

# Buying an Amateur Radio Transceiver

Anthony Luscre, K8ZT



# Contact Information

- Email- [k8zt@arrl.net](mailto:k8zt@arrl.net)
- Website- [www.k8zt.com](http://www.k8zt.com)

# K8ZT



Flying Pigs



QRP Club



70+ Slides & many links so you're probably going to want to review  
**Today's Presentation**

View & access links in this slide show at

*[tiny.cc/buyar](https://tiny.cc/buyar)* 

If you need a PDF copy click [here](#) 

# Types of Amateur Radios

- **VHF/UHF**- Analog or Digital (DMR, D-Star, C4FM, etc.)
  - HT- Handheld FM Only (VHF/UHF)
  - Mobile- FM Only (VHF/UHF) *What To Look For in Your First Mobile Rig* ⚡
  - Base- SSB, CW & FM (any or all- 50, 144, 440, 1200 MHz)
- **HF**- High Frequency (160-6 Meters / 1.8-50 MHz)
  - Base
  - Mobile/Portable
  - Single Band
- **HF/VHF/UHF Combo** (160-6 M plus 2M/70cm / 1.8-50, 144, 430 MHz)



# Available As

- New
  - Ready to Use (Assembled)
  - Kit (some assembly required)
    - Modules to assemble (no soldering)
    - Parts level kits (soldering required)
- Used
  - Dealers- trade-ins, discontinued, demo
  - From owner (via variety of selling methods)
  - For parts-only

# Venues

- Dealers (Ham Radio Specific)
  - In Store
  - Online Ordering
- Online General Merchandisers (Amazon, etc.)
- Auction Sites (eBay, etc.)
- Ham Only Online Private Listings (eHam, QRZ, etc.)
- Hamfests
  - Dealers, Accumulators (private individuals that acquire & resale)
  - Private Sellers
- Private Sellers- Word of Mouth, Want Ads, Craigslist, Club Ads, Silent Key Sales, etc.

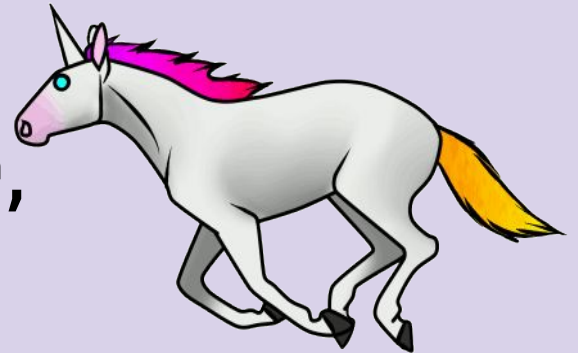
# How Much Will It Cost

|             |                    | New* |      | Used Current |      | Used Older Models |      |
|-------------|--------------------|------|------|--------------|------|-------------------|------|
|             |                    | Low  | High | Low          | High | Low               | High |
| VHF/<br>UHF | HT- Analog         | 30   | 250  | 30           | 200  | 30                | 150  |
|             | HT- Digital        | 65   | 400  | 50           | 250  | -                 | -    |
|             | Mobile- Analog     | 150  | 450  | 120          | 300  | 50                | 175  |
| HF          | Base/Mobile        | 650  | 1300 | 450          | 1200 | 150               | 750  |
|             | Base (next level)* | 1200 | 4000 | 800          | 3000 | 600               | 2000 |
|             | HF/VHF/UHF Combo   | 800  | 1400 | 650          | 1000 | 400               | 750  |
|             | Single Band/Kits   | 50   | 250  | -            | -    | -                 | -    |

\* Excludes higher end equipment (i.e. Lexus, Land Rover, Ferrari, etc.)

# Some Myths of Radio Equipment

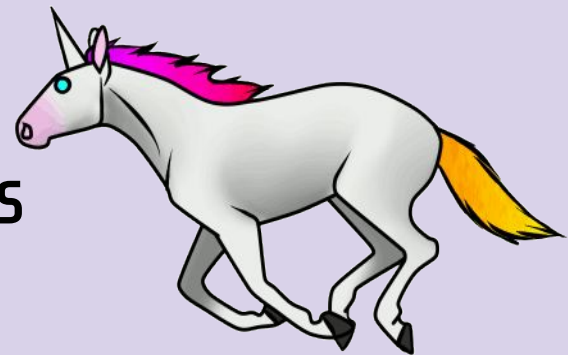
- ❌ You must have newest, best radio to make contacts
- ❌ There is one manufacturer that is always best
- ❌ If owners say a model is great, it definitely is
- ❌ If owners say a model is horrible, it definitely is





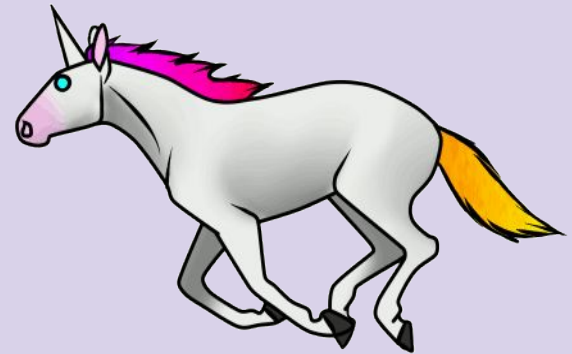
# Some Myths of Radio Equipment

- ❌ Used is always a better buy due to rapid value depreciation of new
- ❌ If buying used always choose a model that is still in production
- ❌ When you buy a new radio, you can discard all packaging, paper manuals, etc. after warranty expires



# Some Myths of Radio Equipment

- ❌ You should always buy radio with all the available options/accessories
- ❌ You should always buy the manufacturer's matching Power Supply, External Speaker, etc.
- ❌ You need an Amplifier
- ❌ When buying new, make to purchase undercoating & teflon wax options



