



Welcome to Ham Radio 201 New General / Extra Session

Sponsored by Bay-Net www.bay-net.org



Agenda

New Technician / New Licensee

- 8:00 Kickoff
- 8:15 VHF/UHF Gear - David
- 9:00 VHF/UHF Operating - George
- 9:45 Digital Radio- George

New General / Extra

- 10:15 HF Gear - George
- 11:00 HF Operating - David
- 11:45 Q&A
- 12:00 Wrap up

Bay-Net www.bay-net.org

Virtual Amateur Radio Club

> 400 “members” - groups.io

7 repeaters @ 2 sites

Linked Analog FM with IRLP

D-Star, Fusion, DMR

Events

Field Day

Antenna Shootout

BayCon

Urban Shield

Supports

American Red Cross

FEMA USAR TF 3

Radio Mala - Nepal

501(C)3 Non-profit

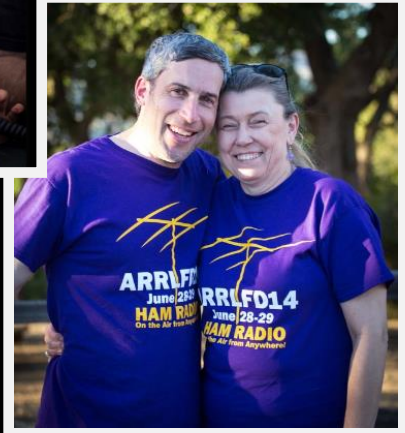
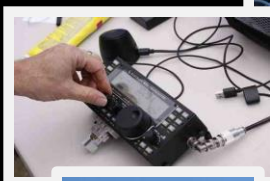
HELLO!

My name is

Bay-Net

Sharpie. TWIN TIP

K6SRA



Great Resources

- Ham Radio Workbench Podcast www.hamradioworkbench.com
- TX Factor  [www.tx factor.co.uk](http://www.txfactor.co.uk)
- The Doctor Is In www.arrl.org
- QSO Today podcast www.qsotoday.com
- Bay-Net website www.bay-net.org

BayCon 2020

Annual Bay-Net Radio Conference

February 8th - 9 AM – 5 PM

Plug-n-Play Tech Center – Sunnyvale



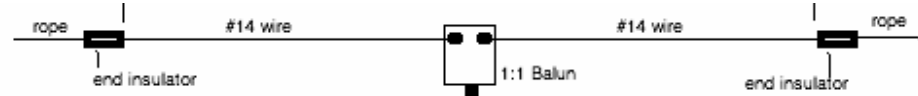
New General / Extra .. Gear George KJ6VU

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What's in a Station?

Antenna



Feed Line

Power Supply



Radio



Watt
Meter

Headphones
Microphone
Speaker



HF Radios

Good

\$650-\$1,000



Better

\$1,000-\$2,000



Best

\$2,000-\$4,000++



Standard features common to all radios
Frequency bands, Modes, Power output

So, what is the difference ???
Performance - Quality - User features

HF Portable / Mobile Radios

Good Universal Rig



- Same standard features as “base” radios
- Some w/ VHF & UHF
- Typically good / not great performance
- Much smaller
- Designed for mobile... good for portable
- Easy to haul around
- Can have a cramped user interface

