

***Albuquerque Duke City Hamfest
and Convention***
'It's a HamFiesta!'



Communications for Search and Rescue (SAR)

A pdf of this presentation will be posted on www.dukecityhamfest.org
shortly after the Hamfest is over.

Communications for SAR

- Search & Rescue in New Mexico
- Communications Needs & Challenges
- Roles for Hams
- Technical Aspects
- Rewards



SAR in New Mexico

- NM State Police authority – “SAR Act”
- Wilderness SAR (usually not urban)
- All Volunteer using own equipment
- Many SAR teams around the state
 - NM SAR Council – see references



Search and Rescue in NM



SAR Communications Needs & Challenges

- Searches are often in remote, sometimes mountainous terrain, can cover many miles
- There may be limited or no cell phone coverage
- Potentially many field teams all needing to communicate with incident base
- Radios provide essential life safety for teams as well as efficient direction & search coordination

Search and Rescue in NM



Communications for Search and Rescue

Ron Nelson NR50N

A Wide Range of Roles for Hams

- From your home – serve as a relay or link to telephone service or internet for incident base, help track field teams via APRS or cell (CalTopo)
- Help install, maintain useful repeaters, cross band repeaters, APRS digipeaters, ...
- Technical Radio support – programming radios, teaching proper radio deployment and use, maintaining equipment
- Join a SAR team and provide comms support in the field

Examples of How to Get Involved

- Contact a team or teams in your area, tell them your expertise and offer to help
- Learn the frequencies used in your area, and how to program a team's radios
- Instruct team members on radio use
 - see references for a sample presentation
- Help team members to get their ham license
- Get field certified, equipped, and join a team

Technical Aspects

- Part 90 (Public Safety) and Part 97 (Ham) frequencies are used, mostly VHF & UHF
- Repeaters, CAP High Bird Relay
- APRS tracking & CalTopo
- Cell phone apps, satellite messengers (SENDs)

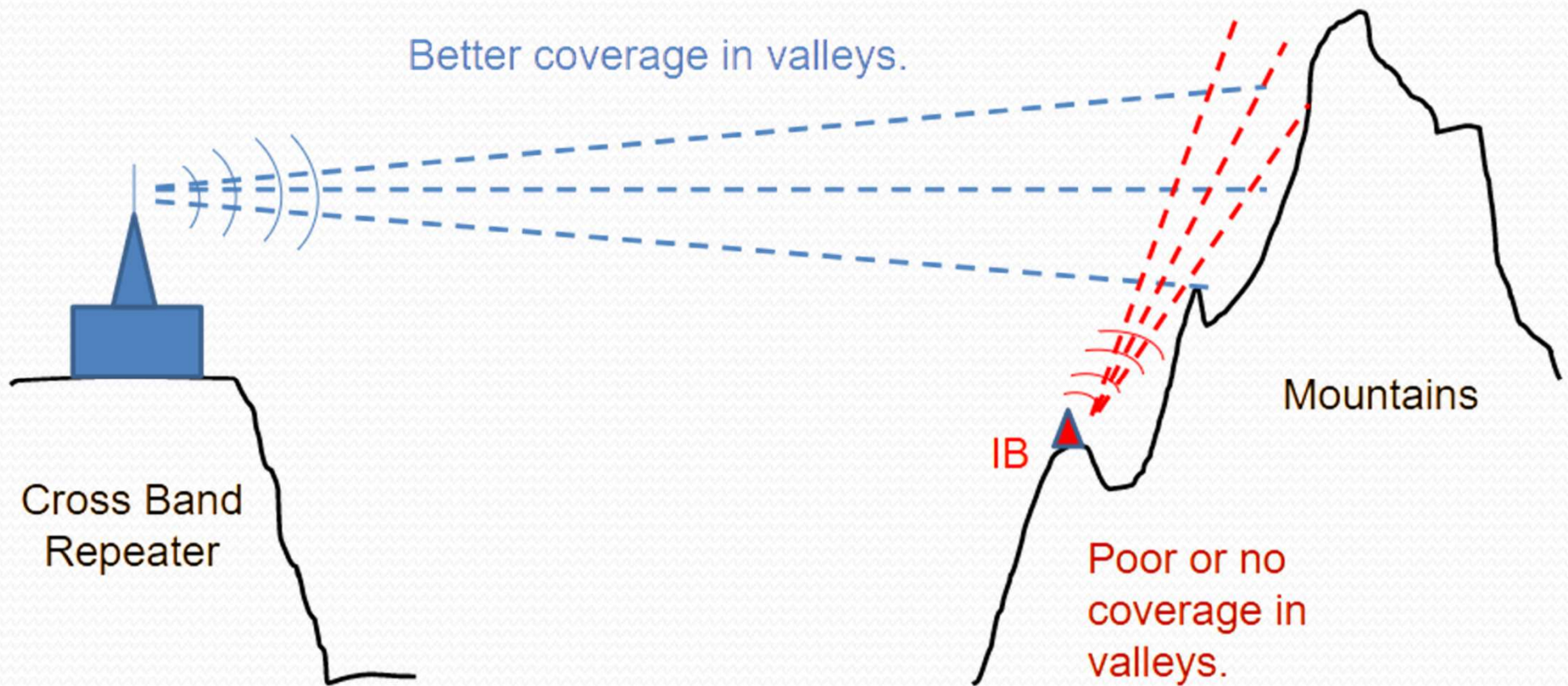
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Communications for Search and Rescue

