Amateur Radio Programming

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for the Parker Radio Association https://www.ParkerRadio.org



What is Programming?

- Amateur radio programming is the process of entering frequencies, channels, and other settings into a radio transceiver. This allows the radio to be used to communicate with other amateur radio operators on a variety of frequencies.
- The specific steps involved in amateur radio programming vary depending on the radio model and the software used to program it. However, there are some common tasks that are typically performed during the programming process.



Typical Parameters

The following parameters need to be set for an analog FM amateur radio:

- Channel Name/Number: The channel name lets you identify the purpose.
- Frequency: The frequency of the radio is the most important setting. It determines the band that the radio will operate on and the other hams that you will be able to communicate with.
- Power output: The power output determines how far the radio's signal will travel. It is important to set the power output to the minimum level that is necessary for your needs.
- Squelch: The squelch is a circuit that prevents the radio from transmitting or receiving audio when the signal is too weak. It is important to set the squelch to a level that will allow you to hear weak signals but will not cause the radio to transmit when there is no signal.

This is the most basic method for communicating between two radios, but they must be within range of each other.

Simplex

Transmitting on the Simplex Frequency: 146.520Mhz

Transmitting Radio

On YOUR Radio: Receive Frequency: Transmit Frequency: 146.520Mhz Transmit Offset: CTCSS Tone:

146.520Mhz 0hz None

Receiving Radio

Receiving on the Simplex

Frequency: 146.520Mhz

Repeater Settings

- The repeater receives a signal on the input frequency and retransmits it on the output frequency. The offset is the difference between the input frequency and the output frequency. For example, if the receive frequency is 145.200 MHz and the offset is 600 kHz, then the transmit frequency will be 145.800 MHz.
- CTCSS tones, sometimes called "Private Line" (PL) codes, are used to filter out unwanted signals. When a station transmits a signal with a CTCSS tone, the repeater will only retransmit the signal if it also hears the same CTCSS tone. This allows stations to use the same repeater frequency without interfering with each other.
- Usually, the CTCSS tone is only needed to transmit, and the receive can be set to not require a tone. This would allow you to hear other radio traffic on the frequency.

Tone Modes

- None No tone is used to transmit, Carrier Squelch for receive.
- Tone Transmits the tone, but uses Carrier Squelch on receive.
- TSQL Transmits the tone and expects it on receive as well.
- DCS A digital code is used (DTCS in CHIRP).
- Some radios can do Split Tones or Cross Mode, where different tones or modes are used for transmit and receive



Finding Repeater Information

- Most club/group will publish the information for their repeaters on their website.
- RepeaterBook.com can search by band, region, etc.
- RadioReference.com a wealth of information on amateur, aviation, and commercial radio
- Rfinder.net Now https://AndroidDMR.com. Android/iOS app with repeater directory. Requires a subscription or application purchase.

Repeater Listings

• Repeater information is usually listed like this:

147.1650	+0.6 MHz	123.0 / 123.0	ldaho Springs, Middle	Clear Creek	KOPRA	OPEN	FM AllStar
			Squaw				
• This of	a a wa tha	Docoivo E	Mountain	to sot or		lia	
I NIS SI	nows the	кесеіvе г	requency	to set or	i your rac	JIO.	

- The Offset for the Transmit Frequency.
- The TX Tone / RX Tone. Typically, if only one tone listed, then no tone is needed on receive.

*Note: The location listed is the repeater location, not the coverage area!

This is the ideal situation for communicating through a repeater. Both radios must be within range of the repeater, but not necessarily in range of each other.

Insmitting on the 7.7

Sending C

.CSS TONE: 123HZ

Transmitting Radio

K0PRA 2m Repeater



On YOUR Radio: Receive Frequency: 147.165Mhz Transmit Frequency: 147.765Mhz Transmit Offset: CTCSS Tone:

+600hz 123Hz



If the transmitting radio is not set to send the correct CTCSS tone, then the repeater will not "open" and will not retransmit any signal.

Transmitting on the 17.7

Transmitting Radio

K0PRA 2m Repeater

123Hz

of Sending CTCSS Tone: 123Hz On YOUR Radio: Receive Frequency: 147.165Mhz Transmit Frequency: 147.765Mhz Transmit Offset: CTCSS Tone:

+600hz 123Hz

repeater trom

Some repeaters will also send a CTCSS tone on the output, which could be the same as the input tone, or could be a different tone. This is optional for receiving.

Transmitting on the 7.7

Sending C

Transmitting Radio

-CSS TONe: 123HZ

K0PRA 2m Repeater

123Hz

On YOUR Radio: Receive Frequency: Transmit Frequency: Transmit Offset: CTCSS Tone:

147.165Mhz 147.765Mhz +600hz 123Hz

Sending

CTCSS Tone. 123Hz

The risk in setting a CTCSS tone for receiving is that you may not hear other traffic on the frequency.

Transmitting on the 17.7

SendingC

-CSS TONe: 123HZ

K0PRA 2m Repeater

123Hz

On YOUR Radio: Receive Frequency: 147.165Mhz Transmit Frequency: 147.765Mhz Transmit Offset: CTCSS Tone:

+600hz 123Hz

123Hz

Receiving Radio

ng on the

Sending CTCSS Tone

Transmitting Radio

It is also possible to transmit on the output frequency of the repeater, which becomes a simplex conversation, bypassing the repeater, in case of an outage or out of range. This is sometimes called "Talkaround" or "Direct" mode.

> Transmitting on the Repeater's TX Frequency: 147.765Mhz

Transmitting Radio

Sending CTCSS Tone: 123Hz On YOUR Radio: Receive Frequency: Transmit Frequency: 147.165Mhz Transmit Offset: CTCSS Tone:

123Hz

K0PRA 2m

Repeater

147.165Mhz 0hz 123Hz

Receiving Radio

Receiving on the Repeater's

TX Frequency: 147.165Mhz

From the Front Panel

- Most amateur radios can be programmed directly from the front panel, by going through a menu or pressing a set of buttons.
- While it is possible to program one or more channels from the front panel, the process is often convoluted and tedious.
- Most people find it easier to update the radio's programming using software on a computer, connect to the radio with a special USB cable.
- It is useful to understand the manual process, however, in case you ever need to add or update a channel in the field, when you may not have a computer and cable with you.



Using Computer Software

- There are a number of different software programs that can be used to program amateur radios.
- Many manufacturers produce their own programming software for their radios.
- This is often referred to as "Customer Programming Software" (CPS)
- Some popular programs include CHIRP and RT Systems. These programs typically offer a graphical user interface that makes it easy to enter the required settings.
- The file with your radio programming is often called a "Code Plug."

CHIRP

- CHIRP is free, open-source software that can program a wide variety of analog FM radios (but not many DMR)
 - Baofeng/BTECH/Radioddity
 - Retevis/TYT
 - Icom
 - Kenwood
 - Yaesu
 - Wouxun
- It is available for Windows, Macintosh, and Linux
- It is updated fairly frequently, so be sure to update when you use it.
- The program should check for updates and will alert you if there is a newer version available.
- Includes the ability to import from services like RepeaterBook and RadioReference
- The website is: https://chirp.danplanet.com

RT Systems

- If you would prefer commercial software that is supported, check to see if RT Systems has software for your radio.
- They sometimes require using their specific cable to connect to the radio, but sometimes standard USB and manufacturer's cables work as well. The challenge is that many generic cables use counterfeit Prolific or FTDI chipsets which are not supported by the official drivers.
- Frequently updated, but checks for updates, and can update itself.
- Has a consistent "look and feel" for most brands of radios.
- Includes the ability to import from services like RepeaterBook, RFinder and RadioReference.
- Website is: https://www.rtsystemsinc.com

Common Tasks

These tasks include:

- Reading the existing channel memory programming from the radio.
- Entering the frequencies of the amateur radio bands.
- Entering the channels for repeaters and other common frequencies.
- Setting the operating mode, such as FM, AM, or SSB.
- Setting the power output.
- Saving the settings to the radio's memory.
- Can often import/export in a variety of formats including CSV to edit in a spreadsheet.



Using the CPS Software

- Have the appropriate cable for your radio. The most common is a USB cable that connects to the external speaker/mic jacks on a handheld. Many mobile and base stations now have USB ports.
- The USB cable likely has a serial communications chip embedded in the connector, which may require a driver. Follow the instructions for your radio or software to install the driver if needed.
- Once connected, you usually have to select the correct COM Port for the cable you just connected.
- Once connected, the first thing that you should do is to READ from the radio, and save the file as a backup, in case you need to restore your current settings. Give the file a meaningful name, like a date or version, so that you can identify it later if needed.

