

Z1800-Series

Technical Support Bulletin Manual



Teradyne, Inc
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Z1800-SERIES TECHNICAL SUPPORT BULLETIN MANUAL

Manual History

- Thirty-third Edition, June 2000, Version G.0 system software. *This edition adds TSB #80 and #81.*
- Thirty-second Edition, April 1999, Version F.2b system software. *To update your manual to this edition, replace pages i–vii from the 31st edition with pages i–vii in this update package and add TSB #79 to the end of the TSB section.*
- Thirty-first Edition, May 1998, Version F.2a system software. *To update your manual to this edition, replace pages i–vii from the 30th edition with pages i–vii in this update package and add TSBs #77 and #78 to the end of the TSB section.*
- Thirtieth Edition, September 1997, Version F.2a system software. *To update your manual to this edition, replace pages i–vii from the 29th edition with pages i–vii in this update package and add TSBs #73 through #76 to the end of the TSB section.*
- Twenty-ninth Edition, January 1997, Version F.1b system software. *To update your manual to this edition, replace pages i–vii and TSB #66 with pages i–vii and the revised TSB #66 in this update package.*
- Twenty-eighth Edition, August 1996, Version F.1 system software. *To update your manual to this edition, replace pages i–v and TSB #46 with pages i–vii and the revised TSB #46 in this update package, and add TSB #72 to the end of the TSB section.*
- Twenty-seventh Edition, April 1996, Version F.0c system software. *To update your manual to this edition, replace pages i–v and TSB #62 with pages i–v and the revised TSB #62 in this update package, and add TSBs #70 and #71 to the end of the TSB section.*
- Twenty-sixth Edition, October 1995, Version F.0 system software. *To update your manual to this edition, replace pages i–v and TSB #66 with pages i–v and the revised TSB #66 in this update package, and add TSB #69 to the end of the TSB section.*
- Twenty-fifth Edition, May 1995, Version E.4 system software. *To update your manual to this edition, replace pages i–v and TSB #66 with pages i–v and the revised TSB #66 in this update package, and add TSBs #67 and #68 to the end of the TSB section.*
- Twenty-fourth Edition, April 1995, Version E.3 system software. *To update your manual to this edition, replace pages i–v with pages i–v and TSB #13 with TSB #13 in this update package, and add TSB #66 to the end of the TSB section.*
- Twenty-third Edition, November 1994, Version E.3 system software. *To update this edition, replace pages i–v with pages i–v in this update package, and add TSB #65 to the end of the TSB section.*
- Twenty-second Edition, August 1994, Version E.2 system software. *Software release notes (formerly TSB #13) are now a separate document called “1800-Series System Software Release Notes” in the Open Me First packet. To update the twenty-first edition of the TSB Manual, replace pages i–iv, TSBs #13 and #61 with pages i–v, TSBs #13 and #61 in the update package. Also add TSBs #63 and #64 to the end of the TSB section.*
- Twenty-first Edition, May 1994, Version E.1 system software. *This edition includes an update to TSBs #13 and #61. If you have the twentieth edition of the TSB Manual, replace pages i–ii and TSBs #13 and #61 with pages i–ii and TSBs #13 and #61 in the update package.*
- Twentieth Edition, March 1994, Version E.0 system software. *This edition includes updated Release and Performance Notes (TSB #13) for E.0 and adds TSBs #54, #55, #56, #57, #58, #59, #60, and #61. If you have the nineteenth edition of the TSB Manual, replace pages i–iv and TSB #13 with pages i–iv and TSB #13 in the update package. Also add TSBs #54 through #62 to the end of the manual.*

Part No. M00-097-00

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- Nineteenth Edition, August 1993, Version D.2.3 system software. *This edition includes updated Release and Performance Notes (TSB #13) and TSBs #52 and #53. If you have the eighteenth edition of the TSB Manual, replace pages i–iv and TSB #13 with pages i–iv and TSB #13 in the update package. Also add TSB #52 and #53 to the end of the manual.*
- Eighteenth Edition, May 1993, Version D.2.2 system software. *This edition adds TSB #51. If you have the seventeenth edition of the TSB Manual, replace pages i–iv with pages i–iv in the update package. Also add TSB #51 to the end of the manual.*
- Seventeenth Edition, April 1993, Version D.2.2 system software. *This edition updates Release and Performance Notes (TSB #13) to current software system version. If you have the sixteenth edition of the TSB Manual, replace pages i–iv and TSBs #13 and #41 with pages i–iv and TSBs #13, #41 in the update package. Also add TSB #50 to the end of the manual.*
- Sixteenth Edition, March 1993, Version D.2.1 system software. *This edition includes an update to TSB #48. If you have the fifteenth edition of the TSB Manual, replace pages i–ii with pages i–ii and replace TSB #48 with the updated version.*
- Fifteenth Edition, February 1993, Version D.2 system software. *This edition includes instructions for installing the Teradyne Corrective Service diskette. If you have the fourteenth edition of the TSB Manual, replace pages i–iv with pages i–iv and add TSB #49 to the end of the manual.*
- Fourteenth Edition, December 1992, version D.2 system software. *This edition updates Release and Performance Notes (TSB #13) to current operating system version. If you have the thirteenth edition of the TSB Manual, replace pages i–iv, and TSBs #13, #46, and #48 with pages i–iv, and updated TSBs #13, #46, and #48 in this package.*
- Thirteenth Edition, October 1992, version D.1.1 operating system. *This edition updates TSB #41 and adds TSB #47 and #48. If you have the twelfth edition of the TSB Manual, replace pages i–iv and TSB #41 with pages i–iv and the revised TSB #41 in this package and add TSBs #47 and #48 to the end of your manual.*
- Twelfth Edition, August 1992, version D.1.1 operating system. *This edition adds TSB #45 and #46. If you have the eleventh edition of the TSB Manual, replace pages i–iii with pages i–iii in this package and add TSBs #45 and #46 to the end of your manual.*
- Eleventh Edition, June 1992, version D.1.1 operating system. *This edition updates the Performance Notes to current operating system version and adds TSB #44. The Eleventh Edition entirely replaces the Tenth Edition.*
- Tenth Edition, May 1992, version D.1 operating system. *This edition updates Release and Performance Notes to current operating system version. The individual bulletins are no longer paginated sequentially to facilitate updating them in future editions. The Tenth Edition entirely replaces the Preliminary Tenth Edition.*
- Preliminary Tenth Edition, March 1992, version D.1 operating system. *If you have the Ninth Edition of the TSB Manual, replace page i and pages 7–16 with pages i–ii and pages 7–10 in this package to bring the Performance Notes up to current operating system version.*
- Ninth Edition, December 1991, version D.0 operating system. *TSBs which are no longer relevant because of software and hardware changes have been eliminated in this edition. Those which are still relevant have been retained with the original numbering system for ease of reference. New TSBs also continue to follow the previous numbering system. For details about the D.0 operating system refer to TSB #13.*
- Eighth Edition, July 1991, version C.1 operating system. *Please add TSBs 36–39 to the end of your TSB Manual, and replace pages i–iv and page 1 with the revised pages of the same number included in this update package.*
- Seventh Edition, January 1991, version C.1 operating system. *If you have the Z1800-series C.1 version software, update your TSB Manual by replacing pages i–iv, 49–50, and 93–96 with the revised pages in this update. Then add TSBs 26, 27, 28, 29, 30, 31, 32, 33, 34, and 35 to your TSB Manual. If you are running the C.0 version of the operating system, please add TSB 26, 27, 28, 29, 30, 31, 32, 33, 34, and 35 to your TSB Manual. If you are using a release prior to C.0, please add TSBs 27, 28, 29, 30, 31, 32, 33, 34, and 35 to your TSB Manual.*
- Sixth Edition, July 1990, version C.0 operating system. *If you have Z1800-series C.0 version software, update your TSB Manual by replacing pages i through 38 with those provided in this edition. Then add TSBs #21 through #25 to the end of the TSB Manual. TSBs #1 through #11 have*

been superseded by the release of the C.0 version operating system. If you do not have C.0 version software, please disregard this consolidation.

- Fifth Edition, May 1990, version C.0 operating system. *Add TSB #20 to your documentation.*
- Fourth Edition, April 1990, version C.0 operating system. *If you do not have Z1800-series C.0 version software, add TSBs #15, 16, 18, and 19 to your documentation. If you have C.0 version software, update your TSBs by adding TSB #15,16, 17, 18, and 19.*
- Third Edition, February 1990, version C.0 operating system. *If you do not have Z1800-series C.0 version software, add TSBs # 11 and 12 to your documentation. If you have C.0 version software, update your TSBs by adding TSB #13 and 14 and then eliminating the following TSBs from your documentation: #1 (except items 9 and 10), 2, 3, 4, 5, 7, 8, 10, 11, and 12. TSB #1, item 9 should read "Devices with more than 1128 pins," item 10; #6; and #9 remain active.*
- Second Edition, June 30, 1989, version B.0 operating system. *Adds Technical Support Bulletins #1 revised plus 2, 3, 4, 5, 6, 7, 8, 9, and 10.*
- First Edition, March 27, 1989, version B.0 operating system. *Includes Technical Support Bulletin #1.*

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Introduction

This Technical Support Bulletin Manual provides information about your Z1800-series tester that may not be included in the standard set of technical manuals. The support bulletins can help with transitions from one revision of software to another, ease system troubleshooting, provide answers to applications questions, and clarify or correct the technical manuals. The bulletins may also provide information about hardware changes to enhance the performance or operation of your system.

It is our desire to provide our customers with accurate, up-to-date and helpful documentation. We would appreciate if you would report errors or omissions in the SPR materials provided.

Technical Support Bulletin #13

Issue Date: July 16, 1990

Revision Date: April 14, 1995

System Model: Z18XX and Z18XXVP (Vector Performance) Series

Subject: Version E-Level Software Release Notes

Z1800-Series Release Notes are now a separate document and are included in all documentation update packages. Place the Release Notes behind the Release Notes tab at the end of your Technical Support Bulletins so that you can archive and easily access them. The Release Notes are also provided with the system software and can be viewed by opening the RELNOTES.DOC file in the \MOS directory.

Technical Support Bulletin #18

Issue Date: April 11, 1990

Revision Date: N/A

System Model: Z1800-Series

Subject: Power Switch Light Bulb, version C.0

The line monitor board powers the light bulb in the power switch located on the Test Jack Panel.

The light bulb draws excessive current from the board, and has been linked with blown fuses in the line monitor board. To avoid this problem, we advise removing the light bulb from the power switch.

To remove the light bulb, first power down the tester. After removing all current from tester, pop the red cover off the power switch. Pull on the metal ejector tab to release the light bulb, and then remove the light bulb. Replace the red switch cover.

With the light bulb removed, the power switch will no longer be illuminated when the tester is powered. The power switch controls switching AC power into the tester power supplies. The Start and Cancel switch lights, and power supply LEDs will be on whenever the tester power supplies are on. These lights indicates the presence of DC power in the tester. When these lights are out, it is safe to remove or install boards in the tester.

... Warning ...

AC VOLTAGE MAY BE PRESENT IN THE TESTER

DO NOT rely on these lights as AC power indicators. AC power is present in the tester whenever power is applied at the power inlet and the Main AC breaker is ON. (Both are located on the rear panel).

The green LED on the AC Control indicates presence of AC power inside the tester.

Technical Support Bulletin #24

Issue Date: July 16, 1990

Revision Date: N/A

System Model: Z1800-Series

Subject: Diagnostic Tests with Fast CPUs, version C.0.

The Z1800-Series Diagnostics were developed on a 25 MHz 80386 PC. Teradyne has discovered that the Diagnostic software of C.0 version will not give reliable test results when run on 80386 PCs with clock speeds greater than 25 Mhz . The symptoms are that E, F, & G relays will fail intermittently.

The solution is to run the Diagnostic tests at a PC clock rate of 25 MHz or less when using a 80386 PC. Most 80386 PCs whose clock speed exceeds 25 MHz have a selectable clock mode which permits the PC to be operated at a slower frequency. Be sure to select a slower clock speed when running the Diagnostic tests.

Please note that this problem has not occurred with 80286- or 80186-based PCs. Furthermore, there is no problem generating, editing or executing test programs with 80386-based PCs that run above 25 MHz.

Technical Support Bulletin #29

Issue Date: January 23, 1991
Revision Date: December 18, 1991
System Model: Z1800-Series
Subject: Digital Count Function

Under most circumstances, the 42026 THC and 45203 VP will report identical results with the COUNT function. In some circumstances, the two boards will produce different COUNT results.

The operation of COUNT on the VP is intuitive: it will count all rising edges of the measurement signal that occur while the listen window is open. Like the VP, the THC COUNT will increment for any rising edge of the measurement signal while the listen window is open; however, the THC will also increment the COUNT any time the listen window toggles open while the measured signal is already high. If the listen window never turns on while the measurement signal is high, both boards produce identical results. If the listen window turns on while the measurement signal is high, the COUNT will differ.

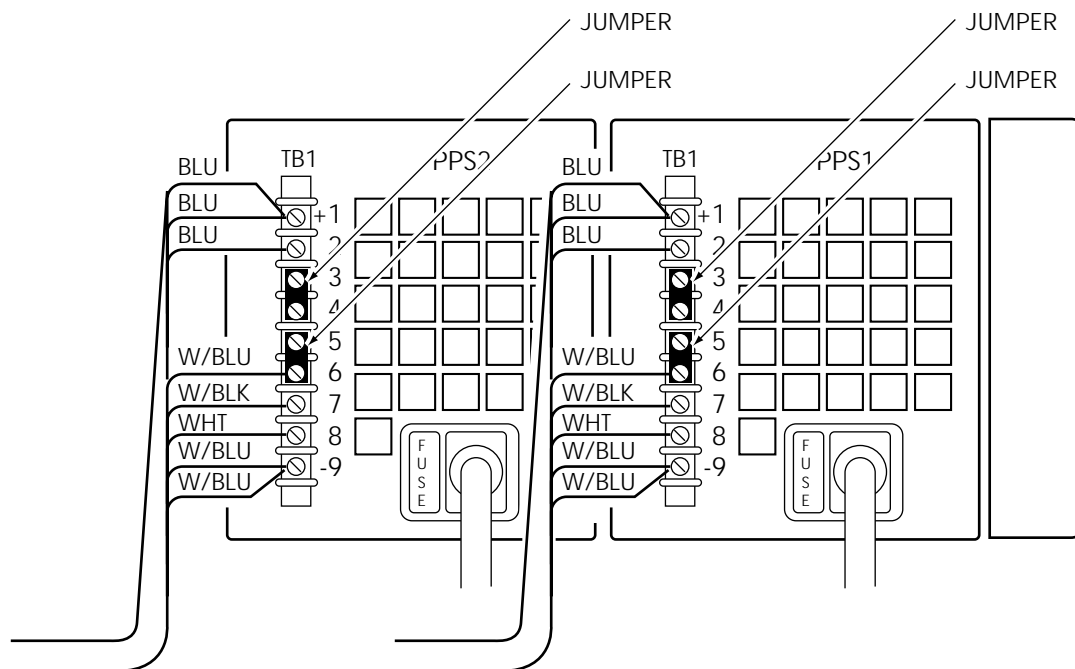
For example, for a measurement signal that is a constant logic high, the VP COUNT will be zero, but the THC result will depend on the listen window. A constant high signal or an open pin has no rising edges of the response itself, but will report a result of at least 1 with the THC. For example, when measuring a constant high signal with the default window (From F1 To F(Highest Stim+2)), the THC COUNT result is 1 because the listen window rises once at F1. If the listen window includes WHILE controls, there are multiple rising edges and the THC COUNT will record them. For example, a test step with a constant high signal with From F1 TO F10 While F2, produces a THC COUNT result of 64 because there are 64 rising edges of the listen window.

