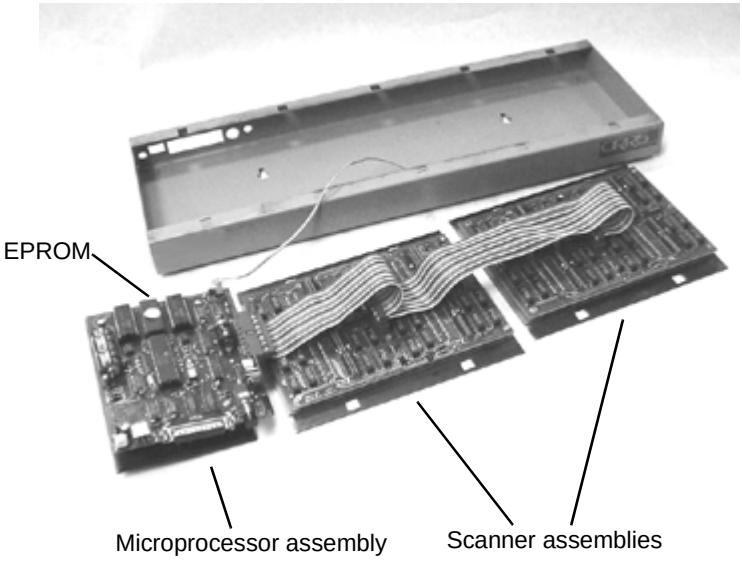
4. Lock the twistlock fasteners to hold the adapters firmly in place.

How to change the EPROM

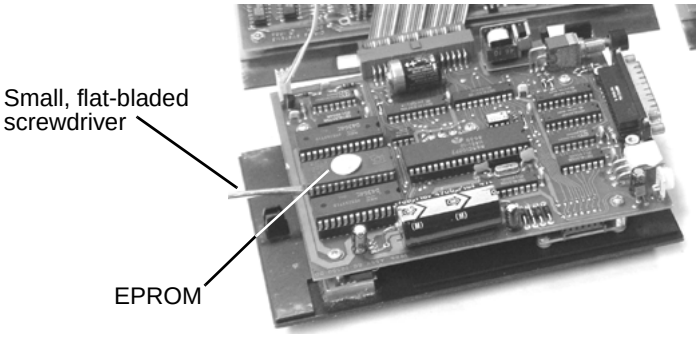
You may need to change the EPROM on the microprocessor assembly. To do this, follow these steps:

1. Disconnect the wall transformer from the wall outlet, then disconnect the power cable from the socket on the back of the analyzer.

2. Unlock the twistlock fasteners, remove the cover plates, and gently lift both the microprocessor assembly and the two scanner assemblies out of the box. Turn them over carefully.You'll now be able to see the EPROM. To make the microprocessor assembly easier to handle, you might wish to disconnect the cable that leads to the scanner assembly, and turn the microprocessor assembly .



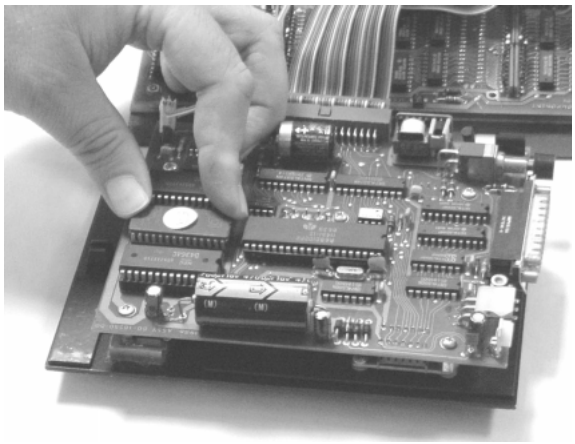
3. Using a small, flat-bladed screwdriver, gently pry the EPROM out of its socket, and remove it.



Note: In this photo, we have turned the microprocessor assembly anticlockwise by ninety degrees to make the EPROM easier to reach.

4. Gently align the pins on the new EPROM with the holes in the socket.

5. Carefully push the new EPROM down into the socket using even pressure. Be careful not to misalign or bend the pins!



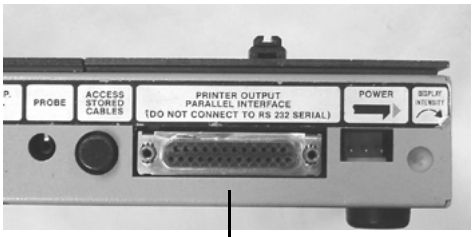
6. If you have disconnected the box-to-box cable, be sure to reconnect it securely. Carefully turn both assemblies over, and lower them carefully into the box. Replace the cover plate, and lock the twistlock fasteners. Your unit is reassembled!

Adding a printer

The Signature 2000 works with almost any printer that has an Epson/Centronics parallel interface. **WARNING!!** Connecting the analyzer to a printer with an RS-232 serial interface will cause serious damage to the analyer, and is not covered by your factory warranty.

To connect the printer, use a standard Epson/Centronic parallel interface cable, readily available from almost any PC dealer. Plug one end of the cable into the

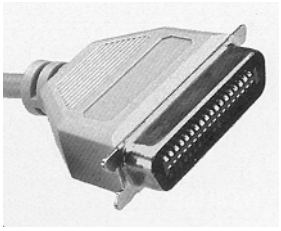
printer, and the other end into the analyzer's parallel printer socket as shown in the photo.



Plug the printer in here

How do I know if I have a parallel printer?

To see if you have a parallel printer, look for the parallel connector on the printer. Printers usually have a parallel interface located in back. Many printers have both a serial and a parallel connector. To work with the Signature 2000 your printer must have a 36-position female ribbon connector similar to the one shown here.



Can I use one printer with more than one analyzer?

Yes. To use your printer with more than one analyzer, use a switchbox. To change which analyzer the printer is receiving information from, simply change the switch setting on the box.

How do I use a printer without an on-line/off-line switch?

If your printer does not happen to have an on-line/off-line switch, you can use either of two solutions:

- Add a switch by placing a switch in the wire to pin 11 of the Epson/Centronics printer cable. When pin 11 on either side of the cable is open, the analyzer will see the printer as being off-line, and will display information rather than send it to the printer. When you close the switch so that pin 11 is closed, information will be sent to the printer.

- If you have a switch box available, you can connect the cable to the switchbox, and use its switch as the on-line/off-line switch.

Changing the company name

To change the company name that appears in the documentation produced by the Signature 2000, you can order an EPROM change from Cirris Systems. Replace the EPROM. For details on how to do this, see page 10.

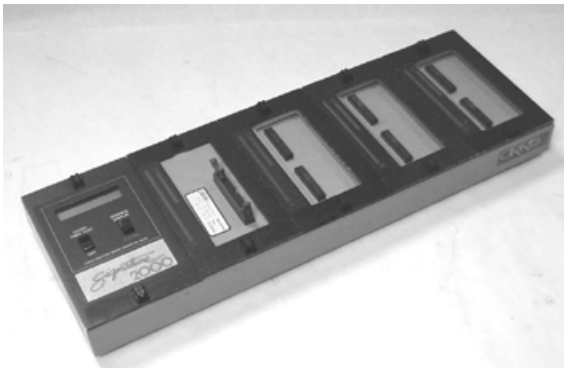
The Frame Mount Stand

There may be times when you will want to test custom fixtures with mating adapters that are not offered by Cirris. These fixtures then connect into standard Cirris connector adapters plugged into the Signature 2000. To secure your custom fixtures, use a frame mount stand from Cirris. This photo shows a frame mount stand for use at scanner positions J1-J2 (part number ACIR-12).

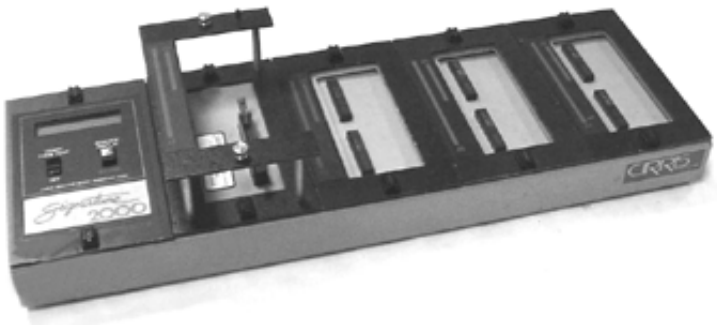


To install the frame mount stand, do these things:

1. Remove the cover plate, and plug the appropriate connector adapter into the Signature 2000 as usual. In our example, we'll install a double-high adapter into position J1-J2.

