

Northern California Contest Club

Excellence In Amateur Radio Contesting



"Remote Controlling Your Station for Contesting"

Mark Aaker, K6UFO

These slides, and more, are at my website k6ufo.com

K3/0 RemoteRig



FlexRadio Systems
Software Defined Radios

Maestro

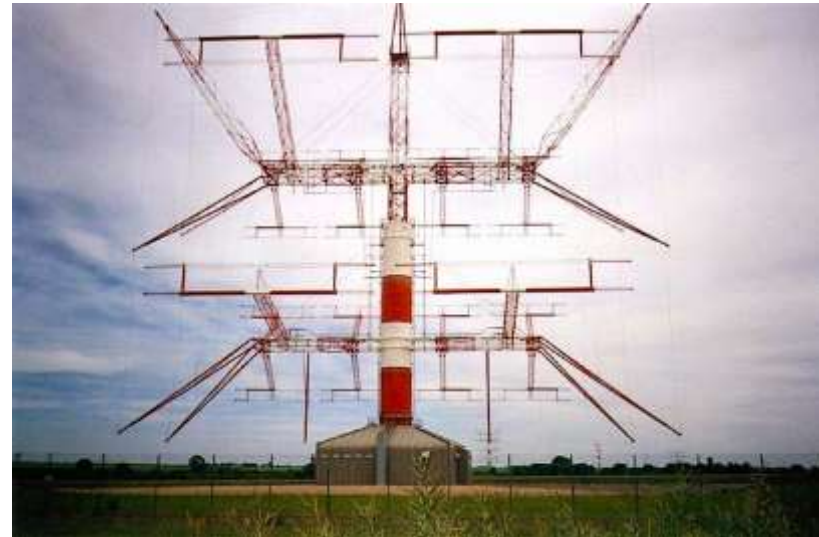
Win PC runs digitals

FlexRadio Systems **MAESTRO** è la nuova console di controllo per i ricetrasmittitori della serie 8000 che permette l'uso immediato dell'apparato senza bisogno del PC, tramite connessione alla rete LAN anche WiFi, oppure direttamente all'apparato.

The image shows a FlexRadio Systems Maestro software-defined radio system. It includes a radio console with a color display, a separate radio unit with an antenna, and a laptop displaying the Maestro software interface. The background is a light blue gradient with the FlexRadio Systems logo at the top.

Today's NCCC Question:

***My friend and I want to do CQP together.
He is at the radio location (e.g. his house).
I want to operate that radio from my house.
How can I do that?***



Rules for Remotes: Rule Number 1: Follow the Rules!

There are Operator Rules, Station Rules, Award and Contest Rules.

- **Operator** must be licensed in the transmitter country or have a reciprocal permit, and use the proper callsign for transmitter location. (No EU hams on US transmitters, using their EU call to work DX - and vice versa.)
- **Station** (transmitter) must be controlled by a licensed operator and meet the transmitter requirements in the location country (power limits, frequencies, etc.)
- **Awards** and **Contests** each have their own rules.
 - E.g., DXCC Award Rule 9. - All stations used to make contacts for a specific DXCC award must be located within the same DXCC entity.
 - E.g., CQWW DX Contest Rule VIII.1. - All transmitters and receivers comprising a station used for a specific contact must be located within a 500-meter diameter circle.
- Remote receivers are available on the internet, but are not allowed for nearly all awards or contests. Only a 2nd receiver at your own transmitter site (500-meter diameter circle).

Using **other people's stations** is useful when you are traveling, or when no station is allowed at your own residence (HOA?)

Use a Receive-only site on the internet: websdr.org kiwisdr.com/public globaltuners.com and many of the RemoteHams.com sites. Good for SWL, monitoring, check your signal...

For Receive AND Transmit: you may need to register, provide a copy of your license, join a club, pay dues or dollars. Look for:

- A friend or club station setup for remote access, especially owners of a FlexRadio-based station. Some big contest stations: N6RO, W7RN, ...
- RemoteHams.com has many shared stations and club stations globally.
- RemoteHamRadio.com An established commercial operation. Free trial, then pay, very high quality stations available in USA, KP4, HH, 9A.
- BeLoud.us A newer commercial operation. Plans for USA, HC and PJ4.

(Be Polite: Do not take over a station for the whole weekend without checking first.)