Multi Purpose / Special Purpose Radios



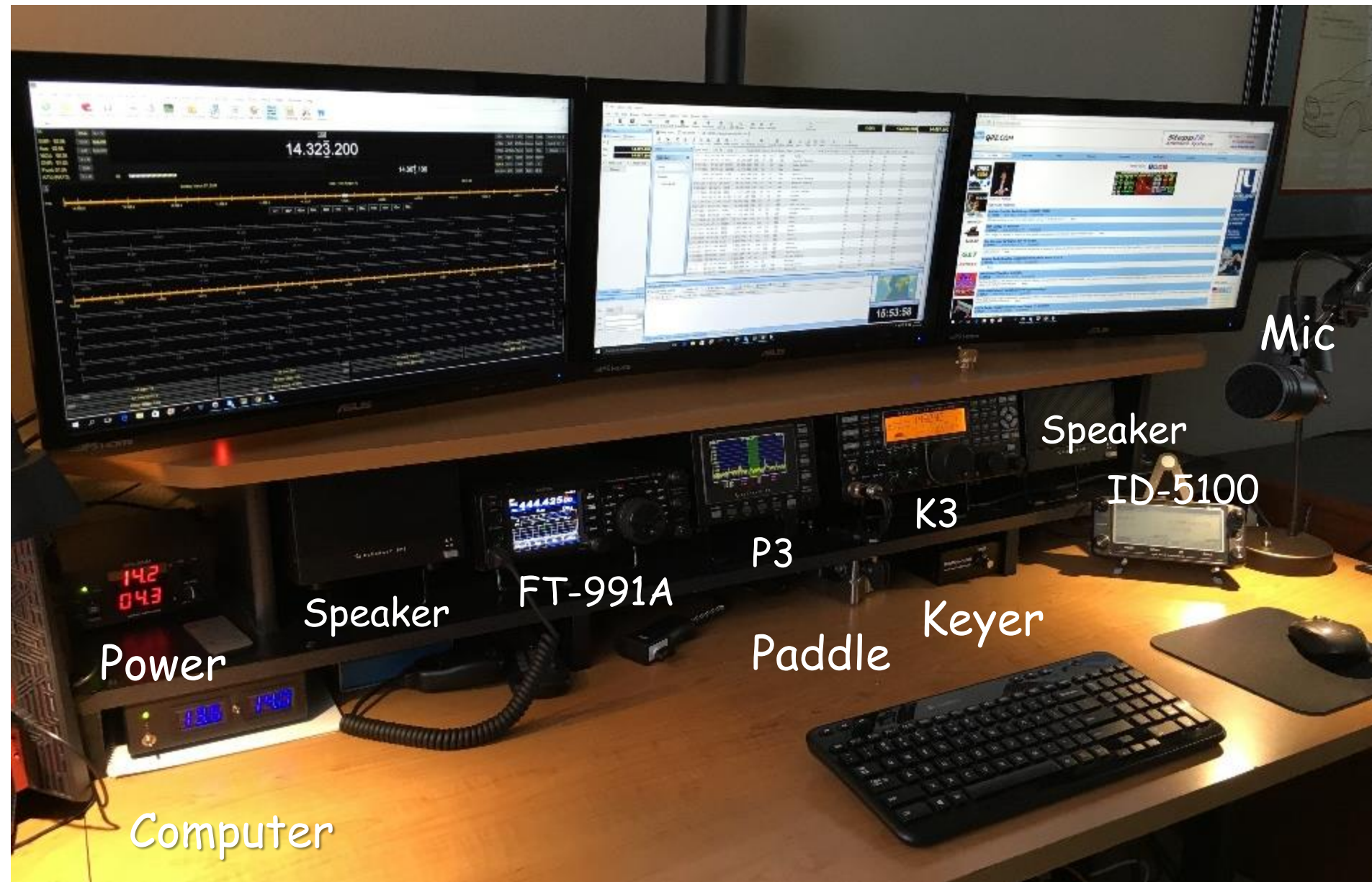
Icom IC-7100
HF, 6m, 2m, UHF
D-STAR
Mobile/Base config



