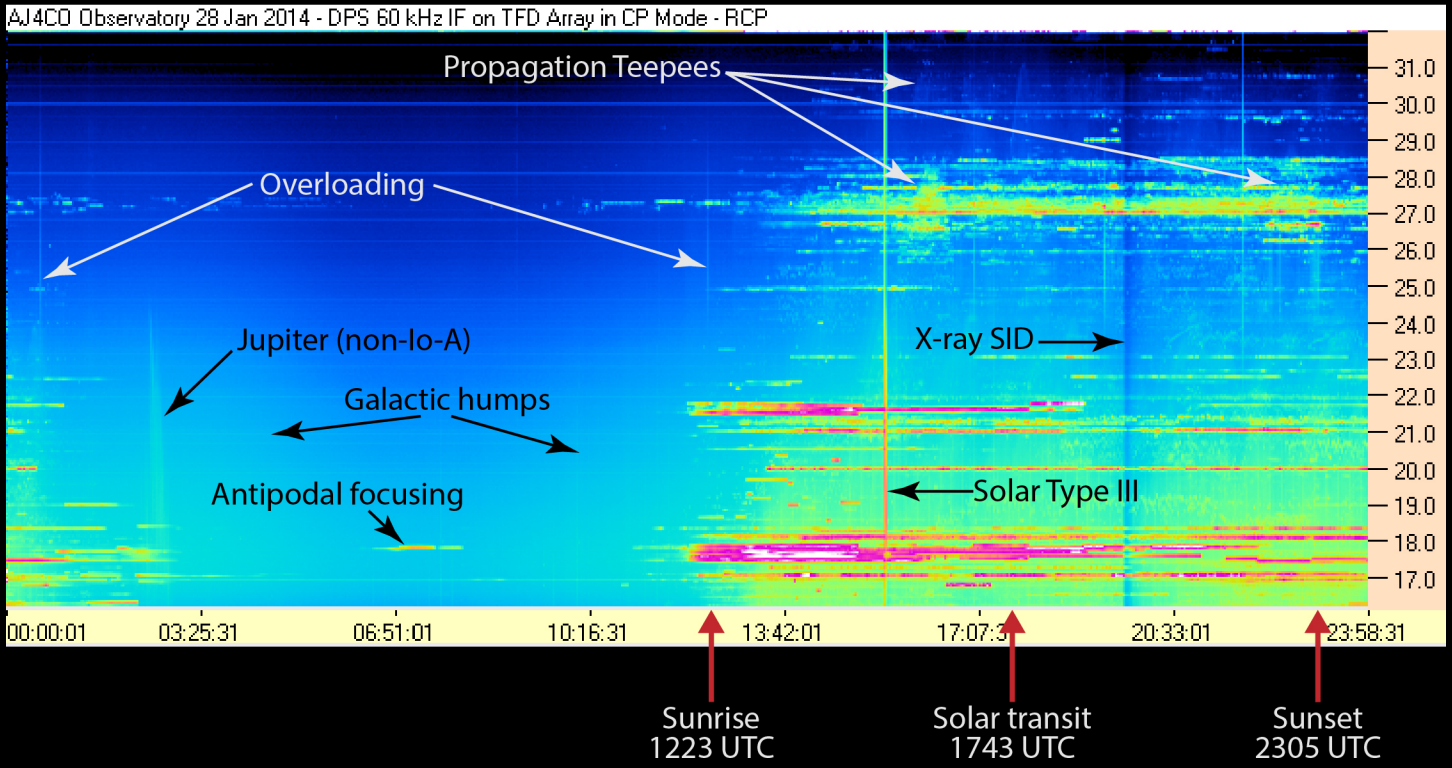
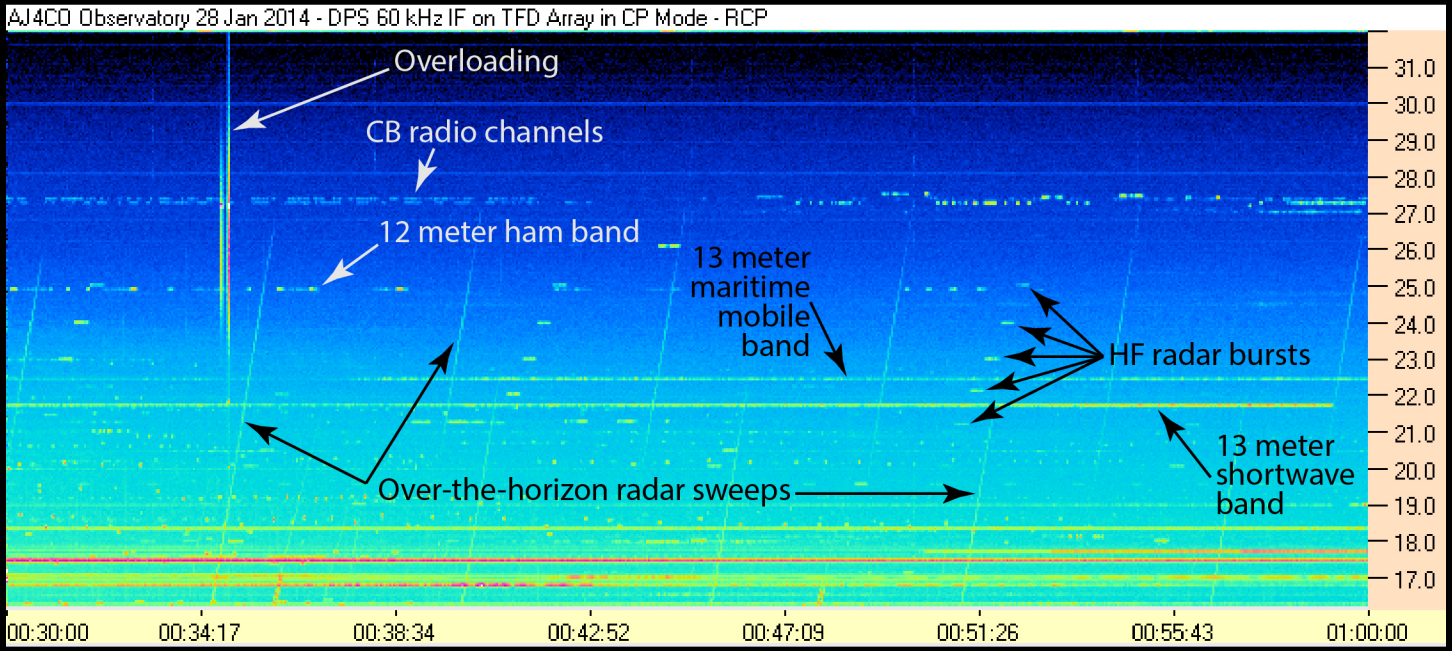
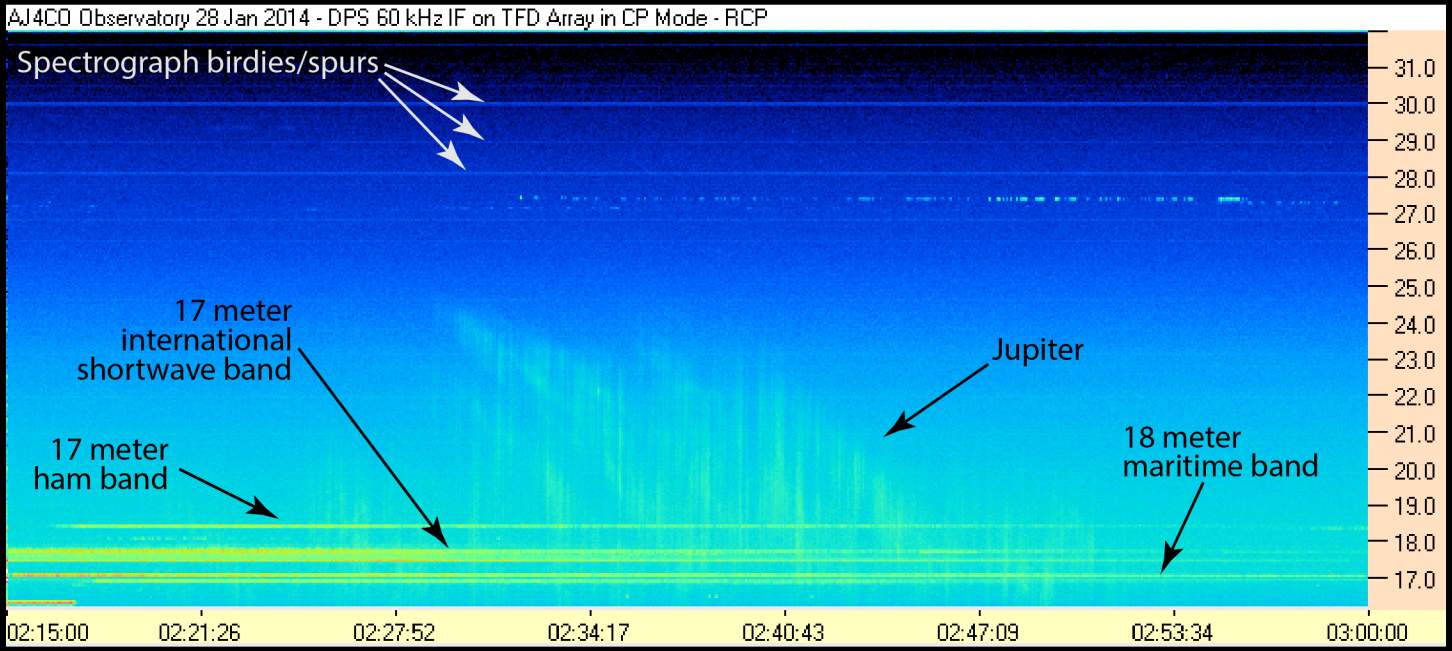
