



Software
Defined
Radio

SDR Technology and User Interfaces at FlexRadio

Abed Haque AB5ED
Ed Gonzalez KG5FBT



Agenda

- User Interfaces
- Digital Modes
- Remote Operation
- Demo!

How do you interact with your radio?



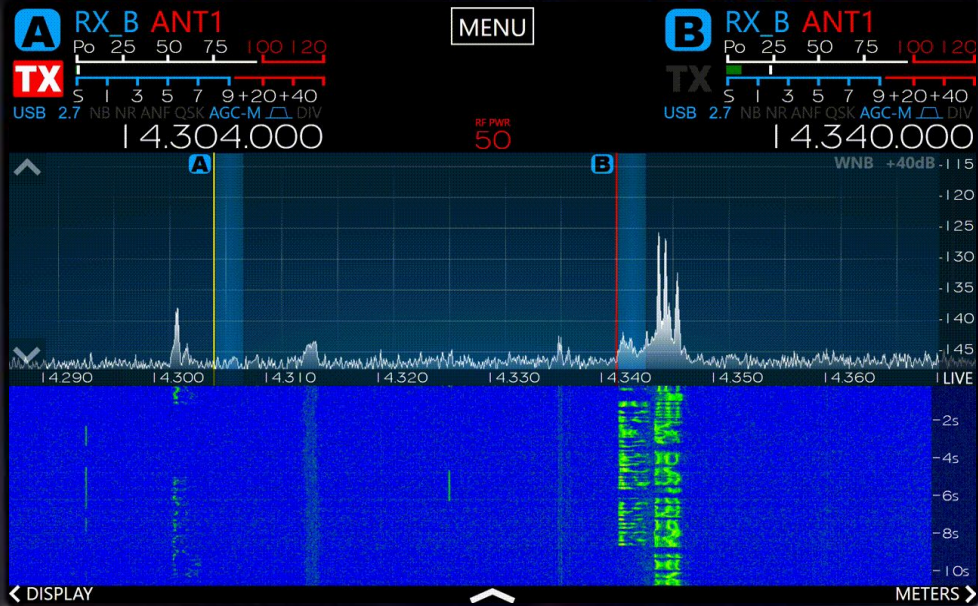


FlexRadio - Simplicity!

*“Every time we add an option checkbox,
an angel loses its wings”*

FlexRadio Systems
Software Defined Radios

Maestro



Control knobs for Channel A and Channel B. Channel A knobs include AGCT SQL, LOW SHIFT, and HIGH WIDTH. Channel B knobs include AGCT SQL, LOW SHIFT, and HIGH WIDTH. Below the knobs are SOLO and BW SELECT buttons for each channel.

Function buttons for Channel A and Channel B. Channel A buttons include MOX, TUNE, and ATU. Channel B buttons include BYPASS, F1, F2, F3, F4, F5, and F6.

MIC SPEED and PWR buttons, and a TX MENU knob.

Mode and RIT buttons. Channel A buttons include RX, TX, A+B, and RIT. Channel B buttons include RX, TX, and RIT.

Large rotary knobs for Channel A and Channel B. Channel A knob includes A MENU/CLR, A LOCK, and A STEP buttons. Channel B knob includes B MENU/CLR and B STEP buttons.



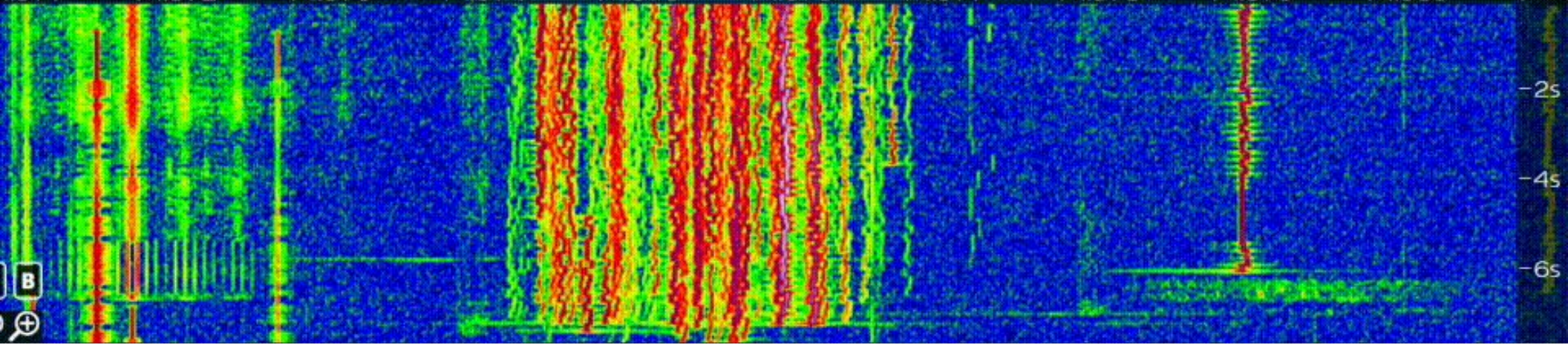
14.074.000

A
TX

+32dB

G8ZZL +10 +9
YC6RMT KG7CW F5BWS
PA3GEG HA7TM KS9A
G3UAS DD7GU OH3EX
K3RA EA3CCN DL5AN WJ2D
A45XR DB5DY F3CJ S57AT

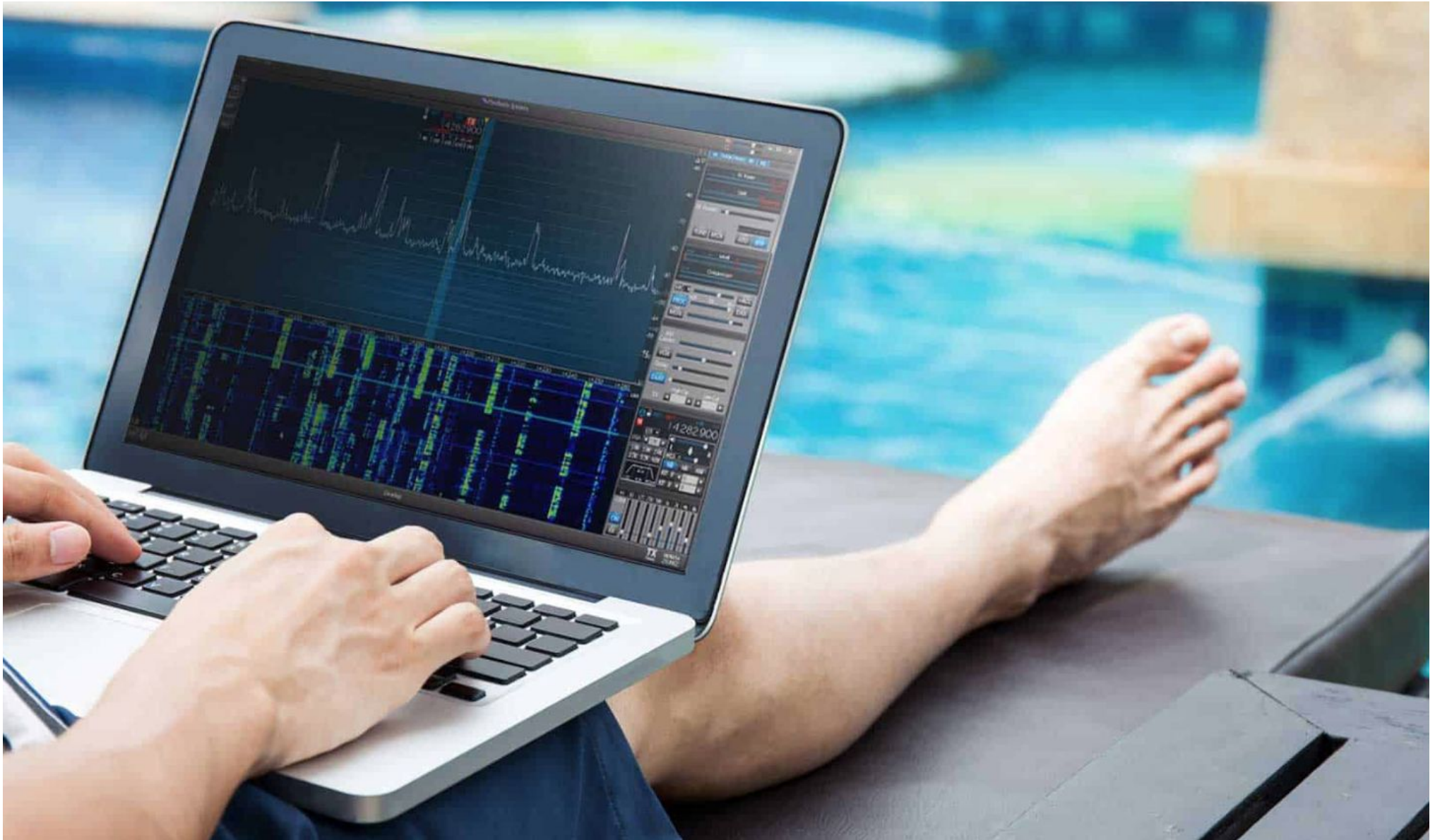
14071 14072 14073 14074 14075 14076 14077 14078 14079 14080



