

K4LED

Georgia Amateur Radio Astronomy Observatory

Observation Date: 07-1-2018, 0:00:00 to 23:59:00 UTC

Location: Lat. 34.42322 N, Lon. -84.49413 W (Jasper, GA 30143)

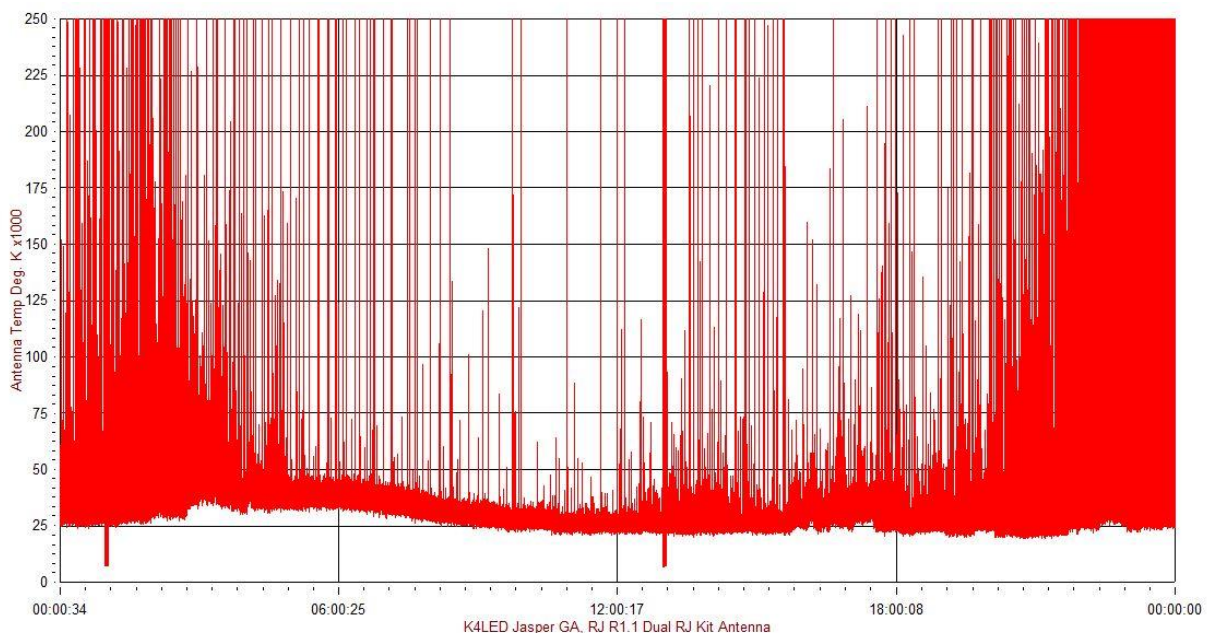
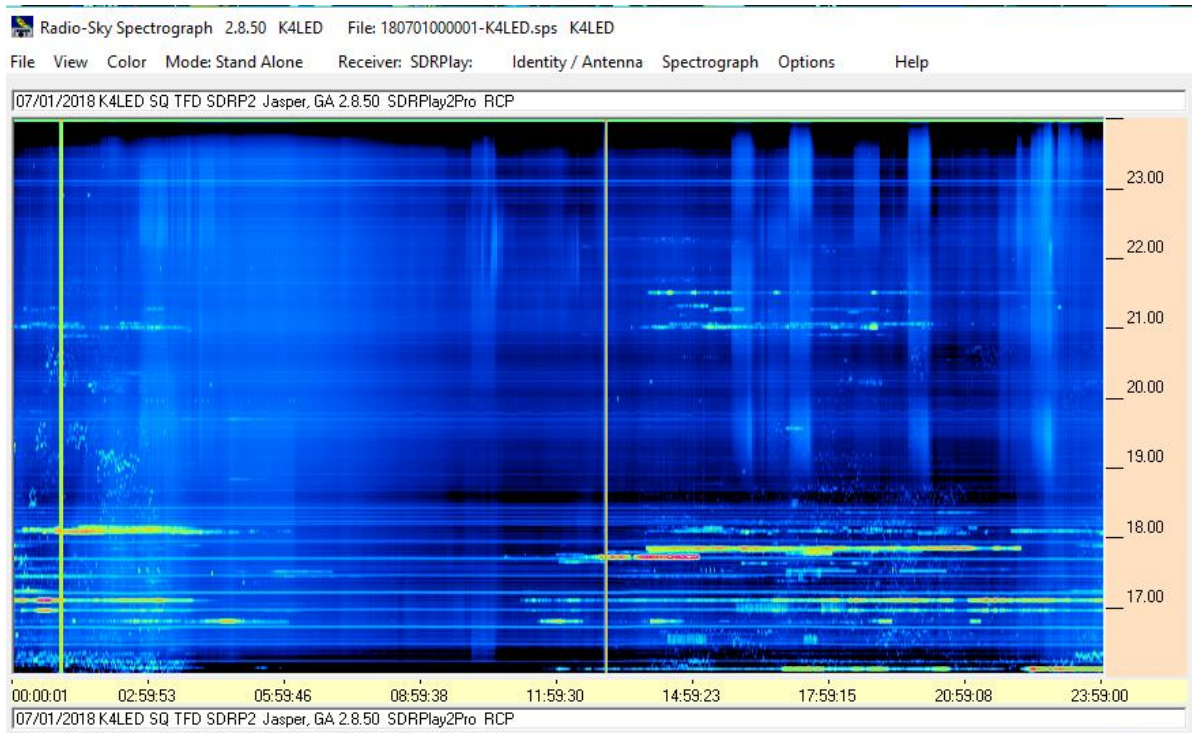
Object: TP, GB,

