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**ADVANTEST**<sup>®</sup>  
ADVANTEST CORPORATION

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***U3641/61 OPT60***  
***CDMA Option***  
***Operation Manual***

MANUAL NUMBER FOE-8311270B02

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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

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## Safety Summary

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.

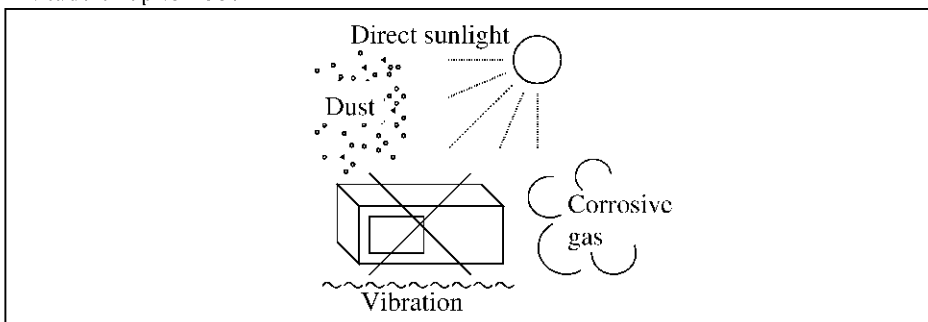
Harmful substances: (1) PCB (polycarbon biphenyl)  
(2) Mercury  
(3) Ni-Cd (nickel cadmium)  
(4) Other  
Items possessing cyan, organic phosphorous and hexadic chromium and items which may leak cadmium or arsenic (excluding lead in solder).

Example: fluorescent tubes, batteries

# Environmental Conditions

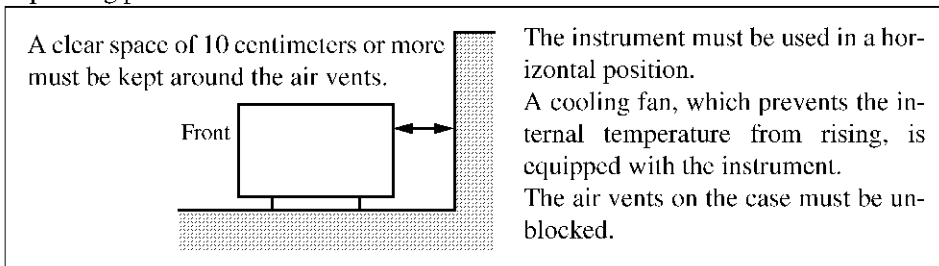
This instrument should only be used in an area which satisfies the following conditions:

- 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



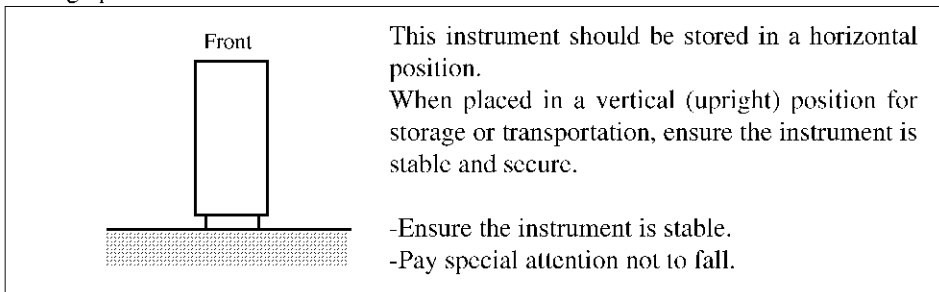
**Figure-1 Environmental Conditions**

- 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 information on how to operate the CDMA option (OPT60).

- Organization of this manual  
This manual consists of the following chapters:

1. Overview	A brief introduction to the product.
2. Measurement flowcharts	Shows CDMA measurement procedures using flowcharts.
3. Functional descriptions	Describes the functions of the various CDMA measurements
4. GPIB	Shows GPIB codes and CDMA program examples.
5. Specifications	Shows the specifications of this option.
Appendices	
Soft menus	Lists the soft menus used with the CDMA.
Error Messages	Lists the error messages for the CDMA.

- Key notations in this manual  
The following styles are used to indicate panel keys and the soft keys in the text of this manual:

Panel keys: In bold type  
Soft keys: In bold and italic type

Example: **CENTER, CDMA**  
Example: ***1 CF STEP AUTO/MNL, 3 ACP***



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## 1 OVERVIEW

Transmission characteristic measurements compliant with IS-95/J-STD-008 can easily be taken by installing the CDMA option on the spectrum analyzer U3641/61.

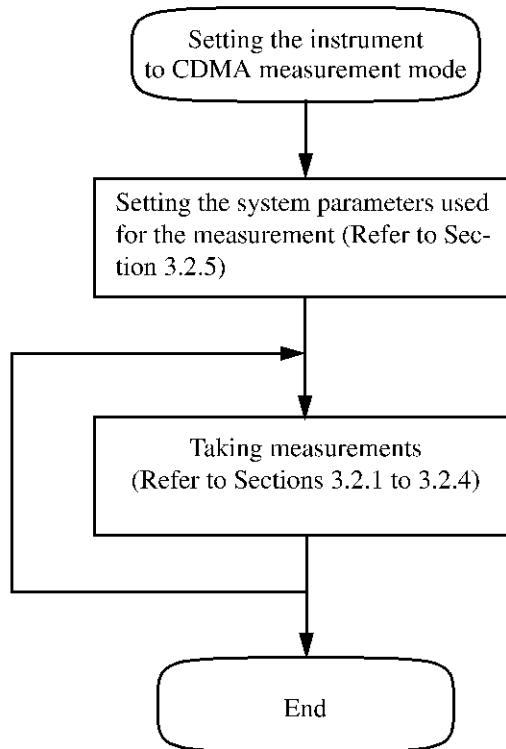
The base or mobile stations controlled by the communication systems (which are covered by this option) and measurement items are as follows.

- Communication systems:
  - US Cellular
  - KOREA Cellular
  - CHINA Cellular
  - JAPAN Cellular
  - US PCS
  - KOREA PCS
  
- Measurement items:
  - Channel power measurement
  - Occupied bandwidth (OBW) measurement
  - Adjacent channel leakage power (ACP) measurement and the spectrum mask function
  - Spurious emission (In-Band) measurement



## 2 MEASUREMENT FLOWCHART

Measurement flowchart of this option is shown bellow.





### 3 FUNCTIONAL DESCRIPTION

#### 3.1 Entering Channels or Center Frequency

When the **CENTER** key is pressed and "**5 UNIT Hz/CH**" is set to "Hz", the Frequency Input mode is activated; when the **CENTER** key is pressed and "**5 UNIT Hz/CH**" is activated to "CH", the Channel Input mode is activated.

