FD 2018

June 22nd, 23rd and 24th

W2LV

SUSSEX COUNTY AMATEUR RADIO CLUB

N W2LV E S

5A NNJ

location

Old Lion Technology

21 Sunset Inn Road
Lafayette, NJ

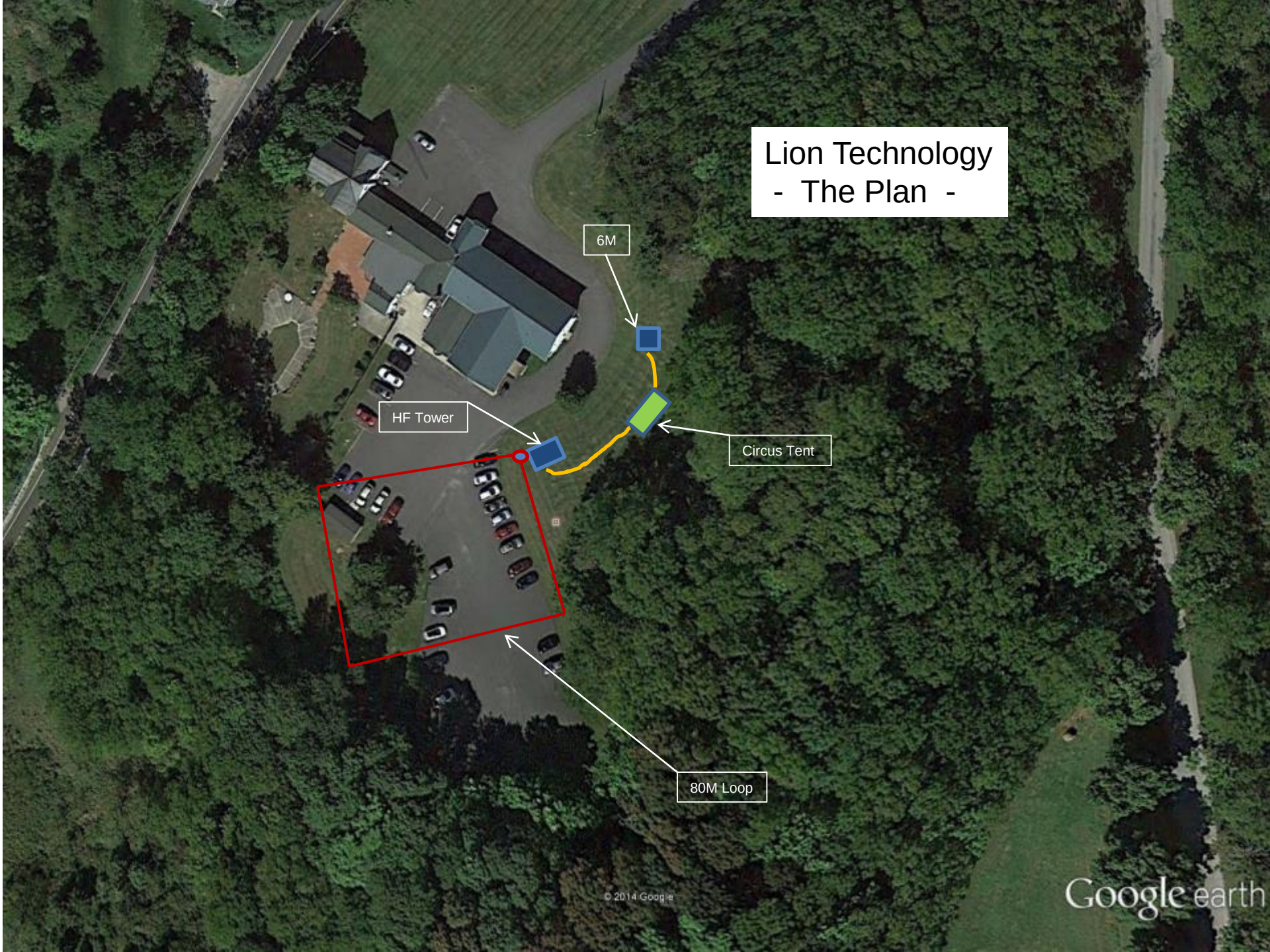
- The Plan
  - Setup starts at 2pm local time on June 22nd
  - Location: Lion Technology 21 Sunset Inn Rd, Lafayette, NJ 07848
  - Setup consists of:
    - Putting up 45' tower
    - Putting up 30' tower for 6M antenna
    - Constructing C4SXL Quad-band Antenna (40, 20, 15, 10) with four independent feedlines.
    - Constructing the 6M antenna
    - Put 2M/432 antennas on 6M tower for satellite work.
    - Putting up the 80M Loop and 160M long wire
    - Running six coax cables
    - Raising the Circus Tent
    - Setting up the Grill area
    - Set up tables and chairs
    - Put up tarps on the west and south side of the tent
    - Put up lights
    - Run generator power.
- Radios / Bands (notional)
  - 80M – SCARC Yaesu FT-1000
  - 40M – K2DFC Icom IC-7410
  - 20M – W2RQ Yaesu FT-1000D
  - 15M – N2HMM Elecraft K3
  - 10M – N2HMM Yaesu FT-847
  - 6M – KB2SYD Icom IC-736
- Modes
  - CW, SSB, PSK-31 and RTTY
  - **Need voice talkers, foot switches, headsets with boom mics for the radios.**
  - At least one rig on CW and PSK/RTTY at all times (subject to operators and conditions)
  - **Move coax cables to switch modes; no mode changes on radios!!!!**

