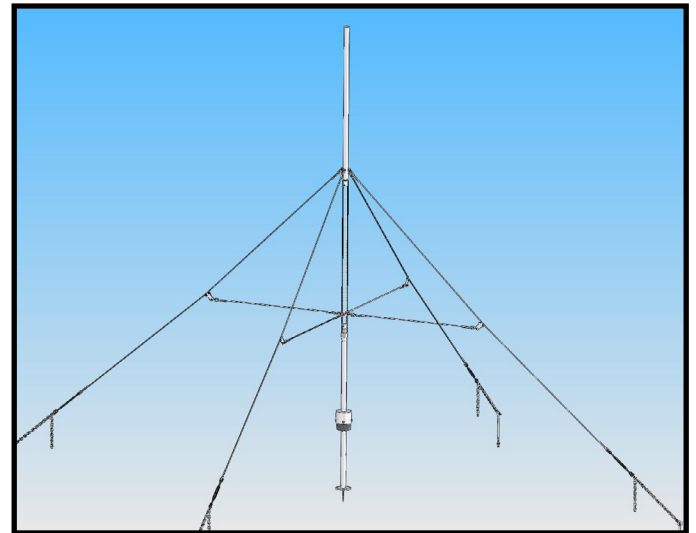
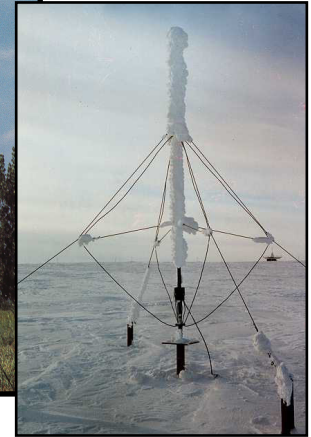
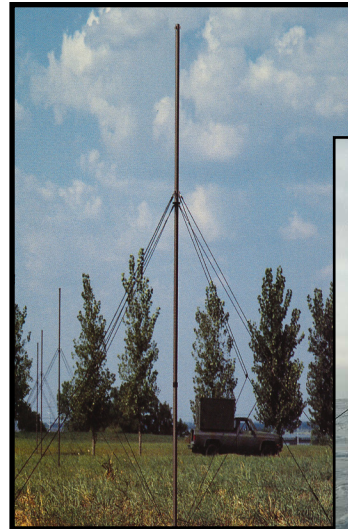


- 1.5 to 30 MHz
- Vertical and Circular Polarization
- Omnidirectional
- Receive Only
- Short-to-Long Range
- Phased Matched Antennas; Ideal for Direction Finding Applications



General Description

The TA 103 series antennas are a family of lightweight, easily deployable, multi-polarized, omnidirectional receive antennas for short-to-long-range communications. The antenna element consists of a sleeve monopole with two orthogonal loops supported by the monopole as well as four guy ropes. A switching unit near the base of the antenna element controlled by a dc voltage fed through the RF coaxial cable allows the antenna element to be operated in one of three modes; vertically polarized, left hand circularly polarized, or right hand circularly polarized. When erected, the TA 103 stands 15.2 feet (4.6 meters) tall and has an anchor radius of 11.8 feet (3.6 meters).

Monopole Antenna

The monopole antenna is a three section mast assembly. Loop mounting rings are positioned at the base section and between the middle and top sections. These rings provide connections and support for the two orthogonal screened loops. The base section houses a quadrature hybrid PC board that processes incoming signals and provides polarization switching. A single BNC connector is mounted on the base section for the feeder cable.

Orthogonal Screening Loops

Each orthogonal screened loop is formed by two loop element cables connected to a crossfeed loop mounting ring at the top of the middle mast section and to a loop mounting ring at the base of the mast. The loop element cables are suspended from the guy lines forming a diamond within the guy lines. Each loop cable is a 13.2 foot (4 meter) length of RG-58C/U cable with a straight coax BNC connector at each end. In the exact center of each loop element cable is a white cable marker to identify the guy line suspension point.

Quadrature Hybrid PC Board

The quadrature hybrid PC provides the various polarizations required for reception of skywave signals from the highest elevation (90°) to the lowest elevation angles (0°). By supplying 0 Vdc to the quadrature hybrid PC board, vertical polarization is selected and the monopole element is used. The two orthogonal screened loops are fed to the quadrature hybrid PC board and phased to provide right-handed and left-handed circular polarizations. These correspond to O-ray and X-ray propagation, depending on whether the antenna is in the northern and southern hemisphere.

Typical Application

The TA 103 Antennas are typically deployed in arrays of 7 to 9 antennas. Most details are phase and amplitude matched making them an ideal choice as part of a direction finding or HFSWR antenna system application.

TA 103 HF Antenna

Characteristics

Electrical	
Frequency Range, MHz	1.5 to 30 MHz
Impedance	50 ohms nominal
Polarization	0 Volts -Vertically Polarizes (Monopole Antenna) +7 Volts -Circular Polarization (crossed loop antenna) -"O-Ray" polarization in northern hemisphere -"X-Ray" polarization in southern hemisphere -7 Volts -Circular Polarization (crossed loop antenna) -"O-Ray" polarization in southern hemisphere -"X-Ray" polarization in northern hemisphere Voltage tolerance of each of the three operating modes is ± 1 volt. Current requirements for the TA 103 with ± 7 volts bias is typically 30 mA.
Patterns	Monopole Antenna: Azimuth - Omnidirectional (± 1 dB) Elevation -Sine (2θ) Loop Antenna: Azimuth - Omnidirectional (± 1 dB) Elevation -Cosine (2θ) where θ is the angle from zenith
Phase Matching	Monopole Phase: 1.5 to 30 MHz; 2° Loop Antenna: 1.5 to 30 MHz; 2° -loop cables are phase stabilized and phase matched to within 0.25°
Amplitude Matching	Monopole Phase: ± 0.5 dB Loop Antenna: ± 0.5 dB
Antenna Switch Time	500msec. between any three bias modes
Antenna Switch Life	1,000,000 cycles
Gain, dBi	Monopole: -24.9 to -5.1 Loop: -25.6 to -1.3

Mechanical

	Transportable Version	Fixed Version
Weight	22 lbs. (10 kg.)	35 lbs. (16 kg.)
Mast Height	15.1 ft. (4.6 m)	15.1 ft. (4.6 m)
Anchor Circle Diameter	23.6 ft. (7.2 m)	23.6 ft. (7.2 m)
Wind	65 mph (105 km/h)	110 mph (180 km/h)
Ice (Radial Thickness)	0.25 inches (6.25 mm)	1.5 inches (40 mm)
Temperature:		
Operation	-40 °C to +55 °C	-40 °C to +55 °C
Storage	-55 °C to +65 °C	-55 °C to +65 °C
MTBF	10,000 Hours (based on a rate of 100 switches /hour)	

Kratos Defense & Security Solutions Inc.
 1120 Jupiter Road, Suite 102
 Plano, Texas, 75074
 USA
 Phone: 1 (214) 291-7654
 Fax: 1 (214) 291-7655
 www.KratosDefense.com
 Space@KratosDefense.com

Bulletin SP50036-D 06/20
 All designs, specifications and availabilities of products and services presented in this bulletin are subject to change without notice
 © 2020 Kratos Defense