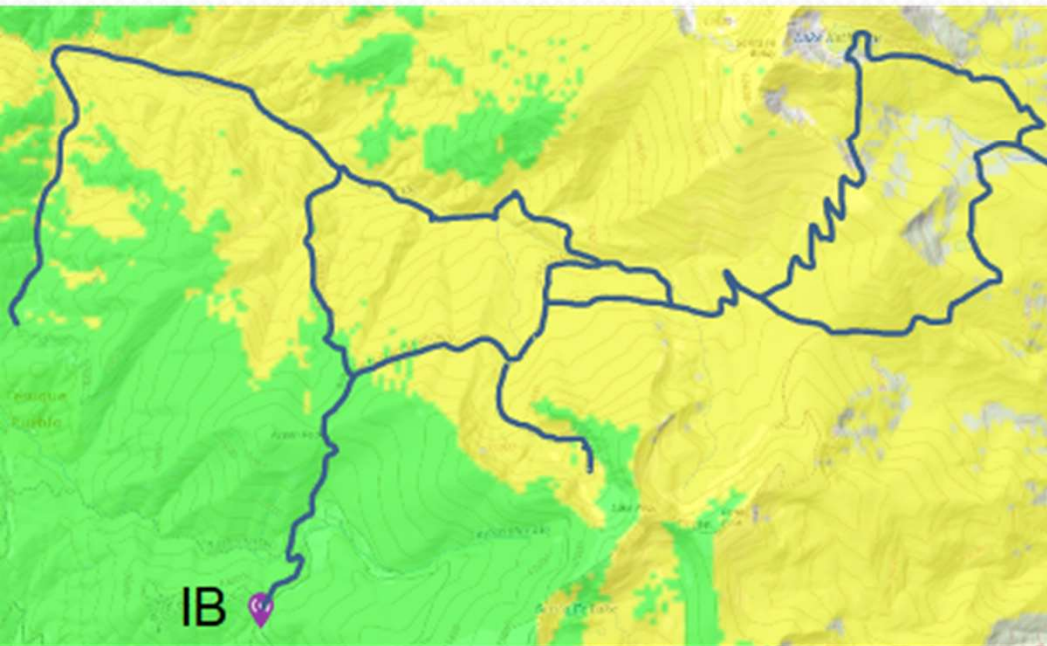
Ron Nelson NR50N

Cross Band Repeater Gives Improved Coverage on Mountain

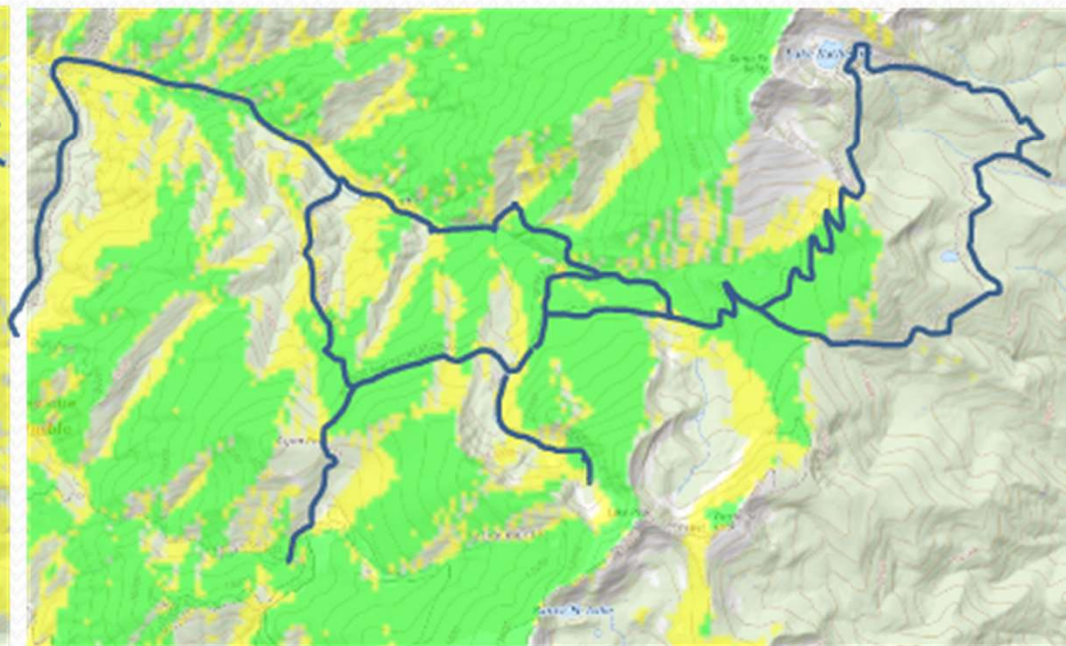


Compare Calculated Radio Coverage – A Well-Located