- (1) When the Frequency Input mode is activated:

A center frequency can be activated by one of the following operations:

- Numeric keys and Unit key
- Step keys (the frequency is moved in the step frequency set using "1 CF STEP AUTO/MNL")
- Data knob

- (2) When the channel input mode is activated:

A channel can be set by one of the following operations:

- Numeric keys and Unit key
- Step keys
- Data knob

#### **CENTER**

##### **1 CF STEP AUTO/MNL**

**AUTO:** Sets the step size to 1/10 of the frequency span.

**MNL:** Sets the step size set mode of the center frequency.

##### **2 FREQ OFS ON/OFF**

**ON:** Allows you to set the offset frequency with a range of -10 GHz to 0 Hz, or 0 Hz to +10 GHz. Any data entered with a value less than the displayed resolution is automatically corrected to a value corresponding to the resolution. currently being displayed  
"Center frequency (displayed) = Center frequency (set) + Offset frequency"

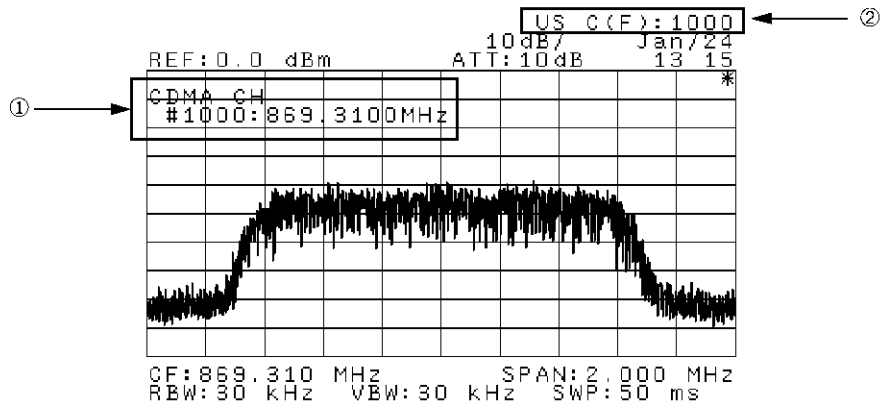
**OFF:** Turns off the offset frequency.

##### **5 UNIT Hz/CH**

**Hz:** Frequency input mode is activated.

**CH:** The channel input mode is activated (see Figure 3-1).  
For more information on changing communication system types (US cellular, US PCS, etc.), refer to Section 3.2.5, Channel Setting.

3.1 Entering Channels or Center Frequency



**Figure 3-1 Screen Display Showing the Channel Input Mode**

① A message shown below is displayed when the user channel table is selected and it has no data.

```

CDMA CH
#?:No Setup
    
```

② Asterisks (\*) are displayed as a channel number when the user channel table has no data.

```

US C(F):1000
    
```

- US C: Channel type
- (F): Link(FORWARD, REVERSE)
- 1000: Channel number

## 3.2 CDMA Measurement

Pressing **CDMA** activates the CDMA measurement mode, displays the soft menu, and lights the LED.

<b>CDMA</b>	Sets CDMA measurement mode
<b>1 CH. POWER</b>	Displays the soft menu used with channel power measurements (Refer to Section 3.2.1).
<b>2 OBW</b>	Displays the soft menu used with OBW measurements (Refer to Section 3.2.2).
<b>3 ACP</b>	Displays the soft menu used with ACP measurements (Refer to Section 3.2.3).
<b>4 SPRIIOUS</b>	Displays the soft menu used with spurious emission (In Band) measurements (Refer to Section 3.2.4).
<b>5 CDMA OFF</b>	Terminates CDMA measurement mode.
<b>6 NEXT</b>	A soft menu used with channel measurements and to enter user channel tables is displayed (Refer to Section 3.2.5 and 3.2.6).

3.2 CDMA Measurement

3.2.1 Channel power measurement

Pressing **CDMA** and "**1 CH. POWER**" displays the soft menu and the measuring window both used with channel power measurements.

**CDMA**

**1 CH. POWER**

Sets the channel power measurement mode and displays the measuring window.

Window position: Center frequency } Factory  
 Window width: 1.23MHz } default

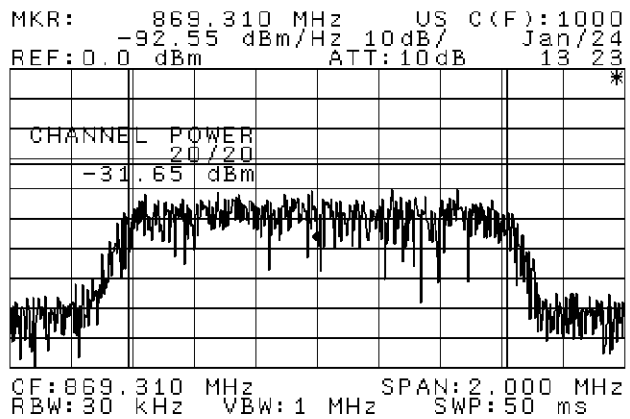


Figure 3-2 Channel Power Measurement

**1 MEASURE**

This mode specifies the number of channel power measurements, and starts or interrupts the measurement.

**1 START/STOP**

START: Starts the measurement.

STOP: Interrupts the measurement.

**3 AV. TIMES ON/OFF**

ON: Measures for the specified number of times. Sets values using the data knob, step keys, or numeric keys (together with unit keys).

OFF: Measures each time the specified sweep finishes.

**4 MEASURE 1/CONT**

Choose whether the measurement must be stopped or restarted for the number of times (specified by "**3 AV. TIMES ON/OFF**").

1: Stopped  
 When stopped, the trace is in VIEW state. If you wish to save the measurement result (BIN type) under these conditions, save it now.

CONT: Re-measurement



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<b>6 RETURN</b>	Returns to the previous menu.
<b>3 WINDOW ON/OFF</b>	ON: Displays the measuring window and measures the power within it. OFF: Removes the measuring window and measures the power over the full screen.
<b>4 WINDOW SETUP</b>	The position and width of the measuring window can be changed.
<b>1 WINDOW DEFAULT</b>	Sets the position and width of the measuring window to the factory defaults.
<b>3 WINDOW POSITION</b>	Changes the position of the measuring window. Sets the values using the data knob, step keys, or numeric keys (together with unit keys).
<b>4 WINDOW WIDTH</b>	Changes the width of the measuring window. Sets the values using the data knob, step keys, or numeric keys (together with unit keys).
<b>6 RETURN</b>	Returns to the previous menu.
<b>5 DSP POSI UP/LOW</b>	UP: Displays the measurement result in the upper left of the screen. LOW: Displays the measurement result in the lower left of the screen.
<b>6 CH. POWER OFF</b>	Turns off the channel power measurement mode.

3.2 CDMA Measurement

3.2.2 Occupied Bandwidth (OBW) Measurement

Pressing **CDMA** and "**2 OBW**" displays the soft menu used with OBW measurements.

**CDMA**

**2 OBW**

Sets the OBW measurement mode.

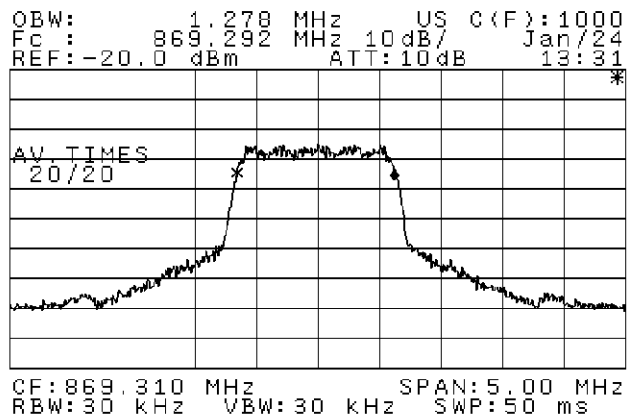


Figure 3-3 OBW Measurement

**1 MEASURE**

This mode specifies the number of OBW measurements, selects the trace detector and starts or interrupts the measurement. For more information, refer to Section 2.5.

**1 START/STOP**

**START:** Starts the measurement.

**STOP:** Interrupts the measurement.

**3 AV. TIMES ON/OFF**

**ON:** Measures for the specified number of times. Sets values using the data knob, step keys, or numeric keys (together with unit keys).

**OFF:** Measures each time the specified sweep finishes.

**4 MEASURE I/CONT**

Choose whether the measurement must be stopped or restarted for the number of times (specified by "**3 AV. TIMES ON/OFF**").

**1:** Stopped  
When stopped, the trace is in VIEW state. If you wish to save the measurement result(BIN type) under these conditions, save it now.

**CONT:** Re-measurement

**5 TRC DET SMPL/POS**

Sets the trace detector used with OBW, ACP or SPURIOUS measurement.

SMPL: Select a sample.

POS: Selects a positive part.

When a measurement is taken with "**3 AV.TIMES ON/OFF**" set ON, performs a trace averaging in SMPL, or performs MAX HOLD the specified number of times.

**6 RETURN**

Returns to the previous menu.

**3 OBW 99.0%**

Sets a ratio of the occupied bandwidth to the total power. The set range is 10.0% to 99.8 %. The factory default is 99.0%.

This value is set using the Data knob, the Step keys or the numeric (together with unit keys).

**6 OBW OFF**

Turns off OBW measurement mode.

3.2 CDMA Measurement

3.2.3 Adjacent Channel Leakage Power (ACP) Measurement

Pressing **CDMA** and "**3 ACP**" displays the soft menu used with ACP measurements.

**CDMA**

**3 ACP**

Sets the ACP measurement mode.

This mode calculates the power by integrating the area within the measuring window (1.23 MHz) after measuring the specified number of times. A template is drawn using this power as the reference power (Ref.Power).

ACP measurement which is compliant with CDMA standards is taken at each offset frequency after displaying the template. Also, a PASS/FAIL is judged using the spectrum mask. The result is made as satisfactory when the measured trace is within the template area.

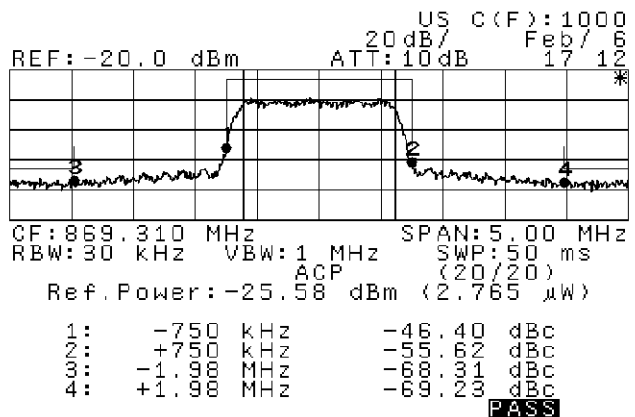


Figure 3-4 ACP Measurement

**1 MEASURE**

This mode specifies the number of ACP measurements, selects the trace detector and starts or interrupts the test.

**1 START/STOP**

**START:** Starts the measurement.

**STOP:** Interrupts the measurement.

**3 AV. TIMES ON/OFF**

**ON:** Measures for the specified number of times. Sets values using the data knob, step keys, or numeric keys (together with unit keys).

**OFF:** Measures each time the specified sweep finishes.

**4 MEASURE I/CONT**

Choose whether the measurement must be stopped or restarted for the number of times (specified by "**3 AV. TIMES ON/OFF**").

1: Stopped  
When stopped, the trace is in VIEW state. If you wish to save the measurement result (BIN type) under these conditions, save it now.

CONT: Re-measurement

**5 TRC DET SMPL/POS**

Sets the trace detector used with OBW, ACP or SPURIOUS measurement.

SMPL: Select a sample.

POS: Selects a positive part.

When a measurement is taken with "**3 AV. TIMES ON/OFF**" set ON, performs a trace averaging in SMPL, or performs MAX HOLD the specified number of times.

**6 RETURN**

Returns to the previous menu.

**4 F-DOMAIN LMT LINE**

Sets the limit line used with the template.

**1 LMT LINE STD/USER**

STD: Uses CDMA standards.

USER: Uses the template entered by using the **3 LMT LINE EDIT**.

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*Note:* When using the STD mode, the template is determined by a channel type which is compliant with CDMA standards.

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**3 LMT LINE EDIT**

Allows you to enter or edit the user table used for the limit line.

The user table accepts a maximum of 20 entries.

The active cursor can be moved using the step keys and data knob.

You can enter frequency and level using the numeric and unit keys.

**1 INSERT ON/OFF**

ON: Turns on the insertion mode that creates a blank line in the cursor line.

OFF: Turns off the insertion mode.

**2 CURSOR CHANGE** Switches the inputs (frequency and level).**3 LINE DELETE**

Removes the cursor line.

3.2 CDMA Measurement

- 4 TABLE INIT** Used to delete all data which are previously entered.
- 1 CONFIRM** Deletes the data.
- 6 CANCEL** Cancels the data deletion, and returns to the table editing menu.
- 5 COPY STD → USER**  
Copies the template used with STD to the user table.
- 6 RETURN** Returns to the previous menu.
- 4 LMT LINE MEM CARD** Saves or recalls the user table.
- 1 LOAD** Recalls the user table saved in the memory card and loads it into the spectrum analyzer.
- 3 STORE** Saves the user table to the memory card  
When the file name already exists, the following menus are displayed.
  - 1 CONFIRM** After confirming the message, the data is overwritten.
  - 6 CANCEL** Cancels the data overwrite.
- 4 RENAME** Used to change the file name (8 characters) which is already in use.  
Refer to Section 7.11, Label Function in the U3641 or U3661 operation manual.
  - 1 MARK 1/2/3** Choose a character type from either 1, 2 or 3.
  - 2 SPACE** Enters a space.
  - 3 LABEL CLEAR**  
Removes all labels currently being displayed.
  - 6 RETURN** Returns to the previous menu.
- 5 CARD DRV A/B** Specifies the active drive in the memory card.
- 6 RETURN** Returns to the previous menu.
- 6 RETURN** Returns to the previous menu.
- 6 ACP OFF** Turns off the ACP measurement mode.

### 3.2.4 Spurious Emission (In Band) Measurement

Pressing CDMA and "*4 SPURIOUS*" displays the soft menu used with spurious emission measurements.

#### CDMA

#### *4 SPURIOUS*

Sets the ACP measurement mode. Table 3-1 lists the frequencies which are set according to the channel and link types.

This mode calculates the power by integrating the area within the measuring window (1.23 MHz) after measuring the specified number of times. A template is drawn using this power as the reference power (Ref. Power).

This mode searches for a peak outside of the measuring window after displaying the template. The detected peak is compared with the template and displayed in the form of relative value (dBc) and PASS/FAIL (PASS is displayed if the peak is inside of the template area). PASS/FAIL is also judged using the normal marker and an arbitrary frequency.

**Table 3-1 In Band Frequency**

Frequency Range for Spurious Emission Measurement	FORWARD		REVERSE	
	Start Frequency	Stop Frequency	Center Frequency	Frequency Span
US Cellular	868.39MHz	894.59MHz	Carrier Frequency	25MHz
KOREA Cellular	868.39MHz	894.59MHz	Carrier Frequency	25MHz
CHINA Cellular	916.40MHz	948.10MHz	Carrier Frequency	31MHz
JAPAN Cellular	831.40MHz	870.60MHz	Carrier Frequency	60MHz
US PCS	1929.38MHz	1990.56MHz	Carrier Frequency	60MHz
KOREA PCS	1839.38MHz	1870.61MHz	Carrier Frequency	30MHz
User channel	Start frequency in the user tabl	Stop frequency in the user table	Carrier Frequency	60MHz

3.2 CDMA Measurement

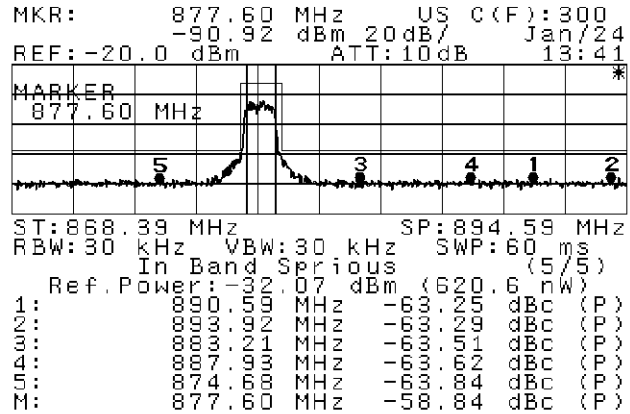


Figure 3-5 Spurious Emission Measurement

**1 MEASURE**

This mode specifies the number of spurious emission measurements, selects the trace detector and starts or interrupts the test.

