PRODUCT REVIEW

ICOM IC-7410 HF and 6 Meter Transceiver

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The ICOM IC-7410 is the now discontinued IC-746PRO writ larger — at least physically, since this radio does not include 2 meter capability. In nomenclature it follows the IC-7400, never marketed in North America but which served as the IC-746PRO in other parts of the world, including Europe.[1] ICOM continues to capitalize on this excellent and popular radio foundation with the nearly simultaneous release of the IC-9100, a higher tier model that *does* include 2 meters, 70 cm, an optional 23 cm module, satellite features and a heftier price tag. So, you could say the IC-7410 is the IC-9100 for the rest of us.

ICOM's description of the IC-7410 as "an excellent balance of technology and performance" may suggest some measure of compromise, but it's quite capable. Keep in mind, too, that ICOM has incorporated the incremental technological improvements — faster signal digital signal processing, no waiting for the radio to "boot up," for instance — that have been showing up in offerings preceding the IC-7410, such as the IC-7600.

What's It Like?

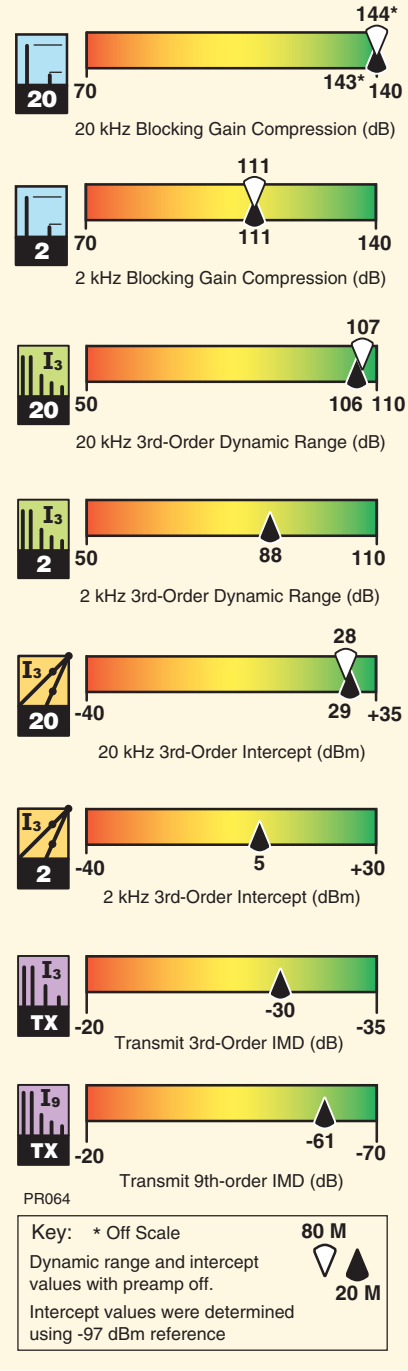
Given its slenderized form factor you could find yourself doing a bit of juggling to fit the longish IC-7410 comfortably on your operating desk. It's narrower by about an inch from the IC-756PRO series or IC-7600 models, but it's certainly deeper. I managed to perch it atop my IC-756PROIII, so I could do some side-by-side (so to speak) comparisons, but I ended up using a mirror to locate rear-panel connector since the newer radio extends about two inches beyond the edge of its older relative.

The '7410 offers a pleasing countenance, with a 10.25 × 6 cm monochrome display window, accented on the left and bottom edges with an inset ogee-style half frame. This is not the more commodious color display of the IC-7600 or even of the PROIII, but it is quite sufficient. The IC-7410's frequency readout seems larger than life within the slightly smaller display screen. The metallic F-1 through F-5 buttons immediately below the display window are easier to differentiate from the MODE buttons that I am always pressing in error on my PROIII. ICOM slightly offset the function buttons from the five MODE buttons, to minimize this possibility on the '7410.

The hefty main tuning knob possesses the sort of solid counterbalanced feel that puts the

[1]R. Lindquist, N1RL, "ICOM IC-746PRO HF/VHF Transceiver," Product Review, *QST*, May 2002, pp 72-78. This review and reviews of the other ICOM transceivers mentioned here are available to ARRL members online at **www.arrl.org/product-review**.