For compatibility purposes, your VP can be made to COUNT like the THC by changing a PAL. The VP boards ship with COUNT PAL (PN 45221) installed in location U74, the active location. The VP boards also ship with THCVPCNT PAL (PN 45279) installed in location U24, a spare location. These same two parts are also included in the VP component level spares kit, PN 46105. To make the VP COUNT like the THC, install the THCVPCNT PAL in location U74 of the VP board.

Technical Support Bulletin #31**Issue Date:** January 23, 1991**Revision Date:** N/A**System Model:** Z1800-Series**Subject:** Jumper Configuration, Dual Power Supply Assembly

Teradyne's internal quality checks have indicated that some Z1800-series testers may have the local sense jumpers on the two adjustable power supplies (P/N 61428, which are part of the Dual Programmable Power Supply Assembly, P/N 45165).

Locate the rear of the power supplies, and determine if the local sense jumpers are connected between terminals + and 2, and terminals 8 and - of both power supplies. Power supply jumpers should be on terminals 3 and 4, and 5 and 6 only. All other jumpers should be removed. (See the illustration below.)



Rear view of programmable power supplies

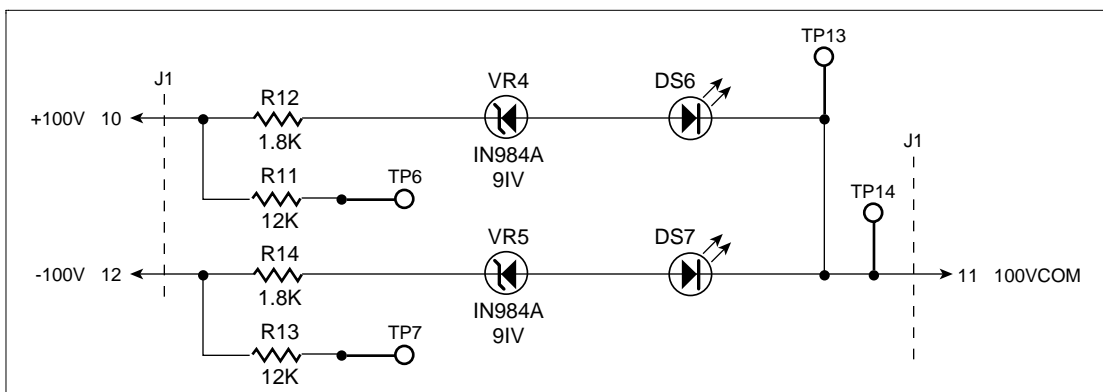
Technical Support Bulletin #32**Issue Date:** January 23, 1991**Revision Date:** N/A**System Model:** Z1800-Series**Subject:** Resistor Burn-Out on Power Supply Display Panel

If the 100 Volt option is installed on your tester, and you have observed that a resistor has burned out on the power supply display panel, Teradyne will replace the board at your request. Check the revision of the display board and consult the factory for further instructions.

The circuit that indicates the presence of +/- 120 volts may overheat and damage the LED power supply display board (P/N 45034 & 45354 for Z1800 and P/N 45354 for the Z1820). The power rating of the current limiting resistors is too small for the tolerance of the zener used in the circuit. The worst case could permit up to 840 milliwatts to be dissipated through the 500 milliwatt resistor.

Customers having 1800 models with serial numbers of 102242 and above or 1820 models with serial numbers of 112227 and above have been shipped testers with display panels modified to prevent resistor burn-out. However, if you add the 100 Volt option to one of the earlier Z1800-series systems, you have two options to prevent damage to the display:

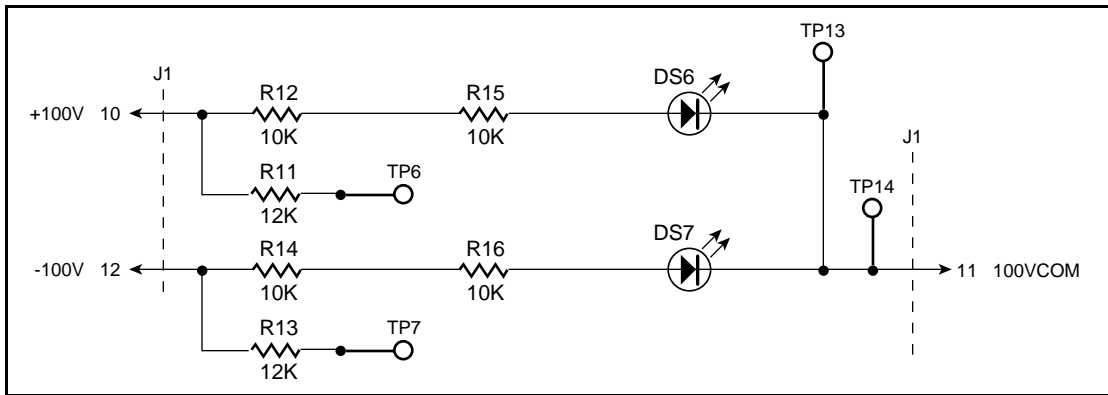
- Request a new revision of the board from Teradyne.
 - Modify the board as instructed below.
1. Remove the LED power supply display boards (45034 and 45354 for the Z1800 and 45354 for the Z1820). (See the illustration below.)



Circuit before change

2. Remove resistors R12 and R14 and zeners VR4 and VR5.

3. Replace R12 and R14 with 10K-1/2 watt resistors. (See the illustration below.)
4. Replace VR4 and VR5 with 10K-1/2 watt resistors. (See the illustration below.)



Circuit after change

5. Replace the display board(s) in the system.

Technical Support Bulletin #38

Issue Date: July 1991

Revision Date: N/A

System Model: Z1820 and Z1800, 50 Hz Operation

Subject: Fuse Replacement in the Line Monitor Assembly

A larger fuse replaces the 0.062 amp fuse in the line monitor assembly (PN 45124) for Z1820 and Z1800 testers powered on 50 Hz power. The line monitor assembly is part of the AC power control assembly (PN 45110). The replacement, a 0.080 amp fuse (5 x 20 mm) (PN 62095-0.080), also requires a different fuse holder (PN 62096).

If you are experiencing problems, please contact your sales representative for a free upgrade kit, or in North America, contact the Help Team (1-800-457-8326).

Technical Support Bulletin #39

Issue Date: July 1991

Revision Date: N/A

System Model: Z1800

Subject: Ground Wire Addition to Correct Calibration Measurement

In some Z1800s, THC threshold diagnostic tests will occasionally fail. The failing data is usually out of range by approximately 20mV. The failures are caused by differences in the THC ground and the ATB ground. The grounds are approximately 20mV apart because of excessive resistance between them.

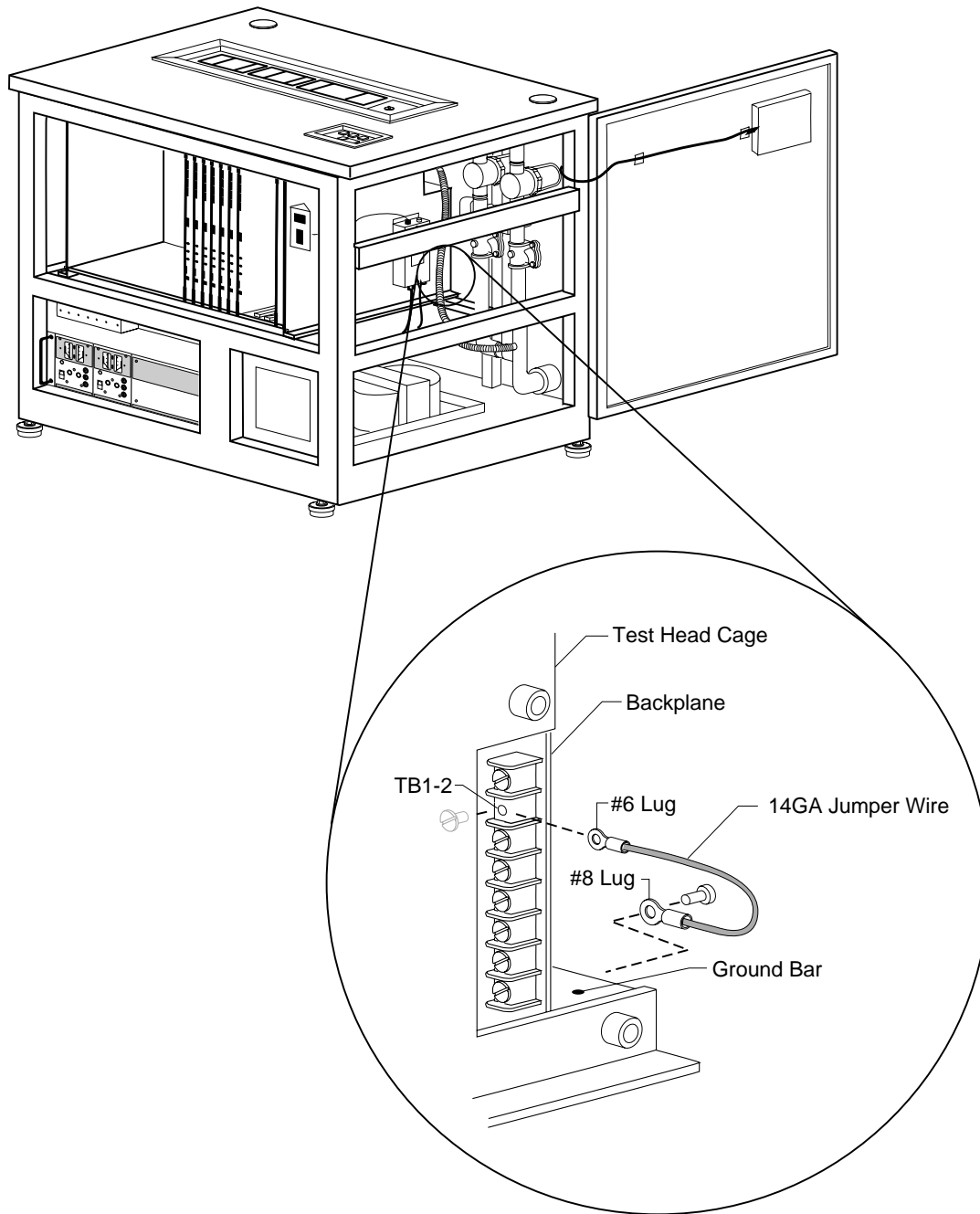
This problem of failing THC threshold diagnostics does not occur on Z1860, Z1840, or Z1820 testers.

You can perform the corrective procedure yourself or contact your local sales office or, in North America, contact the Help Team (1-800-457-8326) for a free upgrade kit.

To correct this problem follow the steps listed below, Referring to the illustration on the following page.

You will need a 6"-8" 14GA jumper wire terminated with a #6 lug on one end and a #8 lug on the other.

1. Shutdown the tester and remove AC power.
2. Unscrew TB1-2 on the backplane. Access to the backplane screws is from the front of the tester.
3. Add the #6 lug terminator to the screw on the backplane, being sure also to reconnect any other wires previously connected to TB1-2. You may need to use a longer screw to accommodate the addition of the ground wire.
4. Insert a 1/4" to 1/2" long #8 screw into the other lug and connect it to any threaded unused hole in the ground bar.



Technical Support Bulletin #40

Issue Date: December 1991

Revision Date: N/A

System Model: Z1800-Series

Subject: Fixture Vacuum Hoses

Fixture vacuum hoses that do not shrink when vacuum is applied are now available. The new hose can be used on all Z1800-series testers and is a direct replacement for the old hose (PN 04900). You may order the new hose (PN 46353) from customer service.

Technical Support Bulletin #41

Issue Date: December 1991

Revision Date: April 1993

System Model: Z1800-Series

Subject: Fixture Interface Seal

The Fixture Interface Seal TSB is no longer relevant and has been eliminated.

Technical Support Bulletin #42

Issue Date: December 1991

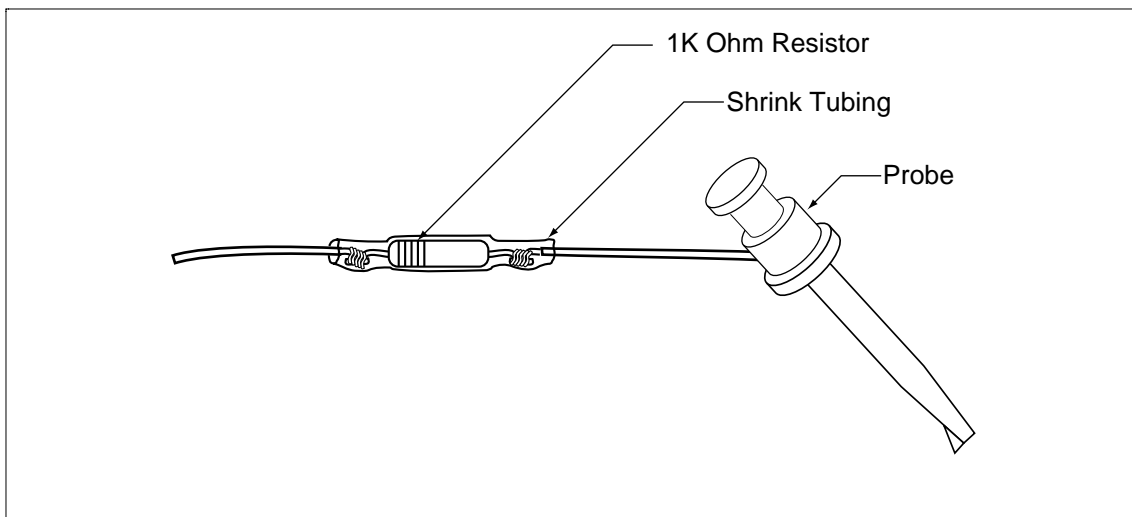
Revision Date: N/A

System Model: Z1800-Series

Subject: Preventing Op Amp Oscillation During Calibration

Some of the operational amplifiers (op amps) were changed to a more reliable type on the Z1800-Series Analog Test Board (ATB) (PN 45556/7 Rev C or higher and PN 43016/7 Rev M and higher). These op amps may be sensitive to the meter leads used during ATB calibration. Teradyne recommends that you modify the meter leads used in ATB calibration.

Add a 1K Ohm resistor to the probe end of both the positive and negative lead.



This modification will prevent the op amps from oscillating during calibration.