# A Lot Like Buying Cars/Trucks

- Wide range of makes & models and thus prices
  - Makes
    - Wide Market Manufacturers (Ford, Chevy, Toyota, etc.)
    - Luxury Manufacturers (Lexus, Acura, Cadillac, etc.)
    - Specialty Manufacturers (Ferrari, Land Rover, Lamborghini, etc.)
    - Super Cheap or Quirky Import (Like VW, Kia or Hyundai when they first started importing to USA)

- Models

- Economy
- Intermediate
- Sports Cars
- Luxury



CABRIOLET

MID SIZE



COMPACT SUV

MINIVAN



STANDARD SUV

COUPE



COMPACT CAR

PICKUP

# A Lot Like Buying Cars/Trucks

- A lot depends on...
  - Are you looking for **Basic Transportation** or **Performance, Luxury, etc?**
  - How much does style and appearance matter to you?
  - Condition is big factor & Models do make a difference
  - Supply & Demand (especially in newly introduced models or used equipment)
  - Some models have better reliability than others (and price is often not a factor)

# A Lot Like Buying Cars/Trucks

- A lot depends on...
  - Are you looking for a high performance model for use in challenging conditions
  - Does it need to go off road (portable)?
  - Adding Extras & Ups can greatly inflate the base price & drive up total cost
  - Aftermarket accessories can often cost less and sometimes even perform better than original equipment ones
  - Preferences often personal and not always logical

# Good/Bad News About Prices

## ● The Good News

- You can often get very good equipment for lower prices
- You can usually resell items that you no longer want
- Used items often include bundled added accessories/features
- Radios hold market value, unlike the immediate depreciation when you drive a new car off of the lot

## ● The Bad News

- Because of slow depreciation, used items can often cost almost as much as new items
- Often buyer-beware with no returns, guarantees or warranties
- Older models may not have features included on new models, so adding them may drive up final costs

# New vs. Used Equipment

- **New**

- Current Models
- Dealer/Manufacturer Support
  - Warranty
  - Available Parts- Accessories or Replacement
  - Continuing Firmware Development

- **Used**

- Availability of Current or Discontinued Models
- Potentially lower price (but possibly not total costs)
- Possible problems- electronics, physical, abused, etc.



# Used Equipment Pricing

- Basis of asking price
  - Current new price of that model
  - Extra Features Included- filters, power supply, etc.
  - Collector Value (Rare Equipment)
  - Current pricing by other sellers
    - Private
    - Hamfest
    - eBay & other auction sites





# Used Equipment Pricing

- Basis of asking price
  - Owner Valuation
    - Personal opinion of equipment
    - Seller Motivation Level
      - Personal financial situation
      - Other equipment owner has at their disposal
    - Not working/for parts only
  - Silent Key Sales
    - Equipment for ham's that have passed away
    - Often being sold for family by friends/club members



# VHF/UHF Equipment Generations

|   | Key Features              | Circuitry                              | Other                         |
|---|---------------------------|--|-------------------------------|
| 1 | Transceivers              | Tubes                                  | Crystal Controlled            |
| 2 | Transceivers              | Transistor                             | Crystal Controlled            |
| 3 | Transceivers              |  | Diode Matrix                  |
| 4 | Transceivers              | Begin to replace point-to-point wiring | VFO                           |
| 5 | Transceivers              | Modules/ICs                            | Programmable Memories         |
| 6 | Transceivers              | Built in PL, NiCad Batteries           | Scanning, Autopatch Repeaters |
| 7 | Transceivers              | Surface Mount                          |                               |
| 8 | Transceivers              |  | DMR (Digital Modes)           |
| 9 | Flood of cheap import HTs | Surface Mount, Li Batteries            |                               |

# VHF/UHF Equipment Manufacturers

- Alinco- [www.alinco.com](http://www.alinco.com)
- Anytone- [anytonetech.com/radios](http://anytonetech.com/radios)
- Baofeng/Btech- <https://baofengradio.us>
- Icom- [www.icomamerica.com](http://www.icomamerica.com)
- Kenwood- [www.kenwood.com/usa/com](http://www.kenwood.com/usa/com)
- TYT- [www.tyt888.com](http://www.tyt888.com)
- Wouxun- [www.wouxun.com](http://www.wouxun.com)
- Yaesu (Standard)- [www.yaesu.com](http://www.yaesu.com)

# VHF/UHF Radios Decisions

- Main decisions
  - Handheld (HT) vs. Mobile
  - Single Band (usually 2M) vs. Dual Band (2M/70 cm)
  - Analog vs. Digital
  - Cheap vs. Traditional Brands/Models
  - New vs. Used
  - Accessories
  - FM vs. SSB

# VHF/UHF Radios – HT vs. Mobile

- Handheld (HT) vs. Mobile
  - HTs usually cheaper
  - Antennas- HT usually come with attached “rubber duck”, Mobiles require external antenna and feedline, but usually better range than ducks
  - Output Power- HT 0.1 to 10 watts, Mobiles 5 to 75 watts
  - Power Source- HT built-in rechargeable battery, Mobile require external 12 volt, either power supply or automobile

# VHF/UHF Radios– HT vs. Mobile

- Handheld (HT) vs. Mobile
  - Mobile often have extra features, more memories, interface capabilities, etc.
  - HT range can be boosted with extendable or external antennas; amplifiers (“bricks”), etc.
  - For base use some opt for combo HF/VHF/UHF Multimode (SSB, CW, FM) instead of FM only VHF/UHF mobile
  - There are also dedicated VHF/UHF only Multimode (SSB, CW, FM) base rigs