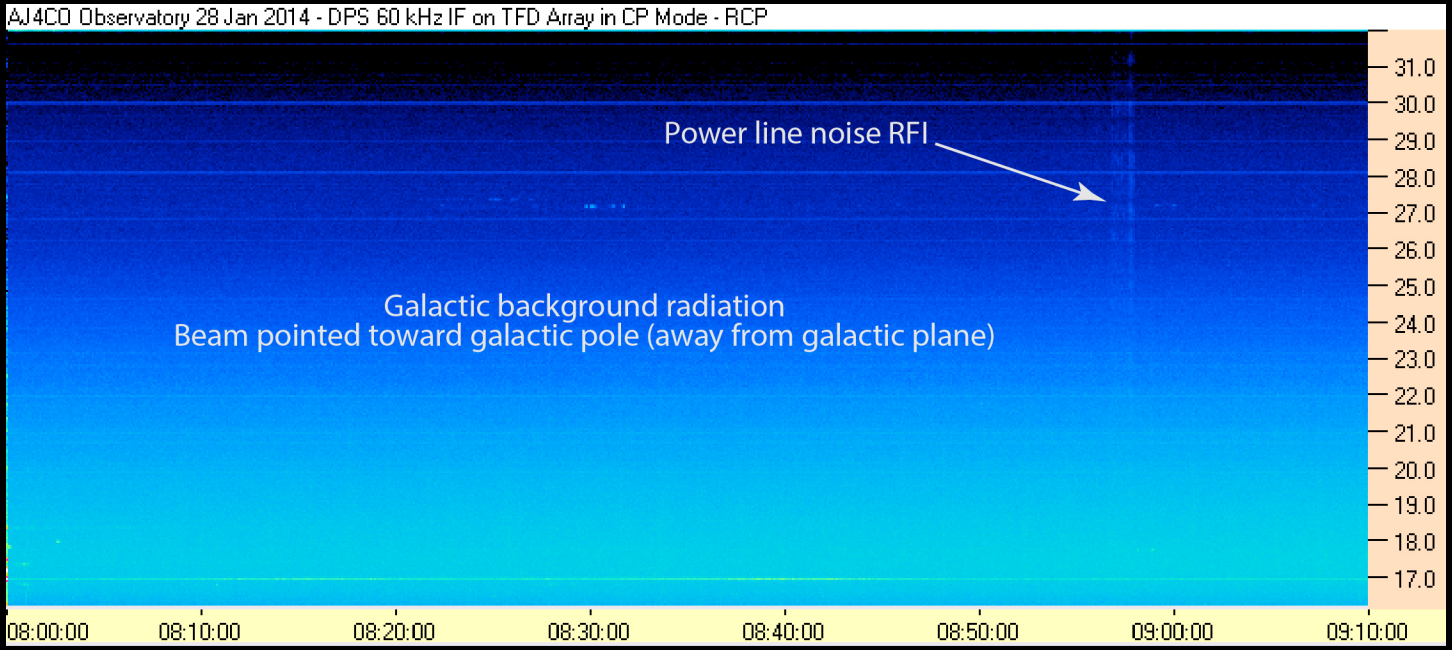
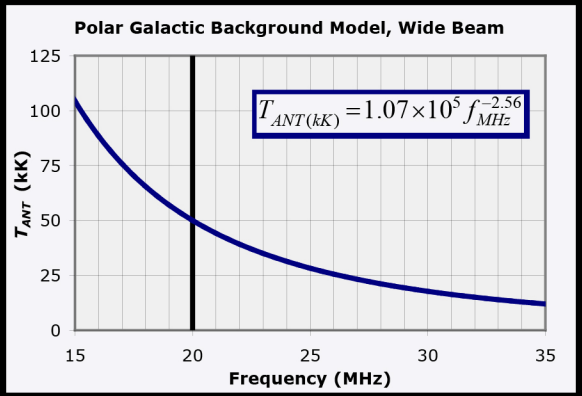
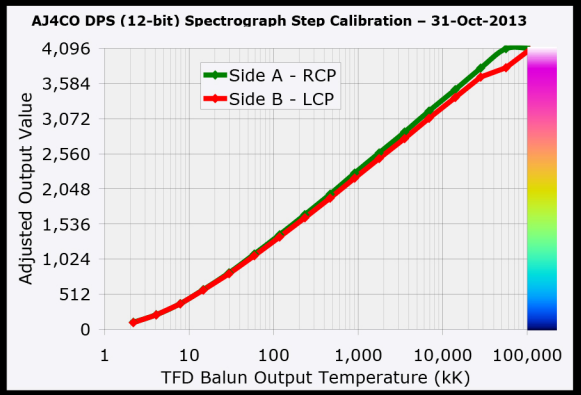

