

# Ten things to do, with a handheld radio

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This series of articles are intended to give the newcomer to ham radio an insight into some of the things you can do with a handheld dual band radio.

## 4: Amplifiers

An amplifier will increase the signal power, and they are available for either transmission or reception. However, they are usually only single band operation, although new devices are coming that will cover both 2m and 70cm bands.



Figure 1 A typical 2m VHF power amplifier

### Antenna switching

The amplifier is connected between the radio's antenna socket and the antenna. As this radio port has to carry transmit and receive signals, a transmit amplifier will have to "get out the way" when receiving, and vice versa for a receive amplifier. This bypassing is usually achieved by automatic switches in the amplifier. See Figure 2. The switches are normally carrying the signal through the receive preamplifier, but transmissions from our radio triggers a detector circuit, which switches the transmit power amplifier into circuit.

### Protection

With higher output power, there is always a higher risk of things going wrong. A bad antenna impedance may cause reflections which will prevent your amplifier from producing its specified power output. Also, some digital transmission modes keep the radio transmitting for long periods, so watch for any overheating.

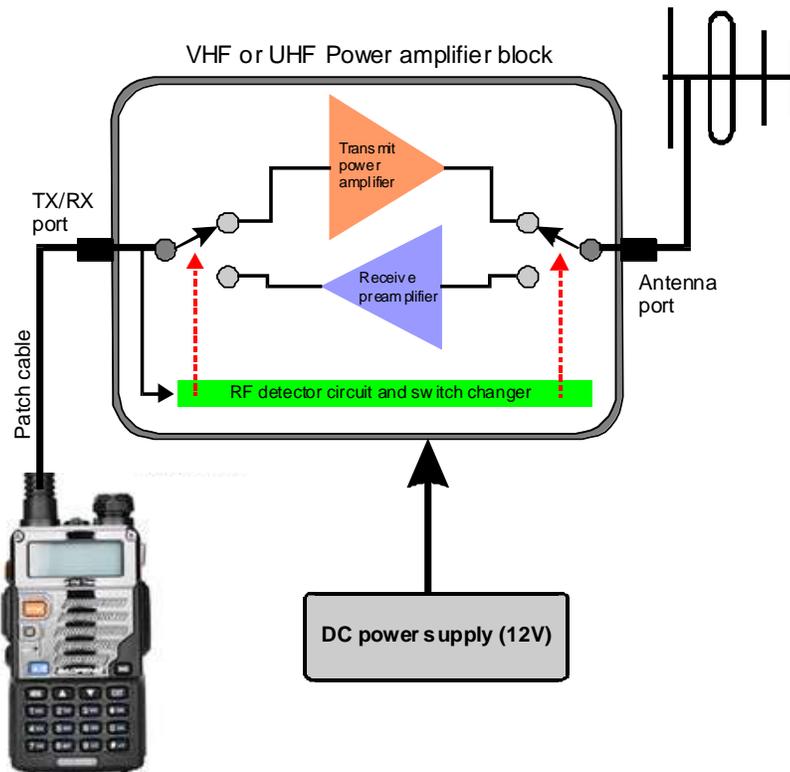


Figure 2 Internal switching in a power amplifier with receiver preamp

## Transmit amplifiers

Normally these will have a power gain of approx 10, so it will boost your 5Watt handheld radio up to 50Watts. As most handheld radios are FM only, the amplifier will only have to handle FM, "linear" amplifiers needed for SSB or AM are not essential but are also acceptable.

Most amplifiers will run from a 12V supply, so they can be used in a car or in the shack, but the latter will then require a mains powered DC supply.

## Receiver preamplifiers

As mentioned above, some amplifiers blocks have a preamplifier in the receive signal path. This is very different from the transmit amplifier as it does not have to have very high output power. However, it does need to be very low noise, and handle both large and small signals coming in through the antenna.

A receive preamp may improve your receiver performance if your radio has a "noisy" antenna input circuit. It should allow reception of weaker signals without unduly increasing the noise.

## More info

Power amplifiers for VHF and UHF can be found easily by web search. Many Chinese manufacturers compete with more expensive devices from US and Europe.

Some of the more reputable manufactures are

MFJ

<http://www.mfjenterprises.com/mirageamps.php>

RMItaly

<http://www.rmitaly.us/>

Don't forget you will need a power supply, normally 12V at around 10Amps for a 50W amplifier, and some coax patch cables.