

Improving portable operating with the IC-705

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Presented to Mercer County ARC Oct 26, 2021

Spend time on the air, not setting up

- ▶ For portable operation, want to minimize time setting up the station and spend more time operating.
- ▶ This was a major reason for transitioning from KX3 to IC-705.
- ▶ KX3 was wiring nightmare, especially for digital modes.
- ▶ Lots of cables, audio interface, splitters, CW keyer, external speaker...a real mess!
- ▶ IC-705 interfaces easily with USB cable.
- ▶ But, USB is noisy and restricts your freedom.
- ▶ If you wrap a USB cable around a ferrite toroid, RFI is reduced, but...
- ▶ There's a better way with the IC-705!

Wireless connection to the IC-705

- ▶ Icom built a wireless server into the IC-705.
- ▶ Can be used for rig control and audio input/output.
- ▶ But...Icom doesn't describe how to use it or why you'd want to.
- ▶ Icom must assume you want to use their RS-BA1 remote control software.
- ▶ RS-BA1 gets many poor reviews in eHam.
- ▶ Only runs on Windows.
- ▶ Costs around \$150.
- ▶ Only available as a CD, can't download. C'mon, this is 2021!

Alternatives to RS-BA1

- ▶ Fortunately, there are Open Source alternatives to RS-BA1.
- ▶ These alternatives are FREE.
- ▶ kappanhang runs on Linux. Connects to IC-705 wirelessly.
- ▶ wfview works on Windows, MacOS, and Linux. Provides rig control and waterfall. Can connect through wifi or USB. Can also forward audio.
- ▶ I use wfview on my remote station in Hermitage. Allows me to see the IC-7300's waterfall remotely. Huge improvement! How did I live without it?

Set IC-705 as wireless access point

- ▶ Two ways to configure wireless access to your IC-705.
- ▶ Choices are “Station” or “Access Point.”
- ▶ Station allows your IC-705 to connect to your home network.
- ▶ Works great...but what if you're out in the field away from a network?
- ▶ Access Point makes more sense for portable rig like IC-705.
- ▶ Configure IC-705 to advertise a wireless access point.
- ▶ Tell your computer's wireless manager to connect to the IC-705.
- ▶ Just like connecting your computer to any wifi network.
- ▶ You then run kappanhang or wfview and you're connected!

Set IC-705 as wireless access point

- ▶ From <https://forum.wfview.org/t/field-operation-aka-access-point-mode/712>

IC705 field operations without an external access point (AP)

this text will describe the steps you need to take to make the IC705 an access point and connects your laptop to the rig. From that point on just follow the normal instructions to connect to the IC-705 with your favourite LAN enabled remote control s/w.

first of all make a backup. this makes it easy to switch between station (home) use and outside/field use

- go to settings
- select wlan set
- switch off wlan if it's on
- select connection type switch to access point
- go back one level
- select connection settings (access point)
- the SSID is default IC-705 – change to whatever you like
- put in a password (for testing I used test1234)
- note the ip address : 192.158.59.1
- back one level
- set WLAN on

now the ic705 will broadcast itself with the SSID as set above

now use your favourite laptop and OS, connect yourself to this SSID and use the password as set above. (outside of scope here as OS setup differs)

that's it! you can ping 192.168.59.1 and you will get replies.

Set IC-705 as wireless access point

- ▶ This is an excellent tutorial and video on configuring wireless access to your IC-705. Explains the difference between Station and Access Point.
- ▶ <https://3fs.net.au/ic-705/station-or-access-point-which-wifi-to-use-on-the-ic-705/>



04 Jul Station or Access Point - Which WiFi to use on the IC-705

kappanhang and wfview Overview

- ▶ Two Open Source programs for connecting wirelessly to your IC-705...
- ▶ kappanhang starts with a shell command, connects to your IC-705.
- ▶ wfview also connects wirelessly to your IC-705...you can also connect through USB cable.
- ▶ wfview also provides rig control and remote display of waterfall.
- ▶ Both programs work well...kappanhang is simpler and better suited to small displays.
- ▶ wfview is much more powerful, but more complex. Runs on multiple operating systems.
- ▶ Let's dive into each in more detail...

kappanhang

- ▶ kappanhang developed by Nibert Varga HA2NON, Akos Marton ES1AKOS, and Elliott Ligget W6EL.
- ▶ Full documentation and download/build instructions at <https://github.com/nonoo/kappanhang>
- ▶ Excellent video tutorial on project page.
- ▶ Written in Go language.
- ▶ Once it's installed, connect your computer's wifi to the IC-705 and issue a command like:
`./kappanhang -u hpb -p password -a 192.168.59.1 -s`

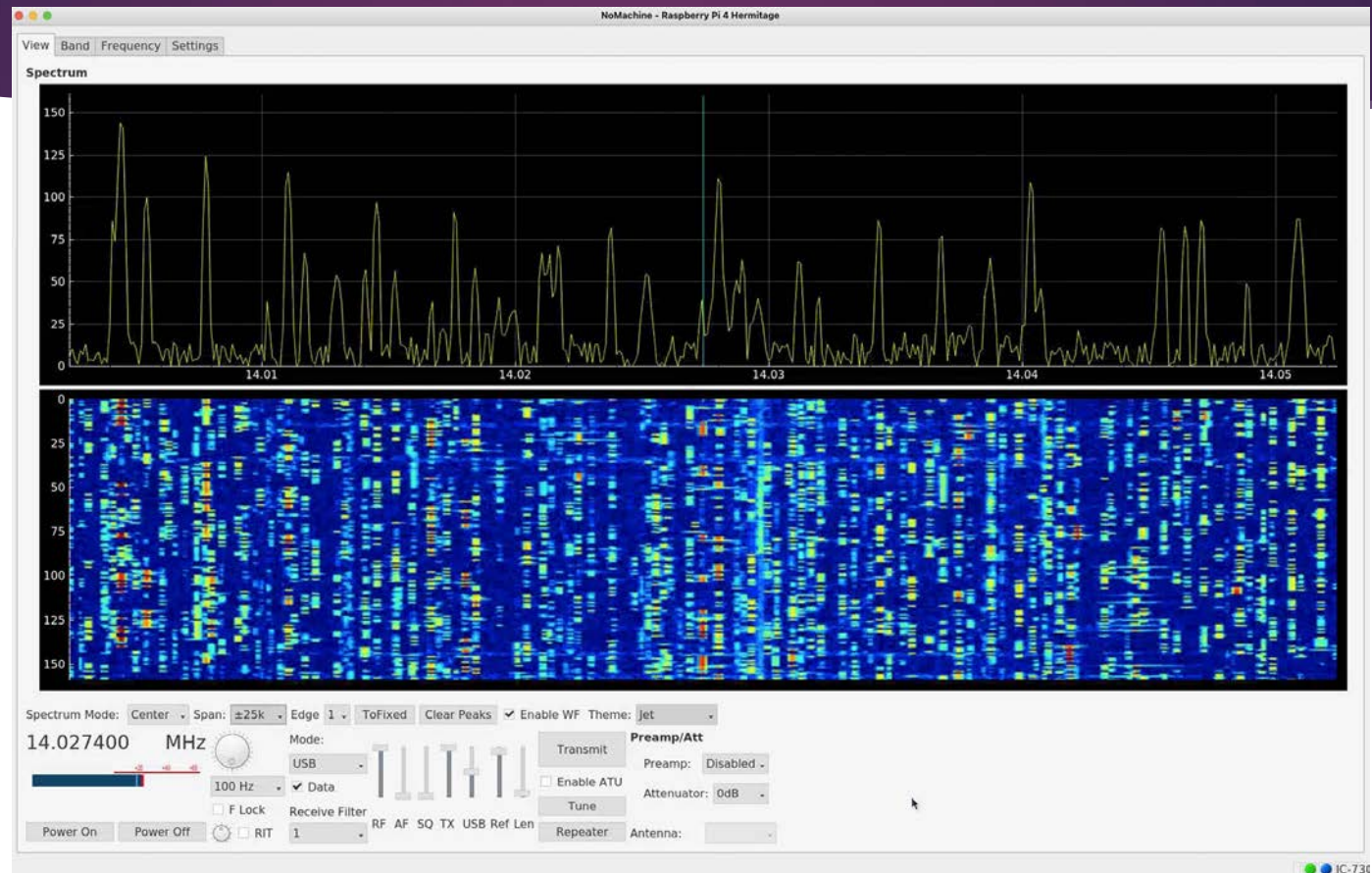
kappanhang

- ▶ kappanhang installs a virtual USB port in /tmp/kappanhang-IC-705.ptty
- ▶ This virtual USB port can be used with other programs like Flrig or WSJT-X.
- ▶ Also creates virtual soundcard devices which can be accessed by Fldigi or WSJT-X.
- ▶ Used kappanhang at MCARC Field Day...works well and is reliable.

wfview

- ▶ <http://wfview.org>
- ▶ Lead developer Elliott Liggett W6EL.
- ▶ Provides rig control, audio streaming, and display of waterfall.
- ▶ Works on recent Icom radios like IC-705, IC-7300, IC-7610, IC-R8600, IC-7850, and IC-9700.
- ▶ Can connect to radio through USB cable or IP address.
- ▶ Extremely well supported with lots of quality documentation and a support forum monitored by developers.

wfview



wfview screenshot during major contest

wfview

- ▶ IC-705 already has a waterfall display. Isn't wfview redundant?
- ▶ Much easier to see waterfall on a monitor.
- ▶ Can also double-click on waterfall to tune radio to desired signal.

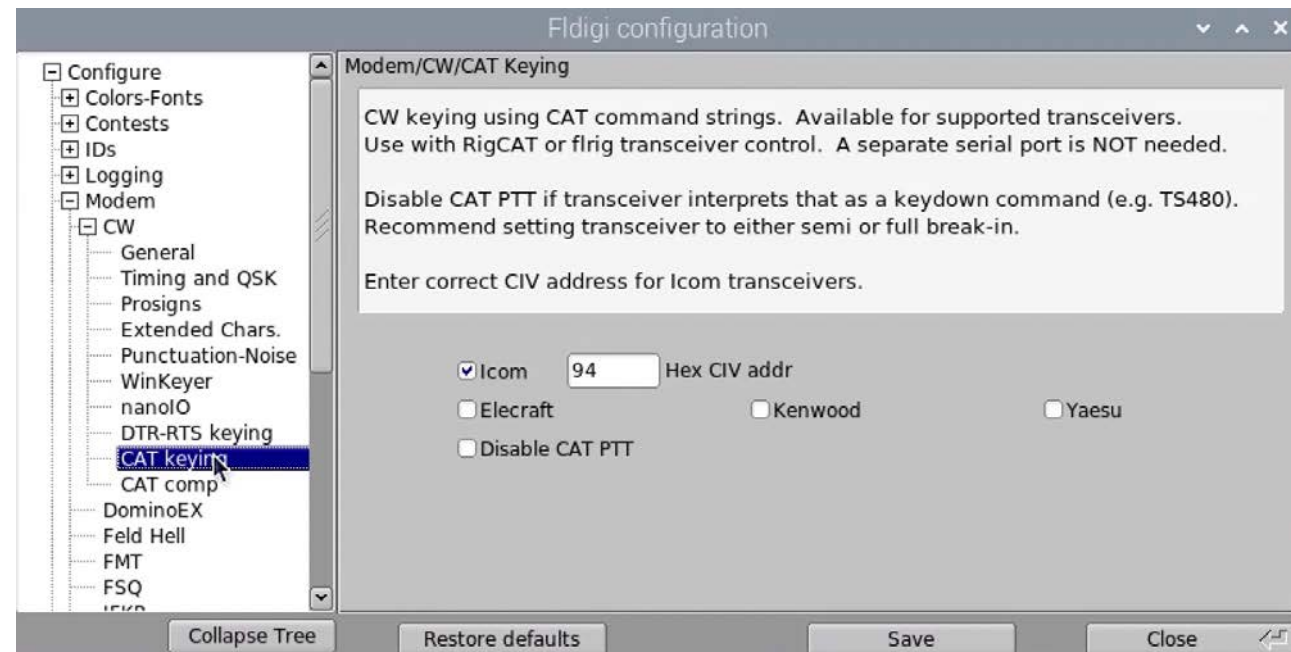


wfview

- ▶ wfview runs on Linux, MacOS, and Windows.
- ▶ On Linux, virtual USB port created.
- ▶ Instructions available for creating soundcard devices for Fldigi and WSJT-X.
- ▶ Bit more complicated under Windows...
- ▶ Must install virtual serial ports and virtual audio cable for Flrig/Fldigi and WSJT-X.
- ▶ Many Windows products for this, some are quite expensive.
- ▶ Good video from VK3FS for configuring WSJT-X and wfview on Windows.
<https://youtu.be/q1C5fh8A5Ow>

CW keying through Icom CAT

- ▶ Fldigi can use Icom CAT commands to send CW through a USB cable.
- ▶ Works with physical USB or virtual USB when wireless.
- ▶ Screenshot from IC-7300.
- ▶ For IC-705, Hex CIV addr is A4.
- ▶ Note you can also key rigs from other manufactures through USB cable.
- ▶ Don't need CW keyer, USB cable to keyer, and CW cable to radio.
- ▶ Speed controlled in Fldigi.



Which computer to use?

- ▶ I've used two computers with the IC-705.
- ▶ Raspberry Pi with 7 inch touchscreen.
- ▶ Lenovo Thinkpad Yoga 11e Gen 6.
- ▶ Each has advantages and disadvantages.