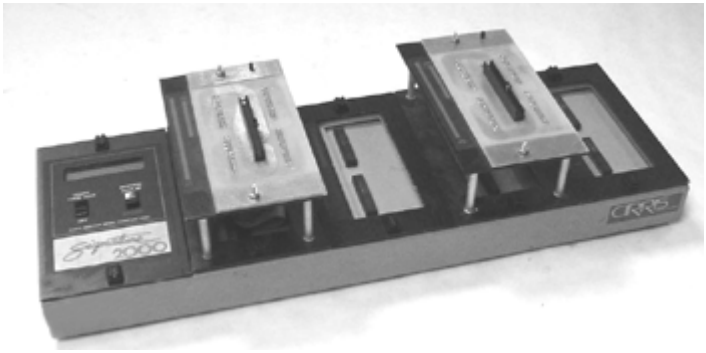


2. Install the frame mount stand onto the Signature 2000 in place of the cover plate you would normally use to secure the adapter. Be sure to lock the twistlock fasteners securely.



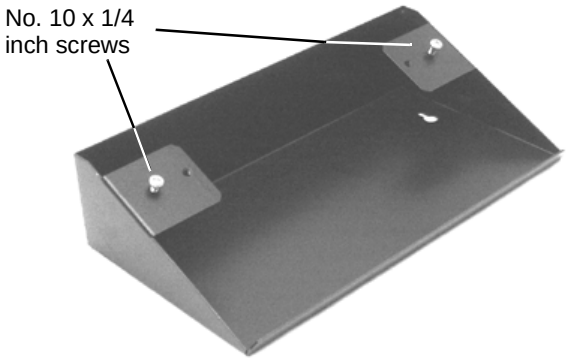
3. Once the frame stand is installed, install your custom fixture on top of the frame stand. Be sure to connect the cable from the custom fixture into the standard adapter installed in the Signature 2000. The setup is ready to learn and test. **Note**: For more details, see the documentation packed with your frame stand, or contact the Cirris technical support team at 801-973-4600 or 800-441-9910. You may also wish to vist our web site at www.cirris.com.

In the example in this photo, we show a Signature 2000 analyzer with a frame stand (part number ACIR-12) installed at scanner position J1-J2, and at J5-J6 (part number ACIR-56). . Custom fixtures have been installed on top of each frame stand.



The Tilt Stand

The tilt stand holds your analyzer at a convenient angle for viewing. If you are working from a seated position, the tilt stand is particularly useful.

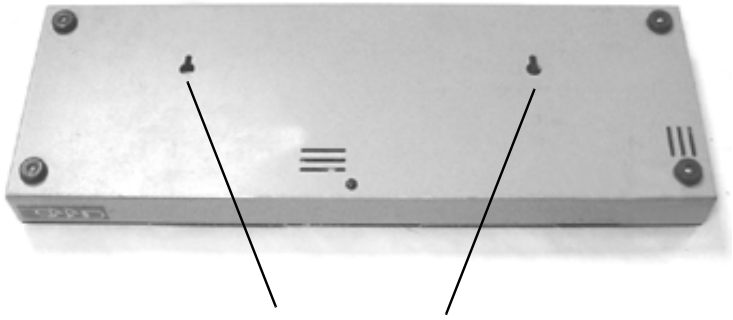


To install the tilt stand, do these things:

1. Adjust the two screws in the tilt stand until they can accomodate the thickness of the analyzer's chassis box bottom. The screws are preset at the factory, but the setting sometimes changes during shipping.

Please see next page...

2. Slide the screws on the tilt stand into the slotted holes on the bottom of the analyzer, then slide the analyzer into position so that the screws engage the slots.



Slide the tilt stand's screws into these slotted openings

3. Turn the analyzer and tilt stand right side up. Once the stand is in place, the analyzer sits on the tilt stand at a thirty degree angle.

Section 2: Check the Option Settings

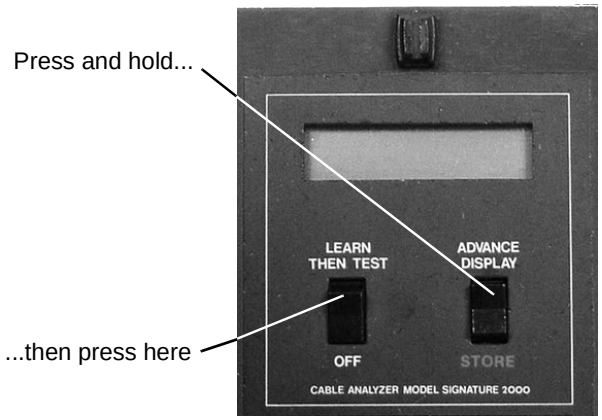
Overview:

The Cirris Signature 2000 has seven test options. Before we learn a Sample Cable, we'll make sure they are set to their factory defaults.

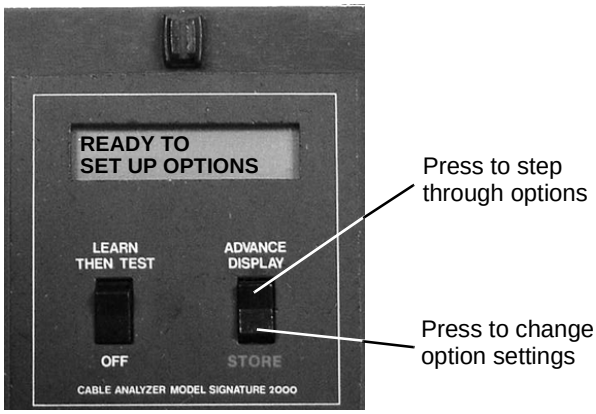
How to check the option settings

To check the option settings, do these things:

1. Press in and hold the Advance Display switch as you turn on the analyzer by pressing the Learn Then Test switch. Hold Advance Display until **Ready To Set Up Options** appears.



2. Once **Ready To Set Up Options** appears in the display, release Advance Display.



3. The first option shown will be **Error Tones**. Set the option to ON by pressing Store. The option toggles on and off as you keep pressing Store.

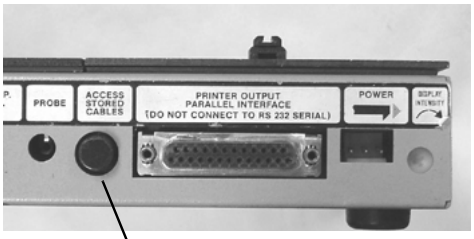
4. Continue stepping through the options by pressing Advance Display, changing the settings as necessary by pressing Store, until all the options are set as shown in this table: When you are done, **Ready to Learn** will appear on the display.

Factory Default Option Settings	
Option	**Setting**
Error Tones are	ON
Lock On Learn	OFF
Long Test Delay	SHORT
Ignore Unused	OFF
Sorted Wire List	OFF
Count All Cables	OFF
Auto Print is	OFF

What to do if you go past the value you want

If you want to go backward through either the options or settings, press in and hold the Access Stored Cables button on the back of the analyzer, while pressing Advance Display or Store. **Note**: All options or settings will roll over to the beginning when you are going forward or backward.

.



Access Stored Cables button

Your option settings are saved

When you set the value you want, it is saved once it is displayed on the screen.Turn off the analyzer, the analyzer will use those settings when you power it up again.

Section 3: What the Option Settings Mean

Overview

The Cirris Signature 2000 has seven test option settings which you set to meet your testing requirements. In this section, we'll tell you what each of the settings means.

Error Tones

When the analyzer detects errors, it emits a series of sharp beeps. If these tones become an annoyance, you can turn them OFF.

Lock On Learn

When this option is set to ON, the analyzer always uses the wirelist it has learned for testing cables. This allows you to learn a cable, then "lock" the test so it will only test that kind of cable. The ON setting protects your test setup in case of a power failure. **Note**: You can still program the Signature 2000 by retrieving a cable from memory when this option is set to ON if you hold in the Access Stored Cables button while you turn on the analyzer by pressing Learn Then Test.

Long Test Delay

This option sets the time it will take for test signals to travel through the cable. The Signature 2000 is shipped with this option set to SHORT.

- When this option is set to SHORT, the analyzer tests all 256 points in approximately 0.3 seconds. When the option is set to MEDIUM or LONG, the test speed is deliberately slowed down. This makes testing especially long cables possible
- The MEDIUM setting is appropriate for cables over 100 feet long.
- The LONG setting is appropriate for cables over 1000 feet long.

Ignore Unused

When this option is ON, the analyzer scans only those "J" positions that have connector adapters installed in them, and ignores all other "J" positions. When this option is OFF, the analyzer scans all pins in adapters that are in use. This option increases the test speed.

When this option is ON, the analyzer begins scanning at position J1, then contrinues through to the highest-numbered position which contains connector adapter. The increased speed helps detect intermittent errors when you flex cables you are testing. **Note**: Because the testing time is so short for small cable assemblies, the clicks which indicate that a cable has tested as "good" may sound more like a buzzing sound.

Sorted Wire List

When this option is ON, the order that pins appear in a net is changed. For example, pin J1-01 will always precede pin J1-14 if they are connected in the same **net**. When the option is OFF, the order that pins appear in a net is controlled by the wire position of an IDC connector.