Client-Server Architecture

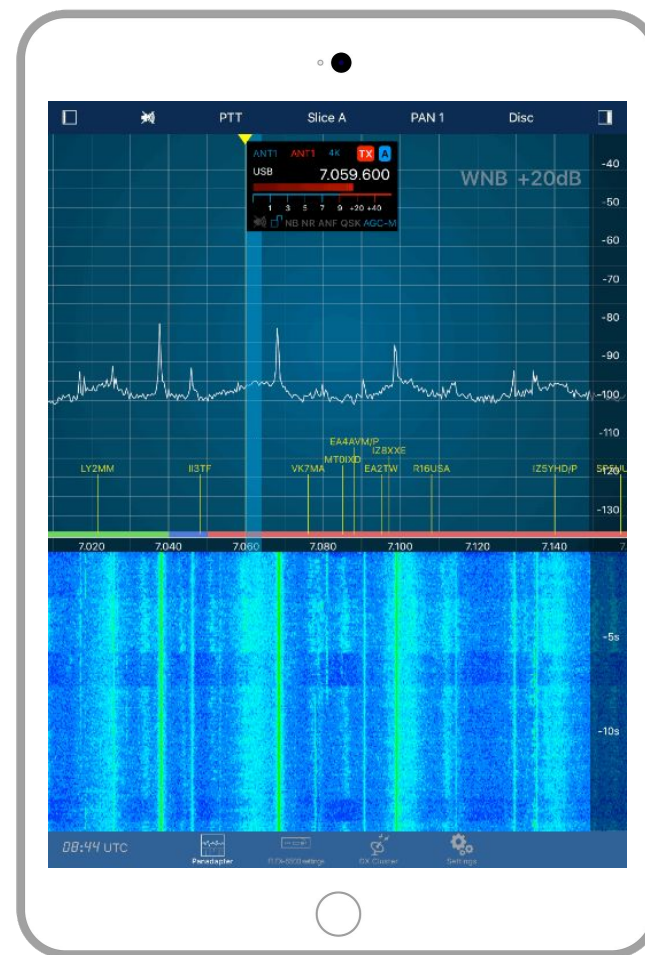
Flex-6000 Client-Server Architecture

- Radio becomes a *server*
- Radio does the heavy lifting, use *thin clients* to control
- Designed with *networking* in mind
- *Open API* - anyone build their own *App* that controls the radio





