RADIO ENGINEERING
MICROWAVE RADIO
ANTENNA SPECIFICATIONS
KS-15924, 10-FOOT, 4-GHz

CONTENTS PAGE

1. GENERAL

1.01 The KS-15924 antenna is a 10-foot parabolic dish antenna for use on lightly loaded 4-GHz radio routes such as TD-2 or TD-3 operating on a spur off of a main route.

1.02 The feed is capable of handling signals of only one polarization, either vertical or horizontal.

2. TRANSMISSION CHARACTERISTICS

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

2.02 The return loss of 22 dB corresponds to a voltage standing wave ratio of 1.17 to 1.

2.03 Smoothed, horizontal-plane (azimuthal) directivity characteristics are given in Table C and illustrated in Fig. 1 and 2. Table C lists the radiation discrimination of the antenna in dB per degree (azimuth) to signals of the same polarization for which the antenna is arranged and also to cross-polarized signals. Azimuthal angles are given between 0 and 180 degrees. The first letter of the four columns designated VV, HV, HH, and VH denotes *V*ertical or *H*orizontal polarization of the signal. The second letter of the four columns, V or H, denotes the polarization for which the antenna is arranged. Figures 1 and 2 are graphical presentations of the information given in Table C. The curves envelop the minor lobes that are likely to occur within the 4-GHz frequency band, and may be used as a worse-case situation when making interference computations.

3. EQUIPMENT DESCRIPTION

3.01 The KS-15924 antenna consists of a 10-foot spun-aluminum dish, a broadband feed assembly, and a mounting frame for attaching the reflector on standard towers. The mounting can be readily adapted for mounting on other structures.

3.02 While no radome is included in the specification for this antenna, one may be obtained from the supplier.

3.03 The feed assembly consists of a length of waveguide 53 inches long with a fixed focal length of 48 inches. The flange matches WR-229 waveguide. The assembly is arranged to be inserted or removed through the rear of the reflector.

3.04 The triangularly shaped 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 weight of the reflector and feed assembly is approximately 248 pounds without the heater and 265 pounds with the heater. The mounting frame weighs about 375 pounds. The antenna and its mounting frame are designed for wind loads of 40 pounds per square foot.

3.06 The equipment information is shown in Table D.

3.07 The reflector and feed assembly may be equipped with or without heaters. The

reflector heater may be operated on either 115-volt or 230-volt ac service with or without thermostats. The reflector heater will be arranged for 230-volt ac service with thermostats unless specified otherwise. If the thermostats are used, heaters will turn on at a temperature of 40 $\pm$6 degrees Fahrenheit and turn off at 55 $\pm$6 degrees Fahrenheit. The feed heater operates only on 115-volt ac service and is not thermostatically controlled.

4. REFERENCES

SD-3C041-01	Short-Haul Radio—Parabolic Reflector Antennas, Passive Reflectors, and Outdoor Waveguide Systems
402-436-200	KS-15837, KS-15838, and KS-15924 Parabolic Antennas—Assembly and Installation
940-340-131*	Microwave Radio—Waveguide Systems—Design Considerations
AA266.091	Antennas, Passive Reflector, and Radomes for Microwave Communication Systems—Toll Systems

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

TABLE A

GAIN-FREQUENCY CHARACTERISTICS

FREQUENCY (GHz)	GAIN (dB)
3.70	39.0-40.5
3.95	39.5-41.0
4.20	40.0-41.5

TABLE B

TRANSMISSION CHARACTERISTICS

CHARACTERISTIC	POLARIZATION	
	VERTICAL	HORIZONTAL
Half-Power Beam Width	1.8 degrees	1.9 degrees
Major Sidelobe Suppression	26 dB MIN	22 dB MIN
Return Loss	22 dB MIN	

