

## INTRODUCTION

Diamond Antenna and Microwave Corporation is committed to continually improve the reliability and performance of products offered through enhanced design, manufacturing, and vendor quality. Diamond has been designing and manufacturing custom microwave devices for over 45 years. From this base of experience, Diamond continues to develop innovative designs to address system requirements with a total commitment to quality.

This catalog is arranged to provide an overview of microwave rotary joint designs. Tables list standard coaxial and waveguide products by configuration, line size, frequency, and model number. Performance specifications include: VSWR, insertion loss, WOW, isolation, and power ratings. Please see the back section, Engineering Information, for clarification.

Special design configurations provide the rotor/stator interface for various microwave applications in radar and satellite communications. Diamond will either prototype new electrical requirements or draw from an extensive base of over 1000 different designs to comply with customer requirements. Exact interface dimensions and performance parameters are detailed for customer approval and test data and certificates of compliance are supplied with all delivered products.



Rotary joints (rotary couplers) are used to transmit microwave energy from stationary lines to rotating lines. The rotary joint is an electro-mechanical device with RF performance dependent upon rigorous electrical and mechanical design.

Rotary joints are described by the types of transmission lines to be coupled and the electrical mode of operation desired:

## LINE TYPE

### 1. Coaxial Line Type:

These rotary joints have coaxial input and output terminals and operate in the TEM mode of operation throughout. They have the widest bandwidth capabilities.

### 2. Waveguide-To-Coaxial Transition Type:

These rotary joints have rectangular waveguide input and output terminals and utilize two modes of operation, the  $TE_{10}$  and TEM. In these type units, the  $TE_{10}$  mode of operation within the waveguides is transduced to the TEM mode within the internal coaxial line between the waveguides. Bandwidth is limited by the characteristics of the transitions and the associated circuitry.

### 3. Rectangular-To-Circular Waveguide Transition Type:

These rotary joints have rectangular waveguide input and output terminals joined by a circular waveguide transmission line. This design operates in the  $TE_{10}$  mode of propagation within the rectangular waveguide, and in the  $TM_{01}$  mode within the circular waveguide. This design is limited to a maximum usable bandwidth of approximately 7% but has the highest power handling capability of all types.

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## GEOMETRY

Rotary joint styles are further defined by physical geometry as follows:

I-style - Two in-line arms both collinear with the axis of rotation.

L-style - One arm is perpendicular to the axis of rotation.

U-style - Both arms are perpendicular to the axis of rotation.

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## ELECTRICAL CHARACTERISTICS

The electrical characteristics generally specified of rotary joints include VSWR, insertion loss, power handling capability and rotational effects of VSWR and insertion loss.

### •VSWR WOW:

VSWR rotational effect (WOW) is the change in VSWR with rotation and is the difference between the maximum and minimum values observed in one revolution.

### •Insertion Loss WOW:

Insertion loss rotational effect (WOW) is the change in insertion loss that occurs with rotation and is the difference between the maximum and the minimum values observed in one revolution.

### •Specified Performance:

While viewing the specifications of this catalog recognize that the specified performance is often conservative and may be improved over narrow frequency bands of operation. Please contact Diamond for an optimal response to your specific requirements.



### •Coaxial Rotary Joints

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  - Broadband-----Page 4
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### •Waveguide Rotary Joints

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### •Coaxial/Waveguide Rotary Joints

- Multiple Channel-----Page 13

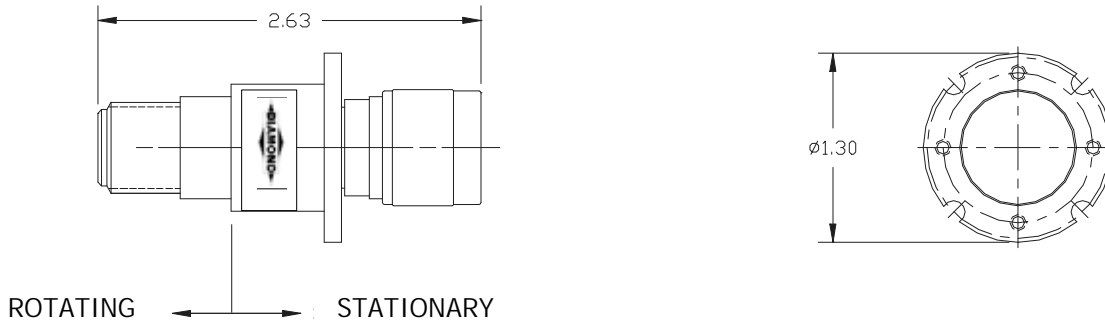
### •Special Designs-----Page 15

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\*The contents of this catalog are not a complete listing of products or capabilities;  
call with specifications for more details.

# Coaxial Rotary Joints

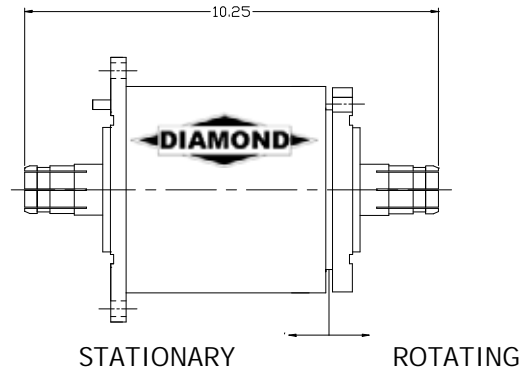
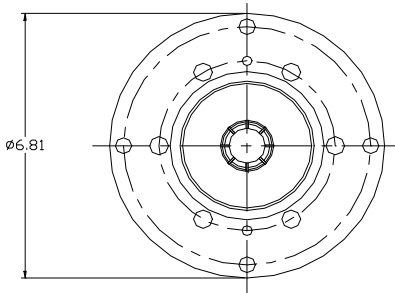
## Single Channel Broadband



Electrical Specifications								
Model Number	Freq [GHz]	Conn.	VSWR (max)	VSWR WOW	Inser. Loss [dB]	WOW [dB]	Peak Power [W]	Avg. Power [W]
54-2124	DC-2.025	F	2.50	.10	3.00	.10	60	45
48-2124	DC-2.15	F - SMA	2.00	.10	1.25	.10	50	10
53-2124	1.525-1.661	TNC - SMA	1.70	NA	1.00	NA	NA	6
48-2120	9.5-10.6	TNC - SMA	1.20	.02	.10	.05	5,000	100
50-2120	9.5-15.4	TNC-N	1.50	.10	.60	.03	4,000	100
37-2120	.240-315	N	1.10	.03	.10	.05	20,000	1,000
43-2120	1.6-1.9	N	1.20	.03	.15	.05	15,000	750
2120/12F	DC-12.0	N	1.30	.03	.35	.05	8,000	250
2120/18F	DC-18.0	N	1.40	.03	.40	.05	4,000	100
32-2120	9.5-10.6	N - SMA	1.20	.01	.10	.05	5,000	100
49-2124	10.5-11.5	SMA	1.10	NA	.10	NA	4,000	100
2124/18	DC-18.0	SMA	1.50	.05	.50	.10	3,000	75
2124/20	DC-20.2	SMA	1.50	.05	.50	.10	3,000	75
2124/26	DC-26.0	SMA	1.75	.07	.75	.15	1,500	40
47-2124	DC-18.0	K	1.40	.05	.50	.10	1,500	75
	18.0-26.5		1.65	.05	.75	.10	500	50
	26.5-40.0		1.80	.10	1.00	.10	300	30

# Coaxial Rotary Joints

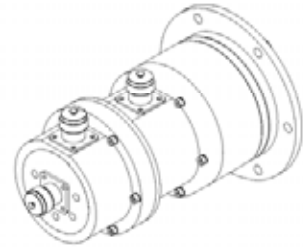
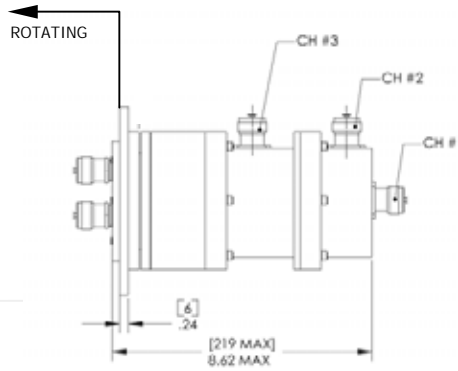
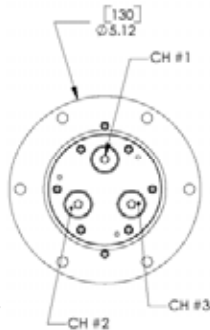
## Single Channel High Power



Electrical Specifications									
Model Number	Freq [GHz]	Conn.	Line Size	VSWR (max)	VSWR WOW	Inser. Loss [dB]	WOW [dB]	Peak Power [W]	Avg. Power [W]
30-2045 F	DC-.75	EIA	6 1/8	1.10	.02	.10	.05	5,000,000	75,000
30-2048 F	DC-1.5	EIA	3 1/8	1.10	.02	.10	.05	1,500,000	15,000
30-2050 F	DC-2.5	EIA	1 5/8	1.25	.02	.10	.05	1,000,000	4,500
30-2049 F	DC-5.5	EIA	7/8	1.25	.02	.20	.05	100,000	1,000

# Coaxial Rotary Joints

## Multi Channel



Electrical Specifications

Model Number	CH	Freq [GHz]	Conn.	VSWR (max)	VSWR WOW	Inser. Loss [dB]	WOW [dB]	Peak Power [W]	Avg. Power [W]	Min. Isolation [dB]
20-2253	1	.145-.225	1 5/8 EIA	1.20	.10	.20	.10	20,000	5,000	40
	2	.145-.225	3 1/8 EIA	1.30	.10	.20	.10	20,000	5,000	40
20-2220C	1	0.40-1.12	TNC	1.25	.10	.15	.05	10,000	NA	50
	2	0.40-1.12	TNC	1.25	.10	.25	.05	10,000	NA	50
47-2255	1	7.9-8.4	TNC	1.25	.05	.40	.05	N/A	400	60
	2	7.25-7.75	TNC	1.25	.05	.40	.05	N/A	1	60
2233	2	9.0-11.0	TNC - SMA	1.50	.05	.35	.05	20,000	20	65
		9.0-11.0	TNC - SMA	1.50	.05	.45	.05	10,000	2	65
		14.0-16.0		1.50	.05	.45	.05	10,000	2	65
21-2220C	1	DC-2.4	N	1.25	.05	.20	.05	15,000	750	50
		2.4-12.0		1.60	.10	.50	.10	8,000	250	50
	2	DC-2.4	N	1.25	.05	.20	.10	10,000	500	50
		2.4-3.0		2.50	.10	.50	.20	10,000	400	50
33-2255	1	DC-18.0	SMA	1.50	.10	.50	.10	5,000	50	50
	2	DC-2.3	N	1.70	.10	.50	.20	5,000	50	50
10-2220D	1	1.4-2.6	N	1.50	.10	.20	.10	1	1	50
	2	1.4-2.6	N	1.50	.10	.20	.10	1	1	50
49-2255	1	2.0-4.0	SC	1.40	.05	.30	.20	NA	640	50
	2	2.0-4.0	N	1.30	.05	.50	.20	NA	5	50
2260	1	2.0-4.0	N	1.50	.04	.50	.02	10,000	100	40
	2	4.0-7.5	N	1.50	.03	.50	.02	5,000	100	40
12-2260	1	4.0-8.0	N	1.50	.05	.50	.10	NA	NA	50
	2	4.0-8.0	N	1.50	.05	.50	.10	NA	NA	50
13-2260	1	8.0-12.0	N	1.75	.10	.75	.15	1	1	50
	2	8.0-12.0	N	1.75	.10	.75	.15	1	1	50
10-2244A	1	DC-4.5	SMA	1.50	.05	.50	.05	NA	5	40
	2	DC-4.5	SMA	2.00	.25	1.00	.25	NA	5	40
48-2255	1	DC-12.0	SMA	1.50	.05	.80	.10	1,000	100	60
	2	8.0-10.0	SMA	1.50	.05	.80	.10	1,000	100	60
2244A	2	DC-18.0	SMA	1.80	.05	1.50	.05	5,000	200	50
		DC-2.0		1.35	.10	.40	.10	5,000	200	50
		2.0-4.0		2.00	.20	1.00	.20	5,000	200	50

