



Getting Started and
Quick Reference
Guide

HP 8591C
Cable TV Analyzer

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HP 8591C
Cable TV Analyzer

HP part number: 08591-90130 Supersedes: 08591-90106
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Notice.

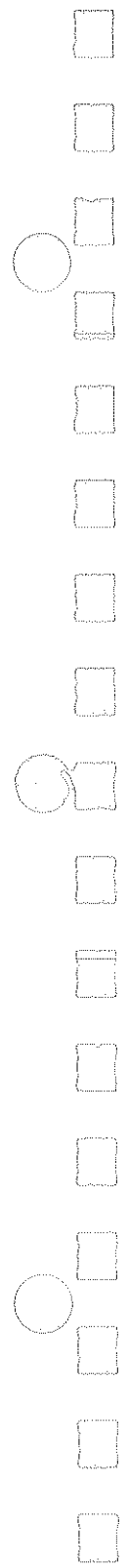
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Regulatory Information.

The regulatory information is in the calibration guide for your analyzer.

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About This Guide

About This Guide

Welcome to the *HP 8591C Cable TV Analyzer Getting Started and Quick Reference Guide*. This guide is divided into two basic sections:

Getting Started

Chapter 1, Chapter 2, and Chapter 3 instruct you how to prepare the cable TV analyzer for use, and introduce you to the cable TV analyzer and its features.

Quick Reference

Chapter 4 and Chapter 5 provide you with a quick reference for commonly used functions of the HP 8591C Cable TV Analyzer. Refer to the *HP 8591C Cable TV Analyzer Cable TV Measurements User's Guide* and *HP 8591C Cable TV Analyzer Spectrum Analyzer Reference User's Guide* for more detailed information.

Other HP 8591C Cable TV Analyzer Documentation

In addition to this guide, other printed guides will help you learn about the HP 8591C Cable TV Analyzer and locate information quickly.

HP 8590 E-Series Spectrum Analyzers and HP 8591C Cable TV Analyzer Calibration Guide

- Tells you how to test your spectrum analyzer to determine if the spectrum analyzer meets its specifications.

HP 8591C Cable TV Analyzer User's Guides

There are two user's guides included with the cable TV analyzer:

Cable TV Measurements

- Tells you how to make cable TV measurements with your cable TV analyzer.
- Describes the cable TV analyzer mode features.

Spectrum Analyzer Reference

- Tells you how to make measurements using the spectrum analyzer mode.
- Describes the spectrum analyzer mode features.
- Tells you what to do in case of a failure.

HP 8590 E-Series and L-Series Spectrum Analyzers and HP 8591C Cable TV Analyzer Programmer's Guide

Describes analyzer operation via a remote controller (computer).

Documentation Options

Option 910: Additional User's Documentation

Provides an additional copy of the user's guides, the calibration guide, and the quick reference guide.

Option 915: Assembly-Level and Component-Level Repair Service Guides

Describes troubleshooting and repair of the spectrum analyzer.

Option 915 consists of two manuals:

HP 8590 E-Series and L-Series Spectrum Analyzers, and HP 8591C Cable TV Analyzer Assembly-Level Repair Service Guide

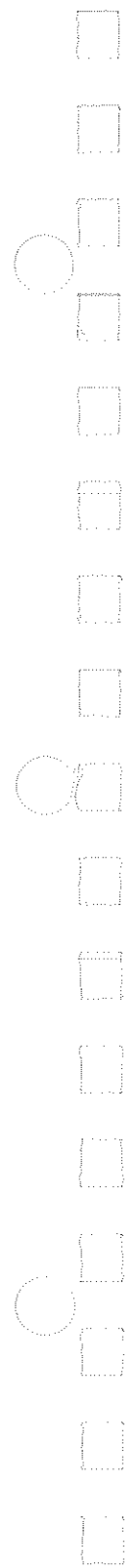
- Describes adjustment and assembly-level repair of the analyzer.

HP 8590 E-Series and L-Series Spectrum Analyzers, and HP 8591C Cable TV Analyzer Component-Level Repair Service Guide

- Provides information for component-level repair of the analyzer.

How to Order Guides

Each of the guides listed above can be ordered individually. To order, contact your local HP Sales and Service Office.



Before You Begin

Become familiar with the conventions and safety information provided in this chapter before you begin using your cable TV analyzer.

Conventions

This guide uses the following conventions:

Front-Panel Key	A boxed, uppercase name in this typeface represents a key physically located on the instrument.
Softkey	A boxed word written in this typeface indicates a "softkey," a key whose label is determined by the instrument's firmware.
Softkey <u>ON</u> <u>OFF</u> (ON)	A boxed word written in this typeface with the words ON and OFF can turn a function on or off. The underlined function is shown parenthetically.
Softkey <u>AUTO</u> <u>MAN</u> (AUTO)	A boxed word written in this typeface with the words AUTO and MAN can either be auto-coupled or have its value manually changed. The underlined function is shown parenthetically.
Screen Text	Text printed in this typeface indicates text displayed on the spectrum analyzer screen.

Safety Notes

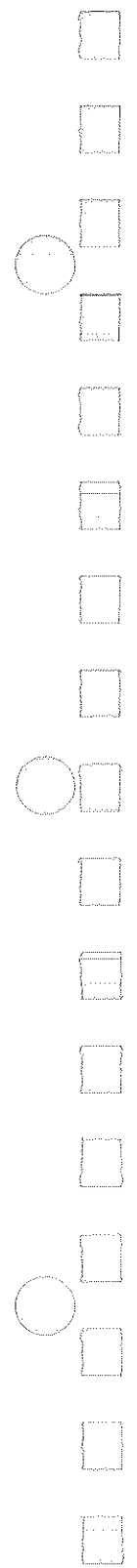
The following safety notes are used throughout this manual. Familiarize yourself with each of the notes and its meaning before operating this instrument.

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.

WARNING

Warning denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in injury or loss of life. Do not proceed beyond a *warning* sign until the indicated conditions are fully understood and met.



General Safety Considerations

WARNING

- *Before this instrument is switched on*, make sure it has been properly grounded through the protective conductor of the ac power cable to a socket outlet provided with protective earth contact.

Any interruption of the protective (grounding) conductor, inside or outside the instrument, or disconnection of the protective earth terminal can result in personal injury.

- There are many points in the instrument which can, if contacted, cause personal injury. Be extremely careful. Any adjustments or service procedures that require operation of the instrument with protective covers removed should be performed only by trained service personnel.
- No operator serviceable parts inside. Refer servicing to qualified personnel. To prevent electrical shock, do not remove covers.
- If this instrument is used in a manner not specified by Hewlett-Packard Co., the protection provided by the instrument may be impaired.

CAUTION

Before this instrument is switched on, make sure its primary power circuitry has been adapted to the voltage of the ac power source.

Failure to set the ac power input to the correct voltage could cause damage to the instrument when the ac power cable is plugged in.

Symbols Used on the Cable TV Analyzer



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.

“CE”

The CE mark is a registered trademark of the European Community. (If this mark is accompanied by a year, it indicates when the design was proven.)

Preparing for Use

Preparing for Use

What You'll Learn in This Chapter

This chapter describes the process of getting the cable TV analyzer ready to use when you have just received it. In this chapter you will:

- Perform an initial inspection
- Set the cable TV analyzer for the selected AC power source
- Turn the cable TV analyzer on for the first time
- Perform automatic self-calibration routines



Preparing Your Cable TV Analyzer for Use

Prepare the cable TV analyzer for use by performing the following procedure:

1. Perform an initial inspection.
2. Set the line voltage selector switch.
3. Check the fuse.
4. Connect the power cable.
5. Turn on the cable TV analyzer for the first time.
6. Perform the frequency and amplitude self-calibration routines.
7. Perform the tracking-generator self-calibration routine. (*For Option 011 only.*)

Detailed information for all of the steps in this process are included in this chapter in the following pages.

Reducing Damage Caused by ESD

The following suggestions may help reduce ESD damage that occurs during testing and servicing operations:

- Before connecting any coaxial cable to an cable TV analyzer connector for the first time each day, momentarily ground the center and outer conductors of the cable.
- Personnel should be grounded with a resistor-isolated wrist strap before touching the center pin of any connector and before removing any assembly from the unit.
- Be sure that all instruments are properly earth-grounded to prevent a buildup of static charge.

Refer to the *HP 8591C Cable TV Analyzer Spectrum Analyzer Reference User's Guide* for more information about static-safe accessories that can be obtained from Hewlett-Packard.

Step 1. Perform an initial inspection

Inspect the shipping container for damage. If the shipping container or cushioning material is damaged, keep it until you have verified that the contents are complete and you have tested the cable TV analyzer mechanically and electrically.

Table 2-1 contains the accessories shipped with the cable TV analyzer. If the contents are incomplete or if the cable TV analyzer does not pass the verification tests in the calibration guide, notify the nearest Hewlett-Packard office. If the shipping container is damaged or the cushioning material shows signs of stress, also notify the carrier. Keep the shipping materials for the carrier's inspection. The HP office will arrange for repair or replacement without waiting for a claim settlement.

If the shipping materials are in good condition, retain them for possible future use. You may wish to ship the cable TV analyzer to another location or to return it to Hewlett-Packard for service. See "Returning the Cable TV Analyzer for Service" in Chapter 9 of the *HP 8591C Cable TV Analyzer Spectrum Analyzer Reference User's Guide* for more information about shipping materials.

NOTE

Complete instructions for installing your cable TV analyzer in an equipment rack are provided in a service note that is included with Options 908 and 909 Rack Mounting Kits.



Table 2-1. Accessories Supplied with the Cable TV Analyzer

Description	HP Part Number	Comments
Cable TV RF/video measurements personality	HP 85721A	Shipped with analyzer.
Cable, 75 Ω , BNC	5062-6452	Shipped with analyzer.
Memory card holder	9222-1545	Shipped with analyzer.
Memory card, 128 kilobyte	HP 82215A	Shipped with analyzer.
Adapter, BNC (m) to Type F (f)	1250-2477	Shipped with analyzer. <i>(Option 107 only)</i>
Coupler	0955-0704	Shipped with analyzer. <i>(Option 107 only)</i>
Power cable	See Table 2-3.	Shipped with analyzer.
Reference connector	1250-1499	Shipped connected between the 10 MHz REF OUT and the EXT REF IN on the rear panel of the analyzer.
Soft carrying pack	9211-7102	Shipped with analyzer.
Documentation:		
<ul style="list-style-type: none"> ● HP 8591C Cable TV Analyzer Spectrum Analyzer Reference User's Guide ● HP 8591C Cable TV Analyzer Cable TV Measurements User's Guide ● HP 8590 E-Series Spectrum Analyzers and HP 8591C Cable TV Analyzer Calibration Guide ● HP 8591C Cable TV Analyzer Getting Started and Quick Reference Guide (this book) ● HP 8590 E-Series and L-Series Spectrum Analyzers and HP 8591C Cable TV Analyzer Programmer's Guide ● HP 8590 E-Series and L-Series Spectrum Analyzers, and HP 8591C Cable TV Analyzer Assembly-Level Repair Service Guide ● HP 8590 E-Series and L-Series Spectrum Analyzers, and HP 8591C Cable TV Analyzer Component-Level Repair Service Guide 	*	Shipped with analyzer.
	*	Shipped with analyzer.
	*	Shipped with analyzer.
	*	Shipped with analyzer.
	*	Shipped with analyzer. <i>(Option 915 only)</i>
	*	Shipped with analyzer. <i>(Option 915 only)</i>
* Contact your nearest sales and service center for current part number.		

Step 2. Set the line voltage selector switch

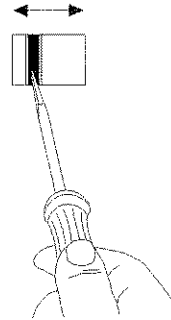
The cable TV analyzer is a portable instrument and requires no physical installation other than connection to a power source.

CAUTION

Do not connect AC power until you have verified that the line voltage is correct, the proper fuse is installed, and the line voltage selector switch is properly positioned, as described in the following paragraphs. Damage to the equipment could result.

Table 2-2. Power Requirements

Characteristic	115 V Requirement	230 V Requirement
Input Voltage	90 to 132 V rms	198 to 264 V rms
Frequency	47 to 440 Hz	47 to 66 Hz
Power	<500 VA, <180 W	<500 VA, <180 W



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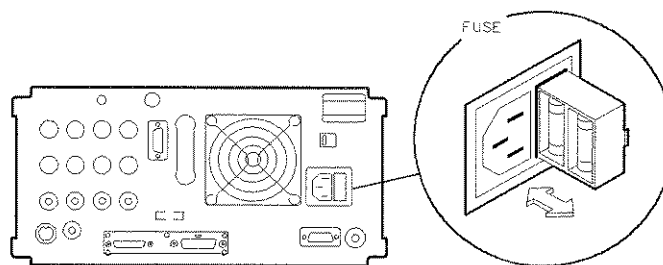
Figure 2-1. Setting the Line Voltage Selector Switch

CAUTION

Before connecting the cable TV analyzer to the power source, you must set the rear-panel voltage selector switch correctly to adapt the cable TV analyzer to the power source. An improper selector switch setting can damage the cable TV analyzer when it is turned on.

Set the instrument's rear-panel voltage selector switch to the line voltage range (115 V or 230 V) corresponding to the available AC voltage. See Figure 2-1. Insert a small screwdriver or similar tool in the slot and slide the switch up or down so that the proper voltage label is visible.

Step 3. Check the fuse



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Figure 2-2. Checking the Line Fuse

The recommended fuse is size 5 by 20 mm, rated F5A, 250 V (IEC approved). This fuse may be used with input line voltages of 115 V or 230 V. Its HP part number is 2110-0709.

With an input line voltage of 115 V an alternate fuse can be used. In areas where the recommended fuse is not available, a size 5 by 20 mm, rated fast blow, 5 A, 125 V (UL/CSA approved) fuse may be substituted. Its HP part number is 2110-0756.

The line fuse is housed in a small container beside the rear-panel power connector. See Figure 2-2. The container provides space for storing a spare fuse, as shown in the figure.

To check the fuse, insert the tip of a screwdriver in the slot at the middle of the container and pry gently to extend the container.

NOTE

The fuse container is attached to the line module; it cannot be removed.

The fuse closest to the cable TV analyzer is the fuse in use. If the fuse is defective or missing, install a new fuse in the proper position and reinsert the fuse container.

Preparing Your Cable TV Analyzer for Use

Step 4. Connect the power cable

The cable TV analyzer is equipped with a three-wire power cable, in accordance with international safety standards. When connected to an appropriate power line outlet, this cable grounds the instrument cabinet.

WARNING

Failure to ground the cable TV analyzer properly can result in personal injury. Before turning on the cable TV analyzer, you must connect its protective earth terminals to the protective conductor of the main power cable. Insert the main power cable plug only into a socket outlet that has a protective earth contact. **DO NOT** defeat the earth-grounding protection by using an extension cable, power cable, or autotransformer without a protective ground conductor.

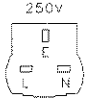
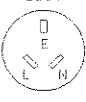
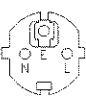

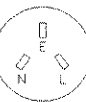
If you are using an autotransformer, make sure its common terminal is connected to the protective earth contact of the power source outlet socket.

Various power cables are available to connect the cable TV analyzer to the types of AC power outlets unique to specific geographic areas. The cable appropriate for the area to which the cable TV analyzer is originally shipped is included with the unit. You can order additional AC power cables for use in different areas. Table 2-3 lists the available AC power cables, illustrates the plug configurations, and identifies the geographic area in which each cable is appropriate.



Preparing for Use
Preparing Your Cable TV Analyzer for Use

Table 2.3. AC Power Cables Available

PLUG TYPE **	CABLE HP PART NUMBER	PLUG DESCRIPTION	CABLE LENGTH CM (INCHES)	CABLE COLOR	FOR USE IN COUNTRY
250V 	8120-1351 8120-1703	Straight* BS1363A 90°	229 (90) 229 (90)	Mint Gray Mint Gray	Great Britain, Cyprus, Nigeria, Singapore, Zimbabwe
250V 	8120-1369 8120-0696	Straight* NZSS198/ASC112 90°	201 (79) 221 (87)	Gray Gray	Argentina, Australia, New Zealand, Mainland China
250V 	8120-1688 8120-1682	Straight* CEE7-Y11 90°	201 (79) 201 (79)	Mint Gray Mint Gray	East and West Europe, Central African Republic, United Arab Republic (unpolarized in many nations)
125V 	8120-1346 8120-1538	Straight* NEMA5-15P 90°	203 (80) 203 (80)	Black Black	United States Canada, Japan (100 V or 200 V), Brazil,
	8120-1378	Straight* NEMA5-15P	203 (80)	Jade Gray	Colombia, Mexico,
	8120-4753	Straight	250 (90)	Jade Gray	Philippines,
	8120-1521	90°	203 (80)	Jade Gray	Saudia Arabia,
	8120-4754	90°	230 (90)	Jade Gray	Taiwan
250V 	8120-5182 8120-5181	Straight* NEMA5-15P 90°	200 (78) 200 (78)	Jade Gray Jade Gray	Israel
* Part number for plug is industry identifier for plug only. Number shown for cable is HP Part Number for complete cable, including plug. ** E = Earth Ground; L = Line; N = Neutral.					

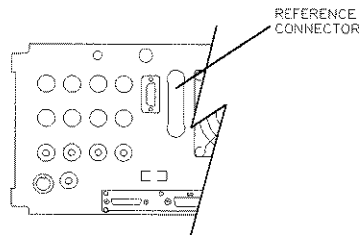
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Step 5. Turn on the cable TV analyzer for the first time

When you turn the cable TV analyzer on for the first time, you should perform frequency and amplitude self-calibration routines to generate correction factors and indicate that the unit is functioning correctly. The cable TV analyzer should be allowed to warm up for 30 minutes before performing the self-calibration routines. See "When Is Self-Calibration Needed?" in Chapter 3 for helpful guidelines on how often the self-calibration routines should be performed.

Perform the following steps:

1. Ensure the reference connector is connected between the 10 MHz OUTPUT and EXT REF IN rear-panel connectors. See Figure 2-3.



pu126e1

Figure 2-3. Reference Connector

If you wish to use an external 10 MHz source as the reference frequency, disconnect the reference connector from the rear-panel and connect an external reference source to the EXT REF IN connector on the rear panel.

2. Press **LINE**.

After a few seconds, the screen displays the firmware revision date in the YYMMDD format. For example, 930522 indicates May 22, 1993. The baud rate (RS232: XXXX) is also displayed.

If your cable TV analyzer is equipped with Option 021 (HP-IB interface), the appropriate interface address (HP-IB ADRS: XX) in place of the baud rate, also appears on the screen.

NOTE

Record the firmware date and keep it for reference. If you should ever need to call Hewlett-Packard for service or with any questions regarding your cable TV analyzer, it will be helpful to have the firmware date readily available.

Step 6. Perform the frequency and amplitude self-calibration routines

1. To meet cable TV analyzer specifications, allow a 30 minute warmup before attempting to make any calibrated measurements. Be sure to calibrate the cable TV analyzer only *after* the cable TV analyzer has met the operating temperature conditions.
2. Connect the 75 Ω coaxial cable between the front-panel CAL OUT and the INPUT 75 Ω connector.

NOTE

Remove all connections to the GATE TRIGGER INPUT rear-panel connector before performing the self-calibration routines.

3. Perform the frequency and amplitude self-calibration routine by pressing **CAL** and **CAL FREQ & AMPTD**.

During the frequency routine, CAL: SWEEP, CAL: FREQ, and CAL: SPAN and CAL: FM GAIN + OFFSET are displayed as the sequence progresses.

During the amplitude routine, CAL; AMPTD, CAL: 3 dB BW, CAL: ATTEN, and CAL: LOGAMP are displayed as the sequence progresses. CAL: DONE appears when the routine is completed. Any failures or discrepancies produce a message on the screen. See **Error Messages**.

4. When the frequency and amplitude self-calibration routines have been completed successfully, store the correction factors by pressing **CAL STORE**.

The self-calibration routines calibrate the cable TV analyzer by generating correction factors. The softkey **CAL STORE** stores the correction factors in the area of cable TV analyzer memory that is stored when the cable TV analyzer is turned off; the cable TV analyzer will automatically apply these factors in future measurements. If **CAL STORE** is not pressed, the correction factors remain in effect until the cable TV analyzer is turned off.

Step 7. Perform the tracking-generator self-calibration routine (Option 011 only)

This procedure is for cable TV analyzers equipped with Option 011 only, the tracking-generator self-calibration routine should be performed prior to using the tracking generator.

NOTE

Since the tracking generator calibration routine depends on the accuracy of the absolute amplitude level of the cable TV analyzer, the cable TV analyzer amplitude calibration should be done prior to using **CAL TRK GEN**.

1. To calibrate the tracking generator, connect the tracking generator output (RF OUT 75 Ω) to the cable TV analyzer INPUT 75 Ω connector, using an appropriate cable.

NOTE

A low-loss cable should be used for accurate calibration. Use the 75 Ω cable shipped with the cable TV analyzer.

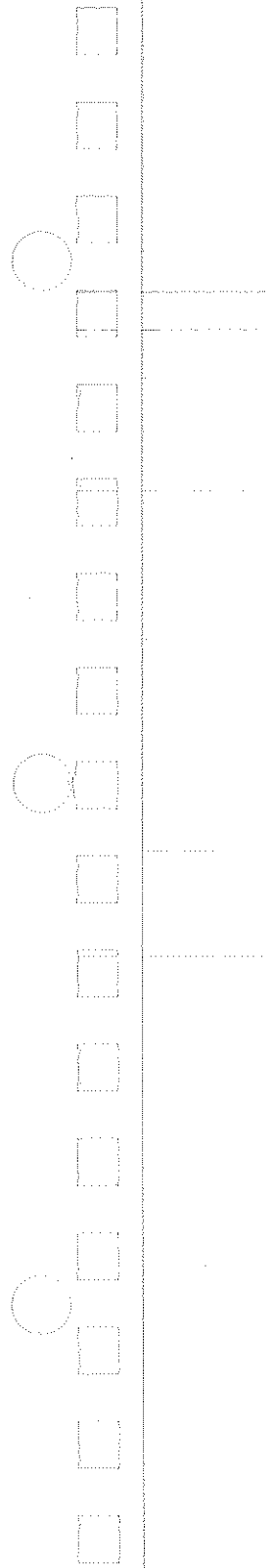
Preparing Your Cable TV Analyzer for Use

2. Press the following cable TV analyzer keys: **CAL**, **More 1 of 4**, **More 2 of 4**, then **CAL TRK GEN**. **TG SIGNAL NOT FOUND** will be displayed if the tracking generator output is not connected to the cable TV analyzer input.
3. To store this data in the area of cable TV analyzer memory that is stored when the cable TV analyzer is turned off, press **CAL STORE**.

When the self-calibration routines have been completed successfully, the cable TV analyzer is ready for normal operation.

Preparing for Use

Preparing Your Cable TV Analyzer for Use



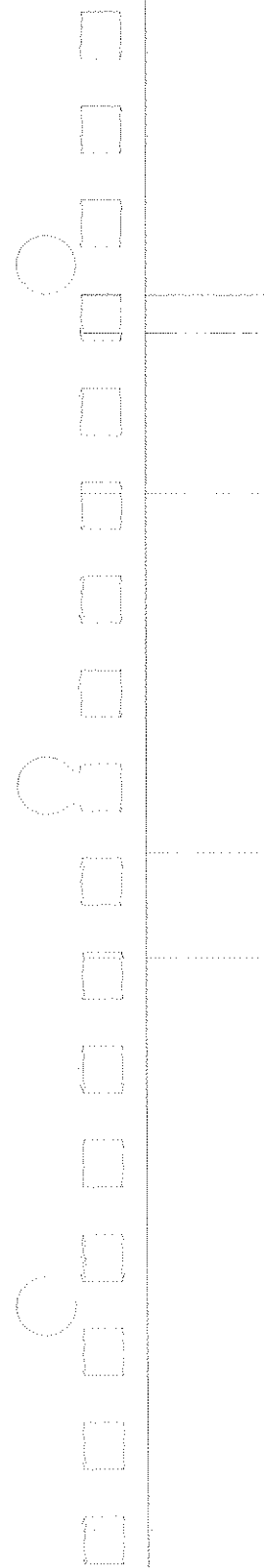
Quick Tour

Quick Tour

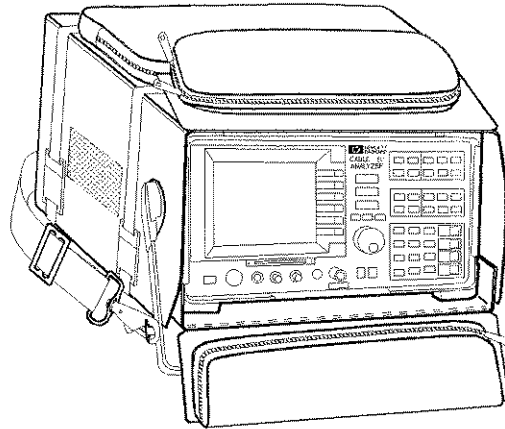
What You'll Learn in This Chapter

This chapter introduces the basic functions and features of the HP 8591C Cable TV Analyzer. In this chapter, you will:

- Get acquainted with the front-panel and rear-panel features.
- Get acquainted with the menus and softkeys
- Learn about screen annotation
- Learn about the cable TV measurements and system monitor personality
- Make a basic measurement using the calibration signal
- Learn how to improve measurement accuracy by using self-calibration routines.
- Learn how to insert the memory card and about the memory-card battery.
- Learn about the cable TV analyzer battery.



Getting Acquainted with the HP 8591C Cable TV Analyzer



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Figure 3-1. HP 8591C Cable TV Analyzer

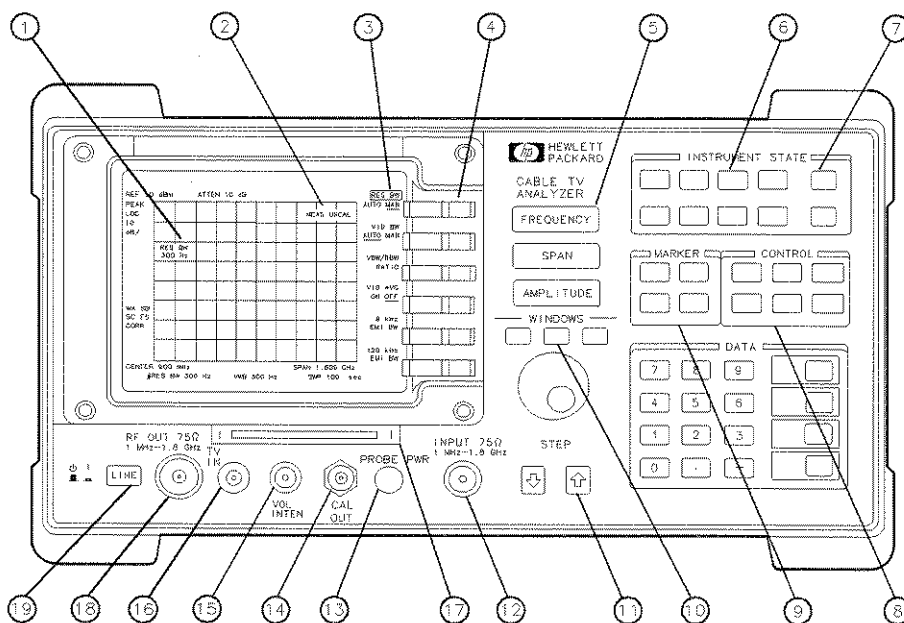
The HP 8591C Cable TV Analyzer is a small, lightweight test instrument that covers the 1 MHz to 1.8 GHz frequency range. The HP 8591C Cable TV Analyzer is a portable instrument ideal for field use. It comes in a durable carrying case that makes it easy to transport and protects it from moisture and dirt. The cable TV analyzer is fully operational within the case so you never need to remove it.

The HP 8591C Cable TV Analyzer comes equipped with the HP 85721A Cable TV Measurements and System Monitor Personality installed. The Cable TV Measurements and System Monitor Personality is a downloadable program (DLP) consisting of measurement routines useful for cable television applications.

Getting Acquainted with the HP 8591C Cable TV Analyzer

Front-Panel Features

The following section provides a brief overview of front-panel features illustrated in Figure 3-2. Refer to *HP 8591C Cable TV Analyzer Spectrum Analyzer Reference User's Guide* for more information about these features.



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Figure 3-2. Front-Panel Feature Overview

Quick Tour
**Getting Acquainted with the
 HP 8591C Cable TV Analyzer**

1	Active function block	is the space on the screen that indicates the active function.
2	Message block	is the space on the screen where MEAS UNCAL and the asterisk (*) appear.
3	Softkey labels	are the annotation on the screen next to the unlabeled keys.
4	Softkeys	are the unlabeled keys next to the screen.
5	FREQUENCY , SPAN , and AMPLITUDE	are the three large dark-gray keys that activate the primary cable TV analyzer functions and access menus of related functions.
6	INSTRUMENT STATE	functions affect the state of the entire cable TV analyzer.
7	COPY	prints or plots screen data.
8	CONTROL	functions access menus that allow you to adjust the resolution bandwidth, adjust the sweep time, store and manipulate trace data, and control the instrument display.
9	MARKER	functions control the markers, read out frequencies and amplitudes along the cable TV-analyzer trace, automatically locate the signals of highest amplitude, and keep a signal at the marker position in the center of the screen.
10	WINDOWS	keys, turn on the windows display mode.
11	DATA keys, STEP keys, and knob	allow you to change the numeric value of an active function.
12	INPUT 75 Ω	is the signal input for the cable TV analyzer.
13	PROBE PWR	provides power for high-impedance ac probes or other accessories.
14	CAL OUT	provides a calibration signal of 300 MHz at 29 dBmV.
15	VOL-INTEN	The VOL-INTEN knob changes the brightness of the display and the volume of the internal speaker.
16	TV IN	Provides the input for the built-in Television-tuner, Option 107.
17	Memory card reader	reads from or writes to a memory card.
18	RF OUT 75 Ω	supplies a source output for the built-in tracking generator. For Option 011 the output frequency range of the cable TV analyzer is 1 MHz to 1.8 Ghz.
19	LINE	turns the instrument on and off.

**Getting Acquainted with the
HP 8591C Cable TV Analyzer**

Rear-Panel Features

The following section provides a brief overview of rear-panel features illustrated in Figure 3-3. Refer to *HP 8591C Cable TV Analyzer Spectrum Analyzer Reference User's Guide* for more information about these features.

