

Figure 61 — Same as Figure 60, except top Yagi points to 356° azimuth.

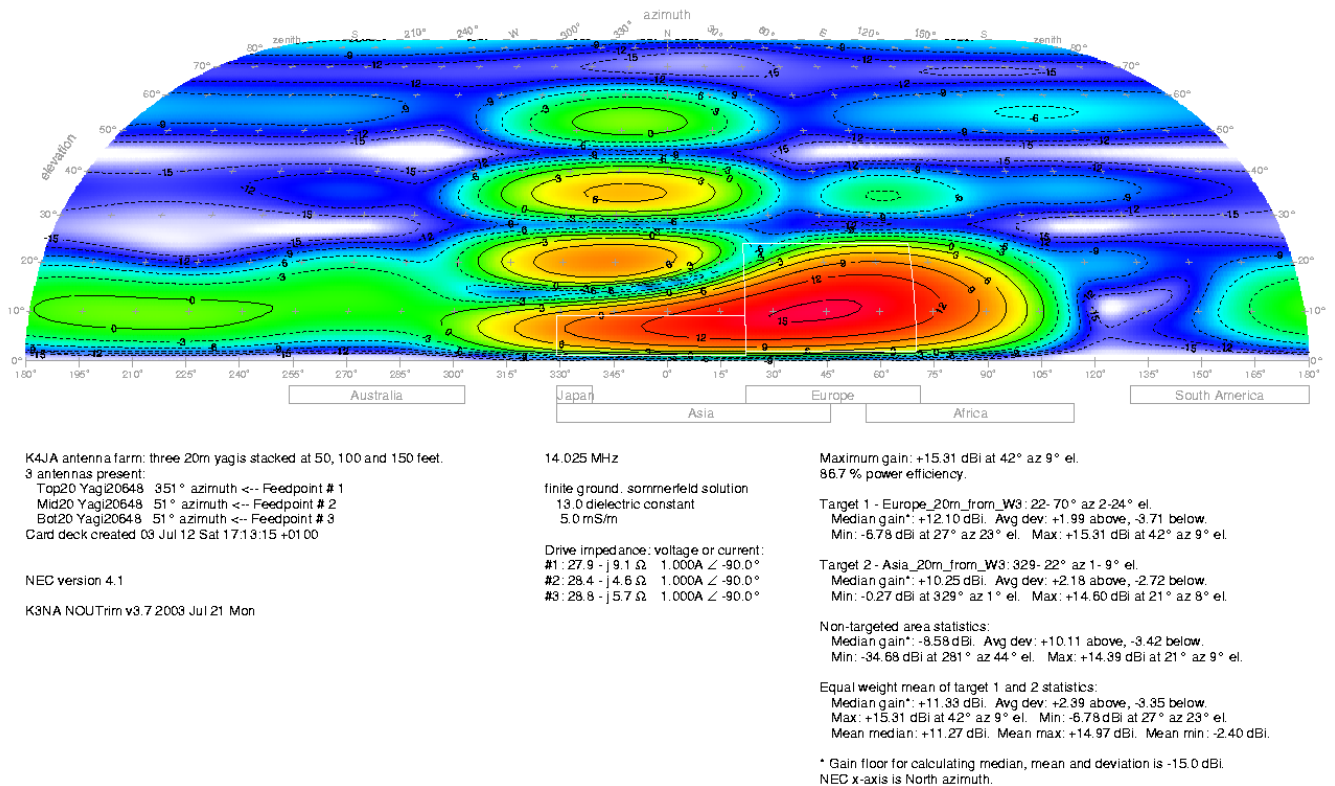


Figure 62 — Same as Figure 60, except top Yagi points to 351° azimuth.

