

Blue Boxes are  
HOT LINKS!  
Click to jump.

# CableEye® APPLICATIONS GUIDE

## *A Step-by-Step Introduction*

This booklet provides a self-guided introduction to CableEye®. Use it to learn how the software works and how to connect CableEye to your computer. In general, we devote one page to each major function. For greater depth, please refer to the *CableEye User's Guide*. This booklet also serves as an excellent training tool for new employees, or as a preview of capabilities that you may not have used previously. To gain the greatest benefit, have the CableEye tester, a set of connector boards, and a test cable available to you while you are reading so you can immediately try the operations we discuss.

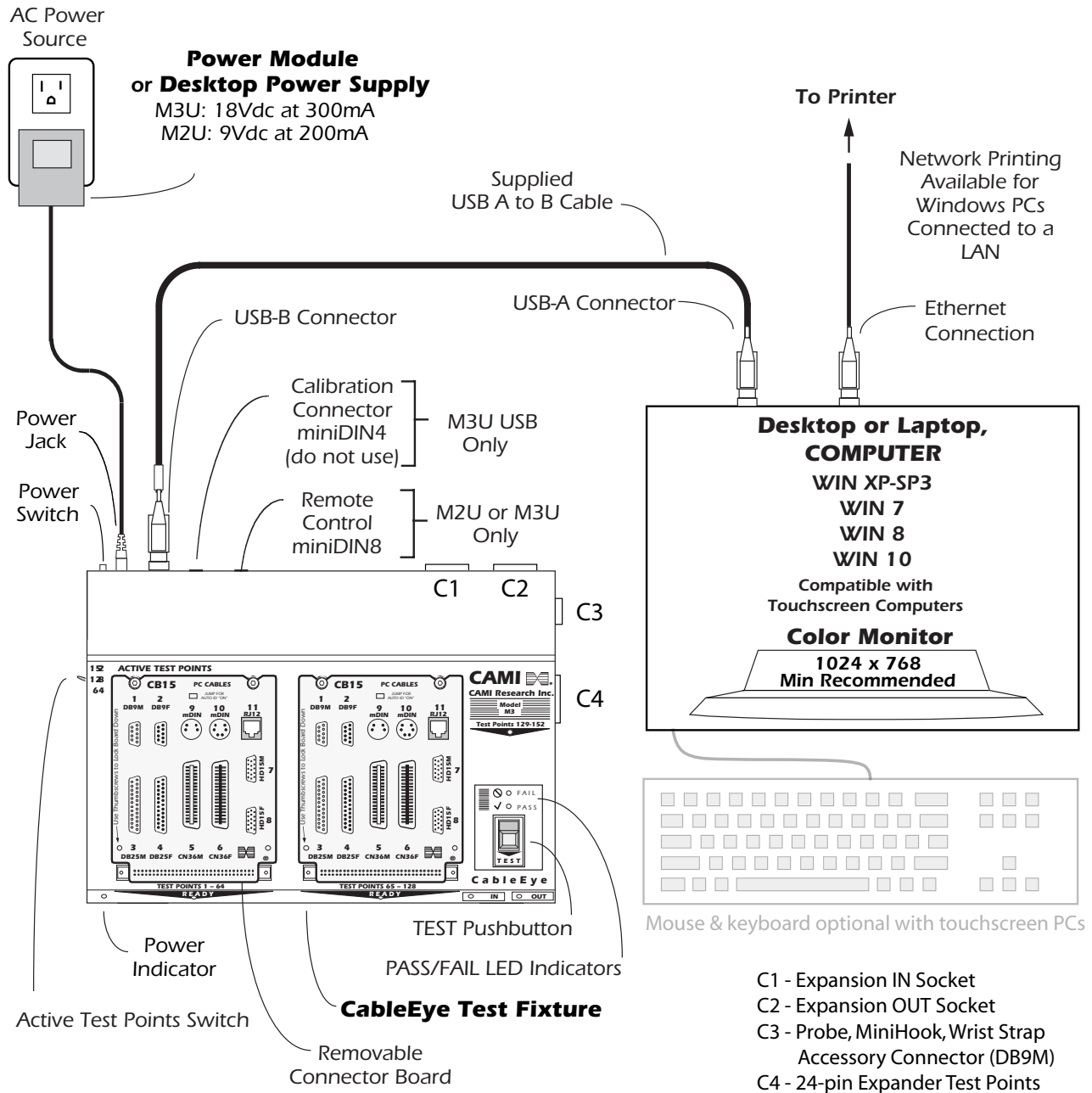
<b>Connecting CableEye to Your Computer .....</b>	<b>2</b>
<b>Using Connector Boards.....</b>	<b>3</b>
<b>Connector Boards Available.....</b>	<b>4</b>
<b>Measuring a Cable .....</b>	<b>5</b>
<b>Learning a Good Cable.....</b>	<b>6</b>
<b>Comparing Two Cables.....</b>	<b>7</b>
<b>Checking for Intermittent Connections .....</b>	<b>8</b>
<b>Saving Cable Data in the Database.....</b>	<b>9</b>
<b>Loading Cable Data from the Database .....</b>	<b>10</b>
<b>Searching the Database for a Match .....</b>	<b>11</b>
<b>Printing Schematics.....</b>	<b>12</b>
<b>Printing Labels .....</b>	<b>13</b>
<b>Batch Testing of Cables .....</b>	<b>14</b>
<b>Data Logging.....</b>	<b>15</b>
<b>Editing a Wire List.....</b>	<b>16</b>
<b>Designing New Cables .....</b>	<b>17</b>
<b>Adapting to Custom Test Fixtures .....</b>	<b>18</b>
<b>Testing Single-Ended Cables .....</b>	<b>19</b>
<b>Testing Wiring Harnesses .....</b>	<b>20</b>
<b>Testing Unterminated Cables.....</b>	<b>23</b>



[www.camiresearch.com](http://www.camiresearch.com)  
**(800) 776-0414** 

# Connecting CableEye to Your Computer

*NOTE:* Several CableEye models are available, all using the same software and following the same operating principles. The drawing below illustrates Model M3U (Item 821U). CableEye software operates on the current Microsoft Windows™ platform and is backwards compatible. At the time of printing, CableEye software is at version 5 which is compatible with WINXP-SP3, WIN7, WIN8, & WIN10. Versions of CableEye software 5-B1188 or later are compatible with touchscreen computers. CableEye software updates are included with warranty renewals, or are available for purchase separately.

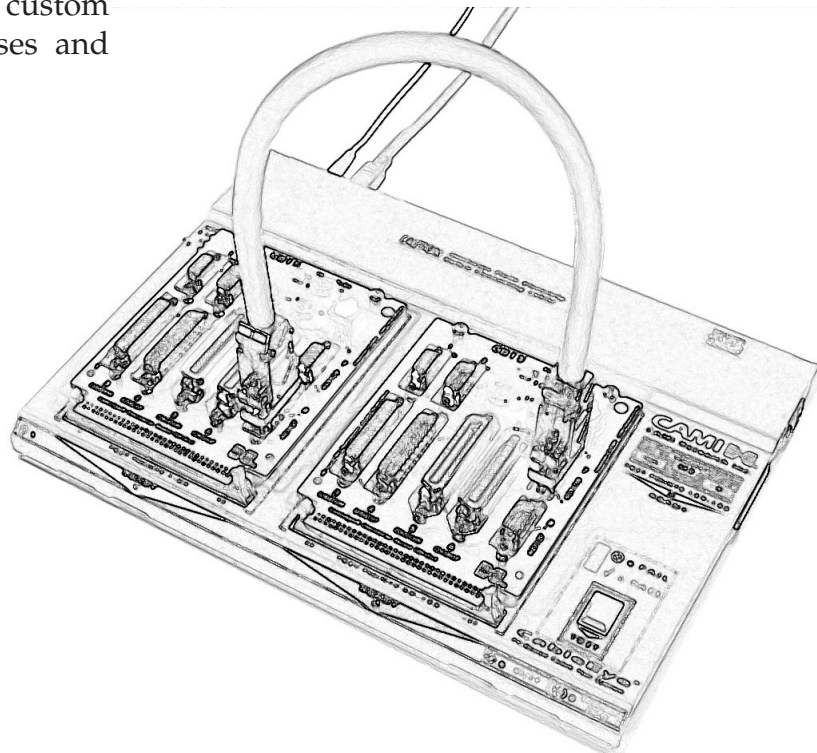
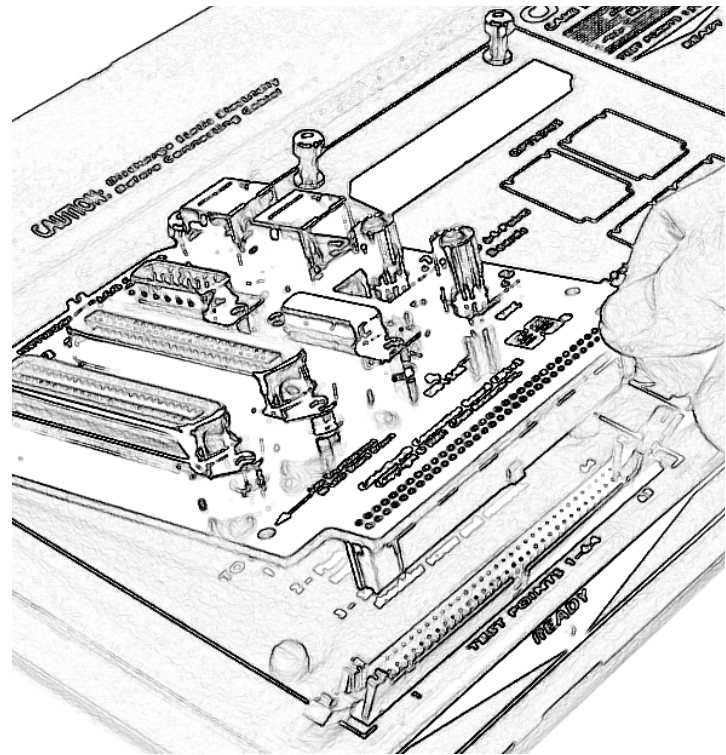


## Using Connector Boards

Instantly attach connector boards to the top of the tester by sliding the slots along the top of the board into the alignment posts, and pressing the front of the board down. To release a board, pull the latches apart until the board pops out.

Mix and match boards as needed to accommodate the connectors on your cables. The software instantly and automatically recognizes the boards you attach using the Jumper ID block on each board.

You may attach a cable between any connector on one board and any connector on another board. To mount more than two boards, use a side-by-side expansion module, or attach our QuickMount housing, Item 712, to a built-in expansion module. See p.20 for a description of how to build a custom interface for wire harnesses and multi-headed cables.



