TEK PROCEDURE MANUAL

Part No. 070-6693-00
Product Group 47

11301 and 11302
Programmable Oscilloscopes

Incoming Inspection Procedure

Please check for CHANGE INFORMATION at the rear of this manual.

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Tektronix®
COMMITTED TO EXCELLENCE

INSTRUMENT SERIAL NUMBERS

Each instrument has a serial number on a panel insert, tag, or stamped on the chassis. The first number or letter designates the country of manufacture. The last five digits of the serial number are assigned sequentially and are unique to each instrument. Those manufactured in the United States have six unique digits. The country of manufacture is identified as follows:

B000000	Tektronix, Inc. Beaverton, Oregon, USA
100000	Tektronix Guernsey, Ltd., Channel Islands
200000	Tektronix United Kingdom, Ltd., London
300000	Sony/Tektronix, Japan
700000	Tektronix Holland, NV, Heerenveen, The Netherlands

Printed in U.S.A.

Contents

Operators Safety Summary

The following general safety information applies to all operators and service personnel.

Terms

In Manuals

CAUTION statements identify conditions or practices that could result in damage to the equipment or other property.

WARNING statements identify conditions or practices that could result in personal injury or loss of life.

As Marked On Equipment

CAUTION indicates a personal injury hazard not immediately accessible as one reads the marking, or a hazard to property including the equipment itself.

DANGER indicates a personal injury hazard immediately accessible as one reads the marking.

Symbols

In Manuals

Static Sensitive Devices.

As Marked on Equipment

DANGER – High voltage.

Protective ground (earth) terminal.

ATTENTION – refer to manual.

Warnings

Power Source

This product is intended to operate from a power source that will not apply more than 250 volts rms between the supply conductors or between either supply conductor and ground. A protective ground connection, by way of the grounding conductor in the power cord, is essential for safe operation.

Grounding the Instrument

The 11301 and 11302 are grounded through the grounding conductor of the power cord. To avoid electric shock, plug the power cord into a properly wired receptacle, where earth ground has been verified by a qualified service person, before making connections to the input or output terminals of the instrument. A protective-ground connection, by way of the grounding conductor in the mainframe power cord, is essential for safe operation.

Danger Arising From Loss of Ground

Upon loss of the protective-ground connection, all accessible conductive parts (including knobs and controls that may appear to be insulating), can render an electric shock.

Use the Proper Fuse

To avoid fire hazard, use only the fuse specified in the parts list for your product, and which is identical in type, voltage rating, and current rating.

Do Not Operate In Explosive Atmospheres

To avoid explosion, do not operate the instrument in an atmosphere of explosive gasses.

Do Not Remove Covers or Panels

To avoid personal injury, do not remove the protective covers. Do not operate this instrument without the panels or covers properly installed.

Introduction

The 11000-series mainframes contain precise internal references—a stable dc source for vertical and trigger circuits, and a crystal for timing circuits—which are used for the self-calibration necessary to enter the Enhanced Accuracy mode. The following procedure verifies these sources and the overall functionality of the instrument by comparing vertical and horizontal measurement results with external standards while in the Enhanced Accuracy mode.

WARNING

To avoid personal injury, do not remove the protective cabinet panels or covers. Operate this instrument only when the panels or covers are properly installed.

Using This Procedure

In the text of the steps, words with initial capital letters (e.g., Amplitude) indicate front-panel controls, indicators, and connectors on associated test equipment. Words containing all capitals (e.g., UTILITY) indicate the same classes of controls on the 11301/11302 or its plug-ins. Finally, words presented in bold (e.g., **INIT**) indicate items appearing on the display of the 11301/11302 mainframe.

This Incoming Inspection Procedure is written assuming that the various Parts will be performed in sequential order at a single session. If you wish to break the procedure into several sessions or perform specific checks in isolation, this can be done provided you make certain that all plug-ins, test equipment, and the instrument itself are all thoroughly warmed up, and the instrument is in Enhanced Accuracy when you begin testing. Part 3 details the procedure to calibrate the 11301/11302 to Enhanced Accuracy.

This procedure allows you to perform an electrical inspection of all Mainframe/Plug-In combinations with a minimum number of steps. You may check the mainframe alone provided you have at least one calibrated plug-in, or you may check the mainframe and a plug-in as a system. If you are performing an Incoming Inspection Procedure on one or more plug-ins (as opposed to this procedure which inspects the mainframe), places are noted in the text where you should detour to perform those procedures.

In the 11301/11302, the RIGHT plug-in compartment cannot be used for performing an Incoming Inspection Procedure on a plug-in. If you wish to inspect more than two plug-ins, you will need to reconfigure the system and perform the procedure more than once.

Operating the Instrument

Details of how to operate the instrument are not included in this Incoming Inspection Procedure. Tutorial exercises are presented in the manual *Introducing the 11301 and 11302 Programmable Oscilloscopes*. This manual is strongly recommended to first-time users of these instruments. Comprehensive information on

using the instrument is found in the *11301 and 11302 Programmable Oscilloscopes User Reference Manual*.

Initializing the Instrument

Most of the tests in the Incoming Inspection Procedure begin with the instrument in an initialized state. This is achieved by pressing the UTILITY button, touching the word **INIT** on the screen to highlight it if it isn't already, and touching the screen area labeled **Touch here to initialize Scope settings.**

Test Equipment

Table 1 below lists the test equipment required to complete the Incoming Inspection Procedure, and gives examples of equipment that qualifies. The procedure steps are based on the suggested example equipment, but equivalent test equipment that meets the listed specifications may be substituted. Test results and setup information may be altered, and related connectors or adapters may need to be changed, if substitute equipment is used.

Table 1 — Test Equipment

Description	Minimum Specification	Examples of Applicable Test Equipment
Medium Frequency Sine Wave Generator	250 kHz to 250 MHz, variable amplitude, 50 kHz reference	TEKTRONIX SG 503 Leveled Sine Wave Generator with a TM 500-Series Power Module
High Frequency Sine Wave Generator	250 MHz to 1000 MHz, variable amplitude, 6 MHz reference	TEKTRONIX SG 504 Leveled Sine Wave Generator with a TM 500-Series Power Module
Plug-In Amplifier	11000-Series	11A32, 11A33, 11A34, 11A52, or 11A71
NOTE — *The Amplifier/Mainframe combination will determine system bandwidth.*		
Time Mark Generator	1 ns through 5 s markers in a 1-2-5 sequence, at least 5 parts in 10^7 accuracy	TEKTRONIX TG 501 Time Mark Generator with a TM 500-Series Power Module
Calibration Generator	Square wave output, 0.25% accuracy, 1-2-5 amplitude selection from 200 μV p-p to 100 V p-p, ~1 ms period	TEKTRONIX PG 506 Calibration Generator with a TM 500-Series Power Module
Digital Counter	At least to 1 part in 10^7 accuracy	TEKTRONIX DC 503A Opt. 1 Universal Counter/Timer with a TM 500-Series Power Module

(Continued)

Table 1 (Continued) — **Test Equipment**

Description	Minimum Specification	Examples of Applicable Test Equipment
Test Oscilloscope	50 MHz or greater bandwidth, 1 MΩ input impedance	TEKTRONIX 2225 50 MHz Oscilloscope
Feedthrough Terminator	50 Ω impedance, dc - 500 MHz, one male and one female BNC connector	Tektronix Part 011-0049-01
2X Attenuator	14 dB attenuation, 50 Ω, one male and one female BNC connector	Tektronix Part 011-0069-02
5X Attenuator	14 dB attenuation, 50 Ω, one male and one female BNC connector	Tektronix Part 011-0060-02
T Adaptor	Two female, one male BNC connectors	Tektronix Part 103-0030-00
Coaxial Cable (2 required)	50 Ω, 18 inch, two male BNC connectors	Tektronix Part 012-0076-00
Coaxial Cable (2 required)	50 Ω, 42 inch, two male BNC connectors	Tektronix Part 012-0057-01
Adaptor	BNC female to BNC female	Tektronix Part 103-0028-00

Part 1: Power–Up Diagnostics

CAUTION

To avoid instrument damage, set the mainframe ON/STANDBY switch to STANDBY before installing or removing plug-in units.

Setup

a. With the rear-panel PRINCIPAL POWER SWITCH set to OFF, connect the 11301/11302 to a suitable power source.

b. Install an 11A-Series Amplifier in the instrument's LEFT compartment. Your choice of plug–in will determine the system bandwidth characteristics.

If additional plug-ins are available, they may be installed in the center and right compartments as well. A removable blank plug-in is shipped in the right compartment.

c. Set the rear-panel PRINCIPAL POWER SWITCH to ON, and then the front–panel ON/STANDBY switch to ON.

When the 11301/11302 is first installed, the rear-panel PRINCIPAL POWER SWITCH should be set to the ON position and left there. Thereafter all power switching should be done by using the front-panel ON/STANDBY switch.

d. Power on all test equipment to be used, so that it is warmed up with the instrument to be tested. A complete list of test equipment is shown in Table 1 on pages 2–3.

