

## **History & Renovation Of The 6PK Soviet Field Radio**

### **Renovated and Written By Ben OH6PA**

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### **Origins Of The 6PK**

The Soviet 6PK field radio was developed at the beginning of the 1930's.

It is claimed that the initial intention of the Soviet Union during this time was to place one of these radio's in local communities, so that the authorities/militia were able to communicate with neighbouring villages using voice telephony (AM) and Morse Code (CW).

There were two slightly different models produced in the period 1930-1939.

During WWII, when the Soviets mobilised their army, these radios were introduced to the front line as a vital form of communication and must have been produced in their thousands.

Arvo ES1CW told me that in Estonia they have a nickname for the 6PK radio "Miliceradio".

This would indicate they these were used for security purposes as well.

### **Technical Specification**

The frequency coverage of the 6PK on transmit is 3500-5900 KHz and 3070-5830 KHz on receive.

Frequency ranges are likely to be specific to an individual radio or group of radio's as the tuned circuits do not have trimmers to adjust.

This was the case with many Soviet radios where they were allowed to work on the specific frequency of 3515 KHz which allowed them to run on full power.

The normal transmission range of the 6PK was about 20 Km with receive range up to 30 Km radius subject to obstacles.

The power supply produced an anode voltage between 80 and 160v with a heater voltage of 4v.

The radio is equipped with four tubes in the transmission section and four on receive , the last of which is a low frequency amplifier for headphones.

The receiver ( figure 1) is a straight tuned radio frequency TRF and is equipped with an inductive feedback circuit which significantly improves sensitivity. The receiver was also designed with separate low frequency amplifier speakers.

The transmitter (figure2) consists of a VFO, a high frequency amplifier , modulator and was crystal controlled or also an option was a VFO. The transmit output power is between 0.5 and 1watt.

An antenna changeover connector system allowed the use of just one antenna for transmit and receive.

The antenna used for normal operation consisted of a 15m long wire with a 15m counterpoise which had some affect on the radiation pattern depending on how it was deployed.

The radio was equipped with two sets of headphones and a carbon low impedance microphone.

Many radios were captured from the Red Army and were used in the Winter War battles and also the early part of the Continuation War with the Finnish Army reportedly using them for artillery spotting and communications.

## **History**

The question is how did they get to the west coast of Finland when primarily used in the east of the country ?

I just know that at the end of the Winter and Continuation Wars Finland's Defence Forces had an electrical storage depot at Kokkola where all the 6PK's were collected and stored.

After the war and into the early 1950's William Knuts OH6NX applied to the regional authorities for permission that this stored equipment could be sold to the radio movement.

My 6pk rear view (figure 4 ) was previously owned by Bertel Qvist which was found when demolishing a house in Vassa Finland.

About 15 years ago Bertel called and told me to come to the village of Sundom. After coffee and much discussion he told me he had found out that I am the only one who could take correct care of the old Soviet radio and donated it to me as I would appreciate and look after the unit.

## **Other Owners Of The 6PK.**

In January 2013 I started to review the 6PK looking at the possibilities of making the radio QRV again. I had managed to get good information and advice from others including Antero OH1KW and Jimmy SM2BYW.

Jimmy BYW also owns a 6PK and I received a CD from him via Antero with lots of information, drawings and data which were very useful. The only problem was it was all in Russian so needed translation.!

With more research it was clear that other hams also have 6PK's in good working order.

Jimmy who is located in Skelleftea had managed to get his 6PK radio into a working condition and as we made a qso all seemed to be working OK. Jimmy who was very young in 1952 bought his own 6PK ( see figure 5) from William Knuts in Nykarleby.

Also located in Nykarleby OH6OB owned a 6PK but he had given it to his son who unfortunately couldn't get it working and damaged it. OH6IU told me that the OH6AN Club also has a wonderful 6PK radio in full working order.

Jimmy SM2BYW also advised that Kare SM5DSB was another owner of a 6PK and it was in perfect condition however the way it actually arrived in Sweden is a story on its own.