# Connector Boards Available

Connector Type	Board	Item
CN50, DB15, RJ45, BNC - Network, Telecom	CB1	731
Dual-Row Headers (60, 50, 40, 34, 26 pin) – IDC Flat Cable	CB2	732
Dual-Row Headers (24, 20, 16, 14, 10 pin) – IDC Flat Cable	CB2A	732A
DB37, DB50 – Control , Communications	CB3	733
v.35, DB25 – Network, Telecom	CB4	734
CN50, MD50, MC50, MD68 – SCSI	CB5	735
DB15HD, DB26HD, DB44HD – Data Communications, Control	CB6	736
DB62HD, DB78HD – Data Communications, Control, Automation Systems	CB7	737
Circular connectors – CPC, Military Cir, Custom Interfaces, Prototyping, 62-Pin Max	CB8	738
Molex pin strip, Mate-n-Lock – Power Distribution, Motors, Control	CB9	739
VME and Europadon 64- and 96-pin – High Density Flat Cable, Backplane	CB10	740
Dual-Row Headers (0.05" pin spacing, up to 80 pins) – High-Density IDC Flat Cables	CB12	742
Single- and Dual-Row Headers (2mm) – European-style connectors	CB13	743
Molex 60-pin LFH, MD26 – Network Applications	CB14	744
DB25, DB9, DB15HD, CN36, RJ12, miniDIN 4, 6, 8 – Computer Cables	CB15	745
13W3, 5W5,, 3W3, BNC – Professional Video, Workstations	CB16	746
CN14, CN24, CN64 – Telecom Applications	CB17	747
RJ45 Octopus (eight connectors) – Telecom Applications	CB18	748
RJ45 Octopus Shielded (eight connectors) – Telecom Applications (M2 or M3 only)	CB18A	748A
XLR, Speakon, Phone Plug, Phono Plug, MiniStereo, DIN5 – Audio Applications	CB19	749
MC68, MC80, MC100 miniCentronics – SCSI, Custom Applications	CB20	750
MD68, MD80, MD100 miniD – SCSI, Custom Applications	CB21	751
USBA, USBB, IEEE1394-4, IEEE1394-6 (Firewire), DVI-I, DVI-D – Computers	CB22	752
MC26, MC36, MC50, MC68 miniCentronics – Network, SCSI, Custom	CB23	753
Dual-Row Headers (0.05"pin spacing, up to 100 pins) – High-Density IDC Flat Cables	CB24	754
Transient Suppressor Board (protects against static discharge from long cables)	CB25	755
SmartSerial, VHDCI, RJModular, USBminiB, Serial ATA, HDMI, Infiniband	CB26	756
Bare Wire Interface using PushPin Connectors	CB27	757
AMP Mate-n-Lok Connectors – Power Distribution, Motors, Control	CB28	758
Screw Terminal Interface Board for Custom Interfaces and Bare Wires	CB29	759
Harness Board Interface (Stackable)	CB29A	759A
Circular connectors – CPC, Military Cir, Custom Interfaces, Prototyping, 128-Pin Max	CB30	760
Mictor Connectors – Complex Test Probes	CB30A	760A
Metral Connectors – 96-pin 2mm Grid	CB31	761
DB104 Connectors – Military Electronics	CB32	762
Molex MiniFit, MicroFit– Power Distribution, Motors, Control	CB33	763
Elco/Edac 20-, 38-, and 56-Pin Rack and Panel Connectors	CB40	770
Micro D Connectors 21-, 25-, 31-, and 37-Pin	} *Select the 'A' suffix for nano D {	CB41(A)* 771(A)*
Micro D Connectors 9-, 15-, 51-Pin		CB42(A)* 772(A)*
Micro D Connectors 9-, 15-, 21-, 25-, 31-, and 37-Pin		CB43(A)* 773(A)*
Micro D Connectors 51-, 100-Pin		CB44 774
1 mm and 0.5 mm Surface-Mount Connectors	CB45	775
Micro D Connectors 100-Pin, Airborn Style	CB46	776
DB62HD Connectors, HV Rated to 1000 Vdc	CB47	777
Header Isolator, Vertical (M3U or HVX) or Horizontal (HVX Only)	CB48	778
Training Board to Simulate Opens, Shorts, Miswires, Resistance, Diodes	CB-T1	800

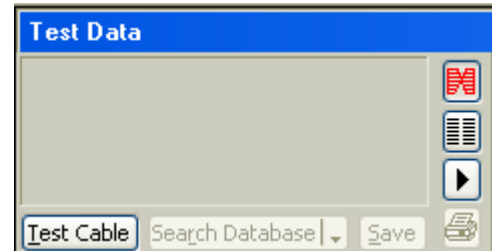
We constantly develop new boards. Call us if you need something not on this list to see if it has been recently introduced, or to make a request.

Note that using the PinMap program (Item 708), you can adapt CableEye to custom fixtures you may already have. Our complete connector library may then be linked to your existing fixtures or new ones you may build for special applications. You may also connect directly to the industry-standard 64-pin dual-row headers on the front of CableEye to link to a custom fixture, bypassing the connector boards completely. If you wish to develop your own boards for CableEye, we will gladly provide you with board routing dimensions and pinouts; contact us for this information.

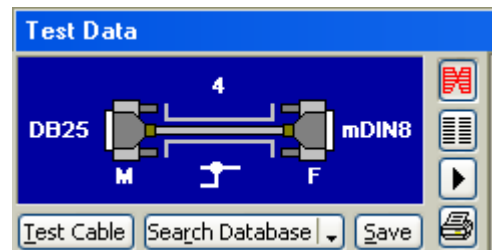
# Measuring a Cable

**1** – Attach a cable of choice between the left CB board and the right CB board. Use only one connector on each board. You may mix and match CB boards in any manner to obtain the right combination of connectors for your cable.

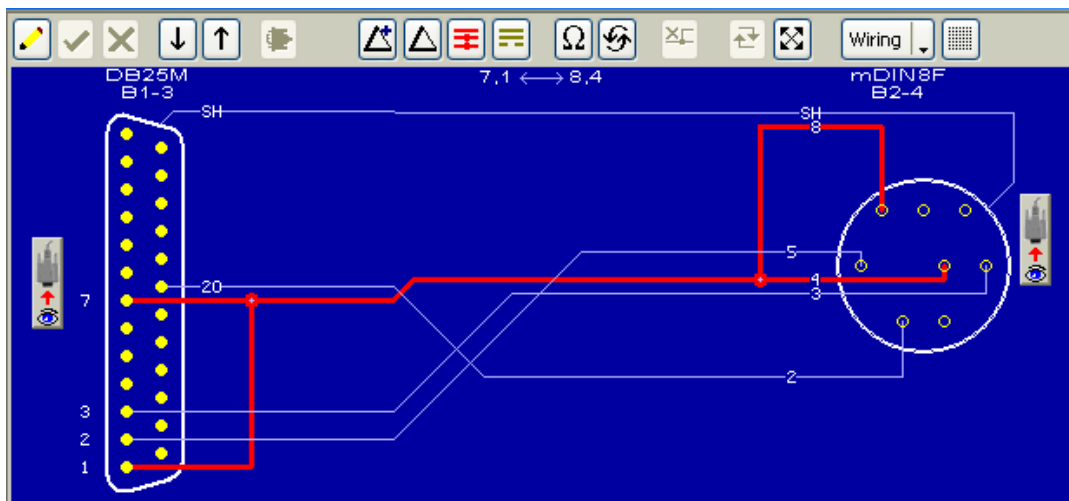
**2** – Click *Test Cable* in the Test Data summary box, or press the TEST pushbutton on the tester, to make a measurement. Most cables are measured in less than one second.



**3** – When the measurement finishes, a simplified diagram appears in the summary box giving characteristics of the cable. In this case, we have a DB25 male connector on the left, a miniDIN8 male connector on the right, a shield is present, four wires connect the left side of the cable to the right, and internal jumpers connect two or more pins together on the same side of the cable.



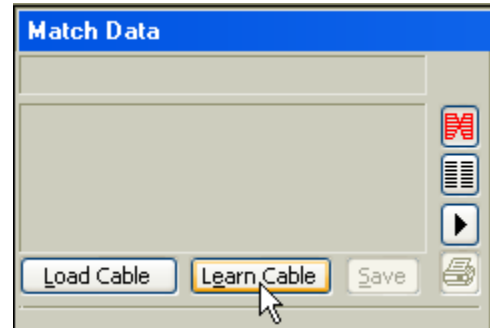
**4** – To examine the wiring of the cable in detail, click the "View Wiring" button (looks like a bow tie). You will see the complete schematic of the cable along with connector and pin information. Use the  $\uparrow$  and  $\downarrow$  keys to highlight a specific wire in the cable as shown below. This is helpful when reviewing the wiring of complex cables.



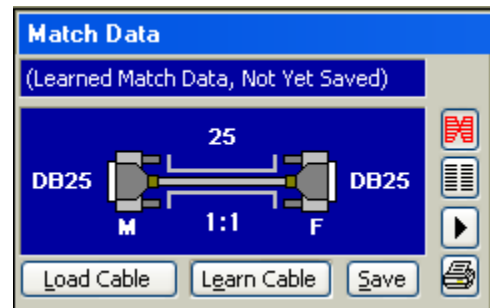
# Learning a Good Cable

You may learn a cable that you know is good and use it as a model. The program stores wiring data from a learned cable in the *Match Data Buffer*. Wiring data from a cable under test is stored in the *Test Data Buffer*. By comparing Match and Test data, the program finds differences between cables.

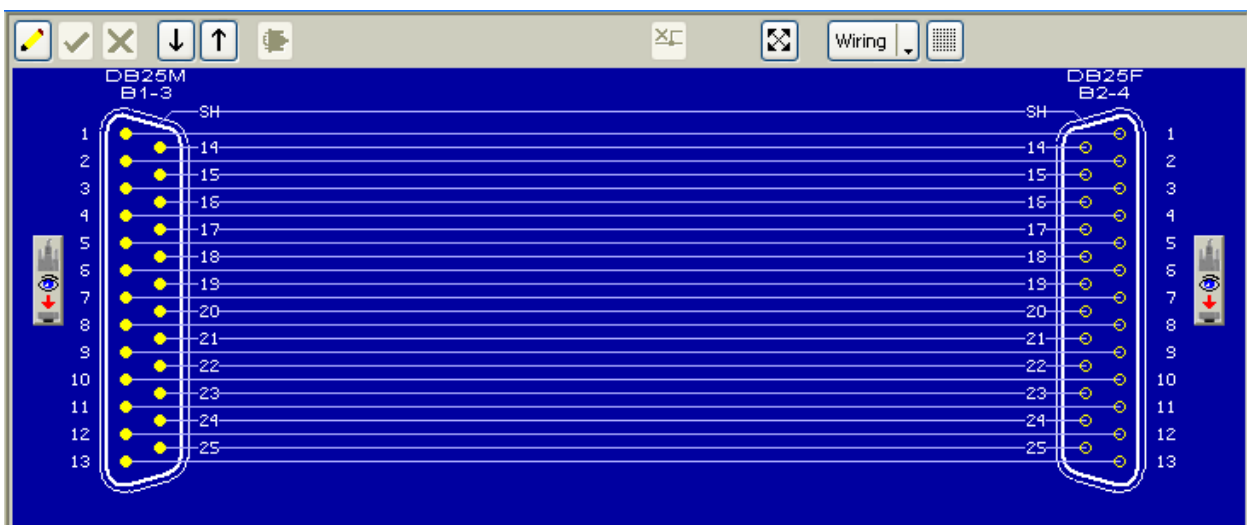
**1** – Click *Learn Cable* in the Match Data summary box located in the lower half of the screen.



**2** – When the measurement is complete, cable data moves into the Match Data Buffer, and a simplified diagram appears in the Match Data summary box. Try to identify this example cable using just the information in the summary box shown here.



**3** – As before, you may view the actual cable wiring by clicking the *View Wiring* button (see below). Use the ↑ and ↓ keys to highlight a specific wire in the cable.

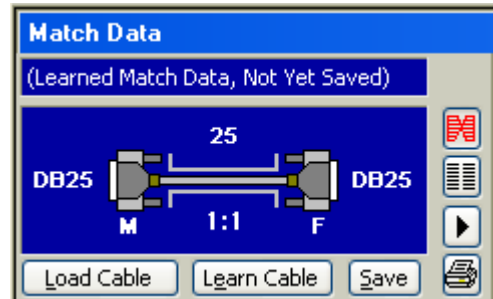
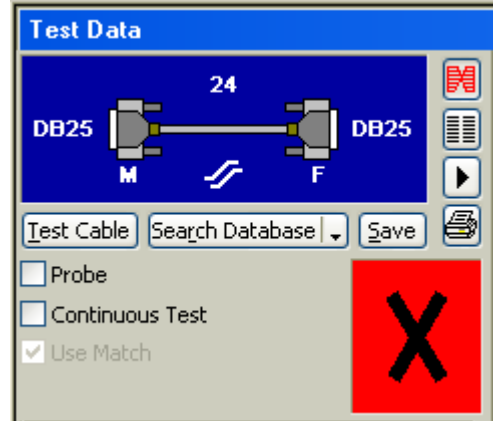


# Comparing Two Cables

After you have learned a good cable and measured a test cable, summaries of both will appear.

**1** – If there are no differences, you will see a green checkmark just below the *Save* button in the Test Data summary box. In the example shown here, however, the cables don't match and a red "X" appears instead.

What can you tell about the differences between these two cable using just the information in the summary boxes?



