



**RIGID COAXIAL
TRANSMISSION LINE
INSTRUCTION MANUAL**

Dielectric LLC
22 Tower Road
Raymond, ME 04071
Phone: 800.341.9678

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VERTICAL RUN CONSIDERATIONS

Provision must be made to accommodate the differential expansion between the cooper of the line and the steel of the tower. Aluminum temperature rise due to RF heating as well as ambient temperature changes must be taken into account. In the vertical run, this is accomplished by fixing the line at the tower top and “floating” it down the tower on spring hangers with expansion accumulating at the bottom of the tower. To accommodate this movement, the length of the horizontal run must be as specified in Table IV. In addition, the minimum distance from the horizontal run as specified in Table V, to accommodate movement of the horizontal run.

Generally, only standard lengths should be included in the vertical run except at the top where a field cut section is utilized. However, one or two special lengths may be inserted if it permits a better pattern of hangers. Positions of flanges relative to hangers, guide rings and tower members must be carefully planned to avoid interference. A steel plate may be used to mount the hanger a sufficient distance above or below the flange to avoid such interference.

Ideally, spring hangers supporting the vertical run of transmission line should occur every 10 feet (3.1 m); however, minor variations may be used provided an average of one hanger for each 10 feet of line is maintained. The vertical portion of line near the top of the run should be anchored firmly using the appropriate fixed hanger(s). Spring-loading charts are used to set spring tensions of expansion hangers. See Fig. 1 & 2. As finally installed, the line must be vertical and free to move in the hanger guides, and the tower must be designed to keep the vertical hangers perpendicular to the line and the fixed hanger(s) from moving. When installing transmission line, the preferred method is to start at the bottom and work toward the top. The transmission line must be mounted with the anchor insulator of each section at the top end.

In most cases, the elbow which joins the vertical and horizontal runs should be a reinforced type.

HORIZONTAL RUN CONSIDERATIONS

In complex horizontal-line layouts involving elevation and direction changes, care must be exercised not to overstress mitre elbows or introduce excessive flexing of the line. Back to back elbows may be used to achieve desired vertical and horizontal angles.

As stated previously, the horizontal run should be at least as long as indicated in Table V, to allow for sufficient movement due to expansion of the vertical run. Adequate bending of the vertical line run to allow for movement of the horizontal run is assured by proper placement of the first vertical supporting ring as specified in Table IV. Three-point-suspension spring

hangers should be used in the horizontal run for at least the distance shown in Table V. Beyond the minimum distance specified, horizontal roller assemblies or swivel hangers may be used to support the line. Where several lines are in close proximity, special provision may be required to prevent lateral movement while allowing vertical movement. The line should be secured at the wall of the building using a horizontal anchor plate. Lines should be protected from falling ice.

INDOOR INSTALLATION CONSIDERATIONS

The indoor part of the transmission line is normally not pressurized. Therefore, a Gas Stop is installed inside the building wall, and unpressurized line components are used between that point and the output of the transmitter. The arrangement permits disconnecting the ungasged portion of the line anywhere before the Gas Stop without loss of pressure in the outside line.

Indoor runs should be provided with a convenient arrangement of fittings on the output lines of the visual transmitter, aural transmitter and filterplexer to facilitate connection of a wattmeter and Dielectric dummy load.

PURGING MOISTURE FROM NEW LINE

A transmission line installation must be free of moisture before power is applied since operating a line with moisture inside is likely to cause substantial damage. If moisture is suspected, the uppermost part of the line should be opened by using the petcock supplied or by slightly loosening the most-distant flange. The line should then be bled with dry (oil-pumped) nitrogen. Lines should be continuously pressurized from a nitrogen or a dry air source. After any complete loss of pressure where moisture may have entered, the line should be purged before it is again placed in use.

Should it be necessary to identify a leak, use non-ammonia based leak detection soap, such as *Snoop*, by Swagelok. If unavailable use a simple mixture of dish detergent and water. Ammonia and ammonia-based chemicals are extremely incompatible with brass and brass is one of the main components in transmission line and antenna systems. Ammonia makes the brass more susceptible to stress-corrosion cracking.

INSTALLATION PRECAUTIONS

Care is required in handling the various transmission line components to prevent damage and assure proper installation. Procedures are outlined in “Transmission Line Do’s and Don’ts.” These recommendations are important.

Tower steel must be designed to support the vertical run in a straight line and maintain line clearance within spring hanger guide rings under load.

TRANSMISSION LINE DO'S AND DON'TS

DO'S

1. DO store packaged transmission line in clean dry place to prevent contamination.
2. DO withdraw and inspect inner and outer conductors completely if in previously opened or damaged shipping boxes.
3. DO withdraw and inspect all short pieces of line.
4. DO check operation of inner expander assembly* and any components suspected of contamination with dirt or moisture.
5. DO cap all unpacked components against the entry of moisture.
6. DO hoist components with connector end up unless component is marked otherwise.
7. DO check the line in the spring hanger guides after each section is installed to ensure free movement for expansion. Shimming of guides at tower support may be necessary.
8. DO consult spring-loading dimensions (Fig. 1 or 2) for proper spring tension on expansion hangers and adjust each position on the tower accordingly.
9. DO ascertain that inner conductors of adjacent sections match alignment to prevent inadvertent damage to the connector. Hold top connector insulator in place and see that the insulator is well sealed before installing the next section.
10. DO tighten flange bolts alternately, one side, then the other, before final torquing. See Table VI.
11. DO use torque wrench for final tightening. See Table VI.
12. DO pressurize line immediately following installation and maintain 3 lbs/in (0.21 kg/cm) at all times. Leaks must be repaired immediately.
13. DO keep ends of transmission line capped during installation. If installation is halted, seal installed line ends and pressurize to at least 0.5 lbs/in (0.04 kg/cm) with dry air or nitrogen.
14. DO coat O-ring gaskets lightly with Dow-Corning DC-4 silicone compound to ease assembly.
15. DO check O-ring and its groove for dirt or other foreign material and ascertain that ring is properly sealed before flange assembly.

