ADVANTEST®

ADVANTEST CORPORATION

R3752H Series

Network Analyzer

Operation Manual

MANUAL NUMBER FOE-8324157A01

Applicable models

R3752AH

R3752BH

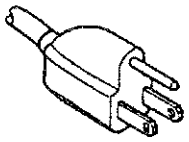
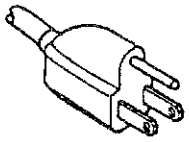
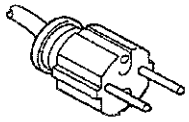
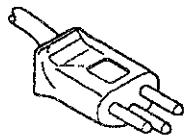
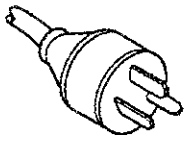
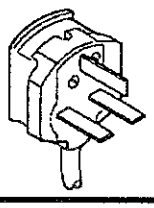
R3752EH

First printing January 20, 1997
Printed in Japan

Table of Power Cable Options

There are six power cable options (refer to following table).

Order power cable options by Model number.

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

PREFACE

<In the Beginning>

This manual explains all processes from the acceptance to actually operation of network analyzer R3752H series. The manual of three volumes related about the R3752H series is shown in the following.

Manual	Outline	Remarks
1. R3752H Series Network Analyzer Operation Manual (this manual)	The following of the R3752H series is explained. • Method of operation • Explanation of function • Measurement method • Notes on use etc.	Standard attachment
2. R3752/53H Series Network Analyzer Programming Manual (separate volume)	GPIB and built-in BASIC are explained.	Standard attachment
3. R3752/53/64/65/66/ 67H Series Network Analyzer Programming Guide (separate volume)	The creation and execution of BASIC program with the editor are explained.	Standard attachment

<Caution>

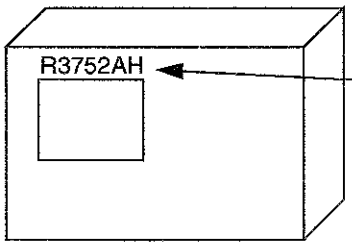
ADVANTEST reserves the right to change the content of this manual and other product information without notice.

The address and the telephone number of ADVANTEST Corporation are described in the end of this manual. Refer for the inquiry etc.

<Confirmation of Product and Attachment>

When you open packing, confirms the following in the beginning.
If any flaw, damage and shortage in the product or the attachment, etc., is found, contact the nearest dealer or the sales and support office.

(1) Product main unit



Type and name of product.

Confirm the product the same as the order from the name plate in the front panel.

(2) Standard attachment lists.

Note: Order the addition of the attachment etc. with type name or stock No.

Name of articles	Type name	Parts code	Quantity	Remarks
Power cable	A01402	DCB-DD2428X01	1	3 pins plug
		JCD-AL003EX03	1*1	AC adapter
BNC-BNC cable	——	DCB-FF4894X01	2	30cm
	——	DCB-FF4894X04	1*3	60cm
BNC through connector	BNC-A-JJ	JCF-AB001EX05	1	
Fuse	——	DFT-AA6R3A	2	T6.3A/250V
Operation Manual	——	JR3752H	1*2	Japanese
	——	ER3752H		English
Programming Manual	——	JR3752/53H (PM)	1*2	Japanese
	——	ER3752/53H (PM)		English
Programming Guide	——	JR3752/64H (PG)	1*2	Japanese
	——	ER3752/64H (PG)		English
Editor install disk	——	PR37670001-FK	1	HD 1.44M bytes
Sample program disk	——	PR37670003-FJ	1	DD 720K bytes

Note: *1 : The AC adapter is a standard attachment only to Japan-domestic.
****2 : Japanese or English is one volume.***
****3 : Don't be attached to model R3752EH.***

<How to read this manual>

(1) Organization of this manual

Configuration		Remarks
Preface	In the beginning. Confirmation of the product and components.	Necessary to read before the first use of the R3752H series.
Contents	The configuration and the page of description.	Use to find needed information easily.
1.	Necessary information before begins to measure, installation - setup, cleaning, transportation and storage. The general remarks	
2.	Explanation of front/rear panel. Name functions and operations of front/rear panel components.	The usage of the R3752H series can be understood by reading it through.
3.	Method of operation	
4.	Function descriptions	Refer if necessary.
5.	Performance test Method of confirming performance of catalog spec. of the R3752H series	
6.	Specifications Technical information and general information	
7.	Error message	
Appendix	Initial setting	
Index	Associated word and the description page	Use to find needed information easily.
Others	External figures.	Use to find the outer dimensions.

(2) Mark of caution level in this manual.

DANGER!
Uses it for the case with the possibility of the body trouble and the death.

WARNING!
Uses for the remarks concerned with the safety of the body.

CAUTION!
Uses for the remarks of the damage or fire of the machine equipment, or for the restriction of use.

REFERENCE
Information helpful to you.

Note: Uses to explain for the supplementation.

(3) Distinction of panel key and soft key in this manual.

Panel key:

(Example) **[MENU], [SPAN]**

Soft key:

(Example) *{ΔMODE MENU}, {ΔMODE OFF}*

(4) This manual has the page attaching the sign of (*) to the upper right of the pagination.

The sign of (*) informs the final page of each chapter.
(Pagination: Page number in the margin is called "pagination".)

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1 GETTING STARTED

1.1 Product Description

The R3752H series network analyzer is a new 500MHz vector network analyzer that has been developed under the concept of "optimum tools for individual applications." They realized a high throughput such as high-speed measurement of 0.1ms/point at resolution bandwidth (RBW) of 10kHz, dynamic-range measurement at 115dB, and parallel measurement for two devices by 4-trace display.
Besides the conventional user sweep functions, the program sweep functions are added which allows to define the RBW, output level, input attenuator (ATT) for each segment during sweeping.
Semiconductor switches are used for adjustment of output level and input ATT, enabling high-speed level sweeping best suitable for oscillator drive level tests.
The built-in BASIC controller functions allow to easily construct a high-speed ATE system for adjustment through verification processes without using external controllers.
For the GPIB and built-in BASIC, refer to the related programming manuals.

<Features>

(1) High throughput

- High-speed frequency sweep at 0.1ms/point, short blanking time of 5ms, and four traces (magnitude and phase) with two channels at RBW 10kHz
- High-speed level sweep of 0.1ms/point
  High speed and long life enabled by use of semiconductor switches

(2) Wide dynamic range

- Wide dynamic range of 115dB allowed by automatic change of input ATT
  High speed and long life enabled by use of semiconductor switches for ATT change

(3) Program sweep functions

- The frequency, output level, input ATT, RBW and settling time can be set for individual segments.

(4) MS-DOS formatted disk

- Because the floppy disks are in the MS-DOS format, program generation and data analysis can be easily done on MS-DOS personal computers.
- Three format types are available: DD (720KB), HD (1.2MB) and HD (1.44MB).

1.2 Overview

(1) Signal source

The range of signal output is 5Hz to 500MHz and the range of output power is +21dBm to -63dBm.

(2) Receiver

Signals in the receiver flow as follows:

① 5Hz to 500MHz input signal is converted into 820kHz 1st IF signal by the 1st Mixer and transferred to the 2nd Mixer.

② The 1st IF signal is converted into 20kHz 2nd IF signal by the 2nd Mixer and output to the A/D circuit.

③ The A/D-converted data is calculated at a high speed by the digital signal processor (DSP) and displayed on the display.

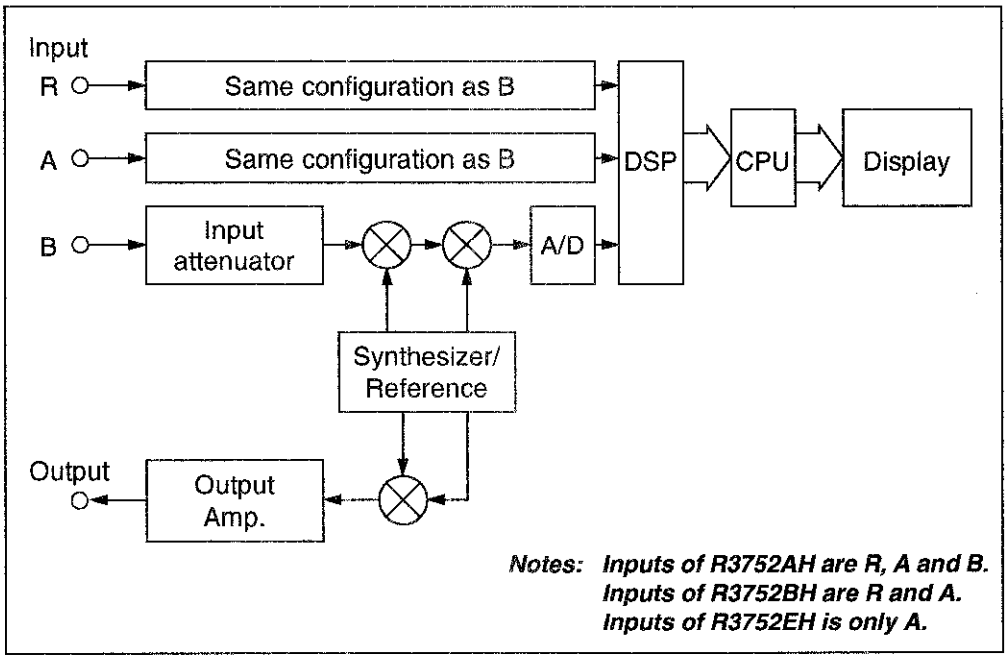


Figure 1-1 Diagram of Receiver

1.3 Data Flow

The signal input in the receiver is processed according to the following flow:

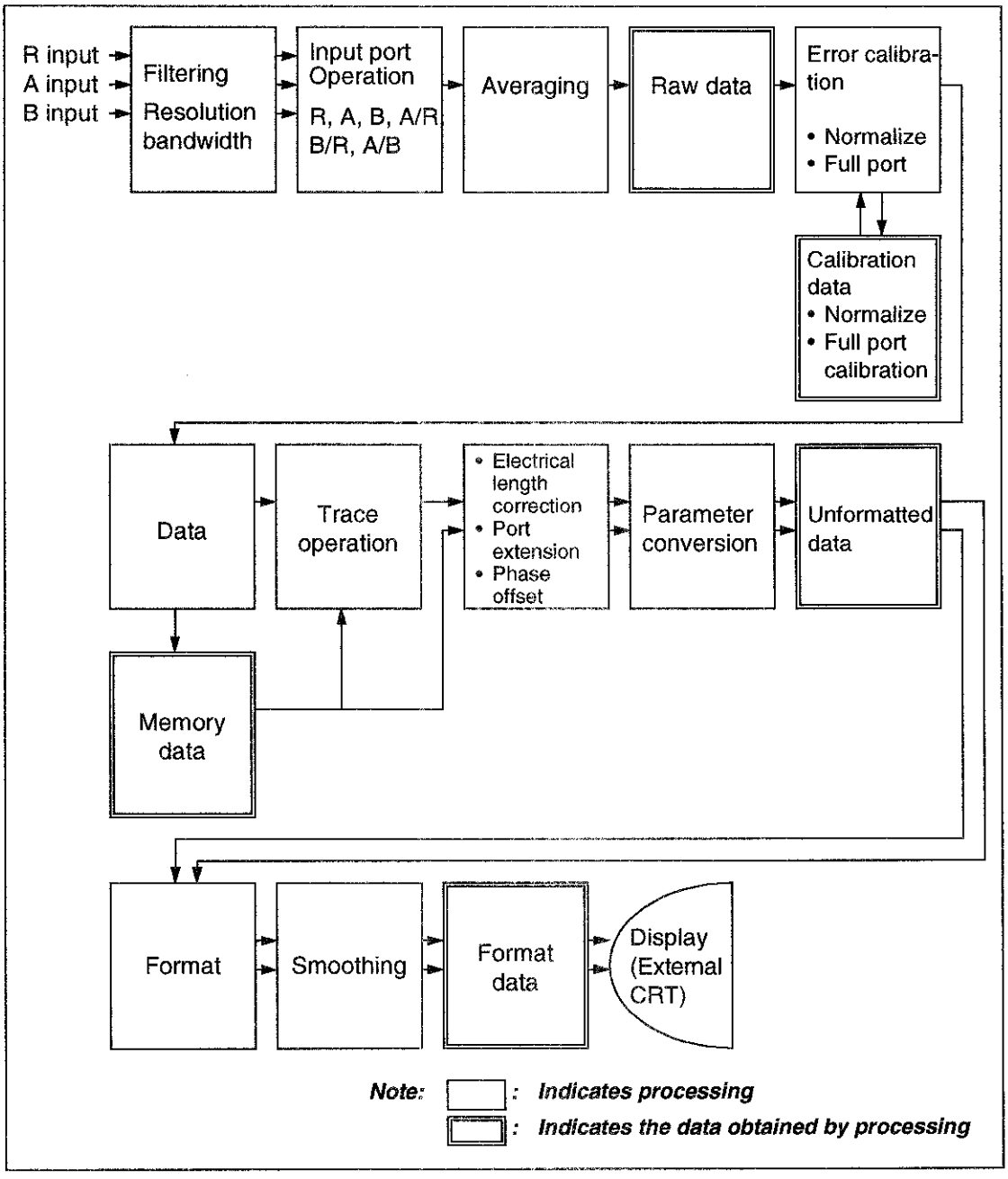


Figure 1-2 Data Flow

1.4 Environmental Conditions

- Operating Environment

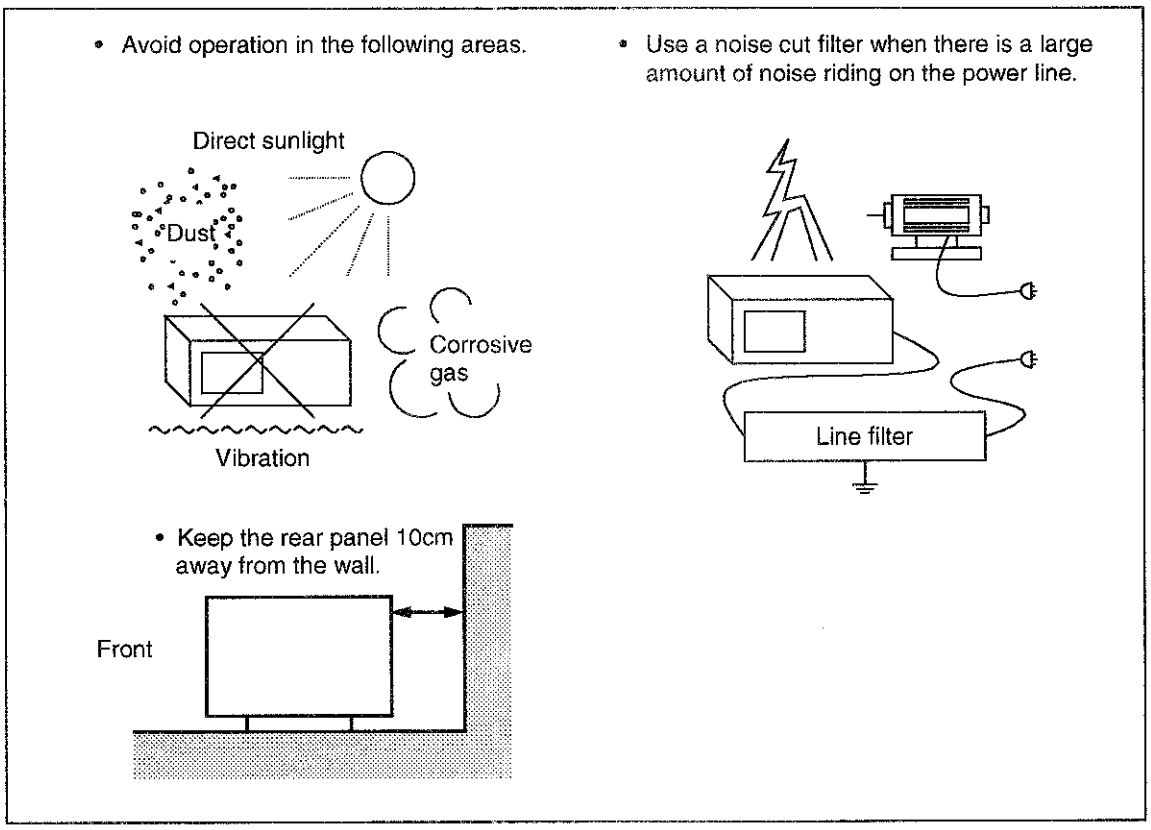


Figure 1-3 Operating Environment

The R3752H series should be installed in an area which satisfies the following conditions:

- Ambient temperature: 0°C to +50°C (operating temperature)
- Relative humidity: RH 85% or less (no condensation)
- An area free from corrosive gas
- An area away form direct sunlight
- A dust-free area
- An area free from vibrations
- A low noise area
  Although the R3752H series has been designed to withstand a certain amount of noise riding on the AC power line, it should be used in an area of low noise. Use a noise cut filter when ambient noise is unavoidable.
- Installation position
  The R3752H series has an air outlet hole on its rear panel. Never block or plug the hole, as the resulting internal temperature rise will affect measurement accuracy.

1.5 Power Supply Description

1.5.1 Power Supply Specifications

WARNING!
Safely use the R3752H series according to the power requirement.
R3752H might be damaged in the case not following the power requirement.

The power requirement of the R3752H series is shown in the following.
Use the power supply by which the power requirement of the R3752H series is satisfied.

Input Voltage	$100V_{AC}$ operation	$200V_{AC}$ operation
	AC100V - 120V	AC220V - 240V
Frequency	48Hz - 66Hz	
Fuse	T6.3A/250V	
Power consumption	300VA or less	

* This input voltage is automatically changed between $100V_{AC}$ system and $200V_{AC}$ system. The above input voltage is the standard of the R3752H series. The available range of the AC power is 90-132V and 198-250V.

1.5.2 Replacing the Power Fuse

WARNING!
Use the power fuse of the standard by which power supply voltage is satisfied.

The power fuse is located in the power connector on the rear panel.
Check or replace the power fuse as follows.

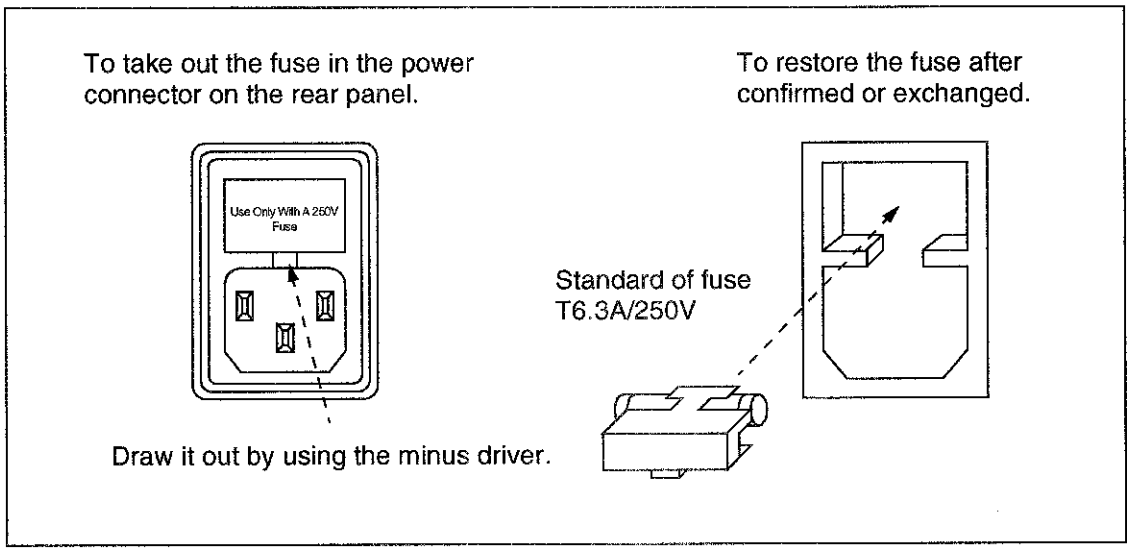


Figure 1-4 Check or replace of Fuse

1.5.3 Connecting the Power Cable

WARNING!

1. ***Power cable***
   - ***Use power cable of the attachment for prevention electric shock and the fire. A standard attachment conforms to The Low on Electrical Appliances of Japan.***
   - ***Use power cable in accordance with the safety standard of the country for use excluding Japan.***
   - ***When you connect power cable with the outlet, turn off the power switch.***
   - ***When you pull out power cable from the outlet, have the plug.***

2. ***Protective earth***
   - ***Connect the power plug cable with the power outlet which has the protective earth terminal.***
   - ***If the code for the extension without the protective earth terminal is used, the protective earth will become invalid.***
   - ***Case in which use of AC adapter (Three pins to two pins conversion adapter, the earth pin of the adapter is grounded to the earth of the outlet, or connect ground terminal of the rear panel with the earth of the outside, and ground it to the earth.***

(1) Power plug and cable

Since 3-core power receptacles are rare in Japan, a 3-pin to 2-pin adaptor (AC adapter) is attached to the R3752H series. Be sure to connect the ground pin of the adapter to the ground line when connecting the power cable to a receptacle with this conversion adapter.

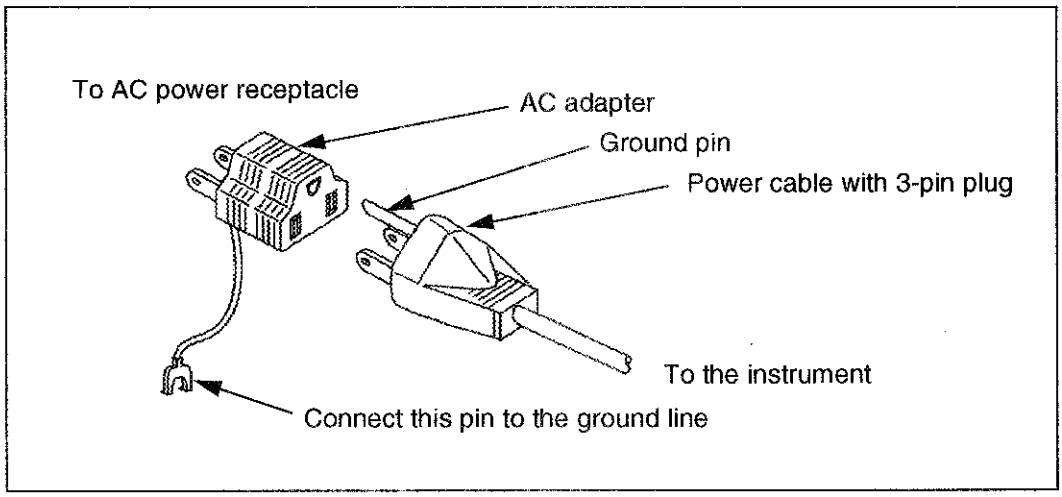


Figure 1-5 Power Cable and AC Adapter

(2) Power plug for overseas use

A separately-sold plug for overseas use is available. For more information, contact ADVANTEST's Service Department.

1.6 System setup Cautions

1.6.1 Notes on the Use of Parallel I/O Ports

(1) In +5V power output from parallel I/O port, maximum current capacity is 100mA.
Use it within 100mA.

(2) In +5V power output from parallel I/O port, there is a fuse.
The fuse fuses with the over current of 100mA or more.
In the case with which the fuse fuses, contact to the nearest dealer or the sales and support offices.

(3) Use the shield cable for the cable for parallel I/O port. (To prevent malfunction by noise)

(4) The standard of the cable for the radiation test of the R3752H series is MO-27.

(5) Cautions of wiring
Do not bundle I/O cable and the AC line.

1.6.2 Notes on the Use of Serial I/O Ports

(1) The length of the cable used for serial I/O port is 15m or less.

(2) Use the shield cable for the cable for serial I/O port. (To prevent malfunction by noise)

(3) The standard of the cable used for the radiation test of the R3752H series is A01235.

(4) Cautions of wiring upper
Do not bundle I/O cable and the AC line.

1.7 Input Signal Level Overload Cautions

A maximum level that can be measured at the input part is 0dBm. (When an input attenuator is set to 20dB)
If a signal with its level 0dBm and more is added to the input, some messages are displayed.

(1) If a signal with its level 0dBm or more and with its frequency 100kHz or more is added to the input, "Overload" is displayed.
When a signal with its level less than 0dBm and with its frequency less than 100kHz is added to the input, "Overload" is also displayed. However, the signal measurement is correctly carried out.

(2) If a signal having much more level than (1) is added to the input, "Overload Trip" is displayed and the input impedance is automatically switched to 1MΩ.
Decrease the input level and then release the trip.
(The level in which the input impedance is switched to 1MΩ depends on the input frequency.)

1.8 Cautions in Setting Up an Output Power

It is possible to set the output power in the range of -63dBm to +21dBm, but a 20dB attenuator is connected by an internal input relay at -43.1dBm or more.
The operating life of this relay is rated at one million times.
Take care of the operating life if the relay is continuously switched.
The relay switch does not work in the output power range of +21dBm to -43.0dBm and of -43.1dBm to -63.0dBm.

1.9 Cleaning, Storage and Transportation

(1) Cleaning

Wipe the dirt of the R3752H series off with a soft cloth (or wet cloth). At this time, attend to the following points.

- Do not remain the fluff of the cloth and do not soak water into the internal of the R3752H series.
- Do not use an organic solvent (for example, benzene and acetone, etc.) which changes plastics in quality.

(2) Storage

The cases in which the R3752H series is not used for a long time, cover with the vinyl cover or put in the cardboard box and prevent dust. Keep it in a dry place where dust and direct sunshine were prevented.
Storage temperature: -20°C to +60°C

(3) Transportation

When you transport the R3752H series, pack it equally to the first packing material or any more.

Packing procedure.

① Wrap the R3752H series itself with cushion material and put in the cardboard box.

② After putting attachment, put cushion again.

③ Shut the lid of the cardboard box. Fix the outside with the string or tape.

1.10 Notes on use

(1) Before starting the measurement

When turning on the power, don't connect DUT. Before starting the measurement, check to see the output power level.

(2) When abnormality occurs

When smoke rises from the R3752H series, smell nasty, or hear unusual sound feel, turn off the power switch. Pull out power cable from the outlet. And contact to our company. The address and the telephone number of our company are in the end of this manual.

(3) Warm up

After the R3752H series temperature has reached the room temperature level, turn the power switch ON and warm it up for 30 minutes.

(4) Electromagnetic interference

High frequency noise of the small power is generated at the R3752H series use.
Therefore, electromagnetic interference is generated to the television or the radio by an improper installation and use of the R3752H series.
If the power of the R3752H series is turned off, and the electromagnetic interference is reduced, then the R3752H series is the cause of it.
Prevent electromagnetic interference by the following procedure.

- Change the direction of antenna of the television or the radio.
- Place is setup to the other side of the television and the radio.
- Place is setup to a place away from the television and the radio.
- Use another line of power source for the television or the radio than the R3752H series.

(5) Cautions when scrapping the R3752H series

When the products are scrapped, be careful to treat them properly.
Call for the inquiry about how to scrap, etc. to the nearest our service station. The addresses and the telephone numbers are at the end of this manual.
Harmful substances: ① PCB (Polychlorinated biphenyl)
② Mercury
③ Ni-Cd (Nickel-cadmium)
④ Others
Substances that contain cyan, organic phosphorous, and hexadic chromium, and substances that might dissolve and flow out cadmium, lead or arsenic. (Except lead for soldering)

2 PANEL DESCRIPTION

2.1 Front Panel Descriptions

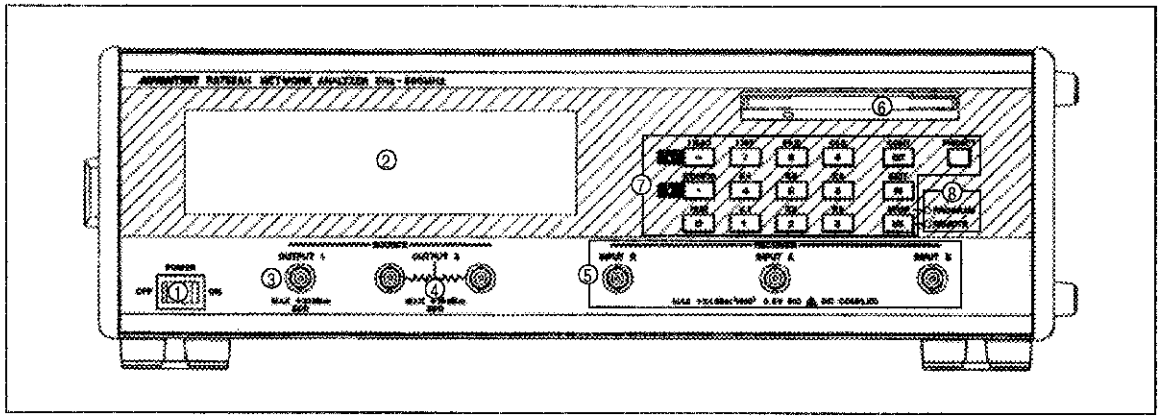


Figure 2-1 Front Panel (R3752AH)

No.	Name	Description
①	POWER switch	Turns on/off the power.
②	Fluorescent display	Displays the FDD and RAM disk file contents and the program execution results in the area of 32 characters × 8 digits.
③	Signal output connector ①	Connects a power divider for absolute or parallel measurement.
④	Signal output connector ②	Used for ratio measurements.
⑤	Input connectors	Used for reference and measurement inputs. The supplied input connectors vary by the models: R3752AH; INPUT A, B and R R3752BH; INPUT A and R R3752EH; INPUT A
⑥	Floppy disk drive	Used to save programs and measurement data. This drive is available in three modes and the format type is 720KB for DD and 1.2 or 1.44MB for HD.
⑦	Panel keys	0 to 9, ., -, BS, NET: Used to input numeric data. K1 to K6: Used as function keys. LOAD, LIST, FILE, CLS, CONT, EXIT, RUN and STOP: Used for program load, execution, stop and so forth.

No.	Name	Description
⑧	LED	Indicates the BASIC execution and GPIB operating states. • PROGRAM LED Goes on when loading a program or saving or loading a file. This LED remains on while the program is being paused. • REMOTE LED Goes on when the R3752H series is in remote mode. It goes off after the R3752H series has exited the remote mode.

