



**Z-Active™ Probe  
Deskew Fixture  
Instructions**

**071-1768-01**

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## Z-Active Probe Deskew Fixture

The Z-Active Probe Deskew fixture (067-1586-00) provides an edge source to time align (deskew) signals at the probe tips. It allows you to deskew the Tip-Clip assemblies that you will install on your circuit board resulting in improved reliability and accuracy. The fixture also provides a method to adjust the offset and gain calibration function for the probes. The fixture supports the Z-Active series oscilloscope probes.

The fixture is powered by one of the USB ports of the oscilloscope. For best results, allow the oscilloscope to warm up for 20 minutes before continuing with these instructions.

Assemble the fixture before initial use. Mount the circuit board to the fixture base and then install the solder box. Use the screws provided.

Use the fixture with your Tektronix oscilloscope to optimize the gain and offset accuracy of your Z-Active probes. Refer to the *DC Probe Calibration Procedure* for detailed instructions for performing the DC Cal procedure. Perform the DC Calibration procedure before the Deskew procedure.

Use the fixture to time align the signals at your probe tips. Several different deskew methods are available:

- Use the hand-held adapters to deskew the probes without any additional equipment.
- Use the fixture with the Tip-Clip assemblies directly.
- Use the fixture with Tip-Clip assemblies and solder pins.

Refer to *Deskew Procedure* on page 3 for the detailed deskew instructions.

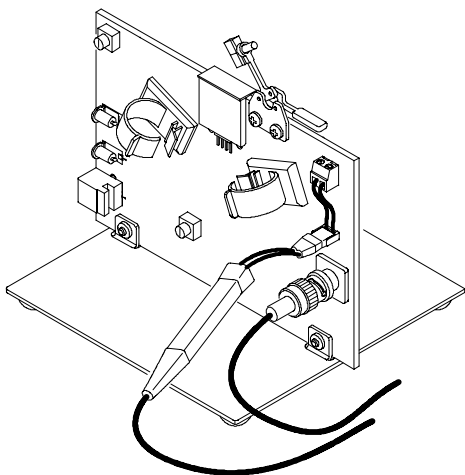
## DC Probe Calibration Procedure

Note the following:

- Perform the DC Cal procedure before the deskew procedure.
- The USB cable does not need to be connected for the DC probe calibration procedure.

### Optimize Gain and Offset Accuracy

1. Connect the probe to the oscilloscope.
2. Connect the DC PROBE CAL output from the oscilloscope to the BNC connector on the deskew fixture.
3. Connect the probe to the fixture as shown in Figure 1 on page 2.



**Figure 1: DC Probe Calibration connections**

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**NOTE.** Replace the Tip-Clip™ assemblies if damaged or worn.

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4. Select **Probe Cal . . .** from the **Vertical** menu.
5. Select the oscilloscope channel to which the probe is attached.
6. Select **Clear Probecal** to erase any previous calibration data.
7. Select the **Calibrate Probe** button.

The oscilloscope will perform a DC calibration operation on the selected probe. The result appears in the Probe Status readout.

8. When the operation is finished, remove the connections from the fixture.

### **Check the Calibration Status**

1. Select **Probe Cal . . .** from the **Vertical** menu.
2. Select the channel to which the probe is attached and then check the Probe Status readout:
  - **Initialized.** The probe has not been calibrated on the selected channel; perform the DC probe calibration procedure.
  - **Pass.** The probe has been calibrated on the selected channel.
  - **Fail.** The probe has not been calibrated; repeat the procedure. If the test continues to fail, trou-

bleshoot the problem; do not continue with the deskew procedure.

## Deskew Procedure

Deskew aligns signals to compensate for differing signal delays from cables of different lengths. The oscilloscope deskew feature applies deskew values after it completes each acquisition. The deskew values do not affect logic triggering. Deskew has no affect on XY and XYZ display formats.

1. Connect the deskew fixture to a USB power source.
2. Connect the probes to the oscilloscope.

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**NOTE.** To get the most accuracy, use the same Tip-Clip assemblies with the deskew fixture that you will install on your circuit board.

