

**N1 AND ON CARRIER REPEATERS—REPEATERED HIGH-FREQUENCY LINE**

**PRELIMINARY TESTS**

**CHECK OF LOCAL CABLING, SPAN PADS, ARTIFICIAL  
LINE SECTIONS, SLOPE NETWORKS, AND NOISE CONTROL UNITS**

Span pads, slope networks, and artificial lines are provided at repeaters to build out the cable loss to the nominal values for the line section and overall system. Span pads are flat loss attenuators available in 2-db steps. Artificial lines are cable building-out sections and are available in 1-, 2-, and 4-mile values. They furnish a compromise loss and slope compensation for short sections of cable but are no longer recommended for use. The noise control unit is a 1:1 transformer with an inductor wired between the midpoints of the two windings for transmission of dc, if power or sealing current is fed. The unit is used to suppress longitudinally induced noise. The 7-db slope networks, which are required on the office side of the ON repeater, are often furnished as a separate assembly which is mounted on the repeater mounting bracket.

This section is reissued to simplify test procedures and to make other minor corrections. Since this reissue incorporates a general revision, marginal arrows ordinarily used to denote changes have been omitted.

The purpose of this test is to make a resistance check of the local cabling and span pads, noise control units, slope networks, and artificial lines between the repeater switching jacks and the cable terminal or ON terminal, ON junction, or ON/K-to-ON connecting circuit.

**APPARATUS:**

- KS-14510 Volt-Ohm-Milliammeter (VOM)
- KS-13895 Connector Plug (unwired)
- W1Y Cords, or equivalent

STEP	PROCEDURE
1	<p style="text-align: center;"><b>A. Repeaters Connected to Cable Pairs</b></p> <p>Check to ensure that one of the following conditions exists:</p> <ul style="list-style-type: none"> <li>(a) If 300-type connectors are used, the heat coils should be of the metal dummy type and protective carbons should be used.</li> <li>(b) If the main distribution frame is used, the cable pairs assigned to the carrier system should have the heat coils removed and permanent straps soldered in their place.</li> </ul>

STEP	PROCEDURE
1 (Cont)	(c) All other types of cable terminals should have protective carbons unless otherwise specified by local instructions.
2	Visually inspect the build-out equipment for agreement with the circuit layout card.
3	Check the A and B sides of the build-out equipment for wiring agreement with SD-95224-01 and SD-95124-03.
4	Strap terminal 0 to terminal 1, 3 to 4, 15 to 16, and 18 to 19 of the spare KS-13895 connector.
5	Remove the repeater from mounting jack J1.
6	At the cable terminal, use W1Y cords to short the tip and ring of the transmitting and receiving pairs and connect them together (see Fig. 2).
7	Insert the strapped KS-13895 connector into jack J1.
8	Measure the dc simplex resistance with the VOM between terminals 0 and 3 of J1 for the West direction and/or terminals 15 and 18 of J1 for the East direction (see Fig. 1).
	<b>Requirement:</b> The resistance shall be the total build-out unit simplex resistance plus up to 6 ohms for office wiring. See Table A and Notes 1 and 2.
	<b>Note 1:</b> Add the dc simplex resistance for each build-out unit in both the transmitting and receiving pairs.
	<b>Note 2:</b> When two noise control units are used to bypass power around the build-out units, the resistance of the combination will be that of the two noise control units only (3 ohms) because of the simplex bypass connection (see Fig. 2).
9	Remove the strapped connector, W1Y cords, and replace the repeater in the mounting.
	<b>B. Repeater Connected to an ON Terminal, ON Junction, or ON/K-to-ON Connecting Circuit</b>
1	Visually inspect the networks installed between the repeater and the ON terminal, ON junction, or ON/K-to-ON connecting circuit for agreement with the circuit layout card.
2	Check the A and B sides of the networks for agreement with SD-95124-03.
3	If the repeater is connected to an ON/K-to-ON connecting circuit, remove the connector plugs from J6, J7, J8, and J9 of the ON/K junction.
4	Remove the connectors from J2 and J3.

<b>TABLE A</b>			
<b>SIMPLEX RESISTANCE OF BUILD-OUT UNITS</b>			
UNIT	SIMPLEX RESISTANCE (OHMS)	UNIT	SIMPLEX RESISTANCE (OHMS)
<b>Span Pad (db):</b>		<b>Artificial Lines (miles):</b>	
2	7.8	1	15.4
4	15.4	2	20.5
6	22.3	4	51.5
8	29.1		
10	35.2	<b>Slope Networks:</b>	
12	40.7	-7 Low Group	100
14	45.3	+7 Low Group	3.6
16	48.7	-7 High Group	1.9
18	52.3	+7 High Group	135
20	55.6		
22	57.6		
24	59.7		
26	61.2		
28	62.4	<b>Miscellaneous:</b>	
30	63.4	Adjustable Deviation Equalizer (J98703BE)	1.3
32	64.2		
34	64.9	Deviation Equalizer (J98703N)	2.0
36	65.7	Noise Control Unit	1.5