But let's set up your own station (or your friend's):

There is no “One Perfect Solution.” It depends on what you want to do:

Modes: Voice, CW, Digital? CW by keyboard only, or do you need key or paddle?

How much equipment will you haul around with you? Just a smartphone or tablet?

Fast setup? Be on in one minute from a smartphone, tablet or laptop?

Or will you take the time to set up a Control Head, edit the router to open ports, have special audio equipment or interfaces, keyers and paddles, an extra screen ...

Dual use? Will the station be used at home AND remotely, or dedicated to remote?

How much re-configuration to go from local to remote use? Will you re-configure every day before leaving to work? Do you need full band-changing, or is a “preset” on one band/mode sufficient?

Is the station easily accessible (in the garage), or is it a 6 hour trip to the hills?

Are you willing to keep a PC on-line at the remote station (helps), or does everything have to be extended across the internet with no on-site PC? (harder).

How much remote “reset” ability do you need? Is anyone on-site to help?

-- Recommendation: Start simple, gain experience, then expand or change.--

Four Basic Needs for Remote Operation

1. Audio In/Out to radio: Access to MIC/SPKR, Line In/Out, audio over USB, or over Ethernet. Just like interface for digital modes (AFSK, FT8).



2. Radio Control: To read and set radio Freq., Mode, PTT ... Need a radio with a **serial port, CAT, CI-V, USB control**, or over Ethernet.



3. Station Control: AC power outlets, antenna switching, rotators, tuners, amplifiers, ... Equipment must be highly automatic, or have PC control, or over-the-web control. Simplify your station where possible.



“Good” Internet service: Upload and Download speeds over 1 Mbps, Low latency/delay under 200ms, low jitter or variation, low packet loss, an IP address (dynamic or static IP) for the radio end. Reliable more important than speed. (DSL/cable/WiFi usually good, Satellite too delayed, cellphone internet may lack IP address (double NAT), have high variation and have data caps.)



And you need your patience and willingness to solve problems.

Two “simple” ways to Implement Remote Access

1. Software Programs designed to control remote radios.

2. Remote Desktop Software designed to control a remote computer.

(These can sometimes be setup in less than an hour.)

(All the methods I will describe are widely used and have been battle-tested.)

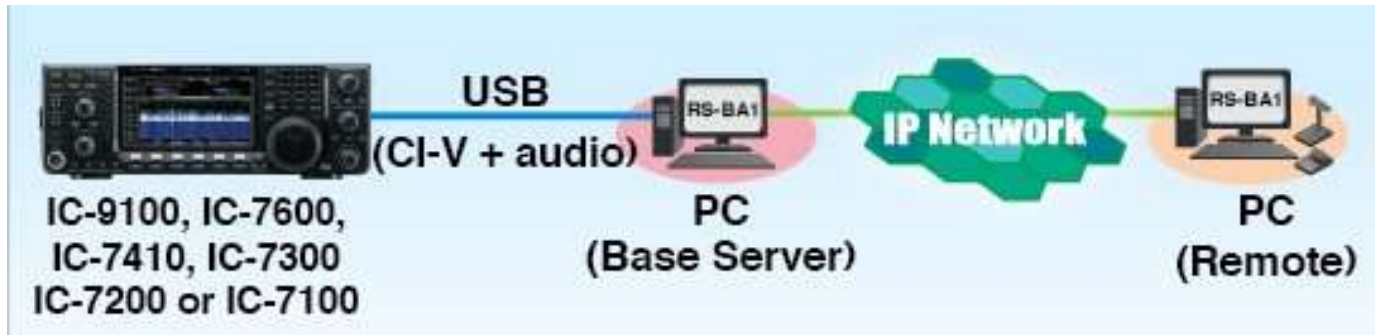
1. Software Programs designed to control remote radios.



RemoteHams.com is both a free software Program (RCForb) and a community of users & stations. You can use the server software to offer up your own station for remote use. (Like many clubs.) See, QST Magazine, April 2017, p30: “DIY Remote Radio Now” by K5PA

NCCC Talk
coming soon
by N6IE !

ICOM's RS-BA-1 IP Remote Control software. Version 2 is \$120.



Some models (7800, 7610) direct to IP Network without Base Server. But Base Server useful to control other shack functions (rotators, amplifier,...)

