



# GRIDLEAK

Official Newsletter of the  
Pueblo Amateur Radio Club  
Pueblo, Colorado USA

Volume 4 - Number 4

April 2019

## Club News

New repeater! We have a 220MHz repeater operational on Bacculite Mesa! 224.260  
– offset (1.66 MHz) 88.5 Tone

The 79 repeater has been moved and it is now linked to the 73 machine on Rattlesnake Butte in Huerfano County.

The Capitol Hill repeater (Walsenburg) is on the air in Pueblo for testing. 447.600 negative offset, 88.5 tone. We are just waiting for the use of a bucket truck to mount the antenna in Walsenburg. The pole is already in place.

Bill Nicoll takes over as repeater chairman. The repeaters are going under the W0PHC call sign so that the repeater ID never has to be changed again should trustees change..

ATTN Officers and staff: Please check your contact info on page 6 and submit any changes to AD0JL

Membership badges are available. If you want one, it will be provided free of charge to members. Please contact AD0JL ([richard@ad0jl.com](mailto:richard@ad0jl.com)) with your name and call sign. The next batch will be printed before our regular meetings

## Calendar of Events

April 8 - PARC Membership meeting and Skywarn Training @ Pueblo ESC 6:00 pm

April 25 - ARES meeting @ Pueblo ESC 6:00 pm.

May 8 CSEPP Exercise

May 13 - PARC Membership meeting @ Pueblo ESC 6:00 pm

All meetings are now being held at the new Pueblo County Emergency Services Center 101 W. 10<sup>th</sup> St. Pueblo, unless otherwise noted. It is at the corner of 10<sup>th</sup> and Main.

# PARC Minutes for 03-11-19

March 11, 2019

Meeting called to order at 6:00 p.m. by President KE0LLH.

Treasurers REPORT: Treasurer KD0SOV reported. The current club balance is \$867.21 deposit 175.00 balance 1042.21 had to spend total 48.31 and new balance \$993.90.

Old Business. Had a good pizza party good time had by all that was there.

New Business weather spotting all so on meeting day.

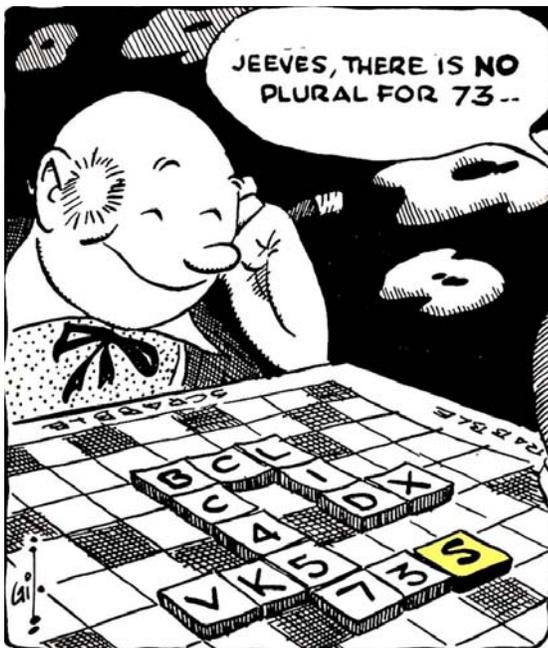
NEXT MEETING April 8, 2019

Submitted by La Dawn

## PARC AGENDA May 8, 2019

SECRETARY REPORT: La Dawn

TREASURES REPORT: Carrie  
Skywarn training



## Repeaters and Nets

### PARC Repeaters, W0PHC Trustee:

146.790 – offset 88.5 Tone , Bacculite Mesa

145.115 – offset 88.5 Tone, Pueblo.  
Pueblo Blvd & St Clair

146.880 - offset 88.5 Tone, 12 Mile

146.730 – offset 88.5 Tone, Rattlesnake Butte

224.260 – offset (1.66 MHz) 88.5 Tone  
Bacculite Mesa

447.950 DMR Bacculite Mesa, Stand Alone

447.175 DMR 12 Mile, Stand Alone

447.600 – offset 88.5 Tone, Walsenburg  
Coming Soon! On air in Pueblo for testing!

### Nets:

PHC NET:146.79 - Wed @7:00pm local;  
146.880 backup

ARES NET:146.88 – Sun @7:30 pm local;  
146.79 backup

ARES Simplex Net 146:580 Thurs 7pm.  
No net on last Thurs of the month due to the ARES meeting.