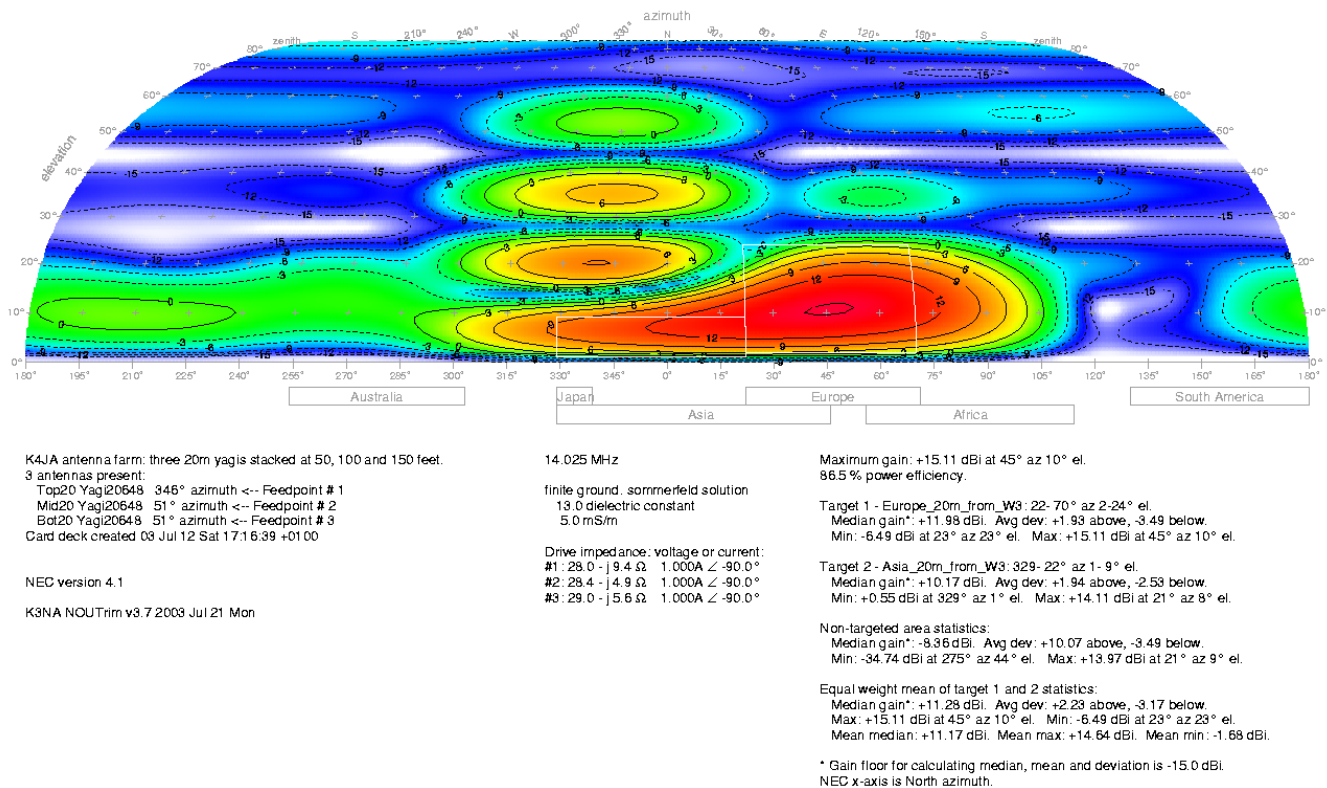


Figure 63 — Same as Figure 60, except top Yagi points to 346° azimuth.

