

Remote Operating

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Why Remote Operating?

Hams are often away from their home station, or have limits on their home station:

- Home Owners Association
- rental apartment or house
- no antennas allowed
- no space for antennas
- RF Noise or Interference

With remote access, they can still be “on-the-air” from:

- their home station
- friend's station
- club station
- online or rental station

New hams can try HF operating before they invest and build a station.
Club members can have a useful project setting up a club station.
Serious DXers can operate from work - never miss a DXpedition again!

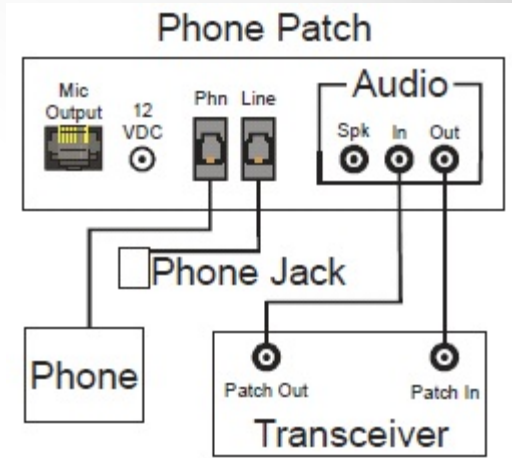


N6V Special Event station
International DX Convention 2015

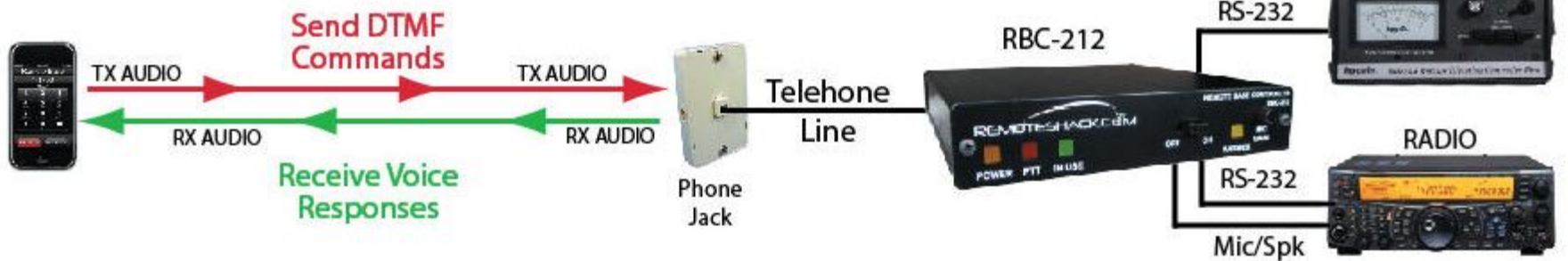
A little history...

Remote operation over telephone lines is ancient. You can still use an old "phone patch" for about \$50 or an MFJ-642E new for \$160.

As "good as it gets" is DTMF tone control of additional functions, like a repeater controller or the Remoteshack.com RBC-212 \$550.



Using the RBC from your cell phone with a land line as the link.



Pros: Simple. Need only an audio line (telephone, UHF link, Skype)

Cons: Limited. Slow and difficult to tune or change bands. Voice only.

Recommend: You can do better. Use an Internet control system.

How much internet do I need?

You need **High Speed**, (bandwidth) same as a streaming music service. "3G Wireless" is the minimum at 144 kbps, above 400 kbps is better. Otherwise, audio “dropouts.” Speed is advertised by “download speed”, and upload speed may be only 1/4 of the download speed, but is important for getting your audio and control to the transmitter. If you can Skype across country, you're good-to-go. www.speedtest.net

You need **Low delay** (latency or ping), same as an online game player. Below 200 millisecond is adequate, below 100 msec is better. Otherwise, tuning “lags” and poor PTT timing. Voice and Digital operating are more tolerant of delay than CW operating. www.pingtest.net

GOOD: broadband, cable modem, WiFi, DSL, 4G,...