Icom IC-7200
HF, 6m
Rugged
Easy to use



Yaesu FT-991A
HF, 6m, 2m, UHF
System Fusion
Part time spectrum display



Mic

Speaker

ID-5100

K3

P3

Keyer

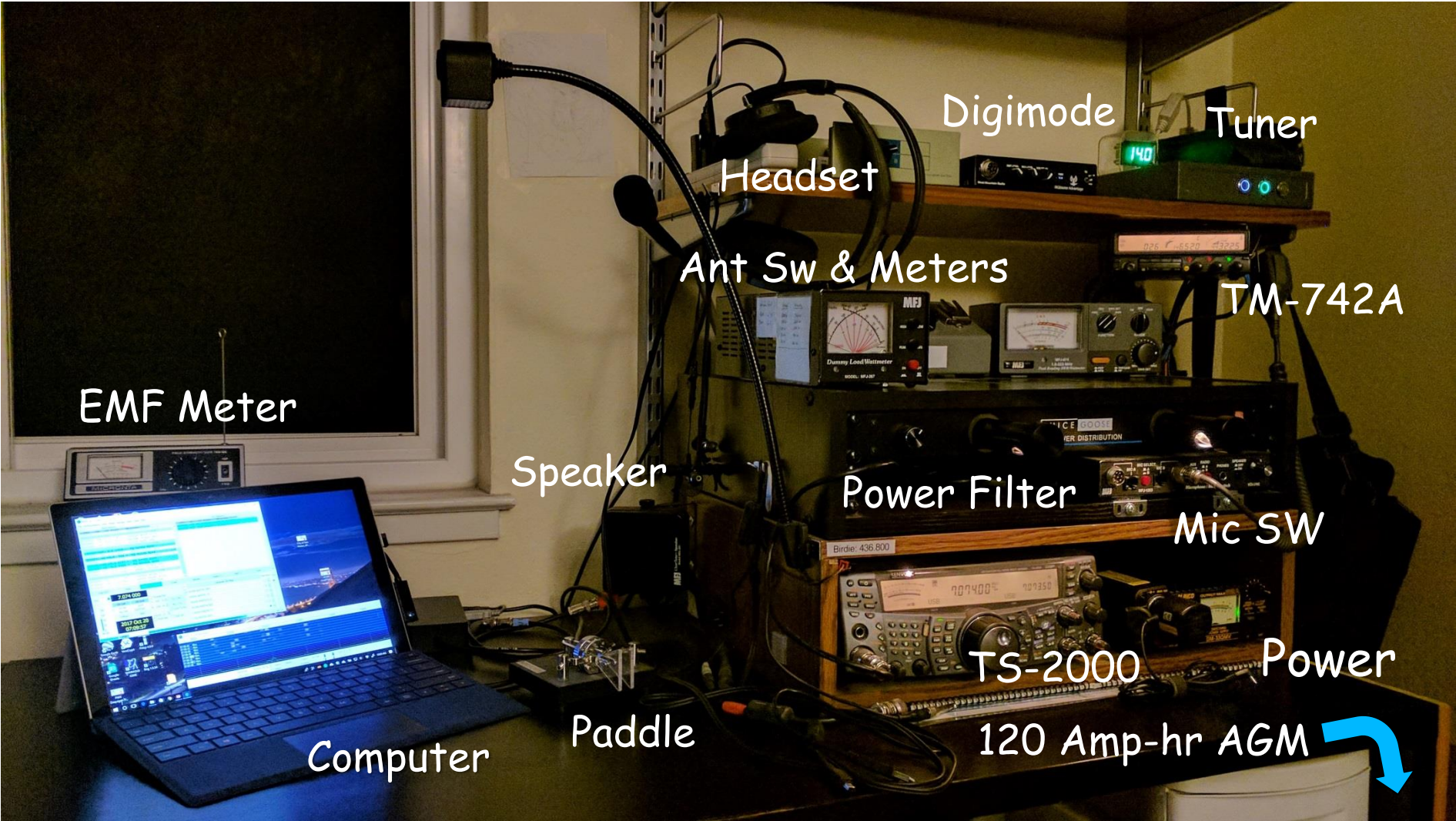
Paddle

FT-991A

Speaker

Power

Computer



EMF Meter

Digimode

Tuner

Headset

Ant Sw & Meters

TM-742A

Speaker

Power Filter

Mic SW

TS-2000

Power

Computer

Paddle

120 Amp-hr AGM



Buy a Used Radio

- A 20 year old radio is still a good radio
- Price range: 50% to 75% of new pricing
- Ebay - Craigslist - Local operators
- Try before you buy if you can - and test it



