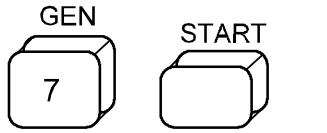
2 Manual Operation

Note: *You do not need any specific knowledge as to the MS-DOS operating system for use of the UPL.*

We assume that you know what is meant by e.g. a file, a directory or a path and do not provide any further explanations on that.

Legend of graphic symbols used in this manual:



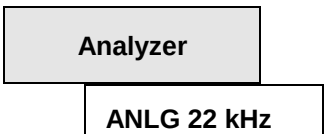
Front-panel keys



Softkey



Menu item of a panel



Parameter of a menu item

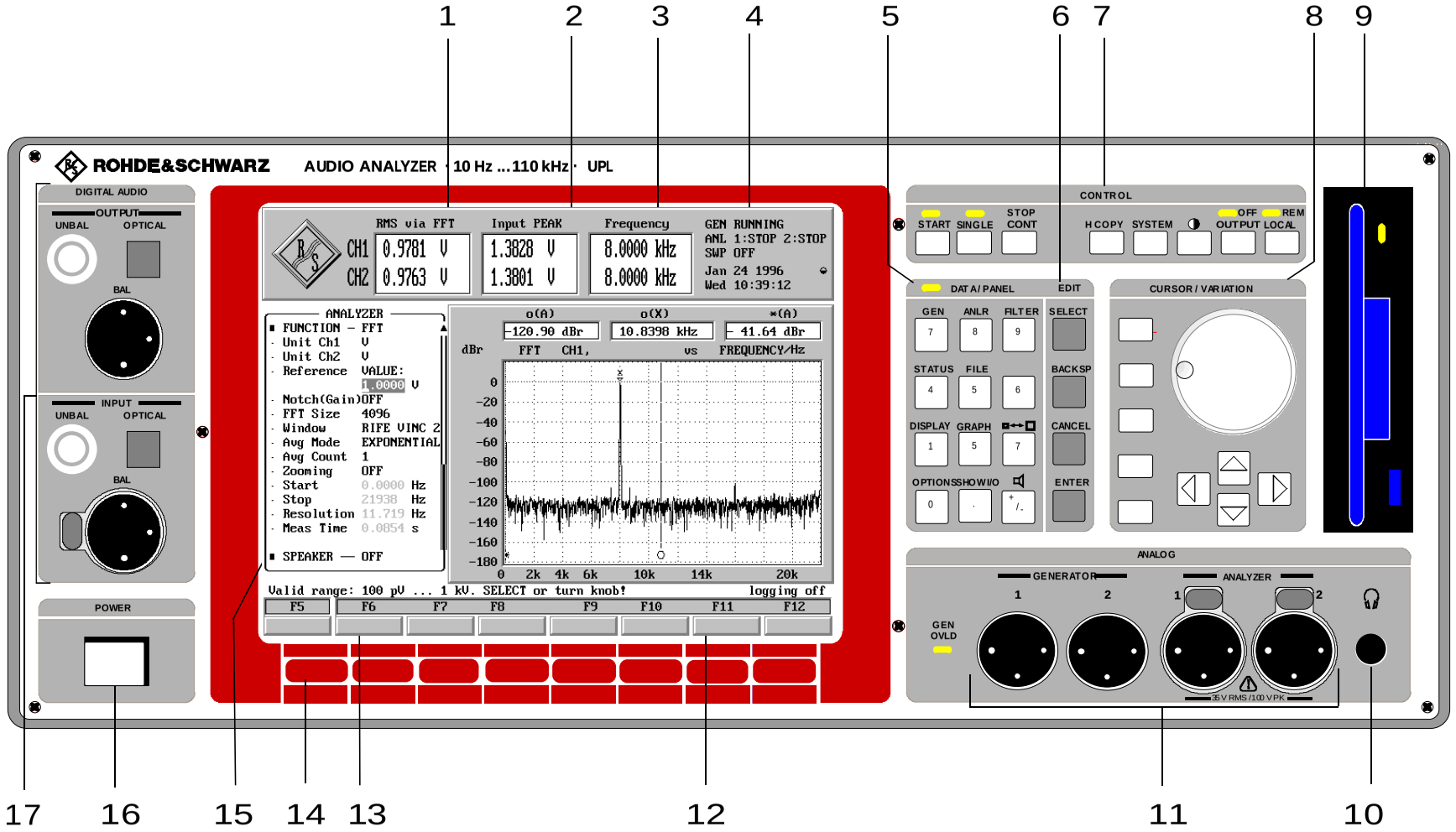


Fig. 2-1 Front-view

2.1 Explanations of Front- and Rearpanel Views incl. Key Combinations on the External Keyboard

2.1.1 Front-panel View

1

Display of the result of a selected measurement function, simultaneously for channel 1 and 2

2

Display of a second measured value per channel, e.g., peak level of input signal, simultaneously for channel 1 and 2

3

Display of frequency for both input signals or of frequency and phase between both input signals

4

Current mode of generator, analyzer and sweep system. Date and time.

5 DATA / PANEL

Keypad with dual assignment:

DATA-LED ON: Keys serve as numeric keypad (± key switches the sign over)
DATA-LED OFF: Keys are used to call a panel (see 2.3.1 Panels); the labeling above the keys is valid:

Front-panel key	**Key combination** External keyboard	**Function**
GEN	Alt G	Settings of all generators (see 2.5 Generators (GENERATOR Panel)
ANLR	Alt A	Settings of all analyzers (see 2.6 Analyzer PANEL)
FILTER	Alt T	Filter definitions of analyzers (see 2.7 Analyzer Filters (FILTER Panel)
STATUS	Alt S	Sum up user-definable menu items of any panel (see 2.8 STATUS Panel)
FILE	Alt F	Loading and storing traces and lists (see 2.9.1), editing files and directories (see 2.9.2)
DISPLAY	Alt D	Parameters for graphical display of results (see 2.10 Graphical Data Presentation)
GRAPH	Alt R	Activate panel or graphical display (toggle function)
□◄►□	ALT Z	Switch between full-screen and part-screen mode (toggle function) (see 2.10.9)

