

A REVIEW OF THE UNIDEN 2020 HF TRANSCEIVER



The Uniden 2020 with matching speaker and external VFO.

Those of us who started out in amateur radio in the immediate post war days and were brought up on such names as Hallcrafters, National, Johnson and Collins, the new crop of Japanese amateur equipment manufacturers seem strange indeed. However, as time passes, no doubt many of these new names will be just as famous and synonymous with our hobby.

Uniden is perhaps the most recent addition to the amateur vocabulary.

In actual fact, Uniden have been producing high grade commercial communications gear for some years now and whilst the 2020 represents their first attempt at the amateur market, it is backed by this experience and obviously a keen know-how of amateur requirements.

TECHNICAL FEATURES

The 2020 is a five band transceiver that covers the 80, 40, 20 and 15 metre bands with 500 kHz coverage on each band.

The ten metre band is covered in four steps of 500 kHz each to give a total coverage of 28.0 to 30 MHz. The eleven metre band is also included with 27.0 to 27.5 MHz coverage. While the Japanese models provide receive only facilities on this band, all 2020's sold in Australia have transmit function on this band. A receive only band from 15.0 to 15.5 MHz is included for reception on WWV and also a few short wave broadcast stations.

Operation is provided for USB, LSB, CW and AM. Separate filters are included for upper and lower sideband which allows for change of sideband without frequency shift. These filters have a nominal band-pass of 2.4 kHz at -6 dB. Also included as standard is a 600 Hz CW filter.

Perhaps the most unusual feature of the Uniden is the tuning system. Instead of covering the full 500 kHz in one sweep as is usual these days, there are five, push-button selected, 100 kHz segments. This enables the operator to shift from one end of the band to the other by simply pressing the appropriate button. The frequency generation system associated with this

tuning method employs the advanced phase locked loop technique.

Rather than take up space here, I would refer readers to page 16 of November 1975 Amateur Radio for a full description of the operation of this system. The PLL circuit is claimed to improve frequency stability over that obtained with a more normal set up. Just how this works out will be discussed later.

Another unusual feature of the Uniden is the dial readout, which is a combination of digital by LEDs for the Megahertz and one hundred kilohertz segments, while the hertz and tens of hertz are displayed on a rotating drum dial with calibrations drawn to imitate the LED readout of the first portion of the dial. Even the red colour of the LEDs has been perfectly matched.

The Uniden 2020 has all the normally expected features of a modern transceiver. It will operate from AC mains from 110 to 240 volts as well as from 12 volts DC. It has receiver offset tuning but once again the Uniden does it with a slight twist. Two tuning ranges are provided, one with ± 5 kHz and the second with ± 1 kHz. The bandspread RIT is selected with a pull-on switch on the offset control.

A cooling fan for the final stages is another part of the standard equipment, as is a three position AGC selector for fast, slow or off. A noise blanker and a built-in monitor loudspeaker are included. Needless to say, the Uniden is all solid state except for the transmitter driver and final stages which use a 12BY7 and two 6146B tubes respectively. 52 transistors, 16 FETs, 18 ICs and 154 diodes are employed in the solid state sections.

All this adds up to a very complex piece of gear and there are surely more components per dollar paid out than any other piece of gear available on the market today. It will of course be interesting to see how reliable the Uniden proves to be after a few years of operation.

Obviously, with such a complex circuit, a good deal of space could be taken up with descriptions of each and every part of the transceiver, but I think most readers will be more interested in how the transceiver handles, how it sounds, and what happens when the knobs are turned.

THE UNIDEN 2020 ON THE AIR

In appearance the 2020 is quite different to any of its competitors. It is also rather large by current standards. It measures 350 mm wide by 165 mm high by 333 mm deep and weighs in at 39.6 pounds or

18 kg. It might therefore be hard to fit into the average family car if mobile operation is required, and would represent quite an effort to lift off the operating table into the car and return. However, most amateurs will probably be using the Uniden as a fixed station only. Incidentally, when running from 12 volts DC, the standby current drain is 7 amps with 22 amps peak at full SSB output.

