RADIO PROGRAMMING

Getting The Most Out Of Your Radio

NCARC HAMLET COURSE 2019

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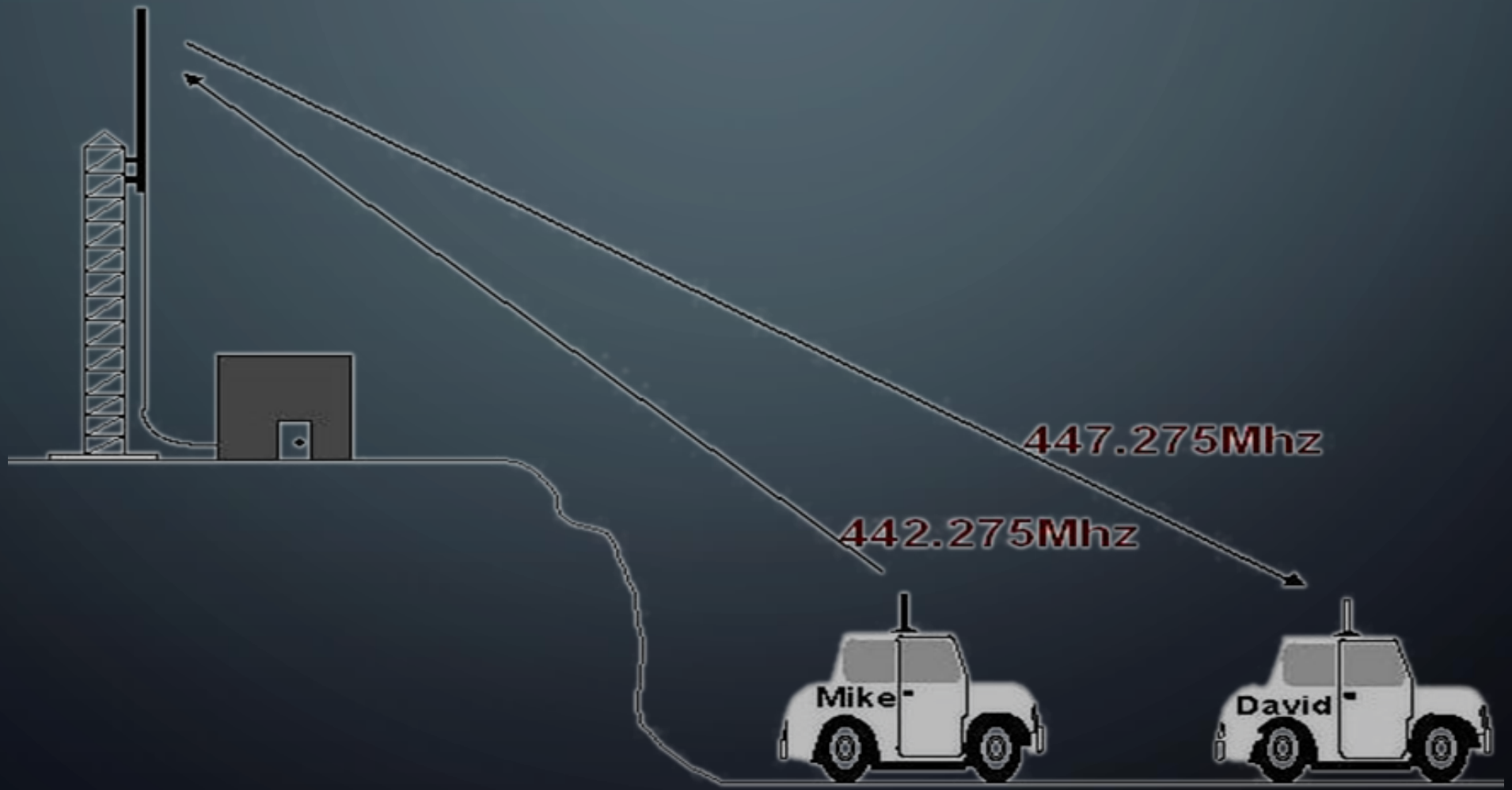
Updated by: Dave Winnett (WØDDZ)