Technical Support Bulletin #43**Issue Date:** December 1991**Revision Date:** N/A**System Model:** Z1800-Series**Subject:** Hardware Changes for Vector Performance Option, I/O Adapter, and Channel Adapter

There is a new PC I/O adapter that is part of the Z1800 Vector Performance upgrade. This new PC I/O board will also work with the test head controller in conjunction with the D.1 software release. It offers no improvements over the existing I/O board when used with the THC, but customers in the process of switching to D.1 and the vector processor may find themselves using the new I/O to communicate to both the THC and the VP. In this situation, care must be taken to examine the THC resistor R54 and the THC cable (PN 45228) to see that they conform to the requirements stated below.

CHANGING THE RESISTOR VALUE

To use the I/O Adapter (PN 45454) or the Channel Adapter (PN 45456) with the Test Head Controller (PN 45026), R54 on the THC must be 221 ohms. If you are using the 45026 THC, check its PCA revision block. If the revision is Rev J or above, or if E3341 has been added to the revision, R54 is the correct value. If the THC revision is below J and does not have E3341 added to it, replace R54 on the THC with a 221 ohm resistor, Teradyne's (PN 61655).

UPDATING THE CABLE

On the 45026 THC, all even pins on the J3 connector are tied to ground. Pins 12, 26 and 34 on the new I/O PCA are signal pins. Because of this change, you may have to modify the cable.

The 45228 cable is installed on the rear panel assembly in systems having the following allocation numbers:

- 1800-197 and above
- 1820-162 and above
- 1840-001 and above
- 1860-001 and above

No changes need to be made to the 45228 cable on these systems. If the revision of the 45228 Cable is revision D or above, no action is required since the cable has already been modified in the factory.

If the revision of the 45228 Cable is below revision D, the cable must be reworked. Rework consists of removing a .500" \pm .250" section of conductor between the THC-J3 (40P) and VP-J3 (50P) connector from the conductors listed below:

- Conductor #12 (the tan wire between the first blue and the first violet wires),
- Conductor #26 (the tan wire between the second orange and the second yellow wires), and
- Conductor #34 (the tan wire between the second violet and the second Gray wires)

NOTE

Conductor #1 of the 45228 is the dark brown wire. It is oriented down when installed on the THC. Make sure that you reference in relation to this wire.

Installing I/O Cable for Vector Processor, I/O Adapter, or Channel Adapter

Teradyne Z1800-Series Testers that are to receive the Vector Performance Option or utilize the 16-bit I/O Adapter or the Channel Adapter, require that you replace the internal tester I/O cable between the THC and the tester rear panel. This requirement effects only testers with the serial numbers 102001 through 102196 (Z1800) and serial numbers 112001 through 112161 (Z1820). All other testers have the required cable in place. The original cable (PN 45762-60) is a 40 conductor flat cable. The replacement cable (PN 45249) is a 50 conductor twisted pair ribbon cable with an adapter bracket to allow secure mounting to the rear panel.

This installation consists of

- Disconnecting the 40-pin cable from the THC,
- Removing it from the rear panel,
- Installing the 50-pin cable and its bracket assembly to the rear panel, and
- Routing it to the THC (or VP).

Follow the steps listed below to install Cable PN 45249

1. Turn off tester power.
2. At the rear panel: set the main circuit breaker to OFF and remove the power cord.
3. Disconnect the old 40-pin cable from THC using the ejectors on the THC's J3 connector.
4. Cut all the cable-ties that secure the internal I/O cable the THC cable harness.
5. At the rear panel: disconnect the external I/O cable using the ejectors on the connector.
6. At the rear panel: remove the nuts and screws that hold the 40-pin connector to the panel. Move the cable away from the panel cutout.
7. Teradyne recommends that you remove the programmer's workstation, if it is installed, and open the right-hand door for the following steps. Slowly and carefully remove the 40-pin cable from the tester.
8. Remove the two nuts from the new cable's adapter bracket. Set them aside for step 10.

9. Orient the bracket so that the text (COMPUTER INPUT) is upright and readable and push the end of the cable with the 2 connectors through the rear panel cutout.
10. Pull the cable all the way through the cutout and position the adapter bracket so that its mounting studs mate with the rear panel mounting holes. Secure the bracket to the rear panel with the previously removed nuts.
11. Route the cable to the THC slot. Be careful—there are sharp angles around the THC and ATB fan assemblies. The 40-conductor cable was routed to the THC by going under the tester's card cage. We recommend that you similarly route the 50-pin cable, but you do not need to route the 50-conductor cable in the same manner. It may be easier to route the cable along the right wall of the test head cage.
12. Insert the cable into the THC using the 40-pin connector or into the VP using the 50-pin connector.
13. Return the tester to operating condition by closing the doors and restoring power. Run Diagnostics to ensure proper installation.

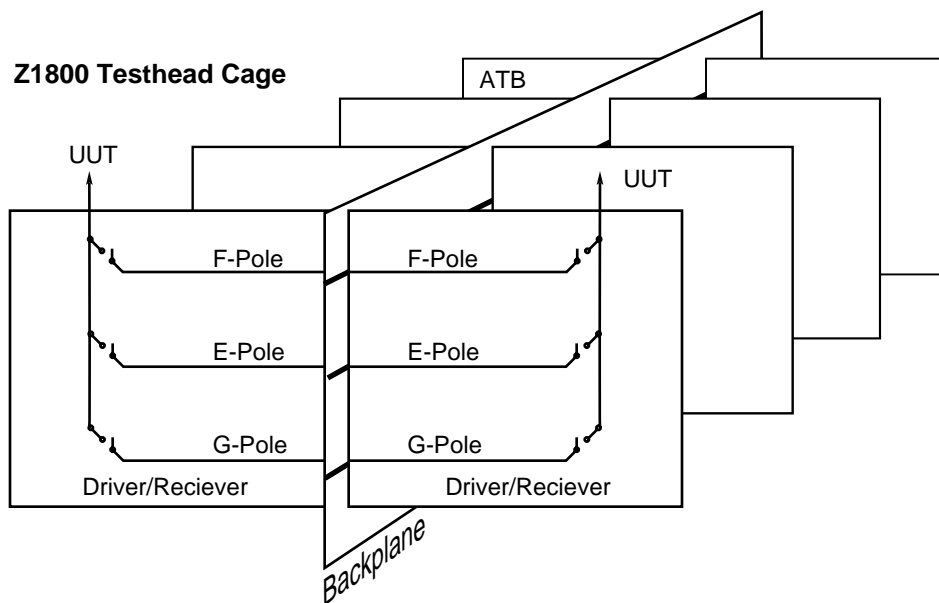
Technical Support Bulletin #44**Issue Date:** June 1992**Revision Date:** N/A**System Model:** Z1800-Series**Subject:** Measuring High Voltage**INTRODUCTION**

The following document describes a potential problem that may occur when using a Z1800-Series test system to make high voltage measurements. It has been determined that the problem can cause reed relay failures within the tester switch matrix. The exact nature of the problem is described below with an appropriate solution.

THE PROBLEM

The problem occurs when using the tester as a voltmeter, i.e. in Test V mode or Test V Stim V mode. This situation requires the node to be measured on the unit-under-test (UUT) to be connected to the tester's measurement system, via the F-Pole. When this connection is made there is an initial current spike caused by the charging of the inherent system capacitance.

This capacitance consists of the tester backplane wiring, all the driver/receiver cards and the measurement system, ATB.

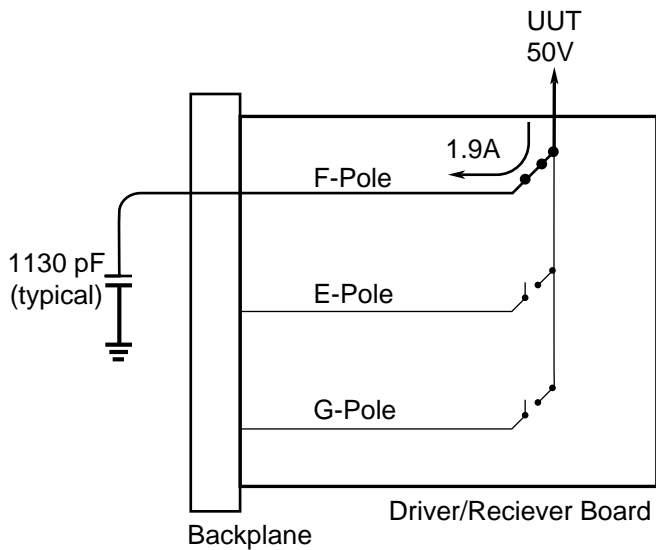


The value of capacitance will vary, depending on how many driver/receiver cards are fitted to the system. With a fully loaded system, the inherent system capacitance is approximately 1350 pF. This value is fairly typical for systems such as the Z1800-Series, and under low voltage conditions (i.e., less than 12 volts) will not cause any problems. However, as the voltage being measured increases, so the charging current increases.

Capacitance:

- 1860/20 Standard (16 boards): ~1020 pF
- 1860/20 Full Cage (64 boards): ~1350 pF
- 1800/40 Standard (12 boards): ~820 pF
- 1800/40 Full Cage (20 boards): ~880 pF

Example 1	Z1860: 64 D/R cards (~1350 pF)	Voltage	Current
		30 V	.7 A
		20 V	.3 A
		15 V	.2 A
Example 2	Z1860: 16 D/R cards (~1020 pF)	Voltage	Current
		30 V	.5 A
		20 V	.2 A
		15 V	.15 A



The MAXIMUM current rating for the reed relays is 500 mA. The effect of carrying currents in excess of this rating will be a reduction in the life of the relay. If this occurs often on the same node the F-Pole relay will “stick” and will remain constantly closed.

Relays that fail in this “short circuit” mode must be replaced.

THE SOLUTION

There are two possible solutions to eliminate the effect of this problem.

1. Resistive load

Connect a series resistor between the point being measured and the tester pin to safely limit the switching current to 500mA.

Voltage being measured	Recommended resistor
less than 12 V	none
12 V to 25 V	50 Ω
25 V to 50 V	150 Ω
50 V to 100 V	300 Ω

Note that if other power-off measurements are required on the same node, then a second channel will have to be wired in parallel and used only for those tests before the high voltage measurements are made.

2. Inductive load

If you wind three turns of 26 AWG wire (normal fixture wire) through a 1cm iron ferrite core and connect this in series with the UUT, sufficient inductance will be present to suppress the current spike. This method has the advantage of avoiding the second channel for low impedance tests.

Applying the Solution

If the impedance of the source being measured is already greater than the values listed above, then the problem will not occur, and you will not need to make changes to your fixture. However, examine the UUT for the following situations to determine where to apply the suggested changes.

- Find all the places where high voltages are being tested.
- Determine if the source impedance exceeds the values listed.

If you are in doubt, apply the solution.

High voltage power supplies with large by-pass capacitors will probably be the most common source of this problem. Most other sources (eg op-amps, zener diodes) are either tested “power-off” or have a high enough impedance to be self limiting.

Maintaining Accuracy of Measurements

Installing these series resistors will not affect the accuracy of your measurements. The input impedance of the ATB is 1 M Ω . Even if 300 Ω were used, that represents a 0.03% difference. The typical tolerance used for power supply measurements is at least 2 orders of magnitude greater than that.

Technical Support Bulletin #45

Issue Date: July 1992

Revision Date: N/A

System Model: Z1800-Series

Subject: Editing Device Pins in Vector Test

Editing device pins in a vector test so that they do not match template pin count can result in damage to your system or board.

D.1.1 software will not allow you to generate a test from a template when the device pin count does not equal the template pin count. The vector file is not created.

However, you can generate a test with the device pin count equalling the template pin count and then edit the device pin count in the Component ID block so that the pin count is larger or smaller than the template pin count. When you run a test with the pins edited in this manner, random node numbers are used for the unused template pins. These random node numbers have the potential for system and/or board damage.

Technical Support Bulletin #46

Issue Date: July 30, 1992

Revision Date: September 6, 1996

System Model: Z1800-Series with D.X Software

Subject: IEEE-488 Instrument Integration

Information about IEEE-488 Instrument Integration has been updated. It is now called the *Z1800-Series IEEE User's Guide*, Publication Number 1800M176-0796.

Technical Support Bulletin #47**Issue Date:** October 1992**Revision Date:** NA**System Model:** Z1800-Series**Subject:** Calibration Verification of Selftest Assembly**WHY**

The calibration verification of the selftest assembly requires modification. A substitute 10 mH inductor has been authorized for use in this assembly. The standard part (PN 08428) is a 10 mH RF choke, $\pm 5\%$, specified at 700 kHz. The Teradyne verification method recommends measurement of this component with an LCR bridge at 1 kHz. This will result in a value of 8.87 mH $\pm 5\%$. The substitute part is a 10 mH high current choke $\pm 10\%$, specified at 1 kHz. The Teradyne-recommended verification method will result in a value of 10 mH $\pm 10\%$, causing this part to appear to be defective.

WHAT

1. Continue to verify the inductors with an LRC bridge at 1 kHz.
2. Change the limits in Table 2-3 to include the substitute 10 mH part:

Table 2-3 (Changes)
Calibration Verification Checklist and Data Form
 (Selftest Assembly, PN 43179 or PN 45254 or PN 46541)

STEP NUMBER	PARAMETER/ FUNCTION	NOMINAL	TOLERANCE LIMITS	
			LOW	HIGH
1.1.20	L1	0.88 mH	0.835	0.925
1.1.21	L2	8.87 or 10 mH	7.983	11.000
1.1.22	L3	88 Mh	83.51	92.49

Technical Support Bulletin #48

Issue Date: October 1992

Revision Date: March 1993

System Model: Z1800-Series

Subject: Erroneous Failure Reports in Diagnostics

Test 236 of the THC Diagnostics

On the Z1811, test 236 on the THC will fail. If this test is put in repeat, it will pass as the analog bus is discharged. A software bug discovered in the diagnostics has been corrected, and the corrected software will be released with D.3.

Technical Support Bulletin #49

Issue Date: February 1993

Revision Date: NA

System Model: Z1800-Series

Subject: Error Messages During Digital Test Execution

Users with the Vector Performance option may have noticed error messages during execution of digital tests. The error message "VP FIFO full" is symptomatic of the problem.

To correct this problem, Teradyne is shipping with this TSB a Teradyne Corrective Service diskette, PN 46720. This update applies to all Z18xx D.2 operating system installations. It is important that *all* users of the D.2 operating system use this update even if you do not have the Vector Performance option.

To update your D.2 installation, use the DOS "COPY" command to copy the file on the diskette to the subdirectory where you have installed the Z18xx D.2 operating system. This is usually in the C:\mos directory. This update replaces the file "68k.img."

If you have any problems with the update, call 1-800-457-8326.

Technical Support Bulletin #50

Issue Date: April 1993

Revision Date: NA

System Model: Z1800-Series

Subject: Using 18XX System Software with DOS 6.0

This notice is directed to users of Z18xx test systems with D.1.1 or D.2 or D.2.1 system software.