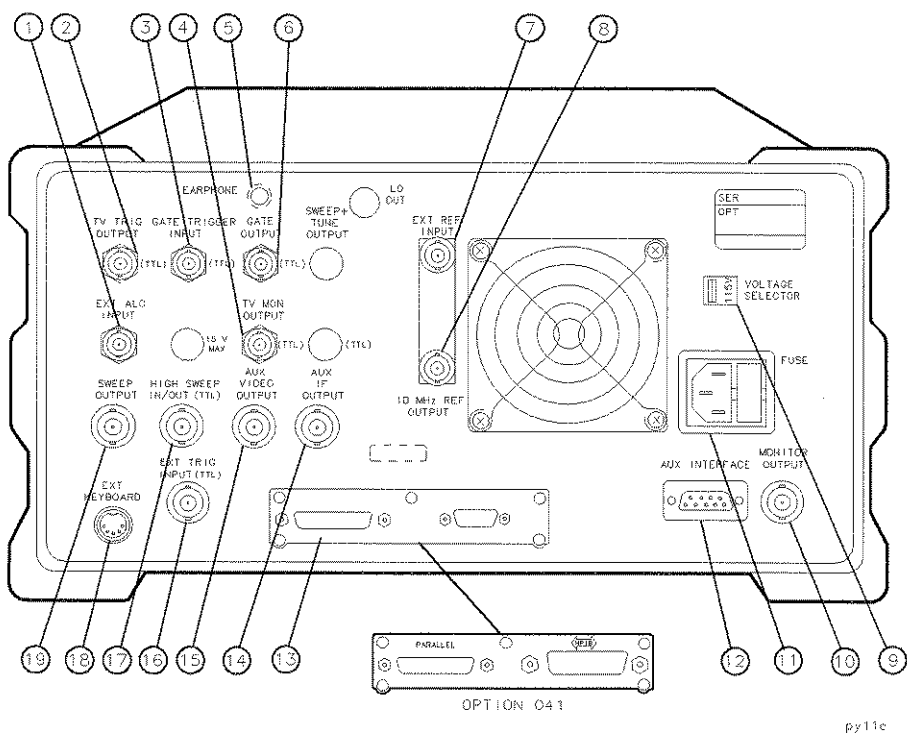


Figure 3-3. Rear-Panel Feature Overview

Quick Tour
**Getting Acquainted with the
 HP 8591C Cable TV Analyzer**

1	EXT ALC INPUT	allows the use of an external detector or power meter for automatic leveling control of the tracking generator. <i>For Option 011 only.</i>
2	TV TRIG OUTPUT (TTL)	provides TV trigger output using TTL and negative-edge triggering. <i>Standard except for Option 701.</i>
3	GATE TRIGGER INPUT (TTL)	accepts a TTL signal which acts as the gate trigger. <i>For Option 107 only.</i>
4	TV MON OUTPUT	connector provides a connection for an external television monitor.
5	EARPHONE	connector provides a connection for an earphone jack instead of using the internal speaker.
6	GATE OUTPUT (TTL)	provides a TTL signal which indicates gate status when the when the gate is in edge trigger mode. <i>For Option 107 only.</i>
7	EXT REF IN	accepts an external frequency source to provide the 10 MHz, -2 to +10 dBm frequency reference used by the cable TV analyzer.
8	10 MHz REF OUTPUT	provides a 10 MHz, 0 dBm minimum, time-based reference signal.
9	VOLTAGE SELECTOR	adapts the unit to the power source: 115 V or 230 V.
10	MONITOR OUTPUT	drives an external monitor with a signal (spectrum analyzer display) that has a 15.7 kHz horizontal synchronizing rate.
11	Power input	is the input for the line power source.
12	AUX INTERFACE	provides a nine-pin "D" subminiature connector for control of external devices.
13	Interface connectors	interfaces for RS-232 and parallel (standard) and HP-IB and parallel (Option 041) interface buses.
14	AUX IF OUTPUT	is a 50 Ω , 21.4 MHz IF output that is the down-converted signal of the RF input of the cable TV analyzer.
15	AUX VIDEO OUTPUT	provides detected video output (before the analog-to-digital conversion) proportional to vertical deflection of the trace.
16	EXT TRIG INPUT (TTL)	accepts the positive edge of an external voltage input that triggers the cable TV analyzer internal sweep source.
17	HIGH SWEEP IN/OUT (TTL)	indicates when the cable TV analyzer is sweeping or can be grounded to stop sweeping.
18	EXT KEYBOARD	connector is provided with the interface connector.
19	SWEEP OUTPUT	provides a voltage ramp proportional to the sweep and the cable TV analyzer span (0 V to 10 V).

Data Controls

Data controls are used to change values for functions such as center frequency, start frequency, resolution bandwidth, and marker position.

The data controls will change the active function in a manner prescribed by that function. For example, you can change center frequency in fine steps with the knob, in discrete steps with the step keys, or to an exact value with the number/units keypad. For example, resolution bandwidth, which can be set to discrete values only, is changed to predetermined values with any of the data controls.

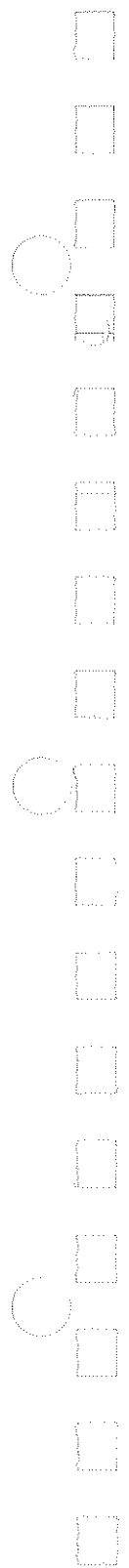
Hold Key

Deactivate functions with **HOLD** which is found under the **DISPLAY** key. The active function readout is blanked, indicating that no entry will be made inadvertently by using the knob, step keys, or keypad. (Pressing a function key re-enables the data controls.)

Knob

The knob allows continuous change of functions such as center frequency, reference level, and marker position. It also changes the values of many functions that change in increments only. Clockwise rotation of the knob increases values. For continuous changes, the extent of alteration is determined by the size of the measurement range; the speed at which the knob is turned does not affect the rate at which the values are changed.

The knob enables you to change the center frequency, start or stop frequency, or reference level in smooth scrolling action. The smooth scrolling feature is designed to move the trace display to the latest function value as the knob is turned. When either center frequency or reference level is adjusted, the signal will shift right or left or up or down with the rotation of the knob before a new sweep is actually taken. An asterisk is placed in the message block (the upper right-hand corner of the cable TV analyzer display) to indicate that the data on-screen does not reflect data at the current setting.



NOTE

When using the knob to change frequency or amplitude settings, the trace data is shifted. Therefore, when using **MAX HOLD A**, **MAX HOLD B**, or **MIN HOLD C**, moving the center frequency with the knob will not simulate a drifting signal.

Number/Units Keypad

The number/units keypad allows entry of exact values for many of the cable TV analyzer functions. You may include a decimal point in the number portion. If not, the decimal point is placed at the end of the number.

Numeric entries must be terminated with a units key. The units keys change the active function in a manner prescribed by that function. For example, the units keys for frequency span are **GHz**, **MHz**, **kHz**, and **Hz**, whereas the units for reference level are **+dBm**, **-dBm**, **mV**, and **μV**.

NOTE

If an entry from the number/units keypad does not coincide with an allowed function value (for example, that of a 12 MHz bandwidth), the cable TV analyzer defaults to the nearest allowable value.

Step Keys

The step keys allow discrete increases or decreases of the active function value. The step size depends upon the cable TV analyzer measurement range or on a preset amount. Each press results in a single step change. For those parameters with fixed values, the next value in a sequence is selected each time a step key is pressed. Changes are predictable and can be set for some functions. Out-of-range values or out-of-sequence values will not occur using these keys.

Quick Tour

**Getting Acquainted with the
HP 8591C Cable TV Analyzer**

Fine-Focus Control

The fine-focus control is located on the side of the cable TV analyzer. Use the following procedure to adjust the fine-focus control:

1. Adjust the front-panel intensity control for a comfortable viewing intensity.
2. Use an adjustment tool or small screwdriver to access the fine-focus adjustment. See Figure 3-4. Adjust for a focused display.

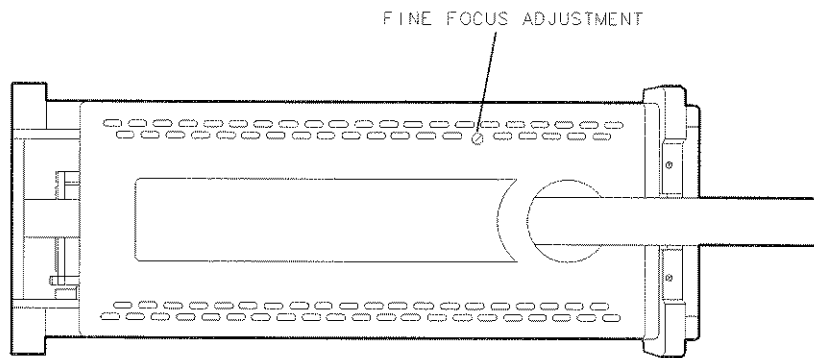
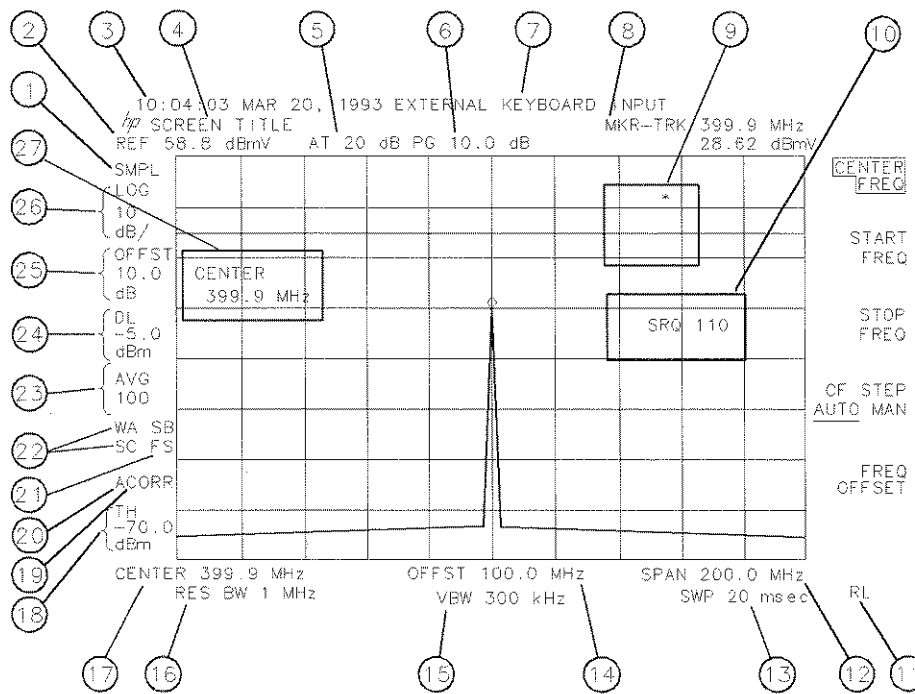


Figure 3-4. Adjusting the Fine Focus

Screen Annotation

Figure 3-5 shows an example of the annotation that may appear on a cable TV analyzer screen. The screen annotation is referenced by numbers and is listed in Table 3-1. The function key column indicates which front-panel key or softkey activates the function related to the screen annotation. Refer to the *HP 8591C Cable TV Analyzer Spectrum Analyzer Reference User's Guide* for more information on a specific function key.

Refer to Table 3-2 for the screen annotation codes for trace, trigger, and sweep modes.



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Figure 3-5. Screen Annotation

Table 3-1. Screen Annotation

Item	Description	Function Key
1	detector mode	DETECTOR SMP PK
2	reference level	REF LVL
3	time and date display	Time Date
4	screen title	Change Title
5	RF attenuation	ATTEN AUTO MAN
6	preamplifier gain	EXTERNAL PREAMPG
7	external keyboard entry	Refer to "External Keyboard" in the <i>HP 8591C Cable TV Analyzer Spectrum Analyzer Reference User's Guide</i> .
8	marker readout	MKR , MKR → , MKR FCTN , or PEAK SEARCH
9	measurement uncalibrated or function-in-progress messages	AUTO COUPLE
10	service request	See Appendix A.
11	remote operation	See "LOCAL" in the <i>HP 8591C Cable TV Analyzer Spectrum Analyzer Reference User's Guide</i> .
12	frequency span or stop frequency	SPAN , STOP FREQ
13	sweep time	SWP TIME AUTO MAN
14	frequency offset	FREQ OFFSET
15	video bandwidth	VID BW AUTO MAN
16	resolution bandwidth	RES BW AUTO MAN
17	center frequency or start frequency	CENTER FREQ, START FREQ
18	threshold	THRESHLD ON OFF
19	correction factors on	CORRECT ON OFF

Table 3-1. Screen Annotation (continued)

Item	Description	Function Key
20	amplitude correction factors on	See "Using Amplitude-Correction Factors" in the <i>HP 8591C Cable TV Analyzer Spectrum Analyzer Reference User's Guide</i> .
21	trigger	TRIG
22	trace mode	TRACE
23	video average	VID AVG ON OFF
24	display line	DSP LINE ON OFF
25	amplitude offset	REF LVL OFFSET
26	amplitude scale	SCALE LOG LIN
27	active function block	Refer to the description of the softkey function that was activated.

Table 3-2. Screen Annotation for Trace, Trigger, and Sweep Modes

Trace Mode	Trigger Mode	Sweep Mode
W = clear write (traces A/B/C)	F = free run	C = continuous
M = maximum hold (traces A/B)	L = line	S = single sweep
V = view (traces A/B/C)	V = video	
S = store blank (traces A/B/C)	E = external	
M = minimum hold (trace C)	T = TV	

More about annotations

- Item 21 refers to the trigger and sweep modes of the cable TV analyzer. The first letter ("F") indicates the cable TV analyzer is in free-run trigger mode. The second letter ("S") indicates the cable TV analyzer is in single-sweep mode.
- Item 22 refers to the trace modes of the cable TV analyzer. The first letter ("W") indicates that the cable TV analyzer is in clear-write mode. The second letter is "A," representing trace A. The trace B trace mode is "SB", indicating trace B ("B") is in the store-blank mode ("S"). The trace mode annotation for trace C is displayed under the trace mode annotation of trace A. In Figure 3-5, the trace C trace mode is "SC", indicating trace C ("C") is in the store blank mode ("S").
- The WINDOWS display mode splits the screen into two separate displays. Only one of these displays is active at a time. The currently active window will have a solid line around the graticule rather than a broken line. The complete annotation is not available for each window because of space limitations.
- The display will be compressed slightly when using the PAL or NTSC format for the MONITOR OUTPUT, instead of the normal format. The PAL and NTSC formats have less vertical resolution than the cable TV analyzer display. The top and bottom of the cable TV analyzer display are compressed slightly so that all of the information can be fit into the size required by the MONITOR OUTPUT.

Menu and Softkey Overview

The keys labeled AMPLITUDE, FREQUENCY, CAL, and MKR are all examples of front-panel keys. Pressing most front-panel keys accesses menus of functions that are displayed along the right side of the display. These menus are called softkey menus.

Softkey menus list functions other than those accessed directly by the front-panel keys. To activate a function on the softkey menu, press the unlabeled key immediately to the right of the annotation on the screen. The unlabeled keys next to the annotation on the display screen are called softkeys.

Front-panel keys are designated with a box around the key label, for example, **AMPLITUDE**; softkeys are designated by shading on the key label, for example, **REF LVL**. The softkeys that are displayed depend on which front-panel key is pressed and which menu level is enabled.

If a softkey function's value can be changed, it is called an active function. The function label of the active function appears in inverse video. For example, press **AMPLITUDE**. This calls up the softkey menu of related amplitude functions. Note the function labeled **REF LVL** appears in inverse video. **REF LVL** also appears in the active function block, indicating that it is the active amplitude function and can now be changed using any of the data entry controls.

A softkey with ON and OFF in its label can be used to turn the softkey's function on or off. To turn the function on, press the softkey so that ON is underlined. To turn the function off, press the softkey so that OFF is underlined.

A function with AUTO and MAN in the label can either be auto-coupled or have its value manually changed. The function's value can be changed manually by pressing the softkey until MAN is underlined, and then changing its value with the numeric keypad, knob, or step keys. To auto-couple a function, press the softkey so that AUTO is underlined.

A summary of all front-panel keys and their related softkeys can be found in the *HP 8591C Cable TV Analyzer Spectrum Analyzer Reference User's Guide*.

Cable TV Measurements and System Monitor Personality

The HP 85721A Cable TV Measurements and System Monitor Personality is a downloadable program (DLP) consisting of measurement routines useful for cable television applications. The cable TV RF/video measurements personality is installed in the HP 8591C Cable TV Analyzer.

The tests included in the cable TV measurements and system monitor personality are:

- Visual carrier level and visual-to-aural level difference test.
- Visual carrier frequency and visual-to-aural frequency difference test.
- Carrier-to-noise test.
- Composite second order (CSO) test.
- Composite triple beat (CTB) test.
- Hum test.
- Depth of modulation test.
- Color tests (chroma-luma delay inequality, differential gain, differential phase).
- In-channel frequency response test.
- FM deviation test.
- Cross modulation test.
- System frequency response test.
- View ingress test.
- View co-channel test.

Each measurement typically performs the following tasks:

- Sets the analyzer to the state required for making the measurement.
- Prompts for any adjustments or values.
- Performs the measurement.
- Displays the measurement results.
- Provides the ability to print the measurement results for FCC proof of performance.

Refer to the *HP 8591C Cable TV Analyzer Cable TV Measurements User's Guide* for detailed information about cable TV measurements.

Making a Measurement

CAUTION

Do not exceed the maximum input power.

The maximum input power for the HP 8591C is +72 dBmV (0.2 watt) continuous, 100 VDC (with 10 dB or more attenuation).

Let's begin using the cable TV analyzer by measuring an input signal. Since the 300 MHz calibration signal (CAL OUT) is readily available, we will use it as our input signal.

You cannot hurt the cable TV analyzer by using the calibration signal and pressing any of the keys described in this section. Don't be afraid to play with the knob, step keys, or number/units keypad. (If you have experimented with other keys and wish to return to a known state, press the green **PRESET** key.)

1. First, turn the instrument on by pressing **LINE**. Wait for the power-up process to complete.
2. Press the green **PRESET** key.
3. Connect the cable TV analyzer CAL OUT to the INPUT 75 Ω with an appropriate cable.
4. Set the frequency.

Press the **FREQUENCY** key. **CENTER** appears on the left side of the screen, indicating that the center-frequency function is active. The **CENTER FREQ** softkey label appears in inverse video to indicate that center frequency is the active function. The active function block is the space on the screen within the graticule where the center frequency messages appear. Functions appearing in this block are active: their values can be changed with the knob, step keys, or number/units keypad. Set the center frequency to 300 MHz with the DATA keys by pressing 300 **MHz**. The knob and step keys can also be used to set the center frequency.

5. Set the span.

Press **SPAN**. **SPAN** is now displayed in the active function block, and the **SPAN** softkey label appears in inverse video to indicate it is the active function. Reduce the span to 20 MHz by using the knob, pressing the down key (**↓**), or pressing 20 **MHz**.

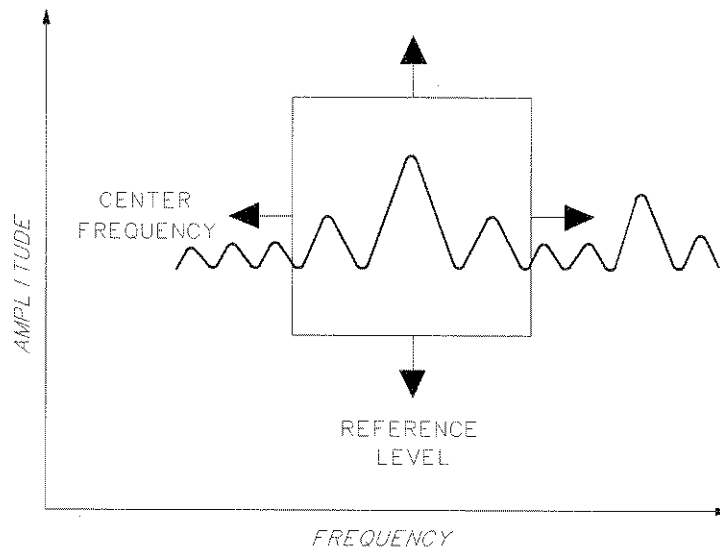
6. Set the amplitude.

Making a Measurement

When the peak of a signal does not appear on the screen, it may be necessary to adjust the amplitude level on the screen. Press **AMPLITUDE**. **REF LEVEL .0 dBm** appears in the active function block. The **REF LVL** softkey label appears in inverse video to indicate that reference level is the active function. The reference level is the top graticule line on the display and is set to 0.0 dBm. Changing the value of the reference level changes the amplitude level of the top graticule line.

If desired, use the reference level function to place the signal peak on the screen using the knob, step keys, or number/units keypad. (Marker functions determine the frequency and amplitude of a signal.)

Figure 3-6 demonstrates the relationship between center frequency and reference level. The box in the figure represents the cable TV analyzer screen. Changing the center frequency changes the horizontal placement of the signal on the screen. Changing the reference level changes the vertical placement of the signal on the screen. Increasing the span increases the frequency range that appears horizontally on the screen.



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Figure 3-6. Relationship between Frequency and Amplitude

7. Set the marker.

You can place a diamond-shaped marker on the signal peak to find the signal's frequency and amplitude.

To activate a marker, press the **(MKR)** key (located in the MARKER section of the front panel). The **MARKER NORMAL** label appears in inverse video to show that the marker is the active function. Turn the knob to place the marker at the signal peak.

You can also use the **(PEAK SEARCH)** key, which automatically places a marker at the highest point on the trace.

Readouts of marker amplitude and frequency appear in the active function block and in the upper-right corner of the display. Look at the marker readout to determine the amplitude of the signal.

If another function is activated, the frequency and amplitude can still be identified by looking at the marker readout in the upper-right corner of the screen.

Measurement Summary

1. Connect the cable TV analyzer CAL OUT to the INPUT 75 Ω and press the **PRESET** key.
2. Set the center frequency by pressing the following keys: **FREQUENCY**, 300 **MHz**.
3. Set the span by pressing the following keys: **SPAN**, 20 **MHz**.
4. The calibration signal is 20 dB (two graticule divisions) below the top of the screen using these cable TV analyzer settings. If desired, adjust the reference level: press **AMPLITUDE** to activate the reference level, and use the knob or step keys to change the reference level.
5. Determine the amplitude and frequency of the signal. You can either press **PEAK SEARCH** or press **MKR** and move the marker to the signal peak. Read the amplitude and frequency. The display screen should look like the one in Figure 3-7. Frequency is displayed horizontally, and amplitude (power) is displayed vertically.

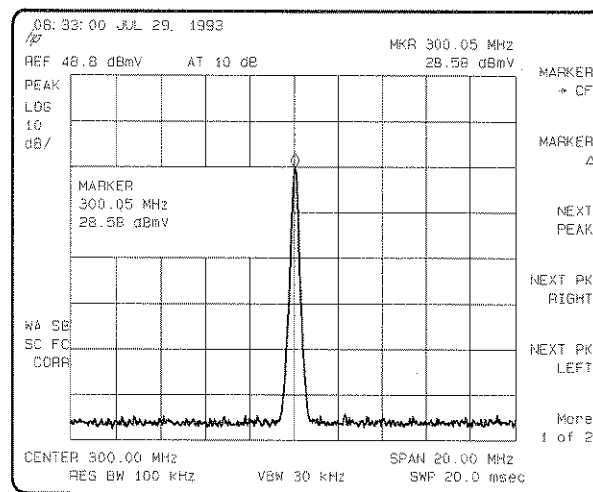


Figure 3-7. Reading the Amplitude and Frequency

Improving Accuracy with Self-Calibration Routines

Data from the self-calibration routine is necessary for cable TV analyzer operation. Executing the self-calibration routine regularly ensures that the cable TV analyzer is using current calibration data that improves the cable TV analyzer frequency and amplitude accuracy. Press the **CAL** key to view the self-calibration routine menus. The last softkey on this menu, labeled **More 1 of 4**, provides access to additional self-calibration functions. For more detailed information on the self-calibration softkeys, refer to Chapter 7 of the *HP 8591C Cable TV Analyzer Spectrum Analyzer Reference User's Guide*.

The self-calibration routines add correction factors to internal circuitry. The addition of the correction factors is required to meet frequency and amplitude specifications.

When the correction factors are added to internal circuitry, **CORR** (corrected) appears on the left side of the screen.

Warmup Time

In order for the cable TV analyzer to meet its specifications, allow the cable TV analyzer to warm up for 30 minutes after being turned on before attempting to make any calibrated measurements. Be sure to calibrate the cable TV analyzer only *after* it has met operating temperature conditions.

Calibrating the Analyzer

The cable TV analyzer frequency and amplitude self-calibration routines are initiated by the **CAL FREQ & AMPTD** softkey in the menu located under the **CAL** key.

1. To calibrate the instrument, connect the cable TV analyzer CAL OUT to the INPUT 75 Ω connector with an appropriate cable.

NOTE

A low-loss cable should be used for accurate calibration. Use the 75 Ω cable shipped with the cable TV analyzer.

2. On the cable TV analyzer, press **CAL** and **CAL FREQ & AMPTD**. **Cal signal not found** will be displayed if CAL OUT is not connected to the cable TV analyzer input. The frequency and amplitude self-calibration functions take approximately 5 minutes to finish (9 minutes with Option 130), at which time the internal adjustment data is in working RAM.
3. To save this data in the area of cable TV analyzer memory that is saved when the cable TV analyzer is turned off, press **CAL STORE**.

NOTE

To interrupt the calibration routines started by **CAL FREQ**, **CAL AMPTD**, or **CAL FREQ & AMPTD**, press **PRESET**, **CAL**, **More 1 of 4**, and **CAL FETCH**. **CAL FETCH** retrieves the previous correction factors. Improperly interrupting the self-calibration routines may result in corrupt correction factors. (If this occurs, press **CAL FREQ & AMPTD** to rerun the frequency and amplitude self-calibration routines.)

Improving Accuracy with Self-Calibration Routines

The frequency and amplitude self-calibration functions can be done separately by using the **CAL FREQ** or **CAL AMPTD** softkeys instead of **CAL FREQ & AMPTD**.

NOTE

If the frequency calibration **CAL FREQ** and the amplitude calibration **CAL AMPTD** self-calibration routines are used, the frequency calibration should be performed before the amplitude calibration, unless the frequency data is known to be accurate.

If the self-calibration routines cannot be performed, see "Check the basics" in Chapter 9 of the *HP 8591C Cable TV Analyzer Spectrum Analyzer Reference User's Guide*.

Calibrating the Tracking Generator (Option 011 only)

In order for the tracking generator to meet its specifications, allow the cable TV analyzer to warm up for 30 minutes after being turned on before attempting to make any calibrated measurements. Be sure to calibrate the cable TV analyzer and the tracking generator only *after* the cable TV analyzer has met operating temperature conditions.

NOTE

Since the tracking-generator self-calibration routine uses the absolute amplitude level of the cable TV analyzer, the cable TV analyzer amplitude should be calibrated prior to using **CAL TRK GEN**.

1. To calibrate the tracking generator, connect the tracking generator output (RF OUT 75 Ω) to the cable TV analyzer INPUT 75 Ω connector, using an appropriate cable and adapters.

Improving Accuracy with Self-Calibration Routines**NOTE**

A low-loss cable should be used for accurate calibration. Use the 75 Ω cable shipped with the cable TV analyzer.

2. Press the following cable TV analyzer keys: **CAL**, **More 1 of 4**, **More 2 of 4**, and **CAL TRK GEN**. **TG SIGNAL NOT FOUND** will be displayed if the tracking generator output is not connected to the cable TV analyzer input.
3. To save this calibration data in the area of cable TV analyzer memory that is saved when the cable TV analyzer is turned off, press **CAL** then **CAL STORE**.

When Is Self-Calibration Needed?

While it is difficult to provide general advice for your specific measurement needs, the following suggestions may help you decide when to use the self-calibration features:

1. Perform the frequency and amplitude self-calibration routines whenever the instrument experiences significant environmental changes such as temperature (± 5 °C), humidity, shock, or vibration (such as may occur during shipping or transport). This is especially important if the frequency and amplitude self-calibration routines were performed last in a different environment.
2. If the environment is relatively stable (for example, a lab environment), use **CAL FREQ & AMPTD** monthly. After being turned off overnight, the cable TV analyzer will need to warm up, but should not require self-calibration.
3. To achieve optimal amplitude accuracy for relative measurements:
 - a. Keep the cable TV analyzer in a stable environment.
 - b. Use **CAL FREQ & AMPTD** before beginning the first measurement.
 - c. Keep the cable TV analyzer turned on between measurements.
 - d. Do not use **CAL FREQ & AMPTD** before subsequent measurements (the amplitude drift is normally smaller than the self-calibration uncertainty).
4. If you change the input signal for EXT REF IN, run the frequency and amplitude self-calibration routines using CAL OUT. Amplitude calibration is required to improve IF centering.
5. If accurate self-calibration is needed temporarily in a different environment, use **CAL FREQ & AMPTD**, but do not press **CAL STORE**. The temporary correction factors will be used until the cable TV analyzer is turned off or until **CAL FETCH** is pressed.

Printing or Plotting

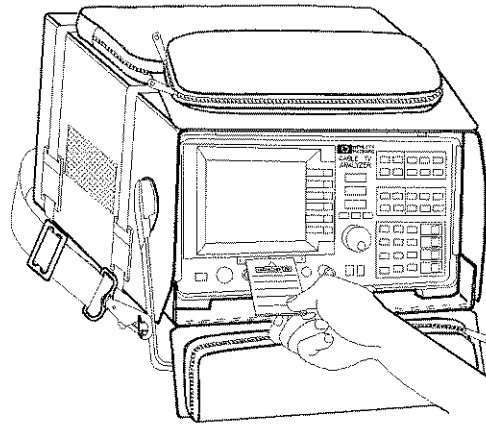
You may wish to obtain a permanent record of data displayed on the cable TV analyzer screen. This can be done using the **COPY** key of the analyzer, and a printer or plotter.

Refer to the *HP 8591C Cable TV Analyzer Spectrum Analyzer Reference User's Guide* for more information about printing or plotting.

Memory Card Insertion and Battery Replacement

Use the following information to ensure that the memory card is inserted correctly. Improper insertion causes error messages to occur, but generally does not damage the card or instrument. Care must be taken, however, not to force the card into place. The cards are easy to insert when installed properly.

1. Locate the arrow printed on the card's label.
2. Insert the card with its arrow matching the raised arrow on the bezel around the card-insertion slot. See Figure 3-8.



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Figure 3-8. Inserting the Memory Card

3. Press the card into the slot. When correctly inserted, about 19 mm (0.75 in) of the card is exposed from the slot.

Changing the Memory Card Battery

It is recommended that the memory card battery be changed every 2 years. The battery is a lithium commercial CMOS type battery, part number CR 2016 or HP part number 1420-0383.

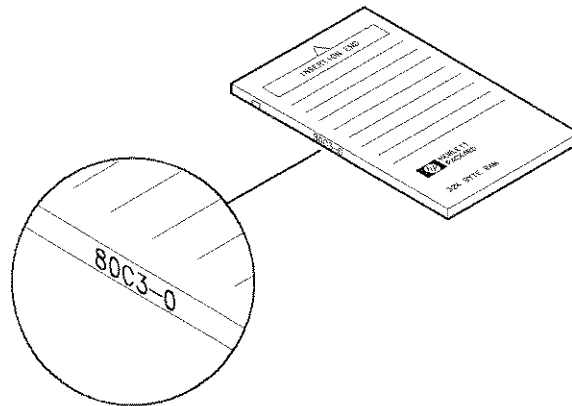
NOTE

The minimum lifetime of the battery (under ordinary conditions) is more than 2 years.