TABLE C

DISCRIMINATION OF TYPE KS-15924 ANTENNA

ANGLE (DEGREES)	DISCRIMINATION (DECIBELS) VV	HV	HH	VH
0	0.0	20.0	0.0	20.0
1	3.5	29.0	4.0	28.0
2	11.3	31.0	13.0	30.0
3	16.5	39.0	15.6	37.5
4	21.7	47.0	18.3	45.0
5	25.0	52.0	25.0	51.0
6	28.0	54.0	29.0	52.5
7	31.0	56.0	33.0	54.0
8	32.0	57.3	33.8	54.7
9	33.0	58.7	34.7	55.3
10	34.0	60.0	35.5	56.0
11	34.8	60.8	36.0	56.4
12	35.5	61.7	36.5	56.8
13	36.3	62.5	37.0	57.1
14	37.0	63.3	37.5	57.5
15	37.8	64.2	38.0	57.9
16	38.5	65.0	38.5	58.3
17	39.1	65.3	39.4	58.5
18	39.8	65.5	40.2	58.6
19	40.4	65.8	41.1	58.8
20	41.0	66.0	42.0	59.0
21	41.6	66.0	42.2	59.1
22	42.2	66.0	42.4	59.2
23	42.8	66.0	42.6	59.3
24	43.4	66.0	42.8	59.4
25	44.0	66.0	43.0	59.5
26	44.6	66.0	43.2	59.6
27	45.2	66.0	43.4	59.7
28	45.8	66.0	43.6	59.8
29	46.4	66.0	43.8	59.9
30	47.0	66.0	44.0	60.0
31	47.1	65.9	43.8	60.2
32	47.2	65.9	43.6	60.4
33	47.3	65.8	43.4	60.6
34	47.4	65.8	43.2	60.8
35	47.5	65.8	43.0	61.0

TABLE C (Cont)

ANGLE (DEGREES)	DISCRIMINATION (DECIBELS) VV	HV	HH	VH
36	47.6	65.7	42.8	61.2
37	47.7	65.6	42.6	61.4
38	47.8	65.6	42.4	61.6
39	47.9	65.5	42.2	61.8
40	48.0	65.5	42.0	62.0
41	48.1	65.6	42.0	62.3
42	48.2	65.8	42.0	62.5
43	48.3	65.9	42.0	62.8
44	48.4	66.1	42.0	63.0
45	48.5	66.2	42.0	63.3
46	48.6	66.4	42.0	63.5
47	48.7	66.5	42.0	63.8
48	48.8	66.7	42.0	64.0
49	48.9	66.8	42.0	64.3
50	49.0	67.0	42.0	64.5
51	49.2	67.3	42.1	64.3
52	49.4	67.6	42.2	64.2
53	49.6	67.9	42.3	64.0
54	49.8	68.2	42.4	63.9
55	50.0	68.5	42.5	63.8
56	50.2	68.8	42.6	63.6
57	50.4	69.1	42.7	63.4
58	50.6	69.4	42.8	63.3
59	50.8	69.7	42.9	63.1
60	51.0	70.0	43.0	63.0
61	50.7	69.9	43.1	63.0
62	50.4	69.9	43.1	63.0
63	50.1	69.8	43.2	63.0
64	49.9	69.7	43.3	63.0
65	49.6	69.6	43.4	63.0
66	49.3	69.6	43.4	63.0
67	49.0	69.5	43.5	63.0
68	48.7	69.4	43.6	63.0
69	48.4	69.4	43.6	63.0
70	48.1	69.3	43.7	63.0
71	47.9	69.2	43.8	63.0
72	47.6	69.1	43.9	63.0
73	47.3	69.1	43.9	63.0
74	47.0	69.0	44.0	63.0
75	46.7	68.8	44.0	62.8

TABLE C (Cont)

ANGLE (DEGREES)	DISCRIMINATION (DECIBELS) VV	HV	HH	VH
76	46.5	68.6	44.0	62.6
77	46.3	68.5	44.0	62.5
78	46.0	68.3	44.0	62.3
79	45.8	68.1	44.0	62.1
80	45.5	67.9	44.0	61.9
81	45.2	67.8	44.0	61.8
82	45.0	67.6	44.0	61.6
83	44.8	67.4	44.0	61.4
84	44.5	67.2	44.0	61.2
85	44.3	67.0	44.0	61.0
86	44.0	66.9	44.0	60.9
87	43.8	66.7	44.0	60.7
88	43.5	66.5	44.0	60.5
89	43.3	66.4	43.7	60.3
90	43.1	66.3	43.3	60.1
91	42.9	66.1	43.0	59.9
92	42.7	66.0	42.7	59.7
93	42.5	65.9	42.3	59.5
94	42.3	65.8	42.0	59.2
95	42.0	65.6	41.7	59.0
96	41.8	65.5	41.3	58.8
97	41.6	65.4	41.0	58.6
98	41.4	65.3	40.7	58.4
99	41.2	65.1	40.3	58.2
100	41.0	65.0	40.0	58.0
101	40.8	64.9	39.6	57.4
102	40.6	64.8	39.3	56.8
103	40.4	64.6	38.9	56.1
104	40.2	64.5	38.5	55.5
105	40.1	64.4	38.1	54.9
106	39.9	64.3	37.8	54.3
107	39.7	64.1	37.4	53.6
108	39.5	64.0	37.0	53.0
109	39.9	63.6	37.2	53.0
110	40.2	63.3	37.5	53.1
111	40.6	62.9	37.8	53.1
112	41.0	62.5	38.0	53.2
113	41.9	62.4	38.4	53.6
114	42.8	62.3	38.8	54.0
115	43.6	62.1	39.2	54.4

