

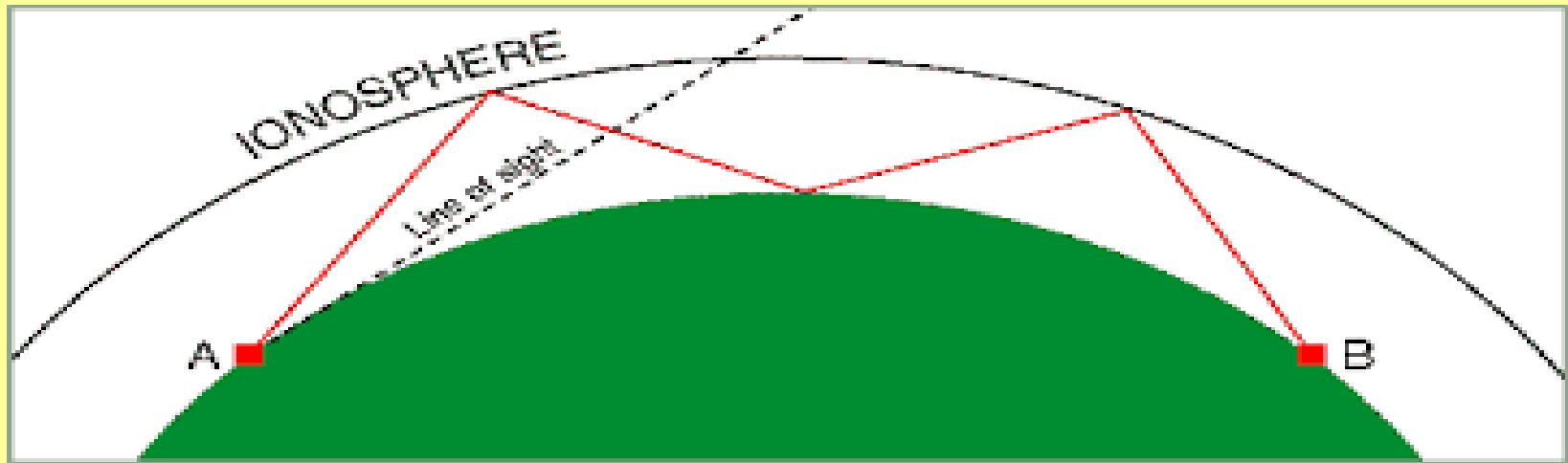


Woodbridge Amateur Radio Club

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 Will 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

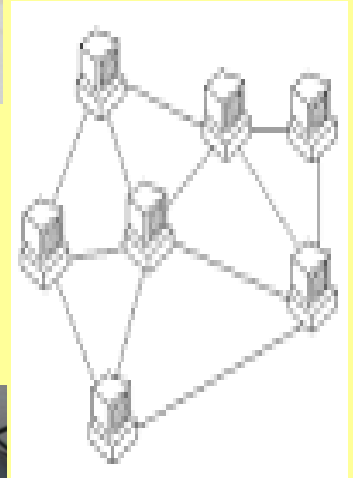
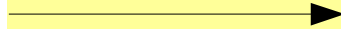
But

not connect to a network or run cables around building.

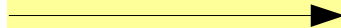
I have the gear but getting it to work together?



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

Local Hosts	Services
KA3EHL-1	

Current Neighbors	LQ	Services
KA3EHL-2	100%	

Remote Nodes	ETX	Services
none		

Previous Neighbors	When
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



The screenshot shows the TeamViewer website in a web browser. A black arrow points from the text 'Hit the green “Download” button' to a green 'Download' button on the website. The website header includes the TeamViewer logo, a 'Web Login' link, a language dropdown set to 'English', and social media icons. A navigation bar contains links for 'Take a Tour', 'Download', 'Support', 'Buy', and 'About Us'. The main content area features the text 'TeamViewer - the All-In-One Software for Remote Support and Online Meetings', a description of its capabilities, and a 'Download' button labeled 'Free for private use'. Below the button are links for 'Join Remote Control Session' and 'Join Online Meeting'. A video player shows a person using a computer with a play button overlay. The footer includes the IDC logo with the tagline 'Analyze the Future', a quote about TeamViewer's market share, and a 'More information' link. The browser's address bar shows 'https://www.teamviewer.com/en/index.aspx'.

TeamViewer - Free Remote Control and Online Meetings

https://www.teamviewer.com/en/index.aspx

New: TeamViewer 11! Up to 30% greater efficiency and 15x faster file transfers, improved toolbar, Chrome OS, and more – [further details](#)

TeamViewer

Web Login English

Take a Tour Download Support Buy About Us

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Remote control any computer or Mac over the internet within seconds or use TeamViewer for online meetings. Find out why TeamViewer has been activated on more than a billion devices.

[Download](#)
Free for private use

[Join Remote Control Session](#)

[Join Online Meeting](#)

New TeamViewer 11 is available! [More information](#)

You will find TeamViewer 10 under [Previous versions](#)

Windows 10 Compatible

TeamViewer– Number 1 in Market Share for Clientless Remote Support

“TeamViewer has taken a more holistic approach in its offering by providing a broad spectrum of capabilities that appeal to service providers (SPs) and SMBs.”

[More information](#)

IDC
Analyze the Future

Search the web and Windows

2:08 AM
12/20/2015

At the bottom left....install the program

The screenshot shows the TeamViewer website in a web browser. The browser's address bar displays <https://www.teamviewer.com/en/index.aspx>. The website features a green banner at the top with the text: "New: TeamViewer 11! Up to 30% greater efficiency and 15x faster file transfers, improved toolbar, Chrome OS, and more – [further details](#)". Below this is the TeamViewer logo and navigation links: "Web Login", "English" (language dropdown), and social media icons. A secondary navigation bar includes "Take a Tour", "Download", "Support", "Buy", and "About Us". The main content area has a blue background with the heading "TeamViewer - the All-In-One Software for Remote Support and Online Meetings". It describes the software's capabilities: "Remote control any computer or Mac over the internet within seconds or use TeamViewer for online meetings. Find out why TeamViewer has been **activated on more than a billion devices**." A prominent green "Download" button is labeled "Free for private use". Below it are links for "Join Remote Control Session" and "Join Online Meeting". A note states "New TeamViewer 11 is available! [More information](#)" and "You will find TeamViewer 10 under [Previous versions](#)". To the right is a video player showing a person using the software. At the bottom of the main section are icons for Windows, Apple, Linux, and other operating systems. Further down is an IDC logo with the text "IDC Analyze the Future" and a quote: "TeamViewer– Number 1 in Market Share for Clientless Remote Support". Below the quote is a link for "More information". An arrow from the text "At the bottom left....install the program" points to the "Download" button. The Windows taskbar at the bottom shows the "TeamViewer_Se...exe" file in the download tray, indicating it has been downloaded (9.2/9.2 MB, 0 secs).

