



HF/50MHz TRANSCEIVER

# IC-7600

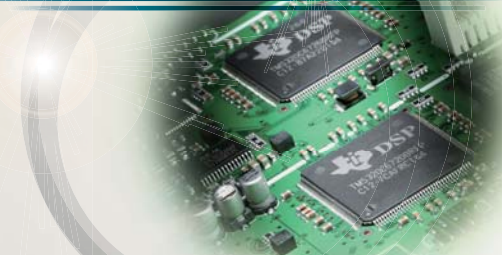
The Flagship's Lineage



# Pushing performance to the pinnacle

The latest DSP technologies developed for the flagship models plus many decades of analog circuit expertise give the IC-7600 the performance advantage. The flagship's lineage: dual DSP units, 3kHz 1st (roofing) filter, double-conversion superheterodyne, all direct descendents of the flagship models.

## Dual DSP



Separate DSP units for transmitter/receiver and spectrum scope.

## Receiver System



The double-conversion superheterodyne system and the image rejection mixer improve inband IMD.

## 1st IF Filter



Three built-in 1st IF (roofing) filters: 3, 6 and 15kHz.

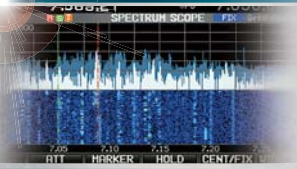
## Display

5.8-inch WQVGA (400x240 pixel) ultra-wide viewing angle TFT display with long-life LED backlighting.



## Waterfall Spectrum Scope

High-resolution real-time spectrum scope with waterfall function using a dedicated DSP unit.



## USB Connectors

Easily connect keyboards, mouse, flash memory drives, and PCs.



## PSK Operation

Built-in PSK and RTTY operation with a USB keyboard - PC not required.



# HF/50MHz TRANSCEIVER IC-7600

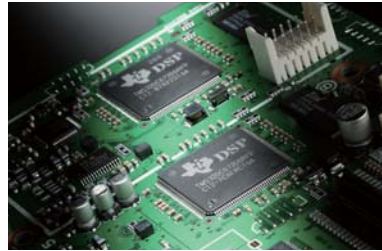


# Receiver Performance Inherited from the Flagship

Receiver performance standards all DX'ers have come to expect

## Dual DSP for transmitter/receiver and spectrum scope

Two separate 32-bit DSP units power the transmitter/receiver and spectrum scope. These processors give the IC-7600 high performance comparable to our top-of-the-line IC-7800 and IC-7700, thanks to the combination of dual DSP and our analog RF design expertise.

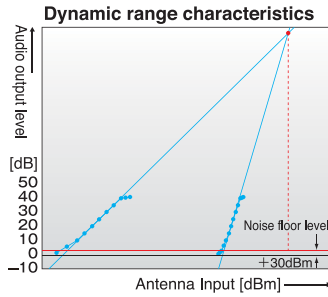


DSP unit for Transmit and Receive TMS320C6728B (Top in photo)  
Internal clock speed: 266MHz  
32-bit floating point DSP  
Maximum performance =1600MFLOPS

DSP unit for Spectrum scope TMS320C6720 (Bottom in photo)  
Internal clock speed: 200MHz  
32-bit floating point DSP  
Maximum performance =1200MFLOPS

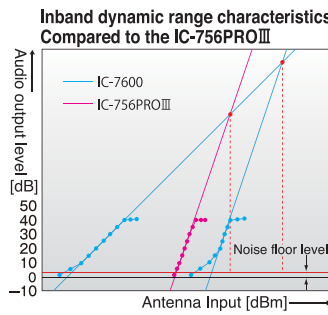
## 104dB dynamic range and +30dBm third-order intercept point (IP3)

Icom's long years of analog RF circuit experience combined with the latest digital technology results in an astonishing 104dB receiver dynamic range and +30dBm IP3 in the HF bands without sacrificing receiver sensitivity. Even a weak signal adjacent to strong signals is clearly received by the IC-7600.