POOR: Dial-up modem (slow), Satellite (delay).

Basic Remote Access Needs

There are many remote access methods, but all involve:

1. Audio: Download from the receiver to you, and Upload from you to the transmitter for voice or digital modes. Your radio or computer will need **Audio IN and OUT** connections, like MIC and SPKR, or Line In/Line Out. Just like when setting up for digital modes with a soundcard interface like a RigBlaster, Signalink, ...

2. Radio Control: To read and set the radio's frequency, mode, filters, PTT, CW keying... Needs a radio with a serial port, USB, CAT or CI-V control.

3. Station Control: To control the station's AC power outlets, antenna switching, rotators, tuners, amplifiers, ...

Setting up **your** station to “provide” these can be a big project!
Let's look at several “popular” solutions:

Ways to implement remote control

Web Browser

Software Programs

Remote front panel

Solutions vary from 100% Software to 100% Hardware.

Money from \$0 to \$2,000.

Time from Minutes to Thousands of Hours.

Web Browser

RemoteHamRadio - PremiumDX

A: 14 K: 2 SFI: 135 SSN: 117 01:32:50 K7CO

W1/Calais W2/Summit W2/Blue W2/Monticello W4/Atlanta W6/Murieta W7/Tacoma W7/Portland More stations

C-31XR Tribander @ 72'

110° 20m

GO STOP LP

Map Satellite

Google

2000 km Terms of Use Report a map error

EU AF SA PAC JA

14007.00 CW Elecraft K3 VFO A

File Edit View Tools Config Window Help

CQ-Frequency Snt Rcv

CW PH 160 160 80 80 40 40 30 30 20 20 17 17 15 15 12 12 10 10

Run S&P 22

F1 Cq F2 Exch F3 Tu F4 N7G F5 His Call F6 Repeat F7 Spare F8 ? F9 TX F10 op F11 RX F12 Wipe Esc: Stop Wipe Log It Edit Mark Store Spot It QRZ

210/32 6,720

Station Status \$0.49/min WEBDX IN USE BY K7CO 8m 50s

Washington Grid: CN8/aj 200' ASL ARRL WVA King County ITU 6 CQZ 3 IOTA NA-065 Vashon Island US Islands WA 0605

12:12 / 04:08

Config RRC

500 Watt Solid State Amplifier 20m 50° C

445 W OPERATE

1.5

Elecraft K3 VOX TX

14.007.000 14.280.000

20m CW SLOW A B A B SPLIT

S4

Real-time CW (ESC to cancel) Macros

K7CO 5NN TU 5NN 5NN Q...

20 CMP 25 PWR 22 WPM 700 BW

AGC-S NOTCH NB NR

PTT (CTRL KEY) PRE ATT SUB Less

Troubleshoot Audio

Check Log/Master/Telet/Call history/Reverse

Log	Master	Telet	Call
203	43229	0	6371

Reverse lookup 6574

S/N Ratio Prediction Map

Online - Support

Chat DX Spots Station Calendar

160m 80m 60m 40m 30m 20m 17m 15m 12m 10m 6m 2m All None

NA SA EU AF AS OC DE NA SA EU AF AS OC MODE SSB CW DIGI Show on map

Time	DX	DE	Freq	Band	Mode	Country	Note
Jun 16 01:31	KW5HP	KQ4PK	21.270.0	15m	SSB	United States	5/9
Jun 16 01:30	P43K	KC4FDT	21.268.0	15m	SSB	Aruba	

Score - 6,720 Points

Band	Mode	QSOs	Pts	Mult
14	CW	118	118	1
18	CW	90	90	20
21	CW	2	2	1
Total	Both	210	210	32

Score: 6,720
1 Mult - 6.6 Q's

Web Browser Pros/Cons

RemoteHamRadio.com \$99/yr plus \$6 to \$36/hr. Can be accessed with a web browser, with extra hardware, or RemoteRig hardware.



Pros: Easy to sign up and get started. No equipment to buy.

Cons: Can be expensive. No “tinkering” with the equipment.