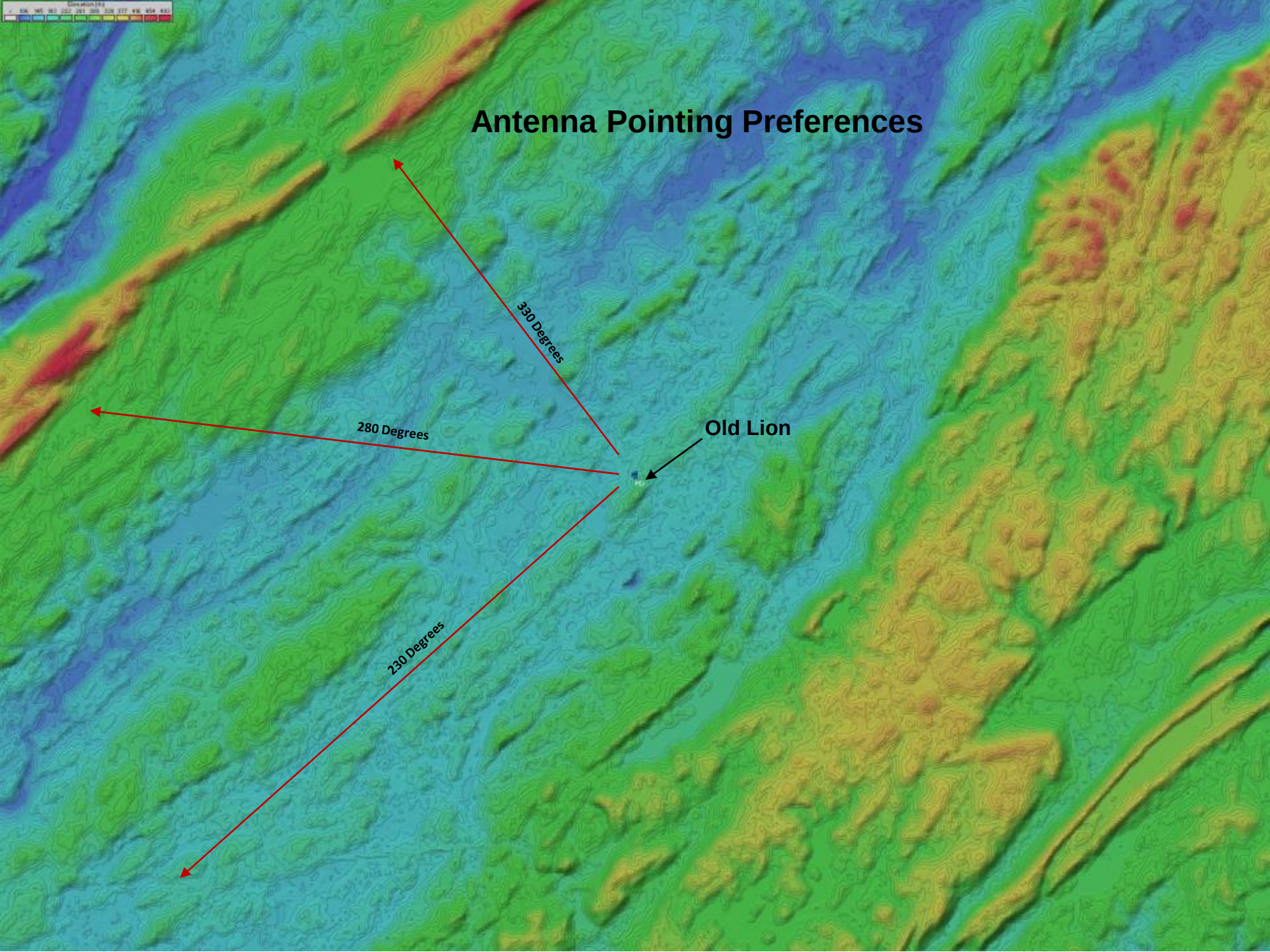
Need Bonus Points Help!