AJ4CO Observatory 28 Jan 2014 - DPS 60 kHz IF on TFD Array in CP Mode - RCP
Propagation Teepees
Overloading
Jupiter (non-Io-A)
Galactic humps
Antipodal focusing
X-ray SID
Solar Type III
31.0
30.0
29.0
28.0
27.0
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
00:00:01
03:25:31
06:51:01
10:16:31
13:42:01
17:07:31
20:33:01
23:58:31
Sunrise
1223 UTC
Solar transit
1743 UTC
Sunset
2305 UTC

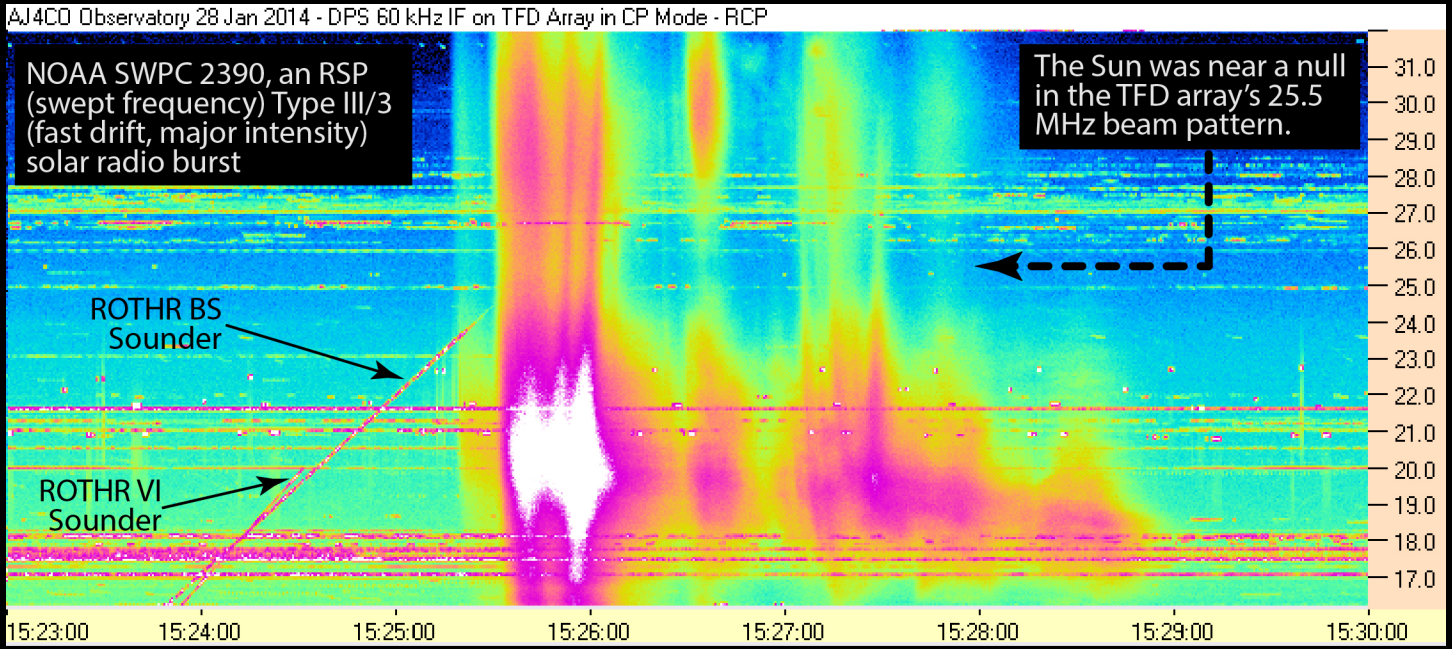

AJ4CO Observatory 28 Jan 2014 - DPS 60 kHz IF on TFD Array in CP Mode - RCP
Overloading
CB radio channels
12 meter ham band
13 meter maritime mobile band
HF radar bursts
Over-the-horizon radar sweeps
13 meter shortwave band
31.0
30.0
29.0
28.0
27.0
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
00:30:00
00:34:17
00:38:34
00:42:52
00:47:09
00:51:26
00:55:43
01:00:00


AJ4CO Observatory 28 Jan 2014 - DPS 60 kHz IF on TFD Array in CP Mode - RCP
Spectrograph birdies/spurs
17 meter international shortwave band
Jupiter
17 meter ham band
18 meter maritime band
31.0
30.0
29.0
28.0
27.0
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
02:15:00
02:21:26
02:27:52
02:34:17
02:40:43
02:47:09
02:53:34
03:00:00


AJ4CO Observatory 28 Jan 2014 - DPS 60 kHz IF on TFD Array in CP Mode - RCP
Power line noise RFI
Galactic background radiation
Beam pointed toward galactic pole (away from galactic plane)
31.0
30.0
29.0
28.0
27.0
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
08:00:00
08:10:00
08:20:00
08:30:00
08:40:00
08:50:00
09:00:00
09:10:00


Polar Galactic Background Model, Wide Beam
$T_{ANT(kK)} = 1.07 \times 10^5 f_{MHz}^{-2.56}$
T_{ANT} (kK)
125
100
75
50
25
0
15
20
25
30
35
Frequency (MHz)

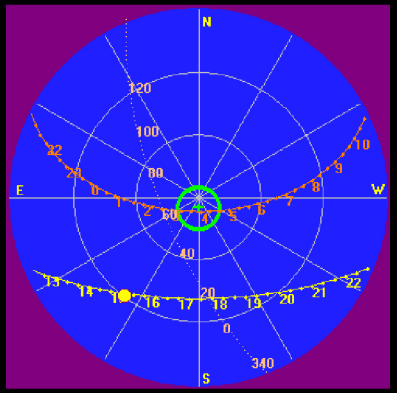

AJ4CO DPS (12-bit) Spectrograph Step Calibration – 31-Oct-2013
Side A - RCP
Side B - LCP
Adjusted Output Value
4,096
3,584
3,072
2,560
2,048
1,536
1,024
512
0
1
10
100
1,000
10,000
100,000
TFD Balun Output Temperature (kK)