Recommend: Free trial. Good way to see what’s possible.

P.S. Many online receivers are freely available: websdr.org or globaltuners.com

Software Programs

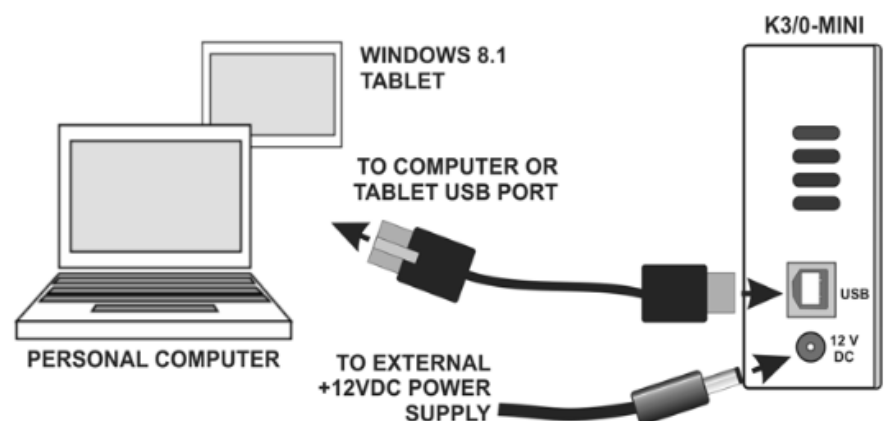


RCFORB (Client) FREE. Also RCFORB server software helps set up your station for others.

Lobby					
Connect	Search: <input type="text"/>	Find Next	Sync	Auto Refresh	Clubs: 93 TX: 95 Total Online: 138
<input checked="" type="radio"/> All Online <input type="radio"/> Club Only <input type="radio"/> Non-Club <input type="radio"/> TX Capable <input type="radio"/> RX Only <input type="radio"/> Offline					
Remote Name	Radio	TX	City	State	Country
N6IJ Club Radio- Elecraft K3 factory test radio. Join at n6ij.org	K3	<input checked="" type="checkbox"/>	Marina	CA	United States
N3HEE - CW ONLY	K3	<input checked="" type="checkbox"/>	Point of R...	MD	United States
W8RJ K3 / KPA500 160-12 CW Ready	K3	<input checked="" type="checkbox"/>	South Lyon	MI	United States
100W WA0TDA IC-7200 Twin Cities MN	IC-7200	<input checked="" type="checkbox"/>	Woodbury	MN	United States
W0ZSW Handiham Club of MN	TS-480	<input checked="" type="checkbox"/>	Twin Cities	MN	United States



