





KATHREIN
SCALA DIVISION

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CA5-FM/CP/RM Yagi

FM

Maximum gain: 6.0 dBd

Circular polarization

Vertical radiation pattern

0 degree electrical downtilt



CA5-FM/CP/RM Yagi

FM

Maximum gain: 6.0 dBd

Circular polarization

Vertical radiation pattern

0 degree electrical downtilt

| Angle | Field | Rel.dB | dBd | PwrMult | Angle | Field | Rel.dB | dBd | PwrMult |
|-------|-------|--------|--------|---------|-------|-------|--------|-------|---------|
| -90 | 0.157 | -16.06 | -10.06 | 0.10 | -45 | 0.423 | -7.47 | -1.47 | 0.71 |
| -89 | 0.156 | -16.14 | -10.14 | 0.10 | -44 | 0.444 | -7.05 | -1.05 | 0.79 |
| -88 | 0.154 | -16.23 | -10.23 | 0.09 | -43 | 0.465 | -6.64 | -0.64 | 0.86 |
| -87 | 0.153 | -16.31 | -10.31 | 0.09 | -42 | 0.486 | -6.26 | -0.26 | 0.94 |
| -86 | 0.151 | -16.39 | -10.39 | 0.09 | -41 | 0.507 | -5.89 | 0.11 | 1.02 |
| -85 | 0.150 | -16.48 | -10.48 | 0.09 | -40 | 0.528 | -5.54 | 0.46 | 1.11 |
| -84 | 0.148 | -16.58 | -10.58 | 0.09 | -39 | 0.548 | -5.22 | 0.78 | 1.20 |
| -83 | 0.147 | -16.67 | -10.67 | 0.09 | -38 | 0.568 | -4.91 | 1.09 | 1.29 |
| -82 | 0.145 | -16.77 | -10.77 | 0.08 | -37 | 0.588 | -4.61 | 1.39 | 1.38 |
| -81 | 0.143 | -16.87 | -10.87 | 0.08 | -36 | 0.608 | -4.32 | 1.68 | 1.47 |
| -80 | 0.142 | -16.97 | -10.97 | 0.08 | -35 | 0.628 | -4.04 | 1.96 | 1.57 |
| -79 | 0.140 | -17.06 | -11.06 | 0.08 | -34 | 0.646 | -3.79 | 2.21 | 1.66 |
| -78 | 0.139 | -17.14 | -11.14 | 0.08 | -33 | 0.664 | -3.55 | 2.45 | 1.76 |
| -77 | 0.138 | -17.22 | -11.22 | 0.08 | -32 | 0.682 | -3.32 | 2.68 | 1.85 |
| -76 | 0.136 | -17.31 | -11.31 | 0.07 | -31 | 0.700 | -3.09 | 2.91 | 1.95 |
| -75 | 0.135 | -17.39 | -11.39 | 0.07 | -30 | 0.718 | -2.87 | 3.13 | 2.05 |
| -74 | 0.135 | -17.41 | -11.41 | 0.07 | -29 | 0.734 | -2.69 | 3.31 | 2.14 |
| -73 | 0.135 | -17.42 | -11.42 | 0.07 | -28 | 0.749 | -2.51 | 3.49 | 2.24 |
| -72 | 0.134 | -17.43 | -11.43 | 0.07 | -27 | 0.765 | -2.33 | 3.67 | 2.33 |