TeamViewer - Free Remote Control and Online Meetings

<https://www.teamviewer.com/en/index.aspx>

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IDC Analyze the Future

TeamViewer_Se...exe
9.2/9.2 MB, 0 secs I...

Show all downloads...

Search the web and Windows

2:09 AM
12/20/2015

Choose Basic installation and Personal/noncommercial use

The screenshot shows the TeamViewer website in a web browser. The URL is <https://www.teamviewer.com/en/index.aspx>. The page features the TeamViewer logo, a navigation bar with links like 'Web Login', 'English', 'Take a Tour', 'Download', 'Support', 'Buy', and 'About Us', and a main content area with a 'Download' button and links to 'Join Remote Control Session' and 'Join Online Meeting'. A 'TeamViewer 11 Setup' window is overlaid on the page. The window has a title bar and a close button. It contains the following text and options:

Welcome to TeamViewer
Remote Support, unattended access, meetings and presentations

How do you want to proceed?

- ☒ Basic installation
- ☐ Installation to access this computer remotely (unattended)
- ☐ Run only (one time use)

How do you want to use TeamViewer?

- ☐ Company / Commercial use
- ☒ Personal / Non-commercial use
- ☐ Both of the above

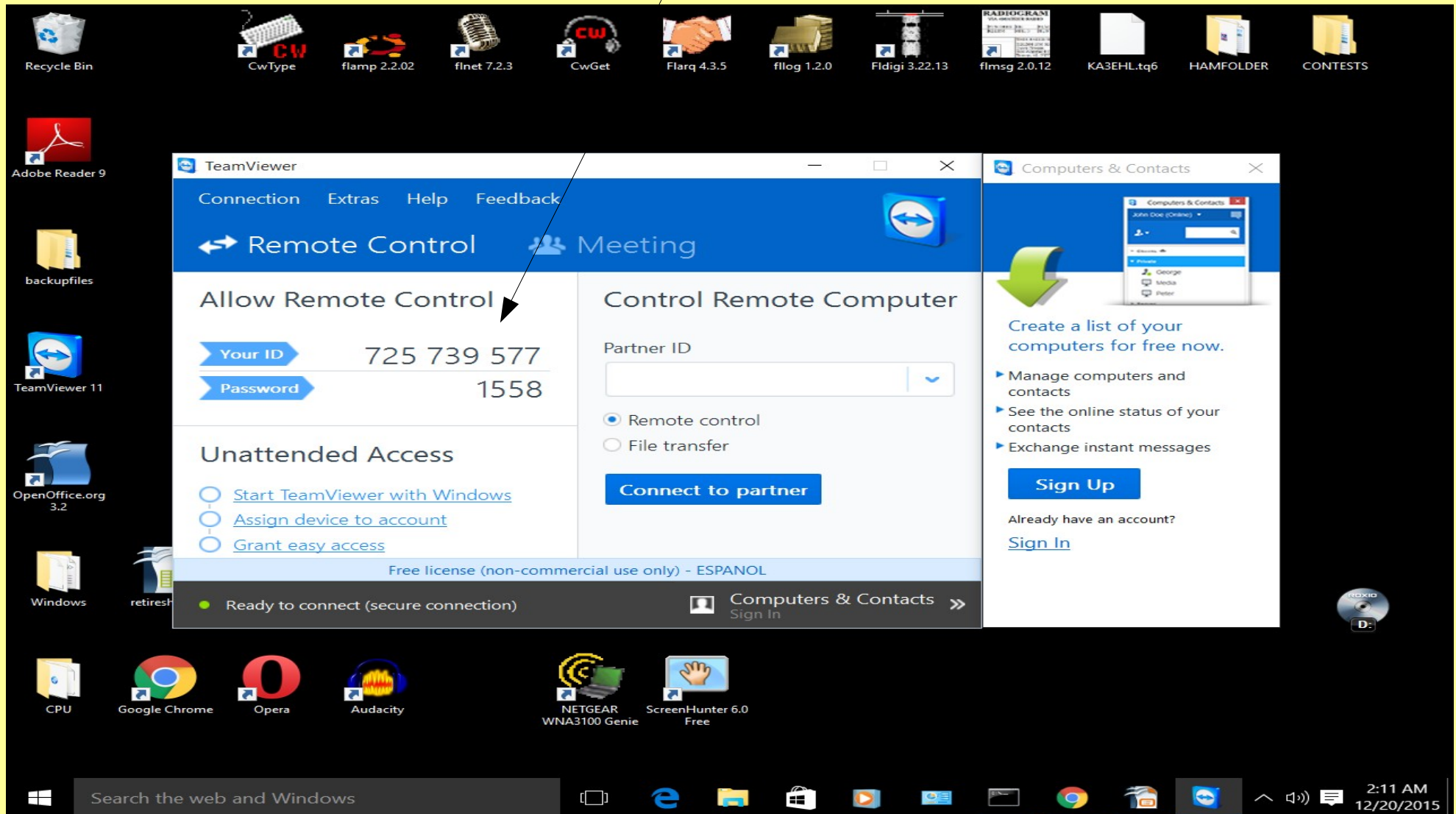
☐ Show advanced settings

[License Agreement](#): By continuing, you agree to the terms of the license agreement.