Observer: Larry E. Dodd

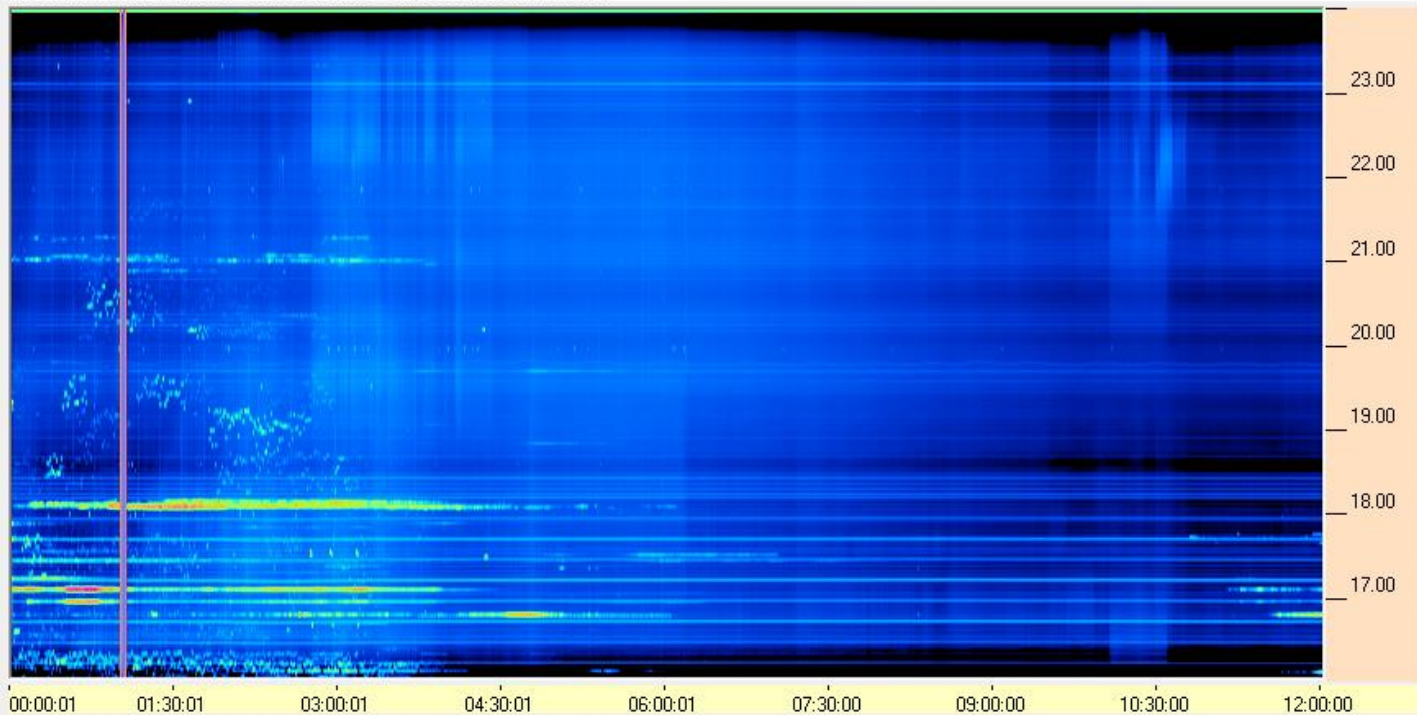
Receivers: FSX11, SDRPlay2PRO, RJ1.1

Software: SkypipeII 2.7.34, Spectrograph 2.8.50

Antennas: Radio Jove Dual Dipole Kit, Typinski Square TFD

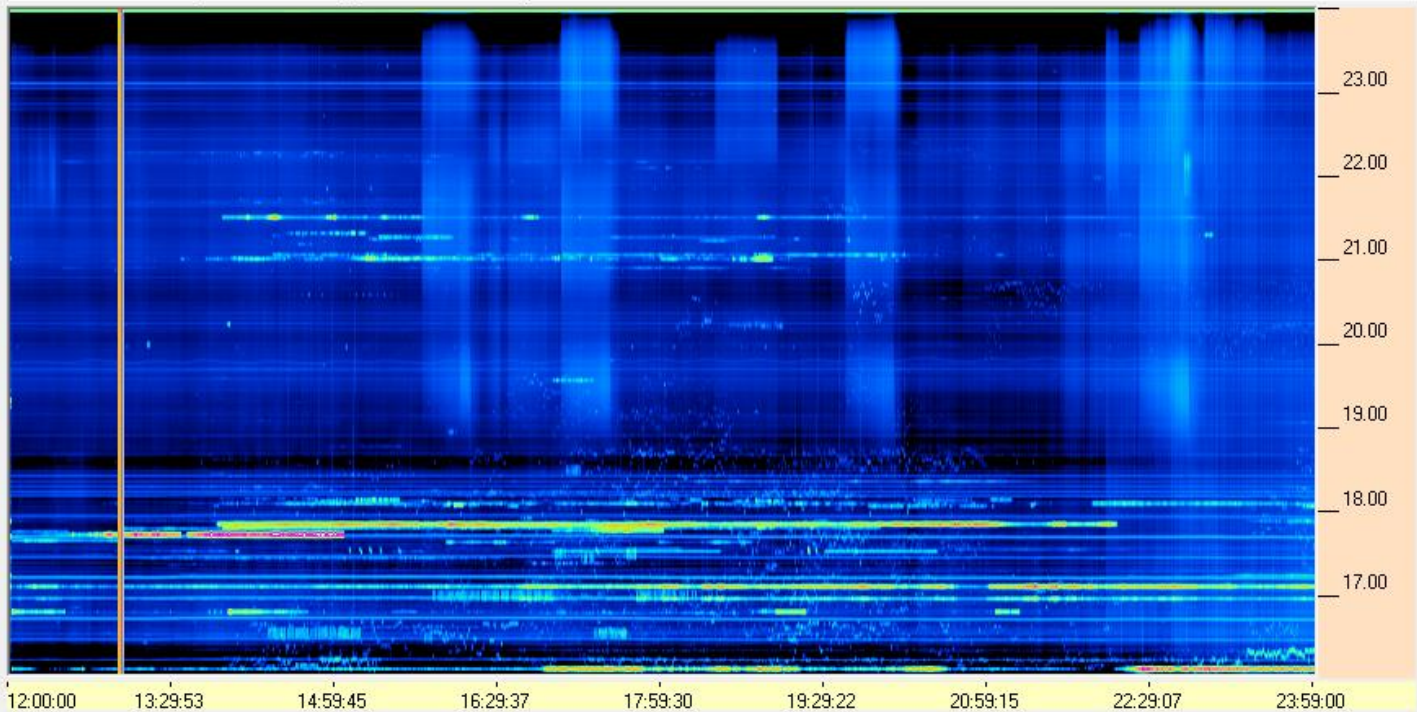


07/01/2018 K4LED SQ TFD SDRP2 Jasper, GA 2.8.50 SDRPlay2Pro RCP



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Station YYYY DAY DDD HHMMSS P1 FFS S AXN PPS IGA PS
Millstone Hill 2018 Jul01 182 120000 RSF 1 712 100 03+ 02