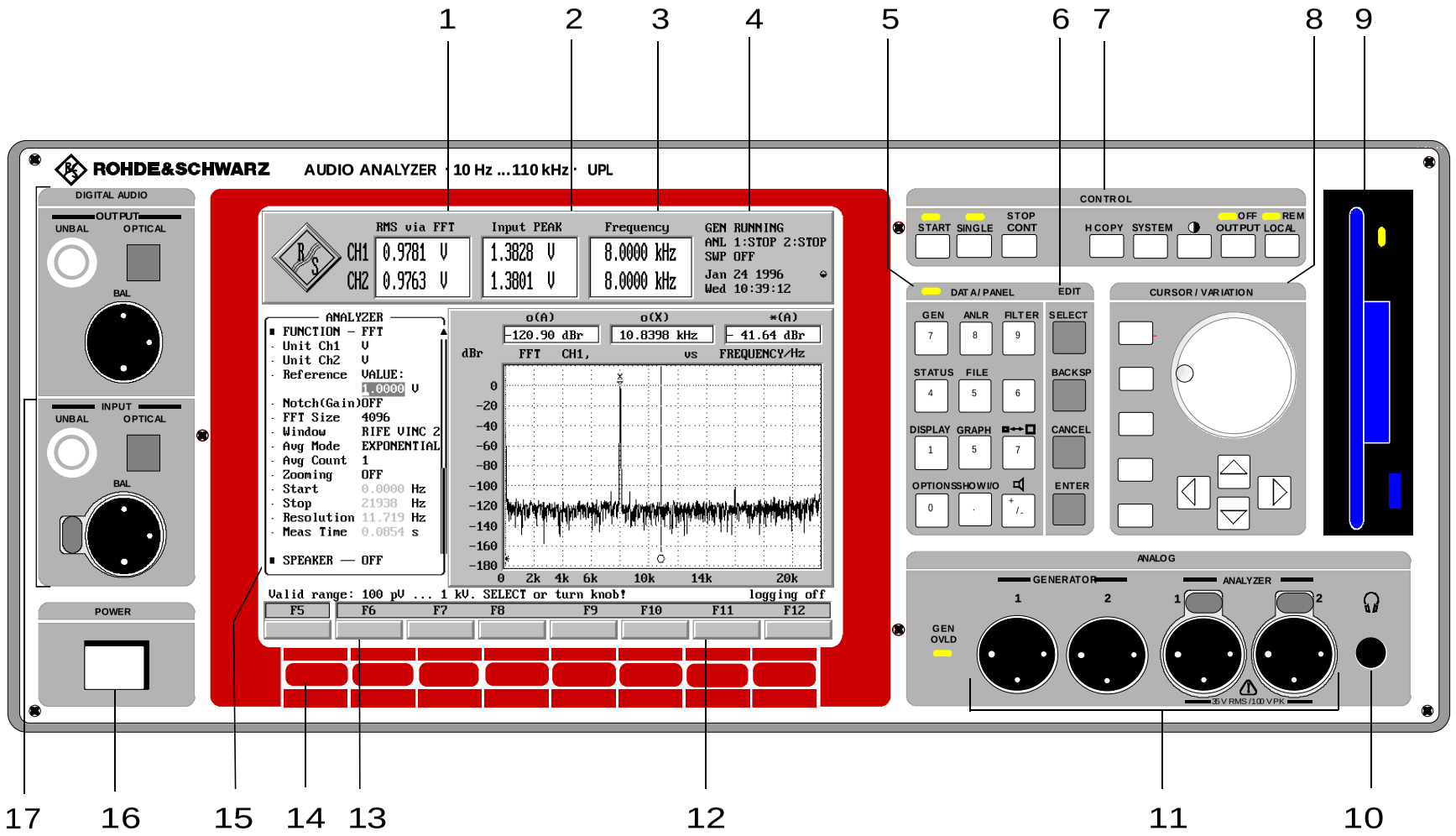


Fig. 2-1 Front-view

5 DATA / PANEL

Keypad with dual assignment:

DATA-LED ON: Keys serve as numeric keypad (± key switches the sign over)
DATA-LED OFF: Keys are used to call a panel (see 2.3.1 Panels); the labeling above the keys is valid:

OPTIONS	Alt O	Parameters for printout (see 2.14 Printing/ Plotting) and auxiliary settings (see 2.15 Setting and Displaying Auxiliary Parameters)
SHOW I/O	Alt I	Front-panel display with the selected inputs/ outputs marked; explanations in the case of indistinct input signals
+/- 		Open a box for setting the monitoring volume if the Option UPL-B5 (Monitor Output) is installed.

6 EDIT keypad

(see 2.3.2 Data Entry)

SELECT	Space	Open a selection, input or dialog window, selects characters in the entry box for entering text without external keyboard
BACKSP	*	Delete the character before the cursor
CANCEL	Esc	Close open window, the old value or parameter will remain effective
ENTER	Enter	Close open window, the new value or parameter will be accepted

7 CONTROL keypad

START	Ctrl F5/ Strg F5	Starts continuous measurement or sweeps. (→ LED lights up). Resets min. and max. values of bargraph display, average values and average traces (see 2.11 Starting and Stopping of Measurements or Sweeps)
SINGLE	Ctrl F6/ Strg F6	Starts a single measurement or single sweep. LED lights during a single sweep (see 2.11 Starting and Stopping of Measurements or Sweeps)
STOP/CONT	Ctrl F7/ Strg F7	Stops or continues measurement or sweep (toggle function) (see 2.11 Starting and Stopping of Measurements or Sweeps)
H COPY	Ctrl F8/ Strg F8	Prints a hard copy of screen (see 2.14.1 Screen copy to printer (pixel-oriented))
SYSTEM	Ctrl F9/ Strg F9	Return to MS-DOS (see 2.18 UPL Used as Computer)