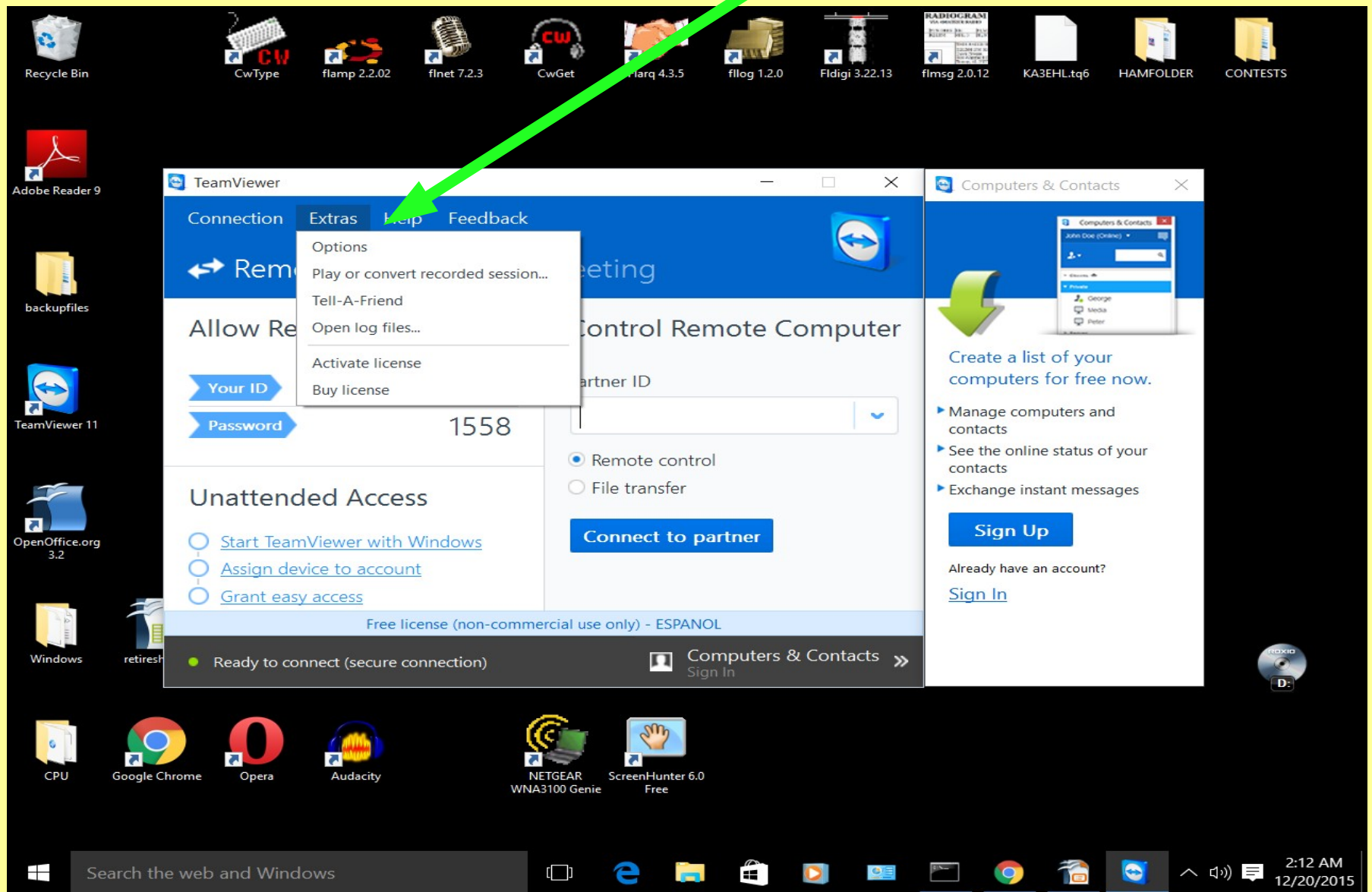
[Accept - finish](#)

At the bottom of the page, there is an IDC logo with the text 'IDC Analyze the Future' and a quote: 'TeamViewer- Number 1 in Market Share for Clientless Remote Support'. Below the quote is a link to 'More information'.

If connected to the internet this what you will see.