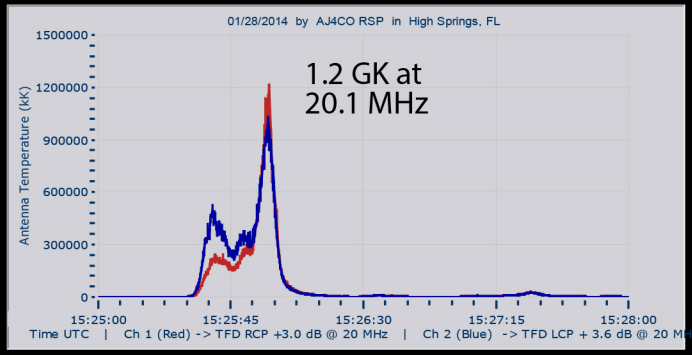


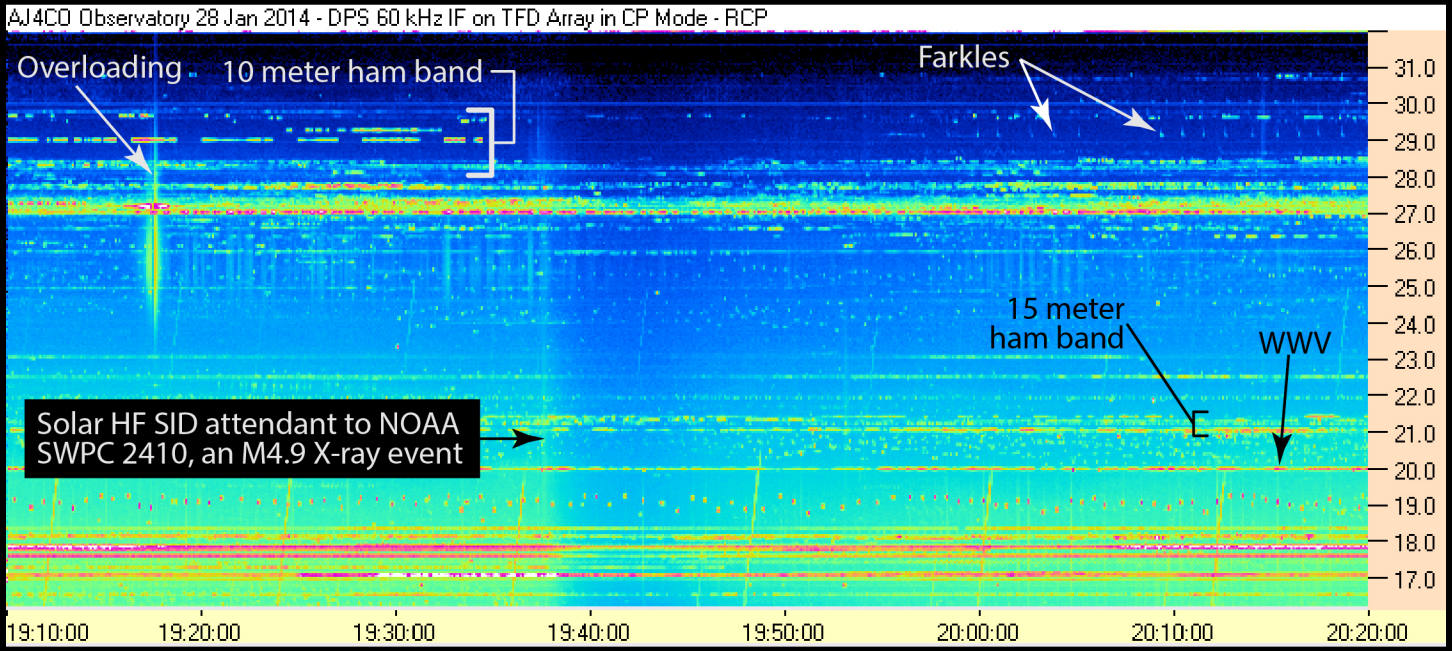
Relocatable Over The Horizon Radar (ROTHR) US Navy AN/TPS-71