**1 START/STOP**

START: Starts the measurement.

STOP: Interrupts the measurement.

**3 AV. TIMES ON/OFF**

ON: Measures for the specified number of times. Sets values using the data knob, step keys, or numeric keys (together with unit keys).

OFF: Measures each time the specified sweep finishes.

**4 MEASURE I/CONT**

Choose whether the measurement must be stopped or restarted for the number of times (specified by "3 AV. TIMES ON/OFF").

1: Stopped  
 When stopped, the trace is in VIEW state. If you wish to save the measurement result (BIN type) under these conditions, save it now.

CONT: Re-measurement

**5 TRC DET SMPL/POS**

Sets the trace detector used with OBW, ACP or SPURIOUS measurement.

SMPL: Select a sample.

POS: Selects a positive part.

When a measurement is taken with "3 AV. TIMES ON/OFF" set ON, performs a trace averaging in SMPL, or performs MAX HOLD the specified number of times.



**6 RETURN** Returns to the previous menu.

**3 PEAK  $\Delta$  Y div** Enters the trace amplitude conditions to detect a peak. For more information on the amplitude conditions, refer to paragraph (2) of Section 7.3.2 in the U3641 or U3661 operation manual.

**4 F-DOMAIN LMT LINE** Sets the limit line used with the template.

**1 LMT LINE STD/USER** STD: Uses CDMA standards.

USER: Uses the template entered by using the **3 LMT LINE EDIT**.

---

*Note:* When using the STD mode, the template is determined by a channel type which is compliant with CDMA standards.

---

**3 LMT LINE EDIT** Allows you to enter or edit the user table used for the limit line. The user table accepts a maximum of 20 entries. The active cursor can be moved using the step keys and data knob. You can enter frequency and level using the numeric and unit keys.

**1 INSERT ON/OFF** ON: Turns on the insertion mode that creates a blank line in the cursor line.

OFF: Turns off the insertion mode.

**2 CURSOR CHANGE** Switches the inputs (frequency and level).

**3 LINE DELETE** Removes the cursor line.

**4 TABLE INIT** Used to delete all data which are previously entered.

**1 CONFIRM** Deletes the data.

**6 CANCEL** Cancels the data deletion, and returns to the table editing menu.

**5 COPY STD  $\rightarrow$  USER** Copies the template used with STD to the user table.

**6 RETURN** Returns to the previous menu.

3.2 CDMA Measurement

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- 4 LMT LINE MEM CARD** Saves or recalls the user table.
  - 1 LOAD** Recalls the user table saved in the memory card and loads it into the spectrum analyzer.
  - 3 STORE** Saves the user table to the memory card  
When the file name already exists, the following menus are displayed.
    - 1 CONFIRM** After confirming the message, the data is overwritten.
    - 6 CANCEL** Cancels the data overwrite.
    - 4 RENAME** Used to change the file name (8 characters) which is already in use.  
Refer to Section 7.11, Label Function in the U3641 or U3661 operation manual.
      - 1 MARK 1/2/3** Choose a character type from either 1, 2 or 3.
      - 2 SPACE** Enters a space.
      - 3 LABEL CLEAR** Removes all labels currently being displayed.
      - 6 RETURN** Returns to the previous menu.
    - 5 CARD DRV A/B** Specifies the active drive in the memory card.
    - 6 RETURN** Returns to the previous menu.
  - 6 RETURN** Returns to the previous menu.
- 6 SPURIOUS OFF** Turns off the spurious emission measurement mode.

### 3.2.5 Setting Channels (the System Parameters Used with the Measurements)

Pressing CDMA, "6 NEXT", "1 CHANNEL SETUP" displays the screen and soft menu used for setting the channel.

#### CDMA

#### 6 NEXT

#### 1 CHANNEL SETUP

Sets the channel set mode. Selects the items you wish to change (channel type, link, rate and channel offset and so on) using the data knob.

```

REF: 0.0 dBm          10dB/ 1 SELECT
                     ATT: 10dB
CDMA Channel Setup  2 -----
CH. TYPE : USER CH  3 -----
LINK      : FORWARD
RATE      : 9600/14400bps
CH. OFFSET: 0
US        Cellular  4 USER STD
KOREA     Cellular  IS/J-STD
CHINA     Cellular  5 -----
JAPAN     Cellular
US        PCS
KOREA     PCS
USER CH   (USER)   6 RETURN
-----
CF: 1.6000 GHz      SPAN: 3200 MHz
RBW: 3 MHz          VBW: 3 MHz     SWP: 50 ms
    
```

Figure 3-6 Setting Channels

#### 1 SELECT

Selects the contents displayed in the selection window. For information on these contents, refer to Table 3-2.

*Note:* The channel offset can be entered using the numeric and unit keys only.

#### 4 USER STD IS/J-STD

*Note:* This menu is displayed only when the user channel is displayed.

IS: User channel uses IS-95 as its standards.

J-STD: User channel uses J-STD-008 as its standards.

#### 6 RETURN

Turns off the channel set mode.

3.2 CDMA Measurement

**Table 3-2 Setting the Relevant Systems and System Parameters for the Measurements**

Item	Description																		
a. Channel Type	<table border="1"> <thead> <tr> <th data-bbox="678 483 900 526">Channel Type</th> <th data-bbox="900 483 1125 526">CDMA Standards</th> </tr> </thead> <tbody> <tr> <td data-bbox="678 526 900 553">US Cellular</td> <td data-bbox="900 526 1125 553">IS-95</td> </tr> <tr> <td data-bbox="678 553 900 580">KOREA Cellular</td> <td data-bbox="900 553 1125 580">IS-95</td> </tr> <tr> <td data-bbox="678 580 900 607">CHINA Cellular</td> <td data-bbox="900 580 1125 607">IS-95</td> </tr> <tr> <td data-bbox="678 607 900 633">JAPAN Cellular</td> <td data-bbox="900 607 1125 633">IS-95</td> </tr> <tr> <td data-bbox="678 633 900 660">US PCS</td> <td data-bbox="900 633 1125 660">J-STD-008</td> </tr> <tr> <td data-bbox="678 660 900 687">KOREA PCS</td> <td data-bbox="900 660 1125 687">J-STD-008</td> </tr> <tr> <td data-bbox="678 687 900 741">User channel (Note 1)</td> <td colspan="2" data-bbox="900 687 1125 741">Either IS-95 or J-STD-008 can be selected.</td> </tr> </tbody> </table>		Channel Type	CDMA Standards	US Cellular	IS-95	KOREA Cellular	IS-95	CHINA Cellular	IS-95	JAPAN Cellular	IS-95	US PCS	J-STD-008	KOREA PCS	J-STD-008	User channel (Note 1)	Either IS-95 or J-STD-008 can be selected.	
	Channel Type	CDMA Standards																	
	US Cellular	IS-95																	
	KOREA Cellular	IS-95																	
	CHINA Cellular	IS-95																	
	JAPAN Cellular	IS-95																	
	US PCS	J-STD-008																	
KOREA PCS	J-STD-008																		
User channel (Note 1)	Either IS-95 or J-STD-008 can be selected.																		
b. Link (Directions of signal)	FORWARD: Falling signal (Note 2) REVERSE: Rising signal (Note 3)																		
c. Rate (Communication rate)	9600/14400bps 4800/7200bps 2400/3600bps 1200/1800bps																		
d. Channel offset	Channel setting = Channel offset + Channel input number (Example) The channel setting is 1010 if you enter 1000 as the channel offset, and 10 as the channel input number using the numeric and unit keys.																		

