Education Committee
Montgomery Amateur Radio Club
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Getting Started with Digital Modes on HF
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October 21, 2015
The goal of this presentation is to help get you started with digital modes on HF.

- station equipment
  - transceiver
  - computer to radio sound interface
  - rig control cable
- setting up a transceiver
- setting up a sound interface
- setting up a rig control cable
- setting up a digital modes program
- operating digital modes program
station equipment

XCVR

SWR

meter

tuner

isolator

audio

interface

rig

control

laptop

computer
station equipment

- transceivers
  - Yaesu FT-857D
  - Icom IC-706MKIIG
- SWR meter – MFJ-860
- automatic antenna tuner
  - LDG Z-100Plus 100 W tuner – generic
  - LDG tuning cables for Tune button
    - Y-ACC – for FT-857D
    - IC-2 – for 706MKIIG
- line isolator – Radio Works T-4-500
- dummy load – MFJ-260C
- antenna
station equipment

- sound interface – Tigertronics SignaLink™ USB
  - has built-in VOX
- 6 pin mini-DIN data cable – SLCAB6PM
- matching jumper module – SLMOD6PM

- rig control cable – Valley Enterprises
  - USB CT-62 FTDI – for FT-857D
  - USB CT-17 FTDI – for IC-706MKIIG
software

- operating systems:
  - Windows 7
  - Ubuntu Linux 14.04 LTS – W2LNX

- digital modes programs:
  - fldigi – W2LNX
  - JT65-HF – K3RRR
  - Ham Radio Deluxe – WA3SWJ
set up transceiver

- FT-857D
  - set menu items:
    - 019 CAT RATE: 9600 bps
    - 020 CAT/LIN/TUN: CAT
    - 038 DIG MODE: PSK31-U
    - 075 RF POWER SET: 100 or 10 for QRP
    - 085 TUNER/ATAS: OFF
  - set transceiver MODE: DIG, not USB
  - select display: MFi
    - set button B: MTR ALC DISP

![Transceiver display](image)
set up transceiver

- IC-706MKIIG
  - Initial set mode:
    - 29 9600 MODE: 1200
    - 35 CI-V BAUD: 19200
  - Quick set mode:
    - Q1 RF POWER: H or 1 for QRP
  - set transceiver mode: USB
Windows: Control Panel

- **Device Manager:** look for USB Audio Device
Windows: setting audio input

- right click on speaker icon – select Recording devices
Windows: setting audio input

- select Microphone USB Audio Device – click Properties
Windows: setting audio input

- click Levels tab
Windows: setting audio input

- select appropriate microphone gain

![Microphone Properties - too high](image1)

![Microphone Properties - better](image2)
Windows: setting audio input

- click Advanced tab – select mono 48000 Hz
right click on speaker icon – select Playback devices
Windows: setting audio output

- select Speakers USB Audio Device – click Properties
Windows: setting audio output

- click Advanced tab
Windows: setting audio output

- select mono 48000 Hz
fldigi: setting sound input/output

- in Configure menu – select Sound Card
fldigi: setting sound output level

- set audio output to appropriate level
transceiver: set audio drive

- transmit PSK31 test message – click on CQ macro
  - use dummy load
  - set TX on SignaLink to just before ALC indication
    - SWR power meter should
      - be about half RF power setting
      - wiggle slightly for PSK31
fldigi: setting macros

- right click on CQ button

- right click on ANS button
fldigi: setting macros

- right click on QSO button

```
<TX>
<CALL> DE <MYCALL> --
```

- right click on KN button

```
-- BTU <NAME> <CALL> DE <MYCALL> KN
<RX>
```
fldigi: setting macros

- right click on SK button

- macros correspond to keyboard function keys
Windows: setting rig control

- open Control Panel – open Device Manager – look for USB Serial Port – note COM port

- rig control – a convenience but not necessary
Windows: setting rig control

- right click Properties – note Manufacturer: FTDI
fldigi: setting rig control

- Configure menu – select Rig control – for FT-857

- click Initialize – red and green LEDs on CT-62 cable should be rapidly blinking
fldigi: setting rig control

- Configure menu – select Rig control – for IC-706MKIIG

- click Initialize – red and green LEDs on CT-17 cable should be rapidly blinking
fldigi: rig control

- turning tuning knob on radio should change displayed frequency

- changing frequency with mouse should change frequency display on radio
fldigi: rig control

- can change bands and transceiver operating modes

- FT-857D quirk – reset transceiver MODE: DIG
fldigi: setting user interface

- in Configure menu – select Operator – fill in details
fldigi: setting user interface

- in Configure menu – select Waterfall – Display tab – click Monitor transmitted signal
fldigi: setting user interface

- in Configure menu – select Waterfall – FFT Processing tab – set waterfall height in pixel
fldigi: using program

- in Op Mode menu – select PSK31
fldigi: using program

- demonstration – PSK31 QSO
conclusions

- This presentation should help get you started with digital modes on HF
  - Configuration for two popular transceivers
  - SignaLink USB makes it easy to get on digital modes

- PSK31 is a popular low RF power digital mode
  - Combines the spectrum efficiency of CW with the convenience of using a computer

- fldigi is a well supported digital modes program

- Digital modes on HF are fun!
thank you

- Chris Sylvain, KB3CS for helping me get started with fldigi and sound interfaces
Questions

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presentation resources

fldigi:
http://www.w1hkj.com
http://sourceforge.net/projects/fldigi/files/fldigi
https://launchpad.net/~kamalmostafa/+archive/ubuntu/fldigi

SignaLink:
http://www.tigertronics.com/slusbmain.htm
http://shop.tigertronics.com/Extra-Radio-Cable-p-n-SLCAB6PM-SLCAB6PM.htm
http://shop.tigertronics.com/Plug-Play-Jumper-Module-p-n-SLMOD6PM-SLMOD6PM.htm

rig control cables:
http://www.ftdichip.com/Drivers/VCP.htm

antenna tuners:
http://www.ldgelectronics.com/c/252/products/17/49/1
presentation resources

SWR/wattmeter:

line isolator:

dummy load antenna: