

U3661 Specifications

Frequency

Frequency range:	9 kHz to 26.5 GHz		
	Frequency	Frequency band	Harmonic order N
	9 kHz to 3.2 GHz	0	1
	3.0 GHz to 7.1 GHz	1	1
	6.7 GHz to 14.5 GHz	2	2
	13.7 GHz to 26.5 GHz	4	4
	Preamplifier 9 kHz to 3.2 GHz (Band 0)		

Frequency read accuracy (Start, stop, center frequency, marker frequency): $\pm(\text{Frequency reading} \times \text{Frequency reference accuracy} + 5\% \times \text{Span} + 15\% \times \text{RBW} + 60 \text{ Hz} \times \text{N})$

Marker frequency counter

Resolution: 1 Hz to 1 kHz
 Accuracy: $\pm(\text{Marker frequency} \times \text{Frequency reference accuracy} + 1\text{LSD} \pm 5 \text{ Hz} \times \text{N})$
 (S/N ≥ 25 dB, 1 kHz \leq span ≤ 200 MHz, RBW ≥ 3 kHz)

Frequency reference accuracy

Aging rate: $\pm 2 \times 10^{-6}/\text{year}$
 Temperature stability: $\pm 1 \times 10^{-6}$ (0 °C to 50 °C)

Frequency span

Range: 1 kHz to 26.7 GHz, 0 Hz (zero span)
 Accuracy: 5% of span or less

Residual FM (zero span): $\leq 60 \text{ Hz-p-p} \times \text{N}/100 \text{ ms}$

Frequency drift (at a fixed temperature, 30 minutes after power-on)

Span ≤ 10 kHz: $< 150 \text{ Hz} \times \text{N} \times (\text{Sweep time}/\text{min})$

Side-band noise

20 kHz offset: Frequency ≤ 7.1 GHz (Band 0, Band 1); ≤ -105 dBc
 Frequency > 6.7 GHz; $\leq (-105 + 20 \log N)$ dBc
 10 kHz offset: Frequency ≤ 7.1 GHz (Band 0, Band 1); ≤ -100 dBc
 Frequency > 6.7 GHz; $\leq (-100 + 20 \log N)$ dBc

Resolution bandwidth (3 dB)

Range: 1 kHz to 3 MHz, 1 to 3 sequences
 100 Hz, 300 Hz (with OPT 26)
 Accuracy: $< \pm 20\%$ (1 kHz to 1 MHz)
 (100 Hz, 300 Hz OPT 26)
 $< \pm 25\%$ (3 MHz)

Selectivity: $< 15:1$ (60 dB : 3 dB)

Video bandwidth: 10 Hz to 3 MHz, 1 to 3 sequences

Amplitude range

Measurement range: +30 dBm to (Average display noise level)

Maximum input level (Input attenuator ≥ 10 dB)

Preamplifier OFF: +30 dBm, 0 VDCmax

Preamplifier ON: +13 dBm, 0 VDCmax

Display range

Log: 10 x 10 div 10, 5, 2, 1 dB/div

Linear: 10%/div of reference level (RBW ≥ 3 kHz)

Reference level range

Preamplifier OFF: (Input attenuator 0 to 50 dB)

Log: -64 dBm to +40 dBm (0.1 dB steps)

Linear: 141.1 μV to 22.36 V

Preamplifier ON: (Input attenuator 0 to 10 dB)

Log: -89 dBm to -25 dBm (0.1 dB steps)

Linear: 7.934 μV to 12.57 mV

Input attenuator range: 0 dB to 50 dB (10 dB steps)

Dynamic range

Average display noise level: RBW 1 kHz, VBW 10 Hz, input attenuator 0 dB, frequency ≥ 1 MHz

Preamplifier OFF:	Frequency band	Noise level
	0	$-(117 - 2 \text{ f[GHz]})$ dBm
	1	-105 dBm
	2	-110 dBm
	4	-105 dBm

Preamplifier ON: -132 dBm + 3 f[GHz] dBm (1 MHz to 3.2 GHz (Band 0))

1dB gain compression

Preamplifier OFF: Input attenuator 0 dB, frequency 10 MHz or more
 > -10 dBm (mixer input level)

Preamplifier ON: > -30 dBm (preamplifier input level)

Spurious response:

2nd order harmonic distortion:	Frequency range	Mixer level	Distortion level
	10 MHz to 1.7 GHz	-30 dBm	≤ -70 dBc
	1.7 GHz to 3.2 GHz	-10 dBm	≤ -80 dBc
	> 3.2 GHz	-10 dBm	≤ -100 dBc

3rd order distortion: ≤ -70 dBc (Mixer input level -30 dBm, 2-signal difference > 10 kHz)

