ADVANTEST

ADVANTEST CORPORATION

R3465 Series OPT08

Rx Control Option

Operation Manual

MANUAL NUMBER FOE-8311285C00

Applicable models

-R3463
-R3465

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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

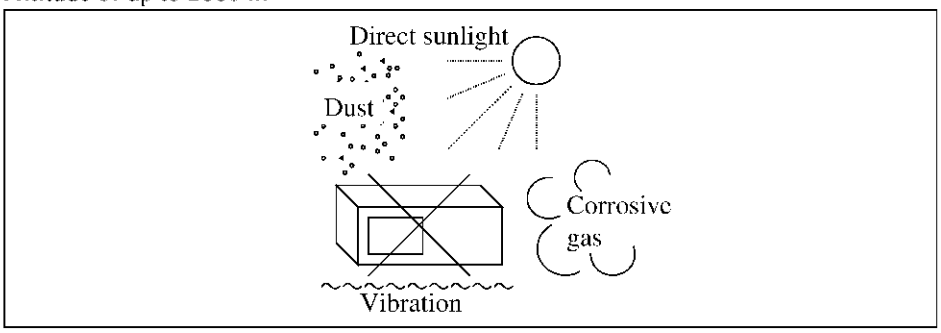


Figure-1 Environmental Conditions

- Operating position

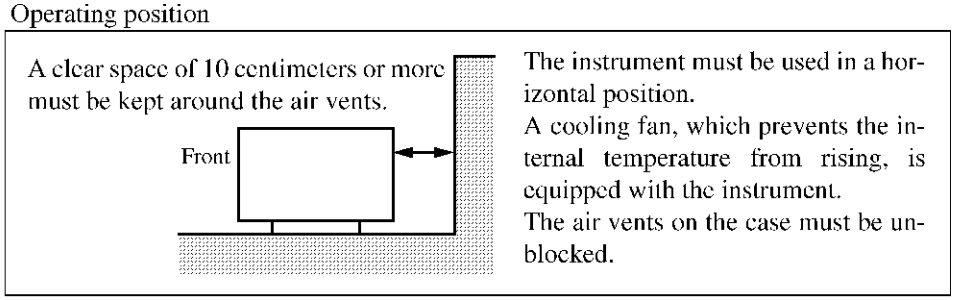


Figure-2 Operating Position

- Storage position

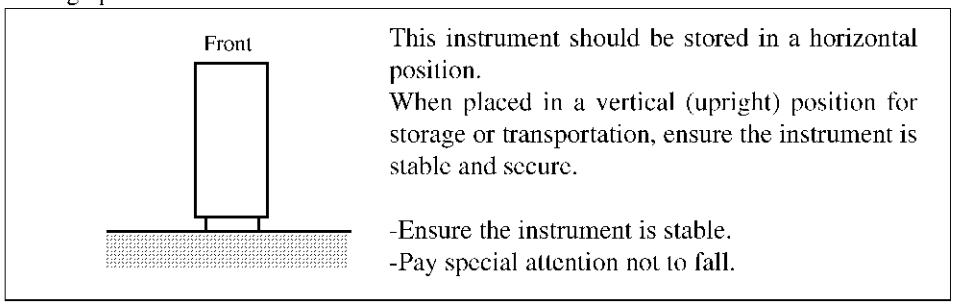


Figure-3 Storage Position

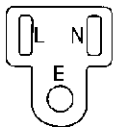
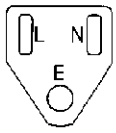
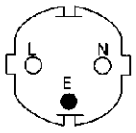
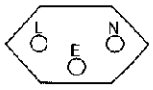
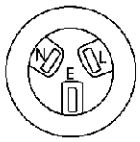
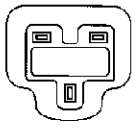
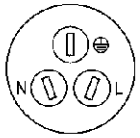
- The classification of the transient over-voltage, which exists typically in the main power supply, and the pollution degree is defined by IEC61010-1 and described below.

  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

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LIST OF TABLES

1 OUTLINE OF THE PRODUCT

This chapter has summarized the option.

1.1 Outline

This option connects modulation spectrum analyzer R3465 series and PDC/PHS receiver test set R3560 or CDMA test source R3561 to enable R3560 or R3561 setting and measurement from the panel of R3465 series.

<Features>

(1) Various settings of R3560 or R3561 can be performed from the front panel of R3465 series.

Parameters that can be set:
Frequency, level, modulation type, etc.

(2) Measurement of R3560 can be performed from the front panel of R3465 series.
Also, the measurement results can be shown on the display of R3465 series.
The items that can be measured from R3465 series are as follows.

Measurement items:

- BER measurement
- Receiver Sensitivity (Sens.) measurement

(3) R3560 or R3561 can be controlled from the application program which uses Program Loader option (OPT15) of R3465 series.

CAUTION:

1. ***To control the R3561, the CDMA measurement option (OPT 61) must be installed in the R3465 series.***
2. ***R3560 or R3561 GPIB code is not supported in this option. Also, this option does not provide special GPIB commands. Therefore, R3560 or R3561 cannot be controlled by using R3560 or R3561 GPIB command from GPIB port of R3465 series, and also the function of this option cannot be controlled from GPIB.***
   When you control R3465 series and R3560 or R3561 from GPIB by using external personal computer, connect the external computer to both GPIB ports and control them individually.
3. ***The control function of R3560 or R3561 may not be supported depending on Program Loader option (OPT15) version.***
   Before using, contact the nearest ADVANTEST Field Office or representative.
4. ***Some functions may not be supported depending on the version of the R3560 main unit.***
   Before using, contact the nearest ADVANTEST Field Office or representative.

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2 BEFORE STARTING

This chapter provides a description of the confirmation of accessories and the connection to R3560 or R3561.

2.1 Confirmation of the accessories

Check the quantity and rating of standard accessories to assure their conformance with Table 2-1.

Table 2-1 Standard accessories

Items	Specification (Type)	Quantity	Remarks
R3560 interface cable	A01274	1	
R3465 Series Option08 Operation Manual	ER3465OPT08	1	English

Note: Please inform ADVANTEST the type when you order additional accessories.

2.2 How to connect to R3560 or R3561

2.2.1 Connecting the R3465 to R3560

① Connections on the rear panel

Connect the cable (see note *1) from the serial I/O connector on the R3465 to the serial I/O connector on the R3560 as shown in Figure 2-1.

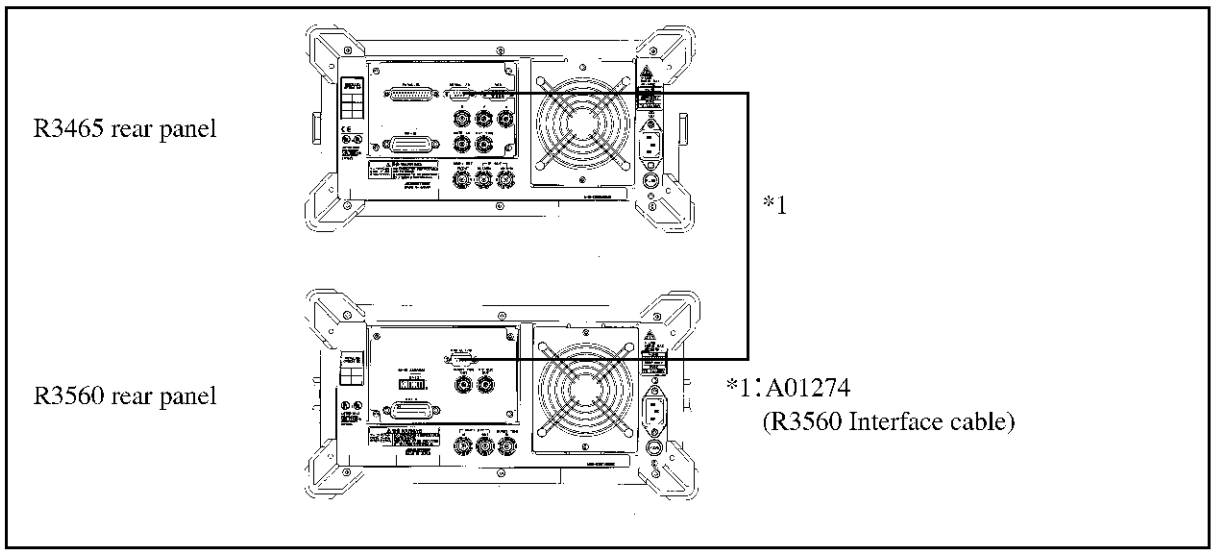

Figure 2-1 Connection between R3465 series and R3560 (Rear panel)

②Connections on the front panel

Connect the cable (see note *2) from the INPUT 50Ω on the R3465 series to the TO ANALYZER 50Ω on the R3560 as shown in Figure 2-2.

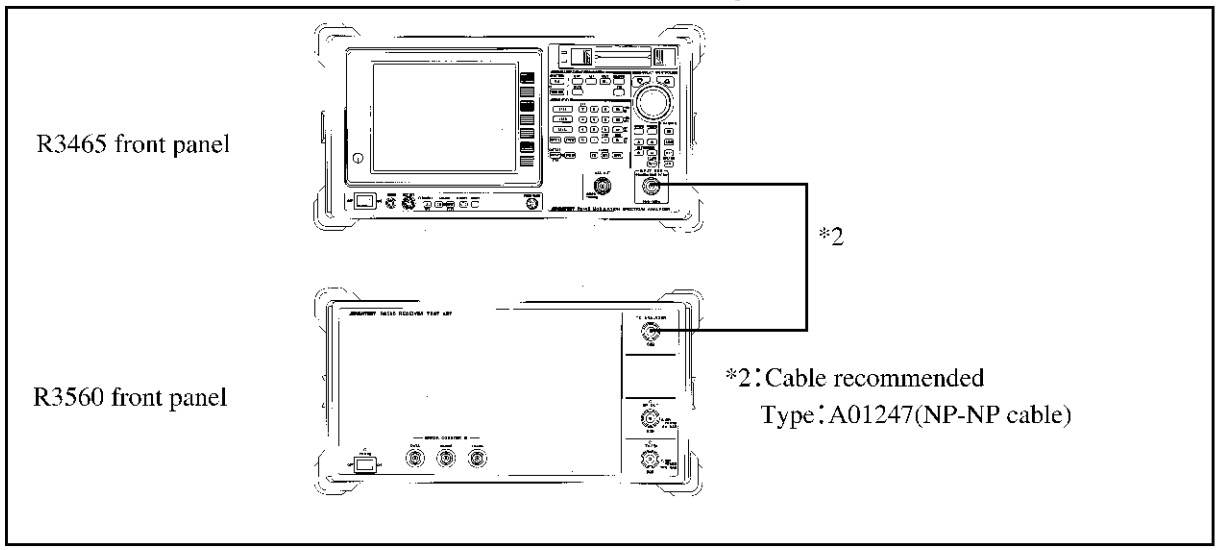

Figure 2-2 Connection between R3465 series and R3560 (Front panel)

2.2.2 Connecting the R3465 to R3561

Connections on the rear panels.