Vertical Incidence (VI) sounder - an ionosonde

Backscatter (BS) sounder - the radar emission

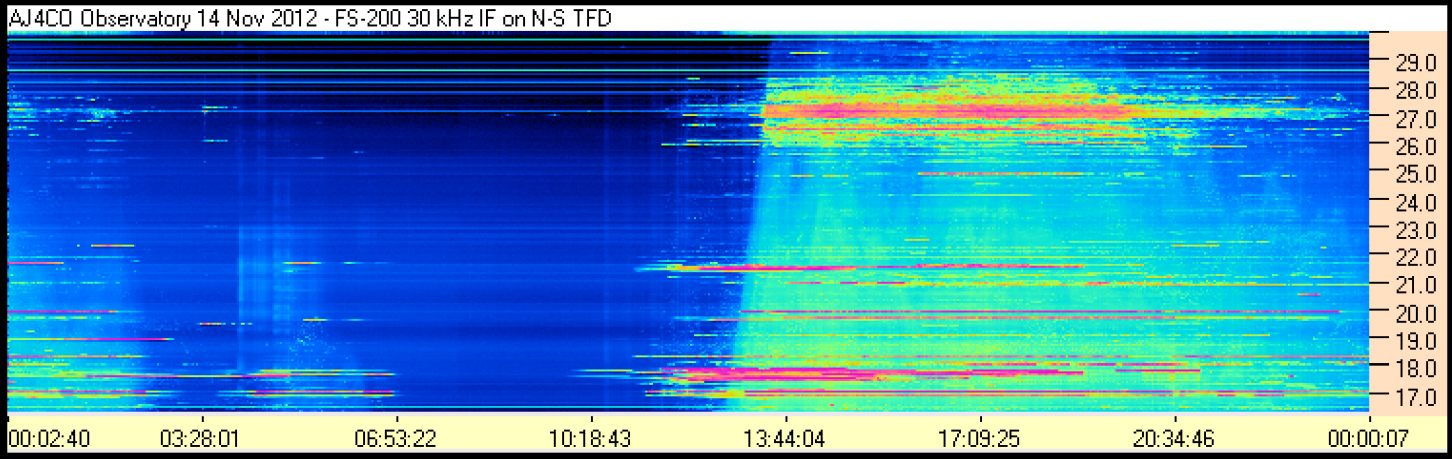


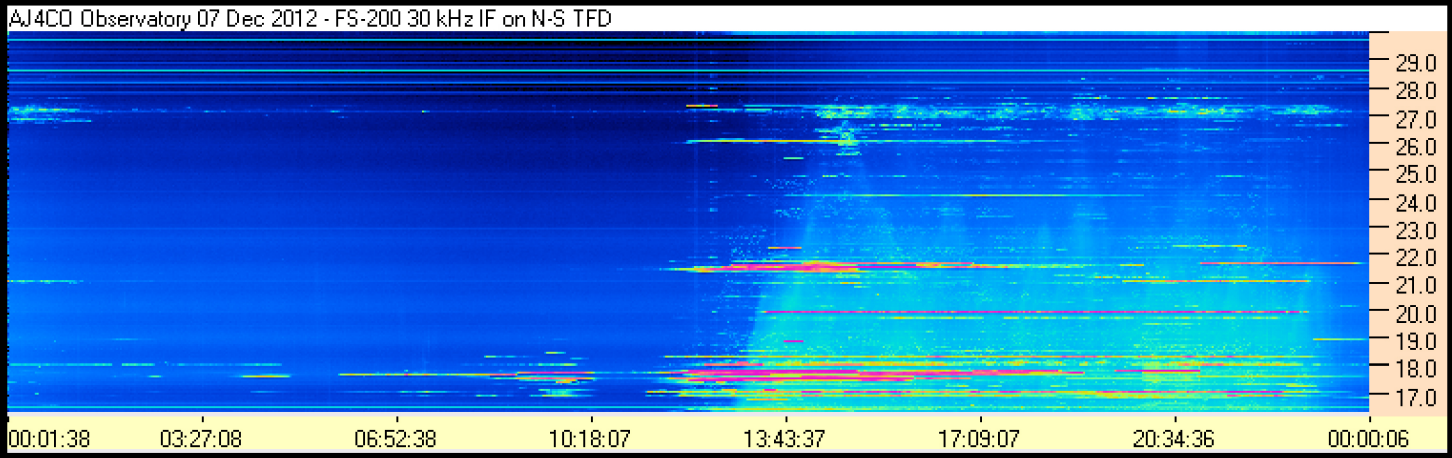




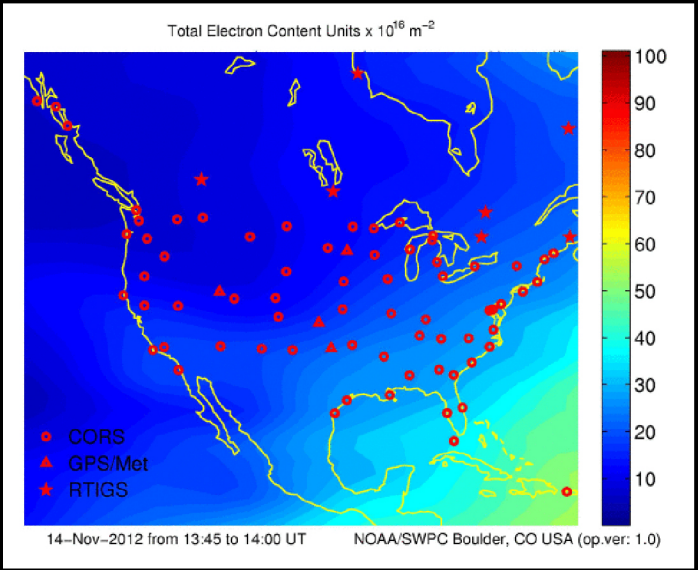
Sudden Inospheric Disturbance (SID) - seen in the HF band as an attenuation of the galactic background and terrestrial propagation due to increased ionization of the D layer causing D layer absorption to increase.

PROPAGATION TEEPEES

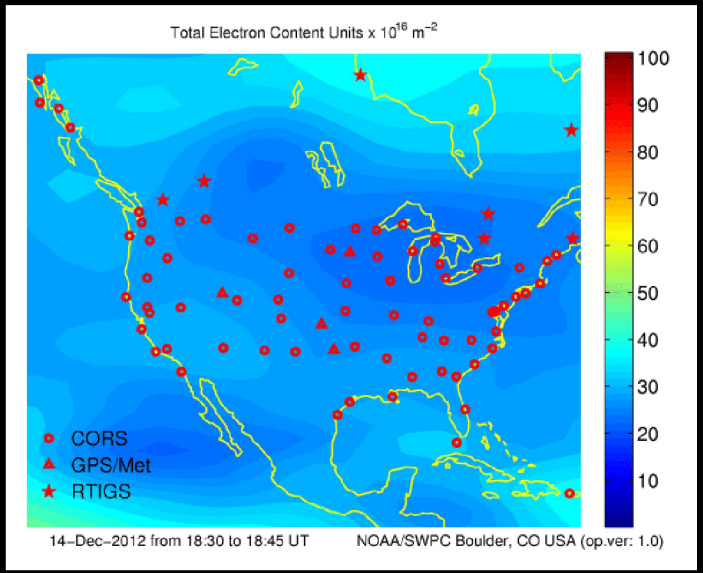




US TEC

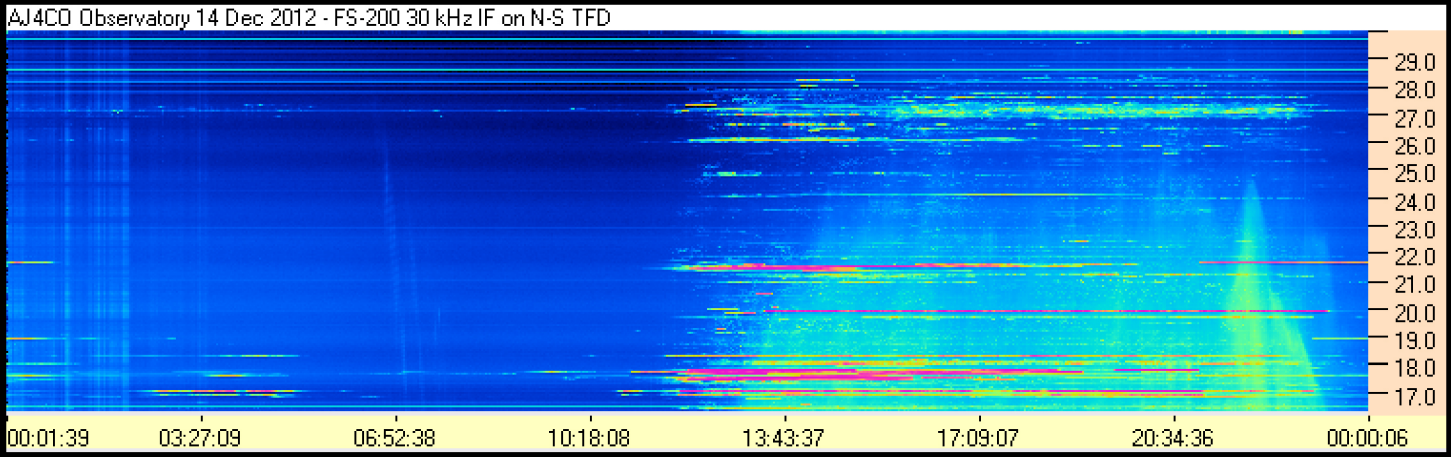


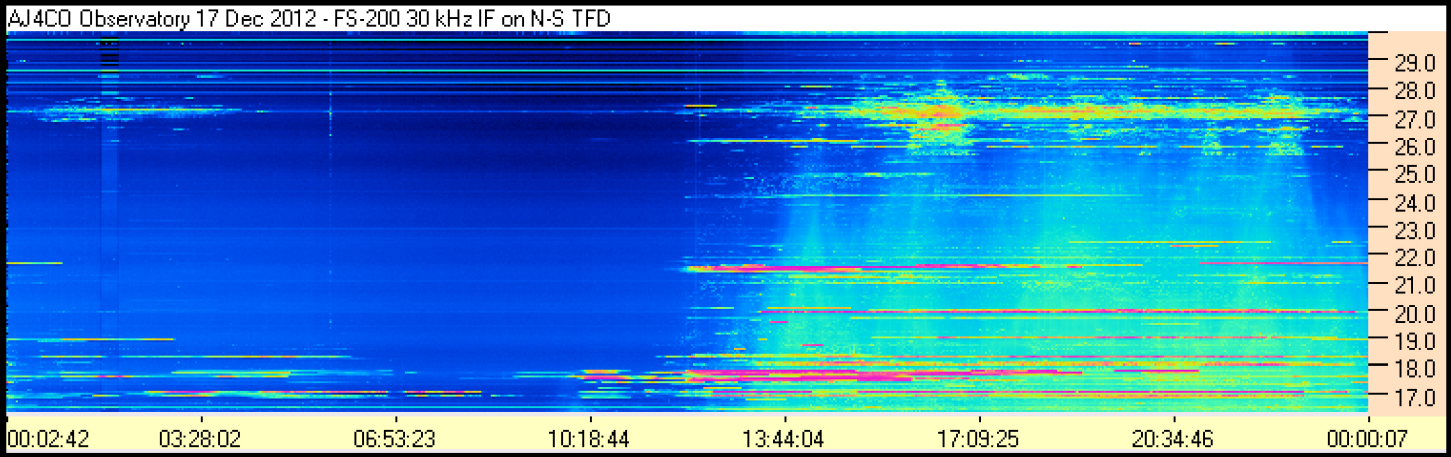
US Total Electron Content (TEC) - number of free electrons in a vertical column - units are 10^{16} electrons per square meter. Larger numbers indicate more propagation of terrestrial radio emissions. See http://www.swpc.noaa.gov/ustec/