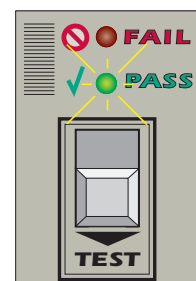
**2** – Change the Test Data wiring display to a *netlist display* by clicking on the *Display Netlist* button.

**3** – Once the netlist is visible, click on the *triangle* button "Δ" (Greek letter *Delta*) to see a detailed list of all wiring differences (shown below). In the +/- column, a "+" indicates an extra connection (a short), while a "-" indicates a missing connection (an open). In this case, we see also a miswire between pin 7 on the left and pin 15 on the right, and that the shield is missing.



Line	+/-	DB25 Male B1-3	DB25 Female B2-4	Value	Description
1	-	SH	SH		
2	-	7	7		
3	+	7	15		
4	-	15	15		

**4** – For batch testing of cables, you may *automate* this entire process by using a *Macro* (described later on page 14). In that case, you would press the TEST pushbutton on the CableEye tester and read the PASS/FAIL result on LED lamps.



# Checking for Intermittent Connections

Bad crimps and broken wires, among other things, may cause *intermittent connections*. CableEye tests for this with the *Continuous Test* function. Test signals are passed through the cable continuously while you flex the cable and connectors. Changes in resistance cause a warning tone to sound and a wiring diagram to appear with intermittent connections highlighted.

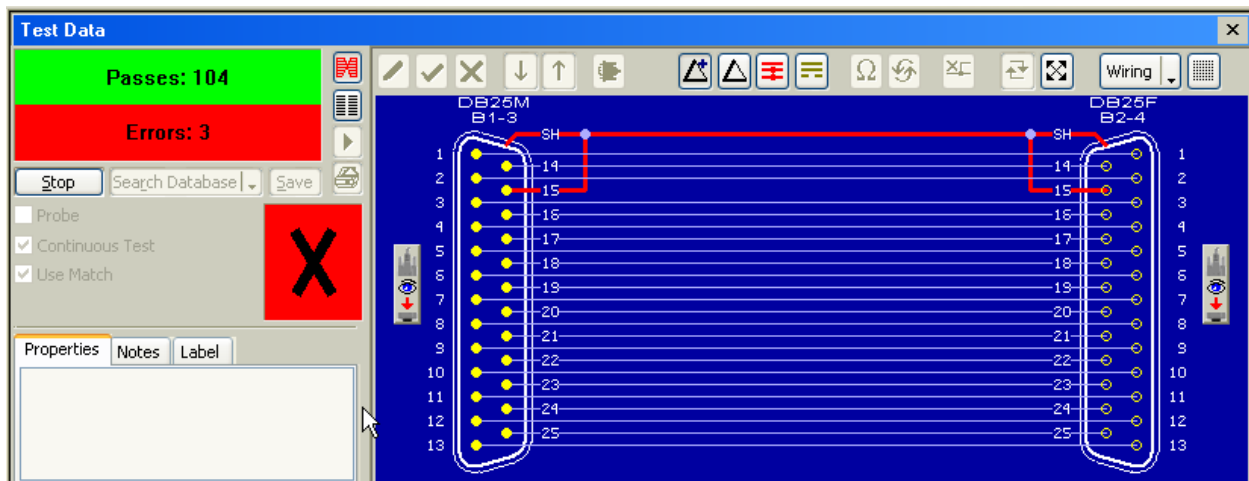
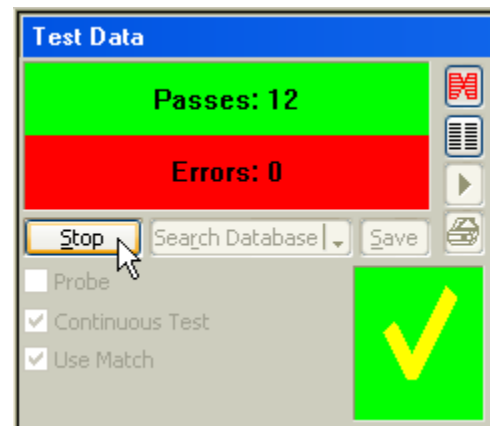
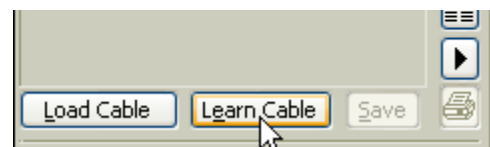
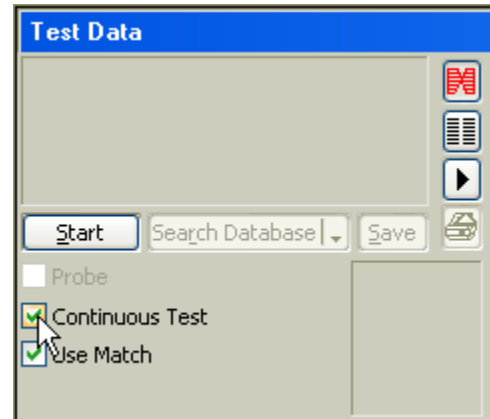
**1** – Check the *Continuous Test* checkbox just below the Test Cable button. The name of this button changes to *Start* and the system is now set for Continuous Test mode.

Checking the *Use Match* checkbox ensures that we compare data acquired during the continuous testing to Match Data. If this box were unchecked, Match Data would not be necessary, and the program would use the first scan of the test cable as a baseline, comparing successive scans to it.

**2** – With the test cable attached, click *Learn Cable* to acquire Match Data. Once Match Data has been loaded, click *Start* to begin testing.

**3** – As the test runs, you see the test results in the Test Data Summary box. A large green checkmark indicates that no intermittent connections have been found.

**4** – Flex the cable and connectors to locate intermittent connections. If any are found, a tone will sound, the error count will increment, and you will see a display with the intermittent connections highlighted (see below). In this case, we see an intermittent short between pin 15 and the shield.



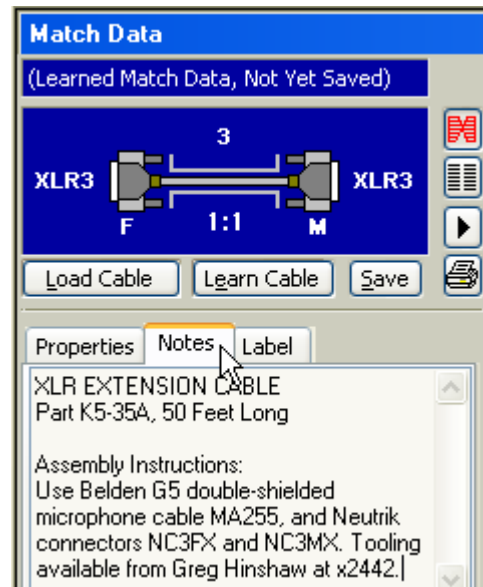


# Saving Cable Data in the Database

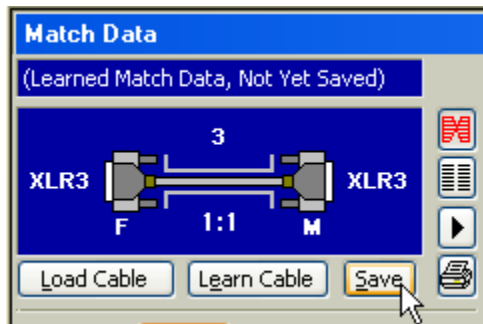
After measuring a good cable, you may wish to annotate it with descriptive notes and save it in the database using a name or part number of your choice. Later, you may reload the cable, or search the database for a match to the cable's wiring.

1 – Click *Learn Cable* to acquire new cable data, and then click on the *Notes* tab to open the Notes editor. Type in descriptive notes, part numbers, names, dates, color codes, or any other information you deem important. You may also copy notes from another cable to the clipboard and paste them here using standard Windows methods, and then edit the notes as necessary. The first line of these notes appears in the title block of printed reports, so you should choose this first line thoughtfully.

If desired, click the *Label* tab and enter any notes that you wish to appear on a printed label.

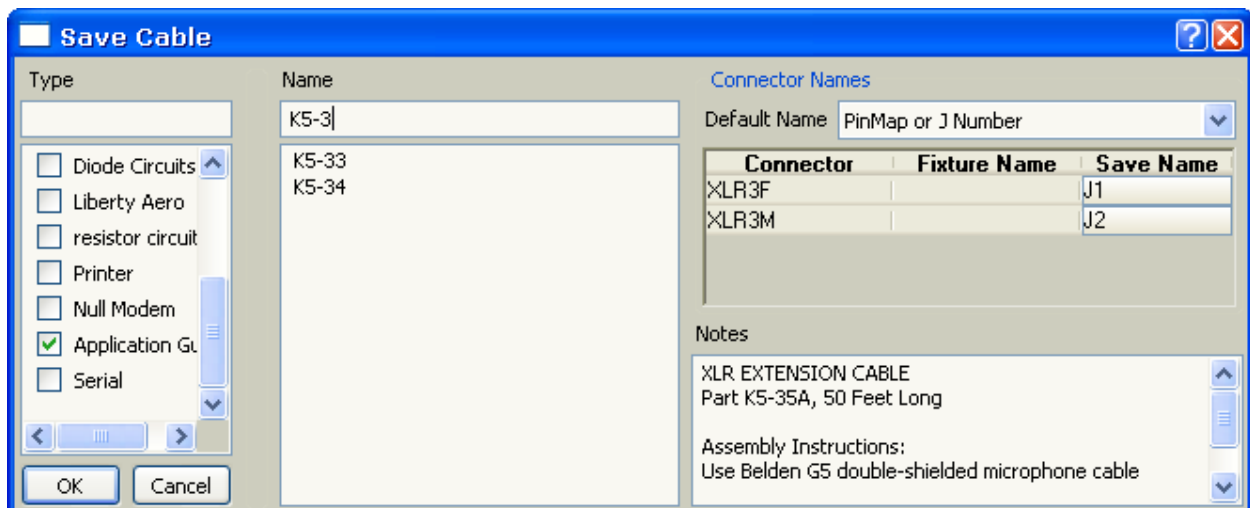


2 – Click the *Save* button when you are ready to save the cable and notes in the database, and the *Save Cable* dialog box will appear (below).



3 – Use as many characters as you need to name the cable. You may use spaces, dashes, and other special symbols in the name. As you type the name, the file list below it shows all other cable files that begin with the characters you have typed thus far.

Continue typing until no other files appear, indicating that you have selected a unique name. You may also check a *Type*, or define a new type, to assign this cable to a special group which may help find the cable when you load it later. Click *OK* to save the cable.

