ADVANTEST®

ADVANTEST CORPORATION

R3267 Series OPT64
PDC/PHS/IS-136
Measurement Option
Operation Manual

MANUAL NUMBER FOE-8335220G00

Applicable models

R3264
R3267
R3273

First printing April 20, 1999
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Safety Summary

To ensure thorough understanding of all functions and to ensure efficient use of this instrument, please read the manual carefully before using. Note that Advantest bears absolutely no responsibility for the result of operations caused due to incorrect or inappropriate use of this instrument.

If the equipment is used in a manner not specified by Advantest, the protection provided by the equipment may be impaired.

- **Warning Labels**

  Warning labels are applied to Advantest products in locations where specific dangers exist. Pay careful attention to these labels during handling. Do not remove or tear these labels. If you have any questions regarding warning labels, please ask your nearest Advantest dealer. Our address and phone number are listed at the end of this manual.

  Symbols of those warning labels are shown below together with their meaning.

  DANGER: Indicates an imminently hazardous situation which will result in death or serious personal injury.

  WARNING: Indicates a potentially hazardous situation which will result in death or serious personal injury.

  CAUTION: Indicates a potentially hazardous situation which will result in personal injury or a damage to property including the product.

- **Basic Precautions**

  Please observe the following precautions to prevent fire, burn, electric shock, and personal injury.

  - Use a power cable rated for the voltage in question. Be sure however to use a power cable conforming to safety standards of your nation when using a product overseas.
  - When inserting the plug into the electrical outlet, first turn the power switch OFF and then insert the plug as far as it will go.
  - When removing the plug from the electrical outlet, first turn the power switch OFF and then pull it out by gripping the plug. Do not pull on the power cable itself. Make sure your hands are dry at this time.
  - Before turning on the power, be sure to check that the supply voltage matches the voltage requirements of the instrument.
  - Connect the power cable to a power outlet that is connected to a protected ground terminal. Grounding will be defeated if you use an extension cord which does not include a protected ground terminal.
  - Be sure to use fuses rated for the voltage in question.
  - Do not use this instrument with the case open.
  - Do not place anything on the product and do not apply excessive pressure to the product. Also, do not place flower pots or other containers containing liquid such as chemicals near this

product.

- When the product has ventilation outlets, do not stick or drop metal or easily flammable objects into the ventilation outlets.
- When using the product on a cart, fix it with belts to avoid its drop.
- When connecting the product to peripheral equipment, turn the power off.

- **Caution Symbols Used Within this Manual**

Symbols indicating items requiring caution which are used in this manual are shown below together with their meaning.

DANGER: Indicates an item where there is a danger of serious personal injury (death or serious injury).

WARNING: Indicates an item relating to personal safety or health.

CAUTION: Indicates an item relating to possible damage to the product or instrument or relating to a restriction on operation.

- **Safety Marks on the Product**

The following safety marks can be found on Advantest products.

 : ATTENTION - Refer to manual.

 : Protective ground (earth) terminal.

 : DANGER - High voltage.

 : CAUTION - Risk of electric shock.

- **Replacing Parts with Limited Life**

The following parts used in the instrument are main parts with limited life.
Replace the parts listed below before their expected lifespan has expired to maintain the performance and function of the instrument.
Note that the estimated lifespan for the parts listed below may be shortened by factors such as the environment where the instrument is stored or used, and how often the instrument is used.
The parts inside are not user-replaceable. For a part replacement, please contact the Advantest sales office for servicing.

Each product may use parts with limited life.
For more information, refer to the section in this document where the parts with limited life are described.

Main Parts with Limited Life

Part name	Life
Unit power supply	5 years
Fan motor	5 years
Electrolytic capacitor	5 years
LCD display	6 years
LCD backlight	2.5 years
Floppy disk drive	5 years
Memory backup battery	5 years

- **Hard Disk Mounted Products**

The operational warnings are listed below.

- Do not move, shock and vibrate the product while the power is turned on.
  Reading or writing data in the hard disk unit is performed with the memory disk turning at a high speed. It is a very delicate process.

- Store and operate the products under the following environmental conditions.
  An area with no sudden temperature changes.
  An area away from shock or vibrations.
  An area free from moisture, dirt, or dust.
  An area away from magnets or an instrument which generates a magnetic field.

- Make back-ups of important data.
  The data stored in the disk may become damaged if the product is mishandled. The hard disc has a limited life span which depends on the operational conditions. Note that there is no guarantee for any loss of data.

- **Precautions when Disposing of this Instrument**

When disposing of harmful substances, be sure dispose of them properly with abiding by the state-provided law.

Harmful substances: (1) PCB (polycarbon biphenyl)
(2) Mercury
(3) Ni-Cd (nickel cadmium)
(4) Other
Items possessing cyan, organic phosphorous and hexadic chromium and items which may leak cadmium or arsenic (excluding lead in solder).

Example: fluorescent tubes, batteries

Environmental Conditions

This instrument should be only be used in an area which satisfies the following conditions:

- An area free from corrosive gas
- An area away from direct sunlight
- A dust-free area
- An area free from vibrations
- Altitude of up to 2000 m

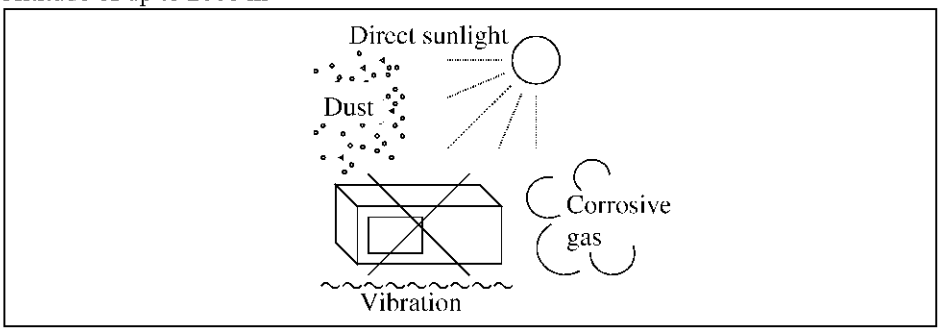


Figure-1 Environmental Conditions

- Operating position

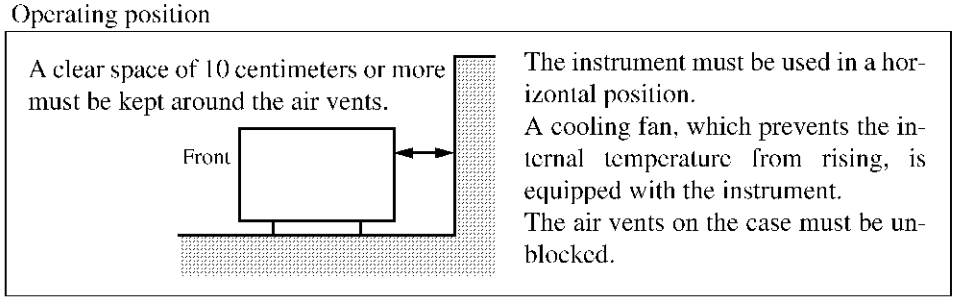


Figure-2 Operating Position

- Storage position

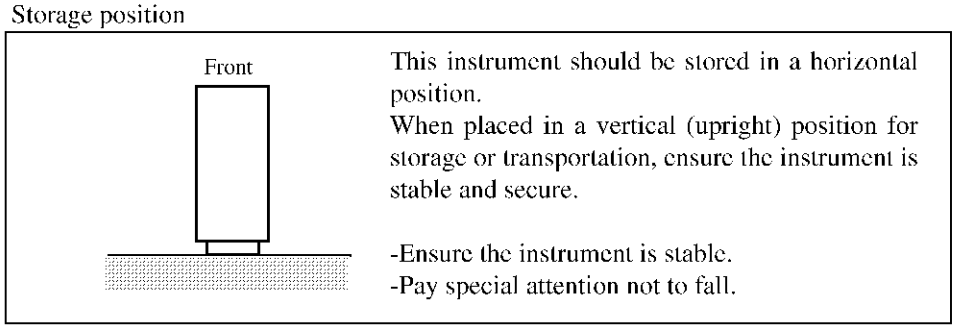


Figure-3 Storage Position

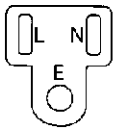
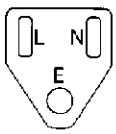
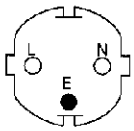
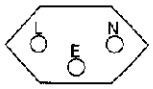
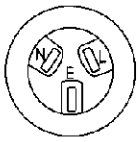
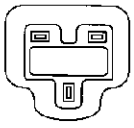
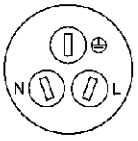
- The classification of the transient over-voltage, which exists typically in the main power supply, and the pollution degree is defined by IEC61010-1 and described below.

  Impulse withstand voltage (over-voltage) category II defined by IEC60364-4-443

  Pollution Degree 2

Types of Power Cable

Replace any references to the power cable type, according to the following table, with the appropriate power cable type for your country.

Plug configuration	Standards	Rating, color and length	Model number (Option number)
	PSE: Japan Electrical Appliance and Material Safety Law	125 V at 7 A Black 2 m (6 ft)	Straight: A01402 Angled: A01412
	UL: United States of America CSA: Canada	125 V at 7 A Black 2 m (6 ft)	Straight: A01403 (Option 95) Angled: A01413
	CEE: Europe DEMKO: Denmark NEMKO: Norway VDE: Germany KEMA: The Netherlands CEBEC: Belgium OVE: Austria FIMKO: Finland SEMKO: Sweden	250 V at 6 A Gray 2 m (6 ft)	Straight: A01404 (Option 96) Angled: A01414
	SEV: Switzerland	250 V at 6 A Gray 2 m (6 ft)	Straight: A01405 (Option 97) Angled: A01415
	SAA: Australia, New Zealand	250 V at 6 A Gray 2 m (6 ft)	Straight: A01406 (Option 98) Angled: ---------
	BS: United Kingdom	250 V at 6 A Black 2 m (6 ft)	Straight: A01407 (Option 99) Angled: A01417
	CCC:China	250 V at 10 A Black 2 m (6 ft)	Straight: A114009 (Option 94) Angled: A114109

PREFACE

This manual provides the information necessary to check functionality, operate and program the R3267 Series Option 64, PDC/PHS/IS-136 measurement.

(1) Organization of this manual

This manual consists of the following chapters:

Safety Summary	To use the analyzer safely, be sure to read this manual first.
1. Introduction • Product Description (Option) • Standard Accessories • Self Test Error • Connectors on the rear panel	Includes a description of the option and its' parts and a self test error.
2. Operation	You can learn the basic operations of the option through the examples shown in this chapter.
3. Reference • Menu Index • Menu Map • Functional Description	Shows a list of operation keys, and describes the function of each key.
4. Remote Control • GPIB	Included are a list of commands necessary for programming.
5. Technical Notes • PDC/PHS/IS-136 Burst measurement	Describes the principle of operation necessary for taking measurements more accurately.
6. Performance Verification Test	Describes how to test performance.
7. Specifications	Shows the specifications of the option.
APPENDIX • Messages	If an error occurs during operation, an error number and its corresponding error message are displayed. The meaning of each error is explained in this section.

(2) Typeface conventions used in this manual

- Panel keys and soft keys are printed in a contrasting typeface to make them stand out from the text as follows:

  Panel keys: Boldface type — Example: **FREQ, TRANSIENT**
  Soft keys: Boldface and italic type — Example: ***Center, Detector***

- When a series of key operations are described using a comma between two keys.
- There are various soft menus used to switch between two states such as ON/OFF and AUTO/MNL.
  For example, when turning off the ***Average Times ON/OFF*** function, the annotation "***Average Times ON/OFF***(OFF)" is used.
  When switching the ***RBW AUTO/MNL*** function to MNL, the annotation "***RBW AUTO/MNL***(MNL)" is used.

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1 INTRODUCTION

1.1 Product Overview

This PDC/PHS/IS-136 analysis option software (Option 64) allows you to measure the modulation accuracy and transfer rate error and evaluate them.

This option is a factory option which is incorporated into the R3267 Series Spectrum Analyzer prior to shipment.

This option includes the following features:

- PDC, PHS and IS-136 system can be measured by simply switching the measurement system.
- Used to measure the transmittion characteristics of the base station (BTS) signals and mobile station (MS) signals.
- Used to measure the Tx Power, Power vs Time, OBW, ACP, modulation accuracy and transfer rate error specified by the communication standard using a simple key operation.

1.2 Accessories

Name of accesories	Type of name	Quantitiy	Remarks
R3267 Series OPT64 Operation manual	ER3267/73 OPT64	1	English

1.3 Self Test Function

The self test also checks the Option 64 for correct operation when the spectrum analyzer power is turned on. The message shown below will be displayed when an error related to Option 64 occurs. Contact ADVANTEST Corp. for repair.

Error Message
Handshake error occurred to DSP

1.4 About Calibration

When you want to calibrate the R3267 Series, please contact a sales representative.

Desirable Period	One year

1.5 Explanation of the Connectors

Connectors used for this option are described as follows:

1. EXT TRIG terminal Connector for inputting the external trigger signal.
2. I channel terminal Connector for inputting the I channel signal (Baseband).
3. Q channel terminal Connector for inputting the Q channel signal (Baseband).

2 OPERATION

This chapter describes how to use this option using practical measurement examples.

2.1 Measuring the Base Station PDC System Signal

Measurement conditions:

The measurement target is PDC system equipment under test, which transmits a signal with a frequency of 810 MHz and a level of -10 dBm.

Measurement specifications:

Physical channels for down-link communication

Synchronization word: 87A4B [HEX]
Full rate

Connection of the Instrument

1. Connect the instrument to the base station equipment as shown in Figure 2-1.

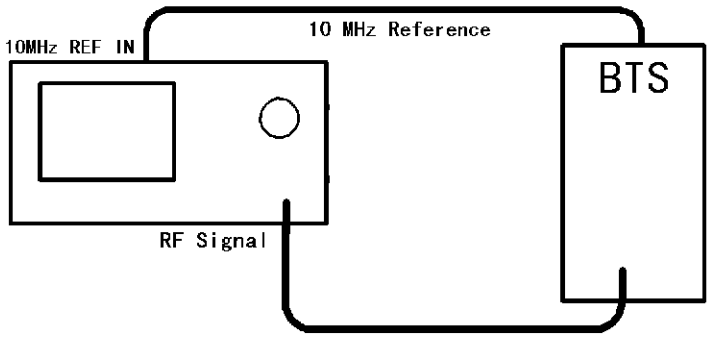

Figure 2-1 Connection for the PDC Measurement

Setting Measurement Conditions

Set measurement conditions so the input signal can be observed clearly.

2. Press **FREQ, 8, 1, 0** and **MHz**.
3. Press **SPAN, 1, 0, 0** and **kHz**.
4. Press **LEVEL, 0** and **GHz (+dBm)**.
5. Press **COUPLE**, ***RBW AUTO/MNL*** (MNL), **3, 0, 0** and **Hz**.
6. Press ***VBW AUTO/MNL*** (MNL), **3, 0, 0** and **Hz**.
7. Press ***Sweep Time AUTO/MNL*** (MNL), **2, 0** and **MHz (sec)**.

8. Press **FORMAT**, ***Trace Detector*** and ***Positive.***

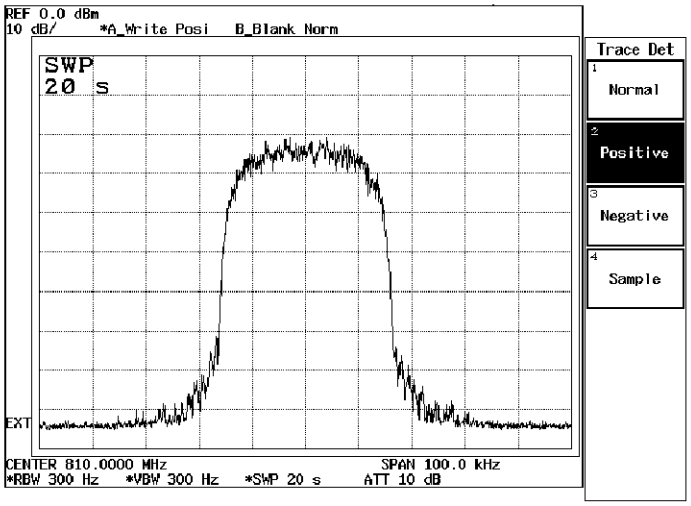

Figure 2-2 PDC Spectrum

9. Press **CONFIG**, ***more 1/2*** and ***Comm. System.***

10. Move the cursor to ***PDC*** in the Communication System menu using the data knob and press **Hz(ENTR)**.

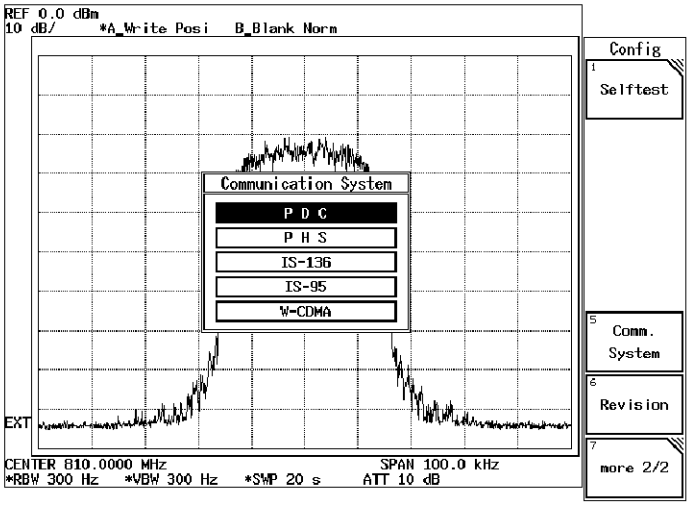

Figure 2-3 Communication System Dialog box

11. Press **TRANSIENT**, ***STD*** and ***STD Setup.***

12. Set ***Type*** to ***PDC 800 M-1*** using the data knob, and then press **Hz(ENTR)**.

13. Set ***Link*** to ***DOWNLINK*** using the data knob, and then press **Hz(ENTR)**.

14. Press **∇**.

15. Set ***Slot Format*** to ***TRAFFIC*** using the data knob, and then press **Hz(ENTR)**.

16. Set ***Rate*** to ***FULL RATE*** using data knob, and then press **Hz(ENTR).**

17. Set ***Sync Type*** to ***SYNC WORD*** using the data knob, and then press **Hz(ENTR)**.

18. Set ***Sync Word*** to ***S1/S7*** using the data knob, and then press **Hz(ENTR)**.

19. Set ***Root Nyquist Filter*** to ***ON*** using the data knob, and then press **Hz(ENTR)**.

20. Set ***Freq Meas Range*** to ***NORMAL*** using the data knob, and then press **Hz(ENTR)**.

21. Set ***Filter Mode*** to ***WIDE*** using the data knob, and then press **Hz(ENTR)**.

22. ENTR **0**, **.**, **0** and **GHz(dB)** to ***Offset Level*** using the numeric keys.

23. Set ***Frequency Input*** to ***FREQUENCY*** using the data knob, and then press **Hz(ENTR)**.

24. Set ***Input*** to ***RF*** using the data knob, and then press **Hz(ENTR)**.

25. Set ***IQ Inverse*** to ***NORMAL*** using the data knob, and then press **Hz(ENTR)**.

26. Set ***Cont Auto Level Set*** to ***OFF*** using the data knob, and then press **Hz(ENTR)**.

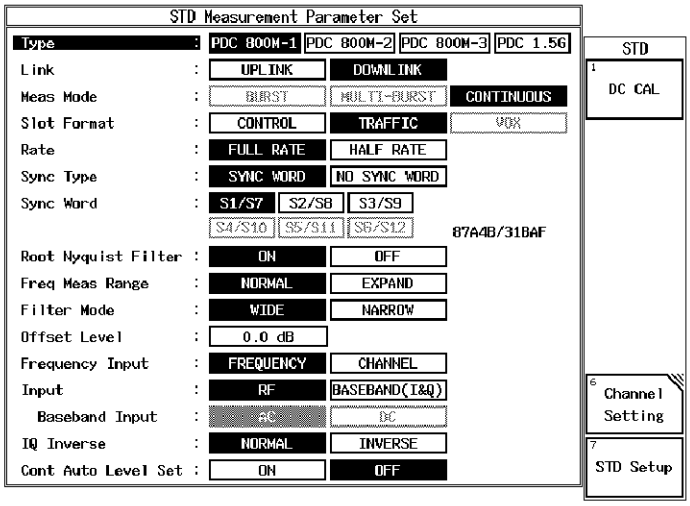

Figure 2-4 STD Measurement Parameter Set Dialog Box

27. Press **RETURN.**

28. Press ***Modulation.***

29. Press ***Modulation Accuracy.***

30. Press ***Parameter Setup.***

31. Set ***Trigger Source*** to ***FREE RUN*** using the data knob, and then press **Hz(ENTR).**

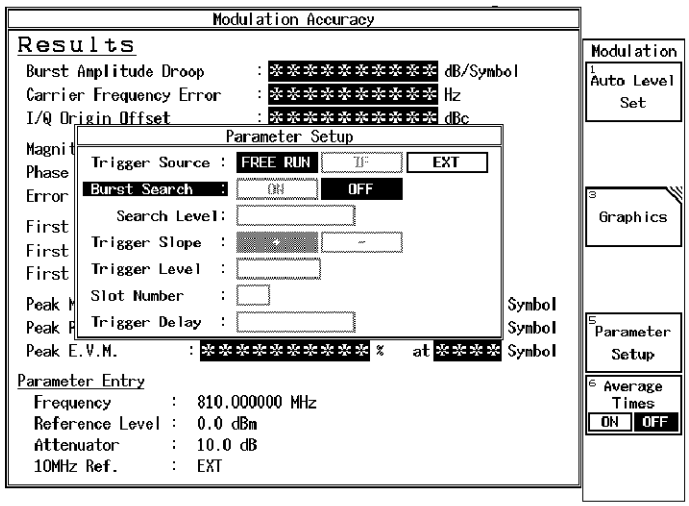

Figure 2-5 Parameter Setup Dialog Box

32. Press ***Parameter Setup.***

33. Press ***Auto Level Set.***

34. Press **SINGLE.**

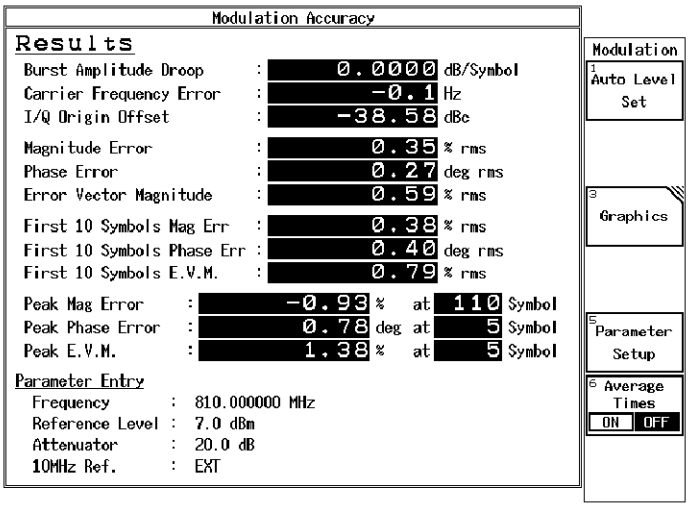

Figure 2-6 Measurement Results of the PDC Signal

Burst Amplitude Droop	Droop factor (dB/Symbol)
Carrier Frequency Error	Carrier frequency error (Hz)
I/Q Origin Offset	I/Q origin offset (dBc)
Magnitude Error	Magnitude error (% rms) used when the symbol specified by the standard is evaluated
Phase Error	Phase error (deg rms) used when the symbol specified by the standard is evaluated
Error Vector Magnitude	Modulation accuracy (% rms) used when the symbol specified by the standard is evaluated
First 10 Symbols Mag Err	Magnitude error (% rms) used when the first 10 symbols are evaluated
First 10 Symbols Phase Err	Phase error (deg rms) used when the first 10 symbols are evaluated
First 10 Symbols E.V.M.	Modulation accuracy (% rms) used when the first 10 symbols are evaluated

Peak Mag Error	Peak value (%) of a magnitude error and its symbol number within the evaluation symbols specified by the standard
Peak Phase Error	Peak value (deg) of a phase error and its symbol number of within the evaluation symbols specified by the standard
Peak E.V.M.	Peak value (%) of modulation accuracy and its symbol number within the evaluation symbols specified by the standard

2.2 Measuring the Mobile Station PDC System Signal

Measurement conditions:

The measurement target is PDC system equipment under test, which transmits a signal with a frequency of 940 MHz and a level of -10 dBm.

Measurement specifications:

Physical channels for up-link communication

Synchronization word: 785B4 [HEX]
Full rate

Connection of the Instrument

1. Connect the instrument to the mobile station equipment as shown in Figure 2-7.

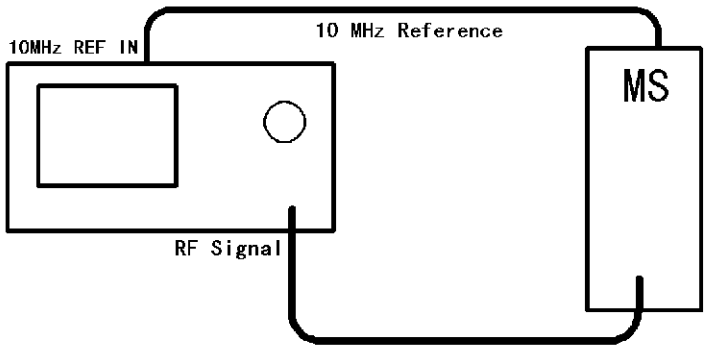

Figure 2-7 Connection for the PDC Measurement

Setting Measurement Conditions

Set the center frequency of the spectrum analyzer for the frequency of a signal to be measured.

2. Press **FREQ, 9, 4, 0** and **MHz**.
3. Press **TRANSIENT**, ***STD*** and ***STD Setup***.
4. Set ***Type*** to ***PDC 800 M-1*** using the data knob, and then press **Hz(ENTR)**.
5. Set ***Link*** to ***UPLINK*** using the data knob, and then press **Hz(ENTR)**.
6. Set ***Meas Mode*** to ***BURST*** using the data knob, and then press **Hz(ENTR)**.
7. Set ***Slot Format*** to ***TRAFFIC*** using data knob, and then press **Hz(ENTR)**.
8. Set ***Rate*** to ***FULL RATE*** using the data knob, and then press **Hz(ENTR)**.
9. Set ***Sync Type*** to ***SYNC WORD*** using the data knob, and then press **Hz (ENTR)**.

10. Set ***Sync Word*** to ***S1/S7*** using the data knob, and then press **Hz(ENTR)**.

11. Set ***Root Nyquist Filter*** to ***ON*** using data knob, and then press **Hz(ENTR)**.

12. Set ***Freq Meas Range*** to ***NORMAL*** using the data knob, and then press **Hz(ENTR)**.

13. Set ***Filter Mode*** to ***WIDE*** using the data knob, and then press **Hz(ENTR)**.

14. Enter **0**, **.**, **0** and **GHz(dB)** to ***Offset Level*** using the numeric keys.

15. Set ***Frequency Input*** to ***FREQUENCY*** using the data knob, and then press **Hz (ENTR)**.

16. Set ***Input*** to ***RF*** using the data knob, and then press **Hz(ENTR)**.

17. Set ***IQ Inverse*** to ***NORMAL*** using the data knob, and then press **Hz(ENTR)**.

18. Set ***Cont Auto Level Set*** to ***OFF*** using the data knob, and then press **Hz(ENTR)**.

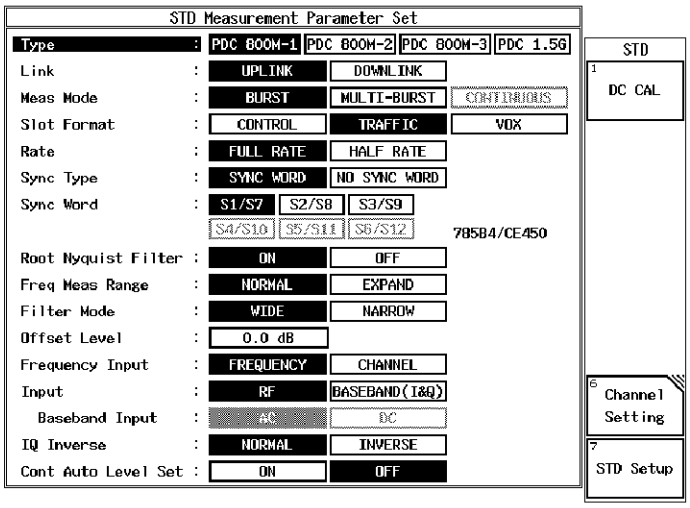

Figure 2-8 STD Measurement Parameter Set Dialog Box

19. Press **RETURN.**

20. Press ***Modulation.***

21. Press ***Modulation Accuracy.***

22. Press ***Parameter Setup.***

23. Set ***Trigger Source*** to ***FREE RUN*** using the data knob, and then press **Hz(ENTR)**.

24. Press **∇**.

25. Enter **-**, **2**, **5** and **GHz(dB)** to ***Search Level*** using the numeric keys.

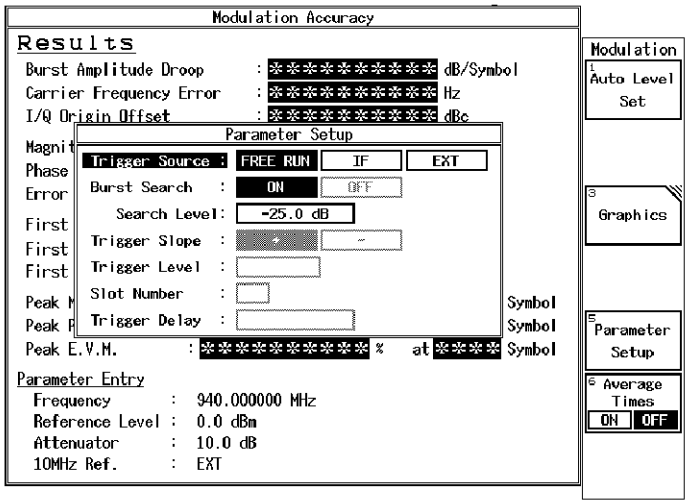

Figure 2-9 Parameter Setup Dialog Box

26. Press ***Parameter Setup***.

27. Press ***Auto Level Set***.

28. Press **SINGLE**.

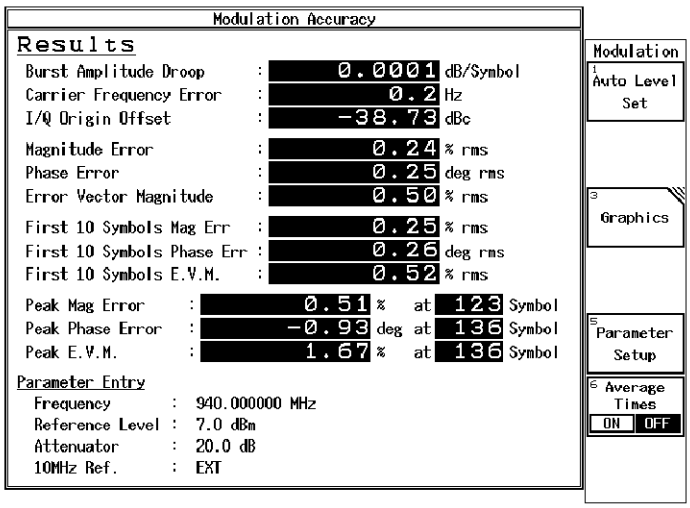

Figure 2-10 Measurement Results of the PDC Signal

Burst Amplitude Droop	Droop factor (dB/Symbol)
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Phase Error	Phase error (deg rms) used when the symbol specified by the standard is evaluated
Error Vector Magnitude	Modulation accuracy (% rms) used when the symbol specified by the standard is evaluated
First 10 Symbols Mag Err	Magnitude error (% rms) used when the first 10 symbols are evaluated
First 10 Symbols Phase Err	Phase error (deg rms) used when the first 10 symbols are evaluated
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Peak Mag Error	Peak value (%) of a magnitude error and its symbol number within the evaluation symbols specified by the standard
Peak Phase Error	Peak value (deg) of a phase error and its symbol number of within the evaluation symbols specified by the standard
Peak E.V.M.	Peak value (%) of modulation accuracy and its symbol number within the evaluation symbols specified by the standard

3 REFERENCE

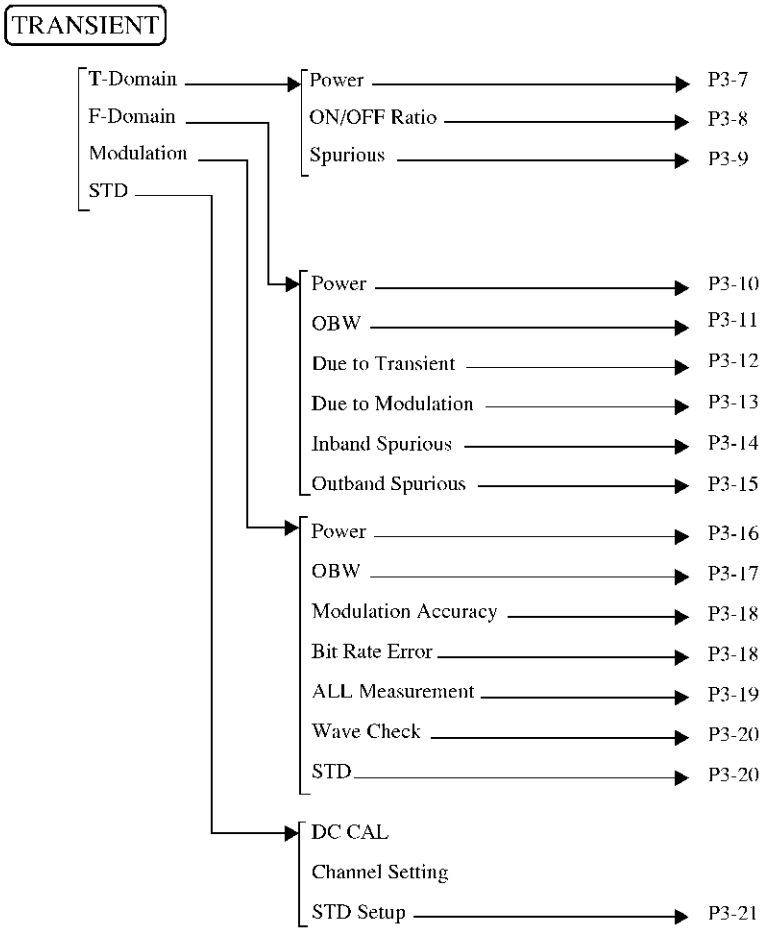
This chapter describes the functions of the panel and soft keys for option 64 software.

