



Radio Programming

Using Chirp and RTSystems

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Radio Programming

This is a 'fishing' lesson

These are the basics

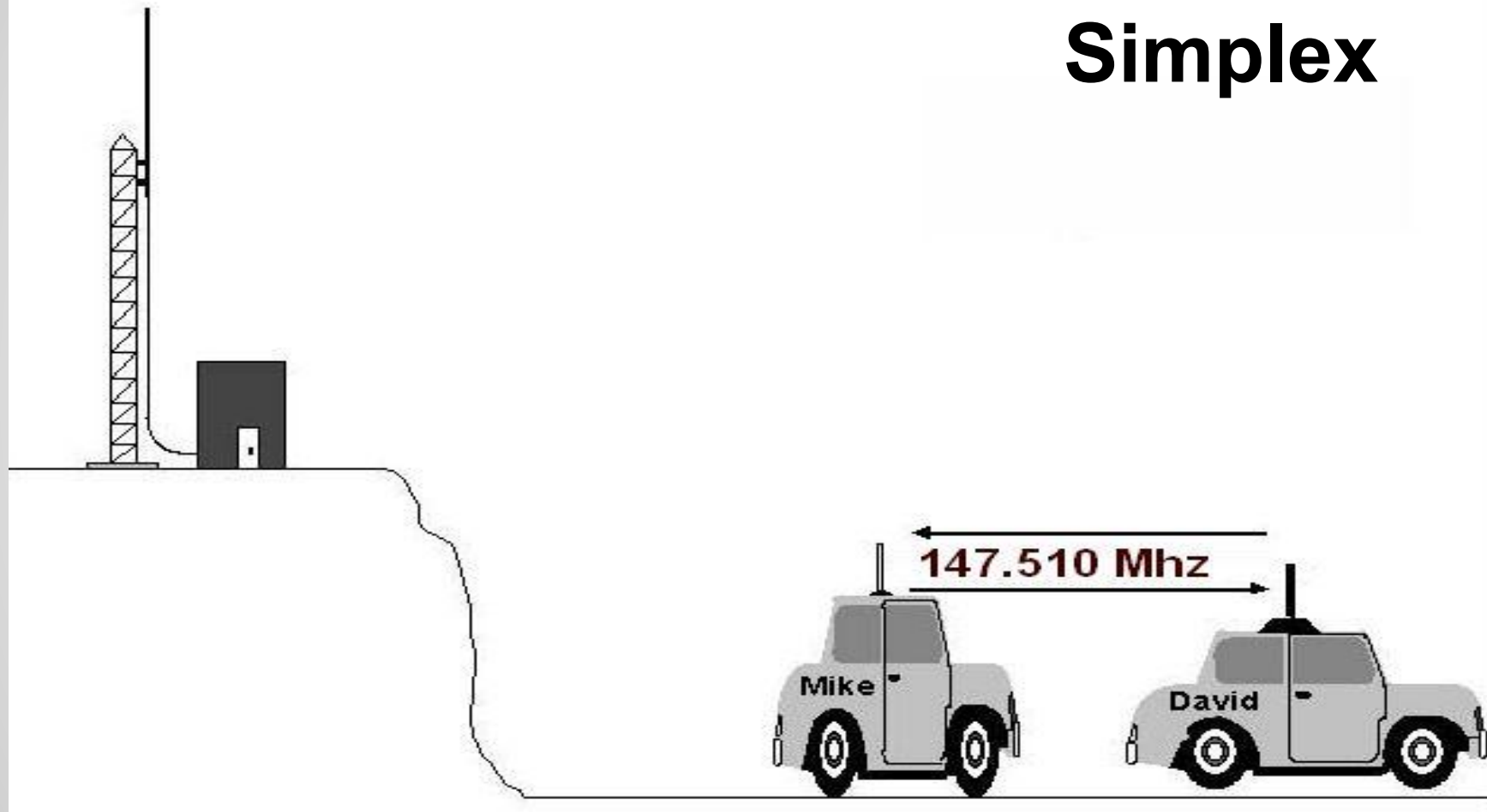
Using CHIRP and RTSystems

Quick Review

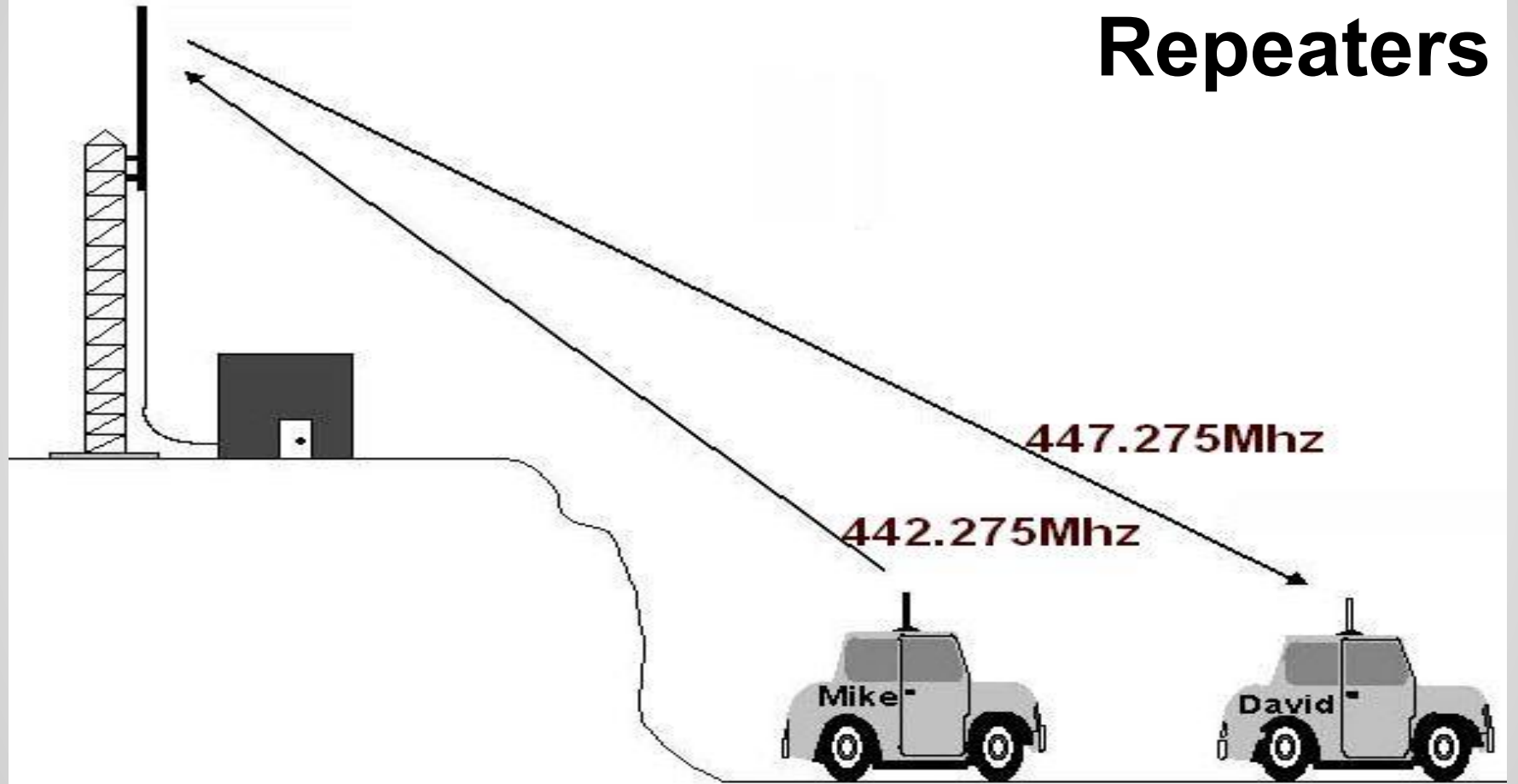
Simplex

Repeaters

Simplex

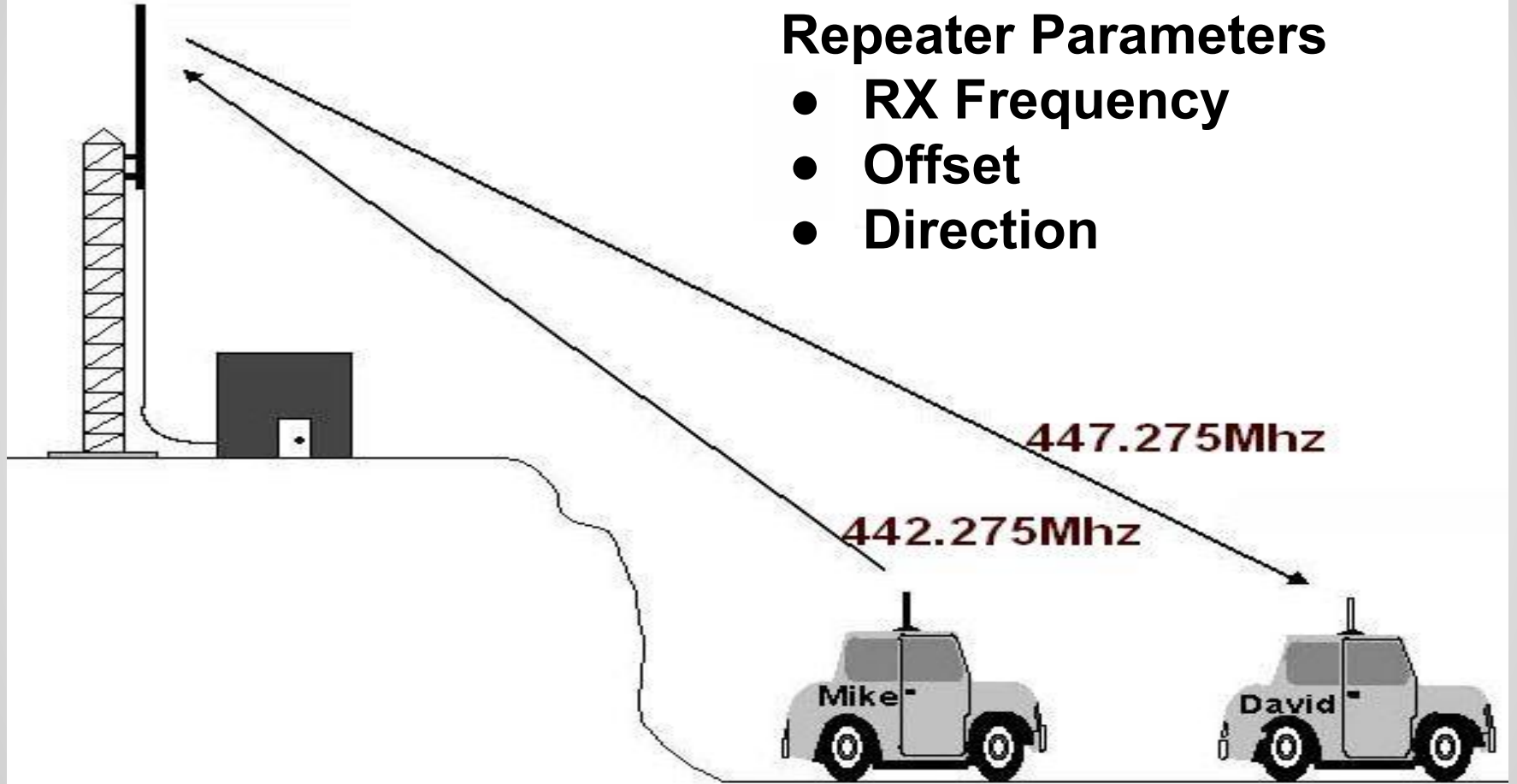


Repeaters



Repeater Parameters

- RX Frequency
- Offset
- Direction



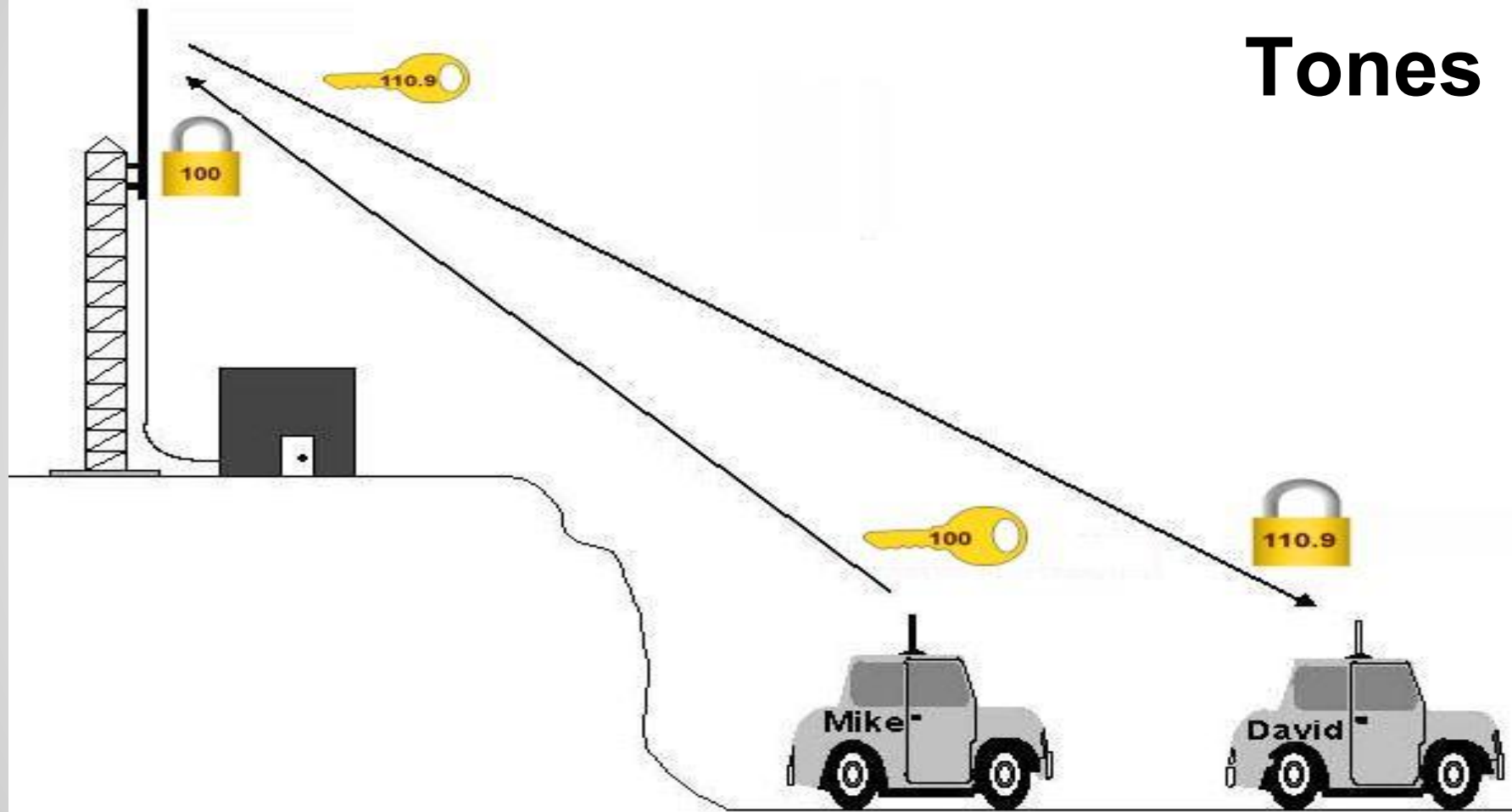
Offsets

- How to get from RX to TX
- Standards
 - 2M: + or - 600kHz
 - 1.25M: -1.6MHz
 - 70cm: + or - 5MHz
- Non-standard - called “odd split”

Tones

- Act like keys to a lock