The date that the memory card battery was installed is either engraved on the side of the memory card or written on a label on the memory card.

If the memory card does not have a label with the date that the battery was installed, use the date code engraved on side of the memory card. The date code engraved on the memory card consists of numbers and letters engraved in the black plastic on the side of the memory card. See Figure 3-9. The first number indicates the year, the following two characters indicate the month, and the following number indicates the week in the month that the memory card battery was installed. For example, 80C3 indicates the battery was installed in the third week in October in 1988.

Memory Card Insertion and Battery Replacement



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Figure 3-9. Memory Card Battery Date Code Location

Procedure to Change the Memory Card Battery

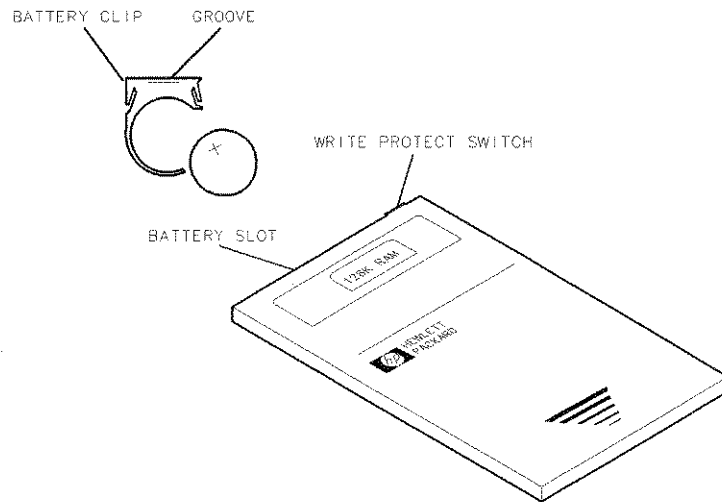
The battery is located beside the card's write-protect switch on the end opposite the connector.

CAUTION

The battery power enables the memory card's memory to retain data. You can lose the data when the battery is removed. Replace the battery while the card is installed in a powered-up instrument.

1. Locate the groove along the edge of the battery clip. See Figure 3-10.
2. Gently pry the battery clip out of the card. The battery fits within this clip.
3. Replace the battery, making sure the plus (+) sign on the battery is on the same side as the plus (+) sign on the clip.
4. Insert the battery clip into the memory card, holding the clip as oriented in Figure 3-10. (Face the "open" edge of the clip toward the write-protect switch on the memory card.)
5. Write the date that the battery was replaced on the memory card label. This will help you to remember when the battery should be replaced.

Memory Card Insertion and Battery Replacement



pu125c

Figure 3-10. Memory Card Battery Replacement

Analyzer Battery Information

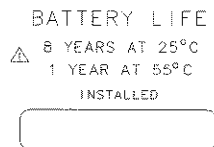
The HP 8591C cable TV analyzers use a 3.6 V lithium battery to enable the cable TV analyzer memory to retain data. The date when the battery was installed is on a label on the rear panel of the cable TV analyzer. See Figure 3-11.

The minimum life expectancy of the battery is 8 years at 25 °C, or 1 year at 55 °C. If you experience problems with the battery or the recommended time period for battery replacement has elapsed, see "Returning the Cable TV Analyzer for Service" in Chapter 9 of the *HP 8591C Cable TV Analyzer Spectrum Analyzer Reference User's Guide*.

If you wish to replace the battery yourself, you can purchase the service documentation that provides all necessary test and maintenance information. The battery is soldered onto the cable TV analyzer processor board.

You can order the service documentation for an HP 8591C cable TV analyzer through your HP Sales and Service office. The documentation is described under "Options" in the front of the *HP 8591C Cable TV Analyzer Spectrum Analyzer Reference User's Guide*.

After replacing the cable TV analyzer battery, write the date of battery replacement on the rear-panel label.



pu132e

Figure 3-11. Rear-Panel Battery Information Label

Softkey Descriptions

Softkey Descriptions

What You'll Find in This Chapter

This chapter describes functions and controls of the cable TV analyzer. The front-panel keys and softkey functions are listed alphabetically followed by a brief description. Refer to the *HP 8591C Cable TV Analyzer Spectrum Analyzer Reference User's Guide* and *HP 8591C Cable TV Analyzer Cable TV Measurements User's Guide* for more detailed information.

Brief descriptions for service functions have also been included in this chapter. However, for more detailed descriptions and information about the use of each function, refer to the *HP 8590 E-Series and L-Series Spectrum Analyzers*, and *HP 8591C Cable TV Analyzer Assembly-Level Repair Service Guide*. A listing of all service calibration and service diagnostic functions has been provided in the following "Service Functions" section.

All softkeys and their relationship to the front-panel keys are illustrated in Chapter 5.



Service Functions

Two types of functions are available for service use only:

- Service calibration functions
- Service diagnostic functions

These service functions are designed for service use only. However, brief descriptions for each function are provided in this chapter. For more detailed descriptions and information about the use of each function, refer to the service guide.

Service documentation can be obtained by ordering Option 915 through your HP Sales and Service office. Option 915 is described in more detail in the *HP 8591C Cable TV Analyzer Spectrum Analyzer Reference User's Guide*.

Service Calibration Functions

Service Cal accesses the following service calibration softkeys:

CAL TIMEBASE
EDIT FLATNESS
EXECUTE TITLE
EXIT
Flatness Data
IDNUM
INIT FLT
SET ATTN ERROR
STOR PWR ON UNITS

Service Diagnostic Functions

Service Diag accesses the following diagnostic softkeys:

⊕ LOCK ON OFF

+10V REF DETECTOR

-10V REF DETECTOR

2v REF DETECTOR

ALC TEST (Option 011 only)

ANALYZER GAINS

AUXB

BINARY SPAN

COARSE TUNE DAC

DACS

DISPLAY CAL DATA

DROOP

FINE TUNE DAC

FM COIL DRIVE

FM GAIN

Service Diagnostic
Functions (continued)

FM OFFST
FM SPAN
FREQ DIAG
FRQ DISC NORM OFF
GND REF DETECTOR
MAIN COIL DR
MAIN SPAN
STP GAIN ZERO
SWEEP RAMP
SWEEP TIME DAC
X FINE TUNE DAC

Cable TV Analyzer Functions

% AM
ON OFF

determines the percent of amplitude modulation of the largest displayed signal and its two sidebands. The sidebands are assumed to be entirely from amplitude modulation. If there are differences in the sideband amplitude, the larger value is used. The measurement runs continuously, re-executing at the end of each sweep.

Key Access: **MEAS/USER**

φ LOCK
ON OFF

turns off the analyzer phase locking. The counter is turned off so frequency correction is no longer done at the start of each sweep. Turning the phase locking off increases measurement speed, but it decreases frequency accuracy. This is a service diagnostic function and is for service use.

Key Access: **CAL**

+10V REF
DETECTOR

displays the output of the +10 V reference from the A7 analog interface assembly as a horizontal line at the top graticule. This is a service diagnostic function and is for service use only.

Key Access: **CAL**

-10V REF
DETECTOR

displays the output of the -10 V reference from the A7 analog interface assembly as a horizontal line at the bottom graticule. This is a service diagnostic function and is for service use only.

Key Access: **CAL**

2v REF
DETECTOR

displays the output of the 2 V reference produced on the A16 processor/video assembly as a horizontal line at the top graticule. This is a service diagnostic function and is for service use only.

Key Access: **CAL**

9 kHz
EMI BW

allows a 6 dB resolution bandwidth of 9 kHz. This bandwidth is useful when performing electromagnetic interference (EMI) measurements.

Key Access: **BW**

120 kHz
EMI BW

allows a 6 dB resolution bandwidth of 120 kHz. This bandwidth is useful when performing electromagnetic interference (EMI) measurements.

Key Access: **BW**

200 Hz
EMI BW

For Option 130 only.

allows a 6 dB resolution bandwidth of 200 Hz. This bandwidth is useful when performing electromagnetic interference (EMI) measurements.

Key Access: **BW**

A<-->B

exchanges the contents of the trace A register with the trace B register and puts trace A in view mode.

Key Access: **TRACE**

A-B - A
ON OFF

when ON is underlined, subtracts the data in trace B from the measured data in trace A. A minus sign (-) appears between the trace A status and the trace B status in the screen annotation while the function is active.

Key Access: **TRACE**

A - C

copies trace A into trace C.

Key Access: **TRACE**

Cable TV Analyzer Functions

ABCDEF

accesses the softkey menu for selecting screen title characters A through F.

Key Access: **CAL**, **CONFIG**, **DISPLAY**, **RECALL**, or **SAVE**

ABORT

allows you to stop the measurement.

Key Access: **SYSTEM MEAS**

**ACPGRAPH
ON OFF**

turns the adjacent channel power graph ON or OFF. With ACPGRAPH ON, the ACP ratio graph is calculated and displayed and the numeric results are not displayed. The value of the ACP ratio is displayed at the selected marker frequency offset from the center frequency. This graph function is used after doing an adjacent channel power measurement with the **ADJ CHAN POWER** or **ADJ CHAN PWR extd** softkeys.

Key Access: **MEAS/USER**

**ADJ CHAN
POWER**

measures the power leakage into the adjacent channels and calculates the adjacent channel power ratio of both the upper and lower channels, with respect to the total power. The total power of the carrier is displayed. The adjacent channel power ratios of both channels are also displayed and the larger number is marked with a \wedge . (Vertical lines on the display indicate the bandwidth edges of the three different channels being measured.)

Key Access: **MEAS/USER**

ADJ CHAN
PWR extd

measures the power leakage into the adjacent channels and calculates the adjacent channel power ratio of both the upper and lower channels, with respect to the reference channel. **ADJ CHAN POWER extd** has an extended dynamic range compared with **ADJ CHAN POWER**. The extended range is measured by taking two different sweeps with different reference levels and combining the trace data. The displayed dynamic range is 104 dB and the log scale is set to 13 dB/ division.

Key Access: **MEAS/USER**

AIR

allows you to select the AIR tune configuration. The AIR is also called off-the-air or over-the air tune configuration. It refers to signals that are broadcast over the air and received with an antenna. The AIR frequency assignments are defined in the Federal Communications Commission's (FCC) channel identification plan, part 76.612.

Key Access: **TV RECEIVER**

ALC MTR
INT XTAL

Option 011 only.

activates the automatic leveling control (ALC) function for internal (INT) leveling or external (XTAL or MTR) leveling. The external leveling input (located on the rear panel of the analyzer) can be used with a power meter or crystal that has a positive or negative voltage output. See specifications and characteristics in your calibration guide for the leveling input characteristics. External leveling increases the amplitude accuracy by improving the effective source match. The meter (MTR) position narrows ALC loop bandwidth so an HP power meter can be used.

Key Access: **AUX CTRL**

Cable TV Analyzer Functions

ALC TEST *Option 011 only.*
breaks the leveling loop of the automatic leveling control in the tracking generator. This is a service diagnostic function and is for service use only. Refer to the service guide for more information.

Key Access: **CAL**

**ALL DLP
— CARD**
saves all the downloadable programs and key definitions that are in analyzer memory onto the memory card. If the downloadable program was stored using a prefix, the file name for the downloadable program consists of d(prefix)_(register number). If no prefix was specified, the data is stored with the file name d_(register number).

Key Access: **SAVE**

ALL TESTS
allows you to select all tests for the currently selected channel.

Key Access: **SYSTEM MEAS**

Amp Cor
accessed by **CAL**. **Amp Cor** accesses the menus for entering and editing the current amplitude-correction factors.

Key Access: **CAL**

AMP COR
when accessed by **SAVE**, **AMP COR** stores the current amplitude-correction factors table in analyzer memory or on the memory card. When accessed by **RECALL**, **AMP COR** recalls the amplitude-correction factors table from either analyzer memory or the memory card. Amplitude-correction factors are saved with an "a" before the memory-card file name. Screen titles are not recalled with the data. Refer to "To Save a Limit-Line Table or Amplitude Correction Factors" in Chapter 3 for more information.

Key Access: **RECALL** or **SAVE**

AMP COR
ON OFF

turns the current amplitude-correction factors on or off.

Key Access: **CAL**

AMPLITUDE

activates the reference level function and accesses the amplitude menu. The softkeys accessed when you press **AMPLITUDE** change reference level, input attenuation, vertical scale, mixer level, amplitude units, input impedance, and amplitude offset.

Amptd
Units

accesses the softkeys that change the amplitude units. The amplitude units can be changed by pressing **dBm**, **dBmV**, **dBuV**, **Volts**, or **Watts**.

Key Access: **AMPLITUDE**

ANALOG+
ON OFF

turns on the analog+ display mode. This is a digital implementation of an analog display, combining the advantages of both types of displays. The display is made up of 401 horizontal points or trace elements. In the analog+ display mode each trace element can display from 1 to 40 dots, or measurements.

The following table shows commands that are not available with Analog+ operation.

Cable TV Analyzer Functions**Table 4-1. Commands Not Available with Analog+ Operation**

Command	Description
A <--> B	exchanges trace A and trace B
A-B -- A ON OFF	puts the difference between trace A and trace B into trace A
B-DL --B	puts the difference between trace B and the display line in trace B
CLEAR WRITE B	initially erases trace B and then displays it continuously
CLEAR WRITE C	initially erases trace C and then displays it continuously
DEMOD ON OFF	turns AM or FM demodulation on and off
FFT	changes zero span data to the frequency domain using an FFT
MKR CNT ON OFF	turns the marker counter on and off
MK PAUSE ON OFF	stops the analyzer sweep at the marker for the defined of the dwell time
MAX HOLD A	updates trace A with the maximum level at each point, each sweep
MAX HOLD B	updates trace B with the maximum level at each point, each sweep
MIN HOLD C	updates trace C with the minimum level at each point, each sweep
NORMLIZE ON OFF	the difference between A and B is added to the display line and put into trace A
MK TRACK ON OFF	moves the signal closest to the marker to center screen and keeps it centered
SPAN ZOOM	finds the highest signal peak, turns on marker track, and activates span
THRESHLD ON OFF	sets a lower boundary to the active trace
TRACKING PEAK	starts a routine that adjusts tracking to peak the tracking generator signal
VID AVG ON OFF	starts a routine that digitally averages display signals and noise
VIEW A	holds and displays the trace A data when used after blanking trace A
VIEW B	holds and displays the trace B data
VIEW C	holds and displays the trace C data

Key Access: **DISPLAY**

Cable TV Analyzer Functions**ANALYZER
ADDRESS***Option 041 only.*

allows you to set the HP-IB address of the analyzer. The analyzer address is set to 18 by pressing **DEFAULT CONFIG**.

Key Access: **CONFIG**

**ANALYZER
GAINS**

displays the current value of the gain for various functional blocks within the analyzer. The gain values will vary depending on the current analyzer settings. This is a service diagnostic function and is for service use only. Refer to the service guide for more information.

Key Access: **CAL**

**Analyzer
Input**

allows you to select an external pad, an external preamplifier, and total power at the input to the analyzer. An external 50 Ω to 75 Ω pad is used for analyzers with 50 Ω input impedances. The **EXT PAD YES NO** function compensates for amplitude loss caused by an external pad.

An external preamplifier is used for the Carrier-to-Noise measurement.

The external pad and preamplifier settings are stored in non-volatile analyzer memory. This means that the analyzer retains the selection, even when power is turned off, until a new selection is made.

The **TTL PWR @ INPUT** measures the total input power and displays the result at the bottom of the screen.

Press **CABLE TV ANALYZER**, **Setup** to access **Analyzer Input**.

Key Access: **CABLE TV ANALYZER**

Cable TV Analyzer Functions

**ANNOTATN
ON OFF**

turns the screen annotation on or off. However, softkey annotation will remain on the screen. The screen annotation may not be required for prints or plots, or during remote operation. Refer to the **HOLD** softkey description regarding softkey annotation.

Key Access: **DISPLAY**

**APND
CAT ITEM**

starts the DLP editor function and allows the highlighted item from the catalog of analyzer memory to be appended to the end of the item that is currently in the analyzer DLP editor memory. If the item to be appended will not fit in the available memory space, it will not be appended.

Key Access: **RECALL** or **SAVE**

**ATTEN
AUTO MAN**

sets the input attenuation in 10 dB increments. The analyzer input attenuator, which is normally coupled (linked) to the reference level control, reduces the power level of the analyzer input signal at the input mixer. The attenuator is recoupled when **AUTO** is underlined.

CAUTION

To prevent damage to the input mixer, the power level at the input mixer must not exceed +72 dBmV. To prevent signal compression, power at the input to the input mixer must be kept below 39 dBmV.

NOTE

To protect the mixer from possible damage, 0 dB RF attenuation (no input power reduction to the mixer) can be selected only from the number/units keypad.

Key Access: **AMPLITUDE** or **AUTO COUPLE**

**AUTO
ALL**

couples the following functions: resolution bandwidth, video bandwidth, attenuation, sweep time, center-frequency step, video bandwidth, and video-bandwidth to resolution-bandwidth ratio.

Key Access: **AUTO COUPLE**

AUTO COUPLE

accesses the softkey menu of functions that can be coupled. (Coupled functions are functions that are linked: if one function is changed, the other function is changed.) The functions that can be auto-coupled are listed below:

- Resolution bandwidth couples to span.
- Video bandwidth couples to resolution bandwidth when the analyzer has a video-bandwidth to resolution-bandwidth ratio of 0.3.
- Sweep time couples to span, resolution bandwidth, and video bandwidth.
- RF attenuation couples to reference level.
- Center frequency step size couples to 10% of span.

**Aux Conn
Control**

accesses the softkey menu used to control the auxiliary outputs and input. The auxiliary outputs are controlled by pressing **CNTL A 0 1**, **CNTL B 0 1**, **CNTL C 0 1**, and **CNTL D 0 1**. The status of the auxiliary input (control line I), can be displayed on the analyzer screen with **DISPLAY CNTL I**.

Key Access: **AUX CTRL**

Cable TV Analyzer Functions

AUX CTRL

accesses the softkey menu used for control of the auxiliary interface connector. **AUX CTRL** accesses demodulation functions.

For Option 011: it accesses tracking generator functions.

AUXB

displays the voltage level present at an unused input to the Test Point MUX circuitry located on the A7 analog interface assembly. This is a service diagnostic function and is for service use only.

Key Access: **CAL**

B → C

copies trace B into trace C.

Key Access: **TRACE**

B ↔ C

exchanges the contents of trace B with trace C and puts trace B in view mode.

Key Access: **TRACE**

B-DL → B

subtracts the display line from trace B and places the result in trace B. The **B-DL → B** function is a math operation. See the **A-B → A ON OFF** softkey description for information about math operations.

Key Access: **TRACE**

**BAUD
RATE**

sets the data transmission speed. (Also see the description for the **COPY** key.) The baud rate is set to 1200 by pressing **DEFAULT CONFIG**.

Key Access: **CONFIG**

**BINARY
SPAN**

displays the output of the span DAC that is located on the A7 analog interface assembly. This is a service diagnostic function and is for service use only.

Key Access: **CAL**

BLANK A

stores the amplitude data for trace A and removes it from the screen. The trace A register will not be updated as the analyzer sweeps.

Key Access: **TRACE**

BLANK B

stores the amplitude data for trace B and removes it from the screen. The trace B register will not be updated as the analyzer sweeps.

Key Access: **TRACE**

BLANK C

stores the amplitude data for trace C and removes it from the screen. The trace C register will not be updated as the analyzer sweeps.

Key Access: **TRACE**

**BLANK
CARD**

deletes all the files from the memory card. Pressing **BLANK CARD** displays the message: **If you are sure, press key again to purge data.** Press **BLANK CARD** again if you want to delete all files from the memory card.

Key Access: **CONFIG**

Cable TV Analyzer Functions

BW

activates the resolution bandwidth function and accesses the softkeys that control the bandwidth functions: **RES BW AUTO MAN** , **VID BW AUTO MAN** , **VBW/RBW RATIO** , **VID AVG ON OFF** , and the **EMI BW Menu** . (Also see the **RES BW AUTO MAN** softkey description.)

CAL

accesses the softkey menus used for the self-calibration, service-diagnostics, and service-calibration functions. For more information about self-calibrating the analyzer, see "Improving Accuracy with Self-Calibration Routines" in Chapter 2.

**CAL
AMPTD**

initiates an amplitude self-calibration routine. Connect **CAL OUT** to the analyzer input before pressing **CAL AMPTD** . Remove the cable from the rear panel **GATE INPUT** before starting the self-calibration routine.

NOTE

If the frequency calibration and amplitude calibration self-calibration routines are both used, the **CAL FREQ** softkey function should always be initiated before the **CAL AMPTD** softkey function.

Key Access: **CAL**

CAL
FETCH

retrieves stored self-calibration correction factors from the last calibration saved using CAL STORE .

Key Access:

CAL
FREQ

initiates a frequency self-calibration routine. Connect CAL OUT to the analyzer input before pressing CAL FREQ . Remove the cable from the rear panel GATE INPUT before starting the self-calibration routine.

Key Access:

CAL FREQ
& AMPTD

initiates both the frequency and amplitude self-calibration routines. Connect CAL OUT to the analyzer input before pressing CAL FREQ & AMPTD . Remove the cable from the rear panel GATE INPUT before starting the self-calibration routine.

Key Access:

CAL
STORE

stores the correction factors from the last calibration. The stored correction factors are automatically retrieved when the analyzer is turned on. If correction factors are not stored, they will be retained only until the analyzer is turned off. See the description for the CAL FETCH softkey.

Key Access:

CAL
TIMEBASE

changes the setting of the 10 MHz reference (standard timebase) DAC that is located on the A25 counter lock assembly. This is a service calibration function and is for service use only.

Key Access:

Cable TV Analyzer Functions

**CAL
TRK GEN**

Option 011 only.

performs the tracking peak self-calibration. The analyzer should be amplitude calibrated by pressing **CAL AMPTD** prior to using the CAL TRK GEN function. Connect the tracking generator output to the analyzer input before pressing **CAL TRK GEN**.

Key Access: **CAL**

**Card
Config**

accesses the softkey menu that allows you to catalog, format, and delete data from a memory card.

Key Access: **CONFIG**

**CARD —
DISPLAY**

recalls into analyzer memory a display image saved on the memory card. It does not recall the associated instrument state, but the restored display can be viewed and copied. Before recalling a display that was saved under a prefix other than the current prefix, change the current prefix to the prefix used when the display was saved.

Key Access: **RECALL**

**CARD —
DLP**

recalls into the analyzer memory a downloadable program (DLP) saved on the memory card. Before recalling data that was saved under a prefix other than the current prefix, change the current prefix to the prefix used when the data was saved.

Key Access: **RECALL**

CARD
— STATE

recalls into analyzer memory a state saved on the memory card. **CARD — STATE** also displays the time and date when the state data was stored. Before recalling a state that was saved under a prefix other than the current prefix, change the current prefix to the prefix used when the state was saved.

If the windows display mode is being used, the instrument state can only be recalled into the active window.

Key Access: **RECALL**

Card
— Trace

recalls into analyzer memory a trace saved on the memory card. Limit lines and amplitude correction factors are recalled by pressing **Card — Trace**, **LIMIT LINES** or **AMP COR**.

Key Access: **RECALL**

CARRIER
LVL&FRQ

initiates the Carrier Level and Frequency measurement.

Key Access: **CHANNEL MEAS**

CARRIER/
NOISE

initiates the Carrier to Noise measurement

Key Access: **CHANNEL MEAS**

CATALOG
ALL

catalogs all the programs and variables stored in analyzer memory in bytes along with the remaining memory available in bytes.

Key Access: **RECALL** or **SAVE**

CATALOG
AMP COR

catalogs the amplitude correction factor files that are on the memory card.

Key Access: **RECALL** or **SAVE**

Softkey Descriptions

Cable TV Analyzer Functions

**Catalog
Card**

accesses a menu with the cataloging functions for the memory card.

Key Access: **RECALL** or **SAVE**

**CATALOG
CARD**

allows you to view a listing of the files stored on a RAM card or a ROM card.

**CATALOG
DISPLAY**

catalogs all of the display images that are on the memory card. A display image can be recalled to the analyzer by using the **CARD—DISPLAY** softkey.

Key Access: **RECALL** or **SAVE**

**CATALOG
DLP**

catalogs all of the downloadable programs (DLPs) that are in analyzer memory or on the memory card. Downloadable programs can be saved in analyzer memory by either loading in a downloadable program from the memory card or defining a function using remote programming commands (**FUNCDEF** or **ACTDEF**).

Key Access: **RECALL** or **SAVE**

**Catalog
Internal**

accesses a menu that has the cataloging functions for analyzer memory.

Key Access: **RECALL** or **SAVE**

**CATALOG
LMT LINE**

catalogs the limit-lines on the memory card. Press **CATALOG REGISTER** to catalog limit-line tables stored in analyzer memory (limit-line tables saved in analyzer memory are stored in trace registers).

Key Access: **RECALL** or **SAVE**

**CATALOG
ON EVENT**

displays the "on event" programming commands and their status. The on event programming commands are as follows:

ONEOS	Performs command list at end of every sweep.
ONSWP	Performs command list at beginning of every sweep.
TRMATH	Performs trace math.
ONCYCLE	Performs command list periodically.
ONDELAY	Performs command list once after a time period.
ONMKR	Performs command list at the marker.
ONSRQ	Performs command list on every service request.
ONTIME	Performs command list at a specific time.
ONPWRUP	Performs command list once at power up.

NOTE

If you get into an infinite loop with ONPWRUP, press **PRESET** to abort the command list, then press **ERASE DLP MEM** to clear all DLPs.

Key Access: **RECALL** or **SAVE**

**CATALOG
PREFIX**

catalogs all of the saved data, that has the specified prefix, that is either on the memory card or in analyzer memory.

Key Access: **RECALL** or **SAVE**

Cable TV Analyzer Functions

CATALOG REGISTER

displays the status of state and trace registers in analyzer memory.

Key Access: **RECALL** or **SAVE**

CATALOG STATES

catalogs all of the states stored on the memory card.

Key Access: **RECALL** or **SAVE**

CATALOG TRACES

catalogs all of the traces stored on the memory card.

Key Access: **RECALL** or **SAVE**

CATALOG VARIABLES

catalogs all of the variables saved in analyzer memory.

Key Access: **RECALL** or **SAVE**

CENTER FREQ

activates the center-frequency function to allow the selection of frequency that will be at the center of the screen.

Key Access: **AUX CTRL**, **MEAS/USER**, or **FREQUENCY**

CF STEP AUTO MAN

changes the step size for the center frequency function.

Key Access: **AUTO COUPLE** or **FREQUENCY**

Change Prefix

allows you to enter a prefix that can be used for saving and recalling data to and from the memory card, and for cataloging by the prefix. The prefix can be from one to seven characters long. The longer the prefix, the shorter the register number must be. The total length of the prefix and register number cannot exceed eight characters. The prefix can be any character; however, the underscore should not be the first character of the prefix.

Key Access: **CONFIG**, **DISPLAY**, **RECALL**, or **SAVE**

Change Title	allows you to write a 53-character screen title across the top of the screen. Key Access: CAL or DISPLAY
CHANNEL BANDWIDTH	allows the user to enter the channel bandwidth to set up the analyzer when using the measurement functions under the Power Menu softkey. Key Access: MEAS/USER
CHANNEL POWER	measures the power and power spectral density in the channel bandwidth specified by the user. Key Access: MEAS/USER
CHANNEL SELECT	a function used in conjunction with measurements. It sets up the analyzer state for cable TV tests, lets you select a specific channel number, and centers the specific channel on the analyzer screen. The channel is selected based on one of the five channel formats available in the Setup menu as described in Chapter 2 of the <i>HP 8591C Cable TV Analyzer Cable TV Measurements User's Guide</i> : STD, AIR, HRC, IRC, or T. Key Access: CHANNEL MEAS or TV RECEIVER
CHANNEL SPACING	allows the user to enter the channel spacing to set up the analyzer when using the measurement functions under the Power Menu softkey. Key Access: MEAS/USER

Cable TV Analyzer Functions

Channel Tuning

allows you to select the channel tuning configuration for the channels in the test plan.

The channel tuning configurations that can be selected are as follows:

- STD For a standard channel format.
- AIR For off-the-air channel format.
- IRC For incrementally related carriers.
- HRC For harmonically related carriers.
- T For downstream channels.

The default value for the channel tuning configuration is the standard (STD) channel format. In addition, the **USR CH 0 CNTR FRQ** and **USR CH 0 SPAN** softkeys allow you to define the center frequency and span for a user defined channel. This channel is then accessed by selecting channel 0 (zero). The default settings are for channel 2 (STD). These settings are stored in non-volatile analyzer memory. This means that the analyzer retains the selections, even when power is turned off, until a new selection is made.

Press **CABLE TV ANALYZER**, **Setup**, to access **Channel Tuning**.

Key Access: **CABLE TV ANALYZER**

CLDI

initiates the Chroma/Luma Delay Inequality measurement.

Key Access: **CHANNEL MEAS**

Clear

clears the current screen title or prefix. This softkey is accessed under the YZ_# Spc Clear softkey when using Change Title or Change Prefix.

Key Access: , , , , or

CLEAR
PARAM

clears all of the pulse parameters in the gate utility. It sets the value of pulse width, pulse repetition interval, and reference edge to zero and turns off the coupling of the pulse parameters to the resolution bandwidth, video bandwidth, and sweep time.

Key Access:

CLEAR
TESTS

allows you to clear all selected tests for the current channel.

Key Access:

CLEAR
TST PLAN

allows you to clear the current test plan.

Key Access:

CLEAR
WRITE A

erases any data previously stored in trace A and continuously displays any signals during the sweep of the analyzer. This function is activated at power on and by pressing .

Key Access:

CLEAR
WRITE B

erases any data previously stored in trace B and continuously displays any signals detected during the sweep of the analyzer. This function is activated at power on and by pressing .

Key Access:

Softkey Descriptions

Cable TV Analyzer Functions

CLEAR
WRITE C

erases any data previously stored in trace C and continuously displays any signals detected during the sweep of the analyzer. This function is activated at power on and by pressing **PRESET**.

Key Access: **TRACE**

CNT RES
AUTO MAN

allows the resolution of the marker counter to be selected manually or auto-coupled. The marker counter has a resolution range of 10 Hz to 100 kHz.

Key Access: **MKR FCTN**

CNTL A
0 1

makes the auxiliary-interface control line A output high or low (TTL).

Key Access: **AUX CTRL**

CNTL B
0 1

makes the auxiliary-interface control line B output high or low (TTL).

Key Access: **AUX CTRL**

CNTL C
0 1

makes the auxiliary-interface control line C output high or low (TTL).

Key Access: **AUX CTRL**

CNTL D
0 1

makes the auxiliary-interface control line D output high or low (TTL).

