

Spectrum Analyzer
9kHz-2.7GHz **SA-7270**

User's Guide

SA-7270

Spectrum Analyzers

User's Guide

Article 1

Read this manual before using the equipment.

Keep this manual with the equipment.

This symbol appears on the display or the equipment this manual, you have the following meanings.

warning : If the harm to the human body or be dangerous to life.
(WARNING) The situation properly and identify the warning signs appear on the device or the manual
Do not proceed until you have a high action.

caution : Result in a fire or cause serious damage to the equipment or other equipment
(CAUTION) If you can.
Please stop work until appropriate action is taken.

Grounded The ground terminal to the chassis (ground)
(GND)

Safety Precautions

circa And

1. Section when working near where the left stick warning display
Refer to the user manual. If you note the advice on the User's Guide
If the job is not done, there is a risk of personal injury. Other than that
It can also decrease the performance of the equipment. Moreover, this alert mark is sometimes a risk
Indicating used with other marks and descriptions.

2. Fold the 3-pin accessory 3-pin power cord When supplying power to this equipment,
How to connect to a power outlet. If a grounded 3-pin outlet before
Program using the adapter ring on the back panel of the equipment or ground the green wire
Attach the frame to the ground floor. Power without grounding the equipment
If supply can cause a serious (sometimes fatal) electric shock and damage to the equipment,
is.
3. This equipment is not user-serviceable. Open or parts inside the cover
Do not disassemble. Trained service personnel or electrification of LG Innotek
And the re-equipment sales representative, only employee with knowledge of the risk of electric shock
It can be repaired. This equipment has severe injuries or for unskilled workers
There are high-voltage components that provide the risk of a fatal electric shock. etc
Risk of damage to precision parts.
4. The equipment must be used in the correct position. If the device side lead
If unstable and fall over as a receiving a slight mechanical shock
Standing may be damaged.

repair

warning

If you fall

3

Safety Precautions

week of

1. Always unplug the power cord disconnected before replacing the fuses from the electrical outlet
Replace the fuse. Always rating and type of fuse indicated on the back cover plate
Use a new fuse for.
Fuse exchange
T3.15A refers to the time lag fuse (overcurrent protection fuses).
caution
If the power cord is connected to replace the fuses while the risk of a fatal electric shock
There is.
2. no power supply and cooling fan free of dust.
 - Clean the power inlet regularly. Dust build up around the power pins
If there is a risk of fire.
 - Make sure the vents are not blocked by the cooling fan clean.
 cleaning

If the ventilation is obstructed, the cabinet may overheat and catch fire fly.

3. ◦ The maximum DC voltage rating:
- Terminal exchange RF input 50VDC
 TG output 0VDC
- Maximum AC Voltage Rating:
 + 26dBm RF input
- No Input: + 26dBm or more, 50VDC or more RF input
- Overvoltage can damage the internal circuits.

4

Safety Precautions

week of

4. The memory back-up power is supplied by a lithium primary battery. This battery drip
The same type of batteries (SANYO; CR12600SE-FT3) must be exchanged only.
Memory backup Since this exchange is only possible when close to LG Innotek LG exchange needed
Battery replacement Innotek, please contact your dealer.
NOTE: The battery life is approximately seven years. It is recommended that you replace the battery in advance
It.
- caution The lithium battery separately from the general waste Cares should be processed in accordance with the disposal procedure
Please.
- Storage media 5. This equipment stores data using a PCMCIA Type I Memory Card
(PCMCIA) is.
By misuse or malfunction and data it may be lost.
Therefore, our LG Innotek is recommended to back up the memory.
- LG Innotek is guaranteed loss of memory caused by improper use of equipment and
Not.

In particular, please note the following items.

- Do not remove the memory card from the device during use.
 - Protect the memory card from static electricity.
- SRAM backup battery on the memory card, it has a limited life span

- ° is. Batteries method specified in the SRAM memory card manufacturer Replace a regular basis.

5

Safety Precautions

week of

Damage prevention

6. Use Proper Power Source: this product from the power source for applying a higher voltage than specified
Do not work.

Proper Ventilation: adequate ventilation to prevent product overheating
Keep the state.

In a state that is suspected of malfunction, do not work: If this product,
In you suspect there is damage, LG Innotek qualified service personnel
To have it inspected.

Do not operate if the protective device is damaged: If the unit is damaged, it
If you like the show or abnormal operation it may have been compromised as a protective device
It is also available. Do not operate the machine under these conditions. Proper
LG Innotek, contact qualified service personnel for machine operation
do it.

About where caution

7. Object and Liquid Entry: What kind of stuff or liquid into the equipment
Do not push. It may touch dangerous voltage short out parts
Stand could result in a fire or electric shock. Liquid of any kind on the equipment
Ssotahseo is not over. Do not use this product near water
For example, five-bath towels, kitchen sink, in a wet basement or near a laundry room,
Or place such as near a swimming pool. This unit avoid humid air, water and dust
Please. If you leave this unit where damp or dusty, anticipated
The value can occur without incident.

Flammable and explosive: This unit prints or on or near the place where the gas
Do not use where there is explosive.

Unstable Location: This device is above an unstable cart, stand, tripod, extruded
Do not leave it on the table or shelf. Equipment is severe the person away
It can hurt or could seriously damage the equipment itself. vibration
Do not install or use where.

LG Innotek Guarantee

If any one of the following conditions, the warranty is void. If within one year after shipment producers
If the failure occurred due to a defect in the function I LG Innotek will repair the equipment free of charge.

- If the defect is outside the scope of the warranty conditions in this user guide
- Operating defective or incorrect use, if due to unauthorized modification or repair your equipment
- If the fault is clearly caused by excessive use of off I normal range
- If the defect is due to improper / inadequate maintenance by the user
- If such defects are due to natural disasters, fires, floods, earthquakes,
- Peripheral equipment or component failure is specified, such as the case of the use of consumables
- If defect by use of the installation site is that that power supply is specified or unspecified

In addition, this warranty is valid only for the original equipment purchaser. If the equipment is resold warranty is not transferable
It.

LG Innotek is unpredictable or unusual faulty equipment or the environment caused by careless handling of user
It is not responsible for the defects caused by the.

LG Innotek Contacts

If LG Innotek's office or the nearest address in the spirit of this manual, if the fault occurs in the equipment
For eopjeom or contact a service center.

Front Power Switch

The power turns on when you press the power switch when the device is in standby status.
If you hold down the power if the power switch for more than 1 second while turning, Chapter
Non-pressing the wrong place I will go into standby state in order to prevent malfunctions.

If the power is turned on when the power plug is pulled from the wall outlet and plug it in again if the wait
It is brought. Another momentary power supply interruption or power failure, the electrical power is lost to the ground again
Ohdeora also contains power is not turned on in the standby mode.

This is when the power is disconnected the power is applied to operate the equipment again incorrect data
It is to prevent coming.

For example, if the sweep time is 1,000 seconds and data acquisition requires a long time, instantaneous ago
Source supply interruption (power failure) might occur during measurement and the power can be restored automatically
is. In such a case, the equipment is the wrong material unaware of the momentary power supply interruption
You can correct mistaken data.

If the equipment is momentary power supply interruption or power failure in the measuring system goes into standby mode
Please check the status of the system and press the front power switch to restore power to this equipment.

Detection mode

This equipment is a spectrum analyzer which uses a digital storage system. The spectrum analyzer will be measuring the frequency range, and each is divided by the number of measurement points 500 to measure the level of each frequency. The. Because of this behavior to use a detector of the following modes associated with the appropriate measurements It is desirable.

Measure	Detector mode
◦ Normal signal	POS PEAK
◦ Random noise	SAMPLE OR AVERAGE
◦ Pulse noise	NORMAL
◦ Occupied bandwidth (For analog communication systems)	SAMPLE
◦ Occupied bandwidth (For digital communication systems)	POS PEAK or SAMPLE

When Detection mode is specified as one of the measurement methods, in the specified Detection mode For measurements.

Declaration of Conformity

according to ISO / IEC Guide 22 & EN45014

Manufacturer's Name: LG Innotek Co., Ltd.

Manufacturer's Address: 133, Gondan Dong, Gumi city
Gyeongsanbuk Do, 730-030
ROK

It declares that the product:

Product Name: Spectrum Analyzer
Model Number: SA - 7270
Date: Dec. 15.1998

Conforms to the following product specification:

EMC: EN 61000-3-2: 1995
EN 61000-3-3: 1995
EN 55011: 1991 Class A
EN 50082-1: 1997
(EN 61000-4-2: 1995, EN 61000-4-3 : 1995,
EN 61000-4-4: 1995, EN 61000-4-5: 1995,
EN 61000-4-6: 1996, EN 61000-4-8: 1993,
EN 61000-4-11: 1994, ENV50204: 1995)
Certified by KOREA TOKIN EMC

Safety: EN 61010-1: 1993 + A2: 1995
Certified by TÜV Rheinland

Supplementary Information:

The product herewith complies with the requirements of the Low
Voltage Directive 73/23 / EEC and the EMC Directive 89/336 / EEC.

Gumi, Gyeong-buk
Location
Gumi, Gyeong-buk
Location

Yeon Ho Kim
Quality Assurance Manager

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This user's manual

(Optional) Configuration of SA-7270 Owner's Manual

Manual of SA-7270 Spectrum Analyzer consists of two documents below.

User's Guide

Vol. One

Owner's Manual
Configuration

User's Guide : SA-7270 Summary of preparation before use, panel description, Operation procedure, soft-key menu, Castle
It provides information on performance tests.

Provides information on RS-232C, GPIB remote control and sample programs: Programming Guide.

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neck car

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Chapter 1 theory

Configuration of the User's Guide

This guide is organized into seven chapters. Each section is shown below.

Configuration of each chapter		doxy	persons
Chapter 1	gun theory	Product overview, options, applicable parts, peripherals and specifications	
Chapter 2	Preparing for use	Work to be performed before power is applied	
Chapter 3	Panel Description	Before / after the description of the panels	
Chapter 4	Soft-key menu	Description of the soft key menu	
Chapter 5	Operating procedures	movement	
Chapter 6	Performance Test	Test is used to check the performance	

Chapter 1 theory

Chapter 1

Total loans

Overview of products

SA-7270 (hereinafter referred to as "equipment" hereinafter) which is digitized using a frequency increased and equipment is increasingly faster Monochrome LCD is a portable spectrum analyzer suited for signal analysis of radio equipment.

SA-7270 is employed by the synthesizer local system to cover all frequencies from 9kHz to 2.7GHz

Can, and distortion, the basic performance such as frequency / level accuracy, outstanding and easily depending on the soft key menu It can work.

This option must be adapted to the various applications a rich and excellent price performance.

Accurate calibration signal, variable attenuator, LOG / LIN-scale switching, various RBW, which can be variable by operating the function of the reference level, such as to accurately calibrate the characteristics of the equipment.

Because the calibration data is corrected by the frequency response of the built-in, a wide range of frequency bands

About enables accurate level measurement.

The switching of the waveform between the time domain and the frequency domain is made in a single operation waveform du gaji

At the same time, because this shows the signal analysis of the two areas is done efficiently.

This equipment provides the MEASURE function can be measured in a variety of applications without the need of an external controller

is. Therefore easy to perform the performance evaluation of the frequency of the radio equipment, noise, occupied frequency, frequency bandwidth, etc. can be.

■ Application

This unit is useful for electronic equipment, production, building and maintenance below.

- AM / FM radio equipment
- Digital cellular / cordless phone
- satellite broadcasting, CATV, TV Equipment
- Small capacity microwave equipment

option

The table below shows the options for the SA-7270, sold separately.

Model Number	Products	ratio And
HS-7270	High Stability Oscillator	Stability: $\leq 0.2\text{ppm}$
PC-7270	PCMCIA card interface	Ver PCMCIA. 2.0 Type I, 1 Slot * does not provide a memory card.
AD-7270	AC, DC Power	100VAC-240VAC (T7A includes one fuse) 13VDC-20VDC
QP-7270	QP Detector	QP B QP C & D
TG-7270	Tracking Generator	100kHz to 2.7GHz 0dBm to -70dBm

+ When you order the model number, product name, please specify the quantity.

Chapter 1 theory

Optional accessories and peripherals

The table below shows the optional accessories and peripheral devices for SA-7270, sold separately.

Optional accessories Device				
Model Number	Products	persons	ratio	And
BT-7270	Battery Pack		Ni-Cd, 14.4V DC, 7AH (Including cable)	
SB-7270	Carrying Case			
CA-7270	Connectors and cable assembly			

+ When you order the model number, product name, please specify the quantity.

Specification of the product

NOTE: You need a warm-up time of 15 minutes.

1.0 FREQUENCY

1.1 Tuning Range:	9 kHz to 2.7 GHz.
1.2 Tuning Resolution:	1 Hz Minimum
1.3 Frequency Span Width:	100Hz / div to 270 MHz / div in 1, 2, 5 step selections (auto selected) plus ZERO SPAN, and FULL Span (9 kHz to 2.7 GHz). Manual selection of start, stop, and span.
1.4 Span Accuracy	± 3% of the indicated Span Width .
1.5 Readout Accuracy:	Span Accuracy + Frequency Standard Accuracy + 50% of RBW.
1.6 Frequency Counter:	
1.6.1 Resolution:	1 kHz, 100 Hz, 10 Hz , 1 Hz (user selection)
1.6.2 Accuracy:	± (Resolution frequency error (maker frequency accuracy + counter resolution ± 1 count)
1.6.3 Sensitivity:	≤-70 dBm (50kHz2.7 GHz)
1.7 Stability	
1.7.1 Residual FM:	<100 Hzp-p 200ms @ 1 kHz RBW, 1 kHz VBW (P-P in 20 ms)
1.7.2 Noise Sidebands:	-90 DBc / Hz @ 10 kHz offset

2.0 AMPLITUDE

2.1 Measurement Range:	+20 To -105 dBm
2.2 Average Displayed Noise Level:	50 kHz to 100 kHz ≤-80 dBm 100 kHz to 1 MHz ≤-100 dBm 1 MHz to 2.7 GHz ≤-105 dBm (300 Hz RBW, 10 Hz Video Filter)
2.3 1 dB Compression Point:	-10 DBm 100 kHz to 2.7 GHz (0dB attenuation)
2.4 Displayed Range:	80 dB in 10 dB / div log scale. 40 dB in 5 dB / div log scale. 16 dB in 2 dB / div log scale. 8 dB in 1 dB / div log scale. 8 divisions with linear amplitude scale.
2.5 Amplitude Units:	
2.5.1 Log Scale Mode:	dBmV or dBm units.
2.5.2 Linear Scale Mode:	V (uV, mV, etc.) , or dBV (dBmV only)
2.5.3 Quasi Peak Enabled:	dBuV, dBmV, or dBm only

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Chapter 1 theory

2.6 Display Linearity:	5 or 10 dB / div, ± 0.15 dB / dB, ≤ ± 1.5 dB over 8 divisions. 1 or 2 dB / div, ± 0.5 dB over 8 divisions. Linear, (10% of Reference Level over 8 divisions
2.7 Frequency Response:	+1 DB -3.0, 9 kHz to 10 MHz, ± 1.5 dB, 10 MHz to 2.7 GHz

(10 dB RF Attenuation)

2.8 Attenuator:

- 2.8.1 Range: 0 to 50 dB, Selected manually or automatically coupled to reference level.
- 2.8.2 Resolution: 10 dB steps.
- 2.8.3 Accuracy: 50 kHz to 2.7 GHz, ± 0.5 dB / step up to 1 dB maximum

2.9 Reference Level:

- 2.9.1 Accuracy: ± 1.5 dB (50 kHz to 2.7 GHz)
- 2.9.2 Range: -110 DBm to +30 dBm with 300 Hz filter using 1dB / div scale
- 2.9.3 Resolution: 0.1 dB Step minimum

2.10 Residual Spurious ≤ -85 dBm (input terminated, 0 dB attenuation)

2.11 Harmonic Distortion: ≤ -60 dBc, -40 dBm input , 0 dB attenuation.

2.12 Intermodulation Distortion: ≤ -70 dBc, 100MHz to 2.7 GH, -30 dBm input
(3rd order) 10dB attenuation ≤ -60 dBc, 1MHz to 100MHz, -30 dBm input

2.13 Other Input Related Spurious: ≤ -60 dBc, 10MHz to 2.7 GH, -30 dBm input

2.14 Resolution Bandwidth:

- 2.14.1 Selections: 300 Hz, 1 kHz, 3 kHz , 10 kHz, 30 kHz, 100 kHz, 300 kHz, 1 MHz, 3 MHz
- 2.14.2 Accuracy: $\leq \pm 20\%$
- 2.14.3 Selectivity: 60 dB / 3 dB ratio $< 15 : 1$
60 dB / 6 dB ratio $< 12 : 1$; 9 kHz & 120 kHz
(Quasi Peak Option).
- 2.14.4 Switching Error: ± 1.0 dB (3kHz Reference RBW)

2.15 Video Bandwidth Selection: 10 Hz to 1 MHz in 1-3-10 steps plus None.

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3.0 SWEEP:

- 3.1 Rate: 50 ms to 1000 sec in 1-2-5 sequence ,
5 ms to 20 sec (ZERO SPAN)
- 3.1.1 Sweep Rate Accuracy: 20%, < 100 msec
10%, for all other sweep rates

3.2 Trigger:

- 3.2.1 Source: External (rear), Line, Video
- 3.2.2 Modes: FreeRun, Single.
- 3.2.3 Coupling: DC.
- 3.2.4 Bandwidth: Selectable: Flat, 5 Hz HPF, or 100 kHz LPF
(-3dB Nominal, measured at External Input)
- 3.2.5 External Rear Level: TTL Level
- 3.2.6 Delay: $\pm$ one sweep time

4.0 DISPLAY

- 4.1 Type: (7.4 ") Monochrome STN LCD
- 4.2 Digital Resolution: 640 H x 480 V active display area

4.3 Marker Modes:	peak Search, Peak Track, Delta Marker , 1 / Delta Marker, Marker Track; Marker to Center, Marker to Reference (2 markers maximum)	
5.0 MEMORY		
5.1 Trace Storage:	20 stored traces including user defined traces and test limits.	
5.2 Setup Storage:	10 operational states.	
5.3 Display Traces at One Time	2 Traces	
6.0 INPUTS		
6.1 RF Input:		
6.1.1 Connector:	Type N Female, 50ohm nominal.	
6.1.2 VSWR:	150kHz to 2.7 GHz, VSWR <1.5 : 1. (with 10 dB Input attenuation)	
6.1.3 Maximum Input Level:	50 Vdc, +26 dBm (with 30 dB attenuation)	
6.1.4 LO Emissions	≤-70 dBm (with 10 dB attenuation)	
7.0 OUTPUTS		
7.1 IF Output	10.7 MHz, Nominal	
7.2 Video Output	0 to 5V DC	
8.0 FREQUENCY STANDARD	STANDARD	HIGH STABILITY OPTION
8.1 Temperature Stability:	± 2ppm	± 0.1 ppm
8.2 Aging:	± 1 ppm / year	± 0.1 ppm / year

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Chapter 1 theory

9.0 EXTERNAL REFERENCE	Switchable between Internal / External			
9.1 Connector:	BNC female connector.			
9.2 Input level	-5 DBm to + 15 dBm			
9.3 Output Level	10 MHz @ +5 dBm nominal			
10.0 IEEE-488 (GPIB) INTERFACE				
10.1 Conforms to:	IEEE-Standard 488-1987.			
10.2 Implemented Subsets:	SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, C0, LE0, TE0			
11.0 RS-232C INTERFACE				
11.1 Type:	Null Modem (Duplex Virtual Hardware Handshaking)			
11.2 Baud Rate:	600 bps, 1200 bps, 2400 bps , 4800 bps, 9600 bps, 19.2 kbps			
11.3 Parity Check:	Odd, Even or None.			
11.4 Data Length:	7 bits, 8 bits.			
11.5 Stop Bits:	1 bit, 2 bits.			
12.0 PRINTER				
12.1 Drivers:	PCL3			
12.2 Connection:	Standard 25 Pin female D-Sub Parallel Printer.			
13.0 QUASI-PEAK OPTION				
SELECTED BANDWIDTH	RECOMMENDED FREQUENCY RANGE	CHARGE TIME (ms)	DISCHARGE TIME (ms)	DISPLAY TIME (ms)

