Why Remote Operating ?

- Antenna restrictions
  - Apartment, HOA, Condo
- Not able to maintain station/antennas
- Station at 2nd home
- Operate when DX station is on, rather than when you are at your station
- Low upfront cost to enjoy operating

- Great way to get on the air!

Remote Operating is Legal

- FCC Rules: Part 97.109 Station control
  - “Any station may be remotely controlled”
- DXCC Rules: Rule 9
  - All stations must be contacted from the same DXCC entity. The location of any station shall be defined as the location of the transmitter. For the purpose of DXCC credit, all transmitters and receivers must be located within a 500-meter diameter circle, excluding antennas. QSOs made with legally licensed, remotely controlled stations are allowed to be used for DXCC credit
- CQWW Rules: IX 5.
  - Remote operation is permitted if the physical location of all transmitters, receivers, and antennas are at one station location….

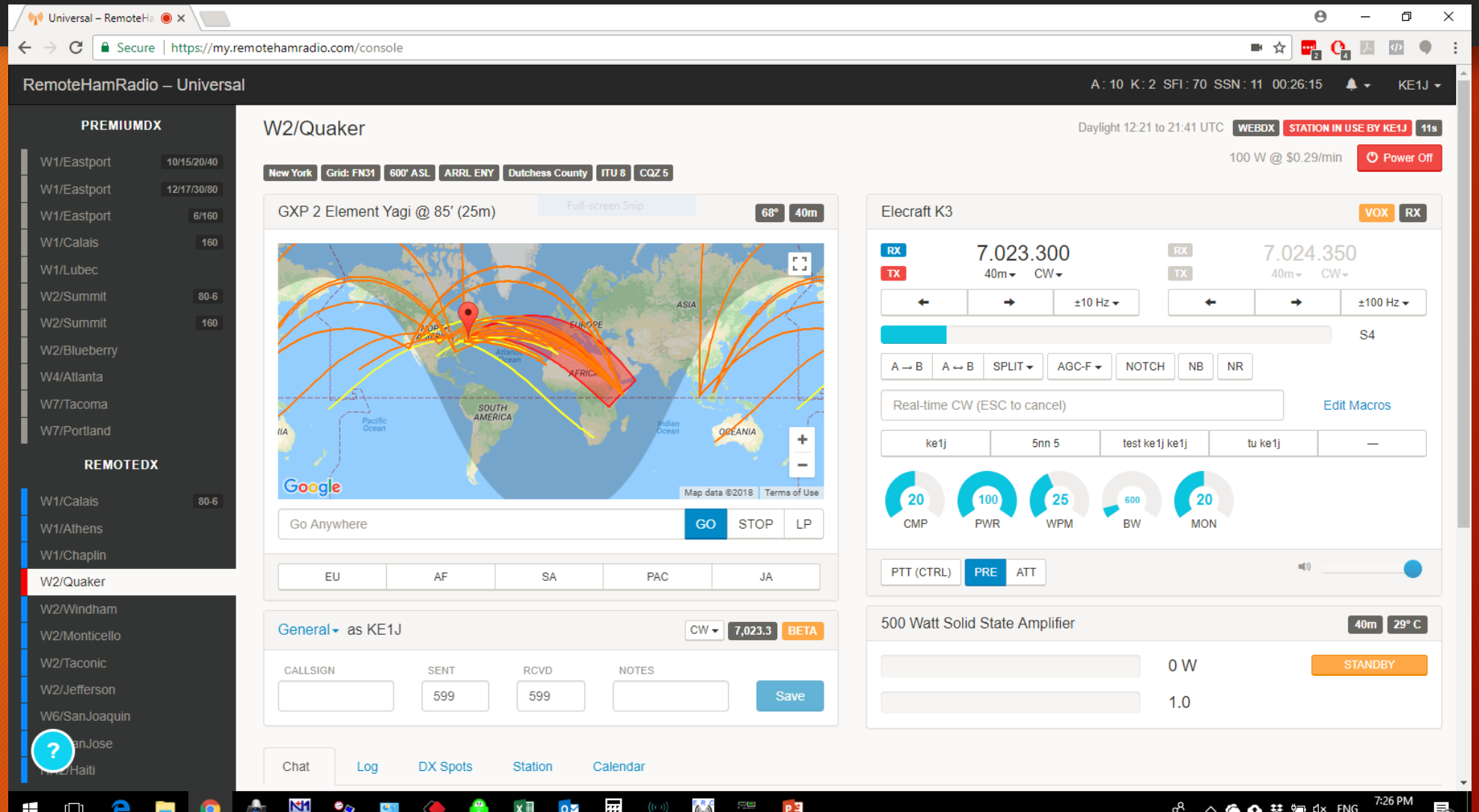
Four Basic Needs for Remote Operation

1. **Audio In/Out**
   - **Access to MIC/SPKR, Line In/Line Out**
2. Radio Control
   - To read and set radio Frequency, Mode, PTT, CW
3. Station Control
   - AC Power outlets, antenna switching, rotators, tuners, amplifiers etc
4. “Good” internet service
   - Low delay under 100ms, low packet loss, speeds over 1 Mbps