NEW LISTING Kenwood TS-430S solid state HF t
meters *Nice*

\$360.00
or Best Offer

11 Photos



KENWOOD TS-530S HF
Filters)

\$650.00

Buy It Now

Free shipping

🔥 23 Watchers



Yaesu FT
OTHER H

\$389.99

Buy It No

🔥 22 Wa



Icom IC 751A Hf Amateur Radio Transceiver
AMATEUR RADIO GEAR

\$249.99

Buy It Now

🔥 26 Watchers

Portable Low Power Radios



\$900+



\$750



\$300

- Optimized for portable use
- Backpacking / hiking / travel
- Battery operated
- Wide range of performance and features
- Wide price range

Advanced Radio Features Typical On Modern Mid-Range Radios

- Performance
 - Digital signal processing
 - Automatic notching
 - IF shift
 - More sensitive / selective
 - Lower noise Rx
 - Better Tx audio processing
- Spectrum display / waterfall display
- Antenna Tuner
- Better Rx filters
- Keyer
- CW / RTTY / PSK decode

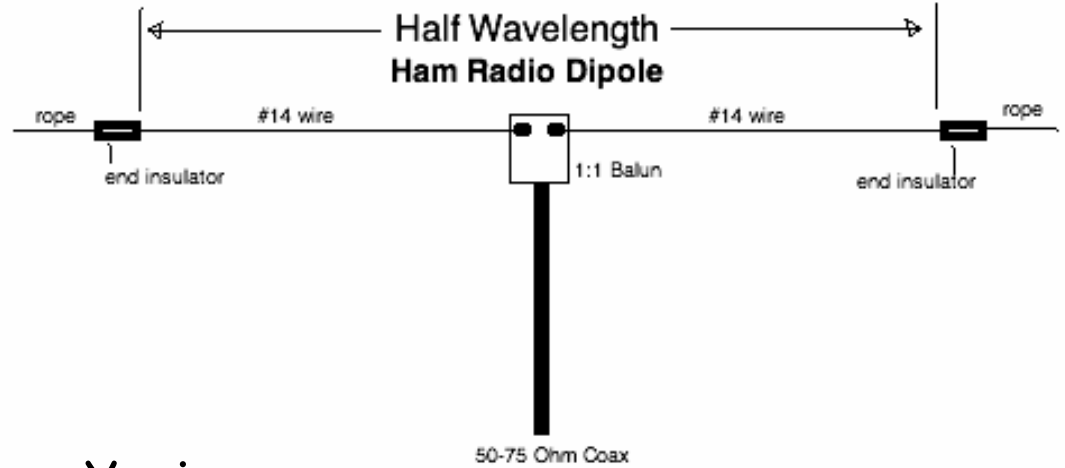


Typical Antennas

Vertical



Wire Dipole



Yagi



Feed Line & Connectors

Cable	Attenuation @ 144 MHz	Attenuation @ 440 MHz	
LMP-400	1.5	2.1	Good
RG-213	2.3	3.1	OK
RG-8X	3.1	4.1	OK
RG-58	4.1	12	Bad
RG-174	10.1	20	Dummy load

**Makes less difference on HF
Stick with RG-213 or RG-8X**



Connectors

N (Best)



BNC (Good)



UHF PL-259 (OK)