Key Measurements Summary



Bottom Line

The IC-7410 replaces the IC-746PRO and adds an improved receiver, much faster DSP performance and new features to the mix, but drops 2 meter coverage. Although the new radio does a lot, the '7410 user interface will be familiar to users of current ICOM radios.

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operator in the driver's seat. The knob has a substantial, easy-to-grip, rubberized outer ring plus the now customary tuning dimple, and I preferred it to the PROIII's main tuning knob. It's possible to manually adjust the tuning dial tension with a slider beneath the knob — no screwdriver needed! ICOM followed through elsewhere on the front panel with larger knobs that offer a more positive sense of control. Even the inner concentric controls are easy to maneuver.

The front panel's bold lettering contrasts nicely with the dark, smooth (easy-to-clean) finish, making legends easy to read. This is a welcome improvement from earlier ICOM designs, which sometimes sacrificed utility at the altar of style. I especially appreciated the conspicuous round XFC and TS buttons, which are much easier to access than on the PROIII. (Press XFC to listen to your transmit frequency when split; TS changes the tuning step.)

The four "stem" controls on the front panel's lower lip are shorter and sturdier than on earlier ICOM models, although it can be a bit difficult to discern the unpainted pointers on these shafts. The stem controls' legends are *above* the shafts and much easier to read than the ones on the PROIII. These make available adjustments for (L–R) KEY SPEED, BK-IN DELAY, COMP and MONI GAIN. I appreciated not having to dig to adjust the keyer speed.

None of the front panel buttons on the IC-7410 are illuminated (for example, to indicate that a given function is enabled). I missed this. You must rely instead on smallish text legends along the lower portion of the main display (below the frequency readout) to determine if a function is enabled. That display can get pretty busy once you've switched on a few things. This forces the operator to pay pretty close attention. I found it extremely easy to neglect to disable the NOTCH feature, for example, after having used it earlier.

The menu system on the IC-7410 hearkens back to the system ICOM introduced with its revolutionary IC-706 series in the mid 1990s. IC-706 and '746 users will feel nearly immediately at home with this interface, although it is easier to use than the initial incarnation. In fact, the radio itself is a bit of an amalgamation of the PRO and '706 series — not that there's anything wrong with that — and some of its finest features remain hidden until you need them. The menu text consists of light, segmented characters. These are serviceable but not always easy to decipher. I found the similar menus on the IC-706 series more readable.

There are actually three menus, all accessible via the front-panel MENU button: Press it quickly, and the M1 and M2 menus allow selecting a few common parameters using the F-1 through F-5 keys. These F key selections are mode dependent. For example, in SSB mode M1 has a TBW (transmit bandwidth)

Table 1
ICOM IC-7410, serial number 02001081

Manufacturer's Specifications	Measured in the ARRL Lab
Frequency coverage: Receive, 0.03-60 MHz; transmit, 1.8-2.0, 3.5-4, 5.33200, 5.34800, 5.35850, 5.37300, 5.40500, 7-7.3, 10.1-10.15, 14-14.35, 18.068-18.168, 21-21.45, 24.89-24.99, 28-29.7, 50-54 MHz.	Receive and transmit, as specified.
Power requirement: 13.8 V dc ±15%; receive, 3 A (max audio); transmit, 23 A (100 W out).	13.8 V dc; receive 1.9 A (no signal, max audio), 1.7 A (backlight off); transmit, 18 A (100 W out). Operation confirmed at 11.4 V dc (89 W output).
Modes of operation: SSB, CW, AM, FM, RTTY.	As specified.
Receiver	**Receiver Dynamic Testing**
SSB/CW sensitivity: 2.4 kHz bandwidth, 10 dB S/N: 0.1-29.99 MHz, 0.16 µV; 50-54 MHz, 0.13 µV.	Noise Floor (MDS), 500 Hz DSP filter, 3 kHz roofing filter: *Preamp off / 1 / 2* 0.137 MHz –129 –135 –136 dBm 0.505 MHz –134 –141 –142 dBm 1.0 MHz –134 –141 –142 dBm 3.5 MHz –135 –142 –144 dBm 14 MHz –134 –141 –143 dBm 50 MHz –131 –140 –142 dBm
Noise figure: Not specified.	14 MHz, preamp off/1/2: 13/6/4 dB
AM sensitivity: 6 kHz bandwidth, 10 dB S/N: 0.1-1.799 MHz, 12.6 µV; 1.8-30 MHz, 2 µV; 50-54 MHz, 1.6 µV.	10 dB (S+N)/N, 1-kHz, 30% modulation, 6 kHz bandwidth: *Preamp off / 1 / 2* 1.0 MHz 1.27 0.56 0.51 µV 3.8 MHz 1.15 0.49 0.43 µV 50.4 MHz 1.84 0.68 0.57 µV
FM sensitivity: 15 kHz bandwidth, 12 dB SINAD: 28-29.7 MHz, 0.5 µV; 50-54 MHz, 0.32 µV.	For 12 dB SINAD, 3 kHz deviation, 15 kHz bandwidth: *Preamp off / 1 / 2* 29 MHz 0.54 0.21 0.18 µV 52 MHz 0.56 0.25 0.20 µV
Spectral display sensitivity: Not specified.	Preamp off/1/2: –94/–101/–109 dBm.
Blocking gain compression: Not specified.	Gain compression, 500 Hz bandwidth, 3 kHz roofing filter: *20 kHz offset, Preamp off/1/2 / 5/2 kHz offset, Preamp off* 3.5 MHz 144/138/136 dB 118*/111* dB 14 MHz 143/140/135 dB 117*/111* dB 50 MHz 139/139/134 dB 117/111 dB
Reciprocal mixing (500 Hz BW): Not specified.	20/5/2 kHz offset: –101/–88/–78 dBc.