Connect the cable (see note *1) from the serial I/O connector on the R3465 to the serial I/O connector on the R3561 as shown in Figure 2-3 which shows the R3465 and R3561 rear panels.

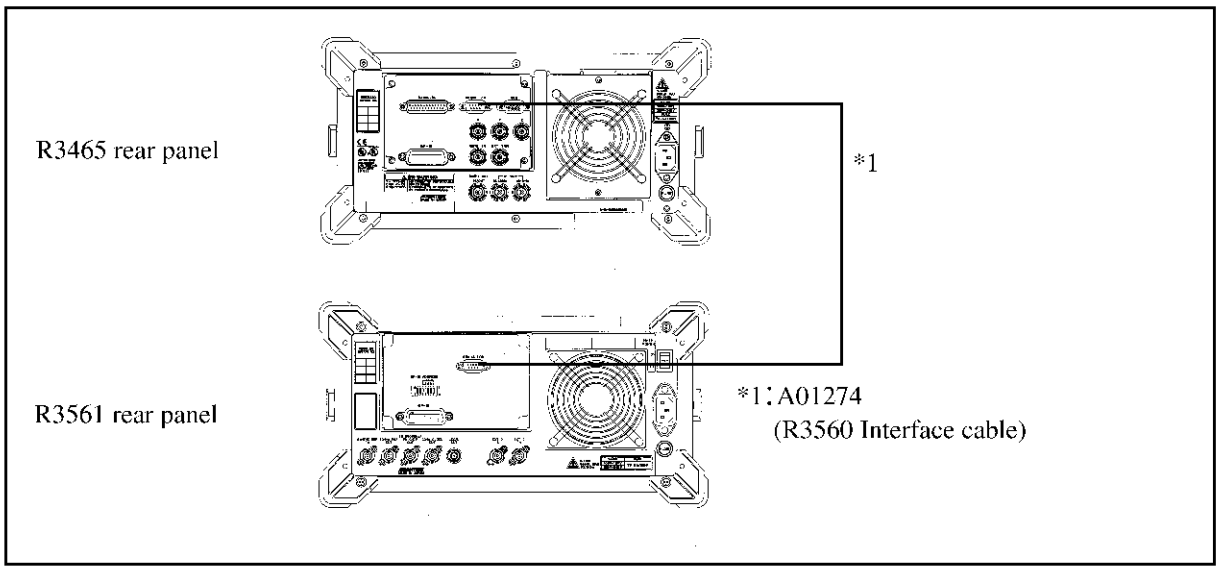

Figure 2-3 Connection between R3465 series and R3561 (Rear panel)

2.3 Serial port setting

Pressing **LCL** and ***RS232*** displays the serial port setting menu.
Before using OPT08, check that Rx Control is selected. If a mode other than Rx Control is selected, change the mode to Rx Control.

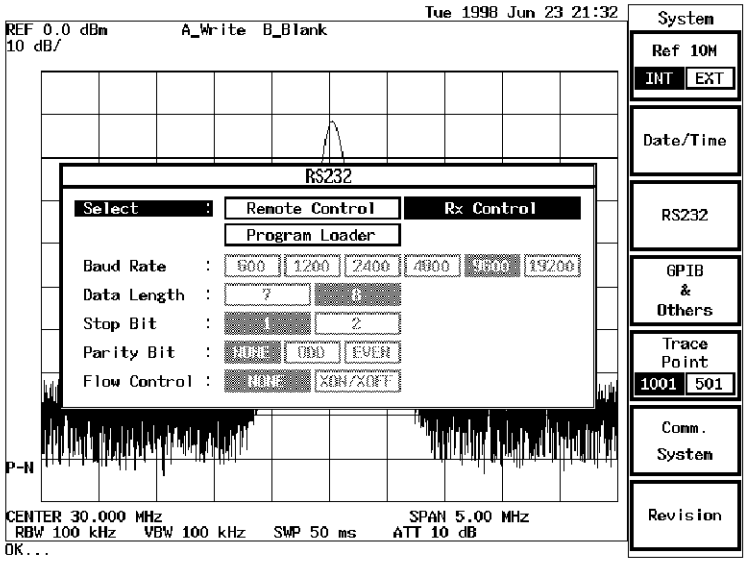

Figure 2-4 Serial port selection screen

2.4 Switching the Standard Measuring function

The R3465 standard measuring function must be switched as shown below depending on which of the R3560 or R3561 was used.

For the R3560: PDC, PHS or NADC
For the R3561: CDMA

NOTE: ***The CDMA measurement option (OPT 61) must be installed in the R3561.***

Follow the procedure below

1. Press **LCL** then ***Comm.System*** to display the dialog box in Figure 2-5.

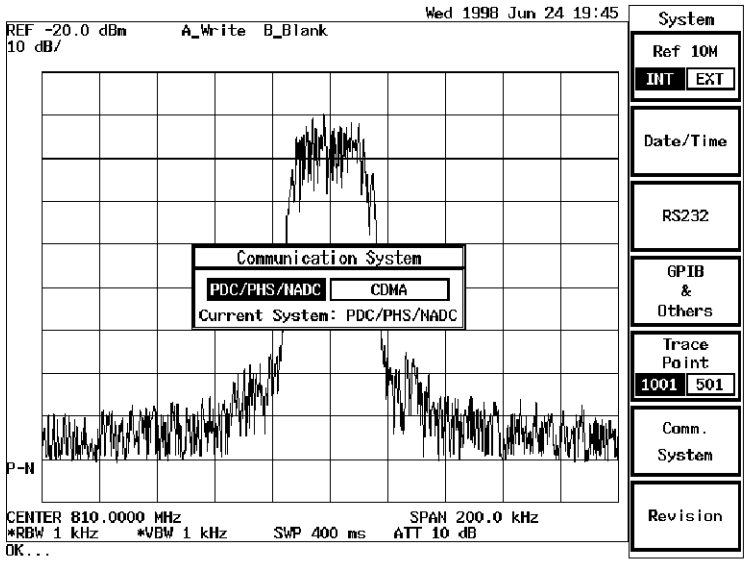

Figure 2-5 Dialog box

2. Select a communication system(PDC/PHS/NADC or CDMA with the data knob.

3. Press **Hz** or the data knob to determine the setting.
Then a box for a confirmation appears. If you want to make the setting effective, select ***Confirm***. If making it ineffective,select ***Cancel*** and press **Hz**.

4. If the power is turned off once then turned on, the communication system to be measured and the menu for measurement are switched. Then either PDC/PHS/NADC standard measurement or CDMA standard measurement becomes executable according to your selection.

NOTE: ***After the system is switched by using Comm. System, always execute a calibration.***

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3 HOW TO OPERATE THE R3560

This chapter describes all key functions of the R3560.

3.1 Outline

The operation menu of R3560 is placed under the **ADVANCE**.

Press **ADVANCE** and ***Rx Test***, R3465 series becomes R3560 control mode and displays Initial screen shown in Figure 3-1 to set and measure R3560.

In this mode, operation with only soft-key or dialog box becomes effective except **FREQ** and **LEVEL**. The operation with **SPAN** , **BW** and so on which can be used in ordinary operation mode cannot be performed.
In order to return to the ordinary operation mode, press **CW**, **TRANSIENT** or ***Quit***.

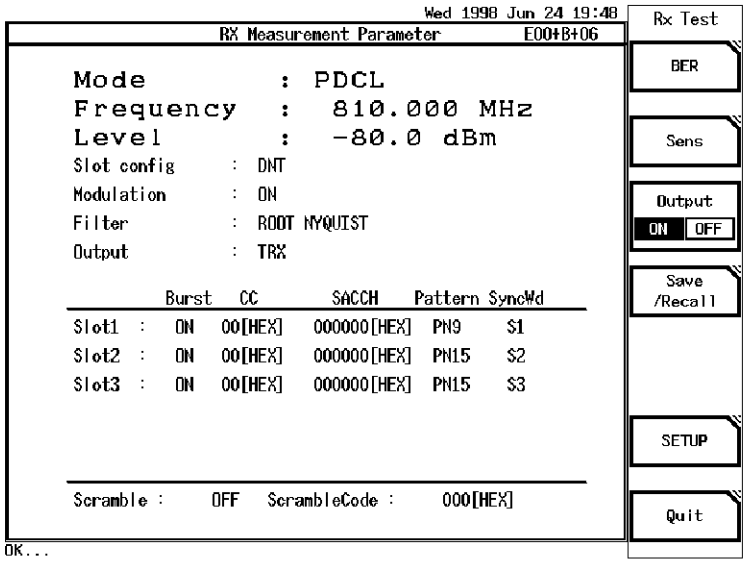
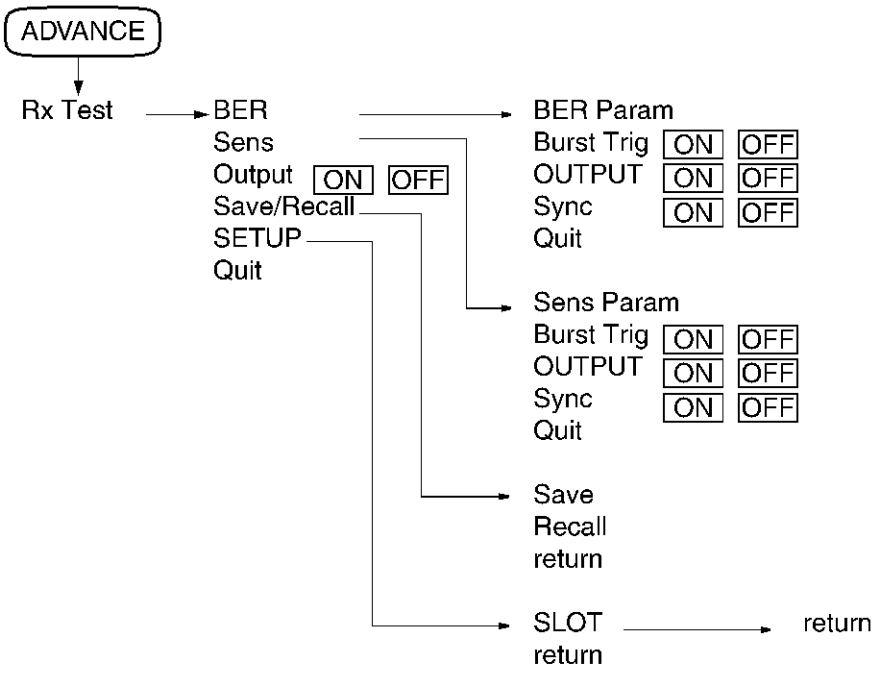


Figure 3-1 Initial screen

3.2 List of Soft menus

All R3560 soft menus, which are under the **ADVANCE** key, are shown below.



