

# Why Remote Operating ?

- Antenna restrictions
    - Apartment, HOA, Condo
  - Not able to maintain station/antennas
  - Station at 2<sup>nd</sup> 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)

Universal - RemoteHa X

Secure | <https://my.remotehamradio.com/console>

RemoteHamRadio - Universal

A: 10 K: 2 SFI: 70 SSN: 11 00:26:15 KE1J

Daylight 12:21 to 21:41 UTC WEBBOX STATION IN USE BY KE1J 11s

100 W @ \$0.29/min Power Off

**PREMIUMDX**

- W1/Eastport 10/15/20/40
- W1/Eastport 12/17/30/80
- W1/Eastport 6/160
- W1/Calais 160
- W1/Lubec
- W2/Summit 80-6
- W2/Summit 160
- W2/Blueberry
- W4/Atlanta
- W7/Tacoma
- W7/Portland


**REMOTEDX**

- W1/Calais 80-6
- W1/Athens
- W1/Chaplin
- W2/Quaker**
- W2/Windham
- W2/Monticello
- W2/Taconic
- W2/Jefferson
- W6/SanJoaquin
- SanJose
- Haiti

**W2/Quaker**

New York Grid: FN31 600' ASL ARRL ENY Dutchess County ITU 8 CQZ 5

GXP 2 Element Yagi @ 85' (25m) Full-screen Snip 68° 40m



Go Anywhere GO STOP LP

EU AF SA PAC JA

General as KE1J CW 7,023.3 BETA

CALLSIGN	SENT	RCVD	NOTES
	599	599	

Save

Chat Log DX Spots Station Calendar

**Elecraft K3** VOX RX

RX 7.023.300 40m CW TX 7.024.350 40m CW

← → ±10 Hz ±100 Hz

S4

A → B A ← B SPLIT AGC-F NOTCH NB NR

Real-time CW (ESC to cancel) Edit Macros

ke1j 5nn 5 test ke1j ke1j tu ke1j —

20 CMP 100 PWR 25 WPM 600 BW 20 MON

PTT (CTRL) PRE ATT

500 Watt Solid State Amplifier 40m 29° C

0 W 1.0

STANDBY



# 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/O-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)

The screenshot displays the RCForb Client by RemoteHams.com software. The interface includes a top menu bar with 'Audio', 'Control Devices', 'Virtual Devices', and 'Layout'. Below this is a control panel with sliders for SPKR and MIC volume, and buttons for ON/OFF, CONFIG (300ms/800ms), and VOX (Local). The main area features a search bar and a table of remote stations. The table has columns for Orb Id, Remote Station, Radio, City, State, and Country. The first row is highlighted in yellow. To the right of the table are panels for Relay, Amp, and Rotator. At the bottom, there's a status bar showing 'Online: 221' and 'Synchronized @ 7:36 PM', along with a chat window and a CW (Continuous Wave) section with a MACROS button and a CONFIG dropdown.

Orb Id	Remote Station	Radio	City	State	Country
11238	KA3ODJ PA	Ic-7300	BANGOR	PA	USA
11931	KG4TGZ Cullman, Al CLUB 160m-440	Ic-7100	Cullman	Al	United States
11842	Alexander Shack	Ic-7100	Moulton	Al	United States
8993	***KJ4TN-ICOM-IC-7300- BIRMINGHAM, AL- ...	Ic-7300	Birmingham	AL	United States
9841	N9INK-Remote	Flex 1500	Summers	Arkansas	United States
10332	WA6OYC - Oakland Yacht Club ARC - members...	Ic-706MkII	Alameda	CA	United States
4109	W6RYO TS-870	TS-870	Alta Loma	CA	United States
9174	K6DXA	TS-2000	Atwater	CA	United States
11739	K6PVR - Pleasant Valley Amateur Radio Club	TS-450	Camarillo	CA	United States
11298	KI6UM	Ic-7000	FOLSOM	CA	United States
2398	N6DJ Club Radio- Elecraft K3s and KPA500 Amp ...	K3	Marina	CA	United States
46	WA6LIE's FT-857 VHF/UHF only	FT857	Salinas	CA	United States
10236	WA6LIE's Elecraft K3 (Private)	K3	Salinas	CA	United States
11204	K6BJ DeLa	TS-570	Santa Cruz	CA	United States
9356	W6AB - Satellite ARC	TS-2000	Vandenberg AFB	CA	United States
4199	Volcano Radio	Ic-7600	Volcano	CA	United States