*Check inner conductor expansion joint for an excursion of 0.2 inch (5mm) travel and in the extended position check for presence of contacting spring through exposed groove on inner conductor. In some lines the contacting spring is not visible in the extended position. Presence of the spring can be determined by inserting a 6-mil (0.15 mm) thick feeler gauge (0.5-inch or 13-mm wide) between the tubing inner surface and the connector body outer surface. If spring is present the feeler gauge can be inserted 0.25 inch (6.4 mm). If gauge goes

in 0.5 inch (13 mm), spring is missing and the line section must not be used.

DON'TS

1. DON'T withdraw complete inner conductor line section if shipping box appears to be new and intact. ONLY inspect inner conductor expander.
2. DON'T hoist coupled sections of transmission line. The stresses involved damage components.
3. DON'T use force when fitting components one to another. If cause cannot be corrected or isn't evidence visually, call for DC assistance.
4. DON'T assemble line components that contain water or condensation.
5. DON'T assemble line components that contain dust, dirt, packing material or other foreign objects. Consult Dielectric regarding any loose or suspicious material in the guide, as it is unpacked.
6. DON'T assemble match-marked components unless the marking is clear and understood. DON'T interchange match-marked items. Consult DC about proper assembly.
7. DON'T install any line component with dust, dirt or grease on insulators.
8. DON'T install line that exhibits any evidence of damage.
9. DON'T attempt to correct defects discovered unless instructed and authorized by Dielectric.
10. DON'T dismiss rigger until transmission line is completely installed and pressurized for at least 12 hours and the appropriate electrical tests performed.
11. DON'T power the transmission line until the line is known to be dry and pressurized to at least 3 PSI.
12. DON'T over pressurize the line. Operating pressure of the transmission line should be between 3PSI and 6PSI
13. DON'T exceed specified torque for flange bolts (see Table 6).
14. DON'T use a line flange with evidence of being overstressed.
15. DON'T use a damaged O-ring gasket. Use a new gasket whenever in doubt.
16. DON'T bend elbow components to fit. If leg angle is incorrect, consult Dielectric.
17. DON'T let rigging equipment damage components. Provide proper protection.
18. DON'T cut tubing without cut-off gauge and remove all burrs and chips from inside and outside of tubing.
19. DON'T assemble a horizontal run without proper support.

GENERAL COMPONENTS, DESCRIPTIONS, AND LOCATIONS

1. **GAS STOP**
Normally one gas stop is needed at each end of a coax run. However, its purpose is to supply a method to stop or dry air from entering into an area which does not require pressurization, or when different pressurizations are required.
2. **GASSING KIT**
This supplies the connection of the tube and fittings from the dehydrator to the gas stop.
3. **DEHYDRATOR**
Select the proper size dehydrator from Table III for the size and length of coax run.
4. **SINGLE SWIVEL HANGERS**
These are used to provide a method to hang a single coax inside the transmitter room. These should be spaced approximately 10 ft. apart.
5. **DUAL SWIVEL HANGERS**
These provide the user the ability to hang two runs of coax side by side inside the transmitter room; proper spacing is approximately 10 ft. apart.
6. **RIGID FLANGED COAXIAL TRANSMISSION LINE**
This line is normally supplied in 19-1/2 ft. and 20 ft. lengths. They are bolted end to end with the seal always on the end towards the antenna or tower top. This allows observation of its condition and the coax contact prior to the installation of the next mating piece. Hardware is always supplied for one end of each component. See DO'S and DONT'S.
7. **RIGID UNFLANGED COAXIAL TRANSMISSION LINE**
The unflanged coax is normally used inside the transmitter room where internal pressurization is not required.
8. **HORIZONTAL ANCHOR PLATE**
These are normally used to anchor the coaxial transmission line to the building. They also permit the user to seal the building from the outside weather.
9. **HORIZONTAL SPRING HANGERS (THREE POINT)**
These hangers are used to suspend the horizontal run and provide flexibility when warranted by expansion and contraction due to heating and cooling of the line. These are to be spaced 10 ft. apart.
10. **HORIZONTAL ROLLERS**
This type of hanger is used only when the horizontal run far exceeds the required length to compensate for the in the vertical run. Therefore, the hangers closest to the tower will require three-point suspension and beyond the required horizontal length rollers may be used. See Table IV.
11. **LATERAL BRACES**
Used to restrict lateral motion of coax while permitting vertical and horizontal movement. One is normally attached at the bottom of the vertical run.
12. **ELBOWS**
Two styles are usually available, "Equal leg" and "Unequal leg." It is suggested that the unequal leg elbow be used in most placed only because it provides the maximum amount of support on the inner conductor. Equal leg elbows may be used to save space and to cut cost. Normally this is used at the bottom of the tower, in the elbow complex at the tower top and inside the building.

To provide extra strength of the outer conductor, we also have available a reinforced type elbow. See DO'S and DON'TS & Torque specifications (Table VI).
13. **VERTICAL SPRING HANGERS**
These hangers support the vertical run of coax and provide the flexibility required when vertical expansion and contractions occur due to thermal temperature changes. See DO'S and DON'TS. Also see Spring Hanger Chart.
14. **SOFT SOLDER FIELD FLANGES**
This provides the user with the ability to cut to length a section of coax and affix a flange using soldering equipment readily available in the field.
15. **CUT OFF GUIDES**
Inner and outer cut off guides are required when doing an installation.