9 kHz	150 kHz to 30 MHz	1 ± 20%	160 ± 20%	160 ± 20%
120 kHz	30 MHz to 1GHz	1 ± 20%	550 ± 20%	100 ± 20%

14.0 GENERAL CHARACTERISTICS

- 14.1 Dimensions:
 - 13.75 ((350 mm) wide (Including handle)
 - 7.15 ((185 mm) high
 - 14.75 ((381 mm) deep
- 14.2 Weight: 18.0lb (8.2 kg) without options
- 14.3 Warm-up Time: 15 minutes for specified accuracy.
- 14.4 Power Requirements (standards)
 - 14.4.1 Source Voltage and Frequency 100-240 VAC at 50 / 60Hz
 - 14.4.2 Power Consumption: 60 watts maximum (without options)

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- 14.5 Power Requirements (Optional AC / DC power supply: AD-7270)
 - 14.5.1 Source Voltage and Frequency 100-240 VAC at 50 / 60Hz
 - 13-21VDC (Use only BT-7270 battery)
 - 14.5.2 Battery (With BT-7270) 14.4VDC nominal Ni-Cd 7000mAh
 - 14.5.3 Power Consumption 80 Watts maximum
- 14.6 Fuse requirements
 - 14.6.1 F1 and F2
 - 14.6.1.1 100 to 120 VAC 3.15A, 250V, Type T
 - 14.6.1.2 220 to 240 VAC 3.15A, 250V, Type T
 - 14.6.1.3 13-21 VDC 7A, Type S (Optional AC / DC Power Supply)
- 14.7 Environmental Range
 - 14.7.1 Use Indoors
 - 14.7.2 Operating Temperature 0 to 40 °C
 - 14.7.3 Storage Temperature -20 To 70 °C.
 - 14.7.4 Temperature / Humidity: Meets MIL-T-28800E for Type 2, Class 5, non-condensing (85% operating, storage 90%)
 - 14.7.5 Vibration / Shock: Meets MIL-T-28800E for Type 2, Class 5
 - 14.7.6 Altitude:
 - Operation up to 3,000 meters
 - Non-operational up to 40,000 feet.
- 14.8 Product Safety
 - 14.8.1 Supplemental Environmental Conditions
 - 14.8.1.1 Main Supply Voltage Fluctuations:
 - ≤ ± 10% of the nominal voltage
 - 14.8.1.2 Transient Overvoltage: According to Installation Category II
 - 14.8.1.3 Pollution Degree: 2
- 14.9 RF Emissions and immunity
 - 14.9.1 RF emissions Complies with EN 55011: 1991, Class A
 - 14.9.2 RF Immunity Complies with EN 50082-1: 1997

Chapter 1 theory

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SECTION 2 PREPARATIONS BEFORE USE

Chapter 2

PREPARATIONS BEFORE USE

This chapter ready to be carried out before using the SA-7270 spectrum analyzer and safety section
It describes the car. Safety procedures to prevent damage to the equipment and risk of injury for the user
Will.
Before using the SA-7270 must be read / understand the contents of the pre-operation preparations.
To set the GPIB cable and GPIB address, see the programming manual for the Vol 2.
do it.

	neck	car
Environmental conditions of the installation site		2-3
Locations To Be Avoided		2-3
Cleaning the fan		2-3
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DC power supply fuse replacement (optional)		2-12
DC battery pack connection method (optional)		2-13

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2-2

Locations To Be Avoided

SA-7270 will operate in a normal 040 °C. However, under the circumstances for the best performance of the damage You must.

- O where the vibration
- O humidity is high
- O where the equipment is exposed to direct sunlight
- O where it will be exposed to an active gas

In order to ensure trouble-free operation in addition to long-term use of the above conditions this equipment is the power supply voltage is larger at room te Should be used in place does not fluctuate.

circa And !

If SA-7270 is used after a long period of time or kept at a low temperature is used, at room temperature by condensation There is a risk of short circuits. To prevent this risk, when the SA-7270 is fully dried Do not turn up.

Cleaning the fan

To suppress any internal temperature is rising Equipment SA-7270 has a cooling fan on the rear panel. The rear panel and the wall so that the vents are not blocked, as shown in the figure below, near equipment or obstacles Between at least one must place a 10 cm distance.

10cm wall
Pan week of !

2-3

SECTION 2 PREPARATIONS BEFORE USE

Safety measures

This I to prevent the risk of an accidental electric shock, damage to the equipment or a major operation interruption Explains the safety procedures to be followed under all circumstances.

Turning on the power

circa And !

- O Powering ago SA-7270 must be connected to protective ground. It is also essential to check out the power supply voltage.

If the abnormal voltage is input that exceeds the specified value
 There is a risk of damage or fire, an unexpected SA-7270.
 O After turning on the power To maintain the SA-7270 open the cover and leave on the power
 There is a need for internal checks and adjustments.
 The service is for trained service personnel of LG Precision
 Please request.

Notes on safety procedures are discussed in Chapter 2, in addition to other chapters.
 Before you start to work together to prevent accidents sure to read this chapter and that chapter and
 Five.

2-4

SECTION 2 PREPARATIONS BEFORE USE

The input level of the RF input

Frequency range: 9kHz to 2.7GHz

Measurement level: N-type maximum signal level input to the RF input connector is +26 dBm

circa And !

RF Input circuit is not protected against overvoltage.
 If the + 26dBm when the input signal is applied exceeds the input attenuator and the mixer
 It will be damaged.
 ! It is warning signs to prevent such damage.

SECTION 2 PREPARATIONS BEFORE USE

Preparation before powering on

SA-7270 is 100VAC/240VAC (automatic selection volts) must operate normally when connected to a 47 63Hz AC power is. Before power is supplied to prevent the occurrence of the need described in the following pages Article It must take the value.

- O accidental electric shock
- O Damage caused by abnormal voltage.
- O Ground current problems.

To protect the user and displays the following warning notices are attached to the SA-7270 rear panel.

WARNING

!

TO AVOID ELECTRIC SHOCK
THE PROTECTIVE GROUNDING CONDUCTOR
MUST BE CONNECTED TO GROUND.
DO NOT REMOVE COVERS.
REFER SERVICING TO QUALIFIED PERSONNEL.

CAUTION

!

FOR CONTINUED FIRE PROTECTION
REPLACE ONLY WITH SPECIFIED
TYPE AND RATED FUSE.

circa And !

week of !

To avoid electric shock, the protective ground wire to the ground must be connected. Do not remove the cover. Only replace the fuse.
Services, contact a qualified service personnel.

circa And !

Disassemble, adjust, repair, or it inside this equipment may only be done by qualified personnel.
Maintenance of fire or electric shock, the LG Precision to service personnel only education about the dangers of this equipment
became. Accidentally touched a high-voltage internal lethal injury or death, or equipment precision parts
There is a possibility that the product is damaged.

Always follow the instructions on the next page.

2-6

SECTION 2 PREPARATIONS BEFORE USE

Protective earthing

Frame ground (FG) terminal and to ground

In the absence of a grounded AC power outlet is just the frame ground (FG) terminal on the rear panel to earth ground open
It must be connected.

When power is applied without protective grounding of electrical shock unexpected place
Hazard. Protection frame earth is on the back panel (FG)
Terminals and ground terminals of the supplied power cord must power
Before it is supplied to the SA-7270 it must be connected to earth ground
All.

TRIG
CAT
GPIB PRINTER POWE
GATE DISCONNECT
BEFORE RE

DEO

SECTION 2 PREPARATIONS BEFORE USE

Fuse exchange

circa And !

O Inserting change the fuse in a state where power is greater risk of an electric shock.

Unplug the power cord, turn off the power switch before inserting change the fuse.

O If power is supplied without protective grounding, there is a risk of accidental electric shock. That out

On, If the AC voltage is not suitable for the internal circuitry of the hand-SA-7270 by the abnormal voltage

There is a risk of damage it. Protection mentioned earlier before turning it on again after inserting the power to change a fuse

For that it is connected to ground, and check that the AC voltage is suitable. Then, before

Turn on the power switch.

week of !

When there is no spare fuse that came with the device, fuse and replace the fuse in the fuse around the house

Pressure, and the same current rating.

O If the fuse is not the same kind of exchange, being an incomplete connection without having to go just for example

Or it may take longer than the time taken when replacing a blown fuse.

O If you do not break the voltage and current rating of the fuse when the fuse to be cut off right equipment

On it can cause damage.

If the fuse is broken and must be replaced, unplug the fuse. The cause is lost before replacing a blown fuse
We must identify and eliminate the cause. SA-7270 has two extra T3.15A fuse.

week of !

step

step

- One Place the front panel (power) switch on the rear panel, leave the STBY (line) switch to OFF.
Then, unplug the power cord from the outlet.
- 2 Pull back the house fuse panel.
- 3 Replace with a spare fuse and remove the fuses in the fuse cap.
(Direction does not matter).
- 4 Slide the fuse cap with fuse into the fuse in the house inside.

SECTION 2 PREPARATIONS BEFORE USE

Memory Card Handling Precautions

When you use a new memory card for storing your files, you must first perform work on MS-DOS Format
The.

When you save data to a memory card; Write lock that is on the side of the card is NOT PROTECTED

After checking into the slot, insert the SA-7270.

O Insert a memory card

SPECTRUM ANALYZER

Cropped area

Memory card back



With the "▷" the position of the card shown above, install the memory card.

O Removing the memory card

Unplug the memory card from the slot.

O Memory card Battery Replacement

The battery and memory card is needed, the stored data when the batteries are dead

Cleared. Please replace the battery before the end of its life. (Battery life and replacement method

See the instruction manual for the memory card.)

2-10

SECTION 2 PREPARATIONS BEFORE USE

AC / DC power and rechargeable battery pack (optional)

AC / DC power supply and recharging the battery pack installed in the system, either the AC or DC power to the system
Work standing.

AC power 100VAC 240VAC, 47 63Hz Lim.

Lim is a range of DC power to 13VDC 21VDC.

The battery pack will power 14.4V DC, 7AH Lim.

The fully charged battery pack can operate the system for about 1 hour.

Follow the procedure below to prevent abnormal operation.

AC and DC power at the same time, primarily used to operate the system when the AC power input to the system
It is used.

This happens when AC power is turned off, the DC power is used to operate the system.

For the optional AC / DC power supply, rechargeable battery pack while connected to a DC power input port
Has a battery charging circuit for recharging the battery pack.

Remove from the equipment when the equipment is not in use to prevent discharge of the battery pack.

circa And !

When AC voltage is applied to a refilling is on, the DC power connector.
DC power output can only be used to recharge the battery pack. (BT-7270)
Do not use the power supply has a different purpose.

2-11

SECTION 2 PREPARATIONS BEFORE USE

Exchange DC power fuses (optional)

DC power fuse 7A, 250V T is the fuse.
Identify the cause before replacing a blown fuse is broken and must be removed for cause.
Please replace the fuse, follow the procedure below.

week of !

step step

- One Place the front panel power switch to STBY leave behind a panel on the main power switch OFF.
- 2 Then, unplug the power cord from the outlet.
- 3 Remove the fuses in the fuse cap and replace with spare fuse.
(Direction does not matter).
- 4 Push the fuse into the fuse cap clockwise Home Place

SECTION 2 PREPARATIONS BEFORE USE

DC battery pack connection method (optional)

week of !

1. SA-7270 to connect the Battery Connector to connect any DC Power supply Battery or other BT-7270
Do not.
2. Make sure Off the main power switch before connecting or disconnecting the Battery.
3. When not using the Battery (charging or discharging) Keep it must be separated from the equipment.

<STEP 1> to open the box.

Connect the <STEP 2> battery cable to the BT-7270.

2-13

SECTION 2 PREPARATIONS BEFORE USE

<STEP 3> Insert the battery cable is connected as shown in the soft carrying case.

Of <STEP 4> battery cable as shown on the rear panel DC power jack
Connect the opposite connector.

Chapter 3 Panel Description

Chapter 3
Panel Description

This chapter describes the front / rear panel.

neck car

Front / rear panel Description	3-3
I / O Connector Table	3-10
IEEE-488 GPIB connector	3-11
RS-232C connector	3-12
Printer connector	3-13
DC input connector	3-14

<Blank>

3-2

This chapter describes the front / rear panel and options.

- Figure 3-1 Front Panel
- Figure 3-2 Front Panel (with optional)
- Figure 3-3 Rear Panel
- Figure 3-4 Rear Panel (with optional)

Front / rear panel Description

Panel indicated number	detail of fuction
1 (LCD)	7.4 "monochrome LCD display with a VGA device. This waveform, parameter setting, It displays the display value, soft menu keys.
2 F1-F7	The keys for selecting the soft key menus linked to work
3 FREQ	The frequency input
4 SPAN	SPAN is input.
5 AMPL	The amplitude of the input
6 MKR	The key to set the Normal Marker.
7 OFF	The key to the off Marker.
8 MKR>	Marker shift function key
9 PEAK	Peak marker is related to the navigation key
10 TRIG	The key to set the Trigger function.
11 CPL	RBW, VBW, the key to set sweep time.
12 DISP	The key to set the display functions.
13 TRACE	Trace waveform, detect, mode, video average mode selector.
14 DATA	Numeric data, device, the key to set the special functions.
Entry	[Scroll Knob] Marker is used to move the data input. [Λ, V] to increase / decrease the data. [BS] Backspace key is to fix the incorrectly entered data. [0 ... 9, +, -] The numerical data input keys. [GHz, MHz, kHz, Hz] is the key used for the input of a frequency, level, and time. [Hz] Enter key can also be used on each screen.
15 AUTOSSET	The key to looking for any signal automatically sets the measurement parameters.
[LOCAL]	The sum is also the key that turns the key remote status LED lights up when the remote to the local conditions is

3-3

Chapter 3 Panel Description

Panel indicated number	detail of fuction
16 PRESET	Set the measurement parameters to the default values. Calibration also includes menu.
17 STBY / ON	A power switch. When the main power switch is on the rear panel is used. Press the key momentarily to allow power from the STBY condition. Again the key 1 seconds Press STBY to return to the state at power-on state.
18 Memory Card	Save the waveform data and measurement parameters such as read / slot to install memory (If this option is not available.)
19 RF Input	RF input connector
20 TG Output	Tracking Generator output connector

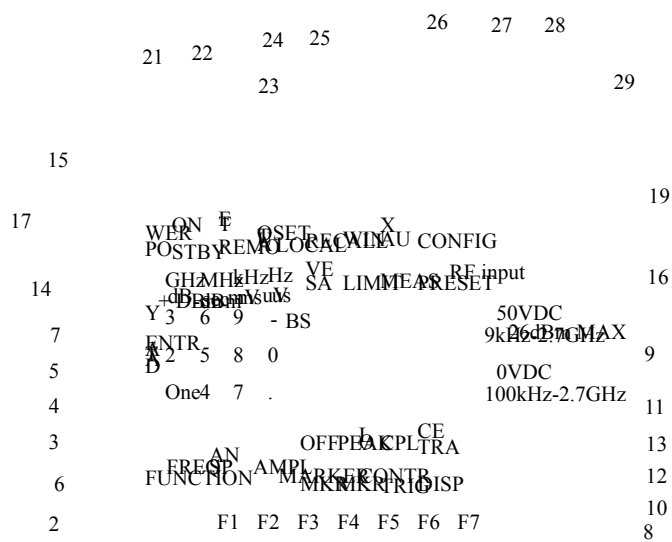
		(If this option is not available.)
21	SAVE	Waveform, the key to save the limit line
22	RECALL	Waveform, the key to query the limit line
23	LIMIT	Key to set the Limit line function
24	WIN	Key used for screen division
25	MEAS	Keys for setting the measurement function
26	AUX	To set the auxiliary function (e.g., FM / AM demodulation, audio control, squelch adjust, etc.) key
27	SCROLL KNOB	Fine-tuning parameter (SCROLL) key used to
28	UP / DOWN	Keys that are used to parameter the UP / DOWN
29	CONFIG	Keys for setting the system configuration
30	(Fan)	Fan to cool the heat generated in the inside ventilation equipment with
31	EXT REF IN / OUT	The reference frequency input / output connector, when the external reference frequency input to the connector, Users can use the Port key operations from the front panel. screen The current information is displayed at the bottom.
32	IF OUT	IF output connector. This signal is controlled by the RBW bandwidth settings
33	Phone	Earphone connector.
34	Off / On	AC mains switch (fuse included).
35	(Inlet)	AC power switch, connect the supplied power cord (including fuses). Two overcurrent Including fuse protection

3-4

Chapter 3 Panel Description

Panel indicated number		detail of fuction
36	RS-232C	RS-232C connector. Connected to the system control unit
37	Printer	Print Using connectors
38	GPIB	Connector for connecting to an external system
39	Video Out	Video signal output connector
40	Swp Gate	sweep gate signal output connector
41	Ext Trig	The external trigger input connector
42	(FG)	Frame ground terminal
43	DC INPUT	DC input connector (not available if the option is not attached.)
44	FUSE	DC Power Fuse house (not available if the option is not attached.)

Chapter 3 Panel Description



One

9kHz - 2.7GHz

SA-7270

YZER

UM ANAL
SPECTR

Figure 3-1 Front Panel

3-6

ON F0 SET RECWIN X
WER F0 SET RECWIN X
POSTBY REMU LOCAL WINDU CONFIG
GHZ MHz kHz Hz VE SA LIM MEAS RE input
-dBm -dBm -dBm -dBm
Y 3 6 9 - BS 50VDC
ENTR 2 5 8 0 9kHz-2.7GHz
D 4 7 . 0VDC 20
One 4 7 . 100kHz-2.7GHz
AN OFFPEAK PLTRIG output
FRESP AMPL MKRKE CONTR
FUNCTION MARKER DISP
F1 F2 F3 F4 F5 F6 F7

9kHz - 2.7GHz

SA-7270

YZER

UM ANAL

SPECTR

Figure 3-2 Front Panel (with optional)

Chapter 3 Panel Description

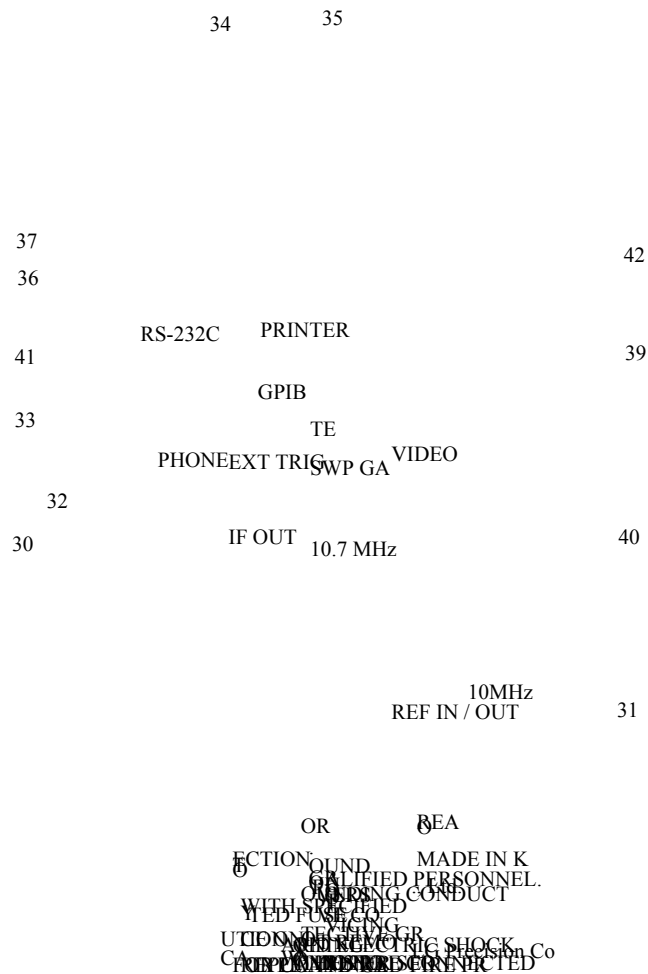


Figure 3-3 Rear Panel

PRINTER

GPIB

TE

EXT TRIG SWP GA VIDEO

IF OUT 10.7 MHz

10MHz

REF IN / OUT

BEA

MADE IN K

SHOCK

3-9

Cone neck from	Bell Ryu	Input / output	God arc
AC input	IEC 320 socket	input	AC power supply
RF input	Type N Female	input	RF
Tracking Generator Option Print	Type N Female	Print	RF
External Trigger Output	BNC Female	input	
External Sweep Gate Output	BNC Female	Print	
External Video Output	BNC Female	Print	
External reference frequency Input / Output	BNC Female	Input / Output	IN: 10MHz OUT: 10MHz
IF output	BNC Female	Print	10.7 MHz
IEEE-488 GPIB	24-Pin Champ	Input / Output	Pin-Out (see Table 2)
printer	25-Pin, D-sub Female	Print	Pin-Out (see Table 4)
RS-232C	9-Pin, D-sub male	Input / Output	Pin-Out (see Table 3)

Table 1. I / O connector

3-10

Chapter 3 Panel Description

IEEE-488 GPIB connector

IEEE-488 GPIB connector is conform to the ANSI / IEEE Standard 488.2 to 1987.

