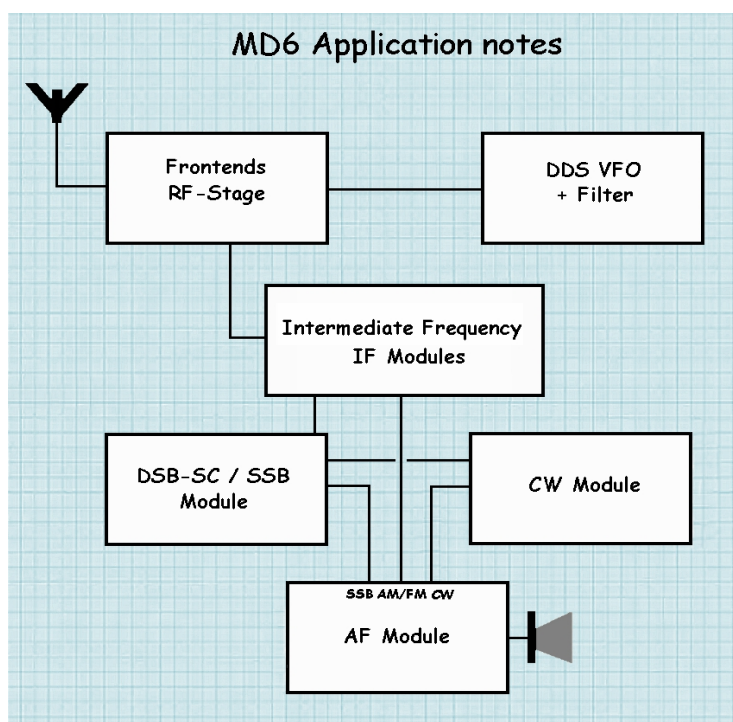


BSP MD6 Applications Notes

Examples of using project modules:



But first, what does a good radio receiver actually consist of and what can the MD6 project offer:

The important antenna: (NOTE: No, we do not sell antennas).

The environment is full of radio waves at all possible frequencies and to catch some of them, you need an antenna. There are basically 3 types of antennas.

One that is adapted to a specific frequency, one that can be used for multiple frequencies and finally, one that is so broadly adapted that it 'pretty much' sucks it all in (e.g. a Mini-Whip antenna).

The RF stage (Frontend module):

If an antenna that 'sucks everything in' is chosen, it is necessary to 'sort a little' so that unwanted signals do not interfere with the desired signal in our receiver. This is done by sending 'the whole thing' through 'some filters' so that only the area we want to listen to passes through to the receiver.

The frontend module has, in addition to filtering, another task. Namely to 'mix/transform' the area to the receiver's intermediate frequency. This is done using the signal coming from the VFO.

DDS VFO:

Its job is to set the receiver to the frequency we want to listen to (also called the receiver's scale). The VFO consists of several interconnected units. A PLL module that generates the VFO signal itself, a display that shows the VFO's set frequency and a CPU module that controls it all.

Since the signal from the PLL module is not 'completely clean', the signal from the VFO must pass through a filter before it is used in the Frontend module.

The IF module:

Is in fact a complete 'one frequency receiver', which in our case listens on a 'boring/peaceful' frequency (10.7 MHz in the shortwave band).

The module's task is, in addition to listening on this frequency (not via the antenna, but on the signal coming from the Frontend module), to give the receiver its sensitivity and its ability to separate exactly the signal we want to listen to.

This is done via an additional 'downmix' to 455 kHz, where a narrow filter separates our signal from the 'signal clutter' on the surrounding frequencies.

The module has some additional facilities. It can listen AM or NFM (narrowband FM), and has connections for S-meter and squelch. We now have what is called a 'double super receiver'. With the intermediate frequencies '10.7 MHz and 455 kHz'.

DSB-SC Module (SSB):

Let's get one thing straight 'DSB-SC' has nothing to do with a 'Danish railway company', but stands for 'Double Side Band' with 'SC' (Suspended Carrier).

