



FlexRadio SMARTLINK



*Ria Jairam, N2RJ
FlexRadio Community Elmer
Hamvention 2018*

“

Creativity is just connecting things.



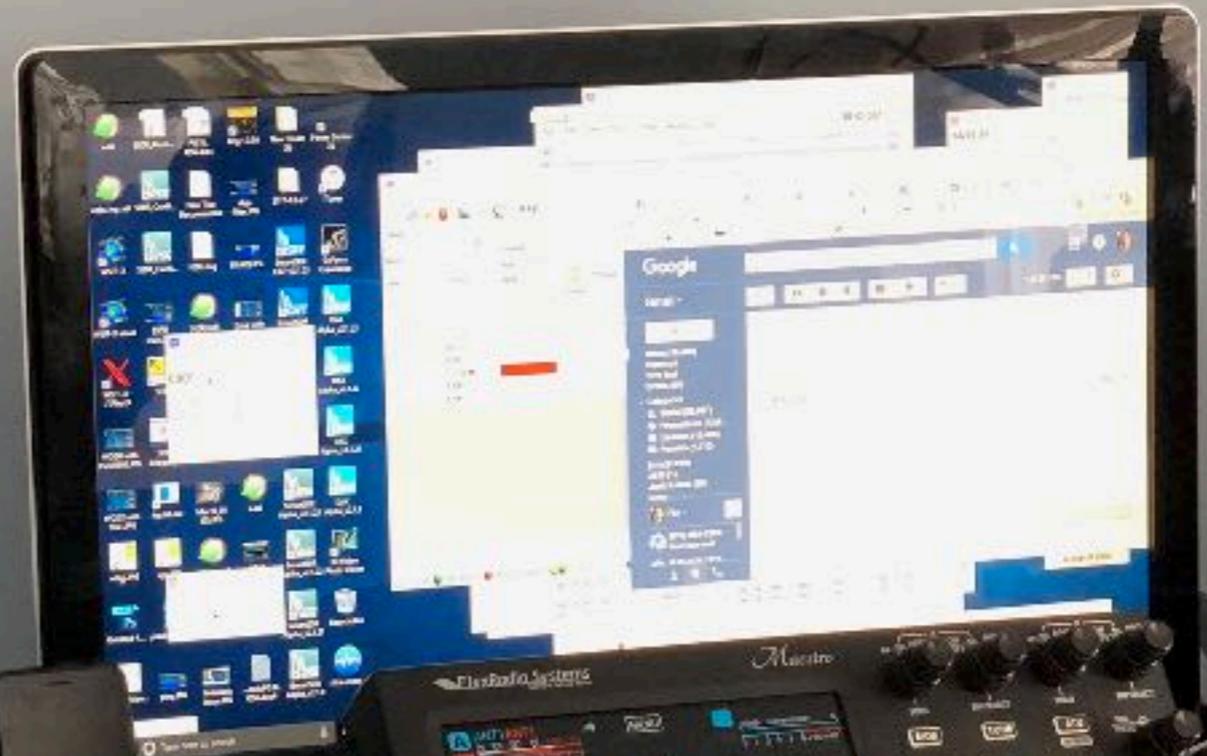
- *Steve Jobs*

THE FLEX-6000 SYSTEM

- Ethernet connected radio
- Thin client (low bandwidth)
- Built for remote operation
- CAT, Audio (DAX), Winkeyer (CW)
available over the network

OTHER THINGS - CURRENT AND ANNOUNCED

- SmartSDR for iOS
- Third party Mac clients
- Maestro
- Power Genius XL amplifier
- Tuner Genius
- and more... TBA





OLD WAY - VPN ACCESS

- Raspberry Pi SoftEther VPN
- Worked well
- Gave access to your entire network (security implications)
- Required setup under Linux (scripted install made it easier)
- Required router configuration
- Did not work with Maestro (unless you used a 2nd Pi)

ENTER SMARTLINK

- Access your FlexRadio Flex-6000 transceiver(s) and connected devices anywhere you have an Internet connection
- Security built in - TLS, MFA, physical verification (PTT)
- Optional social login (Facebook, Google)
- No router configuration required in many cases
- Ability to use Maestro, including knobs and CW with a real key or paddle



WHAT IT DOESN'T DO

- No DAX support.
- Can't be used with carrier grade NAT on the radio end (Satellite, 4G LTE, some land based ISPs)
- Needs UPnP or manual port forwarding. If your router doesn't do these, then no go.
- 6600M/6400M front panel can't be used as a SmartLink client
- No completely remote setup. Must physically key radio to pair to account.
- Windows client version must match radio (no upgrade/downgrade via SmartLink) - but iOS and Mac will work

REQUIREMENTS

- Flex-6000 series radio (6700/R, 6600/M, 6500, 6400/M, 6300).
- Version 2 SmartSDR software license (\$199 or included with some radios)
- Internet connection at the radio end without Carrier Grade NAT
- Router that supports port forwarding or UPnP
- Client - Windows PC, Mac, iPhone/iPad, Maestro

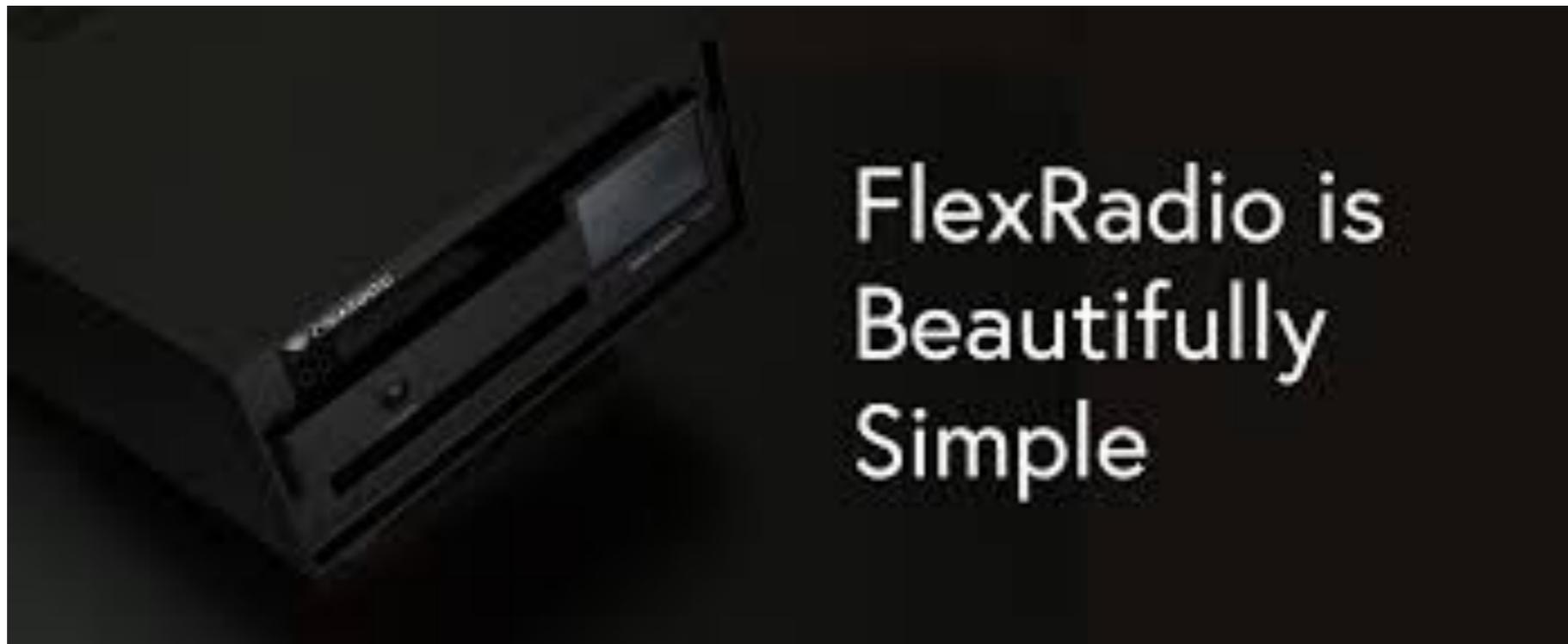
SECURITY

- All radio commands via TCP are encrypted with TLS
- Authentication supports Multi Factor Authentication (MFA)



