POLARAD

# MICROWAVE TEST ANTENNAS

## CALIBRATED DIRECTIONAL_____1.0-21.0 GC; CA-L,-S,-M,-X,-KS,-Ku
## CALIBRATED DIRECTIONAL LOG PERIODIC_____1.0-11.0 GC; CA-LPR
## CALIBRATED OMNIDIRECTIONAL__1.0-21.0 GC; CA-B, CA-KSO, CA-KUO
## UNCALIBRATED TEST ANTENNAS 0.4-40.0 GC; UH-1, S, M, X, Ku, K, Ka

### FEATURES

- Rugged construction for field or laboratory use.
- All models linearly polarized.
- High front-to-back ratio.
- Great stability over wide climatic conditions.
- Provision for tripod mounting.

### APPLICATIONS

**Calibrated Directional Types meet requirements of MIL-I-26600 for field-intensity measurements.**

**Calibrated Omnidirectional Types for use in susceptibility measurements.**

**Uncalibrated Test Antennas for general communications, antenna-pattern plotting, leakage measurements, and propagation studies.**

### DESCRIPTION

The Polarad line of Microwave Test Antennas includes standard models, covering the entire spectrum from 1.0 to 40.0 GC. Developed originally as complementary equipment for Polarad microwave receivers, signal generators, and other precision laboratory instrumentation, their carefully-engineered, field-proven designs, reliable characteristics, and rugged, portable construction have earned recognition and approval in general communications, laboratory, and field operations at microwave facilities throughout the country. They are particularly noted for their consistent performance under extremes of environmental influence; critical feed elements are protected by teflon windows, with a minimum of field disturbance; baked enamel finishes on the metallic parts protect the structure and provide resistance to the weather elements. Judicious selection of materials, such as brass, aluminum, teflon, and standard MIL-type coaxial cables ensures minimum variation of electrical characteristics over wide changes in climatic conditions. Standard coaxial and waveguide fittings permit rapid, easy coupling to associated equipment; power handling capability is limited by the coaxial cable assembly employed, rather than by the antenna itself

All Polarad antennas are provided with a mount designed for simple attachment to a tripod or to any other suitable structure, such as a radome enclosure.

As the patterns displayed in the following pages indicate, excellent directivity and high front-to-back ratios are achieved. All models are linearly polarized.

**CALIBRATED OMNIDIRECTIONAL CONICAL ANTENNAS MODELS CA-B, CA-KSO, and CA-KUO**

These three calibrated antennas cover the range from 1.0 to 21.0 GC. They are omnidirectional conical antennas, with constant directivity characteristics in the H plane, and will receive vertically polarized signals arriving from any direction in the H plane. They are useful in susceptibility measurements and in other cases where 100% probability of intercept is required. Model CA-B is equipped with type N fittings, and Models CA-KSO and CA-KUO are equipped with waveguide fittings. Types WKs and WKo flexguides are available for the CA-KSO and CA-KUO respectively.

**CALIBRATED DIRECTIONAL HORN ANTENNAS MODELS CA-L, CA-S, CA-M, CA-X, CA-KS, and CA-KU**

These six antennas have highly directional characteristics, obtained through the use of standard horns. They meet the requirements of MIL-I-26600 for field-intensity measurements, and are also excellent for point-to-point communications. Models CA-L, CA-S, CA-M and CA-X are equipped with type N coaxial fittings, and Models CA-KS and CA-KU are equipped with waveguide fittings. Types WKs and WKo flexguide are available for the CA-KS and CA-KU respectively. The CA-M, CA-X, CA-KS, and CA-KU are calibrated with the CA-R2 reflector.

### CALIBRATED DIRECTIONAL LOG PERIODIC ANTENNA MODEL CA-LPR

*Model CA-LPR* is a pyramidal log periodic antenna with highly directional characteristics, which are obtained by the use of a parabolic reflector. It is excellent for broadband measurements. Model CA-LPR is equipped with a type N coaxial fitting and is calibrated with its integral reflector.

### UNCALIBRATED TEST ANTENNAS MODELS UH-1, S, M, and X SLOT ANTENNAS MODELS Ku, K, and Ka HORN ANTENNAS

*Models UH-1, S, M, and X* are slot-type antennas, equipped with rectangular-plate ground planes and standard coaxial type N fittings. They are essentially coax-to-waveguide adaptors, with the slot and feed dimensions designed as a transition between the coaxial line and free space.

