

Cross Band Repeaters

3 October 2013
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Topics

1. Cross-band repeaters
2. Advantages
3. Basic Setup
4. Keeping it Legal



Cross Band Repeaters

Adapted with permission from Santa Clara County ARES/RACES

What is cross-band repeating?

- A feature included in some dual band, dual receive radios
- Retransmits on one band what is received on another at the same time

Why is it used?

- A cross-band repeater is a lot less expensive than a conventional repeater
- One antenna
- Quick and easy setup
- No frequency coordination issues (uses simplex channels)
- Can be mobile



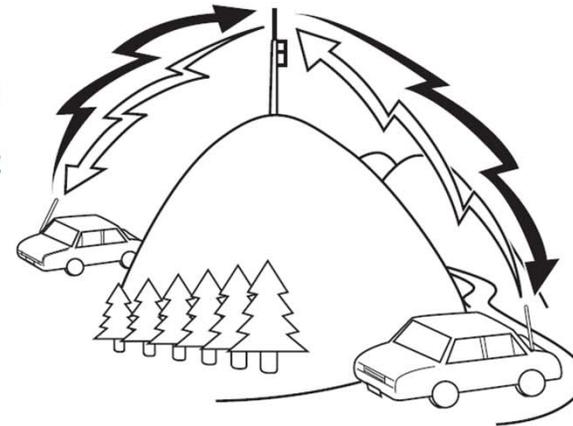
How is it different from a repeater?

Cross Band Repeaters

Normal repeater operation

The transmit and receive frequencies are different, but common for all repeater users.

TX: 144.725 MHz
TX tone: 88.5 Hz
RX: 145.325 MHz



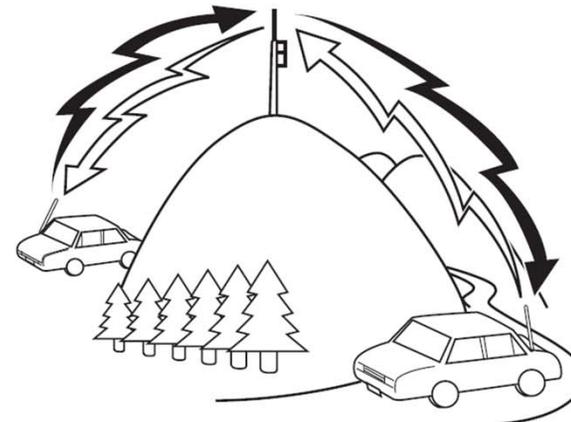
TX: 144.725 MHz
TX tone: 88.5 Hz
RX: 145.325 MHz

Cross-band repeater operation

One station transmits and receives on one band using one frequency

The other station transmits and receives on a different band, using one frequency.

TX: 147.570 MHz
RX: 147.570 MHz



TX: 446.500 MHz
RX: 446.500 MHz



Advantages of cross-band repeating

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1. Mobility – typical scenario

- A mobile/portable cross-band repeater is set up in a parking lot with a high-gain antenna and medium/high power operation.
- HT on ultra-low power, communicating through a cross-band repeater to an ICP or EOC when it could not go direct.

2. Increase Coverage

- A mobile/portable cross-band repeater is set up on high ground.
- Multiple HTs/mobiles can communicate through cross-band repeater

3. Increase Battery Life

- At 5 watts, HTs may go through 2-4 battery packs in a shift.
- Recharging 2-4 battery packs over night can be difficult, especially if the battery is charged in the HT.
- Operating at ½ watt can handle a full shift on one battery.



Basic setup – simplex/simplex

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HT1

2 meter simplex



Dual Band/Dual Receive
Radio set up in Cross Band

70cm (440) simplex



HT2

HT1 setup

1. Set to 147.570Mhz Simplex

Cross-band Repeater setup

1. Pick your 2 frequencies, one in each band
2. Set up Channel 1 to 147.570Mhz simplex
3. Set up Channel 2 to 446.500Mhz simplex
4. Enable cross-band repeat on the radio

HT2 setup

1. Set to 446.500Mhz Simplex



Basic setup – simplex/repeater

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HT1 setup

1. Set to 147.570Mhz Simplex, PL=100.0

Cross-band Repeater setup

1. Set up Channel 1 to 147.570Mhz simplex
2. Set up Channel 2 to 440.150Mhz, + offset, PL=100.0
3. Enable cross-band repeat on the radio

HT2 setup

1. Set to 440.150Mhz, + offset, PL=100.0



One last comment – keeping it legal

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What does the FCC say?