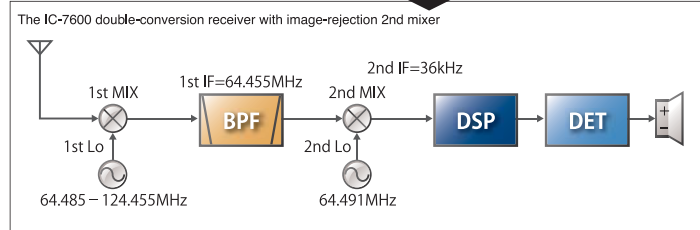
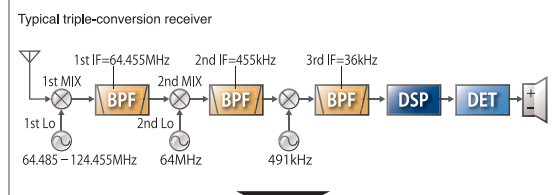


## Double-conversion superheterodyne dramatically improves inband IMD

The IC-7600 employs a double-conversion superheterodyne system which has an image rejection mixer for the 2nd mixer stage. When compared to a typical triple-conversion system, the double-conversion system is more difficult to implement but it dramatically reduces signal distortion and provides a high-fidelity RF signal to the DSP processor.



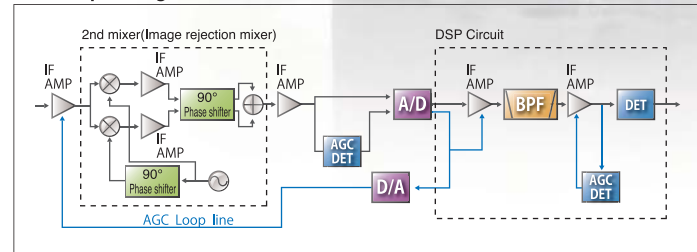
## Receiver System



## Dual AGC loops controlled by DSP

The IC-7600 has dual AGC loops, one analog and one digital, both under DSP control. This architecture prevents strong adjacent signals from "pumping" the AGC and allows maximum dynamic range in the DSP.

### AGC loop management



## Three built-in 1st IF (roofing) filters, including 3kHz

The IC-7600 has three built-in 1st IF (roofing) filters ahead of the 1st IF amplifier stage. The 3kHz filter is especially effective in CW and SSB modes to eliminate overloading caused by strong signals just outside the passband.



6kHz, 3kHz and 15kHz 1st IF filters (from top to bottom)

## Digital IF filter

The IC-7600 DSP allows you to "build your own" digital IF filter. You can quickly choose bandwidth, shape factor, and center frequency, so that you can work that rare DX station while your competition's still tweaking their transceiver controls. Three filter memories allow you to change filter settings instantly, a great help during contesting or other high-rate operating.

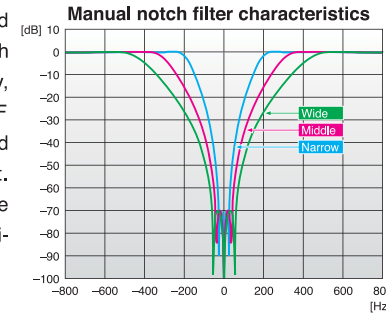


## Digital twin PBT

After "building your own" digital IF filter, you can use digital twin Passband Tuning (PBT) to shift and narrow the IF passband until the interference is gone and you can clearly hear that weak signal.

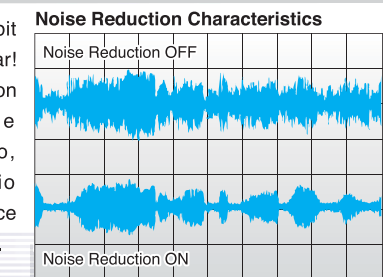
## Digital notch filter

Signals such as heterodynes and AM carriers can be eliminated with automatic notch filter technology, making interference from RF sources such as beat signals and RTTY signals a thing of the past. You can also choose three shape factors for the notch filter, to optimize interference rejection.



## Noise reduction

The processing power of the 32-bit DSP produces results you can hear! The 16-step variable noise reduction can significantly enhance the receiver's signal-to-noise ratio, giving you a clean, clear audio signal that may make the difference between making the contact or not.