ARRL Lab Two-Tone IMD Testing (500 Hz DSP bandwidth, 3 kHz roofing filter)**

Band/Preamp	Spacing	Input Level	Measured IMD Level	Measured IMD DR	Calculated IP3
3.5 MHz/Off	20 kHz	–28 dBm	–135 dBm	107 dB	+26 dBm
		–14 dBm	–97 dBm		+28 dBm
14 MHz/Off	20 kHz	–28 dBm	–134 dBm	106 dB	+25 dBm
		–13 dBm	–97 dBm		+29 dBm
		0 dBm	–64 dBm		+32 dBm
14 MHz/1	20 kHz	–34 dBm	–141 dBm	107 dB	+20 dBm
		–20 dBm	–97 dBm		+19 dBm
14 MHz/2	20 kHz	–40 dBm	–143 dBm	103 dB	+12 dBm
		–27 dBm	–97 dBm		+8 dBm
14 MHz/Off	5 kHz	–36 dBm	–134 dBm	98 dB	+13 dBm
		–24 dBm	–97 dBm		+13 dBm
		0 dBm	–28 dBm		+14 dBm
14 MHz/Off	2 kHz	–46 dBm	–134 dBm	88 dB	–2 dBm
		–97 dBm	–29 dBm		+5 dBm
		0 dBm	–23 dBm		+12 dBm
50 MHz/Off	20 kHz	–23 dBm	–131 dBm	108 dB	+31 dBm
		–12 dBm	–97 dBm		+31 dBm

Receiver	Receiver Dynamic Testing
Second-order intercept point: Not specified.	Preamp off/1/2, +65, +65, +65 dBm. 52 MHz, +77 dBm.
DSP noise reduction: Not specified.	Variable, 20 dB maximum.
Notch filter depth: Not specified.	Manual notch: 52 dB, Auto notch: 55 dB, attack time 100 ms.***
FM adjacent channel rejection: Not specified.	29 MHz, 77 dB†; 52 MHz, 79 dB.†
FM two-tone, third-order IMD dynamic range: Not specified.	20 kHz offset, both preamps on: 29 MHz, 77 dB†; 52 MHz, 79 dB†. 10 MHz channel spacing: 29 MHz, 115 dB, 52 MHz, 114 dB.
S-meter sensitivity: Not specified.	S9 signal at 14.2 MHz: preamp off, 50 µV; preamp 1, 23.4 µV; preamp 2, 8.9 µV.
Squelch sensitivity: SSB, <5.6 µV, FM, <0.32 µV.	At threshold, both preamps, SSB, 0.63 µV; FM, 29 MHz, 0.1 µV; 52 MHz, 0.1 µV.
Receiver audio output: >2 W into 8 Ω at 10% THD.	2.04 W at 10% THD into 8 Ω. THD at 1 V RMS, 0.85%.
IF/audio response: Not specified.	Range at –6 dB points, (bandwidth):‡ CW (500 Hz): 280-795 Hz (515 Hz). Equivalent Rectangular BW: 509 Hz. USB: (2.4 kHz): 197-2770 Hz (2573 Hz). LSB: (2.4 kHz): 200-2770 Hz (2570 Hz). AM: (6 kHz): 165-3138 Hz (5946 Hz). AM: (9 kHz): 163-4496 Hz (8666 Hz).
Spurious and image rejection: HF and 50 MHz, (except IF rejection on 50 MHz): >70 dB.	First IF rejection: 14 MHz, 105 dB; 50 MHz, 81 dB. Image rejection: 14 MHz, >144 dB; 50 MHz, >141 dB.