# VHF/UHF Radios– Single vs Dual

- Single Band (usually 2M) vs. Dual Band (2M/70 cm)
  - Dual band usually only slightly more expensive
  - Single Band often simpler to operate
  - Some unusual bands (222 MHz, 1.2GHz) may be mainly available as single band radios
  - Some areas may only have one type of repeater available usually 2M but in some places 70cm
  - Also available some tri-band & quad-band

# VHF/UHF Radios– Single vs Dual

- Not all Dual Band Radios are equal, some...
  - allow only one band at a time
  - allow simultaneous use of 2 bands (dual receive)
    - some are limited to only V & U at same time (V/U)
    - others allow V/U, V/V or U/U operations
  - allow background monitoring of one freq while using another freq or band
  - allow Cross Band Repeater Operations (links [1](#) & [2](#))
  - have wideband RX only capabilities possibly including NOAA Wx, Aviation bands (AM), or even HF SWL ability



# VHF/UHF Radios – Analog vs Digital

- Analog vs. Digital
  - Analog repeaters much more common
  - For Simplex Analog is typical
  - Digital Repeaters can provide very wide coverage due to Internet backbone linking
  - Digital support 2 simultaneous “streams” of use
  - Many of Digital Radio also support Analog, but
  - Digital Radio much harder to use on the fly for simple tasks like Analog or simplex

# VHF/UHF Radios – Cheap?

- Cheap vs. Traditional Brands/Models
  - Traditional brands have a better history of build quality, durability, performance
  - Cheap can save lots of money, especially if used infrequently
  - Traditional brands often have additional features
  - Some Cheap have performance and regulatory issues such as spurs, out of band signals, stability issues, etc.

# VHF/UHF Radios – New vs Used

- New vs. Used
  - With HTs new is often not much more expensive and you will have a “fresh” battery
  - Cheap can save lots of money, especially if used infrequently
  - Traditional bands often have additional features
  - Some Cheap have performance and regulatory issues such as spurs, out of band signals, stability issues, etc.

# VHF/UHF Radios – Accessories

- Accessories
  - Extended or extendable HT antennas can provide range boost with portability of attached antenna
  - External antennas- mobile verticals, J-Poles, Beams & Loops
  - Mobile Antenna mounts (magnetic, trunk lip, etc.)
  - Antenna connector/coax adapters
  - Extra and/or larger batteries for HTs
  - 12 Volt battery eliminators for using HT in car
  - Speaker/mic or Bluetooth® Headsets

# VHF/UHF Radios – Accessories

- Accessories
  - External Power Amplifiers can increase power
    - FM Only
    - Multimode
  - Receive Preamps (some are built into Power Amps)
  - Transverters for other bands (222, Microwaves etc.)
    - Some used with HF radios (usually 10 Meters)
    - Other used with VHF (usually 2 Meters)
  - Programming cable & software
  - Cup Holder, dash or floor mounts

# VHF/UHF Radios – FM vs SSB

- FM vs SSB
  - FM is majority mode for Repeaters, Simplex
  - SSB (and some CW) are used for Contesting
  - SSB is necessary for Digital Soundcard Modes FT8 & FT4 (for more info [click here](#))
  - Satellites (for more info [FM](#) & [SSB](#))
    - Low Earth Orbit FM satellites are easiest to use
    - SSB Linear Transverter satellites offer additional opportunities with multiple simultaneous QSOs possible on same satellite

# HF Equipment Generations

|   | Key Features                     | Circuitry                    | Other                                  |
|---|----------------------------------|------------------------------|--|
| 1 | Separate Transmitter & Receivers | Tubes                        | Crystal Controlled                     |
| 2 | Separate Transmitter & Receivers | Mixed Tube & Transistor      | VFOs                                   |
| 3 | Transceivers (combined TX & RX)  | Mixed Tube & Transistor      |  |
| 4 | Transceivers (combined TX & RX)  | All Transistor (Solid State) | Analog Display                         |
| 5 | Digital Display Transceivers     | Solid State                  | Begin to replace point-to-point wiring |
| 6 | Digital Display Transceivers     |                              | Computer Interfacing (CAT) RS-232      |
| 7 | Digital Display Transceivers     |                              | USB Computer Interfacing               |
| 8 | Digital Display Transceivers     | SDRs                         | Built-in Sound Cards                   |
| 9 | Band Map Displays                |                              |  |

# HF Equipment Manufacturers

- Alinco- [www.alinco.com](http://www.alinco.com)
- Elecraft- [www.elecraft.com](http://www.elecraft.com)
- FlexRadio Systems- [www.flexradio.com](http://www.flexradio.com)
- Icom\*- [www.icomamerica.com](http://www.icomamerica.com)
- Kenwood\*- [www.kenwood.com/usa/com/amateur](http://www.kenwood.com/usa/com/amateur)
- Xiegu- [www.cqxiegu.com](http://www.cqxiegu.com)
- Yaesu (Standard)\*- [www.yaesu.com](http://www.yaesu.com)

\* “Traditional Big Three”



# HF Kit/Single Band Manufacturers

- Elecraft- [www.elecraft.com](http://www.elecraft.com)
- LNR Precision- [www.lnrprecision.com](http://www.lnrprecision.com)
- MFJ- <https://mfjenterprises.com>
- Midnight Design Solutions (Phaser Digital)- [midnightdesignsolutions.com](http://midnightdesignsolutions.com)
- QRP Guys- <https://qrpguys.com>
- QRP Labs (QCX)- [www.qrp-labs.com](http://www.qrp-labs.com)
- Plus plethora of smaller companies, club sourced kits & Chinese Clones!

