

e-CALLISTO

Udaipur Solar Observatory, Physical Research Laboratory, Udaipur, India

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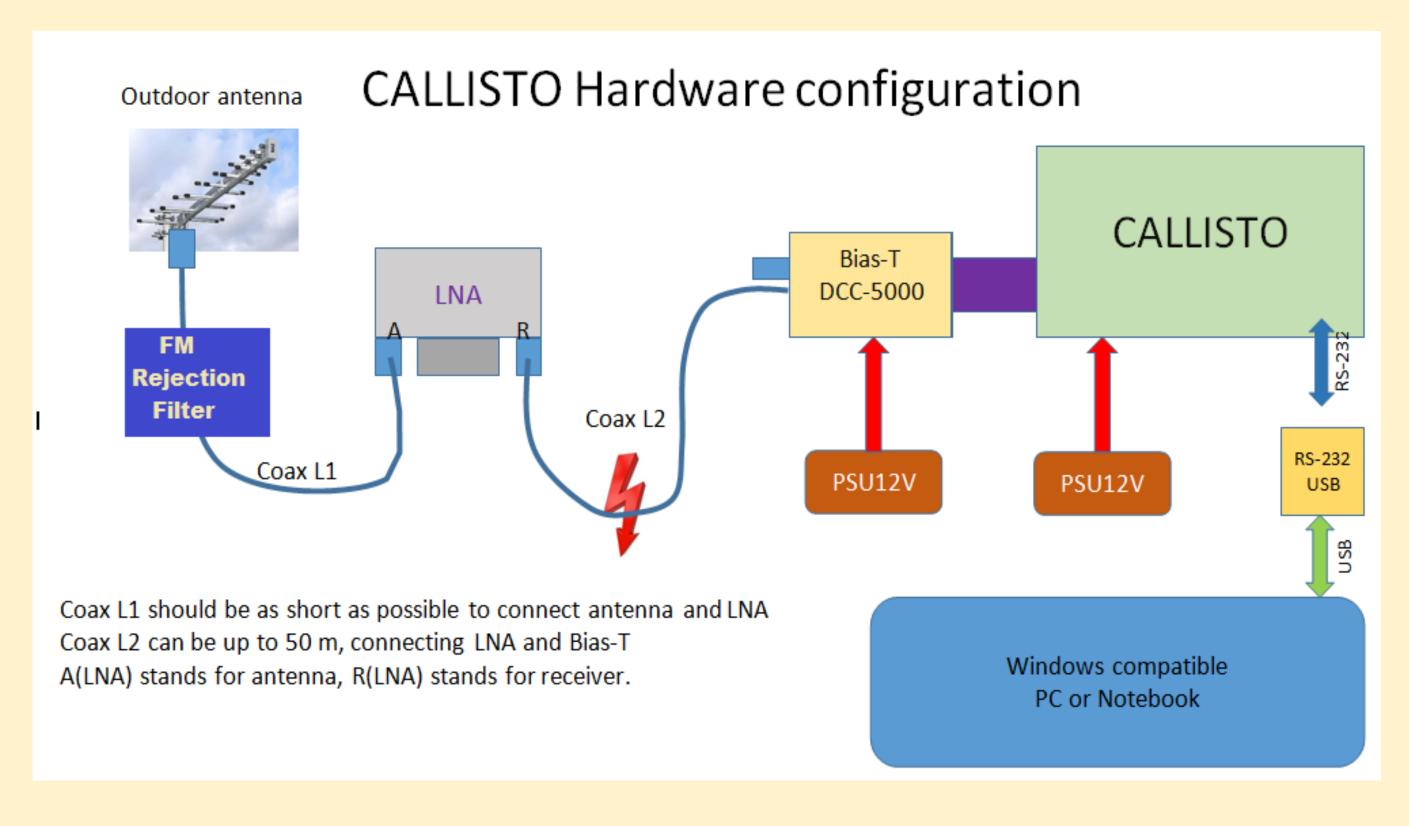
Output

