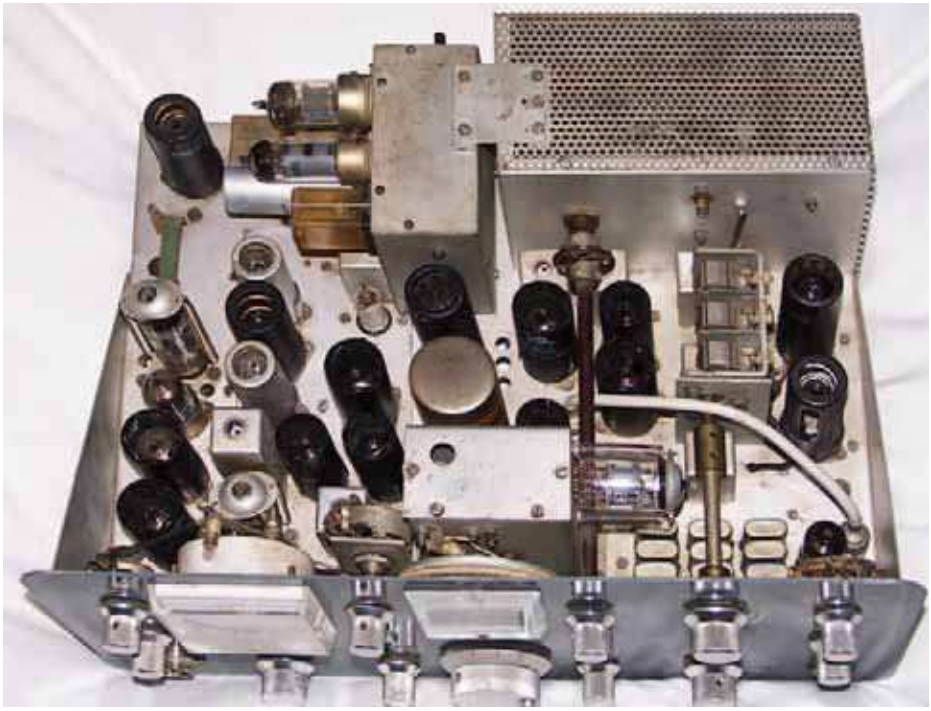
A Classic Rig – The KW2000 series



Inside the KW2000. Photo courtesy G3PIJ.

HISTORY. KW Electronics was started in the 1950s by Rowley Shears BEM, G8KW and Ken Ellis, G5KW. For some time, they sold trap dipoles, Geloso equipment and other smaller items but, in 1957, they announced the KW Vanguard, initially as a kit. This was a 50 watt AM/CW transmitter using a Geloso VFO, a 6146 PA stage and push pull 6L6s in the modulator. Initially located in Wilmington in Kent, they moved to Heath Street, Dartford in the summer of 1959 – a location that was to serve for 16 years as the head office, despatch, sales and development offices.

KW announced the UK's first commercial SSB transmitter, the KW Viscount, at the November 1958 RSGB Radio Communications Exhibition. But this proved to be a false start, with the design using the phasing method. The move to the filter method came with the employment in the summer of 1959 of Fred Hill, G3EVV – Fred had previously gained experience of SSB using homebrew equipment on 2m. Fred designed the Viceroy SSB transmitter using a filter with B7G mounted crystals at 435kHz: the design went through a number of iterations. For some years, separate receivers and transmitters were common, although the Collins KWM2 SSB transceiver was shown at the RSGB Exhibition in the autumn of 1959.

It was at the RSGB Radio Communications Exhibition in London at the end of October 1963 that the KW 2000 was announced – the first relatively low cost SSB transceiver in the UK. The design was in some ways inspired by the KWM2, with 200kHz wide bands: one big difference was that the KW2000 covered 160m. The cabinet design had a great similarity to the Collins, but the turned, polished, aluminium knobs were very much a KW innovation.

KW INNOVATION. A number of what were unusual construction techniques were used: coils were wound directly on the dust iron cores, connected in series and tap selected to get the required inductance for each band. The selectivity was achieved by the use of a Kokusai mechanical filter at 455kHz and, originally, the carrier crystals were B7G glass mounted types – later models moved to the metal HC-6/U type as a cost reduction measure. Of course, nobody at that stage ever envisaged – or worried about – the fact that after some 30 or 40 years, the foam in the filters supporting the resonators would dry out and the filters thus cease to work!

The PA stage was a single 6146 and the output power around 40 or 50 watts. The KW2000 proved an immediate success, both commercially and in its acceptance by the amateur community. Enquiries for commercial versions rapidly led to the development of the KW2000C, a 4-channel crystal controlled transceiver, while a demand for higher power was satisfied by adding a second 6146 to give somewhere around 100 watts output depending on band. Thus the KW2000A version appeared, with a dark blue-grey coloured front panel (the colour scheme varied somewhat: early models had a very light, almost cream front panel) as well as the highly successful KW2000CA.

One function that was included from the word go was the inclusion of IRT – Incremental Receiver Tuning. This could be selected to be receiver tuning, transmitter tuning or both. Provision for connecting a Q multiplier for CW was provided and even a DC power supply for operation from 12 volts – power supplies were always separate. However, the draw on transmit was in the order of 25 amps. The popularity of the rig was such that, at times, there were queues at Dartford on a Saturday morning to collect them and pay cash!