Transmitter	Transmitter Dynamic Testing
Power output: HF and 50 MHz: SSB, CW, RTTY, FM, 2-100 W; AM, 2-27 W.	HF: CW, SSB, RTTY, FM typically 1.2-102 W, AM, 0.27-27 W; 50 MHz: CW, SSB, RTTY, FM, 1.2-95 W, AM, 0.2-24 W.
Spurious-signal and harmonic suppression: >50 dB on HF, >63 dB on 50 MHz.	HF, >70 dB; 50 MHz, >70 dB. Meets FCC requirements.
SSB carrier suppression: >40 dB.	57 dB.
Undesired sideband suppression: >55 dB.	>70 dB.
Third-order intermodulation distortion (IMD) products: Not specified.	3rd/5th/7th/9th order (15 m, worst case): HF, 100 W PEP, –30/–35/–54/–61 dB; 50 MHz, 100 W PEP, –31/–34/–43/–59 dB.
CW keyer speed range: Not specified.	6 to 48 WPM.
CW keying characteristics: Not specified.	See Figures 1 and 2.
Iambic keying mode: Not specified.	Mode B.
Transmit-receive turnaround time (PTT release to 50% audio output): Not specified.	S9 signal, 85 ms at speaker, 16 ms at accessory jack.
Receive-transmit turnaround time (tx delay): Not specified.	SSB, 45 ms; FM, 8 ms.
Composite transmitted noise: Not specified.	See Figure 3.

Size (height, width, depth): 4.6 × 12.3 × 13.5 inches; weight, 22.5 pounds.

Price: $2000; FL-430 (6 kHz) and FL-431 (3 kHz) roofing filters, $125 each.

*No blocking occurred up to threshold of receiver overload.
**ARRL Product Review testing now includes Two-Tone IMD results at several signal levels. Two-Tone, 3rd-Order Dynamic Range figures comparable to previous reviews are shown on the first line in each group. The "IP3" column is the calculated Third-Order Intercept Point. Second-order intercept points were determined using –97 dBm reference.
***Single beat note. Reduces two beat notes up to 55 dB with attack time depending of separation of signals, typically 400 ms.
†Measurement was noise-limited at the value indicated.
‡Default values, sharp setting (smooth setting is available). Bandwidth and cutoff frequencies are adjustable via DSP. CW bandwidth varies with PBT and pitch control settings.

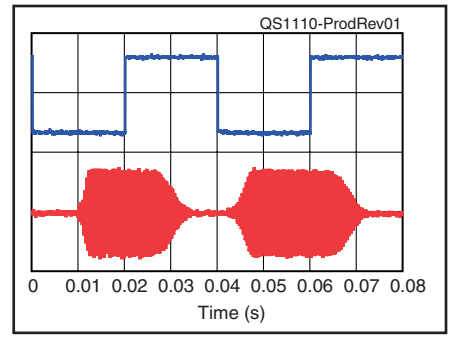

Figure 1 — CW keying waveform for the IC-7410 showing the first two dits in full break-in (QSK) mode using external keying. Equivalent keying speed is 60 WPM. The upper trace is the actual key closure; the lower trace is the RF envelope. (Note that the first key closure starts at the left edge of the figure.) Horizontal divisions are 10 ms. The transceiver was being operated at 100 W output on the 14 MHz band.

