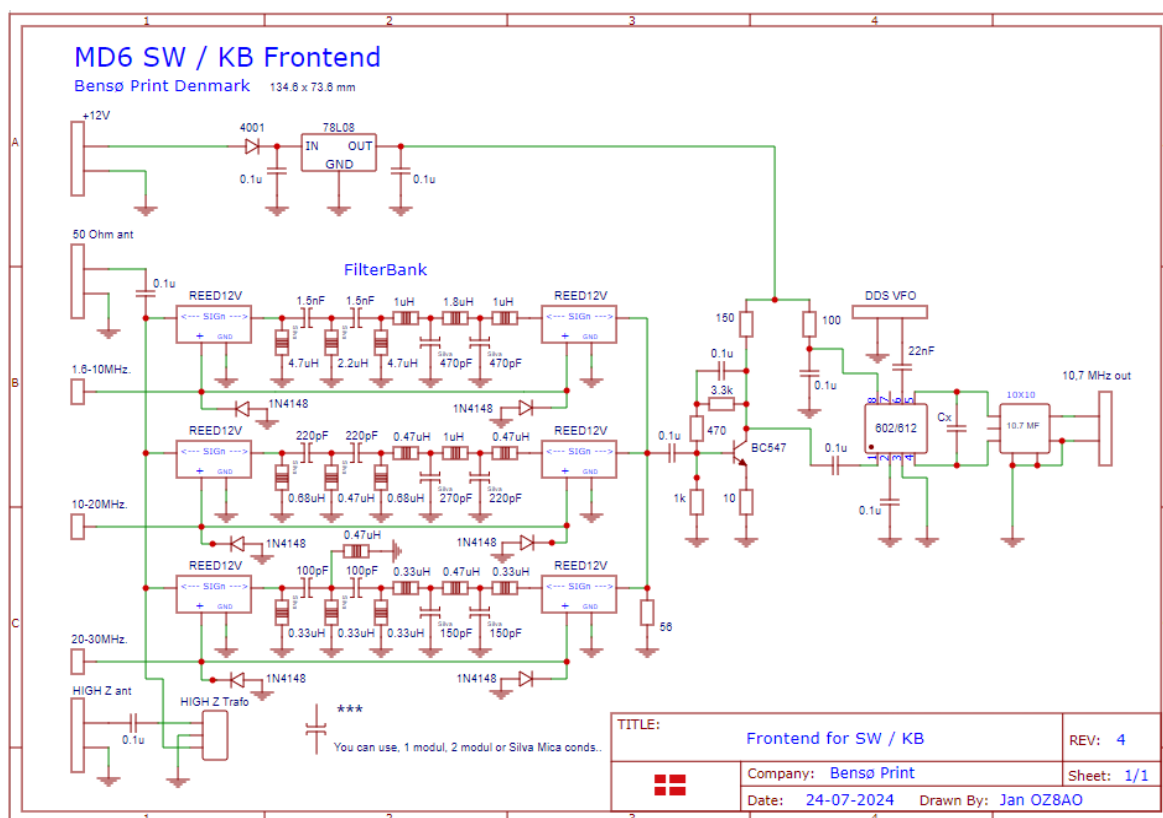




**If you have 'Rev: 3' of the board? Then (33 Ohm at BC547), must be replaced with 10 Ohm.
Provides improved sensitivity.**

Description:

BSP MD6 SW-KB is a so-called 'front-end module'. Its task, like our other front-end modules, is to retrieve and 'mix' the frequency range you want to listen to, to the intermediate frequency of 10.7 MHz. Therefore the module is the 'first step' in a 'double super receiver'.

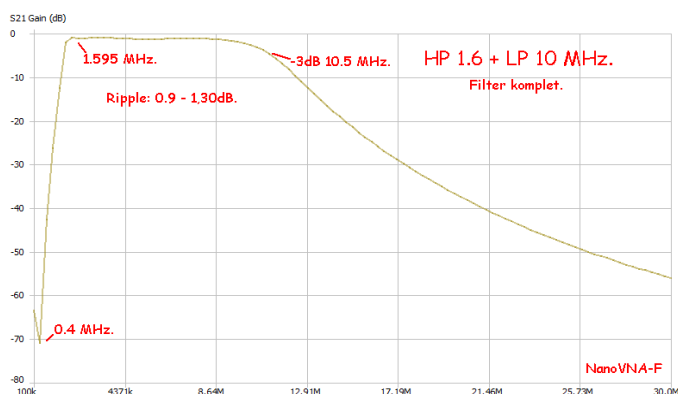
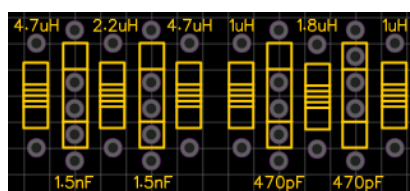
The MD6 SW-KB is designed to listen from the lowest shortwave band 1.6 MHz. (2 MHz.) and up to 30 MHz where shortwave 'ends'.

