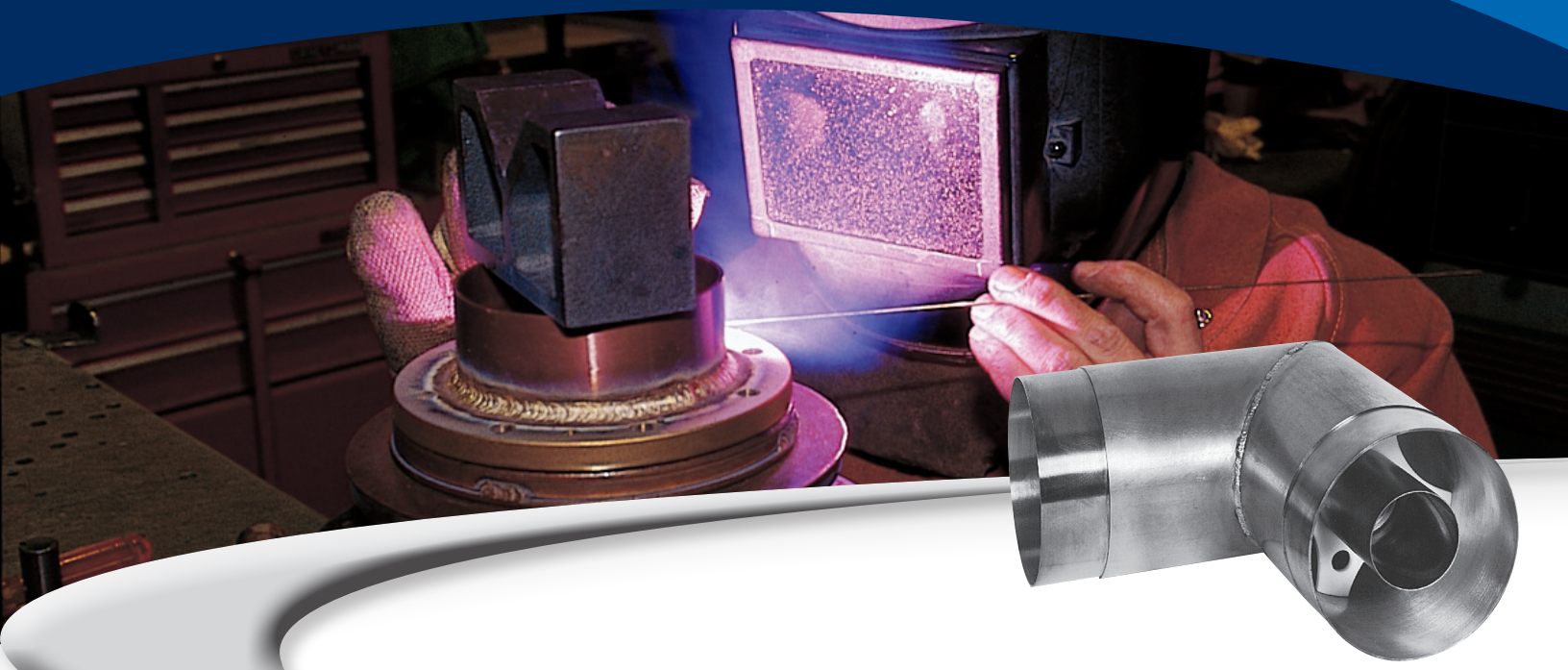
Dielectric®



Transmission Line and Components

Engineering Excellence since 1942

Broadcast Communications Products and Systems since 1942

For over 70 years, Dielectric has been a leader in the communications industry with products and services such as:

- Antennas
- Towers
- Tower Lighting
- Installation
- Maintenance
- Transmission Lines
- Combiners/Filters

Engineering Expertise

With more than 80 engineers on staff with over 1,500 years of combined broadcast engineering experience, the expertise at Dielectric far exceeds that of other broadcast system providers. We plan to have our products in place and working for a very long time, and under the most severe conditions on earth.

Full System Solutions

Since our inception, we have considered ourselves a solutions oriented engineering company, priding ourselves on our depth of scientific experience and knowledge. Clients approach us with broadcast needs and we deliver full system solutions, jointly tasking with client engineering staff to design the most technologically advanced systems in the world. We are one of the few companies who design and manufacture the full broadcast system from the transmitter output through the antenna, including the tower.

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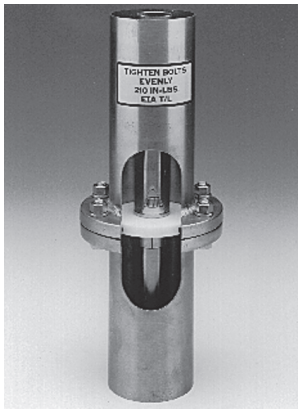
Specifications subject to change without notice.



Introduction

Dielectric is the world's largest manufacturer of Rigid Coaxial Transmission Line. Our experience and record of reliable service, and superior quality, as well as our ongoing research and development programs have kept us the leader in our field. Dielectric manufactures rigid coaxial transmission lines in sizes ranging from 7/8" to 12". Outer conducter material is available in aluminum in certain sizes.

More TV and Radio stations, utilizing rigid Coax Transmission Line, are on the air with Dielectric.

Features

High Conductivity Copper

Dielectric's volume allows us to purchase entire mill runs (to our specifications) of high conductivity copper tubing, 95% ICAS/99.04% purity, providing Transmission Line of constant impedance and continuous high power capacity and low insertion loss.

Welded Construction

All of Dielectric's factory installed flanges and joints are Tungsten Inert Gas Welded to ensure structural integrity and long life.

Expansion Compensation

RF heating of the inner and outer conductors causes differential expansion between the inner and outer which must be compensated for. Dielectric's constant impedance expansion connector is used to provide this differential expansion. The unique design of this silver plated, watch band spring connector prevents arcing and maintains constant impedance.

Inner Conductor Support

Dielectric uses superior low loss PTFE disc type insulators (not pin or rod type supports) for long term reliability and service. Dielectric's line also utilizes a unique magneform process for insulator support undercuts. With magneforming, undercuts are magnetically formed rather than rolled or welded, allowing the use of a continuous inner conductor with excellent mechanical and electrical characteristics.

Heavy Wall Tubing

Dielectric uses heavy wall tubing in most miter elbows. In critical locations requiring extraordinary support, such as the bottom elbow on vertical runs, additional reinforcing is added.

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" and 9 3/16" Dia.	
		Regular	Special*	Regular	Special*	Regular	Special*	Regular	Special*	Regular	Special*
2-6, FM and 7-13	0 to 1000'	1.05	1.04	1.05	1.04	1.05	1.035	1.05	1.035	1.05	1.03
	1000 to 1500'	1.06	1.05	1.06	1.05	1.06	1.05	1.06	1.05	1.06	1.05
14-30	0 to 800'	1.05	1.035	1.05	1.035	1.05	1.03	1.05	1.035	1.05	1.03
	800' to 1500'	1.07	1.05	1.07	1.05	1.07	1.05	1.07	1.05	1.07	1.05
31-62	0 to 800'	1.06	1.05	1.06	1.05	1.05	1.05	1.05	1.04	.....	.....
	800' to 1500'	1.08	1.05	1.08	1.05	1.08	1.05	1.08	1.05	.....	.....
31-52 (8-3/16")	0 to 800'	.....	.....	.....	.....	.....	.....	.....	.....	1.05	1.04
	800' to 1500'	.....	.....	.....	.....	.....	.....	.....	.....	1.08	1.05
31-38 (9-3/16")	0 to 800'	.....	.....	.....	.....	.....	.....	.....	.....	1.05	1.04
	800' to 1500'	.....	.....	.....	.....	.....	.....	.....	.....	1.08	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.

Selection of Proper Line Section Length

Dielectric's patented digiTLine is designed to operate at any VHF, UHF or FM channel. Standard lines require selection of a proper length for a given channel to obtain a low VSWR system.

Combining Channels

When combining channels into coaxial lines the power handling capability of the line must be evaluated (see page 6). For standard lines such as EIA , the line section length must also be evaluated. The tables shown are provided for such an evaluation.

Recommended Line Lengths

Channel	20'	19 3/4'	19 1/2'
2	▪		
3	▪		
4			
5	▪		
6	▪		
FM*			
7	▪		
8	▪		
9	▪		
10			▪
11	▪		
12	▪		
13	▪		
14	▪		
15	▪		
16			▪
17			▪
18	▪		
19	▪		
20			▪
21			▪
22	▪		
23	▪		
24		▪	
25			▪
26			
27	▪		
28	▪		
29			▪
30			▪
31	▪		
32	▪		
33			▪
34			▪
35	▪		

Channel	20'	19 3/4'	19 1/2'
36	▪		
37			▪
38			▪
39	▪		
40	▪		
41			▪
42			▪
43	▪		
44	▪		
45		▪	
46			▪
47	▪		
48	▪		
49		▪	
50			▪
51	▪		
52	▪		
53		▪	
54			▪
55	▪		
56	▪		
57		▪	
58			▪
59	▪		
60	▪		
61		▪	
62			▪
63	▪		
64	▪		
65		▪	
66		▪	
67	▪		
68	▪		
69		▪	

* For full FM band operation 17 1/2' line sections are recommended. For single channel applications standard line lengths can be used.

Prohibited Channels per Line Length

20' Sections	4,10,16,17,20,21,25,26,29,30 33,34,37,38,41,42,45,46,49,50 53,54,57,58,61,62,65,66,69
19 3/4' Sections	10,11,14,17,18,22,23,26,27,30 31,34,35,38,39,42,43,46,47,50 51,55,56,59,60,63,64,67,68
19 1/2' Sections	5,7,14,15,18,19,23,24,27,28,31 32,35,36,39,40,44,45,48,49, 52,53,56,57,60,61,65,66,69

General Specifications

T/L Size	Outer OD	Outer ID	Inner OD	Inner ID
1 5/8"	1.625"	1.527"	0.664"	0.588"
3 1/8"	3.125"	3.027"	1.315"	1.231"
4 1/16"	4.062"	3.935"	1.711"	1.661"
6 1/8"-50 Ohm	6.125"	5.981"	2.600"	2.520"
6 1/8"-75 Ohm	6.125"	5.981"	1.711"	1.661"
7 3/16"	7.144"	7.000"	2.000"	1.932"
8 3/16"	8.150"	8.000"	2.293"	2.226"
9 3/16"-50 Ohm	9.166"	9.000"	3.910"	3.812"
9 3/16"-75 Ohm	9.166"	9.000"	2.580"	2.516"

NOTES:

1. Gas Stop

Normally one gas stop is needed at each end of a coax run. Its purpose is to supply a method to stop gas or dry air from entering into an area which does not require pressurization, or when different pressurizations are required.

2. Dehydrator and Gassing Kit

Select the proper size dehydrator based on the size and length of coax run. The gassing kit supplies the connection of the tube and fittings from the dehydrator to the gas stop.

3. Straight sections of rigid coaxial transmission line

This line is normally supplied in 19 1/2, 19 3/4 or 20 foot lengths. They are bolted end to end with the seal always on the end toward the antenna or tower top. This allows for observation of the condition of the coax contact prior to the installation of the next mating piece. Hardware is always supplied for one end of each component.

4. 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.

5. 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.

6. Lateral Braces

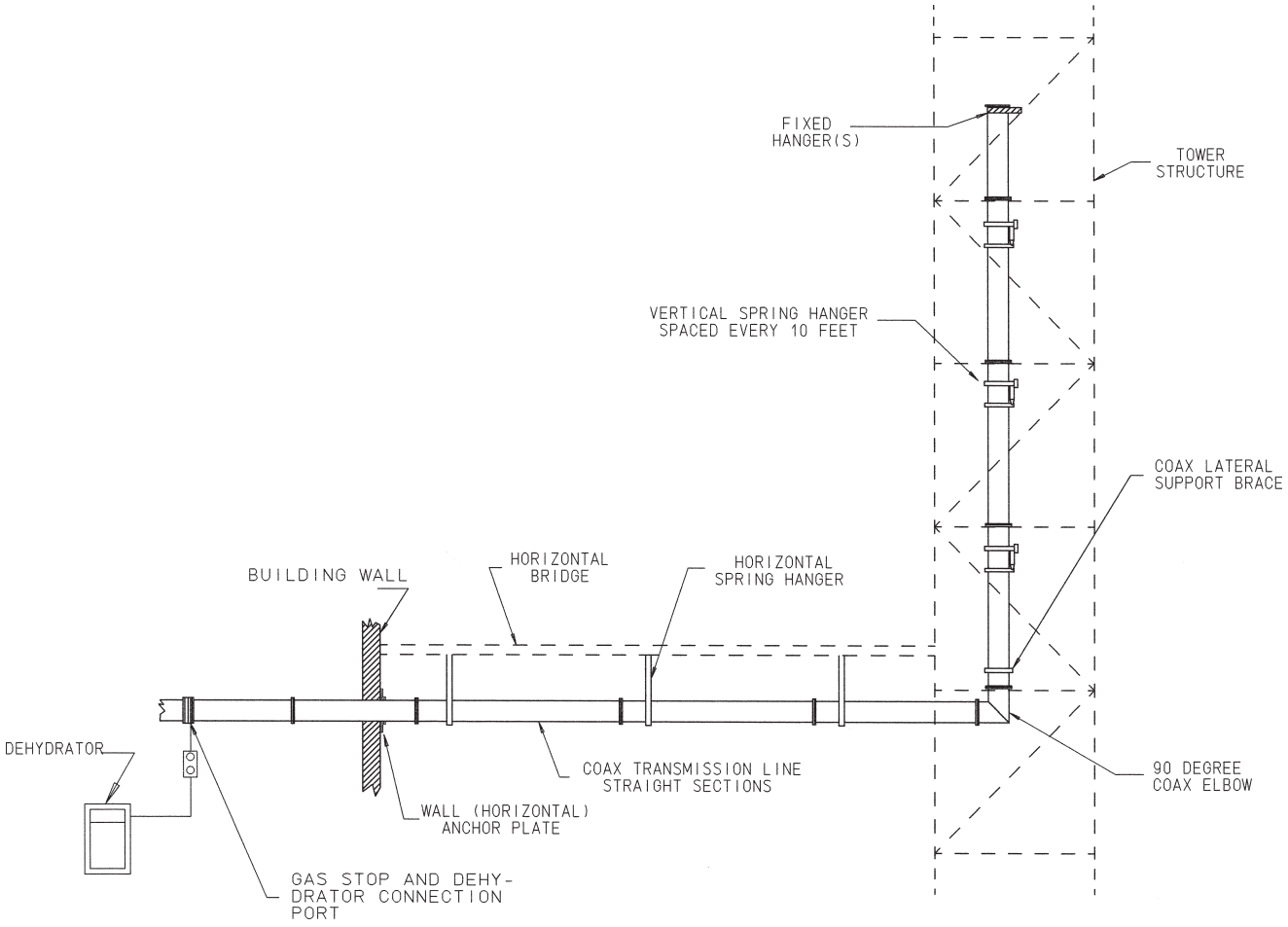
Used to restrict lateral motion of the coax while permitting vertical and horizontal movement. One is normally attached at the bottom of the vertical run.

7. Unequal Leg Reinforced Elbows

It is suggested that unequal leg elbows be used in most places because they provide the maximum amount of support on the inner conductor. Normally they are used at the bottom of the tower, in the elbow complex at the tower top and inside the building.

8. 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.



Minimum Horizontal Run Length vs Height

Vertical	3 1/8"	4 1/16"	6 1/8"	7 3/16"	8 3/16"	9 3/16"
250'	17'	18.5'	22.5'	24'	26'	28'
500'	23'	26.5'	32'	34.5'	37'	40'
1000'	32'	37'	46'	49'	52'	58'
1500'	40'	46'	58'	61.5'	65'	70'
2000'	46'	53'	66'	70.5'	75'	80'

Peak Ratings

Tables of power handling and efficiency are shown on pages 29-32. Ratings are based on a temperature rise of 80°C. Where peak power is the limiting factor it is possible to utilize a more economical size transmission line by increasing the dry air or gas pressure within the line providing the average power does not exceed the line rating[2]. The table below illustrates the ratio of increased peak power in a transmission line with changes of pressures.

Standard Conditions

VSWR:	1.0:1
Line Pressure	0 PSIG
Inner Conductor Temperature	120°C
Ambient Temperature	40°C

Improved Rating with Line Pressure

Line Pressure (PSIG)	Peak Power Rating Factor	AVERAGE POWER Rating Factor 50 Ohm	AVERAGE POWER Rating Factor 75 Ohm
0	1.00	1.00	1.00
5	1.40	1.09	1.08
10	1.90	1.16	1.15
15	2.45	1.21	1.22
20	2.96	1.26	1.28
25	3.50	1.31	1.33

Two factors which impose limits on transmission line use are temperature and voltage (or power). If the maximum temperature of the line is exceeded, the inner conductor will experience excessive oxidation and failure will result. Average power is what causes the temperature of transmission line to rise.

Average Power

A number of conditions affect line temperature and the maximum average power rating of line. Dielectric's transmission line ratings reflect a maximum inner conductor temperature of 120°C. Other factors such as 40°C ambient at sea level (assumes worst case summer condition for the continental US), zero wind velocity, and unity VSWR are utilized for calculation purposes.

A reduction in ambient temperature or increase in wind velocity cause the power rating to increase. Similarly an increase in VSWR, sun load, or very high elevations result in heating and would reflect a decrease in average power handling.

Peak Ratings

Peak voltages and peak power are directly related and can be used interchangeably as a measure of the breakdown limits of the transmission line. Peak voltages must not exceed the ability of the air or the insulators in the line to resist arcing. Laboratory measurements are used to determine voltage breakdown limits. Theoretical calculations can also be used, factoring in allowances for humidity, pressure, surface roughness of inner and outer conductors, the relationship of inner and outer conductors, the relationship between DC Highpot and RF breakdown at high frequencies. The peak voltage limit is the same value for all frequencies in given size line.

NTSC

The peak-of-sync power is defined by the RMS amplitude of the carrier during the horizontal and vertical sync periods. It is sometimes referred to as the peak-envelope-power.

The peak instantaneous power of NTSC occurs when the aural and visual peak voltages add in phase. The peak instantaneous power is used to determine the voltage breakdown condition of all components from the transmitter output to the antenna.

The average power of NTSC is not constant. It depends on the contents of the picture being transmitted. With total blanking, the average visual power is constant and is -2.2 dB below peak-of-sync. The average visual power of NTSC, combined with the aural power are used to calibrate the transmitter from calorimetric measurement of average power. Mathematically, $P_{ave} = P_{sync}(APL + A/P_{sync})$

where APL is the average picture level and is .6 during blanking, and A/P sync is the ratio of aural to visual peak power, typically .1 (10%) for UHF, and .2 (20%) for VHF.

DTV

For DTV the average power is independent of the content of the image being transmitted and unlike the case of NTSC, it is a constant value and there is no separate aural carrier to consider. For DTV, the average power will be the significant parameter used to determine ERP, coverage, interference and CNR (Carrier to Noise Ratio) calculations.

The average power alone however cannot be used to define either the size of the transmitter nor the size of passive components (filters, transmission line, and antennas). Typically this equipment will be evaluated on peak power or voltage breakdown conditions.

Combining Channels

When combining channels into one transmission line both average and peak ratings must be evaluated. In general, for carriers of equal power, the peak power rises as the square of the number of carriers.

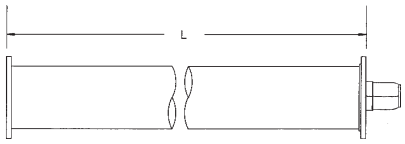
	1 5/8"	3 1/8"	4 1/16"	6"-50 Ohm	6"-75 Ohm	7 3/16"	8 3/16"	9"-75 Ohm	9"-50 Ohm
Peak Power (kW)	554	2,180	3,685	8,513	5,550	7458	9,930	12,568	19,277
Peak Volts (kV)	5	10	13	20	20	23	27	30	31

[1]Peak Voltage Ratings based in 4:1 margin of safety to theoretical.

[2]Average power rating is also increased with greater line pressure.

Straight Sections Fixed Flange

Transmission line with flanges on both ends. Includes one anchor connector, one O-ring and one hardware kit.



With Expansion Inner Conductor

T/L Size	Catalog Number	Impedance in Ohms	L	Approx. Wt.
3 1/8"	375-004	50	20'	56 lb
	375-003	50	19.5'	51 lb
4 1/16"	475-004	50	20'	110 lb
	475-003	50	19.5'	100 lb
6 1/8"	675-004	50	20'	145 lb
	675-003	50	19.5'	135 lb
6 1/8"	677-004	75	20'	145 lb
	677-003	75	19.5'	135 lb
7 3/16"	777-004	75	20'	180 lb
	777-003	75	19.5'	168 lb
8 3/16"	877-004	75	20'	216 lb
	877-003	75	19.5'	202 lb
9 3/16"	977-004	75	20'	260 lb
	977-003	75	19.5'	248 lb

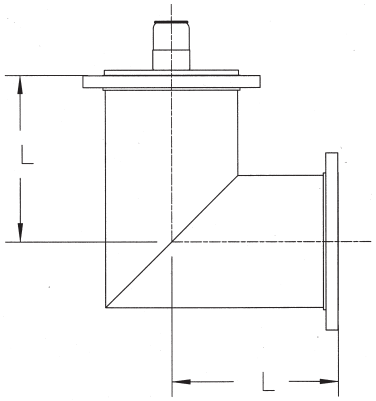
Without Expansion Compensation

Flanged on both ends. Supplied with anchor connector, O-ring and hardware kit.

T/L Size	Catalog Number	Impedance in Ohms	L	Approx. Wt.
1 5/8"	275-002	50	20'	27 lb
	275-001	50	19.5'	26 lb
3 1/8"	375-002	50	20'	60 lb
	375-001	50	19.5'	56 lb
4 1/16"	475-002	50	20'	110 lb
	475-001	50	19.5'	100 lb
6 1/8"	675-002	50	20'	145 lb
	675-001	50	19.5'	135 lb
6 1/8"	677-002	75	20'	140 lb
	677-001	75	19.5'	130 lb
7 3/16"	775-002	75	20'	215 lb
	775-001	75	19.5'	205 lb
8 3/16	877-002	75	20'	192 lb
	877-001	75	19.5	183 lb
9 3/16"	975-002	50	20'	270 lb
	975-001	50	19.5'	202 lb
9 3/16"	977-002	75	20'	229 lb
	977-001	75	19.5'	219 lb

Random Lengths Fixed Flange

T/L Size	Catalog Number	Impedance in Ohms	L	Approx. Wt.
1 5/8"	275-006	50		
3 1/8"	375-006	50		
4 1/16"	475-006	50	Specified	Determined
6 1/8"	675-006	50	By	By
6 1/8"	677-006	75	Customer	Length
7 3/16"	775-006	50		
8 3/16"	877-006	75		
9 3/16"	975-006	50		
9 3/16"	977-006	75		

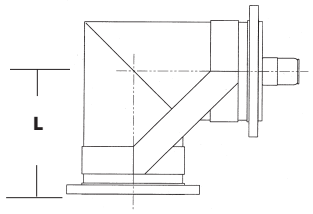


90˚ Mitre Elbow (Equal Leg)

T/L Size	Catalog Number	Impedance in Ohms	L	Approx. Wt.
1 5/8"	275-017	50	3"	3 lb
3 1/8"	375-017	50	6"	9 lb
4 1/16"	475-017	50	6"	12 lb
6 1/8"	675-017	50	9"	28 lb
6 1/8"	677-017	75	9"	28 lb
7 3/16"	777-017	75	9"	35 lb
8 3/16"	877-017	75	12"	40 lb
9 3/16"	975-017	50	12"	50 lb
9 3/16"	977-017	75	12"	50 lb

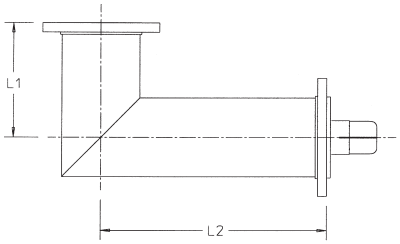
90˚ Mitre Elbow (Equal Leg) Reinforced

90˚ elbow, equal length legs. Includes one anchor connector, one O-ring and one hardware kit. Swivel Flanges.



T/L Size	Catalog Number	Impedance in Ohms	L	Approx. Wt.
3 1/8"	375-021	50	6"	10 lb
4 1/16"	475-021	50	6"	14 lb
6 1/8"	675-021	50	9"	29 lb
6 1/8"	677-021	75	9"	29 lb
7 3/16"	777-021	75	9"	37 lb
8 3/16"	877-021	75	12"	45 lb
9 3/16"	977-021	75	12"	55 lb

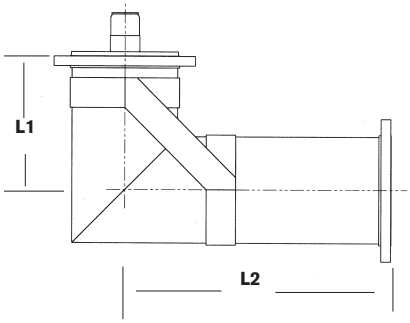
90° Mitre Elbows (Unequal Leg)



T/L Size	Catalog Number	Impedance in Ohms	L1	L2	Approx. Wt.
1 5/8"	275-018	50	3"	6"	4.25 lb
3 1/8"	375-018	50	6"	9"	12 lb
4 1/16"	475-018	50	6"	12"	18 lb
6 1/8"	675-018	50	9"	18"	31 lb
7 3/16"	777-018	75	9"	18"	40 lb
6 1/8"	677-018	75	9"	18"	26 lb
8 3/16"	877-018	75	12"	24"	50 lb
9 3/16"	975-018	50	12"	24"	60 lb
9 3/16"	977-018	75	12"	24"	60 lb

90° Elbow (Unequal Leg) Reinforced

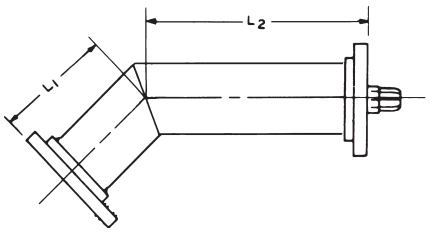
90° reinforced elbow, one long and one short leg. Includes one anchor connector, one O-ring and one hardware kit. Swivel flanges.



T/L Size	Catalog Number	Impedance In Ohms	L1	L2	Approx. Wt.
3 1/8"	375-022	50	6"	9"	13 lb
4 1/16"	475-022	50	6"	12"	20 lb
6 1/8"	675-022	50	9"	18"	32 lb
6 1/8"	677-022	75	9"	18"	27 lb
7 3/16"	777-022	75	9"	18"	45 lb
8 3/16"	877-022	75	12"	24"	55 lb
9 3/16"	977-022	75	12"	24"	65 lb

45° Mitre Elbow (Unequal Leg)

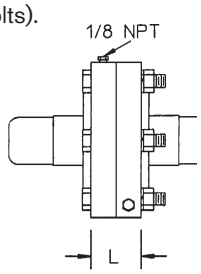
45° elbow, one long and one short leg. Includes one anchor connector, one O-ring and one hardware kit. Swivel flanges.



T/L Size	Catalog Number	Impedance In Ohms	L1	L2	Approx. Wt.
1 5/8"	275-020	50	2.5"	6"	4.25 lb
3 1/8"	375-020	50	6"	12"	12 lb
4 1/16"	475-020	50	6"	12"	18 lb
6 1/8"	675-020	50	9"	12"	31 lb
6 1/8"	677-020	75	9"	12"	31 lb
7 3/16"	777-020	75	9"	12"	45 lb

Gas Stop

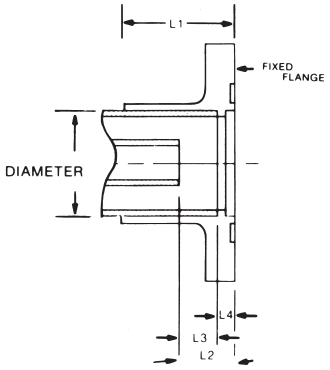
Gas stop for nominal pressure differential. Installs between two flanged line sections. Includes inner-conductor connector, one O-ring and complete hardware (long bolts).



T/L Size	Catalog Number	Impedance In Ohms	L	Approx. Wt.
$1^{5}/_{8}$"	275-005	50	0.88"	4 lb
$3^{1}/_{8}$"	375-005	50	1.50"	7 lb
$4^{1}/_{16}$"	475-005	50	1.50"	12 lb
$6^{1}/_{8}$"	675-005	50	2.00"	16 lb
$6^{1}/_{8}$"	677-005	75	2.00"	18 lb
$7^{3}/_{16}$"	777-005	75	2.25"	22 lb
$8^{3}/_{16}$"	877-005	75	2.38"	35 lb
$9^{3}/_{16}$"	975-005	50	2.00"	40 lb
$9^{3}/_{16}$"	977-005	75	2.38"	40 lb

Soft Solder Flange

Flange for field installation by soft soldering. Includes solder, liquid flux, brush, garnet paper and cleaner.



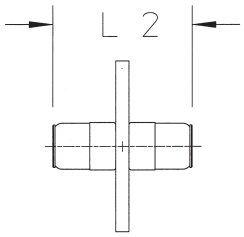
This table shows cut back for 20' sections.

Diameter	Catalog Number	Ohm	L1	L2	L3	L4	Approx. Wt.
$1^{5}/_{8}$"	270-014	50	1.94"	0.59" $\pm^{.03}_{0}$	0.40" $\pm^{.03}_{0}$	.187"	2 lb
$3^{1}/_{8}$"	370-014	50	2.13"	0.91" $\pm^{.03}_{0}$	0.47" $\pm^{.03}_{0}$	.437"	3 lb
$4^{1}/_{16}$"	470-014	50	2.19"	1.22" $\pm^{.03}_{0}$	0.85" $\pm^{.03}_{0}$	.375"	6 lb
$6^{1}/_{8}$"	670-014	50	3.53"	1.28" $\pm^{.03}_{0}$	0.90" $\pm^{.03}_{0}$	.375"	7 lb
$6^{1}/_{8}$"	670-014	75	3.53"	1.22" $\pm^{.03}_{0}$	0.84" $\pm^{.03}_{0}$	.375"	7 lb
$7^{3}/_{16}$"	770-014	75	3.50"	1.41" $\pm^{.03}_{0}$	0.85" $\pm^{.03}_{0}$	.562"	10 lb
$8^{3}/_{16}$"	870-014	75	6.13"	1.59" $\pm^{.03}_{0}$	1.22" $\pm^{.03}_{0}$	.375"	12 lb
$9^{3}/_{16}$"	970-014	50	6.50"	1.78" $\pm^{.03}_{0}$	1.15" $\pm^{.03}_{0}$	.626"	14 lb
$9^{3}/_{16}$"	970-014	75	6.50"	1.59" $\pm^{.03}_{0}$	0.97" $\pm^{.03}_{0}$	.626"	14 lb

Note the cut back difference between 50 and 75 ohms and $6^{1}/_{8}$ and $9^{3}/_{16}$. The given dimensions are for cutting back the inner and outer conductor of transmission line onto the end of which a flange is to be installed.

Connector Anchor Insulator

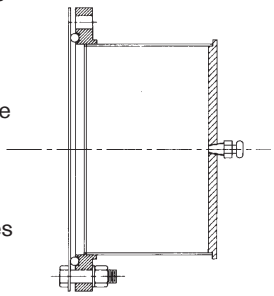
Anchor connector (inner-conductor connector and insulator).



T/L Size	Catalog Number	Impedance In Ohms	L1	L2 Ref.	Approx. Wt.
$1^{5}/_{8}$"	275-011	50	$1^{1}/_{8}$"	$3^{1}/_{8}$"	3.5 oz
$3^{1}/_{8}$"	375-011	50	$1^{3}/_{4}$"	$4^{1}/_{8}$"	13 oz
$4^{1}/_{16}$"	475-011	50	$2^{3}/_{8}$"	$5^{3}/_{8}$"	2 lb
$6^{1}/_{8}$"	675-011	50	$2^{1}/_{2}$"	$5^{1}/_{2}$"	2 lb
$6^{1}/_{8}$"	677-011	75	$2^{3}/_{8}$"	$5^{3}/_{8}$"	2 lb
$7^{3}/_{16}$"	777-011	75	$2^{3}/_{4}$"	$5^{1}/_{16}$"	2 lb
$8^{3}/_{16}$"	877-011	75	$3^{1}/_{8}$"	$6^{1}/_{16}$"	2 lb
$9^{3}/_{16}$"	975-011	50	$3^{1}/_{2}$"	$6^{31}/_{32}$"	5 lb
$9^{3}/_{16}$"	977-011	75	$3^{1}/_{8}$"	$6^{1}/_{8}$"	2 lb

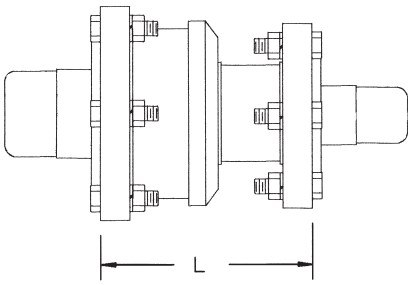
End Cap

End cap with gas port. Includes O-ring and hardware kit. For temporary closure of transmission line to prevent entrance of moisture. Includes pipe plug.



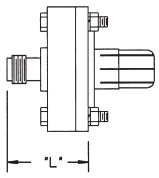
T/L Size	Catalog Number	Approx. Wt.
$1^{5}/_{8}$"	270-024	7 oz
$3^{1}/_{8}$"	370-024	5 lb
$4^{1}/_{16}$"	470-024	7 lb
$6^{1}/_{8}$"	670-024	10 lb
$7^{3}/_{16}$"	770-024	12 lb
$8^{3}/_{16}$"	870-024	14 lb
$9^{3}/_{16}$"	970-024	15 lb

Reducer to smaller line constant impedance. Includes inner conductor connector, O-rings and hardware.

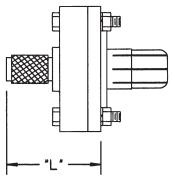


Reducer

T/L Size	Smaller Size	Catalog Number	Impedance In Ohms	L	Approx. Wt.
1 5/8"	7/8"	275-060	50	1.75"	2 lb
3 1/8"	7/8"	375-061	50	1.25"	5 lb
3 1/8"	1 5/8"	375-060	50	0.875"	6 lb
4 1/16"	3 1/8"	475-060	50	4.00"	10 lb
6 1/8"	3 1/8"	675-061	50	6.75"	14 lb
6 1/8"	4 1/16"	675-060	50	5.00"	16 lb
8 3/16"	7 3/16"	877-061	75	9.00"	22 lb
8 3/16"	6 1/8"	877-060	75	9.31"	21 lb
9 3/16"	6 1/8"	975-061	50	9.00"	25 lb
9 3/16"	6 1/8"	977-061	75	10.00"	25 lb
9 3/16"	8 3/16"	977-060	75	9.00"	32 lb



REDUCER TO TYPE "N" (FEMALE)



REDUCER TO TYPE "N" (MALE)

Quick Step Reducer to Type "N"

Female Type "N" Connector

T/L Size	Catalog Number	Impedance In Ohms	L	Approx. Wt.
1 5/8"	275-063	50	2.19"	2 lb
3 1/8"	375-063	50	1.75"	3 lb
4 1/16"	475-063	50	1.87"	4 lb

Male Type "N" Connector

1 5/8"	275-062	50	2.19"	2 lb
3 1/8"	375-062	50	1.75"	3 lb

Cutoff Guide for Outer Conductor

Includes clamp

Outer Conductor O.D.	Catalog Number	Approx. Wt.
1 5/8"	270-040	1 lb
3 1/8"	370-040	2 lb
4 1/16"	470-040	3 lb
6 1/8"	670-040	6 lb
7 3/16"	770-040	8 lb
8 3/16"	870-040	10 lb
9 3/16"	970-040	11 lb

Cutoff Guide for Inner Conductor

Includes clamp

Inner Conductor O.D.	Catalog Number	Impedance in Ohms	Approx. Wt.
1 5/8"	275-041	50	3 oz
3 1/8"	375-041	50	6 oz
4 1/16"	475-041	50	8 oz
6 1/8"	675-041	50	6 oz
6 1/8"	677-041	50	6 oz
7 3/16"	777-041	75	1 lb
8 3/16"	877-041	50	1.5 lb
9 3/16"	975-041	50	6 oz
9 3/16"	977-041	50	1.5 lb

O-Ring Buna-"N"

T/L Size	Catalog Number
1 5/8"	270-010
3 1/8"	370-010
4 1/16"	470-010
6 1/8"	670-010
7 3/16"	770-010
8 3/16"	870-010
9 3/16"	970-010

- *Broadband*
- *High Efficiency*
- *High Power Handling*

The Biggest Breakthrough EVER in Rigid Transmission Line Technology!

Dielectric's patented *digiTLine®* introduced in 1997, is the world's first rigid transmission line designed specifically for the broadcaster who desires a transmission line for NTSC with the capability of using the same line with ANY digital DTV channel in the future.

Dielectric's *digiTLine®* is the result of years of research from the leader in rigid transmission line design and development. Previously, rigid coaxial transmission line was manufactured in 20 ft, 19.75 ft. or 19.5 ft sections. Certain lengths could not be used at specific frequencies as a high VSWR would result. This meant a line used at Channel 22 for example, could not be used at Channel 53. Semiflex cable, while more broadband, is less efficient with lower power handling and a somewhat high overall VSWR.

Broadband Design

digiTLine® combines the best features of rigid copper coaxial line and semi-flexible cable. By eliminating the limitations on channel use, *digiTLine®* can be used at ANY NTSC OR DTV channel. The result is the only BROADBAND rigid line with HIGH POWER HANDLING and HIGH EFFICIENCY.

Advanced Connector

digiTLine®'s new advanced patented connector combines Dielectric's time proven watchband expansion technology, anchor insulator support, and improvements in materials and manufacturing tolerances to virtually eliminate discontinuities at the flange joint.

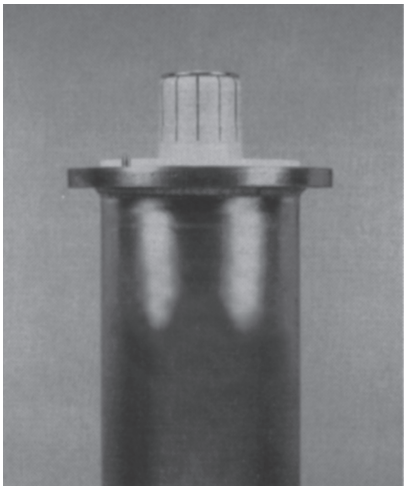
High Efficiency and Power Handling

digiTLine® delivers the high efficiency and power handling required for NTSC and DTV transmissions.

For digital DTV and NTSC, transmission line efficiency is extremely important in order to deliver maximum power to the antenna with minimum loss. Such high efficiencies are only achieved with rigid copper coaxial transmission lines like *digiTLine®*.

The best features of rigid line and semi-flexible cable are combined in

digiTLine®



digiTLine® attenuation and power handling tables are listed on pages 30-34. Examples to evaluate power handling (average and peak) for NTSC, HDTV or combined operation are given in the appendix.

Inner Conductor Support

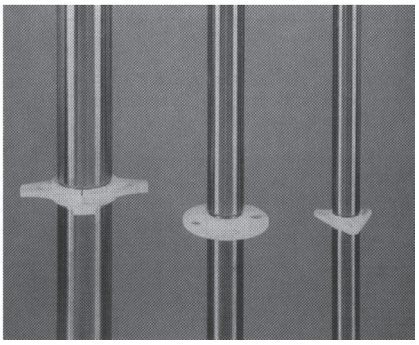
digiTLine® uses Dielectric's superior low loss PTFE disc type insulators (not pin orod type supports) for long term reliability and service. *digiTLine®* also uses Dielectric's unique magniform process for insulator support undercuts. With magniforming, undercuts are magnetically formed rather than rolled or welded, allowing the use of a continuous inner conductor with excellent mechanical and electrical results.

digiTLine® is also available as EHT (Enhanced Heat Transfer) line – refer to pgs 14-15.

Available Sizes

digiTLine® is available in 3-1/8", 4-1/16", and 6-1/8" (50 and 75 ohm) 7-3/16"-75 ohm sizes. *digiTLine®* is also available in 8-3/16" to channel 52, and 9-3/16" to channel 38.

Installation & Maintenance



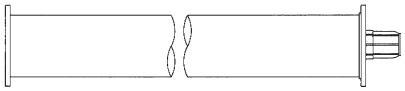
digiTLine® is installed and maintained like standard rigid line.

Other Standard Features

Many well known Dielectric features such as high conductivity copper, heavy wall reinforced elbows and heliarc welded EIA flanges are standard.

The Only Rigid Line Designed to Work with ANY Channel. NTSC, DTV or Both...

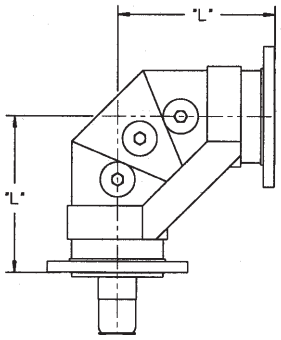
Transmission line with flanges on both ends. Includes expansion connector, O-ring, and hardware kit.



Straight Sections- Fixed Flange With digiTline Expansion Connector

T/L Size	Catalog Number	Impedance in Ohms	Approx. Wt.
3 1/8"	DL 35-004	50	56 lbs
4 1/16"	DL 45-004	50	110 lbs
6 1/8"	DL 65-004	50	145 lbs
6 1/8"	DL 67-004	75	145 lbs
7 3/16"	DL 77-004	75	180 lbs
8 3/16"	DL 87-004	75	216 lbs
9 3/16"	DL 97-004	75	200 lbs

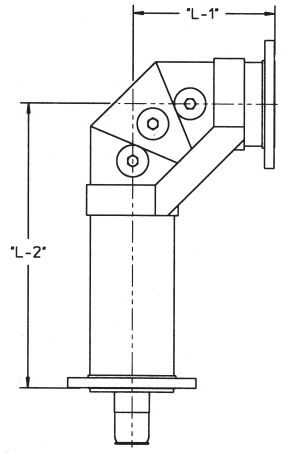
90° reinforced elbow, equal leg. Includes one anchor connector, one O-ring and one hardware kit. Swivel flanges.



90° Elbow (Equal) Reinforced

T/L Size	Catalog Number	Impedance in Ohms	L	Approx. Wt.
3 1/8"	DL 35-021	50	6"	13 lbs
4 1/16"	DL 45-021	50	7"	20 lbs
6 1/8"	DL 65-021	50	9"	32 lbs
6 1/8"	DL 67-021	75	9"	27 lbs
7 3/16"	DL 77-021	75	9"	35 lbs
8 3/16"	DL 87-021	75	12"	55 lbs
9 3/16"	DL 97-021	75	12"	75 lbs

90° reinforced elbow, unequal leg. Includes one anchor connector, one O-ring and one hardware kit. Swivel flanges.

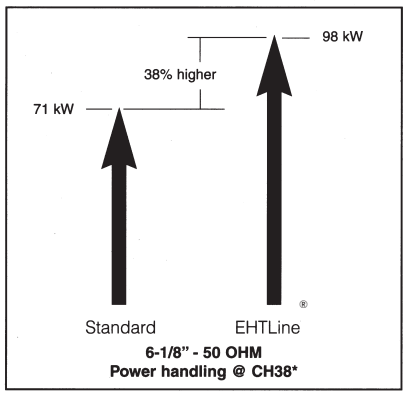


90° Elbow (Unequal Leg) Reinforced

T/L Size	Catalog Number	Impedance In Ohms	L1	L2	Approx. Wt.
3 1/8"	DL 37-022	50	6"	9"	10 lb
4 1/16"	DL 45-022	50	7"	14"	35 lb
6 1/8"	DL 65-022	50	9"	18"	40 lb
6 1/8"	DL 67-022	75	9"	18"	40 lb
7 3/16"	DL 77-022	75	9"	18"	45 lb
8 3/16"	DL 87-022	75	12"	24"	55 lb
9 3/16"	DL 97-022	75	12"	24"	75 lb

Dielectric advances the state of the art in coaxial transmission lines again!

A revolutionary design and unique manufacturing process allow the inner conductor of our new *EHTLine®* to run cooler than standard line at the same input power. The average power ratings of this new line are up to 45% higher than standard coaxial line. This allows the use of a smaller *EHTLine®*, lowering the windload on the tower. EHTLine® is available as EIA or Dielectric broadband *digiTLine®*. Refer to EIA and *digiTLine®* sections for specifications not listed here.



***CONDITIONS:** LOSS AT 0 KW, Power at 15 PSIG, 40°C ambient, 120°C inner.

For power ratings @ 0 PSIG multiply by 0.885 for 50 ohm and 0.875 for 75 ohm.

- *Enhanced Power Handling*
- *Lower Tower Windloading*
- *Proven Connector and Inner Support Designs*
- *Available in All Line Sizes and Types*

EHT Power Handling

4-1/16" - 50 OHM

Channel	Frequency (MHZ)	*Loss (dB/100ft)	*Avg. Power (KW)
2	57	0.050	166
3	63	0.052	157
4	69	0.055	150
5	79	0.059	140
6	85	0.061	135
FM	88	0.071	132
FM	108	0.079	119
7	177	0.089	92
8	183	0.090	90
9	189	0.092	89
10	195	0.093	87
11	201	0.094	86
12	207	0.096	84
13	213	0.097	83
14	473	0.146	54
16	485	0.148	54
18	497	0.150	53
20	509	0.152	52
22	521	0.154	52
24	533	0.155	51
26	545	0.157	50
28	557	0.159	50
30	569	0.161	49
32	581	0.162	49
34	593	0.164	48
36	605	0.166	48
38	617	0.167	47
40	629	0.169	47
42	641	0.169	47
44	653	0.172	46
46	665	0.174	45
48	677	0.176	45
50	689	0.177	44
52	701	0.179	44
54	713	0.180	44
56	725	0.182	43
58	737	0.183	43
60	749	0.185	42
62	761	0.186	42
64	773	0.188	42
66	785	0.189	41
68	797	0.191	41
69	803	0.191	41

6-1/8" - 50 OHM

Channel	Frequency (MHZ)	*Loss (dB/100ft)	*Avg. Power (KW)
2	57	0.039	343
3	63	0.041	327
4	69	0.043	313
5	79	0.046	293
6	85	0.048	282
FM	88	0.049	276
FM	108	0.052	249
7	177	0.069	194
8	183	0.070	190
9	189	0.071	187
10	195	0.073	184
11	201	0.074	181
12	207	0.075	178
13	213	0.076	175
14	473	0.113	113
16	485	0.115	112
18	497	0.116	110
20	509	0.117	109
22	521	0.119	108
24	533	0.120	106
26	545	0.121	105
28	557	0.123	104
30	569	0.124	102
32	581	0.125	101
34	593	0.127	100
36	605	0.128	99
38	617	0.129	98
40	629	0.130	97
42	641	0.132	96
44	653	0.133	95
46	665	0.134	94
48	677	0.135	93
50	689	0.136	92
52	701	0.138	91
54	713	0.139	90
56	725	0.140	89
58	737	0.141	89
60	749	0.142	88
62	761	0.143	87
64	773	0.145	86
66	785	0.146	85
68	797	0.147	85
69	803	0.147	84

EHT Power Handling

6-1/8" - 75 OHM			
Channel Power	Frequency (MHZ)	*Loss (dB/100ft)	*Avg. (KW)
2	57	0.034	300
3	63	0.035	286
4	69	0.037	274
5	79	0.040	256
6	85	0.042	247
FM	88	0.043	242
FM	108	0.048	218
7	177	0.061	169
8	183	0.062	166
9	189	0.063	163
10	195	0.064	160
11	201	0.065	158
12	207	0.066	155
13	213	0.067	153
14	473	0.105	99
16	485	0.107	97
18	497	0.108	96
20	509	0.109	95
22	521	0.111	94
24	533	0.113	92
26	545	0.114	91
28	557	0.115	90
30	569	0.117	89
32	581	0.118	88
34	593	0.119	87
36	605	0.120	86
38	617	0.121	85
40	629	0.123	84
42	641	0.124	83
44	653	0.125	82
46	665	0.126	82
48	677	0.128	81
50	689	0.130	80
52	701	0.131	79
54	713	0.132	78
56	725	0.133	78
58	737	0.134	77
60	749	0.136	76
62	761	0.137	76
64	773	0.138	75
66	785	0.139	74
68	797	0.141	74
69	803	0.141	73

7-3/16" - 75 OHM			
Channel	Frequency (MHZ)	*Loss (dB/100ft)	*Avg. Power (KW)
2	57	0.029	400
3	63	0.031	380
4	69	0.032	362
5	79	0.034	337
6	85	0.036	325
FM	88	0.037	319
FM	108	0.041	287
7	177	0.053	221
8	183	0.054	217
9	189	0.055	213
10	195	0.056	210
11	201	0.057	207
12	207	0.058	203
13	213	0.058	200
14	473	0.090	130
16	485	0.092	129
18	497	0.093	127
20	509	0.094	125
22	521	0.095	124
24	533	0.096	122
26	545	0.098	121
28	557	0.099	119
30	569	0.100	118
32	581	0.101	116
34	593	0.102	115
36	605	0.104	114
38	617	0.105	113
40	629	0.106	111
42	641	0.107	110
44	653	0.108	109
46	665	0.109	108
48	677	0.110	107
50	689	0.111	106
52	701	0.113	105
54	713	0.114	104
56	725	0.115	103
58	737	0.116	102
60	749	0.117	101
62	761	0.118	100
64	773	0.119	99
66	785	0.120	98
68	797	0.121	97
69	803	0.122	97

8-3/16" - 75 OHM			
Channel	Frequency (MHZ)	*Loss (dB/100ft)	*Avg. Power (KW)
2	57	0.025	511
3	63	0.027	485
4	69	0.028	462
5	79	0.030	431
6	85	0.031	415
FM	88	0.032	407
FM	108	0.036	366
7	177	0.046	282
8	183	0.047	277
9	189	0.048	273
10	195	0.049	268
11	201	0.050	264
12	207	0.050	260
13	213	0.051	256
14	473	0.079	167
16	485	0.080	164
18	497	0.081	162
20	509	0.082	160
22	521	0.083	158
24	533	0.084	156
26	545	0.086	154
28	557	0.086	152
30	569	0.087	150
32	581	0.088	149
34	593	0.088	147
36	605	0.089	145
38	617	0.090	144
40	629	0.091	142
42	641	0.092	141
44	653	0.093	139
46	665	0.094	138
48	677	0.095	136
50	689	0.095	135
52	701	0.096	134

Specifications subject to change without notice.

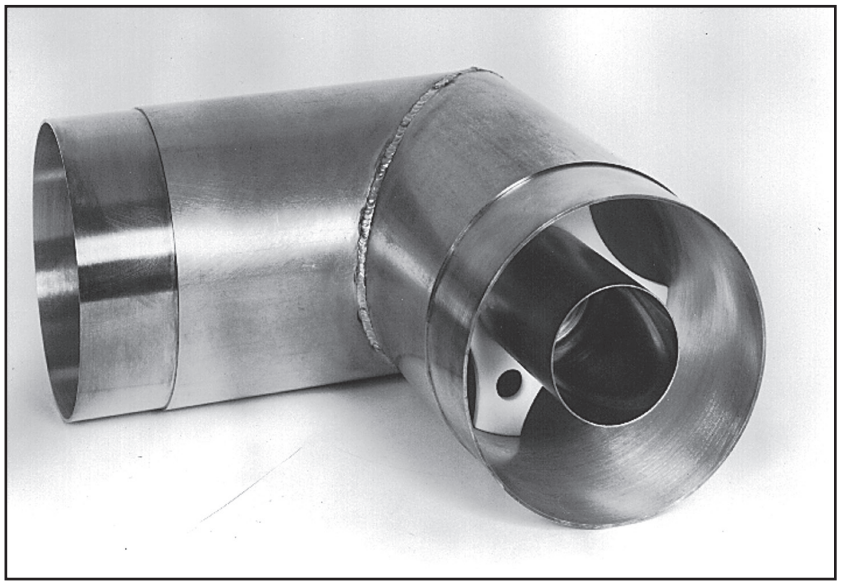
- *High Conductivity Copper*
- *Excellent VSWR characteristics*
- *Low-loss PTFE™ dielectric insulators*
- *Gas welded miter elbows*
- *Easy installation*

Dielectric's 50-ohm unflanged hard drawn copper transmission line is designed for unpressurized indoor applications in AM, FM and all VHF television installations. It has excellent VSWR characteristics. It also makes use of PTFE™ disk supports and high conductivity copper. Insulator undercuts are designed with a magne-formed relief that maintains a continuous inner conductor for maximum strength and conductivity.* Components are ruggedly and precisely constructed. Miter elbows are made of heavy wall tubing and are welded for utmost strength and reliability. The inner conductor is supported with PTFE™ discs. A complete line of components in $1^{5}/_{8}$, $3^{1}/_{8}$, $4^{1}/_{16}$ and $6^{1}/_{8}$-inch line sizes provides installation versatility for a wide power range.

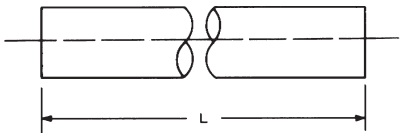
*$1^{5}/_{8}$" uses soldered inner bushings.

General Specifications

T/L Size	Outer		Inner	
	OD	ID	OD	ID
$1^{5}/_{8}$"	1.625"	1.527"	0.664"	0.588"
$3^{1}/_{8}$"	3.125"	3.027"	1.315"	1.231"
$4^{1}/_{16}$"	4.062"	3.935"	1.711"	1.661"
$6^{1}/_{8}$"	6.125"	5.981"	2.600"	2.520"

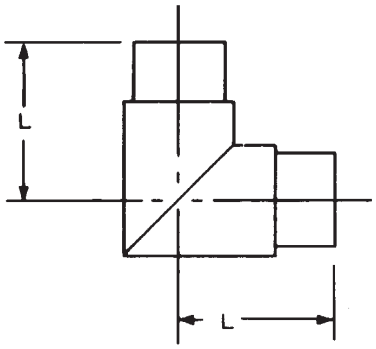


Straight Sections



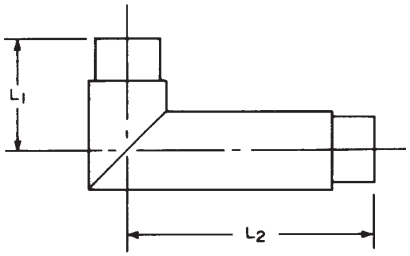
T/L Size	Catalog Number	Impedance in Ohms	L	Approx. Wt.
$1^{5}/_{8}$"	265-002	50	20'	25 lb
$3^{1}/_{8}$"	365-002	50	20'	52 lb
$4^{1}/_{16}$	465-002	50	20'	62 lb
$6^{1}/_{8}$	665-002	50	20'	67 lb

90° Elbow Equal Leg



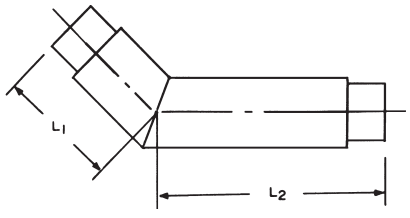
T/L Size	Catalog Number	Impedance in Ohms	L1	Approx. Wt.
$1^{5}/_{8}$"	265-017	50	3"	1.75 lb
$3^{1}/_{8}$"	365-017	50	6"	4 lb
$4^{1}/_{16}$	465-017	50	6"	5 lb
$6^{1}/_{8}$	665-017	50	9"	13 lb

90° Elbow Unequal Leg



T/L Size	Catalog Number	Impedance in Ohms	L1	L2	Approx. Wt.
$1^{5}/_{8}$"	265-018	50	2.44"	5.94"	3 lb
$3^{1}/_{8}$"	365-018	50	3.75"	8"	6 lb
$4^{1}/_{16}$	465-018	50	6"	12"	7 lb
$6^{1}/_{8}$	665-018	50	6"	12"	22 lb

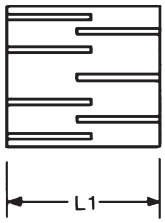
45° Elbow Unequal Leg



T/L Size	Catalog Number	Impedance in Ohms	L1	L2	Approx. Wt.
$1^{5}/_{8}$"	265-020	50	2.43"	5.94"	3 lb
$3^{1}/_{8}$"	365-020	50	3.75"	8"	6 lb
$4^{1}/_{16}$	465-020	50	6"	12"	7 lb
$6^{1}/_{8}$	665-020	50	6"	12"	22 b

Unflanged Coupling

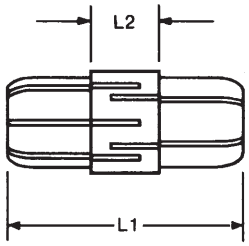
For joining line sections and components. Consists of outer sleeve, inner conductor and two clamps. Coupling, straight, unpressurized. Includes two hose clamps and inner conductor connector.



T/L Size	Catalog Number	Impedance in Ohms	L	Approx. Wt.
$1^{5}/_{8}$"	265-008	50	3"	.5 lb
$3^{1}/_{8}$"	365-008	50	$3^{9}/_{16}$"	1 lb
$4^{1}/_{16}$	465-008	50	4"	2 lb
$6^{1}/_{8}$	665-008	50	$4^{1}/_{2}$"	4 lb

Unflanged Connectors, Inner Conductor

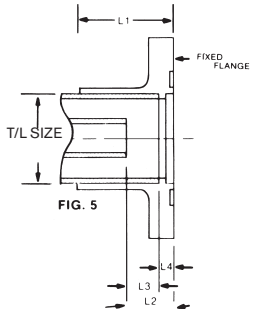
Connectors for joining inner conductors.



T/L Size	Catalog Number	Impedance in Ohms	L	L2	Approx. Wt.
$1^{5}/_{8}$"	265-007	50	2"	0.06"	2 oz
$3^{1}/_{8}$"	365-007	50	$2^{1}/_{2}$"	0.06"	3 oz
$4^{1}/_{16}$	465-007	50	$4^{1}/_{4}$"	1.00"	4 oz
$6^{1}/_{8}$	665-007	50	$3^{7}/_{16}$"	1.06"	8 oz

Mechanical Flange

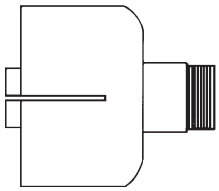
To flange field cut line. Cannot be pressurized. Supplied with hose clamp only. The dimensions given are for cutting back the inner conductor of transmission line onto which a clamp type flange is to be used.



T/L Size	Catalog Number	L1	L2	L3	L4	Approx. Wt.
$1^{5}/_{8}$"	260-015	1.94"	$0.59"^{+.03}_{0}$	$.40"^{+.03}_{0}$	.187"	2 lb
$3^{1}/_{8}$"	360-015	2.25"	$0.91"^{+.03}_{0}$	$.47"^{+.03}_{0}$	.437"	3 lb
$4^{1}/_{16}$	460-015	2.31"	$1.22"^{+.03}_{0}$	$.91"^{+.03}_{0}$	.310"	6 lb
$6^{1}/_{8}$	660-015	4.78"	$1.28"^{+.03}_{0}$	$.90"^{+.03}_{0}$	.375"	7 lb

Reducer, Unflanged to Type "N"

Supplied with hose clamp



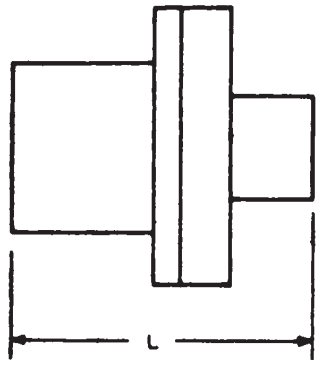
To Type "N" Female

T/L Size	Catalog Number	Impedance In Ohms
$1^{5}/_{8}$"	265-063	50
$3^{1}/_{8}$"	365-063	50

To Type "N" Male

T/L Size	Catalog Number	Impedance In Ohms
$1^{5}/_{8}$"	265-062	50
$3^{1}/_{8}$"	365-062	50

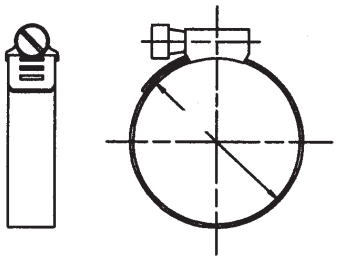
Requires two couplings not supplied.



Reducer, 50-Ohm Unflanged

T/L Size	Catalog Number	Impedance in Ohms	L	Approx. Wt.
$3^5/_8$" to $1^5/_8$"	365-060	50	5"	3 lb
$4^1/_{16}$" to $3^1/_8$"	465-060	50	7"	6 lb
$6^1/_8$" to $4^1/_{16}$"	655-060	50	9"	10 lb
$6^1/_8$" to $3^1/_8$"	655-061	50	$6^3/_4$"	9 lb

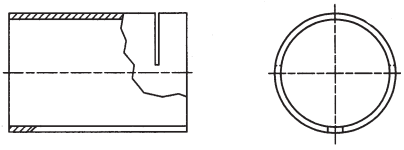
All stainless steel band and screw.



Coupling Clamps

Outer Diameter	Catalog Number
$1^5/_8$"	250-009
$3^1/_8$"	350-009
$4^1/_{16}$"	450-009
$6^1/_8$"	650-009
$8^3/_{16}$"	850-009
$9^3/_{16}$"	950-009

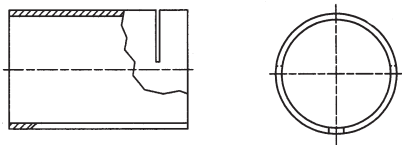
Guide for cutting outer conductors in the field.



Cutoff Guide (Outer Conductors)

Outer Conductor O.D.	Catalog Number	Approx. Wt.
$1^5/_8$"	260-040	1 lb
$3^1/_8$"	360-040	2 lb
$4^1/_{16}$"	460-040	4 lb
$6^1/_8$"	660-040	6 lb

Guide for cutting inner conductors in the field.



Cutoff Guide (Inner Conductors)

Inner Conductor O.D.	Catalog Number	Approx. Wt.
$1^5/_8$"	265-041	3 oz
$3^1/_8$"	365-041	6 oz
$4^1/_{16}$"	465-041	8 oz
$6^1/_8$"	655-041	6 oz

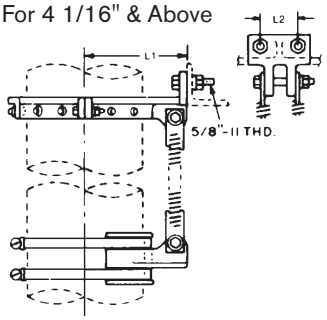
Quality Hangers and Accessories

The materials for all components of hangers and kits are carefully selected to resist deterioration from heat, cold, humidity, or other weather conditions as well as unusual corrosive atmospheric contaminants, such as exist in industrial or coastal areas. Such material as bronze and brass castings and stainless steel springs and hardware are typical.

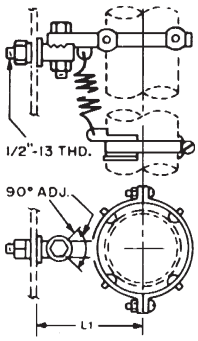
Single Vertical Expansion

T/L Size	Catalog Number	L1	L2	Approx. Wt.
$3\frac{1}{8}$"	370-036	5"		3 lb
$4\frac{1}{16}$"	470-036	$5\frac{3}{4}$"	$2\frac{3}{8}$"	7 lbs
$6\frac{1}{8}$"	670-036	$6\frac{7}{8}$"	$2\frac{3}{8}$"	19 lbs
$7\frac{3}{16}$"	770-036	7.5"	3"	22 lbs
$8\frac{3}{16}$"	870-039	8"	3"	25 lbs
$9\frac{3}{16}$"	970-039	8"	3"	26 lbs

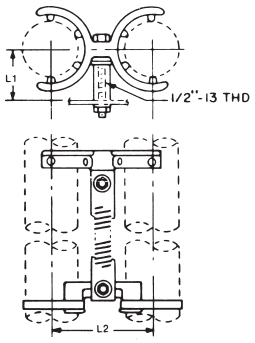
For 4 1/16" & Above



For 3 1/8" Only

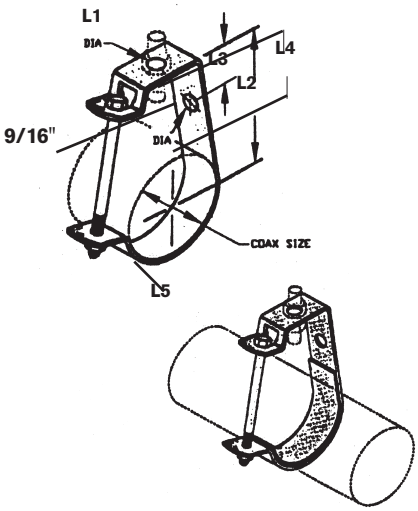


Dual Vertical Expansion

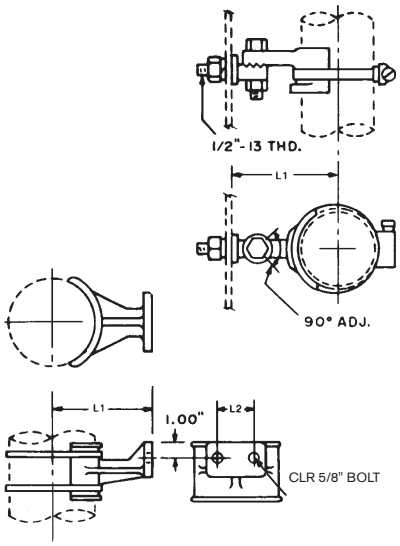


T/L Size	Catalog Number	L1	L2	Approx. Weight
$3\frac{1}{8}$"	370-037	$3\frac{1}{8}$"	$5\frac{1}{2}$"	6 lbs

Ceiling Hanger Kit



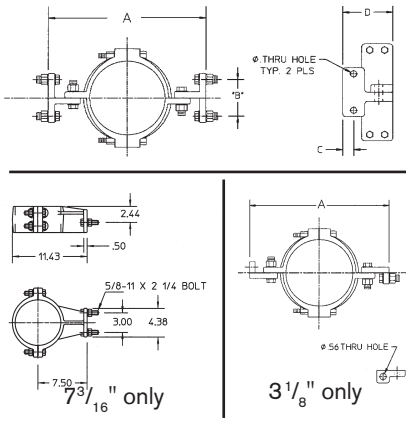
T/L Size	Catalog Number	L1	L2	L3	L4	L5
$3\frac{1}{8}$"	DC 370-050	$\frac{9}{16}$"	$4\frac{7}{8}$"	$1\frac{1}{8}$"	$2\frac{1}{2}$"	$\frac{3}{8}$"-16 x 5"
$4\frac{1}{16}$"	DC 470-050	$\frac{11}{16}$"	$6\frac{1}{8}$"	$1\frac{1}{8}$"	$3\frac{1}{8}$"	$\frac{3}{8}$"-16 x $6\frac{1}{2}$"
$6\frac{1}{8}$"	DC 670-050	$\frac{13}{16}$"	$7\frac{3}{4}$"	$1\frac{1}{4}$"	$3\frac{1}{2}$"	$\frac{3}{8}$"-16 x $8\frac{1}{2}$"
$7\frac{3}{16}$"	DC 770-050	$\frac{15}{16}$"	$9\frac{1}{4}$"	$1\frac{1}{4}$"	$3\frac{7}{8}$"	$\frac{3}{8}$"-16 x $10\frac{1}{2}$"
$8\frac{3}{16}$"	DC 870-050	$\frac{15}{16}$"	$9\frac{1}{4}$"	$1\frac{1}{4}$"	$3\frac{7}{8}$"	$\frac{3}{8}$"-16 x $10\frac{1}{2}$"



Single, Fixed For use with vertical runs under 1000 ft.

T/L Size	Catalog Number	L1	Approx. Wt.
$3\frac{1}{8}$"	370-034	5"	1 lb

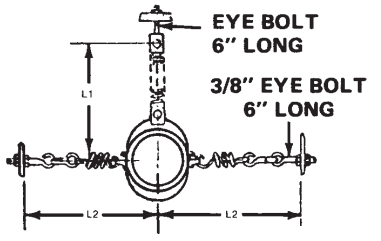
T/L Size	Catalog Number	L1	L2	Approx. Wt.
$4\frac{1}{16}$"	470-034	$5\frac{3}{4}$"	$2\frac{3}{8}$"	5 lbs
$6\frac{1}{8}$"	670-034	$6\frac{7}{8}$"	$2\frac{3}{8}$"	6 lbs
$7\frac{3}{16}$"	770-034	7.5"	3"	8 lbs
$8\frac{3}{16}$"	870-034	8"	3"	11 lbs
$9\frac{3}{16}$"	970-034	8"	3"	11 lbs



Single, Fixed, Heavy Duty Hangers

For use with vertical runs over 1000 ft.

T/L Size	Catalog Number	A	B	C	D	Thru Holes
$3\frac{1}{8}$"	370-042	10"	—	—	—	—
$4\frac{1}{16}$"	470-042	$11\frac{1}{2}$"	$2\frac{3}{8}$"	$\frac{7}{8}$"	$3\frac{7}{8}$"	$\frac{9}{16}$"
$6\frac{1}{8}$"	670-042	$13\frac{3}{4}$"	$2\frac{3}{8}$"	$\frac{15}{16}$"	$3\frac{15}{16}$"	$\frac{11}{16}$"
$7\frac{3}{16}$"	770-042	SEE DRAWING				
$8\frac{3}{16}$"	870-042	16"	3"	$\frac{31}{32}$"	$4\frac{5}{16}$"	$\frac{11}{16}$"
$9\frac{3}{16}$"	970-042	$17\frac{1}{2}$"	3"	$1\frac{3}{32}$"	$4\frac{13}{16}$"	$\frac{11}{16}$"

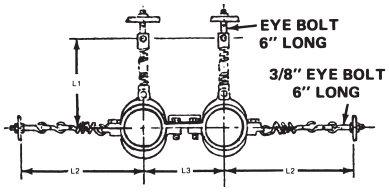


Single Horizontal Three-Point Suspension Hangers

For horizontal suspension of single line.

T/L Size	Catalog Number	L1*	L2	Approx. Wt.
$3\frac{1}{8}$"	370-032	$15\frac{1}{8}$"	15"	5 lbs
$4\frac{1}{16}$"	470-032	$18\frac{1}{2}$"	$17\frac{1}{4}$"	7 lbs
$6\frac{1}{8}$"	670-032	$23\frac{3}{4}$"	$16\frac{3}{4}$"	12 lbs
$7\frac{3}{16}$"	770-032	$24\frac{1}{4}$"	$17\frac{3}{8}$"	20 lbs
$8\frac{3}{16}$"	870-032	$24\frac{3}{4}$"	$17\frac{7}{8}$"	30 lbs
$9\frac{3}{16}$"	970-032	$25\frac{1}{4}$"	$18\frac{3}{8}$"	18 lbs

*Indicates free length (No Load)

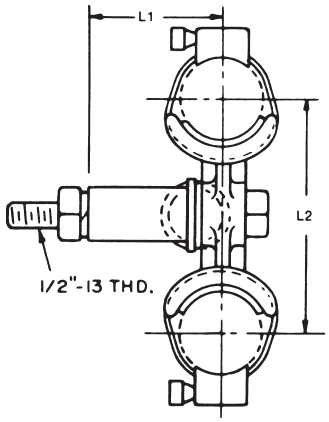


Dual Horizontal Three-Point Suspension Hangers

For horizontal suspension of dual lines.