| -71 | 0.134 | -17.44 | -11.44 | 0.07 | -26 | 0.780 | -2.15 | 3.85 | 2.42 |
| -70 | 0.134 | -17.46 | -11.46 | 0.07 | -25 | 0.796 | -1.98 | 4.02 | 2.52 |
| -69 | 0.136 | -17.36 | -11.36 | 0.07 | -24 | 0.810 | -1.83 | 4.17 | 2.61 |
| -68 | 0.137 | -17.26 | -11.26 | 0.07 | -23 | 0.824 | -1.68 | 4.32 | 2.70 |
| -67 | 0.139 | -17.16 | -11.16 | 0.08 | -22 | 0.838 | -1.54 | 4.46 | 2.80 |
| -66 | 0.140 | -17.07 | -11.07 | 0.08 | -21 | 0.852 | -1.39 | 4.61 | 2.89 |
| -65 | 0.142 | -16.97 | -10.97 | 0.08 | -20 | 0.866 | -1.25 | 4.75 | 2.99 |
| -64 | 0.151 | -16.40 | -10.40 | 0.09 | -19 | 0.876 | -1.15 | 4.85 | 3.05 |
| -63 | 0.161 | -15.86 | -9.86 | 0.10 | -18 | 0.885 | -1.06 | 4.94 | 3.12 |
| -62 | 0.171 | -15.36 | -9.36 | 0.12 | -17 | 0.895 | -0.96 | 5.04 | 3.19 |
| -61 | 0.180 | -14.88 | -8.88 | 0.13 | -16 | 0.905 | -0.87 | 5.13 | 3.26 |
| -60 | 0.190 | -14.42 | -8.42 | 0.14 | -15 | 0.915 | -0.77 | 5.23 | 3.33 |
| -59 | 0.201 | -13.92 | -7.92 | 0.16 | -14 | 0.922 | -0.70 | 5.30 | 3.39 |
| -58 | 0.213 | -13.45 | -7.45 | 0.18 | -13 | 0.930 | -0.63 | 5.37 | 3.44 |
| -57 | 0.224 | -13.00 | -7.00 | 0.20 | -12 | 0.937 | -0.56 | 5.44 | 3.50 |
| -56 | 0.235 | -12.57 | -6.57 | 0.22 | -11 | 0.945 | -0.49 | 5.51 | 3.55 |
| -55 | 0.247 | -12.16 | -6.16 | 0.24 | -10 | 0.952 | -0.42 | 5.58 | 3.61 |
| -54 | 0.263 | -11.59 | -5.59 | 0.28 | -9 | 0.958 | -0.37 | 5.63 | 3.66 |
| -53 | 0.280 | -11.07 | -5.07 | 0.31 | -8 | 0.964 | -0.32 | 5.68 | 3.70 |
| -52 | 0.296 | -10.57 | -4.57 | 0.35 | -7 | 0.970 | -0.26 | 5.74 | 3.75 |
| -51 | 0.313 | -10.09 | -4.09 | 0.39 | -6 | 0.976 | -0.21 | 5.79 | 3.79 |
| -50 | 0.329 | -9.65 | -3.65 | 0.43 | -5 | 0.982 | -0.15 | 5.85 | 3.84 |
| -49 | 0.348 | -9.17 | -3.17 | 0.48 | -4 | 0.986 | -0.12 | 5.88 | 3.87 |
| -48 | 0.367 | -8.71 | -2.71 | 0.54 | -3 | 0.989 | -0.09 | 5.91 | 3.90 |
| -47 | 0.386 | -8.27 | -2.27 | 0.59 | -2 | 0.993 | -0.06 | 5.94 | 3.93 |
| -46 | 0.405 | -7.86 | -1.86 | 0.65 | -1 | 0.996 | -0.03 | 5.97 | 3.95 |
| | | | | | 0 | 1.000 | 0.00 | 6.00 | 3.98 |