Count All Cables Once the analyzer is programmed, it begins to count the cables it has tested. When this option is ON, the printout of test results shows the total number of cables that have been tested since it was programmed, and the number of cables that have tested as good. If this option is OFF, the printout will show only the number of cables which tested as good.

Auto Print When you have a printer connected to your Signature 2000, and this option is set to ON, a one-line result will be printed out after each cable is tested. It will indicate if the cable tested as good or bad. If this option is OFF, the analyzer will only display the test result (good or bad) on its LCD display. It will not print a one-line report on each test.

Section 4: Learn a Sample Cable, Store it in Memory

Overview: In this chapter, we will show you how to learn a Sample Cable, then store the wirelist from that cable in one of the analyzer's permanent memory locations.

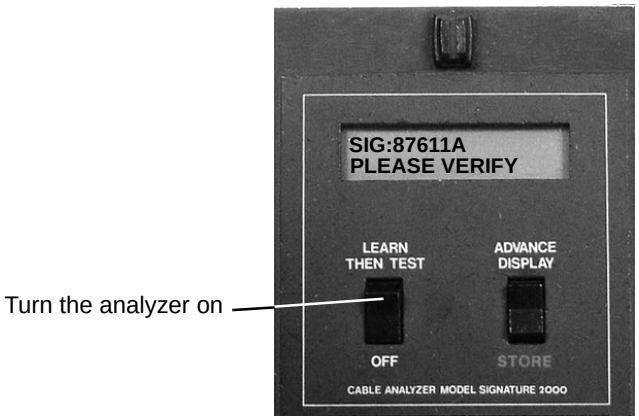
Memory in the Signature 2000 The Signature 2000 has 50 memory positions in which you can store wirelists.

Last Learned When the analyzer learns a new Sample Cable, the wirelist data from that cable is stored in the temporary "Last Learned" memory location. It stays there until you either save it in one of the permanent memory locations, or overwrite it by learning another Sample Cable

Learn a Sample Cable Before you can learn a Sample Cable, you must install the right cable adapters on your Signature 2000 (see page 9 for instructions on how to do this).

To learn the Sample Cable do these things:

1. Connect the Sample Cable you want to learn to the connector adapters already installed on the Signature 2000. Turn on the analyzer by pressing the Learn Then Test switch. The analyzer will learn the cable, then prompt **Please Verify**.



2. To verify that the Sample Cable has been learned correctly, press Advance Display.

   - If you have a printer connected to the analyzer, when you press Advance Display, the analyzer will print out the cable's wirelist information. The printout is your cable documentation. Compare the printed information to the Sample Cable's specification sheet or build list to be sure the cable is a good one.

   - If you don't have a printer connected to the analyzer, pressing Advance Display causes the analyzer to prompt wirelist information in its dis-

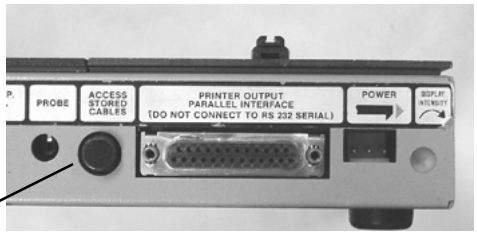
play. Repeatedly press Advance Display to step through the wirelist, transcribing the information to a blank documentation form (see page 57) as you go. Compare the transcribed information to the Sample Cable's specification sheet or build list to be sure it's a good cable.

3. Disconnect the Sample Cable from the analyzer.

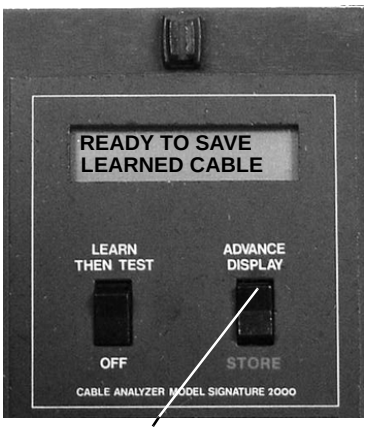
Store the Sample Cable in memory

Now that you've learned the Sample Cable, and verified that the wirelist data is correct, you may store the cable in the analyzer's memory. To store the cable, do these things:

1. Press and hold in the Access Stored Cables button (located on the back of the analyzer as shown in this photo).



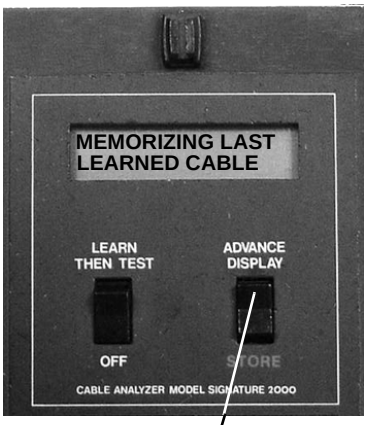
2. When you press the Access Stored Cables button, the analyzer will prompt **Ready To Save Learned Cable**. Continue to hold the Access Stored Cables button in for instructions 3 and 4.



3. While continuing to hold in the Access Stored Cables button, press Advance Display to select a memory location. The analyzer will default to the first unused memory location. Each time you press Advance Display, the analyzer prompts the next unused memory location. For example, if location #1 is empty, the display will prompt **Memory Location 1 Is Now Unused**. Keep pressing Advance Display until you find the memory location you want. **Note**: If the

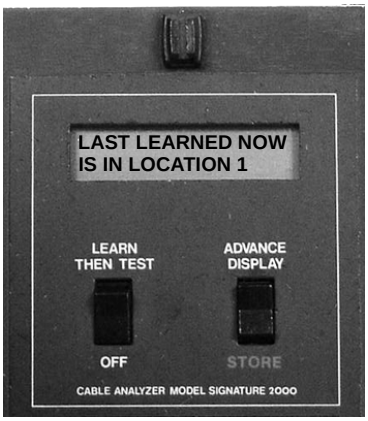
display prompts **No Unused Memory Available**, all of the analyzer's memory locations are full. You'll have to delete a wirelist to make room available. See page 29 for instructions on how to do this.

4. When you have located an available memory position, continue holding the Access Stored Cables button in, and press Store to save the newly-learned wirelist to that memory location. The display will prompt **Memorizing Last Learned Cable**.



Hold the Access Stored Cables button in while you press here

5. Release the Access Stored Cables button. The display will prompt **Last Learned Now Is In Memory X**. The wirelist is now stored in the analyzer's memory.



Section 5: Test Your First Cable

How to test your first cable

Now that you have installed your connector adapters, have checked the option settings, and have programmed the analyzer by learning a Sample Cable (see page 21), or by retrieving a cable from the analyzer's memory (see page 27), you are ready to test your first cable. **Note**: If you retrieved a cable from memory rather than learning a Sample Cable, go directly to step 2.

To test your first cable, follow these steps:

1. Disconnect and remove the Sample Cable from the analyzer.

2. Connect the cable you want to test to the analyzer.

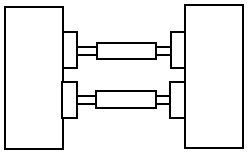
    - Once you have connected the cable, the analyzer will automatically begin the test.

    - **WARNING!! Do not connect a powered ("live") cable to the analyzer!** This will seriously damage your analyzer, and will immediately void any stated or implied warranty.

Check the display, interpret the sounds

As the analyzer does cable tests, it will display results on its LCD display, and will emit sounds. Here's how to interpret what you see and hear:

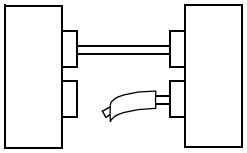
If a cable is good:
The display prompts the same alphanumeric signature as the Sample Cable. The display will show **Good R<X.XΩ**. The analyzer will emit a steady clicking sound.





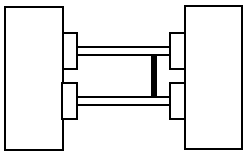
- To continue testing, disconnect the good cable, then replace it with another cable you want to test.

If a connection is missing:
The display prompts **Open Detected**, and the analyzer emits a series of single beeps.



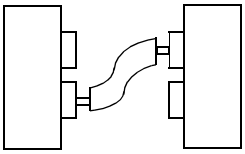


If the analyzer detects a short:
The display prompts **Short Detected**, and the analyzer emits a series of double beeps.





If both opens and shorts are detected:
The display prompts **Errors Detected**, and the analyzer emits a series of triple beeps.





Print or transcribe an error list

If the analyzer detects errors, it can prompt where the error is in a cable. To do this, press Advance Display while the cable is still connected to the analyzer. If you have a printer connected to your analyzer, it will automatically print out an error list. If you don't have a printer, keep pressing Advance Display to step through the errors as you transcribe them to a cable documentation form (see page 57).

Section 6: Retrieve a Cable from Memory

Why retrieve a cable?