Procedure

Each time the front-panel ON/STANDBY switch is set to ON, the oscilloscope performs diagnostics on its internal circuits. This testing could take as long as two minutes with three plug–in units installed. Upon successful completion, the oscilloscope will enter the normal operating mode. You will be prompted to press the ENHANCED ACCURACY button if different plug–in units were installed while the power was off. If the diagnostic test fails, a diagnostic screen will appear; it can be identified by the words **HALT/ERROR** at the center bottom of the screen.

CHECK—to ensure that the diagnostic screen is not displayed.

CAUTION

Turning the instrument power off during the execution of the diagnostic tests may result in losing some or all of the Non-Volatile RAM data, including stored settings, calibration constants, etc. This could affect normal instrument operation in unpredictable ways, and could require a complete instrument recalibration.

Also, during the diagnostic testing, front-panel controls are active. Touching or changing controls during diagnostic testing may result in test failures.

Successful completion of the diagnostic tests verifies the following major circuits:

1. Processor
2. Front Panel
3. Scope Logic
4. Timebase
5. Vertical
6. Left Plug-In
7. Center Plug-In
8. Right Plug-In
9. Plug-In Interface

Failure of any portion of the diagnostic tests will halt the routine and either present an error message on the display or light a combination of major menu labels. Refer this type of test failure to qualified service personnel, noting the light combination or screen message.

NOTE

On instruments with firmware versions **V2.2** *or earlier, a completely cold instrument may cause certain spurious failures. Should such failures occur, simply allow the machine to warm up completely for 20 minutes, and then cycle power off and then on to re-execute the Power-Up Diagnostics.*

The specific failures that may occur will leave the screen with a diagnostics display, where the center of the screen will have a test failure number. The following numbers can be spuriously generated in a cold instrument: **M432x, M433x,** *and* **M442x,** *where the* **x** *may be any digit. If any other test numbers are shown, or if the firmware version number is* **V2.3** *or higher, call your qualified service personnel.*

To verify the firmware version number, look at the top center of the diagnostic display generated by the failure. If you wish to determine the firmware version even if no failure was generated, you may observe the diagnostic screen display containing the version number during Part 2: Extended Diagnostics.

Part 2: Extended Diagnostics

Setup

As left from previous test.

Procedure

a. Press the UTILITY button.

b. Highlight the **EXT TEST** selector by touching it if it isn't highlighted already.

c. Touch the **Run** under the notation **FOR QUALIFIED SERVICE PERSONNEL ONLY**.

d. Touch the selector in the lower right corner, labeled **off** over **RUN**. The tests will be run, during which the screen will flash on and off repeatedly. The entire process will take 2 minutes or less.

e. *CHECK*—that the **Index** column down the center of the screen contains no notations of failure. Each entry should either be **pass** or, in the case of plug-ins that are not installed, either **L????**, **C????**, or **R????** depending upon which plug-in compartment is noted.

   If any **fail** notations are present, note also the number in the **Fault** column and call your qualified service person.

f. Return the oscilloscope to the normal operating mode by pressing the UTILITY button. Wait a moment for the message indicating the extended diagnostics are completed.

Part 3: Enhanced Accuracy

Setup

As left from previous test.

Procedure

a. Ensure that the instrument has been powered on continually for 20 minutes.

b. Press the ENHANCED ACCURACY button.

c. When the message **Press EA again to confirm request** appears, press the ENHANCED ACCURACY button. The calibration procedure will start, displaying blinking dots and bars of light on the screen. After a short time, the message:

ENHANCED ACCURACY IN PROGRESS
APPROX 90 SECONDS TO GO

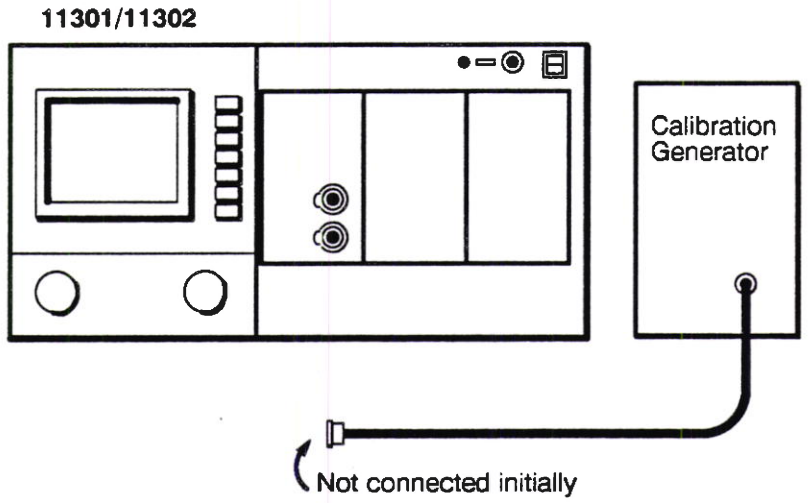
will appear on the screen, signaling that the test is proceeding on track.

d. *CHECK*—that when the calibration is done, the message **Self calibration completed successfully** appears on the screen, and the **EA** symbol will be displayed at the right edge of the screen. If any other message appears, verify that the instrument configuration is correct and that a plug-in is installed. If unable to get the correct message upon retry, contact your qualified service person.

Once the instrument has been calibrated to Enhanced Accuracy, any change of internal temperature by more than five degrees Celsius will require a recalibration to maintain the state. Should this happen, you will be notified by a message that you should press the ENHANCED ACCURACY button again.

Part 4: Vertical Cursor Accuracy

Setup



Perform the following settings in the order listed:

11301/11302 Oscilloscope Mainframe:
..... Initialize

Plug-In:
CH 1 ..... On

11301/11302 Oscilloscope Mainframe:
CURSORS ..... Vertical

Calibration Generator:
Amplitude ..... 5V Standard Amplitude
(10V for 50 Ω-only plug-ins)

Procedure

a. Adjust the reference cursor (LEFT KNOB) to the vertical center of the trace. Bisect the trace as exactly as possible, using the FINE setting of the knob.

b. ***CHECK***—that the **Vert Ref** readout is within specifications of Table 2 on the next page.

c. Connect the Calibration Generator output to Plug-In CH 1 input.

d. Center the trace vertically on the screen.

e. Set the main horizontal size to 500 µs/div.

f. Align the cursors to the waveform base and top. Place the reference cursor at the waveform base, and the other cursor at the top.

g. *CHECK*—that the **ΔVert** readout is within the specifications of Table 2.

Table 2 – Vertical Cursor Tolerances

Plug-In Type	DC Balance (Step b.)	ΔVert Accuracy (Step g.)
11A32	± 230 mV	4.910 – 5.090 V
11A33	± 180 mV	4.890 – 5.110 V
11A34	± 230 mV	4.910 – 5.090 V
11A52	± 150 mV	4.910 – 5.090 V
11A71	± 200 mV	4.905 – 5.095 V

Part 5: Measurement Accuracy

Setup

As left from previous test.

Procedure

a. Press the MEASURE menu button, and select **Min**, **Max**, and **P–P** measurements. Touch **START**.

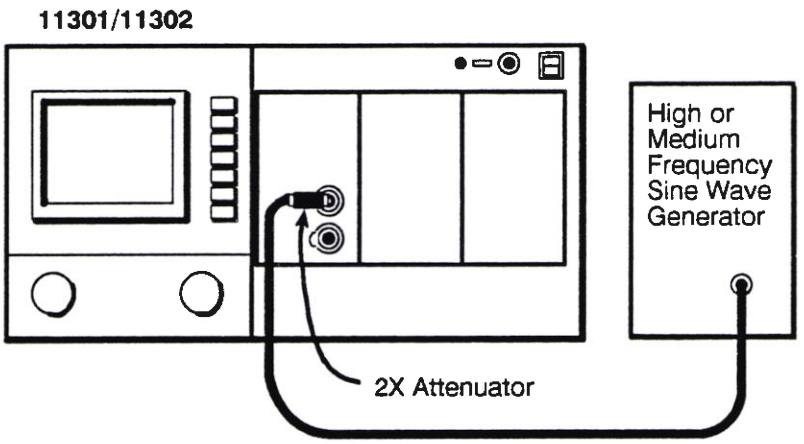
b. *CHECK*—that the measurement values that appear on the screen fall within the following ranges:

Table 3 - Measurement Tolerances

Plug-In Type	P-P	Max	Min
11A32	4.360 – 5.640 V	4.370 – 5.630 V	± 630 mV
11A33	4.340 – 5.660 V	4.420 – 5.580 V	± 580 mV
11A34	4.360 – 5.640 V	4.370 – 5.630 V	± 630 mV
11A52	4.360 – 5.640 V	4.450 – 5.550 V	± 550 mV
11A71	4.355 – 5.645 V	4.400 – 5.600 V	± 600 mV

Part 6: Vertical Bandwidth

Setup



Perform the following settings in the order listed:

11301/11302 Oscilloscope Mainframe:
..... Initialize

Plug-In:
CH 1 ..... On

11301/11302 Oscilloscope Mainframe:
HORIZONTAL SIZE ..... 100 ns/div
VERTICAL SIZE ..... 200 mV/div
Impedance ..... 50 Ω

Sine Wave Generator:
Frequency ..... 6 MHz

Procedure

a. Press the VERTICAL SIZE button below the screen. ***CHECK***—to ensure that Sine Wave Generator you are using is capable of producing the frequency listed on the screen as the **HF Limit**.

b. Adjust the amplitude of the Sine Wave Generator to produce a 6-division high displayed waveform. Use VERTICAL POS to vertically center the waveform if necessary.

c. Display the vertical cursors, and adjust them to the top and bottom of the waveform.

d. Touch the **Set Ref** region of the screen.

e. Touch the **%—dB** region of the screen to select it on.

f. *CHECK*—that the readout indicates **ΔVert** = 100% and **ΔVert** = 0 dB, and that the reference amplitude (immediately above **Set Ref**) is between 5.90 and 6.10 divisions.

g. Set the Sine Wave Generator to the frequency indicated as the **HF Limit**. If necessary, you can display this limit by pressing the VERTICAL SIZE button. Do not change the amplitude of the Sine Wave Generator.