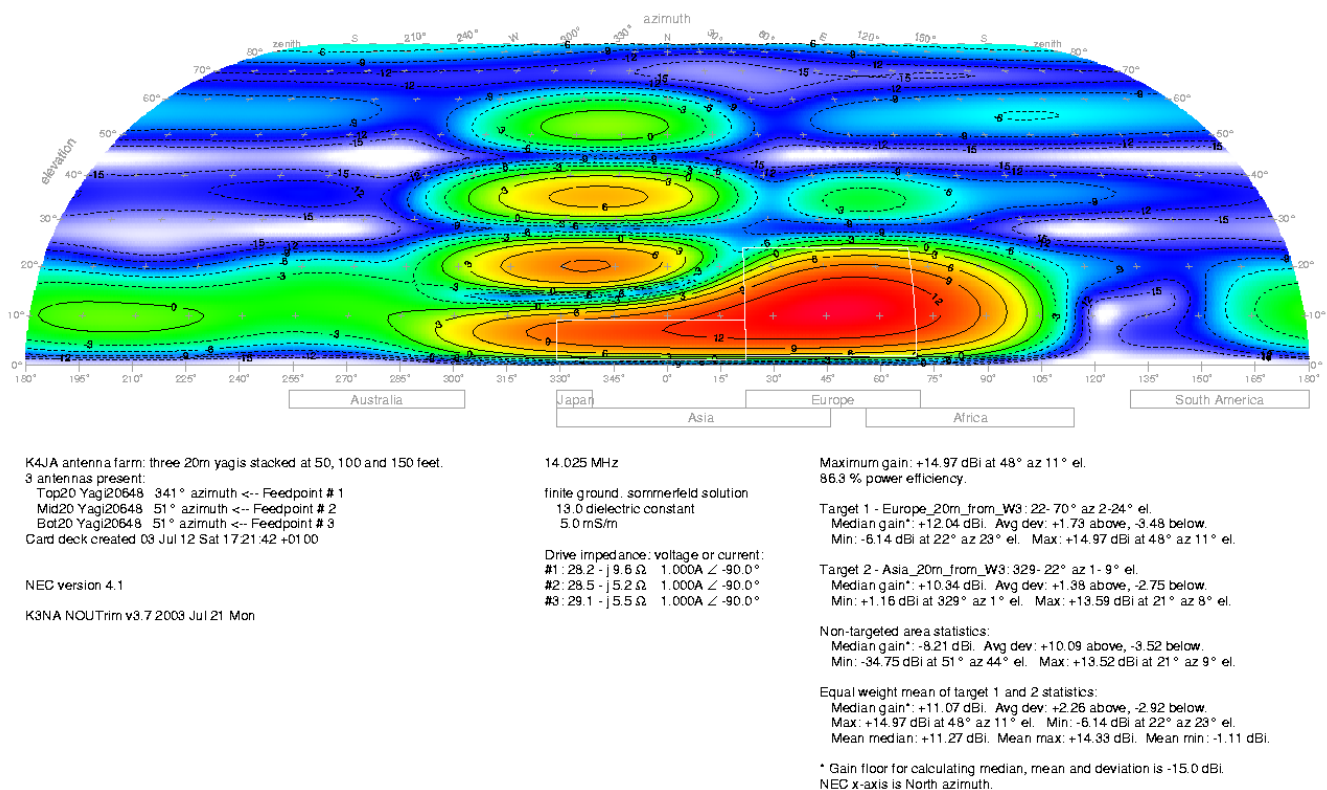


Figure 64 — Same as Figure 60, except top Yagi points to 341° azimuth.