*Note 1: This is the user channel which you can use to enter a maximum of 99 channels and frequencies with the editor.*

*For more details about how to input data, refer to Section 3.2.6, User Channel Table.*

*Note 2: When set to FORWARD, the communication rate does not have to be set, because this does not have any effect.*

*Note 3: Sweep times are changed according to the Rate after setting the measurement mode to either OBW, ACP or SPURIOUS EMISSION with REVERSE already selected. Set "5 TRC DET SMPL/POS" to POS when measuring OBW, ACP or SPURIOUS EMISSION using a burst wave obtained from a rate setting other than Full Rate (9600/14400 bps) and the REVERSE link mode.*

*This option, however, does not support channel power measurements for burst signals. Set Rate to Full Rate when measuring signals in the REVERSE Link mode.*

### 3.2.6 Entering Data in the User Channel Table

Pressing **CDMA**, "**6 NEXT**" and "**3 USER CH EDIT**" displays the editor and soft menu both used for inputting data in the user channel table.

**CDMA**

**6 NEXT**

**3 USER CH EDIT**

Allows you to enter or edit the user channel table. The user table can store a maximum of 99 entries.

1. The active cursor is moved using the step keys or data knob.  
You can enter the channel number and frequency using the numeric and unit keys.
2. The start and stop frequencies used for spurious emission measurements (Link: FORWARD) are designated as START F and STOP F, respectively.

```

REF: 0.0 dBm          10 dB/ 1 INSERT
                    ATT: 10 dB ON/OFF
                    CDMA USER Channel
TITLE: USER CH      2 CURSOR
                    CHANGE
Start/Stop Frequency 3 LINE
                    DELETE
START F:            4 TABLE
STOP F:             INIT
NO CH. Frequency    5 TITLE
                    -----
                    6 RETURN
1 * :
2 :
3 :
4 :
                    : 3200 MHz
                    P: 50 ms
    
```

**Figure 3-7 User Channel Table**

**1 INSERT ON/OFF**

- ON: Sets the insertion mode that creates a blank line in the cursor line.
- OFF: Turns off the insertion mode.

*Note: The insert mode cannot be set to ON when the cursor line is blank.*

**2 CURSOR CHANGE**

Switches the inputs (channel number or frequency).

**3 LINE DELETE**

Removes the cursor line.

**4 TABLE INIT**

Removes all input data.

3.2 CDMA Measurement

<b>1 CONFIRM</b>	Removes the data.
<b>6 CANCEL</b>	Cancels the data deletion, and returns to the Table Edition menu.
<b>5 TITLE</b>	Arbitrarily creates a title in the user channel table. The factory default is "USER CH." For more information on how to change the title, Refer to Section 7.11, Label Function in the U3641 or U3661 Operation manual.
<b>1 MARK 1/2/3</b>	Choose the font type you wish to use from either 1, 2 or 3.
<b>2 SPACE</b>	Enter a space.
<b>3 LABEL CLEAR</b>	Removes all labels displayed.
<b>6 RETURN</b>	Returns to the previous menu.
<b>4 USER CH MEM CARD</b>	Performs saving to or recalling from the user channel table.
<b>1 LOAD</b>	Recalls the user channel table saved in the memory card and loads it into the spectrum analyzer.
<b>3 STORE</b>	Saves the user channel table to the memory card When the file name already exists, the following menus are displayed.
<b>1 CONFIRM</b>	After confirming the message, the data is overwritten.
<b>6 CANCEL</b>	Cancels the data overwrite.
<b>4 RENAME</b>	Used to change the file name (8 characters) which is already in use. Refer to Section 7.11, Label Function in the U3641 or U3661 operation manual.
<b>1 MARK 1/2/3</b>	Choose a character type from either 1, 2 or 3.
<b>2 SPACE</b>	Enters a space.
<b>3 LABEL CLEAR</b>	Removes all labels currently being displayed.
<b>6 RETURN</b>	Returns to the previous menu.
<b>5 CARD DRV A/B</b>	Specifies the active drive in the memory card.

***6 RETURN***

Returns to the previous menu.

***6 RETURN***

Returns to the previous menu.





## 4 GPIB

### 4.1 List of GPIB Codes

Notes on annotations used in this list:

- \*1: Numeric data can be entered following the code.
- \*2: Enter the frequency and level.
- \*3: Enter /filename/. For example, CLMST/A:LMTLINEA/ means that file name LMTLINEA is saved in drive A of the memory card.
- A plus sign (+) in the output format column indicates that more than a single piece of data can be output.
- ON/OFF in the output format column corresponds to an output of 1 or 0, respectively.
- The units in the output column are as follows: Hz for the frequency; second for the time.

4.1 List of GPIB Codes

**Table 4-1 List of GPIB Codes (1 of 4)**

FUNCTION	Listener Code	Talker Request			Remarks
		Code	Output Format	Header	
CDMA mode ON OFF	CDMA ON CDMA OFF	CDMA?	ON/OFF	—	
Channel power measurement OBW measurement ACP measurement Spurious emission measurement START STOP	CMSSTRT CMSSTP				
Number of averaging ON OFF	— CPWTM ON*1 CPWTM OFF	CPWTM? — —	Integer (2 to 999) — —	— — —	
Measurement mode Continuous Once	CMSCNT CMSONE				
Trace detector Sample Positive	CSMP CPOS				
Channel power ON OFF	— CPWCH ON CPWCH OFF	CPWCH? — —	Level — —	— — —	
Measuring window ON OFF Position Width Factory default	CWDO ON CWDO OFF CWDOLX*1 CWDODX*1 CWDODFT	— — — — —	— — — — —	— — — — —	
Measurement result display position Upper Lower	CPDU CPDL	— —	— —	— —	

Table 4-1 List of GPIB Codes (2 of 4)

FUNCTION	Listener Code	Talker Request			Remarks
		Code	Output Format	Header	
OBW ON OFF OBW %	COBW ON COBW OFF COBWR*1	COBW?  COBWR?	Frequency + Frequency  real value	—  —	
ACP ON OFF	CACP ON CACP OFF	CACP?	PASS/FAIL+d1+d2 +a1+a2+a3+a4 1:PASS, 0:FAIL d1: Level (Reference power dBm) d2: Level (Reference power W) a1: Primary level a2: +Primary level a3: -Secondary level a4: +Secondary level	—	
Spurious emission  ON OFF	CSPR ON CSPR OFF	CSPR?	n+d1+d2, (fn+ln+PASS/FAIL) × n n: Number of peaks d1: Level (Reference power dBm) d2: Level (Reference power W) fn: Frequency at the marker ln: Level at the marker 1:PASS, 0:FAIL		The number of peaks is (n+1) when the marker is ON.
Template for ACP& Spurious emission Input for the user table Deletion of the user table  Selection of the template STD USER  Memory card STORE LOAD	CLMIN*2 CLMDL  CLMSTD CLMUSR  CLMST*3 CLMLD*3	— —  — —  — —	— —  — —  — —	— —  — —  — —	