NCARC
Northern Colorado Amateur Radio Club

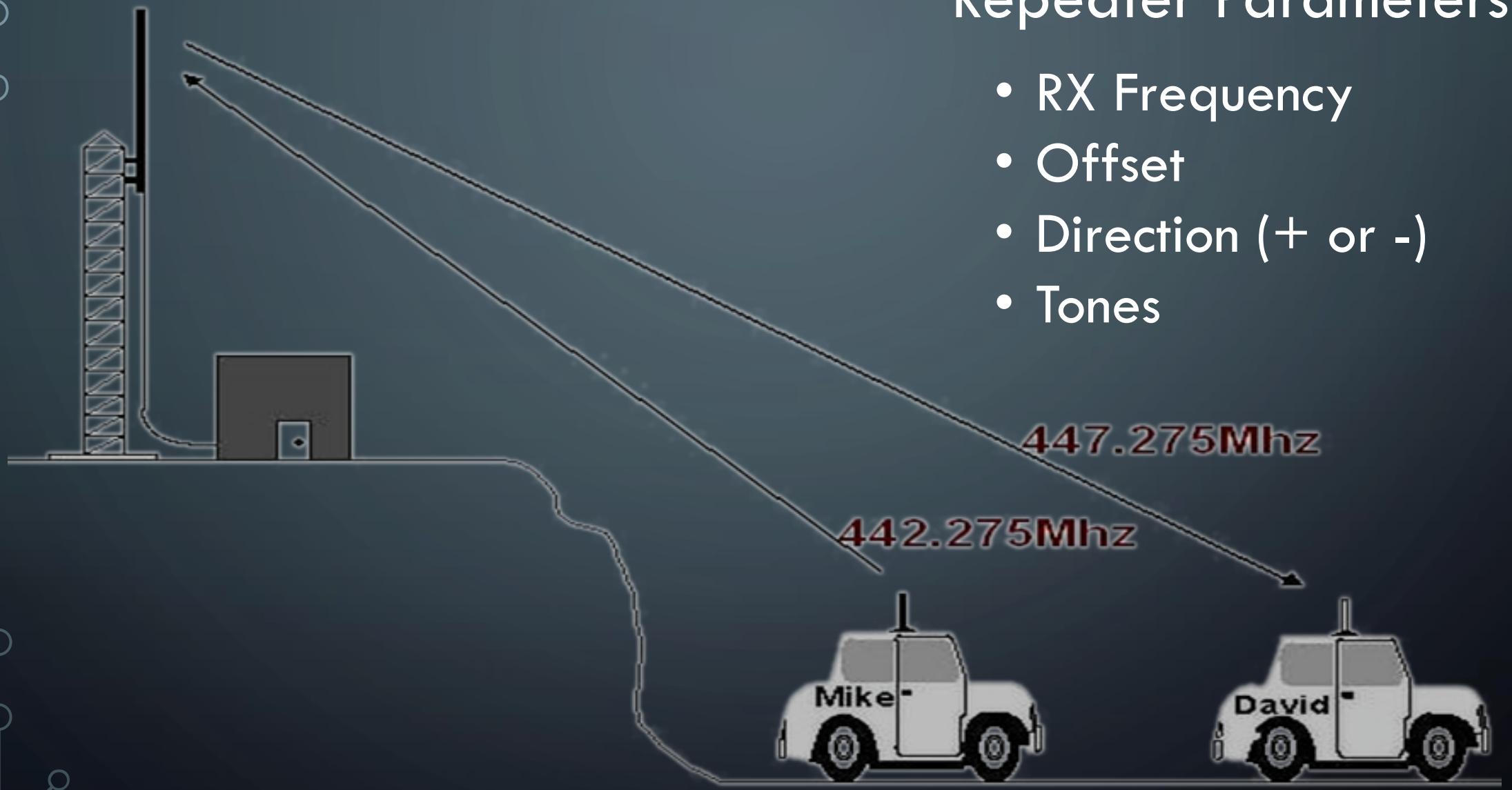
SIMPLEX OPERATION

OPERATING THROUGH A REPEATER



Repeater Parameters

- RX Frequency
- Offset
- Direction (+ or -)
- Tones



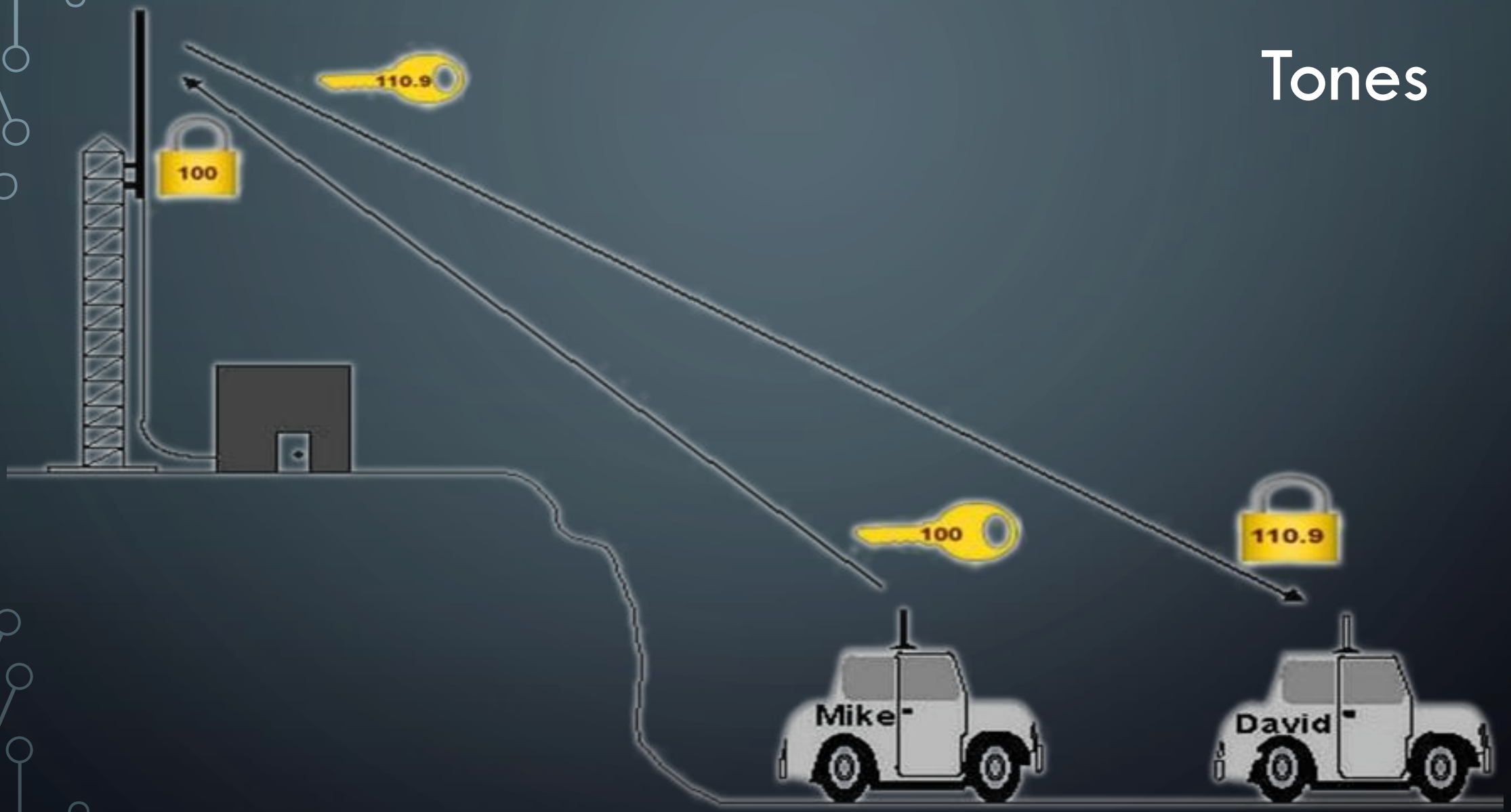
OFFSETS

- How to get from RX to TX
- Standards
  - 2M: + or – 600kHz
  - 1.25M: -1.6MHz
  - 70cm: + or – 5MHz
- Non-standard – Called “Odd Split”

TONES

- Acts 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



RESOURCES

WHERE DO YOU GET REPEATER INFORMATION

ARRL REPEATER LISTING

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

ARES CHANNEL UTILIZATION

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

CLUB WEBSITES

NCARC Repeaters - WØUPS/R, WØUPS-5

NCARC currently maintains and operates 8 repeaters. These repeaters are kept operational through the guidance of the Technical Committee Chair and club members. The repeaters are located in four different locations. Take a look at the other repeaters in the area. Other Repeaters

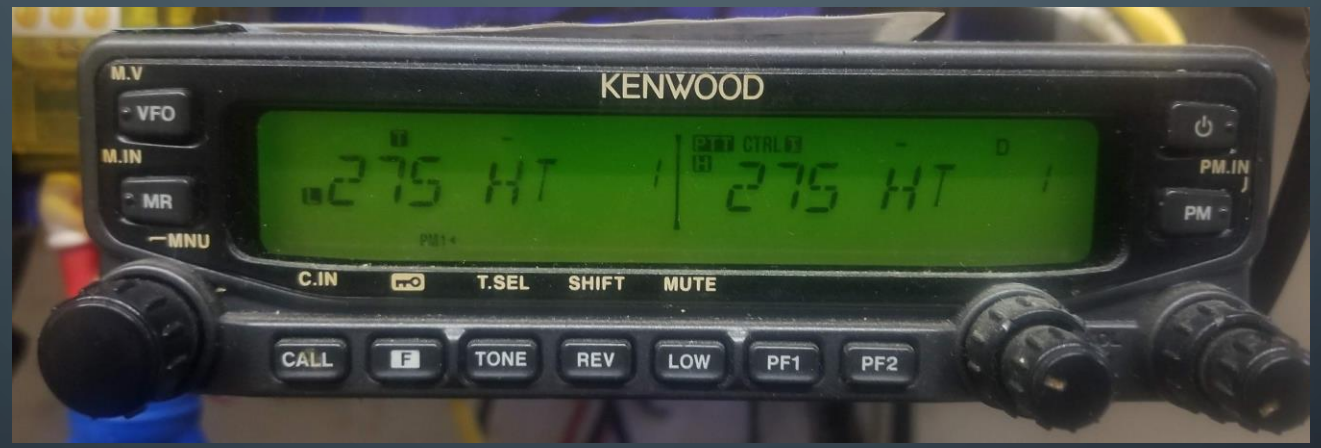
Repeater Frequencies

Frequency Offset	CTCSS Tone (in / out)	Call / Location	Equipment
2 Meter			
144.390		Horsetooth Mtn.	TinyTrak4/Alinco DR1200 / APRX iGate/Digi
145.115 -	100.0/100.0	Horsetooth Mtn.	Kenwood TKR-750 repeater, RTCM/Asterisk Controller, 100W amplifier Repeater Coverage Map
146.850 -	100.0/100.0	UNC Campus – Greeley	Kenwood TKR-750 repeater 25 watt, RTCM/Asterisk Controller Repeater Coverage Map
146.625 -	100.0/100.0	Buckhorn Mtn.	Kenwood TKR-750 repeater 25 Watt, RTCM/Asterisk Controller Repeater Coverage Map
1.25 Meter			
224.520 -	100.0/100.0	Horsetooth Mtn.	BridgeCom BCR-220 repeater, 100 Watt Amplifier Repeater Coverage Map
70 Centimeter			
447.275 -	100.0/100.0	Horsetooth Mtn.	Kenwood TKR-850 repeater, RTCM/Asterisk Controller 100 watt amplifier, ARES R3D2 EchoLink Repeater Coverage Map Linked to 447.750 repeater on Lee Hill courtesy of RMHam

PROGRAMMING

From the face of the radio

KENWOOD


KENWOOD
M.V
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TONE
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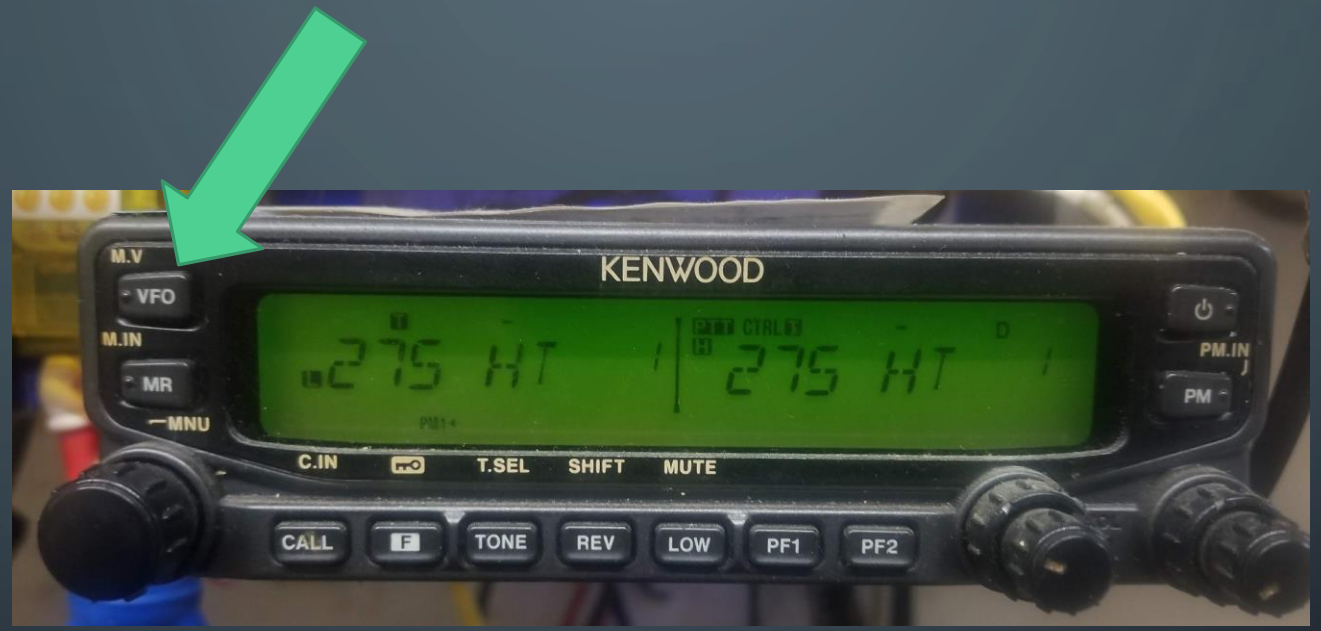
KENWOOD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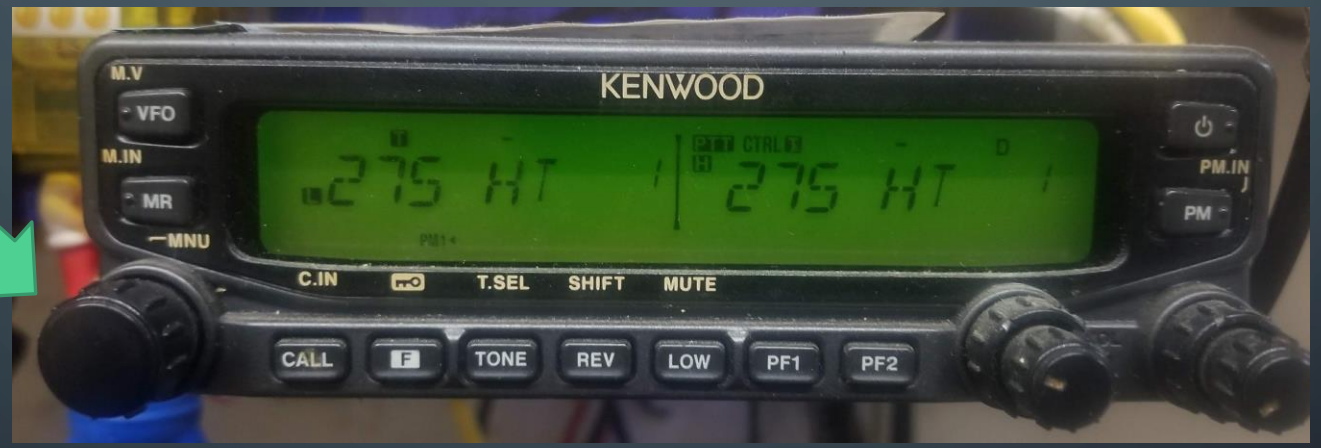
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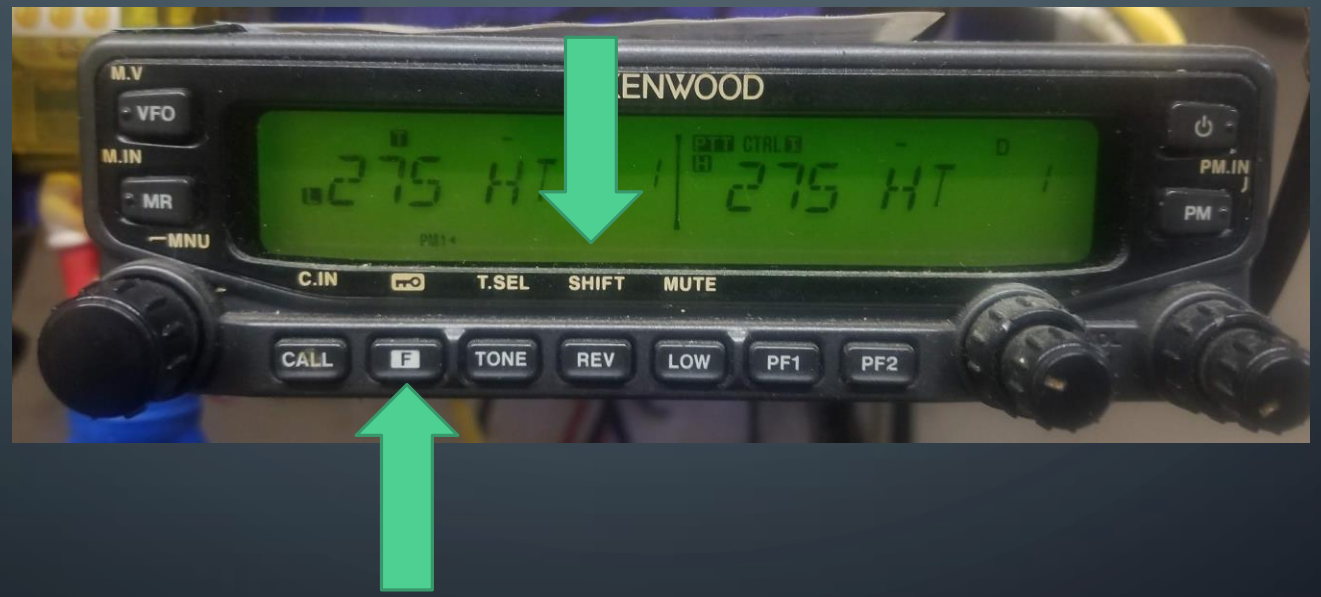
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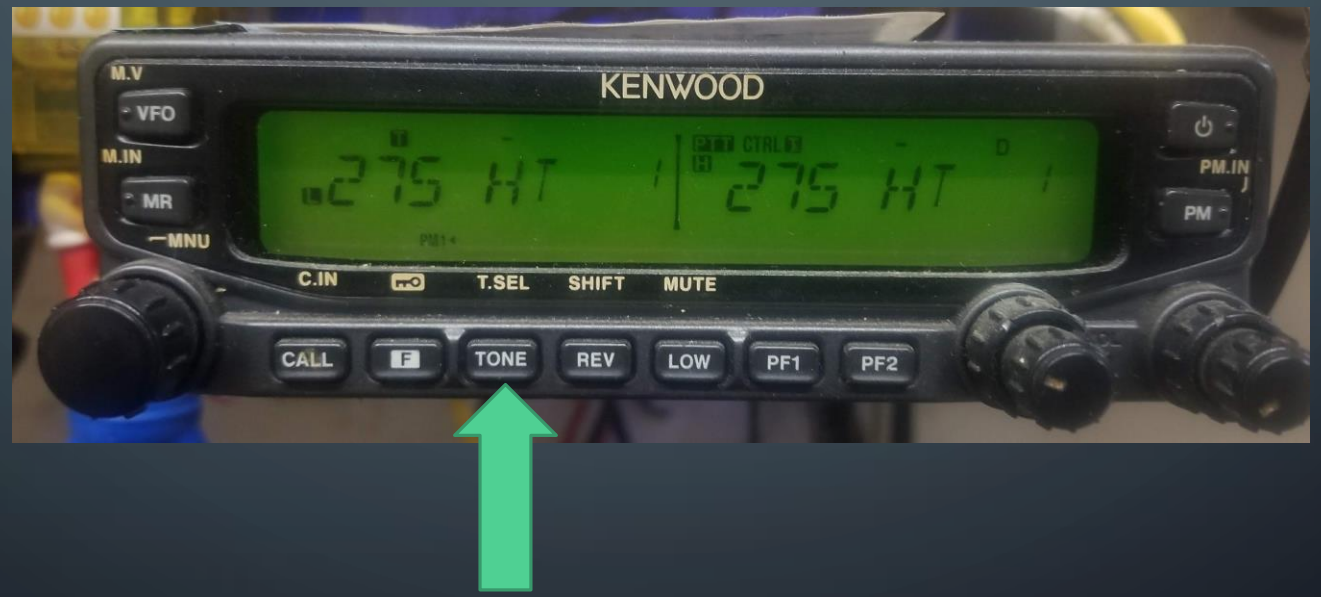
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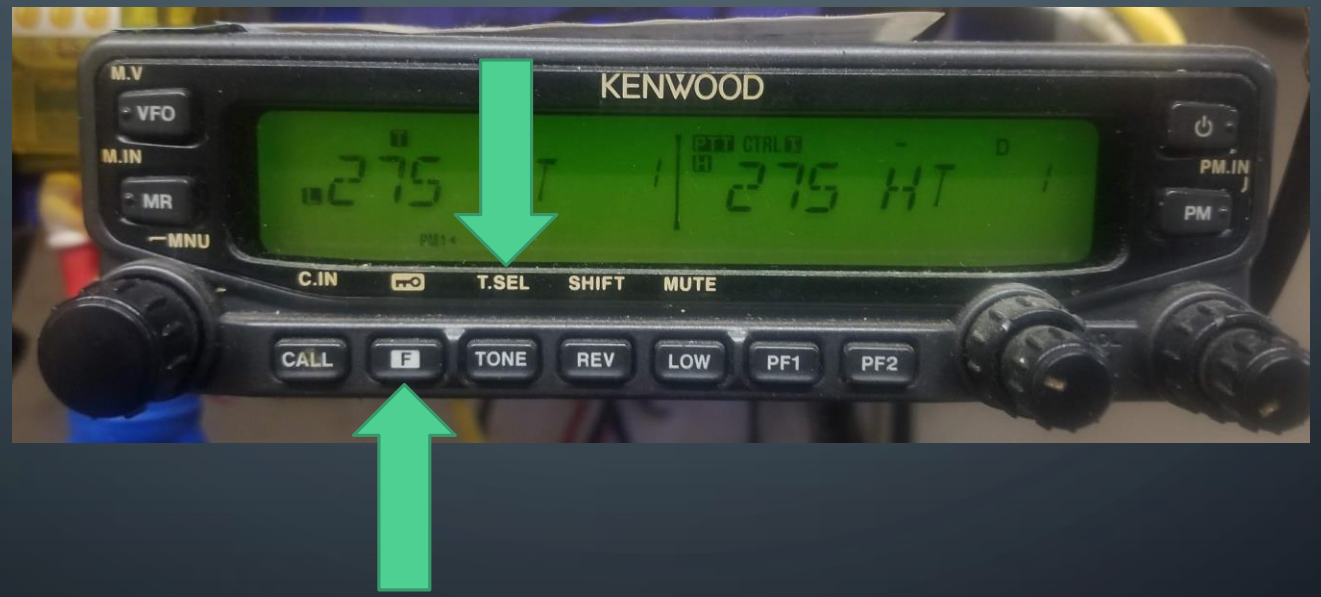
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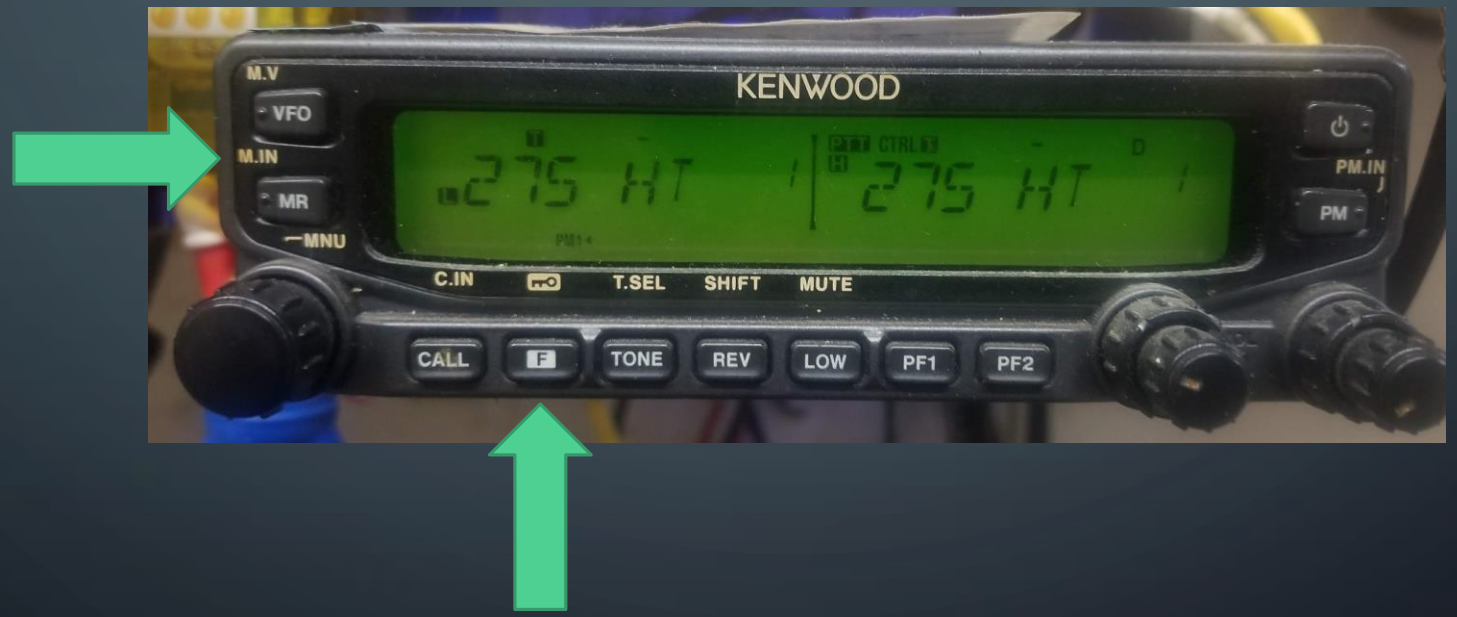
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PROGRAMMING

Using software

WHAT YOU NEED

- Radio
- Programming Cable
- Computer
- Software
  - Chirp
  - RTSystems
  - Manufacturers Software


CHIRP

CHIRP

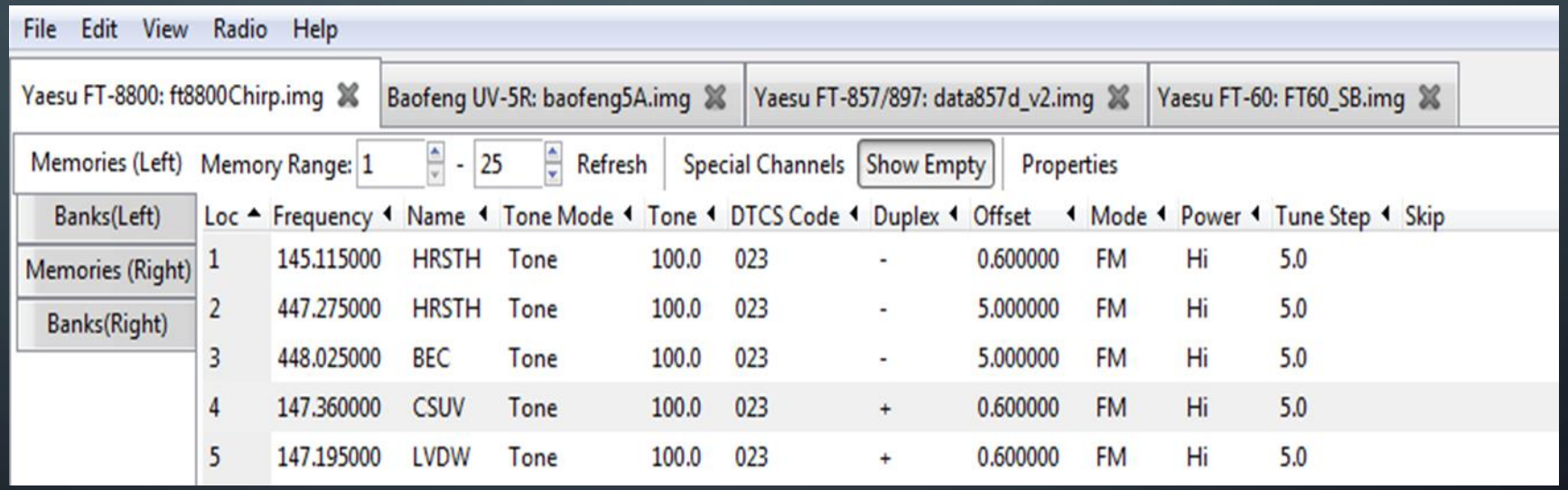
- Download free from: http://chirp.danplanet.com
- Supports lots of radios
- Opensource
- Need your own cable for your radios
- Supported on Windows, Macintosh, Linux, Live CD

CABLES

Watch out for counterfit USB cables!!!!

Best practice is to get serial radio programming cables and a quality USB to Serial converter.

CHIRP MAIN WINDOW



Loc	Frequency	Name	Tone Mode	Tone	DTCS Code	Duplex	Offset	Mode	Power	Tune Step	Skip
1	145.115000	HRSTH	Tone	100.0	023	-	0.600000	FM	Hi	5.0	
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

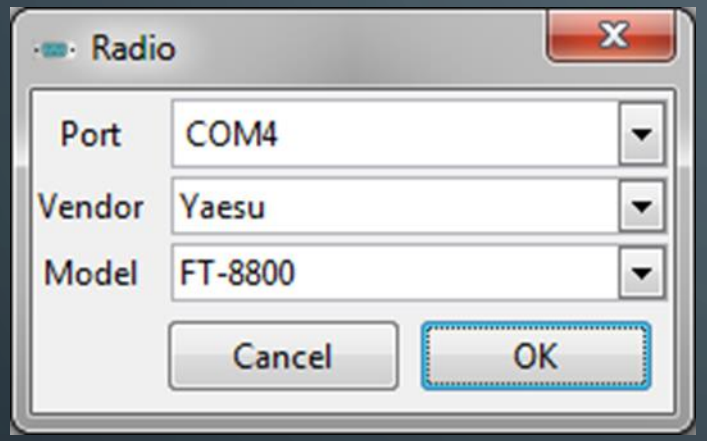
This sets the mode used to transmit or receive squelch tones (or related selective calling technologies). The following explains what each of the options means:

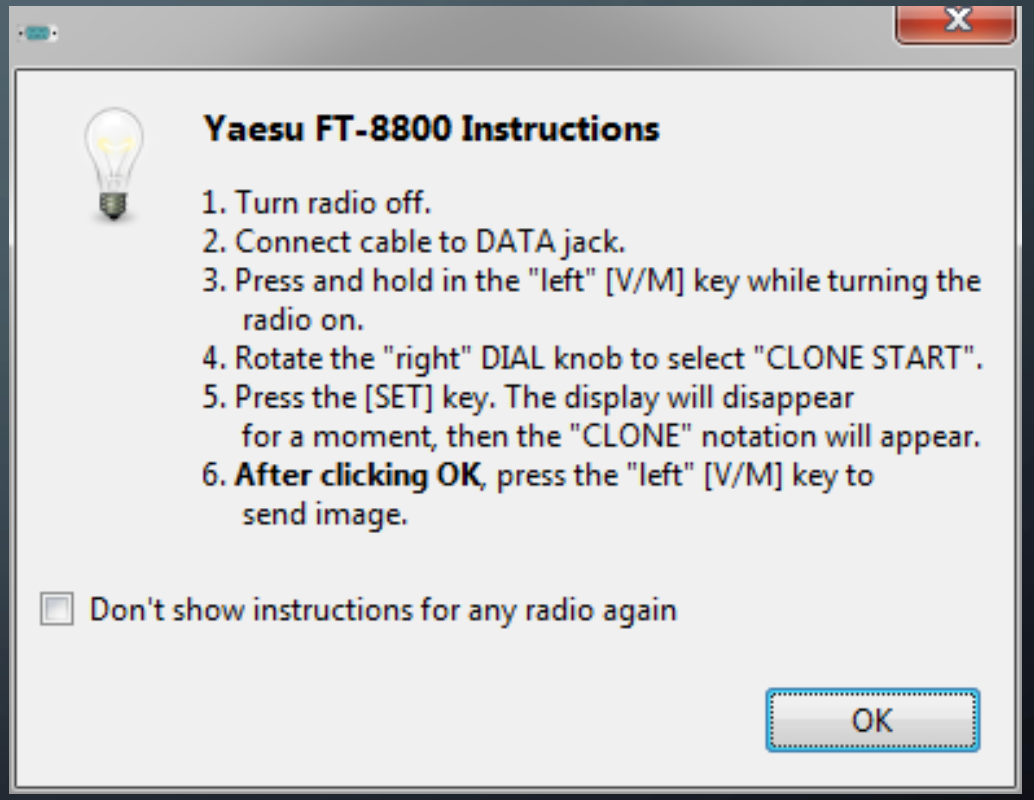
- (None): No tone or code is transmitted, Receive squelch is open or carrier-triggered.
- Tone: A single CTCSS tone is transmitted, receive squelch is open or carrier triggered. The tone used is set in the Tonecolumn.
- TSQL: A single CTCSS tone is transmitted, receive squelch is tone-coded to the same tone. The tone used is the one 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