- Two types
 - CTCSS / PL
 - DCS
- Normally same tone is used for RX and TX
 - Configured individually
 - RX Tone not needed outside high RF areas
- Some radios can scan for tones
- Can be used for simplex too

Tones



Repeater Listings - ARRL

NORTH FRONT RANGE					
Estes Park	146.6850	-	● 123.0l	KC0KXH	EVARC
Fort Collins	145.1150	-	● 100.0ers	W0UPS	NCARC
			WXx		
Fort Collins	147.3600	+	● 100.0	W0QEY	CSUARC
			(CA)		
Greeley	146.8500	-	● 100.0	W0UPS	NCARC
			(CA)ersWX		
Hudson	147.3300	+	●	W0TX	DRC
			100.0/100.0 (CA)		
Loveland	145.1750	-	●	KN6VV	KN6VV
			100.0/100.0 (CA)e		

Repeater Listings - ARES

Colorado Amateur Radio Emergency Service® Region 3 District 2 Channel Utilization						
Channel	Frequency	Offset	Tone	Owned	Assignment	Remarks
1	145.115	-0.6	100	NCARC	Secondary Operations	Horsetooth Mountain
2	447.275	-5.0	100	NCARC	Primary Operations and Net Control	Horsetooth Mountain
3	448.025	-5.0	100	NCARC	Primary Operations and Net Control	Budweiser Event Center
4	147.360	+0.6	100	CSU	Resource Net	Colorado State University
5	147.195	+0.6	100	LRA	Secondary Operations	West of Loveland
6	449.575	-5.0	100	LRA	Secondary Operations	West of Loveland
7	146.625	-0.6	100	NCARC	Secondary Operations	Buckhorn Mountain
8	447.700	-5.0	100	NCARC	Secondary Operations	Buckhorn Mountain
9	146.850	-0.6	100	NCARC	Secondary Operations	North of Greeley
10	449.850	-5.0	100	CSU	Secondary Operations	Colorado State University

Repeater Listings - NCARC

Frequency Offset	Tone (in / out)	Call / Location	Info
<i>2 Meter</i>			
144.390		WØUPS-5 / Horsetooth Mtn.	APRS Simplex
145.115 -	(100.0/110.9)	WØUPS / Horsetooth Mtn.	EchoLink Node 4236
146.850 -	(100.0/100.0)	WØUPS / UNC Campus - Greeley	
146.625 -	(100.0/100.0)	WØUPS / Buckhorn Mtn.	May be linked with 447.700 & 224.840 SkyWarn
<i>1.25 Meter</i>			
224.520 -	(100.0/100.0)	WØUPS / Horsetooth Mtn.	
224.840 -	(100.0/100.0)	WØUPS / Buckhorn Mtn.	May be linked with 146.625 & full time with 447.700