The module can detect both 'USB / Upper sideband' and 'LSB / Lower sideband', 2 modulation types that are often used on the amateur radio bands. We have chosen to do it this way, since both SSB X-tal filters and X-tals are both expensive and difficult to obtain. The module works on 455 kHz. and gets its input directly from the IF module.

The CW Module:

Is an '800 Hz audio-based filter'. It gets its input from the audio output of the DSB-SC module. The CW module is used to listen to CW (telegraphy signals) and allows only a narrow 800 Hz audio signal to pass through. This attenuates neighboring CW signals and makes it easier to concentrate on the desired signal.

The module is 'easily extended' via a switch between SSB and CW, see subsequent our Applications Notes.

The AF Module:

Once you have found the signals you want to listen to, they must be brought up to a level so that you can hear them, either in a set of headphones or in a speaker.

The 'AF module' takes care of this, which not only contains an AF amplifier, but also some filters that improve listening. For example, if you are listening to music, there is no need to filter anything, so here the signal goes directly to the amplifier. If you are primarily listening to speech, there is no need for the 'highest frequencies' to come in, etc. (read more about this in the associated manual).

The AF amplifier itself can deliver up to 2.5 Watts into a '4 – 8 Ohms' speaker, which is plenty in most cases.

Postscript with a little bit of everything:

In the following we will describe different types of receivers that you can build, shown complete with 'wiring'.

Here is a little bit of everything to listen to, right from the lowest usable frequencies (10 kHz and up), where on 17.2 kHz you can find the well-known transmitter in Sweden 'Grimeton in Varberg', which on selected days (search the Internet) broadcasts telegraphy (CW).

If you turn further up through the 'music bands' LB and MB, you will encounter the 160 Meter amateur radio band at 1.8 MHz.

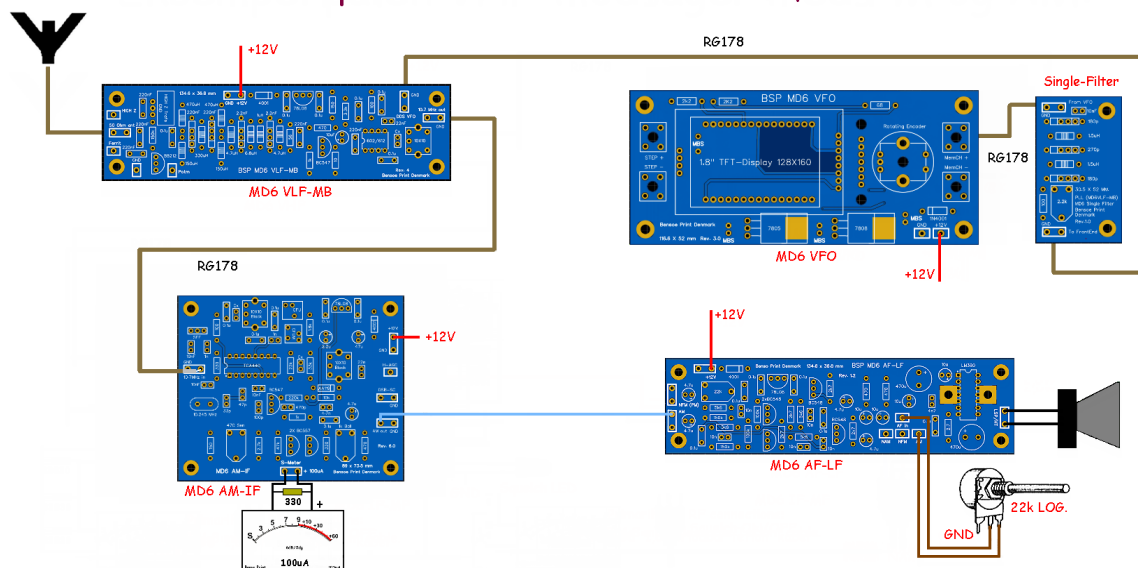
The receivers shown below take you further up through the shortwave band and end up on the other side of the 'FM radiophony band', the 2 Meter amateur band at 144 to 146 MHz.

NOTE: Remember the '+/-' magnification function in the PDF file.