Accessories



SWR/Watt Meter



Computer Interface



Headset



External Speaker



Desk Mic

Power Supply

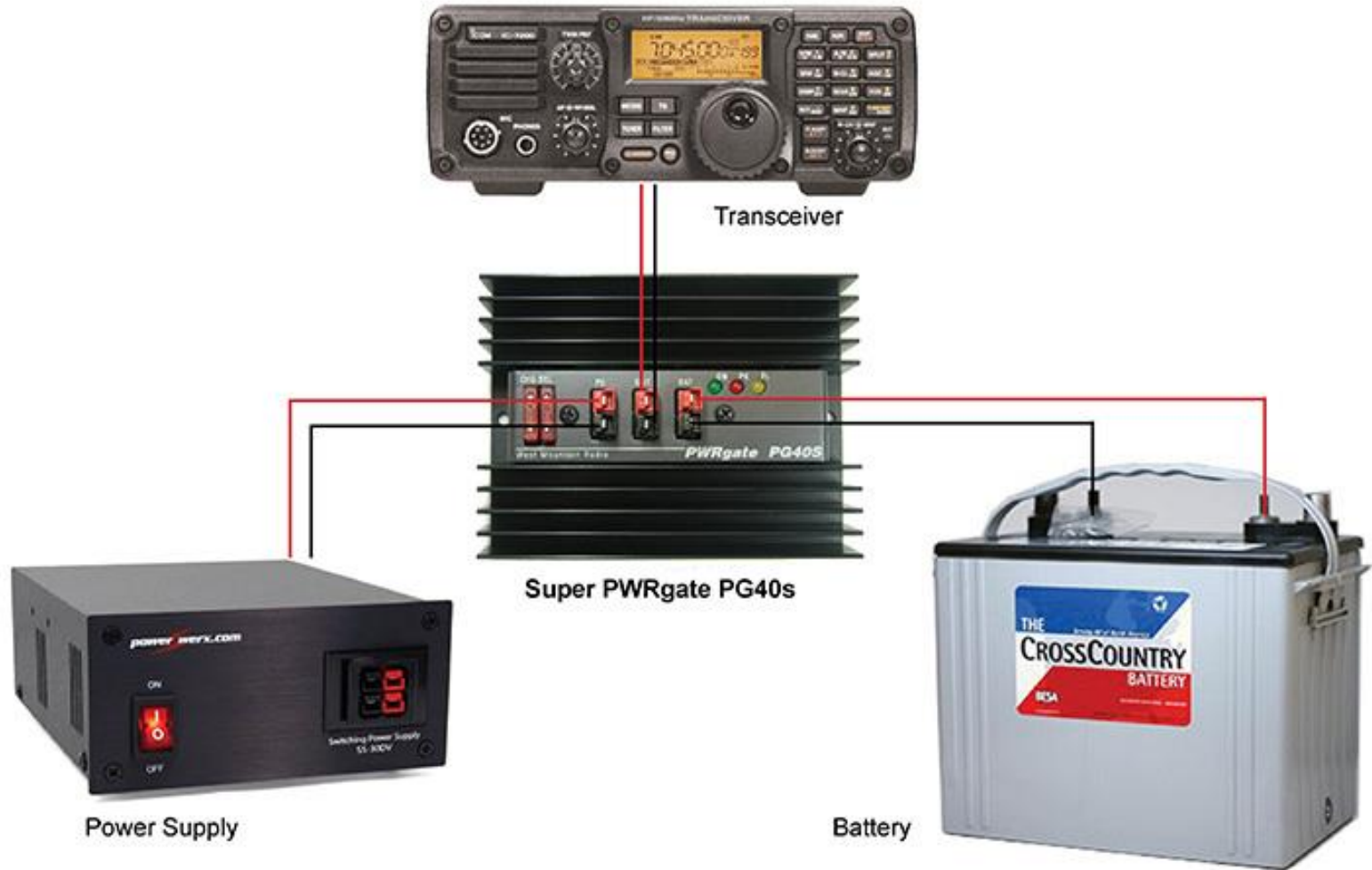


- 13.8 VDC
- 35 Amps



- Fused power junction

Battery Power



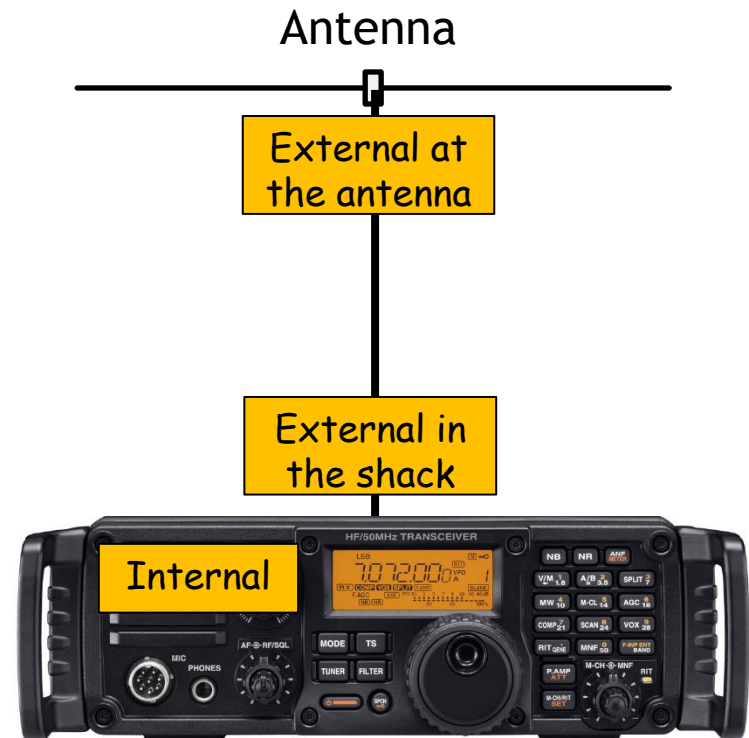
Antenna Tuners

Antenna tuner, a matchbox, transmatch, antenna tuning unit (ATU), or antenna coupler...

- Connected between a radio and its antenna
- Improves power transfer by matching impedance of the antenna to the radio
- If you have a resonant antenna you don't need a tuner

Tuner types

- Internal vs external
- Manual vs auto tuner
- Balanced vs unbalanced



Antenna Tuners

Internal Tuners



Elecraft K3

Max 10:1 SWR range



Icom FT-991A

Max 3:1 SWR range

Up to 150 Ohms

External Auto Tuner



External Manual Tuner



Tool Kit



Antenna Analyzer



Digital Volt/Ohm Meter (VOM)



In-Line Volt / AMP Meter



Watt Meter

Soldering Iron & Hand tools



PowerPole Crimper

Parts Kit

- PowerPole Connectors
- Fuses
- Coax adapters
- Resistors
- Capacitors
- Coax connectors
- Scotch 33+ Tape
- Rescue Tape
- Solder
- Zip ties
- Lugs