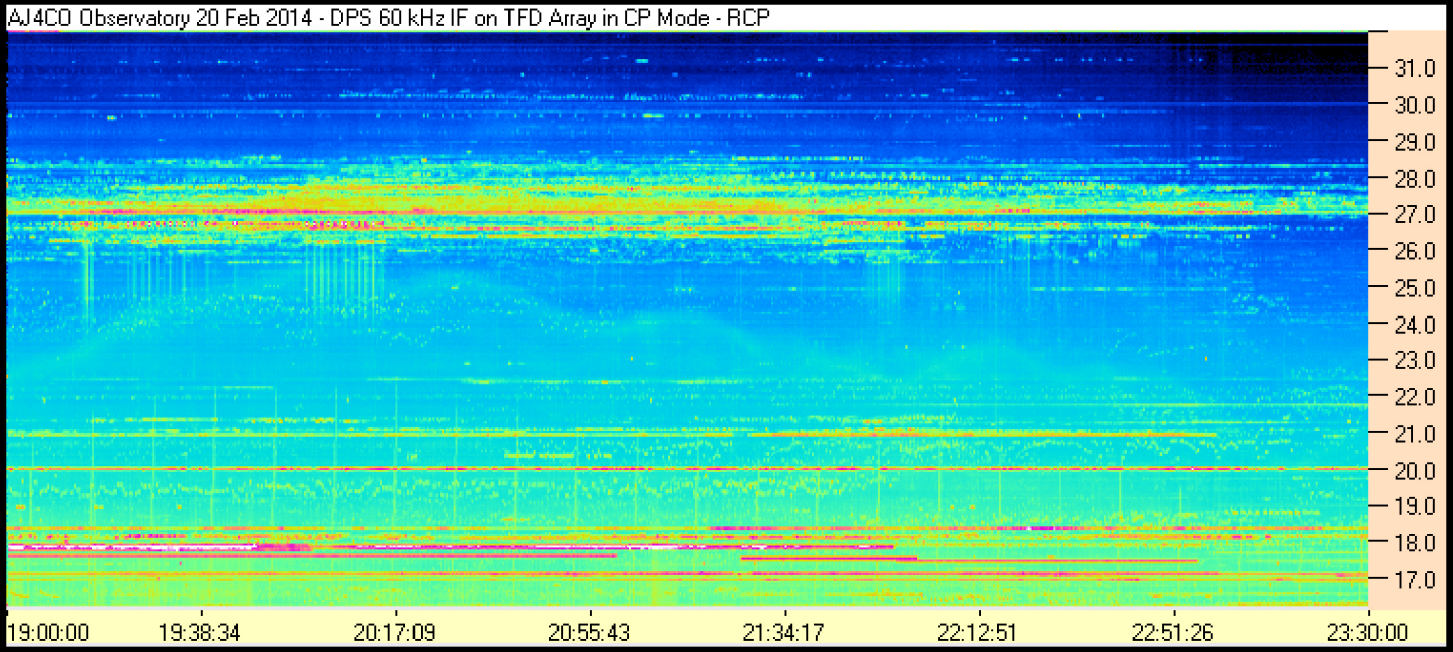
As ionospheric "blobs" – areas of higher TEC – pass near an observer, the propagation teepees are observed.

