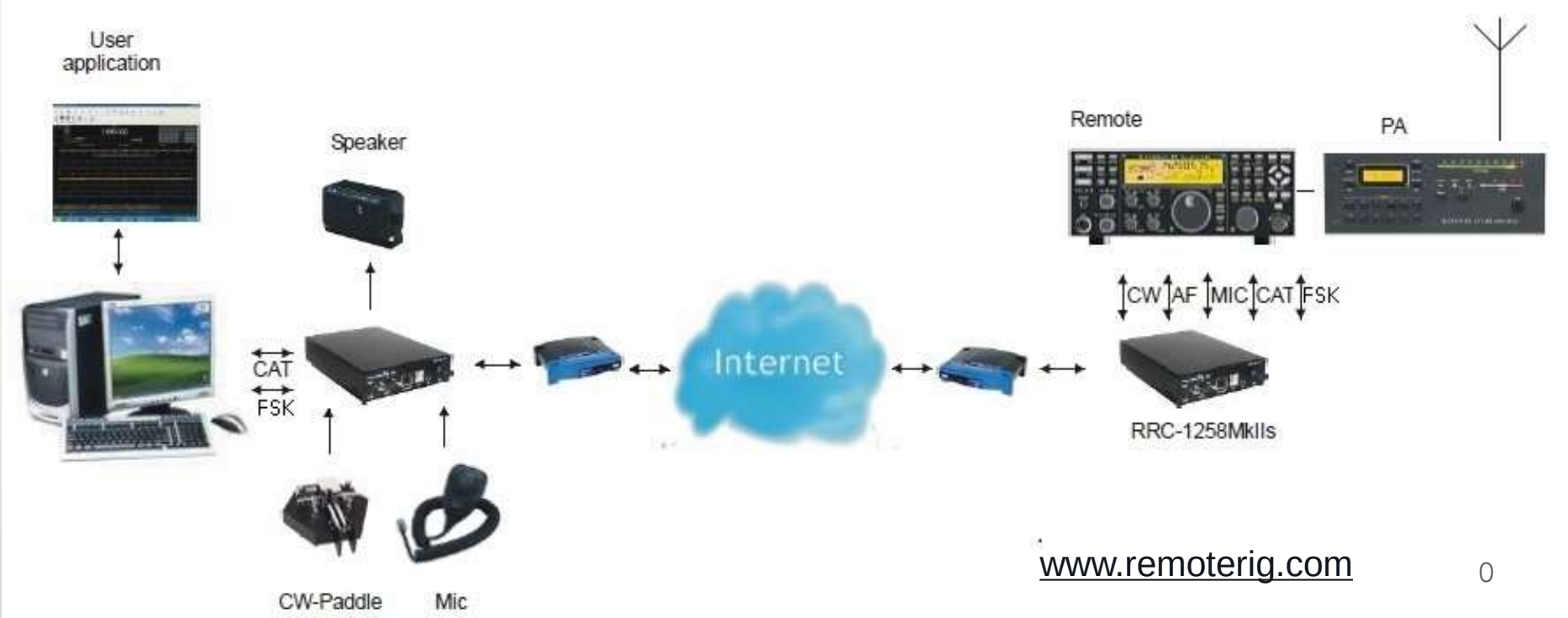
Hamvention RTTY Contest Forum

Remote RTTY Contesting

Mark Aaker, K6UFO

These slides available on k6ufo.com or via my QRZ.com page



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

N6V Special Event
Visalia 2015

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

Of course, follow the license rules and regulations!

In general: there are rules on the TRANSMITTER and rules on the OPERATOR.

In the USA: TX must meet FCC Rules, have a time-out timer. OP must have a US License / treaty / reciprocal license, and identify properly. *"W3 / G1ABC"*

Other countries: Follow licensing rules of the TX location. OP may qualify by CEPT or other agreements, and must identify properly. *"I2 / N1ND"*

For Awards or Contests, follow their rules!

ARRL DXCC Rule 9. Station Location and Boundary:
a) All stations used to make contacts for a specific DXCC award must be located within the same DXCC entity.
b) All transmitters and receivers comprising a station used for a specific contact must be located within a 500-meter diameter circle.
c) QSOs made with legally licensed, remotely controlled stations are allowed to be used for DXCC credit.

CQ WW Contests: IX.5 Remote operation is permitted if the physical location of all transmitters, receivers, and antennas are at one station location. A remotely operated station must obey all station license, operator license, and category limitations.

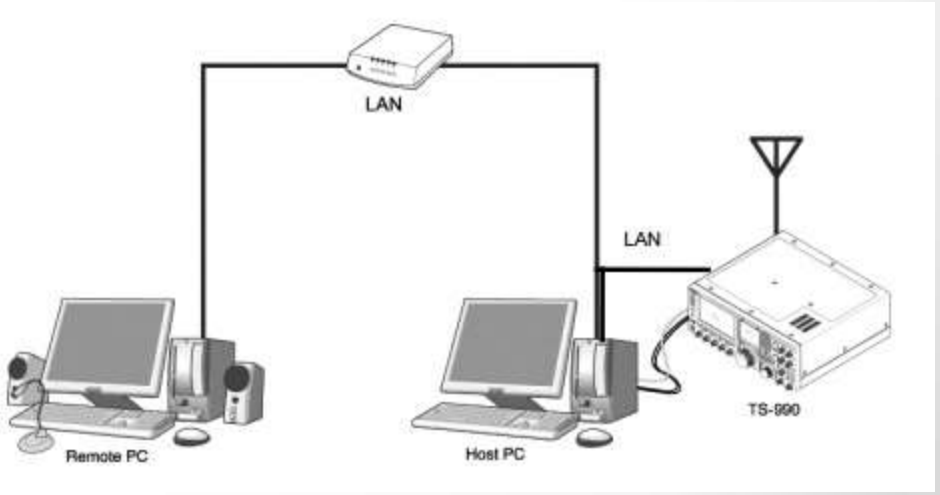
How to do Remote operating?

See my talk yesterday ☺, or my slides on k6ufo.com or search the internet. There are many remote access methods, but all involve:

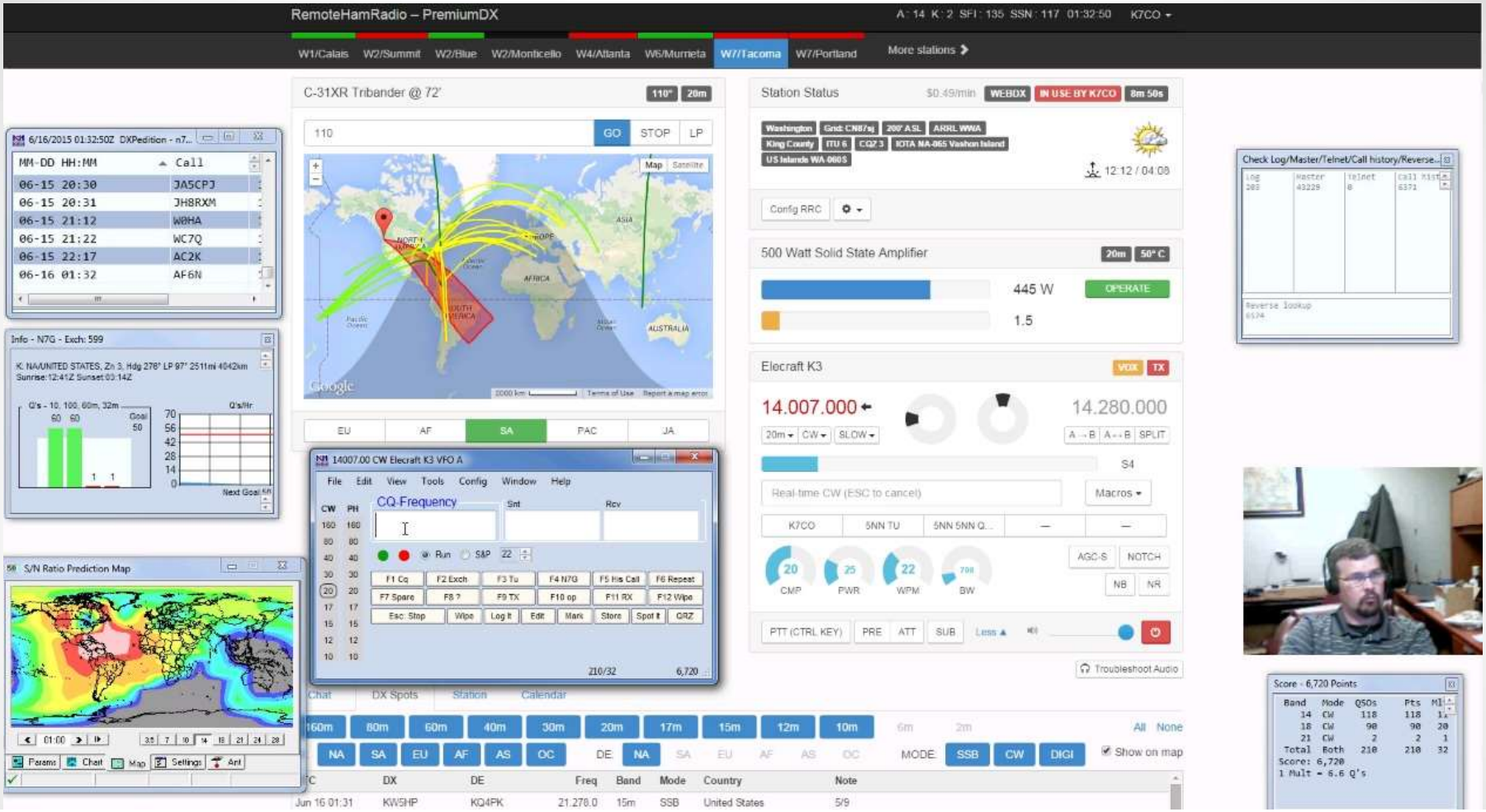
- Audio to and from the remote site.
- Radio control: Freq., Mode, PTT, ... by CAT, CI-V, serial port, USB…
- Station control: AC power, Antenna switch, Rotator, Tuner, Amp, …

Four popular remote access methods are:

1. Web Browser
2. Software Program
3. Remote Desktop
4. Remote Front Panel



#1. Web Browser



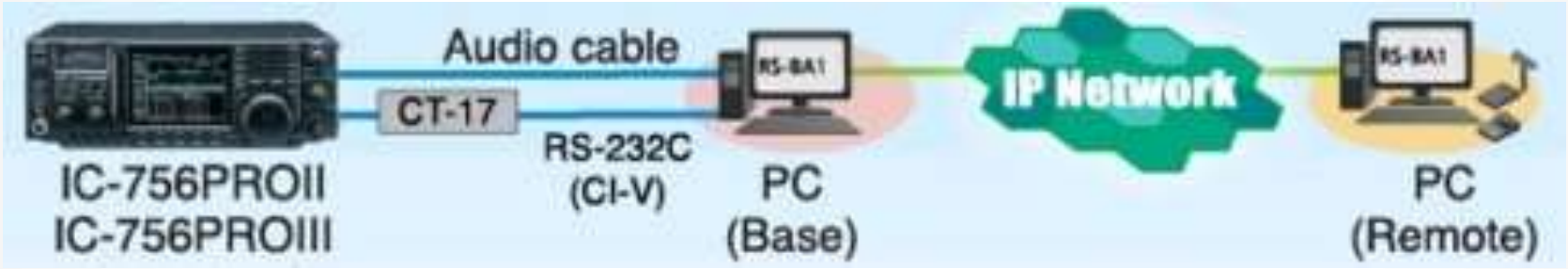
RemoteHamRadio.com $99/yr plus $6 to $36/hr. Can be accessed with a web browser, with extra hardware, or RemoteRig hw. (Full disclosure: K6UFO has a station on RHR.)

Pros: Easy to sign up and get started. Cons: Can be expensive. No “tinkering.”
Recommend: Good way to see what’s possible.

#2. Software Program

See RemoteHams.com Free to sign up. You must use their RCForb Client software. You can also use their server software to set up your own station as a remote.

ICOM's RS-BA-1 software:



See also: Ham Radio Deluxe "Remote Server," Kenwood ARCP-480, TRX-Manager, DF3CB software, N4PY Software, W4MQ, Win4K3Suite, …

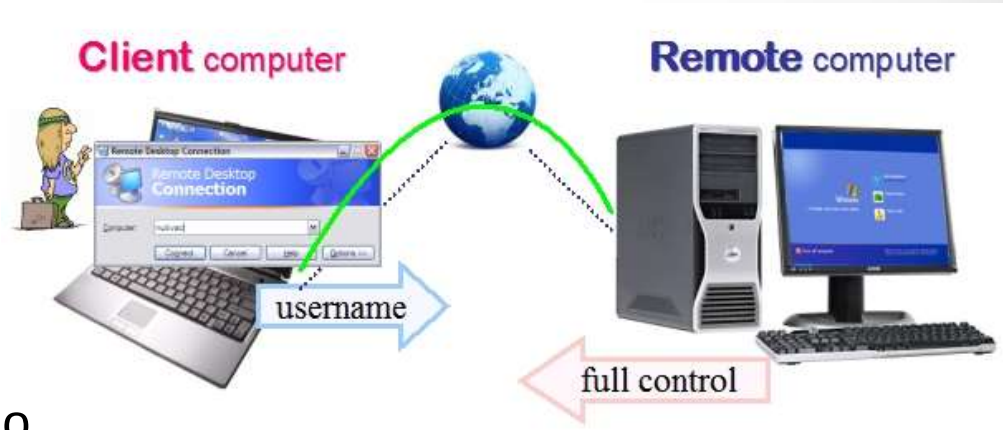
Pros: Built-in remote functions are supported by the software vendor.
Cons: Limited to the configurations and abilities of the chosen software.
Recommend: Good solutions if you want some vendor support.

#3. Remote Desktop

Set up the shack PC to control the station. Use your favorite logging programs or rig control programs - even if they don't have any "remote" ability: N1MM+, Wintest, TR4W, Writelog, DX4WIN, Logger32, DXLab,... Then use a "remote desktop" program to connect-in from your laptop to the shack PC.

There are many "Remote desktop" programs (also called VNC):

- TeamViewer,
- TightVNC
- Chrome Remote Desktop,
- Splashtop, …



If yours doesn't include two-way audio, add Skype, IP-sound, or VOIP "chat" sw like Ventrilo, Mumble, or TeamSpeak.

Pros: Use your station remotely just like sitting at the shack PC.
Cons: Rest of shack needs to be computer-controlled or automatic.
There can be network "firewall" issues to solve.
Recommend: Excellent remote access setup, just like working from home.

#4. Remote Front Panel

RemoteRig method: A detachable front panel, or a 2nd radio in “twin” mode, is used to control the remote radio. RemoteRig "modems" extend the radio control.

FlexRadio method: A FlexRadio Maestro front panel plugs into network (or wireless) to control a FlexRadio elsewhere on the LAN. (Across internet soon.)

Pros: Front panels provide knobs & buttons, just like a real radio. Very reliable once configured. Support by vendors Microbit, Elecraft , FlexRadio.

Cons: Expensive. Front panel or 2nd radio needed. Can be difficult to setup. Rest of shack needs to be computer-controlled or automatic.

Recommend: This is current "Top of the Line“ for a real radio “feel.”

How is RTTY Contesting different when Remote?

Five topics we'll cover:

1. Can you do Remote RTTY Contesting?
2. Noisy locations and Quiet locations.
3. Audio Quality and Decoding Quality.
4. What about delays?
5. What are the REAL problems?

Can you do Remote RTTY Contesting?

Of course! Here a few recent remote RTTY CONTEST operations:

CQ WW WPX RTTY Feb 2016:

VE3UTT	1411 QSOs	27 Hrs
K7JR(@NK7U)	1150	29
WR1ST(W1VE)	1009	16

CQ WW RTTY Sep 2015:

K6AW/2	1200 QSOs	34 Hrs

NAQP RTTY Feb 2016:

N6IE	674 QSOs	10 Hrs

Because it is not a separate contest category, there is no mandatory reporting of "remote." Estimates are around 1 - 2 percent of stations are remote, and growing rapidly.

Noisy locations and Quiet locations.

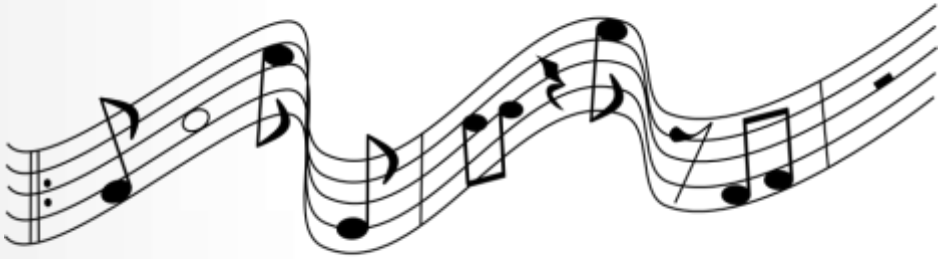
If the remote operator is in a noisy location like a coffee shop or airport, he will have a difficult time hearing CW or SSB signals, but RTTY will still appear on the screen!

If the remote operator is in a quiet location like a library or at work, the operator cannot speak loudly enough to operate SSB, but no speaking is needed for RTTY!

Because a computer (or two) are already involved in the remote access, it is easy to add software and have RTTY operating.

Audio Quality and Decoding Quality

You might think that compressing and transferring the audio to the remote location would lead to poor quality and poor decoding. But as a Billion "streaming music" listeners (Pandora, Spotify, YouTube, SoundCloud ...) can attest, the streaming audio sounds just fine and sounds the same as a "local" audio stream.



Streaming music, typical:
128 kbps, 16-bit, 44.1k

RemoteRig (quality 2):
120 kbps, 16-bit, 16k

Experience by remote operators in many RTTY contests with thousands of operating hours and contacts rarely list "poor audio quality" as a problem. Far more decoding problems are due to the usual problems of radio noise, interference, QRM, doubling, flutter, crowded band ...

… more about Audio Quality and Decoding Quality

Of course, It helps to have your audio levels set for the best dynamic range, and to reduce hum or noise in your system or cabling, and to use two or more decoders (MMTTY and 2Tone) or multiple decoding "profiles".

In a laboratory test, we could prove that the audio has been degraded. But in a RTTY contest environment, or a DX pileup, or any busy band conditions, you will not notice any difference. And if you do notice, its time to adjust the radio settings (Preamp/Attenuater, RF Gain, Slow AGC, wider filters,...) or the audio level settings (more/less audio gain at the source, or at the local decoders.)

For transmit: There are no problems with FSK.

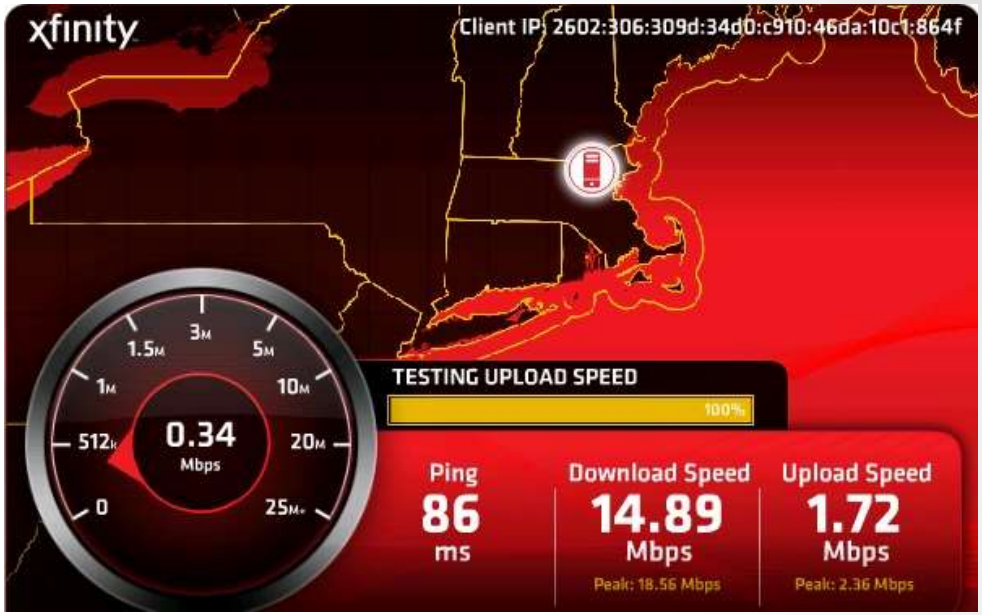
For AFSK (or with sending tones for PSK or WSJT-modes): You must avoid over-modulation, just like when local. You have level control at the source (laptop) and at the radio input (Mic gain).

4. What about delays?

Remote operating incurs inevitable delays of 10ms to 200ms.

Try www.pingtest.net

Delays cause tuning to "lag" and can lead to poor timing in "fast" pileups.



San Francisco, CA to Boston, MA

But the internet is only part of the delay, there is also delay in the radio DSP (16ms), delay in sound cards (10ms), USB delay (125ms), 2Tone decoding delay (200ms), logging software (200+ms), typing and button-pushing delays (250+ms), etc...

Remote stations sound like any other station on the air. The stations with the strange delays are the SO2R guys. ☺

5. What are the REAL problems?

Control of "everything else": rotators, amplifiers, tuners, multiple antennas per band, RX only antennas, watt meters, ... Some functions are automatic, some require you to manually adjust, some have special software controls ...

A "killer" problem when remote is when something needs to be reset or changed, and there is no "remote" way to fix it. There are more of these than you think. ☺

Final Summary:

Remote RTTY contesting is 95% the same as on-site RTTY contesting.

4 percent different – additional software or hardware for the connection.

1 percent better - because you can do it even when away from the station!

Thank you!

Laptop with RTTY and logging software, web browser

K3/0-Mini Front Panel

Extra screen space

RemoteRig "modem"

Internet to station 600 miles away