



# The Kenv

● Kevin Romang G4SKN was impressed by the styling of the Kenwood TS-480SAT. The transceiver is shown here with the separate front panel (see text).

**Kevin Romang G4SKN takes the plunge as he joins PW's review team...looking at the Kenwood TS-480SAT transceiver. Reviewing it over the Christmas holidays, it seems he's reluctant to return it to Kenwood!**

**W**hen thinking of purchasing a new transceiver, most Radio Amateurs will probably take for granted that the r.f. performance will be adequate. However, before we part with our hard earned cash, specifications will be researched and digested before we take the plunge and order that highly sophisticated radio.

But when that rig arrives only time on air will really confirm our choice. However, one thing is certain, nowadays we have a good number of well-specified radios to choose from.

Maybe we will not need all the facilities on offer, but as the equipment gets more and more technologically advanced many exciting features are made available to us. As far as an h.f./50MHz all-mode 100W rig is concerned (as we will see), the Kenwood TS-480SAT has an ample supply of what's required.

## Initial Impressions

The radio arrived with a 'Version 1' manual which might not represent the final customer edition. However, if this version turns out to be anything like the final publication then future owners will not be disappointed!

I was impressed by the manual's layout and anything that needed looking up was easily found.

Kenwood manuals have had a 'thumbs up' in the past for their readability.

Having experienced some not so user-friendly radio literature in the past, I must say it was an 'instruction' manual, rather than the often used on-air term

'destruction manual'!

The review TS-480SAT came fitted with

optional extras. A VGS-1 digital voice synthesiser/recorder, an SO-3 TCXO (temperature compensated crystal oscillator), a YF-107CN 270Hz c.w. filter and the YF-107SN 1.8kHz s.s.b. filter. Also provided was software to enable remote control of the radio using a PC, together with a program for Internet control using voice over Internet protocol from another location. (Software will be available free from the Kenwood website).

## Kevin Impressed!

Initial impressions while unpacking the radio were favourable and I was impressed by the look of the Kenwood. I was especially impressed by the separate stand-alone control panel, **Fig. 1**, with its multi-curved design and pleasing control layout.

The styling of transceivers seems to be going the same way as cars nowadays. To see what I mean look at the difference between old box shaped models and the curvy new ones!

Joking apart, the Kenwood does look very good indeed. Rooting through the packaging I was amazed at the quantity of mounting hardware provided to enable the rig to be used in a mobile, portable, or fixed station situation.

As I unpacked the robust die-cast main body of the TS-480, I became aware of the two antenna flying lead connectors, **Figs. 2 & 3**, not my preferred approach. I know of one Radio Amateur who rejected a rig purely because it had this feature! Of course to be fair, Kenwood are not the only

manufacturer using this system and looking at the entry point for the feeders into the rig, there seems to be no room to chassis mount SO-239 sockets.

The transceiver was quickly set up in the shack and on power-up I was greeted by an impressive large amber display and backlit keypad. I was also treated to a few words from the digital lady lurking within the optional voice synthesiser/recorder!

## Features & Specifications

Before I describe my activities on air with the Kenwood, firstly I'll mention some of the main specifications. So, to start - what has the transceiver to offer and what are its main features?

Briefly answering, the TS-480SAT is an all-mode h.f./50MHz 100W d.s.p.-equipped transceiver with 500kHz-60MHz continuous receiver coverage. It appears to incorporate many of the features of its bigger brother - the TS-2000.

The TS-480SAT arrives with a built-in automatic antenna tuner (a.a.t.u.). The receiver is triple-conversion for narrow band f.m. (n.b.f.m.) and double-conversion in other modes. The intermediate frequencies (i.f.s) are at 73.095, 10.695MHz and 455kHz for n.b.f.m.

The rig has a separate remote control panel with an easy to read display, ideal for use in a vehicle. A comprehensive mounting kit for mobile, portable and base station set-ups is provided. In my opinion the rig would appear to be at home if used in either situation.