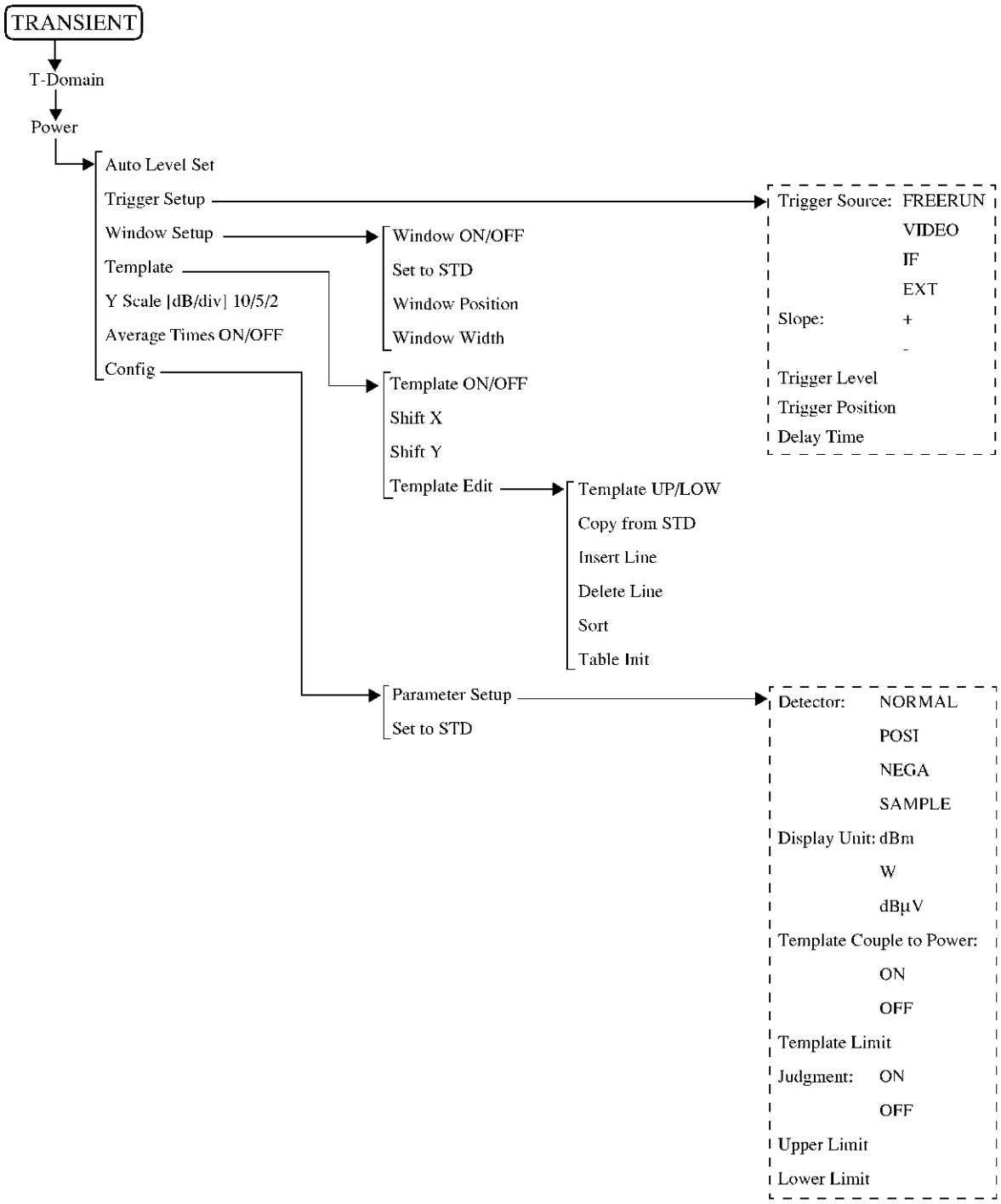
3.1 Menu Index

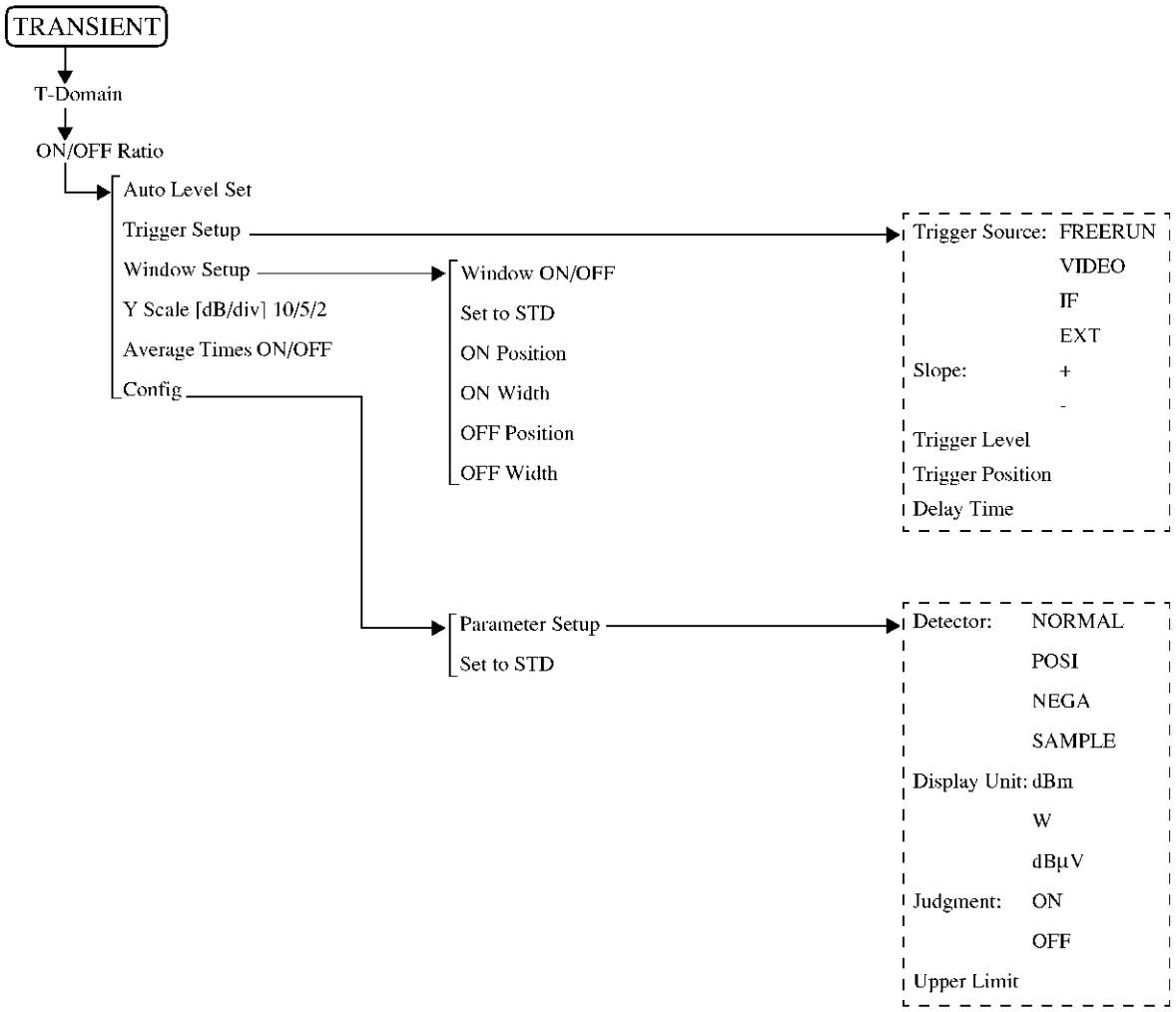
This menu index is used to easily find the keys described in Chapter 3.

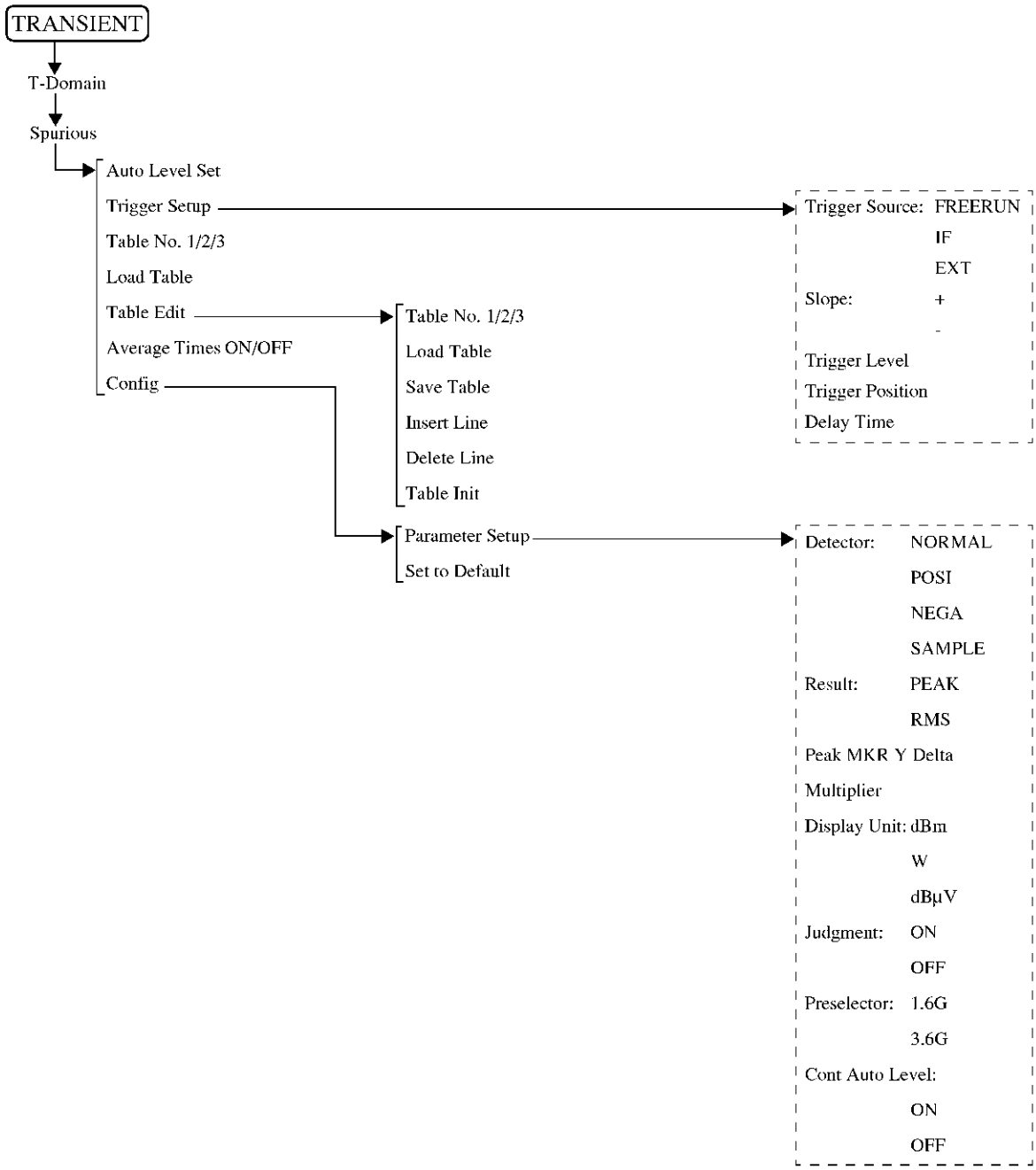
3.2 Menu Map

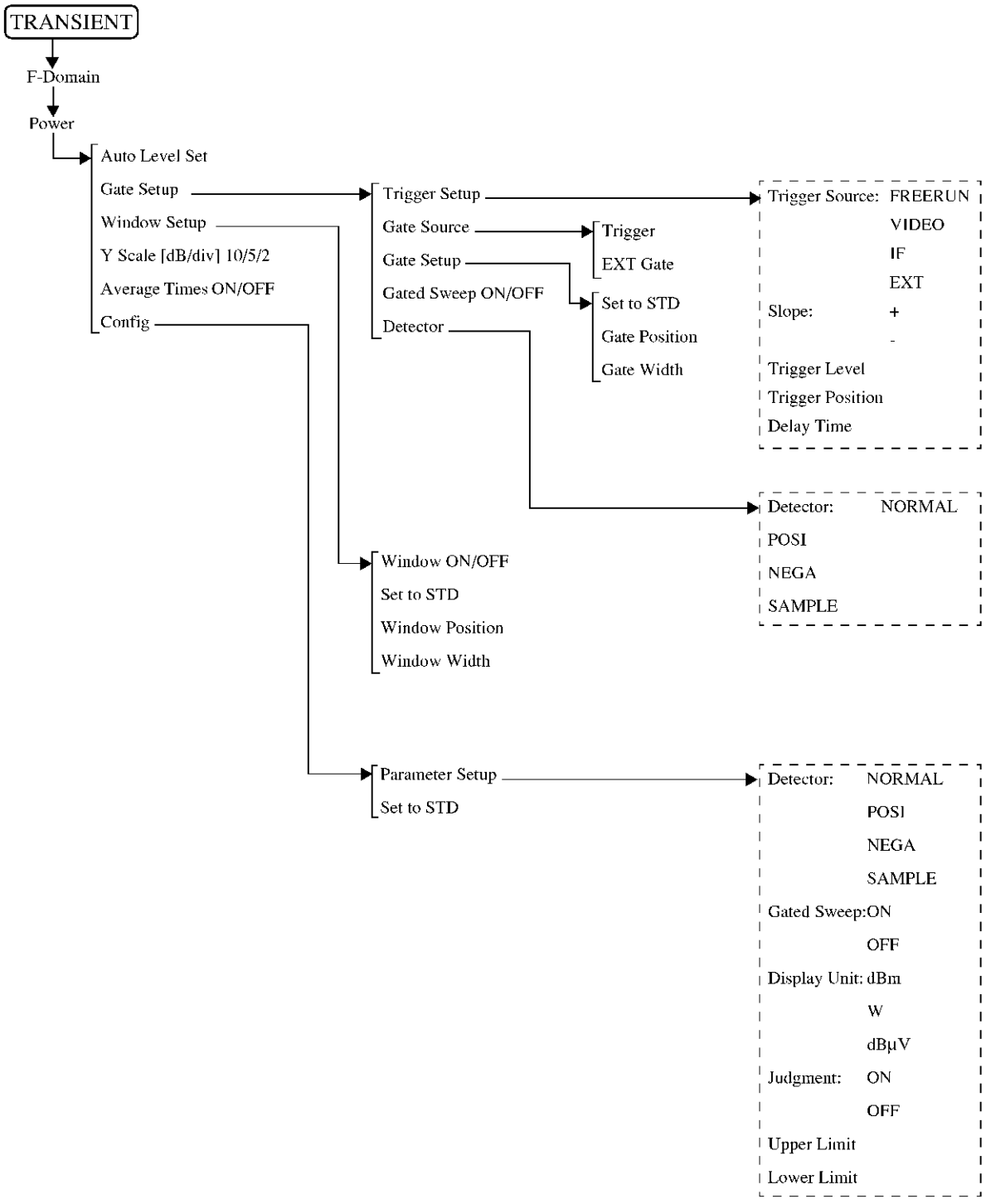
This section shows the hierarchical menu configuration for each panel key.

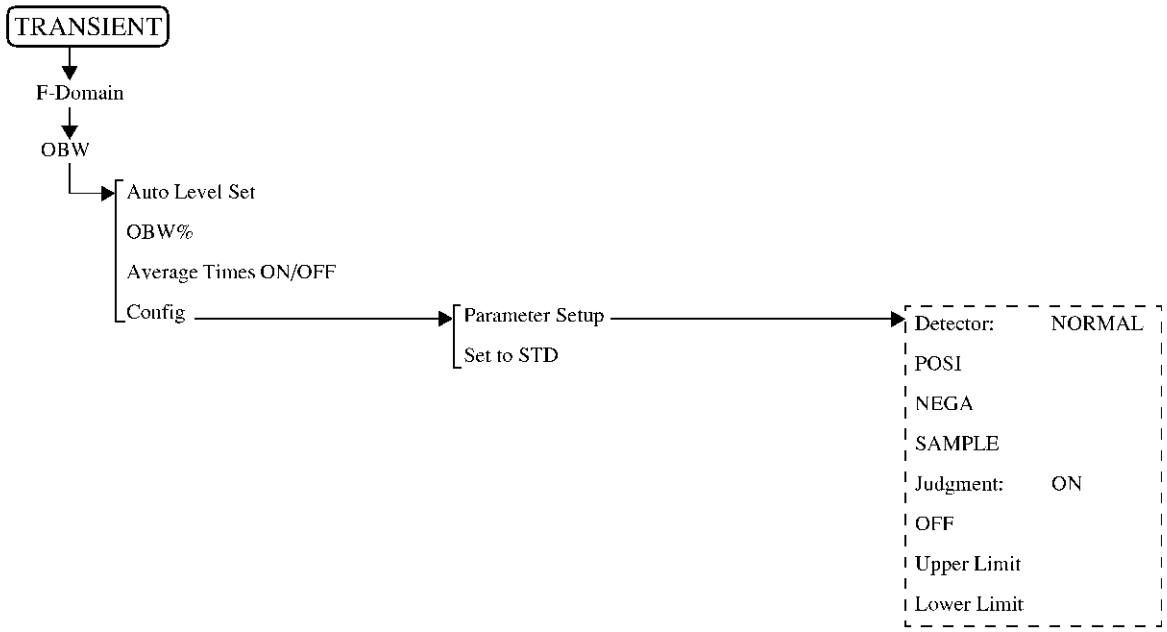


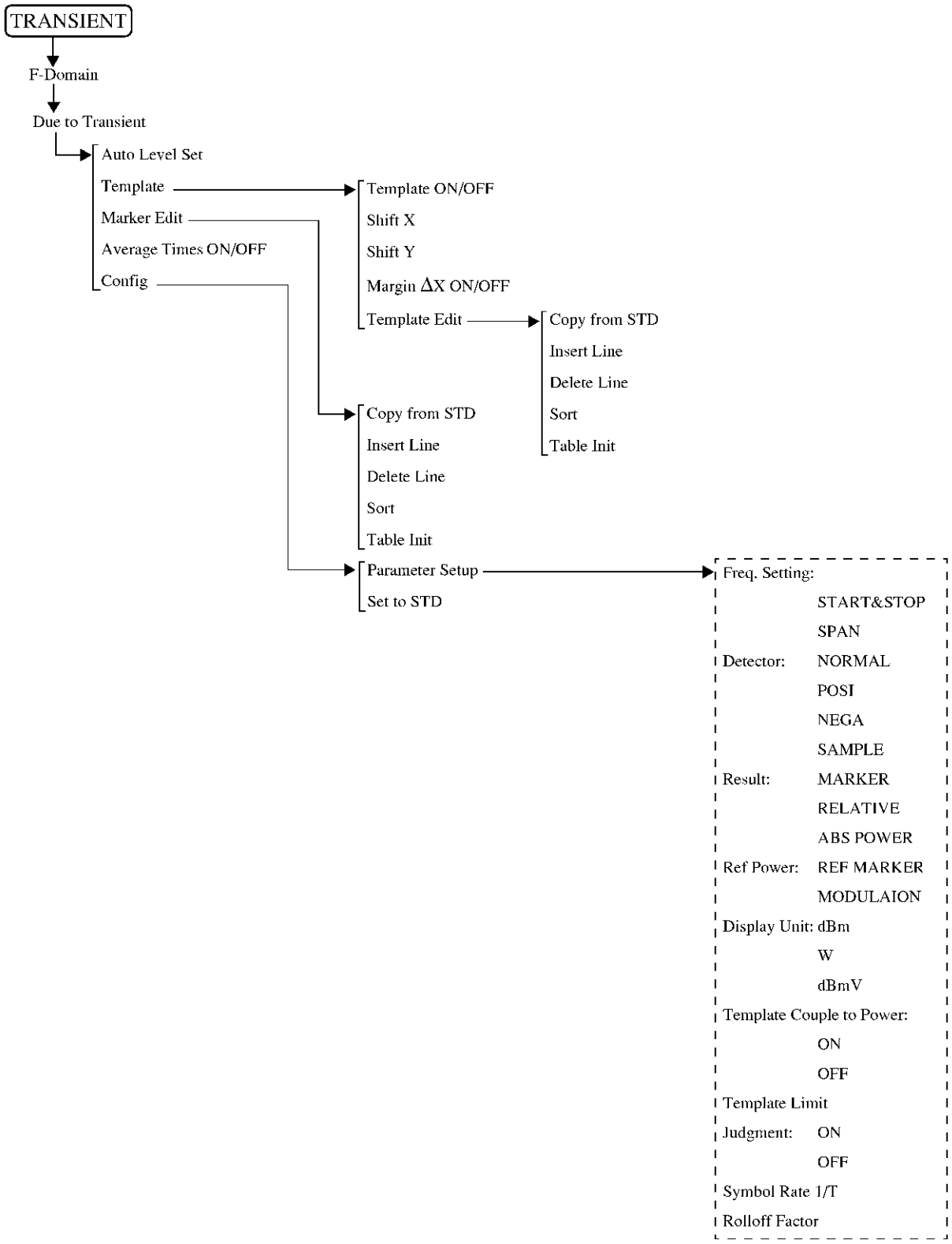

TRANSIENT
T-Domain
Power
Auto Level Set
Trigger Setup
Window Setup
Template
Y Scale [dB/div] 10/5/2
Average Times ON/OFF
Config
Window ON/OFF
Set to STD
Window Position
Window Width
Template ON/OFF
Shift X
Shift Y
Template Edit
Template UP/LOW
Copy from STD
Insert Line
Delete Line
Sort
Table Init
Parameter Setup
Set to STD
Trigger Source: FREERUN
VIDEO
IF
EXT
Slope: +
-
Trigger Level
Trigger Position
Delay Time
Detector: NORMAL
POSI
NEGA
SAMPLE
Display Unit: dBm
W
dBµV
Template Couple to Power:
ON
OFF
Template Limit
Judgment: ON
OFF
Upper Limit
Lower Limit

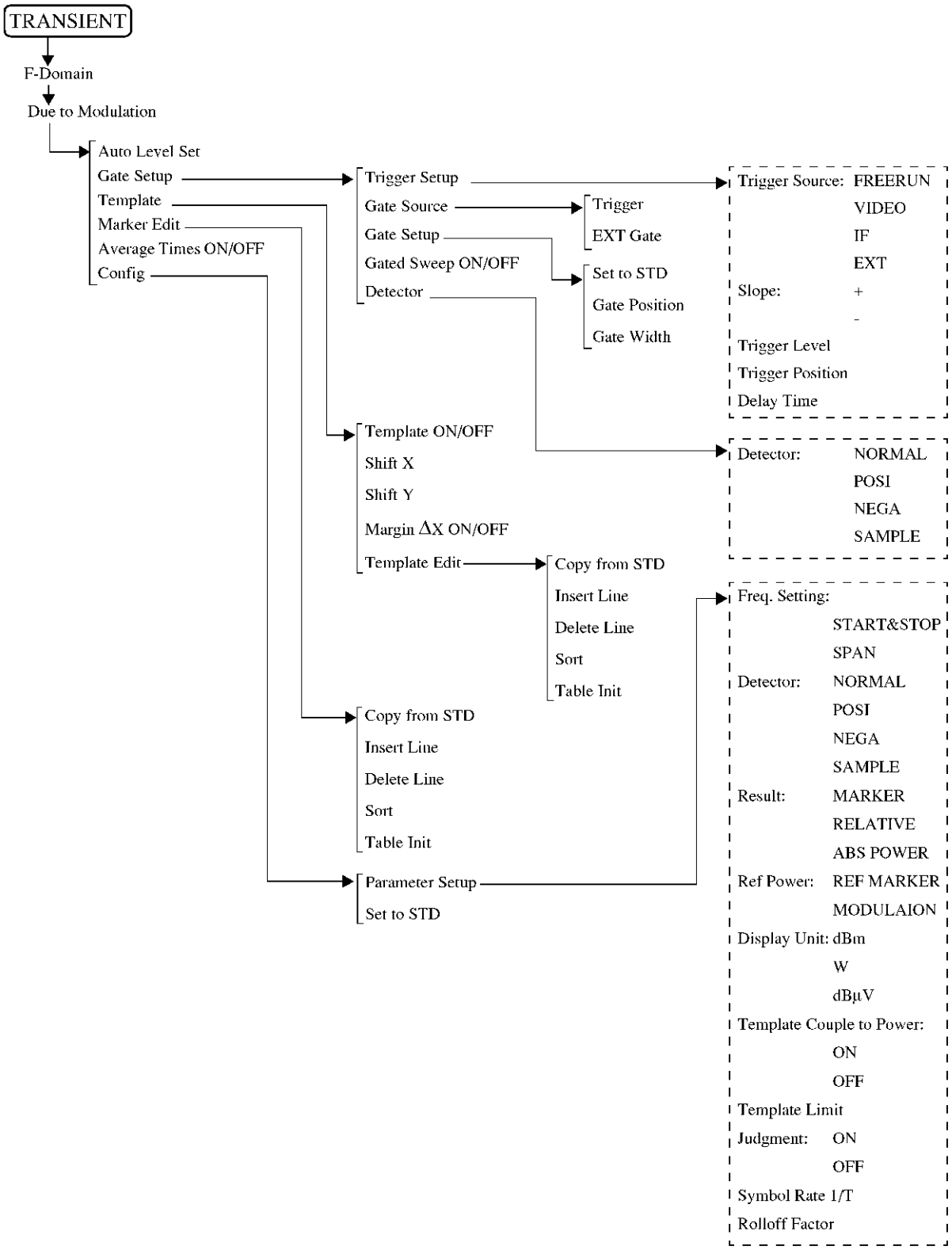

TRANSIENT
T-Domain
ON/OFF Ratio
Auto Level Set
Trigger Setup
Window Setup
Y Scale [dB/div] 10/5/2
Average Times ON/OFF
Config
Window ON/OFF
Set to STD
ON Position
ON Width
OFF Position
OFF Width
Trigger Source: FREERUN
VIDEO
IF
EXT
Slope: +
-
Trigger Level
Trigger Position
Delay Time
Parameter Setup
Set to STD
Detector: NORMAL
POSI
NEGA
SAMPLE
Display Unit: dBm
W
dBµV
Judgment: ON
OFF
Upper Limit

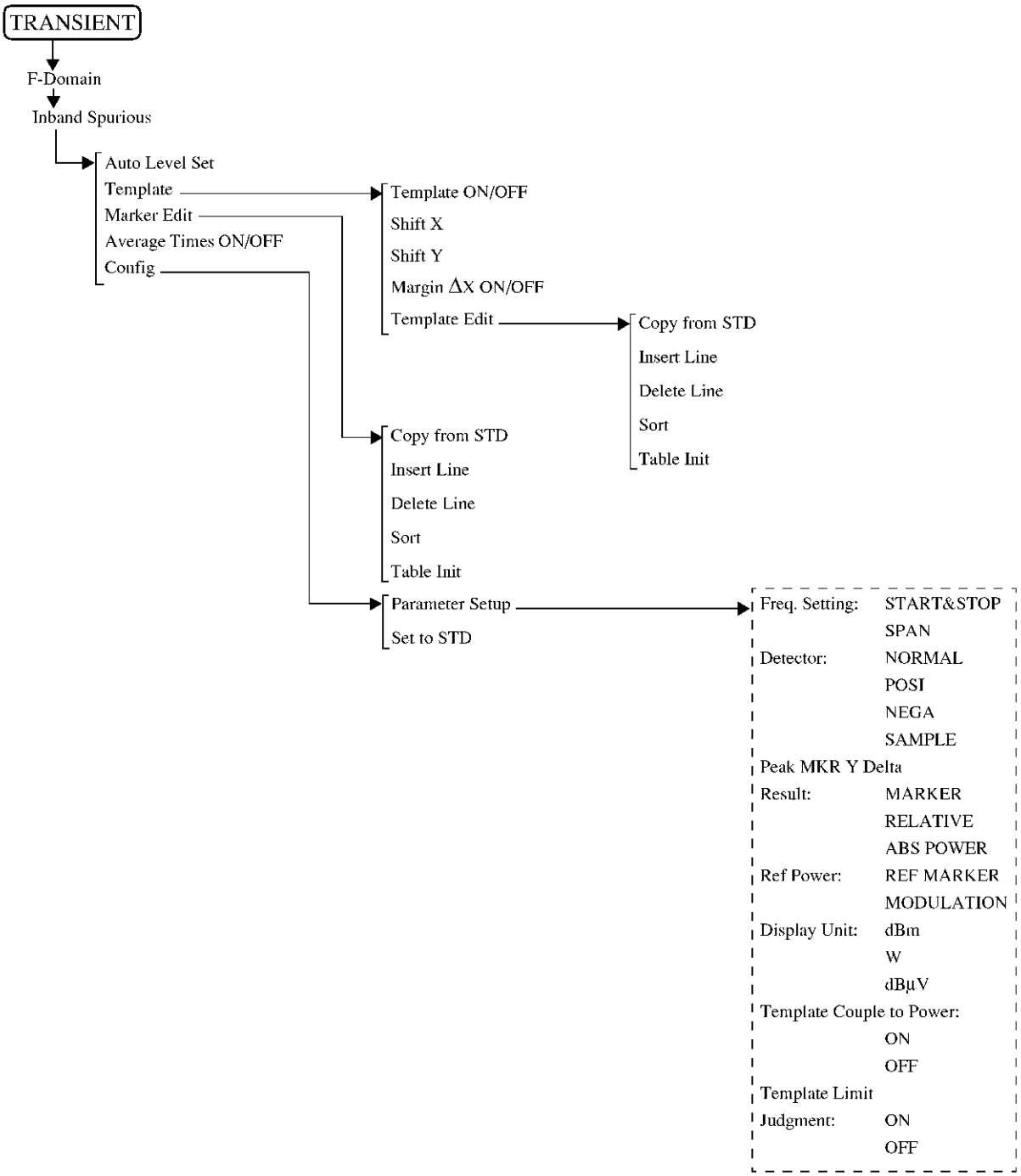

TRANSIENT
T-Domain
Spurious
Auto Level Set
Trigger Setup
Table No. 1/2/3
Load Table
Table Edit
Average Times ON/OFF
Config
Table No. 1/2/3
Load Table
Save Table
Insert Line
Delete Line
Table Init
Parameter Setup
Set to Default
Trigger Source: FREERUN
IF
EXT
Slope: +
-
Trigger Level
Trigger Position
Delay Time
Detector: NORMAL
POSI
NEGA
SAMPLE
Result: PEAK
RMS
Peak MKR Y Delta
Multiplier
Display Unit: dBm
W
dBµV
Judgment: ON
OFF
Preselector: 1.6G
3.6G
Cont Auto Level:
ON
OFF

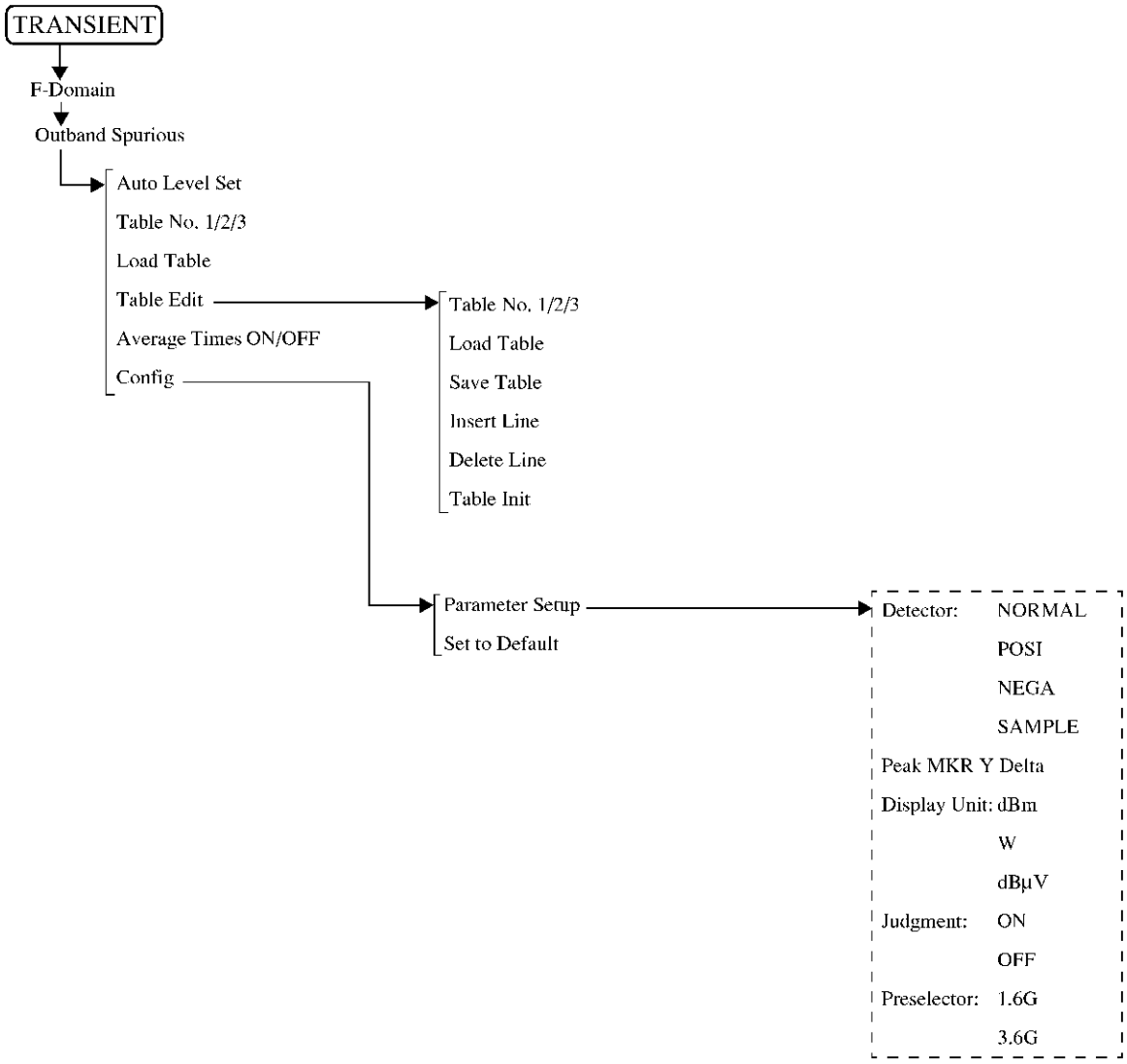

TRANSIENT
F-Domain
Power
Auto Level Set
Gate Setup
Window Setup
Y Scale [dB/div] 10/5/2
Average Times ON/OFF
Config
Trigger Setup
Gate Source
Gate Setup
Gated Sweep ON/OFF
Detector
Trigger
EXT Gate
Set to STD
Gate Position
Gate Width
Trigger Source: FREERUN
VIDEO
IF
EXT
Slope: +
-
Trigger Level
Trigger Position
Delay Time
Detector: NORMAL
POSI
NEGA
SAMPLE
Window ON/OFF
Set to STD
Window Position
Window Width
Parameter Setup
Set to STD
Detector: NORMAL
POSI
NEGA
SAMPLE
Gated Sweep: ON
OFF
Display Unit: dBm
W
dBµV
Judgment: ON
OFF
Upper Limit
Lower Limit