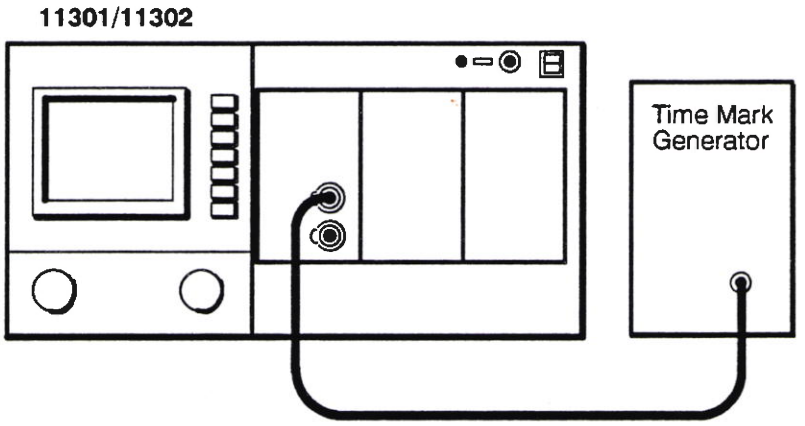
h. Adjust the INTENSITY and HORIZONTAL SIZE as required to achieve a viewable waveform on the display.

i. Realign the vertical cursors to the new top and bottom of the waveform.

j. *CHECK*—that the **ΔVERT** cursor readout indicates a value of 70.7% or greater.

Part 7: Horizontal Timing with Cursors

Setup



Perform the following settings in the order listed:

11301/11302 Oscilloscope Mainframe:
. . . . . Initialize

Plug-In:
CH 1 . . . . . On

11301/11302 Oscilloscope Mainframe:
HORIZONTAL SIZE . . . . . 10 ms/div
Impedance . . . . . 50 Ω

Time Mark Generator:
Markers . . . . . 10 ms

Procedure

a. Adjust the vertical size of the displayed waveform to be from 3 to 6 divisions high. Center the display vertically.

b. Turn on the horizontal cursors.

c. ***CHECK***—the accuracy of the **Main Time/div** entries noted in Table 4 on the next page. For each check, set the Time Mark Generator, **X10 Mag**, and **Main Time/div** to the noted settings. Then position the horizontal cursors the noted number of waveform cycles apart, by placing each cursor at a point where the waveform crosses the centerline of the graticule. Use the rising edges of the waveform markers to set the cursors.

Finally, ***CHECK***—that the **ΔHoriz** cursor readout is within the range noted; you may need to press the CURSOR button to see this readout. Some of the higher speed tests may require adjustment to the vertical size or centering.

Table 4 — Timing Accuracy

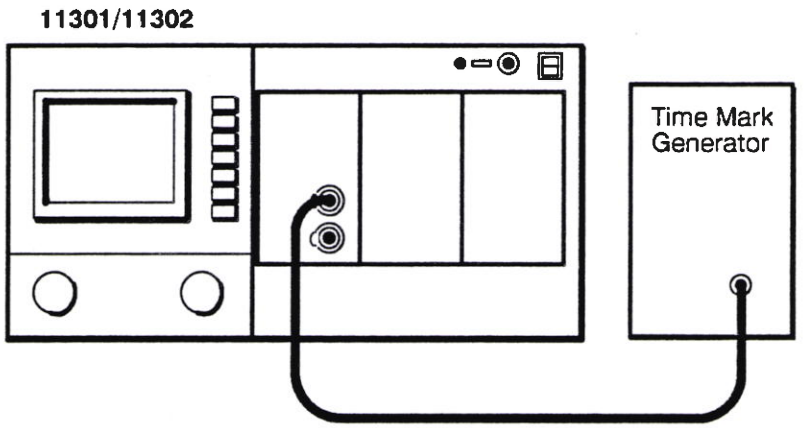
Time Mark Generator	X10 Mag	Main Time/div	Number of Waveform Cycles	Range of ΔHoriz
10 ms	Off	10 ms/div	8	79.3–80.7 ms
1 ms	Off	1 ms/div	8	7.93–8.07 ms
0.1 ms	On	100 μs/div	8	789–811 μs
10 μs	Off	10 μs/div	8	79.3–80.7 μs
5 ns	On	1 ns/div	1	4.88–5.12 ns

d. Bring up window 1, which is available under the HORIZONTAL DELAY (OFFSET) button below the screen. Set the delay 1 time to 0 s.

e. ***CHECK***—the same tolerances using the delayed time base. Use the **Main Time/div** notation in Table 4 for the **Dly'd Time/div** settings. Make sure that **Main Time/div** and **Dly'd Time/div** are set the same, or else the repetition rate of the sweeps may render the trace too difficult to see.

Part 8: Delta Delay Accuracy

Setup



Perform the following settings in the order listed:

11301/11302 Oscilloscope Mainframe:
..... Initialize

Plug-In:
CH 1 ..... On

11301/11302 Oscilloscope Mainframe:
Impedance ..... 50 Ω

Time Mark Generator:
Markers ..... 0.1 ms

Procedure

a. Adjust the vertical size of the waveform to be from 3 to 6 divisions high, and position the baseline of the waveform about one division above the centerline of the graticule.

b. Use the HORIZONTAL DELAY (OFFSET) button to turn on window 1, and set **Main&Dly View** to **Dly View**.

c. Adjust the delayed sweep size to 1 μs/div. You may need to adjust the delayed intensity to see the trace.

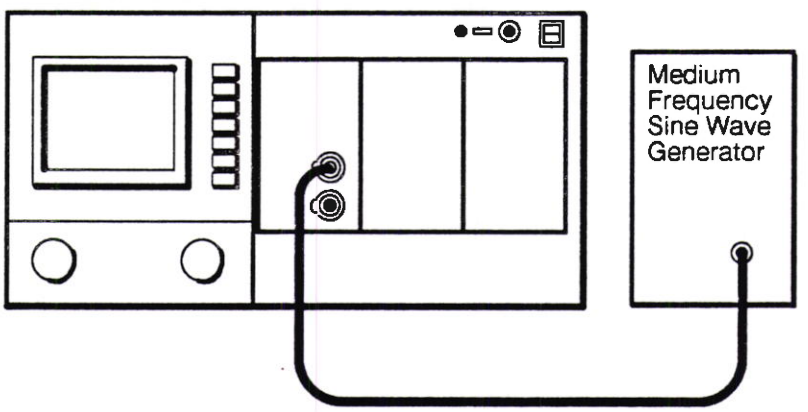
d. Adjust the horizontal position of the delay 1 sweep to align the rising edge of the time mark with a vertical graticule line.

e. Turn on window 2. Adjust the HORIZONTAL DELAY (OFFSET) to precisely overlay the two window waveforms.

f. ***CHECK***—that the **ΔDelay** readout is between 696.90 and 703.10 ms.