4.1 List of GPIB Codes

**Table 4-1 List of GPIB Codes (3 of 4)**

FUNCTION	Listner Code	Talker Request			Remarks
		Code	Output Format	Header	
CDMA Channel	CDMACH*1	CDMACH?	Integer	CCH	
Input selection		CUN?	0:Frequencyr 1:Channel		
Channel Input Mode	CUNFR	—	—	—	
Frequency input mode	CUNCH	—	—	—	
Selection of the channel table		CTYPE?	0:US Cellular 1:KOREA Cellular 2:CHINA Cellular 3:JAPAN Cellular 4:US PCS 5:KOREA PCS 6:User channel	—	
US Cellular	CUS	—	—	—	
KOREA Cellular	CKOREA	—	—	—	
CHINA Cellular	CCHINA	—	—	—	
JAPAN Cellular	CJAPAN	—	—	—	
US PCS	PUS	—	—	—	
KOREA PCS	PKOREA	—	—	—	
User channel	CUSR	—	—	—	
Link		LINK?	0:FORWARD 1:REVERSE	—	
FORWARD	LINK FWD	—	—	—	
REVERSE	LINK RVS	—	—	—	
Rate		RATE?	0:9600/14400 1:4800/7200 2:2400/1800 3:1200/1800	—	
	RATE9600	—	—	—	
	RATE4800	—	—	—	
	RATE2400	—	—	—	
	RATE1200	—	—	—	
Channel offset	CHOFS*1	CHOFS	Integer	—	
CDMA standards for the user channel					
IS-95	USIS	—	—	—	
J-STD-008	USJSTD	—	—	—	

**Table 4-1 List of GPIB Codes (4 of 4)**

FUNCTION	Listener Code	Talker Request			Remarks
		Code	Output Format	Header	
User channel table					
Channel & Frequency Input	CUSIN*1	—	—	—	
Input for start frequency	CUSINST*1	—	—	—	
Input for stop frequency	CUSINSP*1	—	—	—	
Table deletion	CUSDL	—	—	—	
Input for the title	CUSTIT*3	—	—	—	
STORE	CUSST*3	—	—	—	
LOAD	CUSLD*3	—	—	—	

4.2 Service Request (SRQ)

**4.2 Service Request (SRQ)**

The status of various aspects of the spectrum analyzer can be detected remotely using the GPIB service request function. A controller can read out the status of the spectrum analyzer because an error sets the corresponding bit in the status byte using serial polling.

**Table 4-2 SRQ ON/OFF Specification Codes**

GPIB Code	Content
S0	Sends SRQ signal (interruption) to the controller.
S1	Does not send SRQ signal (interruption) to the controller.
S2	Clears the status byte.

**Table 4-3 Status Byte**

Bit	Value in Decimal	Content
0	1	This is set to 1 when UNCAL is generated.
1	2	This is set to 1 when a calibration finishes..
2	4	This is set to 1 when a sweep finishes.
3	8	This is set to 1 when the averaging (for channel power, OBW, ACP or spurious emission measurement) reaches the set number.
4	16	This is set to 1 when plot output finishes.
5	32	This is set to 1 when a GPIB code error or mode error occurs (SYNTAX ERR).
6	64	This is set to 1 when any bit in bits 0 through 5 or bit 7 is set to 1 after sending a service request (S0).
7	128	

### 4.3 Sample Programs

The following sample programs use N88-BASIC in PC9801 series.

#### Example 1: ACP measurement

```

1000 ISET IFC:ISET REN
1010 PRINT @8;"S2"                ! Clear the status byte.
1020 PRINT @8;"HD0 CACP ON CMESSRT" ! Start ACP measurement
1030 *LOOP
1040 POLL 8,S
1050 IF (S AND 8)=0 THEN GOTO *LOOP ! Wait until the measurement finishes.
1060 PRINT @8;"CACP?"            ! Read out the measurement result.
1070 INPUT @8;PS,DBM,WATT,L1,L2,L3,L4 ! Read out Pass/Fail, the reference power and ACP.
1080 END

```

#### Example 2: Spurious emission (In Band) measurement

```

1000 ISET IFC:ISET REN
1010 PRINT @8;"S2"                ! Clear the status byte.
1020 PRINT @8;"HD0 CSPR ON CMESSRT" ! Start SPURIOUS measurement
1030 *LOOP
1040 ROLL 8,S
1050 IF (S AND 8)=0 THEN GOTO *LOOP ! Wait until the measurement finishes.
1060 PRINT @8;"CSPR?"            ! Read out the measurement result.
1070 INPUT @8;N,DBM,WATT          ! Read out the number of peaks and reference power.
1080 FOR I=1 TO N                 ! Read out the data associated the peaks.
1090 INPUT @8;F,L,PS              ! Marker frequency or level, PASS/FAIL
1100 NEXT I
1110 END

```

#### Example 3: Entering user channel table

```

1000 ISET IFC:ISET REN
1010 PRINT @8;"CUSDL"             ! Initialize the user channel table.
1020 PRINT @8;"CUSTIT /CDMA CH/" ! Set the title.
1030 PRINT @8;"CUSINST 5MZ"       ! Set the start frequency in the table.
1040 PRINT @8;"CUSINSP 35MZ"      ! Set the stop frequency in the table.
1050 PRINT @8;"CUSIN"             ! Input state of the channel and frequency.
1060 PRINT @8;"1ENT 10MZ"         ! Enter the channel and frequency.
1070 PRINT @8;"2ENT 20MZ"
1080 PRINT @8;"3ENT 30MZ"
1090 PRINT @8;"CUSR"              ! Change the channel type to USER CH.
1100 PRINT @8;"CDMACH 1ENT"       ! Set the channel.
1110 END