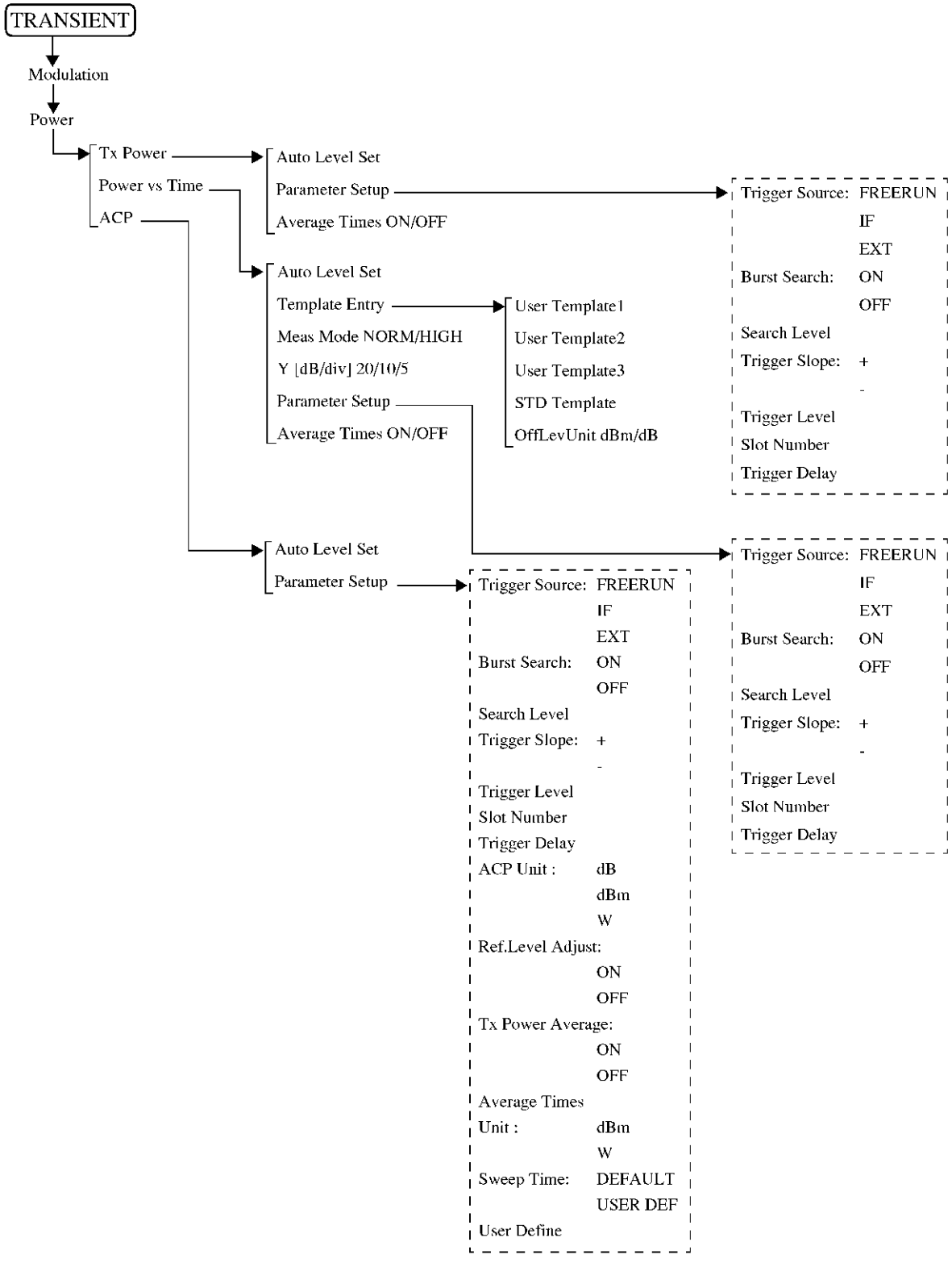

TRANSIENT
F-Domain
OBW
Auto Level Set
OBW%
Average Times ON/OFF
Config
Parameter Setup
Set to STD
Detector: NORMAL
POSI
NEGA
SAMPLE
Judgment: ON
OFF
Upper Limit
Lower Limit

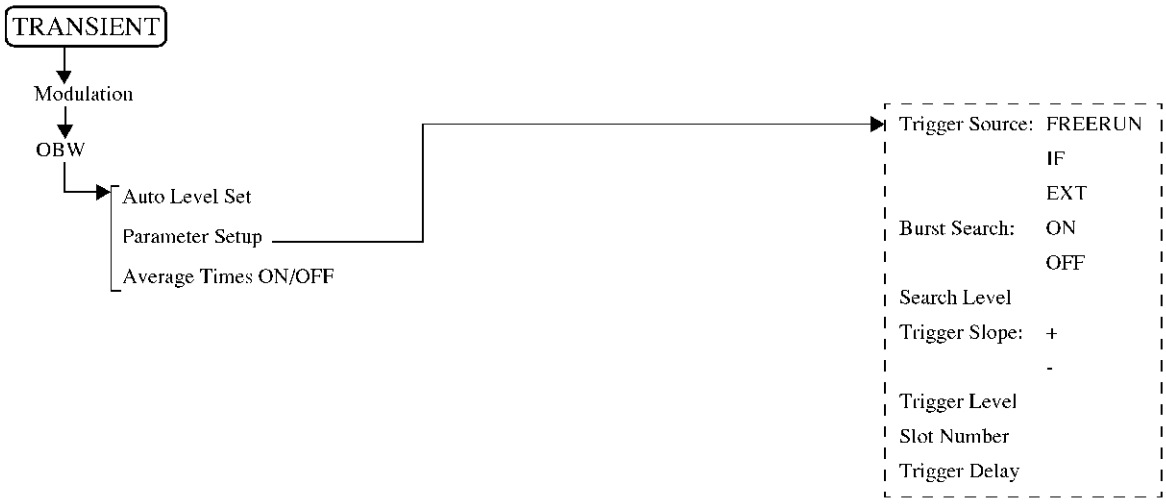

TRANSIENT
F-Domain
Due to Transient
Auto Level Set
Template
Marker Edit
Average Times ON/OFF
Config
Template ON/OFF
Shift X
Shift Y
Margin ΔX ON/OFF
Template Edit
Copy from STD
Insert Line
Delete Line
Sort
Table Init
Copy from STD
Insert Line
Delete Line
Sort
Table Init
Parameter Setup
Set to STD
Freq. Setting:
START&STOP
SPAN
Detector:
NORMAL
POSI
NEGA
SAMPLE
Result:
MARKER
RELATIVE
ABS POWER
Ref Power:
REF MARKER
MODULAION
Display Unit: dBm
W
dBmV
Template Couple to Power:
ON
OFF
Template Limit
Judgment:
ON
OFF
Symbol Rate 1/T
Rolloff Factor

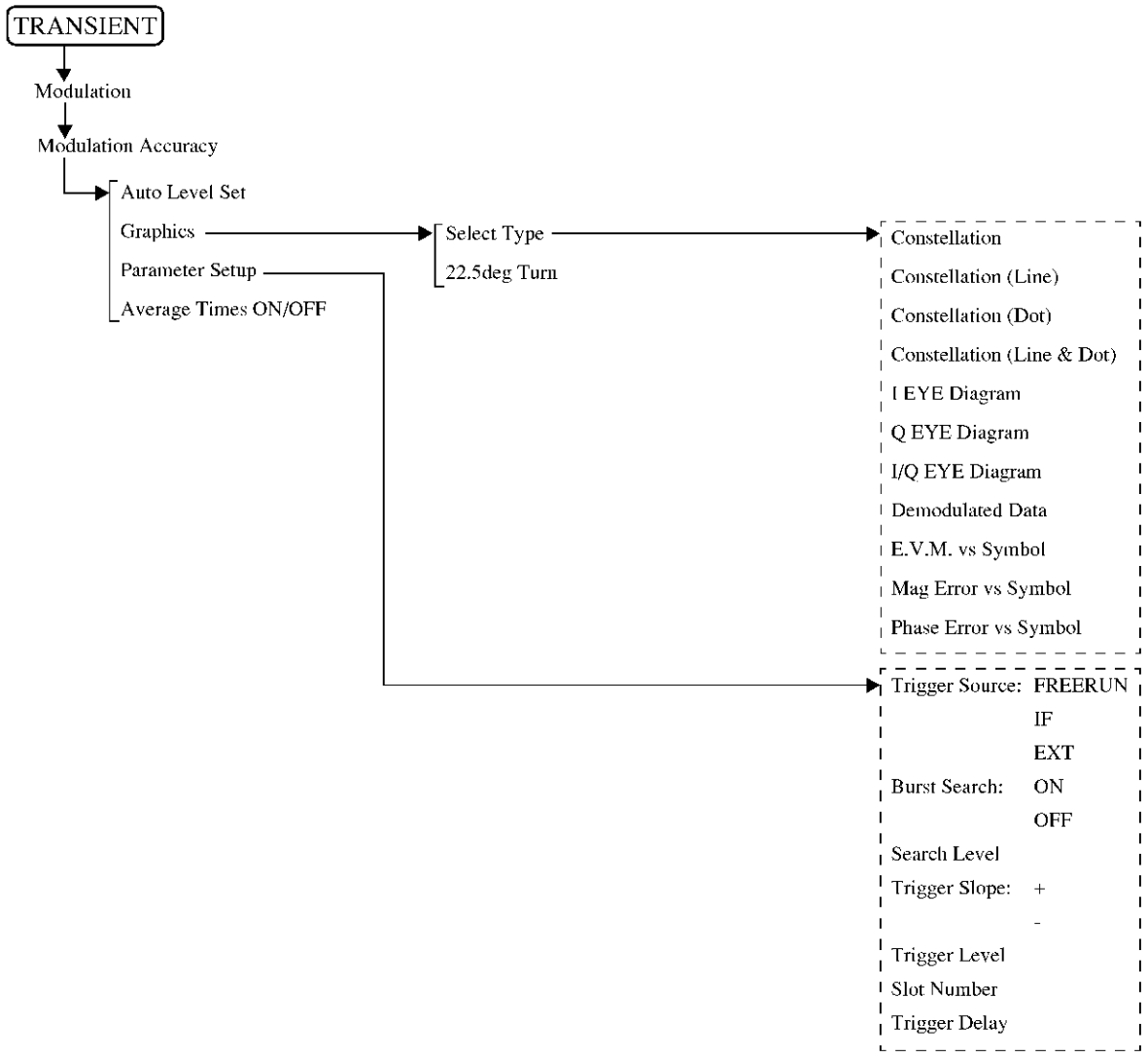

TRANSIENT
F-Domain
Due to Modulation
Auto Level Set
Gate Setup
Template
Marker Edit
Average Times ON/OFF
Config
Trigger Setup
Gate Source
Gate Setup
Gated Sweep ON/OFF
Detector
Trigger
EXT Gate
Set to STD
Gate Position
Gate Width
Trigger Source: FREERUN
VIDEO
IF
EXT
Slope: +
-
Trigger Level
Trigger Position
Delay Time
Template ON/OFF
Shift X
Shift Y
Margin ΔX ON/OFF
Template Edit
Copy from STD
Insert Line
Delete Line
Sort
Table Init
Detector: NORMAL
POSI
NEGA
SAMPLE
Copy from STD
Insert Line
Delete Line
Sort
Table Init
Parameter Setup
Set to STD
Freq. Setting:
START&STOP
SPAN
Detector: NORMAL
POSI
NEGA
SAMPLE
Result: MARKER
RELATIVE
ABS POWER
Ref Power: REF MARKER
MODULAION
Display Unit: dBm
W
dBμV
Template Couple to Power:
ON
OFF
Template Limit
Judgment: ON
OFF
Symbol Rate 1/T
Rolloff Factor

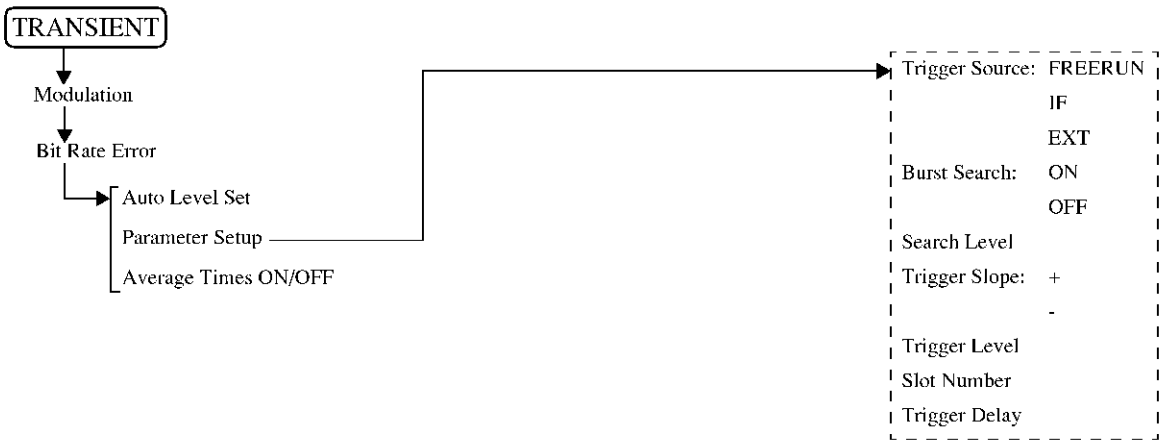

TRANSIENT
F-Domain
Inband Spurious
Auto Level Set
Template
Marker Edit
Average Times ON/OFF
Config
Template ON/OFF
Shift X
Shift Y
Margin ΔX ON/OFF
Template Edit
Copy from STD
Insert Line
Delete Line
Sort
Table Init
Copy from STD
Insert Line
Delete Line
Sort
Table Init
Parameter Setup
Set to STD
Freq. Setting: START&STOP
SPAN
Detector: NORMAL
POSI
NEGA
SAMPLE
Peak MKR Y Delta
Result: MARKER
RELATIVE
ABS POWER
Ref Power: REF MARKER
MODULATION
Display Unit: dBm
W
dBμV
Template Couple to Power:
ON
OFF
Template Limit
Judgment: ON
OFF

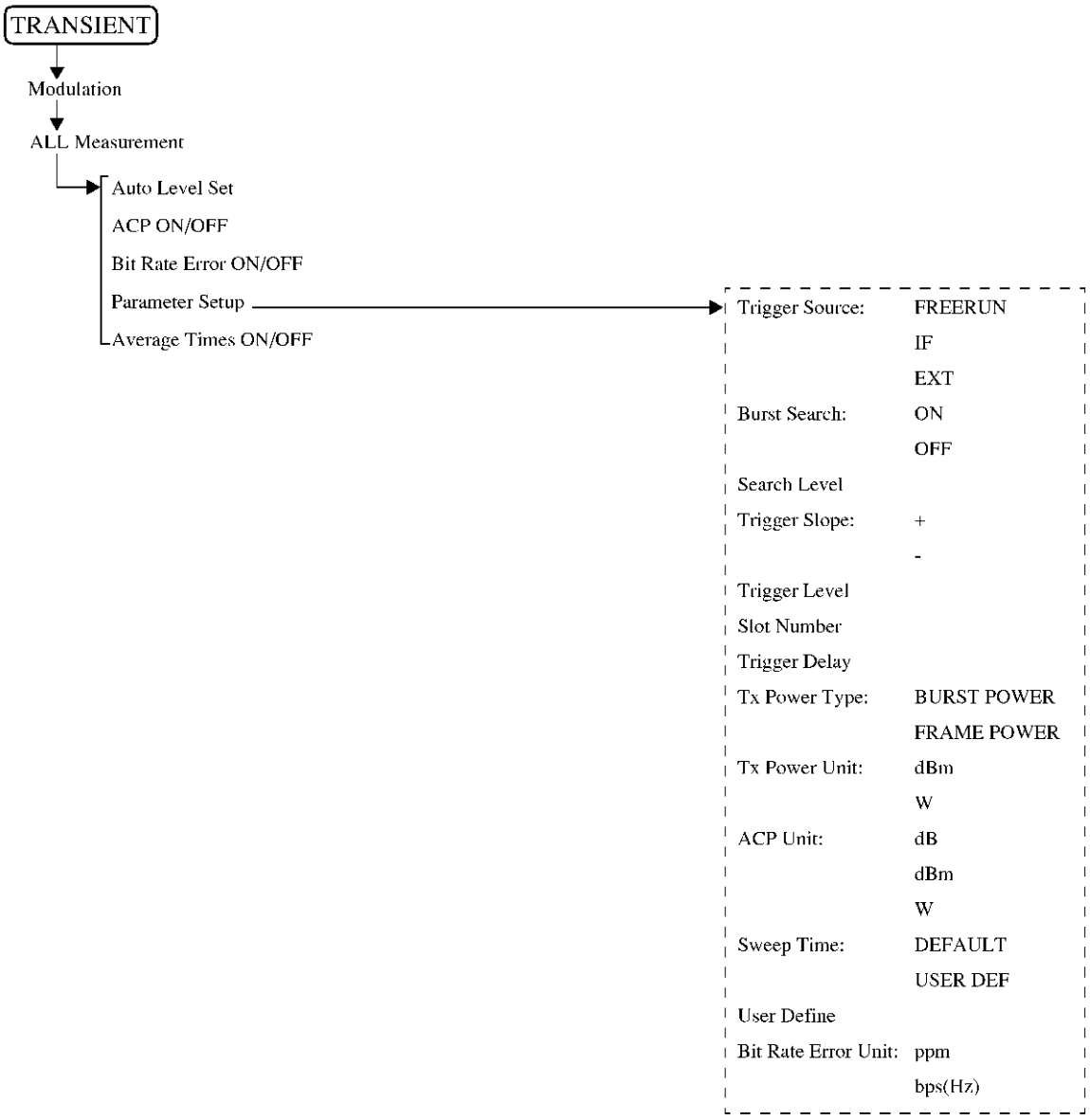

TRANSIENT
F-Domain
Outband Spurious
Auto Level Set
Table No. 1/2/3
Load Table
Table Edit
Average Times ON/OFF
Config
Table No. 1/2/3
Load Table
Save Table
Insert Line
Delete Line
Table Init
Parameter Setup
Set to Default
Detector: NORMAL
POSI
NEGA
SAMPLE
Peak MKR Y Delta
Display Unit: dBm
W
dBµV
Judgment: ON
OFF
Preselector: 1.6G
3.6G

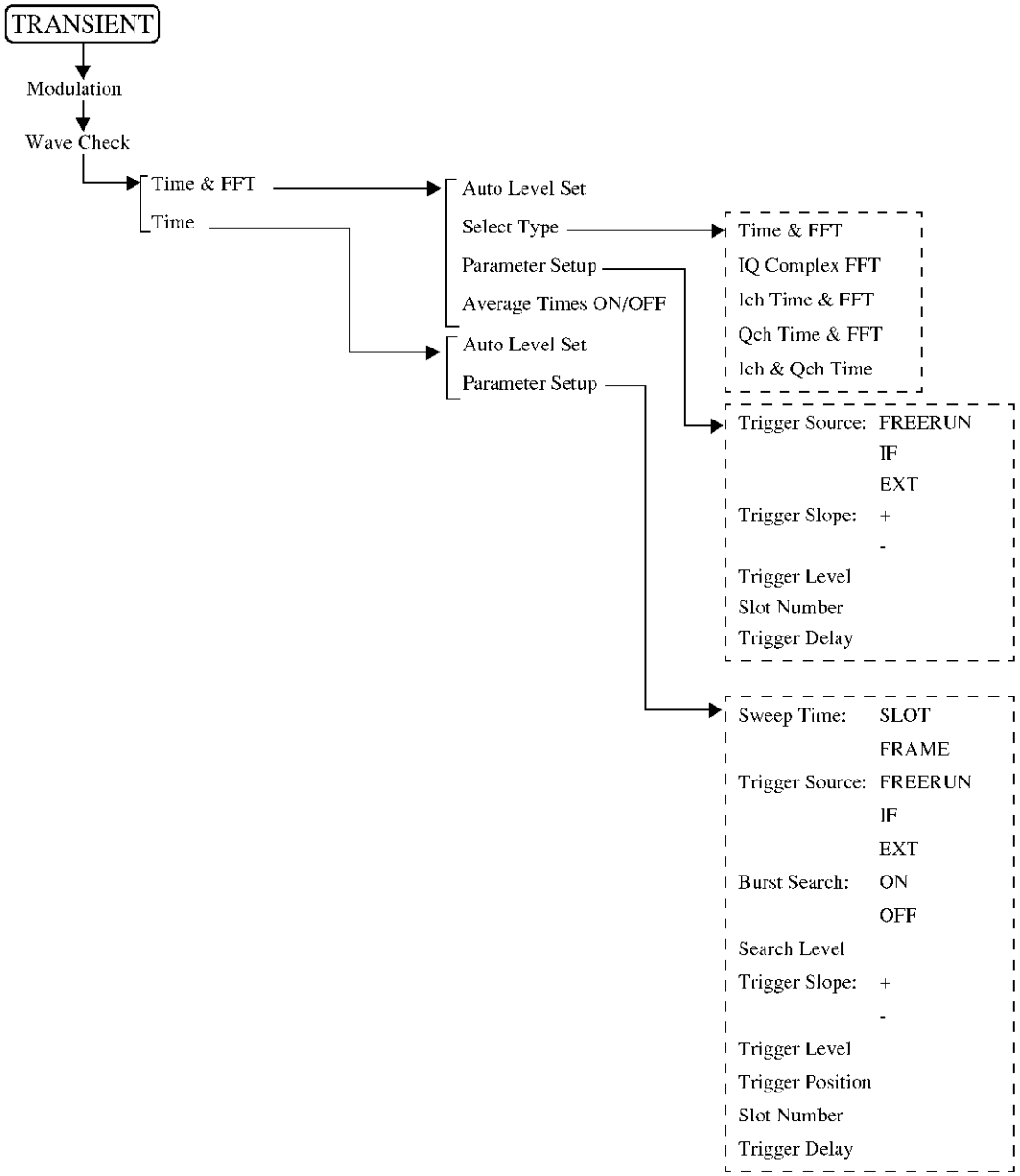

TRANSIENT
Modulation
Power
Tx Power
Power vs Time
ACP
Auto Level Set
Parameter Setup
Average Times ON/OFF
Auto Level Set
Template Entry
Meas Mode NORM/HIGH
Y [dB/div] 20/10/5
Parameter Setup
Average Times ON/OFF
User Template1
User Template2
User Template3
STD Template
OffLevUnit dBm/dB
Auto Level Set
Parameter Setup
Trigger Source: FREERUN
IF
EXT
Burst Search: ON
OFF
Search Level
Trigger Slope: +
-
Trigger Level
Slot Number
Trigger Delay
ACP Unit : dB
dBm
W
Ref.Level Adjust:
ON
OFF
Tx Power Average:
ON
OFF
Average Times
Unit : dBm
W
Sweep Time: DEFAULT
USER DEF
User Define
Trigger Source: FREERUN
IF
EXT
Burst Search: ON
OFF
Search Level
Trigger Slope: +
-
Trigger Level
Slot Number
Trigger Delay
Trigger Source: FREERUN
IF
EXT
Burst Search: ON
OFF
Search Level
Trigger Slope: +
-
Trigger Level
Slot Number
Trigger Delay

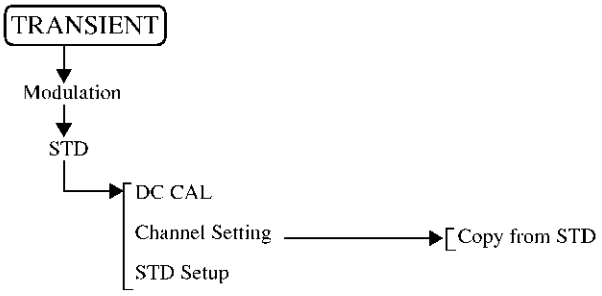

TRANSIENT
Modulation
OBW
Auto Level Set
Parameter Setup
Average Times ON/OFF
Trigger Source: FREERUN
IF
EXT
Burst Search: ON
OFF
Search Level
Trigger Slope: +
-
Trigger Level
Slot Number
Trigger Delay

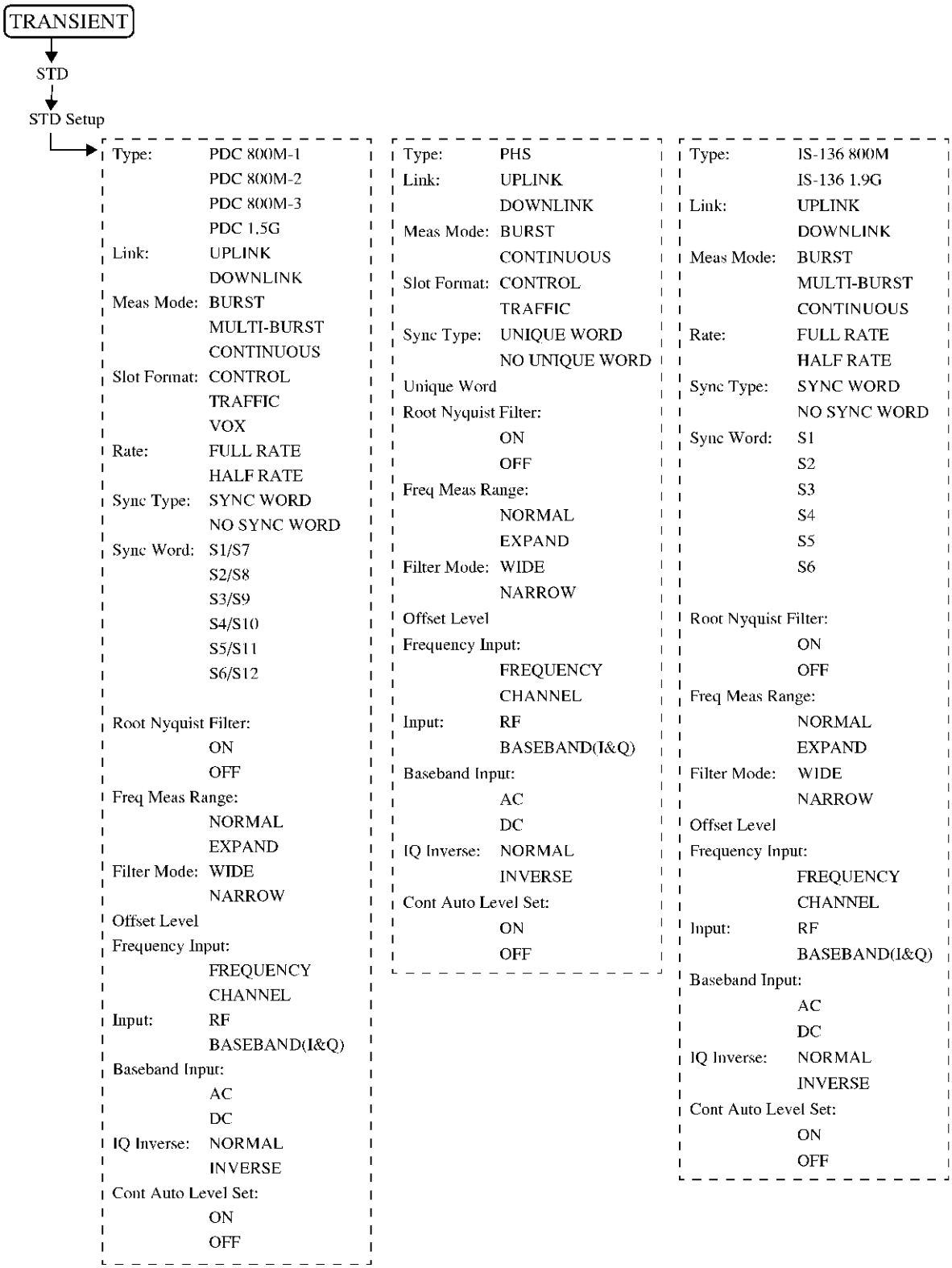

TRANSIENT
Modulation
Modulation Accuracy
Auto Level Set
Graphics
Parameter Setup
Average Times ON/OFF
Select Type
22.5deg Turn
Constellation
Constellation (Line)
Constellation (Dot)
Constellation (Line & Dot)
I EYE Diagram
Q EYE Diagram
I/Q EYE Diagram
Demodulated Data
E.V.M. vs Symbol
Mag Error vs Symbol
Phase Error vs Symbol
Trigger Source: FREERUN
IF
EXT
Burst Search: ON
OFF
Search Level
Trigger Slope: +
-
Trigger Level
Slot Number
Trigger Delay


TRANSIENT
Modulation
Bit Rate Error
Auto Level Set
Parameter Setup
Average Times ON/OFF
Trigger Source: FREERUN
IF
EXT
Burst Search: ON
OFF
Search Level
Trigger Slope: +
-
Trigger Level
Slot Number
Trigger Delay


TRANSIENT
Modulation
ALL Measurement
Auto Level Set
ACP ON/OFF
Bit Rate Error ON/OFF
Parameter Setup
Average Times ON/OFF
Trigger Source: FREERUN
IF
EXT
Burst Search: ON
OFF
Search Level
Trigger Slope: +
-
Trigger Level
Slot Number
Trigger Delay
Tx Power Type: BURST POWER
FRAME POWER
Tx Power Unit: dBm
W
ACP Unit: dB
dBm
W
Sweep Time: DEFAULT
USER DEF
User Define
Bit Rate Error Unit: ppm
bps(Hz)

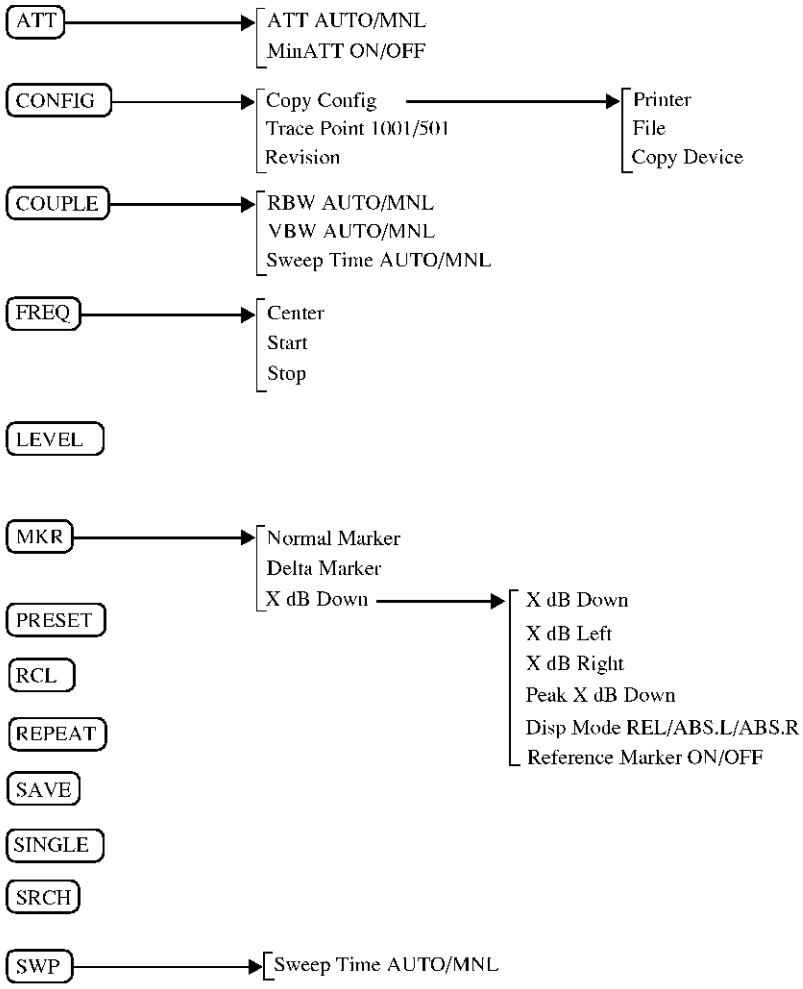

TRANSIENT
Modulation
Wave Check
Time & FFT
Time
Auto Level Set
Select Type
Parameter Setup
Average Times ON/OFF
Auto Level Set
Parameter Setup
Time & FFT
IQ Complex FFT
Ich Time & FFT
Qch Time & FFT
Ich & Qch Time
Trigger Source: FREERUN
IF
EXT
Trigger Slope: +
-
Trigger Level
Slot Number
Trigger Delay
Sweep Time: SLOT
FRAME
Trigger Source: FREERUN
IF
EXT
Burst Search: ON
OFF
Search Level
Trigger Slope: +
-
Trigger Level
Trigger Position
Slot Number
Trigger Delay


TRANSIENT
Modulation
STD
DC CAL
Channel Setting
STD Setup
Copy from STD


TRANSIENT
STD
STD Setup
Type: PDC 800M-1
PDC 800M-2
PDC 800M-3
PDC 1.5G
Link: UPLINK
DOWNLINK
Meas Mode: BURST
MULTI-BURST
CONTINUOUS
Slot Format: CONTROL
TRAFFIC
VOX
Rate: FULL RATE
HALF RATE
Sync Type: SYNC WORD
NO SYNC WORD
Sync Word: S1/S7
S2/S8
S3/S9
S4/S10
S5/S11
S6/S12
Root Nyquist Filter:
ON
OFF
Freq Meas Range:
NORMAL
EXPAND
Filter Mode: WIDE
NARROW
Offset Level
Frequency Input:
FREQUENCY
CHANNEL
Input: RF
BASEBAND(I&Q)
Baseband Input:
AC
DC
IQ Inverse: NORMAL
INVERSE
Cont Auto Level Set:
ON
OFF
Type: PHS
Link: UPLINK
DOWNLINK
Meas Mode: BURST
CONTINUOUS
Slot Format: CONTROL
TRAFFIC
Sync Type: UNIQUE WORD
NO UNIQUE WORD
Unique Word
Root Nyquist Filter:
ON
OFF
Freq Meas Range:
NORMAL
EXPAND
Filter Mode: WIDE
NARROW
Offset Level
Frequency Input:
FREQUENCY
CHANNEL
Input: RF
BASEBAND(I&Q)
Baseband Input:
AC
DC
IQ Inverse: NORMAL
INVERSE
Cont Auto Level Set:
ON
OFF
Type: IS-136 800M
IS-136 1.9G
Link: UPLINK
DOWNLINK
Meas Mode: BURST
MULTI-BURST
CONTINUOUS
Rate: FULL RATE
HALF RATE
Sync Type: SYNC WORD
NO SYNC WORD
Sync Word: S1
S2
S3
S4
S5
S6
Root Nyquist Filter:
ON
OFF
Freq Meas Range:
NORMAL
EXPAND
Filter Mode: WIDE
NARROW
Offset Level
Frequency Input:
FREQUENCY
CHANNEL
Input: RF
BASEBAND(I&Q)
Baseband Input:
AC
DC
IQ Inverse: NORMAL
INVERSE
Cont Auto Level Set:
ON
OFF

3.3 Functional Description

When modulation analysis hardware and software are installed, the following menus are assigned to the **TRANSIENT** key.



