A Russian Military Aircraft Radio

*Colin MacKinnon VK2DYM * gives an interesting insight to old military aircraft radios.*

Older readers and collectors of military history will know of the English TR-5043 VHF aircraft transceiver, which was adapted by the US military as the SCR-522, and was used extensively by the allies in the latter stages of WW2 and up to the 1950s, in Spitfires, Mustangs and other aircraft of that vintage. After the war many amateurs modified the sets for two metres and it provided a cheap entry to that band. See Photo No 1, a top view of a 522 with the lid removed.

The TR-5043/SCR-522 was a 4 channel crystal controlled, amplitude modulated transmitter and receiver, covering the 100-156 MHz range and operated remotely via a 4 button switch. The power output was less than 10 watts (from 320 watts input!). The transmitter and receiver were separate units which fitted side-by-side into a metal case, whilst the channel change and tuning actuator mechanism fitted into the case on top of them. The channel change mechanism was electromechanical with a uni-selector relay which selected the required crystal and moved four metal slides to retune the receiver input and transmitter output circuits. The transmitter has four tuned circuits whilst the receiver has two. Before each mission the correct crystals were fitted and the set was

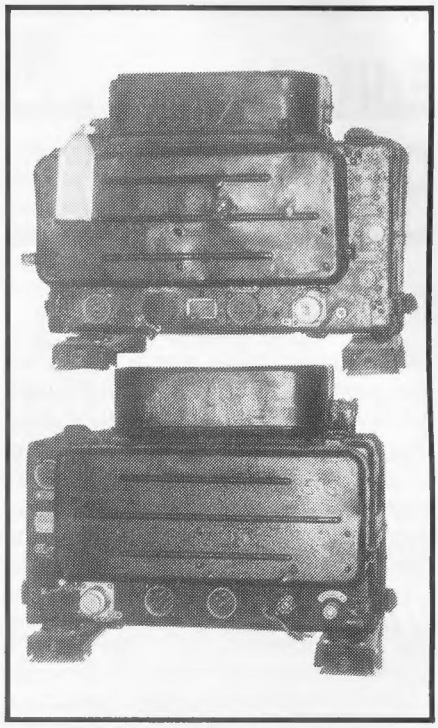

Photo 2: Front view of Russian radio. Transmitter "A" at top, Receiver "B" below.

