



HF/50 MHz ALL MODE TRANSCEIVER

# IC-756PRO



Icom Inc.



# THE DIGITAL REVOLUTION JUST TOOK A HUGE LEAP FORWARD

RELAYING THE REAL MEANING OF PLEASURE INTO THE AMATEUR RADIO WORLD. MATERIALIZING TECHNIQUES NOT PREVIOUSLY ACHIEVABLE, THE IC-756PRO AND ICOM WILL TAKE YOU, YOUR TRANSCEIVER AND OPERATING CAPABILITIES INTO A NEW POWER PERFORMING DIMENSION. BECOMING THE BEST OF THE BEST, THE IC-756PRO STANDS SECOND TO NONE. AN HF/50 MHz, ALL MODE TRANSCEIVER, MADE PERFECT FOR THOSE SERIOUS HAMS. FULL OF REVOLUTIONARY FUNCTIONS DESIGNED TO GIVE YOU AN ADVANTAGE, AND BACKED BY PERFORMANCE THAT WILL KEEP YOUR COMPETITION ON THEIR TOES. ICOM TECHNOLOGY, STARTING A NEW DIMENSION.

## HF/50 MHz ALL MODE TRANSCEIVER **IC-756PRO**

### It began with developing the ultimate in IF-DSP

HF transceivers with DSP are being introduced one after the other. Icom has taken the lead over other transceivers by not just using existing DSP, but in an effort to create the pinnacle in this technology, has developed an all new, original DSP unit.

### Equipping the 32-bit Floating Point DSP— first in amateur equipment

The 32-bit Floating Point DSP— this DSP provides a much wider and precise processing ability than 16-bit Fixed Point DSP, did with previous DSP transceivers. And also, the built-in 24-bit AD/DA converter helps to realize ultra wide dynamic range operation. The result is, this unique Icom technology has made it possible to realize unparalleled performance, deservedly fitting of the name 'PRO'.

### Taking the potential of the transceiver to heights unimaginable, until now.

The combination of the 32-bit Floating Point DSP and 24-bit AD/DA converter is loaded with superior digital functions never before available with previous DSP units. With the DSP controlled AGC loop management, it is now possible to achieve pure digital functions. The digital IF filter, digital twin PBT and manual notch, the elimination of radio interference, unrivaled transmission and reception S/N, ultra-low distortion transmission and reception tone quality etc., is delivered. The search by Icom for the ultimate HF transceiver, resulted in the 32-bit Floating Point DSP and 24-bit AD/DA converter, and brought to life in the IC-756PRO. The most striking impression of the ability of this technology is without a doubt, the performance of the digital IF filter.



### For the efficient operation of all functions.

In particular, people on the DX or contest front lines demand instant response. So, Icom has incorporated a 5-inch TFT color LCD in the IC-756PRO. The LCD, with superior visibility and various types of information clearly defined, has been designed to lessen the burden of the operator, while increasing accuracy and ease of understanding.

### We completely redesigned the whole transmitter and receiver.

The IC-756PRO was designed to be the 'Ultimate HF Transceiver'. It is possible to upgrade and make a better machine from the previous IC-756. But it is even better still, to completely rethink and redesign, and in the process, create revolutionary progress in technology. It was this revolutionary thinking that lead to the creation and realization of the ultimate in everything a DSP machine should be, the 'IC-756PRO'.





# 32-bit Floating Point IF DSP teaming with 24-bit AD/DA converter

## 32-bit floating point DSP

To dramatically increase the ability of all digital functions in this all mode transceiver, the latest technology has been used and a newly designed DSP has been created. The IC-756PRO, has employed an originally designed 32-bit floating point DSP unit. Along with this, sees the adoption of the 24-bit AD/DA converter making a formidable team with ample capacity. Especially with the receive signal input, the AD/DA converter provides ultra wide dynamic range, 144 dB\*, of signal management. Clear signals without any distortion are realized even in any signal conditions, such as very weak or extremely strong signals from nearby stations. The DSP has extremely high performance processing ability, which dramatically improves signal resolution, as well as both transmission and reception S/N ratio, and allows more high performance features and properties.

\*theoretical value at digital operation stage.

## AGC loop management

The digital IF filter, manual notch filter etc. are adopted in the AGC loop, and controlled by the 32-bit floating point DSP. This system removes blocking by extremely strong adjacent signals in out of filter passbands. Therefore, you will never have to suffer blocking of the AGC again. The result is that even very weak signals can be extracted from the noise level in between crowded strong signals clearly! In addition, the AGC time constant, (three presettable slow, medium and fast) are flexibly adjustable for each operating mode to suit operating band conditions, operating style, etc.

