# Small Portable HF Station

SARA Monthly Meeting

2/3/2009

# Why a “small portable HF station”?

- Lower-cost first station
  - More basic, less frills, fewer bands, less power
- Portable second station
  - Emergency HF station
  - Vacation travel (incl. RV or vacation home)
- Contesting or DXpedition
- Fun camping or hiking station
  - HF from mountaintops

# What do such stations look like?

- Can be anything that meets the ham's interests or purpose


# Typical tradeoffs

- Packaging
  - Hard case, soft case, backpack
- Output Power
  - QRO vs QRP tradeoffs (emergency use vs “fun”)
    - No “excuses” in an emergency, go QRO
    - Some hams think “life is too short for QRP” even in a non-emergency, other hams think of it like hunting as a past-time (miles/watt records)!
  - Power Supply (external vs internal sources)
- Weight
  - mobile, portable, briefcase/backpack
- Just “portable” or self-contained “go-kit”

Miles per watt records

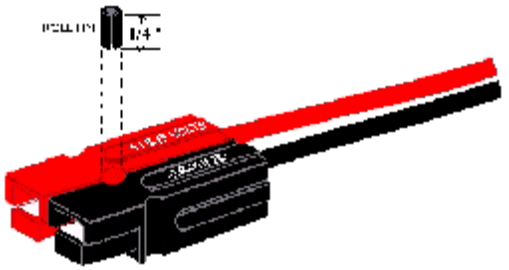
| Band | Award# | Awardee | Pwr | Other Station | His Pwr | Miles | MPW | Mode | Date |
|---|---|---|---|---|---|---|---|---|---|
| 1.8 MHz | #1799 | W8DIZ | 4mW | N4ROA | 100mW | 202 | 50,500 | CW | 001221 |
| 3.5 MHz | #1122 | AA2U | 613uW | CH9ASJ | QRO | 522 | 851,549 | CW | 880203 |
| 7 MHz | #1481 | AA4XX | 221uW | KA3WTF | 5 | 452 | 2,045,249 | CW | 951226 |
| 10 MHz | #914 | AA2U | 480uW | KW9O | QRO | 774 | 1,612,500 | CW | 841005 |
| 14 MHz | #979 | AA2U | 80uW | N4RM | QRO | 1,294 | 16,175,000 | CW | 840714 |
| 18 MHz | #1707 | KJ5TF | 5mW | VE3MFN | 50 | 908 | 181,600 | CW | 991221 |
| 21 MHz | #1455 | G0IFK | 39.9uW | K1RM | 5 | 3,217 | 80,626,566 | CW | 910519 |
| 24 MHz | #1709 | KJ5TF | 12mW | CO8LY | QRO | 1,531 | 127,583 | CW | 000203 |
| 28 MHz | #1178 | K7IRK | 6uW | WA6YPE | QRP | 1,310 | 218,333,333 | CW | 891025 |
| 50 MHz | #1149 | JO1XWH | 4W | JH1MBQ | .05uW | 6.71 | 134,200,000 | AM | 890503 |
| 144 MHz | #1177 | OK1DKW | 160mW | OK1OFK | QRO | 14 | 87,500,000 | SSB | 870620 |
| 1296 MHz | #894 | KF4JU | 150mW | W4ODW | QRO | 346 | 2,306,670 | CW | 840429 |
| 5760MHz | #1550 | W1VT | 155uW | WB1FKF | QRO | 37 | 238,700 | SSB | 960622 |
| 10 GHz | #879 | VK4ZSH | 1MW | VK4ZNC | 1MW | 124 | 124,000 | FM | 780414 |

# What's in the kit?

- Power source
  - batteries or power supply
- Radio
  - Size, weight, features, bands
- Accessories
  - Mike, headphones, speakers, cables, SWR meters, connectors, cables, tools
- Antennas (almost limitless subject)
- Manuals and references
- Computer (laptop or netbook, optional)

# Power Sources

- Most ham equipment is designed to operate from 13.8VDC (car battery) internally
  - Anderson power pole connector system now “standard” amongst hams
  - NiMH/LiH packs may also be available, but usually less than 13.8VDC
    - Obtain AA battery case/pack for easier replacement when HRO isn’t handy
    - Reduced power operation
  - Gel cells are lighter weight (and less operating duration) than lead-acid batteries
  - Lead-acid batteries commonly available
- Built-in or external AC power supply



# Radio

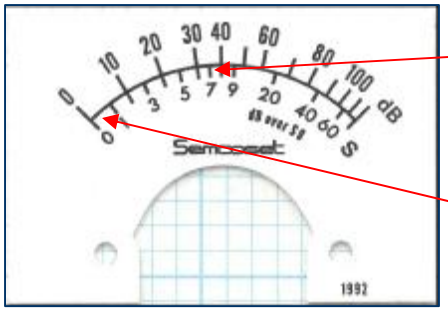
- Compact QRO Transceiver
  - Typically 100 watts
  - Usually all HF bands (160-10M/6M)
    - May or may not have VHF/UHF bands
    - Usually do not have the best receiver sections
    - May not have a built-in antenna tuner
  - May not have AC power supply option
  - More limited features versus “base station” or “contest” transceivers
  - Weight 5-7 lbs
  - Cost range $500-1000

# Radio (cont)

- QRP Transceiver
  - Typically 2-10 watts
  - May be band limited or multi-band (160-10M/6M)
    - Often does not have VHF/UHF bands
    - A select few actually have “contest” quality receiver sections
    - Usually does not have a built-in antenna tuner
  - Rarely has AC power supply option (though “wall wart” can suffice)
  - More limited features versus “base station” or “contest” transceivers
  - Weight 1-3 lbs
  - Cost range $300-700

# Radio (cont)

- QRO
  - System weight: 10-25lbs
  - Power: lead acid/AC supply
  - TX signal strength: 10-13dB (2 S-units) better
  - Higher current means bad SWR/failure can result in greater damage
- QRP
  - System weight: 3-10lbs
  - Power: Alkaline/Gel cells
  - Longer operating time for given power
  - Cables and antennas can also be lighter weight



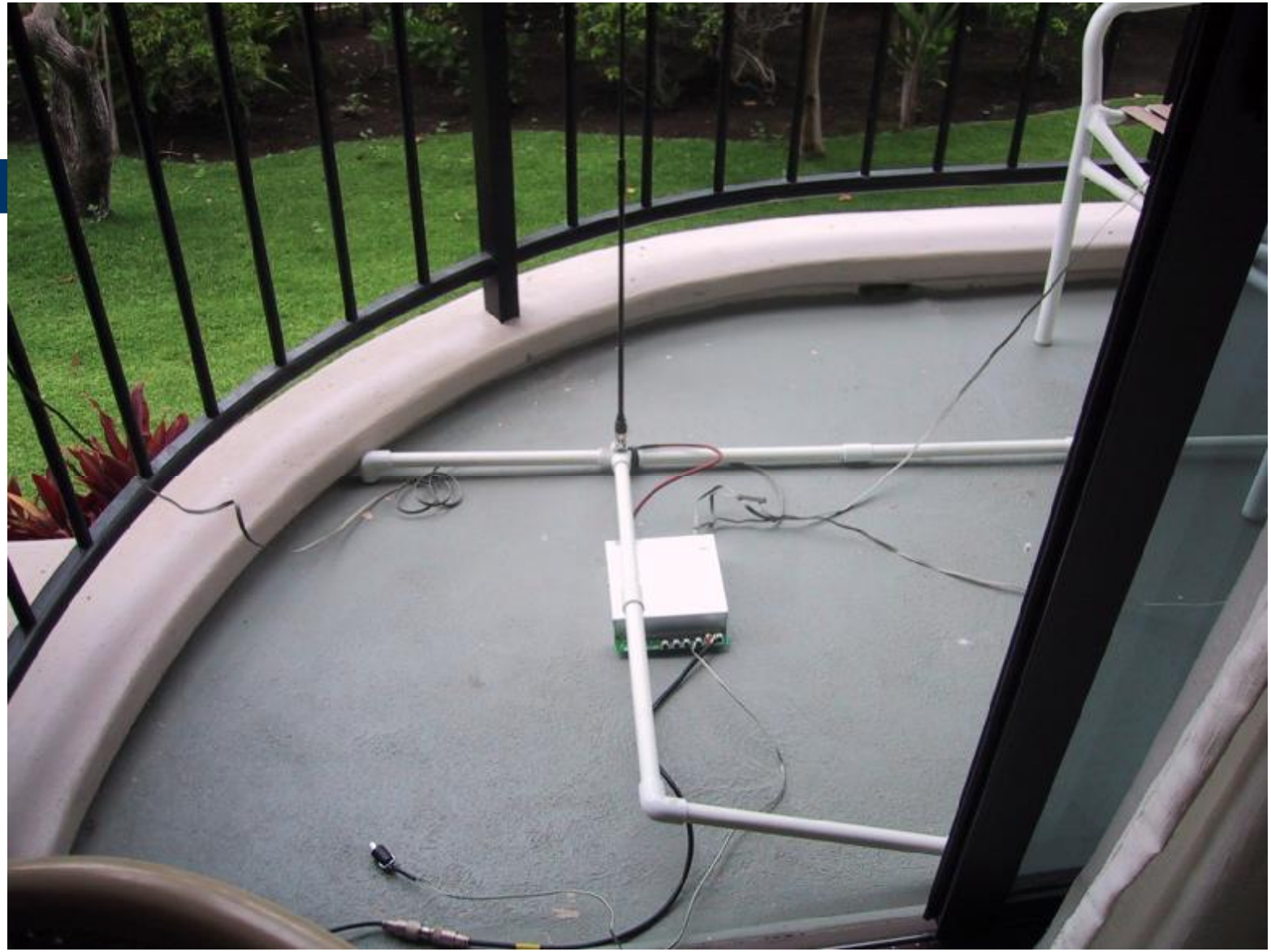

2 S-units here, usually less critical than 2 S-units here

# Antennas

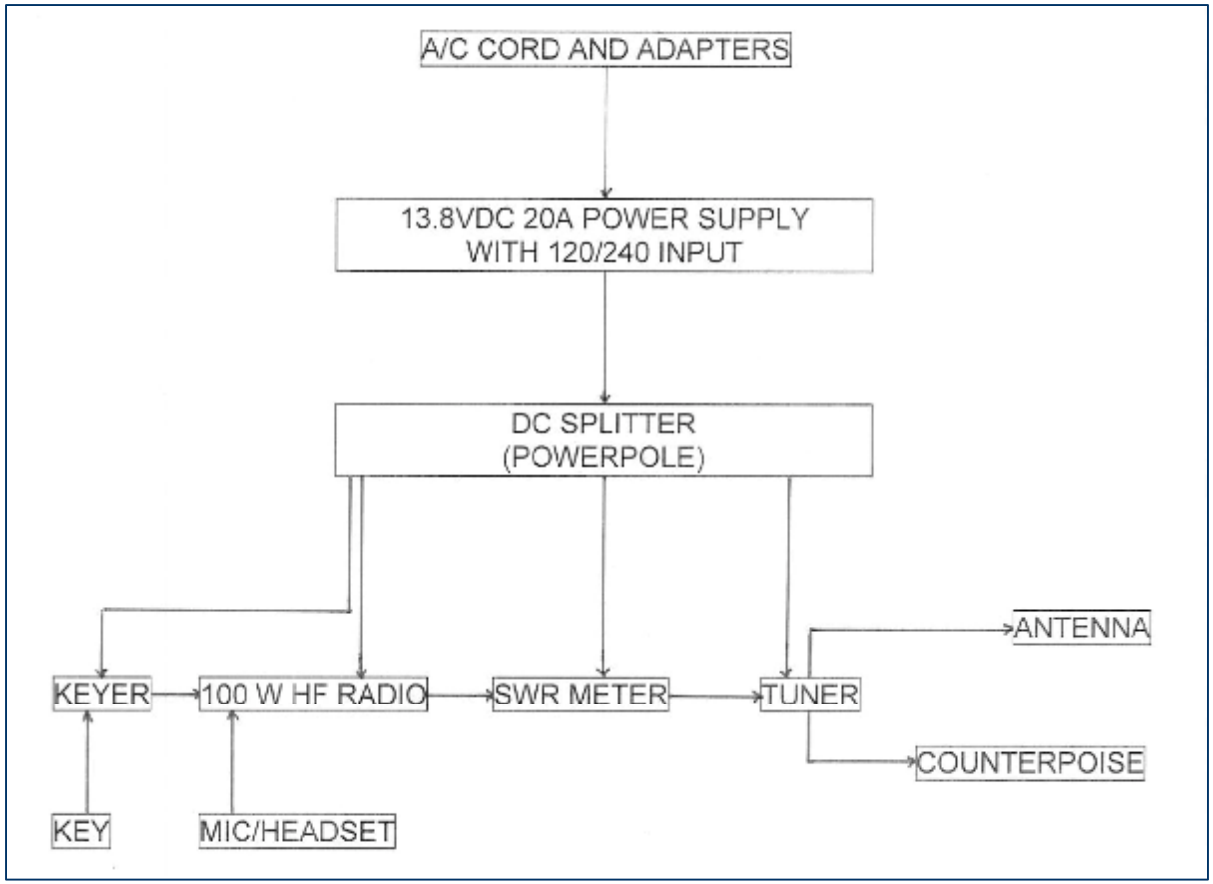
- Good antennas are required for satisfactory communications whether QRO or QRP
  - The only difference is that wire gauge can be less with QRP
  - Choices depend on cost, power, band(s) of operation, topography/locale, ease of setup
- Good antennas will be discussed another time; here are a few examples that have greater/fewer compromises:

# Show & tell


18.073.52
M3 FIL NB MET
POWER SUPPLY
Power
Output



# Station Diagram



# Equipment Checklist

- 13.8VDC/20A Power Supply (120/240AC input)
- AC Cord & Plug Adapters (by locale)
- DC Output Cable to Distribution Box
- 100W 13.8VDC Radio
- Radio Power Cord (Powerpole)
- Microphone
- Headset
- SWR Meter
- SWR Meter Power Cord (Powerpole)
- RF Cable (Radio-SWR Meter)
- Antenna Tuner
- RF Cable (SWR Meter-Tuner)
- Tuner Power Cord (Powerpole)
- Vertical Antenna Assembly (9' whip ¼-20 mount, insul. support, extra wire)
- Counterpoise Assembly (30-50' x 4 legs)
- Waterproof case for Tuner
- Keyer
- Keyer Power Cord (Powerpole)
- Key
- Key-Keyer Cable
- Keyer-Radio Cable
- Manuals for all equipment
- Logbook and pen
- Computer with logging SW (optional)
- Containers for all above
- Dipole antenna & supports, balun, feedline, antenna switch (optional)
- GMT Clock
- Tools (screwdrivers, Swiss Army Knife)
- US/Foreign License, Passport, Gov't papers
- Copy of contest rules (if applicable)