Key Access: **AUX CTRL**

Cable TV Analyzer Functions**COARSE
TUNE DAC**

displays the analog output of the YTO coarse-tune DAC located on the A7 analog interface assembly. This is a service diagnostic function and is for service use only.

Key Access: **CAL**

**CONF
TEST**

initiates a variety of tests to check the major functions of the analyzer.

Key Access: **CAL**

CONFIG

accesses the softkey menu used for printer and plotter configurations, the time and date display functions, changing the current prefix, memory card configuration functions, disposing of user-defined variables and programs from analyzer memory, changing the analyzer address or the baud rate, displaying the installed options on screen, and changing the format of the MONITOR output.

**CONT
MEAS**

sets the functions in the **Power Menu** so that they make the measurement at the end of every sweep.

Key Access: **MEAS/USER**

**CONTINUS
FFT**

initializes the fast Fourier transform (FFT) function, puts the analyzer in continuous sweep and performs an FFT at the end of each sweep. If the FFT function is already active, it puts the analyzer in continuous sweep and performs FFTs.

Key Access: **MEAS/USER**

Cable TV Analyzer Functions**COPY**

initiates an output of the screen data, without an external controller, to a previously specified graphics printer or plotter.

The printer or plotter must have already been selected using **CONFIG** and either **Plot Config** (for a plotter) or **Print Config** (for a printer). To obtain a print, press **CONFIG**, **COPY DEV PRNT PLT** (so that PRNT is underlined), then **Print Config**, **Prn Port Config**.

Use **BAUD RATE** to change the baud rate of the analyzer, if necessary. Press **CONFIG**, **Print Config**, **Prn Port Config**, **PRN PORT SER PAR** (so that SER is underlined), then press **BAUD RATE**.

For Option 041, use **PRINTER ADDRESS** to change the HP-IB address of the printer, if necessary. Press **CONFIG**, **Print Config**, **Prn Port Config**, **PRN PORT HPIB PAR** (so that HPIB is underlined), then press **PRINTER ADDRESS**.

If the analyzer is connected to an HP PaintJet printer and you want a color printout, press **PAINTJET PRINTER**. If the analyzer is connected to an HP PaintJet printer and you want a black and white printout, press **HP B&W PRINTER**. More printer information can be found in the *HP 8590 E-Series and L-Series Spectrum Analyzers and HP 8591C Cable TV Analyzer Programmer's Guide*.

If you want the softkey labels to be printed with the analyzer display printout when using **COPY**, press **PRT MENU ON OFF**, so that ON is underlined.

Press **COPY** and the process will begin. The screen remains frozen (no further sweeps taken) until the data transfer to the printer is complete. The analyzer works with many Hewlett-Packard and Epson compatible printers.

The plotting process is similar to the printing process. On the spectrum analyzer, press **CONFIG**, **Plot Config**. To obtain a plot, press **CONFIG**, **COPY DEV PRNT PLT** (so that **PLT** is underlined), then **Plot Config**, **Plt Port Config**.

Use **BAUD RATE** to change the baud rate of the analyzer, if necessary. Press **CONFIG**, **Plot Config**, **Plt Port Config**, **PLT PORT SER PAR** (so that **SER** is underlined), then press **BAUD RATE**.

For Option 041, use **PLOTTER ADDRESS** to change the HP-IB address for the plotter, if necessary. Press **CONFIG**, **Plot Config**, **Plt Port Config**, **PLT PORT HPIB PAR** (so that **HPIB** is underlined), then press **PLOTTER ADDRESS**.

With **PLTS/PG 1 2 4**, you can choose a full-page, half-page, or quarter-page plot. Press **PLTS/PG 1 2 4** to underline the number of plots per page desired. If two or four plots per page are chosen, a softkey function is displayed that allows you to select the location of the plotter output on the paper. If two plots per page are selected, **PLT - _LOC - _** is displayed. If four plots per page are selected, **PLT - _LOC - _** is displayed. Press the softkey until the rectangular marker is in the desired section of the softkey label. The upper and lower sections of the softkey label graphically represent the position of the page where the plotter output will be located.

NOTE

The HP 7470A Plotter does not support two plots per page output. If you use an HP 7470A Plotter with the HP 8591C cable TV analyzer, you can select one or four plots per page, but not two plots per page.

Softkey Descriptions

Cable TV Analyzer Functions

For a multipen plotter, the pens of the plotter draw the different components of the screen as follows:

Pen Number	Description
1	Draws the annotation and graticule.
2	Draws trace A.
3	Draws trace B.
4	Draws trace C and the display line.
5	Draws user-generated graphics and the lower limit line.
6	Draws the upper limit line.

To plot, press Previous Menu, COPY DEV PRNT PLT (PLT should be underlined), and COPY.

Printing is usually faster than plotting, but plotting provides higher resolution output. The analyzer works with plotters such as the HP 7440A.

COPY DEV
PRNT PLT

changes between a printer and plotter. For example, if you have been printing and want to do a plot, press COPY DEV PRNT PLT to underline PLT before pressing **COPY**.

Key Access: **CONFIG**

CORRECT
ON OFF

controls use of some of the correction factors. When ON is underlined, correction factors are used and **CORR** appears on the display. When OFF is underlined, correction factors are not used. Turning the correction factors off degrades amplitude accuracy.

NOTE

Correction factors must be on for the analyzer to meet its specified performance.

Key Access: **CAL**

CPL RBW
ON OFF

automatically selects the optimum resolution bandwidth for an unmodulated pulse if the pulse width has been entered. If the pulse width has not been determined, the resolution bandwidth will not be coupled to the pulse parameters and a warning message will occur. If a resolution bandwidth is entered manually, the coupling will be turned off.

Key Access: **SWEEP**

Cable TV Analyzer Functions

CPL SWP
ON OFF

automatically selects the optimum sweep time if the pulse repetition interval has been entered. If the pulse repetition interval has not been determined, the sweep time will not be coupled and an error message will occur. If a sweep time is entered manually, the coupling will be turned off. Sweep time coupling only applies to the frequency domain window.

Key Access: **SWEEP**

CPL VBW
ON OFF

automatically selects the optimum video bandwidth if the gate length has been entered. If the gate length has not been determined, the video bandwidth will not be coupled to the gate length and an error message will occur. If a gate length is entered manually, the coupling will be turned off.

Key Access: **SWEEP**

Create
TstPlan

allows you to access the functions used for building a test plan.

Key Access: **SYSTEM MEAS**

CROSSMOD

initiates the Cross Modulation measurement.

Key Access: **CHANNEL MEAS**

CRT HORZ
POSITION

changes the horizontal position of the signal on the analyzer display. Press **CAL STORE** if you want the analyzer to use this position permanently, so that it is not lost when the power is turned off.

Key Access: **CAL**

**CRT VERT
POSITION**

changes the vertical position of the signal on the analyzer display. Press **CAL STORE** if you want the analyzer to use this position permanently, so that it is not lost when the power is turned off.

Key Access: **CAL**

CSD/CTB

initiates the Composite Second Order/Composite Triple Beat measurement.

Key Access: **CHANNEL MEAS**

DACS

changes the DAC numbers of the span, DAC YTO coarse-tune, DAC YTO fine-tune, and YTO FM tune DAC located on the A7 analog interface assembly. This is a service diagnostic function and is for service use only.

Key Access: **CAL**

**DATA TO
PRINTER**

allows you to retrieve the test data from a RAM card file and send it to a printer to be printed. (The printer needs to be connected to the analyzer.)

**DATEMODE
MDY DMY**

changes the display of the date from a month-day-year format to a day-month-year format. It is set to a month-day-year format by pressing **DEFAULT CONFIG**.

Key Access: **CONFIG**

Softkey Descriptions

Cable TV Analyzer Functions

dBm

changes the amplitude units to dBm for the current setting (log or linear).

Key Access: **AMPLITUDE**

dBmV

changes the amplitude units to dBmV for the current setting (log or linear).

Key Access: **AMPLITUDE**

dB μ V

changes the amplitude units to dB μ V for the current setting (log or linear).

Key Access: **AMPLITUDE**

**DEFAULT
CAL DATA**

accesses the factory-default correction factors. A special pass code is required for use. If the message **Self cal needed** appears when **DEFAULT CAL DATA** is pressed, the **CAL FREQ** and **CAL AMPTD** routines need to be run. The **CAL FREQ** and **CAL AMPTD** must be run to ensure specifications. The calibration results must then be saved by pressing **CAL STORE**. See Chapter 8 for more information.

Key Access: **CAL**

**DEFAULT
CONFIG**

resets the analyzer configuration to the state it was in when it was originally shipped from the factory and performs an instrument preset. See Table 4-2 for the default user-configuration values set by pressing **DEFAULT CONFIG**.

Table 4-2. Default Configuration Values

Configuration	Default Value
Analyzer address (Option 021)	18
Copy device	printer
CRT position (Horizontal and Vertical)	10, 48
Printer address	1
Plotter address	5
Baud rate	1200
External preamp	0 dB
Save lock (internal states or traces)	Off
Printer	black and white printer
Print menu	on
Plots per page	1
Time/date display	on
Date mode	month-day-year format
Prefix	(blank)
Analyzer state at power on	instrument preset

Key Access: **CONFIG**

**DEFAULT
 SYNC**

restores the factory default values of the horizontal and vertical synchronization constants for the rear panel MONITOR output. **CRT SYNC DEFAULT** can be used to exit from the NTSC or PAL modes to return to the normal monitor output and use the default synchronization constants.

Key Access: **CONFIG**

**Define
 Coupling**

Option 107 only.
 accesses the time gate utility menu for coupling analyzer settings to the input pulsed signal parameters. It also accesses the pulsed signal parameter entry menus.

Key Access: **SWEEP**

Cable TV Analyzer Functions

Define Gate *Option 107 only.*
accesses the menu for turning on and defining the gate, from within the time gate utility.

Key Access: **(SWEEP)**

Define Time *Option 107 only.*
accesses the menu for manipulating the time domain window in the gate utility. It will automatically make the time window active and turn off the gate. The trigger marker can be activated from this menu.

Key Access: **(SWEEP)**

DELETE FILE
function allows you to delete an item from analyzer memory or a file from the memory card.

NOTE

Deleting items beginning with an underscore from analyzer memory is not recommended and may have unexpected results. Items beginning with an underscore are used by the analyzer.

Key Access: **(RECALL)** or **(SAVE)**

DELETE POINT
deletes an amplitude-correction factor that was previously selected by **SELECT POINT**.

Key Access: **(CAL)**

DELETE SEGMENT
deletes the limit-line entry for the selected segment number. Press **SELECT SEGMENT** then enter the segment number to select the limit-line entry for deletion.

Key Access: **(DISPLAY)**

Demod	accesses the softkeys controlling demodulation functions, speaker volume, squelch level, FM gain, and dwell time. Key Access: AUX CTRL
DEPTH MOD	initiates the Depth of Video Modulation measurement. Key Access: CHANNEL MEAS
DEMODO AM FM	allows selection of amplitude (AM) or frequency (FM) demodulation. Key Access: AUX CTRL
DEMODO ON OFF	turns the AM or FM demodulation on and off. Key Access: AUX CTRL
DESKJET 310/550C	selects the HP DeskJet 310 or 550C for color printing. Use this function if you have one of these color printers. This softkey can be accessed by pressing CONFIG , then Set Color Printer . Key Access: CONFIG
DESKJET 540	selects the HP DeskJet 540 for color printing. Use this function if you have this color printer. This softkey can be accessed by pressing CONFIG , then Set Color Printer . Front-Panel Key Access CONFIG

Cable TV Analyzer Functions

**DETECTOR
PK SP NG**

selects between positive peak, sample, and negative peak detection. When sample detection is selected, **SMPL** appears in the upper-left corner of the screen. In sample mode, the instantaneous signal value at the present display point is placed in memory. Sample detection is activated automatically for noise level markers, during video averaging, and for FFT measurements.

Key Access: **TRACE**

**DIF GAIN
DIF PHAZ**

initiates the differential gain/differential phase measurement.

Key Access: **CHANNEL MEAS**

DISPLAY

accesses softkeys that include the **HOLD** key and limit line menus, and activate the display line, threshold and analog+ display mode. They allow title and prefix entry, and control the display of the graticule and screen annotation.

**DISPLAY
CAL DATA**

displays the current correction-factor data generated by the frequency and amplitude self-calibration routines. This is a service diagnostic function and is for service use only.

Key Access: **CAL**

**DISPLAY
— CARD**

saves the current analyzer display image on the memory card for viewing or copying later. It does not save the analyzer state or trace, so it cannot be used to restore an instrument to the conditions at the time the image was saved.

Key Access: **SAVE**

DISPLAY
CNTL I

displays the status of the auxiliary connector input (control line I) on the analyzer screen (high = 1 or low = 0, in TTL).

Key Access: **AUX CTRL**

Dispose
User Mem

accesses the softkeys **ERASE MEM CARD**, **ERASE DLP MEM**, **ERASE STATEALL**, **ERASE TRACEALL**, and **ERASE MEM ALL**, which are used to erase the user programs and variables that are in analyzer memory.

NOTE

Use **DELETE FILE** to selectively delete stored programs or variables from analyzer memory.

Key Access: **CONFIG**

DL DELTA
ON OFF

displays the change, in percent, between a reference display line and the display line activated by pressing **DL DELTA ON OFF**. The percentage is displayed in the active function block.

Key Access: **DISPLAY**

DO FRQ
RESP TST

compares a spectrum stored at a reference point to a spectrum at any other point in the system where you want to evaluate the frequency response. The signal level and amplitude slope should be approximately the same as the reference trace.

Key Access: **CHANNEL MEAS**

Cable TV Analyzer Functions

DONE

allows you to indicate that you have finished making your selection.

(The DONE softkey should not be confused with the DONE programming command.)

Key Access: **SYSTEM MEAS**

DROOP

disables the reset of the peak detector on the A16 processor/video assembly after each analog-to-digital conversion. This is a service diagnostic function and is for service use only.

Key Access: **CAL**

**DSP LINE
ON OFF**

activates an adjustable horizontal line that is used as a visual reference line.

Key Access: **DISPLAY**, **MKR FCTN**, or **PEAK SEARCH**

**DUMP TO
PRINTER**

allows you to have the test results sent to a printer when using **Measure Now** or **Timed Measure**. The printer needs to be connected to the analyzer.

Key Access: **SYSTEM MEAS**

**DUMP TO
RAM CARD**

allows you to store the test results on a RAM card when using **Measure Now** or **Timed Measure**. The RAM card must be formatted and ready for use to store the test data. Up to 40 files of test data can be stored on a 128 kilobyte or 32 kilobyte RAM card. No more than 40 files of test data can be stored on a RAM card, however.

Key Access: **SYSTEM MEAS**

**DUMP TO
SCREEN**

allows you to send test results to the analyzer screen. Upon being sent to the screen, the following options are available:

- **NEXT PAGE** displays the next page of test results.
- **PREV PAGE** displays the previous page of test results.
- **GOTO PAGE** displays selected page number.
- **PRINT REPORT** prints a test results report.
- **STORE TO CARD** stores test results to a RAM card.

Key Access: **SYSTEM MEAS**

**DWELL
TIME**

sets the dwell time for the marker pause, during which demodulation can take place in nonzero span sweeps. The dwell time can be set from 2 milliseconds to 100 seconds.

Key Access: **AUX CTRL**

**EDGE POL
POS NEG**

determines whether the gate triggers on the positive-going or negative-going edge of the signal at the GATE TRIGGER INPUT connector (on the rear panel of the analyzer).

Key Access: **SWEEP**

**Edit
Amp Cor**

allows you to edit the current amplitude-correction factors table by accessing the **SELECT POINT**, **SELECT FREQ**, **SELECT AMPLITUD**, **DELETE POINT**, **Edit Done**, and **PURGE AMP COR** softkeys.

Key Access: **CAL**

Softkey Descriptions

Cable TV Analyzer Functions

**EDIT
CAT ITEM**

starts the DLP editor function and loads the highlighted item from the catalog of analyzer user memory to be displayed and edited. Refer to the *HP 8590 E-Series and L-Series Spectrum Analyzers and HP 8591C Cable TV Analyzer Programmer's Guide* for more information.

Key Access: **RECALL** or **SAVE**

**Edit
Done**

can be accessed through both the amplitude-correction menu and the change prefix menu. When accessed from the amplitude-correction menu, the amplitude-correction factors table is erased from the analyzer screen and the amplitude-correction menu is restored on-screen. Use **Edit Done** when all the amplitude-correction factors have been entered.

Key Access: **CAL**, **CONFIG**, **DISPLAY**, **RECALL**, or **SAVE**

**EDIT
DONE**

can be accessed through the limit-line menu. Pressing **EDIT DONE** erases the limit-line table from the analyzer screen and restores the menu accessed by the **Limit Lines** softkey. Use **EDIT DONE** when all the limit-line values have been entered.

Key Access: **DISPLAY**

**EDIT
FLATNESS**

allows flatness-correction constants to be viewed or modified. This is a service calibration function and is for service use only.

Key Access: **CAL**

**EDIT
LAST**

starts the DLP editor function and allows the most recent item that was being edited, in the DLP editor buffer, to be accessed again. The item will not be in the analyzer user memory until it is processed by the **SAVE EDIT** softkey. The DLP editor memory remains intact when the instrument is preset and when it is powered off. Refer to the *HP 8590 E-Series and L-Series Spectrum Analyzers and HP 8591C Cable TV Analyzer Programmer's Guide* for more information.

Key Access: **RECALL** or **SAVE**

**Edit
Limit**

allows you to edit the current limit-line tables by accessing **Edit Upper**, **Edit Lower**, **Edit Up/Low**, and **Edit Mid/Delt**. Use **PURGE LIMITS** under any of the above edit menus to dispose of the current limit-line table.

Key Access: **DISPLAY**

**Edit
Lower**

allows you to view or edit the lower limit-line table.

Key Access: **DISPLAY**

**Edit
Mid/Delt**

allows you to view or edit the upper and lower limit-line tables simultaneously.

Key Access: **DISPLAY**

**Edit
Up/Low**

allows you to view or edit the upper and lower limit-line tables simultaneously.

Key Access: **DISPLAY**

**Edit
Upper**

allows you to view or edit the upper limit-line table.

Key Access: **DISPLAY**

Softkey Descriptions

Cable TV Analyzer Functions

**EDIT
UPR LWR**

selects upper or lower limit-line tables. It switches to the limit-line table that is not currently being edited.

Key Access: **DISPLAY**

Editor

accesses the menu of down loadable program (DLP) editor softkeys. Refer to the *HP 8590 E-Series and L-Series Spectrum Analyzers and HP 8591C Cable TV Analyzer Programmer's Guide* for more information.

Key Access: **RECALL** or **SAVE**

**EMI BW
Menu**

accesses the functions that set the analyzer resolution bandwidth to the values required for electromagnetic interference (EMI) testing. (*200 Hz EMI BW is only available with Option 130.*)

Key Access: **BW**

(ENTER)

Pressing **Hz/ μ V/ μ s**, which is also the ENTER key, terminates and enters into the analyzer a numerical value that has been entered from the front panel using the keypad, knob, or step up/down keys.

**ENTER BY
CHANNEL**

allows you to enter channels individually or to edit the test plan. A maximum of 158 channels (channel numbers 0, 2 through 158) can be entered into a test plan.

Key Access: **SYSTEM MEAS**

**ENTER BY
RANGE**

allows you to enter channels as a range of channel numbers. Unlike **ENTER BY CHANNEL**, you cannot use **ENTER BY RANGE** to edit or delete a channel. A maximum of 158 channels (channel numbers 0, 2 through 158) can be entered into a test plan.

Key Access: **SYSTEM MEAS**

**ENTER
LOCATION**

allows you to enter a location code. You do not have to enter a location code; it is only for your convenience to help you keep track of where the test data originated. The location code can be up to seven digits long.

Key Access: **SYSTEM MEAS**

**ENTER
TEMP**

allows you to enter the temperature. You can enter a number from -999 to +999. The temperature is entered without Celsius or Fahrenheit units. The analyzer does not measure the temperature. You must provide the temperature reading.

You do not have to enter a temperature; it is only for your convenience. If you do not enter a temperature, the default temperature entry will either be the temperature that was previously entered or, if a temperature reading was not previously entered, a "0."

On the RAM card, the temperature entry is stored in the test data file. The temperature entry is printed when the test data is printed.

In analyzer memory, the temperature entry is not stored with the current test plan in plans 1 through 5. The temperature entry is stored in nonvolatile analyzer memory, however. Storing the temperature entry in nonvolatile memory means that once a temperature is entered, it will be used as the temperature until a new temperature is entered or the HP 85721A program is deleted from analyzer memory.

Key Access: **SYSTEM MEAS**

Softkey Descriptions

Cable TV Analyzer Functions

ENTER
PRI

accesses the menu for entering the value of the pulse repetition interval (PRI).

Key Access: **SWEEP**

ENTER
REF EDGE

accesses the menu used to define the edge of the pulse that will be used as the time reference.

Key Access: **SWEEP**

ENTER
WIDTH

accesses the menu for entering the value of the pulse width. Press **MARKER ON** to activate a delta marker.

Key Access: **SWEEP**

ERASE
DLP MEM

allows you to dispose of the DLPs, all traces defined by TRDEF, and all VAREF variables that are in analyzer memory.

NOTE

Use **DELETE FILE** to selectively delete stored programs or variables from analyzer memory.

Key Access: **CONFIG**

**ERASE
MEM ALL**

allows you to purge all user state registers, all user trace registers, all mode registers, the editor buffer, Group delay normalization, all DLP memory, and all microprocessor stack data.

NOTE

ERASE MEM ALL ignores the state of the **SAV LOCK**. So, even if **STATES** and **TRACES** are locked, they will still be erased by **ERASE MEM ALL**.

Key Access: **CONFIG**

**ERASE
MEM CARD**

allows you to dispose of any data or programs stored on the memory card by formatting it.

NOTE

Use **DELETE FILE** to selectively delete stored programs or variables from analyzer memory.

Key Access: **CONFIG**

Softkey Descriptions

Cable TV Analyzer Functions

ERASE STATEALL allows you to purge all the user state registers 1 through 9.

NOTE

- If **SAVE LOCK ON OFF** is set to (ON), this function is disabled.
- Use **DELETE FILE** to selectively delete stored programs or variables from analyzer memory.

Key Access: **CONFIG**

ERASE TRACEALL allows you to purge all the user trace registers 0 through TRCMEM.

NOTE

- If **SAVE LOCK ON OFF** is set to (ON), this function is disabled.
- Use **DELETE FILE** to selectively delete stored programs or variables from analyzer memory.

Key Access: **CONFIG**

EP LQ570 SML LRG sets the analyzer to be compatible with an Epson LQ-570 compatible printer.

Key Access: **CONFIG**

EP MX80
SML LRG

sets the analyzer to be compatible with an Epson MX80 compatible printer.

Key Access: **CONFIG**

EXECUTE
TITLE

executes a programming command displayed in the screen title area of the analyzer.

Key Access: **CAL**

EXIT

exits the EDIT FLATNESS softkey menu. This is a service calibration function and is designed for service use only.

Key Access: **CAL**

Exit
Catalog

returns the analyzer to the state it was in before the current catalog function was invoked. It clears the catalog display and returns to a normal analyzer display.

Key Access: **RECALL** or **SAVE**

EXIT
SHOW

removes the screen annotation left after pressing **SHOW OPTIONS**.

Key Access: **CONFIG**

EXIT
UTILITY

exits the gate utility returning to the gate control menu. The analyzer is returned to normal operation. The state of the analyzer becomes the state of the window that was active when exiting the gate utility.

Key Access: **SWEEP**

Cable TV Analyzer Functions

**EXT AMP
GAIN**

allows you to select the gain value of an external preamplifier for the carrier-to-noise test. The default value is 20 dB for the HP 85905A preamplifier.

The preamplifier selection is stored in nonvolatile analyzer memory. This means that the analyzer retains the selection, even when power is turned off, until a new selection is made.

Press **CABLE TV ANALYZER**, **Setup**, **Analyzer Input**, **EXT AMP YES NO** to access **EXT AMP GAIN**.

Key Access: **CABLE TV ANALYZER**

**EXT AMP
NZ FIG**

allows you to select the noise figure value of an external preamplifier for the carrier-to-noise test. The default value is 7 dB for the HP 85905A preamplifier.

The preamplifier selection is stored in nonvolatile analyzer memory. This means that the analyzer retains the selection, even when power is turned off, until a new selection is made.

Press **CABLE TV ANALYZER**, **Setup**, **Analyzer Input** to access **EXT AMP NZ FIG**.

Key Access: **CABLE TV ANALYZER**

**EXT AMP
YES NO**

allows you to select an external preamplifier for the carrier-to-noise test. The preamplifier selection is stored in nonvolatile analyzer memory. This means that the analyzer retains the selection, even when power is turned off, until a new selection is made.

Press **CABLE TV ANALYZER**, **Setup**, **Analyzer Input** to access **EXT AMP YES NO**.

Key Access: **CABLE TV ANALYZER**

Cable TV Analyzer Functions

EXT PAD
YES NO

can be used to compensate for the amplitude loss caused by using a 50 Ω to 75 Ω external matching pad. (A 50 Ω to 75 Ω external matching pad is used to match the signal from a 75 Ω impedance system to a spectrum analyzer with a 50 Ω impedance input.) The external pad function compensates for the 5.8 dB amplitude loss of the external pad by setting the spectrum analyzer's reference level offset to 5.8 dB.

If you are using a spectrum analyzer with 50 Ω input impedance but are not using an external matching pad, the cable TV analyzer mode will compensate for most of the impedance mismatch, but amplitude measurements can have up to ± 0.2 dB error caused by the uncompensated mismatch over the frequency range.

This function is set to NO when the HP 85721A is loaded into analyzer memory.

In spectrum analyzer memory, the setting of the external pad function entry is not stored with the current test plan in plans 1 through 5. The setting of the external pad function is stored in nonvolatile spectrum analyzer memory, however. Storing the setting in nonvolatile memory means that once the external pad function is set to YES, it will remain set to YES until you change the setting or delete the HP 85721A program from analyzer memory.

Press **CABLE TV ANALYZER**, **Setup**, **Analyzer Input** to access **EXT PAD YES NO**.

Key Access: **CABLE TV ANALYZER**

EXTERNAL

activates the trigger condition that allows the next sweep to start when an external voltage (connected to EXT TRIG INPUT on the rear panel) passes through approximately 1.5 V. The external trigger signal must be a 0 V to +5 V TTL signal.

Key Access: **TRIG**

Cable TV Analyzer Functions

**EXTERNAL
PREAMPG**

adds a positive or negative preamplifier gain value, which is subtracted from the displayed signal.

Key Access: **AMPLITUDE**

**FFT
MARKERS**

if the FFT mode is already active, pressing **FFT MARKERS** only activates the FFT markers. If the FFT mode is not active, then the FFT marker will be activated and the FFT annotation will be displayed but an FFT will not be performed.

Key Access: **MEAS/USER**

**FFT
Menu**

accesses the menu of keys to initiate and evaluate a Fourier transform of the analyzer displayed data. Activating other analyzer functions will automatically exit the FFT function or will corrupt the display. See Table 4-3.

Table 4-3. Compatibility of FFT with Other Functions

Function	Compatibility Info
Catalog functions	corrupts the display
DLP editor	corrupts the display
Marker table	exits FFT
N dB points measurement	exits FFT
Peak table	exits FFT
Power menu measurements	exits FFT
Show options	corrupts the display
Time gate functions	exits FFT
TOT measurement	exits FFT
Windows	exits FFT

Key Access: **MEAS/USER**

FFT OFF

exits the FFT mode and menus, returning the analyzer to normal operation.

Key Access: **MEAS/USER**

Cable TV Analyzer Functions**FFT STOP
FREQ**

allows the user to enter the stop frequency for the desired FFT span. This sets the analyzer sweep time by the relationship:

$$\text{FFT stop freq} = 400 / (\text{sweep time} \times 2)$$

NOTE

When using the FFT stop frequency function, the knob and step key increments are not optimal for positioning the signal. To use the knob or step keys to position the signal, select sweep time as the active function.

Key Access: **MEAS/USER**

**FINE
TUNE DAC**

displays the output of the YTO fine-tune DAC, which is produced on the A7 analog interface assembly. This is a service diagnostic function and is for service use only.

Key Access: **CAL**

FLAT

draws a zero-slope line between the coordinate point of the current segment and the coordinate point of the next segment, producing limit-line values equal in amplitude for all frequencies between the two points. If the amplitude values of the two segments differ, the limit line "steps" to the frequency value of the second segment.

Key Access: **DISPLAY**

**Flatness
Data**

provides access to the softkeys used for viewing or editing the flatness-correction constants. This is a service calibration function and is for service use only.

Key Access: **CAL**

Softkey Descriptions

Cable TV Analyzer Functions

**FM COIL
DRIVE**

displays the output of the FM coil driver produced on the A7 analog interface assembly. This is a service diagnostic function and is for service use only.

Key Access: **CAL**

FM DEV

initiates the FM Deviation measurement.

Key Access: **CHANNEL MEAS**

**FM
GAIN**

adjusts the FM deviation display. The center graticule represents zero deviation. The top graticule is the positive deviation set by FM GAIN. The bottom graticule is the negative deviation set by FM GAIN. The range for FM gain is from 10 kHz to 500 kHz. The default value is 100 kHz.

Key Access: **AUX CTRL** or **CAL**

**FM
OFFSET**

adjusts the horizontal trace for center-screen with no modulation on the carrier. This is a service diagnostic function and is for service use only.

Key Access: **CAL**

FM SPAN

displays the FM_SPAN signal from the span dividers on the A7 analog interface assembly. This is a service diagnostic function and is for service use only.

Key Access: **CAL**

**FORMAT
CARD**

formats a card in logical interchange format (LIF). This is the same as **ERASE MEM CARD**.

Key Access: **CONFIG**

FREE RUN

activates the trigger condition that allows the next sweep to start as soon as possible after the last sweep.

Key Access: **TRIG**

**FREQ
DIAG**

displays, in real-time, frequency diagnostic information for the LO section. This is a service diagnostic function and is for service use only.

Key Access: **CAL**

**FREQ DISC
NORM OFF**

indicates the status of the frequency discriminator as a function of LO span. This is a service diagnostic function and is for service use only.

Key Access: **CAL**

**FREQ
OFFSET**

allows the user to input a frequency offset value that is added to the frequency readout, to account for frequency conversions external to the analyzer.

Key Access: **FREQUENCY**

FREQUENCY

activates the center-frequency or start-frequency function and accesses the menu that has the frequency functions. The center frequency or start frequency value appears below the graticule on the screen.

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

Cable TV Analyzer Functions**Gate Control***Option 107 only.*

accesses the menu of gate control functions and the entrance to the gate utility menus. The gate can be controlled independently or from within the gate utility. The gate utility makes it easier to set up and manipulate the gate.

Key Access: **SWEEP****GATE CTL
EDGE LVL***Option 107 only.*

determines if the gate is enabled on the edge of the trigger input or on a threshold level of the input signal. If the gate control is set to EDGE, the edge of the input signal triggers the timer for the gate delay. When the gate control is set to LVL, the gate follows the positive level of the signal connected to GATE TRIGGER INPUT.

