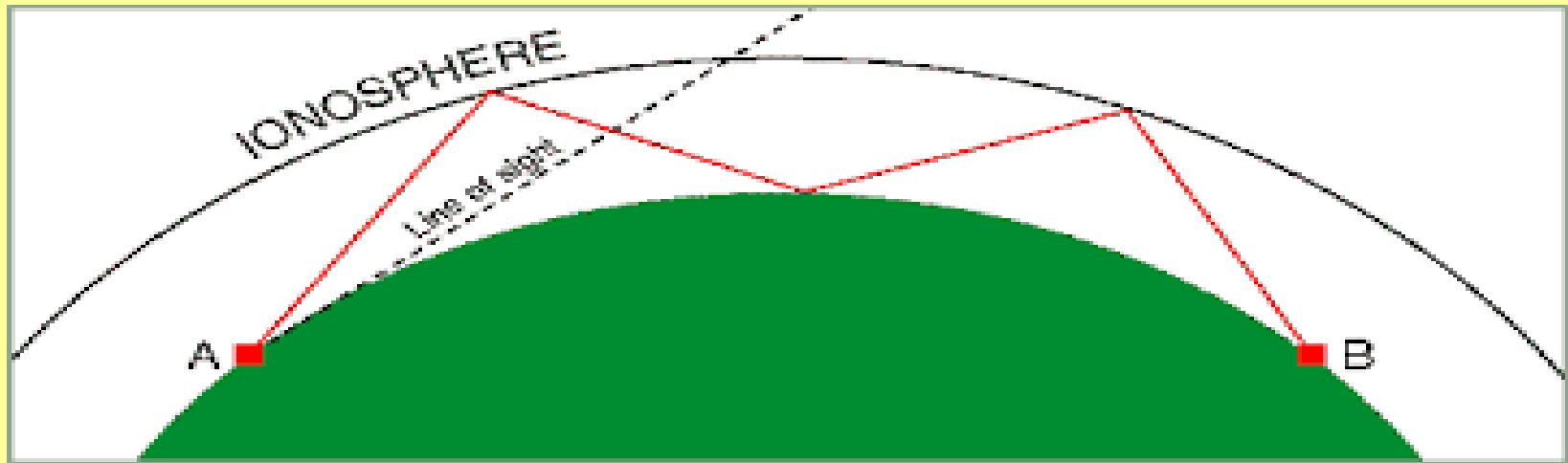Woodbridge Amateur Radio Club

Remote HF Link
using
hammesh/routers and laptops

Chuck Helverson KA3EHL
January 19th, 2016

Goals

Demonstrate long range HF communications
How to handle message traffic
Conduct emergency shelter operations
Conduct HF operations from the Emergency Operations Center
Conduct Public event HF communications

The Problems

NO YOU WiII NOT!
Run coax through unlocked doors!
Introduce the possibility of a lightening strike in the building!
Connect to our network in any shape or form!
Put holes in our walls for coax!
Climb on our roof to put up antennas!
Expose our patrons to high frequency radio waves!
(RF safety zones)

If only I could:

1. Use my HF/VHF radio
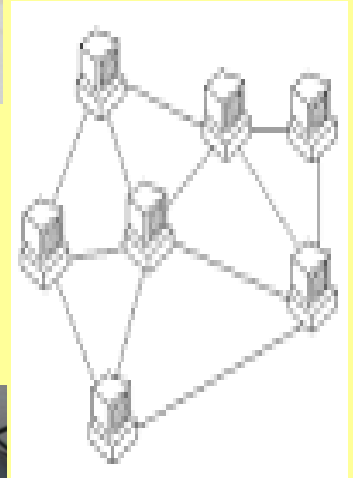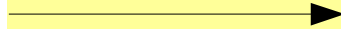2. Set up an antenna
3. Connect a computer
But
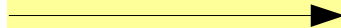not connect to a network or run cables around building.

I have the gear but getting it to work together?

I could use a mesh network!

Connecting computers together via
high speed routers.

Get the linksys routers to form a Broadband Ham Mesh

You reprogram 2 or more routers with software for hams
Go here:
http://www.broadband-hamnet.org/just-starting-read-this.html

A tale of two routers

Using routers Terry WA5NTI helped me find
I was able to flash (reprogram) the routers for
mesh operations.
It was pretty easy!

http://www.broadband-hamnet.org/documentation/68-firmware-installation-instructions.html

Connect routers to laptops via router ports (not the wan port)

Do you have a mesh?

You can see two routers connected in mesh network
You can find out by putting http://localnode:8080 in your web browser on either/all local machines

KA3EHL-1 mesh status

[Refresh] [Auto] [Quit]

Local Hosts	Services	Current Neighbors	LQ	Services
KA3EHL-1		KA3EHL-2	100%	

Remote Nodes	ETX	Services	Previous Neighbors	When
none			none	

Setting up the remote computer control through the mesh

Down load a FREE! Program called
Team Viewer
At
www.teamviewer.com

Hit the green "Download" button
www.teamviewer.com

At the bottom left....install the program

Choose Basic installation and Personal/noncommercial use

If connected to the internet this what you will see.
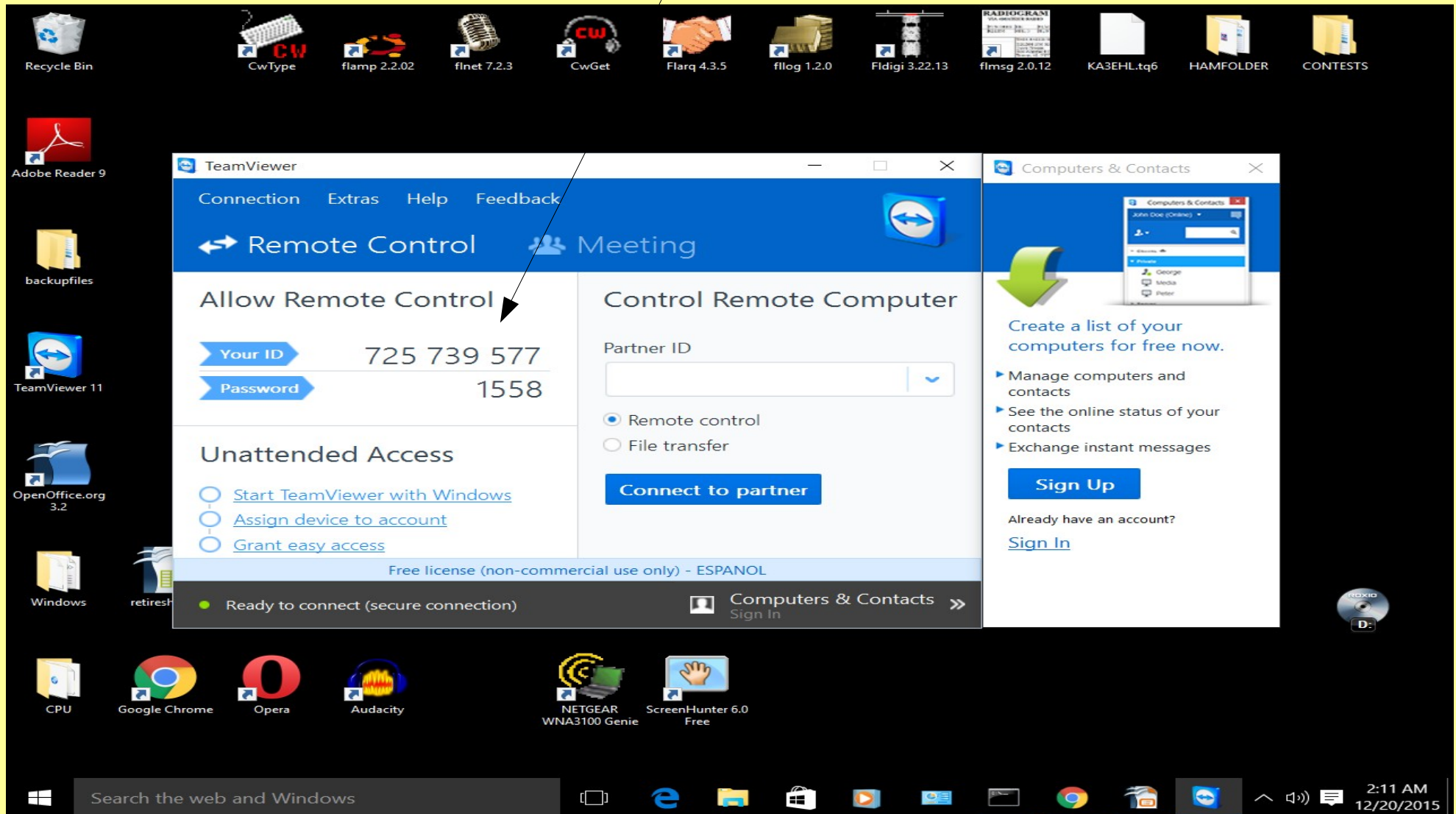
Go to the EXTRA tab at the top choose "Options"
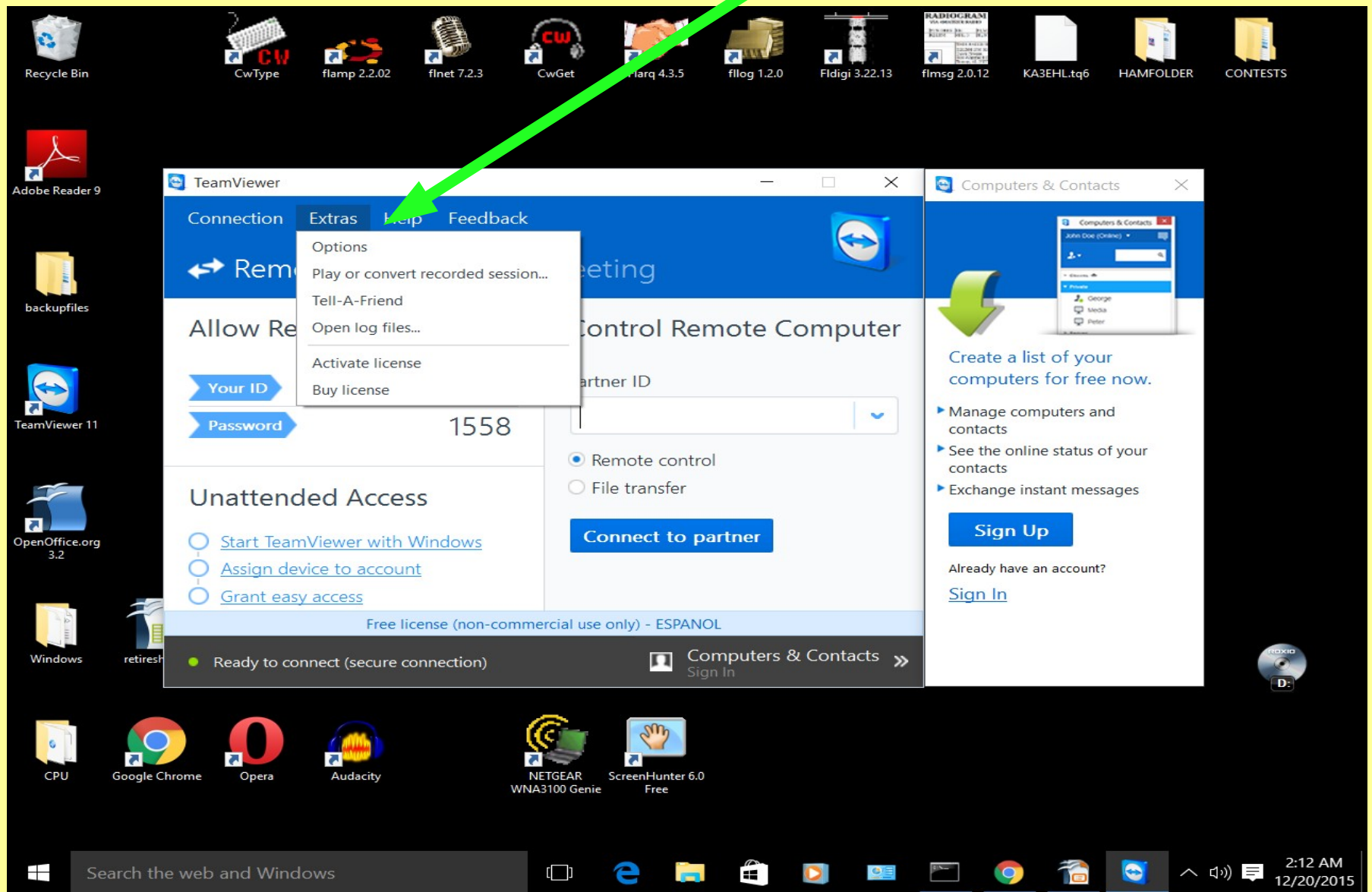
For mesh use: "Incoming LAN connections" drop down box

accept exclusively
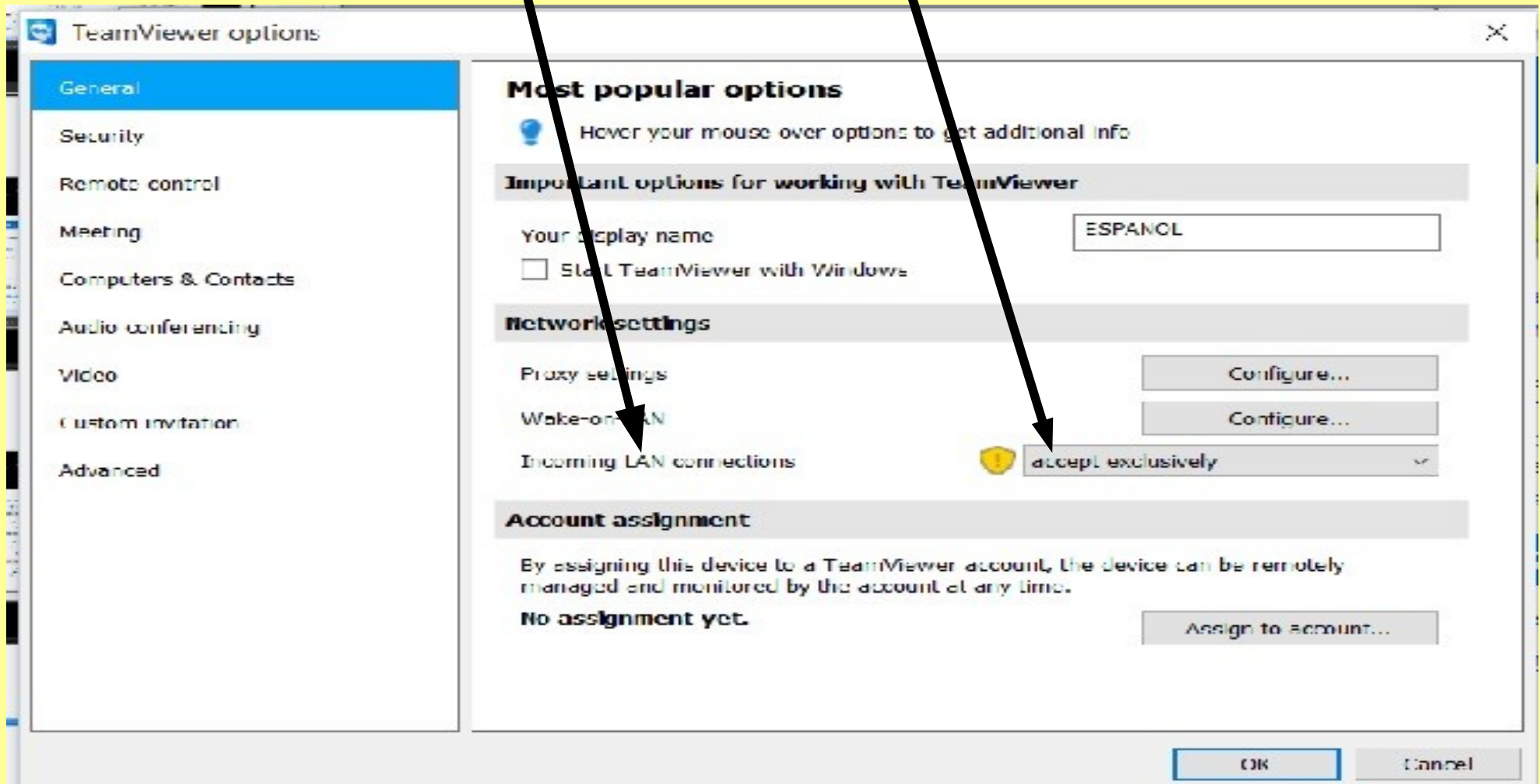
Look for the shield in the LAN drop down! Click OK
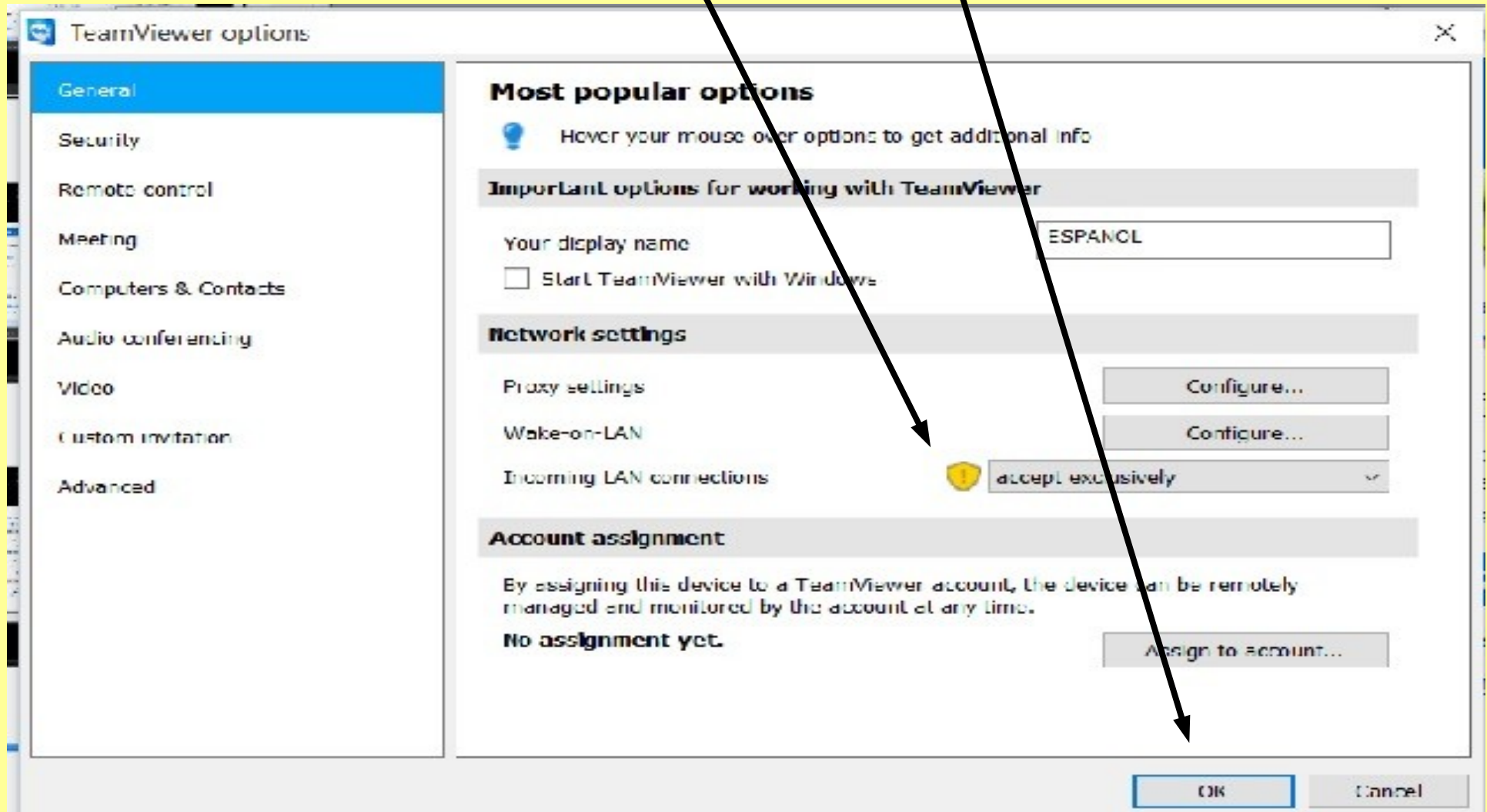
Repeat installation for as many additional computers as needed!

This is the computer attached to the ICOM 7200.
Note the IP address of the mesh router.
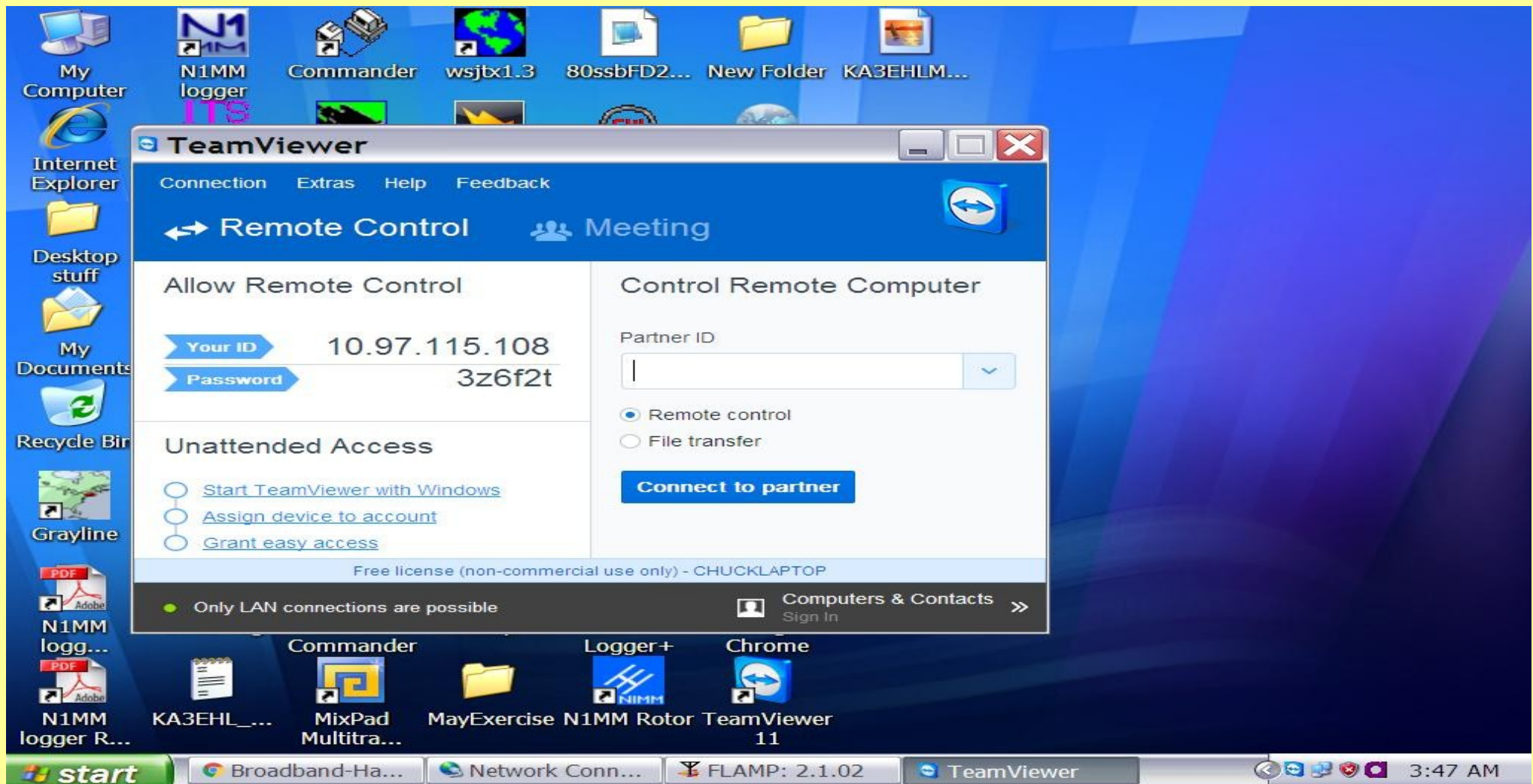
The IP address of the local machine pops up with a password.

This is the remote laptop.

Note: I entered the IP address to control the remote laptop (the one connected to the radio).
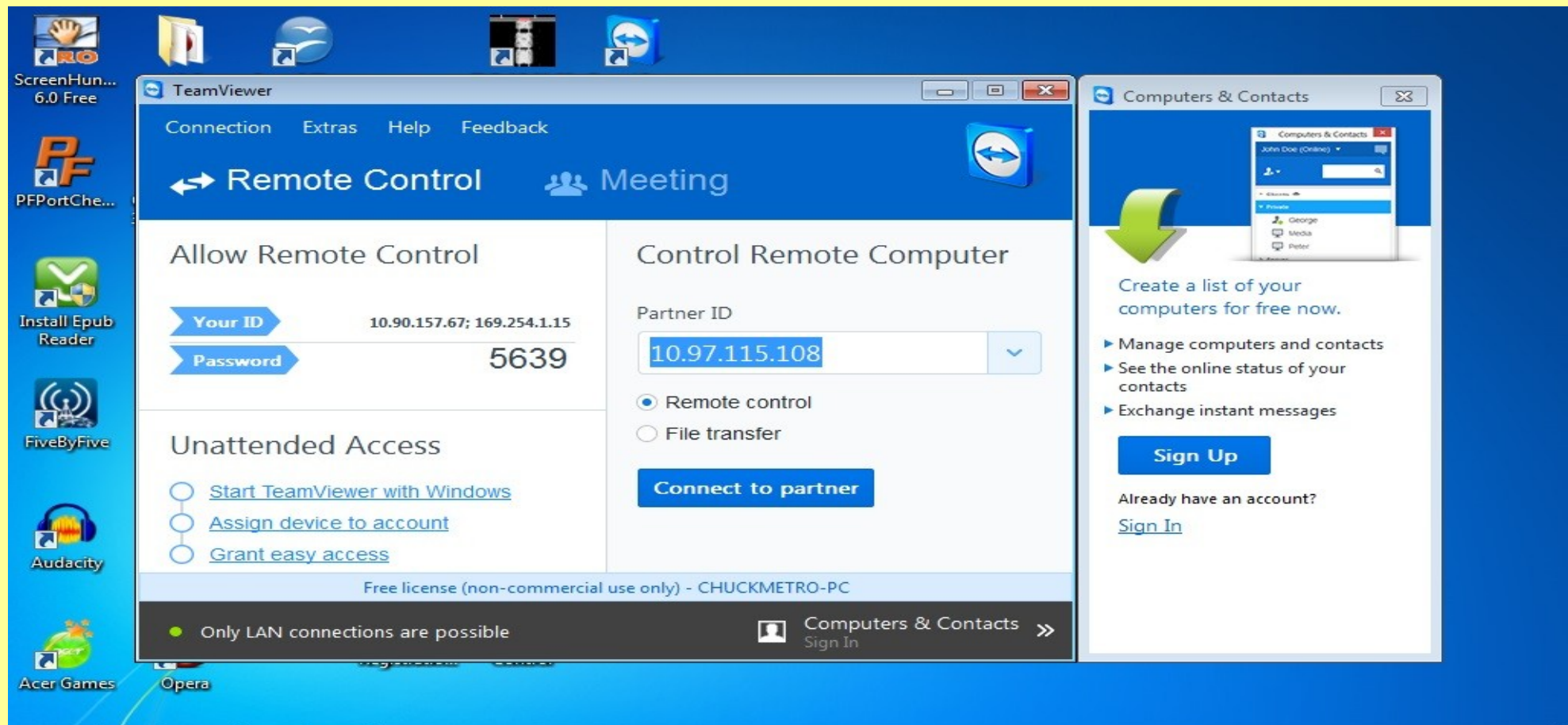
Hit the "Connect to Partner"
Enter password from other machine then hit "Log On".
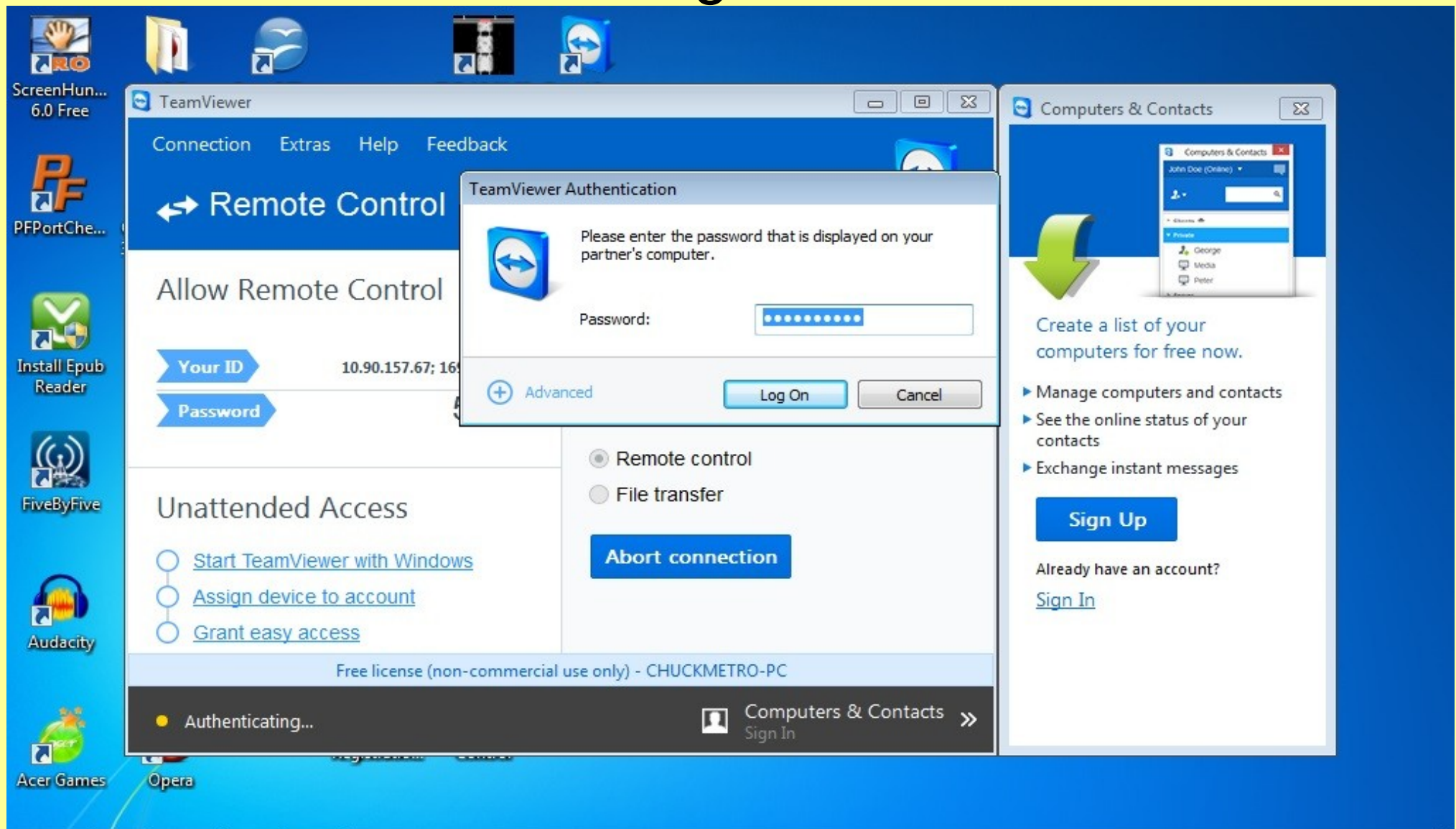
One laptop is now connected through the mesh to the other laptop. You have full control!
