RADIO ENGINEERING
MICROWAVE RADIO
ANTENNA SPECIFICATIONS
KS-20410, 10-FOOT, 4-PORT, 6/11-GHZ

CONTENTS PAGE

1. GENERAL

1.01 The KS-20410 antenna is a 10-foot parabolic dish antenna for use on short-haul microwave routes, such as TL, TM, and TJ radio systems operating in crossband diversity.

1.03 The 4-port construction of the feed assembly provides the capability of operating with two polarizations in both the 6- and 11-GHz frequency bands.

2. TRANSMISSION CHARACTERISTICS

2.01 The gain-frequency characteristics are shown in Table A. Other transmission characteristics are shown in Table B.

2.02 The minimum return loss of 23 dB corresponds to a voltage standing wave ratio of 1.15 to 1.

2.03 Smoothed horizontal directivity patterns are shown in Fig. 1 for the 6-GHz band and in Fig. 2 for the 11-GHz band. The patterns plotted are representative for either vertical or horizontal polarization. These curves envelop the mirror lobes that are likely to occur within the frequency band and are used as a worse-case situation when making interference computations.

TABLE A

GAIN-FREQUENCY CHARACTERISTICS

FREQUENCY (GHZ)	GAIN-MIN (DB) WITH RADOME
5.925	41.8
6.175	42.0
6.425	42.0
10.7	46.0
11.2	46.4
11.7	46.8

TABLE B

TRANSMISSION CHARACTERISTICS

CHARACTERISTIC	FREQUENCY	
	6.175	11.2 GHZ
Half-Power Beam Width	1.1 degrees	0.6 degree
Major Sidelobe Suppression	13.0 dB MIN	13.0 dB MIN
Radome Insertion Loss	0.5 dB	0.9 dB
Return Loss	23 dB MIN	
Polarization Discriminator	20 dB MIN	

2.04 Sufficient isolation is incorporated in the 6-GHz feed so that very little 11-GHz energy enters the 6-GHz rectangular waveguide and therefore the delay performance at 11 GHz is virtually independent of the lengths of waveguide attached to the 6-GHz ports. The delayed signal from this

