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RS-6

Spy radio set

The RS-6 was a spy radio set, developed in 1951 in the USA by the US Central Intelligence Agency (CIA) and built by Motorola, especially for overseas agent communication. The design is clearly based on the earlier - bulky - RS-1. The RS-6 is in fact much smaller and weights far less than its predecessor, mainly due to the use of subminiature valves and lighter metal enclosures.

A complete RS-6 set consists of 4 units as shown in the picture on the right. On the left is the power supply unit (RP-6) that is suitable for a range of mains voltages. At the centre is the receiver (RR-6) that has a rather big dial with 2 frequency ranges. The unit at the right is the transmitter (RT-6) which has a rather clever retractable morse key at the front right.

The unit that lies in front of the other three, is the power Filter Accessory Unit (RA-6) half of which is used as a storage compartment for the various cables that originate from this unit.

The crystal-driven transmitter (RT-6) covers 3-16MHz, divided over 2 ranges (3-7MHz and 7-16.5MHz) with a maximum power output of 10W. It has a built-in keying relay that can be used up to 40wpm (words per minute) when operating the internal key or an externally connected key. When used with an automated keyer, the cathodes of the valves would be driven directly, allowing speeds up to 60wpm.

The power supply unit (PSU, RP-6) is suitable for a wide range of mains (AC) voltages (70, 95, 120, 150, 190, 230 and 270V) so that the RS-6 could be used practically anywhere in the world. The PSU is based around a 6X4 valve instead of the selenium rectifiers that were used in the RS-1, probably to save space.

It also contains a built-in vibrator, allowing the PSU to be used as a power inverter when operating from batteries or a hand-crank generator (GN-58).

A

Production

Production of the RS-6 started in 1951 and they were manufactured until 1953 when a slighty improved version with an extended frequency range (RS-6A) was introduced. Production of the RS-6A went on until 1954. It is estimated that in-all approximately 10,000 RS-6 units were built.

The CIA also developed a single-case version of the RS-6, called the RS-511, which is basically just a single front panel with the four RS-6 units behind it. This unit is described in Keith Milton's book *Ultimate Spy* [2] .

The RS-6 in use

The RS-6 radio set can be used in a variety of ways. The different configurations are described in a small set of plastic cards and on a sheet affixed to the inside of the top lid of the *power adapter*. By using the four major components in different combinations, it can be used for any of the following setups:

1. AC mains powered radio set
2. Battery powered radio set
3. Mains battery charger
4. Hand generator powered radio set

The image on the right show a typical setup of the four units. In this case, it's a AC mains powered radio set. The mains (AC) *power supply* is at the top left. To the right of it (at the centre) is the *power adapter*. At the right is the *transmitter*, shown here witha crystal on top. The unit at the front is the *receiver*. The plastic cards with the circuit diagram are on the left.

The *power adapter* RA-6 acts as a junction box, as it connects all units together. Each of the other three units connect to the *power adapter* by means of a multi-pin circular plug. The antenna and ground wires are connected to the *transmitter* only. The antenna wire is just visible at the top right of the image above. A so-called *inter-unit cord* is used to loop the antenna to the *receiver* (the red/green wire at the centre). This cable is also used for the side tone. A small earpiece is connected to the side of the *receiver*.

RS-6 used by Dutch Stay-Behind

Initially the RS-6 was build exclusively for use by the CIA, but at some point the *Strategic Air Command* (SAC) started ordering large quantities for use aboard some of their aircraft for certain types of missions. The RS-6 was also used for clandestine operations and Stay-Behind.

Recent discoveries have shown that the RS-6 was also used by the secret services of some friendly nations, such as The Netherlands.

The RS-6 was ordered by the Dutch Intelligence Agency (Binnenlandse Veiligheidsdienst, BVD, now AIVD) for the Dutch O&I stay-behind organisation (sometimes referred to as Gladio).

As the circular connectors were rather difficult to obtain in The Netherlands, the units were modified with 9-way sub-D type connectors that were commonly available in Europe at the time.