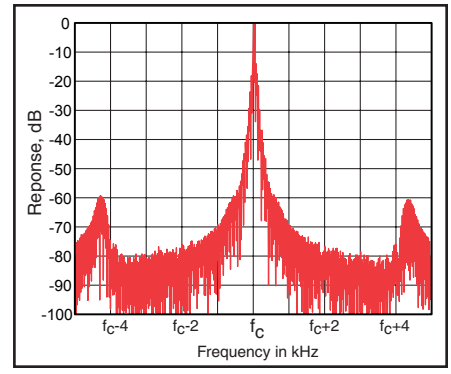

Figure 2 — Spectral display of the IC-7410 transmitter during keying sideband testing. Equivalent keying speed is 60 WPM using external keying. Spectrum analyzer resolution bandwidth is 10 Hz, and the sweep time is 30 seconds. The transmitter was being operated at 100 W PEP output on the 14 MHz band. This plot shows the transmitter output ±5 kHz from the carrier. The reference level is 0 dBc, and the vertical scale is in dB. Note that the keying sideband level rises slightly at the edges, to the –60 dB range.

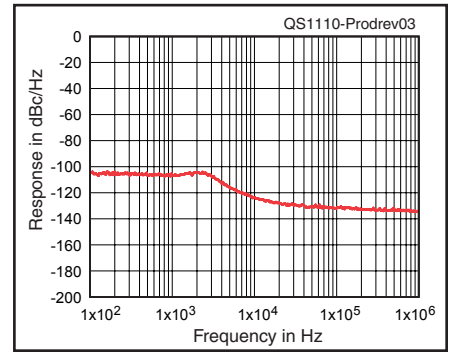

Figure 3 — Spectral display of the IC-7410 transmitter output during composite noise testing. Power output is 100 W on the 14 MHz band. The carrier, off the left edge of the plot, is not shown. This plot shows composite transmitted noise 100 Hz to 1 MHz from the carrier. The reference level is 0 dBc, and the vertical scale is in dBc/Hz.

choice on F-4, while in CW mode, the same key opens one of two selectable KEY menus, and in RTTY mode it opens the decoder screen. Pressing and holding the primary MENU button takes you into SET MODE, letting you enable or adjust those parameters less-traveled. I found menu scrolling to be counterintuitive. You press the ∨ key to ascend the menu tree and the ∧ key to descend.

The power supply connector is not compatible with earlier ICOM gear, so if you're upgrading from a previous model (such as my '756PROIII) you'll need to change some station wiring. The ACC (accessory) socket is a 13 pin DIN connector. ICOM included a compatible DIN plug with color coded pigtails, obviating the need to solder directly to the connector. The SEND jack to key a linear amplifier is an RCA phono connector. The contacts are rated for a maximum of 16 V at 0.5 A, compatible with any modern power amplifier. The rear-apron ground connection uses a fairly short Phillips head screw with two flat washers and one lock washer on its shaft. A wing nut would have been easier to manage.

Two SO-239 coax antenna ports are available on the rear apron. If your station setup only requires a single coax connection to your transceiver, you can disable the unneeded port, so you don't inadvertently transmit into an open load. Very thoughtful! The IC-7410 does *not* provide the means to connect a separate receive antenna, such as a Beverage.

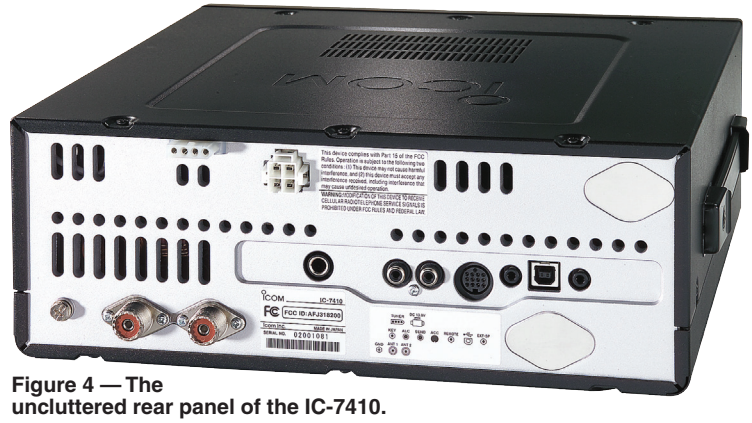

Figure 4 — The uncluttered rear panel of the IC-7410.