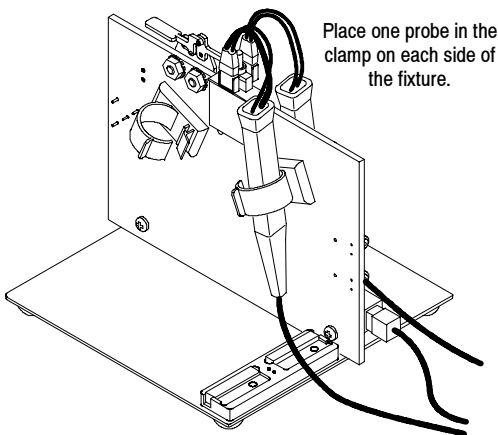
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3. Connect the probes to the fixture using one of the following steps:
  - a. Connect the probes to the fixture using the clamps on the fixture and the Tip-Clip assemblies as shown in Figure 2.

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**NOTE.** Refer to Preparing the Tip-Clip Assemblies with the Deskew Fixture on page 7 for instructions on preparing the Tip-Clip assemblies for use with the fixture.

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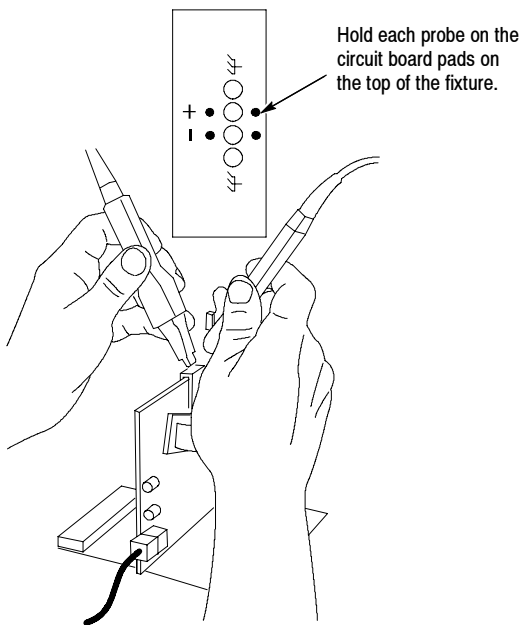
**Figure 2: Connecting probes to the Deskew fixture using the Tip-Clip assemblies**

- b. Connect the probes using the hand held adapter as shown in Figure 3 on page 4.

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**NOTE.** *If you are using a single Tip-Clip assembly and a hand-held adapter, adjust the clamp and fixture as necessary to provide access to the circuit board pads for the hand-held adapter.*

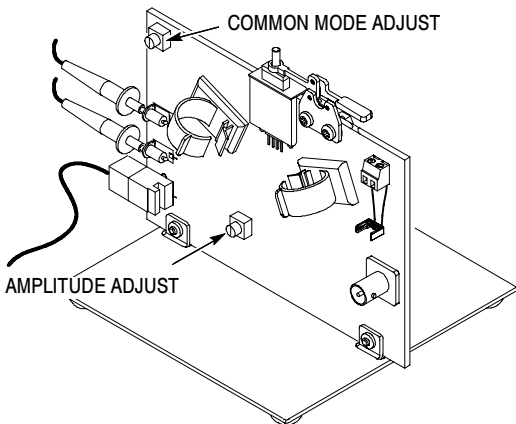
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**Figure 3: Using the hand-held adapters for the Deskew procedure**

4. Select a reference channel with which all other channels will be deskewed. This is typically Channel 1, but can vary depending on your setup.
5. Select **Deskew** from the **Vertical** menu.
6. Select Channel **1** and set the Deskew to **0.0 s**.
7. Display all channels to deskew, including the reference channel.
8. Push the **AUTOSET** button on the oscilloscope.
9. Select **Horizontal/Acquisition Setup** from the **Horiz/Acq** menu and then select the **Acquisition** tab. Select **Average** and **# of Wfms 16**.
10. Adjust the trigger level to get a stable trigger.

11. (Optional) Use a voltmeter to measure the deskew signal common mode voltage for your application at the Common Mode Out terminals. Adjust the voltage using the **COMMON MODE ADJUST** control on the fixture.
12. (Optional) Adjust the deskew amplitude for your application on the oscilloscope display using the **AMPLITUDE ADJUST** control on the fixture (probes not shown).