3.3.1 Switching between Communication Systems

This section describes how to switch the communication systems. The analyzer must be set to the SPA mode to switch between the communication systems.

1. Press the **POWER** key to enter the SPA mode.
2. Press **CONFIG**.
3. Press ***more 1/2***.
   If there are other communication systems installed, with which this instrument can analyze, "Comm.System" is displayed in the soft menu. Press ***Comm.System.*** Select the communication system you wish using the data knob, and press the knob (or **ENTR**).

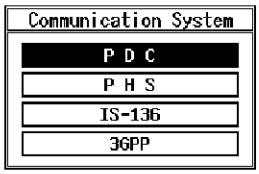


Figure 3-1 Dialog Box Used for the Communication Systems

4. When the data knob (or **ENTR**) is pressed, the message "LOADING" is displayed. After the message disappears, the switchover to another system is complete.
5. Press the **TRANSIENT** key to confirm that the menu has been changed.

---

*NOTE: **After the communication system has been switched, the parameters previously set for the former communication system will be cleared.***

If necessary, save the old parameters, before switching the communication system to another.

1. To save the parameters, press **SHIFT** and **RCL**.
2. Set the SAVE FILE number and press **Save**.

3.3.2 T-Domain

This function carries out a measurement according to the standard using the zero span of the spectrum analyzer. Measurement items include power, ON/OFF ratio of a burst signal, and spurious measurements in the time domain with a specified frequency.

In the T-Domain measurement, the setting for the RBW, VBW, Sweep Time, or Detector is saved when exiting from each measurement and recalled when entering each measurement again. To return the setting to the value specified by the standard, press ***Config*** and ***Set to STD***.

3.3.2.1 Power (T-Domain)

This is a function to measure power in the time domain (zero span).

There are two Pass/Fail judgment functions: a judgment function for the template and a judgment function for power.

NOTE: The RBW must be set wider than the modulation band.

Auto Level Set

Adjusts the internal reference level to an optimum value in accordance with the measurement signal. Level adjustment is carried out only when this key is pressed.

NOTE: The signal level must remain constant while Auto Level Set is being carried out.

Trigger Setup

Sets a trigger.

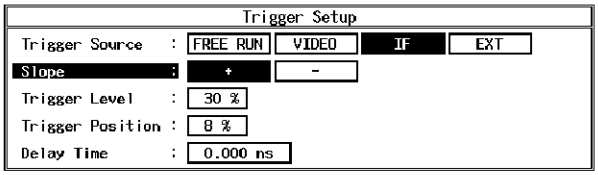


Figure 3-2 Trigger Setup Dialog Box

Trigger Source

Selects a trigger.

FREERUN:
Captures the signal using internal timing.

VIDEO: Triggers the signal using the video signal.

IF: Triggers the signal using the IF signal (approximately 6 MHz band).

EXT: Triggers the signal using the external signal, which is input from the EXT TRIG terminal on the rear panel.

Slope Selects the edge when triggering.

+: Triggers at the leading edge.

-: Triggers at the trailing edge.

Trigger Level Sets the level to trigger.

Trigger Position Sets the trigger position where it is displayed on the screen.

Delay Time Sets a delay time from the time a trigger signal is detected to the time the signal is captured.

NOTE: When Delay Time is a negative value, signals before the trigger can be captured.

Window Setup Sets the window used for power measurement.

Window ON/OFF Displays a window showing the range for power measurement. When OFF is set, the power measurement range covers all points on the display screen.

Set to STD Sets the window specified by the communication standard.

Window Position Sets the position of the window.

Window Width Sets the width of the window.

Template Sets the template.

Template ON/OFF Sets to display the template and to toggles the Pass/Fail judgment function on or off.

Shift X Sets the amount of template movement in the X-axis direction.

Shift Y Sets the amount of template movement in the Y-axis direction.

Template Edit Edits the template.

Template UP/LOW Selects the upper template or the lower template.

Copy from STD Copies the template specified by the communication standard.

Insert Line Inserts a line.

Delete Line Deletes a line.

Sort Sorts template data in ascending order.

Table Init Initializes the table.

Y Scale [dB/div] 10/5/2 Switches the display screen scale to 10, 5 or 2 dB/div.

Average Times ON/OFF Sets the averaging count.
Performs averaging of both display screen and power at the same time.
(This is because a large error results when calculating power from the averaged display screen, since the display screen is logarithmically compressed.)

Config

Parameter Setup Sets the method of measurement, edits the template, and so forth.

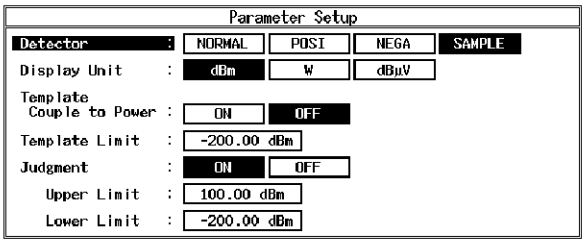


Figure 3-3 Parameter Setup Dialog Box

Detector NORMAL/POSI/NEGA/SAMPLE Sets the detector.

Display Unit dBm/W/dBµV Sets the display unit of power.

Template Couple to Power
Displays the template that is connected to the measured power.

ON: Displays the template that is connected to the measured power.
On the template edit screen, set the template level to the portion linked with the power value set to 0 dB.

OFF: Displays the template regarding the Y-axis value edited by the template as an absolute value.

Template Limit If the absolute value of the template is smaller than this value when Template Couple to Power is set to ON, clip the template at this value.

Judgment Sets ON/OFF for Pass/Fail judgments.

Upper Limit Enters the upper limit value of power.

Lower Limit Enters the lower limit value of power.

Set to STD Returns measurement parameters to the values specified by the communication standard.

3.3.2.2 ON/OFF Ratio

Measures the power during the burst-on period and the one during the burst-off period, and calculate the ratio of the powers.

Auto Level Set

Adjusts the internal reference level to an optimum value in accordance with the measurement signal. Level adjustment is carried out only when this key is pressed.

NOTE: The signal level must remain constant while Auto Level Set is being carried out.

Trigger Setup

Sets a trigger.

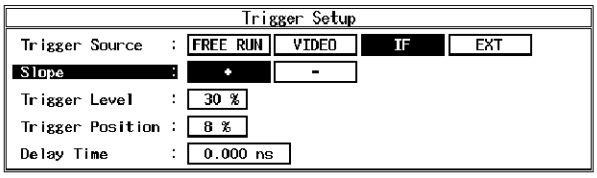


Figure 3-4 Trigger Setup Dialog Box

Trigger Source

Selects a trigger.

FREERUN:
Captures the signal using internal timing.

VIDEO: Triggers the signal using the video signal.

IF: Triggers the signal using the IF signal (approximately 6 MHz band).

EXT: Triggers the signal using the external signal, which is input from the EXT TRIG terminal on the rear panel.

Slope

Selects the edge when triggering.

+: Triggers at the leading edge.

-: Triggers at the trailing edge.

Trigger Level

Sets the level to trigger.

Trigger Position

Sets where the trigger position is displayed on the screen.

Delay Time

Sets a delay time from the time a trigger signal is detected to the time the signal is captured.

NOTE: When Delay Time is a negative value, signals before the trigger can be captured.

Window Setup Sets the burst ON and OFF periods.

Window ON/OFF Displays a window showing the range for power measurement.

Set to STD Sets the value that is specified by or complies with the communication standard.

ON Position Sets the desired position during the burst-on period.

ON Width Sets the desired width during the burst-on period.

OFF Position Sets the position during the burst-off period.

OFF Width Sets the width during the burst-off period.

Y Scale [dB/div] 10/5/2 Switches the display screen scale to 10, 5 or 2 dB/div.

Average Times ON/OFF Sets the averaging count.

Config

Parameter Setup Sets the measurement parameters.

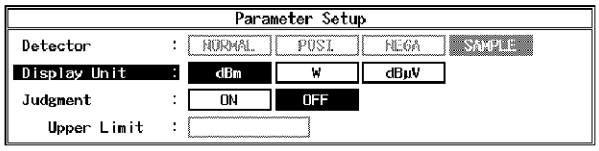


Figure 3-5 Parameter Setup Dialog Box

Detector NORMAL/POSI/NEGA/SAMPLE Selects the detector.

Display Unit dBm/W/dBµV Sets the display unit of power.

NOTE: The ON/OFF ratio is displayed in units of dB (fixed).

Judgment Sets ON/OFF of the Pass/Fail judgment for the ON/OFF ratio.

Upper Limit Enters the upper limit value.

Set to STD Sets measurement parameters to the values specified by the communication standard.

3.3.2.3 Spurious (T-Domain)

This function measures power (or peak power) according to the frequency specified in the table by sweeping in the zero span mode.

Auto Level Set

Adjusts the internal reference level to an optimum value in accordance with the measurement signal. Level adjustment is carried out only when this key is pressed.

NOTE: The signal level must remain constant while Auto Level Set is being carried out.

Trigger Setup

Sets a trigger.

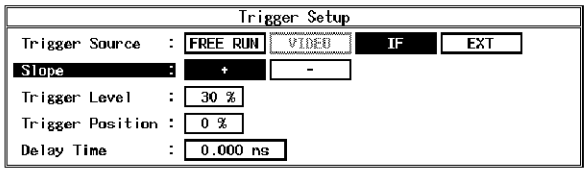


Figure 3-6 Trigger Setup Dialog Box

Trigger Source

Selects a trigger.

FREERUN:
Captures the signal using internal timing.

IF: Triggers the signal using the IF signal (approximately 6 MHz band).

EXT: Triggers the signal using the external signal, which is input from the EXT TRIG terminal on the rear panel.

Slope

Selects the edge when triggering.

+: Triggers at the leading edge.

-: Triggers at the trailing edge.

Trigger Level

Sets the level to trigger.

Trigger Position

Sets where the trigger position is displayed on the screen.

Delay Time

Sets a delay time from the time a trigger signal is detected to the time the signal is captured.

NOTE: When Delay Time is a negative value, signals before the trigger can be captured.

Table No. 1/2/3

Selects the measurement table.

Load Table

Loads the measurement table.

Table Edit Edits the measurement table.

Table No. 1/2/3 Selects the table to be edited.

Load Table Loads the measurement table.

Save Table Saves the measurement table.

Insert Line Inserts additional frequency data before the selected frequency number.

Delete Line Deletes the selected line.

Table Init Initializes the table.

Average Times ON/OFF Sets the averaging count. Max Hold is set when the detector is set to POSI.

Config

Parameter Setup Sets measurement conditions.

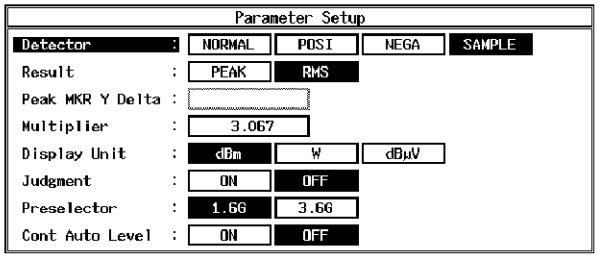


Figure 3-7 Parameter Setup Dialog Box

Detector NORMAL/POSI/NEGA/SAMPLE Sets the detector.

Result PEAK/RMS Sets whether to display the result using average power or peak power.

Peak MKR Y Delta Sets the Y delta of the peak marker.

Multiplier Multiplies the measurement result by the set value, then displays the resultant value.

Display Unit dBm/W/dBµV Sets the display units.

Judgment Sets ON/OFF of the Pass/Fail judgment for the limit value.

Preselector Sets the preselector.

NOTE: This selection is displayed on R3267 only.

1.6G: Used to measure harmonics of more than 1.6 GHz or spurious signals when the carrier frequency is lower than 1.6 GHz.

3.6G: Used to set this parameter for cases other than that above.

Cont Auto Level The auto ranging operation can be performed only within the frequency range where the preselector of the spectrum analyzer attenuates signals.
The dynamic range varies depending on the instrument and preselector settings.
This function runs only when ABS is selected in Freq. Type.

ON: Measures spurious signals after the auto ranging operation.

OFF: Measures spurious signals without the auto ranging operation.

Set to Default Returns the set value to the default.

3.3.3 F-Domain

This function performs measurements according to the communication standard using the spectrum analyzer's sweep measurement method. Measurement items include power, occupied bandwidth, ACP Due To Switching, ACP Due to Modulation, Inband Spurious, and Outband Spurious measurements is the frequency domain.

In F-Domain measurement, the setting for the RBW, VBW, Sweep Time, or Detector is saved when exiting each measurement and recalled when entering each measurement again. To return the setting to the value specified by the standard, press ***Config*** and ***Set to STD***.

3.3.3.1 Power (F-Domain)

This function measures power in the frequency domain using the spectrum analyzer.

Auto Level Set Adjusts the internal reference level to an optimum value in accordance with the measurement signal. Level adjustment is carried out only when this key is pressed.

NOTE: The signal level must remain constant while Auto Level Set is being carried out.

Gate Setup Sets the gated sweep.
This setting is required when the input signal is a bursted signal and Sample Detector is used.

Trigger Setup Sets a trigger.

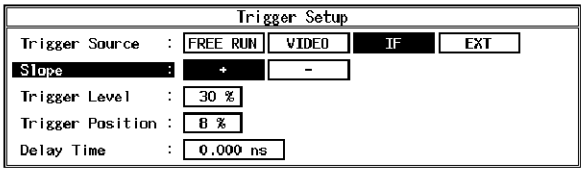


Figure 3-8 Trigger Setup Dialog Box

Trigger Source Selects a trigger

FREERUN:
Captures the signal using internal timing.

VIDEO: Triggers the signal using the video signal (displayed signal).

IF: Triggers the signal using the IF signal (approximately 6 MHz band).

EXT: Triggers the signal using the external signal, which is input from the EXT TRIG terminal on the rear panel.

Slope Selects the edge when triggering.

+: Triggers at the leading edge.

-: Triggers at the trailing edge.

Trigger Level Sets the level to trigger.

Trigger Position Sets where the trigger position is displayed on the screen.

Delay Time Sets a delay time from the time a trigger signal is detected to the time the signal is captured.

NOTE: When Delay Time is a negative value, signals before the trigger can be captured.

Gate Source

Trigger Sets Trigger Source specified by Trigger Setup as Gate Source.

NOTE: When Trigger Source is set to IF and SPAN is set to a frequency higher than 6 MHz, the sweeping seems to be stopped, because the IF trigger bandwidth is approximately 6 MHz and the gate trigger is failing.

EXT Gate Performs the gated sweep using the gate signal input from the EXT GATE terminal on the rear panel.

Gate Setup Sets the gated sweep range when Trigger is selected for Gate Source.

Set to STD Sets the gate position and width to the values specified by the communication standard.

Gate Position Sets the gate position.

Gate Width Sets the gate width.

Gated Sweep ON/OFF Starts the gated sweep.

Detector NORMAL/POSI/NEGA/SAMPLE Selects the detector.

Figure 3-9 Detector Dialog Box

Window Setup Sets the frequency range used for power measurement.

Window ON/OFF Sets the window to ON or OFF. When the window is set to OFF, the power measurement range becomes a sweep band.

Set to STD Sets the value determined by the communication standard.

Window Position Sets the position of the window.

Window Width Sets the width of the window.

Y Scale [dB/div] 10/5/2 Sets the display scale.

Average Times ON/OFF Sets the averaging count.

Config

Parameter Setup Sets measurement conditions.

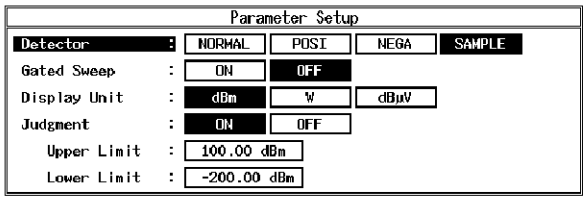


Figure 3-10 Parameter Setup Dialog Box

Detector NORMAL/POSI/NEGA/SAMPLE Selects the detector.

Gated Sweep Sets the gated sweep to ON or OFF.

Display Unit dBm/W/dBµV Selects the display unit.

Judgment Sets ON/OFF of the Pass/Fail judgment for measured power.

Upper Limit Sets the upper limit for Pass/Fail judgment.

Lower Limit Sets the lower limit for Pass/Fail judgment.

Set to STD Sets the measurement parameters to the values specified by the communication standard.

3.3.3.2 OBW

This function measures an occupied bandwidth.

Auto Level Set Adjusts the internal reference level to an optimum value in accordance with the measurement signal. Level adjustment is carried out only when this key is pressed.

NOTE: The signal level must remain constant while Auto Level Set is being carried out.

OBW% Sets the frequency, including the percentage of the total power as an occupied bandwidth, when calculating the occupied bandwidth.

Average Times ON/OFF Sets the averaging count.

Config

Parameter Setup Sets measurement conditions and so on.

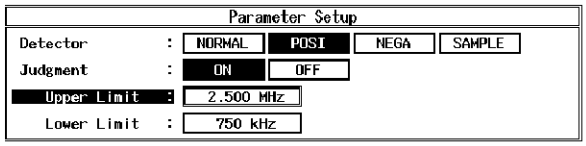


Figure 3-11 Parameter Setup Dialog Box

Detector NORMAL/POSI/NEGA/SAMPLE Selects the detector.

Judgment Sets ON/OFF of the Pass/Fail judgment for the occupied bandwidth.

Upper Limit Sets the upper limit for Pass/Fail judgment.

Lower Limit Sets the lower limit for Pass/Fail judgment.

Set to STD Sets the measurement parameters to the values specified by the communication standard.

3.3.3.3 Due to Transient

This function measures the spectrum, including the rise and fall times of the burst.

Auto Level Set — Adjusts the internal reference level to an optimum value in accordance with the measurement signal. Level adjustment is carried out only when this key is pressed.

NOTE: The signal level must remain constant while Auto Level Set is being carried out.

Template — Sets and edits the template.

- ***Template ON/OFF*** — Sets ON/OFF of the template display. When Template is set to ON, the Pass/Fail judgment for the template is displayed under the sweep screen.
- ***Shift X*** — Shifts the set template in the frequency direction (X-axis).
- ***Shift Y*** — Shifts the set template in the level direction (Y-axis).
- ***Margin ΔX ON/OFF*** — Magnifies the template in the X-axis direction with a set template frequency 0 as the center.
- ***Template Edit*** — Opens the template edit menu.
  - ***Copy from STD*** — Copies the template of the communication standard.
  - ***Insert Line*** — Inserts a line before the selected line.
  - ***Delete Line*** — Deletes the selected line.
  - ***Sort*** — Sorts the tables in order of frequency.
  - ***Table Init*** — Initializes the table.
- ***Marker Edit*** — Sets the measurement frequency (frequency offset) and measurement band.
  - ***Copy from STD*** — Sets to the parameters specified by the communication standard.
  - ***Insert Line*** — Inserts a line before the selected line.
  - ***Delete Line*** — Deletes the selected line.
  - ***Sort*** — Sorts data in order of frequency.
  - ***Table Init*** — Initializes the table.

Average Times ON/OFF Sets the averaging count.

Config

Parameter Setup

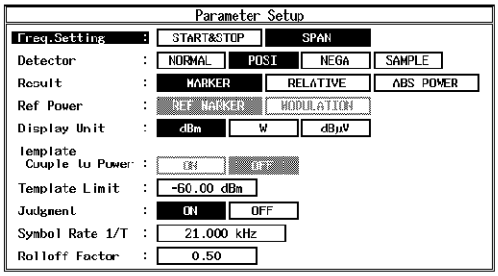


Figure 3-12 Parameter Setup Dialog Box

Freq. Setting
START&STOP/SPAN
Selects the measurement mode.

Detector NORMAL/POSI/NEGA/SAMPLE
Selects the detector.

Result Specifies how to display the result.

MARKER:
Displays the marker read value. The position of the marker is set by Marker Edit.

RELATIVE:
Displays the marker read value using a relative value.

ABS POWER:
Converts the value displayed by RELATIVE into the absolute value using carrier power and displays it.

Ref Power
When RELATIVE is selected for Result, this selects which relative value to use to display the marker read value.

REF MARKER:
Displays a relative value to Ref Marker set by Marker Edit.

MODULATION:
Display a relative value to the measurement result of Tx power in Modulation.

Display Unit
dBm/W/dBµV Specifies the unit of the result displayed.

NOTE: When RELATIVE is selected for Result, the unit is dB.

Template Couple to Power

Sets whether to raise or lower the template with the power set by Ref Power.

Template Limit

If the absolute value of the template is smaller than this value when Template Couple to Power is set to ON, clip the template at this value.

Judgment

Makes the Pass/fail judgment for the limit value set by Marker edit. The Pass/Fail judgment result is displayed under the display screen together with the marker list.

Symbol Rate 1/T

Sets the symbol rate for the Root Nyquist filter.

Rolloff Factor

Sets the rolloff factor for the Root Nyquist filter.

Set to STD

Returns the measurement parameters to the values specified by the standard.

3.3.3.4 Due to Modulation

Measure the modulation spectrum excluding the rise and fall of the burst.

Auto Level Set Adjusts the internal reference level to an optimum value in accordance with the measurement signal. Level adjustment is carried out only when this key is pressed.

NOTE: The signal level must remain constant while Auto Level Set is being carried out.

Gate Setup Sets the gated sweep.

Trigger Setup Sets a trigger.

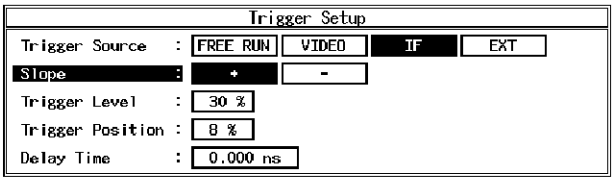


Figure 3-13 Trigger Setup Dialog Box

Trigger Source Selects a trigger.

FREERUN:
Captures the signal using internal timing.

VIDEO: Triggers the signal using the video signal.

IF: Triggers the signal using the IF signal (approximately 6 MHz band).

EXT: Triggers the signal using the external signal, which is input from the EXT TRIG terminal on the rear panel.

Slope Selects the edge when triggering.

+: Triggers at the leading edge.

-: Triggers at the trailing edge.

Trigger Level Sets the level to trigger.

Trigger Position Sets where the trigger position is displayed on the screen.

Delay Time Sets a delay time from the time a trigger signal is detected to the time the signal is captured.

NOTE: When Delay Time is a negative value, signals before the trigger can be captured.

Gate Source

Trigger Sets Trigger Source specified by Trigger Setup as Gate Source.

NOTE: When Trigger Source is set to IF and SPAN is set to a frequency higher than 6 MHz, the sweeping seems to be stopped, because the IF trigger bandwidth is approximately 6 MHz and the gate trigger is failing.

EXT Gate Performs the gated sweep using the gate signal input from the EXT Gate terminal on the rear panel.

Gate Setup Sets the gated sweep range when Trigger is selected for Gate Source.

Set to STD Sets the gate position and width to the values specified by the communication standard.

Gate Position Sets the gate position.

Gate Width Sets the gate width.

Gated Sweep ON/OFF Starts the gated sweep.

Detector NORMAL/POSI/NEGA/SAMPLE Selects the detector.

Figure 3-14 Detector Dialog Box

Template Sets and edits the template.

Template ON/OFF Sets the template display to ON or OFF.
When Template is set to ON, the Pass/Fail judgment for the template is displayed under the sweep screen.

Shift X Shifts the set template in the frequency direction (X-axis).

Shift Y Shifts the set template in the level direction (Y-axis).

Margin ΔX ON/OFF Magnifies the template in the X-axis direction with a set template frequency 0 as the center.

Template Edit

Copy from STD Copies the template specified by the communication standard.

Insert Line Inserts a line before the selected line.

Delete Line Deletes the selected line.

Sort Sorts the tables in frequency order.

Table Init Initializes the table.

Marker Edit

Copy from STD Sets to the parameters specified by the communication standard.

Insert Line Inserts a line before the selected line.

Delete Line Deletes the selected line.

Sort Sorts data in order of frequency.

Table Init Initializes the table.

Average Times ON/OFF Sets the averaging count.

Config

Parameter Setup

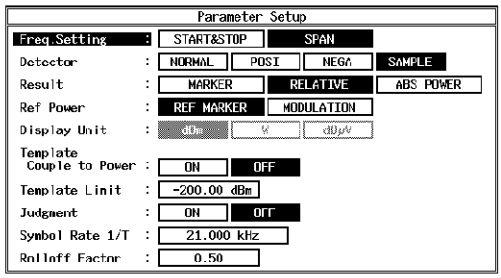


Figure 3-15 Parameter Setup Dialog Box

Freq. Setting START&STOP/SPAN Selects the measurement mode.

Detector NORMAL/POSI/NEGA/SAMPLE Selects the detector.

Result Specifies how to display the results.

MARKER:
Displays the marker read value. The position of the marker is set by Marker Edit.

RELATIVE:
Displays the marker read value using a relative value.

ABS POWER:
Converts the value displayed by RELATIVE into the absolute value using carrier power and displays it.

Ref Power When RELATIVE is selected for Result, this selects which relative value to use to display the marker read value.

REF MARKER:
Displays a relative value to Ref Marker set by Marker Edit.

MODULATION:
Displays a relative value to the measurement result of Tx power in Modulation.

Display Unit dBm/W/dBμV Selects the display unit.

NOTE: When RELATIVE is selected for Result, the unit is dB.

Template Couple to Power
Sets whether or not to raise or lower the template with the power set by Ref Power.

Template Limit If the absolute value of the template is smaller than this value when Template Couple to Power is set to ON, clip the template at this value.

Judgment Makes the Pass/Fail judgment for the limit value set by Marker edit. The Pass/Fail judgment result is displayed under the display screen together with the marker list.

Symbol Rate 1/T Sets the symbol rate for the Root Nyquist filter.

Rolloff Factor Sets the rolloff factor for the Root Nyquist filter.

Set to STD Returns the measurement parameters to the values specified by the standard.

3.3.3.5 Inband Spurious

This function searches for a peak by sweeping the set frequency.

Auto Level Set — Adjusts the internal reference level to an optimum value in accordance with the measurement signal. Level adjustment is carried out only when this key is pressed.

NOTE: The signal level must remain constant while Auto Level Set is being carried out.

Template

- ***Template ON/OFF*** — Sets the template display to ON or OFF. When Template is set to ON, the Pass/Fail judgment for the template is displayed under the sweep screen.
- ***Shift X*** — Shifts the set template in the frequency direction (X-axis).
- ***Shift Y*** — Shifts the set template in the level direction (Y-axis).
- ***Margin ΔX ON/OFF*** — Magnifies the template in the X-axis direction with a set template frequency 0 as the center.
- ***Template Edit***
  - ***Copy from STD*** — Copies the template specified by the communication standard.
  - ***Insert Line*** — Inserts a line before the selected line.
  - ***Delete Line*** — Deletes the selected line.
  - ***Sort*** — Sorts the tables in frequency order.
  - ***Table Init*** — Initializes the table.

Marker Edit

- ***Copy from STD*** — Sets the measurement parameters specified by the communication standard.
- ***Insert Line*** — Inserts a line before the selected line.
- ***Delete Line*** — Deletes the selected line.
- ***Sort*** — Sorts data in order of frequency.
- ***Table Init*** — Initializes the table.

Average Times ON/OFF Sets the averaging count.

Config

Parameter Setup

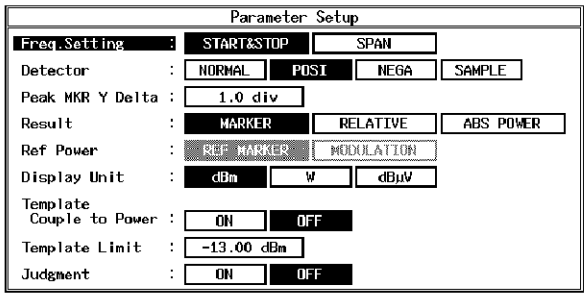


Figure 3-16 Parameter Setup Dialog Box

Freq. Setting START&STOP/SPAN Selects the measurement mode.

Detector NORMAL/POSI/NEGA/SAMPLE Selects the detector.

Peak MKR Y Delta

Sets the Y delta of the peak marker.

Result Specifies how to display the results.

MARKER:

Displays the marker read value. The position of the marker is set by Marker Edit.

RELATIVE:

Displays the marker read value using a relative value.

ABS POWER:

Converts the value displayed by RELATIVE into the absolute value using carrier power and displays it.

Ref Power When RELATIVE is selected for Result, this selects which relative value is used to display the marker read value.

REF MARKER:

Displays a relative value to Ref Marker set by Marker Edit.

MODULATION:

Displays a relative value to the measurement result of Tx power in Modulation.

Display Unit dBm/W/dBμV Selects the display unit.

NOTE: When RELATIVE is selected for Result, the unit is dB.

Template Couple to Power
Sets whether or not to raise or lower the template with the power set by Ref Power.

Template Limit If the absolute value of the template is smaller than this value when Template Couple to Power is set to ON, clip the template at this value.

Judgment Makes the Pass/Fail judgment for the limit value set by Marker edit. The Pass/Fail judgment result is displayed under the display screen together with the marker list.

Set to STD Returns the measurement parameters to the values specified by the standard.

3.3.3.6 Outband Spurious

This function searches for a peak by sweeping the frequency according to the table.

Auto Level Set Adjusts the internal reference level to an optimum value in accordance with the measurement signal. Level adjustment is carried out only when this key is pressed.

NOTE: The signal level must remain constant while Auto Level Set is being carried out.

Table No. 1/2/3 Selects the table number.

Load Table Loads the table.

Table Edit Edits the table.

- ***Table No. 1/2/3*** Selects the table number.
- ***Load Table*** Loads the table.
- ***Save Table*** Saves the table.
- ***Insert Line*** Inserts a line before the selected line.
- ***Delete Line*** Deletes the selected line.
- ***Table Init*** Initializes the table.

Average Times ON/OFF Sets the averaging count.

Config

Parameter Setup Sets measurement parameters.

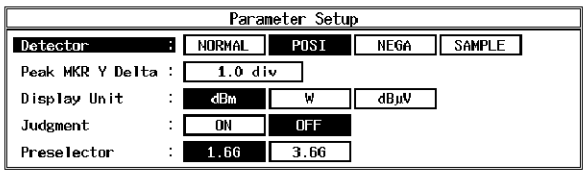


Figure 3-17 Parameter Setup Dialog Box

Detector NORMAL/POSI/NEGA/SAMPLE Sets the detector.

Peak MKR Y Delta
Sets the Y delta of a peak marker.

Display Unit dBm/W/dBµV Sets the display unit.

Judgment Makes the Pass/Fail judgment using the limit values set by Table Edit.

Preselector Sets the preselector.

NOTE: This selection is displayed on R3267 only.

1.6G: Used to measure harmonics of more than 1.6 GHz or spurious signals when the carrier frequency is lower than 1.6 GHz.

3.6G: Used to set this parameter for cases other than that above.

Set to Default Returns the set value to the default.

3.3.4 Modulation

This function performs a modulation analysis with DSP.

3.3.4.1 Power

This function is used when making power measurements (Tx power, Power vs Time and ACP).

Tx Power

Measures an average power within a burst (Burst Power) and an average power within a frame (Frame Power).
When Meas mode in STD Setup is set to BURST, Frame Power indicates an average power measured on condition that there is only one burst in a frame.

NOTE: When Meas mode in STD Setup is set to BURST, the average power measured by Frame Power is incorrect if two or more bursts exist in a frame.

Auto Level Set

Adjusts the internal reference level to an optimum value in accordance with the measurement signal. Level adjustment is carried out only when this key is pressed.

NOTE: The signal level must remain constant while Auto Level Set is being carried out.

Parameter Setup

Sets parameters used for measuring.

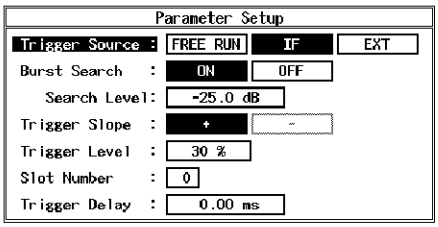


Figure 3-18 Parameter Setup Dialog Box

Trigger Source

Selects a mode of controlling the measurement timing of the burst signal and others.

FREERUN:
Measures the signal using the internal measurement timing.

IF: Captures data in sync with the internal IF signal.

EXT: Captures data in sync with the signal input from the EXT TRIG terminal on the rear panel.

Burst Search Searches for the rising position of the captured signal and measure the signal using that position as a trigger.

Search Level Sets the level at which the rising position of a burst is searched.

Trigger Slope Sets the edge of the trigger.

+: Triggers at the leading edge.

-: Triggers at the trailing edge.

Trigger Level Sets the level at which synchronization is taken using the IF trigger.

Slot Number Sets the slot number. This set value automatically set Trigger Delay to the times of an integral multiple of one slot.

Trigger Delay Sets the delay time from the trigger.

Average Times ON/OFF Sets the averaging count.

Power vs Time Performs a time domain waveform analysis. The rise and fall times of the burst signal can be measured with the template.

Auto Level Set Adjusts the internal reference level to an optimum value in accordance with the measurement signal. Level adjustment is carried out only when this key is pressed.

NOTE: The signal level must remain constant while Auto Level Set is being carried out.

Template Entry Registers the template.

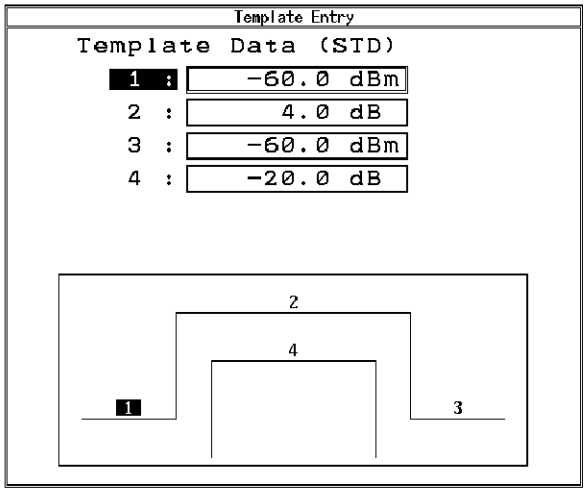


Figure 3-19 Template settings

User Template1 Registers template 1.

User Template2 Registers template 2.

User Template3 Registers template 3.

STD Template Registers the template specified by the communication standard.

OffLevUnit dBm/dB

Sets the unit of the carrier offset level in the template.

dBm: Set the unit to Absolute.

dB: Sets the unit to relative to the average power during the burst ON period.

Meas Mode NORM/HIGH Selects the measurement mode.

NORM: Usually measurement is performed in this mode.

HIGH: Performs measurement with high dynamic ranges.

NOTE: If the signal have the multiple bursts in a frame, the measurement cannot be taken in the HIGH mode.

Y [dB/div] 20/10/5 Sets the vertical axis scale.

Parameter Setup Sets parameters used for measurement.

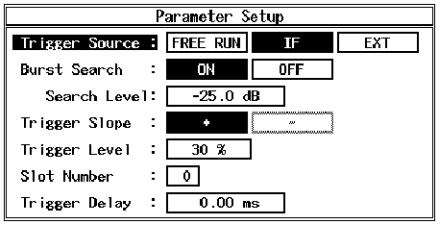


Figure 3-20 Parameter Setup Dialog Box

Trigger Source Selects a mode of controlling the measurement timing of the burst signal and others.