ARRL Handbook

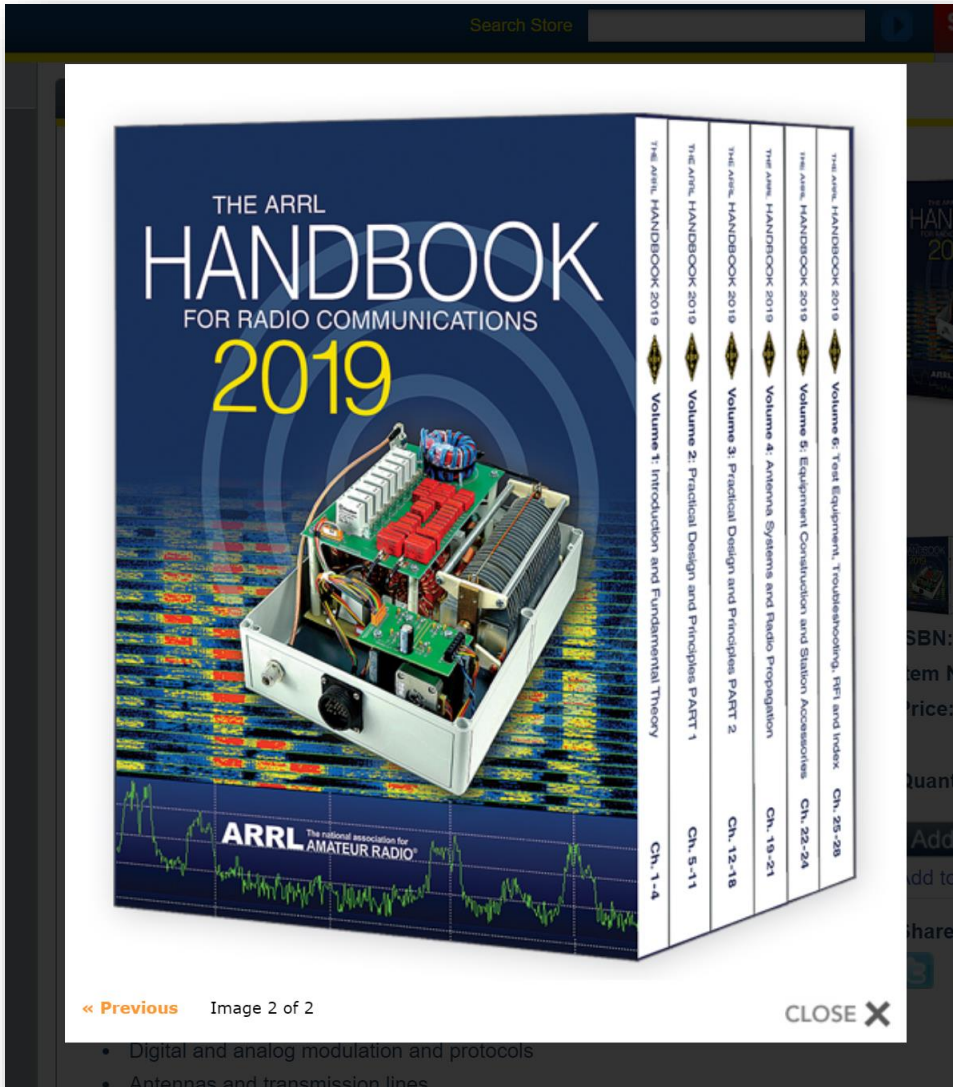
Fundamental Theory
Electrical Fundamentals
Analog Basics
Digital Basics

Practical Design and Principles
RF Techniques
Computer-Aided Circuit Design
Power Supplies
Modulation
Oscillators and Synthesizers
Mixers, Modulators and Demodulators
RF and AF Filters
Receivers
Transmitters
Transceivers
Telemetry and Navigation
DSP and Software Radio Design
Digital Modes
RF Power Amplifiers
Repeaters

Antenna Systems and Radio Propagation
Propagation of Radio Signals
Transmission Lines
Antennas

Equipment Construction and Maintenance
Component Data and References
Construction Techniques
Station Accessories
Test Equipment and Measurements
Troubleshooting and Maintenance
RF Interference

Station Assembly and Management
Safety
Assembling a Station



Radio Advice...

- Get a good quality / basic radio to start
 - Consider mobile radios
 - You will want to upgrade later
- Do NOT start with a QRP radio
- Any antenna is better than none
 - Dipoles and verticals are good starter antennas
 - Get the antenna as high as possible
- Get a CW filter if you plan on operating CW
- Invest in a good quality set of accessories and tools

10 Things You Should Do... In your 1st year

1. Set up your HF station
2. Join a local club ... and Bay-Net !
3. Register for Logbook of the World
4. Work a contest
5. Get a copy of the ARRL handbook
6. Try digital modes on HF
7. Assist with organizing a Field Day event
8. Attend the Maker Faire (or Hamvention)
9. Build a wire antenna
10. Operate HF mobile or portable