

# The end of the world

- That seems to be when ARES will be called on!
- Exception: SWUPHD, yea Steve Rossberg!
- Then we will REALLY be needed.
- All regular communication systems will be non-operational. Internet down!!
- No electricity, no gasoline
- Biggest issue will be be POWER.

# Batteries

- Batteries are where our radios get their power from.
- Types
  - NiCd, NiMH
  - Li Ion, Polymer (many chemistries)
  - Primary (AA's. etc)
  - Lead acid (many pkg types)
  - Silver

# Lead acid

- My favorite, bullet proof, widely available (cars). Remember it is the  $E o t W$
- Rechargeable
- High capacity (lots of amps, ~100Ahr)
- Abt 2.2 V/cell
- '12' V common

# Capacity

- Measured in Amp Hours (Ahr)
- E.G. 100 Ahr battery will supply 100 A for 1 hour (really not true)
- Or 10 A for 10 hrs
- Or 1 A for 100 hrs (truer)
- Capacity depends on rate of discharge
- Don't discharge more than about half capacity!
- 80% remaining is better

# Deep Cycle Battery

Cap Min 25 A	Cap Min 75 A	Cap Ahr 5 hr	Cap Ahr 10 hr	Cap Ahr 20 hr	Cap Ahr 100 hr	E kWhr 100 hr rate
140	36	70	78	85	94	1.13
175	45	85	97	105	117	1.4
200	51	95	106	115	128	1.54

# Charging

- 1/10 C is good. For eg 100 Ahr, max 10A
- Finish V abt 13.8/14 V
- Float at 13.8 V
- Standard DC supply OK, battery charge current will auto 'trickle' once 13.8 is reached, that is no gradient
- Solar, generator gas/wind, hand

# Power conserving radios

- IC-703 HF/6 only, built in tuner, 10 W, hot Rcvr. No longer made. Can be used with amplifier, e.g. HR50
- FT-817, HF/VHF/UHF, no tuner, 5W, use with HF and VHF amps
- KX-3, HF (15W)/VHF(3W), built in tuner, KXPA100 W amp/tuner available
- Any HT and VHF amp

# Radio Example specs

- My IC-706, 100W @ 13.8V:
  - Xmit 20 A
  - Rcv 1.8 – 2.0 A
- My TM-V7A, 50 W @ 11.7-15.8V
  - Xmit 11 A (VHF) 10 A (UHF)
  - Rcv 1 A



# Radio KX-3

- KX-3 40M Dummy load
  - Rcv light on 200mA, off 175mA
  - Xmit 15 W 2.54 A
  - 5 W 1.13 A
- Assume 20% xmit 80% rcv
  - $175 \times 0.8 + 2.6 \times 0.2 = 0.66\text{A}$
  - For 17Ahr batt  $17/0.66 = 26$  hrs

# Radio IC-706

- Rcv 1.5 A
- Xmit (15 W to dummy load) 7.8 A
- Assume Xmit 20% Rcv 80%
- $1.5 \times 0.8 + 7.8 \times 0.2 = 2.76 \text{ A}$
- $17 \text{ Ahr} / 2.76 = 6 \text{ hr}$
- $26 \text{ hr} / 6 \text{ hr} = 4.3 \text{ X longer for KX-3}$

# Power conserving approach

- Use A low power consuming radio and separate amp that can be switched in when needed.
- Use gain antennas when possible.
- Measure actual power consumption in various modes
- Know your likely run times

# The computer issue

- Most older computers use 19 V DC
- Some 12 V to 19 V adaptors are available
- 12 V inverters => 120 VAC and wall wart BUT inverters are noisy
- Some 'book type' computers now run on 5V DC (2-3A) e.g. Nextbook. Make up DC cable
- Digital is power hungry so minimize use

# Power supplies

- Use AC to DC when possible
- Some power supplies can trickle charge battery when AC available then switch to battery when ac is not available e.g. Samlex 1223BM-230
- PowerGate (TM) performs this function as well
- Some PSs now provide 5 VDC for cell phones or notebooks

# Battery Booster

- Switching supply
- Takes low Voltage and boosts it up to 13.8 V
- MFJ-4416B
- N8XJK from TGE
- Low V warning & cutoff
- Really essential for EMCOMM and E o t W

# Ammeter

- Most VOMs, DMMs have current measuring capability
- Usually 10 A max
- Make inline adapter
- Check that your radio's consumption differs from specifications

# Questions/Help?

- I'm available most times for questions or other help
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