The purpose is to aid the user and produce an even, square cut when trimming a piece of coax to a required length.
16. **END CAP**
These are used for a temporary closure of transmission line to prevent entrance of moisture and dust.
17. **REDUCERS**
These are only provided where a reduction of coax size is needed. Two methods of reduction are available; one which reduces one size at a time and the other reduces two sizes at a time.
18. **FIXED HANGERS**
These are used normally at the tower top to fix the vertical run in place.

TRANSMISSION LINE INSTALLATION

To assure proper flange alignment, pins have been placed in each flange and an alignment hole in the opposite side of the flange, simple rotation for alignment is required.

In order to provide pressurization, it will be noted that each piece of line is supplied with one “O”-ring seal. Care must be taken not to pinch or cut the seal during the installation. Also, a small amount of silicone grease may be applied to aid in providing a sure fit. Only a shiny layer is sufficient because an overabundance may cause damage to the coax internally.

SELECTING YOUR TRANSMISSION LINE LENGTH

On long transmission lines, allowances must be provided for differential expansion between outer and inner conductors. Therefore, the inner conductor provides for some relative internal movement of inner and outer conductors. The result is a very small electrical discontinuity which is a function of differential temperature and which can be compensated at only one temperature. Since these discontinuities are a fixed distance apart and numerous in a run of, for example, 300 feet, the combination can represent undesirable VSWR at frequencies where each section is a multiple of half wavelengths. If the operating frequency should coincide with one of the critical frequencies for 20-foot section lengths, 19½-foot sections may be used to avoid the possible addition of reflections. Listed below are the critical frequencies for both section lengths. It is not advisable to work closer than +/-2 MHz to the frequencies listed.

CRITICAL FREQUENCIES

Small reflections at inner conductor connections at flanged areas may add at the following frequencies. For 20-foot and 19½-foot sections, the frequencies in megahertz are 24.52 n and 25.15 n where n is any integer.

For other lengths, the critical frequencies in megahertz may be calculated by:

$$f = \frac{490.4n}{L}$$

where L is the length in feet.

Recommended Section Lengths – U.S. TV Channels

Channel No.	20' Only	19½' Only	Either 19½' or 20'	Channel No.	20' Only	19½' Only	Either 19½' or 20'
2			•	36	•		
3			•	37		•	
4			•	38			•
5	•			39			•
6			•	40	•		
7	•			41		•	
8			•	42		•	
9			•	43			•
10		•		44	•		
11	•			45		•	
12			•	46		•	
13			•	47			•
14			•	48	•		
15	•			49		•	
16			•	50		•	
17		•		51			•
18			•	52	•		
19	•			53	•		
20			•	54		•	
21		•		55			•
22			•	56			•
23	•			57	•		
24			•	58		•	
25		•		59			•
26			•	60			•
27	•			61	•		
28			•	62		•	
29		•		63			•
30			•	64			•
31	•			65	•		
32	•			66		•	
33		•		67			•
34			•	68			•
35			•	69	•		
				70		•	

TABLE I

VSWR Maximum Limit Values

CHANNEL RANGE	LENGTH T/L RUN	3-1/8 DIA.	4-1/16 DIA.	6-1/8 DIA.	7-3/16 DIA.	8-3/16 9-3/16 DIA.
2-6 and FM	0 to 1000'	Regular 1.05	Regular 1.05	Regular 1.05	Regular 1.05	Regular 1.05
	1000' to 1500'	Regular 1.06	Regular 1.06	Regular 1.06	Regular 1.06	Regular 1.06
	0 to 1000'	*Special 1.04	*Special 1.04	*Special 1.035	*Special 1.035	*Special 1.03
	1000' to 1500'	*Special 1.05	*Special 1.05	*Special 1.05	*Special 1.05	*Special 1.05
7-13	0 to 1000'	Regular 1.05	Regular 1.05	Regular 1.05	Regular 1.05	Regular 1.05
	1000' to 1500'	Regular 1.06	Regular 1.06	Regular 1.06	Regular 1.06	Regular 1.06
	0 to 1000'	*Special 1.04	*Special 1.04	*Special 1.035	*Special 1.035	*Special 1.03
	1000' to 1500'	*Special 1.05	*Special 1.05	*Special 1.05	*Special 1.05	*Special 1.05
14-30	0 to 800'	Regular 1.05	Regular 1.05	Regular 1.05	Regular 1.05	Regular 1.05
	800' to 1500'	Regular 1.07	Regular 1.07	Regular 1.07	Regular 1.07	Regular 1.07
	0 to 800'	*Special 1.035	*Special 1.035	*Special 1.03	*Special 1.035	*Special 1.03
	800' to 1500'	*Special 1.05	*Special 1.05	*Special 1.05	*Special 1.05	*Special 1.05
31-62	0 to 800'	Regular 1.06	Regular 1.06	Regular 1.05	Regular 1.05	-----
	800' to 1500'	Regular 1.08	Regular 1.08	Regular 1.08	Regular 1.08	-----
	0 to 800'	*Special 1.05	*Special 1.05	*Special 1.04	*Special 1.04	-----
	800' to 1500'	*Special 1.05	*Special 1.05	*Special 1.05	*Special 1.05	-----
31-52	0 to 800'	-----	-----	-----	-----	Regular 1.05
	800' to 1500'	-----	-----	-----	-----	Regular 1.08
	0 to 800'	-----	-----	-----	-----	*Special 1.04
	800' to 1500'	-----	-----	-----	-----	*Special 1.05

*SPECIAL with application of our factory-installed tuners, DIELECTRIC has the capability of producing improved VSWRs. Contact factory for tuner applications and optimization details.