In 1943 someone brought a sample of the 6PK to the AGA Radio Factory and had asked the company to try and make a copy of it to be used by the Swedish Army. The AGA factory could not fulfil the task and it was somehow left with them in their storage. How it actually arrived in Sweden is unknown but would surely be an interesting story as well. In 1996 the AGA factory was closed and someone gave the old 6PK radio to Kare SM5DSB.

My 6PK has the original plywood box whilst Jimmy's and OH6AN's radios are without a box.

### **The Renovation.**

Had Bertel Qvist or anyone else tried to connect the wires it would have been unlikely that anything would be gained as there were no drawings/schematics at the time and there was no activity from the radio.

It was important for the restoration that I had to gain further info and schematics and once this was achieved a system of numbering all of the components according to the drawing and photographs started the process..

The receiver's high frequency secondary protective aluminium box had been torn open with pliers so it had to be repaired and restored to new condition. Then I had to make a network power supply with two anode voltages. I found a transformer of 220/2 x 55v which gave approx 2 x 60v AC.

The output voltage from the rectifiers gave 78 and 157v respectively. For the filament I had to wind on more turns to achieve the correct voltage. The result was an output of 7v and after the rectification I added filter condensers and a 7805 1 amp stabilizer. Following the stabiliser I connected a string of another two 1N4007 diodes in series. Using this method I achieved 3.8v for the tube filament.

Now came the time to try ! and YES ! the transmitter tuned up immediately on the frequency 3527 KHz exactly on the crystal frequency. Also the VFO came alive and the 6PK transmitter chirped into life on CW right on frequency. Chirp was a characteristic sound for the 6PK and well known. It was easy to say " that's a 6PK"..

The receiver however had more problems and only scratched and beeped not producing any signals. I searched the attic for a 1920 vintage PHILIPS ANODEGERAT device that was from my father's radio service component store. Finally with correct anode voltage from my home made power supply and with the receiver and transmitter connected together the 6PK came to life and I knew that the radio was now in good condition and able to be used on the air.

Connected to my 80m dipole I made a few QSO's with the 6PK while at the same time monitoring the signal on my FT847. All seemed ok and I continued operation.

During one Easter time OH6IU called and said he had found his 6PK which he used as a novice first transmitter. Unfortunately it was only half or part of the original transmitter and not operational..

The 6PK can in fact be split to maintain and service if you need to. 10 screws to open the case and 6 wires to remove enables access into the radio.

While studying the 6PK owned by the Club OH6AN I discovered that the Receive VFO frequency tuning had a planetary gear, which gave really fine adjustment. This wasn't present in mine or Jimmy's 6PK's.

## Operation

The 6PK's were all working fine during 2014 and were able to be displayed for the 70th anniversary of the Stella Polaris operation which took place in Narpes during 1944.

Our group continued its operations in celebration from the main train station and local school .

The big question is "How many more 6PK's are out there in Finland". Sadly the Petäjäveden Radio Museum in the town doesn't have a full working unit in their collection. If any 6PK's are found out there please try to recover and revive !

Currently the following users have working units on the air so far:- OH6PA one + a half, OH6AN, OH6FA, SM2BYW and SM5DSB will have his unit on the air soon.

In January an historical event was made where three 6PK's were used working in a net. This hasn't been seen since the 1950's.

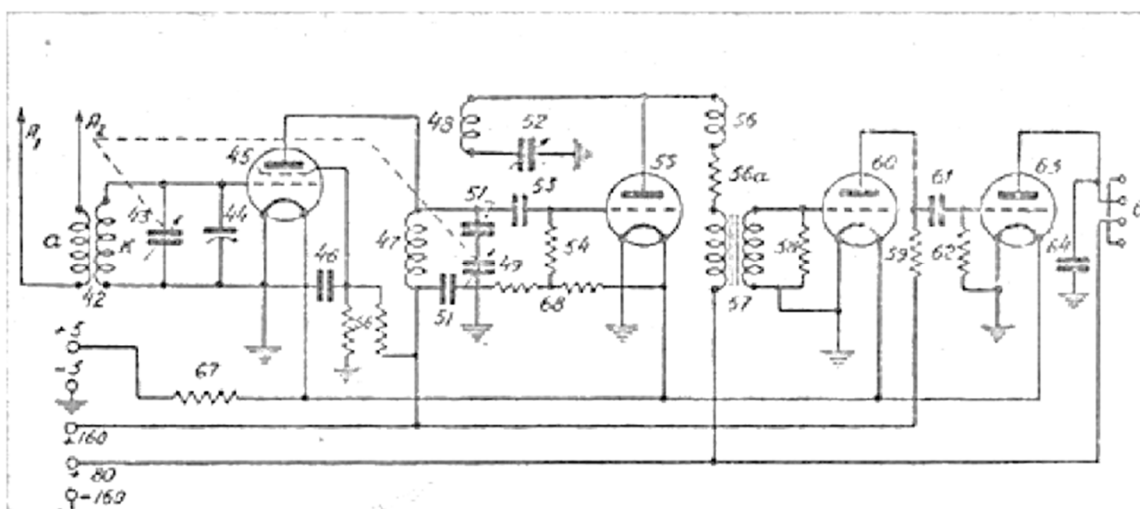
Up to date in 2017 I have identified that there were 15 owners of the 6pk back in 1950.