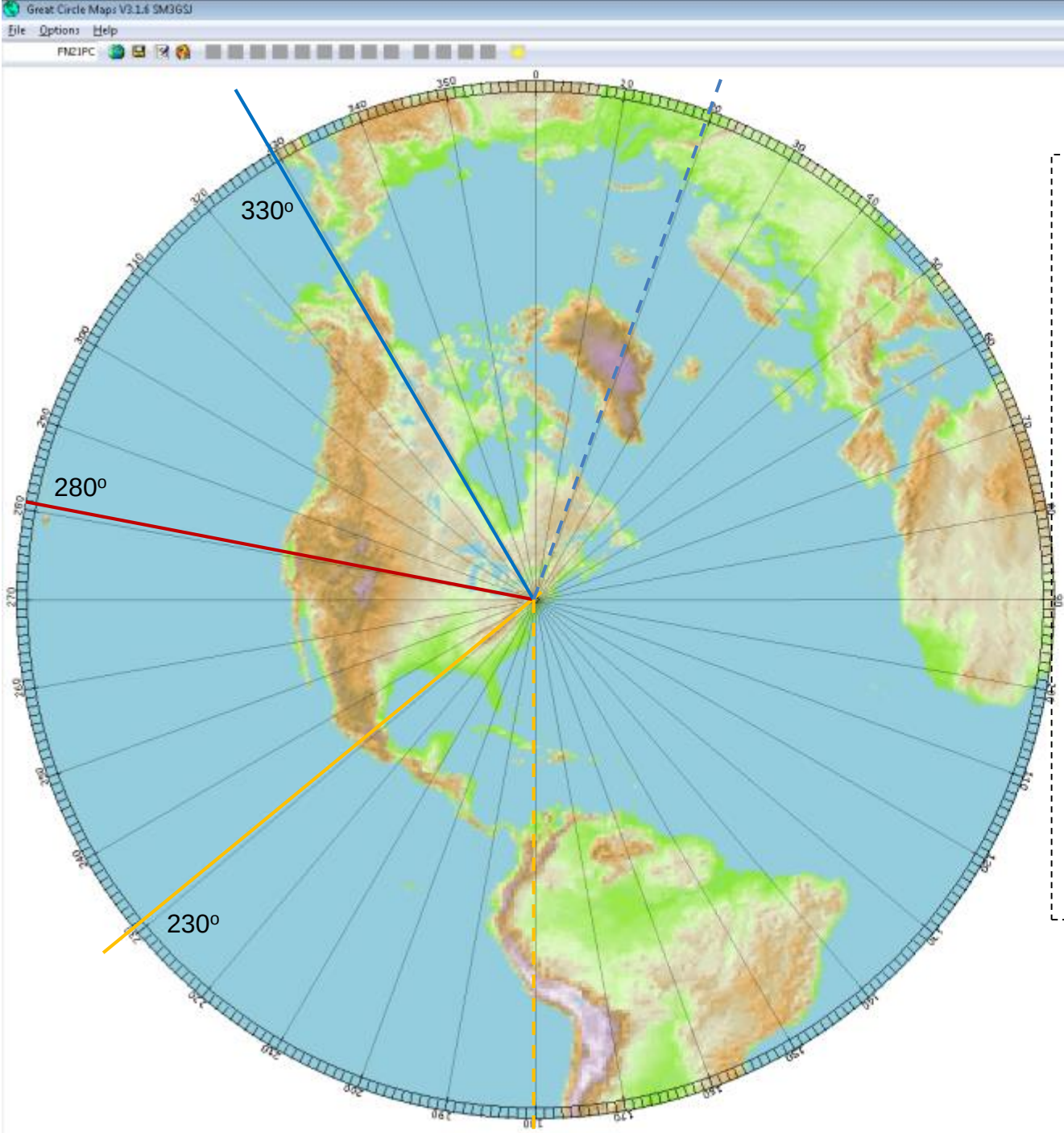
- 100% Emergency Power – YES – WV2V
- Media Publicity – YES - AA8MG
- Public Location – YES – KB2SYD
- Public Information Table – YES - KW3U
- Message to Section Manager – YES – W2RQ
- Message Handling – Need Volunteer
- Satellite QSO – YES – N2HMM
- Alternate Power (Solar) – YES – KW3U
- W1AW Bulletin – YES – KW3U
- Educational Table – Need Volunteer
- Site Visit by Elected Official – YES - AA8MG
- Site Visit by Representative – YES - AA8MG
- GOTA – NO – Newcomers will have access to any station
- Web Submission – YES – N2WM
- FD Youth Participation (<18) – Need five kids to make one QSO
- Press Release – YES - AA8MG
- Social Media – Need Volunteer
- Safety Officer – Need Volunteer
- Guest Log – Need Volunteer