*Models Ku, K, and Ka* are directional horn antennas with rectangular ground planes and waveguide fittings. Standard MIL-type flanges are used, and 24-inch lengths of flexible waveguide, types WKu, WK, and WKa, for convenient coupling to associated equipment and for ease of orientation, are available as accessories for the Ku, K, and Ka respectively.

### ANTENNA REFLECTORS MODELS CA-R2 and CA-R

*The Model CA-R2 Parabolic Reflector* is designed for use with Antenna Models CA-M, CA-X, CA-KS, and CA-KU. The reflector increases both directivity and gain, and has high efficiency with low VSWR. The reflector is a mechanically sturdy, lightweight structure, which permits easy mounting or removal of the horn antennas.

*The Model CA-R Parabolic Reflector* is a perforated version of the CA-R2, and is useful in locations where high wind velocities exist. It can be used with antennas CA-M and CA-X with absolutely no loss in gain.

### ANTENNA TRIPOD MODEL CA-T

*The Model CA-T Tripod* is a rigid and sturdy tripod equipped with a heavy-duty precision pan head, which permits rapid and precise positioning of the antenna, for optimum vertical and horizontal orientation. A rotating RF joint may be employed, when the required arc of rotation exceeds the amount of twist that can be sustained by the waveguide or coaxial cable. A standard coaxial cable assembly (Part No. BP12551) consisting of a 6-ft. length of type RG-9A/U coaxial cable with type UG-21B/U connectors on each end, is used with all models whose top frequency is below 12.4 GC, for coupling to the associated equipment. All models whose top frequencies are above 12.4 GC, employ flexible waveguide for coupling to the associated equipment. The designations of these flexible waveguides are shown in the following table of accessories.

### TABLE OF ACCESSORIES

| MODEL | DIMENSIONS |
|---|---|
| CA-T Antenna Tripod | 36½" H collapsed; 60" H extended |
| CA-R2 Reflector for CA-M, CA-X, CA-KS, and CA-KU | 20-13/16 H x 19-15/16 W x 13-7/16 D |
| CA-R Reflector for CA-M, CA-X | 20-13/10 H x 19-15/10 W x 13-7/16 D |
| WKs flexguide for CA-KSO, CA-KS | 10′ long |
| WKo flexguide for CA-KUO, CA-KU | 10′ long |
| WKu flexguide for KU | 24" long |
| WK flexguide for K | 24" long |
| WKa flexguide for Ka | 24" long |
| RF Cable Assembly BP 12551 | 6′ long |

## LIST OF POLARAD MICROWAVE ANTENNAS

| MODEL | FREQUENCY RANGE, GC | VSWR (Max.) | NOMINAL INPUT Z | NOMINAL GAIN, db | TYPE | HEIGHT, INCHES | WIDTH, INCHES | DEPTH, INCHES |
|---|---|---|---|---|---|---|---|---|
| **CALIBRATED OMNIDIRECTIONAL ANTENNAS** | | | | | | | | |
| **CA-B** | 1.0 -10.0 | 3:1 | 50 Ω | 10@10.0GC | conical | 9 5/16 | 9 5/16 | 10 5/8 |
| **CA-KSO** | 9.8 -15.35 | 3:1 | WR-75 | 6@13.0GC | conical | 9 3/16 | 9 3/16 | 10 5/8 |
| **CA-KUO** | 14.75-21.0 | 3:1 | WR-51 | 8@18.0GC | conical | 9 3/16 | 9 3/16 | 10 5/8 |
| **CALIBRATED DIRECTIONAL LOG PERIODIC ANTENNA** | | | | | | | | |
| **CA-LPR** | 1.0 -11.0 | 2:1 | 50 Ω | 26@10.0GC | pyramidal | 20½ | 19⅛ | 24 |
| **CALIBRATED DIRECTIONAL ANTENNAS** | | | | | | | | |
| **CA-L** | 1.0 - 2.34 | 3:1 | 50 Ω | 11@ 1.5GC | horn | 13¾ | 9 7/16 | 8 |
| **CA-S** | 2.14- 4.34 | 3:1 | 50 Ω | 17@ 3.0GC | horn | 13 15/16 | 10½ | 17 11/16 |
| **CA-M** | 4.19- 7.74 | 3:1* | 50 Ω | *25@ 6.4GC | horn | 2¼ | 2¼ | 2 7/16 |
| **CA-X** | 7.36-10.0 | 3:1* | 50 Ω | *28@ 9.0GC | horn | 2½ | 1½ | 3⅜ |
| **CA-KS** | 9.8 -15.35 | 3:1* | WR-75 | *30@12.50GC | horn | 1 | 15/16 | 3½ |
| **CA-KU** | 14.75-21.0 | 3:1* | WR-51 | *32@18.0GC | horn | ¾ | 11/16 | 4½ |
| **UNCALIBRATED TEST ANTENNAS** | | | | | | | | |
| **UH-I** | 0.4 - 1.0 | 3:1 | 50 Ω | 8@ 0.8GC | slot | 9⅛ | 16⅞ | 6 5/16 |
| **S** | 2.15- 4.6 | 2.5:1 | 50 Ω | 9.25@ 3.0GC | slot | 11 | 15 | 2⅞ |
| **M** | 4.45- 8.0 | 2.5:1 | 50 Ω | 8.0 @ 6.0GC | slot | 11 | 15 | 2⅞ |
| **X** | 7.85-12.4 | 2.7:1 | 50 Ω | 9.6 @ 8.75GC | slot | 11 | 15 | 2⅞ |
| **Ku** | 12.4 -18.0 | 1.5:1 | RG-91/U | 12.4 @15.0GC | horn | 11 | 15 | 2⅞ |
| **K** | 18.0 -26.5 | 1.5:1 | RG-53/U | 17.6 @22.0GC | horn | 11 | 15 | 2⅞ |
| **Ka** | 26.5 -40.0 | 1.5:1 | RG-96/U | 20.0 @35.0GC | horn | 3 7/16 | 1 11/16 | 5¼ |