Key Access: **SWEEP****GATE
DELAY***Option 107 only.*

sets the duration of the delay after an edge trigger before the gate switch closes. The gate delay can be set from 1 μ s to 65.535 ms in 1 μ s steps.

Key Access: **SWEEP****GATE
LENGTH***Option 107 only.*

sets the duration of the gate. The gate length can be set from 1 μ s to 65.535 ms in 1 μ s steps.

Key Access: **SWEEP****GATE
ON OFF***Option 107 only.*

turns on or off the gate, the time-gated analyzer capability. The gate can be turned on outside, or from within, the gate utility. The gate utility makes it easier to set up and manipulate the gate.

The gating function allows you to make carrier-to-noise, in-channel frequency response, and composite second order (CSO) distortion measurements without turning off modulation (Option 107 required).

Key Access: **SWEEP**

**GATE
UTILITY**

Option 107 only.

accesses the softkey functions used for the time-gated analyzer capability. It creates related time domain and frequency domain windows to set up the time gate and make measurements.

Note that if the gate utility menus are exited by pressing one of the front panel keys they may be re-entered by pressing **[SWEEP]** twice.

Some analyzer functions are altered or are not available when the gate utility is active. See Table 4-4. From within the gate utility press **EXIT UTILITY** to return to normal analyzer operation. Press **[SWEEP]** twice, and **EXIT UTILITY** to return to the gate utility and then exit it properly.

Table 4-4.
Commands Altered/Not Available within the Gate Utility

Command	Description of Change
% AM	measurement function is not available
Adjacent channel power	measurement function is not available
Calibration	no calibration functions can be accessed
Channel power	measurement function is not available
FFT	measurement function is not available
N dB points	measurement function is not available
Occupied bandwidth	measurement function is not available
Peak zoom	routine is not available
Res BW	turns off resolution BW coupling to pulse width
Span	must be zero in the time domain window
Sweep time	turns off sweep time coupling to PRI
TOI	measurement function is not available
Video BW	turns off video BW coupling to gate length

Key Access: **[SWEEP]**

Softkey Descriptions

Cable TV Analyzer Functions

GHIJKL

accesses the softkey menu used for selecting screen title or prefix characters G through L.

Key Access: **CAL**, **CONFIG**, **DISPLAY**, **RECALL**, or **SAVE**

**GND REF
DETECTOR**

displays the output of the analog-ground reference produced on the A16 processor/video assembly. This is a service diagnostic function and is for service use only.

Key Access: **CAL**

**GOTO
PAGE**

allows you to select a specific page of on-screen test results to view.

**GRAT
ON OFF**

turns the screen graticule on and off. This is helpful when alternative graphics are drawn on the screen through a remote controller and during plotting, when a graticule is not required.

Key Access: **DISPLAY**

**GRPH MKR
ON OFF**

turns the graph marker ON or OFF. This softkey is available when ACPGRAPH is ON (for ACP or ACP extended measurements), or when PWRGRAPH is ON (for channel power measurements).

Front-Panel Access Key: **MEAS/USER**

HOLD

deactivates the active function and blanks the active function text from the display. No data can be accidentally entered using the knob, step keys, or keypad. Activating another function will turn off the hold function.

Key Access: **DISPLAY**

**HP B&W
DJ540**

selects a black and white print. Use this function if you have a black and white HP DeskJet 540 printer. Press **HP B&W Printer** and then select the **HP B&W PRINTER** softkey. Start printing by pressing **COPY DEV PRNT PLT** (PRNT) and **COPY**.

Front-Panel Key Access **CONFIG**

**HP B&W
PRINTER**

selects a black and white print. Use this function if you have a black and white HP printer, or if you are using an HP PaintJet printer, but want to have a black and white print.

Key Access: **CONFIG**

HRC

allows you to select the harmonically related carriers (HRC) tune configuration. HRC is the channel tuning configuration in which the frequency of each video carrier is a multiple of 6 MHz. The HRC frequency assignments are defined in the Federal Communications Commission's (FCC) channel identification plan, part 76.612.

If you do not select a channel tuning configuration, the default configuration is the standard (STD) configuration. The choices for the channel tuning configuration are: standard (STD), off-the-air (AIR), incrementally related carriers (IRC), harmonically related carriers (HRC), and T format.

The channel tuning configuration selection is selected independently of the test plan and is not stored with the test plan. The analyzer retains the channel tuning configuration selection, even when power is turned off, until a new selection is made.

Press **CABLE TV ANALYZER**, **Setup**, **Channel Tuning** to access **HRC**.

Key Access: **CABLE TV ANALYZER**

Cable TV Analyzer Functions

HUM

initiates the Hum measurement.

Key Access: **CHANNEL MEAS**

IDNUM

is used when the instrument is powered on the first time. It inputs the analyzer model number and option information. This is a service calibration function and is for service use only. Refer to the service guide for more information.

Key Access: **CAL**

INIT FLT

is used when the instrument is powered on the first time. It sets the defaults for spectrum analyzer flatness including the start and stop frequencies and the step size. All of the correction values are set to zero. This is a service calibration function and is for service use only. Refer to the service guide for more information.

Key Access: **CAL**

**INPUT Z
50Ω 75Ω**

adjusts the voltage readout by 1.76 dB to correct for the difference between voltage and power measurements in a 75 Ω system versus a 50 Ω system. The impedance you select is for computational purposes only, since the actual impedance of 75 Ω is set by internal hardware. The preset value can be changed by using a service function. Select the computational input impedance by pressing **INPUT Z 50Ω 75Ω** or by entering 75 or 50 using the numeric keypad.

Key Access: **AMPLITUDE**

**INTERNAL
CARD**

selects between spectrum analyzer memory and the memory card for the save and recall functions.

Key Access: **RECALL** or **SAVE**

Cable TV Analyzer Functions**INTERNAL
— STATE**

recalls the saved analyzer state from the selected state register. Recalling a state from the analyzer memory displays the time and date when the state data was stored.

Key Access: **RECALL**

**Internal
— Trace**

accesses a softkey menu that allows you to either select the trace in which the trace data is to be recalled (trace A, trace B, or trace C), recall the current limit-line tables, or recall amplitude correction factors.

Key Access: **RECALL**

IRC

allows you to select the incrementally related carriers (IRC) channel tuning configuration. IRC is the configuration in which all channels except channels 5 and 6 are at the Federal Communication Commission's (FCC) standard channel frequencies. The IRC frequency assignments are defined in the FCC channel identification plan, part 76.612.

If you do not select a channel tuning configuration, the default configuration is the standard (STD) configuration. The choices for the channel tuning configuration are: standard (STD), off-the-air (AIR), incrementally related carriers (IRC), harmonically related carriers (HRC), and T format.

The channel tuning configuration selection is selected independently of the test plan and is not stored with the test plan. The analyzer retains the channel tuning configuration selection, even when power is turned off, until a new selection is made.

Press **CABLE TV ANALYZER**, **Setup**, **Channel Tuning** to access **IRC**.

Key Access: **CABLE TV ANALYZER**

Cable TV Analyzer Functions

**LAST
SPAN**

changes the analyzer frequency span to the previous span setting.

Key Access: **SPAN**

**Limit
Lines**

accesses the limit-line menus.

Key Access: **DISPLAY**

**LIMIT
LINES**

When accessed by **SAVE**, pressing **LIMIT LINES** stores the current limit-line tables in analyzer memory or on the memory card. When accessed by **RECALL**, pressing **LIMIT LINES** recalls limit-line tables from analyzer memory or the memory card. See "To Save a Limit-Line Table or Amplitude Correction Factors" or "To Recall Limit-Line Tables or Amplitude Correction Factors" in Chapter 3 of the *HP 8591C Cable TV Analyzer Spectrum Analyzer Reference User's Guide* for more information.

Key Access: **RECALL** or **SAVE**

**LIMITS
FIX REL**

allows you to choose fixed or relative type of limit lines. The fixed (FIX) 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.

Key Access: **DISPLAY**

LIMITS
FRQ TIME

selects whether limit lines will be entered using frequency or sweep time to define the segments. Limit lines can be created by the user to test trace data. They can be specified as a table of limit-line segments of amplitude versus frequency, or of amplitude versus time.

Key Access: **DISPLAY**

LINE

activates the trigger condition that allows the next sweep to be synchronized with the next cycle of the line voltage.

Key Access: **TRIG**

LISTEN
ON OFF

Option 102 only.

demodulates the aural carrier so that it is audible through the built-in speaker.

Key Access: **CHANNEL MEAS**

LMT DISP
Y N AUTO

displays any portion of the limit lines that are currently within the analyzer display boundary. If Y (yes) is underlined the limit lines are displayed. If N (no) is underlined they are not displayed. If AUTO is underlined, the display of the limit lines is dependent on LMT TEST. The limit lines will be displayed while the limit test function is turned on, otherwise they will be turned off.

Limit lines cannot be displayed while using the analog+ display mode. Limit testing can be done but the limit lines will not be displayed.

Key Access: **DISPLAY**

Cable TV Analyzer Functions

**LMT TEST
ON OFF**

turns the limit-line testing and (if **LMT DISP AUTO** is selected) turns the display of the limit lines on and off. When limit-line testing is enabled, every measurement sweep of trace A is compared to the limit lines. If trace A is at or within the bounds of the limit lines, **LIMIT PASS** is displayed. If trace A is out of the limit-line boundaries, **LIMIT FAIL** is displayed.

Key Access: **DISPLAY**

**LOAD
FILE**

loads a file from the memory card into analyzer memory.

NOTE

Use of the **LOAD FILE** softkey is not recommended for recalling limit-line tables or amplitude-correction factors stored in analyzer memory.

Key Access: **RECALL** or **SAVE**

(LOCAL)

Pressing **CONFIG (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 lower-right corner of the screen indicating remote and talk. A "T" or "L" may appear during remote operation, indicating talk or listen. Pressing the **CONFIG** key removes the "R" symbol in the lower-right corner.

Key Access: **CONFIG**

MAIN
COIL DR

displays the output produced by the main-coil driver on the A7 analog interface assembly. This is a service diagnostic function and is for service use only.

Key Access: **CAL**

Main
Menu

returns the analyzer to the main menu.

Key Access: **SYSTEM MEAS** or **SWEEP**

MAIN
SPAN

displays the main-coil-span signal, MC_SPAN, from the span dividers on the A7 analog interface assembly. This is a service diagnostic function and is for service use only.

Key Access: **CAL**

MAN TRK
ADJUST

Option 011 only.

allows the user to adjust the frequency of the tracking-generator oscillator manually using the step keys or knob. The tracking adjust is tuned to maximize the amplitude of the trace.

Key Access: **AUX CTRL**

MARKER #
ON OFF

turns the selected marker on or off. One of the four markers must first be selected by the **SELECT 1 2 3 4** key, otherwise marker 1, or the last selected marker, will be turned on or off. When a new marker is turned on by pressing **MARKER # ON OFF**, the **MK TRACE AUTO ABC** function always switches to AUTO and the marker is put on the trace that is selected by the AUTO mode.

Key Access: **MKR**

Cable TV Analyzer Functions

MARKER Δ

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 of the first marker is fixed, and the second marker is under your control. Annotation in the active function block and in the upper-right corner of the screen indicates the frequency and amplitude differences between the two markers. The display mode must not be changed between log and linear while using a delta marker.

NOTE

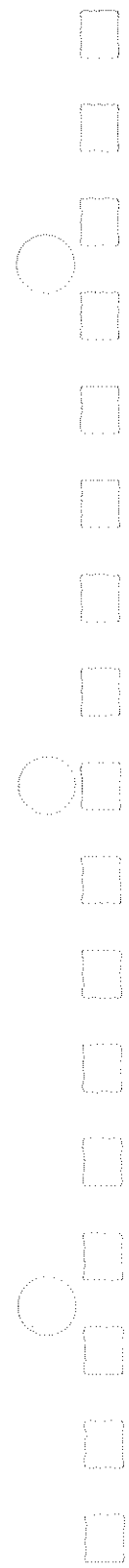
If there are already four markers when **MARKER Δ** is pressed, a nonactive marker disappears, the active marker becomes a reference marker, and the delta marker becomes the active marker.

Key Access: **MKR** or **PEAK SEARCH**

MARKER Δ —SPAN

sets the start and stop frequencies to the values of the delta markers. The start and stop frequencies will not be set if the delta marker is off.

Key Access: **MKR→**



MARKER→
AUTO FFT

functions exactly like the CONTINUS FFT softkey, if the spectrum analyzer is already in zero span. If the analyzer is not in zero span it activates a marker that must be placed on the signal that will have an FFT performed on it and MARKER→ AUTO FFT must be pressed again. The resolution bandwidth setting must be wide enough to include the displayed modulation signals. Refer to Chapter 5 "Measuring Amplitude Modulation Using the Fast Fourier Transform" for more information.

Press FFT OFF to return the analyzer to normal operation. The analyzer state prior to pressing MARKER→ AUTO FFT can be recalled from register 8.

Key Access: MEAS/USER

MARKER
→CF

changes the analyzer settings so that the frequency at the marker becomes the center frequency.

Key Access: MKR→ or PEAK SEARCH

MARKER
→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.

Key Access: MKR→

Cable TV Analyzer Functions

**MARKER—
FFT STOP**

changes the FFT stop frequency to whatever the current value of the FFT marker frequency is, within the limitations of the available sweep times. This puts the marker on the right side of the graticule.

Key Access: **MEAS/USER**

**MARKER—
MID SCRN**

changes the frequency at the middle of the FFT display to whatever the current value of the FFT marker frequency is, within the limitations of the available sweep times. This puts the marker in the middle of the graticule.

When using the FFT function the **MARKER— MID SCRN** softkey replaces the **MARKER → CF** softkey in the **PEAK SEARCH** and **MKR→** menus.

Key Access: **MEAS/USER**, **MKR→**, or **PEAK SEARCH**

**MARKER—
MINIMUM**

moves the active marker to the minimum detected amplitude value.

Key Access: **MKR→**

**MARKER
—PK-PK**

finds and displays the frequency and amplitude differences between the highest and lowest trace points. Pressing **MARKER —PK-PK** performs the routine similar to pressing the following keys: **PEAK SEARCH**, **MARKER Δ**, and **MARKER— MINIMUM**.

Key Access: **MKR→**

MARKER
—REF LVL

changes the analyzer settings so that the amplitude at the active marker becomes the reference level.

Key Access: **MKR→**

MARKER
—START

changes the start frequency so that it is equal to the frequency of the active marker. This moves the active marker to the left edge of the display.

Key Access: **MKR→**

MARKER
—STOP

changes the stop frequency so that it is equal to the frequency of the active marker. This moves the active marker to the right edge of the display.

Key Access: **MKR→**

MARKER
ALL OFF

turns off all of the markers, including markers used for marker track and demodulation. Marker annotation is also removed.

Key Access: **MKR**

MARKER
AMPTD

keeps the active marker at the requested amplitude on the screen.

Key Access: **MKR**

MARKER
NORMAL

activates a single frequency marker at the center frequency on the active trace if an on-screen marker is not already displayed. If there is an on-screen marker before the MARKER NORMAL function is enabled, a frequency marker is enabled at the position of the first marker.

Key Access: **MKR**

Softkey Descriptions

Cable TV Analyzer Functions

**MARKER
ON**

Option 107 only.
activates a marker in the gate utility.

Key Access: **SWEEP**

**MAX
HOLD A**

maintains the maximum level for each trace point of trace A. Updates each trace point if a new maximum level is detected in successive sweeps.

Key Access: **TRACE**

**MAX
HOLD B**

maintains the maximum level for each trace point of trace B. Updates each trace point if a new maximum level is detected in successive sweeps.

Key Access: **TRACE**

**MAX MXR
LVL**

lets you change the maximum input mixer level in 10 dB steps from 39 dBmV to -51 dBmV.

Key Access: **AMPLITUDE**

MEAS OFF

turns off the measurement functions under the **Power Menu** softkey and restores the analyzer to the state prior to initiating the power measurement.

Key Access: **MEAS/USER**

MEAS/USER

switches between the User Menu and the menu containing **N dB PTS ON OFF**, **% AM ON OFF**, **TOI ON OFF**, **Power Menu**, and **FFT Menu**. If no keys have been defined in the user menu, **No User Menu** is displayed. See the *HP 8590 E-Series and L-Series Spectrum Analyzers and HP 8591C Cable TV Analyzer Programmer's Guide* for more information about defining keys in the user menu.

**Measure
Now**

accesses the functions that allow you to initiate the testing immediately (instead of initiating testing at a later time) and send the test results to the screen, a printer, or to a RAM card.

Pressing **Measure Now** will display a screen that allows the option of selecting CTB testing. Then, the **DUMP TO SCREEN**, **DUMP TO PRINTER**, **DUMP TO CARD**, and **Main Menu** softkeys are accessed.

Key Access: **SYSTEM MEAS**

MEM LOCKED

indicates that the save lock function is on. It replaces the **ERASE STATEALL** and **ERASE TRACEALL** softkeys under the **CONFIG** key, and it replaces **STATE — INTERNAL** and **TRACE — INTERNAL** under the **SAVE** key when **SAV LOCK ON OFF** is ON. Pressing **SAV LOCK ON OFF** returns the menu to its unlocked state.

Key Access: **SAVE** or **CONFIG**

**MIN
HOLD C**

maintains the minimum level for each trace point of trace C. Updates each trace point if a new minimum level is detected in successive sweeps.

Key Access: **TRACE**

**MIN HOLD
ON OFF**

puts the analyzer into the sample detection mode and continuously places the minimum level at each trace point of trace A into trace B. Once activated, the function continues until turned off with **MIN HOLD OFF**.

Key Access: **CHANNEL MEAS**

Softkey Descriptions

Cable TV Analyzer Functions

MK COUNT
ON OFF

turns on the marker counter when ON is underlined. If no marker is active before **MK COUNT ON OFF** is pressed, a marker is activated at center screen. Press **MK COUNT ON OFF** (so that OFF is underlined), to turn the marker counter off. Press **CNT RES AUTO MAN** to change the marker counter resolution to an uncoupled value.

Key Access: **(MKR FCTN)**

MK NOISE
ON OFF

reads out the average noise level, referenced to a 1 Hz noise power bandwidth, at the marker position. If no marker is present, a marker appears at the center of the screen. The root-mean-square noise level, normalized to a 1 Hz noise power bandwidth, is read out. The sample detector is activated.

Key Access: **(MKR FCTN)**

MK PAUSE
ON OFF

stops the analyzer sweep at the marker position for the duration of the dwell time. The dwell time can be set from 2 milliseconds to 100 seconds.

Key Access: **(MKR FCTN)**

MK READ
F T I P

selects the marker readout to be displayed in signal frequency, sweep time, the inverse of the sweep time, or the period that is the inverse of the frequency. When the instrument is in zero span the frequency type readout cannot be selected.

Key Access: **(MKR)**

MK TABLE
ON OFF

provides a list of the four available markers that is updated at the end of each sweep or when a marker is used. The marker data can be displayed in different formats. It can be in absolute or delta frequency and amplitude formats. There is also a delta display line format, which can be accessed using the **TABLE ADL NRM** softkey.

The marker table is not saved with the **SAVE** and **RECALL** keys.

Key Access: **MKR FCTN**

MK TRACE
AUTO ABC

assigns a marker to a trace. Pressing **MK TRACE AUTO ABC** will activate a marker on trace A if there are no markers turned on. If a marker is currently active, press **MK TRACE AUTO ABC** until A, B, or C are 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 first look for a trace in the clear-write mode, in the order of trace A, then trace B, then trace C. If no traces are currently being written, it will select a trace in the view-store mode, again in the order of trace A, B, then C.

Key Access: **MKR**

MK TRACK
ON OFF

moves the signal that is nearest to the active marker to the center of the screen and keeps the signal there. **MKR-TRK** or **CNTR-TRK** appears in the upper-right 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.

Key Access: **MKR FCTN**

Cable TV Analyzer Functions

MKR

accesses the marker control softkeys that select the type and number of markers and turn them on and off. Markers are diamond-shaped characters that identify points of traces and allow the traces to be manipulated and controlled on the screen. During manual operation, four markers may appear on the display simultaneously; only one can be controlled at a time. The marker that is controlled is called the "active" marker. Pressing **MKR** activates the **MARKER NORMAL** softkey.

MKR→

(read "marker to") accesses the softkeys used for the transfer of marker information directly into other functions.

MKR FCTN

accesses the marker function softkeys. These softkeys can be used to access the marker table and to turn on marker functions for tracking the signal and counting its frequency. Noise markers and the marker pause function are also accessed under **MKR FCTN**.

MNOPQR

accesses the softkey menu for selecting screen title or prefix characters M through R.

Key Access: **CAL**, **CONFIG**, **DISPLAY**, **RECALL**, or **SAVE**

MODE

changes the softkey menus for the analyzer mode and other modes of operation when **SPECTRUM ANALYZER** (located under **PRESET**) and **PRESET SPECTRUM** are selected, respectively. Other modes are available using the downloadable measurement personalities. The HP 85721A Cable Television Measurements Personality is an example of these modes. Consult the documentation accompanying the personality for information about these other modes of operation.

**Monitor
TV**

allows you to access the TV receiver mode. This feature is the same as the **TV RECEIVER** mode of operation except that it is accessed from a front-panel hardkey.

Press **AUX CTRL** to access **Monitor TV**.

Key Access: **AUX CTRL**

**N dB PTS
ON OFF**

automatically places two markers at points N dB from the highest point on the highest displayed signal, and determines the frequency difference between the two markers. N dB is the active function and the value of N is set by the user. The measurement defaults to 3 dB when it is first turned on. The measurement runs continuously re-executing at the end of each sweep.

Key Access: **MEAS/USER**

**NEW
EDIT**

Refer to the *HP 8590 E-Series and L-Series Spectrum Analyzers and HP 8591C Cable TV Analyzer Programmer's Guide* for more information. starts the DLP editor function, clearing the DLP editor memory to create a new item in the analyzer 2500 byte DLP editor memory. The item will not be in the analyzer user memory until it is processed by the **SAVE EDIT** softkey. The DLP editor memory buffer remains intact when the instrument is preset and when it is powered off.

Key Access: **RECALL** or **SAVE**

NEXT

switches the active window between the two displayed windows, if the windows display mode has been turned on. The active window is marked by solid lines.

Softkey Descriptions

Cable TV Analyzer Functions

NEXT PAGE

allows you to select the next page of on-screen test results. Press **CABLE TV ANALYZER**, **SYSTEM MEAS**, **Measure Now**, **Yes** or **No**, **DUMP TO SCREEN** to access **NEXT PAGE**.

Key Access: **SYSTEM MEAS**

NEXT PEAK

places the marker on the next highest peak. The signal peak must exceed the threshold value. (Also see the **PEAK EXCURSN** and **THRESHLD ON OFF** softkey descriptions.)

Key Access: **AUX CTRL** or **PEAK SEARCH**

NEXT PK LEFT

moves the marker to the next peak to the left of the current marker. The signal peak must exceed the threshold value. If there is no peak to the left, the marker will not move. (Also see the **PEAK EXCURSN** and **THRESHLD ON OFF** softkey descriptions.)

Key Access: **AUX CTRL** or **PEAK SEARCH**

NEXT PK RIGHT

moves the marker to the next peak to the right of the current marker. The signal peak must exceed the threshold value. If there is no peak to the right, the marker will not move. (Also see the **PEAK EXCURSN** and **THRESHLD ON OFF** softkey descriptions.)

Key Access: **PEAK SEARCH**

NO

allows you to select not to do the function. If you press **CLEAR TST PLAN** and then press **NO**, you have selected not to clear the current test plan from analyzer memory. If you enter a channel by using **ENTER BY CHANNEL** or **ENTER BY RANGE** and then press **NO**, the channel or range of channels will be treated as channels that are not scrambled.

NO is accessed either by pressing **CLEAR TST PLAN** or by entering a channel number with **ENTER BY CHANNEL** or **ENTER BY RANGE**.

Key Access: **SYSTEM MEAS**

**No User
Menu**

is displayed if key number 1 has not been defined by the user. Key number 1 can be defined by remote programming commands (**KEYCMD** or **KEYDEF**).

Key Access: **MEAS/USER**

**NORMLIZE
ON OFF**

subtracts trace B from trace A and adds the result to the display line. The result is displayed in trace A.

Key Access: **TRACE**

**NORMLIZE
POSITION**

displays the display line and makes the display line function active. The trace data is normalized with respect to the display line even if the value of the display line is changed.

Key Access: **TRACE**

NTSC

allows you to trigger on the NTSC video format.

Key Access: **TRIG**

Softkey Descriptions

Cable TV Analyzer Functions

**OCC BW
% POWER**

allows the user to enter the percent of the power desired when using the occupied bandwidth measurement under the **Power Menu** softkey.

Key Access: **MEAS/USER**

**OCCUPIED
BANDWIDTH**

integrates the power of the displayed and puts markers at the frequencies containing a selected percent of the power. The measurement defaults to 99% of the occupied bandwidth power.

Key Access: **MEAS/USER**

**PAINTJET
PRINTER**

selects a color print (for use with an HP PaintJet printer only). The traces are displayed in orange (trace A), blue (trace B), and red (trace C). The graticule, screen annotation, and user information are displayed in black.

Key Access: **CONFIG**

PAL

allows you to trigger on the PAL video format.

Key Access: **TRIG**

PAL-M

allows you to trigger on the PAL-M video format.

Key Access: **TRIG**

**PARAM
AUTO MAN**

lets the user choose between automatically or manually setting the parameters used for the measurement functions under the **Power Menu** softkey.

Key Access: **MEAS/USER**

**PEAK
EXCURSN**

sets the minimum amplitude variation of signals that the marker can identify as a peak.

Key Access: **PEAK SEARCH**

**Peak
Menu**

accesses the same softkeys that are available when **PEAK SEARCH** is pressed (see the key description for **PEAK SEARCH** below). Pressing **Peak Menu** instead of **PEAK SEARCH** allows you to use the peak-search functions without initiating a new peak search.

Key Access: **MKR→**

PEAK SEARCH

automatically places a marker on the highest amplitude of a trace, displays the marker's amplitude and frequency. It also accesses the menus of marker peak functions including the peak table functions.

Softkey Descriptions

Cable TV Analyzer Functions

**PEAK
ZOOM**

finds the highest displayed signal and narrows the span to a value selected by the user.

Key Access: **SPAN**

**PICTURE
ON OFF**

allows you to turn the TV picture on and off. This feature is the same as the **TV RECEIVER** mode of operation except that it is accessed from a front-panel hardkey.

Press **AUX CTRL**, **Monitor TV** to access

PICTURE ON OFF.

Key Access: **AUX CTRL**

**PIX &SND
ON OFF**

allows you to view the TV picture and listen to the sound simultaneously. This feature allows you to quickly identify picture quality problems such as noise, distortion, hum, and ingress. Select a channel by pressing **CHANNEL SELECT**, entering a TV channel number, then pressing **PIX &SND ON OFF**. To exit this mode, press any softkey.

Press **TV RECEIVER** to access **PIX &SND ON OFF**.

Key Access: **TV RECEIVER**

Cable TV Analyzer Functions

PK MODE
<>DL NRM

select which peaks will be listed in the peak table to include all peaks, or to exclude the peaks that are either above or below the display line. See table below. The display line is activated if it was not currently being displayed.

Selection	Peaks Listed
NRM	all peaks listed
>DL	peaks above display line listed
< DL	peaks below display line listed

Key Access: **PEAK SEARCH**

PK SORT
FRQ AMP

switches the peak table sorting routine between listing the peaks in order by descending amplitude or by ascending frequency.

Key Access: **PEAK SEARCH**

PK 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 A only. The peak table is not saved with the **SAVE** and **RECALL** keys.

Key Access: **PEAK SEARCH**

Cable TV Analyzer Functions

PLAN 1

allows you to select test plan 1 as the test plan number for either saving the current test plan or recalling a previously saved test plan.

Saving the current test plan overwrites any test plan previously saved in plan 1. When you save the current test plan in test plan 1, it is stored in trace register 6.

Key Access: **SYSTEM MEAS**

PLAN 2

allows you to select test plan 2 as the test plan number for either saving the current test plan or recalling a previously saved test plan.

The operation of **PLAN 2** is similar to **PLAN 1** except that the test plan is stored in and recalled from trace register 7.

Key Access: **SYSTEM MEAS**

PLAN 3

allows you to select test plan 3 as the test plan number for either saving the current test plan or recalling a previously saved test plan.

The operation of **PLAN 3** is similar to **PLAN 1** except that the test plan is stored in and recalled from trace register 8.

Key Access: **SYSTEM MEAS**



PLAN 4

allows you to select test plan 4 as the test plan number for either saving the current test plan or recalling a previously saved test plan.

The operation of **PLAN 4** is similar to **PLAN 1** except that the test plan is stored in and recalled from trace register 9.

Key Access: **SYSTEM MEAS**

PLAN 5

allows you to select test plan 5 as the test plan number for either saving the current test plan or recalling a previously saved test plan.

The operation of **PLAN 5** is similar to **PLAN 1** except that the test plan is stored in and recalled from trace register 10.

Key Access: **SYSTEM MEAS**

**Plot
Config**

accesses the menu used to address the plotter and to select plotter options. See the **COPY** key for more information.

Key Access: **CONFIG**

**PLOTTER
ADDRESS**

Option 041 only.

changes the HP-IB address of the plotter. The plotter address is set to 5 when **DEFAULT CONFIG** is pressed.

Key Access: **CONFIG**

Cable TV Analyzer Functions

PLT _ _
LOC _ _

selects the position of the plotter output. The highlighted portion of the softkey label indicates where the plot is to be output on the page. This softkey function appears only if two or four plots per page are selected when **PLTS/PG 1 2 4** is pressed.

Key Access: **CONFIG**

PLT MENU
ON OFF

allows the softkey labels to be plotted along with the analyzer display. This function operates when the **COPY** key is used in a plot configuration. The **PLT MENU ON OFF** function is set to OFF when **DEFAULT CONFIG** is pressed.

Key Access: **CONFIG**

Plt Port
Config

Option 041 or 043 only.

accesses the menus used by Option 041 (HP-IB and Parallel Interface) and Standard Option 043 (RS-232 and Parallel Interface) to select plotter options. See the **COPY** key for more information.

Front-Panel Key Access: **CONFIG**

PLT PORT
HPIB PAR

Option 041 only.

allows you to select between HP-IB or parallel plotter ports.

PLT PORT
SER PAR

allows you to select between serial or parallel plotter ports. The **BAUD RATE** softkey appears in this menu only when serial is selected.

PLTS/PG
1 2 4

allows you to plot a full-page, half-page, or quarter-page output. Selecting two plots per page requires a plotter that has the rotate command (RO). The plotter will be set to a full-page output when **DEFAULT CONFIG** is pressed.

Key Access: **CONFIG**

PLT->LJT
ON OFF

allows you to plot a full-page, half-page, or quarter-page output to an HP LaserJet printer. This softkey can be accessed by pressing **CONFIG**, then **Plot Config**.

Key Access: **CONFIG**

POINT

specifies a limit value for one coordinate point, so that a POINT segment specifies a limit value for a single frequency or time.