TABLE II

**Recommended Maximum Transmission Line Lengths
for Dielectric Dehydrators**

Model	1-5/8"	3-1/8"	4-1/16"	6-1/8"	7-3/16"	8-3/16"	9-3/16"
MX 200	5,800'	1,500'	875'	375'	280'	214'	169'
600	XXX	3,000'	1,700'	750'	555'	425'	325'
19-507-1200	XXX	6,000'	3,550'	1,525'	1,110'	850'	675'
19-507-2400	XXX	XXX	6,808'	2,974'	2,155'	1,650'	1,300'
19-507-3600	XXX	XXX	XXX	4,475'	3,265'	2,500'	1,975'

XXX = Greater than 10,000 ft.
 IM 1600 Capabilities same as 19-507-2400
 IM 2400 Capabilities same as 19-507-3600
 All lengths are in feet

TABLE III

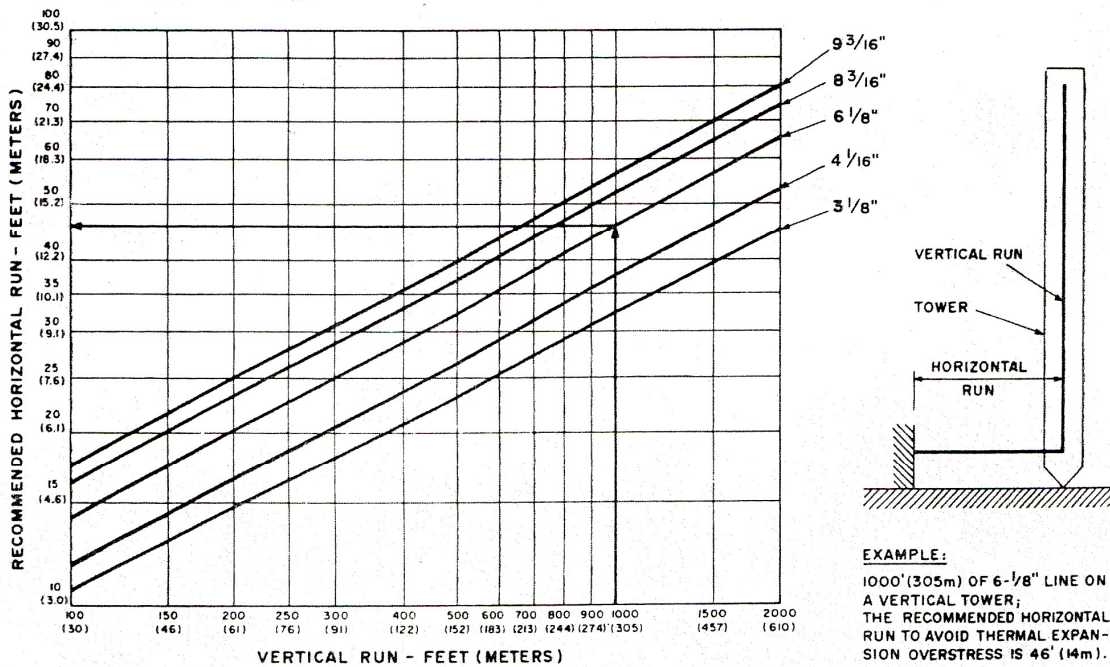


TABLE IV

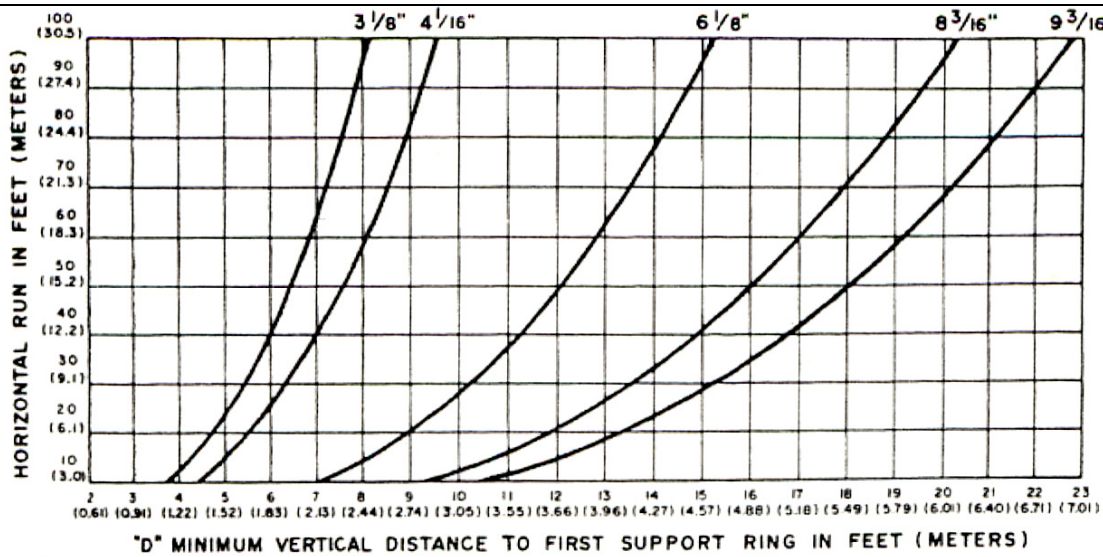


TABLE V

Hardware Torque Specifications

HARDWARE DESCRIPTION	RECOMMENDED TORQUE
	MATERIAL 18-8 SST.
1/4-20	70 IN. LB.
5/16-18	130 IN. LB.
3/8-16	210 IN. LB.
1/2-13	480 IN. LB. = 40 FT. LB.
5/8-11	1080 IN. LB. = 90 FT. LB.
3/4-10	1440 IN. LB. = 120 FT. LB.
1-8	285 FT. LB.
1 1/8-7	413 FT. LB.
1 1/4-7	523 FT. LB.
1 3/8-6	688 FT. LB.
1 1/2-6	888 FT. LB.

TABLE VI

Hanger Clamp Torque Specifications

HARDWARE DESCRIPTION	RECOMMENDED TORQUE
	MATERIAL 18-8 SST.
HOSE CLAMPS	40 – 50 IN. LB.