A potential problem has been discovered for these users if they elect to upgrade their PC to DOS 6.0 operating system. Due to a backward compatibility problem in DOS 6.0, some Z18xx user files may, under certain circumstances, be lost.

The problem occurs only if you upgrade to DOS 6.0 and then reinstall the Z18xx system software. The problem is that when you reinstall the Z18xx system software, files in \PGT\TPL (if any are present) may be lost. This is because the DOS 6.0 operating system did not maintain compatibility of the version of the "xcopy" command used by the Z18xx installer script. Again, this pertains only to those who are installing version D.1.1, D.2, or D.2.1 of the Z18xx system software.

Users who have saved entire sections of their test programs by way of the Utilities/Write function, and therefore have existing files in \PGT\TPL, must exercise caution if the files in \PGT\TPL are to be preserved.

If files exist in the \PGT\TPL directory, the system software installation script presents three choices:

- 1) Move all files in \PGT\TPL to a specified directory,
- 2) Delete all files in \PGT\TPL directory,
- 3) Abort and manually move or delete files.

If you elect to save the files in another directory, select Abort, (choice "3") and manually move the files. Do NOT choose "1" because that choice will result in losing all files in \PGT\TPL.

This problem will not occur when installing Z18xx operating system version D.2.2.

Technical Support Bulletin #51**Issue Date:** May 1993**Revision Date:** NA**System Model:** Z1800-Series**Subject:** Installing ProcessWatch, Rev. A.0

There are known problems in the installation process of the ProcessWatch software. These problems may create some confusion while installing the ProcessWatch software but do not affect the performance of the software.

First Installation of ProcessWatch

Directions in the ProcessWatch manual indicate installation of the ProcessWatch software is accomplished by typing A:INSTALL. This must be done both for the ProcessWatch Monitor software (disk 1 of 3) and for the ProcessWatch Reports software (disks 2 of 3 and 3 of 3). To install all ProcessWatch software, follow these steps:

1. Insert ProcessWatch Monitor disk (1 of 3) in the desired drive.
2. From the DOS prompt, type **A:INSTALL** where A: is the disk drive designator of where the ProcessWatch disk is inserted.
3. Follow the directions on the screen to install the ProcessWatch Monitor software.
4. After returning to the DOS prompt, remove ProcessWatch Monitor disk from the drive.
5. Insert ProcessWatch Reports disk (2 of 3) in the desired drive.
6. From the DOS prompt, type **A:INSTALL** where A: is the disk drive designator of where the ProcessWatch disk is inserted.
7. Follow the directions on the screen to install the ProcessWatch Reports software. When directed to insert the disk labeled *DISK 2*, insert ProcessWatch Reports disk (3 of 3).
8. After returning to the DOS prompt, remove ProcessWatch Reports disk from the drive.

Reinstallation of ProcessWatch

When ProcessWatch software is reinstalled, no indication is given as to the station id or stage id assigned to the system. Also, no opportunity to change the station or stage is offered during the reinstallation of ProcessWatch software. After ProcessWatch software has been reinstalled you can use any text file editor to view or change the station id and/or the stage id, which are stored in the \PWATCH\CONFIG\STATION.ID file. The first line of the STATION.ID file is the station id assigned to the system and the second line is the stage id.

Technical Support Bulletin #52

Issue Date: July 1993

Revision Date: NA

System Model: Z1800-Series

Subject: Calibration Verification Test Methods (Oscillator Verification)

In the Calibration Verification Test Methods for the Z1800-Series Self-Test Assembly, a method of verifying the oscillator is given in paragraph 2.3.1.7 of the *Z1800-Series Maintenance Manual*, Vol. 1. Verification of the oscillator is unnecessary for the Z1800-Series Self-Test Assembly (PN 45254) since these signals are not used by the system diagnostics and calibration routines. Historically, these signals were provided as external clocks for testers such as the Z875. Since Z1800-Series testers do not use external synchronization clocks, there is no reason to require verification of these signals on the self-test assembly.

When calibrating your tester, omit Step 1.1.3.5 in Table 2-3, Calibration Verification Checklist and Data Form, Self-Test Assembly, PN 43179 or 45254 or 46543, of the *Z1800-Series Maintenance Manual*, Vol.1, found on page 3-33 of the 10th edition and later.

Technical Support Bulletin #53**Issue Date:** August 1993**Revision Date:** NA**System Model:** Z1800-Series**Subject:** Preventing DMA Transfers on I/O Adapter (PN 45454) Rev 2.4 and 2.5

The PCA I/O Adapter, Revs. 2.4 and 2.5, (PN 45454) responds to DMA transfers in 66 MHz PCs when it should not. This problem can occur on slower PCs as well.

For earlier revisions of I/O Adapter (PN 45454), contact the Teradyne Repair Parts Service (RPS) to arrange a board exchange. Note that this is not a free service, and an exchange fee will be charged. Call RPS at 1-800-343-2990 (United States, except Massachusetts), 1-800-882-2086 (Massachusetts). International customers should call their local stocking centers; a list of numbers follows.

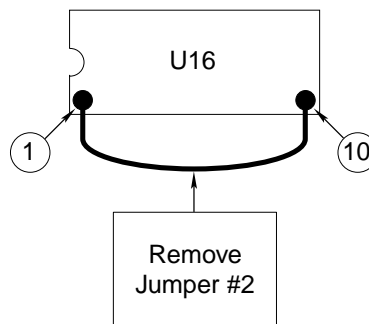
International Stocking Centers

Bracknell, England	44/344-867567
Colombes, France	33/1 46 13 15 00
Milan, Italy	39/2-2134601
Munich, Germany	49/89-41861-0
Seoul, Korea	82/2-548-0724/5
Singapore	65/773-0772
Stockholm, Sweden	46/8-750-5950
Taoyuan, Taiwan, R.O.C	886/3-3268300
Tokyo, Japan	81/3-3711-8597

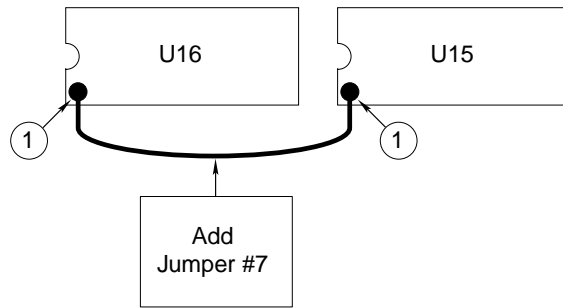
The problem occurs because of erroneous memory transfers due to a jumper connection from U16-1 to U16-10 (GND).

You can remedy this situation as follows:

1. Turn off your computer and remove the I/O Adapter board.
2. On the solder side of the board (noncomponent side), remove jumper #2 between U16-1 and U16-10 (GND).



3. Connect U16-1 and U15-1 by soldering a 26-gauge jumper between U16 pin 1 and U15 pin 1.



4. Reinstall the I/O Adapter in your PC.

Technical Support Bulletin #54

Issue Date: March 1994

Revision Date: NA

System Model: Z1800-Series

Subject: A.5 Diagnostics Release Notes

A.5 diagnostics are being made available to all D-level customers with this edition of the Z1800-Series Technical Support Bulletin Manual. (A.5 diagnostics changes have also been rolled into E.0 diagnostics.)

These diagnostics which correct intermittent diagnostic failures and improve Driver/Receiver II diagnostics replace diagnostic revisions A.1 through A.4. A.5 diagnostics work only with D.2.X revisions of the system software.

The problems you may have been experiencing include

- Intermittent driver/receiver master relay failures,
- Intermittent messages reading "self-test block not found,"
- Intermittent ATB diagnostic failures, and
- Intermittent Test Head Controller test 600 (Count test) failures.

A.5 includes all changes since A.1 diagnostics. The significant changes are as follows:

- ATB_Clr command is invoked in several files.
- ATB system capacitance calculations have been modified.
- ATB tests 175–181; 200–209; 300–309; 500; 600; and 708 have been modified.
- Driver/Receiver II relay numbering has been corrected.

Technical Support Bulletin #55**Issue Date:** March 1994**Revision Date:** NA**System Model:** Z1800-Series**Subject:** PCIO Board Compatibility Issues

This Technical Support Bulletin addresses three compatibility issues relating to the PCIO board.

1. 486 PCs with a clock speed greater than 33 MHz will not function with systems equipped with PCIO Board PN 45030 and the standard Test Head Control board. To fix this problem, you will need to order the PCIO update kit PN 45280 which includes PCIO board PN 45454 and a cable.
2. D.2.3 or E.0 system software requires that U14 and U30 on the PCIO board PN 45454 (045-454-00) be revision A.0 or greater. If these devices are not A.0 or greater, you will see the error message, "PC-IO Hardware revision does not match software revision" indicating that the PCIO and software are incompatible. If you get this error message, call Z18XX Product Support at 1-800 HLP-TEAM.
3. 486 PCs with a clock speed of 33 MHz or greater are not supported by the PCIO board PN 45454 (also PN 045-454-00) with a revision level less than 2.6. If you have one of these fast 486 PCs with the PCIO board at revision 2.5, VP timeouts and FIFO Full errors may occur. You can upgrade revision 2.5 PCIOs to revision 2.6 by simply changing a wire jumper. Follow the instructions below.
 - a. Remove the jumper between U16, pin 1, and U16, pin 10.
 - b. Add a wire jumper between U16, pin 1, and U15, pin 1.
 - c. Change the revision level on the board from 2.5 to 2.6.
 - d. Add the parameter *-t8* to the PCIO statement in the autoexec.bat file as shown below:

```
PCIO -p300 -i10 -md000 -t8
```

If the previous approaches do not solve FIFO Full errors, E.0 software and a VP GAL change is required. The GAL is included in the E.0 upgrade kit. The preferred approach is to upgrade the VP GAL, and then add the parameter *-t0* to the PCIO statement in the autoexec.bat file as shown below:

```
PCIO -p300 -i10 -md000 -t0
```

For further information, call Z18XX Product Support at 1-800 HLP-TEAM.

Technical Support Bulletin #56

Issue Date: March 1994

Revision Date: NA

System Model: Z1800-Series

Subject: The Effect of Dual Stim Modes on Pre-E.0 Test Programs

Test V Stim I measurements below -12 Volts (with the High Voltage Option installed) are not implemented in software revisions below E.0. E.0 software corrects this problem and utilizes the High Voltage Option above +10 V and below -12 V.

Technical Support Bulletin #57

Issue Date: March 1994

Revision Date: NA

System Model: Z1800-Series

Subject: Time Delay in Adjustable Power Supply Fuses

The fuses in the adjustable power supplies (Teradyne PN 61428, part of PN 45165) in all Z1800-series testers have been changed from Bussman GMC 2.5 Amp, 250 V, Time Lag (Kepco PN 141-0097) to Bussman GMD 2.5 Amp, 250 V, Time Delay (Kepco PN 141-0102, Teradyne PN 090-005-00). Although both fuses have the same current rating, their time delay characteristics are slightly different. The replacement has a longer time delay.

This change was made to compensate for the slightly higher surge current into the power supplies of systems using 50 Hz power than systems using 60 Hz power.

Technical Support Bulletin #58

Issue Date: March 1994

Revision Date: NA

System Model: Z1800-Series

Subject: Running Diagnostics With Fully Loaded Z1820 or Z1860—
D-Level Software

When running diagnostics on a Z1820 or Z1860 completely loaded with 64 Driver/Receiver I or II boards, you may find that the driver/receiver digital frequencies diagnostic tests fail when you put any driver/receiver on an extender board. The extender board adds a significant extra capacitive load to the system.

If you are having this problem when testing a driver/receiver board on an extender board, pull several driver/receiver boards out of the tester so that the system is not fully loaded.

After you have run diagnostics on the driver/receiver board on the extender board, remove the extender board, reinsert all the driver/receiver boards, and run diagnostics again to verify the proper operation of all the driver/receiver boards.

Technical Support Bulletin #59**Issue Date:** March 1994**Revision Date:** NA**System Model:** Z1800-Series**Subject:** DRI/DRII and ATB Capacitor Test Variances**Symptoms:**

- With DRII boards installed in the system, ATB Diagnostic Test 500 (1000 pF) may fail low by as much as 30 pf with any A.X diagnostic selftest less than revision A.4.
- Any capacitor test between 10 pF and 10,000 pF may measure differently on systems shipped before August 1993 by as much as 100 pF higher to 30 pF lower.
- The following hardware combinations list the worst possible errors of 1000–10,000 pF capacitor tests reported to date. These are with the typical 40 pF system capacitance already subtracted. System accuracy specification is $\pm 3\%$ & ± 3 pF of target value (33 pF at 1000 pF target).

	ATBII Rev. E.0 or Less	ATBII Rev. F.0 or Greater
DRI	up to 100 pF high (fail spec)	up to 30 pF high (pass)
DRII	up to 70 pF high (fail spec)	< 5 pF error (pass)

Cause:

1. All ATBII boards shipped prior to February 1994 and some late model ATBI boards shipped in 1993 may be affected. Compliance diodes (CR 11, 12) are automatically switched on at 1000 pF, and may have up to 70 pF excessive capacitance. At 999.9 pF and below, these diodes are out of the circuit and do not affect capacitor tests. As the measured capacitance increases above 3,000 pF, the 70 pF variation becomes a small error in comparison to the measured value and the tests are within the system specification of 3%.
2. DRII boards have up to 30 pF less parasitic capacitance than DRI boards.

Fix:

1. ATBII must be rev. F.0 (ECO 4471) or greater. Replace each diode, CR11 and 12, with 3 IN914B diodes in series. For replacement parts or assistance call 800 HLP-TEAM in North America or your local service office.
2. Use Diagnostic revision A.4 or higher with D.X system software. This correctly calculates the DRI/DRII board capacitance for selftest.
3. DRII boards have less capacitance error than the DRI boards. Both boards will produce tests within the published system specification. If no offset has been programmed and correct test tolerances have been programmed, the DRII system will give even more repeatable results than the DRI system.

Technical Support Bulletin #60**Issue Date:** March 1994**Revision Date:** NA**System Model:** Z1800-Series**Subject:** DRII Systems—Intermittent Test Failures**Symptom:**

All of these problems have been reported on Z1850 and Z1860 systems with more than 24 DRII boards installed. In addition, symptoms 3 and 4 have been reported on individual DRII boards in all Z1800-Series systems.

1. Intermittent diagnostic digital test failures.
2. Intermittent diagnostic THC count test failures.
3. Intermittent Gray code test failures. The signal will appear to have an additional 100 nS slew rate from 5 V to 0 V.
4. Intermittent vector test failures. The vector stimulus will appear to stick low or high in some sequences.

Cause:

1. Increased backplane signal-to-noise ratio with DRII cards installed.
2. Error in diagnostic software and THC marginal timing signal quality.
3. Out-of-specification drive transistors.
4. Marginal timing signal on VP board.