How Does It Play?

If I had just one word to describe the IC-7410 it would be *competent*, and the numbers from the ARRL Lab support this impression — not the best but *very* good. In reciprocal mixing testing for two-tone IMD (see Table 1), the IC-7410 stacks up as essentially identical to the IC-7600, and blocking gain compression was superior. The '7410 pretty much blows away the IC-746PRO's much older technology, but it's right on par with the higher tier IC-7800, at least in terms of two-tone IMD on 14 MHz. The numbers are even very good on 50 MHz.

ARRL Lab Engineer Bob Allison, WB1GCM, noted an oddity while testing the '7410's blocking gain compression at 5 kHz and 2 kHz spacings. "I experienced receiver overload at the point when the blocking signal caused the audio to drop by about 0.5 dB, such that strong noise jumps up at this threshold and the desired signal becomes absent," Allison recounted. "Raising the level of the blocking signal further caused an unrelated audio tone to bleed through." For example, he said, if the radio is tuned to 14.020 MHz (preamp off) and a 50 dB over S-9 signal shows up at 14.018 MHz, the receiver will overload. "Needless to say," Allison added, "the blocking figures are still very good."

Allison reports that he was unable to detect *any* receiver images during lab testing. He further notes that the receiver actually is *usable* down into the VLF range — 30 kHz (–99 dBm minimum discernable signal). "Many receivers tested are pretty dead down there," he said. "This receiver is very sensitive at 137 kHz and 505 kHz — spots where some nations already allow amateur activity. You may think that that doesn't matter much, but it does if you're using an active antenna or a small loop antenna."

Flexible DSP IF filters and twin passband tuning (PBT) with a graphical display of passband setting have become hallmarks of this generation of ICOM transceivers. The IC-7410 augments these with optional narrow filters for the 1st IF (64.455 MHz), which install easily. Each has a unique socket, so you cannot inadvertently install them incorrectly. While ICOM does not refer to these as *roofing filters* in the *Instruction Manual*, the display does show an R ahead of the current filter setting. This appears to be a "rose by another name" situation, since the net effect is the same. Narrower filters at this point in the circuit will reduce the impact of other in-band signals on the signal you're trying to pull out, especially when the band is busy (think Field Day or pileup).

Pressing and holding the F-5 button changes the optional 1st IF filter selections — stepping through the default 15 kHz (roofing filter passband), 6 kHz and 3 kHz settings. Quickly pressing the F-5 key changes the second IF (36 kHz) DSP filter contour from "sharp" to "soft." It takes a little practice to make this button do just what you want, and you may have to squint at the display to see the setting itself.

The sharp and soft contours did not make much difference to my ear on CW signals, although narrow filter settings seem more likely to sound "ringy" in the sharp profile as opposed to the soft. You may detect a smoother, even more pleasing sound with SSB audio by enabling the soft contour on a given DSP filter setting. The soft setting also seems to ameliorate some noise profiles.

By the way, the IC-7410's noise reduction (NR) appeared superior to the PROIII's NR. That makes sense, since the IC-7410 is more closely related to the IC-7600 and its more advanced DSP technology.

I thought a few things could be improved. The IC-7410 offers two levels of RF preamplification but just one level of attenuation. I missed having multiple levels of attenuation to deal with noise and interference on the low bands. The AGC attack, at least at default settings, seemed a bit severe. Static crashes actually killed the audio momentarily until it recovered. The speaker crackled a bit at higher AF GAIN settings.

Worth Mentioning (or Repeating)

The IC-7410 retains the most useful features of its predecessors. Take the *voice squelch control* (VSC), for example, introduced with the IC-746PRO. The VSC checks all signals for "voice components" before it breaks squelch. This feature is really cool, especially if you tend to monitor an HF frequency for activity (for example an emergency or traffic net). This means, too, that while scanning, the radio does not stop on every carrier, cable birdie or kerchunker, and it's available on AM and FM, as well as on SSB.

The automatic antenna tuner is excellent. It uses variable capacitors instead of clacking relays, and it works essentially as advertised — quickly and quietly. It can be set to auto start on HF or to start when PTT is activated on a new frequency. You can even set "band edges" for an especially narrowband antenna system. A rear-apron jack allows connection of an external ATU as well.