NOTE:
 HOSE CLAMPS MUST BE ORIENTED PERPENDICULAR TO THE AXIS OF THE OBJECT ON WHICH THEY ARE TO BE MOUNTED.
 (HOSE CLAMP BAND, FLAT ON THE OBJECT SURFACE)

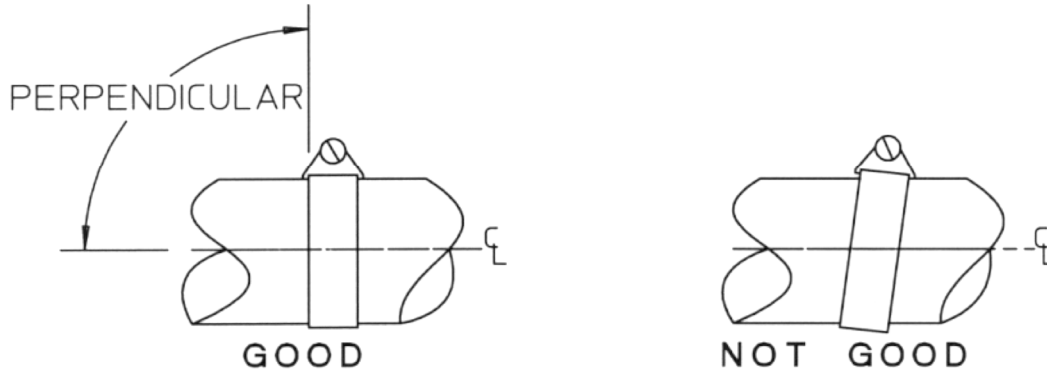


TABLE VII

SPRING LOADING DIMENSIONS FOR EXPANSION HANGERS

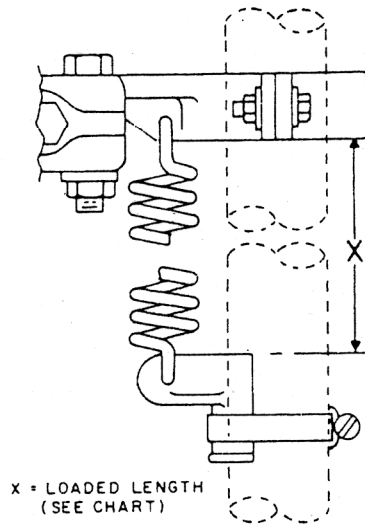


FIG. 1

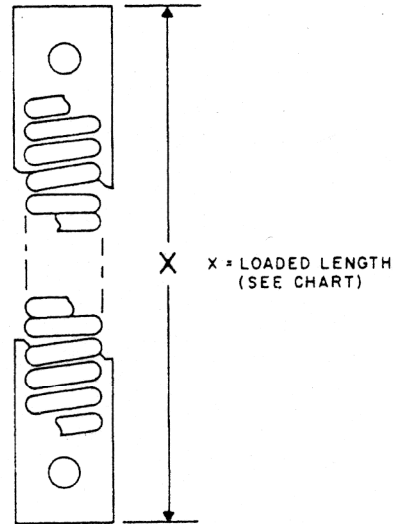


FIG. 2

Single 1-5/8 Inch Line (See Fig. 1)

Distance Below Lowest Fixed Hanger		Loaded Length at Ambient in °F (°C)									
		0° - 20° (-18° - -7°)		20° - 40° (-7° - 4°)		40° - 60° (4° - 16°)		60° - 80° (16° - 27°)		80° - 100° (27° - 38°)	
Feet	Meters	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
0-200	0-61	14-1/4	362	14-1/4	362	14-5/8	365	14-1/2	368	14-1/2	368
200-400	61-122	14	356	14-1/8	359	14-3/8	365	14-5/8	371	14-3/4	375
400-600	122-183	13-3/4	349	14-1/8	359	14-3/8	365	14-5/8	371	14-7/8	378
600-800	183-244	13-5/8	346	14	356	14-3/8	365	14-3/4	375	15-1/8	384
800-1000	244-305	13-3/8	340	13-7/8	352	14-3/8	365	14-7/8	378	15-1/4	387
1000-1200	305-366	13-1/4	337	13-3/4	349	14-3/8	365	14-7/8	378	15-1/2	394

Dual 1-5/8 Inch Line (See Fig. 2)

Distance Below Lowest Fixed Hanger		Loaded Length at Ambient in °F (°C)									
		0° - 20° (-18° - -7°)		20° - 40° (-7° - 4°)		40° - 60° (4° - 16°)		60° - 80° (16° - 27°)		80° - 100° (27° - 38°)	
Feet	Meters	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
0-200	0-61	19-1/8	486	19-1/4	489	19-1/4	489	19-3/8	492	19-3/8	492
200-400	61-122	18-7/8	479	19-1/8	486	19-1/4	489	19-1/2	495	19-5/8	498
400-600	122-183	18-3/4	476	19	483	19-1/4	489	19-1/2	495	19-7/8	505
600-800	183-244	18-1/2	470	18-7/8	479	19-1/4	489	19-5/8	498	20	508
800-1000	244-305	18-5/8	467	18-3/4	476	19-1/4	489	19-3/4	502	20-1/4	514
1000-1200	305-366	18-1/4	464	18-3/4	476	19-1/4	489	19-3/4	502	20-3/8	518

Single 3 1/8-Inch Line (See Fig. 1)