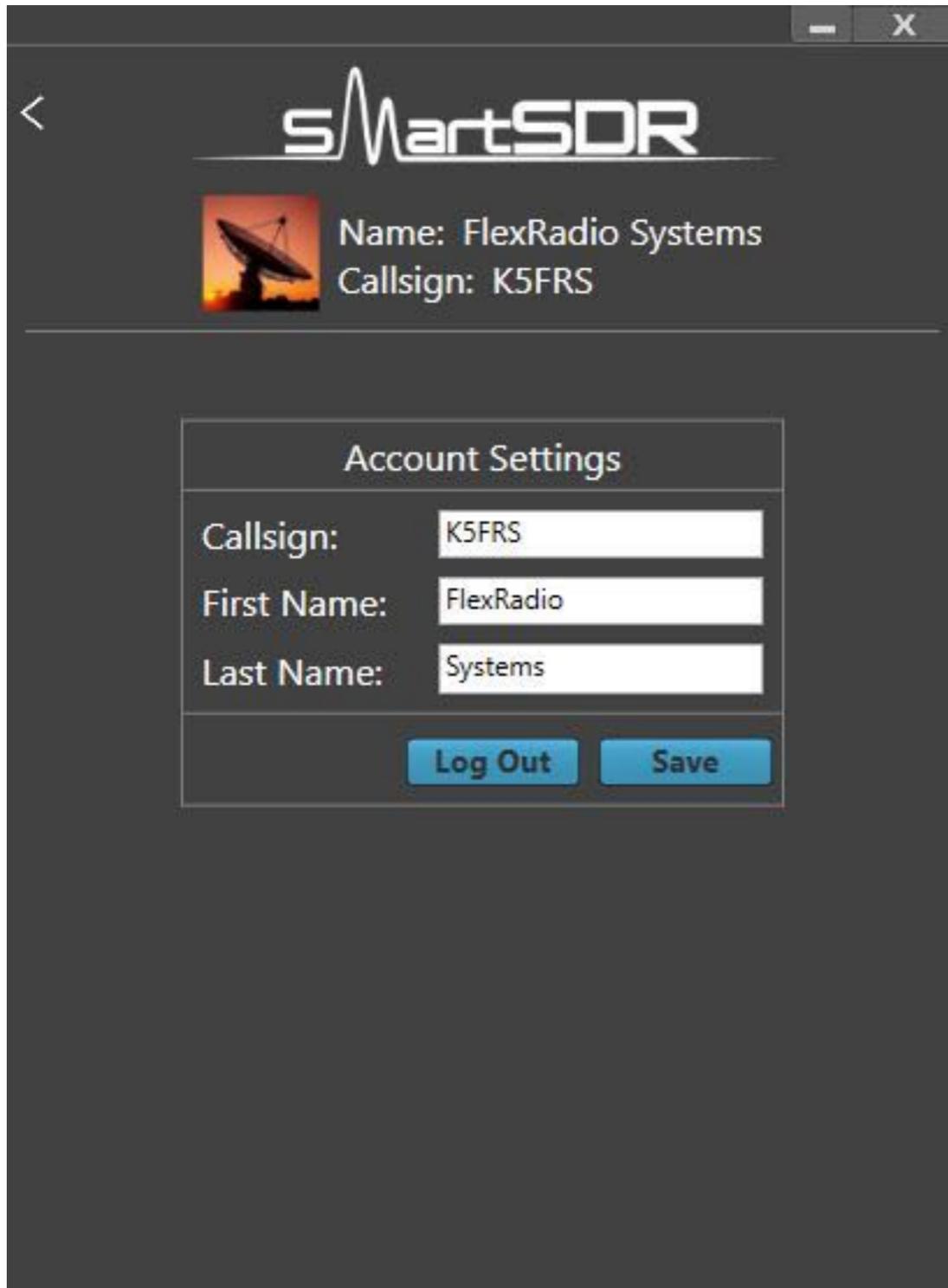
HOW IT WORKS – RADIO PAIRING

- Sign in to or create your Smartlink account. Account exists “in the cloud” at FlexRadio.
- Pair your radio to your account.
- Press PTT when prompted, and confirm via audio tone.
- DONE. Beautifully simple, no?



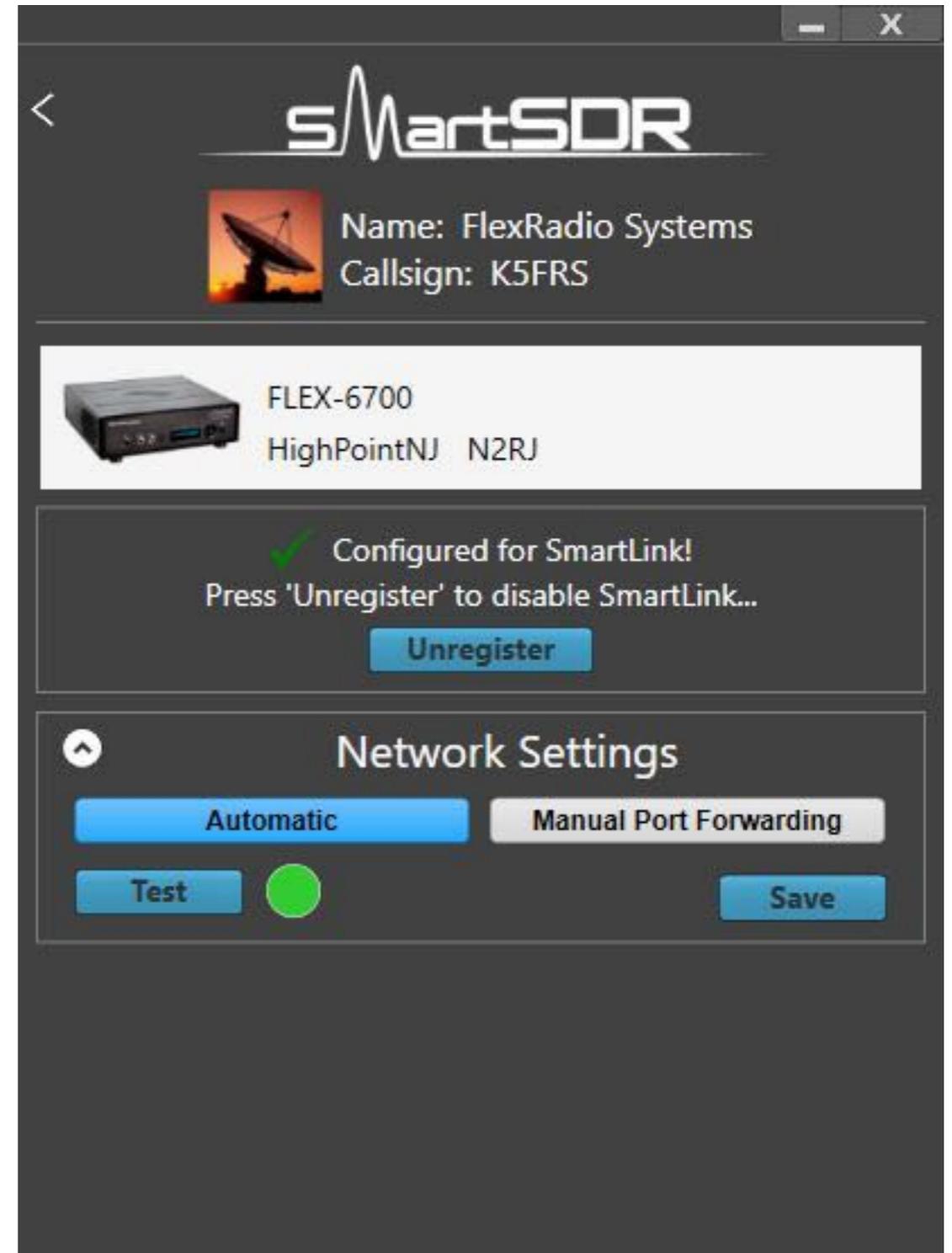
RADIO PAIRING

Step 1 - login



The screenshot shows the SmartSDR login interface. At the top, there is a back arrow and the SmartSDR logo. Below the logo is a profile card with a satellite dish icon, the name "FlexRadio Systems", and the callsign "K5FRS". The main section is titled "Account Settings" and contains three input fields: "Callsign:" with "K5FRS", "First Name:" with "FlexRadio", and "Last Name:" with "Systems". At the bottom of this section are two buttons: "Log Out" and "Save".

Step 2 - pair



The screenshot shows the SmartSDR pairing interface. It features the same top header as Step 1. Below the profile card, a device card is displayed with a radio unit icon, the model "FLEX-6700", and the location "HighPointNJ N2RJ". A green checkmark and the text "Configured for SmartLink!" are shown, along with the instruction "Press 'Unregister' to disable SmartLink...". A blue "Unregister" button is positioned below this message. At the bottom, the "Network Settings" section is visible, showing "Automatic" selected over "Manual Port Forwarding", a "Test" button, a green status indicator, and a "Save" button.