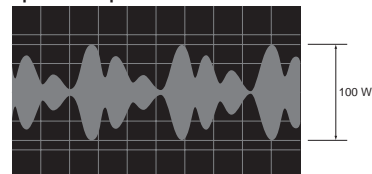


Example for setting time constant for the SSB, 2.5.

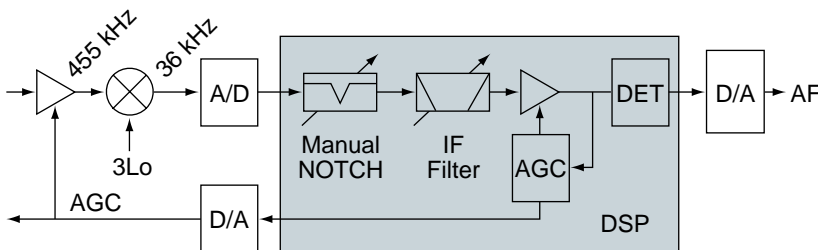
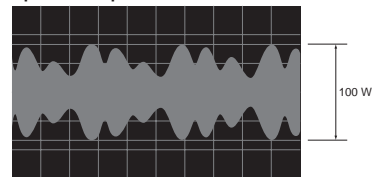
## RF speech compressor

The IC-756PRO has truly drawn the line between previous models and their standard equipped compressors. The 32-bit capacity provided from the DSP, allows the speech compressor to compress the transmitter IF signal, therefore, average talk power is increased. This function of course is effective for long distance communication, or when propagation conditions are poor. IC-756PRO keeps the level of distortion to it's lowest extremity at maximum compression. In turn this ensures that your fellow ham enthusiasts are presented with quality readability. In addition, the transmit bandwidth is selectable, regardless of the speech compressor activity, from 2.2, 2.4 and 2.8 kHz to suit operating band conditions, etc.

Speech compressor OFF



Speech compressor ON

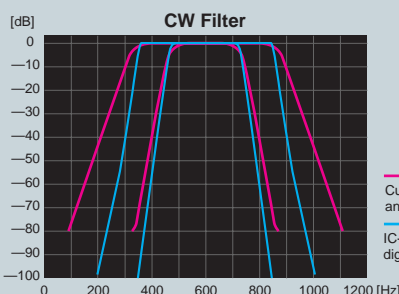
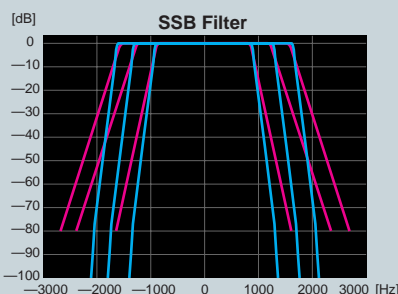


## Edge cutting IF filter

The IC-756PRO is equipped with a digital IF filter that can be set from a total of 51 passband widths. Unacheived with previous analog filters, the IC-756PRO fields an outstanding inclusion with it's shape factor. Sharply cutting in on any adjacent signals. Besides this, the SSB filter will firstly respond to various digital modes, making it possible to narrow a passband to 50 Hz.

Mode	Passband width range	
	50-500 Hz	600-3600 Hz
SSB/RTTY	10; 50 Hz step	31; 100 Hz step
CW	10; 50 Hz step	

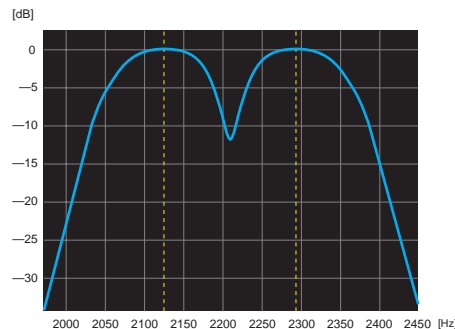
An optional filter no longer needs to be installed at each stage to create a full filter combination to suit your operating needs.



