3672 Series
Vector Network Analyzer
Quick Start Guide

China Electronics Technology Instruments Co., Ltd

This manual is applicable to following vector network analyzers:

- 3672 series vector network analyzer:
  3672A vector network analyzer
  3672B vector network analyzer
  3672C vector network analyzer
  3672D vector network analyzer
  3672E vector network analyzer
  3672A-S vector network analyzer
  3672B-S vector network analyzer
  3672C-S vector network analyzer

Options:

- Two-port programmable step attenuator
- Four-port measurement
- Four-port programmable step attenuator
- Active intermodulation measurement
- Pulse measurement
- Time domain measurement
- Frequency offset measurement
- Mixer scalar measurement
- Mixer vector measurement
- Measurement of the embedded LO converter
- 2D sweep and measurement of the gain compression

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Foreword

Thank you for choosing the 3672 series vector network analyzer manufactured by CETI! For your convenience, please read this manual carefully.

We are devoted to providing for you high-quality products and first-class after-sales service with your most concerns and demands in mind. Our consistent aim is providing excellent quality and good service, and this is our sincere commitment for all users.

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China Electronics Technology Instruments Co., Ltd.

Manual Authorization

This manual may be subject to change without notice. CETI reserves all the rights to the final explanation for all the information and terminologies referred to in this manual.

This manual is the property of CETI. Without CETI's permission, any organizations or individuals shall neither alter nor duplicate/transmit this manual for profits; otherwise, CETI reserves the right to pursue any liabilities therefrom.

Product Warranty

The warranty for this product is 18 months from the day of delivery. Instrument manufacturer will repair or replace the damaged parts according to the actual situation in the warranty period. In order to ship the product back to the manufacturer for repairs, the user must pay shipping and handling fees. After maintenance and repair, the manufacturer will ship the product back to the user along with reimbursement of the shipping and handling fees.

Product Quality Certification

This product is certified to fulfill the standards indicated in this manual from the day of delivery. Calibration measurements have been carried out based on national standards. Related information is available to the user for reference.

Quality/Environmental Management

The quality and environmental management systems have always been implemented during development, manufacturing and test of this product. The 41st Institute has been properly qualified and certified by the ISO 9001 and ISO 14001 management system standards.

Safety Precautions

CAUTION

"Caution" indicates a danger. It reminds the user to be cautious of a certain operation process, operation method or the similar. Failure to follow the rules or operate correctly may result in the minor or moderate personal injury and equipment damage. The conditions indicated by CAUTION should be fully understood and met before the next operation.

ATTENSION

ATTENTION indicates important information rather than a danger. It reminds the user to be cautious of a certain operation process, operation method or the similar. Failure to follow the rules or operate correctly may cause the damage to the instrument or loss of important data. The conditions indicated by CAUTION should be fully understood and met before the next operation.

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Contents

1 About This Manual

This chapter introduces the functions, compositions, and main content in the Quick Start Guide of 3672 series vector network analyzer as well as other related documents provided to the user.

1.1 About This Manual

This manual introduces basic functions and basic operation methods of 3672 series vector network analyzer manufactured by CETI! It describes the preparations before power-on, system setup, features of the front and rear panels, basic operation methods, operation examples,and simple troubleshooting methods of the instrument so as to help you to know and master its operating methods and key use points as soon as possible. To facilitate your familiarity with the instrument, please read this manual carefully before operating the instrument, and then follow the instructions of manual.

However, due to time constraints and limitations of the author, the manual may be subject to errors or deficiencies. We sincerely welcome your corrections! We apologize for any inconvenience caused by our mistake in our work.

The chapters included in Quick Start Guide are as follows:

- **Preparation before Use**

This chapter introduces the pre-operation inspection, operating system configuration, initialization configuration and instrument appearance description of 3672 series vector network analyzer to enable the user to get ready for the correct and safe operation of the instrument.

- **Typical Applications**

The operation examples, such as trace, channel and window setting, data analysis and data export, are introduced according to the popularity and importance of the instrument functions in details, to make users familiar with the application method of 3672 series vector network analyzer.

- **Getting Help**

This chapter includes basic fault diagnosis, solution, and repair methods.

1.2 Related Documents

The product document related tp 3672 series vector network analyzer includes:

- User Manual
- Programming Manual
- Quick Start Guide
- Online support

Quick Start Guide

This manual introduces the settings of the instrument as well as the basic operating methods of measurement with the aim of enabling users to quickly understand the features and operational procedures of the instrument. Main chapters included in this manual are as follows:

- Preparation before Use
- Typical Applications
- Getting Help

User Manual

This manual describes in detail the functions and operational methodss of the instrument, including set-up, measurement, program control, maintenance, etc., so as to provide users with an all-round understanding of the features of the instrument and aid users in learning the most common measurement procedures. Main chapters included in this manual are as follows:

- About This Manual
- Overview
- Start Guide

1.2 Related Documents

- Measurement Setting
- Menu
- Optimization of Measurement
- Calibration
- Network Measurement Basis
- Remote Control
- Fault Diagnosis and Repair
- Specifications and Measurement Methods
- Appendixes

Programming Manual

This manual describes the basics of remote programming, SCPI basics, SCPI command, programming examples, I/O driver library, etc. in details, for the purpose of guiding the user to master the SCPIs and methods of the instrument quickly and comprehensively. Main chapters included in this manual are as follows:

- Remote Control
- SCPI
- Programming Examples
- Error Description
- Appendixes

Online support

Online help is integrated in the instrument product to provide quick text navigation help for user local and remote control operation. The hard keys on the instrument front panel or the user interface toolbars may be activated with their corresponding shortcut keys. The contents are the same as those in the user manual.

2 Preparation before use

2.1 Preparation before Operation

This chapter introduces the precautions before the initial setup of 3672 series vector network analyzer.

WARNING

Damage prevention

To avoid the electric shock, fire and personal injury:

- Do not open the casing without authorization;
- Do not attempt to dismantle or modify any part not described in this manual. Improper removal may cause the deterioration of electromagnetic shielding effectiveness, damage of internal parts, etc. and affect the reliability of product. If the product is under warranty, we will no longer provide the unpaid repairs.

ATTENSION

ESD protection

Pay attention to the ESD protection measures in the workplace to avoid the damage to instrument.

ATTENSION

During instrument operation, please pay attention to the following aspects:

An improper operating position or measurement setting can damage the instrument or appliances connected to it. Before powering on the instrument, please pay attention to the followings:

- Ensure that the fan blades and vents are unobstructed and keep the instrument at least 10 cm away from the wall;
- Keep the instrument dry;
- Place the instrument horizontally and reasonably;
- Ensure that the surrounding temperature is in accordance with the requirements on the reference data page.
- Ensure that the port input signal power is within the indicated range;
- Ensure that the signal output port is properly connected and isn't overloaded.

NOTE

Effect of electromagnetic interference (EMI):

The electromagnetic interference can affect the measurement results, therefore, it is necessary to:

- Select appropriate shielded cables, For example, use RF shielded twisted pair/network connection cable.
- Frequently check that unused cable ports are closed;
- Take note of the electromagnetic compatibility (EMC) grade in the reference data pages.

2.1 Preparation before Operation

2.1.1 Unpacking

2.1.1.1 Appearance inspection

Step 1 Check if there is any damage in the outer packaging and the anti-vibration packaging of the instrument. If no damage is found, keep the packaging in case of future need and continue the inspection as per the following steps.

Step 2 Unpack the instrument and check for any damage to the main unit and attached items.

Step 3 Verify the items in the packaging box carefully by cross-checking with Table 2.1;

Step 4 If the outer packing box, instrument or any attached item is damaged or incorrect, it is forbidden to power on! Please contact our service center via the service hotline indicated on the cover, and we will make repairs and replacements rapidly based on individual circumstances.

ATTENSION

Handling: As the instrument and its packing carton are heavy, they should be moved by two persons at the same time and be handled with care.

2.1.1.2 Model confirmation

Table 2.1 Packing List of Series 3672

Name	Quantity	Function
Main unit:		
✧ 3672	1	—
Standards:		
✧ 3-core power cord	1	
✧ USB mouse	1	—
✧ USB keyboard	1	—
✧ User Manual	2	—
✧ Packing list	1	—
✧ Certificate of Conformity	1	—
Option:		
✧ Two-port programmable step attenuator	1	Extend the output power range and the receiving power range of the receiver
✧ Four-port measurement	1	Extend to four ports
✧ Four-port programmable step attenuator	1	Extend the output power range and the receiving power range of the receiver
✧ Active intermodulation measurement	1	Used for active intermodulation signal measurement of the amplifier
✧ Pulse measurement	1	Used for the pulse S parameter measurement
✧ Time domain measurement	1	Used for time domain measurement, determination and analysis of the discontinuous position of the

		device, fixture or cable
✧ Frequency offset measurement	1	Used for frequency offset measurement
✧ Mixer scalar measurement	1	Used for mixer scalar parameter measurement
✧ Mixer vector measurement	1	Used for measurement of the mixer vector parameter
✧ Embedded LO measurement	1	Used for measurement of the embedded LO converter
✧ 2D sweep and measurement of the gain compression	1	Used for 2D sweep and measurement of the gain compression of the amplifier
Accessories:		
✧ Calibration kit	1	Used for calibration of the main unit
✧ Amplitude & phase stable cable (male)	1	Used for measurement of the main unit
✧ Amplitude & phase stable cable (female)	1	Used for measurement of the main unit

2.1.2 Setup and installation of the instrument

To ensure the normal functions of 3672 series vector network analyzer, you should pay attention to the following aspects:

- The operating place should meet the requirements for the operating environment, heat dissipation and electrostatic protection measures.
- The placement and installation should meet the operating requirements of a desktop instrument: The instrument should be placed horizontally on a table with an anti-static mat or supported by its own leg.