Pin Number	signal	Pin Number	signal
One	DIO 1	13	DIO 5
2	DIO 2	14	DIO 6
3	DIO 3	15	DIO 7
4	DIO 4	16	DIO 8

5	EQUI	17	REN
6	DAV	18	Ground
7	NRFD	19	Ground
8	NDAC	20	Ground
9	IFC	21	Ground
10	SRQ	22	Ground
11	ATN	23	Ground
12	Ground	24	Ground

Table 2. The IEEE-488 GPIB Connector Pin-Out

12	One
24	13

Figure 3-5. IEEE-488 GPIB connector

Chapter 3 Panel Description

RS-232 connector

Pin Number	signal
One	DCD
2	RXD
3	TXD
4	DTR
5	Ground
6	DSR
7	RTS
8	CTS
9	RI (NC)

Table 3. RS-232C Pin-Out of connector

One 5

6 9

Figure 3-6. RS-232C connector

3-12

Chapter 3 Panel Description

Printer connector

Pin Number	signal
One	STB
2	PD0
3	PD1
4	PD2
5	PD3
6	PD4
7	PD5
8	PD6
9	PD7
10	ACK
11	BUSY
12	PE
13	SLCT
14	AFD
15	ERROR
16	INIT
17	SLIN
18	Ground
19	Ground
20	Ground
21	Ground
22	Ground
23	Ground

24	Ground
25	Ground

Table 4. The printer connector Pin-Out

13	One
----	-----

25 Figure 3-7. Printer connector 14

3-13

Chapter 3 Panel Description

DC input connector

Pin Number	signal
One	LED-Anode
2	Battery +
3	Battery +
4	Battery +
5	Battery-
6	Battery-
7	LED-Cathode
8	Battery-

Table 5. DC input connector Pin-Out

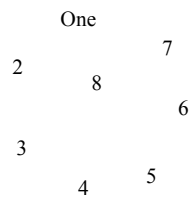


Figure 3-8. DC input connector (front view)

Chapter 4
Menu Structure

	neck	car	
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FREQ, SPAN, AMPL			4-4
MKR, OFF, MKR>, PEAK			4-5
TRACE, CPL			4-6
TRIG, DISP			4-7
SAVE, RECALL			4-8
CONFIG			4-9
MEAS			4-10
AUX, LIMIT, WIN, AUTOSET			4-11
PRESET			4-12

Chapter 4. Menu structure

<Blank>

4-2

Chapter 4. Menu structure

Chapter 4

Menu Structure

This chapter is also soft menu functions and their hierarchy are described using a menu tree.
Points to note about the structure is shown below.

- (1) Panel key indicates a hard key on the key panel.
- (2) SOFT MENU 1 key appears on the screen when you press the panel keys. SOFT SOFT MENU 2 is MENU 1 key points to another menu below.
- (3) SOFT MENU 1 will return from SOFT MENU 2 Press the Return key.

Chapter 4. Menu structure

Menu Structure

Key panel	Soft Menu 1	Soft Menu 2
FREQ	CENTER START STOP CF STEP [AUTO / MNL]	

MKR ⇒ CF
 MKR ⇒ CF STEP
 MKR ⇒ SPAN
 MKR ZOOM IN
 MKR ZOOM OUT

*** Delta marker status**

PEAK

MKR ⇒ CF
 MKR ⇒ REF LVL
 NEXT PEAK
 PEAK LEFT
 PEAK RIGHT
 MKR TRK [ON / OFF]
 MKR NOISE [ON / OFF]

4-5

Chapter 4. Menu structure

Key panel	Soft Menu 1	Soft Menu 2
TRACE	CLR & WRT A [B] MAX HOLD A [B] VIEW A [B] A BLANK [B] SELECT B [A] AVERAGE .. MORE ..	AVERAGE [ON / OFF] COUNT [XX] (2256) CYCLE [ON / OFF] STOP CONTINUE RESET RETURN
	DETECT .. MATH .. PREV ..	NORMAL SAMPLE POS PEAK NEG PEAK AVERAGE RETURN
		AB ⇒ A B-DL ⇒ B A + B ⇒ A A-B + A DL ⇒ A EXCH B RETURN

CPL	ALL AUTO
	RBW
	RBW [AUTO / MNL]
	VBW
	VBW [AUTO / MNL]
	SWEEP TIME
	SWP TIME [AUTO / MNL]

4-6

Chapter 4. Menu structure

Key panel	Soft Menu 1	Soft Menu 2
TRIG	CONT	FREE RUN
	SINGLE	VIDEO
	TRIG SOURCE ..	LINE
	TRIG FLT [LPF / HPF]	EXTERNAL
	TRIG DELAY	RETURN
DISP	DISPLAY LINE	SELECT CHAR
	DISPLAY LN [ON / OFF]	SPACE
	THRESHLD LINE	BACK SPACE
	THRESHLD [OFF / ON]	ERASE TITLE
	SCREEN TITLE ..	TITLE DONE
	CONTRAST	
	MORE ..	
	GRAT [ON / OFF]	
	ANNOT [ON / OFF]	
	INVERSE [ON / OFF]	
	PREV ..	

Chapter 4. Menu structure

Key panel	Soft Menu 1	Soft Menu 2
SAVE	SAVE STATE .. [09] SAVE TRACE A .. [09] SAVE TRACE B .. [09] SAVE LIMIT .. [09] STATE LIST .. [09] SAVE LOCK [ON / OFF] DIR ..	STATE DIR .. TRACE A DIR .. TRACE B DIR .. LIMIT DIR .. PREV ..
*Memory INTERNAL mode		
	SAVE STATE SAVE TRACE A SAVE TRACE B SAVE LIMIT SAVE LOCK [ON / OFF]	
*Memory PCMCIA mode		
RECALL	RECALL STATE .. [09] RECALL TRACE A .. [09] RECALL TRACE B .. [09] RECALL LIMIT .. [09] STATE LIST .. DIR ..	STATE DIR .. TRACE A DIR .. TRACE B DIR .. LIMIT DIR .. PREV ..
*Memory INTERNAL mode		
	LOAD FILE DELETE FILE NEXT PAGE .. PREV PAGE ..	
*Memory PCMCIA mode		

Key panel	Soft Menu 1	Soft Menu 2
CONFIG	HARD COPY HARD COPY SET .. RS-232C CONFIG .. CLOCK SET .. GPIB ADR [031] PCMCIA .. MORE ..	HP LASERJET PCMCIA CARD RETURN
	FACTORY CONFIG .. SYSTEM OPTION .. 10M REF [INT / EXT] BEEP [ON / OFF] VERSION INFO .. PREV ..	BAUD [60019200] DATA LEN [7 / 8BIT] STOP BIT [1 / 2BIT] PARITY [NONE / EVEN / ODD] RETURN
※ FACTORY CONFIG: REFER MAINTENCE	MANUAL	YEAR [XX] MONTH [XX] DAY [XX] HOUR [XX] MINUTE [XX] SECOND [XX] ENTER
※ SYSTEM OPTION: REFER MAINTENCE	MANUAL	PCMCIA FORMAT PCMCIA CHECK MEMORY [INT / PCMCIA] RETURN

Key panel	Soft Menu 1	Soft Menu 2
MEAS	dB DOWN ..	X dB DOWN
	POWER MEAS ..	X dB LEFT
	QUASI PEAK ..	X dB RIGHT
	MKR CNT [ON / OFF]	FORMAT [REL / ABSL / ABSR]
	CNT RES [XXXX] ..	STOP
		CONTINUE
		X dB END
	OBW	BAND B [ON / OFF]
	CHANNEL POWER ..	BAND C [ON / OFF]
	ACP MEAS ..	RETURN
	RETURN	
	CHANNEL BANDWIDTH	1kHz
	RETURN	100Hz
		10Hz
		1Hz
		RETURN
		ACP
		CHANNEL SPACE
		CHANNEL BANDWIDTH
		RETURN

4-10

Key panel	Soft Menu 1	Soft Menu 2
AUX	AM [ON / OFF]	※ AM [ON] 25 [%] / DIV
	FM [ON / OFF]	
	AM / FM SCALE	
	AUDIO [ON / OFF]	
	AUDIO LEVEL	
	SQUELCH LEVEL	
		20 [%] / DIV
		10 [%] / DIV
		5 [%] / DIV
		2.5 [%] / DIV
		RETURN

	TRACKING GEN ..	
LIMIT	PASS CHK [ON / OFF] UPPER [ON / OFF] LOWER [ON / OFF] MAKE LIMIT .. CLEAR LIMIT ALARM [ON / OFF]	※ FM [ON] 25 [kHz] / DIV 20 [kHz] / DIV 10 [kHz] / DIV 5 [kHz] / DIV 2.5 [kHz] / DIV 1 [kHz] / DIV RETURN
WIN	WIN [ON / OFF] UPPER ZONE LOWER ZONE UPPER ZOOM LOWER ZOOM TOGGLE [ON / OFF]	TRACKER [ON / OFF] OUTPUT LEVEL NORMAL [ON / OFF] AUTO FRQ CAL MANUAL FRQ CAL RETURN
AUTOSET	[BLANK]	SELECT [LOW / UP] MARK DOT ACCEL [ON / OFF] UNDO CLEAR RETURN

4-11

Chapter 4. Menu structure

Key panel	Soft Menu 1	Soft Menu 2
PRESET	PRESET LAST STATE ALL CAL .. CAL MODE .. CAL SIG [ON / OFF] AUTO CAL [ON / OFF]	YIG CAL .. RBW CAL .. LEVEL CAL .. SPAN CAL .. LOG AMP CAL .. RETURN

Chapter 5

How it works

neck car

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Chapter 5 How to Operate

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Chapter 5

How it works

FREQ / SPAN FUNCTIONS

When you set the frequency of the SA-7270 can be set in either of two modes.

- O Center Frequency-Span Mode
- O Start Frequency-Stop Frequency Mode

Upper / lower limit of frequency is 0 Hz, respectively, and 2.7GHz.

FREQ key is used the header key for setting the frequency.

SPAN key is used the header key for setting the frequency span.

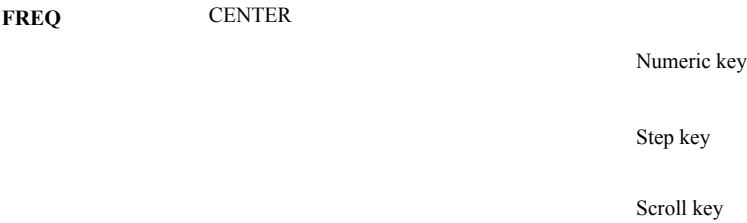
FUNCTION	DATA ENTRY	POWER
FREQ	0 3 6 9 Hz	dBm
F1 SPAN	4 5 6 8 9 Hz	dBm
F2 AMPL	7 8 9 Hz	dBm
F3 MARKER	0 BS	dBm
F4 MARKER	BS	dBm
F5 TRIG	CONTROL	MEAS
F6 DIS	TRACE	PRESET
F7		RF input 50
		9kHz-2.7GHz
		26dBm MAX

Chapter 5 How to Operate

Center-Span Data Input

(1) Center frequency setting

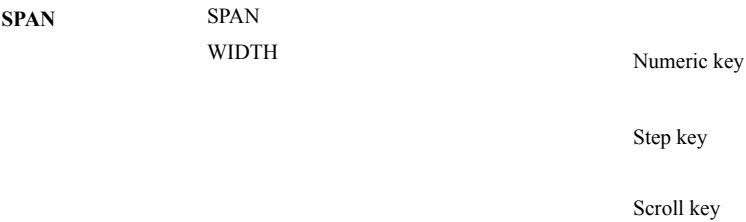
To set the Center Frequency is set using the following keys.



STEP STEP size of the Up / Down key is 1/10 of the current span.
STEP SCROLL key is 1/500 of the size of the present span.

Fig 5-1. Center frequency

- (2) Span settings
Span To set the width settings using the following keys.



span variation due to the STEP Up / Down keys are replaced by 1,2,5 step; 1k, 2k, 5k,, 100k, 200k, 500k
STEP SCROLL key size is 1/500 of the current frequency range.

Fig 5-2 Span Width

Chapter 5 How to Operate

Start-Stop Freq Data Input

- (1) Start frequency setting
To set the Start frequency set using the following keys.



Step key

Scroll key

STEP STEP size of the Up / Down key is 1/10 of the current span.
STEP SCROLL key is 1/500 the size of the current span.

39.500 MHz

Fig 5-3. Start Frequency

5-6

(2) Stop frequency setting
Stop the frequency set using the following keys.

FREQ **STOP**

Numeric key

Step key

Scroll key

STEP STEP size of the Up / Down key is 1/10 of the current span.
STEP SCROLL key is 1/500 the size of the current span.
Note: STEP Up / Down keys are all the start / stop frequency, because it is used for the center frequency bakkwip

is. start / stop frequency can vary depending on the span.

39.500 MHz

Fig 5-4. Stop frequency

5-7

Chapter 5 How to Operate

CF Step Size settings

To use the STEP Up / Down keys to change the STEP SIZE Center frequency of the following
Check the STEP SIZE.

FREQ	CF STEP	
	[AUTO / MNL]	Numeric key
		Step key
		Scroll key

Press the CF STEP soft key changes to MNL mode in the CF STEP AUTO mode, or vice versa
As it is.

In the CF STEP MNL (manual) mode STEP size can be set by the Numeric Key.
If the CF STEP [AUTO / MNL], select the "AUTO" CF STEP SIZE is set to 1/10 of the current span.

Fig 5-5. CF Step

5-8

Chapter 5 How to Operate

Full Span Set

Setting Full Span the entire frequency band of the SA-7270 is set.

SPAN

FULL SPAN

Fig 5-6. Full Span

Chapter 5 How to Operate

Setting Zero Span

Setting the span to 0 Hz on the spectrum analyzer SA-7270, so that the horizontal axis is the time axis may be numbered
You can choose from.

Rising / falling edge of the burst wave can be observed / measured.

When you perform any of the following key operations must SA-7270 works in Zero Span (span = 0Hz) mode
is.

SPAN	ZERO SPAN	
SPAN	0	Hz

functional coupling of RBW, VBW, Sweep time, such as the frequency or time zone can be set to a different value
There is.

Fig 5-7. Zero Span

Return to the previous Span

Pressing the down key to return to the previous Span.

SPAN	LAST SPAN
-------------	------------------

Zoom In / Zoom Out

ZOOM IN function is to reduce the current span to 1/2. Its value can be reduced to 1kHz.
ZOOM OUT function will increase the current span of two times. Its value depends on the current center frequency
But it can be equal to the maximum full span value.
When the center frequency is not changed.

SPAN	ZOOM IN
	ZOOM OUT

Fig 5-8. Zoom In

Fig 5-9. Zoom Out

AMPLITUDE FUNCTIONS

Hz

AMPL key is used the header key for setting the amplitude.

FUNCTION POWER
One 3 dB BW
SPAN 4 5 6 MHz
8 9
AMPL AUTOSET
MARKER LOCAL
RECALL
F 4 PEAK LIMIT
CPL AUX
TRACE CONFIG
RF input 50
9k Hz 2.7 GHz
50 VDC

Log / Linear Detector Mode Selection

To set the amplitude scale Linear scale Log scale or set using the following keys.

(1) Log detector set

AMPL LOG

(2) Linear detector set

AMPL LINEAR

SAVE

Even switching between Log and Linear, reference level is constant.

Amplitude Unit Set

Log in scale, there are five types of SA-7270 reference level unit.

- reference level units: dBm, dBmV, dBuV, VOLTS, WATTS.

To select one of the reference level units, perform the following key operations.

The reference level unit used in the Linear scale is only Volts.

AMPL UNITS dBm RETURN
dBmV
dBuV
VOLTS
WATTS

5-12

Reference Level Setting

Use the following keys to set the Reference level (top grid).

AMPL REF
LEVEL Numeric key

Step key

Scroll key

STEP size is a key value for the current 1division scale.
Scroll key STEP size is 0.1 dB.

Setting Amplitude Scale

Log in scale SA-7270 has four types of scale: 10 dB /, 5 dB /, 2dB /, 1dB /.
Linear scale from SA-7270 uses the Full Scale.
To select one of the scale, it sets the following key operations.

- Log detection mode

AMPL	SCALE	10dB / DIV 5dB / DIV 2dB / DIV 1dB / DIV	RETURN
-------------	--------------	---	---------------

Reference Level Offset Set

AMPL	REF LVL OFFSET
-------------	-----------------------

Reference Level Offset is (reference level on the display value related to the level (amplitude level), marker amplitude ...) is applied is displayed on the screen. This feature of the device connected to the Spectrum Analyzer
To compensate for the gain / loss is more useful when you want to display on the screen. The valid input range is -10 dB.
And +10 dB, you can only enter in dB. If the reference level offset is set to the left side of the screen
To display the "R".

Chapter 5 How to Operate

Input Attenuation Settings

To set the Input attenuator level, perform the following key operations.

AMPL	ATTEN	
	[AUTO / MNL]	Numeric key
		Step key
		Scroll key

Press the ATTEN ATTN key to toggle the mode [AUTO or MNL].
ATTEN MNL (manual) mode, STEP size can be set by the Numeric, STEP, Scroll key.
If ATTEN "AUTO" is selected Input Attenuator is set automatically by the current reference level.

Fig 5-10. Amplitude function

5-14

MARKER FUNCTIONS

It is used as the header for the keys Marker feature set.

MKR key is used as a key header that displays Normal Marker. OFF key is displayed on the screen

The key to attracting Marker.

POWER
STBY

RF input 50

Marker Position Change

To move the Marker position 1 division step, use the STEP Up / Down keys.

Pressing the Up STEP key Marker position moves to the right, Down STEP key is left.

Scroll key STEP size is 1/500 of the span.

Step key

Scroll key

5-15

Chapter 5 How to Operate

Normal Marker

Normal Marker appears as '◇' position on the center frequency of the waveform in the first place. Marker frequency positions And digitized level is displayed.

Normal Marker is set to ON in the early days. Or when the current one state to another mode Marker

To set the Normal Marker ON when the Normal Marker is set to OFF using the following keys:
do it.

MKR

MARKER NORMAL

Normal Marker indicates the amplitude level of the absolute value.

Fig 5-11. Normal Marker

Delta Marker

When Delta Marker is set to ON state, the current position is set to the reference Marker Marker (reference position) Year fixed location. Normal Marker moves to the reference Marker, the Normal Marker difference information (size of Group, frequency) is displayed on the screen. Based on the difference between the Normal Marker Marker and Delta it is defined as the value. The group Delta Marker mode Marker who will appear as '▽'. To turn ON the Delta Marker, use the following keys.

MKR MARKER DELTA

DELTA MARKER When you select a key from the Delta Marker mode, Marker is based on the current position of the Marker Copper, and is a reference point and the current position of the Marker switched to Delta Marker mode.