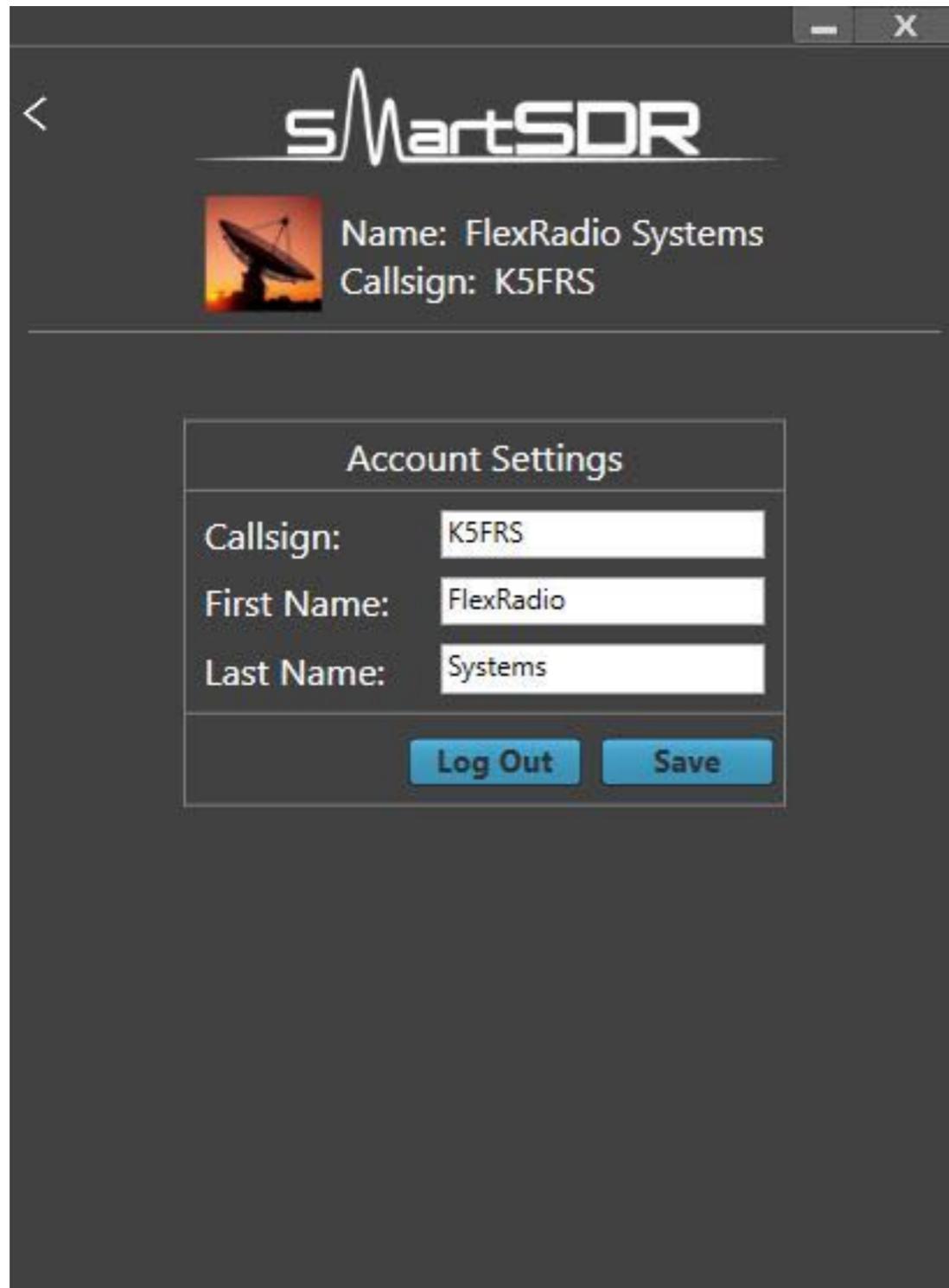
HOW IT WORKS – CLIENT SETUP

- Sign in to your SmartLink account on your remote device
- Click or tap the remote radio with the SmartLink icon
- FlexRadio Smartlink app in the cloud brokers the connection
- Radio and client are connected, Smartlink cloud app no longer in the picture



CLIENT SETUP - WINDOWS

1. Login



The login window features the SmartSDR logo at the top. Below it, a profile card shows a satellite dish icon, the name "FlexRadio Systems", and the callsign "K5FRS". A central "Account Settings" panel contains three input fields: "Callsign:" with "K5FRS", "First Name:" with "FlexRadio", and "Last Name:" with "Systems". At the bottom of this panel are two buttons: "Log Out" and "Save".

SmartSDR

Name: FlexRadio Systems
Callsign: K5FRS

Account Settings

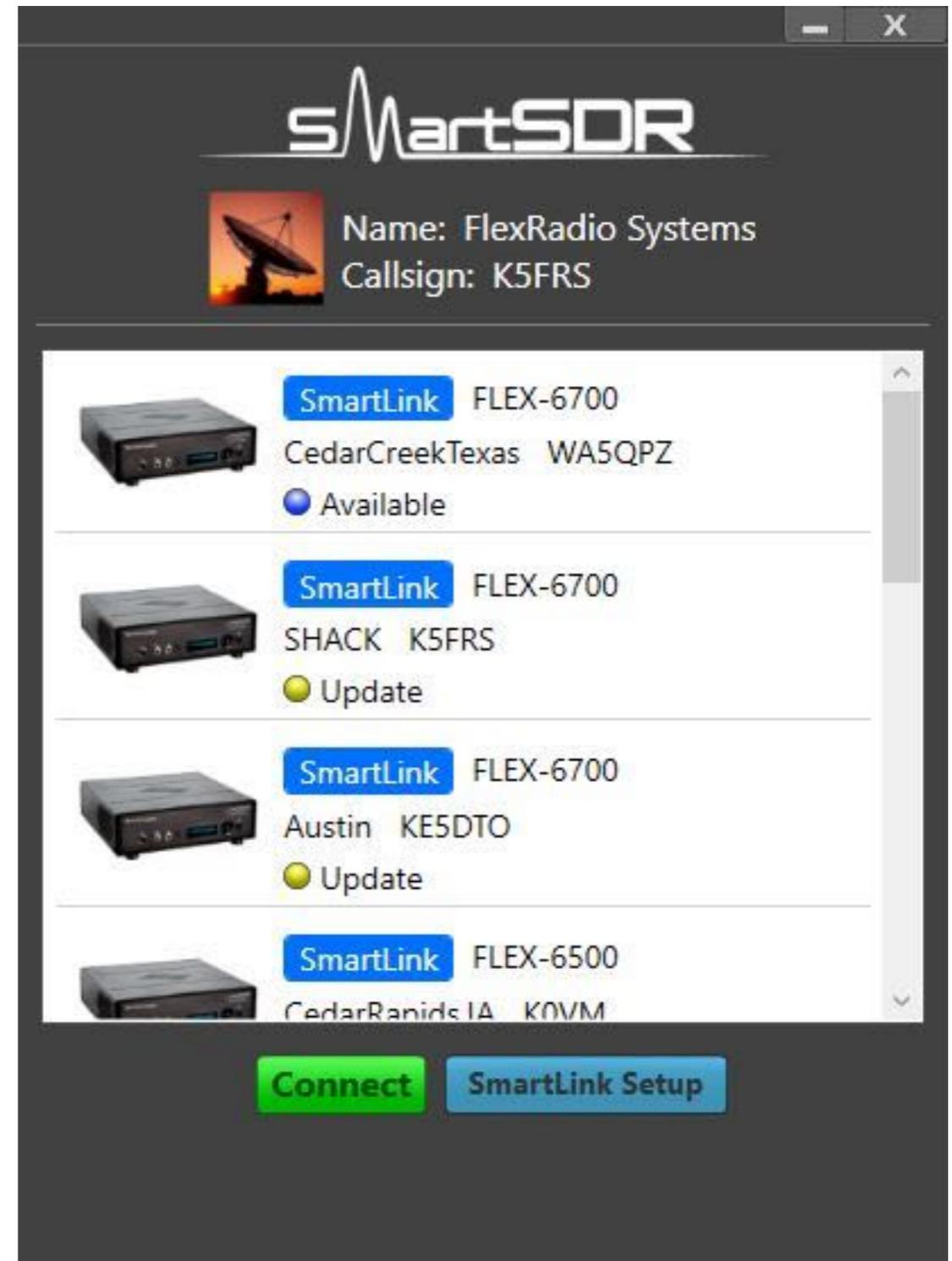
Callsign: K5FRS

First Name: FlexRadio

Last Name: Systems

Log Out Save

2. Connect



The connect window displays the SmartSDR logo and the user's profile information. Below this is a scrollable list of four radio units, each with a SmartLink button, a radio model, a location, and a status indicator. At the bottom, there are two buttons: "Connect" and "SmartLink Setup".