STEP	PROCEDURE									
5	Place an unwired KS-13895 connector in J2.									
6	<p data-bbox="380 380 1526 441">Measure the dc loop resistance between the terminals of the KS-13895 connector as indicated below:</p> <table border="1" data-bbox="631 480 1247 699"> <thead> <tr> <th data-bbox="631 480 870 583">SIDE OF REPEATER TOWARD TERM., JCT, OR ON/K CKT</th> <th data-bbox="870 480 1049 583">REPEATER INPUT TERMINALS</th> <th data-bbox="1049 480 1247 583">REPEATER OUTPUT TERMINALS</th> </tr> </thead> <tbody> <tr> <td data-bbox="631 583 870 636">East</td> <td data-bbox="870 583 1049 636">18 and 19</td> <td data-bbox="1049 583 1247 636">14 and 15</td> </tr> <tr> <td data-bbox="631 636 870 699">West</td> <td data-bbox="870 636 1049 699">0 and 1</td> <td data-bbox="1049 636 1247 699">2 and 5</td> </tr> </tbody> </table> <p data-bbox="380 728 1526 825"><b>Requirement:</b> The resistance shall be up to 6 ohms for office wiring plus the total loop resistance of networks A, B, and C (East direction) or networks F, G, and H (West direction) as shown in Table B or C.</p>	SIDE OF REPEATER TOWARD TERM., JCT, OR ON/K CKT	REPEATER INPUT TERMINALS	REPEATER OUTPUT TERMINALS	East	18 and 19	14 and 15	West	0 and 1	2 and 5
SIDE OF REPEATER TOWARD TERM., JCT, OR ON/K CKT	REPEATER INPUT TERMINALS	REPEATER OUTPUT TERMINALS								
East	18 and 19	14 and 15								
West	0 and 1	2 and 5								
7	Remove the unwired KS-13895 connector and replace the connectors in J2 and J3.									

<b>TABLE B</b>		
<b>TOTAL LOOP RESISTANCE INCLUDING BUILD-OUT UNITS BETWEEN REPEATER AND ON TERMINAL OR ON JUNCTION</b>		
<b>ON Terminal or Junction Options—Receiving</b>		
NETWORK A OR H USED	LOOP RESISTANCE	
J98706L (−7 db Low Group)	129.8	
J98706T (+7 db Low Group)	36.4	
6-db Span Pad (Old)	111.2	
6-db Span Pad (New)	93.2	
(MD) J98706H (+7 db Low Group)	192.4	
<b>ON Terminal or Junction Options—Transmitting</b>		
NETWORK B OR G USED	NETWORK C OR F USED	LOOP RESISTANCE
18 db (Old)	—	211.5
18 db (New)	—	130.6
12 db (Old)	J98706L (−7 db)	565.1
12 db (New)	J98706L (−7 db)	145.0
12 db (Old)	J98706T (+7 db)	179.5
12 db (New)	J98706T (+7 db)	123.3
(MD) 18 db (Old)	J98706T (+7 db)	225.9
(MD)*18 db (Old)	J98706T (+7 db)	410.6
(MD) —	J98706H (+7 db)	185.7
(MD)* —	J98706H (+7 db)	226.9
<p>* No 2507P transformer used on output of ON terminal or junction.</p> <p><b>Note:</b> Old span pads have a shunt capacitor; new span pads do not. (MD) denotes Manufacture Discontinued options.</p>		

TABLE C		
TOTAL LOOP RESISTANCE INCLUDING BUILD-OUT UNITS BETWEEN REPEATER AND ON/K-TO-ON CONNECTING CIRCUIT		
ON/K-to-ON Connecting Circuit—Receiving		
NETWORK A OR H	LOOP RESISTANCE	
J98706L (-7 db)	140.8	
J98706T (+7 db)	180.1	
6-db Span Pad (Old)	254.9	
6-db Span Pad (New)	141.6	
ON/K-to-ON Connecting Circuit—Transmitting		
NETWORK B OR G	NETWORK C OR F	LOOP RESISTANCE
—	J98706L (-7 db)	402.9
—	J98706T (+7 db)	17.9
6 db (Old)	—	92.1
6 db (New)	—	82.2
(MD) 18 db (Old)	J98706L (-7 db)	612.1
(MD) 18 db (Old)	J98706T (+7 db)	227.1
(MD) 24 db (Old)	—	241.7
<p><b>Note:</b>                      Old span pads have a shunt capacitor; new span pads do not.                      (MD) denotes Manufacture Discontinued options.</p>		