Programming

What you need

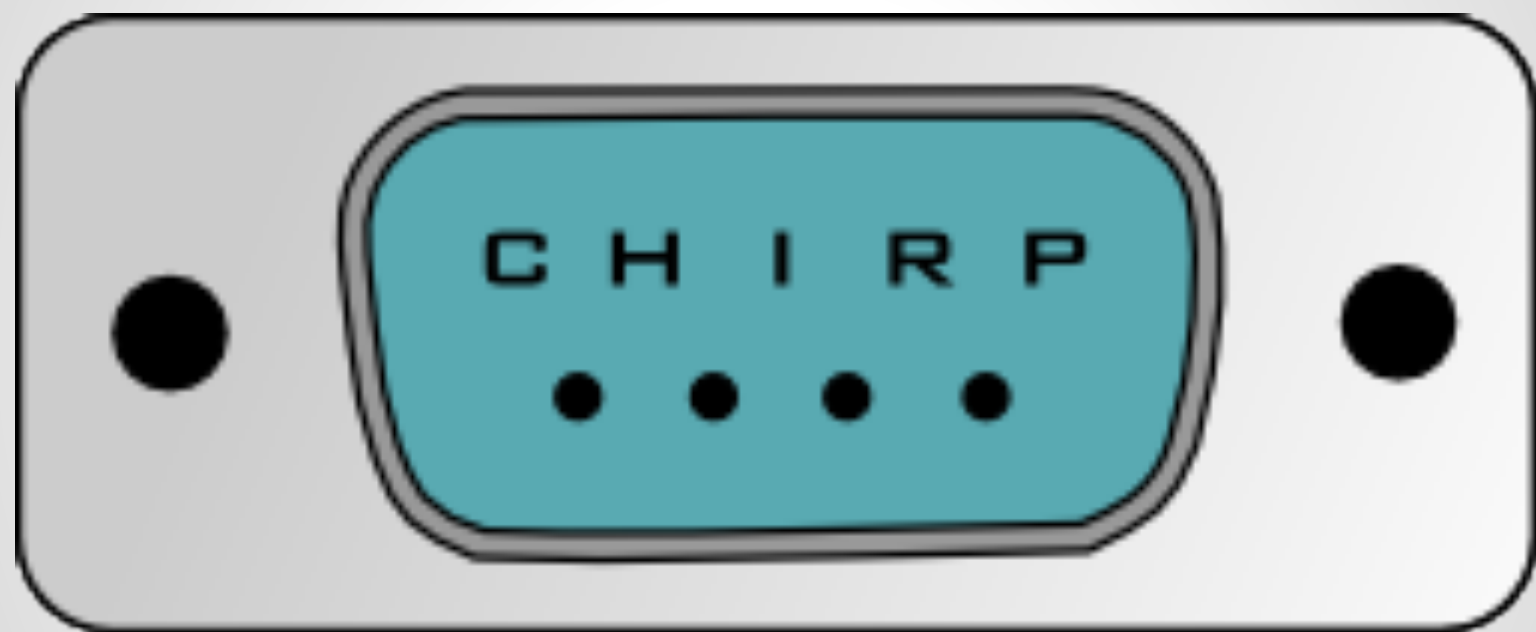
Radio

Programming cable

Computer

Software

- Chirp
- RTSystems



Chirp

Download free from: <http://chirp.danplanet.com>

Supports lots of radios

Opensource

Need your own cable

Supported on Windows, Mac, Linux, Live CD

Cables

Watch out for counterfeit usb cables!!!!

Best practice is to get serial radio cables and one good quality usb->serial converter

Chirp Main Window

File Edit View Radio Help

Yaesu FT-8800: ft8800Chirp.img ✕ Baofeng UV-5R: baofeng5A.img ✕ Yaesu FT-857/897: data857d_v2.img ✕ Yaesu FT-60: FT60_SB.img ✕

Memories (Left) Memory Range: 1 - 25 Refresh Special Channels Show Empty Properties

Banks(Left)	Loc	Frequency	Name	Tone Mode	Tone	DTCS Code	Duplex	Offset	Mode	Power	Tune Step	Skip
Memories (Right)	1	145.115000	HRSTH	Tone	100.0	023	-	0.600000	FM	Hi	5.0	
Banks(Right)	2	447.275000	HRSTH	Tone	100.0	023	-	5.000000	FM	Hi	5.0	
	3	448.025000	BEC	Tone	100.0	023	-	5.000000	FM	Hi	5.0	
	4	147.360000	CSUV	Tone	100.0	023	+	0.600000	FM	Hi	5.0	
	5	147.195000	LVDW	Tone	100.0	023	+	0.600000	FM	Hi	5.0	

Tone Mode

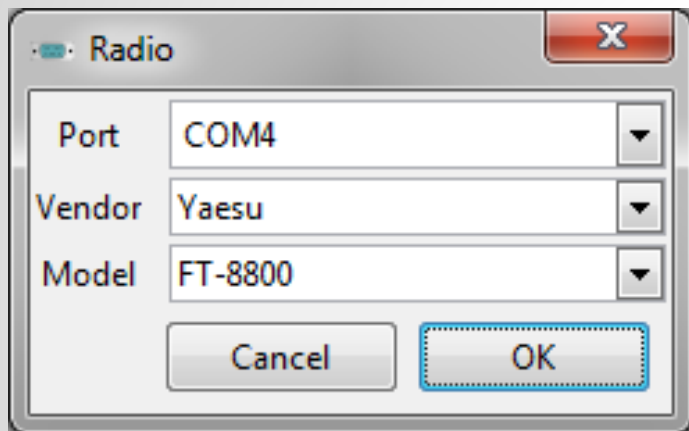
This sets the mode used to transmit or receive squelch tones (or related selective calling technologies). The following explains what the options means:

- (None): No tone or code is transmitted, receive squelch is open or carrier-triggered.
- Tone: A single CTCSS tone is transmitted, receive squelch is open or carrier-triggered. The tone used is that which is set in the Tonecolumn.
- TSQL: A single CTCSS tone is transmitted, receive squelch is tone-coded to the same tone. The tone used is that which is set in the ToneSqlcolumn.
- DTCS: A single DTCS/DCS code is transmitted, receive squelch is digitally tone-coded to the same code. The code used is that which is set in the DTCS Code column.
- Cross: A complex arrangement of squelch technologies is in use. See the definition of the Cross Mode column for details.