CA5-FM/CP/RM Yagi

FM

Maximum gain: 6.0 dBd

Circular polarization

Vertical radiation pattern

0 degree electrical downtilt

| Angle | Field | Rel.dB | dBd | PwrMult | Angle | Field | Rel.dB | dBd | PwrMult |
|-------|-------|--------|-------|---------|-------|-------|--------|--------|---------|
| 0 | 1.000 | 0.00 | 6.00 | 3.98 | 45 | 0.423 | -7.47 | -1.47 | 0.71 |
| 1 | 0.996 | -0.03 | 5.97 | 3.95 | 46 | 0.405 | -7.86 | -1.86 | 0.65 |
| 2 | 0.993 | -0.06 | 5.94 | 3.93 | 47 | 0.386 | -8.27 | -2.27 | 0.59 |
| 3 | 0.989 | -0.09 | 5.91 | 3.90 | 48 | 0.367 | -8.71 | -2.71 | 0.54 |
| 4 | 0.986 | -0.12 | 5.88 | 3.87 | 49 | 0.348 | -9.17 | -3.17 | 0.48 |
| 5 | 0.982 | -0.15 | 5.85 | 3.84 | 50 | 0.329 | -9.65 | -3.65 | 0.43 |
| 6 | 0.976 | -0.21 | 5.79 | 3.79 | 51 | 0.313 | -10.09 | -4.09 | 0.39 |
| 7 | 0.970 | -0.26 | 5.74 | 3.75 | 52 | 0.296 | -10.57 | -4.57 | 0.35 |
| 8 | 0.964 | -0.32 | 5.68 | 3.70 | 53 | 0.280 | -11.07 | -5.07 | 0.31 |
| 9 | 0.958 | -0.37 | 5.63 | 3.66 | 54 | 0.263 | -11.59 | -5.59 | 0.28 |
| 10 | 0.952 | -0.42 | 5.58 | 3.61 | 55 | 0.247 | -12.16 | -6.16 | 0.24 |
| 11 | 0.945 | -0.49 | 5.51 | 3.55 | 56 | 0.235 | -12.57 | -6.57 | 0.22 |
| 12 | 0.937 | -0.56 | 5.44 | 3.50 | 57 | 0.224 | -13.00 | -7.00 | 0.20 |
| 13 | 0.930 | -0.63 | 5.37 | 3.44 | 58 | 0.213 | -13.45 | -7.45 | 0.18 |
| 14 | 0.922 | -0.70 | 5.30 | 3.39 | 59 | 0.201 | -13.92 | -7.92 | 0.16 |
| 15 | 0.915 | -0.77 | 5.23 | 3.33 | 60 | 0.190 | -14.42 | -8.42 | 0.14 |
| 16 | 0.905 | -0.87 | 5.13 | 3.26 | 61 | 0.180 | -14.88 | -8.88 | 0.13 |
| 17 | 0.895 | -0.96 | 5.04 | 3.19 | 62 | 0.171 | -15.36 | -9.36 | 0.12 |
| 18 | 0.885 | -1.06 | 4.94 | 3.12 | 63 | 0.161 | -15.86 | -9.86 | 0.10 |
| 19 | 0.876 | -1.15 | 4.85 | 3.05 | 64 | 0.151 | -16.40 | -10.40 | 0.09 |
| 20 | 0.866 | -1.25 | 4.75 | 2.99 | 65 | 0.142 | -16.97 | -10.97 | 0.08 |
| 21 | 0.852 | -1.39 | 4.61 | 2.89 | 66 | 0.140 | -17.07 | -11.07 | 0.08 |
| 22 | 0.838 | -1.54 | 4.46 | 2.80 | 67 | 0.139 | -17.16 | -11.16 | 0.08 |
| 23 | 0.824 | -1.68 | 4.32 | 2.70 | 68 | 0.137 | -17.26 | -11.26 | 0.07 |
| 24 | 0.810 | -1.83 | 4.17 | 2.61 | 69 | 0.136 | -17.36 | -11.36 | 0.07 |
| 25 | 0.796 | -1.98 | 4.02 | 2.52 | 70 | 0.134 | -17.46 | -11.46 | 0.07 |
| 26 | 0.780 | -2.15 | 3.85 | 2.42 | 71 | 0.134 | -17.44 | -11.44 | 0.07 |
| 27 | 0.765 | -2.33 | 3.67 | 2.33 | 72 | 0.134 | -17.43 | -11.43 | 0.07 |
| 28 | 0.749 | -2.51 | 3.49 | 2.24 | 73 | 0.135 | -17.42 | -11.42 | 0.07 |
| 29 | 0.734 | -2.69 | 3.31 | 2.14 | 74 | 0.135 | -17.41 | -11.41 | 0.07 |
| 30 | 0.718 | -2.87 | 3.13 | 2.05 | 75 | 0.135 | -17.39 | -11.39 | 0.07 |
| 31 | 0.700 | -3.09 | 2.91 | 1.95 | 76 | 0.136 | -17.31 | -11.31 | 0.07 |
| 32 | 0.682 | -3.32 | 2.68 | 1.85 | 77 | 0.138 | -17.22 | -11.22 | 0.08 |
| 33 | 0.664 | -3.55 | 2.45 | 1.76 | 78 | 0.139 | -17.14 | -11.14 | 0.08 |
| 34 | 0.646 | -3.79 | 2.21 | 1.66 | 79 | 0.140 | -17.06 | -11.06 | 0.08 |
| 35 | 0.628 | -4.04 | 1.96 | 1.57 | 80 | 0.142 | -16.97 | -10.97 | 0.08 |
| 36 | 0.608 | -4.32 | 1.68 | 1.47 | 81 | 0.143 | -16.87 | -10.87 | 0.08 |
| 37 | 0.588 | -4.61 | 1.39 | 1.38 | 82 | 0.145 | -16.77 | -10.77 | 0.08 |
| 38 | 0.568 | -4.91 | 1.09 | 1.29 | 83 | 0.147 | -16.67 | -10.67 | 0.09 |
| 39 | 0.548 | -5.22 | 0.78 | 1.20 | 84 | 0.148 | -16.58 | -10.58 | 0.09 |
| 40 | 0.528 | -5.54 | 0.46 | 1.11 | 85 | 0.150 | -16.48 | -10.48 | 0.09 |
| 41 | 0.507 | -5.89 | 0.11 | 1.02 | 86 | 0.151 | -16.39 | -10.39 | 0.09 |
| 42 | 0.486 | -6.26 | -0.26 | 0.94 | 87 | 0.153 | -16.31 | -10.31 | 0.09 |
| 43 | 0.465 | -6.64 | -0.64 | 0.86 | 88 | 0.154 | -16.23 | -10.23 | 0.09 |
| 44 | 0.444 | -7.05 | -1.05 | 0.79 | 89 | 0.156 | -16.14 | -10.14 | 0.10 |
| | | | | | 90 | 0.157 | -16.06 | -10.06 | 0.10 |