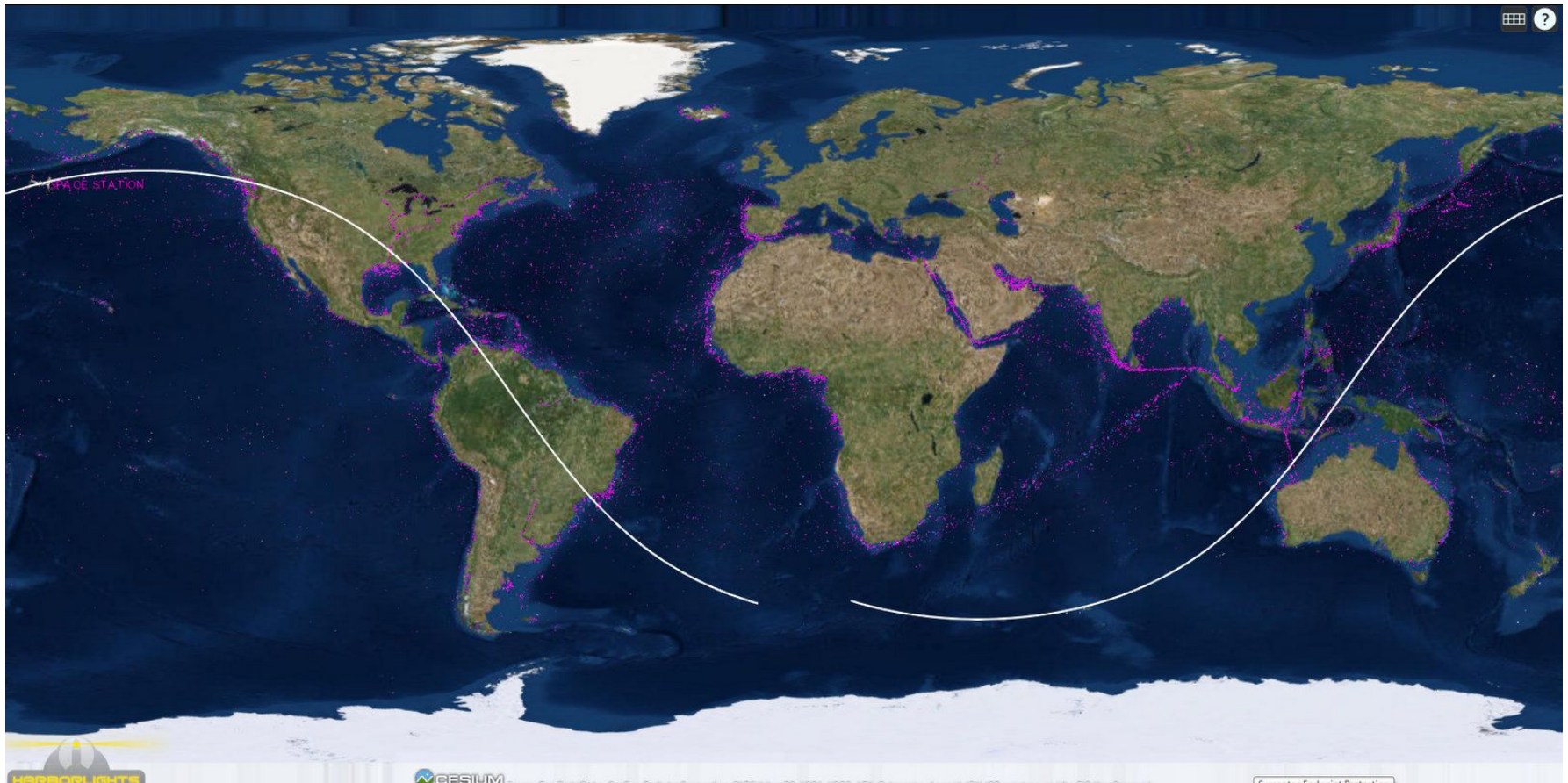
SmartSDR for iOS

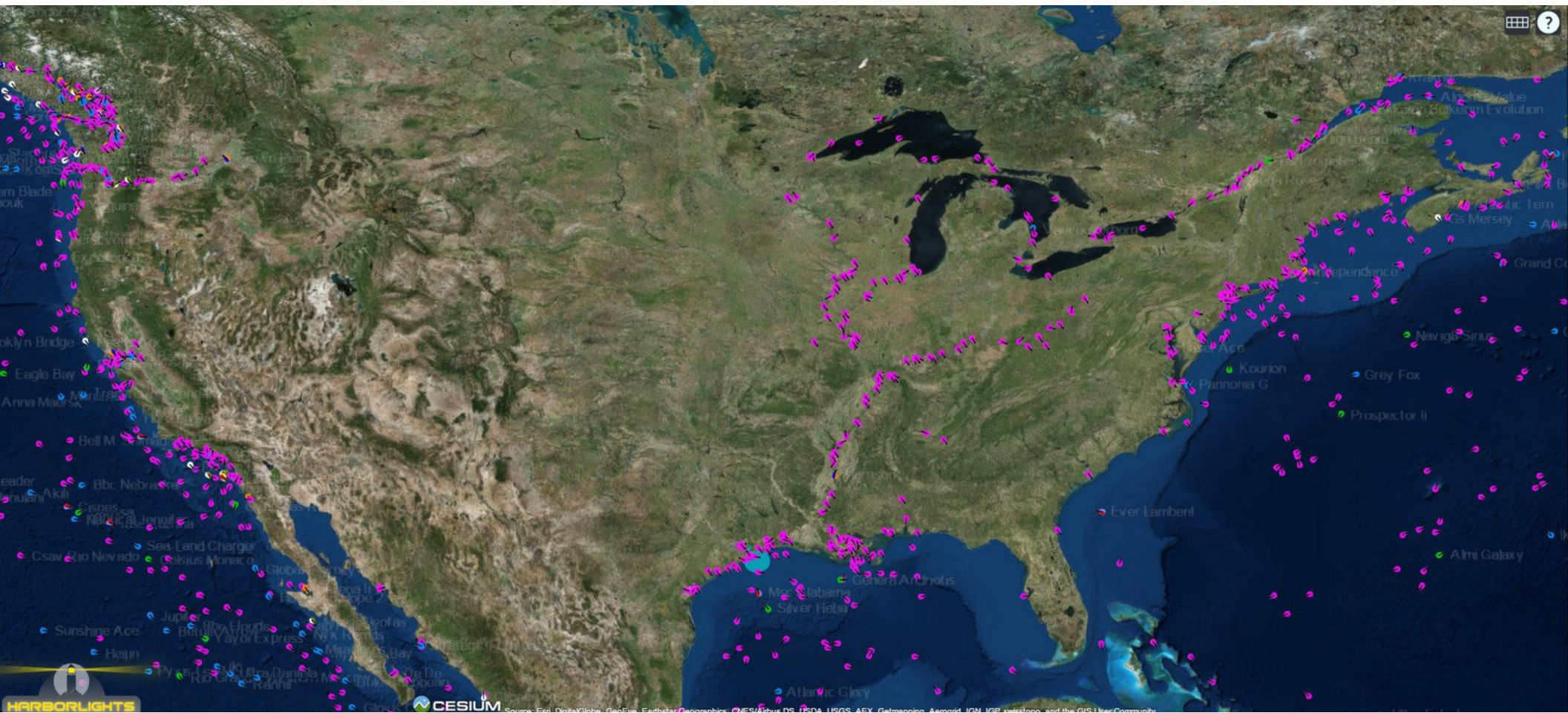


JJRadio by KE5AL



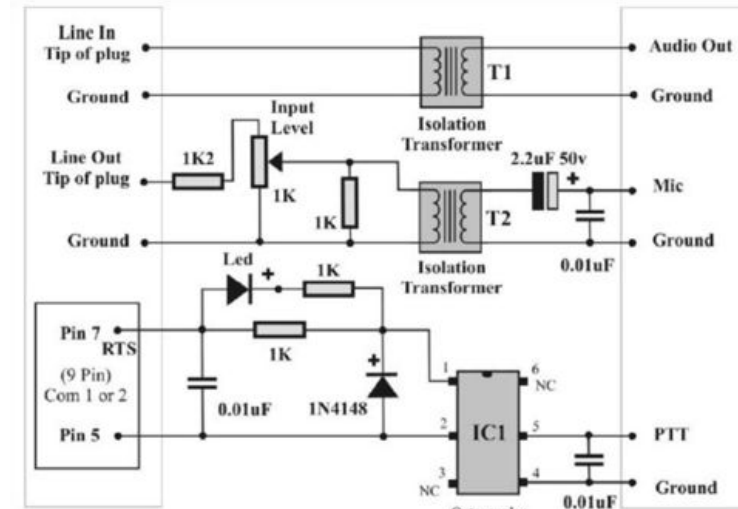
GLASS (GLobal AIS on Space Station)





Digital Modes

Digital Modes



Computer

Radio

Circuit 1

Components for Circuit 1

- 3 x 1k ¼ watt resistors - 1 x 1.2k ¼ watt resistors
- 1 x 1k Potentiometer lin - 1 x 2.2uF 50v capacitor - 3 x 0.01uF capacitors
- 2 x (T1 & T2) 600 ohm transformers type 9000 RS Number 208-822
- 1 x IC1 optocoupler 4N25 RS Number 597-289
- 1 x Red LED (High sensitivity type) - 1 x Diode 1N4148 - 2 x 3.5mm Stereo plugs
- 1 x 9 Pin D plug (Com port 1 or 2) & cover
- Screened cable - Project Box