This large KB area is divided into 3 filter sections constructed as a 'filter bank' with switching relays, which ensure optimal isolation between the individual sections.

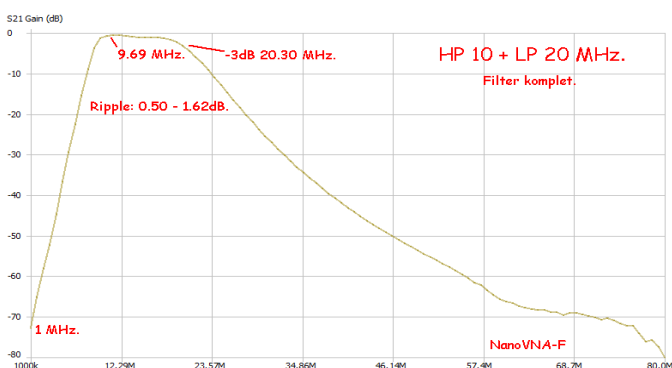
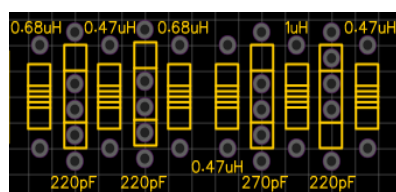
The filter sections are constructed as 'double filters' (High Pass and Low Pass), which ensure the necessary bandwidth in the individual sections.

'Passband ripple' is slightly worse than in theory, this is due to the choice of 'standard components'.

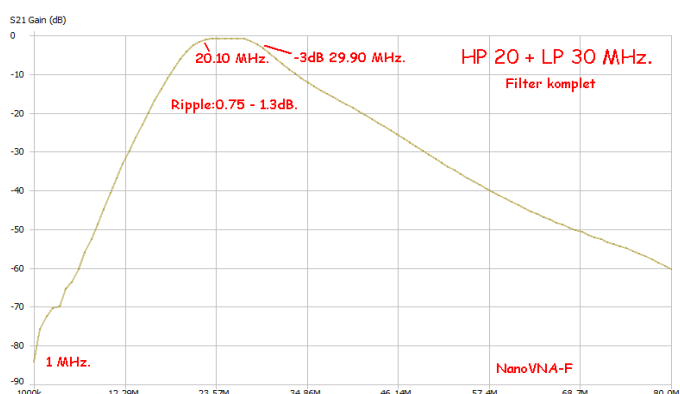
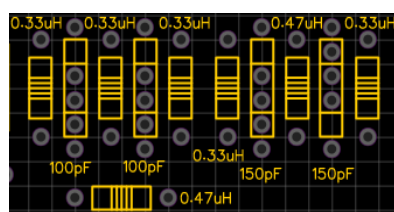
Filter Band 1 1,6 to 10 MHz:



Filter Band 2 10 to 20 MHz:



Filter Band 3 20 to 30 MHz:



The main purpose of the 3 filter sections is briefly explained to dampen all extraneous signals outside the band range you want to listen to.

The filter is finished with a 'buffer' which, in addition to a little amplification, also adapts to the subsequent balanced mixer/mixer '602/612'. The 'second port' of the mixer receives a signal from e.g. our 'DDS VFO' so that a 10.7 MHz. signal is created and passed on to the intermediate frequency.

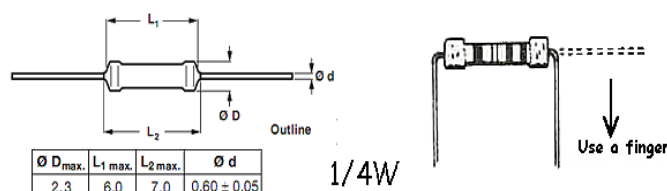
The module can be connected to 2 types of antennas:

A 50 Ohm input for e.g. a 'Mini Web antenna', or some other form of tuned 50 Ohm antenna and a 'High Z' input for rod antenna / wire antenna (with a suitable HF transformer fitted).