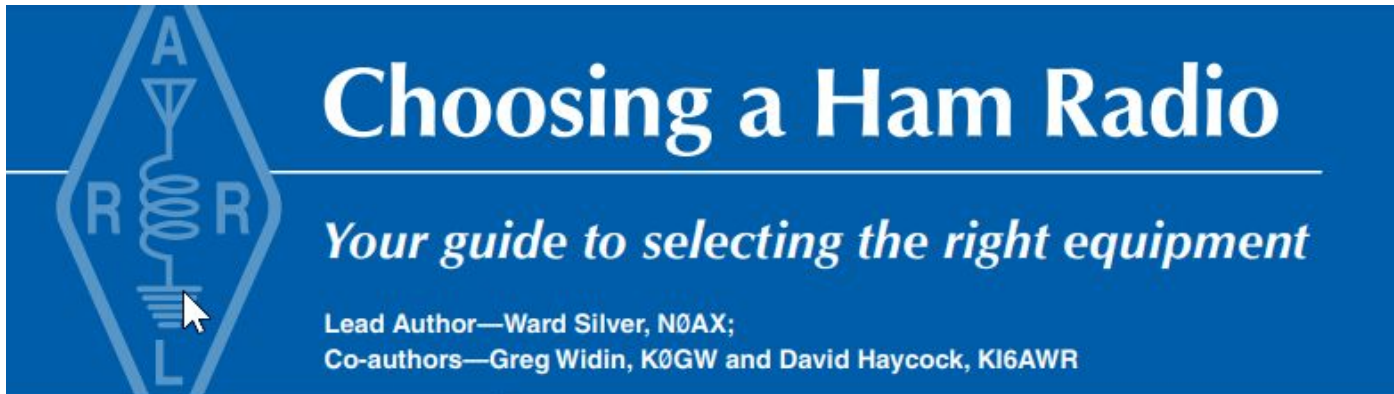
# HF Recent Equipment Matrix

- See spreadsheet [tiny.cc/buyar-ss](http://tiny.cc/buyar-ss)

| Brand    | Radio Model (under \$2000) | Availability | Style    | Internal Battery Power | HF (160-20M)     | 6M | 2M & 70 cm | Internal Antenna Tuner | CAT         | Sound card | CW Decode | List Price      | Discounted Price Range | Used Prices Range | Notes   |
|----------|----------------------------|--------------|----------|------------------------|------------------|----|------------|------------------------|-------------|------------|-----------|-----------------|------------------------|-------------------|---|
| ICOM     | <a href="#">IC-705 (s)</a> | Current      | Portable | ✓                      | ✓                | ✓  | ✓          |                        | USB         | ✓          |           | \$1,299         | ---                    | ---               |   |
|          | <a href="#">IC-7300</a>    | Current      | Base     |                        | ✓                | ✓  |            | 3:1                    | USB         | ✓          |           | \$1,299         | \$950 - \$1200         | \$700 - \$1100    | Large Bandmap   |
|          | <a href="#">IC-7100</a>    | Current      | Mobile   |                        | ✓                | ✓  | ✓          |                        | USB         | ✓          |           | \$979           | \$750 - \$879          | \$500 - \$800     |   |
|          | <a href="#">IC-718</a>     | Current      | Base     |                        | ✓                |    |            |                        | RS-232      |            |           | \$639           | \$600 - \$630          | \$400 - \$500     |   |
| Kenwood  | <a href="#">TS-590SG</a>   | Current      | Base     |                        | ✓                | ✓  |            | 10:1                   | USB         | ✓          | ✓         | \$1,715         | \$1300 - \$1414        | \$850 - \$1400    |   |
|          | <a href="#">TS-590S</a>    | Discont.     | Base     |                        | ✓                | ✓  |            | 10:1                   | USB         | ✓          |           | ---             | ---                    | \$600 - \$1000    | Similar to SG, no CW decode                                 |
|          | <a href="#">TS-480SAT</a>  | Discont.     | Mobile   |                        | ✓                | ✓  |            | 3:1                    | RS-232      |            |           | ---             | ---                    | \$500 - \$700     |   |
|          | <a href="#">TS-2000</a>    | Discont.     | Base     |                        | ✓                | ✓  | ✓          | 10:1                   | RS-232      |            |           | ---             | ---                    | \$900 - \$1600    | Optional 1.2GHz Satellite features                          |
|          | <a href="#">FT-818 (s)</a> | Current      | Base     | ✓                      | ✓                | ✓  | ✓          |                        | Proprietary |            |           | \$669           | \$600 - \$649          | ---               |   |
| Yaesu    | <a href="#">FTDX-3000</a>  | Current      | Base     |                        | ✓                | ✓  |            | 3:1                    | USB         | ✓          | ✓         | \$1,939         | \$1,739                | \$1000 - \$1600   |   |
|          | <a href="#">FTDX10</a>     | Current      | Base     |                        | ✓                | ✓  |            | 3:1                    | USB         | ✓          | ✓         | \$1,698         | ---                    | ---               |   |
|          | <a href="#">FT-450D</a>    | Discont.     | Base     |                        | ✓                | ✓  |            | 3:1                    | Proprietary |            |           | ---             | ---                    | \$400 - \$600     |   |
|          | <a href="#">FT-817 (s)</a> | Discont.     | Base     | ✓                      | ✓                | ✓  | ✓          |                        | Proprietary |            |           | ---             | ---                    | \$275 - \$600     |   |
| Elecraft | <a href="#">K3S</a>        | Out of Stock | Base     |                        | ✓                | ✓  |            | 10:1                   | USB         | ✓          | ✓         | ---             | ---                    | \$1500 - \$3000   | 5 add-on USB interface, better receive & built-in soundcard |
|          | <a href="#">K3</a>         | Discont.     | Base     |                        | ✓                | ✓  |            | 10:1                   | RS-232      |            | ✓         | ---             | ---                    | \$900 - \$1800    |   |
|          | <a href="#">KX2 (s)</a>    | Current      | Portable | ✓                      | 80-10            |    |            | 10:1                   | USB         | ✓          | ✓         | \$830 - \$1340  | \$800 - \$1300         | \$600 - 1000      |   |
|          | <a href="#">KX3 (s)</a>    | Current      | Portable | ✓                      | ✓                | ✓  |            | 10:1                   | USB         | ✓          | ✓         | \$1100 - \$1700 | \$1050 - \$1600        | \$700 - \$1300    |   |
| Flex     | <a href="#">6400</a>       | Current      | Base     |                        | ✓                | ✓  |            | Option                 | USB         | ✓          |           | \$1,999         | ---                    | \$1600 - \$1900   | No front panel, controlled through computer                 |
| Xiegu    | <a href="#">G90 20w</a>    | Current      | Mobile   |                        | ✓                | ✓  |            | 10:1                   | USB         |            | ✓         | \$499           | \$390 - \$450          | \$350 - \$500     |   |
|          | <a href="#">X5105 (s)</a>  | Current      | Portable | ✓                      | ✓                | ✓  |            | 10:2                   | USB         |            | ✓         | \$599           | \$440 - \$500          | \$350 - \$500     |   |
|          | <a href="#">G1M (s)</a>    | Current      | Portable |                        | 80, 40, 20 & 15M |    |            |                        | USB         |            |           | \$299           | \$260 - \$290          | \$200 - \$275     |   |