# Coaxial Rotary Joints

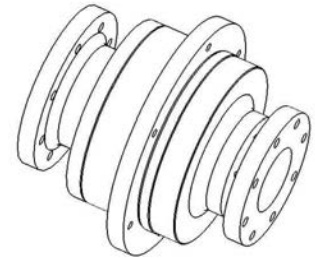
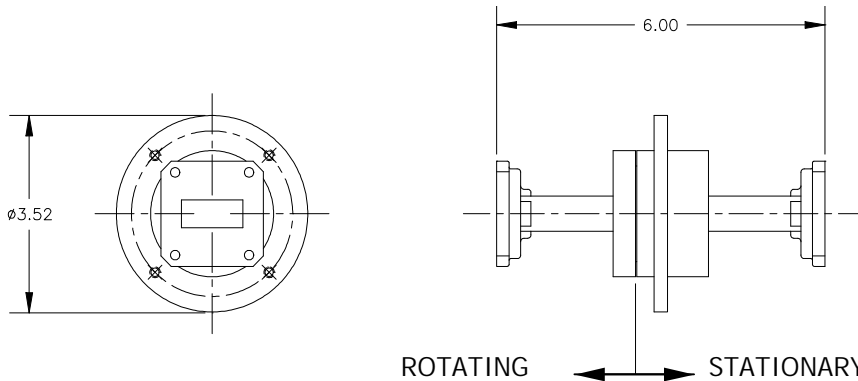
## Multi Channel



Electrical Specifications										
Model Number	CH	Freq	Conn.	VSWR	VSWR	Inser. Loss	WOW	Peak Power	Avg. Power	Min. Isolation
		[GHz]		(max)	WOW	[dB]	[dB]	[W]	[W]	[dB]
2230	1	DC-18.0	SMA	1.80	.05	1.00	.10	300	20	50
	2	2.0-8.0	SMA	1.80	.05	.70	.10	500	20	50
12-2244	1	0.9-1.1	SMA	1.10	.05	.10	.05	10,000	200	50
	2	0.9-1.1	SMA	1.15	.10	.20	.10	10,000	200	50
2232	1	6.5-7.5	SMA	1.25	.05	.30	.10	6,000	125	55
	2	6.5-7.5	SMA	1.25	.05	.30	.10	6,000	125	55
2240	1	DC-8.0	K	1.35	.05	.40	.05	2,000	50	50
		8.0-18.0		1.75	.05	1.00	.05	2,000	50	50
	2	DC-4.0	K	2.00	.10	.75	.10	2,000	50	50
		4.0-8.0		3.00	.35	1.50	.30	2,000	50	50
		8.0-12.0		3.50	.80	2.50	.75	2,000	50	50
12.0-18.0	4.50	2.0	3.00	1.5	2,000	50	50			
23-2240	1	DC-18.0	K	2.00	.05	2.00	.05	1,500	75	50
		18.0-26.5		2.50	.05	3.00	.05	500	50	50
		26.5-40.0		4.00	.10	3.00	.10	300	30	50
	2	DC-2.0	K	1.75	.10	.50	.10	3,500	100	50
		2.0-4.0		2.00	.10	.75	.10	3,500	100	50
		4.0-8.0		3.00	.35	1.50	.30	3,500	100	50
		8.0-12.4		3.50	.80	2.50	.75	3,500	100	50
12.4-18.0	4.50	2.00	3.00	1.50	1,500	50	50			
2349	1	2.2-2.3	SMA	1.35	.05	.60	.05	NA	50	50
	2	2.2-2.3	SMA	1.35	.05	.50	.05	NA	1	50
	3	2.2-2.3	SMA	2.00	.35	1.00	.30	NA	1	50
2347	1	1.8055	N	1.20	.05	.25	.05	10,000	150	60
	2	0.1-1.0	N	1.20	.07	.20	.05	10,000	150	60
	3	0.1-1.0	N	1.20	.07	.20	.05	10,000	150	60
10-2355	1	1.01-1.10	N	1.20	.05	.25	.05	10,000	50	60
	2	1.01-1.10	N	1.20	.05	.35	.05	10,000	200	60
	3	1.01-1.10	N	1.20	.08	.35	.10	10,000	50	60
2511	1	32.65-33.35	K	1.50	.03	1.50	.08	NA	1	50
	2	9.65-10.35	SMA	1.25	.03	.50	.05	NA	1	50
	3	1.8-2.2	SMA	1.25	.05	.50	.05	NA	1	50
	4	1.8-2.2	SMA	1.25	.05	.50	.05	NA	1	50
	5	1.8-2.2	SMA	1.25	.05	.50	.05	NA	1	50
2510	1	DC-18.0	SMA	1.80	.02	1.70	.10	NA	1	55
	2	2.0-6.0	SMA	1.60	.05	1.00	.10	NA	1	55
	3	2.0-6.0	SMA	1.60	.05	1.00	.10	NA	1	55
	4	2.0-6.0	SMA	1.60	.05	1.00	.10	NA	1	55
	5	2.0-6.0	SMA	1.60	.05	1.00	.10	NA	1	55

# Waveguide Rotary Joints

## Single Channel I - Style

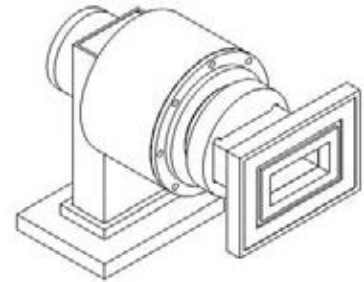
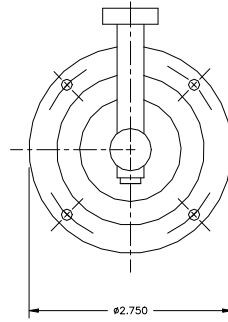
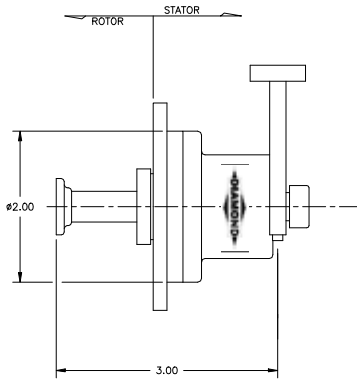


Electrical Specifications									
Model Number	Freq [GHz]	Line Size (WR)	VSWR (max)	VSWR WOW	Inser. Loss [dB]	WOW [dB]	Peak Power [W]	Avg. Power [W]	Air Pressure [psig]
10-245	1.12-1.35	WR-650	1.10	.03	.10	.02	5,000,000	10,000	20
17-345	1.75-1.85	WR-430	1.15	.03	.15	.03	NA	300	0.3
	2.025-2.120		1.15	.03	.15	.03	NA	300	0.3
16-345	2.025-2.120	WR-430	1.08	.04	.10	.05	NA	5,000	0.3
20-445	2.60-3.95	WR-284	1.50	.03	.30	.02	350,000	3,000	15
20-545	3.95-5.85	WR-187	1.50	.03	.15	.02	300,000	250	15
10-740	5.850-6.425	WRD-580	1.50	.10	.70	.05	10,000	800	NA
	7.9-8.4		1.30	.10	.40	.05	10,000	700	NA
	14.0-14.5		1.50	.10	.70	.05	10,000	500	NA
27-645	5.850-6.425	WR-137	1.25	.05	.20	.05	NA	800	0.5
	7.9-8.4		1.25	.05	.20	.05	NA	1,600	0.5
28-645	5.850-6.425	WR-137	1.20	.05	.20	.05	NA	750	0.5
20-645	5.85-8.20	WR-137	1.50	.03	.25	.02	75,000	200	15
21-645	5.925-6.425	WR-137	1.10	.03	.10	.02	NA	6,000	5
27-745	7.0-11.0	WR-112	1.50	.03	.30	.02	100,000	500	15
	7.7-8.9		1.30	.03	.20	.05	62,000	6,200	5
26-745	9.7-10.5	WR-112	1.30	.03	.20	.05	62,000	6,200	5
	7.9-8.4		1.15	.02	.20	.05	NA	1,500	20
28-745	9.40-10.05	WR-112	1.10	.08	.15	.10	80,000	2,400	16.5
11-745	7.0-11.0	WR-102	1.50	.03	.30	.02	50,000	2,000	15
21-845	7.9-12.1	WR-90	1.50	.03	.30	.05	NA	NA	10
20-845	8.2-12.4	WR-90	1.50	.03	.25	.02	35,000	2,000	15
38-845	9.2-9.7	WR-90	1.15	.02	.25	.03	20,000	500	15
37-845	9.25-9.50	WR-90	1.08	.02	.25	.05	150,000	150	15
35-845	10.0-12.2	WR-90	1.20	.03	.20	.02	35,000	2,000	15
22-845	10.0-14.0	WR-75	1.50	.03	.50	.02	35,000	100	15
26-945	11.7-15.1	WR-75	1.50	.03	.40	.02	15,000	100	15
20-945	12.4-18.0	WR-62	1.50	.03	.40	.02	15,000	100	15
18-946	13.0-16.0	WR-62	1.35	.05	.25	.05	NA	450	15
37-945	14.5-15.4	WR-62	1.20	.03	.20	.05	100,000	100	20
22-946	15.7-16.2	WR-62	1.15	.05	.20	.05	20,000	100	3
38-945	15.7-17.7	WR-62	1.15	.03	.40	.02	10,000	16	3
22-1045	19.7-23.9	WR-42	1.50	.05	.40	.03	NA	1	2
23-1145	34.2-35.8	WR-28	1.20	.03	.50	.02	10,000	100	15
17-1147	34.66-35.34	WR-28	1.25	.12	.60	.20	75,000	40	10
23-1245	41.4-45.0	WR-22	1.50	.20	1.00	.20	NA	50	NA
27-545	3.4-4.2	CIRC	1.15	.10	.15	.05	NA	1	2
	4.2-4.8		1.20	.10	.20	.05	NA	1	2
36-945	10.7-14.0	CIRC	1.10	.05	.20	.05	NA	NA	NA
39-945	10.90-12.75	CIRC	1.10	.05	.20	.05	NA	NA	3
42-945	10.95-14.97	CIRC	1.10	.04	.20	.05	NA	450	15
40-945	12.0-15.4	CIRC	1.10	.05	.20	.05	NA	1	0.5
43-945	17.7-21.3	CIRC	1.10	.10	.20	.10	NA	1	2
21-1245	42.5-45.5	CIRC	1.10	.10	.10	.05	NA	1,000	3



# Waveguide Rotary Joints

## Single Channel L - Style

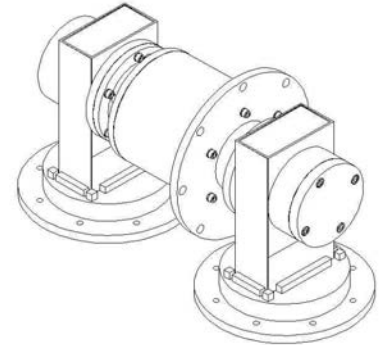
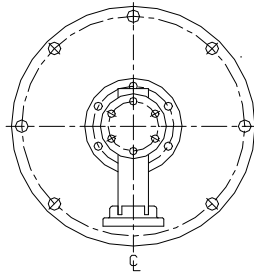
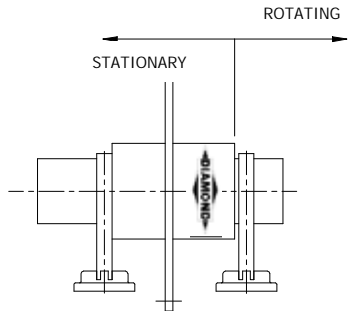