Current analog filter  
IC-756PRO's digital filter

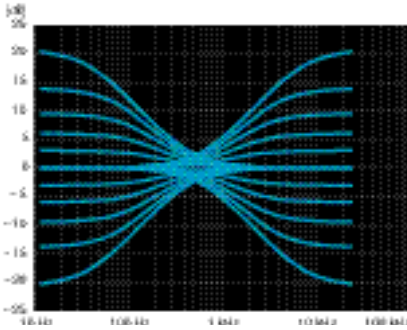
## Twin peak audio filter

A twin peak audio filter has been built in. 2 specified audio frequencies only are passed through the filter in the DSP for accurately receiving an RTTY signal, for a profound decoding rate. You will see a dramatic improvement in the quality of S/N, as well as removing interfering CW signals, etc.



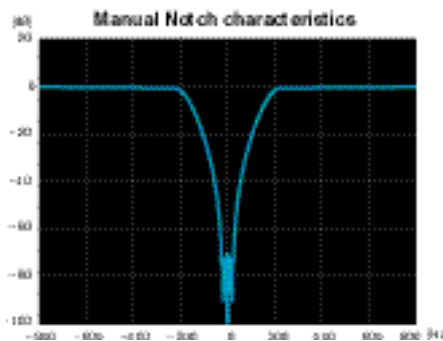
## Microphone equalizer

In the high/low sound ranges, there are 11 different levels respectively, which can set frequency properties. Totalling 121 varieties equalized audio can be set with the built in microphone audio equalizer. Suitable transmit audio can be easily and freely set using the equalizer according to operating style, and your personal preference.



## Manual notch capability

The 32-bit floating point DSP has also allowed the inclusion of possible manual notch operation, as well as equipping current auto notch function. The manual notch filter achieves more than 70 dB of attenuation level, and with its sharp cutting characteristics, the manual notch function can accordingly be adjusted to beat unwanted signals, while protecting the desired signal— very weak signals buried in extremely strong beat signals, can be received. Of course with the auto notch function, the notch frequency is automatically adjusted to follow interfering beat signals— reducing interference from sweeping beat signals, etc.



## DPSN

A digital PSN (Phase Shift Network) is employed at the modulator using an original 90° phase shifter architecture. The result is consistently reproducible, clear and high quality transmit audio for all voice operations. In addition, the DPSN also allows SSB operation with superior carrier suppression and unwanted sideband rejection ratio.

## RTTY demodulator

The first in the world, the Baudot RTTY demodulator and decoder, boasting a superb decoding rate capability, is built-in. Of course, the received alphanumeric details of RTTY signal are indicated on the LCD display— you don't need external units for RTTY receiving any more! The built-in tuning indicator, located at the top of the LCD, can visually recognize the tuning condition, and in combination with the 1/4 speed dialling function, allows quick and simple zero-in, even if you are new at or interested in RTTY receiving.



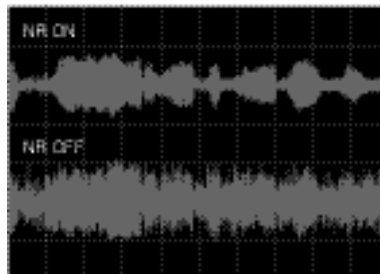
Example for receiving an RTTY signal

## Digital noise reduction

The newly designed DSP digitally separates desired signal components from noise components. Outstanding signal to noise ratio is achieved, providing clean, clear audio in SSB, easy-to-copy RTTY and crisp, clear SSTV reception. In addition, the digital noise reduction has continuously adjustable noise suppression capabilities— complicated, high level of algorithms are instantaneously managed by the 32-bit floating-point DSP.



Audio output competition



## CW wave form

With the CW wave form being created in the DSP— it now has been made possible to materialize CW transmissions with desired leading and trailing edge characteristics. The characteristics are selectable from 4 available steps to suit your operating style. 2, 4, 6 and 8 msec. characteristics are available

# Advanced Features and basics... the Mark of a World Leader

## ■ 5-inch TFT color LCD

The first in an HF transceiver! The IC-756PRO is Icom's prized product, and has adopted a 5-inch TFT color LCD that offers a concentrated indication of various information recognizable at a glance. 4 colors and 7 types of fonts can be selected at your personal preference. Separated into an upper and lower screen, the TFT color LCD will be sure to offer that all important quick operation.

### Color Type

Type A



The most useful screen, displays variety of information.

Type C



Amber colored indication, easy to read even small characters.

Type B



Easy to read even in dark shack.

Type D



A chic, monochrome indication screen.