Fig 5-12. Delta Marker

Marker Off

In the following key operations: Marker Marker is related to soft menu disappears from the screen turns off.

OFF

Chapter 5 How to Operate

PEAK SEARCH FUNCTIONS

There are four SA-7270 Marker Search function below:

- Peak Search
- Next Peak Search
- Next Right Peak Search
- Next Left Peak Search

Peak Search

When you select the Peak Search detects the highest level of the current waveform to be output to the screen to display Marker
It instructs the maximum power point.
Peak Search key, do the following.

PEAK

40.0020 MHz
-30.00dBm

Figure 5-13. Peak Search

Next Peak Search

Next Peak Search Marker to detect is that the next big Peak Relative to the current level Marker

Go to the point. (When there are two or more with the same level on the screen, the left Peak is detected.)

Perform the following key Next Peak.

PEAK

NEXT PEAK

Performing Next Peak Search Marker in a row, you can navigate to each Peak.

39.882 MHz
-27.12dBm

Figure 5-14. Next Peak Search

5-19

Peak Left Search / Peak Right Search

PEAK LEFT Search and PEAK RIGHT Search is adjacent to the right or left of the current level of Marker

Peak detect the level to move the Marker to that point.

To perform the PEAK LEFT Search and PEAK RIGHT Search, please use the following keys.

PEAK

PEAK RIGHT

PEAK LEFT

When you perform a PEAK LEFT Search and PEAK RIGHT Search consecutive adjacent to the right or left
The level detection Peak and Peak Marker moves to the position.

39.882 MHz
-27.12dBm

Figure 5-15. Next Peak Search [Left / Right]

Marker Track

The maximum level point of the waveform when the Marker Track is set to the ON position is always centered on the horizontal axis (frequency axis)
It will be moved to.

To use the Marker Track, perform the following key operations:

PEAK

MKR TRK [ON / OFF]

Pressing the key changes to the Marker Track is ON or OFF.

5-20

Marker Noise

When Marker Noise is set to ON, it appears in the current Noise Power Marker location of the waveform.

Noise Power is calculated using the Noise bandwidth, such as the current RBW.

Detector mode is changed to SAMPLE mode.

To use the Marker Noise, perform the following key operations.

- 1) Set the Delta Marker in the carrier signal.
- 2) Noise levels in the frequency offset, set the default Marker.

PEAK

MKR NOS [ON / OFF]

Pressing the key changes to the Marker Noise ON or OFF.

Chapter 5 How to Operate

Parameter values set using Marker

Marker values can be set by parameters such as the observation frequency, reference level. This facilitates the observation of the desired waveform.

To change the value by using the Marker parameters, the following settings are possible:

- MKR -> CF : Set Marker value to the center frequency.
- MKR -> REF LVL : Set Marker value to the reference level.
- MKR -> CF STEP : Set the value to the center frequency Marker STEP size.
- ΔMKR -> CF : Set the value to the center frequency ΔMarker value.
- ΔMKR -> CF STEP : Set the value to the center frequency ΔMarker STEP size.
- ΔMKR -> Span : Set the value to ΔMarker Span.

In the time domain (zero span) MKR-> REF LVL only valid.

Parameter values set using Marker

Marker Sets the current frequency or level to the center frequency, reference level.

To execute the MARKER Shift, use the following keys:

MKR >	MKR -> CF
	MKR -> REF LVL

MKR -> CF STEP / MKR DELTA -> CF STEP

Set Marker frequency to center frequency step size. (Resolution is determined by the step Up / down keys)

MKR > MKR -> CF STEP

Step Up / Down keys On screen does not change anything when you change the center frequency, center
The frequency is variable depending on the frequency with Marker STEP Size.

This feature is useful for harmonic (harmonic) measurement.

Δ MKR -> SPAN

The key work in Δ Marker mode is the standard mode Δ Marker Marker frequency and the current frequency
Each setting the start frequency and stop frequency.

5-22

MKR ZOOM IN / ZOOM OUT

This feature is available when the current frequency is set in the center of the Marker frequency.

MKR ZOOM IN function is to change the current Span half.

MKR ZOOM OUT function will replace the current double Span.

Figure 5-16. Marker Zoom In

Figure 5-17. Marker Zoom Out

5-23

Chapter 5 How to Operate

AUTOSET

Press the AUTOSET key detects the maximum Peak Signal in the limited frequency domain signal and its frequency With respect to the level set to the center frequency and the reference level.

This key is used to change from Remote mode to Local mode when the Remote LED is turned on.

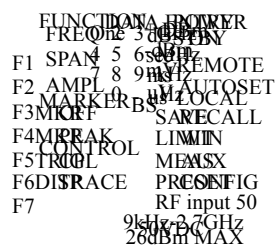
AUTOSET

- State:
- 1. When you perform a function AUTOSET search frequency range is from 6MHz to 2.7GHz.
 - 2. RBW, VBW, SWEEP TIME, ATT is set automatically.
 - 3. Normal Marker frequency is displayed in the center position.
 - 4. AUTOSET function of frequency is 1MHz After Span.

FUNCTIONA POWER
FRE One 3 000Hz
F1 SPAN 4 5 650Hz
F2 AMPL 7 8 9dB
F3 MARKER 10 11 12dB
F4 PEAK 13 14 15dB
F5 CONTROL 16 17 18dB
F6 TRACE 19 20 21dB
F7 22 23 24dB
9kHz-3.7GHz
20dB MAX

TRACE FUNCTIONS

TRACE key is the header key for the trace function.



Press the TRACE key on the Soft menu screen appears as follows:

Figure 5-18. Trace Function

Select Trace

This equipment provides two Trace memory A and B.
Trace memory can be selected in the following key operations.

TRACE SELECT B [A]

CLR & WRT A [B]

The key is to write new data in Trace Memory erasure and overwriting the original data.
Continue to repeat this operation.

TRACE CLR & WRT A [B]

MAX HOLD A [B]

New data of the respective points on the horizontal Sweep is level with the larger value as compared with the previous data
Store and display. Display gathers the maximum value for each point.
Pressing this key again to restart the MAX HOLD function.

TRACE MAX HOLD A [B]

VIEW A [B]

Pressing this key A [B] Trace is beyond the default write mode.
This device stops the writing on the screen and display the contents of the A [B] memory.
To return to the default mode, press the CLR & WRT again.

TRACE VIEW A [B]

A BLANK [B]

Press this key to Trace data is erased from the screen. However, the contents of the memory will remain.
When you select the VIEW function is Trace is displayed again.

TRACE A BLANK [B]

5-26

Computation

To access the Trace math, perform the following key operations:

TRACE	MORE	MATH
AB-> A:	A memory is a result of the difference between the original A memory (or sweep data) and memory B Are teeth. In other words, if the Trace A VIEW or BLANK on the differences A and B Getting between memory and the result is stored in the A. However, the Trace A If the current mode CLR & WRT sweep results are there, minus the memory B data It has saved in A.	
B-DL-> B:	Trace A is the Display Line B in memory when the VIEW or BLANK mode Except, the result is stored in B. However Trace B is in the CLR & WRT mode When you subtract the result is stored in the Display Line A in the current sweep results All.	
A + B-> A:	It adds Trace A and Trace B and stores the result in Trace A ..	
A-B + DL-> A :	Trace A Trace B except in the Display Line In addition to the display on the Trace A The ray.	
A EXCH B:	Replace the contents of the memory Trace A and Trace B memory.	
RETURN:	To return to the previous menu.	

Fig 5-19. Trace Computation

5-27

Chapter 5 How to Operate

Detection Mode

SA-7270 detector has the following five modes:

- NORMAL
- SAMPLE
- POS PEAK
- NEG PEAK
- AVERAGE

To perform the following key operations to select the detection mode:

TRACE	MORE	DETECT	NORMAL SAMPLE POS PEAK NEG PEAK AVERAGE	RETURN
-------	------	--------	---	--------

The SA-7270 is using the oversampling method to get the Video Data.
If the frequency is less than the RBW cells, this method is not valid.
The default (Normal) detection mode is similar to the POS PEAK-NEG PEAK detection mode.
Odd-numbered horizontal line shows the maximum value for the display of duplicate data points.
The even-numbered horizontal line indicates the minimum value for the display of duplicate data points.
However NORMAL detection mode, up to an even number of horizontal lines in the minimum detection mode
Even changes to detection mode, you will not miss a signal.

SAMPLE detection mode stores the instantaneous signal level at each sample point in Trace Memory.
SAMPLE detection mode is primarily used to measure noise level measurements and time zones.

POS PEAK detection mode up between the current display point and next display point
Comparing the level points, and stores the maximum value in the memory corresponding to the current display point Trace
The.

NEG PEAK detection mode is the minimum between the current display point and next display point
Comparing the level points, and storing the minimum value in the current memory corresponding to the display point Trace
The.
NEG PEAK detection mode is often used to measure the lower envelope of the modulated waveform.

5-28

AVERAGE detection mode light without reducing the video filter or use the Trace Averaging function
Rules are used to reduce the noise level. This function is faster than the average display sweep
It provides speed.
AVERAGE detection mode saves the average between POS Peak of each data cell and NEG Peak.

Chapter 5 How to Operate

Averaging Function

The Average function calculates the average data point in the horizontal axis of each sweep and displays the result.

Average function improves the S / N ratio depending on the count and repeat sweep.

To use the Average function, perform the following key operations:

TRACE	AVERAGE
AVERAGE [ON / OFF]	: This ON / OFF the Average function toggle way.
COUNT	: Set Average count. The range is up to 256. 2, the The values are entered using the Numeric keys, STEP key, Scroll key.
CYCLE [ON / OFF]	: Pressing this key followed by the number of Average count NON STOP / STOP Set the average.
STOP	: Average-sweeping stops temporarily.
CONTINUE	: Restart the STOP state.
RESET	: Trace clear the waveform to restart the Average function.
RETURN	: To return to the previous menu.

Notes on the use of averaging locations:

Using the Numeric keys and Unit keys to enter the Average Count clear the count value.

The default value of the average is 8.

The Average Video to the video filter when the narrow bandwidth in order to improve the effectiveness Average sweep

The disadvantage is that time is long. While the digital video averaging reduce the video bandwidth (VBW)

By rather averaging the digital data after the analog to digital conversion on each sweep display Trace

This is flat.

Because Video bandwidth (VBW) is widened relative to the shorter time required for each sweep, the entire

You repetitive sweep can be stopped when the desired spectral image is flat and fast test is.

Video averaging filter is the problem of the time required for flattening the respective sweep becomes long, the entire specification

This takes a long time to examine the spectral image is the point.

5-30

DISPLAY FUNCTIONS

Related to the SA-7270 Display line, Threshold line, Screen Title, display screens, such as contrast control
It provides functionality.

FUNCTIONAL ENTRY
F1 SPAN 5 650MHz
F2 AMPL 8 9dBm
F3 MARKER 9 100Hz
F4 PEAK
F5 CONTROL
F6 TRACE PRESET
F7 RF input 50
9kHz 3.7GHz
26dBm MAX

Display Line

Display Line is a horizontal line across the screen to compare the level.
This line can be established between the Numeric keys, STEP key, or Scroll key reference level and the lowest level
There is.
If you set OFF, Display Line will disappear from the screen.

DISP DISPLAY LINE
 DISPLAY LN [ON / OFF]

STEP STEP is the size of the Up / Down keys 1 division.
The size of the STEP key Scroll is 0.1 dB.

Chapter 5 How to Operate

Threshold line

Threshold Line is a line which the waveform is displayed over it.
This line will be set up between the Numeric keys, STEP key, or Scroll key reference level and the lowest level
You can.
If you set OFF, Threshold Line is will disappear from the screen.

DISP	THRESHLD LINE
	THRESHLD LN [ON / OFF]

STEP STEP is the size of the Up / Down keys 1 division.
The size of the STEP key Scroll is 0.1 dB.

H

Figure 5-21. Display Function

Screen Title

The title of the current waveform can be set with this function

The title can also be used for printer and memory functions.

To create a screen title, perform the following key operations:

Characters appear when you press the SCREEN TITLE softkey

DISP	SCREEN TITLE
SELECT CHAR	: Scroll keys to select the desired character, and select soft key.
SPACE	: Enter a space (blank).
BACK SPACE	: It clears the last letter.
ERASE TITLE	: It clears the displayed title.
TITLE DONE	: To return to the previous menu.

Contrast (Brightness)

To change the LCD contrast level, you must perform the following key operations:

DISP	CONTRAST
	Step key
	Scroll key

To decrease the LCD contrast level, press the STEP key or rotate the Scroll Down key anticlockwise is.

To increase the LCD contrast level, press the STEP Up Scroll key or turn the key clockwise.

GRAT [ON / OFF]

This key causes ON / OFF toggle with a graticule way.

To remove the cross-hairs on the screen of the graticule, perform the following key operations:

DISP	MORE	GRAT
		[ON / OFF]

ANNOT [ON / OFF]

This key causes ON / OFF to toggle the annotation style.
 To remove the annotation from the screen, perform the following key operations:

DISP	MORE	ANNOT
		[ON / OFF]

Annotation is as follows:
 T: Triggered Mode
 S: Single Sweep Mode

INVERSE [ON / OFF]

The key must reverse the current screen colors, it causes ON / OFF to toggle way.
 To reverse the background and waveform, press the following key operations:

DISP	MORE	INVERSE
		[ON / OFF]

5-34

TRIGGER FUNCTIONS

TRIG key is the header key for using the trigger function.

FUNCTION	POWER
FREQ	3 GHz
F1 SPAN	5 6 GHz
F2 AMPL	8 9 dBm
F3 MARKER	BS LOCAL
F4 PEAK	SARCALL
F5 CONTROL	LIMIT
F6 DIS	PRE
F7 TRACE	CONF
	RF input 50
	9 kHz - 3.7 GHz
	20 dBm MAX

Continuous Sweep Mode

The Trigger sweep mode continues to run when it is set to FREE RUN.
When the Trigger mode is set to Triggered (trigger source is not the FREE RUN), the trigger conditions are met:
sweep is run whenever.
To set the Continuous Sweep mode, press the following keys:

TRIG CONT

Single Sweep Mode

The sweep trigger mode is executed once immediately after pressing the SINGLE key when set to FREE RUN.
When the trigger mode is set to Triggered (trigger source is not the FREE RUN) the trigger conditions are met:
The sweep will only be run once.
To set the Single Sweep mode, press the following keys:

TRIG SINGLE

5-35

Chapter 5 How to Operate

Triggered Mode

SA-7270 trigger mode can be divided into FREE RUN and TRIGGER.
The VIDEO, LINE or EXTERNAL trigger source can be selected with the Trigger mode.

Trigger Source

To select the TRIGGER SOURCE, perform the following key operations:

TRIG TRIG SOURCE FREE RUN RETURN
 VIDEO
 LINE
 EXTERNAL

Trigger Filter

SA-7270 trigger circuit has two trigger Filters: High Pass Filter and Low Pass Filter.
The default value is Low Pass Filter.

- LPF cutoff frequency: 100kHz
- HPF cutoff frequency: 5 Hz

TRIGGER FILTER mode can be changed by pressing the softkey.

TRIG TRIG FLT [HPF / LPF]

Trigger Level

VIDEO (ZERO SPAN) trigger when the source is selected, the trigger level greater than the positive waveform detected

The sweep starts with the leading edge synchronization.

To select the trigger level, perform the following key operations:

TRIG TRIG SOURCE VIDEO

The trigger level is set keys STEP Up / Down key and Scroll.

trigger level indicates the trigger level line on the screen.

5-36

Line Trigger

This is in synchronization with the AC power frequency to start the sweep. Line trigger waveform is associated with power

It is conveniently used to observe. trigger level and trigger filters are used in conjunction with the Line trigger functions

Does not.

External Trigger

This function starts sweep in synchronization with an external trigger source. Sweep is on the rear panel EXT TRIG

It begins in the positive leading edge of the signal waveform input to the input connector. TTL trigger execution

It requires the input signal.

Trigger Delay

When the Trigger mode is set (trigger source is VIDEO, only the EXT or LINE selected) trigger points are usually Tues

It will be at the left end of the face.

But this does not mean that you can not see the waveform and the trigger point at the right edge of the screen.

SA-7270 has the waveform of (or behind the display end) in front of trigger points can be displayed by changing the delay time

There is.

Note: TRIGGER DELAY will only work with Zero-SPAN mode.

To set the Delay time, perform the following key operations:

TRIG TRIG DELAY

Delay time is set in the Zero-SPAN modes using the Numeric keys, Scroll keys, STEP Up / Down keys.

Delay Time is a negative value means that the use of the Pre-Trigger mode.

Positive values mean that the Delay Time is used by the Post-trigger mode.

$\frac{b}{T}$

0 Hz

Figure 5-22. Trigger function

5-37

Chapter 5 How to Operate

COUPLED FUNCTIONS

A-7270 RBW, VBW, Sweep Time is to automatically select the optimum setting, the four functions of Input Attenuation Initially set to AUTO. And if it is set to Auto, the optimum is automatically set. There are two hard keys associated with the Coupled features: CPL and AMPL.

POWER
STBY

RF input 50

All Auto Function

Coupled feature has two modes. One is Auto Mode and the other is Manual mode. To run the Auto mode, perform the following key operations.

CPL

ALL AUTO

Figure 5-23. Couple function

RBW and Sweep Time

(1) Auto mode

RBW, according Sweep Time, VBW parameters are set to Auto Span, even if the frequency is changed for each
The level measurement error will be born up parameters are automatically set to the optimum value.

The following shows the Auto Setting Sweep Time Range:

- Lower limit range: 50msec
- Upper limit range: 1000sec

The following table shows the RBW, VBW, Sweep Time for a number of Range Span.

FREQUENCY SPAN	RBW	VBW	SWEEP TIME
1kHz 9.9kHz	300Hz	300Hz	Sweep time while keeping the accuracy To obtain the minimum sweep time SPAN, RBW, VBW, using It is calculated.
10kHz 99.9kHz	1kHz	1kHz	
100kHz 299.9kHz	3kHz	3kHz	
300kHz 999kHz	10kHz	10kHz	
1MHz 1.99MHz	10kHz	10kHz	
2MHz 4.99MHz	30kHz	30kHz	
5MHz 5.99MHz	30kHz	30kHz	
6MHz 19.99MHz	100kHz	100kHz	
20MHz 59.9MHz	300kHz	300kHz	
60MHz 199.9MHz	1MHz	1MHz	
200MHz or faster	3MHz	1MHz	

(2) Manual mode

To select the RBW / Sweep Time in Manual mode, perform the following key operations:

CPL RBW [MNL]

CPL RBW

CPL SWP TIME [MNL]

CPL SWEEP TIME

Video Bandwidth (VBW)

To set the VBW, perform the following key operations:

CPL VBW [MNL]

CPL VBW

(1) Auto mode

When VBW is set to AUTO VBW it is set according to the RBW value.

(2) Manual mode

By narrowing the VBW to RBW set value, regardless of the noise averaged mind or, in the high-frequency modulation

Use the Manual setting you want to create VBW wide to observe the waveform of the signal.

VBW value can be manually set to one of the following values:

[10Hz, 30Hz, 100Hz, 300Hz, 1KHz, 3KHz, 10KHz, 30KHz, 100KHz, 300KHz, 1MHz, NONE]

NOTE: The sweep speed is increased when the average noise is not set to $VBW \geq RBW$.

To set the Input attenuator, perform the following key operations:

AMPL **ATTEN [AUTO / MNL]**

(1) Auto mode

While Auto is selected is automatically set to the optimum value according to the reference level.

Reference level range	Attenuation Auto
+ 30dBm + 20.1dBm	50
+ 20dBm + 10.1dBm	40
+ 10dBm 0.1dBm	30
0dBm -9.9dBm	20
-10dBm -19.9dBm	10
-20dBm -110dBm	0

2) Manual setting

When a signal is input at the same level as the reference level, it does not affect the compression gain (gain compression)

And getting an accurate measurement of high accuracy is made, the noise level is reduced in AUTO mode

The input attenuator control values.

However, the input attenuator manually as shown in the table below, increase the sensitivity to measure low-level signals

Set to:

Reference level range	Attenuation Manual Level
+ 30dBm -60dBm	50
+ 30dBm -70dBm	40
+ 20dBm -80dBm	30
+ 10dBm -90dBm	20
0dBm -100dBm	10
-10dBm -110dBm	0

When the RF input level is less than -10dBm input attenuator can be used a small value.

Chapter 5 How to Operate

CONFIGURATION

SA-7270 system parameters can be set depending on the objective.
CONFIG hard key is the header key related to the system configuration.

FUNCTIONAL POWER
F1 SPAN 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044 1045 1046 1047 1048 1049 1050 1051 1052 1053 1054 1055 1056 1057 1058 1059 1060 1061 1062 1063 1064 1065 1066 1067 1068 1069 1070 1071 1072 1073 1074 1075 1076 1077 1078 1079 1080 1081 1082 1083 1084 1085 1086 1087 1088 1089 1090 1091 1092 1093 1094 1095 1096 1097 1098 1099 1100 1101 1102 1103 1104 1105 1106 1107 1108 1109 1110 1111 1112 1113 1114 1115 1116 1117 1118 1119 1120 1121 1122 1123 1124 1125 1126 1127 1128 1129 1130 1131 1132 1133 1134 1135 1136 1137 1138 1139 1140 1141 1142 1143 1144 1145 1146 1147 1148 1149 1150 1151 1152 1153 1154 1155 1156 1157 1158 1159 1160 1161 1162 1163 1164 1165 1166 1167 1168 1169 1170 1171 1172 1173 1174 1175 1176 1177 1178 1179 1180 1181 1182 1183 1184 1185 1186 1187 1188 1189 1190 1191 1192 1193 1194 1195 1196 1197 1198 1199 1200 1201 1202 1203 1204 1205 1206 1207 1208 1209 1210 1211 1212 1213 1214 1215 1216 1217 1218 1219 1220 1221 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1622 1623 1624 1625 1626 1627 1628 1629 1630 1631 1632 1633 1634 1635 1636 1637 1638 1639 1640 1641 1642 1643 1644 1645 1646 1647 1648 1649 1650 1651 1652 1653 1654 1655 1656 1657 1658 1659 1660 1661 1662 1663 1664 1665 1666 1667 1668 1669 1670 1671 1672 1673 1674 1675 1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1686 1687 1688 1689 1690 1691 1692 1693 1694 1695 1696 1697 1698 1699 1700 1701 1702 1703 1704 1705 1706 1707 1708 1709 1710 1711 1712 1713 1714 1715 1716 1717 1718 1719 1720 1721 1722 1723 1724 1725 1726 1727 1728 1729 1730 1731 1732 1733 1734 1735 1736 1737 1738 1739 1740 1741 1742 1743 1744 1745 1746 1747 1748 1749 1750 1751 1752 1753 1754 1755 1756 1757 1758 1759 1760 1761 1762 1763 1764 1765 1766 1767 1768 1769 1770 1771 1772 1773 1774 1775 1776 1777 1778 1779 1780 1781 1782 1783 1784 1785 1786 1787 1788 1789 1790 1791 1792 1793 1794 1795 1796 1797 1798 1799 1800 1801 1802 1803 1804 1805 1806 1807 1808 1809 1810 1811 1812 1813 1814 1815 1816 1817 1818 1819 1820 1821 1822 1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1843 1844 1845 1846 1847 1848 1849 1850 1851 1852 1853 1854 1855 1856 1857 1858 1859 1860 1861 1862 1863 1864 1865 1866 1867 1868 1869 1870 1871 1872 1873 1874 1875 1876 1877 1878 1879 1880 1881 1882 1883 1884 1885 1886 1887 1888 1889 1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903 1904 1905 1906 1907 1908 1909 1910 1911 1912 1913 1914 1915 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057 2058 2059 2060 2061 2062 2063 2064 2065 2066 2067 2068 2069 2070 2071 2072 2073 2074 2075 2076 2077 2078 2079 2080 2081 2082 2083 2084 2085 2086 2087 2088 2089 2090 2091 2092 2093 2094 2095 2096 2097 2098 2099 2100 2101 2102 2103 2104 2105 2106 2107 2108 2109 2110 2111 2112 2113 2114 2115 2116 2117 2118 2119 2120 2121 2122 2123 2124 2125 2126 2127 2128 2129 2130 2131 2132 2133 2134 2135 2136 2137 2138 2139 2140 2141 2142 2143 2144 2145 2146 2147 2148 2149 2150 2151 2152 2153 2154 2155 2156 2157 2158 2159 2160 2161 2162 2163 2164 2165 2166 2167 2168 2169 2170 2171 2172 2173 2174 2175 2176 2177 2178 2179 2180 2181 2182 2183 2184 2185 2186 2187 2188 2189 2190 2191 2192 2193 2194 2195 2196 2197 2198 2199 2200 2201 2202 2203 2204 2205 2206 2207 2208 2209 2210 2211 2212 2213 2214 2215 2216 2217 2218 2219 2220 2221 2222 2223 2224 2225 2226 2227 2228 2229 2230 2231 2232 2233 2234 2235 2236 2237 2238 2239 2240 2241 2242 2243 2244 2245 2246 2247 2248 2249 2250 2251 2252 2253 2254 2255 2256 2257 2258 2259 2260 2261 2262 2263 2264 2265 2266 2267 2268 2269 2270 2271 2272 2273 2274 2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2289 2290 2291 2292 2293 2294 2295 2296 2297 2298 2299 2300 2301 2302 2303 2304 2305 2306 2307 2308 2309 2310 2311 2312 2313 2314 2315 2316 2317 2318 2319 2320 2321 2322 2323 2324 2325 2326 2327 2328 2329 2330 2331 2332 2333 2334 2335 2336 2337 2338 2339 2340 2341 2342 2343 2344 2345 2346 2347 2348 2349 2350 2351 2352 2353 2354 2355 2356 2357 2358 2359 2360 2361 2362 2363 2364 2365 2366 2367 2368 2369 2370 2371 2372 2373 2374 2375 2376 2377 2378 2379 2380 2381 2382 2383 2384 2385 2386 2387 2388 2389 2390 2391 2392 2393 2394 2395 2396 2397 2398 2399 2400 2401 2402 2403 2404 2405 2406 2407 2408 2409 2410 2411 2412 2413 2414 2415 2416 2417 2418 2419 2420 2421 2422 2423 2424 2425 2426 2427 2428 2429 2430 2431 2432 2433 2434 2435 2436 2437 2438 2439 2440 2441 2442 2443 2444 2445 2446 2447 2448 2449 2450 2451 2452 2453 2454 2455 2456 2457 2458 2459 2460 2461 24

F5CONTROL MENU
F6DISP TRACE PRECONFIG
F7 RF input 50
9kHz-2.7GHz
280dB MAX

Hard Copy

This key is used to print a hard copy using.
To print the current screen, perform the following key operations.

CONFIG HARD COPY

Printer type

SA-7270 printer supports the following:

- HP Laser Jet Printer
- PCMCIA (BMP FILE SAVE) - Im options

To select a printer, perform the following key operations:

CONFIG HARD COPY SET HP LASERJET RETURN
PCMCIA

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RS-232C Configuration

The system can be remotely controlled using an RS-232C interface.
To set the RS-233C protocol, perform the following key operations:

CONFIG RS-232C CONFIG

BAUD RATE :
DATA LENGTH :
STOP BIT :
PARITY BIT :
RETURN :

GPIO Address

To install the GPIO configuration, perform the following key operations:
GPIO address can be set using the STEP key or Scroll key.

Clock Set

Perform the following key operations to set the time and date of the system:

YEAR [XX] :
 MONTH [XX] :
 DAY [XX] :
 HOUR [XX] :
 MINUTE [XX] :
 SECOND [XX] :
 ENTER

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Chapter 5 How to Operate

10M REF [INT / EXT]

The key to the system reference oscillator is selected (10MHz).

This key toggles the INT / EXT state to toggle way.

CONFIG

MORE 10M REF [INT / EXT]

When INT is selected, the internal reference oscillator is selected.

When EXT is connected to a 10MHz reference frequency signal input terminal of the spectrum analyzer rear panel, select External

The frequency accuracy is defined by the reference oscillator.

BEEP [ON / OFF]

beep sound of a key in the menu is selected with this key.

The key to toggle the ON / OFF status to toggle way.

CONFIG

MORE

BEEP [ON / OFF]

Version information

When you press this key (F5) to view information of the system Software.

PCMCIA Memory Card Function (option)

PCMCIA memory card is selected as an option.

Memory cards are used in the current setup / configuration, data waveforms, bit map (BMP) file storage.

Thing necessary for a memory card:

- 1) corresponding to the PCMCIA Type I Release 2.0.
- 2) Memory Card: SRAM type only types available:
- 3) Format type
MS-DOS compatible format
- 4) Memory capacity:
64kB, 128kB, 256kB, 512kB, 1MB, 2MB

Memory card format

New or have not used the card must be used before format

- (1) It is possible to write (write available) in write-protect the card Format (write protect).

Note: If the data is any memory card is initialized, all data will be lost

- (2) Insert a memory card.
- (3) Perform the following key operations to a memory card format:

CONFIG

PCMCIA

PCMCIA FORMAT: format the memory card

FORMAT CHECK: Check the memory card.

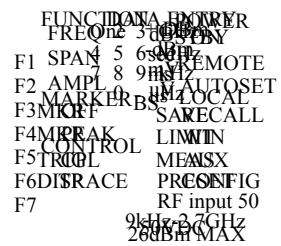
MEMORY [INT / PCMCIA]: Select the memory card

RETURN

Chapter 5 How to Operate

SAVE AND RECALL FUNCTIONS

SA-7270 is the setting conditions (Parameters) and waveform data (Trace) to an internal memory or a memory card (optional) You can store. This data can be recalled and used.



Internal Register

SA-7270 uses internal memory, a memory (RAM) associated with internal Battery.

You can save the setting on waveform and the Internal register

- A. Unit setting conditions : 10 things
- B. Trace A waveform : 10 things
- C. Trace B waveform : 10 things
- D. Limit Line : 10 things

Figure 5-24. Save function

Save Parameters and Waveform

SAVE key is the header key for saving parameters and waveforms. Current parameters, Waveform data, perform the following key operations to save the title on the internal memory or the memory card Please:

SAVE	STATE 0	STATE 6
SAVE STATE	STATE 1	.
	.	.
	STATE 5	STATE 9
	MORE	PREV

Parameters of the instrument can be saved to internal or external memory up to 10.

	TRA 0	TRA 6
SAVE TRACE A	TRA 1	.
	.	.
	TRA 5	TRA 9
	MORE	PREV

Trace A waveform of the equipment can be stored in internal or external memory up to 10.

	TRB 0	TRB 6
SAVE TRACE B	TRB 1	.
	.	.
	TRB 5	TRB 9
	MORE	PREV

Trace B waveforms of the equipment can be stored in internal or external memory up to 10.

	STATE 0	STATE 6
SAVE LIMIT	STATE 1	.
	.	.
	STATE 5	STATE 9
	MORE	PREV

LIMIT Up to 10 can be stored in internal or external memory.

	LIST 0	LIST 6
STATE LIST	LIST 1	.
	.	.
	LIST 5	LIST 9
	MORE	PREV

When you press this key, the stored information will appear on the screen.

SAVE LOCK [ON / OFF]

This key is used for protection purposes in order to prevent the loss of data or unexpected conditions.

	STATE DIR
DIR	TRACE A DIR
	TRACE B DIR

Pressing this key will appear on the data size and the title screen.

The following parameters are stored, waveform data, in order to bring up the subject in the internal memory or the memory card
Perform the following key operations: RECALL key is the header key for calling up the parameters and waveforms.

RECALL STATE	STATE 0	STATE 6
	STATE 1	.
	STATE 5	STATE 9
	MORE	PREV

Source parameters of the instrument can be viewed in the internal or external memory up to 10.

RECALL TRACE A	TRA 0	TRA 6
	TRA 1	.
	TRA 5	TRA 9
	MORE	PREV

Trace A waveform of the equipment can be viewed in the internal or external memory up to 10.

RECALL TRACE B	TRB 0	TRB 6
	TRB 1	.
	TRB 5	TRB 9
	MORE	PREV

Trace B waveforms of the equipment can be viewed in the internal or external memory up to 10.

RECALL LIMIT	LOAD 0	LOAD 6
	LOAD 1	.
	LOAD 5	LOAD 9
	MORE	PREV

LIMIT Up to 10 can be viewed in the internal or external memory.

STATE LIST	STATE 0	STATE 6
	STATE 1	.
	STATE 5	STATE 9
	MORE	PREV

When you press this key, the stored information will appear on the screen.

DIR	STATE 0
	STATE 1
	.
	STATE 5
	MORE

Pressing this key will appear on the data size and the title screen.

Figure 5-25. Recall function

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Chapter 5 How to Operate

MEASUREMENT FUNCTIONS

SA-7270 provides four measurements below:

- X dB down measurement
- Occupied bandwidth measurement
- Marker Frequency Counter
- EMC measurement (option)

FUNCTIONS
F1 SPAN 5 6500Hz
F2 AMPL 0 dBm
F3 MARKER BS LOCAL
F4 PRAK LIN MIN
F5 TRIG MEASX
F6 DISRACE PRECONF
F7 9kHz-3.7GHz
26dBm MAX

Figure 5-26. Measurement functions

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X dB Down Measurement

X dB Down function of frequency between different standards Marker Marker with standard X dB Down (or Up) in (And level) is to show the differences.
It can be specified for X from the screen dynamic range relative dB range is selected using the STEP key or Scroll key.
Default value is 3dB.

To use the X dB Down measurement function, perform the following key operations.

MEAS	dB DOWN
X dB DOWN	: Place the marker on the right and left X dB down from the reference Marker.
X dB LEFT	: Leave the standard X dB down marker on the left point of the marker.
X dB RIGHT	: Place the reference point X dB down marker on the right side of the marker.
FORMAT	: Select Marker display format.
[REL / ABSL / ABSR]	REL: Displays the delta Marker. (Initial value) ABSL: Displays the Marker left value. ABSR: the right to display the Marker value.
STOP	: After pressing this key once, the X dB Down Measurement is running.
CONTINUE	: Press the key X dB Down is running continuously.

X dB END : Stop the X dB Down measurement.

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Chapter 5 How to Operate

Occupied bandwidth power measurement (Occupied power Bandwidth measurement)

To determine the occupied bandwidth of the signal displayed on the screen.

The result is the occupied bandwidth (OBW), occupied band carrier frequency (Fc), with respect to the center frequency band D. Marker
It displays the display area.

SA-7270 has the OBW function that can be calculated from the measured data that appears on the screen. that is

Do find a frequency band that contains a specified percentage of the total power. And the initial value is 10%,

Are measured in a range between 10% and 99.8% can be specified.

OBW Measurement Procedure

- (1) set for the Normal Marker Center Frequency and the input signal (frequency), set up and Span
RBW and sweep time set to AUTO.
- (2) Set the mode to Detect SAMPLE mode.
- (3) to perform the following key operations to calculate the occupied bandwidth (OBW):

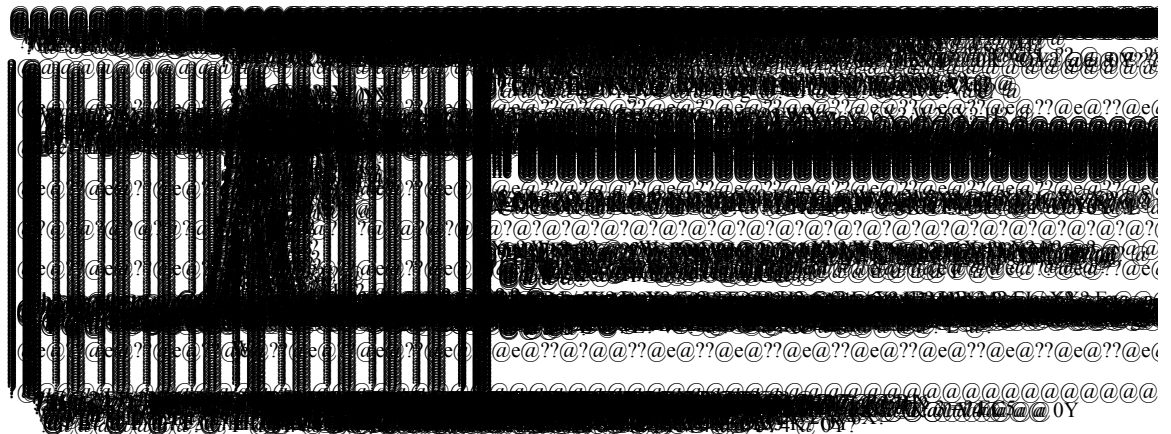
MEAS

MEASURE OBW

When the calculation is completed, occupied bandwidth (Fc is the center frequency band actually occupied Im) of the display

It appears on the left side. "x" marker based on the amount of Marker to indicate the end point frequency band

It is set on the side.



[illegible]

To use the Marker Counter Function perform the following key operations.

When the Marker Counter function is selected when it is necessary to count gate count resolution and accuracy

Waveform update rate is slower at the door.

Press this key to toggle the mode COUNT ON / OFF.
To select the Count resolution, perform the following key operations.

QP EMC Measurement (option)

EMC (Electro Magnetic Compliance) Qusi-set the peak detect mode as required by the specifications CISPR do it.

MEAS	QP MODE	BAND B [9kHz]	RETURN
		BAND C [120kHz]	

To use the Quasi-peak detect mode to perform the following key operations:
The scale of the equipment when the QP detect mode to be selected is set to 5dB / DIV and VBW is automatically set to OFF
It is fixed.

Chapter 5 How to Operate

Channel Power

Channel Power is available for the channel bandwidth, based on the current center frequency
Measure the power of the region.

Channel Power Measurement

- (1) channel bandwidth [F1] when the key is pressed, the current channel bandwidth as previously set
Sweep (sweep) calculation is performed at the time of the end.
- (2) When the step / knob or numeric keys by the channel bandwidth is changed, the current sweep (sweep) is
The calculation is performed on the ending point.
- (3) Measurement is performed in the state detect mode the sample.

Setting environment for Channel Power Measurement

- (1) center frequency: center frequency of the channel
- (2) RBW: $RBW < 0.025 \times \text{Channel Bandwidth}$
- (3) VBW: $10 \times RBW$
- (4) Sweep time: AUTO
- (5) SPAN: $SPAN = 2 \times \text{Channel Bandwidth}$
- (6) Detect mode: SAMPLE
- (7) Scale: log mode



Figure 5-28. Channel Power function

Adjacent Channel Power (ACP)

Transmission power of the transmission channel using a multiple-channel is an adjacent channel (lower band channel, Measure the effect on upper band channel). ACP is the current center frequency
After setting the channel bandwidth / space based, to perform the measurement.

ACP (Adjacent Channel Power) measurement

- (1) ACP [F1] key, channel bandwidth / space value of the current sweep (sweep) is set
The calculation is performed on the ending point.
- (2) The measurements are performed in the state detect mode the sample.

Setting environment for the ACP measurement

- (1) center frequency: center frequency of the carrier channel
- (2) RBW: $RBW < 0.025 \times \text{Channel Bandwidth}$
- (3) VBW: $10 \times RBW$
- (4) Sweep time: AUTO
- (5) SPAN: $SPAN > 2 \times \text{Channel Space} + \text{Channel Bandwidth}$
- (6) Scale: log mode

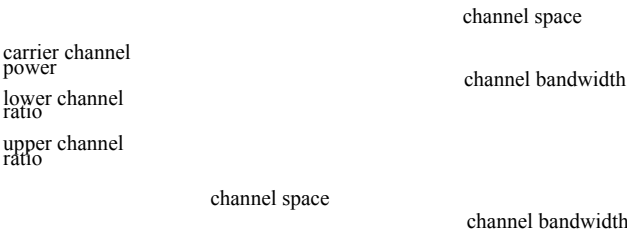


Figure 5-29. ACP features

DEMODULATION AND AUDIO FUNCTIONS

SA-7270 provides analog demodulation and audio monitor functions feature.