Volunteer's Needed / Things to Bring

- Water/Ice etc. for setup – Need Volunteer
- Food, ice, coffee, drinks for the weekend – Need Volunteers
- Saturday dinner will be catered – YES - KB2SYD
- Breakfast – YES - KB2SYD
- Bug Spray the Field – YES – KC2YON / KD2CVR
- Frequency Maps, Antenna Pointing Map – YES – N2HMM
- Field Day Road Sign – YES – KD2CVR
- Setup / Take Down – YES – ALL (more hands, less work)
  - Raise Circus Tent, lighting, tables, chairs, tarps and grill
- 80M Loop – Need Volunteer
- 160M Long Wire – Need Volunteer
- Small American Flag – Need Volunteer
- Computer Networking – KB2SYD
- Operations Day – N2HMM
- Operations Night – KC2QDU
- Need of Antenna Analyzer – YES – N2HMM
- Bring Cooling Fans
- Bring Sunscreen
- Bring Bug Repellant
- Bring Rain Gear


Lion Technology
- The Plan -
6M
HF Tower
Circus Tent
80M Loop
© 2014 Google
Google earth


Antenna Pointing Preferences
330 Degrees
280 Degrees
230 Degrees
Old Lion



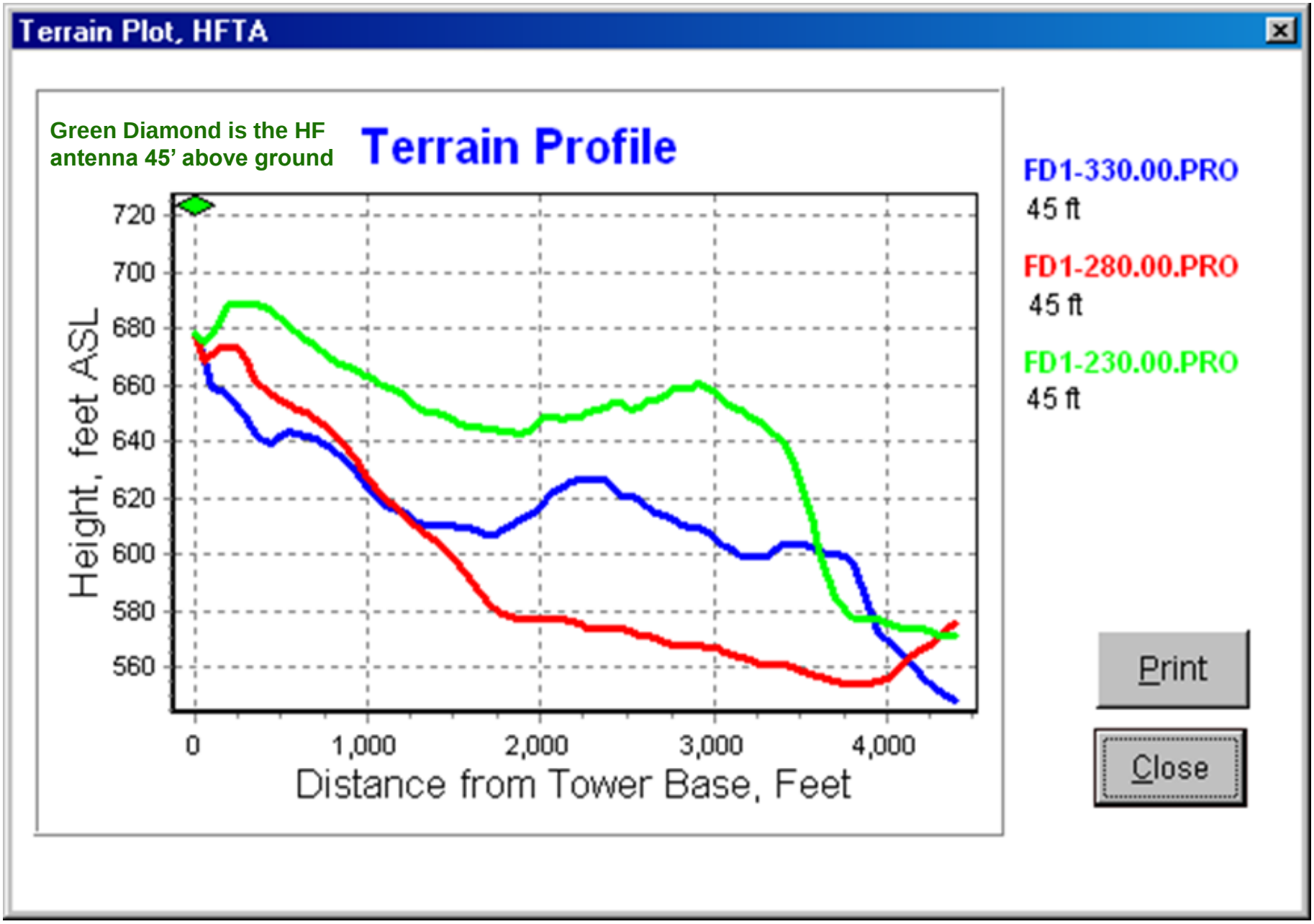
Antenna Pointing Angles.