Image/multiple/out-band response:

< -50 dBc

Residual response:

Preamplifier OFF: Input 50 ohm termination, input attenuator 0 dB
 ≤ -100 dBm (1 MHz \leq Frequency ≤ 3.2 GHz)
 ≤ -90 dBm (Frequency > 3.2 GHz)

Preamplifier ON: ≤ -105 dBm (1 MHz \leq Frequency ≤ 3.2 GHz)

Amplitude accuracy

Frequency response: Automatic calibration, after pre-selector peak execution

Preamplifier OFF: 100 kHz to 2.7 GHz; $\leq \pm 1$ dB

9 kHz to 3.2 GHz; $\leq \pm 2$ dB

3 GHz to 7 GHz; $\leq \pm 1.5$ dB

7 GHz to 14.4 GHz; $\leq \pm 3.5$ dB

14.4 GHz to 26.5 GHz; $\leq \pm 4.0$ dB

Preamplifier ON: 100 kHz to 2.7 GHz; $\leq \pm 1$ dB

(Band 0) 9 kHz to 3.2 GHz; $\leq \pm 2$ dB

Calibration signal

level accuracy (30 MHz): -20 dBm ± 0.3 dB

IF gain error: $< \pm 0.5$ dB (After automatic calibration)

Scale display accuracy:

After automatic calibration

Log: $\leq \pm 1.5$ dB/90 dB

$\leq \pm 1$ dB/10 dB

$\leq \pm 0.2$ dB/1 dB

Linear: $\pm 5\%$ of reference level (RBW ≥ 3 kHz)

Input attenuator

switching accuracy: Referenced to 10 dB, 0 dB to 50 dB

9 kHz to 12 GHz; $\leq \pm 1.1$ dB

12 GHz to 20 GHz; $\leq \pm 1.3$ dB

20 GHz to 26.5 GHz; $\leq \pm 1.8$ dB

Resolution bandwidth

switching error: After automatic calibration

$< \pm 1.0$ dB (RBW referenced to 3 MHz)

Sweep

Sweep time: 50 ms to 1000 s

50 μs to 1000 s (zero span)

manual sweep

Accuracy: $< \pm 5\%$

Trigger mode:

FREE RUN, SINGLE, VIDEO, EXT, TV

Demodulation

Audio demodulation

Modulation type: AM, FM (FM operates at RBW ≥ 3 kHz)

Audio output: Speaker and earphone jacks (with volume control)

Input/output

RF input

Connector: Type N, female (or Type SMA)
 Impedance: 50 ohm (nominal)
 VSWR preamplifier OFF: Input attenuator 10 dB to 50 dB
 <1.5:1 (100 kHz to 3 GHz)
 <2:1 (3 GHz to 26.5 GHz)
 VSWR preamplifier ON: <2.5:1 (9 kHz to 3.2 GHz)
 (Band 0)

10MHz frequency reference input

Connector: BNC female, rear panel
 Impedance: 75 ohm (nominal)
 Input range: 0 dBm to +16 dBm

Video output

Connector: BNC female, rear panel
 Impedance: 75 ohm (nominal), AC-coupled
 Amplitude: Approx. 1 Vp-p, 75 ohm termination (composite video signal)

External trigger input

Connector: BNC female, rear panel
 Impedance: 10k ohm (nominal), DC-coupled
 Trigger level: TTL level

Gated input

Connector: BNC female, rear panel
 Impedance: 10k ohm (nominal)
 Sweep stop: During LOW at TTL level
 Sweep: During HIGH at TTL level

Audio output

Connector: Compact monophonic jack, top panel
 Power output: 0.2 W, 8 ohm (nominal)

GPIB interface

Plotter: IEEE-488, bus connector
 R9833, HP7470A, HP7475A, HP7440A,
 HP7550A, 682-XA
 Printer: HP2225A

RS-232:

D-SUB 9-pin, rear panel

Power input

When battery mounter is applied:
 AC input ; AC/DC adapter A08364 (automatic 100 V/200 VAC switching) (Advantest)
 Battery ; Pro Pac 14 battery (nominal 60 Wh) (Anton Bauer)

TV video demodulation output:

OPT 72
 Connector: BNC female, rear panel
 Impedance: 75 ohm (nominal), DC-coupled
 Amplitude: Approx. 1 Vp-p, 75 ohm termination

TV audio demodulation output:

OPT 72
 Connector: Pin female, rear panel
 Impedance: 1k ohm (nominal), AC-coupled

TV video signal input:

OPT 72
 Connector: BNC female, rear panel
 Impedance: 75 ohm (nominal), AC-coupled
 Input level: Approx. 1 Vp-p