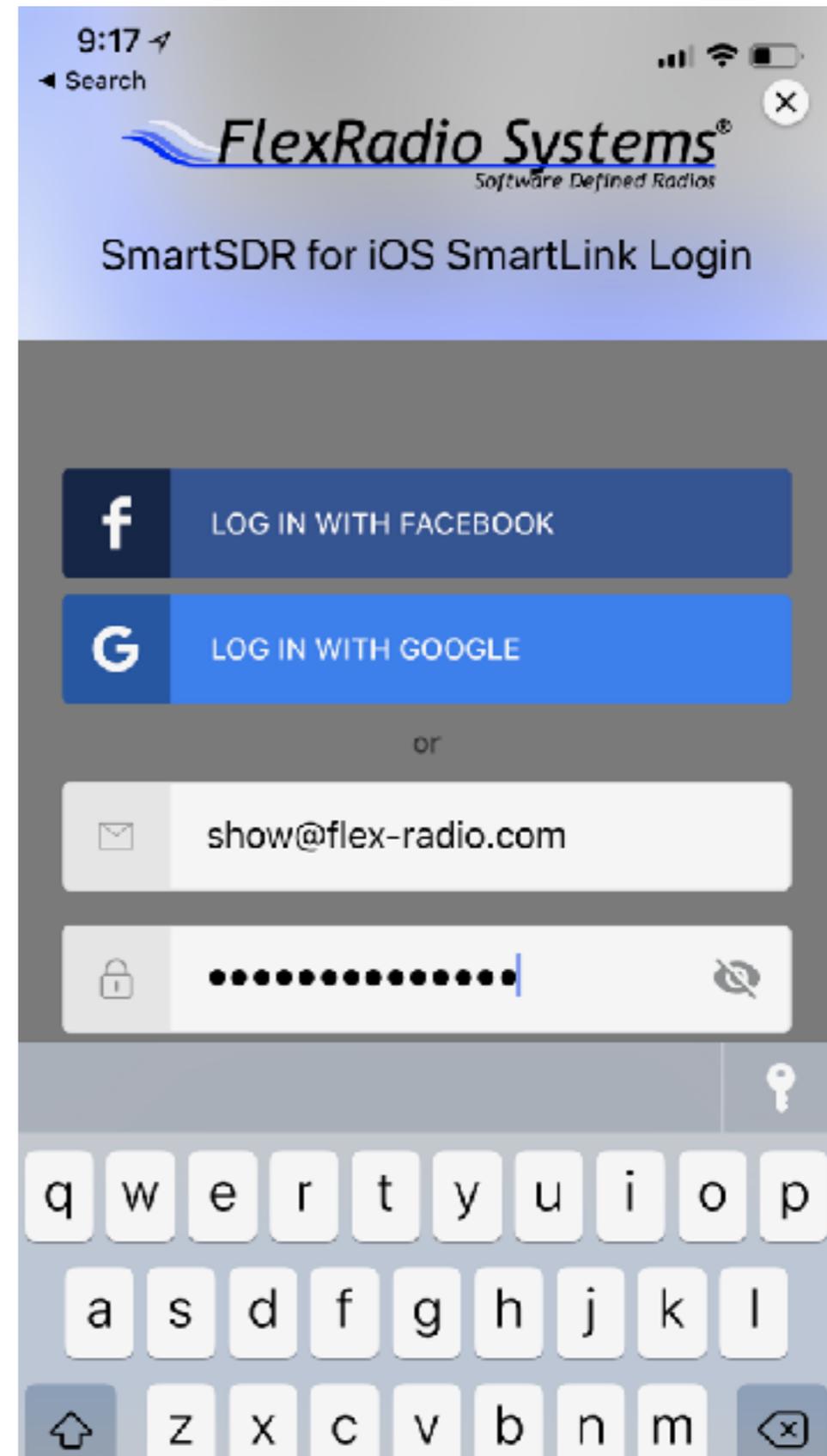
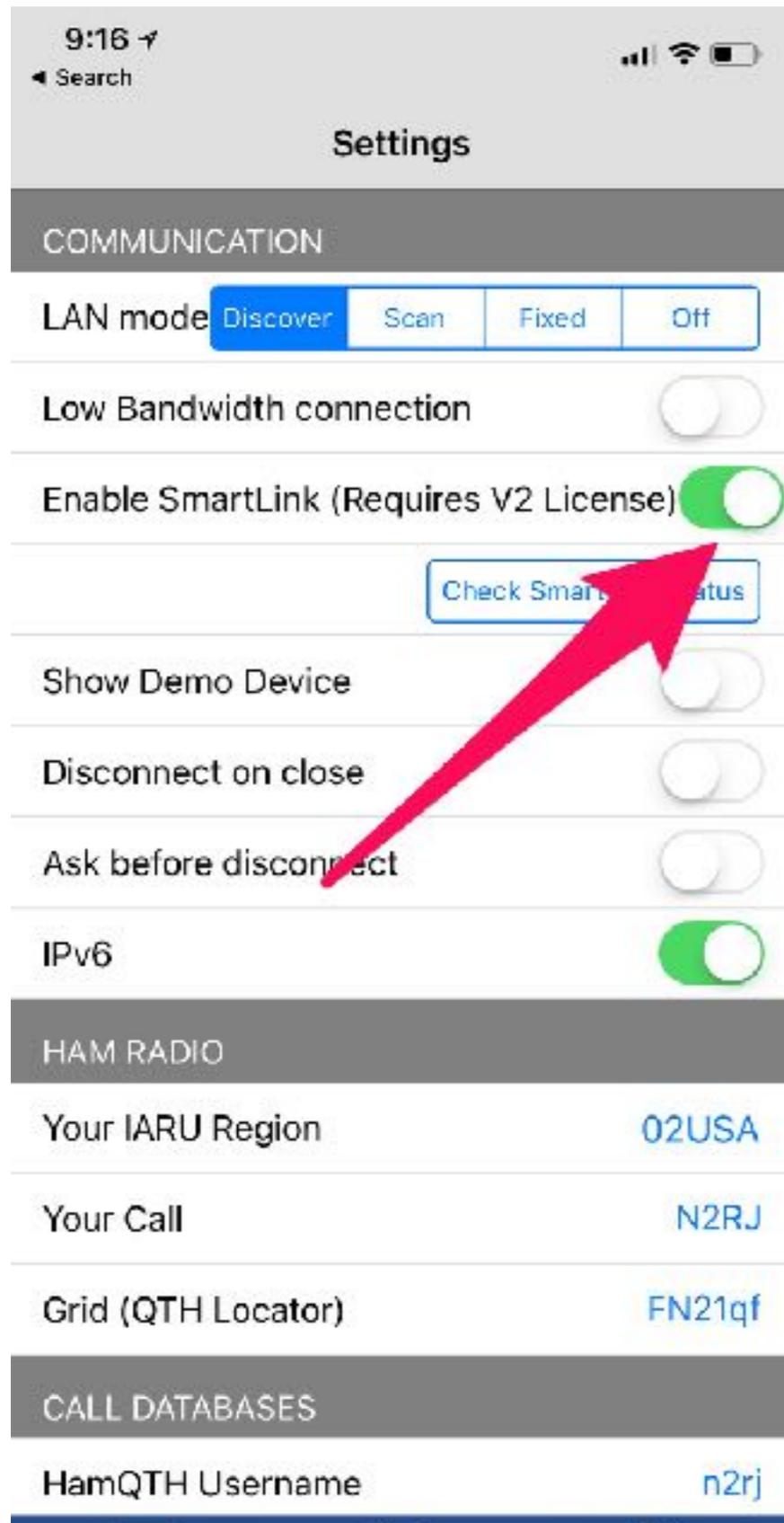
SmartSDR