Part 9: Trigger Filters

Setup



Perform the following settings in the order listed:

11301/11302 Oscilloscope Mainframe:
. . . . . Initialize

Plug-In:
CH 1 . . . . . On

11301/11302 Oscilloscope Mainframe:
VERTICAL SIZE . . . . . 200 mV/div
HORIZONTAL SIZE . . . . . 2 µs/div
Trigger mode . . . . . Auto
Main trigger level . . . . . 0 V
Impedance . . . . . 50 Ω

Sine Wave Generator:
Frequency . . . . . 50 kHz

Procedure

a. Adjust the Sine Wave Generator Amplitude to produce a waveform about 6 divisions in height.

b. Change the VERTICAL OFFSET, and as you are turning the knob, ***CHECK***—that the signal moves up and down on the screen while the triggering point (the leftmost edge of the sweep) stays at a fixed point on the screen. When done, return the offset to zero.

c. Select **Ac** coupling for the main trigger.

d. Change the VERTICAL OFFSET, and as you are turning the knob, *CHECK*—that the signal moves up and down on the screen while the triggering point (the leftmost edge of the sweep) also moves up and down. The triggering point should maintain its relationship to the rest of the waveform. When done, return the offset to zero.

e. Set trigger coupling to **Dc**. Align the falling edge of the sine wave to cross at the center of the screen by adjusting the horizontal position.

f. Set trigger coupling to **DcHf Rej**. *CHECK*—that the falling edge of the sine wave now crosses the horizontal centerline at a point left of the vertical centerline. The distance to the left should be between 0.6 and 1.8 divisions.

g. Set trigger coupling to **AcLf Rej**. *CHECK*—that the falling edge of the sine wave has moved right between 0.6 and 1.8 divisions.

h. Set trigger coupling to **AcHf Rej**. *CHECK*—that the falling edge of the sine wave has moved between 0.6 and 1.8 divisions to the left of center.

i. Set the **Main Time/div** to 5 μs, and return coupling to **Dc**. Verify that the **Main Trig** and **L1 Offset** are zero.

j. Set window 1 on, **Trig'd After Dly**, and **Dly View**. Set the **Dly'd Time/div** to 2 μs, and ensure that the **Dly1 Trig** level is zero.

k. Change the VERTICAL OFFSET, and as you are turning the knob, *CHECK*—that the signal moves up and down on the screen while the triggering point stays at a fixed point on the screen. When done, return the offset to zero.

l. Select AC coupling for the delayed trigger.

m. Change the VERTICAL OFFSET, and as you are turning the knob, *CHECK*—that the signal moves up and down on the screen while the triggering point also moves up and down. The triggering point should maintain its relationship to the rest of the waveform. When done, return the offset to zero.

n. Set trigger coupling to **Dc**. Align the falling edge of the sine wave to cross at the center of the screen by adjusting the horizontal position.

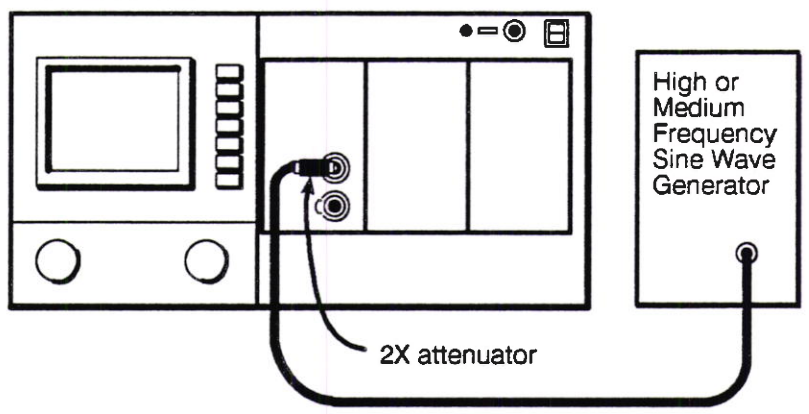
o. Set trigger coupling to **DcHf Rej**. *CHECK*—that the falling edge of the sine wave now crosses the horizontal centerline at a point left of the vertical centerline. The distance to the left should be between 0.6 and 1.8 divisions.

p. Set trigger coupling to **AcLf Rej**. *CHECK*—that the falling edge of the sine wave has moved right between 0.6 and 1.8 divisions.

q. Set trigger coupling to **AcHf Rej**. *CHECK*—that the falling edge of the sine wave has moved between 0.6 and 1.8 divisions to the left of center.

Part 10: Trigger Sensitivity

Setup



Perform the following settings in the order listed:

11301/11302 Oscilloscope Mainframe:
. . . . . Initialize

Plug-In:
CH 1 . . . . . On

11301/11302 Oscilloscope Mainframe:
Main trigger sensitivity . . . . . High
Main trigger mode . . . . . Auto
HORIZONTAL SIZE . . . . . 200 ns/div
VERTICAL SIZE . . . . . 200 mV/div
Impedance . . . . . 50 Ω

Sine Wave Generator:
Frequency . . . . . 6 MHz

Procedure

a. Use the same Sine Wave Generator used in Part 6; one capable of producing a sine wave of a frequency equal to the **HF Limit**. Adjust the Sine Wave Generator Amplitude for a waveform height of 1.75 divisions, or 350 mV.

Throughout this test, be precise in establishing waveform heights as nearly as possible to the specification. One way this can be accomplished is by using the vertical cursor controls. Set **On Tracking**, and adjust the **ΔVERT** readout to the voltage specification of the adjustment. Then, by simultaneously using the VERTICAL POS control and adjusting the Amplitude of the Sine Wave Generator, the waveform can be matched to the cursor size.

b. Set window 1 on, and adjust delay 1 to 0 s.

c. Using the VERTICAL POS control, position the main trace in the top half of the screen and the window trace in the bottom half.

d. For the DELAY 1 TRIGGER, select **Trig'd After Dly** and **High Senstvty**.

e. Install a 5X attenuator in series with the 2X attenuator at the plug-in input.

f. Adjust the TRIGGER LEVEL of both the main and delay 1 triggers.
CHECK—to verify that stable traces can be established on the screen. You will need to use the Fine knob settings.

g. Remove the 5X attenuator, leaving the 2X attenuator in the signal path.

h. Adjust the Sine Wave Generator for a vertical Amplitude of 3.5 divisions, or 700 mV, for each waveform.

i. Reinstall the 5X attenuator in the signal path.

j. Change the trigger sensitivity of both the main and delay 1 triggers to **Medium Senstvty**.

k. Adjust the TRIGGER LEVEL of both the main and delay 1 triggers.
CHECK—to verify that stable traces can be established on the screen.

l. Remove the 5X attenuator, leaving the 2X attenuator in the signal path.

m. Adjust the Sine Wave Generator for a vertical Amplitude of 5.25 divisions, or 1.05 V.

n. Reinstall the 5X attenuator in the signal path.

o. Change the trigger sensitivity of both the main and delay 1 triggers to **Low Senstvty**.

p. Adjust the TRIGGER LEVEL of both the main and delay 1 triggers.
CHECK—to verify that stable traces can be established on the screen. You may need to increase the intensity of the main and delayed traces to see the waveforms. Also, the M TRIG'D and D TRIG'D lights next to the TRIGGER LEVEL button show whether the main and delay triggers are active.

q. Change the trigger sensitivity of both the main and delay 1 triggers to **High Senstvty**.

r. Adjust the **Main Time/div** to 10 ns. This will force the **Dly'd Time/div** to match.

s. Remove the 5X attenuator, leaving the 2X attenuator in the signal path.

t. Press the VERTICAL POS button below the screen to bring up the vertical menu. Observe the system bandwidth in the **HF Limit** readout at the bottom of the screen, and adjust the Sine Wave Generator Frequency to match.

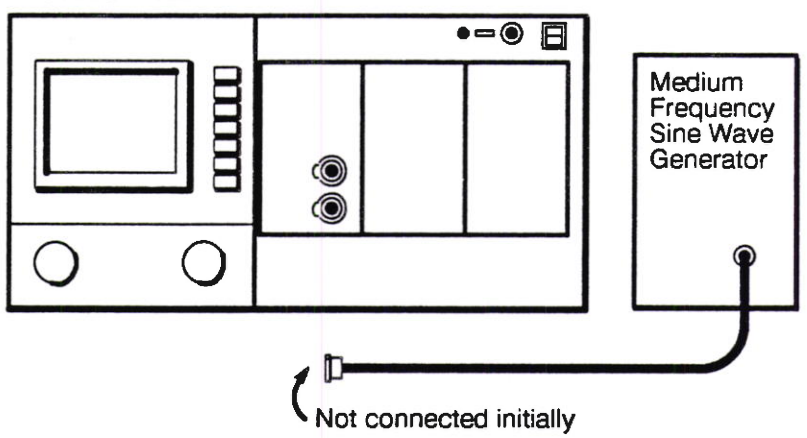
u. Adjust the Sine Wave Generator for a vertical Amplitude of 5.00 divisions, or 1.00 V.

v. Reinstall the 5X attenuator in the signal path.

w. Adjust the TRIGGER LEVEL of both the main and delay 1 triggers.
CHECK—to verify that stable traces can be established on the screen.

Part 11: Trigger Accuracy

Setup



Perform the following settings in the order listed:

11301/11302 Oscilloscope Mainframe:
. . . . . Initialize

Plug-In:
CH 1 . . . . . On

11301/11302 Oscilloscope Mainframe:
HORIZONTAL SIZE . . . . . 2 µs/div
CURSORS . . . . . Vertical
Main trigger mode . . . . . Auto
Impedance . . . . . 50 Ω

Sine Wave Generator:
Frequency . . . . . 50 kHz

Procedure

a. Adjust the reference cursor (left knob) to the center of the trace. Note the **Vert Ref** cursor readout voltage.

b. Connect the Sine Wave Generator cable to the plug-in Channel 1 input. Adjust its Amplitude to produce a waveform height of approximately 4 divisions. Do not change the VERTICAL POSITION, which should remain at zero.

c. Set the **Main Trig** level yo 0 V.

d. Move the trace slightly to the right using HORIZONTAL POSITION, so that its leading end is visible on the screen.

e. Adjust the reference cursor (left knob) so that the cursor touches the leading end of the waveform.

f. *CHECK*—that the **Vert Ref** cursor readout is within ± 0.3 V of the value noted in Step a., before the generator was connected.

g. Bring up window 1, and select **Dly View** and **Trig'd After Dly**. Set the **Main Time/div** to 5 µs and the **Dly'd Time/div** to 2 µs.

h. Verify that the **Dly1** Trig level is 0 V.