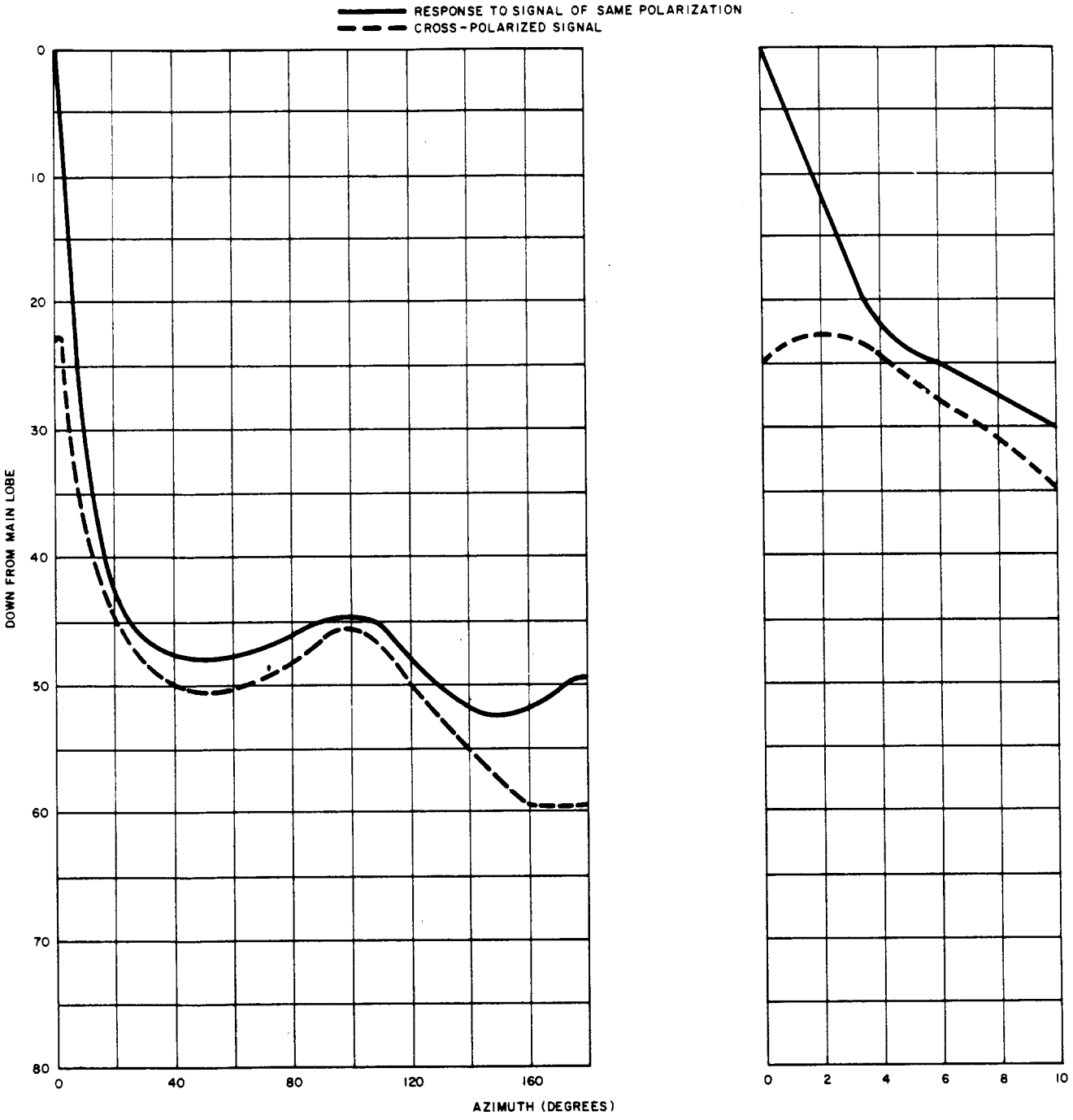

Fig. 1—Smoothed Horizontal-Plane Directivity—Vertical or Horizontal Polarization—6 GHz