Single-band receiver

10 kHz – 2 MHz

A simple AM receiver for one band, here VLF



Listening AM from **10 kHz. to 2 MHz.** The filter in '**MD6 VLF-MB**' can be designed for other frequencies, e.g. by using filter data from the '**MD6 SW-KB**' and the 'PLL filter' or you can design 'HP / LP' filters yourself via a filter design program, such as this: [LC Filter Design Tool](#) Just remember that the PLL LP filter must always be 10.7 MHz. above highest listening frequency. The receiver shown listens to AM as mentioned, but can also listen to SSB if the '**MD6 BSB-SC**' module is connected.

PS: The **RG178** cable is a thin heat-resistant 50 Ohm 'Teflon cable', which can withstand a lot of 'soldering heat' without the inner conductor 'burning together', as is unfortunately known from other thin cables. The cable is primarily used for internal short RF connections in the cabinet. It should be mentioned that the AF signals can easily be pulled with a single conductor, as long as it is not too long.



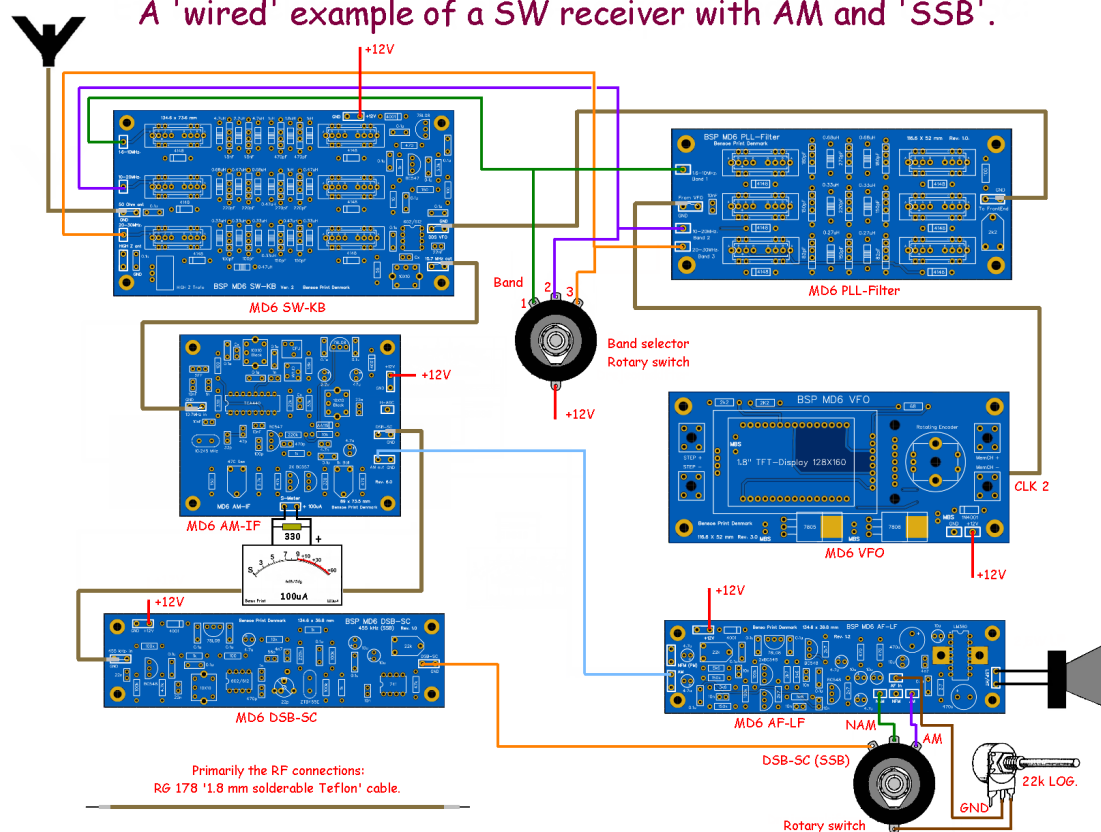
MD6 VLF-MB

NOTE: Get more info in the individual manuals.