2.2 Rear Panel Descriptions

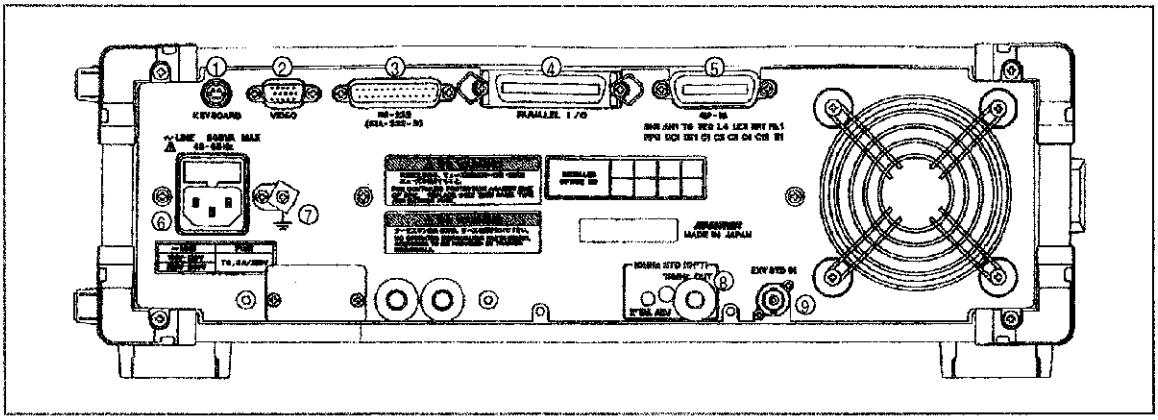


Figure 2-2 Rear Panel (same for all R3752H Series)

No.	Name	Description
①	Keyboard input connector	Connects an IBM-PC keyboard. (The application software is necessary.)
②	Video signal output	Video signal output for VGA (15pin)
③	Serial input/output	RS-232 input/output connector
④	Parallel I/O connector	I/O port used for communication with external devices such as automatic unit or foot switch. (Output: two 8-bit channels, input/output: two 4-bit channels) EXT TRIGGER input (negative logic, pulse width 1 μs or more, 18-pins)

No.	Name	Description
⑤	GPIB connector	Used for remote control of external devices or by an external controller.
⑥	AC power connector	3-pole receptacle. The center pole is a ground pin. To remove the fuse, pull out the cover above the connector.
⑦	Ground terminal	Used to ground the R3752H series when the power cable 3-prong connector or 2-prong adapter are unavailable.
⑧	Highly stable reference frequency output connector (Option 20)	Outputs highly stable reference frequency when Option 20 is equipped.
⑨	External reference frequency input connector	Used to input external reference frequency. Input frequency: 1, 2, 5, 10MHz of 0dBm or more Input frequency accuracy: Within ±10ppm

3 BASIC OPERATION

3.1 Basic Key Operation

This section explains the functions of the panel keys (except the PRESET key) of each mode and how to use these keys.
Basically, the panel keys have four modes: BASIC, LOAD (file load), FILE (file operations) and CONFIG (CONFIG file edit). The BASIC mode is at the base of the other three independent modes (see Figure 3-1). The keys except the PRESET key function differently according to the modes.

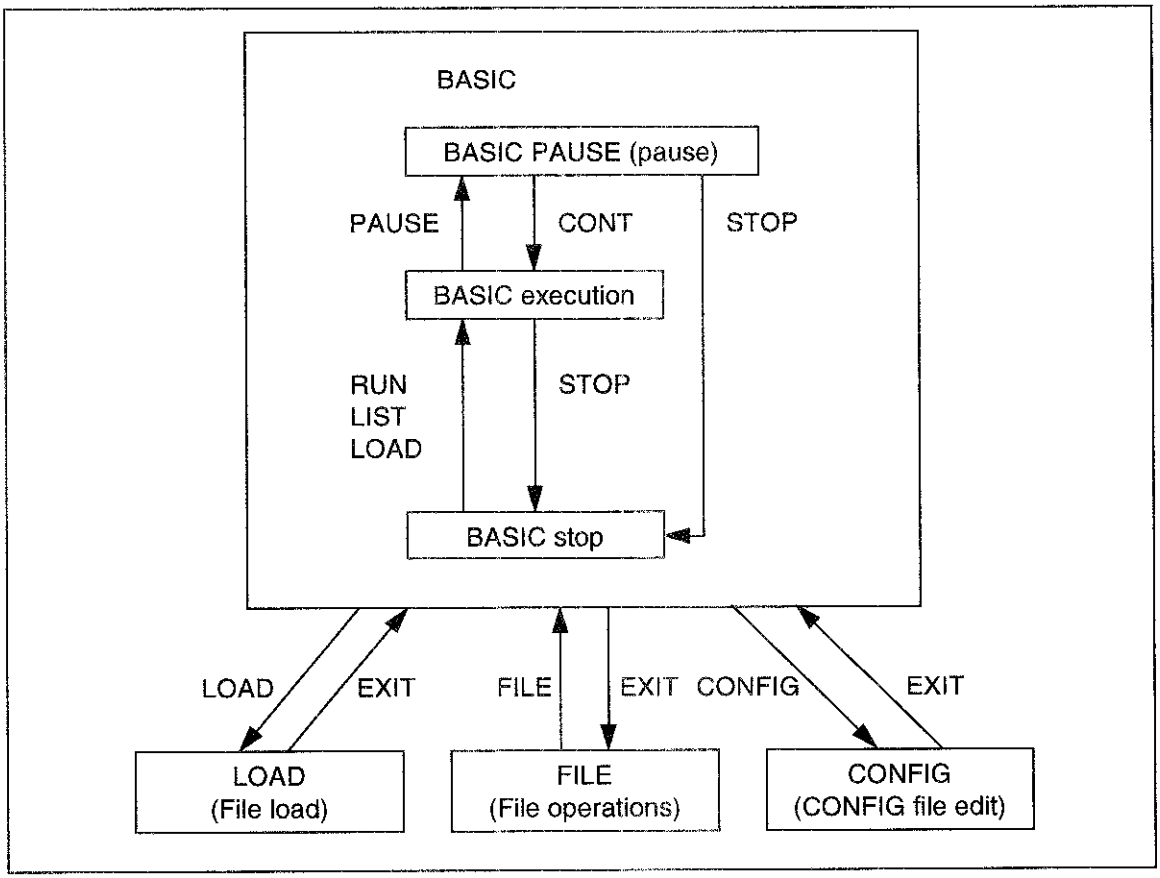
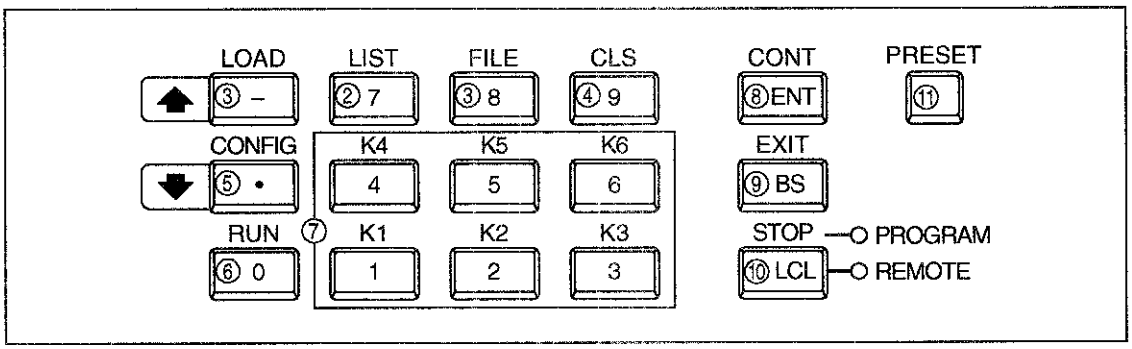


Figure 3-1 Panel Mode Transitions

3.1.1 Key Names and Functions

The keys on the panel except the PRESET key function differently according to the modes. This section gives the key names and outlines their functions. (For the functions in individual modes and operations, see the explanation of mode operations.)



No.	Name	Function
①	LOAD key	Used to select the LOAD mode (selecting the BASIC LOAD file). In the LOAD or FILE (file operations) mode, this key moves the cursor upward. During execution of a BASIC program, this key functions as a minus (-) key.
②	LIST key	Used to display program list in BASIC. During execution of a BASIC program, this key functions as a numeric key (7).
③	FILE key	Used to select the FILE (file operations) mode. During execution of a BASIC program, this key functions as a numeric key (8).
④	CLS key	Clears the screen in the BASIC mode. During execution of a BASIC program, this key functions as a numeric key (9).
⑤	CONFIG key	Used to select the CONFIG.SYS edit mode. In the LOAD (selecting the BASIC LOAD file) or FILE (file operations) mode, this key moves the cursor downward. During execution of a BASIC program, this key functions as a period (.) key.
⑥	RUN key	Executes the program loaded in memory. During execution of a BASIC program, this key function as a numeric key (0).

No.	Name	Function
⑦	K1 to K6 key	In the FILE (file operations) mode, these keys are used as function keys. During execution of a BASIC program, these keys are used as function keys (K1 to K6) or numeric keys (1 to 6).
⑧	CONT・ENT key	Functions as an ENTER key to execute or determine various functions. In the BASIC PAUSE mode (temporary program stop), this key functions as the CONT key to continue the program.
⑨	EXIT・BS key	Functions as the EXIT key to cancel the function. During execution of a BASIC program, this key functions as the BS (Back space) key.
⑩	STOP/LOCAL key	When the R3752H series is in the Remote On mode, the REMOTE LED is on. In this case, the STOP/LOCAL key functions as the LOCAL key. It allows the user to control from the front panel. When the R3752H series is under control of an external computer (Remote On mode), all keys except the LOCAL key are unavailable. To allow the user to access to the R3752H series from the keys on the panel, the R3752H series must be in the Remote Off mode. In the Remote Off mode, the REMOTE LED is off. During execution of a BASIC program, the PROGRAM LED is on. In this case, the STOP/LOCAL key functions as the STOP key which stops the program currently running. When the program stops, the PROGRAM LED goes off. * While the REMOTE LED is on, the STOP/LOCAL key functions as the LOCAL key even if the PROGRAM LED is on.
⑪	PRESET key	Initializes the states of the R3752H series. For details of initialization, see section A.1 "Initialization".

4 FUNCTION DESCRIPTION

4.1 Description of the Each Mode Key

4.1.1 BASIC Mode

When the power is turned on, the R3752H series is initialized and enters the BASIC mode. The BASIC mode is further divided into three modes: BASIC stop, BASIC execution and BASIC pause modes. The keys on the panel have different functions according to the modes.

(1) BASIC stop

In this mode, BASIC is doing nothing. The names and functions of the keys available in this mode are described below.
Figure 4-1 shows the key arrangements in the BASIC stop mode. (Only the keys surrounded by the dotted line can be used.)

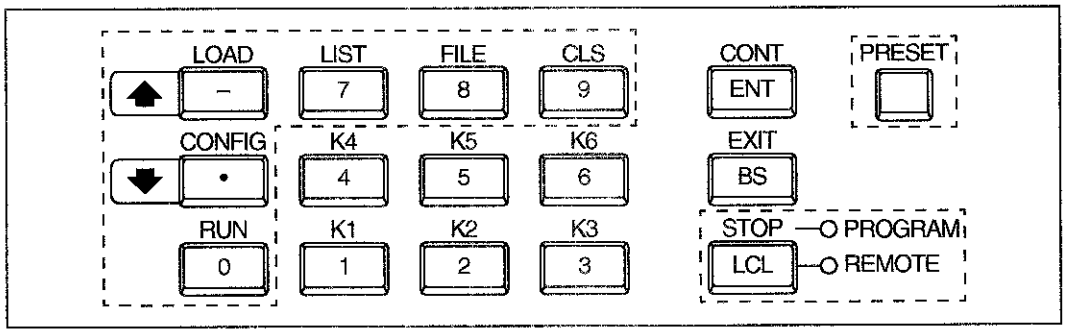


Figure 4-1 Key Arrangements in BASIC (BASIC stop) Mode

Name	Function
LOAD key	Places the R3752H series in the LOAD (file load) mode and displays file names, etc. (See sub-section 4.1.2 "LOAD Mode".)
LIST key	Lists the program loaded in memory.
FILE key	Places the R3752H series in the FILE (file operations) mode and displays file names, etc. (See sub-section 4.1.3 "FILE Mode".)
CLS key	Clears the screen.
CONFIG key	Places the R3752H series in the CONFIG (CONFIG file edit) mode and displays the system set values. (See sub-section 4.1.4 "CONFIG Mode".)

Name	Function
RUN key	Executes the program loaded in memory. The R3752H series enters the BASIC execution mode and the PROGRAM LED goes on. (For program loading from the panel, see sub-section 4.1.2 "LOAD Mode".)
STOP key	Stops the current operation (list display, etc.) and the PROGRAM LED goes off. If the PROGRAM LED is on but the REMOTE LED is still on, this key functions as the LOCAL key.

(2) BASIC execution

A BASIC program is being executed in this mode. The names and functions of the keys available in this mode are described below.
Figure 4-2 shows the key arrangements in the BASIC execution mode.

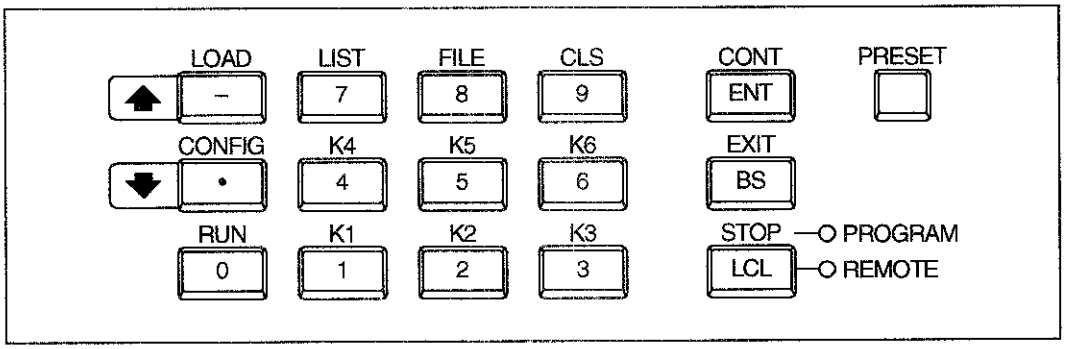


Figure 4-2 Key Arrangements in BASIC (BASIC execution) Mode

Name	Function
Ten key, ENT key, BS key	Used to input numeric or key values for BASIC INPUT instructions, etc.
STOP key	Causes the program currently running to be stopped and the PROGRAM LED to go off. If the PROGRAM LED is on but the REMOTE LED is still on, this key functions as the LOCAL key.

(3) BASIC PAUSE (pause)

Execution of a BASIC program is temporarily stopped (paused) in this mode. The names and functions of the keys available in this mode are described below.
Figure 4-3 shows the key arrangements in the BASIC PAUSE mode. (Only the keys surrounded by the dotted line can be used.)

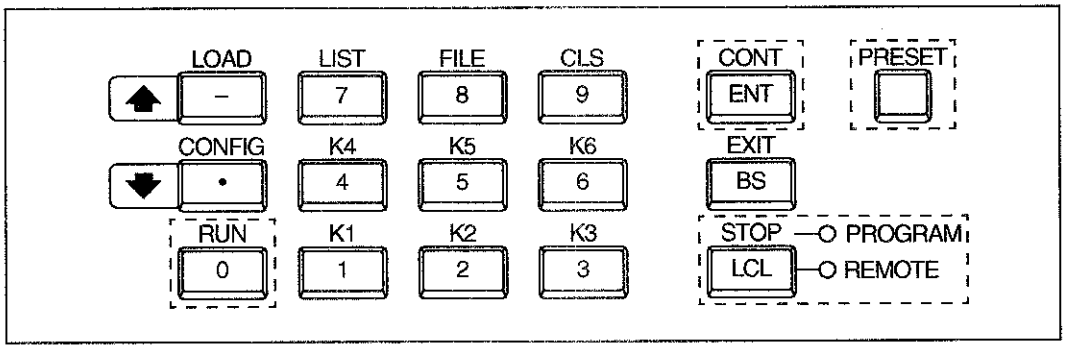


Figure 4-3 Key Arrangements in BASIC PAUSE Mode

Name	Function
RUN key	Executes the paused program from the beginning. The R3752H series enters the BASIC execution mode.
CONT key	Restarts executing the paused program from the current paused position. The R3752H series enters the BASIC execution mode.
STOP key	Causes the paused program to be terminated and the PROGRAM LED to go off. If the PROGRAM LED is on, but the REMOTE LED is still on, this key functions as the LOCAL key.

4.1.2 LOAD Mode

The LOAD mode allows displaying the files in the drives (drives A to D) and loading BASIC files. Pressing the LOAD key in the BASIC stop mode causes a screen like that shown in Figure 4-4 to appear.

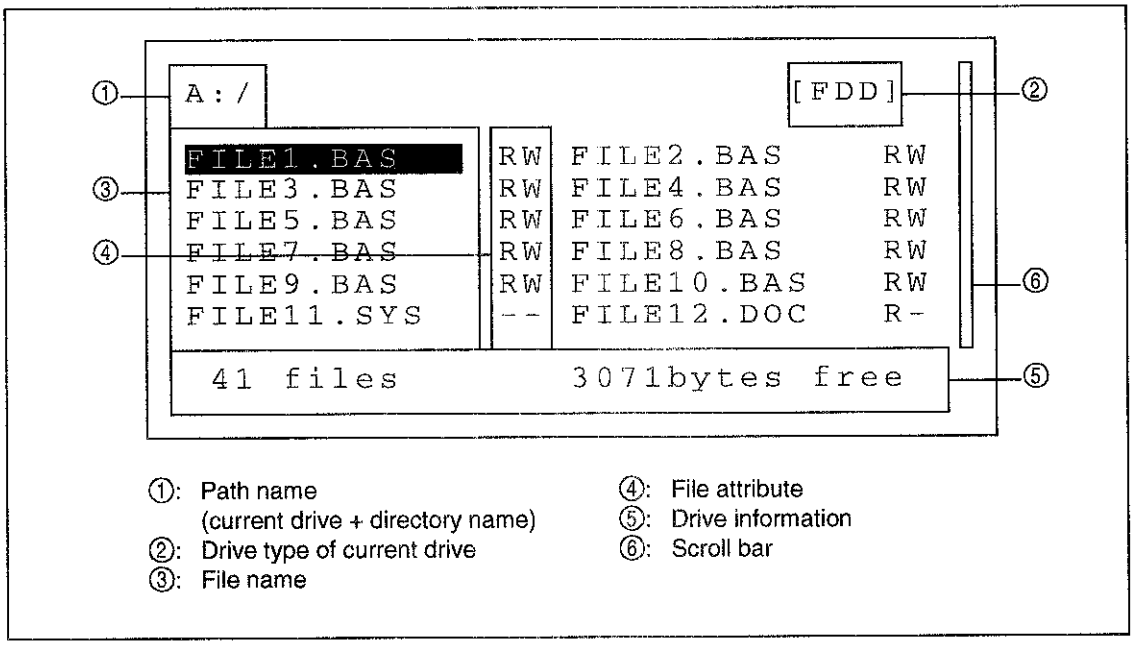


Figure 4-4 LOAD Mode Screen

The first line shows the current path name (①) and the current drive type (②). The path name means the drive + directory name, indicating which directory of which drive is currently used as the working directory.
The second through seventh lines show the file names (③) and attributes (④) in two columns (one screen shows the data for 12 files). The cursor is indicated by reversing the display of a file name. The file at the cursor position is currently being processed.
The eighth line shows the number of files and free area (⑤) in the current drive.
On the right end is a scroll bar (⑥). It indicates the ratio of the displayed files to all of the files included in the current directory.

- Drive type:
  [FDD]; Floppy Disk Drive
  [RAM]; RAM drive
  [ROM]; ROM drive

- File attributes:
  RW; Read/Write file (allowing both read and write)
  R-; Read Only file
  --; System file (inhibiting both read and write)
  <D>; Directory (sub directory)

Figure 4-5 shows the keys available in this mode. (Only the keys surrounded by the dotted line can be used.)

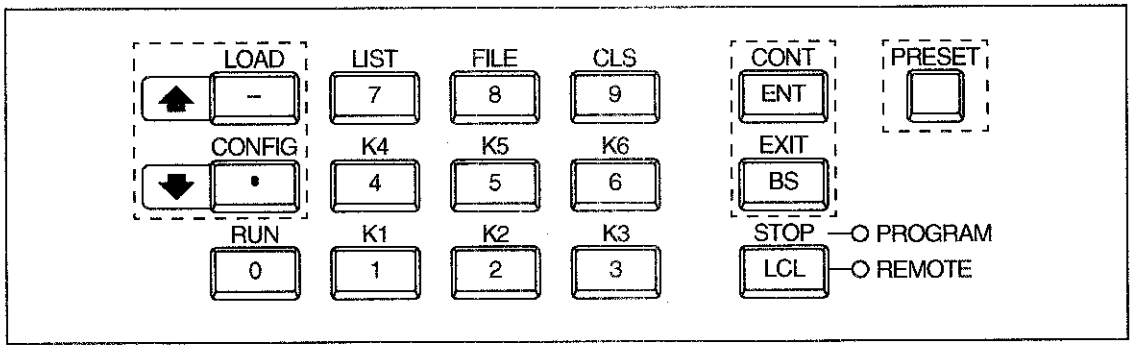


Figure 4-5 Key Arrangements in LOAD Mode

Name	Function
↑, ↓ key	Used to move the cursor.
ENT key	If the file indicated by the cursor is a sub directory, makes sub directory the working directory and displays the files in the directory. If the file indicated by the cursor is a text file, pressing this key loads this file to memory and places the R3752H series in the BASIC mode. (Even if the text file is not a BASIC file, the R3752H series enters the BASIC mode instead of the LOAD mode.)
EXIT key	If the current working directory is the root directory, the R3752H series exits the LOAD mode and returns to the BASIC mode. If the working directory is a sub directory, this key moves the working directory to the previous parent directory and displays the files in the directory.

* The LOAD mode does not allow to change the drive. The drive can be changed only in the FILE mode. To change the drive in the LOAD mode, once enter the FILE mode, change the directory and then return to the LOAD mode.

4.1.3 FILE Mode

This mode is used for file and drive operations such as file deletion and file copy between drives. Pressing the FILE key in the BASIC stop mode causes a screen like that shown in Figure 4-6 to appear.

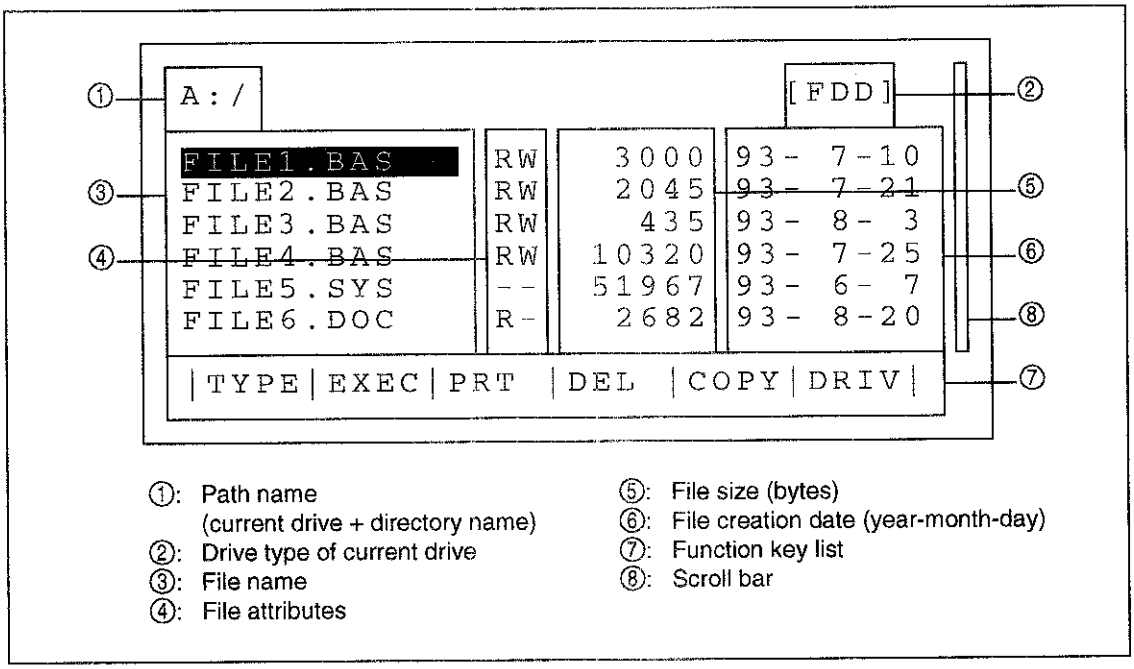


Figure 4-6 FILE Mode Screen

The first line shows the current path name (①) and the current drive type (②). The path name means the drive + directory name, indicating which directory of which drive is currently used as the working directory.
The second through seventh lines show the file name (③), attributes (④), file size in bytes (⑤), and file creation date (⑥: year-month-day) in one column (one screen shows the data for six files). The cursor is indicated by reverse display of a file name. The file at the cursor position is currently being processed.
The eighth line shows the functions available in the FILE mode which are allocated to function keys K1 to K6 (⑦).
On the right end is a scroll bar (⑧). It indicates the ratio of the displayed files to all of the files included in the current directory.

- Drive type:
  [FDD]; Floppy Disk Drive
  [RAM]; RAM drive
  [ROM]; ROM drive

- File attributes:
  RW; Read/Write file (allowing both read and write)
  R-; Read Only file
  --; System file (inhibiting both read and write)
  <D>; Directory (sub directory)

Figure 4-7 shows the keys available in this mode. (Only the keys surrounded by the dotted line can be used.)

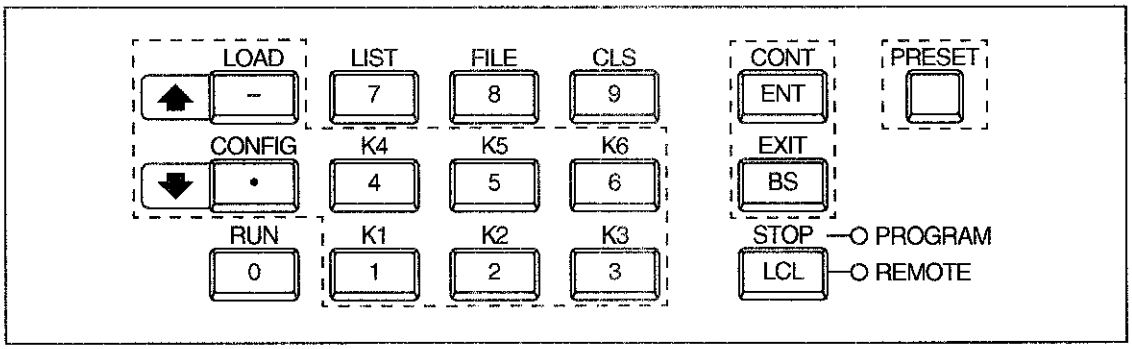


Figure 4-7 Key Arrangements in FILE Mode

Name	Function
↑, ↓ key	Used to move the cursor. In the FILE mode, pressing the ↑ key moves the cursor upward and pressing the ↓ key moves the cursor downward.
ENT key	If the file indicated by the cursor is a sub directory, this key makes sub directory the working directory and displays the files in the directory.
EXIT key	If the current working directory is the root directory, the R3752H series exits the FILE mode and returns to the BASIC mode. If the working directory is a sub directory, this key moves the working directory to the previous parent directory and displays the files in the directory.
TYPE (K1) key	If the file indicated by the cursor is a readable text file, this key displays the file contents. (For details, see (1) below.)
EXEC (K2) key	If the file indicated by the cursor is a text file, it is assumed to be a BASIC file and the BASIC temporarily executes the file. The R3752H series exits the FILE mode and enters the BASIC mode regardless of whether the files have been loaded or the execution has succeeded.
PRT (K3) key	If the file indicated by the cursor is a readable text file, this key outputs the file contents to the printer connected to the RS-232 or GPIB connector. (For details, see (3) below.)
DEL (K4) key	If the file indicated by the cursor is a writable file (the file attribute is "RW"), this key deletes the file. (For details, see (4) below.)
COPY (K5) key	If the file indicated by the cursor is a readable file, this key copies the file between drives. (For details, see (5) below.)

Name	Function
DRIV (K6) key	This key is used to change the current drive or to initialize the floppy disk. (For details, see (6) below.)

(1) TYPE (file contents display) function

The TYPE key displays the file contents on the screen.
Pressing the TYPE (K1) key in the FILE mode causes a screen like that shown in Figure 4-8 to appear if the file indicated by the cursor is a readable text file.

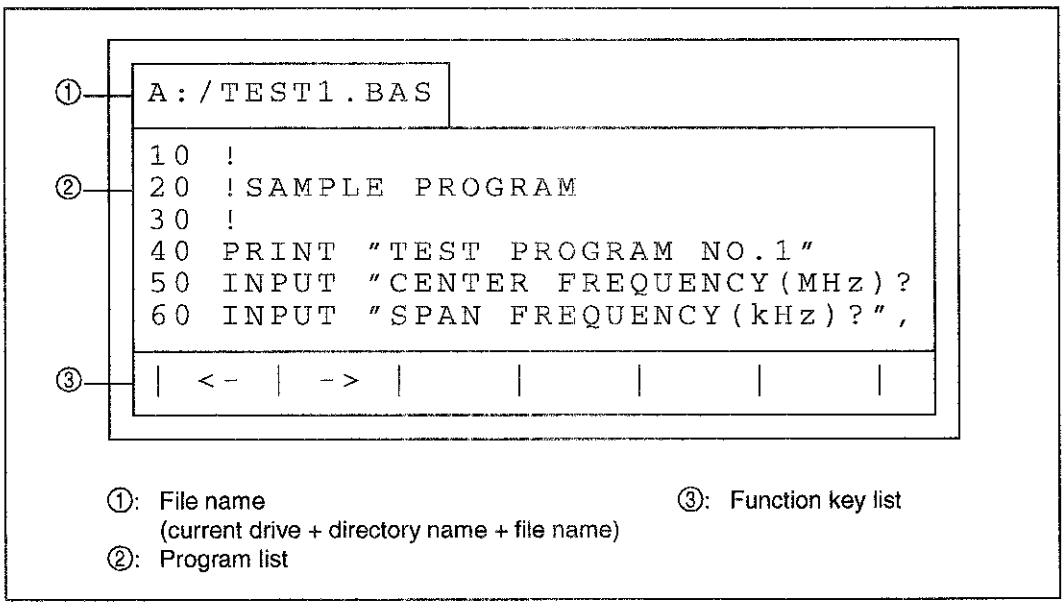


Figure 4-8 TYPE (file contents display) Screen

The first line shows the current path name (①). The path name means the drive + directory name + current file name.
The second through seventh lines show the file contents (②). One line can display a maximum of 32 characters. If it contains more than 32 characters, the exceeding characters can be displayed by shifting the screen horizontally with function keys.
The eighth line shows the functions available in TYPE mode (file contents display) (③). (Function keys shown as blank are allocated no function.)

Figure 4-9 shows the keys available in this mode. (Only the keys surrounded by the dotted line can be used.)