Distance Down From Lowest Fixed Hanger in Feet	Ambient Temperature Degrees (°F) at time of installation "X" Loaded Setting (in inches)					
	From - To	0° - 20°	20° - 40°	40° - 60°	60° - 80°	80° - 100°
0 - 200		16 1/4	16 3/8	16 3/8	16 1/2	16 5/8
200 - 400		16	16 1/4	16 3/8	16 5/8	16 7/8
400 - 600		15 3/4	16	16 3/8	16 3/4	17 1/8
600 - 800		15 1/2	15 7/8	16 3/8	16 7/8	17 3/8
800 - 1000		15 1/4	15 3/4	16 3/8	17	17 5/8
1000 - 1200		15	15 3/4	16 3/8	17 1/8	17 3/4
1200 - 1400		14 7/8	15 5/8	16 3/8	17 1/8	17 7/8
1400 - 1600		14 3/4	15 5/8	16 3/8	17 1/4	18
1600 - 1800		14 5/8	15 1/2	16 3/8	17 1/4	18 1/8
1800 - 2000		14 1/2	15 1/2	16 3/8	17 3/8	18 1/4

Dual 3 1/8-Inch Line (See Fig. 2)

Distance Down From Lowest Fixed Hanger in Feet	Ambient Temperature Degrees (°F) at time of installation "X" Loaded Setting (in inches)					
	From - To	0° - 20°	20° - 40°	40° - 60°	60° - 80°	80° - 100°
0 - 200		24 1/4	24 5/8	24 3/4	24 3/4	24 7/8
200 - 400		24 1/4	24 1/2	24 3/4	24 7/8	25 1/8
400 - 600		24	24 3/8	24 3/4	25	25 3/8
600 - 800		23 3/4	24 1/4	24 3/4	25 1/8	25 5/8
800 - 1000		23 1/2	24 1/8	24 3/4	25 1/4	25 7/8
1000 - 1200		23 3/8	24	24 3/4	25 3/8	26 1/8
1200 - 1400		23 1/8	23 7/8	24 3/4	25 1/2	26 1/4
1400 - 1600		23	23 7/8	24 3/4	25 1/2	26 3/8
1600 - 1800		22 7/8	23 3/4	24 3/4	25 5/8	26 1/2
1800 - 2000		22 3/4	23 3/4	24 3/4	25 5/8	26 5/8

Single 4 1/16-Inch Line (See Fig. 1)

Distance Down From Lowest Fixed Hanger in Feet	Ambient Temperature Degrees (°F) at time of installation "X" Loaded Setting (in inches)				
	0° - 20°	20° - 40°	40° - 60°	60° - 80°	80° - 100°
From – To					
0 – 200	18.00	18.00	18.13	18.13	18.25
200 – 400	17.63	17.88	18.13	18.25	18.50
400 – 600	17.38	17.75	18.13	18.38	18.75
600 – 800	17.25	17.63	18.13	18.50	19.00
800 – 1000	17.00	17.50	18.13	18.63	19.13
1000 – 1200	16.75	17.50	18.13	18.75	19.38
1200 – 1400	16.63	17.38	18.13	18.75	19.50
1400 – 1600	16.50	17.25	18.13	18.88	19.63
1600 – 1800	16.38	17.25	18.13	18.88	19.75
1800 - 2000	16.25	17.13	18.13	19.00	19.88

Single 6 1/8-Inch Line 75 Ohm (See Fig. 2)

Distance Down From Lowest Fixed Hanger in Feet	Ambient Temperature Degrees (°F) at time of installation "X" Loaded Setting (in inches)				
	0° - 20°	20° - 40°	40° - 60°	60° - 80°	80° - 100°
From – To					
0 – 200	32	32	32 1/8	32 1/8	32 1/4
200 – 400	31 3/4	31 7/8	32 1/8	32 3/8	32 1/2
400 – 600	31 3/8	31 3/4	32 1/8	32 1/2	32 7/8
600 – 800	31 1/8	31 5/8	32 1/8	32 5/8	33 1/8
800 – 1000	30 7/8	31 1/2	32 1/8	32 3/4	33 3/8
1000 – 1200	30 5/8	31 3/8	32 1/8	32 7/8	33 5/8
1200 – 1400	30 1/2	31 1/4	32 1/8	33	33 3/4
1400 – 1600	30 1/4	31 1/8	32 1/8	33	34
1600 – 1800	30	31 1/8	32 1/8	33 1/8	34 1/8
1800 - 2000	29 7/8	31	32 1/8	33 1/4	34 1/4

Single 6 1/8-Inch Line 50 Ohm (See Fig. 2)

Distance Down From Lowest Fixed Hanger in Feet	Ambient Temperature Degrees (°F) at time of installation "X" Loaded Setting (in inches)				
	0° - 20°	20° - 40°	40° - 60°	60° - 80°	80° - 100°
From – To					
0 – 200	34 1/8	34 1/4	34 3/8	34 3/8	34 1/2
200 – 400	33 7/8	34 1/8	34 3/8	34 1/2	34 3/4
400 – 600	33 5/8	34	34 3/8	34 5/8	35
600 – 800	33 3/8	33 7/8	34 3/8	34 3/4	35 1/4
800 – 1000	33 1/8	33 3/4	34 3/8	34 7/8	35 1/2
1000 – 1200	32 7/8	33 5/8	34 3/8	35	35 3/4
1200 – 1400	32 5/8	33 1/2	34 3/8	35 1/8	36
1400 – 1600	32 1/2	33 3/8	34 3/8	35 1/4	36 1/8
1600 – 1800	32 1/4	33 1/4	34 3/8	35 3/8	36 3/8
1800 - 2000	32 1/8	33 1/4	34 3/8	35 1/2	36 1/2

Single 7 3/16-Inch 75 Ohm Vertical Spring Hanger (See Fig. 2)

