Keys for QRP- expeditions

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G-QRP-C # 6363

The two articles were published at SPRAT, the journal of the G- QRP – C # 114 and # 115 accordingly. However, I think, the keys will be interesting for all amateurs.

Telegraph key for a QRP-expedition

It is a problem what a key to use in a QRP-expedition, hand or electronic. An electronic key does not provide a good operation at a QRP-expedition for the following reason. At first, it need in an external feeding for it, at second, as rule an electronic key made on the CMOS (Complementary Metal Oxide Semiconductor) chips is undergo of dampness. From dampness it would leave out of operation in the most improper moment. A standard telegraph key, usual for routine radio amateur activity, is complicated in application in field conditions because the key should be reliably fixed to any fixed base. The matter is not always possible in a field QRP-expedition. Often expedition key is keeping in one hand (or even on a knee) and by other hand working on it. Certainly, it is very inconveniently for job in the ether and rate of transmission is very low in that case. My special self-made a hand telegraph key has no the defects. **Fig. 1** shows drawing for the key.

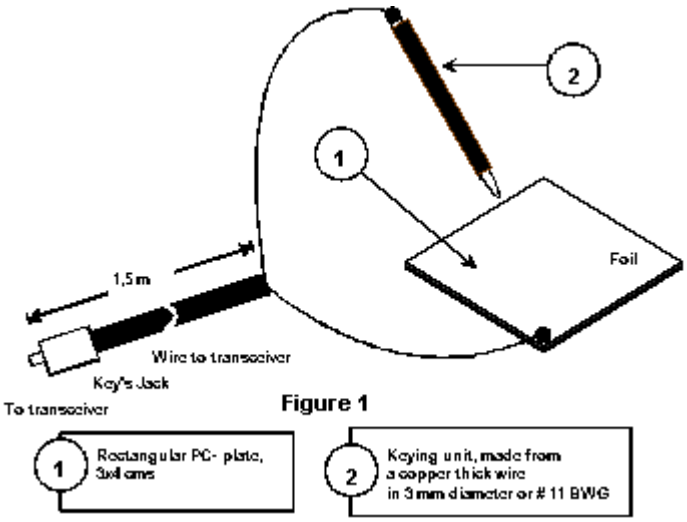

Figure 1

It consists of from a rectangular part of PC- board (item 1), which is connected to “ground” of a transceiver and a keying unit (item 2), made from a copper thick wire in 3 mm diameter or #11 BWG, or # 9 AWG.

At operating in the ether the rectangular part places in a hand, on a knee or on any fixed basis. The other arm does keying. Ever it is possible to paste this slice of PC – board with help of an adhesive tape to a transceiver case or to floor of a tent. This key was used at operation from any possible most inconvenient positions. For example, laying in a tent, and even laying in a sleeping bag. Certainly, the keying rate is not so high, up to 60 symbols per one minute. But it is quite sufficient for operation from a QRP expedition, where the high speed do not use usually.

Electronic keying for an electronic key

When I used an electronic telegraph key made on CMOS chips during my QRP- expedition, I found out that the key is very sensitive to dampness. Even when I covered a PC- board of the key by paraffin (it is possible easily to delete paraffin with the help of hot water and after that with petrol, if a repair is necessary), the failures in activity of the key continued.

Also I found out that small drops of water influenced on key operation, i.e. the drops covered contacts of the key’s manipulator and go to false operation.

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The reed relays were placed on the PC- board of the automatic electronic key, near keying “dot” – “dash” chip. I used old reed relays, taken from burned old relay of a telephone station. **Fig. 1** shows the scheme of the unit. The PC- board of the automatic electronic key with the reed relays was covered with paraffin. Manipulator of the key was placed outside the key’s body. The reed relays had a self-made windings. Each winding contained several thousands turns, coiled by copper wire 0.1 mm in diameter or #36 BWG.