Name: FlexRadio Systems
Callsign: K5FRS

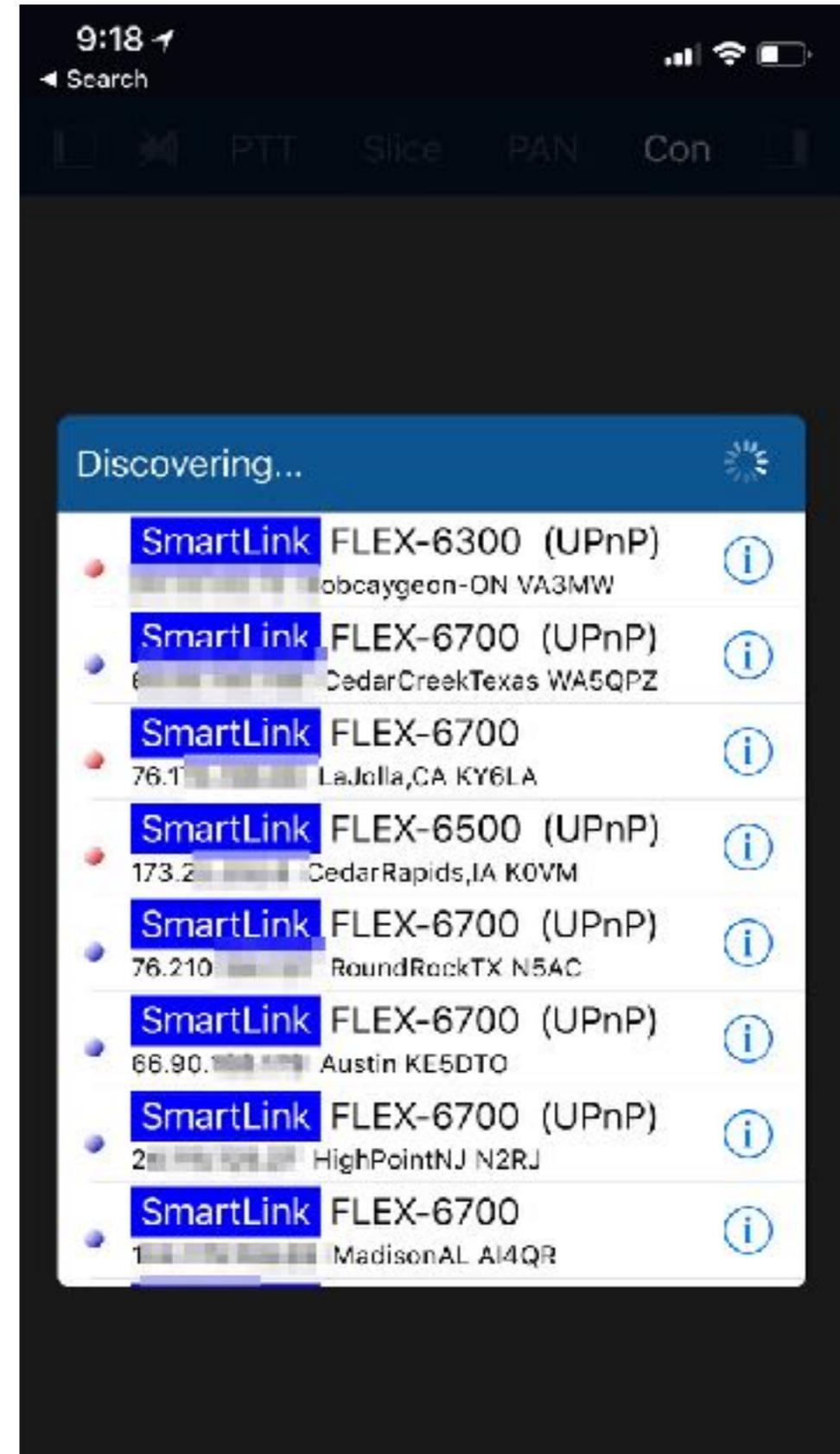
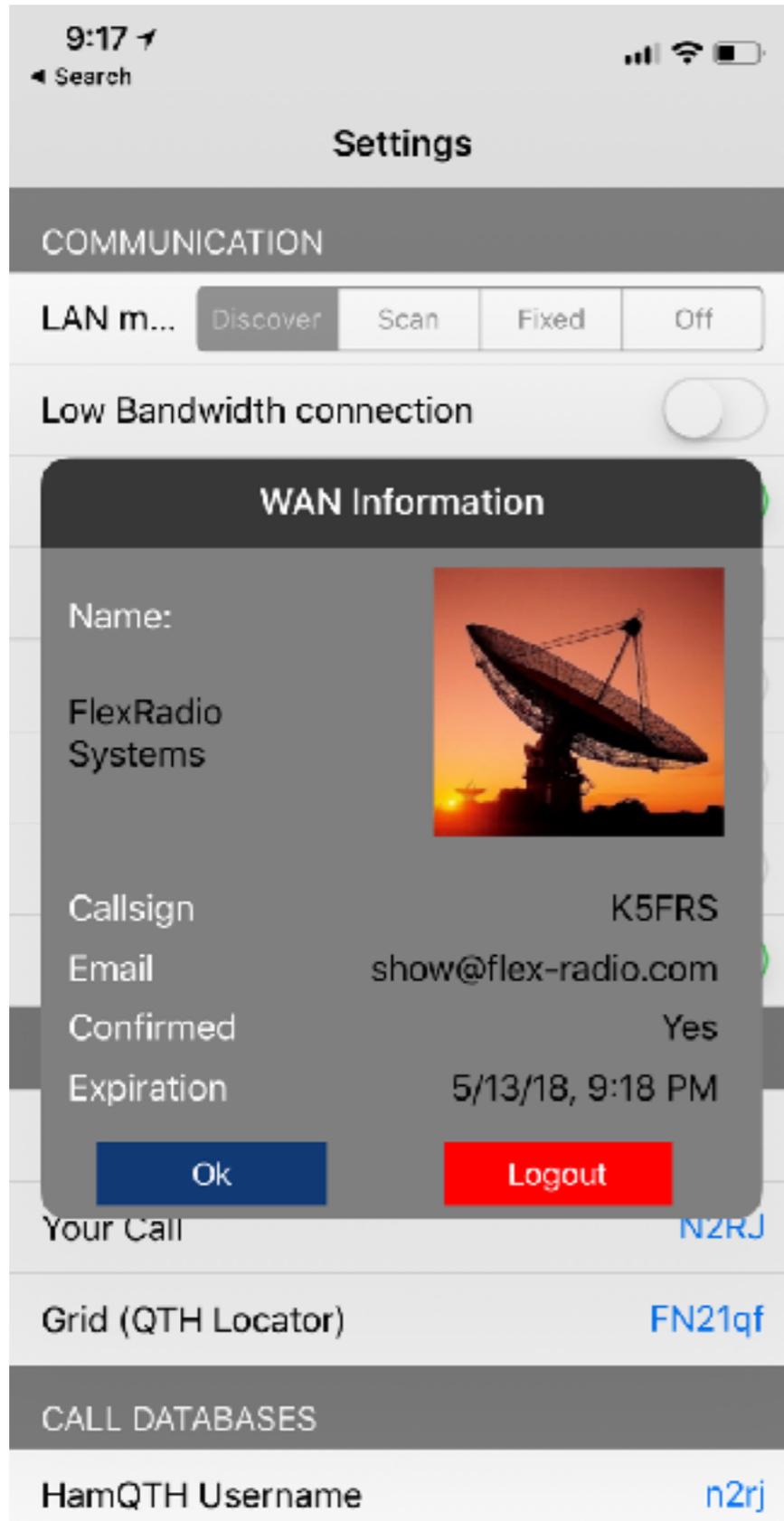
| | |
|---|---|
|  | SmartLink FLEX-6700 CedarCreekTexas WA5QPZ <input checked="" type="radio"/> Available |
|  | SmartLink FLEX-6700 SHACK K5FRS <input type="radio"/> Update |
|  | SmartLink FLEX-6700 Austin KE5DTO <input type="radio"/> Update |
|  | SmartLink FLEX-6500 CedarRapids IA K0VM |

