

K4LED

Georgia Amateur Radio Astronomy Observatory

Observation Date: 06-28-2018, 0:00:00 to 23:59:00 UTC

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

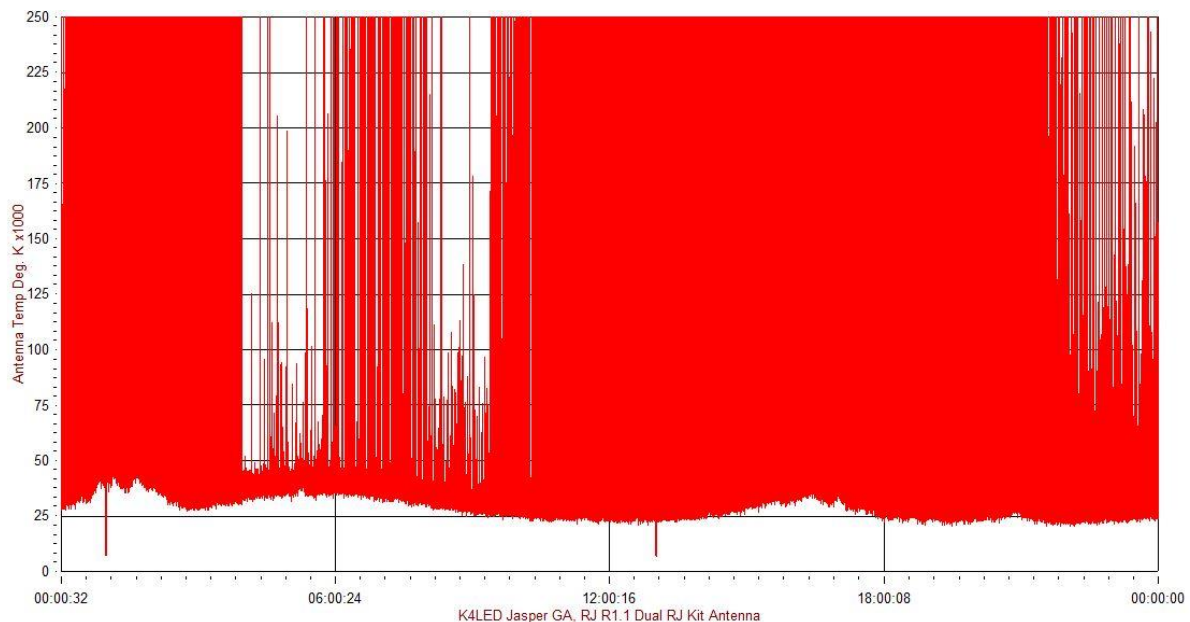
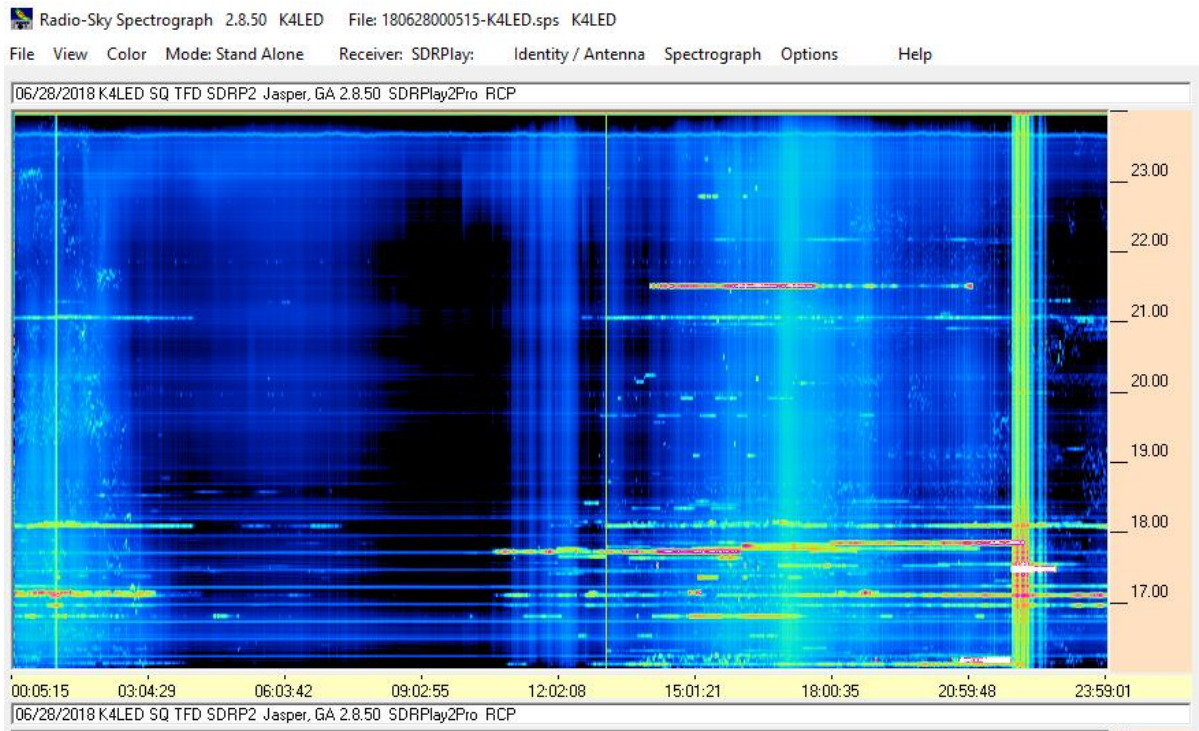
Object: TP, GB, Thunderstorms, Io-B, Non Io-A

Observer: Larry E. Dodd

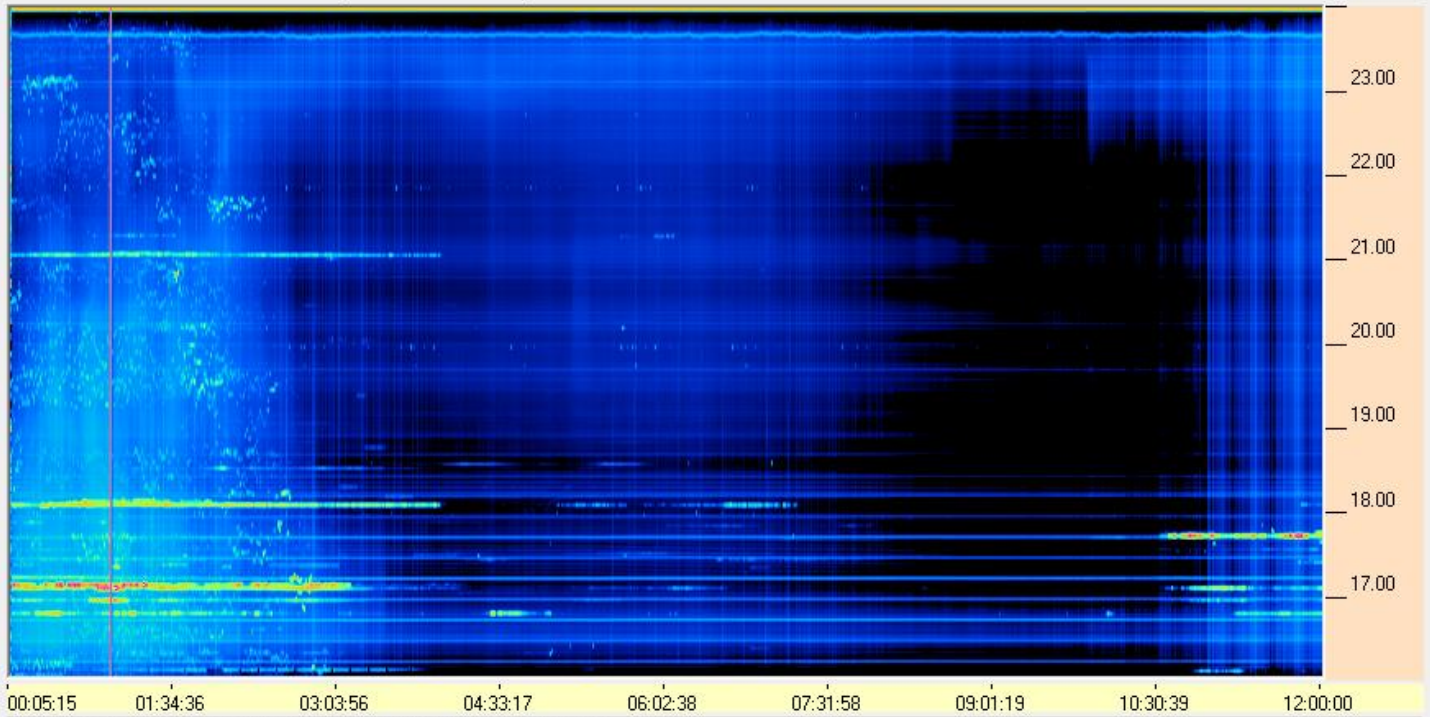
Receivers: FSX11, SDRPlay2PRO, RJ1.1

Software: SkypipeII 2.7.34, Spectrograph 2.8.50

Antennas: Radio Jove Dual Dipole Kit, Typinski Square TFD

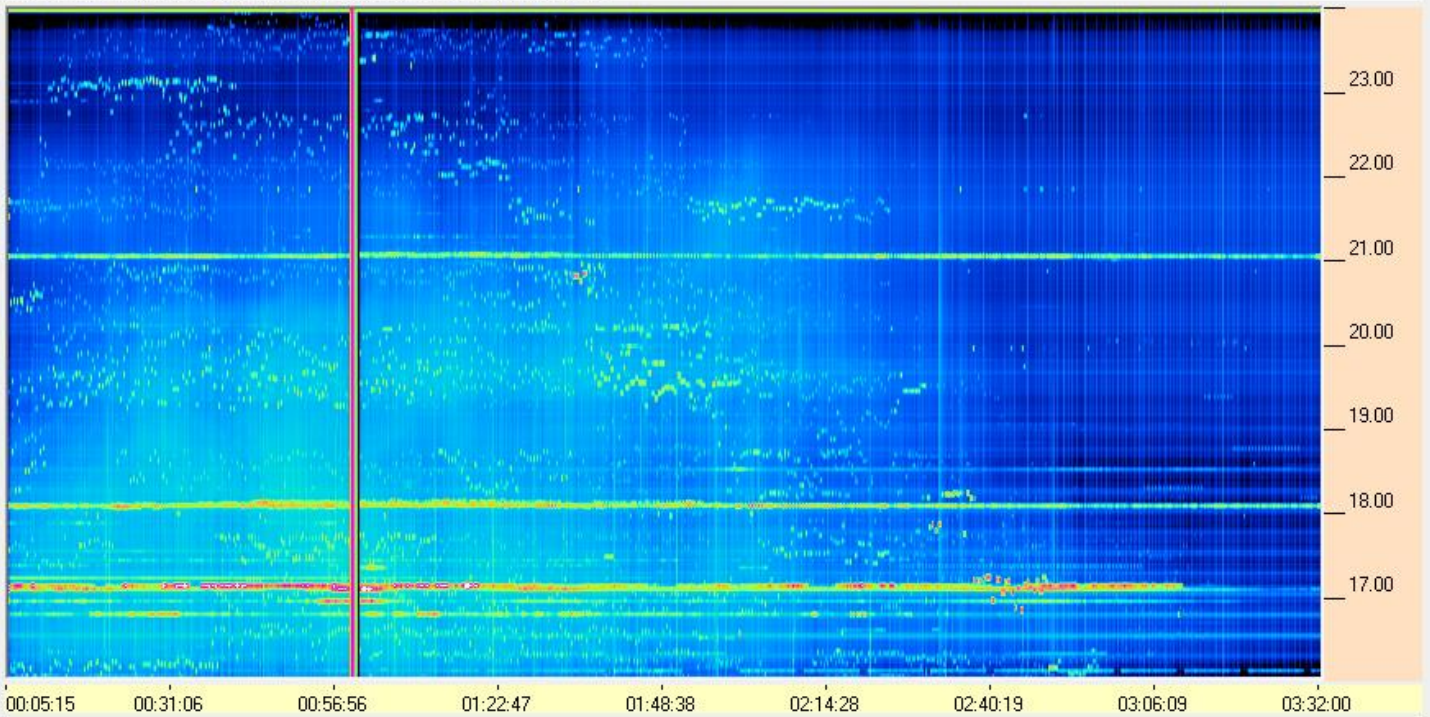


06/28/2018 K4LED SQ TFD SDRP2 Jasper, GA 2.8.50 SDRPlay2Pro LCP



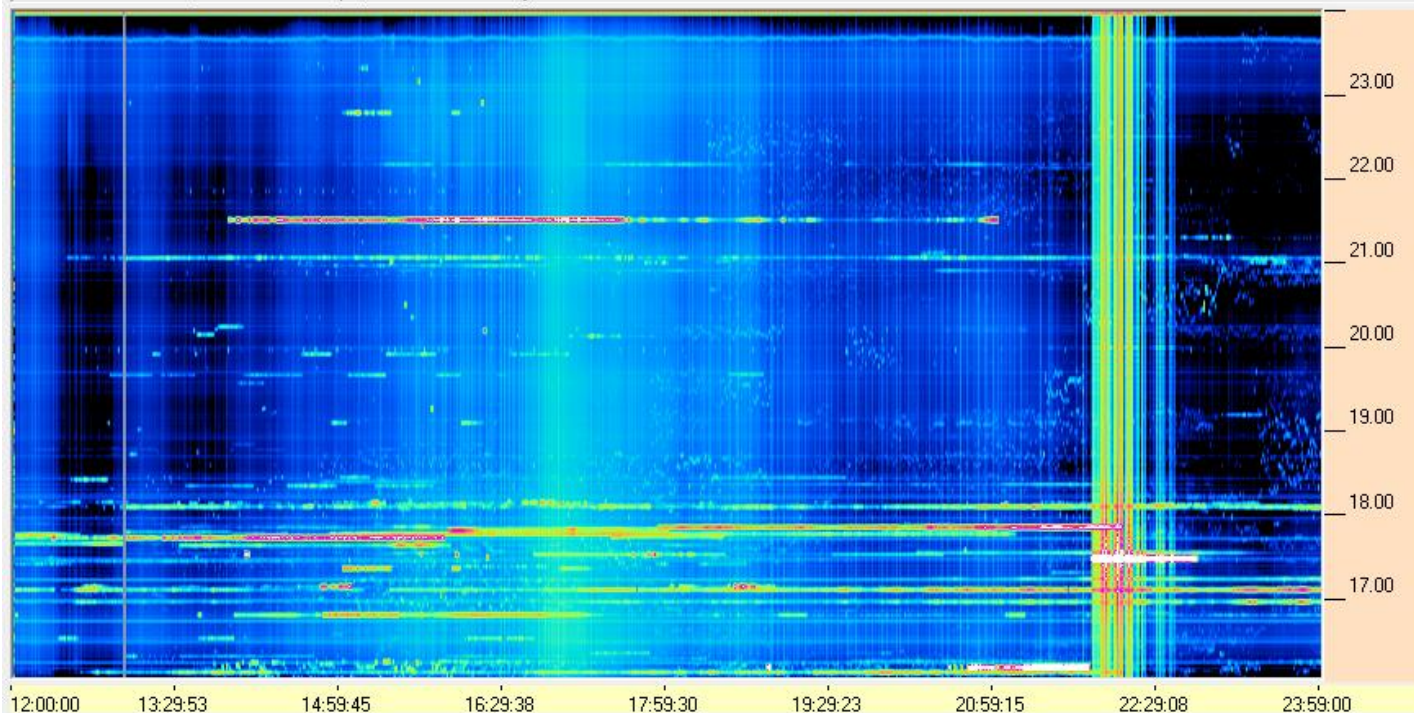
06/28/2018 K4LED SQ TFD SDRP2 Jasper, GA 2.8.50 SDRPlay2Pro LCP

06/28/2018 K4LED SQ TFD SDRP2 Jasper, GA 2.8.50 SDRPlay2Pro RCP



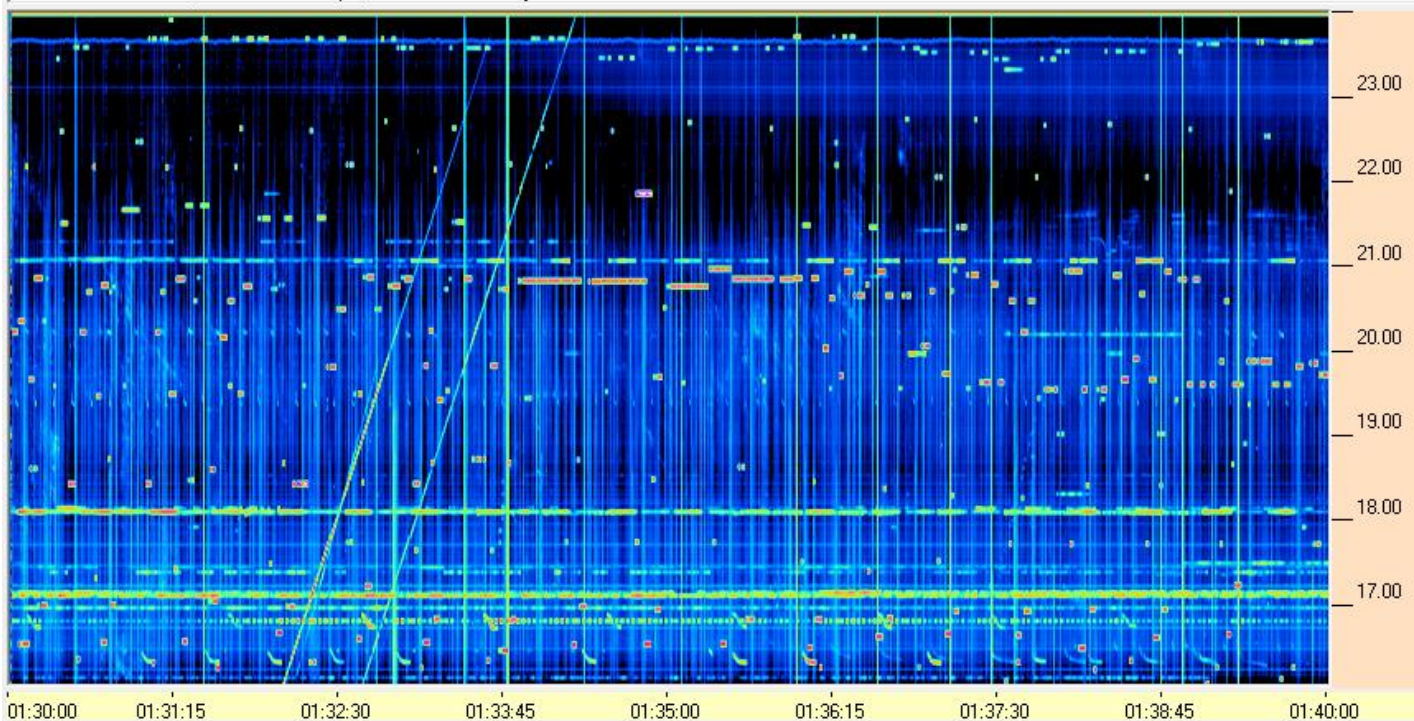
06/28/2018 K4LED SQ TFD SDRP2 Jasper, GA 2.8.50 SDRPlay2Pro RCP

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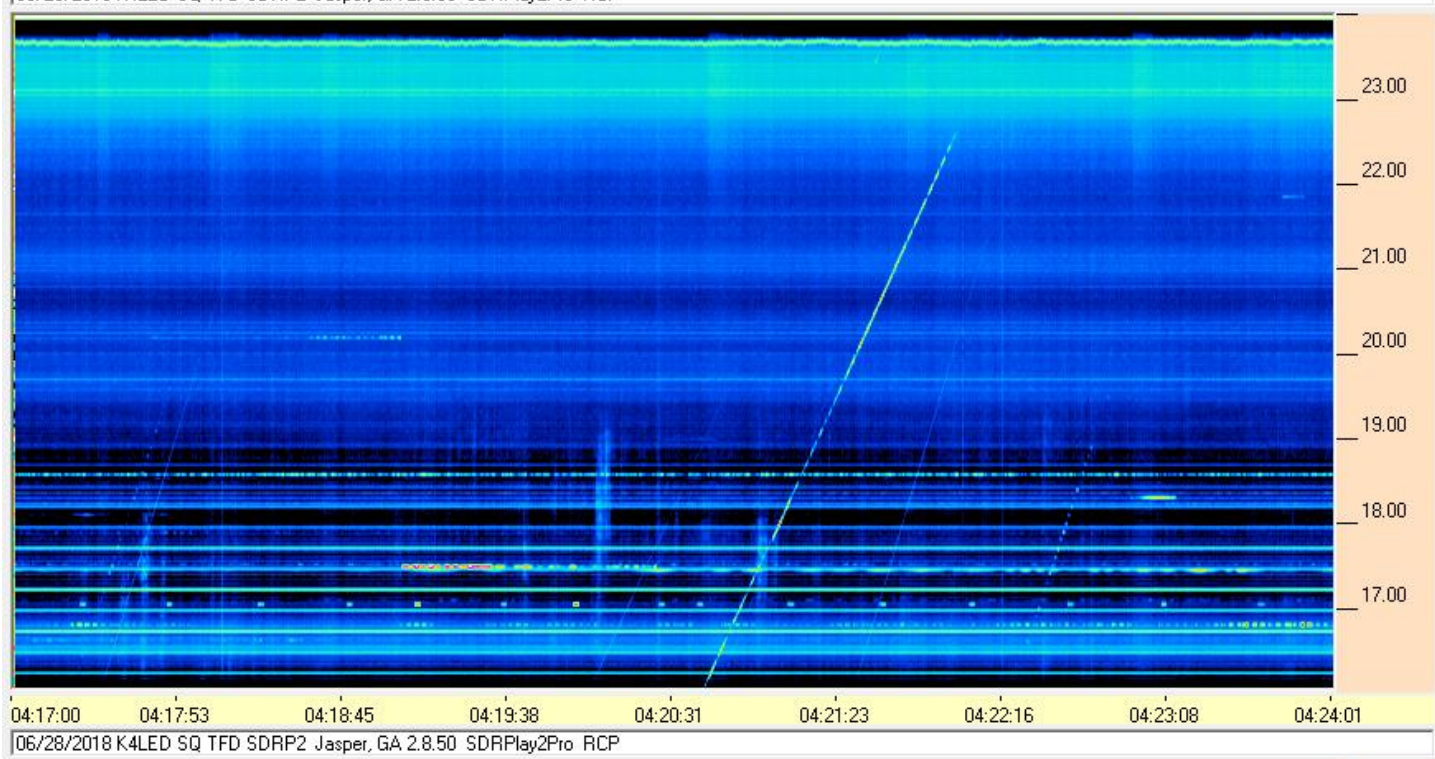
06/28/2018 K4LED SQ TFD SDRP2 Jasper, GA 2.8.50 SDRPlay2Pro RCP

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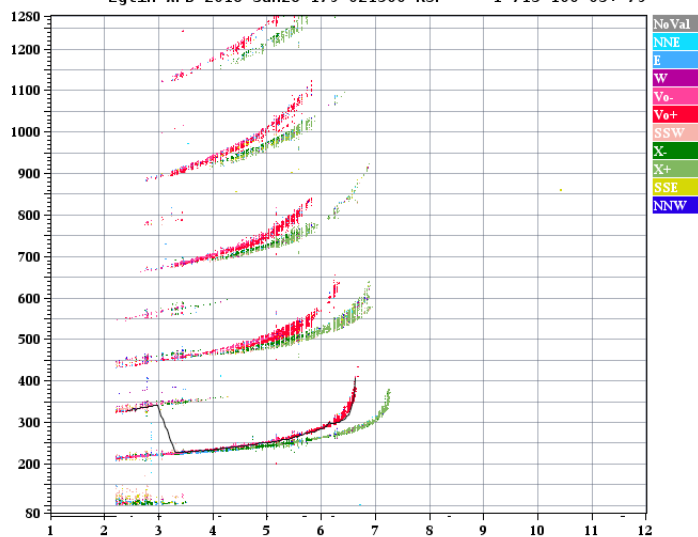
06/28/2018 K4LED SQ TFD SDRP2 Jasper, GA 2.8.50 SDRPlay2Pro RCP

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foF2	6.625
foF1	N/A
foF1p	N/A
foE	N/A
foEp	0.38
fxI	7.30
foEs	N/A
fmin	2.43
MUF(D)	23.13
M(D)	3.49
D	N/A
h'F	227.5
h'F2	227.5
h'E	N/A
h'Es	N/A
hmF2	N/A
hmF1	N/A
hmE	110.0
yF2	N/A
yF1	N/A
yE	20.0
B0	N/A
B1	N/A
C-level	11
Auto:	
Artist5	
500200	

Station	YYYY	DAY	DDD	HHMMSS	P1	FFS	S	AXN	PPS	IGA	PS
Eglin AFB	2018	Jun28	179	021500	RSF			1	713	100	03+ 79



D 100 200 400 600 800 1000 1500 3000 [km]
 MUF 7.2 7.3 7.7 8.3 9.1 10.3 13.9 23.1 [MHz]
 17568316.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:

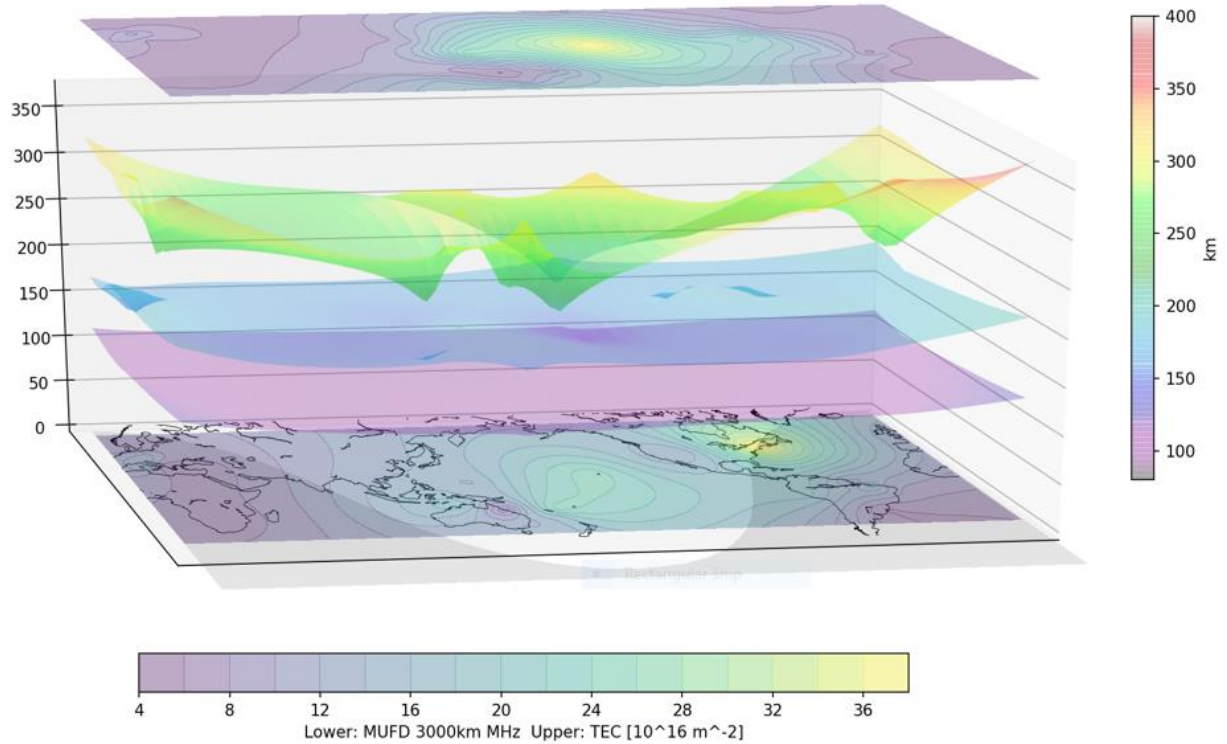
http://www.sws.bom.gov.au/IPSHosted/INAG/uag_23a/UAG_23A_indexed.pdf

<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>

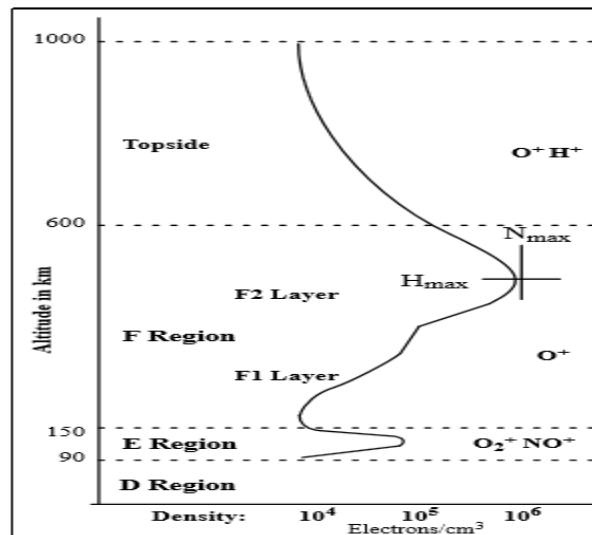
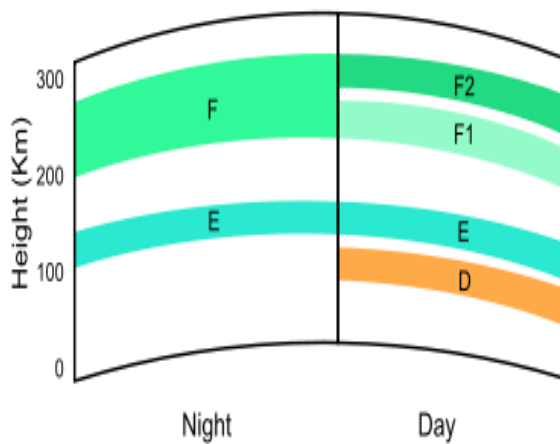
Ionosphere Layers, MUF, Total Electron Content

MUF TEC E, F1, F2 Max Height 2018-06-28 00:25



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

p.html



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:

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

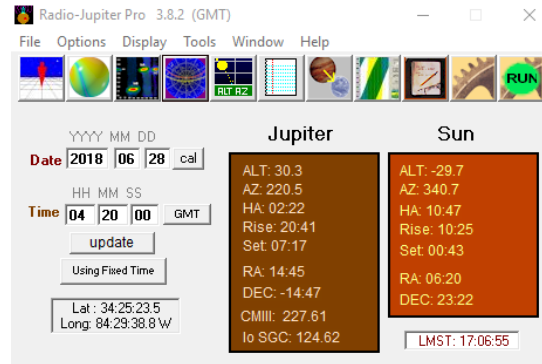
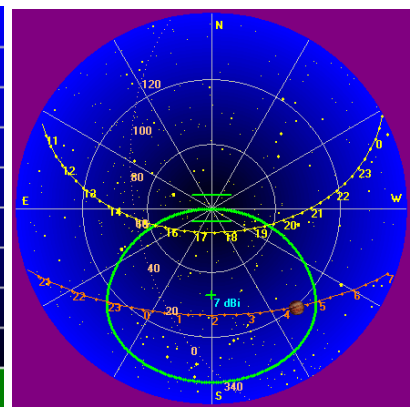
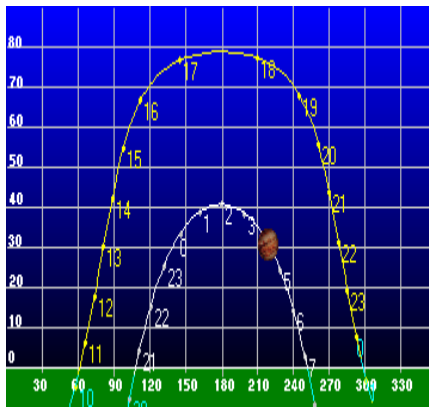
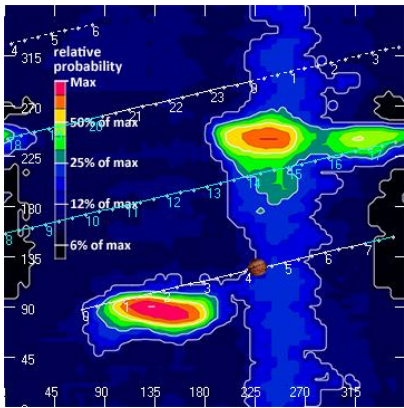
where N = electron density per m^3 and f_{critical} is in Hz.

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.

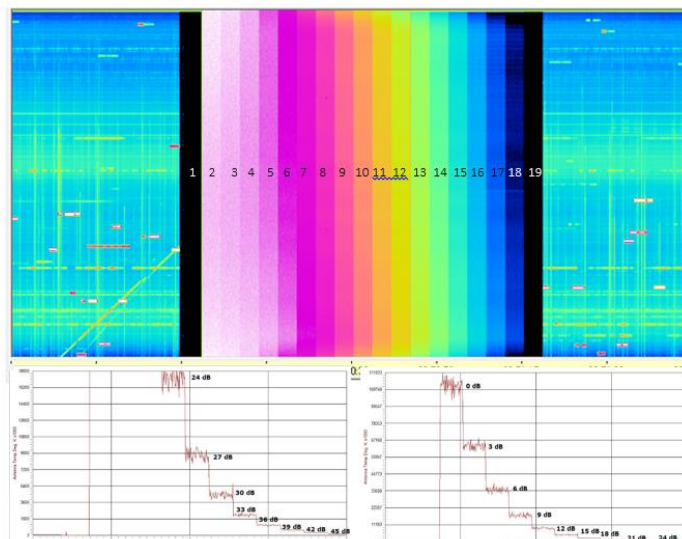
$$f_{\text{muf}} = \frac{f_{\text{critical}}}{\sin \alpha}$$

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>



AUTOMATED CALIBRATION COLOR BAR TEST PATTERN AND DATA ACTUAL MEASURED DATA



STEP	TEMPERATURE	ATTENUATION
1	>1 kK	101 dB
2	104.0 MK	0 dB
3	66.9 MK	3 dB
4	36.3 MK	6 dB
5	19.1 MK	9 dB
6	9.6 MK	12 dB
7	4.5 MK	15 dB
8	2.3 MK	18 dB
9	1.2 MK	21 dB
10	602.0 kK	24 dB
11	296.6 kK	27 dB
12	133.0 kK	30 dB
13	92.2 kK	33 dB
14	51.6 kK	36 dB
15	32.0 kK	39 dB
16	22.6 kK	42 dB
17	17.9 kK	45 dB
18	12.0 kK	48 dB
19	>1 kK	101 dB