User's Guide

Agilent Technologies
EMC Series Analyzers

This guide documents firmware revision A.08.xx

This manual provides documentation for the following instruments:

E7401A (9 kHz- 1.5 GHz)
E7402A (9 kHz - 3.0 GHz)
E7403A (9 kHz - 6.7 GHz)
E7404A (9 kHz - 13.2 GHz)
E7405A (9 kHz - 26.5 GHz)

Agilent Technologies

Manufacturing Part Number: E7401-90050
Supersedes: E7401-90024

Printed in USA

December 2001

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CAUTION *Caution* denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in damage to or destruction of the instrument. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.

NOTE *Note* calls out special information for the user's attention. It provides operational information or additional instructions of which the user should be aware.

The instruction documentation symbol. The product is marked with this symbol when it is necessary for the user to refer to the instructions in the documentation.

This symbol is used to mark the on position of the power line switch.

This symbol is used to mark the standby position of the power line switch.

This symbol indicates that the input power required is AC.

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WARNING **This is a Safety Class 1 Product (provided with a protective earth ground incorporated in the power cord). The mains plug shall be inserted only in a socket outlet provided with a protected earth contact. Any interruption of the protective conductor inside or outside of the product is likely to make the product dangerous. Intentional interruption is prohibited.**

WARNING **No operator serviceable parts inside. Refer servicing to qualified personnel. To prevent electrical shock do not remove covers.**

WARNING **If this product is not used as specified, the protection provided by the equipment could be impaired. This product must be used in a normal condition (in which all means for protection are intact) only.**

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Documentation is updated periodically. For the latest information about Agilent Technologies **EMC** Analyzers, including firmware upgrades and application information, please visit the following Internet URL:

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1 Menu Maps

This chapter provides a visual representation of the front panel keys and their associated menu keys when the analyzer is in EMC mode. Refer to Chapter 2 , “Front-Panel Key Reference,” on page 43 for key function descriptions.

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What You Will Find in This Chapter

This chapter provides menu maps for the front-panel keys having associated menus. The Alpha Editor Menu is associated with many keys, but is shown separately. The front-panel key menus appear in alphabetical order as follows:

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Alpha Editor Menus	Page 9
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Auto Couple	Page 12
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FREQUENCY Channel	Page 20
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SPAN X Scale	Page 38
Sweep	Page 39
System	Page 40
Trace/View	Page 41
Trig	Page 42

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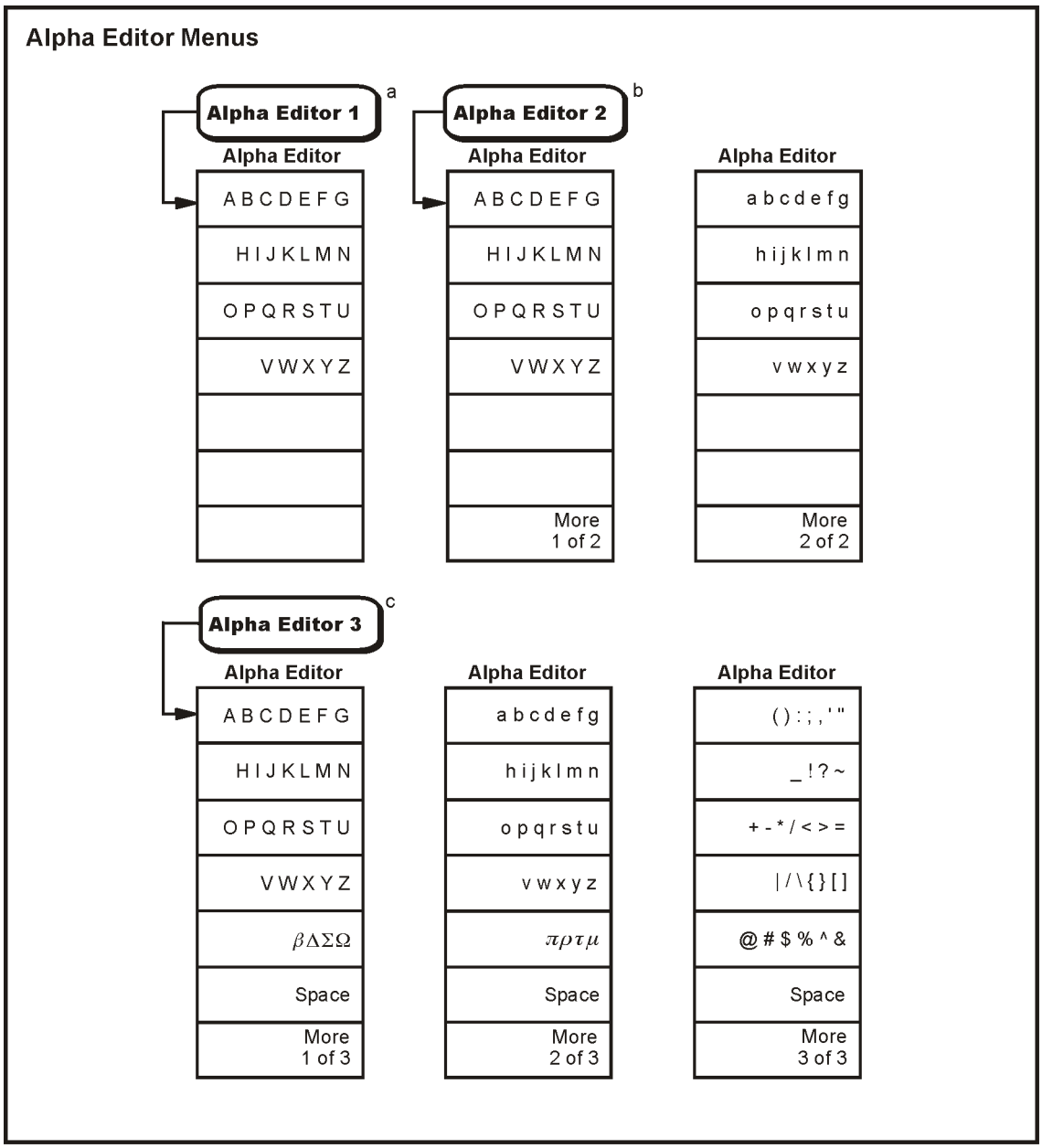
Menus

Alpha Editor Menu



a. The Alpha Editor 1 menu is used to configure system options and licensing.
b. The Alpha Editor 2 menu is used to name files.
c. The Alpha Editor 3 menu is used to change titles on the display and for entering comments in the **MEASURE** menu.

pl748b

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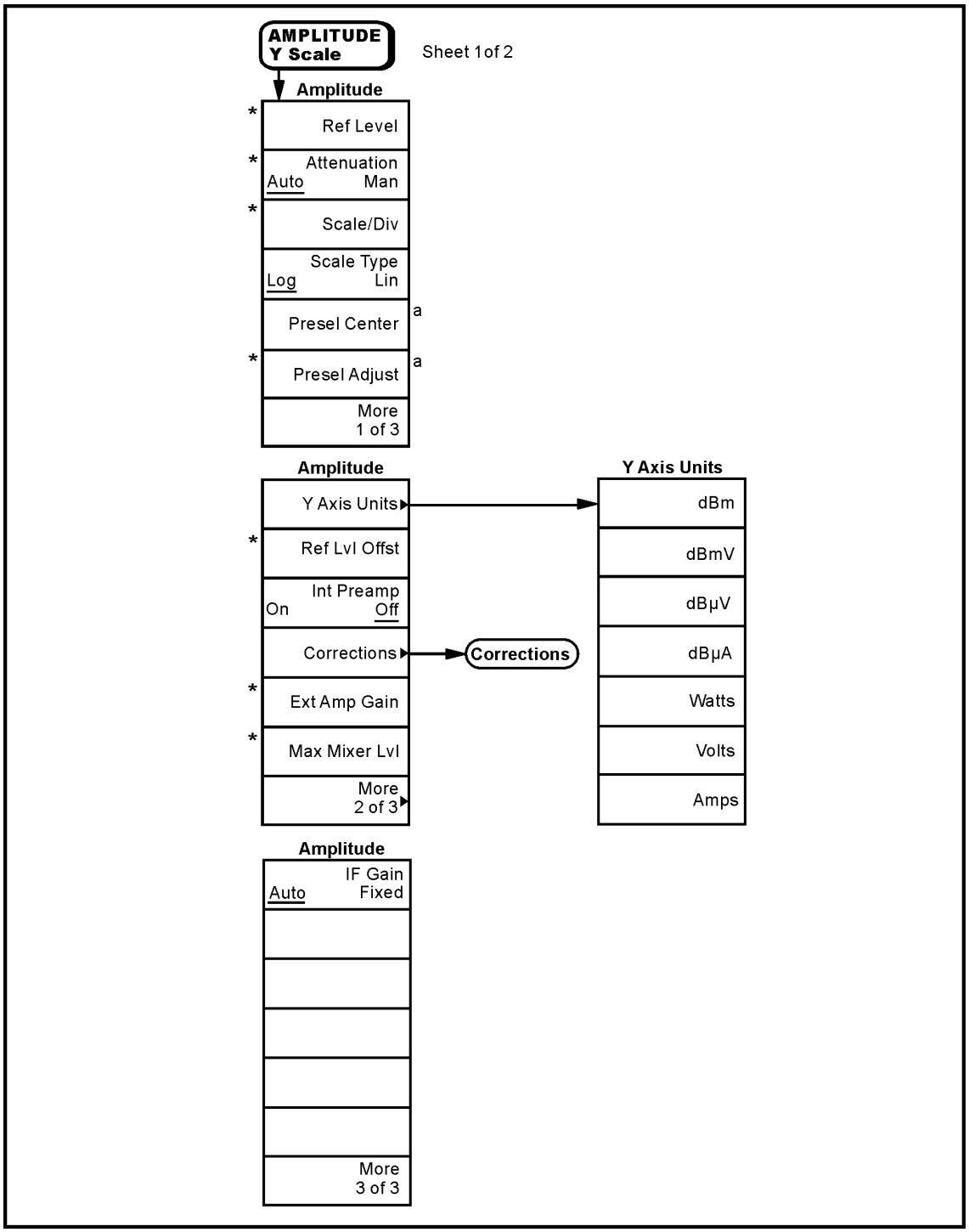
AMPLITUDE Y Scale Menu



a. Only available with E7403A, E7404A and E7405A

* An active function which allows data entry

pl780b

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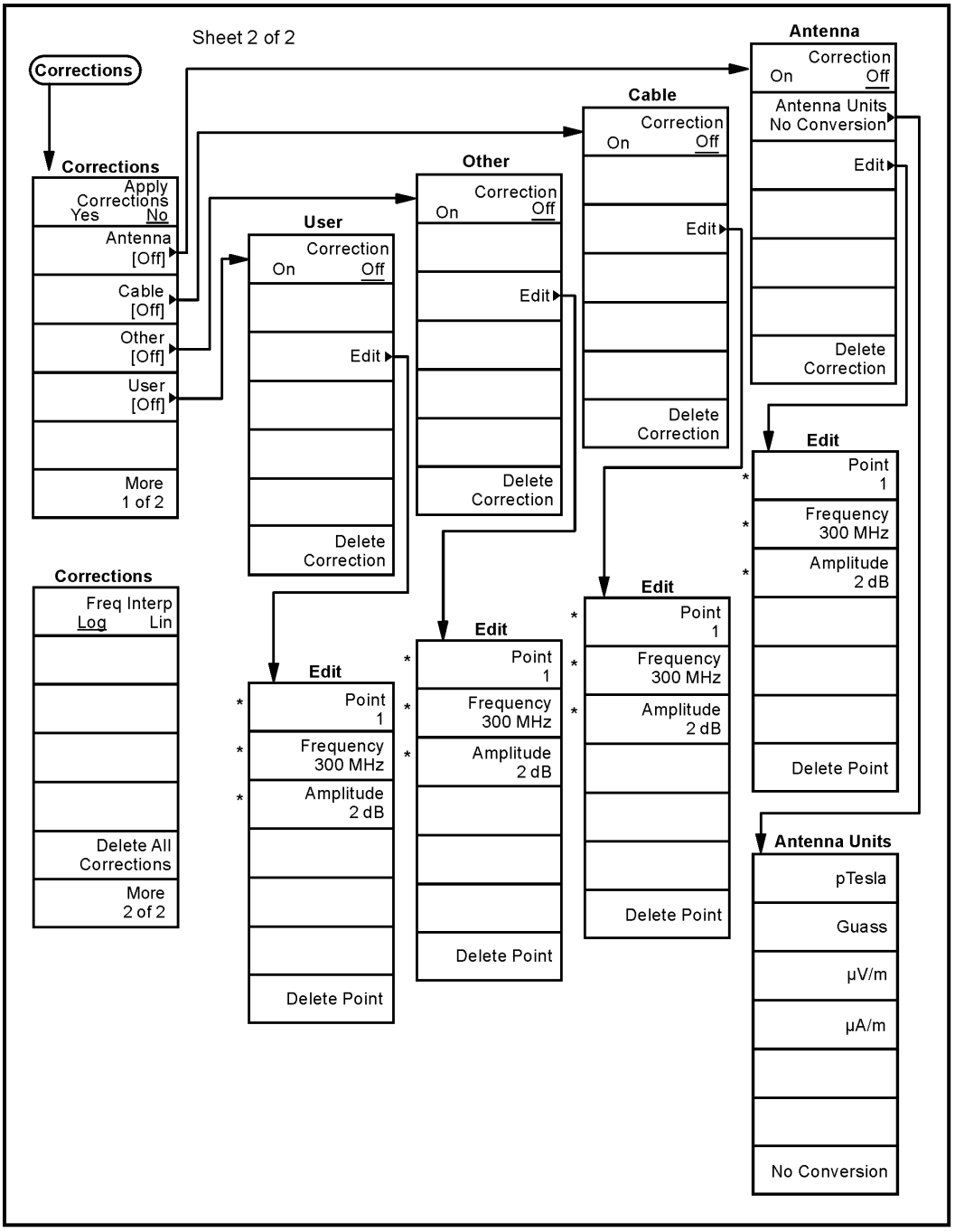
AMPLITUDE Y Scale Menu (Corrections)



* An active function which allows data entry

pl751b

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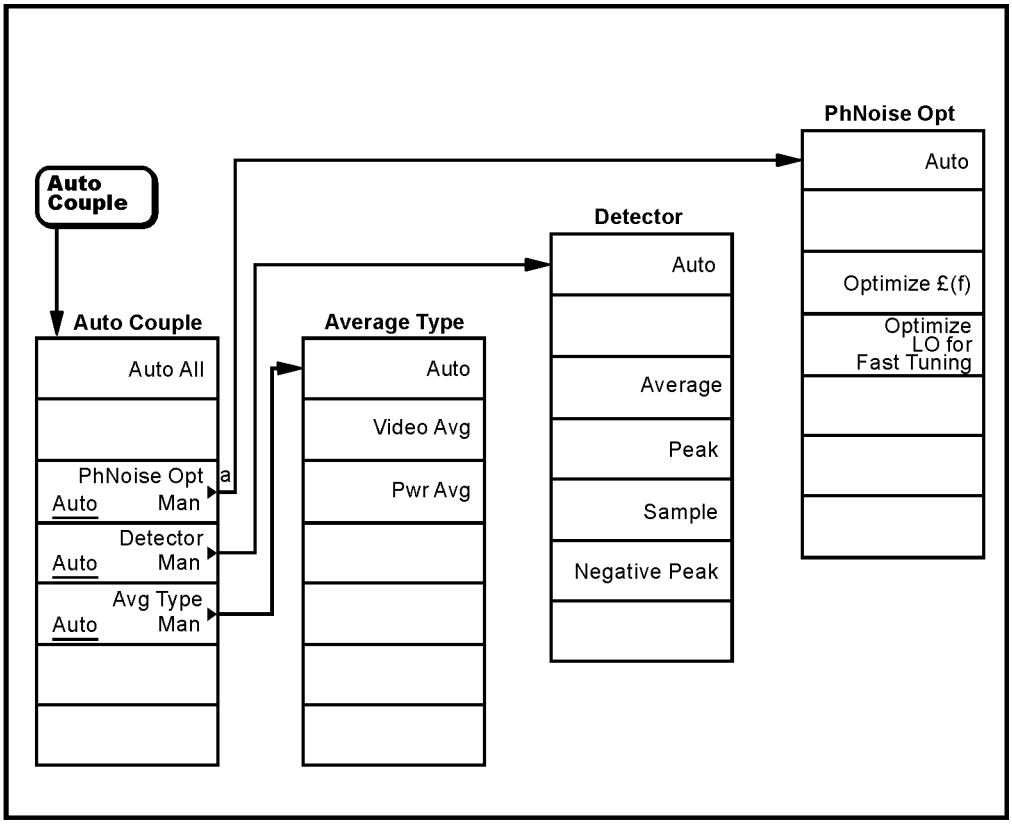
Auto Couple Menu



a. Not available on models E7401A.

pl792b

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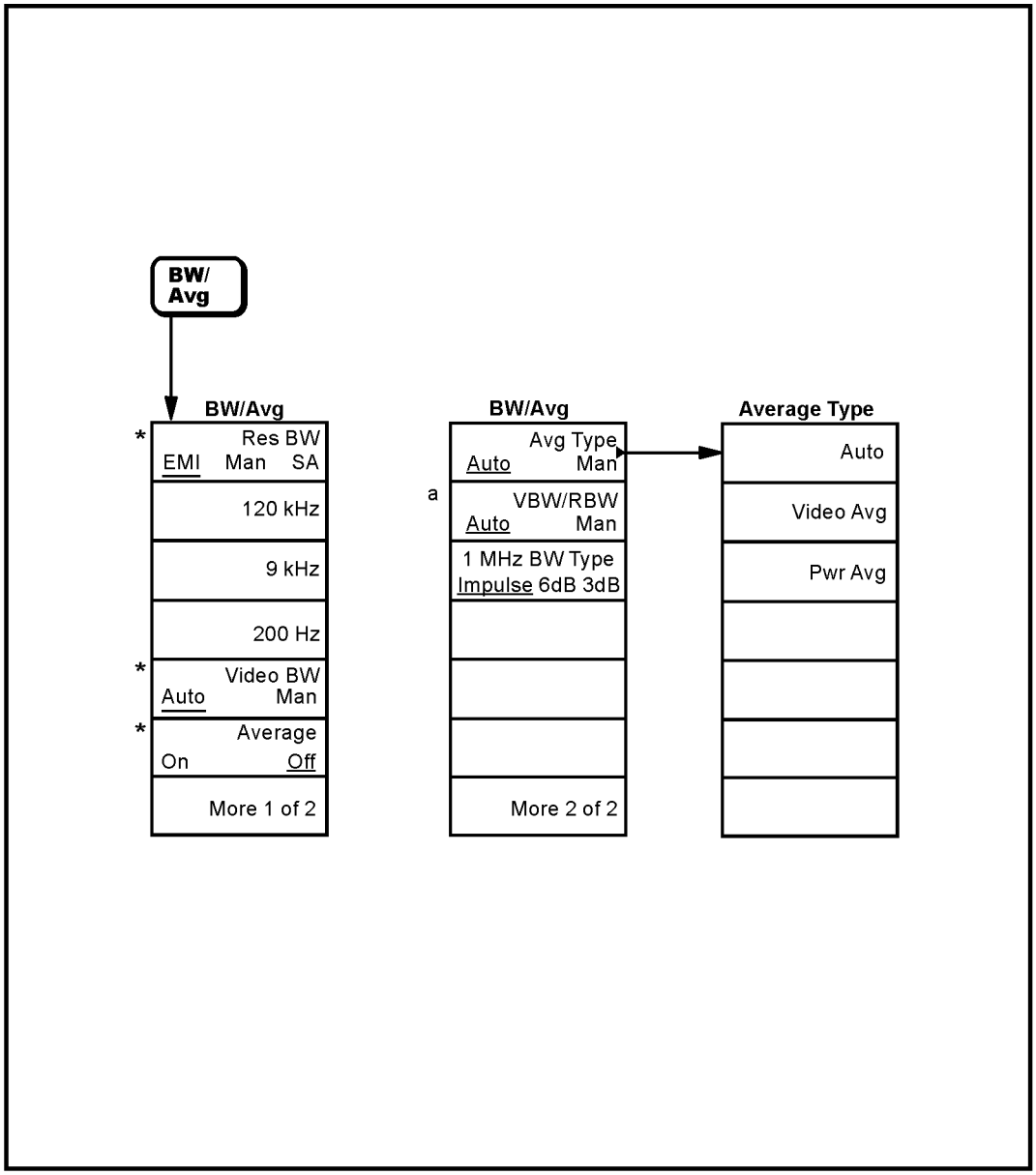
BW/Avg Menu



* An active function which allows data entry
a. Available only with spans < 5MHz

pl755b

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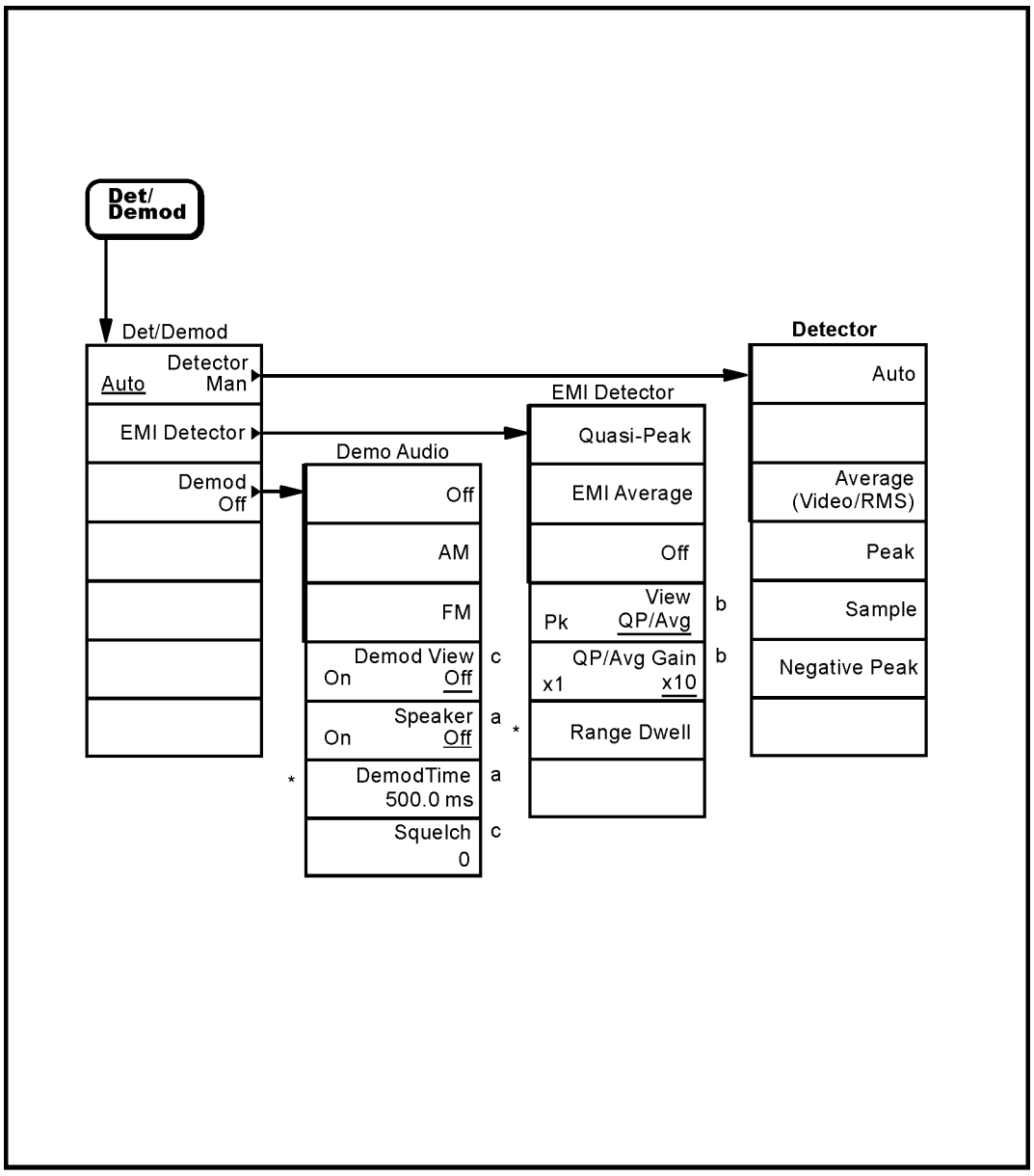
Det/Demod Menu



a. Active if FM Demod or AM Demod is On.
b. Grayed out unless QP/Avg is On.
c. Active if FM Demod is On.
* An active function which allows data entry.

pl757b

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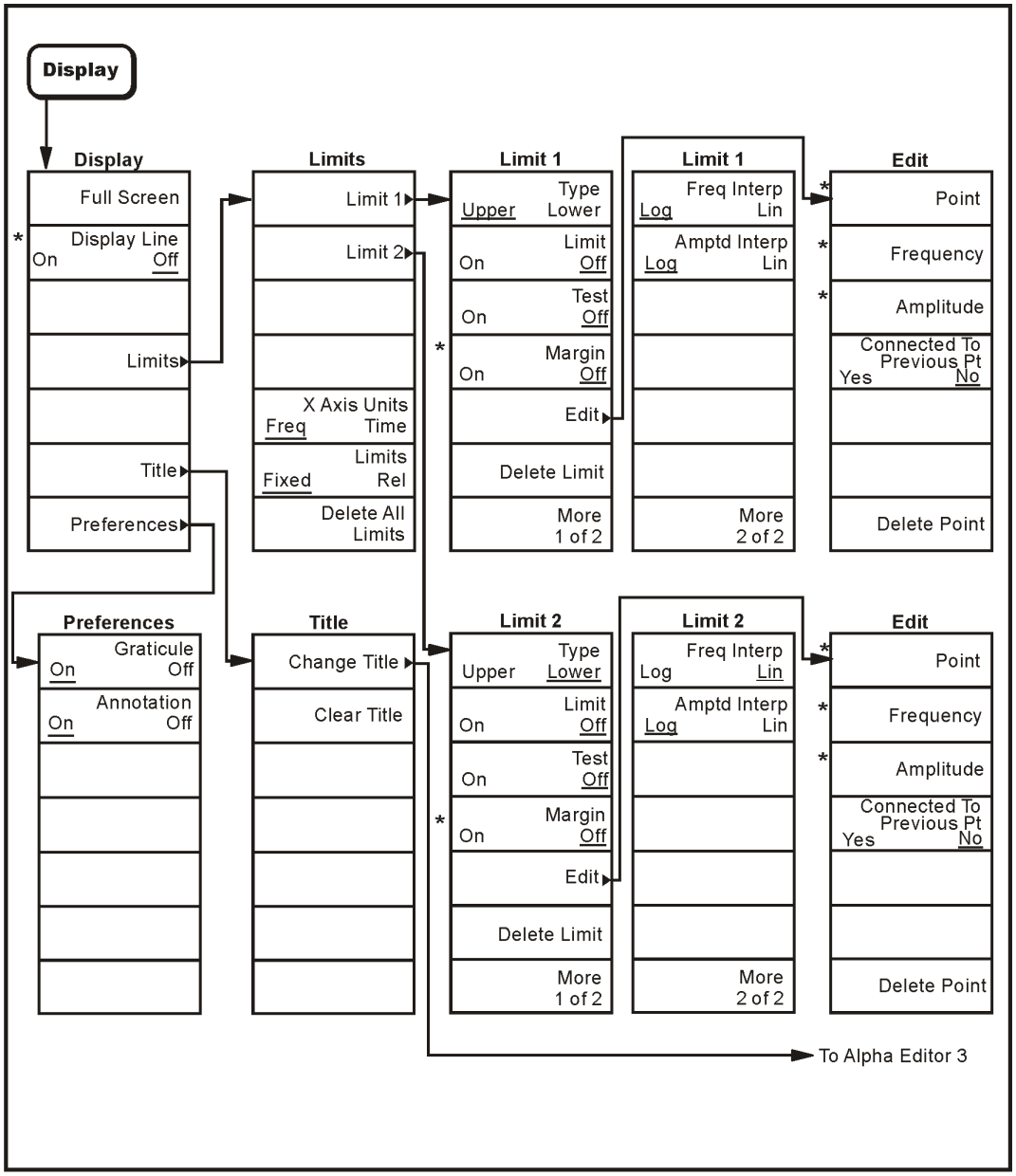
Display Menu



* An active function which allows data entry

pl758b

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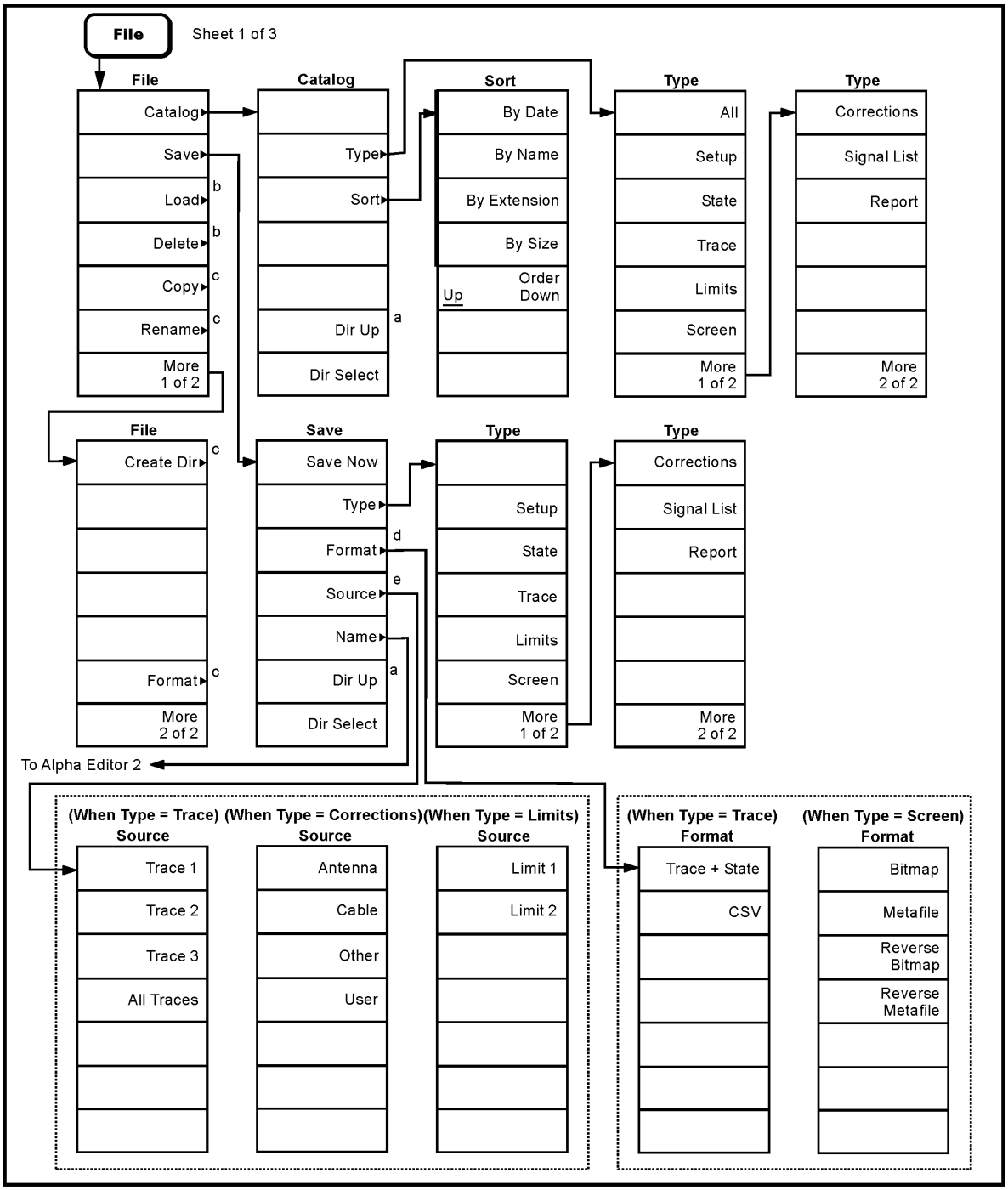
File Menus (1 of 3)



a. Grayed out if no directory selected.
b. Continued on sheet 2 of 3.
c. Continued on sheet 3 of 3.
d. Available only when **Type** is set to **Trace** or **Screen**.
e. Available only when **Type** is set to **Trace**, **Limits**, or **Corrections**.

pl762b

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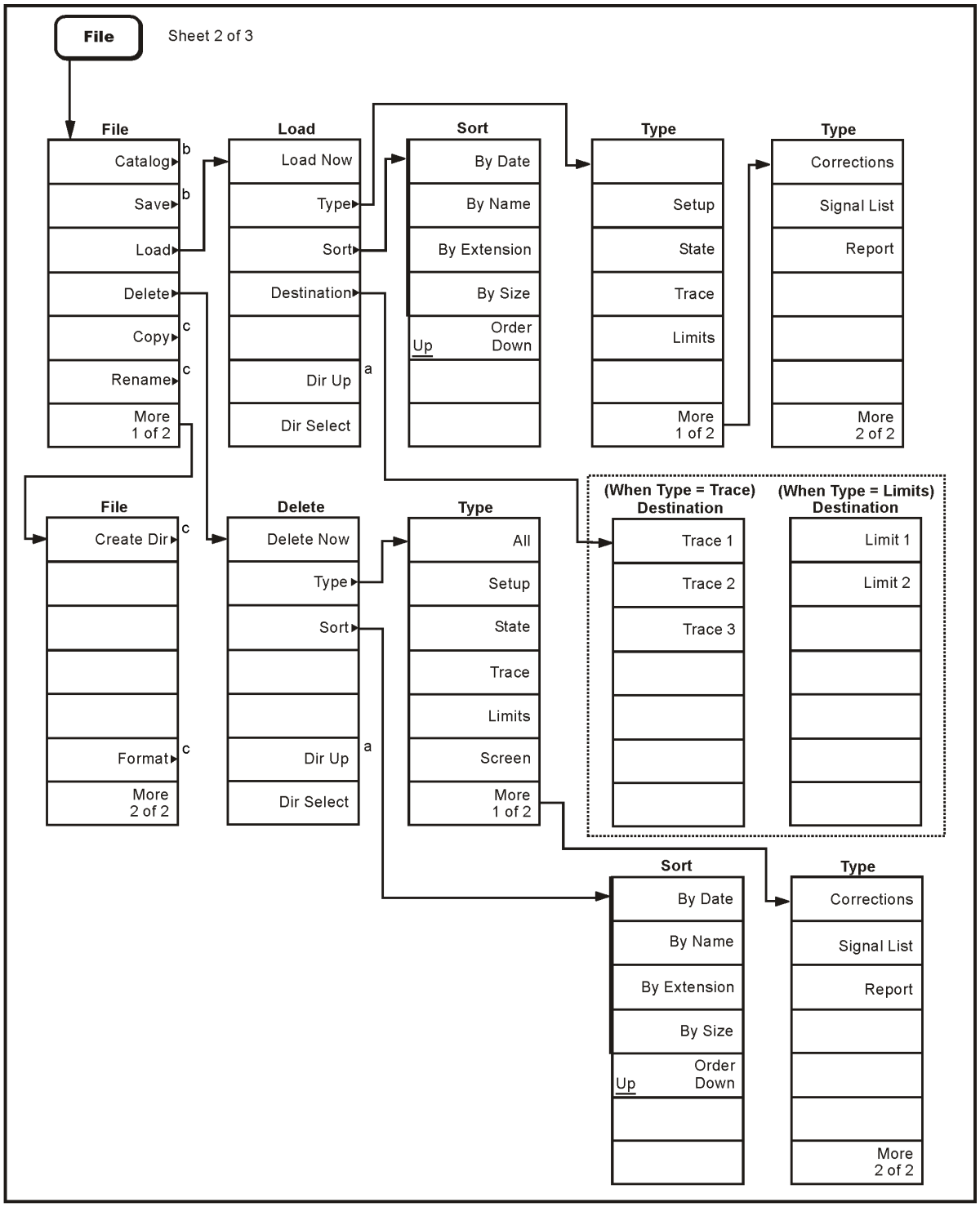
File Menus (2 of 3)



a. Grayed out if no directory selected.
b. See sheet 1 of 3.
c. Continued on sheet 3 of 3.
d. Only available when **Type** is set to **Trace** or **Limit**.s

pb96a

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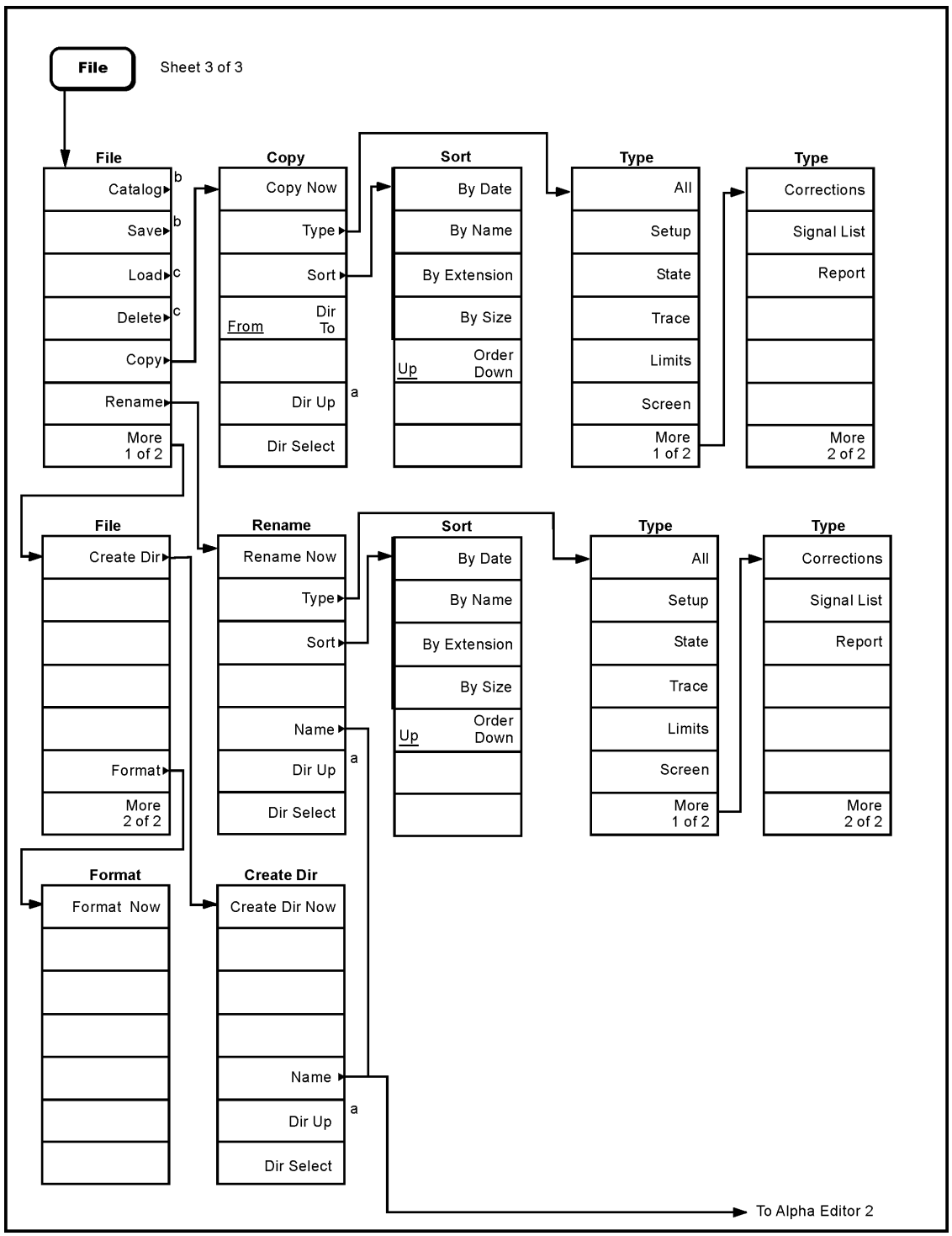
File Menus (3 of 3)



a. Grayed out if no directory selected.
b. See sheet 1 of 3.
c. Continued on sheet 2 of 3.

pl759b

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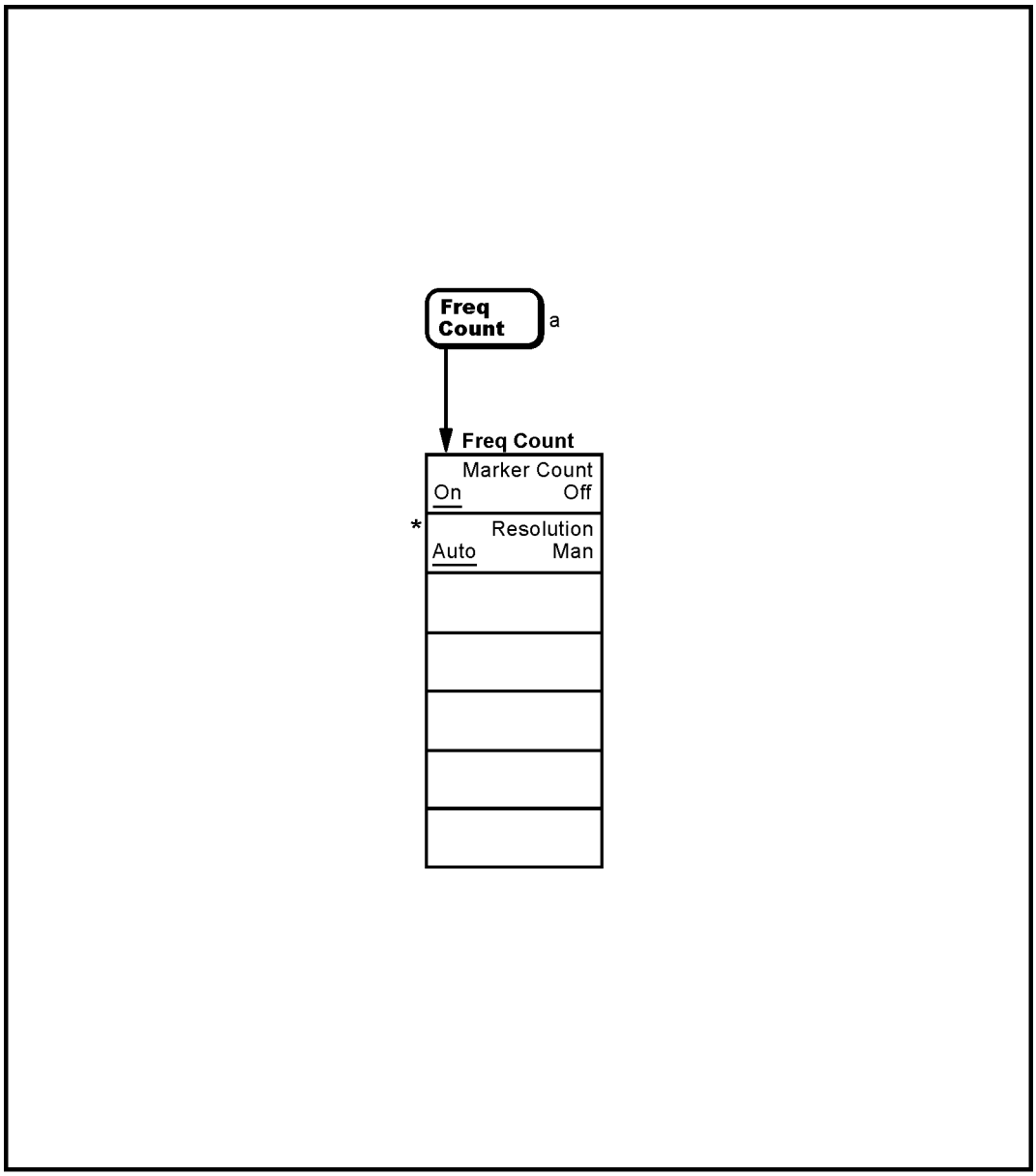
Freq Count (Marker) Menu



* An active function which allows data entry
a. Not available when **Frequency, Scale Type (Log)** is selected.

pl76

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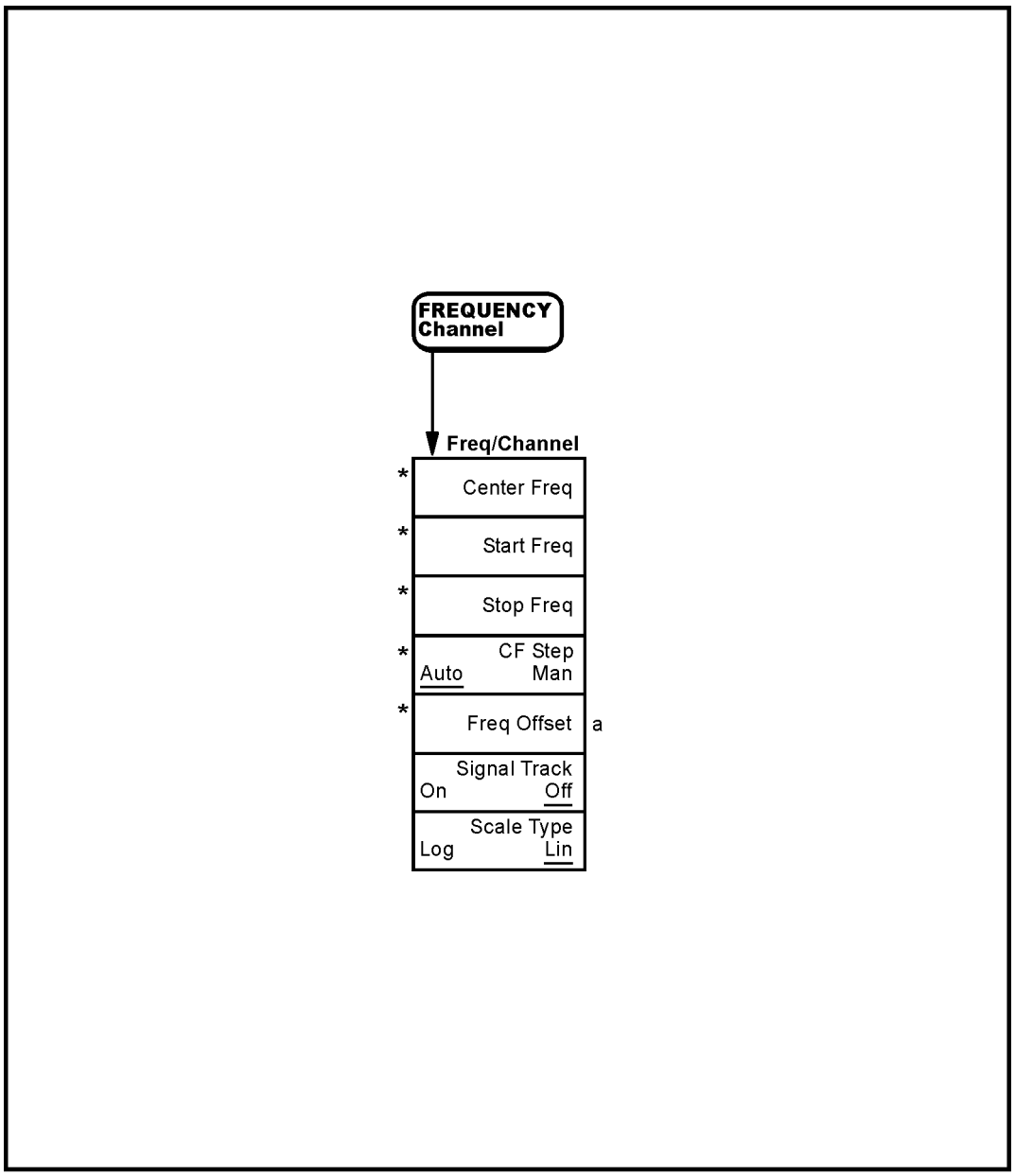
FREQUENCY Channel Menu



* An active function which allows data entry
a. Not Not available when **FREQUENCY, Scale Type (Log)** is selected.

pl795b

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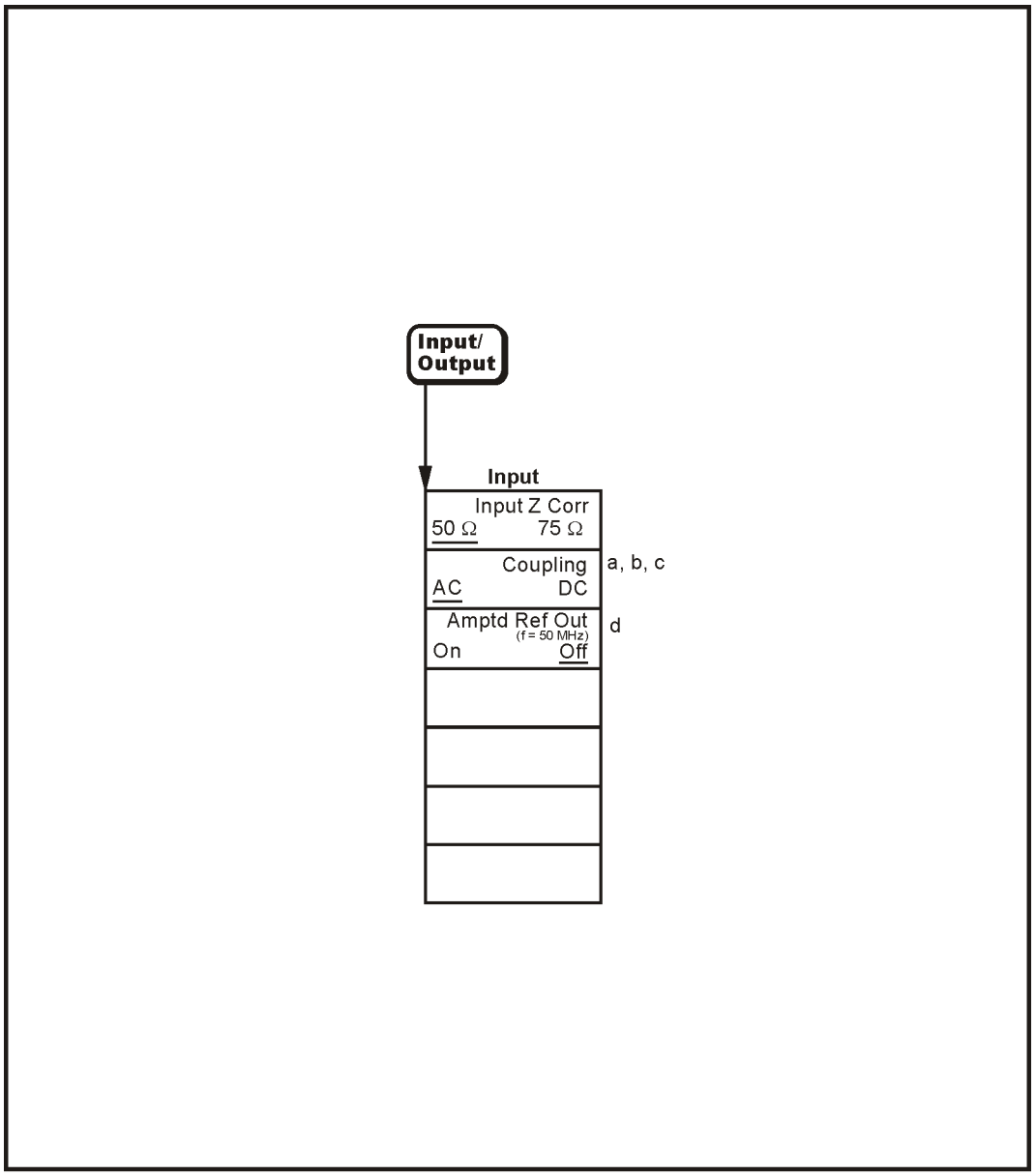
Input/Output Menu



a. This function is only active on models E7403A and E7404A or models E7402A and E7405A with Option UKB installed.
b. AC is always coupled on model E7401A and model E7402A without Option UKB installed and key is blank.
c. DC is always coupled on model E7405A without Option UKB installed and key is blank.
d. This key is labeled "Amptd Ref" on model E7401A.

pl785b

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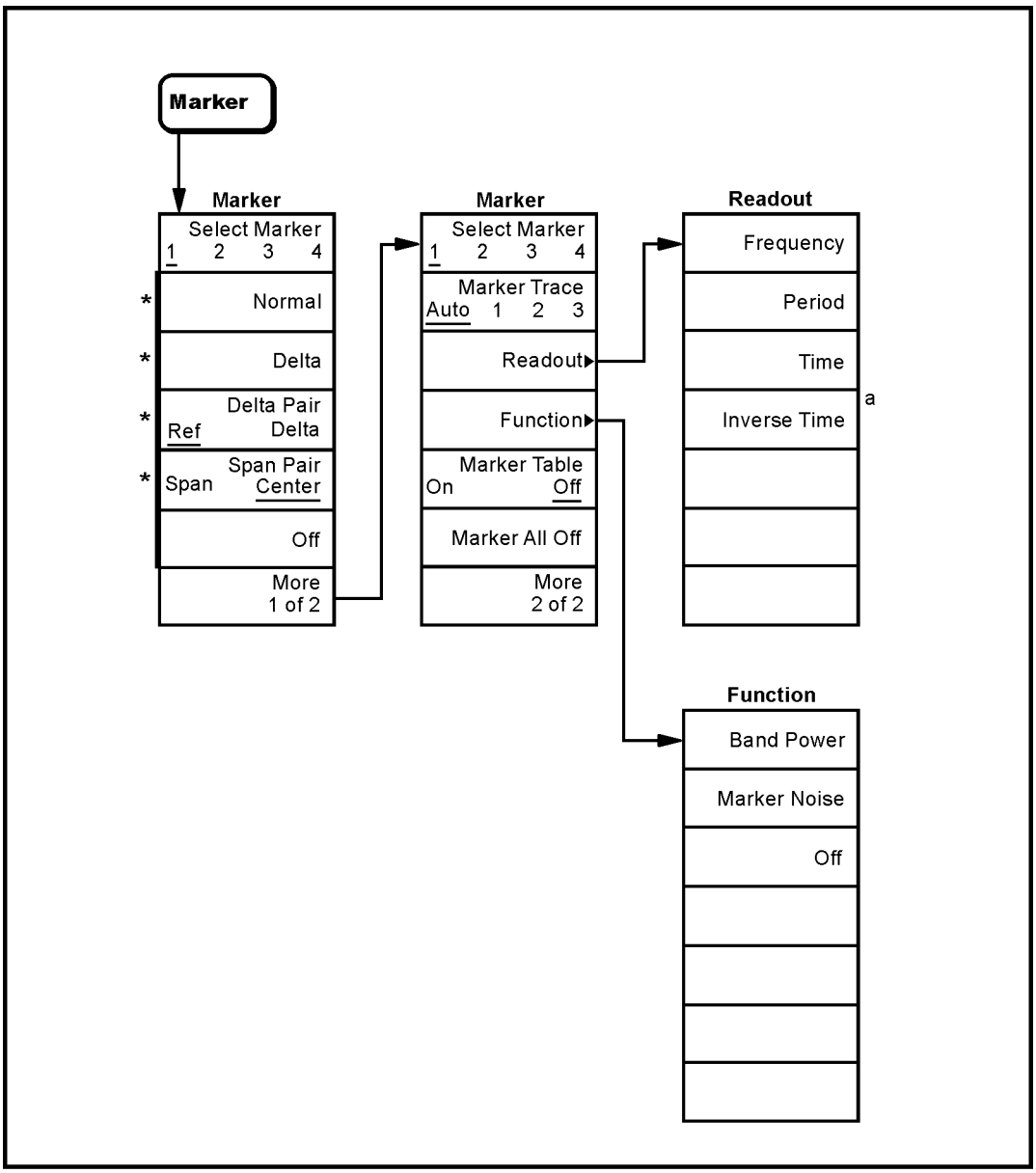
Marker Menu



a. Available in zero span with **Marker Delta** active.
***** An active function which allows data entry

pl764b

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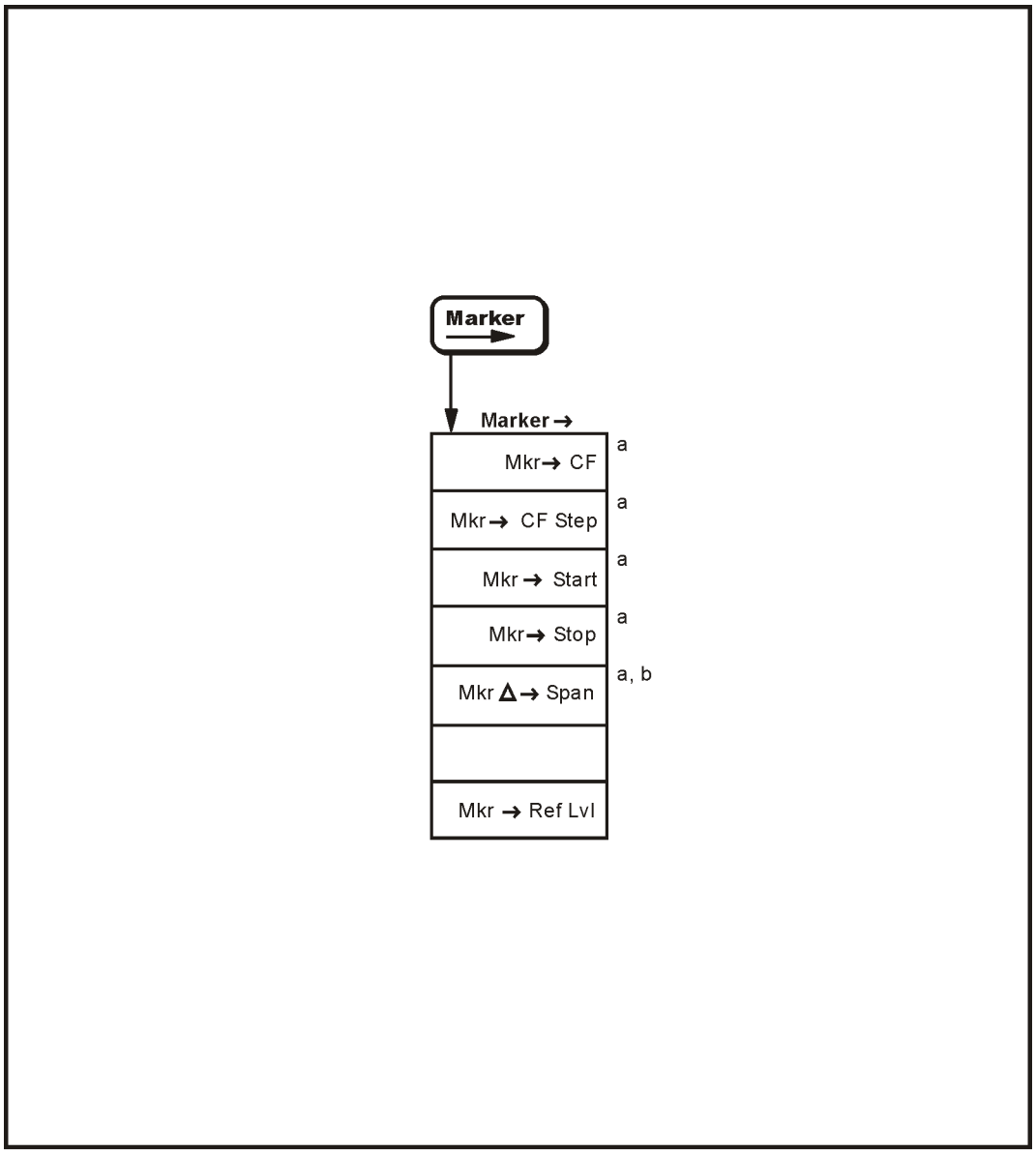
Marker → Menu



a. Not active when **span** is set to zero (Zero Span)
b. Active only when **Marker**, **Delta** is selected.

pb910a

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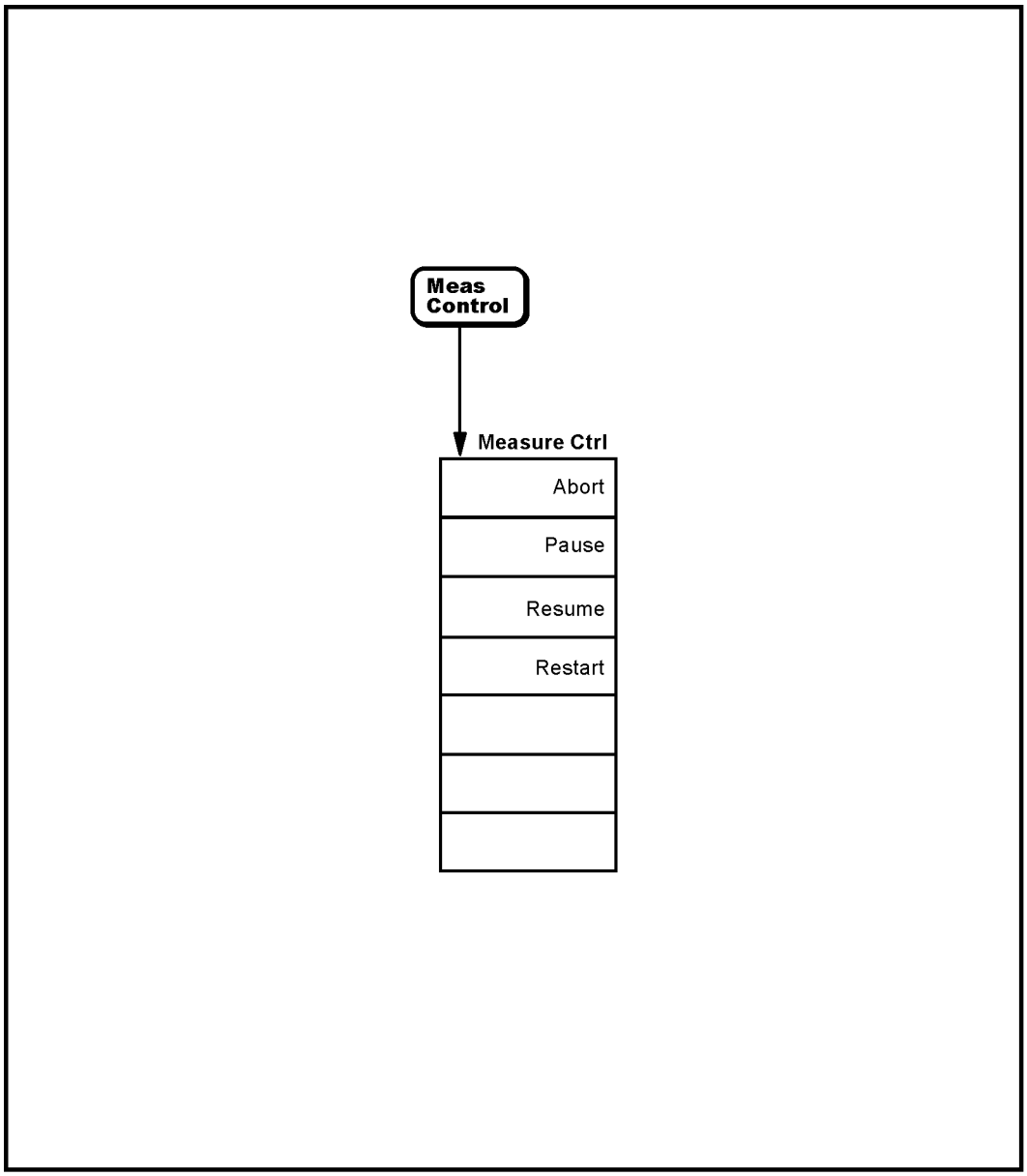
Meas Control Menu



pb99a

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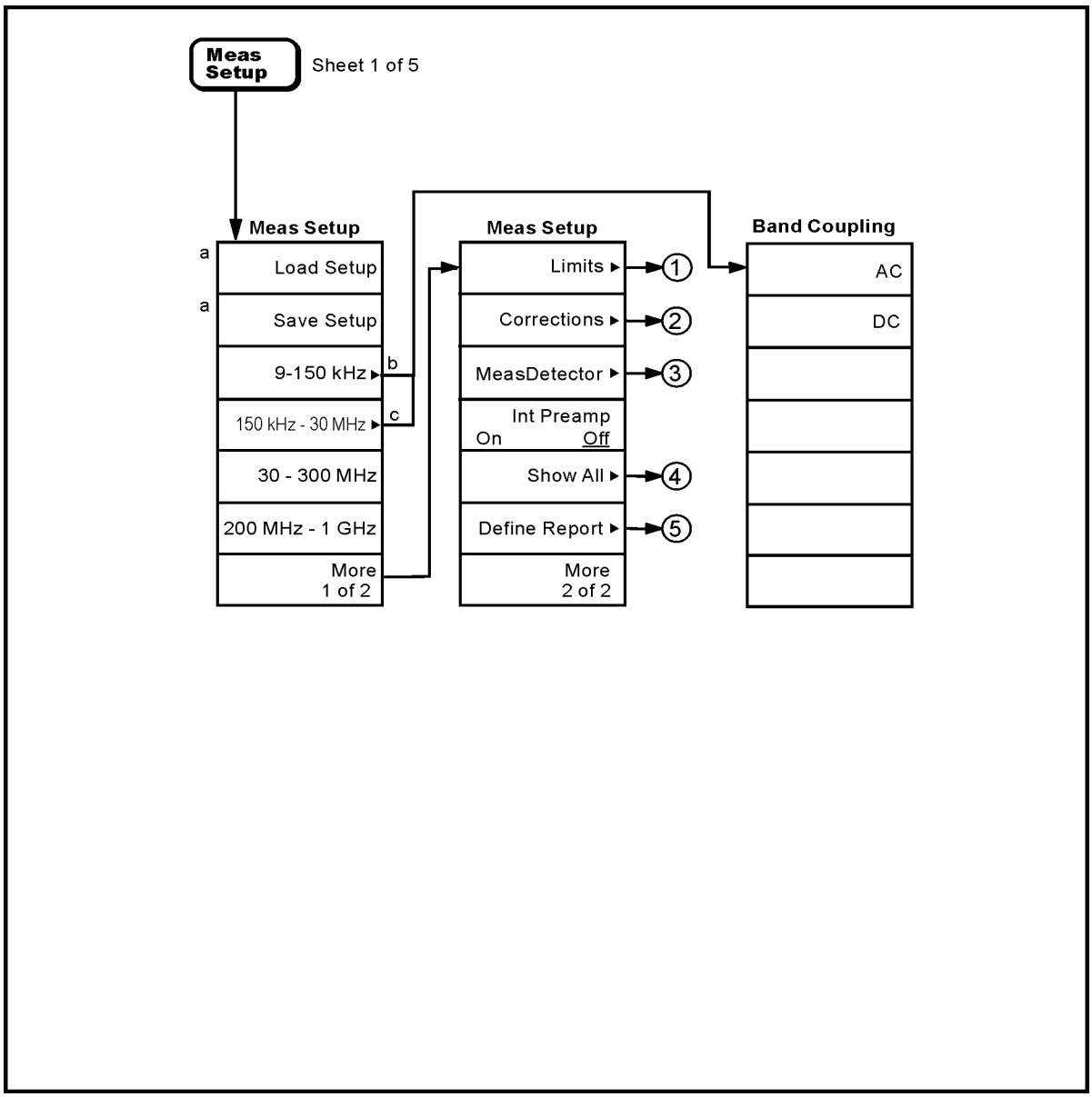
Meas Setup Menu (1 of 5)



a. Refer to the File Menus (1 of 3) and File Menus (2 of 3) for illustrations of the **Save** and **Load** menus
b. Only available on models E7403A and E7404A or on models E7402A, E7403A, E7404A, and E7405A with Option UKB installed.
c. Only available on models E7405A with Option UKB installed.

pb912a

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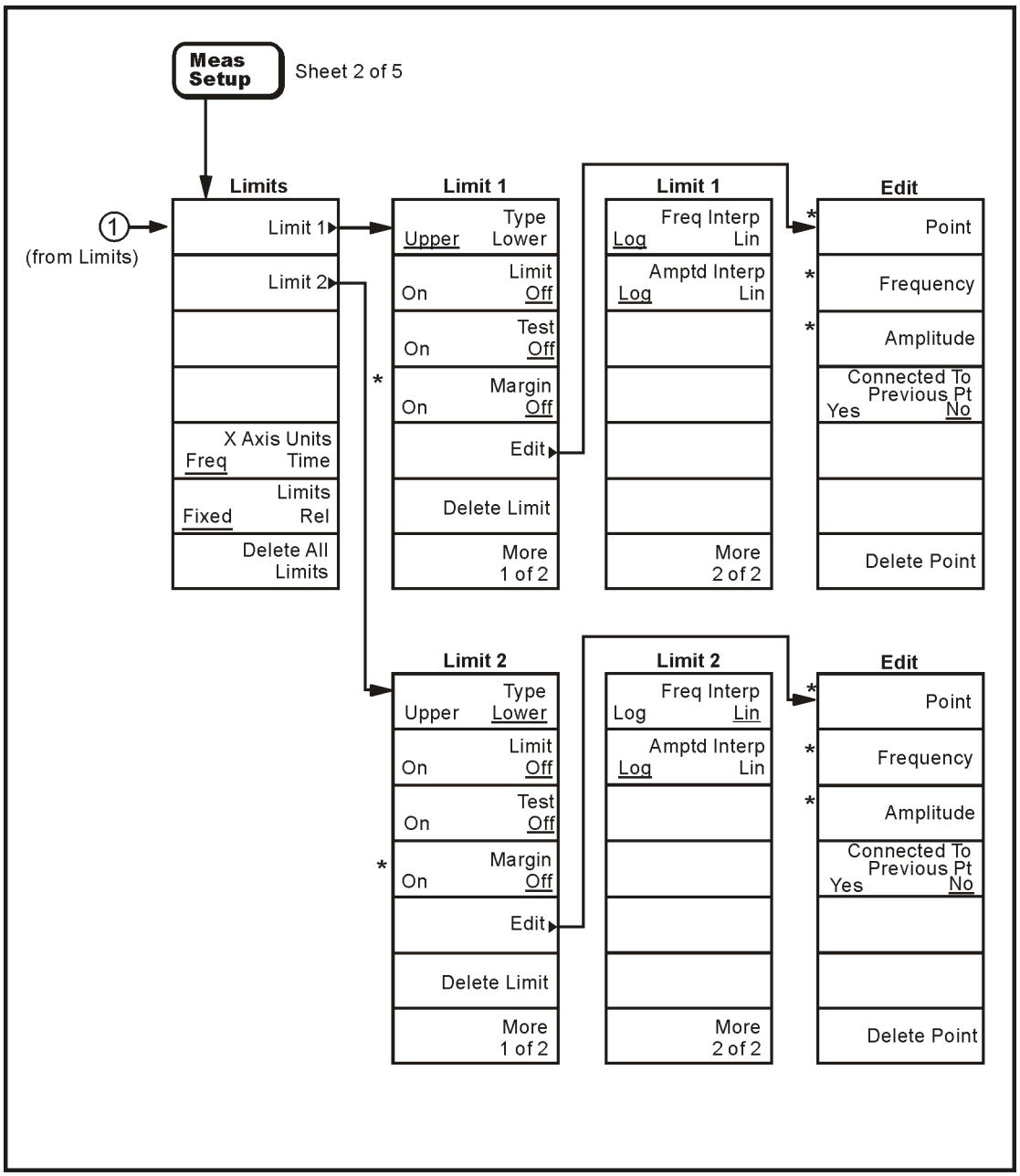
Meas Setup Menu (2 of 5)



* An active function that allows data entry

pl784b

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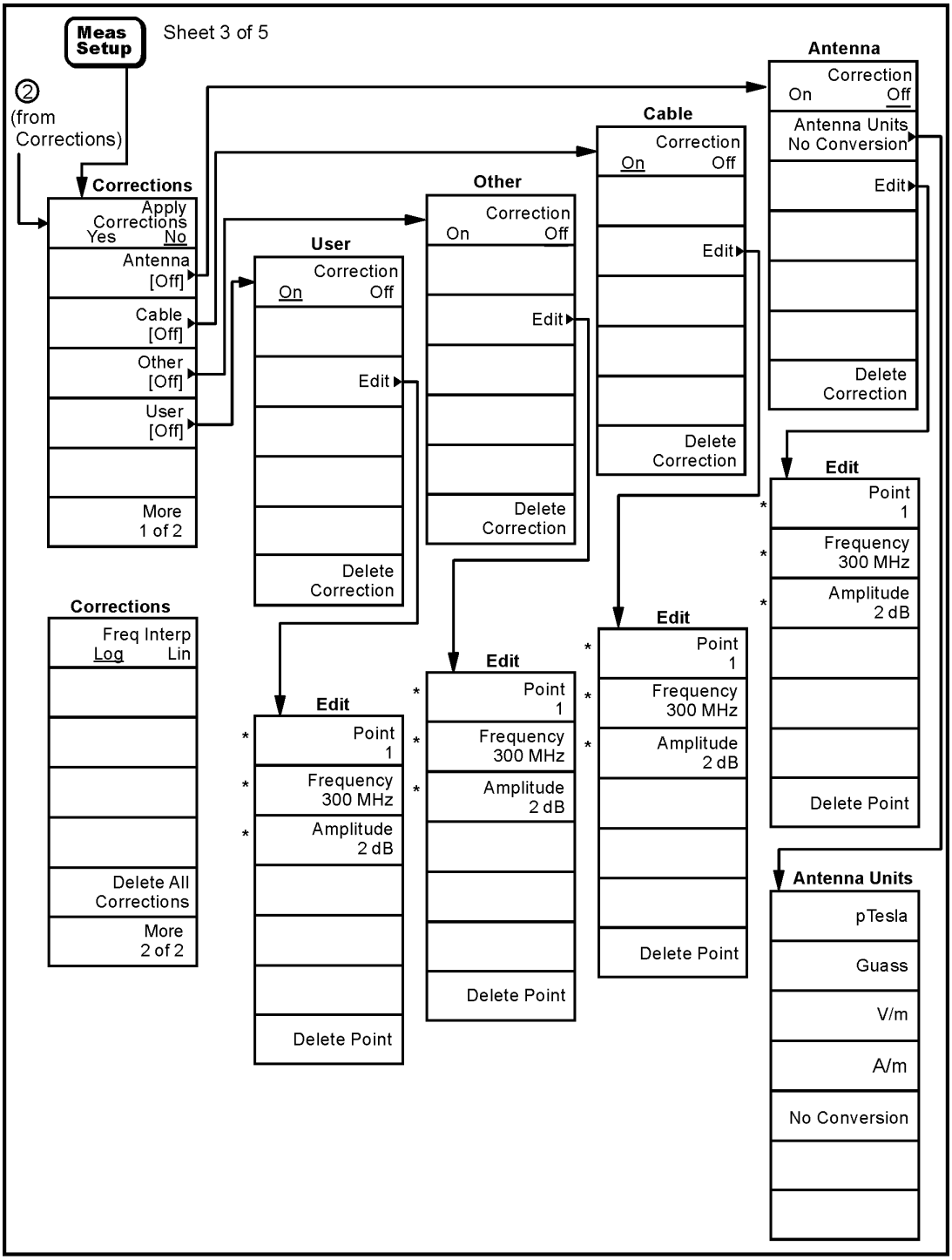
Meas Setup Menu (3 of 5)



* An active function which allows data entry

pl781b

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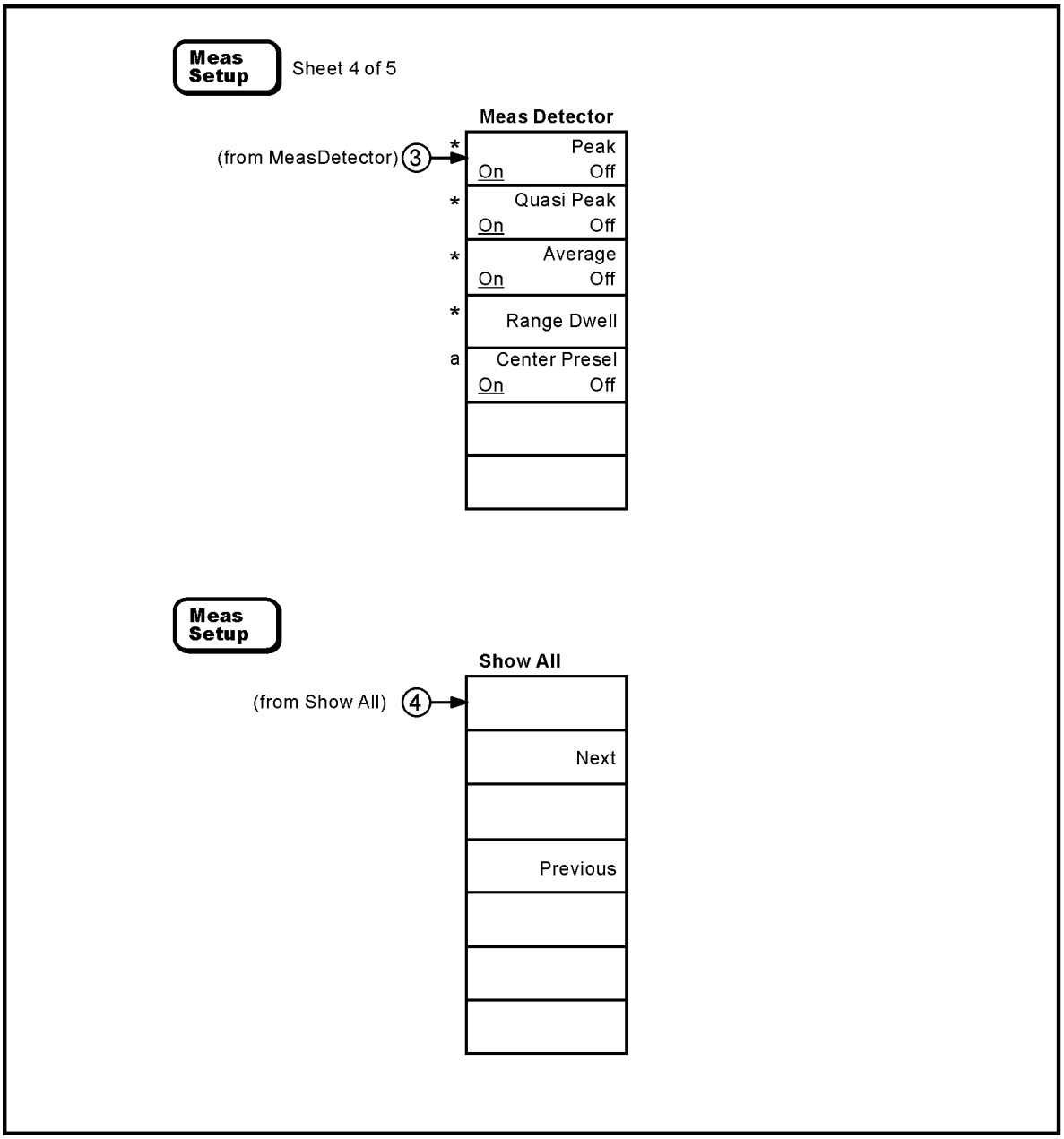
Meas Setup Menu (4 of 5)



* An active function which allows data entry
a. Only in E7403A, E7404A, & E7405A

pb915a

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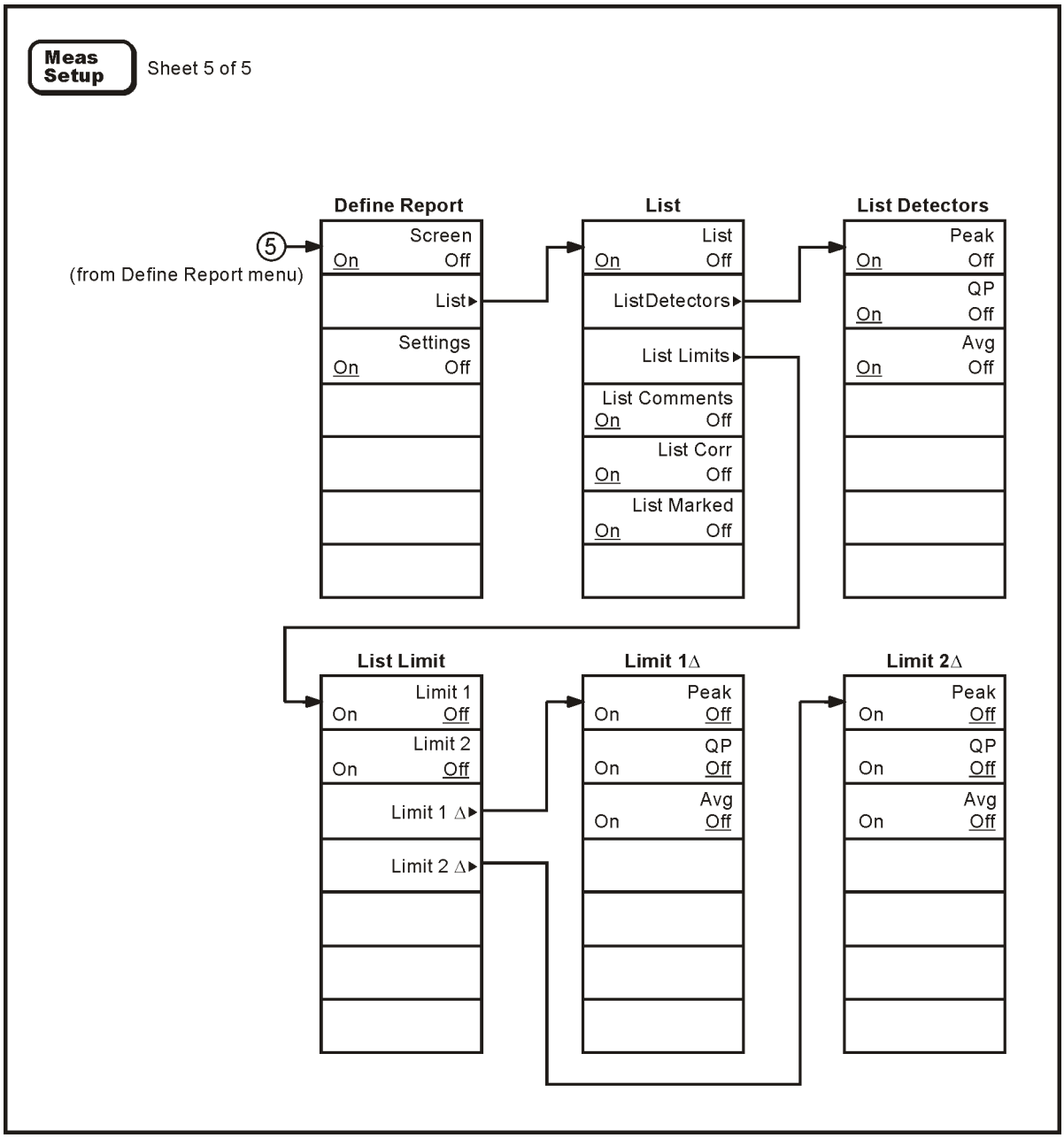
Meas Setup Menu (5 of 5)



pb916a

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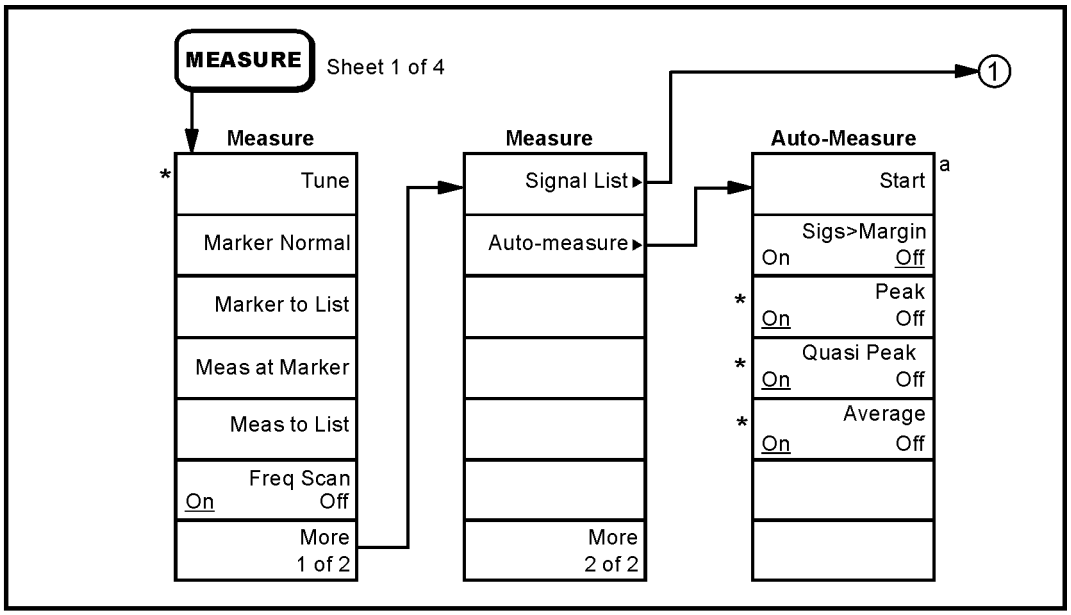
MEASURE Menu (1 of 4)



* An active function which allows data entry
a. Changes to Abort during measurement

pb917a

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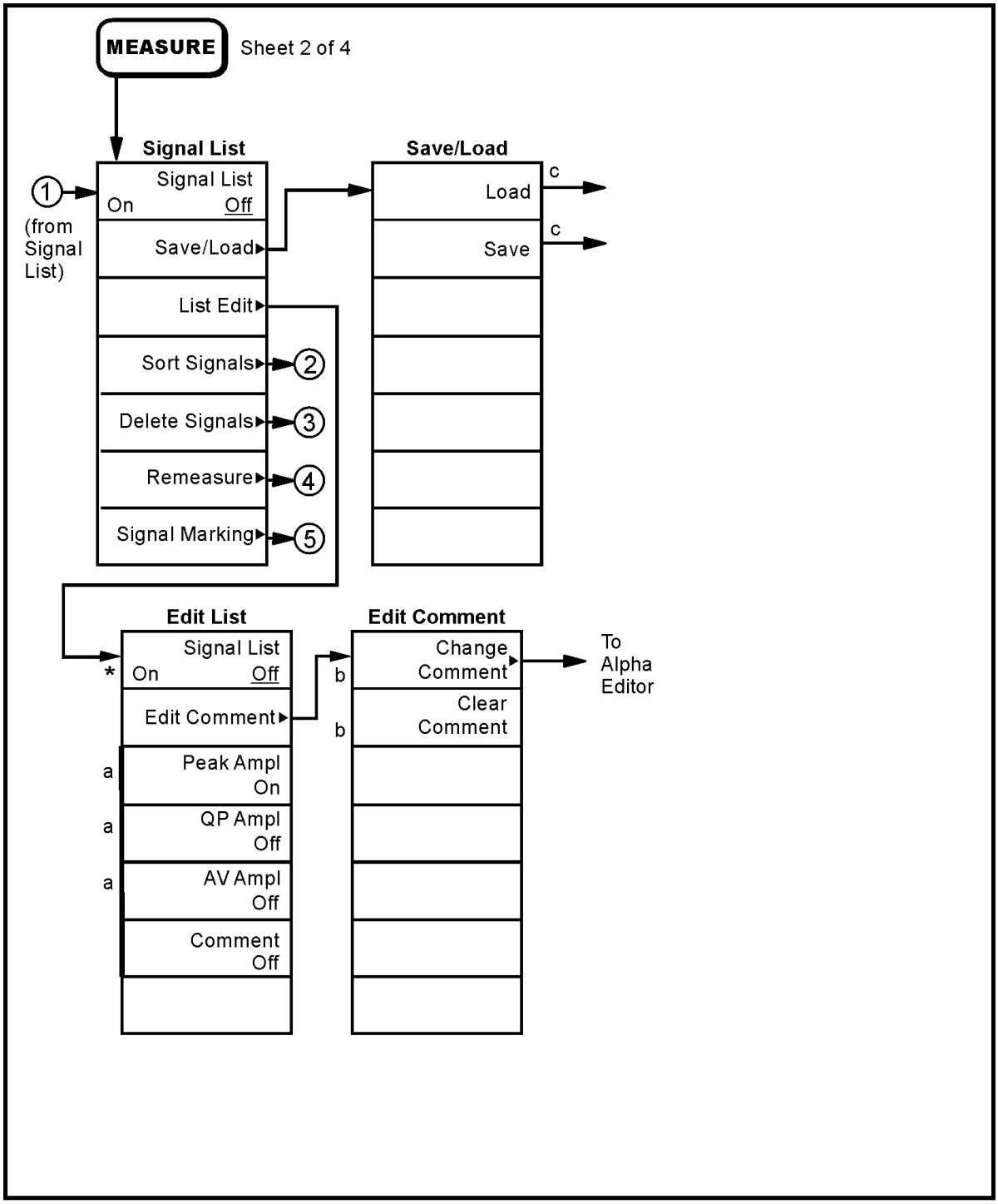
MEASURE Menu (2 of 4)



* An active function which allows data entry

a. Choosing one of these four options turns the other three Off

b. These keys are greyed out unless the Edit Signal List is On

c. Refer to the File Menu (1 of 3) and File Menu (2 of 3) for illustrations of the Save and Load menus.

pb918a

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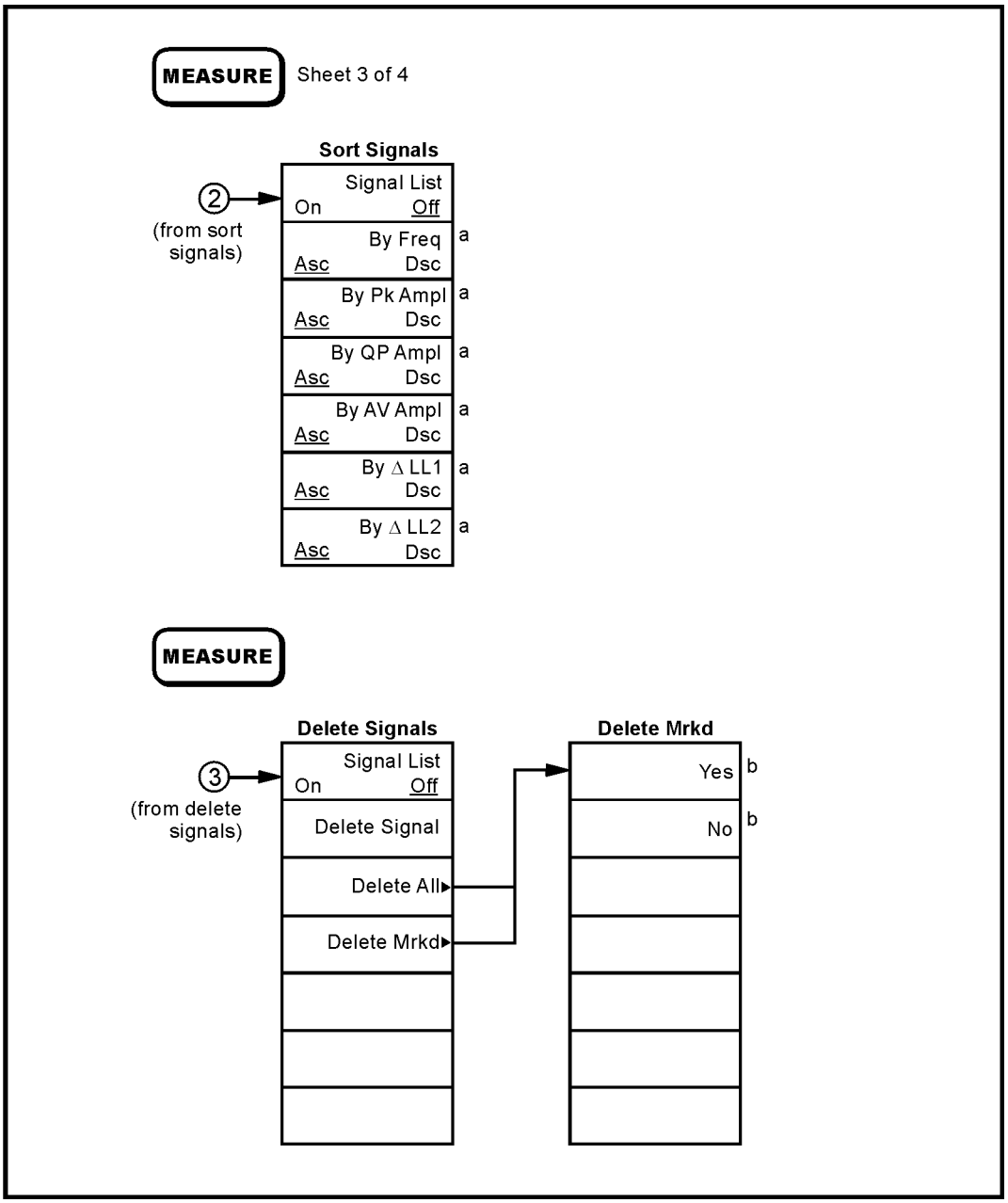
MEASURE Menu (3 of 4)



a. Asc = Ascending Order
b. Pressing one of these keys will return you to the Delete Signal menu.

pb919a

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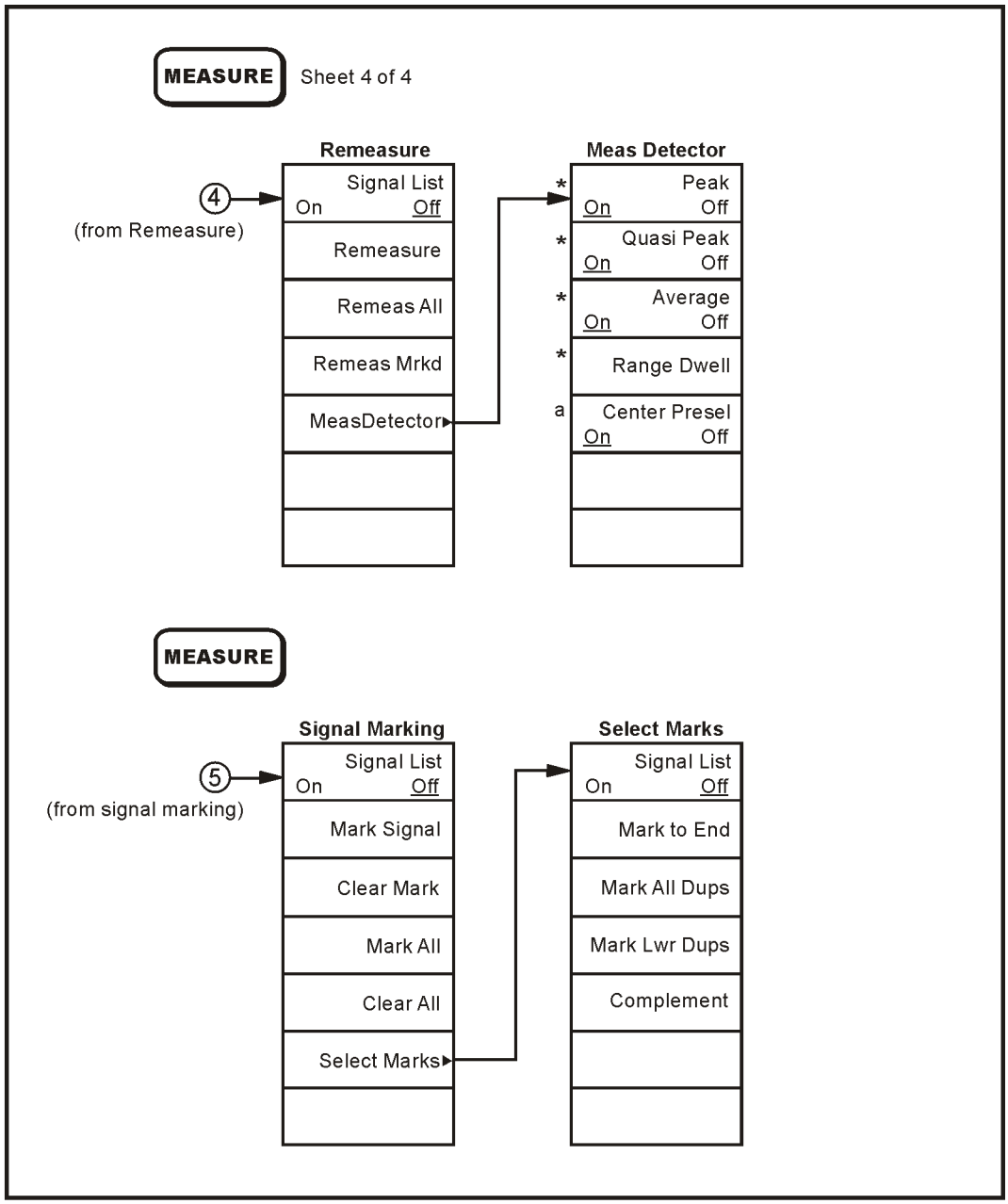
MEASURE Menu (4 of 4)



* An active function which allows data entry.
a. Available in E7403A, E7404A, & E7405A only.

pb920a

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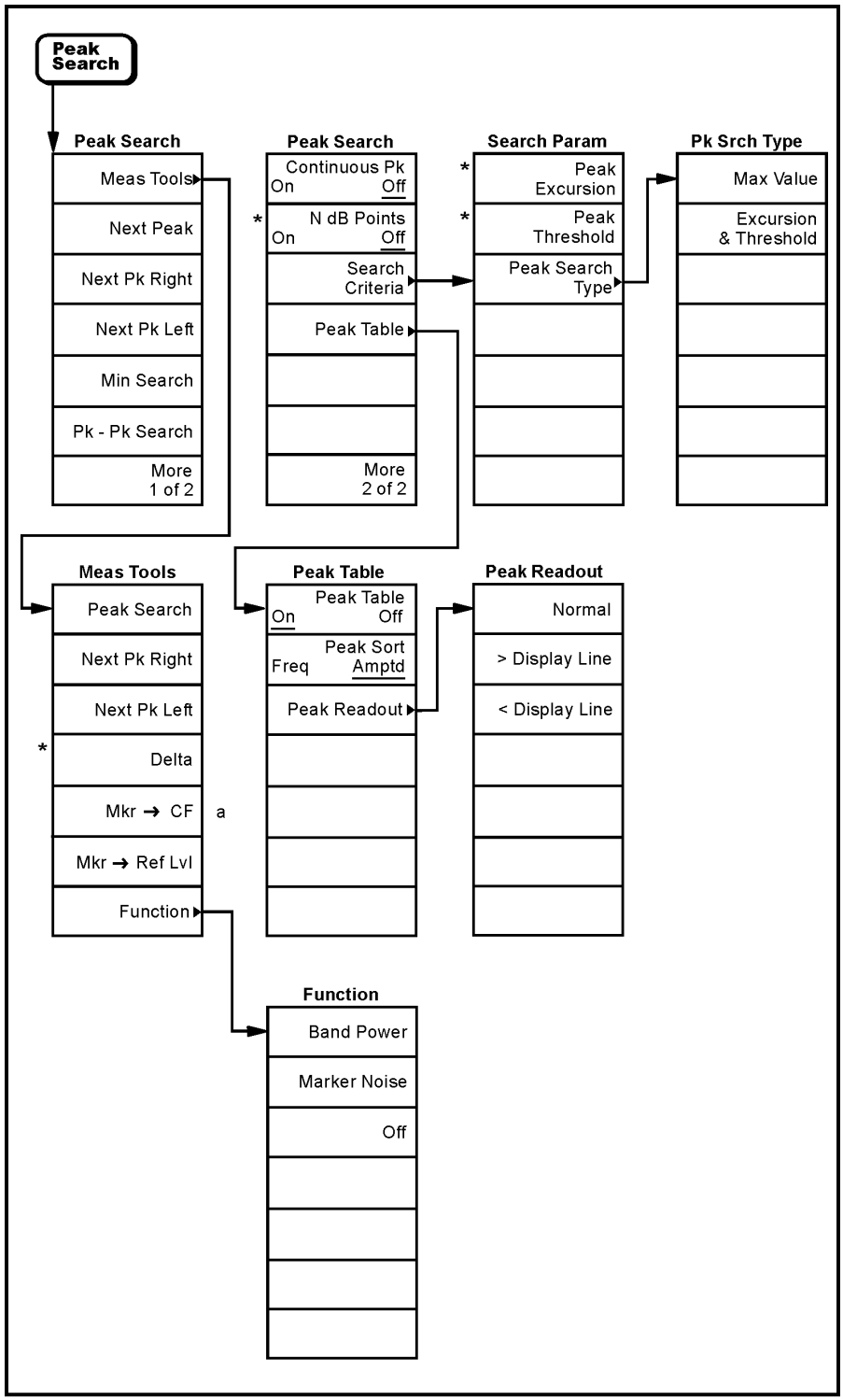
Peak Search Menu



* An active function which allows data entry
a. Unavailable in zero span

pl777b

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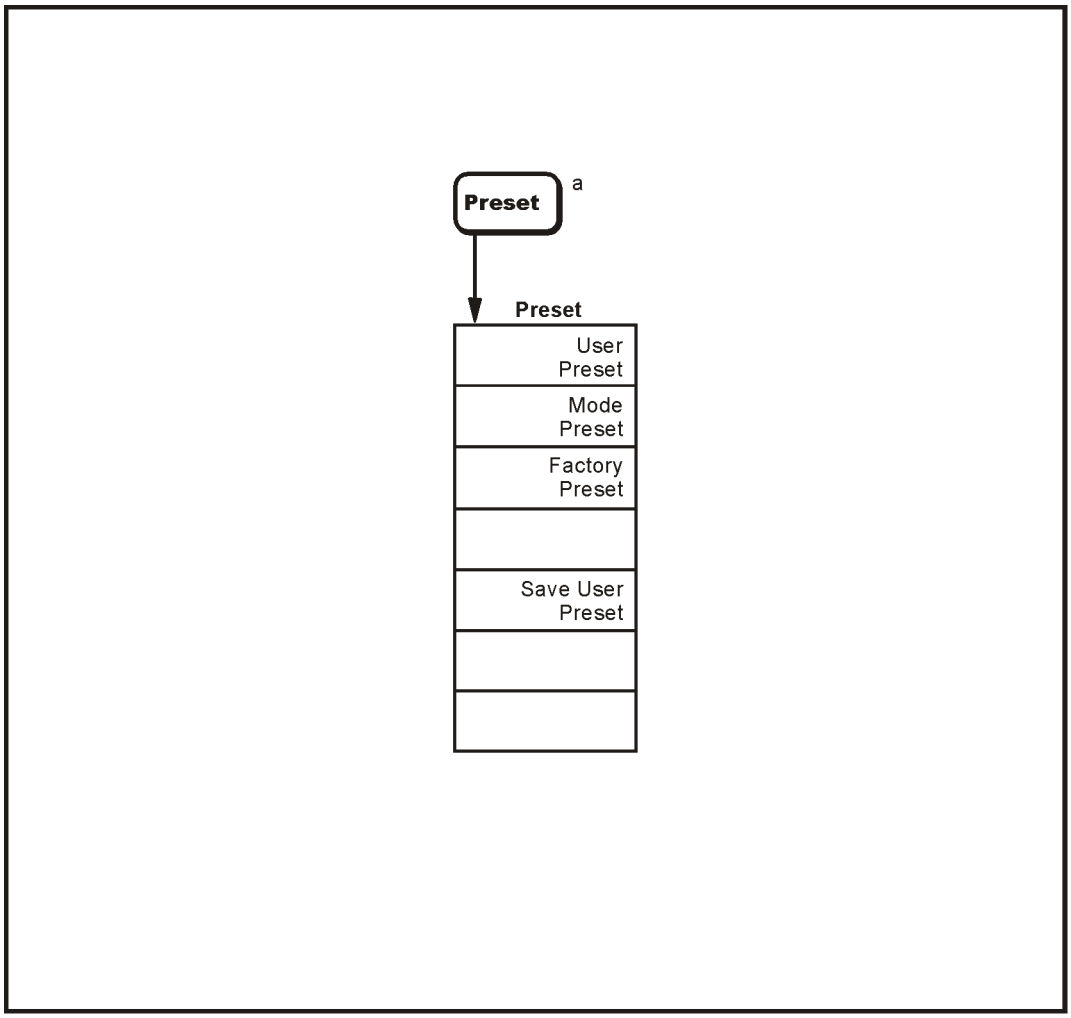
Preset Menu



a. Appears only when Preset is set to User in the **System, Power On/Preset, Preset Type** menu. Otherwise **Preset** performs a **Factory Preset**.

pl768b

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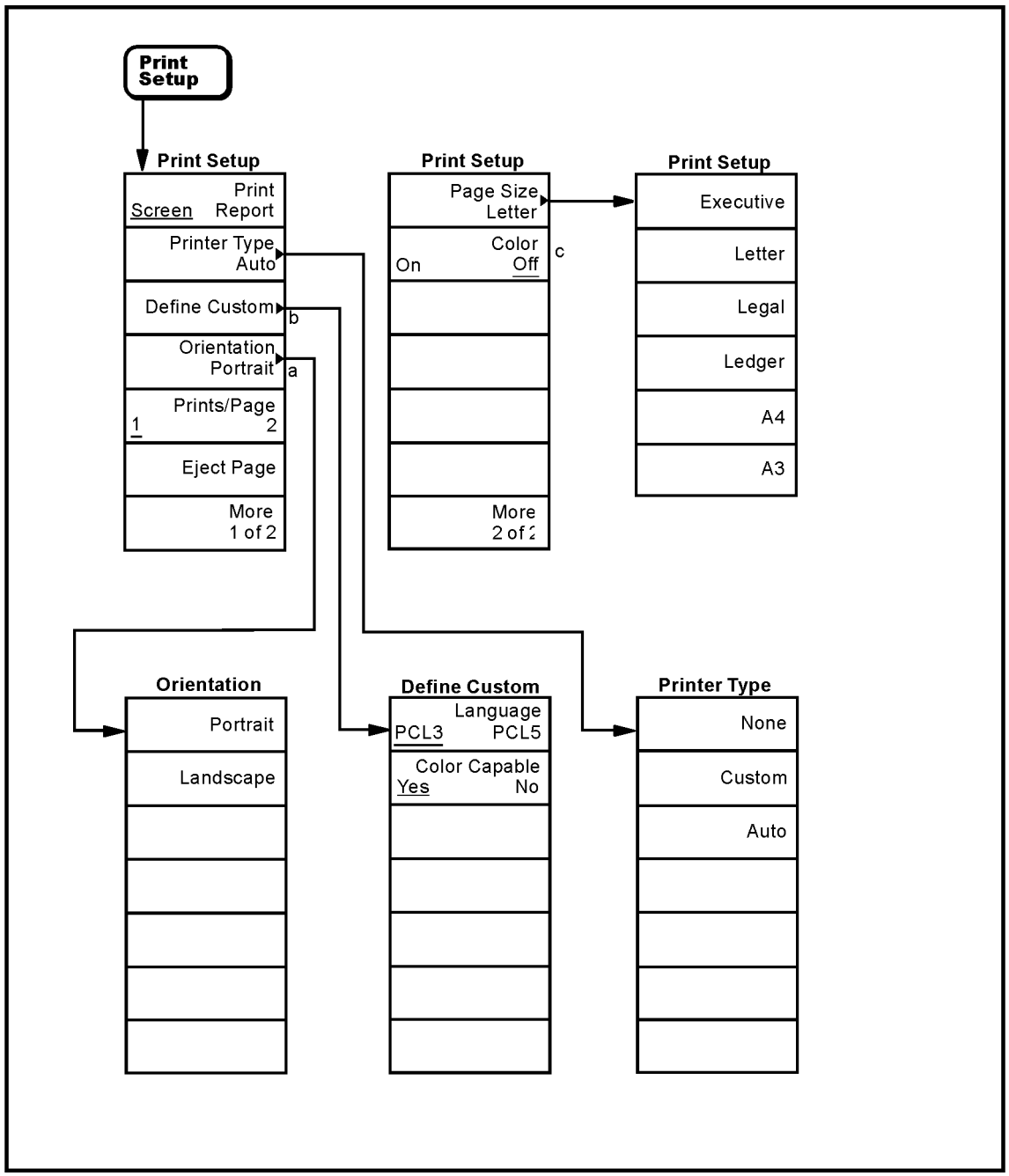
Print Setup Menu



a. Available only with PCL5 printers.
b. Grayed out unless **Custom** is selected in the **Printer Type** menu.
c. Available only with color printers.

pl791a

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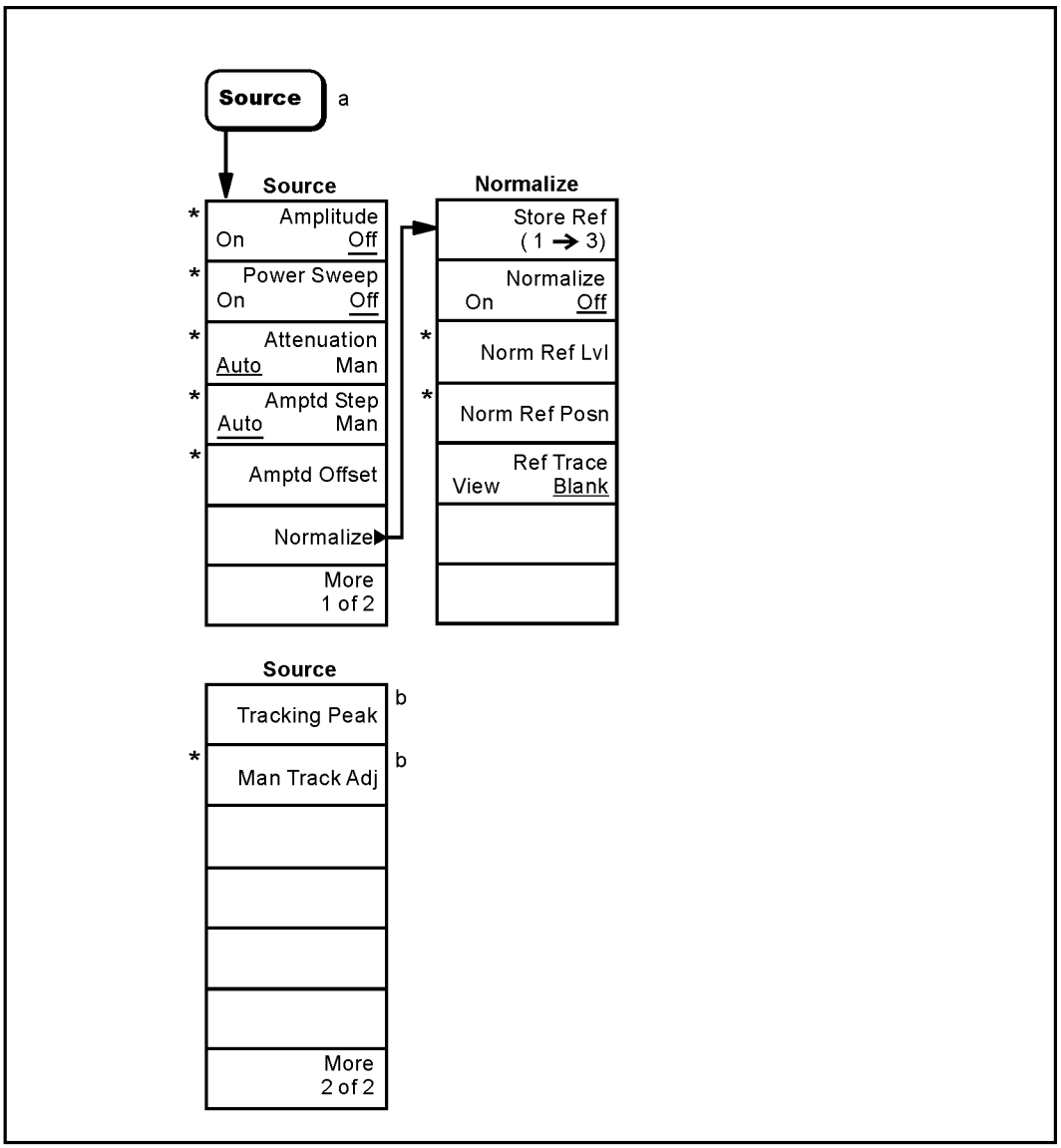
Source Menu



* An active function which allows data entry
a. Source menu only available with Option IDN
b. Available only on models E7402A, E7403A, E7404A, and E7405A.

pl771b

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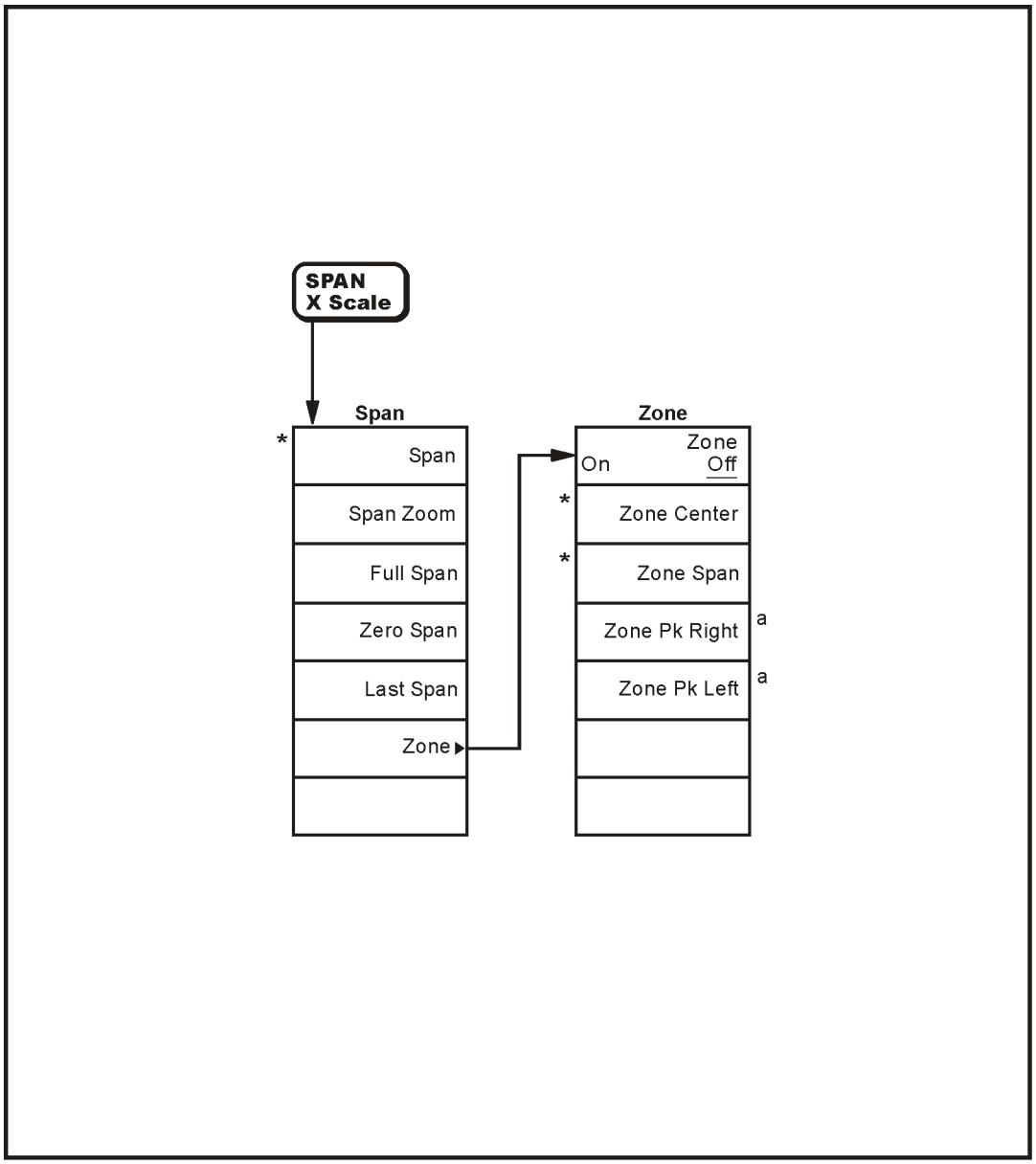
SPAN (X Scale) Menu



a. Available only when the upper window is active
* An active function which allows data entry

pb941a

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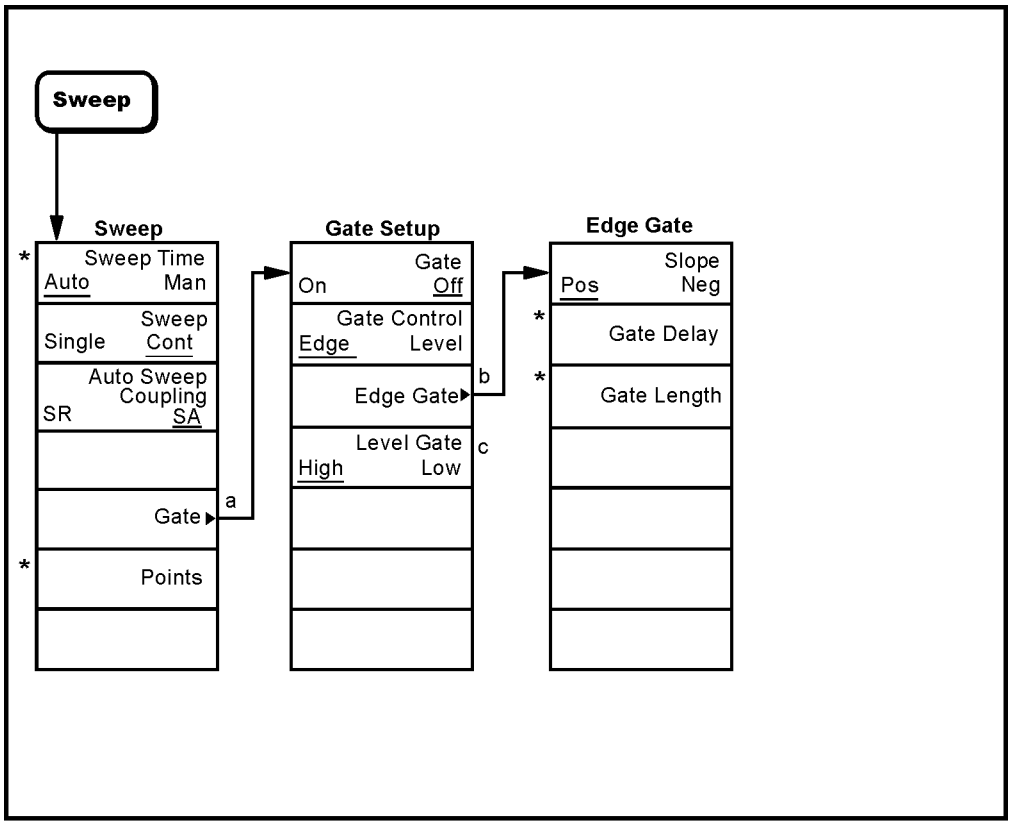
Sweep Menu



* An active function which allows data entry
a. These menu options are only available with option 1D6.
b. Available only when **Gate Control** is set to **Edge**.
c. Available only when **Gate Control** is set to **Level**.

pl776b

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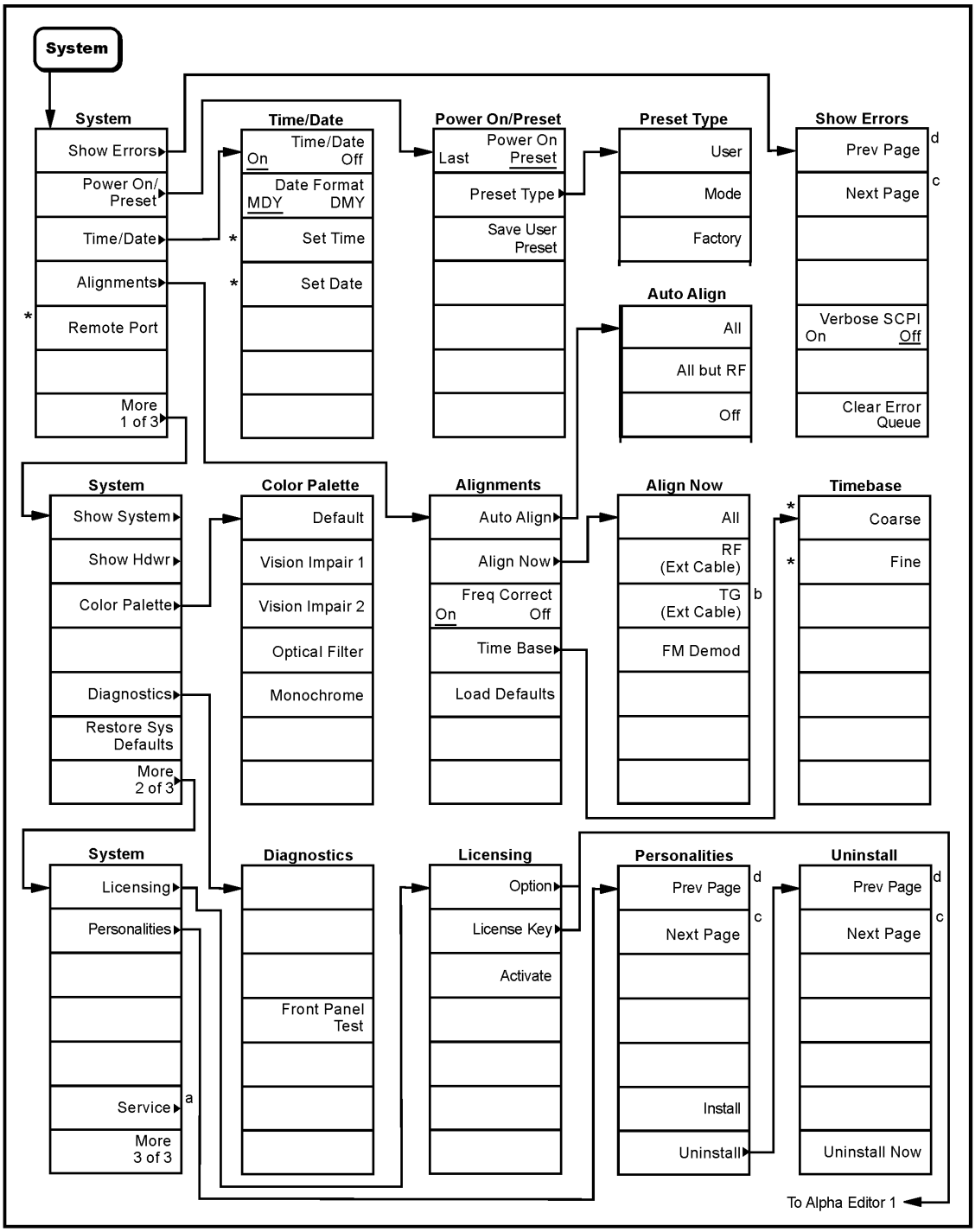
System Menu



a. A password is required for Service menus.
b. Available only in models E7402A, E7403A, E7404A, and E7405A when Option 1DN is installed.
c. Grayed out when on the last page or if there is only one page.
d. Grayed out when on the first page or if there is only one page.
* An active function which allows data entry.

pl775b

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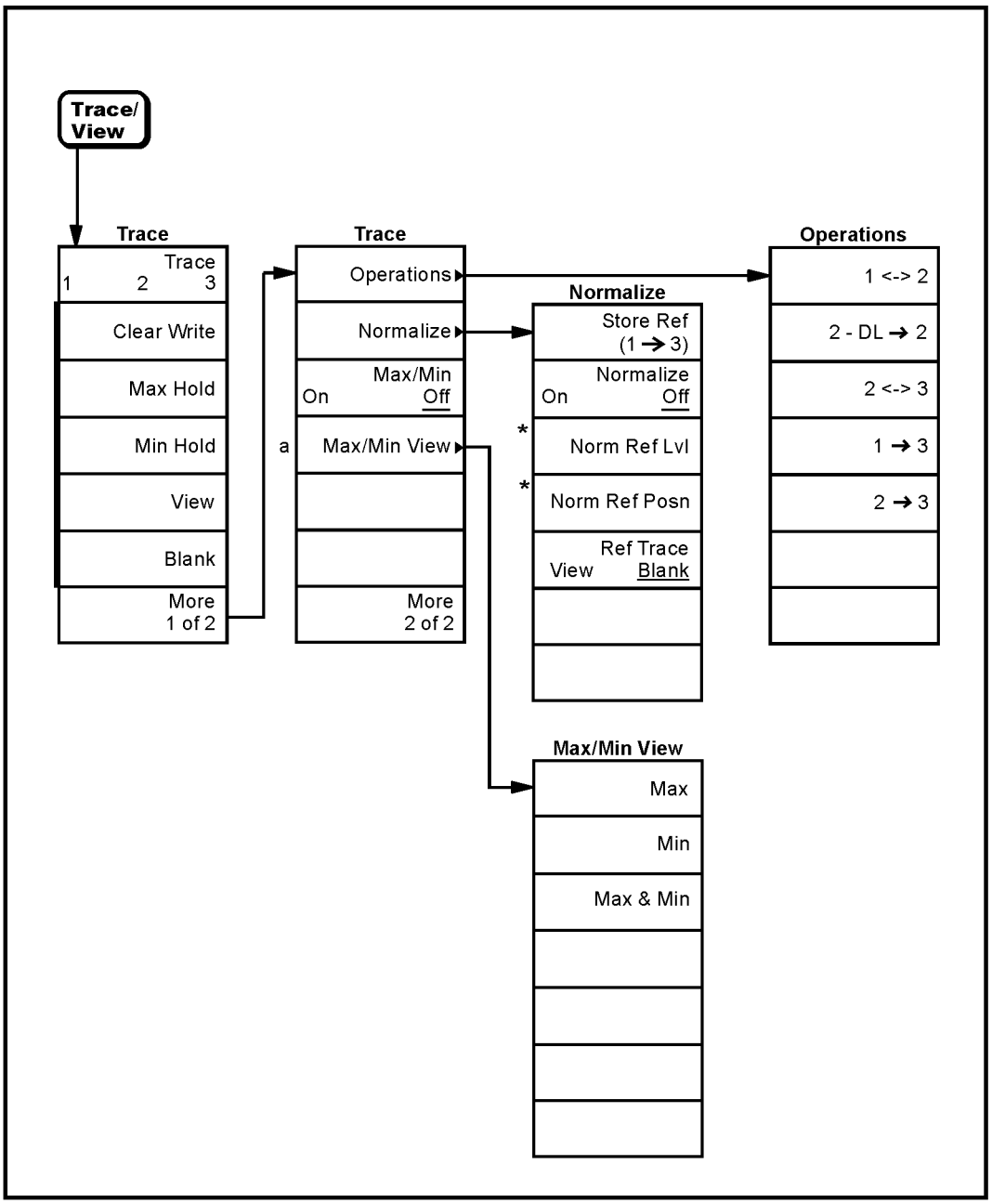
Trace/View Menu



* An active function which allows data entry
a. **Max/Min View** is active when **Max/Min** is set to on.

pl770b

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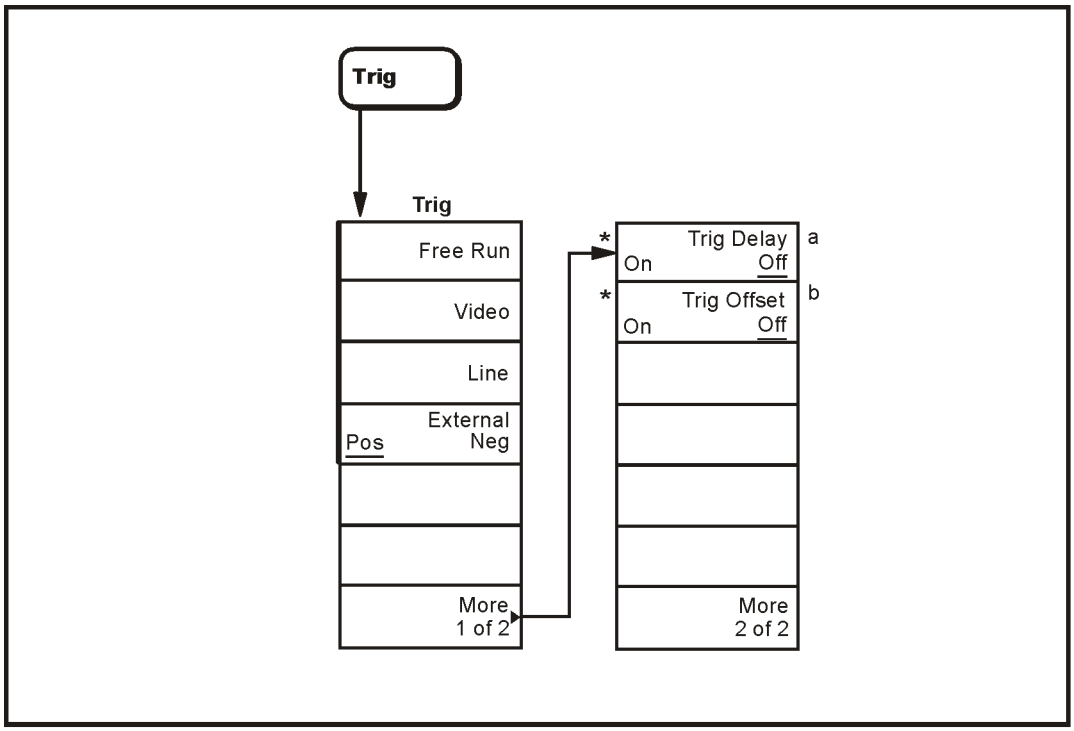
Trig Menu



* An active function which allows data entry
a. **Trig Delay** is active when **External Trigger** key is pressed
b. Only available in Zero Span.

pb925a

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2 Front-Panel Key Reference

The front-panel keys in this chapter are listed alphabetically and are described with their associated menu keys. The menu keys are arranged as they appear in your analyzer menus. Use the following table to locate a specific key.

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> Display Line	page 169
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2 ↔ 3	page 210
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Amplitude	page 86, page 128, page 135, page 142
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Amptd Ref (f = 50 MHz) On Off	page 114
Amptd Ref Out (f=50 MHz) On Off	page 114
Amptd Step Auto Man	page 182
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AMPLITUDE Y Scale

Activates the reference level function and accesses the amplitude menu keys. Amplitude menu keys allow you to set functions that affect the way data on the vertical axis is displayed or corrected.

Ref Level

Allows the reference level to be changed. This function is activated when **AMPLITUDE Y Scale** is pressed. The reference level is the amplitude power or voltage represented by the top graticule on the display. Changing the value of the reference level changes the absolute amplitude level (in the selected amplitude units) of the top graticule line. The reference level can be changed using the step keys, the knob, or the numeric keypad. Pressing any digit (0 through 9) on the numeric keypad brings up the terminator menu.

Key Access: **AMPLITUDE** / **Y Scale**

Attenuation Auto Man

Sets the input attenuation to manual or automatic and allows you to set the attenuation level in 5 dB increments when **Attenuation (Man)** is selected. The analyzer input attenuator, which is normally coupled to the reference level control, reduces the power level of the analyzer input signal at the input mixer. The attenuator is recoupled when **Attenuation (Auto)** is selected. Attenuation can be changed using the step keys, the knob, or the numeric keypad. To select 0 dB, the numeric keypad must be used (except for E7401A.)

Key Access: **AMPLITUDE** / **Y Scale**

CAUTION

To prevent damage to the input mixer, do not exceed a power level of +30 dBm at the input. To prevent signal compression, keep the power at the input mixer below 0 dBm. With the attenuator set to Auto, a signal at or below the reference level will result in a mixer level at or below the **Max Mixer Lvl**.

Scale/Div

Sets the logarithmic units per vertical graticule division on the display. The **Scale/Div** function is only available when the **Scale Type** key is set to **Log**. Scale/Div values may range from 0.1 to 20 dB per division With **Demod View (On)** selected, the range is 1 kHz to 240 kHz/div.

Key Access: **AMPLITUDE** / **Y Scale**

Scale Type Log Lin

Scales the vertical graticule divisions in logarithmic units when **Log** is underlined. Logarithmic units may range from 0.1 to 20 dB per division. When **Lin** is underlined, the vertical divisions are linearly scaled and the default amplitude units are volts. The top of the display is set to the reference-level value and the bottom graticule becomes zero volts. (Each division of the graticule is one-tenth of the reference level in volts.) Pressing **Scale Type** always sets the units specified for the

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current amplitude scale. When **Power On** is set to **Preset** and **Preset Type** is set to **Factory**, pressing **Preset** or powering on the analyzer sets the default units.

Key Access: **AMPLITUDE** / **Y Scale**

Presel Center

Agilent E7403A, E7404A, and E7405A only. Adjusts the frequency of the preselector filter (above 2.85 GHz) to optimize the amplitude accuracy at the active marker frequency. If activated in a non-preselected band, **Presel Center** does nothing.

Preselector center should be used to improve amplitude accuracy for signals which fall into any one of the harmonic mixing bands. The harmonic mixing bands Frequency Ranges are:

Band	Frequency Range
1	2.85 - 6.7 GHz
2	6.2 - 13.2 GHz
3	12.8 - 19.2 GHz
4	18.7 - 26.5 GHz

Key Access: **AMPLITUDE** / **Y Scale**

Presel Adjust

Agilent E7403A, E7404A, and E7405A only. Allows manual adjustment of the preselector frequency to optimize its response on the signal of interest.

By changing the **Presel Adjust**, the center of the preselector filter can be moved in frequency. The signal of interest will appear to change in amplitude with the frequency response of the preselector filter.

Key Access: **AMPLITUDE** / **Y Scale**

Y Axis Units

Accesses the menu keys that change the amplitude units. Amplitude units are maintained for both logarithmic and linear modes. The amplitude units can be changed by pressing **dBm**, **dBmV**, **dBμV**, **dBμA**, **Watts**, **Volts**, and **Amps**. This key is unavailable when **FM Demod** and **Demod View** are on.

Key Access: **AMPLITUDE Y Scale**, **More**

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Ref Lvl Offst

Adds an offset value to the displayed reference level. Reference-level offsets are only entered by using the numeric keypad. Entering an offset does not affect the trace or the attenuation value. Reference-level offsets are used when gain or loss occurs between a device under test and the analyzer input. Thus, the signal level measured by the analyzer may be referred to as the level at the input of an external amplitude-conversion device. When an amplitude offset is entered, its value appears on the left side of the display under `Offst` (as opposed to frequency offsets which appear at the bottom of the display). To eliminate an offset, press **Ref Lvl Offst**, **0**, **dB**. When **Preset Type** is set to **Factory**, pressing **Preset** also sets the offset to zero. See also the **Ext Amp Gain** key description.

Key Access: **AMPLITUDE Y Scale**, **More**

Int Preamp On Off

Turns the internal preamp on and off. Pressing **Int Preamp (On)** results in a correction being applied to compensate for the gain of the preamp so that amplitude readings show the value at the input connector. When the preamp is on, a `PA` indication appears on the left side of the display. The preamp is switched off in frequency bands above 3 GHz and the correction is not applied. In this case, the `PA` indication will still appear even though the preamp is not activated.

The preamp is specified to operate over a 1 MHz to 3 GHz range for the E7402A, E7403A, E7404A and E7405A. The preamp range for the E7401A is 100 kHz to 1.5 GHz.

Key Access: **AMPLITUDE Y Scale**, **More**

Corrections

Accesses the **Corrections** menu keys which allow you to enable the corrections function and to select which set of correction factors you wish to modify.

Key Access: **AMPLITUDE Y Scale**, **More**

Apply Corrections
Yes No

Pressing **Apply Corrections (Yes)** turns on the amplitude-correction factors. Corrections will only be applied to the sets of correction factors whose correction state is set to On. To turn a set of correction factors on, use the **Correction On Off** key in the Antenna, Cable, Other, or User menus. When **Apply Corrections (Yes)** is selected, an `A` will appear on the screen annotation whether or not a correction set has been turned on using the **Correction (On)** key in the Antenna, Cable, Other, or User menus.

Key Access: **AMPLITUDE / Y Scale**, **More**, **Corrections**

Antenna

Accesses the Antenna menu of keys which allow you to correct for antenna loss, but may be used for any kind of correction.

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Key Access: **AMPLITUDE** / **Y Scale**, **More**, **Corrections**

Correction On Off Turns the amplitude correction function on or off for the selected set. The corrections state must be set to On for the correction to be applied.

Key Access: **AMPLITUDE** / **Y Scale**, **More**, **Corrections**, **Antenna**

NOTE Antenna, Cable, and Other correction factors are generally entered as positive values. This indicates a loss in the external device. User correction factors are typically entered as negative values which indicate a gain in the external device.

Antenna Units Accesses the antenna measurement units menu. You can choose **pTesla**, **Gauss**, **μV/m**, **μA/m** or **No Conversion** as a measurement unit. Antenna Units is active only when Antenna is chosen from the Select list, otherwise it is grayed out.

Key Access: **AMPLITUDE Y Scale**, **More**, **Corrections**, **Antenna**

Edit Accesses menu keys that allow you to create and edit an amplitude-correction factor set. It puts the analyzer into a split-screen mode where the correction data is displayed in a table under the trace data. Pressing **ESC** while in this menu will exit the menu and remove the table from the screen. New points will be applied only after the editor is closed. The Tab keys are very useful for navigation between rows in the corrections table.

Key Access: **AMPLITUDE Y Scale**, **More**, **Corrections**, **Antenna**

Point

Allows you to create or edit an amplitude-correction factor data point. Up to 200 points may be defined for each set. Enter the point number to be created or edited by using the numeric keypad, then press **Enter**, or use the knob, tab, or step keys to move to an existing point. Press **Bk Sp** to correct

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errors. After selecting a point, **Frequency** becomes active.

Key Access: **AMPLITUDE Y Scale**, **More**, **Corrections**, **Antenna**, **Edit**

Frequency

Allows you to enter the frequency value for an amplitude-correction point. Enter the frequency value by using the numeric keypad. Change the frequency value by using the step keys or the knob. Press **Bk Sp** to correct errors. After selecting a point, **Amplitude** becomes active.

A frequency coordinate must always be specified for amplitude-correction factors.

Key Access: **AMPLITUDE Y Scale**, **More**, **Corrections**, **Antenna**, **Edit**

NOTE The amplitude correction entered for the lowest frequency will be applied to all frequencies less than the lowest frequency entered. Similarly, the amplitude correction for the highest frequency entered will be applied to all frequencies greater than the highest frequency entered.

NOTE For amplitude-correction factors, a maximum of two entries with the same frequency are valid. Only the first and last points of a series with the same frequency values are used; any middle points are ignored.

NOTE Amplitude-correction data is sorted in the table by frequency. The sorting occurs immediately after you have entered the frequency value via the front-panel.

Amplitude

Allows you to enter the amplitude value for the current amplitude-correction point. After selecting a point, the point number automatically increments and **Frequency** becomes active to allow entry of the frequency of the next point. Press **Bk Sp** to correct errors.

Key Access: **AMPLITUDE Y Scale**, **More**, **Corrections**, **Antenna**, **Edit**

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Delete Point

Allows you to delete the amplitude-correction data for the currently selected point. The prompt `If you are sure, press key again to delete` will appear on the display. Pressing **Delete Point** again will delete the point and adjust all of the point numbers as appropriate.

Key Access: **AMPLITUDE Y Scale**, **More**, **Corrections**, **Antenna**, **Edit**

Delete Correction Allows you to clear all data from the selected amplitude-correction set. The prompt `If you are sure, press key again to delete` will appear on the display. Pressing **Delete** again will delete the correction set.

Key Access: **AMPLITUDE Y Scale**, **More**, **Corrections**, **Antenna**

Cable Allows you to correct for cable loss, but may be used for any kind of correction.

Key Access: **AMPLITUDE** / **Y Scale**, **More**, **Corrections**

Correction On Off Turns the amplitude correction function on or off for the selected set. The corrections state must be set to On for the correction to be applied.

Key Access: **AMPLITUDE** / **Y Scale**, **More**, **Corrections**, **Cable**

NOTE Antenna, Cable, and Other correction factors are generally entered as positive values. This indicates a loss in the external device. User correction factors are typically entered as negative values which indicate a gain in the external device.

Edit Accesses menu keys that allow you to create and edit an amplitude-correction factor set. It puts the analyzer into a split-screen mode where the correction data is displayed in a table under the trace data. Pressing **ESC** while in this menu will exit the menu and remove the table from the screen. New points will be applied only after the editor is closed. The Tab keys are very useful for

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navigation between rows in the corrections table.

Key Access: **AMPLITUDE Y Scale**, **More**, **Corrections**, **Cable**

Point

Allows you to create or edit an amplitude-correction factor data point. Up to 200 points may be defined for each set. Enter the point number to be created or edited by using the numeric keypad, then press **Enter**, or use the knob, tab, or step keys to move to an existing point. Press **Bk Sp** to correct errors. After selecting a point, **Frequency** becomes active.

Key Access: **AMPLITUDE Y Scale**, **More**, **Corrections**, **Cable**, **Edit**

Frequency

Allows you to enter the frequency value for an amplitude-correction point. Enter the frequency value by using the numeric keypad. Change the frequency value by using the step keys or the knob. Press **Bk Sp** to correct errors. After selecting a point, **Amplitude** becomes active.

A frequency coordinate must always be specified for amplitude-correction factors.

Key Access: **AMPLITUDE Y Scale**, **More**, **Corrections**, **Cable**, **Edit**

NOTE The amplitude correction entered for the lowest frequency will be applied to all frequencies less than the lowest frequency entered. Similarly, the amplitude correction for the highest frequency entered will be applied to all frequencies greater than the highest frequency entered.

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NOTE For amplitude-correction factors, a maximum of two entries with the same frequency are valid. Only the first and last points of a series with the same frequency values are used; any middle points are ignored.

NOTE Amplitude-correction data is sorted in the table by frequency. The sorting occurs immediately after you have entered the frequency value via the front-panel.

Amplitude

Allows you to enter the amplitude value for the current amplitude-correction point. After selecting a point, the point number automatically increments and **Frequency** becomes active to allow entry of the frequency of the next point. Press **Bk Sp** to correct errors.

Key Access: **AMPLITUDE Y Scale**, **More, Corrections**, **Cable**, **Edit**

Delete Point

Allows you to delete the amplitude-correction data for the currently selected point. The prompt `If you are sure, press key again to delete` will appear on the display. Pressing **Delete Point** again will delete the point and adjust all of the point numbers as appropriate.

Key Access: **AMPLITUDE Y Scale**, **More, Corrections**, **Cable**, **Edit**

Delete Correction Allows you to clear all data from the selected amplitude-correction set. The prompt `If you are sure, press key again to delete` will appear on the display. Pressing **Delete** again will delete the correction set.

Key Access: **AMPLITUDE Y Scale**, **More**, **Corrections**, **Cable**

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Other Allows you to correct for gain or loss other than for antenna, cable, or user.

Key Access: **AMPLITUDE** / **Y Scale**, **More**, **Corrections**

Correction On Off Turns the amplitude correction function on or off for the selected set. The corrections state must be set to On for the correction to be applied.

Key Access: Amplitude Y Scale, More, Corrections, Other

NOTE Antenna, Cable, and Other correction factors are generally entered as positive values. This indicates a loss in the external device. User correction factors are typically entered as negative values which indicate a gain in the external device.

Edit Accesses menu keys that allow you to create and edit an amplitude-correction factor set. It puts the analyzer into a split-screen mode where the correction data is displayed in a table under the trace data. Pressing **ESC** while in this menu will exit the menu and remove the table from the screen. New points will be applied only after the editor is closed. The Tab keys are very useful for navigation between rows in the corrections table.

Key Access: **AMPLITUDE Y Scale**, **More**, **Corrections**, **Other**

Point

Allows you to create or edit an amplitude-correction factor data point. Up to 200 points may be defined for each set. Enter the point number to be created or edited by using the numeric keypad, then press **Enter**, or use the knob, tab, or step keys to move to an existing point. Press **Bk Sp** to correct errors. After selecting a point, **Frequency** becomes active.

Key Access: **AMPLITUDE Y Scale**, **More**, **Corrections**, **Other**, **Edit**

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Frequency

Allows you to enter the frequency value for an amplitude-correction point. Enter the frequency value by using the numeric keypad. Change the frequency value by using the step keys or the knob. Press **Bk Sp** to correct errors. After selecting a point, **Amplitude** becomes active.

A frequency coordinate must always be specified for amplitude-correction factors.

Key Access: **AMPLITUDE Y Scale**, **More, Corrections**, **Other**, **Edit**

NOTE The amplitude correction entered for the lowest frequency will be applied to all frequencies less than the lowest frequency entered. Similarly, the amplitude correction for the highest frequency entered will be applied to all frequencies greater than the highest frequency entered.

NOTE For amplitude-correction factors, a maximum of two entries with the same frequency are valid. Only the first and last points of a series with the same frequency values are used; any middle points are ignored.

NOTE Amplitude-correction data is sorted in the table by frequency. The sorting occurs immediately after you have entered the frequency value via the front-panel.

Amplitude

Allows you to enter the amplitude value for the current amplitude-correction point. After selecting a point, the point number automatically increments and **Frequency** becomes active to allow entry of the frequency of the next point. Press **Bk Sp** to correct errors.

Key Access: **AMPLITUDE Y Scale**, **More, Corrections**, **Other**, **Edit**

Delete Point

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Allows you to delete the amplitude-correction data for the currently selected point. The prompt `If you are sure, press key again to delete` will appear on the display. Pressing **Delete Point** again will delete the point and adjust all of the point numbers as appropriate.

Key Access: **AMPLITUDE Y Scale**, **More**, **Corrections**, **Other**, **Edit**

Delete Correction Allows you to clear all data from the selected amplitude-correction set. The prompt `If you are sure, press key again to delete` will appear on the display. Pressing **Delete** again will delete the correction set.

Key Access: **AMPLITUDE Y Scale**, **More**, **Corrections**, **Other**

User Allows you to correct for gain or loss and may be used for any type of correction.

Key Access: **AMPLITUDE / Y Scale**, **More**, **Corrections**

Correction On Off Turns the amplitude correction function on or off for the selected set. The corrections state must be set to On for the correction to be applied.

Key Access: **AMPLITUDE / Y Scale**, **More**, **Corrections**, **User**

NOTE Antenna, Cable, and Other correction factors are generally entered as positive values. This indicates a loss in the external device. User correction factors are typically entered as negative values which indicate a gain in the external device.

Edit Accesses menu keys that allow you to create and edit an amplitude-correction factor set. It puts the analyzer into a split-screen mode where the correction data is displayed in a table under the trace data. Pressing **ESC** while in this menu will exit the menu and remove the table from the screen. New points will be applied only after the editor is closed. The Tab keys are very useful for navigation between rows in the corrections table.

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Key Access: **AMPLITUDE Y Scale**, **More**, **Corrections**, **User**

Point

Allows you to create or edit an amplitude-correction factor data point. Up to 200 points may be defined for each set. Enter the point number to be created or edited by using the numeric keypad, then press **Enter**, or use the knob, tab, or step keys to move to an existing point. Press **Bk Sp** to correct errors. After selecting a point, **Frequency** becomes active.

Key Access: **AMPLITUDE Y Scale**, **More**, **Corrections**, **User**, **Edit**

Frequency

Allows you to enter the frequency value for an amplitude-correction point. Enter the frequency value by using the numeric keypad. Change the frequency value by using the step keys or the knob. Press **Bk Sp** to correct errors. After selecting a point, **Amplitude** becomes active.

A frequency coordinate must always be specified for amplitude-correction factors.

Key Access: **AMPLITUDE Y Scale**, **More**, **Corrections**, **User**, **Edit**

NOTE The amplitude correction entered for the lowest frequency will be applied to all frequencies less than the lowest frequency entered. Similarly, the amplitude correction for the highest frequency entered will be applied to all frequencies greater than the highest frequency entered.

NOTE For amplitude-correction factors, a maximum of two entries with the same frequency are valid. Only the first and last points of a series with the same frequency values are used; any middle points are ignored.

NOTE Amplitude-correction data is sorted in the table by frequency. The sorting occurs immediately after you have entered the frequency value via the front-panel.

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Amplitude

Allows you to enter the amplitude value for the current amplitude-correction point. After selecting a point, the point number automatically increments and **Frequency** becomes active to allow entry of the frequency of the next point. Press **Bk Sp** to correct errors.

Key Access: **AMPLITUDE Y Scale**, **More, Corrections**, **User**, **Edit**

Delete Point

Allows you to delete the amplitude-correction data for the currently selected point. The prompt `If you are sure, press key again to delete` will appear on the display. Pressing **Delete Point** again will delete the point and adjust all of the point numbers as appropriate.

Key Access: **AMPLITUDE Y Scale**, **More, Corrections**, **User**, **Edit**

Delete Correction Allows you to clear all data from the selected amplitude-correction set. The prompt `If you are sure, press key again to delete` will appear on the display. Pressing **Delete** again will delete the correction set.

Key Access: **AMPLITUDE Y Scale**, **More**, **Corrections**, **User**

Freq Interp
Log Lin Allows you to determine how trace values are computed between points in a correction table. If the linear mode is selected, a straight line is used between points in a correction table. If the logarithmic mode is selected, frequency values between points are computed by first taking the logarithm of both table values and the intermediate value.

Key Access: **AMPLITUDE Y Scale**, **More**, **Corrections**, **More**

Delete all Corrections Allows you to delete all amplitude-correction sets.

Key Access: **AMPLITUDE Y Scale**, **More**, **Corrections**, **More**

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Ext Amp Gain

Adds a positive or negative preamplifier gain value, which is subtracted from the displayed signal. (Use negative values for gain and positive values for loss.) The function is similar to the **Ref Lvl Offset** function, however with the **Ext Amp Gain** function, the attenuation may be changed depending on the preamplifier gain entered. A preamplifier gain offset is used for measurements that require an external preamplifier or long cables. The offset is subtracted from the amplitude readout so that the displayed signal level represents the signal level at the input of the preamplifier. The preamplifier gain offset is displayed at the top of the screen and is removed by entering zero. The preamplifier gain offset can only be entered using the numeric keypad. The preamplifier gain value is not affected by an instrument preset or a power cycle.

Key Access: **AMPLITUDE Y Scale**, **More**

Max Mixer Lvl

Allows you to change the maximum input mixer level from 6.99 dBµV to 116.99 dBµV (10 dBm to –100 dBm) in 10 dB steps using the step keys, and 1 dB steps using the knob. In addition, you may use the keypad to specify a value. (The default unit of measure is dBµV, however you can change the unit of measure by first pressing **Y Axis Units** key and selecting the appropriate key.) The mixer level is equal to the reference level minus the attenuator setting. As the reference level changes, the input attenuator setting is changed to keep the power levels of on-screen signals less than the selected level at the input mixer. When **Preset Type** is set to **Factory**, pressing **Preset** resets the maximum input mixer level to 97 dBµV.

Key Access: **AMPLITUDE Y Scale**, **More**

IF Gain Auto Fixed

When using digital resolution bandwidths (RBW < 1 kHz), the analyzer uses IF Gain autoranging to set the optimum signal gain for digital processing. This technique produces the maximum measurement range without overloading the digital system. To increase measurement speed, select **IF Gain (Fixed)**. This setting decreases the display range to 70 dB, so you may have to adjust the reference level to ensure complete view of the signal.

Key Access: **Amplitude**, **More**, **More**

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Auto Couple

Accesses the menus to couple functions in your analyzer. Coupled functions are functions that are linked.

Auto All

Auto-couples all coupled functions. If **Auto All** is pressed all coupled functions are set to **Auto**.

Coupled functions are functions that are linked. If one function is changed, the coupled function is changed. During normal operation, resolution bandwidth, video bandwidth, and sweep time are coupled to center frequency.

If any of these functions become uncoupled (is set to manual), a # sign appears next to the screen annotation representing the function on the screen. If one or more functions are manually set so that the amplitude or frequency becomes uncalibrated “Meas Uncal” appears on the top right side of the graticule.

To recouple the analyzer functions, the uncoupled function(s) must be individually set back to Auto. Or, you can press **Auto All** to return all of the functions to their default auto state. Pressing **Auto All** will couple the following functions:

- For normal operation with EMI resolution bandwidths, the intermediate frequency bandwidth couples to the center frequency of a given span. With SA resolution bandwidth, the intermediate frequency bandwidth couples to the current span. However, pressing **Auto All** always couples the analyzer with the appropriate EMI resolution bandwidth for the center frequency of the given span.
- Video bandwidth couples to resolution bandwidth. A video bandwidth to resolution bandwidth ratio of 3.0 is maintained when EMI resolution bandwidths are selected. The ratio is 1.0 when SA resolution bandwidths are selected.
- Sweep time will couple to the span, resolution bandwidth, and video bandwidth.
- **Detector (Auto)** is set.
- **Avg Type (Auto)** is set.
- **PHNoise Opt (Auto)** is set.
- RF attenuation couples to reference level.
- Center frequency step size will couple to 10% of span.
- Sweep coupling (SR/SA) will couple back to SA mode.
- Source attenuation couples to source amplitude.
- Source power step couples to one vertical scale division.

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Key Access: **Auto Couple**

NOTE Although **Marker Count**, **Gate Time**, and **Marker Trace** have **Auto** settings, they are not affected by **Auto All**.

PhNoise Opt Auto Man Chooses the LO (local oscillator) phase noise behavior that is optimum for measurement accuracy.

Key Access: Auto Couple

Auto Allows the analyzer to automatically select a LO phase noise behavior that is optimum for the selected span and RBW. The **Auto** rules choose **Fast Tuning** whenever the span is >10 MHz otherwise the **Auto** rules choose **Optimize £(f)**.

Key Access: **Auto Couple, PhNoise Opt Auto Man**

Optimize £(f) Optimizes for LO phase noise.

Key Access: **Auto Couple, PhNoise Opt Auto Man**

Optimize LO for Fast Tuning The LO behavior compromises phase noise within approximately 10 MHz of the carrier. This allows rapid measurement throughput when changing the center frequency or span.

Key Access: **Auto Couple, PhNoise Opt Auto Man**

Detector Auto Man Selects a specific detector, or in **Auto**, picks the appropriate detector for a particular measurement.

When discussing detectors, it is important to understand the concept of a trace “bucket.” For every trace point displayed, there is a finite time during which the data for that point is collected. The analyzer has the ability to look at all of the data collected during that time and present a single point of trace data based on the detector mode. We call the interval during which the data for that trace point is being collected, the “bucket.” Thus a trace is more than a series of single points. It is actually a series of trace “buckets.” The data may be sampled many times within each bucket.

Selecting **Detector (Auto)** and **BW/Avg**, **Average (On)** changes the detector. The **Auto** choice depends on marker functions, trace functions, and the trace averaging function. If a marker function or measurement is running, the **Auto** choice of detector is either **Average** or **Sample**. When one of the detectors (such as **Average**) is manually selected instead of **Auto**, that detector is used regardless of other analyzer settings.

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The **Average** detector displays the average of the signal within the bucket. The averaging method depends upon **Avg Type** selection (Video or RMS).

The **Peak** detector displays the maximum of the signal within the bucket.

The **Sample** detector displays the instantaneous level of the signal at the time of the sampling.

The **Negative Peak** detector displays the minimum of the signal within the bucket.

Neither average nor sample detectors measure amplitudes of CW signals as accurately as peak, because they may not find a spectral component's true peak, but they do measure noise without the biases of peak detection.

The detector in use is indicated on the left side of the display. A # will appear next to it if the detector has been manually selected.

Key Access: **Auto Couple**

Auto

The system selects peak detection as the default, but if a condition arises where a different type of detection scheme provides greater accuracy, the system will use the alternate scheme. For example, when using the Marker Noise function, Auto mode selects Average detection for Res BWs > 300 Hz and Sample for Res BWs ≤ 300 Hz as shown in Figure 2-1.

Key Access: **Auto Couple, Detector Auto Man**

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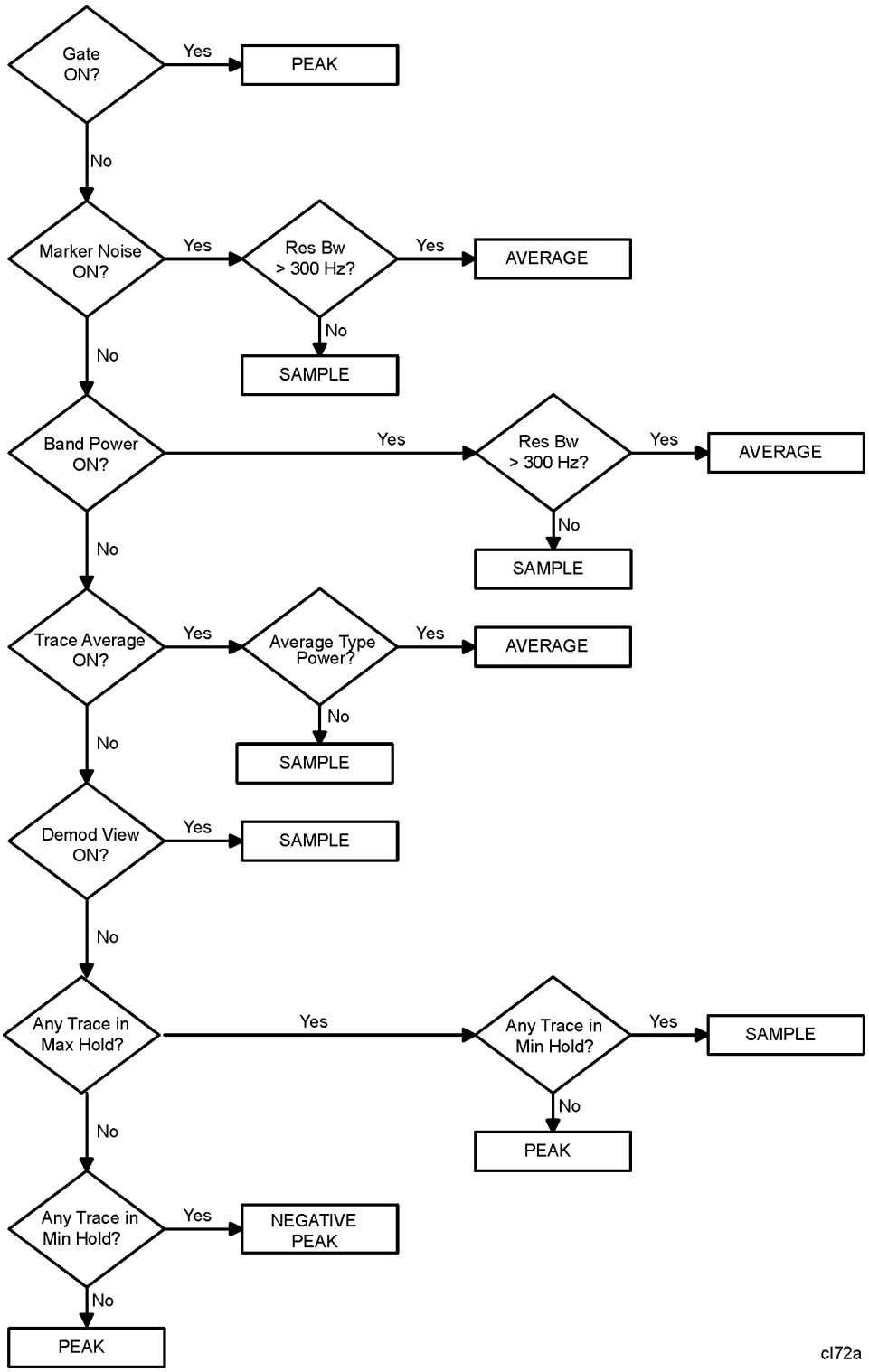
Figure 2-1 Detector (Auto) Selection Flowchart



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Average

Allows you to select between video and power (RMS) averaging, via the **Average Type** key.

Average detection is used when measuring the average value of the amplitude across each trace interval (bucket). The averaging method used by the Average detector will be set to either Video or Power as appropriate when the Average Type is Auto coupled or may be set explicitly through the **BW/Avg**, **Avg Type Auto Man** key.

Video Average detection computes the averaged trace interval as appropriate to the Y-axis scale:

- Log-power average when in log scale.
- Voltage average when in linear scale.
- Frequency deviation when Demod View is enabled for FM Demod.

Power Average ("root mean square" or RMS) detection computes the RMS of the samples collected across the trace interval. The number of samples included in the RMS average for each trace interval depends on the sweep time and the resolution bandwidth. Slower sweep times also increase the number of samples averaged for each trace interval.

When **Average** is selected, `Avg` appears on the left side of the display.

Key Access: **Auto Couple, Detector Auto Man**

Peak

Enables positive peak detection which displays the maximum video signal detected during a sampling interval. EMI measurements usually call for positive peak detection. Peak detection is selected at power on or by pressing **Preset**. When Peak detection is selected, Peak appears in the upper-left corner of the screen.

Key Access: **Auto Couple, Detector Auto Man**

Sample

Sample detection is used primarily to display noise or noise-like signals. This detection should not be used to make the most accurate amplitude measurement of non noise-like signals. In sample mode, the instantaneous signal value at the present display point is placed in memory. When **Sample** detection is selected, **`Samp`** appears in the upper-left corner of the display.

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Key Access: **Auto Couple, Detector Auto Man**

Negative Peak

Negative peak detection functions the same as peak detection, but selects the minimum video signal value. This detection should not be used to make the most accurate amplitude measurements of signals. When **Negative Peak** is selected, `NPeak` appears in the upper-left corner of the screen.

Key Access: **Auto Couple, Detector Auto Man**

Avg Type Auto Man

Accesses the functions to automatically or manually choose from one of the following averaging scales: Video or Power (RMS).

NOTE

If video averaging is selected, the measurement results are the average of the signal level in the y-axis scale. If the power average (RMS) is selected, all measured results are converted into power units before averaging and filtering operations, and converted back to decibels for displaying. The main point to remember is that there can be significant differences between the average of the log of power and the log of the average power.

There are actually four types of averaging processes within a spectrum analyzer. All, except VBW filtering, are affected by this setting. They are:

- Trace averaging (see **BW/Avg**, **Average (On)**).

  Averages signal amplitudes on a trace-to-trace basis. (The type of averaging (Video or Power (RMS)) is selected by pressing **BW/Avg**, **Avg Type**.)

- Average detector (see **Det/Demod**, **Detector, Average (Video/RMS)**).

  Averages signal amplitudes during the time or frequency interval represented by a particular measurement point. The method is determined by selection of either Video or RMS.

- Noise Marker (see **Marker**, **Noise**)

  Averages signal amplitudes across measurement points to reduce variations for noisy signals.

- VBW filtering.

  Filtering the video is a form of averaging the video signal.

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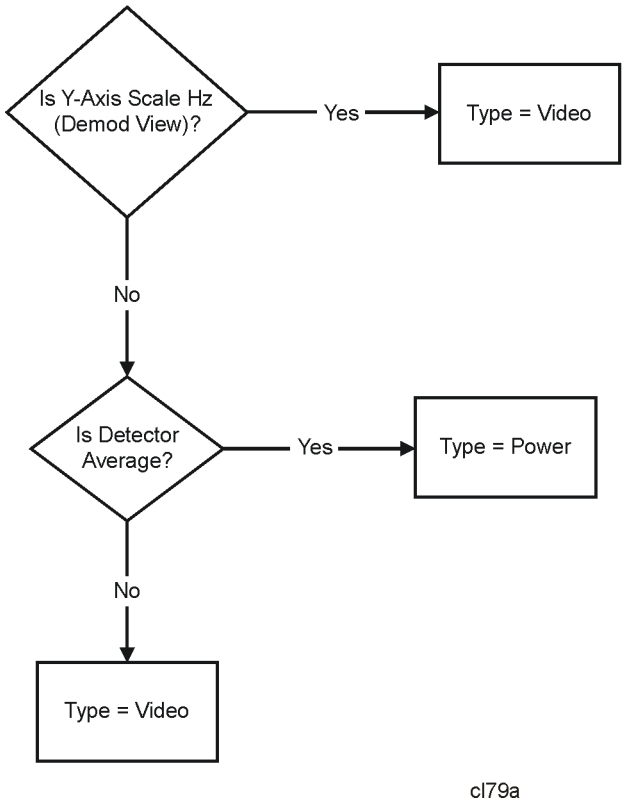
When trace average is on (**BW/Avg**, **Average (On)**, the Average Type is shown on the left side of the display. When **Avg Type (Auto)** is selected, the analyzer chooses the type of averaging to be used as shown in Figure 2-2. When one of the average types is selected manually, the analyzer uses that type without regard to the other analyzer settings and sets **Avg Type** to **Man**.

Figure 2-2 Auto Rules for Average Type



Key Access: **Auto Couple**

Video Avg Video averaging averages the data as appropriate for the y-axis scale. When **Avg Type**, **Video Avg** is selected, **VAvg** appears on the left side of the analyzer display if **Average** is On.

Key Access: **Auto Couple**, **Avg Type**

Pwr Avg Power averaging is performed by converting the trace data from logarithmic to linear power units, and then averaging the power trace data. When **Avg Type**, **Pwr Avg** is selected, **PAvg** appears on the left side of the analyzer display if **Average** is On.

Key Access: **Auto Couple**, **Avg Type**

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Bk Sp (Backspace)

The backspace key is located on the front panel and is used to change or correct an active function entry or a text entry before you save to a file.

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BW/Avg

Activates the resolution bandwidth function and accesses the menu keys that control the bandwidth functions and averaging.

Res BW
EMI Man SA

This key allows you to set the resolution bandwidth as the active function and choose between **EMI**, **Man**, or **SA**. When **Res BW** (**EMI**) is chosen, the bandwidths are "autocoupled" to the center frequency of the analyzer. The relationships are:

Table 2-1

Frequency Range	Resolution Bandwidth
9 kHz to 150 kHz	200 Hz
150 kHz to 30 MHz	9 kHz
30 MHz to 1 GHz	120 kHz
1 GHz to 26.5 GHz	1 MHz

When **Res BW** (**Man**) is chosen, the bandwidths are chosen by the user and ranges from 10 Hz to 5 MHz in a 1, 3, 10 sequence using the knob or step keys. If an unavailable bandwidth is entered using the numeric keypad, the closest available bandwidth in the 1, 3, 10 sequence is used. This bandwidth will be used no matter what the other settings of the analyzer are.

NOTE

For firmware revision A.08.00 and later, the bandwidth range is from 1 Hz to 5 MHz if you have Option 1D5.

A "#" mark appears next to `Res BW` on the display when it is not coupled. To recouple the resolution bandwidth, press **Res BW (EMI)** or **Res BW (SA)** (or press **Auto Couple, Auto All**). The resolution bandwidth can be changed using the step keys, the knob, or the numeric keypad.

When **Res BW** (**SA**) is chosen, the bandwidths are autocoupled to span.

Key Access: **BW/Avg**

120 kHz

Softkey that sets the intermediate frequency bandwidth (ResBW) of 120 kHz. This bandwidth is used when performing electromagnetic interference (EMI) measurements in CISPR Band C and D (30 MHz -1 GHz).

Key Access: **BW/Avg**

9 kHz

Softkey that sets the intermediate frequency bandwidth (ResBW) of 9 kHz. This bandwidth is used when performing electromagnetic interference (EMI) measurements in CISPR Band B (150 kHz-30 MHz).

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Key Access: **BW/Avg**

200 Hz

Softkey that sets the intermediate frequency bandwidth (ResBW) of 200 Hz. This bandwidth is used when performing electromagnetic interference (EMI) measurements in CISPR Band A (9 kHz-150 kHz).

Key Access: **BW/Avg**

Video BW Auto Man

Changes the analyzer post-detection filter from 1 Hz to 3 MHz in a 1, 3, 10 sequence using the knob, step keys, or the numeric keypad. If an unavailable bandwidth is entered using the numeric keypad, the closest available bandwidth in the 1, 3, 10 sequence is used. Video Bandwidth settings are available from 1 Hz to 3 MHz for Resolution Bandwidth settings less than or equal to 300 Hz and from 30 Hz to 3 MHz for Resolution Bandwidth settings greater than or equal to 1 kHz.

As the video bandwidth is decreased, the sweep time is increased to maintain amplitude calibration. A "#" mark appears next to VBW on the bottom of the analyzer display when it is not coupled. To couple the video bandwidth, press **Video BW (Auto)** (or press **Auto All**).

Key Access: **BW/Avg**

Average On Off

Initiates a digital averaging routine that averages the trace points in a number of successive sweeps resulting in trace "smoothing". The number of sweeps (average number) can be selected. Increasing the average number will further smooth the trace. The type of averaging used is selected by pressing **BW/Avg, Avg Type**.

The average is restarted when any of the following occurs:

- a new average number is entered.
- any measurement related parameter (e.g., Center Frequency) is changed.
- **Restart** is pressed.
- **Single Sweep** is pressed.

When in Single Sweep, the specified number of averages is taken, then the sweep stops. When in continuous sweep, the specified number of averages is taken, then the averaging continues with each new sweep averaged in with a weight of $\frac{1}{\text{Average Number}}$ and the old average reduced by multiplying it by $\left(\text{Average Number} - \frac{1}{\text{Average Number}}\right)$.

To turn off averaging, press **Average (Off)**. The number of sweeps can only be entered using the numeric keypad, not the knob or step keys.

Key Access: **BW/Avg**

Avg Type Auto Man

Accesses the functions to automatically or manually choose from one of the following averaging scales: Video or Power (RMS).

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NOTE If video averaging is selected, the measurement results are the average of the signal level in the y-axis scale. If the power average (RMS) is selected, all measured results are converted into power units before averaging and filtering operations, and converted back to decibels for displaying. The main point to remember is that there can be significant differences between the average of the log of power and the log of the average power.

There are actually four types of averaging processes within a spectrum analyzer. All, except VBW filtering, are affected by this setting. They are:

- Trace averaging (see **BW/Avg**).

  Averages signal amplitudes on a trace-to-trace basis. (Press Video or Power (RMS) when **Avg Type (Man)** is selected.)

- Average detector (see **Detector**, **Average**).

  Averages signal amplitudes during the time or frequency interval represented by a particular measurement point.

- Noise Marker (see **Marker**, **Noise**)

  Averages signal amplitudes across measurement points to reduce variations for noisy signals.

- VBW filtering.

  Filtering the video is a form of averaging the video signal.

When trace average is on (**BW/Avg**, **Average (On)**, the Average Type is shown on the left side of the display. When **Avg Type (Auto)** is selected, the analyzer chooses the type of averaging to be used as shown in Figure 2-2 on page 71. When one of the average types is selected manually, the analyzer uses that type without regard to the other analyzer settings and sets **Avg Type** to **Man**.

Key Access: **BW/Avg**

Video Avg Video averaging averages the data as appropriate for the y-axis scale. When **Avg Type**, **Video Avg** is selected, **VAvg** appears on the left side of the analyzer display if **Average** is On.

Key Access: **BW/Avg**, **Avg Type**

Pwr Avg Power averaging is performed by converting the trace data from logarithmic to linear power units, and then averaging the power trace data. When **Avg Type**, **Pwr Avg** is selected, **PAvg** appears on the left side of the analyzer display if **Average** is On.

Key Access: **BW/Avg**, **Avg Type**

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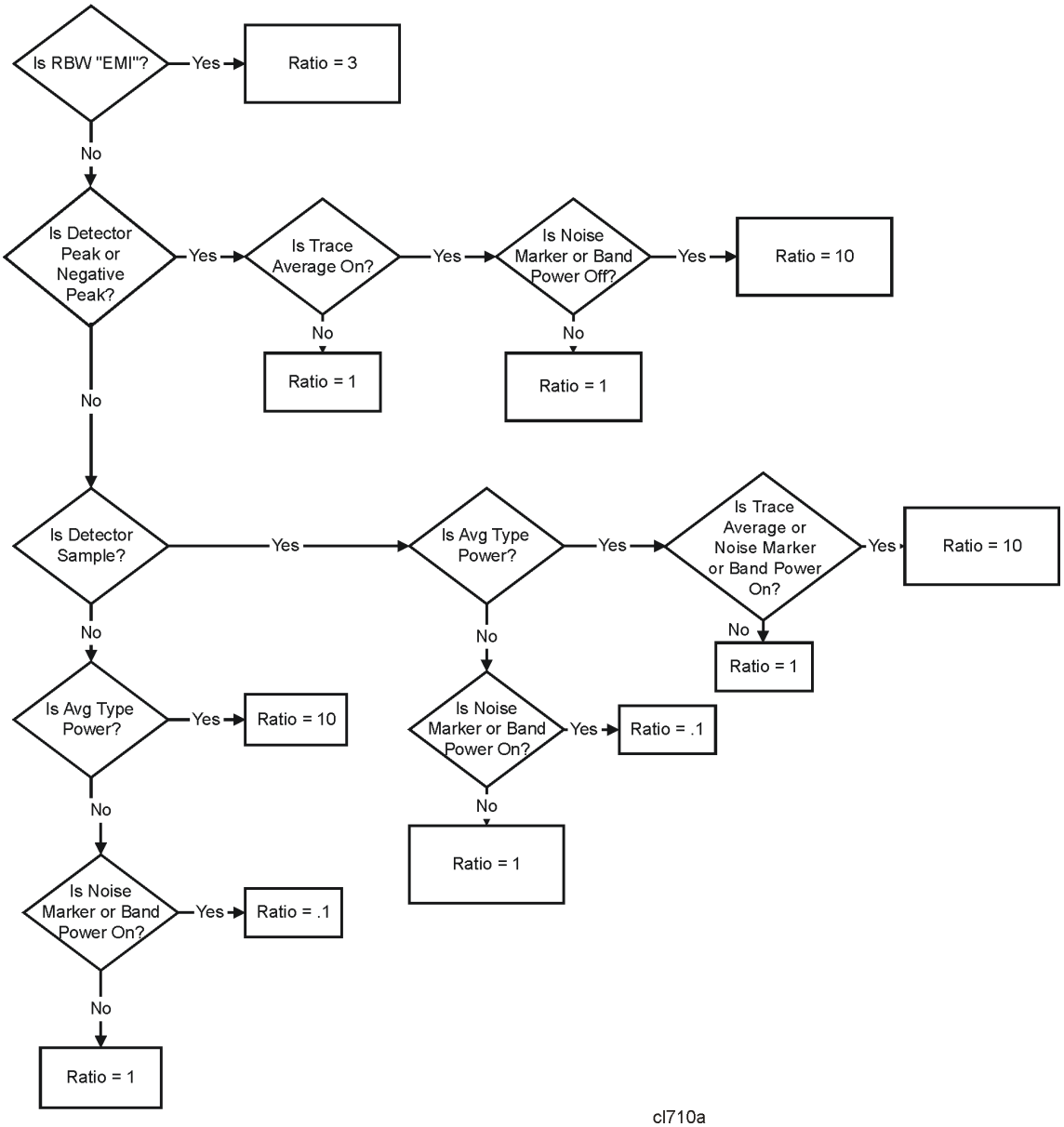
VBW/RBW Auto Man

Selects the ratio between the video and resolution bandwidths. If signal responses near the noise level are visually masked by the noise, the ratio can be set to less than 1 to lower the noise. The knob and step keys change the ratio in a 1, 3, 10 sequence. When **Preset Type** is set to **Factory** and **Preset** is pressed or **Auto Couple**, **Auto All** have been selected, the ratio is set to 1.000 X. The ratio can be changed using the step keys, knob, or numeric keypad. When **VBW/RBW (Auto)** is selected, the ratio is determined by the rules in Figure 2-3.

Figure 2-3 VBW/RBW Ratio Auto Rules



Key Access: **BW/Avg**, **More**

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1 MHz BW Type Impulse 6 dB 3 dB

Selects 1 MHz resolution bandwidth (ResBW). FCC regulations specify 6 dB 1 MHz RBW for measurements above 1 GHz. CISPR regulations (1999) specify 1 MHz IMPULSE RBW. Spectrum analyzers use 3 dB RBW.

Key Access: **BW/Avg**, **More**

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Det/Demod

Accesses the menu keys controlling detector functions, demodulation functions, and the speaker.

NOTE The FM Demod internal circuitry must be aligned before use. Press **System**, **Alignments**, **Align Now**, **FM Demod**.

Detector Auto Man Selects a specific detector, or uses the system to pick the appropriate detector (through **Auto**) for a particular measurement.

When discussing detectors, it is important to understand the concept of a trace "bucket." For every trace point displayed, there is a finite time during which the data for that point is collected. The analyzer has the ability to look at all of the data collected during that time and present a single point of trace data based on the detector mode. We call the interval during which the data for that trace point is being collected, the "bucket." Thus a trace is more than a series of single points. It is actually a series of trace "buckets." The data may be sampled many times within each bucket.

When the detector choice is **Auto**, selecting trace averaging (**BW/Avg**, **Average (On)**) changes the detector. The **Auto** choice depends on marker functions, trace functions, and the trace averaging function. If a marker function or measurement is running, the **Auto** choice of detector is either **Average** or **Sample**. When one of the detectors (such as **Average**) is manually selected instead of **Auto**, that detector is used without regard to other analyzer settings.

The **Average** detector displays the average of the signal within the bucket. The averaging method depends upon **Avg Type** selection (Video or RMS).

The **Sample** detector displays the instantaneous level of the signal at the center of the bucket represented by each display point.

The **Peak** detector displays the maximum of the signal within the bucket.

The **Negative Peak** detector displays the minimum of the signal within the bucket.

Neither average nor sample detectors measure amplitudes of CW signals as accurately as peak, because they may not find a spectral component's true peak, but they do measure noise without the biases of peak detection.

The detector in use is indicated on the left side of the display. A # will appear next to it if the detector has been manually selected.

Key Access: **Det/Demod**

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Auto

The system selects peak detection as the default, but if a condition arises where a different type of detection scheme should be better utilized, the system will use the alternate scheme. For example, the Marker Noise function uses Average detection when in Auto mode because the system determines that the data will be more accurate for noise-type signals.

Key Access: **Det/Demod, Detector Auto Man**

Average

Average detection is used when measuring the average value of the amplitude across each trace interval (bucket). The averaging method used by the Average detector will be set to either Video or Power as appropriate when the Average Type is Auto coupled or may be set explicitly through the **BW/Avg**, **Avg Type Auto Man** key.

Video Average detection computes the averaged trace interval as appropriate to the Y-axis scale:

- Log-power average when in log scale.
- Voltage average when in linear scale.
- Frequency deviation when Demod View is enabled for FM Demod.

Power Average (“root mean square” or RMS) detection computes the RMS of the samples collected across the trace interval. The number of samples included in the RMS average for each trace interval depends on the sweep time and the resolution bandwidth. Slower sweep times also increase the number of samples averaged for each trace interval.

When **Average** is selected, `Avg` appears on the left side of the display.

Key Access: **Det/Demod, Detector Auto Man**

Peak

Enables positive peak detection which displays the maximum video signal detected during a sampling interval. Peak detection is selected at power on or by pressing **Preset** when **Preset Type** is set to **Factory** and **Power On** is set to **Preset**. When Peak detection is selected, **`Peak`** appears in the upper-left corner of the screen.

Key Access: **Det/Demod, Detector Auto Man**

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Sample Sample detection is used primarily to display noise or noise-like signals. This detection should not be used to make the most accurate amplitude measurement of non noise-like signals. In sample mode, the instantaneous signal value at the present display point is placed in memory. When **Sample** detection is selected, **Samp** appears in the upper-left corner of the display.

Key Access: **Det/Demod, Detector Auto Man**

Negative Peak Negative peak detection functions the same as peak detection, but selects the minimum video signal value. This detection should not be used to make the most accurate amplitude measurements of signals. When **Negative Peak** is selected, **NPk** appears in the upper-left corner of the screen.

Key Access: **Det/Demod, Detector Auto Man**

EMI Detector Accesses the Detector menu keys which allow you to select **Quasi-Peak** or **EMI Average** detection. It also allows you to restore settings for reference level and scale type after a Quasi-Peak or EMI Average measurement. The **QP/Avg xGain** and **View** keys are active when either **Quasi Peak** or **EMI Average** is selected.

Key Access: **Det/Demod**

Quasi Peak Enables quasi-peak detection which weights the peak-detected amplitude using specific charge, discharge, and meter time constants as described in CISPR Publication 16. The effect of this detector depends on the characteristics and repetition rate of the input signal.

When the detector is selected, the analyzer is placed in linear amplitude detection mode and the appropriate detector is turned on. The system settings are optimized to accurately measure the amplitude.

When quasi-peak is selected, **QPeak** appears in the upper-left corner of the screen and quasi-peak is turned on in the EMI Detector menu.

Key Access: **Det/Demod**, **EMI Detector**

EMI Average Turns EMI average detector On or Off. When the detector is selected, the analyzer is placed in linear amplitude detection mode and the appropriate detector is turned on. The system settings are optimized to accurately measure the amplitude.

Key Access: **Det/Demod**, **EMI Detector**

Off Turns EMI detectors On or Off.

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Key Access: **Det/Demod**, **EMI Detector**

View
Pk QP/Avg

Selects which view to display.

Key Access: **Det/Demod**, **EMI Detector**

QP/Avg Gain
x1 x10

Turns the linear x10 Gain stage in the quasi-peak and average detector signal path on or off. This stage may be set to On or Off whenever the quasi-peak or average detector is first selected. QP/Avg Gain is only an active function when either the quasi-peak or average detector is selected.

Key Access: **Det/Demod**, **EMI Detector**

Range Dwell

Specifies the amount of time the analyzer dwells on a signal during ranging. Ranging is the first step in a signal measurement. During ranging, the analyzer sweeps for the specified range dwell time, before adjusting the signal peak to the top of the screen for further measurements. If system defaults are restored, Range Dwell will default to 200 ms. See “Dwell Time Settings” in the Measurement Techniques” Chapter of the *Agilent EMC Analyzer Measurement Guide* for more information.

Key Access: **Det/Demod**, **EMI Detector**

Demod

Accesses the menu keys to select **AM** demodulation, **FM** demodulation or demodulation **Off**. It also accesses the **Demod View On Off**, **Speaker On Off,** and **Demod Time** menu keys described below.

Key Access: **Det/Demod**

Off

Turns demodulation off.

Key Access: **Det/Demod**, **Demod**

AM

Activating AM demodulation turns off FM demodulation (if it is on). For non-zero spans, a 10 kHz resolution bandwidth is used during demodulation, regardless of the screen annotation.

Key Access: **Det/Demod**, **Demod**

FM

Turning FM demodulation on turns off AM demodulation (if it is on). For non-zero spans, a 100 kHz resolution bandwidth is used during the demodulation, regardless of the screen annotation. When the span is set to zero span, the displayed bandwidth is used. For best results, move the signal to be demodulated to within 3 graticules of the top of the display.

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Key Access: **Det/Demod**, **Demod**

Demod View
On Off

When **Demod View** (On) is pressed, the vertical scaling of the display is in frequency, and marker will read out the FM deviation in kHz. When Demod View is On, the following functions are not available: Log/Lin (the display is always linear and calibrated in Hz), Y Axis Units, Normalize, Display Line, Peak Excursion, and Peak Threshold. In AM Demod, pressing **Demod View** (On) has no effect.

Key Access: **Det/Demod**, **Demod**

Speaker
On Off

Turns the internal speaker on and off. The volume from the speaker is controlled by the front-panel volume control knob. Selecting AM or FM turns the speaker on. Turning AM or FM off, pressing **Preset** when **Preset Type** is set to **Factory**, or cycling the power sets the speaker function to off.

Key Access: **Det/Demod**, **Demod**

Demod Time

Allows you to set the time, in non-zero spans, to pause and demodulate the signal after each sweep. The demodulated signal can be heard during demodulation when in **Speaker (On)** mode. (In zero span, demodulation is performed (and can be heard) throughout the sweep.) In AM, the Video BW is set to 3 kHz and the Resolution BW is set to 10 kHz. In FM, the Video BW is set to 30 kHz and the Resolution BW is set to 100 kHz.

When AM or FM Demod is enabled, the instrument will tune to the marker frequency and wait for the Demod to take place. For long Demod times, pressing **Preset** when **Preset Type** is set to **Factory** will abort the Demod function. The default value is 500 ms.

Key Access: **Det/Demod**, **Demod**

NOTE

It is normal to hear clicking sounds when the Auto Alignment function is On. During retrace, a small portion of the analyzer circuitry is realigned. Some of the switching of the analyzer circuitry is done using relays. It is the rapid switching of these relays during retrace that causes the clicking sounds. To eliminate the clicking sounds, turn the auto alignment off by pressing **System**, **Alignments**, **Auto Align**, **Off**. When this is done, the **Align Now**, **All** function should be performed periodically. Refer to the Specifications Guide for your instrument to learn more information on how often to perform **Align Now**, **All** when the auto alignment is off.

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Squelch

Allows you to adjust the squelch level. The squelch level mutes weak signals and passes strong signals. Only the audio level is affected. If the internal speaker is On, audio signals are not output unless the signal strength exceeds the squelch threshold. The squelch level does not affect the rear panel AUX VIDEO OUT signal.

Squelch level is indicated on screen by the numbers 0 to 100, with 0 being the minimum threshold (all signals are passed) and 100 being the maximum threshold (no signals are passed). The default squelch value is 0.

Squelch is only active in the FM mode.

Key Access: **Det/Demod**, **Demod**

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Display

Accesses menu keys that allow you to control what is displayed on the analyzer, including titles, the display line, graticule and annotation, as well as the testing of trace data against user entered limits.

Full Screen

Allows the measurement window to expand horizontally over the entire instrument display. Pressing a key that brings up a new menu will cancel the full screen function.

Key Access: **Display**

Display Line On Off

Activates an adjustable horizontal line that is used as a visual reference line. The line, which can be used for trace arithmetic, has amplitude values that correspond to its vertical position when compared to the reference level. The value of the display line appears in the active function block and on the left side of the display. The display line can be adjusted using the step keys, knob, or numeric keypad. Pressing any digit, 0 through 9, on the numeric keypad brings up the selected terminator menu. To deactivate the display line, press **Display Line** (Off).

Key Access: **Display**

Limits

Accesses menu keys that allow you to create and define the parameters of limit lines.

Key Access: **Display**

Limit 1
Limit 2

Allows you to select either of the two available limits. The **Limit 1** and **Limit 2** keys access menu keys that allow you to set parameters for the selected limit.

Key Access: **Display**, **Limits**

Type
Upper Lower

Allows you to define the limit you are editing as either an upper or lower limit. An upper limit fails if the trace exceeds the limit. A lower limit fails if the trace falls below the limit.

Key Access: **Display**, **Limits**, **Limit 1** or **Limit 2**

Limit On Off

Turns the limit line display on and off. Either **Limit** or **Margin**, as well as **Test**, must be turned on for a limit test to work.

Key Access: **Display**, **Limits**, **Limit 1** or **Limit 2**

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Test
On Off

Turns the testing of the limit lines on and off. If the trace is at or within the bounds of the set limit or margin, `PASS LIMIT #` or `PASS MARGIN #` is displayed in green in the upper left corner of the measurement area where # is the number of the selected limit line. Only positive margins are allowed for lower limits and only negative margins are allowed for upper limits. If the trace is out of the limit or margin boundaries, `FAIL LIMIT #` or `FAIL MARGIN #` is displayed in red. The results for Limit 2 are displayed below those for Limit 1. Either **Limit** or **Margin** must be turned on for **Test** to work.

Key Access: **Display**, **Limits**, **Limit 1** or **Limit 2**

Margin
On Off

Margin (Off) turns the margin off. **Margin (On)** allows you to set a limit line offset for the selected limit line. Either **Limit** or **Margin** as well as **Test**, must be turned on for a limit test to work.

Key Access: **Display**, **Limits**, **Limit 1** or **Limit 2**

Edit

Accesses the **Edit** menu keys which include **Point**, **Frequency** (or **Time** if **Display, Limits, X Axis Units (Time)** has been selected), **Amplitude**, **Connected to Previous Pt**, and **Delete Point**. **Edit** also accesses the limits table. The Tab keys allow you to move between the rows in the limits table. New limit segments will only be applied after the editor is closed. Pressing **Return**, or any key not associated with the editor, will close the editor.

Key Access: **Display**, **Limits**, **Limit 1** or **Limit 2**

Point

Allows you to create or edit a limit point. Up to 200 points may be defined for each limit line. Enter the point

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number to be created or edited using the numeric keypad, then Press **Enter**, or use the knob, Tab or step keys to move to an existing point. After selecting a point, **Frequency** (or **Time**) becomes active.

Key Access: **Display**, **Limits**, **Limit 1** or **Limit 2**, **Edit**

Frequency (The key label is **Time** if **X Axis Units** (Time) has been selected.)

Allows you to enter the frequency value for a limit point. After entering a value, the limit table is sorted to place the frequency or time in the correct order. For a new point, **Amplitude** defaults to 0 dBm and **Connected to Previous Pt** defaults to **Yes**. **Amplitude** then becomes active.

Key Access: **Display**, **Limits**, **Limit 1** or **Limit 2**, **Edit**

Amplitude

Allows you to enter the amplitude value for the current limit point. After entering a value, **Connected to Previous Pt** becomes active. If a Tab key is pressed without entering a value, the current **Amplitude** and **Connected to Previous Pt** values of the point are selected. If Tab ⇑ is pressed, the point number automatically increments to allow entry of the amplitude of the next point, or if a new point, to allow **Frequency** to be entered for the new point.

Key Access: **Display**, **Limits**, **Limit 1** or **Limit 2**, **Edit**

Connected to Previous Pt
Yes No

Allows you to determine whether the current point will be connected to the previous point. No limit testing is performed between disconnected points. Pressing this key when the Connected field is selected toggles the

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Connected value of the current point and increments the Point number to allow entry or editing of the Frequency of the next point. If a Tab key is pressed without entering a value, the current Connected value of the point is selected. If Tab ⇑ is pressed, the Point number automatically increments to allow entry of the Connected value of the next point, or if a new point, to allow **Frequency** to be entered for the new point.

Key Access: **Display**, **Limits**, **Limit 1** or **Limit 2**, **Edit**

Delete Point

Allows you to delete the current point in the limit line. You will be prompted with the message `If you are sure, press key again to delete`. Pressing **Delete Point** again will delete the point.

Key Access: **Display**, **Limits**, **Limit 1** or **Limit 2**, **Edit**

Delete Limit

Allows you to delete the current limit set. You will be prompted with the message `If you are sure, press key again to delete`. Pressing **Delete** again will delete the limit set.

Key Access: **Display**, **Limits**, **Limit 1** or **Limit 2**

Freq Interp
Log Lin

Allows you to determine how limit trace values are computed between points in a limit table. The available interpolation modes are linear and logarithmic. If the linear mode is used for both frequency and amplitude, a straight line is used when interpolating between points in a limit table. If frequency interpolation is logarithmic, frequency values between limit points are computed by first taking the logarithm of both the table values and the intermediate value. A linear interpolation is then performed in this

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logarithmic frequency space. An exactly analogous manipulation is done for logarithmic amplitude interpolation.

Key Access: **Display**, **Limits**, **Limit 1** or **Limit 2**, **More**

Amptd Interp Log Lin

Allows you to determine how limit trace values are computed between points in a limit table. The available interpolation modes are linear and logarithmic. If the linear mode is used for both frequency and amplitude, a straight line is used when interpolating between points in a limit table.

Key Access: **Display**, **Limits**, **Limit 1** or **Limit 2**, **More**

NOTE Interpolation modes determine how limit values are computed between points in the limit table. The appearance of a limit trace is also affected by the amplitude scale, which may be linear or logarithmic.

X Axis Units Freq Time

Selects whether limit lines will be entered using frequency or sweep time to define the segments. They can be specified as a table of limit line segments of amplitude versus frequency, or of amplitude versus time. Time values are evaluated with respect to the analyzer sweep time. A time value of zero corresponds to the start of the sweep, which is at the left edge of the graticule.

Switching the limit line definition between frequency and time will erase both of the current limit lines. The message `Changing X axis units will delete all limits. If you are sure, press key again to change units` will appear. Press **X Axis Units Freq Time** again to purge both limit lines and switch between frequency and time.

Key Access: **Display**, **Limits**

Limits Fixed Rel

Allows you to choose fixed or relative limit lines. The fixed (**Fixed**) type uses the current limit line as a reference with fixed frequency and amplitude values. The relative (**Rel**) setting causes the current limit line value to be relative to the displayed center frequency and reference level amplitude values. When limit lines are specified with time, rather than frequency, the **Rel** setting only affects the amplitude values. The current amplitude values will be relative to the displayed reference level amplitude, but the time values will always start at the left edge of the graticule.

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As an example, assume you have a frequency limit line. If the limit line is specified as fixed, entering a limit line segment with a frequency coordinate of 300 MHz displays the limit line segment at 300 MHz. If the same limit line table is specified as relative, it is displayed relative to the analyzer center frequency and reference level. If the center frequency is at 1.0 GHz, a relative limit line segment with a frequency coordinate of 300 MHz will display the limit line segment at 1.3 GHz. If the amplitude component of the relative limit line segment is –10 dB, then –10 dB is added to the reference level value to obtain the amplitude of the given segment (reference level offset included).

A limit line entered as fixed may be changed to relative, and one entered as relative may be changed to fixed. When changing between fixed and relative limit lines, the frequency and amplitude values in the limit line table change so that the limit line remains in the same position for the current frequency and amplitude settings of the analyzer. If a time and amplitude limit line is used, the amplitude values change but the time values remain the same.

Key Access: **Display**, **Limits**

Delete All Limits

Allows you to purge data from the limit-line tables. Pressing **Delete Limits** after the prompt, `If you are sure, press key again to delete`, will delete the limits.

Key Access: **Display**, **Limits**

Title

Accesses the following **Title** menu keys which allows you to change or clear a title on your display.

Key Access: **Display**

Change Title

Allows you to write a title across the top of the display. The marker readout may interfere with the last characters. The markers can be turned off by pressing **Marker**, **More**, **Marker All Off**. Pressing **Change Title** accesses the Alpha Editor Menus that contain available characters and symbols.

NOTE

Pressing **ESC** before exiting the Alpha Editor menus will retain the previous title.

The display title will remain until either **Change Title** is pressed again, or a trace is recalled that was previously saved with a title. A display title can also be cleared by using the clear function. Press **Display**, **Title, Clear Title**.

Key Access: **Display**, **Title**

Clear Title

Allows you to clear a title from the front-panel display. Once cleared, the title cannot be retrieved.

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Key Access: **Display**, **Title**

Preferences

Accesses a menu of the following display functions which allow you to turn the graticule and annotation on or off.

Key Access: **Display**

Graticule
On Off

Turns the display graticule on and off.

Key Access: **Display**, **Preferences**

Annotation
On Off

Turns the screen annotation on or off, however, menu key annotation will remain on the screen. The screen annotation may not be required for prints or during remote operation.

Key Access: **Display**, **Preferences**

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Enter

Terminates and enters into the analyzer a numerical value that has been entered from the front panel using the numeric keypad. (For most applications, it is better to use the units menu keys.)

When using the **File** key menus, the **Enter** key is used to terminate filename entries. When entering titles (**Display**, **Title**, **Change Title**), the **Enter** key is used to terminate title entries.

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ESC

Use the escape key to exit any function without modifying current parameters. Pressing the **ESC** key will:

- Clear any numeric entry that you have begun to enter and cancels the active function (see the section on display annotation, active function area, and other display features in the Getting Started Guide for your instrument).
- Clear any title entry that you have begun to enter and cause the title to revert to the previous name.
- Clear input or output overloads.
- Clear error messages from the status line along the bottom of the display.
- Clear peak threshold from the display (turn it off) if the peak threshold line is on.
- Cancels a print, if one is in progress.

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File

Accesses the menu keys used to view, save, load, and manage data on a floppy disk or the internal analyzer drive. Refer to the Getting Started Guide for your instrument for more information on file menu functions.

Catalog

Displays all directories and files located on the selected drive, depending upon the preferences set under the **Type** and **Sort** keys defined below.

Key Access: **File**

Type

Allows you to select all types or one type of file(s) for viewing.

Key Access: **File, Catalog**

All

Displays all files located on the selected drive.

Key Access: **File, Catalog, Type**

Setup

Displays all setup files (.SET) in the selected directory. Setups are a complete set of instrument parameters including traces, states, limits, and corrections.

Key Access: **File, Catalog, Type**

State

Displays all state files (.STA) in the selected directory. State files contain most instrument settings.

Key Access: **File, Catalog, Type**

Trace

Displays all trace files (.TRC and .CSV) in the selected directory.

Key Access: **File, Catalog, Type**

Limits

Displays all limits files (.LIM) in the selected directory.

Key Access: **File, Catalog, Type**

Screen

Displays all screen (.GIF and .WMF) files in the selected directory.

Key Access: **File, Catalog, Type**

Corrections

Displays all correction files (.ANT, .CBL, .OTH, .AMP) in the selected directory.

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Key Access: **File, Catalog, Type, More**

Signal List Displays all signal list files (.LST) in the selected directory. The signal list files contains a list of signals which include the frequency and measured amplitudes for each signal.

Key Access: **File, Catalog, Type, More**

Report Displays all report files in the selected directory. Report files are saved in a (.HTM) file type format. The Report files can contain the screen in GIF format, the signal list, and the analyzer setup. The report files contain a hyperlink to the GIF file of the analyzer screen.

Key Access: **File, Catalog, Type, More**

Sort Accesses the **Sort** menu keys that allow you to sort your files according to a selected file attribute.The selections include, **By Date**, **By Name**, **By Extension**, **By Size**, and **Order Up Down**. **Order** (Up) allows you to sort files in ascending order (for instance, A,B,C). **Order** (Down) allows you to sort files in descending order (for instance, C,B,A).

Key Access: **File, Catalog**

Dir Up Allows you to move up one directory level. If at the top level, **Dir Up** moves to the drive level, displaying the available disk drives.

Key Access: **File, Catalog**

Dir Select Accesses the highlighted directory on your display.

Key Access: **File, Catalog**

Save Accesses menu keys that allow you to save analyzer setups, states, traces, limits, corrections and screen data to a floppy (A:) drive or internal flash (C:) drive.

NOTE If you intend to save trace files for use with a personal computer, save them as .CSV (comma separated values). However, files formatted in this way cannot be loaded back into the analyzer.

NOTE Never remove the floppy disk during a save operation. To do so could corrupt *all* data on the floppy disk.

Key Access: **File**

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Save Now Executes the save function. When the save is complete, the message `XXXXXX file saved` (where XXXXXX is the filename) will appear in the status line on your display.

Note that once you have used the **File**, **Save**, **Save Now** keys to setup and save a file, the **Save** hardkey will perform an immediate **Save Now** of your file in the same format and to the same location.

Key Access: **File, Save**

NOTE If the `Path:` field above the directory box is empty when pressing **Save Now**, the status line will display the error message: `Unable to save file, invalid path`. In this case, please select a drive.

Type Allows you to select the type of data you want to save.

Setup Displays all previously saved setup files and detects the current setup parameters in preparation to save them in a file for retrieval at a future date. Setup files include all instrument settings including traces, states, limits, and corrections.

NOTE When viewing a floppy disc with saved Setup files (filename.set) on a personal computer, notice there are also many similarly named files with extensions like .s01, .s02, etc. Do not delete these files as they are necessary to allow complete restoration of originally saved Setup.

Key Access: **File, Save, Type**

State Displays all previously saved state files and detects the current state parameters in preparation to save them in a file for retrieval at a future date. State files include all instrument settings but not traces, limits, and corrections. (This is the default setting when power is applied to the analyzer.)

Key Access: **File, Save, Type**

Trace Displays all previously saved trace files (.TRC) and detects the current trace in preparation to save it in a file for retrieval at a future date. A trace can be saved individually or as a group of traces. It can also be saved in .CSV (comma separated values) format (for

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importing into spreadsheets) or in .TRC format, accompanied by the analyzer state (for later recalling into the analyzer). (Note that CSV formatted data cannot be reloaded into the analyzer and TRC formatted data cannot be loaded into most personal computer programs.) Refer to the **Format** key description.

Key Access: **File, Save, Type**

Limits Displays all previously saved limits files and detects the current limits in preparation to save them in a file for retrieval at a future date. Limits provide data sets to determine whether a trace has exceeded preset specifications. Limit sets can hold up to 200 points and can only be saved individually. Refer to the **File, Source** key description.

Key Access: **File, Save, Type**

Screen Displays all previously saved screen files and captures the current screen displayed in preparation to save it in a file for retrieval at a future date. Screen files can be saved in any of the following formats: Bitmap, Metafile, Reverse Bitmap, and Reverse Metafile. Refer to the **Format** key description.

Key Access: **File, Save, Type**

NOTE Screen files saved in WMF format can *only* be loaded into Microsoft®[1] applications such as Microsoft Word.

NOTE The screen saved is that which was displayed before pressing **File**. For this reason, the screens seen while in the file menus cannot be saved.

Corrections Displays all previously saved correction files and detects the current corrections in preparation to save them in a file for retrieval at a future date. Corrections provide a way to adjust the trace display for preset gain factors (such as

1. Microsoft® is a U.S. registered trademark of Microsoft Corporation.

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for cable loss). A correction set may hold up to 200 points. Pressing **Corrections** activates the **Source** key. Refer to the **Source** key description.

Key Access: **File, Save, Type, More**

Signal List Displays all previously saved signal list files (.LST) and detects the current signal list in preparation to save it in a file for retrieval at a future date. The signal list files contains a list of signals which include the frequency and measured amplitudes for each signal.

Key Access: **File, Save, Type, More**

Report Displays all previously saved report files and detects the current report in preparation to save it in a file for retrieval at a future date. Report files are saved in a (.HTM) file type format. The Report files can contain the screen in GIF format, the signal list, and the analyzer setup. The report files contain a hyperlink to the GIF file of the analyzer screen.

Key Access: **File, Save, Type, More**

Format *When* ***Type*** *is set to* ***Trace***, **Format** allows you to save a trace accompanied by the analyzer state. The **CSV** format is readable by a spreadsheet on your PC, but cannot be loaded back into the analyzer. The TRC format cannot be loaded into a PC, but can be loaded back into the analyzer. TRC files include the state of the analyzer and restore all settings when loaded.

When ***Type*** *is set to* ***Screen***, **Format** allows you to choose between bitmap and metafile formats. **Bitmap** saves the screen image in Graphics Interchange Format (GIF) and **Metafile** saves the screen image in Windows Metafile Format (WMF). **Reverse Bitmap** and **Reverse Metafile** turn black backgrounds to white and yellow traces to green so they can be printed visibly and with less use of black ink. Screen images cannot be loaded back into the analyzer.

Key Access: **File, Save**

Source *When* ***Type*** *is set to* ***Trace,*** **Source** allows you to save trace **1**, **2**, or **3** along with state. Saving trace **All** saves all traces in a single .trc file, along with the state.

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When ***Type*** *is set to* ***Corrections***, **Source** accesses the **Antenna**, **Cable**, **Other** and **User** menu keys, which allow you to select the type of correction to be saved.

When ***Type*** *is set to* ***Limits***, **Source** accesses the **Limit 1** and **Limit 2** menu keys. **Limit 1** and **Limit 2** provide data sets to determine whether a trace has exceeded preset specifications. Limit sets can hold up to 200 points and can only be saved individually.

Key Access: **File, Save**

Name Accesses the Alpha Editor and allows you to enter a filename. The external keyboard can also be used to enter a filename while the alpha editor is accessed.

Key Access: **File, Save**

NOTE Only capital letters (A-Z) and digits (0-9) may appear in file names (8 characters, maximum). Additionally, file names include a 3 character extension which is automatically set by the instrument.

Dir Up Allows you to move up one directory level. If at the top level, **Dir Up** moves to the drive level, displaying the available disk drives.

Key Access: **File, Save**

Dir Select Accesses the highlighted directory on your display.

Key Access: **File, Save**

Load Accesses menu keys that allow you to load analyzer setups, states, traces, limits and corrections into the analyzer from a floppy (A:) drive or internal flash (C:) drive.

Key Access: **File**

Load Now Executes the load function. When the load is complete, the message `XXXXXX file loaded` (where XXXXXX is the filename) will appear in the status line on your display.

Key Access: **File, Load**

Type Allows you to select the type of file you want to load.

Setup Displays all setup files you may wish to load (.SET). Setup files include a complete set of instrument parameters including traces, states, limits, and corrections. Loading a setup restores the analyzer (as closely as possible) to all previous instrument settings at the time of the save.

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Key Access: **File, Load, Type**

State Displays all state files you may wish to load (.STA). Loading a state restores most settings to the previously saved values.

Key Access: **File, Load, Type**

Trace Displays all trace files (.TRC) you may wish to load. Traces can be loaded individually or as a group. When a trace is loaded, the state that existed when that trace was saved is loaded along with the trace. Also, the loaded trace is placed in view mode.

Key Access: **File, Load, Type**

NOTE If you wish to compare two saved traces, place traces in view mode before saving them. This prevents the trace from being rewritten based on a state change from subsequent loads.

Limits Displays all limits files you may wish to load to determine whether a trace has exceeded preset specifications (.LIM). Limit sets can hold up to 200 points. Limits can only be loaded individually.

Key Access: **File, Load, Type**

NOTE When loading Limits files, be sure you have selected the appropriate X-Axis Units: frequency or time (**Display**, **Limits**, **X Axis Units**). If you are in time X-Axis Units, and you load frequency limits, all current limit line data will be erased and the analyzer will switch to frequency units. The reverse of the this situation also holds true.

Corrections Displays all corrections files you may wish to load (.CBL, .ANT, .OTH, .AMP). Corrections provide a way to adjust the trace display for preset gain factors (such as for cable loss). A correction set may hold up to 200 points.

Key Access: **File, Load, Type, More**

Signal List Displays all signal list files (.LST) you may wish to load and allows you to load a selected signal list. The signal list files contain a list of signals which include the frequency and measured amplitudes for each signal.

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Key Access: **File, Load, Type, More**

Report Displays all report files you may wish to load. Report files are in a (.HTM) file type format. The Report files can contain the screen in GIF format, the signal list, and the analyzer setup. The report files contain a hyperlink to the GIF file of the analyzer screen.

Key Access: **File, Load, Type, More**

Sort Accesses the **Sort** menu key.

Sort accesses a menu of keys that allow you to view your saved files according to a selected file attribute. The selections include, **By Date**, **By Name**, **By Extension**, **By Size**, and **Order Up Down**. **Order** (Up) allows you to view files in ascending order (for instance, A,B,C). **Order** (Down) allows you to view files in descending order (for instance, C,B,A).

Key Access: **File, Load**

Destination *When* ***Type*** *is set to* ***Trace***, **Destination** allows you to direct your data to **Trace 1**, **Trace 2**, or **Trace 3**. If the data is for all three traces (for instance, **Source** was **All** when they were saved), the data will be returned to the original trace registers.

When ***Type*** *is set to* ***Limits***, **Destination** allows you to direct your data to **Limit 1** or **Limit 2**.

Key Access: **File, Load**

Dir Up Allows you to move up one directory level. If at the top level, **Dir Up** moves to the drive level, displaying the available disk drives.

Key Access: **File, Load**

Dir Select Accesses the highlighted directory on your display. If [. .] is highlighted, this key acts in the same manner as **Dir Up**.

Key Access: **File, Load**

Delete Allows you to delete files and directories.

Key Access: **File**

Delete Now Executes the delete function. If a directory is selected to be deleted, the message `WARNING: You are about to delete the contents of directory XXXXXX` (where XXXXXX is the full path and directory name) will

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appear on your display. After a successful delete, the message `XXXXXX file deleted` (where XXXXXX is the filename) will appear in the status line on your display.

Key Access: **File, Delete**

Type Allows you to select the type of file you want to delete.

Key Access: **File, Delete**

All Displays all files you may wish to delete.

Key Access: **File, Delete**, **Type**

Setup Displays all setup files you may wish to delete (.SET). A Setup file is a complete state of instrument parameters including traces, states, limits and corrections.

Key Access: **File, Delete**, **Type**

State Displays all state files you may wish to delete (.STA).

Key Access: **File, Delete**, **Type**

Trace Displays all trace files you may wish to delete (.TRC and .CSV).

Key Access: **File, Delete**, **Type**

Limits Displays all limits files you may wish to delete (.LIM).

Key Access: **File, Delete**, **Type**

Screen Displays all screen files you may wish to delete (.GIF and .WMF).

Key Access: **File, Delete**, **Type**

Corrections Displays all corrections files you may wish to delete (.CBL, .ANT, .OTH, .AMP).

Key Access: **File, Delete**, **Type**, **More**

Signal List Displays all signal list files (.LST) you may wish to delete and allows you to delete a selected signal list file. The signal list files contains a list of signals which include the frequency and measured amplitudes for each signal.

Key Access: **File, Delete, Type, More**

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Report Displays all report files (.HTM) you may wish to delete and allows you to delete a selected report file. Report files can contain the screen in GIF format, the signal list, and the analyzer setup. The report files contain a hyperlink to the GIF file of the analyzer screen. GIF files can only be deleted from a PC.

Key Access: **File, Delete, Type, More**

Sort **Sort** accesses a menu of keys that allow you view the files you wish to delete, according to a selected file attribute. The selections include, **By Date**, **By Name**, **By Extension**, **By Size**, and **Order Up Down**. **Order** (Up) allows you to view files you may wish to delete in ascending order (for instance, A,B,C). **Order** (Down) allows you to view files you may wish to delete in descending order (for instance, C,B,A).

Key Access: **File, Delete**

Dir Up Allows you to move up one directory level. If at the top level, **Dir Up** moves to the drive level, displaying the available disk drives.

Key Access: **File, Delete**

Dir Select Accesses the highlighted directory on your display. If [. .] is highlighted, this key acts in the same manner as **Dir Up**.

Key Access: **File, Delete**

Copy Allows you to copy files from one directory to another or to one or more mass storage devices.

Key Access: **File**

Copy Now Executes the copy function. If the copy is successful, the message `xxxxx file copied` (where xxxxx is the filename) will appear on the display.

Key Access: **File**, **Copy**

Type Allows you to select the type of file you want to copy.

Key Access: **File**, **Copy**

All Displays all files you may wish to copy.

Key Access: **File**, **Copy**, **Type**

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Setup Displays all setup (.SET) files you may wish to copy. A Setup file is a complete state of instrument parameters including traces, states, limits and corrections.

NOTE When using a personal computer to copy Setup files, ensure the similarly named files with extensions like .s01, .so2, etc. are also copied. These files are necessary to allow complete restoration of originally saved Setup.

Key Access: **File**, **Copy**, **Type**

State Displays all state (.STA) files you may wish to copy.

Key Access: **File**, **Copy**, **Type**

Trace Displays all trace (.TRC and .CSV) files you may wish to copy.

Key Access: **File**, **Copy**, **Type**

Limits Displays all limit (.LIM) files you may wish to rename.

Key Access: **File**, **Copy**, **Type**

Screen Displays all screen (.GIF and .WMF) files you may wish to rename.

Key Access: **File**, **Copy**, **Type**

Corrections Displays all corrections (.CBL, .ANT, .OTH, .AMP) files you may wish to rename.

Key Access: **File**, **Copy**, **Type**, **More**

Signal List Displays all signal list files you may wish to copy and allows you to copy a selected signal (.LST) list file. Signal list files contains a list of signals which include the frequency and measured amplitudes for each signal.

Key Access: **File, Copy, Type, More**

Report Displays all report files you may wish to copy and allows you to copy a selected report (.HTM) file. Report files can contain the screen in GIF format, the signal list, and the analyzer setup. The report files contain a hyperlink to the GIF file of the analyzer screen. GIF files can only be copied from a PC.

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Key Access: **File, Copy, Type, More**

Sort — **Sort** accesses a menu of keys that allow you to view the files you wish to copy according to a selected file attribute. The selection includes, **By Date**, **By Name**, **By Extension**, **By Size**, and **Order Up Down**. **Order** (Up) allows you to view files you may wish to copy in ascending order (for instance, A,B,C). **Order** (Down) allows you to view files you may wish to copy in descending order (for instance, C,B,A).

Key Access: **File, Copy**

Dir From To — Allows you to select the source and destination directories for your copy on one or more drives.

Key Access: **File, Copy**

Dir Up — Allows you to move up one directory level. If at the top level, **Dir Up** moves to the drive level, displaying the available disk drives.

Key Access: **File, Copy**

Dir Select — Accesses the highlighted directory on your display.

Key Access: **File, Copy**

Rename — Allows you to rename a file.

Key Access: **File**

Rename Now — Executes the rename function. When the rename is complete, the message `XXXXXX file renamed to YYYYYY` (where XXXXXX and YYYYYY are the filenames) will appear in the status line on your display.

Key Access: **File, Rename**

Type — Allows you to select the type of file you want to rename.

Key Access: **File, Rename**

All — Displays all files you may wish to rename.

Key Access: **File, Rename**, **Type**

Setup — Displays all setup (.SET) files you may wish to rename. A Setup file is a complete state of instrument parameters including traces, states, limits and corrections.

Key Access: **File, Rename**, **Type**

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State Displays all state (.STA) files you may wish to rename.

Key Access: **File, Rename**, **Type**

Trace Displays all trace (.TRC and .CSV) files you may wish to rename.

Key Access: **File, Rename**, **Type**

Limits Displays all limit (.LIM) files you may wish to rename.

Key Access: **File, Rename**, **Type**

Screen Displays all screen (.GIF and .WMF) files you may wish to rename.

Key Access: **File, Rename**, **Type**

Corrections Displays all corrections (.CBL, .ANT, .OTH, .AMP) files you may wish to rename.

Key Access: **File, Rename**, **Type**, **More**

Signal List Displays all signal list files you may wish to rename and allows you to rename a selected signal list (.lst) file. The signal list files contains a list of signals which include the frequency and measured amplitudes for each signal.

Key Access: **File, Rename, Type, More**

Report Displays all report files you may wish to rename and allows you to rename a selected report (.htm) file. The report function create a report file that contains the screen in GIF format, the signal list, and the analyzer setup. The report file contains a hyperlink to the analyzer screen GIF file. You can only rename GIF files from a PC.

Key Access: **File, Rename, Type, More**

Sort **Sort** accesses a menu of keys that allow you to view the files you wish to rename according to a selected file attribute. The selections include, **By Date**, **By Name**, **By Extension**, **By Size**, and **Order Up Down**. **Order (UP)** allows you to view files you may wish to rename in ascending order (for instance, A,B,C). **Order (Down)** allows you to view files you may wish to rename in descending order (for instance, C,B,A).

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Key Access: **File, Rename**

Name Accesses the Alpha Editor and allows you to enter a filename. The external keyboard can also be used to enter a filename while the alpha editor is accessed. Complete your entry by pressing **Return** or **Enter**.

NOTE Only capital letters (A-Z) and digits (0-9) may appear in file names (8 characters, maximum). Additionally, file names include a 3 character extension which is automatically set by the instrument.

Key Access: **File, Rename**

Dir Up Allows you to move up one directory level. If at the top level, **Dir Up** moves to the drive level, displaying the available disk drives.

Key Access: **File, Rename**

Dir Select Accesses the highlighted directory on your display.

Key Access: **File, Rename**

Create Dir Allows you to create subdirectories.

Key Access: **File, More**

Create Dir Now Executes the create directory function. When the directory has been created, the message `Directory XXXXXX created` (where XXXXXX is the directory name) will appear in the status line on your display.

Key Access: **File, More, Create Dir**

Name Accesses the Alpha Editor and allows you to enter a filename. The external keyboard can also be used to enter a filename while the alpha editor is accessed. Complete your entry by pressing **Return** or **Enter**.

Key Access: **File, More, Create Dir**

NOTE Only capital letters (A-Z) and digits (0-9) may appear in file names (8 characters, maximum). Additionally, file names include a 3 digit extension which is automatically set by the instrument.

Dir Up Allows you to move up one directory level. If at the top level, **Dir Up** moves to the drive level, displaying the available disk drives.

Key Access: **File, More, Create Dir**

Dir Select Accesses the highlighted directory on your display.

Key Access: **File, More, Create Dir**

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Format Formats a double-density floppy disk to 1.44 MB format. 720 kB disks are not supported.

Key Access: **File**, **More**

Format Now Executes the format function. After pressing **Format Now**, the following message will appear on the display: `WARNING: You are about to destroy ALL data on volume A: Press Format Now again to proceed or any other key to abort`. During the formatting, `Formatting Disk` will appear on the display. Once formatted, `Volume A: formatted` will appear in the status line on the display.

NOTE When using a personal computer to manipulate Setup files (filename.set) saved to a floppy, ensure the similarly named files with extensions like .s01, .s02, etc. are handled in a like manner. For example, if you rename of the .set file, you must rename all the .s0x files, as well. These files are necessary to allow complete restoration of the originally saved Setup.

Key Access: **File, More, Format**

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Freq Count

Activates the **Marker Normal** function if there are no markers, and then turns the marker count function on.

Marker Count On Off

Marker Count (On) turns on the marker counter. If no marker is active before **Marker Count (On)** is pressed, a marker is activated at the center of the display. Press **Marker Count (Off)** to turn the marker counter off. Press **Resolution (Man)** to change the marker counter resolution to an uncoupled value.

NOTE

Marker Count frequency readings are not affected by the frequency offset function.

An asterisk (*****) may appear in the upper-right area of the display along with the message `Cntr 1` (the number in the message depends on the active marker). The ratio of the resolution bandwidth to span must be greater than 0.002 for the marker count function to work properly. `Marker Count: Widen Res BW` appears on the display if the bandwidth to span ratio is less than 0.002. `Widen RES BW` indicates that the resolution bandwidth must be increased or the span decreased.

Key Access: **Freq Count**

Resolution Auto Man

Allows the resolution of the marker counter to be selected manually or auto-coupled. The marker counter has a resolution range of 1 Hz to 100 kHz. The available resolution values are 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, and 100 kHz. The resolution can be changed by using the step keys or by entering the resolution using the numeric keypad or knob. The marker counter resolution can be auto coupled to the span by pressing **Resolution (Auto)**.

Key Access: **Freq Count**

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FREQUENCY Channel

Activates the center frequency function, and accesses the menu of frequency functions. The center frequency, or start and stop frequency values appear below the graticule on the display.

Although the analyzer allows entry of frequencies greater than the specified frequency range, using frequencies greater than the frequency range of the analyzer is not recommended

NOTE When changing both the center frequency and the span, change the frequency first since the span can be limited by the frequency value.

CAUTION When operating in dc coupled mode, take care to protect the input mixer by limiting the input level to 0 Vdc and +30 dBm.

Center Freq Activates the center frequency function (when **Scale Type** is set to **Lin**) which allows you to set the horizontal center of the display to a specific frequency. When **Scale Type** is set to **Log**, **Center Freq** activates the center frequency function which allows you to move the average of the start and stop frequencies. In this scale type the center frequency value will not necessarily represent the horizontal center of the display.

Key Access: **FREQUENCY Channel**

Start Freq Sets the frequency at the left side of the graticule. The left and right sides of the graticule correspond to the start and stop frequencies. When these frequencies are activated, their values are displayed below the graticule in place of center frequency and span.

Key Access: **FREQUENCY Channel**

Stop Freq Sets the frequency at the right side of the graticule. The left and right sides of the graticule correspond to the start and stop frequencies. When these frequencies are activated, their values are displayed below the graticule in place of center frequency and span.

Key Access: **FREQUENCY Channel**

CF Step Auto Man Changes the step size for the center frequency function. Once a step size has been selected and the center frequency function is activated, the step keys change center frequency by the step-size value. The step size function is useful for finding harmonics and sidebands beyond the current frequency span of the analyzer. When auto-coupled, the center frequency step size is set to one division (10 percent of the span).

Key Access: **FREQUENCY Channel**

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Freq Offset

Allows you to input a frequency offset value that is added to the frequency readout of the marker, to account for frequency conversions external to the analyzer. Offset entries are added to all frequency readouts including marker, start frequency, and stop frequency. Offsets may only be entered using the numeric keypad. Offsets are not added to the span or frequency count readouts. Entering an offset does not affect the trace display. When a frequency offset is entered, its value appears on the bottom of the display. To eliminate an offset, perform a **Factory Preset**, or press **Freq Offset**, **0**, **Hz**.

When a frequency offset is entered, its value appears on the bottom of the display (as opposed to reference level offsets, which appear on the left side of the display). To eliminate an offset, press **Freq Offset**, **0**, and **Enter**. Pressing **Preset** also sets the offset to zero.

NOTE This function is not available when **FREQUENCY, Scale Type (Log)** is selected.

NOTE **Frequency, Scale Type (Log)** is not available when utilizing the frequency offset function.

Key Access: **FREQUENCY Channel**

Signal Track On Off

Moves the signal that is nearest to the active marker to the center of the display and keeps the signal there. ST appears in the lower-left corner of the display. An (*) may appear in the upper-right corner of the display while the analyzer is verifying that it has the correct signal.

Pressing **Signal Track (Off)**; **Preset** (with **Preset Type** set to **Factory**); or **Marker**, **More**, **Marker All Off** turns off the signal track function.

When signal track is on and the span is reduced, an automatic zoom is performed and the span is reduced in steps so that the signal remains at the center of the display. If the span is zero, signal track cannot be activated.

Key Access: **FREQUENCY Channel**

NOTE If no marker is active, pressing **Signal Track (On)** will activate a marker, perform a peak search, and center the marker on the display.

NOTE Switching to zero span sets **Signal Track (Off)**.

NOTE FREQUENCY, Scale Type (Log) is not available when Signal Track (On) is selected.

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Scale Type Log Lin

Scales the horizontal (x-axis or frequency) graticule divisions logarithmically when **Scale Type (Log)** is selected. When **Scale Type (Lin)** is selected, the horizontal divisions are linearly scaled.

In **Scale Type (Log)**, the number of sweep points is limited to a multiple of the number of sweep segments. For example, if you select 308 points when 3 segments are required to create a logarithmic display, the points will be set at 306 points. The span determines the minimum number of sweep points. Pressing **Preset** (when **Preset Type** is set to **Factory**) sets **Scale Type to Lin**.

NOTE Sweep time is auto-coupled when **Scale Type (Log)** is selected.

NOTE **Marker Span Pair, Frequency Offset, Signal Track (On)**, and **Demod View (On)**, are not available when **Scale Type (Log)** is selected.

NOTE **FREQUENCY, Scale Type (Log)** is not available when **Frequency Offset Zero Span, Signal Track (On)** is selected.

Key Access: **FREQUENCY Channel**

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Help

Accesses a short description of any front panel or menu key. After pressing **Help**, an explanation of the next key pressed will appear on the display. After the information is displayed, press any key to remove the help window. Pressing **ESC** allows you to remove the help window without changing functions.

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Input/Output

Input Z Corr
50Ω 75Ω

Sets the input impedance for voltage-to-power conversions. The impedance you select is for computational purposes only, since the actual impedance is set by internal hardware to 50 Ω. Setting the computational input impedance to 75 Ω is useful when using a 75 Ω to 50 Ω adapter to measure a 75 Ω device on an analyzer having a 50 Ω input impedance.

Key Access: **Input/Output**

Coupling
AC DC

Only available in Agilent models E7402A or E7405A with Option UKB, and E7403A or E7404A. Specifies alternating current (ac) or direct current (dc) coupling at the analyzer input. Selecting ac coupling blocks any dc voltage at the analyzer input, but also decreases the frequency range of the analyzer. Input coupling is set to ac by an instrument preset (With **Preset Type** set to **Factory**). Some amplitude specifications apply only when coupling is set to dc. Refer to the appropriate amplitude specifications and characteristics for your analyzer.