foF2 4.463
foF1 3.76
foF1p 3.88
foE 2.53
foEp 2.70
fxI 5.05
foEs 3.08
fmin 1.60

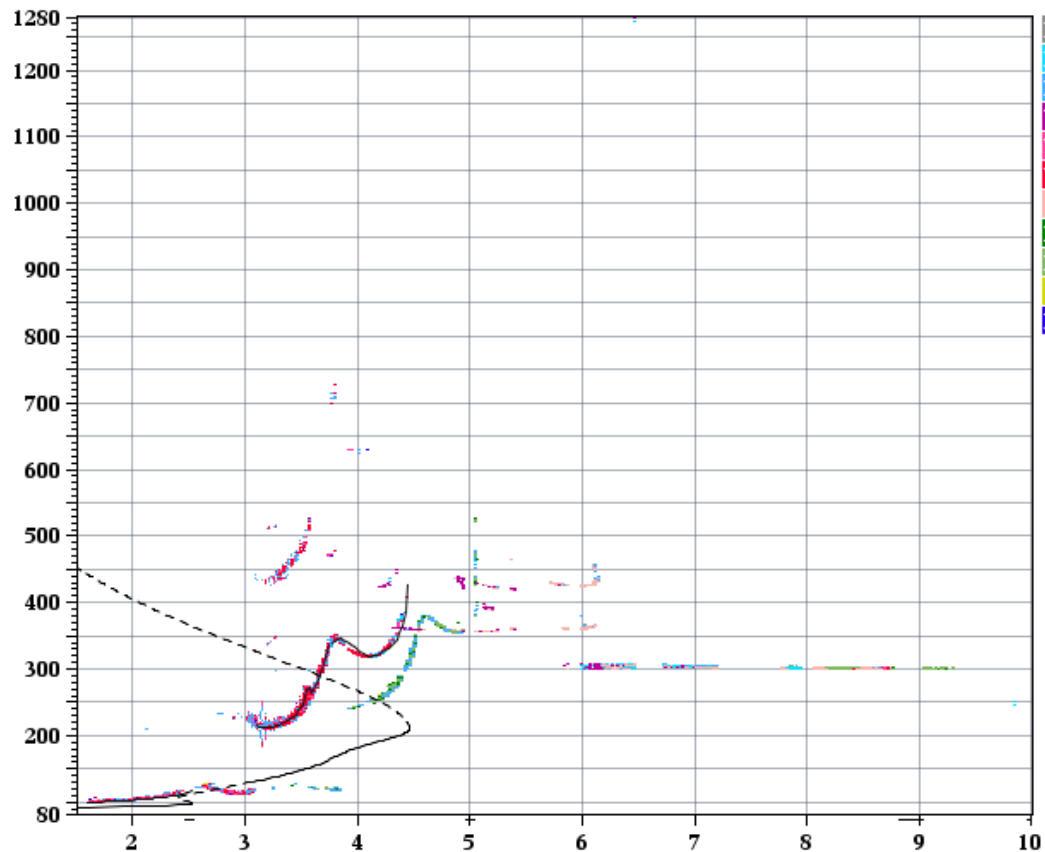
MUF(D) 14.76
M(D) 3.32
D N/A

h`F 212.5
h`F2 317.5
h`E 99.5
h`Es 112.5

hmF2 209.5
hmF1 166.2
hmE 98.5
yF2 52.2
yF1 54.6
yE 8.3
B0 102.7
B1 1.41

C-level 11

Auto:
Artist5
500200



D 100 200 400 600 800 1000 1500 3000 [km]
MUF 5.1 5.2 5.4 5.8 6.3 7.0 9.2 14.8 [MHz]
51409578.tmp / 340fx512h 25 kHz 2.5 km / DPS-4D MHJ45 042 / 42.6 N 288.5 E