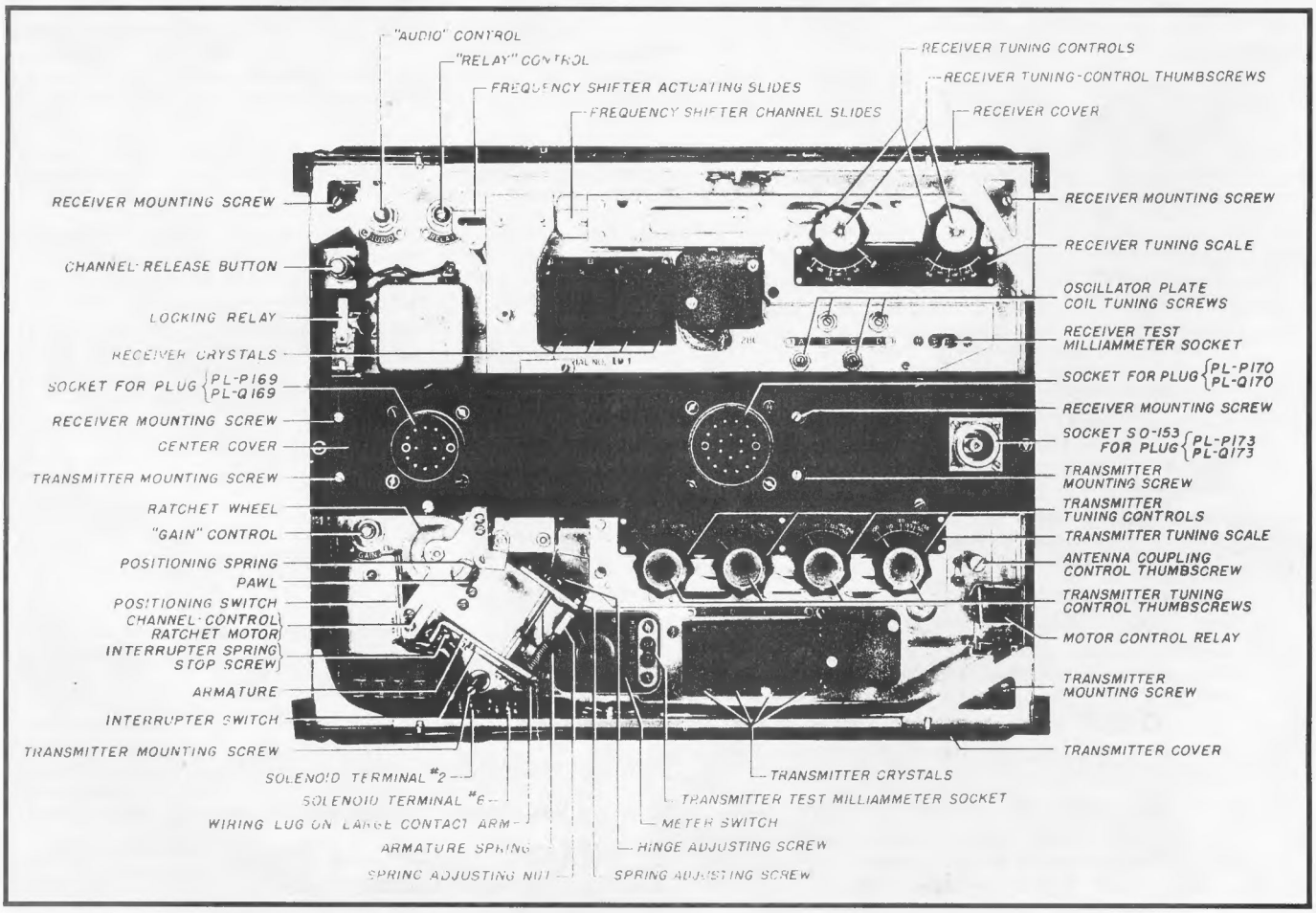

Photo 1: Top View of SCR-522 with lid removed.

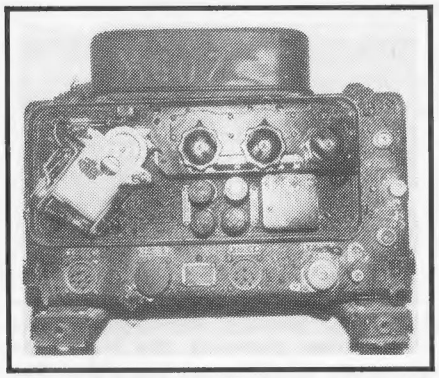

Photo 3: Front view of Transmitter with cover removed.

pre-tuned for each channel. The separate power supply was a very heavy (19 kg genemotor in a metal case with filters etc. Most sets had a 28 volt input, although 14 volt versions were made.

Recently a Russian version of the SCR-522 was obtained from a Polish made MiG-15 fighter aircraft and it is interesting to compare the two. Electrically the set is very similar to the 522 but with Russian valves and electrical components. However, the channel change mechanism and many other components are obviously American made! The explanation for this is that during the war, the US supplied the Russians with large quantities of equipment

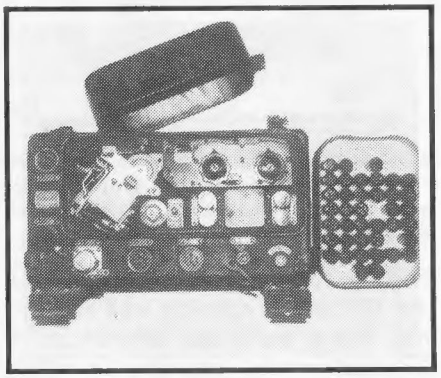

Photo 4: Front view of Receiver showing box of crystals at right.

and materials and that must have included the components of the SCR-522, which they have built into a modified version of the US set.

The Russian radio consists of three separate boxes, a transmitter unit "A" and a receiver unit "B" as shown in Photo No 2, plus a vibrator type power supply unit "C". Whereas the SCR-522 was only fitted with four sets of crystals as needed, the Russian set

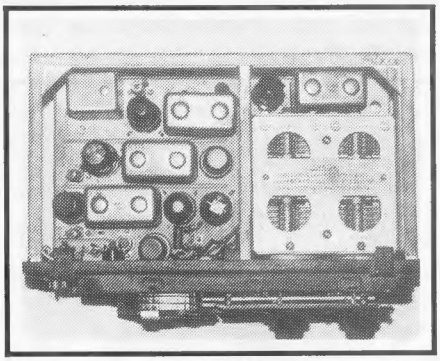

Photo 5: Top view inside Receiver. The tuning units at the right are of US manufacture.

has a metal box with a hinged lid attached to the top of each unit, containing a full complement of crystals. The crystals are fitted inside cylindrical holders marked "A" for the transmitter and "B" for receiver with the channel number marked. The electrical connectors are different to the US type and all nameplates are in Polish. The mounting brackets

underneath the Russian set are also not to US and British standard. The construction is quite good, but the cases are of lighter construction than the 522 and exhibit a few dents from mishandling.