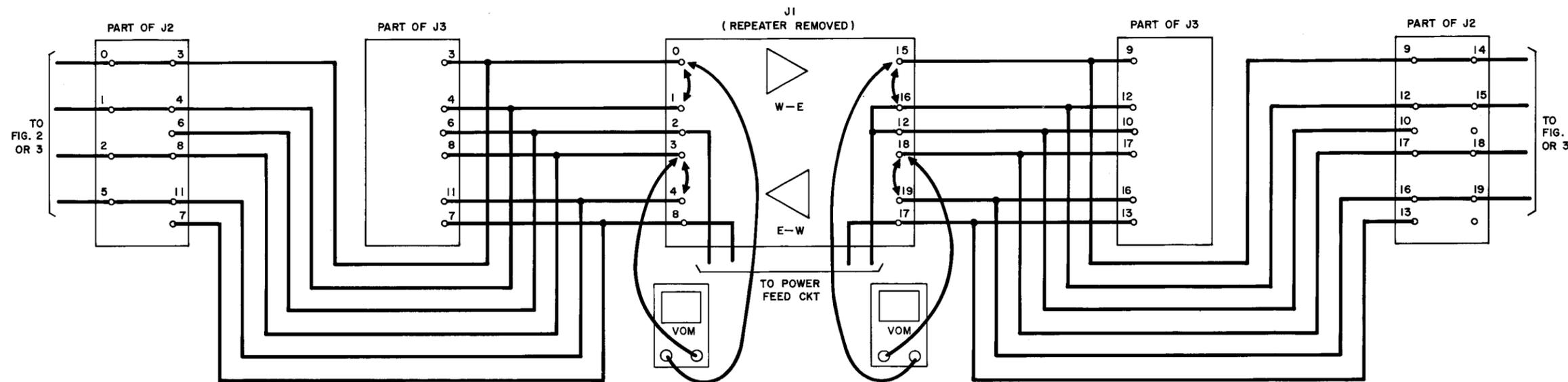


Fig. 1 — Test Arrangement

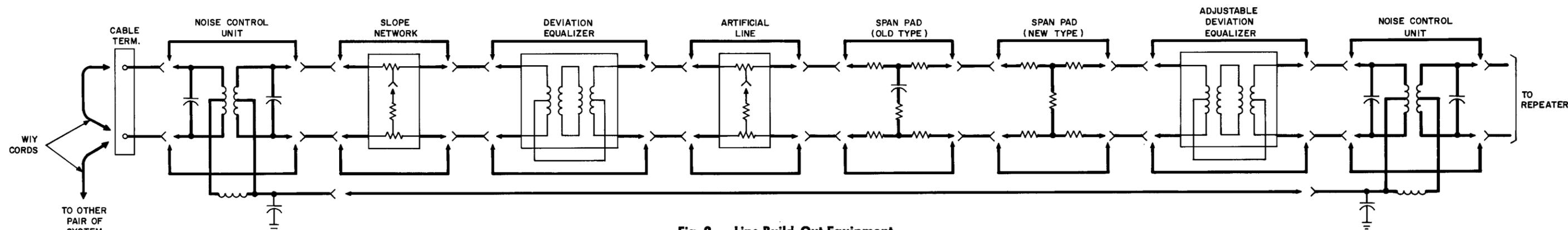


Fig. 2 — Line Build-Out Equipment

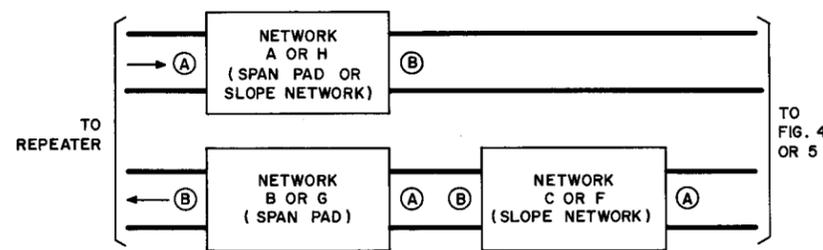


Fig. 3 — Build-Out Equipment

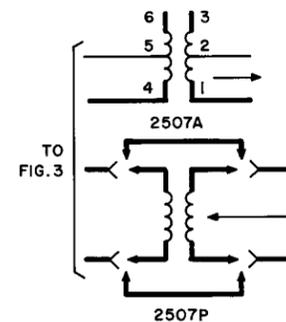


Fig. 4 — ON Terminal or ON Junction Input

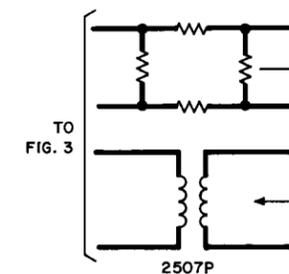


Fig. 5 — ON/K-to-ON Connecting Circuit Input

Fig. 1, 2, 3, 4, and 5