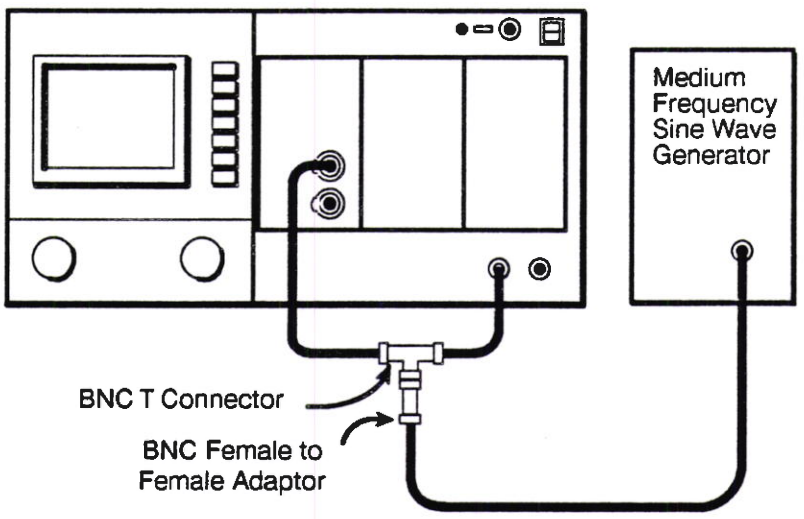
i. Move the delayed trace slightly to the right using HORIZONTAL POSITION, so that its leading end is visible on the screen.

j. Adjust the reference cursor (left knob) so that the cursor touches the leading end of the waveform.

k. CHECK—that the **Vert Ref** cursor readout is within ± 0.3 V of the value noted in step a., before the generator was connected.

Part 12: A and B External Inputs

Setup



Perform the following settings in the order listed:

11301/11302 Oscilloscope Mainframe:
- Initialize

Plug-In:
- CH 1 ..... On

11301/11302 Oscilloscope Mainframe:
- VERTICAL SIZE ..... 200 mV/div
- HORIZONTAL SIZE ..... 50 ns/div
- Impedance ..... 50 Ω
- Main trigger ..... Auto
- Main trigger level ..... 0 V

Sine Wave Generator:
- Frequency ..... 10 MHz
- Amplitude ..... 1 V P-P

Procedure

a. From the TRIGGER SOURCE menu, select the main trigger source to be **A Ext÷5** and the delay 1 trigger source to be **B Ext÷5**.

b. Adjust the following trigger levels to be 0 V: **Main**, **Dly1**, **CT Ext A**, and **CT Ext B**.

c. Press the COUNTER button, and select **Ratio Measure**.

d. Place a 50 Ω terminator on the B EXTERNAL INPUT. Remove the cable from the plug-in CH 1 and connect it to the terminator.

e. *CHECK*—that the **Ratio D1÷M** is between 999.9990000m and 1.000001000.

f. Select **A & B Ext Source** from the COUNTER menu.

g. *CHECK*—that the **Ratio B÷A** is between 999.9990000m and 1.000001000.

h. From the TRIGGER SOURCE menu set the main trigger source to **A Ext** and the delay 1 trigger source to **B Ext.**

i. Install a 5X attenuator between the coaxial cable from the Sine Wave Generator and the BNC T Connector.

j. *CHECK*—that the **Ratio B÷A** is between 999.9990000m and 1.000001000.

k. From the COUNTER menu, select **M & D1 Trig Source.**

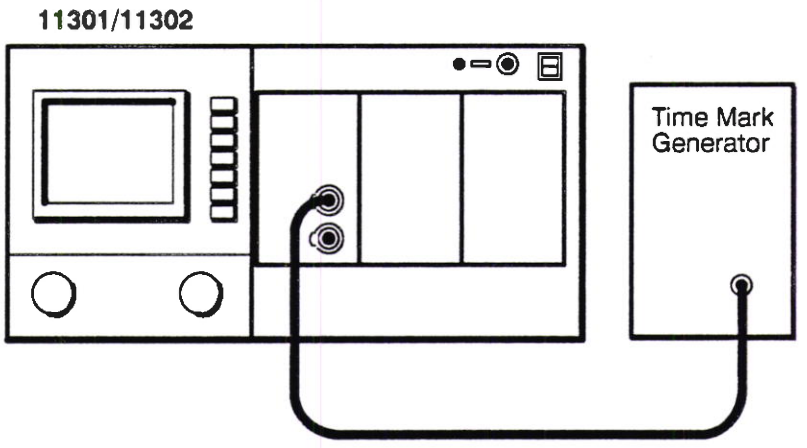
l. *CHECK*—that the **Ratio D1÷M** is between 999.9990000m and 1.000001000.

m. From the WAVEFORM menu, touch **Count View** and create two new waveforms on the screen representing the **A Ext** and **B Ext** counter view signals. Use the VERTICAL POS controls to separate the two traces.

n. *CHECK*—that both the new waveforms appear on the screen as square or rectangular waves with both high and low portions, and are not simply horizontal lines.

Part 13: Counter Timer

Setup



Perform the following settings in the order listed:

11301/11302 Oscilloscope Mainframe:
. . . . . Initialize

Plug-In:
CH 1 . . . . . On

11301/11302 Oscilloscope Mainframe:
HORIZONTAL SIZE . . . . . 100 ns/div
Vertical coupling . . . . . Dc
Impedance . . . . . 50 Ω

Time Mark Generator:
Markers . . . . . 0.1 μs

Procedure

a. Adjust VERTICAL SIZE and VERTICAL POS for a waveform display from 3 to 6 divisions high. If necessary, adjust the main trigger for a stable display.

b. Turn on window 1 and adjust the **Delay1** readout to 400 ns.

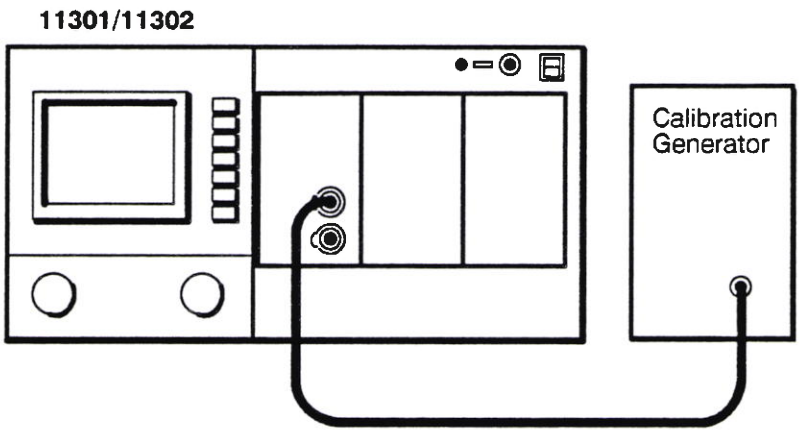
c. Turn on window 2 and adjust **ΔDelay** to 0 s.

d. Use the COUNTER menu to select **Time A→B Measure**.

e. CHECK—that the **TimeD1→D2** readout is within the range 0 ns ± 1.5 ns.

Part 14: Front Panel Calibrator

Setup



Perform the following settings in the order listed:

11301/11302 Oscilloscope Mainframe:
..... Initialize

Calibration Generator:
Amplitude ..... 0.5 V
(0.1 V for 50 Ω only plug-ins)

Plug-In:
CH 1 ..... On

11301/11302 Oscilloscope Mainframe:
VERTICAL SIZE ..... 100 mV/div
(10 mV/div for 50 Ω only plug-ins)
HORIZONTAL SIZE ..... 500 µs/div

Procedure

a. Use the VERTICAL POS button to center the trace vertically on the screen.

b. If possible, set the bandwidth limit to **20.0 MHz HF Limit**. Not all plug-ins support this setting.

Note

To miminize noise interference of the calibration signal, set any nearby sine wave generators to their reference (lowest) frequencies.

c. Use the vertical cursors to measure the amplitude of the waveform. Use the fine knob settings, and set the reference cursor to split the waveform bottom and the measuring cursor to split the waveform top.

d. Touch the **Set Ref** area, and the **%–dB** screen area to set it on.

e. Move the cable from the Calibration Generator output to the 11301/11302 CALIBRATOR output.

f. Use the UTILITY menu and the **Cal Sig** selector to set calibrator output to a **500 mV Sq Wave** of **1 kHz**.

g. Adjust the cursors to measure the calibrator signal. ***CHECK***–that the **ΔVert** readout is between 98.8% and 101.2%. For 50 Ω plug-ins, use 98% and 102% as acceptable limits.