**Figure 4: Adjustment locations**

13. Adjust the vertical **SCALE** and **POSITION** (with active probes, adjust the offset as needed) for each channel so that the signals overlap and are centered on screen. Make sure all channels being deskewed are at the same volts/div setting. Deskew the channels at the same level as your planned signal measurement.
14. Adjust the horizontal **POSITION** so that a triggered rising edge of the reference channel is at center screen.
15. Adjust the horizontal **SCALE** so the differences in the channel delays are clearly visible.
16. Adjust the horizontal **POSITION** again so that the first rising edge of the reference channel is at center screen.
17. Select **Deskew** from the **Vertical** menu.
18. Select one of the channels to match to the reference channel.

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**NOTE.** *Do the next step at a signal amplitude within the same attenuator range (vertical scale) as your planned signal measurements. Any change to the vertical scale after the deskew is complete can change the attenuator setting and give a slightly different signal path. This signal path difference can cause as high as 100 ps variation in timing skew between channels.*

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19. Adjust the deskew time for that channel so that its signal aligns with that of the reference channel.
20. Repeat steps 18 and 19 for each additional channel that you want to deskew.



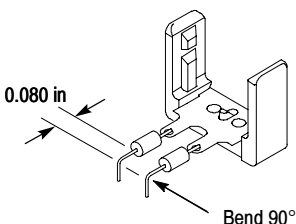
## Preparing the Tip-Clip Assemblies with the Deskew Fixture

The deskew fixture provides a means to hold the probes and any size Tip-Clip assembly for performing the deskew procedures. Choose one of the following methods for preparing the assemblies for use with the deskew fixture:

- Use the Tip-Clip assemblies with either large or small resistors and connect them directly to the fixture.
- Use the Tip-Clip assemblies with solder pins to create an assembly for easy handling while performing the deskew procedure.

### Connecting the Tip-Clip Assemblies Directly to the Deskew Fixture

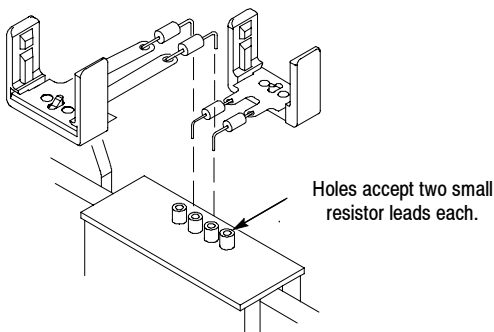
To use the Tip-Clip assemblies directly with the fixture, bend the resistors as shown in Figure 5. and install the assemblies on the fixture. After performing the deskew procedure, trim the resistors at the bend.



**Figure 5: Bend the resistor leads**

If you are using the small resistor Tip-Clip assemblies, install the assemblies on the fixture as shown in Figure 6.

#### Small resistors



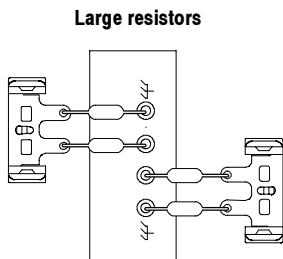
**Figure 6: Installing the small resistor Tip-Clip assemblies on the fixture**

If you are using the large resistor Tip-Clip assemblies, install the assemblies on the fixture as shown in Figure 7.

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**NOTE.** *The large resistor leads are too large to insert two of them in the same holes on the fixture.*

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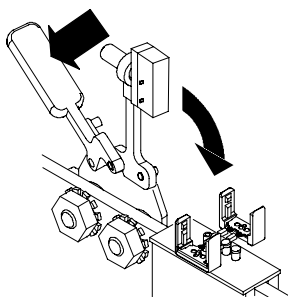
**Figure 7: Installing the large resistor Tip-Clip assemblies on the fixture**

Close the clamp to secure the Tip-Clip assembly as shown in Figure 8.