Entering the Parameters

- Most CPS software has a spreadsheet or table view to list the parameters for each channel.
- You may need to enter the name first, or sometimes the receive frequency.
- Some software may set the offset and transmit frequency for you automatically, based on the frequency range.
- Each CPS may have different names for common parameters, which can make it confusing. You should be able to identify the common ones, and probably best to leave the others alone until you understand what they do. Look for on-screen help.
- Many radios have Groups or Zones to let you save channels as sets to make it faster to find the channels you want. Some radios will only show channels added to Groups or Zones.



Saving and Writing to the Radio

- Once you have entered the channel information you want, be sure to save your file, again using a meaningful name like a date or version.
- The CPS should have a command to WRITE to data to the radio. Some may require setting a programming or "clone" mode on the radio first. Follow the prompts in the software or refer to the instructions for your radio.
- Typically, after writing the data, the radio will restart itself.
- Scroll through the channel list to confirm that your changes show up.

What Else Can the CPS Do?

- Change Settings
- Background Pictures
- Firmware Updates
- Icon Updates
- Update the Contact List

Digital Mobile Radio (DMR) Programming

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Digital Mobile Radio (DMR)

- Has the same basic parameters as Analog FM:
 - Receive Frequency
 - Transmit Frequency or Offset
 - Bandwidth is only 12.5K
 - Power Level can be set
- Requires a "Radio ID" instead of your callsign
- Adds three new properties:
 - Time Slot (TS)
 - Color Code (CC)
 - Talk Group (TG)



Radio ID

- Create an account at https://RadioID.net
- Your Radio ID number will be assigned to you.
- Used in commercial digital radios like DMR instead of your callsign.
- Even though your radio will send your RadioID, you will still need to identify with your FCC callsign.

Time Slot

- DMR radios are able to have two simultaneous conversations on the same frequency by splitting the time, using Time Division Multiple Access (TDMA)
- The radio transmits for 30 milliseconds and then receives for 30 milliseconds.
- The normal time slot (TS) to use for dynamic groups is TS1.
- The typical time slot for local or static groups is TS2.



Color Code

- DMR radios use something called a Color Code in the same way that an analog repeater uses the CTCSS tones.
- The color codes are actually a numeric value, from 0-15.
- A color code is required for each channel, it is **not** optional like CTCSS.
- If your color code is not set correctly, you will not be able to access the repeater.

Talk Groups

- DMR Repeaters are able to connect to other repeaters or personal "hot spots" using a network like https://Brandmeister.network.
- The notion of a Talk Group is used to organize radio traffic by countries, states, special interest groups, etc.
- Each DMR repeater is assigned a "local" talk group using its RadioID
- A DMR repeater can also be dynamically linked to any talk group by connecting to an open time slot, typically TS1.
- The audio for that talk group is sent through the internet to other connected repeaters and hot spots.
- A dynamic link will eventually time out and disconnect, or can be manually unlinked by connecting with TG4000

PRA DMR Talk Groups

- Time slot 1 linked to BM Talk Group 310759 (Colorado Mega).
- Time slot 2 linked to BM Talk Group 310844 (Parker Local).
- These talk groups are bridged with our Yaesu System Fusion and D-Star repeaters through AllStar
- Use Color Code 1.



Zones

- Most DMR radios allow you to group channels into Zones
- Zones are just an arbitrary grouping of channels
- Can organize by location, club, etc.
- You can have multiple channels in a zone.
- You can have the same channel in multiple zones.
- A channel must be in at least one zone to show up on your radio.



KØPRA DMR Repeater

Transmitting Radio

ting on

olor code.

On YOUR Radio: Receive Frequency: 447.300Mhz Transmit Frequency: 442.300Mhz Transmit Offset: Color Code:

CC1

-5Mhz

Channel Information Edit533 ×				
Channel Name	K0PRA DMR Mes		,	
Receive Frequency	447.30000	PTT Prohibit Talk	Around(Simplex) C APRS RX	
Correct Frequency[Hz]	0	Digital	sable) Auto Scan	
Channel Type	D-Digital 💌	Contact		
Transmit Power	High	Color Code		
Band Width	12.5K 💌	Slot	Slot2	
TX Permit	Different Color Code 🔹	Receive Group List	None	
Scan List	None	Digital Encryption	Off 🗨	
		Extend Encryption	AES	
		ARC4 Encryption Code	Off	
		AES Digital Encryption	Off	
Exclude channel from roaming	off	Multiple Key		
DMR MODE	Repeater 💌	Random Key	Off	
Analog APRS Report Freq	1	SMS Forbid	Off	
		I Send Talker Alias IM	Call Confirmation J Ranging	
Analog			SMS Contirmation	
CTCSS/DCS Decode	Off 💌		F -	
CTCSS/DCS Encode	Off 💌		I Reverse	
Squeich Mode	Carrier 💌		2TONE Decode	
Optional Signal	Off 💌		Custom CTCSS 131.8	
		R	itoneBot	
5Tone ID	1	R5	ToneEot 1	
PTT ID	Off 🔽			
	<u>O</u> K <u>C</u> ancel	Pre	evious <u>N</u> ext	

Transmitting Radio

Transmitting on the Repeater's RX Frequency: 442.300Mhz

Sending Color Code: 1

Transmitting on the Report RX Frequency: 442.300h

Time Slot: 1 Talk Group: 310759

KØPRA DMR Repeater

Transmitting Radio

Sending Color Code: 1 Sending Slot: 2,310844 Time Group: 310844 **On YOUR Radio:** Receive Frequency: Transmit Frequency: 442.300Mhz Transmit Offset: Color Code:

CC1

447.300Mhz -5Mhz

Receiving Radio

Receiving on the Repeater's TX Frequency: 447.300Mhz Time Slot: 1 Talk Group: 310759



0	Channel Information Edit532 X				
	Channel Name	K0PRA CO Mega			
	Receive Frequency	447.30000	PTT Prohibit Talk /	Around(Simplex)	
	Transmit Frequency	442.30000	🔲 Work Alone 🔲 DataACK Di	sable 🔲 Auto Scan	
	Correct Frequency[Hz]	0	Digital Contact	PRA CO Mega	
	Channel Type	D-Digital 💌	Radio ID	WIRDT	
	Transmit Power	High 💌	Color Code		
	Band Width	12.5K 💌	Slot	Slot1	
	TX Permit	Different Color Code 🔹	Receive Group List	None	
	Scan List	None	Digital Encryption		
			Extend Encryption	AES	
			ARC4 Encryption Code	Off V	
			AES Digital Encryption	Off V	
			Multiple Key	Off 🗸	
	Exclude channel from roaming	off	Random Key		
	DMR MODE	Repeater 💌	SMS Earlid		
	Analog APRS Report Freq	1 💌	Canal Tallian Alian		
			Send Talker Allas	Call Continnation	
1	Analog			SIVIS Coniirmation	
	CTCSS/DCS Decode	Of 💌		_	
	CTCSS/DCS Encode	Of 💌		Reverse	
	Squelch Mode	Carrier 💌		2TONE Decode	
	Optional Signal	Off 💌		Custom CTCSS 131.8	
	DTMF ID	·	R5	toneBot 1	
	2Tone ID	•	R5	ToneEot 1	
	5Tone ID	1 💌		,	
	PTT ID	Off			
	<u>Q</u> K <u>Cancel</u> <u>Previous</u> <u>N</u> ext				

Contact List

- Most DMR radios have a Contact List or directory to look up the RadioID and display a name/callsign instead.
- This Contact List is updated frequently, as new RadioIDs are assigned.
- The Contact list can include contacts from all around the world.
- Most DMR radios have a limited amount of memory for storing the Contact List, with some older models limited to around 200K entries.
- The full Contact List is now nearly 250K entries, so you may have to filter out some contacts to store in your radio.
- The Contact List can be downloaded from https://RadioID.net or other sources.
- There are several software packages that can be used to filter the list.

What is a Static Talkgroup?

- A static talkgroup is one that is permanently activated on a particular timeslot by the repeater sysop. This type of static assignment passes ALL traffic from the DMR network over the air on the timeslot it is assigned to.
- For example, if a statewide talkgroup is assigned to the local repeater on timeslot 1, anytime someone keys that talkgroup on the network, regardless of where they are, the audio will be retransmitted locally.
- In simple terms, this networks many repeaters together fulltime for that particular talkgroup.

What is a Dynamic Talkgroup?

- Dynamic talkgroups assignments are used for temporary activation on a timeslot on a particular repeater. This type of talkgroup functions for a set amount of time AFTER a local repeater user activates it by transmitting on a repeater using that talkgroup in their radio. When the timer expires and no local user has keyed up again for a set amount of time... the timeslot and the talkgroup and release and the repeater is again open only to the talkgroups that remain static.
- For example, if you are traveling in Colorado and wish to talk to a friend back home in Missouri, you could key up the Missouri talkgroup on a Colorado repeater that allows dynamic talkgroups and make a call on repeaters at home that have the Missouri talkgroup set as static. When you are done with your conversation, the dynamic timer will expire and the Colorado repeater will go back to normal.

Dynamically Linking Talk Groups

- You can also dynamically link a repeater (or hot spot) to any Talk Group using Time Slot 1.
- Use the Frequency, Offset and Color Code for the Repeater
- Enter any Talk Group ID that you wish, and key the radio
- The repeater will link to that Talk Group, so you can hear and transmit.
- After some amount of idle time, the repeater will drop the dynamic link.
- You can manually unlink the repeater by keying up with TG4000.



💁 Channel Information Edi	t343		×
Channel Name	Unlink PRA TS1		
Receive Frequency	445.07500	PTT Prohibit Talk	Around(Simplex)
Transmit Frequency	440.07500	🗆 Work Alone 🔲 DataACK Di	sable 🔲 Auto Scan
Correct Frequency[Hz]	0	Digital	Unfact
Channel Type	D-Digital 💌	Dedia ID	
Transmit Power	High 🔹	Radio ID	
Band Width	12.5K 👻	Color Code	
TX Permit	Different Color Code	Bensive Group List	
Scan List	None	Diaital Encrution	
		Extend Encryption	
		ARC4 Encryption Code	
		AES Digital Encryption	
		Multiple Key	Off V
Exclude channel from roaming	off 🗨	Random Key	
DMR MODE	Repeater 💌	OMO E-1-1	
Analog APRS Report Freq	1 💌		
		Send Talker Allas	Call Continuation I Ranging
Analog			
CTCSS/DCS Decode	Of 💌		_
CTCSS/DCS Encode	Off 💌		Reverse
Squelch Mode	Carrier 💌		2TONE Decode
Optional Signal	Off		Custom CTCSS 131.8
DTMF ID	-	R	itoneBot 1
2Tone ID	•	R5	ToneEot 1
5Tone ID	1 🔹		
PTT ID	Off 💌		
<u>Q</u> K <u>C</u> ancel <u>Previous N</u> ext			

Example Talk Groups

- World-Wide 91
- North America 93
- TAC 310, 311, 312, 313, 314, 315, 316, 317, 318, 319
- Colorado 3110 (10 minute limit)
- POTA 3181
- EmComm USA 31000
- Colorado Chat 31080
- CO Severe Weather 31083
- Parrot 310997

What is a TAC Channel?

- A TAC or Tactical or Talk Around Channel is a virtual talk group which allows for a talk group for users to move to once they establish a call on a State-wide, Global (like 91) or other large area/or high profile talk groups to continue their conversations.
- TACS were designed for a temporary usage and not for users to utilize them for a daily channel for groups of users to meet on. See Alterative to TAC Channels for another option for a group of users to utilize daily.



Using TAC Channels

- TAC 310, 311, and 312 are special talk groups which are a common bridge between BrandMeister and CBridge networks. Please be considerate in their use as these are designed to allow cross communication between the two networks. These are not to be used as a calling channel or for users to park their hotspots on. Again these are a place to allow continued conversations from a larger or high profile talk group to move from.
- TAC 313-319
- These are BrandMeister only TAC groups and are not bridged to any other network and never will be. These are specific for users of BrandMeister. Please again refrain from using these as calling channels but for usage when calling on talk groups like 91,93, 3100, etc to move to to continue a lengthy conversation. This allows the high profile/high usage talk groups to be free for others to access and call others for a chat.



Parrot Talk Group

- Use TG9990 or TG310997
- Will record you and echo back your audio
- Useful for testing
- Remember to unlink with TG4000 when done

0	Channel Information Edit	257		×
	Channel Name	Parrot PR		
	Receive Frequency	445.07500	PTT Prohibit Talk	Around(Simplex)
	Transmit Frequency	440.07500	Work Alone DataACK Di	isable 🔲 Auto Scan
	Correct Frequency[Hz]	0	Digital Contact	Parrot
	Channel Type	D-Digital 💌	Radio ID	W0BDT
	Transmit Power	High 💌	Color Code	1
	Band Width	12.5K 💌	Slot	Slot2
	TX Permit	Different Color Code 🔹	Receive Group List	None 🔽
	Scan List	None	Digital Encryption	Off 🔹
			Extend Encryption	AES
			ARC4 Encryption Code	Off
			AES Digital Encryption	Off
			Multiple Key	Off
	Exclude channel from roaming	off 🔽	Random Key	Off
	DMR MODE	Repeater 💌	SMS Forbid	Off T
	Analog APRS Report Freq	1	Send Talker Alias	Call Confirmation Ranging
			Slot Suit	SMS Confirmation
I r	Analog			
	CTCSS/DCS Decode	Of 🔽		F -
	CTCSS/DCS Encode	Off 💌		L Reverse
	Squelch Mode	Carrier		2TONE Decode
	Optional Signal	Of 🔽		Custom CTCSS 131.8
	DTMF ID	<u> </u>	R	5toneBot 1
	2Tone ID	<u> </u>	R5	ToneEot 1
	5Tone ID	1		
	PTT ID	Off 🔽		
		<u>O</u> K <u>C</u> ancel	Pre	evious <u>N</u> ext

Simplex

- Just as you can use analog transceivers in FM mode, you can use DMR-capable transceivers to talk directly from radio to radio simplex. Commonly used North America DMR simplex frequencies:
- Admit criteria: Always or Channel Free
- Time slot: 1
- Color code: 1
- Talkgroup ID: 99
- UHF simplex channels:
 - 441.0000 MHz
 - 446.5000 MHz
 - 446.0750 MHz
 - 433.4500 MHz
- VHF simplex channels:
 - 145.7900 MHz
 - 145.5100 MHz

Simplex Using All Call

• To be sure that a simplex call gets received by all operators in the area, a so-called "All Call" should be used. This is a special call type to the reserved number 16777215, that gets received by all radios irrespective of their configuration.

Channel Information Edit	38	
Channel Name	446.3000 SX Dig	
Receive Frequency	446.30000	PTT Prohibit Talk Around(Simplex) APRS RX
Transmit Frequency	446.30000	Work Alone DataACK Disable Auto Scan
Correct Frequency[Hz]	0	Digital Contact All Call
Channel Type	D-Digital 💌	
Transmit Power	High 💌	
Band Width	12.5K 💌	
TX Permit	Always 💌	Receive Groun List None
Scan List	None 💌	Divital Encrution
		Extend Encrution
		ARC4 Encryption Code Off
		AES Digital Encryption Off
		Multiple Key Off
Exclude channel from roaming	off 💌	Bandom Kau
DMR MODE	Repeater 💌	
Analog APRS Report Freq	1 💌	
		Send Talker Alias Call Contrination Call Ranging
- Analog		Slot Suit SMS Continuation
CTCSS/DCS Decode	Of 💌	
CTCSS/DCS Encode	Off 💌	Reverse
Squelch Mode	Carrier 💌	2TONE Decode
Optional Signal	Of 💌	Custom CICSS 131.8
DTMF ID	T	R ⁵ toneBot
2Tone ID	_	R5ToneEnt
5Tone ID	1	
PTT ID	Off 👻	
!	<u>O</u> K <u>C</u> ancel	<u>Previous</u> <u>N</u> ext

Rocky Mountain Ham (RMHAM)

- Rocky Mountain Ham Radio The RMHAM network covers Colorado and parts of New Mexico and Wyoming. RMHAM repeaters up and down a large swath of the Rocky Mountain region are linked together via microwave, making it possible for a large community of hams to communicate on the supported talkgroups.
- See https://www.rmham.org/dmr-site-information/ for more info.



SkyHub Link System

- The Colorado-based SkyHub Repeater Linking System, N2SKY, is an all-mode link system providing a communication bridge between many amateur radio repeaters and networks. The overall purpose of the SkyHubLink System is to provide the following:
- Enable anyone with any mode radio to essentially contact anyone with any mode radio anytime anywhere.
- To provide repeaters with activity to let other hams know they are there on the air.
- To interconnect different regions with each other for fun and possible emergency use when needed.
- To promote good amateur practice and friendship for all, this is an OPEN system.
- See https://skyhublink.com/ for more info