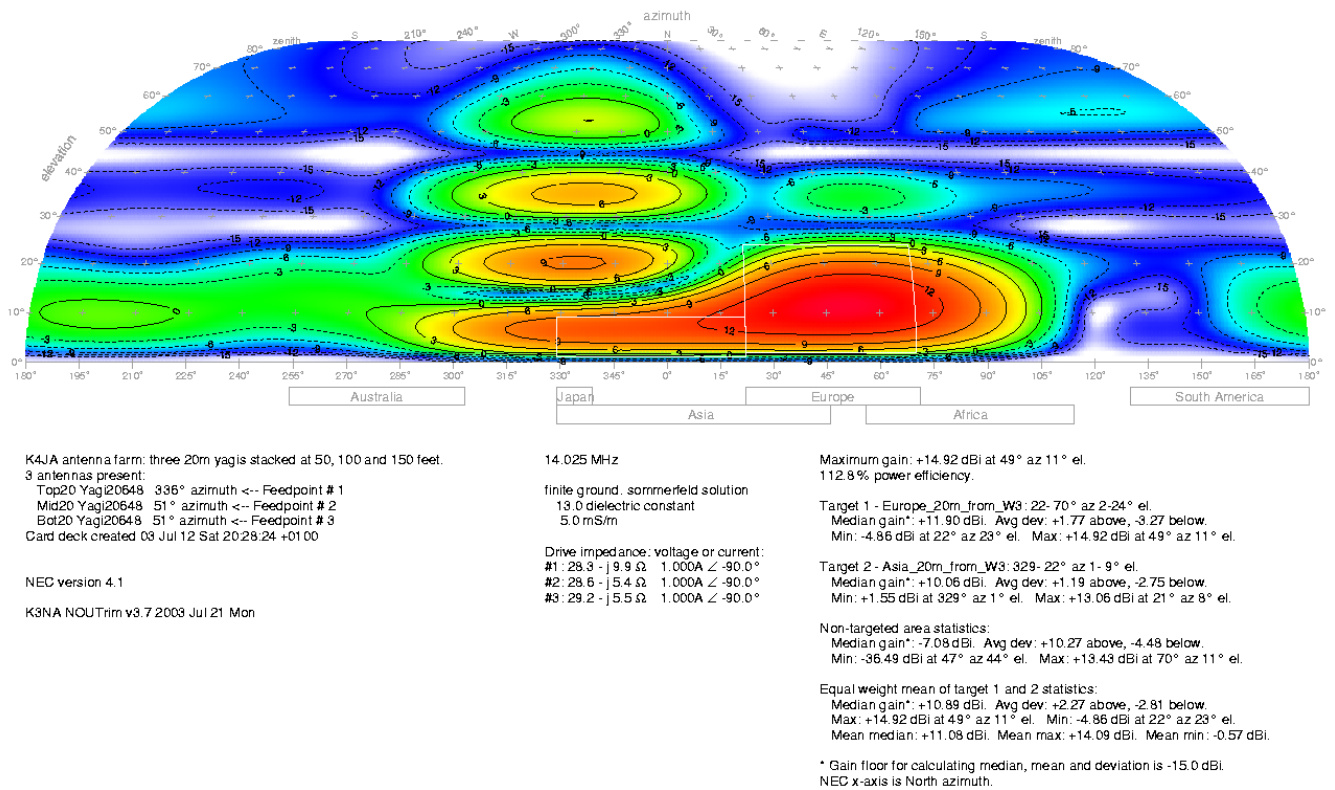


Figure 65 — Same as Figure 60, except top Yagi points to 336° azimuth.

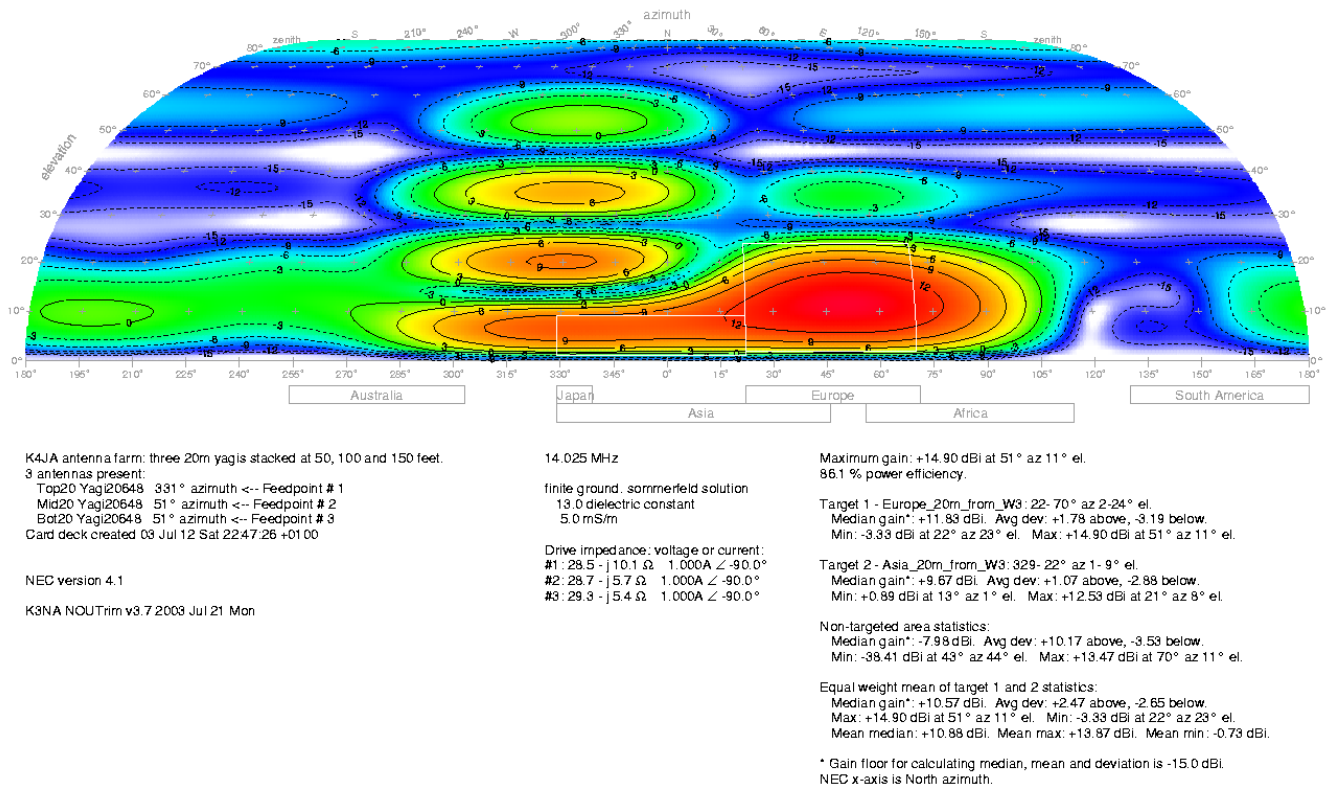
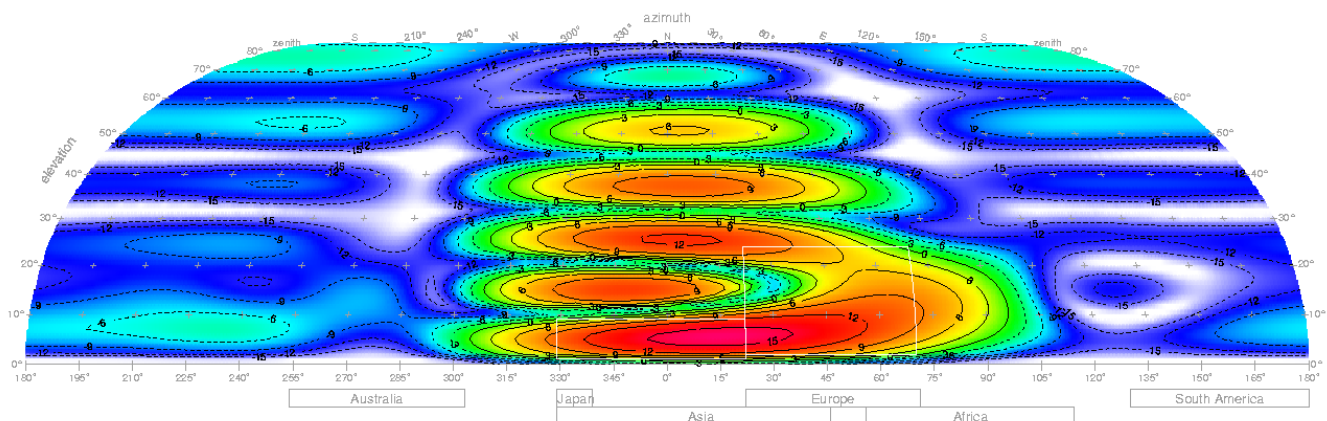


