

Equipment Review

The Kenwood TM-701A and the TM-731A Dual Band FM Transceivers

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That's right! Not one but two transceivers for our review this month; these are both dual-band FM transceivers that cover both the 144 to 148MHz and also the 430 to 440MHz bands. The 731A has a nominal power output of 50 watts on the 144MHz band and 35 watts on the 430MHz band, while the 701A has an output of 25 watts on both bands. However, back to the beginning. In the April 1990 issue of *AR*, I reviewed the TM-231A 2m FM transceiver. I guess the best way to describe the 701A is to call it a dual-band version of the 231A. It has the same general appearance and is of the same overall size. However, it does have two coax output connectors, one for each of the two bands. The LCD multi-purpose read-out gives all the information you might need, but it only shows the main operating frequency. The 731A, on the other hand, not only shows both the 2m and 70cm frequencies, it also has two S-meters. Just consider that — not even the new TS-950S has that facility! The 731A also has two coax output connectors, so you will need either two separate antennas or a diplexer if a dual-band antenna system with a single feeder is used. If you are a casual FM operator, the latter approach is probably the preferred way to go. By the way, if you have noted that the price

of diplexers is rather steep, don't worry — I will be covering the construction of one in *Random Radiators* very soon. Total cost about \$20.

With the bigger display and increased power output, the 731A is a bit larger than the 701A. In fact, it measures 150 x 50 x 219mm and weighs in at 1.8kg, compared with 140 x 40 x 200mm and 1.4kg for the 701A. Also for the extra size and cost, you get a few interesting features included. A squelch control for the sub-receiver and a balance control to set the relative audio outputs of each receiver. It is also possible to run two external speakers, one for each band. Without external speakers connected a mix of the audio is supplied to the internal speaker. Both transceivers have their internal speakers mounted in the top of the cabinets. I feel that, in general, this is the best place for them, although care needs to be taken when mounting the rigs in the car to avoid masking the sound.

The TM-731A — a Closer Look

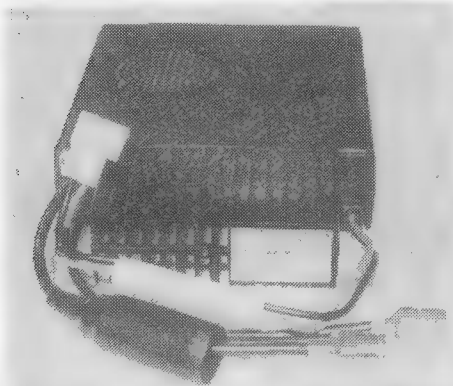
I will take each of the rigs separately and cover the various features that they have.

The tuning facilities on the 731A are very comprehensive. There are two tuning controls, one for main tuning and the

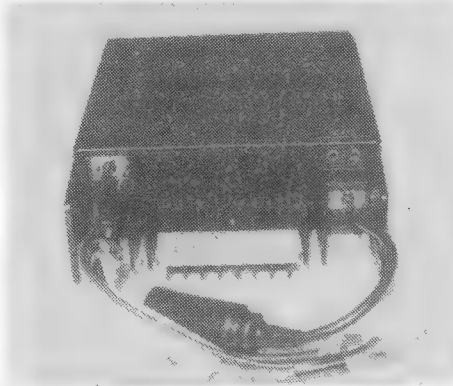
other for 'sub' band tuning. This means that each band can be tuned independently of the other. These same controls are also used to select the memory channels when operating in the memory mode. Underneath the main tuning control are two up/down buttons which step the main tuning in one MHz segments.

Tuning steps can be programmed for 5, 10, 12.5, 15, 20 and 25kHz, with a separate choice available for each band. Thirty memory channels are available and these are divided equally between the two bands. One of the memory channels on each band is allocated as a call frequency. Memory channel 'one' is allocated for the special alert function. If your call channel corresponds to the one you require the alert function to be on, then you will have to have the same frequency in two memory channels. This means that you might well run short of memory capability. It seems odd that many handheld transceivers can run to 50 or even 100 memories, and yet a full-featured transceiver has only 30 (or less). Some of the memories are also designated for other uses, such as band scan limits and offsets other than the standard ones.

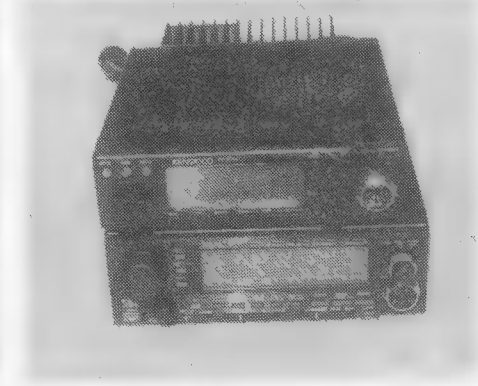
Many of the control buttons are dual purpose, with the second function coming into use with the operation of the function button first. Luckily, most of the



Rear view of the TM-701A. Dual coax output leads can be seen which are not identified on the name plate.



Rear view of the TM-731A. Note the two speaker output sockets at top left.



The smaller TM701A on top of the TM-731A note the relative sizes.

'second' functions are of the set-and-forget type. In general, the ergonomics are very well thought out, but the combination of small buttons, small labelling and my bi-focal glasses made it rather hard to hit the right button every time. No doubt, given time, I would have become familiar with it all. The microphone supplied with both rigs is one that has come in for some adverse comment (not from me). It has a 1mm hole for the microphone acoustic input. It has been said that this is too small. I did many tests and comparisons with other Kenwood microphones and must say that it came out sounding better than most.