See also: Ham Radio Deluxe, N4PY Software, Writelog Remote Control, Win4K3Suite Server, Kenwood ARCP-590, TRX-Manager, DF3CB software, ...

Warning: Can be hard to also connect to your logging program since “serial port is already in use.” You may have to log manual/un-connected.

Wait a minute – That “warning” is important!

Warning: Can be hard to also connect to your logging program since “serial port is already in use.” You may have to log manual/un-connected.

Lets also remember “What Contesters Want!”

1. A **keyboard** for typing, sending and logging. (Not a smartphone or tablet.)
2. To use their favorite **logging software**: N1MM+, N3FJP, Win-Test, Dxlog.net, ... (Logger helps create a proper log, check Dupes/Mults, monitor rate and score, ...)
3. To have “**rig control**” – the radio frequency monitored and controlled by logger, and automated sending from F-keys of CW or SSB messages.
4. Ability to receive and **jump to DX cluster spot frequencies**.
5. ...

To reach #3 and #4, you need to have a “serial port” connection from the radio to the logging software. But if Icom RS-BA1 is using the serial port, your logger is disconnected “manual” unless you switch the connections, or have a “serial port splitter” or other sharing software (like N4PY or Win4K3...). You will not be able to use the logging software for all your rig control – it can do simple things (freq, mode, PTT,...) but does not reach all radio controls, like: adjust filters, turn on Noise Blanker, ... you need to switch to “full-featured” radio control software for that.

Look for software that shares to a logger, or use one of the “advanced” methods (RemoteRig or FlexRadio) that reduce the problem.

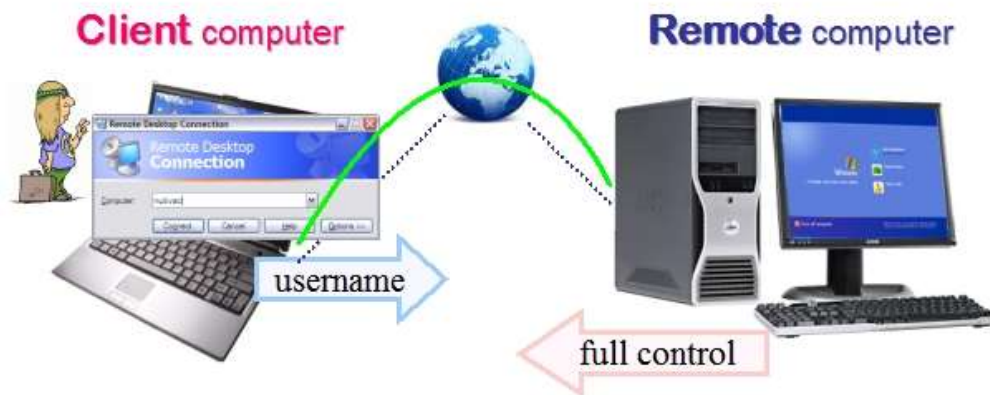
2. Remote Desktop Software designed to control a remote computer.

Set up the shack PC to control the station. Use any software - even if it doesn't have any "remote" ability: N1MM+, Logger32, DXLab, WSJT-X, ...

Then, use remote desktop software to "connect-in" to the shack PC. You "see" the shack desktop, and control the station, just like being at the shack PC.

There are many good free "remote desktop" programs (also called VNC):
Chrome Remote Desktop,
TeamViewer (license problems?),
Windows Remote Desktop,
Splashtop, AnyDesk, ...

*make sure your VNC includes two-way audio, or you'll have to add SW like Skype, Mumble, RemAud, ... adds complexity.
Google the productname + audio, or google "wiki VNC comparison" and look at "Features" chart.



- + Use any software in the station on the shack PC.
- + Audio decoding for RTTY/FT8 is best at station.
- Needs the most internet speed. 5+ Mbps.
- Sometimes feels "laggy" and "slow."

Remote Desktop Example:

In the shack: Interface the radio and amplifier to the shack PC. E.g., Radio serial port to PC, Win4K3 and N1MM+ software, Elecraft KPA1500 Remote software. Radio audio to shack PC by USB or audio in/out cables. Antenna switching by amp's ANT1 jack on 20m and ANT2 jack on 40m, which is good enough for CQP...

When the station can be operated from the shack PC without any “manual” operation, you are ready to proceed to remote.