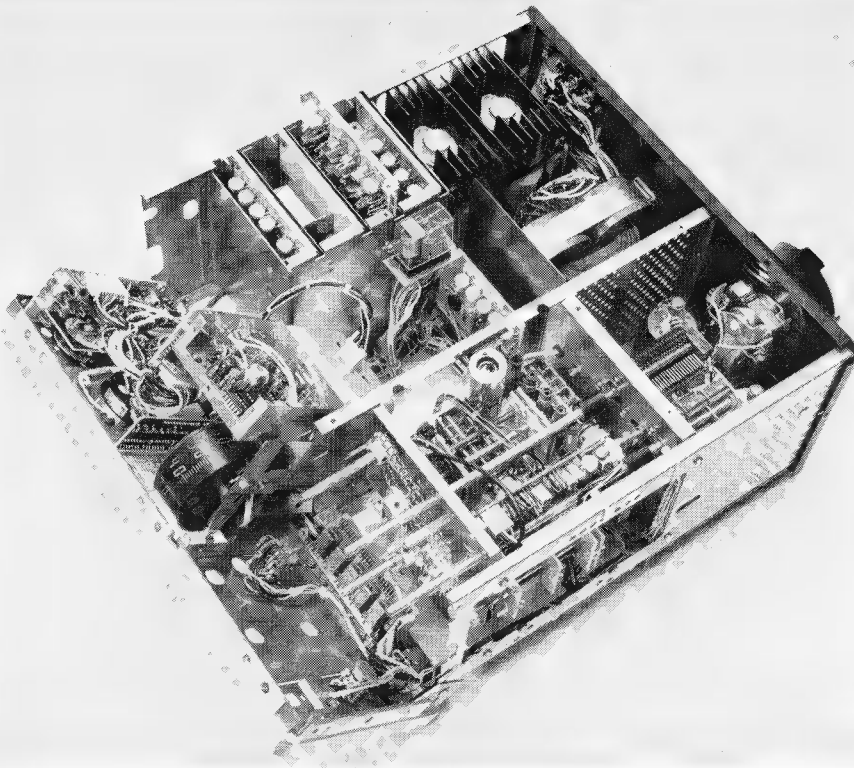
The 'S' meter, which also reads ALC voltage, cathode current, and relative RF output when in the transmit mode, must be the clearest meter on any piece of amateur gear on the market today. It has a predominantly bright green scale with a red needle that stands out with remarkable clarity. The meter movement is well damped and average readings can be taken without any eye strain at all.

The tuning system of the 2020 proved a little disappointing. Firstly, the tuning knob is much too big. One about fifteen millimetres smaller in diameter would be much easier to turn. It also seems an odd omission that a spinner handle has not been provided. The 100 kHz tuning range could also come in for some criticism. It seems that the designers of the 2020 set out to prove Murphy's Law. That is, that the station you want to listen to is just outside the range of that particular segment.

If you like to tune up and down the band it is amazing how often this happens. But, speaking to many owners of the Uniden, the majority put the tuning system on the top of their best-liked features list.

Calibration points on the kilohertz dial are spaced about 1.5 mm apart and the pointer, which can be adjusted vertically to achieve zero set, is illuminated to give excellent contrast against the moving scale. Linearity of the kHz scale is quite good. It checked out to within 500 Hz over the full range.

The crystal calibrator works with rather an unusual system. Instead of using a 100 kHz crystal as is normal these days, a 6.4 MHz crystal, with a multi-vibrator to divide down to 25 kHz is employed. Though unusual, it appeared to work somewhat better than the older 100 kHz system with regard to stability. However, the strength of the 25-kHz points on the various tuning ranges was rather low and in fact often hard to find at all amongst the QRM on 80 and 40 metres. An average of 'S' 8 was obtained with the lowest reading on 80, and the highest of just over S9 on 10 metres.



This exploded view of the 2020 shows many of the components and the facility of swinging out the front panel for easy access.

Switching from band to band produced no more than a 500 Hz change in the dial calibration point.

Another feature of the tuning system is a tightness control for the knob. This enables the tension to be controlled up to the point of actually locking the knob; quite a handy feature for mobile operation.

One last comment on the tuning dial is that if the transceiver is used in a position with direct sunlight falling on the front panel, the readout becomes very hard to see. Unfortunately this is one of the problems that has to be accepted with LED readouts and there does not seem to be any easy solution.