Key Access: **DISPLAY**

Softkey Descriptions

Cable TV Analyzer Functions

**Power
Menu**

accesses functions that make transmitter power measurements. The measurements are designed for analog radio or continuous carrier digital radio signals.

Key Access: **MEAS/USER**

**POWER ON
IP LAST**

determines the state of the analyzer when the analyzer is powered on.

NOTE

If you have a downloadable program or "personality" installed in analyzer memory, the following changes apply to the operation of the POWER ON function: When using a downloadable program or personality, the last state of the personality is not recalled. We recommend that if you are using a downloadable program or personality, you set **POWER ON IP LAST** to IP. If

POWER ON IP LAST is set to LAST, you must press **PRESET** whenever you power on the analyzer.

Key Access: **CONFIG**

PRESET

provides a convenient starting point for making most measurements. Pressing **PRESET** displays softkeys used for accessing the operating modes available for your analyzer. See Table 4-6 and Table 4-5 for the conditions established by pressing **PRESET**.

The instrument preset function performs a processor test, but does not affect CAL data. Pressing **PRESET** clears both the input and output buffers, but does not clear trace B. The amplitude values of trace C are set to the reference level. Amplitude-correction factors are turned off. Limit-line testing is turned off, but the limit-line tables remain in analyzer memory. The status byte is set to 0. Instrument preset affects all operating modes. (See the key description for **MODE** for more information about other operating modes.) Pressing **PRESET** erases all “on time” functions—ONCYCLE, ONDELAY, ONEOS, ONMKR, ONSRQ, ONSWP, ONTIME, and TRMATH. These are remote programming commands. See the *HP 8590 E-Series and L-Series Spectrum Analyzers and HP 8591C Cable TV Analyzer Programmer's Guide* for more information.

NOTE

Turning the analyzer on performs an instrument preset. Turning on the analyzer also fetches CAL data; completes a processor test; clears trace B, trace C, and both the input and output buffers; turns off amplitude correction factors; turns off limit-line testing; and sets the status byte to 0. The last state of the analyzer (before it was switched off) is recalled, unless IP has been set by the POWER ON function.

Cable TV Analyzer Functions**Table 4-5. Model Specific Preset Conditions**

Model	Center Frequency	Span	Start Frequency	Stop Frequency	Sweep Time
HP 8591C	900 MHz	1.8 GHz	0 Hz	1.8 GHz	20 ms (auto-coupled)

Table 4-6. Common Preset Conditions

A → B → A	off
Amplitude correction factors	off
Amplitude units	default values
Annotation and graticule display	on
Attenuation	10 dB (auto-coupled)
Center frequency	Refer to Table 4-5.
CF step size	10% of span
Coupled functions	all set to AUTO
Mass storage device (card or internal)	INTERNAL
Detector	positive peak
Display line level	2.5 graticule divisions below reference level, display off
Frequency offset	0 Hz
Limit-line testing	off
LIMIHI and LIMILO	cleared
Log scale	10 dB/division
Marker counter	off
Marker counter resolution	auto-coupled
Markers	off
Mixer level	39 dBmV
Operating mode	analyzer
Reference level	49 dBmV in power-on units
Reference level offset	0 dB
Reference level position	top (8th) graticule
Resolution bandwidth	3 MHz (auto-coupled)
Span	Refer to Table 4-5.

Table 4-6. Common Preset Conditions (continued)

SRQ mask	octal 50
Start Frequency	Refer to Table 4-5.
Stop Frequency	Refer to Table 4-5.
State registers 1–8	unaffected
Sweep	continuous
Threshold level	one graticule above baseline, display off
Title	cleared
Trace A	clear-write
Trace B	store-blank
Trace C	store-blank, at reference level
Trace registers	unaffected
Trigger	free run
VBW/RBW ratio	0.3
Video averaging	off
Video bandwidth	1 MHz (auto-coupled)

Cable TV Analyzer Functions**PRESET
SPECTRUM**

allows the analyzer mode only to be preset. Table 4-7 lists the conditions affected by the PRESET function. Other operating modes will not be affected. See the description of the **MODE** key.

In addition, pressing **PRESET SPECTRUM** erases user-generated graphics and blanks the active-function block that is on the analyzer screen.

Pressing **PRESET SPECTRUM** disposes of ONEOS, ONSWP, and TRMATH. These are remote programming commands; see the *HP 8590 E-Series and L-Series Spectrum Analyzers and HP 8591C Cable TV Analyzer Programmer's Guide* for more information.

Key Access: **MODE** or **PRESET**

Table 4-7. Preset Conditions for All Models

A — B → A	off
Analog+ display mode	off
Annotation and graticule	on
Attenuation	coupled
Center frequency	Refer to Table 4-5.
Center frequency step size	10% of span
Coupled functions	all set to AUTO
Detector	positive peak
Display line	off
Frequency offset	0 Hz
Limit-line testing	off
Scale	log 10 dB/div
Marker counter	off
Marker counter resolution	2 kHz (auto-coupled)
Markers	off
Measure	SA (analyzer)
On end-of-sweep command (ONEOS)	cleared
On-sweep command (ONSWP)	cleared

Table 4-7. Preset Conditions for All Models (continued)

Reference level	49 dBmV in power-on units
Reference level offset	0 dB
Reference level position	top (8th) graticule
Resolution bandwidth	3 MHz (coupled)
Span	Refer to Table 4-5.
Start frequency	Refer to Table 4-5.
Stop frequency	Refer to Table 4-5.
State registers 1–8	unaffected
Sweep	continuous
Sweep time	Refer to Table 4-5. (coupled)
Threshold	off
Trace A	clear-write
Trace B	store-blank
Trace C	store-blank
Trace math command (TRMATH)	cleared
Trace registers	unaffected
Trigger	free
Video averaging	off
Video bandwidth	1 MHz (coupled)
Video bandwidth to resolution bandwidth ratio	0.3

**Prev
Menu**

allows you to access the previous system measurement menu.

Key Access: **SYSTEM MEAS**

**PREV
PAGE**

allows you to select the previous page of on-screen test results.

Press **CABLE TV ANALYZER**, **SYSTEM MEAS**, **Measure Now**, **Yes** or **No**, **DUMP TO SCREEN** to access **PREV PAGE**.

Key Access: **SYSTEM MEAS**

Softkey Descriptions

Cable TV Analyzer Functions

**Print
Config**

accesses the softkey functions that are used to address the printer, select a black and white print or a color print, and reset the printer. See the **COPY** key for more information.

Key Access: **CONFIG**

**PRINT
REPORT**

allows you to print a report of the currently displayed test results.

Press **CABLE TV ANALYZER**, **SYSTEM MEAS**, **Measure Now**, **Yes** or **No**, **DUMP TO SCREEN** to access **PRINT REPORT**.

Key Access: **SYSTEM MEAS**

**PRINTER
ADDRESS**

Option 041 only.

allows you to change the HP-IB address of the printer. The printer address is set to 1 by pressing **DEFAULT CONFIG**.

Key Access: **CONFIG**

**PRINTER
SETUP**

resets the printer, sets the printer to 60 lines per page, and skips line perforations. This function enables you to obtain up to three printouts per page. The printer paper should be at the top of the form before using this function. The **PRINTER SETUP** function may not work with printers that are not recommended (see Chapter 9 for recommended printers).

Key Access: **CONFIG**

Prn Port Config	<i>Option 041 or 043 only.</i> accesses the menus used by Option 041 (HP-IB and Parallel Interface) and Standard Option 043 (RS-232 and Parallel Interface) to select printer options. See the COPY key for more information. Front-Panel Key Access: CONFIG
PRN PORT HPIB PAR	<i>Option 041 only.</i> allows you to select between HP-IB or parallel printer ports.
PRN PORT SER PAR	allows you to select between serial or parallel printer ports. The BAUD RATE softkey appears in this menu only when serial is selected.
PRT MENU ON OFF	allows the softkey labels to be printed along with the analyzer display. This function operates when the COPY key is used in a print configuration. The PRT MENU function is set to ON when DEFAULT CONFIG is pressed. Key Access: CONFIG
Pulse Param	accesses the gate utility menus for entering the pulse parameters: reference edge, pulse width, and pulse repetition interval. If pulse parameters have previously been entered, pressing Pulse Param causes a list of the current values to be displayed. Key Access: SWEEP

Cable TV Analyzer Functions

**PURGE
AMP COR**

clears the current amplitude-correction factors table. Pressing **PURGE AMP COR** displays the message: **If you are sure, press key again to purge data.** Pressing **PURGE AMP COR** a second time clears the amplitude-correction data. Press **SAVE AMP COR** to save amplitude-correction factors, and then press **PURGE AMP COR** to clear the current amplitude-correction factors table.

Key Access: **CAL**

**PURGE
LIMITS**

clears the current limit-line table from analyzer memory. Pressing **PURGE LIMITS** displays the message: **If you are sure, press key again to purge data.** Press **PURGE LIMITS** again if you wish to clear the current limit-line table. Press **SAVE LIMIT** to save the current limit-line table, and then press **PURGE LIMITS** to clear the current limit-line table.

Key Access: **DISPLAY**

PWRGRAPH
ON OFF

turns the channel power graph ON or OFF. With the PWRGRAPH ON, the channel powergraph is calculated and displayed and the numeric results are not displayed. The value of the channel power is displayed at the selected marker frequency. This graph function is used after doing a channel power measurement with the CHANNEL POWER softkey.

Key Access: MEAS/USER

PWR SWP
ON OFF

Option 011 only.

activates (ON) or deactivates (OFF) the power-sweep function, which sweeps the output power of the tracking generator over the selected power-sweep range. The value of the power-sweep range is displayed in the active-function block when PWR SWP ON OFF is turned on.

Key Access: AUX CTRL

RECALL

accesses softkey menus that allow you to recall data from the memory card or analyzer memory.

RECALL
AMP CGR

recalls an amplitude-correction factors table from the current mass-storage device (analyzer memory or memory card).

Key Access: CAL

Cable TV Analyzer Functions

Recall Data

allows you to access **DATA TO PRINTER** and **DATA TO SCREEN**. **DATA TO PRINTER** sends the test results from a file on a RAM card to a printer. **DATA TO SCREEN** sends the test results from a file on a RAM card to the screen.

Press **CABLE TV ANALYZER**, **SYSTEM MEAS**, **More 1 of 2** to access **Recall Data**.

Key Access: **SYSTEM MEAS**

**RECALL
FRM CRD**

allows you to recall a previously saved test plan from a RAM card.

Recalling a test plan overwrites the current test plan. If you do not want the current test plan to be overwritten, save the current test plan before recalling a test plan.

Press **CABLE TV ANALYZER**, **SYSTEM MEAS**, **Recall TstPlan** to access **RECALL FRM CRD**.

Key Access: **SYSTEM MEAS**

**RECALL
FRM INT**

For channel-measurement mode it recalls a trace into trace B for use as a reference trace or to recall a system frequency response trace.

This function simplifies recalling a trace from the analyzers internal memory. A trace can also be recalled from a memory card using procedures provided in the analyzer user's guide.

For system-measurement mode it allows you to recall a previously saved test plan (from plans 1 through 5) from analyzer memory.

Recalling a test plan overwrites the current test plan. If you do not want the current test plan to be overwritten, save the current test plan before recalling a new one. See "Step 3. Save the current test plan in internal memory" in Chapter 3 of the *HP 8591C Cable TV Analyzer Cable TV Measurements User's Guide* for more information.

The test plans are saved in trace registers 6 through 10.

The channel numbers, tests, scrambling status, channel tuning configuration, quiet line number, frequency response line number, test signal line number, and field selection are saved in the test plan; the location code, the temperature, the selection of CTB testing, and the setting for an external pad (**EXT PAD YES NO**) are stored in nonvolatile analyzer memory and are retained until changed.

Key Access: **CHANNEL MEAS** or **SYSTEM MEAS**

Softkey Descriptions

Cable TV Analyzer Functions

**RECALL
LIMIT**

recalls limit-line tables from the current mass-storage device (analyzer memory or memory card).

Key Access: **DISPLAY**

**Recall
TstPlan**

allows you to access the softkeys used to recall a previously saved test plan from analyzer memory, or from a RAM card.

Recalling a test plan overwrites the current test plan. If you do not want the current test plan to be overwritten, save the current test plan before recalling a new one.

Press **CABLE TV ANALYZER**, **SYSTEM MEAS** to access **Recall TstPlan**.

Key Access: **SYSTEM MEAS**

REF LVL

allows the reference level to be changed.

Key Access: **AMPLITUDE**

**REF LVL
OFFSET**

adds an offset value to the displayed reference level.

Key Access: **AMPLITUDE**

**RES BW
AUTO MAN**

changes the analyzer 3 dB resolution bandwidth.

Key Access: **AUTO COUPLE** or **BW**

**RPG
TITLE** provides additional characters for the Change Title function.
Key Access: **CAL** or **DISPLAY**

**SAV LOCK
ON OFF** locks all the current internal state and trace registers against further data storage, when ON is underlined.

NOTE

When **SAV LOCK ON OFF** is set to ON, none of the state registers, (1-8), can be overwritten. The analyzer automatically updates state register nine with the last state. **ERASE MEM ALL** ignores the state of the **SAV LOCK**. So, even if STATES and TRACES are locked, they will still be erased by **ERASE MEM ALL**.

Key Access: **SAVE**

SAVE

accesses softkey menus that allow you to store state data, trace data, limit-line tables, and amplitude-correction factors on a memory card or in analyzer memory. The **SAVE** function also allows you to save state data, trace data, limit-line tables, amplitude-correction factors, and program data on the memory card. In addition, pressing **SAVE** accesses the softkey menus used to catalog the saved data in analyzer memory or on the memory card.

Softkey Descriptions

Cable TV Analyzer Functions

**SAVE
AMP COR**

saves the current amplitude-correction factors table to the current mass-storage device (analyzer memory or memory card).

Key Access: **CAL**

**SAVE
EDIT**

Refer to the *HP 8590 E-Series and L-Series Spectrum Analyzers and HP 8591C Cable TV Analyzer Programmer's Guide* for more information. passes the text from the DLP editor memory through the parser to execute as analyzer commands.

Key Access: **RECALL** or **SAVE**

**SAVE
LIMIT**

saves the current limit-line tables in the current mass-storage device (analyzer memory or memory card).

Key Access: **DISPLAY**

**SAVE TO
INT MEM**

allows you to save the current test plan in analyzer memory.

Saving a test plan overwrites any previously saved test plan of the same test plan number.

Up to five test plans can be saved in analyzer memory. The test plans are saved in nonvolatile analyzer memory, in trace registers 6 through 10.

The channel numbers, tests, scrambling status, channel tuning configuration, quiet line number, frequency response line number, test signal line number, and field selection are saved in the test plan; the location code, the temperature, the selection of CTB testing, and the setting for an external pad (**EXT PAD YES NO**) are stored in nonvolatile analyzer memory and are retained until changed.

Pressing **CABLE TV ANALYZER**, **SYSTEM MEAS**,
More 1 of 2, **Save TstPlan** accesses
SAVE TO INT MEM.

Key Access: **SYSTEM MEAS**

SAVE TO
MEM CRD

allows you to store the on-screen test results to a RAM card.

Press CABLE TV ANALYZER , SYSTEM MEAS ,
Measure Now , Yes or No , DUMP TO SCREEN to access
STORE TO CARD .

Key Access: SYSTEM MEAS

SAVE TRB
TO INT

stores trace B in internal memory.

This function simplifies saving either a reference trace or a
test result to internal memory. This trace can also be saved
to a memory card using procedures provided in the analyzer
user's guide.

Key Access: CHANNEL MEAS

Softkey Descriptions

Cable TV Analyzer Functions

**Save
TstPlan**

allows you to access **SAVE TO INT MEM** and **SAVE TO MEM CRD**.

Pressing **CABLE TV ANALYZER**, **SYSTEM MEAS**, **More 1 of 2**, **Create TstPlan** accesses **Save TstPlan**.

Key Access: **SYSTEM MEAS**

**SCALE
LOG LIN**

scales the vertical graticule divisions in logarithmic units when **LOG** is underlined. When the **SCALE LOG LIN** function is the active function, the logarithmic units per division can be changed. Values may range from 0.1 to 20 dB per division. When **LIN** is underlined, the vertical scale is in linear mode that has a range of 1 kW to 1 pW. The reference-level value is set to the top of the screen and the bottom graticule becomes zero volts. (Each division of the graticule is one-eighth of the reference level in volts.)

Key Access: **AMPLITUDE**

SECAM-L

triggers on the SECAM-L video formats.

Key Access: **TRIG**

SELECT
1 2 3 4

selects one of the four possible markers. A marker can be turned on once it is selected. 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 and the **MK TRACE AUTO ABC** softkey will have the appropriate trace letter underlined.

Key Access: **(MKR)**

SELECT
AMPLITUD

allows you to enter either the amplitude value for the displayed (upper or lower) limit-line segment or the amplitude value for the current amplitude-correction point. Enter the amplitude value for the selected frequency or time by using the data keys. Change an amplitude value by using the step keys or the knob. Press **(BK SP)** to correct errors.

Key Access: **(CAL)** or **(DISPLAY)**

SELECT
DLT AMPL

allows you to enter the delta amplitude value. The middle amplitude value and the delta amplitude value create an upper and lower limit-line segment. The default value is 0.

Key Access: **(DISPLAY)**

Cable TV Analyzer Functions

**SELECT
FREQ**

allows you to enter the frequency value for a limit-line segment or for an amplitude-correction point.

Key Access: **CAL** or **DISPLAY**

**SELECT
LWR AMPL**

allows you to enter the amplitude value for the lower limit-line segment.

Key Access: **DISPLAY**

**SELECT
MID AMPL**

allows you to enter the middle amplitude value. The middle amplitude value and the delta amplitude value create upper and lower limit-line segments.

Key Access: **DISPLAY**

**SELECT
POINT**

allows you to create or edit an amplitude-correction factor data point.

Key Access: **CAL**

**SELECT
PREFIX**

allows you to select an already existing prefix of a cataloged file and changes the current prefix to this selected prefix.

Key Access: **RECALL** or **SAVE**

**SELECT
SEGMENT**

allows you to create or edit a limit-line segment.

Key Access: **DISPLAY**

**SELECT
TIME**

allows you to enter the time value for a limit-line segment.

Key Access: **DISPLAY**

**SELECT
TYPE**

accesses the softkey menu used to select the limit-line type of line.

Key Access: **DISPLAY**

**SELECT
UPR, AMPL**

allows you to enter the amplitude value for the upper limit-line segment.

Key Access: **DISPLAY**

**Service
Cal**

accesses several service calibration functions. The service calibration functions are designed for service use only. More detailed descriptions of the service functions are available in the service documentation. Service documentation can be obtained by ordering Option 915 through your HP Sales and Service office. For a listing of all available service calibration functions, refer to "Service Functions" at the beginning of this chapter.

Key Access: **CAL**

**Service
Diag**

accesses several service diagnostic functions. The service diagnostic functions are designed for service use only. More detailed descriptions of the service diagnostic functions are available in the service documentation. Service documentation can be obtained by ordering Option 915 through your HP Sales and Service office. For a listing of all available service diagnostic functions, refer to "Service Functions" at the beginning of this chapter.

Key Access: **CAL**

Cable TV Analyzer Functions

**SET
ATTN
ERROR**

sets the calibration attenuator-error factors (this is not the same as the input attenuator). This is a service calibration function and is for service use only.

Key Access: **CAL**

**Set B&W
Printer**

accesses the softkeys for setting up black and white HP and Epson compatible printers.

Key Access: **CONFIG**

**Set Color
Printer**

accesses the softkey for setting up the HP paintjet printer.

Key Access: **CONFIG**

**SET
DATE**

allows you to set the date of the real-time clock. Enter the date in the YYMMDD format using the number keypad and press **ENTER**. Valid year (YY) values are 00 through 99. Valid month (MM) values are from 01 to 12, and valid day values are from 01 to 31.

Key Access: **CONFIG**

**SET
TIME**

allows you to set the time of the real-time clock. Enter the time in 24 hour, HHMMSS format, using the number 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: **CONFIG**

Cable TV Analyzer Functions**Setup**

accesses the menu used to set up parameters specific to the power measurements.

If another front-panel key is pressed, exiting the power menus, press the **MEAS/USER** key twice to return to the last power menu that was being used.

Key Access: **MEAS/USER**

Setup

(For Cable TV Analyzer)

allows you to access the softkeys used to set up defaults for channel tuning configuration, input configuration, non-interfering RF and video measurement configurations, and channel to test for system beats.

The channel tuning configuration softkeys include **STD**, **AIR**, **IRC**, **HRC**, **T**, **USR CH 0 CNTR FRQ**, and **USR CH 0 SPAN**.

The analyzer input configuration softkeys include **EXT PAD YES NO** (50 Ω spectrum analyzers only), **EXT AMP YES NO**, and **TTL PWR @ INPUT**.

The non-interfering RF and video measurement configuration softkeys include **GATING YES NO** and **PAUSE YES NO**.

The **SYS BTS TST CH#** softkey is used to specify the channel you wish to use for testing beats.

These settings are stored in nonvolatile analyzer memory. This means that the analyzer retains the selections, even when power is turned off, until a new selection is made.

Press **CABLE TV ANALYZER** to access **Setup**.

Key Access: **CABLE TV ANALYZER**

SGL SWP

changes the sweep control to single sweep if the analyzer is in the continuous sweep mode. It executes a sweep after the trigger condition is met.

Softkey Descriptions

Cable TV Analyzer Functions

**SHOW
OPTIONS**

displays the number and description of the options installed in your analyzer, the instrument model number of the analyzer, the last five digits of the analyzer serial number, and the firmware revision.

Key Access: **CONFIG**

**SIGNAL
ID**

activates an FFT marker that must be put on a signal to verify that it is not being displayed at the wrong frequency due to aliasing.

Key Access: **MEAS/USER**

**SINGLE
FFT**

initializes the fast Fourier transform (FFT) function.

Key Access: **MEAS/USER**

**SINGLE
MEAS**

sets the functions in the **Power Menu** so that they make the measurement on a single sweep.

Key Access: **MEAS/USER**

SLOPE

draws a straight line between the coordinate point of the current segment and the coordinate point of the next segment, producing limit-line values for all frequencies between the two points.

Key Access: **DISPLAY**

**SOUND
ON OFF**

allows you to turn the TV sound on and off. This feature is the same as the **TV RECEIVER** mode of operation except that it is accessed from a front-panel hardkey.

Press **AUX CTRL**, **Monitor TV** to access **SOUND ON OFF**.

Key Access: **AUX CTRL**

SPAN or **SPAN**

activates the SPAN function and accesses the frequency-span functions.

Key Access: **SPAN**

Cable TV Analyzer Functions

**SPAN
ZOOM**

finds the highest signal peak on-screen. If a marker is not already on the peak, it places a marker on it, turns on the marker-track function, and activates the span function. Pressing **SPAN ZOOM** performs the routine similar to pressing the following keys: **PEAK SEARCH**, **MKR FCTN**, **MK TRACK ON OFF** (ON), and **SPAN**.

Key Access: **SPAN**

**SPEAKER
ON OFF**

turns the internal speaker on and off. The volume from the speaker is controlled by the -panel volume control knob and **FM GAIN** (when using FM demodulation). There is no output from the speaker unless demodulation is turned on. Pressing **PRESET** sets **SPEAKER ON OFF** to ON.

Key Access: **AUX CTRL**

**SPECTRUM
ANALYZER**

sets the analyzer to the spectrum analyzer operating mode and accesses the **PRESET SPECTRUM** softkey function.

Key Access: **MODE** or **PRESET**

SQUELCH

adjusts the squelch level. The squelch level mutes weak signals and passes strong signals. The squelch level affects the audio output only.

Key Access: **AUX CTRL**

SRC ATN
MAN AUTO

Option 011 only.

allows you to select between automatic and manual adjustment of the tracking generator's switching attenuator.

Key Access: **AUX CTRL**

SRC PWR
OFFSET

Option 011 only.

offsets the displayed power of the tracking generator (SRC). Offset values may range from -100 dB to +100 dB.

Key Access: **AUX CTRL**

SRC PWR
ON OFF

Option 011 only.

activates (ON) or deactivates (OFF) the output power of the tracking generator (SRC).

Key Access: **AUX CTRL**

SRC PWR
STP SIZE

Option 011 only.

allows the user to set the step size of the source-power level, source-power offset, and power-sweep range functions. The step size may be values from -32.7 dB to 32.7 dB. The default setting is one vertical scale division.

Key Access: **AUX CTRL**

START
FREQ

sets the frequency at the left side of the graticule.

Key Access: **FREQUENCY**

Cable TV Analyzer Functions

START TIME

allows you to specify the time and the date when testing is to begin for timed measurements. The time is specified in 24-hour, hour, minute format; the date is specified in year, month, and day format. If you do not specify a time, the current time is used. If you do not specify a date, the current date is used. If you specify a time earlier than the current time, the current time is used. If you specify a date earlier than the current date, the current date is used. If the date or time setting of the analyzer is incorrect, see "If the wrong date or time is displayed" in Chapter 4 of the *HP 8591C Cable TV Analyzer Cable TV Measurements User's Guide*.

Pressing **CABLE TV ANALYZER**, **SYSTEM MEAS**, **Timed Measure** accesses **START TIME**.

Key Access: **SYSTEM MEAS**

STD

allows you to select the standard (STD) channel tuning configuration. The standard configuration means that the channels are at the frequencies that the FCC defines to be the standard channel frequencies. The standard frequency assignments are defined in the FCC channel identification plan, part 76.612.

If you do not select a channel configuration, the default configuration is the standard (STD) configuration. The choices for the channel tuning configuration are: standard (STD), off-the-air (AIR), incrementally related carriers (IRC), harmonically related carriers (HRC), and T format.

The channel tuning configuration selection is selected independently of the test plan and is not stored with the test plan. The analyzer retains the channel tuning configuration selection, even when power is turned off, until a new selection is made.

Press **CABLE TV ANALYZER**, **Setup**, **Channel Tuning** to access **STD**.

Key Access: **CABLE TV ANALYZER**

**STOP
TIME**

allows you to specify the time and the date to end the testing for a timed measurement. The time is specified in 24-hour, hour, minute format; the date is specified in year, month, and day format. If you enter a stop time that is 24 hours or greater, the stop time will be set to 23 hours and 59 minutes.

Pressing **CABLE TV ANALYZER** , **SYSTEM MEAS** ,
Timed Measure accesses **STOP TIME** .

Key Access: **SYSTEM MEAS**

Softkey Descriptions

Cable TV Analyzer Functions

STATE
— CARD

saves the current analyzer state on the memory card.

Key Access: **SAVE**

STATE
— INTRNL

saves the current analyzer state in the selected state register.

Key Access: **SAVE**

STOP
FREQ

sets the frequency at the right side of the graticule.

Key Access: **FREQUENCY**

STOR PWR
ON UNITS

sets the default settings for the units used in the linear and the logarithmic modes when the instrument is powered on. The settings for the units can be changed during normal instrument operation but they will return to the default settings when the instrument is powered on again. This is a service calibration function. Refer to the service guide for more information.

Key Access: **CAL**

STP GAIN
ZERO

disables the two 20 dB step-gain amplifiers on the A12 amplitude control assembly. This is a service diagnostic function and is for service use only.

Key Access: **CAL**

STUVWX

accesses the softkey menu used for selecting screen title or prefix characters S through X.

Key Access: **CAL**, **CONFIG**, **DISPLAY**, **RECALL**, or **SAVE**

SWEEP

accesses the sweep-time menu and accesses the sweep-time softkey functions **SWP TIME AUTO MAN** and **SWEEP CONT SGL**.

SWEEP
CONT SGL

switches the analyzer between the continuous-sweep mode and the single-sweep mode.

Key Access: **SWEEP** or **TRIG**

SWEEP
DELAY

Option 107 only.

delays the start of sweep with respect to the gate trigger edge in the time domain window of the gate utility. The time segment being displayed can be shifted up to 65 msec after the gate trigger edge in 1 μ sec increments.

Key Access: **SWEEP**

Softkey Descriptions

Cable TV Analyzer Functions

**SWEEP
RAMP**

displays the RAMP signal from the sweep-ramp generator that is located on the A7 analog interface assembly. This is a service diagnostic function and is for service use only.

Key Access: **CAL**

**SWEEP
TIME DAC**

displays the output of the sweep-time DAC (SWP_DAC) from the sweep-ramp generator that is on the A7 analog interface assembly. This is a service diagnostic function and is for service use only.

Key Access: **CAL**

**SWP CPLG
SR SA**

Option 011 only.

selects stimulus-response (SR) or spectrum-analyzer (SA) auto-coupled sweep time.

Key Access: **AUX CTRL**

**SWP TIME
AUTO MAN**

selects the length of time in which the analyzer sweeps the displayed frequency span.

Key Access: **AUTO COUPLE** or **SWEEP**

**SYNC CRD
TV TRIG**

provides sweep triggering on the selected line of a video picture field and accesses the softkey menu used to select the line number of the video picture field and the type of video picture frame.

Key Access: **TRIG**

SYNC
NRM NTSC

changes the rear panel MONITOR output between normal internal monitor horizontal and vertical synchronization constants or the NTSC video compatible format.

Key Access: **CONFIG**

SYNC
NRM PAL

changes the rear panel MONITOR output between normal internal monitor horizontal and vertical synchronization constants or the PAL video compatible format.

Key Access: **CONFIG**

SYS BTS
TST CH#

allows you to select a channel to perform system beats testing. The default is channel 4.

If **YES** is selected after selecting **Measure Now**, system beats will be measured in the channel specified by **SYS BTS TST CH#**. The results are displayed on the first page of the measurement data.

System beats testing is selected independently of the test plan and is not stored with the test plan. The analyzer retains the channel selection, even when power is turned off, until a new selection is made.

Pressing **CABLE TV ANALYZER**, **Setup** accesses **SYS BTS TST CH#**.

Key Access: **CABLE TV ANALYZER**

Cable TV Analyzer Functions

**SYSTEM
FRQ RESP**

initiates the System Frequency Response measurement.

Key Access: **CHANNEL MEAS**

SYSTEM MEAS

Accesses the system measurement mode. When the analyzer is in the system measurement mode, **MONITOR** is displayed in the upper right corner of the analyzer display.

Pressing **SYSTEM MEAS** accesses the following:

ENTER LOCATION, **ENTER TEMP**, **Recall TstPlan**,
Measure Now, **Timed Measure**, **Create TstPlan**,
Recall Data, **CATALOG CARD**, **VIEW LAST**, and
VIEW CH SEL.

Accessing the system measurement mode automatically changes the input impedance setting of a spectrum analyzer to 75 Ω . (The setting of the input impedance is usually controlled by **INPUT Z 50 75**.) For spectrum analyzer's with 50 Ω impedance, changing the input impedance with **INPUT Z 50 75** minimizes the impedance mismatch, but does not eliminate the impedance mismatch unless a 50 Ω to 75 Ω external matching pad is used.

Press **(MODE)**, **CABLE TV ANALYZER** to access
SYSTEM MEAS.

Key Access: **SYSTEM MEAS**

T

allows you to select the T channel tuning configuration.

If you do not select a channel tuning configuration, the default configuration is the standard (STD) configuration. The choices for the channel tuning configuration are: standard (STD), off-the-air (AIR), incrementally related carriers (IRC), harmonically related carriers (HRC), and T format.