TV audio signal input:

OPT 72
 Connector: BNC female, rear panel
 Impedance: 1k ohm (nominal), AC-coupled

General specifications

Temperature

Operating temperature: 0 °C to 50 °C
 Relative humidity: 85% or less
 Storage temperature: -20 °C to 60 °C

Power requirements

External DC input: Connector; XLR 4 pins
 Input range; +10 V to +16 V
 With AC adapter: Automatic 100 V/200 VAC switching
 100 VAC operation: Voltage; 100 V to 120 V
 Frequency; 50 Hz/60 Hz
 220 VAC operation: Voltage; 220 V to 240 V
 Frequency; 50 Hz/60 Hz
 Power consumption: External DC input; 70 W maximum
 With AC adapter; 120 VA maximum

Weight

Main unit: 8.5 kg or less (accessories, carrying strap, and battery not included)
 AC/DC adapter (A08364): 1.1 kg
 Pro Pac 14 battery: 2.3 kg

Dimensions:

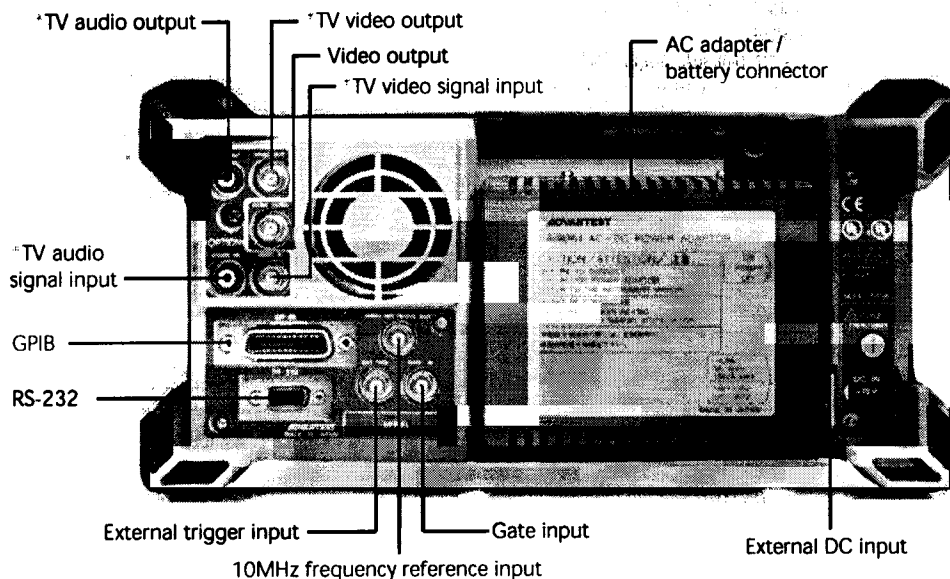
Approx. 148mm (H) x Approx. 291mm (W) x 330mm (D)
 (Stand, connectors, and other protrusions not included)

External memory

Memory card drive: 2 slots, top panel
 Connector: JEIDA Ver. 4.1, PCMCIA Rel. 2.0

Accessories

- AC/DC adapter: A08364
- Power cable: A01402
- Power fuse: 328010
- N-BNC conversion adapter: JUG-201A/U
- N-SMA conversion adapter: FLA-H-SA7
- Carrying strap
- Instruction manual



Rear panel

OPT72 only

Option Specifications

OPT 20 High-Stability Frequency Reference Source

Frequency:	10 MHz
Frequency stability:	$\pm 2 \times 10^{-2}/\text{day}$ $\pm 1 \times 10^{-7}/\text{year}$

OPT 26 Narrow RBW 100/300 Hz

Resolution bandwidth (3 dB)	
Range:	100 Hz, 300 Hz
Bandwidth accuracy:	$\leq +20\%$
Selectivity:	$\leq 15:1$ (60 dB:3 dB)

OPT 60 CDMA

Measurement standard: Conforms to CDMA standard IS95 and J-STD-008
Channel input function

US cellular:	1 to 799, 990 to 1023
KOREA cellular:	1 to 799, 990 to 1023
CHINA cellular:	0 to 1000, 1329 to 2047
JAPAN cellular:	1 to 799, 801 to 1039, 1041 to 1199

US PCS:	0 to 1199
KOREA PCS:	0 to 1300
USER TABLE:	99 channels can be created.