Online: 221 RX: 55 TX: 166 Clubs: 132 Non-Clubs: 89 Synchronized @ 7:36 PM

Chats

CW

MACROS

CONFIG

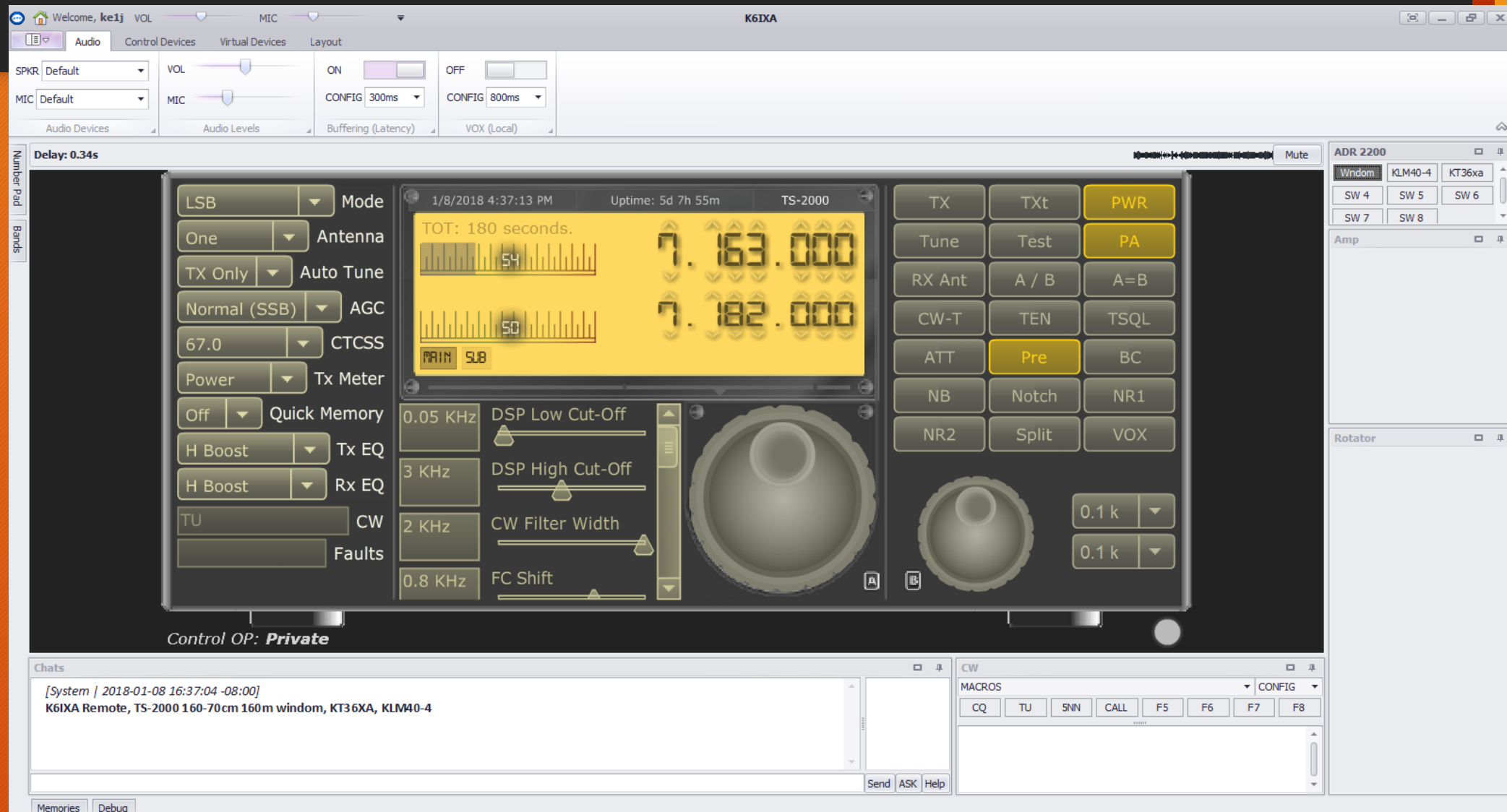
CQ TU SNIN CALL F5 F6 F7 F8

Send ASK Help

Memories Debug



## 2. Software Programs (RemoteHams.com)



## 2. Software Programs (RemoteHams.com)

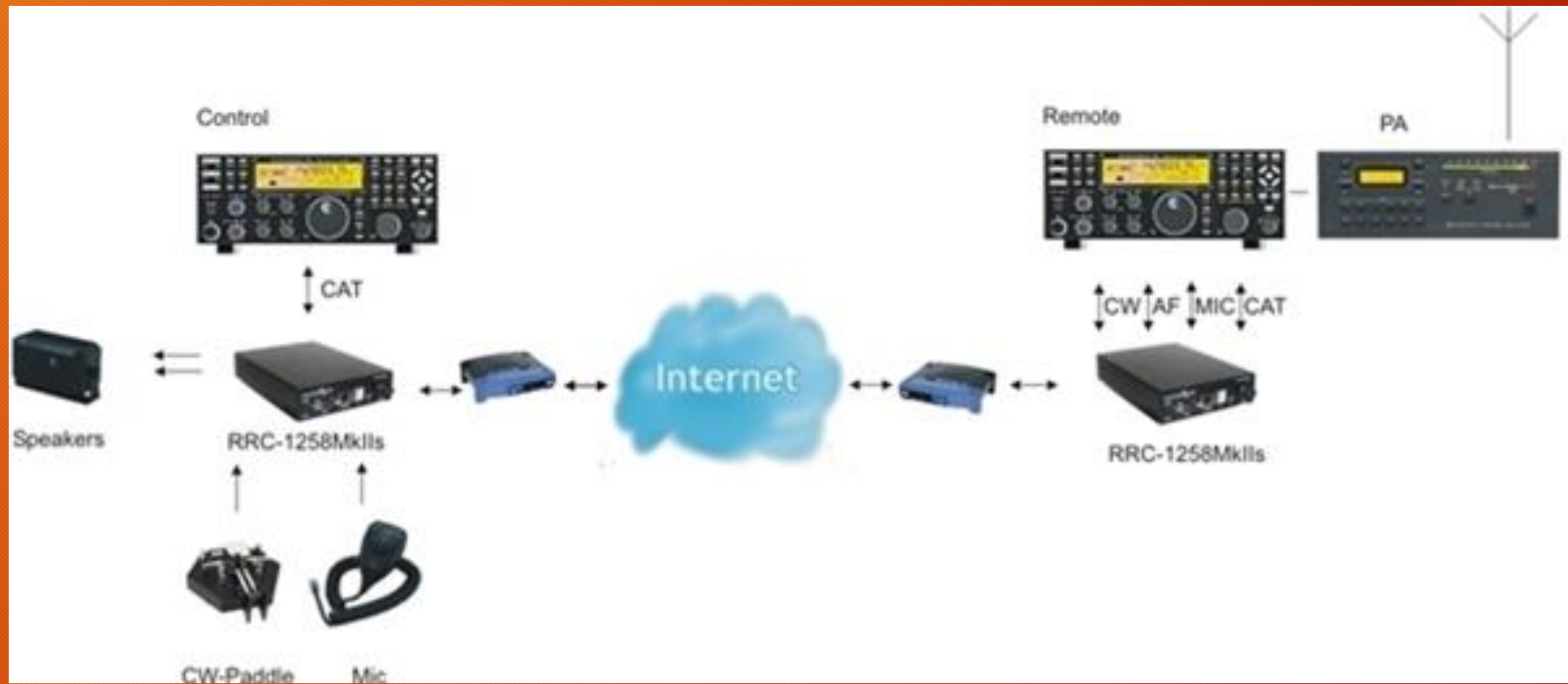
- “Free”
  - Software is free
- LOTS of stations around the world
- Some stations require “membership”
- Must use RCForb Client Software
- Only works on a Windows PC
- No or limited verification of license
- Great if you want to listen/tune around - FREE

