COMMON SYSTEMS ON1, ON2 & ON/K CARRIER TELEPHONE SLOPE NETWORK, SPAN PADS AND ARTIFICIAL LINE CKTS.

CHANGES

A. CHANGED AND ADDED FUNCTIONS

A.1 A new 2-mile artificial line was added which is to be used in preference to an "N" type 2-mile artificial line whenever there is need for a 2-mile artificial line to be used between the 559A line filter and the receiving amplifier in ON/K systems.

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Fig. 10 was added as described in A.1 above.

D.2 Shielding information in Figs. 2, 3, and 4 was removed. The information is available on the associated application schematic.

D.3 Note 202 was deleted. The information is available on the associated application schematic.

D.4 In note 102 resistors R100 and R105 were changed from 49.9 ohms to 50.0 ohms. These resistors are a 144E type which is not available in the 49.9 ohm value.

D.5 For the connecting information in Figs. 6 and 7 "or to Appl. Schem. for ON1 & ON2 Repeater" was added.

All other headings under Changes, no change.

1. PURPOSE OF CIRCUIT

This circuit shows various networks required for applying type "ON1" carrier to a radio system. Included are the +7 and -7db low group and high group slope networks, span adjusting pads, 1-, 2-, and 4-mile artificial lines and combined span pad and 2-mile artificial line.

2. WORKING LIMITS

2.1 None

3. FUNCTIONS

3.1 The 7db slope networks provide the equalization required for transmission of carrier and sidebands between ON repeaters and radio terminals.

3.2 The span adjusting pads, artificial lines and combined span pad and artificial line provide means for building out any particular line loss and the span pads also are used to adjust levels between radio and carrier equipment.

4. CONNECTING CIRCUITS

4.1 Application Schematic for ON1 Carrier to Radio Junction - SD95175-01

4.2 20 Channel - 40 Channel Combining Ckt.- SD95223-01

4.3 Application Schematic for ON/K Junction- SD95228-01

4.4 Application Schematic for ON/K Repeater - SD95229-01

4.5 Application Schematic for ON/K Terminal - SD95230-01

4.6 Application Schematic for ON1 & ON2 Repeater - SD95124-01

DESCRIPTION OF OPERATION

5. GENERAL

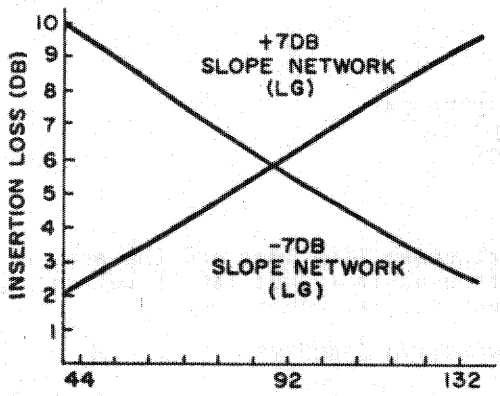
5.1 Where a radio terminal connects to an ON1 system through a wire-line extension, plus or minus slope networks are required between the radio and the ON repeater at the radio terminal.

5.11 These slope networks impart to the essentially flat carrier output of the radio receiver a slope of 7db across the ON1 spectrum for correct transmission to the type N line.

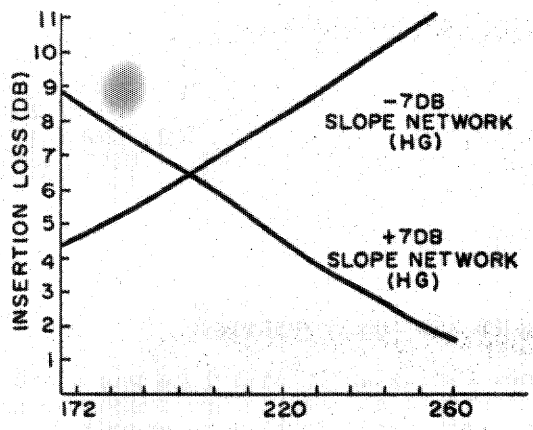
5.12 These networks also act to adjust the carrier levels received from the type N line so that the carriers are essentially flat over the ON1 spectrum for application to the input of the radio transmitter. In the average case the carriers received from the line have approximately a 7db slope.

5.2 Where an ON carrier repeater is at the end of a cable having less than the nominal slope, artificial line sections of 1, 2, or 4 miles are inserted on the line side of the repeater to alter the slope of the received carrier to that which would be received at the end of a line having nominal slope.