PROPAGATION TEEPEES

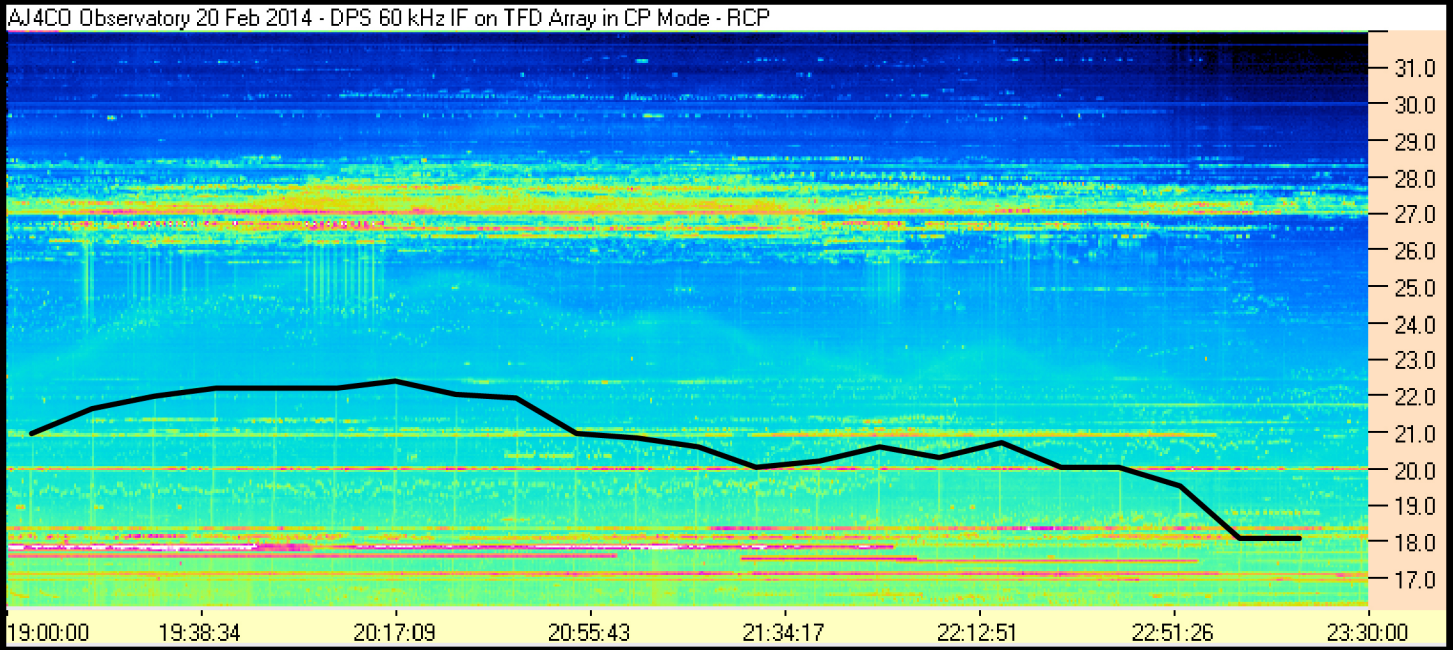




PROPAGATION TEEPEES

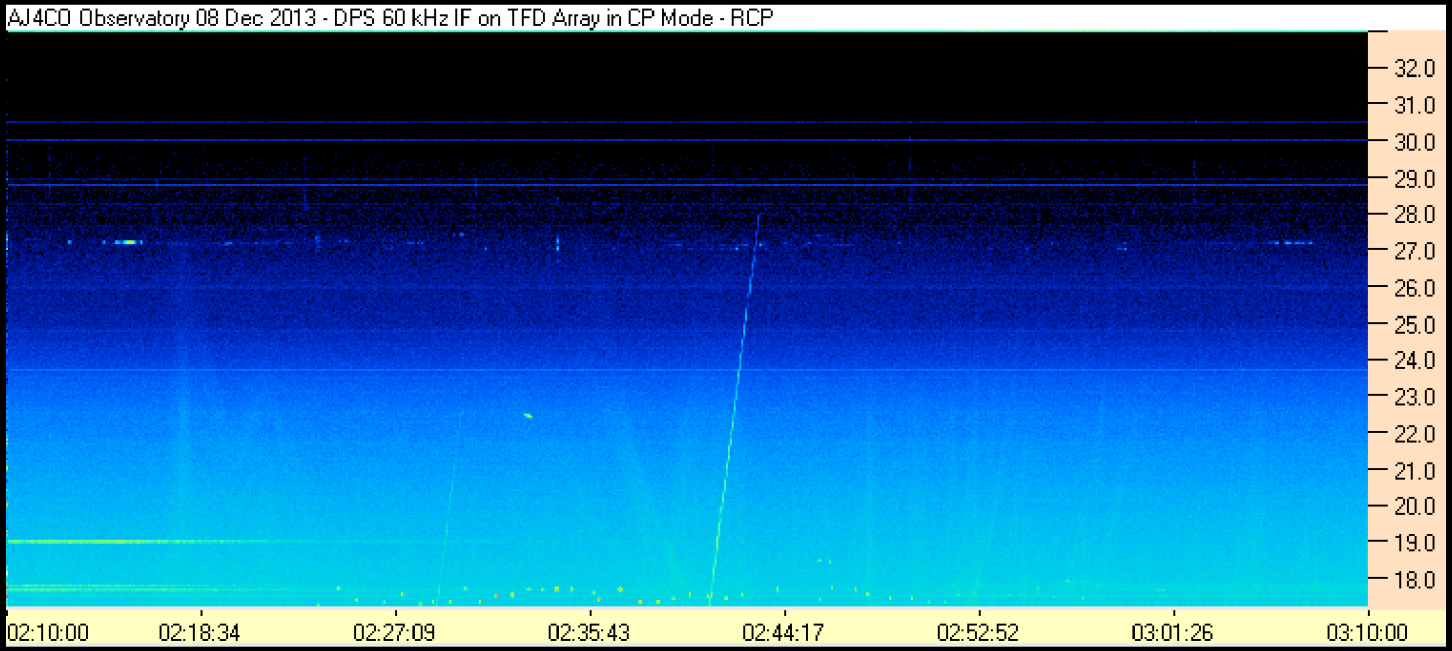


PROPAGATION TEEPEES



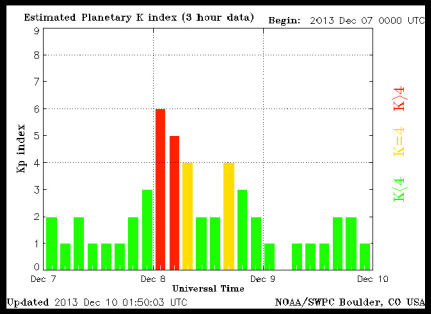
ROTHR backscatter sounders sweep to 30 MHz every 12 minutes.
The maximum observed radar emission frequency indictaes the maximum usable frequency (MUF) between the radar transmitter and the observer.
Note how the MUF tracks with the propagation TP envelope.

GEOMAGNETIC UPSET



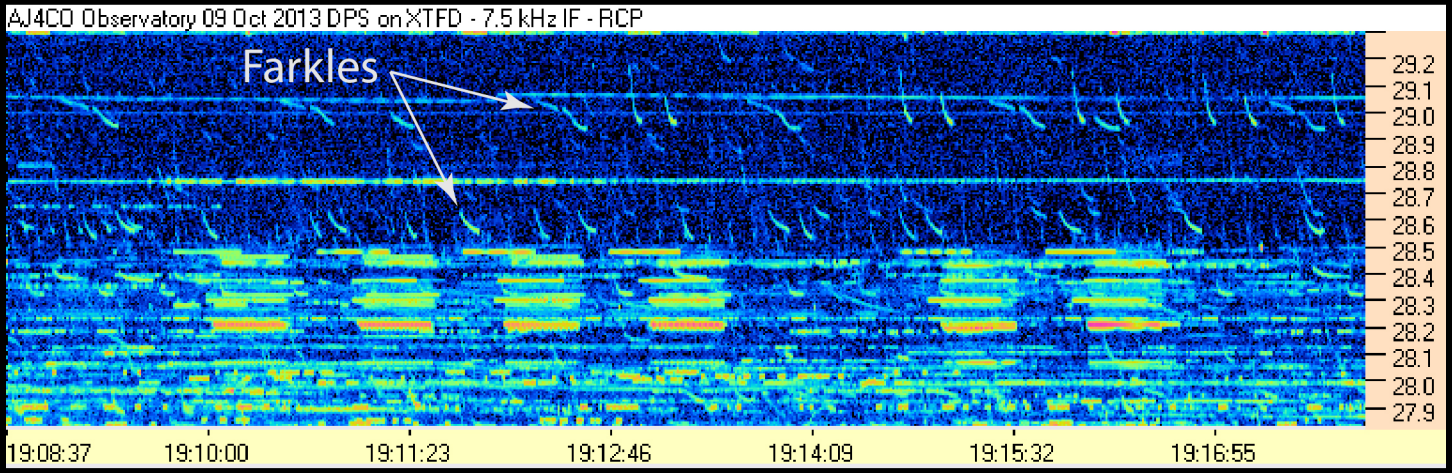
Sunset at 1730 UTC previous day.

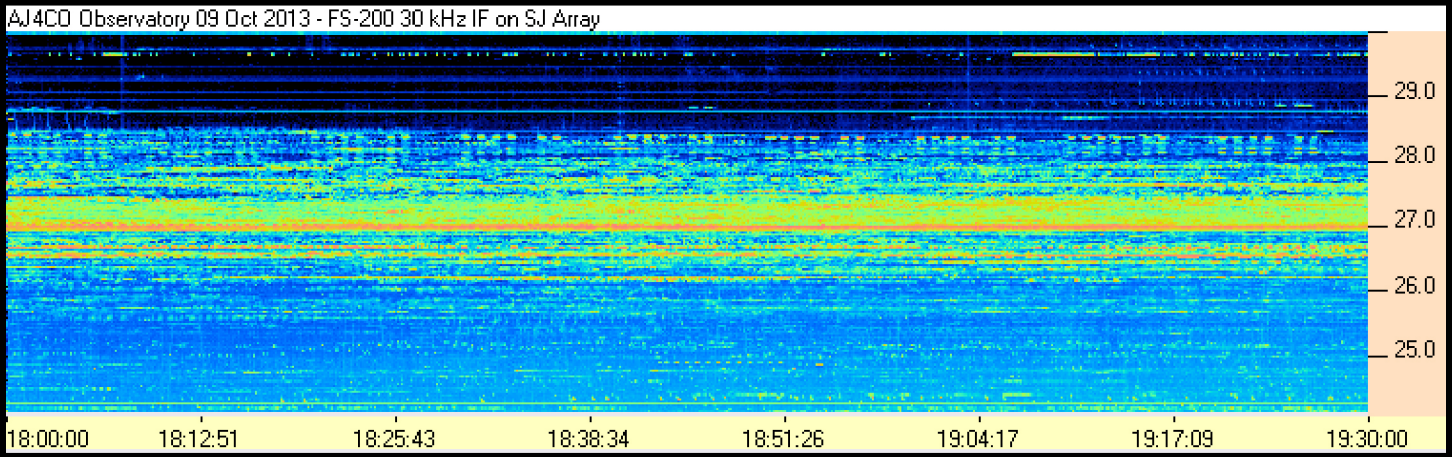
CME impact causing changes in the ionosphere observed as a propagation anomaly.