NOTE

The 11301/11302 CALIBRATOR has an output impedance of 450 ohms, while the output impedance of the Calibration Generator you use will probably be different. The Tektronix PG506 Calibration Generator has an output impedance of 50 ohms. The tolerance of the plug-in input varies with the impedance matching of the signal source and the input impedance of the plug-in, and this is why the different specification with 50 Ω only plug-ins.

h. On 50 Ω only plug-ins, set the vertical sensitivity to 50 mV/div.

i. Adjust the calibrator with the UTILITY menu to **Fast**.

j. Adjust the cursors to measure the calibrator signal. ***CHECK***–that the **ΔVert** readout is 100% or greater for all plug-ins.

k. Set VERTICAL SIZE to 1 V/div (100 mV/div for 50 Ω only plug-ins).

l. Move the cable from the 11301/11302 CALIBRATOR output back to the Calibration Generator output. Set the Calibration Generator output to 5 V (1 V for 50 Ω only plug-ins).

m. Adjust the cursors to measure the new signal, and touch **Set Ref**.

n. Move the cable from the Calibration Generator output to the 11301/11302 CALIBRATOR output.

o. Use the UTILITY menu and the **Cal Sig** selector to set calibrator output to a **5 V Sq Wave** of **1 kHz**.

p. Adjust the cursors to measure the calibrator signal. ***CHECK***–that the **ΔVert** readout is between 98.8% and 101.2%. For 50 Ω plug-ins, use 98% and 102% as acceptable limits.

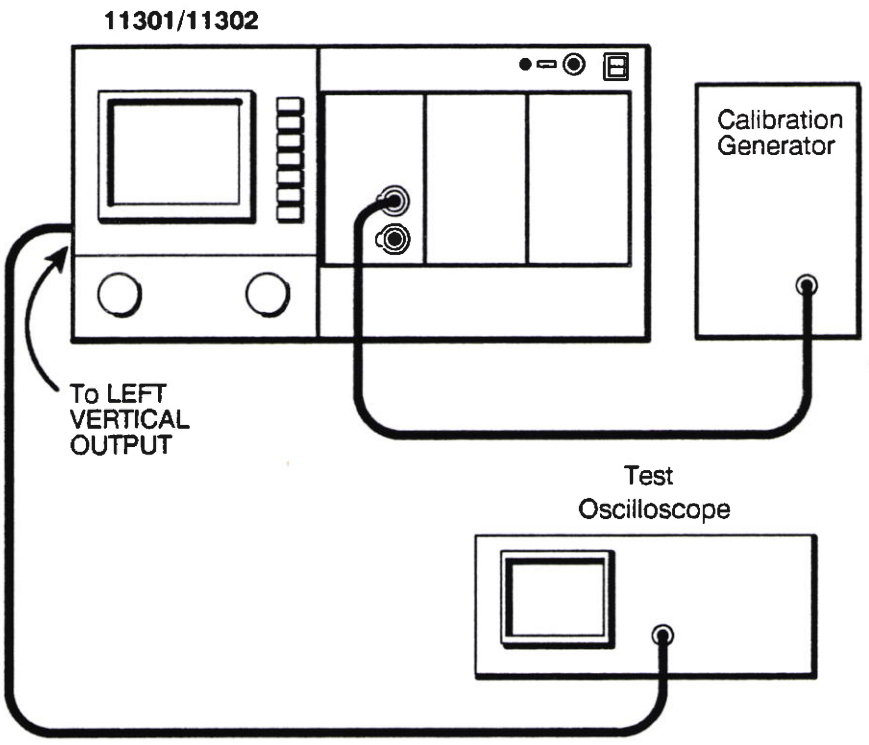
q. Press the MEASURE COUNTER button beneath the screen (not the MEASURE button to the right of the screen), and select **Freq Measure**.

r. ***CHECK***–that the **Freq** readout is between 998.0000 Hz and 1.002000 kHz.

s. ***CHECK***–that the number of displayed digits in the **Freq** readout display is 7, or, for 11301/11302 Option 1T, 9 digits.

Part 15: Rear Panel Input/Output Signals

Setup



Perform the following settings in the order listed:

11301/11302 Oscilloscope Mainframe:
. . . . . Initialize

Plug-In:
CH 1 . . . . . On

11301/11302 Oscilloscope Mainframe:
VERTICAL SIZE . . . . . 500 mV/div
HORIZONTAL SIZE . . . . . 500 µs/div
Impedance . . . . . 50 Ω

Calibration Generator:
Amplitude . . . . . 5 V

Test Oscilloscope:
Horizontal . . . . . 500 µs/div
Vertical . . . . . 100 mV/div
Triggering . . . . . Auto

Procedure

a. Use the 11301/11302 VERTICAL POS control to center the waveform vertically.

b. ***CHECK***—that the signal displayed on the Test Oscilloscope shows a waveform baseline within the range of ±175 mV.

c. ***CHECK***—that the peak-to-peak amplitude of the signal on the Test Oscilloscope is in the range 450 mV – 550 mV.

d. Disconnect the cable from LEFT VERTICAL OUTPUT. Using a BNC T Adaptor, connect the Calibration Generator signal to the back-panel Z AXIS connector in addition to the plug-in.

e. ***CHECK***—that the positive peaks of the signal are blanked on the screen.

f. Set the HORIZONTAL SIZE to 1 ms/div.

g. Remove all cables from the plug-in and the Z AXIS. Connect a cable from the back-panel MAIN SWP OUT to the Test Oscilloscope. Set the Test Oscilloscope to 1 V/div vertical, 2 ms/div horizontal, 1 MΩ impedance, auto triggering, and - slope trigger.

h. ***CHECK***—that the waveform baseline on the Test Oscilloscope is within the range ±0.5 V. ***CHECK***—that the slew rate is 0.5 V/ms ± 10%. Over a sweep distance of 4 divisions, the waveform should rise vertically 4 divisions ± 0.4 divisions.

i. Remove the cable from the MAIN SWP OUT, and connect it to the back-panel SWEEP GATE. Adjust the Test Oscilloscope to normal (not auto) triggering, dc coupling for vertical and trigger signals, and negative trigger slope. Adjust the Test Oscilloscope trigger level near the middle of the range in which triggering occurs.

NOTE

This setup of the Test Oscilloscope will be used in an upcoming step, in which the trigger level adjustment is somewhat difficult. Leave the settings on the Test Oscilloscope as they are through the end of this Part.

j. ***CHECK***—that the low level of the signal is in the range of 0 – 0.5 V, and the high level of the signal is in the range of 2.4 – 5 V.

k. On the 11301/11302, set the trigger to Auto, and set the main trigger level to its maximum value (5 V). Select the **2 ns Step Holdoff** and rotate the left knob one click. Observe that the **Holdoff** readout indicates in the range of 15.999999 – 16.000001 ms.

l. Select the MEASURE COUNTER mode of **Period Measure**, **A Ext Source**. Remove the cable from the Test Oscilloscope and use it to connect the SWEEP GATE to the A EXT INPUT.

m. From the TRIGGER SOURCE menu, select **A Ext ÷5** as the main trigger source, to set the A EXT INPUT sensitivity. Then select **L1** as the main trigger source.

n. Adjust the **CT Ext A** trigger level to 1.500 V.

o. ***CHECK***—that the measured period is in the range of 15.99999 – 16.00001 ms. For Option 1T additional digits will be displayed.

p. Select **Time** TRIGGER HOLDOFF, and select **Off Measure** on the counter. Remove the cable from between the SWEEP GATE and the A EXT INPUT.

q. Set the HORIZONTAL SIZE to 10 ms/div.

r. Move the BNC cable connected to the Calibration Generator from the plug-in input to the rear-panel TRIGGER RESET connector. Set the Calibration Generator for an Amplitude of 5 V.

s. ***CHECK***—that the 11301/11302 sweep does not traverse the full width of the screen, and that the beeper sounds continually.

t. Connect the rear-panel TRIGGER READY output to the Test Oscilloscope.

u. Set the HORIZONTAL SIZE to 1 ms/div. Use the TRIGGER LEVEL menu to establish **Single Mode**.

NOTE

When in **Single Mode** *the knobs and buttons will not respond in a normal manner, and the 11301/11302 may appear to be "locked up." Normal operation may be reestablished by removing the TRIGGER RESET signal and touching any button.*

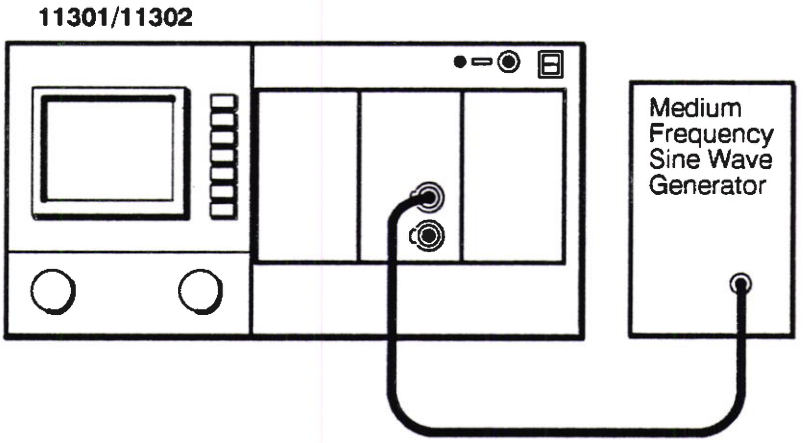
v. ***CHECK***—that the low level of the signal on the Test Oscilloscope is in the range of 0 – 0.5 V, and the high level of the signal is in the range of 2.4 – 5 V.

