COMMUNICATIONS DEPARTMENT DATA SHEET 404

A list of the types of lines currently used for providing video circuits and their characteristics.

1" Coaxial Pair

Loss

Atten. = $1.55\sqrt{f} + 0.01f$ dB/mile (where f is in MHz)
Example: loss at 6 MHz = 3.8 dB per mile

Loop Resistance

7.5 ohms/loop mile

Characteristic Impedance (Zo)

75 ohms

Delay

approx. 6 μ s per mile

⅜" (0.375") Coaxial Pair

Loss

Atten. = $3.74\sqrt{f} + 0.003f$ dB/mile (f in MHz)
Example: loss at 6 MHz = 9.2 dB per mile

Note: This is for E type ⅜" coaxial cable which is the type of ⅜" coaxial generally met with.
There is also a D type ⅜" coaxial (which may be identified by its black rubber spacers). Examples of this may be found in the interstice coaxial pairs associated with the London/Birmingham 1" coaxial cable.

Atten. of D type coaxial = $4.05\sqrt{f} + 0.003f$ dB/mile

Loop Resistance

Centre conductor = 5.08 ohms per mile
Outer conductor = 3.5 ohms per mile
Total = 8.58 ohms/loop mile

Characteristic Impedance

75 ohms

Delay

approx. 6 μs per mile

0.174" Coaxial Pair

Loss

Atten. $\simeq 8.4\sqrt{f}$ dB/mile (f in MHz)
Example: loss at 1 MHz = 8.65 dB per mile
loss at 6 MHz = 20.06 dB per mile

Loop Resistance

Inner conductor = 25 ohms/mile
Outer conductor = 10.5 ohms/mile
Total = 30.5 ohms per loop mile

Characteristic Impedance (Zo)

75 ohms $\pm$ 0.75 ohm at 1 MHz

74 ohms $\pm$ 0.75 ohm at 4.5 MHz

Delay

approx. 6 μ s per mile

0.163" Coaxial Pair (type 163 A)

Loss

Atten. $\simeq 10.3\sqrt{f}$ dB/mile (f in MHz)
Example: loss at 1 MHz = 10.4 dB per mile
loss at 6 MHz = 25.2 dB per mile

Loop Resistance

Inner 38.9 ohms/mile

Characteristic Impedance (Zo)

75 ohms $\pm$ 2 ohms at 1 MHz

Delay

approx. 6.5 μ s per mile

Siemens/E.M.I. (1") Balanced Pair

Loss

Attenuation $\simeq 4.5\sqrt{f} + 0.5f$ dB/mile (f in MHz)
Example: loss at 3 MHz = 8 dB per mile
loss at 6 MHz = 14 dB per mile

Loop Resistance

17.6 ohms/loop mile (i.e. 100 lb. conductor)

Characteristic Impedance (Zo)

186 ohms

Delay

approx. 8 μ s per mile

S.T. & C. Balanced Pair ($\frac{3}{8}$")

Loss

Atten. $\simeq 7.7\sqrt{f} + 0.3f$ dB/mile (f in MHz)
Example: loss at 3 MHz = 14 dB per mile
loss at 6 MHz = 20.5 dB per mile

Loop Resistance

44 ohms/loop mile (i.e. 40 lb. conductor)

Characteristic Impedance (Zo)

140 ohms

Delay

approx. 8 μ s per mile

Telephone Pair

Loss

The attenuation varies of course with the type of cable and weight of conductor used. Some examples of the more frequently met cables are given:-

Attenuation of 6½ lb Conductors = 60-70 dB/mile at 3 MHz
" " 10 lb " = 50-60 dB/mile at 3 MHz
" " 20 lb " = 40-50 dB/mile at 3 MHz
" " 40 lb " = 30-40 dB/mile at 3 MHz

Loop Resistance

6½ lb = 270 ohm/loop mile
10 lb = 176 ohm/loop mile
20 lb = 88 ohm/loop mile
40 lb = 44 ohm/loop mile

Characteristic Impedance (Zo)

When using telephone pair for the provision of vision circuits, the Zo is generally assumed to be 100 ohms irrespective of the type of plant being used.

ATTENUATION CHARACTERISTICS OF COAXIAL CABLES