97.119 Station Identification

Each amateur Station ... must transmit its assigned call sign on its transmitting channel... at least every 10 minutes... No station may transmit unidentified communications or signals...

97.201 Auxiliary Station

- (a) Any amateur station licensed to a holder of a Technician, General, Advanced, or Amateur Extra Class operator license may be an auxiliary station...
- (b) An auxiliary station may only transmit on 2 meters and shorter wavelengths except... [specific 2 meter, 220, and 440 frequency citations].
- (c) When an auxiliary station causes harmful interference to another auxiliary station, the licensees are equally and fully responsible for resolving the interference...
- (d) An auxiliary station may be automatically controlled.
- (e) An auxiliary station may transmit one-way communications



One last comment – keeping it legal

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- Technically: a cross-band repeater is not a “repeater”... it is officially considered a remote base station, so it follows the Auxiliary Station rules.
- Input is considered control and voice uplink, therefore must comply with 97.201.
- Operator must be able to control the station.
- If the operator is remote, then a 3 minute timer must be used.
- Must identify on ALL frequencies every 10 minutes or at the end of the transmissions.
 - The control operator must identify every 10 minutes. For instance, if KN6PE setups up a cross-band repeater using the call sign K6KP (CARES Call Sign),

“This is K6KP, cross-band”

- If another station uses the cross-band repeater AND the control operator is not making periodic announcements, then they must ID themselves and the cross-band repeater. For the setup as above, KD6QPP would ID as:

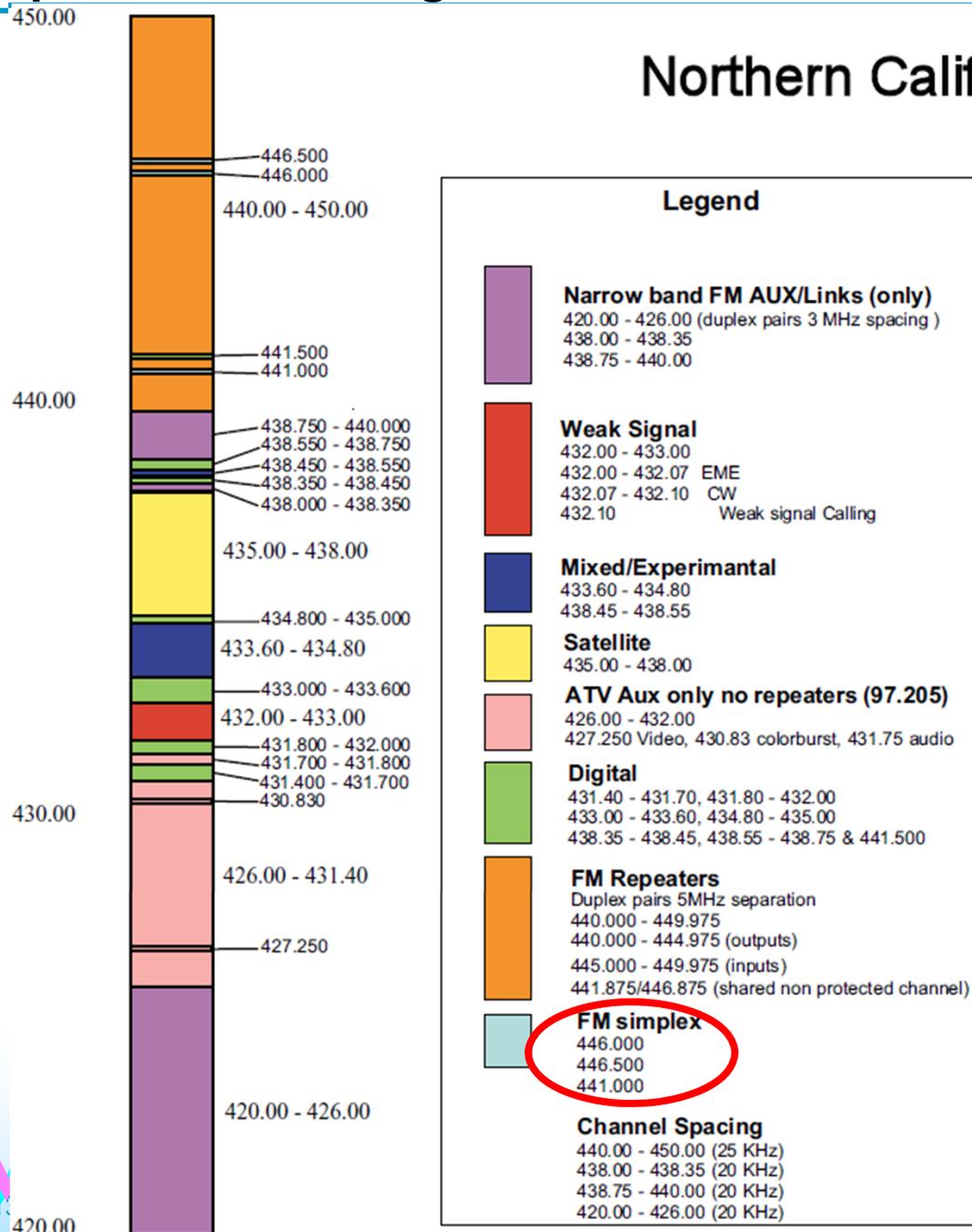
“KD6QPP on K6KP, cross-band”.



