Kenwood TM-D710E Dual Band Mobile

required data connection to enable it to be an *Echolink* node.

The TM-D710E comes as a two-part rig – it has the main radio unit measuring 140 x 44 x 142mm with protrusions and a detached front panel measuring 156 x 71 x 56mm with protrusions. The '710E front panel unit is a bit larger than that of the '700E but as you can see from the photographs of the mobile installation, the head unit fitted in my car without any trouble, **Fig. 1**.

Thumbs Up!

Initially, I was not at all convinced about the increased size of the head unit. However, it got a huge 'thumbs up' from my better half, **Diane M3HJN** and a good friend of mine (and '700E owner) **Steve Rann G1YNY**.

The TM-D710E screen is easier to see than it's predecessor and the information on it is much easier to read. This is especially true when operating in APRS mode as you can choose to have station information across the whole screen; there's now more information displayed and also the ability to send more information as well.

In the end, as always, I had to agree with Diane that the display on the TM-D710E was a hit. You can even choose whether you want an orange or a green back light!

Operation of the rig is much easier, access to the menu function and the more frequently used options are conveniently to hand. You also have the ability to programme two **PF** keys with your own menu choices for quick and easy access.

The head unit has a mini DIN connection for use with the optional extra PG-5G data cable when connecting the built-in TNC to a computer. It also has the 2.5mm jack socket connection on it and this is for connecting the rig to a compatible GPS or Weather Station.

The rig is supplied with a ready to use cable terminated in a 2.5mm stereo jack for the operator to add to your GPS or Weather Station data lead. Putting these connections on the head unit has made it a lot easier to connect the required additions to the rig for some of the

S ince Kenwood introduced the ground breaking TM-D700E Automatic Packet (Position) Reporting System-ready rig with built-in packet modem to the market some years ago, I've been waiting for other similar radios to follow. However, although we have seen some transceivers arrive with some great features, the '700E seems to have set the bar for the mobile Packet/APRS operator, until now as Kenwood have released the Kenwood TM-D710E. Yes, the wait is over and the best bit? I've been asked to take a look at it for *PW*!

An Overview

I'll look at each main feature in detail but first I think it's best to provide a bit of an overview. The purpose of this review is to look at The Kenwood TM-D710E. However as a very satisfied owner of a TM-D700E it is going to be difficult not to do just a few comparisons!

The Kenwood TM-D710E is true dual v.f.o, dual-band Amateur Radio rig covering the 144 and 430MHz bands. It also has extended receive coverage, which may be of interest for those with an interest in Air band and Marine band.

In addition to being a well-made and feature-packed dual-band rig, the TM-D710E also boasts a built-in TNC and built-in firmware for the Automatic Packet (Position) Reporting System operation, built-in firmware and the

Richard Newton G0RSN takes a look at what he considers to be a very special mobile rig. As Richard discovered – it's a mobile with a host of extras and he quickly found himself using the versatile rig at home and in his car.

more advanced data features, GPS and laptop for example. These connections were on the main body of the rig on the '700E and because the radio invariably goes under a seat or in the boot, Kenwood have made making these connections a much easier and less back-breaking exercise by putting them on the head unit.

The rig comes with two mounts for the head unit. There's a small mount for use in the car – this is the same size as the mount for the '700E, great for me as I only had to clip the '710E head on my existing set up! The other head mount is far more substantial and is supplied for when the rig is being used as a base station, **Fig. 2**.

The larger head mount comes with rubber feet and is a really good size and weight. I set the rig up at home and found the base extremely stable, no matter what I button I pressed or what control I twiddled – it stood resolutely still. Incidentally, the base has pre-drilled holes if it has to be anchored a bit more effectively.

I was able to easily fit the rig into the car and had routed the new separation cable for the head unit and re-route my GPS cable to fix into the head of the '710E. It was all done in half an hour and I was up and running! The head unit was mounted down on the centre console, with the radio under my driver's seat.