3.3 Function of Each key

(1) Output frequency setting

FREQ

Sets output frequency.
The frequencies which can be set are different depending on the system mode.

PDCL: PDC 800 MHz band
PDCH: PDC 1.5 GHz band
DNT : Downlink traffic channel
UPT : Uplink traffic channel
PHS : 1.9GHz band

(2) Output level setting

LEVEL

Sets output level.
Maximum output levels are different depending on RF terminal or Tx/Rx terminal.

Terminal	Maximum output	Minimum output	Output step
Tx/Rx	-7dBm	-125Bm	0.1dB
RF	+6dBm	-125 Bm	0.1dB

(3) Output ON/OFF setting

Output ON/OFF

Switches the signal of the output terminal to ON/OFF.

(4) Save/Recall setting

(a) Saving

Saves all currently-set conditions to the R3560 backup memory according to the specified memory number.

Save/Recall*, *Save

The save operation screen is displayed. To select the memory number and to execute data saving, use a knob.

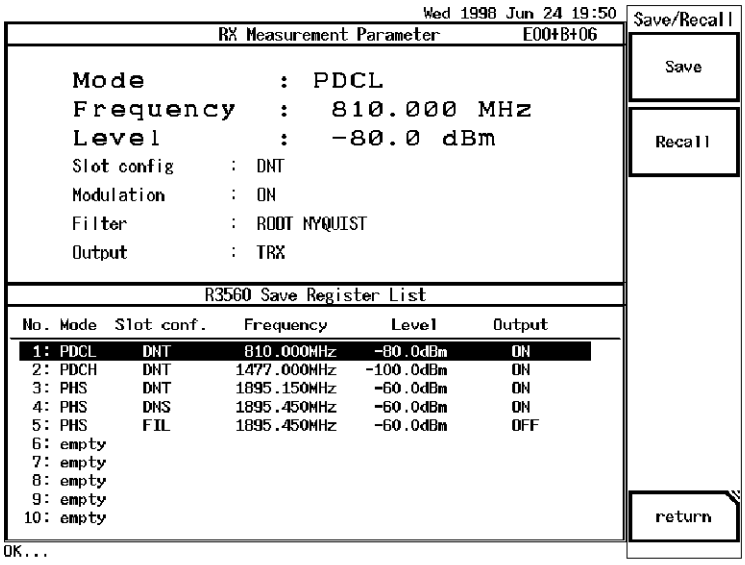


Figure 3-2 Save operation screen

In the save operation screen, the major settings inside the R3560 backup memory are displayed.

Details on the settings are explained below.

No	: The memory number is displayed.
Mode	: The set system mode is displayed.
Slot conf	: The set pattern of the slot is displayed.
Frequency	: The set output frequency is displayed. (The unit is fixed to MHz.)
Level	: The set output level is displayed. (The unit is fixed to dBm.)
Output	: The set condition (ON or OFF) of the data output is displayed.

NOTE: ***When empty is displayed after the column of No., it shows that no condition is saved to that memory number.***

(b) Recalling

Re-sets all set conditions of the memory according to the specified memory number of the R3560 backup memory.

Save/Recall, Recall

The recall operation screen is displayed. To select the memory number and to execute data recalling, use a knob.
The explanation of the recall operation screen is the same as that of the save operation screen. Refer to the explanation in the above (a).

(5) System mode and slot setting

Sets R3560 system mode and slot configuration, etc.

SETUP

The dialog box is displayed on the screen to set the system mode and the slot configuration, etc.

* How to operate the dialog-box

The operation to select the set items and set parameters is performed using the data knob and step keys in the same manner as the standard dialog-box in the R3465.

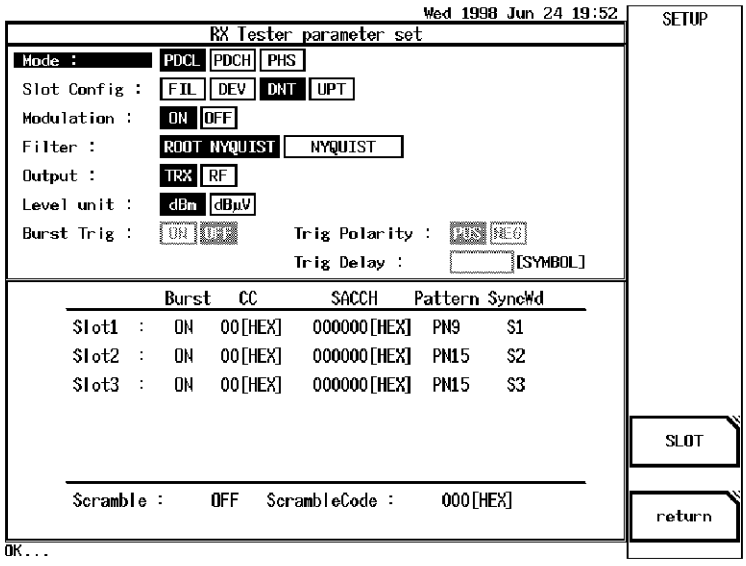


Figure 3-3 SETUP setting screen

Mode: Set R3560 system mode.
PDCL : PDC system 800 MHz band
PDCH : PDC system 1.5 GHz band
PHS : PHS system

Slot Config: Sets slot pattern.
FIL : FILL pattern
DEV : Frame for device evaluation
DNT : Downlink traffic channel
UPT : Uplink traffic channel
DSYNC : Downlink synchronization burst frame (PHS only)
USYNC : Uplink synchronization burst frame (PHS only)

Modulation: Switches modulation and non-modulation of the output.
ON : Modulation signal (π/4 DQPSK)
OFF : Non-modulation signal (cw)

Filter: Switches the base band filter.
RNYQ : Root Nyquist filter
NYQ : Nyquist filter

Output: Switches the signal output terminal.
TRX : Tx/Rx terminal
RF : RF terminal

Level unit: Selects the setting of signal level and the display unit.
dBm : Sets the level unit to dBm.
dBμV : Sets the level unit to dBμVemf.

Burst Trig: (*1) Selects ON or OFF to make the Burst Trigger function enabled or disabled. This setting can be made from the SoftKey menu in the BER/SENS measurement screen.
ON : Enables the Burst Trigger function.
OFF : Disables the Burst Trigger function.

Trig Polarity: Selects POS or NEG to make the rising edge or the falling edge of the input signal of the R3560 Burst Trigger in terminal enabled.
POS : Selects the rising edge.
NEG : Selects the falling edge.

Trig Delay: Sets the delay from the input signal of the R3560 Burst Trigger in terminal in symbols.
When a signal effective to the Burst Trigger in terminal is gotten,delay can be changed within ±10 symbols (resolution of 0.1 symbols) based on the time "T" (see Table 3-1 and Figure 3-4) defined according to the system mode and the rate.

*1: The timing to output the R3560 RF signal is controlled by synchronizing with the input signal of R3560 Burst Trigger in terminal.
This function takes effect when the modulation is in the ON state and settings of the system mode and the slot configuration are as shown in Table 3-2 Conditions.

Table 3-1 Time defined according to the system mode and the rate

System mode	Rate	Time "T" defined according to the system mode
PDCL/PDCH	FULL	20[msec]
	HALF	40[msec]
PHS		5[msec]

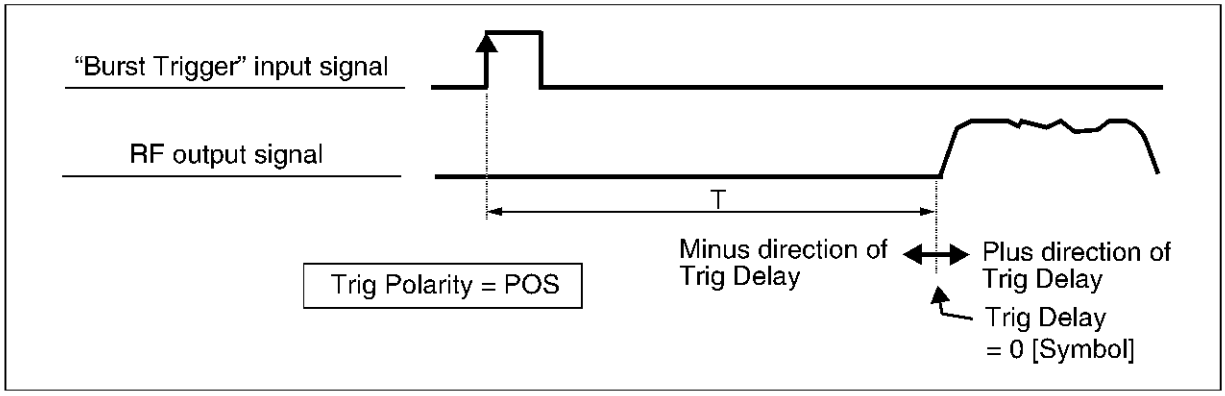


Figure 3-4 Timing of RF signal output vs the Burst Trigger input signal

Table 3-2 Effective setting condition in Burst Trigger functions

System mode	Slot configuration					
	FIL	DEV	DNT	UPT	DSYNC	USYNC
PDCL	×	○	×	○	Not set	
PDCH						
PHS			○		○	○

○ : Effective ×: Ineffective

SETUP, SLOT

The dialog box to set modulation pattern and communication rate in the slot is displayed.