TABLE C (Cont)

ANGLE (DEGREES)	DISCRIMINATION (DECIBELS) VV	HV	HH	VH
116	44.5	62.0	39.7	54.8
117	45.4	61.9	40.1	55.2
118	46.3	61.8	40.5	55.6
119	47.1	61.6	40.9	56.0
120	48.0	61.5	41.3	56.4
121	48.9	61.4	41.7	56.8
122	49.7	61.3	42.2	57.2
123	50.6	61.1	42.6	57.6
124	51.5	61.0	43.0	58.0
125	52.2	61.0	43.2	58.5
126	52.8	61.0	43.3	59.0
127	53.5	61.0	43.5	59.5
128	54.2	61.0	43.7	60.0
129	54.8	61.0	43.8	60.5
130	55.5	61.0	44.0	61.0
131	55.8	61.1	44.0	60.8
132	56.0	61.1	44.0	60.6
133	56.3	61.2	44.0	60.4
134	56.5	61.2	44.0	60.2
135	56.8	61.3	44.0	60.0
136	57.0	61.3	44.0	59.8
137	57.3	61.4	44.0	59.6
138	57.5	61.4	44.0	59.4
139	57.7	61.5	44.0	59.2
140	58.0	61.6	44.0	59.1
141	58.3	61.6	44.0	58.9
142	58.5	61.7	44.0	58.7
143	58.8	61.7	44.0	58.5
144	59.0	61.8	44.0	58.3
145	59.2	61.8	44.0	58.1
146	59.5	61.9	44.0	57.9
147	59.8	61.9	44.0	57.7
148	60.0	62.0	44.0	57.5
149	60.0	62.0	44.0	57.5
150	60.0	62.0	44.0	57.5
151	60.0	62.0	44.0	57.5
152	60.0	62.0	44.0	57.5
153	60.0	62.0	44.0	57.5
154	60.0	62.0	44.0	57.5
155	60.0	62.0	44.0	57.5

TABLE C (Cont)

ANGLE (DEGREES)	DISCRIMINATION (DECIBELS) VV	HV	HH	VH
156	59.9	61.7	44.0	57.7
157	59.7	61.3	44.0	57.8
158	59.6	61.0	44.0	58.0
159	59.5	60.7	44.0	58.2
160	59.3	60.3	44.0	58.3
161	59.2	60.0	44.0	58.5
162	59.1	59.7	44.0	58.7
163	58.9	59.3	44.0	58.8
164	58.8	59.0	44.0	59.0
165	58.7	58.7	44.0	59.2
166	58.5	58.3	44.0	59.3
167	58.4	58.0	44.0	59.5
168	58.3	57.7	44.0	59.7
169	58.1	57.3	44.0	59.8
170	58.0	57.0	44.0	60.0
171	57.4	56.7	43.8	59.4
172	56.8	56.4	43.6	58.8
173	56.2	56.1	43.4	58.2
174	55.6	55.8	43.2	57.6
175	55.0	55.5	43.0	57.0
176	54.4	55.2	42.8	56.4
177	53.8	54.9	42.6	55.8
178	53.2	54.6	42.4	55.2
179	52.6	54.3	42.2	54.6
180	52.0	54.0	42.0	54.0