The channel tuning configuration selection is selected independently of the test plan and is not stored with the test plan. The analyzer retains the channel tuning configuration selection, even when power is turned off, until a new selection is made.

Press **CABLE TV ANALYZER**, **Setup**, **Channel Tuning** to access **T**.

Key Access: **CABLE TV ANALYZER**

**TAKE
REF TRACE**

allows you to take a reference trace measurement at any point in the system that you want to use as the "reference." For example, typical reference spectrums can be set up at the output of the headend or AML hub. Thirty-two or more reference traces can be stored.

Key Access: **CHANNEL MEAS**

Cable TV Analyzer Functions

Timed Measure

allows you to access the functions that you can use to initiate the testing at a later time.

When you press **Timed Measure**, you access a menu with the following softkeys: **START TIME**, **STOP TIME**, **TIME INTERVAL**, **DUMP TO PRINTER**, **DUMP TO RAM CARD**, and **Main Menu**.

Pressing **CABLE TV ANALYZER SYSTEM MEAS** accesses **Timed Measure**.

Key Access: **SYSTEM MEAS**

TIME INTERVAL

allows you to specify the time interval between the starting of testing for a timed measurement. The time is specified in 24-hour, hour, minute format. The maximum time interval is 99 hours.

If you do not specify a time interval, the time interval is set to zero. When the time interval is set to zero, testing will begin immediately after the previous tests have been completed.

When specifying a time interval, you need to specify a time interval that is at least long enough to allow the analyzer to complete the testing before beginning testing again. Here are some general guidelines for estimating how long it takes the analyzer to test one channel:

- It takes approximately 1 minute to test a channel that is not scrambled with all of the tests selected for that channel.
- It takes approximately 1 minute and 30 seconds to test a scrambled channel with all of the tests selected for that channel.

So the time interval that you specify (in minutes) should, at the least, exceed the number of channels that you are testing plus 10 minutes.

Press **CABLE TV ANALYZER** , **SYSTEM MEAS** ,
Timed Measure to access **TIME INTERVAL** .

Key Access: **SYSTEM MEAS**

**TODAY'S
DATE**

allows you to select the current date as the start date or stop date for timed measurements.

When you press **TODAY'S DATE** , the analyzer uses the date setting of the spectrum analyzer. If the date or time setting of the analyzer is incorrect, see "If the wrong date or time is displayed" in Chapter 4 of the *HP 8591C Cable TV Analyzer Cable TV Measurements User's Guide*.

Press **CABLE TV ANALYZER** , **SYSTEM MEAS** ,
Timed Measure , **START TIME** to access **TODAY'S DATE**
as the start date for the timed measurement. Press
Timed Measure , **STOP TIME** to access **TODAY'S DATE** as
the stop date for the timed measurement.

Key Access: **SYSTEM MEAS**

Softkey Descriptions

Cable TV Analyzer Functions

**TODAY'S
TIMEDATE**

allows you to select the current time and date as the start time and date for timed measurements.

When you press **TODAY'S TIMEDATE**, the analyzer uses the time and date setting of the analyzer. If the date or time setting of the analyzer is incorrect, see "If the wrong date or time is displayed" in Chapter 4 of the *HP 8591C Cable TV Analyzer Cable TV Measurements User's Guide*.

Press **CABLE TV ANALYZER**, **SYSTEM MEAS**, **Timed Measure**, **START TIME** to access **TODAY'S TIMEDATE**.

Key Access: **SYSTEM MEAS**

**T WINDOW
RES BW**

Option 107 only.

changes the resolution bandwidth in the time domain window of the gate utility.

Key Access: **(SWEEP)**

**T WINDOW
SWP TIME**

Option 107 only.

changes the sweep time in the time domain window of the gate utility and re-scales the gate markers.

Key Access: **(SWEEP)**

TABLE
ΔDL NRM

switches the marker table between the normal marker formats and the delta display line format. The marker information can be displayed in absolute amplitude and frequency. It can also be displayed in delta amplitude and frequency using one marker as the reference. These are normal marker modes.

Key Access: **MKR FCTN**

THRESHLD
ON OFF

sets a lower boundary to the active trace. The threshold line "clips" signals that appear below the line when this function is on. The boundary is defined in amplitude units that correspond to its vertical position when compared to the reference level.

Key Access: **DISPLAY**

Time
Date

accesses the softkey menu used to set and display the real-time clock.

Key Access: **CONFIG**

TIMEDATE
ON OFF

turns the display of the real-time clock on or off. Pressing **DEFAULT CONFIG** sets **TIMEDATE ON OFF** to ON.

Key Access: **CONFIG**

Cable TV Analyzer Functions

**TOI
ON OFF**

finds the third-order intercept of the two highest amplitude signals and the two associated distortion products.

Key Access: **MEAS/USER**

TRACE

accesses the trace softkeys that allow you to store and manipulate trace information. Each trace is comprised of a series of data points that form a register where amplitude information is stored. The analyzer updates the information for any active trace with each sweep. If two traces are being written to, they are updated on alternating sweeps.

**TRACE
A B C**

selects the softkey menu used for trace A, trace B, or trace C functions. Press **TRACE A B C** until the letter of the desired trace is underlined.

Key Access: **TRACE**

TRACE A

sets up trace A for recalling previously-saved trace data into trace A or saving trace data from trace A.

Key Access: **RECALL** or **SAVE**

TRACE B

sets up trace B for recalling previously-saved trace data into trace B or saving trace data from trace B.

Key Access: **RECALL** or **SAVE**

TRACE C

sets up trace C for recalling previously-saved trace data into trace C or saving trace data from trace C.

Key Access: **RECALL** or **SAVE**

Trace → Card	begins the process used to save trace data, limit-line tables, or amplitude-correction factors on the memory card. Key Access: SAVE
Trace → Intrnl	accesses a softkey menu that allows you to select the item to be stored in analyzer memory: the trace to be saved (trace A, trace B, or trace C), limit-line tables, or amplitude-correction factors. Key Access: SAVE
Track Gen	<i>Option 011 only.</i> displays softkey menus for use with a built-in tracking generator. Key Access: AUX CTRL
TRACKING PEAK	<i>Option 011 only.</i> activates a routine that automatically adjusts the tracking adjustment to obtain the peak response of the tracking generator on the analyzer display.

NOTE

For tracking peak to function properly, the tracking generator must be connected to the analyzer. Before making a stimulus-response measurement, care must be taken to maximize the tracking adjustment of the tracking generator to ensure maximum available dynamic range.

Key Access: **AUX CTRL**

Cable TV Analyzer Functions

TRIG

accesses softkeys that let you select the sweep mode and trigger mode. (Also see "Screen Annotation" in Chapter 1 of this guide.)

NOTE

With some delayed trigger functions (for example, external or TV triggering), the softkey menu is not updated until after the trigger has occurred.

**TRIG MKR
ON OFF**

Option 107 only.

activates a marker that indicates the time from the gate trigger to the current marker position. The trigger marker is in the time domain window of the gate utility. It is turned off when the menu is exited or if another active function is activated.

Key Access: **SWEEP**

**TTL PWR
@ INPUT**

allows you to measure the total power at the input of the analyzer.

This function is used in conjunction with an external preamplifier.

By measuring the total input power, you ensure that the preamplifier's specifications are not exceeded, which could contribute to distortion products when measuring CSO/CTB.

Press **CABLE TV ANALYZER**, **Setup**, **Analyzer Input** to access **TTL PWR @ INPUT**.

Key Access: **CABLE TV ANALYZER**

**TV
LINE #**

selects the line number of the video picture field. The values

allowed are 1 to 1012. **PRESET** sets the TV line number to 17.

Key Access: **TRIG**

TV RECEIVER

allows you to access the TV receiver mode. In this mode, you can view a TV picture and listen to the sound simultaneously by pressing **CHANNEL SELECT**, entering a TV channel number, then pressing **PIX &SND ON OFF**. To exit this mode, press any softkey.

Press **MODE** to access **TV RECEIVER**.

Front-Panel Access Key: **MODE**

TV Standard

allows the analyzer to trigger on the standard video formats; NTSC, PAL, PAL-M, or SECAM-L.

Key Access: **TRIG**

**TV SYNC
NEG POS**

selects the polarity of the modulation of the video format. NTSC uses the negative or positive modulation video format. NTSC, PAL, and PAL-M use negative modulation. SECAM-L uses positive modulation.

Key Access: **TRIG**

Softkey Descriptions

Cable TV Analyzer Functions

TV TRIG
EVEN FLD

selects an even video field of an interlaced video format to trigger on.

Key Access: **TRIG**

TV TRIG
ODD FLD

selects an odd video field of an interlaced video format to trigger on.

Key Access: **TRIG**

TV TRIG
VERT INT

selects a vertical interval to trigger on. Triggering occurs on the next pulse edge. If it triggers on an even field, triggering will not alternate between odd and even fields. If it triggers on an odd field, triggering will alternate between odd and even fields. The vertical interval is used for non-interlaced video formats.

Key Access: **TRIG**

UPDATE
TIMEFREQ

Option 107 only.

switches between the time domain and frequency domain windows in the gate utility. The window is updated to reflect the current state when it is activated. The **WINDOWS** **NEXT** key will also switch between the windows.

Key Access: **SWEEP**

User
Menus

accesses a menu available for your use for user-defined programs and key functions.

Key Access: **MEAS/USER**

USR CH 0
CNTR FRQ

allows you to define the center frequency for a user defined channel. This channel is then accessed by selecting channel 0 (zero). The setting defined here is stored in nonvolatile analyzer memory. This means that the analyzer retains the setting, even when power is turned off, until a new setting is made.

Press CABLE TV ANALYZER, Setup, Channel Tuning to access CHNL 0 CNTR FRQ.

Key Access: CABLE TV ANALYZER

USR CH
0 SPAN

allows you to define the span for a user defined channel. This channel is then accessed by selecting channel 0 (zero). The setting defined here is stored in nonvolatile analyzer memory. This means that the analyzer retains the setting, even when power is turned off, until a new setting is made.

Press CABLE TV ANALYZER, Setup, Channel Tuning to access CHNL 0 SPAN.

Key Access: CABLE TV ANALYZER

Cable TV Analyzer Functions

V

changes the amplitude units to V for the current setting (log or linear).

Key Access: **AMPLITUDE**

**VBW/RBW
RATIO**

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 smooth this noise. The knob and step keys change the ratio in a 1, 3, 10 sequence. Pressing **PRESET** and **AUTO ALL** sets the ratio to 0.300 X. The ratio can be changed using the step keys or the knob.

Key Access: **BW**

**VID AVG
ON OFF**

initiates a digital averaging routine that averages displayed signals and noise. This function does not affect the sweep time, bandwidth, or other analog characteristics of the analyzer.

Key Access: **BW**, **TRACE**, or **MEAS/USER**

VID BW
AUTO MAN

changes the analyzer post-detection filter from 30 Hz to 3 MHz in a 1, 3, 10 sequence. *For Option 130 only.* Option 130 provides additional narrow resolution bandwidths of 30 Hz, 100 Hz, and 300 Hz.

NOTE

Coupling the video bandwidth function also couples the video bandwidth to resolution bandwidth ratio function. If you want to auto-couple the video bandwidth to a nonstandard ratio, you must set the video bandwidth to auto-couple before setting the video-bandwidth/resolution-bandwidth ratio.

Key Access: **AUTO COUPLE** or **BW**

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 display line.

Key Access: **TRIG**

VIEW A

holds and displays the amplitude data that is in the trace A register. The trace A register is not updated as the analyzer sweeps. If trace A is deactivated by pressing **STORE BLANK A**, the stored data can be retrieved by pressing **VIEW A**.

Key Access: **TRACE**

Softkey Descriptions

Cable TV Analyzer Functions

VIEW B

holds and displays the amplitude data that is in the trace B register. The trace B register is not updated as the analyzer sweeps. If trace B is deactivated by pressing **STORE BLANK B**, the stored data can be retrieved by pressing **VIEW B**.

Key Access: **TRACE**

VIEW C

holds and displays the amplitude data that is in the trace C register. The trace C register is not updated as the analyzer sweeps. If trace C is deactivated by pressing **STORE BLANK C**, the stored data can be retrieved by pressing **VIEW C**.

Key Access: **TRACE**

VIEW CH SEL

allows you to view the selected channels of the current test plan.

Key Access: **SYSTEM MEAS**

VIEW CO-CHNL

allows the user to measure the relative power of any co-channel signal that is present.

Key Access: **CHANNEL MEAS**

VIEW INGRESS

initiates the View Ingress measurement.

Key Access: **CHANNEL MEAS**

**VIEW
LAST**

allows you to view the last test results on the analyzer screen. Upon being sent to the screen, the following options are available:

- **NEXT PAGE** displays the next page of test results.
- **PREV PAGE** displays the previous page of test results.
- **GOTO PAGE** displays selected page number.
- **PRINT REPORT** prints a test results report.
- **STORE TO CARD** stores test results to a RAM card.

Press **CABLE TV ANALYZER**, **SYSTEM MEAS**,
More 1 of 2 to access **VIEW LAST**.

Key Access: **SYSTEM MEAS**

Volts

changes the amplitude units to volts.

Key Access: **AMPLITUDE**

Watts

changes the amplitude units to watts.

Key Access: **AMPLITUDE**

**WINDOWS
OFF**

turns off the windows display mode and returns to the normal full-sized instrument display. The state of the last active window will become the instrument state when the windows display is turned off.

Key Access: **WINDOWS** **ON**

Cable TV Analyzer Functions**WINDOWS** **ON**

activates the windows display mode and accesses the menu of window zone functions. The windows display function splits the screen into two separate displays. Only one of these displays is active at a time. The currently active window will have a solid line around the graticule rather than a broken line.

Most functions can be used from within the windows display mode. Some functions, like editing limit lines and showing the options, require a full-sized display. They will temporarily exit the windows display format. When the function is finished the instrument will return to a windows display. Other functions will permanently exit the windows display and it will be necessary to restart the windows display mode by pressing **WINDOWS ON**. See Table 4-8.

This key can also be used to toggle the TV picture and sound On and Off when in the channel measurement mode and after a channel has been selected. Pressing any softkey returns you to the analyzer display.

Table 4-8. Functions That Exit the Windows Display Format

Function	Description
% AM	measures percent amplitude modulation
Adjacent Channel Power	measures adjacent channel power
Calibration Functions	self-calibration routines
Channel Power	measures channel power
Confidence Test	built-in self test routine
Dispose User Memory	deletes user's items from analyzer memory
FFT	initiates FFT on zero span input
Gate Utility	accesses time gate functionality
Instrument Preset	returns analyzer to preset state
Marker Table	lists all of the active markers
N dB Points	measures N dB bandwidth
Occupied Bandwidth	measures occupied bandwidth
Peak Table	lists displayed signal peaks
Peak Zoom	initiates the peak zoom routine
TOI	makes a third-order intercept measurement

Cable TV Analyzer Functions

X FINE
TUNE DAC

displays the output of the YTO extra-fine-tune DAC (FM_TUNE) that is on the A7 analog interface assembly. This is a service diagnostic function and is for service use only.

Key Access: **CAL**

YES

allows you to confirm that you want to perform the function. If you press **CLEAR TST PLAN** and then press **YES**, you have selected to clear the current test plan from analyzer memory. If you enter a channel by using **ENTER BY CHANNEL** or **ENTER BY RANGE** and then press **YES**, the channel or range of channels will be treated as scrambled channels. If you press **Measure Now** and then press **YES**, CTB testing will be performed.

YES is accessed by pressing **CLEAR TST PLAN**, or entering a channel number with **ENTER BY CHANNEL** or **ENTER BY RANGE**, or by pressing **Measure Now**.

Key Access: **SYSTEM MEAS**

YZ_# Spc
Clear

accesses the softkey menu used for selecting the characters Y, Z, underscore (_), #, space, or for clearing the screen title.

Key Access: **CAL**, **CONFIG**, **DISPLAY**, **RECALL**, or **SAVE**

ZERO
MARKER

zeros the value of the delta marker to establish a new reference. The **ZERO MARKER** softkey is in the pulse parameter entry menus of the gate utility.

Key Access: **SWEEP**

ZERO
SPAN

changes the frequency span to zero and turns off marker track if it is on.

Key Access: **SPAN**

Softkey Descriptions

Cable TV Analyzer Functions

**ZONE
CENTER**

allows the zone markers to be moved in frequency without changing the zone span.

Key Access: WINDOWS **ON**

**ZONE
PK LEFT**

searches for the next frequency peak outside and to the left of the zone markers on the upper window trace and then moves the zone so that it is centered around the new peak.

Key Access: WINDOWS **ON**

**ZONE
PK RIGHT**

searches for the next frequency peak outside and to the right of the zone markers on the upper window trace and then moves the zone so that it is centered around the new peak.

Key Access: WINDOWS **ON**

**ZONE
SPAN**

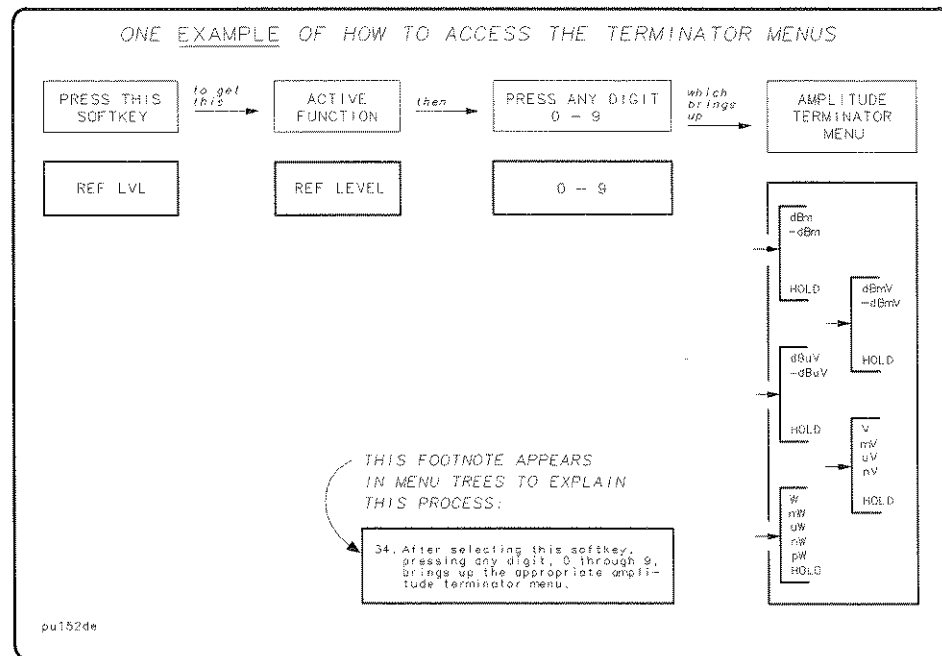
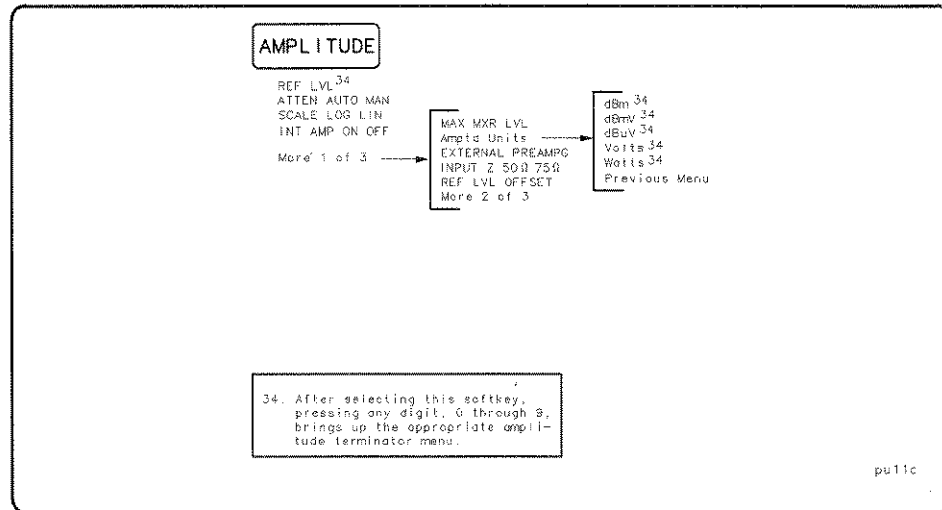
allows the span of the zone markers to be changed without changing the center frequency.

Key Access: WINDOWS **ON**

ZOOM

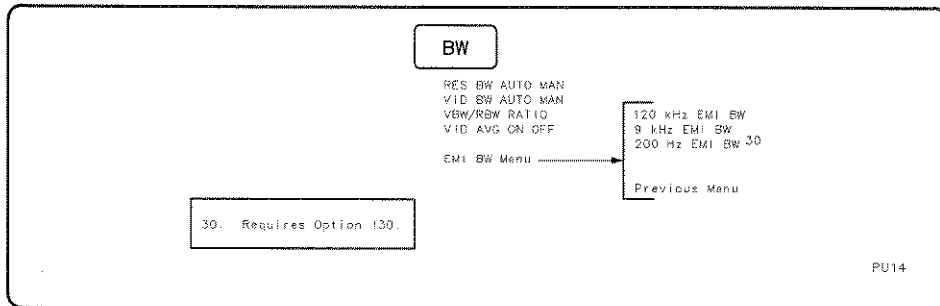
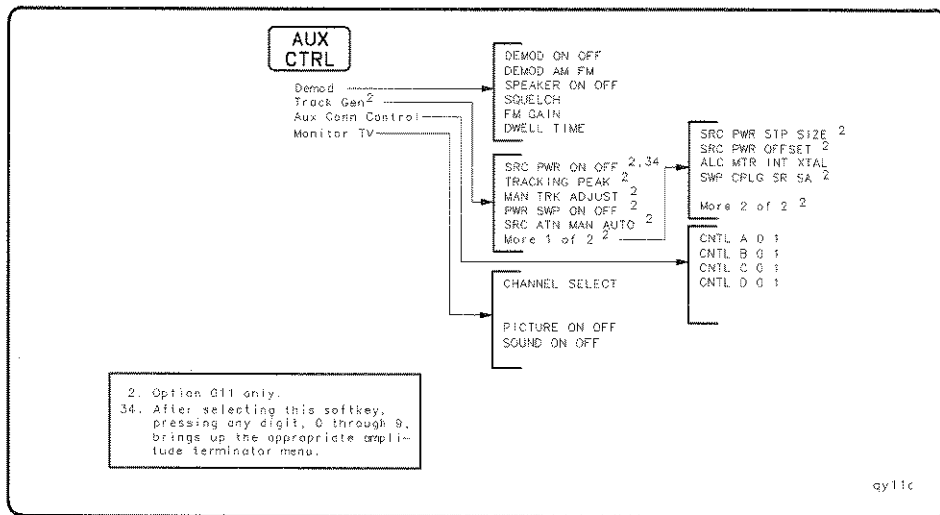
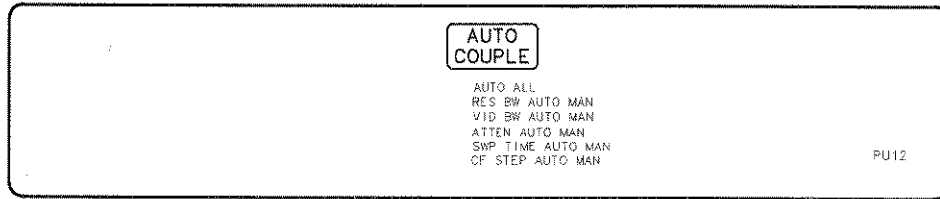
switches between the split-screen windows display and a full size display of the window that is currently active. Once the ZOOM function is active the **NEXT** key can be used to switch between the two windows while remaining zoomed (full sized).

Key Menus

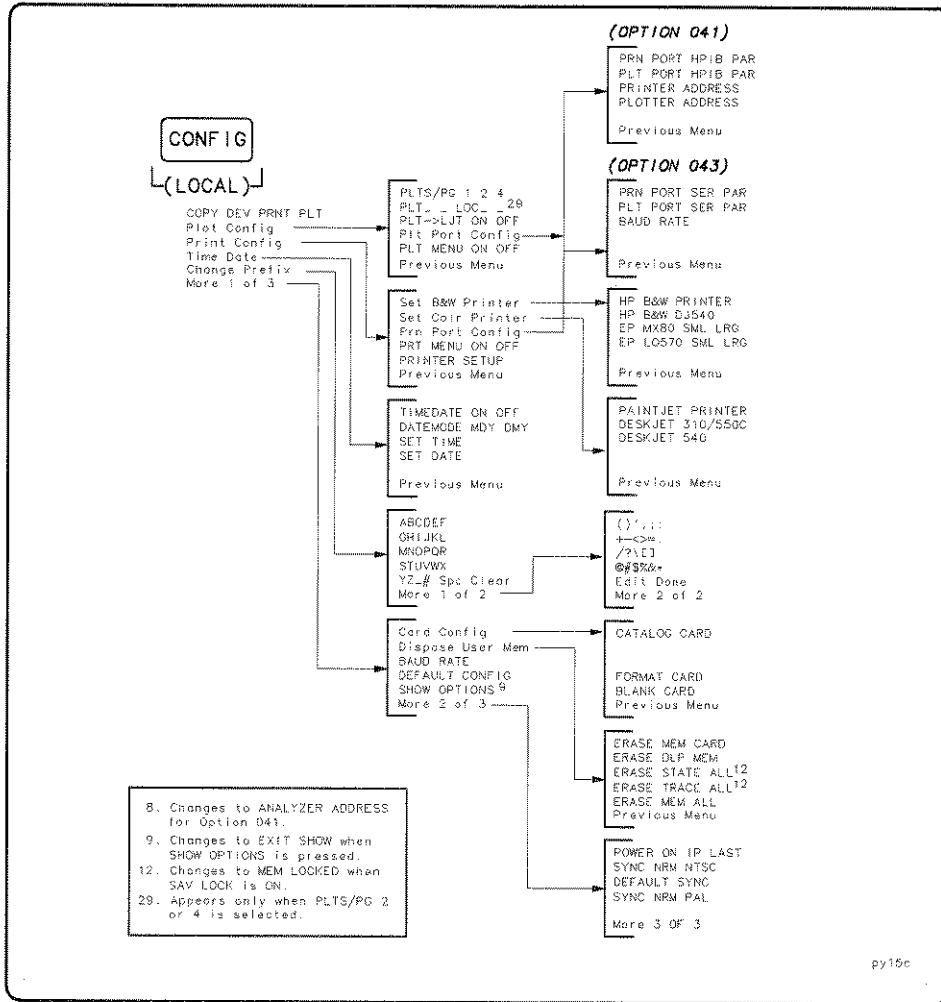


Key Menus

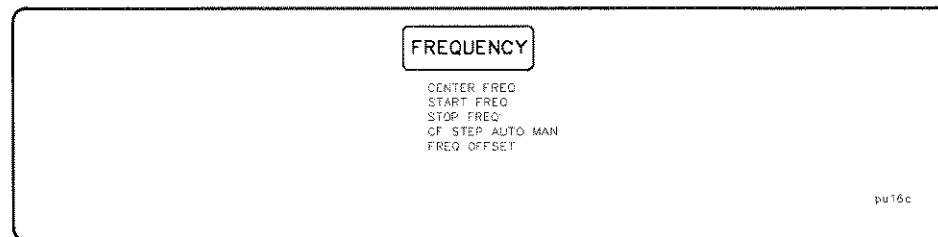
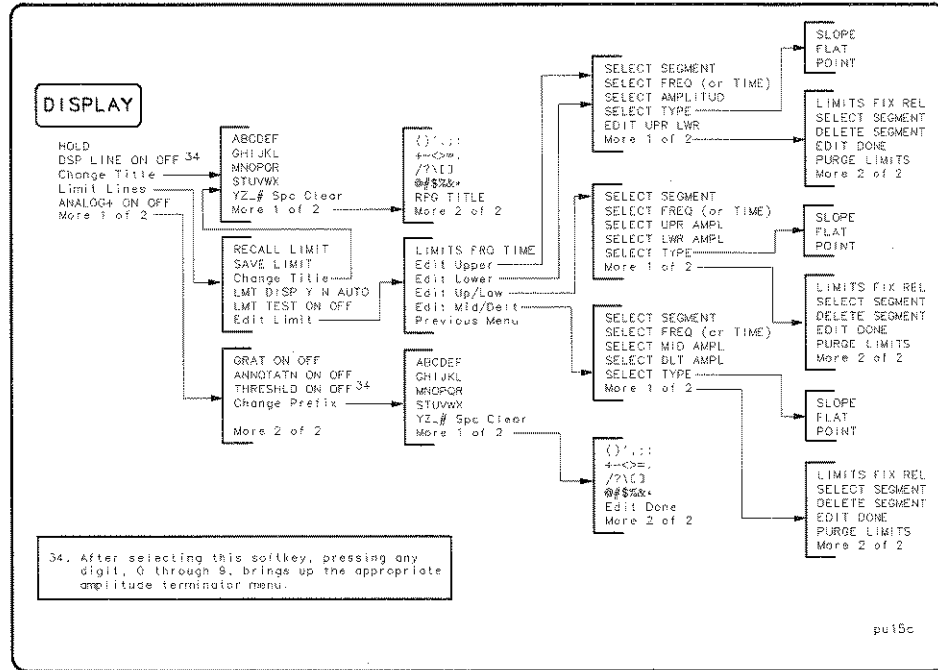
Cable TV Analyzer Functions



Cable TV Analyzer Functions

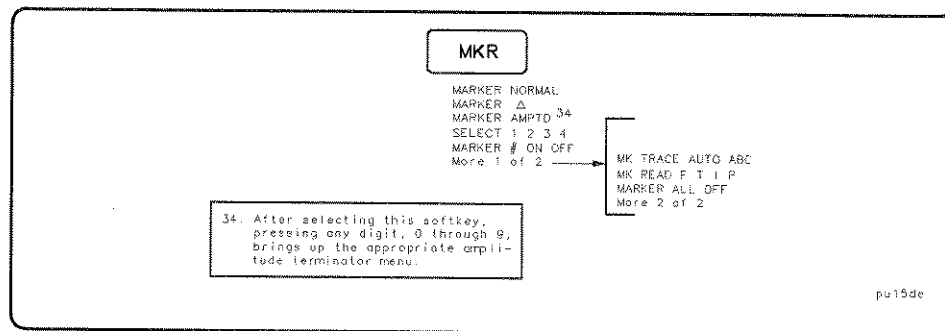
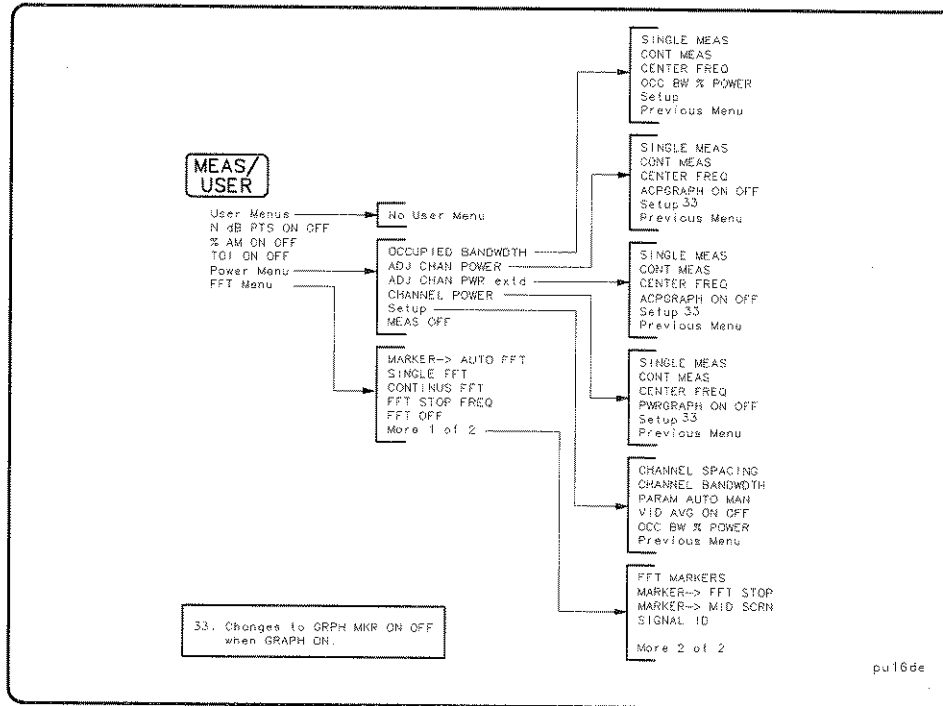