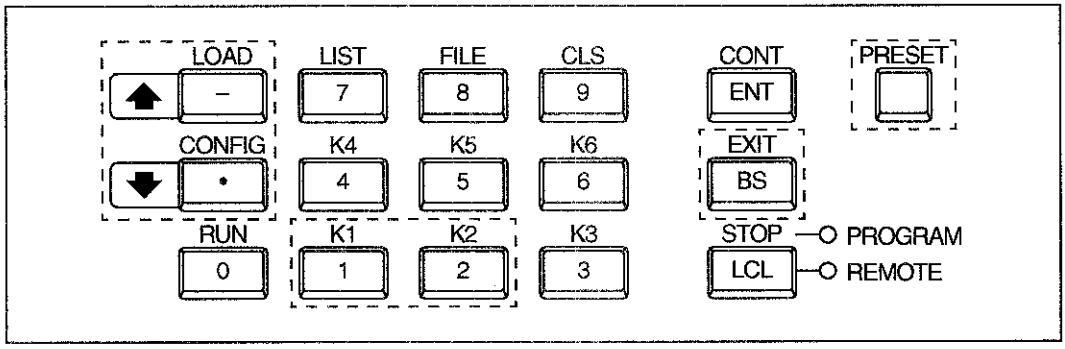


Figure 4-9 Key Arrangements in TYPE (file contents display) Mode

Name	Function
↑, ↓ key	Used to scroll the list display of file contents. Pressing the ↑ key scrolls the display upward and pressing the ↓ key scrolls the display downward.
<- (K1), -> (K2) key	If more than 32 characters are contained in one line, these keys can be used to display the exceeding data. One line can contain a maximum of 256 characters. Characters after the 256th character, if any, are not displayed (that is, ignored).
EXIT key	The R3752H series exits the TYPE (file display) mode and returns to the FILE mode.

(2) EXEC (BASIC file execution) function

When the file indicated by the cursor is a text file, the EXEC key temporarily executes that file. When the program executed by EXEC completes or stops, it is removed from memory.

(3) PRT (file contents print) function

The PRT function outputs the contents of a text file to a printer.
If the file indicated by the cursor is a readable text file, pressing the PRT (K3) key in the FILE mode causes a screen like that shown in Figure 4-10 to appear.

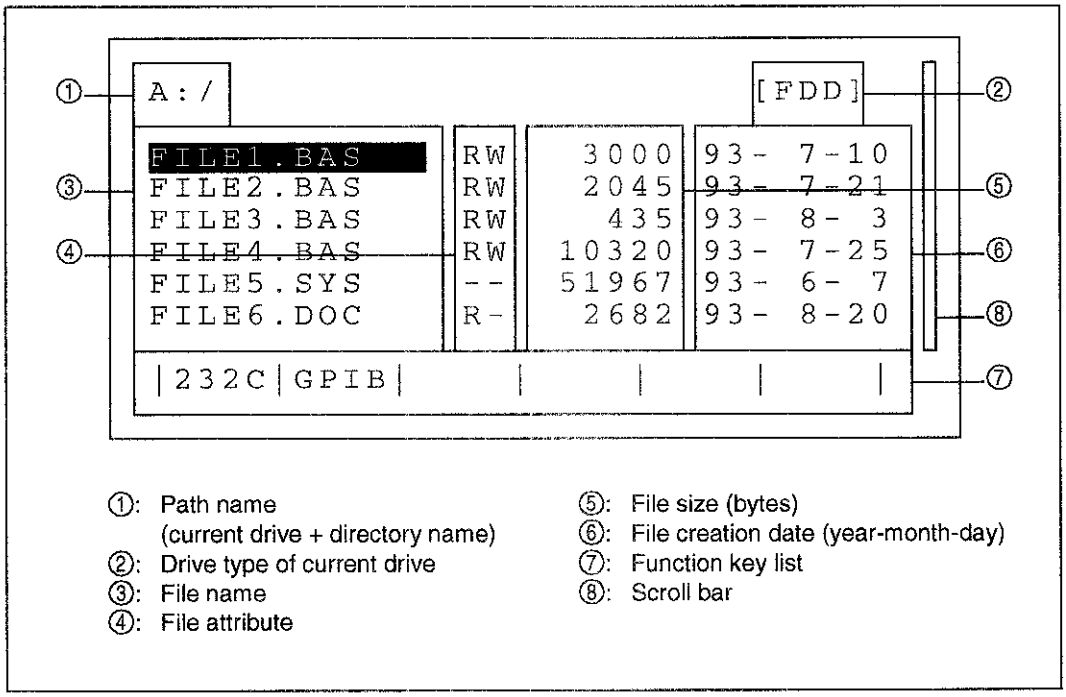


Figure 4-10 PRT (file contents print) Screen

The first through seventh lines are the same as those for FILE mode screen (see Figure 4-6). The function keys displayed in the eighth line are those for a printer. (Function keys shown as blank are allocated no functions.)

Figure 4-11 shows the keys available in this mode. (Only the keys surrounded by the dotted line can be used.)

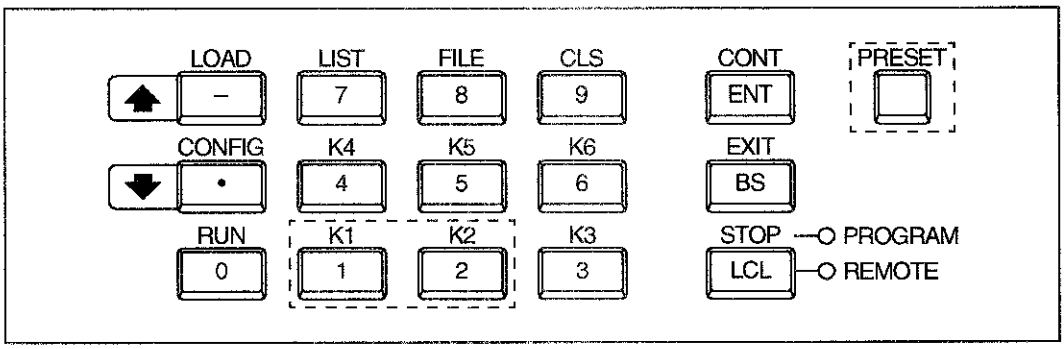


Figure 4-11 Key Arrangements for PRT (file contents print)

Name	Function
232C (K1) key	Outputs the contents of the file indicated by the cursor through RS-232. To use RS-232, the following settings are necessary: 1. Baud rate 2. Parity 3. Character length 4. Stop bits These settings must be the same as those of the output destination. They may be set in the CONFIG mode. (For details, see sub-section 4.1.4 "CONFIG Mode".)
GPIB (K2) key	Outputs the contents of the file indicated by the cursor through GPIB. Before using GPIB, set CONTROLLER = ON in the CONFIG mode and set the printer address. (For details, see sub-section 4.1.4 "CONFIG Mode".) To stop the output through GPIB, press the PRESET key.

(4) DEL (file deletion) function

If the file indicated by the cursor is a writable file, pressing the DEL (K4) key in the FILE mode causes a message like that shown in Figure 4-12 to appear on the screen.

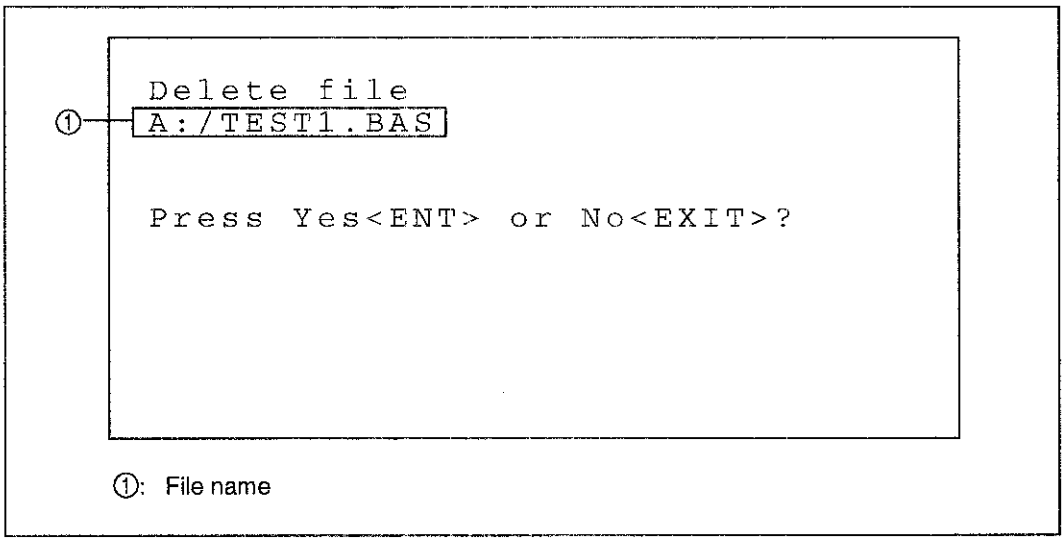


Figure 4-12 DEL (file deletion) Screen

Figure 4-13 shows the keys available in this mode. (Only the keys surrounded by the dotted line can be used.)

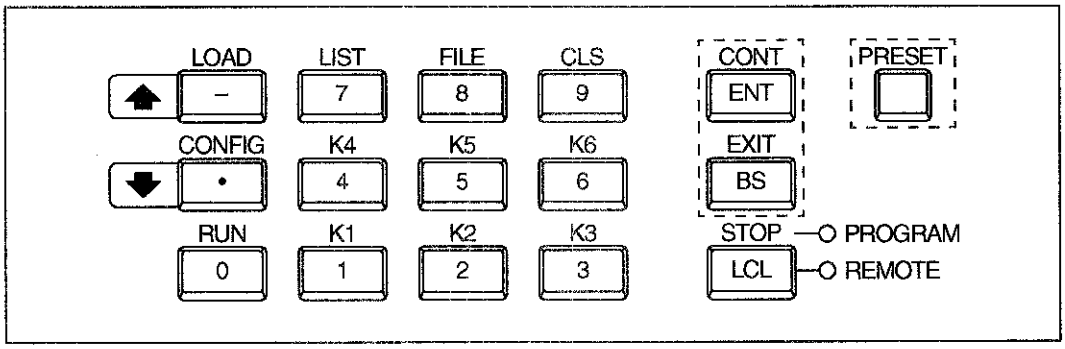


Figure 4-13 Key Arrangements for DEL (file deletion)

Name	Function
ENT key	Deletes the file indicated by the cursor.
EXIT key	Returns to the FILE mode without deleting the file.

(5) COPY (file copy between drives) function

The COPY key is used to copy files between drives. That is, it copies the specified file to the root directory in the copy destination drive.
If the file indicated by the cursor is a readable file, pressing the COPY (K5) key in the FILE mode causes a screen like that shown in Figure 4-14 to appear.

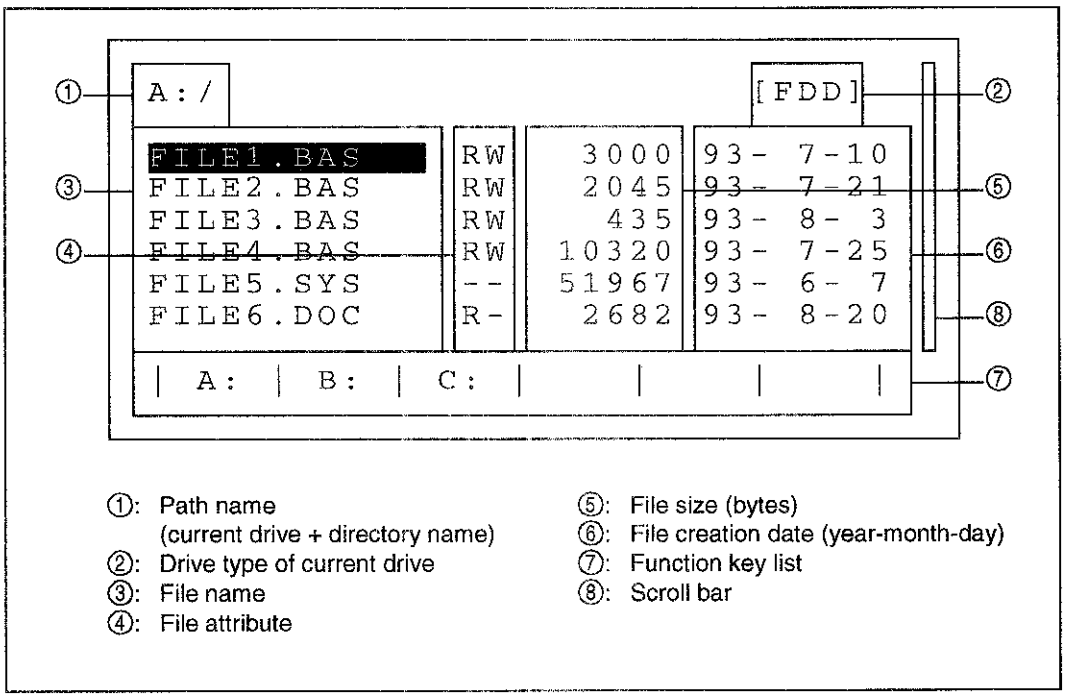


Figure 4-14 COPY (file copy between drives) Screen

The first through seventh lines are the same as those for FILE mode screen (see Figure 4-6). The function keys displayed in the eighth line are those for COPY. (Function keys shown as blank are allocated no functions.)

Figure 4-15 shows the keys available in this mode. (Only the keys surrounded by the dotted line can be used.)

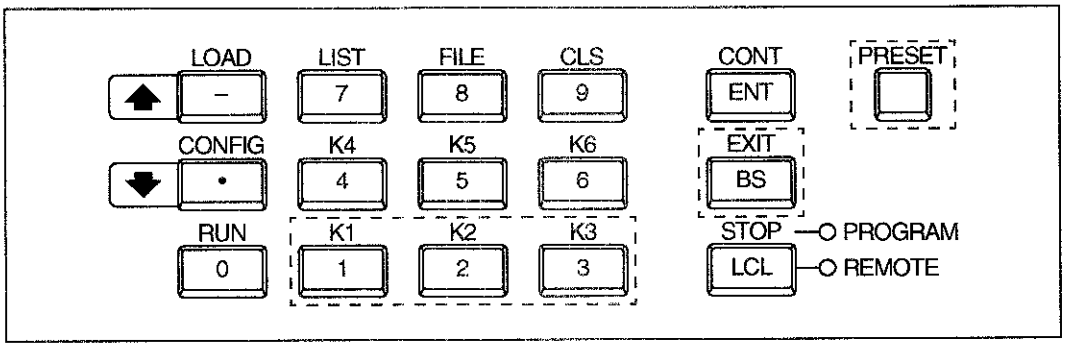


Figure 4-15 Key Arrangements in COPY (file copy between drives) Mode

Name	Function
A: (K1), B: (K2), C: (K3) key	These keys specify the copy destination drive. Files cannot be copied within the same drive. Directories cannot be copied.
EXIT key	Stops copying and returns to the FILE mode.

Specifying the drive causes a message like that shown in Figure 4-16 to appear.

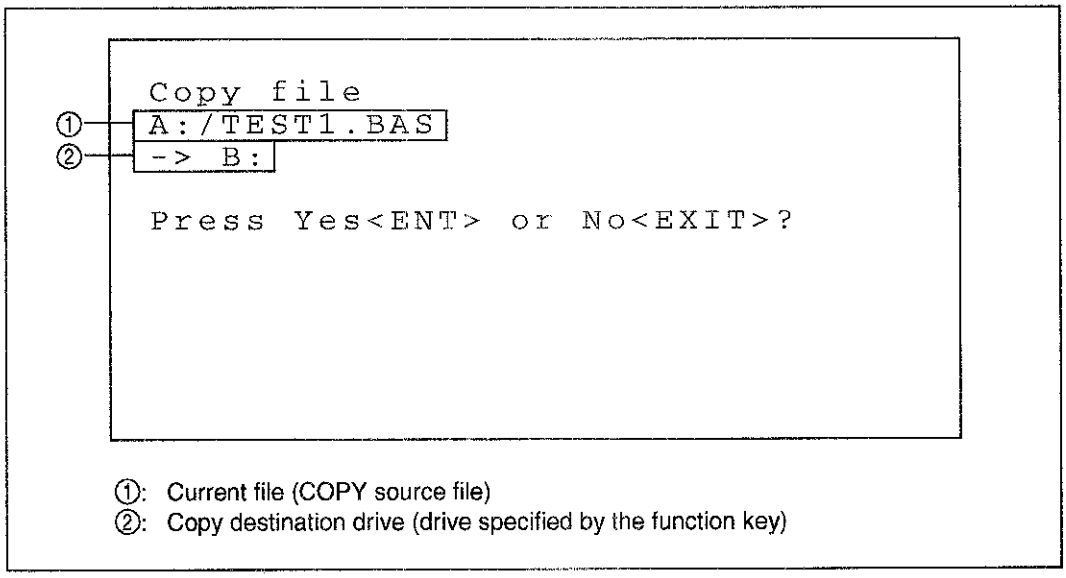


Figure 4-16 COPY (file copy between drives) Check Screen

In this screen, check the source file (①) and copy destination drive (②). The source file is the file indicated by the cursor in the FILE mode.

Figure 4-17 shows the keys available in this mode. (Only the keys surrounded by the dotted line can be used.)

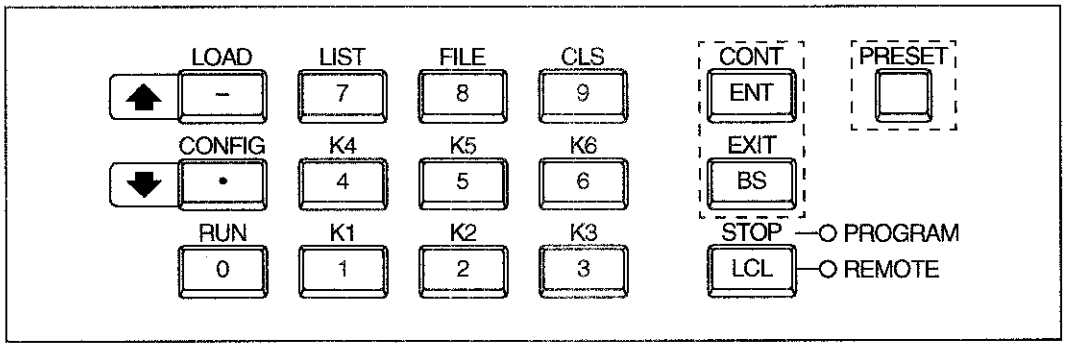


Figure 4-17 Key Arrangements for COPY (file copy between drives)

Name	Function
ENT key	Executes copy and then returns to the FILE mode.
EXIT key	Stops copying and returns to the FILE mode.

(6) DRIV (drive operation) function

The DRIV key is used for drive operations such as changing the current drive or initializing the floppy disk.
Pressing the DRIV (K6) key in the FILE mode causes a screen like that shown in Figure 4-18 to appear.

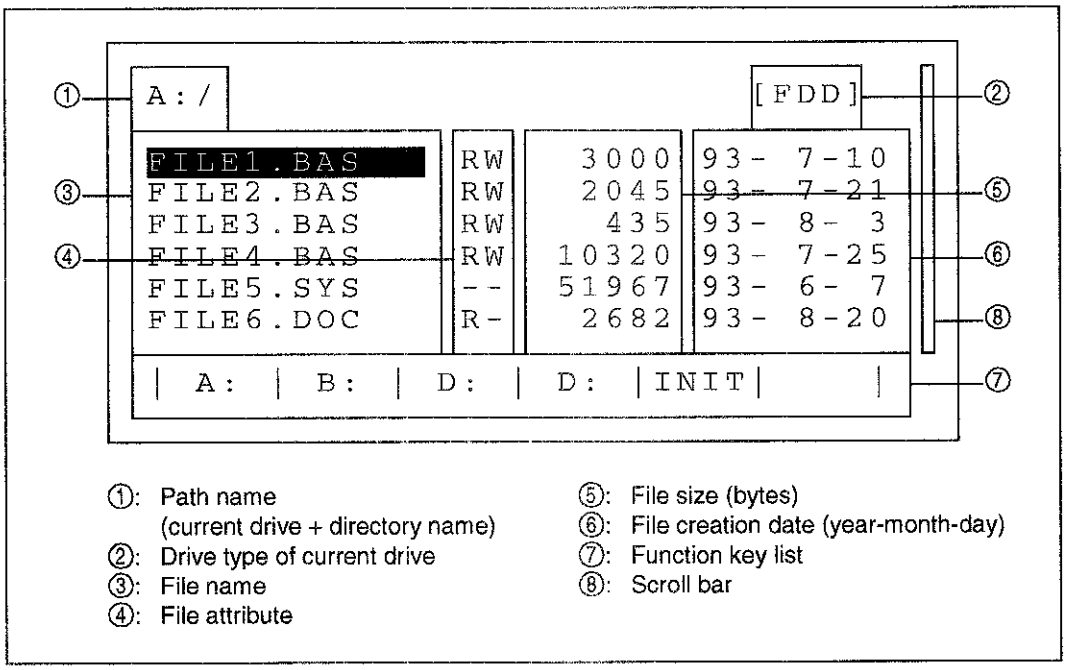


Figure 4-18 DRIV (drive operation) Screen

The first through seventh lines are the same as those for FILE mode screen (see Figure 4-6). The function keys displayed in the eighth line are those for DRIV.

Figure 4-19 shows the keys available in this mode. (Only the keys surrounded by the dotted line can be used.)

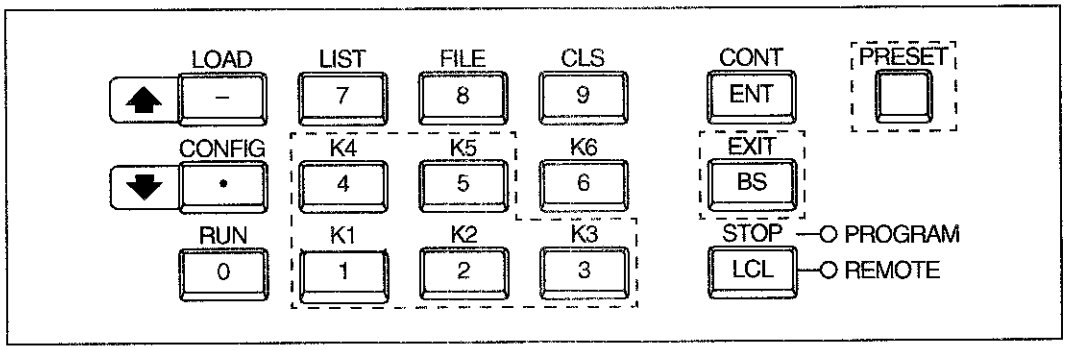


Figure 4-19 Key Arrangements for DRIV (drive operation)

Name	Function
A: (K1), B: (K2), C: (K3), D: (K4) key	These keys are used to change the current drive. After changing the drive, the R3752H series returns to the FILE mode. (This is the only way to change the drive from the panel.)
INIT key	Initializes the floppy disk. (For details, see (7) below.)
EXIT key	Stops the DRIV operation and returns to the FILE mode.

(7) INIT (floppy disk initialization) function

The INIT key is used to initialize the floppy disk (drive A).
Pressing the INIT (K5) key from DRIV (drive operation) causes a message like that shown in Figure 4-20 to appear.

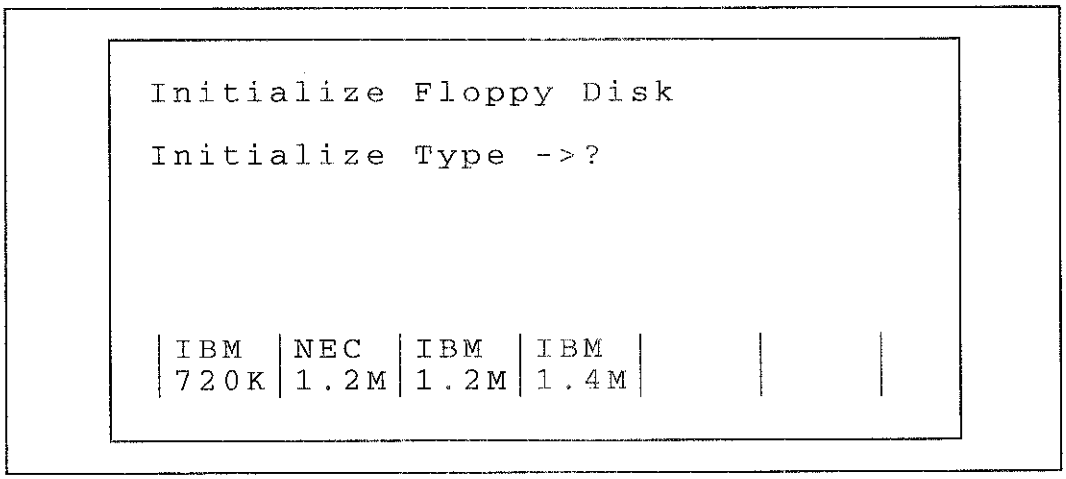


Figure 4-20 INIT (floppy disk initialization) Selection Screen

First, select the initialization mode (format type) of the floppy disk.

Figure 4-21 shows the keys available in this mode. (Only the keys surrounded by the dotted line can be used.)

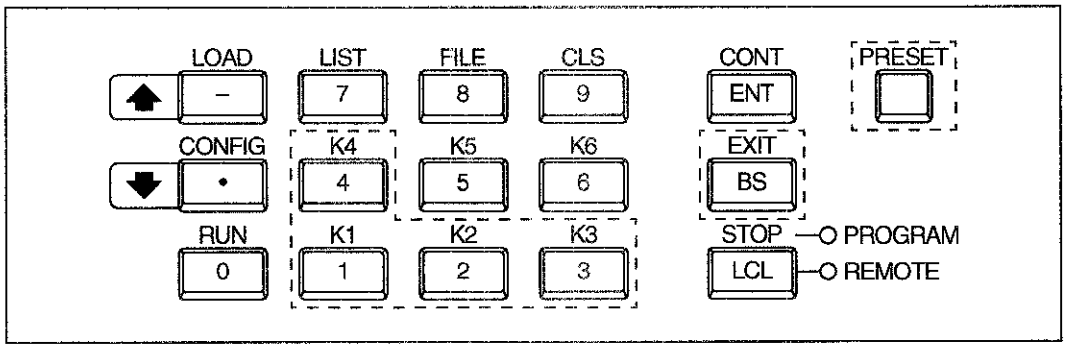


Figure 4-21 Key Arrangements for Selecting Initialization Size

Name	Function
IBM 720K (K1) key	Initializes a 2DD floppy disk in the 720K-byte 9-sector/track format (same as the IBM 2DD floppy disk format).
NEC 1.2M (K2) key	Initializes a 2HD floppy disk in the 1.2M-byte 8-sector/track format (same as the NEC PC-9801 Series 2HD floppy disk format).
IBM 1.2M (K3) key	Initializes a 2HD floppy disk in the 1.2M-byte 15-sector/track format.
IBM 1.4M (K4) key	Initializes a 2HD floppy disk in the 1.4M-byte 15-sector/track format.
EXIT key	Returns to the FILE mode without executing initialization.

When the 720K-byte, 1.2M-byte or 1.4M-byte format is selected, the screen displays a message like that shown in Figure 4-22.

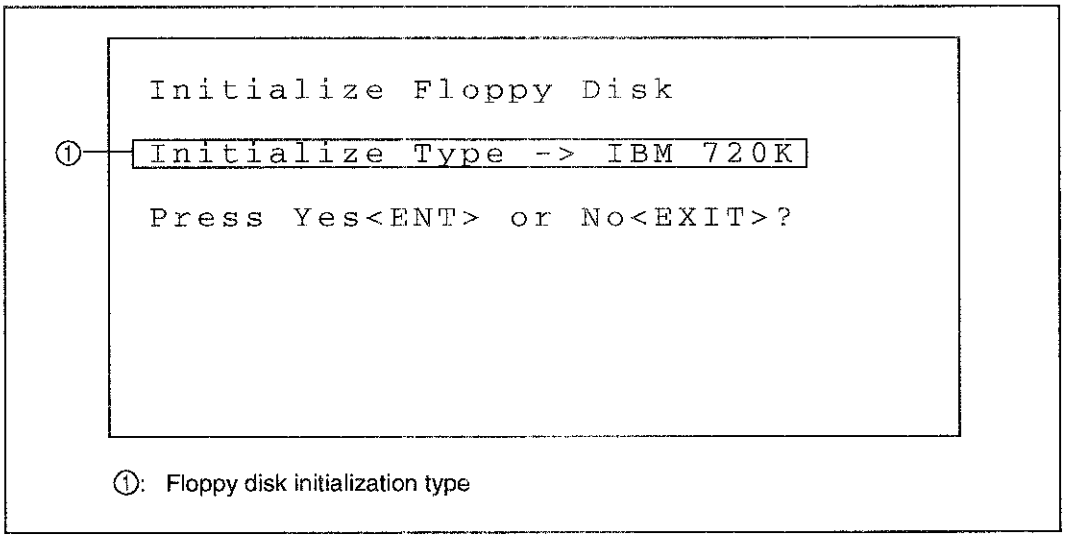


Figure 4-22 INIT (floppy disk initialization) Check Screen

In this screen, check the floppy disk initialization size (①).

Figure 4-23 shows the keys available in this mode. (Only the keys surrounded by the dotted line can be used.)

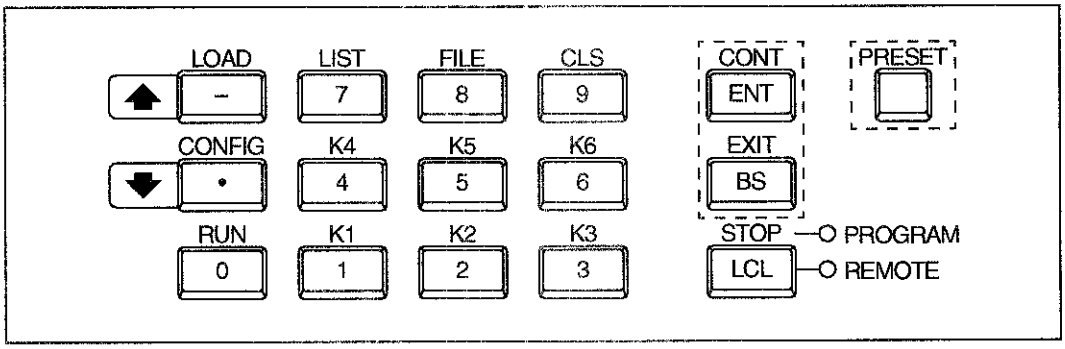


Figure 4-23 Key Arrangements for Checking Initialization

Name	Function
ENT key	Executes initialization. After that, the R3752H series returns to the FILE mode.
EXIT key	Returns to the FILE mode without executing initialization.

4.1.4 CONFIG Mode

This mode allows the GPIB and serial settings. Pressing the CONFIG key while the BASIC is being stopped causes a screen like that shown in Figure 4-24 to appear.

