

K4LED

Georgia Amateur Radio Astronomy Observatory

Observation Date: 06-21-2018, 0:00:00 to 23:59:00 UTC

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

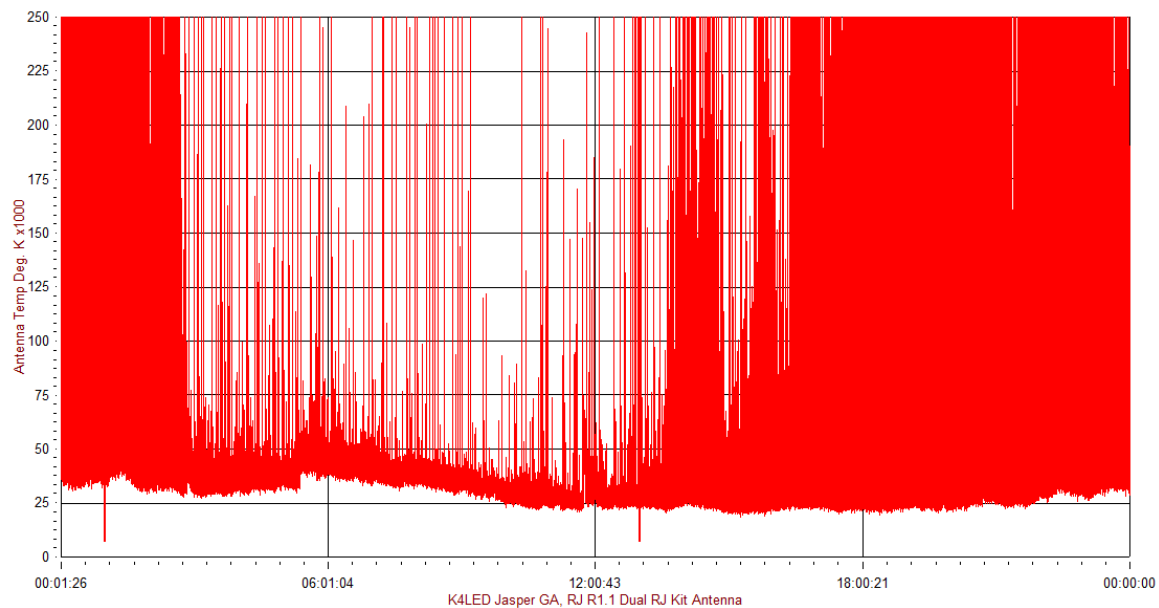
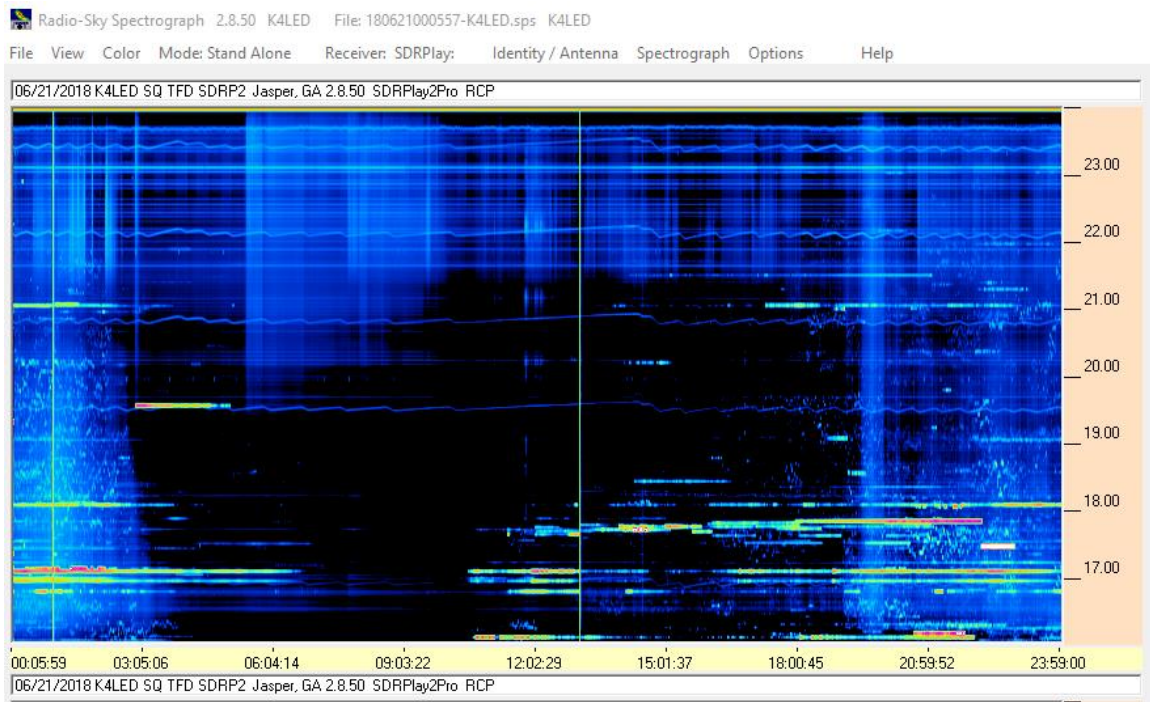
Object: TP, GB, Light Solar