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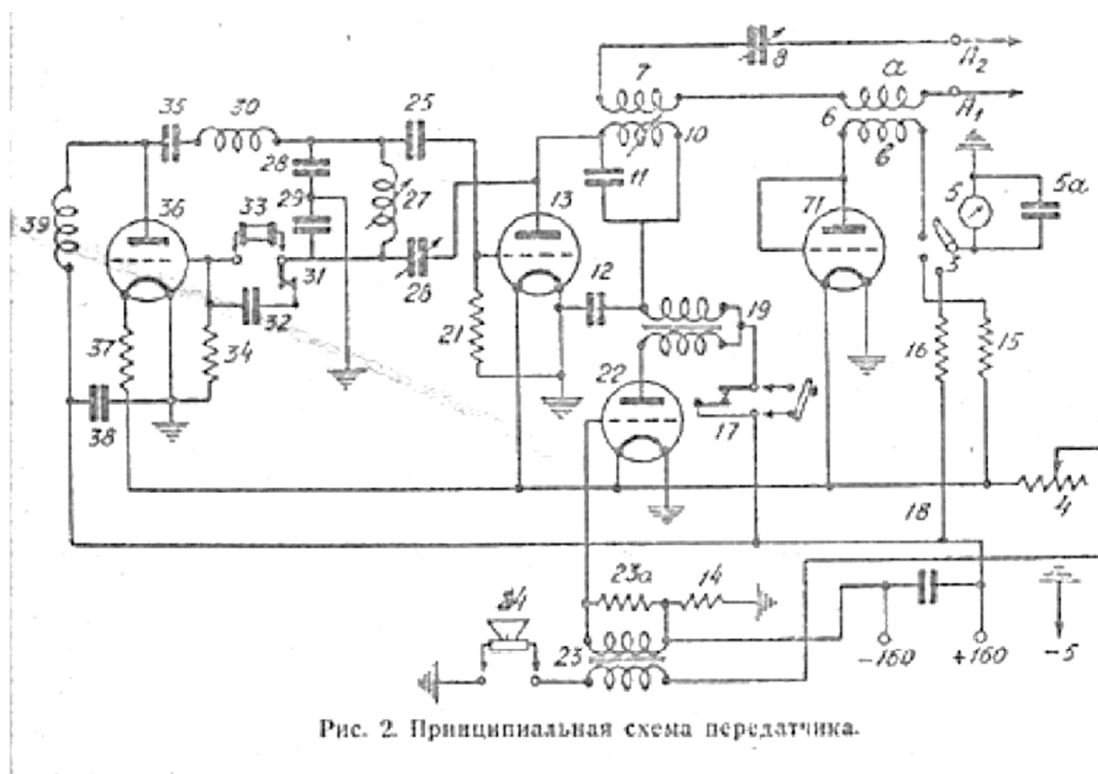
Ben OH6PA

Narpes

**Figure 1 6PK Receiver Circuit Diagram**



**Figure 2 6PK Transmitter Circuit Diagram**



**Figure 3 6PK In The Field**



**Figure 4 Rear View 6PK from OH6PA**



**Figure 5 Front View 6PK from SM2BYW**