- AM Demodulation
- FM Demodulation
- Audio ON / OFF, Audio Level Control, Squelch Function
- Tracking Generator ON / OFF, Output level control

FUNCTION POWER
 FREQ 300MHz
 4 5 6sec
 F1 SPAN 7 8 9MHz
 F2 AMPL 10 11 AUTOSET
 F3 MARKER 12 LOCAL
 F4 OFF 13 SARECALL
 F5 BREAK 14 LIMIT
 F6 CONTROL 15 MAX
 F7 TRACE 16 PRESET
 RF input 50
 9kHz-2.7GHz
 20dBm MAX

Figure 5-30. AUX function

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AM Demodulation

The AM demodulation function displays the amplitude-modulated waveform. Pressing the key turns the horizontal time base
 The center carrier frequency is the center frequency.
 To use AM demodulation function, perform the following key operations:

AUX AM [ON / OFF]

This key is AM demodulation ON / OFF to toggle way.
 The SA-7270 AM demodulation function provides the scale with five scale.
 To set the Scale, perform the following key operations:

AUX	AM [ON]	AM / FM SCALE	25 [%] / DIV
			20 [%] / DIV
			10 [%] / DIV
			5 [%] / DIV
			2.5 [%] / DIV

FM Demodulation

The FM demodulation function displays the frequency modulation waveforms. Pressing the key turns the horizontal time base
The carrier frequency is the center frequency.
To use FM demodulation function, perform the following key operations:

AUX FM [ON / OFF]

The key is to demodulate FM ON / OFF to toggle way.
The SA-7270 offers an FM demodulation scale of six scale.
To set the Scale, perform the following key operations:

AUX	FM [ON]	AM / FM SCALE	25 [kHz] / DIV
			20 [kHz] / DIV
			10 [kHz] / DIV
			5 [kHz] / DIV
			2.5 [kHz] / DIV
			1 [kHz] / DIV

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Chapter 5 How to Operate

Audio Monitor

SA-7270 has a built-in speaker and phone jack in the back.
The AUDIO ON / OFF internal speaker will be used to ON or OFF.
AUDIO LEVEL is used to adjust the audio level by the STEP Up / Down key Scroll keys.
The audio level is 8 levels. (07) The initial value is 3.
SQUELCH key is used to switch the function kwechi. The adjustment range is 256 levels and key STEP Up / Down
It can be adjusted by the Scroll key. The default value is 127.

TRACKING GENERATOR (optional)

SA-7270 has the option Tracking Generator.
To use the Tracking Generator, perform the following key operations:

AUX TRACKING GEN.

TRACKER [ON / OFF]: TRACKER ON / OFF or ON is the Tracking Generator Output
It used to OFF.

OUTPUT LEVEL : OUTPUT LEVEL is STEP Up / Down keys, Scroll keys, Numeric
Key is used to adjust the output power level.
Power level is adjusted to a 0.1dB step 0 to -70.0 dB
You can.

NORMAL [ON / OFF] : Normalize the function output level defined by the user,

Temporarily compensate for the frequency response.

- AUTO FRQ CAL : AUTO FRQ CAL is for the center frequency of the system
The level of the center frequency of the Tracking Generator automatically
It will be used to compensate.
- MANUAL FRQ CAL : MANUAL FRQ CAL is for the center frequency of the system
The user the level of the center frequency of the Tracking Generator
Up / Down keys, and compensate for the level of frequency using the Scroll keys
It will be using.
- RETURN

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LIMIT LINE FUNCTIONS

LIMIT key is the header key for using the limit line function.

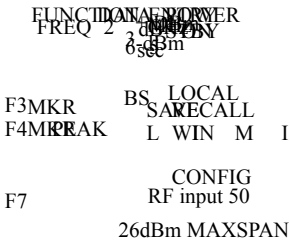


Figure 5-31. Limit Line Function

Chapter 5 How to Operate

LIMIT LINE FUNCTION has been set to demonstrate the acceptable upper / lower bounds on the spectral waveform. It shows two lines.

Very easy to compare the measured data with the LIMIT line.

To create the Up / lower limit tables, perform the following key operations:

When the upper limit is LIMIT line selection cursor (◊) is displayed in the upper left corner of the screen.

The bottom line, the cursor is displayed at the bottom left of the screen.

Up / Down step is used to move the cursor to LIMIT line in the amplitude axis (Y position).

Scroll keys are used to move the cursor to LIMIT line in the frequency axis (X position).

To create a range of LIMIT line, do the following work:

LIMIT	MAKE LIMIT
SELECT [LOW / UP]	: Set upper / lower limit.
MARK DOT	: Position the cursor in the X or Y.
ACCEL [ON / OFF]	: Select the size of the LIMIT line to move the cursor. ON: 1 division, OFF: 1 pixel
UNDO	: Mark dot and then erases the last line drawn.
CLEAR	: All LIMIT line is cleared.
RETURN	: To return to the previous menu.

Use the following keys to set the PASS / FAIL mode.

PASS appears on the screen when the spectrum waveform is within the upper / lower limit. If it is not, FAIL

It appears on the screen.

LIMIT	PASS CHK [ON / OFF]
-------	---------------------

When the ON key below compares only the upper limit.

LIMIT	UPPER [ON / OFF]
-------	------------------

When the ON key below compares only the upper limit.

LIMIT	LOWER [ON / OFF]
-------	------------------

ON If the following keys when you hear a BEEP PASS-CHECK fail.

LIMIT	ALARM [ON / OFF]
-------	------------------

WINDOW FUNCTIONS

WIN key is the header key for using Windows functions.

FUNCTIONS POWER
F1 SPAN 5 650Hz
F2 AMPL 8 9dB
F3 MARKER BS LOCAL
F4 PEAK LIMIN
F5 TRIGL MEXX
F6 TRACE PRECONF
F7 9kHz 3.7GHz
26dBm MAX

When the window functions ON The screen is divided into two parts as shown below.

Figure 5-32 Window Function

Window function divides the screen into two display areas. (Top and bottom of the display area display This area)

To use the Windows function, perform the following operation:

WIN

WINDOW [ON / OFF] : When the ON state is selected, the screen display is divided into two.

UPPER ZONE : The top area is activated.

LOWER ZONE : The lower area of activation.

UPPER ZOOM : The upper zone is activated and the normal displays.

LOWER ZOOM : The lower zone is activated and the normal displays.

TOGGLE [ON / OFF] : Updates will appear alternately on / bottom area.

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PRESET FUNCTION

Preset key is the header key for the preset and calibration functions.

Pressing the Preset soft key to display the following menu.

- PRESET
- LAST STATE
- ALL CAL
- CAL MODE

- CAL SIG [ON / OFF]
- AUTO CAL [ON / OFF]

PRESET

Pressing the Preset key All parameter analyzer will return to the following value.

Factory Default Settings

Center Frequency	: 1.375GHz
Frequency Span	: 2.75GHz
Reference Level	: 0 dBm
Detector	: LOG
Scale	: 10 dB / DIV
Sweep Time	: 50 msec, AUTO mode
RBW	: 3MHz, AUTO mode
VBW	: 1MHz, AUTO mode
ATTEN	: 10 dB, AUTO mode
Trigger	: Free Run
Marker	: OFF
Display Line	: OFF
Threshold Line	: OFF
Trace Detector Mode	: POS PEAK
Contrast	: 60%

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Chapter 5 How to Operate

LAST STATE

Pressing the LAST STATE parameter has all the equipment to return to the previous status.

All CAL

Press ALL CAL key to execute the system calibration process for the system.

CAL Mode

CAL MODE Press the soft key to display the menu for the system calibration process.

- YIG CAL : The recalibration value of the YIG tuning curve.
- RBW CAL : RBW center frequency to compensate for the gain error and drift with the new calibration values Calculate.

- LEVEL CAL : Calculates a new correction value for correcting the gain error due to temperature.
- SPAN CAL : SPAN compensate for the attenuator error and sweep gain to calculate a new calibration The.
- LOG AMP CAL : LOG amp to compensate for drift and calculate the new calibration factor.

CAL SIGNAL

If the CAL SIGNAL ON, the calibration signal acts.
The calibration signal is 40MHz, -30 dBm.
This feature is useful for checking the system itself.

AUTO CAL [ON / OFF]

When the AUTO CAL ON, calibration routine will automatically perform a calibration to detect temperature changes.
This feature does not work when the AUTO CAL is OFF.

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SECTION 6 PERFORMANCE TESTS

Chapter 6

Performance Testing

This chapter describes the measuring tool with the setup and operation procedures necessary for the performance of inspections.

neck car

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SECTION 6 PERFORMANCE TESTS

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SECTION 6 PERFORMANCE TESTS

6.1 Performance Testing Requirements

Performance tests are used as preventive maintenance to prevent degradation of the SA-7270. After repairs Acceptance testing, performance tests whenever necessary to check after the test, such as a funny performance Please use.

- O Reference Oscillator Frequency Stability
- O Center Frequency Accuracy
- O Span Accuracy
- O resolution bandwidth (RBW), selectivity, switching errors
- O sideband noise (phase noise)
- O Frequency Measurement Accuracy
- O amplitude linearity
- O Frequency Response
- O Reference level accuracy
- O Average Noise Level
- O Harmonic Distortion
- O Input Attenuator switching error
- O Residual FM
- O Internal modulation
- O Spurious response
- O local oscillator radiation
- O Input VSWR

Regularly conduct performance checks on preventive maintenance for important evaluation item for Please. Twice a year is recommended for regular performance tests. Performance test specifications If you do not fit, contact LG precision.

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6.2 Performance test equipment required

Equipment necessary for conduction performance tests (1/2)

Recommended Instrument (model name)	Performance Requirements				Inspection items
	term	neck	four	amount	
Synthesized Signal Generator (MG3633A) (HP 8648C)	Frequency Range		10 kHz	2.7 GHz	Frequency-span readout accuracy
	Resolution		1 Hz		Resolution Bandwidth, selectivity
	Output Level Range		-20 DBm	0 dBm	Sideband noise
	Output level resolution		0.1 dB		Amplitude display linearity
	SSB phase noise		≤ 130 dBc / Hz		Reference level accuracy
			(10 kHz offset from)		Second harmonic distortion
	Second harmonic		≤ 30 dBc		Resolution bandwidth switching error
	Amplitude Modulation		0% 100%		Input Attenuator switching error
			0.1 400 Hz		
	External reference input		10 MHz		
Attenuator (Attenuator 1 = HP8494 Attenuator 2 = HP8496)	Frequency Range		DC	26.5 GHz	Amplitude display linearity
	Attenuation		0 11 dB (1 step)		Input attenuator switching error
	Repeatability		≤ 0.01 dB		
			(≤ 0.05 dB,		
			18 26.5 GHz)		
	Frequency Range		DC	26.5 GHz	
	Attenuation		110 0 dB (step 10)		
	Repeatability		≤ 0.01 dB		
			(≤ 0.05 dB,		
			18 26.5 GHz)		
Power Meter (HP 437B)	Frequency Range		100 kHz	110 GHz	Frequency response
	Measuring range		-70 DBm	44 dBm	Reference level accuracy
	Power resolution		0.001 dB		Input attenuator switching error
Power sensor (HP8481A)	Frequency Range		10 MHz	18 GHz	Frequency response
	VSWR (max)		1.4 (10 MHz 30 MHz)		Reference level accuracy
			1.18 (30 MHz 50 MHz)		Input attenuator switching error
					1.1 (50 MHz 2 GHz)
			1.18 (2 GHz 12.4 GHz)		
					1.28 (12.4 GHz 18 GHz)
	Power range		-30 DBm	+20 dBm	

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Recommended Instrument (model name)			
Power sensor (HP8481D)	Frequency Range	10 MHz 18 GHz	Frequency response
	VSWR (max)	1.4 (10 MHz 30 MHz)	Reference level accuracy
		1.15 (30 MHz 4 GHz)	Input attenuator switching error
			1.2 (4 GHz 10 GHz)
		1.3 (10 GHz 15 GHz)	
Power Combiner		2.35 (15 GHz 18 GHz)	
	Power range	-70 DBm -20 dBm	
	Frequency Range	DC 18 GHz	Frequency response
	Output impedance	50 Ω	DC 18 GHz 18 G @

SECTION 6 PERFORMANCE TESTS

6.3 Performance Testing

Test item other than oscillator frequency stability, warm-up and the equipment for at least 30 minutes, After the SA-7270 is fully stabilized, check the performance. In addition, calibration of the equipment warm-up After the time is considered sufficient to start the measurement. In addition, the test at room temperature, and the AC power source Fluctuations in voltage must do in the little state. Noise, dust, etc. jusip damage, vibration, moisture, Please.

6.3.1 Reference Oscillator Frequency Stability

Measuring the internal reference oscillator output frequency (10MHz), and changes state at a temperature in the range of 0 °C 40 °C
Examine the frequency stability, such as the aging of the reference oscillator when the equipment operating for a long time.

6.3.1.1 Specifications

■ reference oscillator

O Frequency : 10 MHz

O Aging rate: $\leq 1 \times 10^{-6}$ / year

24 hours after the warm-up at 25 °C ± 5 °C

O temperature stability: for the frequency measured at 25 °C 0 °C and $\leq 2 \times 10^{-6}$ at 40 °C

6.3.1.2 Inspection Equipment

O Frequency counter (HP5350B)

6.3.1.3 Installation

Frequency Counter

Hp5350B

<Reference Oscillator Frequency Stability Test>

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SECTION 6 PERFORMANCE TESTS

6.3.1.4 Procedures

6.3.1.4.1 Temperature stability

Test condition: Test this performance in a vibration-free variable temperature bath.

step

step

One. 25 °C, install the SA-7270 in the cabinet.

2. Turn on the power of the SA-7270, SA-7270 and wait for the internal temperature to stabilize.

(About 1.5 hours after the chamber temperature stabilized)

3. the frequency by using a counter having a resolution 0.1Hz When the internal temperature stabilized

Measures.

4. Change the chamber temperature to 40 °C.

5. When the chamber temperature and SA-7270 internal temperature stabilizes, using a frequency counter

You can measure.

6. used to calculate the stability of the expression below.

$$\text{Frequency stability} = \frac{(\text{Counter reading at } 40^\circ\text{C}) - (\text{counter reading at } 25^\circ\text{C})}{(\text{Counter reading at } 25^\circ\text{C})}$$

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SECTION 6 PERFORMANCE TESTS

6.3.2 Center Frequency Accuracy

Set the CF (you know the frequency) and span as shown in the figure below, CF frequency Synthesized Signal Generator output frequency. Equipment set the center frequency to frequency in the SA-7270 CF. And one can then select the same peak search for the frequency indicated by the marker. At this time the measuring range of the frequency error is detected. In order to synchronize the reference oscillator Synthesized Signal Generator use the reference oscillator and the reference oscillator SA-7270 at the same oscillator Use.

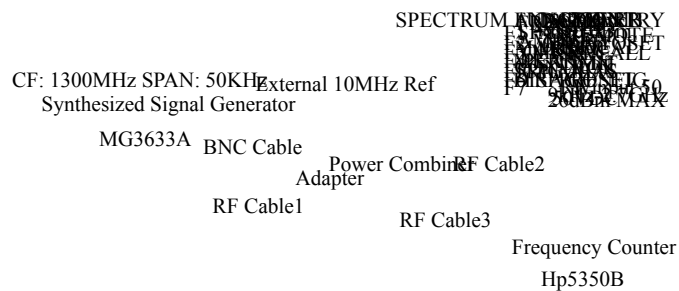
6.3.2.1 Specifications

O center frequency accuracy: $\pm (\text{frequency indication} \times \text{frequency reference accuracy} + \text{accurate span} \times \text{span} + 0.5 \times \text{RBW})$; After calibration,

6.3.2.2 Inspection Equipment

O Synthesized Signal Generator	: MG3633A [Anritsu]
O Frequency counter	: HP5350B
O Power combiner	: HP11636A
O RF Cable 1,2,3	: N [male] N [male]
O Adapter	: N [female] N [female]
O BNC Cable	: BNC [male] BNC [male]

6.3.2.3 Installation



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SECTION 6 PERFORMANCE TESTS

SECTION 6 PERFORMANCE TESTS

Frequency test equipment (MG3633A)	SA-7270		Measuring the frequency (MHz)	
	Span	Center frequency	Minimum	Measures The maximum accuracy
Frequency: 1300 MHz	50 kHz	1300 MHz	1299.9935	1300.0066
Output power level:	200kHz		1299.9890	1300.1107
- 10 dBm	1 MHz		1299.9650	1300.0351
	2 MHz		1299.9350	1300.0651
	5 MHz		1299.8449	1300.1551
	10 MHz		1299.6949	1300.3051
	20 MHz		1299.3949	1300.6051
	50 MHz		1298.4949	1301.5050
	100 MHz		1296.9949	1303.0050
	500 MHz		1284.9949	1315.0050

SECTION 6 PERFORMANCE TESTS

6.3.3 Span Accuracy

Use the diagram below to configure the system and the first nine times on the left side of the screen scale
Set the frequency for the second division in Signal Generator.. First division and ninth
The frequency difference between the peak level of division is as $\text{span} \times 0.8$.

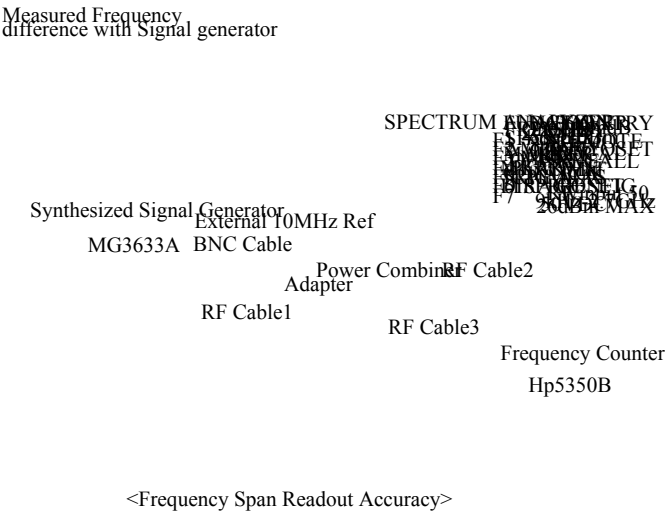
6.3.3.1 Specifications

O Frequency span accuracy: $\pm 3.0\%$

6.3.3.2 Inspection Equipment

- O Synthesized Signal Generator : MG3633A [Anritsu]
- O Frequency counter : HP5350B
- O Power combiner : HP11636A
- O RF Cable 1,2,3 : N [male] N [male]
- O Adapter : N [female] N [female]
- O BNC Cable : BNC [male] BNC [male]

6.3.3.3 Installation



6.3.3.4 Procedures

step step

One. SA-7270, turn on the main power switch on the rear panel power switch on the front panel SA-7270
Turn on.

- 2. The SA-7270, press the [PRESET] key.
- 3. [PRESET], press the soft key, and then press the [ALL CAL] soft key.
- 4. Set the signal generator output frequency below.

Frequency : 1300 MHz
Power : -10 DBm

- 5. Set the SA-7270 as follows:
- 6. Set the SA-7270 in the attenuator 10dB.

Center frequency : 1300 MHz
Span : 50 kHz
Reference level : 0 dBm
Couple : All Auto

- 7. To set in the first division from the left edge of the screen, the peak signal to come MG3633A
Adjust the output frequency. Record the frequency f1.
- 8. To set the ninth division from the left edge of the screen, the peak signal to come
Adjust the MG3633A output frequency. Record the frequency f2.
- 9. Calculate the (f2-f1) / (span × 0.8), and commits the value specified in the table on the next page
Make sure that in the above.
- 10. Repeat steps 5 through 9 for a span in the following table.
- 11. Calculate the span accuracy by using the following equation:

Frequency range, accuracy =
$$\frac{[\text{Frequency (f2)} - \text{frequency (f1)}] \times 100}{(\text{Span} \times 0.8)}$$

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SECTION 6 PERFORMANCE TESTS

SA-7270		Signal Generators (MHz)		four	amount
Center frequency	Span	f1	f2	Minimum Span	Maximum Span accuracy
1300 MHz	50 kHz			8.5 kHz	51.5 kHz
	200kHz	194 kHz			206 kHz
	1 MHz	970 kHz			1.3 MHz

2 MHz	1.94 MHz	2.06 MHz
5 MHz 4.85 MHz		5.15 MHz
10 MHz	9.7 MHz	10.3 MHz
20 MHz	19.4 MHz	20.6 MHz
50 MHz	48.5 MHz	51.5 MHz
100 MHz	97 MHz 103 MHz	
200 MHz	194 MHz	206 MHz
500 MHz	485 MHz	515 MHz
1000 MHz	970 MHz	1030 MHz
2000 MHz	1940 MHz	2060 MHz

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SECTION 6 PERFORMANCE TESTS

6.3.4 The resolution bandwidth (RBW), selectivity, switching errors

★ RBW accuracy and selectivity

There are two input signals having a different frequency corresponding to 3dB bandwidth (IF final stage)

When signals can be decomposed in two waveforms. This is referred to as RBW (Resolution Bandwidth).