Before the Signature 2000 can test cables, it has to be programmed with wirelist data for the cables you intend to test. You can avoid having to re-learn a Sample Cable each time you want to test, by storing the learned information in the analyzer's memory (see page 22 for instructions on how to do this). Once the information is stored, all you have to do to set up for testing is to install the correct cable adapters on the analyzer, then retrieve the cable data from memory in order to program the analyzer.

How to retrieve a cable

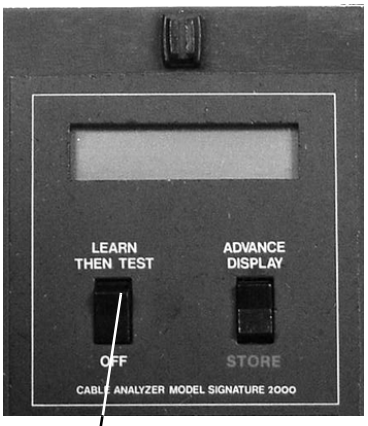
To retrieve a learned cable's data from memory and program the analyzer for testing, do these things:

1. Install the connector adapters that mate with the cables you want to test (see page 9 for instructions on how to do this).

2. Hold in the Access Stored Cables button as you turn on the analyzer. Continue holding in the Access Stored Cables button as you do the next step. The analyzer will prompt **Ready To Access Memorized Cables**.



Press and hold...



...as you turn the analyzer on

3. Continue holding in the Access Stored Cables button while you press Advance Display to step through the Sample Cables stored in the analyzer's memory. The first time you press the switch the display prompts the signature of the cable in the "Last Learned" memory location. When you press Advance Display again, the analyzer prompts the signature for the cable stored in perma-

nent memory location number 1 (there are 50 of these). Continue pressing Advance Display until you see the signature for the kind of cable you want to test.



Continue to hold...

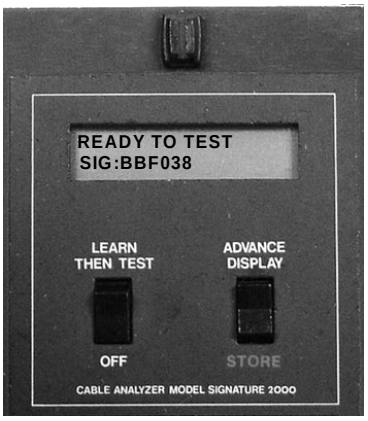


...while you step through the cable signatures

4. When the display prompts the signature for the kind of cable you want to test, release the Access Stored Cables button.

    - If the display prompts **Ready To Test**, the analyzer has retrieved the Sample Cable data, the correct adapters are in place, and you are ready to test cables.

    - If the display prompts **JX Adapter Sig: Should Be**, this means that the adapters you have installed don't go with the Sample Cable you've retrieved. Read the display to get the correct adapters and their positions, then install them. **Note**: It's OK to install adapters without turning off the analyzer when it is in this mode. Once you've installed the correct adapters, the display will prompt **Ready To Test**.



Cable retrieved, adapters are correct. You are ready to test.



Installed adapters are not correct. Install correct adapters. When you've done that, prompt will change to **Ready to Test**.

Section 7: Delete a Cable from Memory

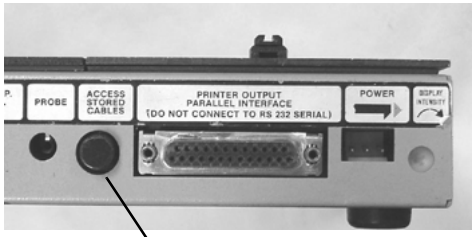
Why delete a cable?

The Cirris Signature 2000 has a maximum of 50 permanent memory locations for storing cable information. You may need to delete cables to make room for new wirelists, or to discard wirelists you no longer use for testing.

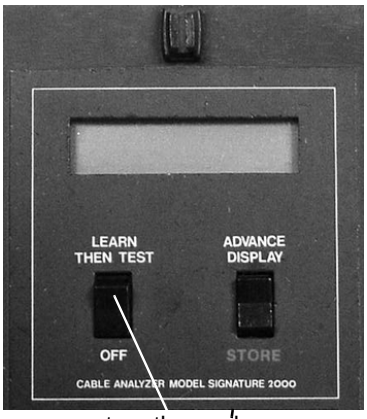
How to delete a cable

To delete a cable from the analyzer's memory, do these things:

1. Hold in the Access Stored Cables button as you turn on the analyzer. Continue holding in the button as you do the next step. The analyzer will prompt **Ready To Access Memorized Cables**.

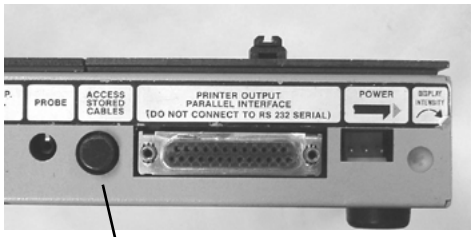


Press and hold...

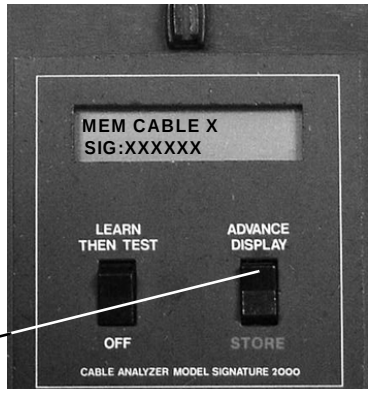


...as you turn the analyzer on

2. Continue holding in the Access Stored Cables button while you press Advance Display to step through the Sample Cables stored in the analyzer's memory, until you come to the signature of the cable you want to delete. (Remember, the first cable displayed will be the cable in the "Last Learned" memory location. It cannot be deleted.) When you come to the cable you want to delete, the display should prompt **Mem. Cable X Sig: XXXXXX**, indicating the memory location and signature of the cable.



Continue to hold...



Press here

3. Continue to hold in the Access Stored Cables button while you press Store to

select the cable for deletion. Continue to hold down the Store switch as you do the next step.



Continue to hold...

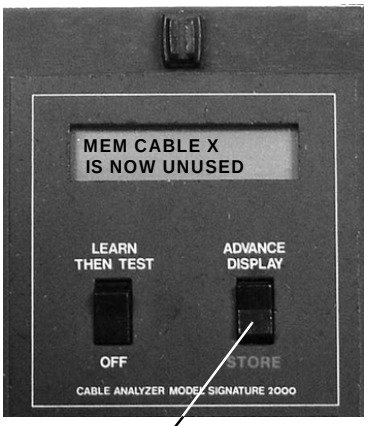


...while you press here to select the cable for deletion

4. Delete the Sample Cable you've selected by first releasing the Access Stored Cables button, then releasing the Store switch. When you release the Access Stored Cables button, the prompt will change to **Mem Cable X Is Now Unused**. When you release the Store switch, the prompt will change to **Ready To Learn**. The memory location is now empty.



First release this button...



...then release this button

Section 8: Print a Directory of Cables Stored in Memory

Overview

If you have a printer connected to your Signature 2000, you can print a directory that shows all the Sample Cables stored in the analyzer's memory. The directory will show the memory location number, and the signature of the Sample Cable stored in each memory location.

Print out a directory

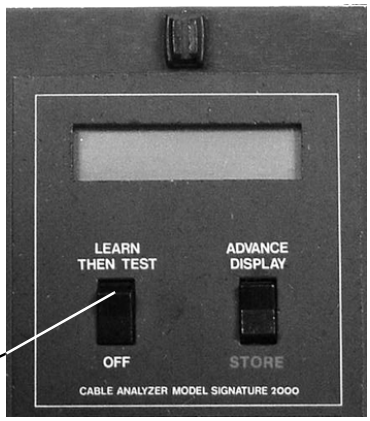
To print out a directory of the Sample Cables stored in the analyzer's memory, do these things:

1. Make sure the printer is properly connected to the analyzer, is turned on, has paper, and is selected (on-line).

2. Press and hold in the Access Stored Cables button as you turn on the analyzer. Continue to hold in the Access Stored Cables button as you do the next step.

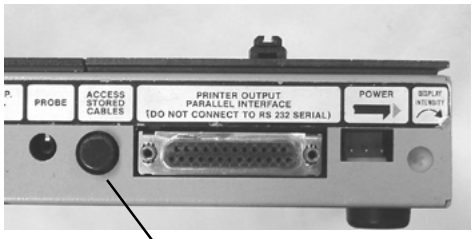


Press and hold this button...

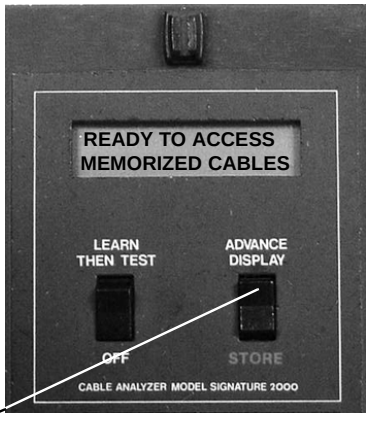


...as you turn the analyzer on

3. As you continue to hold in the Access Stored Cables button, press Advance Display once..



Continue to hold this button in...