It's possible to connect two external speakers to the '710E and these can be configured along with the two different bands. but I soon found it was possible to hear sufficiently well with the rig's internal speaker, even when it was under the driver's seat.

Truly Separate VFOs

The Kenwood TM-D710E provides the user with two separate v.f.o.s, **Band A** and **Band B**. Both bands can be used independently, thus setting this rig aside from radios that are described as 'dual-band' but only one band can be used at a time. The v.f.o.s are independent, therefore both could be used for v.h.f. or both used for u.h.f. frequencies. (This is particularly useful when using the APRS system.

In practice during the review I tended to have **Band A** set to the APRS frequency of 144.8MHz – this operates totally automatically with the volume turned down. **Band B** is then set to monitor 145.5MHz.

I also have local u.h.f. repeaters saved in memories, I can happily then tune Band B to any Amateur v.h.f. or u.h.f. frequency I desire and have the **Band B** audio output turned up to let me chat away to my heart's content. The TM-D710E also offers extended receive capability on each bands.

Band A offers an extended range of 118 – 524MHz for the Air Band using amplitude modulation (a.m.), it also supports 8.33kHz channel spacing. **Band B** offers extended receive coverage from 13 to 524MHz and 800 to 1300MHz.

Formidable Mobile!

Even before considering the advanced data additions on the TM-D710E, it's still a formidable dual-band mobile rig. It offers 1000 memory channels, full DCS and CTCSS capability, 50W transmit power on both bands and many other features you would expect to see on a modern mobile rig.

Many of the features are complimented with the use of the MCP-2A operating software, this is a free download but you will need the PG-5G data cable which is an optional extra. Using this software you can configure the rig and

Fig 1: Fitted in the car, the TM-D710E's head is slightly larger than its predecessor's.

Fig. 2: Fitted at home, and showing the alternative display background colour.

Fig. 3: The '710E acts as a stand-alone Packet Radio unit.

even set a security password to prevent the rig being used by any unauthorised user.

The '710E has three power settings. **High** power is 50W, the **Mid** power level is 10W and for those concerned about their carbon footprint there is also a **Low** power setting of approximately 5W.

I liked the fact that the mid power level has been set to 10W, despite the fact this is different to the more widely used 25W setting on the TM-D700 and other similar mobile rigs. I am assuming that this is to accommodate the Novice Licence conditions, if my assumptions are correct then I say, "well done Kenwood!"

The TM-D710E has an AX25 protocol packet modem built-in, **Fig. 3**. This means that with the use of the optional extra of a data lead and a computer, the rig gives the user easy access to any packet operation without the need for a separate TNC.

The '710E is able to use its built-in packet modem in conjunction with some built-in firmware to enable it to operate as a stand alone station using the **Automatic Packet/ Position Reporting System**, otherwise known as APRS. This means that you need nothing else to get this rig on the air using APRS, **Fig. 4**.

Put simply, the APRS system uses data transmitted by packet radio via a network of repeaters called nodes on one internationally designated frequency of 144.8MHz. This can be received by stations and used to plot the positions of stations on a map. These can be either static stations or – with the addition of a Global Positioning Satellite (GPS) equipment – moving stations. The International coverage can be extended by the use of Internet Gateways.

Moving stations can be tracked on a map using software such as UI-View, the more often they 'beacon' (sending an updated position) the more often they are seen to move on the map. And when the Icon is double-clicked it's possible to see enhanced information, such as speed, distance, bearing and even altitude.

Mobile operation with APRS using the 'TM-D710E requires a GPS unit, capable of outputting NMEA data to the rig using the socket provided. The '710E is ready to receive NMEA data strings and will do everything else – it's just plug in and go!

I had wondered – as we have innovations coming thick and fast – whether we may see a Bluetooth option with connectivity to GPS? This would have been very useful but I don't know how technically feasible this is. So, for now you still have to plug in the wire.