Connect SmartLink Setup

CLIENT SETUP - IOS

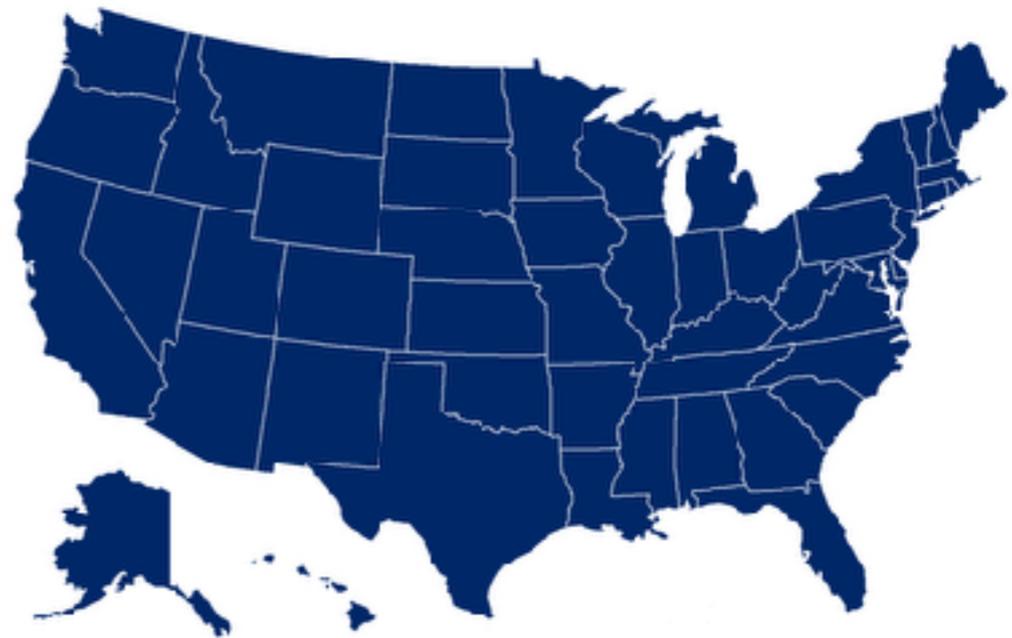


CLIENT SETUP - IOS



LEGAL ISSUES – US LICENSEES AND STATIONS

- Radio will stop transmitting after a short period of time if control link is interrupted (97.213(b))
- Control point is the client software (97.109 (c)). You are always in full, exclusive control.
- If you let others use your station, verify they can legally operate. You can monitor their operation via DAX.
- CEPT operators not physically present in the US may not operate US remote stations.



LEGAL ISSUES – WORLDWIDE

- Check your local regulations
- Some may prohibit remote operation entirely
- Some may require a special license/variation
- Some may limit who/when/where/license class

Physical Map of the World, February 2016



ETHICS WHEN OPERATING REMOTELY

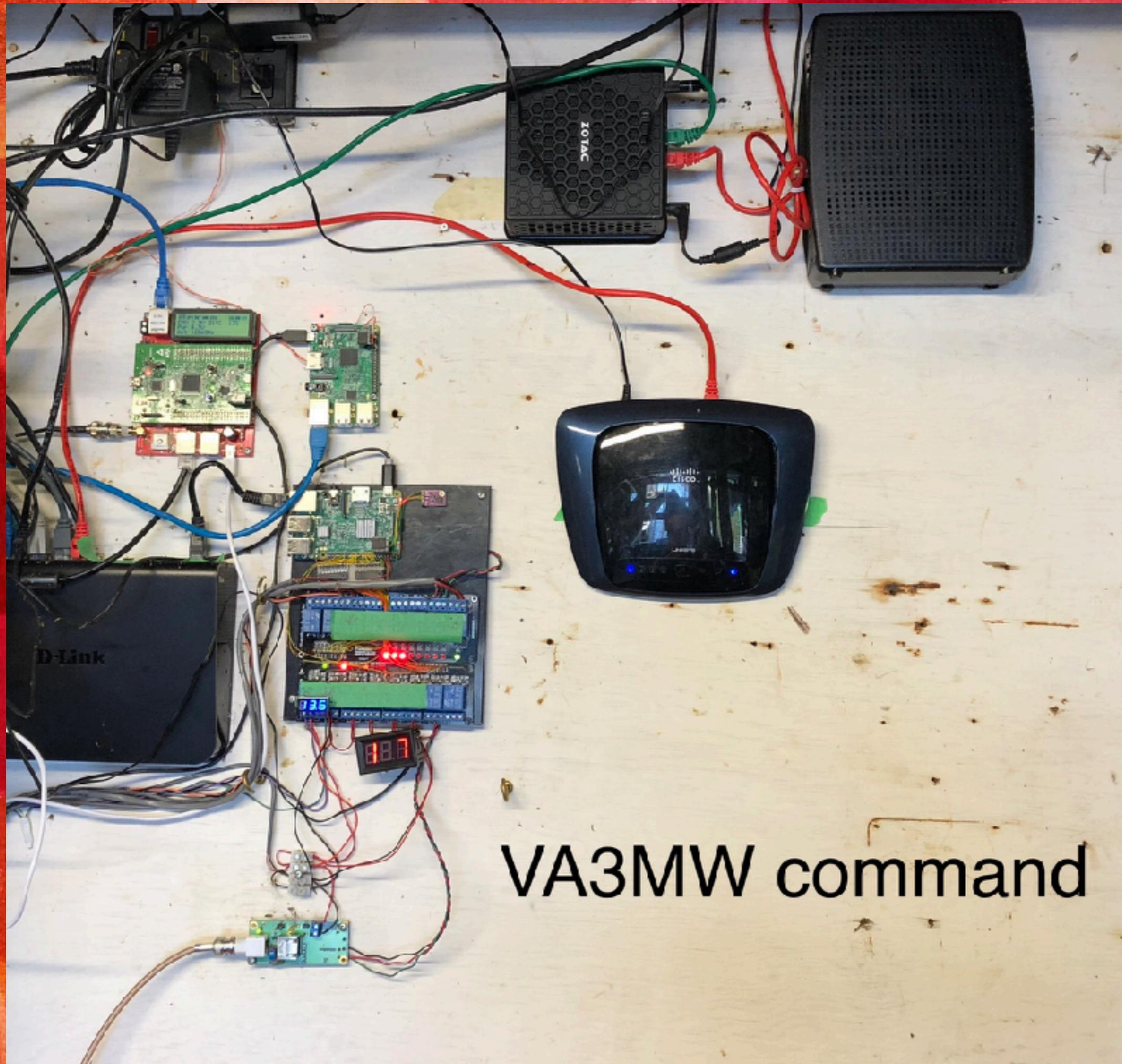
- Always identify where your transmitter is, NOT where you, the operator physically are
- Awards are largely on the honor system. Some ban or restrict remote receivers. However most are fine if receiver and transmitter are in the same location.
- DXCC now allows remote operation.

CONTROLLING OTHER EQUIPMENT

- Smartlink and SmartSDR has limited ability to control other equipment.
- Flex-6000 radios can send ethernet commands or serial commands via USB, which relay the frequency of a slice or TX antenna port.
- No rotor control. PSTRotator or DDUtil works.
- Basic tunable antenna (SteppIR) control. (controller follows slice frequency)
- Power Genius XL amplifier is fully controllable within SmartSDR
- SmartLink cannot reset the radio, nor can it power on/off (radio must be always on or you must have external means to power off/on)

SOLUTIONS!

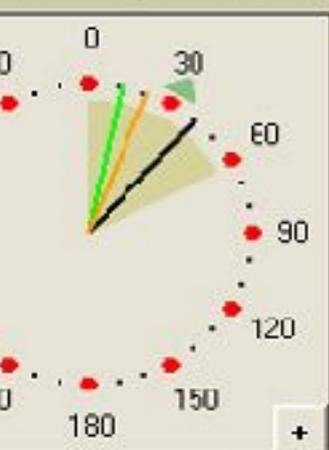
- Remote web switch
- RemoteQTH using Raspberry Pi
- Other home automation solutions
- Windows PC with teamviewer
- VPN



VA3MW commmand

VA3MW Remote Base PstRotatorAz - Registered to VA3MW v13.21

Location Setup Tracker Map View Show Preset Help



DXCC
 DX Local Time: ?
 1A: Gov Mil Order of Malta
 1S: Spratly Islands
 3A: Monaco
 386: Agalega & St. Brandon
 388: Mauritius
 389: Rodriguez Island
 3C: Equatorial Guinea

Mode
 Manual Tracking

QRB
km

QTH Locator
 GO to Locator

Az
 31 41 **GO**

BD 0 90 **ANT** 1 **STOP**

UTC
15:14:13

Call **GO**

Flex-6000 Setup

FlexRadio
 Use Flex-6000
 IP Address

Connected
 50.323 MHz

CMD

Commands

- Ground
- 40M Array
- 80M SSB
- 40 V
- SteppIR
- Dummy Load
- 160/80M CW
- spare
- spare
- spare