### Electrical Specifications

Model Number	Freq [GHz]	Line Size (WR)	VSWR (max)	VSWR WOW	Inser. Loss [dB]	WOW [dB]	Peak Power [W]	Avg. Power [W]	Air Pressure [psig]
12-246	1.25-1.35	WR-650	1.20	.03	.15	.05	4,000,000	4,000	15
17-346	1.75-1.85	WR-430	1.20	.05	.15	.03	NA	2,000	5
15-446	2.7-3.1	WR-284	1.25	.03	.15	.02	2,000,000	5,000	30
33-446	2.7-2.9	WR-284	1.15	.03	.10	.05	5,000,000	5,000	30
27-446	2.9-3.1	WR-284	1.15	.03	.15	.02	3,000,000	3,000	40
20-546	3.9-4.5	WR-187	1.40	.04	.20	.02	50,000	100	10
30-546	4.9-5.1	WR-187	1.25	.03	.15	.02	2,000,000	2,000	30
19-546	5.4-5.9	WR-187	1.20	.02	.10	.02	1,500,000	3,000	30
41-546	5.45-5.85	WR-187	1.20	.02	.10	.02	400,000	300	15
26-646	5.850-6.425	WR-137	1.25	.05	.20	.05	NA	800	0.5
	7.9-8.4		1.25	.05	.20	.05	NA	1,600	0.5
25-646	5.925-6.425	WR-137	1.20	.05	.20	.05	NA	500	2
11-646	6.5-7.5	WR-137	1.20	.02	.10	.01	500,000	3,000	30
29-746	7.145-8.450	WR-112	1.20	.02	.20	.05	NA	75	NA
18-746	F1-F2	WR-112	1.15	.03	.20	.05	5,000	250	30
23-746	9.05-10.00	WR-112	1.08	.03	.15	.05	300,000	300	10
35-746	9.40-10.05	WR-112 TO WR-90	1.15	.08	.15	.05	80,000	2,400	16
23-846	8.5-9.7	WR-90	1.20	.03	.20	.05	100,000	300	25
14-846	9.13-9.27	WR-90	1.10	.02	.15	.02	2,000	40	10
34-847	9.2-9.7	WR-90	1.15	.02	.13	.02	20,000	500	15
32-847	11.2-14.5	WR-75	1.25	.10	.30	.10	NA	50	25
24-846	11.9-13.6	WR-75	1.20	.03	.20	.05	100,000	300	25
25-847	14.0-14.5	WR-75	1.20	.05	.17	.05	NA	1,000	2
21-946	11.9-16.0	WR-62	1.35	.03	.25	.05	50,000	200	NA
17-946	13.0-16.0	WR-62	1.35	.05	.25	.05	50,000	450	15
14-946	14.3-15.7	WR-62	1.20	.02	.15	.02	1,500	100	10
20-1045	18.0-26.5	WR-42	1.50	.02	.50	.05	16,000	100	15
24-1145	33.25-36.75	WR-28	1.50	.03	.50	.02	2,000	200	15
10-1147	34.65-35.05	WR-28	1.12	.02	.20	.02	150,000	50	30

# Waveguide Rotary Joints

## Single Channel U - Style



### Electrical Specifications

Model Number	Freq [GHz]	Line Size (WR)	VSWR (max)	VSWR WOW	Inser. Loss [dB]	WOW [dB]	Peak Power [W]	Avg. Power [W]	Air Pressure [psig]
146	.405-.450	WR-2100	1.10	.02	.05	.05	30,000,000	330,000	1
11-346	1.7-2.4	WR-430	1.20	.03	.20	.10	2,000,000	12,000	5
16-346	1.71-1.85	WR-430	1.20	.03	.15	.10	NA	6,500	5
18-346	2.060-2.072	WR-430	1.10	.03	.10	.05	NA	6,000	2
18-346	2.10-2.11	WR-430	1.10	.03	.10	.05	NA	6,000	2
18-446	2.5-3.5	WR-284	1.30	.05	.20	.02	1,000,000	1,300	30
26-446	2.7-3.1	WR-284	1.15	.03	.15	.02	6,000,000	10,000	30
17-446	2.8-3.2	WR-284	1.30	.03	.15	.05	1,000,000	3,000	15
38-446	2.88-3.02	WR-284	1.20	.05	.40	.02	1,000,000	1,000	45
13-446	3.1-3.5	WR-284	1.30	.03	.15	.02	1,000,000	5,000	30
36-446	3.15-3.45	WR-284	1.22	.05	.15	.05	600,000	48,000	45
28-546	4.8-5.1	WR-187	1.50	.05	.20	.05	1,000,000	1,000	NA
26-546	4.9-5.1	WR-187	1.20	.05	.20	.05	1,500,000	1,500	30
22-546	5.4-5.9	WR-187	1.30	.03	.15	.02	1,000,000	2,000	30
19-646	5.725-6.225	WR-159	1.20	.03	.20	.05	3,500	3,500	2
20-646	5.725-6.725	WR-159	1.30	.03	.25	.05	3,500	3,500	2
39-647	5.825-6.425	WR-159	1.15	.05	.10	.05	NA	15,000	0.5
32-646	5.85-6.50	WR-159	1.15	.03	.20	.05	5,000	5,000	2
29-646	5.850-6.725	WR-159	1.20	.03	.20	.05	5,000	5,000	2
30-646	5.900-6.675	WR-159	1.20	.05	.20	.05	NA	12,000	2
18-646	5.925-6.725	WR-159	1.20	.03	.20	.05	5,000	5,000	2
41-647	6.425-6.675	WR-159	1.15	.05	.20	.05	NA	12,000	2

# Waveguide Rotary Joints

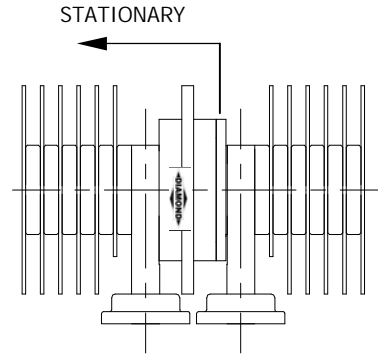
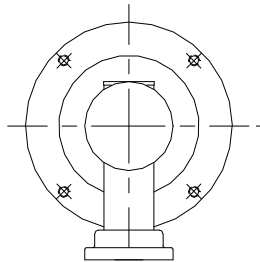
## Single Channel U - Style



Electrical Specifications									
Model Number	Freq [GHz]	Line Size (WR)	VSWR (max)	VSWR WOW	Inser. Loss [dB]	WOW [dB]	Peak Power [W]	Avg. Power [W]	Air Pressure [psig]
21-646	5.70-6.65	WR-137	1.20	.05	.20	.03	NA	2,000	10
16-646	5.850-6.475	WR-137	1.20	.03	.20	.05	NA	3,000	10
24-646	5.85-6.65	WR-137	1.20	.03	.20	.05	NA	5,000	10
31-646	6.88-7.12	WR-137	1.20	.02	.20	.01	NA	2,500	30
	7.68-8.42		1.20	.02	.20	.01	225,000	2,430	30
26-746	7.25-8.40	WR-112	1.15	.02	.15	.05	100,000	3,000	15
17-746	F1-F2	WR-112	1.15	.03	.20	.05	5,000	250	15
34-746	8.5-10.0	WR-112	1.15	.05	.17	.03	20,000	600	10
46-846	8.0-18.0	WRD-750	2.00	.05	1.20	.20	NA	700	2
20-846	8.0-12.4	WR-90	1.28	.05	.15	.05	150,000	300	25
25-846	9.0-10.0	WR-90	1.20	.02	.15	.02	8,000	80	15
15-846	9.13-9.27	WR-90	1.10	.02	.15	.02	2,000	40	10
28-846	9.5-10.5	WR-90	1.22	.05	.20	.05	100,000	35,000	45
44-846	11.2-14.5	WR-75	1.25	.10	.30	.10	NA	50	25
24-846	11.9-13.6	WR-75	1.20	.03	.20	.05	100,000	75	25
36-846	12.68-15.22	WR-75	1.30	.06	.40	.05	300,000	750	45
27-846	12.70-13.25	WR-75	1.20	.05	.30	.05	150,000	2,000	5
	13.75-14.50		1.20	.05	.30	.05	150,000	2,000	5
35-846	12.7-14.5	WR-75	1.20	.06	.30	.05	NA	2,000	2
29-846	12.75-13.25	WR-75	1.20	.05	.30	.05	NA	4,000	5
	13.75-14.50		1.20	.05	.30	.05	NA	4,000	5
26-846	12.78-13.32	WR-75	1.30	.10	.40	.10	300,000	300	45
	14.58-15.22		1.30	.10	.40	.10	50,000	75	45
30-846	13.40-14.06	WR-75	1.20	.05	.20	.05	NA	100	2
	14.60-15.22		1.20	.05	.20	.05	NA	500	2
35-847	13.75-14.50	WR-75	1.20	.05	.10	.05	NA	7,000	2
13-946	12.4-18.0	WR-62	1.50	.05	.50	.05	1,000	250	15
23-946	13.75-14.50	WR-62	1.30	.05	.35	.05	NA	3,000	2
	17.3-18.1		1.30	.05	.35	.05	NA	3,000	2

# Waveguide Rotary Joints

## Single Channel Circular (TM<sub>01</sub>) Mode

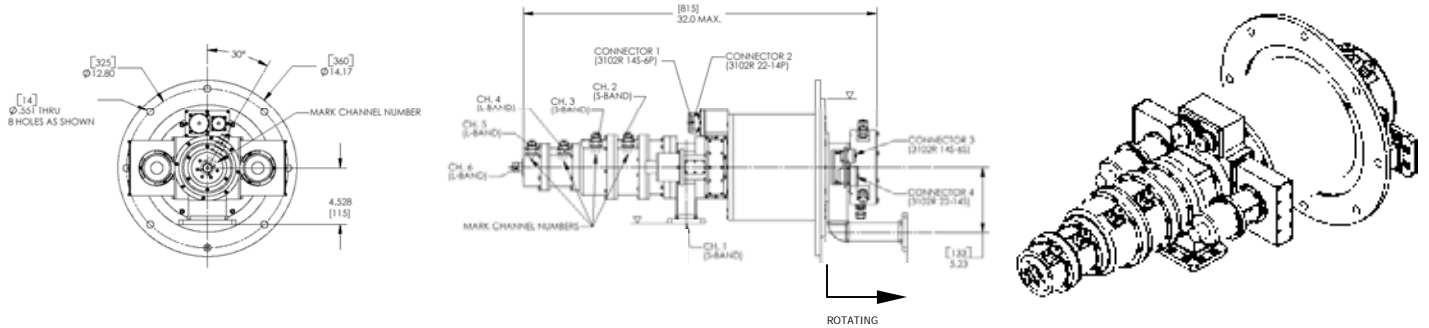


Electrical Specifications

Model Number	Freq [GHz]	Line Size (WR)	VSWR (max)	VSWR WOW	Inser. Loss [dB]	WOW [dB]	Peak Power [W]	Avg. Power [W]	Air Pressure [psig]
10-246	1.25-1.35	WR-770	1.17	.06	.10	.02	10,000,000	150,000	10
447	2.95-3.05	WR-284	1.10	.03	.10	.03	4,000,000	50,000	30
547	4.4-5.0	WR-187	1.20	.05	.10	.03	1,000,000	20,000	20
35-647	5.85-6.42	WR-159	1.15	.05	.08	.05	NA	5,000	0.5
13-647	6.2-6.5	WR-159	1.15	.05	.08	.05	500,000	25,000	10
31-647	5.90-6.42	WR-137	1.20	.08	.15	.05	600,000	6,000	5
12-647	6.22-6.42	WR-137	1.15	.05	.08	.02	500,000	25,000	10
26-647	7.25-7.75	WR-137	1.20	.05	.10	.02	1,000,000	15,000	15
25-647	7.90-8.40	WR-137	1.15	.05	.10	.02	6,500,000	15,000	15
15-747	9.0-9.6	WR-112	1.15	.06	.15	.02	600,000	8,000	30
18-847	13.69-14.50	WR-75	1.20	.05	.15	.05	NA	6,000	0.5
26-847	13.75-14.50	WR-75	1.20	.05	.10	.05	NA	2,100	0.5
28-847	13.75-14.50	WR-75	1.20	.05	.15	.05	NA	3,000	2
31-847	13.75-14.50	WR-75	1.13	.05	.10	.05	NA	3,000	0.5
29-847	13.90-14.51	WR-75	1.15	.05	.15	.05	NA	3,000	2
19-847	14.0-14.5	WR-75	1.15	.05	.12	.05	NA	9,000	2
27-847	14.0-14.5	WR-75	1.20	.05	.15	.05	NA	1,000	0.5
23-947	16.0-16.5	WR-62	1.15	.05	.15	.02	1,500	100	2
947	16.0-17.0	WR-62	1.20	.05	.20	.05	125,000	1,000	25
12-947	16.0-17.0	WR-62	1.20	.05	.15	.02	150,000	3,000	25
17-947	16.9-17.9	WR-62	1.30	.02	.30	.05	150,000	3,000	25
28-947	17.2-17.7	WR-62	1.20	.04	.15	.05	NA	1,000	0.5
27-947	17.3-17.8	WR-62	1.20	.03	.15	.05	NA	2,500	2
31-947	17.3-18.1	WR-62	1.20	.04	.15	.05	NA	3,000	2
29-947	17.3-18.1	WR-62	1.20	.04	.15	.05	NA	5,000	2
32-947	17.3-18.4	WR-62	1.20	.05	.15	.05	NA	3,000	2
26-947	17.6-17.7	WR-62	1.20	.02	.15	.05	NA	2,000	25
10-1000	20.2-21.2	WR-51	1.15	.05	.15	.05	NA	1,400	4
10-1100	29.0-30.0	WR-34	1.25	.05	.30	.05	NA	800	2
1100	30.0-31.0	WR-34	1.20	.05	.25	.05	NA	600	2
13-1147	33.2-34.0	WR-28	1.20	.02	.20	.02	150,000	1,000	60
1147	34.5-35.2	WR-28	1.12	.02	.20	.02	150,000	1,000	60
17-1147	34.66-35.34	WR-28	1.15	.10	.20	.10	75,000	40	10

# Coaxial / Waveguide Rotary Joints

## Multi Channel



Electrical Specifications										
Model Number	CH	Freq	Line Size	VSWR	VSWR	Inser. Loss	WOW	Peak Power	Avg. Power	Min. Isolation
		[GHz]		(max)	WOW	[dB]	[dB]	[W]	[W]	[dB]
2620	1	2.7-2.9	WR-284	1.20	.05	.15	.05	30,000	3,000	60
	2	2.7-2.9	N	1.30	.05	.90	.05	5,000	75	60
	3	2.7-2.9	N	1.30	.06	1.00	.05	5,000	75	60
	4	1.10-1.11	N	1.30	.06	.80	.05	5,000	75	60
	5	1.10-1.11	N	1.30	.06	.80	.05	5,000	75	60
	6	1.10-1.11	N	1.30	.06	.80	.05	5,000	75	60
2520	1	2.9-3.1	WR-284	1.20	.05	.15	.05	35,000	3,500	60
	2	2.9-3.1	N	1.30	.05	1.00	.05	350	10	60
	3	2.9-3.1	N	1.30	.05	1.00	.05	350	10	60
	4	1.00-1.12	N	1.35	.10	.80	.10	3,000	10	60
	5	1.00-1.12	N	1.35	.10	.80	.10	3,000	10	60
2409	1	5.4-5.9	WR-187	1.15	.02	.10	.05	75,000	4,000	50
	2	5.4-5.9	WR-187	1.25	.03	.30	.05	250	6	50
	3	DC-1.1	N	1.30	.03	.50	.10	2,000	150	50
	4	1.0-1.1	N	1.50	.03	.80	.10	2,000	100	50
10-2344	1	5.4-5.9	WR-187	1.15	.05	.20	.05	1,000,000	1,000	50
	2	5.4-5.9	N	1.75	.05	1.20	.05	1	1	50
	3	0.40-0.55	N	1.20	.05	.40	.05	1,400	1,400	50
2356	1	8.5-9.6	WR-112	1.20	.05	.20	.05	250,000	250	55
	2	1.0-1.1	N	1.30	.07	.50	.10	3,000	30	55
	3	1.0-1.1	N	1.30	.07	.50	.10	3,000	30	55
2348	1	8.5-10.0	WR-90	1.30	N/S	.20	.05	500,000	100	50
		0.5-14.0	SMA	2.00	N/S	2.00	.10	2	1	50
	14.0-18.0	2.00		N/S	2.50	.10	2	1	50	
	3	0.5-1.5	SMA	2.00	N/S	1.00	.10	4,000	20	50
		1.5-14.0		4.50	N/S	2.50	.60	4,000	15	50
		14.0-18.0		4.50	N/S	3.50	.75	4,000	15	50
2354	1	8.6-9.9	WR-90	1.20	.05	.20	.05	300,000	500	60
	2	8.6-9.9	WR-90	1.30	.05	.35	.05	3,000	5	60
	3	8.6-9.9	SMA	1.50	.05	1.00	.05	100	5	60
2350	1	Fo	WR-90	1.10	.05	.10	.03	Pw	Pw	50
	2	0.9-1.1	SMA	1.30	.05	.40	.20	2,000	20	50
	3	0.9-1.1	SMA	1.30	.10	.40	.20	2,000	20	50

# Coaxial / Waveguide Rotary Joints

## Multi Channel



Electrical Specifications										
Model Number	CH	Freq	Line Size	VSWR	VSWR	Inser. Loss	WOW	Peak Power	Avg. Power	Min. Isolation
		[GHz]		(max)	WOW	[dB]	[dB]	[W]	[W]	[dB]
31-2281	1	2.7-2.9	WR-284	1.2	.02	.10	.05	1,500,000	1,500	50
	2	2.7-2.9	WR-284	1.2	.02	.20	.05	1,500,000	1,500	50
2261	1	2.875-3.125	WR-284	1.05	.02	.10	.05	3,000,000	20,000	50
	2	1.015-1.105	N	1.25	.03	.25	.10	15,000	150	50
2.875-3.125		1.25		.03	.25	.10	1,000	10	50	
22102	1	5.850-6.425	WR-137	1.40	.10	.30	.05	NA	700	50
		7.9-8.4		1.20	.10	.20	.05	NA	700	50
	2	14.0-14.5	WR-75	1.30	.10	.25	.10	NA	200	50
	24-2288	1	WR-137	5.850-6.425	1.25	.05	.20	.05	NA	300
7.9-8.4				1.25	.05	.20	.05	NA	1,600	60
	2	DC-7.75	N	1.25	.05	.70	.05	NA	2	60
	21-2288	1	WR-137	5.850-6.425	1.20	.05	.20	.05	NA	1,600
7.9-8.4				1.20	.05	.20	.05	NA	1,600	60
2		N	3.7-4.2	1.20	.05	.70	.05	NA	1	60
			7.25-7.75	1.20	.05	.70	.05	NA	1	60
2288	1	5.925-6.425	WR-137	1.20	.05	.20	.05	NA	400	60
	2	3.7-4.2	N	1.20	.05	.70	.05	NA	1	60
22-2287	1	8.5-9.6	WR-137	1.15	.03	.15	.03	300,000	200	60
	2	8.5-9.6	WR-137	1.25	.03	.25	.03	20,000	20	60
10-2287	1	7.25-7.75	WR-112	1.15	.03	.20	.03	NA	125	50
	2	7.9-8.4	WR-112	1.20	.03	.20	.03	NA	3,000	50
12-2273	1	7.25-8.40	WR-112	1.15	.02	.20	.05	NA	3,000	63
	2	DC-8.4	WR-112	1.25	.02	.40	.05	NA	1	63
20-2287	1	8.5-9.6	WR-112	1.15	.03	.20	.02	250,000	500	50
	2	1.03-1.09	N	1.10	.01	.65	.05	3,500	100	50
19-2251	1	8.5-10.0	WR-112	1.15	.05	.17	.03	20,000	600	80
	2	8.5-10.0	N	1.25	.05	.35	.03	1,500	42	80
2290	1	9.0-10.3	WR-90	1.30	.05	.20	.05	500,000	2,500	70
	2	DC-10.0	SMA	1.50	.05	.30	.05	10,000	50	70
20-2289	1	9.2-10.1	WR-90	1.25	.05	.20	.05	50,000	500	60
	2	9.2-10.1	WR-90	1.25	.05	.50	.05	500	5	60
21-2289	1	Fo	WR-90	1.25	.05	.20	.05	Pw	Pw	60
	2	Fo	WR-90	1.25	.05	.50	.05	500	50	60
14-2266	1	14.0-14.5	WR75	1.20	.05	.20	.05	NA	50	50
	2	DC/12.25-12.75	SMA	1.30	.05	.50	.05	NA	50	50
2266	1	12.0-18.0	WR-62	1.75	.03	.50	.10	1,000	250	50
	2	8.0-12.0	WR-90	1.70	.03	.50	.10	1,000	250	50
11-2266	1	12.0-18.0	WR-62	1.75	.03	.50	.10	1	1	50
	2	12.0-18.0	WR-62	1.75	.03	.50	.10	1	1	50
15-2266	1	14.0-14.5	WR-62	1.25	.05	.20	.05	20,000	1,000	50
	2	13.9-14.4	SMA	1.50	.05	.50	.05	10	10	50
16-2266	1	14.40-15.35	WR-62	1.30	.05	.35	.05	1,500	60	70
	2	14.40-15.35	TNC/SMA	1.30	.05	.90	.05	NA	1	70
18-2266	1	16.0-17.0	WR-62	1.50	.05	.50	.05	60,000	120	50
	2	8.0-8.5	SMA	1.50	.05	.75	.05	1,500	100	50
16.0-17.0		1.50		.05	.75	.05	10	10	50	
13-2266	1	14.5-16.2	WR-62	1.20	.05	.20	.05	50,000	100	80
	2	13.0-14.0	N	1.50	.05	.50	.05	2,000	10	80
2292	1	19.7-23.9	WR-42	1.50	.05	.40	.03	1	1	50
	2	1.47-1.50	N	1.20	.05	.20	.05	1	1	50

# Special Designs

## Overview



Diamond designs and manufactures rotary joints to meet a broad range of electrical and mechanical specifications, from relatively simple single channel units to complex multi-channel devices. The special designs described in this section are representative of the many units designed to meet specific customer requirements. Diamond offers expertise in the following applications:

- Rotary Joint/Slip Ring Assemblies
- Air Traffic Control
- SatCom Groundstations
- Space Qualified
- Airborne
- Multi Channel Radar
- Dual Ridge Waveguide
- High Power

Diamond has the widest experience in custom designed rotary joints and solicits your exacting inquiries.





NOTE: Description and data herein contain design information and other knowledge of a proprietary nature. This information is the property of the manufacturer and is not to be disclosed, copied, reproduced, transmitted, used or otherwise made available to any other person or entity without the prior written consent of the manufacturer. The manufacturer shall not be held responsible for any damage or injury resulting from the use of this information in any application, modification, or repair of any equipment, system or component, or for any other matter or claim, in whole or in part, arising from the use of this information. The manufacturer shall not be held responsible for any damage or injury resulting from the use of this information in any application, modification, or repair of any equipment, system or component, or for any other matter or claim, in whole or in part, arising from the use of this information. The manufacturer shall not be held responsible for any damage or injury resulting from the use of this information in any application, modification, or repair of any equipment, system or component, or for any other matter or claim, in whole or in part, arising from the use of this information.

APPLICATION		
LTR.	DESCRIPTION	DATE
A	CHANGE PER ECN 172B	8/27/98

2X EMHART P/N 3585-02BN086  
180° APART

3X R.125

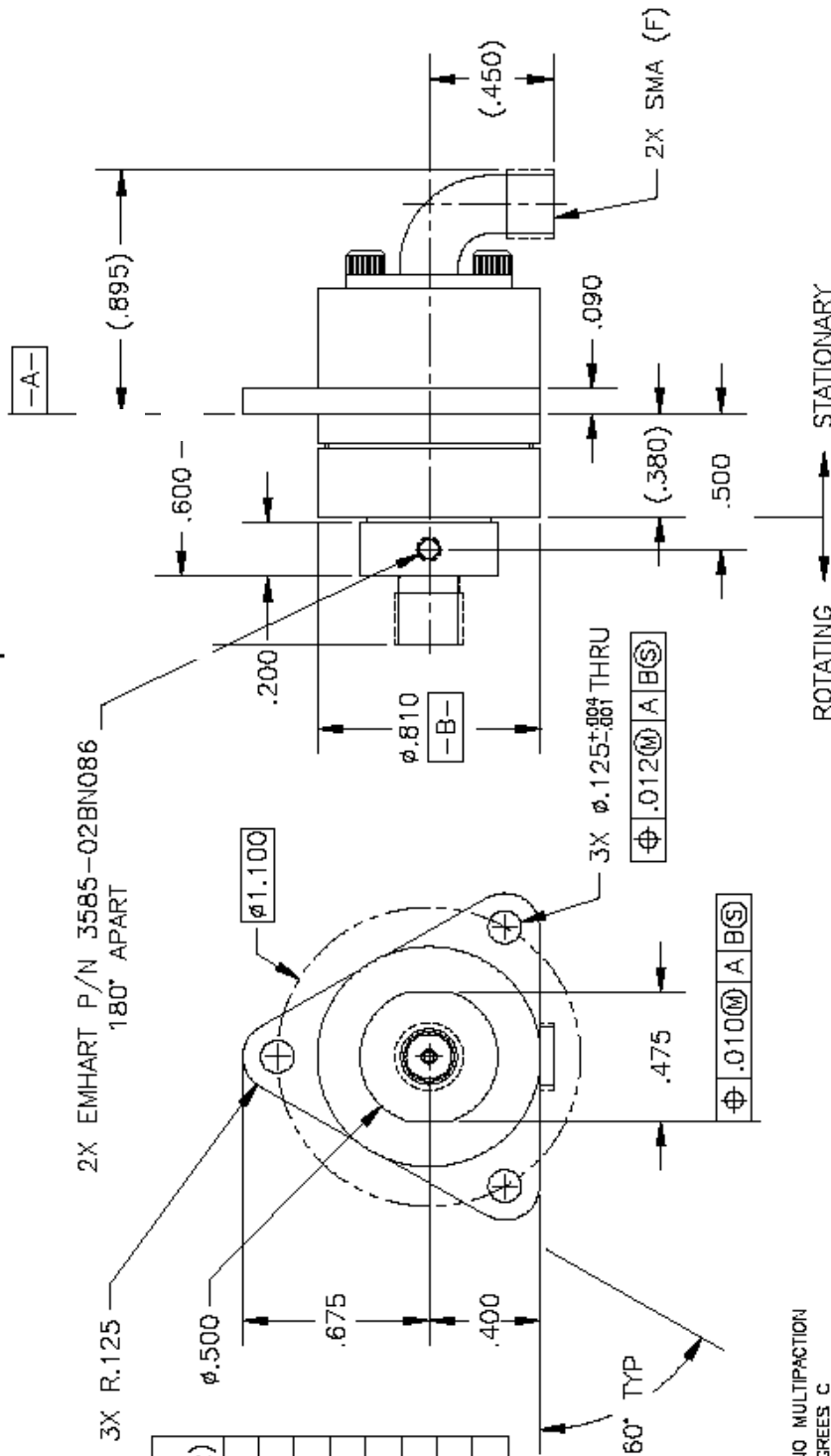
Freq (Hz)	Acceptance PSD ( $g^2/Hz$ )	Protoflight PSD ( $g^2/Hz$ )
20	0.500	1.000
100	0.500	1.000
200	0.100	0.200
500	0.100	0.200
2000	0.025	0.050
RMS (G)	12.70	18.00
Duration	75 sec	150 sec

for testing in axial and rad. dir.