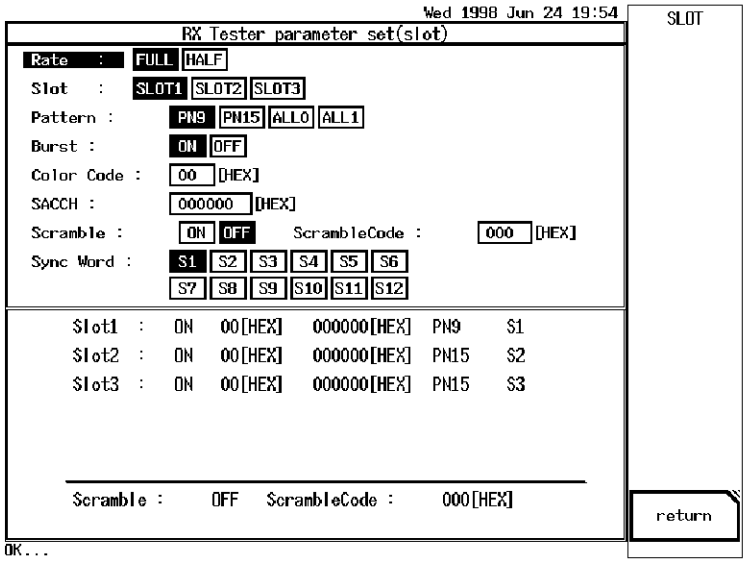


Figure 3-5 SLOT setting screen

Rate: Switch the communication rate.
The setting can be performed only when the system mode is PDCL/PDCH.
FULL : Full rate
HALF : Half rate

Slot: Specify to which slot the Pattern, Burst, Color Code, and SACCH are set.

Pattern: Select a pattern of the user information transmiting channel of traffic channel for PDC, information channel I of traffic channel for PHS, and pseudo random pattern (frame for device evaluation or continuous pseudo random pattern).
PN9 : PN9 pattern
PN15 : PN15 pattern
ALL0 : ALL 0 pattern
ALL1 : ALL 1 pattern

Burst: (*1)
Switch ON/OFF of the current slot which was selected at Slot.
ON : Sets the slot to ON.
OFF : Sets the slot to OFF.

Color Code: (*1, *2)
Set the color code in the slot.
The setting can be performed only when the system mode is PDCL/PDCH.
The setting range is 0 to FF in hexadecimal.

SACCH: (*2)
Set slow associated control channel.
The setting can be performed only when the slot configuration is DNT/UPT.
The setting range is as Table 3-3 with hexadecimal.

Table 3-3 SACCH settable range

System mode	Slot configuration		Setting range of SACCH	
			Minimum value	Maximum value
PDCL/PDCH	Downlink traffic channel Uplink traffic channel	: DNT : UPT	0 (Hexadecimal) 0 (Hexadecimal)	1FFFFF (Hexadecimal) 7FFF (Hexadecimal)
PHS	Downlink traffic channel Uplink traffic channel	: DNT : UPT	0 (Hexadecimal) 0 (Hexadecimal)	FFFF (Hexadecimal) FFFF (Hexadecimal)

Scramble: (*1)
The setting to perform or not to perform scramble control to traffic channel for PDC communication, traffic channel, and synchronization burst for PHS communication.
The ranges of the scramble are different depending on the communication system, uplink/downlink, and so on. Refer to R3560 operation manual for details.
ON : The scramble control is performed.
OFF : The scramble control is not performed.

*1: The setting may be limited depending on the state of the slot configuration. Refer to R3560 Operation Manual Slot Configuration for details.

*2: The input is performed in hexadecimal. The input of A to F in hexadecimal is performed as follows with the shift key.

Input value	Operation
A:	Shift → 0
B:	Shift → 1
C:	Shift → 2
D:	Shift → 3
E:	Shift → 4
F:	Shift → 5

Scramble Code: Set scramble pattern.
(*2) The setting ranges are different depending on the system mode.

Table 3-4 Scramble pattern setting range

System mode	Setting range	
	Minimum value	Maximum value
PDCL/PDCH	0 (Hexadecimal)	1FF (Hexadecimal)
PHS	0 (Hexadecimal)	3FF (Hexadecimal)

User Scramble: Set to do user scramble or not to do user scramble to the physical slot for communication.
The setting can be performed only when the system mode is PHS.
ON : The user scramble is performed.
OFF : The user scramble is not performed.

User Scramble Code:
(*2) Set user scramble pattern to the traffic channel.
The setting range of the user scramble pattern is 0 to FFFF in hexadecimal.

PS: Calling identification pattern is set.
(*2) The setting can be performed only when the system mode is PHS and the slot configuration is USYNC/DSYNC.
The setting range is 0 to FFFFFFF in hexadecimal.

CS: Called identification pattern is set.
(*2) The setting can be performed only when the system mode is PHS and the slot configuration is USYNC/DSYNC.
The setting range is 0 to 3FFFFFFFFFF in hexadecimal.

*2: The input is performed in hexadecimal. The input of A to F in hexadecimal is performed as follows with the shift key.

Input value	Operation
A:	Shift → 0
B:	Shift → 1
C:	Shift → 2
D:	Shift → 3
E:	Shift → 4
F:	Shift → 5

Sync Word: Specify the slot and change the synchronization word. This command can be set when the system mode is PDCL or PDCH and the slot configuration is UPT or DNT. Setting value of the synchronization word is shown in Table 3-5.

Table 3-5 Setting value of the synchronization word

Sync word No.	20-bit synchronization word pattern (hexadecimal)	
	DNT	UPT
S1	87A4B	785B4
S2	9D236	62DC9
S3	81D75	7E28A
S4	A94EA	56B15
S5	5164C	AE9B3
S6	4D9DE	B2621
S7	31BAF	CE450
S8	1E56F	E1A90
S9	E712C	18ED3
S10	FBC1F	043E0
S11	8279E	7D861
S12	98908	676F7

Note: S1 to S12 in the table correspond to the 20-bit synchronization word pattern numbers of STD-27.

(6) BER measurement

BER

Enters into BER (Bit Error Rate) measurement mode.

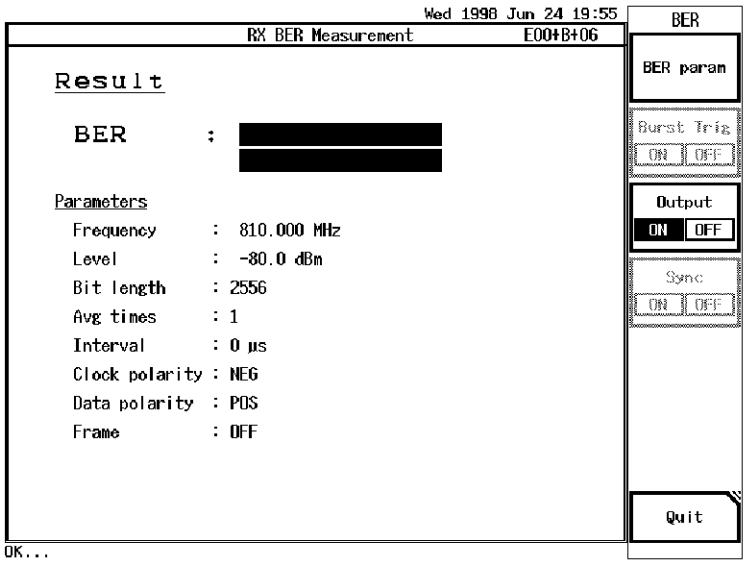


Figure 3-6 BER measurement screen

BER Param

Dialog box for BER measurement parameter setting is displayed to set bit length or average number of times, etc.

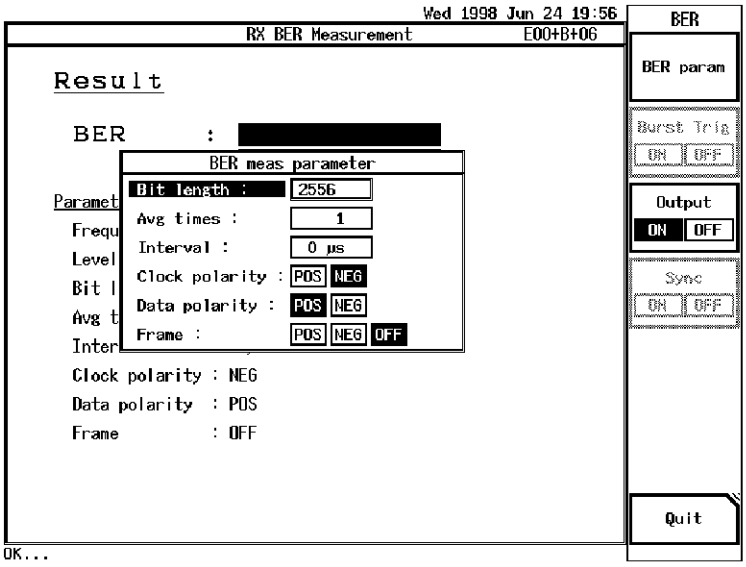


Figure 3-7 Dialog box for BER measurement screen

Bit Length: Set BER measurement time with the bit length.
The setting range of the bit length is 1000 to 1000000 bits.

Avg times: Set measurement averaging count.
The setting range of the averaging count is 1 to 32 times.

Interval: Set interval time between receipt of measurement start from R3560 and actual measurement start.
When average measurement is specified, it also can be used as the interval time between the end of the measurement and the start of the next measurement. Refer to R3560 operation manual for details.
The setting range of the interval time is 0.00 to 1.00 second which has steps of 0.01 second (10 msec.).

Clock polarity: Select from which edge you get data, the rising edge of the signal from BER clock terminal or the falling edge.
POS : Rising
NEG : Falling

Data polarity: Select if you invert BER DATA terminal data or not.
POS : Positive logic (not invert)
NEG : Negative logic (invert)

Frame: Perform the timing control of TCH frame. If you use the TCH frame timing signal that is entered from the FRAME terminal for BER measurement, specify a logic of the TCH frame timing.
OFF : Not use.
POS : Positive logic
NEG : Negative logic

Burst Trig ON/OFF

Select ON or OFF to make the Burst Trigger function enabled or disabled.

Output ON/OFF

Switches the signal of the output terminal to ON/OFF.

Sync ON/OFF

Switch the synchronization burst output of PHS to ON/OFF.
This is available only on conditions that the system mode is PHS and that the slot pattern is DNT/UPT.
When ON is selected, the synchronization burst frame is output. When OFF is selected, the output of the synchronization burst frame is stopped.

Quit

Quits BER measurement mode.

(7) Receiver sensitivity (Sens) measurement

Sens

Enters into the receiver sensitivity measurement mode.

