Repeater Section Return Loss and Singing Point

TOLL CABLE - SINGING (NOMINAL VALUES)

Facility	Critical Freq.	Structural Singing Point(96%)	22-A Equip. Loss (One end)	Reptr. Sect. Pair Loss	Repeater Section Singing Point (96%) 22-A	Repeater Section Singing Point (96%) V1
19 ga. H-172-S	2000 (B)	21.9	.6	15.8	22.8	21.9
16 ga. "	2000 (B)	20.0	.6	10.5	20.7	19.7
19 ga. H-106-P	2000 (B)	21.3	.9	12.5	22.6	21.1
16 ga. "	2000 (B)	19.4	.9	7.9	20.3	18.7
19 ga. H-88-S	2900 (D)	22.2	.9	17.3	23.7	22.2
16 ga. "	2900 (D)	20.2	.9	10.4	21.5	19.9
19 ga. B-88-S	2900 (D)	21.2	.7	15.6	22.3	21.2
16 ga. "	2900 (D)	19.4	.7	10.2	20.3	19.1
19 ga. H-63-P	2200 (C)	24.5	1.1	15.4	26.0	24.4
16 ga. "	2200 (C)	22.3	1.1	9.5	23.5	21.6
19 ga. H-50-P	2900 (D)	22.3	1.1	14.2	24.0	22.2
16 ga. "	2900 (D)	20.2	1.1	8.5	21.5	19.5
19 ga. B-50-P	2900 (D)	21.0	1.1	12.8	22.8	20.9
16 ga. "	2900 (D)	19.2	1.1	8.3	20.6	18.6
19 ga. H-44-S	2200 (C)	30.3	.7	16.9	29.9	30.1
16 ga. "	2200 (C)	27.8	.7	12.9	27.8	27.3
19 ga. H-44-S	2900 (D)	27.3	.7	17.1	27.7	27.2
16 ga. "	2900 (D)	24.9	.7	13.4	25.6	24.7
19 ga. H-25-P	2200 (C)	30.0	.9	14.0	29.8	29.5
16 ga. "	2200 (C)	27.6	.9	10.8	27.4	26.4
19 ga. H-25-P	2900 (D)	27.2	.9	14.3	27.9	27.0
16 ga. "	2900 (D)	24.8	.9	11.3	25.5	24.2

Notes: For the 22-A type repeater the repeater section value consists of the power summation of the following components:

1. Structural Singing Point + 2 x Equipment Loss.
2. Equipment Singing Point (35 db).
3. Section End Singing Point = 11 + 2 x Repeater Section Pair Loss + 2 x Equipment Loss.

The V1 repeater value is the power summation of:

1. Structural Singing Point.
2. Section End Singing Point = 11 + 2 x Reptr. Sect. Pair Loss.

The repeater section pair (or phantom) loss is at the critical frequency and for the following cable lengths: 35 mi. for 19 ga. H-44-25; 45 mi. for H-88-50; 50 mi. for other types of facility.

The critical frequencies assume that the repeaters are equipped with the filters standard for the type of facilities involved as indicated by the standard circuit layout filter codes in parenthesis.

Notes: The repeater section singing points of this section are for normal length sections of cable installed in 750 ft. reel lengths without deviation test splicing, and free of intermediate irregularities. They are suitable for general use in absence of known data for the particular section involved or of conditions departing substantially from those assumed. The method of derivation is indicated for use in other cases. Among the variables involved are:

1. Equipment Losses: Those shown are applicable generally though values from circuit layout cards may be used where revised singing points need to be evaluated.

2. Cable Length: No revision is necessary for short cables due to the increased structural singing point. The greater influence of the section-end singing point with shorter cables will reduce the repeater section values 1 db for 19 ga. cables about 25 miles in length and for 16 ga. cables about 30 miles in length.

3. Reel Lengths: Assuming no deviation test splicing reels longer than 750 ft. will have about the same effect on repeater section singing points as on structural singing points, namely, a reduction of 0.5 db for 1,000 ft. reels, 1.5 db for 1,500 ft. reels, and 2.5 db for 3,000 ft. reels.

4. Section-End Singing Point: As indicated, a value of 11 db is used generally, which is based on a repeater termination and half-section end loading section (half-coil for B-88-50). Corrections for other conditions of the end-loading section or for other terminations, such as 4-wire terminating sets or 600 ohms in case of end repeater sections without terminal repeaters, will not generally be necessary, but may be advisable for short sections, especially if 16 gauge.