...as you press here

4. The directory will be printed. Release the Access Stored Cables button.

Section 9: Cable Documentation and Signatures

What is cable documentation?

Cable documentation is a printed record of a Sample Cable's unique signature, the adapters used to test it, and the test parameters used to test it. It also contains a complete list of the interconnections in the cable, and any notes necessary to help you build the cable.

Why prepare cable documentation?

When you prepare complete documentation, you prepare a standard set of information from which future cables will be built. The Signature 2000 can help you prepare documentation by learning a Sample Cable. Once the cable has been learned, you can either transcribe it by hand onto a documentation form (see page 57), or print it out if you have a printer connected to your analyzer.

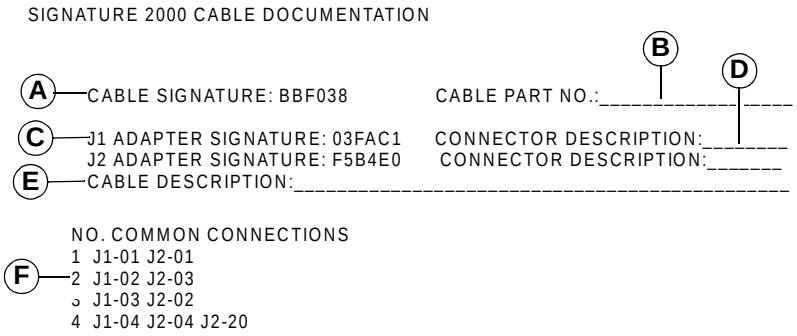
Once the cable has been completely documented and stored in memory, you won't need to keep an array of "known good" cables handy for comparison. If the signature prompted by the analyzer after each test matches the signature in the cable's documentation, you can be sure the cable is correctly built according to your specifications.

You can store Sample Cable information in the analyzer's memory. When you retrieve that information from memory, you program the analyzer just as if you'd learned a real Sample Cable. The analyzer will prompt the Sample Cable's alphanumeric signature, and which connector adapters to install. See page 22 for information on how to store a Sample Cable in memory, and page 27 for information on how to retrieve a cable from memory.

Please see next page...

How to interpret cable documentation

The documentation your Signature 2000 produces contains all the information you will need to precisely duplicate test setups. This example shows a typical wirelist with the cable signature, adapter signatures, and the list of interconnections.



A. This example shows a cable with the cable signature BBF038. This signature must match those prompted in the display when you are preparing to test cables.

B. This blank area is left so you can write in the cable's part number.

C. These are the connector adapter signatures. In this example, the signature for the adapter in position J1 should be 03FAC1. The signature for the adapter in position J2 should be F5B4E0.

D. This blank area is for writing a brief description of the connector adapters.

E. This blank section is for writing a cable description.

F. The interconnections that comprise each net appear after each net number, and are shown directly under the heading COMMON CONNECTIONS. The numbers J1, J2, J3, and J4 indicate the adapter position. The number after the hyphen is the specific pin to which a connection is made

How signatures work

Signatures are the working basis of the Signature 2000 system. When the Signature 2000 learns a Sample Cable (a cable that you know is built correctly), it computes and displays a cable signature for that Sample Cable. This signature becomes part of your cable documentation for that kind of cable.

- When the signature prompted by the analyzer matches the signature in your cable documentation, you know that your test setup is correct.
- When the signature of a cable you are testing matches the documented signature during a test, you know the cable under test is correctly built.

Types of signatures

The Signature 2000 uses one type of signature:

- The *cable* signature.

The cable signature

The six characters in a signature (as displayed by the Signature 2000) are called the *cable* signature. This six-character alphanumeric number represents a summary of the interconnections in a cable. When the analyzer learns a cable, it computes this unique signature based on the cable's interconnections, and the connector adapters in use.

How connector adapters are supported

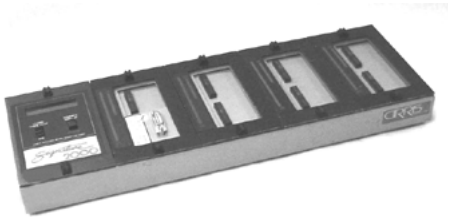
The Signature 2000 uses connector adapters mounted on small printed circuit boards to connect the cables you want to test to the analyzer's scanner assembly. Cirris Systems can provide adapters for nearly all popular connectors.

There are two general adapter types available for the Signature 2000. These are:

1. *Single-high* adapters. These are for connectors with up to 28 pins. They occupy one "J" position on the analyzer's scanner.



Example: An ADBP-15 single-high adapter

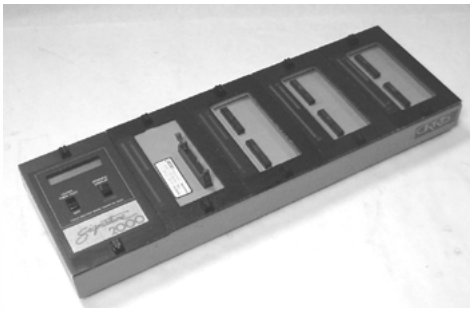


Single-high ADBP-15 adapter in scanner position J1.

2. *Double-high* adapters. These are for connectors with from 29 to 64 pins. They occupy two "J" positions on the analyzer's scanner.



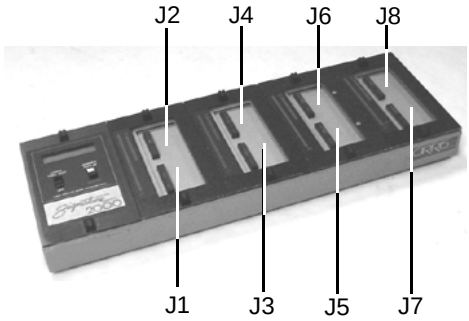
Example: ADPG-37 double-high adapter



Double-high AHED-34 adapter in scanner postions J1, J2

How connector adapters are placed on the analyzer

The Signature 2000 analyzer itself has eight connector adapter positions on its scanner assembly, marked J1 through J8. Each position has 32 points, for a total of 256 available points.



Install adapters lowest-numbered first

When you install connector adapters, you must install them beginning with the lowest-numbered "J" positions first. For example, if you intend to use adapter positions J2 and J4, first install the connector adapter at position J2. Then install the connector adapter at position J4. If you don't do this (especially if you're installing more than one type of adapter), you may find that the connector adapters won't fit the scanner assembly correctly.

Sample wirelist showing connector adapters

Here is a portion of a cable's printed documentation showing how single-high and double-high connector adapters usually appear.

```
SIGNATURE 2000 CABLE DOCUMENTATION
_____________________________________

CABLE SIGNATURE: 006A15          CABLE PART NUMBER:_____________
J1-ADAPTER SIGNATURE: D507F1     CONNECTOR DESCRIPTION_____________
J4-ADAPTER SIGNATURE: 03FAC1     CONNECTOR DESCRIPTION_____________
CABLE DESCRIPTION:_____________________________________________

NO. COMMON CONNECTION LIST:
1 J1-01 J4-01
2 J1-02 J4-02
3 J1-04 J4-08
4 J1-05 J4-09
5 J1-03 J4-03
```

Section 10: Rework and Guided Assembly

The hand-held test probe

You can connect a hand-held test probe (provided with your analyzer) to the Signature Signature 2000. It will help you quickly identify test points as you rework or assemble cables. **Note**: The probe works only when the analyzer is in the rework mode. It will not function when the analyzer prompts **Ready to Test** or **Please Verify**.

Installing the probe

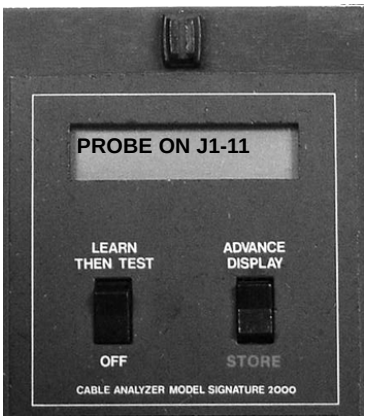
Plug the probe into the connector labeled Probe on the back of the analyzer. This photo shows the location of the probe jack.



Plug the probe in here

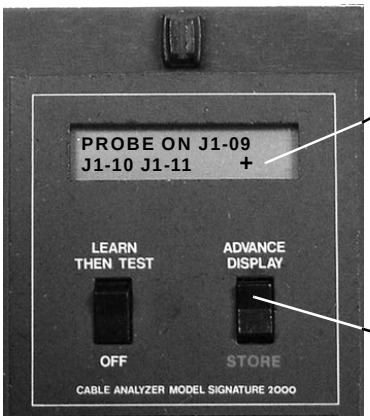
Example: Identifying test points using the probe

While the analyzer is in the test mode, touch the tip of the probe to the connector pin or wire you want to identify. For example, if you touch the probe tip to position J1, pin 11, the analyzer will prompt **Probe On J1-11**.