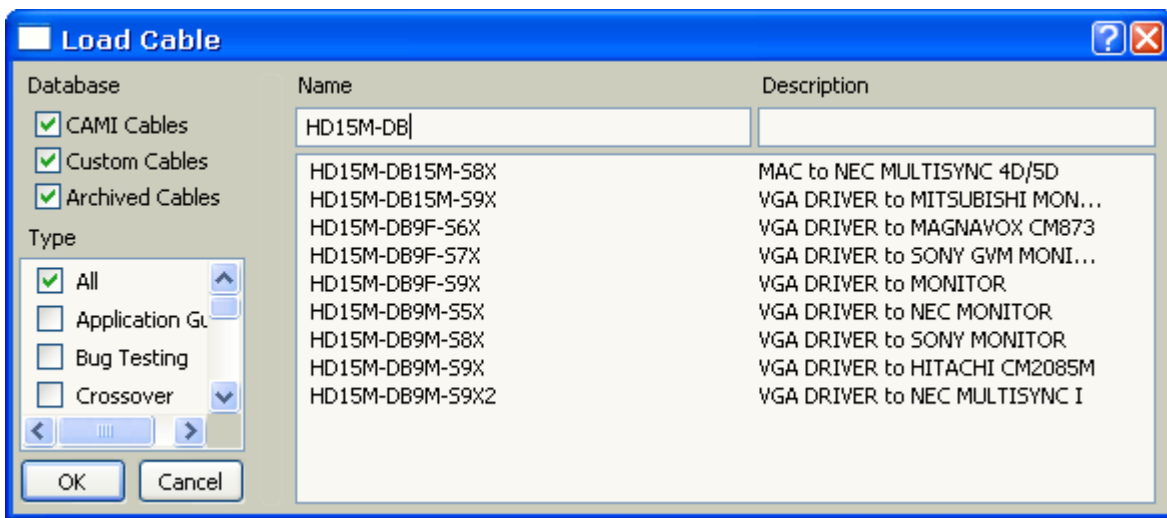
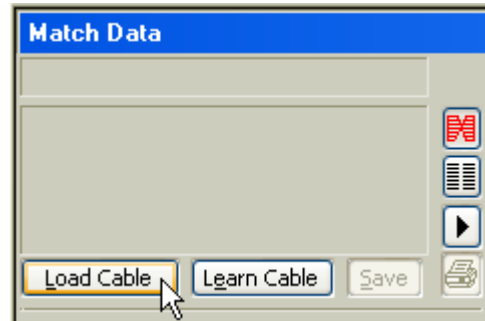




# Loading Cable Data from the Database

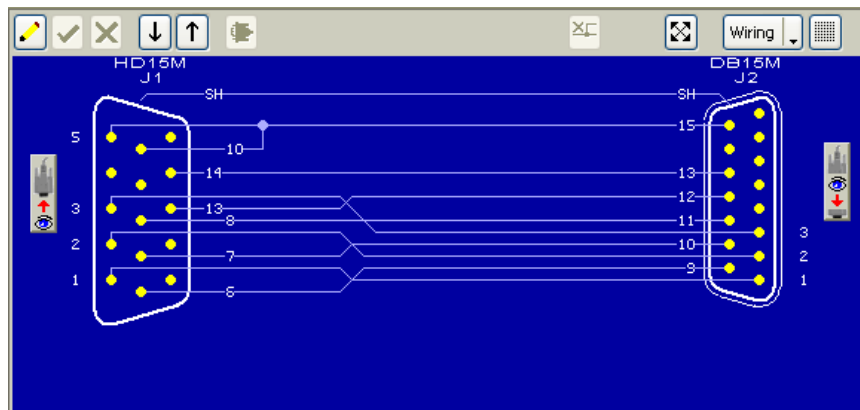
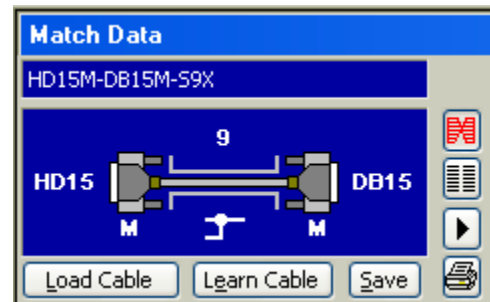
You may wish to recall previously saved cable data to read the descriptive notes, view its wiring, print a label, or compare the wiring to a test cable.

**1** – Click *Load Cable*.

**2** – Select the cable by its Name or its Description by typing into the appropriate entry box. As you type, the file list below the entry box gives all files that begin with the characters you have typed. At any time, you may scroll into this list with the ↓ key to choose a file, or click directly on a cable of interest. Click *OK* to load the cable, or *Cancel* to dismiss this window.



**3** – The Match Data summary box describes the cable just loaded. Note that the cable's database name appears at the top. Click the View Wiring button  to see the cable's schematic (below), or the netlist button  to see a wire list.

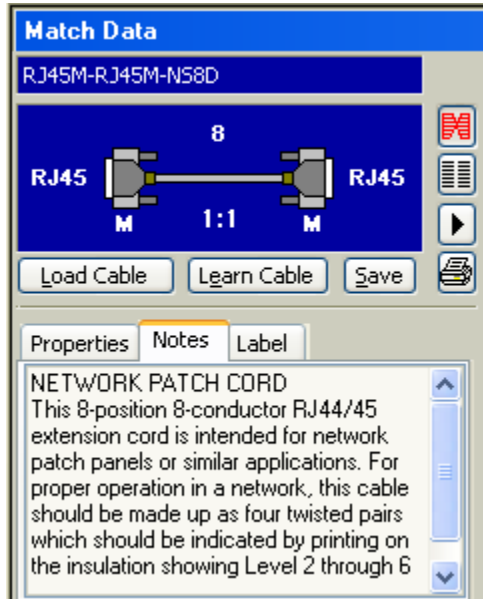
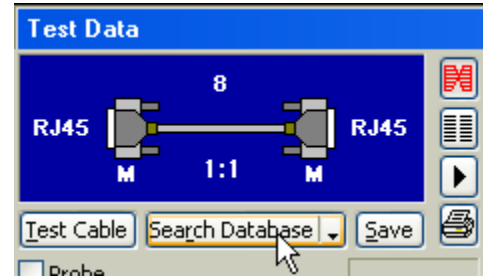


# Searching the Database for a Match

Unlabeled or unknown cables with complex internal wiring may cause damage if connected to inappropriate equipment, or may go unused or be discarded. To avoid problems like these, you may measure an unknown cable and search the database for a match to its wiring. If CableEye locates a match, it loads it and displays the descriptive notes to give you the cable's name and some information about it.

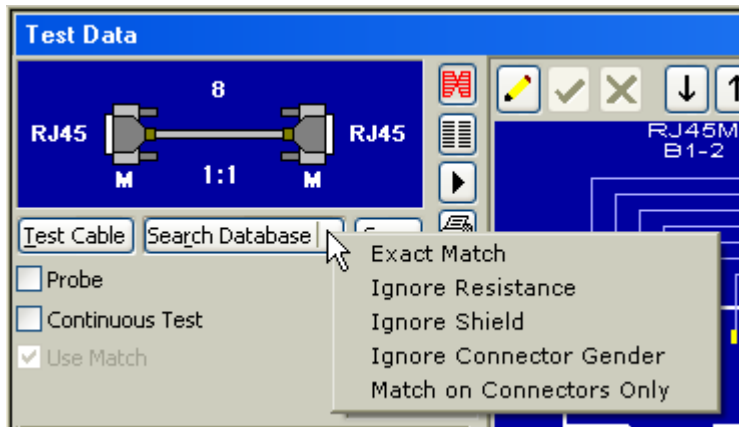
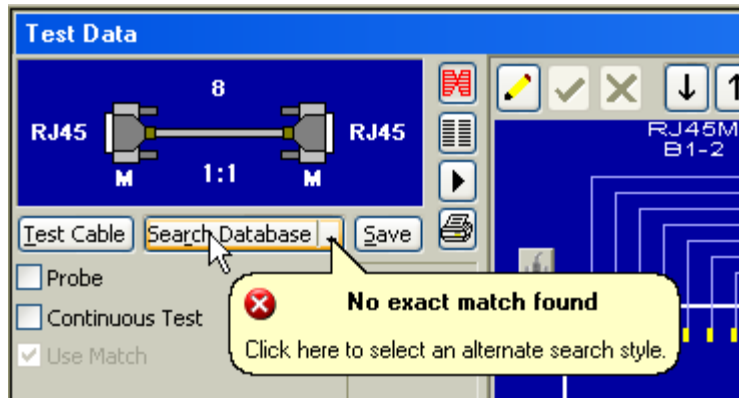
**1** – Measure a cable using *Test Cable*. Then click *Search Database* (top).

**2** – If a matching cable is found, it loads immediately for your review (right).



**3** – If an exact match is not found, a pop-up window alerts you. Click the down arrow tab to activate a pull-down menu with additional search criteria (bottom), and try again.

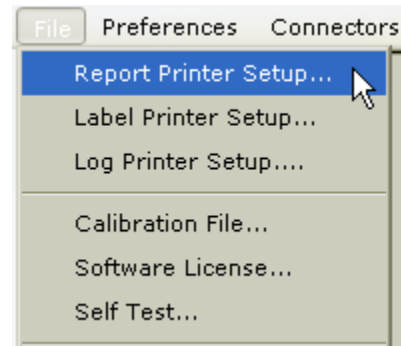
If you would like to *automatically* search the database after clicking *Test Cable*, turn on the *Auto Search after TEST* option in *Preferences/Control*. With this option on, the database will be searched silently after each test. If an exact match is found and the match buffer is empty, the new match will be loaded.



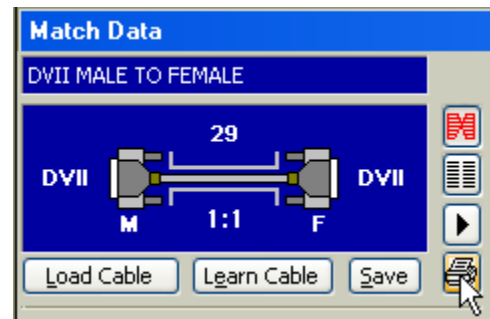
# Printing Schematics

Print complete documentation on any cable you test, or any cable in the database. Each page includes the wiring schematic with connectors and pins labeled, the wire list, and your descriptive notes and label text.

**1** – Before printing, choose the printer you wish to use under the *\File\Report Printer Setup...* menu item. Any printer for which you have a Windows driver will appear in this list and should work. You may define different printers for Reports, Labels, and Logs.



**2** – Obtain the data you wish to print by either measuring a cable (use *Test Cable*) or loading a cable from the database (use *Load Cable*). Then click the *Print* button .



**3** – Printing normally requires about 10 seconds on a laserprinter but could take longer on inkjet types. Two or more pages may be printed for long wire lists or extensive notes.

Before printing, you may change the connector orientation by clicking the *Connector View Button* next to the connector (see below). The graphic will print as shown on the screen. In this way you may depict the cable as a technician would see it while wiring with the hoods off.

View into Pins -



View into Terminations -



**CableEye Wiring Report**
**MATCH DATA**
4-8-15 11:01 AM

Name: DVIII MALE TO FEMALE
29 Wire Shielded Direct Extension

*Print your company information here. Set up in Preferences / Print Options.*

**NOTES**

DVI Integrated Direct Extension (shielded)  
Use this cable to extend DVI peripheral devices up to six feet further than the length of the built-in cable. This version of the DVI standard includes power pins.

**LABEL**

DVI EXTENSION  
Part 34D-27

NETLIST

Line	J1	J2																																																																		
1	SH	SH	2	1	1	3	2	2	4	3	3	5	4	4	6	5	5	7	6	6	8	7	7	9	8	8	10	9	9	11	10	10	12	11	11	13	12	12	14	13	13	15	14	14	16	15	15	17	16	16	18	17	17	19	18	18	20	19	19	21	20	20	22	21	21	23	22	22
1	SH	SH																																																																		
2	1	1																																																																		
3	2	2																																																																		
4	3	3																																																																		
5	4	4																																																																		
6	5	5																																																																		
7	6	6																																																																		
8	7	7																																																																		
9	8	8																																																																		
10	9	9																																																																		
11	10	10																																																																		
12	11	11																																																																		
13	12	12																																																																		
14	13	13																																																																		
15	14	14																																																																		
16	15	15																																																																		
17	16	16																																																																		
18	17	17																																																																		
19	18	18																																																																		
20	19	19																																																																		
21	20	20																																																																		
22	21	21																																																																		
23	22	22																																																																		

NETLIST (cont.)

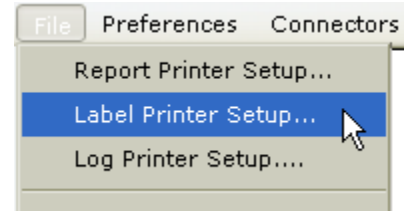
Line	J1	J2
24	23	23
25	24	24
26	C1	C1
27	C2	C2
28	C3	C3
29	C4	C4
30	C5	C5

CableEye® by CAMI Research Inc.
Conductivity Threshold: 10 Ω Isolation Threshold: 1.0 MΩ

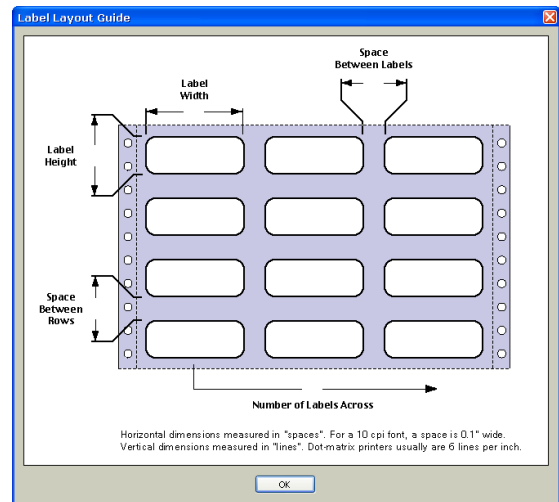
# Printing Labels

Connect a label printer to your computer, or use a laser printer with the proper label paper. Label and report printers have different setup choices and may remain active simultaneously, and employed as needed.