Music And Then A QSO!

The APRS facility can also be used to send text messages to stations. In fact, as I was writing this review I had the '710E sat next to me on the desk with the APRS function turned on and all of a sudden it made a little musical noise and the display started flashing with a message I had received from **Dave G1OCN** in Portland, Dorset. Messaging on the '710E – just using the radio – is a bit fiddley and after a couple of messages Dave and I went over to voice and had a conversation via the local Bournemouth repeater.

Dave runs an APRS weather station and was interested in the '710E's ability to connect direct to a weather station without the need for software.

Although the QSO was via a repeater, Dave was very complimentary about the audio from the TM-D710E. We were then joined by another old friend of mine, **Simon G0FOZ**. Simon, despite being hard at work at home near Christchurch in Dorset agreed to move to a simplex frequency to give me a report on the audio.

Simon had this to say, "Sounds very good Richard, crisp

and fully deviated, rounded and fully readable." He also said that the audio packed quite a punch and that at sat at home on his Icom IC-7000 this did seem very punchy but it was the kind of audio that he really appreciated hearing when mobile, as it would over-ride the ambient road noise very effectively.

Note: It is possible to connect a weather station to the TM-D710E. The handbook seems to suggest that the rig will accept two types of weather station, the Davis or PeetBros for direct connection. All the information will then be transmitted and will appear on other people's maps as a **WX** icon and when it's double clicked it will reveal weather information from that station, **Fig. 5**.
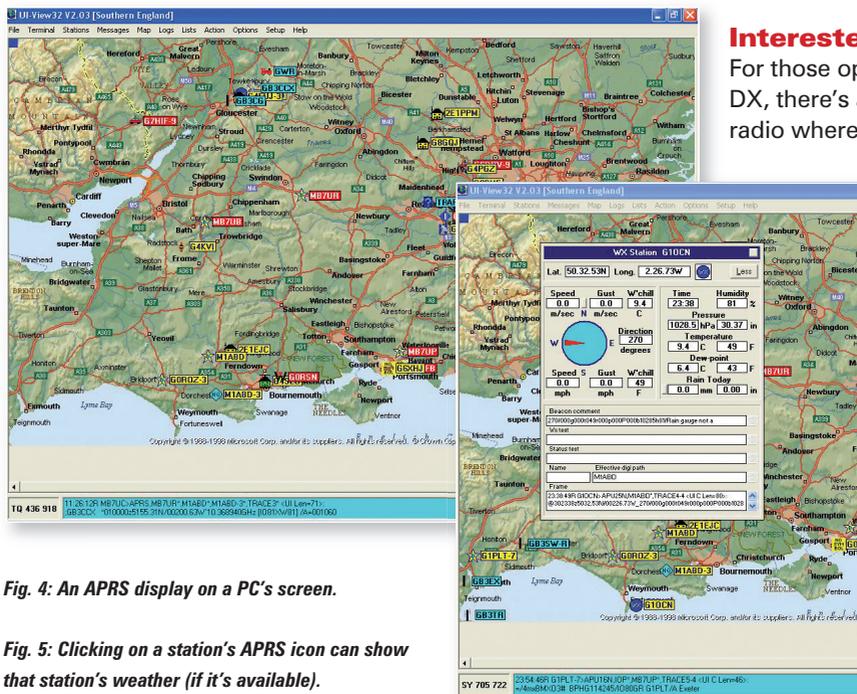

Fig. 4: An APRS display on a PC's screen.

Fig. 5: Clicking on a station's APRS icon can show that station's weather (if it's available).

Interested In DX?

For those operators interested in DX, there's a facility on packet radio where DX cluster stations broadcast up-to-the-minute information on DX spots. The Kenwood TM-D710E can be tuned to the local DX cluster frequency and will automatically receive and display the information as it is broadcast.