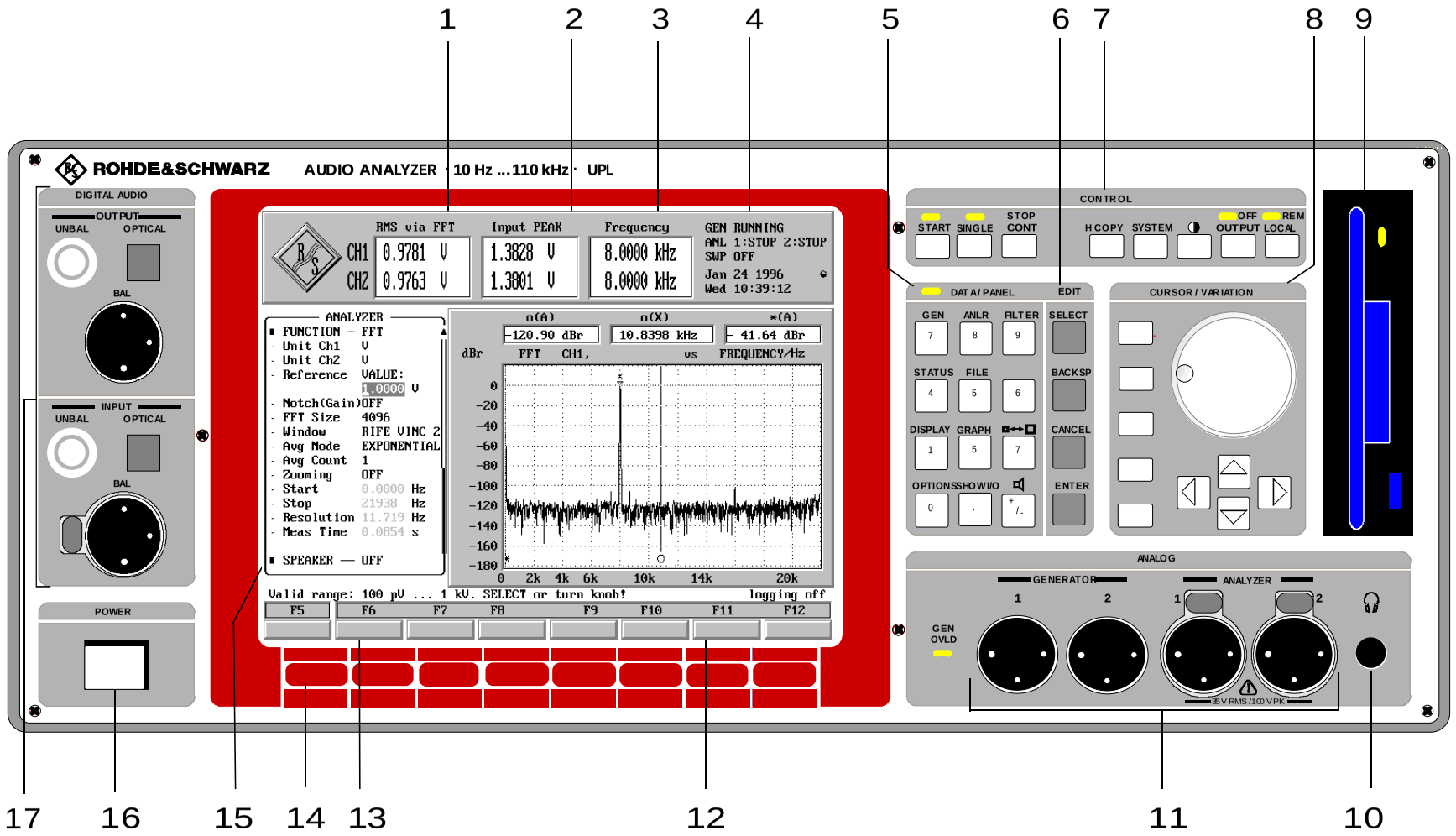


Fig. 2-1 Front-view

7 CONTROL keypad

◑	Ctrl F10/ Strg F10	Open window for setting the contrast of the LCD via rotary knob.
OUTPUT	Ctrl F11/ Strg F11	Switches all outputs ON/OFF (OFF: LED lights up) (see 2.13 Fast Switch-off of Outputs)
LOCAL  **(Speaker off)**	Ctrl F12/ Strg F12	Switch from remote to local mode (Remote control: LED is ON) In LOCAL mode, the internal loudspeaker and, optionally, the connected headphones are switched on/off if the option UPL-B5 (Monitor Output) is installed.

8 CURSOR / VARIATION keypad

(see 2.3.2 Data Entry, 2.3.1 Panels)

HELP	F1	Opens a help window
→|**,**|∗	→|**,**|∗	Tabulator right/left; change to the next input field to the right or to the left, may be used also for toggling between input panel and graphical window
PAGE∗, PAGE∗	Page ∗, Page ∗ Picture∗, Picture ∗	Turn pages in a panel or move windows back and forth If the graphical window is activated (by means of the GRAPH key or Alt R, and discernible from the softkeys being labeled with the graphics control functions), the PAGE keys are used to scroll up or down the scan index (see 2.9.3.3, Scans count >1).
∗**,** ∗	∗, ∗	Move the cursor up/down
→, ∗	→, ∗	Move the cursor to the left, right; only effective in an open input window. In the graphical window, too, the cursor position is changed unless MANUAL SWEEP is selected. With MANUAL SWEEP (started by means of the START key), the sweep steps are advanced by means of the horizontal cursor keys. When the STOP key is pressed, switchover is made back to the graphics cursors. In manual sweeps, the rotary knob has the same function as the horizontal cursor keys.
Rotary knob	Cntrl ∗ / Strg ∗ Cntrl → / Strg →	Increment or decrement the number on the cursor position, move the active cursor in the graphical display

9

3.5" disk drive, LED indicates a read or write access

10

Headphones connector (Option UPL-B5)

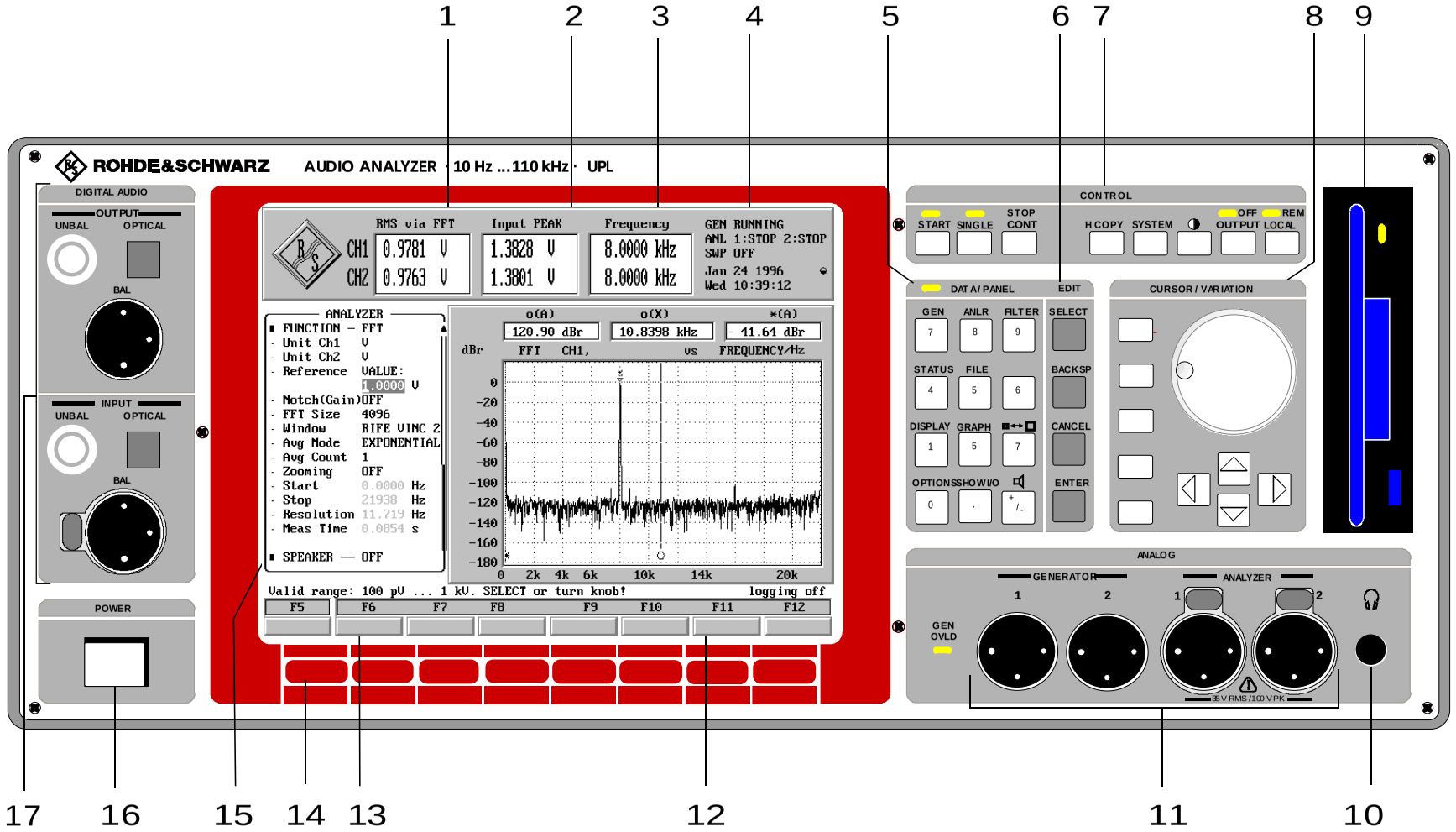


Fig. 2-1 Front view

11

Input and output connectors of the analyzers and generator for the analog interfaces (see 2.5.2 Configuration of the Analog Generator and/or 2.6.2 Configuration of the Analog Analyzers)

12

Graphical presentation of results, the measured values at the cursor positions being used.