Furthermore, the mechanical vibrator-based inverter was replaced at some point by an electronic circuit, which made it far more reliable. The new electronic inverter was build inside the empty compartment of the Filter Accessory Unit (RA-6).

B

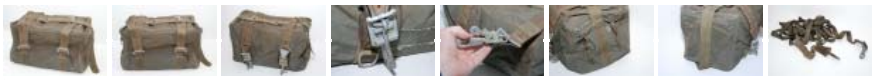
Parts

Bag Pockets TX RX PSU Filter Extras Circuit

Canvas carrying bag

The complete RS-6 radio set was sometimes stored in this military-issue canvas carrying bag, such as the one shown here. The bag is large enough to hold all units, cables, the GN-58 generator, etc.

Various straps are attached to the bag, allowing it to be closed firmly. An additional 9 meter long strap with hooks at both ends allows the bag to be lowered in a building, shaft, bunker, etc.



C

Water tight packaging

The four units of the RS-6 were often packed inside a set of canvas/plastic bags to protect them agains water and dirt. Special packaging instructions were supplied in the instruction booklet.

Each bag is actually a long 'sleeve' that tightly fits the unit. The surplus end of the sleeve is folded like a harmonica and a strap is used to keep the lot in place. The images below show the correct way of packing a unit.

D

Transmitter RT-6

The transmitter covers a frequency span of 3-16 MHz, in two ranges, and is crystal operated. The maximum power output is 10 Watt.

The built-in morse key can be used for speeds up to 40 wpm (words per minute). When using an automated keyer or a burst encoder, speeds up to 60 wpm are possible. In the latter case, the cathodes of the valves are driven directly.

E

Receiver RR-6

The receiver convers approx. the same frequency ranges as the transmitter. It has a beautifully shaped die-cast aluminium body with an integrated frequency adjustment scale.

The big dial is used for coarse adjustement, whilst a smaller thumbwheel (at the top right) allows fine tuning.

F

Power Supply RP-6

The RP-6 power supply unit allows the RS-6 to be used with a variety of mains voltages, from 70 to 270 Volt AC. As the unit contains a power inverter (vibrator) it also allows operation from a standard 6 Volt DC car battery.

Furthermore, the RP-6 can be used to charge the battery from any mains voltage. The connections for all three modes of operation are at the right of the unit in the shape of two 8-pin sockets. The text just above the sockets tells us that instructions on how tu use these connectors, can be found inside the lid of the RA-6 filter unit.

G

Filter Accessory Unit RA-6

The RA-6 filter accessory unit basically acts as a junction box, connecting the remaining three units together. At the same time it filters the power lines for unwanted HF energy and excessive power surges.

Only about half of the unit is occupied by the electronic circuit, whilst the remaining half serves as a storage unit for the power cables. Originally, the mains and battery cables are fixed inside the cable compartment, but as the cables have become less flexible over time, they have been removed in most cases.

H

Accessories

The RS-6 came with a set of small accessories, packed inside a tiny water-tight canvas pocket. The following items were supplied:

- Inter-connection cord
- One or more crystals
- Earpiece
- Two battery clamps
- Hank antenna (100 ft wire)
- Two antenna insulators

- Canvas pocket to store the items

I

Circuit diagrams

The RS-6 was supplied with a set of plastic cards containing the full circuit diagrams and instructions on how to setup the radio for use. The cards were bound together with a metal ring in one of the corners.

The cards were usually stored in the top lid of the RA-6 Filter Accessory Unit, behind a metal spring.

J

References

1. Louis Meulstee, *Wireless for the Warrior, volume 4*
   ISBN 0952063-36-0, September 2004

2. H. Keith Melton, *Ultimate spy.*
   ISBN: 0-7513-4791-4, 1996-2002

3. Instruction Book for Radio Station RS-6
   See download below

Further information

- Good description of the RS-6 on Peter McCollum's site
- Great description of the RS-6 by TIM (N6CC)
- RS-6 Operator's Manual (off-site download, by Bill NJ7P)
- RS-1, the predecessor of the RS-6
- Information about Gladio
- Other USA spy sets
- Other spy sets used for Gladio
- Main spy set page