FREERUN:
Measures the signal using internal measurement timing.

IF: Captures data in sync with the internal IF signal.

EXT: Captures data in sync with the signal input from the EXT TRIG terminal on the rear panel.

Burst Search Searches for the rising position of the captured signal and measure the signal using that position as a trigger.

Search Level Sets the level at which the rising position of a burst is searched.

Trigger Slope Sets the edge of the trigger.

+: Triggers at the leading edge.

-: Triggers at the trailing edge.

Trigger Level Sets the level at which synchronization is taken using the IF trigger.

Slot Number Sets the slot number. This set value automatically set Trigger Delay to the multiples of one slot.

Trigger Delay Sets the delay time from the trigger.

Average Times ON/OFF Sets the averaging count.

ACP This function measures the adjacent channel leakage power including the leading and trailing edges using the spectrum analyzer's sweep measurement.

Auto Level Set Adjusts the internal reference level to an optimum value in accordance with the measurement signal. Level adjustment is carried out only when this key is pressed.

NOTE: The signal level must remain constant while Auto Level Set is being carried out.

Parameter Setup Sets the parameter to be used for the measurement.

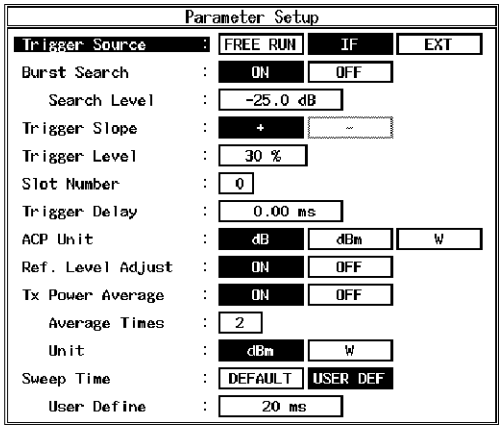


Figure 3-21 Parameter Setup Dialog Box

Trigger Source Selects a mode of synchronization where timing signals such as burst signal are measured.

FREERUN:
Measures the signal using internal measurement timing.

IF: Captures data in sync with the internal IF signal.

EXT: Captures data in sync with the signal input from the EXT TRIG terminal on the rear panel.

Burst Search Searches for the rising position of the captured signal and measures the signal using the position as the trigger.

Search Level Sets the level at which the rising position of a burst is searched.

Trigger Slope Sets the edge of the trigger.

+: Triggers at the leading edge.

-: Triggers at the trailing edge.

Trigger Level Sets the level at which the signal is brought into sync with the IF trigger.

Slot Number Sets the number of slots. This value automatically set Trigger Delay to an integral multiple of slot interval.

Trigger Delay Sets the delay time from the trigger.

ACP Unit Sets the unit of the ACP.

dB: Displays a value relative to the carrier power.

dBm: Displays a value in dBm.

W: Displays a value in W.

Ref. Level Adjust Measures Tx Power and sets the reference level to an optimum value. When set to ON, ACP and Tx Power are measured at the same time.

ON: Sets the reference level to an optimum value.

OFF: The reference level stays unchanged.

NOTE: To take measurements in other menus after you have taken measurements in the current menu with Ref. Level Adjust set to OFF, perform AUTO Level Set in advance.

Tx Power Average Toggles the Tx Power Averaging function on or off.

ON: Performs the Tx Power averaging.

OFF: Does not perform the Tx Power averaging.

Average Times Sets the Tx Power averaging count.

Unit Sets the unit of Tx Power.

dBm: Displays the power in dBm.

W: Displays the power in W.

Sweep Time Sets the sweep time for the ACP measurement.

DEFAULT: Sets the sweep time to the default.

USER DEF: Sets the sweep time to the desired value.

User Define When the USER DEF is selected in the Sweep Time setting, enter the desired sweep time.

3.3.4.2 OBW

This function measures the occupied bandwidth (OBW).

CAUTION: In the STD Setup menu, the analyzer does not make a measurement in sync with SYNC WORD or UNIQUE WORD, even if Sync type for the PDC/IS-136 is set to SYNC WORD or Sync type for the PHS is set to UNIQUE WORD.

Auto Level Set Adjusts the internal reference level to an optimum value in accordance with the measurement signal. Level adjustment is carried out only when this key is pressed.

NOTE: The signal level must remain constant while Auto Level Set is being carried out.

Parameter Setup Sets parameters used for measurement.

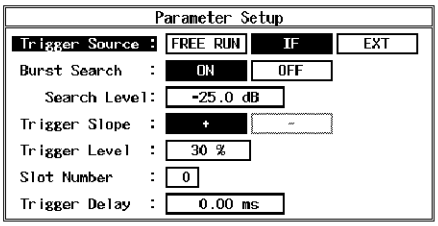


Figure 3-22 Parameter Setup Dialog Box

Trigger Source Selects a mode of controlling the measurement timing of the burst signal and others.

FREERUN:
Measures the signal using the internal measurement timing.

IF: Captures data in sync with the internal IF signal.

EXT: Captures data in sync with the signal input from the EXT TRIG terminal on the rear panel.

Burst Search Searches for the rising position of the captured signal and measure the signal using that position as a trigger.

Search Level Sets the level at which the rising position of a burst is searched.

Trigger Slope Sets the edge of the trigger.

+: Triggers at the leading edge.

-: Triggers at the trailing edge.

Trigger Level Sets the level at which synchronization is taken using the IF trigger.

Slot Number Sets the slot number. This set value automatically set Trigger Delay to the times of an integral multiple of one slot.

Trigger Delay Sets the delay time from the trigger.

Average Times ON/OFF Sets the averaging count.

3.3.4.3 Modulation Accuracy

This function measures the modulation accuracy (Frequency Error, Magnitude Error, Phase Error, Modulation Accuracy, etc.).

Auto Level Set Adjusts the internal reference level to an optimum value in accordance with the measurement signal. Level adjustment is carried out only when this key is pressed.

NOTE: The signal level must remain constant while Auto Level Set is being carried out.

Graphics Displays the menu to show graphs.

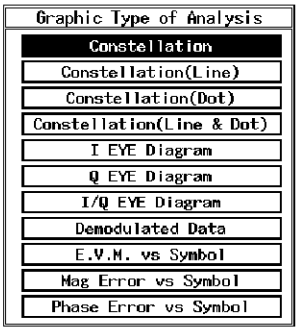


Figure 3-23 Graph Menu

Select Type Opens the graphics selection window.

Constellation Constellation (interpolation)

Constellation (Line)
Constellation (straight-line interpolation)

Constellation (Dot)
Constellation (symbol)

Constellation (Line & Dot)
Constellation (interpolation and symbol)

I EYE Diagram Eye pattern (in-phase components)

Q EYE Diagram Eye pattern (quadrature phase components)

I/Q EYE Diagram
Eye pattern (in-phase/quadrature phase components)

Demodulated Data
Demodulated bit data

E.V.M. vs Symbol The relationship between error vector magnitude and a symbol.

Mag Error vs Symbol
The relationship between a magnitude error and a symbol.

Phase Error vs Symbol
The relationship between a phase error and a symbol.

22.5deg Turn Turns the graphic data of the EYE Diagram and the constellation by 22.5°.

Parameter Setup

Sets parameters used for measurement.

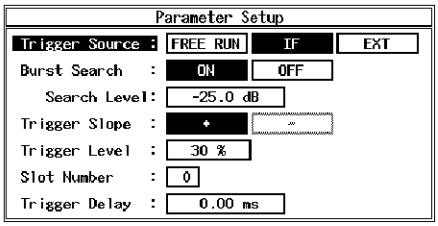


Figure 3-24 Parameter Setup Dialog Box

Trigger Source

Selects a mode of controlling the measurement timing for the burst signal and others.

FREERUN:
Measures the signal using internal measurement timing.

IF: Captures data in sync with the internal IF signal.

EXT: Captures data in sync with the signal input from the EXT TRIG terminal on the rear panel.

Burst Search

Searches for the rising position of the captured signal and measure the signal using that position as a trigger.

Search Level

Sets the level at which the rising position of a burst is searched.

Trigger Slope

Sets the edge of the trigger.

+: Triggers at the leading edge.

-: Triggers at the trailing edge.

Trigger Level

Sets the level at which synchronization is taken using the IF trigger.

Slot Number

Sets the slot number. This set value automatically set Trigger Delay to the times of an integral multiple of one slot.

Trigger Delay

Sets the delay time from the trigger.

Average Times ON/OFF

Sets the averaging count.

3.3.4.4 Bit Rate Error

This function measures the transmission rate error. Displays the transmission rate error in units of ppm and bps (Hz).

Auto Level Set

Adjusts the internal reference level to an optimum value in accordance with the measurement signal. Level adjustment is carried out only when this key is pressed.

NOTE: The signal level must remain constant while Auto Level Set is being carried out.

Parameter Setup

Sets parameters used for measurement.

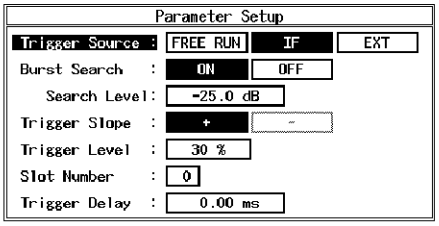


Figure 3-25 Parameter Setup Dialog Box

Trigger Source

Selects a mode of controlling the measurement timing of the burst signal and others.

FREERUN:
Measures the signal using internal measurement timing.

IF: Captures data in sync with the internal IF signal.

EXT: Captures in sync with the signal input from the EXT TRIG terminal on the rear panel.

Burst Search

Searches for the rising position of the captured signal and measure the signal using that position as a trigger.

Search Level

Sets the level at which the rising position of a burst is searched.

Trigger Slope

Sets the edge of the trigger.

+: Triggers at the leading edge.

-: Triggers at the trailing edge.

Trigger Level Sets the level at which synchronization is taken using the IF trigger.

Slot Number Sets the slot number. This set value automatically set Trigger Delay to the times of an integral multiple of one slot.

Trigger Delay Sets the delay time from the trigger source.

Average Times ON/OFF Sets the averaging count.

3.3.4.5 ALL Measurement

This function is used to measure the Tx Power, ACP, OBW, Modulation Accuracy and Bit Rate Error in a single operation.

Auto Level Set Sets the reference level to an optimum value according to the signal to be measured. The level is adjusted when this key is pressed.

NOTE: The signal level must remain constant while Auto Level Set is being carried out.

ACP ON/OFF Sets whether or not the ACP is measured.

ON: Measures the ACP.

OFF: Does not measure the ACP.

Bit Rate Error ON/OFF Sets whether or not the Bit Rate Error is measured.

ON: Measures the Bit Rate Error.

OFF: Does not measure the Bit Rate Error.

Parameter Setup Sets parameters used for measurement.

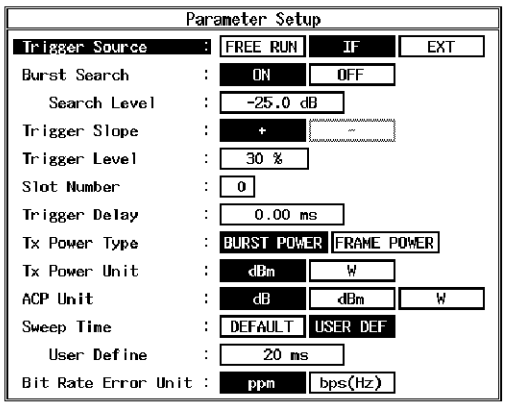


Figure 3-26 Paramenter Setup Dialog Box

Trigger Source

Selects a mode of controlling the measurement timing for the burst signal and others.

FREERUN:
Measures the signal using internal measurement timing.

IF: Captures data in sync with the internal IF signal.

EXT: Captures data in sync with the signal input from the EXT TRIG terminal on the rear panel.

Burst Search

Searches for the rising position of the captured signal and measure the signal using that position as a trigger.

Search Level

Sets the level at which the rising position of a burst is searched.

Trigger Slope

Sets the edge of the trigger.

+: Triggers at the leading edge.

-: Triggers at the trailing edge.

Trigger Level

Sets the level at which synchronization is taken using the IF trigger.

Slot Number

Sets the slot number. This set value automatically set Trigger Delay to the times of an integral multiple of one slot.

Trigger Delay

Sets the delay time from the trigger.

Tx Power Type

Sets the display type of Tx Power.

BURST POWER:
Displays an average power during the burst ON period.

FRAME POWER:
Displays an average power during the frame period.

NOTE: The Frame Power is converted from the Burst Power assuming that there is only one burst in the frame period when Meas mode in STD Setup is set to BURST.

Tx Power Unit

Sets the unit of Tx Power.

dBm: Displays a value in dBm.

W: Displays a value in W.

ACP Unit

Sets the unit used with the ACP

dB: Displays a value relative to the carrier power.

dBm: Displays a value in dBm.

W: Displays a value in W.

Sweep Time

Sets the sweep time for the ACP measurement.

DEFAULT: Sets the sweep time to the default.

USER DEF: Sets the sweep time to the desired value.

User Define

When the USER DEF is selected in the Sweep Time setting, enter the desired sweep time.

Bit Rate Error

Sets the unit of the Bit Rate Error.

ppm: Displays a value in ppm.

bps (Hz): Displays a value in bps (Hz).

Average Times ON/OFF

Sets the averaging count.

NOTE: The averaging is not performed for the ACP measurement.

3.3.4.6 Wave Check

This function is used to display IF or baseband waveforms in the time domain or FFT traces.

Time & FFT

This function is used to display IF or baseband waveforms in the time domain or FFT traces.
This key is used for verification of input signal.

Auto Level Set

Sets the reference level to an optimum value according to the signal to be measured. The level is adjusted when this key is pressed.

NOTE: The signal level must remain constant while Auto Level Set is being carried out.

Select Type

Selects the type of graphic display.

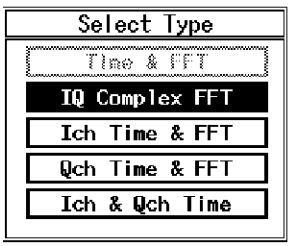


Figure 3-27 Select Type Dialog Box

Parameter Setup Sets parameters used for measurement.

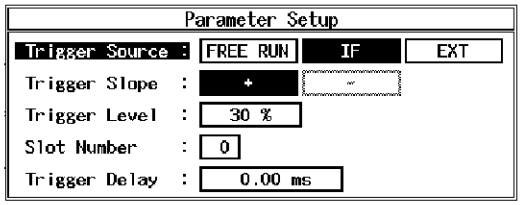


Figure 3-28 Parameter Setup Dialog Box

Trigger Source Selects a mode of controlling the measurement timing for the burst signal and others.

FREERUN:
Measures the signal using internal measurement timing.

IF: Captures data in sync with the internal IF signal.

EXT: Captures data in sync with the signal input from the EXT TRIG terminal on the rear panel.

Trigger Slope Sets the edge of the trigger.

+: Triggers at the leading edge.

-: Triggers at the trailing edge.

Trigger Level Sets the level at which synchronization is taken using the IF trigger.

Slot Number Sets the slot number. This set value automatically set Trigger Delay to the times of an integral multiple of one slot.

Trigger Delay Sets the delay time from the trigger.

Average Times ON/OFF Sets the averaging count.

Time

Displays IF or baseband waveforms in the time domain using the slot length and frame length. This function is used to check the settings used with Trigger Level and Trigger Delay or the input signals used.

Auto Level Set

Sets the reference level to an optimum value according to the signal to be measured. The level is adjusted when this key is pressed.

NOTE: The signal level must remain constant while Auto Level Set is being carried out.

Parameter Setup

Sets the parameter to be used for the measurement.

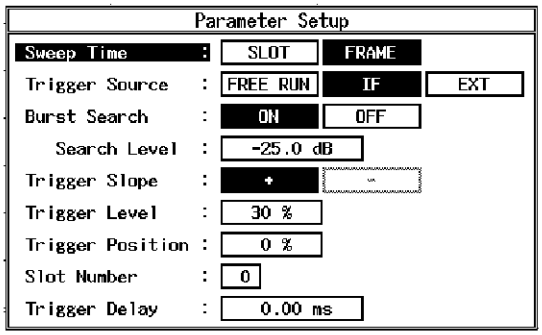


Figure 3-29 Parameter Setup Dialog Box

Sweep Time

Sets the sweep time when displaying a waveform in the time domain.

SLOT: Displays a waveform within one slot.

FRAME: Displays a waveform within a frame.

Trigger Source

Selects a mode of controlling the measurement timing for the burst signal and others.

FREERUN:
Measures the signal using internal measurement timing.

IF: Captures data in sync with the internal IF signal.

EXT: Captures data in sync with the signal input from the EXT TRIG terminal on the rear panel.

Burst Search

Searches for the rising position of the captured signal and measure the signal using that position as a trigger.

Search Level

Sets the level at which the rising position of a burst is searched.

Trigger Slope Sets the edge of the trigger.

+: Triggers at the leading edge.

-: Triggers at the trailing edge.

Trigger Level Sets the level at which synchronization is taken using the IF trigger.

Trigger Position Sets the trigger position where it is displayed on the screen.

Slot Number Sets the number of slots. This set value automatically set Trigger Delay to an integral multiple of slot interval.

Trigger Delay Sets the delay time from the trigger.

3.3.5 STD

This function sets parameters used for measurement and the relationship between the channel number and frequency.

3.3.5.1 DC CAL

Compensates for direct current components inside the circuit.

3.3.5.2 Channel Setting

Sets the relationship between the channel number and frequency.

Copy from STD Sets the relationship between the channel number and frequency specified by the communication standard.

3.3.5.3 STD Setup

Setting the PDC system

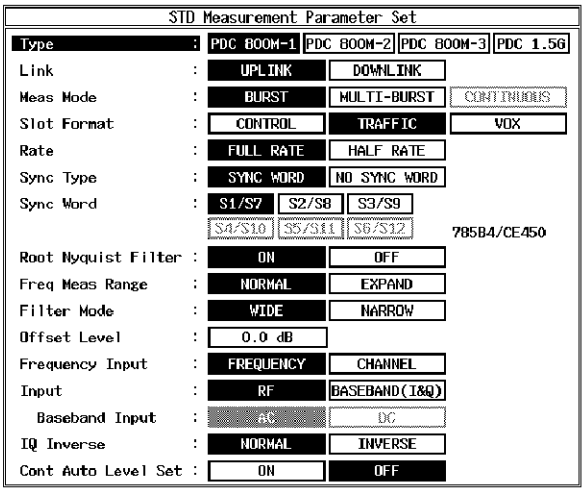


Figure 3-30 STD Measurement Parameter Set Dialog Box

Type

Sets the frequency band.

PDC 800M-1: 800 MHz band 1

PDC 800M-2: 800 MHz band 2

PDC 800M-3: 800 MHz band 3

PDC 1.5G: 1500 MHz band

The above frequency bands are required to calculate the frequency from the channel number.

Link

Sets the direction of the channel.

UPLINK:
Up-link channel

DOWNLINK:
Down-link channel

Meas Mode

Sets the measurement mode.

BURST: Measures one burst in the frame.

MULTI-BURST:
Searches for the desired burst,which contains the target sync word, from the multiple bursts in the frame to make the measurement.

CONTINUOUS:
Measures continuous waves.

Slot Format Sets physical channels.

CONTROL:
Control Physical channel and Packet traffic physical channel

TRAFFIC:
Traffic physical channel

VOX: Transmission signal format during VOX control (traffic channel up-link burst)

Rate Sets the signal rate.

FULL RATE:
Sets the signal rate to the full rate.

HALF RATE:
Sets the signal rate to the half rate.

Sync Type Sets the sync word synchronization.

SYNC WORD:
Sets the sync word to obtain synchronization.

NO SYNC WORD:
Performs measurement without using the sync word.

Sync Word Selects a Sync Word type.

NOTE: In FULL RATE, S1/S7 through S3/S9 can be set. In HALF RATE, S1/S7 through S6/S12 can be set. Synchronization is obtained using either of the two Sync Words.
It is possible to measure a signal from the supper frame structure for this reason.

Root Nyquist Filter Specifies whether or not to apply the Root Nyquist filter.

ON: Sets the Root Nyquist filter for measurement.

OFF: Performs measurements without using the Root Nyquist filter.

Freq Meas Range Sets the estimated range of frequency error.

NORMAL:
Sets this mode when signals exist in the adjacent channels.

EXPAND:
Expands the estimated range of frequency error.

NOTE: When Freq Meas Range is set to EXPAND, signals other than the standard coding test signal or signals including a large number of noise components may sometimes not be measured.

Filter Mode

Sets the band of the internal filter.

WIDE: Sets the internal filter to the wide band. This mode is set when measuring Power vs Time and OBW based on the standard.

NARROW:
Sets the internal filter to the narrow band. This mode is set when signals exist in the adjacent channels.

NOTE: Filter Mode cannot be set to NARROW when Freq Meas Range is set to EXPAND.

Offset Level

Sets the offset value of the reference level within the range of ± 100 dB.

NOTE: In a high-power signal measurement, this function allows you to read the signal directly when a fixed attenuator is connected to the input signal.

Frequency Input

Sets whether or not a frequency or a channel number is used to input the center frequency of the instrument.

FREQUENCY:
Frequency input

CHANNEL:
Channel number input

Input

Sets the input signal.

RF: Sets Input to RF.

BASEBAND(I&Q):
Sets Input to BASEBAND(I&Q).

Baseband Input

Selects the coupling of signals. Effective for BASEBAND(I & Q) only

AC: Sets an alternate current coupling. (A cutoff frequency is approx. 15 Hz)

DC: Sets a direct current coupling.

IQ Inverse

Sets the phases I and Q.

NORMAL:
The phases I and Q do not change.

INVERSE:
The phases I and Q are swaped.

Cont Auto Level Set

Selects ON or OFF from the mode which automatically sets the internal reference level (REF LEVEL) to an optimum value in accordance with the measurement signal.

ON: Sets automatically the reference level to an optimum value. Always check the level before starting measurement and set an optimum value.

OFF: Fixes the reference level at the set level. Set the level manually or using "Auto Level Set" soft key.

NOTE: The signal level must be constant while Auto Level Set is being performed.
This key is enabled for the following measurements: Tx Power, Power vs Time, ACP (Modulation), OBW (Modulation), Modulation Accuracy, Bit Rate Error measurements and ALL measurement.
However, ACP (Modulation) is enabled when Ref. Level Adjust is turned on.

Setting the PHS system

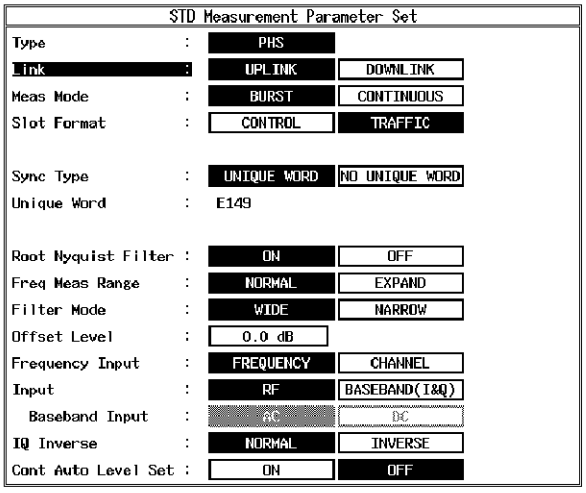


Figure 3-31 STD Measurement Parameter Set Dialog Box

Type

PHS

Link

Sets the direction of the slot.

UPLINK:
Up-link slot

DOWNLINK:
Down-link slot

Meas Mode

Sets the measurement mode.

BURST: Measures one burst in the frame.

CONTINUOUS:
Measures continuous waves. Normally the PHS signals are burst waves, but this mode is set when continuous waves are transmitted for testing.

Slot Format

Sets physical slots.

CONTROL:
Physical slots for control

TRAFFIC:
Physical slots for communication

Sync Type

Sets the unique word synchronization.

UNIQUE WORD:
Sets the unique word to get synchronization.

NO UNIQUEWORD:
Performs measurement without using the unique word.

Unique Word

Displays the Unique Word that is determined by the combination of Link and Slot Format.

Root Nyquist Filter

Specifies whether or not to apply the Root Nyquist filter.

ON: Sets the Root Nyquist filter for measurement.

OFF: Performs measurements without using the Root Nyquist filter.

Freq Meas Range

Sets the estimated range of frequency error.

NORMAL:
This mode is set when signals exist in the adjacent channels.

EXPAND:
Expands the estimated range of frequency error.

NOTE: When Freq Meas Range is set to EXPAND, signals other than the standard coding test signal or signals including a large number noise components may sometimes not be measured.

Filter Mode

Sets the band of the internal filter.

WIDE: Sets the internal filter to the wide band. This mode is set when measuring Power vs Time and OBW based on the standard.

NARROW:
Sets the internal filter to the narrow band. This mode is set when signals exist in the adjacent channels.

NOTE: Filter Mode cannot be set to NARROW when Freq Meas Range is set to EXPAND.

Offset Level

Adjusts the offset value of the reference level within the range of ± 100 dB.

NOTE: In a high-power signal measurement, this function allows you to read the signal directly when a fixed attenuator is connected to the input signal.

Frequency Input

Sets whether a frequency or a channel number is used to input the center frequency of the instrument.

FREQUENCY:
Frequency input

CHANNEL:
Channel number input

Input

Sets the input signal.

RF: Sets Input to RF.

BASEBAND(I&Q):
Sets Input to BASEBAND(I & Q).

Baseband Input

Selects the coupling of signals. Effective for BASEBAND(I & Q) only

AC: Sets an alternate current coupling. (A cutoff frequency is approx. 15 Hz)

DC: Sets a direct current coupling.

IQ Inverse

Sets the phases of I and Q.

NORMAL:
The phases I and Q do not change.

INVERSE:
The phases I and Q are swaped.

Cont Auto Level Set

Selects ON or OFF of the mode which automatically adjusts the internal reference level (REF LEVEL) to an optimum value in accordance with the measurement signal.

ON: Sets automatically the reference level to an optimum value. Always checks the level before starting measurement and sets an optimum value. The signal level must be constant while Auto Level is being performed.

OFF: Fixes the reference level at the set level. Set the level manually or using "Auto Level Set" soft key.

NOTE: The signal level must be constant while Auto Level Set is being performed.
This key is enabled for the following measurements: Tx Power, Power vs Time, ACP (Modulation), OBW (Modulation), Modulation Accuracy, Bit Rate Error measurements and ALL measurement.
However, ACP (Modulation) is enabled when Ref. Level Adjust is turned on.

Setting the IS-136 system

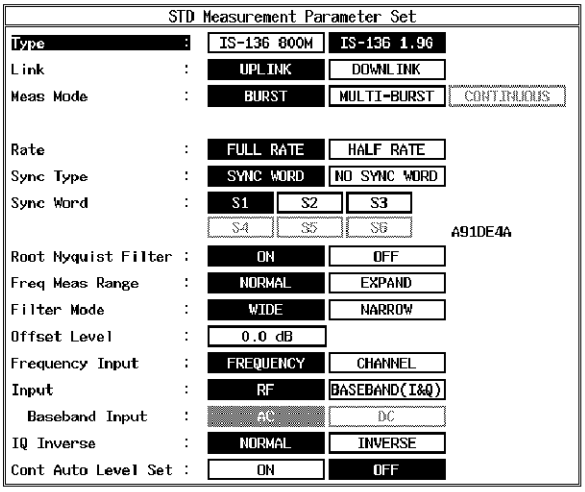


Figure 3-32 STD Measurement Parameter Set Dialog Box

Type

Sets the frequency band.

IS-136 800M:
800 MHz band

IS-136 1.9G:
1900 MHz band

The above bands are required to calculate the frequency from the channel number.

Link

Sets the direction of the channel.

UPLINK:
Up-link channel

DOWNLINK:
Down-link channel

Meas Mode

Sets the measurement mode.

BURST: Measures one burst in the frame.

MULTI-BURST:
Searches for the desired burst from the multiple bursts in the frame to perform measurement.

CONTINUOUS:
Measures continuous waves.

Rate

Sets the signal rate.

FULL RATE:
Sets the signal rate to the full rate.

HALF RATE:
Sets the signal rate to the half rate.

Sync Type

Sets the sync word synchronization.

SYNC WORD:
Sets the sync word to obtain synchronization.

NO SYNC WORD:
Performs measurement without using the sync word.

Sync Word

Selects a Sync Word type.

In FULL RATE:
S1 to S3 can be set.

In HALF RATE:
S1 to S6 can be set.

Root Nyquist Filter

Sets whether or not to apply the Root Nyquist filter.

ON: Sets the Root Nyquist filter for measurement.

OFF: Performs measurement without using the Root Nyquist filter.

Freq Meas Range

Sets the estimated range of frequency error.

NORMAL:
This mode is set when signals exist in the adjacent channels.

EXPAND:
Expands the estimated range of frequency error.

NOTE: When Freq Meas Range is set to EXPAND, signals other than the standard coding test signal or signals including a large number of noise components may sometimes not be measured.

Filter Mode

Sets the band of the internal filter.

WIDE: Sets the internal filter to the wide band. This mode is set when measuring the Power vs Time and OBW based on the standard.

NARROW:
Sets the internal filter to the narrow band. This mode is set when signals exist in the adjacent channels.

NOTE: Filter Mode cannot be set NARROW when Freq Meas Range is set to EXPAND.

Offset Level

Sets the offset value of the reference level to the range within ±100 dB.

NOTE: In a high-power signal measurement, this function allows you to read the signal directly when a fixed attenuator is connected to the input signal.

Frequency Input

Sets whether a frequency or a channel number is used to input the center frequency of the instrument.

FREQUENCY:
Frequency input

CHANNEL:
Channel number input

Input

Sets the input signal.

RF: Sets Input to RF.

BASEBAND(I&Q):
Sets Input to BASEBAND(I & Q).

Baseband Input

Selects the coupling of signals. Effective for BASEBAND(I & Q) only

AC: Sets an alternate current coupling. (A cutoff frequency is approx. 15 Hz)

DC: Sets a direct current coupling.

IQ Inverse

Sets the phases of I and Q.

NORMAL:
The phases I and Q do not change.

INVERSE:
The phases I and Q are swaped.

Cont Auto Level Set

Selects ON or OFF of the mode which automatically sets the internal reference level (REF LEVEL) to an optimum value in accordance with the measurement signal.

ON: Sets automatically the reference level to an optimum value. Always checks the level before starting measurement and sets an optimum value.

OFF: Fixes the reference level at the set level. Set the level manually or using "Auto Level Set" soft key.

NOTE: The signal level must be constant while Auto Level Set is being performed.
This key is enabled for the following measurements: Tx Power, Power vs Time, ACP (Modulation), OBW (Modulation), Modulation Accuracy, Bit Rate Error measurements and ALL measurement.
However, ACP (Modulation) is enabled when Ref. Level Adjust is turned on.

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4 REMOTE CONTROL

4.1 GPIB Command Index

This GPIB command index can be used as the index for Chapter 4.

4.2 GPIB Command Codes

The following table list the GPIB commands by function.

Table 4-1 Operating Mode

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Operating mode	Spectrum analyzer mode TRANSIENT mode	SETFUNC CW SETFUNC TRAN	SETFUNC?	0: Spectrum analyzer 1: TRANSIENT	
Communi-cation system	IS-95 mode	COMMSYS IS95		2: IS-95	*1
	PDC mode	COMMSYS PDC		3: PDC	
	PHS mode	COMMSYS PHS		4: PHS	
	IS-136 mode	COMMSYS IS136		5: IS-136	

*1: Listener code is available only when the analyzer is set to the CW mode. The codes within the talker request are available for both the CW and TRANSIENT modes.