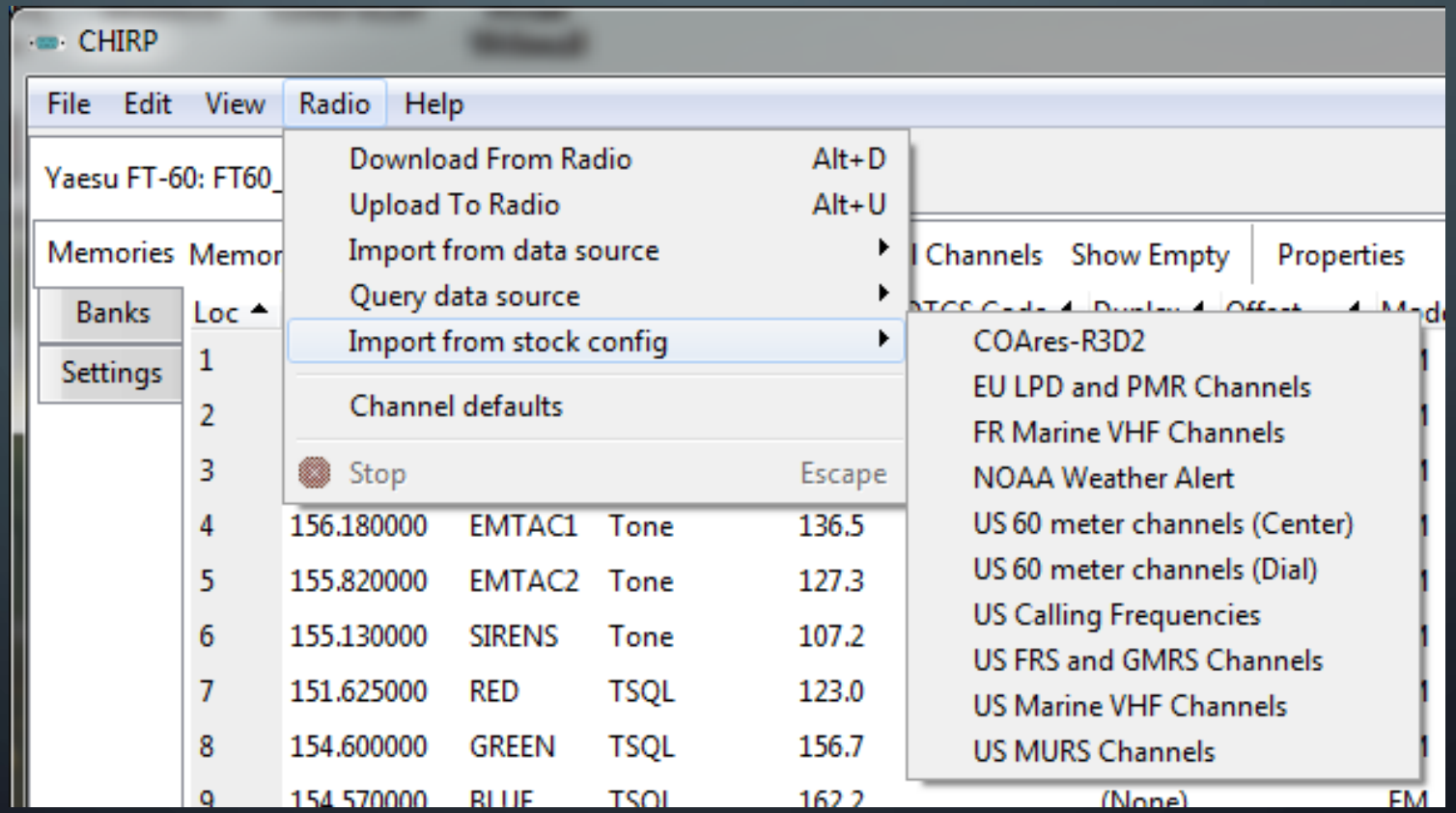
1. ‘Download from Radio’
2. Edit channels (can use stock configs)
3. Edit options
4. Save to disk
5. ‘Upload to Radio’

DOWNLOAD FROM RADIO





STOCK CONFIGS



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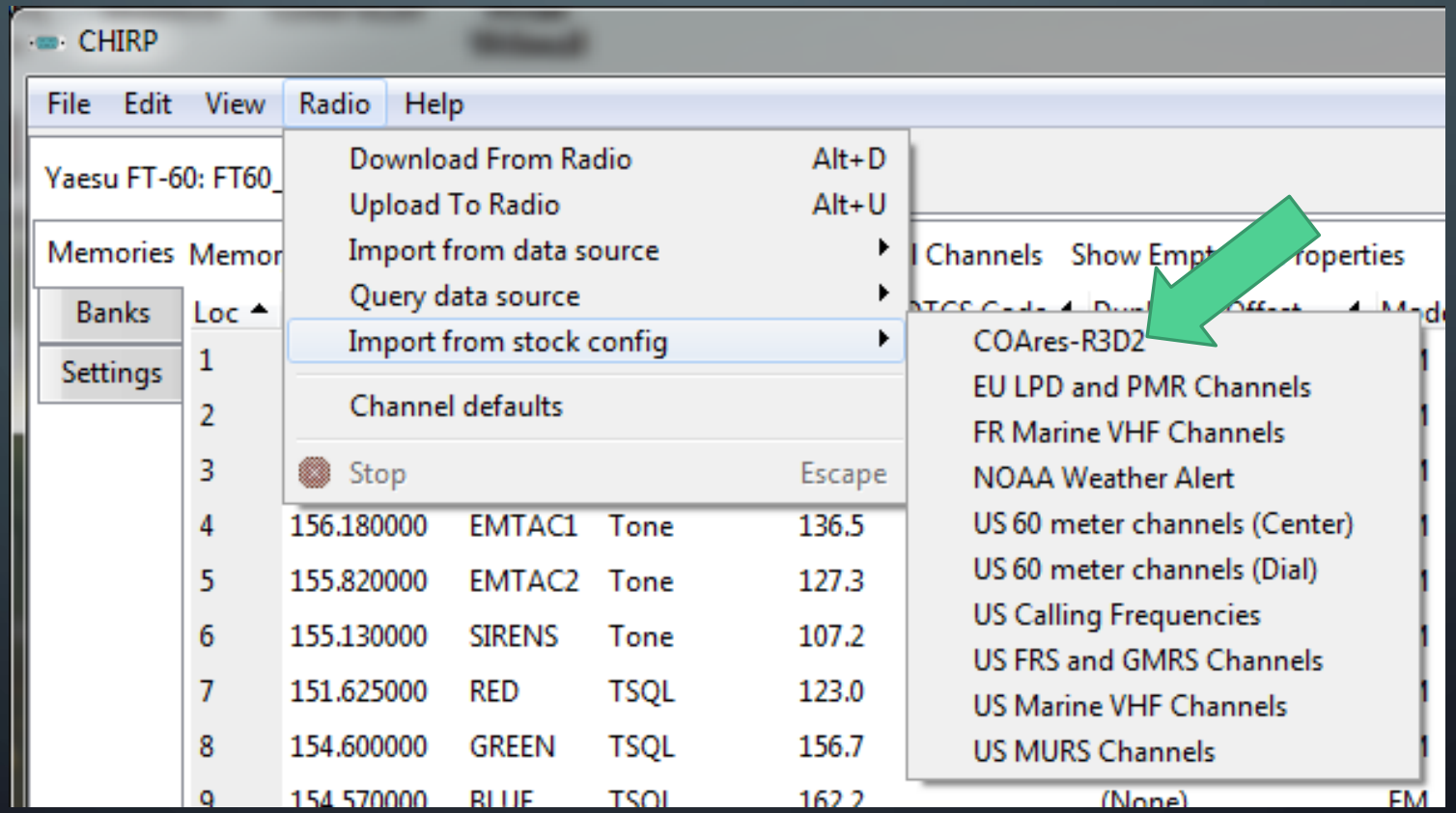