CAUTION

Attention to instrument placement:

- To ensure the stability and personal safety of the instrument, please select a firm and flat position to place it, such as an anti-static table;
- After the instrument is placed, it shall not be moved, and no articles can be operated or placed under the instrument;

2.1.3 Power on/off

It is necessary to check the following items before powering on the instrument:

2.1.3.1 Connecting the power supply

Please confirm the power supply parameters and power cords before the initial charge.

Step 1. **Connect the power cord:** Connect one end of the power cord supplied with the network analyzer in the packaging box or a 3-core power cord as required to the power port on the rear panel of the network analyzer (as shown in Fig. 2.1); the required voltage parameter is indicated beside the power socket to remind users to use specified voltage. Connect the other end of the power cord to a conforming AC power supply;

Step 2. **Turn on the power switch of the rear panel:** As shown in Fig. 2.2, check if the standby indicator lamp above the power switch of the front panel (as shown in Fig. 2.3) lights up in yellow;

2.1 Preparation before Operation

Step 3. Turn on the power switch on the front panel: As shown in Fig. 2.3, do not connect any equipment to the network analyzer before power-on. If everything is OK, power on the instrument, and the indicator lamp on the power switch on the front panel will turn green.

Fig. 2.1 3672 Power Outlet

Fig. 2.2 3672 Rear Panel Power Button

Fig. 22.3 3672 Front Panel Power Button

2.1.3.2 Switching the instrument on/off

1) Power-on

Step 1. Turn on the power switch of the rear panel ("|");

Step 2. Turn on the power switch in the lower left corner of the front panel, and the power indicator lamp above the power switch will change from yellow to green.

Step 3. The network analyzer will take about one minute to start up Windows 7 system, perform a series of self-check and adjustment programs, and then start running the main measurement program.

The instrument will in an operable state.

NOTE

During cold start of the 3672 series vector network analyzer, preheat it for at least 30 minutes before measurement to make it reach the specified performance indicators.

NOTE

Analyzer running applications

The network analyzer will automatically run the applications after power on. If it exits from the applications, rerun the measurement program by the following methods:

Method 1. Click **[Start]** in the task bar in the lower left corner of the screen; point to **[Program]** in the start men; point to **[Vector Network Analyzer]** in the program sub-menu; click **[Vector Network Analyzer]** in the pop-up menu, and the analyzer will start running the applications. The desktop shortcut icon can also be double clicked to run the applications.

Method 2. Press down **[Preset]** key in the functional key area, and the analyzer will start running applications of 3672 series vector network analyzer.

2) Switching off the instrument

Step 1. Turn off the power switch on the bottom left of front panel. Then the analyzer goes into the shut-down process (software and hardware may need some time to process before power-off) and after several seconds, the analyzer powers off when the power indicator lamp above the power switch turns from green to yellow;

Step 2. Turn off the power switch on the rear panel ("O"), or disconnect the power supply of the instrument.

The instrument is switched off.

ATTENSION

Power-off

When the instrument is in normal working status, it can only be powered off through operation of the front panel power button. **Do not operate the power switch of the rear panel or disconnect the power supply directly,** otherwise the analyzer cannot go into the power-off status, which may damage the analyzer or cause the current status/measurement data being lost. **Please shut down the analyzer properly.** If the operating system or application is abnormal and the machine can't be powered off normally, press down **[Power On/Standby]** key for at least 4 s to turn off the analyzer.

2.1.3.3 Power off

In abnormal conditions, the analyzer shall be powered off to avoid causing personal injuries. At this time, just disconnect the power cord (from the AC power outlet or rear panel power outlet of the instrument). Therefore, a sufficient operating space should be reserved during instrument operation so that the power supply can be disconnected directly when necessary.

2.1.4 Correct Use of Connectors

The connector will be often used in case of the tests of the network analyzer. Even though connectors of the calibrators, test cables, and analyzers measurement ports are designed and manufactured according to the highest standards, their service life is limited. As wear will be inevitable during normal use and it will lead to reduction of the performance index of the connector and even make it can't satisfy the measurement requirements, the correct maintenance and measurement of the connector can obtain accurate and repeatable measurement results, extend the service life of the connector, and reduce the measurement cost. During actual use, please pay attention to the following aspects:

2.1.4.1 Check of connectors

It is necessary to wear an anti-static wrist strap when checking the connectors. It is recommended to use a magnifier to check:

1) the electroplated surface for wear and deep scratches;
2) the thread for deformation;
3) the thread and joint surface for metallic particles;
4) the inner conductor for bending and breakage;
5) the screw for improper rotation.

CAUTION

Check the connectors so as not to damage the instrument ports

Any damaged connector may damage the good connector connected to it even for the first time of measuring connection, and to protect the ports of the network analyzer, the connector to be used shall be checked before connection.

2.1.4.2 Connection

The connectors should be checked and cleaned before measurement and connection to ensure that they are clean and undamaged. It is necessary to wear an anti-static wrist strap during connection. The correct connection methods and procedures are as follows:

Step 1. As shown in Fig. 2.4, align the axes of the two interconnecting devices to ensure that the pins of the male connector has slipped concentrically into the socket of the female connector.

Fig. 2.4 Coaxial Alignment of Interconnected Connectors

Step 2. Move the two connectors together in parallel so that they can be joined smoothly. Rotate the connector screw (rather than the connector body) until it is tightened. The connectors should not rotate relative to each other during connection. as shown in Fig. 2.5.

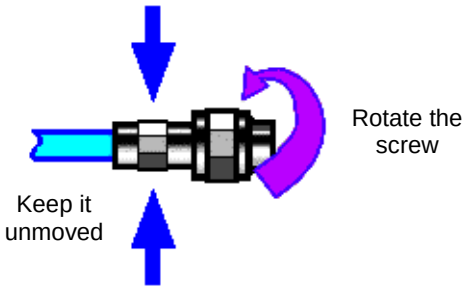

Fig. 2.5 Connection

Step 3. As shown in Fig. 2.6, use a torque wrench to complete the final connection. It should be noted that the torque wrench should not exceed the starting kick point. An auxiliary wrench can be used to prevent the connectors from rotation.

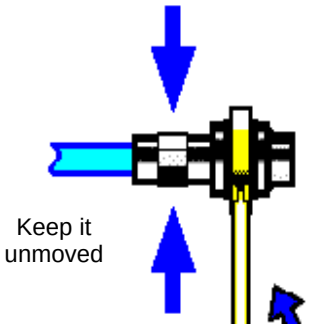

Fig. 2.6 Completion of Final Connection with a Torque Wrench

2.1.4.3 Disconnection

Step 1. Support the connector to prevent any part from being shaken, distorted, or bent;

Step 2. Use an open-end wrench to prevent the main connector from rotating;

Step 3. Use another wrench to loosen the screw on the connector.

Step 4. Loosen the screw by hand until the connection is completely broken.

Step 5. Separate the connectors by pulling them apart in parallel.

2.1.4.4 Use of torque wrench

The torque wrench should be used as indicated in Fig. 2.7. Please pay attention to the following points when using the torque wrench:

- Confirm that the torque of the torque wrench is set correctly before use;
- Ensure that the angle between the torque wrench and the other wrench (used to support the connector or cable) is less than 90^{o} before applying a force;
- Gently grasp the end of the torque wrench handle and apply a force in the direction perpendicular to the handle until the breakout torque of the wrench is reached.

Torque direction

Stop applying a force when the handle bends

Fig. 2.7 Use of Torque Wrench

2.2 Operating System Configuration

The 3672 series vector network analyzer has installed with Windows 7 operating system which has been configured according to the functions and requirements of the instrument. The host software of this instrument is based on Windows 7 operating system, and it has been installed before delivery. In order to ensure the normal operation of software of the instrument, certain rules shall be observed when using the operating system.

ATTENSION

Third-party software may affect the analyzer's performance

The 3672 series vector network analyzer is equipped with open Windows environment, and installed with other third-party software, and it may affect the analyzer's performance. Only software tested by the manufacturer and compatible with the main unit software can be run.