While the '7410 does not have a spectrum scope, it does have what ICOM dubs a *simple band scope* (SCP). At first glance, this might not seem a very useful operating aid, but it certainly came in handy during the ARRL June VHF QSO Party. I was expecting it to operate much in the same manner as the similar utility on the IC-706 series, but it's *way* faster. At any of the available settings it scanned the given swath of spectrum nearly instantly, leaving "blips" on the horizontal line representing signals detected (the receiver is muted during scanning). The scan limits depend upon how closely you want the band scope to check for signals — every

1 kHz, 2 kHz, 5 kHz etc. You then tune to the blip to hear what's there. You can use this tool to seek activity on one of the three band stacking registers, then swapping to a second band register to dial up the signal without tuning away from your original frequency.

You can monitor SWR and *relative* power output (there's no level or percentage readout) at the same time, although I still prefer a "real" meter or at least a digital representation, such as the virtual meter on the IC-7600. The IC-7410 has an LCD bargraph style meter, which can be set up to hold peaks for 0.5 second. Speaking of SWR, the IC-7410 lets you read and graph your antenna system's SWR curve, right on the screen. You can plot up to 13 points in various steps. Transmit briefly to plot the SWR on each step, and when you're done, the screen will graphically display the SWR profile of the antenna system under test.

As with the IC-7600, the IC-7410 offers a single USB connection to your computer. This link may be used to control the radio from your logging program or other software and/or to route audio to and from the radio or decoded RTTY to your computer. To make use of it you first must download and install the USB-to-UART bridge driver from the ICOM website, where you select the driver that's appropriate for the radio and your computer's operating system. This is a reasonably trouble free process. It did take a bit of juggling and tweaking to get the software to recognize the radio, however.

I was able to use the USB interface to control the radio (I checked it out with *N1MM Logger* and *Ham Radio Deluxe* — *N1MM* has a specific IC-7410 driver, but *HRD* does not) and to play "canned" contest audio files from my PC at the same time (sorry, phone contesters, but the IC-7410 does *not* have a voice-keyer). As with the IC-7600, however, you cannot set the USB interface to route the audio from your contesting software and from the microphone at the same time. The menu lets you pick one source or the other (or ACC, which lets you feed audio to the radio via the accessory jack on the rear apron, or MIC, ACC, which lets you route audio simultaneously via both inputs). It's possible to work around this by programming some rather clumsy CAT strings. As we suggested in the IC-7600 review, however, this appears to be a software issue, not an ICOM issue.[2]

Various and Sundry

Transmit bandwidth is adjustable, but it sounded good to other ops at the default settings when I was using my Heil ProSet Plus! headset. There are adjustable NAR, MID and WID ranges plus ESSB. You also can adjust high-pass and low-pass filter settings for received audio.

While the IC-7410 does not have a voice keyer, it does have an excellent CW memory keyer that is similar in implementation to those in the '746 and '756 series radios. You can set the menu to display either the memory keyer "root" menu first or the "send" menu first. As with other ICOM radios, CW keyer memories are loaded by using the function keys and tuning knob to select and enter characters one at a time. This takes some getting used to. As with past ICOM transceivers of this heritage, you still must roll your own external keypad to access your CW memories without going through the menu.

The radio is capable of full-break-in (QSK) CW, although as a veteran CW operator I didn't find it much better than semi-break-in.

The radio can decode RTTY signals, but it needs an external encoder to transmit it (FSK or AFSK). The IC-7410 makes it a bit easier to use sound card based data modes, and you can use the USB connection to pass baseband audio between the radio and your computer. One thing you cannot do, however, is use the terrific twin-peak RTTY filter system when running AFSK. (This filter boosts the MARK and SPACE frequencies for better copy.) You can only use it when operating true FSK, accessible via a rear-panel connection.

Press the SPEECH key, and a pleasant, digitized female voice announces the frequency, mode and S-meter reading. The menu gives you a choice of hearing these in English (default) or Japanese. Voice speed and volume are adjustable. In addition you can set this feature to announce the mode each time you press a mode button, and you can disable the S meter announcement. This is a terrific feature for visually impaired operators! For the North American market, ICOM may want to consider adding Spanish and French to its list of available languages.

