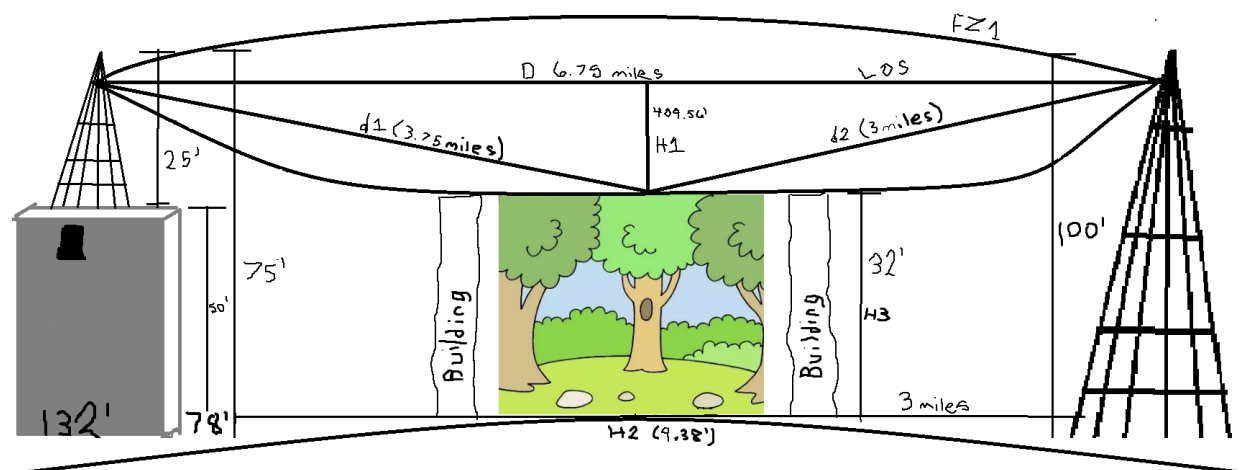


# Project 2: Outdoor Bridge

## Alexis Fenderson


# Diagrams/Demonstrations:



# Equipment & Supplies

## Antennas:

**0.9M | 3 Ft High Performance Parabolic Antenna, Dual Polarized, 10.7-11.7 GHz, Mimosa® B11**



**PROLINE ANTENNA**  
Frequency Range: 10.7 GHz to 11.7 GHz  
Dish Diameter: 3-Foot  
Polarization Type: Dual  
Gain: 39 dBi  
Vertical Beamwidth: 2.1°  
Horizontal Beamwidth: 2.1°  
Cross Polarization: 30 dB  
F/B Ratio: 62 dB  
Antenna Input: Waveguide Interface

Price Table	
1 +	\$1,010.00

Product SKU:  
**KP-11PDDMM-3**

Available Quantity:  
**54 In Stock**

[Buy From A Partner](#)

[Install Guide](#) [Datasheets](#)

## Additional Specs

## Wireless Bridge (Used indoors)

### AirMAX NanoStation M5

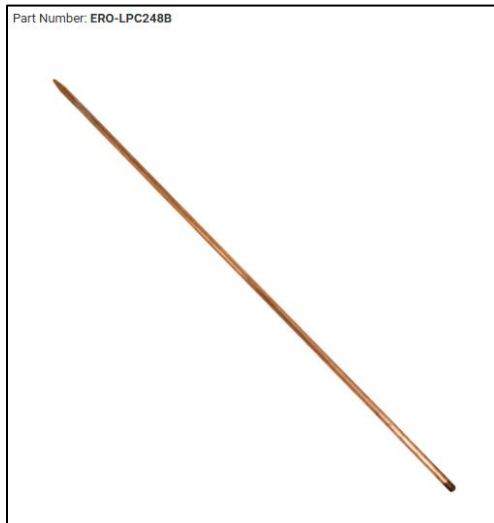


<b>Hardware</b>	
Dimensions	294 x 31 x 80 mm (11.6 x 1.3 x 3.2")
Weight	400 g (14.1 oz)
Enclosure material	Outdoor UV-stabilized plastic
Mounting	Pole-mount (Kit included)
<b>Hardware</b>	
Networking interface	(2) 10/100 MbE RJ45 ports
Power method	Passive PoE 2-pair (4, 5+; 7, 8 return)
Power supply	24V, 0.5A PoE adapter (Included)
Supported voltage range	22-27V DC
Max. power consumption	8W

## Additional Specs

## Grounding Kit/Coaxial Lightning Protections/ Lightning Rod/Weatherproofing

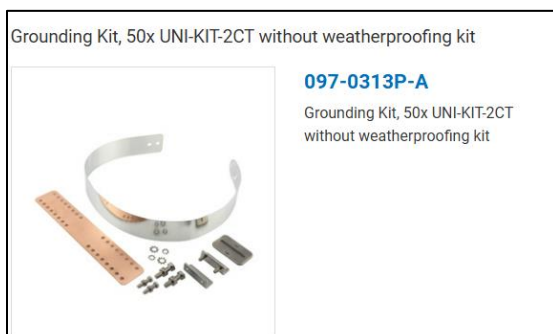
### ERICO Lightning Rods LPC248BST



### Additional Specs



### Additional Specs



## Additional Specs

L-com RF Connector Weatherproofing Kit, Water-Impermeable, Non-conductive

SKU: WK-1-LC



## Ethernet Cable

Category 6a Ethernet Cable Assembly Double Shielded SF/UTP 26AWG Str Braided Black 25.0F



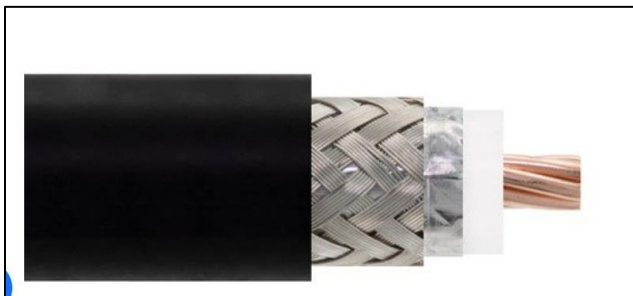
**TTE695AZHF-BLK-25F**

Category Rating: Category 6a  
Shielding: 2  
Gauge: 26 AWG  
Environment: Industrial High Flex  
Color: Black  
Length: 25 feet

## Coaxial Cables with N-Connectors

Low Loss Flexible LMR-400-UF Indoor/Outdoor Rated Coax Cable Double Shielded with Black TPE Jacket

Product ID: LMR-400-UF-BULK



## [Additional Specs](#)

### Data Isolator

Data Isolator 10/100/1000Base-T Ethernet RJ45, DIN-Rail Mount



#### **MDD-1000BT-4KV-DR**

Indoor/Outdoor: Indoor  
Number of Ports: 1  
Data Protocols: 10/100/1000Base-T Ethernet  
Connector 1 Type: RJ45  
Connector 1 Gender: Female  
Connector 2 Type: RJ45  
Connector 2 Gender: Female  
Voltage Isolation: 4 kV

## [Additional Specs](#)

### Data Surge Protector

Data Surge Protector SPD DPR Indoor Gigabit  
Ethernet PoE++ Shielded RJ45 SASD, GDT  
CE Compliant, EN/IEC 60950-1, UL 497B



#### **DPR-F140**

## [Additional Specs](#)

### Other Materials:

Cable Clips, Sealant, Ground Block, Grounding Wire, Drip Loop



# Calculations

Considerations: The Fresnel zone must be clear, because the obstruction occurs not in the center of the distance, we must use the complex calculation. Secondly, the obstruction for these calculations is not even as such, D1 is greater than D2 and will be used in the calculation of H2. As for Frequency, because of the selected Antenna specs, F will be calculated as 11 GHz.

## Calculations:

$$H1 = .6 \times 72.1 \times \sqrt{3.75 \times 3 \text{ (in miles)} / (3.75 + 3) \times 11 \text{ (in GHz)}}$$

$$H1 = 409.56' \text{ (Rounded 2 decimals places)}$$

$$H2 = (3.75 \times 2)^2 / 6$$

$$H2 = 9.38' \text{ (Rounded 2 decimal places)}$$

$$H3 = 32' \text{ (Given Obstruction Value)}$$

$$H4 = 10' \text{ (Growth Rate Flat rate)}$$

$$\text{Antenna Height} = 409.56 + 9.38 + 32 + 10$$

$$AH = 460.94'$$