```









## APPENDIX

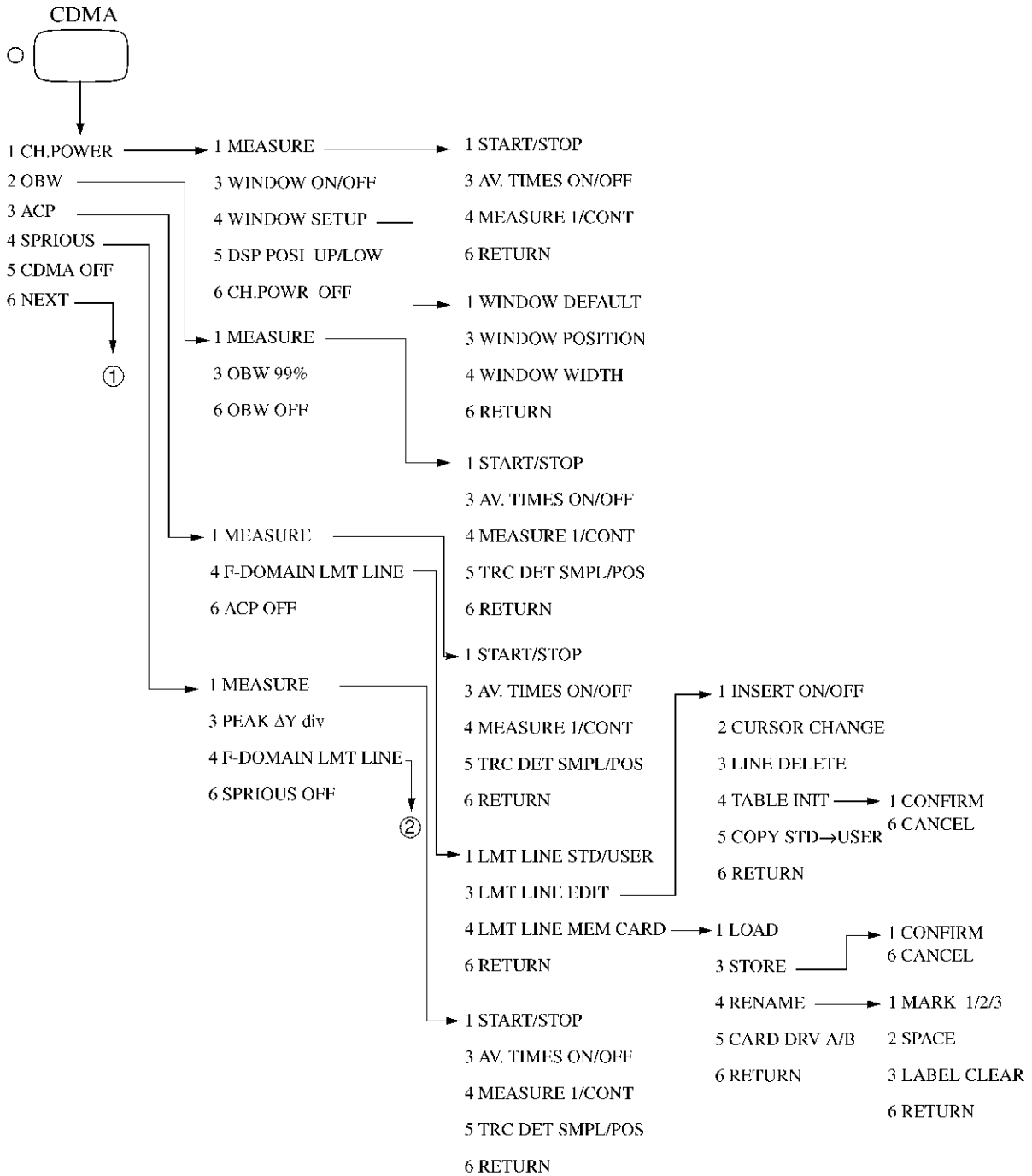
### A.1 Soft Menus

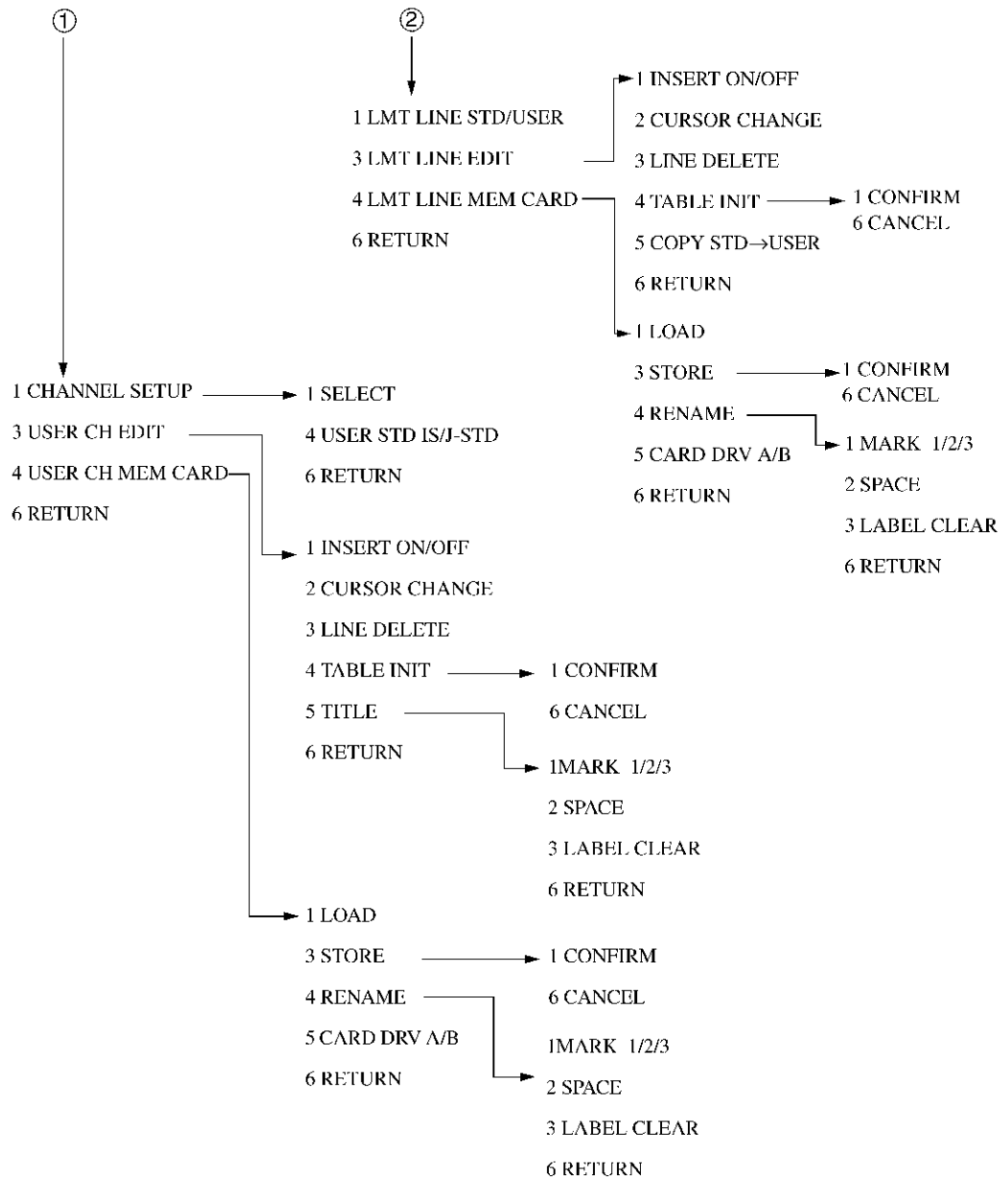
CENTER



- 1 CF STEP AUTO/MNL
- 2 FREQ OFS ON/OFF
- 5 UNIT Hz/CH

A.1 Soft Menus





A.2 Error Messages

**A.2 Error Messages**

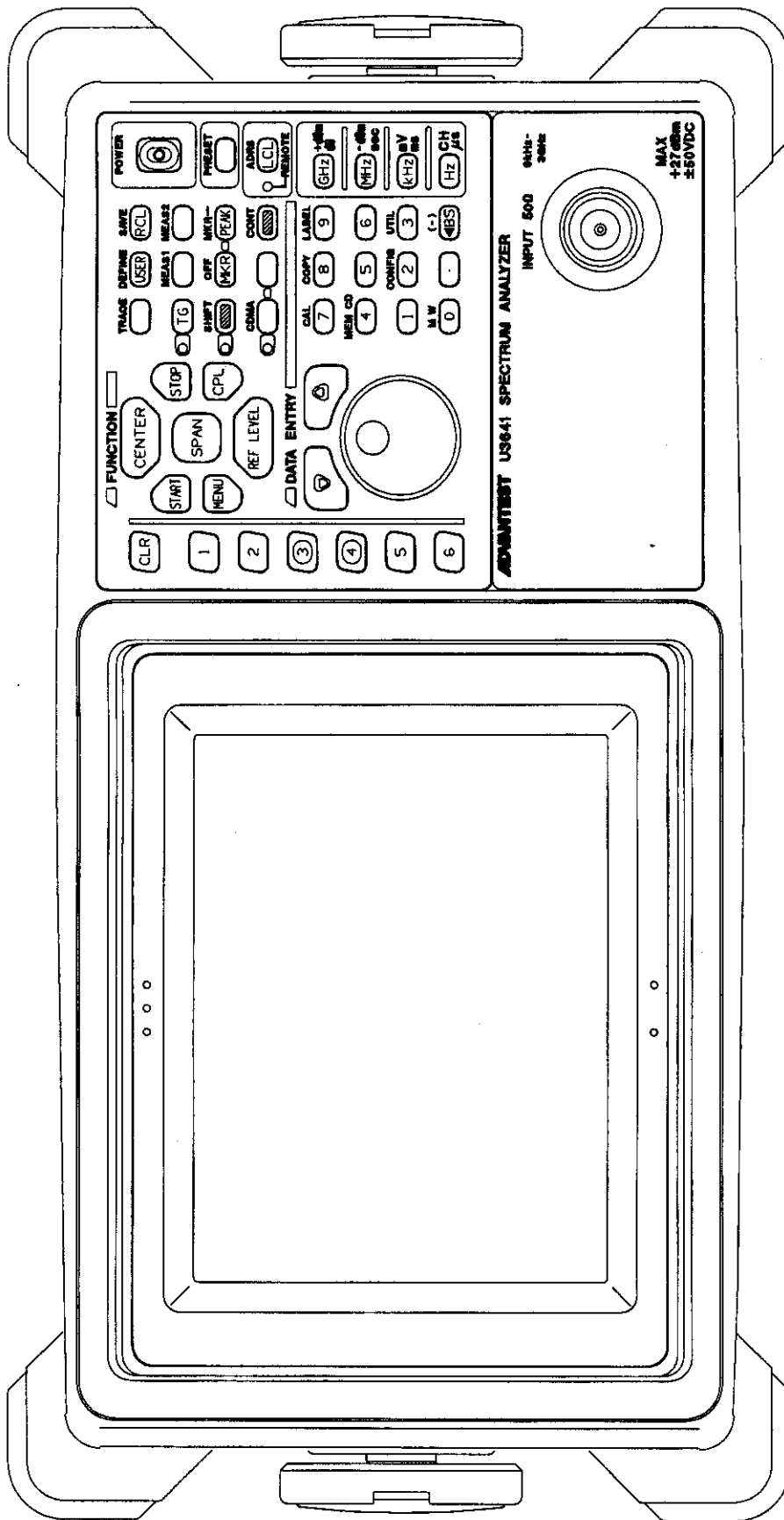
Error Code	Displayed Message	Description
ERR:229	NG LIN SCL	CDMA measurement mode cannot be set, because the spectrum analyzer is set to the linear scale.
ERR:317	NG MNL SWP	CDMA measurement mode cannot be set, because the spectrum analyzer is set to the linear scale.
ERR:363	ANT CORR ON	CDMA measurement mode cannot be set, because the spectrum analyzer is set to the antenna correction mode.
ERR:755	CDMA MODE	Disables the marker function, because the spectrum analyzer is in CDMA measurement mode.
ERR:756	CDMA MODE	Disables the trace function, because the spectrum analyzer is in CDMA measurement mode.
ERR:758	CDMA MODE	The linear scale cannot be selected, because the spectrum analyzer is in CDMA measurement mode.
ERR:759	CDMA MODE	The only unit which can be used is dBm, because the spectrum analyzer is in CDMA measurement mode.
ERR:760	CDMA MODE	MANUAL SWEEP cannot be performed, because the spectrum analyzer is in CDMA measurement mode.
ERR:761	CDMA MODE	Antenna correction cannot be turned ON or antenna factor cannot be changed, because the spectrum analyzer is in CDMA measurement mode.