Normal Process

1. 'Download from Radio'
2. Edit channels (can use stock configs)
3. Edit options
4. Save to disk
5. 'Upload to Radio'

'Download' from radio



A dialog box titled "Radio" with a close button (X) in the top right corner. It contains three dropdown menus: "Port" set to "COM4", "Vendor" set to "Yaesu", and "Model" set to "FT-8800". At the bottom, there are two buttons: "Cancel" and "OK".

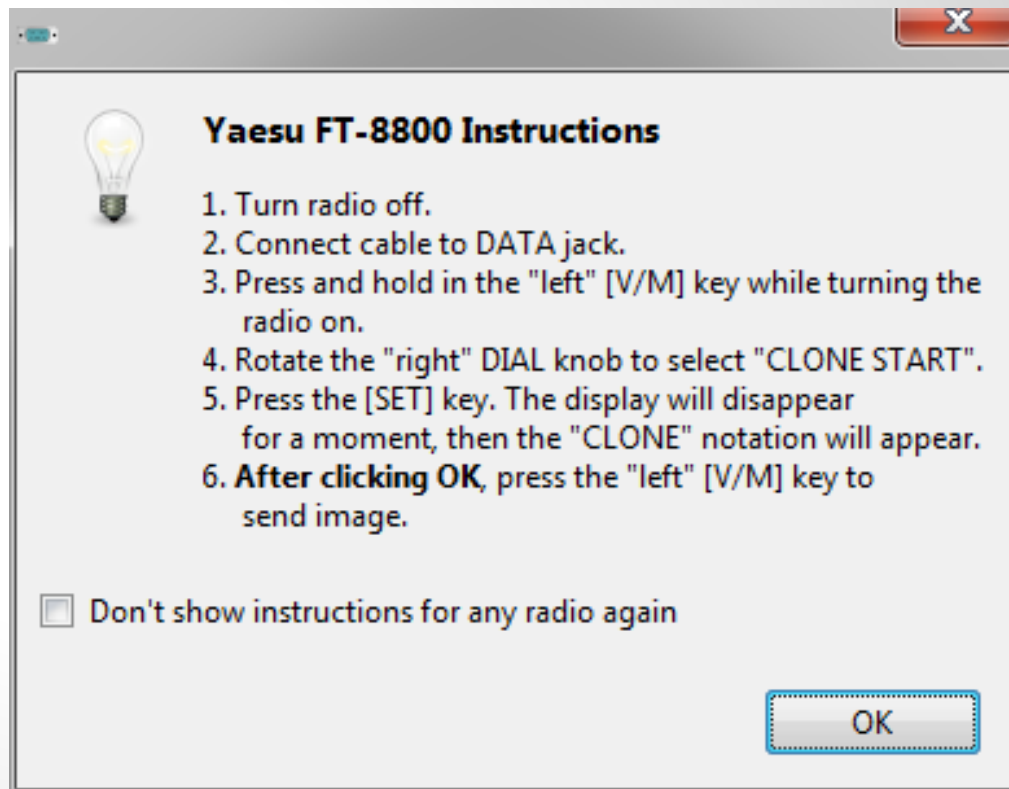
Radio

Port COM4

Vendor Yaesu

Model FT-8800

Cancel OK



A dialog box titled "Yaesu FT-8800 Instructions" with a close button (X) in the top right corner. It features a lightbulb icon on the left. The main content is a numbered list of six steps for cloning a radio. At the bottom, there is a checkbox labeled "Don't show instructions for any radio again" and an "OK" button.