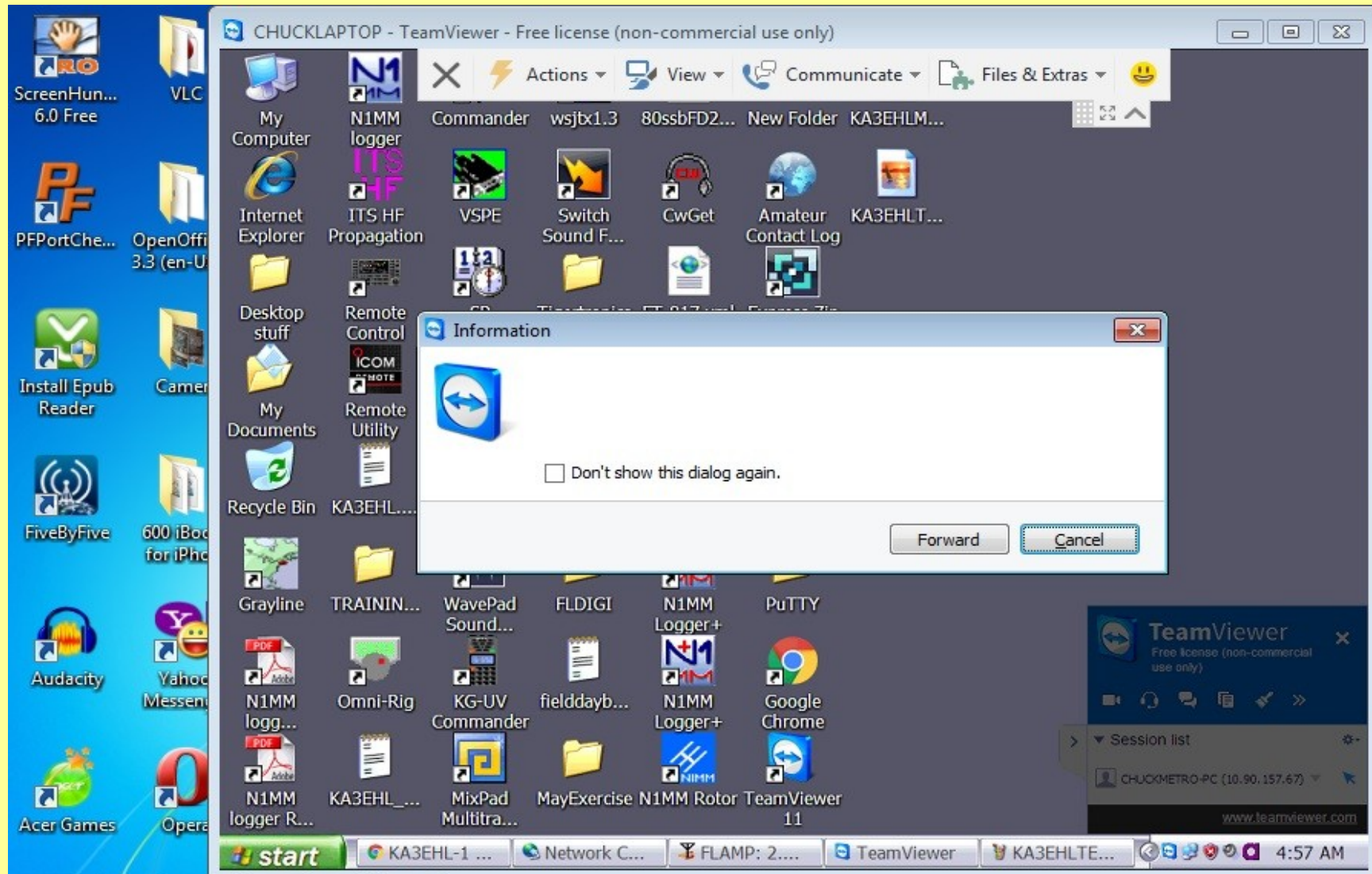
Running FLDIGI through the mesh in good control of ICOM 7200. (Some draw backs – see notes)
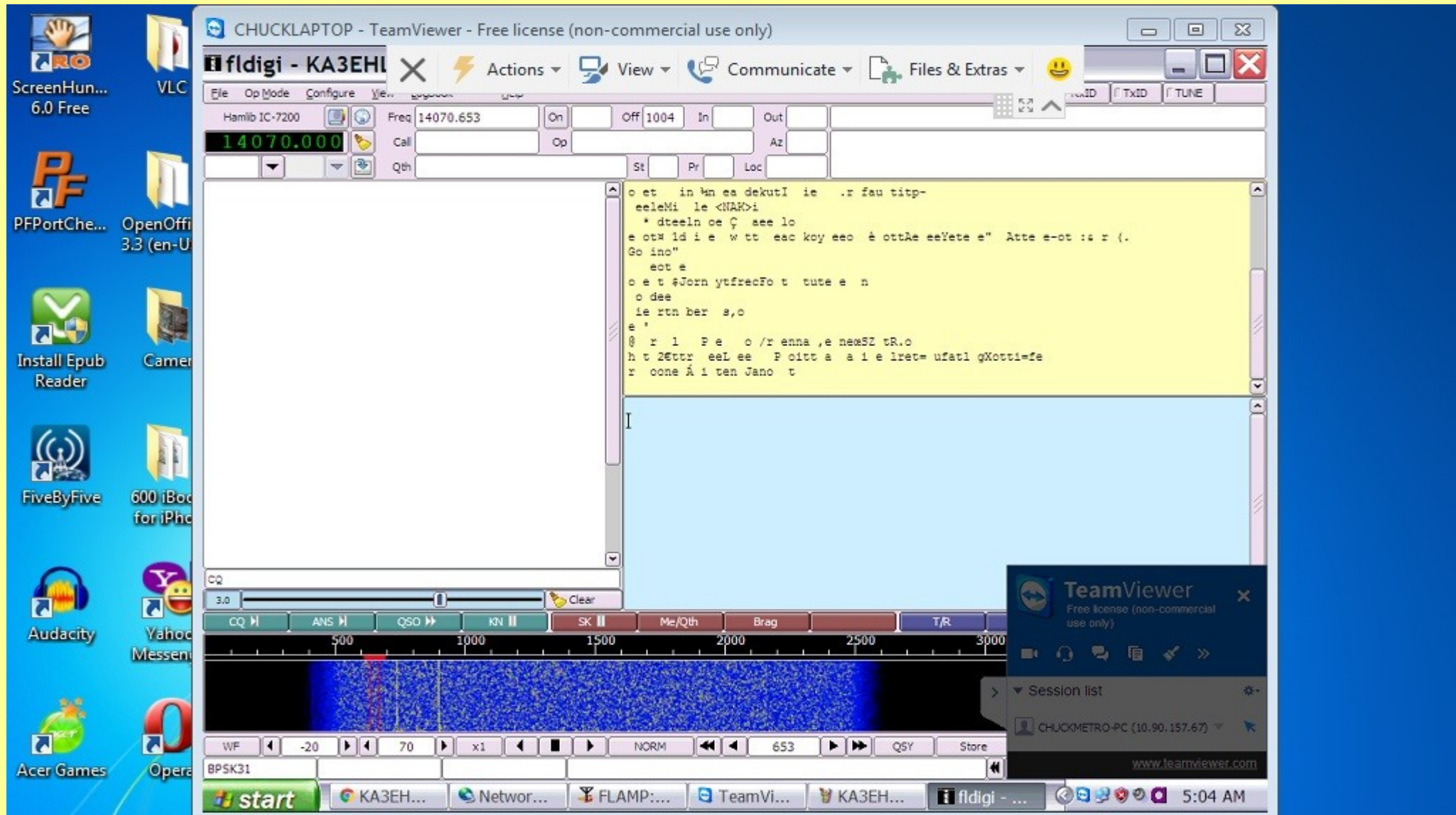
ICOM 7200 RS-BA1