Distance Below Lowest Fixed Hanger		Loaded Length (in.) at Ambient in F (Dimension "X")				
Feet	Meters	10-30°	30-50°	50-70°	70-90°	90-110°
0 – 200	0-61	33 5/8	33 3/4	33 7/8	33 7/8	34
200 - 400	61-122	33 3/8	33 5/8	33 7/8	34	34 1/4
400 - 600	122-183	33 1/8	33 1/2	33 7/8	34 1/4	34 1/2
600 - 800	183-244	32 7/8	33 3/8	33 7/8	34 3/8	34 7/8
800 - 1000	244-305	32 5/8	33 1/4	33 7/8	34 1/2	35 1/8
1000 - 1200	305-366	32 3/8	33 1/8	33 7/8	34 5/8	35 3/8
1200 – 1400	366-427	32 1/8	33	33 7/8	34 3/4	35 5/8
1400 – 1600	427-488	32	33	33 7/8	34 3/4	35 3/4

1600 - 1800	488-549	31 7/8	32 7/8	33 7/8	34 7/8	35 7/8
1800 - 2000	549-610	31 3/4	32 3/4	33 7/8	35	36

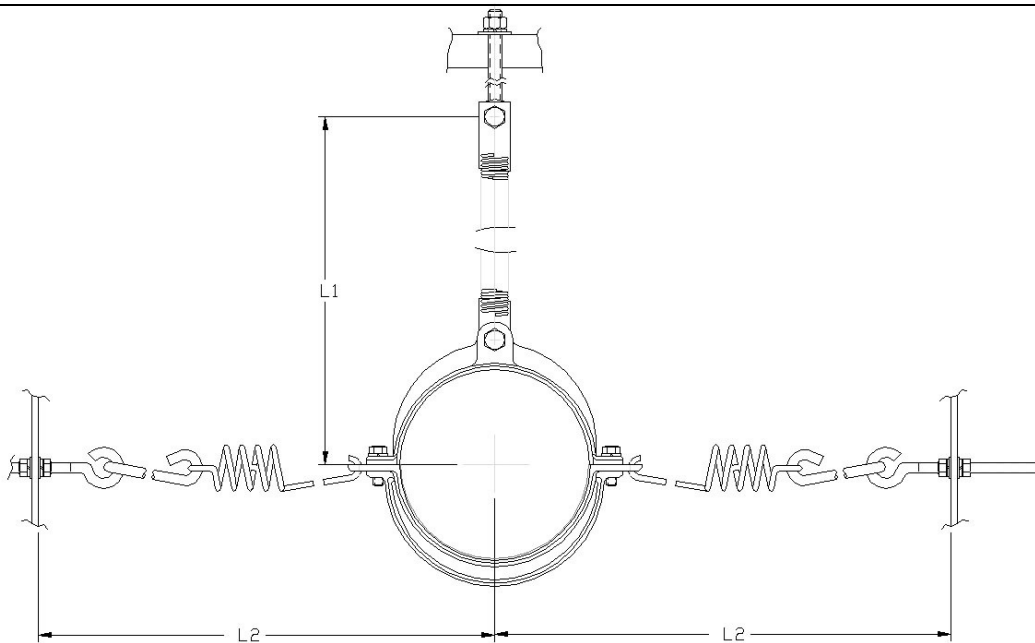
Single 8 3/16-Inch Line (See Fig. 2)

Distance Below Lowest Fixed Hanger		Loaded Length at Ambient in °F (°C) (Dimension X)									
		0° - 20° (-18° - -7°)		20° - 40° (-7° - 4°)		40° - 60° (4° - 16°)		60° - 80° (16° - 27°)		80° - 100° (27° - 38°)	
Feet	Meters	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
0-200	0-61	27 3/4	704	27 1/8	706	28	711	28	711	28 1/8	714
200-400	61-122	27 1/2	699	27 3/4	704	28	711	28 1/4	717	28 3/8	720
400-600	122-183	27 1/4	692	27 5/8	702	28	711	28 3/8	720	28 3/4	730
600-800	183-244	27	686	27 1/2	699	28	711	28 1/2	724	29	737
800-1000	244-305	26 3/4	679	27 3/8	693	28	711	28 5/8	733	29 1/4	743
1000-1200	305-366	26 1/2	673	27 1/4	692	28	711	28 3/4	730	29 1/2	749
1200-1400	366-427	26 1/4	666	27 1/8	689	28	711	28 7/8	733	29 5/8	755
1400-1600	427-488	26 1/8	664	27	686	28	711	28 7/8	733	29 7/8	759
1600-1800	488-549	25 7/8	655	27	686	28	711	29	737	30	762
1800-2000	549-610	25 3/4	654	26 7/8	683	28	711	29 1/8	740	30 1/8	765

Single 9 3/16-Inch Line (See Fig. 2)

Distance Below Lowest Fixed Hanger		Loaded Length at Ambient in °F (°C) (Dimension X)									
		0° - 20° (-18° - -7°)		20° - 40° (-7° - 4°)		40° - 60° (4° - 16°)		60° - 80° (16° - 27°)		80° - 100° (27° - 38°)	
Feet	Meters	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
0-200	0-61	31 1/8	791	30 1/8	791	31 1/4	794	30 1/4	794	31 3/8	797
200-400	61-122	30 3/4	781	31	787	31 1/4	794	31 1/2	800	31 5/8	803
400-600	122-183	30 1/2	775	30 7/8	784	31 1/4	794	31 5/8	803	31 7/8	809
600-800	183-244	30 1/4	768	30 3/4	781	31 1/4	794	31 3/4	806	32 1/8	815
800-1000	244-305	30	762	30 5/8	778	31 1/4	794	31 7/8	809	32 1/2	826
1000-1200	305-366	29 3/4	756	30 1/2	775	31 1/4	794	32	812	32 3/8	822
1200-1400	366-427	29 1/2	749	30 5/8	779	31 1/4	794	32 1/8	815	32 7/8	835
1400-1600	427-488	29 1/4	743	30 1/4	768	31 1/4	794	32 1/8	815	33 1/8	841
1600-1800	488-549	29 1/8	740	30 1/8	765	31 1/4	794	32 1/4	819	33 7/8	841
1800-2000	549-610	28 7/8	733	30	762	31 1/4	794	32 3/8	822	33 1/2	850

