



# Introduction to Remote Operating

Zach Thompson - KM4BLG



# What is remote operating?

Controlling and operating your radio equipment from virtually anywhere.

Can be done on HF, VHF, UHF, or any other band you choose.

Traditionally, remote operation was difficult, nowadays it's easier than ever!

Traditionally, links were established over telephone or RF and capabilities were limited.

The advancement of internet connectivity and smartphones have greatly expanded our abilities.

# What do you need for a remote station?

An active internet connection

A radio capable of computer control (via CAT or similar)

A computer that can remain powered on

A radio to computer sound card interface (Signalink, RigBlaster, etc)

# How It's Done - Proprietary Software

Several radio manufacturers already have proprietary software for remote control of their higher-end radios:

FlexRadio SmartLink

Icom RS-BA1

These softwares are often very useful and easy to set up, but they restrict you to specific software platforms and radio models.

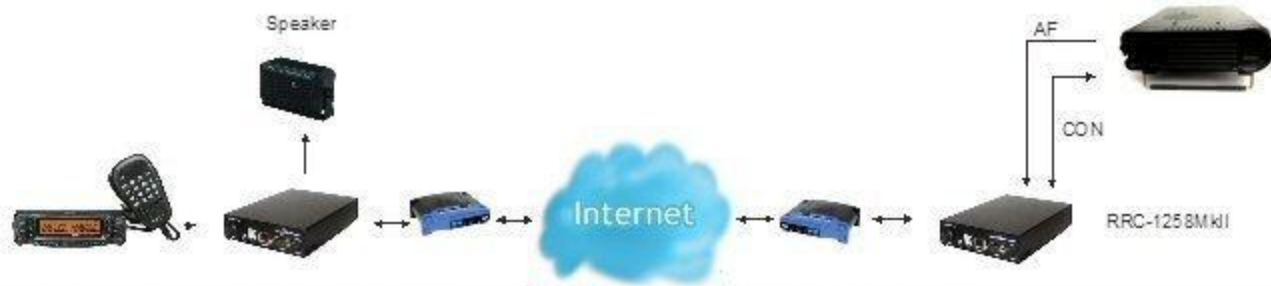
# How It's Done - RemoteRig

A RemoteRig is a (mostly) plug and play option, that allows you use radios with detachable control heads, and utilize the internet between the control head and the radio.

RemoteRigs are sold in pairs. One attaches to the radio body at home. The other to the control head wherever you are operating from.

They allow you to operate the radio physically, much like you would if you were sitting directly in front of it.

They have two key disadvantages though - 1) They require you to carry physical hardware with you wherever you go, and 2) They are expensive (~\$600 for the pair)



# How It's Done - RCForb

Started as a network of publicly available remote ham radio transceivers.

Nowadays, you can set up your own RCForb server without having to share it with the public.

Can control other station accessories (antenna rotors, amplifiers, antenna switches, etc)

Two pieces of software:

- Server - Connects to the radio and accessories at the TX/RX point.

- Client - Connects over the internet to the server and allows for control and use of the radio.

Best of all, RCForb is free software! (mostly)

# What do you need for an RCForb server?

A Windows computer capable of remaining powered on

A transceiver of your choice with CAT control capabilities

A sound card radio interface

A CAT control cable



# Configuring The Server

1. Create an account at RemoteHams.com
2. Connect all the necessary accessories between the computer and radio.
3. Download, install, and launch the RCForb server software.
4. Configure the software with the appropriate sound card, COM ports, and radio model.
5. Configure user privileges.
6. Configure your network for RCForb.
  - a. Open ports 4524 and 4525 through your router.
  - b. Set up Dynamic DNS (DDNS) if necessary.
7. Launch your desired RCForb client and test. (Depending on your router configuration, you may need to test from *outside* of your home network.)

# Port Forwarding

Port forwarding essentially tells any incoming connections where on your network to find the service you are interested in. (i.e. your RCForb server)

You will need to access your router's settings to configure port forwarding.

You will need to know what IP address your server is on. You can often determine this by running "ipconfig" (without quotes) through Command Prompt on Windows.

Each router model has a slightly different process for doing this. Detailed instructions for your router model can be found at [portforward.com](http://portforward.com).

# Public IP Addresses

In order to access your RCForb server from another location, you will need to know your **public** IP address. **This is different than the IP address you entered into your router for port forwarding.**

To find your public IP address, you can visit a website like [whatismyipaddress.com](https://whatismyipaddress.com).

Most Internet Service Providers (ISPs) will grant a single IP address to everything behind your router.

Although rare, some ISPs share IPs over more than one customer. In this case, you will need to request a dedicated public IP from your ISP.

IP addresses can be static (never changing) or dynamic (prone to change). If your IP address changes often, you may need to set up a Dynamic Domain Name System (DDNS) client on the server.

# Dynamic DNS (DDNS)

In order to avoid having to memorize an IP address, you can set up a domain name you'll utilize in your client that is easier to remember.

For users that experience frequent IP address changes, a DDNS address is almost essential.

DDNS utilizes a special application that you install on your computer that automatically updates your domain name with the latest IP address.

This allows you to always use the same domain name to access your server, regardless of what your IP address is or how often it changes.

Instead of using DDNS, you can request a static IP address from your ISP, often for an additional cost.

# A Word About PTT

When setting up the PTT keying on your radio, there are a few ways to do it, depending on your setup:

- Use a separate keying line - often from a serial port directly to the mic or accessory connector.

- Use the CAT interface to key the radio.

- Use VOX built into the radio or sound card interface.

Depending on the wiring of your radio, you may be limited in which options are available to you.

All will work, but VOX has one key limitation. If it detects silence, the radio will un-key, regardless.

Therefore, if you must use VOX, it is recommended to minimize silence and increase your VOX un-key delay.

# Remote Computer Access

When running a remote station server, it is recommended to have remote desktop application installed on the server in order to access the computer outside of the remote software.

This software allows you to view your computer screen and control it as if you were directly in front of it.

This will allow you to change settings, restart software, and check statuses of the remote server.

For digital only operators, this, in itself, can serve as your remote station control. Simply open your favorite digital mode software on the server computer and connect via your remote desktop software to control it.

Several good products available: AnyDesk, TeamViewer, Splashtop, LogMeIn, Google Remote Desktop, etc.

# Staying Compliant

Part 97.213(b) states that a station may be under telecommand where “Provisions are incorporated to limit transmission by the station to a period of no more than 3 minutes in the event of malfunction in the control link”

Most of the platforms discussed here have safeguards already built into them.

However, at the risk of becoming non-compliant and/or damaging your equipment due to a control malfunction, it is good to have a redundant means to shut down your transmitter.

This can be as simple as cutting power to the power supply providing power to the radio.

# An Easy and Affordable Backup

Several manufacturers produce “smart plugs”.

These devices connect to your WiFi and allow you to use a smartphone app to turn power on and off to a connected device.

They typically cost about \$10-30 each, and can be configured in about 5-10 minutes.

In the event of a malfunction, one tap of a button in the app will kill all power to your transceiver.





# Conclusion

Anyone can set up a remote station with a little time and patience!

Your remote station can either be dedicated solely for that purpose, or utilize the computer and radios you already have in the shack.

Remote stations can be started or stopped at will to fit your needs.

Remote stations are a great way to remain connected to your local radio waves, even when away from the shack.