Digital Modes with FlexRadio 6000 Series

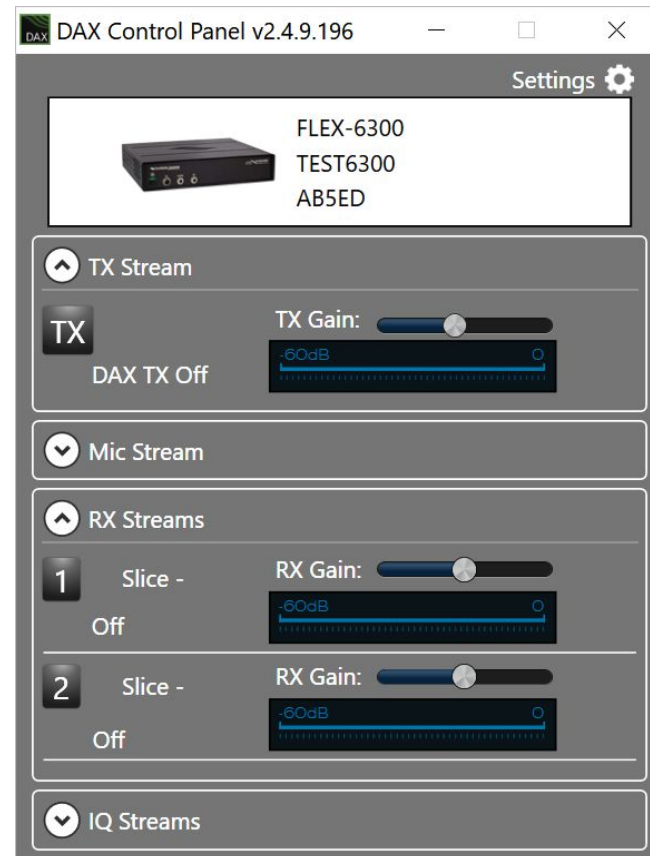


ETHERNET



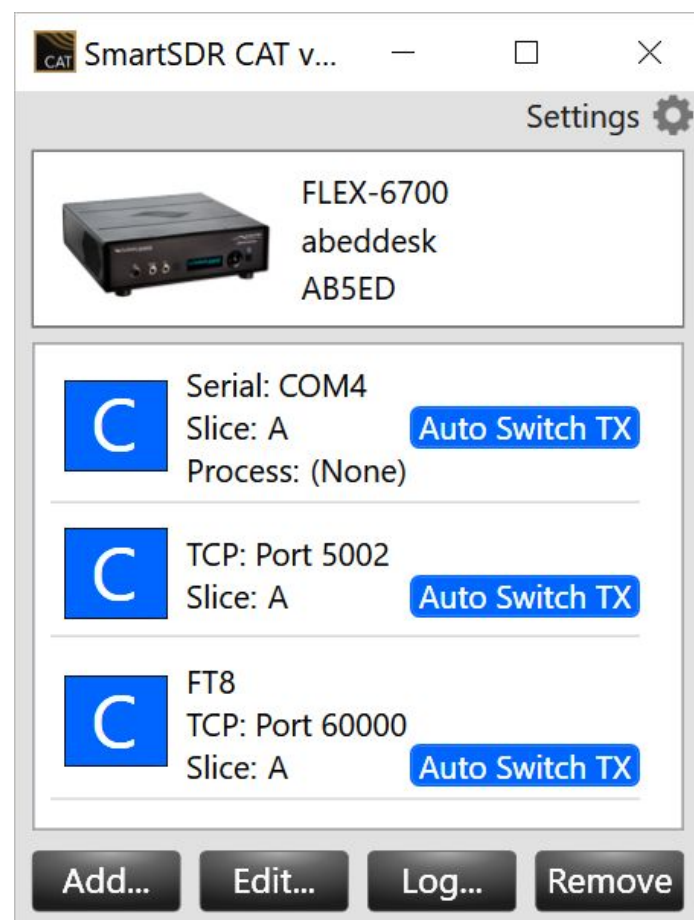
SmartSDR DAX

- 'Virtual' Sound Cards
- Audio over the network
- No additional cables!

