
Recent and Upcoming Developments in the 222-225 MHz Amateur Radio Band

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2014-2016: President, 220 Spectrum Management Assn. of Southern California
2016- April 2017: Coordination Board Secretary, 220 S.M.A. of Southern California

March 2020

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- 1. Why so few choices in equipment until 2012-2014**
 - 2. History of the 222-225 MHz band...and a recent threat**
 - 3. Developments in 222-225 MHz mobile radios**
 - 4. Developments in 222-225 MHz handheld radios**
 - 5. Developments in the 220 Spectrum Management Association of Southern California**
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222-225 MHz amateur band historically under-utilized in the U.S. due to few equipment choices

U.S. 222-225 MHz amateur band until recently had few radio choices because no world-wide market

- 222-225 MHz amateur band is only in Western Hemisphere
 - Used for television broadcasting elsewhere
 - Ireland, Channel J
 - Video: 223.25 MHz
 - Western Europe; most of Africa and Asia; Australia, New Zealand:
 - Channel 11 audio: 222.75 MHz
 - Channel 12 video: 224.25 MHz
 - Eastern Europe:
 - Channel 12 video: 223.75 MHz
-

**222-225 MHz amateur band under-utilized in the U.S.
due to few equipment choices...but that is changing**

Many new 222-225 MHz radios recently... more expected

- **Most new radios coming from China; several from U.S. maker**
- **Prices very reasonable...but quality varies**
- **Plenty of reasons to get on the 222-225 MHz band**

**If you are a 222-225 MHz organization, please promote using
this spectrum**

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 - **1973-1977: FCC considered and rejected 224 MHz for another "Citizens Band"**
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 - **1973-1977: FCC considered and rejected 224 MHz for another "Citizens Band"**
 - **1988: United Parcel Service lobbied & got 220-222 MHz for proposed fleet and package tracking system**
 - **Narrow-banded SSB voice and data network envisioned**
 - **But UPS turned to cellular providers for wireless tracking**
 - **UPS abandoned 220-222 MHz, FCC auctioned it to others**
-

Amateurs need to use our 222-225 MHz band more, can't let spectrum sit idle

Further history about the 222-225 MHz ham band

- **1990: Amateur radio decided to prevent another spectrum give-back; major makers started selling 1.25-meter radios**
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 - **2014-2018:** A new threat emerged from below in 220-222 MHz
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A railroad signaling technology called “Positive Train Control” now the biggest threat to 222-225 Mhz ham band

After some fatal train accidents, 10 frequencies (now 19) across 220-222 MHz assigned for Positive Train Control

- **2008: Chatsworth MetroLink crash with freight train started PTC**
 - **PTC systems use three components with 220 MHz radios**
 - **Locomotive speed control and display**
 - **Bi-directional transmission of track, train speed conditions**
 - **On-board GPS navigation system with database of track speed limits, other considerations for braking**
 - **Goals: immediately warn train engineer, automatically activate brakes in 15 seconds**
 - **As of 2020: 19 base and 19 mobile PTC frequencies**
-

Railroad signal technology called “Positive Train Control” now biggest threat to 222-225 Mhz ham band

You will find Positive Train Control here:

Frequency	License	Type	Tone	Alpha Tag	Description
220.12750		B		PTC-1 BASE	Base - 01
220.13250		B		PTC-2 BASE	Base - 02
220.13750		B		PTC-3 BASE	Base - 03
220.14250		B		PTC-4 BASE	Base - 04
220.14750		B		PTC-5 BASE	Base - 05
220.75250		B		PTC-6 BASE	Base - 06
220.76750		B		PTC-7 BASE	Base - 07
220.77250		B		PTC-8 BASE	Base - 08
220.75750		B		PTC-9 BASE	Base - 09
220.10250		B		PTC-10 BASE	Base - 10
220.10750		B		PTC-11 BASE	Base - 11
220.11250		B		PTC-12 BASE	Base - 12
220.11750		B		PTC-13 BASE	Base - 13
220.12250		B		PTC-14 BASE	Base - 14
220.77750		B		PTC-15 BASE	Base - 15
220.78250		B		PTC-16 BASE	Base - 16
220.78750		B		PTC-17 BASE	Base - 17
220.79250		B		PTC-18 BASE	Base - 18
220.79750		B		PTC-19 BASE	Base - 19

221.12750	M		PTC-1 MOB	Mobile - 01
221.13250	M		PTC-2 MOB	Mobile - 02
221.13750	M		PTC-3 MOB	Mobile - 03
221.14250	M		PTC-4 MOB	Mobile - 04
221.14750	M		PTC-5 MOB	Mobile - 05
221.75250	M		PTC-6 MOB	Mobile - 06
221.76250	M		PTC-7 MOB	Mobile - 07
221.77250	M		PTC-8 MOB	Mobile - 08
221.75750	M		PTC-9 MOB	Mobile - 09
221.10250	M		PTC-10 MOB	Mobile - 10
221.10750	M		PTC-11 MOB	Mobile - 11
221.11250	M		PTC-12 MOB	Mobile - 12
221.11750	M		PTC-13 MOB	Mobile - 13
221.12250	M		PTC-14 MOB	Mobile - 14
221.77750	M		PTC-15 MOB	Mobile - 15
221.78250	M		PTC-16 MOB	Mobile - 16
221.78750	M		PTC-17 MOB	Mobile - 17
221.79250	M		PTC-18 MOB	Mobile - 18
221.79750	M		PTC-19 MOB	Mobile - 19

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2001-2010: Alinco DR-235T was only 220 mobile transceiver sold; many disaster amateur radio groups have these



- Familiar radio in many EOCs
- Costs about \$240
- Easy to manually program
- Head not detachable
- 25 watts, 100 channels
- But...issues with IF filter failure, final PA easy to blow out

Other 222-225 MHz mobile transceivers today made in China, have varying quality, mostly sold through non-ham channels

**BTECH Mini-UV 25
Tri-band**

**136-174 MHz
220-260 MHz
400-520 MHz**

\$129 on Amazon

**25 watts,
200 memories,
color screen,
dual-receive**



Radiodity offers a compact quad-band transceiver for \$115 on Amazon...but can a small radio do it all...or stay cool?

Radiodity QB-25

136-174 MHz
220-260 MHz
350-390 MHz
400-480 MHz

\$115 on Amazon

50 watts,
200 memories,
Very small size



TYT entered 220-MHz sector through Amazon.com...and transmit 220-260 MHz with 60 watts

TYT TH-9000D
Tri-band

220-260 MHz

\$129 on Amazon

**60 watts,
200 memories,**



(Some heavy 220 users really like this model)

**BTECH UV-50 tri-bander with detachable head is great concept,
but power limited to 5 watts on 1.25 meters**

**BTECH Mini-UV 50
Tri-band**

**137-174 MHz
222-225 MHz
400-480 MHz**

\$350 on Amazon

**50 watts on 2m, 440;
Only 5 watts on 220.**

1000 memories,



In late 2019, AnyTone launched a “game-changer” radio: first with DMR on 1.25-meters, “cross-mode” cross-banding

**AnyTone D578UV III
Tri-band**

**140-174 MHz
222-225 MHz
400-480 MHz**

**\$400 from
Powerwerx,
Connect Systems,
others**

**50 watts on 2m, 440;
5 watts on 220.**



**DMR/analog on all bands;
first cross-mode rig (DMR to
analog, analog to DMR)**

A “commercial-build quality” 220 radio appeared in late-2015 from BridgeCom Systems (review in QST, Nov. 2016)



BCM-220 1.25m Mobile Radio

\$ 240.00 ~~\$ 315.00~~

Options

BCM-220 Mobile Radio

Quantity

1

Add to cart

Order Today

Introducing the BCM-220 Mobile Radio for amateur ham radio. The BCM-220 operates in 220 MHz (1.25m) part of the RF Spectrum. The BCM-220 is packed with features including 30 watt Mitsubishi power amplifier, Alpha-Numeric Display, 4W Front Panel Speaker and 250 memory channels.

Included in the package is the Radio, DTMF microphone, mounting hardware, and 12V power cord. Don't forget to add the programming software and cable. Get on the 1.25m band today with a BCM-220.

- 222.0-224.995 MHz Rx and Tx, 219-220.0 MHz Data Only
- High quality Mitsubishi RF Power Amplifier - 5W / 10W / 20W / 30W selectable
- 250 Channel Capability
- VFO and Memory Mode
- 4W Front Panel Speaker
- High Quality ± 1.5 ppm Frequency Stability TCXO
- Alpha-Numeric Dot Matrix Display
- CTSS/DCSS Enc/Dec



<http://www.bridgecomsystems.com/products/bcm-220-mhz-mobile-radio>

Announced at Dayton Hamvention 2016: a \$900 mobile tri-band transceiver that does analog, D-Star, DMR, C4FM, P25, and voice over LTE—but still not sold as of Mar. 2020

DV4 Mobile transceiver not released yet...

Digital modes may cause havoc on 220 band



With some technical skills, a used Motorola CDM-1550 mobile radio for 216-222 MHz can be moved up to 225 MHz

**Shop very carefully:
220 model has product label:
AAM25MHF4DP5A**

25 watts; 128 channels

**Need hex editor (and some
knowledge) to change band
mask limit in firmware**

**Great radio...used by DARN
for their 1.25-meter repeaters**



TAIT units used as taxi radios in Asia sometimes available



Shop by category

Search...

All Cat

Back to home page | Listed in category: Consumer Electronics > Radio Communication > Ham, Amateur Radio > Ham Radio Transceivers



TAIT TM-8110 1.25 Meter 220 (216-266) MHz Radio Transceiver

🔥 1 viewed per hour

Item condition: **Seller refurbished**

"Clean good condition. Works fine. Will program the radio for free if you do Buy it Now."