RS-BA1 is hard to get to work through the mesh
 but using Teamviewer I got better and easier results.
 Clarence K4CNM and I spent hours trying to get this to work
through the mesh and never did!...Just 5 minutes with
Teamviewer and I had cleared my first two contacts with SSB
through a hammesh network!

Setting up Teamviewer for SSB
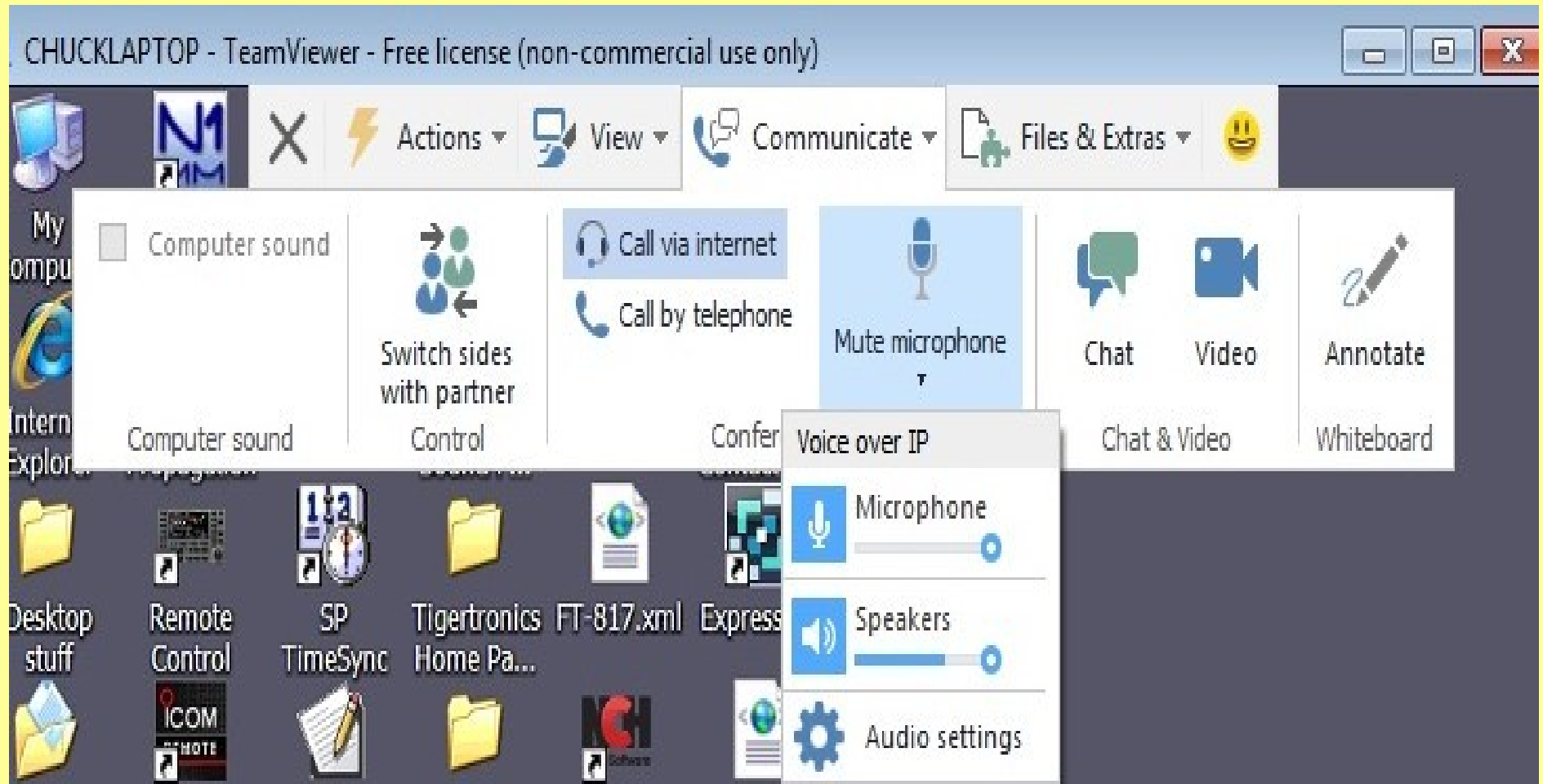
1. At the top of the remote computer choose the tab "communicate"
2. Choose "Call via internet"
3. Click on the "Mute Microphone" to open a drop down box which sets the audio level with the computer you are using.

Remember set transmit and receive audio levels with both the ICOM 7200 RS-BA1 and Teamviewer

In the IC7200 menu turn "DATA" off.....(at the radio)
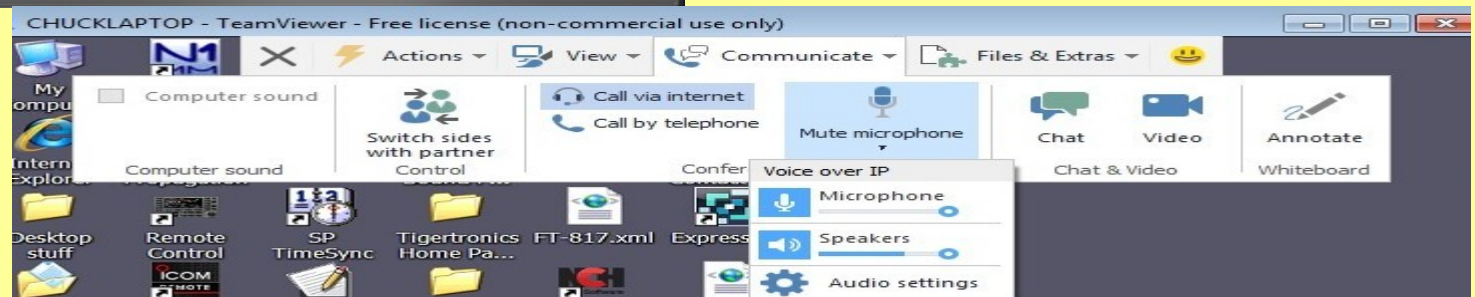
System layout

Distance between routers as big as mesh network will allow

RF link

Lan Cable

Lan Cable

USB cable

Coax

Notes

- The good
    - You have control from both ends of the link.
    - You are not connected to anyone else through the mesh unless someone adds the internet to the mesh.
    - You can drop and drag files from machine to connected machine.
    - This method works through the internet as well as a mesh network.
    - This works for any combinations of radios where a _computer has some control_ over the radio.
    - This would work with a signal link FLDIGI setup with limited rig control.

Notes

- The good
  - You will notice some lag in operations at the remote computer. This lag in software is not reflected on the remote/radio connected computer. This includes typing during transmission.
  - This operation could also have shared locations.

    For example three or four computer stations collect data and the computer station that needs to pass data could connect to the one transmitter and pass traffic without wiring up a new transmitting station.

    You do not have to install RSBA1 in every computer just the local computer connected to the radio.
  - RSBA1 will allow you to tune the antenna remotely and switch bands/frequency/filter options.

Notes

- The bad
  - If you lose mesh link while transmitting, your station will continue to transmit however if you can re-establish the link, you will regain control of the station. (Yes, I tested a loss of link)
  - Consider a loss of link vital if you are planning to be long distance from the computer/radio.
  - Band/Antenna switching could be a problem if your radio does not allow for it.
  - You many not have full control of all of your radios options such as frequency control or power control.

Notes:

- The bad continued

    - Current layout calls for the laptops to be LAN wired connected the router. I tried the wireless connection but that didn't work.

    - Digital or SSB - Make a choice you can not run RSBA1 and FLDIGI at the same time.

    - On the ICOM you must choose SSB for both FLDIGI and SSB.

Operational notes

This presentation assumes you have a computer set up for use with an ICOM 7200 and optional RSBA1 program (about $100) (Or any ICOM with USB port). TEST TEST TEST -----TEST your system before you deploy!

Credits

- Broad Band ham-net group at WARC for my first exposure to the mesh networks

- www.broadband-hamnet.org

- Dennis KC9OIC who posted on a forum on how to use Teamviewer (in 2013!)

- Presentation by Chuck Helverson KA3EHL

  January 19th, 2016