Assembling the PCB:

It is recommended that a soldering tip with the same width as the diameter of the small pads (2mm) is used, with 'reasonably thin' solder lead.

Should you happen to misplace a component in the plated solder pad, then use a 'solder wick' or a desoldering pump, first from the top (if possible) and then from the bottom.

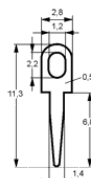


To create some distance between the print itself and the bottom of the 'soon-to-be cabinet', start by mounting 3 mm. threaded rods or 'solderable brass tubes' in the four mounting holes.

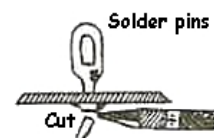
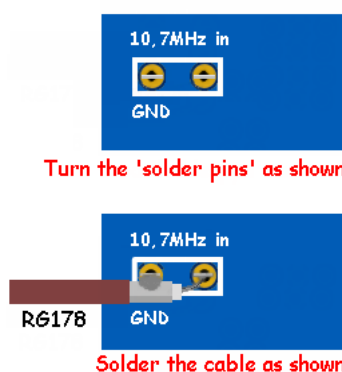


If you use brass tubes without threads, you can initially mount them into the 'four mont holes' with a 3 mm screw and nut, solder the tube onto the print and remove the bolt and nut again. **Be careful... A soldered brass tube stays hot for quite a while (ouch).**

Installation of RG 178:



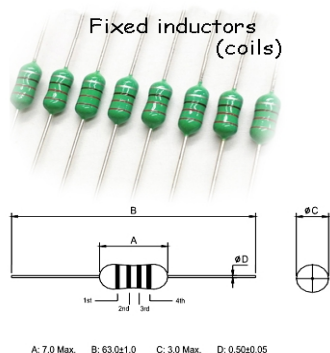
For 1,2 mm



Fit all solder pins. PS: In the places where screen cables are to be mounted, turn the 'pins' as shown in the picture when they are mounted.

Then mount the 'lowest components' first, resistors, the IC socket, one-module ceramic capacitors, two-module capacitors (100 nF.), transistor and the IF can.

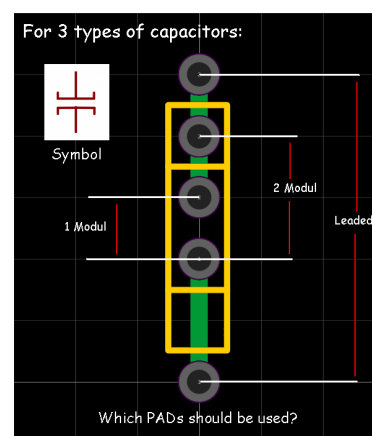
Be especially careful when fitting the 'fixed inductors' that the correct ones come in the correct holes.



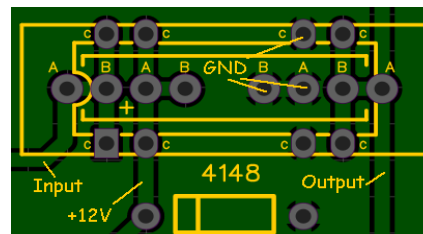
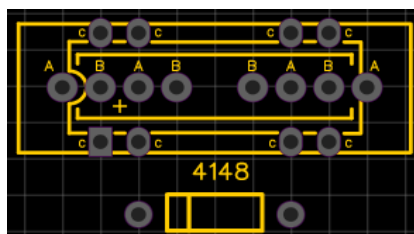
The slightly special 'capacitor footprint figure' used in the filter section is intended for 3 sizes capacitors can be used, 1 module, 2 modules or e.g. a leaded capacitor (Styroflex or Silver mica), or whatever the 'drawer' can offer.

It should be added that you can easily design filters yourself to other frequencies and use them in MD6 SW-KB.

[LC Filter Design Tool \(markimicrowave.com\)](http://markimicrowave.com)



Installation of relays:



The PLL board is 'laid out' so that 3 types of '12V reed relays' (single closing contact) can be used, use the corresponding 'lettered holes A – B and C'. The grid shown in the picture is 'a module Dual In-line' **Remember you can zoom in the image with the +/- keys in the PDF file.**

Testing:

If the assembly is done correctly and no components are defective, then the module should work immediately when the power is connected for the first time.