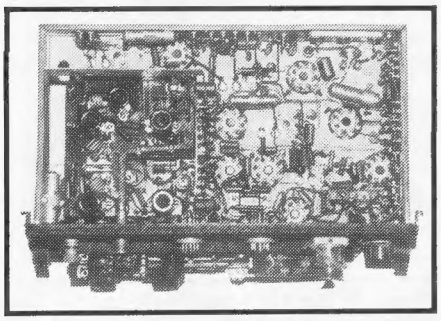

Photo 6: Underneath view of Receiver. The neat wiring is similar to US methods. Components have English markings.

Photo No 3 shows the Transmitter with the front cover removed so that the channel change and tuning mechanism can be compared with the 522. This transmitter only has three tuning adjustments whereas the 522 has four. Just below the three tuning dials you can see the four cylindrical crystals. The receiver in Photo No 4 has its own channel changer/tuning slide, again a 522 component, and it has the same volume and relay controls as the American radio. The box of crystals for it is shown on the right. The internal photos, No 5 and 6 (receiver) and 7 and 8 (transmitter), show the neat construction of both, with valves ("lampy" in Polish), component designations and values all in English. There are obvious differences in part location and component dimensions but the similarities are such that radio technicians who worked on the 522 set would feel right at home with this gear.

The Russian set appears to have a similar output power to the 522, but the power supply is a marked contrast to the heavy US set, in that it is a vibrator type unit, weighing only around 10 kg. I haven't included a photo because it is just a small black box.

The MiG-15 and its later, faster development, the MiG-17, carried this VHF radio as well as a low frequency Direction Finding radio which is based on the Bendix MN-26 radio

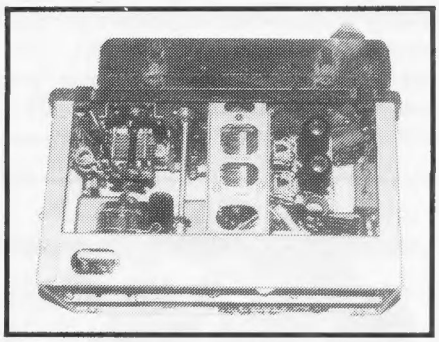

Photo 7: Top view inside Transmitter, with the 832 equivalent final output visible at lower left.

made in the US commencing in the late 1930s and running well into the 40s. There are a few differences in construction technique and the Polish wording indicates its origin but it is otherwise almost an exact copy of the MN-26. Whereas the VHF radio does not comply with current air communications standards and has been replaced, the MN-26 radio performs better than modern solid state models so has been retained in the aircraft.

Another interesting comparison is the engine of the MiG-15 which is a copy of the Rolls Royce Nene jet engine. The English Government sold 25 Nenes to the Russians in 1946 and the design was promptly copied (illegally) and improved. When working on the MiG engine the English Rolls Royce manuals proved very adequate for the purpose!

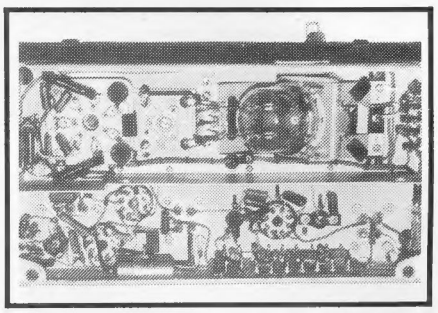

Photo 8: Bottom view inside the Transmitter showing the 832 type harmonic amplifier at top right. The socket for the final output valve is on the top left.

The MiG-15 first flew in 1947 and several thousand were made in various variants with many still in service. The Polish made aircraft were mostly two seat trainer MiG-15 UTI models, called the LIM-3 in Poland. It has a wing span and length of 10 metres, and a top speed of 1000 km/hr, with armament of a single 23 mm cannon. The MiG-15 gave the United Nations forces in Korea a rude shock as it was superior to the allied aircraft including the F-86 Sabre jet, but fortunately the Chinese pilots were poorly trained and inexperienced.

Today I can sell you an airworthy MiG-15 for only $500,000, so please form a queue!

* *52 Mills Road, Glenhaven NSW 2156*

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WIA News

Appreciation for WICEN

The acting Chief Commissioner from Victoria Police, Robert Falconer, has written to WICEN (Victoria) Inc, expressing appreciation for their work during the floods last year in Northern Victoria.

The acting Chief Commissioner said, *"I write to express both the Police Force's and my personal gratitude for the excellent work done by WICEN members..."*

He went on to say, *"...WICEN members provided valuable assistance in the data transfer of registration information.*

"The effort by WICEN volunteers, and the fact that they are volunteers who provide their own time and resources, is to be highly commended as in such circumstances it would have been extremely difficult to complete the registration of evacuees by any other method.

"...be assured that WICEN will continue to have a vital role in emergency response communications within Victoria."

WICEN (Victoria) can take a well-deserved pat on the back.