## Font type

Basic 1



Basic 2



Pop



7-Segment



Italic 1



Italic 2



Classic



## ■ Digital voice memories

Whether you're contesting or on a DX'pedition, the digital voice memories are a built-in feature you'll really appreciate. A total of 8 memories, 4 each for transmit and receive, with 15 sec. of storage space per location, use the recorder for calling CQ, reporting call sign, or any other continuously repeated audio. Of course record and playback audio quality is remarkably high.



Example for transmitting condition of recorded contents (T1).

## ■ Highly stable transmitter

The IC-756PRO has a newly adopted high rating power transistor (2SC5125 × 2) in the PA circuit, and with the realization of superior IMD characteristics, this all mode transceiver easily ensures an output of 100 W. The SSB modulator has also been able to adopt the PSN modulator in the 32-bit DSP. This creates a 10 dB improvement in the S/N ratio compared to previous models. Advanced design considerations along with an aluminum, die-cast frame, and large cooling fan, help to stabilize the PA circuit providing this 100%, full duty cycle operation.

## ■ Digital Twin PBT

Proving hard to beat, the IC-756PRO's digital twin PBT shows extraordinary sharpness of cutting in on interfering signals. The twin PBT narrows the IF passband in one stage, and efficiently eliminates any interfering signals limiting delay in operation. The new digital twin PBT function is especially useful during crowded band conditions such as pileups, contests, etc. Of course, the twin PBT conditions, such as tuned value (50 Hz step), direction, and passband width, are indicated on the LCD for easy recognition. This digital twin PBT will prove to be one of those most vital functions when hunting for DX stations.

## ■ Spectrum scope

A real time spectrum scope is ideal for monitoring conditions around the displayed frequency (including relative signal strengths). With the main frequency displayed at the center, the sweep frequency range (span) is selectable from four individual levels; ±12.5 kHz, ±25 kHz, ±50 kHz, and ±100 kHz for convenient observation at a glance. Furthermore, IC-756PRO's spectrum scope sports full dot LCD features, including a peak hold function that can set 2 contrasting colors if preferred—Making distinction between bands easy, and especially for detecting on air stations, has an unsurpassed capability.



Spectrum scope screen (peak-hold function ON)

## ■ Performing foundations

The IC-756PRO covers a wide frequency range, 30 kHz to 60 MHz (except some frequency bands), with superior performance. A wide dynamic range of 105 dB\*, and a high intercept point of +23 dBμ\*! Of course, Icom's original DDS (Direct Digital Synthesizer) is adopted, and it provides a superior C/N ratio.

\*Not guaranteed; Rx: 14.1 MHz, interfering freq.: F1=14.2 MHz, F2=14.3 MHz; IF passband width=500 Hz

## ■ High frequency stability

A high stability crystal unit, CR-338, is used for the PLL reference oscillator, allowing ±0.5 ppm (-10°C to 50°C) of extremely high stable operation.





## High performance memory keyer

CW operators working long hours will appreciate the 4 channel memory keyer. The entire memory channel contents may be viewed on the display— no need to memorize the contents yourself. A maximum of 55 characters may be recorded. A serial contest number auto counter is built in, viewable on the TFT.



Example for editing a memory channel 2 (M2).

## Analog and digital meters

In addition to the built-in, large analog S/R/F meter, the IC-756PRO employs a digital S/R/F meter. Output power, ALC level, speech compression level and VSWR ratio are simultaneously indicated while transmitting, and peak hold function is available while signal strength level is indicated during receive.



Digital meter screen

## Set mode condition list

All set mode items are classified into 4 groups and a maximum of 9 items can be easily called up onto the display. Settings are simple and straight forward.



Level setting screen

## Complete CW features

CW enthusiasts won't be disappointed. All of the following capabilities are included in the IC-756PRO;

- Continuously adjustable CW pitch control, from 300 to 900 Hz
- Multi-functional electronic keyer includes continuously adjustable keying speed and dot/dash ratio, from 7 to 56 wpm and from 2:8:1 to 4:5:1, respectively.
- Double key jacks— one each for front and rear panels
- Full break-in (QSK) responsiveness

## Superior receive IMD

A 4-element system is employed for receiver mixer circuits, providing superior in-band receive IMD, especially near-by interfering signals, and a well-designed triple-conversion system to help minimize image and spurious responses for better signal fidelity, is also standard.