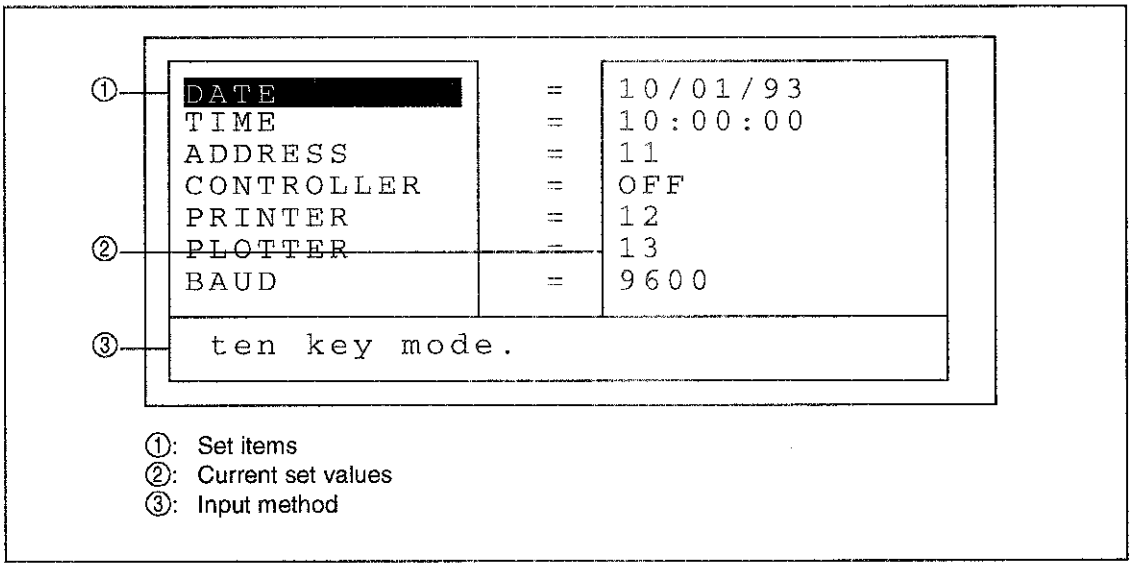


Figure 4-24 CONFIG Mode Screen (for ten-key input)

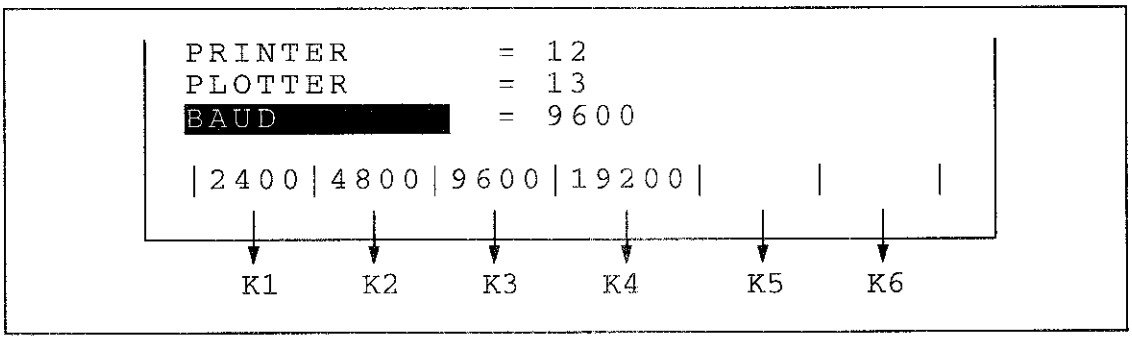


Figure 4-25 CONFIG Mode Screen (for function key input)

The first through seventh lines show the set items (① in Figure 4-24) and the current set values (② in Figure 4-24). The current item is indicated by the cursor.

The eighth line shows the input method (③ in Figure 4-24). When the method is shown as "ten key mode.", input numeric values with the ten keys. For other methods, use function keys K1 to K6 for input (see Figure 4-25). The function keys are K1 through K6 from the left most one. The numeric values shown correspond to these function keys. Select the set values from these numeric values. Function keys shown as blank are unavailable. (In Figure 4-25, the K5 and K6 keys are unavailable.)

Figure 4-26 shows the keys available in this mode. (Only the keys surrounded by the dotted line can be used.)

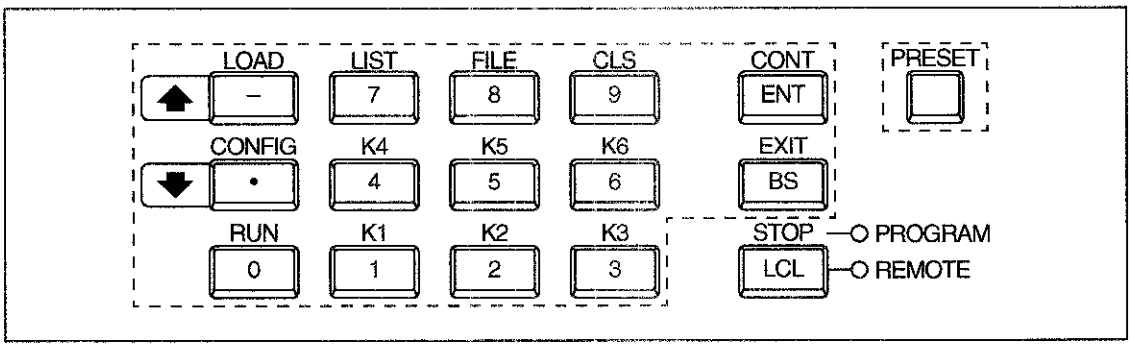


Figure 4-26 Key Arrangements in CONFIG Mode

Name	Function
↑, ↓ key	Used to move the cursor upward or downward. Pressing the ↑ key moves the cursor upward and pressing the ↓ key moves the cursor downward. While inputting values (a cursor appearing at the end of input data), pressing one of these keys stops the input and moves the cursor. The data currently being input is discarded.
ENT key	Used to determine or save the set value. While inputting a set value (a cursor appearing at the end of input data), pressing the ENT key determines the set value. If the set value is correct, the R3752H series changes its set value and completes the set operation. If the set value is incorrect, the R3752H series prompts re-input. When not inputting a set value (no cursor indicating data input at the end of the current set value), pressing the ENT key causes the set value to be saved. A file is generated in C:/CONFIG.BAT. If the file already exists, it is overwritten. If the file contents are valid, the saved set values are used for the next start-up. Before saving to the file, a screen like that shown in Figure 4-27 appears.
BS key	Available as the BS (Back space) key while inputting set values with the ten keys. While inputting with function keys, the BS key is unavailable. When not inputting set values, pressing the BS key causes to return to the BASIC screen without saving the set values in the file.
Ten key	Used to input numeric values for set items.
Function key (K1 to K6)	When the set values are specific values, use function keys instead of ten keys.

Before set values saving to the file, a screen like that shown in Figure 4-27 appears.

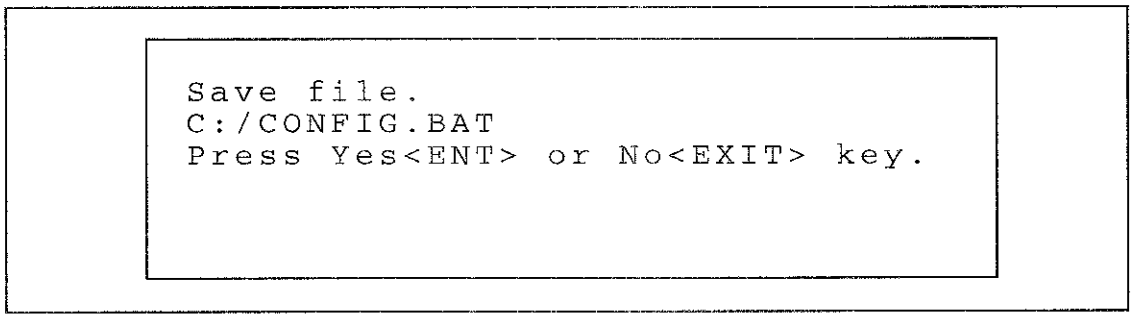


Figure 4-27 Save Check Screen in CONFIG Mode

In the save check screen in CONFIG mode, check whether to execute saving. Press the ENT key to execute saving and the BS (EXIT) key not to execute saving.

<CONFIG mode set items>

In the CONFIG mode, the following items can be set:

* (T) of the item names indicates to use ten keys for input and (F) indicates to use function keys (K1 to K6).

- DATE(T)

  Set the date by inputting data as month-day-year. Determine the input with the ENT key for each data.
  Example: Set the date of October 1, 1993.

  [1] → [0] → [ENT] → [0] → [1] → [ENT] → [1] → [9] → [9] → [3] → [ENT]

  (When the month or day value consists of one digit, "0" may be omitted.)
  The allowable ranges are: 1 to 12 for the month, 1 to 31 for the day and 1991 to 2030 for the year.

- TIME(T)

  Set the time by inputting data as hour-minute-second. Determine the input with the ENT key for each data.
  Example: Set the time of 15:05:30.

  [1] → [5] → [ENT] → [0] → [5] → [ENT] → [3] → [0] → [ENT]

  (When the value consists of only one digit, "0" may be omitted.)
  The allowable ranges are: 0 to 23 for the hour, 0 to 59 for the minute and 0 to 59 for the second.

- ADDRESS(T)

  Set the GPIB address of the R3752H series. The allowable range is 0 to 30. Make sure the set values do not overlap.

- CONTROLLER(F)

  Set on/off the GPIB controller of the R3752H series. For details of the controller, refer to the "programming manual".

- PRINTER(T)

  Specify the address of the GPIB printer used for the R3752H series. The allowable range is 0 to 30. Make sure the set values do not overlap.

- PLOTTER(T)

  (Currently, no plotter functions are supported.)

- BAUD(F)

  Sets the RS-232 interface baud rate of the R3752H series. The baud rate indicates the communication rate, that is, the number of data bits which can be sent and received between the units connected through RS-232. Select one of 2400, 4800, 9600 or 19200 bps.

- CHARBIT(F)

  Set the character length of the RS-232 interface of the R3752H series. The character length means the number of bits of an individual character to be transmitted. Select one of 5, 6, 7 or 8 bits.

- PARITY(F)

  Set the parity check mode of the RS-232 interface of the R3752H series. A parity check is a way to see whether the transmitted data contains errors. Each piece of binary-noted data is added another bit (parity bit). In this method, number of transmitted data and parity bits that are set to "1"s is counted and determined to be even or odd to see whether the data is correctly sent and received.
  For an even parity (EVEN), a parity bit is added so that each piece of binary-noted data contains an even number of bits that are set to "1"s. For an odd parity (ODD), a parity bit is added so that each piece of binary-noted data contains an odd number of bits that are set to "1"s. No parity check (NONE) can also be selected.
  Select one of EVEN, ODD or NONE.

- STOPBIT(F)

  Set the stop bit length of the RS-232 interface of the R3752H series. The stop bit length means the duration of the stop bits.
  Select one of NONE, 1, 1.5 or 2 bits.

- SCREEN(F)

  Set the monitor connected to the R3752H series.

  VGA: Outputs video signals applicable to 640 × 480 line monitors.
  PC98: Outputs video signals applicable to 640 × 400 line monitors for the PC-9801 Series.

  CAUTION!
  To use a monitor for the PC-9801 Series, a conversion connector for the VGA connector is necessary.
  If a monitor for the PC-9801 Series is used in the VGA setting or a VGA monitor is used in the PC98 setting, the normal display will be disabled.

- COUNTRY(F)

  Select the country code as "81" (Japan).

- HOME(F)

  Set the home directory. This must be one of A:, C: or D:.

  * For the initial values of the items above, see section A.1 "Initialization".

4.2 Description of Display Screens

4.2.1 Fluorescent Display Screen

The fluorescent screen on the R3752H series front panel is used for BASIC applications and file displays. This section describes about the screen in individual modes.

(1) Display screen in BASIC mode

When the R3752H series starts up, a fluorescent screen (hereinafter called the screen) like that shown in Figure 4-28 appears.
The BASIC mode allows a display in 32 characters x 8 lines. (For details, see sub-section 4.1.1 "BASIC Mode".)

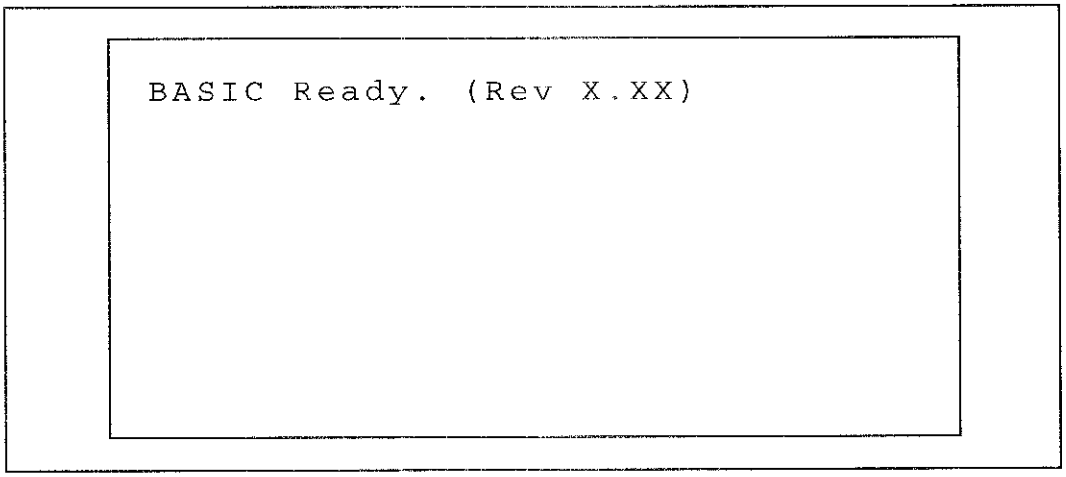


Figure 4-28 BASIC Mode Start-up Screen

(2) Display screen in LOAD mode

When the R3752H series enters the LOAD mode from the BASIC mode, a screen like that shown in Figure 4-29 appears. (For details, see sub-section 4.1.2 "LOAD Mode".)

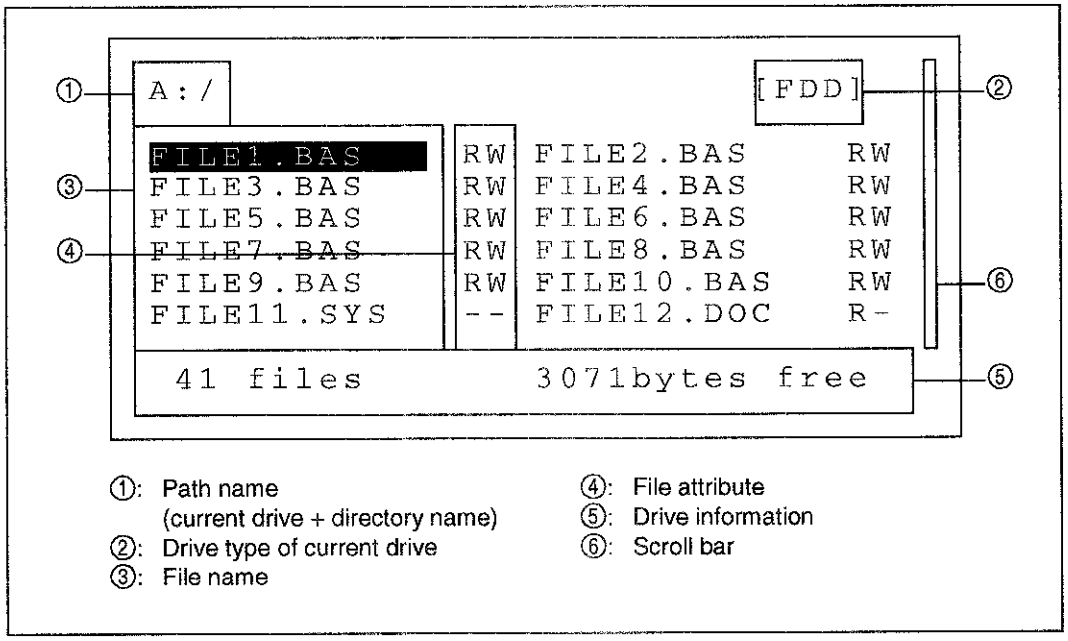


Figure 4-29 Display Screen in LOAD Mode

②: The drive type of the current drive is indicated as follows;

[FDD]: Floppy Disk Drive
[RAM]: RAM drive
[ROM]: ROM drive

④: The file attributes are indicated as follows;

RW: Read/Write file (allowing both read and write)
R-: Read Only file
--: System file (inhibiting both read and write)
<D>: Directory (sub directory)

⑤: The drive information indicates the number of files and free area in the current drive.

⑥: The scroll bar indicates the ratio of the displayed files to all of the files included in the current directory.

(3) Display screen in FILE mode

When the R3752H series enters the FILE mode from the BASIC mode, a screen like that shown in Figure 4-30 appears. (For details, see sub-section 4.1.3 "FILE Mode".)

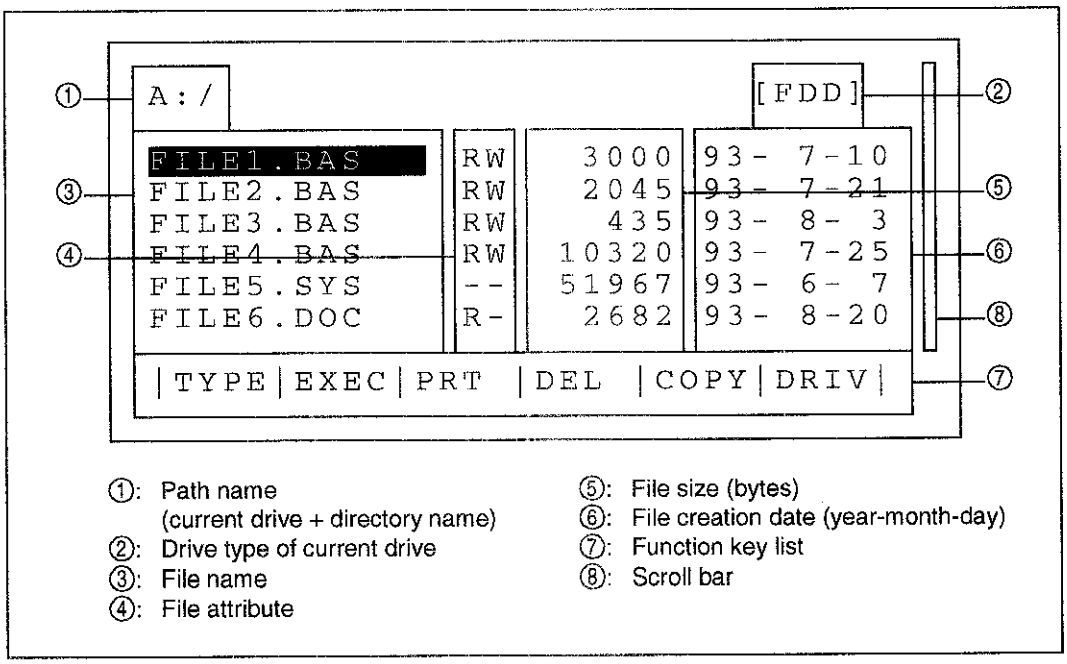


Figure 4-30 Display Screen in FILE Mode

②: The drive type of the current drive is indicated as follows;

[FDD]: Floppy Disk Drive
[RAM]: RAM drive
[ROM]: ROM drive

④: The file attributes are indicated as follows;

RW: Read/Write file (allowing both read and write)
R-: Read Only file
--: System file (inhibiting both read and write)
<D>: Directory (sub directory)

⑦: The function key list indicates the function keys available in the FILE mode.

⑧: The scroll bar indicates the ratio of the displayed files to all of the files included in the current directory.

(4) TYPE (file contents display) screen

When TYPE (K1) is selected with the function key from the FILE mode, a screen like that shown in Figure 4-31 appears if the working file is a text file. (For details, see (1) in subsection 4.1.3 "FILE Mode".)

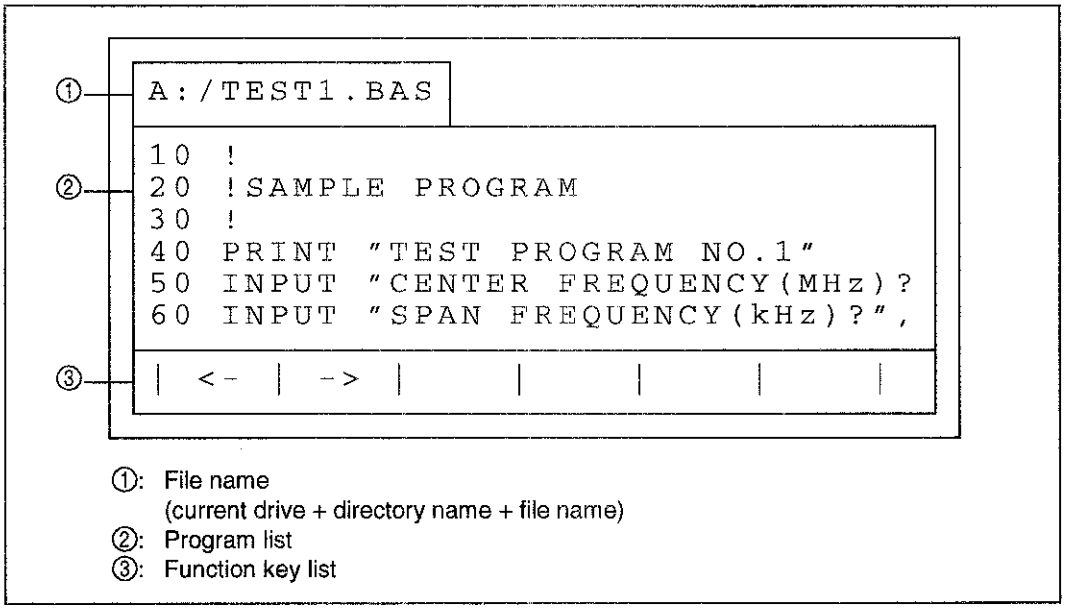


Figure 4-31 TYPE Display Screen

②: The program list is displayed in 32 characters × 6 lines. When a line exceeds 32 characters, display the exceeding characters by shifting the screen horizontally with function keys K1 and K2.
A maximum of 256 characters can be contained in one line. (If more than 256 characters are contained in a line, the characters beginning at the 257th characters are ignored.)

③: The function key list indicates the function keys available by TYPE (file contents display).

(5) PRT (printer output of file contents) screen

When PRT (K3) is selected with the function key from the FILE mode, a screen like that shown in Figure 4-32 appears if the working file is a text file. (For details, see (3) in subsection 4.1.3 "FILE Mode".)

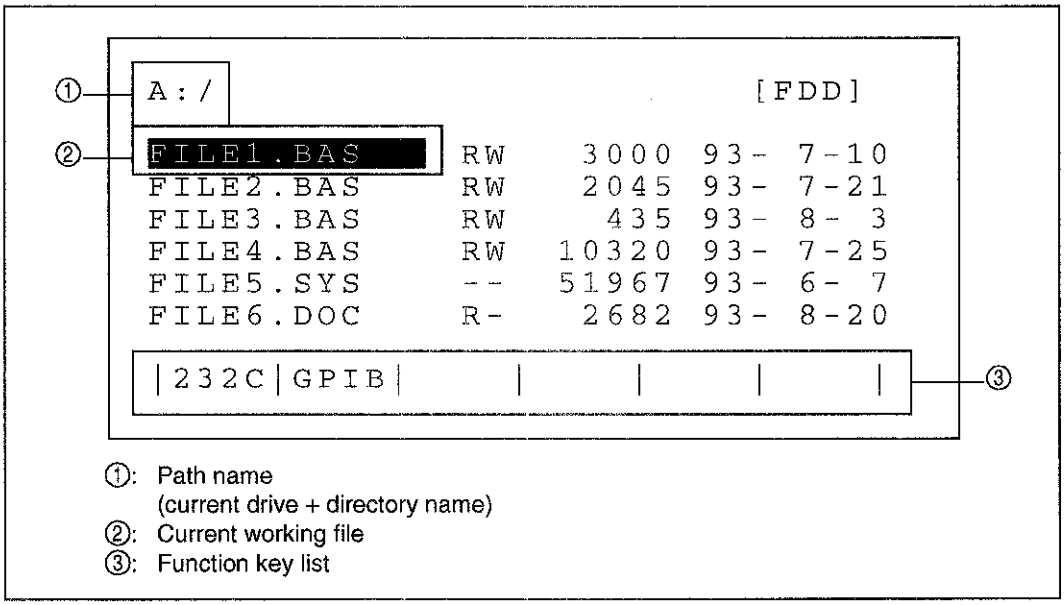


Figure 4-32 PRT Display Screen

②: The file indicated by the cursor will be output.

③: The function key list indicates the function keys available by PRT (printer output of file contents).

(6) DEL (file deletion) screen

When DEL (K4) is selected with the function key from the FILE mode, a screen like that shown in Figure 4-33 appears if the working file is a text file. (For details, see (4) in subsection 4.1.3 "FILE Mode".)

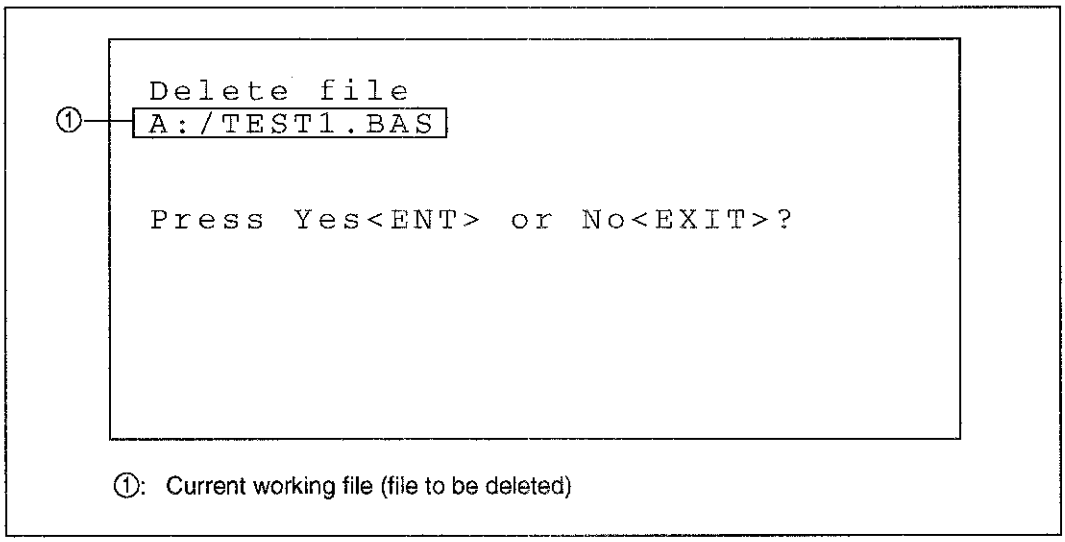


Figure 4-33 DEL Display Screen

①: The current working file is the file indicated by the cursor in the FILE mode.

(7) COPY (file contents copy) screen

When COPY (K5) is selected with the function key from the FILE mode, a screen like that shown in Figure 4-34 appears if the working file is a text file. (For details, see (5) in subsection 4.1.3 "FILE Mode".)

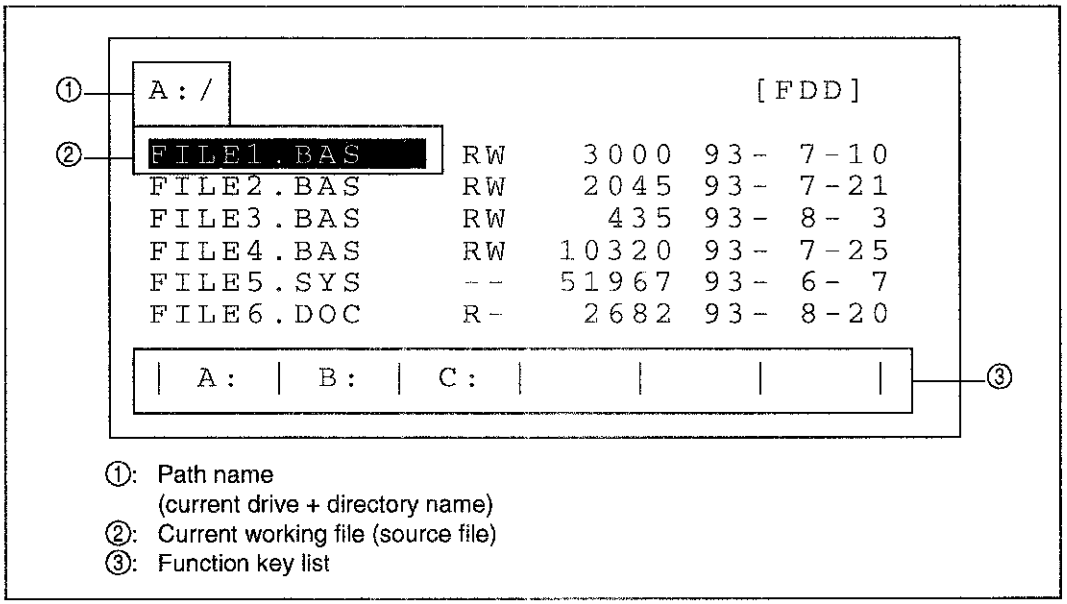


Figure 4-34 COPY Display Screen

②: The file indicated by the cursor is used as the source file.

③: The function key list indicates the function keys available by COPY (file contents copy).

When the copy destination drive is specified by the function key, a screen like that shown in Figure 4-35 appears.

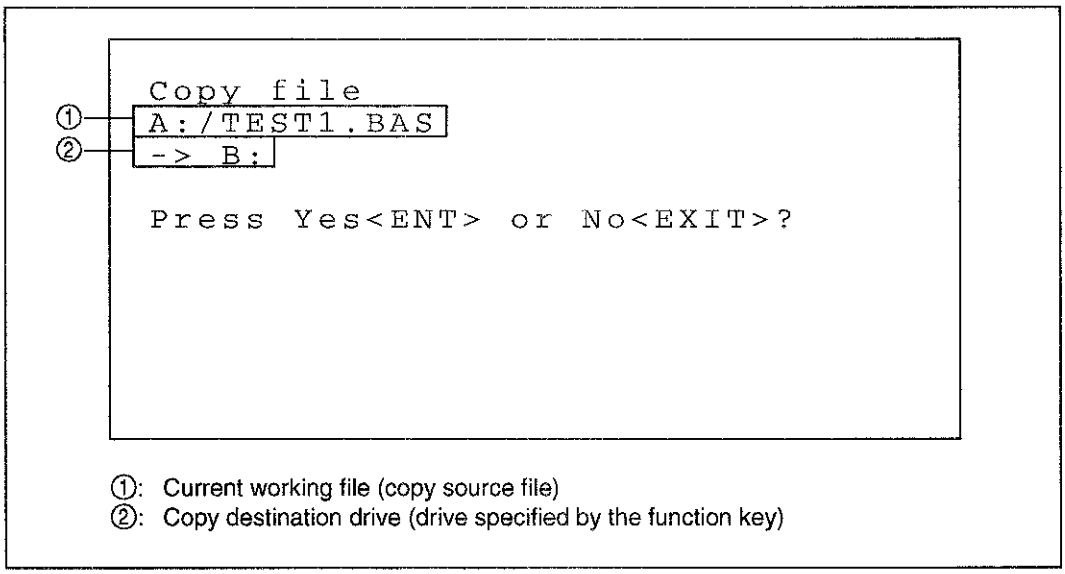


Figure 4-35 Specifying Copy Destination Drive

(8) DRIV (drive operation) screen

Pressing the DRIV (K6) key in the FILE mode causes a screen like that shown in Figure 4-36 to appear. (For details, see (6) in sub-section 4.1.3 "FILE Mode".)

