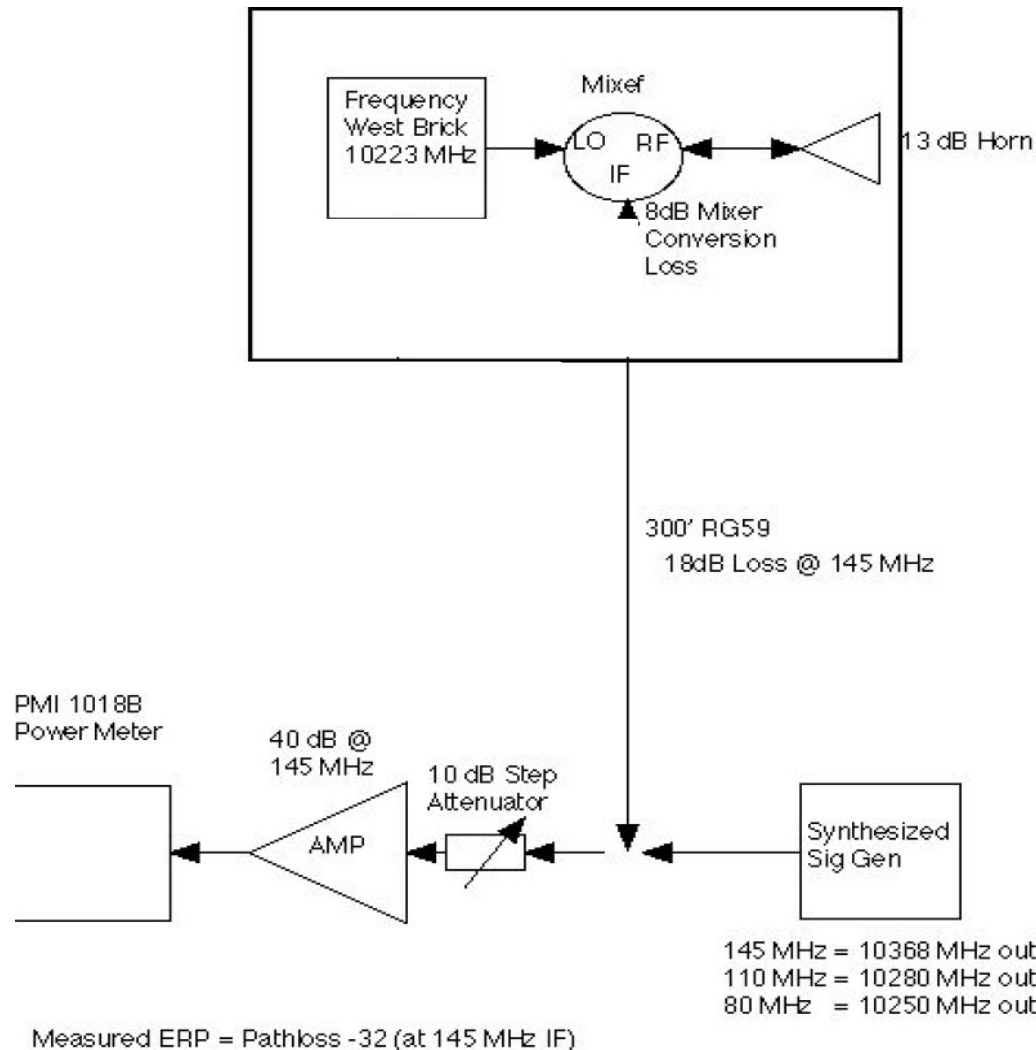# Rig Tuneup

- Prep team arrives around 0830
  - Test antenna set up on far side of (at least) 350 foot grassy area
  - Cable run back to test equipment in center of "rig row"
- **Rigs set up by ops 0900 - 1000**
  - Set up on grass side of sidewalk, about 10-15 feet from large, long, parking area
  - **Bring your own power supply** (batteries, not generators)
  - Line up your dish, check for reflection nulls
- **Test starts at 1000**
  - Test source on medium strength so all rigs can do final peak on it
  - Reduce test source till none can hear, jigger the frequency a kHz or two
  - Bring it up in 1 dB steps, record each rig's MDS (minimum detectable signal)
  - Finally, each rig takes a turn transmitting a carrier so we can measure ERP (effective radiated power)
  - Do above for 10 and 24 GHz
- **Admire each other's rigs before & after the test**
- **Adjorn to nearby (covered) group picnic area for lunch picnic**

Rig Tuneup

- We could use a 435 head style **LCD** power meter (the better to read in the bright sun)
- We could use a standard horn and source (to calibrate range)
- We could use a photographer to take snaps of all the rigs and people for the website

- A scribe will record the MDS and ERP data
- We will publish a results spreadsheet

- Early start to avoid day users, kite fliers, etc on the lawn

Tune Up Gear (Gary, AD6FP)

Frequency West Brick 10223 MHz → **Mixer** (LO, RF, IF) — 8dB Mixer Conversion Loss → 13 dB Horn

300' RG59
18dB Loss @ 145 MHz

PMI 1018B Power Meter ← **AMP** 40 dB @ 145 MHz ← 10 dB Step Attenuator ← Synthesized Sig Gen

145 MHz = 10368 MHz out
110 MHz = 10280 MHz out
80 MHz = 10250 MHz out

Measured ERP = Pathloss -32 (at 145 MHz IF)

Copy from Kerry N6IZN (San Diego)

Remote horn + mixer + LO
(use an odd freq brick for an odd IF)
10 and 24 GHz

Ideal antenna range
No reflections (ground or side)
Open grassy field or across a gully
Careful antenna heights

300-450' long IF cable
from remote antenna/mixer
to IF test station & firing line (rigs)

IF test station *(146.xx MHz)*
*Tx sig gen & atten -> Rigs' Rx **min. det. sig.***

Rigs -> Rx atten + IF amp + pwr mtr
*measures rigs' Tx **effective radiated power***

Roll up results using spreadsheet
Min sig gen level copied: Rig MDS
Rx reading, path loss: Rig EIRP
EIRP, Dish size, PA power: Tx efficiency

Some hard to control variables:
Signal reflections, paths to rigs
Op's "copy" level for Rx MDS test
Absolute calibration of path & losses
Still valuable for identifying rig issues