NOTE

AC is always coupled in Agilent EMC models E7401A and E7402A (without Option UKB).
DC is always coupled in Agilent EMC model E7405A (without Option UKB).

Table 2-2 **Selecting Input Coupling**

ESA Model #	AC Frequency Range	DC Frequency Range
E7402A with Option UKB	100 kHz to 3 GHz	100 Hz to 3 GHz
E7403A	100 kHz to 6.7 GHz	9 kHz to 6.7 GHz
E7403A with Option UKB	100 kHz to 6.7 GHz	100 Hz to 6.7 GHz
E7404A	100 kHz to 13.2 GHz	9 kHz to 13.2 GHz
E7404A with Option UKB	100 kHz to 13.2 GHz	100 Hz to 13.2 GHz
E7405A with Option UKB	10 MHz to 26.5 GHz	100 Hz to 26.5 GHz

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CAUTION When operating in dc coupled mode, ensure protection of the input mixer by limiting the input level to 0 Vdc, +30 dBm.

CAUTION To prevent damage to the EMC analyzer from power line switching transients:

— Disconnect the receiver input from the LISN (or current clamp) output prior to connecting or disconnecting the mains to the EUT.
— Disconnect the receiver input from the LISN (or current clamp) output prior to turning the EUT on or off.
— If you are using a switchable LISN, disconnect the receiver input from the LISN output prior to switching the LISN between lines.
— Disconnect the receiver input from the current clamp output prior to attaching or detaching it to a powered EUT main.

Key Access: **Input/Output**

Amptd Ref (f=50 MHz) On Off

Agilent E7401A only. Turns the internal amplitude reference signal on or off. When the internal amplitude reference signal is on, the RF input is disabled.

Key Access: **Input/Output**

Amptd Ref Out (f=50 MHz) On Off

Agilent E7402A, E7403A, E7404A, and E7405A only. Turns the external amplitude reference signal on or off.

Key Access: **Input/Output**

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Marker

Accesses the marker control keys which select the type and number of markers and turns them on and off. Markers are diamond-shaped characters that identify points of traces. Up to four pairs of markers may appear on the display simultaneously; only one pair can be controlled at a time. The marker that is controlled is called the “active” marker. Pressing **Marker** activates the **Normal** menu key.

Select Marker 1 2 3 4

Selects one of the four possible markers. A marker that has already been turned on will become active when it is selected. If a marker has been turned on and assigned to a specific trace, it will become active on that trace if that marker is selected.

Key Access: **Marker**

Normal

Activates a single frequency marker at the center position of the active trace if a marker is not already displayed. If a marker is displayed before the **Normal** function is enabled, the marker is enabled at the position of the selected marker. The marker number is indicated above the marker. Use the data controls to position the marker. The knob and/or Up/Down keys move the marker left or right. If a value is entered from the numeric keypad, the marker is moved to the trace point nearest to that value. Annotation in the active function block and in the upper-right corner of the display indicates the frequency and amplitude of the marker (time and amplitude, if in zero span.) The marker stays on the trace at the horizontal screen position where it was placed unless **Signal Track**, or a “marker to” key function (such as **Mkr** → **CF**, **Mkr** → **RL**, **Mkr** → **CF STEP**, **Mkr** Δ **Span**, or **Min Search**) is selected. Pressing **Normal** turns off the **Delta** function and moves the active marker to the delta marker position.

Key Access: **Marker**

Delta

Activates a second marker at the position of the first marker. (If no marker is present, two markers appear at the center of the display.) The amplitude and frequency (or time) of the first marker is fixed. The marker number is indicated above the delta marker, and the same number is indicated with an `R` (for example, `1R`) above the reference marker. Use the data controls to position the delta marker. Annotation in the active function block and in the upper-right corner of the display indicates the frequency (or time) and amplitude differences between the two markers. The markers will be turned off if the scale type is changed between log and linear.

Key Access: **Marker**

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NOTE Pressing **Delta** again moves the reference marker to the active marker position, so you can make delta measurements from differing reference points without having to turn off the markers and begin again.

NOTE The delta marker function permits signal-to-noise measurements provided the signal is a single spectral component (sinusoid). Place a normal marker on the signal, press **Delta**, place the delta marker in the noise, and activate **Marker Noise** (see below). The indicated amplitude difference is signal-to-noise/Hz.

Delta Pair
Ref Delta

Enters a mode that allows adjustment of both the **Ref** (start) and **Delta** (stop) markers independently. Pressing **Delta Pair**, toggles between the reference and delta markers. The start marker number is indicated with a number and an R above the marker (for example, 1R) and the delta marker is indicated with a marker number. This mode is useful in functions such as **Band Power**.

Key Access: **Marker**

NOTE Ref and Delta markers maintain their displayed x-axis location, but not their frequency values when you change a parameter that redefines the x-axis scale. Reset these markers when parameters such as Span or Center Freq are changed.

Span Pair
Span Center

Enters a mode that allows adjustment of both the ref and delta markers. Pressing **Span Pair**, toggles between the span and center markers. The start marker number is indicated with a number and an R above the marker (for example, 1R) and the stop marker is indicated with a marker number. Adjusting the span changes the frequency difference between the two markers while maintaining the midpoint between the two markers at a fixed frequency. Changing the center changes the center point between the two markers while maintaining the frequency difference. This mode is useful in functions such as **Band Power**.

NOTE Span Pair is not available when **FREQUENCY**, **Scale Type (Log)** is selected.

Key Access: **Marker**

Off

Turns off the marker that has been selected by the **Select Marker 1 2 3 4** key. **Off** also turns off functions related to the selected marker such as signal track and demodulation. It also removes marker annotation from the display.

Key Access: **Marker**

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Select Marker 1 2 3 4

Selects one of the four possible markers. A marker that has already been turned on will become active when it is selected. If a marker has already been turned on and assigned to a specific trace, it will become active on that trace if that marker is selected.

Key Access: **Marker**, **More**

Marker Trace Auto 1 2 3

Assigns a marker to a trace. Pressing **Marker Trace Auto 1 2 3** will activate a marker on trace 1 if there are no markers turned on. If a marker is currently active, press **Marker Trace Auto 1 2 3** until **1**, **2**, or **3** is underlined. The active marker will be moved to the selected trace.

Selecting the **Auto** mode will move the marker to the trace that is automatically selected. The selection order is to look for the lowest numbered trace in the following order of trace modes: clear-write, max-hold, min-hold, view-mode. If there are no traces in any of these modes, it selects trace 1.

Key Access: **Marker**, **More**

Readout

Accesses the following menu keys that allow you to change the active marker readout.

Key Access: **Marker**, **More**

Frequency

Sets the marker to **Frequency**. The default selection in non-zero spans, displays the absolute frequency of a normal marker or the frequency of the delta marker relative to the reference marker.

Key Access: **Marker**, **More**, **Readout**

Period

Sets the marker readout to **Period**. Displays the reciprocal of the above frequency.

Key Access: **Marker**, **More**, **Readout**

Time

Sets the marker readout to **Time**. The default selection in zero span, displays the time interval between a normal marker and the start of the sweep or the time of the delta marker relative to the reference marker.

Key Access: **Marker, More, Readout**

Inverse Time

Sets the marker readout to **Inverse Time**. Displays the reciprocal of the above time interval.

Key Access: **Marker**, **More**, **Readout**

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Function Accesses the following marker function menu keys listed below.

Key Access: **Marker**, **More**

Band Power Indicates the power over that part of the trace between the reference and active markers. If only one marker is present when you press **Band Power**, a second marker is placed at the same location as the first marker. To reposition the markers, press **Marker** to access **Delta Pair** and **Span Pair** keys. If **Detector (Auto)** is selected, average detection is used for RBW ≥ 1 kHz, and Sample detection is used for RBW < 1 KHz.

Key Access: **Marker**, **More**, **Function**

NOTE For best accuracy, set the video bandwidth to at least ten times the resolution bandwidth to minimize its averaging effect.

NOTE **Band Power** has no meaning in zero span, and the indicated value is independent of signal level and marker placement.

Marker Noise Reads out the average noise level, referenced to a 1 Hz noise power bandwidth. If no marker is present, a marker appears at the center of the display. When Marker Noise is enabled in resolution bandwidths of 1 kHz and above, the auto coupled detector selection is set to Average and the Avg Type is set to Power because the tradeoff between sweeptime and variance of the result is best with power Average detection. In resolution bandwidths < 1 kHz, the auto coupled detector selection is Sample. However, the Marker Noise function generates appropriately corrected values for all supported detetctor modes. If the marker delta function is on and the noise marker is activated and moved to measure the noise floor, the marker readout will display the signal-to-noise ratio.

NOTE You can use **Delta** and **Marker Noise** to indicate noise level relative to sinusoidal signal (signal to noise). However, be sure to activate the delta marker before pressing **Marker Noise** or the reference marker units may be incorrect.

The noise marker averages 5% of the trace data values (one-half a horizontal division), centered on the location of the marker on the frequency or time scale. Marker noise indicates noise power density per Hertz or noise voltage per root Hertz depending upon the amplitude units selected. The number of sweep points is noted in parenthesis to the right of the sweep time in the lower right corner of the graticule.

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Note that the data values averaged will not always be symmetrical with respect to the marker position. If the marker is positioned within 2.5% of the beginning of the trace (one-quarter division), the trace data values in the first half-division will be averaged. Similarly, if the marker is positioned within 2.5% of the end of the trace, the trace data values in the last half-division will be averaged.

NOTE Do not use Marker Noise to evaluate the displayed average noise level of the analyzer relative to the specification. Read the displayed average noise level directly from the display or use the normal marker. Refer to Application Note 150 for a discussion of how noise is displayed on a spectrum analyzer.

To guarantee accurate data for noise-like signals, a correction for equivalent noise bandwidth for each resolution bandwidth is measured and included in the measurement. The Marker Noise function accuracy is optimal when the detector is set either to Average or to Sample becuase neither of these detectors peak-biases the noise.

Key Access: **Marker**, **More**, **Function**

Off Turns off the active function markers.

Key Access: **Marker**, **More**, **Function**

Marker Table On Off Compresses the graticule and displays marker information in a table. The information includes the marker number, trace number, marker type, X axis value, and the amplitude.

Key Access: **Marker**, **More**

Marker All Off Turns off all of the markers, including markers used for signal track and demodulation. Marker annotation is also removed.

Key Access: **Marker**, **More**

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Marker →

Accesses the following marker function menu keys:

Mkr → CF Sets the center frequency of the analyzer to the marker frequency. In Delta mode, **Mkr → CF** sets the center frequency to the marker delta value. **Mkr → CF** is not available in zero span.

NOTE When the frequency scale is in log mode, the center frequency is not at the center of the display.

Key Access: **Marker →**

Mkr → CF Step Changes the center-frequency step size to match the value of the active marker. Press **Frequency** then **CF Step Auto Man** to view the step size. If marker delta is active, the step size will be set to the frequency difference between the markers. This function can be used to step from one signal harmonic to another. **Mkr → CF Step** is not available in zero span.

Key Access: **Marker →**

Mkr → Start Changes the start frequency so that it is equal to the frequency of the active marker. In Delta mode, **Mkr → Start** sets the start frequency to the marker delta value. **Mkr→ Start** is not available in zero span.

Key Access: **Marker →**

Mkr→ Stop Changes the stop frequency so that it is equal to the frequency of the active marker. In Delta mode, **Mkr → Stop** sets the stop frequency to the marker delta value. **Mkr → Stop** is not available in zero span.

Key Access: **Marker →**

Mkr Δ → Span Sets the start and stop frequencies to the values of the delta markers. The marker is then set to normal at the center frequency. **Mkr Δ → Span** is not available if the marker is off, or in zero span.

Key Access: **Marker →**

Mkr → Ref Lvl Changes the reference level to the active marker value, moving the marked point to the reference level (top line of the graticule). In Delta mode, **Mkr → Ref Lvl** sets the reference level to the amplitude difference between the markers. (For example, if the difference is –15 dB, the reference level will be set to –15 dBm.)

Key Access: **Marker →**

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Meas Control

If in a measurement, accesses a menu of keys that allow you to abort, pause, resume, or restart one of the measurements available in the **MEASURE** key menu.

Press **MEASURE** and then select one of the available measurements. Once the desired measurement is selected, press **Meas Control**. **Meas Control** accesses the following keys:

Abort

Aborts the current measurement. Pressing **Abort** while a measurement is being made will stop the current measurement routine at the first possible stopping point. Then the most recent measured values are added to the signal list and the analyzer returns to the pre-measurement state.

Key Access: **Meas Control**

Pause

Allows you to pause a measurement. Pressing **Pause** while a measurement is being made will halt the current measurement routine at the first possible stopping point. The analyzer will remain idle until the measurement is aborted, resumed, or restarted.

Key Access: **Meas Control**

Resume

Allows you to resume a measurement that had been paused. The key label will toggle between **Pause** and **Resume**. Resume is active only if pause has been executed first. If an averaged measurement was in progress when paused, the measurement continues and the average counter resumes from its frozen value.

Key Access: **Meas Control**

Restart

Performs the same functions as the "Restart" front-panel key. Repeats your measurement from the beginning. Pressing **Restart** while a measurement is being made will halt the current measurement routine at the first possible stopping point and repeat the measurement. Signals added to the signal list before the execution of the restart routine will remain in the signal list. If auto measure is not currently running, pressing this key has no affect.

Key Access: **Meas Control**

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Meas Setup

Accesses the main measurement setup options. This includes the ability to automatically set the analyzer up in one of the CISPR bands and the ability to activate the appropriate limit lines, correction factors, and measurement detectors. In addition, the measurement menus include the ability to load and save setups, activate the internal preamp, display the current settings, and define a report.

Load Setup

Allows you to load saved system setups by accessing menu keys that allow you to load analyzer setups, states, traces, limits and corrections into the analyzer from a floppy (A:) drive or internal flash (C:) drive. Refer to the "File" menu key descriptions on page 93 for more detailed information on loading setups.

Key Access: **Meas Setup**

Save Setup

A setup represents the current state of the instrument. Saving it to a file and allowing the file to be recalled makes it easy to quickly setup the instrument for a specific application without having to manually reset the parameters. Refer to the "File" menu key descriptions on page 93 for more detailed information on saving setups.

Key Access: **Meas Setup**

9 - 150 kHz

Sets CISPR BAND A start frequency to 9 kHz and the stop to 150 kHz. The reference level is set to 70 dBuV in log scaling and the units to dBuV. The resolution bandwidth is set to 200 Hz (Man Couple), the marker is turned on as the active function, and the following settings are set to Auto: video bandwidth, video bandwidth ratio, sweep time, attenuation, and center frequency step size. Start Frequency is made the frequency default.

This key sets the analyzer up for making CISPR BAND A measurements. The analyzer settings for this setup are as follows:

Description	Setup
Start Frequency	9 kHz
Stop Frequency	150 kHz
Resolution Bandwidth	200 Hz (manually coupled)
Video Bandwidth	300 Hz
Sweep Time	Autocoupled
Reference Level	70 dBµV
Attenuation	5 dB

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Description	Setup
Detector	Peak
Scale Type	Log
Scale/Division	10 dB/Div
Marker 1	Normal, active

Key Access: **Meas Setup**

AC Sets the input coupling to ac coupling. Measurements below 100 kHz (10 MHz for E7405A) will have significant amplitude errors in the ac coupled mode. You should use the dc coupled mode to avoid this rolloff effect.

Key Access: **Meas Setup**, **9 - 150 kHz**

DC Sets the input coupling to dc coupling. This allows you to make measurements at low frequencies with increased accuracy.

CAUTION To prevent damage to the input circuitry of the analyzer, please ensure that dc and transient signals are suppressed before selecting dc coupled mode. Select ac mode if you are unsure of the nature of the input signal.

Once dc coupling has been selected, the analyzer remains in the dc coupled mode until you do one of the following:

1. Press **Preselect**.
2. Press **Input/output**, **Coupling** (AC).
3. Press **Meas Setup** and then select one of the band keys that automatically set the coupling mode to ac or manually set the coupling to ac under one of the band keys that allow ac and dc coupling.
4. Execute a SCPI remote commands that is the equivalent to one of the items 1 through 3.

Key Access: **Meas Setup**, **9 - 150 kHz**

150 kHz - 30 MHz Sets CISPR BAND B start frequency to 150 kHz and the stop to 30 MHz. The reference level is set to 75 dBuV in log scaling and the units to dBuV. The resolution bandwidth is set to 9 kHz (Man Couple), the marker is turned on as the active function, and the following settings are set to Auto: video bandwidth, video bandwidth ratio, sweep time, attenuation, and center frequency step size. Start Frequency is made the frequency default.

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This key sets the analyzer up for making CISPR BAND B measurements. The analyzer settings for this setup are as follows:

Description	Setup
Start Frequency	150 kHz
Stop Frequency	30 MHz
Resolution Bandwidth	9 kHz
Video Bandwidth	30 kHz
Sweep Time	Autocoupled
Reference Level	75 dBµV
Attenuation	5 dB
Detector	Peak
Scale Type	Log
Scale/Division	10 dB/Div
Marker 1	Normal, active

Key Access: **Meas Setup**

AC Sets the input coupling to ac coupling. Measurements below 100 kHz (10 MHz for E7405A) will have significant amplitude errors in the ac coupled mode. You should use the dc coupled mode to avoid this rolloff effect.

Key Access: **Meas Setup**, **150 kHz - 30 MHz**

DC Sets the input coupling to dc coupling. This allows you to make measurements at low frequencies with increased accuracy.

CAUTION To prevent damage to the input circuitry of the analyzer, please ensure that dc and transient signals are suppressed before selecting dc coupled mode. Select ac mode if you are unsure of the nature of the input signal.

Once dc coupling has been selected, the analyzer remains in the dc coupled mode until you do one of the following:

1. Press **Preselect**.
2. Press **Input/output**, **Coupling** (AC).
3. Press **Meas Setup** and then select one of the band keys that automatically set the coupling mode to ac or manually set the coupling to ac under one of the band keys that allow ac and dc coupling.

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4. Execute a SCPI remote commands that is the equivalent to one of the items 1 through 3.

Key Access: **Meas Setup**, **150 kHz - 30 MHz**

30 - 300 MHz

Sets CISPR BAND C start frequency to 30 MHz and the stop to 300 MHz. The reference level is set to 80 dBuV in log scaling and the units to dBuV. The resolution bandwidth is set to 120 kHz (Man Couple), the marker is turned on as the active function, and the following settings are set to Auto: video bandwidth, video bandwidth ratio, sweep time, attenuation, and center frequency step size. Start Frequency is made the frequency default.

This key sets the analyzer up for making CISPR BAND C measurements. The analyzer settings for this setup are as follows:

Description	**Setup**
Start Frequency	30 MHz
Stop Frequency	300 MHz
Resolution Bandwidth	120 kHz
Video Bandwidth	300 kHz
Sweep Time	Autocoupled
Reference Level	80 dBµV
Attenuation	5 dB
Detector	Peak
Scale Type	Log
Scale/Division	10 dB/Div
Marker 1	Normal, active

Key Access: **Meas Setup**

200 MHz - 1 GHz

Sets start frequency to 200 MHz and the stop to 1 GHz. The reference level is set to 80 dBuV in log scaling and the units to dBuV. The resolution bandwidth is set to 120 kHz, the marker is turned on as the active function, and the following settings are set to Auto: video bandwidth, video bandwidth ratio, sweep time, attenuation, and center frequency step size. Start Frequency is made frequency default.

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This key sets the analyzer up for making CISPR BAND D measurements. The analyzer settings for this setup are as follows:

Description	Setup
Start Frequency	200 MHz
Stop Frequency	1 GHz
Resolution Bandwidth	120 kHz
Video Bandwidth	300 kHz
Sweep Time	Autocoupled
Reference Level	80 dBµV
Attenuation	5 dB
Detector	Peak
Scale Type	Log
Scale/Division	10 dB/Div
Marker 1	Normal, active

Key Access: **Meas Setup**

Limits Accesses menu keys that allow you to create and define the parameters of limit lines.

Key Access: **Meas Setup, More**

Limit 1
Limit 2 Allows you to select either of the two available limits. The **Limit 1** and **Limit 2** keys access menu keys that allow you to set parameters for the selected limit.

Key Access: **Meas Setup, More**, **Limits**

Type
Upper Lower Allows you to define the limit you are editing as either an upper or lower limit. An upper limit fails if the trace exceeds the limit. A lower limit fails if the trace falls below the limit.

Key Access: **Meas Setup, More**, **Limits**, **Limit 1** or **Limit 2**

Limit On Off Turns the limit line display on and off. Either **Limit** or **Margin**, as well as **Test**, must be turned on for a limit test to work.

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Key Access: **Meas Setup, More**, **Limits**, **Limit 1** or **Limit 2**

Test On Off

Turns the testing of the limit lines on and off. If the trace is at or within the bounds of the set limit or margin, `PASS LIMIT #` or `PASS MARGIN #` is displayed in green in the upper left corner of the measurement area where # is the number of the selected limit line. Only positive margins are allowed for lower limits and only negative margins are allowed for upper limits. If the trace is out of the limit or margin boundaries, `FAIL LIMIT #` or `FAIL MARGIN #` is displayed in red. The results for Limit 2 are displayed below those for Limit 1. Either **Limit** or **Margin** must be turned on for **Test** to work.

Key Access: **Meas Setup, More**, **Limits**, **Limit 1** or **Limit 2**

Margin On Off

Margin (Off) turns the margin off. **Margin (On)** allows you to set a limit line offset for the selected limit line. Either **Limit** or **Margin** as well as **Test**, must be turned on for a limit test to work.

Key Access: **Meas Setup More**, **Limits**, **Limit 1** or **Limit 2**

Edit

Accesses the **Edit** menu keys which include **Point**, **Frequency** (or **Time** if **X Axis Units (Time)** has been selected), **Amplitude**, **Connected to Previous Pt**, and **Delete Point**. **Edit** also accesses the limits table. The Tab keys allow you to move between the rows in the limits table. New limit segments will only be applied after the editor is closed. Pressing **Return**, or any key not associated with the editor, will close the editor.

Key Access: **Meas Setup, More**, **Limits**, **Limit 1** or **Limit 2**

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Point

Allows you to create or edit a limit point. Up to 200 points may be defined for each limit line. Enter the point number to be created or edited using the numeric keypad, then Press **Enter**, or use the knob, Tab or step keys to move to an existing point. After selecting a point, **Frequency** becomes active.

Key Access: **Meas Setup, More**, **Limits**, **Limit 1** or **Limit 2**, **Edit**

Frequency (The key label is **Time** if **X Axis Units (Time)** has been selected.)

Allows you to enter the frequency value for a limit point. After entering a value, the limit table is sorted to place the frequency or time in the correct order. For a new point, **Amplitude** defaults to 0 dBm and **Connected to Previous Pt** defaults to **Yes**. **Amplitude** then becomes active.

Key Access: **Meas Setup, More**, **Limits**, **Limit 1** or **Limit 2**, **Edit**

Amplitude

Allows you to enter the amplitude value for the current limit point. After entering a value, **Connected to Previous Pt** becomes active. If a Tab key is pressed without entering a value, the current **Amplitude** and **Connected to Previous Pt** values of the point are selected. If Tab ⇑ is pressed, the point number automatically increments to allow entry of the amplitude of the next point, or if a new point, to allow **Frequency** to be entered for the new point.

Key Access: **Meas Setup, More**, **Limits**, **Limit 1** or **Limit 2**, **Edit**

Connected to Previous Pt
Yes No

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Allows you to determine whether the current point will be connected to the previous point. No limit testing is performed between disconnected points. Pressing this key when the Connected field is selected toggles the Connected value of the current point and increments the Point number to allow entry or editing of the Frequency of the next point. If a Tab key is pressed without entering a value, the current Connected value of the point is selected. If Tab ⇑ is pressed, the Point number automatically increments to allow entry of the Connected value of the next point, or if a new point, to allow **Frequency** to be entered for the new point.

Key Access: **Meas Setup, More, Limits**, **Limit 1** or **Limit 2**, **Edit**

Delete Point

Allows you to delete the current point in the limit line. You will be prompted with the message `If you are sure, press key again to delete`. Pressing **Delete Point** again will delete the point.

Key Access: **Meas Setup, More**, **Limits**, **Limit 1** or **Limit 2**, **Edit**

Delete Limit

Allows you to delete the current limit set. You will be prompted with the message `If you are sure, press key again to delete`. Pressing **Delete** again will delete the limit set.

Key Access: **Meas Setup, More**, **Limits**, **Limit 1** or **Limit 2**

Freq Interp
Log Lin

Allows you to determine how limit trace values are computed between points in a limit table. The available interpolation modes are linear and logarithmic. If the linear mode is used for both frequency and amplitude, a straight line is used when interpolating between points in a limit table. If

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frequency interpolation is logarithmic, frequency values between limit points are computed by first taking the logarithm of both the table values and the intermediate value. A linear interpolation is then performed in this logarithmic frequency space. An exactly analogous manipulation is done for logarithmic amplitude interpolation.

Key Access: **Meas Setup, More**, **Limits**, **Limit 1** or **Limit 2**, **More**

Amptd Interp Log Lin

Allows you to determine how limit trace values are computed between points in a limit table. The available interpolation modes are linear and logarithmic. If the linear mode is used for both frequency and amplitude, a straight line is used when interpolating between points in a limit table.

Key Access: **Meas Setup**, **Limits**, **Limit 1** or **Limit 2**, **More**

NOTE Interpolation modes determine how limit values are computed between points in the limit table. The appearance of a limit trace is also affected by the amplitude scale, which may be linear or logarithmic.

X Axis Units Freq Time

Selects whether limit lines will be entered using frequency or sweep time to define the segments. They can be specified as a table of limit line segments of amplitude versus frequency, or of amplitude versus time. Time values are evaluated with respect to the analyzer sweep time. A time value of zero corresponds to the start of the sweep, which is at the left edge of the graticule.

Switching the limit line definition between frequency and time will erase both of the current limit lines. The message `Changing X axis units will delete all limits. If you are sure, press key again to change units` will appear. Press **X Axis Units Freq Time** again to purge both limit lines and switch between frequency and time.

Key Access: **Meas Setup, More**, **Limits**

Limits Fixed Rel

Allows you to choose fixed or relative limit lines. The fixed (**Fixed**) type uses the current limit line as a reference with fixed frequency and amplitude values. The relative (**Rel**) setting causes the current limit line value to be relative to the displayed center frequency and reference level amplitude values. When limit lines are specified with time, rather than frequency, the **Rel** setting only affects the amplitude values. The

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current amplitude values will be relative to the displayed reference level amplitude, but the time values will always start at the left edge of the graticule.

As an example, assume you have a frequency limit line. If the limit line is specified as fixed, entering a limit line segment with a frequency coordinate of 300 MHz displays the limit line segment at 300 MHz. If the same limit line table is specified as relative, it is displayed relative to the analyzer center frequency and reference level. If the center frequency is at 1.0 GHz, a relative limit line segment with a frequency coordinate of 300 MHz will display the limit line segment at 1.3 GHz. If the amplitude component of the relative limit line segment is –10 dB, then –10 dB is added to the reference level value to obtain the amplitude of the given segment (reference level offset included).

A limit line entered as fixed may be changed to relative, and one entered as relative may be changed to fixed. When changing between fixed and relative limit lines, the frequency and amplitude values in the limit line table change so that the limit line remains in the same position for the current frequency and amplitude settings of the analyzer. If a time and amplitude limit line is used, the amplitude values change but the time values remain the same.

Key Access: **Meas Setup, More**, **Limits**

Delete All Limits

Allows you to purge data from the limit-line tables. Pressing **Delete Limits** after the prompt, `If you are sure, press key again to delete`, will delete the limits.

Key Access: **Meas Setup, More**, **Limits**

Corrections

Accesses the **Corrections** menu keys which allow you to enable the corrections function and to select which set of correction factors you wish to modify.

Corrections are used for the gains and losses associated with the addition of external devices such as antennas and amplifiers, while making measurements. By applying Corrections, you can read the true signal level (such as electric field strength) directly from the analyzer. The unit conversions are automatically handled by the analyzer when the appropriate correction factors are applied.

Example: Suppose that at a particular frequency, the analyzer measures 113 dBμV. Use Corrections to account for the conversion loss of the antenna (transferring a 377 ohm system to 50 ohm system), the loss of the cable, and the gain of the amplifier.

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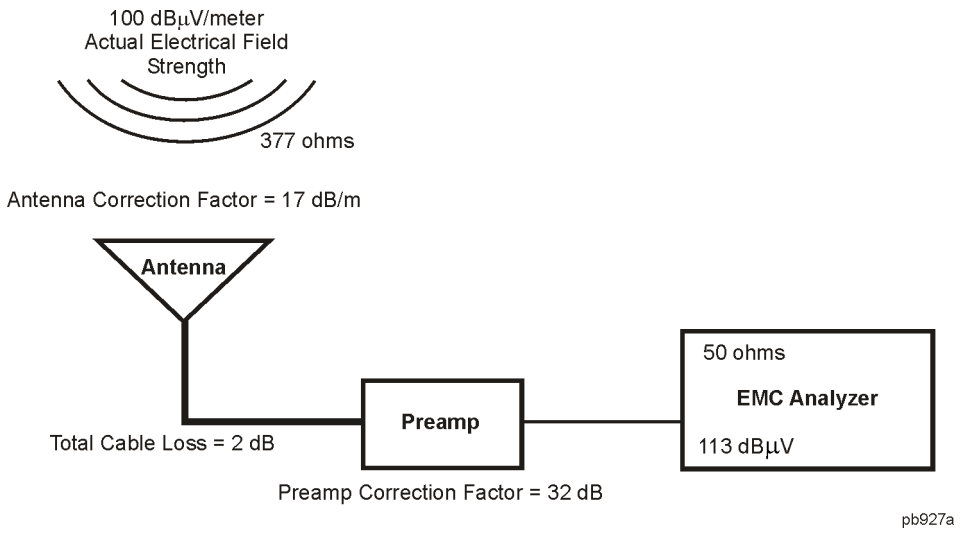

In order to transfer the measured signal amplitude to the true signal level we must first “correct” for:

- The gain of the amplifier. Subtracting the amplitude gain correction factor (32 dB) from 113 dBµV, will yield a level of 81 dBµV.
- The overall cable loss. Since the cable loss results in a measured value lower then the actual value we must add the cable correction factor (2 dB) to the 81 dBµV. This leaves us with 83 dBµV.
- The conversion loss between the intrinsic impedance of free space, 377 ohms, and the 50 ohm system the analyzer operates in. By adding the antenna factor of 17 dBµV to 83 dBµV we find the true signal field strength level of 100 dBµV.

Because of the way corrections are applied, the following convention is used for indicating correction factors as positive or negative values.

Correction Factor	**Sign**
Antenna Factors	Positive
Cable Factors	Positive
Other Factors	Positive
User Factors	Negative

The correction factor signs are only a convention. Although all correction factors are handled the same algebraically, losses are typically entered as positive corrections and gains are typically entered as negative corrections.

Key Access: **Meas Setup**, **More**

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Apply Corrections

Yes No Pressing **Apply Corrections (Yes)** turns on the amplitude-correction factors. Corrections will only be applied to the sets of correction factors whose correction state is set to On. To turn a set of correction factors on, use the **Correction On Off** key in the Antenna, Cable, Other, or User menus. When **Apply Corrections (Yes)** is selected, an A will appear on the screen annotation whether or not a correction set has been turned on using the **Correction (On)** key in the Antenna, Cable, Other, or User menus.

Key Access: **Meas Setup**, **More**, **Corrections**

Antenna Accesses the Antenna menu of keys which allow you to correct for antenna loss, but may be used for any kind of correction.

Key Access: **Meas Setup**, **More**, **Corrections**

Correction On Off Turns the amplitude correction function on or off for the selected set. The corrections state must be set to On for the correction to be applied.

Key Access: **Meas Setup**, **More**, **Corrections**, **Antenna**

NOTE Antenna, Cable, and Other correction factors are generally entered as positive values. This indicates a loss in the external device. User correction factors are typically entered as negative values which indicate a gain in the external device.

Antenna Units Accesses the antenna measurement units menu. You can choose **pTesla**, **Gauss**, μ**V/m**, μ**A/m** or **No Conversion** as a measurement unit. Antenna Units is active only when Antenna is chosen from the Select list, otherwise it is grayed out.

Key Access: **Meas Setup**, **More**, **Corrections**, **Antenna**

Edit Accesses menu keys that allow you to create and edit an amplitude-correction factor set. It puts the analyzer into a split-screen mode where the correction data is displayed in a table under the trace data. Pressing **ESC** while in this menu will exit the menu and remove

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the table from the screen. New points will be applied only after the editor is closed. The Tab keys are very useful for navigation between rows in the corrections table.

Key Access: **Meas Setup**, **More, Corrections**, **Antenna**

Point

Allows you to create or edit an amplitude-correction factor data point. Up to 200 points may be defined for each set. Enter the point number to be created or edited by using the numeric keypad, then press **Enter**, or use the knob, tab, or step keys to move to an existing point. Press **Bk Sp** to correct errors. After selecting a point, **Frequency** becomes active.

Key Access: **Meas Setup**, **More, Corrections**, **Antenna**, **Edit**

Frequency

Allows you to enter the frequency value for an amplitude-correction point. Enter the frequency value by using the numeric keypad. Change the frequency value by using the step keys or the knob. Press **Bk Sp** to correct errors. After selecting a point, **Amplitude** becomes active.

A frequency coordinate must always be specified for amplitude-correction factors.

Key Access: **Meas Setup**, **More, Corrections**, **Antenna**, **Edit**

NOTE The amplitude correction entered for the lowest frequency will be applied to all frequencies less than the lowest frequency entered. Similarly, the amplitude correction for the highest frequency entered will be applied to all frequencies greater than the highest frequency entered.

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NOTE For amplitude-correction factors, a maximum of two entries with the same frequency are valid. Only the first and last points of a series with the same frequency values are used; any middle points are ignored.

NOTE Amplitude-correction data is sorted in the table by frequency. The sorting occurs immediately after you have entered the frequency value via the front-panel.

Amplitude

Allows you to enter the amplitude value for the current amplitude-correction point. After selecting a point, the point number automatically increments and **Frequency** becomes active to allow entry of the frequency of the next point. Press **Bk Sp** to correct errors.

Key Access: **Meas Setup**, **More,** **Corrections**, **Antenna**, **Edit**

Delete Point

Allows you to delete the amplitude-correction data for the currently selected point. The prompt `If you are sure, press key again to delete` will appear on the display. Pressing **Delete Point** again will delete the point and adjust all of the point numbers as appropriate.

Key Access: **Meas Setup**, **More,** **Corrections**, **Antenna**, **Edit**

Delete Correction Allows you to clear all data from the selected amplitude-correction set. The prompt `If you are sure, press key again to delete` will appear on the display. Pressing **Delete** again will delete the correction set.

Key Access: **Meas Setup**, **More**, **Corrections**, **Antenna**

Cable Allows you to correct for cable loss, but may be used for any kind of correction.

Key Access: **Meas Setup**, **More**, **Corrections**

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Correction On Off Turns the amplitude correction function on or off for the selected set. The corrections state must be set to On for the correction to be applied.

Key Access: **Meas Setup**, **More**, **Corrections**, **Cable**

NOTE Antenna, Cable, and Other correction factors are generally entered as positive values. This indicates a loss in the external device. User correction factors are typically entered as negative values which indicate a gain in the external device.

Edit Accesses menu keys that allow you to create and edit an amplitude-correction factor set. It puts the analyzer into a split-screen mode where the correction data is displayed in a table under the trace data. Pressing **ESC** while in this menu will exit the menu and remove the table from the screen. New points will be applied only after the editor is closed. The Tab keys are very useful for navigation between rows in the corrections table.

Key Access: **Meas Setup**, **More**, **Corrections**, **Cable**

Point

Allows you to create or edit an amplitude-correction factor data point. Up to 200 points may be defined for each set. Enter the point number to be created or edited by using the numeric keypad, then press **Enter**, or use the knob, tab, or step keys to move to an existing point. Press **Bk Sp** to correct errors. After selecting a point, **Frequency** becomes active.

Key Access: **Meas Setup**, **More**, **Corrections**, **Cable**, **Edit**

Frequency

Allows you to enter the frequency value for an amplitude-correction point. Enter the frequency value by using the numeric keypad. Change the frequency

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value by using the step keys or the knob. Press **Bk Sp** to correct errors. After selecting a point, **Amplitude** becomes active.

A frequency coordinate must always be specified for amplitude-correction factors.

Key Access: **Meas Setup**, **More, Corrections**, **Cable**, **Edit**

NOTE The amplitude correction entered for the lowest frequency will be applied to all frequencies less than the lowest frequency entered. Similarly, the amplitude correction for the highest frequency entered will be applied to all frequencies greater than the highest frequency entered.

NOTE For amplitude-correction factors, a maximum of two entries with the same frequency are valid. Only the first and last points of a series with the same frequency values are used; any middle points are ignored.

NOTE Amplitude-correction data is sorted in the table by frequency. The sorting occurs immediately after you have entered the frequency value via the front-panel.

Amplitude

Allows you to enter the amplitude value for the current amplitude-correction point. After selecting a point, the point number automatically increments and **Frequency** becomes active to allow entry of the frequency of the next point. Press **Bk Sp** to correct errors.

Key Access: **Meas Setup**, **More, Corrections**, **Cable**, **Edit**

Delete Point

Allows you to delete the amplitude-correction data for the currently selected point. The prompt `If you are sure, press key again to delete` will appear on the display. Pressing **Delete Point** again will delete the point and adjust all of the point numbers as appropriate.

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Key Access: **Meas Setup**, **More**, **Corrections**, **Cable**, **Edit**

Delete Correction Allows you to clear all data from the selected amplitude-correction set. The prompt `If you are sure, press key again to delete` will appear on the display. Pressing **Delete** again will delete the correction set.

Key Access: **Meas Setup**, **More**, **Corrections**, **Cable**

Other Allows you to correct for gain or loss other than for antenna, cable, or user.

Key Access: **Meas Setup**, **More**, **Corrections**

Correction On Off Turns the amplitude correction function on or off for the selected set. The corrections state must be set to On for the correction to be applied.

NOTE Antenna, Cable, and Other correction factors are generally entered as positive values. This indicates a loss in the external device. User correction factors are typically entered as negative values which indicate a gain in the external device.

Edit Accesses menu keys that allow you to create and edit an amplitude-correction factor set. It puts the analyzer into a split-screen mode where the correction data is displayed in a table under the trace data. Pressing **ESC** while in this menu will exit the menu and remove the table from the screen. New points will be applied only after the editor is closed. The Tab keys are very useful for navigation between rows in the corrections table.

Key Access: **Meas Setup**, **More**, **Corrections**, **Other**

Point

Allows you to create or edit an amplitude-correction factor data point. Up to 200 points may be defined for each set. Enter the point number to be created or edited by using the numeric keypad, then press **Enter**, or use the

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knob, tab, or step keys to move to an existing point. Press **Bk Sp** to correct errors. After selecting a point, **Frequency** becomes active.

Key Access: **Meas Setup**, **More, Corrections**, **Other**, **Edit**

Frequency

Allows you to enter the frequency value for an amplitude-correction point. Enter the frequency value by using the numeric keypad. Change the frequency value by using the step keys or the knob. Press **Bk Sp** to correct errors. After selecting a point, **Amplitude** becomes active.

A frequency coordinate must always be specified for amplitude-correction factors.

Key Access: **Meas Setup**, **More, Corrections**, **Other**, **Edit**

NOTE The amplitude correction entered for the lowest frequency will be applied to all frequencies less than the lowest frequency entered. Similarly, the amplitude correction for the highest frequency entered will be applied to all frequencies greater than the highest frequency entered.

NOTE For amplitude-correction factors, a maximum of two entries with the same frequency are valid. Only the first and last points of a series with the same frequency values are used; any middle points are ignored.

NOTE Amplitude-correction data is sorted in the table by frequency. The sorting occurs immediately after you have entered the frequency value via the front-panel.

Amplitude

Allows you to enter the amplitude value for the current amplitude-correction point. After selecting a point, the point number automatically increments and **Frequency** becomes active to allow entry of the frequency of the next point. Press **Bk Sp** to correct errors.

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Key Access: **Meas Setup**, **More**, **Corrections**, **Other**, **Edit**

Delete Point

Allows you to delete the amplitude-correction data for the currently selected point. The prompt `If you are sure, press key again to delete` will appear on the display. Pressing **Delete Point** again will delete the point and adjust all of the point numbers as appropriate.

Key Access: **Meas Setup**, **More**, **Corrections**, **Other**, **Edit**

Delete Correction Allows you to clear all data from the selected amplitude-correction set. The prompt `If you are sure, press key again to delete` will appear on the display. Pressing **Delete** again will delete the correction set.

Key Access: **Meas Setup**, **More**, **Corrections**, **Other**

User Allows you to correct for gain or loss and may be used for any type of correction.

Key Access: **Meas Setup**, **More**, **Corrections**

Correction On Off Turns the amplitude correction function on or off for the selected set. The corrections state must be set to On for the correction to be applied.

Key Access: **Meas Setup**, **More**, **Corrections**, **User**

NOTE Antenna, Cable, and Other correction factors are generally entered as positive values. This indicates a loss in the external device. User correction factors are typically entered as negative values which indicate a gain in the external device.

Edit Accesses menu keys that allow you to create and edit an amplitude-correction factor set. It puts the analyzer into a split-screen mode where the correction data is displayed in a table under the trace data. Pressing **ESC** while in this menu will exit the menu and remove the table from the screen. New points

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will be applied only after the editor is closed. The Tab keys are very useful for navigation between rows in the corrections table.

Key Access: **Meas Setup**, **More, Corrections**, **User**

Point

Allows you to create or edit an amplitude-correction factor data point. Up to 200 points may be defined for each set. Enter the point number to be created or edited by using the numeric keypad, then press **Enter**, or use the knob, tab, or step keys to move to an existing point. Press **Bk Sp** to correct errors. After selecting a point, **Frequency** becomes active.

Key Access: **Meas Setup**, **More, Corrections**, **User**, **Edit**

Frequency

Allows you to enter the frequency value for an amplitude-correction point. Enter the frequency value by using the numeric keypad. Change the frequency value by using the step keys or the knob. Press **Bk Sp** to correct errors. After selecting a point, **Amplitude** becomes active.

A frequency coordinate must always be specified for amplitude-correction factors.

Key Access: **Meas Setup**, **More, Corrections**, **User**, **Edit**

NOTE The amplitude correction entered for the lowest frequency will be applied to all frequencies less than the lowest frequency entered. Similarly, the amplitude correction for the highest frequency entered will be applied to all frequencies greater than the highest frequency entered.

NOTE For amplitude-correction factors, a maximum of two entries with the same frequency are valid. Only the first and last points of a series with the same frequency values are used; any middle points are ignored.

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NOTE Amplitude-correction data is sorted in the table by frequency. The sorting occurs immediately after you have entered the frequency value via the front-panel.

Amplitude

Allows you to enter the amplitude value for the current amplitude-correction point. After selecting a point, the point number automatically increments and **Frequency** becomes active to allow entry of the frequency of the next point. Press **Bk Sp** to correct errors.

Key Access: **Meas Setup**, **More**, **Corrections**, **User**, **Edit**

Delete Point

Allows you to delete the amplitude-correction data for the currently selected point. The prompt `If you are sure, press key again to delete` will appear on the display. Pressing **Delete Point** again will delete the point and adjust all of the point numbers as appropriate.

Key Access: **Meas Setup**, **More**, **Corrections**, **User**, **Edit**

Delete Correction Allows you to clear all data from the selected amplitude-correction set. The prompt `If you are sure, press key again to delete` will appear on the display. Pressing **Delete** again will delete the correction set.

Key Access: **Meas Setup**, **More**, **Corrections**, **User**

Freq Interp
Log Lin

Allows you to determine how trace values are computed between points in a correction table. If the linear mode is selected, a straight line is used between points in a correction table. If the logarithmic mode is selected, frequency values between points are computed by first taking the logarithm of both table values and the intermediate value.

Key Access: **Meas Setup**, **More**, **Corrections**, **More**

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Delete all Corrections Allows you to delete all amplitude-correction sets.

Key Access: **Meas Setup**, **More**, **Corrections**, **More**

MeasDetector Allows you to choose between the following menu selections.

Key Access: **Meas Setup**, **More**.

Peak
On Off Allows you to turn peak measurements On or Off. When Peak is On, you can change the measurement dwell time. If this detector is On, the Measure at Marker and the Auto-measure functions make a peak detector measurement for the specified dwell time. Default is On with a 200 ms dwell time.

