TCI
A Dielectric Company

MODEL
641
VHF/UHF DF and Monitor Antenna Array

641 Fixed

641 Mobile

The TCI Model 641 VHF/UHF Antenna* is designed for applications which require an accurate, multi-element, direction finding antenna combined with a sensitive omni-directional monitoring antenna. The 641 provides broad-band operation from 20 to 3000 MHz for both DF and signal monitoring. When used in TCI's Spectrum Monitoring System (SMS), typical DF accuracy is 2° rms. The 641 supports calibrated signal amplitude measurements over the full frequency range. The 641 includes built-in test equipment (BITE) for automatic testing and verification of the operational status of the antenna.

The 641 antenna is available in two configurations: the 641F for fixed-site installations, and the 641M for mobile applications. Both configurations operate over the same frequency range and feature a 9-element directional UHF DF array, plus a single omni-directional monitoring antenna. However, the 641F includes a separate 5-element VHF DF array which provides greater DF accuracy and sensitivity from 20 to 175 MHz.

The UHF DF array in the 641F consists of nine vertically polarized UHF fan elements which are housed in a plastic radome. The radome also includes a broad-band biconical monitoring antenna and a broad-band RF switch. The VHF DF array consists of five vertical dipoles and is mounted just below the radome on a sturdy wagon wheel structure. In SMS or DF systems, the RF switch commutates signals from the DF elements to an external 2-channel DF/Monitoring receiver and generates test signals for DF calibration and automatic system self test.

- **20–3000 MHz broad-band antenna for DF, Monitoring, and Metrics.**
- **Unique design provides high sensitivity over entire frequency range.**
- **Large aperture for greater DF accuracy: 2° rms typical over frequency range.**
- **Rugged, lightweight construction for easy installation and long life.**
- **Available in two configurations for fixed and mobile applications.**

The 641M is similar to the 641F, but to reduce the antenna size for mobile applications, the VHF elements are omitted and the UHF fan elements are used over the entire frequency range (with slightly reduced sensitivity and accuracy below 175 MHz). This mobile antenna also includes an electronic flux gate compass used to determine a North reference for DF bearing calculations.

* US Patent #5,990,845

Specifications

Frequency Range

641M ..... 20–3000 MHz in one band

641F ..... 20–175 MHz and 175–3000 MHz in two bands

Array Element Types ..... Nine UHF fans (DF)
One UHF bicone (monitor/DFRef)
Five VHF dipoles (DF, 641F only)

Directivity ..... 2-9 dBi
(UHF DF element)

RF Switch ..... High dynamic range solid-state switch with broad-band RF preamp. Includes test and DF Cal circuits.

Outputs..... Two (DF Sample, Monitor/DFRef) 50 ohm, Type N connectors

Inputs..... Power & Control, MIL-C-38999 connector

Sensitivity *

100 MHz (641M)..... –29 dBµV/m

100 MHz (641F) ..... –33 dBµV/m

500 MHz..... –26 dBµV/m

1 GHz ..... –17 dBµV/m

2 GHz ..... –12 dBµV/m

3 GHz ..... –8 dBµV/m

**Field strength required for 10 dB SNR @ receiver output when 641 is installed in a typical TCI SMS system, including typical coax cable losses and receiver noise figure; referenced to 1 Hz bandwidth.*

Dimensions

(excluding tower, but including tower-mast adapter)

641F ..... 3.1m (122 in.) high x 2.7m (106 in.) diameter

641M ..... 0.7m (28 in.) high x 1.3m (51 in.) diameter

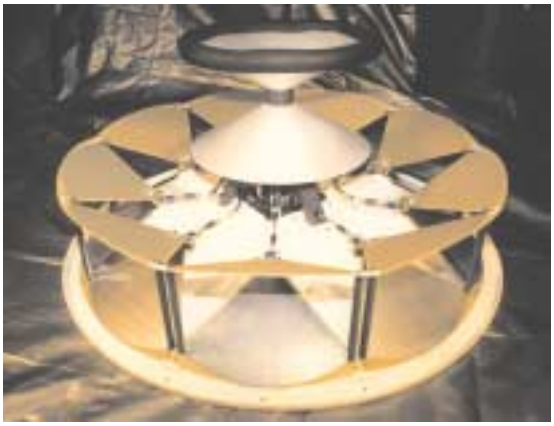
Weight

641F ..... 180 kg (395 lb)

641M ..... 37 kg (82 lb)

Environmental

Operating Temp. ..... –25° to +50° C ambient



641M Antenna Elements
(Radome Removed)

641M Internal RF Switch

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