Displaying multiple interconnected pins

Up to three different pins can be displayed at the same time. If more than three pins are interconnected, a plus sign (+) will appear in the lower right-hand corner of the display. To view any additional interconnections, press Advance Display..

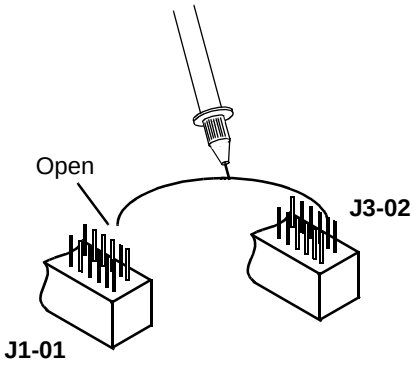


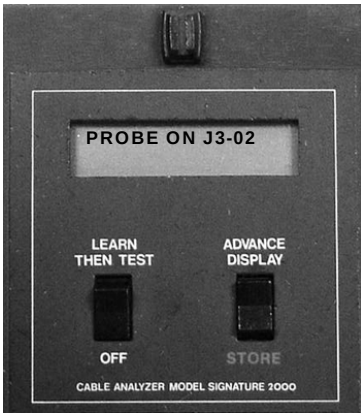
Plus sign here indicates more than three points are interconnected.

Press to display additional points

Using the probe to identify an open circuit

Using the probe, the analyzer can detect which end of an interconnection has an open. When the analyzer prompts an open, use the sharp metal tip of the probe to pierce the insulation of the wire that should connect between the two pins. The pin shown in the display is the pin that has a good connection to the wire. The pin that is **not** displayed is the open.





Rework/Guided Assembly

Before you begin reworking a cable assembly, remember these things:

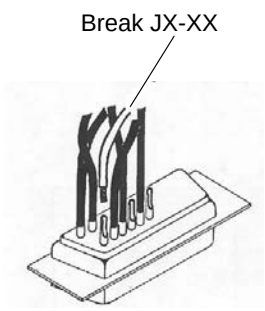
- If you have a printer connected to your analyzer, either turn it off or disconnect it.
- When the analyzer displays errors, pressing Advance Display once will put the analyzer into rework mode. If you press Advance Display twice, the analyzer will just prompt all the errors it detects.

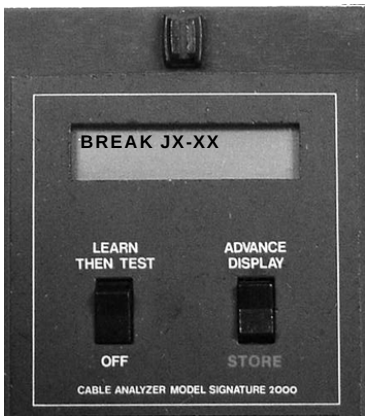
Please see next page...

Removing shorts within a net

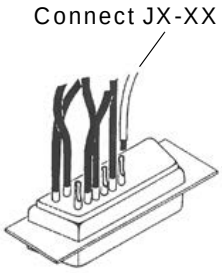
If the analyzer detects a short, follow these steps:

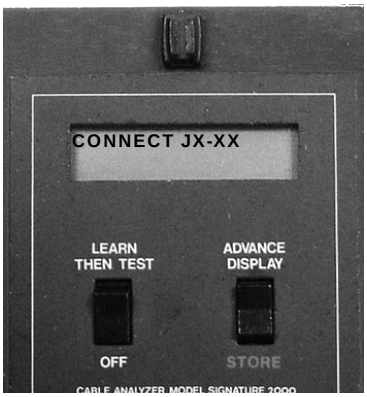
1. Press Advance Display once to put the analyzer into rework mode. The analyzer will prompt **Break JX-XX**, where X indicates the adapter position and the pin number. Break all connections indicated in the display





2. When you break a connection, the analyzer will prompt the next short. When all the shorts have been broken, the analyzer will prompt the net and point to which you should connect JX-XX. Connect JX-XX to the point indicated in the display.



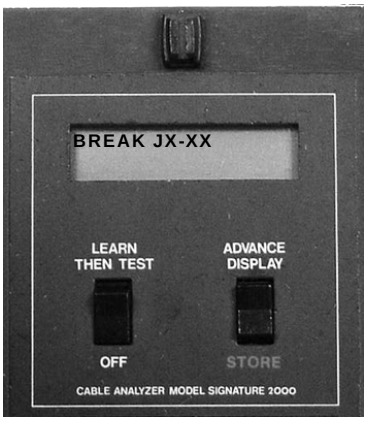


Please see next page...

3. Once you've corrected all the shorted connections, the analyzer will either prompt **Good Cable**, or **Connect JX-XX**. If the analyzer prompts **Break JX-XX**, you have created another short. Go back to step 2 and try again.



Cable has been corrected

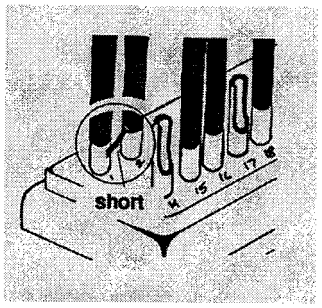


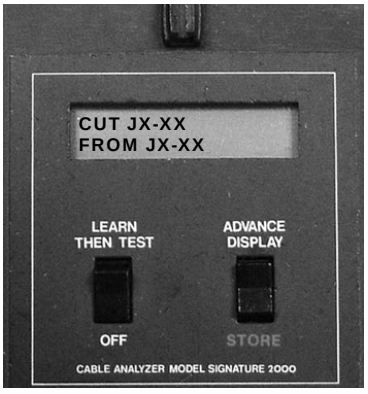
You've created another short. Go back and try again

Removing shorts between nets

If the analyzer detects short circuits in the cable or harness you are testing, it will tell you where to make cuts to correct the shorts. This will happen if two nets should become shorted. To correct a detected short, do these things:

1. The analyzer will prompt **Cut JX-XX From JX-XX**, where X indicates the adapter positions and pin number.





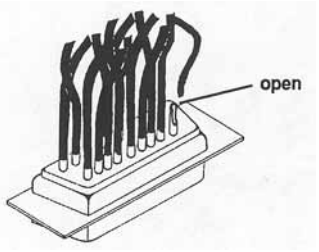
2. Locate the short between the nets, and remove it.

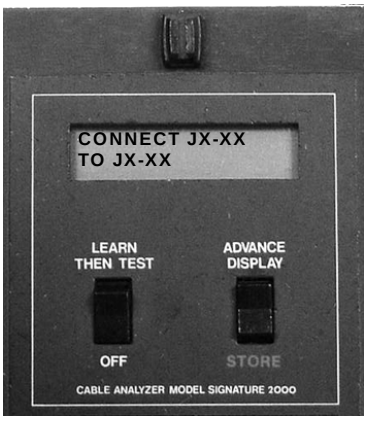
Please see next page...

Correcting opens

If the analyzer prompts **Connect JX-XX to JX-XX** indicates that the cable you're testing has an open circuit. To correct an open, follow these steps:

1. Locate the open circuit prompted in the analyzer's display.





2. Make the correct connections in the cable as indicated.

    - Once you've connected all the opens, the analyzer should prompt **Good Cable**.

    - If you should happen to create another short, the analyzer will prompt **Break JX-XX**.

Testing Awkward Assemblies

Using Extension Cables

Connector adapters can wear out, especially from heavy use. Therefore, it may be easier to replace an extension cable plugged into an adapter than it is to replace the connector adapter itself. Cable extensions are also useful for testing large, difficult-to-handle assemblies such as harnesses and backplanes. Cable extensions make testing extremely short cables easy.

To build connector adapter extensions, do these things:

1. Select the male or female connectors that match your connector adapters.

2. Wire cable to those connectors according to the standard build specifications for your adapters.

3. Document and test the cable extensions. Make sure to note any changes in signatures caused by the extensions.

4. Plug in the new extensions to matching connector adapters installed on the analyzer.

5. Connect the assemblies you intend to test to the extension cables, then test as usual.

Testing Extremely Short Cables

If a cable is so short that it will not reach between two cable adapters installed on the analyzer, create extension cables that span the necessary length at each end, to allow the cable you want to test to be connected.

Testing short IDC-type cables

If you need to test short IDC-type cables, it may be convenient for you to build a daisy chain of assemblies. You create a series of short cables, each followed by a short length of ribbon cable that connects it to the next cable. Test the assembly as a daisy chain, then cut away the excess ribbon cable between the assemblies.

Testing cables with many connections

Cables with lots of connections are easy to test if they consist of a daisy chain of identical connectors with identical interconnections.

