Amateur Radio Remote Station in Prince Edward Island

Building a Ham Radio Station
based on my Icom IC-7100
mobile rig for Remote Operation

Arthur Smith, VA3BIT / VY2BIT
Ottawa Amateur Radio Club
March 10, 2021

Thanks to Chris VE3FU

For describing his remote station in Labrador (VO2AC) at OARC and OVMRC presentations over the past several years. It inspired me!

Lessons Learned

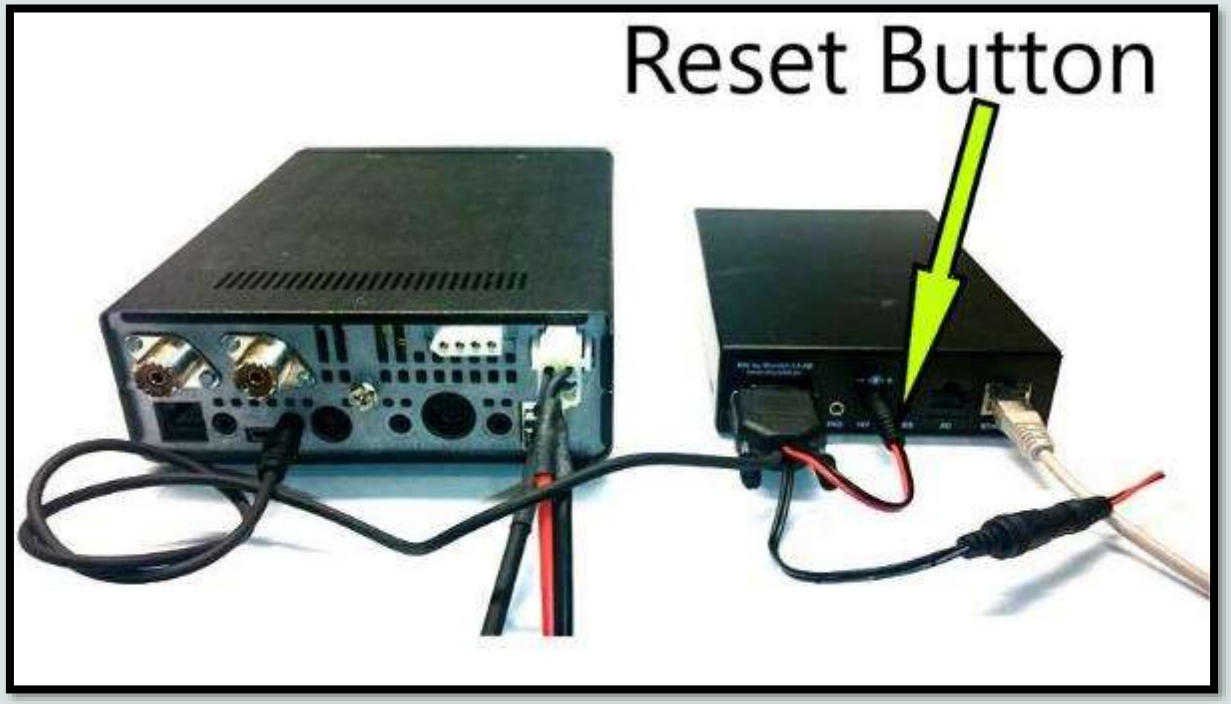
Follow the manufacturer's directions:

When the directions say to locate your new antenna away from metallic objects, do just that!

Lessons Learned

Follow established principles:

After buying used electronic gear, press the reset button!



Lessons Learned

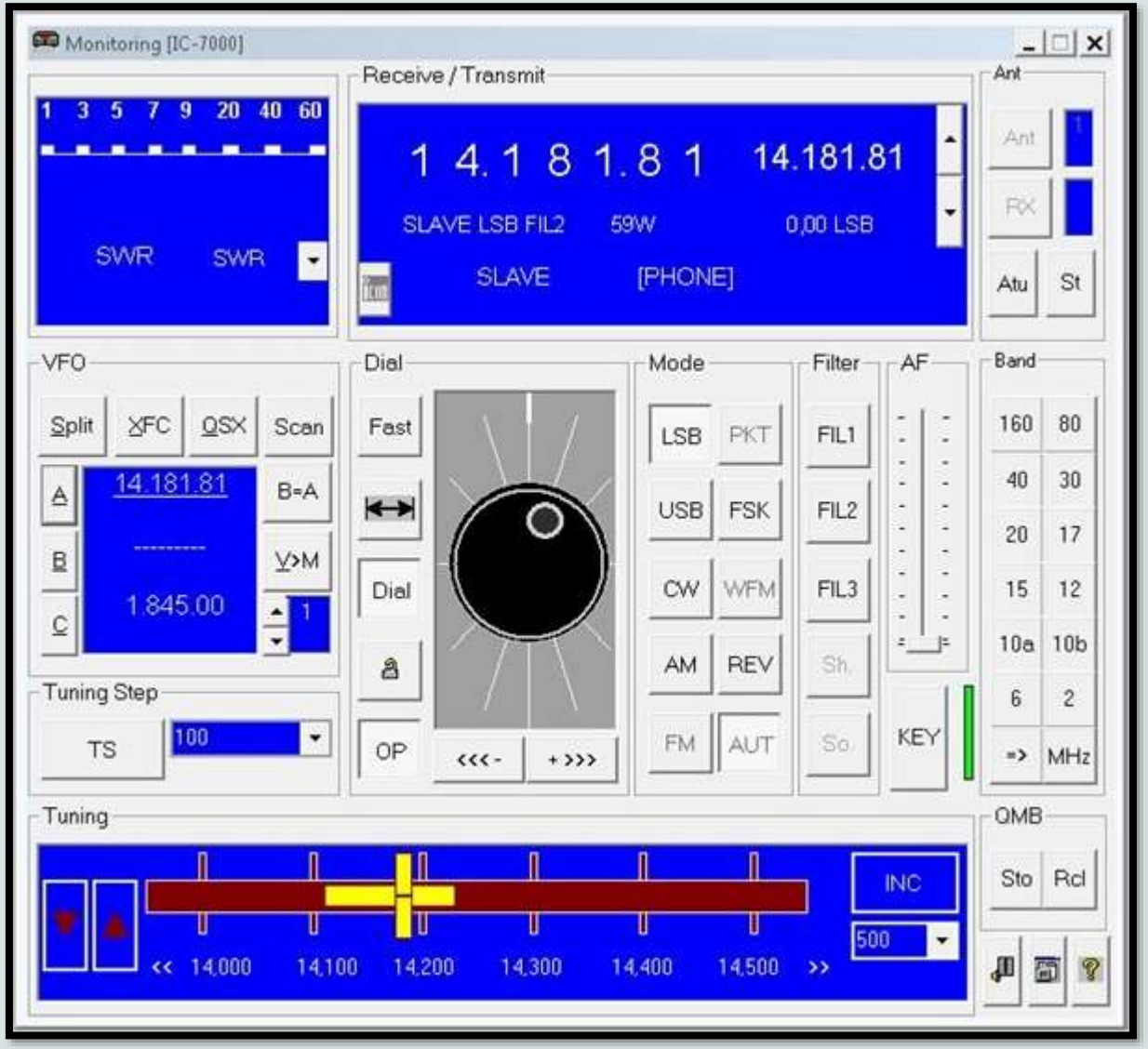
It’s called Remote for a Reason:

- *Bring everything you think you’ll need, plus more.*
- *If building while quarantining for an epidemic, try to think waaaay ahead!*

Remoting over the Internet

Two general means to control your radio:

- *Virtual representation of your radio controls using a PC, Mac or Raspberry Pi*



Remoting over the Internet

Two general means to control your radio:

- *Use of the actual control head with an associated modem*

Remoting over the Internet

I chose the latter: I prefer to control my radio with the control head that came with it.

Obviously, with a remote station, I can operate anywhere with an Internet connection. This is my preferred shack at home in Ottawa.

Warning!!!

Like Chris VE3FU, what follows is a depiction of what I did to build a remote station in PEI.

This presentation is not intended to be a tutorial. If you choose to build a remote station, your experience will definitely vary from mine. ☺

About two years ago...

Chris VE3FU made a presentation at the Ottawa Valley Mobile Radio Club (OVMRC) about his remote station at his parents' home in Labrador. That station is now VO2AC. Chris has since made the same presentation at OARC.

Hmmm…I can do something similar in PEI if only I can convince my father!

To my surprise...

Dad was enthusiastic!

Despite Dad's "OK", I endeavored to minimize the footprint of the station. Like Chris' initial station, the rig, power supply and modem would be in the garage. The antenna would be in the "bush" behind the back yard.

Chris' Major Problem

Chris found that a WiFi link from his parents' house to the RemoteRig modem in the garage introduced significant latency.

I intended to learn from Chris' experience by wiring an Ethernet link from the garage to the router.

Initial Considerations

…took place prior to Covid.

- *Three weeks vacation max: enough time to clear the bush for radials?*
- *Hardwired Internet (Ethernet)*
- *Mice in the garage? Chewing on cables?*
- *Overheating / too cold?*

Discussed potential station with Dad during Christmas 2019

To build the station during my summer vacation in 2020.

Then Covid-19 happened.

Canada closed its borders.

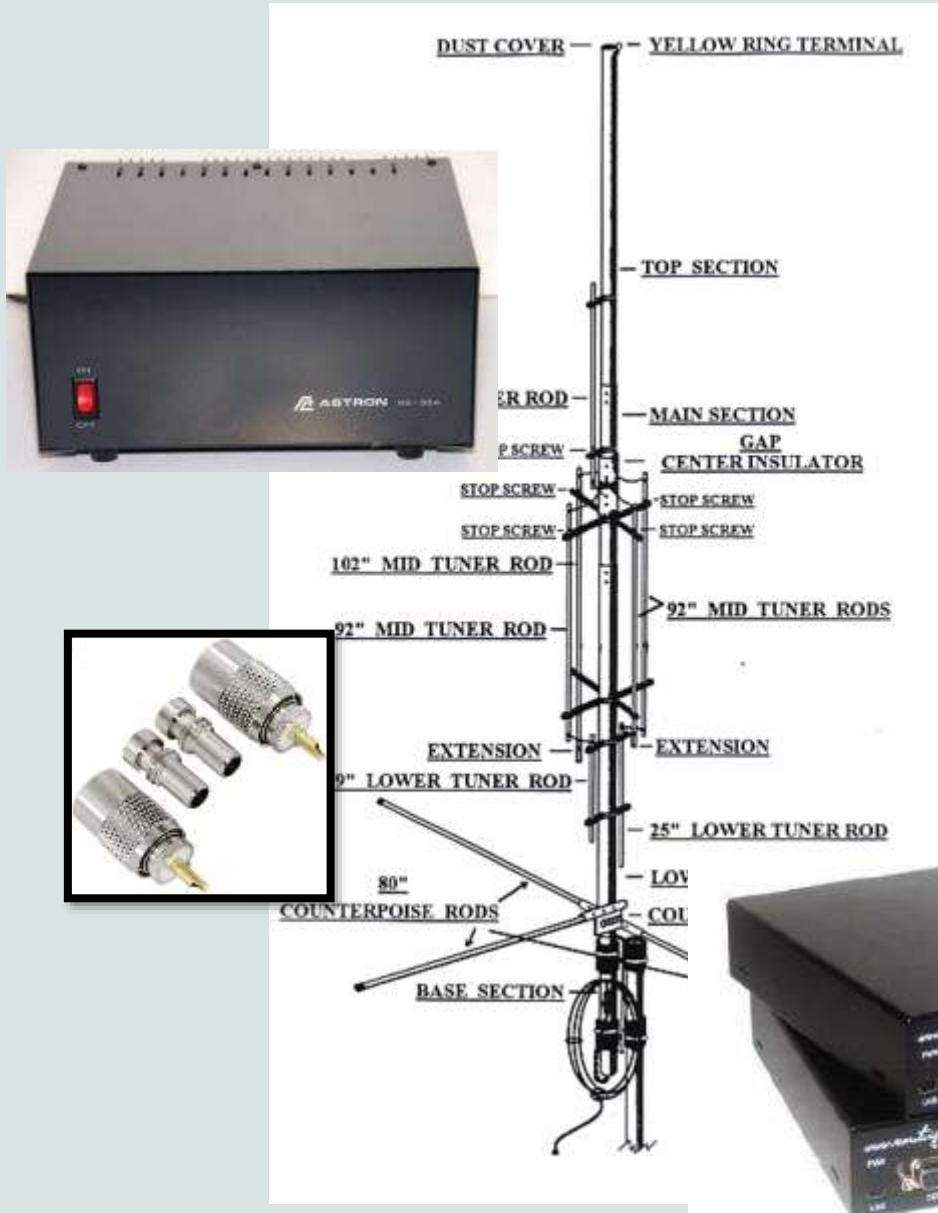
No visitors allowed in PEI.

June 2020

PEI opened its borders to “Seasonal Residents” and “Family Connections”.

Quarantine was a perfect time to build a radio station!

I accompanied my parents to their home in PEI, and along the way, picked up a new GAP Titan DX antenna, Astron 25 amp power supply, RemoteRig modems and lots of connectors.



July 2020: Build Part I

Assembly of GAP Titan DX went quickly.

But…should have spent more time reading directions!

July 2020: Build Part I

Assembly of GAP Titan DX went quickly. Should have spent more time reading directions!

Initial antenna location too “bushy”, so relocated to far edge of back yard.

July 2020: Build Part I

Testing of the GAP Titan DX at ground level, here with my father lending a hand.

Testing went well, so…

July 2020: Build Part I

…installation at the permanent location commenced.

July 2020: Build Part I

And up she goes!

July 2020: Build Part I

However, despite tuning well in the center of the yard, my Titan DX did not tune well in its permanent location.

I chose to concentrate on other tasks for the time being.

July 2020: Build Part I

I was concerned about my rig overheating, so made sure to include lots of ventilation! I was also concerned about mice and other critters chewing on the cables, but never figured out a solution to that dilemma.

July 2020: Build Part I

Researched the Internet:

- *Short cables, long cables, even longer cables*
- *Adjusted/extended length of 40m "counterpoise"*
- *Relocated antenna feed; adjusted stand-offs*
- *In desperation, emailed photos and phoned GAP in Florida; Richard set me straight!*

July 2020: Build Part I

Turned out the real problem was the proximity of metal to the antenna in the form of my brother's trailers. Once they were moved, the Titan DX tuned up nicely. Also, Richard advised me how to orient the antenna lead. That makes a difference too. Cable length, not so much.

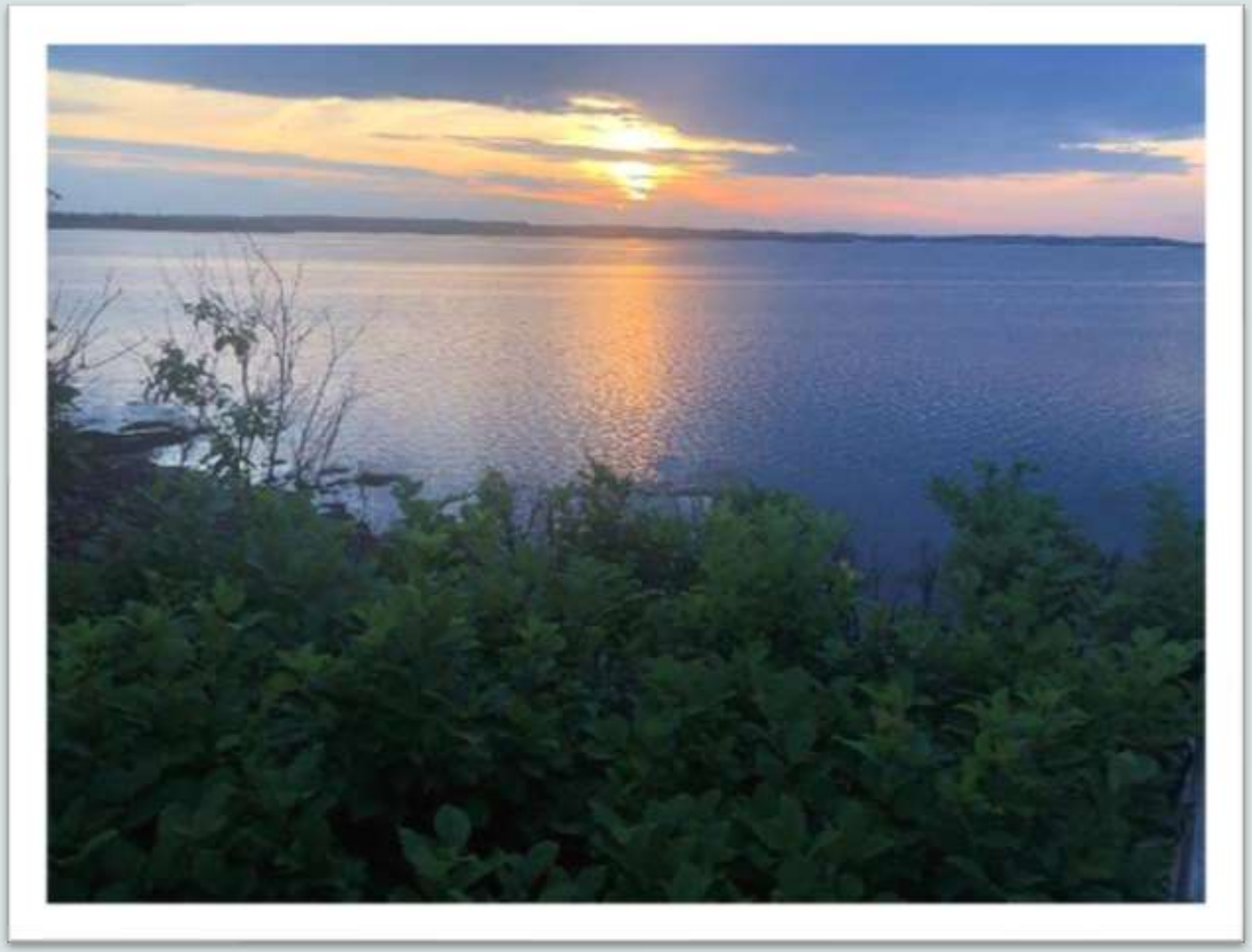
July 2020: Build Part I

By this time, I had only a few days left in PEI before returning to home in Ottawa.

Remote operation working “internal” to the LAN, but not “external”, ie, Internet

Unable to get Port Forwarding to work, prior to departure.

Very disappointed. ☹



December 2020: Build Part IIa

I had another opportunity to visit PEI from December to February. During this time I resolved to move the GAP Titan DX into the “bush”, away from any nearby metallic objects.

And, get the RemoteRigs working.

December 2020: Build Part IIa

Luckily, we had a very mild December and I was able to dig a hole and get the Quikrete to set before sub-zero temperatures were the norm.

December 2020: Build Part IIa

Once again, Dad assisted in moving the GAP Titan DX to its new location in the bush.

Although the Titan was not tuned to the portion of 80m that I preferred, it tuned up well on all other bands.

I enjoyed operating in the RAC Winter Contest for the first time in many years!

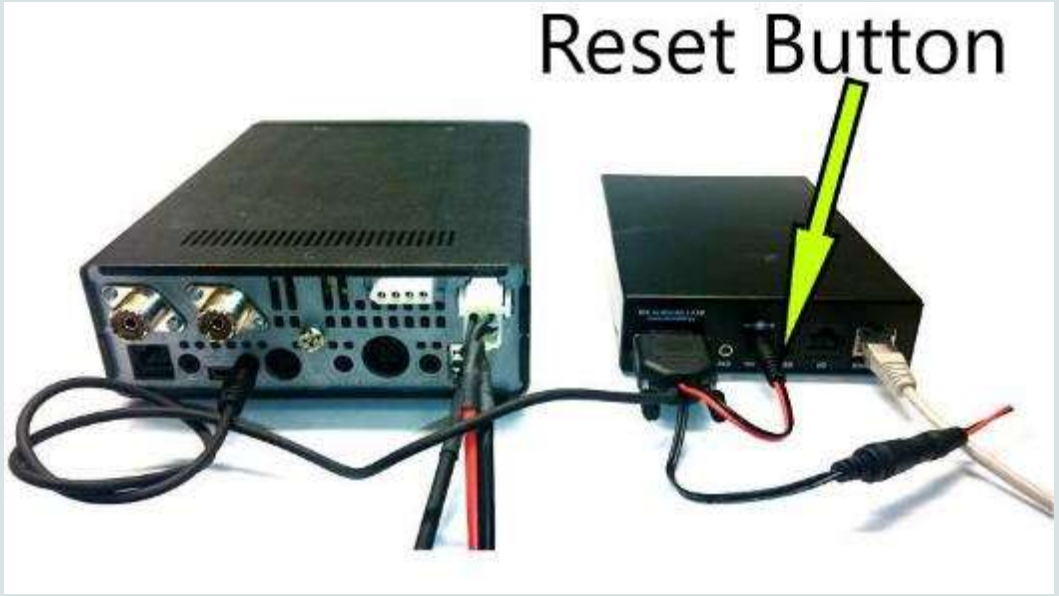
December 2020: Build Part IIa

Despite the Titan now working as it should, I was still unable to get my Icom IC-7100 to work remotely.

On January 1, 2021, I departed with my parents to their home in Florida.

January 2021: Build Part IIa

While in Florida, I pondered the situation. In desperation, it occurred to me to reset both RemoteRig modems.



January 2021: Build Part IIb

Lo-and-behold, resetting the modems fixed everything!

I followed some online directions for configuring port forwarding for webcams, and that worked too!

January 2021: Build Part IIb

While chatting with Mike VE3FFK last year, he recommended including a means for emergency shutdown of my remote station. My problems with configuring also suggested a remote switch. I bought Microbit's 1216H Remote Switch as well as their AS-1289 Remote Antenna Switch on my return drive north to PEI.

January 2021: Build Part IIb

After another quarantine, I joined the Charlottetown ARC and learned about their 80m net on Thursday evenings. I wired up the remote antenna switch, rigged up a temporary 80m NVIS antenna, and successfully checked into their net.

January 2021: Build Part IIb

Despite the IC-7100 and RemoteRig working fine in the garage, I got cold feet (hi!), and thought perhaps the radio box should be insulated, much like Chris did by installing his rig in a cooler.

Digital Modes

The IC-7100 is compatible with digital modes using the mini-USB port at the rear of the radio. However, using the rig remotely, I must use a SignaLink USB plugged into the mic jack on the control head. This will be my next project.

Future Plans

Having a remotely controlled antenna switch, I want to add

- *80m end-fed half wave (EFHW) inverted-L antenna*
- *160m full-size dipole (somewhat inverted-V)*
- *6m fixed beam*

Final Thoughts

It's early yet, but so far my remote station has worked well contacting VE3BOW in Quebec on 40m as well as for the RAC Winter Contest and the ARRL SSB DX Contest this past weekend. And, of course, local PEI/Maritime nets on VHF, UHF and 80m.