13

Operator guidance line, also indicating the permissible range of values during data entry.

14

Softkeys. Entry of units and operation of the graphical display; can also be activated via mouse or function keys of external keyboard.

15

One of altogether 7 panels, each containing all the appertaining settings

16 Power Switch

17

Input and output connectors of the analyzer and generator for the digital interfaces (Option UPL-B2, see data sheet for order No.); see 2.5.3 Configuration of the Digital Generator / 2.6.3 Configuration of the Digital Analyzer.

Unbal:	BNC connector
Optical:	Interface EIJ CP-340, system TOSLINK
Bal:	XLR connector



To avoid EMC problems the user should take care of proper shielding of the XLR connector cables.

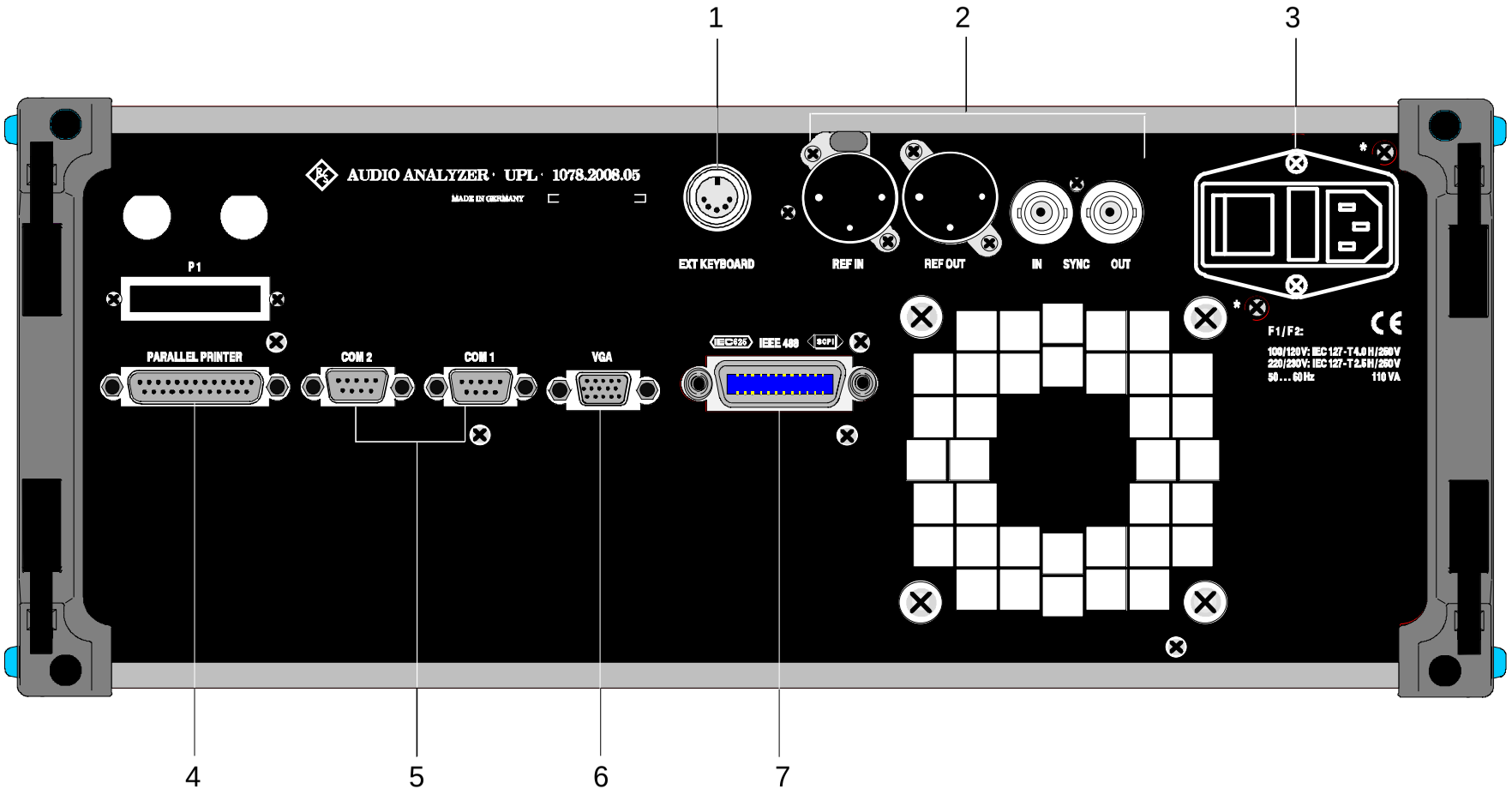


Fig. 2-2 Rear-panel view

2.1.2 Rear-panel View

1

Connector for an external keyboard (see 1.1.6, Connecting an external keyboard)

2

Inputs and outputs for reference and sync signals of the digital audio interfaces (Option UPL-B2) (see UPL-B2 data sheet)

REF IN:	input for a digital audio reference signal (DARS)
REF OUT:	output for a digital audio reference signal generated by UPL
SYNC IN:	synchronization input for wordclock and video signals
SYNC OUT:	synchronization output for synchronization of external devices (e.g., oscilloscope) to digital input signal

3

Display of the set ac voltage

4

IEC-BUS female connector (IEC-625/IEEE-488), Remote Control Option (UPL-B4) required, (see data sheet for order No.) (see Section 3, Remote Control)

5

Connector for an external VGA monitor, 15-contact D-SUB female connector, triple-row