Fix:

1 & 2:

- Change backplane terminator RP (see table) from PN 08217 to PN 090-034-00. (ECO 4443 and 4461.) Some systems may have an alternate custom made terminator installed in the following locations:

System	PN	Revision	RP#
Z1800	45032	F.0 or greater	RP6
Z1820/60 Front	45351	F.0 or greater	RP10
Z1820/60 Rear	45353	F.0 or greater	RP7
Z1840	46054	B.0 or greater	RP6
Z1812	46627	C.0 or greater	RP6
Z1850	47004	B.0 or greater	RP6
Z1812	46527-02	C.0 or greater	RP6
Z1811	46527-01	C.0 or greater	RP6

- DRII cards PN 46153 must be rev. E.0 or greater (ECO 4418). This places 100 ohm resistors in four synch lines.

- THC PN 45026 must be rev. N.0 or greater (ECO 4483). This corrects a D-synch pulse width with a cut/jumper. It allows the THC to operate correctly on an extender board. Other applicable ECOs are as follows:
 - ECO 4170, rev. L.0—changes backplane drivers from "HC" to "F" logic, and corrects an intermittent count problem.
 - ECO 4444, rev. M.0—unrelated to this problem, fixes an intermittent start pad problem.
 - Use diagnostic A.4 with D.2.3 system software and diagnostic E.0 or higher with E.0 system software.
 - VP system must have VP at revision J.0 or greater. See item 4.
3. DRII cards must be at rev. E.0 or greater and include rework ECO 4447. This replaces "Philips" brand drive transistors identified by a "PH" in all odd number locations from Q3 to Q65 with alternate brands.
 4. VP must be at revision J.0 or greater (ECO 4476). Change GAL U55 to revision B.0 or greater.

Contact 1-800 HLP-TEAM in North America or your local service office if you suspect your system has not been updated. Retrofit kits are available.

Technical Support Bulletin #61**Issue Date:** March 1994**Revision Date:** April 1994**System Model:** Z1800-Series**Subject:** Z18XX DRII Systems—Fixture Wiring Requirements

Symptom:

Digital drive errors may occur with Z1800-Series systems using the DRII card. The symptoms may vary from intermittent digital tests results to no digital drive at all. The same tests may work properly on systems with DRI cards.

These problems should not occur if your fixture power wiring is done according to Teradyne fixture wiring guidelines first published in our *Mark 3 Fixture Assembly Manual* in May 1988 and also included in the *Z1800-Series Programmer's Guidebook*, fifth edition, December 1992.

Cause:

Some fixture vendors have not followed Teradyne's recommended wiring guidelines.

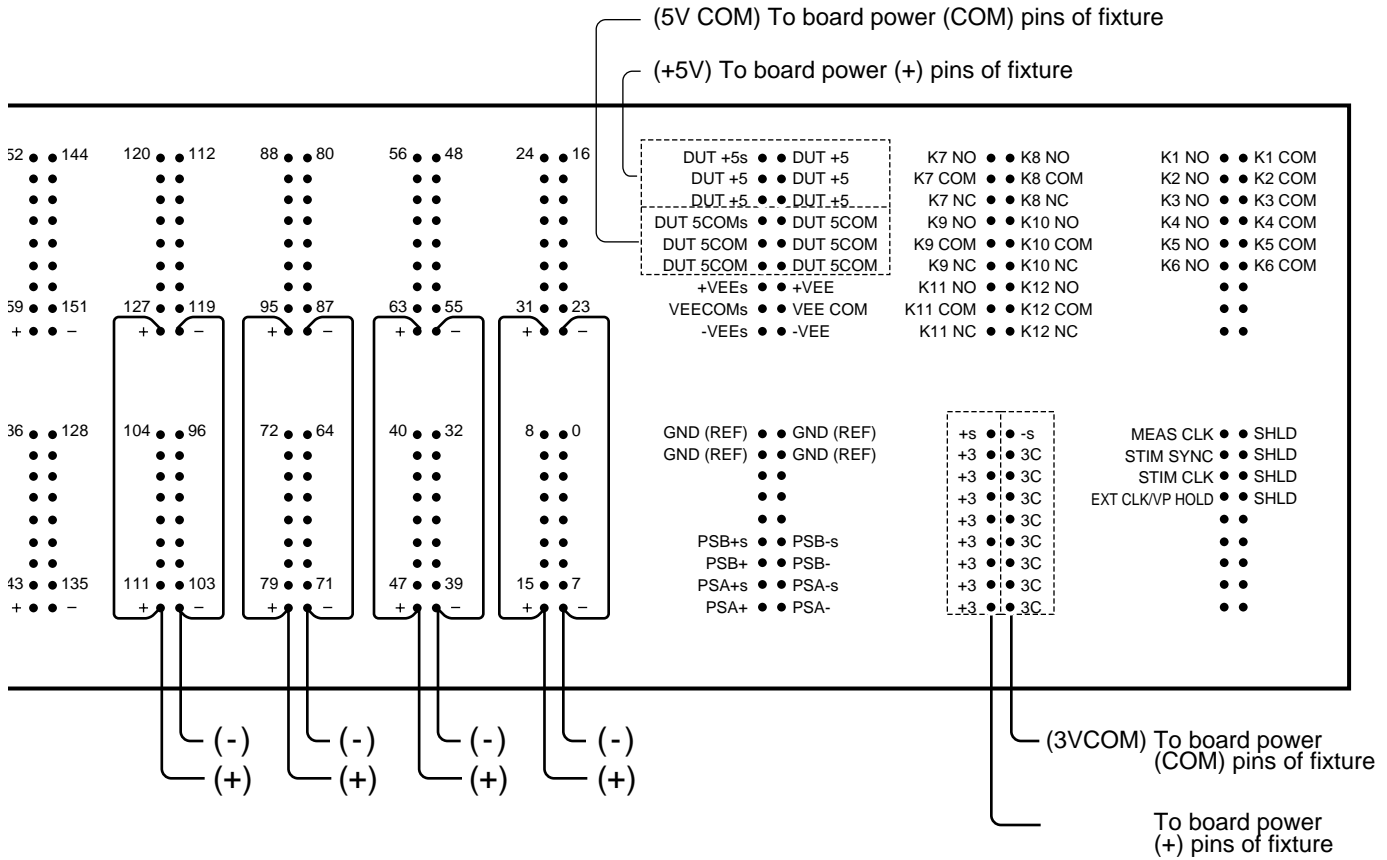
If the correct number of power and ground wires (1 set each per ampere of current drawn by the board-under-test) are installed and no more than 3 V+/V- driver/receiver pins are daisy-chained together to the board power bus, the DRII should function correctly.

DRII boards draw all drive power through the V+ and V- sense pins on the interface. This allows the boards to be wired to either a 5 V or 3 V source. There are no backplane connections to the system power.

DRI board drivers will still function if no V+ and V- wiring is included in the fixture, because they are connected to the 5 V system power. The sensing is marginal, but is acceptable for Gray code tests, where because only a limited number of transitions occur on any given synch pulse, the current draw does not cause significant threshold level shifts at the DUT. The omission of V+ and V- wiring will not work if vectors are used and many transitions occur simultaneously. The drive thresholds will shift, and the DUT may not respond correctly.

Fix:

For proper operation, all V+ and V- pins must be connected to 5 V or 3 V and GND respectively. The minimum requirement are described in the published guidelines of the *Z1800-Series Programmer's Guidebook*, fifth edition, December 1992. For improved performance, rewire the sense pins as shown in the diagram below. Each DR board has 32 drivers and 2 each V- and V+ sense pins available. This recommendation reduces the daisy chain to two and also changes the procedure from chaining between boards to connecting each board with at least a single sense pin. This will insure that a 5 V and 3 V board are not connected together. Even better performance can be achieved by connecting each sense pin to the DUT.



Note: The block to which the 3 volt option can be connected is accessible through the J1 connector and can be used for custom applications if the 3 volt option is not installed. See the RAB II documentation in the *Z1800-Series Options Manual*.

Technical Support Bulletin #62

Issue Date: March 1994
Revision Date: April 5, 1996
System Model: Z1800-Series
Subject: Fixture Vacuum Filters

Z1800-Series test systems shipped after March 1, 1996, have a new fixture vacuum filter installed in place of the older style screen filter. This new filter will protect the system's vacuum valves and vacuum pumps from particles small enough to pass through the old style screen filter. This new filter is a disposable filter and will have to be replaced when the filter's pores fill up enough to hinder proper fixture actuation. The average length of time that the new filter is effective is 4 to 6 weeks. Replacement filters can be ordered from Teradyne Customer Parts Service, CPS (formerly RPS). A box of 25 filters (PN 090-328-00) can be ordered by calling CPS at 1-800-343-2990.

In addition, the filters (Polyethelene Filter, PN 14009) can be ordered directly from the filter vendor:

If your tester resides in a clean environment, and you prefer to use the older style screen filter, you can order that filter, PN 10524 from RON-VIK.

RON-VIK, Inc.
800 Colorado Avenue South
Minneapolis, MN 55416
USA

Phone: 1-800-328-0598
FAX: 1-612-545-0142

Technical Support Bulletin #63

Issue Date: August 1994

Revision Date: NA

System Model: Z1800-Series

Subject: AC Power Distribution Specifications and Recommendations

The Z1800-series AC Power Distribution is designed to supply AC power to a load of 15 Amps at 120 volts or 7.5 Amps at >200 volts. These specifications are sufficient for a system with all driver/receiver slots filled and all standard options installed and operating under full load.

Connecting equipment such as logic analyzers, or other test equipment results in a significant additional current load on the Z1800-series AC distribution system. This additional equipment may present a current overload sufficient to trip the input AC breaker. Teradyne recommends that an additional AC power source be provided for the external equipment.

Technical Support Bulletin #64

Issue Date: August 1994

Revision Date: NA

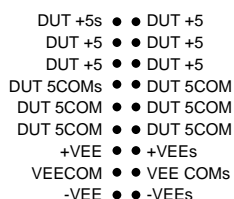
System Model: Z1800-Series

Subject: Internal Power Wiring to Vee Connections

Problem

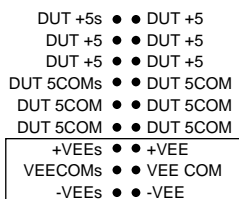
The internal power wiring to the Vee connections in the Z18XX interface is not as illustrated in the Z18XX manuals prior to those shipped with the E.1 system software release.

Manuals prior to E.1 showed the interface wired as illustrated below.

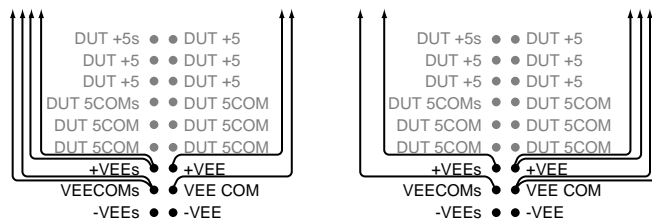


Correction

The correct illustration with the Vee power connections swapped is shown below.



In most customer applications and programs this discrepancy does not affect production testing because Vee power connections have one power probe and one sense probe with the same gauge wire. However, if your fixtures were originally wired to make use of heavier gauge wires or probes for power pins, and lighter gauge sense wires, you may wish to correct your fixture wiring by switching the power and sense connections for each of the two power supply outputs.



Original Wiring

Corrected Wiring

Technical Support Bulletin #65**Issue Date:** November 1994**Revision Date:** NA**System Model:** Z1800-Series**Subject:** Configuring Refresh Strobe to Ensure PC/Tester Communication**Problem**

Communication between a 386 or 486 PC is lost when the PCIO tries to respond to refresh strobes as it would to normal 18XX system software commands.

Cause

The refresh strobe is a hidden (or transparent) function within all 386/486 PCs that maintains the data in the Upper-Memory-Block (UMB). In some CMOS setups this function is called "SHADOW RAM" or "SHADOW ROM" and in other PCs it is called "HIDDEN REFRESH".

The PCIO board (PN 045-454-00 or PN 045-456-00) is memory mapped to a 4K byte region in the UMB, by the -mXXXX parameter in the PCIO command usually found in the AUTOEXEC.BAT file. When the hidden refresh function is enabled, the PCIO will try to respond to the refresh strobes as it would to normal 18XX OS commands. Because these responses are unexpected by the 18XX OS, all PC to Tester communication is garbled.

Below is an example of the Advanced CMOS Setup menu from a 486 PC. Notice that the "Adaptor ROM Shadow C800, 16K" refresh function (highlighted in boldface) is DISABLED. This is the default memory address location for the PCIO.

```

+-----+
|          BIOS SETUP PROGRAM - ADVANCED CMOS SETUP          |
|          (C) 1990 American Megatrends Inc., All Rights Reserved          |
+-----+
| Typematic Rate Programming :Disabled | Video   ROM Shadow C400,16K :Enabled | |
| Typematic Rate Delay (msec):500     | | Adaptor ROM Shadow C800,16K :Disabled |
| Typematic Rate (Char/Sec) :15       | | Adaptor ROM Shadow CC00,16K :Enabled |
| Above 1 MB Memory Test :Disabled    | | Adaptor ROM Shadow D000,16K :Enabled |
| Memory Test Tick Sound :Disabled    | | Adaptor ROM Shadow D400,16K :Enabled |
| Hit <DEL> Message Display :Enabled   | | Adaptor ROM Shadow D800,16K :Enabled |
| Hard Disk Type 47 RAM Area :0:300   | | Adaptor ROM Shadow DC00,16K :Enabled |
| Wait For <F1> If Any Error :Enabled  | | Adaptor ROM Shadow E000,16K :Enabled |
| System Boot Up Num Lock :On          | | Adaptor ROM Shadow E400,16K :Enabled |
| Weitek Processor :Absent             | | Adaptor ROM Shadow E800,16K :Enabled |
| Floppy Disk Seek At Boot :Disable    | | Adaptor ROM Shadow EC00,16K :Enabled |
| System Boot Up Sequence :A:, C:     | | System ROM Shadow F000,64K :Enabled |
| External Cashe Memory :Enabled       | |                                     |
| Internal Cashe Memory :Enabled       | |                                     |
| Turbo Switch Function :Enabled       | |                                     |
| Password Checking Option :Always     | |                                     |
| Video ROM Shadow C000,16K :Enabled   | |                                     |
+-----+
|-----| ESC:EXIT v><^: Sel (Ctrl) Pu/Pd:Modify F1:Help F2/F3:Color |-----|
|-----| F5: Old Values F6: Bios Setup Defaults F7:Power-On Defaults |-----|
+-----+

```

Solution

A proper 18XX installation is not limited to location C800. However, if the "mapped" location is changed, you must ensure that the corresponding Shadow Refresh address range is also disabled.

Some PC CMOS Setups may not have a specific Shadow RAM/ROM disable selection. In this case you may have to disable all refresh functions. You will usually find the overall refresh selection on the ADVANCED CHIP SET Menu. It is usually called "Hidden Refresh". This will turn off all refresh.

PCs that are used as "Programming Stations" and that do not have a PCIO board installed, are not affected, and no CMOS changes are required.

Technical Support Bulletin #66

Issue Date: April 1995

Revision Date: January 21, 1997

System Model: Z1800-Series

Subject: Preventing Driver/Receiver Board Damage

Applicability

This bulletin is applicable to the following part numbers: PN 45028 (DR1); PN 46153 (DR2); PN 5100X (DR2p); PN 51XXX (DR2d).

