

**FANLITE™**

**Lightweight Manportable HF Broadband Antennas**

Commonly known as the LFH, this antenna is available in 1.6 to 30 MHz, 2 to 30 MHz, 3 to 30 MHz, and 4 to 30 MHz models with various input power options. This datasheet provides primary information on the most popular model, the LFH230/1/VE 2 30 MHz 1 kW antenna.

The FANLITE™ is a tactical, quick erect base station type of antenna which can be erected by one or two personnel in less than 30 minutes. It provides true broadband capability in a NVIS plus omnidirectional pattern and has repeatedly demonstrated excellent connectivity to all stations within a 2,000 mile circle.



(NSN 5985-01-342-9592ZX)

**In Service With**

AN/TSC107 Quick Reaction Package (QRP)

AN/TRC181 Air Logistics Communication Elements (ALCE)



- Broadband 2 to 30 MHz
- Rapid deployment
- Light, compact manportable package
- Excellent performance characteristics
- 0 to 1,000 mile range, omnidirectional

- 1 kW continuous operation
- Ideal for frequency-agile and ALE radios
- Available options:
  - Reconfigurable kit for long range
  - 500 W operation
  - Fixed-station version, LFH (P)

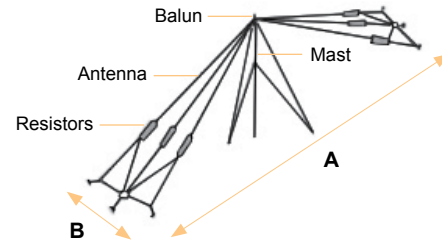
# FANLITE™ Manportable Theater Range FH Antenna

## Services Provided

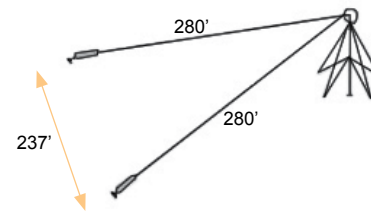
- Omnidirectional theater range HF skywave communications
- Long range directional communications (optional)

## Applications

- Temporary Base Stations
- Contingency Communications
- Emergency Communications
- Short-Range Communications in Mountainous or Difficult Terrain
- Counter-Narcotics Operations
- Ground to Air
- Shore to Ship
- Diplomatic Communications (Rooftop Mount available)
- Covert Communications (Low-profile Kit available)



	LFH 1.630	LFH 230	LFH 330
A	64 m (210 ft)	48 m (150 ft)	32 m (106 ft)
B	18.4 m (60 ft)	13.8 m (45 ft)	9.2 m (30 ft)



## Description

The LFH230/1/VE FANLITE™ antenna is a lightweight, transportable HF wire antenna intended primarily for omnidirectional skywave communications to a range of about 1,000 miles, including short-range Near Vertical Incidence Skywave (NVIS) operation. Supplied in a rapidly assembled kit form, the antenna is designed for use with C&S Antenna's telescopic CARRYMAST™. When erected on one of these masts, the LFH may be set up by two people in less than 25 minutes.

The antenna is rated for 1 kW continuous operation and is broadband, with a VSWR of better than 2.2:1 from 2 to 30 MHz. An antenna coupler is not necessary.

The primary configuration is a fan dipole. Viewed from above, the elements resemble a bow tie. In this configuration, the center of the antenna beam over the lower portion of the HF band is directed straight upwards for optimum NVIS operation. Here the radiation pattern is omnidirectional  $\pm 1$  dB over the frequency range 2 to 8 MHz at angles at or above 60° above the horizon. At higher frequencies, the antenna beam becomes approximately hemispherical, providing useful single-hop performances to about 1,000 miles.

## Available Options

For directional long range communications (2,000+ miles), the antenna may be deployed as a sloping vee or sloping long wire using C&S Antenna's available SVK reconfiguration kit.

For covert operations, the fan dipole may be deployed without an antenna mast. In this configuration, a central ground stake and camouflaged nonconducting rods are used to support the antenna and balun at a height of 18 inches. The additional equipment necessary for this low-profile vertical incidence configuration weighs less than 2 kg (5 lb) and is available as an optional accessory kit: LFH(C). A fixed version of the FANLITE™ is also available from C&S Antennas. This model, the LFH(P), provides omnidirectional communications to ranges in excess of 1,000 miles, has permanent fixtures and a conventional copper wire antenna curtain, and can be supplied suitable for ground or rooftop mounting.

C&S Antenna's lightning protection kit (LPK) is designed to divert lightning strike energy to ground via a deliberate and controlled path.



**C&S Antennas, Inc.**

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# Antenna Specifications

## LFH Fan Dipole

ELECTRICAL	
Frequency Range:	2 to 30 MHz
Input Impedance:	50 ohms
VSWR:	< 2.2:1 across band
Power Rating:	1 kW continuous
Polarization:	Horizontal
Gain:	refer to Gain Table on page 4

MECHANICAL	
Weight:	19 kg (42 lb)
Stowed Size:	0.25 x 0.25 x 0.6 m (10 x 10 x 24 in)
Deployed Size:	48 x 13.8 m (150 x 45 ft)
Erection Time:	25 minutes (2 people) with C&S Antenna's CARRYMAST™ telescopic mast
Max Wind Speed:	145 km/hr (90 mph)
Temperature Range:	-40° to +160° F
Antenna Elements:	Kevlar & copper
Fittings:	Stainless steel