DESIGN SPECIFICATIONS:  
(CONTACTLESS DESIGN FOR  
SPACEFLIGHT APPLICATION)

- FREQUENCY (GHz): 8.2 +/- 0.4
- VSWR (max): 1.35:1
- VSWR W/OV (max): .05
- INSERTION LOSS (max): .25 dB
- POWER, OPERATING: 6 WATTS CW - NO MULTIPLICATION
- TEMP. - OPERATIONAL: -55 TO +40 DEGREES C
- NON-OPERATING: -80 TO +40 DEGREES C
- ROTATIONAL SPEED: 2 RPM max.
- TORQUE: 4 oz.-in. max.
- LIFE (min): 7.5 YEARS, 50,000 REV.
- WEIGHT: 2 oz.
- VIBRATION: SEE TABLE ABOVE
- FINISH: BARE/UNFINISHED
- VENTING: -0.5 psi/sec max.
- PACKAGING: BAG AND TAG PER MIL-STD-130

WORKMANSHIP SHALL CONFORM TO DICO SPEC 8000



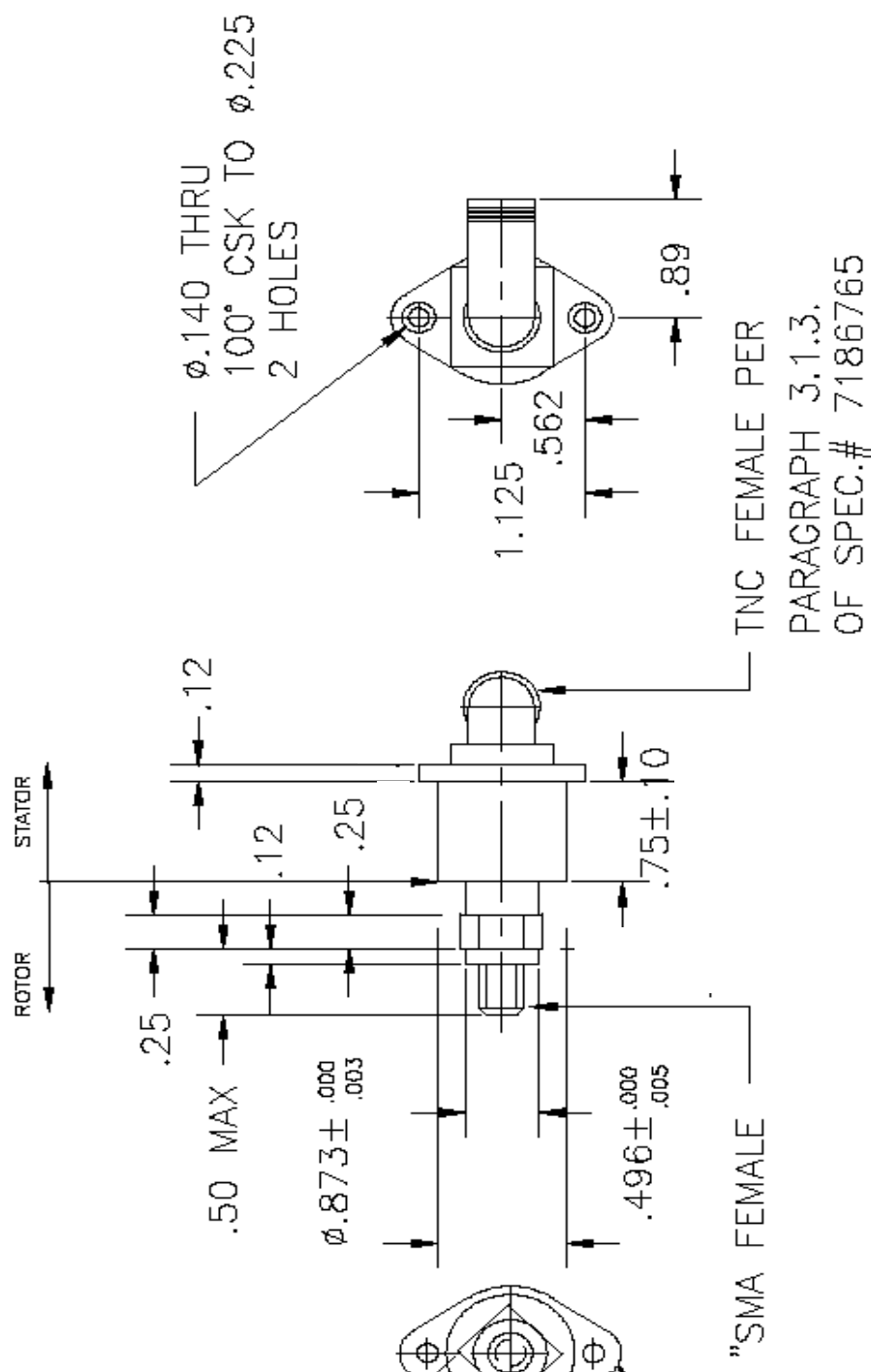
UNLESS OTHERWISE SPECIFIED  
SURFACE FINISH (R) FINISH  
BREAK ALL SHARP EDGES .005 MAX  
TOLERANCES: 3 PLACES DECIMALS ± .01  
5 PLACES DECIMALS ± 1/100  
ANGLES ± 1/2°

MATERIAL  
FINISH  
NEXT ASSY  
45-2124  
USED ON  
APPLICATION

CONTRACT NO.		DRAWN BY		CHECKED BY		APPROVED BY		CUSTOMER APPROVAL		GOVERNMENT APPROVAL	
		C. KLOTZLE									
			7/23/98								
DIAMOND ANTENNA & MICROWAVE CORP. LOWELL, MASS. 01854											
TITLE OUTLINE, SINGLE CHANNEL COAXIAL ROTARY JOINT											
SIZE	CODE IDENT	DRAWING NO.	REV.								
B	01882	45-2124-S	A								
SCALE 2:1										FILE:	
										SHEET 1 OF 1	

NOTE: Description and data herein contain design information and other knowledge which is the property of the Government and is to be controlled in whole or in part. The application, dissemination, use or disclosure by any other means or in any form or by any person, past, present or future, whose conduct may be detrimental to the national defense is prohibited. This information is not to be released, transmitted, furnished, or otherwise disclosed in any way without the written approval of the contractor, for conveying any signs or permission to manufacture, use, or sell any published invention or proprietary data herein that in any way be needed therefor.

LTR.	APPLICATION DESCRIPTION	DATE	APPROVED
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.248(2) PLACES  
± .000  
.496(2) PLACES

SUMMARY OF SPECIFICATION  
 FREQUENCY (GHz): 9.5-10.6  
 VSWR: 1.20  
 VSWR WOV ±.02  
 INSERTION LOSS (dB): 0.1  
 LOSS WOV (dB): 0.05  
 POWER (PEAK) (AVG): 5 KW 100W  
 INPUTS N(F): TNC(F)  
 ROTATION: 100 RPM  
 TORQUE: 8 OZ-IN  
 MATERIAL: BRASS  
 FINISH: SILVER PLATE:RHODIUM FLASH

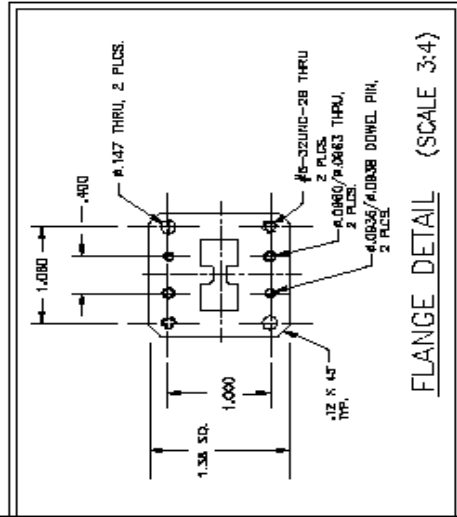
Q4	G3	G2	G1	QTY.	PER	PART NUMBER	DESCRIPTION	CODE IDENT.	ITEM NO.	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES SURFACE FINISH AS SHOWN BREAK ALL SHARP EDGES .005 MAX TOLERANCE: 3 PLACES DECIMALS ± .01 3 PLACES DECIMALS ± 1/64 FRACTIONS ± 1/2						CONTRACT NO.	DIAMOND ANTENNA & MICROWAVE CORP.			
MATERIAL						SEE SPEC.	DATE	LOWELL, MASS. 01054		
FINISH						SEE SPEC.	4/21/98	TITLE		
NEXT ASSY						USED ON	4/21/98	OUTLINE		
APPLICATION							4/21/98	ROTARY JOINT		
								RADIO FREQUENCY		
								SIZE	CODE IDENT	DRAWING NO.
								B	01882	48-2120-0-S
								SCALE	FULL	FILE: -
										SHEET 1 OF 1

WORKMANSHIP SHALL CONFORM TO DICO SPEC 9000

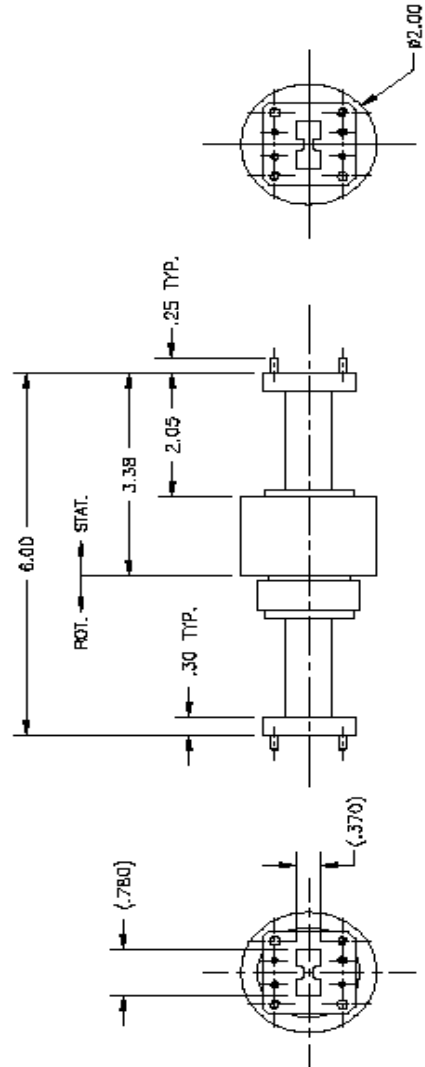


4 3 2 1

LTR.	APPLICATION	DATE	APPROVED
	DESCRIPTION		



FLANGE DETAIL (SCALE 3:4)