Background

A situation that can potentially damage digital driver/receiver boards has been identified. The damage may occur on all driver/receiver board DR1, DR2, DR2p, and DR2d types. The situation can happen when there is a voltage present on the device under test that exceeds the voltage connected to the test system's digital drivers. For example, these conditions are met when you program a board that uses +5 volt power to the board and Z18xx digital drivers, and the board also has other supply voltages outside the 0 to 5 volt range. Damage can occur during debug operations when a programmer attempts to add a single new digital test worksheet using the Generate function in the Tools menu. If all of the following conditions are met, damage can occur to the driver/receiver board.

Problem

Driver/receiver boards can be damaged if ALL of the following conditions are met.

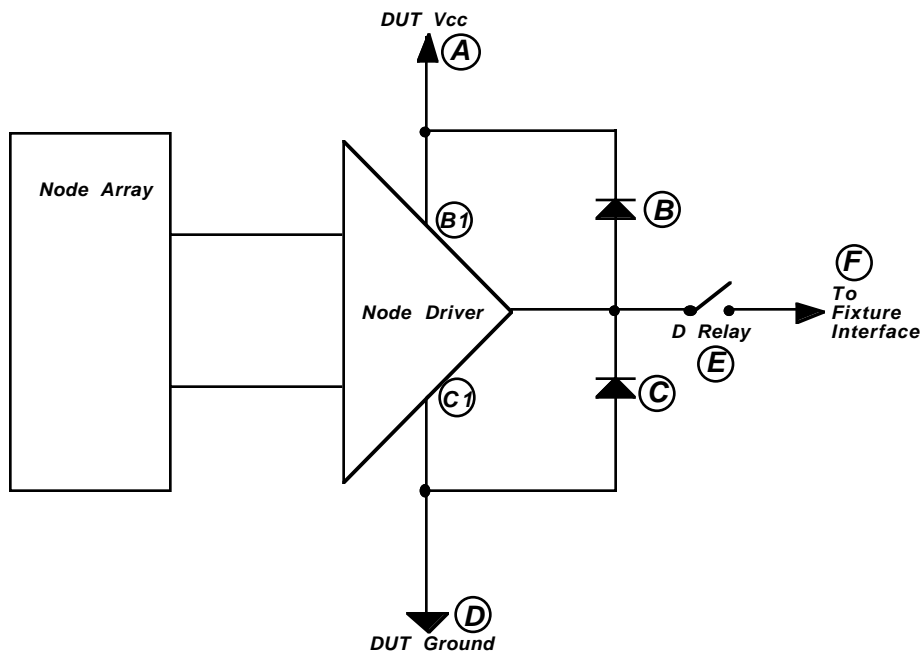
1. The device being programmed has at least one pin whose voltage is greater than the TTL logic high voltage on the drivers, or less than the TTL logic low voltage on the drivers.
2. You must be doing a generate from the worksheet level on a test type using digital driver Stims.
3. The manual test generate fails because the vector or Gray code template is not found in the library, causing a "default test." This situation assigns all of the pins as STIM pins.
4. The board and fixture are installed on the test system; vacuum is applied, and DUT power is applied.
5. You have later than revision C.1 software.

If you are using Revision C.1 through E-Level, the damage will occur as soon as the "default test" comes up, if the power is on. On F-Level and above, the damage may occur if you execute (that is, press Start) before performing steps 8 through 10 of the following solution.

The sequence of events is illustrated in the diagram below.

If the voltage on node (*F*) exceeds the voltage at *Vcc* (*A*) and when the D Reed (*E*) closes, the two voltage sources are shorted together through the clamping diode (*B*) or driver transistor (*B1*). Conversely, if the voltage on node (*F*) is below the ground potential (*D*) and the D Reed (*E*) closes, the voltage source is shorted to ground through a clamping diode (*C*) or driver transistor (*C1*).

Even if the voltage at (*F*) is within the specified voltage, transistor (*B1*) could be damaged if the driver is trying to drive HIGH (stim high) when (*F*) is accidentally connected to the voltage source. Similarly, transistor (*C1*) could be damaged if the driver is trying to drive LOW (stim low).



Solution

Steps 7 through 10 in the procedure below prevent shorting the two voltage sources together.

1. A fixture is connected to the tester, and interface vacuum is applied.
2. A printed circuit board is on the fixture, and board vacuum is applied.
3. All board powers are applied to the board-under-test through the fixture.
4. You have entered all device pins/nodes into the program (either manually or from an input list).
5. From the worksheet menu you select the function Tools/Generate Test.
6. After the Program Generator module of the Z18XX OS fails to find the device template in any library, it prompts you whether or not to choose the Default Test.
7. **Press Cancel to turn off power BEFORE choosing the Default test, entering the editor, or pressing Start**

8. **Choose the Default test. The Default test assigns every node of the test as a STIM node.**
9. **Edit each power node, marking each one Unused before you reapply DUT power.**
10. **Reapply DUT power. At this time the Z18XX OS closes all D Reeds associated with the vector's STIM nodes without shorting the voltage sources together.**
11. Continue debugging the test.

Technical Support Bulletin #67

Issue Date: April 1995

Revision Date: NA

System Model: Z1800-Series

Subject: Novell Network Conflicts With 18XX System Software

Problem

If you try to use the 18XXsystem software from a PC connected to a Novell network, you may find that the files you are creating do not show up in 18XX directories. This problem has been observed with a PC connected to a Novell Network. The symptoms were file "open" and file "read" errors reported by the 18XX system software.

Cause

The Novell Network has a Search Mode parameter which, when on, can cause files to be created in the wrong directory.

The Search Mode is an attribute which is attached to all executable files that reside on a server. The default value for Search Mode is "on."

The conflict between the 18XX system software and the Search Mode is outlined below.

1. Search Mode is on for a program trying to create file XYZ in directory C:\HERE.
2. A file named XYZ already exists in directory C:\THERE, which is in the DOS path.
3. The file XYZ, then, will not be created in C:\HERE as the program expects. It will instead be created in C:\THERE.

Basically, the Search Mode, when on, allows the file system some leeway in where files are created. The 18XX test programs reside in "board directories." Each "board directory" contains files with the same names as every other "board directory." Because each test program is a file called ICT.TST, and the "board directory" that it is in distinguishes it from other test programs, it is important that files be created in the exact directory that the 18XX system software specifies.

Thus, when you turn Search Mode off, the network file system will create files in the exact directory that the 18XX system software requested.

Solution

If your system is connected to a Novell Network, turn off the Search Mode for all 18XX executables prior to using the 18XX.

Technical Support Bulletin #68

Issue Date: June 1995

Revision Date: NA

System Model: Z1800-Series

Subject: WaveScan Demultiplexer Problems and WaveScan Programming Requirements

WaveScan Fixture Assembly

Demultiplexer Board Problem

Cross-talk between the drive signals on the demultiplexer card and the fixture node wiring may occur when the demultiplexer board(s) is installed in the fixture pan of the fixture.

Symptoms

The symptoms are as follows: (1) An 8888 appears in the Meas Val field, or (2) unstable numbers show up in the Meas Val field.

Solution

Teradyne recommends that you install the demultiplexer board(s) on the top platen or top overclamp only.

If all of the inducers to be installed are on the bottom of the DUT, and there is no top platen or overclamp, the demultiplexer board(s) may be mounted in the fixture pan. Take care to mount the demultiplexer board(s) as far away as possible from the fixture node wiring. Teradyne recommends putting the demultiplexer board(s) inside a mu-metal magnetically shielded box.

Demultiplexer Cable Problem

Environmental noise interference with conduction of the RF signals within the demultiplexer cable may occur if you use the unshielded demultiplexer cable PN 047-230-28.

Symptoms

The symptoms are as follows: (1) An 8888 appears in the Meas Val field, or (2) unstable numbers show up in the Meas Val field.

Solution

An Engineering Change Order was implemented to provide magnetic shielding for the RF signals in route to the demultiplexer board. Cables, Revision C and above, have a black sleeve covering the ribbon cable for shielding. All fixtures should be using Revision C or above. If you have cables below Revision C, you should replace them. Contact Terri Souza at Assembly Test Walnut Creek, (510) 932-9600 ext. 278 to order replacement cables.

Validate

Always Run Validate

Validate is an essential step in generating WaveScan worksheet tests. The user must *always* run Validate after generating the test worksheet (Tools/Generate Test).

Validate is necessary to select the correct bias and threshold for the conditions on the board under test. The consequence of not running Validate is that the default biases and thresholds found in the PGEN.CFG file are used, which may result in false failures or false passes when the test is run.

"Not Tested" Pin Type

Use Care When Changing a "Not Tested" Pin Type

In general, pins with a Pin Type of "Not Tested" should not be changed to any other Pin Type. Validate software changes the Pin Type to "Not Tested" for reasons such as

- too small a signal level
- too high a noise level
- excessive variation in signal levels

When you change a pin from "Not Tested" to another Pin Type such as "Normal," the apparent gain in fault coverage is acquired at the risk of producing false failures or false passes when the test is run. If you override Validate, run the test multiple times to ensure stability of the test.

Technical Support Bulletin #69**Issue Date:** June 1995**Revision Date:** NA**System Model:** Z1800-Series**Subject:** Managing Multiple Revisions of 18XX System Software

If you need several revisions of the 18XX on the same computer, each revision requires a separate disk partition. You can easily add partitions by using the DOS SUBST command. The SUBST command directs DOS to treat a specified directory as a disk partition without reformatting and/or repartitioning the hard drive(s).

The following example shows how to use the SUBST command for a system configured with

- One hard drive partition—C:
- A RAM drive—D:
- Two revisions of the system software—D.2.3 and E.4

With two revisions of the system software, you need to build two disk partitions—E: and F:—as follows.

1. **To accommodate the new disk partitions, in the CONFIG.SYS file, change the LASTDRIVE statement to**

`LASTDRIVE=F`

2. **Create individual directories to receive each revision of the system software with the DOS command MD, as shown below.**

`md c:\d23`

`md c:\e4`

3. **In the AUTOEXEC.BAT file delete all Z18XX calling statements such as**

`PCIO -mC800 -i10 -p300 -t0`

and

`Z18XX`

These calls will be made via batch files as explained below.

4. **Add the following two statements:**

`SUBST E: C:\D.2.3`

`SUBST F: C:\E4`

5. **Reboot the system.**

Two new disk partitions now exist on your hard drive.

6. Build the system software batch files.

For the D.2.3 system software—

```
@echo off
set OPATH=%PATH%
set PATH=%PATH%;e:\mos
e:
cd\mos
pcio -mC800 -i10 -p300
18xx.exe
pcio -r
c:
cd \
set PATH=%OPATH%
```

For the E.4 system software—

```
@echo off
set OPATH=%PATH%
set PATH=%PATH%;f:\mos
f:
cd\mos
pcio -mC800 -i10 -p300 -t0
18xx.exe
pcio -r
c:
cd \
set PATH=%OPATH%
```

- Where the statement `set OPATH=%PATH%` records the current DOS path in a temporary environment variable for safe keeping.
- Where the statement `set PATH=%PATH%;f:\mos` adds the MOS directory to the DOS path.
- Where the statements `pcio -mC800 -i10 -p300 -t0` and `18xx.exe` invoke the desired 18xx system software.
- Where the statement `pcio -r` clears the pcio TSR from the PC's memory.
- Where the statement `set PATH=%OPATH%` restores the DOS path to its original condition.

To start either revision of the system software, type the batch file name at the DOS prompt, such as
C:>D23

The D.2.3 system software will be started with all correct path and environment variables.

Technical Support Bulletin #70

Issue Date: April 5, 1996

Revision Date: NA

System Model: Z1800-Series

Subject: Diagnostic Failures with DeltaScan I/II

Problem #1:

Symptom:

When DeltaScan II (PN090-327-00) and cable (PN 046-586-00) are installed and you run the diagnostic for the Relay Array Board II, relays K1 and K2 will fail. This failure occurs only when using the self-test assembly (PN 045-254-00).

Cause:

There is a path between one of the FrameScan II wires from the DeltaScan II board and the bus pull-up resistor in the (PN 045-254-00) self-test assembly.

Workaround:

Remove J4 (the top connector) from the DeltaScan II board when you test the RAB II board.

Solution:

When they are released, F.1 diagnostics will fix the problem.

Problem #2:

Problem:

Damage may occur to the DeltaScan boards when you test the DUT +5V power supply using the new Self-Test Assembly, PN 047-705-00. The problem occurs only if the DeltaScan board is installed in driver/receiver slots 0-19. The DUT 5V diagnostic may fail. DO NOT RUN THIS TEST WITH SOF.

Cause:

There is a path from the +v reeds through a DeltaScan I or DeltaScan II board IF it is installed in slots 0-19.

Workarounds:

1. Locate the DeltaScan board in a non-driver/receiver slot.
2. Locate DeltaScan in driver/receiver slot 20 or higher.
3. Remove the J3 connector from DeltaScan when testing the DUT 5V supply. IF you are required to adjust the supply, be sure to remove the J3 cable first.

Solution:

An ECO is in process to fix the self-test assembly.

Technical Support Bulletin #71

Issue Date: April 5, 1996

Revision Date: NA

System Model: Z1800-Series

Subject: Relay Array Board Conflicts with Testhead Controller Board

Problem

Z1800-Series test systems that use either a Relay Array Board (RAB, PN 045-035-00) or a Relay Array Board II (RABII, PN 045-399-XX) and the test head controller (THC, PN 045-026-00) may be prone to multiple user relay closures on the RAB or RABII when more than one user relay are programmed to close. Test systems with VP controllers do not exhibit this multiclosure problem.

The 18xx diagnostics will not detect multiclosure problems.

Cause

The multiclosure failure occurs because of a shortened clock strobe that latches the relay command data into the RAB's latches.

Solution

To fix this problem, change C12 on the RAB (or RABII) from 47 pF to 100 pF in order to lengthen the strobe from ~100 nsec to ~220 nsec. When you have made this change, permanently mark the RAB's revision number +E4866.

RABII, PN 045-399-XX, revision E.0 and above, will have this change installed.

Technical Support Bulletin #72**Issue Date:** August 31, 1996**Revision Date:** NA**System Model:** Z1800-Series**Subject:** Demonstration Program Fails With Self-Test Assembly III

Problem

All versions of the 18XX system software are shipped with a demonstration in-circuit test that uses the self-test assembly. This in-circuit program is loaded in the directory: \tpd\demo. However, when you use Self-Test Assembly III (PN 047-705-00), the Demo program does not run properly.

Solution

To run the Demo program successfully, you must modify it as follows:

1) Remove the following continuities:

- | | |
|-------------|-------------|
| A) 7 to 23 | D) 47 to 63 |
| B) 15 to 31 | E) 71 to 87 |
| C) 39 to 55 | F) 79 to 95 |

2) Menu: Brd_Power; Test Label: 5 volt

- A) Change the node number for pin 1 from 21 to 7

3) Menu: Linear; Test Label: Measure

- A) Change the node number for pin 1 from 21 to 7.
B) Change the name from "Node 21 test" to "Node 7 test."
C) Change the description from "Retest Vcc at Node 21" to "Retest Vcc at Node 7."