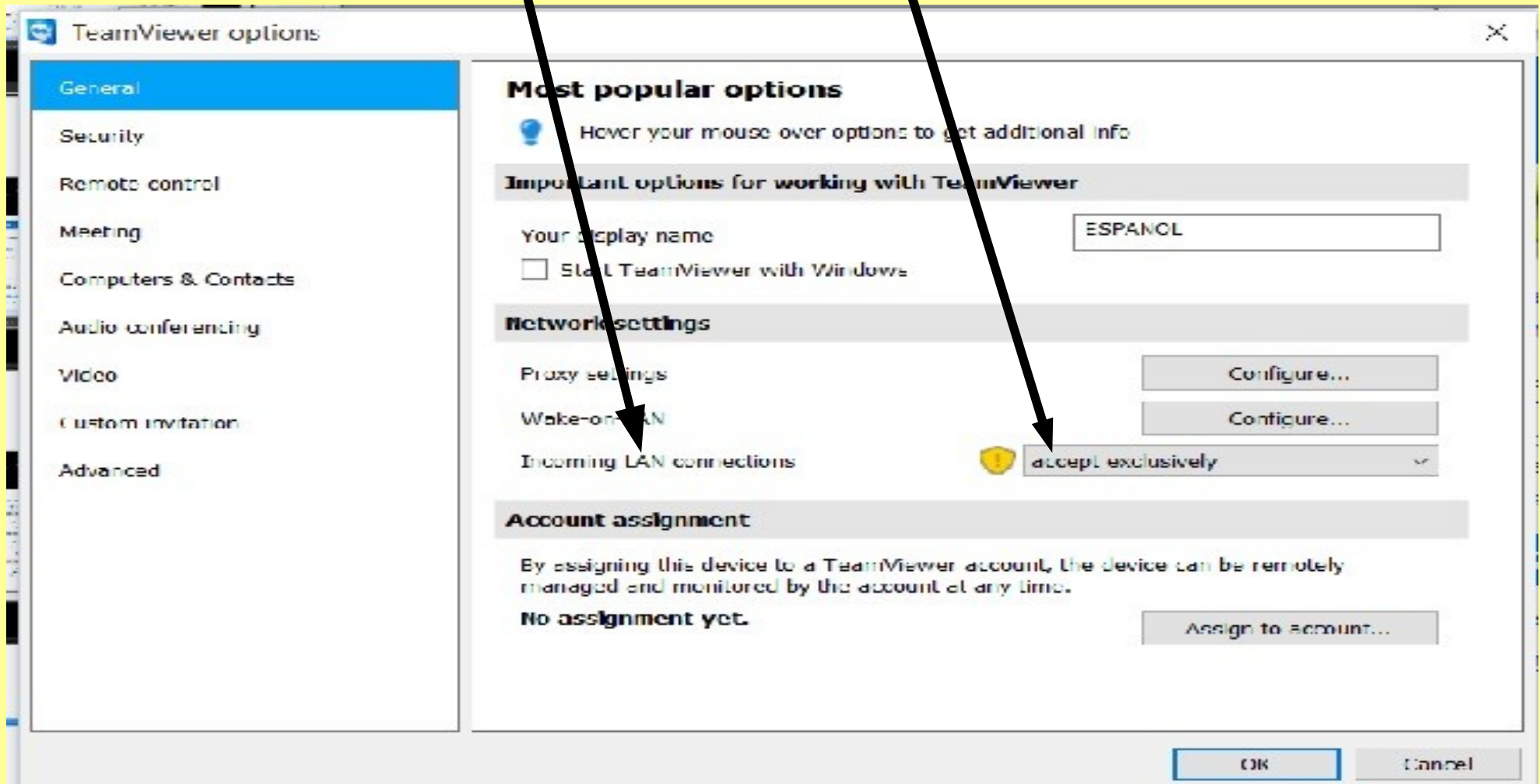


Go to the EXTRA tab at the top choose “Options”