Four Ways to Remote Operate

1. Web Browser Access
   - Any device
   - RemoteHamRadio.com
2. Software Programs
   - RemoteHams.com
3. Remote Desktop
4. Remote “Front Panels/Radio”
   - RemoteRig
   - K3/K3-mini/Flex

1. Web Browser Access (RemoteHamRadio.com)



RemoteHamRadio.com

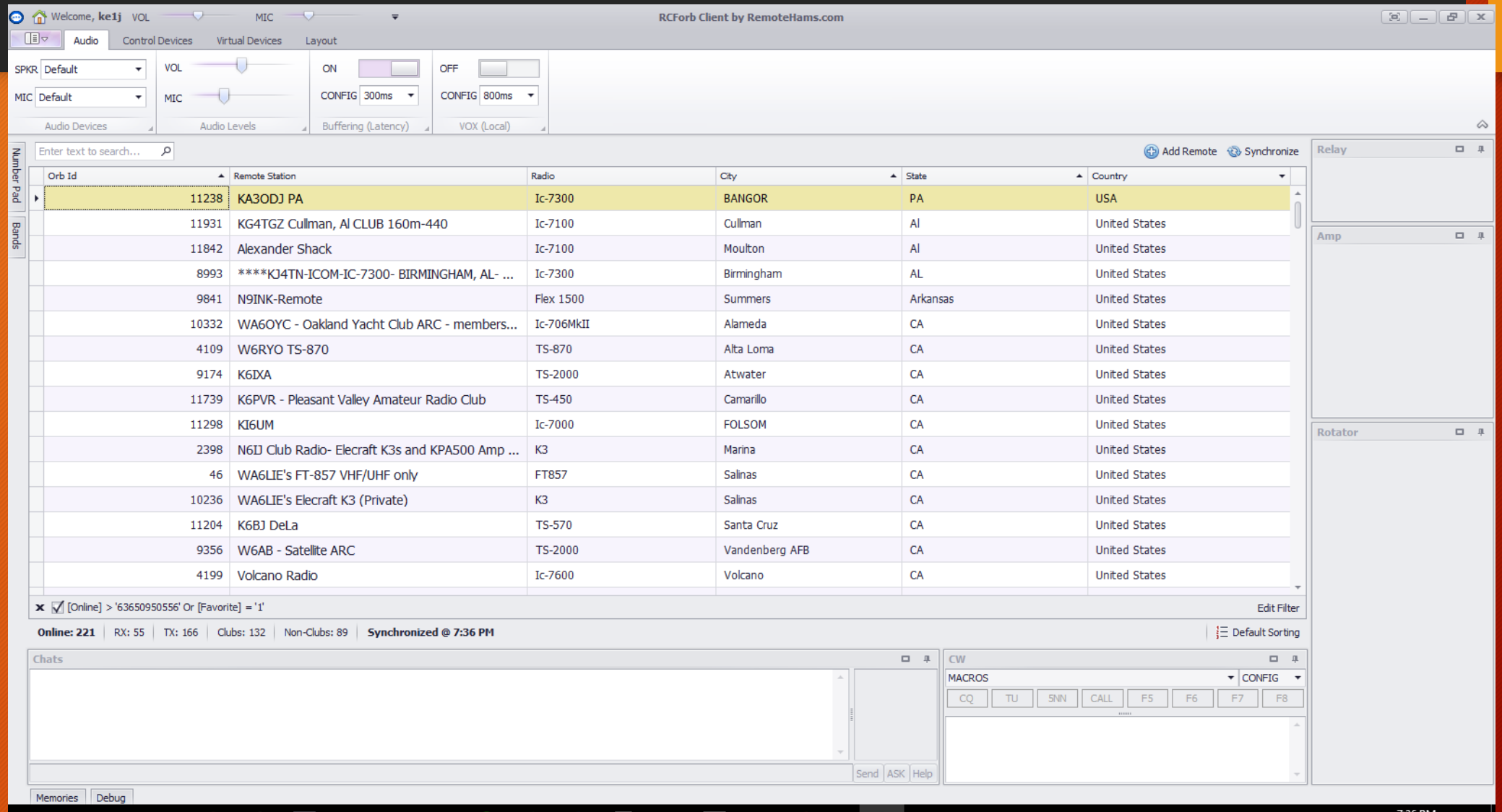
- $99/year plus 9 to 49 cents/min
- Can be accessed with
  - Chrome web browser
  - iPhone
  - iPad
  - RemoteRig hardware
- Use K3 or K3/0-Mini without any extra hardware!
- US Stations and HH2AA
- Verifies your US license!

RemoteHamRadio.com

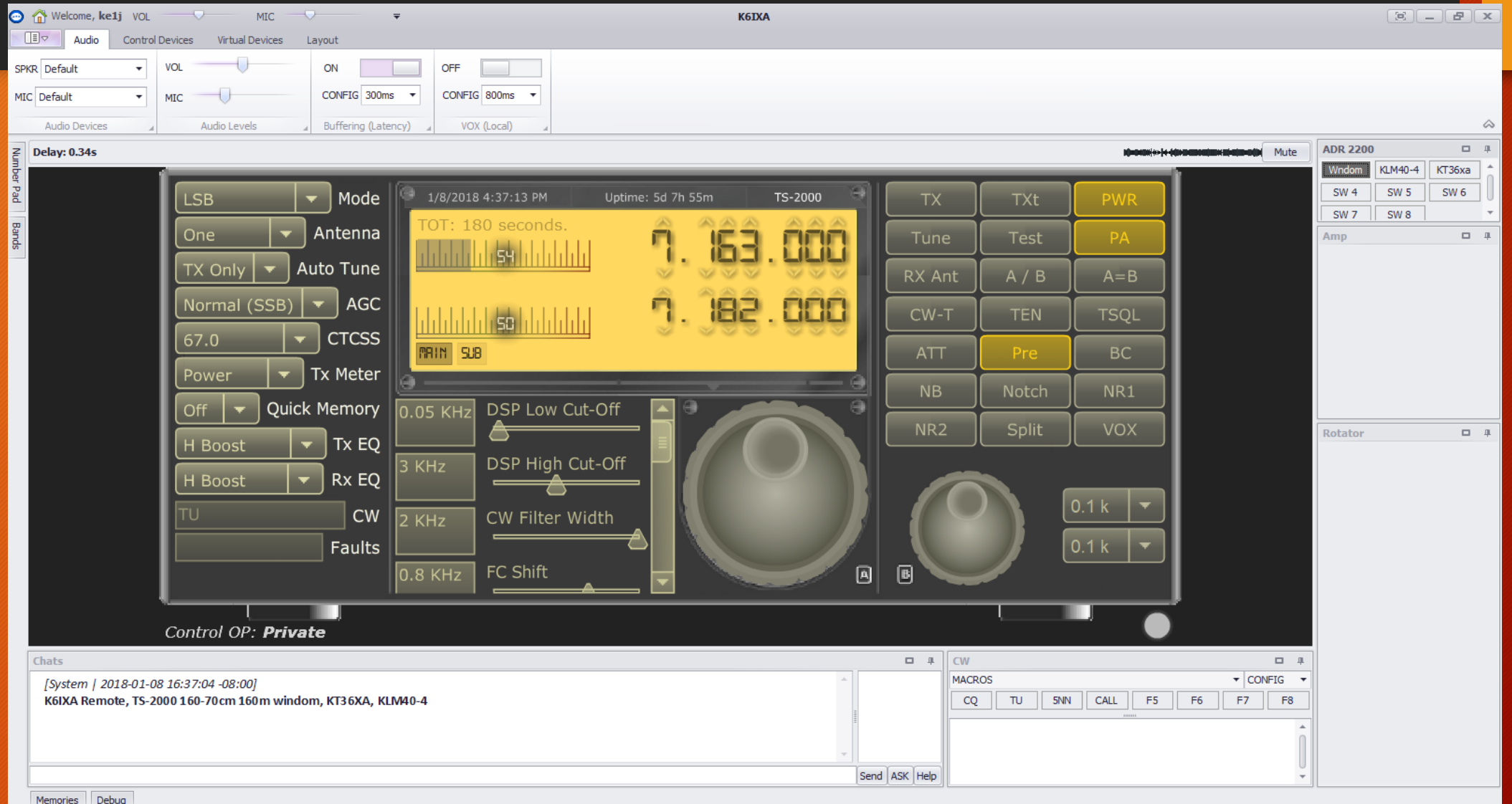
- Easy to sign up and get started.
- No equipment to buy.
- No software to maintain.
- 20+ stations to choose from.
- All types of antennas (OCF dipole to stacked yagis)
- No repairs or maintenance

- Hands down the best option for Remote Operating

2. Software Programs (RemoteHams.com)



2. Software Programs (RemoteHams.com)



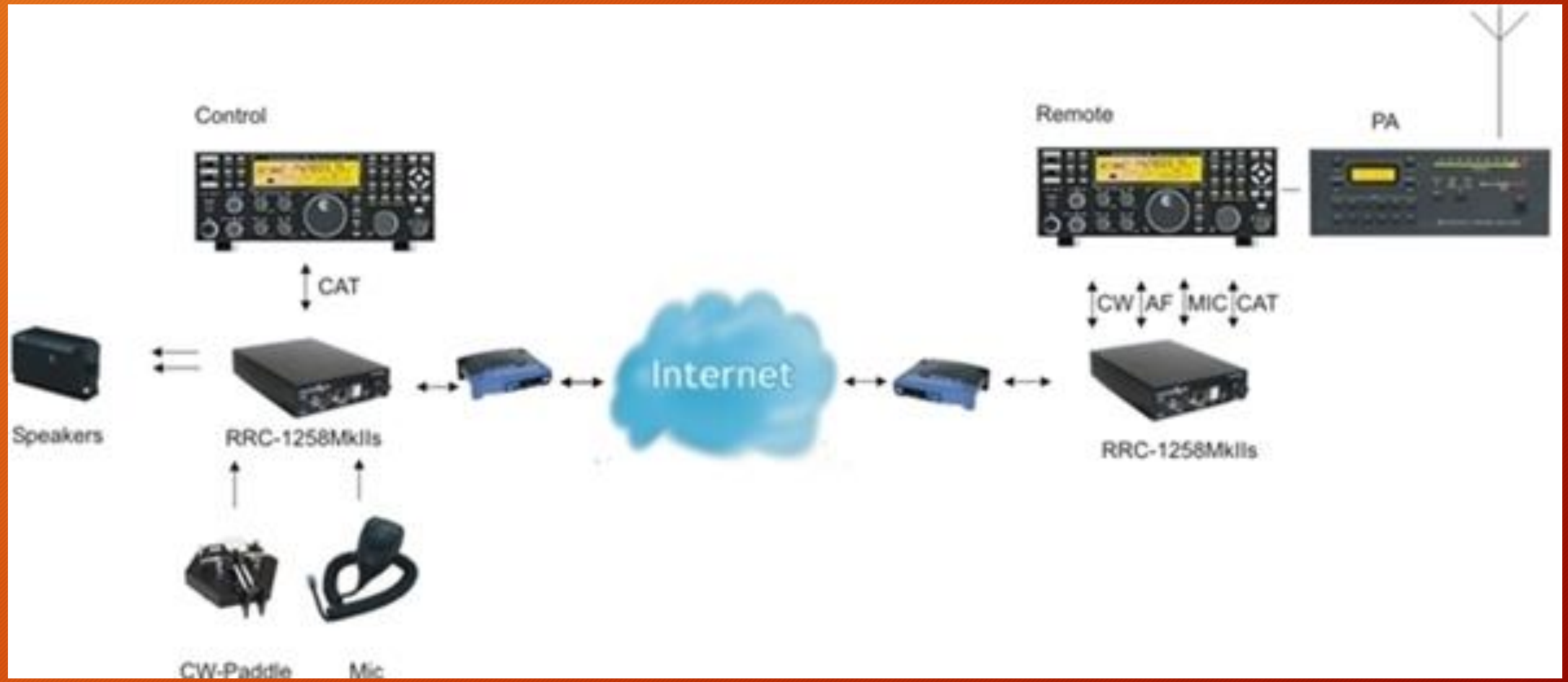
2. Software Programs (RemoteHams.com)

- “Free”
  - Software is free
- LOTS of stations around the world
- Some stations require “membership”
- Must use RCForb Client Software
- Only works on a Windows PC
- No or limited verification of license
- Great if you want to listen/tune around - FREE

3. Remote Desktop

- Use “remote desktop” software to connect to shack PC
  - Team Viewer
  - Any Desk
  - Windows Remote Desktop
  - Skype
- NEEDS High Speed Internet (lots of bandwidth)
- Not recommended!!!!!

4. Remote “Front Panel/Radio”



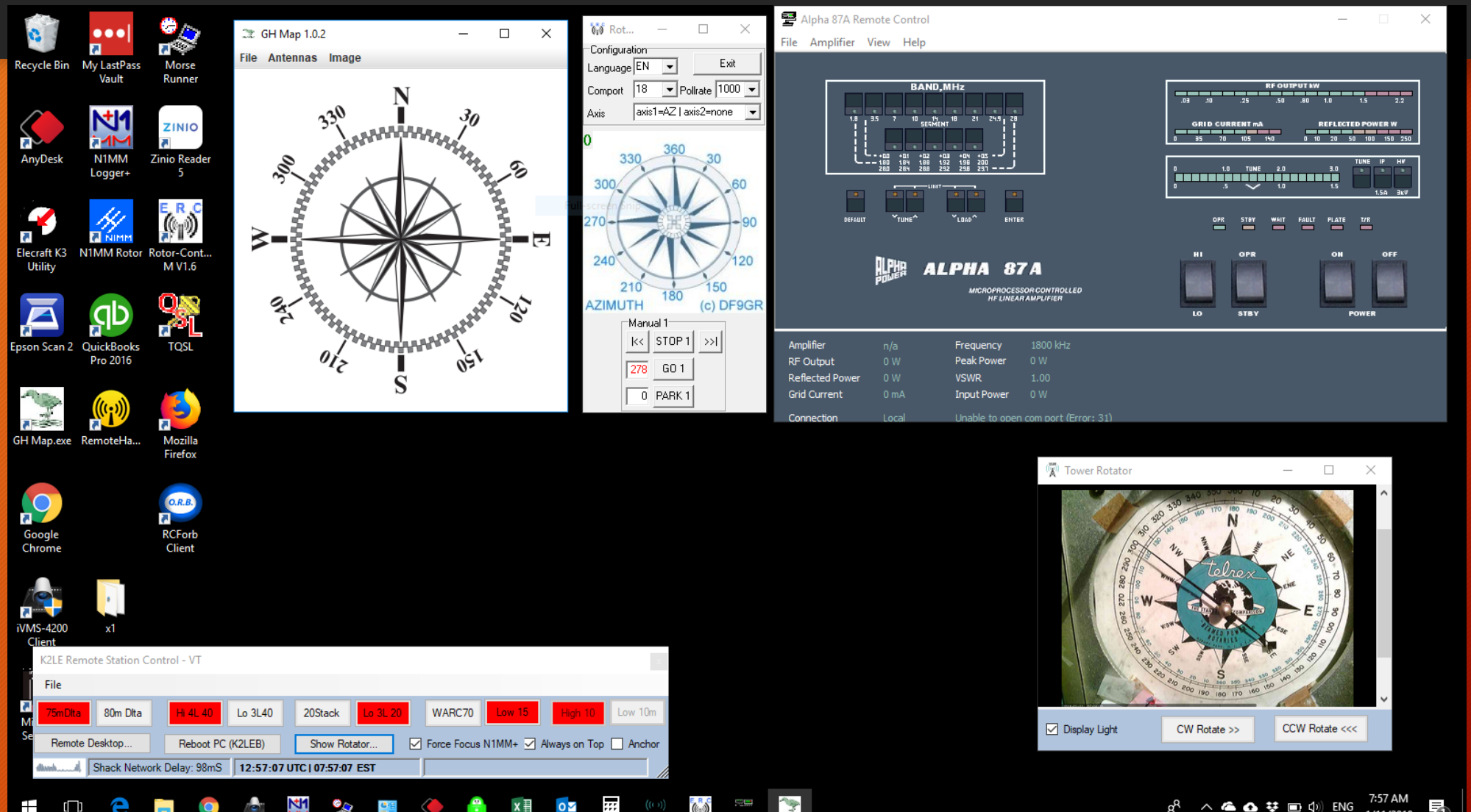
4. Remote “Front Panel/Radio”

- No PC required (except to configure)
- Real Radio feel (VFO, knobs and buttons)
- Uses a pair of Microbit RemoteRig “modems” to transfer audio, radio control
- K3 or K3/0-Mini can be used with RemoteHamRadio.com without any extra hardware!

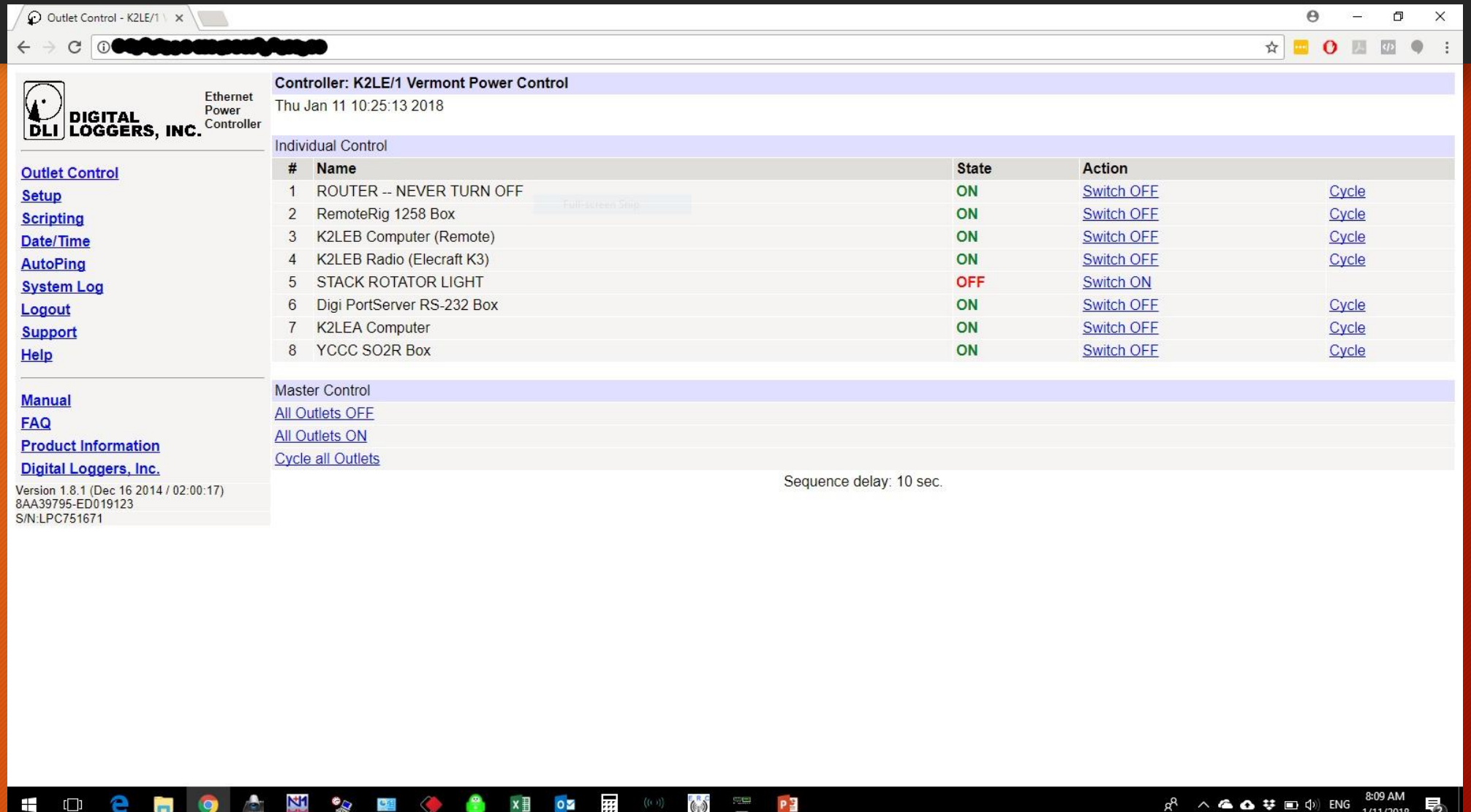
What is the REAL Problem ?

- Station Control!
  - AC Power outlets
  - Antenna switching
  - Rotators
  - Amplifiers
  - RX-only antennas

K2LE “Control Screen”



K2LE “Power Control Screen”



Lets kill the myth that it's expensive!

Cost to use RHR Quaker Hill (100W)	
Elecraft K3/0-Mini	$700
Total	**$700**
Annual subscription	$99
Cost per min	$0.29
Cost per hour	$17.40

Antennas at RHR Quaker Hill, NY (70' tower)	
6M	7el
10, 12, 15, 17, 20 M	4el Full Size
30, 40 M	2el Full Size
80M	Full size vertical
160M	INV L

- Remove K3/0-Mini if you don't want "knobs"
- You can get on the air with a good station for less than $100!!

Lets kill the myth that it's expensive!

Cost to build own Station	
Elecraft K3s (100W)	$4,200
70' Rhone 45 with Rotator	$6,000
Antennas (6, 10 - 40)	$4,000
Cables/Wires/Misc	$1,000
Installation	$2,000
Total	**$17,200**
Annual maintenance incl insurance	**$1,200**
5 year cost	**$22,000**

Cost to use RHR Quaker Hill (100W)	
Elecraft K3/0-Mini	$700
Total	**$700**
Annual subscription	$99
Cost per min	$0.29
Cost per hour	$17.40
5 year cost @200 hrs/year	**$18,595**
5 year cost @250 hrs/year	**$22,945**

Antennas at RHR Quaker Hill (70' tower)	
6M	7el
10, 12, 15, 17, 20 M	4el Full Size
30, 40 M	2el Full Size
80M	Full size vertical
160M	INV L

Lets kill the myth that it's expensive!

Rent a station (cost for 1 week)	
FM5BH	$1,100
Air Fare	$700
Total	**$1,800**
J68HZ	$2,700
Air Fare	$700
Total	**$3,400**

Rent HH2AA	
48hrs	$1,000
Total	**$1,000**

Rent RHR Eastport #1 QTH in US	
48hrs	$2,000
Total	**$2,000**

Antennas at RHR Eastport	
10M	8/8/8
15M	4/4/4
20M	**4/4/4**
40M	3
80M	4-SQ
160M	¼ Vertical

More Remote Options?

- Many (200+) online RECEIVERs are available:
  - websdr.org
    - Great if you want to listen.
    - Not that easy to “tune around”

websdr.org

websdr.org

A WebSDR is a Software-Defined Radio receiver connected to the internet, allowing many listeners to listen and tune it simultaneously. SDR technology makes it possible that all listeners tune independently, and thus listen to *different* signals; this is in contrast to the many classical receivers that are already available via the internet.

More background information is available here. Questions and comments can be sent to PA3FWM, the author of the WebSDR software and maintainer of this site; but please check the frequently asked questions first.

WebSDR servers can register themselves automatically on this site, leading to the below list of currently active WebSDR servers.

Currently there are 168 servers active, with 991 users and 625 MHz of radio spectrum.

Filter band: Any and region: Any and mobile support and covering MHz.

Location and URL	Frequency range	Antenna	
WebSDR at the University of Twente, Enschede, NL http://websdr.ewi.utwente.nl:8901/ JO32KF; 374 users	0.000 - 29.160 MHz	Mini-Whip	1
KFS WebSDR HF receiver system on the Pacific coast south of San Francisco, CA http://69.27.184.62:8901/ CM87tj; 27 users	1.804 - 1.996 MHz 3.488 - 3.680 MHz 3.620 - 3.812 MHz 3.810 - 4.002 MHz 6.943 - 7.135 MHz 7.125 - 7.317 MHz 13.990 - 14.182 MHz 14.165 - 14.357 MHz	TCI Model 530 Log-Periodic Antenna (omni, 6 dB gain)	2
160m, 60m, 80m, 40m and 17m SDR's from Nantwich in Cheshire http://hackgreensdr.org:8901/ IO83RA; 64 users	1.804 - 1.996 MHz 3.600 - 3.792 MHz 5.237 - 5.428 MHz 7.008 - 7.200 MHz 14.130 - 14.322 MHz 18.019 - 18.211 MHz	204 foot long double size G5RV	3
WebSDR in C3 Ordino - ANDORRA PRINCIPALITY - ARDAM Ham Radio Association - RX 4 pcs FuncubeDonggle Pro+ http://sdr.radioandorra.org:8901/ JN02SN; 22 users	7.008 - 7.200 MHz 5.262 - 5.454 MHz 3.610 - 3.802 MHz 14.043 - 14.235 MHz	Half wave Dipole. Short dipole. Half wave Dipole.	4
Home of K3FEF and W3TKP in Milford, Pennsylvania, NE USA. 160/80/40/30/20/10M and more! http://K3FEF.com:8901/ FN21mh; 44 users	-0.024 - 2.024 MHz 3.276 - 5.324 MHz 5.326 - 7.374 MHz 8.876 - 10.924 MHz 10.976 - 13.024 MHz	ZS6BKW w/ RPA-1Plus LNA	5

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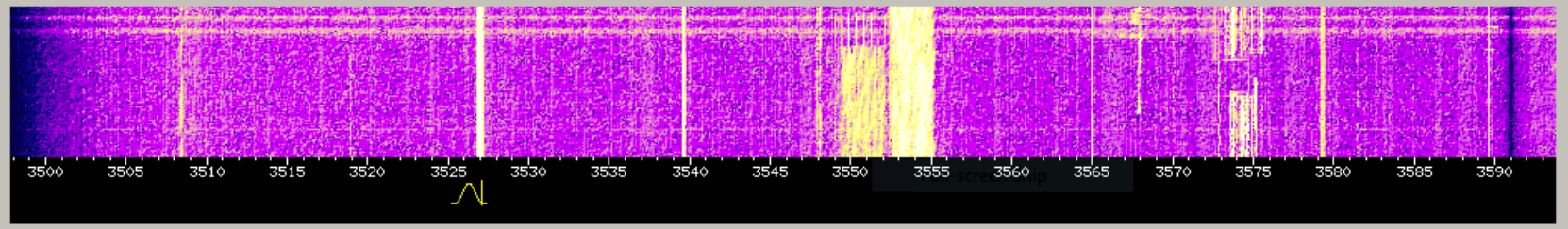
SK3W LOWBAND We

Not secure | websdr.sk3w.se:8901

View: all bands | others slow | one band | blind **Allow keyboard:**

Waterfall: Java HTML5 **Sound:** Java HTML5



Frequency: 3526.28 kHz

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Band: 160m 80m_CW 80m_SSB 60m 40m 30m 20m

Or tune by clicking/dragging/scrollwheel on the frequency scale.

Memories:

recall erase store (new)

Bandwidth:

0.15 kHz @ -6dB; **0.61** kHz @ -60dB.

wider CW-wide LSB USB AM FM

narrower CW-narrow LSB-nrw USB-nrw AM-nrw

Or drag the passband edges on the frequency scale.

Waterfall view:

zoom out zoom in

max out max in

Or use scroll wheel and dragging on waterfall.

Speed: slow

Size: medium

View: waterfall

Hide labels

-87.8 dB; peak -87.8 dB;

mute squelch autonotch

Volume:

Audio recording: start

Signal strength plot: none

Logbook:

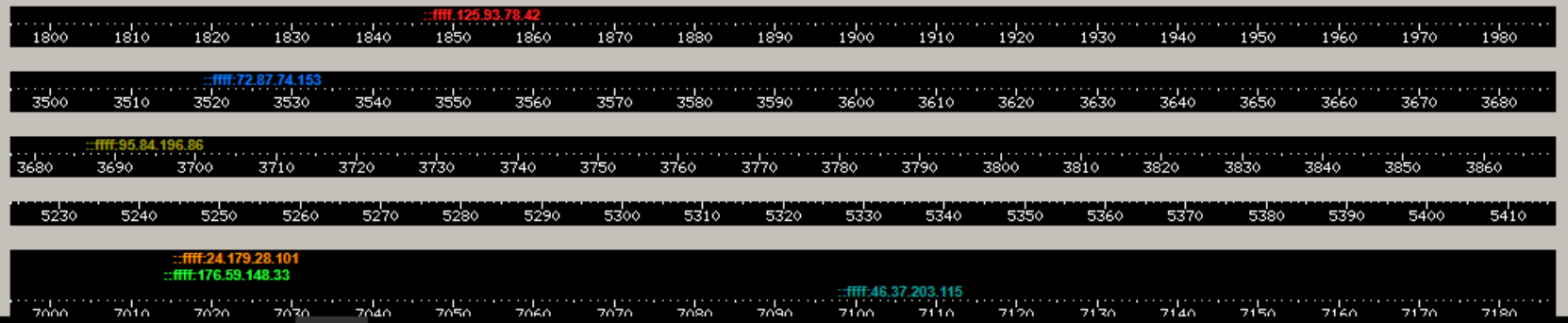
Call of station that you hear:

Comments, if any: submit

Note: time, frequency, your name/call, and DXCC information are added automatically.

View the last 20 lines of the logbook, or the entire logbook (ctrl-click for new tab/window).

This WebSDR is currently being used by 6 user(s) simultaneously: compact view



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What's Next

- Live Demo of RemoteHamRadio.com
  - K3/0-Mini with Laptop
  - Laptop
  - iPad
  - iPhone

- Thanks to RemoteHamRadio.com for letting us have this Demo!
- 20% Discount code K4UT-72V5-4CUJ