# Features

- ARRL- *Choosing a Ham Radio* 



- **About This Publication**
- **Types of Operation**
- **VHF/UHF Equipment**
- **HF Equipment**
- **Manufacturer's Directory**

## WHO NEEDS THIS PUBLICATION AND WHY?

Hello and welcome to this handy guide to selecting a radio. Choosing just one from the variety of radio models is a challenge! The good news is that most commercially manufactured Amateur Radio

ip

it be overh

# Features

- One of many YouTubes describing radio features



# Features

- One of many YouTubes describing radio features



# Features



- One of many YouTubes comparing two radios



# Features / Specifications

- Bands & Modes
- Filters
- Memories
- DSP (Digital Signal Processing)
- Bandscope (Waterfall)
- CAT Interface (computer control)
- Built in Sound Card
- Built-in CW and/or RTTY Decode
- Internal Antenna Tuner (important to note range 3:1, 10:1, etc.)

# Features / Specifications

- *ARRL Lab Test Procedures Manual* 
- *Understanding HF Receiver Specifications* (01:22 hr in) 
- Receiver Specs
  - Sensitivity
  - Specificity
    - 3rd order Dynamic Range
    - AGC response
    - Random Spurs



# What Else Will You Need ?

- Typically Needed:
  - Power Supply (usually good to get 23-25A)
  - Antenna(s) (wide variety of choices), Coax & Adapters
  - Mic, may or may not be included
  - CAT Interface Cable
    - USB cable (A-B) if rig uses standard USB for CAT and/or built-in soundcard (get one with ferrite suppressors)
    - RS-232 or proprietary connect to USB cable (avoid cheap/counterfeit Prolific drivers and go for one with FTDI chip)
  - Headphones

# What Else Will You Need ?

- Depending on features included, may need/want:
  - For FT8/FT4 if no built-in soundcard: soundcard interface
  - If no or limited antenna tuner built-in: a wide range external antenna tuner
  - If CW operator and radio does not include adjustable filtering you may want to added optional filters, typically not as important for SSB
  - Shack computer with CAT, logging, SDR control, external band display, etc. software
  - Headset mic or boom mic and foot switch

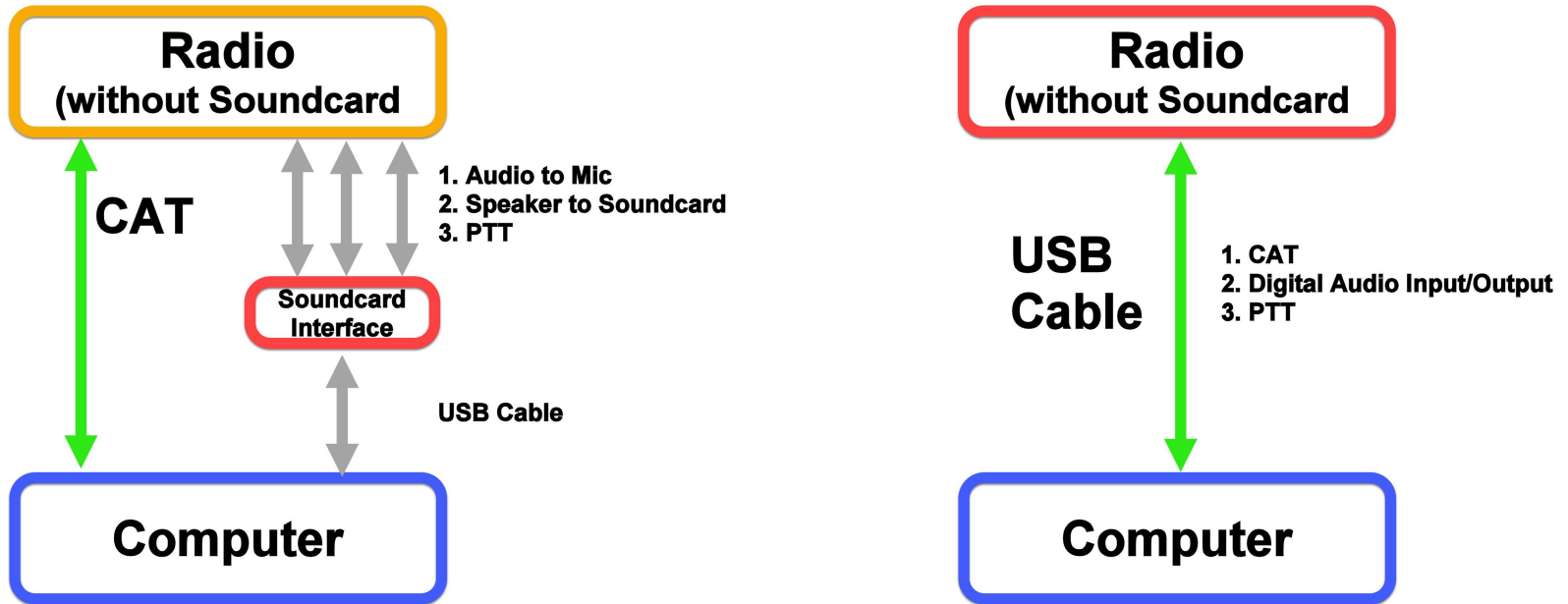
# What Else Will You Need ?