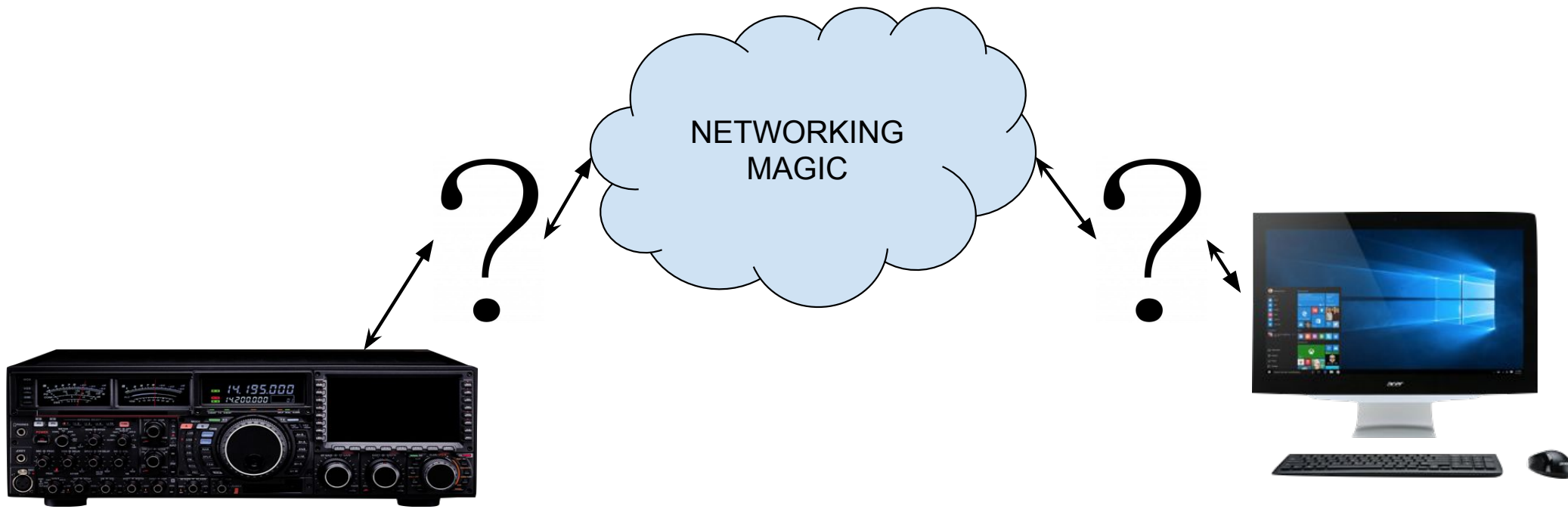


SmartSDR CAT

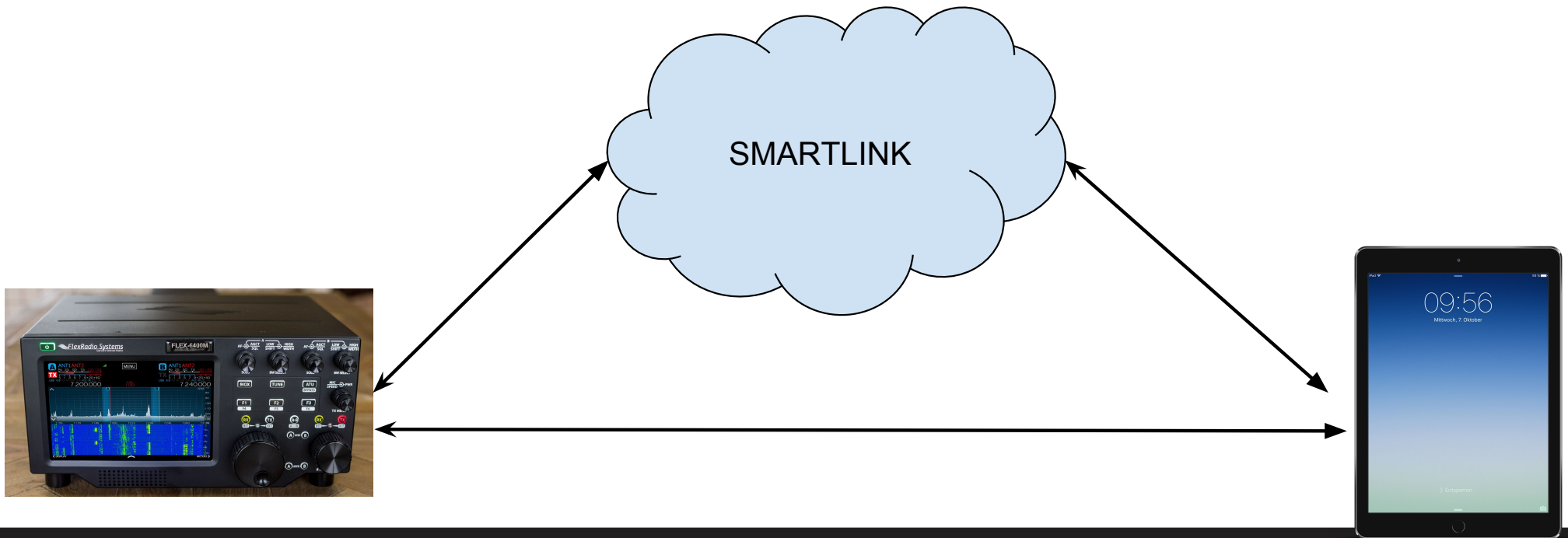
- 'Virtual' Serial Ports
- Serial to Network Translation
- OTRSP, CAT, PTT, Winkey Emulation