T/L Size	Catalog Number	L1*	L2	L3	Approx. Wt.
$3\frac{1}{8}$"	370-033	$15\frac{1}{8}$"	15"	$5\frac{1}{2}$"	9 lbs
$4\frac{1}{16}$"	470-033	$20\frac{3}{4}$"	$17\frac{1}{4}$"	$6\frac{1}{2}$"	11 lbs
$6\frac{1}{8}$"	670-033	28"	$16\frac{3}{4}$"	$8\frac{3}{4}$"	19 lbs

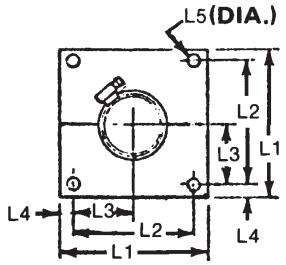
*Indicates free length (No Load)



Dual, Fixed

T/L Size	Catalog Number	L1	L2	Approx. Wt.
3 1/8"	370-035	3 5/32"	5 1/2"	2 lb.

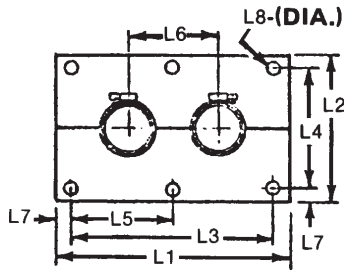
Supports single line at point of entry through wall. One anchor required on each side of wall. Mounting bolts not supplied.



Single Horizontal Anchor

T/L Size	Catalog Number	L1	L2	L3	L4	L5	Approx. Wt.
1 5/8"	270-028	6"	4 7/8"	2 7/16"	9/16"	9/16"	2 lb
3 1/8"	370-028	8"	6 7/8"	3 7/16"	9/16"	9/16"	4 lb
4 1/16"	470-028	9"	7 3/4"	3 7/8"	5/8"	9/16"	5 lb
6 1/8"	670-028	11 3/4"	10 1/4"	5 1/8"	3/4"	9/16"	15 lb
7 3/16"	770-028	16"	13 1/2"	6 3/4"	1 1/4"	3/4"	34 lb
8 3/16"	870-028	16"	13 1/2"	6 3/4"	1 1/4"	3/4"	32 lb
9 3/16"	970-028	16"	13 1/2"	6 3/4"	1 1/4"	3/4"	29 lb

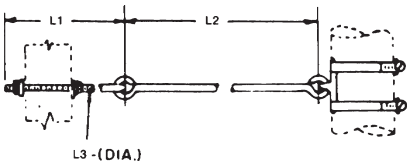
Supports two lines at point of entry through wall. One anchor required on each side of wall. Mounting bolts not supplied.



Dual Horizontal Anchor

T/L Size	Catalog Number	L1	L2	L3	L4	L5	L6	L7	L8	Approx. Wt.
1 5/8"	270-029	9 3/4"	6"	8 5/8"	4 7/8"	4 5/16"	3 3/4"	9/16"	9/16"	4 lb
3 1/8"	370-029	13 1/2"	8"	12 3/8"	6 7/8"	6 3/16"	5 1/2"	9/16"	9/16"	7 lb
4 1/16"	470-029	14 1/2"	9"	13 1/4"	7 3/4"	6 5/8"	6 1/2"	5/8"	9/16"	8 lb
6 1/8"	670-029	22"	11 3/4"	20 1/2"	10 1/4"	10 1/4"	10 1/4"	3/4"	9/16"	30 lb

Mounts through single hole. Complete with two hose clamps. Used to restrict lateral motion of line while permitting vertical and horizontal movement.



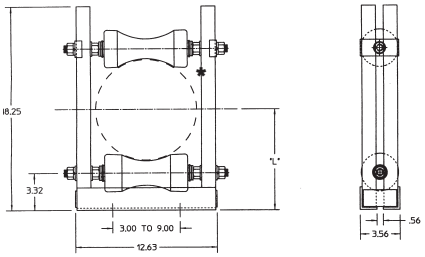
Lateral Braces

T/L Size	Catalog Number	L1	L2	L3	Approx. Wt.
3 1/8"	370-038	7 3/4"	38 3/4"	3/8"	2 lb
4 1/16"	470-038	7 3/4"	38 3/4"	3/8"	3 lb
6 1/8"	670-038	7 3/4"	38 3/4"	3/8"	2 lb
7 3/16"	770-038	7 3/4"	38 3/4"	3/8"	4 lb
8 3/16"	870-038	7 3/4"	38 3/4"	3/8"	4 lb
9 3/16"	970-038	7 3/4"	38 3/4"	3/8"	4 lb

Supports single horizontal line. Two required for dual lines. Mounting bolts not supplied. Rollers accommodate no vertical movement; use 3-point suspension hangers for horizontal runs when length of vertical run or stiffness of line will require vertical as well as horizontal movement of the horizontal run.

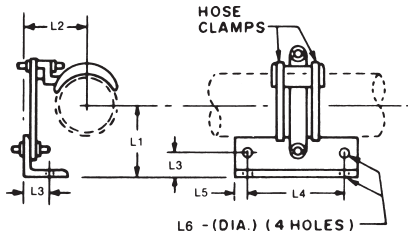
Horizontal Roller Assembly

T/L Size	Catalog Number	L
$1\frac{5}{8}$"	270-027	
$3\frac{1}{8}$"	370-027	
$4\frac{1}{16}$"	470-027	$6\frac{1}{2}$"
$6\frac{1}{8}$"	670-027	$7\frac{1}{2}$"
$7\frac{3}{16}$"	770-027	8"
$8\frac{3}{16}$"	870-027	$8\frac{1}{2}$"
$9\frac{3}{16}$"	970-027	9"



*Adjustable

*L Dim is adjustable & indicates min.



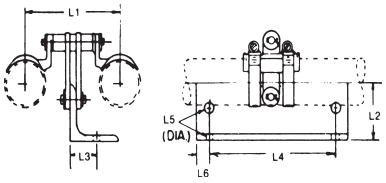
Single Swivel Hangers

T/L Size	Catalog Number	L1	L2	L3	L4	L5	L6 Dia.	Approx. Wt.
$1\frac{5}{8}$"	270-030	$2\frac{1}{16}$"	$1\frac{1}{2}$"	$1\frac{1}{8}$"	5"	$\frac{1}{2}$"	$\frac{9}{32}$"	2 lbs
$3\frac{1}{8}$"	370-030	$2\frac{17}{32}$"	$2\frac{7}{8}$"	$1\frac{1}{8}$"	5"	$\frac{1}{2}$"	$\frac{7}{16}$"	2 lbs

For dual horizontal line runs. Takes care of some horizontal line expansion but permits no vertical movement. Use 3-point suspension hangers for horizontal runs when length of vertical run or stiffness of line will require vertical as well as horizontal movement of the horizontal run.

Dual Swivel Hangers

T/L Size	Catalog Number	L1	L2	L3	L4	L5 Dia.	L6	Approx. Wt.
$1\frac{5}{8}$"	270-031	$3\frac{3}{4}$"	$2\frac{1}{16}$"	$1\frac{1}{8}$"	5"	$\frac{7}{16}$"	$\frac{1}{2}$"	3 lbs
$3\frac{1}{8}$"	370-031	$5\frac{1}{2}$"	$2\frac{15}{32}$"	$1\frac{1}{8}$"	5"	$\frac{7}{16}$"	$\frac{1}{2}$"	4 lbs



Insulated Hangers

Available for FM installations onto AM towers.
Contact factory for details.

For spring tension charts refer to installation guide.

The following examples demonstrate how to add peak voltage of each carrier, assuming worst case conditions, i.e. all peak voltages add in phase. For digital DTV transmissions, a 7 dB peak to average ratio is assumed.

Note: The examples assume all new equipment. Older systems which may have deteriorated may not withstand recommended limits of average power, peak voltage, and peak power. For all multiplex applications, please consult factory.

EXAMPLE 1: NTSC operating at 60 kW peak with 10% aural into 50 ohm line

Average Power

P_{ave} (visual) = .6 x 60 = 36 kW
P_{ave} (aural) = 6 kW

Total P_{ave} 42 kW

Peak Instantaneous Voltage

V_p (visual) = $1.414\sqrt{P_{sync}\,Z_o}$ = 2449 volts

V_p (aural) = $1.414\sqrt{P_{ave}\,Z_o}$ = 774 volts

Total V_{peak} = 3223 volts

Equivalent Peak Power = V_p^2/Z_o = 208 kW

EXAMPLE 2: DTV operating at 15 kW average power into 50 ohm line

Peak Power

P_{peak} = 5 (P_{ave}) = 75 kW (assumes Peak/Ave ratio of 7 dB)

Peak Voltage

$V_p = \sqrt{P_{peak}\,Z_o}$ = 1936 volts

EXAMPLE 3: Diplexed NTSC 60 kW peak with 10% aural with HDTV 15 kW average (Example 1 & 2)

Average Power

P_{ave} (NTSC) = 42 kW

P_{ave} (HDTV) = 15 kW

Total P_{ave} 57 kW

Peak Voltage

V_p (NTSC Visual) = 2449 volts

V_p (NTSC Aural) = 774 volts

V_p (HDTV) = 1936 volts

Total V_{peak} = 5159 volts

Equivalent Peak Power = V_p^2/Z_o = 532 kW

$3^{1}/_{8}$" 50-ohm Line Channels 2-69

Peak Power Rating (kW) 2,180
Peak Voltage Rating (kV) 10

Channel	Loss	Ave.*	Efficiency (%) Total Length in Feet					
	dB/100'	Power KW	200	600	1000	1200	1600	2000
2	0.072	71	96.7	90.5	84.7	81.9	76.6	71.7
3	0.076	68	96.6	90.0	83.9	81.0	75.5	70.3
4	0.080	64	96.4	89.5	83.2	80.2	74.5	69.2
5	0.086	60	96.1	88.9	82.1	78.9	72.8	67.4
6	0.089	58	96.0	88.4	81.5	78.2	72.0	66.4
201-FM	0.093	56	95.9	88.1	80.9	77.6	71.3	65.5
300-FM	0.103	50	95.4	86.9	79.1	75.4	68.7	62.5
7	0.130	40	94.2	83.6	74.1	69.9	62.0	54.9
8	0.132	39	94.1	83.4	73.8	69.5	61.5	54.4
9	0.134	38	94.0	83.1	73.4	69.2	61.0	53.8
10	0.136	38	94.0	82.9	73.1	68.8	60.6	53.4
11	0.138	37	93.8	82.6	72.8	68.3	60.2	52.9
12	0.141	37	93.7	82.3	72.3	67.7	59.5	52.2
13	0.143	36	93.6	82.1	71.9	67.4	59.1	51.6
14	0.223	24	90.2	73.5	59.8	54.0	44.0	35.7
16	0.227	24	90.1	73.1	59.3	53.4	43.3	35.1
18	0.231	24	89.9	72.7	58.8	52.8	42.7	34.5
20	0.234	23	89.8	72.4	58.3	52.4	42.2	33.9
22	0.237	23	89.7	72.1	57.9	52.0	41.8	33.5
24	0.240	23	89.5	71.8	57.5	51.5	41.3	33.0
26	0.243	23	89.4	71.5	57.2	51.1	40.9	32.7
28	0.247	22	89.3	71.1	56.6	50.5	40.3	32.0
30	0.250	22	89.1	70.8	56.2	50.1	39.8	31.5
32	0.254	22	89.0	70.4	55.7	49.6	39.2	31.1
34	0.256	22	88.9	70.2	55.5	49.3	38.9	30.8
36	0.258	21	88.8	70.0	55.2	49.0	38.7	30.4
38	0.262	21	88.6	69.6	54.7	48.5	38.1	29.9
40	0.265	21	88.5	69.3	54.3	48.1	37.7	29.4
42	0.267	21	88.4	69.2	54.1	47.8	37.4	29.2
44	0.270	21	88.3	68.9	53.7	47.4	37.0	28.8
46	0.274	20	88.1	68.5	53.2	46.9	36.4	28.3
48	0.276	20	88.1	68.3	53.0	46.6	36.2	28.0
50	0.279	20	87.9	68.0	52.6	46.3	35.8	27.6
52	0.282	20	87.8	67.7	52.2	45.9	35.4	27.2
54	0.284	20	87.7	67.5	52.0	45.6	35.1	27.0
56	0.286	20	87.7	67.4	51.8	45.4	34.9	26.8
58	0.290	19	87.5	67.0	51.3	44.9	34.4	26.3
60	0.294	19	87.3	66.6	50.8	44.4	33.9	25.8
62	0.297	19	87.2	66.3	50.5	44.0	33.5	25.5
64	0.299	19	87.1	66.2	50.2	43.8	33.2	25.2
66	0.301	19	87.1	66.0	50.0	43.5	33.0	25.0
68	0.303	19	87.0	65.8	49.8	43.4	32.8	24.8
69	0.303	19	87.0	65.8	49.8	43.3	32.7	24.8

$4^{1}/_{16}$" 50-ohm Line Channels 2-69

Peak Power Rating (kW) 3,685
Peak Voltage Rating (kV) 13

Channel	Loss	Ave.*	Efficiency (%) Total Length in Feet					
	dB/100'	Power KW	200	600	1000	1200	1600	2000
2	0.050	114	97.7	93.4	89.2	87.2	83.3	79.5
3	0.052	108	97.6	93.0	88.7	86.5	82.5	78.6
4	0.055	103	97.5	92.7	88.2	86.0	81.7	77.7
5	0.059	96	97.3	92.2	87.4	85.0	80.6	76.3
6	0.061	92	97.2	91.9	86.9	84.5	79.9	75.5
201-FM	0.071	89	96.8	90.7	84.9	82.2	77.0	72.1
300-FM	0.079	80	96.4	89.7	83.4	80.4	74.7	69.5
7	0.089	63	96.0	88.5	81.6	78.3	72.2	66.5
8	0.090	62	95.9	88.3	81.3	78.0	71.8	66.0
9	0.092	61	95.9	88.1	81.0	77.6	71.4	65.6
10	0.093	60	95.8	87.9	80.7	77.3	71.0	65.2
11	0.094	59	95.7	87.8	80.4	77.0	70.6	64.7
12	0.096	59	95.7	87.6	80.2	76.7	70.2	64.3
13	0.097	58	95.6	87.4	79.9	76.4	69.9	63.9
14	0.146	39	93.5	81.7	71.4	66.8	58.4	51.0
16	0.148	38	93.4	81.5	71.1	66.4	58.0	50.6
18	0.150	38	93.3	81.3	70.8	66.1	57.6	50.1
20	0.152	37	93.3	81.1	70.5	65.7	57.2	49.7
22	0.154	37	93.2	80.9	70.2	65.4	56.8	49.3
24	0.155	36	93.1	80.7	69.9	65.1	56.4	48.9
26	0.157	36	93.0	80.5	69.6	64.8	56.1	48.5
28	0.159	36	92.9	80.3	69.4	64.5	55.7	48.1
30	0.161	35	92.9	80.1	69.1	64.2	55.3	47.7
32	0.162	35	92.8	79.9	68.8	63.9	55.0	47.3
34	0.164	34	92.7	79.7	68.5	63.6	54.6	47.0
36	0.166	34	92.7	79.5	68.3	63.3	54.3	46.6
38	0.167	34	92.6	79.4	68.0	63.0	54.0	46.3
40	0.169	33	92.5	79.2	67.8	62.7	53.6	45.9
42	0.171	33	92.4	79.0	67.5	62.4	53.3	45.6
44	0.172	33	92.4	78.8	67.2	62.1	53.0	45.2
46	0.174	33	92.3	78.6	67.0	61.8	52.7	44.9
48	0.176	32	92.2	78.5	66.8	61.6	52.4	44.6
50	0.177	32	92.2	78.3	66.5	61.3	52.1	44.2
52	0.179	32	92.1	78.1	66.3	61.0	51.8	43.9
54	0.180	31	92.0	78.0	66.0	60.8	51.5	43.6
56	0.182	31	92.0	77.8	65.8	60.5	51.2	43.3
58	0.183	31	91.9	77.6	65.6	60.3	50.9	43.0
60	0.185	31	91.8	77.5	65.3	60.0	50.6	42.7
62	0.186	30	91.8	77.3	65.1	59.8	50.3	42.4
64	0.188	30	91.7	77.1	64.9	59.5	50.1	42.1
66	0.189	30	91.7	77.0	64.7	59.3	49.8	41.8
68	0.191	30	91.6	76.8	64.5	59.0	49.5	41.5
69	0.191	30	91.6	76.8	64.3	58.9	49.4	41.4

**Power handling refers to EIA, digitLine and Ultimate line. Does not apply to EHTLine or EHT/digitLine. Refer to pgs. 14-15.*

Peak Voltage Ratings are based on 4:1 margin of safety to theoretical.
Peak Power Ratings are calculated from peak voltage according to the formula, Ppk – Vpk^2/Zo.
To determine the peak power based on the RMS of the peak voltage, divide the listed peak powers by 2.

6 1/8" 50-ohm Line
Channels 2-64

Peak Power Rating (kW) 8,513
Peak Voltage Rating (kV) 20

Channel	Loss	Ave.*	Efficiency (%) Total Length in Feet					
	dB/100'	Power KW	200	600	1000	1200	1600	2000
2	0.039	240	98.2	94.7	91.4	89.7	86.5	83.5
3	0.041	227	98.1	94.5	90.9	89.2	85.9	82.7
4	0.043	217	98.0	94.2	90.5	88.7	85.3	82.0
5	0.046	202	97.9	93.8	89.9	88.0	84.3	80.8
6	0.048	195	97.8	93.6	89.5	87.6	83.8	80.2
201-FM	0.049	188	97.8	93.5	89.3	87.3	83.5	79.8
300-FM	0.052	169	97.6	93.1	88.7	86.6	82.6	78.7
7	0.069	133	96.9	90.9	85.3	82.6	77.5	72.7
8	0.070	131	96.8	90.7	85.0	82.3	77.2	72.3
9	0.071	129	96.8	90.6	84.8	82.1	76.8	71.9
10	0.073	127	96.7	90.5	84.6	81.8	76.5	71.6
11	0.074	125	96.7	90.3	84.4	81.6	76.2	71.2
12	0.075	123	96.6	90.2	84.2	81.2	75.9	70.9
13	0.076	122	96.6	90.0	84.0	81.1	75.6	70.5
14	0.113	81	94.9	85.5	77.1	73.2	65.9	59.4
16	0.115	80	94.9	95.4	76.8	72.9	65.6	59.0
18	0.116	79	94.8	85.2	76.6	72.6	65.2	58.6
20	0.117	78	94.7	85.0	76.3	72.3	64.9	58.3
22	0.119	77	94.7	84.9	76.1	72.0	64.6	57.9
24	0.120	76	94.6	84.7	75.8	71.8	64.3	57.5
26	0.121	76	94.6	84.6	75.6	71.5	63.9	57.2
28	0.123	75	94.5	84.4	75.4	71.2	63.6	56.8
30	0.124	74	94.4	84.3	75.2	71.0	63.3	56.5
32	0.125	73	94.4	84.1	74.9	70.7	63.0	56.1
34	0.127	73	94.3	84.0	74.7	70.5	62.7	55.8
36	0.128	72	94.3	83.8	74.5	70.2	62.4	55.5
38	0.129	71	94.2	83.7	74.3	70.0	62.1	55.2
40	0.130	70	94.2	83.5	74.1	69.7	61.8	54.8
42	0.132	70	94.1	83.4	73.8	69.5	61.6	54.5
44	0.133	69	94.1	83.2	73.6	69.3	61.3	54.2
46	0.134	68	94.0	83.1	73.4	69.0	61.0	53.9
48	0.135	68	94.0	83.0	73.2	68.8	60.7	53.6
50	0.136	67	93.9	82.8	73.0	68.6	60.5	53.3
52	0.138	67	93.9	82.7	72.8	68.4	60.2	53.0
54	0.139	66	93.8	82.5	72.6	68.1	60.0	52.8
56	0.140	66	93.8	82.4	72.4	67.9	59.7	52.5
58	0.141	65	93.7	82.3	72.2	67.7	59.4	52.2
60	0.142	64	93.7	82.2	72.1	67.5	59.2	51.9
62	0.143	64	93.6	82.0	71.9	67.3	58.9	51.7
64	0.145	63	93.6	81.9	71.7	67.1	58.7	51.4

6 1/8" 75-ohm Line
Channels 2-69

Peak Power Rating (kW) 5,550
Peak Voltage Rating (kV) 20

Channel	Loss	Ave.*	Efficiency (%) Total Length in Feet					
	dB/100'	Power KW	200	600	1000	1200	1600	2000
2	0.034	206	98.5	95.4	92.5	91.1	88.3	85.5
3	0.035	195	8.4	95.2	92.1	90.7	87.7	84.8
4	0.037	186	98.3	95.0	91.8	90.2	87.2	84.2
5	0.040	173	98.2	94.6	91.2	89.5	86.3	83.1
6	0.042	167	98.1	94.4	90.8	89.1	85.8	82.4
7	0.061	115	97.1	91.8	86.7	84.4	79.7	75.1
8	0.062	113	97.1	91.7	86.6	84.1	79.4	74.9
9	0.063	111	97.0	91.6	86.4	83.9	79.1	74.6
10	0.064	109	97.1	91.5	86.2	83.7	78.9	74.3
11	0.065	107	97.0	91.4	86.0	83.5	78.6	73.9
12	0.066	106	97.0	91.2	85.8	83.2	78.3	73.8
13	0.067	104	96.9	91.1	85.6	83.0	78.0	73.2
14	0.105	70	95.3	86.5	78.5	74.8	67.9	61.6
16	0.107	69	95.2	86.3	78.2	74.4	67.4	61.1
18	0.108	68	95.2	86.1	78.0	74.2	67.2	60.8
20	0.109	67	95.1	86.0	77.7	73.9	66.8	60.3
22	0.111	66	95.0	85.8	77.5	73.6	66.4	60.0
24	0.113	66	94.9	85.5	77.1	73.2	65.9	59.4
26	0.114	65	94.9	85.4	76.9	73.0	65.7	59.1
28	0.115	64	94.8	85.3	76.7	72.8	65.5	58.8
30	0.117	64	94.8	85.1	76.4	72.4	65.0	58.3
32	0.118	63	94.7	85.0	76.2	72.2	64.7	58.0
34	0.119	62	94.7	84.8	76.0	72.0	64.5	57.8
36	0.120	62	94.6	84.7	75.8	71.7	64.2	57.4
38	0.121	61	94.6	84.5	75.6	71.5	63.9	57.1
40	0.123	60	94.5	84.4	75.3	71.2	63.6	56.8
42	0.124	60	94.5	84.3	75.2	71.0	63.3	56.5
44	0.125	59	94.4	84.1	75.0	70.8	63.1	56.2
46	0.126	59	94.3	84.0	74.7	70.0	62.7	55.8
48	0.128	58	94.3	83.8	74.0	70.2	62.4	55.3
50	0.130	58	94.2	83.6	74.1	69.8	61.9	54.9
52	0.131	57	94.1	83.4	74.0	69.6	61.7	54.7
54	0.132	57	94.1	83.3	73.7	69.3	61.4	54.3
56	0.133	56	94.0	83.2	73.5	69.1	61.2	54.0
58	0.134	56	94.0	83.0	73.4	69.0	60.9	53.8
60	0.136	55	93.9	82.9	73.1	68.7	60.6	53.4
62	0.137	55	93.9	82.8	72.9	68.5	60.4	53.1
64	0.138	54	93.8	82.6	72.8	68.3	60.2	52.9
66	0.139	54	93.8	82.5	72.6	68.1	60.0	52.7
68	0.141	54	93.7	82.3	72.3	67.7	59.5	52.3
69	0.141	53	93.7	82.2	72.2	67.6	59.4	52.1

**Power handling refers to EIA, digitLine and Ultimate line. Does not apply to EHTLine or EHT/digitLine. Refer to pgs. 14-15.*

Peak Voltage Ratings are based on 4:1 margin of safety to theoretical.
Peak Power Ratings are calculated from peak voltage according to the formula, Ppk – Vpk²/Zo.
To determine the peak power based on the RMS of the peak voltage, divide the listed peak powers by 2.

$7^{3}/_{16}$" 75-ohm Line Channels 2-68

Peak Power Rating (kW) 7,458
Peak Voltage Rating (kV) 23

Channel	Loss	Ave.*	Efficiency (%) Total Length in Feet					
	dB/100'	Power KW	200	600	1000	1200	1600	2000
2	0.029	282	98.6	95.8	93.21	91.8	89.2	86.6
3	0.031	267	98.5	95.6	92.7	91.4	88.6	86.0
4	0.032	255	98.4	95.4	92.4	91.0	88.1	85.4
5	0.034	238	98.3	95.1	91.9	90.4	87.4	84.5
6	0.036	229	98.3	94.9	91.6	90.0	86.9	83.9
FM	0.037	225	98.2	94.8	91.5	89.9	86.7	83.7
FM	0.041	202	98.0	94.2	90.6	88.8	85.4	82.1
7	0.053	156	97.5	92.7	88.1	85.9	81.7	77.7
8	0.054	153	97.5	92.6	87.9	85.7	81.5	77.3
9	0.055	150	97.4	92.5	87.8	85.5	81.1	77.0
10	0.056	148	97.4	92.4	87.6	85.3	80.9	76.7
11	0.057	145	97.3	92.2	87.4	85.1	80.6	76.4
12	0.058	143	97.3	92.1	87.2	84.9	80.4	76.1
13	0.058	141	97.3	92.0	87.1	84.7	80.1	75.8
14	0.090	92	96.0	88.3	81.3	78.0	71.9	66.1
16	0.092	91	95.9	88.2	81.1	77.8	71.6	65.8
18	0.093	90	95.9	88.1	80.9	77.6	71.3	65.5
20	0.094	88	95.8	87.9	80.7	77.3	71.0	65.1
22	0.095	87	95.8	87.8	80.5	77.1	70.7	64.8
24	0.096	86	95.7	87.7	80.3	76.9	70.4	64.5
26	0.098	85	95.7	87.5	80.1	76.6	70.1	64.2
28	0.099	84	95.6	87.4	79.9	76.4	69.9	63.8
30	0.100	83	95.6	87.3	79.7	76.2	69.6	63.6
32	0.101	82	95.5	87.2	79.5	76.0	69.3	63.3
34	0.102	81	95.5	87.0	79.4	75.8	69.1	63.0
36	0.104	81	95.4	86.9	79.2	75.6	68.8	62.7
38	0.105	80	95.4	86.8	79.0	75.3	68.6	62.4
40	0.106	79	95.3	86.7	78.8	75.1	68.3	62.1
42	0.107	78	95.3	86.6	78.6	74.9	68.1	61.8
44	0.108	77	95.3	86.4	78.4	74.7	67.8	61.5
46	0.109	77	95.2	86.3	78.3	74.5	67.6	61.3
48	0.110	76	95.2	86.2	78.1	74.3	67.3	61.0
50	0.111	75	95.1	86.1	77.9	74.1	67.1	60.7
52	0.113	74	95.1	86.0	77.8	74.0	66.9	60.5
54	0.114	74	95.1	85.9	77.6	73.8	66.6	60.2
56	0.115	73	95.0	85.8	77.4	73.6	66.4	60.0
58	0.116	72	95.0	85.7	77.3	73.4	66.2	59.7
60	0.117	72	94.9	85.6	77.1	73.2	66.0	59.5
62	0.118	71	94.9	85.5	76.9	73.0	65.7	59.2
64	0.119	71	94.9	85.3	76.8	72.8	65.5	58.9
66	0.120	70	94.8	85.2	76.6	72.6	65.3	58.7
68	0.121	69	94.8	85.1	76.5	72.5	65.1	58.5

**Power handling refers to EIA, digiTLine and Ultimate line. Does not apply to EHTLine or EHT/digiTLine. Refer to pgs. 14-15.*

$8^{3}/_{16}$" 75-ohm Line Channels 2-52

Peak Power Rating (kW) 9,930
Peak Voltage Rating (kV) 27

Channel	Loss	Ave.*	Efficiency (%) Total Length in Feet				
	dB/100'	Power KW	800	1000	1400	1800	2000
2	0.028	336	95.0	93.8	91.4	89.0	88.0
3	0.029	320	94.8	93.5	91.0	88.6	97.4
4	0.031	306	94.5	93.2	90.6	88.1	86.9
5	0.033	286	94.2	92.7	90.0	87.3	86.0
6	0.034	275	93.9	92.5	89.6	86.9	85.5
201-FM	0.034	270	93.5	92.4	89.5	86.7	85.3
300-FM	0.038	244	93.2	91.6	88.4	85.4	83.9
7	0.049	191	91.4	89.4	85.5	81.7	79.9
8	0.049	188	91.3	89.2	85.3	81.5	79.6
9	0.050	185	91.2	89.1	85.0	81.2	79.3
10	0.051	182	91.0	88.9	84.8	80.9	79.0
11	0.052	179	90.9	88.7	84.6	80.7	78.8
12	0.053	176	90.8	88.6	84.4	80.4	78.5
13	0.053	174	90.6	88.4	84.2	80.2	78.2
14	0.079	117	86.5	83.4	77.5	72.1	69.5
15	0.079	116	86.4	83.3	77.4	72.0	69.4
16	0.080	116	86.3	83.2	77.3	71.8	69.2
17	0.080	115	86.2	83.1	77.2	71.7	69.0
18	0.081	114	86.2	83.0	77.0	71.5	68.9
19	0.081	114	86.1	82.9	76.9	71.4	68.7
20	0.082	113	86.0	82.8	76.8	71.2	68.6
21	0.082	112	85.9	82.7	76.7	71.1	68.4
22	0.083	112	85.8	82.6	76.6	70.9	68.3
23	0.083	111	85.8	82.5	76.4	70.8	68.1
24	0.084	110	85.7	82.4	76.3	70.7	68.0
25	0.084	110	85.6	82.4	76.2	70.5	67.8
26	0.085	109	85.5	82.3	76.1	70.4	67.7
27	0.085	108	85.5	82.2	76.0	70.2	67.5
28	0.086	108	85.4	82.1	75.9	70.1	67.4
29	0.086	107	85.3	82.0	75.8	70.0	67.3
30	0.087	107	85.3	81.9	75.6	69.8	67.1
31	0.087	106	85.2	81.8	75.5	69.7	67.0
32	0.088	106	85.1	81.7	75.4	69.6	66.8
33	0.088	105	85.0	81.7	75.3	69.4	66.7
34	0.088	105	85.0	81.6	75.2	69.3	66.5
35	0.089	104	84.9	81.5	75.1	69.2	66.4
36	0.089	104	84.8	81.4	75.0	69.1	66.3
37	0.090	103	84.8	81.3	74.9	68.9	66.1
38	0.090	102	84.7	81.2	74.8	68.8	66.0
39	0.091	102	84.6	81.2	74.7	68.7	65.9
40	0.091	102	84.6	81.1	74.6	68.6	65.7
41	0.092	101	84.5	81.0	74.5	68.4	65.6
42	0.092	101	84.4	80.9	74.3	68.3	65.5
43	0.092	100	84.4	80.8	74.2	68.2	65.3
44	0.093	100	84.3	80.8	74.1	68.1	65.2
45	0.093	99	84.2	80.7	74.0	67.9	65.1
46	0.094	99	84.2	80.6	73.9	67.8	65.0
47	0.094	98	84.1	80.5	73.8	67.7	64.8
48	0.095	98	84.0	80.4	73.7	67.6	64.7
49	0.095	97	84.0	80.4	73.6	67.5	64.6
50	0.095	97	83.9	80.3	73.5	67.4	64.5
51	0.096	97	83.8	80.2	73.4	67.2	64.3
52	0.096	96	83.8	80.1	73.3	67.1	64.2

Peak Voltage Ratings are based on 4:1 margin of safety to theoretical.
Peak Power Ratings are calculated from peak voltage according to the formula, Ppk – Vpk^2/Zo.
To determine the peak power based on the RMS of the peak voltage, divide the listed peak powers by 2.

9 3/16" 75-ohm Line Channels 2-38

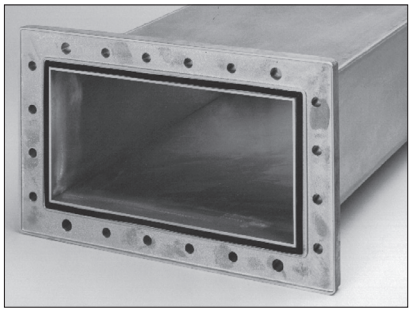
Peak Power Rating (kW) 12,568
Peak Voltage Rating (kV) 30

Channel	Loss dB/100'	Ave.* Power KW	Efficiency (%) Total Length in Feet				
			800	1000	1400	1800	2000
2	0.004	415	99.2	99.0	98.6	98.2	98.0
3	0.005	395	99.1	98.8	98.4	97.9	97.7
4	0.006	377	98.9	98.6	98.1	97.6	97.3
5	0.007	353	98.6	98.3	97.6	97.0	96.7
6	0.008	340	98.5	98.1	97.4	96.6	96.3
201-FM	0.009	334	98.4	98.0	97.2	96.4	96.0
300-FM	0.012	302	97.8	97.3	96.2	95.2	94.6
7	0.024	236	95.6	94.5	92.5	90.4	89.4
8	0.025	232	95.4	94.3	92.1	90.9	88.9
9	0.027	228	95.2	94.1	91.8	89.6	88.5
10	0.028	224	95.0	93.8	91.5	89.2	88.0
11	0.029	221	94.8	93.6	91.1	88.8	87.6
12	0.030	218	94.6	93.3	90.8	88.3	87.1
13	0.031	215	94.5	93.1	90.5	87.9	86.7
14	0.068	145	88.2	85.5	80.3	75.4	73.1
15	0.069	144	88.1	85.4	80.2	75.3	72.9
16	0.069	143	88.1	85.3	80.0	75.1	72.8
17	0.070	142	88.0	85.2	79.9	75.0	72.6
18	0.070	141	87.9	85.1	79.8	74.9	72.5
19	0.070	140	87.9	85.1	79.7	74.7	72.3
20	0.071	139	87.8	85.0	79.6	74.6	72.2
21	0.071	139	87.7	84.9	79.5	74.5	72.1
22	0.072	138	87.6	84.8	79.4	74.3	71.9
23	0.072	137	87.6	84.7	79.3	74.2	71.8
24	0.072	136	87.5	84.6	79.2	74.1	71.6
25	0.073	135	87.4	84.6	79.1	74.0	71.5
26	0.073	135	87.4	84.5	79.0	73.8	71.4
27	0.074	134	87.3	84.4	78.9	73.7	71.2
28	0.074	133	87.3	84.3	78.8	73.6	71.1
29	0.074	132	87.2	84.3	78.7	73.5	71.0
30	0.075	132	87.1	84.2	78.6	73.3	70.9
31	0.075	131	87.1	84.1	78.5	73.2	70.7
32	0.076	130	87.0	84.0	78.4	73.1	70.6
33	0.076	130	86.9	83.9	78.3	73.0	70.5
34	0.076	129	86.9	83.9	78.2	72.9	70.3
35	0.077	128	86.8	83.8	78.1	72.7	70.2
36	0.077	128	86.8	83.7	78.0	72.6	70.1
37	0.078	127	86.7	83.6	77.9	72.5	70.0
38	0.078	127	86.6	83.6	77.8	72.4	69.8

NOTES:

**Power handling refers to EIA, digitLine and Ultimate line. Does not apply to EHTLine or EHT/digitLine. Refer to pgs. 14-15.*

Peak Voltage Ratings are based on 4:1 margin of safety to theoretical.
Peak Power Ratings are calculated from peak voltage according to the formula, Ppk – Vpk^2/Zo.
To determine the peak power based on the RMS of the peak voltage, divide the listed peak powers by 2.



Rectangular Waveguide - pages 34-45 For High Power-High Efficiency UHF Applications

DTW Waveguide - pages 46-55 The “Low Windload” Alternative

Dielectric has been a major supplier of large high power waveguide to the microwave industry for the past two decades. This experience has resulted in design, manufacturing, and testing techniques that represent the current state-of-the-art.

The High Power Alternative

Each form of transmission line has certain features which make its use more advantageous over other types of transmission systems. For UHF television applications, waveguide is particularly attractive because it out performs coaxial transmission line in virtually every area of importance.

Waveguide can handle power levels far in excess of coaxial line ratings.

Because there is no center conductor, waveguide is much less susceptible to shock and vibration during shipping and installation. No center conductor means no insulators and consequently lower loss.

Complete Systems

Dielectric's product line includes not only individual waveguide components and accessories, but integrated waveguide feed systems as well. Typical feed systems include such items as straight waveguide, sweeps and elbows, mitre bends, twists, switches, couplers, and other components as required for a specific application. In order to provide system compatibility, each component must be manufactured with stringent electrical and mechanical controls.

Quality Manufacturing

Extreme care is taken to ensure a superior surface finish on the flanges. Flange flatness tolerances do not exceed a total deviation over 5 to 10 mils on a flange face. Deviations exceeding these dimensional tolerances can result in serious arcing at the flange junction in a high power system.

Another unique process welds the flanges in a manner that prevents localized distortion, thus minimizing the periodic VSWR spike that is often characteristic of transmission line systems. Facing the flanges, after welding, ensures accurate parallelism, thus minimizing interface discontinuities.

Precision Welding

Dielectric's waveguide is spayarc argon® welded by unique techniques using precision tooling and fixtures. These techniques eliminate distortion and bow by maintaining uniform stress loading and uniform weld penetration. Consequently, mechanical stability is attained and performance degradation of the guide with aging is eliminated. This is extremely important in long waveguide runs where low VSWR is necessary.

Pressurization Systems

Rectangular waveguide by the nature of its shape and relatively thin walls, is not conducive to high pressurization; but a slight positive pressure in any transmission line system is necessary to prevent condensation during temperature change.

The guide must not be over-pressurized because the walls will be deformed, causing excessive VSWR or a ruptured waveguide window.

LPB-100 Standby System

The LPB-100 is a standby system designed to prevent negative pressure in large volume waveguide runs due to rapid temperature change.

As this rate of change is often much too great for the primary compressor/dehydrator to supply, a pressure switch starts the LPB-100 blower, rapidly supplying a very large volume of dry air through a cylinder containing molecular sieve type desiccant. When the pressure is stabilized, The LPB-100 returns to standby, with its desiccant tower regenerated by a small flow of dry air from the primary compressor/dehydrator.

Gas Dump

Because of the large volume of air and large surface of the guide, a rapid change of ambient temperature can cause a relatively fast change in the internal pressure. The extra pressure must be bled off rapidly and this is accomplished by the gas dump. The gas dump consists of precisely weighted cap over an opening in the guide. The cap "pops" off at the maximum pressure for which the guide is designed. When the guide cools, the automatic dehydrator must have sufficient capacity to replace the air in a short time.

The physical parameters of the rectangular waveguide determine the electrical operating characteristics. The dimension of the "broad wall" determines the frequency range of operation.

The dimension of the narrow wall sets the breakdown voltage of the waveguide and therefore the peak power handling capability. It should be noted that as this dimension decreases, transfer efficiency decreases.

The ratio between the broad and narrow wall recommended by the Electronics Industries Association is 2:1. This combination yields a favorable compromise between electrical and mechanical properties and has been utilized extensively by the broadcast industry.

For special applications, Dielectric offers a complete line of rectangular waveguide components including sidewall couplers, directional couplers, folded tees (magic tees), phase shifters, special sweeps and elbows, special waveguide lengths, and half height waveguide.

Rectangular Waveguide Parameters

Waveguide Designation	Inside Dimensions	Inside Dimension Tolerance	Outside Dimensions	Wall Thickness	Recommended Operating Range (Megahertz/)	Max. Pressure
WR 1800	18.00" x 9.00"	±.020"	18.375" x 9.375"	.190"	470-602	0.25 PSIG
WR 1500	15.00" x 7.50"	±.015"	15.250" x 7.750"	.125"	506-728	0.25 PSIG
WR 1150	11.50" x 5.75"	±.015"	11.750" x 6.000"	.125"	662-806	0.50 PSIG

General Specifications

Operating Temperature Range:
-40 Deg. C to +52 Deg. C

Humidity:
Up to 100% R.H. Including condensate and rain.

Altitude:
0 to 10,000 feet A.M.S.L. S.T.P.

Nominal VSWR (without tuning):
1.1:1 for standard waveguide line run.

Recommended Line Lengths

Channel	WR 1800	WR 1500	WR 1150
14	143 5/8"		
15	143 5/8"		
16	143 5/8"		
17	138"		
18	138"	143 5/8"	
19	143 5/8"	143 5/8"	
20	143 5/8"	138"	
21	143 5/8"	138"	
22	138"	143 5/8"	
23	138"	143 5/8"	
24	143 5/8"	143 5/8"	
25	143 5/8"	138"	
26	143 5/8"	138"	
27	143 5/8"	143 5/8"	
28	138"	143 5/8"	
29	138"	143 5/8"	
30	143 5/8"	138"	
31	143 5/8"	138"	
32	143 5/8"	143 5/8"	
33	138"	143 5/8"	
34	138"	143 5/8"	
35	143 5/8"	138"	
36		138"	
37		143 5/8"	
38		143 5/8"	
39		143 5/8"	
40		138"	
41		138"	
42		143 5/8"	
43		143 5/8"	
44		143 5/8"	138
45		138"	138"
46		138"	143 5/8"
47		143 5/8"	143 5/8"
48		143 5/8"	143 5/8"
49		143 5/8"	138"
50		143 5/8"	138"
51		138"	143 5/8"
52		138"	143 5/8"
53		143 5/8"	138"
54		143 5/8"	138"
55		143 5/8"	143 5/8"
56		143 5/8"	143 5/8"
57			143 5/8"
58			138"
59			138"
60			143 5/8"
61			143 5/8"
62			143 5/8"
63			138"
64			138"
65			138"
66			143 5/8"
67			143 5/8"
68			138"
69			138"

White - Recommended
Shaded - Acceptable
Black - Not Recommended

Section Length vs VSWR

Waveguide, similar to standard rigid coaxial line, requires selection of a proper length for a given channel to obtain a system with low VSWR. The table to the left is provided for proper length selection.

Combining Channels

When combining channels into waveguide both the size and length must be evaluated to obtain low VSWR. The tables at left and below list recommended and prohibited standard line lengths by waveguide size and channel. For specific applications special designs may be available. Contact Dielectric for more information.

Broadband Systems

In specific applications Dielectric has the ability to design broadband systems to combine two or more UHF channels into a single waveguide run. Contact Dielectric for more information.

Prohibited Line Lengths

(size vs length vs channel)

WR 1800	
11.5'	14,15,19,20,25,26,30,31,36,37,42,43,48,49
11.75'	14,18,19,23,24,29,30,35,36,41,42 47,48
11.95'	17,18,22,23,28,29,33,34,39,40,45,46,51,52
WR 1500	
11.5'	14,17,18,22,23,26,27,32,33,37,38,43,44,48,49,54,55,60,61,66,67
11.75	14,17,18,21,22,26,27,30,31,36,37,41,42,47,48,52,53,58,59,64,65
11.95'	16,17,20,21,25,26,30,31,35,36,40,41,45,46,51,52,57,58,62,63,68,69
WR 1150	
11.5'	38,39,42,43,46,47,51,52,56,57,61,62,66,67
11.75'	37,38,41,42,45,46,50,51,54,55,59,60,65,66
11.95'	40,41,44,45,49,50,53,54,58,59,63,64,68,69

Minimum Horizontal Run Length vs. Height

Waveguide Size	Vertical Run in Feet	Minimum Required Horizontal Run Length
WR 1800	1800-2000	120 FT.
	1200-1800	106 FT.
	900-1200	96 FT.
	500-900	84 FT.
	400-500	72 FT.
WR 1500	1400-2000	84 FT.
	800-1400	72 FT.
	400-800	60 FT.
WR 1150	1800-2000	72 FT.
	900-1800	60 FT.
	400-900	48 FT.

Note: 11.75' (141") lengths can be used for multiple channel applications.

System Worksheet

1. Gas Barrier (500XX-13)
Located before the gas dump section inside the transmitter building. If the elbow complex at the top of the vertical run is coax, an additional Gas Barrier may be required.

2. Gas Dump Section (500XX-18)
Located horizontally with the gas dump hanging downward. Valve is set to protect the guide from high pressure.

3. Wall Anchor Plate (500XX-2)
Used to anchor the horizontal run of waveguide to the transmitter building wall. A second one may be used on the interior building wall for aesthetic purposes.

4. Rectangular Waveguide Straight Sections (500XX-10)
Bolted together end to end with the seal always facing toward the antenna, allowing observation of the contact surface and seal during installation. Section length dependent upon channel.

5. Sweep Elbows (500XX-8)
Used any where a 90° bend is required. One is normally used to connect the bottom of the vertical run to the horizontal run. Where space is limited a mitre elbow may be substituted.

6. Tuner Sections (500XX-21)
As a rule of thumb, one tuner may be placed as close to the building as practical, one at the tower base elbow (vertically is preferred), one at the tower top, just below the cut length and the remainder equally spaced between the top and the bottom tuners in the vertical run

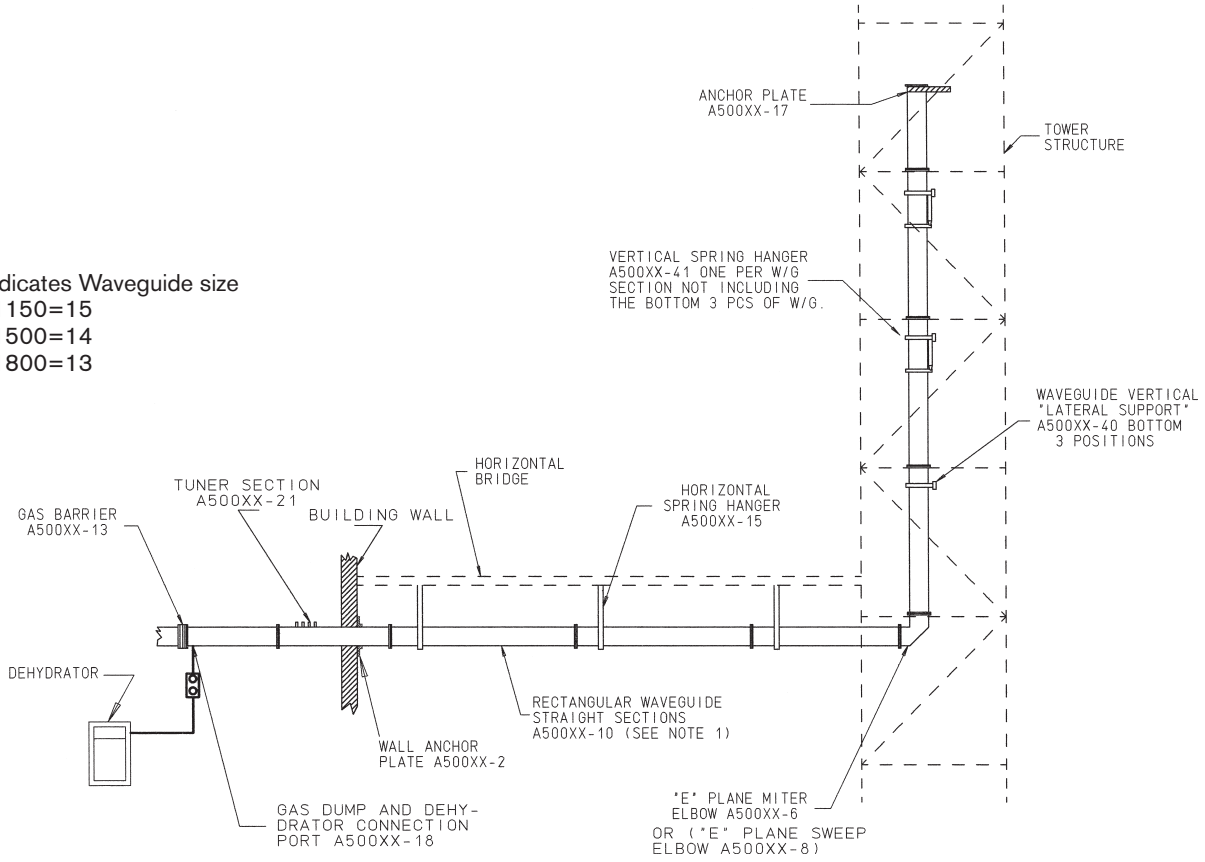
7. Lower Vertical Hanger Lateral Support (500XX-40)
Allows the horizontal run to expand and contract under normal temperature changes. Normally only three of these are required and will be positioned in place of the bottom three (3) vertical spring hangers. The distance from the centerline of the guide to the mounting surface is 2.50" greater than the standard vertical spring hanger.

8. Vertical Spring Hangers (500XX-41)
These hangers are to be spaced approximately 12 feet apart (one per waveguide section), other than the vertical lateral supports all hangers in the vertical run are the same.

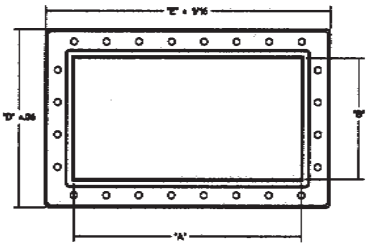
9. Tower Top Anchor Plate (500XX-17)
Designed to fix the vertical run to the tower top.

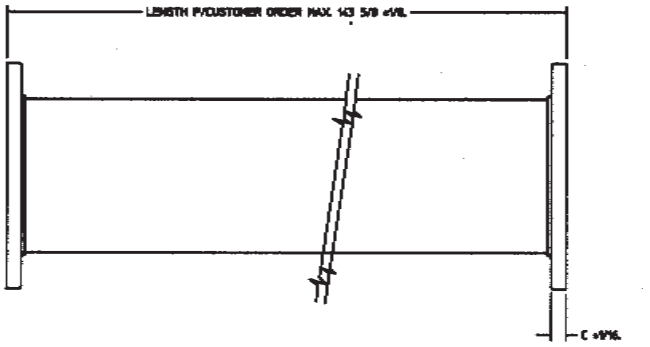
10. Horizontal Spring Hangers (500XX-15)
Supports the horizontal run while allowing for vertical movement due to the expansion of the vertical run. One is required for each full length section of waveguide and should be placed near the center of each section.

Note: XX indicates Waveguide size
WR 1150=15
WR 1500=14
WR 1800=13



Straight Flanged Waveguide





Wave Guide Size	Catalog Number	Freq Range MHz.	A	B	Min. C	D	E	Wall Thickness	Max. Pressure PSIG	Net Weight/Ft Unflanged
WR 1800	50013-10	410-620	18.00"	9.00"	5/8"	12.50"	21.50"	.190"	0.25	12 Lbs
WR 1500	50014-10	490-750	15.00"	7.50"	5/8"	11.00"	18.50"	.125"	0.25	7 Lbs.
WR 1150	50015-10	640-960	11.50"	5.75"	5/8"	9.25"	15.00"	.125"	0.50	5 Lbs.

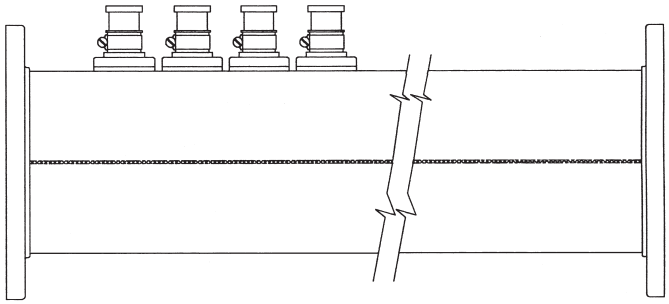
Note: Hardware kits are ordered separately.

VSWR Tuning Sections

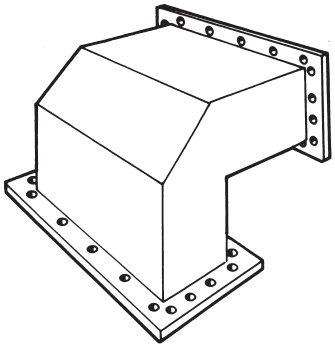
As manufactured, Dielectric Waveguide has a VSWR of 1.1. With on-site tuning, a VSWR of 1.05 is obtainable.

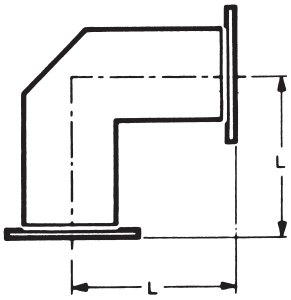
Tuner sections are the same length as standard sections.

The use and quantity of tuning sections required will be determined at time of order.



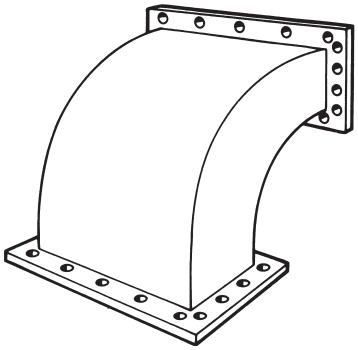
Waveguide Size	Catalog Number
WR 1800	50013-21
WR 1500	50014-21
WR 1150	50015-21

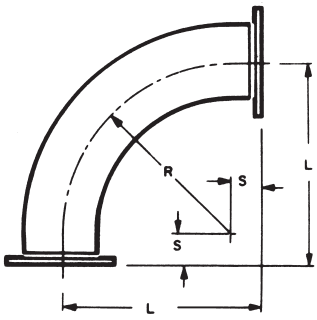




90° "E" Plane Mitre Bend

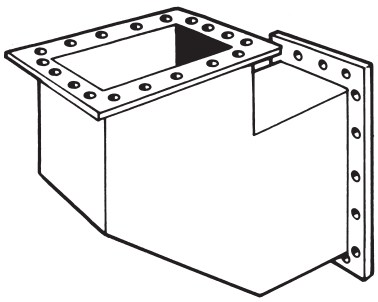
Waveguide Size	Catalog Number	L
WR1800	50013-6	12"
WR1500	50014-6	9"
WR1150	50015-6	9"

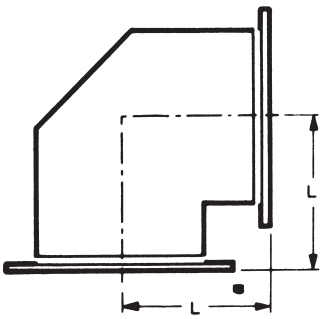




90° "E" Plane Sweep Bends

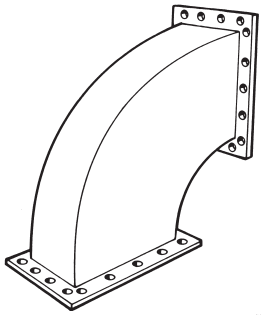
Waveguide Size	Catalog Number	L	R	S
WR1800	50013-8	21"	18"	3"
WR1500	50014-8	15"	12"	3"
WR1150	50015-8	15"	12"	3"

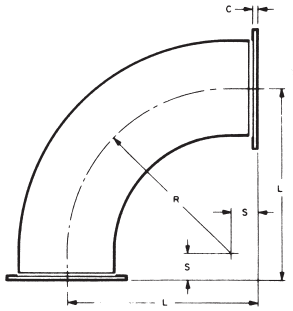




90° "H" Plane Mitre Bend

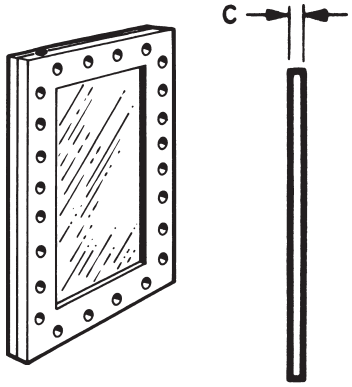
Waveguide Size	Catalog Number	L
WR1800	50013-5	18"
WR1500	50014-5	12"
WR1150	50015-5	12"





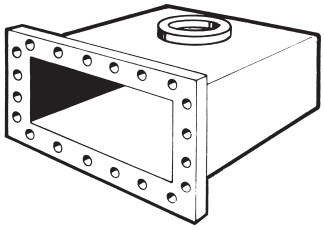
90° "H" Plane Sweep Bends

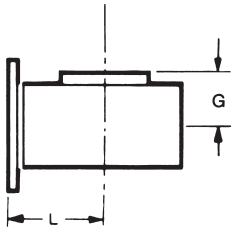
Waveguide Size	Catalog Number	Freq. Range GHz.	L	R	S
WR1800	50013-7	0.41-0.62	39"	36"	3"
WR1500	50014-7	0.49-0.75	33"	30"	3"
WR1150	50015-7	0.64-0.96	27"	24"	3"



Waveguide Gas Barrier

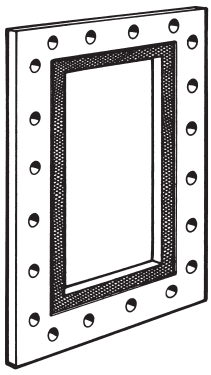
Waveguide Size	Catalog Number	C	Gas Port Thread
WR1800	50013-13	1.38"	1/4" NPT
WR1500	50014-13	1.38"	1/4" NPT
WR1150	50015-13	1.38"	1/4" NPT

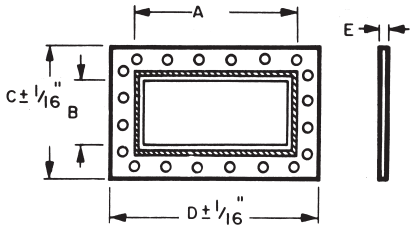




Waveguide To Coax Transitions

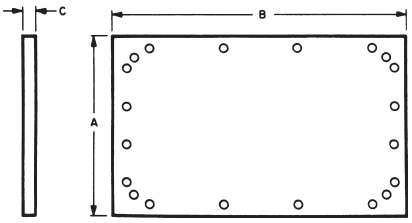
Waveguide Pressure Size	Catalog Number			G			L			Max
	$3^1/_8$EIA	$6^1/_8$EIA	$8^3/_{16}$EIA	$3^1/_8$"	$6^1/_8$"	$8^3/_{16}$"	$3^1/_8$"	$6^1/_8$"	$8^3/_{16}$"	PSIG
WR1800	50013-23	50013-22	50013-24	5.56"	5.69"	5.62"	6"	6"	10"	0.25
WR1500	50014-23	50014-22	50014-24	4.81"	4.94"	4.88"	6"	6"	10"	0.25
WR1150	50015-23	50015-22	50015-24	3.94"	4.06"	4.00"	6"	6"	10"	0.50





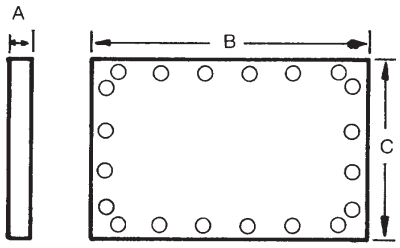
Waveguide Flange Seals

Waveguide Size	Catalog Number	Freq. Range GHz	A	B	C	D	E
WR 1800	50013-9	0.41-0.62	18.00"	9.00"	12.50"	2.50"	1/8"
WR 1500	50014-9	0.49-0.75	15.00"	7.50"	11.00"	18.50"	1/8"
WR 1150	50015-9	0.64-0.96	11.50"	5.75"	9.25"	15.00"	1/8"



Shorting Plate

Waveguide Size	Catalog Number	A	B	C
WR 1800	50013-1	12.50"	21.50"	.250"
WR 1500	50014-1	11.00"	18.50"	.250"
WR 1150	50015-1	9.25"	15.00"	.250"



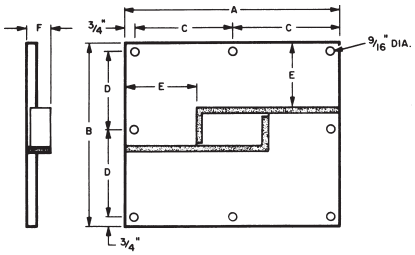
Cover Plate — Fiber

Waveguide Size	Catalog Number	A	B	C
WR 1800	50013-28	0.250"	12.50"	21.50"
WR 1500	50014-28	0.250"	11.50"	18.50"
WR 1150	50015-28	0.250"	9.25"	15.00"

Hardware Kits

Waveguide Size	Catalog Number
WR 1800	50013-12
WR 1500	50014-12
WR 1150	50015-12

Contains enough hardware for one standard joint

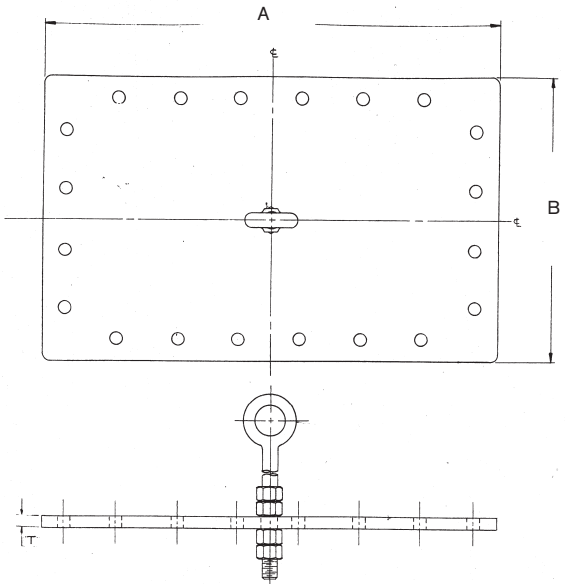


Wall Anchor Plate

Waveguide Size	Catalog Number	A	B	C	D	E	F
WR 1800	50013-2	30.25"	21.25"	14.38"	9.88"	5.44"	2"
WR 1500	50014-2	27.25"	19.75"	12.88"	9.13"	5.50"	2"
WR 1150	50015-2	23.75"	18.00"	11.13"	8.25"	5.56"	2"

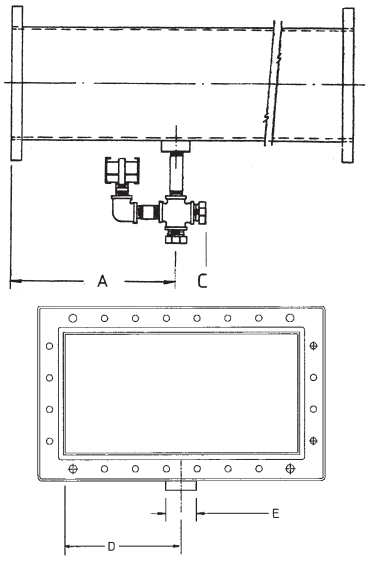
Lifting Plate

Waveguide Size	Catalog Number	A	B	T
WR 1800	50013-16	21.50"	12.50"	.38"
WR 1500	50014-16	18.50"	11.00"	.38"
WR 1150	50015-16	15.00"	9.25"	.38"



Alignment Pins

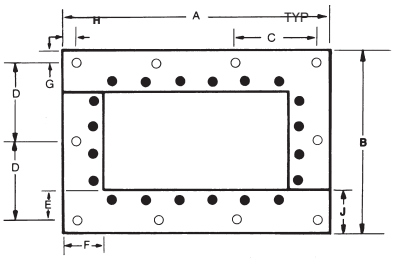
Waveguide Size	Catalog Number
WR 1800	50013-30
WR 1500	50014-30
WR 1150	50015-30



Gas Dump Section

Size	Catalog Number	A	C	D	E
WR 1800	50013-18	12.00"	4.00"	9.19"	2.00"
WR 1500	50014-18	12.00"	4.00"	7.62"	2.00"
WR 1150	50015-18	12.00"	4.00"	5.88"	2.00"

Note: Overall length dictated by Channel. Contact factory.



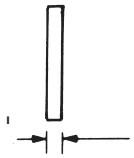
Anchor Plate — Tower Top

Waveguide Size	Catalog Number	A	B	C	D	E	F	J
WR 1800	50013-17	28.00"	18.00"	8.66"	8.00"	3.00"	4.50"	4.00"
WR 1500	50014-17	25.00"	16.50"	7.66"	7.25"	3.00"	4.50"	4.00"
WR 1150	50015-17	21.50"	14.75"	6.50"	6.38"	3.00"	4.50"	4.00"

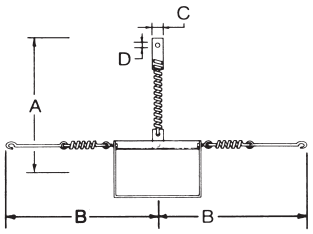
G & H = 1.00" (all sizes)
I = .625 (all sizes)

● Holes for $^{3}/_{8}$" Dia Bolts on flange

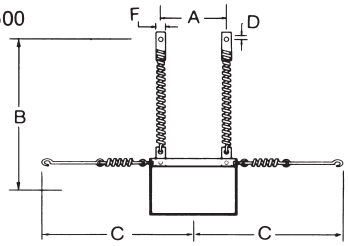
○ Holes for $^{1}/_{2}$" Dia Bolts on tower mount



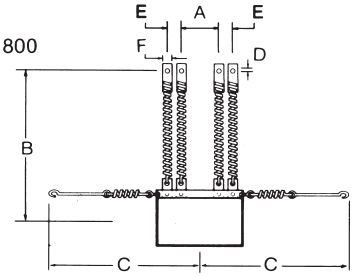
WR 1150



WR 1500



WR 1800

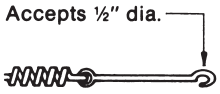


Horizontal Spring Hangers

Space one per Waveguide length

Waveguide Size	Catalog Number	A	B	C	D	E	F
WR 1800	50013-15	10.50"	27.44"	23.50"	.56"	1.50"	1.125"
WR 1500	50014-15	11.00"	30.63"	25.00"	.64"	—	2.50"
WR 1150	50015-15	41.00"	23.50"	2.50"	.64"	—	2.50"

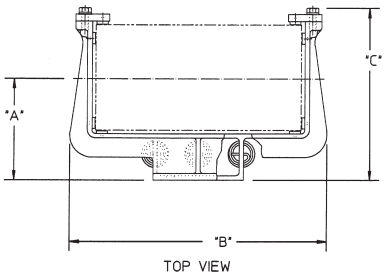
Dimensions are for installed waveguide

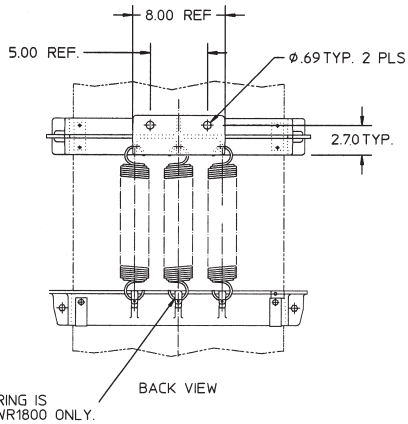


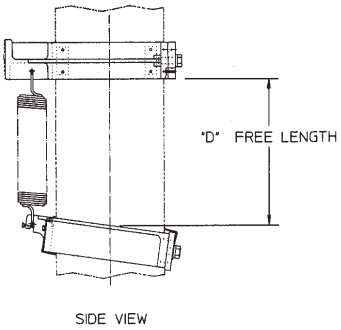
Vertical Spring Hangers

Waveguide Size	Catalog Number	A	B	C	D
WR 1800	50013-41	9.07"	23.00"	15.33"	13.00"
WR 1500	50014-41	7.38"	20.00"	12.83"	10.95"
WR 1150	50015-41	6.50"	16.38"	11.02"	9.60"

For spring tension charts refer to installation guide







Horizontal Fixed Hangers

Material: Strap-aluminum Cushion-neoprene

Finish: Irridite

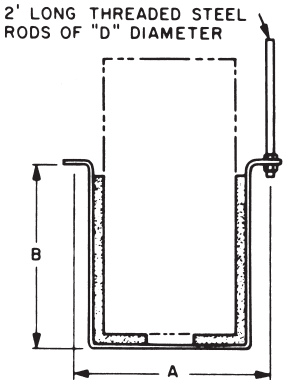
Fixed Hangers are used before Flex Section on horizontal runs. See tower layout page for Hanger location.

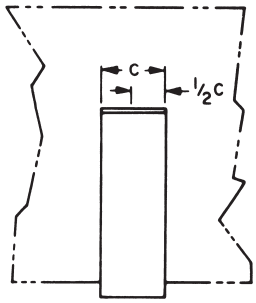
"H" Plane Waveguide Hangers

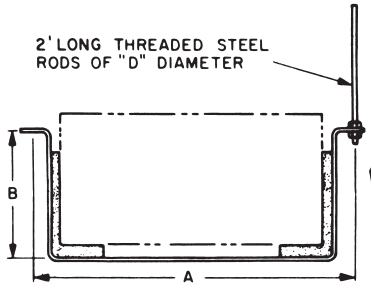
Waveguide Size	Catalog Number	A	B	C	D
WR 1800	50013-4	12.50"	12.00"	3.00"	.50"
WR 1500	50014-4	11.00"	9.50"	3.00"	.50"
WR 1150	50015-4	9.25"	7.50"	3.00"	.50"

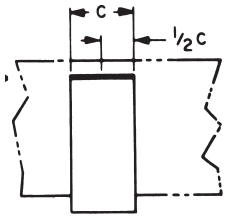
"E" Plane Waveguide Hangers

Waveguide Size	Catalog Number	A	B	C	D
WR 1800	50013-3	21.38"	7.00"	3.00"	.50"
WR 1500	50014-3	18.38"	5.75"	3.00"	.50"
WR 1150	50015-3	14.25"	4.50"	300"	.50"



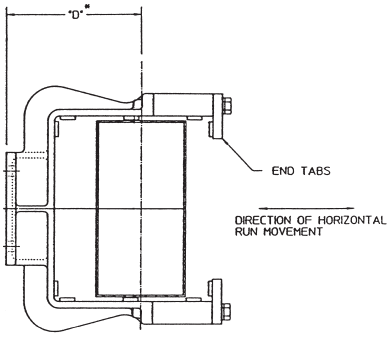






Vertical Lateral Support

Waveguide Size	Catalog Number	D
WR 1800	50013-40	11.63"
WR 1500	50014-40	9.88"
WR 1150	50015-40	9.00"



VERTICAL MEDIAN CENTER LINE.
BOTTOM (3) HANGERS ONLY. ("D")
SEE INSTALLATION GUIDE.

FOR MOUNTING SURFACE DIMENSIONS
REFER TO VERTICAL SPRING HANGER.

WR1800 (Channels 14 through 34)

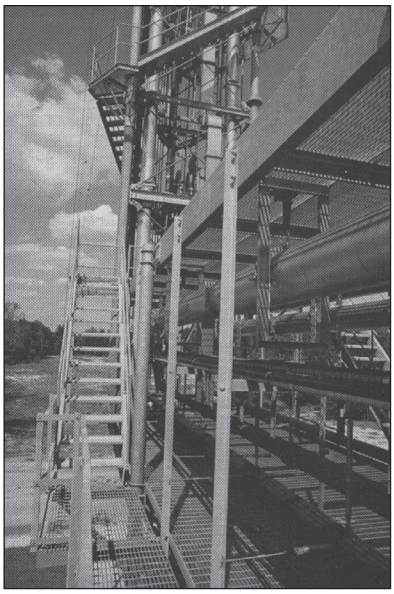
Channel	Visual Carrier	dB/100' 1100 alloy WR 1800	Efficiency (%) Total Length in Feet					
			200	600	1000	1200	1600	2000
14	471.25	0.046	97.9	93.9	90.0	88.1	84.5	81.0
16	483.25	0.045	98.0	94.0	90.2	88.4	84.8	81.4
18	495.25	0.044	98.0	94.2	90.4	88.7	85.2	81.8
20	507.25	0.043	98.0	94.3	90.6	88.8	85.4	82.1
22	519.25	0.042	98.1	94.4	90.8	89.0	85.7	82.4
24	531.25	0.041	98.1	94.4	90.9	89.2	85.9	82.6
26	543.25	0.041	98.1	94.5	91.0	89.3	86.0	82.9
28	555.25	0.040	98.2	94.6	91.1	89.5	86.2	83.1
30	567.25	0.040	98.2	94.6	91.2	89.6	86.4	83.3
32	579.25	0.040	98.2	94.7	91.3	89.7	86.5	83.4
34	591.25	0.039	98.2	94.7	91.4	89.7	86.6	83.5

WR1500 (Channels 20 through 56)

Channel	Visual Carrier	dB/100' 1100 alloy WR 1500	Efficiency (%) Total Length in Feet					
			200	600	1000	1200	1600	2000
20	507.25	0.070	96.8	90.8	85.2	82.5	77.3	72.5
22	519.25	0.067	97.0	91.1	85.7	83.1	78.1	73.4
24	531.25	0.065	97.1	91.4	86.1	83.6	78.7	74.1
26	543.25	0.063	97.1	91.7	86.5	84.0	79.3	74.8
28	555.25	0.062	97.2	91.9	86.8	84.4	79.7	75.3
30	567.25	0.060	97.3	92.0	87.1	84.7	80.2	75.9
32	579.25	0.059	97.3	92.2	87.3	85.0	80.5	76.3
34	591.25	0.058	97.4	92.4	87.6	85.3	80.9	76.7
36	603.25	0.057	97.4	92.5	87.8	85.5	81.1	77.0
38	615.25	0.056	97.5	92.6	87.9	85.7	81.4	77.3
40	627.27	0.055	97.5	92.7	88.1	85.9	81.7	77.6
42	639.25	0.054	97.5	92.8	88.2	86.1	81.9	77.9
44	651.25	0.054	97.6	92.8	88.4	86.2	82.1	78.1
46	663.25	0.053	97.6	92.9	88.5	86.4	82.2	78.3
48	675.25	0.053	97.6	93.0	88.6	86.5	82.4	78.5
50	687.25	0.052	97.6	93.1	88.7	86.6	82.5	78.7
52	699.25	0.052	97.6	93.1	88.8	86.7	82.6	78.8
54	711.25	0.051	97.7	93.1	88.8	86.8	82.7	78.9
56	723.25	0.051	97.7	93.2	88.9	86.8	82.8	79.0

WR1150 (Channels 46 through 69)

Channel	Visual Carrier	dB/100' 1100 alloy WR 1150	Efficiency (%) Total Length in Feet					
			200	600	1000	1200	1600	2000
46	663.25	0.104	95.3	86.6	78.7	75.1	68.2	62.0
48	675.25	0.101	95.5	87.0	79.3	75.7	69.0	62.9
50	687.25	0.098	95.6	87.3	79.8	76.3	69.7	63.7
52	699.25	0.096	95.7	87.6	80.2	76.8	70.3	64.4
54	711.25	0.094	95.8	87.9	80.6	77.2	70.8	65.0
56	723.25	0.092	95.9	88.1	80.9	77.6	71.3	65.5
58	735.25	0.090	95.9	88.3	81.3	78.0	71.8	66.0
60	747.25	0.088	96.0	88.5	81.6	78.3	72.2	66.5
62	759.25	0.087	96.1	88.7	81.8	78.6	72.5	66.9
64	771.25	0.086	96.1	88.8	82.1	78.9	72.9	67.3
66	783.25	0.085	96.2	88.9	82.3	79.1	73.2	67.7
68	795.25	0.084	96.2	89.1	82.5	79.4	73.5	68.0
69	801.25	0.083	96.2	89.1	82.6	79.5	73.6	68.2



Doubly Truncated Waveguide (DTW) was developed as a means to transmit high power levels to an antenna. An existing tower, usually constructed to handle coaxial transmission line at lower power levels, may not withstand the increased windload of conventional rectangular waveguide. Dielectric's patented design eliminates the problems associated with circular waveguide while offering lower windload than rectangular guide.

DTW waveguide offers extremely stable VSWR characteristics in the presence of varying temperature and pressure. A DTW system does not require special mode suppression transitions, tuning pins nor other means to control undesired modes nor does it require reject loads to dispose of power from unwanted modes.

DTW Operating Range

Waveguide Designation	Television Channel	Frequency MHz
DTW 1750A	14-47	470-674
DTW 1500A	25-59	536-746
DTW 1350A	37-69	608-806

Construction

DTW is a unique waveguide design with the narrow wall curved to fit a radius. The waveguide was then enclosed in a circular fairing which serves a dual purpose. First, it presents a circular profile effectively reducing the resistance presented to the wind. Secondly, the shell is pressure tight allowing both the interior and exterior of the waveguide to be equally pressurized to as much as 3 psig. This means that regardless of how the weather changes, the guide cannot be cooled to the point where its internal pressure becomes a partial vacuum, nor will the shape of the power carrying walls be deformed. This results in less chance of water being forced into the waveguide and virtually no change in VSWR across the band.

The power carrying walls of DTW are made of 1100 alloy aluminum offering the highest power transmission efficiencies of any material popularly used today while the circular fairing is constructed of 6061-T6 alloy for increased strength.

DTW is interfaceable with all applicable sizes of Dielectric rectangular waveguide and coax.

DTW General Specifications

Operating Temperature Range:	-40 Deg C to +52 Deg C.
Altitude:	0 to 10,000 feet AMSL STP
Max. Internal Pressure:	3.00 PSIG
Nominal VSWR:	1.08: 1 Across channel for standard waveguide runs 1.05: 1 At picture carrier

Weights and Windload

Windload is a large advantage to be gained by the selection of DTW waveguide. The table below shows dead weights and windloads for all popular sizes of waveguide.

	Waveguide Weights	Windload	Hanger Weight
DTW 1750A	164	599	50
DTW 1500A	140	518	35
DTW 1350A	134	468	30

NOTE: All values are in pounds. The windload data has been calculated at 50/33 psf, assuming 12' section lengths.

Recommended Line Lengths

Channel	DTW 1750A	DTW 1500A	DTW 1350A
14	143 5/8"		
15	143 5/8"		
16	138"		
17	138"		
18	143 5/8"		
19	143 5/8"		
20	143 5/8"		
21	138"		
22	138"		
23	143 5/8"		
24	143 5/8"		
25	143 5/8"	138"	
26	138"	143 5/8"	
27	138"	143 5/8"	
28	143 5/8"	143 5/8"	
29	143 5/8"	138"	
30	143 5/8"	138"	
31	138"	143 5/8"	
32	138"	143 5/8"	
33	143 5/8"	143 5/8"	
34	143 5/8"	138"	
35	143 5/8"	138"	
36	143 5/8"	143 5/8"	
37	138"	143 5/8"	143 5/8"
38	138"	138"	143 5/8"
39	143 5/8"	138"	138"
40	143 5/8"	143 5/8"	138"
41	143 5/8"	143 5/8"	143 5/8"
42	138"	143 5/8"	143 5/8"
43	138"	138"	143 5/8"
44	143 5/8"	138"	138"
45	143 5/8"	143 5/8"	138"
46	143 5/8"	143 5/8"	143 5/8"
47	143 5/8"	143 5/8"	143 5/8"
48		143 5/8"	143 5/8"
49		138"	138"
50		138"	138"
51		143 5/8"	143 5/8"
52		143 5/8"	143 5/8"
53		143 5/8"	143 5/8"
54		138"	138"
55		138"	138"
56		143 5/8"	143 5/8"
57		143 5/8"	143 5/8"
58		143 5/8"	143 5/8"
59		138"	138"
60			138"
61			143 5/8"
62			143 5/8"
63			143 5/8"
64			138"
65			138"
66			143 5/8"
67			143 5/8"
68			143 5/8"
69			143 5/8"

Section Length vs VSWR

Waveguide, similar to standard rigid coaxial line, requires selection of a proper length for a given channel to obtain a system with low VSWR The table to the left is provided for proper length selection.

Combining Channels

When combining channels into waveguide both the size and length must be evaluated to obtain low VSWR. The tables at left and below list recommended and prohibited standard line lengths by waveguide size and channel. For specific applications special designs may be available. Contact Dielectric for more information.

Broadband Systems

In specific applications Dielectric has the ability to design broadband systems to combine two or more UHF channels into a single waveguide run. Contact Dielectric for more information.

Prohibited Line Lengths (size vs length vs channel)

DTW 1750A	
138"	14,18,19,23,24,28,29,34,35,39,40,45,46,51,52,57,58,64,65
141"	17,18,22,23,27,28,32,33,38,39,44,45,50,51,56,57,62,63
143 5/8"	16,17,21,22,26,27,31,32,37,38,42,43,48,49,54,55,60,61
DTW 1500A	
138"	22,23,26,27,31,32,36,37,41,42,46,47,52,53,57,58,63,64,69
141"	21,22,25,26,30,31,34,35,39,40,45,46,50,51,56,57,61,62,67,68
143 5/8"	21,22,25,26,29,30,34,35,38,39,43,44,49,50,54,55,60,61,65,66
DTW 1350A	
138"	28,29,32,33,36,37,41,42,46,47,51,52,56,57,62,63,68,69
141"	31,32,36,37,40,41,45,46,50,51,55,56,60,61,66,67
143 5/8"	31,32,35,36,39,40,44,45,49,50,54,55,59,60,64,65

Minimum Horizontal Run Length vs. Height

DTW Size	Vertical Run In Feet	Minimum Required Horizontal Run Length
DTW 1750A	1800-2000	120 Ft.
	1200-1800	108 Ft.
	900-1200	96 Ft.
	500-900	84 Ft.
	400-500	72 Ft.
DTW 1500A	1400-2000	84 Ft.
	800-1400	72 Ft.
	400-800	60 Ft.
DTW 1350A	1800-2000	72 Ft.
	900-1800	60 Ft.
	400-900	48 Ft.

White - Recommended
Shaded - Acceptable
Black - Not Recommended

The following items will typically be utilized in a DTW installation. The "X" represents the DTW type, 1750, 1500, or 1350.

1. Wall Anchor Plate (DTW-X-2)
Used to anchor the horizontal run to the outside building wall. A second is suggested only for aesthetic purposes.

2. "E" Plane Miter Elbow (DTW-XA-6) and "H" Plane Miter Elbow (DTW-XA-5)
"E" Plane typically used at the bottom of the vertical run. "H" Plane may be used as an option.

3. DTW Waveguide Straight Sections (DTW-XA-10)
DTW straight sections will mate only with other DTW sections and DTW miter bends. Entrance and exit of the waveguide is accomplished via DTW-XA-40 adapter tuner.

4. Hardware Kit (DTW-X-12)
Order one kit for every flange joint-Plus 10% extra to replenish parts dropped from the tower during installation.

5. Gas Barrier (DTW-X-13)
This Gas Barrier contains a thicker window to handle 3 lbs. PSIG. Flanges are rectangular and should not be placed between the adaptor tuner and the DTW.

6. Vertical Spring Hanger (DTW-X-44)
Use one hanger for every section of DTW.

7. Horizontal Hanger (DTW-X-45)
Use one hanger for every 10 feet of horizontal run.

8. Installation Kit (DTW-X-16)
Consists of the gas relief valve, lifting plate and two sets of alignment pins. The gas relief valve should be mounted inside the building to prevent failure due to environmental conditions. The valve mounts on the DTW-WR adaptor tuner.

9. Tower Top Anchor Plate (DTW-X-17)
Used to fix the top of the run relative to the tower.
One per vertical run is typical.

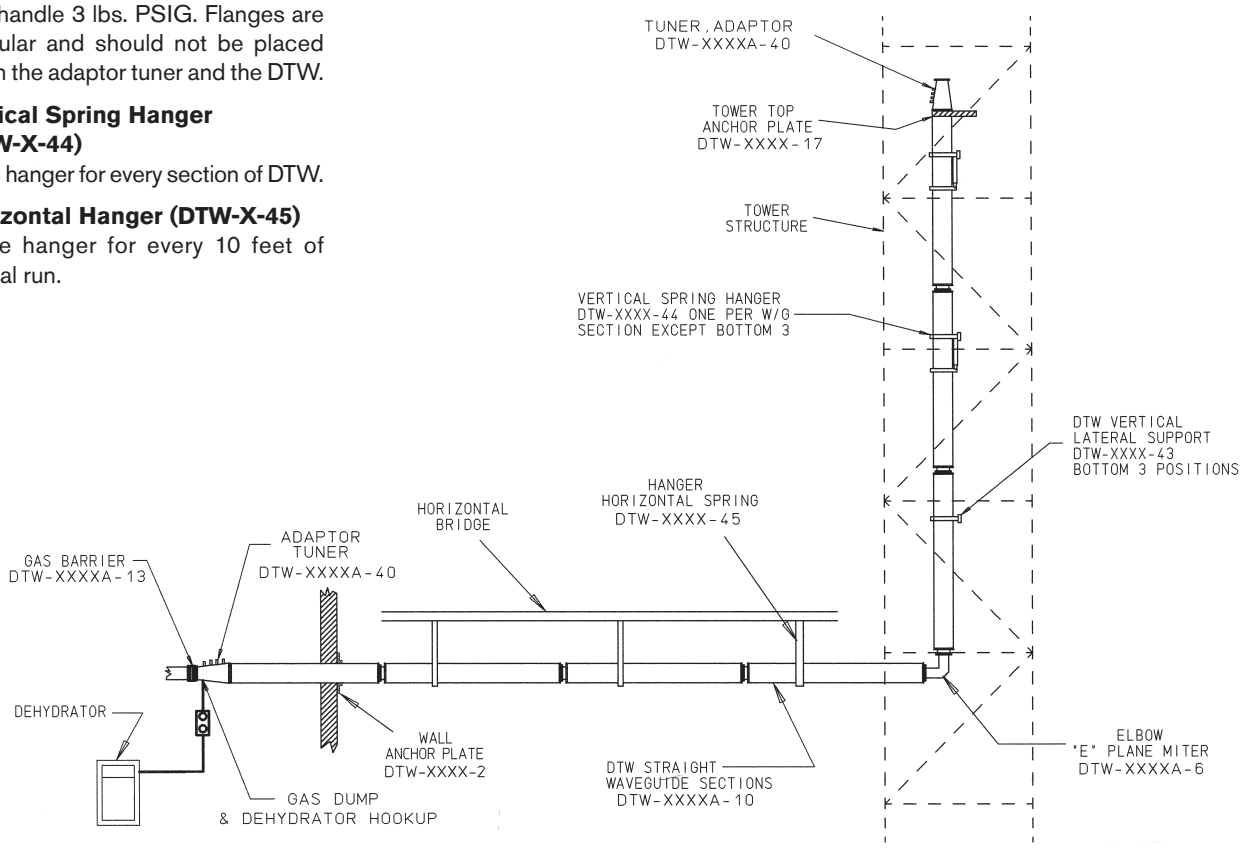
10. Tuning Section (DTW-X-21)
Uniformly distributed through the DTW run. Supplied as required.

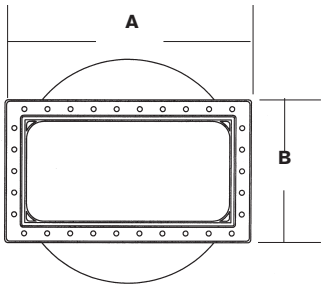
11. DTW to Coax Transition (DTW-XA-22)
Similar to waveguide transition, with bracing to handle the increase in air pressure. Has rectangular flanges and requires an adaptor transformer from DTW.

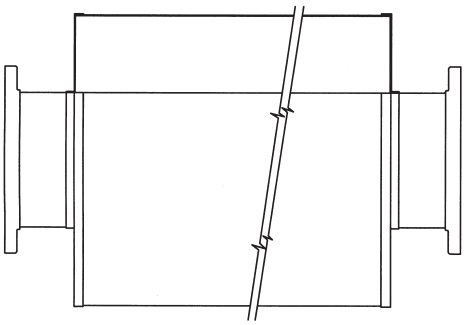
12. Pressurization Kit (DTW-X-29)
Includes a special 2400 series dehydrator and interconnecting fittings for a typical system.

13. WR to DTW Adapter Tuner (DTW-XA-40)
These are supplied to interface with coax transitions and/or rectangular waveguide, gas barrier, etc. Also serves as a tuning section.

14. Vertical Lateral Support (DTW-X-43)
Replaces three spring hangers in the vertical run provided the tower height does not exceed 2,000 feet and the horizontal run is within the restrictions set forth on page 47.

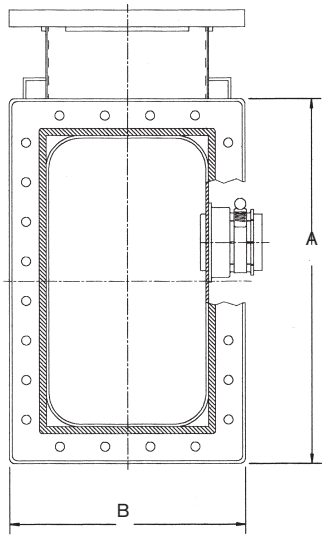






Straight Section

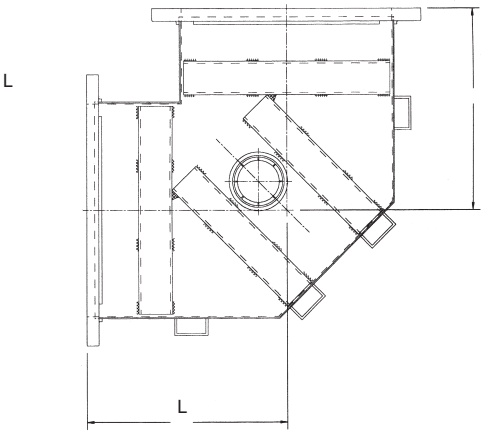
Catalog Number	A	B	L
DTW 1350A-10	16.15"	10.45"	SEE
DTW 1500A-10	17.50"	11.00"	TABLE
DTW 1750A-10	20.00"	11.60"	PG. 47



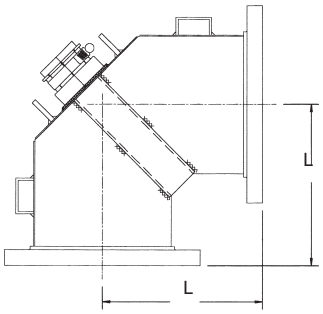
"H" Plane Mitre Elbow

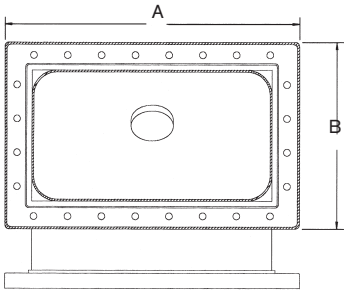
Catalog Number	L	A	B
DTW 1350A-5	12.00"	16.15"	10.45"
DTW 1500A-5	12.00"	17.50"	11.00"
DTW 1750A-5	18.00"	20.00"	11.60"

Note: Seals are located on both ends.



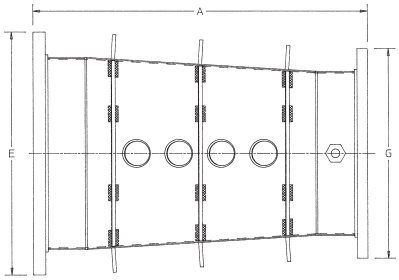
“E” Plane Mitre Elbow

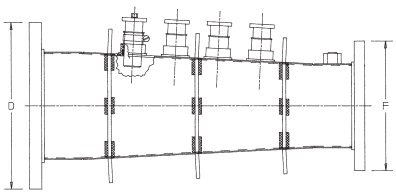




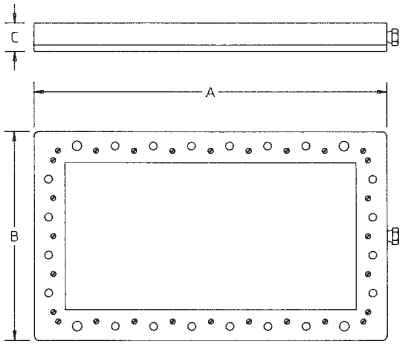
Catalog Number	L	A	B
DTW 1350A-6	9.00"	16.15"	10.45"
DTW 1500A-6	9.00"	17.50"	11.00"
DTW 1750A-6	12.00"	20.00"	11.60"

Transition



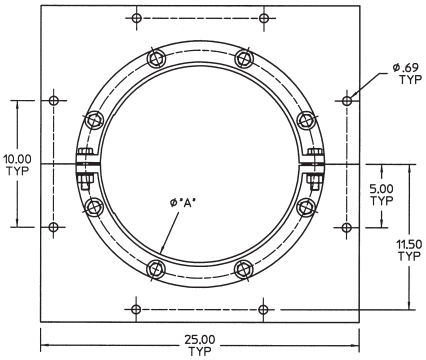


Catalog Number	From	To	A	D	E	F	G
DTW 1350A-40	DTW 1350A	WR 1150	24.00"	10.45"	16.15"	9.25"	15.00"
DTW 1500A-40	DTW 1500A	WR 1500	24.00"	11.00"	17.50"	11.00"	18.50"
DTW 1750A-40	DTW 1750A	WR 1800	24.00"	11.60"	20.00"	12.50"	21.50"



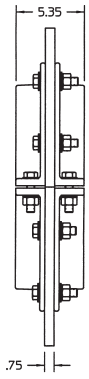
Gas Barrier

Catalog Number	A	B	C
DTW 1350-13	15.00"	9.25"	1.38"
DTW 1500-13	18.50"	11.00"	1.38"
DTW 1750-13	21.50"	12.50"	1.50"

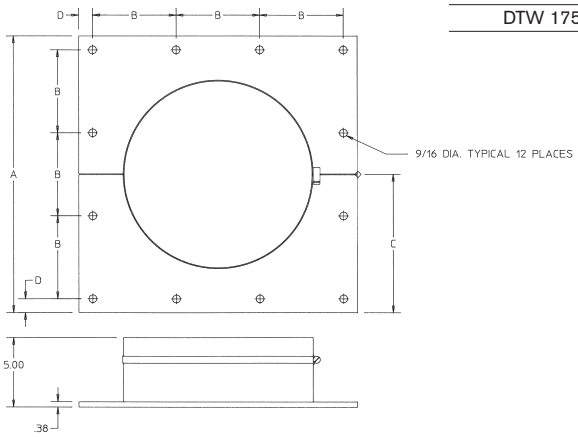


Anchor Plate

Catalog Number	A
DTW 1350-17	14.00"
DTW 1500-17	15.50"
DTW 1750-17	18.00"

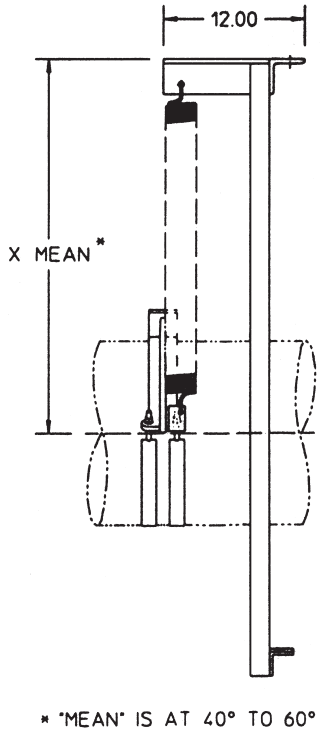


Wall Anchor Plate

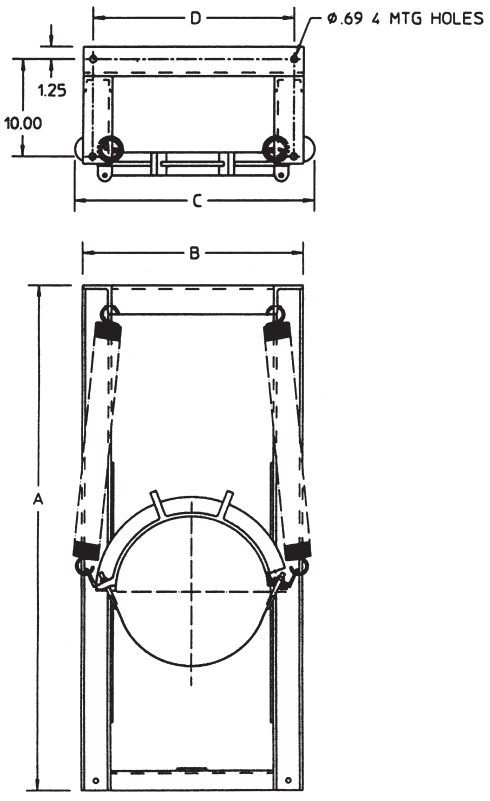


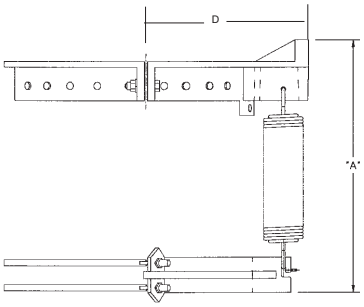
Catalog Number	A	B	C	D
DTW 1350-2	20.00"	6.00"	10.00"	1.00"
DTW 1500-2	20.00"	6.00"	10.00"	1.00"
DTW 1750-2	24.00"	7.00"	12.00"	1.50"

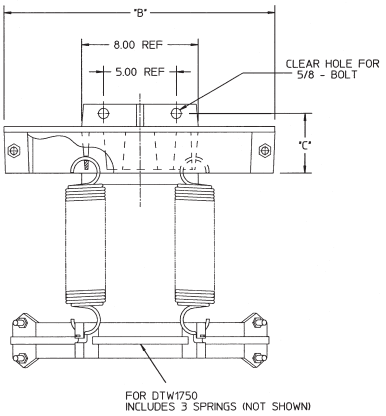
Horizontal Spring Hanger



Catalog Number	A	B	C	D	X
DTW 1350A-45	50.00"	20.66"	22.64"	18.00"	30.45"
DTW 1500A-45	52.00"	22.50"	24.18"	20.50"	31.63"
DTW 1750A-45	56.00"	24.66"	27.08"	22.00"	33.97"

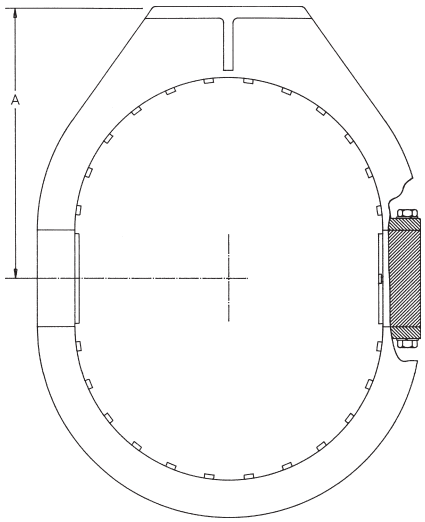






Vertical Spring Hanger

Catalog Number	A	B	C	D
DTW 1350-44	17.00"	18.75"	4.00"	11.22"
DTW 1500-44	19.81"	20.38"	4.00"	12.23"
DTW 1750-44	20.94"	23.00"	3.75"	13.00"



Vertical Lateral Support

Catalog Number	A
DTW 1350-43	13.50"
DTW 1500-43	14.50"
DTW 1750-43	15.50"

Note: The "A" dimension is depicted for hanger placement only. See Instruction booklet for positioning at time of installation.

DTW 1750A (Channels 14-46)

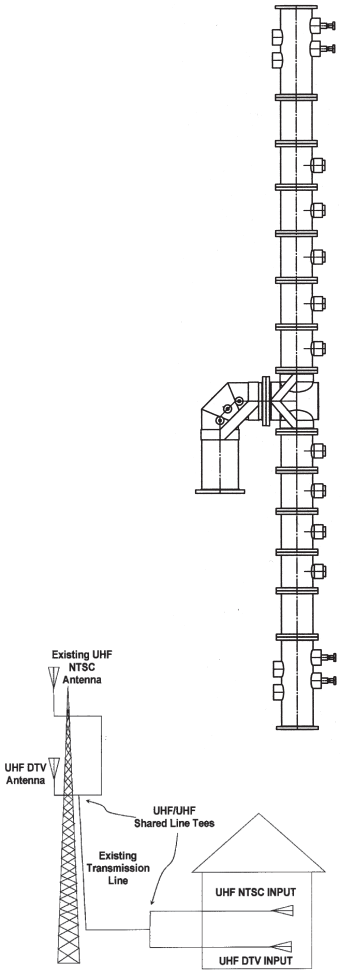
Chan.	Visual Carrier	dB/100' 1100 alloy DTW 1750A	Efficiency (%) Total Length in Feet					
			200	600	1000	1200	1600	2000
14	471.25	0.059	97.3	92.1	87.2	84.9	80.3	76.1
16	483.25	0.057	97.4	92.4	87.7	85.4	81.0	76.8
18	495.25	0.055	97.5	92.6	88.0	85.8	81.5	77.5
20	507.25	0.054	97.6	92.8	88.3	86.2	82.0	78.0
22	519.25	0.053	97.6	93.0	88.6	86.5	82.4	78.5
24	531.25	0.051	97.7	93.2	88.9	86.8	82.8	79.0
26	543.25	0.050	97.7	93.3	89.1	87.0	83.1	79.3
28	555.25	0.049	97.8	93.4	89.3	87.2	83.4	79.7
30	567.25	0.048	97.8	93.5	89.4	87.4	83.6	80.0
32	579.25	0.048	97.8	93.6	89.6	87.6	83.8	80.2
34	591.25	0.047	97.8	93.7	89.7	87.8	84.0	80.4
36	603.25	0.047	97.9	93.8	89.8	87.9	84.2	80.6
38	615.25	0.046	97.9	93.8	89.9	88.0	84.3	80.8
40	627.25	0.046	97.9	93.9	90.0	88.1	84.5	81.0
42	639.25	0.045	97.9	93.9	90.1	88.2	84.6	81.1
44	651.25	0.045	97.9	94.0	90.1	88.3	84.7	81.3
46	663.25	0.045	98.0	94.0	90.2	88.4	84.8	81.4

DTW 1500A (Channels 25-58)

Chan.	Visual Carrier	dB/100' 1100 alloy DTW 1500A	Efficiency (%) Total Length in Feet					
			200	600	1000	1200	1600	2000
25	537.25	0.076	96.5	90.0	83.9	81.0	75.5	70.4
26	543.25	0.075	96.6	90.2	84.2	81.3	75.9	70.9
28	555.25	0.072	96.7	90.5	84.7	82.0	76.7	71.8
30	567.25	0.070	96.8	90.8	85.2	82.5	77.4	72.6
32	579.25	0.068	96.9	91.1	85.6	83.0	77.9	73.2
34	591.25	0.066	97.0	91.3	85.9	83.4	78.5	73.8
36	603.25	0.064	97.1	91.5	86.2	83.7	78.9	74.4
38	615.25	0.063	97.1	91.7	86.5	84.0	79.3	74.8
40	627.25	0.062	97.2	91.8	86.8	84.3	79.7	75.3
42	639.25	0.061	97.2	92.0	87.0	84.6	80.0	75.6
44	651.25	0.060	97.3	92.1	87.2	84.8	80.3	76.0
46	663.25	0.059	97.3	92.2	87.3	85.0	80.5	76.3
48	675.25	0.058	97.4	92.3	87.5	85.2	80.8	76.6
50	687.25	0.058	97.4	92.4	87.6	85.4	81.0	76.8
52	699.25	0.057	97.4	92.5	87.8	85.5	81.2	77.0
54	711.25	0.056	97.5	92.6	87.9	85.7	81.3	77.3
56	723.25	0.055	97.5	92.6	88.0	85.8	81.5	77.4
58	735.25	0.055	97.5	92.7	88.1	85.9	81.7	77.6

DTW 1350A (Channels 37-68)

Chan.	Visual Carrier	dB/100' 1100 alloy DTW 1350A	Efficiency (%) Total Length in Feet					
			200	600	1000	1200	1600	2000
38	615.25	0.083	96.3	89.2	82.7	79.6	73.8	68.4
40	627.25	0.080	96.4	89.5	83.2	80.2	74.5	69.2
42	639.25	0.078	96.5	89.8	83.6	80.6	75.0	69.8
44	651.25	0.076	96.6	90.0	83.9	81.1	75.6	70.5
46	663.25	0.074	96.6	90.2	84.3	81.4	76.0	71.0
48	675.25	0.073	96.7	90.4	84.6	81.8	76.5	71.5
50	687.25	0.072	96.8	90.6	84.8	82.1	76.9	72.0
52	699.25	0.070	96.8	90.8	85.1	82.4	77.2	72.4
54	711.25	0.069	96.9	90.9	85.3	82.6	77.5	72.7
56	723.25	0.068	96.9	91.0	85.5	82.8	77.8	73.1
58	735.25	0.067	97.0	91.1	85.7	83.0	78.1	73.4
60	747.25	0.066	97.0	91.2	85.8	83.2	78.3	73.7
62	759.25	0.066	97.0	91.3	86.0	83.4	78.5	73.9
64	771.25	0.065	97.1	91.4	86.1	83.6	78.7	74.1
66	783.25	0.064	97.1	91.5	86.2	83.7	78.9	74.4
68	795.25	0.064	97.1	91.6	86.4	83.9	79.1	74.6



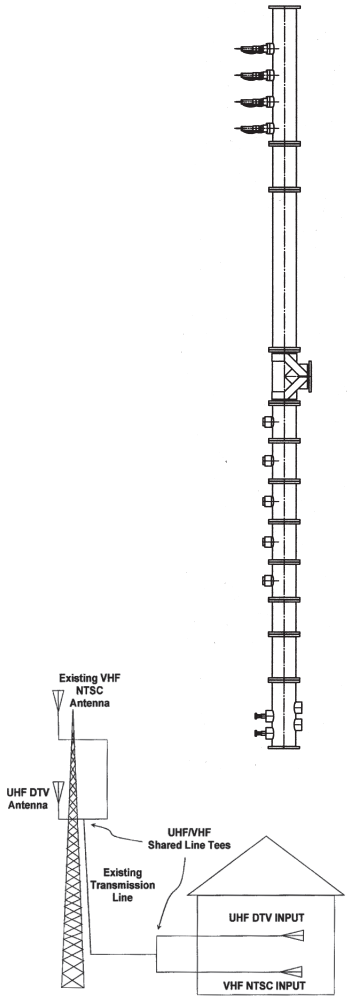
- **Single Feedline for Two Stations**
- **Completely Isolated Operation**
- **Very Low Windload**
- **Minimal Group Delay, Loss and VSWR**
- **Stable in All Environments**
- **Minimum of Six Channel Spacing**

Dielectric's dual channel shared line tee tower top splitter and/or combiner allows two UHF stations to share a common feedline up the tower and then feed separate antennas. The tees utilize wide passband filters on each channel to maintain high levels of isolation between the inputs. By avoiding narrowband filters the impedance, group delay, and insertion loss variations across the channel are minimized and sensitivity to the elements is virtually eliminated. Our unique in-line coaxial bandpass filters have the added benefit of an extremely low windload, essentially that of the coax line itself.

Specifications

Type:	Dual Channel Bandpass/Bandpass Starpoint Combiner
Channels:	Two – UHF, Minimum five channels between (i.e. 20 and 26). Consult factory to determine line size.
Construction:	Copper and Brass Coax power handling & channel limitations.
Outputs:	6-1/8", 7-3/16", 8-3/16"
Isolation:	>40 dB Each Channel
Max. Output Power:	Determined by Feed-Line Size, to 95% of Line Rating
Insertion Loss:	<0.15 dB Each Channel
VSWR:	<1.05 : 1 Each Channel
Group Delay:	<20 nS variation over 6 MHz
Pressurization:	Gas Passing, To 15 PSIG max.

* Patents Pending



- **Single Feedline for Two Stations**
- **Completely Isolated Operation**
- **Very Low Windload**
- **Minimal Group Delay, Loss and VSWR**
- **Stable in All Environments**

Dielectric's dual channel shared line tee tower top splitter and/or combiner allows a VHF station and a UHF station to share a common feedline up the tower and then feed separate antennas. The tees act as frequency selective combiners or splitters to maintain high levels of isolation between the inputs. By avoiding narrowband filters the impedance, group delay, and insertion loss variations across the channel are minimized and sensitivity to the elements is virtually eliminated. Our unique in-line coaxial filters have the added benefit of an extremely low windload, essentially that of the coax line itself.

Specifications

Type:	Dual Channel Lowpass/Bandpass Starpoint Combiner
Channels:	One - Lo-VHF or Hi-VHF; One-UHF. Consult factory to determine line size, power handling and channel limitations.
Construction:	6-1/8", 7-3/16", 8-3/16"
Outputs:	>40 dB between Inputs
Isolation:	Determined by Feed-Line Size, to 95% of Line Rating
Max. Output Power:	<0.15 dB Each Channel
Insertion Loss:	<1.05 : 1 Each Channel
VSWR:	<20 nS variation over 6 MHz
Group Delay:	Gas Passing, To 15 PSIG max.
Pressurization:	

* Patents Pending

Model 600/850

Dielectric's dehydrator products have been in service in the broadcast, microwave and telephone industries for over 40 years.

Dielectric's Models 600 and 850 provide a dry air source for a variety of small volume applications (see capacity chart below). These fully automatic, self-contained units are quiet and compact making them the ideal choice for diverse applications. Adjustable system pressure allows for altitude compensation to assure peak efficiency at any elevation.

The Models 2400/3200 are fully enclosed systems providing quieter operation. All models incorporate five independent alarm circuits that can be monitored individually or as a single C.O. alarm. These units are designed to minimize maintenance time through modularized, field replaceable subassemblies.

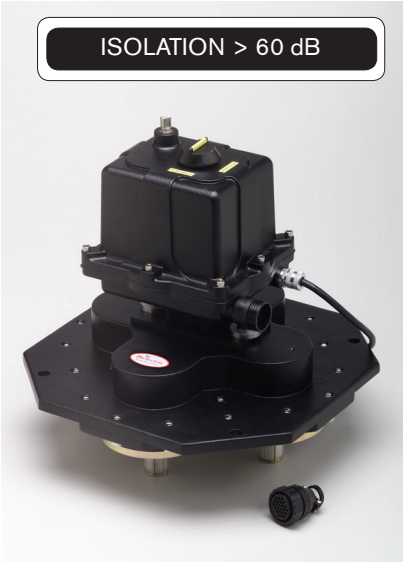
Model 2400

The waveguide dehydrator packages 50015-29, 50014-29 and 50013-29 come complete with everything necessary for a standard installation. The kits include a 2400 dehydrator, excess run alarm, special low pressure regulator (high pressure output option also available), 20 feet of 3/4" hose and fittings necessary to pressurize your waveguide system.

AIR DRYERS FOR TRANSMISSION LINE

	TRANSMISSION LINE							WAVEGUIDE					
								WR	WR	WR	DTW	DTW	DTW
	1-5/8"	3-1/8"	4-1/16"	6-1/8"	7-3/16"	8-3/16"	9-3/16"	1150	1500	1800	1350	1500	1750
Model	Ft (Mtrs)	Ft (Mtrs)	Ft (Mtrs)	Ft (Mtrs)	Ft (Mtrs)	Ft (Mtrs)	Ft (Mtrs)	Ft (Mtrs)	Ft (Mtrs)	Ft (Mtrs)	Ft (Mtrs)	Ft (Mtrs)	Ft (Mtrs)
300 TLS	5000'	1650'	850'										
66788	(1525)	(500)	(260)										
200C	5000'	1650'	850'										
46345(115V)	(1525)	(500)	(260)										
600C		*3500'	2100'	900'	750'	510'		800'	550'	480'			
40627(115V)		(1070)	(640)	(275)	(230)	(155)		(250)	(170)	(150)			
850C	*5000'	3000'	1500'	1100'	740'	600'	1200'	800'	700'	480'	530'	465'	
41016 (115V)	(1525)	(915)	(460)	(335)	(225)	(180)	(365)	(240)	(210)	(150)	(160)	(140)	
2400 Portable			3500'	2600'	1650'	1350'			2300'	1600'	1800'	1500'	1100'
49341			(1065)	(800)	(500)	(500)			(700)	(500)	(550)	(460)	(335)
2400IM			3500'	2600'	2500'	2050'			2300'	1600'	1800'	1500'	1100'
47141			(1065)	(800)	(760)	(625)			(700)	(500)	(550)	(460)	(335)
3200 Portable					3250'	2650'				2080'	2340'	1950'	1400'
49344					(990)	(810)				(635)	(710)	(595)	(425)
3200IM					3250'	2650'				2080'	2340'	1950'	1400'
47144					(990)	(810)				(635)	(710)	(595)	(425)

* Use Model "D" for waveguide applications to provide low pressure output.



Motorized Switches (50000 & 60000 Series)

These switches are blade type SPDT or 4 port transfer switches. Sizes include 7/8" through 9-3/16". Switch position is indicated by a mechanical pointer and through auxiliary switches used for readout and interlocking circuits. In the closing mode, the interlock switches do not activate until the RF contacts are ready to accept full power. In the opening mode, the interlock switches open prior to the RF contacts to prevent the breaking of the RF contacts while under power. Manual operation is provided for by a knob. Terminations are standard EIA fixed flanges with non-removable male connectors. Control panels are available.

For more information refer to Dielectric's switch catalog.

COAXIAL PATCH PANELS

- **High Isolation**
- **Low VSWR**
- **Sizes 1-5/8" through 8-3/16"**
- **3, 4 or 7 port Standard**
- **Custom Types Available**

Dielectric patch panels are a low cost reliable solution to multi-connection routing situations. Patch panels are available with or without interlocks. Bolt type (EIA) flanges are standard. Transitions to “no flange” or other line sizes are available. Dielectric can supply panels in custom configurations for special requirements.

For more information refer to Dielectric's switch catalog.

LOCKOUT/TAGOUT SWITCH

The RF “Lockout/Tagout” Safety Switch prevents the accidental exposure of workers to RF energy. It acts as an isolation device preventing the flow of RF energy to the transmission line and antenna system. Complies with OSHA rule 1910.147.

Specifications

Isolation	> 50 dB
Insertion Loss (in disengaged mode)	< 0.03 dB @ 100 Mhz
Characteristic Impedance	50 or 75 Ohms
Power Rating	equal to specific line size
RF Connections	7/8" to 6-1/8" EIA flanged
Frequency Range	300 KHz to 1 GHz
VSWR (in disengaged mode)	<1.05:1.0

1-5/8", 3-18", 4-1/6" 6-1/8", 7-3/16", 8-3/16", 9-3/16"

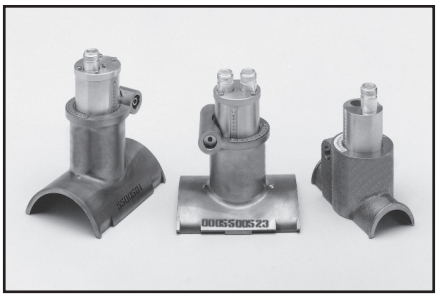
- **Low VSWR**
- **30 dB Directivity or Greater**
- **Type N Output**
- **Field Replaceable Resistor**

Dielectric VHF/UHF Directional Couplers are designed to couple signals from a transmission line to external monitoring equipment for tuning, operating, and maintaining the station. By installing several couplers in the output transmission line, it is possible to monitor parameters including: VSWR, RF line power, system losses, sideband response, and filter performance.

The directional characteristic of the coupler permits sampling of the transmitter output line without any of the inherent variations in frequency response obtained with non-directional couplers. The voltages obtained with a directional coupler in the line are a sample of either the incident or reflected wave. The directional coupler provides a source impedance to the RF coaxial cable equal to the characteristic impedance of the cable.

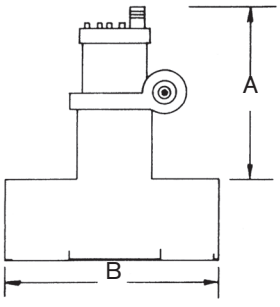
These directional couplers are designed for mounting on any section of transmission line with an impedance of 50 or 75 ohms. Coupling is electromagnetic with directivity of 30 dB or better, and is accomplished with a coupling loop inserted into the fields of the main output line. Etched angle and penetration scales on the coupler assembly permit accurate adjustment for calibration of the output voltage at the particular frequency desired. The output is type "N" and at maximum, 2-3 watts. VSWR is 1.03:1 or less.

The coupling loop termination resistor is a high tolerance, fixed composition resistor which is field replaceable.



Outer Diamter	Part Number	Dimensions A.max.	B	Weight lbs.
		SINGLE		
1-5/8"	4270-503	3.63"	4"	3.5
3-1/8"	5500-501	5.13	4.5"	4
4-1/16"	5500-518	5.13"	4.5"	4
6-1/8"	5500-502	5.13"	4.5"	4
7-3/16"	5500-502	5.13"	4.5"	4
8-3/16"	5500-517	5.13"	4.5"	4
9-3/16"	5500-504	5.13"	4.5"	4
		DUAL		
3-1/8"	5500-525	5.13"	4.5"	4
4-1/16"	5500-526	5.13"	4.5"	4
6-1/8"	5500-523	5.13"	4.5"	4
7-3/16"	5500-523	5.13"	4.5"	4
8-3/16"	5500-524	5.13"	4.5"	4
9-3/16"	5500-527	5.13"	4.5"	4

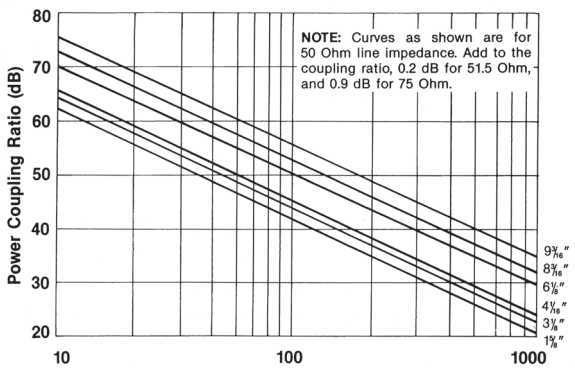
Supplied with Hose Clamps.



MOUNTING NOTE: A hole is made in outer conductor to accommodate the coupler.

Frequency (MHz)

Note: Maximum coupling ratio is approximately 50 dB greater than the minimum values shown.



General

Dielectric products are represented in 90 countries around the world. With the rapid expansion of communications, Dielectric is positioned to service the broadcast needs of small and large stations, DTV and NTSC, FM and specialty RF systems, complete systems and components.

Abu Dhabi
Angola
Argentina
Australia
Austria
Belgium
Belize
Benin
Botswana
Brazil
Canada
Chad
Chile
China
Colombia
Costa Rica
Denmark
Dominican Republic
Ecuador
Egypt
El Salvador
England
Ethiopia
Finland
France
Germany
Ghana
Greece
Greenland
Guam
Guatemala
Hong Kong
Iceland
India
Indonesia
Ireland
Israel
Italy
Japan
Jordan
Korea
Kuwait
Lebanon
Liberia
Madagascar
Malaysia
Mali
Malta
Mauritania
Mauritius
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Morocco
Nepal
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Nicaragua
Nigeria
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Sao Tome
Saudi Arabia
Singapore
South Africa
Spain
Sri Lanka
Sweden
Switzerland
Syria
Taiwan
Thailand
Togo
Uganda
United States
Venezuela
Vietnam
Yemen
Zambia
Zimbabwe

Specifications subject to change without notice.