TABLE D

EQUIPMENT INFORMATION — KS-15924

List 1	10-foot diameter, spun-aluminum paraboloidal reflector (without feed and heater)
List 2	10-foot diameter, spun-aluminum paraboloidal reflector and 2250-watt heater (without feed)
List 3	Mounting frame assembly
List 4	Broadband antenna feed assembly (fixed flange—without heater)
List 5	Broadband antenna feed assembly (360-degree adjustable flange—without heater)
List 6	Broadband antenna feed assembly (fixed flange and 80-watt heater)
List 7	Broadband antenna feed assembly (360-degree adjustable flange and 80-watt heater)
List 8	2250-watt, 10-foot reflector heater assembly
List 9	80-watt feed heater assembly

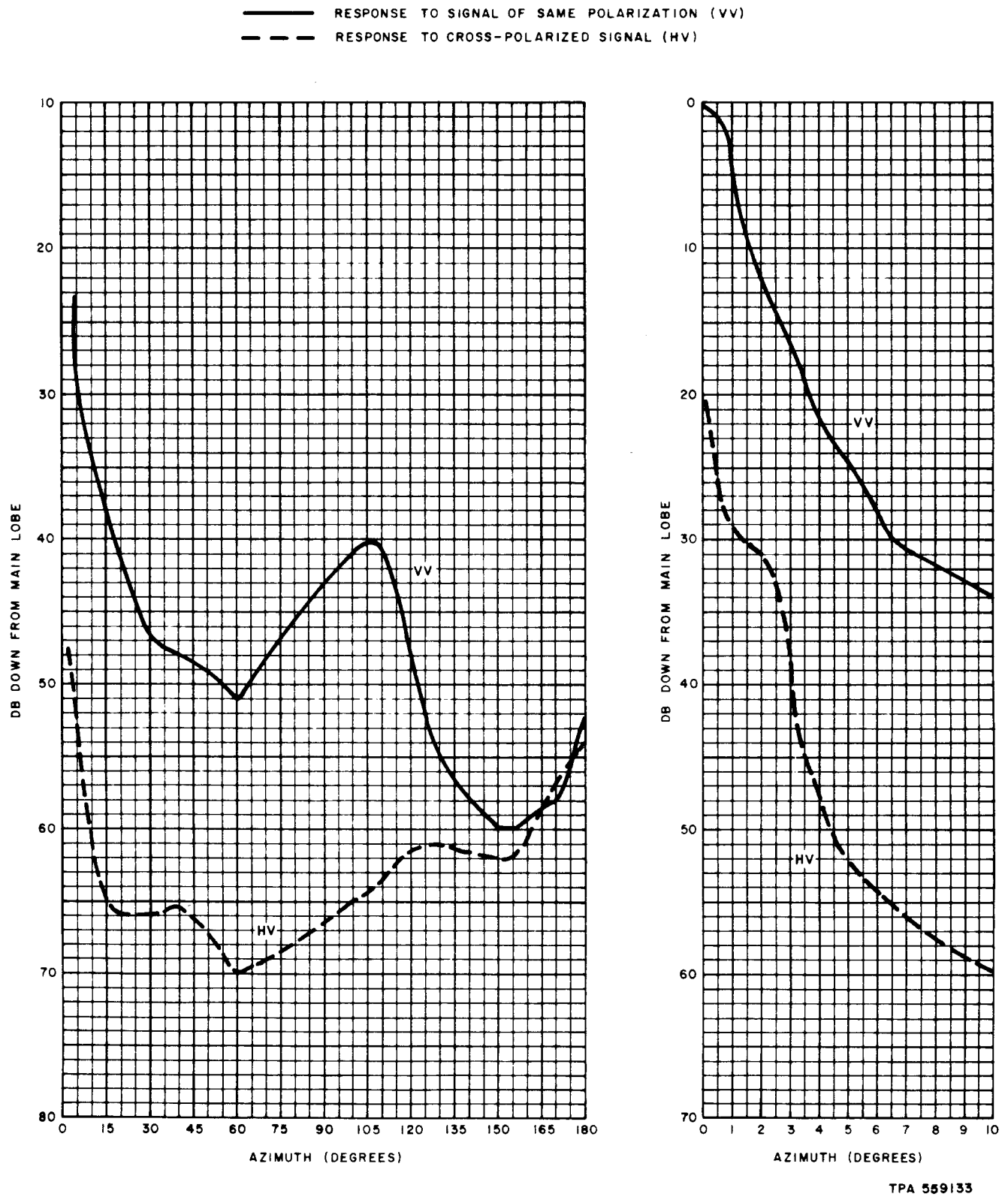

Fig. 1—Discrimination Characteristics of Antenna KS-15924 Arranged for Vertical Polarization—Horizontal-Plane (Azimuthal) Directivity