Channel power measurement: (After automatic calibration, automatic setting, preamplifier OFF, -50 dBm/1.23 MHz to +20 dBm/1.23 MHz, within 80 dB range)

Absolute accuracy: $\leq \pm 2.0$ dB (15 °C to 35 °C)

$\leq \pm 2.5$ dB (0 °C to 50 °C)

Relative accuracy: $\leq \pm 0.5$ dB (15 °C to 35 °C)

$\leq \pm 0.8$ dB (0 °C to 50 °C)

Occupied frequency bandwidth (OBW) measurement:

Occupation ratio can be set to 10.0% to 99.8%

Adjacent channel leakage power (ACP) measurement:

Template display (After making measurement the specified number of times, calculates the reference power and draws a template.)
Standard template, user template selectable
PASS/FAIL function

Spurious emission (in-band) measurement (relative value):

Template display (After making measurement the specified number of times, calculates the reference power and draws a template.)
Standard template, user template selectable
PASS/FAIL function

The OPT 72 and OPT 78 cannot be mounted at the same time.

OPT 72 TV Demodulation

TV demodulation	
Demodulation type:	NTSC, PAL (PAL-M not included), SECAM
TV STD:	M, B/G, D/K/K', I, L/L'
Demodulation output:	Video, audio

TV video demodulation output

Connector:	BNC jack (rear panel)
Impedance:	75 ohm (nominal), DC-coupled
Amplitude:	Approx. 1 Vp-p, 75 ohm termination

TV audio demodulation output

Connector:	Pin jack (rear panel)
Impedance:	1k ohm (nominal), AC-coupled

TV video signal input

Connector:	BNC jack (rear panel)
Impedance:	75 ohm (nominal), DC-coupled
Input level:	Approx. 1 Vp-p

TV audio signal input

Connector:	Pin jack (rear panel)
Impedance:	1k ohm (nominal), AC-coupled

Cannot be mounted at the same time as the OPT 60.

OPT 74 Tracking Generator

Frequency range:	100 kHz to 2.2 GHz
Output level range:	0 dBm to -31 dBm, in 1 dB steps
Output level accuracy:	$\leq \pm 0.5$ dB (30 MHz, -10 dBm, 20 °C to 30 °C)
Output level flatness:	$\leq \pm 0.7$ dB (100 kHz to 1 GHz) $\leq \pm 1.5$ dB (100 kHz to 2.2 GHz) (at the time of -10 dBm, referenced to 30 MHz)

Output level switching accuracy:	$\leq \pm 1.0$ dB (100 kHz to 1 GHz) $\leq \pm 2.0$ dB (100 kHz to 2.2 GHz) (referenced to the time of -10 dBm)
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Output level spurious:	Harmonic < -20 dBc Non-harmonic < -30 dBc
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TG leakage:	≤ -95 dBm
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TG output:	Connector ; Type N jack Impedance ;50 ohm (nominal) VSWR ≤ 1.5 (100 kHz to 2 GHz) VSWR ≤ 2.0 (100 kHz to 2.2 GHz) ≤ -10 dBm output
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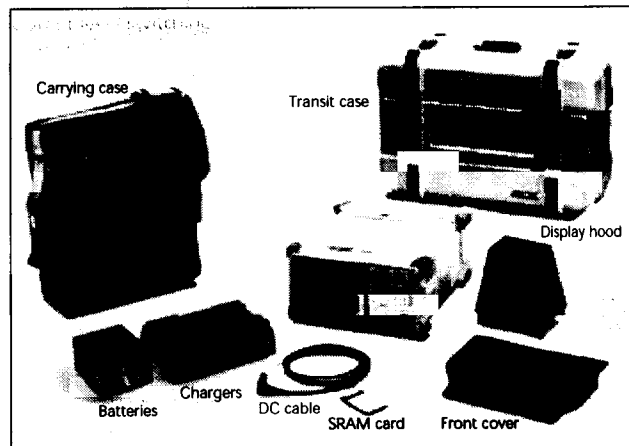
OPT 78 Channel Setting

Channel setting:	Channel setting for VHF, UHF, CATV, BS, and CS for various countries Two user channels are available; 99 channels can be registered for each.
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The OPT 78 is included in the OPT 72.

Cannot be mounted at the same time as the OPT 60.

Accessories



Options (sold separately)

OPT 3661 + 20	High-stability reference option
OPT 3661 + 26	Narrow RBW option
OPT 3661 + 60	CDMA option
OPT 3661 + 72	TV demodulation option
OPT 3661 + 74	Tracking generator option
OPT 3661 + 78	Channel input setting option

Accessories (sold separately)

R16072	Transit case
R16216A	Carrying case
R16601	Display hood
A02806	Front cover
PROPAC14 BATT	Battery
DUAL2401 CHARGER	Charger
A09507	64K byte SRAM memory card
A09508	256K byte SRAM memory card
A09509	2M byte SRAM memory card
A01434	DC cable



Specifications may change without notification.

Oct. 2001 + 20

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2001 + 20