Elecraft K3/0 Mini-F radio head



USB cable connects head to PC

Software Programs Pros/Cons

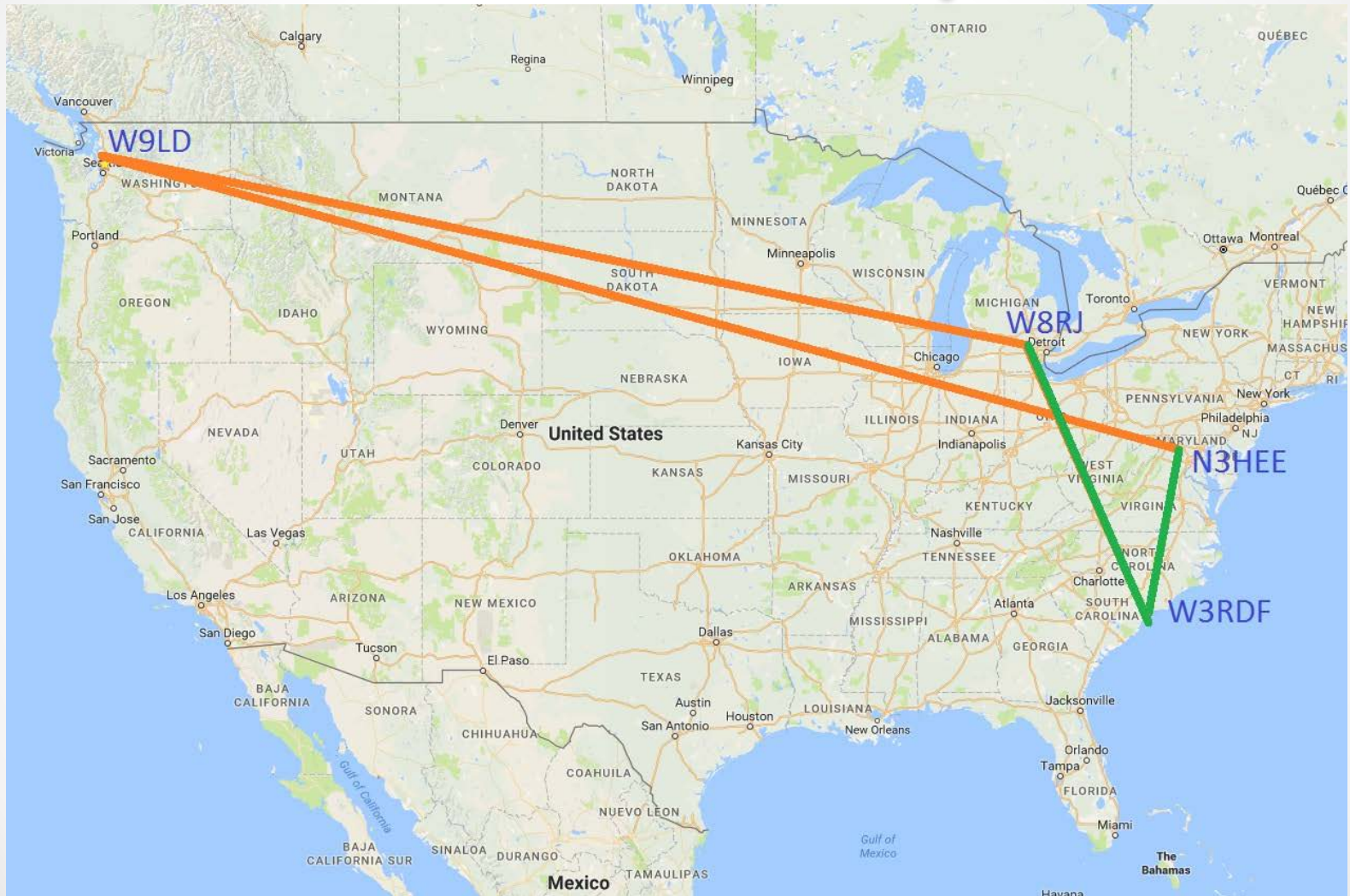
Pros: Built-in remote functions are supported by the software vendor. You may already have a compatible radio.

Cons: Limited to the configurations and abilities of the chosen software. Rest of shack needs to be computer-controlled or automatic. Requires a shack PC and a remote PC (laptop). Limited control of antennas (Ant1/Ant2) or other station accessories (rotator, amp).

Recommend: Good solutions if you want some vendor support.



Remote map



Examples: How to Connect

RemoteHamRadio.com

1. Start laptop, open webpage to RHR, login.
2. Select a station, click Power On button.
3. Adjust radio to band and mode, turn rotator as needed.
4. Start external logging program if used.
5. Operate!