### 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/O-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”

The screenshot displays a Windows desktop environment with several applications open, primarily related to amateur radio operations. The desktop background is orange. The taskbar at the bottom shows various icons including Recycle Bin, My LastPass Vault, Morse Runner, AnyDesk, N1MM Logger+, Zinio Reader 5, Elecraft K3 Utility, N1MM Rotor, Rotor-Cont... M V1.6, Epson Scan 2, QuickBooks Pro 2016, TQSL, GH Map.exe, RemoteHa..., Mozilla Firefox, Google Chrome, RCForb Client, iVMS-4200 Client, and x1.

Open applications include:

- GH Map 1.0.2**: A window showing a compass rose with degree markings (30, 60, 90, 120, 150, 180, 210, 240, 270, 300, 330) and a smaller inset compass.
- Rot...**: A window with configuration settings for Language (EN), Comport (18), Pollrate (1000), and Axis (axis1=AZ | axis2=none). It also features a manual control section with buttons for STOP 1, GO 1, and PARK 1.
- Alpha 87A Remote Control**: A window displaying the control interface for an Alpha 87A amplifier. It includes a frequency display (BAND, MHz), a power meter (RF OUTPUT W, GRID CURRENT mA, REFLECTED POWER W), and a status section with indicators for HI, OPR, LO, STBY, ON, OFF, and POWER. A table at the bottom shows amplifier status: Amplifier (n/a), RF Output (0 W), Reflected Power (0 W), Grid Current (0 mA), Frequency (1800 kHz), Peak Power (0 W), VSWR (1.00), and Input Power (0 W). The connection status is "Local" with a note "Unable to open com port (Error: 31)".
- K2LE Remote Station Control - VT**: A window showing a control interface with buttons for File, 75mDita, 80m Dita, Hi 4L 40, Lo 3L 40, 20Stack, Lo 3L 20, WARC70, Low 15, High 10, and Low 10m. It also includes buttons for Remote Desktop..., Reboot PC (K2LEB), Show Rotator..., and checkboxes for Force Focus N1MM+ and Always on Top. The status bar shows "Shack Network Delay: 98mS" and "12:57:07 UTC | 07:57:07 EST".
- Tower Rotator**: A window showing a photograph of a tower rotator with a compass rose and a "telrex" logo. It includes a checkbox for "Display Light" and buttons for "CW Rotate >>" and "CCW Rotate <<<".

# K2LE “Power Control Screen”

**DIGITAL LOGGERS, INC.**

Ethernet Power Controller

[Outlet Control](#)  
[Setup](#)  
[Scripting](#)  
[Date/Time](#)  
[AutoPing](#)  
[System Log](#)  
[Logout](#)  
[Support](#)  
[Help](#)

[Manual](#)  
[FAQ](#)  
[Product Information](#)  
[Digital Loggers, Inc.](#)

Version 1.8.1 (Dec 16 2014 / 02:00:17)  
8AA39795-ED019123  
S/N:LPC751671

Outlet Control - K2LE/1

Controller: K2LE/1 Vermont Power Control  
Thu Jan 11 10:25:13 2018

Individual Control

#	Name	State	Action
1	ROUTER -- NEVER TURN OFF	ON	<a href="#">Switch OFF</a> <a href="#">Cycle</a>
2	RemoteRig 1258 Box	ON	<a href="#">Switch OFF</a> <a href="#">Cycle</a>
3	K2LEB Computer (Remote)	ON	<a href="#">Switch OFF</a> <a href="#">Cycle</a>
4	K2LEB Radio (Elecraft K3)	ON	<a href="#">Switch OFF</a> <a href="#">Cycle</a>
5	STACK ROTATOR LIGHT	OFF	<a href="#">Switch ON</a>
6	Digi PortServer RS-232 Box	ON	<a href="#">Switch OFF</a> <a href="#">Cycle</a>
7	K2LEA Computer	ON	<a href="#">Switch OFF</a> <a href="#">Cycle</a>
8	YCCC SO2R Box	ON	<a href="#">Switch OFF</a> <a href="#">Cycle</a>

Master Control

[All Outlets OFF](#)  
[All Outlets ON](#)  
[Cycle all Outlets](#)

Sequence delay: 10 sec.



8:09 AM 1/11/2018

# Lets kill the myth that it's expensive!

Cost to use RHR Quaker Hill (100W)	
Elecraft K3/O-Mini	\$700
Total	<b>\$700</b>
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/O-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
<b>Total</b>	<b>\$17,200</b>
Annual maintenance incl insurance	\$1,200
<b>5 year cost</b>	<b>\$22,000</b>

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

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](http://websdr.org)
    - Great if you want to listen.
    - Not that easy to “tune around”








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:  and region:  and ☐ mobile support and covering  MHz.

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

SK3W LOWBAND WebSDR

Not secure | websdr.sk3w.se:8901

☆

...

🔍

🔧

🗨

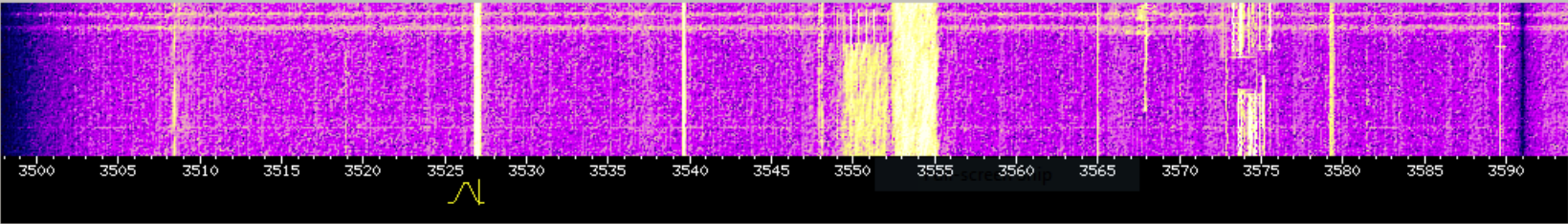
⋮

View: ☐ all bands ☐ others slow ☒ one band ☐ blind

Allow keyboard: ☐

Waterfall: ☐ Java ☒ HTML5

Sound: ☐ Java ☒ HTML5



Frequency:  kHz

---

--

-

+

++

+++

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

\$1 \$3 \$5 \$7 \$9 +20dB +40dB +60dB

-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

fffr:126.93.78.42

1800 1810 1820 1830 1840 1850 1860 1870 1880 1890 1900 1910 1920 1930 1940 1950 1960 1970 1980

fffr:72.87.74.153

3500 3510 3520 3530 3540 3550 3560 3570 3580 3590 3600 3610 3620 3630 3640 3650 3660 3670 3680

fffr:95.84.196.86

3680 3690 3700 3710 3720 3730 3740 3750 3760 3770 3780 3790 3800 3810 3820 3830 3840 3850 3860

fffr:52.30.54.101

5230 5240 5250 5260 5270 5280 5290 5300 5310 5320 5330 5340 5350 5360 5370 5380 5390 5400 5410

fffr:24.179.28.101

fffr:176.59.148.33

fffr:46.37.203.115

7000 7010 7020 7030 7040 7050 7060 7070 7080 7090 7100 7110 7120 7130 7140 7150 7160 7170 7180

Windows Taskbar

8:24 PM 1/8/2018

# What's Next

- Live Demo of RemoteHamRadio.com
  - K3/O-Mini with Laptop
  - Laptop
  - iPad
  - iPhone
- Thanks to RemoteHamRadio.com for letting us have this Demo!
- 20% Discount code K4UT-72V5-4CUJ