

IRCA Technical Column

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The Grundig Yacht Boy YB 400PE as a Medium Wave Receiver

I recently had a chance to try out the Yacht Boy YB 400PE, and to put it through its paces as a medium wave receiver in comparison with the venerable Sony ICF-2010. One might say outright that this could not be a fair comparison, as the 2010 lists for roughly twice the price of the YB400, even after over 15 years on the market, but after all that time, it remains a benchmark of portable radio design. A fairer comparison would be with the Sony ICF-7600G but I did not have that available for review. However, see "The SONY ICF-SW7600G, ICF-SW1000T, and ICF2010 as Medium Wave Receivers" in the June 21, 1997 [DX Monitor](#) for an indirect comparison.



Overall descriptions:

The YB is roughly 8x5x1.5", and tunes 144-353 kHz and 520 kHz to 30 MHz in 1 kHz steps (5, 9 and 10 kHz steps are also available depending on the band and settings), as well as FM. It has the usual clock and alarm as well as 40 memories. There are two IF filter settings, and SSB can be monitored using a "fine tuning" control to clarify the USB or LSB signal being received. Tone switch, a bar-graph S-meter, DX/local switch, external antenna jack, headphone jack and external power jack round out the features. (As you will know from other reviews, the ICF-2010 has a few more features as befits its greater cost. The principal features are synchronous AM detection, a switchable choice of LSB or USB rather than a fine tuning control, readout and tuning to 0.1 kHz, and a tuning knob rather than up/down tuning buttons.)

Sensitivity (using the DX position of the front end attenuator):

In all cases on medium wave, the ICF-2010 was more sensitive, when either set was using its internal loop antenna. This is not surprising, given that the '2010 has a larger ferrite loop antenna, but for example, the '2010 showed traces of audio on 1580 kHz on a winter afternoon, while only a faint sub-audible heterodyne was heard on the YB400. A similar result was noted with daytime reception of a TIS on 530 kHz, as well as on other MW frequencies. Having said that, the YB400 was still sensitive enough to register a slight TA carrier on 1314 kHz in December 2000, though a large loop antenna was needed to verify the presence of that carrier. Note that the Yacht Boy seems to be a bit more sensitive than the '2010 on shortwave using the stock whip antenna.

In order to try to level the sensitivity playing field, I placed each radio in the center of an unamplified 3-foot air core box loop, with the loop lobes lined up with the internal loop lobes. The sensitivity difference between the two radios is not so pronounced under these circumstances, and most signals heard on the

'2010 were also heard on the Yacht Boy, but when the received signal was marginal, as 1580 kHz was above, the YB400 still didn't deliver quite as solid a signal as the '2010 did.

Both receivers have external antenna jacks, but only the '2010 switches out the internal ferrite loop when that jack is used. Not only does the Yacht Boy continue to use its internal antenna, it seems to attenuate an external signal quite severely below 1600 kHz. In fact, below 1400 kHz, it was impossible to tell whether an external antenna was plugged in or not; presumably this is to prevent strong MW signals from overloading the set when it is tuned to shortwave using an outside antenna. The only way to couple a random wire to the set at MW and LW frequencies was to wrap a few turns of wire around the case, and feed the antenna and ground to either end of the wire. The external antenna connector does work fine for the tropical bands and above however.

Selectivity:

It's sometimes difficult to tell how much of a radio's performance is due to its selectivity and how much is due to signal handling capabilities, but the YB400 is capable of separating out most 10 kHz domestic channels quite nicely, even using its wide filter. Channels next to my two 10kw locals were more difficult, but that was as much due to the sheer volume of the splatter and to signal handling problems as to lack of selectivity (see further comments below). The filters on the Yacht Boy and on the '2010 seem comparable when I used the test of tuning past a local and noting where the signal became readable as the carrier was shifted into the IF passband, then became unreadable again as the carrier was shifted out. For example, the narrow filter on the YB400 delivered readable audio on my 900 kHz local between 898 and 902 kHz (i.e. tuning to 897 or 903 yielded just loud splatter) while the '2010 showed a readable signal between 897.3 and 902.8 kHz. Conditions lately have not been good for overseas stations, but I would imagine that there shouldn't be too much problem hearing split frequencies within 4 or 5 kHz of domestic channels.