Observer: Larry E. Dodd

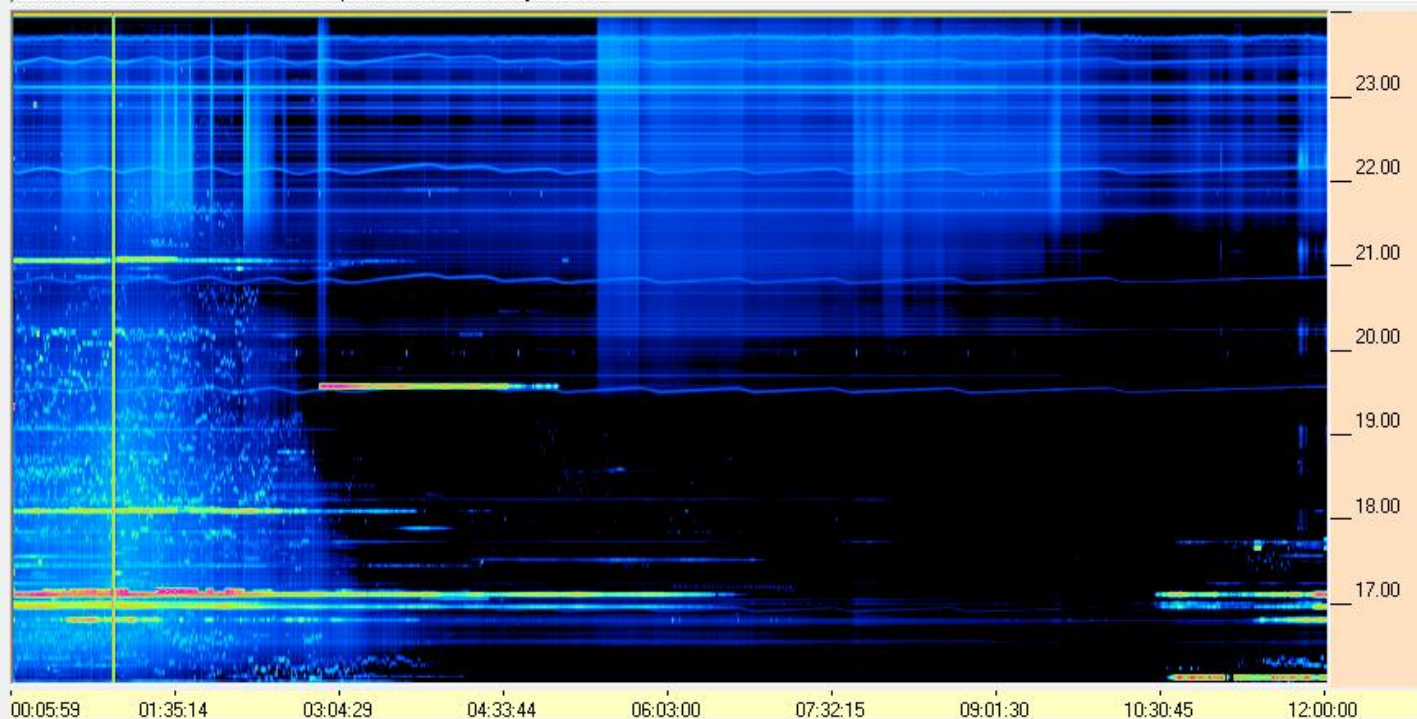
Receivers: FSX11, SDRPlay2PRO, RJ1.1

Software: SkypipeII 2.7.34, Spectrograph 2.8.50