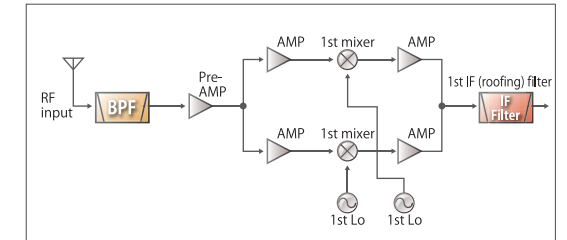
## Noise blanker

A 100-step digital noise blanker reduces interference from pulse-type noise sources such as engine ignition systems.

## Dualwatch function

Dualwatch allows you to receive two signals in the same band simultaneously. For example, you can listen to a DX station transmitting on 14.025MHz while also listening to the pileup calling him on 14.030MHz.

### Dualwatch receiver (Same band only)



## High stability TCXO unit

The IC-7600 provides  $\pm 0.5$ ppm frequency stability using a high stability temperature-compensate crystal oscillator (0°C to +50°C). This high stability TCXO unit offers stable operation even during continuous transmission on RTTY or PSK31 mode.



TCXO Unit



Above photo includes optional SP-23 and IC-PW1/EURO.

# Versatile Functions and Intuitive Operation

The real performance of the IC-7600 is apparent in the front lines of a DX contest.

## 5.8 inch ultra-wide viewing angle TFT display

The IC-7600's ultra-wide viewing angle display has excellent color rendition and high contrast ratio with fast response time. These features allow the spectrum scope and simulated analog meters to move smoothly and naturally. White LED backlighting offers faster start-up, stable brightness, and very long life.



Ultra-wide viewing angle display

Photo taken with room light turned off.

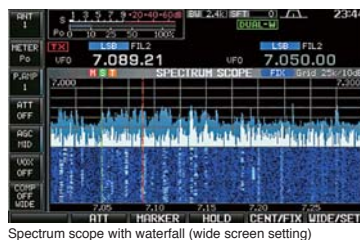
## LCD and backlight Comparison between IC-7600 and IC-756PROIII\*

		IC-7600	IC-756PROIII
LCD	Size	5.8 inch WQVGA	5 inch QVGA
	Viewing Angle	180° (approx.) (Horizontal/Vertical)	90° (approx.) (Horizontal) 60° (approx.) (Vertical)
Backlighting	Type	LED (White)	CCFL (Cold cathode fluorescent lamp)

\*These specifications show the specifications of the individual devices only.

## Spectrum waterfall display

The dedicated spectrum scope DSP with built-in digital filtering greatly improves dynamic range, response time, and frequency accuracy of the spectrum scope. The scope automatically selects the optimum resolution based on the sweep bandwidth. The waterfall display captures signal strengths over time. This allows you to see signals that may not be apparent on a normal scope. You can monitor band conditions between the selected sweep edges (Max. 500kHz) in the fixed mode, as well as sweep a selected band width centered on the receiving frequency in the center mode.



Spectrum scope with waterfall (wide screen setting)

## Mouse operation

Connect a USB mouse to select various spectrum scope features. You can work with mouse operation, you can point and click the mouse for "Click-and-Listen" receiver control. \* A USB hub is required to simultaneously connect both a USB mouse and keyboard.



Installation example of a USB mouse

### For example:

- Left-click to select a signal or operating frequency
- Right-click to temporarily select a different frequency. Release the mouse button to return to the original frequency.
- Click a button (either left or right) and move to the right or left to increase or decrease the operating frequency (similar to rotating the main dial)

## Digital voice memory

With digital voice memory, you can record the incoming signal and immediately replay the audio, a must-have feature for DXing and contesting. Because the transceiver is recording continuously, time-shift playback can replay the 15 seconds of audio that you heard <before> you pushed the Rec button!

The IC-7600 has a 4 channel transmit memory (maximum 90 seconds per channel) and 20 channel receive memory (maximum 30 seconds per channel, total 200 seconds with 20 channels). In addition, the recorded incoming signal can be saved on a USB flash drive.