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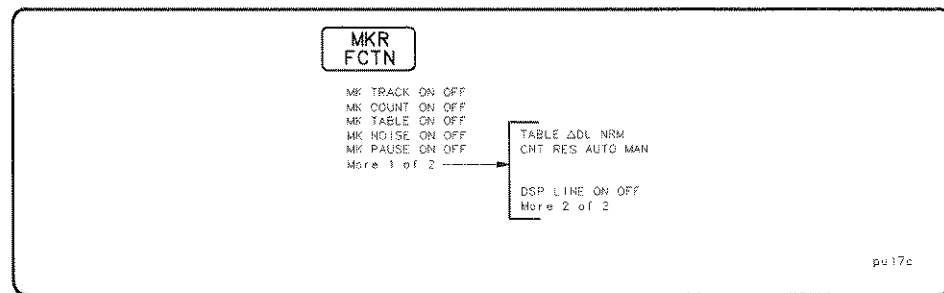
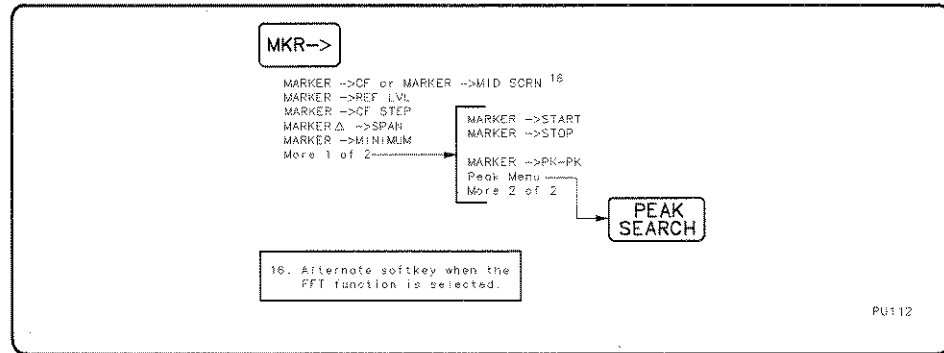


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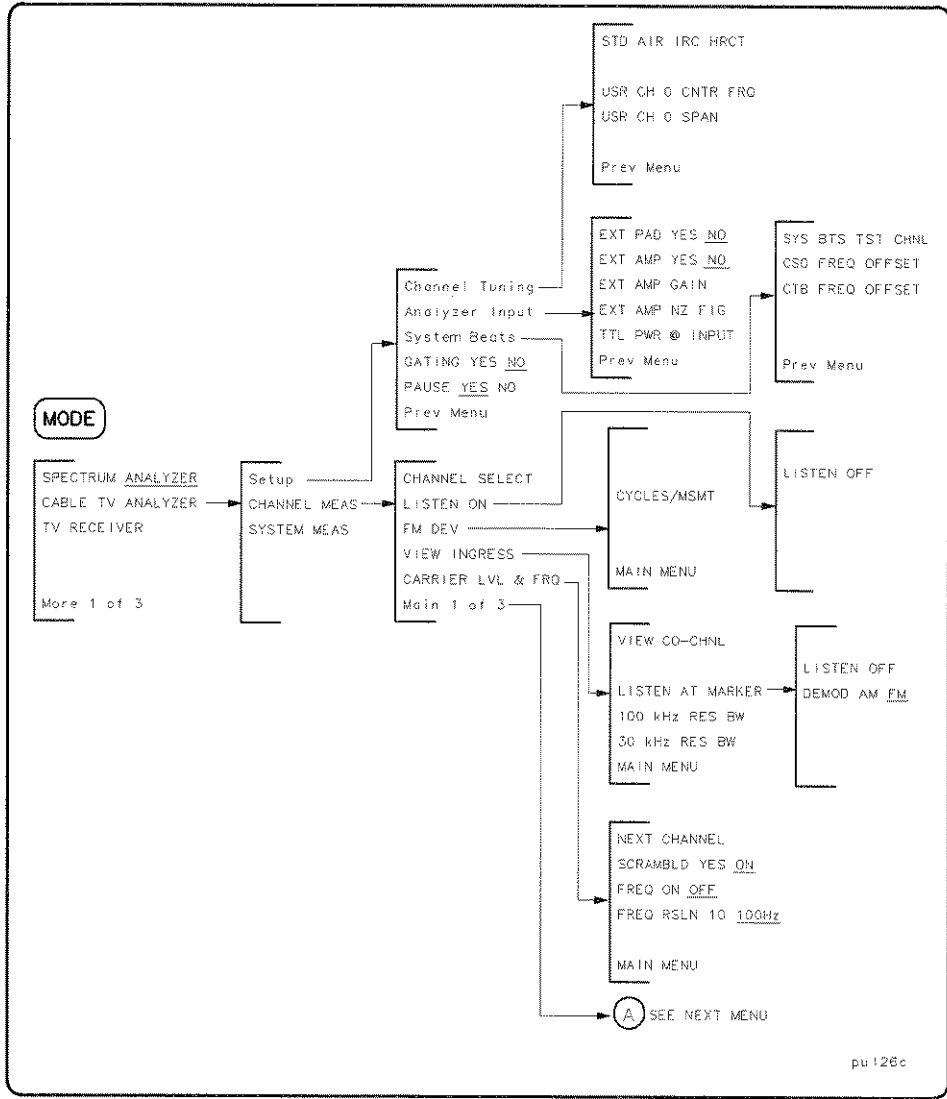


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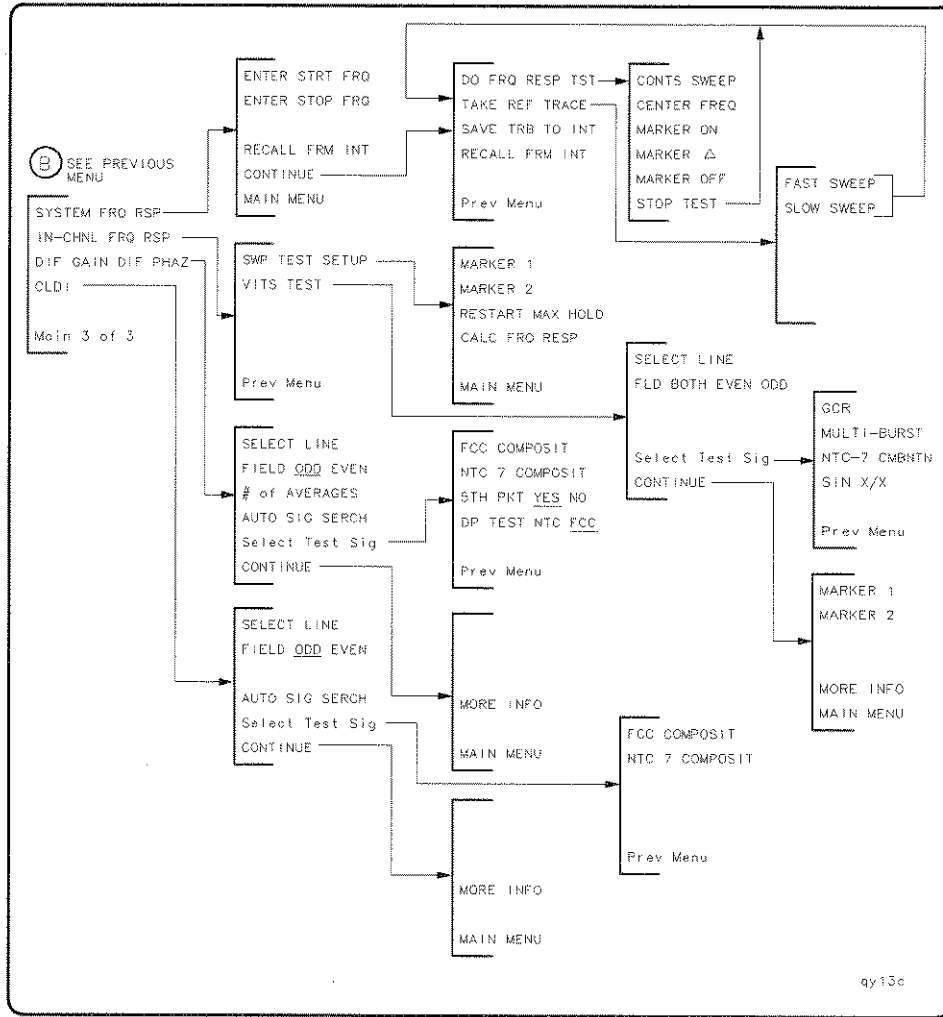
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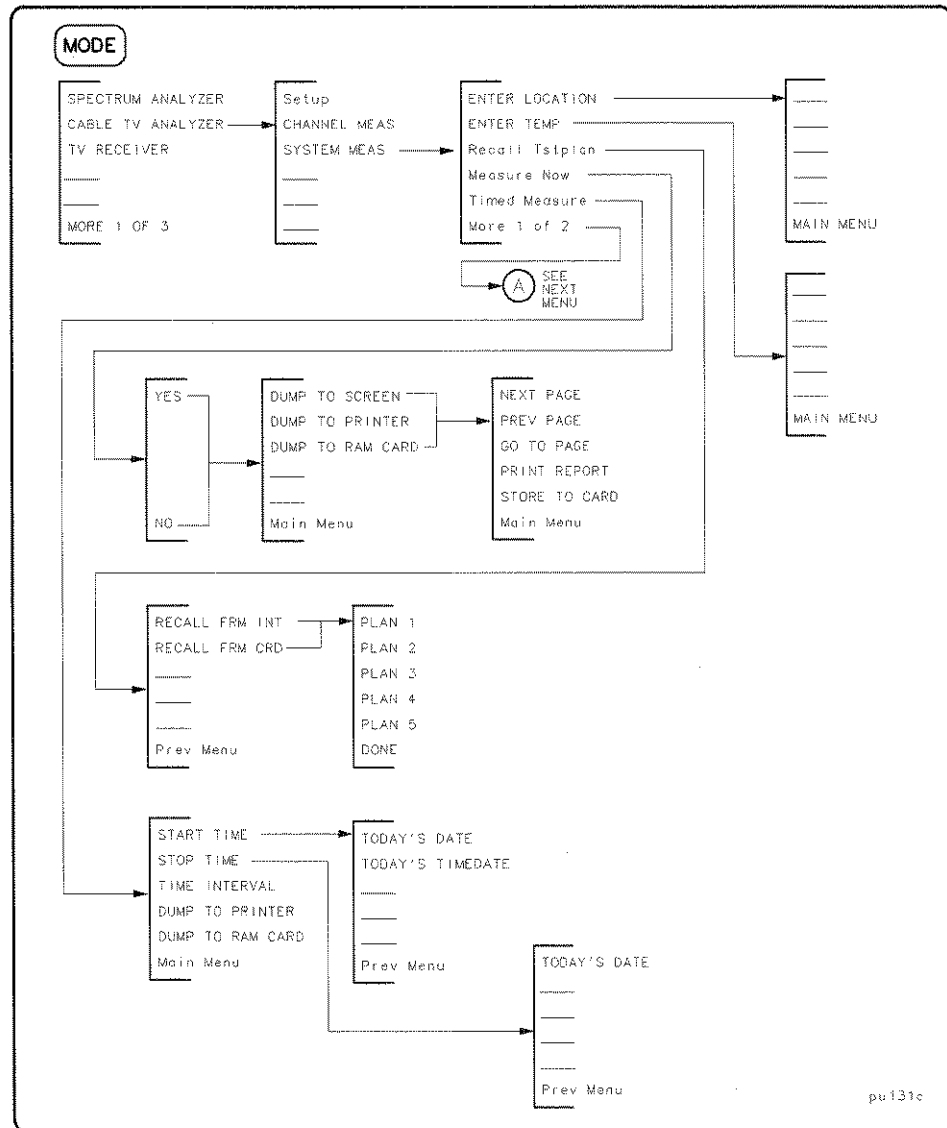


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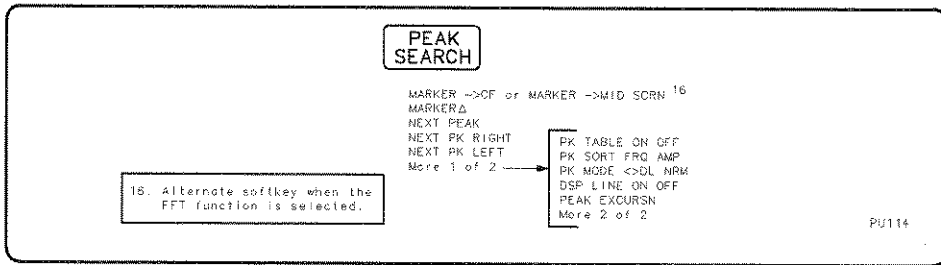
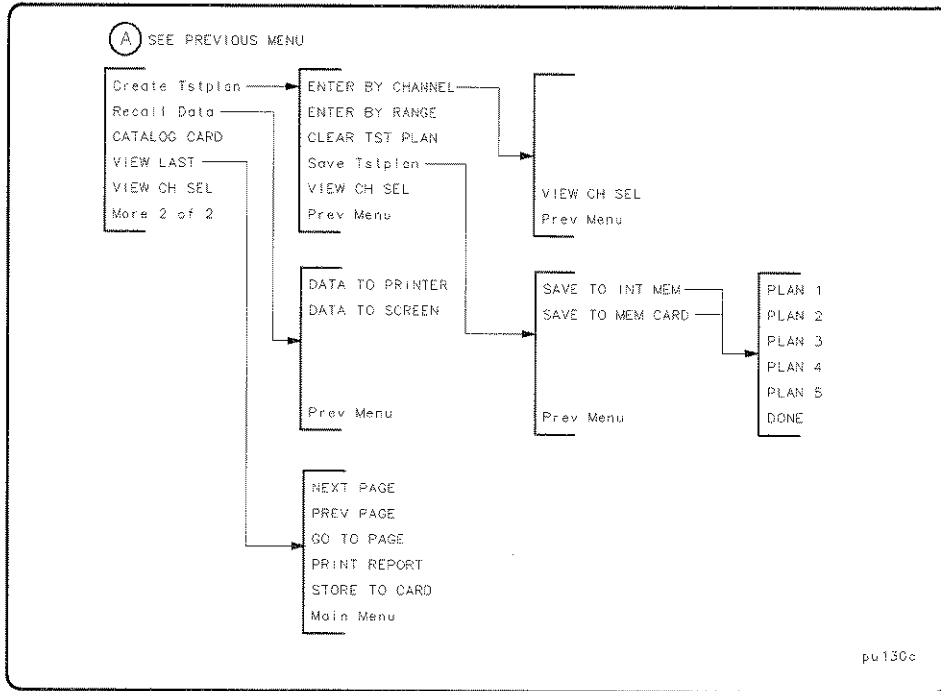
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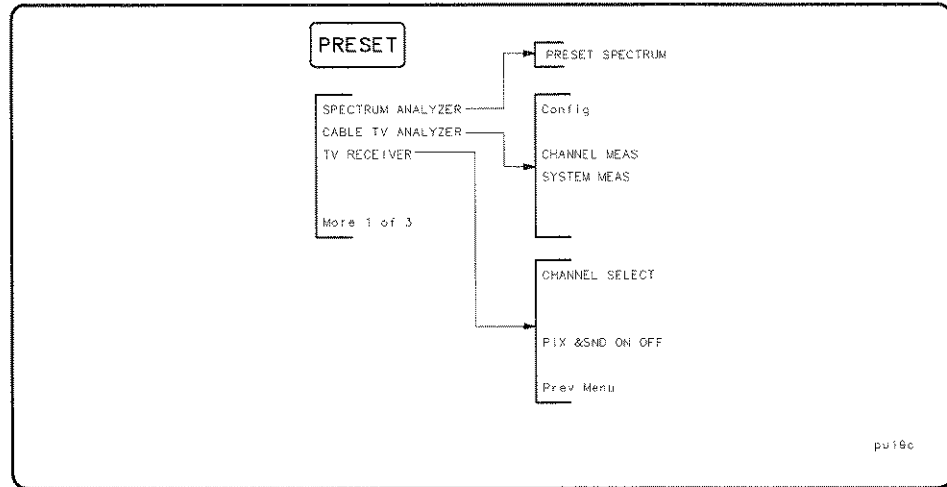
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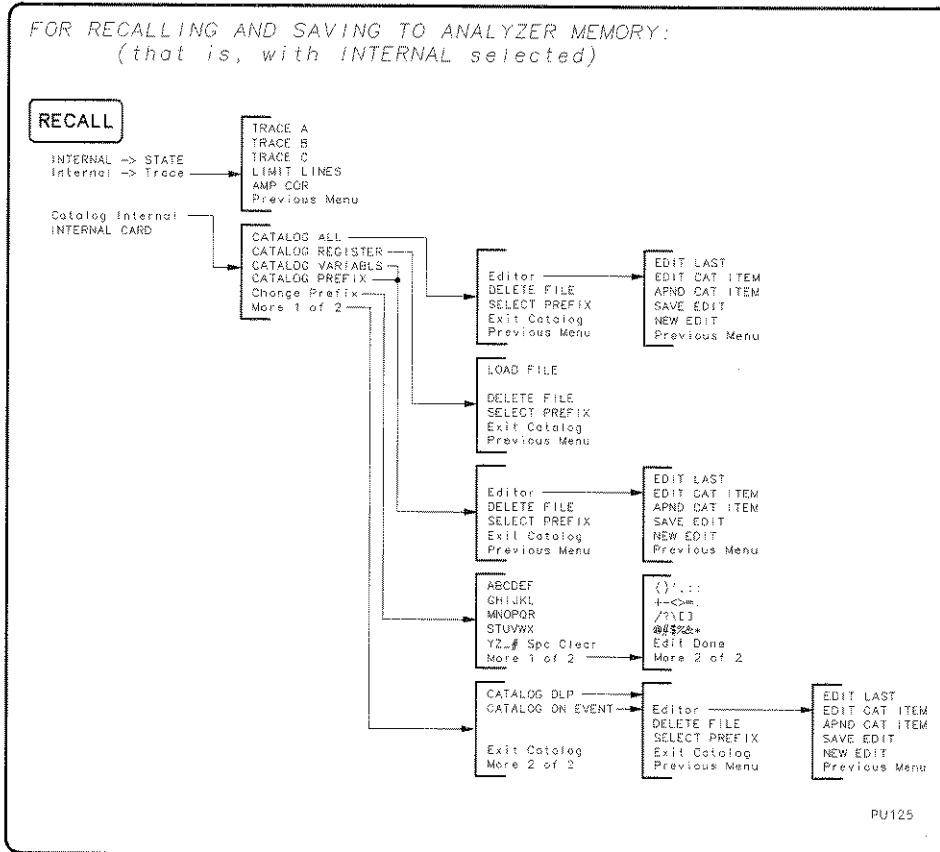
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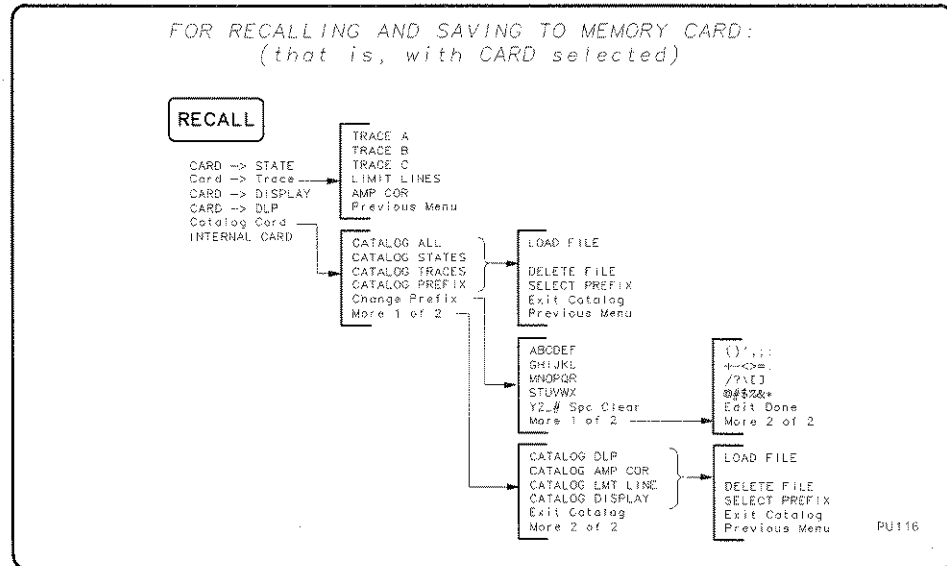


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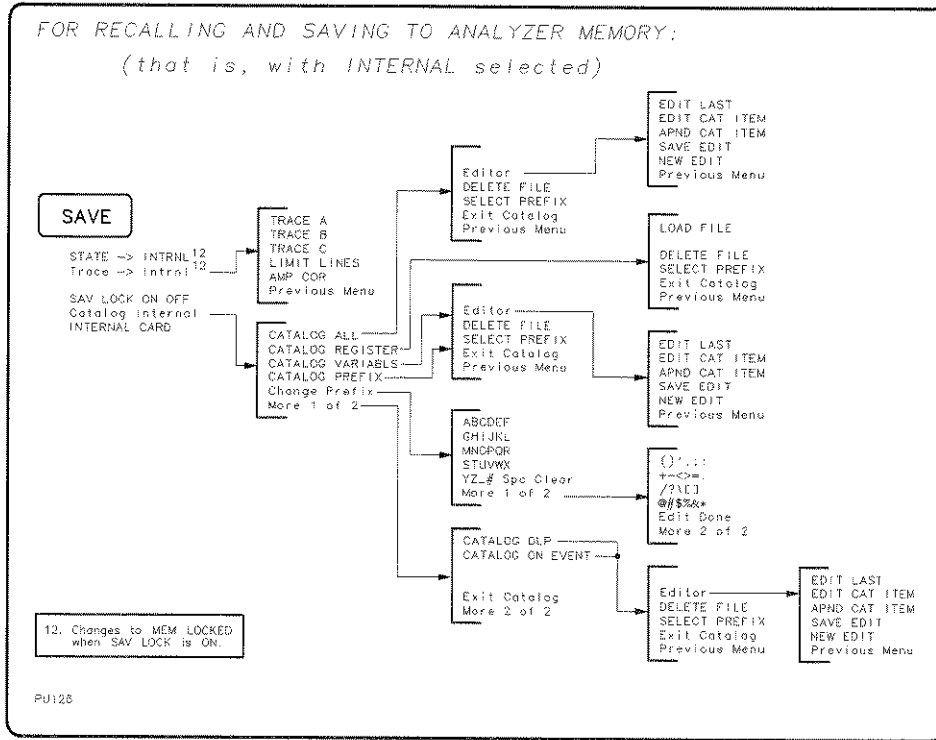


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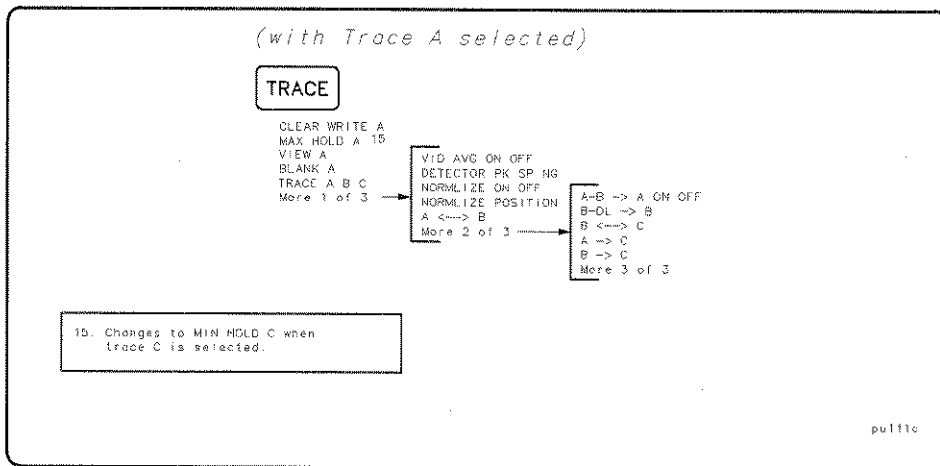
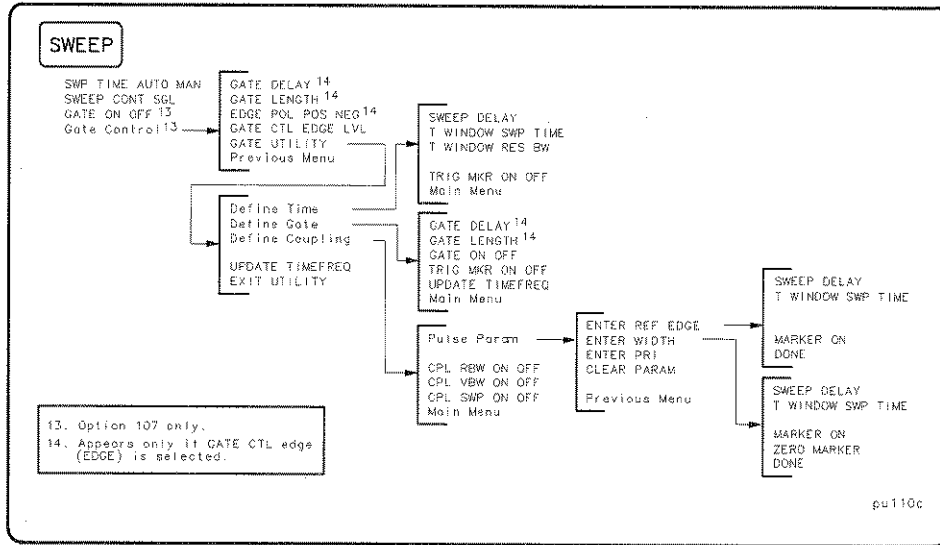


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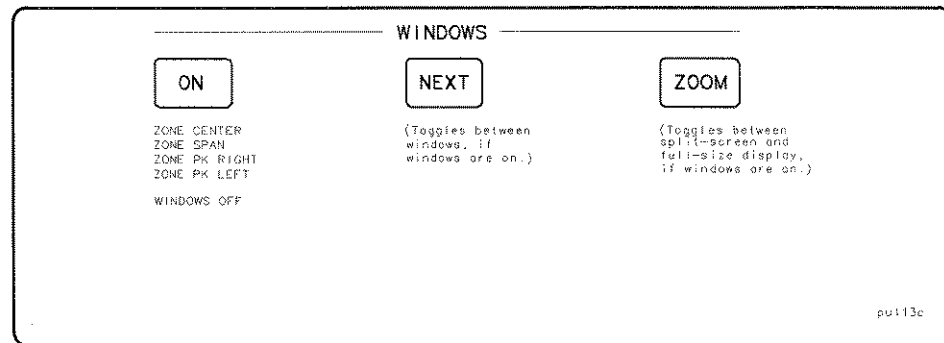
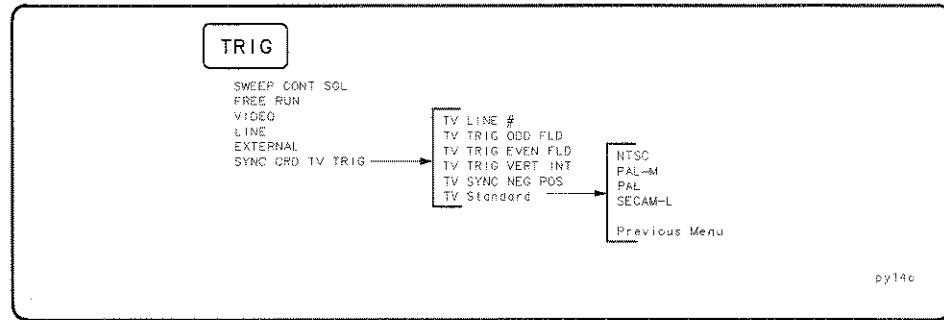


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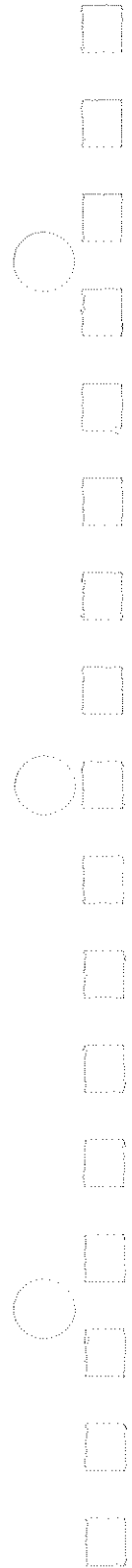


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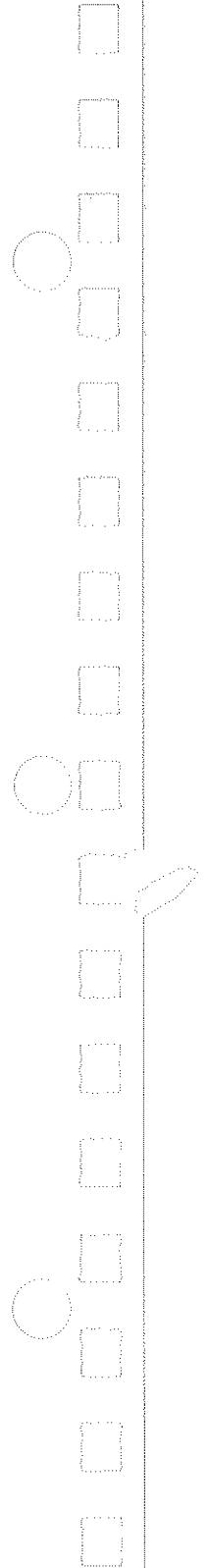
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