Just plug each identical connector into the analyzer in succession to test them. However, if the interconnections are not identical, you must check each feasible combination of connectors. This will mean you'll have to test and document several different connector combinations.

Testing harnesses and backplanes

The Signature 2000 easily tests harnesses with less than 256 termination points. Do these things:

1. Select connector adapters which have a large enough number of pins for you to create an interface cable that will connect from the analyzer to each termination point on the harness board.

2. Label the termination points with equivalent pin numbers.

3. Document and test the assembly as though the harness were a cable assembly.

Cirris manufactures analyzers well-suited to testing large harnesses and other assemblies. Call us at 1-801-973-4600 or 800-441-9910 for details. You may also wish to visit our web site at www.cirris.com. We'll meet your testing needs with good solutions.

Section 11: Troubleshooting

What is in this section?

In this section we will tell you how to deal with two basic kinds of trouble which may occur when you are working with your Signature 2000. These are:

- General problems with the analyzer.
- Problems with printing.

Need more help? Call us!

Each section will help you solve problems you might have with your analyzer. You may be able to correct some of the problems yourself. If you find that the problem is a defective microprocessor or scanner assembly, or if for some other reason you cannot solve the problem yourself, please contact our customer support team at Cirris by calling 1-801-973-4600, or 1-800-441-9910. When you call, please have the following information ready:

- What model of analyzer do you have?
- Purchase date (if you know it).
- What is the analyzer's serial number?
- What have you done to try to solve the problem?

Please have your analyzer set up near your telephone so you can duplicate troubleshooting steps as our customer service team talks with you.

General Problems with the Analyzer

There are problems you may see with the analyzer that are not detected by the analyzer's own internal tests. We will talk about those here.

Problem: No display and no sound. The analyzer's display is totally blank.

Possible Causes:

- Bad 10 VAC wall mount transformer.
- The intensity control for the display is not adjusted correctly.
- Bad microprocessor assembly.

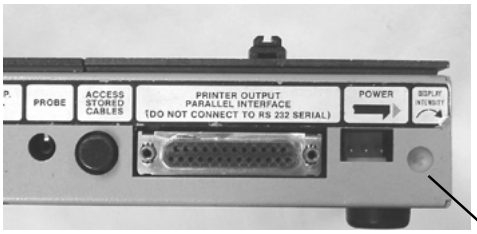
Things to do:

1. Be sure the wall transformer is plugged into a live wall outlet, then feel if it is warm. If the transformer stays cold, it is probably bad. If the outlet is good and the transformer is bad, call Cirris to replace the transformer.

2. If the transformer feels warm, check to see if the microprocessor assembly feels warm. It should warm up within about five minutes after you turn it on. If it is still cold after five minutes, the transformer is bad. Call Cirris to replace it.

3. If the microprocessor assembly feels warm and the display has a blue back-

ground, but is otherwise blank, adjust the Display Intensity control at the back of the analzyer by turning it clockwise. If the display is still blank, call Cirris to replace the microprocessor assembly.



4. If the microprocessor assembly is warm, but the display is totally blank, or there is no blue background showing in the display, call Cirris to replace the microprocessor assembly.

Problem: Display shows a darkened row, or gibberish characters.

Possible Causes:

- Display Intensity control is not adjusted properly.
- Scanner assembly is bad.

Things to do:

1. If both rows of the display are dark, try adjusting the Display Intensity control at the back of the analyzer by turning it counterclockwise. If this does not solve the problem, go to step 2.

2. Turn off the analyzer, disconnect the microprocessor from the rest of the system, then turn on the microprocessor. if display now reads **Scanner Failure**, the scanner assembly is probably bad. Call Cirris to replace it.

3. If the problem is not solved after the microprocessor is disconnected, the microprocessor assembly is probably bad. Call Cirris to replace it.

Problem Display prompts **Scanner Failure**, and no cables or adapters are connected to the analyzer.

Possible Causes:

- The internal cable between the scanner assembly and the microprocessor assembly is disconnected.
- The scanner assembly is bad.
- The microprocessor assembly is bad.

Things to do:

1. Disassemble the analyzer and make sure the internal cable between the scanner assembly and the microprocessor is securely connected.

2. If you have another Signature 2000 analyzer available, try swapping their scanner assemblies. If the swapped scanner assembly works, then the first scanner assembly is bad. Call Cirris to get a replacement.

3. If swapping the scanner assemblies does not solve the problem, try swapping the two microprocessor assemblies. If this corrects the problem, call Cirris to get a replacement microprocessor assembly.

Problem: The display prompts **Scanner Failure** only when a cable is connected to the analyzer.

Possible Causes:

- There are too many points within a given net.
- The scanner assembly is bad.

Things to do:

1. Check to see if there are more than 64 points in the same **net**. If there are, this exceeds a compatibility limitation in the Signature 2000. If feasible, change the test setup so that a maximum of 64 points are found in each net.

2. If you have another Signature 2000 available, try swapping the scanner assemblies. If this solves the problem, the first scanner assembly is bad. Call Cirris to get a replacement.

Problem: When a cable is disconnected, the display still prompts **Please Verify**.

Possible Causes:

- A cable adapter is bad, or the adapting cables are bad.
- The scanner assembly is defective.

Things to do:

1. Remove the cable adapters from the analyzer while the analyzer is still on. If the analyzer still prompts **Please Verify**, the scanner is probably bad. Call Cirris to replace it.

2. If the analyzer prompts **Ready To Test** after step one is done, you have unwanted connections in your cable adapters or adapting cables.

Problem: Connections are not recognized by the analyzer.

Possible Causes:

- Bad cable adapters or adapting cables.
- Bad scanner assembly.

Things to do:

1. Using the hand-held test probe as a diagnostic tool, use the sharp steel tip of the probe to pierce the insulation on the connecting wire for the connection that is not being recognized. The pin which is displayed by the analyzer when the insulation is pierced is the pin that makes a connection to the wire. The pin that is not displayed is the one that is open. Remove the connector and check the connector adapter with the probe to see if the missing pin is recognized there. If it is recog-

nized at the test adapter, you may have a worn contact, or contaminants such as solder flux on the contacts.

2. If you are using an adapting cable, move back to the test point on the adapter connected to the analyzer, and see if the analyzer will recognize it there. If the analyzer recognizes the point, the adapting cable is bad. Rework the adapting cable.

3. If you are using an AUNV-64, or AHR2-64 adapter, be aware that some pins are used to identify these adapter's signatures. Because they are incorporated into the adapter signature, these connections may cause test points to no longer be recognized. If this is the case, you have miswired your connections, and you will have to rework them.

    - To isolate a problem with an AUNV adapter, remove all connections to pin 31, 32, 33, and 34 on a 34-pin connector adapter.
    - If you are using an AHR2-64 adapter, make sure there are no connections to pins 33 and 34.
    - If after removing these connections you can now identify these pins with the probe, you have found the type of miswire described above. Rework your adapting cable.
    - It is possible the adapter is bad. Check for worn connectors on the adapter. Also check for continuity of the adapter pin on the bottom of the adapter to the test connector on top. If you find open or worn connections, replace the adapter.
    - If you find a bad pin after all these tests, call Cirris to replace the scanner assembly.

Problem: The analyzer stops operating while it is being used.

Possible Causes:

- Damage from static electricity.
- Bad microprocessor assembly.

Things to do:

1. If static electricity may be a problem, be sure the safety ground on the wall plug is connected. Take measures to control static in your work area.

2. If the microprocessor is bad, call Cirris Systems to replace the microprocessor assembly.

Problem: Speaker problem. There is no sound, but the display works.

Possible Causes:

- The Error Tones option is set to OFF.
- The speaker inside the analyzer is not plugged in.
- The microprocessor assembly is bad.

Things to do:

1. If you hear clicking sounds for cables that test as good, but no sounds for cables that test as bad, the Error Tones option is set to OFF. See page 17 for instructions on how to change the option setting.

2. Connect the speaker wire to the microprocessor assembly.

3. If the speaker wire is connected, but the sounds still do not work, call Cirris to replace the microprocessor assembly.

Problem: The sounds the analyzer makes disturb others.

Things to do:

- Set the Error Tones option to OFF or LOW.
- Place tape over the speaker opening in the metal case to dampen the sounds.
- Disconnect the speaker from the microprocessor.

Problem: Analyzer will not learn a cable.

Possible Causes:

- Lock On Learn is set to ON

Things to do:

1. You cannot learn a cable's wirelist when the Lock On Learn option is set to ON. Change the setting to OFF. See page 17 for instructions on how to do this.

Problems with Printing

Printer failures usually take place because of one of four things:

1. User error.

2. A bad printer.

3. A bad cable.

4. A bad microprocessor assembly.

These guidelies will help you solve printing problems:

Problem: Nothing prints.