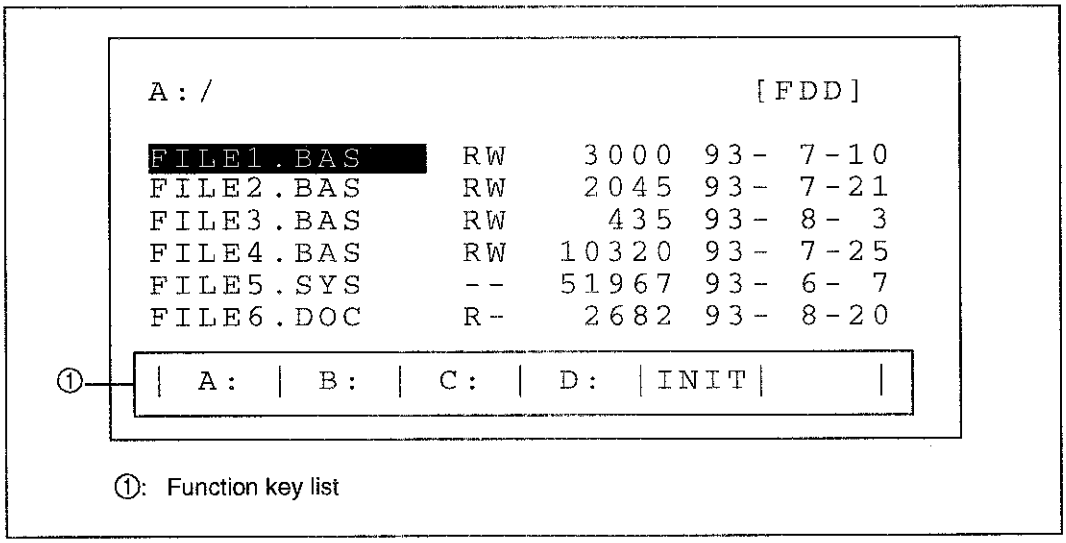


Figure 4-36 DRIV Display Screen

①: The function key list indicates the function keys available by DRIV (drive operation).

(9) INIT (floppy disk initialization) screen

Pressing the INIT (K5: floppy disk initialization) key in the DRIV mode (see Figure 4-36) causes a screen like that shown in Figure 4-37 to appear. (For details, see (7) in subsection 4.1.3 "FILE Mode".)

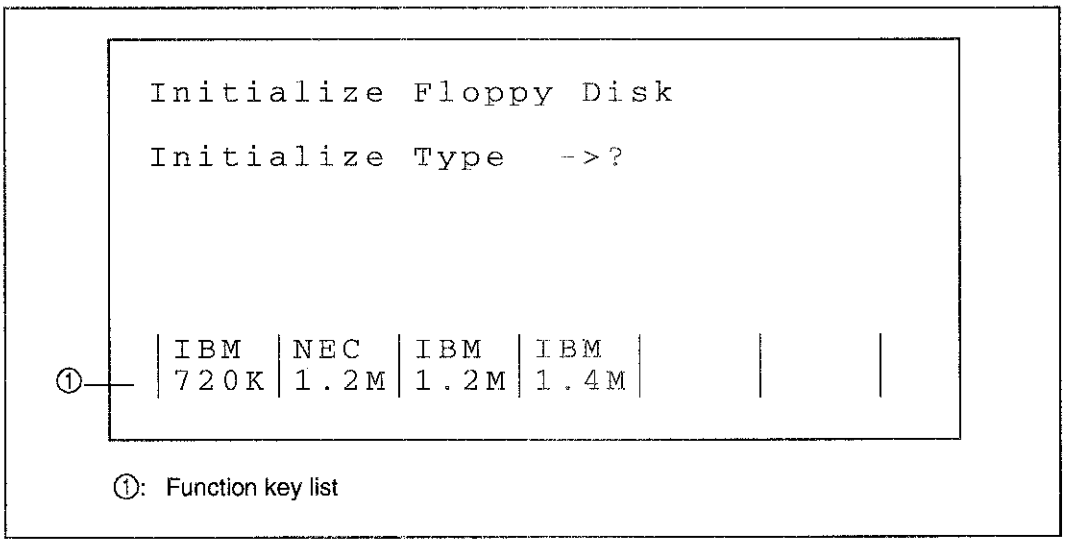


Figure 4-37 INIT Display Screen

①: The function key list indicates the function keys available by INIT (floppy disk initialization).

When the initialization type is determined by the function key, a screen like that shown in Figure 4-38 appears.

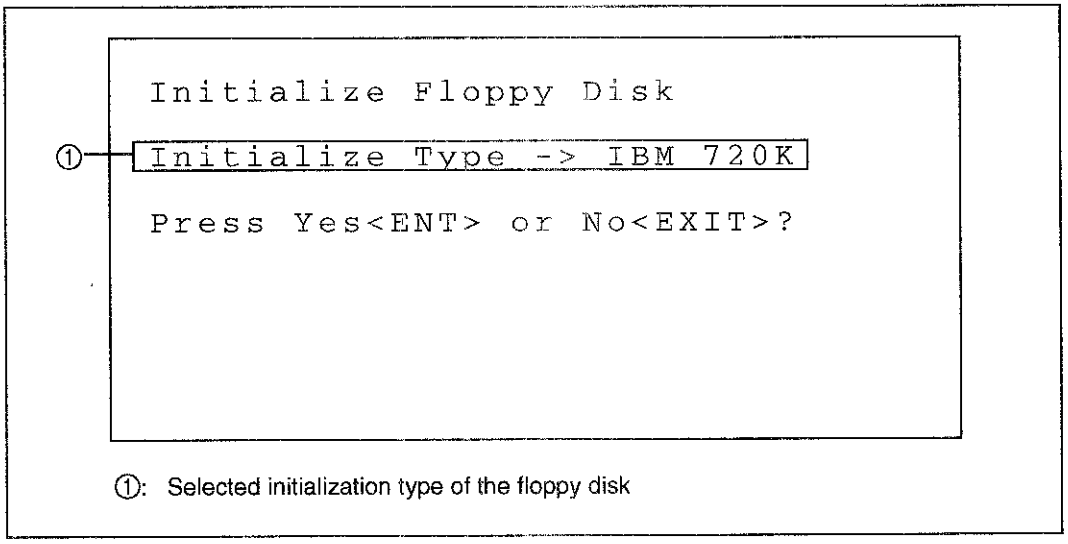


Figure 4-38 Determining Initialization Size

4.2.2 Display Screen in CONFIG Mode

When the R3752H series enters the CONFIG mode from the BASIC screen, a screen like that shown in Figure 4-39 appears. (For details, see sub-section 4.1.4 "CONFIG Mode".)

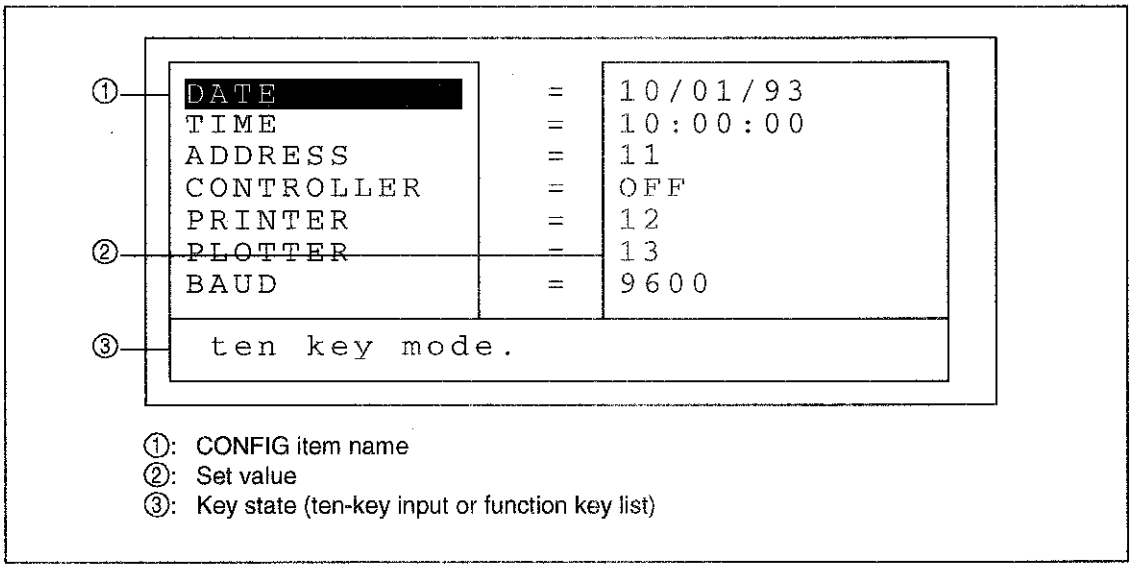


Figure 4-39 CONFIG Mode Screen

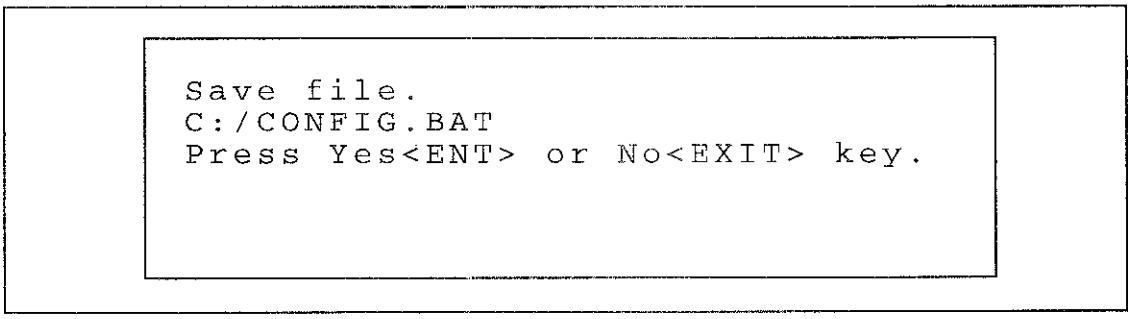


Figure 4-40 Save Check Screen in CONFIG Mode

4.3 Communication with Peripheral Devices

As standard, the R3752H series is equipped with the parallel I/O interface and RS-232 interface as well as the GPIB interface. With these interfaces, it can communicate with peripherals.

- Parallel I/O : Used for communication with peripheral devices such as the handler. (See sub-section 4.3.1.)
- RS-232 : Used for the hard copy output of internal BASIC. (See sub-section 4.3.2.)

4.3.1 Parallel I/O Port

(1) Outline

The parallel I/O port is the input/output port to communicate with the handler or peripherals. Use always the shield cable for the condition.
The parallel I/O connector on the back panel is used for communication. Figure 4-42 shows the internal pin assignment and signals of the connector. These I/O port is controlled with ENTER and OUTPUT commands.

- Input/output port
  There are two output ports and two input/output ports, as follows:
  - Port only for output : A port : 8-bit width
    B port : 8-bit width
  - Input/output port : C port : 4-bit width
    D port : 4-bit width
- Port C status output, port D status output
  Shows the settings of the input of the input/output ports C and D. It is low when C or D port is set to input, it is high when it is set to output.
- Write strobe output for output port
  By generating a negative pulse on the write strobe output, it shows a data is output to some port.
  Figure below shows the timing chart of the write strobe output and data output.

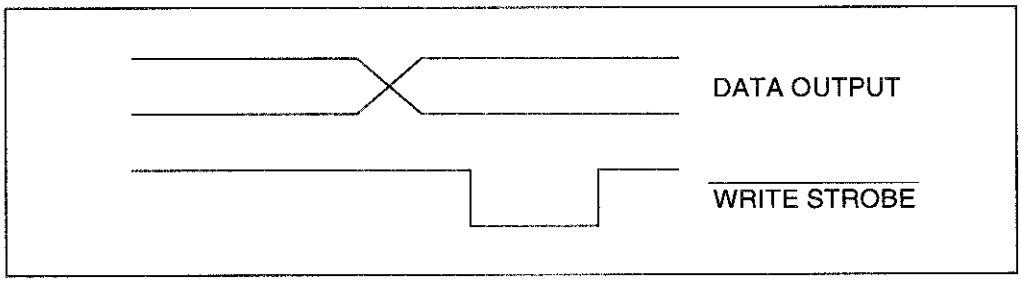
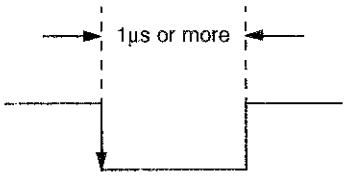


Figure 4-41 Timing Chart of WRITE STROBE

- INPUT 1
  By entering a negative pulse on the INPUT 1, the OUTPUTs 1 and 2 are set to LOW. The pulse width of the input signal to be entered in the INPUT 1 should be more than 1 μs.
- OUTPUT 1 and 2
  These two signal lines are the latch output terminals set to LOW when a negative pulse is entered on the INPUT 1. It can be set to LOW or HIGH with the BASIC command (OUTPUT).
- PASS/FAIL output
  Always LOW is generated.
- Write strobe output for PASS/FAIL output
  Always HIGH is generated.
- SWEEP END
  When the analyzer finishes the sweeping, generates a negative pulse with a width of 10 μs.
- +5V output
  +5V output is provided for the external device. The maximum current to be supplied is 100mA. This line has a fuse which will be blown when overcurrent flows for circuit protection. The blown fuse needs to be replaced.
- EXT TRIG input
  By entering a negative pulse on this line, it is possible to trigger the sweep of measurement. The pulse width should be at least 1 μs. The sweeping starts at the trailing edge of the pulse. When this signal line is used, the trigger mode should be set external source.



(2) Connector Internal Pin Assigned and Signal Standard

Pin No.	Signal name	Function
1	GND	Ground
2	INPUT 1	Negative logic pulse input of TTL level (width: 1 µs or more)
3	OUTPUT 1	Negative logic latch output of TTL level
4	OUTPUT 2	Negative logic latch output of TTL level
5	Output port A0	Negative logic latch output of TTL level
6	Output port A1	Negative logic latch output of TTL level
7	Output port A2	Negative logic latch output of TTL level
8	Output port A3	Negative logic latch output of TTL level
9	Output port A4	Negative logic latch output of TTL level
10	Output port A5	Negative logic latch output of TTL level
11	Output port A6	Negative logic latch output of TTL level
12	Output port A7	Negative logic latch output of TTL level
13	Output port B0	Negative logic latch output of TTL level
14	Output port B1	Negative logic latch output of TTL level
15	Output port B2	Negative logic latch output of TTL level
16	Output port B3	Negative logic latch output of TTL level
17	Output port B4	Negative logic latch output of TTL level
18	EXT TRIG	EXTERNAL TRIGGER input (width: 1 µs or more), negative logic
19	Output port B5	Negative logic latch output of TTL level
20	Output port B6	Negative logic latch output of TTL level
21	Output port B7	Negative logic latch output of TTL level
22	Input/output port C0	Negative logic state input/latch output of TTL level
23	Input/output port C1	Negative logic state input/latch output of TTL level
24	Input/output port C2	Negative logic state input/latch output of TTL level
25	Input/output port C3	Negative logic state input/latch output of TTL level
26	Input/output port D0	Negative logic state input/latch output of TTL level
27	Input/output port D1	Negative logic state input/latch output of TTL level
28	Input/output port D2	Negative logic state input/latch output of TTL level
29	Input/output port D3	Negative logic state input/latch output of TTL level
30	Port C status	TTL level, Input mode: LOW, Output mode: HIGH
31	Port D status	TTL level, Input mode: LOW, Output mode: HIGH
32	Write strobe signal	TTL level, Negative logic, Pulse output
33	PASS/FAIL signal	TTL level, PASS: LOW, FAIL: HIGH, latch output
34	SWEEP END signal	TTL level, Negative logic, Pulse output (width: 10 µs or more)
35	+5V	+5V ± 10%, 100mA MAX
36	Write strobe signal (PASS/FAIL)	TTL level, Negative logic, Pulse output

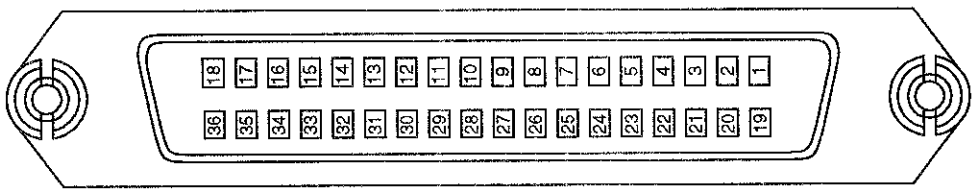
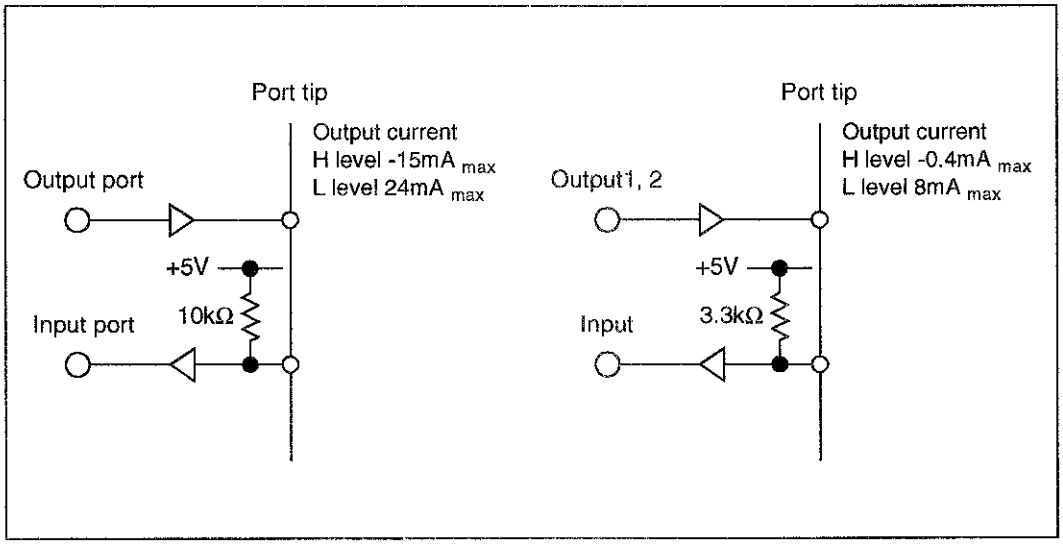


Figure 4-42 36-pin Connector Internal Pin Assignment and Signal



(3) Mode setting of port

Command	Output port	Input port
OUTPUT 36 ; 16	A, B,C, D	
OUTPUT 36 ; 17	A, B, D	C
OUTPUT 36 ; 18	A, B, C	D
OUTPUT 36 ; 19	A, B	CD

To use a parallel I/O port, first set the mode setting of port. The combination of the setting command and the input/output port is referred the above table.

Example :

```
10  OUTPUT 36;19
20  OUTPUT 33;255
30  ENTER  37;A
    :
```

Set the output port for port A and port B, and the input port for port CD.

(4) Each port operation method

Describes the operation method by built-in BASIC.
OUTPUT statement (for output) and ENTER statement (for input) are used for data input/output.
In the BASIC command (OUTPUT and ENTER statements), each port is distinguished by the address used in the statement.

(a) BASIC format

OUTPUT (address) ; (output data)
ENTER (address) ; [variable]
(Input data are assigned to specified variable.)

(b) Address and data range

Address	Port to be used
33	Port A (Output only: OUTPUT statement only)
34	Port B (Output only: OUTPUT statement only)
35	Port C (Input/output: ENTER, OUTPUT)
36	Port D (Input/output: ENTER, OUTPUT)
37	Port CD (Input/output: ENTER, OUTPUT)

- OUTPUT 33, 34, 37
  OUTPUT × × ; 0 to 255 (8-bit)
- OUTPUT 35, 36
  OUTPUT × × ; 0 to 15 (4-bit)

  Note: The OUTPUT 35 concerns with the Set/Reset of Flip Flop.
- ENTER 35, 36
  ENTER × × ; numeric variable (4-bit) (Data from 0 to 15 are assigned.)
- ENTER 37
  ENTER 37 ; numeric variable (8-bit) (Data from 0 to 255 are assigned.)

(5) INPUT 1, OUTPUT 1 and OUTPUT 2 Terminals

By combining with the signal lines of INPUT 1, OUTPUT 1 and OUTPUT 2, convenient functions are provided to easily control external devices.
The functions are; function which sets two latch outputs of OUTPUTs 1 and 2 to LOW by pulse input to INPUT 1, and function which detects the state of OUTPUT 1 by INPUT 1. Also, the state of OUTPUTs 1 and 2 can be controlled by OUTPUT command.

(a) Setting and Reseting of OUTPUT 1 and OUTPUT 2. and Reset

The following four types are provided for set/reset as follows:

- Setting OUTPUT 1 : OUTPUT 35 ; 16
- Setting OUTPUT 2 : OUTPUT 35 ; 48
- Resetting OUTPUT 1 : OUTPUT 35 ; 80
- Resetting OUTPUT 2 : OUTPUT 35 ; 112

(b) INPUT 1 (external input)

The state of variable OUTPUT 1 can be observed by INPUT 1 using ENTER statement.

ENTER 34; (numeric variable)

If 1 is assigned to the numeric variable, OUTPUT 1 is ON (Low level: negative logic), if 0, OUTPUT is OFF (High level).

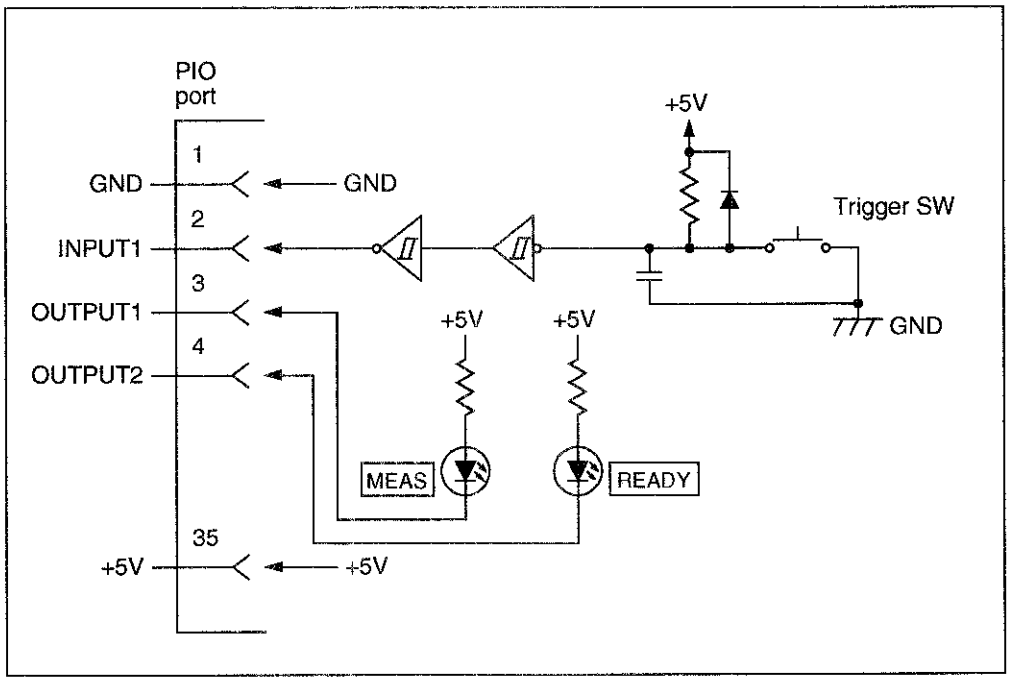
Example :
```
10  OUTPUT 36 ; 16
20  ENTER 34 ; A
30  IF A<> 1 THEN GOTO 20
40  OUTPUT 33 ; 1
      ⋮
```

By observing the state of OUTPUT 1, if OUTPUT 1 is set to ON, then 1 is output to the port A.

① Examples of INPUT 1, OUTPUT 1 and OUTPUT 2

< When program is executed by trigger switch: >

- Circuit example



- Program example

Waiting time for measurement: Represents **[READY]**.
During measurement operation: Represents **[MEAS]**.

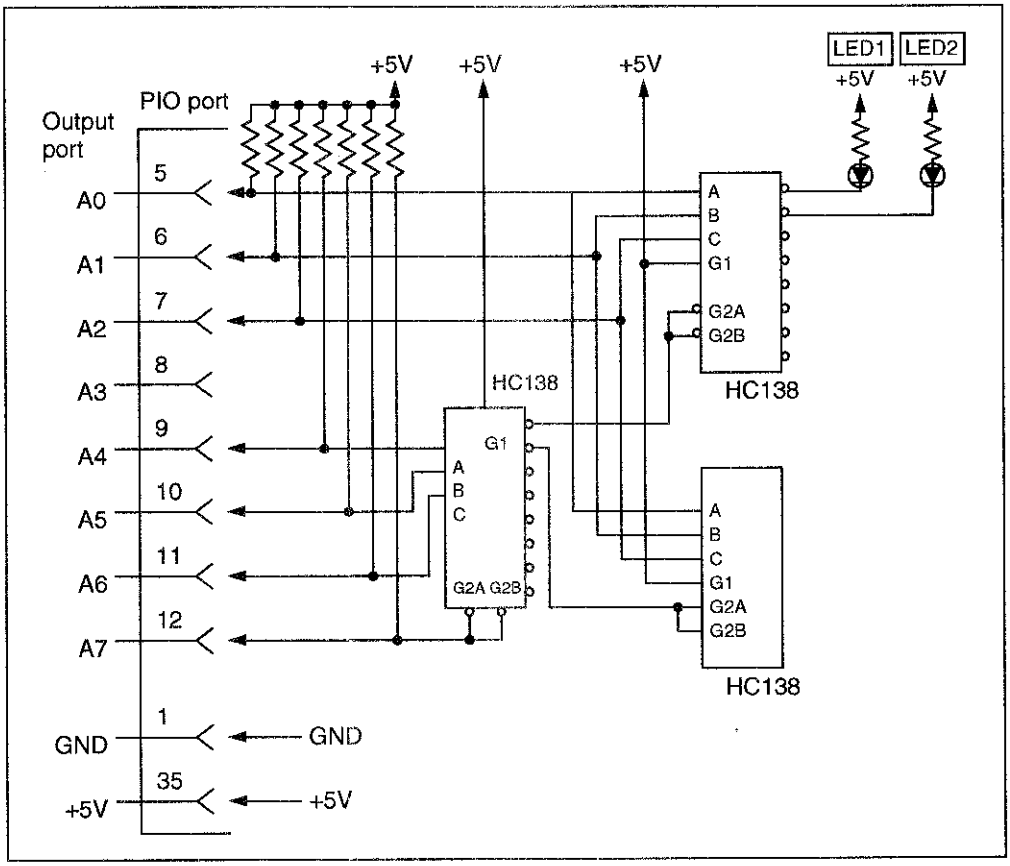
```
10    OUTPUT 35 ; 80
20    OUTPUT 35 ; 112      [READY], [MEAS] turns OFF.

 :                          The R3752H series initial setup
100   OUTPUT 35 ; 48       [READY] turns ON.
110   ENTER 34 ; A
120   IF A < > 1 THEN GOTO 110   Recognition of Trigger SW
130   OUTPUT 35 ; 112      [READY] turns OFF.
 :
 :                          Measurement routine
500   OUTPUT 35 ; 80       [MEAS] turns OFF.
510   GOTO 100             When repeating the measurement
520   STOP
```

② Usage example of output ports A and B

< When LED is used for selecting devices (when port A is used): >

- Circuit example



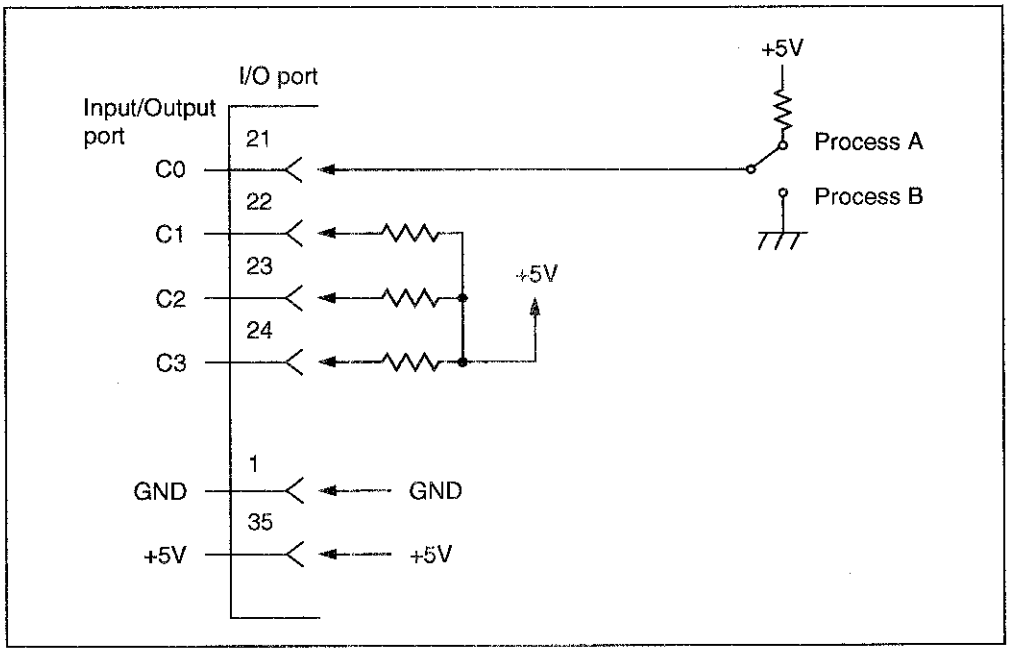
- Program example

```
10    OUTPUT 36 ; 16        Defines ports A, B, C and D as output port.
20    OUTPUT 33 ; 0         Initializes LED.
30
 :                          Measurement and judgment
 :                          ( measurement variable:  A
 :                            judgement range: JED0 to JED1, JED1 to JED2... )
500   IF A > = JED0 AND A < JED1 THEN OUTPUT 33 ; 0xFF
                            (When JED0 to JED1, lights up LED 1.)
510   IF A > = JED1 AND A < JED2 THEN OUTPUT 33 ; 0xFF
                            (When JED1 to JED2, lights up LED 2.)
 :
800   GOTO 30
810   STOP
```

③ Usage example of input/output ports C and D

< Example to change routine whether bit 0 of I/O port C is 0 or 1 >

- Circuit example



- Program example (Check the port C by pressing **[Trigger SW]** in example ①.)

```
10    OUTPUT 36 ; 19                Defines ports A and B as output port.
20    OUTPUT 35 ; 80                Defines ports C and D as input port.
30    OUTPUT 35 ; 112
 :                                  The R3752H series initial setup
100   *TRIG
110   ENTER 34 ; A
120   IF A < > 1 THEN GOTO *TRIG
130   ENTER 35 ; B                  Obtains value of port C.
140   IF B = 1 THEN GOTO *ROUT_B
150   *ROUT_A
 :                                  Process A
490   GOTO *TRIG
500   *ROUT_B
 :                                  Process B
900   GOTO *TRIG
910   STOP
```

4.3.2 RS-232 Interface

The R3752H series is equipped with an RS-232 interface as a standard. Therefore, data such as a measurement and analysis data can be output to an RS-232 printer.

The RS-232 interface defines mechanical and electrical characteristics of interface for connecting between data terminal and data communication device standardized by Electronic Industries Association (EIA).

Refer to "Regulation" for details.