Curvature of the Earth puts most of the country at 280 degrees from W2LV FD (and your home QTH as well).

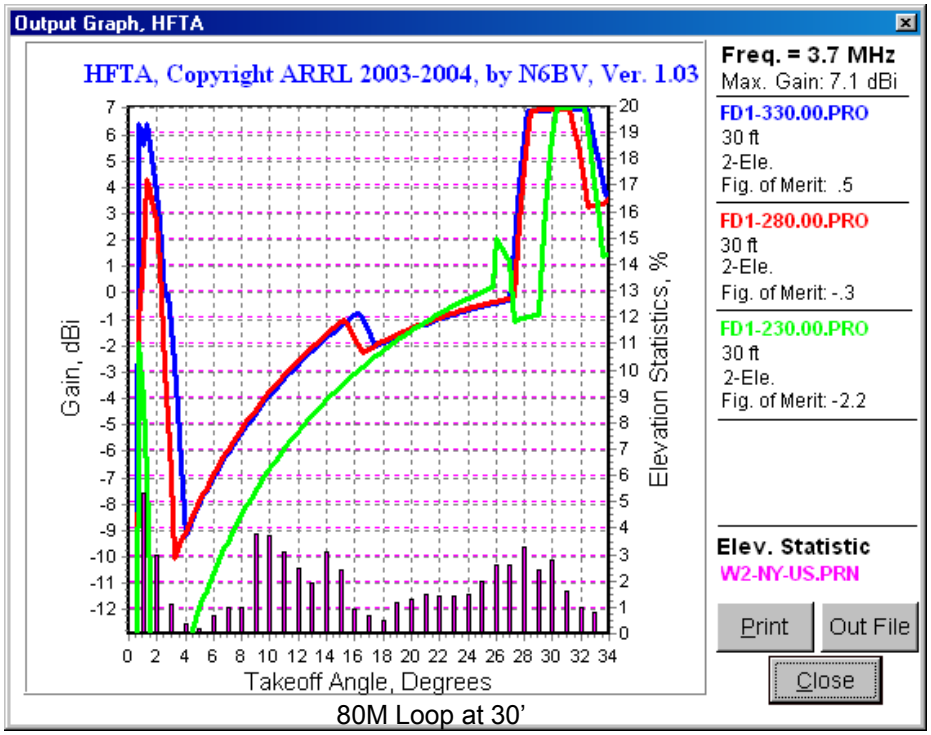
C4SXL antenna beam-width is very wide so pointing is not critical. At 280 degrees beam-width is from 330 to 230. Dash lines show beam-width for 230 and 330.

Analysis of the SCARC Field Day Site at Old Lion Technology

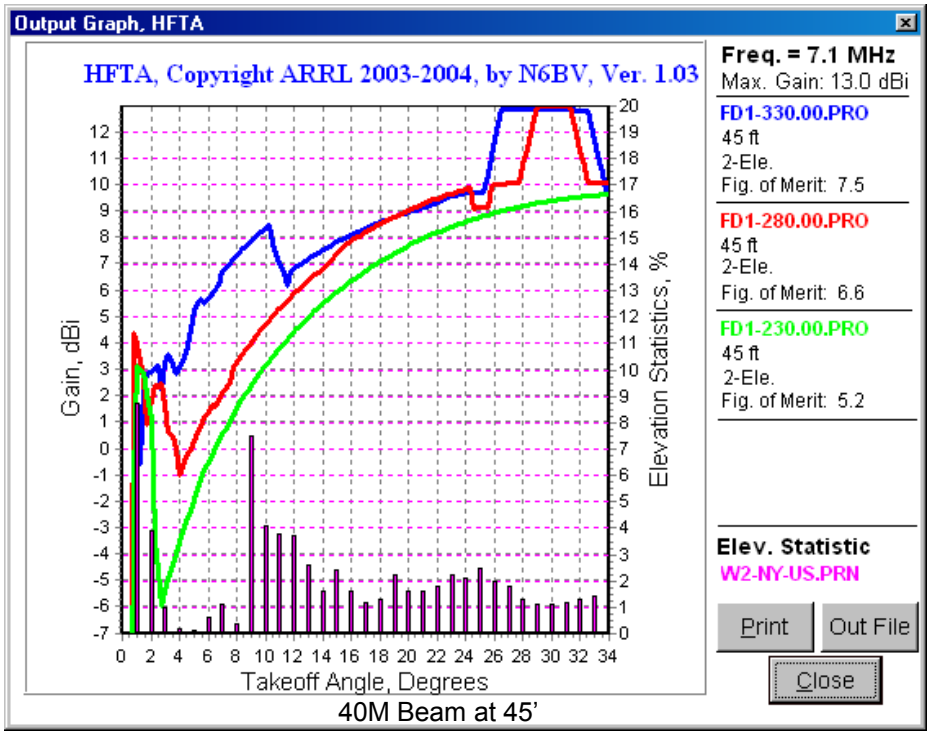
21 Sunset Inn Road



Terrain Profile of current FD Site looking NW, W and SW. Clear in all directions



80M Loop at 30'



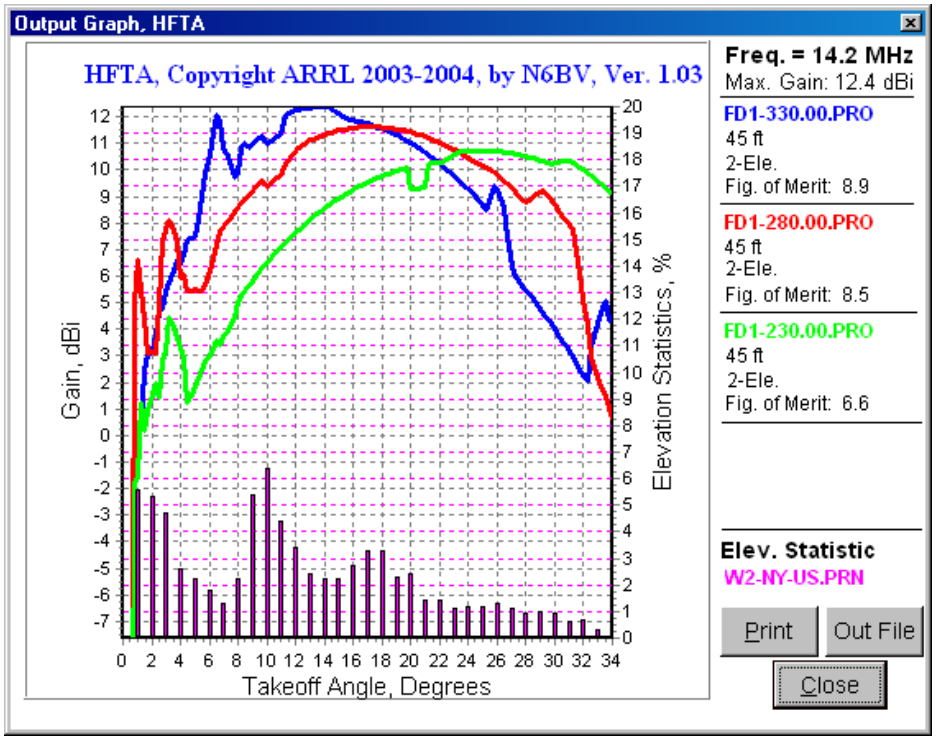
40M Beam at 45'

This is an analysis of the terrain at our current FD location. Three separate programs were used to generate the data seen in this presentation; Radio Mobile, Micro Digital Elevation Model (MicroDEM) and High Frequency Terrain Analysis (HFTA). These programs takes into account the exact location of our antenna, the surrounding terrain out to 2.5 miles, the ground gain effects, the ground conductivity, the antenna type, the antenna pattern and the height of that antenna. The data in these plots depict three azimuth pointing angles which I have selected. Those angles are Northwest (330 degrees) shown in Blue. West (280 degrees) shown in Red. Southwest (230 degrees) shown in Green.