SCALA
Model CA2-CP RM Circularly Polarized FM Antenna



Frequency = 105.9 Mhz
Interfering Contour 107 dBu (50,10)

ERP= 99 watts
Height = 148 m AGL

| Depression Angle | Relative Field (o) | Effective Power (w) | Distance to Contour (m) | Distance from Antenna to Ground (m) | Clearance (m) |
|------------------|--------------------|---------------------|-------------------------|-------------------------------------|---------------|
| 1 | 0.996 | 98.2 | 310.51 | 8,480.21 | 8170 |
| 2 | 0.993 | 97.6 | 309.58 | 4,240.75 | 3931 |
| 3 | 0.989 | 96.8 | 308.33 | 2,827.88 | 2520 |
| 4 | 0.986 | 96.2 | 307.39 | 2,121.67 | 1814 |
| 5 | 0.982 | 95.5 | 306.15 | 1,698.11 | 1392 |
| 6 | 0.976 | 94.3 | 304.28 | 1,415.88 | 1112 |
| 7 | 0.970 | 93.1 | 302.41 | 1,214.42 | 912 |
| 8 | 0.964 | 92.0 | 300.53 | 1,063.42 | 763 |
| 9 | 0.958 | 90.9 | 298.66 | 946.08 | 647 |
| 10 | 0.952 | 89.7 | 296.79 | 852.30 | 556 |
| 11 | 0.945 | 88.4 | 294.61 | 775.64 | 481 |
| 12 | 0.937 | 86.9 | 292.12 | 711.84 | 420 |
| 13 | 0.930 | 85.6 | 289.93 | 657.92 | 368 |
| 14 | 0.922 | 84.2 | 287.44 | 611.77 | 324 |
| 15 | 0.915 | 82.9 | 285.26 | 571.83 | 287 |
| 16 | 0.905 | 81.1 | 282.14 | 536.94 | 255 |
| 17 | 0.895 | 79.3 | 279.02 | 506.20 | 227 |
| 18 | 0.885 | 77.5 | 275.91 | 478.94 | 203 |
| 19 | 0.876 | 76.0 | 273.10 | 454.59 | 181 |
| 20 | 0.866 | 74.2 | 269.98 | 432.72 | 163 |
| 21 | 0.852 | 71.9 | 265.62 | 412.98 | 147 |
| 22 | 0.838 | 69.5 | 261.25 | 395.08 | 134 |
| 23 | 0.824 | 67.2 | 256.89 | 378.78 | 122 |
| 24 | 0.810 | 65.0 | 252.52 | 363.87 | 111 |
| 25 | 0.796 | 62.7 | 248.16 | 350.20 | 102 |
| 26 | 0.780 | 60.2 | 243.17 | 337.61 | 94 |
| 27 | 0.765 | 57.9 | 238.49 | 326.00 | 88 |
| 28 | 0.749 | 55.5 | 233.51 | 315.25 | 82 |
| 29 | 0.734 | 53.3 | 228.83 | 305.27 | 76 |
| 30 | 0.718 | 51.0 | 223.84 | 296.00 | 72 |
| 31 | 0.700 | 48.5 | 218.23 | 287.36 | 69 |
| 32 | 0.682 | 46.0 | 212.62 | 279.29 | 67 |
| 33 | 0.664 | 43.6 | 207.01 | 271.74 | 65 |
| 34 | 0.646 | 41.3 | 201.40 | 264.67 | 63 |
| 35 | 0.628 | 39.0 | 195.78 | 258.03 | 62 |
| 36 | 0.608 | 36.6 | 189.55 | 251.79 | 62 |
| 37 | 0.588 | 34.2 | 183.31 | 245.92 | 63 |
| 38 | 0.568 | 31.9 | 177.08 | 240.39 | 63 |
| 39 | 0.548 | 29.7 | 170.84 | 235.17 | 64 |
| 40 | 0.528 | 27.6 | 164.61 | 230.25 | 66 |
| 41 | 0.507 | 25.4 | 158.06 | 225.59 | 68 |
| 42 | 0.486 | 23.4 | 151.51 | 221.18 | 70 |
| 43 | 0.465 | 21.4 | 144.97 | 217.01 | 72 |
| 44 | 0.444 | 19.5 | 138.42 | 213.05 | 75 |
| 45 | 0.423 | 17.7 | 131.87 | 209.30 | 77 |