2.2.1 System recovery

When the analyzer operating system works abnormally because the user improperly powers off the analyzer, the analyzer infects with the virus or it is installed with other software, the system shall be recovered to the factory default status. The system recovery steps are as follows:

1) Power off the analyzer, and connect the USB interface with the keyboard;

2) Press down 【**Power On/Standby**】 key in the left bottom corner of the front panel. When the indicator lamp connected with the keyboard lights up and the page as shown in Fig. 2.8 appears, immediately press down 【↑】 and 【↓】 keys on the keyboard to select System Recovery, and then press down 【Enter】 key on the keyboard to automatically recover the instrument;

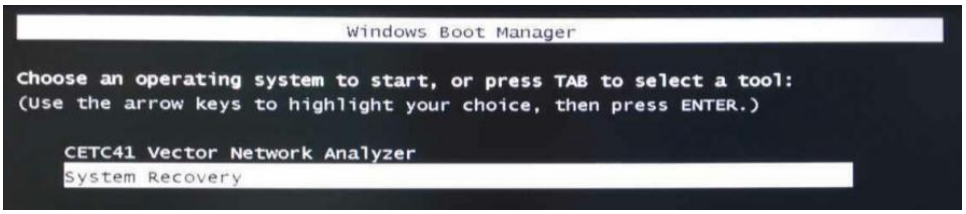

Fig. 2.8 Power-on Display

2.3 Instrument Appearance

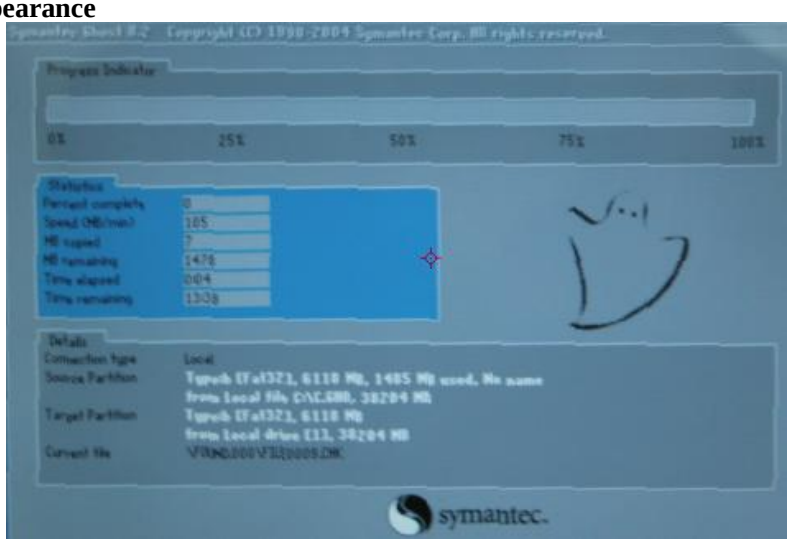

Fig. 2.9 System Recovery Interface

3) After the system recovery starts, the page as shown in Fig. 2.9 will appear, and the system recovery will start. The whole process will take about 10 minutes, and the analyzer shall be restarted after the recovery is completed.

2.2.2 Program installation

If the program files of the 3672 series vector network analyzer needs to be updated, install the new program, **double click the D:\3672 installation program, and follow the wizards of [3672 Vector Network Analyzer. exe]** menu and press down **[NEXT]**. When **[Select Installation Type]** appears, select **[All]** for installation, and click **[Cancel]** directly when any other menu appears. After that, click the **3672 Series Vector Network Analyzer** icon on the desk or press down **【Preset】** to start the program.

2.3 Instrument Appearance

This section introduces the components and their functions of the front panel, the rear panel and the operating interface of the 3672 series vector network analyzer.

2.3.1 Description of front panel

This section describes components of the front panel of the 3672 series vector network analyzer and their functions, as shown in Fig. 2.10.

Fig. 2.10 Front Panel of 3672 Series

1) ENTRY area

These keys are used to input measurement setting values, as shown in Fig. 2.11.

Fig. 2.11 3672 Input Key Area

a) 【OK】 key

It is used to confirm the setting and input values in the dialog and close the dialog, which is equivalent to [OK] key in the dialog.

b) 【Cancel】 key

It is used to neglect the setting and input in the dialog and close the dialog, which is equivalent to [Cancel] key in the dialog.

c) 【Soft Key】 key

It is used to recall Windows 7 system soft keyboard.

d) 【BkSp】 key

Press down this key and the marker after entering a value to delete the original input.

e) Number keys

It includes 0-9, which is used to enter the value when setting the measurement, and then the corresponding unit key can be pressed down to complete the input.

f) Unit keys

It is used to end the value input and assign a unit to the input value. The corresponding units of each key are as follows:

【G/n】 G/n (10^9/10^{-9})

【M/μ】 M/μ (10^6/10^{-6})

【k/m】 k/m (10^3/10^{-3})

【↵】 Basic units: dB, dBm, °, s, Hz, or dB/GHz, which can also be used for unitless value input and used as the Enter key.

2) ADJUST area

It includes navigation keys and adjusting knob, as shown in the following figure.

Fig. 2.12 3672 Adjustment Key Area

a) Adjusting knob

Rotate the knob to adjust the setting value of the currently activated input box. It has click functions after being pressed down.

b) 【←Tab】 and 【→Tab】 keys

- Move the marker left or right to select the menu.
- Switch the activated options in the dialog.

c) 【↑】 and 【↓】keys

Move the marker up or down to select the menu item. In addition, it has following functions in the dialog: Change the value, select the item in the drop-down list, and select the target option in a set of option buttons.

3) SETUP area

The functional key area includes 6 commonly used setting keys, as shown in the following figure.

Fig. 2.13 3672 Setting Key Area

a) 【Freq】 key

It is a shortcut key for frequency setting. In normal mode, it can be used to set starting frequency, ending frequency, center frequency, frequency span and frequency offset; in the multi-function option measurement, it can be used to set the frequency of the corresponding measurement.

b) 【Power】 key

It is a shortcut key for power setting. In normal mode, it can be used to set power level, power status on/off, power, power and attenuation, power slope; in the multi-function option measurement, it can be used to set the power of the corresponding measurement.

c) 【Meas】 key

It is a shortcut key for measurement setting, which is used to set the measurement parameter of the current trace. In normal mode, it can be used to set S parameter and receiver; in the multi-function

option measurement, it can be used to set the measurement parameter in the corresponding mode. For example, in the amplifier gain compression measurement mode, it can be set to "Compression Point Gain CompGain21".

d) 【Sweep】 Key

It is a shortcut key for sweep setting, which can be used to set sweep time, number of sweep points, sweep type, etc.

e) 【Trigger】 key

It is a shortcut key for trigger setting, which can be used to set the current sweep to hold, single, group sweep, continuous sweep, etc.

f) 【Scale】 key

It is a shortcut key for scale setting, which can be used to set the ratio of the current trace, reference value, reference position, etc. to facilitate the trace observation.

4) MENU area

The menu key area includes 9 main menu setting key except Help, as shown in the following figure.

Fig. 2.14 3672 Menu Key Area

a) 【File】 Key

Open the main menu of the file, and display the first level menu in the auxiliary menu bar: save, recall, print, minimize the application, exit.

b) 【Trace】 key

Open the main menu of the trace, and display the first level menu in the auxiliary menu bar: create new trace, delete trace, select trace, move trace, trace title, and maximize trace.

c) 【Channel】key

Open the main menu of the channel, automatically select the current channel, and display the first level menu in the auxiliary menu bar: channels 1/2/3/4, open channel, close channel, select channel, copy channel, and hardware setting.

d) 【Stimulus】 key

Open the main menu of the stimulus, and display the first level menu in the auxiliary menu bar: frequency, power, sweep, trigger.

e) 【Response】key

Open the main menu of the response, and display the first level menu in the auxiliary menu bar: measurement, format, scale, display, average.

f) 【Cal】 key

Open the main menu of the calibration, and display the first level menu in the auxiliary menu bar: calibration, correction on/off, interpolation on/off, port extension, fixture, edit calibration kit, attribute, power calibration.

g) 【Marker】 key

2.3 Instrument Appearance

Open the main menu of the marker, and display the first level menu in the auxiliary menu bar: marker, marker function, marker search, marker attribute, and marker display. If no marker is opened currently, the marker 1 will be automatically opened by default. If one marker has already been opened, the current marker will be selected automatically.

h) 【Analysis】 key

Open the main menu of the analysis, and display the first level menu in the auxiliary menu bar: save, test, trace statistics, door, window, time domain, structure return loss, and formula editor.

i) 【System】key

Open the main menu of the system, and display the first level menu in the auxiliary menu bar: configure, record/run, frequency extending, Windows taskbar, reset, define user reset status, language.

5) FUNCTION area

The functional key area includes 4 commonly used functional keys in the left side of the display screen, as shown in the following figure.

Fig. 2.15 3672 Functional Key Area

a) 【Help】 Key

Open the main menu of the help, and display the first level menu in the auxiliary menu bar: user manual, programming manual, technical support, error information, about.

b) 【Macro/Local】 key

If the analyzer is a remote control status, press down this key to switch to macro. If the analyzer is unavailable for remote control, press down this key to open the macro menu.

c) 【Record/Run】 key

It is a recording/running shortcut key of the analyzer. Press down this key to start recording automatically; if there is a recording, press down this key to start running automatically. This key is only valid for recording/running 1, which can’t control recording/running 2.

d) 【Preset】 Key

It is a reset shortcut key of the analyzer. If the user has saved the reset status and checked and enabled the user reset status, press down this key to recover to the status saved by the user; otherwise, recover to the system reset status.

6) USB interface

The USB interface can be used to connect the keyboard, mouse, or other USB devices. The front panel provides four USB interfaces conforming to the USB2.0 specification, the interface socket has a type A configuration (4 embedded contacts: The contact 1 is on the left side), and the

characteristics of each interface are as follows:

- Port 1: Vcc, 4.75 V ~ 5.25 V, max. output current: 500 mA.
- Port 2: Data-.
- Port 3: Data+.
- Port 4: Ground.