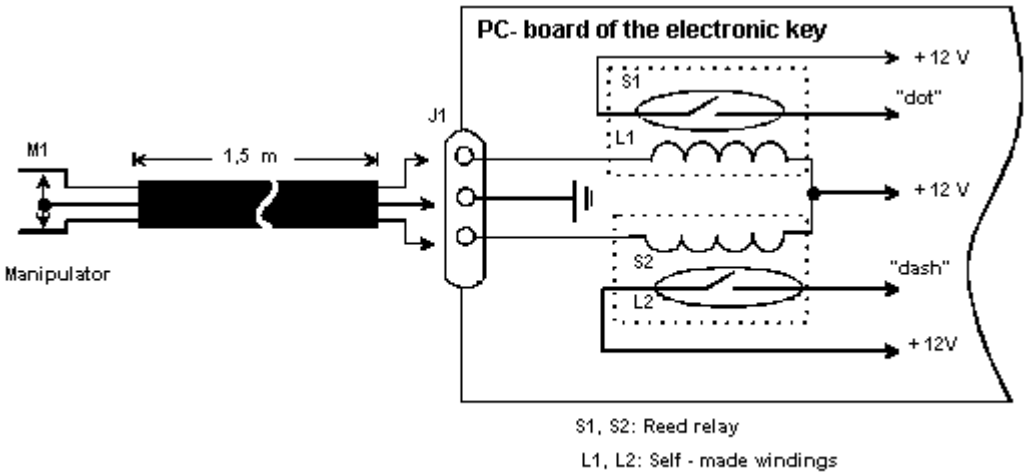

Figure 1

Winding of reed relay consumed current near 3- 4 mA at 12 volts of key power voltage. Such small current did not load much key battery.

The electronic telegraph key, consisted of such electronic keying unit and PC- board covered with paraffin, reliably works even while raining. Also the key was serviceable in the morning when both key PC-board and manipulator were covered with dew.

QRP beyond belief

by Igor Grigorov / RK3ZK

G-QRP-C # 6363

The article was published at SPRAT, the journal of the G- QRP – C # 114. However, I think, the keys will be interesting for all amateurs.

Work on QRP is wonderful when with only several watts of power to do a DX QSO. But the surprise is especially great if a radio amateur does not know that he works on QRP... later he looks into his log and does not belief it! About such improbable work on QRP I want to tell.

It took place on the 10th of December 2001, during the QRP expedition on Ai - Petri plateau. This expedition was held in honor of the centenary of Marconi's First Transoceanic radio contact. The UR-QRP Club arranged the expedition. The call EN100GM was used. We used an old military Russian made radio R - 143. It provided 8 watts RF- power at 1.8 to 18 MHz. An ATU (Antenna Tuning Unit) (see reference [1]) was used with the military transceiver. **Fig. 1** shows the scheme for the ATU.

By mistake, one of the operators connected our transmitting antenna to jack J4 instead of jack J2. In other words, our antenna was connected to R4, the dummy load, installed inside the ATU. The dummy helped to do right matching a transmitter with the ATU.

So, during several hours we worked in the Air with the

Photo: December 10, 2002

antenna, connected to R4, not to the transceiver. It is beyond belief, but we made 21 QSOs! One QSO was made on a range of 40-m, three QSOs were made on a range of 17-m and the others 17 QSOs were made on a range of 20-m. Only casually the mistaken connection was detected when we could not make QSOs on a range of 80-m... **Tab. 1** shows the page from EN100GM log with the QRPP QSOs..