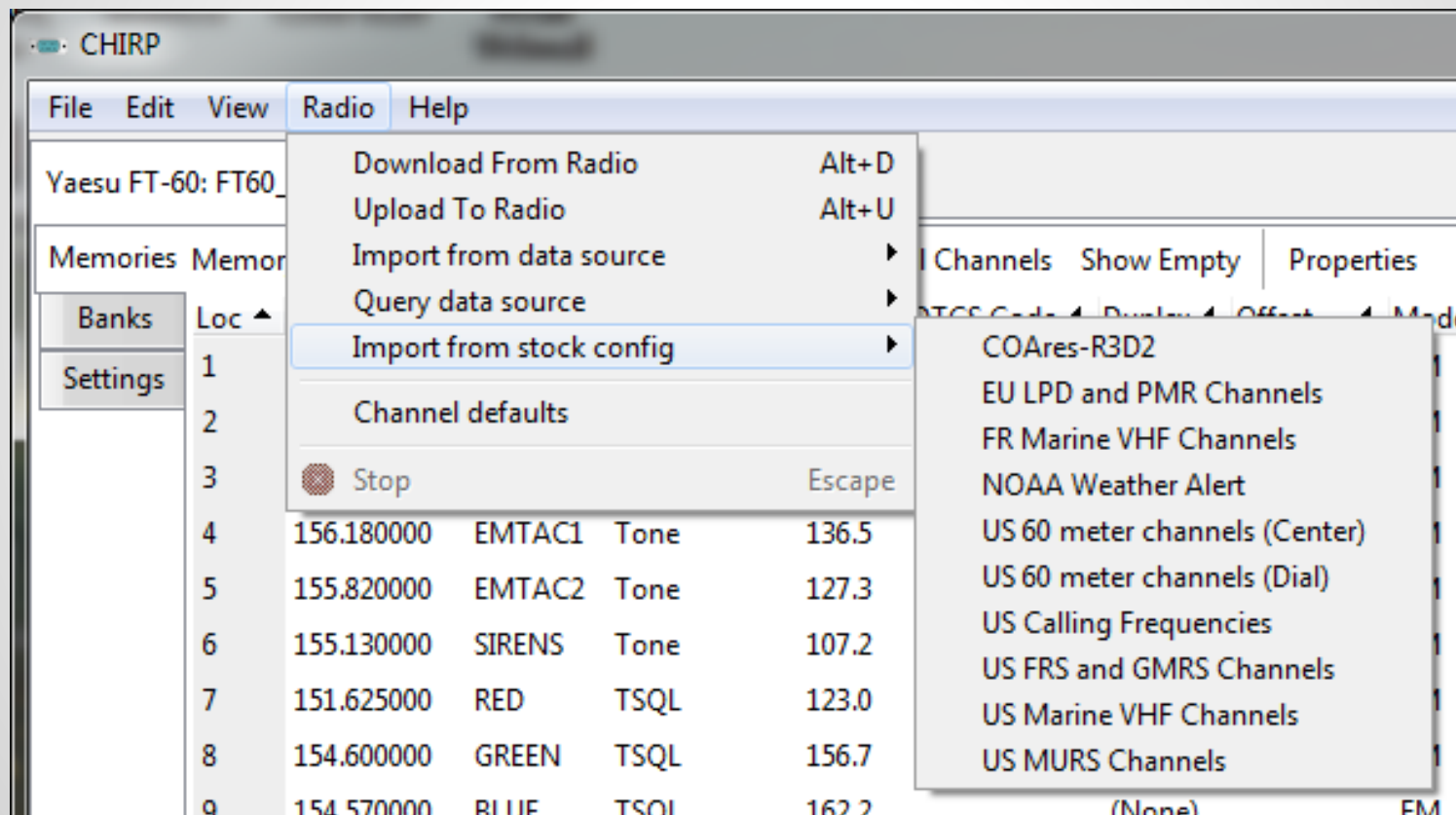
Yaesu FT-8800 Instructions

1. Turn radio off.
2. Connect cable to DATA jack.
3. Press and hold in the "left" [V/M] key while turning the radio on.
4. Rotate the "right" DIAL knob to select "CLONE START".
5. Press the [SET] key. The display will disappear for a moment, then the "CLONE" notation will appear.
6. **After clicking OK**, press the "left" [V/M] key to send image.

Don't show instructions for any radio again

OK

Stock Configs



The screenshot shows the CHIRP software interface. The 'Radio' menu is open, and 'Import from stock config' is selected. A sub-menu is displayed, listing various channel sets. The background shows a table of radio channels with columns for frequency, name, mode, and offset.

Loc	Frequency	Name	Mode	Offset
1				
2				
3				
4	156.180000	EMTAC1	Tone	136.5
5	155.820000	EMTAC2	Tone	127.3
6	155.130000	SIRENS	Tone	107.2
7	151.625000	RED	TSQL	123.0
8	154.600000	GREEN	TSQL	156.7
9	154.570000	RI IIF	TSQI	162.2

Radio Menu Options:

- Download From Radio (Alt+D)
- Upload To Radio (Alt+U)
- Import from data source
- Query data source
- Import from stock config
- Channel defaults
- Stop (Escape)