Time left: 13d 20h 10/30, 4:12PM

Quantity: 3 available / 2 sold

Price: **US \$125.00**

Buy It Now

Add to cart

Best Offer:

Make Offer

7 watching

👁 Add to watch list

★ Add to collection

Longtime member

Best offer available

Mouse over image to zoom



💰 Have one to sell? **Sell now**

Shipping: **\$35.00** Economy Shipping from outside US | [See details](#)

See details about international shipping here.

Item location: Flower City, Indonesia

Ships to: Worldwide. See exclusions

BridgeCom has a U.S.-assembled 220 MHz amateur repeater, combines two mobile radios--only turn-key 220 solution

BridgeCom 1.25-meter
amateur repeater

222-225 MHz

\$1,195 direct

30-watts continuous
Duty

Most new 220
repeaters are this



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Developments in HT radios for 222-225 MHz: With FCC enforcement since 2018 handheld models have become fewer

Wouxun in 2018 discontinued this great 220 HT: UV3D with 220



- 2-meters and 220
- Dual receivers
- Only transmits in ham bands
- Built in LED flashlight
- Voice prompts (if desired)
- \$99; available at ham stores

Baofeng (BTECH) introduced in Fall 2016 a \$60 version of Kenwood's TH-F6A tri-band HT



BTECH

BTECH UV-5X3 5 Watt Tri-Band Radio: 130-179.99mhz (VHF), 220-225.99mhz (1.25M), 400-520.99mhz (UHF) Amateur (Ham)

★★★★★ 334 customer reviews | 58 answered questions

Price: **\$59.89 & FREE Shipping**. Details

In Stock.

Want it tomorrow, July 28? Order within **6 hrs 43 mins** and choose **One-Day Shipping** at checkout. Details

Sold by BaoFeng Tech and Fulfilled by Amazon. Gift-wrap available.

- BaoFeng Tech is the only authorized BaoFeng & BTECH Distributor to honor the Manufacturer Warranty. Only BaoFeng Tech offers warranty claims without shipping anything to China. You must insure that BaoFeng Tech is your selected buying option when buying to be able to have the full USA warranty.
 - What's New: Tri-band Frequency Range • Display Sync • DTMF Decode • Incoming ANI Display • Remote Start, Kill, Revive, Inspect, and Monitor • Selectable Frequency Range Scanning • Remove/Add Channels from Scanning Right in Menu
 - Recommended Accessories: Pair UV-5X3 with the Nagoya NA-320A Antenna for all-in-one antenna option. The PC03 FTDI Cable is recommended for easy computer programming - Uses CHIRP Software
 - Features: VOX • Talk Around Mode • Busy Channel Lock-Out (BCLO) • Transmission Time Out • Channel Receive Only (TX OFF) • Frequency Reverse • Squelch Tail Elimination (STE) • Work Mode (Selectable VFO/ Menu Lockout) • Alpha Numeric Channel Storage • PC Programmable
 - Kit Includes: UV-5X3 Radio, 1500mAh Battery, V-85 Dual Band Antenna, 220MHz Single Band Antenna, CH-5 Charger, CH-5 110V Adapter, Earpiece Kit, Wrist Strap, Belt Clip, User Manual
- ▶ See more product details

[Compare with similar items](#)

[Used & new \(2\) from \\$59.86 & FREE shipping](#). Details

128 channels + broadcast FM 88-108 MHz

Kenwood introduced at 2016 Dayton Hamvention a tri-band HT including 220 that does D-Star and analog FM

Kenwood TH-D74A, costs \$550

- Does 2-meters, 220, and 440 in analog FM and D-Star
- Built-in APRS, GPS (can search for D-Star repeaters in area)
- Color display—great in bright light
- SD memory card slot
- Bluetooth

Bottom line: “You get what you pay for.”



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220 Spectrum Management Association maintains a band plan and coordinates 220 repeaters in Southern California

220 Spectrum Management Association

- **Coordinates 137 repeaters on 1.25m in Southern California and maintains 220 band plan**
 - **Membership open to all licensed amateurs (not just repeater owners); annual dues \$20**
 - **Value transparency-- open meetings quarterly, held in different cities**
 - **Recent leadership changes have found repeater pairs for new repeater**
 - **New repeater coordination priority is toward “Open” systems**
-

In summary, your choices in 220 MHz ham radios are increasing, though still limited: Let's get on the air!

Credit goes to China radio makers who found other uses too

Warning: Product quality of some units not very good

Not all manuals well-written; programming by hand difficult

Be careful where you transmit (some go out of ham bands)

Bottom line: Wider selection and low prices will lead to more 220 MHz amateur operators

For more info on 222-225 MHz in Southern California and coordinated repeaters, visit www.220sma.org