Fig. 2.16 USB Interface

7) Display screen

The screen display of the analyzer is as shown in the following figure. The screen display of the analyzer is the TFT LCD, and the technical indicators are as follows:

- FT 12.1 inch LCD
- Resolution: 1,280 × 800
- Vertical refresh rate: 60 Hz
- Horizontal refresh rate: 48.4 kHz

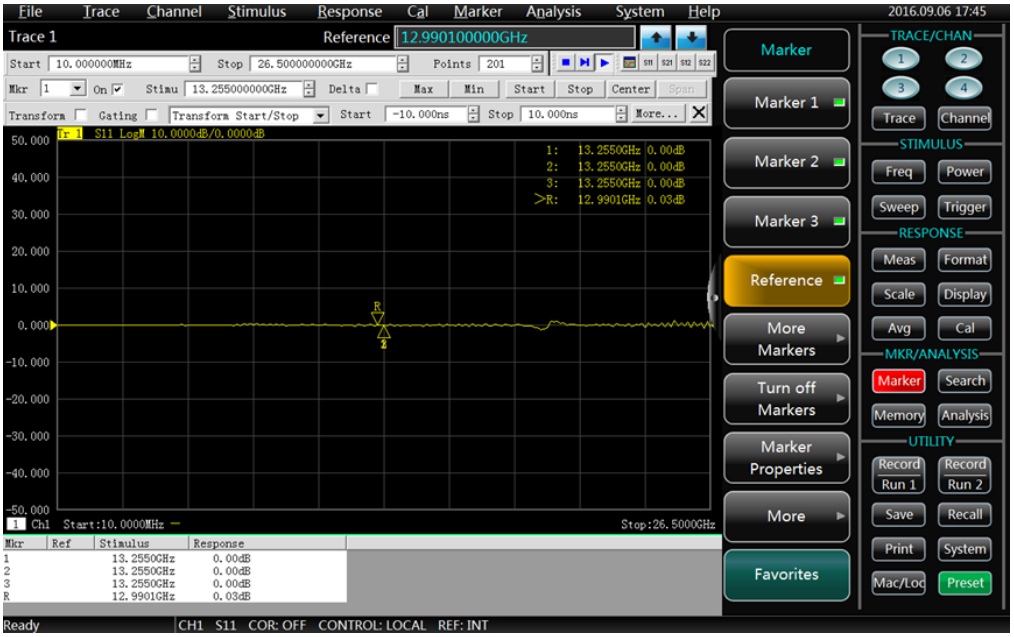

Fig. 2.17 Display Screen of the Analyzer

8) 【Power On/Standby】 key and indicator lamp

The【**Power On/Standby**】 key and indicator lamp are as shown in the following figure. The power switch is used to power on the analyzer or keep it in a standby status.

- The indicator lamp of the analyzer is green when it is powered on.
- The indicator lamp of the analyzer is orange in case of standby.
- When the analyzer is powered on, press down the power button, and the analyzer will automatically run Windows 7 operating system and load the analyzer application measurement program.
- When the power button is pressed down in a standby status, the analyzer will automatically exit the application and will be powered off to enter the standby status.

2.3 Instrument Appearance

➢ This is only a standby switch. As it is not directly connected with external power supply, it can't cut off the connection between the instrument and the external power supply, and the external power supply of the analyzer can be cut off through the power switch of the rear panel and the connection between the analyzer and the external power supply can be completely cut off by removing the power cord.

Fig. 2.18【**Power On/Standby**】 key and indicator lamp

9) Test port

The test port is as shown in the following figure. The analyzer has two 50Ω, 3.5 mm (male) test ports, which can be used for mutual switching between RF source and receiver, so as to measure the device in two directions. The yellow lamp is used to indicate the source output port.

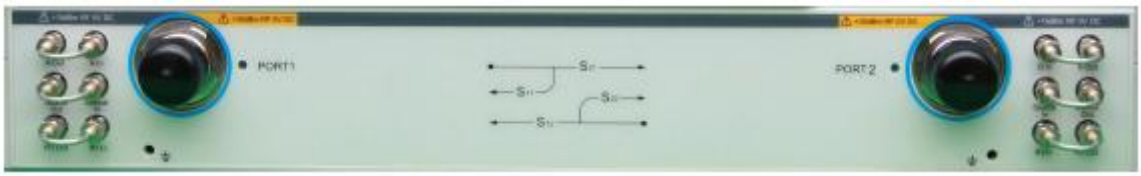

Fig. 2.19 Test Port of the Analyzer

2.3.2 Description of rear panel

This section describes components of the rear panel of the 3672 series vector network analyzer and their functions, as shown in the following figure.

Fig. 2.20 Rear Panel of the Network Analyzer

1) 10 MHz reference connector

10 Mhz reference input

10 MHz reference output

Fig. 2.21 10 MHz Reference Connector

a) 10 MHz Reference Input

As shown in the above figure, the BNC (female) connector can make the analyzer match with the external reference signal. If the 10 MHz external reference signal is detected on this port, it will be used as the instrument frequency benchmark to replace the internal frequency benchmark. The 10 MHz reference input port has the following characteristics:

- Input frequency: 10 MHz±1 ppm
- Input level: -15 - +20 dBm
- Input impedance: 200Ω

b) 10 MHz Reference Output

It can provide the reference signal with following characteristics through the BNC (female) connector:

- Output frequency: 10 MHz±1 ppm
- Signal type: Sine wave
- Output level: 13 dBm±4 dB into 50Ω
- Output impedance: 50Ω

2) Universal interface bus connector

As shown in the following figure, this is a 24-pin type D female connector conforming to the IEEE-488 standard. It is used to send and receive the GPIB/SCPI command.

Fig. 2.22 Universal Interface Bus Connector

3) LAN connector

As shown in the following figure, this is a 10/100/1000BasetT Ethernet connector with a standard 8-pin structure, which can be automatically selected from three data rates.

Fig. 2.23 LAN Connector

4) USB connector

As shown in the following figure, the jack socket of the connector can be classified into type A configuration (4 embedded contact: The contact 1 is on the left side) and type B configuration. The type A configuration connector can be connected with the USB mouse, keyboard or other USB interface equipment, and there are 4 connectors in the rear panel. The interface characteristics are as follows:

- Port 1: Vcc, 4.75 V ~ 5.25 V, max.: 500 mA
- Port 2: Data-
- Port 3: Data+
- Port 4: Ground

The type B configuration connector is mainly used to complete the control function, and the network device can be controlled through the SCPI to connect with the external computer or remote control equipment. There is 1 connector in the rear panel.

2.3 Instrument Appearance

Fig. 2.24 USB Connector (the Type B/Type A Configurations are On the Left/Right Side)

5) Video graphic adapter (VGA) output connector

As shown in the following figure, this is a 15-pin female D-sub connector. After it is connected with the external VGA display with the corresponding resolution, we can observe the internal and external display at the same time.

Monitor

Fig. 2.25 Video Graphic Adapter (VGA) Output Connector

Right click the mouse on the Windows desktop and configure the multi-display mode through the right-click menu, as shown in the following figure.

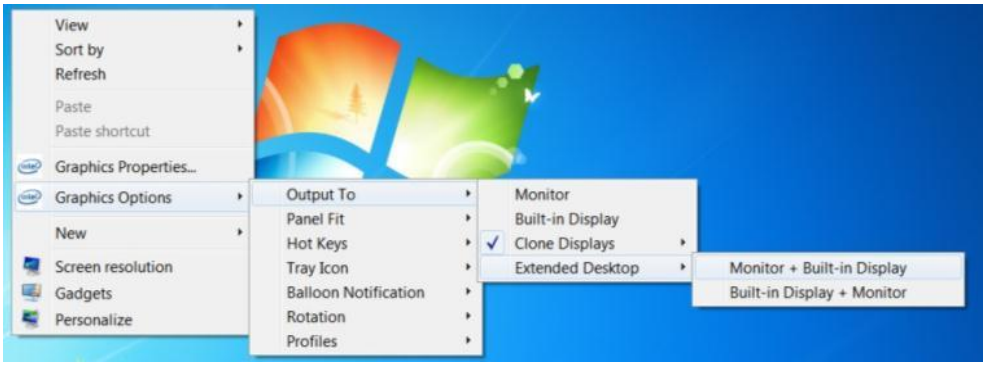

Fig. 2.26 Configuration of the Multi-display Mode

- When **[Monitor]** is checked, only the external VGA display can be used to observe and display the measurement, and the internal LCD of the analyzer has no display.
- When **[Laptop]** is checked, only the internal LCD of the analyzer can be used to observe and display the measurement, and the external VGA display has no display.
- When **[Monitor+Laptop]** is checked, both the internal LCD and the external VGA display can be used to observe the measurement result.

6) Local oscillator and RF output connector.

As shown in the following figure, the LO output and RF output is a 3.5 mm female interface respectively. The LO output is an internal LO signal and the RF output is a source RF signal, and both of them can be used for fault detection and millimeter-wave frequency extending. The interface characteristics are as follows:

- LO output signal frequency range: 12.535 MHz ~ 26.507606 GHz
- LO output signal power range: -4 dBm ~ 6 dBm
- RF output signal frequency range: 3.2 GHz ~ 26.5 GHz
- RF output signal power: About 0 dBm

LO output RF output

Fig. 2.27 LO and RF Output Connector.

7) Pulse input/output connector

As shown in the following figure, this is a 15-pin type D female connector, which can be used to synchronize the working status of the internal pulse generator. In addition, the external pulse generator can be used to provide pulse control signal for internal pulse modulator and IF gate.

Its characteristics are as follows:

- Pulse width range: 33 ns ~ 60 s
- Pulse transition time: 30 ns
- Input impedance: 1 K Ohm
- DC input:＜5.5 V
- Driving voltage: 0 V (off)+3.3 V (on)

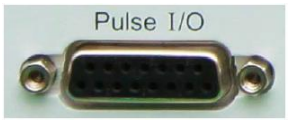

Fig. 2.28 Pulse Input/Output Connector

Table 2.2 Description of Pins of the Pulse Input/Output Connector

Pin	Functional Description
1 ~ 5	IF pulse gate input A/B/C/D/R (TTL)
6, 9, 15	Reference ground
7	Pulse synchronization trigger input
8	Source pulse modulation drive input
10 ~ 13	Pulse output 1-4 (TTL)
14	Null

8) External IF Input Connector

As shown in the following figure, the 5-way SMA interface is used as the external IF input of the vector network. The two-port model is identified as A, B, R1 and R2, and the four-port model is identified as A, B, C, D and R. Its characteristics are as follows:

- Input impedance: 50Ω
- RF input:＜23 dBm
- DC input:＜5.5 V
- 0.1 dB compression point: -9 dBm

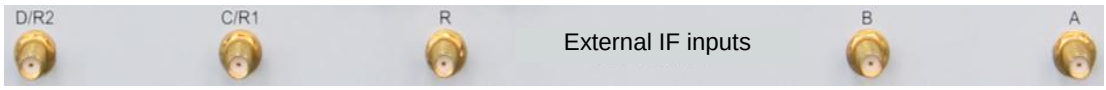

Fig. 2.29 External IF Input Connector

9) Automatic test interface connector

As shown in the following figure, this interface is a 36-pin female connector. The network analyzer and the Material Handler can carry out signaling interaction through this interface, so as to provide users with a stable and reliable automatic test environment.

2.3 Instrument Appearance

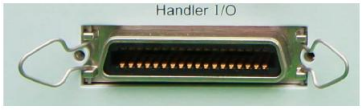

Fig. 2.30 Automatic Test Interface Connector

The port is composed of the TTL array, and its characteristics are as follows:

a) Input voltage range: -0.5 V ~ 5.5 V

TTL high level: 2.0 V ~ 5.0 V

TTL low level: 0 V ~ 0.5 V

b) Output current/voltage range: -10 mA ~ 10 mA

Output current

TTL high level: -5 mA

TTL high level: 3 mA

Output current:

TTL high level: 2.0 V ~ 3.3V

TTL low level: 0 V ~ 0.8V

The definitions and descriptions of the pin are as follows:

Table 2.3 Description of Pins of the Automatic Test Interface Connector

Pin	Functional Description
1 (lower left corner)	Ground wire
2	FEED1
3, 4	FEED1, 2
5 ~ 12	Input ports A0-A7
13 ~ 17, 19	Output ports B0-B5
22 ~ 25	Input/output ports C0-C3
26 ~ 29	Input/output ports D0-D3
18	External trigger
20	Output port B6/Index signal
21	Output port B7/trigger ready
30, 31	Port C/D status
32	Output port write confirmation
33	Pass/Fail status information
34	End of sweep
35, 36	+5 V, Pass/Fail status information

10) Extending interface connector

As shown in the following figure, this interface is a 9-pin type D female connector.

Fig. 2.31 Extending Interface Connector

The definitions and descriptions of the pin are as follows:

Table 2.4 Description of Pins of the Extending Interface Connector

Pin	Item	Functional Description
1, 2 (lower left)	+15 V, -15 V	15 V@400 mA
3, 4	Analog output ports 1 and 2	It can be controlled through an internal setting dialog +/-10 V@100 mA output resolution: 2.44 mV
5	ACOM	System ground wire
6	GndSence	Analog input and output detection ground
7, 8	Analog input ports 1 and 2	Analog input +/-10 V@1.22 mV resolution
9	Power switch	Power switch input

11) Interface connector of the external test device

As shown in the following figure, the test device interface is a kind of DB-25 female interface, including 13-way address and data reuse line, three-way control line and one interruption control line, which can control the external test device (such as external frequency extending controller) through the control logic.

2.3 Instrument Appearance

Fig. 2.32 Interface Connector of the External Test Device

The definitions and descriptions of the pin are as follows:

Table 2.5 Description of Pins of the Interface Connector of the External Test Device

Pin	Item	Functional Description
1, 15, 16, 18 (1# pin is at the lower left corner)	Test device address selection bit	The connection to the ground is initially low, and one bit will be added in case of successful access to an external device
2	Sweep wait	Trigger mode remote control sweep switch, introduce delay mode
3 ~ 6, 9 ~ 11, 17, 19 ~ 23	Address bit AD0-AD12	Used to output data address or to receive/send data information
7, 12	Ground wire	Reference ground wire
8	Address switch LAS	The low level indicates that the address information is transmitted currently
24	Data switch LDS	The low level indicates that the data information is transmitted currently
25	Read-write indication RLW	Low level output, high level input data
13	Interruption input	Remote control reading of TTL input status
14	Not connected	Max. range: +22 V 100 mA

12) Trigger input/output interface connector

As shown in the following figure, this interface in an external and auxiliary trigger input/output interface. The specific functions are as follows:

- External trigger input - After being enabled, the vector network analyzer will be triggered by the connector signal;
- External trigger ready - After being enabled, the vector network analyzer will send a "Ready" signal to the external equipment through this interface;
- Auxiliary trigger input 1/2 - After being enabled, the external equipment will send an "OK" signal to the external equipment through this connector (the external equipment is ready to receive the trigger signal);
- Auxiliary trigger input 1/2 - After being enabled and before (or after) the measurement, the vector network analyzer will send an "OK" signal through this interface.

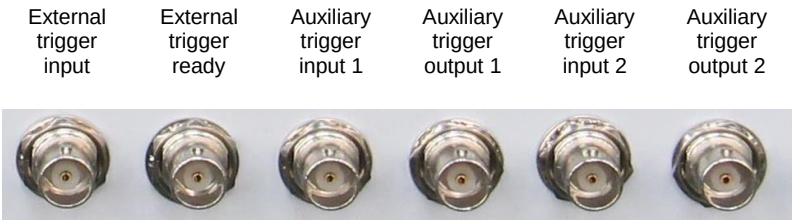

Fig. 2.33 Trigger Input/Output Interface Connector

13) 28 V (BNC) interface connector

As shown in the following figure, the BNC (female) connector can be used to drive a noise source.

Fig. 2.34 28 V (BNC) Interface Connector

2.3.3 Mouse interface

As shown in the following figure, following operations can be carried out with the mouse:

- Click the **Menu** oolbar to display the drop-down menu.
- Click the **Entry** toolbar to adjust size of the input value.
- Click the **marker** toolbar to activate the marker function.
- Click the **Meas** toolbar to add the measurement trace.
- Click the **Sweep** toolbar to control the sweep of the analyzer.
- Click the **Stimulus** toolbar to set the sweep stimulus.
- Click the **Time Domain** toolbar to set the time domain parameters.

Right click the mouse on the screen to display the right-click menu.

- Click the trace bar to select the currently activated trace.
- Right click the mouse on the trace bar to display the right-click menu and set the currently activated trace.
- Click the auxiliary menu bar and the shortcut toolbar for corresponding settings.

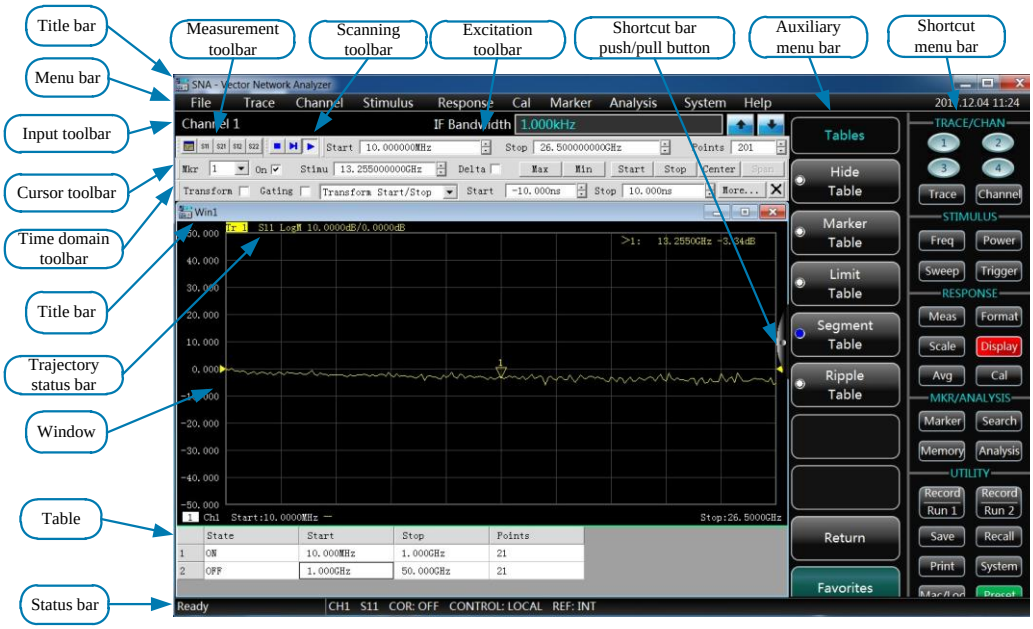

Fig. 2.35 Display Screen of the Analyzer

3 Typical Applications

3.1 Analyzer Preset

The analyzer can be reset to a known default status or a user-defined status. By default, when the analyzer is reset to a default status, it can be reset to a user-defined status by settings. The specific steps for setting the user reset status are as follows:

1) Select the menu path **[System]→[Define the User Status...]**, and the **Define the User Preset Status** dialog will be displayed;

2) Click **[Enable User Preset Status]** check box;

Note: a) If checking **[Save Last Status as User Preset Status]**, the last status before exiting the program will be saved as the user reset status;

b) After clicking **[Save Current Status as User Preset Status]** button, the analyzer will save the current setting of the instrument as the user reset status;

c) If an existing status shall be used, click **[Load Existing File as User Preset Status]** button and open the status file in **Open** dialog, and the analyzer will use the selected file as the user reset status.