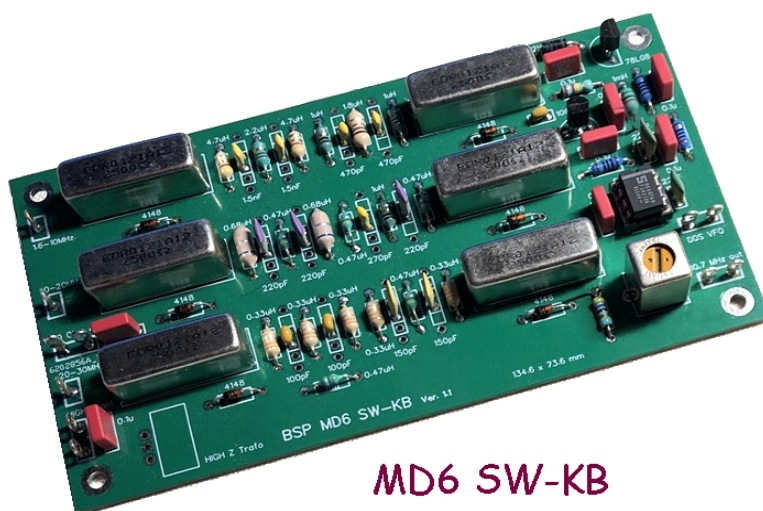
3 band Shortwave receiver

1,6 MHz – 30 MHz

A 'wired' example of a SW receiver with AM and 'SSB'.



The receiver listens AM and DSB (USB / LSB) in 3 ranges, from **1.6 to 30 MHz**. Operation is simple. A range switch, a modulation type selector and a volume potentiometer.



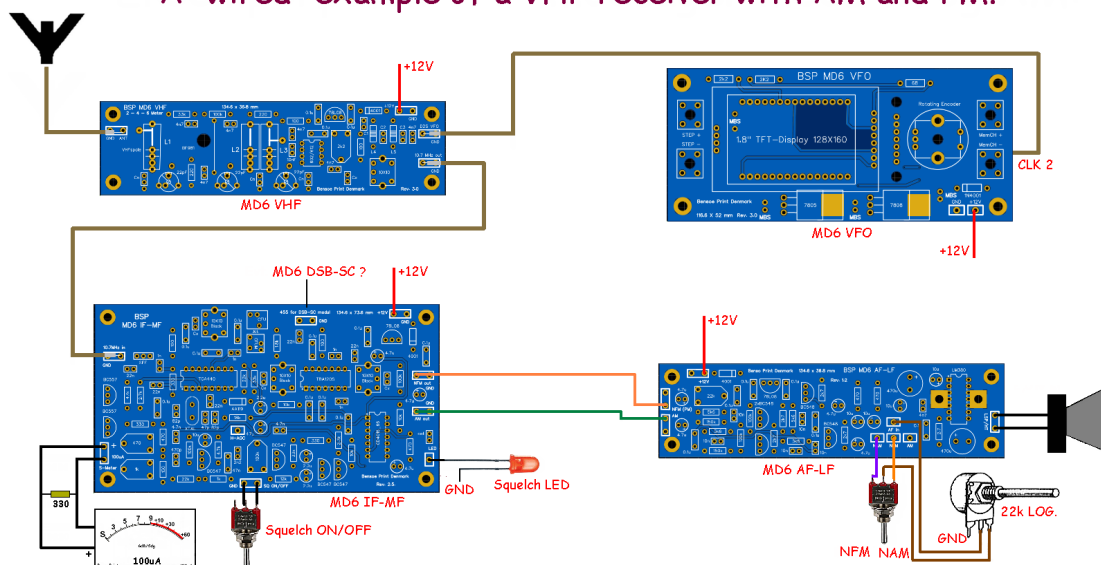
MD6 SW-KB

NOTE: Get more info in the individual manuals.

Build a complete VHF receiver

4 Meter, Airband or 2 Meter

A 'wired' example of a VHF receiver with AM and FM.