The rig also has a facility that (with the optional extra cable connected to a compatible h.f. rig) where you can press a soft key marked **Tune** and the '710e will tune your h.f. rig to the DX spot frequency shown on its display! I'm sure someone may find that useful!

Additionally and apart from the distinctive Kenwood audio, a built-in TNC and all the other features the 'TM-D710E also has built-in Voice over Internet Protocol operation (VoIP) and this is a system in which audio is passed over the Internet. I'm sure lots of you will be familiar with Skype, MSN and other software packages that enables users to talk to other people via a PC.

There are also software packages available for Radio Amateurs, such as *EchoLink* and *eQSO* which enable you to interface a radio to a PC and therefore give you a voice portal to the internet.

Note: The TM-D710E is advertised as having *EchoLink* memories included and is able to be an *EchoLink* node or link. However, the memories and the ability to be a link or node are two completely different functions. Also, by using the proprietary name, 'EchoLink', Kenwood may have caused a little confusion. I'll now try and explain why*!

*Note: Please see reply panel from Kenwood UK. **Editor**.*

EchoLink Program

The software programme *EchoLink* is in fact a available from **http://www.echolink.org** using Voice over Internet Protocol. It's just one of several Amateur Radio software packages

available, perhaps the most well known alternative being *eQSO* this is available from **http://www.eqso.net**

The difference between the two is that *EchoLink* is a series of point-to-point nodes, using unique number identifiers. Normally one station connects to another and it would be unusual for more than two or three to be connected together.

In practice, *eQSO* is more like a chat room where many stations connect to one central point and everyone hears what's going on and everyone hears everyone else. If the local node, link or gateway is running *eQSO* you'll call up like you were listening through a repeater, it just that the repeater has world wide coverage depending on the gateways that are connected at the time you call.

If your local VoIP node on 430.05MHz and is running *EchoLink*, you would call up on that frequency and take pot luck that it was connected to another node across the internet. If however, you knew the unique number given to the node you wanted, you could send a connect request over the air using DTMF tones. The *EchoLink* software will them connect to that remote gateway station and you will be able to communicate with anyone who can hear that gateway, disconnecting when you have finished.

The TM-D710E can store up to 10 dedicated memories representing the code numbers of your favourite remote Echolink nodes. The '710E differs from most other mobiles in that it has a VoIP interface built-in and ready to go. This is not referring to the rig being used to access a node, instead it's actually being used as a node.

Where Kenwood have described the system as *EchoLink* they could have caused confusion as it's just as able to be used as an *eQSO* gateway (the protocol is the same) and it's just the software and what it offers that's different. Incidentally, to set up a gateway or node in this country you have to have a Notice of Variation (NoV), fortunately I have one and already run a modest local link on 430.050MHz.

Simple Interface

I had been using a simple interface that I built from bits and cost me less than a 'tenner'. I had used an old crystal controlled PMR rig re-tuned to 430.050MHz and had quite good results but it took me a good while to get it all set up.

With the TM-D710E all you need is a PC, the software (either *eQSO* or *EchoLink* for example) and the PG-5H PC interface cable. All I had to do was just tune to the correct frequency, set up the rig to 'EchoLink sysop' mode and adjust the software settings on the PC – it's that simple! Finally, I think it's important to note that the two major features of this rig, APRS and the VoIP Sysop mode cannot be used together.

So how did the rig shape up? Well in my humble opinion the '710e is a worthy successor to my beloved TM-D700E. I'm truly amazed at what can be achieved in a mobile rig nowadays!

In fact, the progress achieved in modern rigs got Simon G0FOZ into reminiscing about his old FT-290 and I was thinking back to my Trio TR-2300. They were great rigs and ground-breaking at the time, I still treasure my '2300!

The hobby has always been about development and seeing my Kenwood/Trio TR-2300 and the TM-D710E side-by-side just amazes me. The Kenwood TM-D710E offers a huge amount of potential in one little box – so what will they think of next? I can't wait to find out!