



# Buying Your First Radio: A Systematic Approach

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# Goal

- What is the right radio for you?
- What accessories are needed?
- How do you get it programmed?
- Programmed with what?
- Finally, how to use it? (General tips and tricks)

# The “real” world

- There is no “perfect” radio. Everything is a compromise.
- Don’t do it *too* fast.
  - Picking out a radio is \*FUN\*
  - Treat it as a learning exercise. If the feature set says that the radio will do “X” – then figure out what “X” is and how you might use it.
  - Let your creative juices flow . . .
- This isn’t the last radio you will ever purchase. There will be others.
- Ham radios retain their long-term value. There is different value prop from other types of electronics, i.e. smartphones.

# A quick survey . . .

Double check your plans with other hams  
<http://www.eham.net/reviews/> is your friend.  
However they are just reviews.  
The final choice is yours.





UV-82C  
\$55 (Amazon)



BF-888S  
\$15 (Amazon)



UV-5R5  
\$25 (Amazon)



T70A  
 \$180 (Universal Radio)  
 \$190 (HRO)



ID-51A PLUS  
 \$330 (Gigaparts)  
 \$350 (Universal Radio)  
 \$370 (HRO)

ID-51A PLUS2  
 (no \$\$\$ yet)



IC-V80  
 \$80 (Universal Radio)  
 2M only

<http://www.universal-radio.com/catalog/ht/4380.html>



ID-5100A  
 \$490 (HRO)



IC-OPC-440

Microphone Extension Cable -  
 Modular - 16.5 Feet Long - IC-  
 2729H . IC-V8000 etc

\$72.95

INCLUDE



Nifty stand  
 \$26 (HRO)



IC-OPC-1156

Separation Cable for ID-5100A /  
 IC-2720H - 11.5 Feet Long

\$21.95

INCLUDE





DJ-500T  
\$99 (HRO)



DR-B185HT  
\$170 (Gigaparts)  
2M only but 85w



DJ-V27T  
\$150 (HRO)  
220

Similar models  
e.g. DJ-G7T for  
2M/440/1.2Hz



DR-638T  
\$360 (Gigaparts)  
2M/440

# KENWOOD



TH-K20A  
\$130 (HRO)  
2M only



TH-D74A  
\$650 (HRO)  
Tri-bander



TH-D72A  
\$390 (HRO)  
Dual-bander



TM-D710GA  
144/440 MHz FM Dual Bander  
\$560 (HRO)



TM-V71A  
144/440 MHz FM Dual Bander  
\$345 (HRO)



TM-281A  
144 MHz FM Transceiver  
\$135 (HRO)



TH-F6A  
\$280 (HRO)  
Tri-bander



# YAESU



FT-60R  
\$150 (Universal Radio)  
2M/440



VX-8DR  
\$340 (Universal Radio)  
6M/2M/220/440+APRS



FT2DR  
\$300 (Gigaparts)  
\$330 (Universal Radio)  
2M/440 w/ Fusion digital



VX-6R  
\$240 (Gigaparts)  
2M/220/440

FTM-400XDR  
\$519 (Gigaparts)  
2M/440 w/ Fusion digital



FTM-8900  
\$340 (Gigaparts)  
10M/6M/2M/440



FTM-3200DR  
\$134 (Gigaparts)  
C4FM/FM 2m ONLY





Wouxun KG-UV6X Dual Band VHF/UHF 200 Channel Handheld Commercial Radio



~~\$184.99~~ \$159.99

SKU: KG-UV6X



Wouxun KG-UV3X Pro Dual Band VHF/UHF 125 Channel Handheld Commercial Radio



~~\$159.99~~ \$139.99

SKU: KG-UV3X



Powerwerx DB-16X Dual Band VHF/UHF 16 Channel Handheld Commercial Radio



\$119.99

SKU: DB-16X



Wouxun KG-UV3D Dual Band 128 Channel Handheld Amateur Radio



As Low As \$89.99



Wouxun KG-UV9D Plus U.S. Version 7-Band 999 Channel Dual-Band Handheld Amateur Radio



~~\$199.99~~ \$179.99

SKU: KG-UV9D-PL



Wouxun KG-UV8T U.S. Version Tri-Band 999 Channel Amateur Handheld Radio



~~\$179.99~~ \$159.99

SKU: KG-UV8T

# Brackets \*

< \$50

## Throw away

Baofeng  
BF-888S  
UV-5R5

< \$100

## Function

Alinco  
DJ-500T  
Baofeng  
UV-82C  
UV-82HP  
UV-5X5  
Wouxun  
KG-UV3D

< \$150

## Quality

Allinco  
DJ-V27T  
DJ-G7T  
Icom  
IC-V80  
Kenwood  
TH-K20A  
Wouxun  
KG-UV3X  
Yaesu  
FT-60R

< \$250

## Quality+

Allinco  
UV-82C  
UV-82HP  
Icom  
T70A (HD & Sport)  
Kenwood  
TH-F6A  
Wouxun  
KG-UV6X  
KG-UV8T  
KG-UV9D  
Yaesu  
VX-6R

## Specialized

Icom  
ID-31A  
ID-51A (ALL)  
  