With the receiver shown here, you can choose to listen to 3 VHF areas. **4 meter, the aircraft band or the 2 meter band** depending on the winding data of the coils (see manual MD6 VHF module). If 'VFO 2' is used, can automatically 600 kHz. repeater change on 2 meters happens, see manual for VFO 2 for more info. If you want to **listen on the 6 meter band, use the MD6 VHF6M module.**



MD6 VHF



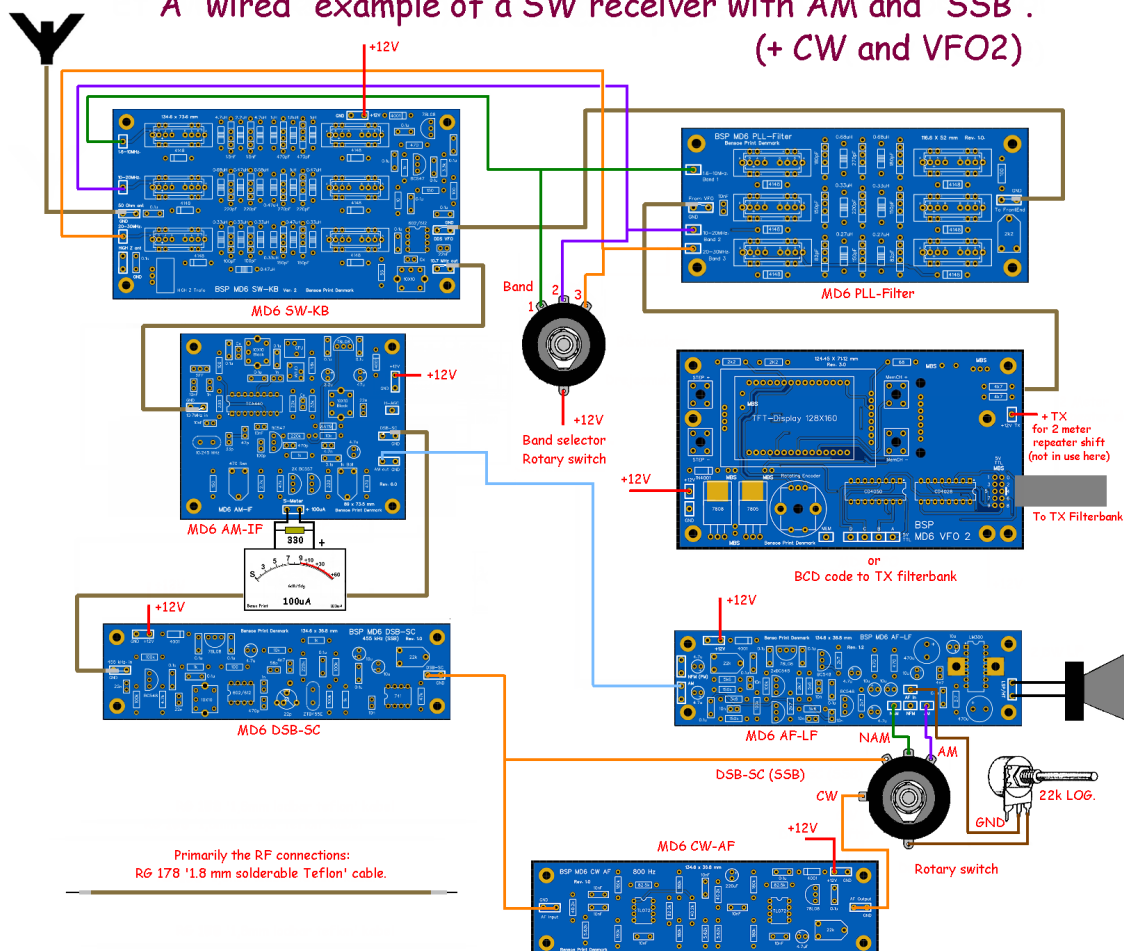
MD6 VHF6M

NOTE: Get more info in the individual manuals.

Complete 3 band SW receiver with TX-Bank control

1.6 MHz – 30 MHz

A 'wired' example of a SW receiver with AM and 'SSB'.
(+ CW and VFO2)



The shortwave receiver again extended with **CW and VFO 2** is used to control a 'external TX filter bank'.



MD6 VFO (1)



MD6 DSB-SC

[Our homepage](#)

NOTE: Get more info in the individual manuals.

[Price List](#)