*With Parabolic Reflector CA-R2.

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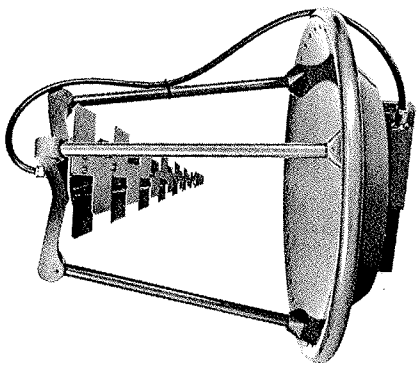
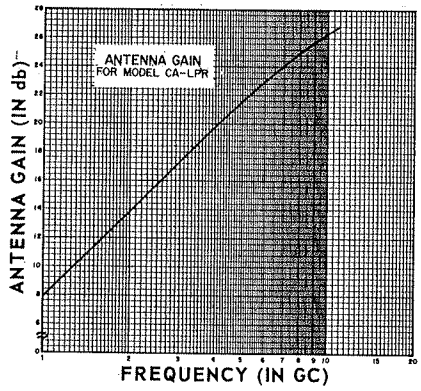
# CALIBRATED DIRECTIONAL LOG PERIODIC ANTENNA

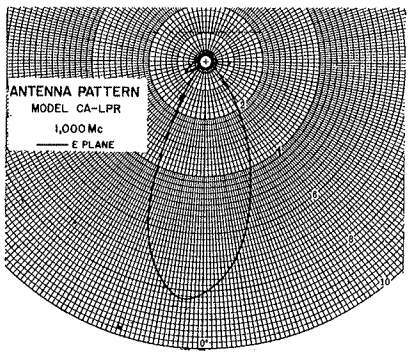
# MODEL CA-LPR 1.0 to 11.0 GC

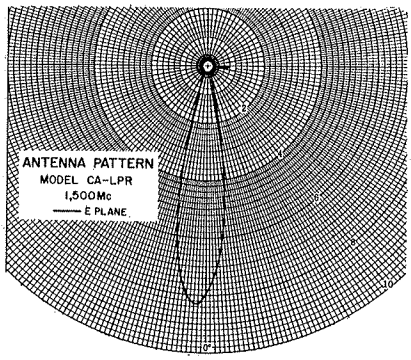