4) Menu: Digital; Submenu: Components; Test Label: Mixed 1

- A) Change the node number from 21 to 7.

Note that once you make these changes, the Demo program will no longer work with any other versions of the self-test assembly.

If you anticipate using the Demo program with self-test assemblies other than the PN 047-705-00, copy the Demo program into another directory and make the modifications in this new directory.

Future releases of the 18XX system software will contain two Demo programs—one for Self-Test Assembly PN 047-705-00 and one for all other self-test assemblies.

Technical Support Bulletin #73

Issue Date: June 5, 1997

Revision Date: NA

System Model: Z1800-Series

Subject: Preventing Relay Welding During Capacitor Discharge

Applicability

This bulletin applies to the following part numbers:

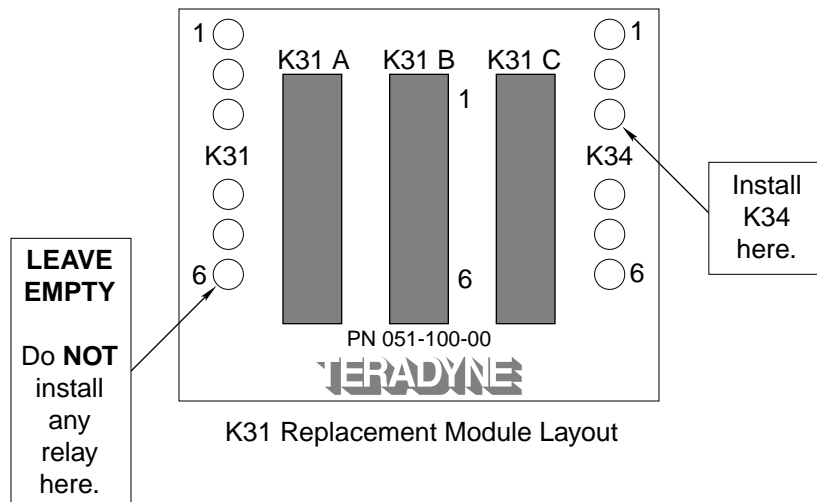
- PN 043-016-00 (ATB1), 043-017-00 (ATB1 with 100 V)
- PN 045-556-00 (ATB1), 045-557-00 (ATB1 with 100 V)
- PN 046-172-01/-02 (ATB2)
- PN 046-160-01/-02 (EAA)
- PN 046-213-01/-02/-3/-4 (EAA with 100 V)

Background

Relay K31 on the ATB/EAA has been susceptible to welding during capacitor discharge routines. Prior to the release of F.1a Diagnostics, there were no tests in ATB diagnostics that would detect that K31 was being welded. Revision F.1a (and above) diagnostics now include Test 730 and 731 which test the contacts of K31 for proper operation.

Solution

A retrofit kit, PN 048-725-00, has been developed to protect K31 from damage. This kit contains a module, PN 051-100-00, which replaces K31 on the ATB board. This module adds a series resistor to the circuit during initial closing of K31 which protects the contacts. This module is now standard on all new ATBs and EAAs from the factory and is available at no charge to any customer who requests one.



Installation Instructions

1. Run ALL system diagnostic tests to verify proper operation before installing this kit.
2. Power off the tester.
Refer to your Z1800-Series Hardware Reference or Operator's Guide for power off instructions.
3. Remove the ATB/EAA assembly from the test head cage, observing all ESD precautions.
4. Remove K31 from the ATB and discard it.
5. Remove K34 from its socket.
6. Plug the K31 Replacement Module into the empty relay sockets noting the Pin 1 orientation of K31 and K34.
7. Plug the relay removed from K34 on the ATB into the socket marked K34 on the PN 051-100-00 module.
8. Reinstall the ATB and power the system back up.
9. Run all system diagnostics.
10. Return system to normal operation.

The installation is now complete.

Technical Support Bulletin #74

Issue Date: July 28, 1997

Revision Date: NA

System Model: Z1800-Series

Subject: FrameScan/CapScan Measurement Instability

Applicability

This bulletin applies to

- all 1800-Series systems which have DeltaScan II (PN 090-327-00) or DeltaScan II with Disconnect (PN 047-081-XX) installed, and
- all 1800-Series fixtures which have a FrameScan Plus Selector Card Rev 1.2 or earlier (PN 051-065-00)

Background

When the system 5 volt power supply exceeds the level of the 5 volts generated on the FrameScan Plus Selector Card, (PN 051-065-00), CapScan and FrameScan Plus measurements can become unstable.

The interim solution was to adjust the system 5V power supply so that its level is slightly lower than the 5V generated on the FrameScan Plus Selector board. To make this adjustment

1. Use a DMM to measure and record the FrameScan Plus 5V on VR1, pin 1, (shown on engineering Reference Drawing 03B51065).
2. Measure and record the system 5V power supply.
3. If the system 5V is higher, adjust the system 5V source until it reads slightly below that of FrameScan.

Do NOT set the system V power supply lower than +4.975 volts. Setting the voltage any lower than this could compromise system performance.

Solution

If your system is producing unstable CapScan and /or FrameScan measurements, replace the Rev 1.3 or below boards with Rev. 1.4 or above. Teradyne recommends that you replace the board rather than adjust the system 5V power supply.

Technical Support Bulletin #75

Issue Date: October 27, 1997

Revision Date: NA

System Model: Z1800-Series

Subject: Distribution of DR2 and DR2D Boards in Your System

Background

When you use combinations of DR2 and DR2D-type boards in 1024 and 2048 node models of Z1800-series testers, certain configurations can cause problems. If your system has 20 or fewer cards, DR2 and DR2D-type boards can be mixed freely in the tester. With larger numbers of cards and relatively large quantities of both DR2 and DR2D-type boards, transmission line effects can distort the clock signals on the backplane, causing intermittent failures.

Symptoms of a bad distribution of these boards show up as digital diagnostic failures. If your system is exhibiting digital diagnostic failures, and the system contains both DR2 and DR2D-type boards, you should first verify that the arrangement of the boards meets Teradyne's recommendations. The proper arrangements of DR2 and DR2D-type boards are listed below

- Boards in the DR2-type category include DR2, DR2A, DR2P, and FIB.
- Boards in the DR2D-type category include DR2D, DRDA, and DR2E.

Note that DR1 boards have no effect on the problem described in this bulletin.

Solution

You can avoid these problems by arranging the boards appropriately. Board arrangement is important only when your system has more than 20 boards, and more than 25% of both types of boards.

Arrangements that work are

1. Locate all DR2-type boards in a block near the VP/THC. Locate all DR2D-type boards in a block after the DR2s and away from the THC/VP.
2. Evenly mix DR2 and DR2D-type boards in the tester, with no more than two boards of the same type side-by-side.
3. Locate DR2 and DR2D-type boards in separate cages (front or rear).

AVOID locating more than 10 DR2D-type boards near the VP/THC, and having 10 or more DR2-type boards beyond them.

Technical Support Bulletin #76**Issue Date:** July 25, 1997**Revision Date:** November 9, 1997**System Model:** Z1800-Series**Subject:** Disconnecting FrameScan Power from the Fixture Receiver

Applicability

This bulletin applies to all Z1800-Series systems which have DeltaScan II installed. The DeltaScan II board is PN 090-327-00 without the Disconnect Module, or PN 047-081-XX with the Disconnect Module. There are two functionally identical designs for the disconnect module:

PN 090-439-00, Cabled Disconnect Module, which is mounted on standoffs and connects via a cable to the older motherboards.

PN 090-438-00, Plug-on Disconnect Module, which plugs directly onto newer motherboards.

This bulletin does NOT apply to systems with DeltaScan I, PN 090-250-00, installed.

Problem

The FrameScan Plus power pins from the DeltaScan II board have always been "hot" at the fixture receiver interface. If these pins are inadvertently shorted out, damage to the DeltaScan II board or FrameScan Module may occur. Incorrectly wired fixtures may also be damaged.

Solution

A FrameScan Disconnect Module has been designed which is installed in series with the FrameScan Plus pins going to the fixture receiver. Its main function is to connect FrameScan Power (+5V, $\pm 15V$) and Data, Clock, and Reset signals to the interface only when needed for FrameScan tests and to disconnect them at all other times.

The board has two modes of operation—*Always ON* (Enabled) or *Switched* (under software control). The operational status is indicated by the +5V OUT LED on the disconnect board. This LED will be ON all the time if the *Switched/Enable Jumper* is in the *Enable* position. If the jumper is in the *Switched* position, this LED will be ON only when FrameScan tests are being executed.

Note that revision F.1b or later of the Z18XX system software is required to control the Disconnect Module in *Switched Mode*.

The FrameScan Disconnect Module has been shipping with all new systems and Multiscan Upgrades since July 1997. Disconnect Modules shipped between July 1997 and November 1997 were shipped in the *Always ON (Enabled)* mode to ensure compatibility with Revision F.1a, and below, of the Z18XX system software.

A retrofit kit, PN 048-724-00, is now available on request, at no charge to customers wishing to take advantage of the added protection it offers. The kit contains the FrameScan Disconnect Module, which mounts directly onto the DeltaScan II board, and a cable and installation instructions. Please contact Teradyne Assembly Test Walnut Creek Sales or your local Teradyne support center to order this kit.

You will need to provide the part number (PN 048-724-00) and the system model and serial numbers of the systems in which you will be installing the retrofit kit(s).

To determine whether or not your system has the FrameScan Disconnect Module installed, and determine its mode of operation, refer to the following procedure.

Inspecting the FrameScan Disconnect Module

1. Exit the 18XX system software.
2. Open (or remove) the Front Test Head Cage door (panel).
On Z1840 systems, the Test Head Cage is accessed from the rear.
3. Locate the DeltaScan II board.
4. Determine if the FrameScan Disconnect board is installed. You can make this determination without removing any boards and without powering down the system. See Figure 1 below.

If the disconnect board is NOT present, follow the instructions above to order the retrofit kit.

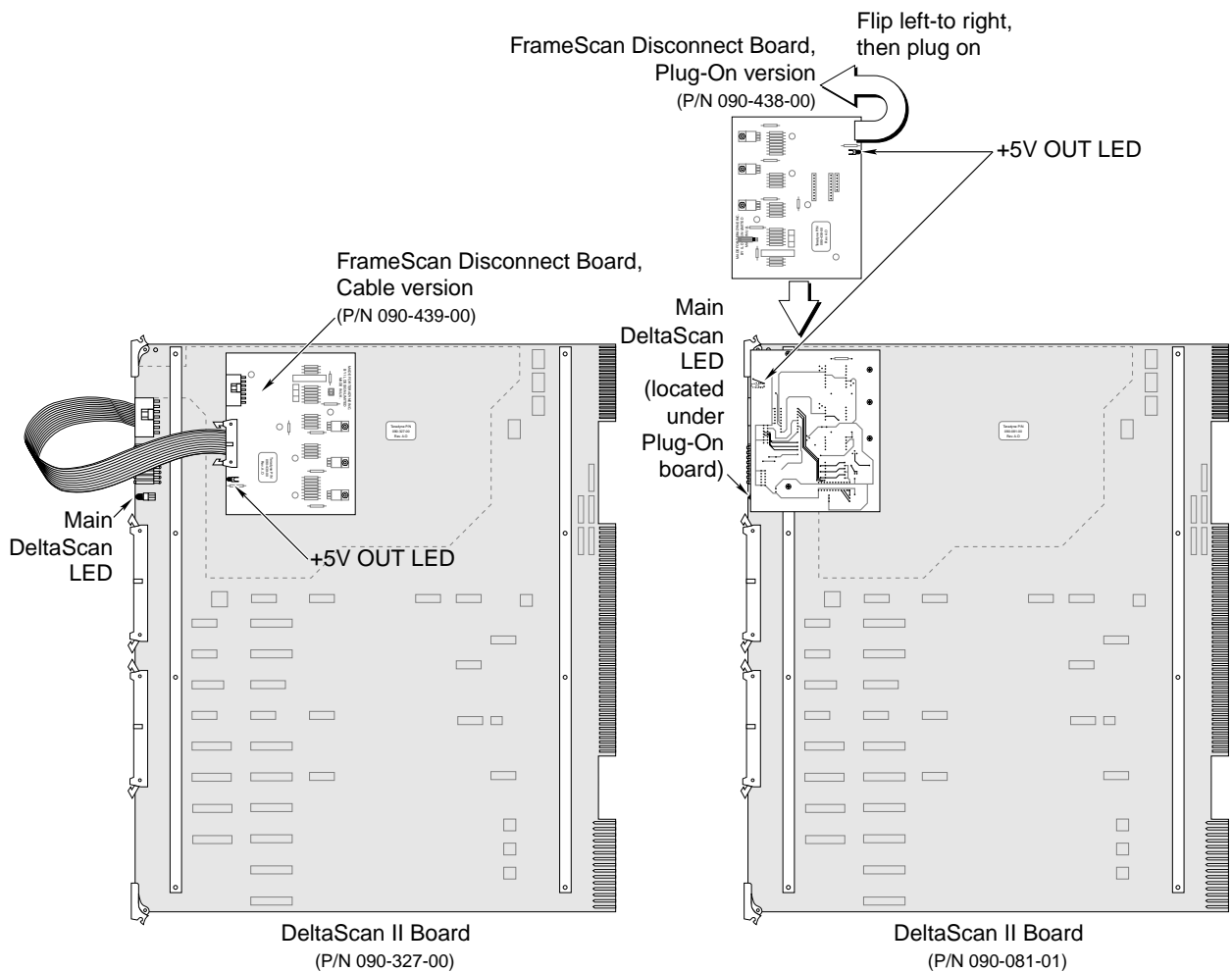


Figure 1. DeltaScan II with FrameScan Disconnect Board Installed

If the disconnect board is present, is the +5V OUT LED on the disconnect board lit?

If the LED is NOT lit, then the board is operating in *Switched Mode*, and there is nothing you need to do. Return your system to normal operation.

If the LED is lit, then the board is operating in the *Always ON (Enabled)* mode. If you are using only Revision F.1b or later software, Teradyne recommends that you change the jumper to the *Switched Mode*. Continue with the procedure below to place the board in *Switched Mode*.

Placing the FrameScan Disconnect Board in Switched Mode

1. Run all system diagnostic tests to verify proper operation before continuing.
2. Run a program using DeltaScan and FrameScan to verify proper operation. Retain the pass/fail results.
3. Power off the tester. Refer to the *Z1800-Series Operator's Guide* for power-off instructions.

4. Unplug cables J1, J2 and J3 from the DeltaScan board.
If your system has the Plug-On Version (see Figure 1 above) of the disconnect board installed, you will also have to disconnect the cable going to J4.

If your system has the Cabled Version of the disconnect board installed, you do not need to unplug the cable from J4 of the DeltaScan board. You will have to disconnect the cable from the TOP (J2) connector of the Disconnect board.

Remove the DeltaScan Assembly from the test head cage, observing all ESD handling precautions.