Figure 66 — Same as Figure 60, except top Yagi points to 331° azimuth.



W3LPL 20m Europe tower:
 5-el yagi rotatable top:
 200 ft height
 46° azimuth
 50 power
 0° phase
 5-el yagi rotatable middle:
 100 ft height
 46° azimuth
 25 power
 0° phase
 5-el yagi rotatable bottom:
 50 ft height
 46° azimuth
 25 power
 0° phase
 Card deck created 03 Jul 13 Sun 18:47:17 +0100

NEC version 4.1

K3NA NOUTrim v3.7 2003 Jul 21 Mon

14.025 MHz
 finite ground, sommerfeld solution
 13.0 dielectric constant
 5.0 mS/m
 Drive impedance: voltage or current:
 #1: 29.9 - j19.0 Ω 100.000A \angle -90.0°
 #2: 28.3 - j18.4 Ω 50.000A \angle -90.0°
 #3: 28.2 - j16.8 Ω 50.000A \angle -90.0°

Maximum gain: +16.12 dBi at 16° az 5° el.
 85.8 % power efficiency.

Target 1 - Europe_20m_from_W3: 22- 70° az 2-24° el.
 Median gain*: +8.19 dBi. Avg dev: +3.90 above, -3.14 below.
 Min: -8.18 dBi at 22° az 18° el. Max: +15.97 dBi at 22° az 5° el.

Target 2 - Asia_20m_from_W3: 329- 22° az 1- 9° el.
 Median gain*: +12.53 dBi. Avg dev: +2.09 above, -2.54 below.
 Min: +3.36 dBi at 329° az 8° el. Max: +16.12 dBi at 16° az 5° el.

Non-targeted area statistics:
 Median gain*: -9.49 dBi. Avg dev: +11.93 above, -3.08 below.
 Min: -31.62 dBi at 128° az 9° el. Max: +12.48 dBi at 4° az 25° el.

Equal weight mean of target 1 and 2 statistics:
 Median gain*: +9.57 dBi. Avg dev: +3.61 above, -3.26 below.
 Max: +16.12 dBi at 16° az 5° el. Min: -8.18 dBi at 22° az 18° el.
 Mean median: +10.88 dBi. Mean max: +16.05 dBi. Mean min: +0.64 dBi.

* Gain floor for calculating median, mean and deviation is -15.0 dBi.
 NEC x-axis is North azimuth.

Figure 67 — W3LPL 5-element rotatable Yagi at 200 feet pointed to 1° azimuth. A European stack on the same tower contains two 5-element Yagis at 50 and 100 feet. Half the transmitted power goes to the high rotatable Yagi. All antennas are assumed to be fed in phase. A severe pattern cancellation occurs towards Europe, reducing signals by as much as -18 dB.

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² Scafe, Eric; "Antenna Interactions – Part 1: Stop Squinting! Get the Big Picture", *National Contest Journal*, 2003 Jul/Aug; ARRL, Newington CT USA.