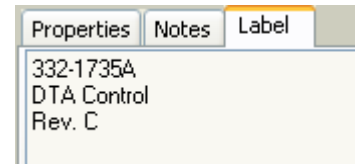
**1** – From the *File* menu, choose *Label Printer Setup...* and select the printer you wish to use for labels.



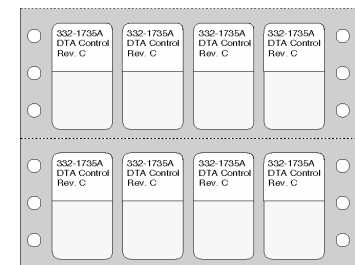
**2** – From the *Preferences* menu, choose *Labels*. Then select the label size, spacing, and number across. Click the *Layout Guide* button in the Labels panel to see what the “placement” values control; the Layout Guide appears on the right. One-wide or multi-column labels may be printed. Type in the measurements shown. All units are in “spaces” except for the number of labels across. Be sure to set your printer for a fixed-width font like Courier (each character takes the same amount of space). You will not need to set the Preferences and Label Printer settings again unless you are making a change.



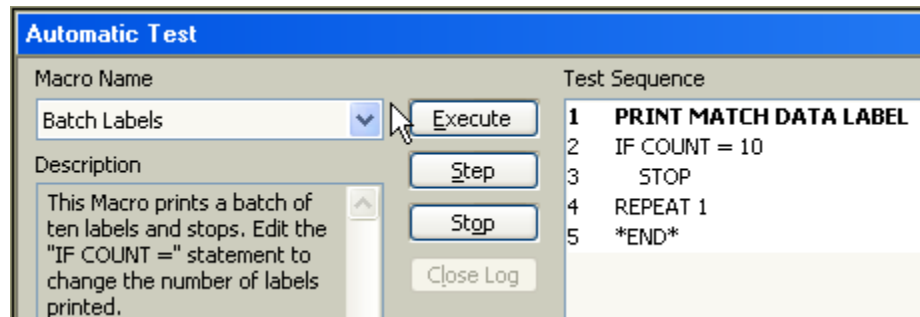
**3** – Load *Match Data* from the database in which label text has been stored, or *Learn* a cable and type in label text.



**4** – Click the *Label* button to print one label. If you are printing on a laser printer, the page will not print until a full page of labels has been transmitted. Sheet-fed printers usually have an Eject button that will print a partially full page.



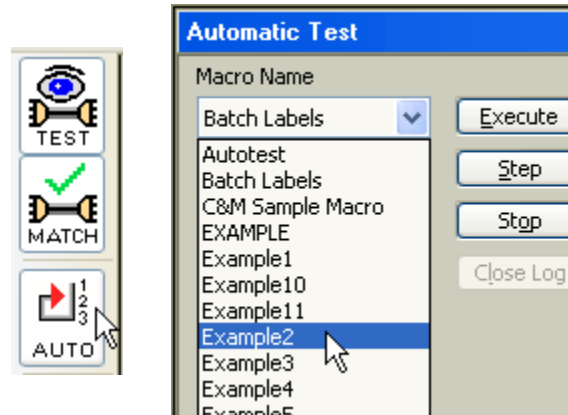
**5** – You may print labels one at a time as you test as shown above, or all at once in a large batch by making a simple Macro. This example prints ten labels, however, you can easily set the number of labels you need by changing the instruction on line 2.



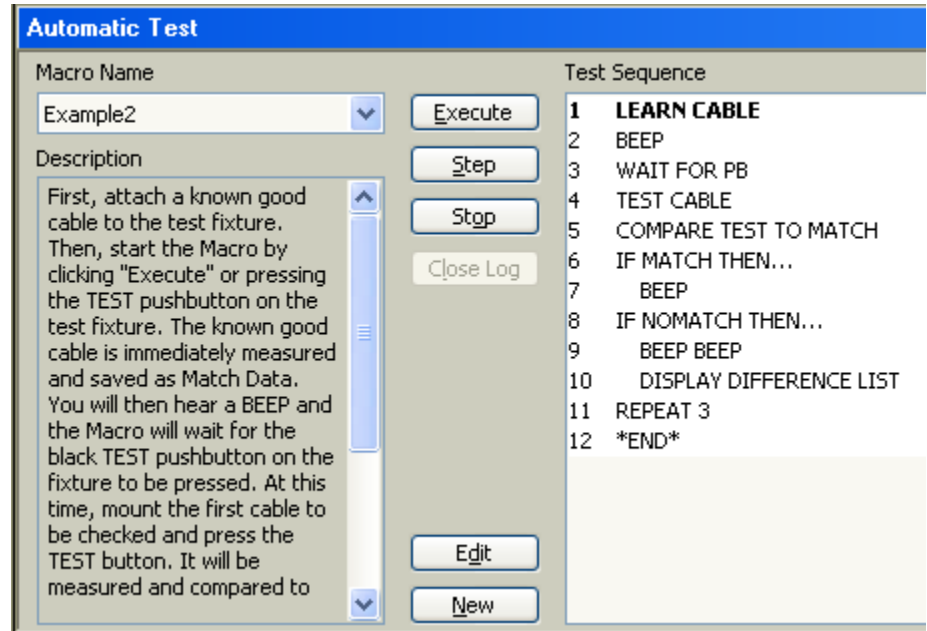
# Batch Testing of Cables

Production testing requires only that a PASS/FAIL result be obtained. You may set up CableEye so that the operator needs only to press the TEST pushbutton on the fixture and read results on nearby LED lamps. Using the mouse or keyboard, or reading the screen, becomes unnecessary. The test engineer would initially create a *Macro* (also called a *Script*) to specify a desired test procedure. Then the operator loads the Macro and may immediately begin testing without any knowledge of the set-up procedure.

**1** – Click the *Auto* button to open the Automatic Test window. Then choose a Macro to load from the menu. You may create any number of Macros for different jobs. You will find the example shown here on your distribution disk.

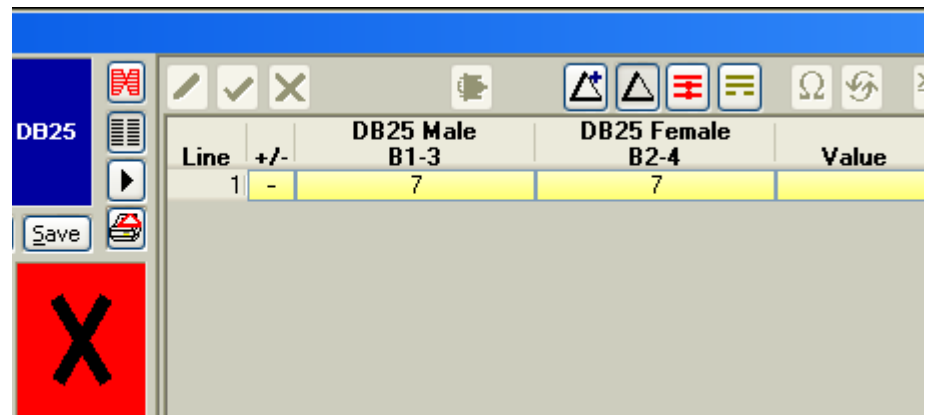


**2** – The Macro specifies the test operations you need for a particular job. Easily create Macros by just choosing commands from a menu (not shown here). You may modify the Macro at any time with the “Edit” function, and save the final Macro on disk for future use.



**3** – Press the TEST pushbutton on the fixture, or click the “Execute” button on the screen, to begin testing. Results are shown on bright LED lamps. The PASS lamp is green, and the FAIL lamp is red.

**4** – If CableEye detects a fault, the instruction on Line 10 (above right) displays the *Differences List*. The problem found here is a missing connection between pin 7 on the left and pin 7 on the right.



# Data Logging

You may wish to record the result of every test when testing a batch of identical cables. Then, at the end of the batch, print a summary report showing exactly the test results you've obtained. CableEye will do this automatically when you employ Data Logging. Several new commands need to be added to a standard Macro to engage Data Logging.

Initialize the *Count* value seen in the drawing below at a number other than "1" if desired, print labels as you test each cable, and use the count value as a serial number for either labels or reports. You may end the log after a fixed number of cables, or at an arbitrary time. You may also interrupt the batch test to check a cable for someone else, and resume the batch test later without disrupting the data log.

**1** – Convert a standard Macro to a data-logging Macro by adding several new instructions. At the beginning, add the command OPEN LOG FILE to create a new data log (you will be asked to supply a log file name when this executes). To insert the title block, use the command LOG HEADER. Then add the instruction LOG TEST RESULT in the main test loop to record the result of every test. Finally, at the end, add LOG SUMMARY to print a summary at the end of the test. If you wish to print the result from within the Macro, add PRINT LOG FILE before the Macro ends. As an example, have a look at the Macro "LOGTEST1" included with your software.

**2** – Execute the data-logging Macro like any other (as described on the previous page).

**3** – When you finish a batch test, the results are printed as shown on the right. You can print any log file at any time by clicking the LOG button. CableEye stores log files as comma-delimited ASCII, so you may import them into other programs if desired.

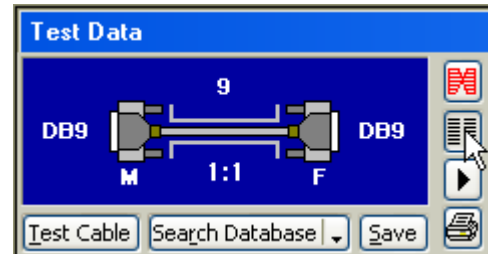


CableEye Log Report		TEST SUMMARY		04-09-15 06:37 AM	
Log File Name: Example.LOG					
<small>Made by Corian Cable Company, Cheshire Division, Tel (800) 345-6789, G.B. Brinton Sales Agent</small>					
CABLE NAME: DB25M-DB25F-S25D					
CONNECTORS: DB25Male DB25Female					
COUNT	RESULT	TIME			
1	PASS	06:37:11 AM			
2	PASS	06:37:15 AM			
3	PASS	06:37:18 AM			
4	PASS	06:37:21 AM			
5	F A I L	06:37:29 AM		B1-3:7	B2-4:7 OPEN
6	PASS	06:37:37 AM			
7	PASS	06:37:40 AM			
8	PASS	06:37:43 AM			
9	F A I L	06:37:50 AM		B1-3:SH	B1-3:15 SHORT
10	PASS	06:38:01 AM			
Total Units Tested: 10		Total Test Time: 0 min 50 sec			
Total Units Failed: 2		Average Time Per Unit: 5 sec			
Accuracy: 80%					

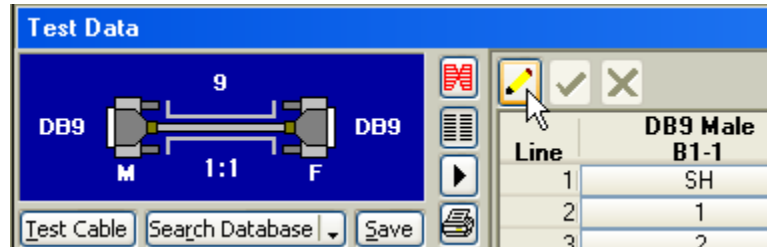
## Editing a Wire List

Modify the wire list of a cable at any time. You may add or delete wires, or change the connector types using CableEye's netlist editor.

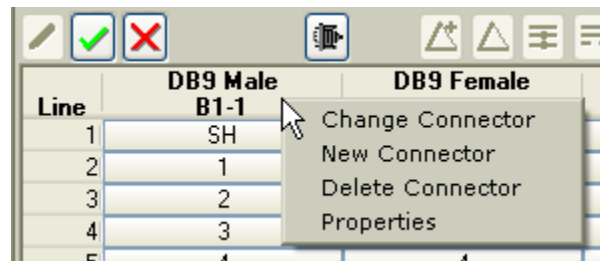
**1** – Measure a cable, or load a cable from the database, and click the *Display Netlist* button to see a wire list.