Selectivity is the ratio of the width of the filter in the filter pokdae -3dB point at -60dB as shown in the following formula

Determined by the doepda.

In order to test the resolution bandwidth and selectivity, first measurement bandwidth (3dB bandwidth), then

Measure the 60dB bandwidth. And calculate the 60dB / 3dB bandwidth ratio.

★ RBW switching error

Switching error is to check the amplitude difference of each filter when the RBW filters have been switched.

6.3.4.1 Specifications

O Accuracy: from 3 dB $\leq \pm 20\%$ (300Hz, 1kHz, 3kHz, 10kHz, 30kHz, 100 kHz,
300 kHz, 1 MHz, 3 MHz)

In 6 dB $\leq \pm 20\%$ (9 kHz, 120 kHz)

- O selectivity (60 dB / 3dB bandwidth): $\leq 15: 1$
(1kHz, 3kHz, 10kHz, 30kHz, 100kHz, 300kHz, 1MHz, 3MHz)
- (60 dB / 6dB bandwidth): $\leq 12: 1$
(9 kHz, 120 kHz)
- O switching error: $\leq \pm 1.0$ dB

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SECTION 6 PERFORMANCE TESTS

- 6.3.4.2 Inspection Equipment
 - O Synthesized Signal Generator: MG3633A [Anritsu]
- 6.3.4.3 Installation

SPECTRUM ANALYZER
SPAN 100 kHz
RF input 50
26dBm MAX

F2

F5

- 6.3.4.4 Procedures
 - 6.3.4.4.1 RBW Accuracy

step step

- 1. Press the [PRESET] key.

MEAS
PEAK
MARK

2. [ALL CAL] softkey.
3. Set the SA-7270 as shown below:

center frequency : 100 MHz
Span : 10 MHz
Reference level : -10 DBm
ATT : Auto
RBW : 3 MHz
Scale : 1 dB / Div

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- Sweep time : Auto
4. Set the Synthesized signal generator (MG3633A) as shown below:

Frequency : 100 MHz
Power : -15 DB

- Also touches the Press - [> REF MKR] signal lines on the screen at the top of the peak [REF LEVEL] 5. [PEAK]
You rock.
6. To run the Single sweep, press the [TRIG] [SINGLE] soft key single sweep has been completed
Check that.
7. [MEAS] [dB DOWN -> X dB DOWN] softkey and set to 3 dB or 6 dB
After you measure the value of measure.
8. Press the [TRIG] [CONT] softkey.
9. After you change the RBW filter to perform the measurement.
10. Repeat from 5 to 9 for each RBW filter.
11. Calculate RBW filter accuracy:

Accuracy = $\frac{(\text{RBW} - \text{measure})}{\text{RBW}}$

SA-7270		Marker Δ 3dB accuracy			Remarks
RBW	Span	Lowest	Measures	The maximum value accuracy	
300 Hz	10 kHz	240 Hz		360 Hz	
1 kHz	50 kHz	800 Hz		1.2 kHz	
3 kHz	50 kHz	2.4 kHz		3.6 kHz	
9 kHz	50 kHz	7.2 kHz		10.8 kHz	(6 dB BW)
10 kHz	50 kHz	8.0 kHz		12.0 kHz	
30 kHz	50 kHz	24 kHz		36 kHz	

100kHz	200 kHz	80 kHz	120 kHz	(6 dB BW)
120kHz	300 kHz	96 kHz	144 kHz	
300kHz	500 kHz	240 kHz	360 kHz	
1 MHz	5 MHz	800 kHz	1.2 MHz	
3 MHz	10 MHz	2.4 MHz	3.6 MHz	

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SECTION 6 PERFORMANCE TESTS

6.3.4.4.2 RBW Selectivity

step

step

1. Press the [PRESET] key.
2. [ALL CAL] softkey.
3. Set the SA-7270 as shown below:

Center frequency	: 100 MHz
Span	: 100 MHz
Reference level	: -10 DBm
ATT	: Auto
RBW	: 3 MHz
Scale	: 10 dB / Div
Sweep time	: Auto

4. Set the Synthesized signal generator (MG3633A) as shown below:

Frequency	: 100 MHz
Power	: -10 DBm

Also touches the Press - [> REF MKR] signal peaks at the top line of the screen [REF LEVEL] 5. [PEAK]
You rock.

6. To run a single sweep, press the [TRIG] [SINGLE] soft keys are single sweep has been completed
Check whether.
7. [MEAS] - Press [dB DOWN> X dB DOWN] key measurement after setting the 60 dB.
8. Press the [TRIG] [CONT] softkey. Replace the RBW filter.
9. Repeat 5 to 8 for each RBW filter.
10. If the 3dB bandwidth is used in this table values. (Section 6.3.4.4.1)
11. Calculate RBW filter accuracy:

$$\text{Selectivity} = \frac{60 \text{ dB bandwidth}}{3 \text{ dB bandwidth (or 6 dB bandwidth)}}$$

SECTION 6 PERFORMANCE TESTS

SA-7270		VBW	3dB BW	60dB BW	Selectivity	Remarks
RBW Span						
300 Hz	10 kHz	10 Hz				
1 kHz	50 kHz	100 Hz				
3 kHz	100 kHz	100 Hz				
9 kHz	200 kHz	100 Hz				(6dB BW)
10 kHz	200 kHz	100 Hz				
30 kHz	1 MHz	100 Hz				
100kHz	10 MHz	100 Hz				
120kHz	10 MHz	100 Hz				(6dB BW)
300kHz	20 MHz	100 Hz				
1 MHz	50 MHz	100 Hz				
3 MHz	100 MHz	100 Hz				

6.3.4.4.3 RBW switching error

step step

- 1. Press the [PRESET] key.
- 2. [ALL CAL] softkey.
- 3. Set the SA-7270 as shown below:

Center frequency	: 100 MHz
Span	: 20 kHz
Reference level	: -10 DBm
ATT	: Auto
RBW	: 30 kHz
Scale	: 10 dB / Div
Sweep time	: Auto

- 4. Set the Synthesized signal generator (MG3633A) as shown below:

Frequency	: 100 MHz
Power	: -15 DBm

5. To set the signal peak at the center of the top of the screen [PEAK] [MKR -> CF] key [MKR-> REF] and press.
6. To set the Δ marker the Marker, press [MRK] [MARKER DELTA].
7. The amplitude variation of each RBW RBW and SPAN and set the table below by steps 8 and 9 below, Measure the (error).
8. Press the [PEAK] key to execute peak search of the signal spectrum of the current Marker Move to the peak point.
9. reads Δ marker level value.

RBW	Frequency Range	Deviation (error)	ratio And
1 kHz	10 kHz		
3 kHz	20 kHz		
9 kHz	50 kHz		
10 kHz	50 kHz		
30 kHz	150 kHz (criteria)		
100 kHz	500 kHz		
120 kHz	500 kHz		
300 kHz	1.5 MHz		
1 MHz	5 MHz		
3 MHz	15 MHz		

SECTION 6 PERFORMANCE TESTS

6.3.5 sideband noise (phase noise)

Sideband noise is no measure for the local oscillator signal from the residual deviation from the carrier frequency Izu measure. Sideband noise of more than 10dB Signal Generatore a spectrum analyzer It is important to use the equipment.

RBW	: 1 kHz
VBW	: 30Hz
Scale	: 10 dB / div
Sweep time	: Auto

4. [PEAK] to set the signal peak at the center, at the top of the screen, [MKR -> CF] key [MKR-> REF] and press.
5. To run a single complete sweep, press the [TRIG] [SINGLE] softkey single sweep Check that.
6. To set a Marker at Δ marker press the [MRK] [MARKER DELTA].
7. Set the Δ marker to 10 kHz frequency and read the marker value (amplitude).
8. Calculate japeumreul sideband. (In the 10kHz side.)
Sideband noise measured value = (Δ marker value) -10log (RBW / 1Hz)

Yes :

The offset frequency	Measures	Sideband noise
10 kHz -65dBc -95dBc / Hz		

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SECTION 6 PERFORMANCE TESTS

6.3.6 Frequency Measurement Accuracy

More than 20 dB below the noise level generated by the equipment in order to measure the accuracy of frequency counter
Position the marker point on the point, the signal generator output is also more than 20 dB above the noise level
It must generate the output. By operating the Frequency Counter COUNT ON mode of SA-7270
Check the frequency measurement accuracy.

6.3.6.1 Specifications

O Accuracy : $\leq (\times \text{frequency reference oscillator accuracy} \pm (1 \text{ LSB}))$

O Resolution : 1Hz, 10Hz, 100Hz, 1KHz

O Sensitivity : -70 DBm min

※ reference oscillator accuracy $\pm 5\text{ppm}$

6.3.6.2 Inspection Equipment

O Synthesized signal generator : MG3633A or equivalent

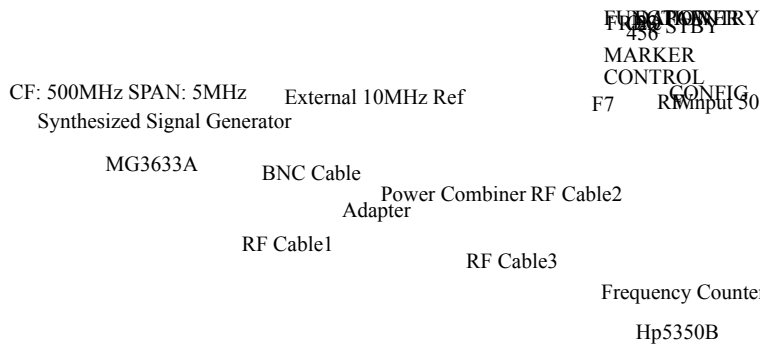
O Frequency counter : HP5350B

O Power Splitter : HP11636A

O RF cable 1,2,3 : N [male] N [male]

O BNC cable : BNC [male] BNC [male]

6.3.6.3 Installation



<Frequency Measurement Accuracy>

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SECTION 6 PERFORMANCE TESTS

6.3.6.4 Procedures

step step

1. Press the [PRESET] key.
2. [ALL CAL] softkey.
3. Set the SA-7270 as shown below:

Center frequency	: 100 MHz
Span	: 5 MHz
Couple	: All Auto

4. Set the Synthesized signal generator as shown below:

Frequency	: 100 MHz
Power	: -10 DBm

5. [MKR -> PEAK SEARCH] key, press the Frequency Counter ON [MEAS -> MKR Set the COUNT [ON]].
6. Marker resolution [MEAS -> MKR RESOL -> 1 Hz] key, then press the [RETURN] key It differs.
7. Make sure to change the counter resolution to 10 Hz frequency 100 MHz $\pm$ 10Hz or less.
8. Change the counter resolution to 100 Hz Make sure the frequency 100 MHz $\pm$ 100 Hz or less
9. Make sure to change the resolution to 1 kHz counter frequency 100 MHz $\pm$ 1 kHz or less.
10. changing the amplitude of the signal generator to -70dBm to confirm the frequency is still correct.

Signal Generators	SA-7270	Measurement frequency	Accuracy Standards
frequency	CF	resolution Marker frequencyMeasurement Accuracy	

100 MHz	100 MHz	1 Hz	$\leq (\text{read-aloud frequency} \times \text{Accuracy reference oscillator} \pm 1 \text{ LSB})$
		10 Hz	
		100 Hz	
		1000 Hz	
100MHz-70dBm	100MHz	1000Hz	

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SECTION 6 PERFORMANCE TESTS

6.3.7 amplitude linearity

This test measures the error per vertical scale for displaying the LOG display and LINEAR.
The exact level of the applied signal to the RF input via an attenuator and the external attenuator
Measure the error of Δ marker read in attenuation and waveform peaks.

6.3.7.1 Specifications

O Amplitude display linearity: After automatic calibration

LOG: $\leq \pm 1.5 \text{ dB } 10 \text{ dB} / \text{div } 8 \text{ division over}$ (RBW $\leq 3 \text{ kHz}$)

$\leq \pm 1.5 \text{ dB } 5 \text{ dB} / \text{div } 8 \text{ division over}$ (RBW $\leq 3 \text{ kHz}$)

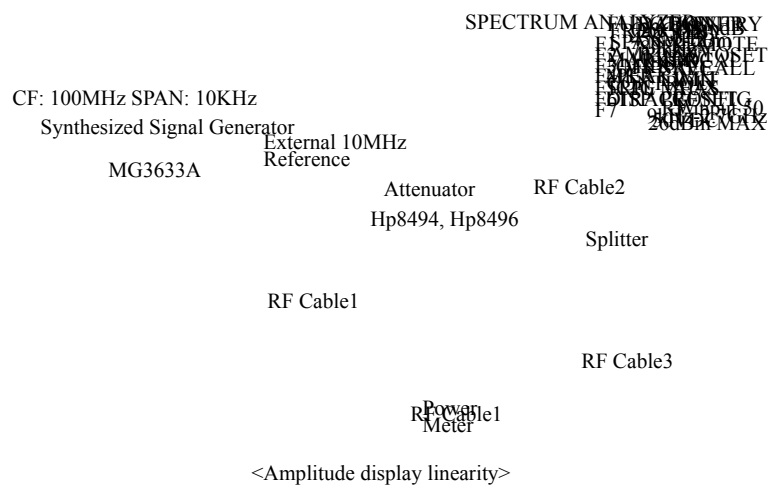
$\leq 0.5 \text{ dB } 1 \text{ or } 2 \text{ dB} / \text{div } 8 \text{ division over}$ (RBW $\leq 3 \text{ kHz}$)

LINEAR: $\leq \pm 8 \text{ division more than } 10\%$ of the reference level

6.3.7.2 Inspection Equipment

- O Synthesized Signal generator : MG3633A
- O Attenuator : HP 8494, HP 8496
- O RF cable 1,2,3 : N [male] N [male]
- O Power meter : HP437B
- O Power splitter

6.3.7.3 Installation



SECTION 6 PERFORMANCE TESTS

6.3.7.4 Procedures

6.3.7.4.1 LOG-linearity [10 dB / div, 5 dB / div, 2 dB / div, 1 dB / div]

step step

1. Press the [PRESET] key.
2. [ALL CAL] softkey.
3. Set the SA-7270 as shown below:

Center frequency	: 100 MHz
Reference level	: 10 kHz
Span	: 0 dBm
ATT	: 10 dB
RBW	: 1 kHz
VBW	: 10 Hz
Scale	: 10 dB / div

4. Set the Synthesized signal generator (MG3633A) as shown below:

Frequency	: 100 MHz
Power	: +6 DBm

5. Press [AMPL] [LOG] key to set the display state of the Log [SCALE-Tap> 10dB / div] key.
6. [PEAK] [MKR -> CF] to set the waveform peak to the center of the screen and select the key [MKR-> REF] to select the key to be located at the top of the screen. The Power meter 0 Adjust the signal generator needed to ensure that the measure dBm.
7. [MKR] [MARKER DELTA] keys to select the step attenuator [HP8494, HP8496] To increase by 10dB to measure the level Δmarker.
8. Calculate the Log Linearity [10 dB / div].
 ▲ Amplitude display linearity error = Attenuator value (dB) + Δmarker level
9. Log Linearity [5 dB / div, 2 dB / div, 1 dB / div] Repeat steps 5-8 during the test.

SECTION 6 PERFORMANCE TESTS

Log Display Linearity [10 dB / div]

Damper Inspection Equipment Setting (dB)	Δ Marker Value (dB)	error	Remarks
0	0	0	standard
10			
20			
30			
40			
50			
60			
70			
80			

Log Display Linearity [5 dB / div]

Damper Inspection Equipment Setting (dB)	Δ Marker Value (dB)	error	Remarks
0	0	0	standard
5			
10			
15			
20			
25			
30			
35			
40			

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SECTION 6 PERFORMANCE TESTS

Log Display Linearity [2 dB / div]

Damper Inspection Equipment Setting (dB)	Δ Marker Value (dB)	error	Remarks
---	-------------------------------	-------	---------

0	0	0	standard
2			
4			
6			
8			
10			
12			
14			
16			

Log Display Linearity [1 dB / div]

Damper Inspection Equipment Setting (dB)	Δ Marker Value (dB)	error	Remarks
0	0	0	standard
One			
2			
3			
4			
5			
6			
7			
8			

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SECTION 6 PERFORMANCE TESTS

6.3.7.4.2 LINEAR Linearity [Full scale]

stepstep

1. Press the [PRESET] key.
2. [ALL CAL] softkey.
3. Set the SA-7270 as shown below:

Center frequency	: 100 MHz
Reference level	: 0 dBm
Span	: 10 kHz
Attenuator	: 10 dBm

RBW	: 1 kHz
VBW	: 10 Hz
Scale	: 10 dB / div

4. Set the Synthesized signal generator (MG3633A) as shown below:

Frequency	: 100 MHz
Power	: 0 dBm

- Press the [AMPL] [LINEAR] key to display the linear state [AMPL] [UNIT-> VOLT] and press.
- [PEAK] [MKR -> CF] and then press the key in the waveform peak to the center of the screen [PEAK] [MKR-> REF] and press.
- [MKR] [MARKER DELTA] keys to select the step attenuator [HP8494, HP8496] By increments of 6dB to measure the level Δmarker.
- Calculate the LINEAR Linearity.
Amplitude display linearity error = attenuator value (dB) + Δmarker level

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SECTION 6 PERFORMANCE TESTS

LINEAR linear display [full scale]

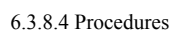
ATT Setting (dB)	Value (dB)	error	Remarks
0	0	0	standard
6			
12			
18			
24			
30			
36			

6.3.8 Frequency Response

6.3.8.1 Specifications

6.3.8.2 Inspection Equipment

6.3.8.2 Installation



step

step

1. Connect the Power sensor [HP8481A] the Power Meter [HP437B].
2. Connect the Power sensor to Power Meter input port.
3. Press the Power REF button on the Power Meter displays the value 0 dBm.
4. This displays the value 0 dBm or so to adjust the Cal ADJ is 0dBm.
5. Connect the test equipment as shown above.
6. Adjust the signal generator output level to -10 dBm.
Set the Synthesized Signal Generator as shown below:

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SECTION 6 PERFORMANCE TESTS

Frequency : 100 MHz
Power : -10 DBm

7. Power meter values to adjust the signal generator output level so that -10dBm.
8. Press the [PRESET] key.
9. [ALL CAL] softkey.
10. Install the SA-7270 as follows:

Center frequency : 100 MHz
Reference level : -10 DBm
Span : 200kHz
Couple : All Auto

Press - [> CF MKR] key 11. [PEAK] to set the waveform peak to the center of the screen.

12. In order to change the signal generator output frequency to maintain level on the power meter
Adjust the generator.

13. Calculate the frequency response.

Error = Power meter -SA-7270 value of the peak value Marker

Frequency signal generator	Power meter (dBm)	Marker peak value (dBm)	error	Remarks
100 MHz				
300 MHz				
500 MHz				
1000 MHz				
1500 MHz				
2000 MHz				

SECTION 6 PERFORMANCE TESTS

6.3.9 Reference level accuracy

Here it is checked only on the absolute amplitude level of 100MHz. Calibrated by a standard power meter
Check the accuracy level of the signal from the signal generator.

