

WHERE DO I GO FROM HERE?

Radios, Antennas, Accessories, Personal Items, & More



WH-711 WH-711C WH-712 WH-713 WH-718 WH-719



CE



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Presented by Carl Leon, N7KUW, with 25 years of amateur radio experience and extensive experience in commercial radio, also supports VHF and UHF radio voice communications for King County Search & Rescue, and is a member of Seattle Auxiliary Communications Service (ACS). Carl also co-founded a non-profit corporation that provides 2-way radio support to educational, charitable, and civic organizations including Washington Special Olympics. Carl has completed the FEMA Communications Unit Leader (COML) course, and the Department of Homeland Security Communications Unit Technician (COMT) and Auxiliary Communicators (AUXCOM) courses.

Some Broad Radio Categories

- Handheld
 - Small, portable, light weight
 - Easily transported
 - Use much less power (battery)
- Mobile
 - Much higher transmit power
 - Better audio (volume & quality)
 - Easier to use controls and displays
- Amateur
 - Field programmable – frequency, tone, power
 - Very wide receive capability (“DC to daylight”)
 - Multi-band capability
 - Only legal on amateur frequencies
- Commercial
 - Less susceptible to intermod
 - Better selectivity, less sensitive to de-sense
 - Some are much more rugged
 - Legal on business, public safety, and amateur

DE-SENSE

When a nearby powerful transmitter totally overwhelms your receiver.

For example, you are parked beside another vehicle, you both have mobile ham radios and are both tuned to the same repeater. The person in the other car is talking on the repeater, but you can't hear him on your radio.

Or, two of you are sitting at the same table with handheld radios, same situation. The other person is transmitting, talking on the repeater and you can't hear him on your radio.

SOLVING DE-SENSE

- USE LOWEST POWER POSSIBLE (ALWAYS)
- ANTENNA SEPARATION
 - Free space attenuation is about 6db (or about 75%) every time you double the distance between antennas.
 - 10 feet of vertical separation is equal to 40 feet of horizontal separation. At 150 MHz that provides about 35 db of isolation.
- WIDER FREQUENCY SEPARATION

BUT WE'RE ON DIFFERENT BANDS

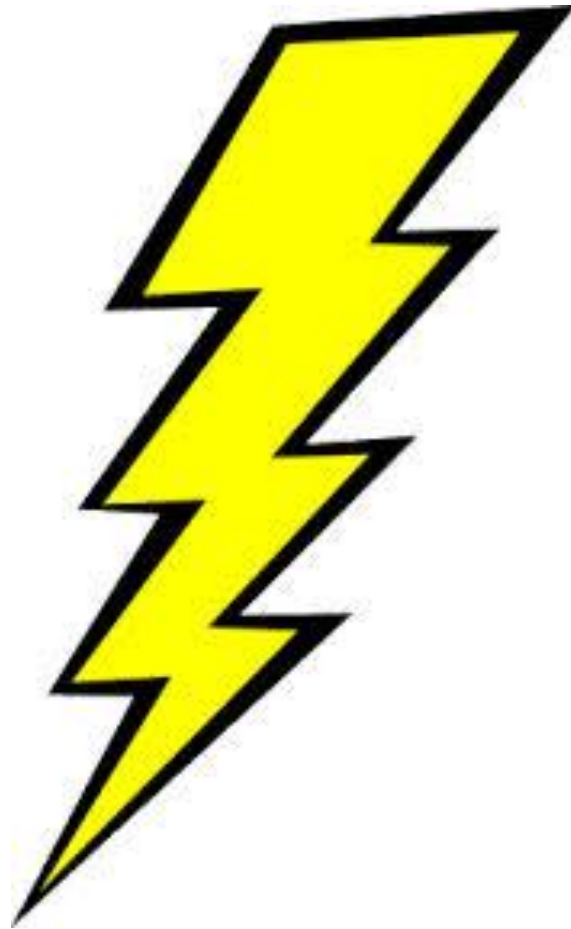
- Amateur UHF (70 cm) is roughly the third harmonic of Amateur VHF (2 meter).

$$147.80 \times 3 = 443.40$$

- Intermod products are very complex calculations. For example, if we have 146.36, 448.55 and 467.55 all transmitting at the same time, there are 72 3rd, 5th, 7th and 9th order harmonics ranging from 70 MHz to 1.7 GHz

Again, lowest possible transmit power and maximum possible antenna separation are your solutions.

A QUICK LOOK AT (DC) POWER



Battery Power Consumption

- Wouxun Handheld
 - On, idle 0.02 amp
 - RX low volume 0.09 amp
 - RX high volume 0.20 amp
 - TX low power 0.55 amp
 - TX high power 1.50 amp
- Kenwood TM-V71A Mobile
 - Off 0.02 amp
 - On, idle 0.58 amp
 - RX low volume 0.60 amp
 - RX high volume 0.70 amp
 - TX low power 2.75 amp
 - TX high power 7.40 amp

BATTERY CAPACITY

- Rated in Amp Hours (or milli-amp hours)
 - Can't totally deplete – figure 60% of rated capacity
 - If draw down faster than rating plan, figure 90% of the previously calculated 60%.
 - Example: a 7.5 amp hour gell cell
 - 60% = 4.5 amp hour and 90% of that = 4.05 amp hour
 - Example: an 80 amp hour car battery
 - 60% = 48 amp hour and 90% of that = 43 amp hour

(A quick & conservative estimate is 50% of rated capacity)

HOW LONG WILL MY RADIO RUN?

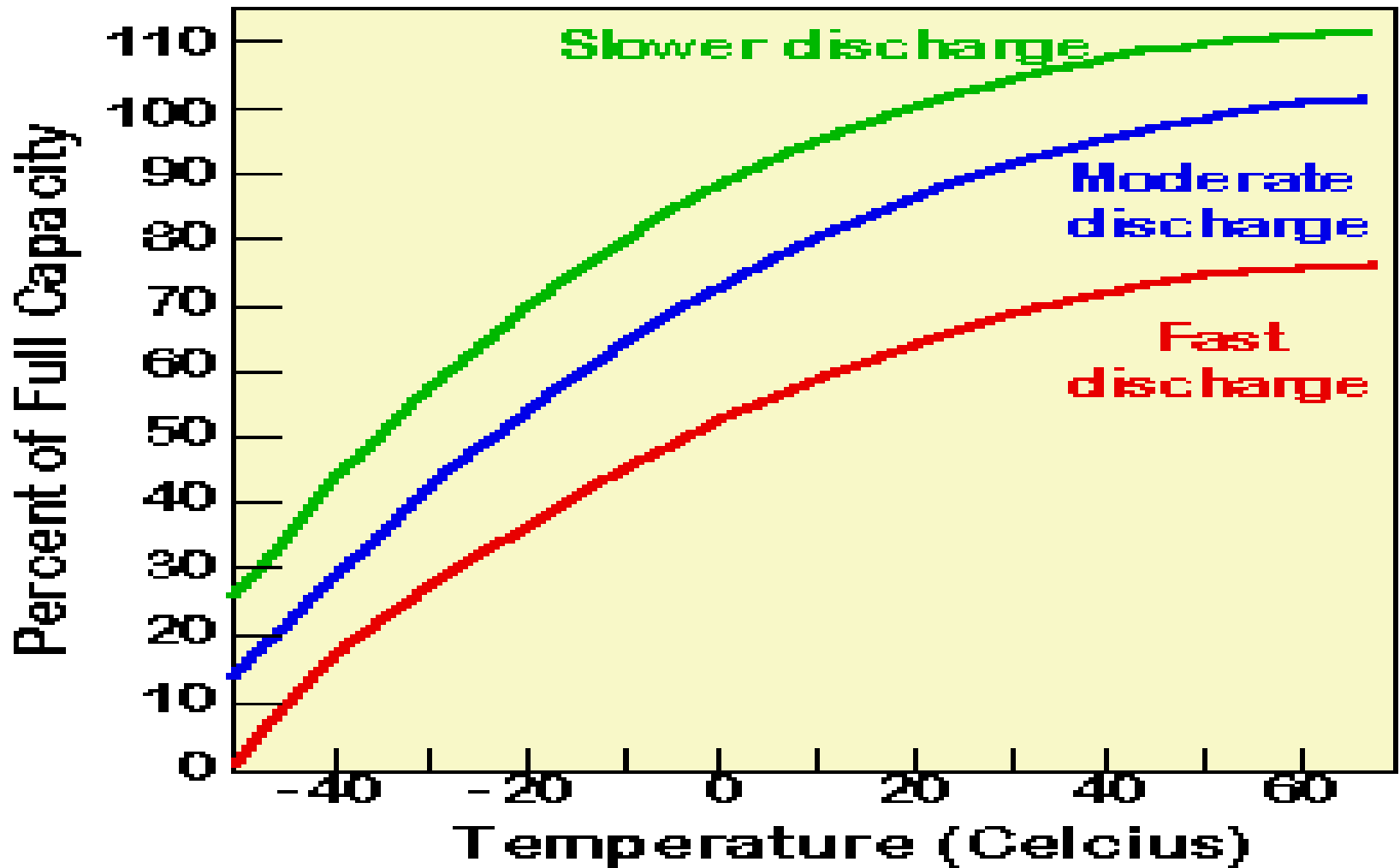
Assume higher than normal radio traffic – let's use 65% receive, 10% transmit and 25% idle (most HT batteries are rated at 5%, 5% and 90%)

	V71 hi	V71 low	Wouxun
1700 mAh			3.6 Hrs
7.5 mAh	2.5 Hrs	4.8 Hrs	16 Hrs
80 Ah	27.2 Hrs	51.3 Hrs	171 Hrs

So the HT will run approximately 3 times longer than the mobile radio on the same sized battery given the same transmit power & usage pattern.

10% transmit is only 6 minutes per hour! And in an emergency situation, it is not realistic to expect even 25% idle time.

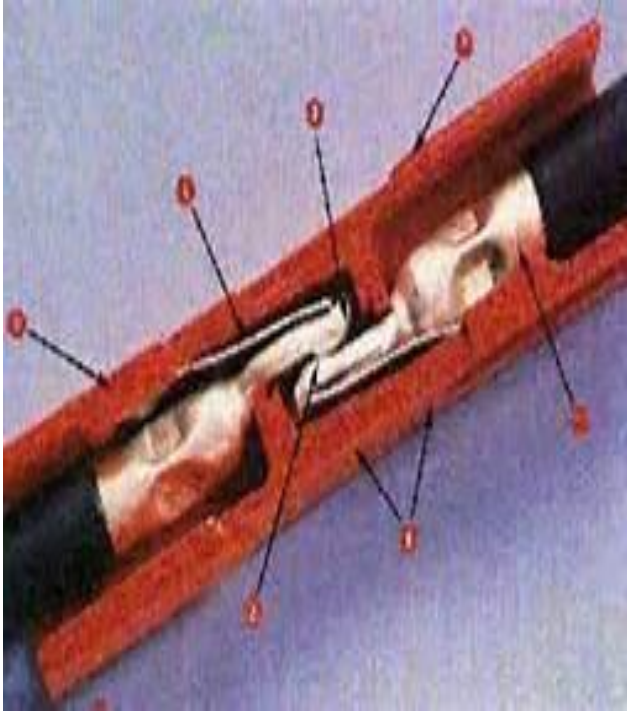
BATTERY CAPACITY IN PRACTICE



Sources of Emergency Power

- STORAGE BATTERY
- GENERATOR
- SOLAR
- HUMAN GENERATED
- MOTOR VEHICLE
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CONNECTIONS THAT WORK TOGETHER

THE ANDERSON POWER POLE

ADVANTAGES

- Has become an Amateur EMCOMM standard
- Can be plugged and unplugged countless times
- Polarity easy to see and maintain
- Little danger of short in a dry environment

DISADVANTAGES

- Requires specialized crimpers and parts
- Crimping technique requires some training or practice
- Supplies not readily available locally
- Connection does not positively lock
- Connection not waterproof

Radio Summary

- Many variables, pick based on your specific needs for your specific situation (mobile, handheld, etc.)
- Environmental considerations – some radios are rated for wet/moist environments.
- Accessories – external power, external antenna adapter, spare battery, manual for the radio.

IT'S ALL ABOUT THE ANTENNA



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BASIC ANTENNA RULES

1. Use the best antenna possible
2. Get it as high as possible
3. Keep it away from other antennas
4. Remember RF exposure safety requirements.
5. Have the proper adapters/connectors.

Beams can help, especially when receiving and for reducing multipath.

Speaker-microphones and the Statue of Liberty

Safety and Security

TRAINING or DISASTER

New or Rarely Practiced Activities

New or Rarely Visited Locations

May be Hazardous Locations

Likely to be Unsecured Locations

DISASTER

Likely to be Hazardous Locations

Panicked People and General

Disorder

Can You Deploy? – personal safety, family, property

Keep Yourself Safe – don't become a casualty and a liability

Think About What You Do – Is it Safe?

Ask For Help – If you have any doubt, ask for advice or assistance

Pay Attention to What Others Do – Is it Safe? Speak Up

Heed Warnings from Others – Stop, Listen, Adjust

JUST A FEW THINGS TO CONSIDER:

Cold/Wind/Rain – Hypothermia

Sun/Heat – Heat Exhaustion

Dehydration

Cuts, Scrapes, Bumps, etc

Head and Eye Injuries

Guy Wires and Stakes – Tripping

Free Standing Antenna Masts – Injury from falling mast

Preparing for radio operations

Recommended radio supplies from the ARES Field Manual:

- Toolbox
- Electrical and duct tape
- Soldering iron and solder
- Safety glasses
- VOM
- Additional radios
- Digital gear
- Microphones
- Headphones
- Power supplies, chargers
- RF Connectors
- Antennas with mounts
- Patch cords
- SWR bridge
- Extra coax
- Extra batteries

Personal preparation

Be prepared to live off your own resources, carried in your “go kit,” for the duration of the deployment. This includes food, water, replacement clothing, medical supplies, and so on.

Personal preparation

Recommended personal supplies for a 72 hour go kit from the ARES Field Manual:

- Snacks
- Liquid refreshments
- Throat lozenges
- Aspirin
- Prescriptions
- Toilet articles
- First aid kit
- Message forms
- Log books
- Shelter (tent and sleeping bag)
- 3 day change of clothes
- Foul weather gear
- 3 day supply of water and food
- Portable stove; mess kit with cleaning kit
- Flashlight
- Batteries
- Candles
- Water proof matches
- Alarm clock

For More Information

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Written notes with detailed info

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