Elecraft W2 - Server

Help

Sensor2 = HF 2KW

2W 20W 20CW 2KW AUTO **SENSOR** S1 S2 **SETUP**

| | | | | | | | | | | | | | | | | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|--|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | |
| <input type="text"/> | |
| | | | | | | | | | | | | | | | | | | | | |
| 1 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2 | 2.5 | 3 | 3.5 | 4 | 5 | | | | | |
| <input type="text"/> | |
| | | | | | | | | | | | | | | | | | | | | |

0.00W
0.00W
0.00:1

ROP **PWR(ser)** **PWR(led)** **PEAK** **DECAY** **LED** **ALARM** **CAL**

FAST **PEP** **AVG** **ON** **SLOW** **ON** **OFF** **509**

VA3MW Remote Base SteppIR Controller

Setup Calibrate Radio View

To SteppIR **From SteppIR**

Bands

Normal **180** **Bi-Dir** **3/4** **160 Auto**

Auto **Home** **Manual** **Relay**

VA500 Remote by Elecraft®

Connect Disconnect Mini Mode About

Operate Operate **Standby** **Band** 80m

0 W
0.0 to 1
0.0 A
0.0 V
C
Speed: Auto

PWR OFF Clear Fault

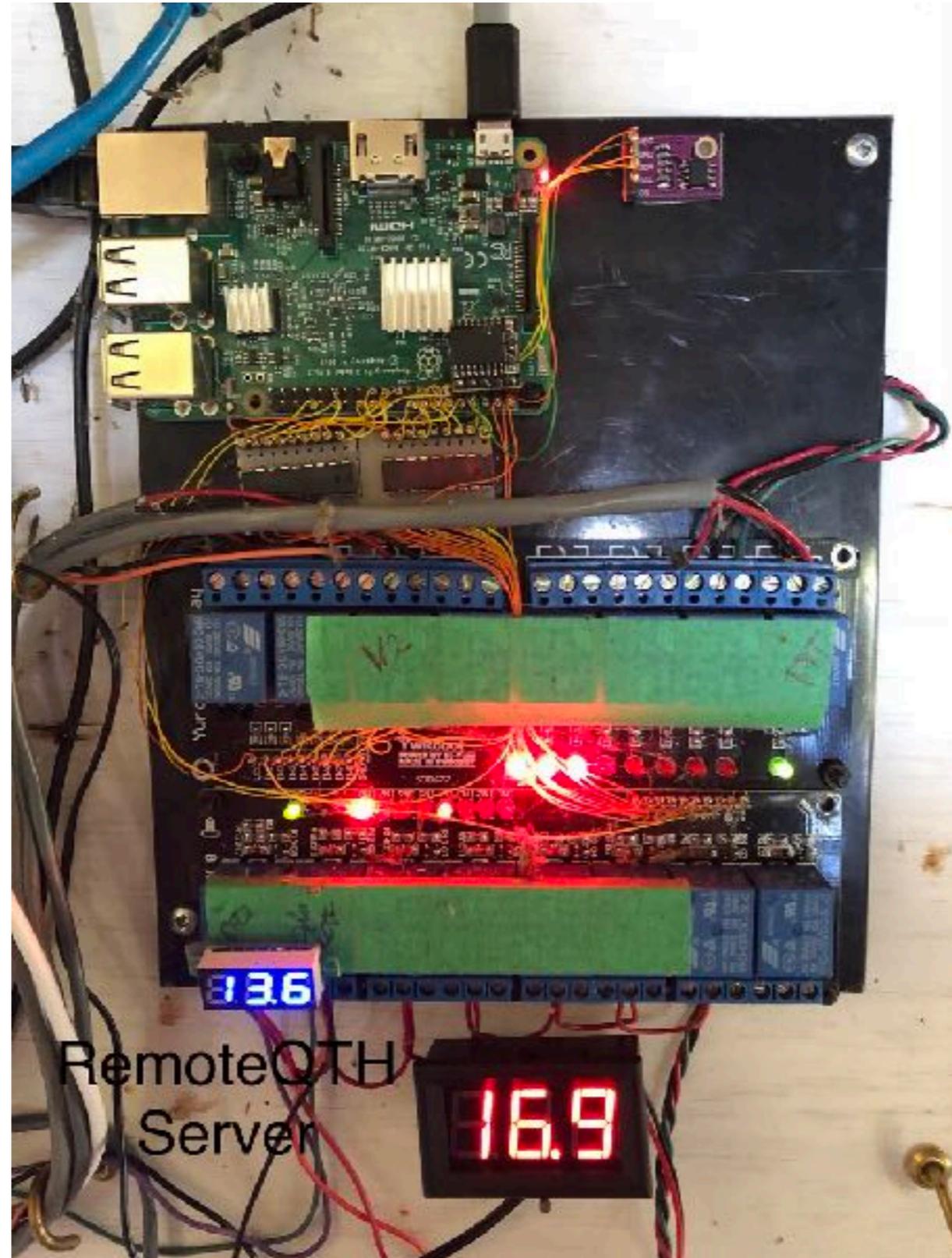
Antenna control

RPT Internal 37.0 °C
 Bathouse 17.0 °C

AC Power **6300 PWR** **W2 PWR** **RX 1/2**

PTT Auto-OFF **40M E/W** **480 6300**

THE BRAIN



REMOTE OPERATING EXAMPLES

N2KOJ OPERATING 13 COLONIES

THE US. ORIGINAL 13 COLONIES SPECIAL EVENT GROUP PRESENTS THE 9TH ANNUAL
★ 4th Of July Week - The Original 13 Colonies Special Event ★

INDEPENDENCE WEEK 2017

JULY 1ST - JULY 6TH

MAY GOD BLESS AMERICA

LIBERTY OR DEATH



SAMPLE



DONT TREAD ON ME



IN RECOGNITION FOR PARTICIPATING IN THIS 4TH OF
JULY WEEK - 13 COLONIES SPECIAL EVENT, THIS
CERTIFICATE IS AWARDED TO ARS: - KU2US

73'