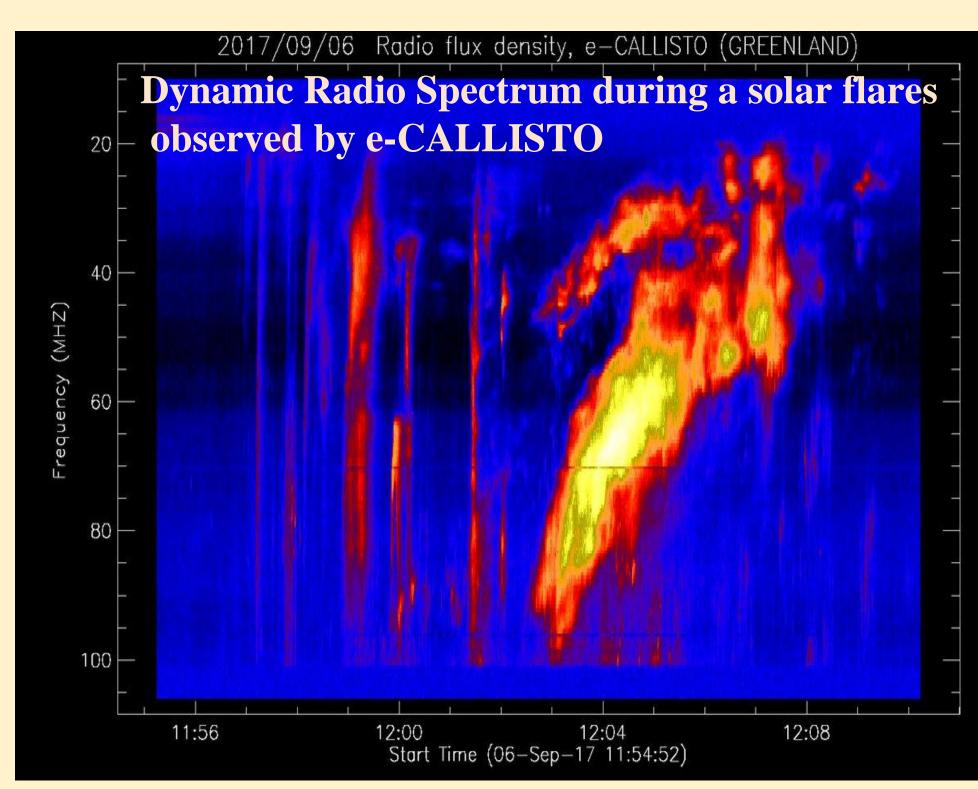
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<u>CALLISTO</u>: Compound Astronomical Low-Frequency Low-Cost Instrument for Spectroscopy and Transportable

Observatory

- e-CALLISTO is used for the observations of solar radio bursts and radio frequency interference monitoring for astronomical science.
- The e-CALLISTO system is a valuable new tool for monitoring solar activity and for space weather research.







Log Periodic Dipole Antenna (LPDA)



Antenna Specifications:

Frequency Range: 40-850 MHz

Gain: 8-9 dBi

Beam width: 90-110 degree

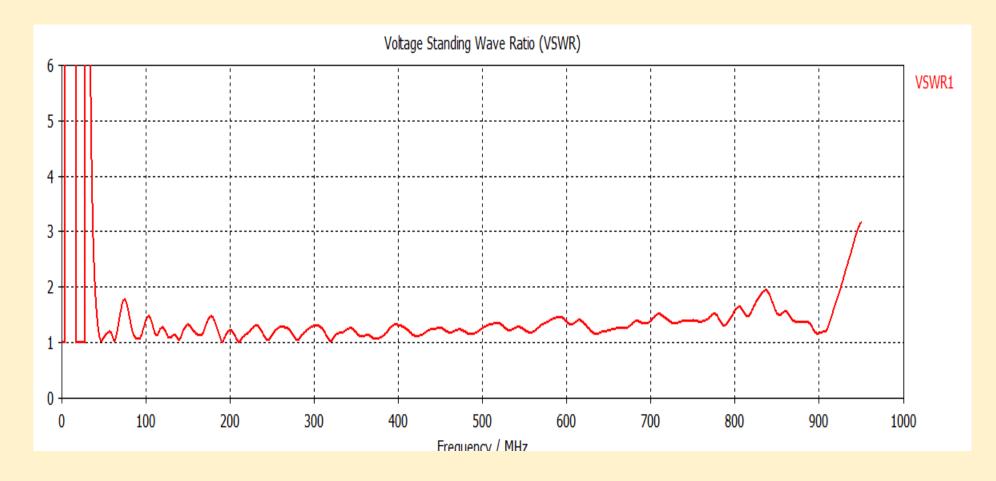
VSWR <2

Return Loss < -10 dBi

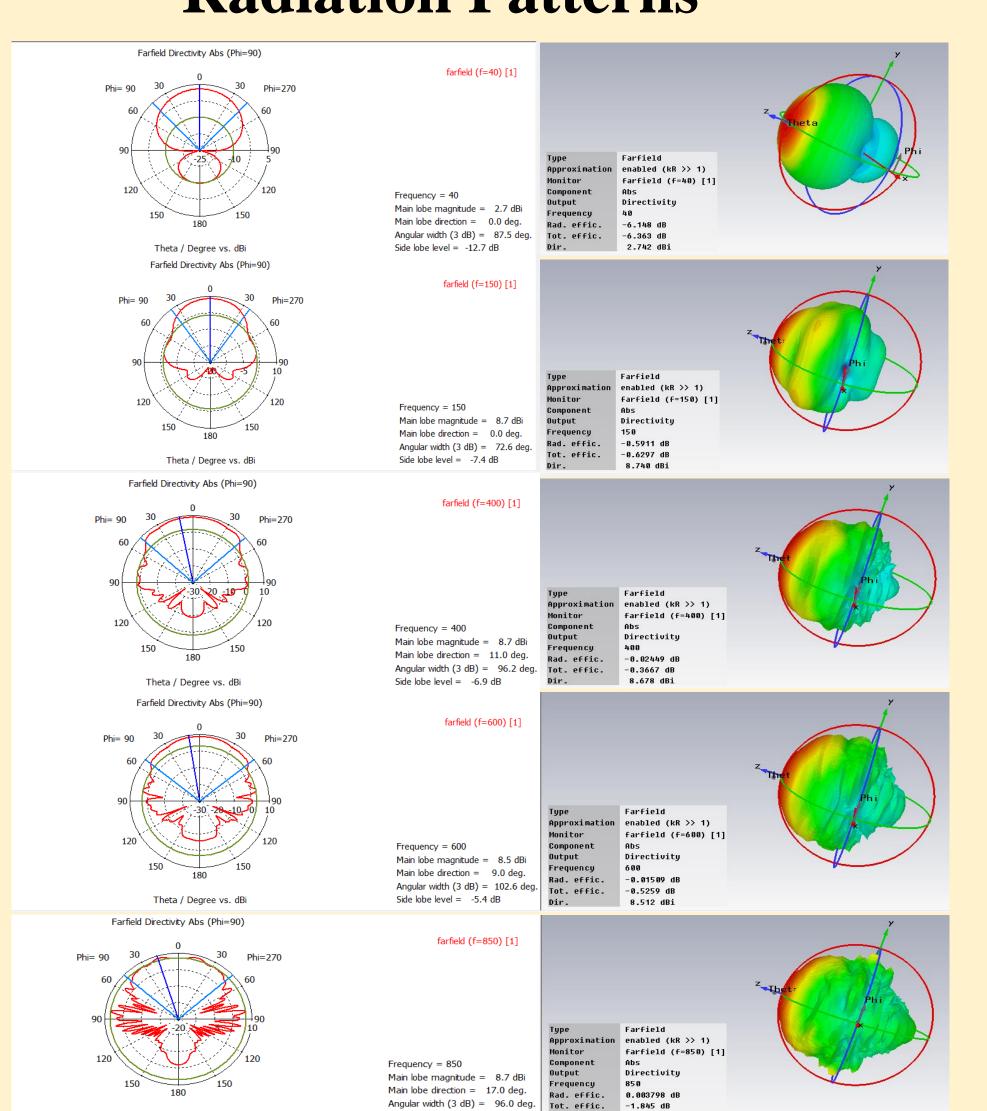
Design Parameter for Fabrication:

Number of Element = 28Material for Boom and Elements = Aluminium Length of Each Boom = 3.63 m (Parallel Two booms with spacing 1cm) Cross section = 4 cm \times 4 cm Total Stub length = 0.937 m