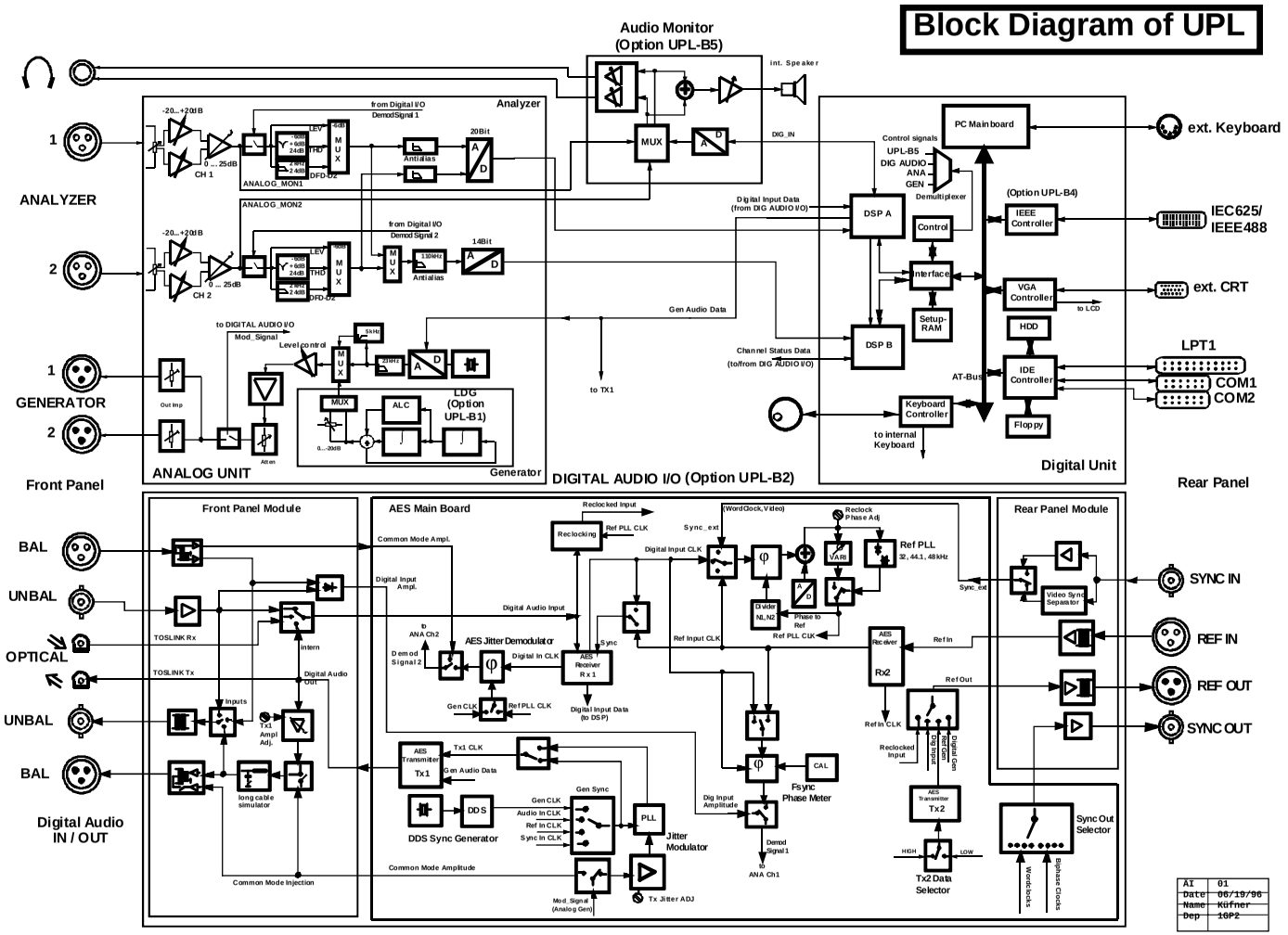
6

two RS 232-C interfaces, 9-contact D-Sub female

7

Parallel printer interface, 25-contact D-Sub female

2.1.3 Block Diagram



2.2 Operating Instructions

2.2.1 Brief Introduction

General

Subsequent to switch-on, the instrument assumes the same state as prior to switch-off. This applies to ***all setting parameters*** of the UPL, i.e., also for those which are currently not displayed.

The UPL is operated using the cursor (inverted field) ,the rotary knob and the keys SELECT, BACKSP, CANCEL and ENTER . The cursor indicates the input field for which an entry is expected. The cursor can be moved from one input field to another using the rotary knob or one of the keys ↑, ↓, PAGE↑, PAGE↓, Tab → and Tab ←. The cursor cannot be placed on fields with indicating function only. They are displayed in a different gray or another color.

Panel Structure

Associated functions and settings are displayed together in panels:

- **Analyzer panel**
  - selection of the instrument (analog or digital interfaces, frequency range)
  - configuration of the interfaces
  - measuring functions (incl. sweeps of tracking filters)
  - trigger conditions (incl. ext. sweep)
  - selection of the filters
- **Generator panel**
  - selection of the instrument (analog or digital interfaces, frequency range)
  - configuration of the interfaces
  - selection of the test signals incl. level setting
  - sweep of the generator signals
- **Filter panel**
  - definition of the filter characteristics
- **File panel**
  - storage and loading of instrument settings and measured-value sequences
  - editing of files and directories
- **Display panel**
  - definition of the type of graphical display
  - scaling of x and y-axes
  - selection of multiscans
  - entry of tolerance lines
- **Graph panel**
  - selection of cursor and marker functions
  - graphical analysis of the measurement results
- **Status panel**
  - user-configurable panel (only in combination with graphical display)
- **Options panel**

settings for

- remote control
- parameter link
- printer/plotter
- COM2-interface

- external keyboard
- external monitor
- display of the measurement result: selection of the number of digits and update rate
- display mode and language of the help texts
- version numbers of hardware and software and options fitted
- calibration
- installation of options

Basic rules of operation

- **First select the instrument (both generator and analyzer)**

  Reason: An individual set of parameters is provided for each instrument. This parameter set is saved when changing the instrument and restored when returning to the instrument. It must be loaded first before beginning to make new entries. When changing an instrument, the current choice of functions may change also (e.g., analog instruments do not offer selection of the sampling rate..).

- **Always proceed from ”top to bottom” in the panels.**

  Reason: Variations in parameters of individual menu items may affect the selection or the range of values of menu items further down, however not of menu items above.

- **Edit the DISPLAY panel only after the generator and the analyzer have been set**.

  Reason: Everything which can be displayed graphically also depends on the selected measurement function.
  Many setting parameters of the DISPLAY panel are automatically adopted from other panels, if desired, eliminating the need for setting display parameters.

Selection of function and entry of values

Selection of functions and parameters:

First open input box (SELECT key or space key on external keyboard), then

either: - select function or parameter using the arrow keys
or: - enter the first letter of the desired function on the external keyboard

Pressing the "Enter" key acknowledges the selection, "CANCEL" retains the previous selection.

Entry of numeric values:

either: - open the input box (SELECT key or space key on the external keyboard or first digit of the number to be entered)
- numeric entry
- terminate with "Enter"

the unit remains unchanged

or: - open the input box and do the numeric entry (as above)
- terminate by selecting the unit via softkey (or the corresponding function key on the external keyboard)

or:
- switch the rotary knob function to "value change mode" by pressing one of the keys ENTER, ← or →
- vary the numeric values using the rotary knob, the position of the digit to be changed can be selected using the cursor keys (← or →)

The permitted range for the selected function is displayed in the operator guidance line (between panels and softkeys).

Help Functions

The UPL provides a manifacility of help functions to support the user:

1. HELP function

- A HELP information is provided for each input field, optionally in German or English (HELP key or F1 of the external keyboard, selection of the language in the option panel).
- The help information corresponds always to the firmware version of the instrument

2. ONLINE help

The permitted range for the selected menu item is indicated in the operator guidance line (between the panels and the softkeys), respectively.

3. Entries exceeding the specified range

Entries which exceed the specified range permitted for the selected function are not accepted, an acoustic warning is output and the entry is modified to the respective minimum or maximum value.

4. SHOW I/O key

If the measured value can not be displayed, e.g., due to a missing or inappropriate input signal, the message "-Input?- Press SHOW I/O" is displayed. Pressing this key causes notes on possible error causes to be displayed together with the input and output configuration.