(1) Connection connector and signal table

Connection connector : 25-pin D-sub connector (male type)
Signal table :

Pin No.	Signal name	Description
1	FG	Frame ground
2	TxD	Transmit data
3	RxD	Receive data
4	RTS	Request to send
5	CTS	Clear to send
6	DSR	Data set ready
7	SG	Signal ground
20	DTR	Data terminal ready

(2) Printer output method

The LLIST or LPRINT command is used to output to the RS-232 printer by the R3752H series. The setting such as a baud rate is defined by the CONTROL command.
Refer to "Programming manual" for details.
LLIST : Outputs BASIC program to the printer.
LPRINT : Outputs the contents of character strings, numeric values and variables.
CONTROL : Sets the values such as a baud rate, character length and others.

Setting values at power-on
Baud rate : 9600 baud
Character length : 8 bits
Parity : None
Stop bit : 1 bit

5 PERFORMANCE TEST

This chapter describes testing procedures designed to maintain this analyzer's efficiency. For items not covered in this chapter, contact ADVANTEST.

5.1 Preparing for a Performance Test

(1) Warm up

Warm up the R3752H series for at least 30 minutes before executing the performance test.

(2) Preparing measurement instruments

The following measurement instruments are required perform the test items as shown in Table 5-1.

Table 5-1 Required Measurement Instruments for Performance Test (1 of 2)

Test items	Measurement instrument		Remarks
1. Frequency accuracy and range	• Counter Frequency: 5Hz to 500MHz Display: 7 digits or more Accuracy: 0.1ppm or less	Model R5372 (to 18GHz) or Model R5373 (to 26GHz) (Manufactured by ADVANTEST)	Refer to section 5.2
	• BNC-BNC cable		
2. Output/ Input level and flat-ness	• Power meter Frequency: 100kHz to 500MHz Power range: -63dBm to +21dBm	HP436A (HP437B) (HP438A) (Calibrated under the national stan-dard)	Refer to section 5.3
	• Power sensor Frequency: 100kHz to 500MHz Power range: -63dBm to +21dBm	HP8482A	
3. Output level linearity	• Power meter Frequency: 100kHz to 500MHz Power range: -63dBm to +21dBm	HP436A (HP437B) (HP438A) (Calibrated under the national stan-dard)	Refer to section 5.4
	• Power sensor Frequency: 100kHz to 500MHz Power range: -63dBm to +21dBm	HP8482A	

Table 5-1 Required Measurement Instruments for Performance Test (2 of 2)

Test items	Measurement instrument		Remarks
4. Spectral purity (Phase noise)	• Spectrum analyzer 100Hz to 500MHz	Model R3265A (to 8GHz) (Manufactured by ADVANTEST)	Refer to section 5.5
	• BNC cable		
	• N-BNC conversion connector		
5. Input return loss	• Network analyzer 300kHz to 500MHz	Model R3763B (to 3GHz) (Manufactured by ADVANTEST)	Refer to section 5.6
	• Calibration kit	MODEL9617K3 (Recommended by ADVANTEST)	
	• BNC cable (60cm or less)		
	• N-BNC conversion connector		
6. Input level accuracy (Absolute value measurement)	• Power meter Frequency: 50MHz Power range: -10dBm to +10dBm	HP436A (HP437B) (HP438A) (Calibrated under the national standard)	Refer to section 5.7
	• BNC cable (60cm or less)		
7. Input level accuracy (Absolute value measurement)	• BNC cable × 2 (60cm or less)		Refer to section 5.8
10. Crosstalk	• BNC terminator		Refer to section 5.11
	• BNC cable (60cm or less)		

Note: ***The software used for each performance test can be found in directory R3752 of the sample program disk included with the R3752H series.***

(3) General note

- Use an AC power source having a voltage of 100V to 120V, 220V to 240V and a frequency of 48Hz to 66Hz.
- Make sure the power switch is in the off position before connecting the power supply cable.
- The R3752H series should not be exposed to dust, vibration, or noise and be tested under the following conditions:
  Temperature : 25°C ± 5°C
  Relative humidity : 80%RH or less

5.2 Frequency Accuracy and Range

Testing procedure

① Setup the R3752H series and the power meter as shown in the figure below.

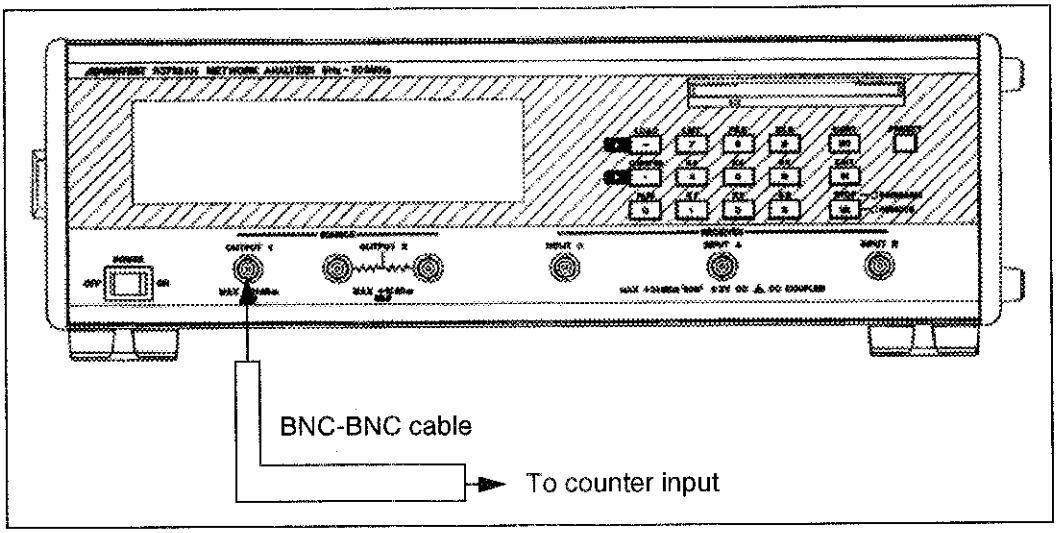


Figure 5-1

② Run the program "FREQ_ACC.BAS". Set the R3752H series as follows.

Span : 0Hz
Sweep mode : SINGLE
Output port : OUTPUT1

③ When the message "FREQENCY(MHz)?" is displayed, input the center frequency and press the **[ENT]** key.
(Set any center frequency in the range of 5Hz to 500MHz.)

④ Read the frequency by using the counter.

Check that the counter read frequency< center frequency ±center frequency× 20× 10^{-6}

Example: When the center frequency is at 10MHz, the range is 10MHz ± 200Hz (that is between 9,999,800Hz and 10,000,200Hz).

5.3 Output Level Accuracy and Flatness

Testing procedure

(1) Setup the R3752H series as shown in the figure below.

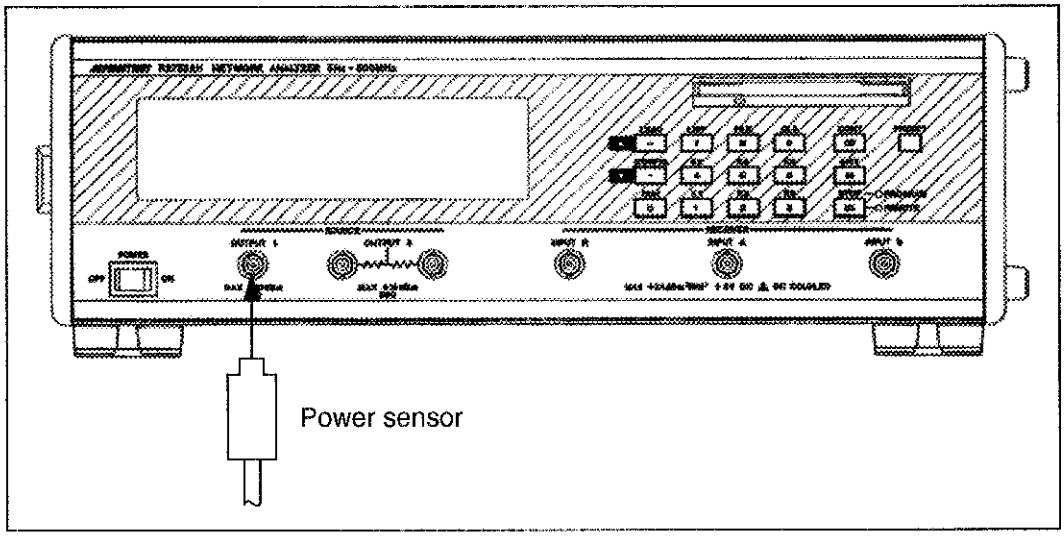


Figure 5-2 Output Level Accuracy and Flatness

(2) Output level accuracy

① Perform the ZERO calibration for the power meter.

② Run the program "OUTLEV.BAS". Set the R3752H series as follows.

Center frequency : 50MHz
Span : 0Hz
Output level : 0dBm
Output port : OUTPUT1

③ Connect the power sensor to the output terminal and perform the measurement.

Note: The calibration factor should be set to 50MHz.

④ Check the output level accuracy of ±0.5dB at 0dBm and 50MHz.

(3) Flatness

① Perform the ZERO calibration for the power meter.

② Run the program "FLATNESS.BAS". Set the R3752H series as follows.

Center frequency : 50MHz
Span : 0Hz
Output level : 0dBm

③ Press the **[REL]** key on the power meter and set it to 0dB (ratio measurement mode).

④ When the message "FREQENCY(MHz)?" is displayed, input the value of the frequency and press the **[ENT]** key.

Note: Use the calibration factor at the center frequency.

⑤ Check that the flatness of 0dBm is as follows.

5Hz to 100kHz : ±4.0dB
100kHz to 1MHz : ±2.0dB
1MHz to 300MHz : ±1.5dB
300MHz to 500MHz : ±2.0dB

5.4 Output Level Linearity

Testing procedure

① Perform the ZERO calibration for the power meter.

② Run the program "OUT_LIN.BAS". Set the R3752H series as follows.

Center frequency : 50MHz
Span : 0Hz
Output level : 0dBm
Output port : OUTPUT1

③ Connect the power sensor to the output terminal as shown in the figure below.

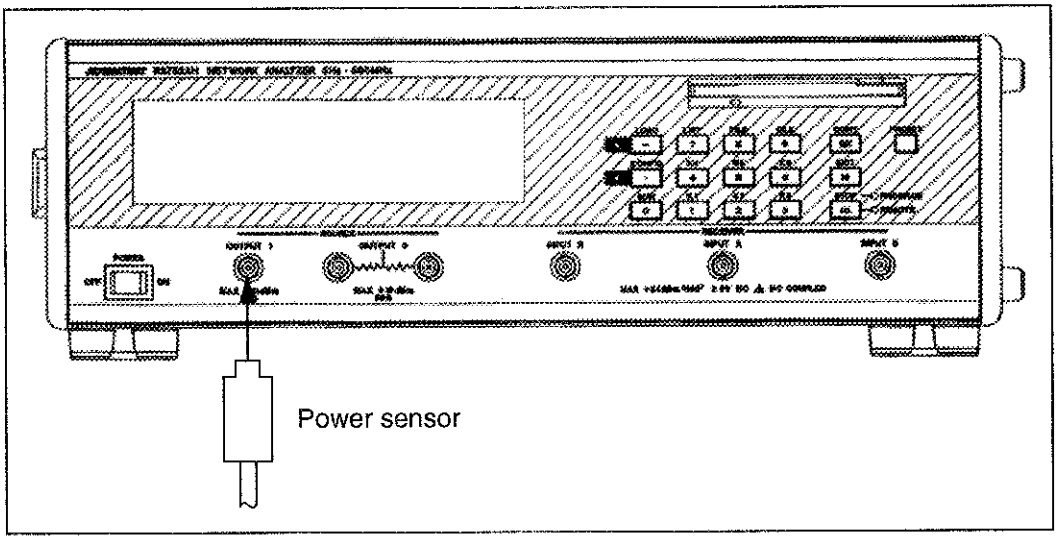


Figure 5-3 Output Level Linearity

④ Press the **[REL]** key on the power meter and set it to 0dB (ratio test mode).

⑤ When the message "OUT LEVEL(dBm)?" is displayed, input the value of the output level and press the **[ENT]** key.

Note: The calibration factor should be set to 50MHz.

⑥ Check that the output level linearity of 0dBm is as follows.

+21dBm to -35dBm : ± 0.5dB
-35dBm to -63dBm : ± 1.5dB

5.5 Signal Purity (Phase Noise)

Testing procedure

① In order to measure spectrum purity, connect the R3752H series and the spectrum analyzer, R3265A as shown in Figure 5-4.

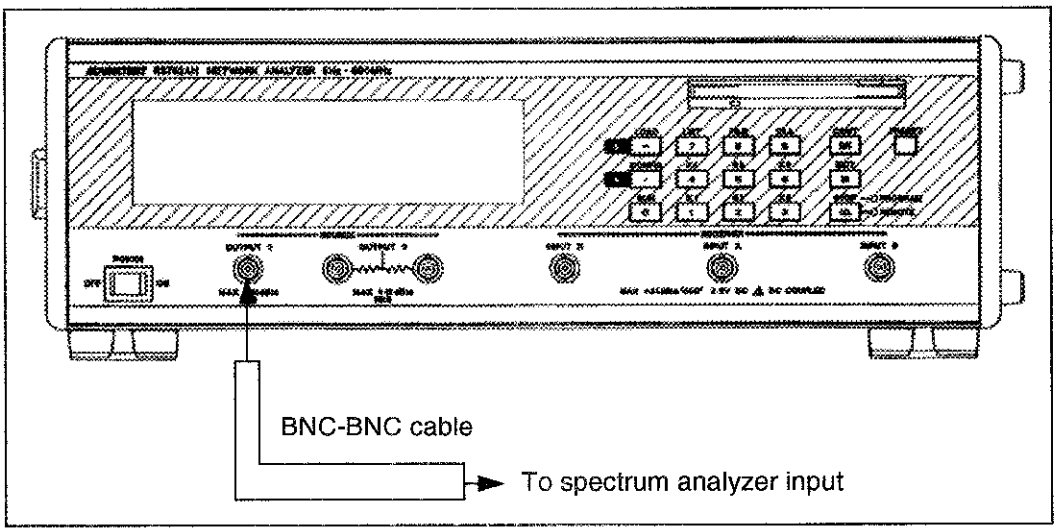


Figure 5-4

② Run the program "OUTCN.BAS". Set the R3752H series as follows.

Span frequency	:	0Hz
Sweep mode	:	SINGLE
Output port	:	OUTPUT1

③ When the message "FREQENCY(MHz)?" is displayed, input any frequency with in the measurement range of the spectrum analyzer and press the **[ENT]** key.
(Setting range: 5Hz to 500MHz)

④ Set the spectrum analyzer as follows.

Center frequency	:	Center freguency set to the R3752H series.
Span frequency	:	50kHz
Resolution band width	:	1kHz
Average	:	32

⑤ After performing a peak search to get the MAX data, use the Delta Marker function to obtain the value at a point of 10kHz higher than the MAX value.
(Obtain a difference between the MAX value and the data at a point of 10kHz higher.)

⑥ Check {(readout of the difference) -30}dBc/Hz < -75dBc/Hz.

5.6 Input Return Loss

Testing procedure

① In order to measure the input return loss, connect the network analyzer, R3763B as shown in Figure 5-5.

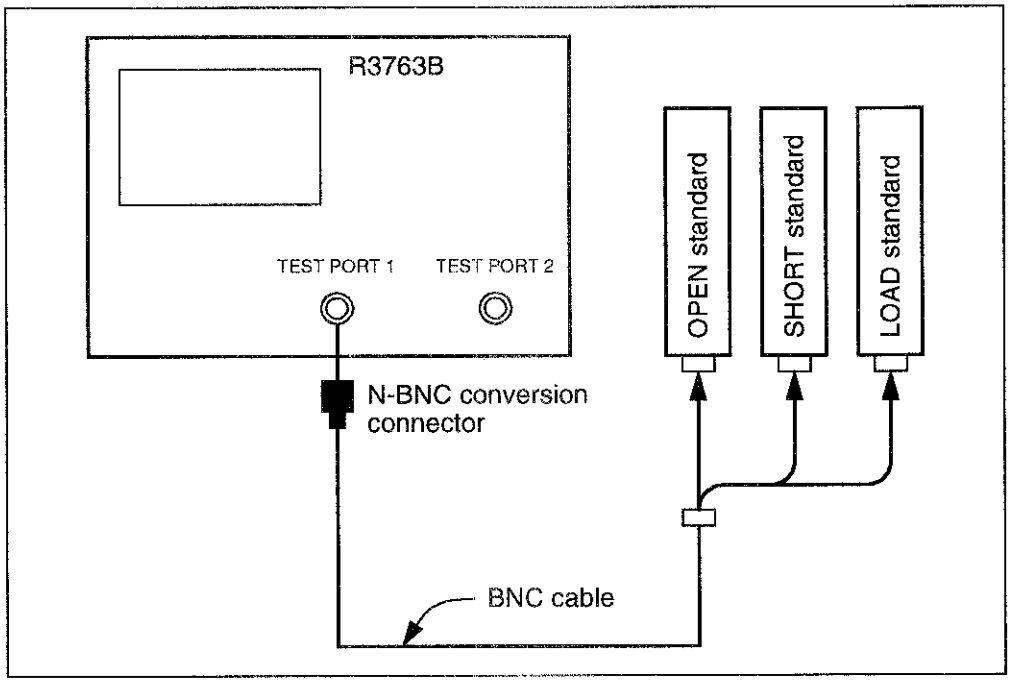


Figure 5-5

② When performing measurements, set the R3763B as follows.
(Other settings should be left at default values.)

Start frequency	:	300kHz
Stop frequency	:	500MHz
Measure	:	S_{11}
Resolution band width	:	100Hz

③ Perform the 1PORT FULL calibration.

(a) Press the **[CAL]**, *{CAL MENU}* and *{1PORT FULL CAL}* button.
(b) Connect the open standard to the BNC cable and press the *{OPEN}* button.
(c) Connect the short standard to the BNC cable and press the *{SHORT}* button.
(d) Connect the load standard to the BNC cable and press the *{LOAD}* button.
(e) Press the *{DONE 1-PORT}* key.

④ Connect R3763B to the input port A of the R3752H series with the BNC cable as shown in the figure below.

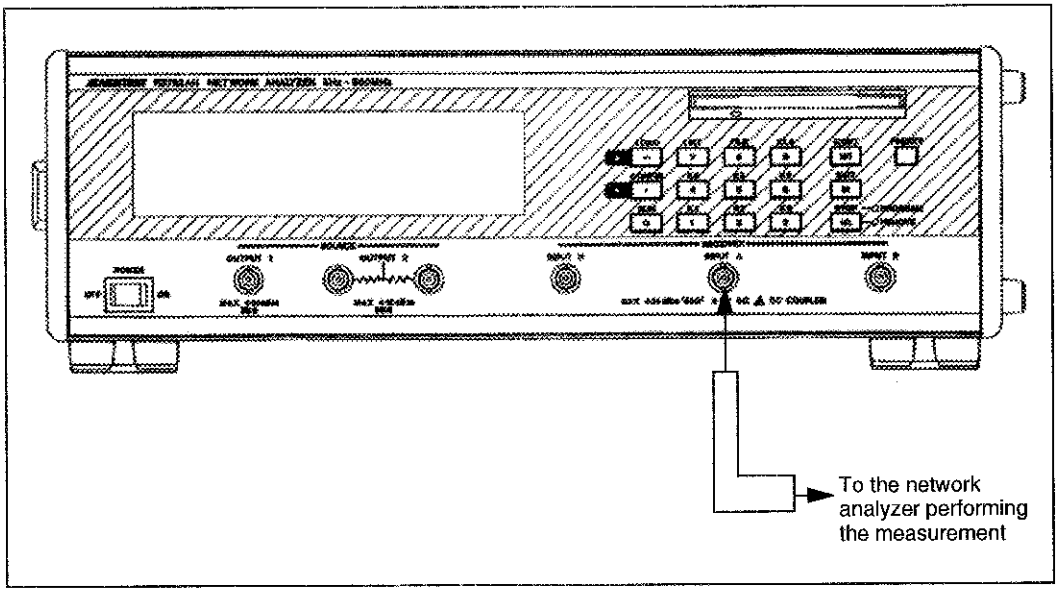


Figure 5-6

⑤ Run the program "RTLOSS.BAS". Set the R3752H series as follows.

Center frequency : 10kHz
Span frequency : 0Hz
Input attenuator : 20dB
Sweep mode : SINGLE

When the message "Rch --> 1 Ach --> 2 Bch --> 3" is displayed, type **[2]** and then press the **[ENT]** key.
(Type **[1]** when measuring the Rch, and type **[3]** when measuring the Bch.)

⑥ When the message "INPUT ATT20dB CHECK" is displayed, check that the readout of the R3763B is as follows.

Maximum value between 5Hz and 300MHz < -23dB
Maximum value between 300MHz and 500MHz < -20dB

⑦ The message "OK?" is displayed, so press the **[ENT]** key after completing the CHECK. Set the R3752H series as follows.

Input attenuator : 0dB

⑧ Check that the message "INPUT ATT0dB CHECK" is displayed and the readout of the R3763B is as follows.

Maximum value between 5Hz and 300MHz < -20dB
Maximum value between 300MHz and 500MHz < -15dB

⑨ For model R3752AH, perform the same tasks for the Input Port R and the Input Port B. For model R3752BH, perform the same tasks for the Input Port R.

5.7 Input Level Accuracy (Absolute value measurement)

Testing procedure

① Perform the ZERO calibration for the power meter.

② Setup the R3752H series as shown in the figure below.

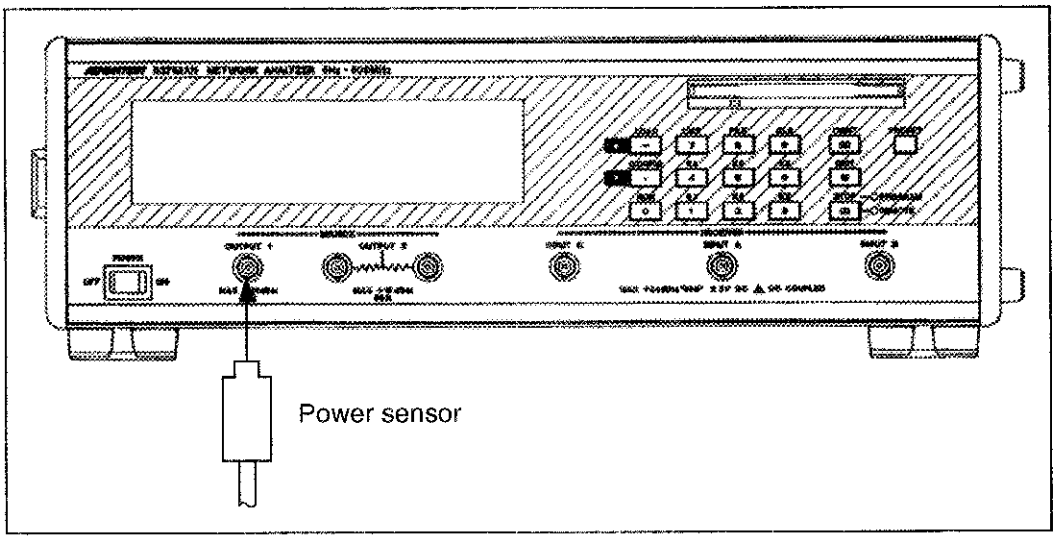


Figure 5-7

③ Run the program "INACC_Z.BAS". Set the R3752H series as follows.

Center frequency	:	50MHz
Span frequency	:	0Hz
Output level	:	0dBm
Output port	:	OUTPUT1
Input port	:	A
Resolution band width	:	1kHz
Format	:	LOGMAG
Sweep mode	:	SINGLE

When the message "Rch --> 1 Ach --> 2 Bch --> 3" is displayed, type **[2]** and then press the **[ENT]** key.
(Type **[1]** when measuring the Rch, and type **[3]** when measuring the Bch.)

④ Connect the power sensor to the OUT1 port and perform the measurement.

Note: The calibration factor should be set to 50MHz.

Connect OUT1 port with the Ach by using the BNC cable as shown in the figure below.

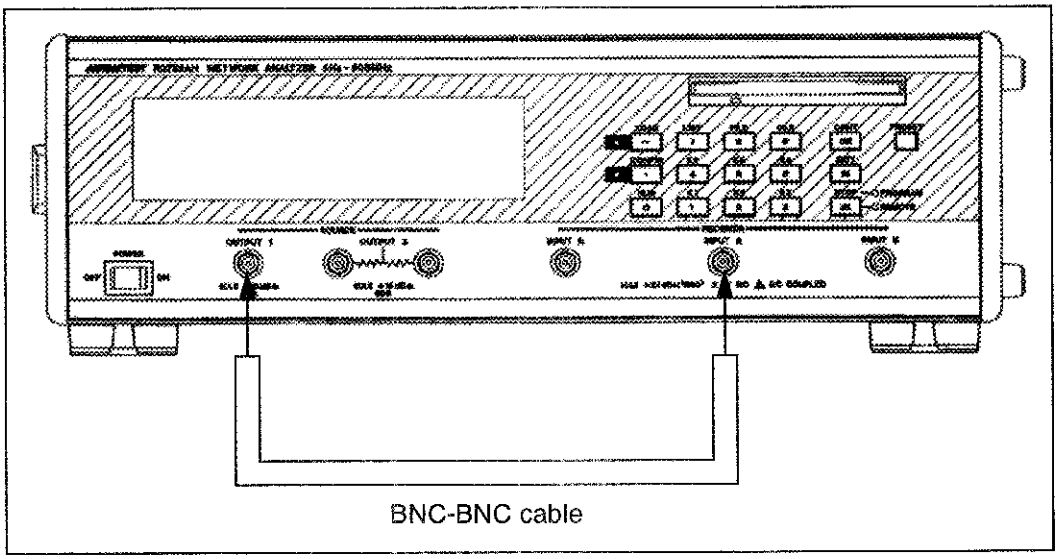


Figure 5-8

⑤ After connecting the cable, the message "CONNECT OK?" should be displayed. Press the **[ENT]** key to complete the connection. The measurement value is displayed.

⑥ Perform the calculation described below by using the measurement value of the R3752H series and that by using the power meter.
<Check> : [(Measurement value of the R3752H series) - (Measurement value by using the power meter)] : ± 0.5dB

⑦ For model R3752AH, connect the OUTPUT1 with the Rch in the same way and perform the measurement of the Rch and then connect the OUTPUT1 with the Bch and perform the measurement of the Bch.

For model R3752BH, connect the OUT1 with the Rch in the same way and perform the measurement of Rch.

5.8 Input Level Accuracy (Relative value measurement) ------ Only for model R3752AH/R3752BH

Testing procedure

① Connect the two BNC cables to the R3752H series as shown in the figure below. (Use the cables that have the same length and characteristics.)

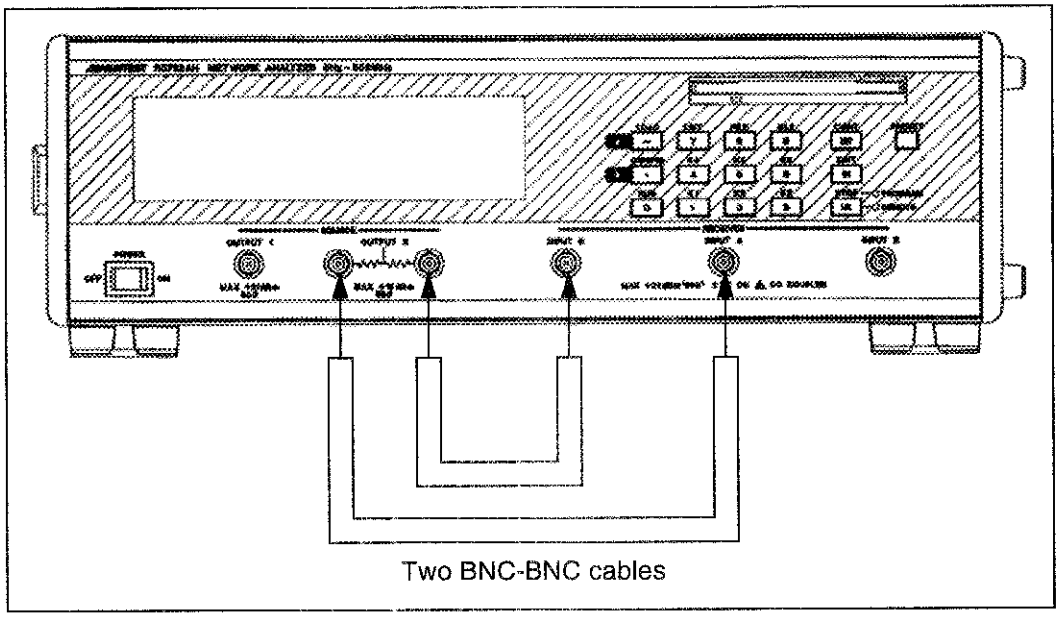


Figure 5-9

② Run the program "INACC_S.BAS". Set the R3752H series as follows.

Center frequency	:	50MHz
Span frequency	:	0Hz
Output level	:	0dBm
Output port	:	OUTPUT2
Format	:	LOGMAG
Input port	:	A/R
Resolution band width	:	1kHz

When the message "A/R --> 1 B/R --> 2 A/B --> 3" is displayed, type **[1]** and then press the **[ENT]** key.
(Type **[2]** when measuring the B/R, and type **[3]** when measuring the A/B.)

③ When the message "CONNECT OK?" is displayed, press the **[ENT]** key.

④ The measurement value is displayed.
<Check> : Measurement value of the R3752H series : ± 0.5dB

⑤ For model R3752AH, change the Input port to the Input B/R and A/B and perform the measurement in the same way and check it.

5.9 Noise Floor

Testing procedure

① Nothing should be connected to the R3752H series.

② Run the program "NOISE.BAS".

When the message "A.TYPE --> 1 B.TYPE --> 2 E.TYPE --> 3" is displayed, select the product model type.

When the model is B.TYPE, type **[2]** and the press **[ENT]** key.

Set the R3752H series as follows.

Output level : 0dBm
Number of the measurement points
: 1201
Smoothing : ON
Smoothing aperture : 5%
Format : LOGMAG
Input attenuator : 100kHz or less 0dBm
100kHz or more AUTO

③ When the message "RBW(kHz)" is displayed, type any one of "10", "3", "1", "0.3" and "0.1" and then press the **[ENT]** key.

④ Sum up the results of measurement data from the first point to the 1201th point, divide it by 1201 and display the result.

$$\text{Noise floor} = \frac{\text{MEAS (1)} + \text{MEAS (2)} + \cdots + \text{MEAS (1201)}}{1201}$$

MEAS(n) : the R3763Bmeasurement data at the nth point

⑤ Check that the values on the noise floor at each frequency range and the resolution band width satisfy the values shown in the table below.

RBW / FREQ	10kHz	3kHz	1kHz	300Hz	100Hz
minf to 500kHz	minf = 200kHz -90dBm	minf = 60kHz -95dBm	minf = 20kHz -100dBm	minf = 6kHz -100dBm	minf = 2kHz -100dBm
500kHz to 300MHz	-105dBm	-110dBm	-115dBm	-115dBm	-115dBm
300MHz to 500MHz	-105dBm	-110dBm	-110dBm	-110dBm	-110dBm

5.10 Crosstalk (between the input and output)

Testing procedure

① Nothing should be connected to the R3752H series.