Remote Operation



Remote Operation with SmartLink



Remote Operation - Digital Modes

WSJT-X v1.9.1 by K1JT

File Configurations View Mode Decode Save Tools Help

Band Activity

UTC	dB	DT	Freq	Message
160400	4	1.8	1234	~ K7XB 4U1WB -11
160400	-5	0.4	1296	~ VE9HF W2ARP R-09
160400	1	0.5	1341	~ CQ EU WORIC DM33
160400	-12	0.4	1450	~ IV3KEI K9IG 73
160400	-17	0.5	1580	~ YU1AB W1GLV EL89
160400	-10	0.4	1739	~ N5GJ K9RJO RRR
160400	3	0.4	1873	~ ON4XM K9GL 73
160400	1	0.5	1917	~ IS0/OE2LCM W1RH
160400	-14	0.9	2633	~ CQ CO8LY FL20
160400	-22	1.5	908	~ WB2REM N3OGT R-05
160400	-8	0.5	1190	~ KP4PRE AE4WG EL99
160400	-5	0.3	1348	~ AF6JO N8LSU EN90
160400	-24	1.7	1450	~ CQ OAAA DM26
160400	-8	0.5	1904	~ F4FVW VA3HP RRR

DAX Control Panel v2.4.9.196

Settings

FLEX-6700
SHACK
K5FRS

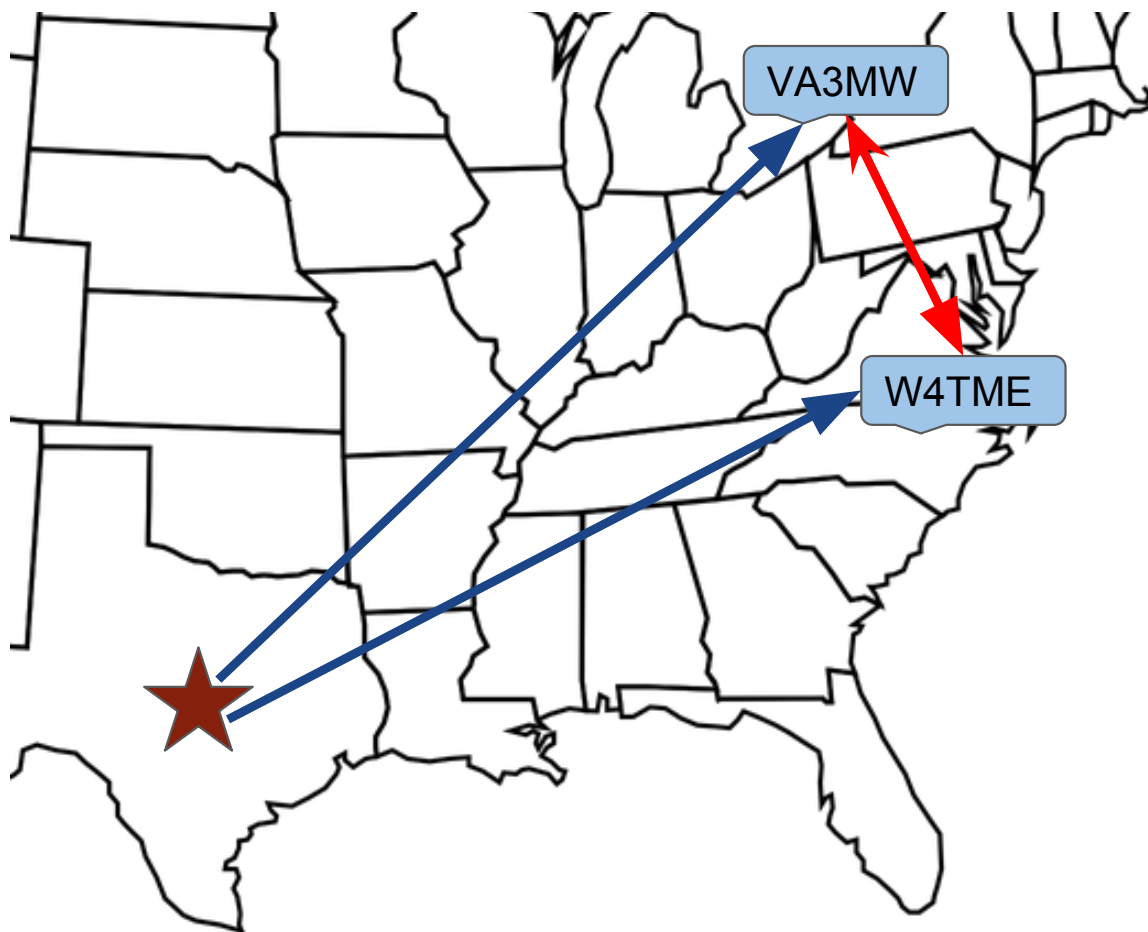
TX Stream
TX Gain: [Slider]
Streaming [Level Meter]

Mic Stream
Mic Record Gain: [Slider]
Streaming [Level Meter]

RX Streams
1 Slice A
RX Gain: [Slider]
Streaming [Level Meter]

DEMO

Remote FT8 Stations



Q/A