NOTE

If you are performing an Incoming Inspection Procedure upon the plug-in installed in the LEFT compartment, detour and perform that procedure before continuing on to Part 16.

Part 16: Clock In/Out

Setup



Perform the following settings in the order listed:

11301/11302 Oscilloscope Mainframe:
. . . . . Initialize

Plug-In:
CH 1 . . . . . On

11301/11302 Oscilloscope Mainframe:
VERTICAL SIZE . . . . . 200 mV/div
Impedance . . . . . 50 Ω

Sine Wave Generator:
Amplitude . . . . . 1 V P-P
Frequency . . . . . 10 MHz

Procedure

NOTE

The CENTER plug-in compartment is being tested in the next few Parts. If you do not have a plug-in in the CENTER compartment, power down the oscilloscope and move the plug-in from the LEFT compartment to CENTER. You may proceed with this Part and with Part 17 without waiting for the 20-minute warm-up period to permit ENHANCED ACCURACY.

a. Use the MEASURE COUNTER button to bring up **Freq Measure**, and refine the Sine Wave Generator frequency to a range from 9.99 – 10.1 MHz.

b. Use the UTILITY menu's **I/O BNC** selector to set the clock to **Ext 10 MHz**.

c. ***CHECK***—for the message **Counter Timer PLL unlocked** being on the screen.

d. Use a BNC T Adaptor to connect the incoming signal to the rear-panel COUNTER REF CLOCK connector, as well as the plug-in input.

e. ***CHECK***—that the **Freq** readout is from 9.999993 – 10.000007 MHz.

f. Disconnect the COUNTER REF CLOCK cable and BNC T Adaptor from the plug-in, leaving only the Sine Wave Generator attached to the plug-in input. Cable from the COUNTER REF CLOCK through a 50 Ω terminator to the input of a Digital Counter. (You should have one cable from the Sine Wave Generator to the plug-in input, and a second cable from the COUNTER REF CLOCK connector to a 50 Ω terminator on the Digital Counter input.) Return the clock reference back to internal (UTILITY MENU **I/O BNC** selector).

NOTE

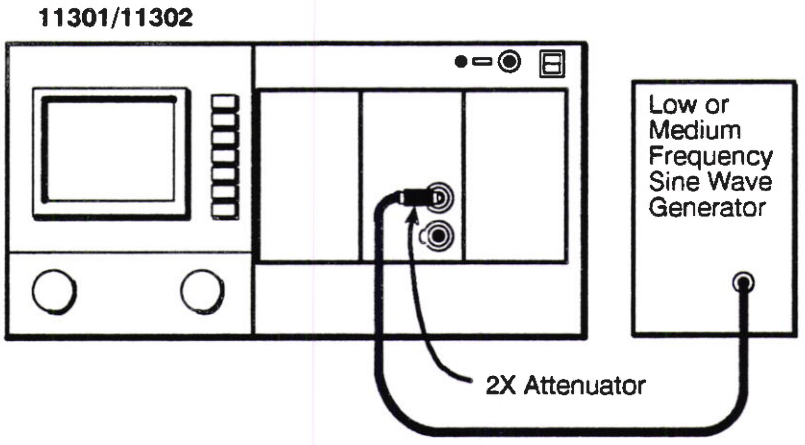
In the next steps, the Digital Counter being used must be thoroughly warmed up. Ideally, it should have been turned on at the beginning of this entire Incoming Inspection Procedure.

g. On the Digital Counter, select a frequency measuring mode with a short gating period. Adjust the trigger level near the middle of the range in which triggering occurs. Select a gating period that resolves to 1 Hz on a 10 MHz measurement.

h. ***CHECK***—that the frequency measured on the Digital Counter is within the range 9.999950 – 10.000050 MHz, or for Option 1T, 9.999988 – 10.000012 MHz.

Part 17: Vertical Bandwidth

Setup



Perform the following settings in the order listed:

11301/11302 Oscilloscope Mainframe:
..... Initialize

Plug-In:
CH 1 ..... On

11301/11302 Oscilloscope Mainframe:
HORIZONTAL SIZE ..... 100 ns/div
VERTICAL SIZE ..... 200 mV/div
Impedance ..... 50 Ω

Sine Wave Generator:
Frequency ..... 6 MHz

Procedure

a. Press the VERTICAL SIZE button below the screen. ***CHECK***—to ensure that Sine Wave Generator you are using is capable of producing the frequency listed on the screen as the **HF Limit**.

b. Adjust the amplitude of the Sine Wave Generator to produce a 6-division high displayed waveform. Use VERTICAL POS to vertically center the waveform if necessary.

c. Display the vertical cursors, and adjust them to the top and bottom of the waveform.

d. Touch the **Set Ref** region of the screen.

e. Touch the **%—dB** region of the screen to select it on.

f. ***CHECK***—that the readout indicates **ΔVert** = 100% and **ΔVert** = 0 dB, and that the reference amplitude (immediately above **Set Ref**) is between 5.90 and 6.10 divisions.

g. Set the Sine Wave Generator to the frequency indicated as the **HF Limit**. If necessary, you can display this limit by pressing the VERTICAL SIZE button. Do not change the amplitude of the Sine Wave Generator.

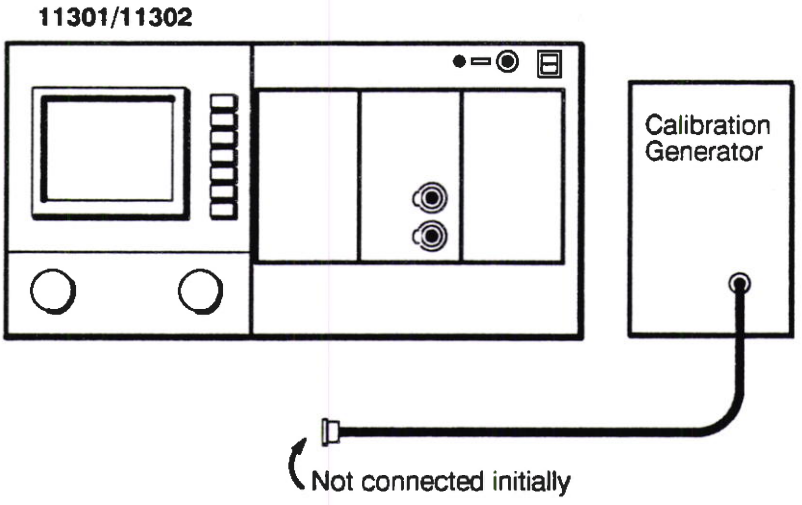
h. Adjust the INTENSITY and HORIZONTAL SIZE as required to achieve a viewable waveform on the display.

i. Realign the vertical cursors to the new top and bottom of the waveform.

j. ***CHECK***—that the **ΔVERT** cursor readout indicates a value of 70.7% or greater.

Part 18: Vertical Cursor Accuracy

Setup



Perform the following settings in the order listed:

11301/11302 Oscilloscope Mainframe:
..... Initialize

Plug-In:
CH 1 ..... On

11301/11302 Oscilloscope Mainframe:
CURSORS ..... Vertical

Calibration Generator:
Amplitude ..... 5V Standard Amplitude
(10V for 50 Ω-only plug-ins)

Procedure

NOTE

This Part requires that the 11301/11302 be in Enhanced Accuracy mode. If you powered off the oscilloscope to move the plug-in just before Part 16, be sure to press ENHANCED ACCURACY now to calibrate the oscilloscope. If it has been less than 20 minutes since that power down, you will need to wait for the complete warm-up timeout before being able to perform the Enhanced Accuracy calibration.

a. Adjust the reference cursor (LEFT KNOB) to the vertical center of the trace. Bisect the trace as exactly as possible, using the FINE setting of the knob.

b. *CHECK*—that the **Vert Ref** readout is within specifications of Table 5 on the next page.

c. Connect the Calibration Generator output to the Plug-In CH 1 input.

d. Center the trace vertically on the screen.

e. Set the main horizontal size to 500 µs/div.

f. Align the cursors to the waveform base and top. Place the reference cursor at the waveform base, and the other cursor at the top.

g. *CHECK*—that the **ΔVert** readout is within the specifications of Table 5.

