

## Spread Spectrum: Transmission Line Attenuation Chart

**Introduction to Spread Spectrum** 

**TAPR Statement on Spread Spectrum** 

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**Voice Link Over Spread Spectrum Radio** 

Tim Shepard MIT Thesis

**VK2TDS Thesis** 

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**Transmission Line Attenuation Chart** 

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1990's SS Rule Changes

TAPR SS STA

**Buaas SS STA** 

TAPR FHSS Radio Project

The following table shows coax type and the attenuation (measured in db) you can expect by frequency of use per 100 feet of cable.

From Barry McLarnon, VE3JF, Attenuation of Coaxial Transmission Lines in the VHF/UHF/Microwave Amateur and ISM Bands

| Coax         | Size   | 150MHz | 220MHz | 450MHz | 900MHz | 1.5GHz | 2GHz | 5.8GHz |
|--------------|--------|--------|--------|--------|--------|--------|------|--------|
| LDF6-50      | 1.550" | 0.34   | -      | 0.617  | 0.907  | 1.22   | 1.45 | 2.50   |
| LMR-1700     | 1.670" | 0.347  | 0.427  | 0.427  | 0.632  | 1.267  | 1.50 | -      |
| Helliax LDF5 | 1.090" | 0.458  | -      | 0.834  | 1.23   | 1.66   | 1.97 | -      |
| LMR-1200     | 1.200" | 0.481  | 0.589  | 0.864  | 1.26   | 1.69   | 1.99 | -      |
| LMR-900      | 0.870" | 0.619  | 0.755  | 1.10   | 1.60   | 2.12   | 2.49 | -      |
| LMR-600      | 0.590" | 0.964  | 1.18   | 1.72   | 2.50   | 3.31   | 3.90 | 7.3    |
| HELIAX FSJ4  | 0.630" | 0.845  | -      | 1.51   | 2.20   | 2.93   | 3.45 | -      |
| LMR-500      | 0.500" | 1.22   | 1.49   | 2.17   | 3.13   | 4.13   | 4.84 | -      |
| HELIAX FSJ4  | 0.520" | 1.29   | -      | 2.32   | 3.38   | 4.50   | 5.31 | -      |
| LMR-400      | 0.405" | 1.5    | 1.8    | 2.7    | 3.9    | 5.1    | 6.0  | 10.8   |
| Belden 9913  | 0.405" | 1.6    | 1.9    | 2.8    | 4.2    | 5.6    | 6.7  | 13.8   |
| Ultra-Link   | 0.405" | 1.5    | -      | 2.7    | 4.19   | -      | 6.7  | -      |
| RG213/RG214  | 0.405" | 2.8    | 3.5    | 5.2    | 8.0    | 10.1   | 15.2 | 28.6   |
| HELIAX FSJ1  | 0.300" | 2.23   | -      | 3.93   | 5.687  | 7.47   | 8.73 | -      |
| LMR-240      | 0.240" | 3.0    | 3.7    | 5.3    | 7.6    | 9.9    | 11.5 | 20.4   |
| ProFlex 800  | 0.242" | -      | -      | 7.8    | -      | -      | -    | -      |
| Belden RG8X  | 0.242" | 4.7    | 6.0    | 8.6    | 12.8   | 15.9   | 23.1 | 40.9   |
| LMR-200      | 0.195" | 4.0    | 4.8    | 6.9    | 9.9    | 12.9   | 15.0 | -      |
| Ultra-Link   | 0.195" | 5.1    | _      | 9.5    | 14.0   | -      | 36   | -      |
| RG-58        | 0.195" | 6.2    | 7.4    | 10.6   | 16.5   | 21.1   | 32.2 | 51.6   |
| LMR-100      | 0.150" | 8.9    | 10.9   | 15.8   | 22.8   | 30.0   | 35.0 | -      |

## Data gathered from:

- Hutton Antenna Supply Catalog, 1997, p. 144
- Barry McLarnon, VE3JF, Attenuation of Coaxial Transmission Lines in the VHF/UHF/Microwave Amateur and ISM Bands

## Other Info:

- The LMR series is manufactured by Times Microwave.
- 9913 is manufactured by Belden Corp.
- RG-series cables are manufactured by Belden and many others.
- The LDF series are foam dielectric, solid corrugated outer conductor cables, best known by the brand name HELIAX (®Andrew Corp.).
- Attenuation at any frequency = (K1 x SqRt(Fmhz) + K2 x Fmhz)



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