

A longwave converter for the Sony ICF-SW1000 portable radio

This circuit extends the SW1000's frequency range to below 150 kHz, but it can be used for other receivers as well. It connects directly to a rod antenna and is therefore mainly intended for being used in the open; noise from the main lines, from TV sets, computers etc. is usually too strong inside the house to hear anything but hum and the strongest stations.

The circuit shown in Figure 1 converts signals in the range 0 - 150 kHz to 14000 - 14150 kHz. T1 acts as an impedance converter for the antenna. The signal is then passed to the mixer U1 through a low pass filter. The mixer operates on a symmetrical load in order to reduce the 14 MHz oscillator signal at the converter output. The SW1000 sets the external antenna terminal to approximately +2.5 V DC when operated in AM mode; this voltage is sensed with T2, and T3 connects the 9 V battery to the converter circuit. I have no information if this principle will also work with other Sony portables.

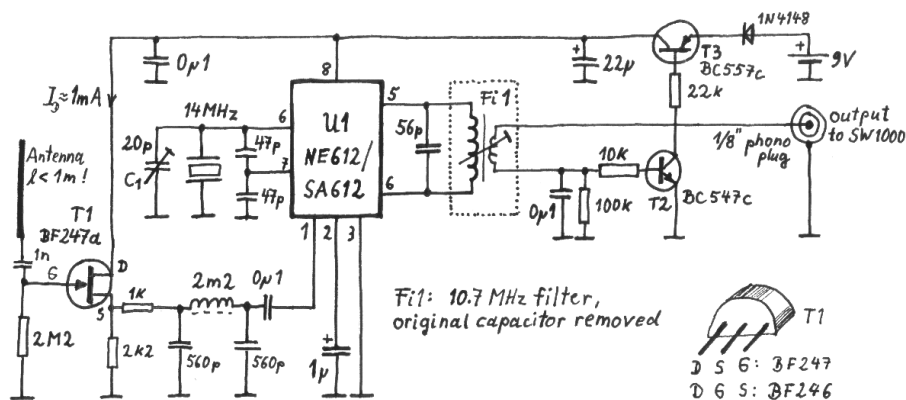


Figure 1. Circuit diagram

Unfortunately the SW1000's bandwidth (in SSB mode) is quite large for radio services on LF and VLF, and the filter shape factor is poor. Nevertheless, at my location in Central Europe, I can hear the Russian RDSN-20 ("Alpha") navigation signals on 11.9, 12.6 and 14.9 kHz from Krasnodar, and sometimes also those from Novosibirsk. An antenna length of 30 cm is usually sufficient. The lower the frequency, the more snoring sounds from the radio's computer and display circuits can occur. This noise can be reduced by connecting the circuit ground to some kind of "earth". Even a capacitive "counterweight", simply created by holding the converter in hand, improves the reception. Anyway not much effort was made to optimise the circuit, so some experiments can be worthwhile.

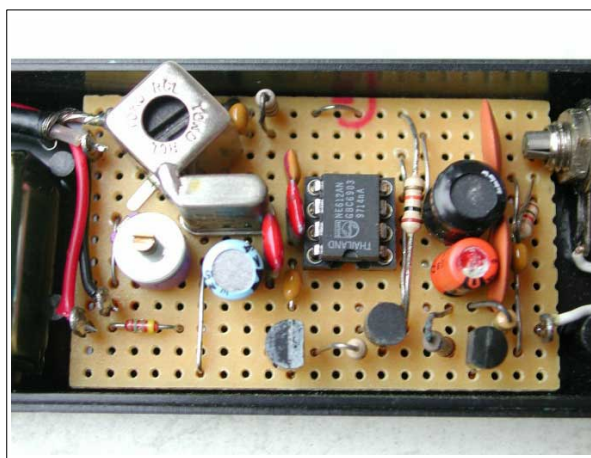


Figure 2. The circuit built on perforated board, and a setup with the SW1000.