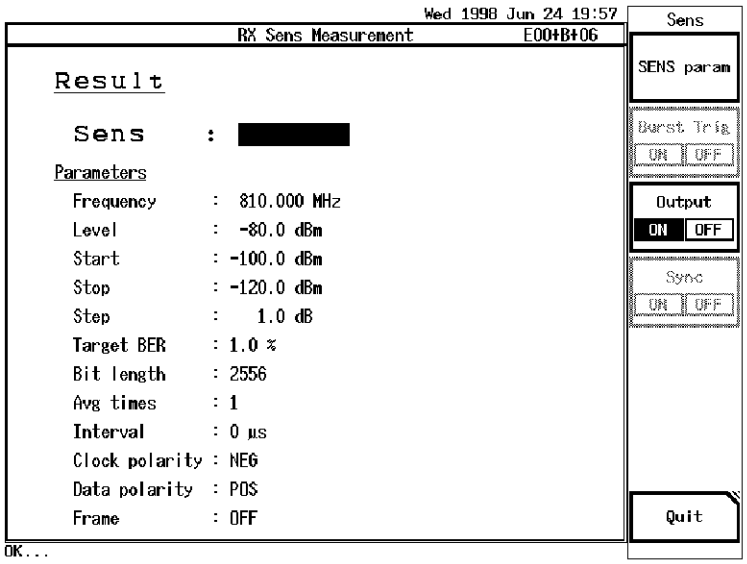


Figure 3-8 Sens measurement screen

Sens Param

Displays a dialog box to set the receiver sensitivity measurement parameter and sets output level, etc to start the receiver sensitivity measurement.

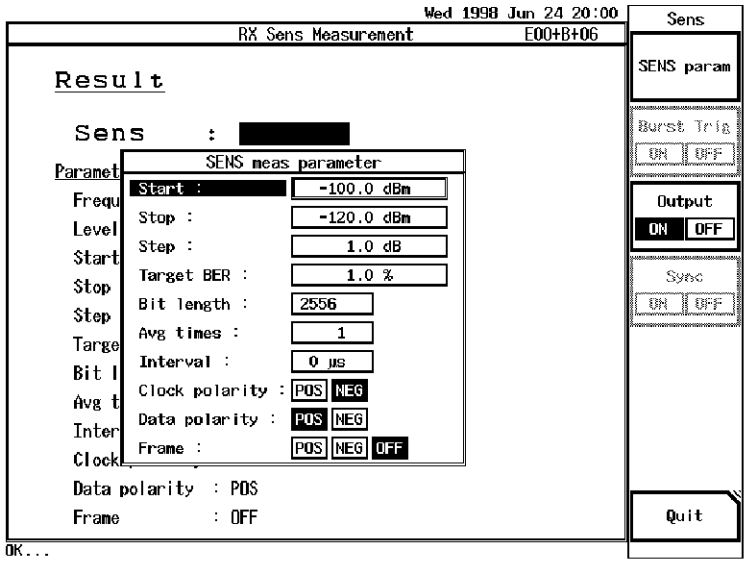


Figure 3-9 Dialog box screen for Sens Parameter setting

Start: Set output level (the search upper limit value) to start sensitivity measurement.
The relationship between the search upper limit value and the search lower limit value should be;
Search upper limit value > Search lower limit value.

Stop: Set output level (the search lower limit value) to end sensitivity measurement.

Step: Set the width of output level change.

Target BER: Specify BER point to search. The setting range of the search points is 0% to 5% which has steps of 0.1%.

Bit length: Set the time for BER measurement with bit length.
The setting range is 1000 to 1000000 bits.

Avg times: Set the averaging times for BER measurement.
The setting of averaging times is between 1 and 32 times.

Interval: Set R3560 interval time for BER measurement.
The setting range is 0.00 to 1.00 sec. which has steps of 0.01 sec. (10 msec.).

Clock polarity: Select at which edge you get the data for BER measurement, the rising edge of the signal from BER clock terminal or the falling edge.
POS : Rising
NEG : Falling

Data polarity: Select to invert or not to invert BER DATA terminal data for BER measurement.
POS : Positive logic (not invert)
NEG : Negative logic (invert)

Frame: Control the timing of TCH frame for BER measurement.
If you use the TCH frame timing signal that is entered from the FRAME terminal for BER measurement, specify a logic of the TCH frame timing.
OFF : Not use.
POS : Positive logic
NEG : Negative logic

Burst Trig ON/OFF

Select ON or OFF to make the Burst Trigger function enabled or disabled.

Output ON/OFF

Switches the signal of the output terminal to ON/OFF.

Sync ON/OFF

Switch the synchronization burst output of PHS to ON/OFF.
This is available only on conditions that the system mode is PHS and that the slot pattern is DNT/UPT.
When ON is selected, the synchronization burst frame is output.
When OFF is selected, the output of the synchronization burst frame is stopped.

Quit

Quits the receiver sensitivity measurement mode.

(8) Measurement error message displaying function

With this function, measurement error messages in the Bit Error Rate measurement (hereafter called BER measurement) and the receiver sensitivity measurement (hereafter called SENS measurement) are displayed.
The cause that the BER or the SENS measurement was not properly executed is displayed. The measurement error messages and details on errors are as follows.

① Sync error

Synchronization cannot be taken with the data input from the DATA terminal of the BER measurement.

② Clock error

A clock is not input to the clock terminal of the BER measurement.

③ SensPoint is not found

The point of BER (Target BER) specified in the Sens measurement is not found. (This message is output only in the Sens measurement.)

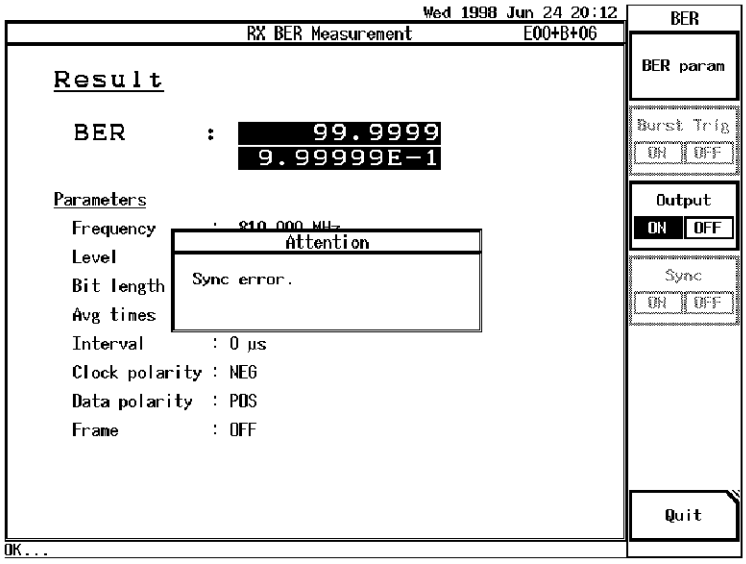


Figure 3-10 BER measurement screen (in occurrence of Sync error)

3.4 Example of the measurement (BER measurement)

Here explains the outline of the operation with a measurement example of a receiver which has a control mode to receive physical channel for down communication.

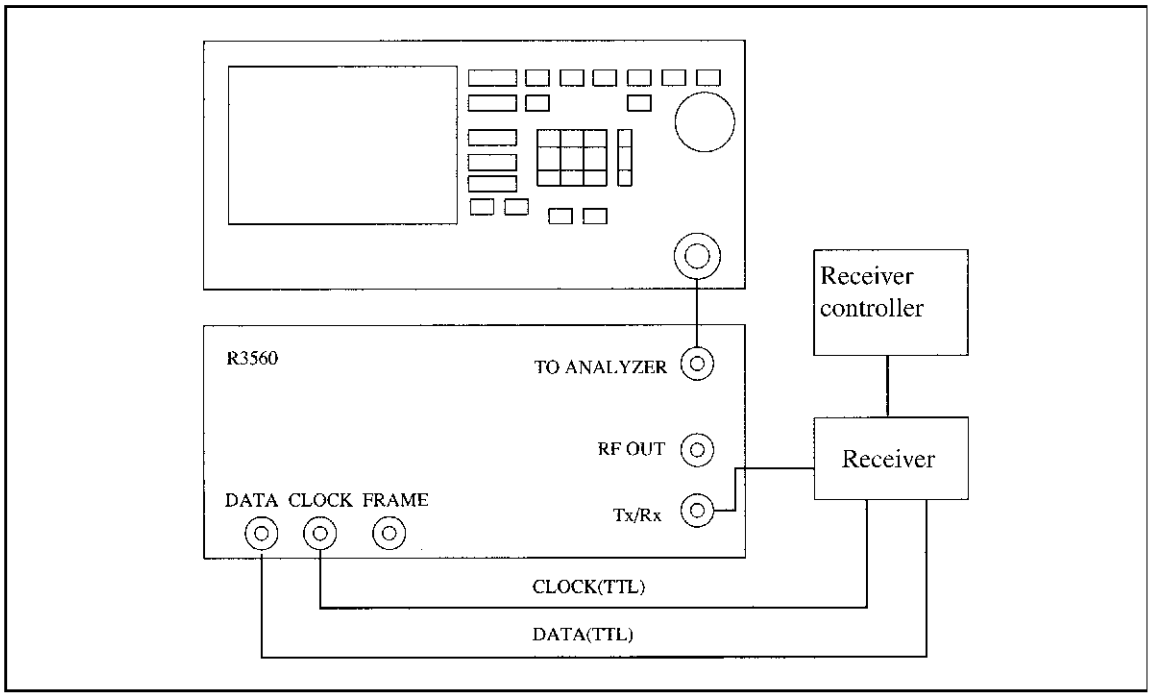


Figure 3-11 BER measurement connection

Follow the procedure below

1. Connect as shown in Figure 3-11.

2. Pressing ***SETUP*** displays dialog box for system mode and slot configuration setting.
   In this box, the selection of each parameter setting value with the data knob and the movement between parameters with the step key can be performed.
   After selecting 1 parameter with the data knob, in order to define the setting, press the data knob or **Hz**.
   Set system mode by using this dialog box. Set slot configuration in downlink traffic channel (DNT) as well.

3. Pressing ***SLOT*** displays dialog box for the setting in the slot.
   By operating this dialog box, slot No., slot TCH pattern, PN 9 pattern, etc. for the measurement are set. Set SACCH, scramble, etc. as needed.
   After the setting in the slot, press ***return*** twice and return the menu to the top step of ***Rx Test*** menu.

4. Press **FREQ** and set the frequency to test R3560 frequency.

5. Press **LEVEL** and set R3560 output level to a suitable level for the receiver.

6. Set the receiver in a receivable mode using the receiving controller.

7. Pressing ***BER*** and ***BER Param*** displays dialog box for BER counter setting. Set demodulation data, polarity of demodulation clock, average times, interval, etc.

8. Pressing **REPEAT** or **SINGLE** starts the measurement.

4 HOW TO OPERATE THE R3561

This chapter describes all key functions of the R3561.

4.1 Outline

The operation menu of R3561 is placed under the **ADVANCE**.

Press **ADVANCE** and ***Rx Test***, R3465 series becomes R3561 control mode and displays Initial screen shown in Figure 4-1 to set and measure R3561.