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**NOTE.** *To avoid unnecessary wear on the clamp elastomer, leave the top clamp in the open position when not using the fixture.*

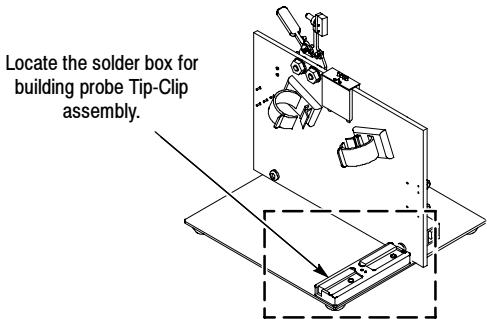
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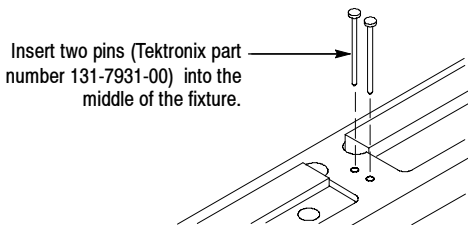
**Figure 8: Secure the Tip-Clip assembly**

## Using the Tip-Clip Assemblies with the Solder Pins

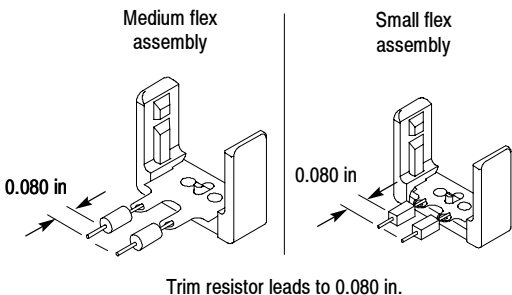
Refer to Figure 9 through Figure 15 to prepare the Tip-Clip connectors for use with solder pins on the fixture.



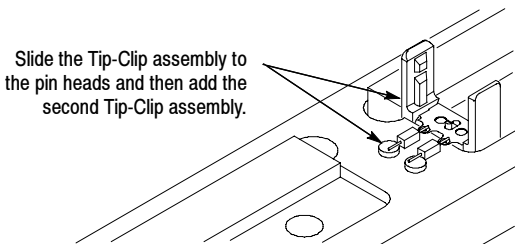
**Figure 9: Locate the solder box**



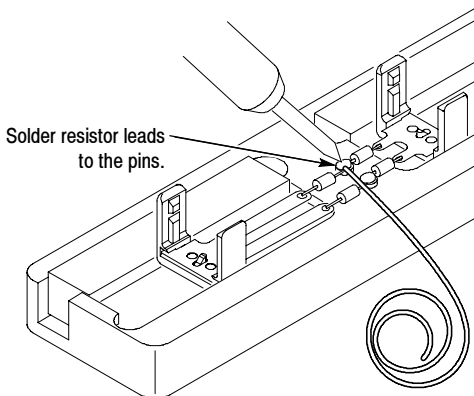
**Figure 10: Insert the solder pins into the solder box**



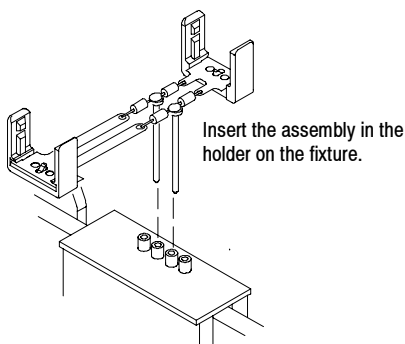
**Figure 11: Trim the resistor leads**



**Figure 12: Position the Tip-Clip assemblies**



**Figure 13: Solder the Tip-Clip assemblies to the solder pins**

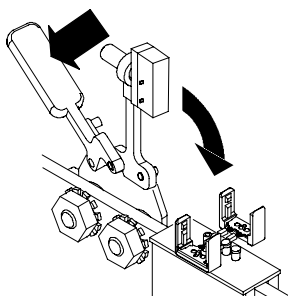


**Figure 14: Inset the assembly into the fixture holder**

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**NOTE.** To avoid unnecessary wear on the clamp elastomer, leave the top clamp in the open position when not using the fixture.

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**Figure 15: Secure the Tip-Clip assembly**