Key Access: **Meas Setup**, **More**, **Meas Detector**

Quasi Peak
On Off Allows you to turn quasi-peak measurement On or Off. When **Quasi Peak** is On, you can change the measurement dwell time. If this detector is On, the Measure at Marker and the Auto-measure functions make a quasi-peak detector measurement for the specified dwell time. Default is On with a 200 ms dwell time.

Key Access: **Meas Setup**, **More**, **Meas Detector**

Average
On Off Allows you to turn average measurement On or Off. When Average is On, you can change the measurement dwell time. If this detector is On, the Measure at Marker and the Auto-measure functions make an Average detector measurement for the specified dwell time. Default is On with a 200 ms dwell time.

Key Access: **Meas Setup**, **More**, **Meas Detector**

Range Dwell Specifies the amount of time the analyzer dwells on a signal during ranging. Ranging is the first step in a signal measurement. During ranging, the analyzer sweeps for the specified range dwell time, before adjusting the signal peak to the top of the screen for further measurements. If system defaults are restored, Range Dwell will default to 200 ms. See “Dwell Time Settings” in the Measurement Techniques” Chapter of the *Agilent EMC Analyzer EMC Measurement Guide* for more information.

Key Access: **Meas Setup**, **More**, **Meas Detector**

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Center Presel Agilent E7403A, E7404A, and E7405A only. Allows you to turn the center preselector filter On or Off. This determines whether or not you do a preselector center before each measurement in the preselected bands.

Key Access: **Meas Setup**, **More**, **Meas Detector**

Show All Clears all the text, annotation, traces, etc. off the analyzer screen and replaces them with a tabular listing of the settings that are currently in effect. **ESC** will restore the instrument settings. From the **Show All** menu, you can move backward (**Previous**) or forward (**Next**) to see all the current settings.

Key Access: **Meas Setup**, **More**

Next Allows you to access the next page of current measurement setup settings. It is grayed out if you are on the last page or only one page exists.

Key Access: **Meas Setup**, **More**, **Show All**

Previous Allows you to access the previous page of current measurement setup settings. It is grayed out if you are on the last page or only one page exists.

Key Access: **Meas Setup**, **More**, **Show All**

Define Report Accesses submenu keys that allow you to define the type of report you want to produce. Report outputs can include the current screen and or the current instrument setup. Reports can be sent to a file or sent to a printer.

Key Access: **Meas Setup More**

Screen Turns the screen function On or Off. Screen reports are copies of the data on the screen in GIF format.

Key Access: **Meas Setup**, **More**, **Define Report**

List Accesses a set of menu keys which allow you to determine list parameters.

Key Access: **Meas Setup**, **More**, **Define Report**

List
On Off Used to toggle the inclusion of the signal list in the report. If Off, the remaining parameter keys are unavailable for modification. This key applies only to the use of the signal list in a report.

Key Access: **Meas Setup**, **More**, **Define Report**, **List**

List Detectors Accesses the List Detectors option menu.

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Key Access: **Meas Setup**, **More**, **Define Report**, **List**, **List Detectors**

Peak
On Off

Turns the peak amplitude column On or Off for report.

Key Access: **Meas Setup**, **More**, **Define report**, **List**, **List Detectors**

QP
On Off

Turns the quasi-peak amplitude column On or Off for report.

Key Access: **Meas Setup**, **More**, **Define Report**, **List**, **List Detectors**

Avg
On Off

Turns the average amplitude column On or Off for the report.

Key Access: **Meas Setup**, **More**, **Define Report**, **List**, **List Detectors**

List Limits

Allows the selection of limit lines that are displayed and added to a report. Also allows selection of columns displaying the deference, or delta (Δ), in dB, between measured values and the selected limit line for the selected detector.

Key Access: **Meas Setup**, **More**, **Define Report**, **List**

Limit 1
On Off

Determines if limit line 1 amplitude is added to the report.

Key Access: **Meas Setup**, **More**, **Define Report**, **List**, **List Limits**

Limit 2
On Off

Determines if limit line 2 amplitude is added to the report.

Key Access: **Meas Setup**, **More**, **Define Report**, **List**, **List Limits**

Limit 1 Δ

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Accesses limit line 1Δ menu which allows the selection of specific limit line deltas that will appear for which detectors in the report. These detectors can be turned on or off: **Peak**, **QP**, **Avg**.

Key Access: **Meas Setup**, **More**, **Define Report**, **List**, **List Limits**

Peak
On Off

Turns the peak amplitude column on or off for the report.

Key Access: **Meas Setup**, **More**, **Define Report**, **List**, **List Limits**, **Limit 1Δ**

QP
On Off

Turns the quasi–peak amplitude column on or off for the report

Key Access: **Meas Setup**, **More**, **Define Report**, **List**, **List Limits**, **Limit 1Δ**

Avg
On Off

Turns the average column on or off for the report

Key Access: **Meas Setup**, **More**, **Define Report**, **List**, **List Limits**, **Limit 1Δ**

Limit 2 Δ

Accesses limit line 1Δ menu which allows the selection of specific limit line deltas that will appear for which detectors in the report. These detectors can be turned on or off: **Peak**, **QP**, **Avg**.

Key Access: **Meas Setup**, **More**, **Define Report**, **List**, **List Limits**

Peak
On Off

Turns the peak amplitude column on or off for the report.

Key Access: **Meas Setup**, **More**, **Define Report**, **List**, **List Limits**, **Limit 2Δ**

QP

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On Off

Turns the quasi–peak amplitude column on or off for the report

Key Access: **Meas Setup**, **More**, **Define Report**, **List**, **List Limits**, **Limit 2**Δ

Avg
On Off

Turns the average column on or off for the report

Key Access: **Meas Setup**, **More**, **Define Report**, **List**, **List Limits**, **Limit 2**Δ

List Comments
On Off Turns List Comments On or Off for the report.

Key Access: **Meas Setup**, **More**, **Define Report**, **List**

List Corr
On Off Determines if amplitude list correction values are included in the report.

Key Access: **Meas Setup**, **More**, **Define Report**, **List**

List Marked
On Off Determines if marked signals will be included in the report.

Key Access: **Meas Setup**, **More**, **Define Report**, **List**

Settings Allows you to include current settings in the report. You can view the current setting information by pressing **Meas Setup**, **More**, **Show All**.

Key Access: **Meas Setup**, **More**, **Define Report**

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MEASURE

Access a menu of keys which are designed to assist in making EMI measurements.

These keys include: **Tune**, **Marker Normal**, **Marker to List**, **Meas at Marker**, **Meas to List**, **Freq Scan**, **Signal List**, and **Auto-measure**.

Tune

Displays the center frequency. Use the step keys to change the value up or down, the numeric keypad to enter a specific center frequency, or the knob to fine tune the value in single increments.

If Center Frequency Step is set to auto and Span is set to zero, the increment is set to the Resolution Bandwidth value.

If Center Frequency Step is set to auto and Span is set to a value greater than zero, the increment is set to the Span value divided by ten.

If Center Frequency Step is set to manual, the increment is set to the Center Frequency Step value you have entered.

Key access: **MEASURE**.

Marker Normal

Activates a single frequency marker at the center frequency on the active trace if an on-screen marker is not displayed. If there is an on-screen marker before the marker normal function is pressed, the existing marker is kept active. Use the step keys, numeric keypad, or knob to position the marker. The step keys move the marker next peak left or next peak right. The frequency and amplitude of the marker is indicated in the active function block and the upper right hand corner of the screen. The marker stays on the trace unless a “marker to” function is selected. Pressing marker normal turns off the marker delta function.

Key Access: **MEASURE**.

Marker to List

Adds the frequency and amplitude identified with the current marker to the signal display list. The frequency and amplitude pair are known as an element. New elements are added to the end of the signal list, `Signal Added To List` appears at the bottom of the screen.

Key Access: **MEASURE**

Meas at Marker

Makes a measurement using specified detectors. The Measure at Marker function performs a zoom to zero span at the marker frequency. The signal is then ranged to the top of the screen using the dwell time specified in range dwell. and a sweep using the dwell time associated with each of the selected detectors (peak, quasi-peak, or average) is performed. If there is no marker on the screen then one is turned on and put on the highest peak on the screen. As part of the zoom down process, the signal is centered on the screen.

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Key Access: **MEASURE**.

Meas to List

Places the measurement results produced by the measure at marker function into a signal list element and appends the element to the end of the signal list.

Key Access: **MEASURE**.

Freq Scan On Off

Turns Freq Scan On or Off. When it is turned off the analyzer will decrease the span until the span reaches 0 Hz. It does this with the intent of keeping a signal at or near the marker centered in the screen. When a span of 0 Hz is reached, the analyzer is tuned to the signal's frequency. The original span is saved and restored when the Freq Scan in turned on.

During the zoom down process the noise floor is measured and if the amplitude at the end of the zoom is close to the noise, a message **No Signal Found** is put on the screen.

Key Access: **MEASURE**.

Signal List

The signal list is used for presentation, storage, and manipulation of the highest amplitude signals from selected detector measurements. Signals are added to the list as measurements are made or entries can be made for specific frequencies by manipulating markers and adding them to the list before the measurement is made.

A signal list detail line contains: the index number; the frequency; the amplitude for the peak, quasi-peak, or average detectors; and the delta to limit line 1 or 2. An arrow (→) symbol is used to identify marked signal list items. The last two columns contain one of the following pieces of information: delta to peak data, delta to quasi-peak data, delta to average, or comment for display or editing. Current settings for detectors, limit lines, deltas, and dwell times are maintained and updated.

When a signal is highlighted the marker is moved to the frequency of the signal. If the frequency is not currently on the screen, the analyzer is tuned to that frequency (center frequency) and then the marker is placed on the frequency. The span remains constant unless limited by the hardware.

Items added to the signal list appear on the display if they are within the section of the list items displayed on the screen. As items are added the total item count is updated on the screen. If the item has associated measurement results, they are also displayed. If a signal has not been measured with a detector, that area is left blank. New signals are always appended to the end of the signal list, regardless of the sort order.

Key Access: **MEASURE**, **More**

Signal List

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On Off This key is used to switch between signal list display (split screen) and normal analyzer display. The upper portion of the split screen is the active window with the live trace. The lower portion of the screen displays the signal list that contains the active (live) signal list item. As the active signal list item is changed, the number displayed in the menu key is updated to show the active list item index. An annotation is maintained that shows which item is current out of the total items (example: 1 of 8 or 44 of 200). A total of 2000 points can be added.

Key Access: **MEASURE**, **More**, **Signal List**

Save/Load Accesses menu keys that allow you to save analyzer setups, states, traces, limits, corrections and screen data to a floppy (A:) drive or internal flash (C:) drive.

NOTE Never remove the floppy disk during a save operation. To do so could corrupt *all* data on the floppy disk.

Key Access: **MEASURE**, **More**, **Signal List**

Load Allows you to load a signal list file from saved files of the graticule screen. Refer to **Load** on page 98 for the available menu options

Key Access: **MEASURE**, **More**, **Signal List**, **Save/Load**

Save Allows you to save a signal list file to a floppy (A:) drive or internal flash (C:) drive. Refer to **Save** on page 94 for the available menu options

Key Access: **MEASURE**, **More**, **Signal List**, **Save/Load**

List Edit Accesses the submenu used to select which delta limit parameters will appear in the signal list. It also enables the selection of comments in the signal list.

Key Access: **MEASURE**, **More**, **Signal List**

Signal List On Off Switches between signal list display (split screen) and normal analyzer display. The upper portion of the split screen contains the live display. The lower portion of the screen displays the signal list. As the current signal list is changed, the number displayed in the menu key (list item index) is updated,

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the signal, the marker in the upper window is moved to the frequency of the signal, and if the frequency is not currently on the screen, the analyzer is tuned to that frequency (center frequency).

Key Access: **MEASURE**, **More**, **Signal List**, **List Edit**

Edit Comment Pressing this key enables the comment field for display in the signal list.

Key Access: **MEASURE**, **More**, **Signal List**, **List Edit**

Change Comment

Pressing this key will activate the Alpha Editor and display the selected comments (if any). The backspace arrow key (←) may be used to erase individual characters in the comment. The Alpha Editor can be used to add characters to an existing comment or add comments to the list. This key is only active when there are signals in the list and the list is being displayed.

Key Access: **MEASURE**, **More**, **Signal List**, **List Edit**, **Edit Comment**

Clear Comment

Pressing this key clears the comment for the selected signal from the signal list. This key is only active when there are signals in the list and the list is being displayed.

Key Access: **MEASURE**, **More**, **Signal List**, **List Edit**, **Edit Comment**

Peak Ampl Pressing this key will enable the peak delta values for display in the signal list.

Key Access: **MEASURE**, **More**, **Signal List**, **List Edit**

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NOTE The Peak Δ LL1 and Peak Δ LL2 values are displayed in the signal list if the appropriate limit line is turned on and Limit Test has been turned On.

QP Ampl Pressing this key will enable the quasi-peak delta values for display in the signal list.

Key Access: **MEASURE**, **More**, **Signal List**, **List Edit**

NOTE The Quasi-Peak Δ LL1 and Quasi-Peak Δ LL2 values are displayed in the signal list if the appropriate limit line is turned on and Limit Test has been turned On.

AV Ampl Pressing this key will enable the average delta values for display in the signal list.

NOTE The Average Δ LL1 and Average Δ LL2 values are displayed in the signal list if the appropriate limit line is turned on and Limit Test has been turned On.

Key Access: **MEASURE**, **More**, **Signal List**, **List Edit**

Comment Selects the comment data to be displayed for each signal list element. Note that when you select this key, it will turn off other delta limit line selections in this menu.

Key Access: **MEASURE**, **More**, **Signal List**, **List Edit**

Sort Signals Accesses a list of sort options. You can define how you want the signal list to be displayed and determine if you want the list in ascending (**Asc**) or descending (**Dsc**) order. These options include: **By Freq**, **By Pk Ampl**, **By QP Ampl**, **By AV Ampl**, **By Δ LL1**, and **By Δ LL2**. The current sort order is underlined. Pressing the key again changes the sort order. The signal list display is refreshed when a new sort order is indicated.

Key Access: **MEASURE**, **More**, **Signal List**

Signal List On Off Switches between signal list display (split screen) and normal analyzer display. The upper portion of the split

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screen contains the live display. The lower portion of the screen displays the signal list. As the current signal list is changed, the number displayed in the menu key (list item index) is updated, the signal, the marker in the upper window is moved to the frequency of the signal, and if the frequency is not currently on the screen, the analyzer is tuned to that frequency (center frequency).

Key Access: **MEASURE**, **More**, **Signal List**, **Sort Signals**

By Freq Asc Dsc

Specifies that the elements in the signal list will be sorted based on the frequency in ascending or descending order.

Key Access: **MEASURE**, **More**, **Signal List**, **Sort Signals**

By Pk Ampl Asc Dsc

Specifies that the elements in the signal list will be sorted based on the peak detector amplitude in ascending or descending order.

Key Access: **MEASURE**, **More**, **Signal List**, **Sort Signals**

By QP Ampl Asc Dsc

Specifies that the elements in the signal list will be sorted based on the quasi-peak detector amplitude in ascending or descending order.

Key Access: **MEASURE**, **More**, **Signal List**, **Sort Signals**

By AV Ampl Asc Dsc

Specifies that the elements in the signal list will be sorted based on the average detector amplitude in ascending or descending order.

Key Access: **MEASURE**, **More**, **Signal List**, **Sort Signals**

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By Δ LL1
Asc Dsc

Specifies that the elements in the signal list will be sorted based on the delta to limit line 1 in ascending or descending order.

Key Access: **MEASURE**, **More**, **Signal List**, **Sort Signals**

By Δ LL2
Asc Dsc

Specifies that the elements in the signal list will be sorted based on the delta to limit line 2 in ascending or descending order.

Key Access: **MEASURE**, **More**, **Signal List**, **Sort Signals**

Delete Signals

Accesses the delete signals option menu.

Key Access: **MEASURE**, **More**, **Signal List**

Signal List
On Off

Switches between signal list display (split screen) and normal analyzer display. The upper portion of the split screen contains the live display. The lower portion of the screen displays the signal list. As the current signal list is changed, the number displayed in the menu key (list item index) is updated, the signal, the marker in the upper window is moved to the frequency of the signal, and if the frequency is not currently on the screen, the analyzer is tuned to that frequency (center frequency).

Key Access: **MEASURE**, **More**, **Signal List**, **Delete Signals**

Delete Signal

Deletes the highlighted signal list element identified by index number.

Key Access: **MEASURE**, **More**, **Signal List**, **Delete Signals**

Delete All

Accesses a Delete Signals submenu where you can choose either Yes or No to delete all the elements of a signal list.

Key Access: **MEASURE**, **More**, **Signal List**, **Delete Signals**

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Yes

Executes the deletion of all the elements of a signal list.

No

Cancels the deletion of all the elements of a signal list.

Delete Mrkd Accesses the Delete Mrkd menu where you can choose either Yes or No to delete only the marked elements of a signal list.

Key Access: **MEASURE**, **More**, **Signal List**, **Delete Signals**

Yes

Executes the deletion of the marked elements of a signal list.

No

Cancels the deletion of the marked elements of a signal list.

Remeasure Accesses the submenu used for determining which signal list elements are to be remeasured. As each item is remeasured, the active trace screen is tuned to the frequency and the current set of detectors is used to perform the measurements. As results are completed, they appear in the appropriate area in the signal list display. If an error occurred during the sweep, then the error is noted for that signal list item.

Key Access: **MEASURE**, **More**, **Signal List**

Signal List On Off Switches between signal list display (split screen) and normal analyzer display. The upper portion of the split screen contains the live display. The lower portion of the screen displays the signal list. As the current signal list is changed, the number displayed in the menu key (list item index) is updated, the signal, the marker in the upper window is moved to the frequency of the signal, and if the frequency is not currently on the screen, the analyzer is tuned to that frequency (center frequency).

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Key Access: **MEASURE**, **More**, **Signal List**, **Remeasure**

Remeasure Remeasures the currently highlighted element in the signal list using the current set of measurement parameters.

Key Access: **MEASURE**, **More**, **Signal List**, **Remeasure**

Remeas All Remeasures all the signals in the signal list using the current set of measurement parameters.

Key Access: **MEASURE**, **More**, **Signal List**, **Remeasure**

Remeas Mrkd Remeasures all the marked signals in the signal list using the current set of measurement parameters.

Key Access: **MEASURE**, **More**, **Signal List**, **Remeasure**

MeasDetector Allows you to choose between the following menu selections.

Key Access: **MEASURE**, **More**, **Signal List**, **Remeasure**

Peak
On Off

Allows you to turn peak measurements On and Off. When Peak is On, you can change the measurement dwell time. If this detector is On, the Measure at Marker and Auto-measure functions make a peak detector measurement for the specified dwell time. Default is On with a 200 ms dwell time.

Key Access: **MEASURE**, **More**, **Signal List**, **Remeasure**, **MeasDetector**

Quasi Peak
On Off

Allows you to turn quasi-peak measurements On and Off. When **Quasi Peak** is On, you can change the measurement dwell time. If this detector is On, the Measure at Marker and Auto-measure functions make a

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quasi-peak detector measurement for the specified dwell time. Default is On with a 200 ms dwell time.

Key Access: **MEASURE**, **More**, **Auto Measure**

Average
On Off

Allows you to turn average measurements On and Off. When Average is On, you can change the measurement dwell time. If this detector is On, the Measure at Marker and Auto-measure functions make an average detector measurement for the specified dwell time. Default is On with a 200 ms dwell time.

Key Access: **MEASURE**, **More**, **Signal List**, **Remeasure**, **MeasDetector**

Range Dwell

Specifies the amount of time the analyzer dwells on a signal during ranging. Ranging is the first step in a signal measurement. During ranging, the analyzer sweeps for the specified range dwell time, before adjusting the signal peak to the top of the screen for further measurements. If system defaults are restored, Range Dwell will default to 200 ms. See “Dwell Time Settings” in the Measurement Techniques” Chapter of the *Agilent EMC Analyzer Measurement Guide* for more information.

Key Access: **MEASURE**, **More**, **Signal List**, **Remeasure**, **RemeasDetector**

Center Presel
On Off

Agilent E7403A, E7404A, and E7405A only. Allows you to turn the center preselector filter On or Off. This determines whether or not you do a preselector center before each measurement in the preselected bands.

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Key Access: **MEASURE**, **More**, **Signal List**, **Remeasure**, **MeasDetector**

Signal Marking Accesses to the submenu used for determining which signal elements are to be marked.

Key Access: **MEASURE**, **More**, **Signal List**

Signal List Switches between signal list display (split screen) and normal analyzer display. The upper portion of the split screen contains the live display. The lower portion of the screen displays the signal list. As the current signal list is changed, the number displayed in the menu key (list item index) is updated, the signal, the marker in the upper window is moved to the frequency of the signal, and if the frequency is not currently on the screen, the analyzer is tuned to that frequency (center frequency). Use the Step keys or knob to move around the signal list.

Key Access: **MEASURE**, **More**, **Signal List**, **Signal Marking**

Mark Signal Marks the currently highlighted signal. A symbol appears next to the entry to distinguish it from unmarked signals.

Key Access: **MEASURE**, **More**, **Signal List**, **Signal Marking**

Clear Mark Clears the mark from the selected signal list item.

Key Access: **MEASURE**, **More**, **Signal List**, **Signal Marking**

Mark All Marks all the signals in the signal list for further processing. A symbol appears next to the entries to distinguish them from unmarked signals.

Key Access: **MEASURE**, **More**, **Signal List**, **Signal Marking**

Clear All Clears all the marks from the currently highlighted signals in the signal list.

Key Access: **MEASURE**, **More**, **Signal List**, **Signal Marking**

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Select Marks

Accesses the following Select Marks menu keys.

Key Access: **MEASURE**, **More**, **Signal List**, **Signal Marking**

Signal List
On Off

Switches between signal list display (split screen) and normal analyzer display. The upper portion of the split screen contains the live display. The lower portion of the screen displays the signal list. As the current signal list is changed, the number displayed in the menu key (list item index) is updated, the signal, the marker in the upper window is moved to the frequency of the signal, and if the frequency is not currently on the screen, the analyzer is tuned to that frequency (center frequency).

Key Access: **MEASURE**, **More**, **Signal List**, **Signal Marking**, **Select Marks**

Mark To End

Marks all the signals from the current signal list item to the end of the signal list.

Key Access: **MEASURE**, **More**, **Signal List**, **Signal Marking**, **Select Marks**

Mark All Dups

Marks all items with the same (duplicate) frequency.

Key Access: **MEASURE**, **More**, **Signal List**, **Signal Marking**, **Select Marks**

Mark Lwr Dups

Marks all duplicate items with a lower amplitude.

Key Access: **MEASURE**, **More**, **Signal List**, **Signal Marking**, **Select Marks**

Complement

Marks all unmarked items and unmarks all items that are marked.

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Key Access: **MEASURE**, **More**, **Signal List**, **Signal Marking**, **Select Marks**

Auto-measure

Accesses the Auto-measure menu. The auto measure function performs a measure at marker on all signals that meet the criteria (above the margin or peak excursion) followed by an add to the list of all the signals on the screen.

Key Access: **MEASURE**, **More**.

Start

Starts the Auto-measure process. Pressing this softkey starts a series of routines which are designed to detect the presence of signals and perform zero span measurements on each one. As the measurement is made, each signal is swept once (on the screen) to help you keep track of the progress of the measurement. The sweep that is shown is the last sweep before zooming to zero span. If the signal list is turned On, you can see each signal as it is added to the end of the signal list.

Key Access: **MEASURE**, **More**, **Auto Measure**

Sigs > Margin

When On is selected, only the signals above the lowest limit line margin on the screen are measured. If Off is selected or no margin is on the screen then all the signals on the screen that meet peak excursion are measured. Default is Off.

Key Access: **MEASURE**, **More**, **Auto Measure**

Peak
On Off

Allows you to turn peak measurements On and Off. When Peak is On, you can change the measurement dwell time. If this detector is On, the Measure at Marker and Auto-measure functions make a peak detector measurement for the specified dwell time. Default is On with a 200 ms dwell time.

Key Access: **MEASURE**, **More**, **Auto Measure**

Quasi Peak
On Off

Allows you to turn quasi-peak measurements On and Off. When **Quasi Peak** is On, you can change the measurement dwell time. If this detector is On, the Measure at Marker and Auto-measure functions make a quasi-peak detector measurement for the specified dwell time. Default is On with a 200 ms dwell time.

Key Access: **MEASURE**, **More**, **Auto Measure**

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Average
On Off

Allows you to turn average measurements On and Off. When Average is On, you can change the measurement dwell time. If this detector is On, the Measure at Marker and Auto-measure functions make an average detector measurement for the specified dwell time. Default is On with a 200 ms dwell time.

Key Access: **MEASURE**, **More**, **Auto Measure**

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MODE

Selects the measurement mode of your analyzer. EMC analyzer mode (**EMC**) is the default mode and currently, the only mode available.

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Mode Setup

Brings up a menu for setting up the current mode. The (**EMC**) mode has no mode setup functions.

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Next Window

Allows you to select the active window in functions which support split-screen display modes, such as zone span. In split-screen display modes, pressing **Zoom** allows you to switch between split-screen and full-sized displays of the active window. See also “Zoom”.

NOTE The active window is indicated by a solid green box around the window.

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Peak Search

Places a marker on the highest peak based on the setting of the search parameters, **Max** (default) or **Param**. Refer to **Peak Search Type** on page 168, for more information on the effect of setting **Peak Search** to **Max** or **Param**. When you preset the analyzer, the **Peak Search** is set to **Max** unless you save **Peak Search** (Param) as part of the user preset conditions and set **Preset** to **User**. Refer to **Preset** on page 170, for more information on presetting the analyzer.

NOTE All peak search functions ignore the LO feedthrough. Peak Search may locate the LO feedthrough when **FREQUENCY**, **Scale Type (Log)** is selected.

Meas Tools Accesses the following frequently used menu keys which are replicated here for your convenience.

Peak Search Performs peak search as described above.

Key access: **Peak Search**, **Meas Tools**

Next Pk Right Refer to "Next Pk Right" on page 166.

Key access: **Peak Search**, **Meas Tools**

Next Pk Left Refer to "Next Pk Left" on page 166 of this chapter.

Key access: **Peak Search**, **Meas Tools**

Delta Refer to "Delta" on page 115.

Key access: **Peak Search**, **Meas Tools**

Mkr → CF Refer to "Mkr → CF" on page 116.

Key access: **Peak Search**, **Meas Tools**

Mkr → Ref Lvl Refer to "Mkr → Ref Lvl" on page 117.

Key access: **Peak Search**, **Meas Tools**

Function Refer to "Function" on page 118.

Key Access: **Peak Search**, **Meas Tools**

Band Power Refer to "Band Power" on page 118.

Key Access: **Peak Search**, **Meas Tools**, **Function**

Marker Noise Refer to "Marker Noise" on page 118.

Key Access: **Peak Search**, **Meas Tools**, **Function**

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Off Refer to "Off" on page 116.

Key Access: **Peak Search**, **Meas Tools**, **Function**

Next Peak Places the marker on the next highest peak. The signal peak must exceed the peak threshold value by the peak excursion value. If there is no peak, the marker will not move. (Also see the **Peak Excursion** and **Peak Threshold** key descriptions.)

Key Access: **Search**

Next Pk Right Moves the marker to the next peak to the right of the current marker. The signal peak must exceed the peak threshold value by the peak excursion value. If there is no peak to the right, the marker will not move and the `No Peak Found` error message will appear on the display. (Also see the **Peak Excursion** and **Peak Threshold** key descriptions.)

Key Access: **Search**

Next Pk Left Moves the marker to the next peak to the left of the current marker. The signal peak must exceed the peak threshold value by the peak excursion value. If there is no peak to the left, the marker will not move and the `No Peak Found` error message will appear on the display. (Also see the **Peak Excursion** and **Peak Threshold** key descriptions.)

Key Access: **Search**

Min Search Moves the active marker to the minimum detected amplitude value.

Key Access: **Search**

Pk-Pk Search Finds and displays the frequency (or time, if in zero span) and amplitude differences between the highest and lowest trace points.

Key Access: **Search**

Continuous Pk On Off When a marker is placed on a signal and **Continuous Pk (On)** is pressed, the marker will remain on the signal even if the signal changes in frequency and amplitude.

Key Access: **Search**, **More**

N dB Points On Off Activates the N dB function. Pressing **N dB Points (On)** turns on the N dB feature and activates two arrows that are N dB down from the marker. The frequency difference between the two arrows will be displayed in the upper right-hand corner of the display. If the feature is unable to find data N dB below the marker, the value of –100 Hz will be displayed in the upper right-hand corner of the display.

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For example, N dB Points can be used to measure the 3 dB bandwidth of a filter in a transmission test with the tracking generator. The default value is –3 dB. Possible values range from –1.00 dB to –80.00 dB. You can enter values to a resolution of 0.01 dB using the numeric key pad, 0.1 dB using the knob, or 10 dB using the step keys.

The measured signal cannot have more than one peak that is greater than or equal to N dB. A signal must be greater than the peak excursion above the peak threshold to be identified. The setting for peak excursion may be increased from the –6 dB default value so that noise will not be identified as signals. Increasing the value too much may cause a smaller signal to be missed or misinterpreted as part of a larger signal. The amplitude scale may be either linear or logarithmic.

The N dB function follows the active marker. If you turn on a marker after N dB Points has been activated, the arrows will follow that marker. If the marker associated with N dB Points moves, the arrows will move with the marker unless there is no data N dB below the marker.

Key Access: **Search**, **More**

Search Criteria

Accesses the following menu keys:

Key access: **Search**, **More**

Peak Excursion Sets the minimum amplitude variation of signals that the marker can identify as a peak. If a value of 10 dB is selected, the marker moves only to peaks that rise and fall more than 10 dB above the peak threshold value. Pressing **Preset** (when **Preset Type** is set to **Factory**) or turning on power resets the excursion to 6 dB and the threshold to 90 dB below the reference level, (16.99 dBμV).

NOTE

Two signal peaks, which are so close together that the amplitude drop between them is less than the peak-excursion value, are not recognized as two peaks. A signal peak is recognized only if it has a peak excursion drop above the noise floor, on both sides of the signal.

When the peak excursion value is 6 dB or higher, the marker-peaking functions do not recognize signals less than the peak excursion value above the noise floor. To correct this, when measuring signals near the noise floor, the excursion value can be reduced even further. To prevent the marker from identifying noise as signals, reduce the noise floor variance to a value less than the peak-excursion value by reducing the video bandwidth or by using video averaging.

Key access: **Peak Search**, **More**, **Search Criteria**

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Peak Threshold Sets the minimum amplitude of signals that the marker can identify as a peak. For example, if a value of 16.99 dBµV is selected, the marker moves only to peaks that rise and fall more than the peak excursion value above 16.99 dBµV. Pressing **Preset** or turning the Power on resets the excursion to 6 dB and the threshold to 16.99 dBµV.

The value of the threshold appears in the active-function block and on the lower-left side of the display. The threshold level does not influence the trace memory or marker position. The value of the peak threshold level can be changed using the step keys, the knob, or the numeric keypad. Pressing any digit, 0 through 9, on the numeric keypad brings up the selected terminator menu.

Key access: **Peak Search**, **More**, **Search Criteria**

Peak Search Type Allows you to select the peak search mode.

Key access: **Peak Search**, **More**, **Search Criteria**

Max Value When **Peak Search Type** is set to **Max Value**, a peak search places a marker on the highest peak, excluding the LO feedthrough peak.

Key Access: **Peak Search**, **More**, **Search Criteria**, **Peak Search Type**

Excursion & Threshold When **Peak Search** is set to **Excursion & Threshold**, a peak search places a marker on a peak that meets the **Peak Excursion** and **Peak Threshold** parameters. If **Peak Search Type** is set to **Excursion &Threshold** and no peak satisfies the selected parameters, a marker is placed at the center of the trace, and the error message, `No Peak Found` will appear. Refer to, **Show Errors** on page 194, to remove the error message.

Key Access: **Peak Search**, **More**, **Search Criteria**, **Peak Search Type**

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Peak Table Accesses the following **Peak Table** menu keys:

Key Access: **Peak Search**, **More 1 of 2**

Peak Table
On Off Displays a list of up to ten signal peaks that is updated at the end of each sweep. The peaks can be sorted in order by descending amplitude or by ascending frequency. Peaks above or below the display line can be excluded from the table. The peak table function works with trace 1 only.

Key Access: **Search**, **More**, **Peak Table**

Peak Sort
Freq Amptd Switches the peak table sorting routine between listing the peaks in order by descending amplitude or by ascending frequency.

Key Access: **Search**, **More**, **Peak Table**

Peak Readout Accesses the following **Peak Readout** menu keys:

Key Access: **Search**, **More**, **Peak Table**

Normal

Shows up to ten signal peaks.

Key Access: **Search**, **More**, **Peak Table**, **Peak Readout**

> Display Line

Shows only peaks above the display line.

Key Access: **Search**, **More**, **Peak Table**, **Peak Readout**

< Display Line

Shows only peaks below the display line.

Key Access: **Search**, **More**, **Peak Table**, **Peak Readout**

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Preset

Provides a known convenient starting point of the instrument state for making measurements. You can select whether a user preset, mode preset, or factory preset is performed. When you press **Preset**, the default is **Mode** preset, which will set the analyzer to the default state for the current mode. The user preset is user-defined using the **Save User Preset** function in the **System** menu (Press **System**, **Power On/Preset**, **Save User Preset**.) The **Preset Type** selection (**User**, **Mode** or **Factory**) can be set by pressing **System**, **Power On/Preset**, **Preset Type.**

NOTE The **Preset** menu keys are only available when the **Preset Type** key in the **System** menu is set to **User**. Press **System**, **Power On/Preset**, **Preset Type**, **User**.

If **Preset Type** is set to **Factory** in the **System** menu:

Pressing the **Preset** front-panel key performs a factory preset, which performs the following:

- Brings up the **Measure Setup** menu.
- Sets certain conditions to their default values.
- Performs a processor test, but does not affect alignment data.
- Clears both the input and output buffers and clears all trace data.
- Sets the amplitude values of trace 2 and 3 to the bottom of the screen.
- Amplitude-correction factors are turned off, but remain in analyzer memory.
- Limit line testing is turned off, but the limit line tables remain in analyzer memory.
- The status byte is set to 0.

See Table 2-3 on page 171 for the conditions established by performing a factory preset.

NOTE For *Agilent E7402A or E7405A with Option UKB, E7403A, and E7404A* only, you can specify alternating current (ac) or direct current (dc) coupling at the analyzer input. Selecting ac coupling blocks any dc voltage at the analyzer input, but also decreases the frequency range of the analyzer. Make sure the analyzer is dc coupled when measuring below 100 kHz for Agilent E7403A and E7404A and below 10 MHz for *Agilent E7405A*. (See "Input/Output" in this chapter for more information on this setting.)

If **Preset Type** is set to **User** in the **System** menu:

Pressing the **Preset** front-panel key brings up the **User Preset** , **Mode Preset**, and **Factory Preset** menu keys.

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- If **User Preset** is pressed, the user preset state is recalled. To set the user preset state, change the analyzer settings as desired, then press **System**, **Power On/Preset**, **Save User Preset**.
- If **Mode Preset** is pressed, the current mode settings are reset to the factory defaults. Pressing **Mode Preset** does not change the mode.
- If **Factory Preset** is pressed, a factory preset will be performed as described above.

NOTE Recalling any state, including the user preset state, will affect the conditions of more parameters than are affected by a factory preset. For example, external preamp gain and input impedance correction are not affected by a factory preset but may be affected by a user preset.

NOTE In the **System** menu, if **Power On** is set to **Preset**, and **Preset Type** is set to **Factory**, turning on the analyzer performs a factory preset. The last state of the analyzer (before it was turned off) is recalled if **Power On** is set to **Last**. The user preset state is recalled if **Power On** is set to **Preset** and **Preset Type** is set to **User**.

Table 2-3 Factory Preset Conditions

Amplitude correction factors	off
Amplitude units	dBμV log
Annotation and graticule display	on
Attenuation	10 dB (auto-coupled)
Center frequency:	600 MHz
CF step size	10% of span
Coupled functions	all set to AUTO
Detector	Peak (auto-coupled)
Display line level	–25 dBm, display off
Frequency (scale type)	Linear
Frequency offset	0 Hz
Input Coupling[1] E7402A & E7405A with Option UKB, E7403A and E7404A	AC
Int Preamp	off
Limit line testing	off

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Table 2-3 Factory Preset Conditions (Continued)

Log scale (Amplitude)	10 dB/division
Marker count	off
Marker counter resolution	auto-coupled
Markers	off
Max Mixer level	–10 dBm
Reference level	0 dBm in power-on units (+107 dBµV)
Reference level offset	0 dB
Reference level position	top (10th) graticule
Resolution bandwidth	120 kHz (EMI coupled)
Span	800 MHz
Speaker	Off
SRQ mask	40
Start Frequency	200 MHz
Stop Frequency	1000 MHz
State Registers	unaffected
Sweep	continuous
Sweep Time	120.8 ms (auto coupled)
Sweep Points	401
Threshold level	–90 dBm, display off
Title	cleared
Trace 1	clear-write
Trace 2	blank, at bottom of display
Trace 3	blank, at bottom of display
Trigger	free run
Trig Delay Off	1 µsec
Trig Offset Off	0 sec
VBW/RBW ratio	1.000 X (auto-coupled)
Video averaging	off
Video bandwidth	300 kHz (auto-coupled)

1. E7401A and E7402A without Option UKB have fixed AC coupling. E7405A without Option UKB has fixed DC coupling.

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User Preset

This key is only available when the **Preset Type** key is set to **User**. Press **System**, **Power On/Preset**, **Preset Type**, **User**.

User Preset loads the analyzer configuration that existed when **Save User Preset** was pressed. If **Save User Preset** has never been pressed, the factory preset state is loaded. If the user preset state has been saved but the load fails for any reason, the error message: `Unable to load user state` is displayed in the status line and the state is reset to whatever it was before the **Preset** key was pressed. This can sometimes happen if firmware has been upgraded or applications have been (un)installed after the user preset state was saved. **Save User Preset** can be accessed by pressing **System**, **Power On/Preset**.

Key Access: **Preset**

Mode Preset

This key is only available when the **Preset Type** key is set to **User**. Press **System**, **Power On/Preset**, **Preset Type**, **User**.

Mode Preset does not change the mode. It only resets the current mode settings to the factory defaults and to continuous sweeps/measurements.

Key Access: **Preset**

Factory Preset

This key is only available when the **Preset Type** key is set to **User**. Press **System**, **Power On/Preset**, **Preset Type**, **User**.

A factory preset is executed so all of the instrument modes are returned to the factory default state. A factory preset will not reset “persistent” functions such as GPIB address, time/date display style, or auto alignment state to the factory defaults.

Key Access: **Preset**

Save User Preset

This key is only available when the **Preset Type** key is set to **User**. Press **System**, **Power On/Preset**, **Preset Type**, **User**.

This key saves the current state of the analyzer into the **User Preset** state for recalling when the instrument is user preset. After you save a state here, you must go to the **Preset Type** key and select **User** in order to have this state used as the preset state.

Key Access: **Preset**

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Print

The standard I/O Option A4H (GPIB and Parallel) or Option 1AX (RS-232 and Parallel) only. **Print** initiates an output of the display data or report, without an external controller, to a previously specified graphics printer. Refer to "Printer Setup and Operation" in your Getting Started or Programmer's Guide for detailed information about printing.

Press the **Print** key to immediately print the screen or report to the currently-defined printer. The screen remains frozen (no further sweeps are taken) until the data transfer to the printer is complete. Refer to the **Print Setup** key description in this chapter for more information about the structure and definitions of the printer keys.

If you need to abort a print in progress, use the **ESC** (escape) key.

NOTE Printing requires an I/O interface. The *Agilent EMC Analyzers Programmer's Guide*, included with the optional interfaces, provides interface details. Refer to "Printer Setup and Operation" in the *Agilent EMC Analyzers Getting Started Guide* for more information about printing.

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Print Setup

1AX (RS-232 and Parallel) only. Accesses the menu keys which allow you to define a printer and select printer options.

Print Screen Report

Pressing **Print (Screen)** and then the **Print** key, will print out what is on the analyzer display. Pressing **Print (Report)** will print the information defined under **Meas Setup**, **More**, **Define Report** key sequence.

Key Access: **Print Setup**

Printer Type

Accesses the Printer Type menu keys. When you connect your printer and press the **Print** key, the analyzer will attempt to identify your printer. If identification is unsuccessful, **None** or **Custom** will automatically be set in the Printer Type menu.

Key Access: **Print Setup**

None

The Printer Type will automatically be set to **None** when you press the **Print** key with an unsupported printer connected to your analyzer.

Key Access: **Print Setup**, **Printer Type**

Custom

When you press the **Print** key and the analyzer cannot identify your printer, **Custom** will automatically be set in the Printer Type menu. Setting the Printer Type menu key to **Custom** allows you to define your printer using the **Define Custom** menu keys.

Key Access: **Print Setup**, **Printer Type**

Auto

When **Auto** is selected, and the **Print** key is pressed, the analyzer will attempt to communicate with the printer and obtain its identification. If the printer is identified, the print will be successful and no message will appear on the display. If the analyzer is not able to identify the printer, the Printer Type will automatically be set to **Custom** and an error message asking you to press **Define Custom** to set up your printer will be displayed. If the printer is not supported, the Printer Type will automatically be set to **None** and an error message will inform you that your printer is unsupported.

Key Access: **Print Setup**, **Printer Type**

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Define Custom Allows you to define your printer.

Key Access: **Print Setup**, **Printer Type**

Language
PCL3 PCL5 Allows you to define your printer as a Hewlett-Packard PCL3. (Most DeskJets) or Hewlett-Packard PCL5 (LaserJets and DeskJets: 1100,1200,1600,2000 series) printer.

Key Access: **Print Setup**, **Define Custom**

Color Capable
Yes No Allows you to define the color capability of your printer.

Key Access: **Print Setup**, **Define Custom**

Orientation Allows you to select either **Portrait** or **Landscape** printing. The **Orientation** key will not function with a PCL3 (HP DeskJet) printer.

Key Access: **Print Setup**

Prints/Page
1 2 Selects the number of prints per page when orientation is set to **Portrait**. In **Landscape** printing, **Prints/Page** is always set to 1.

Key Access: **Print Setup**

Eject Page Ejects your printed page.

Key Access: **Print Setup**

Page Size Allows you to select from the following page sizes: **Executive**, **Letter**, **Legal**, **Ledger**, **A4**, and **A3**.

Key Access: **Print Setup, More**

Color
On Off Allows you to select between color or black and white printing. This key will not function when pressed unless the connected printer supports color.

Key Access: **Print Setup**, **More**

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Restart

Restarts the auto-measure routine. Pressing this key will start the automeasure routine again even if setup parameters are changed.

If no measurement is active and **Sweep (Single)** is selected, a new sweep is initiated.

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Return

Returns you to the previous menu. Repeated presses of this key move back through previously selected menus (including previous pages selected by the **MORE** key.

NOTE When a menu requiring a yes or no key press has been accessed, the **Return** key will not respond.

NOTE When entering an alphanumeric value (a screen title or filename), pressing **Return** terminates the entry.

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Save

Executes a save operation as though you were in the **File**, **Save** menu and had pressed **Save Now**. If you have previously used the **File**, **Save**, **Save Now** keys to setup and save a file, the **Save** hardkey will save your file in the same format and to the same location using a new automatically generated filename. If you have not saved a file since power on, a state file (.STA format) will be saved to the C: drive.

For example, if you use the **File**, **Save** menu to configure the analyzer to save Trace 1 in .CSV format on the C: drive, using the automatically generated file name (TRACE001.CSV), then every time the front panel **Save** key is pressed, Trace 1 will be saved in .CSV format and the filename will be incremented (TRACE002.CSV, TRACE003.CSV). This provides a convenient format for saving several files with the same format quickly.

NOTE In the event that a valid save cannot be performed because a drive has not been selected, the **Save** key will report the error `No drive selected`. In this case, press **File**, **Save** and select a drive.

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Single

When analyzer is in continuous sweep mode and not in a measurement (**Measure**, **Meas Off**), this key changes the sweep control to single sweep and executes a sweep after the trigger condition is met. If the analyzer is already in single sweep, pressing **Single** executes a new sweep after the trigger condition is met.

If Average is on (**BW**/**Avg**, **Average (On)**), pressing **Single** resets the average trace and starts the average again from a count of zero. Sweeps are averaged until N sweeps are then taken (where N is the average number), and then the sweep is halted.

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Source

Accesses the tracking generator key functions (Options 1DN only). Without Option 1DN, pressing **Source** will cause the error message `Option not installed` to appear on the analyzer display.