Digital Voice Recorder



Voice memory buttons

## Multi-function meter

The multi-function meter allows you to observe the transmit/receive conditions at a glance.

In addition to the signal strength, transmit power level, ALC, compression level and SWR meters, the IC-7600 shows the drain terminal voltage of the final amplifier (Vd), the drain current of the final amplifier (Id) and temperature of the PA circuit (TEMP).



Multi-function meter setting screen

## RF speech compressor

The digital RF compressor boosts average RF output power, improving signal strength and readability.

## RTTY/PSK31 operation with a USB keyboard

Simply plug in a USB keyboard to operate RTTY and PSK! The digital twin-peak filter greatly reduces interference and a tuning indicator helps you zero-beat the signals. Eight RTTY and PSK transmit memories store up to 62 characters per channel.

## Triple band stacking register

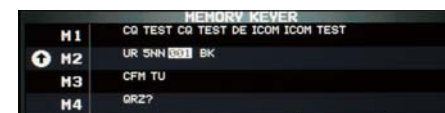
The triple band stacking register quickly memorizes and calls up the operating frequency and mode for 3 channels on each band. Just push the band key button (ten-key pad), and you can call up the last operating frequency and mode. This function is convenient especially when switching bands during contests, etc.

## Programmable band edge beep

You can program the band edge not only according to the amateur radio band plan but also more specific frequencies like contest frequencies, CW operating mode, etc. If you try to operate on the OFF band, the transceiver alerts you with a beep sound. You can also inhibit transmitting in the OFF band.

## Built-in memory keyer

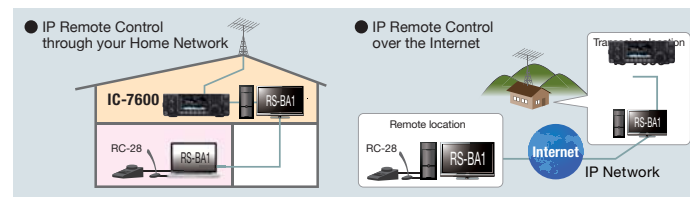
Built-in memory keyer provides 4 channels for CW mode and 8 channels each for RTTY and PSK31 modes, capable of storing up to 70 characters for each channel. The memory keyer is useful for sending CQ or exchanging numbers during contests. When not contesting, you can store and send your name, QTH, rig, etc. With a USB keyboard, you can send memory contents using a function key on the keyboard.



Memory keyer screen

## Optional RS-BA1 IP remote control software

The optional RS-BA1 software allows you to operate the IC-7600 from a remote PC over the Internet or local home network. The IC-7600 gives consistent response time as the main dial tunes smoothly. In addition, the optional RC-28 remote encoder provides a hardware dial/transmit function for realistic dial operation.



## Other outstanding features

[Antenna connectors]

- Two Tx/Fx antenna connectors with automatic antenna selector
- Fx antenna In/Out connector for receiver antenna or external attenuator

[Receiver]

- General coverage receiver\* covers from 30kHz to 60MHz (\* Some frequency bands are not guaranteed, depending on version)
- Two types of receiver preamplifiers : Preamp 1: Increases low level signal improving intermodulation characteristics Preamp 2: High gain preamplifier
- Built-in 3-step RF attenuator (6, 12 and 18dB)

[Transmitter]

- Tx monitor • 50 CTCSS tone encoder and decoder • VOX capability (Voice operated transmission)
- All mode power control
- [CW mode]
- DSP controlled CW keying waveform shaping
- Multi-function electronic keyer with adjustable keying speed, dot-dash ratio, paddle polarity and bug keyer
- CW pitch control from 300Hz to 900Hz • Double key jack
- Full break-in function and semi break-in function
- Adjustable CW envelope
- Audio peak filter AF level setting