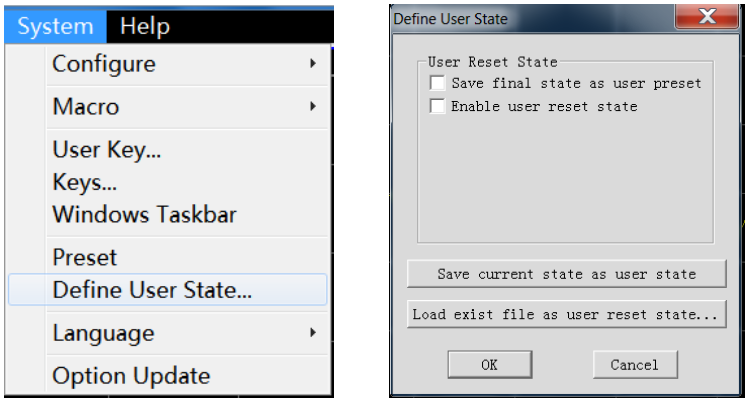

Fig. 3.1 Define the User Reset Status

3.2 Measurement Parameters Selection

3.2.1 S parameter

1) Overview of Sparameter

The S parameter (scattering parameter) is used to describe how a device changes the input signal, which also describes the reflection and transmission characteristics of the DUT. The S parameter adopts the agreed digital arrangement to express the ratio relationship ($S_{output\ input}$) between two complex vectors containing amplitude and phase information. The output refers to the output signal port number of the DUTs, and the input refers to the input signal port number of the DUT. The analyzer has four test ports and can measure single-port, dual-port, three-port and four-port devices.

For example, 4 S parameters can be measured simultaneously when a dual-port device is connected to ports 1 and 2.

In this case, 4 S parameters of the dual-port device include S11, S12, S21 and S22. The S parameter will be further explained in Fig. 3.2:

- a represents the stimulus signal input to the DUT
- b represents the reflection and transmission signal (response signal) of the DUT

The S parameter is a plural linear value, and its measuring accuracy depends on the calibration kit indicators and the applied measurement connection technology, and it is also related to the non-measurement port (un-activated port).

The ports 1 and 2 are used to measure the dual-port devices to introduce S parameters hereinafter:

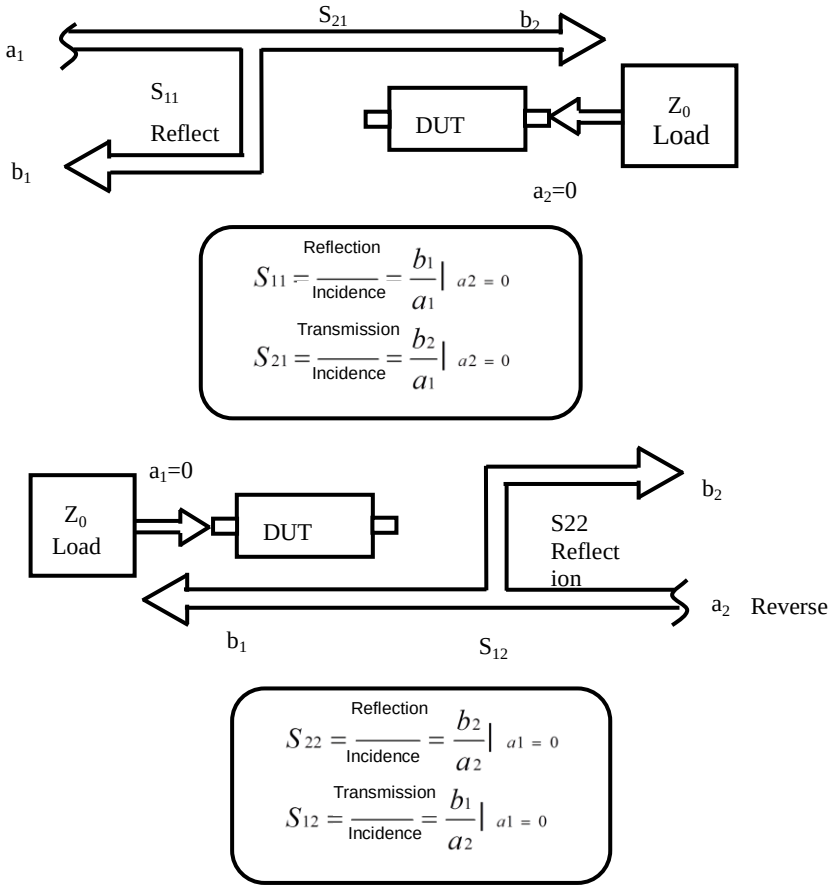

Fig. 3.2 Definition of S Parameter

2) Application of S parameter

The S parameter can be used for measurement of the following parameters:

Reflection measurement: SXX (X=1, 2, 3, 4)

- Return loss
- Standing-wave ratio (SWR)
- Reflection coefficient
- Impedance
- S11, S22, S33, S44

Transmission measurement: SXY (X=1, 2, 3, 4; Y=1, 2, 3, 4; X≠Y)

- Insertion loss
- Transmission coefficient
- Gain

3.3 Frequency Range Setup

- Group delay
- SXY

3) Create the S parameter measurement trace

Select the menu path: **[Trace]→[Create Trace]**, and click **S-parameter** in the dialog

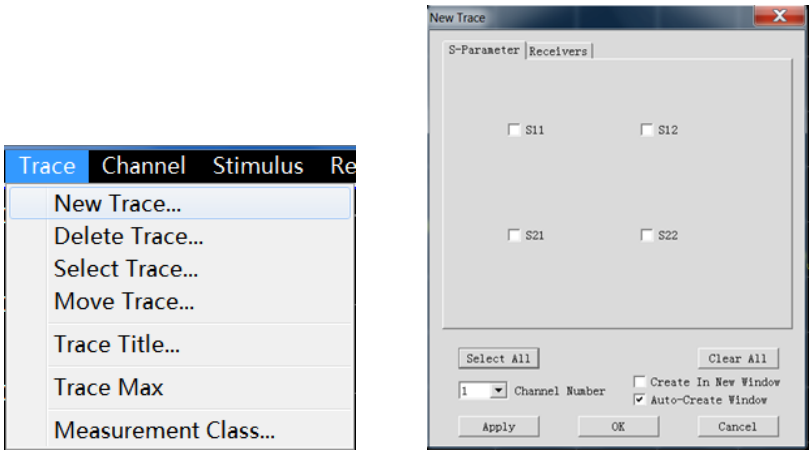

Fig. 3.3 Definition of S Parameter

3.2.2 Change measurement types of the trace

If a trace shall be set and modified in the analyzer, the trace shall be made as the currently activated trace.

1) Change activation status of the trace

Click the **Trace Status** button in the window, and the corresponding trace will become the currently activated trace.

Fig. 3.4 Change Activation Status of the Trace

2) Change measurement parameters of the currently activated trace

Select the menu path: **[Response]→[Meas]**, and the **Meas** sub-menu will be displayed, as shown in Fig. 3.5.

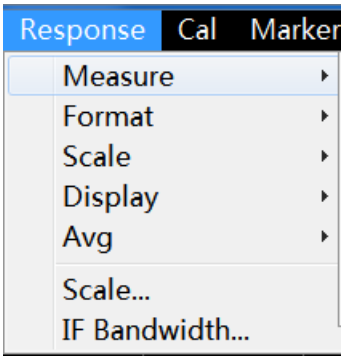

Fig. 3.5 Set Measurement Types of the S Parameters of the Currently Activated Trace

3.3 Frequency Range Setup

Frequency range:10 MHz ~ 13.5 GHz/26.5 GHz/40 GHz/50 GHz/67 GHz.

Frequency resolution: 1 Hz.

1) There are tow modes for frequency range setting

a) Specify start frequency and stop frequency.

b) Specify center frequency and frequency span.

2) Set start frequency and stop frequency

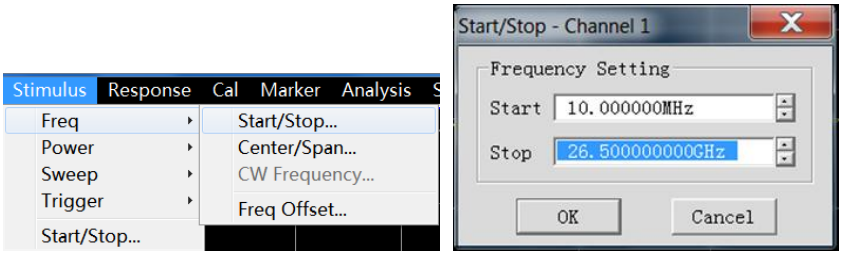

Fig. 3.6 Set Start Frequency and End Frequency

3) Set center frequency and frequency span

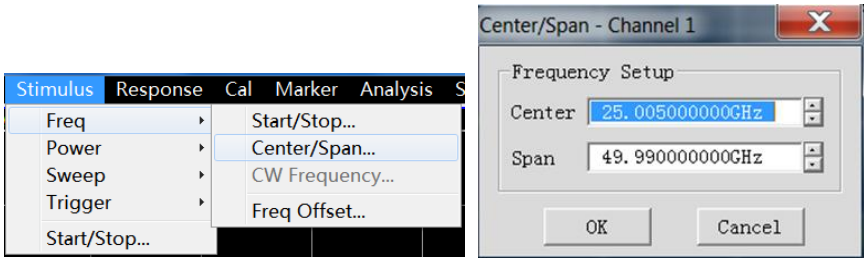

Fig. 3.7 Set Center Frequency and Frequency Span

NOTE

The【Freq】 shortcut key in the functional key area of the front panel can be used to set frequency quickly.