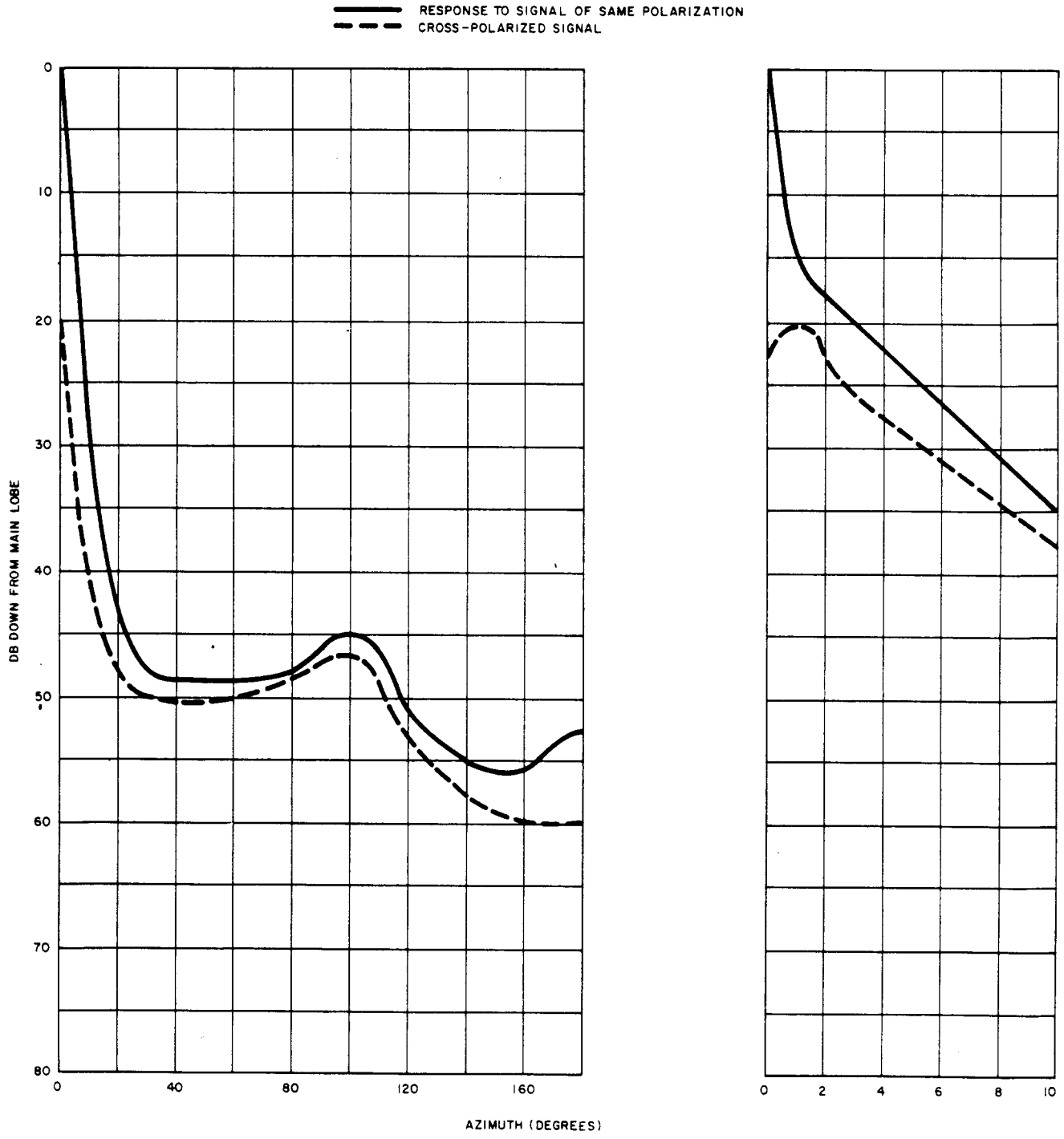

Fig. 2—Smoothed Horizontal-Plane Directivity—Vertical or Horizontal Polarization—11 GHz

source will be at least 50 dB down with respect to the direct signal.

3. EQUIPMENT DESCRIPTION

3.01 The KS-20410 antenna consists of a 10-foot solid-surface aluminum dish (Fig. 1), a 2-element feed assembly, a radome, and a mounting frame for attaching the reflector on a tower or other structure.

3.02 A low-loss radome fits over the front face of the reflector and is required for the antenna to meet the design wind load requirements, and to protect the feed assembly. Dish and feed heaters are not available.

3.03 The feed assembly uses an axial configuration consisting basically of networks for coupling to WR-159 and WR-90 waveguides, a length of concentric cylindical waveguide with apertures, and a "splash plate" subreflector to illuminate the parabolic dish. The feed assembly can be inserted or removed from the rear without disturbing the reflector or radome. The focal length of the feed and the orthogonal alignment of polarizations with respect to one another are established at the factory and require no field adjustment. The complete feed assembly may be rotated through 360 degrees thus providing flexibility in assigning ports and making final adjustment of cross-polarization discrimination.

3.04 The mounting frame provides for independent azimuth and elevation adjustment. A fine adjustment of ± 6 degrees on azimuth and ± 4 degrees on elevation is possible with the mounting frame design.

3.05 The reflector and feed assembly weigh approximately 650 pounds. The mounting frame and radome weigh approximately 330 and 90 pounds respectively. The mounting frame and antenna with radome are rated at 40 pounds per square foot wind loading.

3.06 The equipment information is shown in Table C.

TABLE C

EQUIPMENT INFORMATION — KS-20410

List 1	10-foot parabolic reflector
List 2	Feed assembly
List 3	Mounting frame
List 4	Radome

4. REFERENCES

REFERENCE	TITLE
SD-3C041-01	Antennas, Passive Reflectors, and Outdoor Waveguide Systems —Short Haul Radio
402-439-200*	KS-20012, KS-20013, KS-20409, and KS-20410 Parabolic Antenna —Assembly and Installation
940-340-131*	Microwave Radio—Waveguide Systems—Design Considerations
AA266.091	Antennas, Passive Reflectors, and Radomes for Microwave Communications Systems—Toll Systems

* This section may not be issued. Consult the latest numerical index.