### NEW HAMMS!

Checking into a net is one of the best ways to ease into the hobby. It is also a good way to learn net procedures should you want to get involved in emergency communications.

# THE PUEBLO AMATEUR RADIO CLUB



# WANTS YOU

**There is a lot of neat stuff happening now with the Pueblo Amateur Radio Club**

We now operate more repeaters in the area than any other club. We are linking repeaters and getting new ones on the air. Soon our coverage will be from Colorado Springs down to the New Mexico Border and hopefully out to Kansas and new fun activities are being planned. But we can't do it without you.

Club membership is a great way for those new and even experienced in ham radio to network with other amateur operators in order to learn more about the many facets of ham radio. Older hams also have the opportunity to help mentor newer hams as well. Your membership also helps support our growing repeater network and helps support emergency communications in the region. Remember when all else fails, there is still ham radio. Go to [www.puebloradio.org](http://www.puebloradio.org) and download the latest copy of our newsletter, The Grileak and fill out an application today!

# Why 220 MHz for Amateur Ham Radio, V2.0?

June 19, 2015 Ron Kochanowicz



220 MHz amateur radio boasts of a long and colorful history, affording it a special place in the hearts of amateur radio enthusiasts.

Conceptually, amateur radio repeaters are not too different from public safety devices (fire, first response, police) or those in use at federal, business or military services. However, they are often assembled (power supplies, transmitter, receivers, antenna etc.) or commercially packaged to operate only within amateur RF (radio frequency) bands, like 222-224.995 220 MHz band.

## History

The Federal Communications Commission (FCC) approved VHF bands as early as 1938, one of them being 1.25 meters (224 MHz) band. Amateur radio activity spiked rapidly in 1960s and 1970s, as 2m and 70cm bands swiftly rose to prominence in the hobby. The commercial spectrum of the VHF and UHF bands became the backbone of emergency service communications like police, fire and ems. The 1.25m band however, escaped the commercial

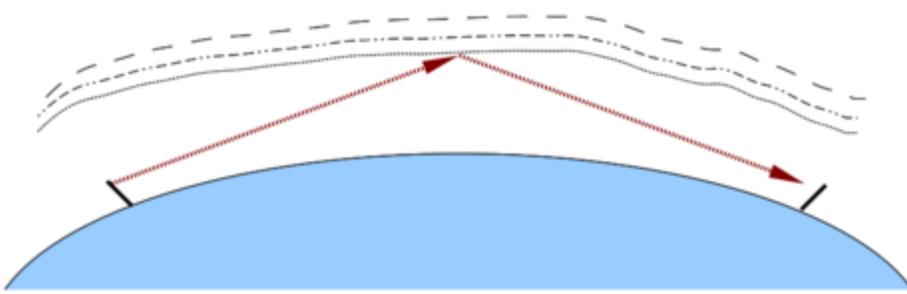
popularity - partly due to lack of enough commercial frequency allocations. Add to it, commercial radio equipment for the band has been scarce. Amateurs willing to go live on this band have had to build their own equipment or buy specialized amateur radio equipment from designated manufacturers.

Today, the 1.25m or 220 MHz band VHF radio spectrum is universally recognized and reserved for amateur radio use. Primarily available from 222 to 225 MHz, with 219 to 220 MHz for secondary local communications and data. The recent increase 220 MHz amateur equipment and repeaters, like the [BridgeCom System BCR-220](#), have sparked a recent resurgence in band interest.

## Why does 220MHz need a repeater?

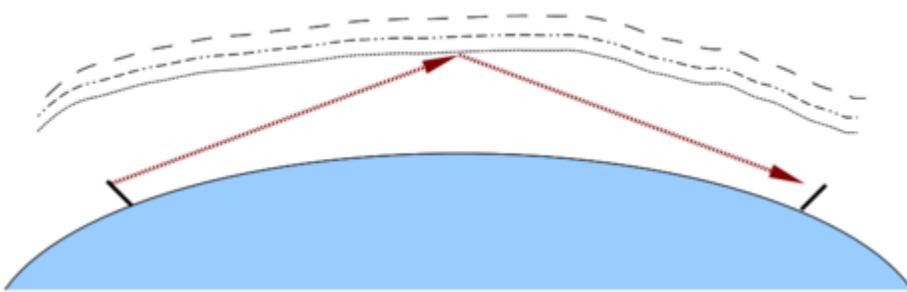
To understand the need for repeaters for VHF bands, it is important to know the science of radio transmissions. High frequency (HF) radio waves bounce off upper atmospheric layers, allowing them to transmit a fairly long distance (albeit with losses).