## Rear panel view

- ① Ground Terminal
- ② Antenna Connectors
- ③ DC Power Socket
- ④ Transverter Jack
- ⑤ Receive Antenna Connectors
- ⑥ ALC Input Jack
- ⑦ SEND Control Jack
- ⑧ Tuner Control Socket
- ⑨ Accessory Sockets
- ⑩ Key Jack
- ⑪ Meter Jack
- ⑫ USB Connector
- ⑬ CI-V Remote Control Jack
- ⑭ External Speaker Jack

## Microphone equalizer and adjustable transmit bandwidth

The built-in audio equalizer has separate bass and treble adjustments for a total of 121 combinations, so you can adjust the tonal quality of your voice as you want. In addition, the transmit bandwidth is selectable from 100, 200, 300, 500Hz at the low-pass edge, and 2500, 2700, 2800, 2900Hz at the high-pass edge, respectively. Three types of high and low combinations can be stored in the memory as favorite settings. With this flexibility of DSP-based waveform shaping, transmit audio quality is adjustable to your preference.

## High power final amplifiers

High-power FET transistors, RD100HHF1, are used in the PA unit providing excellent signal quality and low IMD characteristics. With a large heat sink and cooling fans, reliable 100W output at high duty cycle can be used, for example in contesting or data modes.



High power FET Transistors

## Two types of send relay settings

For amplifier keying (SEND jack), you can select either a mechanical relay (max. 16V/500mA) or a FET switch (max. 250V/200mA). The FET switch is designed to key older tube-type amplifiers that may have high voltage on the SEND line. In addition, TX delay function sets the transmission timing for use with an external amplifier which has a slow TX rise time.

## Built-in high-speed automatic antenna tuner

The antenna tuner memorizes its settings based on your transmit frequency, so that it can rapidly tune when you change bands. High-voltage capacitors allow continuous-duty-cycle full-power operation.

[Operation]

- Digital meter indicates output power, ALC level, SWR, COMP (compression level), Id (drain current of the final amplifier) and Vd (voltage of the final amplifier)
- Built-in voice synthesizer announces the frequency, mode and S-meter level in English
- Memory pad stores up to 10 operating frequencies
- Quick split function and frequency lock function • Single knob control from RF gain to squelch
- RIT and ZTX variable up to ±9.999kHz • Two clocks to show local and UTC time
- 1Hz pitch tuning and indication • 101 memories with 10-character name
- Program, memory, select memory and Zf scans • Auto tuning step function
- Adjustable tuning dial tension • Dial lock • Band edge beep (Can be disabled)
- AH-4 control circuit • Automatic tuning speed for data mode operation • Screen saver function
- Added RIT, ZTX, antenna control and logging software commands for CI-V remote control
- Wake-up function from the standby mode via the remote jack (CI-V)



## SPECIFICATIONS

GENERAL	
Frequency coverage*1 (Unit: MHz)	
Receiver	0.030-60.000**2
Transmit	1.810-1.999 3.500-3.800 7.000-7.200 10.100-10.150
	14.000-14.350 18.068-18.168 21.000-21.450 24.890-24.990
	28.000-29.700 50.000-52.000
*1 Showing EUR-1(#04) version. Varies according to version. **2 Some frequency bands are not guaranteed.	
Mode	USB, LSB, CW, RTTY, PSK31, AM, FM
No. of memory channels	101 (99 regular, 2 scan edges)
Antenna connector	SO-239x2 and RCAx1 (50Ω unbalanced (Tuner off))
Operating temp. range	0°C to +50°C; +32°F to +122°F
Power supply requirement	13.8V DC ±15%
Frequency stability	Less than ±0.5ppm (0°C to +50°C)
Frequency resolution	1Hz (minimum)
Current drain	TX: 23A (Max. power) RX: 3.5A/3A (Max. audio/standby)
Dimensions (WxHxD, projections not included)	340 × 116 × 279.3 mm; 13.39 × 4.57 × 11 in
Weight (approximate)	10 kg; 22 lb
TRANSMITTER	
Output power	SSB/CW/FM/RTTY/PSK31: 2-100W AM: 1-30W
Modulation system	SSB: Digital P.S.N. modulation AM: Digital low power modulation FM: Digital phase modulation
Spurious emissions	HF bands: More than 50dB 50MHz band: More than 63dB
Carrier suppression	More than 40dB
Unwanted sideband suppression	More than 55dB
Microphone impedance	600Ω (8-pin connector)