DESIGN SPECIFICATIONS

FREQUENCY (MHz):	(5.85 - 14.5)	14.0-14.5
VSWR (max):	5.85-6.425 7.9-8.4	1.60:1
VSWR (goal):	1.40:1	1.20:1
VSWR W/O W (max):	.10	.10
INSERTION LOSS (max):	.70 dB	.40 dB
INSERTION LOSS (goal):	.40 dB	.30 dB
W/O W (max):	.05 dB	.05 dB
POWER, PEAK (min):	<-----	10 KW
POWER, AVERAGE (min):	800 W	700 W
RF LEAKAGE (max):	<-----	60 dB
ROTATIONAL SPEED:	TO 100 RPM	
TORQUE (max):	16 oz.-in.	
WEIGHT (nom):	14 oz.	
TEMPERATURE, OPERATING:	-32C TO +48C	
HUMIDITY:	5 - 100%	
ALTITUDE:	to 7K Feet	
SHOCK, NON-OPER:	15G	

WORKSHIP SHALL CONFORM TO DODD SPEC 9000

Q4	Q3	Q2	Q1	PART NUMBER	DESCRIPTION	CODE IDENT.	ITEM NO.
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES SURFACE FINISH IS BROWN ALL SHARP EDGES .005 MAX TOLERANCE ± .005 DECIMALS ± 1/64 FRACTIONS ± 1/2				Q4	Q3	Q2	Q1
MATERIAL ALUMINUM ALLOY				Q4	Q3	Q2	Q1
FINISH IRIDIUM				Q4	Q3	Q2	Q1
CUSTOMER APPROVAL				Q4	Q3	Q2	Q1
SUBMITTER APPROVAL				Q4	Q3	Q2	Q1
DRAWN BY: M.E.M.				Q4	Q3	Q2	Q1
CHECKED BY: J.E.F.				Q4	Q3	Q2	Q1
APPROVED BY:				Q4	Q3	Q2	Q1
TITLE: WRD580 INLINE ROTARY JOINT				Q4	Q3	Q2	Q1
DRAWING NO. 10-740-0-S				Q4	Q3	Q2	Q1
SCALE: 1:2				Q4	Q3	Q2	Q1
FILE:				Q4	Q3	Q2	Q1
SHEET 1 OF 1				Q4	Q3	Q2	Q1

4 3 2 1

1 2 3 4 5 6 7

**SPECIFICATIONS**

1. The system shall be designed to meet the following requirements:

2. The system shall be able to process data from multiple sources simultaneously.

3. The system shall be able to handle large volumes of data without performance degradation.

4. The system shall be able to integrate with existing systems and databases.

5. The system shall be able to provide real-time monitoring and reporting capabilities.

6. The system shall be able to handle complex queries and data analysis tasks.

7. The system shall be able to provide a user-friendly interface for data visualization and reporting.

**IMPLEMENTATION**

1. The implementation shall follow the following steps:

2. Conduct a detailed analysis of the requirements and data sources.

3. Design the system architecture and database schema.

4. Develop the system components and integrate them with existing systems.

5. Test the system thoroughly to ensure it meets all requirements.

6. Deploy the system to the production environment.

7. Provide training and support to the users.

1. The system shall be able to handle the following data sources:

2. Database A

3. Database B

4. Database C

5. Database D

6. Database E

7. Database F

1. The system shall be able to provide the following reports:

2. Report A

3. Report B

4. Report C

5. Report D

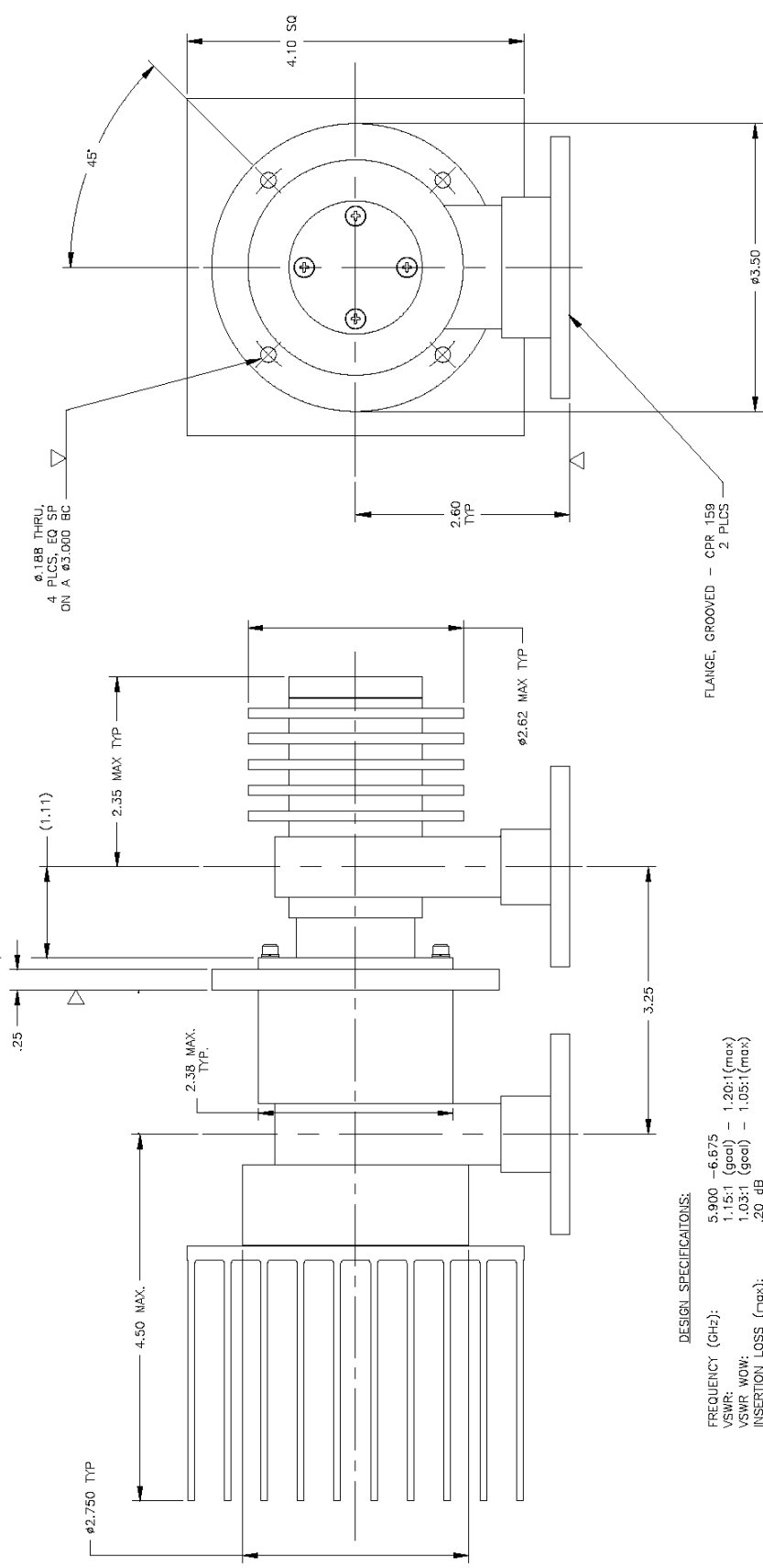
6. Report E

7. Report F

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LTR.	APPLICATION DESCRIPTION	DATE	APPROVED
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STATIONARY ← ROTATING



**DESIGN SPECIFICATIONS:**

- FREQUENCY (GHz): 5.900 - 6.675
- VSWR: 1.15:1 (goal) - 1.20:1 (max)
- VSWR: 1.03:1 (goal) - 1.05:1 (max)
- INSERTION LOSS (max): .20 dB
- POWER (avg): .05 dB
- POWER (avg): 12 KW CW
- COOLING: HEAT PIPE CENTER CONDUCTOR W/ AMBIENT AIR COOLING
- PRESSURE (max): 2 psig DRY AIR, 0.25 psig DRY AIR OPERATIONAL
- LEAK RATE (max): 10 cc/min
- TORQUE: 10 in.-lbs.
- ROTATIONAL SPEED: 10 RPM (max)
- MATERIAL: BRASS/COPPER
- FINISH: CHEMICAL CONVERSION COAT, BRIGHT, IRIDIUM 7 & PAINT BLACK (SEMI-GLOSS) EXCEPT WHERE INDICATED BY (V)

CONTRACT NO.	DIAMOND ANTENNA & MICROWAVE CORP.
DATE	11/27/00
DESIGNED BY	C. KLDTZLE
CHECKED BY	CUSTOMER APPROVAL
APPROVED BY	GOVERNMENT APPROVAL
TITLE	WR 159 HIGH POWER ROTARY JOINT
SIZE	C
CODE IDENT	30-646-0-S
REV.	-
SCALE	1:1
FILE	SHEET 1 OF 1

WORKMANSHIP SHALL CONFORM TO DDD SPEC 5008



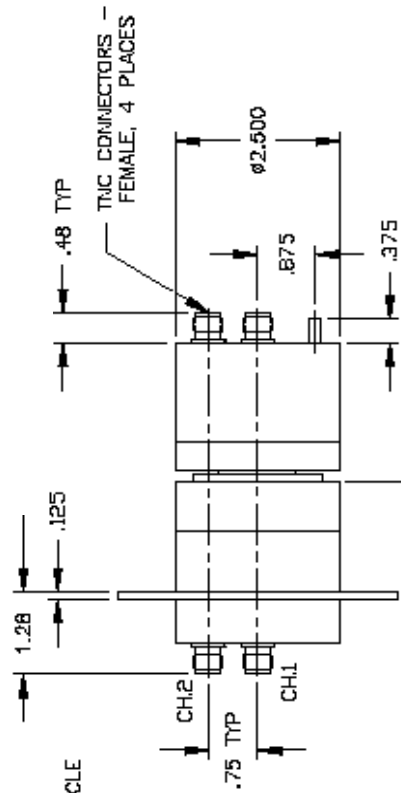
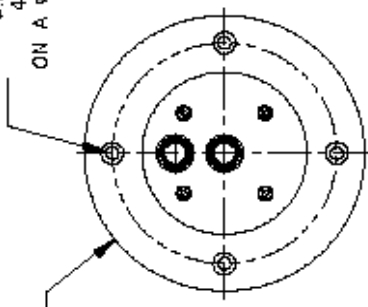




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LTR.	A	DATE	5/29/01	APPROVED
DESCRIPTION	per ECH 2185			

Ø1.194 THRU,  
Ø.337 X 100° CS  
4 PLS. EQ. SP.  
ON A Ø3.875 BOLT CIRCLE



STATIONARY ← ROTATING

SUMMARY OF SPECIFICATIONS

<b>CHANNEL 1</b>	<b>CHANNEL 2</b>
FREQUENCY: (GHz)	7.9 - 8.4
TRANSMISSION LINE:	7.25 - 7.75
VSWR:	COAX.
VSWR BW:	1-.25:1
LOSS (dB):	1.05:1
LOSS WDW:	0.4 dB MAX
POWER PEAK:	.05 dB/360°
POWER AVERAGE:	N/A
ROTATION SPEED (deg/sec):	Receive < 1 W
ISOLATION (min):	
MAT'L:	
FINISH:	

----- 60°/SEC.  
----- 60 DB BETWEEN CHANNELS  
----- ALUMINUM  
----- IRIDITE

QTY.	PER	PART NUMBER	DESCRIPTION	CODE IDENT.	ITEM NO.
1			DIAMOND ANTENNA & MICROWAVE CORP.		
CONTRACT NO. DRAWN BY: MC CHECKED BY: C. KLOTZLE APPROVED BY: P. CHRISTIAN DATE: 4/10/00 5/9/00 5/9/00					
TITLE: DUAL CHANNEL COAX ROTARY JOINT SIZE: B CODE IDENT: 01882 DRAWING NO.: 47-2255-0-S REV.: A					
SCALE: 1:2 FILE:					