Table 4-2 ATT Key (Attenuator)

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Attenuator	AT	AT *	AT?	Level	
	ATT AUTO	AA	AA?	0: Manual 1: AUTO	
	Min. ATT	ATMIN *	ATMIN?	Level	
	Min. ATT ON	ATMIN ON [*]	ATMINON?	0: OFF	
	OFF	ATMIN OFF		1: ON	

Table 4-3 COPY Key (Hand copy)

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Printer output File output		HCOPY	-	-	

Table 4-4 COUPLE Key (Couple function)

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Couple function	RBW	RB *	RB?	Frequency	
	RBW AUTO	BA	BA?	0: Manual 1: AUTO	
	VBW	VB *	VB?	Frequency	
	VBW AUTO	VA	VA?	0: Manual 1: AUTO	
	Sweep Time	SW * ST *	SW? ST?	Time	
	Sweep Time Auto	AS	AS?	0: Manual 1: AUTO	

Table 4-5 FREQ Key (Frequency)

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Frequency	Center frequency	CF *	CF?	Frequency	
	Start frequency	FA *	FA?	Frequency	
	Stop frequency	FB *	FB?	Frequency	

Table 4-6 LEVEL Key (Reference Level)

Function	Listener Code	Talker Request		Remarks
		Code	Output Format	
Reference level	RL *	RL?	Level	

Table 4-7 MKR Key (Marker)

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Marker	ΔMarker ON	MKD [*]	-	Frequency(Time)	
	OFF	MKOFF MO	- -	- -	
	Reading marker frequency (time)	-	MF?	Frequency(Time)	
	Reading marker level	-	ML?	Level	
	Reading marker frequency (time) and marker level	-	MFL?	Frequency(Time), Level	
	Normal marker	MK [*] MKN [*]	- -	Frequency(Time)	
	Peak search	PS			
	X-dB Down				
	X-dB Down width	MKBW *	MKBW?	Level	
	X-dB Down	XDB	-		
	X-dB Down Left	XDL	-		
	Right	XDR	-		
	Display mode REL.	DC0	DC?	0: Relative mode	
	ABS.L.	DC1		1: Absolute mode (Left side)	
	ABS.R.	DC2		2: Absolute mode (Right side)	

Table 4-8 PRESET Key (Initialization)

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Preset	Instrument preset	IP	-	-	

Table 4-9 RCL Key (Recall)

Function	Listener Code	Talker Request		Remarks
		Code	Output Format	
Recall	RC REG_nn RC file name	- -	nn: 01 to 10 File name: Max.8 character	

Table 4-10 SAVE Key (Save)

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Save	Save	SV REG_nn SV file name	- -	nn: 01 to 10 File name: Max.8 character	
	Deletion	DEL REG_nn DEL file name	- -	nn: 01 to 10 File name: Max.8 character	

Table 4-11 SPAN Key (Frequency span)

Function	Listener Code	Talker Request		Remarks
		Code	Output Format	
Frequency span	SP *	SP?	Frequency	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
STD Setup (PDC)	Communication System				
	PDC 800M - 1	MODTYP PDC800M1	MODTYP?	0: 800M-1	
	PDC 800M - 2	MODTYP PDC800M2		1: 800M-2	
	PDC 800M - 3	MODTYP PDC800M3		2: 800M-3	
	PDC 1.5G	MODTYP PDC1500M		3: 1.5G	
	Link				
	UPLINK	LINK UP	LINK?	0: UPLINK	
	DOWNLINK	LINK DOWN		1: DOWNLINK	
	Signal Type				
	BURST	MEASMD BURST	MEASMD?	0: BURST	
	MULTI-BURST	MEASMD MBURST		1: MULTI-BURST	
	CONTINUOUS	MEASMD CONT		2: CONTINUOUS	
	Transfer Rate				
	FULL	CODEC FULL	CODEC?	0: FULL	
		RATE FULL	RATE?	1: HALF	
	HALF	CODEC HALF			
		RATE HALF			
	Sync.Type&Sync.Word				
	SYNC WORD Using	SYNC S *	SYNC?	1: S1/S7 2: S2/S8	
				3: S3/S9 4: S4/S10	
				5: S5/S11 6: S6/S12	
	SYNC WORD Not using	SYNC NO		0: NO SYNC WORD	
	Root Nyquist Filter				
	Filter OFF	RNYQ OFF	RNYQ?	0: OFF	
	Filter ON	RNYQ ON		1: ON	
	Freq.Range				
	NORMAL	FRRNG NORM	FRRNG?	0: NORMAL	
	EXPAND	FRRNG EXP		1: EXPAND	
	Meas.Filter mode				
	WIDE	MFLTMD WIDE	MFLTMD?	0: WIDE	
	NARROW	MFLTMD NARW		1: NARROW	
	Offset Level	RO *	RO?	Level	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
STD Setup (PDC)	Freq.Setting mode				
	Freq.Input mode	FINPMD FREQ	FINPMD?	0: Frequency Input	
	Channel Input mode	FINPMD CHL		1: Channel Input	
	Channel Setting	CH *	CH?	Integer (Channel No.)	
	Channel Edit				
	Input #1(UPLINK)	CHEDUP1 *,*,*,*,*	CHEDUP1?	ch1,ch2,f1,f2,chof	
	Input #2(UPLINK)	CHEDUP2 *,*,*,*,*	CHEDUP2?	ch1,ch2,f1,f2,chof	
	Input #3(UPLINK)	CHEDUP3 *,*,*,*,*	CHEDUP3?	ch1,ch2,f1,f2,chof	
	Input #1(DOWNLINK)	CHEDDN1 *,*,*,*,*	CHEDDN1?	ch1,ch2,f1,f2,chof	
	Input #2(DOWNLINK)	CHEDDN2 *,*,*,*,*	CHEDDN2?	ch1,ch2,f1,f2,chof	
	Input #3(DOWNLINK)	CHEDDN3 *,*,*,*,*	CHEDDN3?	ch1,ch2,f1,f2,chof ch1: Start channel no. ch2: Stop channel no. f1: Base frequency(Hz) f2: Channel space(Hz) chof: Channel offset	Units of frequency are necessary for f1 and f2.
	Selection of ENABLE or DISABLE for channel table				
	#1 ENABLE	CHTBL1 ENBL	CHTBL1?	0: Disable	
	DISABLE	CHTBL1 DSBL		1: Enable	
	#2 ENABLE	CHTBL2 ENBL	CHTBL2?	0: Disable	
	DISABLE	CHTBL2 DSBL		1: Enable	
	#3 ENABLE	CHTBL3 ENBL	CHTBL3?	0: Disable	
	DISABLE	CHTBL3 DSBL		1: Enable	
	Channel				
	Copy from STD	CHSETSTD			
	Input				
	RF	INPUT RF	INPUT?	0: RF	
	Baseband(I&Q)	INPUT IQ		1: Baseband(I&Q)	
	BaseBand Input				
	AC	BBINPUT AC	BBINPUT?	0: AC	
	DC	BBINPUT DC		1: DC	
	IQ Inverse				
	NORMAL	IQMD NORM	IQMD?	0: NORMAL	
	INVERSE	IQMD INV		1: INVERSE	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
STD Setup (PDC)	Auto Level Setting				
	Auto Level OFF	ALS OFF	ALS?	0: OFF	
	Auto Level ON	ALS ON		1: ON	
	DC CAL	CLDC			
STD Setup (PHS)	Link				
	UPLINK	LINK UP	LINK?	0: UPLINK	
	DOWNLINK	LINK DOWN		1: DOWNLINK	
	Signal type				
	BURST	MEASMD BURST	MEASMD?	0: BURST	
	CONTINUOUS	MEASMD CONT		2: CONTINUOUS	
	SLOT format				
	CONTROL	SLTTYP CONT	SLTTYP?	0: CONTROL	
	TRAFFIC	SLTTYP TRAF		1: TRAFFIC	
	Sync. type				
	UNIQUE WORD sync.	UNIQ B32	UNIQ?	1: UNIQUE WORD Using	
	UNIQUE WORD no sync.	UNIQ NO		0: NO UNIQUE WORD	
	Root Nyquist Filter				
	Filter OFF	RNYQ OFF	RNYQ?	0: OFF	
	Filter ON	RNYQ ON		1: ON	
	Freq. Range				
	NORMAL	FRRNG NORM	FRRNG?	0: NORMAL	
	EXPAND	FRRNG EXP		1: EXPAND	
	Meas. Filter mode				
	WIDE	MFLTMD WIDE	MFLTMD?	0: WIDE	
	NARROW	MFLTMD NARW		1: NARROW	
	Offset Level	RO *	RO?	Level	
	Frequency Setting Mode				
	Frequency Input Mode	FINPMD FREQ	FINPMD?	0: Frequency Input	
	Channel Input Mode	FINPMD CHL		1: Channel Input	
	Channel Setting	CH *	CH?	Integer (Channel No.)	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
STD Setup (PHS)	Channel Edit				
	Input#1(UPLINK)	CHEDUP1 *,*,*,*,*	CHEDUP1?	ch1,ch2,f1,f2,chof	
	Input#2(UPLINK)	CHEDUP2 *,*,*,*,*	CHEDUP2?	ch1,ch2,f1,f2,chof	
	Input#3(UPLINK)	CHEDUP3 *,*,*,*,*	CHEDUP3?	ch1,ch2,f1,f2,chof	
	Input#1(DOWNLINK)	CHEDDN1 *,*,*,*,*	CHEDDN1?	ch1,ch2,f1,f2,chof	
	Input#2(DOWNLINK)	CHEDDN2 *,*,*,*,*	CHEDDN2?	ch1,ch2,f1,f2,chof	
	Input#3(DOWNLINK)	CHEDDN3 *,*,*,*,*	CHEDDN3?	ch1,ch2,f1,f2,chof	
				ch1: Start channel no.	
				ch2: Stop channel no.	
				f1: Base frequency(Hz)	Units of frequency are necessary for f1 and f2.
				f2: Channel space(Hz)	
				chof: Channel offset	
	Channel Table Enable/Disable				
	#1 ENABLE	CHTBL1 ENBL	CHTBL1?	0: Disable	
	DISABLE	CHTBL1 DSBL		1: Enable	
	#2 ENABLE	CHTBL2 ENBL	CHTBL2?	0: Disable	
	DISABLE	CHTBL2 DSBL		1: Enable	
	#3 ENABLE	CHTBL3 ENBL	CHTBL3?	0: Disable	
	DISABLE	CHTBL3 DSBL		1: Enable	
	Channel				
	Copy from STD	CHSETSTD			
	Input				
	RF	INPUT RF	INPUT?	0: RF	
	Baseband(I&Q)	INPUT IQ		1: Baseband(I&Q)	
	BaseBand Input				
	AC	BBINPUT AC	BBINPUT?	0: AC	
	DC	BBINPUT DC		1: DC	
	IQ Inverse				
	NORMAL	IQMD NORM	IQMD?	0: NORMAL	
	INVERSE	IQMD INV		1: INVERSE	
	Auto Level Setting				
	Auto Level OFF	ALS OFF	ALS?	0: OFF	
	Auto Level ON	ALS ON		1: ON	
	DC CAL	CLDC			

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
STD Setup (IS-136)	Communication system				
	IS-136 800M	MODTYP IS800M	MODTYP?	0: 800M	
	IS-136 1.9G	MODTYP IS1900M		1: 1.9G	
	Link				
	UPLINK	LINK UP	LINK?	0: UPLINK	
	DOWNLINK	LINK DOWN		1: DOWNLINK	
	Signal Type				
	BURST	MEASMD BURST	MEASMD?	0: BURST	
	MULTI-BURST	MEASMD MBURST		1: MULTI-BURST	
	CONTINUOUS	MEASMD CONT		2: CONTINUOUS	
	Transfer Rate				
	FULL	CODEC FULL	CODEC?	0: FULL	
	HALF	CODEC HALF		1: HALF	
	Sync. Type & Sync. Word				
	SYNC WORD using	SYNC S *	SYNC?	1: S1 2: S2 3: S3 4: S4 5: S5 6: S6	
	SYNC WORD not using	SYNC NO		0: NO SYNC WORD	
	Root Nyquist Filter				
	Filter OFF	RNYQ OFF	RNYQ?	0: OFF	
	Filter ON	RNYQ ON		1: ON	
	Freq. Range				
	NORMAL	FRRNG NORM	FRRNG?	0: NORMAL	
	EXPAND	FRRNG EXP		1: EXPAND	
	Meas. Filter Mode				
	WIDE	MFLTMD WIDE	MFLTMD?	0: WIDE	
	NARROW	MFLTMD NARW		1: NARROW	
	Offset Level	RO *	RO?	Level	
	Frequency Setting Mode				
	Frequency Input Mode	FINPMD FREQ	FINPMD?	0: Frequency Input	
	Channel Input Mode	FINPMD CHL		1: Channel Input	
	Channel Setting	CH *	CH?	Integer (Channel No.)	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
STD Setup (IS-136)	Channel Edit				
	Input #1(UPLINK)	CHEDUP1 *,*,*,*,*	CHEDUP1?	ch1,ch2,f1,f2,chof	
	Input #2(UPLINK)	CHEDUP2 *,*,*,*,*	CHEDUP2?	ch1,ch2,f1,f2,chof	
	Input #3(UPLINK)	CHEDUP3 *,*,*,*,*	CHEDUP3?	ch1,ch2,f1,f2,chof	
	Input #1(DOWNLINK)	CHEDDN1 *,*,*,*,*	CHEDDN1?	ch1,ch2,f1,f2,chof	
	Input #2(DOWNLINK)	CHEDDN2 *,*,*,*,*	CHEDDN2?	ch1,ch2,f1,f2,chof	
	Input #3(DOWNLINK)	CHEDDN3 *,*,*,*,*	CHEDDN3?	ch1,ch2,f1,f2,chof	
				ch1: Start channel no.	
				ch2: Stop channel no.	
				f1: Base frequency(Hz)	Units of frequency are necessary for f1 and f2.
				f2: Channel space(Hz)	
				chof: Channel offset	
	Selection of ENABLE or DISABLE for channel table				
	#1 ENABLE	CHTBL1 ENBL	CHTBL1?	0: Disable	
	DISABLE	CHTBL1 DSBL		1: Enable	
	#2 ENABLE	CHTBL2 ENBL	CHTBL2?	0: Disable	
	DISABLE	CHTBL2 DSBL		1: Enable	
	#3 ENABLE	CHTBL3 ENBL	CHTBL3?	0: Disable	
	DISABLE	CHTBL3 DSBL		1: Enable	
	Channel				
	Copy from STD	CHSETSTD			
	Input				
	RF	INPUT RF	INPUT?	0: RF	
	Baseband(I&Q)	INPUT IQ		1: Baseband(I&Q)	
	BaseBand Input				
	AC	BBINPUT AC	BBINPUT?	0: AC	
	DC	BBINPUT DC		1: DC	
	IQ Inverse				
	NORMAL	IQMD NORM	IQMD?	0: NORMAL	
	INVERSE	IQMD INV		1: INVERSE	
	Auto Level Setting				
	Auto Level OFF	ALS OFF	ALS?	0: OFF	
	Auto Level ON	ALS ON		1: ON	
	DC CAL	CLDC			

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
T-Domain Power	Auto Level Set	AUTOWFL TDPAUTOLVL			
	Trigger Setup				
	Trigger Source				
	FREERUN	TRGSRC FREE	TRGSRC?	0: FREERUN	
		TDPTRGSRC FREE	TDPTRGSRC?	1: VIDEO	
	VIDEO	TRGSRC VIDEO		2: IF	
		TDPTRGSRC VIDEO		3: EXT	
	IF	TRGSRC IF			
		TDPTRGSRC IF			
	EXT	TRGSRC EXT			
		TDPTRGSRC EXT			
	Trigger Slope				
	+	TRGSLP RISE	TRGSLP?	0: -	
		TDPTRGSLP RISE	TDPTRGSLP?	1: +	
	-	TRGSLP FALL			
		TDPTRGSLP FALL			
	Trigger Level	TRGLVL *	TRGLVL?	Integer (0 to 100)	
		TDPTRGLVL *	TDPTRGLVL?		
	Trigger Position	TRGPOS *	TRGPOS?	Integer (0 to 100)	
		TDPTRGPOS *	TDPTRGPOS?		
	Trigger Delay				
		TRGDT *	TRGDT?	Time	
		TDPTRGDT *	TDPTRGDT?		
	Window Setup				
	Window				
	ON	TDPWDO ON	TDPWDO?	0: OFF	
	OFF	TDPWDO OFF		1: ON	
	Window Position	TDPWPOS *	TDPWPOS?	Time	
	Window Width	TDPWWID *	TDPWWID?	Time	
	Y Scale				
	10dB/div	TDPDIV P10DB	TDPDIV?	0: 10dB/div	
	5dB/div	TDPDIV P5DB		1: 5dB/div	
	2dB/div	TDPDIV P2DB		2: 2dB/div	
	Average Times	TDPAVG *	TDPAVG?	Integer (1: OFF, 2 to 999)	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
T-Domain Power	Template				
	Template				
	ON	TDPTMPL ON	TDPTMPL?	0: OFF	
	OFF	TDPTMPL OFF		1: ON	
	Template Shift				
	Shift X	TDPTMPLSX *	TDPTMPLSX?	Time	
	Shift Y	TDPTMPLSY *	TDPTMPLSY?	Level	
	Template Edit				
	Template UP/LOW Selection	TDPTMPLSEL UP	TDPTMPLSEL?	0: UP	
		TDPTMPLSEL LOW		1: LOW	
	Copy from STD Template	TDPTMPLCP			
	Data Input	TDPTMPLED *,*		t1,l1 t1: Time l1: Level (dBm/W/dBµV)	
	Init Table	TDPTMPLCLR			
	Parameter Setup				
	Detector				
	Normal	TDPDET NRM	TDPDET?	0: Normal	
	Posi	TDPDET POS		1: Posi	
	Nega	TDPDET NEG		2: Nega	
	Sample	TDPDET SMP		3: Sample	
	Display Unit				
	dBm	TDPUNIT DBM	TDPUNIT?	0: dBm	
	W	TDPUNIT W		1: W	
	dBµV	TDPUNIT DBUV		2: dBµV	
	Template Couple to Power				
	ON	TDPTMPLPW ON	TDPTMPLPW?	0: OFF	
	OFF	TDPTMPLPW OFF		1: ON	
	Template Limit	TDPTMPLBTM *	TDPTMPLBTM?	Level (dBm/W/dBµV)	
	Judgement				
	ON	TDPJDG ON	TDPJDG?	0: OFF	
	OFF	TDPJDG OFF		1: ON	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
T-Domain Power	Upper Limit	TDPJDGUP *	TDPJDGUP?	Level	
	Lower Limit	TDPJDGLOW *	TDPJDGLOW?	Level	
	Set to STD	TDPSETSTD			
	Starts measurement T-Domain Power Starts measurement in the same mode	 WAVEFM TDPMEAS SI			
	Measurement results T-Domain Power		TDPMEAS?	 l1, j1 l1: Level (dBm/W/dBμV) j1: Integer (0: FAIL, 1: PASS, -1: Judgement OFF)	
ON/OFF Ratio	Auto Level Set	OORAUTOLVL			
	Trigger Setup Trigger Source FREERUN VIDEO IF EXT	 OORTRGSRC FREE OORTRGSRC VIDEO OORTRGSRC IF OORTRGSRC EXT	 OORTRGSRC?	 0: FREERUN 1: VIDEO 2: IF 3: EXT	
	Trigger Slope + -	 OORTRGSLP RISE OORTRGSLP FALL	 OORTRGSLP?	 0: - 1: +	
	Trigger Level	OORTRGLVL*	OORTRGLVL?	Integer (0 to 100)	
	Trigger Position	OORTRGPOS *	OORTRGPOS?	Integer (0 to 100)	
	Trigger Delay	OORTRGDT *	OORTRGDT?	Time	
	Window Setup Window ON OFF	 OORWDO ON OORWDO OFF	 OORWDO?	 0: OFF 1: ON	
	ON Position	OORWONPOS *	OORWONPOS?	Time	
	ON Width	OORWONWID *	OORWONWID?	Time	
	OFF Position	OORWOFPOS *	OORWOFPOS?	Time	
	OFF Width	OORWOFWID *	OORWOFWID?	Time	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
ON/OFF Ratio	Y Scale				
	10dB/div	OORDIV P10DB	OORDIV?	0: 10dB/div	
	5dB/div	OORDIV P5DB		1: 5dB/div	
	2dB/div	OORDIV P2DB		2: 2dB/div	
	Average Times	OORAVG *	OORAVG?	Integer (1: OFF, 2 to 999)	
	Parameter Setup				
	Detector				
	Normal	OORDET NRM	OORDET?	0: Normal	
	Posi	OORDET POS		1: Posi	
	Nega	OORDET NEG		2: Nega	
	Sample	OORDET SMP		3: Sample	
	Display Unit				
	dBm	OORUNIT DBM	OORUNIT?	0: dBm	
	W	OORUNIT W		1: W	
	dBµV	OORUNIT DBUV		2: dBµV	
	Judgement				
	ON	OORJDG ON	OORJDG?	0: OFF	
	OFF	OORJDG OFF		1: ON	
	Upper Limit	OORJDGUP *	OORJDGUP?	Level	
	Set to STD	OORSETSTD			
	Starts measurement ON/OFF Ratio Starts measurement in the same mode	OORMEAS SI			
	Measurement results ON/OFF Ratio		OORMEAS?	l1,l2,d1,j1 l1: ON Level (dBm/W/dBµV) l2: OFF Level (dBm/W/dBµV) d1: ON/OFF Ratio(dB) j1: Integer (0: FAIL, 1: PASS, -1: Judgement OFF)	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
T-Domain Spurious	Auto Level Set	TDSAUTOLVL			
	Trigger Setup				
	Trigger Source				
	FREERUN	TDSTRGSRC FREE	TDSTRGSRC?	0: FREERUN	
		TRSPMD FREE	TRSPMD?	2: IF	
	IF	TDSTRGSRC IF		3: EXT	
		TRSPMD IF			
	EXT	TDSTRGSRC EXT			
		TDSTRGSRC EXT			
	Trigger Slope				
	+	TDSTRGSLP RISE	TDSTRGSLP?	0: -	
		TRSPSLP RISE	TRSPSLP?	1: +	
	-	TDSTRGSLP FALL			
		TRSPSLP FALL			
	Trigger Level	TDSTRGLVL *	TDSTRGLVL?	Integer (0 to 100)	
	Trigger Position	TDSTRGPOS *	TDSTRGPOS?	Integer (0 to 100)	
	Trigger Delay	TDSTRGDT *	TDSTRGDT?	Time	
	Table				
	Table No. 1/2/3	TDSTBL *	TDSTBL?	Integer (1 to 3)	
	Table Edit	TDSTBLED *,*		f1,l1 f1:Frequency l1:Limit Level	
	Load Table	TDSLD RCLTBL *		Integer (1 to 3)	
	Save Table	TDSSV SVSTBL *		Integer (1 to 3)	
	Init Table	TDSCLR DELSTBL			
	Table Freq. Input				
	ABS	TDSTBLF ABS	TDSTBLF?	0: ABS	
	REL	TDSTBLF REL		1: REL	
	Average Times	TDSAVG *	TDSAVG?	Integer (1: OFF, 2 to 999)	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
T-Domain Spurious	Parameter Setup				
	Detector				
	Normal	TDSDET NRM	TDSDET?	0: Normal	
	Posi	TDSDET POS		1: Posi	
	Nega	TDSDET NEG		2: Nega	
	Sample	TDSDET SMP		3: Sample	
	Display Unit				
	dBm	TDSUNIT DBM	TDSUNIT?	0: dBm	
	W	TDSUNIT W		1: W	
	dBμV	TDSUNIT DBUV		2: dBμV	
	Judgement				
	ON	TDSJDG ON	TDSJDG?	0: OFF	
	OFF	TDSJDG OFF		1: ON	
	Result				
	Peak	TDSRES PK	TDSRES?	0: Peak	
	RMS	TDSRES RMS		1: RMS	
	Multiplier	TDSMULTI *	TDSMULTI?	Real Number	
	Peak Marker Y-Delta	TDSPKMKY *	TDSPKMKY?	Real Number	
	Preselector 1.6G	TDSPRE 16G	TDSPRE?	0: 1.6G	
	3.6G	TDSPRE 36G		1: 3.6G	
	Cont Auto Level				
	ON	TDSCONTALS ON	TDSCONTALS?	0: OFF	
	OFF	TDSCONTALS OFF		1: ON	
	Set to Default	TDSSETSTD			
	Starts measurement				
	Spurious	TDSMEAS SPUR			
	Starts measurement in the same mode	SI			

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
T-Domain Spurious	Measurement results Spurious		TDSMEAS?	n<CR+LF>+f1,l1,j1<CR+LF> ..... +fn,ln,jn<CR+LF> n: Amount (Integer) fn: Frequency ln: Level (dBm/W/dBμV) jn: Integer (0: FAIL, 1: PASS, -1: Judgement OFF)	
			SPULVL?	n<CR+LF>+f1,l1<CR+LF> ..... +fn,ln<CR+LF> n: Amount (Integer) fn: Frequency ln: Level (dBm)	
F-Domain Power	Auto Level Set	FDPAUTOLVL			
	Gate Setup				
	ON	TGTSETUP ON	TGTSETUP?	0: OFF	
	OFF	TGTSETUP OFF		1: ON	
	Trigger Source				
	FREERUN	TGTTRG FREE	TGTTRG?	0: FREERUN	
	VIDEO	TGTTRG VIDEO		1: VIDEO	
	IF	TGTTRG IF		2: IF	
	EXT	TGTTRG EXT		3: EXT	
	Trigger Slope				
	-	TGTTRGSLP FALL	TGTTRGSLP?	0: -	
	+	TGTTRGSLP RISE		1: +	
	Trigger Level	TGTTRGLVL *	TGTTRGLVL?	Integer (0 to 100)	
	Trigger Position	TGTTRGPOS *	TGTTRGPOS?	Integer (0 to 100)	
	Trigger Delay	TGTTRGDT *	TGTTRGDT?	Time	
	Gate Source				
	Trigger	TGTSRC TRG	TGTSRC?	0: Trigger	
	Ext Gate	TGTSRC EXT		1: EXT	
	Gate Position	TGTPOS *	TGTPOS?	Time	
	Gate Width	TGTWID *	TGTWID?	Time	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
F-Domain Power	Detector				
	Normal	TGTDET NRM	TGTDET?	0: Normal	
	Posi	TGTDET POS		1: Posi	
	Nega	TGTDET NEG		2: Nega	
	Sample	TGTDET SMP		3: Sample	
	Gated Sweep ON/OFF				
	ON	TGTSWP ON	TGTSWP?	0: OFF	
	OFF	TGTSWP OFF		1: ON	
	Window Setup				
	Window				
	ON	FDPWDO ON	FDPWDO?	0: OFF	
	OFF	FDPWDO OFF		1: ON	
	Window Position	FDPWPOS *	FDPWPOS?	Frequency	
	Window Width	FDPWWID *	FDPWWID?	Frequency	
	Y Scale				
	10dB/div	FDPDIV P10DB	FDPDIV?	0: 10dB/div	
	5dB/div	FDPDIV P5DB		1: 5dB/div	
	2dB/div	FDPDIV P2DB		2: 2dB/div	
	Average Times	FDPAVG *	FDPAVG?	Integer (1: OFF, 2 to 999)	
	Parameter Setup				
	Detector				
	Normal	FDPDET NRM	FDPDET?	0: Normal	
	Posi	FDPDET POS		1: Posi	
	Nega	FDPDET NEG		2: Nega	
	Sample	FDPDET SMP		3: Sample	
	Display Unit				
	dBm	FDPUNIT DBM	FDPUNIT?	0: dBm	
	W	FDPUNIT W		1: W	
	dBμV	FDPUNIT DBUV		2: dBμV	
	Judgement				
	ON	FDPJDG ON	FDPJDG?	0: OFF	
	OFF	FDPJDG OFF		1: ON	
	Upper Limit	FDPJDGUP *	FDPJDGUP?	Level (dBm/W/dBμV)	
	Lower Limit	FDPJDGLOW *	FDPJDGLOW?	Level (dBm/W/dBμV)	
	Set to STD	FDPSETSTD			

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
F-Domain Power	Starts measurement F-Domain Power Starts measurement in the same mode	 FDPMEAS SI			
	Measurement results F-Domain Power		FDPMEAS?	l1, j1 l1: Level (dBm/W/dBμV) j1: Integer (0: FAIL, 1: PASS, -1: Judgement OFF)	
OBW	Auto Level Set	OBWAUTOLVL			
	OBW%	OBWPER *	OBWPER?	Real Number (0.5 to 99.5)	
	Average Times	OBWAVG *	OBWAVG?	Integer (1: OFF, 2 to 999)	
	Parameter Setup Detector				
	Normal	OBWDET NRM	OBWDET?	0: Normal	
	Posi	OBWDET POS		1: Pos	
	Nega	OBWDET NEG		2: Nega	
	Sample	OBWDET SMP		3: Sample	
	Judgement				
	ON	OBWJDG ON	OBWJDG?	0: OFF	
	OFF	OBWJDG OFF		1: ON	
	Upper Limit	OBWJDGUP *	OBWJDGUP?	Frequency	
	Lower Limit	OBWJDGLOW *	OBWJDGLOW?	Frequency	
	Set to STD	OBWSETSTD			
	Starts measurement OBW Starts measurement in the same mode	 OBWMEAS SI			
	Measurement results OBW		OBWMEAS?	f1,f2,f3,j1 f1: OBW frequency f2: Lower side frequency f3: Higher side frequency j1: Integer (0: FAIL, 1: PASS, -1: Judgement OFF)	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Due to Transient	Auto Level Set	DTSAUTOLVL			
	Template				
	Template				
	ON	DTSTMPL ON	DTSTMPL?	0: OFF	
	OFF	DTSTMPL OFF		1: ON	
	Template Shift				
	Shift X	DTSTMPLSX *	DTSTMPLSX?	Frequency	
	Shift Y	DTSTMPLSY *	DTSTMPLSY?	Level	
	Margin delta X	DTSTMPLDX *	DTSTMPLDX?	Frequency (0: OFF)	
	Copy from STD	DTSTMPLCP			
	Data Input	DTSTMPLED *,*		f1,l1 f1: Frequency l1: Level (dBm/W/dBμV)	
	Init Table	DTSTMPLCLR			
	Marker Edit				
	Copy from STD	DTSMKRCP			
	Data Input	DTSMKRED *,*,*,*		d1,f1,f2,l1 d1: (0: Normal 1: Integral 2: √Nyquist) f1: Offset frequency f2: Bandwidth l1: Limit Level	(*1)
	Init Table	DTSMKRCLR			
	Average Times	DTSAVG *	DTSAVG?	Integer (1: OFF, 2 to 999)	
	Parameter Setup				
	Detector				
	Normal	DTSDET NRM	DTSDET?	0: Normal	
	Posi	DTSDET POS		1: Posi	
	Nega	DTSDET NEG		2: Nega	
	Sample	DTSDET SMP		3: Sample	

(*1) After the table has been initialized using an appropriate listener code, the parameters d1 and f2 defined in the first command correspond to the reference MKR type and reference band width setting, respectively (the values assigned to f1 and l1 are ignored).
The parameter d1 of the second command corresponds to the offset MKR type. Even if the setting of the command parameter d1 is changed from the third command onwards, the new settings are ignored.

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Due to Transient	Display Unit				
	dBm	DTSUNIT DBM	DTSUNIT?	0: dBm	
	W	DTSUNIT W		1: W	
	dBµV	DTSUNIT DBUV		2: dBµV	
	Template Couple to Power				
	ON	DTSTMPLPW ON	DTSTMPLPW?	0: OFF	
	OFF	DTSTMPLPW OFF		1: ON	
	Template Limit	DTSTMPLBTM *	DTSTMPLBTM?	Level (dBm/W/dBµV)	
	Judgement				
	ON	DTSJDG ON	DTSJDG?	0: OFF	
	OFF	DTSJDG OFF		1: ON	
	Freq. Setting				
	CFSP	DTSFRMD CFSP	DTSFRMD?	0: Center/Span Mode	
	STSP	DTSFRMD STSP		1: Start/Stop Mode	
	Result Type				
	ABS	DTSRES ABS	DTSRES?	0: Absolute	
	REL	DTSRES REL		1: Relative	
	MKR	DTSRES MKR		2: Marker	
	Reference Power				
	MKR	DTSREF MKR	DTSREF?	0: Reference Marker	
	MOD	DTSREF MOD		1: Modulation	
	Symbol Rate 1/T	DTSSYMRT *	DTSSYMRT?	Frequency	
	Rolloff Factor	DTSRFACT *	DTSRFACT?	Real Number	
	Set to STD	DTSSETSTD			
	Starts measurement Due to Transient	DTSMEAS			
	Starts measurement in the same mode	SI			
	Measurement results Due to Transient		DTSMEAS?	n<CR+LF>+d1,j1<CR+LF>" ..... +dn,jn<CR+LF> n: Amount(Integer) dn: Power jn: Integer (0: FAIL, 1: PASS, -1: Judgement OFF)	
	Ref. Power	-	DTSREFPWR?	Level	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Duc to Modula-tion	Auto Level Set	DTMAUTOLVL			
	Gate Setup				
	ON	TGTSETUP ON	TGTSETUP?	0: OFF	
	OFF	TGTSETUP OFF		1: ON	
	Trigger Source				
	FREERUN	TGTTRG FREE	TGTTRG?	0: FREERUN	
	VIDEO	TGTTRG VIDEO		1: VIDEO	
	IF	TGTTRG IF		2: IF	
	EXT	TGTTRG EXT		3: EXT	
	Trigger Slope				
	-	TGTTRGSLP FALL	TGTTRGSLP?	0: -	
	+	TGTTRGSLP RISE		1: +	
	Trigger Level	TGTTRGLVL *	TGTTRGLVL?	Integer (0 to 100)	
	Trigger Position	TGTTRGPOS *	TGTTRGPOS?	Integer (0 to 100)	
	Trigger Delay	TGTTRGDT *	TGTTRGDT?	Time	
	Gate Source				
	Trigger	TGTSRC TRG	TGTSRC?	0: Trigger	
	Ext Gate	TGTSRC EXT		1: EXT	
	Gate Position	TGTPOS *	TGTPOS?	Time	
	Gate Width	TGTWID *	TGTWID?	Time	
	Detector				
	Normal	TGTDET NRM	TGTDET?	0: Normal	
	Posi	TGTDET POS		1: Posi	
	Nega	TGTDET NEG		2: Nega	
	Sample	TGTDET SMP		3: Sample	
	Gated Sweep ON/OFF				
	ON	TGTSWP ON	TGTSWP?	0: OFF	
	OFF	TGTSWP OFF		1: ON	
	Template				
	Template				
	ON	DTMTMPL ON	DTMTMPL?	0: OFF	
	OFF	DTMTMPL OFF		1:ON	
	Template Shift				
	Shift X	DTMTMPLSX *	DTMTMPLSX?	Frequency	
	Shift Y	DTMTMPLSY *	DTMTMPLSY?	Level	
	Margin delta X	DTMTMPLDX *	DTMTMPLDX?	Frequency (0: OFF)	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Due to Modulation	Copy from STD	DTMTMPLCP			
	Data Input	DTMTMPLED *,*		f1,l1 f1: frequency l1: Level (dBm/W/dBμV)	
	Init Table	DTMTMPLCLR			
	Marker Edit Copy from STD	DTMMKRCP			(*1)
	Data Input	DTMMKRED *,*,*,*		d1,f1,f2,l1 d1: (0: Normal 1: Integral 2: √Nyquist)) f1: Offset frequency f2: Bandwidth l1: Limit Level	
	Init Table	DTMMKRCLR			
	Average Times	DTMAVG *	DTMAVG?	Integer (1: OFF, 2 to 999)	
	Parameter Setup Detector				
	Normal	DTMDET NRM	DTMDET?	0: Normal	
	Posi	DTMDET POS		1: Posi	
	Nega	DTMDET NEG		2: Nega	
	Sample	DTMDET SMP		3: Sample	
	Display Unit				
	dBm	DTMUNIT DBM	DTMUNIT?	0: dBm	
	W	DTMUNIT W		1: W	
	dBμV	DTMUNIT DBUV		2: dBμV	
	Template Couple to Power				
	ON	DTMTMPLPW ON	DTMTMPLPW?	0: OFF	
	OFF	DTMTMPLPW OFF		1: ON	
	Template Limit	DTMTMPLBTM *	DTMTMPLBTM?	Level (dBm/W/dBμV)	

(*1) After the table has been initialized using an appropriate listener code, the parameters d1 and f2 defined in the first command correspond to the reference MKR type and reference band width setting, respectively (the values assigned to f1 and l1 are ignored).
The parameter d1 of the second command corresponds to the offset MKR type. Even if the setting of the command parameter d1 is changed from the third command onwards, the new settings are ignored.