- Other shack accessories, may need/want:
  - CW paddles or key if want to operate CW
  - External CW Keyer (if radio does not have one or you want additional features- multiple memories, keyboard sending, etc.)
  - External Speaker
  - External SWR/Power Meter
  - Coax A/B Switch
  - Mobile mount
  - Carrying Case

# Computer ↔ Radio Interfacing

- Possible Computer ↔ Radio Interfacing:
  - CAT
  - Programming (Memories, Firmware Update)
  - Audio In/Out from Radio
    - Audio (with Sound Card in Computer)
      - Computer Speaker ↔ Radio Mic
      - Computer Mic (record) ↔ Radio Speaker
    - Virtual Audio (with Sound Card in Radio)
  - Accessories (tuner, rotator, etc.)

# Computer ↔ Radio Interfacing



# What Is CAT & Do I Need It ?

- CAT stands for **C**omputer **A**ided **T**ransceiver:
  - CAT allows you to control Frequency & Mode of rig using a computer program (Logging, Contesting, Digital, etc.)
  - CAT allows you to read Frequency & Mode info from rig and import it into a computer program
  - Earlier CAT interfaces used either RS-232 or TTL (Transistor-Transistor Logic) if TTL is used level convertor was usually necessary
  - Some early systems used proprietary interfaces and/or connectors



# What Is CAT & Do I Need It ?

- CAT Interfacing:
  - To use these earlier rigs with new computers that only have USB and no RS-232 (serial) ports you will need one of following depending on model:
    - USB to standard RS-232 Interface (2 gender styles)
    - Proprietary interface with USB output
  - Most newer radio simply use a standard USB (AB) ( I strongly suggest Ferrite suppressor style)



# What Is Sound Card Interface & Do I Need It?

- Sound Card Interface (for detailed info see [tiny.cc/ft8ft4](https://tiny.cc/ft8ft4)):
  - Used to share computer and radio audio streams
  - Used with Digital Modes software (RTTY, PSK, FT8, FT4, Slow Scan TV, etc.)
  - In addition to sound it may also function as PTT control
  - Some rig's have built in sound card interface & use the same USB cable used for CAT to provide connection



# What Is Sound Card Interface & Do I Need It?

- Sound Card Interface:
  - External Sound Card Interface- has sound card in it connects to computer via USB and rig via mic and speaker audio and PTT line (*Tigertronics Signalink*, *MFJ-1204* & *ZLP Electronics MiniProSC*)
  - Interface without sound card- connects to Computer via computer's internal or external sound card (often USB soundcard) and to rig via mic and speaker audio and uses rig's VOX or CAT control in lieu of PTT



# Computer ↔ Radio Interfacing

- Programming Only:
  - Most VHF/UHF radios do not have CAT, but they have Programming capabilities
    - Memories (upload/download to/from radio)
    - Cloning (2nd radio of same model to have same memories of 1st, requires no software or computer, direct radio-to-radio cable connection)
    - Software for programming (including some HF radios)
      - From manufacturer (only some manuf./models, free or paid)
      - From third party vendors ([RTSystems](#)®, also interface cable vendor)
      - Open Source ([CHIRP](#)®)



# Equipment Reviews & Testing

- *ARRL Lab Product Review Testing*
- eHam- *[www.eham.net/reviews](http://www.eham.net/reviews)*
- *Sherwood Engineering- Receiver Test Data*
- QRZ Reviews- *[forums.qrz.com](http://forums.qrz.com)*
- YouTube- *[youtube.com](http://youtube.com)*
- Individual mailing lists by brand on *<https://groups.io>* are great places to get support, news ,etc. on the radios you own
- Your “Elmer” or local radio club (see later slides)

# Equipment Reviews & Testing

- Some caveats on user reviewer sites-
  - Dissatisfied owners are quick to **complain**, but satisfied owners are not as likely to **compliment**
  - Owner Loyalty- once you have invested money in something you tend to view it overall positively
  - Sometimes owner dissatisfaction is based on improper use
  - Use of anecdotal information to judge quality

# Find an Elmer to Help

- An “**Elmer**”\* is someone who can help answer questions and avoid some pitfalls of the hobby. They can answer questions about what rig to buy, loan you an antenna analyzer, or when you’re having trouble understanding a particular concept.
- If you haven’t already, I suggest you find an Elmer.

\* The term Elmer first appeared in the March 1971 issue of QST. Rod Newkirk, W9BRD, called them “the unsung fathers of Amateur Radio.” He wrote that an Elmer is “the ham who took the most time and trouble to give you a push toward your license.” His personal Elmer had been Elmer P. “Bud” Frohardt Jr, W9GFF

# Find an Elmer to Help

- Where do you find an Elmer?
  - The first place you might look is the club\* you just joined and/or that provided your Tech licensing class.
  - Lots of the “old timers” are more than happy to help newcomers, and many clubs have formal “Elmering” programs.