ShowIonogram v 1.0

References for Interpreting the Ionogram:

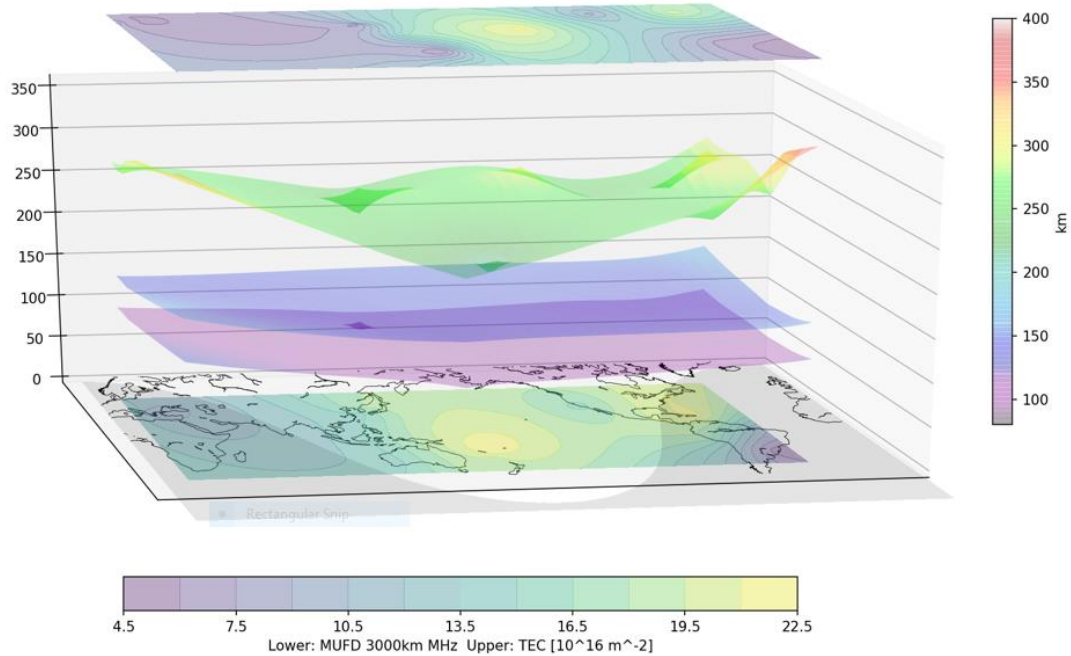
http://www.sws.bom.gov.au/IPSHosted/INAG/uag_23a/UAG_23A_indexed.pdf

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.404.5517&rep=rep1&type=pdf>

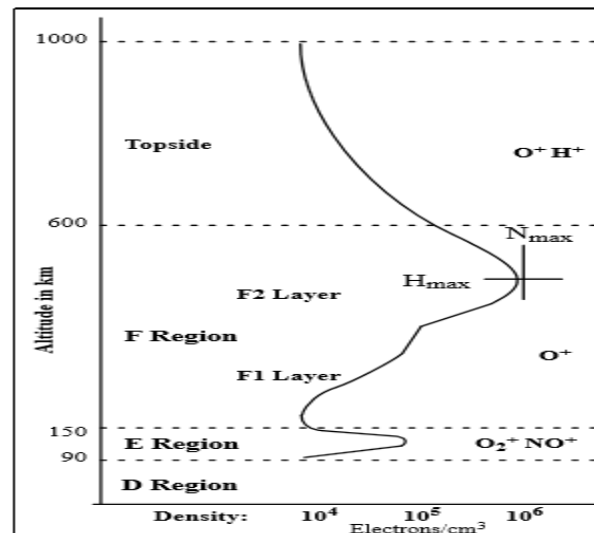
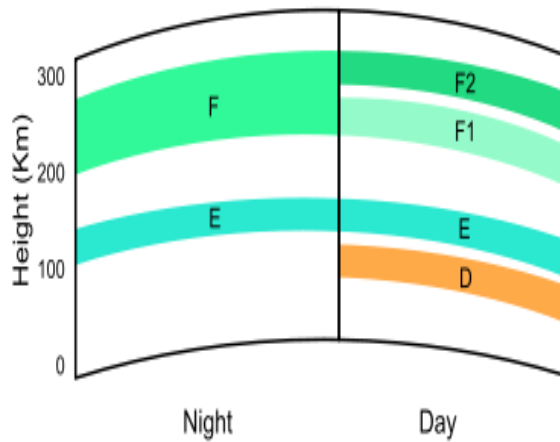
<https://www.hfunderground.com/wiki/index.php/Ionosonde>