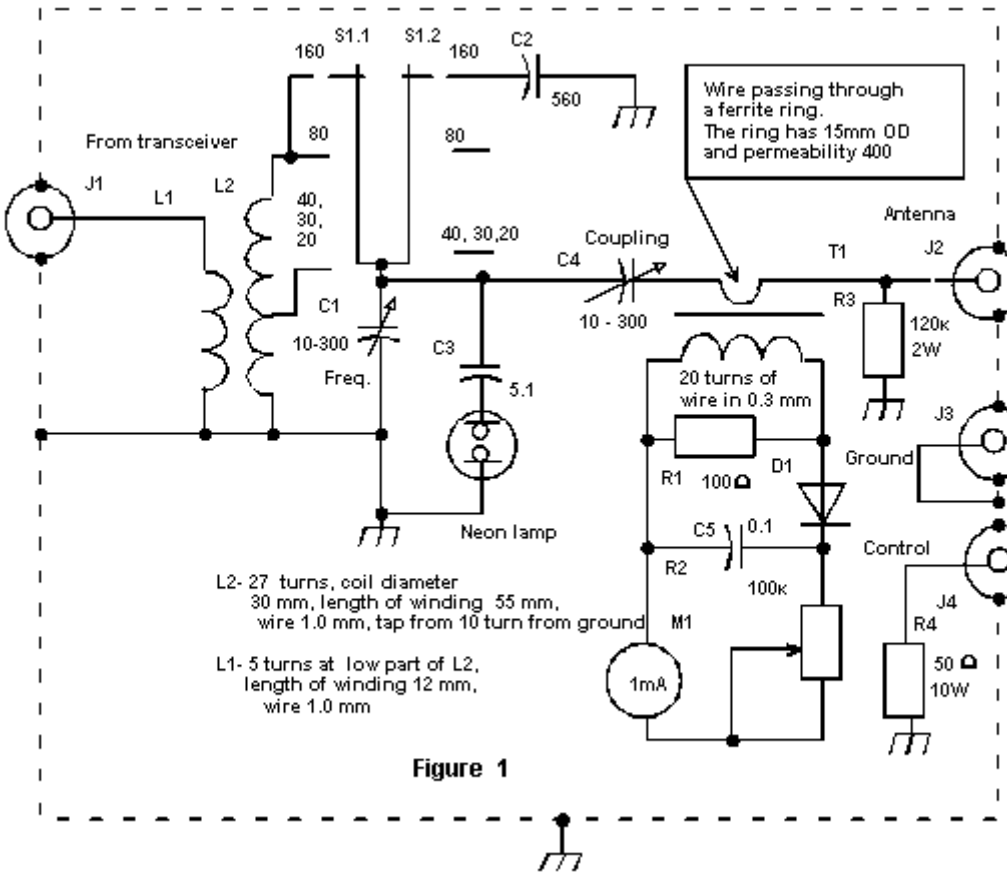

Figure 1

Certainly, when tank L2C1 (see **Fig.1**) is tuned in resonance with the input frequency, a high RF voltage is on the tank, and a little part of the RF energy from the tank L2C1 is induced on the dummy load R4. Hence, a small RF voltage is presence on R4, and a very little power goes in the antenna. Off course, a little RF energy also is induced on current transformer

T1 (see **Fig. 1**). So, the RF- transformer shows a RF current.

When we stayed on receiving, I think a little part of RF energy from R4 was induced to L2C1, and from L2C1 goes to input of P-143. This military radio station could provide quite a good reception even at very poor radio signals.

After our expedition, when I have arrived home, I have measured the level of the RF power what could be induced on the dummy load, R4.

When I run 10 watts in to the unloaded ATU, I obtained, that it was 0.5 – 0.8-V RF across the dummy load. Hence 5 -15 milliwatts were dissipated by the dummy load. When an antenna was connected to the dummy load the induced RF power shares with the antenna.

Table 1

# QSO	Call	Time, GMT	Band, MHz	RS
1	RK4LXD	14.20	14	59\59
2	UA1UPC	14.21	14	59\59
3	RV9MM/9	14.25	14	59\59
4	UA3BT	14.30	14	59\59
5	RA3DCU	14.31	14	59\58
6	RK4CXK	14.32	14	59\59
7	RW9AS	14.33	14	58\59
8	UA0AX	14.38	14	58\58
9	UA1NCX	14.39	14	59\57
10	UA9FLD	14.45	14	58\59
11	RW4UU	14.49	14	59\59
12	UA4SX	14.56	14	59\55
13	RX3AX	15.00	14	59\59
14	RX3FZ	15.04	14	58\59
15	RK4YWK	15.07	14	58\58
16	RV3DNT	15.12	14	58\58
17	4Z5AF	15.41	14	58\58
18	UR4QI/M	15.53	7	59\56
19	IK4WKU	16.15	18	59\54
20	ON4LAN	16.33	18	59\53
21	PA3DUV/M	16.36	18	59\59

Ooops, we worked while several hours with several milliwatts in our antenna! Four hams, UU4JCQ, US1REO, USIRCH, RK3ZK, observed the wonderful work.

Reference

1. Grigorov I.N.: Antennas: Adjustment and Tuning. Moscow, RadioSoft, 2002, ISBN: 5- 93037-087-7 (in Russian)