Raspberry Pi with touchscreen

- ▶ Small and lightweight.
- ▶ Cheap...around \$120.
- ▶ Low current drain.
- ▶ 250 mA for Rasp Pi 3B+.
- ▶ 500 ma for Rasp Pi 4.
- ▶ Powered from 12VDC by PowerWerx USBbuddy.
- ▶ Wrap power cables around toroids!
- ▶ Plenty powerful for amateur radio.
- ▶ WSJT-X a challenge on small screen.
- ▶ No internal clock, need GPS when away from network.
http://www.w1hkj.com/W3YJ/PI_IC-705_GPS.pdf



Lenovo Thinkpad Yoga 11e Gen 6

- ▶ Nearly perfect computer for amateur radio.
- ▶ 11.6 inch touchscreen.
- ▶ Cheap...around \$500 refurbished from Amazon and you can apply your Amazon rewards. I paid \$150.
- ▶ Refurbished machine in Like New condition with two warranties.
- ▶ Rugged...designed for schools...250 GB SSD, spill proof keyboard, Gorilla Glass touchscreen.
- ▶ Comes with Win 10, easy to configure to dual boot with Ubuntu Linux.
- ▶ Much more powerful than Pi.
- ▶ At least 10 hours off internal battery.
- ▶ Powered by USB-C, lots of lightweight commodity power supplies available.



Which computer to use?

- ▶ Use Raspberry Pi 4 for Field Day...will run a long time off LiFePo4 batteries.
- ▶ Lately, been using Lenovo laptop more.
 - ▶ Bigger display, wfview does not fit well on Raspberry Pi display.
 - ▶ WSJT-X easier to use.
 - ▶ Bigger display easier to read.
 - ▶ Long battery life extremely convenient.
 - ▶ Occasionally need Windows for N1MM+ and Winlink.
- ▶ Can't go wrong with either computer.
- ▶ Don't take expensive computer to Field Day!
- ▶ Big displays are nice, but computer is bigger and heavier.
- ▶ In my experience, 11.6 inch display is sweet spot.

Weren't the goal to simplify things?

- ▶ Yes, this is a lot of software to setup and configure.
- ▶ But, you do all this once, only once, and you're done!
- ▶ When you're in the field, just wirelessly connect your computer to your IC-705...
- ▶ Start either kappanhang or wfview...
- ▶ Run Flrig/Fldigi/WSJT-X...and...
- ▶ That's it!

When you want more than 10W

- ▶ There's times you want more than 10W.
- ▶ Own an Elecraft KXPA100 amp.
- ▶ Amp is expensive, but purchased 10 years ago so may as well use it.
- ▶ Solid 100W amp, well constructed. Bulletproof.
- ▶ Interfaces easily to IC-705.
<https://www.dxengineering.com/parts/xyz-a-v-cbl>
- ▶ Drive with 5W for 100W out.



Considerations for portable antennas

- ▶ All things being equal, a large high wire antenna will outperform a portable vertical.
- ▶ But...
- ▶ Wire antennas can be a pain to set up.
- ▶ Remember our goal is to spend more time on the air and less setting up.
- ▶ Need to support a wire antenna.
- ▶ What if there's no trees around?
- ▶ Slingshots not a lot of fun...snags and misfires.
- ▶ Portable masts? Need a base of some kind and maybe guy ropes.
- ▶ So...I decided on a portable vertical.

Building a portable vertical

- ▶ Base is a small carbon fiber camera tripod.
- ▶ Legs lay out flat.
- ▶ Makes for a very stable base.
- ▶ Legs can be staked down to avoid tipping over.
- ▶ Mounting plate for feedline, antenna, and radials from Buddipole.
- ▶ Attaches to top of tripod with setscrew.
- ▶ Loading coil from Wolf River Coils...easy to tune, rated at 100W.
- ▶ Shock-corded mil-style whip from Buddipole.
- ▶ Balun from Buddipole...lower and broader SWR.
- ▶ Use three 33 ft and three 16 ft radials.
- ▶ Antenna works great, assembles in 10 minutes.

Portable Vertical Antenna Parts



OM0ET mag loop antenna

- ▶ OM0ET makes a well-constructed lightweight mag loop antenna.
<https://www.om0et.com/ultralight-mla-mc-20.html>
- ▶ Works well, 10M-40M with 10W max power.
- ▶ Pavol answers emails and is very helpful.
- ▶ Cost around \$300 + shipping via Slovak Post.
- ▶ Assembles easily, very packable, quality materials.
- ▶ Like all mag loops, very sharp tuning.
- ▶ Doesn't perform as well as full-sized antenna, but you can use a mag loop in tight spaces.
- ▶ Performs best with digital modes and CW.



wfview live demo

- ▶ Would prefer to an in-person demo outside.
- ▶ Anybody want to meet some weekend in Buhl Park?
- ▶ For now...a live demo of wfview on my remote station in Hermitage.