5. OUTPUT OFF

All UPL outputs can be switched off using this key, e.g., in order to protect a connected device under test.

2.2.2 Introductory Examples

This section provides an introduction to the operation of the UPL via the front-panel keyboard by way of examples which base on each other (operation via external keyboard or mouse, see Section 2.3 General Instructions for Use).

The examples are:

- Loading the default setup
- Frequency response measurement of the analog UPL generator from 15 Hz through 20 kHz using the sweep function
- Cutting in a filter
- Ways of presentation of measurement results
- FFT of a two-tone signal, measured at digital interface
- Hard copy of screen

Note: *Menu items which are not explained in the examples remain unchanged.*

Example 1: Loading the Default Setup

(Only required to ensure that equal conditions prevail in the examples given below)

FILE

5

Press the figures key 5 on the front panel. As the instrument is currently not expecting a numerical input (LED above the figures keys does not light up) the secondary function indicated above the keys is automatically executed. In this example, it is the FILE function.
Causes the appertaining panel (= input window) to be displayed on the screen. The panel contains the menu items dealing with file management.

Mode

DEF SETUP

Using the keys above, place the cursor to the input field in the second line of the panel (= right-hand column of menu item "Mode" under the heading LOAD INSTRUMENT STATE), press SELECT, select DEF SETUP with the cursor, close the window using ENTER. The UPL default setup is loaded.

Note: *The operator sequence "SELECT, selection with the cursor, ENTER" is always necessary to select a parameter, is however not explicitly stated in the following explanations.*

Example 2: Frequency Response Measurement of the UPL Generator in the Range from 15 Hz to 20 kHz using the Sweep Function

Analyzer settings:

FILTER

9

ANLR

8

Causes the panels for setting the analyzer filters to be displayed on the screen instead of the display panel and then changes to the analyzer panel. The cursor is always located in the last-selected panel.

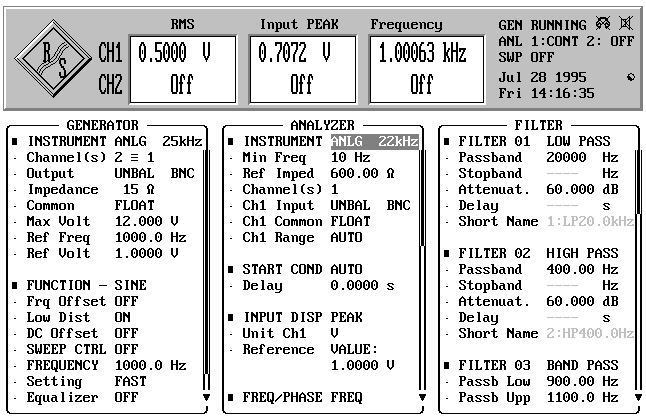


Fig. 2-3

ANALYZER

ANLG 22 kHz

Define which one of the three analyzers is to be used. The preset parameter is ANLG 22 kHz, which is designed for the analog interfaces and the frequency range up to 22 kHz. The panel displayed on the screen indicates all possible ways of setting this analyzer; the settings of the other analyzers, e.g. the analyzer DIGITAL are suppressed, however retained.

Channel(s)

1&2

Define which channel is to be measured. Select two-channel measurement.

CH1 Input

GEN CH2

Select the input on which the measurement is to be carried out. Switch channel 1 to GEN CH2 and channel 2 to GEN CH1. The generator outputs are now connected internally crosswise to the analyzer inputs. (This feature is required, e.g., for performing precise gain measurements or, as in this example to execute the examples without changing external connections.)

CH2 Input

GEN CH1

FREQ / PHASE

Freq &Phase

Switch to simultaneous frequency and phase measurement.

FUNCTION

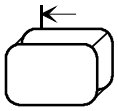
RMS&S/N

Define the measurement function. All measurement capabilities are listed in the selection window (SELECT key). Keep the preset RMS measurement (CANCEL key).

The UPL measures continuously, which is why the measurement results of the signal currently output by the generator are already displayed on the upper range of the screen:

- the first window shows the results for both channels of the selected measurement function, which is here the rms measurement (the heading of the window reflects the selected function)
- the second window gives the peak level of the input signal, also for both channels
- the third window outputs the frequency of the input signal and the phase between both channels

Generator settings:



Switch to the next input field (to the left); in this case, when pressing the key no more than twice, to the GENERATOR panel and to the position the cursor was placed when the panel was left, in this example the first line.

GENERATOR

ANLG

Specify which one of the five generators is to be used. The preset parameter is ANLG, which is the generator for the analog interfaces.

FUNCTION

SINE

Specify the type of signal to be output. The selection window lists all possible types of signals. Keep the presetting, which is sine-wave.

SWEEP CTRL

AUTO SWEEP

Define whether a sweep is to be carried out, whether the sweep is specified by parameters or a list and whether the sweep is to be continued automatically or manually via rotary knob. Switch to AUTO SWEEP. The panel shows some additional lines in which the sweep parameters are to be specified:

X Axis

FREQ

Define which parameter is to be swept, here the frequency.

Start

20 kHz

Specify the start and stop values of the sweep. With a frequency sweep selected, frequency values are expected:
Enter the start value of 20 kHz: place the cursor to the input field, press SELECT (the LED DATA above the entry block for digits lights up indicating that these keys have now the function of figures keys and cannot be used to select panels), key in 20, press softkey kHz (= F6), thus closing the input window. Select the input field for the stop value using the cursor key.

Stop

15 Hz

Place the digital cursor to the second position using the ←→ key, set 15 Hz using the rotary knob.

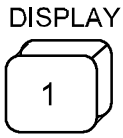
VOLTAGE

1.0 V

Specify the output voltage. Set to 1.0 V.
The permissible range of values is output in the operator guidance line (above the softkeys).

Note: *The maximum level which is still permitted to be output can be defined in the menu item "Max volt" (upper section of panel) (protects custom circuits against destruction in case of a keying error). The upper range limit permissible for inputs is thus limited to this value and accordingly varied in the operator guidance line.*

Setting the Display Parameters:



Causes the DISPLAY panel to be displayed on the screen (at the former position of the FILTER panel) and the cursor to be placed in this panel. Contains all parameters concerning the graphical presentation.

OPERATION

CURVE PLOT

The standard setting CURVE PLOT is used to display the measurement results in the form of a curve.

Trace A

FUNC CH1

Define which data are to be collected in the measured value memory A. Here, the parameter FUNC CH1 specifies the results of the function currently active for channel 1. With rms measurement selected in the analyzer, the results of this measurement are collected.

Unit

dBr

Specify the unit with which the Y axis is to be scaled. (It is possible to select a different unit from that selected in the ANALYZER panel for numerical display of the measurement result. A different unit can be selected even at a later date in order to rescale an already available trace.)
Hint: The ↑ key allows for jumping to the end of the selection box, thus obtaining dBr very fast.

Scale

MANUAL

The standard setting AUTO ONCE causes the scaling to be effected automatically whenever a measurement function is changed. At the beginning of the sweep, the full-scale values are set to a useful start value. After the sweep has been completed, the measured full-scale values are taken as the basis for rescaling.
Switch to Manual. Scaling can now be specified in the lines Top and Bottom.