Kenwood  
TH-D72A  
TH-D74A  
  
Yaesu  
VX-8DR  
FT2DR

\* my groupings – your mileage may vary



# Accessories





Baofeng UV-82C  
\$55

BL-8 upgrades the standard  
1800 mAh battery to 3350 mAh  
\$12



BL-8 six AAA  
batteries \$16

VB-25 dual PTT speaker mic  
\$10



Case + Strap  
MSC-20B \$9



Nagoya NA-701/717/771  
\$16



\$50 RT Systems  
or CHIRP w/ cable



# What is your primary scenario?

- I'm a ham – all hams have an HT
- Basic simplex use
- Basic repeater use
- Specialized usage
  - Satelitte
  - Jeeping
  - RC aircraft / Drones
- Other technologies
  - DSTAR
  - APRS

# Bands?

- 2M+440 is default – best to have both to maximize your coverage
- You should have a reason to go with 2M or 220 or 440 only
- 220 used for packet and general use
  - Less repeaters available
  - Much \*MUCH\* less crowded
  - Great for personal simplex, but a bit more \$\$ and less radio options
- 2M used exclusively by most jeepers
- 6M sometimes with old time hams (some repeaters in the area)

# Modes?

- All radios have FM so you don't need to worry about that. If you are a first-timer, then keep things just FM.
- Later you can think about:
  - DSTAR?
  - System Fusion?
  - Weak signal SSB + CW
    - While a portion of all bands have reserved space for these, it is usually a mobile or base station issue; not an HT

# Specialized needs

- Many HTs have wide-band receive to cover aircraft, etc.
  - Is it a requirement of yours??
- Most satellites require two band operation
  - V+U, U+V, e.g.:  
Saudisat SO-50 RCV: 436.795 MHz \* XMIT: 145.850 MHz

\* RCV frequency varies based on elevation with Doppler effect, i.e. 436.810 MHz on horizon to 436.795 MHz overhead



# What Satellites??!?!?? For me??



## SO-50 satellite information

SO-50 carries several experiments, including a mode J FM amateur repeater experiment operating on 145.850 MHz uplink and 436.795 MHz downlink. The repeater is available to amateurs worldwide as power permits, using a 67.0 Hertz PL tone on the uplink, for on-demand activation. SO-50 also has a 10 minute timer that must be armed before use. Transmit a 2 second carrier with a PL tone of 74.4 to arm the timer.

The repeater consists of a miniature VHF receiver with sensitivity of -124dBm, having an IF bandwidth of 15 KHz. The receive antenna is a 1/4 wave vertical mounted in the top corner of the spacecraft. The receive audio is filtered and conditioned then gated in the control electronics prior to feeding it to the 250mW UHF transmitter. The downlink antenna is a 1/4 wave mounted in the bottom corner of the spacecraft and canted at 45 degrees inward.



List at:

<http://www.amsat.org/wordpress/wp-content/uploads/2013/06/Active-Amateur-Radio-Communications-Satellites.pdf>



# Why not get an HT . . .

- Not enough power or line of sight to any repeaters
- Primary operating venue is within your car
- Mobile equipment fits the bill better, e.g. jeeping and a VHF mobile
- Voice communication is not your thing, e.g.
  - CW HF person
  - R/C aircraft and drones
  - Digital packet

Adafruit Arduino Feather \$22 mounted below a  
RFM69HCW 433MHz packet radio 100mW \$10

See <https://www.adafruit.com/products/3230>



# How do you find local/distant repeaters?

- Local frequency coordinators (<http://www.wwara.org> )
- Local clubs (<http://www.mikeandkey.org/repeater.htm> )
- RepeaterBook (<https://www.repeaterbook.com/> )
- Local club website (<http://www.lakewashingtonhamclub.org/> RHS)
- Commercial book and app resources
  - ARRL Repeater Directory (<http://www.amazon.com/ARRL-Repeater-Directory-2016-Pocket/dp/1625950535/> )
  - ARRL Travel Plus (replaced with . . . )
  - Rfinder (<http://www.rfinder.net/blog/> \$9 per year)

# How do I program my HT?

- LEARN HOW TO DO IT BY-HAND!  
Particularly if you are in ARES/RACES
- That being said however, massive updates are best done by computer
- Apps:
  - Free: CHIRP <http://chirp.danplanet.com/projects/chirp/wiki/Home>
  - ~\$50 w/ cable: RT Systems <https://www.rtsystemsinc.com/> (may include cable)
- Both apps interface with Rfinder to automatically download their repeater directory for your local area

# How do I know a channel is programmed right?

- Only one way! Make a QSO with a signal report.
- Kerchunking does not mean that you have a good enough signal to actual make a QSO.
  - Also . . . Kerchunking is transmitting – you must ID as normal.
- Alternatives:
  - DSTAR ECHO test
  - IRLP Echo node “9999”

# Where do you buy radios

- Baofeng: Amazon
  - Ensure Baofeng Tech or Amazon is seller to get USA warranty
- Wouxon: <https://powerwerx.com>
- All others:
  - DX Engineering: <https://www.dxengineering.com/>
  - Gigaparts: <http://www.gigaparts.com/> \*
  - Ham City: <https://www.hamcity.com/>
  - Ham Radio Outlet (HRO): <http://www.hamradio.com/>
  - R&L Radio: <http://www.rlham.com/>
  - Universal Radio: <http://www.universal-radio.com/>

\* Offers many of their radios with MARS mod done by them (a whole other presentation on what that is and why you might want it)