In this mode, operation with only soft-key or dialog box becomes effective except **FREQ** and **LEVEL**. The operation with **SPAN** , **BW** and so on which can be used in ordinary operation mode cannot be performed.
In order to return to the ordinary operation mode, press **CW**, **TRANSIENT** or ***Quit***.

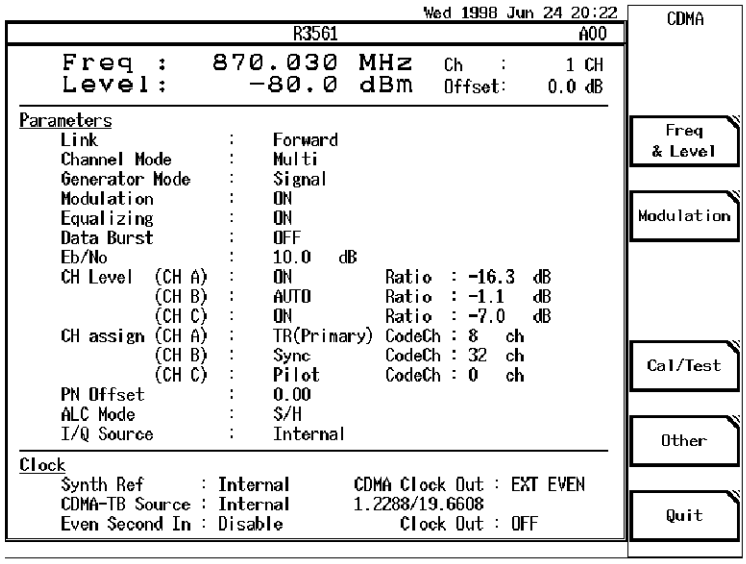
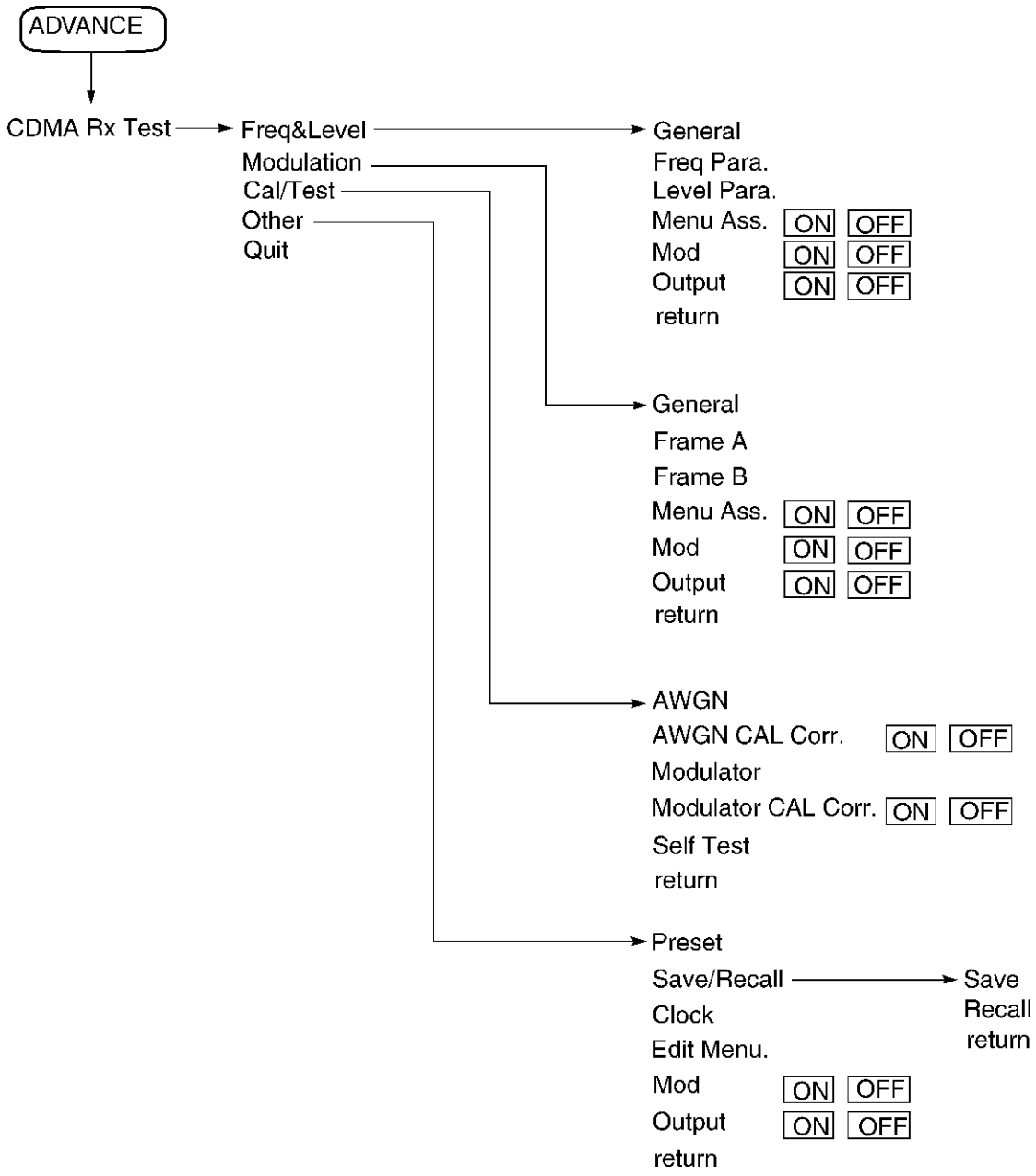


Figure 4-1 Initial Screen

4.2 List of Soft Menus

A list of soft menus, which are under the **ADVANCE** key, used with the R3561 are shown below.



4.3 Function of Each Key

(1) Setting the output frequency

FREQ

A window prompting numeric values is displayed.
Sets the output frequency.
Use the up or down keys, the data knob and the numeric keys to enter data.

Freq&Level, Freq Para.

A dialog box related to frequency parameter settings will be displayed.

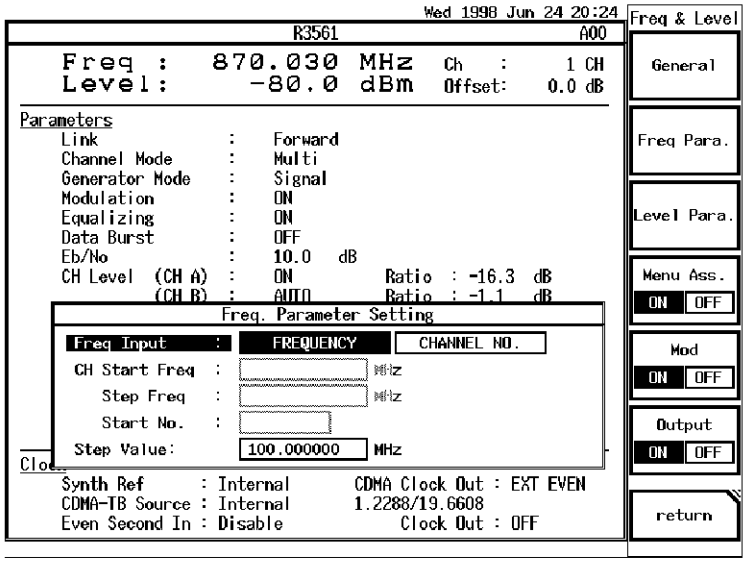


Figure 4-2 Freq Para.Dialog Screen

Freq Input	: Selects the frequency entry mode.
	FREQ Directly enters a frequency value.
	CH Enters a channel number.
CH Start Freq	: Sets the channel start frequency.
Step Freq	: Sets the channel spacing.
Start No	: Sets the channel start number.
Step Value	: Sets a step value of the up or down keys.

When ***return*** is pressed, the screen display returns to the initial screen.

(2) Setting the output level

LEVEL

A window prompting numeric values is displayed.
Used to set the output level.
Use the up or down keys, the data knob and the numeric keys to enter data.

Freq&Level, Level Para.

A dialog box to set parameters associated with the output level is displayed.

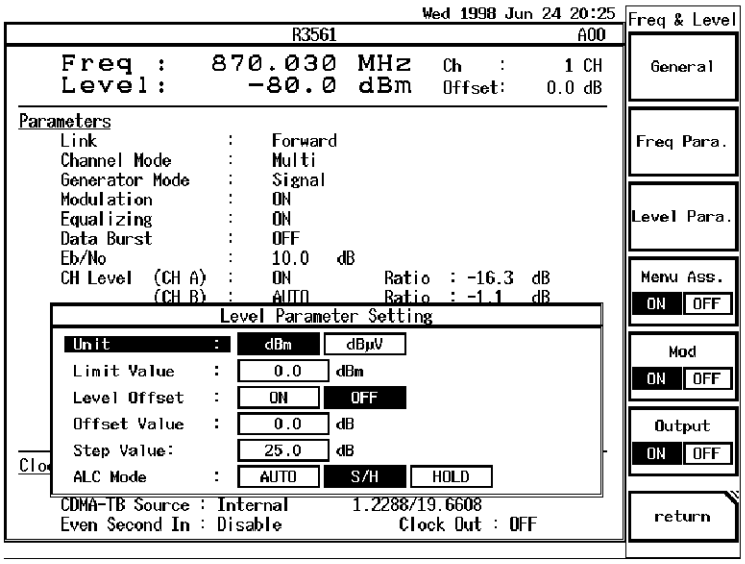


Figure 4-3 Level Para. Dialog Screen

Unit : Selects the unit to display or enter the data.
Limit Value : Sets the upper limit.
Level Offset : Toggles the level offset addition function on or off.
Offset Value : Sets the level offset value.
Step Value : Sets the up or down keys step value.
ALC Mode : Selects the ALC operating mode.
Automatically selects the optimum operating mode depending on the R3561 settings. (For details, refer to the R3561Operation manual.)

AUTO	Normal ALC
S/H	Sample and hold using the reference modulation pattern.
Hold	ALC voltage hold when the reference modulation pattern is used.

NOTE: When not set to the optimum operation mode, the output from the RF OUT terminal may deviate from the target value.

Freq&Level, Output ON/OFF

Toggles the output signal on or off.
When ***return*** is pressed, the screen display returns to the initial screen.

* How to operate the dialog box

Use the data knob and step keys as used to operate the R3465 standard dialog box when selecting items and setting parameters.

(3) Setting the modulation

Modulation

Displays the menu used with the modulation function.
When ***return*** is pressed, the screen display returns to the initial screen.

Modulation, General

The display box used to set general items such as Link and Channel mode is displayed on the screen.