CAUTION

If **Auto Align** is on, the 3 GHz tracking generator will be momentarily retuned to approximately 1.557 GHz between most sweeps. Some devices under test (for example, amplifiers with AGC) may be susceptible to damage due to this momentary retuning. To avoid this momentary retuning, turn the auto align off by pressing **System**, **Alignments**, **Auto Align**, **Off**. Refer to the Specifications Guide for your instrument to learn more information about using the analyzer with Auto Align set to off.

Amplitude
On Off

Activates (**On**) or deactivates (**Off**) the output power of the tracking generator. The power level can then be adjusted using the numeric keypad, step keys, or knob. Pressing any digit, 0 through 9, on the numeric keypad brings up the selected terminator menu. See the specifications chapter in the calibration guide for the available output power for your tracking generator.

Key Access: **Source**

CAUTION

When the source attenuation is set manually, the actual source amplitude may be greater than the amplitude indicated by the source amplitude. With source attenuation set to manual, source amplitude is permitted to be set to values beyond output levels to accommodate the full range of the analyzer capabilities. As a result, exercise caution when connecting a power-level sensitive device to the tracking generator output

NOTE

When **Amplitude (Off)** is selected, the output attenuation on the Agilent E7402A, E7403A, E7404A, and E7405A is set to the maximum attenuation.

Power Sweep
On Off

Sets the power-sweep function to **On** or **Off**. The value of the power-sweep range is displayed in the active-function block when you press **Power Sweep (On)**. The analyzer continues to sweep the specified frequency range when power sweep is on. (To do a power sweep at a fixed frequency, set the analyzer to zero span at the desired frequency.) The available power-sweep range is a function of the source attenuator setting. For your instrument's available power sweep range refer to the appropriate Specifications Guide for your analyzer.

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The output power of the tracking generator is swept according to the sweep rate of the analyzer. The output power is always swept from the source power setting to a higher power setting (negative source power sweep values are not allowed).

Power-sweep measurements are particularly useful in making gain compression measurements or output power versus frequency measurements.

Key Access: **Source**

Attenuation Auto Man

Allows you to select between automatic and manual adjustment of the tracking generator's output attenuator. The Agilent E7401A can be manually adjusted from 0 to 60 dB in 10 dB steps. All other Agilent EMC analyzers can be manually adjusted from 0 to 56 dB in 8 dB steps. When auto-coupled, the attenuation function automatically adjusts the attenuator to yield the source amplitude level specified by the **Amplitude On Off** softkey function. For the Agilent E7401A, press **Attenuation (Man)** for power sweeps greater than 10 dB.

Key Access: **Source**

CAUTION

When the source attenuation is set manually, the actual source amplitude may be greater than the amplitude indicated by the source amplitude. With source attenuation set to manual, source amplitude is permitted to be set to values beyond output levels to accommodate the full range of the analyzer capabilities. As a result, exercise caution when connecting a power-level sensitive device to the tracking generator output

Amptd Step Auto Man

Allows you to set the step size of the power level range of the tracking generator. The default setting is one vertical scale division when in a logarithmic amplitude scale.

Key Access: **Source**

Amptd Offset

Offsets the displayed power of the tracking generator. Using the amplitude offset capability of the tracking generator allows you to take system losses or gains into account, thereby displaying the actual power delivered to the device under test.

Key Access: **Source**

Normalize

Key Access: **Source**

Store Ref (1→ 3).

Copies trace 1 into trace 3. **Store Ref (1→ 3)** must be pressed before pressing **Normalize (On)**. If **Normalize (On)** is pressed before **Store Ref (1→ 3)**, the error message: `Store reference trace before turning on Normalize` is displayed in the status line, however Normalize has been activated.

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Key Access: **Source**, **More**, **Normalize**

Normalize On Off.

Normalize (On) Activates the normalize function. On each sweep, the normalized trace (Trace 3) is subtracted from Trace 1 and the result is added to the normalized reference level. The display shows the result of the following calculation:

Trace 1 – Normalized Trace + Normalized Reference Level

The trace data is normalized with respect to the normalized reference level, even if the value of the normalized reference level is changed. This function remains in effect on all subsequent sweeps until it is turned off.

CAUTION Trace 1 should be in clear write mode prior to setting normalize to on.

The normalize function is most useful for applying correction data to a trace while making a stimulus response measurement with a tracking generator. For example, connect the cables and a thru line, in place of the device to be measured, between the tracking generator and the analyzer input. Notice that the frequency response is not perfectly flat, showing the response of the cables, as well as the flatness of both the tracking generator and the analyzer.

Now press **Store Ref (1→ 3)**, **Normalize On**. Notice that the displayed trace is now flat, or normalized. The position of the normalized trace can now be moved to a different position on the display by changing the normalized reference position. This may be useful if the device to be tested has positive gain, such as an amplifier. Now replace the thru line with the device under test, and an accurate measurement of the gain or loss can be made.

Key Access: **Source**, **More**, **Normalize**

Norm Ref Lvl. Sets the level (in dB) of the normalized reference.

Key Access: **Source**, **More**, **Normalize**

Norm Ref Posn. Offsets the displayed trace without affecting the instrument gain or attenuation settings. This allows the displayed trace to be moved without decreasing measurement accuracy. The normalized reference position is indicated with a (>) character on the left side of the display and a (<) character on the right side of the display.

Key Access: **Source**, **More**, **Normalize**

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Ref Trace
View BLank Allows you to view or blank the reference trace on the display.

Key Access: **Source**, **More**, **Normalize**

Tracking Peak *Agilent E7402A, E7403A, E7404A, and E7405A only*. Activates a routine that automatically adjusts fine tracking adjustments to obtain the peak response of the tracking generator on the spectrum analyzer display. Tracking Peak is performed in the active resolution bandwidth.

Key Access: **Source**, **More**

Man Track Adj *Agilent E7402A, E7403A, E7404A, and E7405A only*. Allows you to adjust the frequency of the tracking generator oscillator manually using the step keys, knob, or numeric keypad. The tracking adjust is tuned to maximize the amplitude of the trace.

Key Access: **Source**, **More**

NOTE When **Source** is On, resolution bandwidths less than 1 kHz are not available.

NOTE When the resolution bandwidth is less than 1 kHz, **Source** may not be turned on.

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SPAN X Scale

Activates the **Span** function and accesses the menu of span functions. Pressing **SPAN X Scale** allows you to change the frequency range symmetrically about the center frequency. The frequency-span readout describes the total displayed frequency range. To determine frequency span per horizontal graticule division (when the frequency scale type is set to linear), divide the frequency span by 10.

Span

Allows you to enter a span frequency range value.

Key Access: **SPAN X Scale**

Span Zoom

Performs an automatic zoom so that the signal at the marker remains at the center of the display. If a marker is already on, the zoom begins at the frequency of the marker. If a marker is not already on, a marker is placed on the highest on-screen signal (ignoring the LO feedthrough). Signal-track is turned on, and the span function is activated. Entering a new span value causes the analyzer to change the span in steps, keeping the signal centered on the screen until the desired span is reached. The analyzer is left in Signal Track mode. Pressing **Span Zoom** performs the routine similar to pressing the following keys: **Search**, **Frequency**, **Signal Track (On)**, and **Span**.

NOTE **Span Zoom** is not available when the **Frequency**, **Scale Type (Log)** is selected.

NOTE Span Zoom leaves the analyzer in Signal Track mode.

Key Access: **SPAN X Scale**

Full Span

Changes the analyzer span to full span showing the full frequency range of the analyzer. In external mixing mode, pressing **Full Span** changes the analyzer span to the specified range for the selected external mixing band. Full span sets **Signal Track (Off)**.

Key Access: **SPAN X Scale**

Zero Span

Changes the frequency span to zero. In this mode, the current center frequency is displayed in the time domain (the x-axis is displayed in units of time), like a conventional oscilloscope.

Sweep times faster than those in the frequency domain display mode are available if Option AYX is installed.

Resolution Bandwidths less than 1 kHz are unavailable when in zero span if the sweep time is being achieved by utilizing the Option AYX.

Key Access: **SPAN X Scale**

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NOTE Sweep times that would require Option AYX are not available in zero span if the Resolution Bandwidth is less than 1 kHz.

NOTE The minimum number of sweep points in zero span varies with firmware revision:

Firmware Revision	Minimum # of Sweep Points in Zero Span
≤ A..03.03	401 (fixed)
A.04.xx	101
≥ A.05.00	2

NOTE Zero Span sets **Signal Track (Off)** and **FREQUENCY, Scale Type** to linear mode.

Last Span Changes the analyzer frequency span to the previous span setting. If pressed after **Signal Track** is turned off, the span setting returns to the span that was in effect before **Signal Track** was turned on. This is true, even if **Signal Track** was turned on as part of **Span Zoom**. The state of **Frequency, Scale Type Log Lin** is included in the recalled information.

Key Access: **SPAN X Scale**

Zone Accesses menu keys that allow you to control the two-window zone function. This function allows you to have an upper window with a broad display of frequency and two zone markers (vertical bars) that define the span for the lower window.

Key Access: **SPAN X Scale**

Zone On Off **Zone (On)** allows you to change from a one-window to a two-window display. The top window will display the trace with two vertical lines (Zone Markers) displayed at center frequency plus and minus 5% of the current span. (You can change the default zone frequency and zone span values using the **Zone Center** and **Zone Span** keys.) The top window will be inactive.

The bottom window will display the section of the trace in the top window that is between the Zone Markers. The span of the bottom window is 10% of the span of the top window. (You can change the default zone frequency and zone span values using the **Zone Center** and **Zone Span** keys.) When first activated, both windows have the same center frequency. The bottom window is active and the sweep time, resolution bandwidth, and video bandwidth have been coupled to the bottom window span.

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There are separate annotations for frequency, bandwidth, sweep time, reference level, amplitude scale and scale/div for each window. The values for these parameters can be changed for each window independently.

To activate the top window, press the **Next Window** key located below the display. The active window is distinguished by a green border. Only the active window will have a sweep taken and updated to the display. When the active window is toggled, the state for the active window is saved, and the last state of the inactive window is recalled. When the window becomes inactive, its data invalid indicator will appear on the display. The data invalid indicator will remain until the window becomes the active window and a complete sweep has been executed. Pressing **Zoom** will change to a one-window display showing only the active window. Pressing **Zoom** again will return you to the two-window display. Pressing **Zone (Off)** will return you to a one-window display of the active window.

Key Access: **SPAN X Scale**, **Zone**

NOTE Pressing **Zoom** will set **Zone (On)**, if it is off.

Zone Center Allows you to change the frequency of the zone markers without changing the zone span. The zone markers are vertical lines marking the zone in the upper window. They determine the frequency range displayed in the lower window. As the zone markers in the upper window are moved, the center frequency of the lower window is changed but the lower window will not be updated to reflect the change unless it is selected as the active window. (See **Zone On Off**.)

The center frequency for the lower window is not limited by the selected start and stop frequencies in the upper window. However, if the frequency span of the lower window is outside of the span for the upper window, the vertical span markers will be displayed at the edge of the graticule. When the lower window is active, the **FREQUENCY Channel** key will allow you to change **Zone Center**. Any change to the lower window while it is active will change the center frequency.

Key Access: **SPAN X Scale**, **Zone**

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Zone Span Allows the span of the zone markers to be changed without changing the center frequency. The zone markers are vertical lines marking the zone in the upper window. They determine the frequency range displayed in the lower window. As the zone markers are moved, the span of the lower window is changed but the lower window will not be updated to reflect the change unless it is selected as the active window.
(See **Zone On Off**.)

The span limit of the lower window is the same as the span limit of the analyzer. The span for the lower window is not limited to the selected span of the upper window. However, if the frequency span of the lower window is outside of the span of the upper window, the vertical span markers will not be displayed. When the lower window is active, the **SPAN X Scale** key will change **Zone Span**, and any change to **Zone Span** while the lower window is active, will change the span.

Key Access: **SPAN X Scale**, **Zone**

Zone Pk Right Finds the next peak to the right of the zone center frequency on the upper window trace and then moves the zone so that it is centered around the new peak. The zone span is not changed. The center frequency of the lower window changes to reflect the new zone center frequency. The lower window will not be updated until it is made active. If no peak is found, the zone will not be moved. A signal must obey the parameters defined in **Search**, **Search Param** to be identified as a peak signal. Pressing **Zone Pk Right** will have no effect if the upper window is not the active window or if it is in zero span.

Key Access: **SPAN X Scale**, **Zone**

Zone Pk Left Finds the next peak to the left of the zone center frequency on the upper window trace and then moves the zone so that it is centered around the new peak. The zone span is not changed. The center frequency of the lower window changes to reflect the new zone center frequency. The lower window will not be updated until it is made active. If no peak is found, the zone will not be moved. A signal must obey the parameters defined in **Search**, **Search Param** to be identified as a peak signal. Pressing **Zone Pk Left** will have no effect if the upper window is not the active window or if it is in zero span.

Key Access: **SPAN X Scale**, **Zone**

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Standby

Removes power from the analyzer, except for a small portion of circuitry inside the switching power supply. No internal time base circuitry, or any other function outside of the power supply is powered when the analyzer is in “standby.”

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Sweep

Activates the sweep time function and accesses the following menu keys:

Sweep Time Auto Man

Selects the length of time the analyzer takes to tune across the displayed frequency span (or, in zero span, the time the analyzer takes to sweep the full screen). Reducing the sweep time increases the sweep rate. The sweep time can be changed using the step keys, the knob, or the numeric keypad.

In non-zero spans:

When the sweep time is auto-coupled, the analyzer selects the optimum (shortest) sweep time for the current settings. This selection process is influenced by several factors:

- The maximum tuning rate of the spectrum analyzer
- The selected Resolution Bandwidth and Video Bandwidth filters
- The maximum sample rate of the Analog-to-Digital converter (ADC) (Trace data are digitized and stored in memory)
- The number of trace points (**Sweep**, **Points**)

You may select a sweep time less than the auto-coupled value; however this may generate measurement errors. If this happens, the error message: `Meas Uncal` will appear in the upper right corner of the display.

In zero span:

The minimum sweep time is determined by the maximum sample rate of the ADC and the number of sweep points. With Option AYX, the fastest sweep time is 5 microseconds (with 101 sweep points). Without the option installed, the fastest sweep time is 1 millisecond (with 101 sweep points) and 4 milliseconds (with 401 sweep points).

NOTE

With firmware A.08.00 and greater, in zero span, the auto/manual function of this key is not applicable. When **Sweep Time (Auto)** is selected in non-zero span, any changes to Sweep Time while in zero span will revert to the Auto value when you return to non-zero span. When **Sweep Time (Man)** is selected in non-zero span, any changes to Sweep Time while in zero span will be maintained when you return to non-zero span.

The maximum sweep time is 4000 seconds for any set of conditions. Refer to your instrument's appropriate Specifications Guide for more information about Sweep Time and its relation to other instrument settings.

Key Access: **Sweep**

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Sweep
Single Cont

Switches the analyzer between the continuous-sweep mode and the single-sweep mode. Pressing **Sweep (Single)** puts the analyzer in single-sweep mode. Press **Single** on the front panel, to enable a sweep when in single-sweep mode. When **Sweep (Cont)** is selected, one sweep follows another as soon as it is triggered. Pressing **Preset** (When **Preset Type** is set to **Factory**) or turning the power on, sets the sweep mode to continuous sweep.

Key Access: **Sweep**

Auto Swp
Coupling
SR SA

Selects stimulus-response (SR) or spectrum-analyzer (SA) (default) auto-coupled sweep times. In stimulus-response mode, auto-coupled sweep times are usually much faster for swept-response measurements. Stimulus-response auto-coupled sweep times are typically valid in stimulus-response measurements when the system's frequency span is less than 20 times the bandwidth of the device under test.

Key Access: **Sweep**

Gate

Requires Option 1D6 (Time Gate). Accesses the following menu keys that allow you to setup various gate parameters:

Key Access: **Sweep**

Gate On Off

Requires Option 1D6 (Time Gate). Turns the gate function on and off. When set to **Gate (On)**, the video signal that is digitized is controlled by the gate circuitry. The gate circuitry switches between two states. When the gate is "open", the normal video signal of the analyzer is passed through the video filters to the peak detectors and digitizer of the analyzer. When the gate is "closed", the video filters, peak detectors, and digitizer are given a signal at the bottom of the display.

The gate function requires that a gate trigger signal be connected to the **GATE TRIG/EXT TRIG IN (TTL)** input on the rear panel. When the gate function is on, the state of the gate appears at the **GATE/HI SWP OUT (TTL)** rear panel connector. A TTL high output indicates that the gate is open. The gate out signal is only valid while the analyzer is sweeping. Between sweeps, the gate out signal is invalid. You can adjust the gate delay and gate length using an oscilloscope to view the gate out signal. The analyzer sweep time should be set to a large value (50 sec) during the adjustment so that the gate signal is valid most of the time. When the adjustment is done you can set the analyzer back to the desired sweep time, or set it back to **Auto Couple**.

Key Access: **Sweep, Gate**

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NOTE **Trig Delay (On)** and **Gate (On)** cannot be active at the same time. If **Trig Delay (On)** has been previously selected, it will be reset to **Trig Delay (Off)** when **Gate (On)** is selected. Conversely, if **Gate (On)** has been previously selected, it will be reset to **Gate (Off)** when **Trig Delay (On)** is selected.

NOTE If **Gate (On)** is selected without an external trigger signal present, operating other functions, such as: tracking, frequency count, or preselector centering, may cause the analyzer to stop functioning until it is powered on again.

Gate Control

Edge Level Allows you to select between **Edge** and **Level** triggering of the gate. **Gate Control (Edge)** opens the gate in response to an edge trigger on the trigger input after a delay set in **Gate Delay**. The gate stays open for the selected **Gate Length**. When **Gate Control (Level)** is selected, the gate is open as long as the trigger input is true, as defined under the **Level Gate** key.

Key Access: **Sweep**, **Gate**

Edge Gate Accesses menu keys that allow you to set up edge triggering.

Key Access: **Sweep**, **Gate**

Slope Pos Neg Sets the polarity for edge triggering of the gate. When **Slope (Pos)** is pressed, a positive-going edge will trigger the opening of the gate, after the delay set with the **Gate Delay** key. When **Slope (Neg)** is pressed, a negative-going edge will trigger the opening of the gate after the set delay.

Key Access: **Sweep**, **Gate**, **Edge Gate**

Gate Delay Controls the length of time from the trigger until the gate is turned on.

Key Access: **Sweep**, **Gate**, **Edge Gate**

Gate Length Controls the length of time that the gate is on when using edge triggering to control the gate.

Key Access: **Sweep**, **Gate**, **Edge Gate**

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Level Gate High Low

Sets up level polarity that will open the gate. Requires Option 1D6.

Level Gate (High) Selects a high TTL level to open the gate. **Level Gate (Low)** selects a low TTL level to open the gate.

Key Access: **Sweep**, **Gate**

Points

Allows you to set the number of points per sweep, from 101 to 8192 in non-zero span and 2 to 8192 in zero span (firmware revision A.05.00 and greater). Use the knob, step keys, or numeric keypad to set this value. When the sweep time is limited by the Analog to Digital Converter (ADC) sample rate, the sweep time changes with the number of points selected. The greater the number of points, the longer the sweep time becomes. If **Preset** is pressed (and **Preset Type** is set to **Factory**), or the analyzer power is cycled, the number of points per sweep will default to 401. The current value of points is displayed next to the sweep time.

When **FREQUENCY**, **Scale Type (Log)** is selected, the desired number of sweep points may not be possible. Refer to "Scale Type Log Lin" on page 111 for more information.

Changing the number of points has several effects on the analyzer. Since markers are read at the point location, the marker reading may change. Press **Peak Search**, again for greater accuracy in the marker reading. All trace data for the current window is cleared. If in continuous sweep mode, (**Sweep**, **Sweep (Cont)**), a new sweep begins immediately. If average is on (**BW/Avg**, **Average (On)**), the averaging starts over with a count of 0. With firmware revisions prior to A.08.00, if Limit Lines are on (**Display**, **Limits**, **Modify**, **Limit 1 or 2 (On)**), they are turned off.

Key Access: **Sweep**

NOTE

By selecting a number of sweep points greater than 401, you are optimizing frequency resolution and accuracy while accepting a reduced measurement speed. In addition to sweep points, the span, resolution bandwidth, video bandwidth, average detection and center frequency will also affect measurement speed.

When zone span is on (**Span**, **Zone**. **Zone (On)**), each window has its own value for points.

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System (Local)

Accesses the System menu keys. Pressing **System (Local)** after the analyzer has been placed in the remote mode, places the analyzer in the local mode and enables front-panel control. During remote operation, R appears in the upper-right corner of the screen. R, T, L, or S may appear during remote operation, indicating talk, listen, or service request. Pressing the **System (Local)** key removes the R symbol in the upper-right corner.

Symbol	Description
R	Remote
T	Talk
L	Listen
S	Service Request

Show Errors

Accesses a display of the last 30 errors reported. The most recent error will appear at the top of the list. The first error listed will be the first error removed if the error list is longer than 30 entries. If the same error message occurs several times the error message will be incremented rather than added to the list as a new error message.

The date and time identify the first time and the last time (if there is more than one of the same type of error) an error occurred. The number of identical errors is shown, and the error number is also shown with firmware revision A.08.00 and later.

Key Access: **System**

Prev Page

Allows you to access the previous page of error messages. It is grayed out if you are on the first page or only one page exists.

Key Access: **System**, **Show Errors**

Next Page

Allows you to access the next page of error messages. It is grayed out if you are on the last page or only one page exists.

Key Access: **System**, **Show Errors**

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Verbose SCPI On Off

The information in the Error History Screen is formatted to fit the screen size. Additional information is available via the `SYSTem:ERRor?` command. It indicates which SCPI command was executing when the error occurred and what about that command was unacceptable.

Example: First set `SYST:ERR:VERBOSE ON`

If the command `SENSe:FREQuently:CENTer 942.6MHz` is sent, then sending `SYST:ERR?` returns:

```
-113, "Undefined
header;SENSe:FREQuently:<Err>CENTer 942.6MHz
$<NL>"
```

Key Access: **System**, **Show Errors**

Clear Error Queue

Clears the error queue in the **Show Errors** display.

Key Access: **System**, **Show Errors**

Power On/Preset

Accesses the following menu keys.

Key Access: **System**

Power On Last Preset

Determines the state of the analyzer when the analyzer is powered on. If the Power On function is set to **Preset**, the state of the analyzer is the same as it is after **Preset** is pressed, when the analyzer is powered on. If the Power On function is set to **Last**, then the state that the analyzer was in when it was powered off is recalled.

The setting (Last or Preset) of the Power On function is not changed by pressing **Preset**. Use the **Power On/Preset** menu key function to change the setting of the analyzer state that is recalled at power on. Limit lines are not recalled when the analyzer is powered on. Refer to "Preset" in this chapter for more information.

Key Access: **System**, **Power On/Preset**

Preset Type

Allows you to select User, Mode, or Factory preset.

Key Access: **System**, **Power On/Preset**

User

Pressing **Preset (User)** sets the analyzer to the settings defined by the **Save User Preset** key. Refer to "Preset" in this chapter for more information.

Key Access: **System**, **Power On/Preset**, **Preset Type**

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Mode Selects the mode preset type to be the instrument state that will be restored when you do a preset. A mode preset does not change the mode and it only resets the settings of the current mode to their factory defaults.

Key Access: **System**, **Power On/Preset, Preset Type**

Factory Pressing **Factory** presets the analyzer to the configuration originally set at the factory. Refer to the "Preset" key description for the default factory-configuration settings.

Key Access: **System**, **Power On/Preset, Preset Type**

Key Access: **System**, **Power On/Preset**, **Preset Type**

Save User Preset Saves the active state of the analyzer into the User Preset register for recall on **Preset** if **Preset (User)** is selected. Refer to "Preset" in this chapter for more information.

Key Access: **System**, **Power On/Preset**

Time/Date Accesses the following **Time/Date** menu keys used to set and display the real-time clock:

Key Access: **System**

Time/Date On Off Turns the display of the real-time clock on or off.

Key Access: **System**, **Time/Date**

Date Format MDY DMY Changes the display of the date from a month-day-year format to a day-month-year format.

Key Access: **System**, **Time/Date**

Set Time Allows you to set the time of the real-time clock. Enter the time in 24 hour HHMMSS format, using the numeric keypad and pressing **Enter**. Valid hour (HH) values are from 00 to 23. Valid minute (MM) and second (SS) values are from 00 to 59.

Key Access: **System**, **Time/Date**

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Set Date Allows you to set the date of the real-time clock. Enter the date in the YYYYMMDD format using the numeric keypad and press **Enter**. Valid year (YYYY) values are 0000 through 9999. Valid month (MM) values are from 01 to 12, and valid day values are from 01 to 31.

Key Access: **System**, **Time/Date**

Alignments Accesses the following **Alignments** menu keys which align the internal circuitry of the analyzer, load default values for the alignment system, and adjust the 10 MHz reference.

Key Access: **System**

Auto Align Accesses the **Auto Align** menu keys.

All Turns on the automatic alignment of all measurement systems. When **Auto Align**, **All** is selected, "**AA**" appears along the left edge of the display.

Key Access: **System**, **Alignments**

All but RF Turns on the automatic alignment of all measurement systems except the RF section. (Eliminating automatic alignment of the RF prevents changes in the input impedance between sweeps, which could cause input device instability.) When **Auto Align**, **All but RF** is selected, "**AB**" appears along the left edge of the display.

Key Access: **System**, **Alignments**

Off Turns off automatic alignment.

Key Access: **System**, **Alignments**

NOTE It is normal to hear clicking sounds when the Auto Alignment function is On. During retrace, a small portion of the analyzer circuitry is realigned. Some of the switching of the analyzer circuitry is done using relays. It is the rapid switching of these relays during retrace that causes the clicking sounds. To eliminate the clicking sounds, turn the auto alignment off by pressing **System**, **Alignments**, **Auto Align**, **Off**. When this is done, the **Align Now**, **All** function should be performed periodically. Refer to the appropriate "Specifications and Characteristics" chapter in the *Agilent Technologies EMC Analyzers Specifications Guide* for more information on how often to perform **Align Now**, **All** when the auto alignment is off

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Align Now Accesses the **Align Now** menu keys and immediately executes an alignment cycle of the selected system(s). Menu key selections include:

Key Access: **System**, **Alignments**

All Initiates the alignment of all systems. Except the Option 1DN Tracking Generator for models *E7402A, E7403A, E7404A, and E7405A*.

Key Access: **System**, **Alignments, Align Now**

RF (Ext Cable) Initiates the alignment of the RF system with a cable connected from AMPTD REF OUT to INPUT 50 Ω. *Models E7402A, E7403A, E7404A, and E7405A*.

Key Access: **System**, **Alignments, Align Now**

RF Initiates the alignment of the RF system. This Alignment uses an Internal Signal Source.

Key Access: **System**, **Alignments, Align Now**

TG (Ext Cable) Initiates the alignment of the tracking generator only when the Option 1DN is installedin Agilent *E7402A, E7403A, E7404A, and E7405A*. You must connect a cable from RF OUT 50 Ω to INPUT 50 Ω

Key Access: **System**, **Alignments, Align Now**

FM Demod Initiates an alignment of the FM Demod portion of the EMC Detectors and Demod board.

Key Access: **System**, **Alignments, Align Now**

After a five minute warm-up, **Align Now**, **All** (with a cable connected from AMPTD REF OUT to INPUT 50 Ω) should be performed on Agilent *E7402A, E7403A, E7404A, and E7405A*. Refer to your analyzer's appropriate Specifications Guide for details on using **Align Now** when **Auto Align** is **Off**.

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Freq Correct
On Off Controls use of some of the correction factors. When On is underlined, frequency correction factors are used. When Off is underlined, frequency correction factors are not used, and `Freq Corr Off` appears on the display. Turning the correction factors off degrades frequency accuracy.

Key Access: **System**, **Alignments**

NOTE Frequency correction factors must be on for the analyzer to meet its specified performance.

Timebase Accesses the **Fine** and **Coarse** Timebase menu keys, which allow control of the 10 MHz time base frequency. This function is used to verify the settability of the 10 MHz reference and to adjust for changed operating conditions, such as temperature. Pressing **Load Defaults** or cycling power, resets the time base to its original value.

Key Access: **System**, **Alignments**

Load Defaults Loads the default values for the alignment system, turns on the frequency corrections, and resets the time base to the factory values. **Align Now, All**, will automatically execute three times after pressing **Load Defaults**.

Key Access: **System**, **Alignments**

Remote Port Allows the GPIB address to be entered. The default address is 18.

With Option 1AX (RS-232 and Parallel) only. Allows the baud rate to be set. The available baud rate values are as follows: 110, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200. The default baud rate is 9600.

Key Access: **System**

Show System Displays the number and description of the options installed in your analyzer. It also displays the instrument model number, product number, serial number, firmware revision number, Host ID (for licensing), bootrom revision, and amount of RAM and ROM.

Key Access: **System**, **More**

Prev Page Allows you to access the previous page of show system. It is grayed out if you are on the first page or only one page exists.

Key Access: **System**, **More**, **Show System**

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Next Page Allows you to access the next page of show system. It is grayed out if you are on the last page or only one page exists.

Key Access: **System**, **More**, **Show System**

Show Hdwr Gives detailed information about the hardware installed on your analyzer.

Key Access: **System**, **More**

Prev Page Allows you to access the previous page of show hardware. It is grayed out if you are on the first page or only one page exists.

Key Access: **System**, **More**, **Show Hdwr**

Next Page Allows you to access the next page of show hardware. It is grayed out if you are on the last page or only one page exists.

Key Access: **System**, **More**, **Show Hdwr**

Color Palette Accesses the **Color Palette** menu keys. These keys are only available with analyzers having a color display.

Key Access: **System**, **More**

Default Sets all the display screen attributes to the factory defined colors.

Key Access: **System**, **More**, **Color Palette**

Vision Impair 1 and **Vision Impair 2** The special colors built into the **Vision Impair 1** and **Vision Impair 2** keys accommodate most color-deficient vision problems.

Key Access: **System**, **More**, **Color Palette**

Optical Filter Accommodates the use of protective goggles while viewing lasers.

Key Access: **System**, **More**, **Color Palette**

Monochrome Sets the display screen to green monochrome. The monochrome display uses different shades of green for each green value. This is especially useful for driving external monochrome monitors.

Key Access: **System**, **More**, **Color Palette**

Diagnostics Accesses the **Front Panel Test** menu key.

Key Access: **System**, **More**

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Front Panel Test

Allows you to verify the functionality of each front-panel key (except **Preset**). The number next to each key name increments once each time the key is pressed. Rotating the knobs causes the number of pulses to be counted. Press **ESC** to exit.

Key Access: **System**, **More**, **Diagnostics**

Restore Sys Defaults

Resets the "persistent" state variables to their defaults. These are values, such as the GPIB address, that are unaffected by a power cycle or a preset (when **Preset Type** is set to **Factory**.)

Key Access: **System**, **More**

Table 2-4 System Default Settings

Feature	Default Setting
Color Printing	On
Custom Printer, Color Capability	No
Custom Printer, Language	PCL3
Date Format	MDY
Display Viewing Angle	4
External Amplifier Gain	0 dBm
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Input Impedance	50 (Ohm)
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Print Orientation	Portrait
Printer Selection	Auto
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RS-232 Baud Rate	9600
RS-232 DTR Control	On (hardware pacing)
RS-232 Receive Pacing	None (data pacing)
RS-232 RTS Control	IBFULL (hardware pacing)

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Table 2-4 System Default Settings (Continued)

Feature	Default Setting
RS-232 Transmit Pacing	None (data pacing)
Speaker Volume	0
Time Date Display	On
Verbose SCPI	Off

Licensing Accesses the security system to enable licensing for individual options. For information on how to use this system, see the installation information for individual options in the measurement personalities' user's guides.

NOTE Currently, there are no measurement personality options available nor are any supplied with the EMC analyzer.

NOTE Not all options can be enabled using this system and there is no way to turn *off* an option through this system. Once an option has been licensed for a given analyzer, it cannot be transferred to a different analyzer.

Key Access: **System**, **More, More**

Option Accesses the Alpha Editor allowing you to enter a three character option number. To terminate the entry, press **Enter** or **Return**. An external keyboard may also be used for this entry. The option number will appear on the second line of the **Option** key. Key

Access: **System**, **More**, **Licensing**

License Key Accesses the Alpha Editor allowing you to enter the license key number. To terminate the entry, press **Enter** or **Return**. An external keyboard may also be used for this entry. The license key number will appear on the second line of the **License Key** menu key.

Key Access: **System**, **More**, **Licensing**

Activate Allows you to activate the option. When a valid option key number and license key number have been entered, press **Activate**. If your entry was correct, the option will be enabled and the message: `Option activated` will appear in the status line of your display. The option number and license key number will also be cleared from the **License Key** and **Option** key.

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If your entry was incorrect, the error message: `License key invalid` will appear in the status line of your display. The option number and license key number can be edited until they are correct.

Key Access: **System**, **More**, **Licensing**

NOTE It is possible to enable an option for which the analyzer is not yet configured. Therefore, the message `Option activated` does not mean that the option will immediately function. For a display of options that are enabled and for which the analyzer is properly configured, press **System**, **More**, **Show System**.

Personalities Accesses a display listing the personalities that are currently installed in the analyzer. Information about the personalities are under the column headings **Opt** (option number), **Name** (option name), **Version** (personality version), **Licensed** (whether or not the personality is licensed), and **Size** (personality memory). At the bottom of the display is a line showing the available memory for installing personalities.

Key Access: **System**, **More**, **More**

NOTE Some files are shared between personalities. If shared files are installed, a personality may require less room than is indicated on the display. The **Uninstall** key will not delete any shared file unless the personality being deleted is the last personality to use the shared file.

Prev Page Allows you to view a previous page of installed personalities. It is grayed out if you are on the first page or only one page exists.

Key Access: **System**, **More**, **More**, **Personalities**

Next Page Allows you to view the next page of installed personalities. It is grayed out if you are on the last page or only one page exists.

Key Access: **System**, **More**, **More**, **Personalities**

Install Allows you to install the latest version of the EMI Measurement Suite. For more information on this key, see the documentation that accompanies the measurement suite software.

Key Access: **System**, **More**, **More**, **Personalities**

Uninstall Allows you to uninstall a personality. Highlight the appropriate personality and press **Uninstall**, **Uninstall Now**. You will be prompted with the displayed message `If you are sure you want to uninstall, press Uninstall Now again`.

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Some personalities may not be deleted. If the attempt is made to do so, the message `Can't uninstall this program` will appear on the display.

Key Access: **System**, **More**, **More**, **Personalities**

Service

Accesses the **Service** menu keys. You must have a password to access this menu. For information, refer to the troubleshooting chapter in the *Agilent EMC Analyzers Service Guide*.

Key Access: **System**, **More**, **More**

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Tab Keys

The Tab keys are located below the display and are used to move between fields in the tables and forms.

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Trig

Accesses the menu of keys that allow you to select the sweep mode and trigger mode of the analyzer.

Free Run

New sweep starts as soon as possible after the current sweep ends.

Key Access: **Trig**

Video

Activates the trigger condition that allows the next sweep to start if the detected RF envelope voltage rises to a level set by the video trigger level. When **Video** is pressed, a line appears on the display. The analyzer triggers when the input signal exceeds the trigger level at the left edge of the display. You can change the trigger level using the step keys, the knob, or the numeric keypad

Key Access: **Trig**

NOTE This function is not available when the Resolution Bandwidth is less than 1 kHz. If a Resolution Bandwidth less than 1 kHz is selected while in Video Trigger mode, the Trigger mode changes to Free Run.

Line

Activates the trigger condition that allows the next sweep to be synchronized with the next cycle of the line voltage.

Key Access: **Trig**

NOTE Line trigger is not available when operating from a dc power source.

External
Pos Neg

Activates the trigger condition that allows the next sweep to start when the external voltage (connected to **GATE TRIG**/**EXT TRIG IN** on the rear panel) passes through approximately 1.5 volts. The external trigger signal must be a 0 V to +5 V TTL signal. This function also controls the trigger polarity (for positive or negative-going signals).

Key Access: **Trig**

Trig Delay
On Off

Allows you to set and turn on or off a delay, during which the analyzer will wait to begin a sweep after receiving an external trigger signal. This function is not available when **Gate** is on. **Trig Delay** is active when **External** is selected.

Key Access: **Trig**, **More**

NOTE This function is not available in Free Run or Video Trigger modes.

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Trig Offset On Off

Allows you to set and turn on or off an offset value from the trigger point of the sweep at which to begin storing data in the trace of the analyzer. The offset is specified as a function of time, and permits positive (pre trigger) and negative (post trigger) values to be specified.

Key Access: **Trig**, **More**

NOTE

This function is only available when in Zero Span. (It is grayed out when in swept span.) If this key is pressed in swept spans, the error message: `Trigger Offset unavailable in swept spans` is displayed in the status line. The value and state of Trigger Offset is remembered if Zero Span is exited and restored when Zero Span is reselected.

NOTE

This function is only available with Resolution Bandwidths of 1 kHz or greater. If this key is pressed when the Resolution Bandwidths is less than 1 kHz, the error message: `Trigger Offset unavailable in bandwidths < 1 kHz` is displayed in the status line. While Trigger Offset is on, it is not possible for the instrument to be set to a Resolution Bandwidth less than 1 kHz. Any attempt to do so will cause the error message: `Bandwidths <1 kHz unavailable with Trigger Offset on` to be displayed in the status line.

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⇑ (UP) and ⇓ (DOWN) Arrow Keys

The ⇑ (UP) and ⇓ (DOWN) arrow keys can be used to adjust the analyzer parameters incrementally. The arrow keys are also used to select between files or points on a list. These keys are also called step keys.

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Trace/View

Accesses the trace keys that allow you to store and manipulate trace information. Each trace is comprised of a series of data points in which amplitude information is stored. The analyzer updates the information for any active trace with each sweep.

Trace 1 2 3

Selects the menu keys used for trace 1, trace 2, or trace 3 functions. Press **Trace 1 2 3** until the number of the desired trace is underlined.

Key Access: **Trace/View**

CAUTION

When using normalization, the mode of traces 2 and 3 should not be changed.

Clear Write

Erases any data previously stored in the selected trace and continuously displays any signals during the sweep of the analyzer. This function is activated for trace 1 at power-on and by pressing **Preset**.

Key Access: **Trace/View**

Max Hold

Maintains the maximum level for each trace point of the selected trace (1, 2 or 3), and updates each trace point if a new maximum level is detected in successive sweeps.

Key Access: **Trace/View**

NOTE

Changing the vertical scale (**Amplitude**, **Scale Type**, Log or Lin), pressing **Restart**, turning averaging on (**BW/Avg**, **Average (On)**), or switching window in Zone Span (**Span**, **Zone**) restarts the held trace.

Min Hold

Maintains the minimum level for each trace point of the selected trace (1, 2 or 3), and updates each trace point if a new minimum level is detected in successive sweeps.

Key Access: **Trace/View**

NOTE

Changing the vertical scale (**Amplitude**, **Scale Type**, Log or Lin), pressing **Restart**, turning averaging on (**BW/Avg**, **Average (On)**), or switching window in Zone Span (**Span**, **Zone**) restarts the held trace.

View

Holds and displays the amplitude data of the selected trace. The trace register is not updated as the analyzer sweeps. If a trace is deactivated by pressing **Blank,** the stored trace data can be retrieved by pressing **View**.

Key Access: **Trace/View**

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Blank

Stores the amplitude data for the selected trace, and removes it from the display. The selected trace register will not be updated as the analyzer sweeps. This function is activated for traces 2 and 3 at power-on and by pressing **Preset** (when **Preset Type** is set to **Factory**.)

Key Access: **Trace/View**

Operations

Accesses the following **Operations** menu keys:

Key Access: **Trace/View**, **More**

1↔2

Exchanges the contents of the trace 1 register with the trace 2 register and puts trace 1 and 2 in view mode.

Key Access: **Trace/View**, **More**, **Operations**

2 – DL → 2

Subtracts the display line from trace 2 and places the result in trace 2 and puts trace 2 in view mode. The **2 – DL → 2** function is a math operation.

Key Access: **Trace/View**, **More**, **Operations**

2 ↔ 3

Exchanges the contents of trace 2 with trace 3 and puts trace 2 and 3 in view mode.

Key Access: **Trace/View**, **More**, **Operations**

1 → 3

Copies trace 1 into trace 3 and puts trace 3 in view mode.

Key Access: **Trace/View**, **More**, **Operations**

2 → 3

Copies trace 2 into trace 3 and puts trace 3 in view mode.

Key Access: **Trace/View**, **More**, **Operations**

Normalize

Accesses the following **Normalize** menu keys:

Key Access: **Trace/View**, **More**

Store Ref (1→ 3)

Copies trace 1 into trace 3. **Store Ref (1→ 3)** must be pressed before pressing **Normalize (On)**. If **Normalize (On)** is pressed before **Store Ref (1→ 3)**, the error message: `Store reference trace before turning on Normalize` is displayed in the status line, however Normalize has been activated.

Key Access: **View/Trac**, **More**, **Normalize**

Normalize On Off

Normalize (On) Activates the normalize function. On each sweep, the normalized trace (Trace 3) is subtracted from Trace 1 and the result is added to the normalized reference level. The display shows the result of the following calculation:

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Trace 1 – Normalized Trace + Normalized Reference Level

The trace data is normalized with respect to the normalized reference level, even if the value of the normalized reference level is changed. This function remains in effect on all subsequent sweeps until it is turned off.

CAUTION Trace 1 should be in clear write mode prior to setting normalize to on.

The normalize function is most useful for applying correction data to a trace while making a stimulus response measurement with a tracking generator. For example, connect the cables and a thru line, in place of the device to be measured, between the tracking generator and the analyzer input. Notice that the frequency response is not perfectly flat, showing the response of the cables, as well as the flatness of both the tracking generator and the analyzer.

Now press **Store Ref (1→ 3)**, **Normalize On**. Notice that the displayed trace is now flat, or normalized. The position of the normalized trace can now be moved to a different position on the display by changing the normalized reference position. This may be useful if the device to be tested has positive gain, such as an amplifier. Now replace the thru line with the device under test, and an accurate measurement of the gain or loss can be made.

Key Access: **Trace/View**, **More**, **Normalize**

Norm Ref Lvl Sets the level (in dB) of the normalized reference.

Key Access: **Trace/View**, **More**, **Normalize**

Norm Ref Posn Offsets the displayed trace without affecting the instrument gain or attenuation settings. This allows the displayed trace to be moved without decreasing measurement accuracy. The normalized reference position is indicated with a (>) character on the left side of the display and a (<) character on the right side of the display.

Key Access: **Trace/View**, **More**, **Normalize**

Ref Trace View Blank Allows you to view or blank the reference trace on the display.

Key Access: **Trace/View**, **More**, **Normalize**

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Max/Min On Off

Used to distinguish broadband signals from CW signals. The Max/Min function is valuable when the span is equal to or smaller than 400 times the resolution bandwidth.

When going from the Off to the On state, the detectors alternate between Peak and Sample for each sweep and place trace 2 into Max Hold and trace 3 into Min Hold. Trace 1 goes into clear write. Use Max/Min View to analyze the results. When going from the On to the Off state, trace 2 and trace 3 are blanked and trace 1 is put into clear write with the detector set to peak.

Key Access: **Trace/View, More**

Max/Min View

Accesses the following submenus. Max/Min View also places both trace 2 and trace 3 in view mode, sets the detector to peak and turns on the marker (if it isn't already on). Trace 1 is blanked.

Key Access: **Trace/View**, **More**

Max

Places trace 2 in view mode and trace 3 into blank mode.

Key Access: **Trace/View**, **More**, **Max/Min View**

Min

Places trace 3 in view mode and trace 2 in blank mode.

Key Access: **Trace/View**, **More**, **Max/Min View**

Max & Min

Places both trace 2 and trace 3 into view mode. If a signal in trace 2 (Max) has a larger amplitude than the trace 3 signal at the same amplitude, the signal has some broadband content. The wider the difference between the two amplitude levels, the more broadband content there is in the trace 2 signal. If the amplitudes of a signal in both traces are approximately the same, that signal is a narrowband (CW) signal.

Key Access: **Trace/View**, **More**, **Max/Min View**

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Viewing Angle

Controls the optimum viewing angle of the display. The viewing angle keys are located next to each other at the upper left-hand corner of the analyzer, bordering the display. These two keys allow you to adjust the intensity of the objects on the display so that it can be optimally viewed from different angles.

The **Viewing Angle** keys automatically repeat when they are held down.

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Zoom

Allows you to switch between the split-screen and full-sized display of the active window in zone span and other functions which support split-screen display modes. The active window is indicated by a solid green line surrounding the window.

If **Zoom** is pressed while in a non-split-screen display mode, it will activate the zone span mode. (See **Span**, **Zone**, and also **Next Window**.) If **Zoom** is pressed when zone markers are off, it will turn on zone markers and put the display in split-screen mode. (See **Span**, **Zone.**)

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