Equipment

To listen and/or operate on air, radio amateur needs some kind of equipment. Generally, there are two significant parts: receiving and transmitting. To receive signals, we need antennas, antanna feeding cables, impedence matchinng units (also known as antenna tuners) and a receiver. To transmit, we need a signal generator (telepgrah or audio), transmitter, low-pass filters (must) and receiving setup. Setup varies from station to station and may include additional pieces of equipment, such as antenna tuners, power meters, power amplifiers. Combination of receiver and transmitter is known as tranceiver, which mostly holds necessary elements in one case. Some enthusiasts build equipment themselves, some obtain them from shops, second-hand radio amateur related events. This book is about equipment I had experience with, general thoughts, ideas and vision.

- RX Receivers
- TX Transmitters
- XCVR Transceivers
    - FlexRadio 6400
- ANT Antennas
- PA Power Amplifiers
    - 00164 - QRO Power Meter
- PSU Power Supply Units and PDU Power Distribution Units

RX Receivers

TX Transmitters

Nowadays, transmitter usually is part of transceiver, that is why is chapter mostly dedicated to self-contained transmitter projects, such as radio beacons (telegraph, WSPR and APRS).

XCVR Transceivers

A transceiver stands for TRANSmitter/reCEIVER, a combination of receiver and transmitter. Usually, a main element on radio amateur desk ("shack") and a door (or window) on the air.

XCVR Transceivers

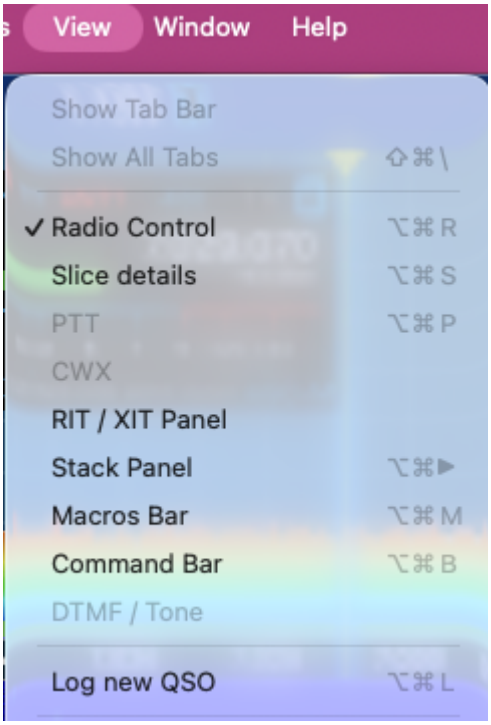
FlexRadio 6400

Shortcuts for SmartSDR (on Macintosh)

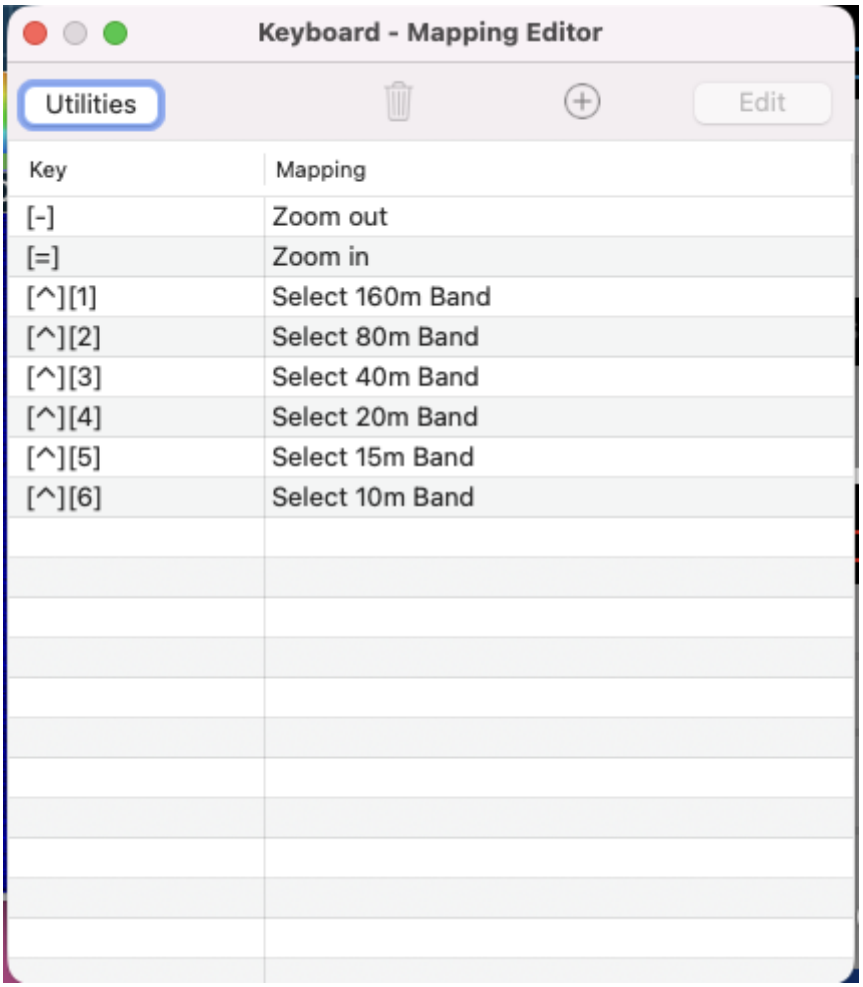
Global shortcuts

```
CMD-D    DX-Cluster

View
OPT-CMD-R  Radio Control
OPT-CMD-S  Slice details
OPT-CMD-P  PTT
OPT-CMD-P  Log new QSO
```



Key mappings



Challenges

Absence of sidetone on telegraph transmission

Solution:

Local: use phones/speaker attached to transceiver

Remote:

Manually key the FlexRadio using SmartSDR

Solution:

Local: attach key/paddle to transceiver

Remote: via MIDI/Serial tool box, such as

Software	Solution Chain	Hardware	Pros	Cons
SmartSDR for Windows	HaliKey MIDI + NetKeyer for Windows, MacOS, and Linux	HaliKey MIDI		? no sidetone
SmartSDR on Windows	HaliKey Serial: NetKeyer for Windows, MacOS, and Linux	HaliKey Serial		? no sidetone
SmartSDR on Windows	CTR2 MIDI	Lynovation - CTR2 Midi	Buzzer for sidetone on board	
SmartSDR on Windows	CTR2 Micro	Lynovation - CTR2 Micro	Buzzer for sidetone on board	

ANT Antennas

Antennas are all of sorts. They can be big, very big and strange. Due to the limitations of my locations (QTH), mostly, I build portable antennas.

PA Power Amplifiers

Power amplifiers are intended.. hmm.. to amplify power of outgoing signal from transmitter to antenna. I would categorize power amplifiears, very broadly into three categories: low power QRP (to 20 W), normal power (to 100-200 W) and high power QRO (all above), sometimes you may see QROO (which stands for very high power and, usually, amount power which is being delivered is not asked, but silently observed from power meter. :D

00164 - QRO Power Meter

= Objectives =

- measure outgoing and reflected power from transceivers and power amplifiers.

= Resources =

- digital power indicator and measurament board (https://eb104.ru)
- case aluminium case

= Schematics =

= Assembly =

= Inital run and adjustments =

PSU Power Supply Units and PDU Power Distribution Units

To be able to emit radio signals, we need energy. That energy, usually, comes from the socket, but not always. This chapter is all about it.