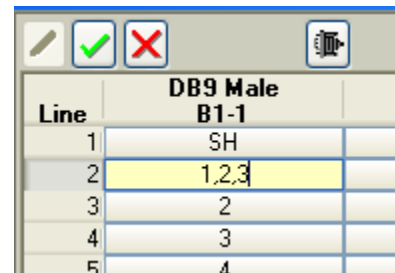
**2** – To edit the wiring, click the “Pencil” button.



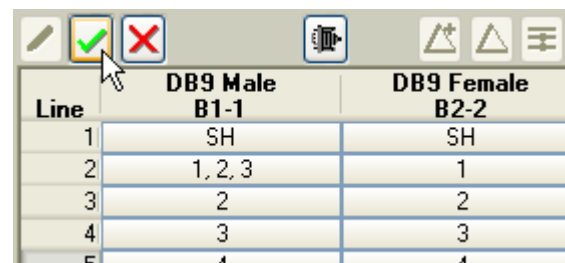
**3** – If you would like to change connectors, click the connector name and make a new selection from the pop-up window that appears (not shown).



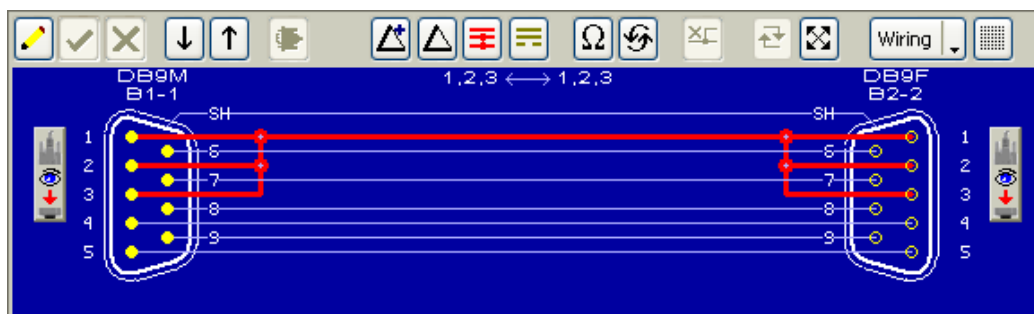
**4** – Then click on the cell you wish to edit and type in the new numbers. In this case, we have started to create a jumper between pins 1, 2, and 3 on the left and 1, 2, and 3 on the right.



**5** – When you have finished editing, click the green “Checkmark” button to save your changes, or the red “X” button to discard them.



**6** – Finally, view the wiring of your edited cable (below) by clicking the “View Wiring” button.

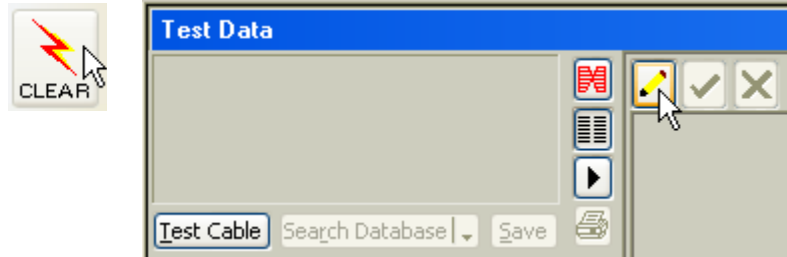




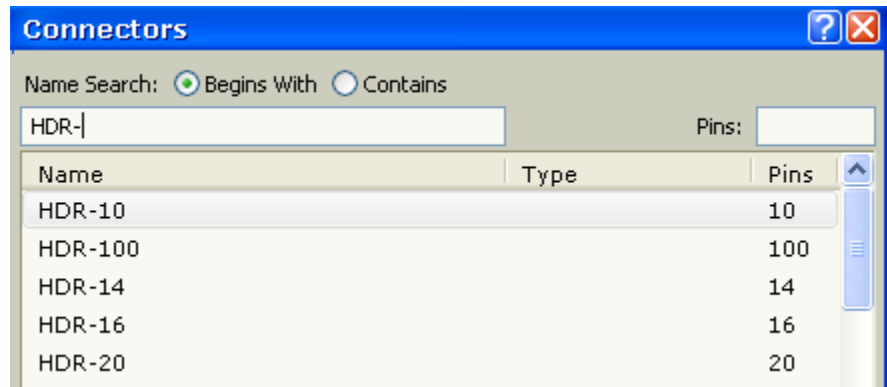
# Designing New Cables

You may design a completely new cable to create model data against which the first prototype can be measured. You will use the same netlist editor for wire entry as was used to add or delete wires from an existing cable.

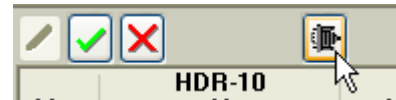
**1** – Clear any existing data, set the view mode for Netlist, and click the yellow pencil button to begin editing.



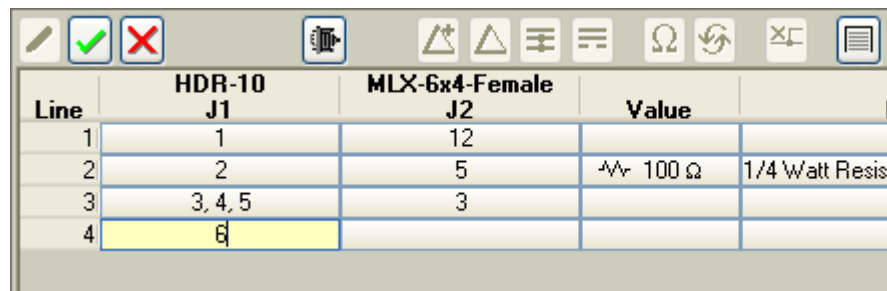
**2** – When you click the *Edit* button with no data present, the *Connectors* window immediately appears. Choose the first connector you need and click “OK” (not shown) at the bottom of the window.



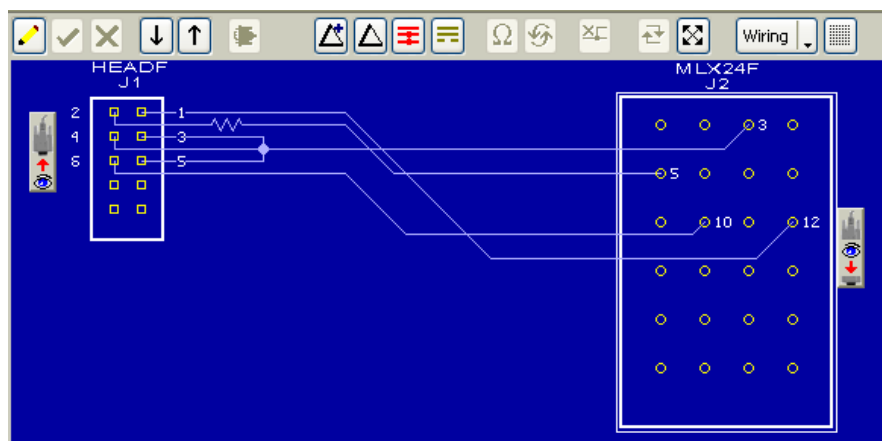
**3** – Choose any additional connectors by clicking on the *New Connector* button and making your selection as above.



**4** – Enter the wire list in the same way you edited connections previously. Press the green Checkmark button when all connections have been entered.



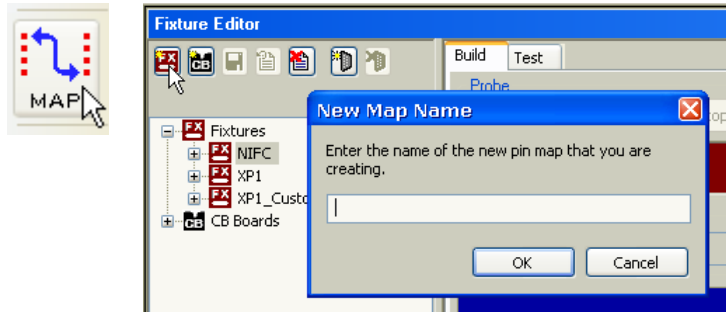
**5** – Review the cable’s wiring to confirm the design (see below). You may add or remove wires at any time or, if necessary, change the gender or type of the connectors. Annotate the final result with descriptive notes, and save it in the database before finishing.



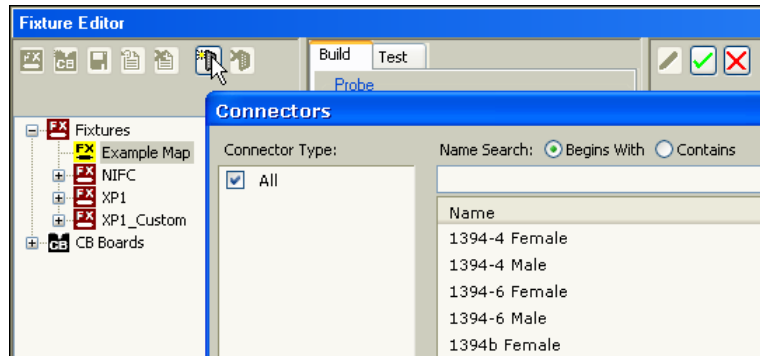
# Adapting to Custom Test Fixtures

CableEye can easily adapt to custom test fixtures. You may mount unusual mating connectors on our CB8 (up to 64 pins) or CB30 (up to 128 pins) boards, build adapter cables that attach to our CB29 or CB29A Screw Terminal boards, or use 64-conductor IDC flat cable connected directly from CableEye to your custom-designed PC board. With the optional PinMap™ software (Item 708), you may choose a suitable connector graphic from our large library for each mating connector, and assign custom pin labels that match your schematic.

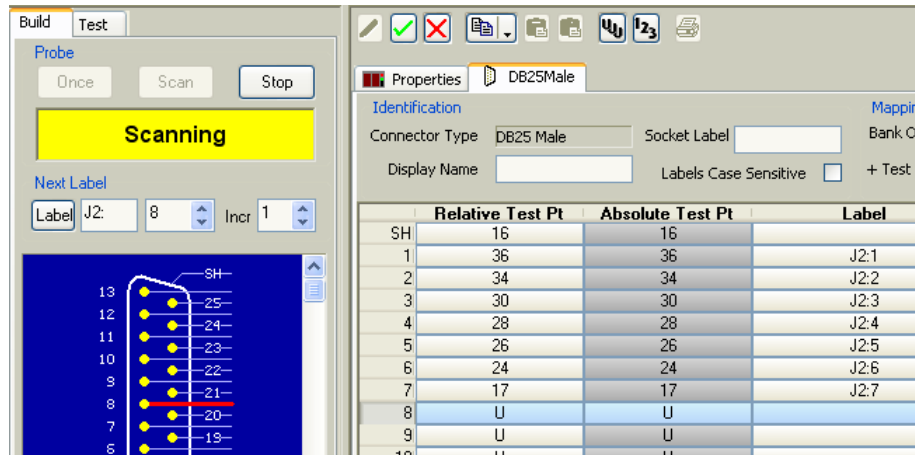
**1** – To create a new map, start PinMap by clicking on the *Map* button, and specify the name of the map file you wish to create.



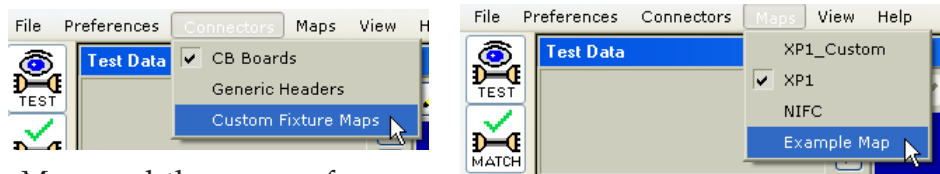
**2** – Choose the connector graphic you wish to use for the mating connector and click OK. You may employ as many different connectors as needed for the cable or wire harness interface you have constructed. The software can handle as few as one connector to hundreds of connectors.