EVOLUTION. Production requirements led to the renting of premises in Crayford for the production of the whole range of KW equipments, leaving room at Dartford for the expansion of the development facilities. The transceivers evolved – the KW2000B, which was a somewhat modernised version, and the KW2000E, which moved to having coverage in 500kHz bands. There was a version with digital readout, the KW2000D, of which only two were ever produced. This design suffered from being designed just at the wrong time: the cost of programmable up/down counters in TTL (the only viable logic family at that time) was such that it was cheaper to mix the VFO with a 3.2MHz crystal to drive the counter chain. By the time it was ready for production, the price of TTL had fallen to the point where it was cheaper to use the programmable up/down counters! Also, by this stage, Japanese competition at lower prices was beginning to bite.

The style became known as the G line – an obvious 'take' from the Collins S line – and included in the series were the KW600 linear amplifier (one 572B, 600 watts input) and the KW1000, running 1kW input to a pair of 572B valves, both in matching cabinets. There were the 'C' variants of these as well, which proved rather more popular in some quarters than the Collins 30L1 with which they were somewhat equivalent, mainly because it was only necessary to change a channel switch.

Additionally, the loudspeaker and power supply was in a matching cabinet, and two models of antenna coupler/dummy load/SWR/power meter (KW107 for lower powers, KW109 for use with the KW1000 linear) in the same size cabinet. Another not so popular piece in the line was the KW108 monitor 'scope, which was all solid state except for the CRT.

Top - KW77 receiver, bottom - KW2000D, one of only two ever made. From the RSGB museum collection. Photo: G1MFG.

The final variant was a completely different beast – the KW2000CAT. This was a 4 channel crystal controlled transceiver, with a pair of 6146Bs in the PA, driven by a 12BY7A. The rest of the circuitry was solid state, with fairly extensive use of the Plessey SL600 series. The PA circuit also used toroidal inductors: the IF was 1.4MHz, using 8 pole crystal filters. For operation above 15MHz, there was an option of adding a crystal filter at signal frequency on receive to obtain better image rejection. This transceiver entered production after KW Electronics had been taken over by the Decca Navigator Company. Initially called KW-Decca, it soon became Decca Communications: eventually being absorbed by Racal after Decca ran into financial difficulties.

STILL IN USE. The KW2000 series was very successful. It introduced the SSB transceiver to the British amateur at a relatively low cost – and at a time when the US competition was relatively expensive. The commercial variants were very profitable, but by the mid 1970s, the performance of the amateur band models was not really competitive with products from companies such as Drake and Swan in the US. One failing of all KW equipment was that it was never designed with CW operation as anything other than an afterthought. However, examples of the series can still be found on the air, with new filters substituted for the old failed Kokusai filters and there is an active KW_Radios Yahoo group on the web. A number of members of the Vintage and Military Amateur Radio Society (VMARS) also run these fine old transceivers on the air. While not having the performance of modern rigs, they are, at least while valve stocks last, maintainable!

Rowland Shears BEM, G8KW 1919 – 2009

Rowland George Shears BEM, was born in North London on 4 Sept 1919. In his teenage years he developed a keen interest in radio communications, building his own receivers and transmitters. He was issued the call sign G8KW in 1936 at the age of 17. Volunteering for the Army in 1939 he joined the Royal Signals as a Signalman. He was posted to Egypt and stationed just outside Cairo where he was tasked with setting up transmitting stations. But as a radio enthusiast he spent the nights tuning around the wavelengths on his own receiver. It was whilst doing this that he picked up unusual transmissions in German that eventually turned out to from Panzer tanks on the Russian front thousands of miles away. This remarkable breakthrough got him noticed by the army hierarchy and he was promptly transferred to Special Intelligence. He was involved in a number of important counter-intelligence operations in Egypt and Crete.

After four years overseas, Rowley returned to England briefly before being sent to Germany as part of the Allied Government, the Control Commission for Germany. His main responsibilities were to set up communications links and to re-establish the public broadcasting network throughout the country. His first task was to rebuild the broadcasting station at Cologne that had been destroyed by retreating troops. Becoming fluent in German, one of his own initiatives was to seek permission from the authorities on behalf of the German amateur radio enthusiasts for them to be re-issued with transmitting licences. This was forthcoming and he helped set up the German Amateur Radio Club, DARC, of which his German friends made him honorary member Number 1! Whilst in Germany he rose to the rank of Major at the age of 27, making him the youngest Major in the Signals.

In the early '50s he set up KW Electronics as a small concern designing and producing radio equipment such as the KW Vanguard and other such well known names. As the demand grew he moved to larger premises in Dartford, Kent, manufacturing both amateur and professional communications equipment. Radio enthusiasts from all over the world were entertained there, ranging from customers wanting to collect their own 'KW' kit to Nigerian chiefs, Saudi Princes and King Hussein of Jordan, who was also a keen operator. The company always had a very strong and loyal 'KW' following and, after several changes along the way, ended with a smaller operation in Chatham from where Rowley retired at the age of 70.

Obviously, radios were an important part of Rowley's life, not only in business, but also as his lifelong hobby. As a result, he had friends across the world and met many of them on his travels – both on business and holidays! He held licences in many countries and was a prominent member of the RSGB, joining in 1934. In 1990 he attended a ceremony in New York to be inaugurated as a Fellow of the Radio Club of America for services to the radio communications industry. He made many contributions to enhancing radio and antenna design, and to signal propagation, writing papers on the subject.

Rowley passed away peacefully on 17 November 2009 at the age of 90.