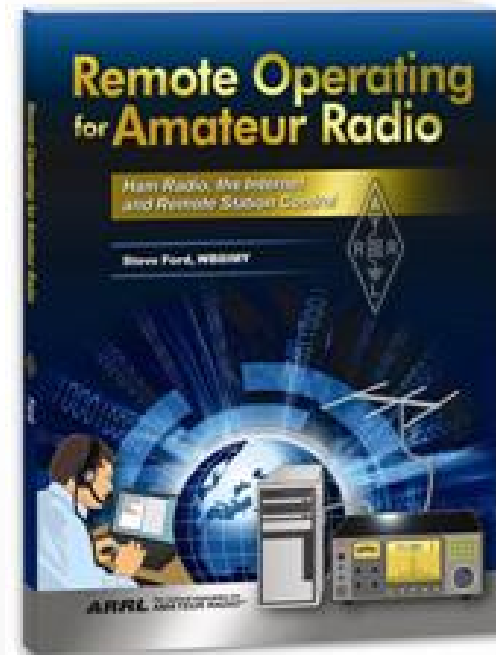
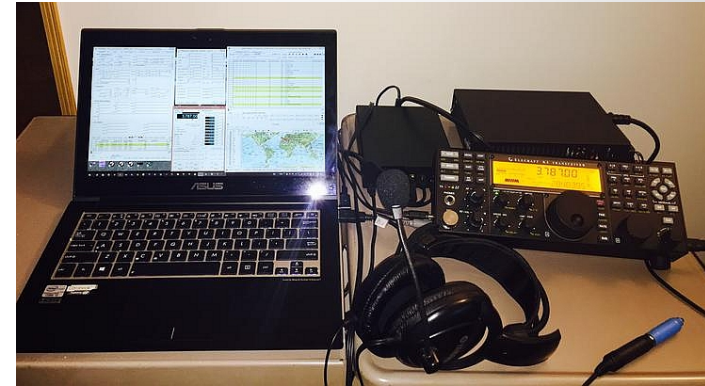
RemoteHams.com

1. Start PC, execute RCFORB program, and turn ON radio head.
2. Select station as remote server from RCFORB lobby. (Request permission of owner.)
3. Set frequency, mode, bandwidth, AF volume, as needed.
4. Operate!

Yes, once all the setup problems are solved, its easy!

There is no single correct solution.

- Software/Hardware
- Simple / Complex
- PC/ Laptop / Tablet / Smartphone
- One radio/ multiple radios (HF,VHF & UHF)
- This is real ham radio experimentation, you can try out new ideas and technology as you wish and experiment.
- This is a fast growing and fast changing topic, and there is far more information we haven't touched on. There are books, web pages, Youtube videos, blogs, ...and it will change a lot by next year.



In closing...

- Remote operators just want to be on the air, and enjoy radio operating.
- Remote access may allow you to operate more and increase your enjoyment of Amateur Radio.



Fred, K6DGW: "I was worried that operating remote and not making RF at home would not provide the fun level that I've enjoyed for so long, but that turns out not to be the case at all."

Now for a live demonstration!

Start remote operation

- 1. Turn on computer.
- 2. Run remote client software (RCFORB.)
- 3. Turn on remote radio head (Elecraft K3/0 mini.)
- 4. Select remote server station on software display.
- 5. Select mode (CW) and keying speed.
- 6. Tune receiver to frequency, filter select bandwidth.
- 7. Begin QSO.

QSO TEXT (approx)

- W3RDF DE W9LD K
 - W9LD DE W3RDF R HI DAVE UR RST 599 IN SC HW COPY? BK
- BK FB DON UR RST 599 HR IN WA VIA REMOTE CLIENT IN MD BT GREETINGS TO U FROM THE SNOHOMISH COUNTY HAMS CLUB AR DE W9LD K
 - W9LD DE W3RDF R SOLID COPY DAVE.TKS FOR GREETINGS FROM SNOHOMISH CLUB BT VY GLAD TO TAKE PART IN PRESENTATION OF REMOTE OP BT WX IN SC TODAY SUNNY AND MILD, TEMP ABT 75F BT SO HOW ARE TNGS IN EVERETT? AR DE W3RDF K
- W3RDF DE W9LD R SOLID COPY DON GUD REMOTE QSO ON HAM RADIO FROM THIS HOSP BT MANY TKS FER CONCRETE DEMO BT WX HR CLDY ES 65F BT 73 TO U AND URS AR W3RDF DE W9LD SK
 - DE W3RDF R SOLID DAVE VY PSED BE PART OF REMOTE DEMO FOR CLUB, HOPE IT WILL BLESS OTHERS BT 73 AR W9LD DE W3RDF SK