| Depression Angle | Relative Field | Effective Power (w) | Distance to Contour (m) | Distance from Antenna to Ground (m) | Clearance (m) |
|------------------|----------------|---------------------|-------------------------|-------------------------------------|---------------|
| 46 | 0.405 | 16.2 | 126.26 | 205.74 | 79 |
| 47 | 0.386 | 14.8 | 120.34 | 202.36 | 82 |
| 48 | 0.367 | 13.3 | 114.42 | 199.15 | 85 |
| 49 | 0.348 | 12.0 | 108.49 | 196.10 | 88 |
| 50 | 0.329 | 10.7 | 102.57 | 193.20 | 91 |
| 51 | 0.313 | 9.7 | 97.58 | 190.44 | 93 |
| 52 | 0.296 | 8.7 | 92.28 | 187.81 | 96 |
| 53 | 0.280 | 7.8 | 87.29 | 185.32 | 98 |
| 54 | 0.263 | 6.8 | 81.99 | 182.94 | 101 |
| 55 | 0.247 | 6.0 | 77.00 | 180.67 | 104 |
| 56 | 0.235 | 5.5 | 73.26 | 178.52 | 105 |
| 57 | 0.224 | 5.0 | 69.83 | 176.47 | 107 |
| 58 | 0.213 | 4.5 | 66.40 | 174.52 | 108 |
| 59 | 0.201 | 4.0 | 62.66 | 172.66 | 110 |
| 60 | 0.190 | 3.6 | 59.23 | 170.90 | 112 |
| 61 | 0.180 | 3.2 | 56.12 | 169.22 | 113 |
| 62 | 0.171 | 2.9 | 53.37 | 167.62 | 114 |
| 63 | 0.161 | 2.6 | 50.19 | 166.10 | 116 |
| 64 | 0.151 | 2.3 | 47.08 | 164.67 | 118 |
| 65 | 0.142 | 2.0 | 44.27 | 163.30 | 119 |
| 66 | 0.140 | 1.9 | 43.65 | 162.01 | 118 |
| 67 | 0.139 | 1.9 | 43.33 | 160.78 | 117 |
| 68 | 0.137 | 1.9 | 42.71 | 159.62 | 117 |
| 69 | 0.136 | 1.8 | 42.40 | 158.53 | 116 |
| 70 | 0.134 | 1.8 | 41.78 | 157.50 | 116 |
| 71 | 0.134 | 1.8 | 41.78 | 156.53 | 115 |
| 72 | 0.134 | 1.8 | 41.78 | 155.62 | 114 |
| 73 | 0.135 | 1.8 | 42.09 | 154.76 | 113 |
| 74 | 0.135 | 1.8 | 42.09 | 153.96 | 112 |
| 75 | 0.135 | 1.8 | 42.09 | 153.22 | 111 |
| 76 | 0.136 | 1.8 | 42.40 | 152.53 | 110 |
| 77 | 0.138 | 1.9 | 43.02 | 151.89 | 109 |
| 78 | 0.139 | 1.9 | 43.33 | 151.31 | 108 |
| 79 | 0.140 | 1.9 | 43.65 | 150.77 | 107 |
| 80 | 0.142 | 2.0 | 44.27 | 150.28 | 106 |
| 81 | 0.143 | 2.0 | 44.58 | 149.84 | 105 |
| 82 | 0.145 | 2.1 | 45.20 | 149.45 | 104 |
| 83 | 0.147 | 2.1 | 45.83 | 149.11 | 103 |
| 84 | 0.148 | 2.2 | 46.14 | 148.82 | 103 |
| 85 | 0.150 | 2.2 | 46.76 | 148.57 | 102 |
| 86 | 0.151 | 2.3 | 47.08 | 148.36 | 101 |
| 87 | 0.153 | 2.3 | 47.70 | 148.20 | 101 |
| 88 | 0.154 | 2.3 | 48.01 | 148.09 | 100 |
| 89 | 0.156 | 2.4 | 48.63 | 148.02 | 99 |
| 90 | 0.157 | 2.4 | 0.00 | 148.00 | 148 |

NOTES:
- HEIGHT HAS BEEN REDUCED BY 2 METERS TO ALLOW FOR HUMAN EXPOSURE
- DISTANCE FROM ANTENNA TO GROUND IS ACTUALLY TO A POINT 2 METERS ABOVE GROUND