**3** – Attach the Pin-Map probe to the tester, click the *Scan* button, and begin touching the probe to the pins on the connector, starting with the Shield and moving up (see the grid). Custom labels like *J2:1* overwrite the default number if desired.



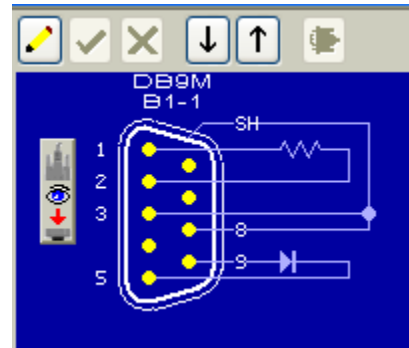
**4** – Turn off PinMap by clicking again on the *Map* button. Then choose *Custom Fixture Maps* and the name of your map, as shown here. *Ready to test!*



# Testing Single- and 'Remote'-Ended Cables

## Case 1: Single-ended cable

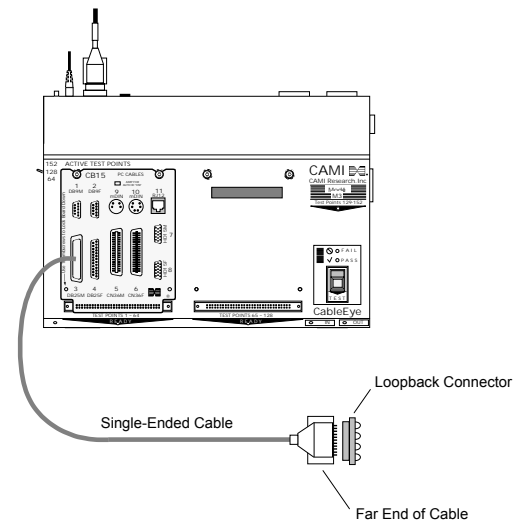
You may need to measure a cable that has only a *single connector*, with the other side hard-wired to a board or other component. To do so, insert an appropriate CB board into the left or right bank, or activate a custom pin map for your own interface, then attach the cable to an available mating connector. After you click *Test Cable*, the program may ask what kind of connector its attached. View the wire list or graphic display for the result.



Case 1

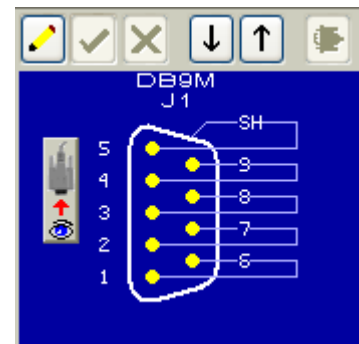
## Case 2: Double-ended cable with one 'remote'

You may also have a cable with two connectors where only one end can be connected to the tester. Maybe the other end terminates a long distance away (for example, if the cable runs through a conduit). Or perhaps the cable cannot be uninstalled from machinery. For this case, you may employ a loopback connector. Testing then becomes a two-step process:



### Step 1 – Test for Open Circuits

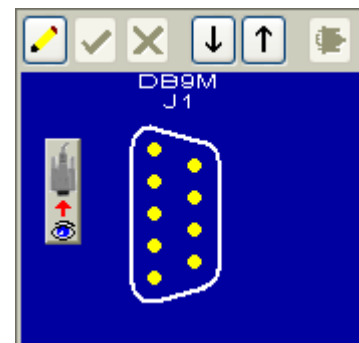
Attach a loopback connector to the 'far' end so that pairs of pins are connected together. This completes an electrical circuit to allow current to flow down the cable on one wire and return to the tester on the other wire. After testing, you should then see pairs of connected wires on the graphic display.



Case 2: Step 1

### Step 2 – Test for Shorts

Remove the loopback connector and test in this configuration. If no shorts exist in the cable, you should see a connector with no wiring shown at all. If shorts are present, you will see connections showing which wires contain the short.



Case 2: Step 2

If you see continuity between pairs of wires in step 1, and no connections in step 2, the cable is functioning correctly. If you perform a test like this, *be sure any installed cables are completely disconnected from any signal sources before testing with CableEye!* Also, keep in mind that the resistance will double since the test signal must traverse the cable in both directions.

Of course, you can always route a return cable from the far end back to CableEye. If possible, this is the best solution since no loopback is necessary. We have tested cables as long as 2000 feet with no problems, and the upper limit is likely to be even longer.

# Testing Wiring Harnesses

Cables and wire harnesses differ primarily in the number of connectors they employ. You may easily test wiring harnesses with CableEye and take advantage of all of the benefits available when testing two-ended cables. Specifically, you may connect a model harness to CableEye and learn the correct wiring, add descriptive notes and label text, and store the wiring information on disk for future reference. Most importantly, you may directly compare the unit under test to a model harness and instantly view any differences in wiring graphically or in list form. Finally, of course, you may print test reports, and error reports (if problems are revealed). Adapting CableEye to test wire harnesses requires that you first build a *mating harness*, and then tell CableEye which graphics and pin labels to employ for the connectors.

**1 – Build a Mating Harness:** The mating harness consists of a series of opposite-gender connectors that exactly mate to the harness under test. The other side consists of *transition connectors* that link to CableEye. These transition connectors may take several forms:

a – connect individual wires from the mating harness to screw terminal boards (for example, CB29 or CB29A in the CableEye catalog)

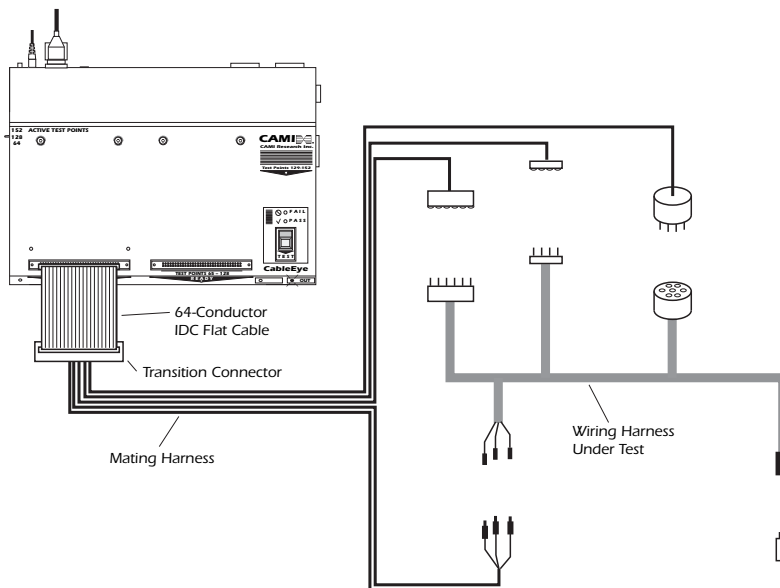
b – wire the mating harness directly to prototyping boards (for example, CB8 in the CableEye catalog). This is the basis of the example on the following page.

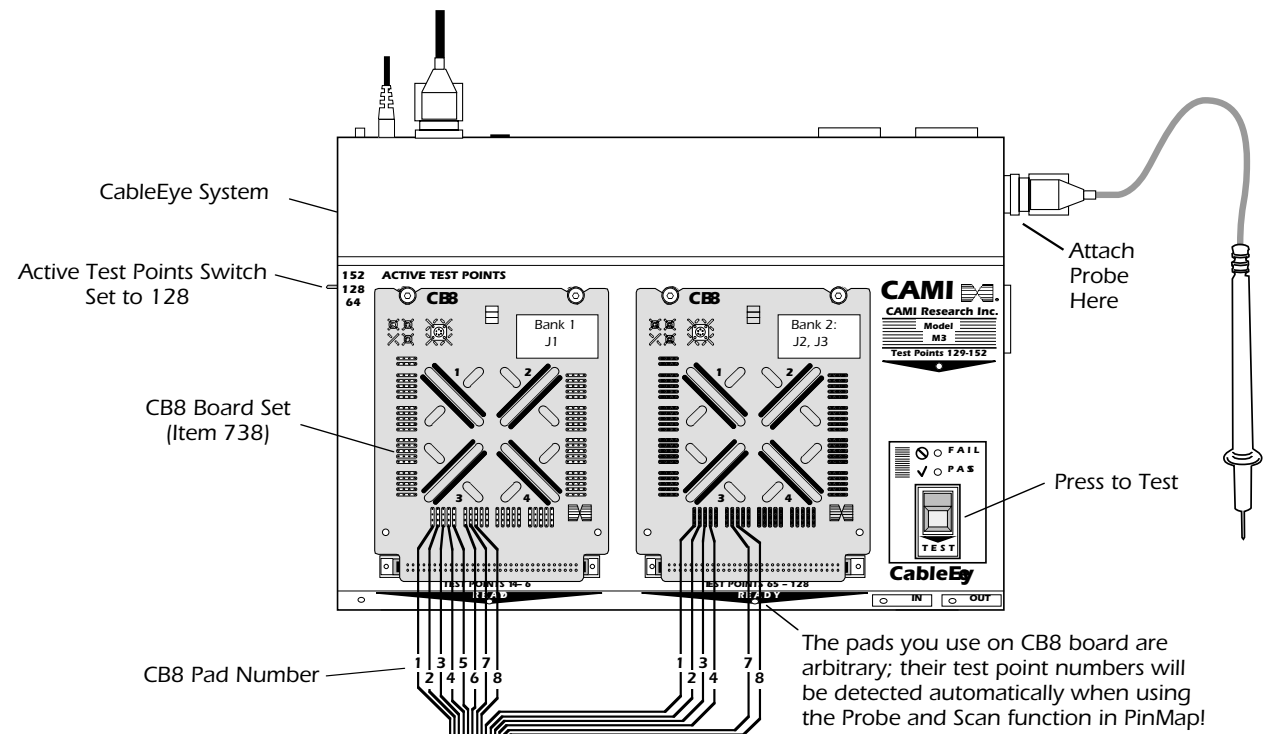
c – wire the mating harness to a common connector that then joins to one of the standard CB boards (for example, terminate the mating harness in two DB50 male connectors, and connect them to two CB3 boards).

d – if the mating harness can be constructed strictly from IDC flat cable, then you can use two 64-pin wiremount sockets (such as 3M #7964-6500EC with strain relief 3448-7964) that connect directly to CableEye's 64-pin latch headers.

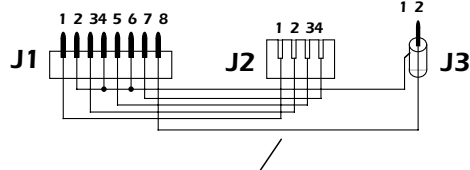
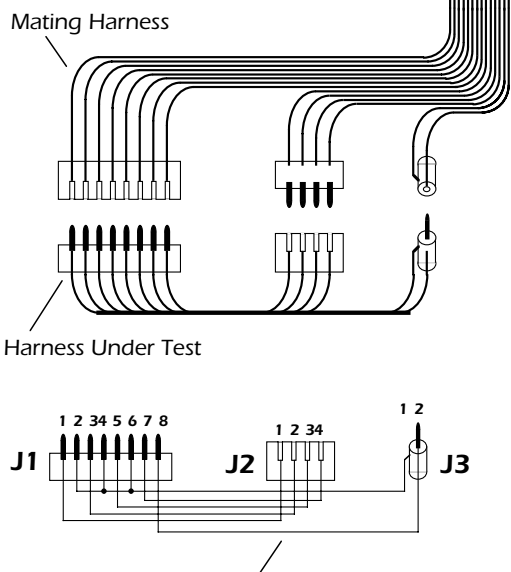
**2 – Create a Custom Pin Map for the Harness:** Once you determine how the mating harness is wired to CableEye, you will create a look-up table for the CableEye software showing which test point is assigned to which connector pin on the harness. Use our optional *Pin-Map* software (Item 708) for this purpose.

The drawing on the next page provides a simple harness interface example using the CB8 board set. We provide the map information for CB8 (telling you which test point corresponds to which pad), and you add the labels you like.





The pads you use on CBB board are arbitrary; their test point numbers will be detected automatically when using the Probe and Scan function in PinMap!