Repeater Greatly Improves Coverage

Transmitter on mountain at IB



Transmitter across valley



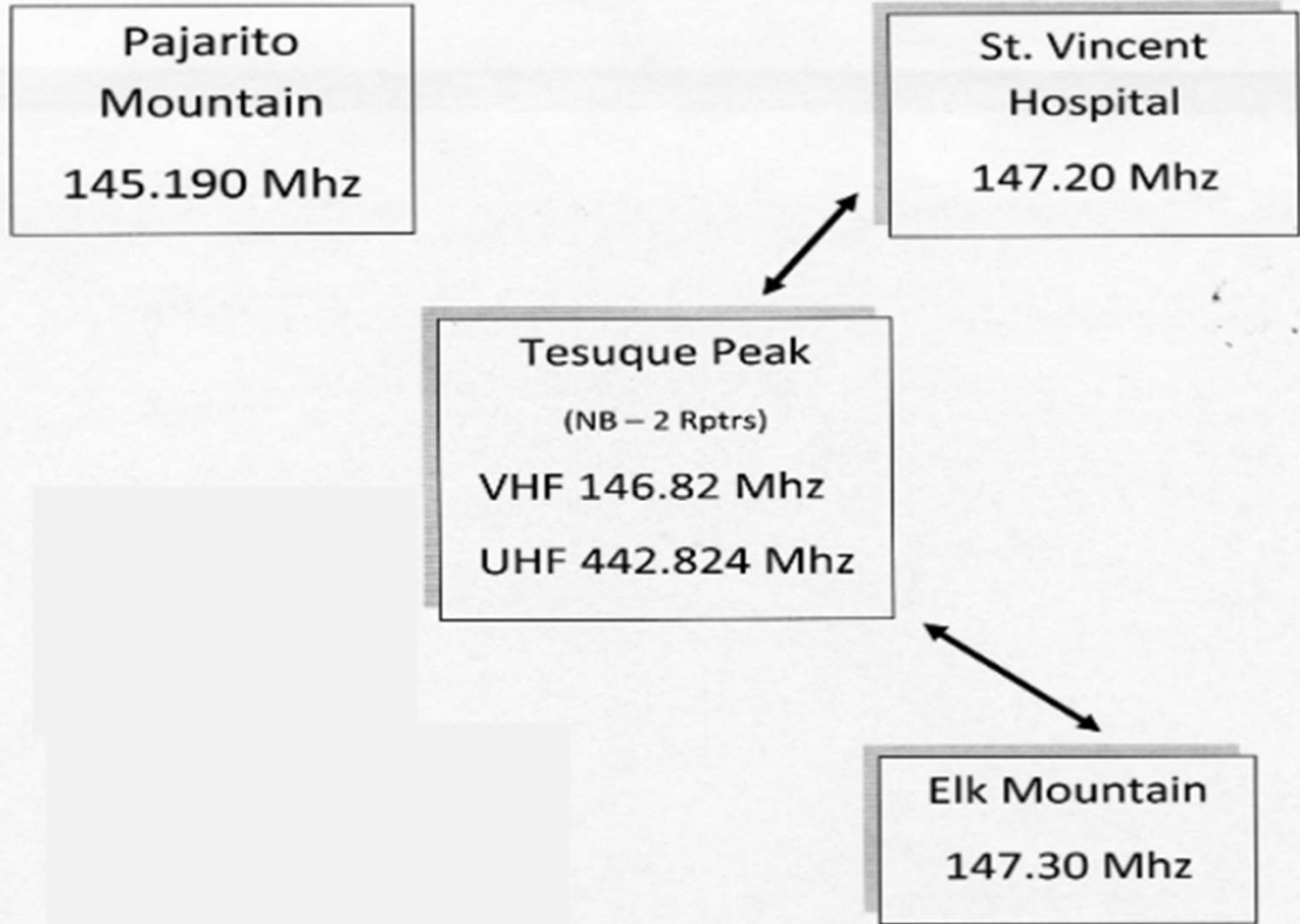
Green – areas with good signal
Dark lines – commonly used trails



