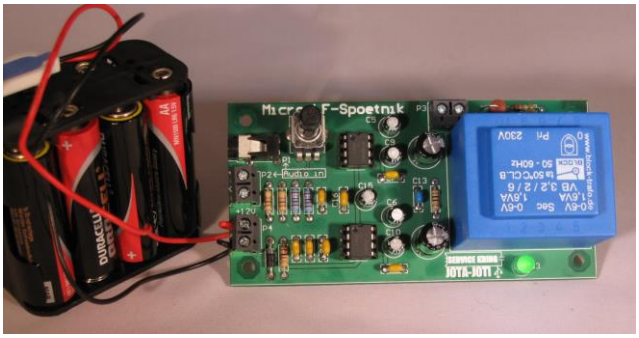
The construction of the micro-LF Sputnik is best build by the older members (Explorers / Rover Scouts) and reviewed by a technical assistance..



The Micro-sputnik-LF is designed to generate a signal which can be detected with the signal finder from a few meters distance.
The Micro-LF Sputnik amplifies the signal on its input state (eg from an MP3 player) to a strong electric field. By a long wire attached to the output of the Sputnik and a wire to connect the "earth", the signal is broadcasted. Powering the Sputnik is done with eight AA batteries, so there are no restrictions were the Sputnik is used..

The construction of the Sputnik is the same principle as the construction of regular self-build packages. It starts with the parts that are the lowest from the board. Then the higher components. In this building description, a preferred construction sequence is given.

All parts are mounted on the side of the PCB with the white text printing. First start with the two IC sockets. Note the notch which is located on one side. Make sure that all pins of the socket go through the holes. Then bend two diagonally opposite pins so the IC socket does not drop from the board when you are ready to solder.

After the IC sockets are soldered, the resistors can be mounted. Bend the two wires of the resistors at right angles. Then insert it through the holes on the PCB. Bend the wires then a 45 º angle. Again to prevent the resistance from dropping from the board, when you flip the board for soldering.

The best all resistors are mounted, except for R7.
R1, R2: 470 Ohm (yellow, purple, brown, gold)
R3, R4: 13kOhm (brown, orange, orange, gold)
R5: 10 Ohm (brown, black, black, gold)
R6: 270kOhm (red, purple, yellow, gold)
R7: 33kOhm / 3Watt (orange, orange, orange, gold) To be installed!
R8: 2kOhm (red, black, red, gold)

Then the diode, D1, a 1N4007, is mounted. Bend the wires and insert it through the board.

Note When mounting the diode has a "ring". This is attached to the housing of the diode and is also indicated on the PCB. Make sure that these correspond, otherwise the Sputnik will not work!

Then the 3.5 mm stereo jack is mounted. Make sure the jacket levels to the edge of the PCB, otherwise it will be difficult later to place the jack plug correctly.

After mounting the jack you can start mounting the capacitors. Notice the marking of polarity. The ceramic capacitors have a code to indicate capacity. The electrolytic capacitors, Elko's for short, have a "+" pole and a "-" pole. This is indicated on the board. On the capacitor is the "-" pole marked with a colored / gray band.

C1, C2: 1NF (marking 102)
C3, C4: 100nF (marking 104)
C5, C6: 10uF (Elko, note polarity!)
C7, C8: 100nF (marking 104)
C9, C10: 10uF (Elko, note polarity!)
C11, C12: 470uF (Elko)
C13: 47nF (marking 473)
C14: 100pF (101 mark)
C15: 10uF (Elko)
C16: 100nF (marking 104)

The board now looks like this (except C11 and C12):

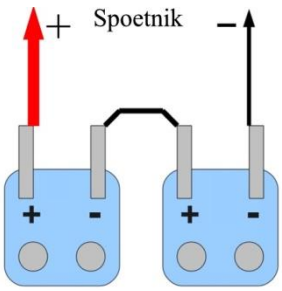
Now it's time for the larger / higher parts. You can now assemble the volume potentiometer (POT1) and R7. R7 is mounted upright. Bend this wire all the way around, past the body's resistance. Now you can mount the resister straight up . Insert the straight wire through the hole in the circle. The other wire comes into the adjacent hole.

After assembly of the resistance and the potentiometer, the LEDs are mounted. Note the flat side of the LED (note the marking on the PCB). It is located on the side of the short leg.

If all "small" components are mounted, transformer T1 can be installed. Make sure that the legs of the transformer is not skewed, otherwise the transformer is not fitting correctly.

In principle, the board is now fully constructed, there is still a possibility to connect the wires to perform professionally printed with terminal blocks. These offer the possibility of screwing the wires on the PCB instead of soldering. Because the soldering is likewise OK, and for cost sake the terminal Blocks are left out the package. However, the board does offer the possibility to assemble. If you want you can obtained the terminal strips (2 pole, with a pitch of 5 mm) from an electronics store for example, or Conrad.

At P4 you can plug in the power supply. This is done using a 9V battery clip. The common thread is the "+" pole, the black "-" pole. The common thread is in the hole with the phrase "12 V", the black wire into the other hole of P4. Then fit the battery clip on the included AA battery holder.



In some cases 2 x 4 Battery holders are supplied with the kit. If so, please connect them in serial connected like the picture .

Connectors P1 and P2 allow a source to be connected. P1 is intended for an MP3 player. For this purpose you can us an audio cable with both sides a 3.5 mm audio jack.

P2 can be used to connect a signal source with loose wires. Example, a print from a musical greeting card. The wires of the speaker are then connected to P2.

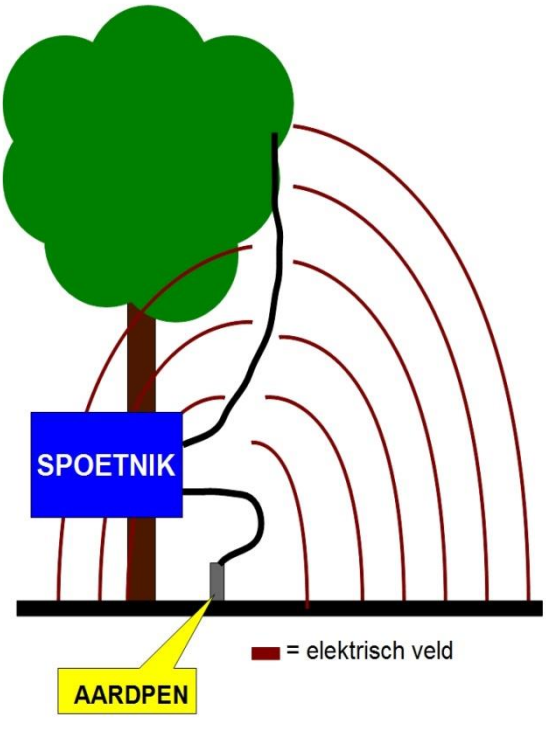
P3 is the "antenna" connected to the Micro-LF Sputnik. The antenna consists of two well-insulated wires, one for the ground connection and one for the actual antenna (the emitter). Connect the emitter to the terminal that is closest to P7.

Using the Sputnik, the ground connection need to be connected to eg a metal water pipe, metal (!) Heating pipe or a pen in the earth (Pegg). If this is not possible, you can use a long wire lay down on the ground (floor).

The other wire, the emitor, is a wire that is hanging as free as possible and as high as possible. The largest distance is achieved when the signal seeker has a clear view on the radiator from the Sputnik. Conductive objects near the radiator can absorb the generated electric field and thereby limit the scope of the transmitter. Conductive objects, for example, metal fences, reinforcement in walls, trees and shrubs.

This effect can also use: the Sputnik hangs on one side (say) from a metal gate, the signal on one side of the fence can be heard but not on the other side.

As a variation, the emitor is also a horizontal wire. With a little luck you can use a wire of a fence (note that this fence is NOT a charged electric wire!). The signal is then heard down the length of the wire.



The principle which is used for the Sputnik is to generate a strong, harmless, electric field. An electric field between two points is always a difference in electrical potential. (So also between the "+" pole and "-" pole of the battery is an electric field!) Sputnik build a strong alternating electric field, strong enough to detect using the signal finder. This is a high potential difference generated between the emitter and the ground connection. The current, that can be provided is limited to a safe value. As

long as the wires are well insulated, there is no risk of electric shock. If isolation would be broken (in contact) you may get a shock, a decidedly unpleasant feeling. So make sure that the insulation of the wires is in order!

As mentioned, there are two poles required for a electrical filed. Whith Sputnik is a pool formed by the earth (via the ground wire), the other pole is formed by the emitor. The figure below shows the electric field lines. Once the signal finder can pick up that electric field the signal is heard.

The Sputnik is connected to the supplied battery (for 8 AA Battery / AA battery). Depending on the capacity of the battery, the Sputnik will work on one a set of batteries for two to three days of continuous use. (Average current consumption is approximately 40 mA). **TIP: You can calculate the number of hours by the number "mAh" divided by 40.**

When using the Sputnik it can best be placed in a plastic box. You can use a nylon fresh container or freezer container. Or another plastic box like a icecream box (see photo).