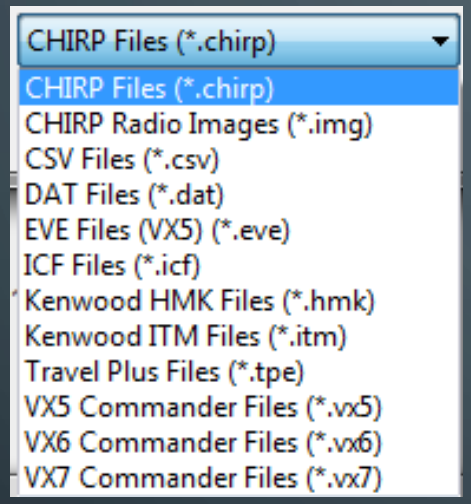
STOCK CONFIGURATIONS

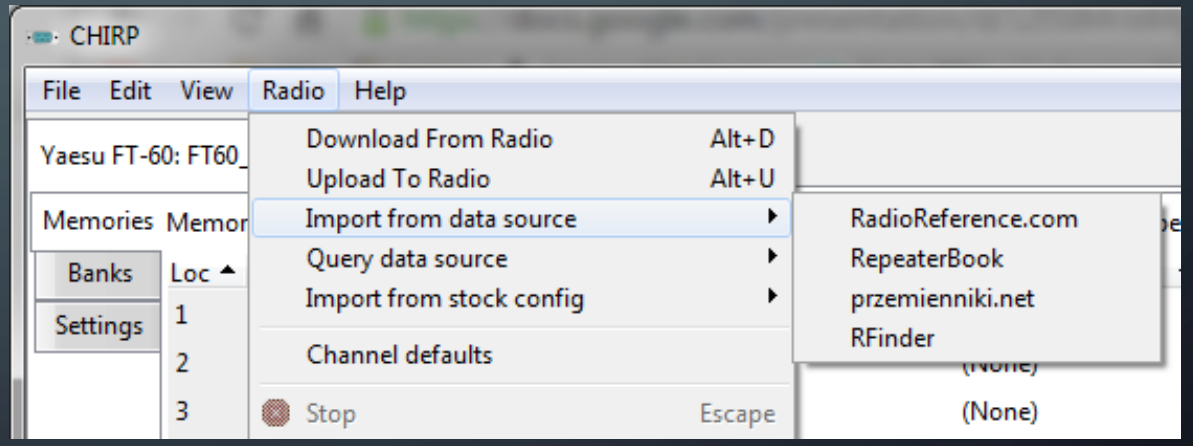
- ARES comm plan available from ColoradoARESR3D2.org or make your own.
- Copy csv file to: C:\Program Files (x86)\CHIRP\stock_configs
- When you run it stock configs are copied to:

  C:\Users\<*user*>\AppData\Roaming\CHIRP\stock_configs

- Can then be imported into any radio with a couple of clicks

IMPORTS


CHIRP Files (*.chirp)
CHIRP Files (*.chirp)
CHIRP Radio Images (*.img)
CSV Files (*.csv)
DAT Files (*.dat)
EVE Files (VX5) (*.eve)
ICF Files (*.icf)
Kenwood HMK Files (*.hmk)
Kenwood ITM Files (*.itm)
Travel Plus Files (*.tpe)
VX5 Commander Files (*.vx5)
VX6 Commander Files (*.vx6)
VX7 Commander Files (*.vx7)


CHIRP
File
Edit
View
Radio
Help
Yaesu FT-60: FT60_
Memories
Memor
Banks
Settings
Loc
1
2
3
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
RadioReference.com
RepeaterBook
przemienniki.net
RFinder
(None)

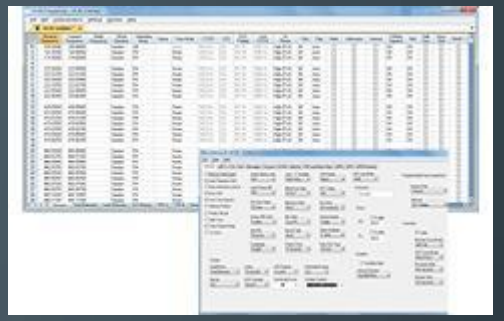

rt
SYSTEMS
RADIO PROGRAMMING MADE EASY

RT SYSTEMS

- Purchase from: https://RTSystemsInc.com
- Supports lots of radios
- Free updates
- Typically $50 for the software and cable for one type of radio
- Great support
- Wondows only
- Local Company that supports our club's hamfest

RTSYSTEMS

Open several files at once.

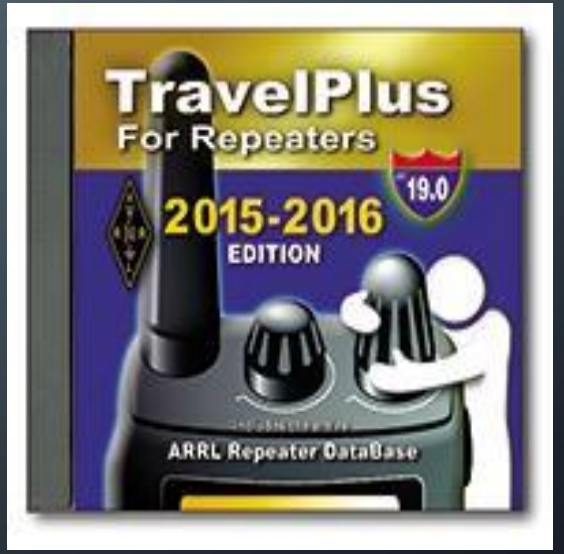


- Files can be for the same or different radios (Version 4.5 programmer for each radio required).
- Different color tabs at the top of the screen let you see that several files are open. Simply click a tab to switch between the files
- Split screen to see more than one file at once

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

- Some Yaesu radios are different side-to-side (8800/8900/400 DR/100 DR)
- Yaesu ‘banks’ are powerful, but can be tricky to configure.
- Almost every Baofeng is a different firmware version and saved files are incompatible