② Run the program "CTALK_OI.BAS".

When the message "A.TYPE --> 1 B.TYPE --> 2 E.TYPE --> 3" is displayed, select the product model type.

When the model is B.TYPE, type **[2]** and the press **[ENT]** key.

Set the R3752H series as follows.

Output level	:	15dBm	
Number of measurement points			
	:	1201	
Smoothing	:	ON	
Smoothing aperture	:	5%	
Format	:	LOGMAG	
Input attenuator	:	100kHz or less	0dBm
		100kHz or more	AUTO
Resolution band width	:	100Hz	

③ Start the measurement and display the measurement value.

④ Check that the measurement values satisfy the following conditions.

<Check> :	When 20kHz to 500kHz	:	105dB or more
	When 500kHz to 300MHz	:	110dB or more
	When 300MHz to 500MHz	:	105dB or more

5.11 Crosstalk (between the inputs) ----- Only for model R3752AH/R3752BH

Testing procedure

① Connect the R3752H series by using the BNC cable and BNC terminator as shown in the figure below.

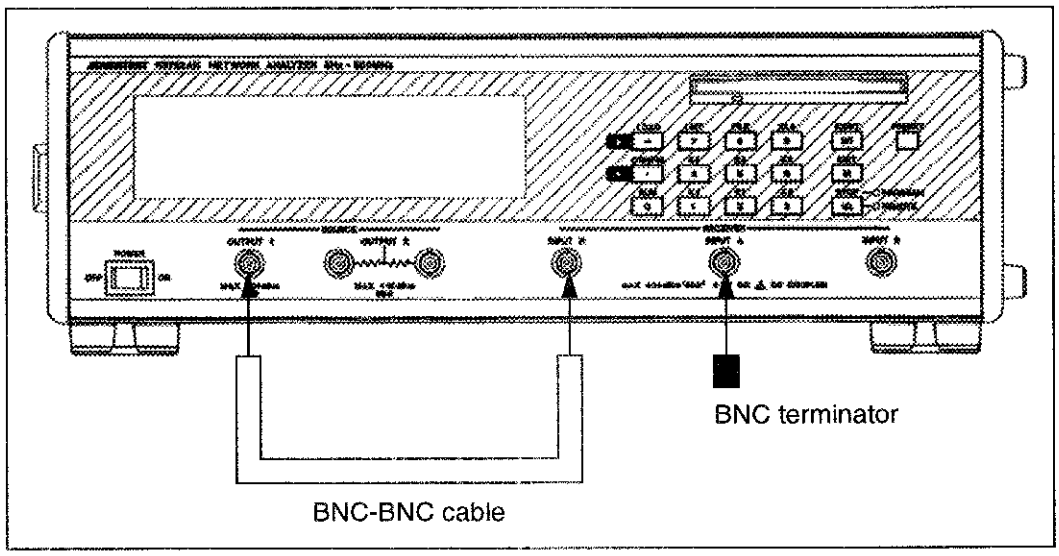


Figure 5-10

② Run the program "CTALK_II.BAS".

When the message "A/R --> 1 B/R --> 2 A/B --> 3" is displayed, type **[1]** and then press the **[ENT]** key.
(Type **[2]** when measuring the B/R, and type **[3]** when measuring the A/B.)

Set the R3752H series as follows.

Output level : 0dBm
Output port : OUTPUT1
Input port : A/R
Format : LOGMAG
Number of measurement points
: 1201
Smoothing : ON
Smoothing aperture : 5%

③ When the message "CONNECT OK?" is displayed, press the **[ENT]** key after completing the connection.

④ <Check> : When 20kHz to 500kHz : 105dB or more
When 500kHz to 300MHz : 115dB or more
When 300MHz to 500MHz : 110dB or more

⑤ For model R3752AH, connect with B/R and A/B and perform the measurements in the same way.

- When performing the measurements for B/R, connect the BNC terminator to the Bch and connect the BNC cable to the Rch.
- When performing the measurements for A/B, connect the BNC terminator to the Ach and connect the BNC cable to the Bch.

6 SPECIFICATIONS

Note: ***If there is no other description, these specifications are guaranteed in the temperature range of 25°C ± 5°C***

(1) Measurement function

Measurement channel	2 channels (4 trace display)	
Measurement parameter	A/R, B/R, A/B, R, A, B A/R, R, A A	(R3752AH, R3753AH) (R3752BH, R3753BH) (R3752EH, R3753EH)
Measurement format	R3753H series	R3752H series
Rectangular display	Log/Linear magnitude, Phase, Group delay, the real part and the imaginary part of a complex parameter |Z|, R, X (When performing the measurement of the Impedance conversion) |Y|, G, B (When performing the measurement of the Admittance conversion) Phase extension display	
Smith chart	The marker provides readouts of Log/linear magnitude, Phase, the real part + the imaginary part, R + jX, G + jB	
Pole coordinate display	The marker provides readouts of Log/linear magnitude, Phase, the real part + the imaginary part	

(2) Source characteristics

<table>
<tr><td>Frequency characteristic
Range
Resolution
Stability
Accuracy</td><td>
5Hz to 500MHz
0.1Hz
±5 × 10^{-6}/Day (25 ± 5°C)
±20ppm (25 ± 5°C)</td></tr>
<tr><td>Output power characteristic
Range
Resolution
Accuracy
Linearity

Flatness

Impedance</td><td>
+21dBm to -63dBm (Output port 1)
0.1dB
±0.5dB (0dBm, 50MHz, 25 ± 5°C)
(50MHz, 25 ± 5°C)
<table><tr><td>+21dBm to -35dBm</td><td>±0.5dB</td></tr><tr><td>-35dBm to -63dBm</td><td>±1.5dB</td></tr></table>
(0dBm, 25 ± 5°C)
<table><tr><td>5Hz to 100kHz</td><td>±4.0dB</td></tr><tr><td>100kHz to 1MHz</td><td>±2.0dB</td></tr><tr><td>1MHz to 300MHz</td><td>±1.5dB</td></tr><tr><td>300MHz to 500MHz</td><td>±2.0dB</td></tr></table>
(Output port 1)
Nominal 50Ω
Return loss 13dB or more (0dBm, typical)</td></tr>
<tr><td>Spectral purity
Harmonic distortion
Non-harmonic spurious signal
Phase noise</td><td>(25 ± 5°C)
≤ -20dBc
≤ the bigger one of -30dBc or -70dBm
≤ -75dBc/Hz (10kHz offset)</td></tr>
<tr><td>Sweep characteristics
Sweep parameter
Range

Range setting
Sweep type

Sweep time
Measuring point
Sweep trigger
Sweep mode
Dual sweep

Alternate sweep</td><td>
Frequency, Signal level
Frequency sweep: Same as the Frequency characteristics
Level sweep: +21dBm to -43dBm
Start/Stop or Center/Span
Linear sweep and logarithmic sweep, available for a user-specified segment, level sweep
0.1ms/point (RBW 10kHz)
3, 6, 11, 21, 51, 101, 201, 301, 401, 601, 801, 1201 points
Continuoust, Single, External

Sweeps frequency for each channel in the same frequency range.
Sweeps frequency for each channel in different sweep ways and different frequency ranges.</td></tr>
</table>

Output format	
Output	Single, Dual: (R3752AH/BH, R3753AH/BH) Single: (R3752EH, R3753EH)
Connector	Type BNC female, 50Ω
Power splitter	R3752AH/BH, R3753AH/BH only
(Output port 2)	
Insertion loss	6dB (typical)
Magnitude tracking	<100MHz 0.1dB (typical) ≥100MHz 0.2dB (typical)
Phase tracking	1° (typical)
Equivalent output SWR	<100MHz 1.2 (typical) ≥100MHz 1.4 (typical)

(3) Receiver characteristics

Input characteristics Input channel	3Ch (R3752AH, R3753AH) 2Ch (R3752BH, R3753BH) 1Ch (R3752EH, R3753EH)
Frequency range	5Hz to 500MHz
Impedance	Nominal: 50Ω, 1MΩ/20pF or less
Return loss	(25 ±5°C)

	ATT 0dB	ATT 20dB
< 300MHz	> 20dB	> 23dB
≥ 300MHz	> 15dB	> 20dB

Maximum input level

Input impedance	ATT 0dB	ATT 20dB
50Ω	-20dBm	0dBm
1MΩ	22.4mV	224mV

Input damage level	50Ω +23dBm, 0VDC 1MΩ ±3V

Noise level (ATT AUTO (for 100kHz or less, ATT = 0dB) at 25 ± 5°C)

	RWB 10kHz	3kHz	1kHz	300Hz	100Hz
5Hz to 500kHz	min f 200kHz -90dBm	min f 60kHz -95dBm	min f 20kHz -100dBm	min f 6kHz -100dBm	min f 2kHz -100dBm
500kHz to 300MHz	-105dBm	-110dBm	-115dBm	-115dBm	-115dBm
300MHz to 500MHz	-105dBm	-110dBm	-110dBm	-110dBm	-110dBm

Resolution band width (RBW)	10kHz to 3Hz (1, 3 steps)
Input crosstalk (25 ± 5°C)	ATT 0dB, RBW 30Hz (R3752AH/BH, R3753AH/BH)

20kHz to 500kHz	105dB
500kHz to 300MHz	115dB
300MHz to 500MHz	110dB

<table>
<tr><td>Source crosstalk (25 ± 5°C)</td><td>(at +15dBm output level, ATT = 0dB)<table><tr><td>20kHz to 500kHz</td><td>105dB</td></tr><tr><td>500kHz to 300MHz</td><td>110dB</td></tr><tr><td>300MHz to 500MHz</td><td>105dB</td></tr></table></td></tr>
<tr><td>Input connector</td><td>Type BNC female, 50Ω</td></tr>
<tr><td>Automatic offset calibration
Normalize function

Electrical length correction

Range</td><td>
Reduces the frequency characteristics of a measurement system
Equivalent electric length or group delay time can be added to the measured phase and group delay time.
-3 × 10⁹m to +3 × 10⁹m or +10sec to -10sec</td></tr>
<tr><td>Magnitude characteristic
Relative characteristic
Measurement range
Display resolution
Accuracy

Frequency response

Dynamic accuracy</td><td>
(R3752AH/BH, R3753AH/BH)
0 ±115dB (RBW 1kHz, ATT AUTO)
0.001dB/div
±0.5dB (50MHz at 25 ± 5°C, input 50Ω, maximum input level)
(25 ± 5°C)<table><tr><td rowspan="3">50Ω</td><td>5Hz to 100MHz</td><td>1dB P-P</td></tr><tr><td>100MHz to 300MHz</td><td>2dB P-P</td></tr><tr><td>300MHz to 500MHz</td><td>3dB P-P</td></tr><tr><td rowspan="2">1MΩ</td><td>5Hz to 1kHz</td><td>5dB P-P</td></tr><tr><td>1kHz to 100MHz</td><td>1.5dB P-P</td></tr></table>(25 ± 5°C, RBW 3Hz, Frequency ≥ 1kHz, ATT= 20dB)<table><tr><td>0 to -10dBm</td><td>±0.10dB</td></tr><tr><td>-10 to -60dBm</td><td>±0.05dB</td></tr><tr><td>-60 to -70dBm</td><td>±0.10dB</td></tr><tr><td>-70 to -80dBm</td><td>±0.30dB</td></tr><tr><td>-80 to -90dBm</td><td>±0.90dB</td></tr></table></td></tr>
</table>

Absolute characteristic

Measurement range

(RBW 1kHz)

0dBm to -115dBm	ATT AUTO
0dBm to -95dBm	ATT 20dB
-20dBm to -115dBm	ATT 0dB

Display resolution

0.001dB/div

Accuracy

±0.5dB (50MHz at 25 ± 5°C, input 50Ω, maximum input level)

Frequency response

(25 ± 5°C)

50Ω	5Hz to 10kHz	4dB P-P
	10kHz to 300MHz	2dB P-P
	300MHz to 500MHz	3dB P-P
1MΩ	5Hz to 1kHz	10dB P-P
	1kHz to 100MHz	1.5dB P-P

Dynamic accuracy

(R3752EH, R3753EH)

(25 ± 5°C, RBW 3Hz, Frequency ≥ 1kHz, ATT= 20dB)

0 to -10dBm	±0.4dB
-10 to -60dBm	±0.1dB
-60 to -70dBm	±0.2dB
-70 to -80dBm	±0.6dB

Phase characteristic

Relative characteristic

Measurement range

(R3752AH/BH, R3753AH/BH)

±180° (The phase extending function enables the display to trace data over ±180° continuously.)

Display resolution

0.01°

Frequency response

(25 ± 5°C, when attenuation value is the same)

50Ω	5Hz to 100MHz	5° P-P
	100MHz to 300MHz	15° P-P
	300MHz to 500MHz	20° P-P
1MΩ	5Hz to 1kHz	20° P-P
	1kHz to 100MHz	10° P-P

Dynamic accuracy

(25 ± 5°C, RBW 3Hz, Frequency ≥ 1kHz, ATT= 20dB)

0 to -10dBm	±1.0°
-10 to -50dBm	±0.3°
-50 to -60dBm	±0.5°
-60 to -70dBm	±1.0°
-70 to -80dBm	±3.0°
-80 to -90dBm	±8.0°

<table>
<tr><td>Absolute characteristic
Measurement range

Dynamic accuracy</td><td>(R3752EH, R3753EH)
±180° (The phase extending function enables the display to trace data over ±180° continuously.)
(25 ± 5°C, RBW 3Hz, Frequency ≥ 1kHz, ATT= 20dB)
<table><tr><td>0 to -10dBm</td><td>±3.0°</td></tr><tr><td>-10 to -50dBm</td><td>±1.5°</td></tr><tr><td>-50 to -60dBm</td><td>±2.0°</td></tr><tr><td>-60 to -70dBm</td><td>±2.4°</td></tr><tr><td>-70 to -80dBm</td><td>±3.6°</td></tr></table></td></tr>
<tr><td>Delay characteristic
Range

Measurement range
Group delay resolution
Aperture frequency
Accuracy</td><td>The following formula is used to determine the range.
$r = \frac{\Delta\phi}{360 \times \Delta f}$ $\Delta\phi$: Phase
Δf : Aperture frequency (Hz)
1ps to 250s
1ps
0.01% to 50% of the specified span frequency
$\frac{\text{Phase accuracy}}{360 \times \text{Aperture frequency (Hz)}}$</td></tr>
</table>

(4) Error calibration function

Normalize	Corrects the Frequency response (of Magnitude, Phase) in the Transmission measurement.
One port calibration	Corrects the errors caused by the bridge directivity, the Frequency response and the Source match in the Reflection measurement. Short, Open and Load standards are required for the error correction.
Data averaging	Averages the data (vector values) at each sweep. The averaging number can be set between 2 to 999.
Transmission full calibration	The transmission normalize enables the high accuracy measurement on transmission measurement. The Short and Load standards are required for the error correction.

(5) Connection with external instruments

Signal output for an external display	15 pin D-SUB connector (VGA)
GP-IB data output and Remote control	IEEE488 applicable
Parallel I/O output	TTL level, 8-bit output (Two ports) 4-bit input and output (Two ports)
Serial port	RS-232 compatible
Keyboard	IBM PC-AT compatible
External reference frequency input	Applicable input signal is Frequency: 1, 2, 5, 10MHz ± 10ppm, 0dBm (50Ω) or more

(6) Display section

R3752H series	
Indicator	fluorescent display tube, Green
Resolution	256 × 64 dots
Display mode	Character display, 32 × 8 characters
R3753H series	
Indicator	7.8inch TFT color LCD
Resolution	640 × 480 dots
Display mode	Rectangular log/Linear coordinates, Polar Coordinate, Smith chart (Impedance/Admittance display)
Display format	Single Channel Display, Dual Channel Display (which shows plural traces together or respectively.)
Measurement condition display	Start/Stop, Center/Span, Scale/DIV, Reference level, Marker value, Soft key function, Warning message
Position of Reference line	The top (100%) to the bottom (0%) of the vertical axis
Auto scale	Optimizes the reference value and the scale to show the traced data best in the screen.
Brightness	The back-light can be turned on/off.

(7) Marker function (R3753H series)

Marker display	The readout of the Marker can be converted to the display value conformed to the measurement format.
Multi marker	Ten markers can be set for each channel, respectively.
Delta marker	Any one of the ten markers can be specified as a reference marker and can measure the delta value between a movable marker and the reference marker.
Marker couple	The marker of each channel can be set as a coupling marker or an independent marker.
Analysis of arbitrary specified zone	The marker search function can be performed in a segment specified by the delta marker function.
MKR search	MAX search, MIN search, NEXT search
Marker tracking	Performs the search for each sweep.
Target search	Calculates a XdB-down Band width, a Center frequency, Q value and so on. It is also possible to search the frequency of the phase 0° or the frequency band of ±X°.
MKR →	MKR → the reference value, MKR →| START, MKR → STOP, MKR → CENTER
Limit line function	

(8) Instruments state function

Save register	The setting condition and the CAL data can be saved in the internal memory which is keeping backup.
Data save/recall	Each kind of data can be stored by using a floppy disk which is standard.

(9) Programming function

BASIC controller function	Controls the R3752H series itself and instruments equipped with GPIB interface functions. This is a built-in standard controller function.
Built-in function	Enables the high speed analysis of the measurement data.
FDD function	MS-DOS format compatible. Recording capacity: DD 720kB HD 1.2MB, 1.44MB

(10) General specification

Operating conditions When disk drive is in operation When disk drive is not in operation	 Temperature: +5°C to +40°C Humidity (without condensation): 80% or less Temperature: 0°C to +50°C Humidity (without condensation): 80% or less
Non-operating conditions	-20°C to +60°C
Power supply	AC100V to 120V, AC220V to 240V at 50Hz/60Hz Automatically switched to the AC100 family or the AC200V family.
Power consumption	300VA or less
Cabinet dimensions R3752H series R3753H series	 Approx. 424(W) × 132(H) × 400(D) mm Approx. 424(W) × 200(H) × 400(D) mm
Mass R3752H series R3753H series	 12kg or less 15kg or less

7 ERROR MESSAGES

This chapter explains the error messages displayed on the screen.
Error messages are classified into the following groups.

7.1 Hardware trouble
7.2 Overloading an input part
7.3 Notice of hardware information
7.4 Operating error
7.5 Warning of internal set, change, etc.
7.6 Completion operating condition messages

These error message are displayed as following.

- The message of section of 7.4 to 7.6 are not displayed in GPIB operation (also including an internal BASIC operation).

Note: *→ marks explain supplemental remarks of error message list and problem-solving methods.*

7.1 Hardware Trouble

LOCAL #1 Unlock.
LOCAL #2 Unlock.

LOCAL has been unlocked.

SYNTHE Unlock.

SYNTHE has been unlocked.

VCXO Unlock.

VCXO has been unlocked.

→ If these error message appear, call the nearest dealer or sales-and-support office.

7.2 Overloading an Input Part

Ach Overload.
Bch Overload.
Rch Overload.

A signal exceeding a maximum permissible level has been input to the channel.

→ Check the input signal level.

Ach Overload Trip.
Bch Overload Trip.
Rch Overload Trip.

A signal exceeding a maximum permissible level has been input to the displayed channel. Then a protection circuit has started.

→ Check the input signal level. Then release the trip state by executing CLEAR-TRIP.

7.3 Notice of Hardware Information

External Standard In.

An external reference signal has been input.

External Trigger ignored.

An input external trigger was ignored. (That does not mean a prohibiting state.)

→ An external trigger (PIO-18pin) has been input in a state of not waiting for the external trigger.
The state of waiting for the external trigger is the state of waiting for sweep in the external trigger mode (that is, in a state that TRIGGER[CONT] or TRIGGER[SINGLE] on the panel).
If next trigger pulse is input during a sweep in using an external trigger source, the above error occurs.
Check the trigger setting and the specification of an external trigger signal.

7.4 Operating Error

Already Memorized.

Memorizing calibration data which {DONE} operation was already executed was attempted.

→ Clear the already-memorized calibration data with {CLEAR CAL DATA}.

Calibration aborted.

Memorizing calibration data was aborted.

→ While calibration data is being memorized, if the setting is changed, the calibration is aborted.
Do not change the setting until the calibration is finished.

Calibration data not found.

CORRECT ON was executed without memorized calibration data.

→ Memorize the calibration data.

Can't ... When CORRECT ON.

To memorize calibration data or to execute {CLEAR CAL DATA} was attempted in the state of CORRECT ON.

→ Choose CORRECT OFF.

Can't ... When PROG-SWEEP.

To set the number of points or to clear segments was attempted in the state of program sweep.

→ Specify a sweep type other than PROGRAM SWEEP and USER SWEEP.

Can't ... When USER-SWEEP.

To set the number of points or to clear segments was attempted in the state of user frequency sweep.

→ Specify a sweep type other than PROGRAM SWEEP and USER SWEEP.

Data and Coef not matched.

To execute CORRECT ON was attempted under a condition differing from a measurement condition where correction data was obtained.

→ Specify the same measurement condition where the correction data was obtained.

Data and Memory not matched.

A trace operation (DATA/MEM, etc.) or a memory waveform display (DISPLAY MEMORY, DISPLAY DATA&MEM) was specified under a condition differing from a measurement condition where a memory waveform was obtained.

→ Specify the measurement condition where the memory waveform was obtained.

Disk not found

Data in a floppy disk was not able to be read.

→ The floppy disk has some scratches or has not be formatted or inserted. Check the floppy disk.

File load error.

An error occurred in a {LOAD FILE} execution.

→ Something is wrong with the floppy disk, or a file other than files stored in the R3752H series was specified. Check the floppy disk.

File store error

An error occurred in a {STORE FILE} execution.

→ The floppy disk has no available space, or the floppy disk is not formatted or is in a write-protect state. Check the floppy disk.

Formatting failure

Something was wrong in the formatting operation.

→ The floppy disk has some scratches or is in a write-protect state. Check the floppy disk.

Illegal PROG-SWEEP points.

With the number of total points of all segments being less than 3 or more than 1201, the program sweep was specified.

→ Specify the number of the segment point again.

Illegal USER-SWEEP points.

With the number of total points of all segments being less than 3 or more than 1201, the user frequency sweep was specified.

→ Specify the number of the segment point again.

Memory not found.

A trace operation (DATA/MEM, etc.) or a memory waveform display (DISPLAY MEMORY, DISPLAY DATA&MEM) was specified, with a memory waveform not stored.

→ Obtain the memory waveform.

Please set 1-trace FORMAT

With the measurement format two traces (LOGMAG&PHASE, LOGMAG&DELAY, LOGMAG&PHASE), the memory waveform display (DISPLAY MEMORY, DISPLAY DATA&MEM) was specified.

→ The memory waveform display is invalid with the measurement format two traces.
Set the measurement format to one trace (other than LOGMAG&PHASE, LOGMAG&DELAY or LOGMAG&PHASE).

Register recall error.

An error occurred in recalling a register.

→ A register that had not been saved was specified or the resister was broken by some factor.
Clear the resister with CLEAR REG and save again.

Register save error.

An error occurred in saving a register.

→ Available space is not in C: drive.
Delete unnecessary files.

Segment #x error.

The PROGRAM SWEEP or USER SWEEP was specified in a state that STOP FREQ of the Xth segment is higher than START FREQ of the following segment.

→ Specify the frequency of the Xth segment again.

Segment not entered.

The PROGRAM SWEEP or USER SWEEP was specified without setting any segment.

→ Specify the segment.

Some STD not memorized.

To execute the DONE operation was attempted without obtaining all related calibration data.

→ Obtain all calibration data.

7.5 Warning of Internal Set, Change, etc.

CH1 INPUT-MEAS changed.
CH2 INPUT-MEAS changed.

The INPUT MEAS setting at the channel 1 or channel 2 was internally changed.

→ When a S-parameter test set is connected, a INPUT MEAS setting that a Forward direction and Reverse direction of the S parameter test set, respectively, are simultaneously assigned to either CH1 or CH2 is invalid for a dual sweep (DUAL CH ON, COUPLE CH on). These messages are displayed when the above setting is executed.

When above message is displayed, the direction assigned to the channel described in the message is internally made the same direction as the other channel has been assigned to in INPUT MEAS setting. (Settings of reflection or transmission measurement are not changed.)

CORRECT turned off.

The CORRECT setting was internally altered to OFF.

→ The measuring condition in which the correction data was obtained must be the same as the current measuring condition in the correcting measurement (CORRECT ON). Therefore, when the number of points or a sweep type is altered in a state of CORRECT ON, this message is displayed and CORRECT OFF is set.

CORR or MEM can't be saved.

The correction data or memory waveform data was not able to be saved in executing SAVE REGISTER.

→ The correction data or memory waveform data is saved in B: drive with SAVE REGISTER. If available space is not in B: drive, this message is displayed. (However, the setting condition of the R3752H series is saved.)
Clear unnecessary register.

Data file can't be stored.

The waveform data (RAW, COEF, MEM, DATA) was not able to be saved with STORE FILE.

→ Available space is not in A: drive (floppy disk). (However, the setting condition of the R3752H series is saved.)
Clear unnecessary file or use another floppy disk.

Display Mode changed.

The display mode setting was internally altered to DISPLAY DATA.

→ A measuring condition in which the memory waveform was obtained must be the same as the current measuring condition and the measuring format must be set to one trace in the memory waveform display mode (DISPLAY MEMORY, DISPLAY DATA&MEM).
Therefore, when the number of points or the sweep type is altered in a state that the memory waveform is displayed, or when the measuring format is set to two traces (LOGMAG&PHASE, LOGMAG&DELAY, LINMAG&PHASE), this message is displayed and the display mode is altered to DISPLAY DATA.

Sweep time increased.

The setting of the sweep time was internally altered and the sweep time was increased.

→ The minimum setting of the sweep time depends on the RBW setting or others. When the sweep time is set to AUTO, this message is not displayed.
Therefore, when the sweep time is not set to AUTO, if this message is displayed by altering the setting of the RBW or and the sweep time is increased.
Afterward, even if the RBW setting is set to the previous setting, the sweep time setting do not be set back to the previous setting.

Trace-Math turned off.

The setting of the trace operation (DATA/MEM and others) was internally altered to OFF.

→ The measuring condition in which the memory waveform was obtained must be the same as the current measuring condition in the trace operation.
Therefore, when the number of points or the sweep type was altered with the trace operation executed, this message is displayed and the trace operation is set to OFF.

7.6 Completion operating condition messages

Abort PLOT !!!

The plot output was interrupted by pushing the ABORT key, PRESET key or STOP key.

Clear Completed.

The memorized calibration data was cleared with CLEAR CAL DATA.

Clear Input Trip.

The trip state of the input part was released with CLEAR TRIP.

Formatting now...

The floppy disk is now under formatting.

Formatting complete

Formatting the floppy disk was correctly complete.

Store Completed

A data waveform was copied into a memory waveform with DATA → MEMORY.

Wait for sweep.

A sweep is being executed to obtain the calibration data.

APPENDIX

A.1 Initial Setting

(1) Initial setting

(1 of 4)

Function	Initialize method	
	Power on or preset	*RST
Stimulus		
Sweep type	Linear frequency sweep	Linear frequency sweep
Continuous sweep	ON	OFF
Trigger source	Internal (free-running)	Internal (free-running)
Trigger delay	OFF (0sec)	OFF (0sec)
Sweep time	30msec (Manual)	120msec (Auto)
Number of measurement points	201	1201
Starting frequency	5Hz	5Hz
Stopping frequency	500MHz	500MHz
Center frequency	250.0000025MHz	250.0000025MHz
Frequency span	499.999995MHz	499.999995MHz
Frequency display	Start/stop	Start/stop
Fixed frequency of level sweep	100MHz	100MHz
Output level	0dBm	0dBm
Start level	-43dBm	-43dBm
Stop level	0dBm	21dBm
Trip	Clear	Clear
2-channel coupling	ON	ON
Program sweep segment	All clear	All clear
Output port	Port 2 *1	Port 2 *1

*1: Port 1 is used for R3752EH.

(2 of 4)

Function	Initialize method	
	Power on or preset	*RST
Response		
Dual channel	OFF	OFF
Active channel	1	1
Resolution bandwidth	10kHz	10kHz
Input port selecting conditions	A/R *2	A/R *2
Average	OFF (count: 16)	OFF (count: 16)
Trace calculation	NONE	NONE
Conversion	NONE	NONE
Characteristic impedance Z_0	50Ω	50Ω
Measurement format	LOGMAG&PHASE	LOGMAG&PHASE
Group delay aperture	10%	0.01%
Smoothing	OFF (aperture 10%)	OFF (aperture 0.01%)
Display	Data	Data
Split or overlap	Overlap	Overlap
Label	NONE	NONE
Calibration		
Compensative measurement	OFF	OFF
Calibration data	Clear	Clear
Electrical length correction	OFF (0sec)	OFF (0sec)
Phase offset	OFF (0°)	OFF (0°)
Measurement end extension correction	OFF	OFF
R input	0sec	0sec
A input	0sec	0sec
B input	0sec	0sec
Port 1	0sec	0sec
Port 2	0sec	0sec
Velocity factor	1	1

*2: A is used for R3752EH.