Power output on transmit was well up to spec on both bands, but it was interesting to note that the current drain was higher on 430MHz, despite the lower power output, indicating a somewhat lower efficiency on the higher band. The output was well maintained right across both bands.

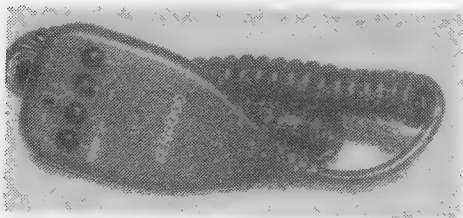
Current drain	146MHz	435MHz
	7.6 amps	8.6 amps

In the lower power position, the power output was just on five watts on both bands with a current drain of 2.7 amps on 146 and three amps on 435MHz.

Receiver sensitivity appeared to be excellent, with only 0.1µV input required to produce a 12dB sinad on 146MHz. As I am not blessed with a signal generator covering the 430MHz band, I can only guess, but it appeared to be just as good, easily beating my old (and little used) transceiver. No reciprocal mixing problems were noted on either band and, as I have a police UHF repeater less than 100 metres from my antennas, this certainly indicates first-class front-end performance. Receiver audio power output was measured at 2.9 watts into an 8-ohm load and a very healthy 4.8 watts into a 4-ohm load. Audio quality was good, but with a little less low frequency response than I have found with Kenwood VHF gear previously.

The 'S' meter was checked on 146MHz only, and it was noted that 14dB increase in level was required to go from S1 to S9 with another 6dB required to get to the top of the '+' section. This is certainly better than most, but don't give antenna reports on the basis of 6dB or even 3dB per 'S' point.

With the ability to transmit on one



The somewhat controversial microphone which we found to work very well. Note the remote control buttons.

band and listen on the other at the same time, you are set for versatile operation. Just one point, however. If you intend to do much duplex operation, headphone use is almost mandatory. Perhaps on the next model, Kenwood might like to consider putting a 3.5mm stereo headphone socket on the front panel.

The TM-701A — A Closer Look

Basically the 701A is smaller, has less power output and a few less features compared to its big brother. Let's see first off what you don't get. As mentioned earlier, the read-out is much smaller. The second, or sub-frequency, read-out is not provided, neither is the second 'S' meter. The transmitter power output is lower on 144MHz, 50 watts down to 25 but, in fact, is not that much lower on 430MHz, 36 watts down to about 25 watts. Not enough to make any real difference. The sub-tuning control, the audio balance control and the sub-band squelch control are all missing. However, there is one thing the 701A has that the 731A does not have: a power on/off switch which is not combined with the audio gain control. You can leave the audio set to a suitable level — very handy.

The 701A also has that handy facility of being able to select the VFO tuning rate. I feel that the 25kHz rate is the best choice as it fits our band exactly.

With the rig on test, I was unable to pick very much difference between the two rigs apart from the higher power output of the 731A. The specification of the 701A indicates that the receiver sensitivity is a fraction down on the 731A. However, my rather ancient test equipment was unable to pick this up. On-air tests were unable to show up any detectable difference in receiver performance between the two rigs. Probably the main difference is the ability of the 731A to receive two bands simultaneously. The 701 does not include this feature. On VHF/UHF this is not quite the same as the new dual-frequency HF transceivers, because I would guess that most amateurs would use the facility to perhaps monitor a simplex or repeater channel waiting for an unexpected call to come along. If you can listen to and comprehend two transmissions at the same time, you are better than I am.

Of course both rigs are capable of operating in full duplex mode. In other words, you can transmit on one band and receive on the other at the same time. One thing that might deter this, however, is the transmit duty cycle, which is rated at one minute transmit to three minutes receive. I feel that this might be a bit on the conservative side, but both rigs do get hot after a few minutes of transmission. If

you intend to operate duplex, it might be a good idea to let the button go from time to time.

Kenwood offers a wide range of optional equipment to complement the two transceivers. There is a variety of external speakers suitable for both mobile and fixed station applications. There are also AC power supplies available, but actually all are designed to match HF equipment. While quite suitable electrically, they do not match the colour or appearance of these transceivers. There is also the interesting RC-10 remote control unit. The photos I have seen of this seem to make it look like a cellular phone unit. Buy one and impress your non-technical friends. But I feel it could actually be a very useful thing to have. What about sending one down for us to review one day?

The Instruction Manuals

Unlike the TM-231A, reviewed April 1990, the books for our review transceivers were not published in six languages — only English. Again the technical information is very limited, with only a circuit diagram included. I know that we reviewers keep on about this, and I hope that one day we might see some results. There is no doubt that some manufacturers are better than others but, in general, the instruction books are aimed at non-technical buyers. No doubt, Kenwood will have a full service manual available as an option, but often these are oriented quite the other way. In other words, if you are looking for basic adjustment information it's hard to find the trees for the woods.

The TM-731A and the TM-701A Conclusions

It's an interesting choice. If you require a full-featured dual-band transceiver, one that can produce double talk and even have dual 'S' meters to tell which is which, and one which feeds the double talk to separate speakers (now single talk twice) then the 731A is for you. However, if you are normally a 2m operator who would like to keep up with what's going on on 70cm, then maybe the 701A is the one for you. Both are rather short on memory space; a thing that I find strange in this day and age. For the features included, both represent very good value. The audio quality is, as usual, pure Kenwood — in other words, the best in the business. I would be happy to recommend either transceiver.

My thanks to Kenwood Electronics Australia for the loan of the review transceivers. If you require more details on price and delivery, you should contact Kenwood or one of its local agents. **ar**