Table 5 - Vertical Cursor Tolerances

Plug-In Type	DC Balance (Step b.)	ΔVert Accuracy (Step g.)
11A32	± 230 mV	4.910 – 5.090 V
11A33	± 180 mV	4.890 – 5.110 V
11A34	± 230 mV	4.910 – 5.090 V
11A52	± 150 mV	4.910 – 5.090 V
11A71	± 200 mV	4.905 – 5.095 V

Part 19: Measurement Accuracy

Setup

As left from previous test.

Procedure

a. Press the MEASURE menu button, and select **Min**, **Max**, and **P-P** measurements. Touch **START**.

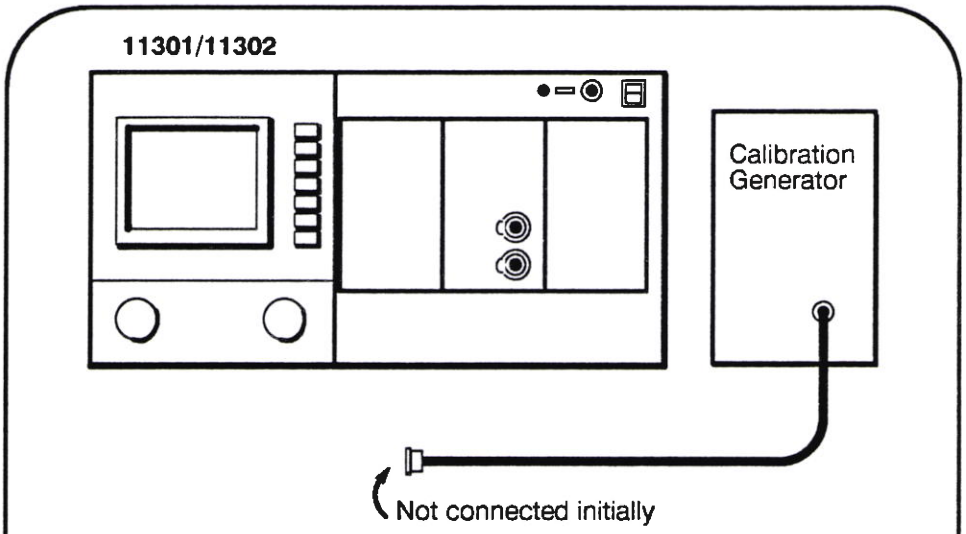
b. *CHECK*—that the measurement values that appear on the screen fall within the following ranges:

Table 6 - Measurement Tolerances

Plug-In Type	P-P	Max	Min
11A32	4.360 – 5.640 V	4.370 – 5.630 V	± 630 mV
11A33	4.340 – 5.660 V	4.420 – 5.580 V	± 580 mV
11A34	4.360 – 5.640 V	4.370 – 5.630 V	± 630 mV
11A52	4.360 – 5.640 V	4.450 – 5.550 V	± 550 mV
11A71	4.355 – 5.645 V	4.400 – 5.600 V	± 600 mV

Part 20: X-Axis Cursor Accuracy

Setup



Perform the following settings in the order listed:

11301/11302 Oscilloscope Mainframe:

..... Initialize
CURSORS ..... Horizontal

Calibration Generator:
Amplitude ..... 5V Standard Amplitude
(10V for 50 Ω-only plug-ins)

Procedure

a. Use the WAVEFORM button to define an XY trace representing **L vs C1**.

b. Adjust XY INTENSITY to dim the resultant dot waveform to a level low enough to prevent possible crt damage.

c. Adjust the reference cursor (LEFT KNOB) to the center of the dot. Use the FINE knob adjustment.

d. ***CHECK***—that the **Horiz Ref** readout is within specifications of Table 7 on the next page.

e. Connect the Calibration Generator output to the Plug-In CH1 input.

f. Use HORIZONTAL POS to center the two dots on the screen.

g. Readjust the reference cursor (LEFT KNOB) to the center of the left dot, and use the RIGHT KNOB to adjust the other cursor to the center of the right dot.

h. CHECK—that the **ΔHoriz** readout is within the specifications of Table 7.

Table 7 – Horizontal Cursor Tolerances

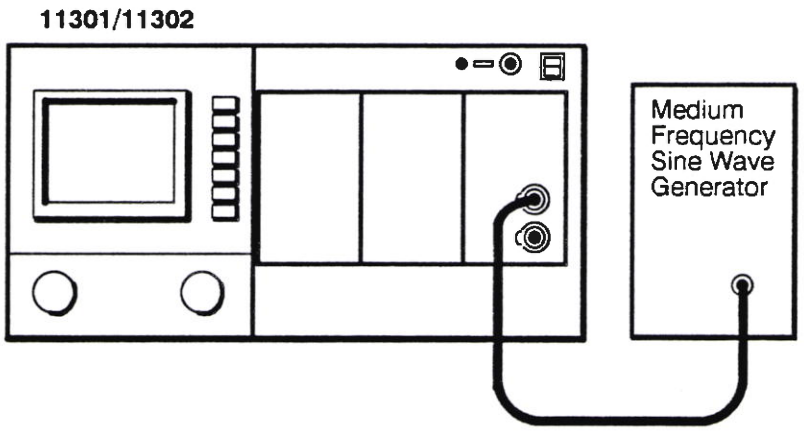
Plug-In Type	DC Balance (Step d.)	ΔHoriz Accuracy (Step h.)
11A32	± 330 mV	4.885 – 5.115 V
11A33	± 280 mV	4.865 – 5.135 V
11A34	± 330 mV	4.885 – 5.115 V
11A52	± 250 mV	4.885 – 5.115 V
11A71	± 300 mV	4.880 – 5.120 V

NOTE

If you are performing an Incoming Inspection Procedure upon the plug-in installed in the CENTER compartment, detour and perform that procedure before continuing on to Part 21. If the plug-in you are using in the CENTER compartment has already been so inspected in the LEFT compartment, there is no need to repeat that procedure in the CENTER compartment.

Part 21: Right Plug-In Compartment

Setup



Perform the following settings in the order listed:

11301/11302 Oscilloscope Mainframe:

. . . . . Initialize
CURSORS . . . . . Horizontal

Sine Wave Generator:
Frequency . . . . . 50 kHz

Procedure

NOTE

The RIGHT plug-in compartment is being tested in this Part. If you do not have a plug-in in the RIGHT compartment, power down the oscilloscope and move the plug-in from the CENTER compartment to RIGHT. You may proceed with this Part without waiting for the 20-minute warm-up period to permit ENHANCED ACCURACY.

a. Use the WAVEFORM button to define an XY trace representing **L vs R1**.

b. Adjust XY INTENSITY to dim the resultant dot waveform to a level low enough to prevent possible crt damage.

c. Use the TRIGGER SOURCE button to select R1 as the main trigger source. Use the TRIGGER LEVEL button to select **Auto Mode** and adjust the main trigger level to 0V, in that order.

d. Use HORIZONTAL SIZE to set R1 to 100 mV/div.

e. Adjust the Sine Wave Generator Amplitude for a 7-division horizontal deflection.

f. Adjust the cursors to the ends of the waveform and verify that the **ΔHoriz** readout indicates a range from 690 – 710 mV.

g. Touch **%–dB** to turn it on and touch **Set Ref**. Verify that the **ΔHoriz** readouts indicate 100% and 0 dB. (On some early versions of firmware, the **%–dB** area is mislabeled **%–Degree**.)

h. Change the Frequency of the Sine Wave Generator to 3 MHz, without changing its Amplitude.

i. Adjust the cursors to the ends of the waveform.

j. ***CHECK***–that the **ΔHoriz** readout indicates a value of 70.7% or larger.

k. Change the HORIZONTAL SIZE to set R1 to 1 V/div.

l. ***CHECK***–that the main trigger level can be adjusted so that the M TRIG'D light is illuminated. Use the FINE knob setting if necessary.

m. Use the WAVEFORM button to select an additional trace of L or L1. Select window 1 on and **Trig'd After Dly**. Use the TRIGGER SOURCE button to set R1 as the trigger source for the delay 1 trigger.

n. ***CHECK***–that the delay 1 trigger level can be adjusted so that the D TRIG'D light is illuminated. Use the FINE knob setting if necessary.

NOTE

If you wish to perform an Incoming Inspection Procedure upon the plug-in installed in the RIGHT compartment, you will need to reconfigure the system so that this plug-in is installed in either the LEFT or CENTER compartments. The capabilities of the RIGHT compartment are limited, and this compartment cannot be used for a plug-in Incoming Inspection Procedure. If the plug-in you are using in the RIGHT compartment has already been inspected in either the LEFT or CENTER compartments, there is no need to repeat the Incoming Inspection Procedure.

MANUAL CHANGE INFORMATION

At Tektronix, we continually strive to keep up with latest electronic developments by adding circuit and component improvements to our instruments as soon as they are developed and tested.

Sometimes, due to printing and shipping requirements, we can't get these changes immediately into printed manuals. Hence, your manual may contain new change information on following pages.

A single change may affect several sections. Since the change information sheets are carried in the manual until all changes are permanently entered, some duplication may occur. If no such change pages appear following this page, your manual is correct as printed.