(3 of 4)

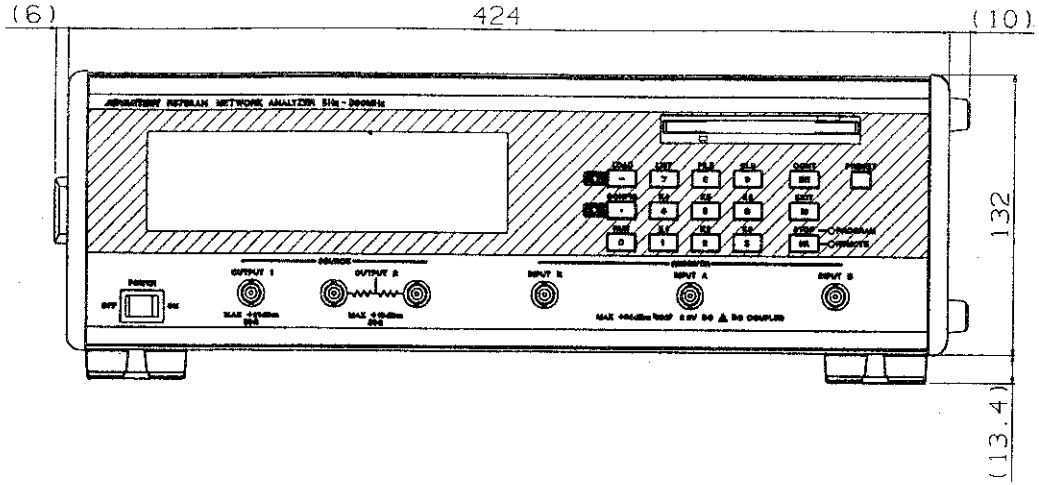
Function	Initialize method	
	Power on or preset	*RST
Y-axis scale unit		
Logarithmic magnitude	10dB	10dB
Phase	90°	90°
Group delay	0.1μsec	0.1μsec
Smith chart	-	-
Polar coordinate	-	-
Linear magnitude	0.1	0.1
SWR	1	1
Real part	1	1
Imaginary part	1	1
Continuous phase	360°	360°
Reference position		
Logarithmic magnitude	100%	100%
Phase	50%	50%
Group delay	50%	50%
Smith chart	-	-
Polar coordinates	-	-
Linear magnitude	0%	0%
SWR	0%	0%
Real part	100%	100%
Imaginary part	100%	100%
Continuous phase	50%	50%
Reference value		
Logarithmic magnitude	0dB	0dB
Phase	0°	0°
Group delay	0sec	0sec
Smith chart	1	1
Polar coordinates	1	1
Linear magnitude	0	0
SWR	1	1
Real part	10	10
Imaginary part	10	10
Continuous phase	0°	0°

(4 of 4)

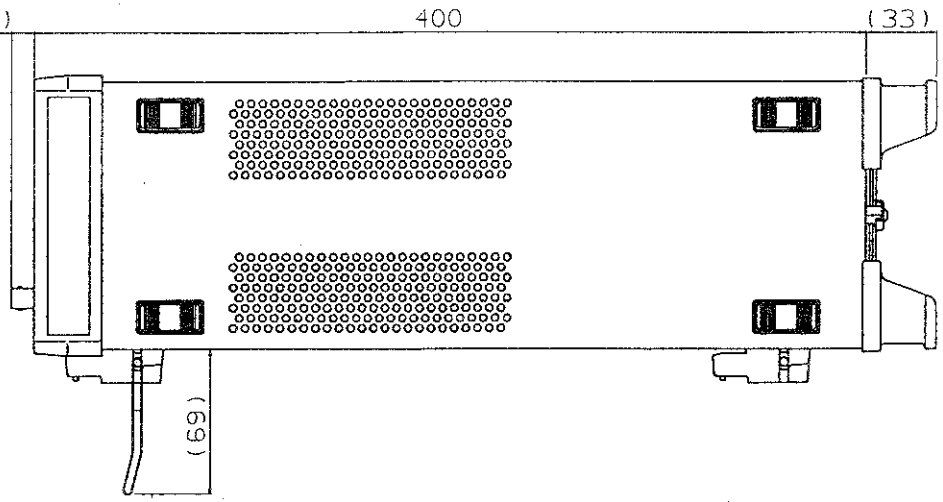
Function	Initialize method	
	Power on or preset	*RST
Input attenuator		
R input	AUTO	AUTO
A input	AUTO	AUTO
B input	ATUO	ATUO
Input impedance		
R input	50Ω	50Ω
A input	50Ω	50Ω
B input	50Ω	50Ω

(2) Backup memory setting (set at factory)

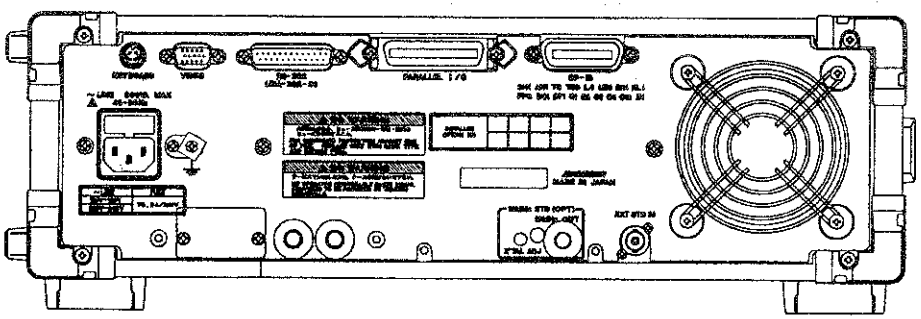
Network analyzer GPIB address	11
System controller or addressable	Addressable
Printer GPIB address	12
Plotter GPIB address	5
Serial port setting	Baud rate : 9600 Character length : 8 bits Plarity : None Stop bit length : 1 bit
Save register	All clear



FRONT VIEW



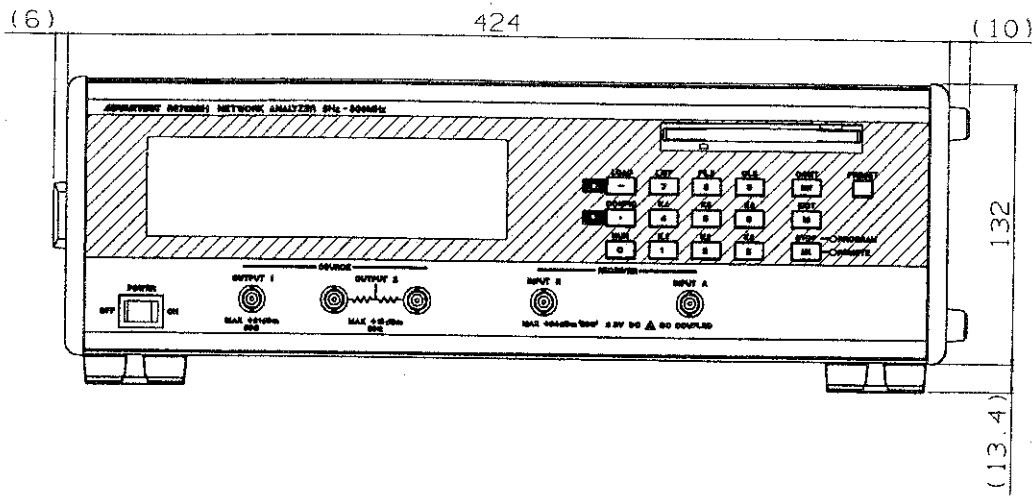
SIDE VIEW



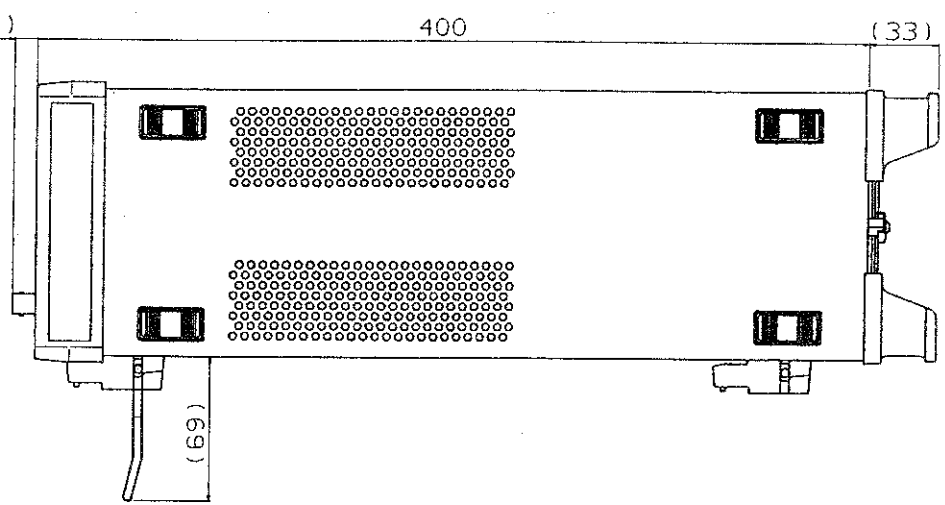
REAR VIEW

Unit; mm

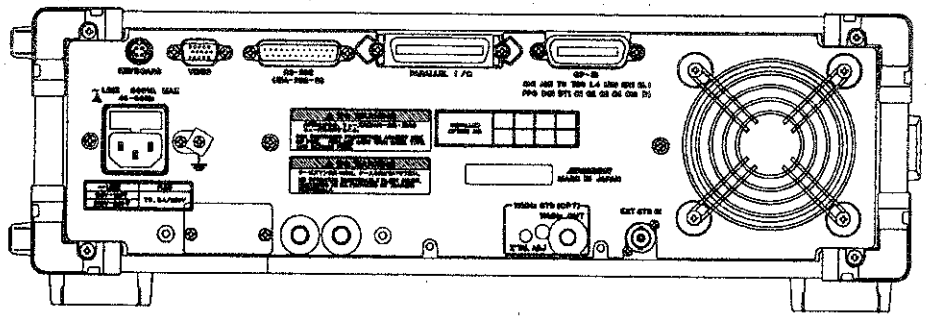
R3752AH EXTERNAL VIEW



FRONT VIEW



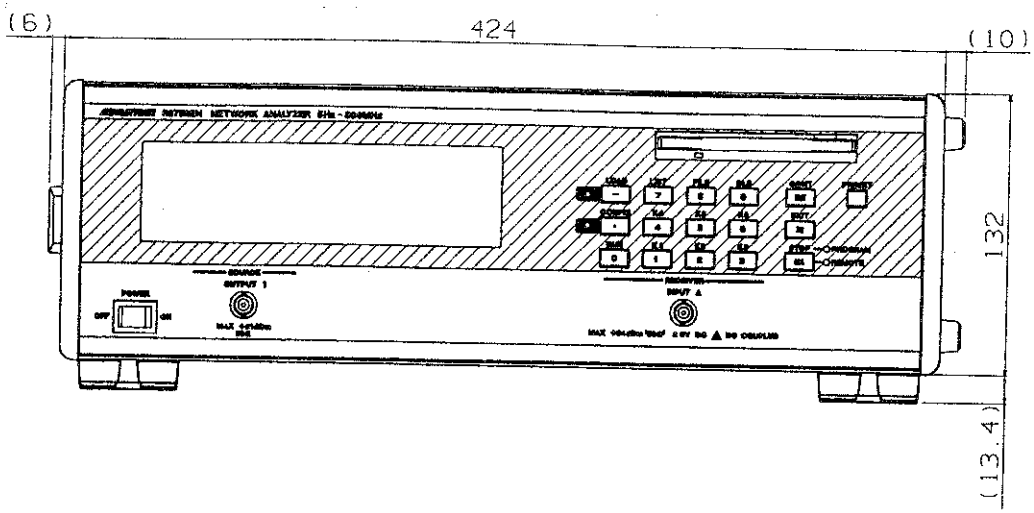
SIDE VIEW



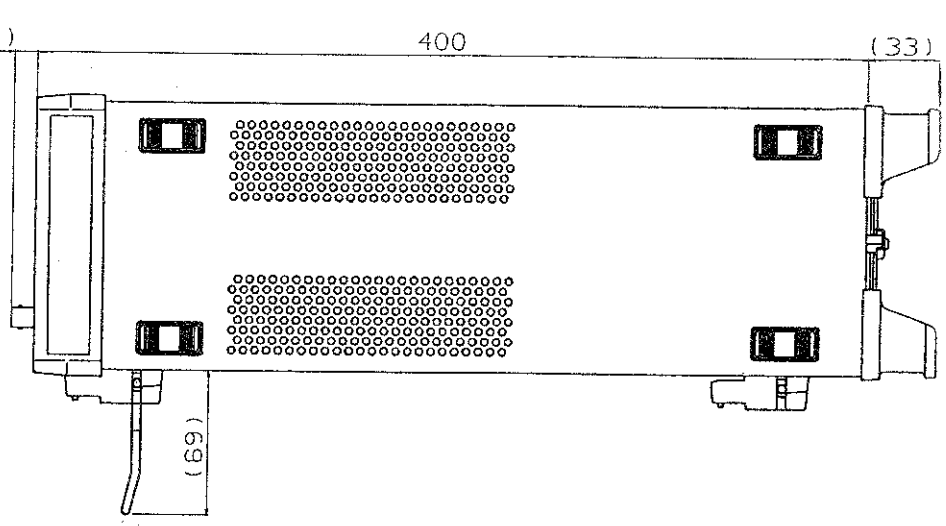
REAR VIEW

Unit; mm

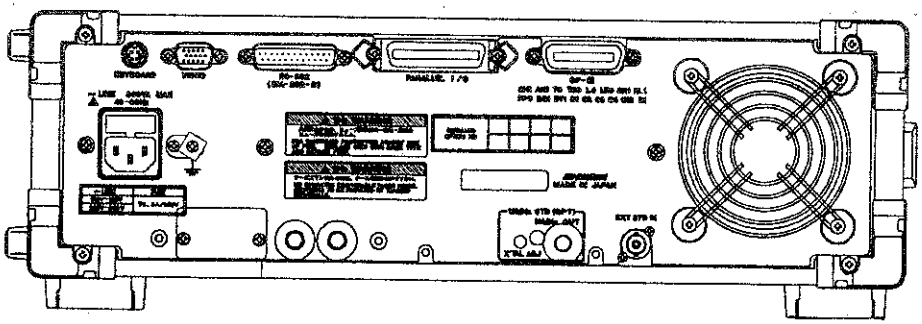
R3752BH EXTERNAL VIEW



FRONT VIEW



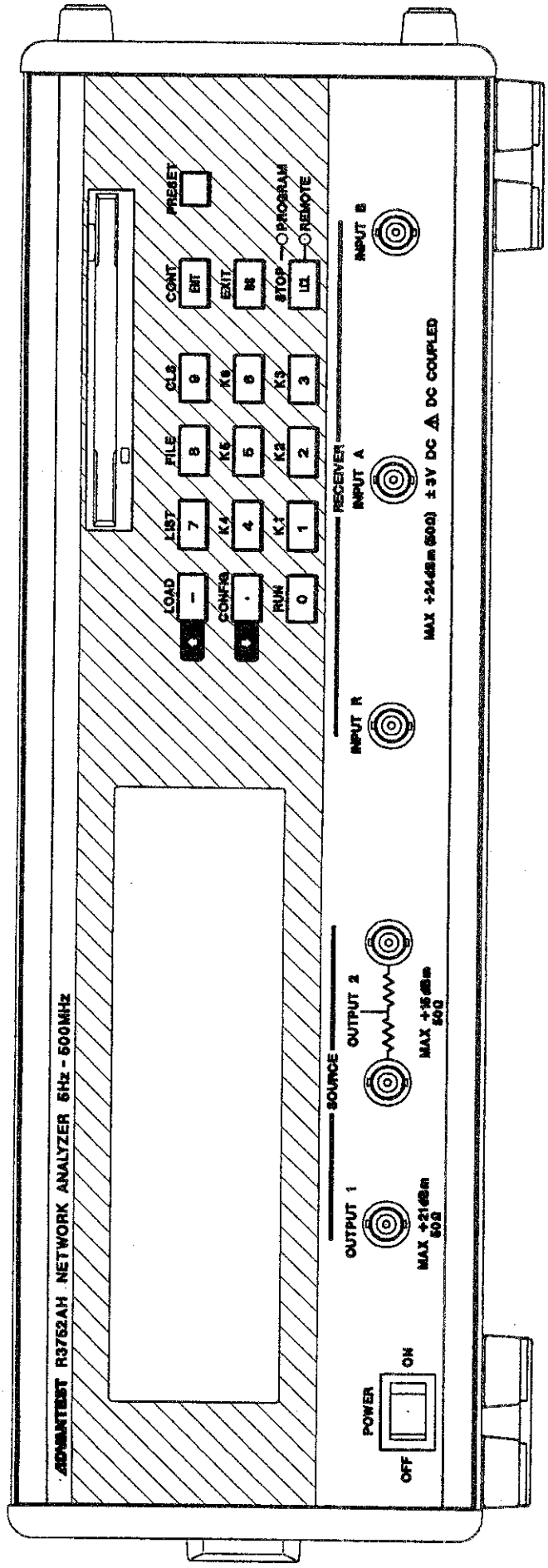
SIDE VIEW



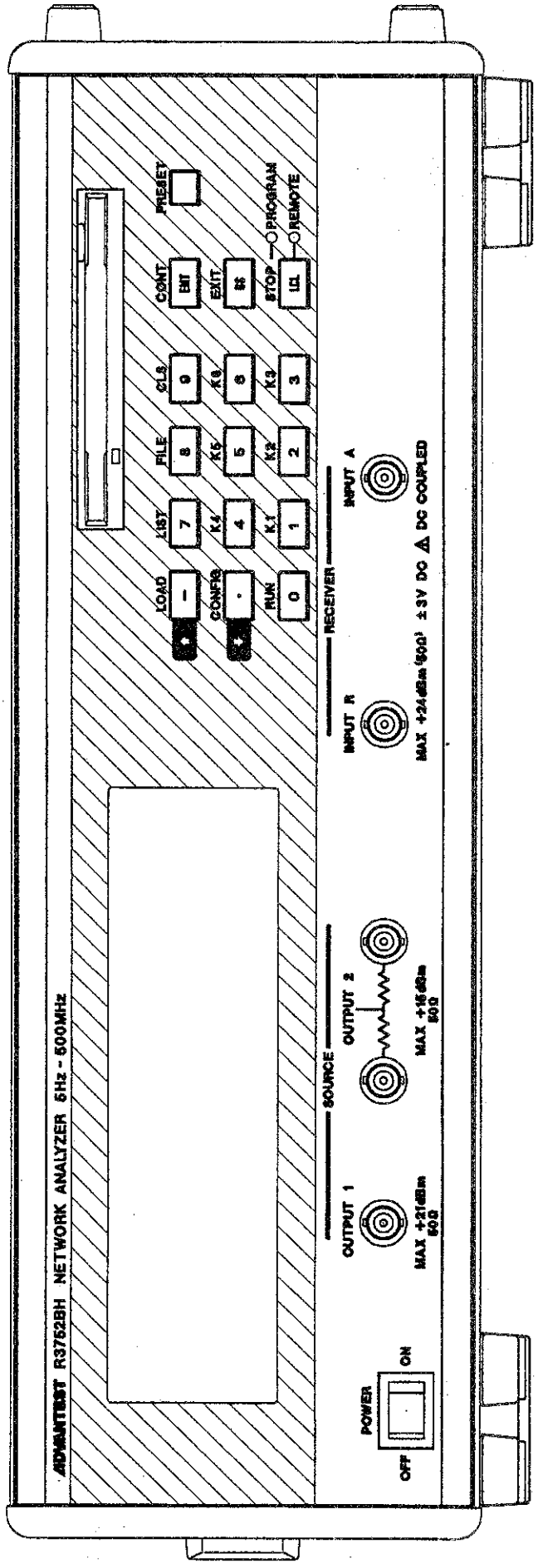
REAR VIEW

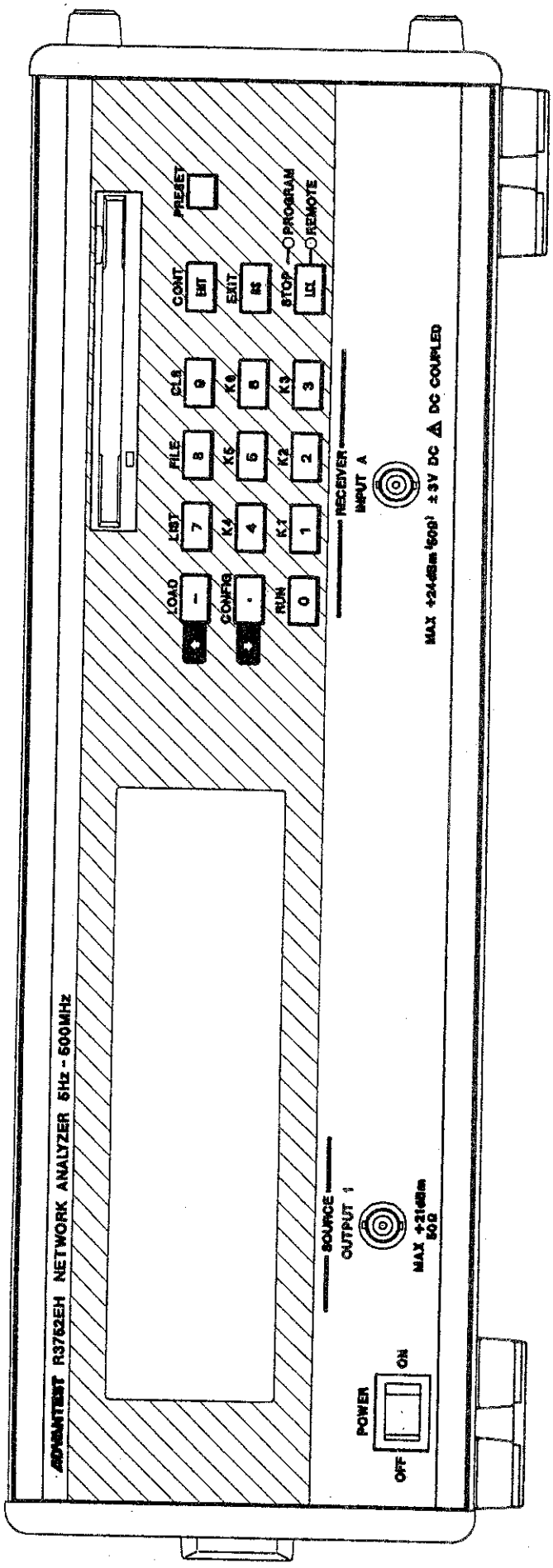
Unit; mm

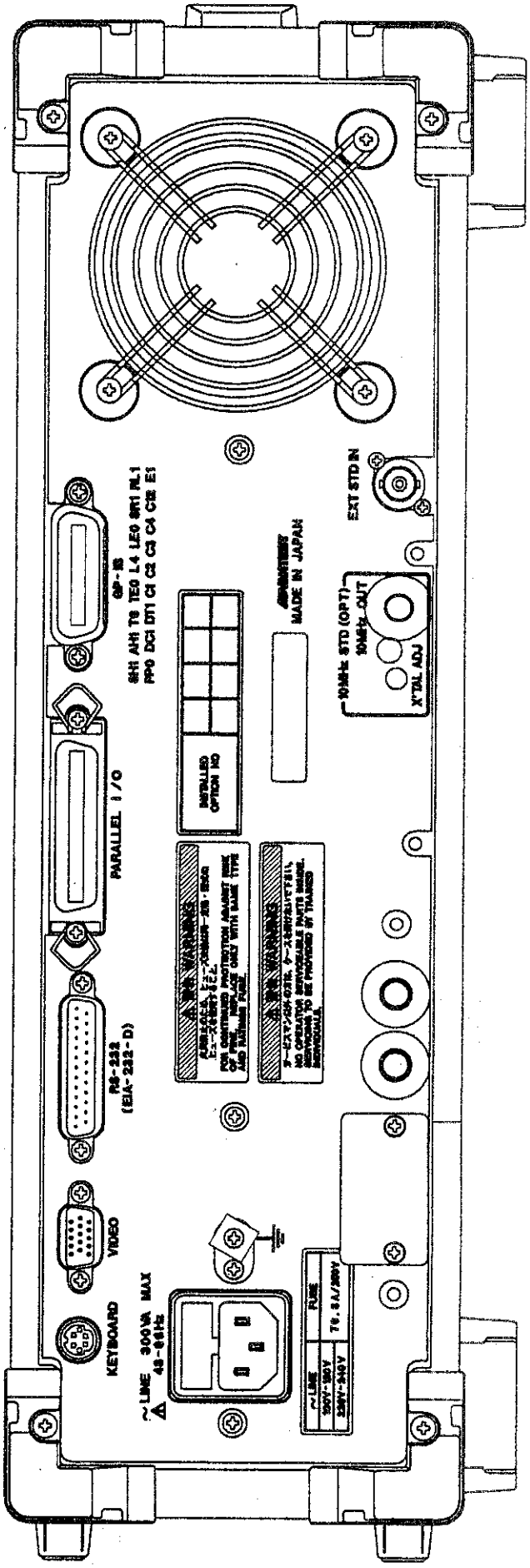
R3752EH EXTERNAL VIEW


ADVANTEST R3752AH NETWORK ANALYZER 5Hz - 500MHz
POWER
ON
OFF
SOURCE
OUTPUT 1
OUTPUT 2
RECEIVER
INPUT R
INPUT A
INPUT B
MAX +24dBm (600) ±3V DC DC COUPLED
PRESET
CONT
ENT
EXIT
CLR
FILE
LIST
LOAD
CONFIG
RUN
PROGRAM
REMOTE

R3752BH FRONT VIEW




ADVANTEST R3752EH NETWORK ANALYZER 5Hz - 500MHz
PRESET
CONT
ENT
EXIT
ESC
STOP
PROGRAM
REMOTE
LCL
CLR
9
K6
8
K3
3
FILE
8
K5
6
K2
2
LIST
7
K4
4
K1
1
LOAD
-
CONFIG
.
RUN
0
RECEIVER
INPUT A
MAX +24dBm 50Ω ± 3V DC DC COUPLED
SOURCE
OUTPUT 1
MAX +21dBm 50Ω
POWER
ON
OFF


GP-IB
SH1 AH1 T6 TE0 L4 LE0 SR1 RL1
PP0 DC1 DT1 C1 C2 C3 C4 C28 E1
EXT STD IN
10MHz STD (OPT)
10MHz OUT
X'TAL ADJ
MADE IN JAPAN
INSTALLED OPTION NO
PARALLEL I/O
RS-232
(EIA-232-D)
VIDEO
KEYBOARD
~LINE 300VA MAX
48-66Hz
~LINE
90V-132V
180V-264V
FUSE
T6.3A/250V

ALPHABETICAL INDEX

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[T]

[W]

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LIMITED WARRANTY

1. Unless otherwise specifically agreed by Seller and Purchaser in writing, Advantest will warrant to the Purchaser that during the Warranty Period this Product (other than consumables included in the Product) will be free from defects in material and workmanship and shall conform to the specifications set forth in this Operation Manual.

2. The warranty period for the Product (the "Warranty Period") will be a period of one year commencing on the delivery date of the Product.

3. If the Product is found to be defective during the Warranty Period, Advantest will, at its option and in its sole and absolute discretion, either (a) repair the defective Product or part or component thereof or (b) replace the defective Product or part or component thereof, in either case at Advantest's sole cost and expense.

4. This limited warranty will not apply to defects or damage to the Product or any part or component thereof resulting from any of the following:

   (a) any modifications, maintenance or repairs other than modifications, maintenance or repairs (i) performed by Advantest or (ii) specifically recommended or authorized by Advantest and performed in accordance with Advantest 's instructions;

   (b) any improper or inadequate handling, carriage or storage of the Product by the Purchaser or any third party (other than Advantest or its agents);

   (c) use of the Product under operating conditions or environments different than those specified in the Operation Manual or recommended by Advantest, including, without limitation, (i) instances where the Product has been subjected to physical stress or electrical voltage exceeding the permissible range and (ii) instances where the corrosion of electrical circuits or other deterioration was accelerated by exposure to corrosive gases or dusty environments;

   (d) use of the Product in connection with software, interfaces, products or parts other than software, interfaces, products or parts supplied or recommended by Advantest;

   (e) incorporation in the Product of any parts or components (i) provided by Purchaser or (ii) provided by a third party at the request or direction of Purchaser or due to specifications or designs supplied by Purchaser (including, without limitation, any degradation in performance of such parts or components);

   (f) Advantest's incorporation or use of any specifications or designs supplied by Purchaser;

   (g) the occurrence of an event of force majeure, including, without limitation, fire, explosion, geological change, storm, flood, earthquake, tidal wave, lightning or act of war; or

   (h) any negligent act or omission of the Purchaser or any third party other than Advantest.

5. **EXCEPT TO THE EXTENT EXPRESSLY PROVIDED HEREIN, ADVANTEST HEREBY EXPRESSLY DISCLAIMS, AND THE PURCHASER HEREBY WAIVES, ALL WARRANTIES, WHETHER EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE, INCLUDING, WITHOUT LIMITATION, (A) ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND (B) ANY WARRANTY OR REPRESENTATION AS TO THE VALIDITY, SCOPE, EFFECTIVENESS OR USEFULNESS OF ANY TECHNOLOGY OR ANY INVENTION.**

6. **THE REMEDY SET FORTH HEREIN SHALL BE THE SOLE AND EXCLUSIVE REMEDY OF THE PURCHASER FOR BREACH OF WARRANTY WITH RESPECT TO THE PRODUCT.**

7. **ADVANTEST WILL NOT HAVE ANY LIABILITY TO THE PURCHASER FOR ANY INDIRECT, INCIDENTAL, SPECIAL, CONSEQUENTIAL OR PUNITIVE DAMAGES, INCLUDING, WITHOUT LIMITATION, LOSS OF ANTICIPATED PROFITS OR REVENUES, IN ANY AND ALL CIRCUMSTANCES, EVEN IF ADVANTEST HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES AND WHETHER ARISING OUT OF BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING, WITHOUT LIMITATION, NEGLIGENCE), STRICT LIABILITY, INDEMNITY, CONTRIBUTION OR OTHERWISE. TORT (INCLUDING, WITHOUT LIMITATION, NEGLIGENCE), STRICT LIABILITY, INDEMNITY, CONTRIBUTION OR OTHERWISE.**

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CUSTOMER SERVICE DESCRIPTION

In order to maintain safe and trouble-free operation of the Product and to prevent the incurrence of unnecessary costs and expenses, Advantest recommends a regular preventive maintenance program under its maintenance agreement.

Advantest's maintenance agreement provides the Purchaser on-site and off-site maintenance, parts, maintenance machinery, regular inspections, and telephone support and will last a maximum of ten years from the date the delivery of the Product. For specific details of the services provided under the maintenance agreement, please contact the nearest Advantest office listed at the end of this Operation Manual or Advantest 's sales representatives.

Some of the components and parts of this Product have a limited operating life (such as, electrical and mechanical parts, fan motors, unit power supply, etc.). Accordingly, these components and parts will have to be replaced on a periodic basis. If the operating life of a component or part has expired and such component or part has not been replaced, there is a possibility that the Product will not perform properly. Additionally, if the operating life of a component or part has expired and continued use of such component or part damages the Product, the Product may not be repairable. Please contact the nearest Advantest office listed at the end of this Operation Manual or Advantest's sales representatives to determine the operating life of a specific component or part, as the operating life may vary depending on various factors such as operating condition and usage environment.

SALES & SUPPORT OFFICES

Advantest Korea Co., Ltd.
22BF, Kyobo KangNam Tower,
1303-22, Seocho-Dong, Seocho-Ku, Seoul #137-070, Korea
Phone: +82-2-532-7071
Fax: +82-2-532-7132

Advantest (Suzhou) Co., Ltd.
Shanghai Branch Office:
Bldg. 6D, NO.1188 Gumei Road, Shanghai, China 201102 P.R.C.
Phone: +86-21-6485-2725
Fax: +86-21-6485-2726

Shanghai Branch Office:
406/F, Ying Building, Quantum Plaza, No. 23 Zhi Chun Road,
Hai Dian District, Beijing,
China 100083
Phone: +86-10-8235-3377
Fax: +86-10-8235-6717

Advantest (Singapore) Pte. Ltd.
438A Alexandra Road, #08-03/06
Alexandra Technopark Singapore 119967
Phone: +65-6274-3100
Fax: +65-6274-4055

Advantest America, Inc.
3201 Scott Boulevard, Suite, Santa Clara, CA 95054, U.S.A
Phone: +1-408-988-7700
Fax: +1-408-987-0691

ROHDE & SCHWARZ Europe GmbH
Mühldorfstraße 15 D-81671 München, Germany
(P.O.B. 80 14 60 D-81614 München, Germany)
Phone: +49-89-4129-13711
Fax: +49-89-4129-13723

ADVANTEST

http://www.advantest.co.jp

ADVANTEST CORPORATION
Shin-Marunouchi Center Building, 1-6-2 Marunouchi, Chiyoda-ku, Tokyo 100-0005, Japan
Phone: +81-3-3214-7500