WORKMANSHIP SHALL CONFORM TO DDG SPEC 8000



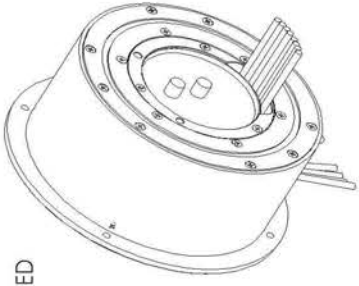
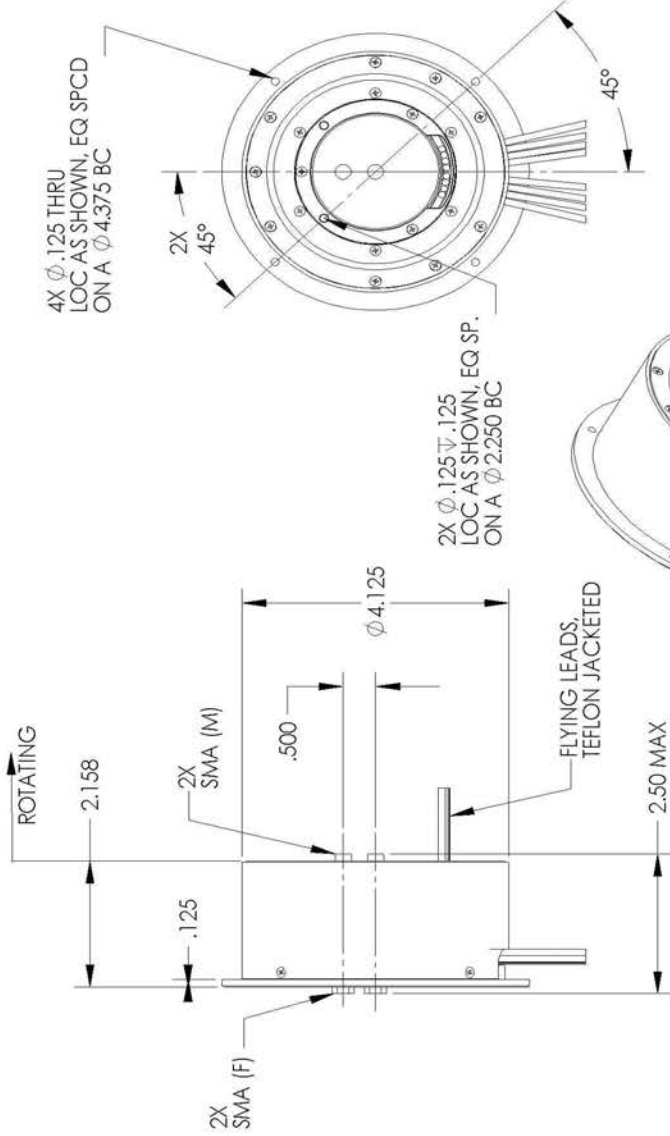
ROTARY JOINT SPECIFICATIONS

CHANNEL 1 CHANNEL 2

FREQUENCY (GHz): DC-40 DC-18  
 VSWR (max): 1.5:1 (DC-18) 1.75:1 (DC-2.0)  
 2.0:1 (20-4.0) 2.0:1 (20-4.0)  
 2.5:1 (26.5-40) 3.0:1 (4.0-8.0)  
 3.5:1 (8.0-12.4) 4.5:1 (12.4-18)

INSERTION LOSS (max): 75 dB (DC-18) 0.5 dB (DC-2.0)  
 1.0 dB (18-26.5) .75 dB (2.0-4.0)  
 1.5 dB (26.5-40) 1.5 dB (4.0-8.0)  
 2.5 dB (8.0-12.4)  
 3.0 dB (12.4-18)

POWER, PK. (min @ 1 GHz): 300 W 500 W  
 POWER, AVG. (min @ 1 GHz): 30 W 10 W  
 ISOLATION (min): <----- 50 dB ----->  
 ROTATIONAL SPEED: 50 RPM  
 TORQUE (max): 8 oz.-in. STARTING, 6 oz.-in. RUNNING  
 WEIGHT (max): 15 oz.  
 MATERIAL: BRASS  
 FINISH: IRIDITE



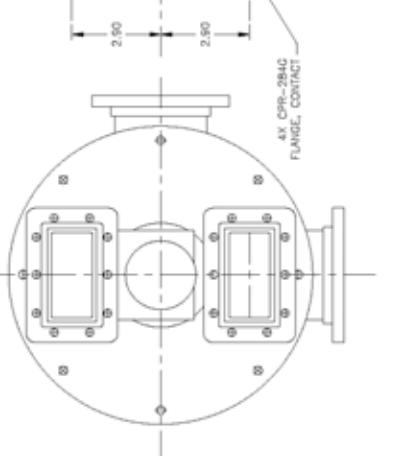
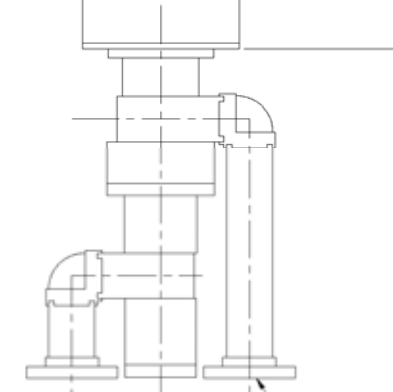
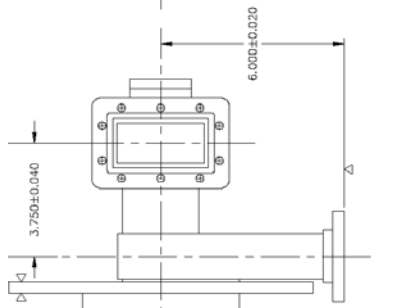
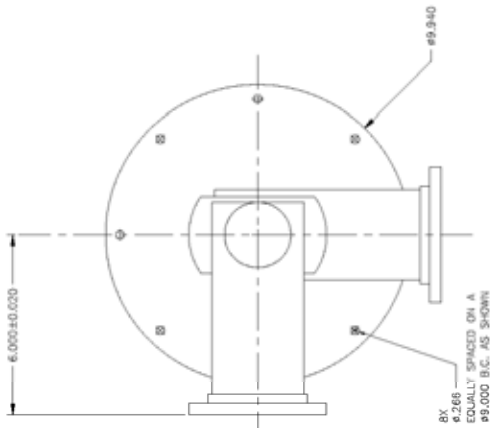
ROLL-RING® SPECIFICATIONS

CIRCUIT #	MAX VOLTAGE	MAX CURRENT	WIRE GAGE	COLOR
1	48 VDC	10 AMPS	18 AWG	WHITE
2	48 VDC	10 AMPS	18 AWG	BLACK
3	48 VDC	10 AMPS	18 AWG	BROWN
4	48 VDC	10 AMPS	18 AWG	RED
5	5 VDC	1 AMP	20 AWG	ORANGE
6	5 VDC	1 AMP	20 AWG	YELLOW
7	5 VDC	1 AMP	20 AWG	GREEN
8	5 VDC	1 AMP	20 AWG	DARK BLUE

MATERIAL	-	DRAFTING:	M. WAGERS	4/10/02	DIAMOND ANTENNA & MICROWAVE CORP. LOWELL, MASS. 01854		
FINISH	-	CHECKED BY:			TITLE: 2 CH COAX ROTARY JOINT WITH 8 CIRCUIT ROLL-RING®		
DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED. REMOVE ALL BURRS AND SHARP EDGES .005 MAX. FRACTIONS DECIMALS ANGLES 2 PLACES ±.03 1/2° 3 PLACES ±.010				CUST. APPROV:	CODE IDENT:	DRAWING NUMBER:	REV.
				GOVT. APPROV	B	1006-2240-S	-
				SCALE	1:2	CAD FILE:	SHEET 1 OF 1



APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHK: \_\_\_\_\_ DESCRIPTION: \_\_\_\_\_



ROTATING ← → STATIONARY

SPECIFICATIONS

	CHL-1	CHL-2
FREQUENCY (MHz)	2.7-2.9	2.7-2.9
VSWR	1.20	1.20
WDR	.02	.02
LOSS (dB)	.10	.20
LOSS WDR (dB)	.05	.05
POWER PEAK	1.5 MW	1.5 MW
AVG	1.5 KW	1.5 KW
INPUTS	CRR-284G	CRR-284G
ISOLATION	50 dB	
SPEED	10 R.P.M.	
TORQUE	2.0 FT-LBS	
PRESSURE	25 PSIG	
LEAKRATE	20 CC/MIN	
MATERIAL	ALUMINUM	ALUMINUM
FINISH	IRONITE, PAINT EXTERNAL DOD GREY	

NOTES: 1. MASK SURFACES MARKED 'V'

DESIGNED BY	DATE	SCALE	SHEET NO.
CHECKED BY	DATE	SCALE	SHEET NO.
APPROVED BY	DATE	SCALE	SHEET NO.
DATE	SCALE	SCALE	SHEET NO.
JOURNAL ANTENNA & MICROWAVE CORP. 1000 W. 10TH ST. SUITE 100 DENVER, CO 80202 TEL: 303-733-1111 FAX: 303-733-1112 WWW: WWW.JACOR.COM			
DUAL CHANNEL ROTARY JOINT DRAWING NO. 31-2281-C-S REV. B 01852			

1 2 3 4 5 6 7

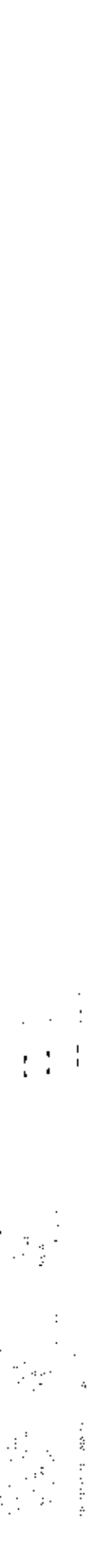
E E



C C



B B



A A



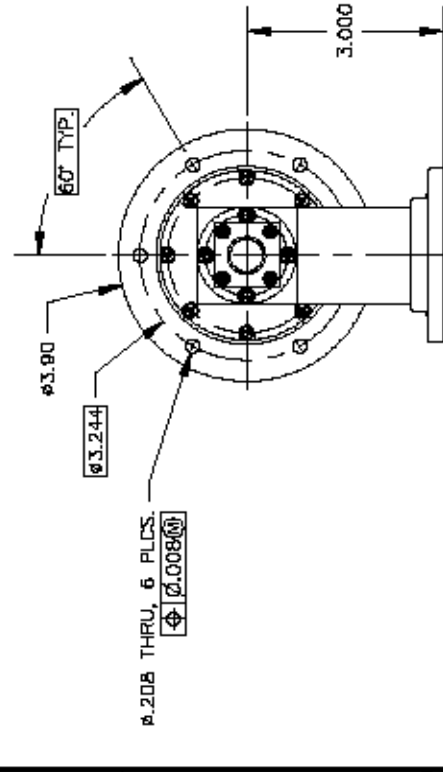
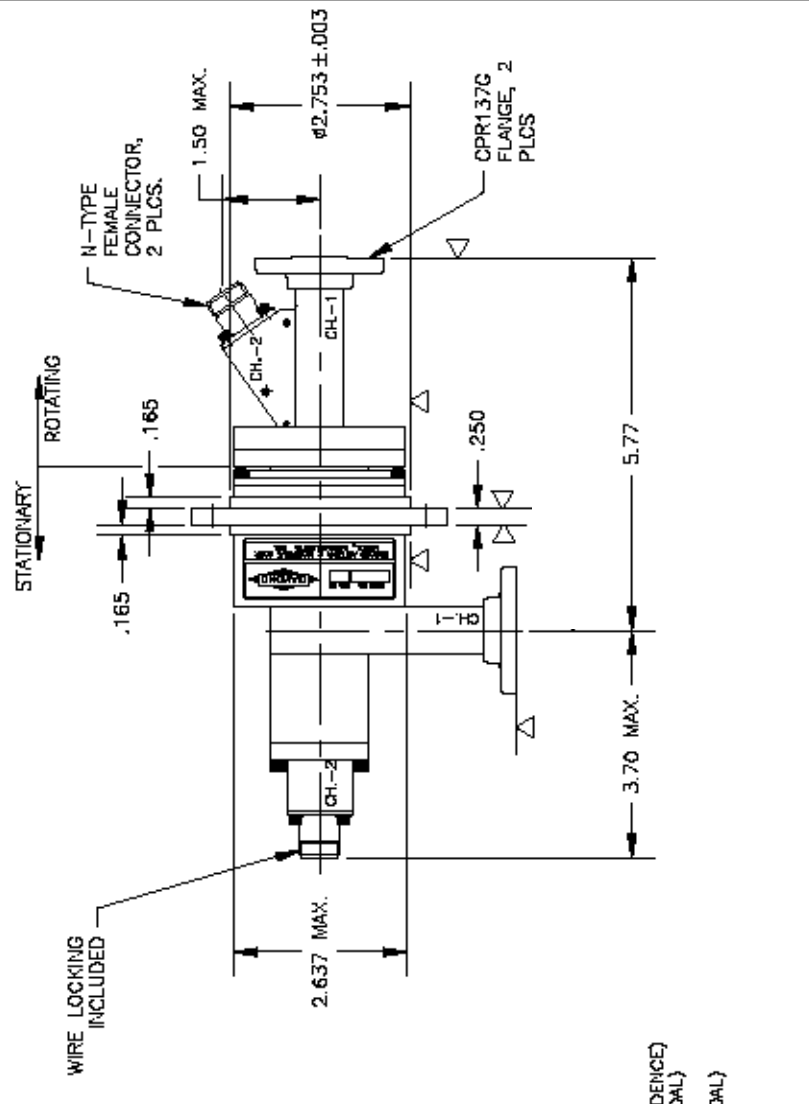