3.4 Signal Power Level Setup

The power level refers to the power level of the source output signal of the test port of the analyzer. The port of the 3672 series vector network analyzer can set following power level indicators:

Table 3.1 Power Level Index of the Source Output Signal

Frequency range	Source power range (dBm)	Configuration conditions
10 MHz ~ 13.5 GHz/26.5 GHz/40 GHz/50 GHz/67 GHz	-30 ~ +20	Standard configuration
10 MHz ~ 13.5 GHz/26.5 GHz	-100 ~ +20	With programmable step attenuator options
10 MHz ~ 40 GHz/50 GHz/67 GHz	-90 ~ +20	With programmable step attenuator options

Select the menu path: **[Stimulus]→[Power]**. **In addition, 【Power】 shortcut key is in the functional key area and shortcut menu bar of the front panel.** Enter the target stimulus power value in the port power input box, and then click OK.

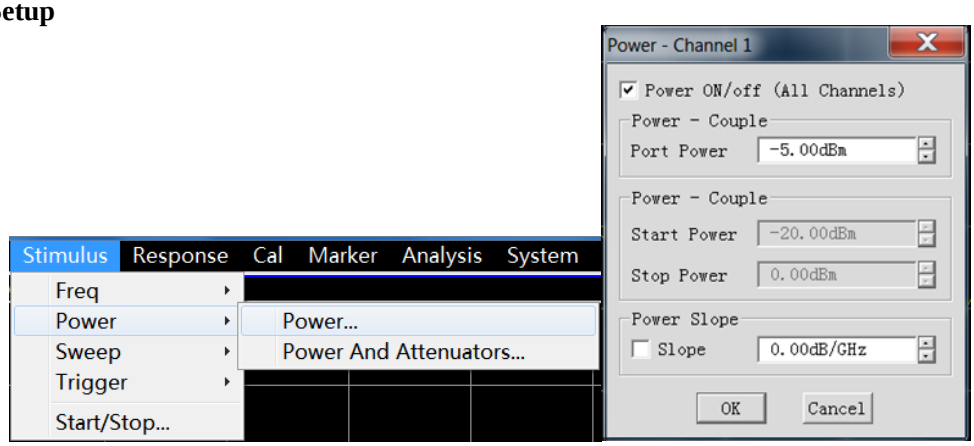

Fig. 3.8 Set Power Level

3.5 Sweep Setup

The sweep is the process for continuous data point measurement with stimulus values with a specified sequence.

3.5.1 Sweep type

The network analyzer supports the following six sweep types:

1) Linear frequency

This is the default sweep type of the instrument, and the frequency linearity continuously covers the whole frequency range.

2) Logarithmic frequency

The source frequency will increase with logarithmic step under the logarithmic frequency setting, and the frequency ratio of two adjacent frequency points is the same.

3) Power sweep

The power sweep will be carried out at fixed frequency, with the max. settable sweep range of 50 dB and the default power sweep range of -30 dbm ~ +20 dBm.

4) Fixed frequency

The fixed frequency sweep mode will set the analyzer to the single sweep frequency, which will accurately and continuously sample the measurement data according to the time interval determined by the sweep time and number of measurement points as well as display changes of the measurement data over time.

5) Segment sweep

The segment sweep setting starts the sweep consisting of multiple segments, and each segment can independently define the power level, IF bandwidth, and sweep time. When calibration on all segments is completed, the calibrated measurement can be carried out on one or more segments. The segment will be defined in the increasing frequency order, and the frequency ranges can't be overlapped. The power level of all segments shall have the same attenuator setting, so as to avoid damaging the attenuator due to frequent switching. When the currently defined segment and the defined segment have different attenuator settings, the analyzer will automatically change the power level and attenuator settings of the defined segments.

6) Phase sweep

Sweep the phase of one or more sources relative to another source, with the measurement value of -360° ~ +360°.

3.5.2 Sweep time

After the measurement setting is completed, the analyzer will satisfy some specific measurement demands with the shortest sweep time as much as possible, but the sweep time can be increased. If the

sweep time is set to 0, the analyzer will automatically select the shortest sweep time. When the sweep time is longer than or equal to 300 ms, the analyzer will display a sweep indicator to indicate the point-to-point measurement sweep. The measurement indicator is a small upward arrow, which points to the point which has just been measured on the trace.

1) Set sweep time

Select the menu path: **[Stimulus]→[Sweep]→[Sweep Time...]**, and the **Sweep Time** dialog will be displayed.

Input the sweep time in the **[Sweep Time]** box directly. If setting through the keys and the auxiliary menu bar, enter the sweep time directly in the input toolbar.

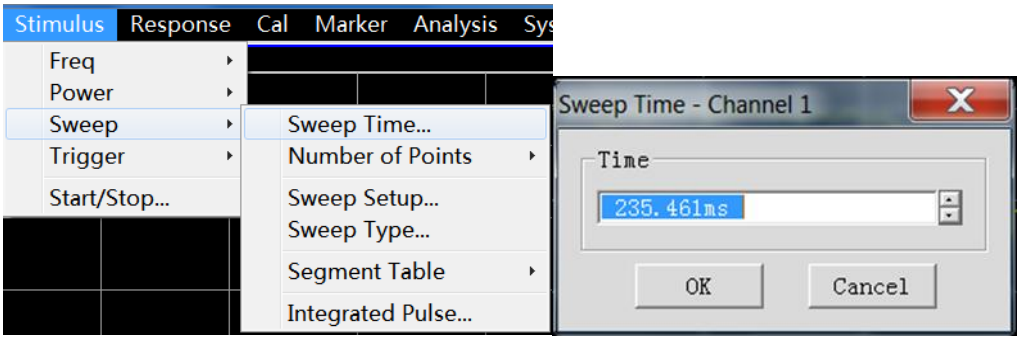

Fig. 3.9 Set Sweep Time

3.6 Data Format and Scale Setup

3.6.1 Data format

Select the menu path: **[Response]→[Format]**, and the **Format** sub-menu will pop up.

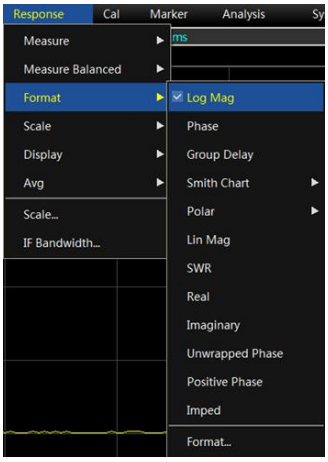

Fig. 3.10 Set Data Format

3.6.2 Scale

The scale is used to set and display scale of the vertical part of the grid. Under the polar coordinate and Smith chart format, it will be used to change the full scale value of the circumcircle. The scale and format setting determines the display mode of measurement data on the screen. Under the logarithmic format, the scale setting range is 0.001 dB/grid ~ 500 dB/grid.

Select the menu path: **[Response]→[Scale]**, and the **Scale** sub-menu will pop up.

Click the corresponding input area or button to set the proper scale, reference position and reference level.

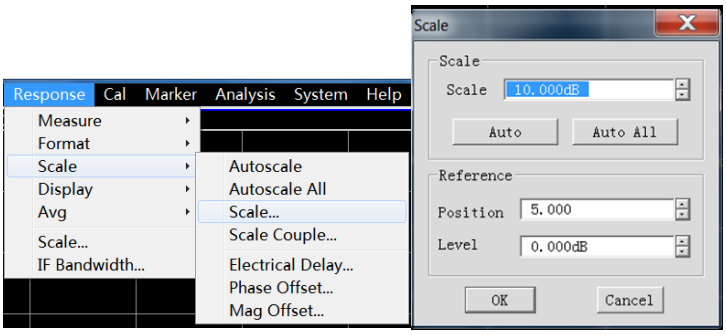

Fig. 3.11 Set Scale

3.7 Data Output

3.7.1 Save and recall files

The 3672 series vector network analyzer supports saving and recall of different formats of files.

File saving

Select the menu path: **[File]→[Save]→[Save]/[Save As...]**.