Single Horizontal Three-Point Suspension Hangers Free Length-No Load



T/L SIZE	CATALOG NUMBER	L1	L2	APPROX. WT.
3 1/8"	370-032	15 1/8"	15"	5 LBS
4 1/16"	470-032	18 1/2"	17 1/4"	7 LBS
6 1/8"	670-032	23 3/4"	16 3/4"	12 LBS
7 3/16"	770-032	24 1/4"	17 3/8"	20 LBS
8 3/16"	870-032	24 3/4"	17 7/8"	30 LBS
9 3/16"	970-032	25 1/4"	18 3/8"	18 LBS

**Special Instructions
for
digi TLine Installations
*excluding Ultimate Connectors***

In order to achieve the extreme broadband performance that Dielectric's digi TLine is capable of, each connector must be properly seated during installation.

In order to accomplish this, the installation should begin at the transmitter end of the horizontal run with line section number 1. After each transmission line section is bolted on, the inner conductor must

be seated on the anchor connector of the previous section. This is done by inserting the connector seating tool (essentially a 10" long, 3/4" diameter rod) into the exposed connector until it bottoms out on the first magneformed bushing. Then by pushing or gently tapping with a rubber mallet, the inner conductor is seated onto the previous anchor connector. The total amount of inner conductor travel should be about .25".

This process is repeated for every flange joint in the horizontal and vertical run.

******NOTE******

*Failure to follow these instructions will result in degraded VSWR performance.
If you have any questions, please call Dielectric at 1-207-655-8100*

Note: This product may be covered by one or more of the following patents: 6,816,040; 6,650,209; 4,654,962; 5,455,548 or 5,401,173.
Additional patents may be pending.

COMPANY CONFIDENTIAL. INFORMATION CONTAINED HEREIN IS CONFIDENTIAL. IT IS THE PROPERTY OF DIELECTRIC. IT IS TO BE USED SOLELY FOR THE PURPOSE PROVIDED, AND IT IS NOT TO BE DISCLOSED TO OTHERS WITHOUT THE PRIOR WRITTEN CONSENT OF SPX CORPORATION.

REVISIONS		DATE	APPROVED
SYM	DESCRIPTION		
A	ADDED NEW PIECE TO ALLOW 7" TO WORK.	K4	5-26-98

STEP:3
AFTER DOING STEPS 1 AND 2 PUSH DOWN ON THE HANDLE SEATING THE BOLT DOWN AGAINST THE BOTTOM INSIDE SURFACE OF THE CONNECTOR. THIS SHOULD ONLY BE APPROX. 20 lbs. OF FORCE, MAX.

POSITION THE BOLT IN THIS HOLE FOR 4" DIGITLINE

POSITION THE BOLT IN THIS HOLE FOR 6" DIGITLINE

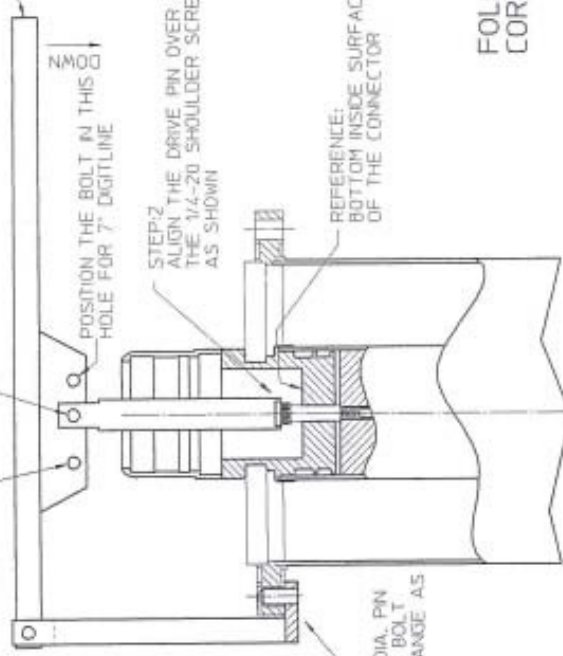
POSITION THE BOLT IN THIS HOLE FOR 7" DIGITLINE

STEP:2
ALIGN THE DRIVE PIN OVER THE 1/4"-20 SHOULDER SCREW AS SHOWN

STEP:4
ONCE COMPLETING STEPS 1 THRU 3 REMOVE THE TOOL AND ASSEMBLE THE NEXT PIECE OF COAX AND REPEAT THE PROCESS AS REQUIRED.

STEP:1
PLACE THE .400 DIA. PIN INTO ONE OF THE BOLT HOLES IN THE FLANGE AS SHOWN.

REFERENCE:
BOTTOM INSIDE SURFACE OF THE CONNECTOR



FOLLOW STEPS 1 THRU 4 FOR CORRECT INSTALLATION PROCEDURES

PART NO: 60543	26-May-98 7:44:01 882608	Dielectric A DIV OF SPX CORPORATION	
MATERIAL: FOR ASSY DRAWING SEE C82407	DIMENSIONAL TOLERANCES (UNLESS OTHERWISE NOTED) 3 PLACE DIMENSIONS .005 2 PLACE DIMENSIONS .010 4 PLACE DIMENSIONS .0010 NEW DIMENSIONS ARE NOT FOR MANUFACTURING OR INSPECTION	TITLE: SET TOOL INSTRUCTION DRAWING FOR 4", 6" & 7" DIGITLINE	REV: A
FINISH:	DATE: 9/15/97 DRAWN: Louie CHECK: ENG APPL: BEVN	CODE IDENT NO 08441 B	82608
PART NO: 60543 DWG REV: A TITLE: SET TOOL 4", 6" & 7" DIGITLINE DRN: BEVN/DWG: LOU/82608		SCALE:	SHEET: