

auxiliary input which works well with radios that only have an earphone jack. Record level can be set auto or manually. There is a real VU meter. The speaker is large, audio is powerful, and there's a tone control.

Now for three features that really set this unit apart from the crowd. Half speed recording! Yep, up to two hours recording time on one side of a cassette. Up to three hours if you use the Super Thin TDK C-180 tape, and unlike other recorders I've tried, it will record properly on this tape without distortion. Playback speed is variable $\pm 15\%$. Want to copy a tape made with weak batteries? No problem. This control will bring the pitch back to normal, or use it to play back a CW tape at a speed that you copy. The last feature is something I've not seen before on a cassette recorder. In addition to a 1/8 inch earphone jack on the side, there is a 1/4 inch jack on the front. Just plug your communication headphones right in! I like to connect the recorder to the speaker jack of my SPR-4 and then listen through the headphones connected to the recorder...then I can switch from play to record and back to repeat ID's etc.

The Superscope C-202LP sells in the US for about \$100. A second model, C-200LP is about \$20 less, but lacks manual record level setting and variable speed playback. Superscope/Marantz makes (or used to make) a number of recorders with this sort of quality and features, but unfortunately most are being discontinued. The only ones remaining will be the C-202LP and C-200LP mentioned above, and one 3-head stereo model, the 430 which has a \$400-\$500 price tag.

Regarding tapes, I find the TDK series D cassettes seem to give the best performance/cost ratio. They stand up well to repeated use and provide 15 minutes to 90 minutes of recording time per side.

A further note to my headphone review (DX Monitor, Nov. 24, 1984), I picked up a pair of Sony stereophones MDR-S30. Good for DX, too! Has large (2-3/4") earpads, 6 foot cord, good sealing around ears, unimatch stereoplug (1/8" and 1/4"), comfortable for long wear and earpieces pivot for flat carrying. Priced under \$30, and with a good sound.

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(part of the above article first appeared in CIDX Messenger; the following article is reprinted in full from the Messenger. Should we call this the CIDX Technical Column?)

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The Sony ICF 2010

by Don Moman

The January 18 edition of Media Network featured a review by Jonathon Marks of the new receiver from Sony, the ICF2010 (or ICF 2001D outside North America). Their comments were detailed in the March 2 DX Monitor (page 8). Since I now have one in my possession, my comments follow:

Basic facts and specifications: Coverage is AM 150-29,999 kHz, FM 76-108 MHz, AIR 116-136 MHz. Built in antennas for all bands. 4 inch speaker, 380 mw of audio, .775 mV tape output (low level for "mic" input on recorder). 3 D cells (2 AA for computer memory) of 4.5 volts external power. Battery life should be 8 hours with standard 1.2 amp/hr D NiCads, considerably (30-40 hrs) longer with fresh alkalines. 32 memory channels, each will store frequency, mode and bandwidth. Keyboard plus tuning knob frequency input system. LCD readout to .1 kHz. 4 digit 12/24 hour clock with 4 timers, each capable of selecting the frequency as well as on/off times. Versatile memory and band scanning functions, modes keypad selectable. Size is 288 x 159 x 52 mm (11.375 x 6.375 x 2.125 inches w/h/d) which is very similar to the 2001. Weight is 1.7 kg, nearly 4 pounds.

Performance wise, the 2010 comes off as a very competent package. Readout to .1 kHz, with stability to match, 32 memories and key pad tuning might make you think I was describing the ICOM R71! And in many ways, the 2010 is a more "portable" version of the R71. Many of the comparisons in this review are made with my R71.

Tuning the set is accomplished 3 ways. A very easy to use keypad--just hit the numbers, then EXECUTE and there you are. Slightly simpler than the R71--no leading or trailing zeroes need be entered. Tenths of a kHz entry is not allowed in the 2010, only a small complaint here. A manual tuning knob is also provided--two tuning steps (.1 and 1 kHz increments) are switch selectable. 50 kHz/rev in fast, 5 in slow. Minimum steps are 100 Hz with no provision for fine tuning (RIT)--this is an unfortunate situation, but

with the special "sync" feature it becomes much less of an annoyance. More on that later. But for utility and ham listening it still is a shortcoming, especially if you have a CW/RTTY decoder--they may require unusually precise frequency resolution.

The third way of tuning is via the 32 button (64 function) memory preset system. Each of the 32 presets will store frequency, mode and bandwidth (plus a "skip" feature). Each button (most of them, anyway) has a second function that is used to define scanning parameters, and can also take you to a preset band edge instantly. Example, hit shift and C1/41m and you'll be at 7.000.0 instantly, no matter where you were before. Hitting scan will then only scan that portion of the spectrum. Conventional upper and lower scan limits can also be defined. Keys are provided for LW, MW, 120 through 11 meters, FM and AIR. It may sound complex but it is very easy to use and requires an absolute minimum of keystrokes to accomplish a function. The 4 x 8 matrix of memory preset buttons is more versatile than the rotary stepper switch on the R71, since any memory may be selected in any order.

Some form of fine tuning, like the 2001 had, would be nice on this set, as it tunes in 100 Hz increments at minimum. 10 Hz may be a bit much to expect in a small portable, especially in this price range; to build a good spectrally pure 10 Hz PLL is not a simple or cheap task--the R71 is probably the lowest priced set to have such a good PLL. The only other complaint is the noise the PLL makes as you tune. There's a popping sound as the PLL unlocks momentarily. The same noises are found in the R71 but they are much less noticeable there.

Sensitivity using the built in whip seemed to be low, but compared to other sets which I know to be at least of average sensitivity (Sony ICF 7600A, Panasonic 6300) it was almost identical. It should be significantly better than the 2002, which was insensitive. With an external input, it was very good, and kept up with the R71 on all frequencies above the BCB range. The R71 became the leader as the frequency decreased, but then my R71 is not "stock"--the front end has been modified for better MW performance.

Measured performance (HP606 RF generator) indicated that it could just detect a .08 microvolt signal at 9.5 MHz, and at 1000 kHz sensitivity had fallen to 1 uV. Quite comparable to a stock R71 actually. The 10 LED S-meter reads values of 1/1.5/2/2.5/3/5/10/25/50/80 uV at 9.5 MHz for the 1 through 10 LEDs. Notice that the "9" LED is exactly 50 uV. At 1000 kHz, the meter started indicating at 20 uV with all values correspondingly higher. One nice feature with the antenna input--unlike almost any other portable--is that the external antenna plug, when inserted, cuts off all internal antennas. Not just the whip but even the LW/MW internal loops. Very nice for the DXer who wishes to use an external directional loop or FM/AIR directional beam system. Surprisingly, the shielding is very good too. With a dummy plug inserted to cut off the internal antennas, only faint audio from my locals could be heard, and my locals are VERY local! My compliments to Sony for incorporating this into their design.

FM performance was only fair, in my opinion. It seemed reasonably sensitive (2 stations about 100 miles away came in fair) but it seemed on the verge of overloading as well. AIR band performance was poor--using only the telescopic whip the set received no audio on the local airport flight information frequencies, while my Radio Shack PRO-30 handheld scanner was able to provide just barely readable audio. And I don't consider the PRO-30 to be above average in sensitivity.

Surprisingly, an external SW antenna did not introduce severe overloading from my strong locals. At my DX'pedition site near Cooking Lake (still with strong locals but free from externally produced spurious signals) the 2010 suffered no more (or less) overloading than the R71 on the SW bands. MW held up quite well, but LW was awash with images. Here the problem is compounded by the already low sensitivity on this band. Still, LW is not that important to the majority of listeners, I'm sure. Unfortunately, it is important to me, so the 2010 is not my dream LF receiver, and it only covers LF down to 150 kHz. Overall it performed surprisingly well, better than any other portable with the exception of the much higher priced Sony CRF-1.

Selectivity is rather typical for a portable. The wide filter is w-i-d-e and provides good audio when conditions permit. The narrow filter is adequate in that it provides much relief from QRM but still allows quite respectable audio. Measurements I made indicated a wide value of 10 kHz (16 at -50 dB) and a narrow value of 5 kHz (8 kHz at -50 dB). A third, narrower choice for SSB would be useful. Using the 2010 in either USB or LSB while listening to a conventional AM signal AM signal is nearly totally

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unsatisfactory, since the 100 Hz tuning steps are far too large to permit in-phase tuning. However, a small button labelled "sync" does the job very well and automatically. Tuning to the high side of the signal will cause it to lock onto the USB portion, and vice versa. As to whether it helps much--it can reduce the impact of fades, and does allow you to choose the least interfered sideband with ease. But it also adds some background noise (a high frequency hiss), quite noticeable on weak signals. On some signals (ones with a lot of random fades and rather weak too) it adds another noise--a burbling sound. It's no doubt caused by a confused PLL circuit, wandering about looking for a signal to lock onto. Sometimes the noise would stay even after the signal came back; turning off the sync and then turning it back on would get rid of the noise. Not unexpectedly, if there are two carriers present within the lock range of the circuit (typically 400 Hz), the circuit cannot choose between them. Tahiti on 15170.25 was producing a strong het this morning, and the audio on the 2010 was hopeless; without fine tuning there was no way to manually zero beat the signal. The R71 fared much better, as it should. Listening to RCI on 11945 at 2130 for the SWL Digest, which suffered severe splash from Gabon on 11940, the 2010 again fared worse than the R71.

Other Features:

A separate clock display (only 4 digit) is 12/24 hour selectable. It is also the heart of a useful timer function which allows you to program 4 "on" times, each of which selects a frequency stored in a particular memory channel. The tuning dial is used to set the clock times--both forward and reverse setting make it very easy to use.

Memory and band scanning are quite versatile but the scanner will only stop on relatively strong signals. It scans so quickly that weak signals are not even audible, and unlike the R71, there seems to be no adjustment to slow down the scan rate. On FM the scan consistently stops before, during and after a strong signal. You can scan several ways--predefined "bands", user defined limits and all memory channels (you can program in a "skip" function too); and the set can either pause for 1.5 seconds on each strong signal or stop scanning altogether.

Audio from the 4 inch speaker is certainly not in the "ghetto blaster" tradition, and bass response is obviously lacking in such a small set. A 3 position tone control is provided. I would rate it to have good audio for the SWL but only fair for FM. Panasonics and other portables have better FM sound, possibly at the expense of their weak signal SW audio.

Overall, I quite enjoy the ease of using the 2010, and it makes an excellent companion for use with the R71, but when reception conditions get difficult it soon becomes obvious that there is nothing terribly exceptional about its ability. The "sync" feature does little to improve things. A narrower filter would certainly help matters, but I haven't checked out the inside of the set yet--there may very well be no room to do any experimenting with better filters. Price is listed as \$520 (Canadian) and the set seems to be in quite plentiful supply already.

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Sloping Random Wire Antennas

by Jim Herkimer

In his phasing unit articles, Mark Connelly mentioned the minimum antenna length for passive systems is about 120 feet. In order to accommodate this length in the space available, I simply tilted the wires using available supports. I've found these sloping wires preferable to horizontal ones for phasing experiments. It makes no difference which end is fed, directionality is always from the low end, which makes it equally convenient for those with shack locations on second or third floors, as opposed to those with basement or first floor locations. Although a slope angle of 45 degrees is desirable, angles as great as 60 degrees will still show a pronounced directionality. With the slopers used here, (120 feet long, at 60 and 170 degrees), minimum phasing unit adjustments are required to cover a large portion of the band. Often, only one LC module is needed, simply to peak the wire favoring the direction of the propagation opening. Under these conditions, actual phasing is reserved for stations that are seldom heard/desired, and/or masked in adjacent channel interference. In short, it pays to optimize the wires to be phased

At our cottage, I use a 120 foot sloper at 160° which runs down to the dock at the edge of the St. Lawrence River. This has proven to be an effective Caribbean antenna. Unfortunately, during the summer months, there is considerable ignition noise from the numerous outboard motor boats

on the river. I tied a short piece of copper tubing to the end of the sloper, and tossed this into the river. This has proven effective in reducing the noise, but also narrowed the beamwidth, as normally dominant stations to the west, in Ontario, are now completely absent. I've not experimented with various resistors, as I have been quite happy with the antenna thus far. Incidentally, I had a neighbor remove the copper tubing from the river at timed intervals. The effect was similar to throwing a switch. The differences in response were quite remarkable. Also, this terminated sloper was excellent for longwave trans-Atlantics, while a similar length wire at horizontal was poor, even though the horizontal wire favored Europe on BCB.

We know about resonant antennas using sloping elements from the ham press: Inverted Vees, Delta Loops, and the $\frac{1}{2}$ and $\frac{1}{4}$ wave slopers; these consistently show better low angle response than horizontal arrays. However, at BCB frequencies, such short wire lengths (in terms of wavelength) require some investigation.

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...still on antennas, I'd like to add a couple of extra comments to "Notes on Mediumwave Beverage Antennas" in the Jan 12/85 DXM. Further experiments have changed my tune a bit about termination of Beverages. If the ground is damp at the end of the wire, and you have plenty of QRM off the back of the wire, then use a termination by all means...In a recent DXpedition to the west coast of Vancouver Island, two wires were put out at 270°, one terminated at the far end to a single ground rod via a 560 ohm resistor; both wires were 1000' long. In this situation, almost all domestics were off the back of the wire, and desired DU DX was all that was off the front of the wire. In the early evening, the terminated wire sounded quite "dead", as domestic strength was not as good on this one as the unterminated wire. As the DU's started fading in, they were readable first on the terminated wire and continued more readable all morning, due to less domestic splatter. This was a universal observation, at least up to the middle of the band; there was little DU activity above about 1100 kHz.

In another later experiment, a 300° wire was laid out along a beach, again 1000' long, and unterminated. Although conditions favored Asiatics that morning, using a TRF with Shotgun loop, very little improvement in DX signals was noted when the wire was hooked up to the TRF. This was not unexpected; the ground under the wire was salty and damp, with the ocean close by and parallel to the wire, and it would seem that the excellent ground conductivity severely restricted the action of the Beverage antenna.

--NHP

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Morning Distributing Co., P.O. Box 717, Hialeah, FL 33011, offers a number of kits of possible use to the homebrew receiver builder. Included are kits for an audio preamplifier and power amplifier, active modulators or mixers, AM envelope detector, IF amplifiers, SSB product detector, crystal oscillators and buffers, RF amplifiers/mixers etc. These boards are intended for use in an amateur radio SSB transceiver, but many of the boards would be useful to the MW experimenter. The kits range in price from \$4 to \$10 complete with etched board and parts. For full circuit details of available kits, send \$2 to the above address. The company also offers parts including 365 pF air-variable capacitors for \$1.49, which sounds like a steal.

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The latest Fair Radio catalog, WS-85, once again includes spare parts for the R-390A, but the mechanical filters are down in price, e.g. 2 or 4 kHz filters now go for \$35.

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--that's it for now. 73, Nick

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