**HF will bounce off the upper layers of the atmosphere ...**



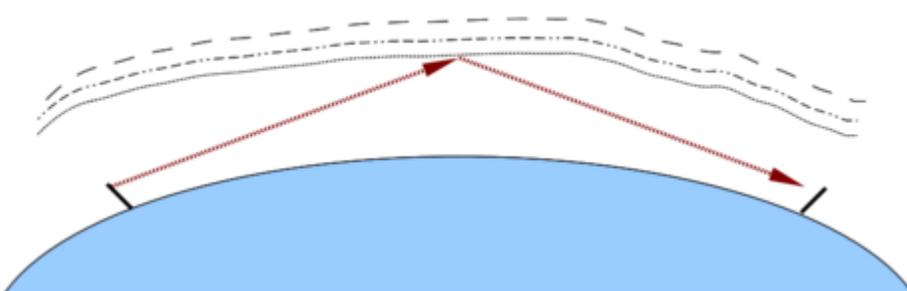
However, VHF and UHF frequencies are potent enough to pass through, which makes them essentially line-of-sight frequencies.

**HF will bounce off the upper layers of the atmosphere ...**



The only problem is, several natural and artificial barriers tend to impede their progress. Hence repeaters mounted on tall buildings or a high altitude locations act to reinforce the signal quality and improve range.

**HF will bounce off the upper layers of the atmosphere ...**



It is important to have different frequencies for transmitting and receiving signals - to ensure that both kinds of communications do not interfere. Additionally, it is recommended to keep the signals short, in the vicinity of 30 seconds to ensure that there is enough allowances for

emergency signals, although sometimes transmissions up to 3 minutes are allowed.

Amateur Radio Repeater Coordinators however, are essentially volunteering groups - given no official jurisdiction or control over a frequency band controlled by the FCC.

## 220 MHz repeater - questions and concerns

Despite high traffic across some pockets of the United States (namely major metros in states like New York, New Jersey, Texas, Washington and California) - the 220MHz band has historically seen less traffic and activity. This could be due to the lack of easily modifiable equipment for amateur use means, the hams have to rely on specialized equipment manufacturers like Wacom, Icom, Sinclair, [BridgeCom Systems](#), or Chinese makes like Baofeng and Wouxun.

There is also a small matter of the band pair 70cm/2m not being harmonically compatible with 220MHz. Neither is the antenna designed for the band pair resonant at 1.25m. It does enhance the risk of accidental damage owing to unmatched

frequency transmission load. However, the rise in interest has led to refining custom solutions like the GE Mastr II High-Band mobile. It requires considerable refining (modification) of the receiver, additional band pass filters, to filter the transmitted signal, and other electronics to ensure the device performs as expected.

Other than the scientific aspect, there have been other hurdles. Recently the amateur enthusiasts from the USA and Canada lost 220-222 MHz to commercial use, originally to UPS. However, UPS eventually chose other open spectrum while 220-222 remained open for commercial use, for example PTC (Positive Train Control Data). The 220 MHz band invites some amount of hesitation owing to its variable past history where it has suffered multiple allocations and reallocations, division, or placement for secondary usage.



In the U.S. with FCC auctioning licenses for commercial use, things have been better. UPS never quite used the 220-222 MHz band and amateurs are pushing for reclaiming or at least maintaining the band.

With none of the super-narrowband digital communication companies showing particular interest, it appears that the entire 222-225 MHz band is yet again up for ham activity.

## Advantages of 220Mhz repeater

The limited access to commercial equipment does not always mean bad news. The 220MHz repeaters have some distinct advantages over those designed to operate for 2m/70cm pair:

- Worth the customization effort - a few manufacturers who have made the 220 MHz repeaters have discovered that it's an excellent, low-interference band. That totally makes it worth the effort to even customize equipment.
  - 220MHz band delivers the best propagation among the "big three bands" (70cm, 1.25m or 2m)
  - Increase in recent traffic and commercial interest - Like the 2m band, ever increasing footprint of licensed hams, converted gear from Motorola, MICOR High Band and traffic is convincing
- manufacturers to pitch in for 220MHz rigs. The repeater market in this domain is on the cusp of bigger commercial investments, like the new [BCR-220 repeater](#) from BridgeCom Systems and the New Kenwood 220 D-STAR handheld, and a new 220 D-STAR Dual mode repeater from BridgeCom.
  - Change in 220MHz perception - With the 'lack of commercial gear' myth being busted for the 220 band - attractive prices for equipment is a reality. The repeaters out there today can adapt from weak-signal work to FM. Serious VHF contesters are making a move to leverage 220 using SSB and CW, for the extra multipliers.