\* Finding an Amateur Radio Club

- [www.arrl.org/clubs](http://www.arrl.org/clubs) ☞
- [www.qrz.com/clubs](http://www.qrz.com/clubs) ☞



# Find an Elmer to Help

- Nowadays, you might find your Elmer online. There are lots of websites and mailing lists that are geared towards helping people become better amateur radio operators.
- One common fallacy is that you can only have one Elmer, in fact many hams have multiple Elmers both in person and online



# Equipment Lists

- I have been putting together a spreadsheet of *Recent Models of AR Transceivers*
  - The spreadsheet is a work-in-progress
  - Many of the links are from *Universal Radio* website which conveniently keeps information on discontinued models, but unfortunately is in process of closing
  - I will continue to add additional models and further information links as time permits



# Equipment Lists

- Online Rig Lists & Resources
  - K8ZT- [www.k8zt.com/radios](http://www.k8zt.com/radios)



# Clones & Questionable Equipment

- There are a lot of clones and knock-off rigs available on the Internet
  - Some are perfectly good function wise, but may have other issues (especially for newer hams)
  - Other equipment is pure JUNK!

# Clones & Questionable Equipment

- Potential problems for new hams
  - Lack of Documentation (User Instructions)
  - Lack of software (drivers, not supported/recognized by other ham software, etc.)
  - Require extensive re-tuning, adjustment, etc.
  - Doesn't support USA band allocations/conventions/rules
  - Lack of other users familiar with product to help with potential problems

# Questionable Equipment- 10 M Radios

- 10 M Tech Phone Privileges are limited to SSB, so **10 M FM or AM Only Radios from “CB vendors” are often of no use!**
- “CB Vendor” 10 M radios with SSB can be used, but often favor CB type features- channelized, roger beep, squelch, no antenna tuner, no CAT interface, etc.



# Questionable Equipment To Avoid

- Wide variety of Cheap Amplifiers (often designed for illegal CB market)
- Amplified Microphones
- “Miracle” Devices
- Deals that sound too good to be true
- Sellers you don't feel comfortable with

# Used & Hamfest Shopping

- Finding Hamfests- [link](#)
- Use Equipment Listings
  - [eHam Classifieds](#)
  - [QRZ Swapmeet](#)
  - [QTH.com Swap](#)
  - [Facebook “Ham Radio for Sale”](#)
  - Local Club’s Newsletter
  - On-air “Swap & Shop” Nets – ask local hams

The screenshot displays the ARRL (American Radio Relay League) website. At the top, the ARRL logo is visible with the tagline "The national association for AMATEUR RADIO". A user profile for "Hello Anthony" is shown in the top right corner, along with options for "Log Out", "Your Favorites", "Edit your Profile", and "GO". A "Website Search" box is also present.

The main content area is titled "Hamfests and Conventions Calendar". On the left, a navigation menu includes links for "Clubs", "Collegiate Amateur Radio", "Donate to ARRL", "The ARRL Foundation", "Hamfests and Conventions Calendar" (which is highlighted), "ARRL Sanctioned Events", "ARRL at Home", "Recruiting & Outreach", "Volunteer Opportunities", and "Youth".

The "Hamfest and Convention Database" search interface is shown. It includes a search box with the following fields and values:

- Keyword: (empty)
- ZIP Code: 44224 (with a dropdown for "within 100 Miles")
- City: (empty)
- State: (empty)
- ARRL Division: (empty)
- ARRL Section: (empty)

Buttons for "Search" and "Clear" are located at the bottom of the search form.

Below the search form, a "Search for ARRL Hamfests and Conventions" section displays a list of results with map thumbnails. The visible results are:

- 02/21/2021 - CANCELED - MANSFIELD HAMFEST**  
Location: MANSFIELD, OH  
Type: ARRL Hamfest  
Sponsor: INTERCITY AMATEUR RADIO CLUB  
Website: <http://www.iarc.club>  
Learn More
- 03/07/2021 - CANCELED - WINTERHAM**  
Location: ERIA, OH  
Type: ARRL Hamfest  
Sponsor: Northern Ohio Amateur Radio Society  
Learn More
- 04/18/2021 - TRARC 49th Hamfest and Show**  
Location: McKeesport, PA  
Type: ARRL Hamfest  
Sponsor: Two Rivers Amateur Radio Club  
Website: <http://trarc.net>  
Learn More
- 07/10/2021 - Mansfield Mid-Summer Tr**

# Used & Hamfest Shopping

- Know what you want
  - Look at websites, catalogs & magazine ads ahead of time
  - Visit manufacturer's websites
  - Visit major vendors web sites
  - e-ham Reviews
  - Ask knowledgeable friends for advice



# Used & Hamfest Shopping

- Make a list of "to buys"
  - Know what it should cost and how available is it
  - Visit e-bay and various "prices realized" sites
  - Ask knowledgeable friends
- Alternative/Competing products choice is not if first available at reasonable price





# Used & Hamfest Shopping

- Understand What Effects Prices
  - Supply & demand
  - Its condition
  - Reselliability
  - Seller motivation
  - Value as collector's item vs. as an item to be used



# Used & Hamfest Shopping

## ● Physical Appearance & Condition

- Wear and tear
- Fit and finish
- Cleanness and discoloration
- Signs of tampering / modification
  - Missing or stripped screw heads
  - Extra holes in case
  - Relabeled Controls
  - Non matching knobs or connectors
- Signs of environment in which it was used or stored-
  - Rust/Oxidation
  - Mildew/Mold
  - Nicotine Stains
  - Overheating or heat damage (including smell)

# Used & Hamfest Shopping

- When poor outside physical condition can still mean a good working bargain
  - Good Electrical condition
  - Physical case damage, scratches, paint/finish damage
  - Satisfactory operational demonstration
  - Willingness of seller to provide returns
  - Poor cleaning (but underlying item in good condition)
  - Remember there could still be undetected issues and it will definitely affect resale price

# Used & Hamfest Shopping

- When poor electrical or operating condition can still mean a good bargain
  - It is a well known, easily fixed problem
  - Failure dependent on power source (bad battery in HT, etc.)
  - You or someone you know has ability to fix problems with much extra cost or bother
  - If you are looking for physical replacement parts for a good working unit you already own- case, knobs, accessories, etc.

