Remote Ham Radio Operation

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Presentation Goals

• Basics of Remote Operation Over Internet

• Terminology Pertinent to Remote Operation

• Dedicated RemoteRig Remote Operation System

• Demonstrate the K3/RRC and TS-480/RRC Systems
Simplest Remote Operation Over Internet

TeamViewer
Skype

Computer

Internet

Computer

SKYPE AND TEAMVIEWER

AUDIO AND CONTROL

CONTROL SITE

REMOTE SITE
Critical Parameters for Voice over Internet

A/D Sampling Rate and Bits

Packet Size  Buffer Size

RTP packets generated at the source device

Loop Time (PING)
Processing Delay
Total Delay <150 ms

Time Jitter  Dropped Packets

This sample of the RTP stream has jitter (but has no dropped packets)
Current Remote Radio Operation Systems

• **RemoteRig** – remoterig.com
  • Dedicated Specially Designed Hardware

• **RemoteHams** – remotehams.com
  • Software System Using Computers

• **RigBlaster** – westmountainradio.com
  • Computer Driven System

Lots of new groups and companies creating software and products for Remote Operation
RemoteRig Remote Control System

Dedicated Microprocessor And Electronics for Faster Processing

www.remoterig.com
RemoteRig Dedicated Hardware System

• No Computer Needed

• A Black Box that contains a microprocessor, inputs for Mic, Speaker and CAT signal. A serial port for the CAT signal and an extra serial port to be used for other controls. A Winkey device for CW operation.

• One box required at each site. One is called the Radio unit (remote location) and the other is the Control unit at the user. Ethernet cable connects each box to the outside world.
Control Site

‘Control End’ station at G4IRN

WiFi Access Point
(e.g. Hotel, 3G Mobile)

Remote Rig RC-1258MkII
(Control End)

K3 to Remote-Rig Interface Cable

K3 at Remote Station

CAT data
(used for logging)

Audio from Remote K3

Software:
Windows
DX4Win (Logging)
VCOM (Virtual Serial to IP)
KTERM_232 (Expert Remote Control)

CW Key
K0NM Control Site

K3/0mini

K3/0 RRC
Remote Site

'Remote End' station at G4IRN
K0NM Remote Site
K0NM Remote Site Antennas

Verizon LTE Antenna

Optibeam 10-20 Beam
Remote Rotor Control

Remote CW Contesting
Remote from Hotels in USA and Europe

RRC USB Micro Sound Card and software
Laptop with Kenwood Rig Software
SSB and CW with Keyboard
Remote Operation Using a Phone

Your Rig in the Palm of Your Hand

- Android Phone
- Hot Spot Ethernet
- Half the Cost
- Cheaper Than Mobile
Mobile Remote (K0NM/MR)
Look Ma – No Antennas!
TS-480 Remote
Cruising and Working Pileups
1 KW output with VEE Beam
Mobile Remote – Working DX w/o Antenna
SO2R Operation

• Contest Setup
• TS-480 remote with SPE 1.3K amp at home
• K3 Local with SPE 2K amp at Ranch
• N1MM+ operating system
• Only Problem - Operator
WG5H Remote

- 135 ft tower with 10, 15 20, 40 meter beams and inverted VEEs for 80 and 160 at 80 feet, at ranch near Freer, TX
- K3 with KPA500 and RRC, remote rotor control, remote SPE 2K control
- K3/0 with RRC for Control for home use
- Second tower being installed for a second remote rig.
Remote Hams Basic Model – KJ5Y
Remote Hams credits

Remote Hams Concept by Scott Avery (WA6LIE)
RCForb Client/Server Software
developed by Brandon Hansen (KG6YPI)
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Special Thanks:
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VK4FSGW (Skin Development, Support & Testing)
Kelly (Logo Design)

• [http://download.remotehams.com/download](http://download.remotehams.com/download)

• [http://hamradionation.com/](http://hamradionation.com/)
Remote Radio at the RF Ranch

Bob Feldtman – W5RF
• Dream AM Radio
HEX Beam
6-20 meters
K3/0 at Home
K3s at Ranch
SPE Amp
Verizon Router
Transmit Antennas

• Hexbeam 20-6 meters at 55 feet
• 270 foot OCF 160-10 meters at 50 feet
• Two legged Vee beam 40 feet
  • Centerline 60 degrees to EU and North Africa
  • Non terminated thus good to 240 degrees
  • 350 ft (5 wl 20 meters) legs -45 degrees apart
• 30 Mhz dipole 30 feet
• 40 M elevated vertical ¼ wave, elevated radials
Aerial View
RF Ranch
Aerial View
RF Ranch
Antennas
Receive Antennas

• Any transmit antenna per Extra 2K program
  • Extra 2K amplifier 6 antenna inputs
  • Programmable remote with Team Viewer

• SAL-30 phased loops
  • Remotely steerable through Team Viewer
  • 8 directions
  • Up to 20 db gain over dipole.
Projects

• Upgrade Yeasu rotator controller to Green Heron controller for remote access
• Add Spiderbeam 160 m 60 ft vertical for low angle 160 DX radiation
• Finalize N1MM+ integration to RRC with Nizar Mullani’s teaching
TeamViewer control of Remote Station