The Albrecht AE485S 10m

*Reviewed by Chris Lorek, G4HCL**

WITH THE SUNSPOT cycle at its present high state the 10m band is often 'open', with world-wide QSOs possible even if you're just using low power and simple antennas. Several years ago, converted multimode CB rigs were very popular for this purpose, although you needed to have the required formal documentation from the Radiocommunications Agency to own and use one legally. Recent changes in the UK law now mean that we can freely purchase single-band 10m rigs again. Because of this, transceivers such as the Albrecht AE485S have become available.

The AE485S is a lightweight and easily transportable single-band 10m rig, weighing just 1.2kg and measuring 52 x 165 x 194mm. It has transceive modes of USB, LSB, FM and AM, with a maximum power output of 25W on SSB and FM, and 6W on AM. A variable power control lets you reduce this to a couple of watts for QRP work.

Being originally derived from a multimode CB transceiver design, it does *not* have CW transmit capabilities, and just tunes using the front panel click-step control in 10kHz increments. All isn't lost though, as a press of the front panel 'step' button also lets you select the 1kHz digit for frequency selection, so you can interpolate between the 10kHz steps. A variable clarifier also lets you tune in between the 1kHz steps, albeit only on receive.

For 10m FM operation it usefully has selectable plus and minus repeater shifts. There's even a 1750Hz toneburst button on the supplied fist microphone for use with repeaters which need this for access. Five programmable memory channels are available in which to store your operating frequencies, and a scan facility can search through the entire tuning range in 10kHz steps, pausing whenever the receive squelch opens.

CONTROLS

THE FIST microphone also comes with up / down buttons for frequency / channel change, which operate in parallel with the front panel click-step control. A combined power on / off and rotary volume knob is mounted just above the 6-pin microphone socket, and to the right of this are concentric controls for mic gain and receive RF gain, a further concentric control being fitted for variable transmit power and receive squelch adjustments. Each of the rotary controls has an orange backlit outer ring to help you locate them in the dark.

The orange backlit front panel LCD shows the operating frequency to within 1kHz in large easily-read digits, with a further smaller digit to the right indicating the selected memory channel if you've recalled one of these. Along the bottom is a five-section bargraph giving you an S-meter reading on receive and relative output power level on transmit. Smaller icons show the operation mode, shift status, scan, audio 'low' filter selection and noise blanker status.

Six large push buttons below the display act together with a push-button facility on the clarifier control to give multi-function capability. These let you control the 100kHz, 10kHz or 1kHz frequency digit selection, noise blanker on / off, operation mode (USB / LSB / FM / AM), a low pass audio filter to cut out high-frequency noise, transmit repeater shift, last channel recall, scan, and memory save and recall functions. The repeater shift can be varied between 0 and 999kHz, I programmed this for 100kHz to suit 10m operation but other shifts (eg 600kHz) could be useful if you're using, say, a 2m transverter with the rig.

The transceiver comes supplied with an adjustable mobile mounting bracket, mic clip, a fused DC power lead and a 17-page user instruction booklet. An internal speaker is fitted to the lower case lid of the transceiver, and a 3.5mm jack socket is also fitted at the rear which lets you plug in an external speaker if you wish. That's it, a no-nonsense, easy to use, rig to get you on to 10m. So let's see how it performed on-air.

IN USE

THE OPERATION OF the transceiver was very simple, as long as I kept to the pre-set 10kHz steps and within minutes of connecting it up to my power supply and antenna I was having my first contact on 29.600MHz FM. Over the review period, 10m was certainly lively during the daytime, with plenty of European, Russian, and both North and South American stations coming in. One such station was Ray, DL2GG/YV5, in Caracas, Venezuela, romping in at exceptional strength on FM one lunchtime working G stations.

As well as direct FM operation, I was able to operate through a number of 10m FM repeaters across 29.610 to 29.690MHz. Some of these, typically North American ones, require a CTCSS tone for access, which the AE485 isn't equipped with. However, I did successfully operate through a number of repeaters in areas around the world. I must say, though, that I often preferred simplex, as the overall multipath distortion was rather less. If you've ever operated HF FM in an ionospheric fading environment you'll know that signals often become quite distorted as a result of this.

The traditional DX modes are of course, CW and SSB and, together with various data modes such as PSK31, these are the mainstay of most HF operation (the AM mode included instead of CW on the AE485 revealing its design origins as a mass-user CB rig). This mass-production does, however, make it economic enough to be placed on to the amateur market, which we can't argue with! The transceiver did, in fact, operate reasonably well on SSB, with reports on my transmit audio being well up to those of a top-flight amateur transceiver costing much more - no wide transmit splatter here!

I felt the receive bandwidth was a little on the wide side, with the occasional adjacent SSB signal sometimes 'splitching' through. But then 10m isn't usually an overcrowded band, and I never found this to be a problem in use on SSB. A slight limitation I did find was that I couldn't always accurately 'net' on to a station calling CQ, or call in at the end of an existing contact, without sometimes being up to a few hundred Hertz off-frequency

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Multimode Transceiver

due to the 1kHz minimum transmit steps. But even with this, calling invariably brought a response from the other station and I found that a quick explanation of the rig's 1kHz increments was always understood and acknowledged by the other station. They typically just continued to keep their RIT switched in for the remainder of the contact.