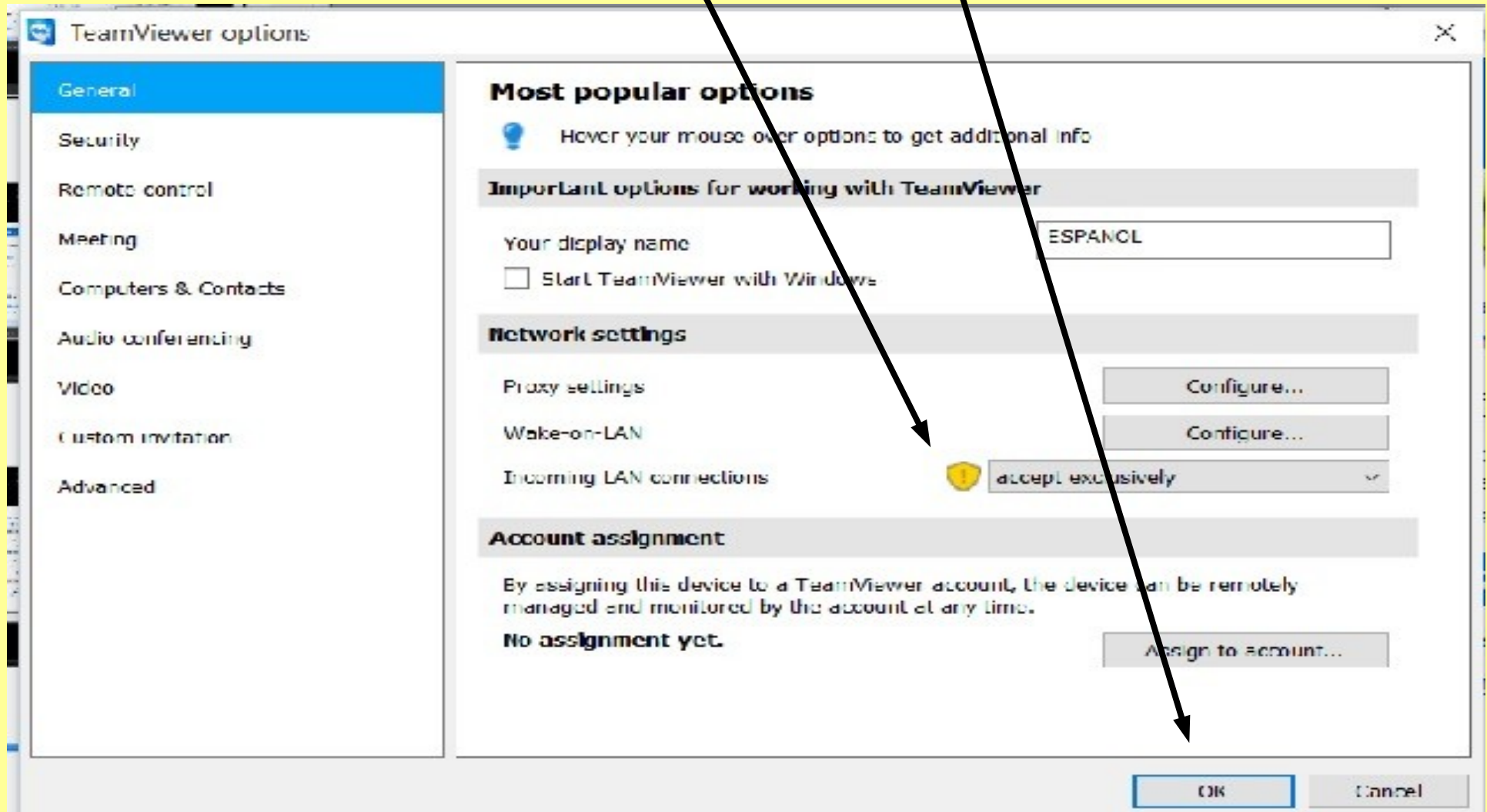


For mesh use: “Incoming LAN connections” drop down box

accept exclusively

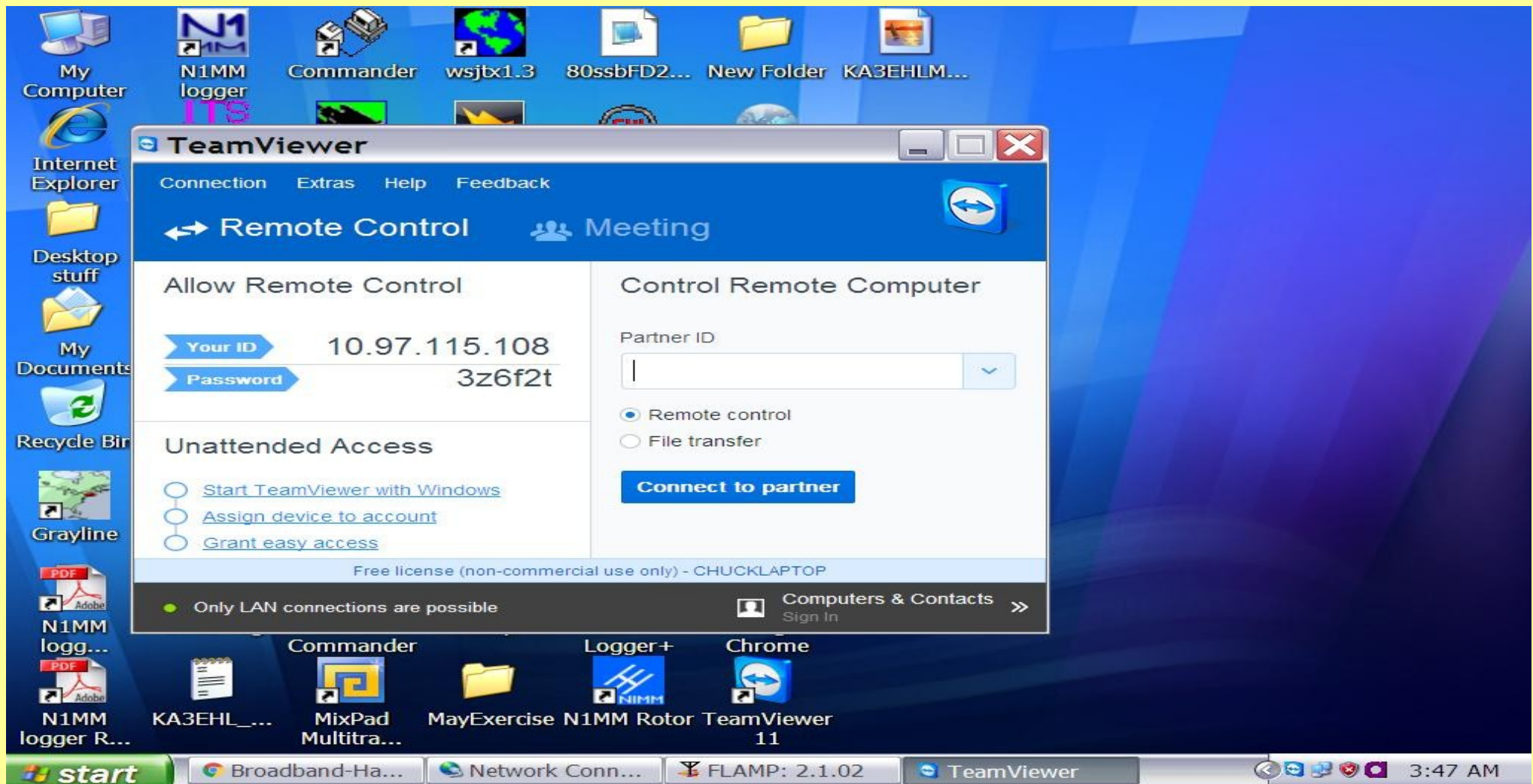


Look for the shield in the LAN drop down! Click OK



Repeat installation for as many additional computers as needed!

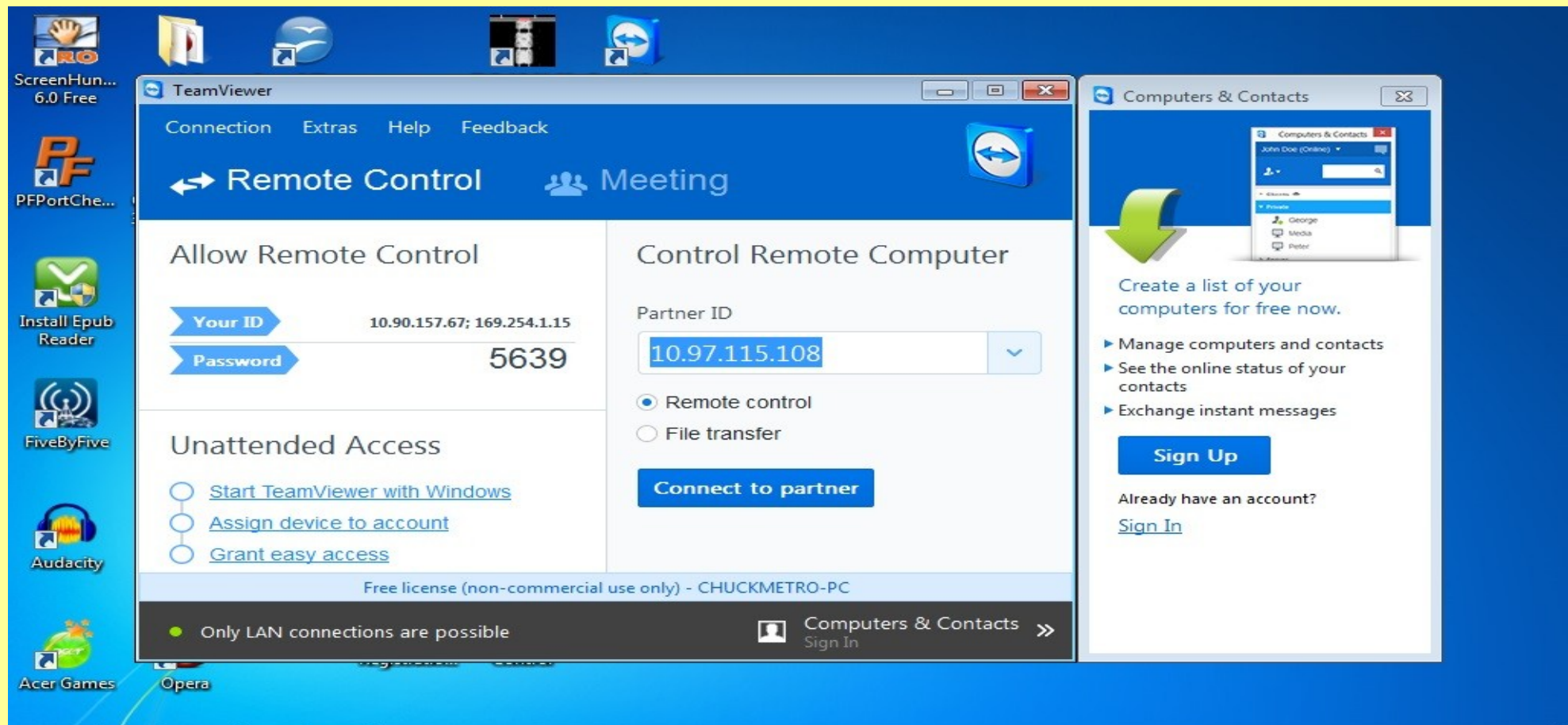
This is the computer attached to the ICOM 7200.
Note the IP address of the mesh router.