5. Refer to the following figures which show the relative placement of the Enable/Switched Jumper on the FrameScan Disconnect board.

Move the Enable Jumper on the Disconnect board to the EMPTY pair of jumper posts adjacent to its current position. This should install the jumper between posts 3 and 4 and place the board in the Switched Mode of operation. If the jumper is installed between posts 1 and 2, the Disconnect board is always enabled and will not turn off the voltages to the interface.

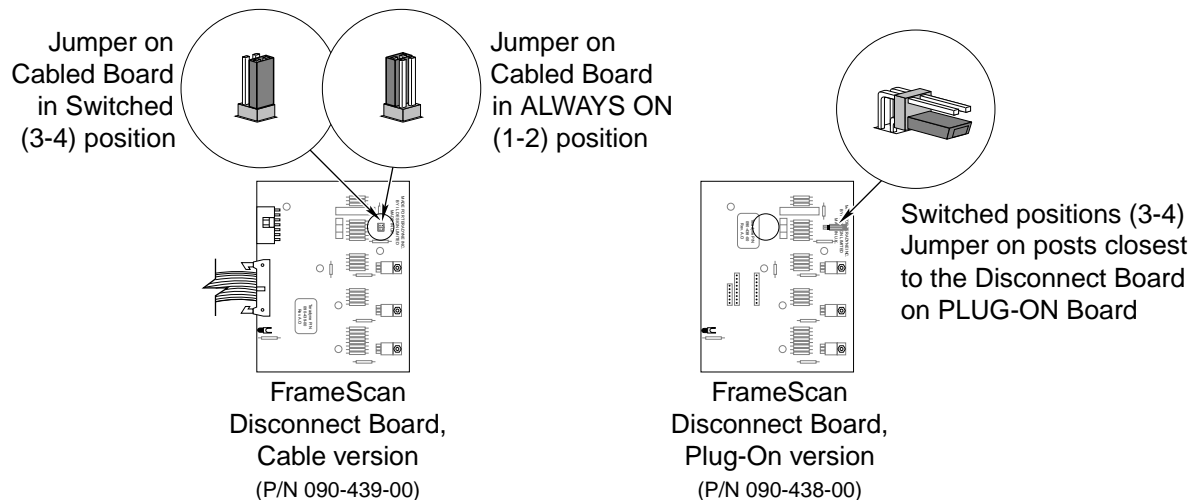


Figure 2. Jumper Positions on on cabled board (left) and on plug-on board (right)

6. Reinstall the DeltaScan board. The cable that previously went to J4 on the DeltaScan board now connects to J2 of the module. Reconnect all the other cables.
7. Power the tester back on, and run all system diagnostics.
8. Rerun the same DeltaScan/FrameScan program that you ran in step 2.
9. Return the system to normal operation.

Technical Support Bulletin #77**Issue Date:** April 10, 1998**Revision Date:** NA**System Model:** Z1800-Series**Subject:** Relay Welding in 18xx System Software, Version F.2a

A problem has been discovered with the 18XX F.2a_48653 system software that can cause relay welding on driver/receiver boards when running the system with fast PCs.

Background

In F.2a there are two ways to clear and set node relays between tests. You can choose between these two methods by means of a new field on the Setup/System Variables screen. This new field, titled "Clear Test Page setup at," can be set to "Beginning of the Page" or "End of the Page." Prior to the F.2a release, when you did not have a choice of when to clear the node relays, the 18XX system software cleared the node relays at the beginning of the page. With the F.2a release, the default setting for this field is "End of the Page."

The relay setting and clearing operation was changed in F.2a for two reasons. The ideal PRISM-Z setup is to run the test and then disconnect it from the DUT driver/receiver boards. Additionally, in some instances a potentially damaging voltage or condition could be established on the DUT if a programmer were to set up a test, execute it (START), and then leave the tester for a while. In such cases, all the stims would remain connected and applied to the DUT for an indefinite period of time.

There was a 100 μ s delay programmed into the Clear routine executed at the beginning of the page. When a clear at "End of the Page" was added to the end, a similar delay was thought to be redundant and so it was removed from the clear at the end routine. However, we have found that with the new clear at the end of the page, some relays in the system had not fully disconnected when the next page started connecting the DUT and closing other relays. As a result, it was possible that a Stim V voltage might still be present from one page when a ground path was set up on the next page.

The Problem

This overlapping of node relay opening and closing has caused relay welding when the "End of the Page" method is selected for clearing the test page setup and a "fast" PC is used. This situation can result in a potentially charged capacitor on the DUT being shorted via the node matrix during relay switching. The "End of the Page" method lacks sufficient wait time between the clearing of the node relays for the current page and the setup of the node relays for the next page. A fast PC contributes to the problem because the only delay between the calls to open the relays and to close the relays is the code execution time. The code execution time is how long it takes to get from the end of the page (where the relays are cleared) to the beginning of the next page (where the relays are closed). Thus, the faster the PC, the less time elapses between the open and close calls.

The Work Around

To work around this problem, under Setup/System Variables, set the "Clear Test Page setup at" to the "Beginning of Page" selection. This mode has a 100 μ s delay between opening the node relays set by the previous page and closing the node relays for the current page.

Long Term Solution

The F.2b version of the 18XX system software will correct this problem. In the F.2b release, a 100 μ s delay will be added to the "End of the Page" method.

Technical Support Bulletin #78

Issue Date: May 14, 1998

Revision Date: NA

System Model: Z1800-Series

Subject: Service Notice—Kepco 5V/60A Power Supply

Background

A number of the 5V/60A Kepco power supplies (PN 061-559-00) have been returned from customers who reported the power supply had no output or had shut down. This power supply is used in two locations in the Z18XX-series testers. It is used as the Test Head (System) 5V power supply and the DUT 5V power supply.

During failure analysis by Teradyne and the repair vendor, no specific fault could be found, other than the possibility that the power supply experienced an over voltage condition which tripped the internal Over Voltage Protection (OVP) circuit. When the OVP circuit is tripped, the power supply must be reset by turning off the system (or DUT PS).

Problem

Unlike many other power supplies, it takes 2–3 minutes for the OVP circuitry in the power supply to reset. Failure to wait a sufficient length of time may result in unnecessarily replacing the power supply.

Solution

Remove power from the system and/or power supply for at least 3 minutes. Then re-apply power and see if the power supply comes up again. If it does not, then the power supply may be defective and should be replaced.

When installing a new power supply, care should also be taken to ensure that the correct jumpers are installed on the power supply's output terminals. The System PS is always on, while the DUT PS is under program control, which necessitates a different jumper configuration on the output terminals. Refer to the Engineering Reference Drawing Manuals for specific wiring details.

Technical Support Bulletin #79

Issue Date: April 13, 1999

Revision Date: NA

System Model: Z1800-Series

Subject: PRISM-Z Resistor Test and Diagnostic Failures

Applicability

This bulletin applies to all Z18XX systems with a PRISM-Z board, PN 051-071-00 installed.

This bulletin is no longer applicable when

1. the PRISM-Z board is Revision T.0 or above –AND–
2. the Z18XX OS software is Revision F.2b or above –AND–
3. the Z18XX Diags and Cal software is Revision F.2d or above.

Problem Symptoms

#1) While a resistor is being measured, the resistor sometimes reads as a very small value or a short. This can occur on resistors of any value having nodes either on the same DR card or on separate DR cards. Some resistors measure as shorts over 50% of the time, but if the standard ATB RESISTOR test is used, no difficulty is encountered.

#2) When testing low value capacitors, especially with capacitors in the guard path, tests are sometimes noisy. Capacitors in the guard path may increase the jitter of the test.

Root Causes

Symptom #1) has been traced to Revisions R and S of the PRISM-Z board when used in conjunction with F.2a operating system software. The PRISM-Z board may exhibit an oscillation due to the potential of an open op-amp feedback loop during the setup phase of the MOA. When checking with a scope on TP11 of the PRISM-Z board, one can see oscillation when the failure exists.

The symptoms of this condition are intermittent failures of PRISM-Z resistor tests resulting in very low measured values (< 5 ohms). Revisions prior to Rev. R.0 do NOT exhibit this problem.

Symptom #2) has been traced to noise coupled from the digital circuits, DSP, into the analog circuits through the AGND to DGND connection path.

Known Temporary Problems

Prism-Z, Revision T.0 and 18XX Diagnostics, Revision F.2b:

Revision T.0 of the PRISM-Z board, PN 051-071-00 will cause PRISM-Z tests #330 and #332 to fail intermittently with Revision F.2a system software and F.2b Diagnostics due to the changes that have been made to the compliance circuit in preparation for the next release of 18XX system software and Diagnostics.

Solution

ECO E7078 has been created to correct the hardware problems and change the PRISM-Z board, PN 051-071-00, to Revision T.0. Revision F.2b system software and F.2d Diagnostics in conjunction with a Revision T.0 PRISM-Z board will correct the software setup problems as well as solve other PRISM-Z test-related and diagnostic issues.

Barring the discovery of any significant problems during the final stages of Beta testing, we expect to complete the release and distribution of the F.2b system software and F.2d Diagnostics by the beginning of Q2, 1999.

If the diagnostic failures above cannot be tolerated until the new software is distributed, you may request a Beta site copy of the F.2b system software and F.2d Diagnostics which are currently in Beta test. Please contact the ATD-West Product Support Group or your local Teradyne Support Office to request the Beta release software.

Technical Support Bulletin #80

Issue Date: May 25, 2000

Revision Date: NA

System Model: Z1800-Series

Subject: Intermittent COM Port Timeouts Running PTDIAGS
Under Windows® 95 and 98

Applicability

This bulletin applies only to an installation of DFP software on a PC running Windows 95 or Windows 98.

Background

After you have started 18xx system software from a Windows desktop icon, running the DFP's PTDIAGS program or DFP applications program can cause intermittent COM Port timeouts.

If the DFP is working under Windows 95, you can possibly cause this error by exiting 18XX and then restarting the 18XX system software. If a timeout occurs, you must

- Power off the tester (including the DFP PC).
- Power it back on.
- Reboot the 18XX Windows PC.

After you have taken these steps, the software should work consistently as long as you do not exit the 18XX system software.

If you start 18XX system software from DOS mode (that is, shutdown and restart in DOS rather than in Windows 95 or 98) and select PTDIAGS, 18XX works without timeout errors.

Timeout errors are a Windows 95 problem with the software control of the COM Ports when a DOS application (18XX) is running under Windows 95 or 98. This problem is computer-dependent, showing up on some computers but not on others. Microsoft Corporation has informed Teradyne that it will not fix this problem.

Solution

Disable the COM Port in Windows 95 or 98.

To disable the COM Port,

1. Boot up in Windows 98 (or Windows 95, as applicable).
2. From the Start menu, click **Settings** and then **Control Panel**.
3. When the Control Panel is displayed, double click the **System icon**.
4. When the System Properties dialog box is displayed, click the **Device Manager** tab.

5. When the devices are displayed in View devices by Type format, double-click the **Computer** icon.
6. When the Computer Properties dialog box View Resources tab is displayed, verify that the IRQ button is selected.
7. Scroll through the list of IRQs to make sure that there are no conflicts at this point.
8. Click **Add** near the bottom of the Reserve Resources tab.
9. Enter the IRQ for the COM port used for DFP: Enter **4** for COM1 or **3** for COM2; then click **OK**.
You will see a Resource Conflict Warning at this point because COM1/COM3 share IRQ4 and COM2/COM4 share IRQ3. This resource (COM1/IRQ4) is intentionally reserved to prevent Windows 95 and 98 from interfering with DFP operation on this port. Therefore click **OK** on the Resource Conflict Warning screen.
10. On the Reserve Resources tab in Computer Properties, select **Input/Output**.
11. Click **Add** near the bottom of the Reserve Resources tab.
12. Enter the I/O address for the COM port used for DFP:

For COM1, enter *Start value=03F8, End value=03FF*
For COM2, enter *Start value=02F8, End value=02FF*
15. Click **OK**.
You will see another Resource Conflict Warning message. Click **OK** on the Resource Conflict Warning screen.

Note: On Windows 95, you may see the message, "System Settings Changed," and you will be asked to reboot. Click **Yes** or **OK** to save changes and reboot.
16. When the Computer Properties dialog box appears, on the Reserve Resources tab, click **OK** to return to the System Properties. Click **OK** again to return to the Control Panel.
17. Close the Control Panel.
18. From the Start menu, select **Shutdown**.
19. When the Shutdown Windows dialog box appears, select **Restart** and click **OK**.

Verify the Settings

When the system finishes rebooting, verify that you reserved the correct IRQ and I/O addresses as follows.

1. From the Start menu, select **Settings** and then **Control Panel**.
2. When the Control Panel is displayed, double-click the **System icon**.
3. When System Properties is displayed, Click the **Device Manager** tab.

4. When the devices are displayed in View devices by Type format, expand the Ports (COM and LPT).
You will see an ! (exclamation point)) on the DFP COM Port (COM1/3 or COM2/4).

5. Double-click the **DFP COM port** to open the Port Properties window.

6. Click the **Resources** tab.

The **Use automatic settings** box should be checked.

The Resource Type field should list (for COM1):

Red NO symbol followed by :	IRQ Setting	04
Red NO symbol followed by:	I/O Range	03F8–03FF

The conflicting device list below the Resource Type field should list the following (for COM1, as an example):

Interrupt Request 04 used by	:	System Reserved
Input/Output Range 03F8–03FF used by	:	System Reserved

7. Click **OK** to exit from the Control Panel Settings.

Verify That the Settings Work

To verify that the settings work, run all the DFP Diagnostics tests.

1. Double-click the **18xx_Win** icon to access 18xx in Windows mode.
2. In the File menu, click **Select**.
3. Click (**DPF**) in the Select menu.
4. Click **Run** in the Main menu, and then click **Start**.

The DFP Diagnostics interface is displayed.

5. From the Options menu, click **Loop Diags**.
6. Click **Start**.
By default all diagnostics tests will be run.
7. Run at least 10 loops with no failures to verify that the settings work.
The leftmost field in the Status bar shows how many loops have run.

For further assistance, call 1.800.HLP.TEAM (1.800.457.8326).

Technical Support Bulletin #81

Issue Date: May 25, 2000

Revision Date: NA

System Model: Z1800-Series

Subject: Reserving Upper Memory for DFP

Problem

The Digital Function Processor will not function properly unless you reserve an area of upper memory for it.

Solution

When you use the second generation Memory-mapped Channel Control Cards (PN 090-315-00), you must reserve an area of upper memory for the Channel Control Cards that is not controlled by the Plug and Play setup.

The DFP config.sys must contain the following configuration:

```
DEVICE=C:\DOS\HIMEM.SYS
DEVICE=C:\DOS\EMM386.EXE NOEMS X=C800-CFFF
DOS=HIGH, UMB
FILES=30
BUFFERS=10

SHELL=C:\COMMAND.COM /E:1024 /P

DEVICEHIGH=C:\PT2VASYNC.SYS COM: 1, 4, 3F8, 1024, 1024
LASTDRIVE=C
STACKS=9, 256
```