Top

0.2 dBr

Bottom

-0.2 dBr

Enter the full-scale values +0.2 dBr and -0.2 dBr.
The full-scale values can be entered in units other than specified for scaling of the axis. (Renders conversion of the full-scale values when changing the scaling unit unnecessary.)

Trace B

PHASE

The phase measurement values are collected in the measured value memory B.

Scale

MANUAL

Switch to manual scaling. The scale for trace B is displayed in the right-hand margin of the graphics window.

Top

+ 1°

Enter full-scale values of ±1°.

Bottom

- 1°

X AXIS

FREQ

Indication value only. Is automatically set to the sweep control variable.

Scale

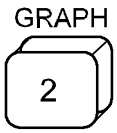
Auto

Automatically scale the x axis with the start and stop values of the sweep.

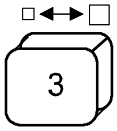
Spacing

LOG

Select between linear and logarithmic scaling of the x axis (=sweep parameter). Keep the presetting LOG.

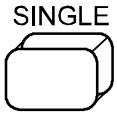


Toggle key switching from the selected input panel to the window for graphical presentation of traces, bargraphs or trace lists and vice versa. Press the key.
The graphics window will appear in **full** display (because the key was pressed when the panels were shown in full display, i.e. 3 panels simultaneously).



Switches from full-screen to part-screen mode and vice versa.

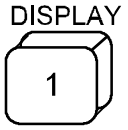
The panel most recently selected (here: DISPLAY panel) is shifted to the left on the screen, the GRAPH window being displayed next to it on the right side instead of the other two panels (part-screen mode).



Start a single sweep. The current measured values are output in the measurement result window and, at the same time, both traces are displayed. The sweep starts at the high frequencies (because of start value=20 kHz). The graph window is now active, i.e. the → and ← keys, the rotary knob and the softkeys refer to the graphical display.

The measurement of the sum frequency response of generator and analyzer is thus complete.

Example 3: Cutting in a Filter



Select the DISPLAY panel.

TRACE B

OFF

Switch off trace B.

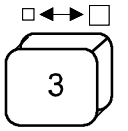
TOP

10 dBr

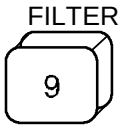
Reset the top full-scale value of trace A to 10 dBr and the bottom full-scale value of trace A to -90 dBr.
You can select Scale Auto Once instead, causing the scaling to be automatically matched at the end of the sweep.

Bottom

- 90 dBr



Switch from part-screen to full-screen mode (here: 3-panel display as the cursor was in a panel).



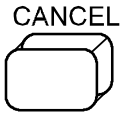
Select the FILTER panel. Up to 9 filters can be defined by the user at the same time: Enter the type of filter (lowpass, highpass...), attenuation, passband or center frequency and bandwidth you wish to use in the menu item ”FILTER XX”, finished. To make the entry more convenient for you, some filters are predefined.

Filter 05

Scroll to the first notch filter.
The parameters displayed in green or gray are values which have been determined by the internal filter design program. These values are for your information and cannot be changed.



If you need help, press the Help key to open the help window, which provides you with brief information on the current menu item, here the filters. You may select key words highlighted in the help text and obtain further information on these items by pressing SELECT.

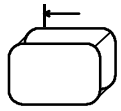


Cancel closes the help window (also ENTER).

Center Frq

4 kHz

Set the center frequency to 4 kHz, the (band)Width to 500 Hz and Atten(uation) to 50 dB. The filter is now defined and is automatically designated ”5:NO4000 Hz".

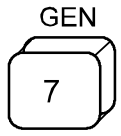


Select the ANALYZER panel using e.g. the tabulator key (press twice) and scroll to its end using e.g. the Page ↓key.

Filter

5:NO4:00 KHz

Define the filters activated in the selected rms measurement. Scroll to the first menu item ”Filter” under the heading FUNCTION, open the selection window containing a list with the nine filters defined in the FILTER panel together with their short designations and all weighting filters. All settable filters can be made visible by scrolling with the ↓ and ↑ cursor keys.
Place the cursor on Filter 5:NO4000 Hz and select using Enter.
The filter is now being calculated. The displayed filter parameters are UPLated in the FILTER panel.



Select the GENERATOR panel.

Frequency:

Spacing

LIN Points

Select linear spacing between sweep variables.

Start

3500 Hz

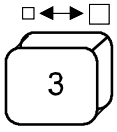
Change the start and stop values of the sweep to 3500 Hz or 4500 Hz in order to facilitate analysis of the stopband of the notch filter.

Stop

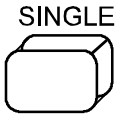
4500 Hz

Stop

4500 Hz



Switch from full-screen (3 panels) to part-screen mode.



Start a new sweep. The frequency response for channel 1 with the notch filter activated is displayed. Scaling of the X-axis is automatically matched to the new sweep values.

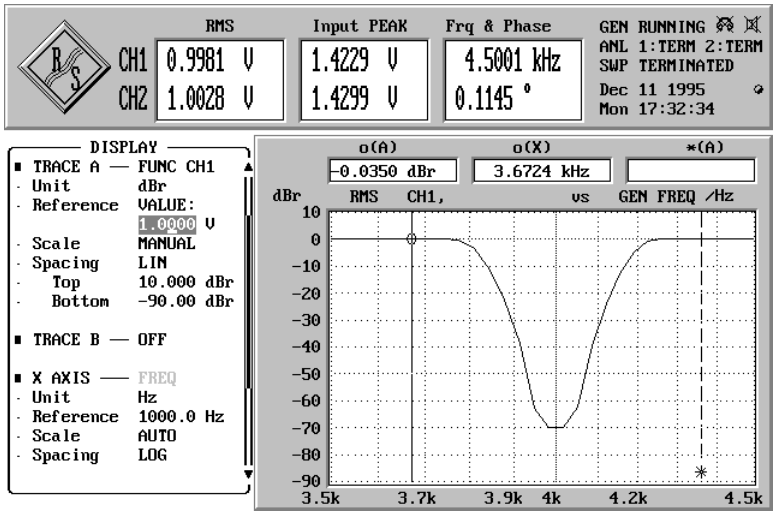
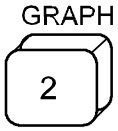
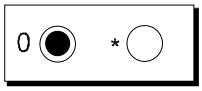


Fig. 2-4

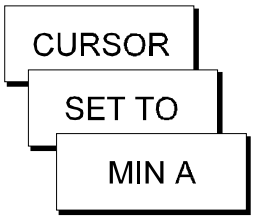
Example 4: Ways of Presentation of Measurement Data



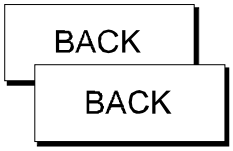
The graphical display window is activated, i.e. all entries (e.g. via rotary knob, softkeys) are relevant for graphical display.



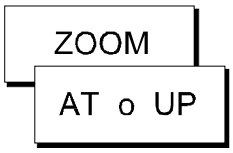
The softkey indicates by the filled circle which cursor is active, i.e. can be moved using the cursor keys or the rotary knob (in the example 0-cursor). Select the 0-cursor by pressing the softkey.