Ionosphere Layers, MUF, Total Electron Content

MUF TEC E, F1, F2 Max Height 2018-07-02 00:25



Data Global Ionospheric Radio Observatory (GIRO) Principal Investigator Prof. B. W. Reinisch UMass Lowell



The **critical frequency** is the limiting frequency at or below which a radio wave is reflected by an ionospheric layer at vertical **incidence**. If the transmitted frequency is higher than the **plasma frequency** of the ionosphere, then the electrons cannot respond fast enough, and they are not able to re-radiate the signal. It is calculated as shown below:

$$f_{\text{critical}} = 9 \times \sqrt{N}$$

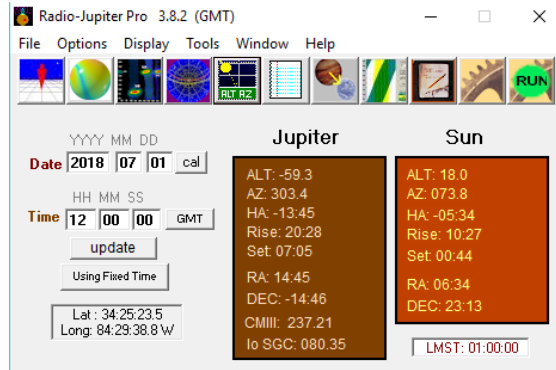
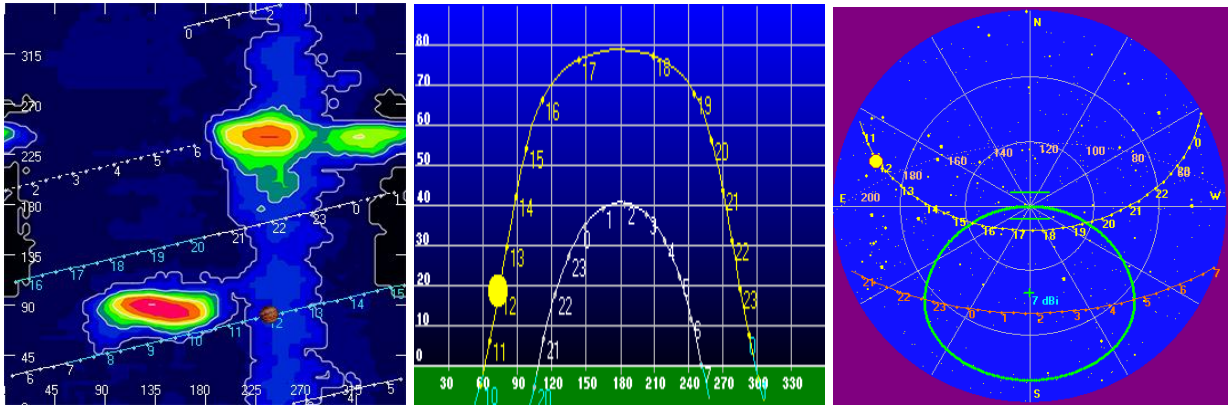
where N = electron density per m³ and f_{critical} is in Hz.

The Maximum Usable Frequency (MUF) is defined as the upper frequency limit that can be used for transmission between two points at a specified time.

$$f_{\text{muf}} = \frac{f_{\text{critical}}}{\sin \alpha}$$

where α = **angle of attack**, the angle of the wave relative to the **horizon**, and sin is the **sine** function.

Reference: <https://en.wikipedia.org/wiki/Ionosphere>



AUTOMATED CALIBRATION COLOR BAR TEST PATTERN AND DATA ACTUAL MEASURED DATA