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










RECEIVER			
Receive system	Double conversion super-heterodyne system		
Intermediate frequencies	64.455MHz/36kHz (1st/2nd)		
Sensitivity (typical)	(HF: Pre-amp 1 ON, 50MHz: Pre-amp 2 ON)		
	0.1-1.799MHz	1.8-29.995MHz	50-54MHz
SSB, CW (BW=2.4kHz, at 10dB S/N)	-	0.15μV	0.12μV
AM (BW=6kHz, at 10dB S/N)	6.3μV	2.0μV	1.6μV
FM (BW=15kHz, at 12dB SINAD)	-	0.5μV (28-29.7MHz)	0.3μV
Squelch sensitivity (threshold)	SSB, CW, RTTY, PSK: Less than 3.2μV (Pre-amp: ON) FM: Less than 0.3μV (Pre-amp: ON)		
Selectivity	More than	Less than	
SSB (BW=2.4kHz, sharp)	2.4kHz/-6dB	3.8kHz/-60dB	
CW (BW=500Hz, sharp)	500Hz/-6dB	900Hz/-60dB	
RTTY (BW=350Hz)	350Hz/-6dB	650Hz/-60dB	
AM (BW=6kHz)	6.0kHz/-6dB	15.0kHz/-60dB	
FM (BW=15kHz)	12.0kHz/-6dB	20.0kHz/-60dB	
Spurious and image rejection ratio	More than 70dB		
Audio output power	More than 2.0W (10% distortion, 8Ω load)		
RIT variable range	±9.999kHz		
ANTENNA TUNER			
Matching impedance range	HF bands: 16.7Ω to 150Ω unbalanced (VSWR better than 3:1) 50MHz: 20Ω to 125Ω unbalanced (VSWR better than 2.5:1)		
Minimum operating power	HF bands: 8W 50MHz band: 15W		
Tuning accuracy	VSWR 1.5:1 or less (Motor stopped)		
Insertion loss	Less than 1.0 dB (after tuning at 100W output)		

### Supplied accessories:

- Hand microphone, HM-36 • Carrying handle, MB-121 • DC power cable • Spare fuses • CW key plugs

## OPTIONS

Some options may not be available in some countries. Please ask your dealer for details.

<b>HM-36</b> HAND MICROPHONE 	<b>DESKTOP MICROPHONES</b> <b>SM-50</b> Dynamic microphone with low-cut filter  <b>SM-30</b> Compact, lightweight electret microphone. 	<b>SP-23</b> EXTERNAL SPEAKER  Hi-pass and low-pass filters with two cut-off frequencies.	<b>PS-126</b> DC POWER SUPPLY  13.8V DC, 25A max.	<b>AH-4</b> HF+50MHz AUTO-ANTENNA TUNER  Covers 3.5-54MHz with a 7m (23ft) or longer wire antenna.	<b>AH-2b</b> ANTENNA ELEMENT  Covers 7-54MHz. Use with AH-4.	
<b>IC-PW1EURO</b> HF+50MHz 1kW HF LINEAR AMPLIFIER 	<b>CT-17</b> CI-V LEVEL CONVERTER 	<b>RS-BA1</b> IP REMOTE CONTROL SOFTWARE  For use with RS-BA1	<b>RC-28</b> USB REMOTE ENCODER 	<b>AH-5NV</b> NVIS KIT  Fiberglass mobile mounting antenna element for use with AH-740. Covers 2.2-30MHz (amateur band) with AH-740.	<b>OPC-2321</b> CONTROL CABLE  Control cable for use with AH-740. (6m; 19.6ft)	<b>AH-740</b> AUTOMATIC TUNING ANTENNA  Covers 2.5-30MHz (amateur band). OPC-2321 is required.

The LCD display may have cosmetic imperfections that appear as tiny spots. This is not a malfunction or defect, but a normal characteristic of LCD displays.

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