440 Band Plan

<http://www.narcc.org/>

Northern California 70 cm Band Plan



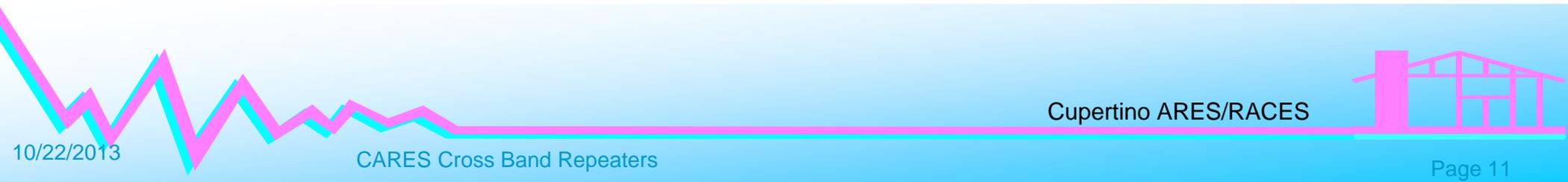
Contact information

For Repeater coordination in Northern California
 Contact: NARCC
www.narcc.org

For weak signal information
 Contact Western States weak signal society
www.wswss.org

For Amateur satellite information
 Contact: AMSAT
www.amsat.org

Give it a try...



10/22/2013

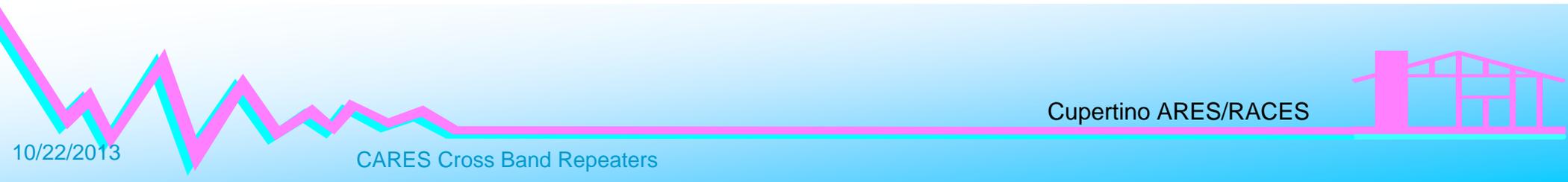
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Thank you

Any Questions?



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