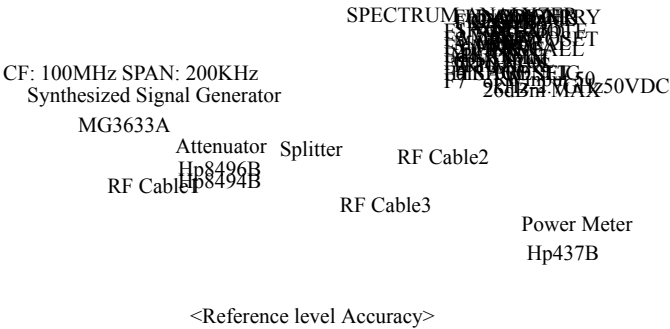
6.3.9.1 Specifications

- O The reference level accuracy:
 $\leq \pm 1.5\text{dB}$
(-100 DBm + 30 dBm, 10dB / div)

6.3.9.2 Inspection Equipment

- O Synthesized signal generator : MG3633A
- O Power Meter : HP437B
- O Power Sensor : HP8481A HP8481D
- O Step Attenuator : HP8496B, HP8494B
- O RF cable 1,2,3 : N [male] N [male]
- O RF splitter

6.3.9.3 Set



The reference level (DBm)	Marker level value (DBm)	Step Attenuator value (DBm)	error
0			

-10
-20
-30
-40
-50
-60
-70
-80

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SECTION 6 PERFORMANCE TESTS

6.3.10 average noise level

The internal noise of the spectrum analyzer is measured in this test.

6.3.10.1 Specifications

O Average Noise Level:

$\leq$ - 80 dBm (frequency range: 50 kHz 100 kHz)

$\leq$ -100 dBm (frequency range: 100 kHz 1 MHz)

$\leq$ -105 dBm (frequency range: 1 MHz 2.7 GHz)

6.3.10.2 Inspection Equipment

O 50 Ω terminator: HP 909F

6.3.10.3 Installation

50 ohm Termination
Hp 909F

50 ohm Termination
Hp 909F

50 ohm Termination
Hp 909F

50 ohm Termination
Hp 909F

- 50 ohm Termination
Hp 909F

50 ohm Termination
Hp 909F

50 ohm Termination
Hp 909F

50 ohm Termination
Hp 909F

50 ohm Termination
Hp 909F

- 50 ohm Termination
Hp 909F

50 ohm Termination
Hp 909F

SECTION 6 PERFORMANCE TESTS

6.3.11 Second Harmonic Distortion

The core of the test is lower than harmonic distortion (SA-7270 internal harmonic distortion [at least 20dB below]
With a) signal is applied to the SA-7270, and measuring the level difference between the primary signal and the secondary harmonic
Will. Low-distortion signal source to the SA-7270 and then pass through the low pass signal filter (LPF)
It can be obtained by applying the signal.

6.3.11.1 Specifications

O Second harmonic distortion: -60dBc @ Input level: -40 dBm

6.3.11.2 Inspection Equipment

- O Synthesized Signal generator : MG3633A
- O RF cable 1,2,3 : N [male] N [male]
- O LPF : More than 70dB at two times the fundamental frequency
Having a damping
- O RF splitter
- O RF power meter

6.3.11.3 Installation

STBY

RF input 50

SECTION 6 PERFORMANCE TESTS

6.3.11.4 Procedures

step step

- 1. Press the [PRESET] key.
- 2. [ALL CAL] softkey.
- 3. Set the SA-7270 as shown below:

Center frequency	: 95 MHz
Span	: 50 kHz
Reference level	: -40 DBm
ATT	: 0 dB
RBW	: 300 Hz
VBW	: 30 Hz
Sweep time	: Auto

- 4. Set the Synthesized signal generator as shown below:

Frequency	: 95 MHz
Power	: -40 DBm

- 5. The measured signal on the SA-7270 adjusts the signal level so that the generator must -40dBm All.
- 6. The center frequency for display on the screen, the second harmonic of the fundamental frequency doubling Set.
- 7. Press the [PEAK] [MKR-> CF] key to calculate the difference from -40dBm.

Signal Generators		Second Harmonic		
Output Power	frequency	Marker Levels	dBc	frequency
- 40 dBm	95 MHz			190 MHz
	245 MHz			490 MHz
	495 MHz			990 MHz
	995 MHz			1990 MHz
Example: -40dBm	95 MHz	-105dBm	65dBc	190 MHz

SECTION 6 PERFORMANCE TESTS

6.3.12 Input Attenuator switching error

This test measures the switching error when the attenuator at the RF input section is switched.

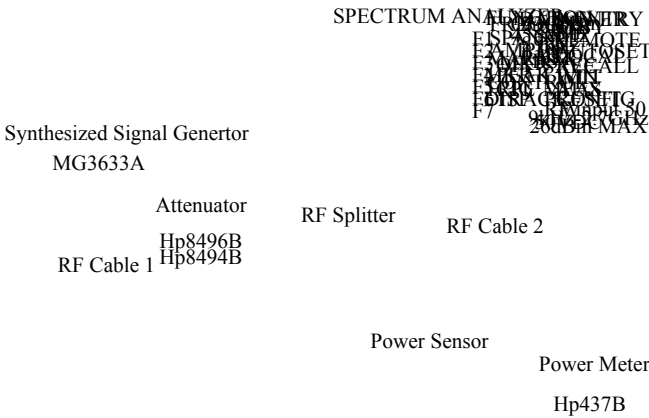
6.3.12.1 Specifications

O Input attenuator switching error: $\pm 0.5\text{dB}$ (9kHz 2.7 GHz, total = $\pm 1\text{dB}$ maximum)

6.3.12.2 Inspection Equipment

- O Synthesized signal generator : MG3633A
- O Step Attenuator : HP8496B, HP8494B
- O Power Meter : HP437B
- O Power Sensor : HP8481A, HP8481D
- O RF Cable 1,2 : N [male] N [male]
- O RF Splitter

6.3.12.3 Installation



6.3.12.4 Procedures <Input Attenuator Switching Error>

6.3.12.4.1 Power meter calibration and the calibration signal generator

- step
- step
1. Connect the Power sensor [HP8481A] the Power Meter [HP437B].
 2. Connect the Power sensor to Power Meter input port.
 3. Press the Power REF button on the Power Meter displays the value 0 dBm.
 4. The display will cause the value of 0 dBm or 0 dBm by adjusting the Cal ADJ.

SECTION 6 PERFORMANCE TESTS

- step
- step
1. Press the [PRESET] key.
 2. [ALL CAL] softkey.
 3. Set the SA-7270 as shown below:

Center frequency	: 100 MHz
Span	: 100 kHz
Reference level	: -50 DBm
RBW	: 3 kHz
VBW	: 30 Hz
Sweep time	: Auto

4. Set the Synthesized signal generator (MG3633A) as shown below:

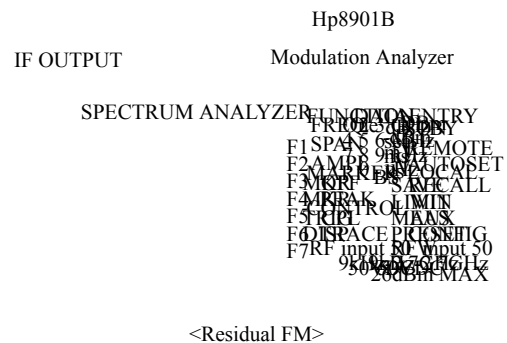
Frequency	: 100 MHz
Power	: 0 dBm

5. Set the attenuation of Attenuator HP8496B to 0 dB.
6. Power meter to adjust the value of the signal generator output level so that the -10 dBm.
7. Set the SA-7270 attenuation to 0 dB.
8. Select [PEAK] to measure the maximum value of the output waveform.
The more the difference between SA-7270 Power meter and all amounts in the table (calibration factor).
(Or subtract).
9. Attenuator switching to calculate the error.
Error = Marker level value-reference value
10. Replace the Attenuator with different values in the table, repeat steps 7-9.

SA-7270		Marker level	error
standard	ATT		
-60 DBm	50		
-50 DBm	40		
-40 DBm	30		
-30 DBm	20		
-20 DBm	10		
-10 DBm	0		

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6.3.13.2 Inspection Equipment
O Modulation Analyzer: HP8901B
O BNC Cable : BNC [male] BNC [male]
6.3.13.3 Installation



SECTION 6 PERFORMANCE TESTS

6.3.13.4 Procedures

- | | |
|------------------------------------|-----------|
| step | step |
| 1. Press the [PRESET] key. | |
| 2. [ALL CAL] softkey. | |
| 3. Set the SA-7270 as shown below: | |
| Center frequency | : 40 MHz |
| Reference level | : -10 DBm |
| Span | |

	: 10 kHz
RBW	: 1 kHz
VBW	: 1 kHz
Sweep time	: Auto

4. ON the internal calibration signal [40MHz].
5. In order to bring the spectral waveform of the top of the screen [MKR>] [MRK -> CF] key Press.
6. Press the [SPAN] [ZERO SPAN]..
7. Connect the rear panel IF output and Modulation Analyzer measures the frequency modulation The.

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SECTION 6 PERFORMANCE TESTS

6.3.14 Internal modulation (3rd Order Inter-modulation)

The two signal generators provides the signals required for internal modulation (3rd Order Inter-modulation) is.

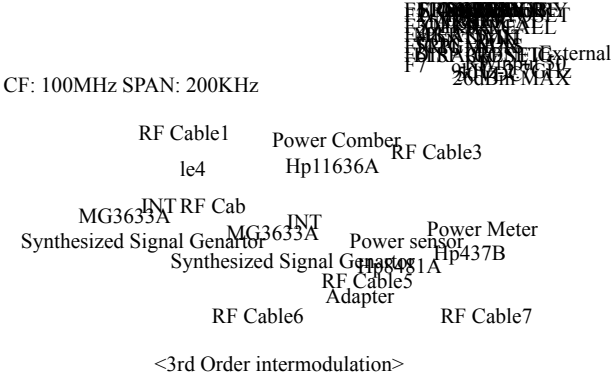
If the input signal level is -30dBm work close to the size of the noise level of the inner-side modulated signal Jung difficult.

6.3.14.1 specifications: ≤ -70 dBc @ Input: -30 dBm, Input Att: 10 dB

6.3.14.2 Inspection Equipment:

O Synthesized Signal Generator 1,2	: MG3633A
O Step Attenuator	: HP8494B, HP8496B
O Power Meter	: HP437B
O Power Sensor	: HP8481A
O Power Combiner	: HP11636A
O RF Cable 1,2,3,4	: N [male] N [male]
O RF Cable 5,6,7	: BNC [male] BNC [male]
O Adapter	: T-BNC [female]

6.3.14.3 Installation



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SECTION 6 PERFORMANCE TESTS

6.3.14.4 Procedures
6.3.14.4.1 Power meter calibration

- | | |
|--|----------------|
| step | step |
| 1. Connect the Power sensor [HP8481A] the Power Meter [HP437B]. | |
| 2. Connect the Power sensor to Power Meter input port. | |
| 3. Press the Power REF button on the Power Meter displays the value 0 dBm. | |
| 4. This displays the value 0 dBm or so to adjust the Cal ADJ is 0dBm. | |
| 5. On the front page, install a Synthesized Signal Generator like this. | |
| Synthesized signal generator 1 | |
| | : 1100.050 MHz |
| | : -20 DBm |
| Synthesized signal generator 2 | |
| | : 1100.000 MHz |
| | : -20 DBm |

6.3.14.4.2 internal modulation measurements

- | | |
|------------------------------------|------|
| step | step |
| 1. Press the [PRESET] key. | |
| 2. [ALL CAL] softkey. | |
| 3. Set the SA-7270 as shown below: | |
| Center frequency | |

: 1100.025 MHz
: -10 DBm

: 5 00 kHz
: 0 dBm

: Auto
: Auto

: Auto

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S yq & "dV7i!" @ G7dPyS yyS;

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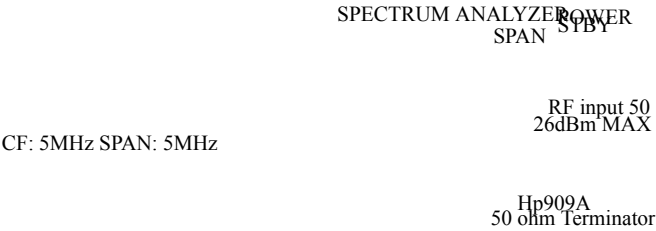
SECTION 6 PERFORMANCE TESTS

4. The signal generator # 2 RF OFF. Power meter is a signal generator that is -20dBm
Adjust the # 1.
5. # 1 RF OFF signal generator and signal generator # 1 RF ON.
6. Power meter will adjust the signal generator # 2 to be -20dBm.
7. Both signal generator RF ON.
8. Set the Normal marker above the default Marker in one place in the two signals from -20dBm
To press the [PEAK] key.
9. Press the [Δ marker] key.
10. Marker to move the base of the peak inter-modulation product signals.
11. Inter-modulation 20dB performance and adds value to calculate the Δ marker.
12. For Δ marker = 60dB.
$$\text{inter-modulation performance} = 60 + 20 = 80\text{dB}.$$

SECTION 6 PERFORMANCE TESTS

6.3.15 spurs (spurious) response

This test measures spurious frequency levels in SA-7270.
RF input is selected, 0 dB input attenuator is interrupted.
6.3.15.1 specifications: ≤ -85 dBm @ Input Terminated, Input Att: 0 dB
6.3.15.2 Inspection Equipment
O 50 ohm Termination : HP 909A
6.3.15.3 Installation



6.3.15.4 Procedures

step step

- 1. Press the [PRESET] key.
- 2. [ALL CAL] softkey.
- 3. Set the SA-7270 as shown below:

Center frequency	: 1300 MHz
Span	: Full
Reference level	: -40 DBm
ATT	: 0 dB
RBW	: 1 kHz
VBW	: 1 kHz
Sweep Time	: Auto
Detector Mode	: POS Peak

SECTION 6 PERFORMANCE TESTS

4. [DISP] [DISPLAY LN (ON) => DISPLAY LINE] Press and rotate the knob
Align to -85 dBm.
5. Press the [TRIG] [SINGLE] key. Wait until Sweep is complete.
6. any residual should be less than the response also display line.
7. Press the [MKR] [PEAK SEARCH] key to record marker amplitude.

Marker amplitude	SA-7270
(DBm)	Specification (dBm)

SECTION 6 PERFORMANCE TESTS

6.3.16 radiated local oscillator (LOCAL Oscillator Emission)

- | SA-7270
Center frequency | Power Measurement
(DBm) | SA-7270
Specifications |
|-----------------------------|----------------------------|---------------------------|
| 100 MHz | | ≤ -70 dBm |
| 500 MHz | | |
| 1000 MHz | | |
| 1500 MHz | | |
| 2000 MHz | | |
| 2500 MHz | | |

SECTION 6 PERFORMANCE TESTS

6.3.17 Input VSWR

This test checks the input VSWR of the spectrum analyzer.

6.3.17.1 Specifications: 1 @ input Att: 10 dB 150kHz 2.7GHz

6.3.17.2 Inspection Equipment

O Network Analyzer 1: HP 8720D

※ Frequency range: 50 MHz 20 GHz

O Network Analyzer 2: HP 8751A

※ Frequency Range: 5 Hz 500 MHz

(S-parameter [HP87511A]: 100 kHz 500 MHz)

O Calibration Cable: HP 85131-60012 [3.5 mm flexible]

HP 85131-60013 [3.5 mm flexible]

O Calibration Kit: HP85052B [3.5 mm Calibration Kit]

HP 85032B [Type N Calibration Kit]

O Adapter

: SMA [female] N [male]

6.3.17.3 Installation

RL-0 dBm VSWR 1.5: 1

SPECTRUM ANALYZER

Network Analyzer ~~FOR REFERENCE ONLY~~
Hp8720D 200dB MAX

Start: 100MHz Stop 2700MHz Calibration Cable
RL-0 dBm VSWR 1.5:1 Network Analyzer RL-10 dBm Log 10dB / Att: 10dB
Hp8751A

Start: 100MHz Stop 150MHz CF: 500MHz SPAN: 5 MHz

<Input VSWR>

6.3.17.4 Procedures

1. Follow the Network Analyzer calibration procedure.
2. Press the [PRESET] key on the SA-7270.

SA-7270 Measures
Specifications
 $\leq 1.5: 1$

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SECTION 7 STORAGE AND TRANSPORTATION

Chapter 7

STORAGE AND TRANSPORTATION

This chapter provides routine maintenance procedures and timing, long-term archiving of SA-7270, about repackaging, transport It explains.

neck car

Cleaning cover	7-3
Keep notes	7-4
Keep your attention before	7-4
Conditions for caution on storage	7-4
Repackaging and transportation	7-5
Repacking	7-5
carrying	7-5
service	7-6

SECTION 7 STORAGE AND TRANSPORTATION

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SECTION 7 STORAGE AND TRANSPORTATION

Chapter 7

STORAGE AND TRANSPORTATION

Cleaning cover

Always turn off the power switch of the SA-7270 before cleaning the cabinet, plug in the AC power outlet
Elect.

To clean the outer cabinet:

- O Clean with a soft, dry cloth.
- O equipment is very dirty, use a cloth moistened with a mild detergent diluted before long-term storage solution
do it.
- After that the cabinet has been thoroughly dried, wipe it with a soft, dry cloth.
- O If a loose screw is found, tighten with the proper tools.

caution !

To clean the outer cabinet, benzene, thinner (thinner), do not use alcohol: Hands on the surface
Go different variations, it can cause discoloration.

SECTION 7 STORAGE AND TRANSPORTATION

Keep notes

I will explain the precautions to be taken during long-term storage of the SA-7270 analyzer.

Keep your attention before

(1) Clean the storage of SA-7270, dust, fingerprints, and when.

(2) places to avoid storage of the SA-7270:

Where 1) may be exposed to direct sunlight or dust

2) It may be exposed to high humidity.

3) It may be exposed to active gases.

4) It may be exposed to extreme temperatures ($> 50^{\circ}\text{C}$) or high humidity ($\geq 90\%$).

Conditions for caution on storage

Recommended storage conditions are as follows:

- O Temperature 0 to 30°C
- O Humidity 40% to 80%
- O more than 24 hours, a stable temperature and humidity

7-4

Repackaging and transportation

When Shigeru sent to LG Innotek for the SA-7270 service, you must take the precautions below.

Repacking

Use the original packing material. If the SA-7270 is packed with different materials the following packing procedure Observe:

- (1) to SA-7270 with plastic wrap or something similar kinds of materials.
- (2) shock-absorbing materials to fit in all aspects of the equipment cardboard, wooden box, or aluminum case
Please use.
- (3) a shock absorbing material to protect the SA-7270 during transportation, and prevent movement in a container
Use enough.
- (4) The bond containers tightly packing straps, adhesive tape or band.

carrying

SA-7270 must not be subjected to excessive vibration during transportation. Under the terms of the advice for the care for Storage
The stand must be transported.

7-5

SECTION 7 STORAGE AND TRANSPORTATION

service

If SA-7270 LG Innotek nearest distributor or sales office if it damaged or does not operate as specified
For repair. When you request a repair, please provide the following information:

- (A) the model and serial number on the rear panel
- (B) Description failure
- (C) when a fault is confirmed or repair has been completed, which can be contacted contact address and telephone number

7-6

282-558K

example four : Yeoksam-dong, Gangnam-gu, Seoul 135-080 679 LG Kangnam Tower
Tel: (02) 2005-5282, 5496, 5498
Fax: (02) 2005-5499
URL: <http://www.lgp.co.kr>

Ball American Ball chapters: Gyeongbuk Gumi 730-030 gongdandong Mulberry
Tel: (0546) 469-8500, 463-910110
Fax: (0546) 461-8065

A / S to collapse
Seoul: Yeoksam-dong, Gangnam-gu, Seoul 135-080 679 LG Kangnam Tower
Tel: (02) 2005-5282, 5496, 5498
Fax: (02) 2005-5499
Kumi: Gumi, Gyeongbuk 730-030 gongdandong Mulberry
Tel: (0546) 469-8574
Fax: (0546) 469-8443
Apply calibration test
Kumi: Tel: (0546) 469-8277