Possible Causes:

- Printer is not on-line (selected).
- Cable between analyzer and printer is not connected properly.
- The printer has a serial instead of a parallel interface.
- A bad cable.
- A bad printer.
- A bad microprocessor assembly.

Things to do:

1. Make sure the printer is turned on, on-line (selected), and not out of paper.

2. Check the cable connections at the analyzer and the printer. The cable should be securely connected to the back of the analyzer where it is marked Printer-Parallel Interface. Check the connection at the printer end too.

3. Your printer must have a parallel cable interface. Do **not** use a printer with an RS-232 serial interface. You will damage the analyzer.

4. The cable running from the analyzer to the printer may be bad. Try another cable to see if it works.

5. The printer may be bad. Try using another printer, or test your original printer and cable with a standard computer. If the printer does not work with the PC, it is probably bad.

6. If the cable and printer work with a PC, the microprocessor assembly inside the analyzer is probably bad. Call Cirris to replace it.

Problem: Characters missing in printout.

Possible Causes:

- Bad printer cable.
- Printer cable is too long.
- Printer is incompatible with the analyzer.
- Microprocessor assembly inside the analyzer is bad.

Things to do:

1. Verify that the printer cable is correctly built. Check for shorts in pin 11.

2. If the printer cable is more than 10 feet long, you may have printing problems. The electrical signals from the printer become too weak to work well as the cable gets longer. Use a shorter printer cable.

3. Try using the printer cable with a PC. If it works, the printer probably is not compatible with the analyzer.

4. If the cable and printer work with a PC, the analyzer's microprocessor assembly is probably bad. Call Cirris to replace it.

Problem: Wrong characters in printout.

Possible Causes:

- Bad printer cable.
- Bad printer.
- Printer cable too long.
- Microprocessor assembly inside the analyzer is bad.

Things to do:

1. The printer cable may be bad. Check for shorts, opens, or miswires on pins 2 through 9. Either fix the cable, or replace it with a good cable.

2. The printer may be bad. Try using another printer with the analyzer, or test your original printer cable and printer with a PC. If the printer does not work with a PC, the printer is bad. Replace the printer. If the printer and cable do work with a PC, the analyzer's microprocessor assembly is probably bad.

3. The printer cable may be too long. Your printer cable should not be longer than 10 feet. The printer signals get too weak to work properly if the cable is longer than 10 feet.

4. If you have another Cirris 2000 analyzer available, it is possible to exchange microprocessor assemblies. If using a different microprocessor assembly solves the problem, the original microprocessor is bad. Call Cirris to replace it.

Section 12: Specifications

Test Point Capacity	256 ponts (eight 28-pin or four 64-pin connectors).
Controls	Learn Then Test Advance Display Store Access Stored Cables
Display	2-line x 16-character backlit LCD.
Maximum Cable Length	500 feet (typical) 152.4 m
Memory	Nonvolatile memory for storage of 50 wirelists. 8-year lithium battery backup.
Maximum Points per Net	64 maximum.
Power	105-135 VAC, 60 Hz., 10 Watts
Printer Output	Compatible with Epson/Centronics-type parallel printer. Pinout matches IBM PC parallel port.
Probe	For test point identification.
Sensitivity	Shorts detected- resistance <1Kohm Opens detected- >1.5Kohm
Signature	6-digit hexadecimal.
Size	19” w X 7” d X 2” h (53 cm. wide X 18 cm. deep X 5 cm. high)
Test Levels	5 volts @ 1mA.
Test Points	256 max.
Test Rate	256 points in 0.3 seconds.
Weight	7 lbs. (3.4 kg.)
Warranty	1 year parts and labor. Replacement modules available next working day.

Section 13: Glossary

continuity An electrical connection between two points.

connector adapters position One of the analyzer's eight locations (J1 through J8) where you mount connector adapters.

control The regulation of manufacturing or assembly processes; particularly the use of a cable signature for verifying the test setup against the master documentation.

documentation The written definition of how a cable should be constructed.

interconnection Continuity between two connector pins, usually by a wire connecting them.

last learned The last wirelist programmed into the analyzer either from memory, or from learning a Sample Cable.

learning The self-programming process of the analyzer where interconnections are sensed from a Sample Cable. This data (in list form) is stored in the analyzer's memory as long as the analyzer is turned on.

memory location The Signature 2000 has 50 memory locations for storing wirelists.

microprocessor assembly The controlling electronics (including the LCD display) located on the left-hand side of the analyzer's chassis box.

miswire A type of interconnection error where a pin is connected to the wrong pin.

net Any group of pins connected together. The analyzer assigns a number to each group of connected pins (referred to as a **net**). This number appears on the left side of the documentation, and on the LCD display.

open An error where there is no continuity between two connector pins that should be connected together according to your master build list for the cable.

pin An electrical contact point within a connector. In this manual, "pin" is used in place of "point," "contact," "socket," "termination," etc.

Sample Cable The first cable used by the analyzer to load the list of interconnections into its memory. This is a cable that you know is correctly built. It is the cable against which the cables you test will be compared. Cables which don't match this cable will register a signature mismatch in the analyzer.

scanner assembly The switching system that performs continuity tests between all connector pins in all possible combinations.

setup The operations involved to prepare the analyzer to test cables as defined in their documentation.

short A type of interconnection error where there is continuity between two connector pins that has not been shown in the master documentation for the cable.

signature A six-digit code that changes when any change in interconnections exists. Valid characters include the numbers 0 through 9, and the letters A through F.

test setup The preparatory work you do with the analyzer before you can begin testing cables.

testing The process whereby cables are tested to be sure they're wired correctly as shown in the master build list.

standard connector adapters Connector adapters are organized in a 3 x 5" card file. When they are organized in this way, you can identify an adapter by the label on its cardboard carrying sleeve. Adapters are identified by the connector they mate to, not by the connector mounted on the adapter.

Section 14: Statement of Warranty

Cirris Systems Corporation warrants the Signature 2000 Cable Analyzer to be free of defects in materials and workmanship for a period of one (1) year from the date of delivery to you, as evidenced by receipt of your warranty registration form. In the event a defect develops due to normal use during the warranty period, Cirris Systems will repair or replace the analyzer with a new or reconditioned unit of equal value. For this warranty to be valid you must complete and return the warranty registration card.

In the event of replacement with a new or reconditioned model, the replacement unit will continue the warranty period of the original analyzer. Replacement units will be returned by the same method shipped; generally within one (1) working day.

If analyzer failure results from accident, abuse, or misapplication, Cirris Systems Corporation shall have no responsibility to replace the analyzer or refund the purchase price. Defects arising from such causes will be considered a breach of this warranty. Cirris Systems Corporation is not responsible for special, incidental, or consequential damages resulting from any breach of warranty, or under any other legal theory, including lost profits, downtime, goodwill, damage to or replacement of equipment and property, and any costs of recovering materials used with the Cirris Signature 2000 Analyzer.

ANY IMPLIED WARRANTIES ARISING OUT OF SALES OF THE Signature 2000 ANALYZER, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED IN DURATION TO THE ABOVE STATED ONE (1) YEAR PERIOD. Cirris Systems SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGE, EXPENSES, OR ECONOMIC LOSS.

Some states do not allow limitations on length, or implied warranty, or the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

Cirris Systems Corporation
Salt Lake City, Utah.

PLEASE RECORD PURCHASE DATE AND SERIAL NUMBER BELOW.

DATE:_____
SERIAL NUMBER: _____

Section 15: Blank Forms to Photocopy

What are these for?

We have designed three forms that we believe will help you document the cables you test. They are:

- **Master Parts List:** This form will help you keep track of cables by their part numbers and cable signatures.
- **Directory of Wirelists Stored in Analyzer's Memory:** This form allows you to easily write down which cable's information is stored in each of the analyzer's permanent memory locations. Remember that there are a maximum of 50 memory positions available.
- **Cable Documentation Form:** This form lets you keep track of signatures, option settings, and net lists for each cable you test.

PHOTOCOPY THESE!

You should photocopy these forms instead of writing directly on them. That way you'll have a fresh supply of blank forms whenever you need them.

Directory of Wirelists Stored in Analyzer's Memory

Memory Location	Cable Description	Signature
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
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46		
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48		
49		
50		

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Master Parts List

Cable Part Number	Description	Signature

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Cable Documentation Form

Memory Location #:_____ Cirris Analyzer Model:_____

Cable Signature:_____ **Parameter Signature**:_____
(first six characters) (last five characters)

Cable Description:_____
_____

Adapter Signatures for:
Main unit

J1_____ J5_____
J2_____ J6_____
J3_____ J7_____
J4_____ J8_____

Notes:

Note: All of these options may not appear in your particular type of analyzer.

Error Tones _____
Lock On Learn _____
Long Test Delay _____
Ignore Unused _____
Sorted Wirelist _____
Count All Cables _____
Auto Print _____

Net Number	Common Interconnections
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

List continues on back

Net Number	Common Interconnections
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	
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Use additional page if necessary

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