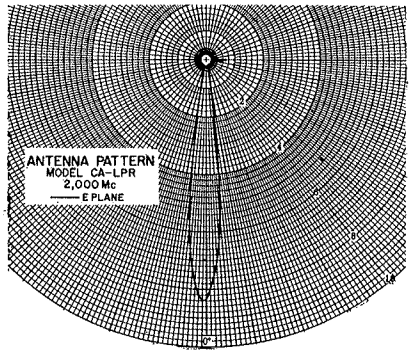
## TYPICAL GAIN

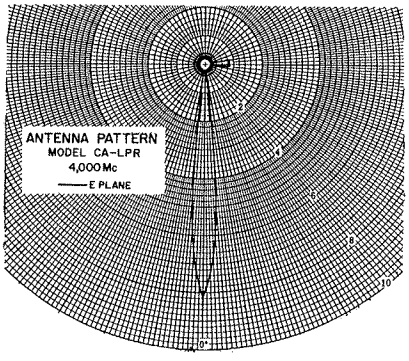


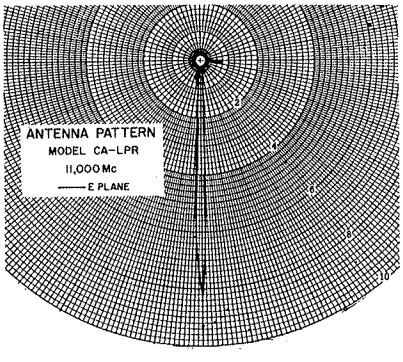

## TYPICAL DIRECTIVITY

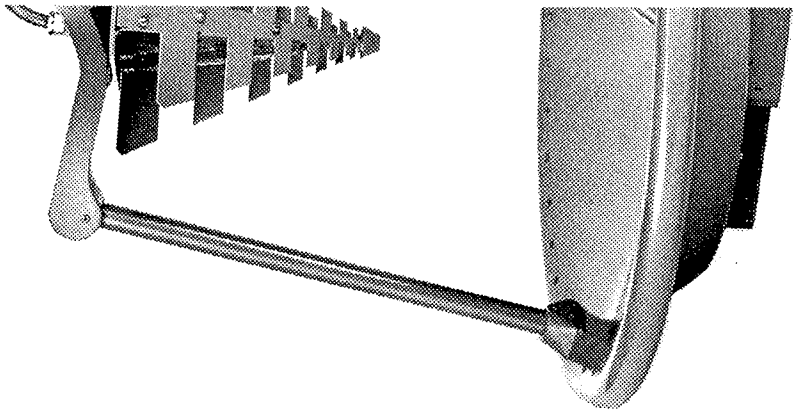




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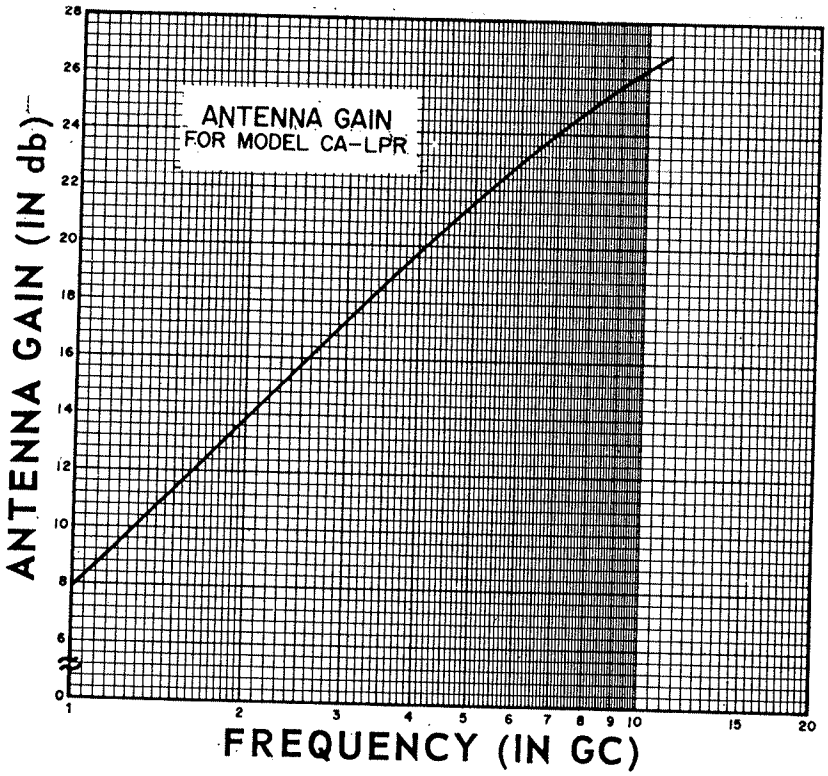


# TYPICAL DIRECTIVITY