ARRL Lab testing determined that the dial accuracy was dead on. The SET MODE also offers a means to tweak the radio onto the calibrator's frequency to keep it honest, but you shouldn't have to do that. The manual says this factory setting differs for each radio. In this same vein the IC-7410 has a built-in calibrator. Somehow I had managed to switch it on while fumbling thorough some menus. Hearing the calibration signals made me wonder if I'd broken the radio.

I had to engage in a delicate dance between the MIC GAIN and COMP settings. You don't want to use too much compression — good advice with any radio — since there's plenty to go around. The compression metering puzzled me, though, as I never could get it to kick up into the higher reaches of the scale at any combination of settings. The COMP control is one of the little "stem" controls, while the MIC GAIN is a genuine front-panel knob (this is a stem control on the PROIII and similar radios).

Other observations:

- You can set "user band edge" frequencies — a total of 30 band edge frequencies. These may come in handy in households where not all operators hold Amateur Extra class tickets.
- The radio includes a transmit time-out timer (*a la* your handheld VHF-UHF transceiver) with a choice of 3, 5, 10, 20 or even 30 minutes if you're especially long-winded!
- There are separate "Quick Split" menus for HF and for 50 MHz.
- The main tuning dial has two settable rates making rapid frequency excursions. These are essentially "fast" and "faster."
- The SET MODE lets you lock out either the manual or automatic NOTCH (there are separate settings for SSB/CW and AM). This eliminates the need to toggle through both when you really only use one notch mode, as I tend to do.
- If the power amplifier temperature gets too high, the IC-7410 will cut its output power in half and display LMT above the TX icon on the display. I never saw this happen.
- A look at the rear apron reminded me of the times I'd purchased a new vehicle without some of the features of the top-of-the-line model. On the dashboard and elsewhere were "blanks" to plug the spots where the controls for the optional luxury features, such as heated seats or mirror defrosters, would go. Similar blanks are prominent on the IC-7410's rear panel, since the radio shares a chassis with the IC-9100. These blanks cover the spots where you'd find interfacing connections for VHF and UHF accessories available on the IC-9100.

Beating the Heat

ICOM took pains with the IC-7410 to address problems of semiconductor failures that some IC-746 series transceiver owners have reported. For the driver, the IC-746, including the PRO, employed a μPC1678G (330 mW dissipation at a supply voltage of 5 V dc). These were said to run hot, making them more subject to premature failure. The finals were 2SK2975s. As does the IC-756PROIII and its successor IC-7600, the '7410 uses a pair of RD15HVF1 HF MOSFETs (12.5 V and rated at 15 W typical output with 0.6 W maximum input) as the driver and a pair of RD100HHF1 HF MOSFETs for the power amplifier. These units can put out 100 W apiece.

The upgraded device complement in the IC-7410 coupled with a much larger heat sink, copious vents on the top of the case, and a quiet, efficient blower ought to minimize significantly the possibility of heat-related component failure. The design of the heat sink is the primary reason why the IC-7410 is longer, although a bit narrower, than its

[2]R. Lindquist, WW3DE, "Product Review — ICOM IC-7600 HF and 6 Meter Transceiver," *QST*, Nov 2009, pp 54-59.

predecessors in the IC-746 series and the IC-756 series. ICOM does advise users not to place anything on top of the IC-7410.

And Furthermore . . .

Where does the IC-7410 fit into the larger Amateur Radio transceiver market? While the IC-7410 occupies the middle ground in terms of price, its performance definitely trends toward that of higher-tier transceivers.

An IC-7410 goes for approximately $2000 at the big outlets, and the optional 6 and 3 kHz filters are about $125 apiece. In the end, parsing the feature sets of ICOM's similar models will be part of anyone's buying decision. Do I want 2 meters and UHF capability? Would I rather have a subreceiver? Should I go with all the filter options? At its price point — even factoring in the optional filters — the IC-7410 would prove a worthy choice for value-conscious casual and serious operator alike, or as a second radio. An ARRL staffer who used the radio may have summed it up best: "Very impressive performance *and* looks!"

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ICOM
IC-7410

If you own a tablet or smartphone with the appropriate application, scan this QR Code to see a video overview of the IC-7410. You can also watch this video on your computer by going to:

http://youtu.be/jLa7kizlAYM