Is the line clear?

When the module is fully assembled, connect it to a 10.7 MHz. intermediate frequency (IF), e.g. one of those from our 'MD6 series' and a VFO signal is fed, e.g. from MD6 VFO + filter. In order to make the test as optimal as possible, the 'IF' must have a AF amplifier (eg MD6 AF-LF), a speaker, and a 'S-meter' must be connected.

Connect some form of antenna to the 50 Ohms antenna input and connect 12 – 13.5V.

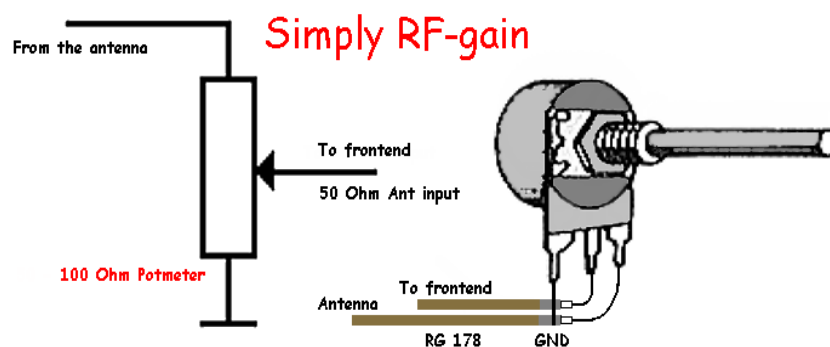
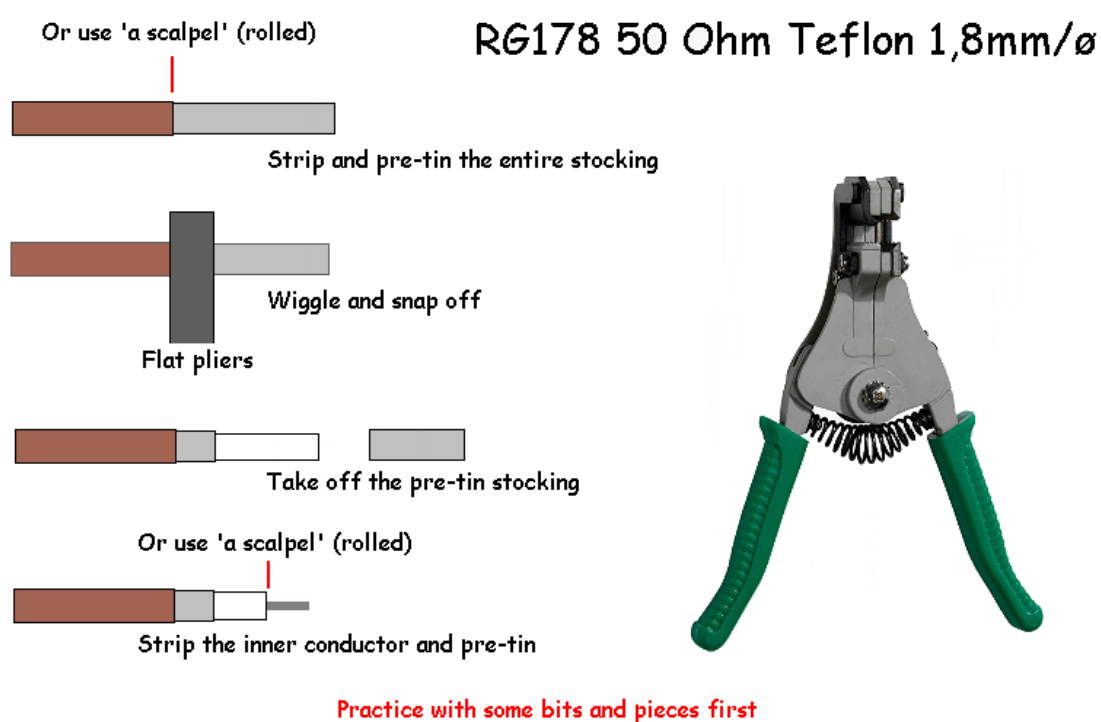
Preferably do not use a digital power supply 'and computers', as these tend to make noise.