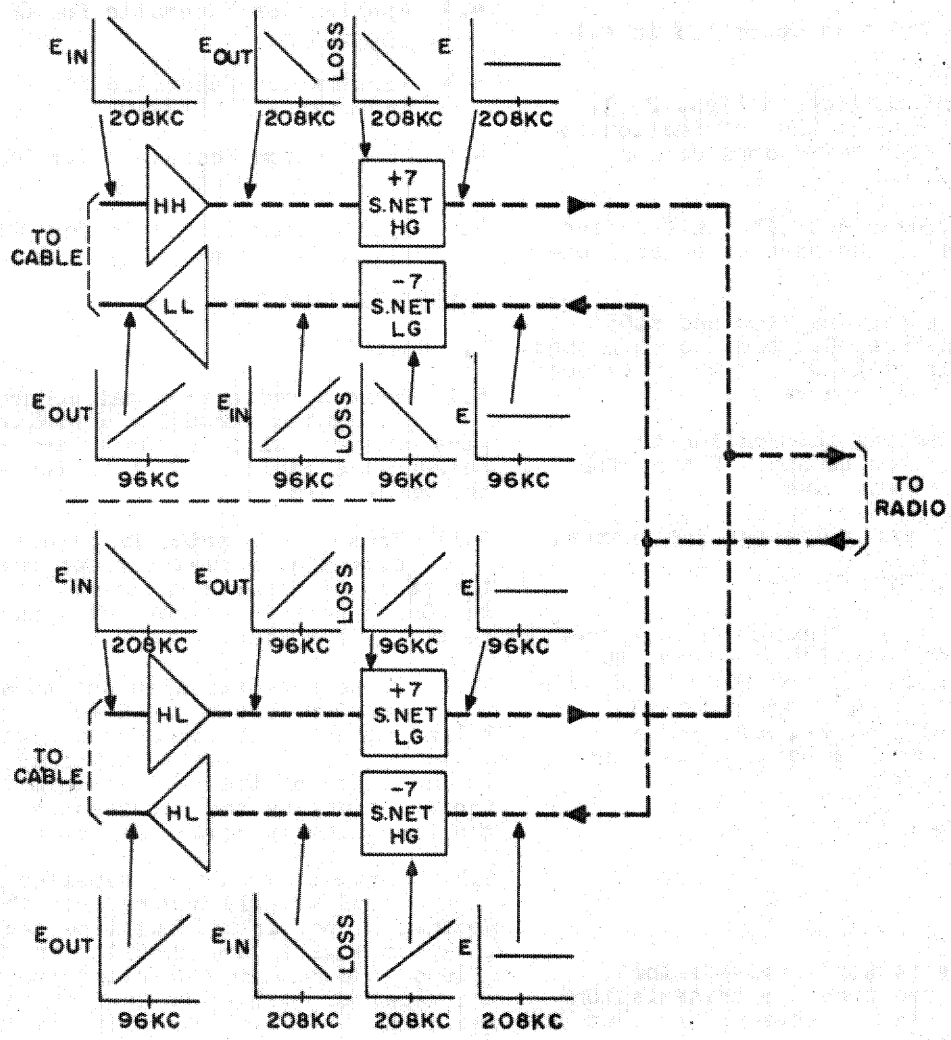
5.3 Span adjusting pads are used generally throughout the type N system. They are used here to insert flat attenuation in the



FREQ (KC)
SKETCH 1



FREQ (KC)
SKETCH 2



SKETCH 3

transmission path wherever required. In some cases they may be mounted on the ON repeater mounting bracket to build out the loss of a short cable span, or to furnish the correct levels of carrier for application to the radio. In other cases, the span pads may be mounted on the 20-channel - 40 channel combining circuit panel to adjust the transmission levels. They are obtainable in 2db steps between 2db and 24db.

5.4 The combined span adjusting pad and 2-mile artificial line is used on the line side of the ON repeater to build out both slope and flat loss of a cable span electrically shorter than nominal. It furnishes a space saving over that of separate artificial line and span pad assemblies. It is obtainable with equivalent flat loss in 2db steps between 2db and 10db.

5.5 The 2-mile artificial line shown in Fig. 10 was designed for use in ON/K Carrier Systems. The impedance and loss characteristics are better than the "N" type 2-mile artificial line. It should be used in preference to the "N" type 2-mile line whenever a 2-mile artificial line is to be used between the 559A line filter and the receiving amplifier in an ON/K system.

6. DETAILED OPERATION

6.1 Detailed descriptions of the span adjusting pads, artificial lines and combined span adjusting pad and 2-mile artificial line are covered in CD95124-01

6.2 Slope Networks (Figs. 6 and 9)

6.21 The four slope networks shown in Figs. 6 and 9 are constructed of resistors, inductors and capacitors mounted on tenite strips (Miniplas assemblies) as are the span adjusting pads and artificial lines. These networks are furnished optionally in the 20 channel - 40 channel combining circuit for ON1 carrier on radio. The slope networks act to either remove the slope across the received frequency band, due to the cable transmission characteristic, or to impart the pre-equalization (slope) required when the ON1 carrier is to be transmitted over type N carrier cable facilities.

6.22 The -7db low group slope network is used between the output of a low-low repeater and the radio, and between the radio and the input of a low-low repeater. The loss of this network decreases with increasing frequency in the ON1 low group band as shown in Sketch 1.

6.23 The +7db low group slope network is used between the output of a high-low repeater and the radio input, and between the radio output and the input of a low-high repeater. The loss of this network increases with increasing frequency in the ON1 low group and as shown in Sketch 1.

6.24 The -7db high group slope network is used between the output of a low-high repeater and the radio input and between the radio output and the input of a high-low repeater. As shown in Sketch 2, the loss increases with increasing frequency across the ON1 high group band.

6.25 The +7db high group network is used between the output of a high-high repeater and the radio input and the radio output and the high-high repeater input. This network has decreasing loss with increasing frequency across the ON1 high group band.

6.26 Sketch 3 illustrates a typical example of the application of each type of slope network and the graphs illustrate the slope condition in various sections of the circuit.

6.27 Since these networks are asymmetric, the two ends have been designated "A" and "B". The impedance at the "A" terminals is 135 ohms and is essentially constant with frequency in the operating band of each network. The impedance at the "B" terminals is not constant with frequency and for this reason the "B" terminals will be found connected toward pads or other "good" 135 ohm impedances. It is important that the "A" and "B" terminals not be reversed.

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