## Dual watch

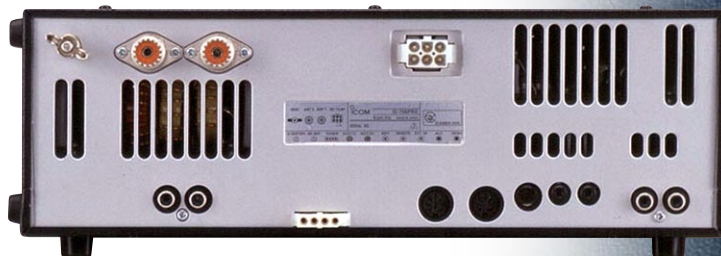
This function allows you to receive 2 signals on the same band simultaneously. You can conveniently monitor a DX station while operating on another frequency. To appreciate and fully enjoy HF, the IC-756PRO now makes DXing and hunting for those rare stations possible, as well as making your transceiver respond to high degree contesting.

## Memory pad

The memory pad function stores up to 5 operating frequencies and modes for easy write and recall. These memory pads are separate from the included memory channels, and are convenient especially when finding a DX station in a pile-up, or when a station is busy for a long time and you want to temporarily search for other stations— Use memory pads instead of your hastily scribbled notes

## Other outstanding features

- Triple band stacking register
- Quick split function with split lock capability
- Built-in antenna tuner covers HF through 50 MHz of amateur bands
- AH-4 control circuits
- Dial lock
- Band edge beep (OFF also selectable)
- Independent RIT and  $\Delta$ TX control for each main and sub bands
- Dual antenna system
- VOX
- 2 levels pre-amplifier and 3 levels attenuator
- Auto TS function
- CI-V interface capability with the optional CT-17
- Noise blanker
- Programmed, Memory, Select memory and  $\Delta$ F scans
- 101 memory channels (incl. 2 scan edges) with 10-character memory note
- Optional voice synthesizer announces operating frequency, mode, as well as receiving signal strength
- 50 frequency tone encoder built-in, and more...



## SPECIFICATIONS

### GENERAL

- Frequency coverage : Rx 0.030–60.000 MHz<sup>\*1, \*2</sup>  
Tx 1.800– 1.999 MHz<sup>\*2</sup>  
3.500– 3.999 MHz<sup>\*2</sup>  
7.000– 7.300 MHz<sup>\*2</sup>  
10.100–10.150 MHz<sup>\*2</sup>  
14.000–14.350 MHz<sup>\*2</sup>  
18.068–18.168 MHz<sup>\*2</sup>  
21.000–21.450 MHz<sup>\*2</sup>  
24.890–24.990 MHz<sup>\*2</sup>  
28.000–29.700 MHz<sup>\*2</sup>  
50.000–54.000 MHz<sup>\*2</sup>
- \*1 Some freq. bands are not guaranteed. \*2 Depending on version
- Mode : USB, LSB, CW, RTTY, AM, FM
- Number of memory ch. : 101 (99 regular, 2 scan edges)
- Antenna connector : SO-239×2 and phono [RCA; (50 Ω)]
- Temperature range : -10°C to +50°C; +14°F to +122°F
- Frequency stability : Less than ±0.5 ppm (1 min. after powered ON/0 to 50°C; +32 to +122°F)
- Frequency resolution : 1 Hz
- Power supply requirement : 13.8 V DC ±15% (negative ground)
- Power consumption : Tx Max. power 23 A  
Rx Standby 3.0 A (typ.)  
Max. audio 3.5 A (typ.)
- Dimensions : 340(W)×111(H)×285(D) mm;  
(projections not included) 13½(W)×4¾(H)×11½(D) in
- Weight (approx.) : 9.6 kg; 21 lb 1 oz
- ACC 1 connector : 8-pin DIN connector
- ACC 2 connector : 7-pin DIN connector
- CI-V connector : 2-conductor 3.5 (d) mm (¼")
- Display : 5-inch (diagonal) TFT color LCD

### TRANSMITTER

- Output power : SSB, CW, RTTY, FM 5–100 W  
(continuously adjustable) AM 5–40 W
- Modulation system : SSB PSN modulation  
AM Low power modulation  
FM Phase modulation
- Spurious emission : 50 dB (HF bands)  
60 dB (50 MHz band)
- Carrier suppression : 40 dB
- Unwanted sideband suppression: 55 dB
- ΔTX variable range : ±9.999 kHz
- Microphone connector : 8-pin connector (600 Ω)
- ELE-KEY connector : 3-conductor 6.35 (d) mm (¼")
- KEY connector : 3-conductor 6.35 (d) mm (¼")
- SEND connector : Phono (RCA)
- ALC connector : Phono (RCA)