## LFH Sloping Vee Configuration (available option)

ELECTRICAL	
Frequency Range:	2 to 30 MHz (8 to 26 MHz optimum)
Input Impedance:	50 ohms
VSWR:	< 2.2:1 across band
Power Rating:	1 kW continuous
Polarization:	Horizontal
Gain:	refer to Gain Table on page 4

MECHANICAL	
Weight:	19 kg (42 lb)
Stowed Size:	0.25 x 0.25 x 0.6 m (10 x 10 x 24 in)
Deployed Size:	86 x 76 m (280 x 250 ft)
Erection Time:	20 minutes (2 people) with C&S Antenna's CARRYMAST™ telescopic mast
Max Wind Speed:	145 km/hr (90 mph)
Temperature Range:	-40° to +160° F
Antenna Elements:	Kevlar & copper
Fittings:	Stainless steel

## Options

LFH	500 W balun
Mast	C&S Antenna's CARRYMAST™ CTM12 or CTM15
LPK	Lightning Protection Kit
LFH(P)	Permanent Site Version (rooftop mounting details on request)
LFH(C)	Covert Operations Kit (details on request)
SVK	Kit to reconfigure to sloping vee or sloping long wire

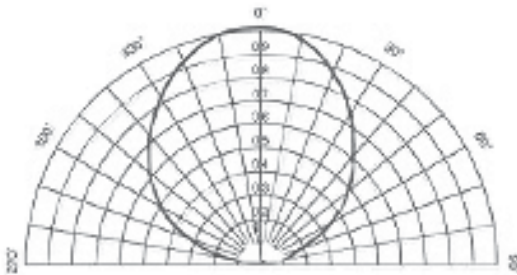
# Power Gain & Radiation Diagrams

## Typical Power Gain (dBi)

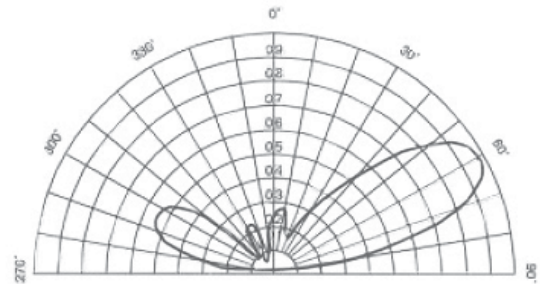
Frequency (MHz)	2	3	4	6	8	10	12	16	20	30	40
Fan Dipole	-2.5	-2.0	-1.0	0	+2.0	+2.5	+3.0	+3.0	+2.5	+2.0	-
Sloping Vee 280'	-9.4	-6.5	-1.8	+1.7	+4.6	+6.4	+7.5	+8.2	+8.5	+9.6	+10.0

### Notes:

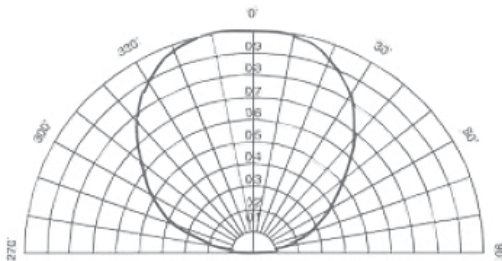
1. The sloping vee data refers to an antenna with 86 m (280 ft) leg lengths.
2. Power gain for sloping vee assumes apex angle between legs is 50° for frequencies between 24 MHz and 35° for frequencies above 24 MHz. This equates to leg spacings of 73 m (237 ft) and 53 m (172 ft) respectively.
3. Gains are stated for antennas supported on a 15 m (49.2 ft) mast over average ground. (Conductivity 10 mS/m; relative permittivity 10).



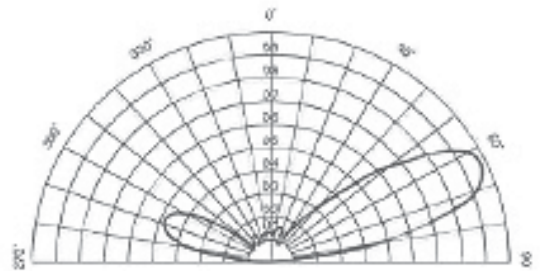
Fan Dipole 6 MHz



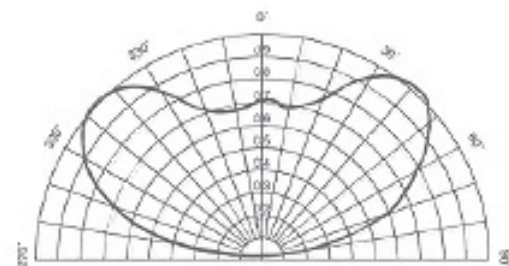
Sloping Vee 6 MHz



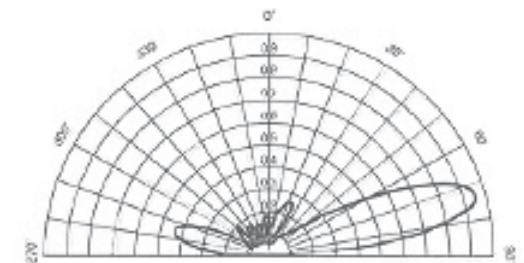
Fan Dipole 10 MHz



Sloping Vee 10 MHz



Fan Dipole 16 MHz



Sloping Vee 16 MHz