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Due to Modula-tion	Judgement				
	ON	DTMJDG ON	DTMJDG?	0: OFF	
	OFF	DTMJDG OFF		1: ON	
	Freq. Setting				
	CFSP	DTMFRMD CFSP	DTMFRMD?	0: Center/Span Mode	
	STSP	DTMFRMD STSP		1: Start/Stop Mode	
	Result Type				
	ABS	DTMRES ABS	DTMRES?	0: Absolute	
	REL	DTMRES REL		1: Relative	
	MKR	DTMRES MKR		2: Marker	
	Reference Power				
	MKR	DTMREF MKR	DTMREF?	0: Reference Marker	
	MOD	DTMREF MOD		1: Modulation	
	Symbol Rate 1/T	DTMSYMRT *	DTMSYMRT?	Frequency	
	Rolloff Factor	DTMRFACT *	DTMRFACT?	Real Number	
	Set to STD	DTMSETSTD			
	Start measurement Due to Modulation Starts measurement in the same mode	DTMMEAS SI			
	Measurement results Due to Modulation		DTMMEAS?	n<CR+LF>+d1, j1<CR+LF> .....+dn,jn<CR+LF> n: Amount (Integer) dn: Power jn: Integer (0: FAIL, 1: PASS, -1: Judgement OFF)	
	Ref. Power	-	DTMREFPWR?	Level	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Inband Spurious	Auto Level Set	DTMAUTOLVL			
	Template				
	Template				
	ON	SPRTMPL ON	SPRTMPL?	0: OFF	
	OFF	SPRTMPL OFF		1: ON	
	Template Shift				
	Shift X	SPRTMPLSX *	SPRTMPLSX?	Frequency	
	Shift Y	SPRTMPLSY *	SPRTMPLSY?	Level	
	Margin delta X	SPRTMPLDX *	SPRTMPLDX?	Frequency (0: OFF)	
	Copy from STD	SPRTMPLCP			
	Data Input	SPRTMPLED *,*		f1,l1 f1: Frequency l1: Level (dBm/W/dBμV)	
	Init Table	SPRTMPLCLR			
	Marker Edit				
	Copy from STD	SPRMKRCP			
	Data Input	SPRMKRED *,*,*,*		d1, f1,f2,l1 d1: (0: Peak, 1: Integral) f1: Start Frequency f2: Stop Frequency l1: Limit Level	(*1)
	Init Table	SPRMKRCLR			
	Average Times	SPRAVG *	SPRAVG?	Integer (1: OFF, 2 to 999)	
	Parameter Setup				
	Detector				
	Normal	SPRDET NRM	SPRDET?	0: Normal	
	Posi	SPRDET POS		1: Posi	
	Nega	SPRDET NEG		2: Nega	
	Sample	SPRDET SMP		3: Sample	

(*1) After the table has been initialized using an appropriate listener code, the parameters d1 and f2 defined in the first command correspond to the reference MKR type and reference band width setting, respectively.
Even if the setting of the command parameter d1 is changed from the next command onwards, the new settings are ignored.

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Inband Spurious	Display Unit				
	dBm	SPRUNIT DBM	SPRUNIT?	0: dBm	
	W	SPRUNIT W		1: W	
	dBμV	SPRUNIT DBUV		2: dBμV	
	Template Couple to Power				
	ON	SPRTMPLPW ON	SPRTMPLPW?	0: OFF	
	OFF	SPRTMPLPW OFF		1: ON	
	Template Limit	SPRTMPLBTM *	SPRTMPLBTM?	Level (dBm/W/dBμV)	
	Judgement				
	ON	SPRJDG ON	SPRJDG?	0: OFF	
	OFF	SPRJDG OFF		1: ON	
	Freq. Setting				
	CFSP	SPRFRMD CFSP	SPRFRMD?	0: Center/Span Mode	
	STSP	SPRFRMD STSP		1: Start/Stop Mode	
	Result Type				
	ABS	SPRRES ABS	SPRRES?	0: Absolute	
	REL	SPRRES REL		1: Relative	
	MKR	SPRRES MKR		2: Marker	
	Reference Power				
	MKR	SPRREF MKR	SPRREF?	0: Reference Marker	
	MOD	SPRREF MOD		1: Modulation	
	Peak Marker Y-Delta	SPRPKMKY *	SPRPKMKY?	Real Number	
	Set to STD	SPRSETSTD			

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Inband Spurious	Starts measurement Inband Spurious Starts measurement in the same mode	 SPRMEAS SI			
	Measurement results Inband spurious		SPRMEAS?	n<CR+LF>+f1,l1,j1<CR+LF> ..... +fn,ln,jn<CR+LF> n: Amount (Integer) fn: Frequency ln: Level (dBm/W/dBuV) jn: Integer (0: FAIL, 1: PASS, -1: Judgement OFF)	
	Ref. Power	-	SPRREFPWR?	Level	
Outband Spurious	Auto Level Set	FDSAUTOLVL			
	Table Table No.1/2/3	 FDSTBL *	 FDSTBL?	 Integer (1 to 3)	
	Table Edit	FDSTBLED *,*,*,*,*,*		f1,f2,f3,f4,d1,l1 f1: Start Frequency f2: Stop Frequency f3: RBW f4: VBW d1: Sweep Time l1: Limit Level	
	Load Table	FDSLD			
	Save Table	FDSSV			
	Init Table	FDSCLR			
	Average Times	FDSAVG *	FDSAVG?	Integer (1: OFF, 2 to 999)	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Outband Spurious	Parameter Setup				
	Detector				
	Normal	FDSDET NRM	FDSDET?	0: Normal	
	Posi	FDSDET POS		1: Posi	
	Nega	FDSDET NEG		2: Nega	
	Sample	FDSDET SMP		3: Sample	
	Display Unit				
	dBm	FDSUNIT DBM	FDSUNIT?	0: dBm	
	W	FDSUNIT W		1: W	
	dBμV	FDSUNIT DBUV		2: dBμV	
	Judgement				
	ON	FDSJDG ON	FDSJDG?	0: OFF	
	OFF	FDSJDG OFF		1: ON	
	Peak Marker Y-Delta	FDSPKMKY *	FDSPKMKY?	Real Number	
	Preselector 1.6G	FDSPRE 16G	FDSPRE?	0: 1.6G	
	3.6G	FDSPRE 36G		1: 3.6G	
	Set to Default	FDSSETSTD			
	Starts measurement Outband Spurious Starts measurement in the same mode	FDSMEAS SI			
	Measurement results Outband Spurious		FDSMEAS?	n<CR+LF>+f1,l1,j1<CR+LF> ..... +fn,ln,jn<CR+LF> n: Amount (Integer) fn: Frequency ln: Level (dBm/W/dBμV) jn: Integer (0: FAIL, 1: PASS, -1: Judgement OFF)	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Tx Power	Auto Level Set	AUTOLVL			
	Trigger Setup				
	Trigger Mode	MODTRG FREE	MODTRG?	0: FREERUN	
	FREERUN	TRGMODE FREE	TRGMODE?		
	IF	MODTRG IF		1: IF	
		TRGMODE IF			
	EXT	MODTRG EXT		2: EXT	
		TRGMODE EXT			
	EXT Trigger Slope				
	+	MODTRGSLP RISE	MODTRGSLP?	0: -	
	-	MODTRGSLP FALL		1: +	
	EXT Trigger Delay				
	Time Setting	MODTRGDLY *	MODTRGDLY?	Time	
	Slot Setting	MODTRGSLT *	MODTRGSLT?	0 to 2 (FULL RATE)	
	IF Trigger Level	MODTRGLVL *	MODTRGLVL?	Integer (0 to 100)	
	Burst Search				
	Burst Search OFF	MODTRGBRST OFF	MODTRGBRST?	0: OFF	
	Burst Search ON	MODTRGBRST ON		1: ON	
	Average Times	TXAVG *	TXAVG?	Integer (1: OFF, 2 to 32)	
		TAVGTX *	TAVGTX?		
		TAVGAP *	TAVGAP?		
	Starts measurement Tx Power Starts measurement in the same mode	TXPWR SI			
	Measurement results Tx Power		TXPWR?	d1,d2, d3, d4 d1: Burst Power(dBm) d2: Burst Power(W) d3: Frame Power(dBm) d4: Frame Power(W)	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Power vs Time	Auto Level Set	AUTOLVL			
	Trigger Setup				
	Trigger Mode				
	FREERUN	MODTRG FREE	MODTRG?	0: FREERUN	
		TRGMODE FREE	TRGMODE?		
	IF	MODTRG IF		1: IF	
		TRGMODE IF			
	EXT	MODTRG EXT		2: EXT	
		TRGMODE EXT			
	EXT Trigger Slope				
	+	MODTRGSLP RISE	MODTRGSLP?	0: -	
	-	MODTRGSLP FALL		1: +	
	EXT Trigger Delay				
	Time Setting	MODTRGDLY *	MODTRGDLY?	Time	
	Slot Setting	MODTRGSLT *	MODTRGSLT?	0 to 2 (FULL RATE)	
	IF Trigger Level	MODTRGLVL *	MODTRGLVL?	Integer (%)	
	Burst Search				
	Burst Search OFF	MODTRGBRST OFF	MODTRGBRST?	0: OFF	
	Burst Search ON	MODTRGBRST ON		1: ON	
	Average Times	PTAVG *	PTAVG?	Integer (1: OFF, 2 to 32)	
	Measurement Mode				
	Normal	PTMOD NORM	PTMOD?	0: NORM	
	High dynamic range	PTMOD HIGH		1: HIGH	
	Y Scale				
	20dB/div	PTDIV P20DB	PTDIV?	0: 20dB/div	
	10dB/div	PTDIV P10DB		1: 10dB/div	
	5dB/div	PTDIV P5DB		2: 5dB/div	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Power vs Time	Template				
	Template selection	RUTEMP * PTTYP *	RUTEMP? PTTYP?	Integer (Template No.: 1,2,3,4) (#4: STD Template)	
	Template Edit	EUTEMP PDC: d1, d2, d3, d4, d5, d6 PHS, IS-136: d1, d2, d3, d4 PTTENT PDC: d1, d2, d3, d4, d5, d6 PHS, IS-136: d1, d2, d3, d4		PDC: d1 to d6 PHS, IS-136: d1 to d4 level(dB)	Unit of level, dB, is necessary
	Off Level Unit				
	dBm	PTTUNIT DBM	PTTUNIT?	0: dBm	
	dB	PTTUNIT DB		1: dB	
	Average Times	PTAVG *	PTAVG?	Integer (1: OFF, 2 to 32)	
	Starts measurement				
	Power vs Time	RUPDN PWRTM			
	Starts measurement in the same mode	SI			
	Measurement results				
	Burst Power		RUDPWR? PWRTM?	Level(dBm)	
	PASS/FAIL		RUDJDG? PTJDG?	0: FAIL 1: PASS	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Bit Rate Error	Auto Level Set	AUTOLVL			
	Trigger Setup				
	Trigger Mode				
	FREERUN	MODTRG FREE	MODTRG?	0: FREERUN	
		TRGMODE FREE	TRGMODE?		
	IF	MODTRG IF		1: IF	
		TRGMODE IF			
	EXT	MODTRG EXT		2: EXT	
		TRGMODE EXT			
	EXT Trigger Slope				
	+	MODTRGSLP RISE	MODTRGSLP?	0: -	
	-	MODTRGSLP FALL		1: +	
	EXT Trigger Delay				
	Time Setting	MODTRGDLY *	MODTRGDLY?	Time	
	Slot Setting	MODTRGSLT *	MODTRGSLT?	0 to 2 (FULL RATE)	
	IF Trigger Level	MODTRGLVL *	MODTRGLVL?	Integer(%)	
	Burst Search				
	Burst Search OFF	MODTRGBRST OFF	MODTRGBRST?	0: OFF	
	Burst Search ON	MODTRGBRST ON		1: ON	
	Average Times	BTRAVG *	BTRAVG?	Integer (1: OFF, 2 to 32)	
	Starts measurement Bit Rate Error	BTR			
	Starts measurement in the same mode	SI			
	Measurement results Bit Rate Error		BITRERR?	d1,d2 d1: Bit Rate Error(ppm) d2: Bit Rate Error(Hz)	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Modula-tion Accuracy	Auto Level Set	AUTOLVL			
	Trigger Setup				
	Trigger Mode				
	FREERUN	MODTRG FREE	MODTRG?	0: FREERUN	
		TRGMODE FREE	TRGMODE?		
	IF	MODTRG IF		1: IF	
		TRGMODE IF			
	EXT	MODTRG EXT		2: EXT	
		TRGMODE EXT			
	EXT Trigger Slope				
	+	MODTRGSLP RISE	MODTRGSLP?	0: -	
	-	MODTRGSLP FALL		1: +	
	EXT Trigger Delay				
	Time Setting	MODTRGDLY *	MODTRGDLY?	Time	
	Slot Setting	MODTRGSLT *	MODTRGSLT?	0 to 2 (FULL RATE)	
	IF Trigger Level	MODTRGLVL *	MODTRGLVL?	Integer(%)	
	Burst Search				
	Burst Search OFF	MODTRGBRST OFF	MODTRGBRST?	0: OFF	
	Burst Search ON	MODTRGBRST ON		1: ON	
	Average Times	TAVGMOD *	TAVGMOD?	Integer (1: OFF, 2 to 32)	
	Starts measurement Modulation Accuracy	MODACC			
	Starts measurement in the same mode	SI			
	Measurement results				
	Modulation Accuracy		MODACC?	d1,d2,d3,d4,d5,d6 d1: Burst Amplitude Droop(dB/symbol) d2: Frequency Error(Hz) d3: I/Q origin offset(dBc) d4: Magnitude Error d5: Phase Error (deg. rms) d6: Error Vector Magnitude(% rms)	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Modulation Accuracy	Modulation Accuracy (10 symbols)		MODACC10?	d1,d2,d3 d1: 10 symbol Magnitude Error(%rms) d2: 10 symbol Phase Error(deg.rms) d3: 10 symbol E.V.M(%rms)	
	Modulation Accuracy (Peak)		MODACCPK?	d1,s1,d2,s2,d3,s3 d1: Peak Magnitude Error(%rms) s1: Position of Peak Mag. Error d2: Peak Phase Error(deg.rms) s2: Position of Peak Phase Error d3: Peak E.V.M(%rms) s3: Position of Peak E.V.M	
OBW (Modulation)	Auto Level Set	AUTOLVL			
	Trigger Setup				
	Trigger Mode				
	FREERUN	MODTRG FREE TRGMODE FREE	MODTRG? TRGMODE?	0: FREERUN	
	IF	MODTRG IF TRGMODE IF		1: IF	
	EXT	MODTRG EXT TRGMODE EXT		2: EXT	
	Trigger Slope				
	+	MODTRGSLP RISE	MODTRGSLP?	0: -	
	-	MODTRGSLP FALL		1: +	
	Trigger Delay				
	Time Setting	MODTRGDLY *	MODTRGDLY?	Time	
	Slot Setting	MODTRGSLT *	MODTRGSLT?	0 to 2 (FULL RATE)	
	IF Trigger Level	MODTRGLVL *	MODTRGLVL?	Integer(%)	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
OBW (Modulation)	Burst Search				
	Burst Search OFF	MODTRGBRST OFF	MODTRGBRST?	0: OFF	
	Burst Search ON	MODTRGBRST ON		1: ON	
	Average Times	TAVGOBW?	TOBWAVG?	Integer (1: OFF, 2 to 32)	
	Starts measurement OBW	TOBW			
	Starts measurement in the same mode	SI			
	Measurement results OBW		TOBW?	OBW	
			TOBW1?	OBW, fc	
				OBW: OBW frequency	
				fc: Inband Center frequency(Hz)	
Graphics Selection	Constellation	GPHTYP INP	GPHTYP?	0: Constellation	
	Constellation(Line)	GPHTYP LIN		1: Constellation(Line)	
	Constellation(Dot)	GPHTYP DOT		2: Constellation(Dot)	
	Constellation(Line&Dot)	GPHTYP CON		3: Constellation (Line&Dot)	
	I EYE Diagram	GPHTYP IEYE		4: I EYE Diagram	
	Q EYE Diagram	GPHTYP QEYE		5: Q EYE Diagram	
	I/Q EYE Diagram	GPHTYP IQEYE		6: I/Q EYE Diagram	
	Demodulated Data	GPHTYP DEMOD		7: Demodulated Data	
	E.V.M. vs Symbol	GPHTYP EVM		8: E.V.M. vs Symbol	
	Mag. Error vs Symbol	GPHTYP ME		9: Mag. Error vs Symbol	
	Phase Error vs Symbol	GPHTYP PFE		10: Phase Error vs Symbol	
Output data Constellation Constellation (Line) Constellation (Dot)	I-channel data output		GPHI?	n<CR+LF>+d1<CR+LF>+ .....+dn<CR+LF> n: Number of output dn: Data (Real Number)	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Constella-tion (Line& Dot)					
I EYE Diagram	Q-channel data output		GPHQ?	n<CR+LF>+d1<CR+LF>+ .....+dn<CR+LF>	
Q EYE Diagram				n: Number of output	
I&Q EYE Diagram				dn: Data (Real Number)	
Demodu-lated Data	Demodulated data output		DEMOD?	n<CR+LF>+d1<CR+LF>+ ....+dn<CR+LF>	
				n: Number of output	
				dn: Character string data (1 Data: 10 bit)	
E.V.M. vs Symbol	X data (Symbol number)		GPHX?	n<CR+LF>+d1<CR+LF>+ .....+dn<CR+LF>	
Mag. Error vs Symbol				n: Number of output	
Phase Error vs Symbol	Y data		GPHY?	dn: Data (Integer) n<CR+LF>+d1<CR+LF>+ .....+dn<CR+LF> n: Number of output dn: Data (Real Number)	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
ACP	Auto Level Set	TACPAUTOLVL			
	Parameter Setup				
	Trigger Mode				
	FREERUN	MODTRG FREE	MODTRG?	0: FREERUN	
		TRGMODE FREE	TRGMODE?		
	IF	MODTRG IF		1: IF	
		TRGMODE IF			
	EXT	MODTRG EXT		2: EXT	
		TRGMODE EXT			
	EXT Trigger Slope				
	+	MODTRGSLP RISE	MODTRGSLP?	0: -	
		TRGMSLP RISE	TRGMSLP?	1: +	
	-	MODTRGSLP FALL			
		TRGMSLP FALL			
	EXT Trigger Delay				
	Time specification	MODTRGDLY *	MODTRGDLY?	Time	
	Slot specification	MODTRGSLT *	MODTRGSLT?	0 to 2 (FULL RATE)	
	IF Trigger Level	MODTRGLVL *	MODTRGLVL?	Integer(%)	
	Burst Search				
	Burst Search OFF	MODTRGBRST OFF	MODTRGBRST?	0: OFF	
	Burst Search ON	MODTRGBRST ON		1: ON	
	Search Level	MODBRSTLVL *	MODBRSTLVL?	Level	
	ACP Unit				
	dB	TACPRES DB	TACPRES?	0: dB	
	dBm	TACPRES DBM		1: dBm	
	W	TACPRES W		2: W	
	Ref. Level Adjust				
	OFF	TACPLVLADJ OFF	TACPLVLADJ?	0: OFF	
	ON	TACPLVLADJ ON		1: ON	
	Tx Power				
	Average Times	TACPPWRAVG *	TACPPWRAVG?	Integer (1: OFF, 2 to 32)	
	Unit				
	dBm	TACPPWRRES DBM	TACPPWRRES?	0: dBm	
	W	TACPPWRRES W		1: W	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
ACP	Sweep Time				
	Sweep Time	TACPSTIME *	TACPSTIME?	Time	
	Sweep Time Default	TACPSTDEF	TACPSTDEF?	0: User Define 1: Default	
	Starts measurement				
	ACP	TACP			
	Starts measurement in the same mode	SI			
	Measurement results				
	ACP(PDC)		TACP?	bpwr,pl1,pl2,pu1,pu2, 0,0,0,0	
			TACPX?	bpwr,pl1,pl2,pu1,pu2 bpwr: Burst Power pl1: -50kHz pl2: -100kHz pu1: 50kHz pu2: 100kHz	
	ACP(PHS)		TACP?	bpwr,pl1,pl2,pu1,pu2, 0,0,0,0	
			TACPX?	bpwr,pl1,pl2,pu1,pu2 bpwr: Burst Power pl1: -600kHz pl2: -900kHz pu1: 600kHz pu2: 900kHz	
	ACP(IS-136)		TACP?	bpwr,pl1,pl2,pl3,pu1, pu2,pu3, 0,0,0,0,0,0	
			TACPX?	bpwr,pl1,pl2,pl3,pu1, pu2,pu3 bpwr: Burst Power pl1: -30kHz pl2: -60kHz pl3: -90kHz pu1: 30kHz pu2: 60kHz pu3: 90kHz	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
ACP	Tx Power		TXPWR?	d1,d2,d3,d4 d1: Burst Power(dBm) d2: Burst Power(W) d3: Frame Power(dBm) d4: Frame Power(W)	
ALL Measure-ment	Auto Level Set	AUTOLVL			
	Parameter Setup Trigger Mode FREERUN	MODTRG FREE TRGMODE FREE	MODTRG? TRGMODE?	0: FREERUN	
	IF	MODTRG IF TRGMODE IF		1: IF	
	EXT	MODTRG EXT TRGMODE EXT		2: EXT	
	EXT Trigger Slope +	MODTRGSLP RISE TRGMSLP RISE	MODTRGSLP? TRGMSLP?	0: - 1: +	
	-	MODTRGSLP FALL TRGMSLP FALL			
	EXT Trigger Delay Time specification	MODTRGDLY *	MODTRGDLY?	Time	
	Slot specification	MODTRGSLT *	MODTRGSLT?	0 to 2 (FULL RATE)	
	IF Trigger Level	MODTRGLVL *	MODTRGLVL?	Integer(%)	
	Burst Search Burst Search OFF	MODTRGBRST OFF	MODTRGBRST?	0: OFF	
	Burst Search ON	MODTRGBRST ON		1: ON	
	Search Level	MODBRSTLVL *	MODBRSTLVL?	Level	
	Tx Power Type BURST POWER	TXMPWRTYP BURST	TXMPWRTYP?	0: BURST	
	FRAME POWER	TXMPWRTYP FRAME		1: FRAME	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
ALL Measure-ment	Tx Power Unit				
	dBm	TXMPWRRES DBM	TXMPWRRES?	0: dBm	
	W	TXMPWRRES W		1: W	
	ACP Unit				
	dB	TXMACPRES DB	TXMACPRES?	0: dB	
	dBm	TXMACPRES DBM		1: dBm	
	W	TXMACPRES W		2: W	
	Sweep Time				
	Sweep Time	TXMST *	TXMST?	Time	
	Sweep Time Default	TXMSTDEF	TXMSTDEF?	0: User Define 1: Default	
	Bit Rate Error Unit				
	ppm	TXMBTRRES PPM	TXMBTRRES?	0: ppm	
	bps(Hz)	TXMBTRRES BPS		1: bps(Hz)	
	ACP measurement				
	OFF	TACPST OFF	TACPST?	0: OFF	
	ON	TACPST ON		1: ON	
	Bit Rate Error Measurement				
	OFF	BTRST OFF	BTRST?	0: OFF	
	ON	BTRST ON		1: ON	
	Average Times	TXMAVG *	TXMAVG?	Integer (1: OFF, 2 to 32)	
	Start measurement				
	ALL Measurement	TXMEAS			
	Srart measurement in the same mode	SI			
	Measurement results				
	Tx Power		TXPWR?	d1,d2,d3,d4 d1: Burst Power(dBm) d2: Burst Power(W) d3: Frame Power(dBm) d4: Frame Power(W)	
	OBW		TOBW?	OBW	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
ALL Measure-ment	ACP(PDC)		TACP?	bpwr,pl1,pl2,pu1,pu2, 0,0,0,0	
			TACPX?	bpwr,pl1,pl2,pu1,pu2	
				bpwr: Burst Power	
				pl1: -50kHz	
				pl2: -100kHz	
				pu1: 50kHz	
				pu2: 100kHz	
	ACP(PHS)		TACP?	bpwr,pl1,pl2,pu1,pu2, 0,0,0,0	
			TACPX?	bpwr,pl1,pl2,pu1,pu2	
				bpwr: Burst Power	
				pl1: -600kHz	
				pl2: -900kHz	
				pu1: 600kHz	
				pu2: 900kHz	
	ACP(IS-136)		TACP?	bpwr,pl1,pl2,pl3,pu1, pu2,pu3,	
				0,0,0,0,0,0	
			TACPX?	bpwr,pl1,pl2,pl3,pu1, pu2,pu3	
				bpwr: Burst Power	
				pl1: -30kHz	
				pl2: -60kHz	
				pl3: -90kHz	
				pu1: 30kHz	
				pu2: 60kHz	
				pu3: 90kHz	

Table 4-12 TRASIENT Key

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
ALL Measure-ment	Modulation Accuracy		MODACC?	d1,d2,d3,d4,d5,d6 d1: Burst Amplitude Droop(dB/symbol) d2: Frequency Error(Hz) d3: I/Q origin offset(dBc) d4: Magnitude Error d5: Phase Error (deg. rms) d6: Error Vector Magnitude(% rms)	
	Modulation Accuracy (10 symbols)		MODACC10?	d1,d2,d3 d1: 10 symbol Magnitude Error(%rms) d2: 10 symbol Phase Error(deg.rms) d3: 10 symbol E.V.M(%rms)	
	Modulation Accuracy (Peak)		MODACCPK?	d1,s1,d2,s2,d3,s3 d1: Peak Magnitude Error(%rms) s1: Position of Peak Mag. Error d2: Peak Phase Error(deg.rms) s2: Position of Peak Phase Error d3: Peak E.V.M(%rms) s3: Position of Peak E.V.M	
	Bit Rate Error		BITRERR?	d1,d2 d1: Bit Rate Error(ppm) d2: Bit Rate Error(Hz)	

Table 4-13 Numeric Keys/Step Keys/Data Knob/Unit Keys (Entering Data)

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Entering data	0 to 9	0 to 9	-	-	
	. (Decimal point)	.	-	-	
	GHz	GZ	-	-	
	MHz	MZ	-	-	
	kHz	KZ	-	-	
	Hz	HZ	-	-	
	mV	MV	-	-	
	mW	MW	-	-	
	dB	DB	-	-	
	mA	MA	-	-	
	sec	SC	-	-	
	ms	MS	-	-	
	μs	US	-	-	
	ENTER	ENT	-	-	

Table 4-14 Miscellaneous

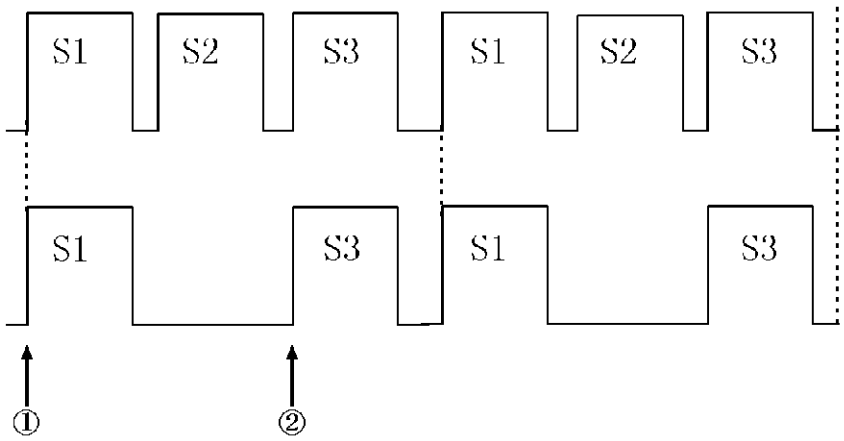
Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Miscella-neous	Outputting error number	-	ERRNO?	Integer	
	Local	LC	-	-	
	Reading GPIB address	-	AD?	Integer (0 to 30)	
	Specification of the delimiter				
	CR LF <EOI>	DL0	-	-	
	LF	DL1	-	-	
	<EOI>	DL2	-	-	
	CR LF	DL3	-	-	
	LF <EOI>	DL4	-	-	
	Service request interruption ON	S0	-	-	
	OFF	S1	-	-	
	Status clear	S2	-	-	
	Service request mask	RQS *	RQS?	Decimal number corresponding to the SRQ bit	
	Outputting ID of the instrument	-	*IDN?	Manufacturer name (character string), instrument type (character string), 0 and revision (character string)	
	Initializing the instrument	*RST	-	-	
	Clearing the queues related to the status byte	*CLS	-	-	
	Accessing the standard event enable register	*ESE *	*ESE?	Decimal number corresponding to the register bits	
	Reading or clearing the standard event enable register	-	*ESR?	Decimal number corresponding to the register bits	
	Accessing the service request enable register	*SRE *	*SRE?	Decimal number corresponding to the register bits	
	Reading the status byte and MSS bit	-	*STB?	Decimal number corresponding to the status byte	

Table 4-14 Miscellaneous

Function		Listener Code	Talker Request		Remarks
			Code	Output Format	
Miscella-neous	Accessing the operation status enable register	OPR *	OPR?	Decimal number corresponding to the register bits	
	Reading or clearing the operation status register	-	OPREVT?	Decimal number corresponding to the register bits	

5 TECHNICAL NOTES

5.1 Measuring Signals Including Multiple Bursts in the Frame in the PDC or IS-136 System



S1 to S3: Kind of Sync.Word

Figure 5-1 Signal with Multiple Bursts in the Frame

For the PDC or IS-136 system, a target slot can be measured by setting Meas Mode of STD Setup to MULTI-BURST even if the signal includes multiple bursts in the frame as shown in Figure 5-1.

When the analyzer measures the slot with the sync word S1, set the parameters in STD Setup as shown below.

[STD Setup]

Meas Mode: MULTI-BURST

Sync Type: SYNC WORD

Sync Word: S1

(1) When Meas Mode is set to BURST, measurement is possible when a trigger is activated at the position ①. However, the measurement is not possible when a trigger is activated at the position ②.

(2) However, measurement is always possible by means of setting Meas Mode to MULTI-BURST even if a trigger is activated at the trailing edge of any burst.

In this mode, adjacent slot data is captured and measurement is repeated even though the sync word of the first burst does not match with S1. For this reason, no matter which burst is the first one, measurement is possible by means of using the slot with the sync word of S1 in the frame so long as the trailing edge of the burst is correctly detected.

5.2 Measuring the Signals Including Both Up Link and Down Link Bursts in the Frame in the PHS System

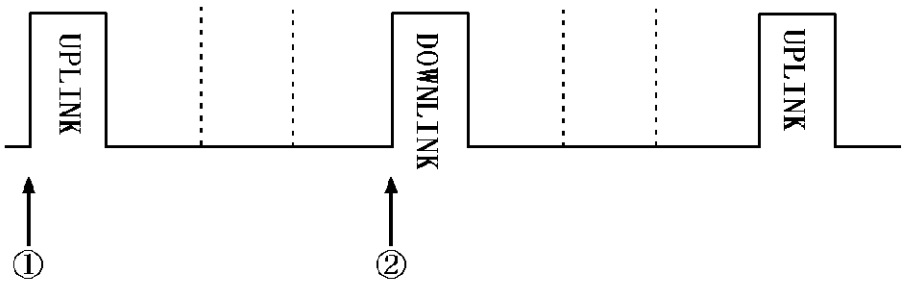


Figure 5-2 Burst Wave Including Both Up Link and Down Link Signals In the Frame

For the PHS system, signals including both up and down-link signals in the frame can be measured as shown in Figure 5-2.

Set STD Setup as shown below.

[STD Setup]

Link: UPLINK

Meas Mode: BURST

Sync Type: UNIQUE WORD

(1) The signal can be measured using the up-link slot when a trigger position is at ①.

(2) When a trigger position is at ②, measurement is not possible because the direction of this slot is down-link. When the measurement is not possible, this up-link slot is measured by means of capturing data located on the position automatically shifted by four slots inside the instrument.

As the result, the set signal can be measured even if both up and down-link signals are transmitted.

---

*NOTE: **Even if Link is set to DOWNLINK, the down-link slot can be measured in the same way.***

5.3 Averaging the First 10 Symbols of Error Vector Magnitude in the IS-136 System

Modulation Accuracy measurement includes First 10 Symbols Mag Err, First 10 Symbols Phase Err and First 10 Symbols E.V.M. measurement parameters. The functions of these parameters are to calculate Magnitude Error, Phase Error and Error Vector Magnitude as average values (rms) of the first 10 symbols out of evaluation symbols in one slot.

For the IS-136 system, there is a measurement item for the average of 10 bursts of Error Vector Magnitude (modulation accuracy). (For more information, refer to Page 31 of TIA/EIA/IS-136.2-A.)

This measurement method calculates the RMS value of 10 bursts using 10 symbols after the rising of the burst for evaluation symbols.

In the Modulation Accuracy measurement, the average of 10 bursts can be measured for First 10 Symbols Mag Err, First 10 Symbols Phase Err and First 10 Symbols E.V.M. with the average times set to 10.

5.4 How to Measure the ACP using the Modulation Menu

The ACP measurement in the Modulation menu uses spectrum analyzer's sweep measurement to comply with the communication standards. (See Table 5-1 for information on how to set the spectrum analyzer.)

As an example of the PDC system, the standard (STD-27) stipulates that at least one burst must be included in one sampling. Therefore, a minimum sweep time of 10 sec is required if there are 501 trace points in the full rate mode (500 points × 20 msec = 10 sec). The definitions necessary to measure the ACP measurement in the PDC system are: the specified bandwidth of the main carrier, the specified bandwidth of the adjacent channel with an offset of 50 kHz, and the alternate channel with an offset of 100 kHz. As a result, it is intended that the measurement time required for the ACP measurement in the Modulation menu be reduced by sweeping only the adjacent and alternate channels.

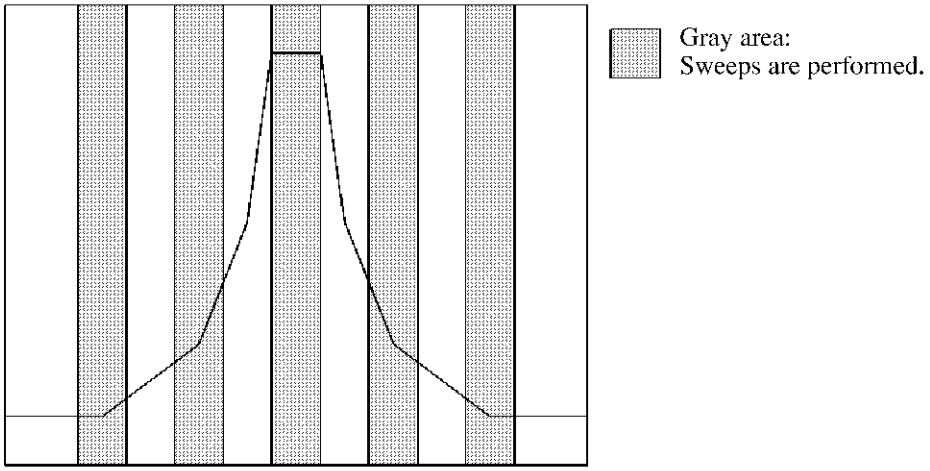


Figure 5-3 Principle of the Partial Sweeps

The PHS and IS-136 systems use measurement modes similar to the one used in the PDC system. However, the IS-136 system uses Root Nyquist filters that are specified by the standard for each band.

Table 5-1 Spectrum Analyzer's ACP Measurement Settings in the Modulation Menu

Comm. System	Link or Meas Mode	DEFAULT Sweep Time	Span	RBW	VBW	Trace Detector	Trace point
PDC	UPLINK	10 sec (FULL RATE) 20 sec (HALF RATE)	500 kHz	1 kHz	3 kHz	Positive	501
	DOWNLINK	1.0 sec	500 kHz	1 kHz	3 kHz	Positive	501
PHS	BURST	2.5 sec	2 MHz	3 kHz	10 kHz	Positive	501
	CONTINUOUS	450 msec	2 MHz	3 kHz	10 kHz	Positive	501

Comm. System	Link or Meas Mode	DEFAULT Sweep Time	Span	RBW	VBW	Trace Detector	Trace point
IS-136	UPLINK	10 sec (FULL RATE) 20 sec (HALF RATE)	250 kHz	1 kHz	10 kHz	Positive	501
	DOWNLINK	2.5 sec	250 kHz	1 kHz	10 kHz	Positive	501

5.5 Template Edit function

In TRANSIENT mode, the user can change template. It is necessary to pay attention when entering template, because the data can be interpreted as a relative or absolute value, depending on the setting of Template Couple to Power ON/OFF in the Config menu.