A separate carrying handle is provided to attach to the main body of the transceiver using its portable mounting bracket. This converts the separate items of the radio into a self-contained portable package, very neat!

The main transmitting-receiving unit is 179mm long and 278mm wide. It stands 69.5mm high and weighs in at 3.2kg.

The linking and microphone connectors are modular and ample lengths of cabling are supplied. Jack sockets are provided for paddle, straight Morse keys and for an extension speaker. Mini-DIN

# Kenwood TS-480SAT

sockets can be found for data and linear amplifier remote control. An RS-232C socket is provided for computer interfacing. Complete specifications are readily available for prospective buyers for comparison purposes.

Having installed the Kenwood in the shack, I then set about exploring some of its many features. It was time to test the rig out on air!

## Possible Angle

The radio was set up on a computer desk and I found that it was possible to angle the remote control panel upwards so that I got the best definition from the display. The controls then fell easily to hand.

The first receive test was carried out on 7MHz in the early evening. At that time I could hear a few UK stations but also some very strong European signals as well. The band was very active, with quite a high general noise level.

I could easily switch between the 480SAT and my other h.f. equipment, one is a d.s.p. equipped modern transceiver and there's an older rig, which I knew had a good receiver. All the radios were connected to my doublet antenna and external a.t.u.

The Kenwood soon proved to have a very lively receiver with smooth sounding audio on s.s.b. My own modern transceiver sounded just a little harsh in comparison.

Most radios benefit from the addition of a good extension speaker but the Kenwood's rear mounted driver in the remote control panel, Fig. 1, sounded excellent to my ears. Although I realise that of course mobile operators will probably want to use the rig with an extension speaker directly facing them.

The 7MHz band proved to be a good band on which to try out the d.s.p. filtering. In fact this was almost a necessity, as things were getting quite hectic on the band!

I soon became used to the button pressing needed to change parameters. I must also say that after a short period of time it became quite intuitive and finding my way around the Kenwood's different controls was a much faster learning curve than with some other rigs I have tried.

The menu system has a large number of functions as can be expected in a rig of this complexity. Programming though, is not too daunting and to anyone used to a software-controlled system it will pose no problems.

Two menus are provided, to switch between completely different set-ups. You can also create your own quick menu consisting of your most frequently used functions.

It was a pleasure to use the comprehensive d.s.p. and it would take up most of this review to list all the options! The high and low cut filter frequencies can easily be changed and monitored on the screen, with of course different settings available for different modes. As well as bandwidth control, rejection of noise and beat frequencies are well catered for, with several types of filtering to try.

The i.f. shift on the Kenwood worked well. However, as I've already mentioned, two optional filters were fitted in the review model, one at 1.8kHz for s.s.b. and the c.w. narrow filter at 270Hz. Incidentally, when combining the d.s.p. and i.f. filtering I found it was hard to find a difficult receive situation that couldn't be tamed, or at least greatly improved by using the above features in different modes.

One small gripe, which I personally would have liked to have seen, is a single control for r.f. gain on the front panel like the i.f. shift control. I tend to change my r.f. gain frequently on the lower h.f. bands. To do this on the TS-480SAT required a one second button press and then an adjustment via the 'multi' control knob. I soon got used to this and it didn't take long to execute, but I would have preferred a separate control.

## Swedish Report

On my first s.s.b. QSO on 7MHz I asked **Dag SM4SET** (Sweden) for a critical audio report. He said that the audio sounded very good.

At the time I was not using the speech processor. We exchanged

59+ signal reports and I was pleased that my audio sounded okay without any voice compression. I then went on to work more 7MHz stations, receiving good reports and the general opinion was that the '480SAT was sounding fine.

I then had a listen round on some other bands. I missed my own rig's Shuttle Jog facility for quickly tuning up and down, but a quick QSY is possible on the '480SAT using the 'multi' control.

It was also nice to see that VOX had been included on this model. This facility is sadly lacking on my main station rig from another manufacturer's stable. Again, this was very easy to set up on the Kenwood.