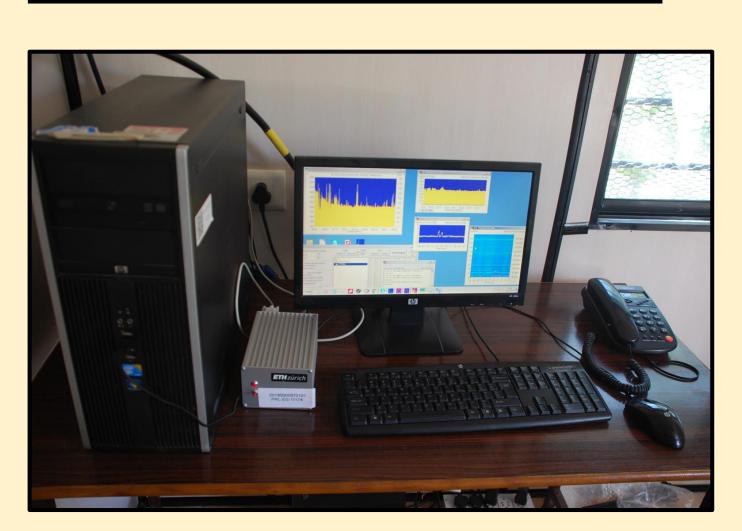
VSWR Plot



Radiation Patterns



e-CALLISTO Receiver



e-CALLISTO Instrumental Parameter:

1) Frequency range: 45 MHz - 870 MHz

2) Frequency resolution: 62.5 KHz

3) Dynamic range: -120 dBm to -20 dBm 4) Sensitivity: 25 (mV/dB) ± 1mV/dB

5) Noise figure: < 10dB

6) Sampling frequency internal clock: 800 s/sec max,

external clock: 1000 s/sec max

7) Number of channels: 1-500, nominal 200

frequencies per sweep

8) Supply: $12V \pm 2V / 225mA$

9) Weight: ~ 800 g

10) Dimensions: 110mm x 80mm x 205mm

11) Input: 3 configuration files (configuration,

frequency, scheduler)

12) Software Output: 2 files (FITS-file and logfile)

Low Noise Amplifier



ZX60-33LN-S+ broad band low noise amplifier **Specifications:**

1) Wide bandwidth: 50 -3000 MHz

2) Low noise figure 1.1 dB typical

3) Output power, up to 17.5 dBm typical

4) Gain = 18-21 dBi

5) Characteristics impedance = 50 ohm

6) Input VSWR = 2.0

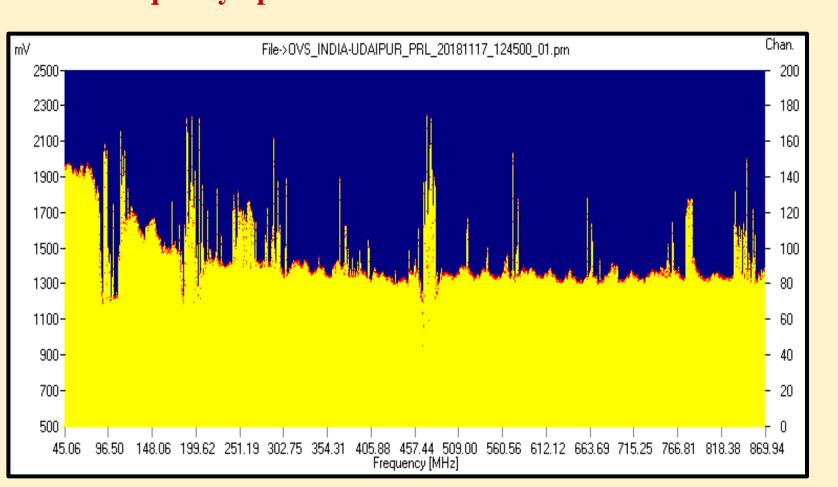
7) Output VSWR = 1.6

8) Supply Voltage = +5V

9) Supply current = 70 mA

Observation at e-CALLISTO Udaipur Station

Radio Frequency Spectrum



Standard RF signals in our observation: 1. Analog terrestrial transmission at ~460 MHz, 2. US military satellite at ~250 MHz, 3. Mobile communication signal above 850 MHz.