The 'step' button let me alter the 1kHz setting of the frequency display, but this didn't mean the transceiver tuned across the band in 1kHz steps - after 10kHz it 'rolled round' again, ie 8 kHz, 9 kHz, 0 kHz, 1 kHz etc, without incrementing the 10kHz digit when '0' kHz digit was reached. This meant that finding SSB signals over a range of, say, 100kHz or so was a bit of a two-handed affair in looking around 10 segments of 10kHz each, but I quickly got used to this.

FM was no problem whatsoever, with stations typically using 10kHz steps as operating 'channels'. Potential CW operation does suffer from this step limitation though, and naturally there's no CW key input jack.

The memory channels store the frequency but not the operating mode or repeater offset. But in use I tended to use these as handy 'scratch pad' memories when tuning around, particularly on SSB, making QSYing back an easy job. The 'last used frequency' button was also quite handy, this remembered the frequency which I'd either last transmitted on or listened to for at least a few seconds, again letting me QSY back very quickly.

The user manual doesn't give circuit or mic connection details and so I didn't test the transceiver on CW or data modes as this would need a bit of circuitry experimentation. But using a program such as *DigiPan* on PSK31 overcomes 1kHz step size and receive filter bandwidth limitations, and the transceiver would certainly be a powerful QRP tool using this mode.

LABORATORY TESTS

THESE SHOW THE receiver to be adequately sensitive as well as quite sensitive given its intended use in terms of blocking and other strong-signal rejection. The receive intermodulation rejection (where off-frequency signals combine internally to form an on-frequency interfering signal) wasn't up to that of an expensive top-flight purpose-built amateur transceiver, also the SSB receive bandwidth which was, as I found on air, a little wider than usual. But one would expect this and once again, 10m isn't usually the busiest of bands strong-signal wise.

On transmit, just over 25W maximum was produced on both FM and SSB modes, the operating frequency being accurate to within a few tens of Hertz. Transmit harmonics were nicely suppressed, something which surprised me at first, showing the internal filtering to be very effective. The transmit IMD (ie the amount of splatter you're likely to cause) again wasn't that of a rather more expensive top-flight rig, but it certainly wasn't as bad as I've seen on some transmitters!

CONCLUSIONS

THE ALBRECHT AE485S is an easy-to-use transceiver for 10m FM and SSB, it's also very lightweight and ideal for taking along with you on holiday for a spell of DX operation. The 1kHz minimum transmit steps are a slight limitation for SSB working, and no CW mode is available, but the receive clarifier allows received stations to be tuned in correctly.

The transceiver has recently been reduced in price to £169.95. Our thanks go to Martin Lynch and Sons (tel: 0208 566 1120) for the loan of the transceiver for review. If you order from ML&S before the end of January 2001 and quote '*RadCom*', you can claim free carriage. ♦

LABORATORY RESULTS

All measurements carried out on 29.000MHz in USB mode unless stated.

Blocking

Measured as increase over 12dB SINAD level of interfering signal, unmodulated carrier, causing 6dB degradation in 12dB SINAD on-channel signal.

	SSB	AM	FM
+100kHz:	85.9dB	74.2dB	87.5dB
+1MHz:	93.5dB	81.8dB	92.6dB
+10MHz:	104.4dB	98.6dB	98.1dB

S-Meter Linearity

	SSB		AM		FM	
	Sig Level	Rel Level	Sig Level	Rel Level	Sig Level	Rel Level
S1	1.40 µV pd	-38.6dB	2.18 µV pd	-36.0dB	1.68 µV pd	-28.9dB
S3	2.83 µV pd	-30.8dB	4.18 µV pd	-30.4dB	3.08 µV pd	-23.7dB
S5	7.59 µV pd	-22.2dB	10.6 µV pd	-22.2dB	6.56 µV pd	-17.1dB
S9	97.3 µV pd	-0dB ref	64.3 µV pd	0dB ref	48.5 µV pd	0dB ref
S9+30	825 µV pd	+18.7dB	1.31 µV pd	+19.7dB	738 µV pd	+23.9dB

3rd Order Intermodulation Rejection

Increase over 12dB SINAD level of two interfering signals giving identical 12dB SINAD on-channel 3rd order intermodulation product, measured at 21.4MHz.

	SSB	AM	FM
20kHz spaced signals:	54.9dB	53.8dB	55.8dB
40kHz spaced signals:	55.1dB	53.9dB	55.9dB

RECEIVER

Image Rejection

1st image:	92.5dB
2nd image:	78.7dB

Sensitivity

Input level in µV pd required to give 12dB SINAD

Freq	SSB	AM	FM
28.00	0.19	0.25	0.23
29.00	0.21	0.25	0.23
29.69	0.22	0.26	0.23

TRANSMITTER

SSB IMD Performance

Measured with a two-tone AF signal at onset of Tx ALC, results given as dB below PEP level.

	3rd Order	5th Order	7th Order	9th Order	11th Order
+ve:	-31dB	-33dB	-41dB	-39dB	-38dB
-ve:	-31dB	-41dB	-50dB	-43dB	-47dB

TX Power / Current Consumption

Connected to stabilised 13.8V DC using supplied DC lead

Max Power:	26.3W (5.6A)
Min Power:	1.85W (2.85A)

Harmonics

2nd:	-67dBc
3rd:	-75dBc
4th:	-77dBc
5th:	-72dBc
6th:	<-90dBc
7th:	<-90dBc

SSB Selectivity

-3dB:	3.58kHz
-6dB:	3.78kHz
-10dB:	4.36kHz
-20dB:	5.00kHz
-40dB:	6.05kHz
-60dB:	7.14kHz