The dual speed offset tuning proved to be a delight to use. The \pm one kHz range was ideal for setting an SSB signal spot on. A separate switch is provided for the RIT and a small and rather dull LED above the control indicates operation of this.

Frequency stability was next checked out. The published specification is rather vague, stating 'Less than 300 Hz drift in starting. Less than 100 Hz drift or less after 30 minutes of warm up'. This would seem to indicate that no more than 400 Hz drift could occur over all. In fact, over an eight hour period, the 2020 drifted 1400 Hz. If the specification is interpreted as meaning 100 Hz drift per hour after warm up, then this would be just met.

The above is not implying that this amount of drift is in any way unsatisfactory. For the average amateur using the 2020 for two or three hours, the total drift would be very small and go unnoticed.

However considering the complex system of frequency generation, the Uniden does little better in regard to stability than any other modern transceiver.

The action of the noise blanker was disappointing. It did reduce the level of car ignition noise to some extent and proved useful in weak signal copy through this type of interference. On all other types of noise such as electrical appliances and power line noise, no noticeable improvement could be detected. As far as could be seen there is no adjustment to increase the blanking action.

One of the small but nice features on the 2020 is the inclusion of a tip-ring and sleeve headphone socket. This enables the use of the common and cheap stereo type headphones available from supermarkets and discount shops. An attenuator is also included to bring the audio level to the right point.

On receive the Uniden proved a most pleasant set to listen to. Audio quality from the built-in speaker, which is set into the bottom cover of the cabinet, was very well balanced. It produced a full, round tone that is often lacking with these small speaker units. The overall good quality was assisted by a first rate AGC system. Several owners suggested that the slow AGC position could have been a bit slower, but after listening for several lengthy periods no strain or fatigue was encountered. Whilst no actual measurements were taken it was obvious that both the product detector and audio output section were working with very low distortion.

A point of criticism is the cooling fan. Reading the advertising on the 2020 the impression is gained that the fan switches off when the transmitter heaters are off. This does not occur. It is possible to switch the fan off in the receive mode but to do this it is necessary to reach behind the set and push the 'RF power AMP' switch to the off position. This is normally actuated when a transverter is connected. To make matters worse, the fan is by no means silent. It produces a good deal of low frequency rumble. The actual fan mounting seems to be the culprit as the motor noise is transmitted through the cabinet which sets up a resonant effect.

On transmit, the Uniden proved to be a very smooth performer. Power output was checked at 110 watts on 80, 40 and 20 metres with 100 and 95 watts on 15 and 10 metres. This was in the CW position with PEP output on SSB essentially the same. The transmitted wave form as viewed on a Heath SB610 monitor scope was extremely clean. No doubt this can be attributed to the regulated screen voltage on the 6146B finals. The AM output is double sideband and the transmitted signal was of good quality. Power output on AM averaged about 35 watts. Double sideband AM reception is not possible with the 2020.

VOX operation on SSB was very smooth. There is no audible clicking or popping through the speaker and only a very subdued sound from the relay. Those who are consistent VOX operators may find the delay a little long even when set to the shortest position. It would seem that this could be modified with little trouble.

ACCESSORIES

The Uniden is supplied with a very complete set of accessory plugs and connectors. These include a good quality PTT dynamic microphone with curly-cord and four pin screw-on connector. A spare microphone connector is also included for use with your favourite mike. In addition to this you receive a PL259 antenna plug, several RCA plugs, headphone and key plugs, 3.5 mm plug for an external speaker, plus spare fuses, and extra cabinet feet to raise the front of the transceiver.

The instruction book is very well produced. Actual operating data is complete and well illustrated. As is usual these days, no alignment data is included and trouble shooting is assumed to be the dealers problem rather than the individual amateur. However, if you are game, there is an excellent illustration of each circuit board showing every part clearly.

There is a full range of external accessories available for the Uniden 2020. These include an external VFO and matching external loud speaker. The unit used in our test report was supplied by Vicom International of 139 Auburn Road, Auburn, Victoria, and information regarding price and delivery of the Uniden 2020 and its external accessory units should be addressed to them, or to their Sydney branch at 23 Whiting Street, Artarmon. ■