# Used & Hamfest Shopping

- Ways to get best bargains
  - Package/Bundled, multiple item, etc. deals where you get a lot extras at typical price for unit alone
  - Knowing how to bargain
  - Trades
  - Being at right place at right time, knowing value of items & having sufficient amount of cash to close deal



# Used & Hamfest Shopping

- Extra Questions to ask before closing deal
  - Can they demonstrate that it works?
  - Is it returnable or “guaranteed”?
  - Will they provide contact info for after sell questions?
  - Is price negotiable & what type of payment will they take?




# Used & Hamfest Shopping

- Extra Questions to ask before closing deal
  - Do they have all the original accessories, cables, connectors, mic, manuals, packaging, etc.?
  - Do they have any complimentary items that you might make a combo/package deal on?



# Questions / Comments ?

View this slideshow and  
access all resources links at

*[tiny.cc/buyar](https://tiny.cc/buyar)* 

If you need a PDF copy click [here](#) 

Transceiver Spreadsheet [Link](#) 





# Contact Information

- Email- [k8zt@arrrl.net](mailto:k8zt@arrrl.net)
- Website- [www.k8zt.com](http://www.k8zt.com)



# Presentations

- If your club is interested in a online presentation I am currently offering multiple options, for a list visit

[tiny.cc/k8zt-p](https://tiny.cc/k8zt-p) 

- Email me if interested  
[k8zt@arrl.net](mailto:k8zt@arrl.net)

| <a href="https://tiny.cc/k8zt-p">This list- tiny.cc/k8zt-p</a> | Slideshow   | Video                                     |
|--|---|---|
| Amateur Radio Logging- ARRL Webinar                            | <a href="https://tiny.cc/arrl-log">tiny.cc/arrl-log</a>     | <a href="https://www">https://www</a>     |
| Choosing Your Ideal Callsign- QSO Today Expo 2021              | <a href="#">TBA</a>   | <a href="#">TBA</a>                       |
| Dx Engineering Interview by K3LR- K8ZT                         |   | <a href="https://www">https://www</a>     |
| Field Day in Social Distancing                                 | <a href="https://tiny.cc/fdsd">tiny.cc/fdsd</a>             | <a href="https://youtu">https://youtu</a> |
| FT8/FT4 Digital Modes  | <a href="https://tiny.cc/ft8ft4">tiny.cc/ft8ft4</a>         |   |
| Fun with Morse   | <a href="https://tiny.cc/fwm">tiny.cc/fwm</a>               | <a href="https://youtu">https://youtu</a> |
| Intro to AR Contesting   | <a href="#">TBA</a>   | <a href="#">TBA</a>                       |
| N1MM Contesting Software- Elmering Day                         | <a href="https://tiny.cc/n1mm-eln">y.cc/n1mm-eln</a>        | <a href="https://youtu">https://youtu</a> |
| Pandemic Ham Radio Activities An Opportunity to Grow- RATPAC   | <a href="https://tiny.cc/clubcovi">ny.cc/clubcovi</a>       | Jan 27, 20                                |
| QRP Amateur Radio  | <a href="https://tiny.cc/qar">tiny.cc/qar</a>               |   |
| QSLing In Digital World  | <a href="https://tiny.cc/qx3">tiny.cc/qx3</a>               | <a href="https://youtu">https://youtu</a> |
| Radio, Radio, Radio- 100 yrs of Commercial Broadcasting        | <a href="https://tiny.cc/rrradio">tiny.cc/rrradio</a>       | <a href="https://youtu">https://youtu</a> |
| <b>RATPAC Programs Listings</b>                                | <a href="https://tiny.cc/ratpac-list">ny.cc/ratpac-list</a> |   |
| RATPAC- Ham Radio- Online Meeting Resources                    | <a href="https://tiny.cc/hrmr">tiny.cc/hrmr</a>             | <a href="https://vime">https://vime</a>   |
| Software & Web Resources for Contesting                        | <a href="https://tiny.cc/gl-contest">ny.cc/gl-contest</a>   |   |
| State QSO Party Challenge                                      | <a href="https://tiny.cc/stqspc">tiny.cc/stqspc</a>         | <a href="https://youtu">https://youtu</a> |
| Technicians, Life Beyond Repeaters                             | <a href="https://tiny.cc/btech">tiny.cc/btech</a>           |   |
| Top Secret Techniques to WAS & DXCC                            | <a href="https://tiny.cc/ham50">tiny.cc/ham50</a>           |   |
| Youth in Amateur Radio   | <a href="https://tiny.cc/yiar">tiny.cc/yiar</a>             |   |



Software & Web Resources for Contesting by [Anthony Luscre, K8ZT](#)  
is licensed under a [Creative Commons  
Attribution-NonCommercial-ShareAlike 4.0 International License](#).  
Permissions beyond the scope of this license may be available at  
[www.k8zt.com](http://www.k8zt.com).