ALL 13 COLONY STATES
CLEAN SWEEP



WM3PIN



GB13COE



K2A
NY

K2B
VA

K2C
RI

K2D
CT

K2E
DE

K2F
MD

K2G
GA

K2H
MA

K2I
NJ

K2J
NC

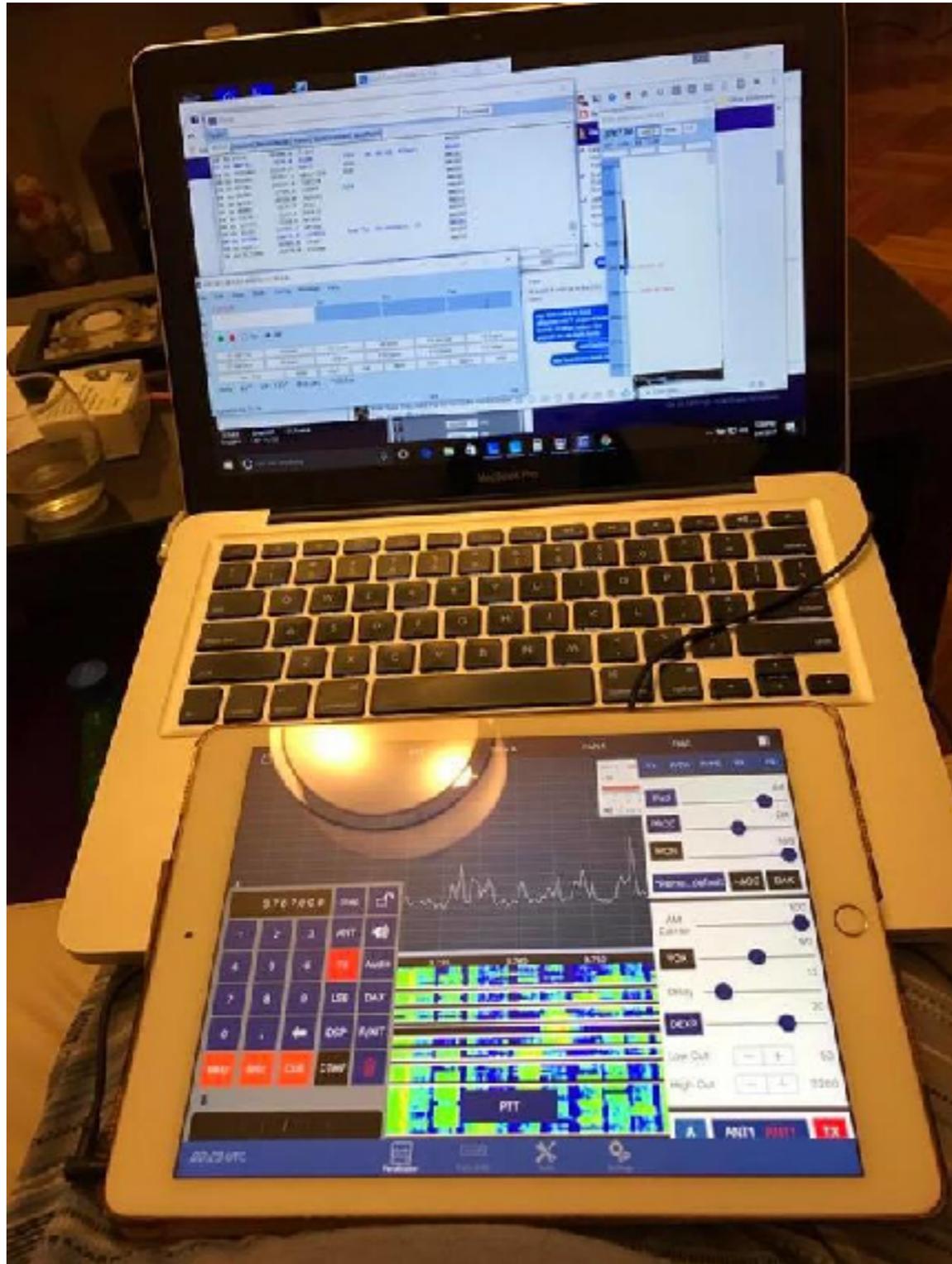
K2K
NH

K2L
SC

K2M
PA

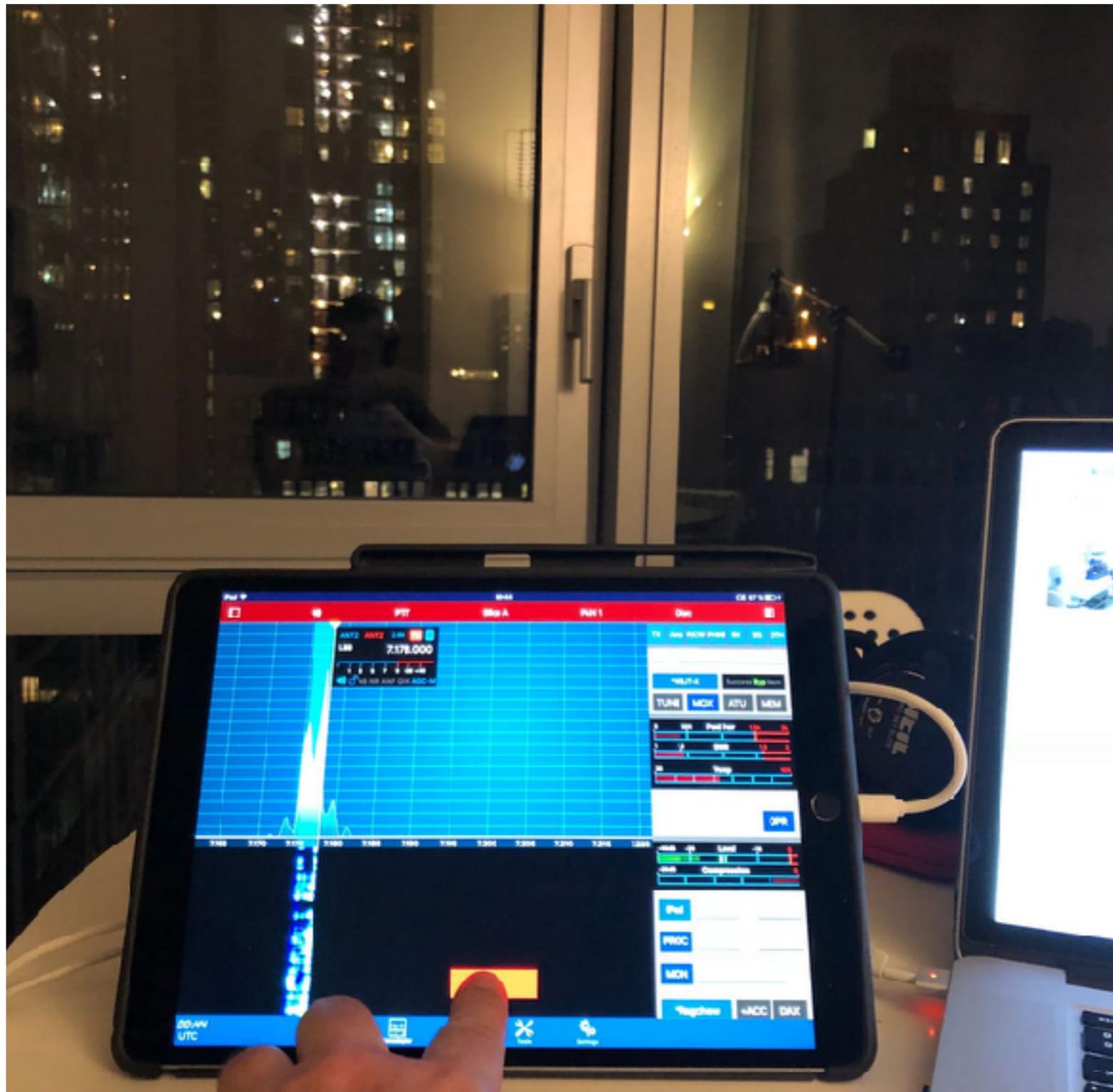
KEN VILLONE-KU2US-EVENT MGR: *Ken Villone*

ARRL DX SSB REMOTELY FROM BUENOS AIRES, ARGENTINA



SmartLink with iPad

SmartLink CAT for N1MM+



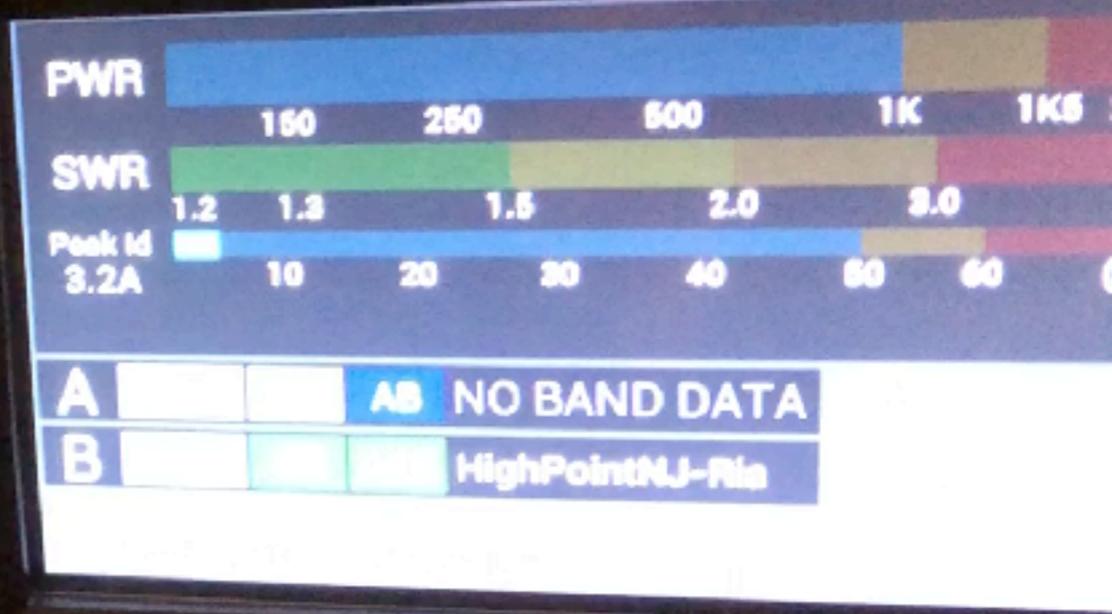
*Allan, EA3HSO operating as W2/EA3HSO on his iPad and Bluetooth headset
Physically present in NYC, operating N2RJ station in NJ*

FlexRadio

HF/6M AMPLI



STBY/OPER



POWER GENIUS XL

4 3A in

QUESTIONS AND LIVE DEMO

n2rj@arrl.net

<http://n2rj.com>

<https://www.flexradio.com>