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LTR.	APPLICATION	DATE	APPROVED
	DESCRIPTION		



**SUMMARY OF SPECIFICATIONS**

FREQUENCY: (MHz) (SPLIT BAND)	CH-1 (TRANSMIT)	CH-2 (RECEIVE)
VSWR: W/O W	5.850 - 8.425	3.700 - 4.200
LOSS (dB)	7.900 - 8.400	7.250 - 7.750
POWER: W CW MAX.	1.20-1	1.20-1 (50 OHM IMPEDENCE)
ISOLATION:	0.05 (0.03 DESIGN GOAL)	0.05 (0.03 DESIGN GOAL)
TORQUE:	0.2 (0.15 DESIGN GOAL)	0.7
PRESSURIZATION:	1800 W CW MAX.	1.000 (0.03 DESIGN GOAL)
LEAK RATE:	CPRI 137(G)	1.000 (0.03 DESIGN GOAL)
MAT'L:		TYPE N
FINISH:		100 dB
WEIGHT:		
	70 oz.-in. [.5 N-m]	
	0.5 psi	
	10 cc/min. max.	
	ALUMINIUM	
	IRIDITE	
	LIGHT GREY, COLOR CHIP 26270 PER FED-STD-595	
	(EXCEPT AS INDICATED BY Δ)	
	3.3 lbs. max.	
	[1.5 kg]	

WORKMANSHIP SHALL CONFORM TO DDCD SPEC. 1000

G4	G3	G2	G1	PART NUMBER	DESCRIPTION	CODE IDENT.	ITEM NO.
VALUE DEDUCTIBLE DESIRED QUANTITY PER ORDER REMOVE ALL SHARP EDGES TOLERANCES 2 PLACES DECIMALS ± .001 FINISHING DIMENSIONS ± .001 WELD ± 1/2				CONTRACT NO.	DIAMOND ANTENNA & MICROWAVE CORP.		
MATERIAL				DRAWN BY	LOWELL, MASS. 01106-4		
SEE SPECS.				CHECKED BY	2 CHANNEL		
FINISH SEE SPECS.				APPROVED BY	L-STYLE ROTARY JOINT		
				CUSTOMER APPROVAL	SIZE	CODE IDENT	DRAWING NO.
				GOVERNMENT APPROVAL	B	01882	21-2288-0-S
					SCALE 1/2	FILE	SHEET 1 OF 1

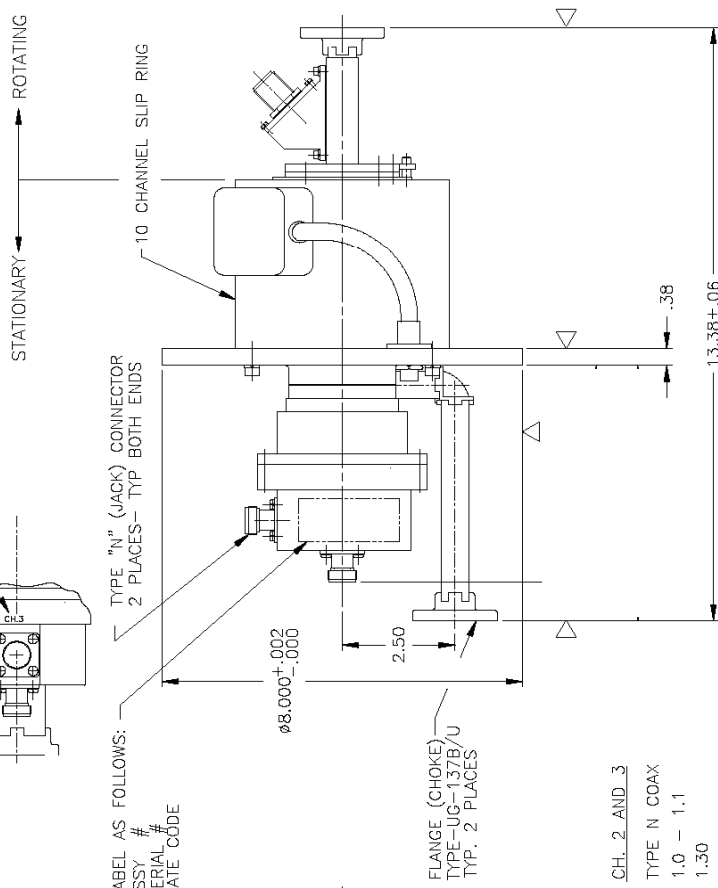






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LTR.	APPLICATION DESCRIPTION	DATE	APPROVED
------	-------------------------	------	----------



LABEL AS FOLLOWS:  
 ASSY # \_\_\_\_\_  
 SERIAL # \_\_\_\_\_  
 DATE CODE \_\_\_\_\_

FLANGE (CHOKE)  
 TYPE-UG-137B/U  
 TYP. 2 PLACES

—SUMMARY OF SPECIFICATIONS—

ELECTRICAL	CH. 1	CH. 2 AND 3
CHANNEL TYPE:	WR-112	TYPE N COAX
FREQUENCY (GHz):	8.5 - 9.6	1.0 - 1.1
VSWR (MAX.):	1.20	1.30
VSWR VOW (MAX.):	1.05	1.07
INSERTION LOSS (MAX.):	.20dB	.50dB
POWER, PEAK:	250KW	3KW
POWER, AVG.:	250W	30W
ISOLATION:	55 dB	55 dB

SLIP RING CHANNEL SPECIFICATIONS: 10 CHANNELS CAPABLE OF 2 AMPS @ 115 VDC

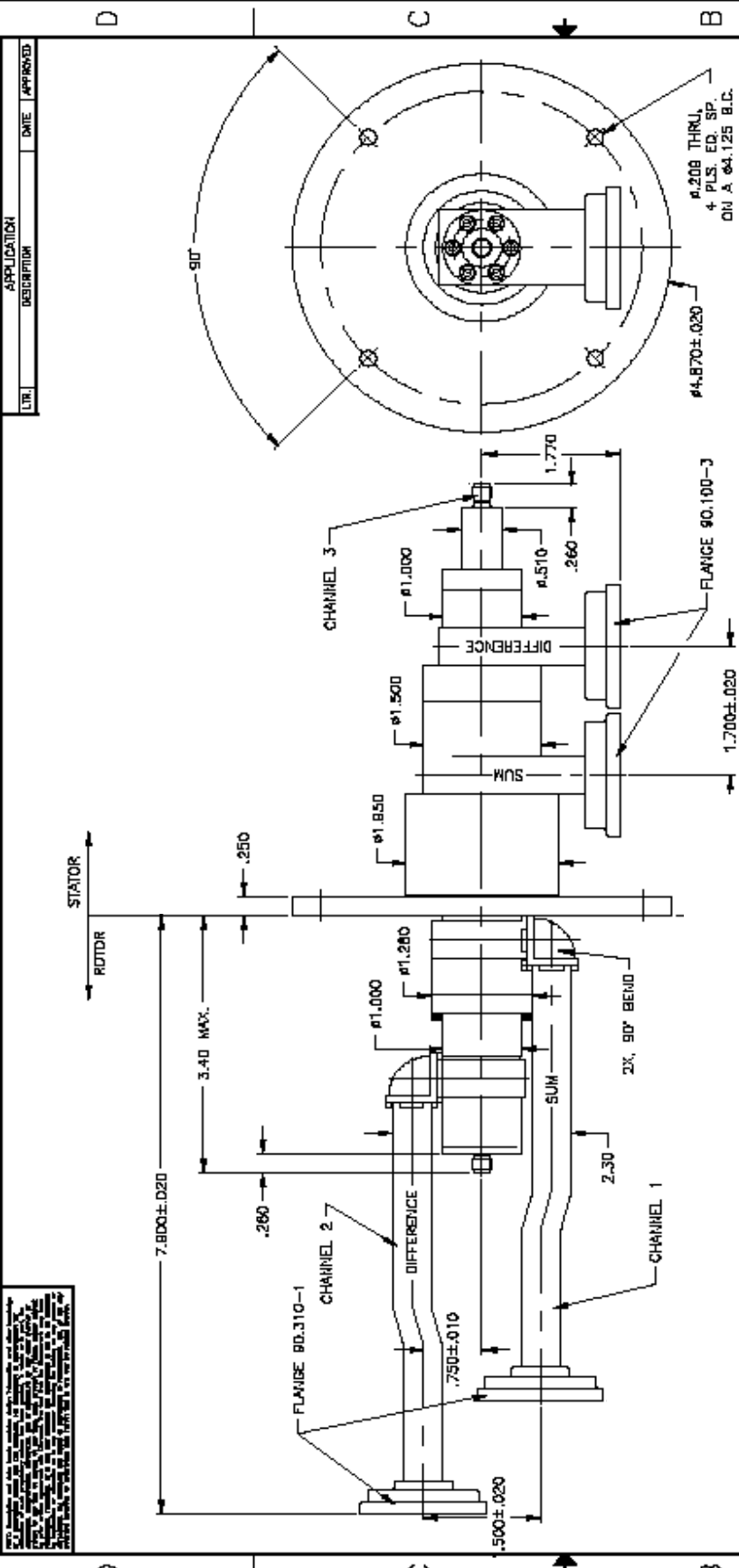
MECHANICAL

PRESSURE: 30 PSIG [CH.1 (WAVEGUIDES) ONLY]  
 LEAK RATE (MAX.): 2 CC/MIN MAX. (GOAL)  
 TORQUE (MAX.): 15 IN.-LBS. MAX.  
 ROTATION RATE: ~15 RPM  
 ENVIRONMENTAL: WEATHERIZED  
 MATERIAL: ALUMINUM ALLOY  
 FINISH: IRIDITE per MIL-C-5541  
 PRIMER PER IT-P-1757 COLOR Y  
 PAINT PER MIL-E-15090 COLOR 26307 PER FED-STD-595  
 DO NOT PAINT SURFACES MARKED: Δ  
 PER MIL-STD-130

MARKING:  
 WORKMANSHIP SHALL CONFORM TO DCD SPEC. 8000

CONTRACT NO.		DIAMOND ANTENNA & MICROWAVE CORP.	
DESIGNED BY	DATE	LOVELL, MARSH, CHASE	
CHECKED BY	9/26/00		
APPROVED BY			
CUSTOMER APPROVAL			
GOVERNMENT APPROVAL			
FINISH SEE SPEC		TITLE	
		ROTARY JOINT- 3 CHANNEL	
		XL BAND (WR112)	
SIZE	CODE IDENT	DRAWING NO.	REV.
C	01882	2356-0-S	-
SCALE 1/2	FILE		SHEET OF 1

1 2 3 4



**SPECIFICATIONS**

Unit:	Ch. #1 (W/G)	Ch. #2 (W/G)	Ch. #3 (Coax.)
Frequency (GHz):	8.6 ~ 9.9	8.8 ~ 9.9	8.8 ~ 9.9
VSWR (max):	1.20:1	1.30:1	1.50:1
Ins. Loss (dB max.):	.20	.35	1.0 dB
WOW (Low)/360 Deg. (dB):	.05	.05	.05
VSWR Rot/360 Deg.:	.05	.05	.05
Power Peak:	300 KW	3 KW	100 W
Power Average:	500 W	5 W	5 W
Channel Isolation (dB):	60	20 PSIG	
Pressure:	20 PSIG	10 CC/Min	10 CC/Min
Leak Rate (max):	30 RPM	60 RPM	60 RPM
Rotational Speed:	60 CC-lh	WR-90	WR-90
Torque (max):	UG135/UG138B/U	Aluminum	Aluminum
Transmission line:	Color No.36251 (Gray) Epoxy Paint,		
Connector:	Paint per FED-STD-595		
Material:			
Finish:			

APP. CAUTION	DATE	APPROVED
DESCRIPTION		

DELORMO ANTENNA & INSTRUMENT CORP.	
CONTROL, MAINT. CO. CALIF.	
TITLE 3 CHANNEL ROTARY JOINT OUTLINE	
DATE	01/88
DESIGNER	2354-J-S
CHECKED BY	
APPROVED BY	
REVISIONS	

1 2 3 4