The IP address of the local machine pops up with a password.

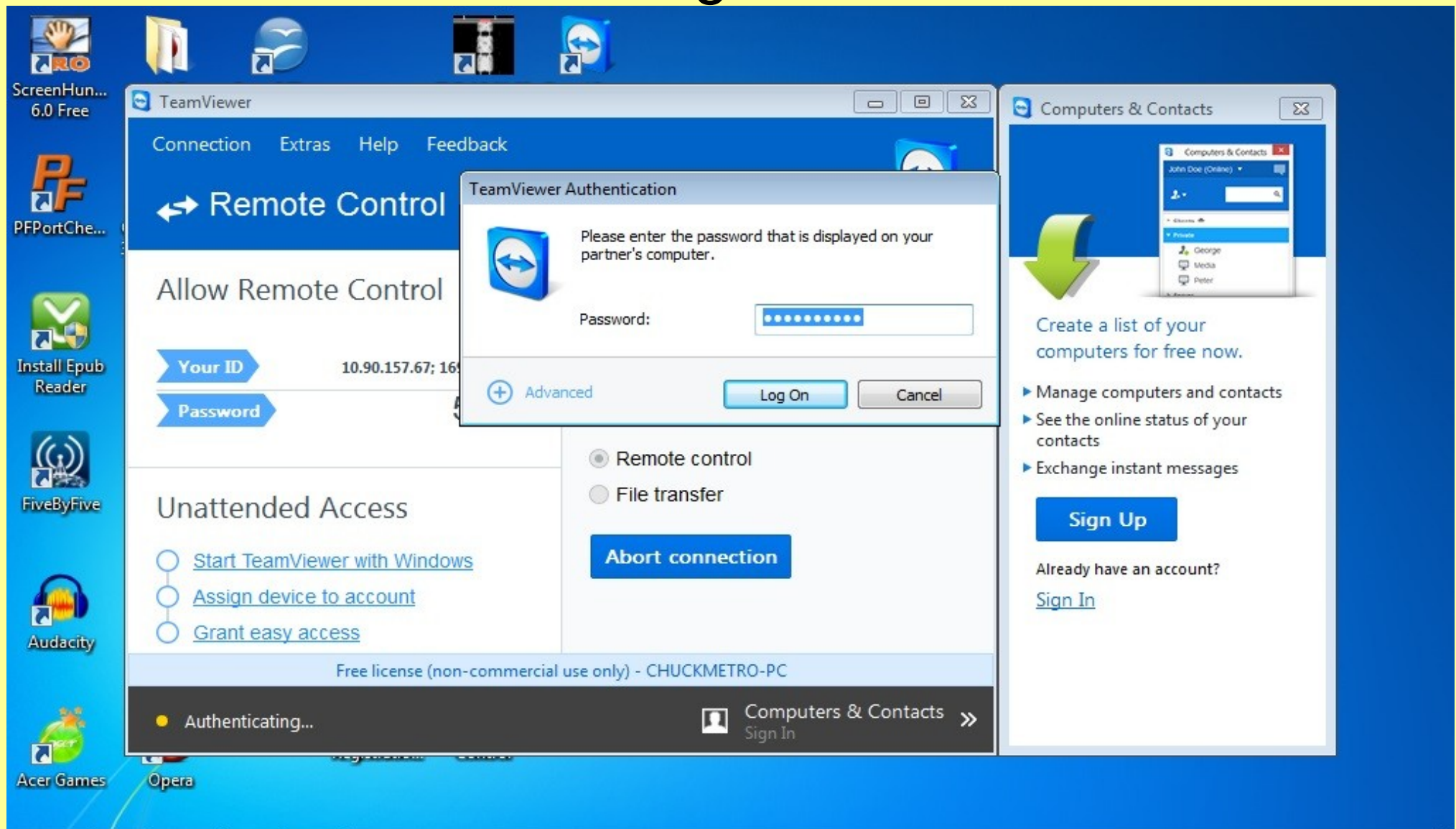
This is the remote laptop.

Note: I entered the IP address to control the remote laptop (the one connected to the radio).