Harness Schematic

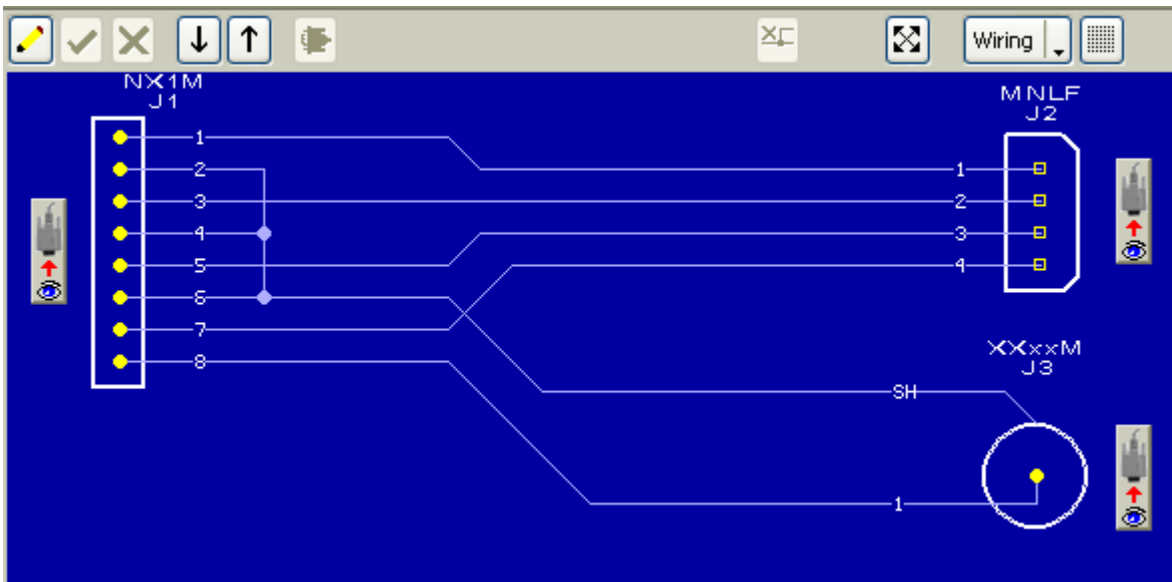
NOTE: Screen image and wire list are normally viewed only when locating errors. Generally, it is not necessary to examine them, but just to look for a PASS or FAIL condition.

### MAP ASSIGNMENTS

BANK 1 CBB			BANK 2 CBB		
Pad	Test Point	Label	Pad	Test Point	Label
1	11	J1:1	1	75	J2:1
2	13	J1:2	2	77	J2:2
3	15	J1:3	3	79	J2:3
4	17	J1:4	4	81	J2:4
5	19	J1:5	5	U	
6	23	J1:6	6	U	
7	25	J1:7	7	89	J3:1
8	27	J1:8	8	91	J3:2

### WIRE LIST

From	To
L-J1:1	R-J2:1
L-J1:2	L-J1:4 L-J1:6 R-J3:1
L-J1:3	R-J2:2
L-J1:5	R-J2:3
L-J1:7	R-J2:4
L-J1:8	R-J3:2



Display of Wiring Harness Graphic

Match Data (Learned Match Data, Not Yet Saved)

6 Connections, 3 Connectors

Load Cable Learn Cable Save

Active Map Example Map

Line	nx1 Male J1	MnL4 Female J2	M_MONO Male J3	Value	Description
1	1	1			
2	2, 4, 6		SH		
3	3	2			
4	5	3			
5	7	4			
6	8		1		

Wire Harness Netlist (individual connector columns view)

Match Data (Learned Match Data, Not Yet Saved)

6 Connections, 3 Connectors

Load Cable Learn Cable Save

Active Map Example Map

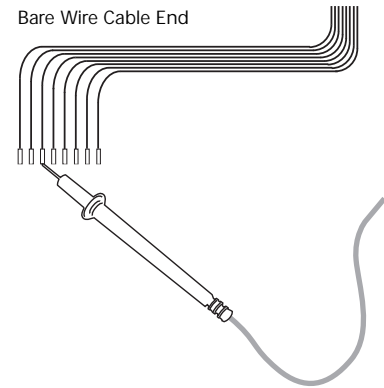
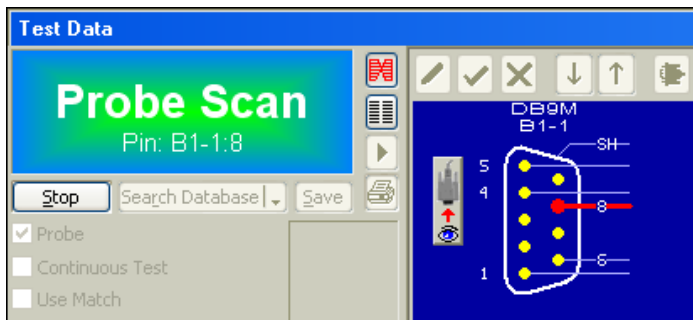
Line	Connections	Value	Description
1	J1:1, J2:1		
2	J1:2, J1:4, J1:6, J3:SH		
3	J1:3, J2:2		
4	J1:5, J2:3		
5	J1:7, J2:4		
6	J1:8, J3:1		

Wire Harness Netlist (FROM/TO view)

# Testing Unterminated Cables

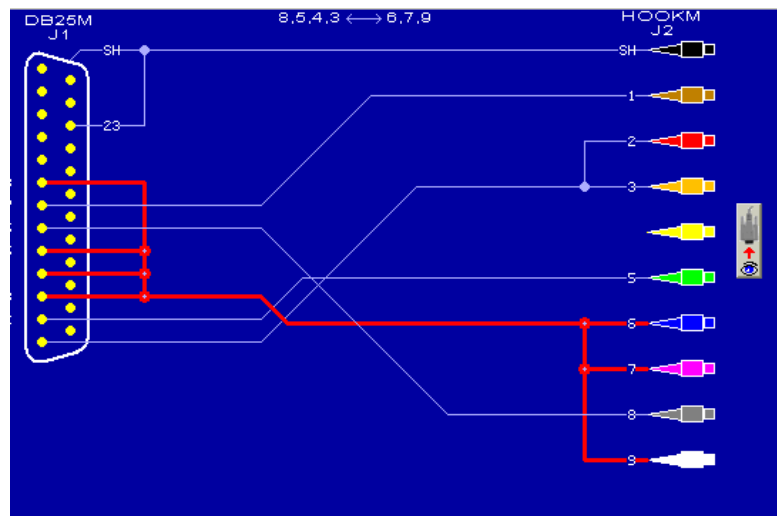
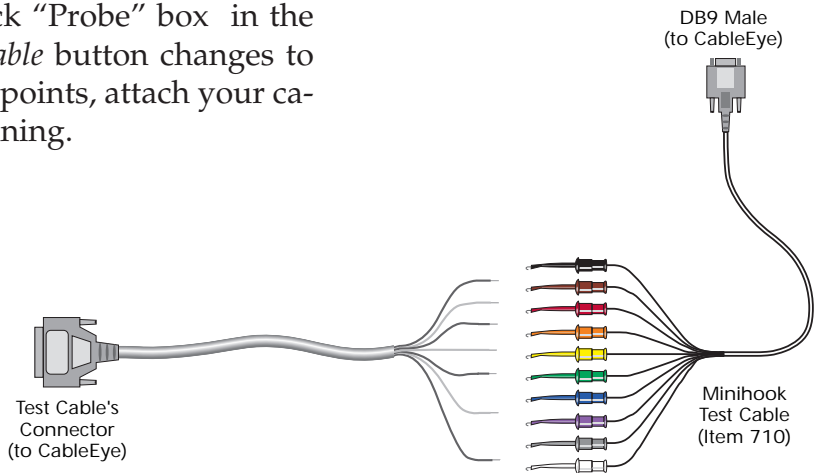
When a cable or harness terminates in bare wires (no connector), you need a means of making a temporary electrical connection to these wires during testing. CAMI Research offers several possibilities:

**1** – Use a handheld probe, suitable for a momentary electrical contact with one wire (Item 718), and the special *Probe* function in the software. The probe works well for point-by-point testing of individual wires. In the screen shot below, the highlighted wire shows the last wire probed, and the white wires show memory of previous wires probed.

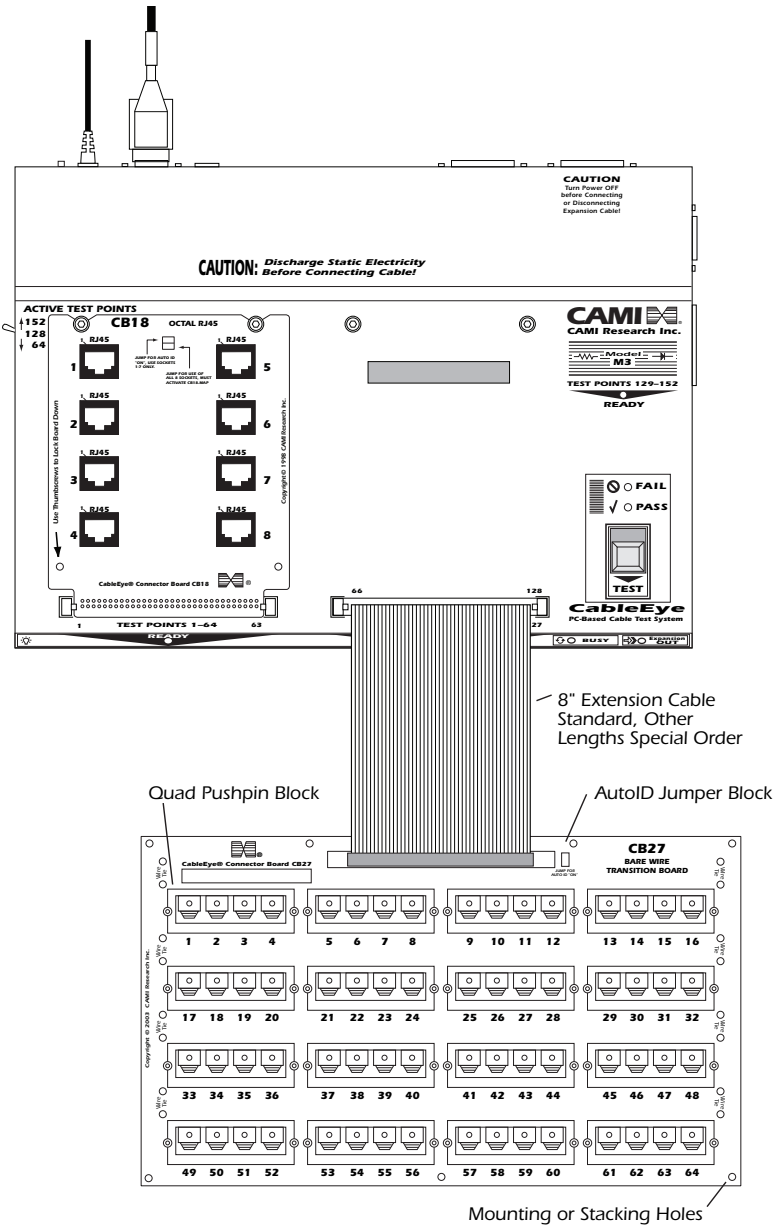


To use the Probe function, check “Probe” box in the Test Data Window. The *Test Cable* button changes to *Start*. Set the system for 152 test points, attach your cable, and click Start to begin scanning.

**2** – Use our special Minihook probes (Item 710) consisting of ten color-coded spring-loaded hooks capable of holding up to ten wires simultaneously. To use the minihooks, attach the DB9 connector to the *Minihooks* socket on the right side of the tester. Set the system for 152 test points, attach the minihooks to the cable’s bare wire ends, and click *Test Cable* in the usual manner to measure the cable. A diagram similar to that shown on the right will appear.



**3** – Use CB27 which has 64 individual push-pins (the type of connector on the back of audio speakers). Push-pins are very quick to attach and detach wires and provide an excellent electrical contact. Attach the CB27 extender cable to the tester as shown here, and use as you would any other CB board.



**4** – Use CB29 or CB29A screw terminal boards. 64 screw terminals provide a more secure and permanent connection than push-pins and are best suited for heavier gauge wire (20 gauge or large) or complex connections.