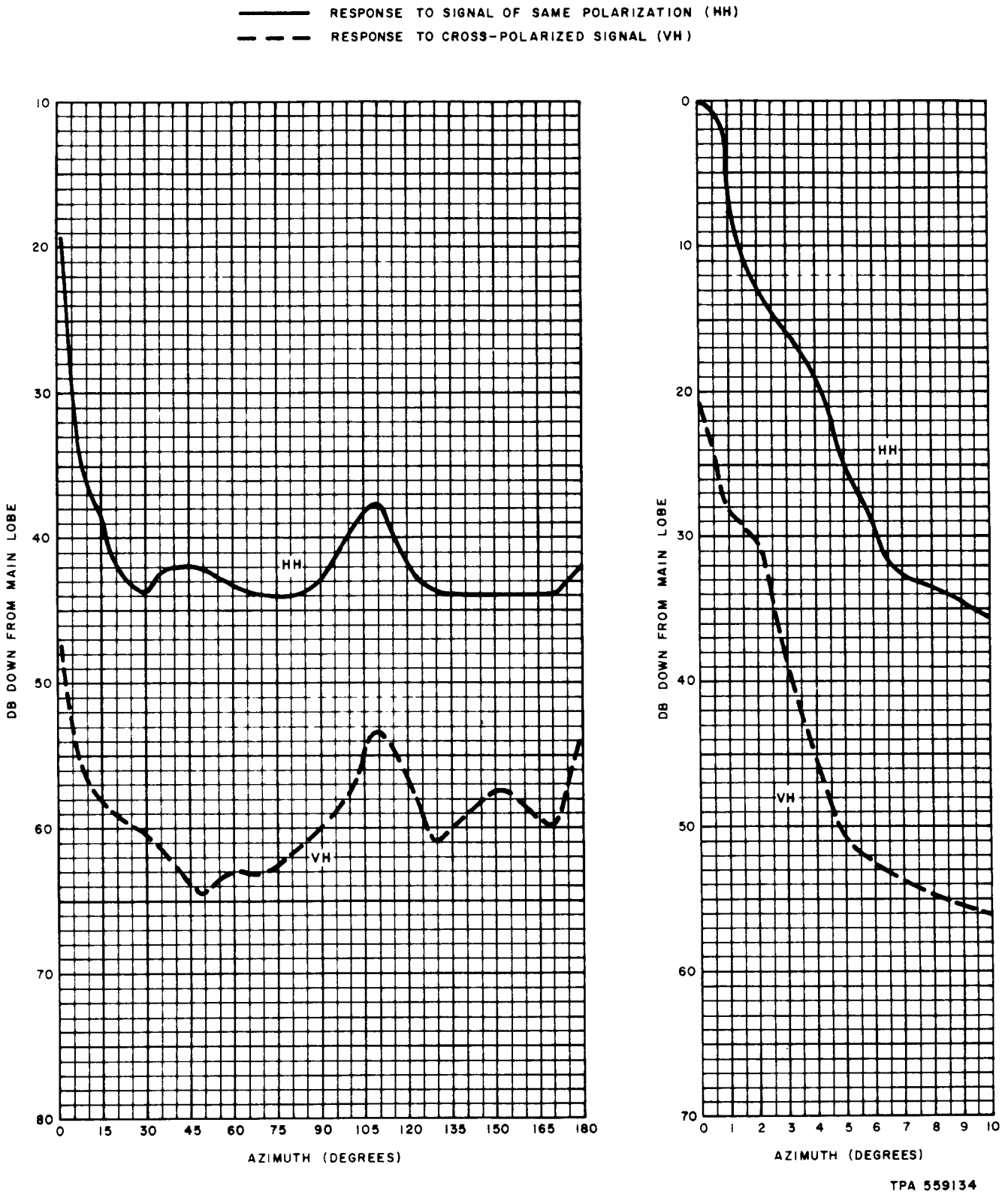

Fig. 2—Discrimination Characteristics of Antenna KS-15924 Arranged for Horizontal Polarization—Horizontal-Plane (Azimuthal) Directivity