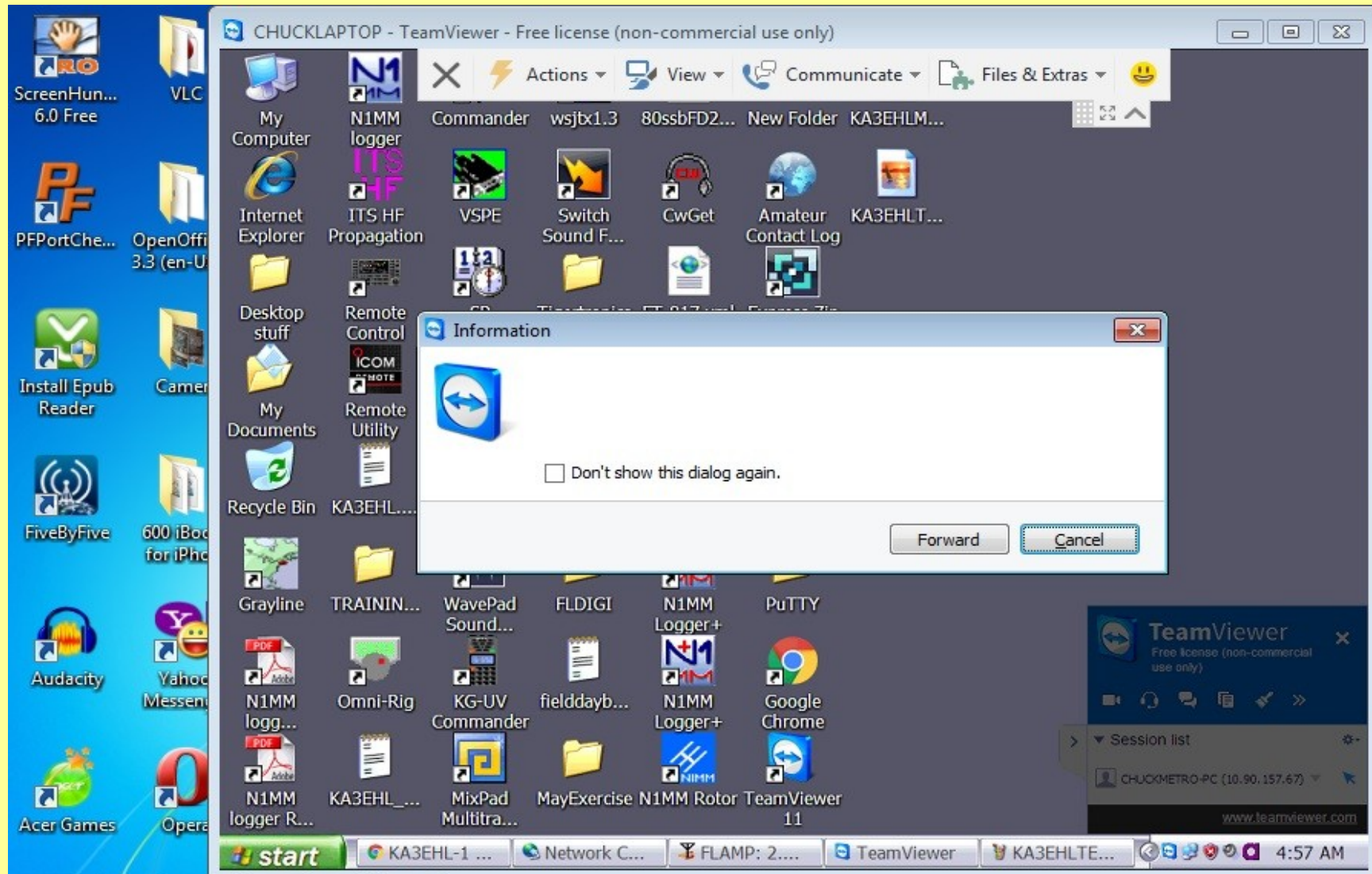


Hit the “Connect to Partner”

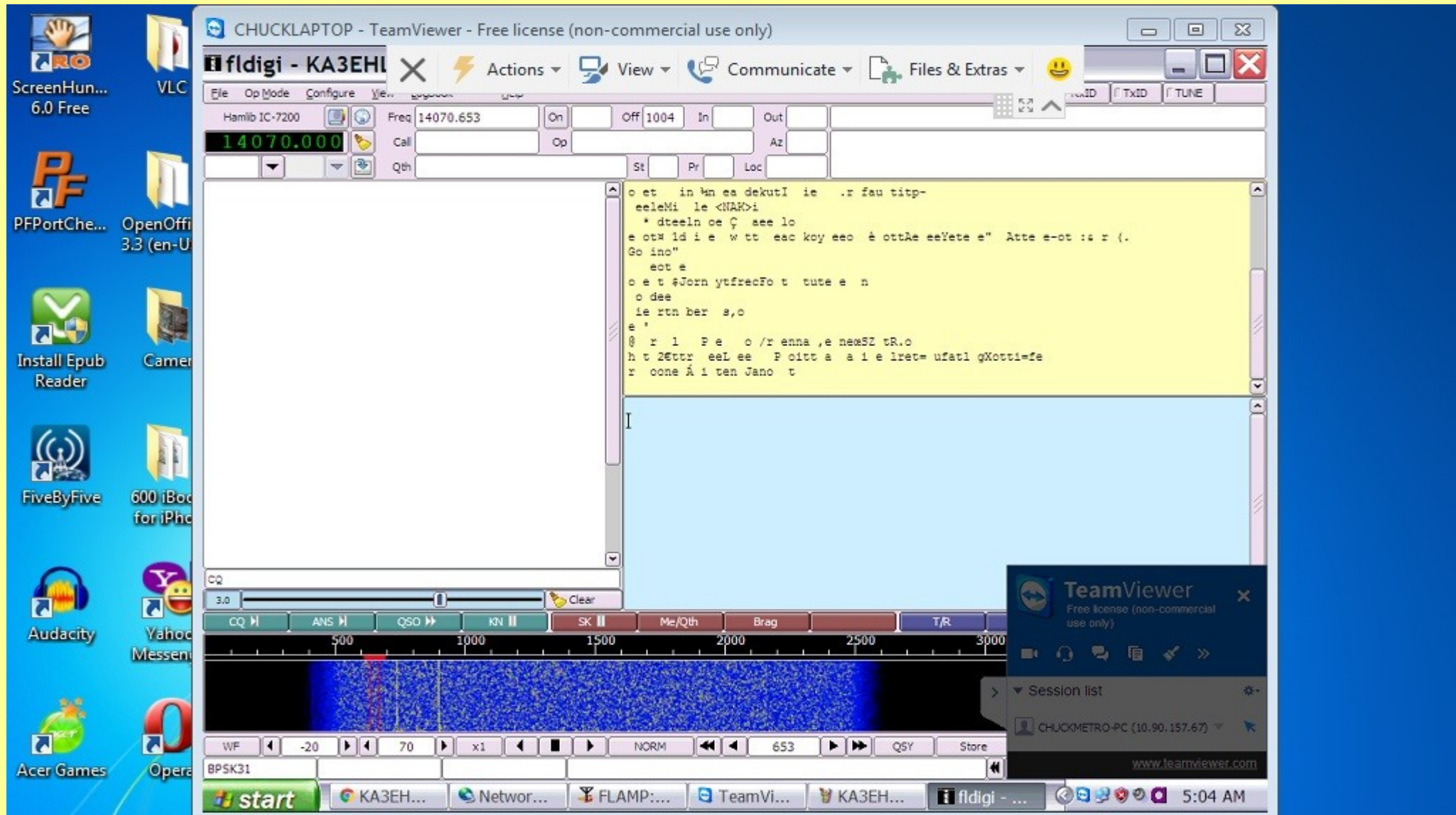
Enter password from other machine then hit
“Log On”.