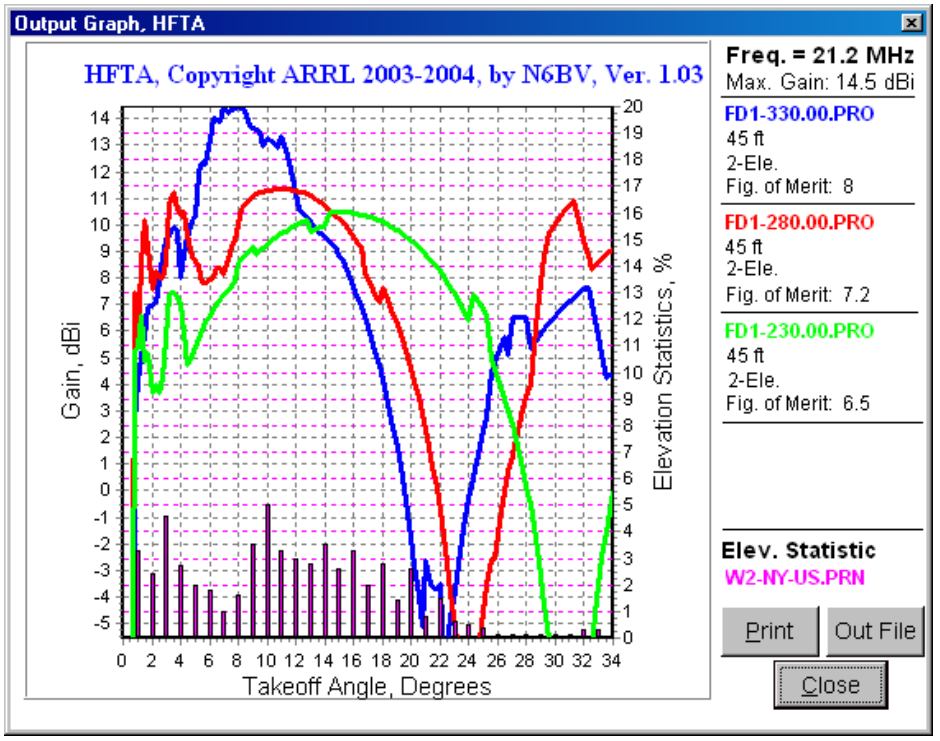
The Horizontal X Axis shows the arrival angle of incoming signals from all of the Continental US, Hawaii, Alaska and the Caribbean. The vertical bars is the percentage of time a signal arrives at that angle from the Continental US. As you can see for 80M (top left), the receive angle distribution is fairly uniform while 40M (top right) sees the most energy arriving at 9 degrees and 1 degree.

The Vertical Y Axis shows the gain of the antenna at the specific arrival angle when summed with the effects of the terrain, antenna height ground effects, etc. For example look at the Red curve (azimuth 280 degrees) on the 40M plot (top right). At the 9 degree arrival angle the gain of our antenna is +4dBi, but at 330 degrees (Blue curve) the gain is over +8dBi. At 230 degrees (Green) the gain is only +2dBi. This is all due to ground gain and terrain effects. You always want to have good gain at the highest arrival angle.

All of this is based on statistical propagation analysis for typical arrival angles for CONUS signals. Hour-to-hour these conditions can change. That's why it's important to have people sitting in the chairs. Because conditions can change suddenly.



20M Beam at 45’

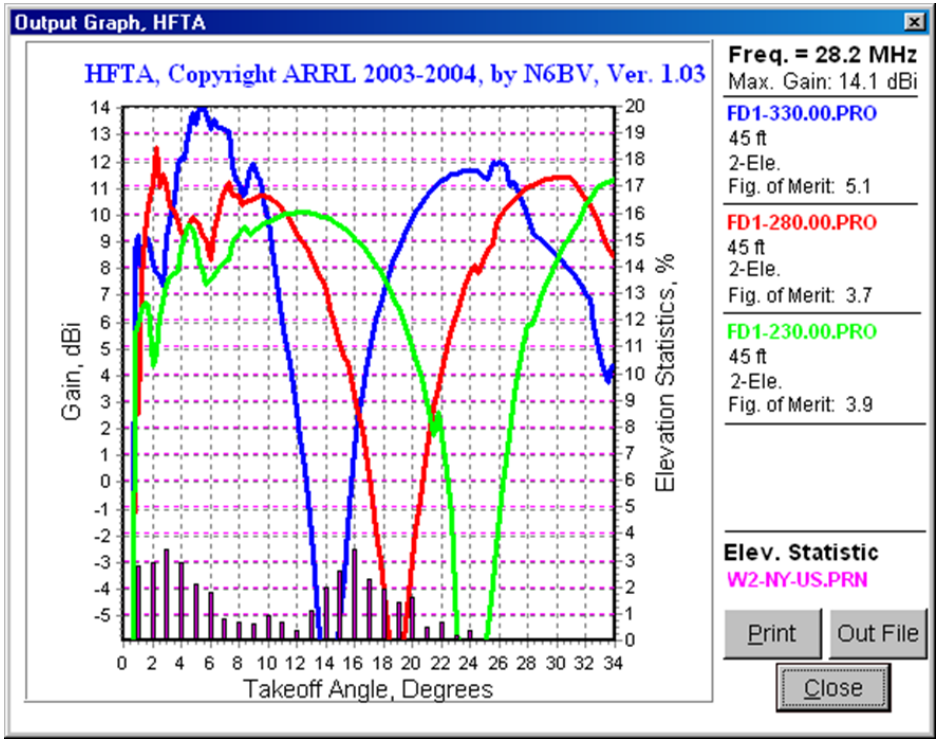


15M Beam at 45’

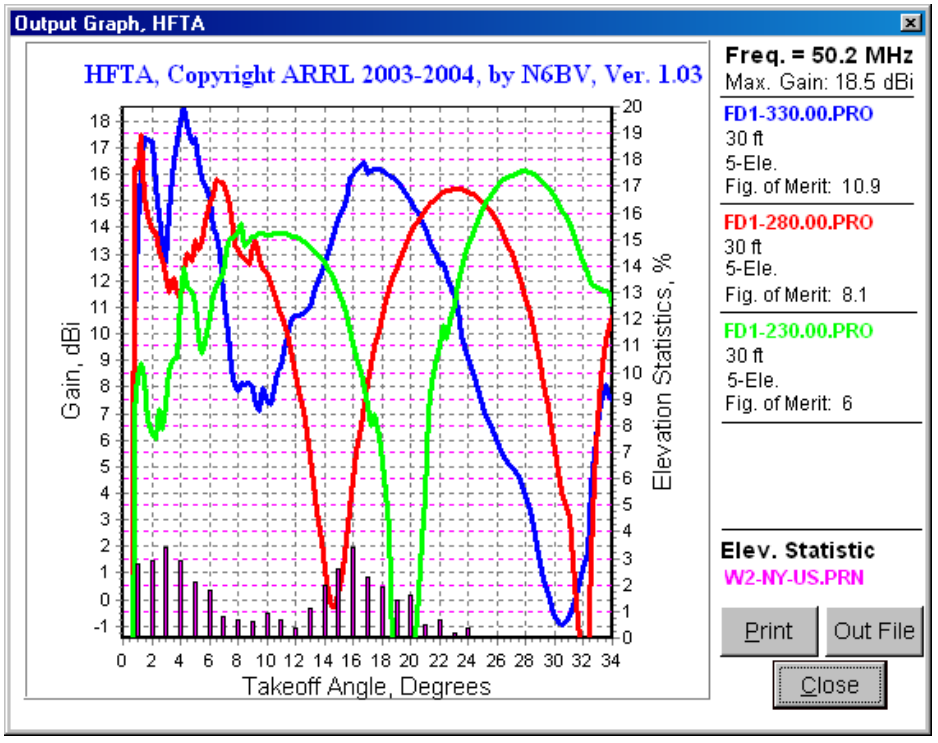
The top left plot shows the results of our 20M setup. Here most signals arrive at angles below 20 degrees energy arriving above. But observe the antenna gain. It is very prominent and uniform in all three directions so our QSO totals should be high and our signal strong.

The top right plot shows the results of our 15M setup. Here all the signals arrive at or below 22 degrees. The antenna gain is around the same performance as 20M and we’ll need every bit of it since 15M will probably be only marginally open. This will be our primary PSK/RTTY band. Notice the deep nulls. This is due to the antenna height. If the antenna was lowered a bit the nulls would shift higher. From this plot the Southern stations will be strong for all arrival angles. This is good since 15M propagation might only open to the south.

For the early stages of FD I believe we should keep the C4SXL pointed at 230 degrees to take advantage of any openings that might occur on 10 and 15M. As evening falls move to 280 degrees to take advantage of the high gain we get on 40M.



10M Beam at 45’



6M Beam at 30’

For 10M and 6M most signals arrive below 20 degrees with a concentration around 16 and 3 degrees.

For 10M we might not hear signals to well from the Northwest and Midwest but we’ll be loud to the Southwest. We can’t do anything about the short skip nulls unless we put up a 10M Mono-bander to a height of 30 feet. The low angle radiation is an advantage if the propagation is only Ground Wave.

For 6M an antenna height of 30 feet yields excellent low angle Ground Wave coverage with superb performance to the Northwest and West. We have those pesky nulls again but there’s not much we can do about that unless we change the height of the antenna. Nulls are not good, if a null is present at a specific arrival angle then you might not hear the signal. Single digit arrival angles are long path skip. Double digit arrival angles are short skip. Hope for Sporadic E (Es) openings for 10M and 6M because the chance of an F layer propagation opening is slim.