Linked repeaters!

Santa Fe Amateur Radio Club Repeaters

Most VHF Repeaters PL tone = 162.2 Hz; UHF = 131.8 Hz



NMSARC Resources- Map

<http://www.nmsarc.org/communications.html>

Key HAM Repeaters for...

- Amateur Radio Repeaters (FCC license required for use) for New Mexico Search and Rescue missions organized by linked 328 views
[SHARE](#) [EDIT](#)
- ARES Repeaters (not linked)**
 - Tesuque - ARES
 - Turkey Mt. ARES
 - Touch-Me-Not Mt. ARES
 - Sierra Grande ARES
 - ... 13 more
- Mega-Link Repeaters (linked)**
 - Turkey Mt. Mega-Link
 - Sierra Grande Mega-Link
 - U Iron Mt. Mega-Link
 - Maljamar Mega-Link
 - ... 29 more
- Not Linked Repeaters**
 - Pajarito Mt
 - Los Alamos

The map displays the state of New Mexico and parts of Arizona, with numerous colored pins indicating the locations of HAM repeaters. Major cities like Albuquerque, Las Vegas, and Tucson are visible. The map also shows various Indian Reservations and National Forests. The Google My Maps logo is present in the bottom right corner of the map area.

Some Part 90 HTs



Some SAR Mobile (In-Vehicle) Radios

- Mobile Radios (FCC Part 90, dual band VHF/UHF)
 - Anytone AT-D578UV (DMR, 3 models)
 - Wouxun KG-UV920R-A - 999 channels
 - Alinco DR-638 – 758 channels
 - Powerwerx DB-750X – 750 channels



Antennas and More Antennas



Tall masts improve signal "reach" especially in forested areas.



Communications for Search and Rescue

Ron Nelson NR5ON

Comms Trailers – Outfitted with Mast, Antennas, Batteries, PCs, WiFi



Rewards

- Helping save lives, rescue people in need
- Assist in successful SAR operations, improve team communications
- Put your radio communications skills to greater use
- Great training for anyone doing emergency communications anywhere
- Experience special outdoor places and work with great people

Summary

- There are many ways for hams to get involved in search and rescue communications
- Join for the excitement!
- Stay for the rewards
- Questions?

References

- New Mexico Search and Rescue Council (501(c)3)
<https://www.nmsarc.org/>
- New Mexico Dept. of Public Safety
<https://www.dps.nm.gov/nmsp/search-and-rescue/>
- NMSARC – Communications (frequencies, etc.)
- Comms training for SAR Field Teams (pdf file)
- Comms training for Incident Management Teams (pdf file)
- NM SAR Field Certification information
- NM SAR Field Certification Guide (pdf file)
- NM SAR Teams
- SAR Mission Anatomy

References (continued)

- [National Interoperability Field Guide \(NIFOG\)](#)
- [Radio Mobile RF Propagation Software](#)
- [Megalink repeater network](#)
- [New Mexico Frequency Coordination Committee](#)
- [Automatic Packet Reporting System APRS™ \(Bob Bruninga\)](#) , [Wikipedia APRS entry](#)
- [Online APRS tracking example \(aprs.fi\)](#) for example
- [Cal Topo Mapping/Tracking/Planning software](#)
- [Gaia GPS Mapping/Tracking app \(Android & Apple\)](#)