Strong signal handling:

Using its internal antenna, the Yacht Boy was able to hear a mixing product from my two locals at only one spot, and that was in the longwave band. Those with many more locals may not be so lucky, and plenty of MW overload was found on longwave if an external random wire was coupled into the set through turns around the case as described above. (See "Spurious Responses and How To Recognize Them", IRCA reprint T10 for details on calculating second and third order products)

More importantly, without any external antenna I was able to get muddy but readable audio from local CKMO-900 (10 kw at about 3 miles) on top of semi-local KIXI-880, when maximizing CKMO's signal by rotating the radio. If one uses the YB400 inside an air-core loop, this effect is not noted, as long as one tunes carefully to make sure the loop is tuned to the same frequency as the radio is. That's a good general rule in any case as overload can certainly occur in the Yacht Boy if the box loop antenna is mistuned to a strong signal.

An image 910 kHz below my local on 1070 kHz was found on the Yacht Boy, but the '2010 has that problem also, and overall image rejection seemed good enough that there were no birdies heard on 10 kHz channels below 790 kHz (1700 kHz-910 kHz), as has been a problem on some other portables tested including the ICF-7600G. Interestingly, there wasn't much evidence of images on the lower end of the MW band even with an external wire coupled in.

Finally, there were no internally generated "birdies" found in the LW and MW bands.

S-meter and memories

The S-meter on this radio is not quite as impressive as it looks at first glance. Although there are 21 bars in the display, they are actually illuminated 4 bars at a time, so there are really only 5 gradations in signal strength, not quite as impressive as the 2010's 10 LED display, but good enough to indicate loop nulls in most cases.

The 40 memories store frequency only, as the filter passband and SSB on/off are controlled by slide switches and can't be "remembered". What is more of a concern to me is the delay (a good portion of a second) going from one memory to the next, effectively making the memories useless for checking

parallels. I've been spoiled by the virtually instant response of the individual push button memories on the ICF-2010.

Synchronous detection:

It's hardly fair to evaluate the YB-400's lack of synchronous detection, but unfortunately, the ICF-2010's sync detector really does make a difference to the readability of medium strength signals which are suffering from interference. It substitutes for a steeper sided filter, and allows one to monitor the sideband which is affected less by adjacent channel splatter. For example, only traces of audio were noted when tuning the YB400 to the Calgary station on 1060 kHz next to my local on 1070, but using the 2010's synchronous detector on the low side of 1060 yielded a readable signal in the splatter, even though the IF filters on both radios had similar passbands.

In addition, non-synchronous heterodyne detection (using USB/LSB positions to demodulate AM) is not possible on the Yacht Boy because the continuously variable SSB fine tuning control does not tune to the edges of the passband of the narrow IF filter, so tends to receive both sidebands of an AM signal at once.

Overall, audio quality on the YB400 is crisper than on the ICF-2010, even when using the narrow IF filter.

Conclusion:

Unsurprisingly, the Grundig Yacht Boy YB400 is not a replacement for the Sony ICF-2010, but its narrow IF filter, 1 kHz tuning steps, good quality audio, and relatively good sensitivity and signal handling capability make it a reasonable starter radio for a MW DXer, particularly one with shortwave interests. However, it does suffer from an external antenna input which doesn't switch out the internal MW antenna, and attenuates severely MW signals from an outside antenna. In addition, the lack of synchronous AM detection means that it is not as capable as it could be in demodulating weak signals next to stronger ones.

Of course, if I'd been offered this radio for MW DXing in the 60's, at the comparable 60's price, roughly equivalent to that of an "all-American 5", I would have been in DXer's heaven. We've come a long way in that time.

(Thanks to Colin Newell for the loan of his Grundig YB400PE)