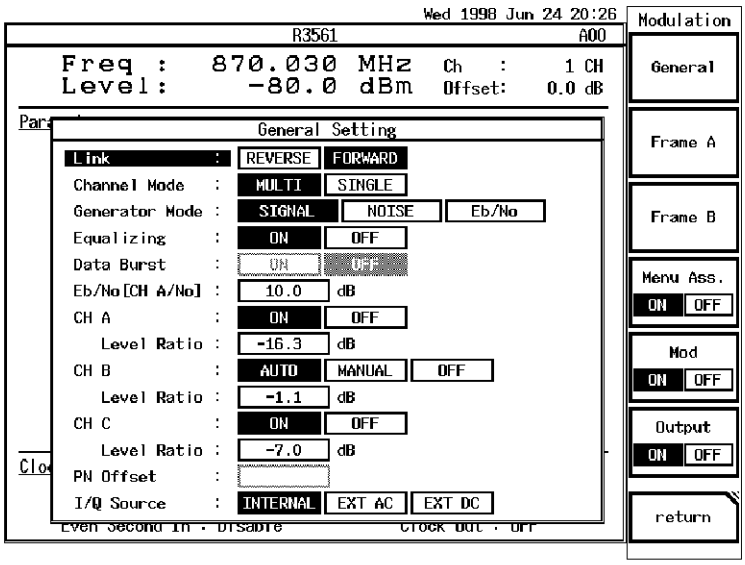


Figure 4-4 General Dialog Screen

Link : Specifies the Link-Direction of the signals used in the R3561.
REVERSE:Sends signals from the Mobil station to the Base station. The modulation method is OQPSK.
FORWARD:Sends signals from the Base station to the Mobil station. The modulation method is OQPSK.

Channel mode : Selects the base band channel multiplexing.
When in the Reverse link, only SINGLE mode can be used.
MULT : Multiplexed output from channels A, B and C is obtained.
SINGLE: Outputs channel A only.

Generator Mode : Selects the signal input to the I Q-Modulator in the MOD/CONV block.
SIGNAL: Selects CDMA signals.
NOISE : Selects an AWGN output with a bandwidth of 2 MHz.
Eb/Nt (No) :
Selects CDMA signal superimposed on AWGN signal.
The ratio of channel A signal to the AWGN output level can be changed by Eb/NO [CH A/No].

NOTE: AWGN calibration must be performed to select the generator mode Eb/Nt(No).
When an IQ Sequence is set to EXTAC or EXTDC, only SIGNAL is selected for the generator mode.

Equalizing : Toggles the Equalizing Filter on or off. This setting is automatically toggled when the setting for Link is changed.

Data Burst : Toggles the Data burst on or off.

Eb/No[CH A/No]: Sets the value of Eb/Nt(No) for channel A. This setting is valid when the Generator mode is set to Eb/Nt(No).

Channel ON/OFF: This setting is valid when the Channel mode is set to MULTI, and channels A and C can set this function on or off. Channel B can select AUTO, MANUAL or OFF. When set to AUTO, channel B level is automatically set so that the sum of the levels (of channels A, B and C) is 0 (dB).
When set to MANUAL, an arbitrary value can be specified by the Channel Level Ratio.

Channel Level Ratio:
This setting is valid when the channel mode is set to MULTI. Each channel level is set in relation to the sum of the levels (of channels A, B and C).

NOTE: A ratio is obtained when channel B is set to AUTO for the Channel ON/OFF.

PN Offset : Sets the PN sequence offset value.
1PN Offset = 64 chips

IQ Source : Selects the signal to be input to the IQ-Modulator.
INTERNAL: Connects the internal base band IQ signal.
EXT AC: Couples the external IQ signal with an AC coupling.
EXT DC: Couples the external IQ signal with a DC coupling.

NOTE:An alarm will sound when the IQ Source is selected to EXT DC and its input level exceeds the upper limit. Lower the input level below the upper limit immediately

---

CAUTION:There is a possibility that this instrument will be damaged if an input level at the EXTERNAL IQ input terminal l exceeds the upper limit. Be sure to use within the specified range.

Modulation, Frame A

Modulation, Frame B

Sets frame details for channels A and B.

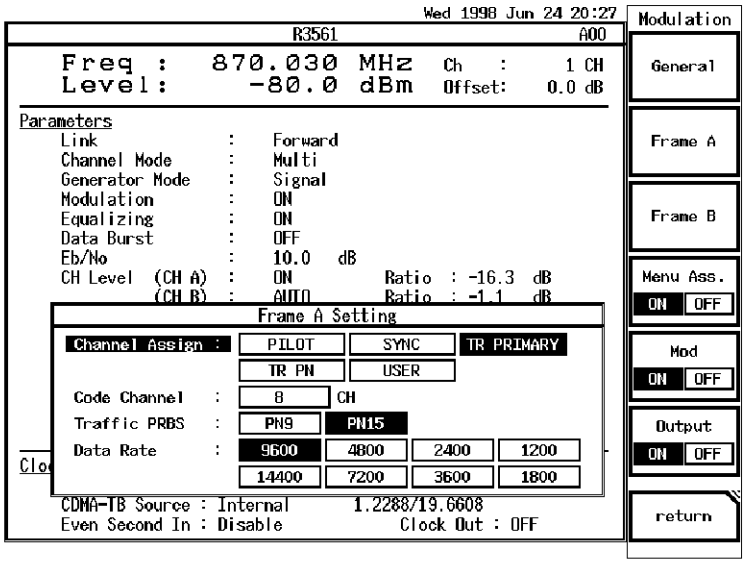


Figure 4-5 Frame A Dialog Box Screen

Channel Assign: Selects channel signals for channels A and B.

Table 4-1 Channel Signals

Channel Signal Type	Description
PILOT	When LINK is set to FORWARD, this becomes the PILOT channel based on the TIA/EAI IS95 standards.
ZEROS (ZEROES)	When LINK is set to REVERSE, the data pattern is DATA ALL0.
SYNC	This is enabled only when the LINK is set to FORWARD. This becomes the SYNC channel based on the TIA/EAI IS95 standard.
TRAFFIC PRIMARY	Selects the frame which inserts PRBS into the Primary Traffic section within Information bits in the Traffic channel frame.
TRAFFIC PN	Selects the frame which inserts PRBS into all of the Information bits in the Traffic channel frame.
USER	Downloads data from the outside into the User Defined Buffer in this instrument, and outputs this data. For detailed information on how to use USER, refer to User Define Buffer Functions in the R3561 Operation manual.

Code Channel :This function selects the type of code channel for channels A and B. Orthogonal code spreading is performed for each channel using the Walsh function corresponding to the selected code channel.
The code channel is always set to 0 (zero) when the channel assignment is set to PILOT. When set to SYNC, the code channel is set to 32.

Traffic PRBS :This function selects the PRBS inserted into Information Bits in the Traffic channel frame.
PN9:Pattern based on ITU-T V5.2
PN15:Pattern based on ITU-T 0.151

Data Rate :Selects the data rate for channels A and B.

Modulation, Menu Ass. ON/OFF

When this key is turned on, set items for the general dialog box are edited by Edit Menu.

Modulation, Mod ON/OFF

Toggles the modulation on or off.

(4) Calibration/Self-test

Cal/Test

Switches the screen display to set or select each function of the R3561 calibration and self-test.
When ***return*** is pressed, the screen display returns to the initial screen.

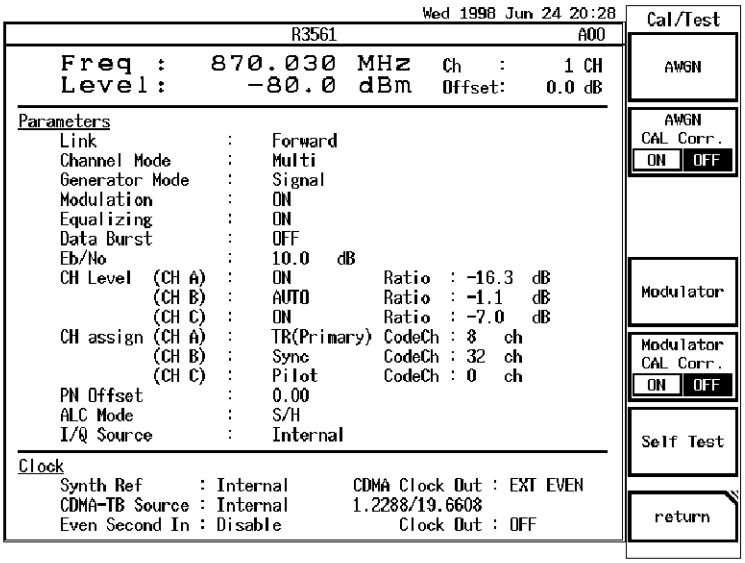


Figure 4-6 Cal/Self Test Screen

Cal/Test, AWGN

Calibrates the AWGN level and CDMA signal level.
When the generator mode is selected to "Eb/Nt(Eb/No)", a calibration is required.

NOTE: ***It takes 10 to 30 seconds to perform the calibration. When an abnormal condition is detected during calibration, an error message will be displayed and the calibration will be terminated.***

Cal/Test, AGWN CAL Corr. ON/OFF

Specifies whether or not to use the correction data obtained in the AWGN calibration.

Cal/Test, Modulator

The IQ - Modulator balance is calibrated.

NOTE: ***It takes 10 to 30 seconds to perform the calibration. When an abnormal condition is detected during calibration, an error message will be displayed and the calibration will be terminated.***

Cal/Test, Modulator CAL Corr. ON/OFF

Specifies whether or not to use the correction data obtained in the Modulator calibration.

Cal/Test, Self Test

This function performs a self-test for each block of this instrument. The POWER, REMOTE and SYNTHE UNLOCK lamps are turned on during the test.An alarm will sound when the self-test is complete.
When the self-test is finished, the instrument will revert to its initial state.
When the self-test detects an error, an error message and the corresponding error code will be displayed with the POWER, REMOTE and SYNTHE UNLOCK lights lit at the same time (for more detailed information on error codes, refer to the R3561 Operation manual). Contact the nearest ADVANTEST Field Office or representative.

(5) Others

Using this screen, other functions can be set.

Other

Furthermore, ***Preset***, ***Clock*** and so on are displayed.
When ***return*** is pressed, the screen display returns to the initial screen.