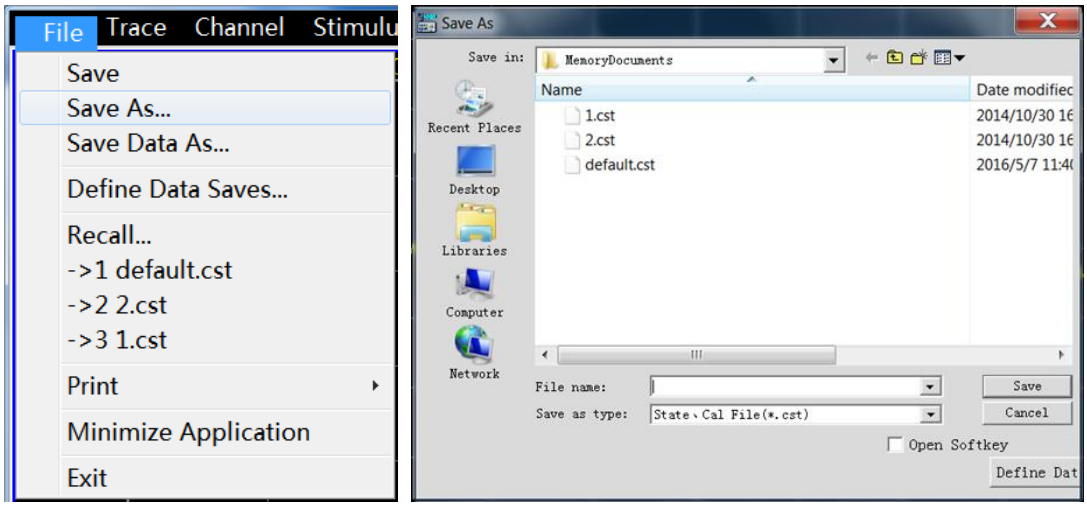

Fig. 3.12 File Saving

Call back files

1) Callback status and calibration data:

a) sta file

The sta file contains the status data of the instrument, including instrument setting, trace data, limit line and marker.

b) cal file

The cal file only contains the calibration data, excluding the instrument status data. The correction accuracy of the calibration data is related to the instrument status setting; therefore, in order to obtain the highest measurement accuracy, the instrument setting during file recall shall be consistent with that during calibration, otherwise the calibration accuracy can't be guaranteed.

c) cst file

As the cst file contains all measurement status and calibration data in the instrument, the recall can save the test time.

2) File recall method:

Select the menu path: **[File]→[Recall...]**, and the **Open** dialog will be displayed.

Select the type of the loaded file in **[File Type]** box.

Set the directory of the called back files through **[Search Range]** box and **[File List]** box below it.

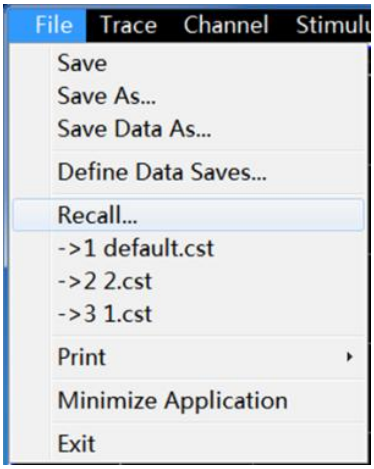

Fig. 3.13 File ReCall

3.7.2 Measurement result printing and displaying

The analyzer supports outputting or printing the measurement display content to a specified file through a printer. The printer can be a local or network printer, with types including parallel, serial or USB interface. The printer can be used after it is added to the WINDOWS operating system.

3.7.2.1Setting of printed content

The print supports setting the printed content, and the method is as follows:

Select the menu path: **[File]→[Print]→ [Page Setup]**, and the **Page Setup** dialog will be displayed.

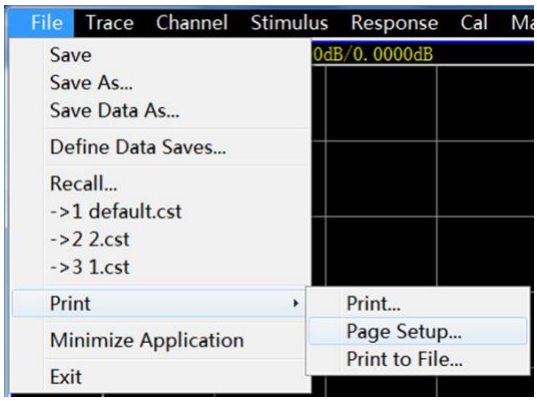

Fig. 3.14 Print Setup

3.7.2.2 Printing

After adding the printer and setting the printed content in the analyzer, the measurement information can be output through the printer. The method is as follows:

Select the menu path: **[File]→[Print]→ [Printing...]**, and the **Print Setup** dialog will be displayed.

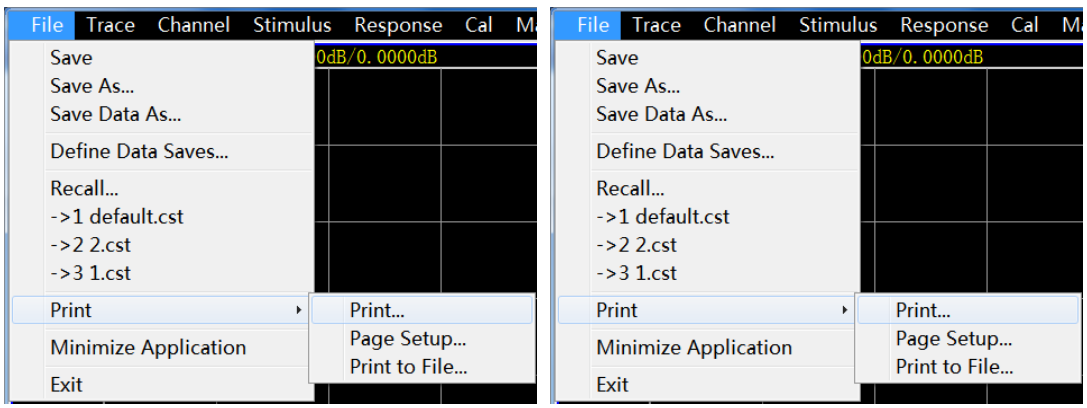

Fig. 3.15 Printing of Measurement Information

3.7.2.3Print to files

The analyzer supports outputting the printed content to the bitmap (BMP) file. If multiple pages shall be printed, multiple BMP files will be automatically created, with each file corresponding to one page, and other files will be identified in a form of the ‘File Name (Number).bmp’, such as amp.bmp, amp(1).bmp, amp(2).bmp. The printing method is as follows:

Select the menu path: **[File]→[Print]→ [Print to Files...]**.

Set the directory of saved files and name of files in the dialog.

Click **[Save]** button for file saving.

4 Getting Help

Under normal circumstances, problems may arise due to hardware or software errors or inappropriate use. When a problem is encountered, first observe and save the error message and analyze the possible causes of the problem by referring to the troubleshooting steps in Chapter 4.1 "Basic check". Alternatively, you can contact our customer service center and provide the collected error information, and we will help you solve the problems as quickly as possible. For details, please refer to the contact information on the cover or search the website address online: www.ei41.com, on which you can get the contact information about the nearest technical support.

4.1 Basic inspection

✧ Check weather the power outlet is live?

✧ Check whether the vector network analyzer is powered on? Check whether the green LED next to the power button is lit up. Check for noise from the internal fan to determine whether the cooling fan of the analyzer is running properly.

✧ If any other device, cable, or connector is used in conjunction with the network analyzer, ensure that they are properly connected and are running normally.

✧ If the network analyzer can't communicate via LAN, check the yellow LED next to the LAN interface on the rear panel, and if the LED does not flicker, check the LAN cable and its connection.

If the network analyzer does not fully loaded or run the operating system, or if the applications fail to start up properly, there may be a fault in the hard drive. If the system recovery of the network analyzer has run for a sufficiently long time but still failed to be completed, please follow the instructions stated in "System Recovery" in "2.2 Operating System Configuration".

✧ Whether the measurement application is running? If not, click the desktop program start shortcut icon.

✧ Whether the measurement application window is selected? (Namely the blue window bar is highlighted). If not, select the application window with Alt-Tab.

✧ When encountering a problem for the first time, check the measurement procedures. Have all settings been configured properly?

✧ If the analyzer is not running normally, press down 【Preset】 button to return the analyzer to a known status.

✧ Are the measurements being performed and the result consistent with the performance index and characteristics of the analyzer? Please refer to "11.1 Specifications" of the User Manual for performance indicators of the analyzer.

4.2 Helpful information

When a problem is encountered, the instrument will display an error message. In most cases, the problem can be diagnosed and solved based on the error message. The "Fault diagnosis" in the User Manual describes the error messages in detail.

In addition, our customer service center is able to provide help to users at any time regarding the problems encountered while using the 3672 series vector network analyzer. Please provide us with the following information so that we can help you

find a solution more rapidly and efficiently.

➢ **System configuration:** The "About..." dialog provides information related to the following content:

– Frequency band: Host model and its frequency range;

– Option: The status of all software and hardware options installed in your instrument;

➢ **Error log:** Open the "Error Information→View Error Log" dialog to view the error log.

4.3 Repair Method

When your network analyzer incurs a problem that is difficult to solve, please contact us by phone or fax. If it is decided that the network analyzer needs to be returned for repair, please package it with the original packaging material and box, and follow these steps:

1) Please include a detailed explanation of the problem that you've encountered when using the network analyzer along with the apparatus in the packaging box.
2) Pack the network analyzer with the original packaging material to reduce possible damage.
3) Seal the packing box with tapes, lock it with buckles, and reinforce it with nylon tape;
4) Mark "Fragile! No Touch! Handle with Care!" indicated.
5) Please arrange the consignment as required for the precise instrument.
6) Keep copies of all the shipping documents.

ATTENSION

Pay attention to followings when packaging the network analyzer

The use of other materials to package the network analyzer may cause damage to the device. It is forbidden to use polystyrene beads as the packaging material because they can't fully protect the instrument and may damage the instrument after being sucked into the instrument fan by the static electricity.

NOTE

Packaging and transport of the instrument

When moving or transporting the instrument (because of, for example, damage during delivery), please adhere strictly to the points noted in ?2.1.1 Unpacking".

Please keep the packing case properly and use the original packing case during product repair. The user shall be responsible for the transportation damage due to the use of other packing cases.

Contact information:

Tel: +86-**0532-86896691**

E-mail: **sales@ceyear.com**

Postal code: **266555**

Address: **No.98, Xiangjiang Road, Qingdao City, China**