What can you hear? ***

Start by setting the VFO to one of the frequencies you want to listen on. Remember with 12V to select the filter of the 3 which opens for the area in question you want to listen to. When you have found a suitable signal, you can already adjust the 10.7 MHz can for max on the S meter.

You may encounter strange 'noisy signals' during the test. They are caused by radiation from 'digital things' from e.g. your own computer and monitor, perhaps also individual 'empty carrier waves' you can encounter e.g. in the low frequency range. They are primarily due to internal radiation from the 'DDS VFO's internal machinery' itself and are not immediately removable.

PS: Remember that much of the final KB activity only really starts to emerge after sunset.



*** Parts list ***

Resistors (1/4 W 7 mm):

10 1 pcs. 56 1 pcs. 100 1 pcs. 150 1 pcs. 470 1 pcs. 1k 1 pcs. 3,3k 1 pcs.

Capacitors (keram.1 module):

22nF 1 pcs.

Filter capacitors (More types possible, see text):

100pF 2 pcs.

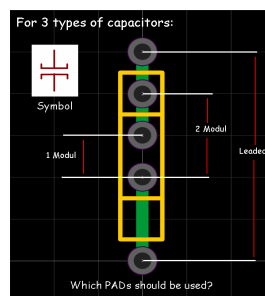
150pF 2 pcs.

220pF 3 pcs.

270pF 1 pcs.

470pF 2 pcs.

1,5 nF 2 pcs.



2 module:

100nF 10 pcs.

Fixed Inductions

0,33uH 5 pcs.

0,47uH 5 pcs.

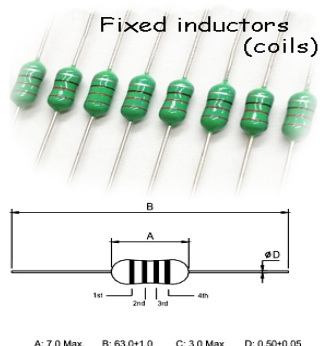
0,68uH 2 pcs.

1,0uH 3 pcs.

1,8uH 1 pcs.

2,2uH 1 pcs.

4,7uH 2 pcs.



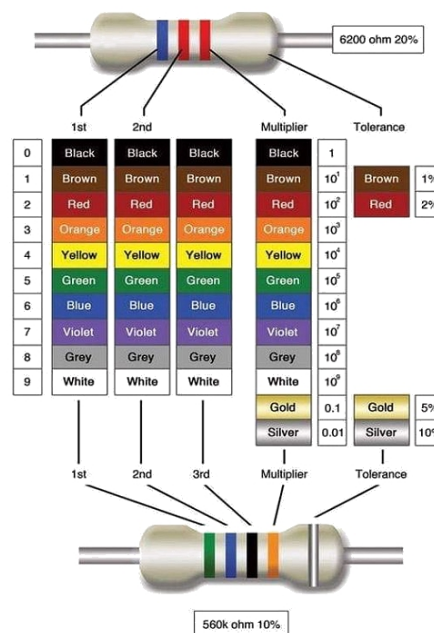
Diodes:

1N4148 6 pcs.

1N4001 1 pcs.

Transistor:

BC547 1 pcs.



ICs:

78L08 1 pcs. NE602 / 612 1 pcs.

IC-sockets:

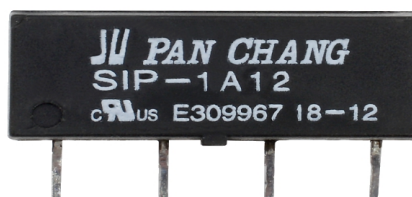
8 pin 1 pcs.

Relays: (see text)

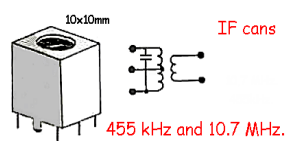
12V en slutte 6 pcs.

Solder pins:

For 1,2mm. 13 pcs.



Several types can be used, see text..

IF-can:

10,7 MHz. Green or Kank 3334R ($C_x = 39\text{pF}$).
(Ca. 4,8uH. - 3uH.) 1 pcs.

PCB:

BSP MD6 SW-KB.

Component purchase:

Bensø Print:

[Project2024](#)

[Price List](#)

and

Your local dealers in your country...

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