Increased traction of Amateur radio and ham clubs towards the 220 band naturally creates the demand for technology refinement in 220 MHz repeater space.

## Skywarn Training April 8<sup>th</sup>

We have a very unusual program scheduled for the April meeting. Skywarn training. This is the official class and participants will be issued spotter certificates this year. It is also open to the public.



In most years, thunderstorms, tornadoes and lightning caused hundreds of injuries and deaths and billions in property and crop

damages. To obtain critical weather information, the National Weather Service (NWS) established SKYWARN® with partner organizations. SKYWARN® is a volunteer program with between 350,000 and 400,000 trained severe weather spotters. These volunteers help keep their

local communities safe by providing timely and accurate reports of severe weather to the National Weather Service.

Although SKYWARN® spotters provide essential information for all types of weather hazards, the main responsibility of a SKYWARN® spotter is to identify and describe severe local storms. In an average year, the the United States experiences more than 10,000 severe thunderstorms, 5,000 floods and more than 1,000 tornadoes.

Since the program started in the 1970s, the information provided by SKYWARN® spotters, coupled with Doppler radar technology, improved satellite and other data, has enabled NWS to issue more timely and accurate warnings for tornadoes, severe thunderstorms and flash floods. SKYWARN® storm spotters are citizens who form the nation's first line of defense against severe weather. There can be no finer reward than to know that their efforts have given communities the precious gift of time--seconds and minutes that can help save lives.

### **Who is eligible and how do I get started?**

NWS encourages anyone with an interest in public service to join the SKYWARN® program. Volunteers include police and fire personnel, dispatchers, EMS workers, public utility workers and other concerned private citizens. Individuals affiliated with hospitals, schools, churches and nursing homes or who have a responsibility for

protecting others are also encouraged to become a spotter. Ready to learn more? [Find a class in your area](#). Training is free and typically lasts about 2 hours. You'll learn:

- Basics of thunderstorm development
- Fundamentals of storm structure
- Identifying potential severe weather features
- Information to report
- How to report information
- Basic severe weather safety

### **Need help with your Spotter Number or other local information such as a missing class schedule? Looking for our online program?**

If you're looking for a class or information about the local NWS program, check [find a class in your area](#) for local information. If you need a little more help finding your spotter number or a class schedule, contact your local [Warning Coordination Meteorologist](#). He or she can help you get, find or replace your spotter information and let you know about upcoming classes. Classes are typically held in an office's relatively slow season. Classes are NOT typically offered all year. Schedules vary from office to office. You also can also take our [online spotter program](#). Some local offices also ask that you take a local class to learn about weather unique to your area.

SKYWARN ® is a registered trademark of NOAA's National Weather Service.



*"One day, son, all of these perfectly good A.C. adapters, which have long outlived the products they were originally designed for, will be yours."*



TUBES TUBES TUBES! The Pueblo Amateur Radio Club has a large inventory of vacuum tubes for sale. If you need tubes, please contact Jon Fredericks at 719-547-7537. Prices vary.

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Old style FCC AMATEUR licenses and Skywarn IDs available. All license classes now available! Personalized replications of the 1970s and 80s FCC licenses and laminated photo Skywarn IDs are now available. Licenses are \$15 for a printed copy. Message AD0JL for more info. Skywarn IDs are \$10. Visit [www.ad0jl.com](http://www.ad0jl.com) for more info or email [richard@ad0jl.com](mailto:richard@ad0jl.com) 719-251-0418

AD0JL will be willing to trade graphics and web design services for any used radio odds and ends. Contact Richard at [richard@ad0jl.com](mailto:richard@ad0jl.com) or at 719-251-0418

AD0JL is also looking for FCC part 15 certified radios such as the old Kenwood Pueblo Zoo TK-280s to use for youth programs at the Ice Arena.

Remember if you would like to place an ad for something to sell or are looking for something to buy, please contact AD0JL on the 79, [richard@ad0jl.com](mailto:richard@ad0jl.com), or at 251-0418 No calls before noon or after 9pm, please.

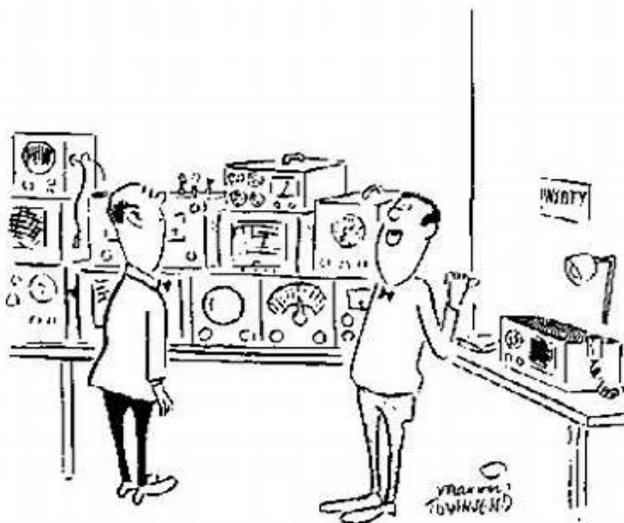
**Wanted! Your photos! We need pictures of our events, past present and future for the website and the archives.**

# PARC Organizational Structure

President	Brad Fox	KE0LLH	924-3140	bradfox42@msn.com
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Secretary	LaDawn Worley	KD0QMS	250-8584	ldpath@gmail.com
Treasurer	Carrie Worley	KD0SOV	569-2169	cworley.cw1@gmail.com
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Board Member	Dan Wantuck	W0OJW		
Board Member	Brian Thompson	KE0KEP		
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Parliamentarian	John Fredricks	WA9SBX	547-7537	wa9sbx@aol.com
ARES EC	Mike Conder	WB0YKO	696-2561	mtconder@gmail.com
ARES AEC (North)	Chris Truby	KE0BYQ	248-4569	jctruby@gmail.com
ARES AEC (South)	John Fink	W0DNR		
VEC	Ed McCandless	AA0XP	671-7450	aa0xp@comcast.net
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	Mark Balsick	W0AOK		

## GRIDLEAK DISCLAIMER...

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"My transceiver is over here.  
That's just my testing equipment."

**MEMBERSHIP APPLICATION FOR PUEBLO AMATEUR RADIO CLUB INC.**

Date: \_\_\_\_\_ ARRL Member? \_\_\_\_\_ New Member/Renewal? \_\_\_\_\_

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ ZIP: \_\_\_\_\_

Your CALLSIGN: \_\_\_\_\_ License Class: \_\_\_\_\_

HamPhone: \_\_\_\_\_ Cell Phone \_\_\_\_\_ Email: \_\_\_\_\_

**Additional Family Members to Join/Renew**

Name \_\_\_\_\_ Call: \_\_\_\_\_ Class: \_\_\_\_\_

Name \_\_\_\_\_ Call: \_\_\_\_\_ Class: \_\_\_\_\_

Name \_\_\_\_\_ Call: \_\_\_\_\_ Class: \_\_\_\_\_

Would you like your Grid leak to be delivered by E MAIL or regular mail? \_\_\_\_\_

COSTS: Full Member \$25, Senior (60+) \$20, Associate \$20, Family \$35 Senior Family \$27.50, Student \$20.

**Make checks payable to "PARC" Circle Membership Above Total Amount Included: \_\_\_\_\_**



**ARRL** The national association for **AMATEUR RADIO** 225 Main Street, Newington, CT 06111-1494 USA

860-594-0200 or Toll-Free 1-888-277-5289

Welcome to the only national organization representing Amateur Radio in the US. As an ARRL member you support the ranks of thousands of other ham radio enthusiasts shaping the Amateur Radio service today. If you consider yourself an active ham... you need ARRL now. If you are not presently an active ham... let ARRL help you. As a member of the ARRL, for as little as \$39.00 per year, here are some of the benefits you will enjoy: QST Magazine – your monthly membership journal

- Online Services –
  - Download digital copies of QST articles from 1915 through December 2006 – view and print your favorite articles and projects. ARRL [Diamond Club members](#) have exclusive access to the most recent years of QST online archive.
  - QST, QEX and NCJ article index
  - Email forwarding E-Newsletters – delivered to your inbox
- A voice in the affairs of ARRL and ham radio through locally appointed volunteers
- Publication Specials and on-line course discounts
- Emergency Communication Services
- Technical and Regulatory Information Services Operating Awards
- Ham Radio Equipment Insurance Plan Available
- Outgoing Foreign QSL Service
- Plus [much more!](#)

**PUEBLO AMATEUR RADIO CLUB, INC.**

**P.O. BOX 92**

**PUEBLO, CO 81002**

**ADDRESS CORRECTION REQUESTED**