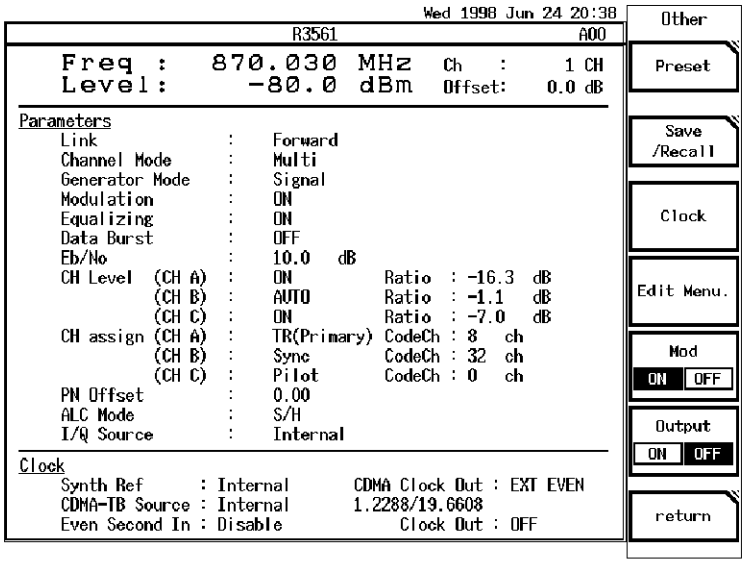


Figure 4-7 Other Screen

Other, Preset

Initialize the following sections of the R3561: the frequency, RF level, modulation, frame and input/output blocks. The settings of the other sections will not be reset to the factory defaults.
Table 4-2shows set or selected values after the preset.

Table 4-2 Set Values when Preset (1 of 3)

Section	Item to Be Set	Channel	Set value/Selected value
Output frequency	Frequency input mode		Direct input mode
	Output frequency		870.03MHz
	Output channel		1
	Channel start number		1
	Channel spacing		30kHz
	Start frequency		870.03MHz
RF level	Output level		-80.0dBm
	Output level upper limit value		0.0dBm
	Output level offset ON/OFF		OFF
	Output level offset value		0.0dB
	Output ON/OFF		ON
	ALC mode		SAMPLE&HOLD
Modulation	Modulation ON/OFF		ON
	LINK		FORWARD
	Channel mode		MULTI
	Generator mode		SIGNAL ONLY
	Equalizing Filter ON/OFF		ON
	Data burst		OFF
	Eb/No (Eb/Nt) value		10.0dB
	Channel ON/OFF	A	ON
		B	AUTO
		C	ON
	Channel level	A	-16.3dB
		B	-1.1dB
		C	-7.0dB

Table 4-2 Set Values when Preset (2 of 3)

Section	Item to Be Set	Channel	Set value/Selected value
Modulation	PN Offset value		0.00
	IQ source value		INTERNAL
Frame	Channel assignment	A	TRAFFIC PRIMARY
		B	SYNC
		C	PILOT
	Channel code	A	8
		B	32
		C	0
	Traffic PRBS	A	PN15
		B	PN15
		C	
	Data rate	A	9600bps
		B	1200bps
		C	***
	Start frame number specification*1	A	1
		B	
		C	
	Repetitive frame number specification*1	A	600
		B	
		C	
Frame	Frame number specification		***
	Frame data		***

Table 4-2 Set Values when Preset (3 of 3)

Section	Item to Be Set	Channel	Set value/Selected value
Input/Output	EVEN SEC/SYNC IN		DISABLE
	CDMA CLOCK OUT		EVEN SECOND IN
	CDMA TIMEBASE OUT		OFF
	Synthe Reference IN		INTERNAL
	CDMA TIMEBASE IN		INTERNAL

*1 : Factory-shipped set value. This value is not set even if the preset is performed after changing the set value.
*** : Cannot be set or this value is pending.

Other, Save/Recall

Displays the screen used to save or recall the set data.

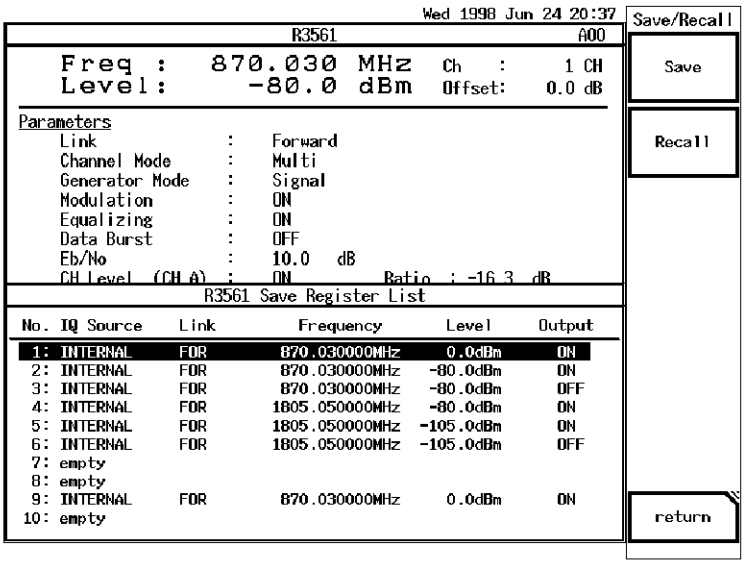


Figure 4-8 Save/Recall Display Screen

Other, Save/Recall, Save

Saves the currently set value in the R3561 back-up memory.Pressing this key displays the contents of the R3561 back-up memory (see Figure 4-8).
To save the current setting in the back-up memory, press the data knob or the **ENTER** after selecting the file number using the data knob. A maximum of 10 settings can be saved in the back-up memory.
Pressing ***RETURN*** returns the screen display to the Other screen.

Other, Save/Recall, Recall

This key is used to read a value saved in the R3561 back-up memory and to set the instrument using this value. Pressing this key displays the contents of the R3561 back-up memory (see Figure 4-9).
To read and reset the contents of the back-up memory, press the data knob or the **ENTER** after selecting the file number using the data knob.
Pressing ***RETURN*** returns the screen display to the Other screen.

Other, Clock

The dialog box which sets various clock signals is displayed.

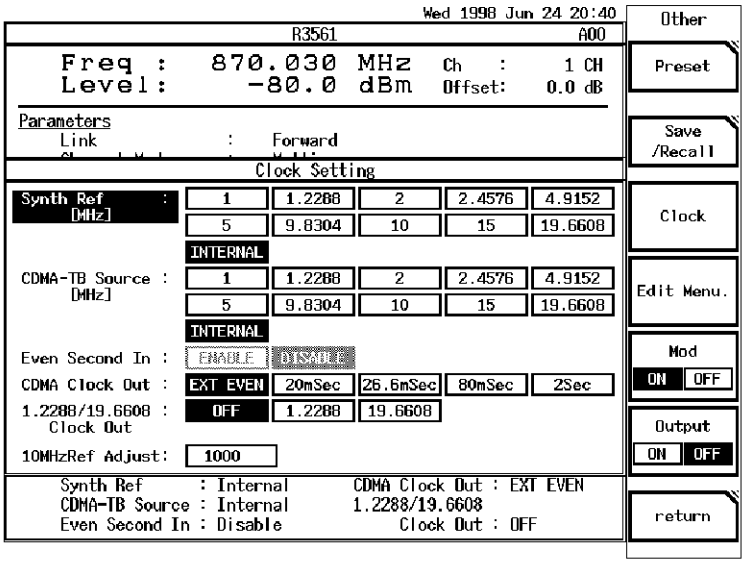


Figure 4-9 Clock Dialog Box Screen

Synthe Ref : Selects the reference frequency of the signal which is output from the SYNTHE REF IN terminal and input to the RF synthesizer reference circuit. When INTERNAL is selected, however, the internal reference oscillator signal is input to the RF synthesizer reference circuit.

CDMA-TB Source:
Selects the reference frequency of the signal which is output from the CDMA TIMEBASE IN terminal and input to the CDMA TIMEBASE reference circuit.
When INTERNAL is selected, however, the internal reference oscillator signal is input to the CDMA TIMEBASE reference circuit.

EvenSecond In : Specifies whether or not the R3561 base band block functions in sync with the signal from EVENSEC/SYNC IN connector on the front panel.

CDMA Clock Out:
Selects the CDMA frame clock signal to be output from the CDMA CLOCK OUT terminal.

Table 4-3 Types of CDMA Frame Clock

CDMA Frame Clock	Description
EVEN SECOND IN	Outputs the signal that is input to the EVEN SEC/SYNC IN termial. This output is obtained only when the input signal is applied to the EVEN SEC/SYNC IN terminal.
2 sec 80msec 26.6msec 20msec	Outputs the clock signal in the base band block of this instrument.

1.2288/19.6608 Clock Out:

Selects the signal to be output from the PN CHIP OUT terminal.

10 MHzRef Adjust:

Sets a frequency of the internal reference oscillator and corrects the frequency deviation due to the variation of time.
The factory-shipped setting is 0, and its range is between -2000 and +2000. These values represent the variable range, but not the frequency range.

Other, Edit Menu

Displays the screen where set items used in the General dialog box are edited.

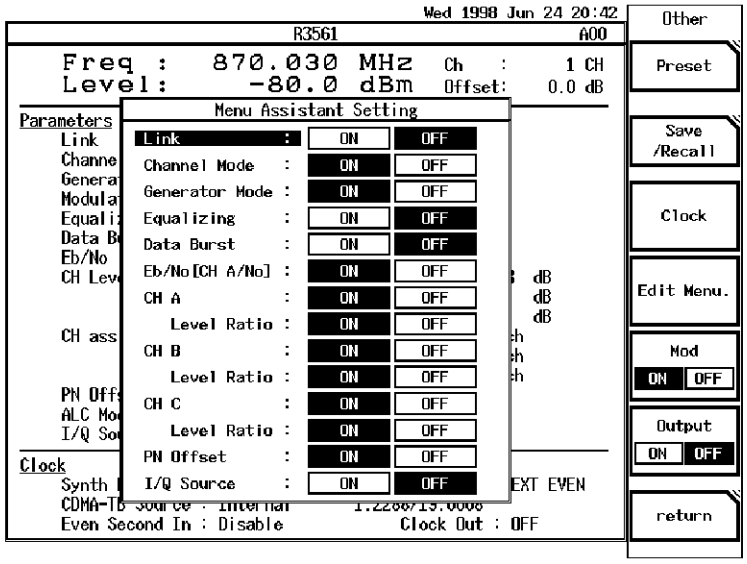


Figure 4-10 Edit Menu Dialog Box Screen

The items you set to ON (on this screen) can be changed on the general dialog box screen shown in Figure 4-4. If you set unnecessary items to OFF, these items will be skipped when operating the step keys.
It is possible to simplify the operation using this method for specific applications. ***Menu Ass. ON/OFF***, however, must be turned on to enable the Edit menu.

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