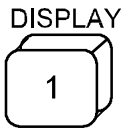
Graphical display and the cursor function can be altered using these softkeys. The key sequence CURSOR, SET TO, MIN A, for example, sets the (active) cursor to the minimum value of the sweep.



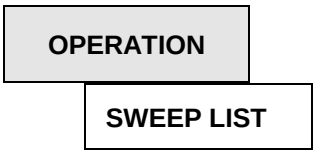
The Back softkey allows you to return to the next higher menu level. Press twice.



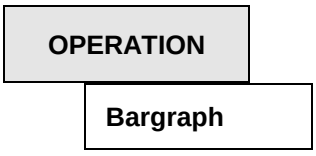
The X-axis is zoomed symmetrically around the 0-cursor by the factor of 2 with each pressing of the key.



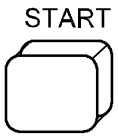
Select the DISPLAY panel.



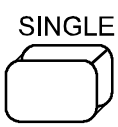
Display of measured value list for the most recent sweep. This list can be stored e.g. for further processing (FILE panel, "STORE TRACE/LIST": "STORE" ∅ "TRACE A", select a file name).



Select bargraph display. The function to be displayed and the other parameters can be selected independently for each bargraph. The minimum and maximum values indicated are reset whenever the START key is pressed.

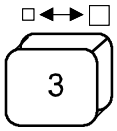


Start a continuous sweep. The current rms values and frequency are indicated in bargraph display.

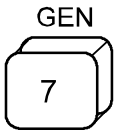


Ends the continuous sweep at the end of the last sweep.

Example 5: FFT of a Two-tone Signal, Measured at Digital Interface



Select full-screen mode for the panels.



Select the GENERATOR panel.

GENERATOR

DIGITAL

Select the generator for the digital interfaces.

Channel(s)

1

Set single-channel output.

FUNCTION

DFD

A difference tone is generated. A box is first displayed containing the question: „Really Parameter Link Yes/No“. Yes means that the corresponding DFD measurement is automatically switched on in the analyzer. Acknowledge by entering NO in this example, since an FFT is to be made. Select mean frequency (enter in menu item ”Mean Freq”) and difference frequency (menu item ”Diff freq”) is generated. The total level is 100 % FS (full scale), i.e. the peak value of the level matches the maximum number that can still be displayed (”all bits set”).

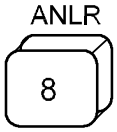
MEAN FREQ

10 kHz

Enter mean and difference frequency.

DIFF FREQ

80 Hz



Select the ANALYZER panel.

ANALYZER

DIGITAL

Select the analyzer for the digital interfaces.

Input

Intern

Switch to the internal digital interface to the generator. The generator is connected internally to the analyzer. (The internal sample rate is fixedly set to about 43 kHz.)

Function

FFT

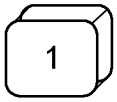
Select FFT analysis (selection in a box can always be made, alternatively, by entering the first letter on the external keyboard, i.e. „F“ in this example).

FFT-Size

8192

Specify the size of the calculated FFT in number of points. The higher the FFT, the higher the frequency resolution (see DISPLAY menu item ”Resolution”), however the more the measuring time (see DISPLAY menu item ”Meas Time”).

Display

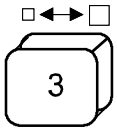


Trace A:

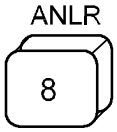
Unit

dBFS

Select unit of the y-axis. Scaling is then made automatically, since the parameter “Scale“ is set to “AUTO ONCE“.



Switch to part-screen mode.
The spectrum of the difference tone signal is displayed.



Select analyzer panel.

Zooming

ON (2 ... 128)

Increases the frequency resolution by one center frequency (menu item ”Center”) through digital preprocessing of the signal by the zoom factor (DISPLAY menu item ”Zoom-Fact”). The frequency range displayed is thus decreased by the same factor (menu item ”Span”).

Note: *Not to be confused with the Zoom in Graph where the measured data are only displayed in zoomed form. Here, the measurement is really made at this higher resolution!*

Center

10 kHz

Set to 10 kHz (= center frequency of difference tone signal)

Span

2.49 kHz

Select 2.49 kHz. This results in an expansion by a factor of 16 (zoom factor). In the graphics window, the zoomed spectrum is displayed (see Fig. 2.5).

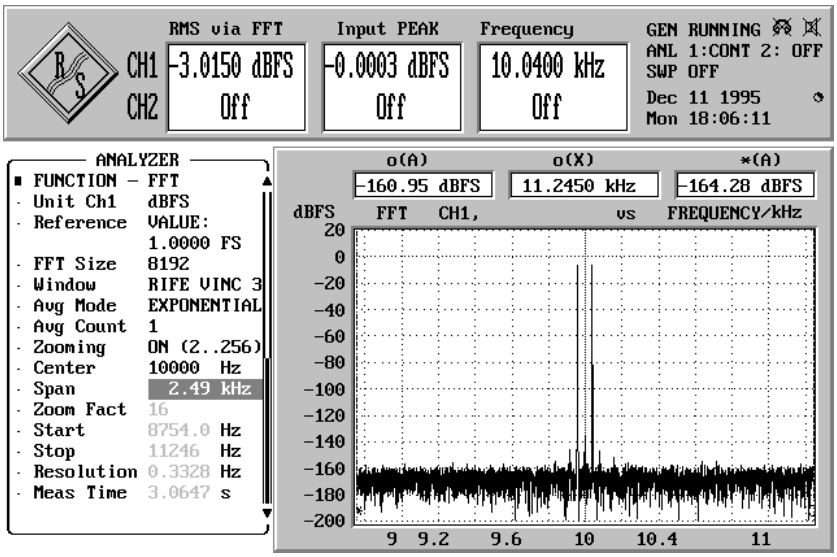


Fig. 2-5

Example 6: Hard Copy of Screen

Span

Use the key in the “Span“ line to enter the first column of the panel. The SELECT key is used to tick off this line and generate a copy of this line in the status panel.



Activate the STATUS panel. In this panel, all lines which have been ticked off by the user in one of the panels are listed. It is thus possible to sum up all particularly important parameters in one panel and to print them out together with the measurement results.

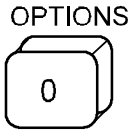
Span

1.37 kHz

The UPL can also be operated from the status panel: select a span of 1.37 kHz (the frequency resolution is increased again).

Essential parameters can thus be modified without changing the panel.

For generation of a hard copy, just connect a printer to the parallel interface and configure the UPL appropriately:



Select the OPTIONS panel.

Destin

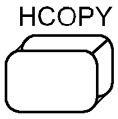
Printer

Select hardcopy output to a printer.

Printname

xxx

Select the appropriate printer driver from the list provided. Subsequently, change to the type of display which is to be printed (e.g., activate status panel again).



A box is displayed which allows for selection whether and which comment is added to the printout. Upon acknowledging the request, the printjob is started.
It is advisable with fast printers, to stop the measurements by pressing the STOP key thus increasing the printwork.