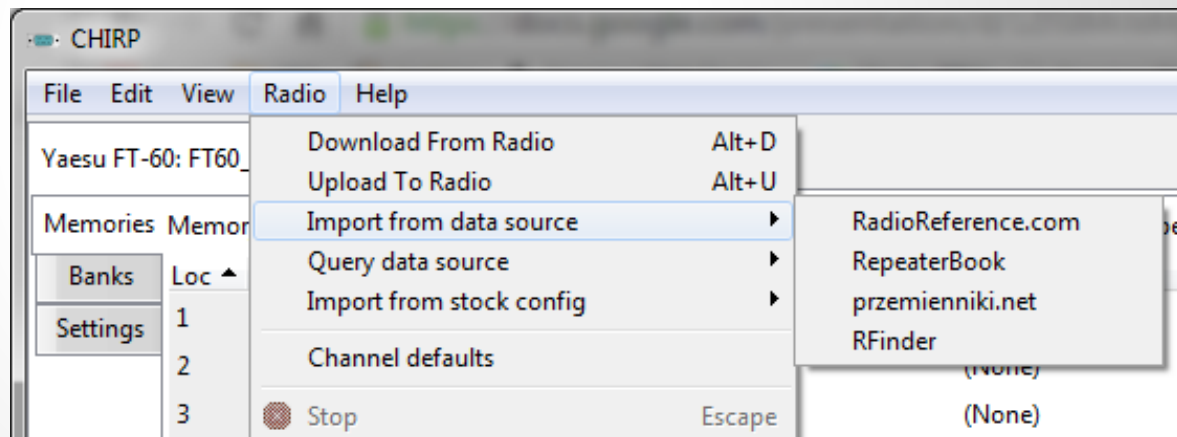
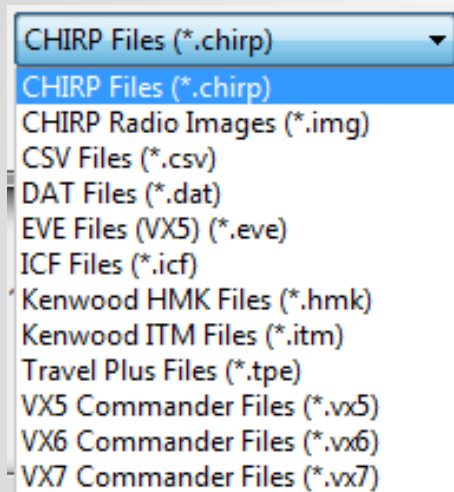
Stock Config Sub-menu Options:

- COAres-R3D2
- EU LPD and PMR Channels
- FR Marine VHF Channels
- NOAA Weather Alert
- US 60 meter channels (Center)
- US 60 meter channels (Dial)
- US Calling Frequencies
- US FRS and GMRS Channels
- US Marine VHF Channels
- US MURS Channels

Stock Configurations

- ARES comm plan available from <http://ncarc.net> or make your own.
- Copy csv file to
 - C:\Program Files (x86)\CHIRP\stock_configs
- When you run it stock configs are copied to:
 - C:\Users*<user>*\AppData\Roaming\CHIRP\stock_configs
- Can then be imported into any radio with a couple of clicks

Imports



rt SYSTEMS 

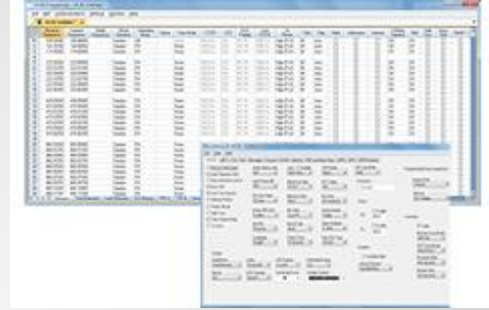
RADIO PROGRAMMING MADE EASY

RTSystems

- Purchase from: <https://www.rtsystemsinc.com/>
- Supports lots of radios
- Free updates
- Typically \$50 for the software and a cable for one radio type
- Great support
- Windows Only
- Local company that supports our Hamfests

RTSystems

Open several files at once.

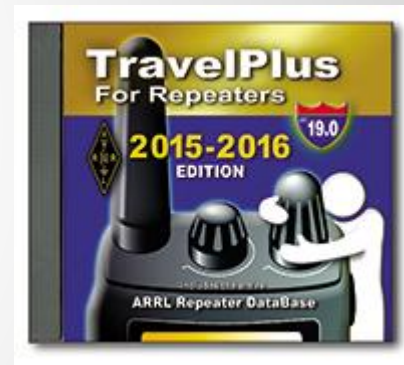


- Files can be for the same or different radios (Version 4.50 Programmer for each radio required).
- Different color tabs at the top of the screen let you see that several files are open. Simply click a tab to switch between the files.
- Split the screen to see more than one file at once. [Click here](#) to see how easily this is done.

RTSystems

More ways to get the data you want to program in your radio. Quick... Easy... Create a file in 4 mouse clicks!

- ARRL Travel Plus.
- Radio Reference.
- Repeater Book.
- RFinder Worldwide Data Base.
- Options for using multiple settings files



Extra Slides

Radio Anomalies

- Yaesu 8800/8900 are different side-to-side
- Yaesu 'banks' are powerful, but tricky to configure.
- Almost every Baofeng is a different firmware version and the saved files are incompatible