ERR:762	CDMA MODE	Limit line cannot be turned ON, because the spectrum analyzer is in CDMA measurement mode.
ERR:763	CDMA MODE	WIDE RBW cannot be turned ON, because the spectrum analyzer is in CDMA measurement mode.
ERR:764	CDMA MODE	The delay sweep mode cannot be set ON, because the spectrum analyzer is in CDMA measurement mode.
ERR:765	NG LMT LINE	Measurement cannot be started, because there is no data in the user table used with the limit line.
ERR:766	WINDOW LMT	The width of the measuring window is in the minimum size and cannot be made smaller than the actual size.
ERR:767	SPRIOUS MD!	The Frequency Input mode cannot be set, because the spectrum analyzer is in Spurious Emission Measurement mode.
ERR:768	FREQ IINPUT!	The Spurious Emission Measurement mode cannot be set, because the spectrum analyzer is in the Frequency Input mode.
ERR:769	USER TABLE?	The Frequency Input mode cannot be set, because the spectrum analyzer is in Spurious Emission Measurement mode.

Error Code	Displayed Message	Description
ERR:770	OBW MD!	The marker function cannot be set ON, because the spectrum analyzer is in OBW measurement mode.
ERR:771	MEAS MODE?	CDMA measurement mode (the channel power, OBW and so on) is not selected.
ERR:772	CH.POW MD?	Noise/Hz cannot be set, because channel power measurement mode is not set.

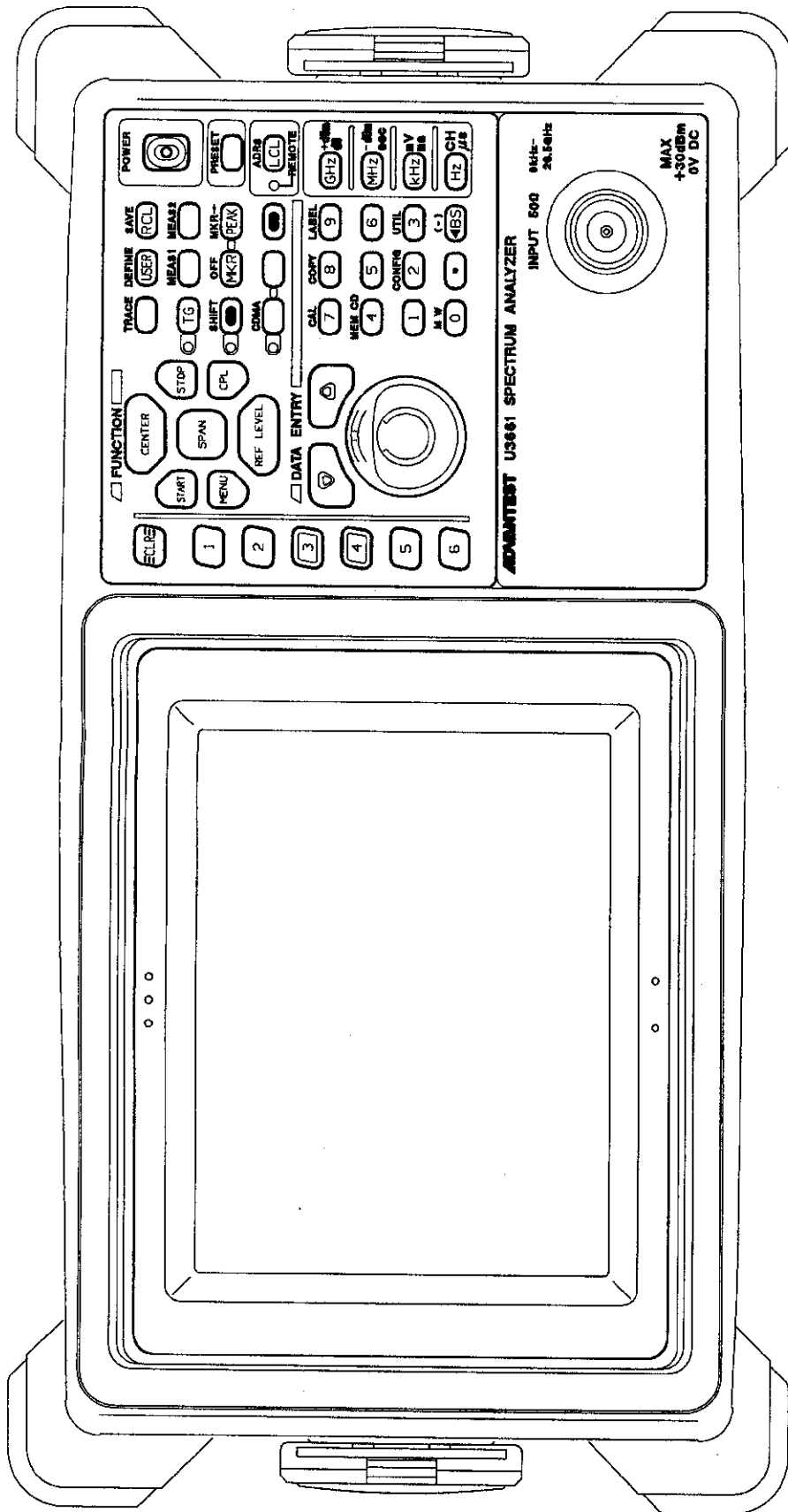




EXTERNAL VIEW



U3641 OPT60



U3661 OPT60

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