Download and install Team Viewer (free) on shack PC and a laptop. Get them both working and able to connect, and able to transfer audio. Then try to run station from the laptop. If working, take the laptop away with you, and test some more.



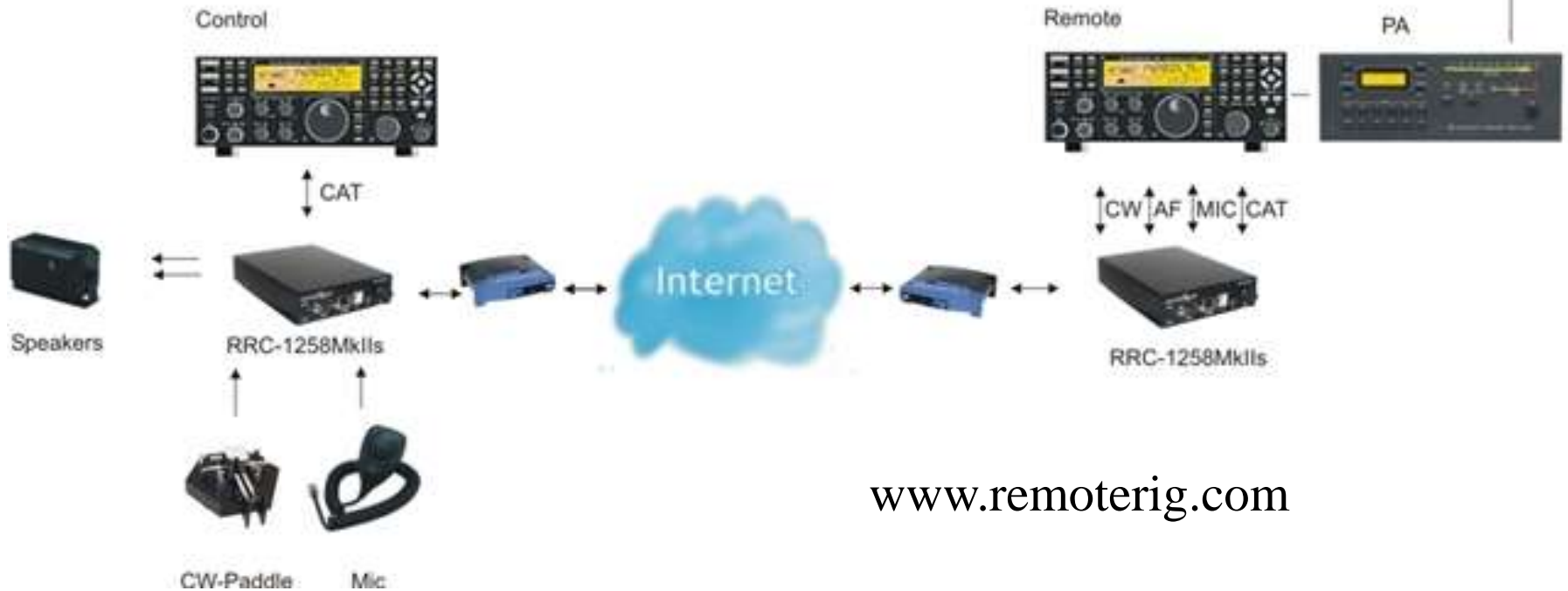
Two “advanced” ways to Implement Remote Access

3. Microbit RemoteRig.

4. FlexRadio SmartLink.

(Costs more in time and \$\$, but more knobs and capability.)

3. Microbit RemoteRig and a Control Panel



www.remoterig.com

Use a pair of RemoteRig “modems” to send audio and control signals to station. Can use with: detached front panel(TS-480), "control heads" (Elecraft K3/0-Mini), “twin” pair of radios, a PC program or an Android App.

- + No shack PC needed to operate. Very reliable once working. Real knobs.
- + Good CW keying from computer or paddle or straight key. Widely used.
- Expensive? (\$500 a pair, plus a \$700 control head or 2nd radio)
- May be hard to configure the 1st time. Get help from a current user/expert.

4. FlexRadio and a Maestro control panel



- + Good support, one vendor.
- + No shack PC required.
- + Real Knobs.
- + Good CW keying from computer or paddle or key.
- + Widely used.
- + Nice Spectrum Display.
- Expensive? \$2k radio and \$1k Maestro

**NCCC Talk
coming soon
by N6WM !**

A FlexRadio Maestro control panel connects across a local network or the internet to control a FlexRadio transceiver. If no Maestro, can control from a PC program or App on smartphone or tablet. Remote access is “built-in” to the SmartSDR software.

FlexRadio Systems
Software Defined Radios

Maestro™

Win PC runs digitals

FlexRadio Systems **MAESTRO** è la nuova console di controllo per i ricetrasmittitori della serie 8000 che permette l'uso immediato dell'apparato **senza bisogno del PC**, tramite connessione: alla rete LAN anche WiFi, oppure direttamente all'apparato.

FlexRadio Systems **MAESTRO** è un moderno e funzionale pannello radio dotato di schermo touch, pulsanti e manopole, connessioni per microfono e tasto/paddle con il quale usare l'apparato senza rinunciare alla operatività tradizionale di una qualsiasi apparecchiatura radio, oltre che a permetterne la remotizzazione in qualsiasi punto coperto dalla vostra rete LAN.

What are the REAL problems?



Station Control: The control of “everything else”: AC power outlets, antenna switching, rotators, tuners, amplifiers, RX-only antennas, watt meters, 12v power supplies, audio devices, ...

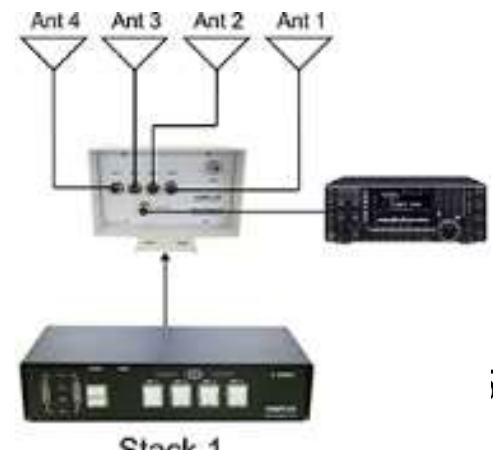
Simplify your station, make your station as automatic as possible, then solve remaining issues. Look for devices that are “automatic” or “computer-controlled”(uses the PC in shack). (Trust, but verify)

Eliminate things that require you to manually switch, plug, adjust or reset.

No!



Yes!



There are solutions to the REAL problems:

AC Power switching: WeMo Mini Smart Plug \$20, or DLI Web Power Switch \$160



Antenna switching: The radio's ANT 1/2 button, or band decoders & coax switches.

Rotators: Control box has serial port, use logging sw or PstRotatorAz or Green Heron.

Tuners and amplifiers: If manual tune, use on one band switched-in by antenna switch. If auto-tune: use anywhere. Use in Automatic-mode or with control sw on shack PC, or over internet if remote-capable control sw. (KPA-1500 works great!)

Other devices can be controlled across the internet with serial port extenders, “web” relays and switches, computer controlled switches, RaspberryPi controller, ...

Remember our NCCC Question:

***My friend and I want to do CQP together.
He is at the radio location (e.g. his house).
I want to operate that radio from my house.***

Q1: Can the station be operated from the shack PC?

Or can be easily improved to reach control by the shack PC?

A1: Use either “Simple” method (Slide 7) : Software Programs or Remote Desktop.
Download/Purchase, Install, configure and test.

Q2: Is a K3 already in place, with auto antenna switching, etc...?

A2: Consider adding a pair of RemoteRig boxes, and borrow/use a second K3 or K3/0 as the control panel. Install, configure and test. This is a common remote setup.

Q3: Is a Flexradio already in place, with auto antenna switching, etc...?

A3: Ha! Flexradio software (2017 or later) already supports remote operation.
Install Flexradio SmartSDR at operator site, configure, and test.

You may find some limit on changing bands, retuning amp, or ... If you can overcome this with a procedure or an on-site assist, you are ready for the contest. Solving every last problem may not be cost-effective for a contest weekend.

Your NCCC has many users and experts on the various kinds of remote operation. I know we have users of RemoteHams and RemoteHamRadio.com, HamRadioDeluxe remote, Remote Desktops, K3 and RemoteRig (and K4 coming soon), Flexradio and more... Ask on the email group!

The goal of “remote” setups is to get more operators and stations on the air, for more hours of contesting (and DXing), which leads to more fun for the operators, and for the stations on the other end of the QSOs. Win-win!

Thank you!

Questions?