The next day I was visited by **Andy M3HLT** and I let him have a look at the review '480SAT. While operating the rig he said that he found the digital voice synthesiser/recorder a little annoying. Having got used to the sound of my 'digital lady' I missed her after turning her off!

We both agreed however, that for blind or disabled operators the speech synthesiser is a fantastic option to have. I thought that her speech pattern was a little slow, but I think it best not to change that parameter. As expected, while you can get her to speak faster, the voice pitch increases dramatically and the 'digital lady' then starts to sound like a very technical chipmunk!

The optional VGS-1 will also record 30 second voice messages, which can be transmitted

### Product

The Kenwood TS-480SAT.

### Company

Kenwood Electronics UK Ltd.

### Contact

Sales & Marketing, Communications Division,  
Tel: (01923) 655284.

### Pros and Cons

**Pros:** Superb multi-purpose design packed full of useful features. Great audio on receive and transmit, enhanced by a comprehensive and smooth sounding d.s.p.

**Cons:** Difficult to find any! But no separate r.f. gain control, and those flying leads can get in the way when moving the rig as a portable set-up.

### Price

£ 1000 to £1100 (depending on model).

### Summary

I got hooked on the radio and will miss the easy to set-up features. Sure to be a winner for Kenwood!

### Supplier

My thanks go to **Kenwood Electronics UK Ltd., Kenwood House, Dwight Road, Watford, Hertfordshire WD18 9EB** for the loan of the review transceiver.

● Fig. 1: Close-up view of the TS-480SAT separate front panel. The internal loudspeaker is mounted on the rear of this panel (see text for comments).





from three different channels. Incoming audio can also be recorded for later playback.

## Using Low Power

Andy then had a tune round on 21MHz and we found a VK6 station at S7-8 finishing a QSO with a European station. I turned the speech processor on and did the quick button press to reduce power to 10W. (Note: the minimum power you can select is 5W on c.w., s.s.b., f.s.k. and n.b.f.m. Maximum output on a.m. is 25W, and the lowest is 5W).

Andy got ready to call using **M3HLT/P**. To our surprise he was immediately picked out from the mini 'pile-up' and **VK6NTE** near Perth, gave us a 55 report. Andy asked what the audio sounded like and again the reply was "excellent audio".

It seems that the tradition of Kenwood rigs of the past (like my own first Kenwood rig, the TS-530S) having good audio on transmit and receive, is being sustained with the new breed of Kenwood transceivers.

## On The Key

The next evening I thought I would try c.w. And, as I had just bought myself an early Christmas present in the form of a new Iambic paddle key, this was duly plugged in!

Incidentally, all the options available to the c.w. operator, as in other modes, are too numerous to list in this short review. Needless to say everything worked well using the built-in electronic keyer and the semi break-in option that I had selected (full break-in is provided). The three memory channels available for storing c.w. messages are worthy of note and they're ideal for the contest operator of course.

The 270Hz optional i.f. filter for c.w. is selected as the bandwidth of the d.s.p. filter is changed. Serious c.w. operators would find this a useful addition on some of the more crowded bands including 3.5MHz.

The 3.5MHz band was not busy at the time and I soon made contact with a club station **DL0OV** from Bonn in Germany, operated by **Alex** who's own call was **DL3ALX**. Alex gave me a good report although my sending was a bit rusty. My poor Morse was due to me not being used to my keyer and not the fault of the TS-480SAT!

By the next day my sending

had improved and I had a nice QSO with **Peter VE1BHH**, in Nova Scotia. I was suffering a little QRM on his signal at times. Again the versatile d.s.p. came to the rescue and all was copied once I had narrowed the pass-band frequency after a few quick button presses.

I found the auto zero-beat function handy during this QSO which automatically netted my transmit frequency quickly onto Peter's exact CQ call frequency. (Note: the DSP filter set-ups are also available for data modes such as PSK31 and RTTY).