Antennas: Radio Jove Dual Dipole Kit, Typinski Square TFD

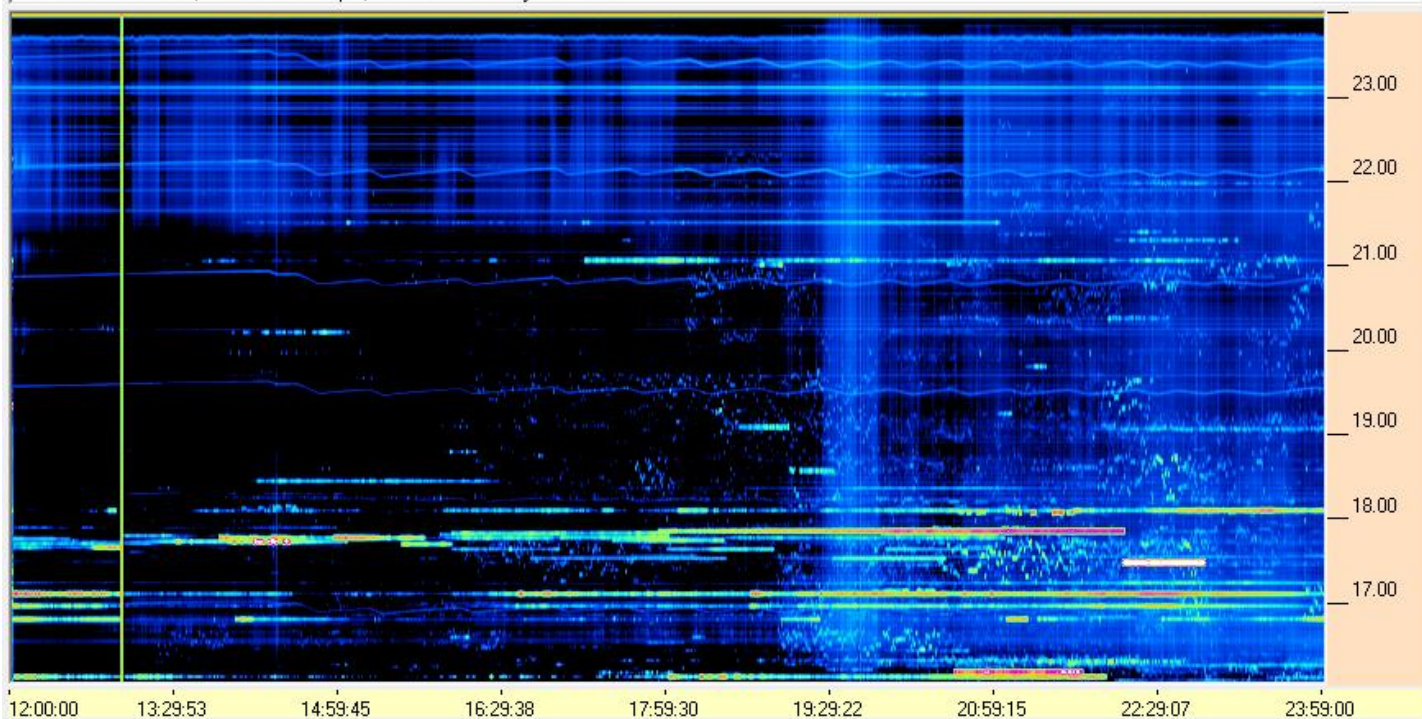


06/21/2018 K4LED SQ TFD SDRP2 Jasper, GA 2.8.50 SDRPlay2Pro RCP

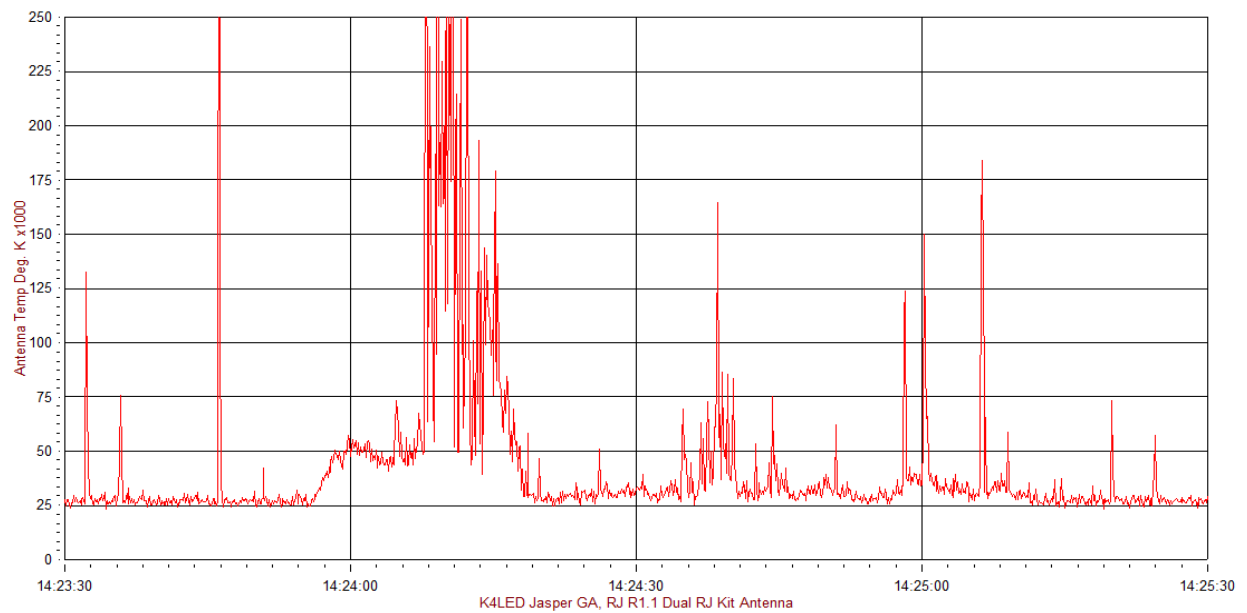
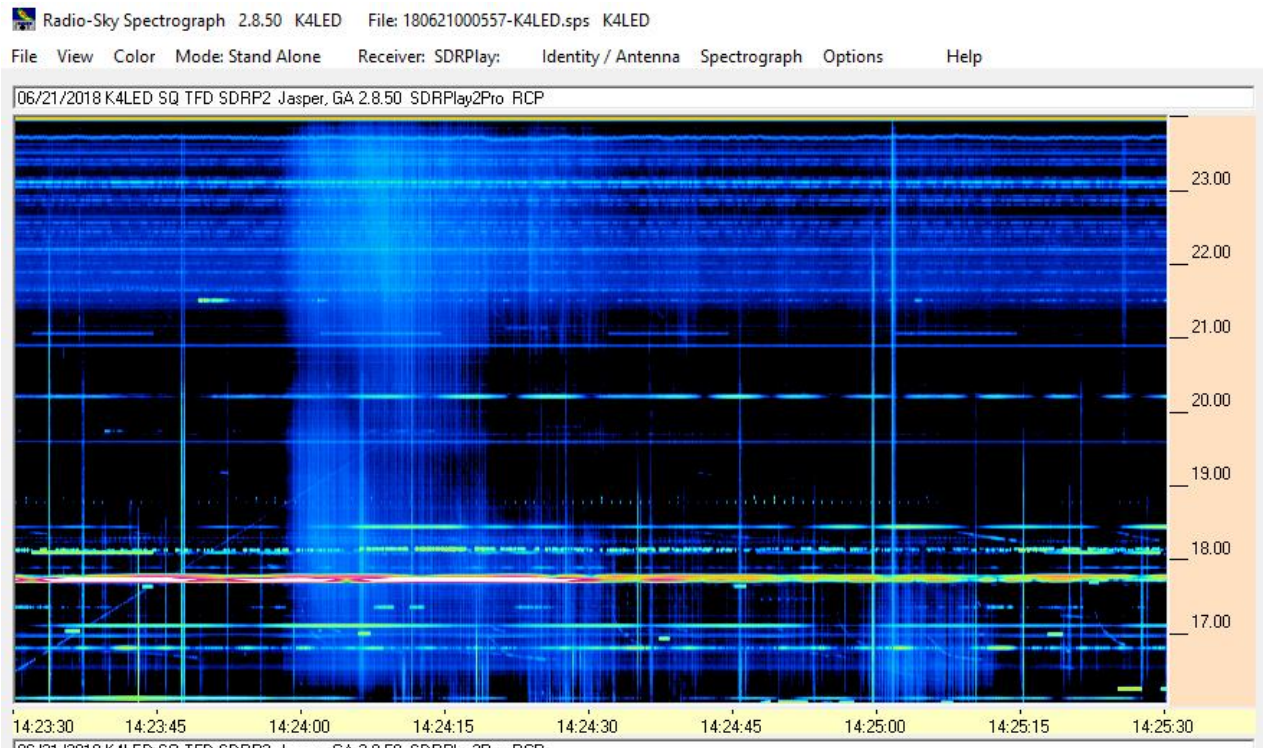


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Station YYYY DAY DDD HHMMSS P1 FFS S AXN PPS IGA PS
Eglin AFB 2018 Jun21 172 141500 RSF 1 713 100 03+ 79

foF2 5.213
foF1 4.16
foF1p 4.22
foE 3.03
foEp 3.04
fxI 5.78
foEs 3.15
fmin 1.00
MUF(D) 17.72
M(D) 3.41
D N/A
h`F 165.0
h`F2 300.0
h`E 91.1
h`Es 100.0
hmF2 201.7
hmF1 132.4
hmE 96.4
yF2 58.7
yF1 10.6
yE 6.2
B0 127.2
B1 1.25
C-level 11
Auto:
Artist5
500200



No Val
NNE
E
W
Vo-
Vo+
SSW
X-
X+
SSE
NNW

D 100 200 400 600 800 1000 1500 3000 [km]
MUF 5.8 5.9 6.1 6.6 7.2 8.2 10.8 17.7 [MHz]
22730498.tmp / 440fx512h 25 kHz 2.5 km / DPS-4D EG931 084 / 30.5 N 273.5 E

ShowIonogram v 1.0

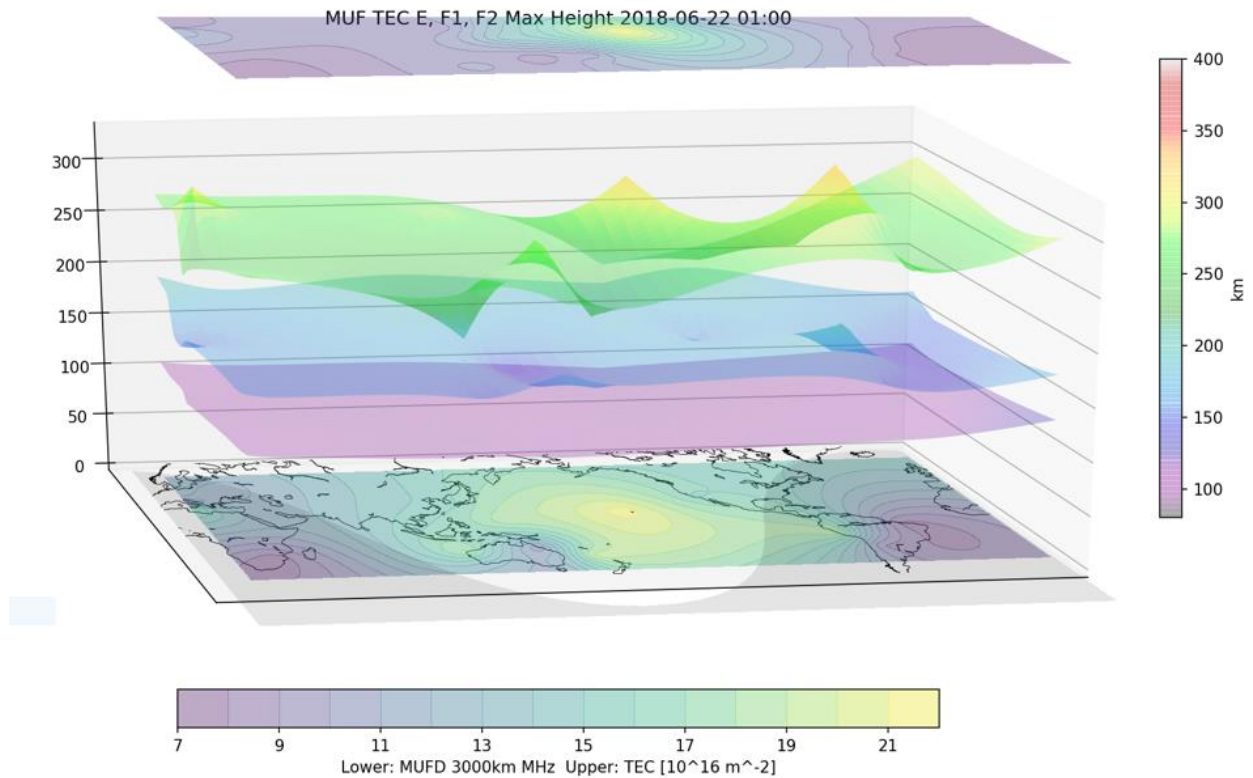
References for Interpreting the Ionogram:

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

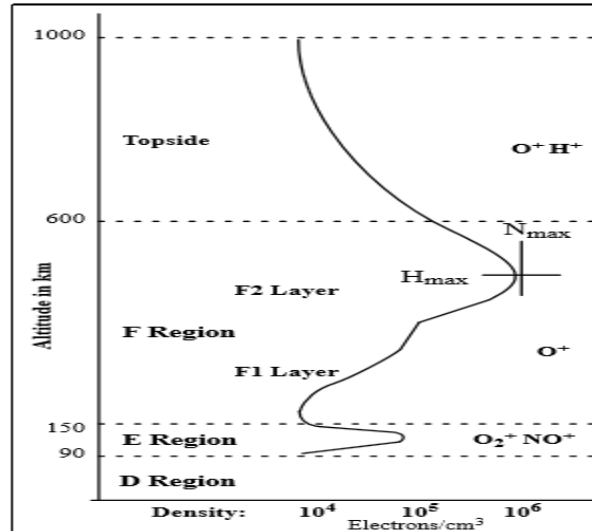
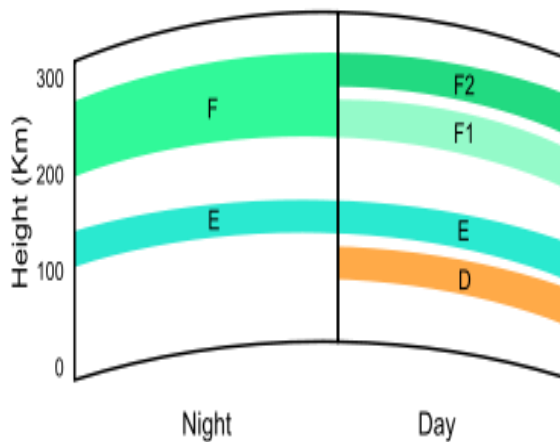
<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.404.5517&rep=rep1&type=pdf>

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

Ionosphere Layers, MUF, Total Electron Content



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 m^3 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>