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)

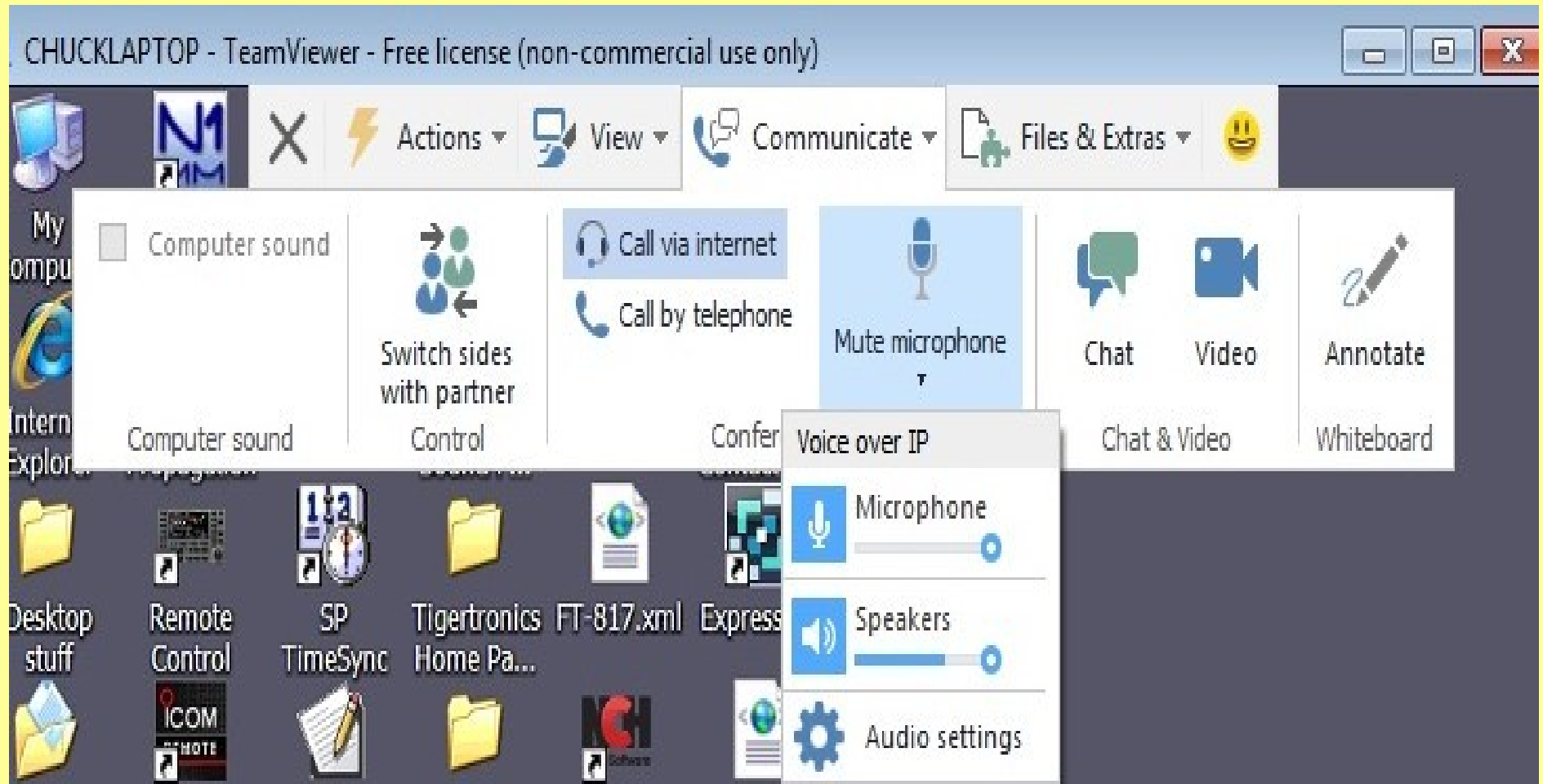


ICOM 7200 RS-BA1



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

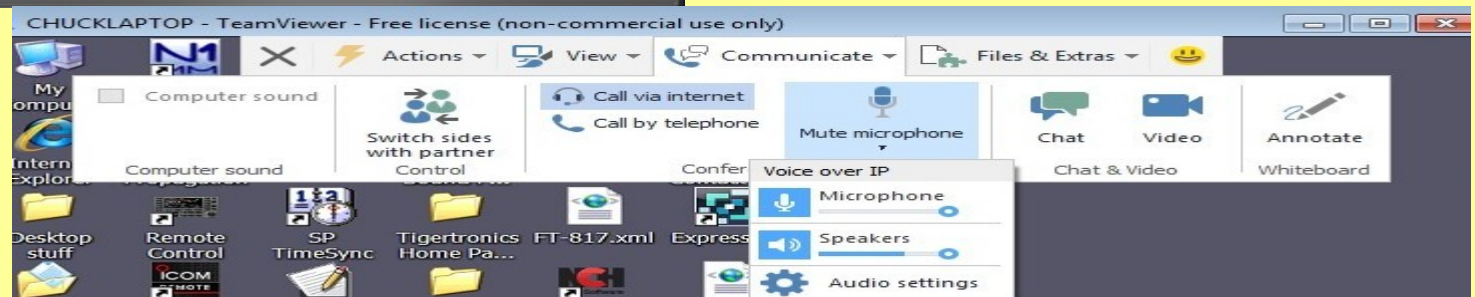


1. At the top of the remote computer choose the tab "communicate"
2. Choose "Call via internet"
3. Click on the "Mute Microphone" to open a drop down box which sets the audio level with the computer you are using.

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