## Using 28MHz FM

I also had a couple of 28MHz narrow band f.m. (n.b.f.m.) contacts, the first was with local station **Ron G1LJT** not far from me in Wiltshire. Ron reported that my audio sounded a bit 'edgy' on his RS-HTX10. This was rectified by changing to narrow band transmit, although Ron commented that my audio level was a little down even on the high microphone gain setting (adjusted via the menu).

**Jon G0IUE/M** who was driving in the vicinity was also worked. Jon said that "the audio was fine" on his FT-8900 and as loud as Ron's, who was still on frequency. I then tested out the speech processor in n.b.f.m. and discovered that I could easily put on too much compression. This should be no problem if the set-up instructions are followed in the manual!

All in all I was very taken with the rig during my time on air, especially with the very flexible d.s.p., which in most configurations never sounded tiring on the ears. This sort of feature is essential nowadays on our busy broadcast and h.f. bands.

I also gave my wife **Karen M3KIR**, (not a keen h.f. operator!) a crash course on d.s.p. She was amazed at how a very difficult receive situation could be tamed by a few button pushes!

## Notable Features

More notable features include the built-in automatic a.t.u. with presets. Due to the nature of my balanced antenna system I could not try this out in depth, but I managed to load up a very mismatched vertical on several bands with no problems. The '480SAT achieved this in very quick style as well.



Fig. 2: Top view of the main transceiver unit, showing 'flying lead' antenna connectors (see text).

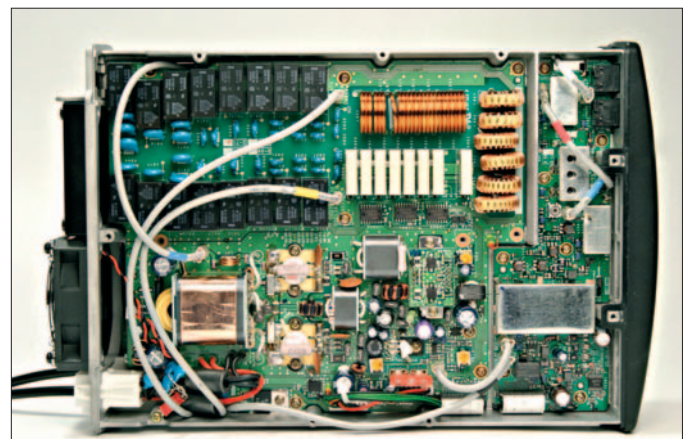


Fig. 3: Inside of the TS-480SAT, showing the cooling fan, far left (lower).

Personally, I recommended that you check with your dealer just what can be expected from the a.a.t.u. (especially if used with antennas such as the popular G5RV).

Also worth mentioning is the free software available from the Kenwood website. The ARCP-480 program duplicates the controls of the radio and will enable full control of the '480SAT from your PC and the Kenwood Network Command System. (I did not have the opportunity to try the program out but it looks very comprehensive).

Equaliser settings can also be determined via this software. Also on offer is the exciting new Internet control software ARHP-10, again a free download. This program will control the radio remotely via an Internet connection or LAN, using the Kenwood Network Command System to apply voice over Internet protocol (VoIP).

Imagine having a computer abroad and operating your rig from afar when you feel the urge by going on-line! More than average computer skills will be needed to

set up this facility, but as with all new Amateur Radio 'advances' in the past, this feature will probably become widely used in the future.

## Kevin's Christmas Present?

I had the transceiver over Christmas to review and one night I dreamt that it was a Christmas present and I could keep it forever! A nice thought and I would gladly accept - the TS-480 certainly deserves to be a big seller.

Use the transceiver in any situation and enjoy that lively receiver and smooth sounding d.s.p. The styling is second-to-none and its ease of use commendable. Lack of v.h.f. and u.h.f. might deter some, but the amount of features included in this h.f./50MHz offering will attract most I am sure.

Hoping I haven't developed a fetish for voice synthesisers I reluctantly say "Goodbye my Digital Lady". But maybe I'll hear you again some day.