The PASS/FAIL judgment is performed and then the result is displayed on the screen, when Template ON/OFF in the Template menu is set to ON.

5.5.1 Template Setting in the T-Domain Measuring Mode

When Template Couple to Power is set to OFF, template (Y axis data) is interpreted as an absolute value. As a result, the template consists of the data you entered.

Use the Shift X/Y keys to adjust the template position over the measured value.

When Template Couple to Power is set to ON, template (Y axis data) is interpreted as a relative value to the average power.

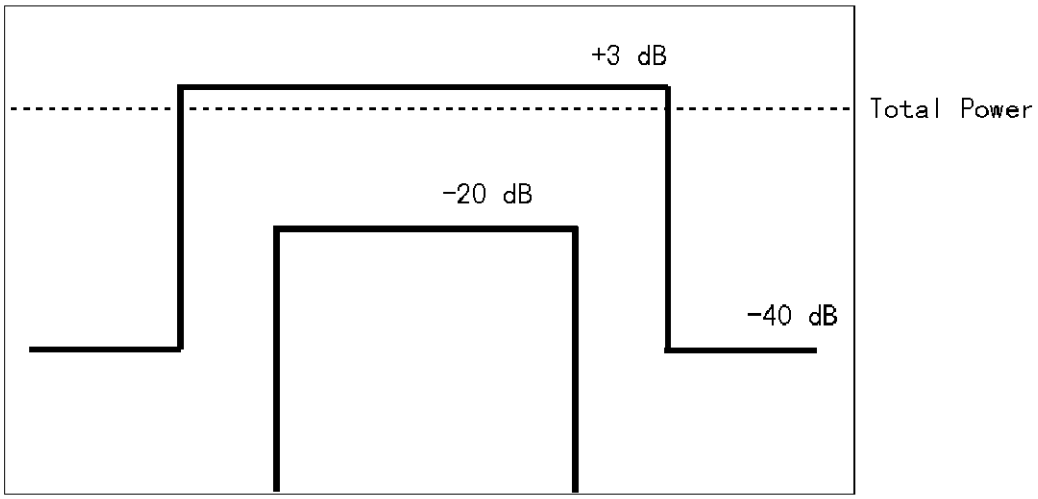


Figure 5-4 Template to Be Set

For example, the above template gives +3 dB and -40 dB of the power during the burst period of the signal. To prepare this template, follow the procedure shown below.

Set the template using the relative value to the average power.

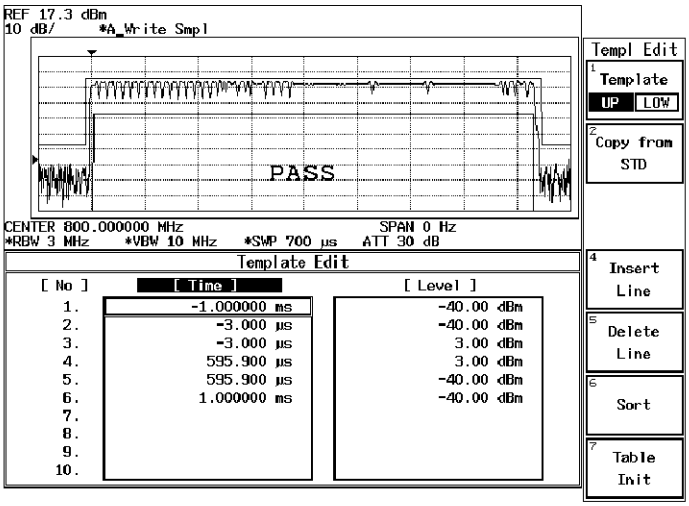


Figure 5-5 Template settings

When you shift the template to the direction of Y axis using Shift X/Y function while the Template Couple to Power is set to ON, the relative value to the average power is: Relative value (set on the template) + Shifted data on Y axis.

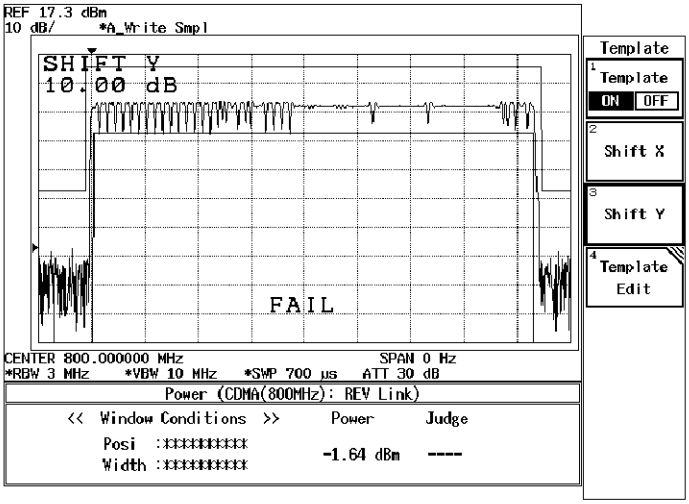


Figure 5-6 Template Shifted Using the Shift Y Function

5.5.2 Template Setting in the F-Domain Measuring Mode

In F-Domain measurement mode, the carrier frequencies depend on the channel numbers. As a result, use the offset frequency from the carrier frequency for template's X axis data.

Set the carrier frequency on the template to 0 Hz so that you can use plus or minus values for the offset frequencies.

The analyzer sets the template by adding the center frequency currently used to X value in the Shift X menu.

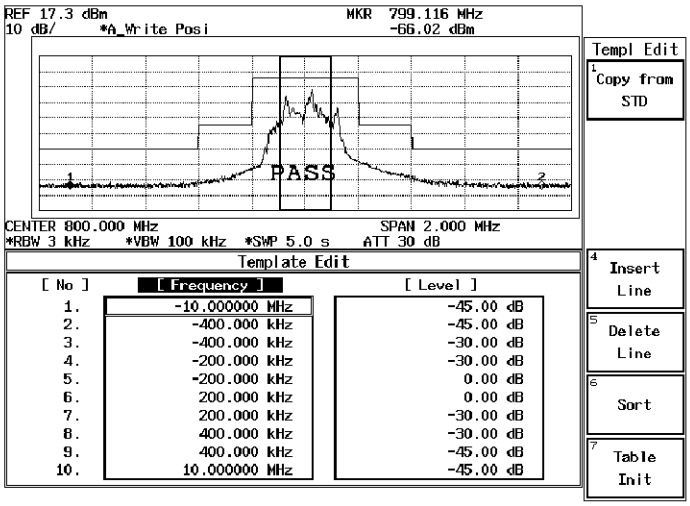


Figure 5-7 Template with the Set Values

Soft menu Margin delta X expands the template frequency by (X/2 to both sides toward plus and minus frequency directions) from the 0 Hz on the template.

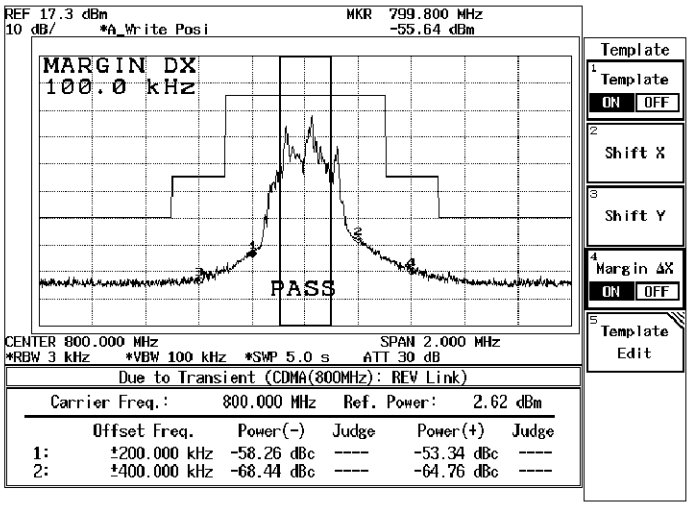


Figure 5-8 Template with Margin Delta X.

When Template Couple to Power is set to OFF, template (Y axis data) is interpreted as an absolute value. As a result, the template is made up of the data you entered.

Use the Shift X/Y keys to adjust the template position over the measured value.

When Template Couple to Power is set to ON, template (Y axis data) is interpreted as a relative value to the average power.

When the template is shifted on Y axis using the Shift X/Y function, the relative value to the average power is: Relative value (set on the template) + Shifted data on Y axis.

5.6 Measurement Parameter Settings in Due to Transient, Due to Modulation and Inband Spurious

In TRANSIENT mode, any parameters are compliant with the communication standard when you specify the communication standard. You can also change the measuring frequency and the secondary processing of the measured results.
For the method of changing these, refer to the following.

5.6.1 Marker Edit Function

Measurement frequency can be set using Marker Edit in Due to Transient, Due to Modulation or Inband Spurious function (these three functions are found within the Transient mode). In addition, each limit level can be set using Marker Edit.

(1) Marker Edit used in the Due to Transient and Due to Modulation

The measuring frequency is set using the offset frequency from a carrier frequency. If you set the offset frequency to 200 kHz, the offset frequencies (+200 kHz and -200 kHz) can be measured. The Normal marker, Integral marker and Root Nyquist marker are available.

Normal marker is used to read the level of the frequency previously set, and the Integral marker is used to calculate the power of the bandwidth whose center frequency is specified by Marker Edit.

When Root Nyquist is selected, calculates the power of the bandwidth to which the Root Nyquist filter is applied. Set the Root Nyquist filter at Config in Parameter Setup.

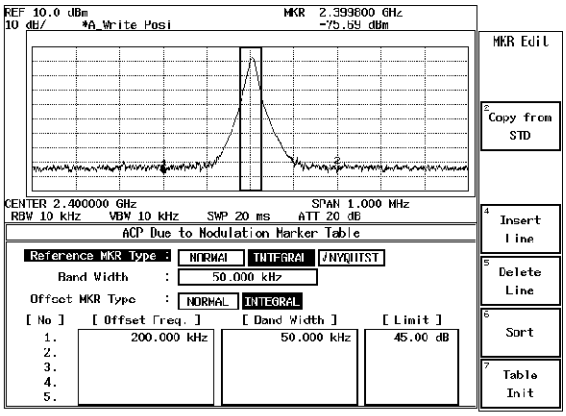


Figure 5-9 Example of Marker Edit Setting

(2) Marker Edit used in the Inband Spurious

Measuring frequency range is set using the offset frequency form the carrier frequency. If you set 3 MHz and 10 MHz, the peak search is performed for two ranges: one of the two offset frequency range is between -3 MHz and -10 MHz; another range is between +3 MHz and +10 MHz.

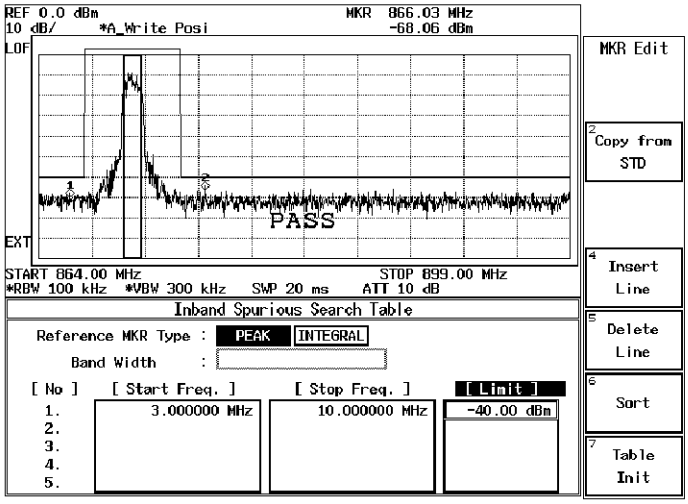


Figure 5-10 Marker Edit Setting

Peak marker is set using the Peak Marker Y Delta soft key in the Config menu.

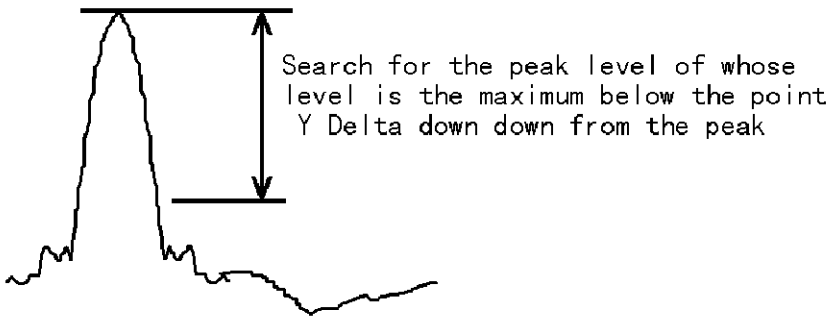


Figure 5-11 Example of Peak Marker Y Delta

5.6.2 Measurement results Using Due to Modulation, Due to Transient and Inband Spurious Modes

In spectrum measurements, there are three methods for displaying results of adjacent or alternate adjacent channel leakage power measurements.

(1) The measured value displays the absolute level of the marker, which is located at an offset frequency from the carrier frequency.

(2) The ratio of the absolute level of the marker to the absolute level of the carrier is displayed. The marker point is located at an offset frequency from the carrier frequency.

(3) The value obtained in (2) is multiplied by the level by the power meter. The calculated value is then displayed.

This method is used when the absolute value of the adjacent channel power cannot be measured. The ratio of the adjacent channel power to the carrier power can be measured only when Detector is set to Posi. However, the absolute level cannot be measured.

NOTE: As for the absolute level of adjacent channel power and the absolute level of carrier frequency, each of these can be defined in two modes:

- *Level at a specific frequency where the marker is located (the marker level is read in such a case)*
- *Level calculated from integration to the specified frequency band*

To display a measured value in (1), select MARKER on the Result : MARKER/RELATIVE/ABS POWER menu in the Parameter Setup dialog box.

To display the measured value in (2), select RELATIVE.

To display a measured value in (3), select ABS POWER. In addition, use the Marker Edit menu to set up measurement conditions for the carrier power. Set the MKR Type to NORMAL or INTEGRAL in the Reference Marker in order to measure the carrier power.

To measure the power of the bandwidth by integration, Reference MKR Type must be set to INTEGRAL.

To measure a point level (marker reading), Reference MKR Type must set to NORMAL.

To measure adjacent channel power, set Offset MKR Type to NORMAL or INTEGRAL. To measure the carrier power in (2) or (3), there are two methods: one is by setting the Marker Edit to the Reference MKR type (set the Ref Power to REF MARKER. Ref Power is in the Parameter Setup dialog box on the config menu); another is to measure power using the DSP (set the Ref Power to MODULATION. Ref Power is in the Parameter Setup dialog box on the config menu).

When REF MARKER is selected, the carrier power is measured by setting Reference MKR Type in the Marker Edit menu.

When MODULATION is selected, the carrier power is measured by Tx Power (Modulation, Tx Power).

When ABS POWER of the Result is selected from the Parameter Setup dialog box in the Config Menu, the ratio of Offset MKR to Reference MKR is calculated, the measurement value from Tx Power is multiplied by this ratio. Then, the result will be displayed.

5.6.3 Measurement Result of Inband Spurious

In Spurious measurements, there are two methods:

(1) After searching for the peak on the trace, the frequency and level at the marker are displayed.

(2) After searching for the peak on the trace, the ratio of the marker level to the carrier level is displayed.

(3) The calculated level, which is calculated using the result obtained in (2) and the level on the power meter is displayed.

To display the measured value in (1), select MARKER on the Result : MARKER/RELATIVE/ABS POWER menu in the Parameter Setup dialog box. And also, to display the measured value in (2), select RELATIVE; for the (3), select ABS POWER. The measurement conditions for the carrier power is set up using the Marker Edit menu. To measure the carrier power, set Reference MKR Type to PEAK or NORMAL.

To measure the carrier power at the specified frequency, NORMAL is set; and to measure the carrier power at the peak on the trace, PEAK is set.

To measure the carrier power in (2) or (3), there are two methods: one is by setting the instrument to the Reference MKR type in the Marker Edit menu; another is by the DSP.

When Ref Power is set to REF MARKER, the carrier power is measured by Reference MKR Type in the Marker Edit menu.

When Ref Power is set to MODULATION, the carrier power is measured by the Tx Power (Modulation, Tx Power).

5.7 Mag Error (Magnitude Error)

Mag Error is defined as shown in Figure 5-12, and the value is calculated using the following formula.

$$\text{Magnitude Error}(i) = \left(\sqrt{Im(i)^2+Qm(i)^2} - \sqrt{Ir(i)^2+Qr(i)^2}\right) \times 100$$

Im(i), Qm(i) : measured value
Ir(i), Qr(i) : Reference value
i : Symbol number

5.8 Phase Error

Phase Error is defined as shown in Figure 5-12, and the value is calculated using the following formula.

$$\text{Phase Error}(i) = \tan^{-1}\left(Qm(i)/Im(i)\right) - \tan\left(Qr(i)/Ir(i)\right)$$

Im(i), Qm(i) : measured value
Ir(i), Qr(i) : Reference value
i : Symbol number

5.9 E.V.M. (Error Vector Magnitude)

E.V.M. is defined as shown in Figure 5-12, and the value is calculated using the following formula.

$$\text{Error Vector Magnitude (i)} = \sqrt{(Im(i) - Ir(i))^2 + (Qm(i) - Qr(i))^2} \times 100$$

Im(i), Qm(i) : measured value
Ir(i), Qr(i) : Reference valuc
i : Symbol number

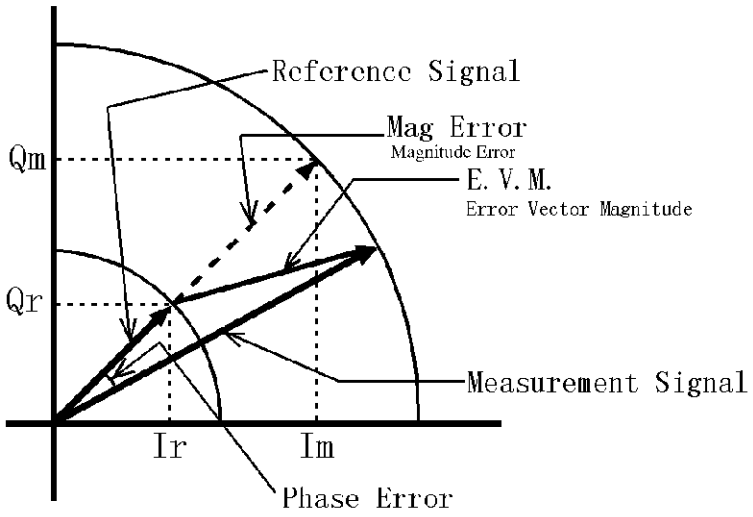


Figure 5-12 Mag Error, Phase Error, E.V.M.

5.10 Block Diagram

This section shows the block diagram for the modulation analysis hardware.

The Figure 5-13 shows the modulation analysis part. Therefore the spectrum analyzer part is simplified. The area inside the double lines is the block diagram for the spectrum analyzer, and the part outside that area represents the modulation analysis hardware.

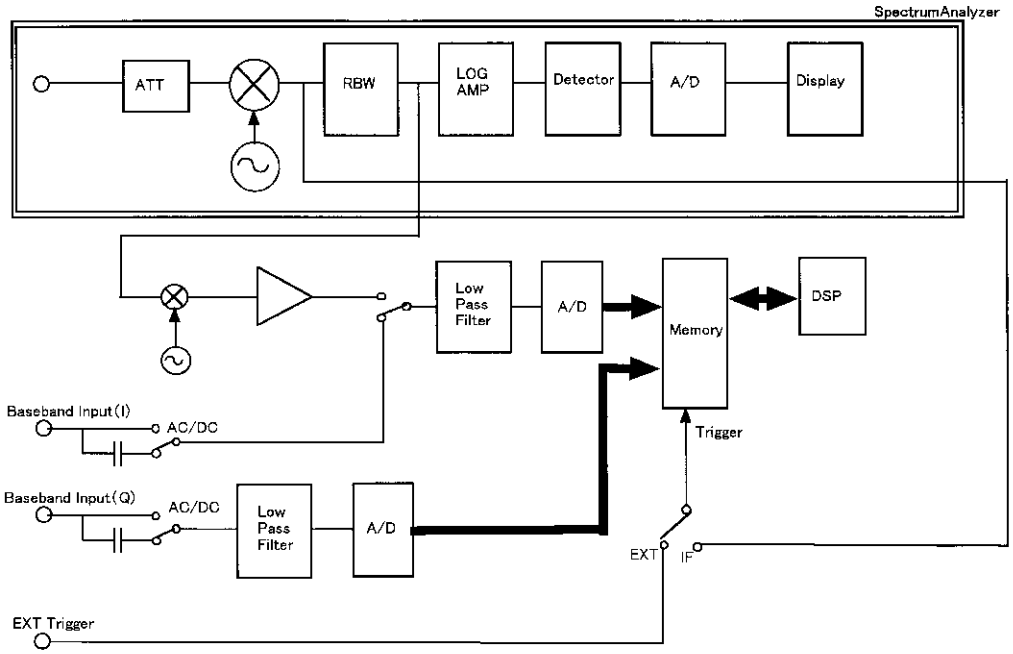


Figure 5-13 Block Diagram

6 PERFORMANCE VERIFICATION TEST

6.1 General

6.1.1 Introduction

This chapter provides R3267 Series performance verification test procedures, item by item as listed in Table 6-1.

Performance verification test will be carried out under following condition.

Temperature range: 20°C to 30°C

Relative Humidity: 85% or less

Table 6-1 Performance Verification Items

No.	Test Items
6.2.1	Modulation Accuracy Measurement for PDC
6.2.2	Modulation Accuracy Measurement for PHS
6.2.3	Modulation Accuracy Measurement for IS-136

6.1.2 Test Equipment

The Table 6-2 lists recommended test equipment.

The equipment needed to perform all of the performance test.

Equipment lists for individual tests are provided in each performance verification test.

In the table, PV is abbreviation of performance verification.

NOTE:
1. ***The R3267 Series with OPT64 to be tested should be warm up for at least 30 minutes before starting test.***
2. ***Make sure that the test equipment used meets its own published specifications.***
3. ***Any equipment that meets the critical specifications given in the table can be substituted for recommended models.***

Table 6-2 Equipment List

No.	Description	Specification required	Recommended Model	Manufacturer	Usage
1	RF Cable	BNC(m)-BNC(m), 50 Ω	MI-09	Advantest	PV
2	Adapter	Type N(m)-BNC(f), 50 Ω	JUG-201A-U	Advantest	PV

6.1.3 Calibration Cycle

The performance verifications test should be used to check the spectrum analyzer against its specifications once a year recommended.

6.1.4 Performance Verification Test Record Sheet

The performance verification test record sheets are provided at the end of this chapter.

The test record lists test specification and acceptable limits.

Recommend that make a copy of this table, record the complete test results on the copy, and keep the copy for calibration test record.

This record could prove invaluable in tracking gradual changes in test result over long periods of the time.

6.1.5 Performance Verification Procedures

Typeface conventions used in this manual.

- Panel keys and soft keys are printed in a contrasting typestyle to make them stand out form the text as follows:

  Panel keys: Boldface type Example: **FREQ**, **FORMAT**
  Soft keys: Boldface and Italic Example: ***Center***, ***Trace Detector***

- When a series of key operations are described using a comma between two keys.
- There are various soft menus used to switch between two states such as ON/OFF and AUTO/MNL.

For example, when turning off the ***Display ON/OFF*** function, the annotation "***Display ON/OFF*** (OFF)" is used.

When switching the ***RBW AUTO/MNL*** function to MNL, the annotation "***RBW AUTO/MNL*** (MNL)" is used.

6.2 Performance Verification Test Procedure

This section provides performance verification test procedure for R3267 Series OPT 63.

Built-in calibration signal is used for performance verification.

6.2.1 Modulation Accuracy Measurement for PDC

(1) Description

Test carrier frequency accuracy and modulation accuracy for PDC.

(2) Specification

Carrier Frequency Accuracy: < ±5 Hz

Modulation Accuracy: < 1%

(3) Equipment used

RF Cable: BNC (m)-BNC (m)

Adapter: N (m)-BNC (f)

(4) Setup

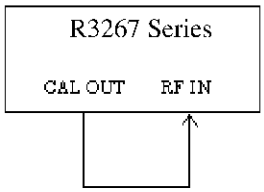


Figure 6-1 Setup of Modulation Accuracy Measurement for PDC, PHS and IS-136

(5) Procedure

1. Connect equipment as shown in Figure 6-1.
2. On the R3267 Series, after preset, set control as follow:

   Center Frequency: 29.997375 MHz

3. On the R3267 Series, set the STD parameter as shown Figure 6-2.

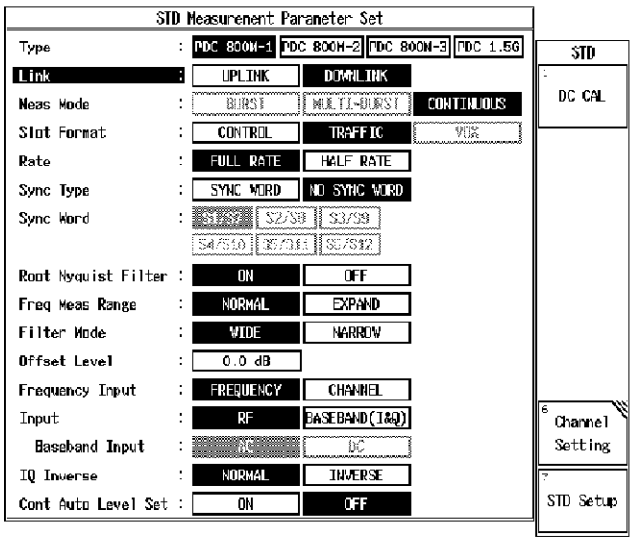


Figure 6-2 Setup of Parameter for Phase Accuracy Measurement (PDC)

4. On the R3267 Series, press ***DC CAL***, ***Modulation Accuracy*** and ***AUTO LEVEL***.

5. On the R3267 Series, press **SINGLE** for single sweep.

6. After single sweep has completed, record the measurement result in the performance verification record sheet.

6.2.2 Modulation Accuracy Measurement for PHS

(1) Description

Test carrier frequency accuracy and modulation accuracy for PHS.

(2) Specification

Carrier Frequency Accuracy: < ±20 Hz

Modulation Accuracy: < 1%

(3) Equipment used

RF Cable: BNC (m)-BNC (m)

Adapter: N (m)-BNC (f)

(4) Procedure

1. Connect equipment as shown in Figure 6-1.
2. On the R3267 Series, after preset, set control as follow:

   Center Frequency: 29.976 MHz
3. On the R3267 Series, set the measurement parameter as shown in Figure 6-3.

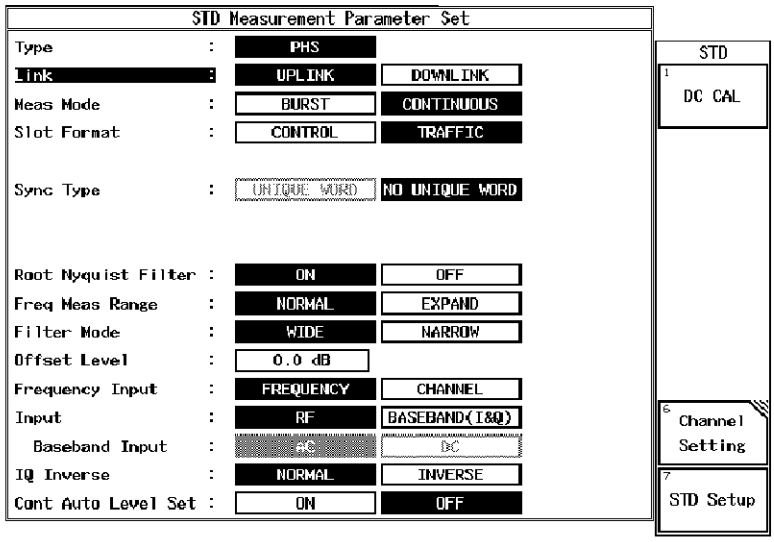


Figure 6-3 Setup of Measurement Parameter for Modulation Accuracy (PHS)

4. On the R3267 Series, press ***DC CAL***, ***Freq Deviation*** and ***AUTO LEVEL***.
5. On the R3267 Series, press **SINGLE** for single sweep.
6. After single sweep has completed, record the measurement result in the performance verification record sheet.

6.2.3 Modulation Accuracy Measurement for IS-136

(1) Description

Test carrier frequency accuracy and modulation accuracy for IS-136.

(2) Specification

Carrier Frequency Accuracy: < ±5 Hz

Modulation Accuracy: < 1%

(3) Equipment used

RF Cable: BNC (m)-BNC (m)

Adapter: N (m)-BNC (f)

(4) Procedure

1. Connect equipment as shown in Figure 6-1.
2. On the R3267 Series, after preset, set control as follow:

   Center Frequency: 29.996963 MHz
3. On the R3267 Series, set the measurement parameter as shown in Figure 6-4.

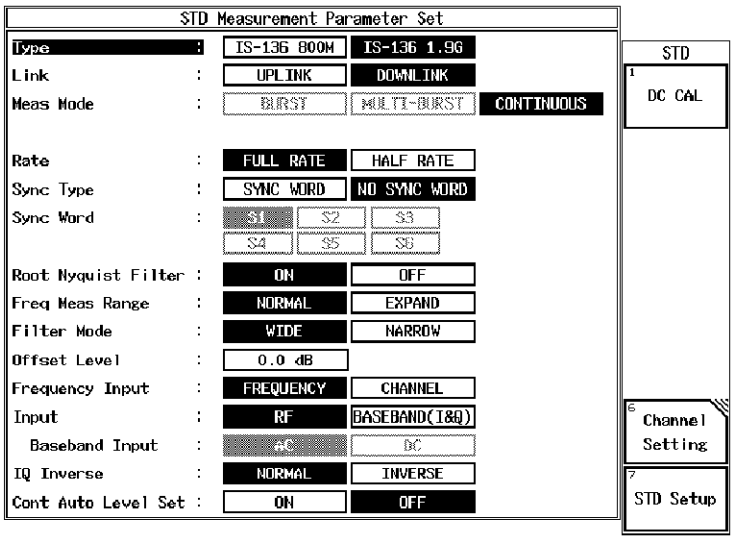


Figure 6-4 Setup of Measurement Parameter for Modulation Accuracy (IS-136)

4. On the R3267 Series, press ***DC CAL***, ***Freq Deviation*** and ***AUTO LEVEL***.
5. On the R3267 Series, press **SINGLE** for single sweep.
6. After single sweep has completed, record the measurement result in the performance verification test record sheet.

6.3 Performance Verification Test Record Sheet

Model: OPT3264/67/73+64

S/N:

(1) Modulation Accuracy Measurement for PDC

Items	Specification			Result
	Min.	Measured Value	Max.	Pass/Fail
Carrier Frequency Accuracy	-5 Hz		+5 Hz	
Modulation Accuracy	N/A		1%	

(2) Modulation Accuracy Measurement for PHS

Test Items	Specification			Result
	Min.	Measured Value	Max.	Pass/Fail
Carrier Frequency Accuracy	-20 Hz		+20 Hz	
Modulation Accuracy	N/A		1%	

(3) Modulation Accuracy Measurement for IS-136

Test Items	Specification			Result
	Min.	Measured Value	Max.	Pass/Fail
Carrier Frequency Accuracy	-5 Hz		+5 Hz	
Modulation Accuracy	N/A		1%	

7 SPECIFICATIONS

RF input

PDC/IS136 measurement

Characteristics	Description
Measurement frequency range	30 MHz to 3.0 GHz
Input level range	-30dBm to +30 dBm
Frequency error accuracy	< ±(Reference frequency accuracy × Carrier frequency + 5 Hz)
Frequency error measurement range Normal Expand	 < ±1.4 kHz < ±5 kHz
Modulation accuracy Measurement accuracy	 < ±1% ±(measured value) × ±2%
Transfer rate	< 1 ppm

PHS measurement

Characteristics	Description
Measurement frequency range	30 MHz to 3.0 GHz
Input level range	-30dBm to +30 dBm
Frequency error accuracy	< ±(Reference frequency accuracy × Carrier frequency + 20 Hz)
Frequency error measurement range Normal Expand	 < ±13 kHz < ±50 kHz
Modulation accuracy Measurement accuracy	 < ±1% ±(measured value) × ±2%

APPENDIX

A.1 Messages

In this section, the messages that are displayed while the analyzer is being used are described.

Code	Messages	Description
700	System Error. Cannot allocate the required memory.	Fatal Error occurred. Data area for the calculation is insufficient on the memory. Contact a sales representative.
701	System Error. Clock is not operational.	Fatal Error occurred. System clock is not in operation. Contact a sales representative.
702	Modulation Gain CAL error. Check 30 MHz CAL signal for connection.	
703	Modulation DC CAL error. Remove input signals and try again.	
704	Time Out! No Trigger Detected	Time out error on the trigger signal occurred. Check the trigger settings.
705	Input Level is out of Range. Check the Ref. level.	
706	No graph data. Execute measurement.	
708	System Error. Contact qualified engineer.	
710	Auto Level completed !	
711	Auto Level Set can not be succeed. Signal level is not stable.	
715	Frequency Error is out of Meas. Range.	
716	Cannot execute measurement in the selected Meas Mode. Change Meas Mode.	
717	Cannot execute measurement. Set Sync Type SYNC WORD (UNIQUE WORD).	

Code	Messages	Description
718	Sync Word (Unique Word) is not detected. Check Sync Word (Unique Word).	
719	Burst signal is not detected. Check Burst length or Ref. level.	
720	Data detection error. Check the input signal.	
721	Modulation Gain CAL error!(#100) Check 30 MHz CAL signal for connection.	
722	Modulation Gain CAL error!(#200) Check 30 MHz CAL signal for connection.	
723	Modulation Gain CAL error!(#300) Check 30 MHz CAL signal for connection.	
724	Modulation Gain CAL error!(#110) Check 30 MHz CAL signal for connection.	
725	Modulation Gain CAL error!(#120) Check 30 MHz CAL signal for connection.	
726	Modulation Gain CAL error!(#210) Check 30 MHz CAL signal for connection.	
727	Modulation Gain CAL error!(#220) Check 30 MHz CAL signal for connection.	
728	Modulation Gain CAL error!(#310) Check 30 MHz CAL signal for connection.	

Code	Messages	Description
729	Modulation Gain CAL error!(#320) Check 30 MHz CAL signal for connection.	
735	Cannot measure Baseband signal.Set Iput to RF.	The baseband signal cannot be measured. Set the Input to RF.
750	Handshake error occurred to DSP. Contact qualified engineer.	
751	Cannot Detect Mod. DSP board. Contact qualified engineer.	
795	System Error. Memory test failed. (#0)	A memory error was detected. Contact a sales representative.
796	System Error. Memory test failed. (#1)	A memory error was detected. Contact a sales representative.
797	System Error. Memory test failed. (#2)	A memory error was detected. Contact a sales representative.
798	System Error. Memory test failed. (#3)	A memory error was detected. Contact a sales representative.

ALPHABETICAL INDEX

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