### RECEIVER

- Receive system : Triple conversion superheterodyne system
- Intermediate frequencies : 1st 64.455 MHz (for all modes)  
2nd 455 kHz (for all modes)  
3rd 36 kHz (for all modes)
- Sensitivity (typical) :

Frequency Range (MHz)	SSB, CW, RTTY (at 2.4 kHz BW)	AM (at 6 kHz BW)	FM (at 15 kHz BW)
0.50–1.799	—	13 μV	—
1.80–27.99	0.16 μV <sup>*1</sup>	2 μV <sup>*1</sup>	—
28.0–29.99	0.16 μV <sup>*1</sup>	2 μV <sup>*1</sup>	0.5 μV <sup>*1</sup>
50.0–54.0	0.13 μV <sup>*2</sup>	1 μV	0.32 μV <sup>*2</sup>

10 dB S/N for SSB, CW, RTTY and AM, 12 dB SINAD for FM

\*1 Pre-amp 1 is ON, \*2 Pre-amp 2 is ON

- Squelch sensitivity (Pre-amp: OFF):  
SSB, CW, RTTY Less than 5.6 μV  
FM Less than 1 μV
- Selectivity (representative value):  
SSB, RTTY More than 2.4 kHz/–6 dB  
(variable between 50 Hz and 3.6 kHz)  
Less than 2.8 kHz/–60 dB  
CW (BW: 500 Hz) More than 500 Hz/–6 dB  
(variable between 50 Hz and 3.6 kHz)  
Less than 700 Hz/–60 dB  
AM (BW: 6 kHz) More than 6.0 kHz/–6 dB  
Less than 15.0 kHz/–60 dB  
FM (BW: 15 kHz) More than 12.0 kHz/–6 dB  
Less than 20.0 kHz/–60 dB
- Spurious and image rejection ratio : More than 70 dB  
(except IF through on 50 MHz band)
- AF output power : More than 2.0 W at 10% distortion  
(at 13.8 V DC) with an 8 Ω load
- RIT variable range : ±9.999 kHz
- PHONES connector : 2-pin connector 6.35 (d) mm (¼")
- EXT SP connector : 2-pin connector 3.5 (d) mm (¼")/8 Ω

### ANTENNA TUNER

- Matching impedance range: 16.7–150 Ω unbalanced<sup>\*1</sup> (HF bands)  
20–125 Ω unbalanced<sup>\*2</sup> (50 MHz band)

\*1 Less than VSWR 3:1; \*2 Less than VSWR 2.5:1

- Min. operating input power: 8 W
- Tuning accuracy : VSWR 1.5:1 or less
- Insertion loss : Less than 1.0 dB (after tuning)

### Supplied accessories:

- Hand microphone
- DC power cable
- Spare fuses
- CW key plug

All stated specifications are subject to change without notice or obligations.

## OPTIONS



**IC-PW1 HF+50 MHz 1 kW LINEAR AMPLIFIER**  
Covers all HF and 50 MHz bands, provides clean, stable 1 kW output. Automatic antenna tuner and compact detachable controller are standard. 2 exciter inputs are available.



**AH-4 HF+50 MHz AUTOMATIC ANTENNA TUNER**  
Covers 3.5–54 MHz with a 7 m (23 ft) or longer wire antenna.



**AH-2b ANTENNA ELEMENT**  
A 2.5 m long antenna element for mobile operation with the AH-4. All bands between 7–54 can be matched.



**SP-20 EXTERNAL SPEAKER**  
4 audio filters; headphone jack; can connect to 2 transceivers. Input impedance: 8 Ω Max. input power: 5 W



**SP-21 EXTERNAL SPEAKER**  
Designed for base station operation. Input impedance: 8 Ω Max. input power: 5 W



**SM-20 DESKTOP MICROPHONE**  
Unidirectional, electret microphone for base station operation. [UP/DOWN] switches and a low cut function are available.



**SM-8 DESKTOP MICROPHONE**  
Electret condenser-type desktop microphone including 2 connection cables for simultaneous connection of 2 transceivers. [UP/DOWN] switches are included.



**CT-17 CI-V LEVEL CONVERTER**  
For remote transceiver control using a personal computer equipped with an RS-232C port. You can change frequencies, operating mode, etc.



**UT-102 VOICE SYNTHESIZER UNIT**  
Announces operating frequency and mode.



**HM-36 HAND MICROPHONE**  
Same as that supplied.

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