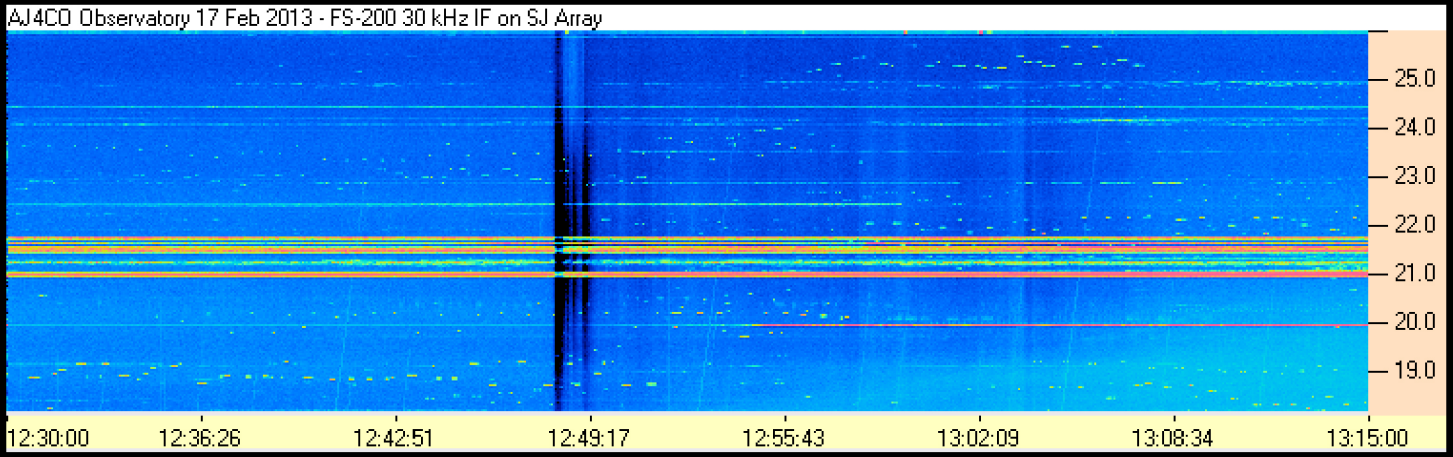
Estimated Planetary K Index (K_p) was 6.
http://www.swpc.noaa.gov/rt_plots/kp_3d.html

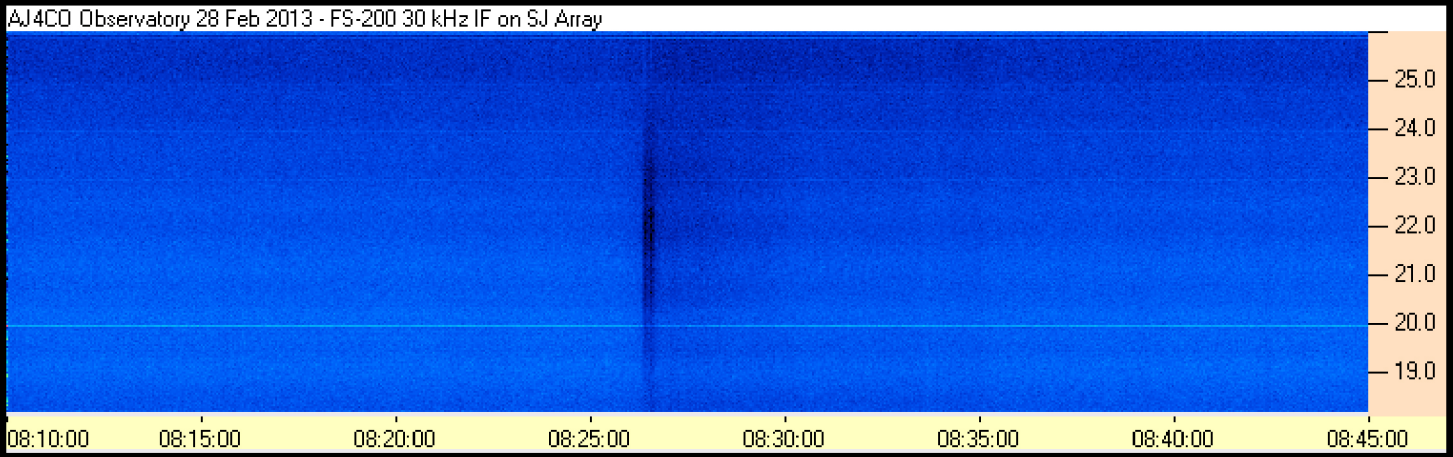
HI JUNO


AJ4CO Observatory 09 Oct 2013 DPS on XTFD - 7.5 kHz IF - RCP
Farkles
29.2
29.1
29.0
28.9
28.8
28.7
28.6
28.5
28.4
28.3
28.2
28.1
28.0
27.9
19:08:37
19:10:00
19:11:23
19:12:46
19:14:09
19:15:32
19:16:55

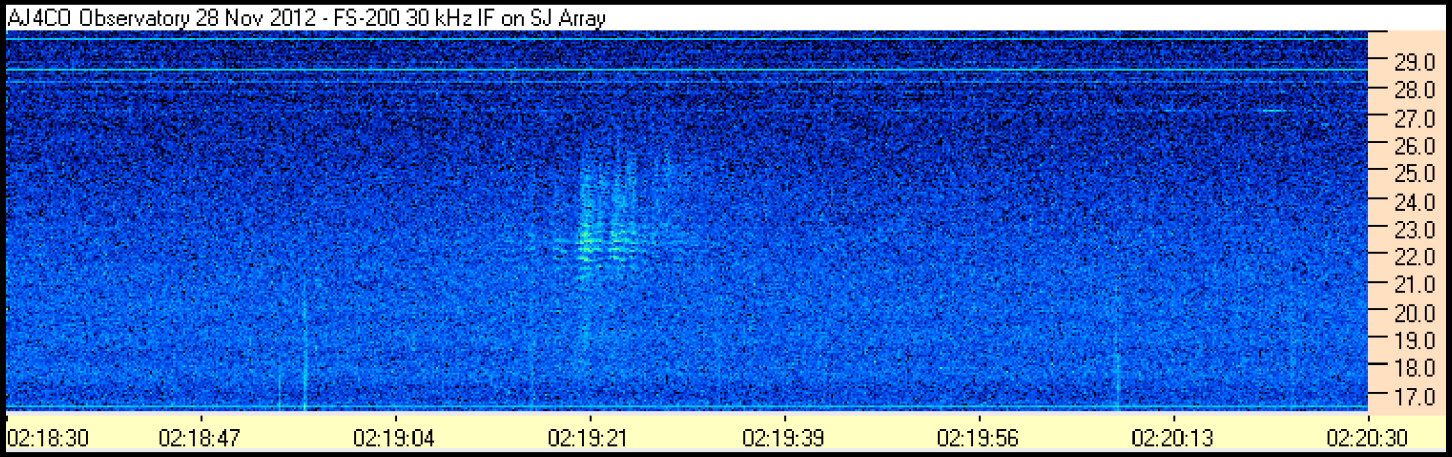

AJ4CO Observatory 09 Oct 2013 - FS-200 30 kHz IF on SJ Array
29.0
28.0
27.0
26.0
25.0
18:00:00
18:12:51
18:25:43
18:38:34
18:51:26
19:04:17
19:17:09
19:30:00

POOR COAX CONNECTION

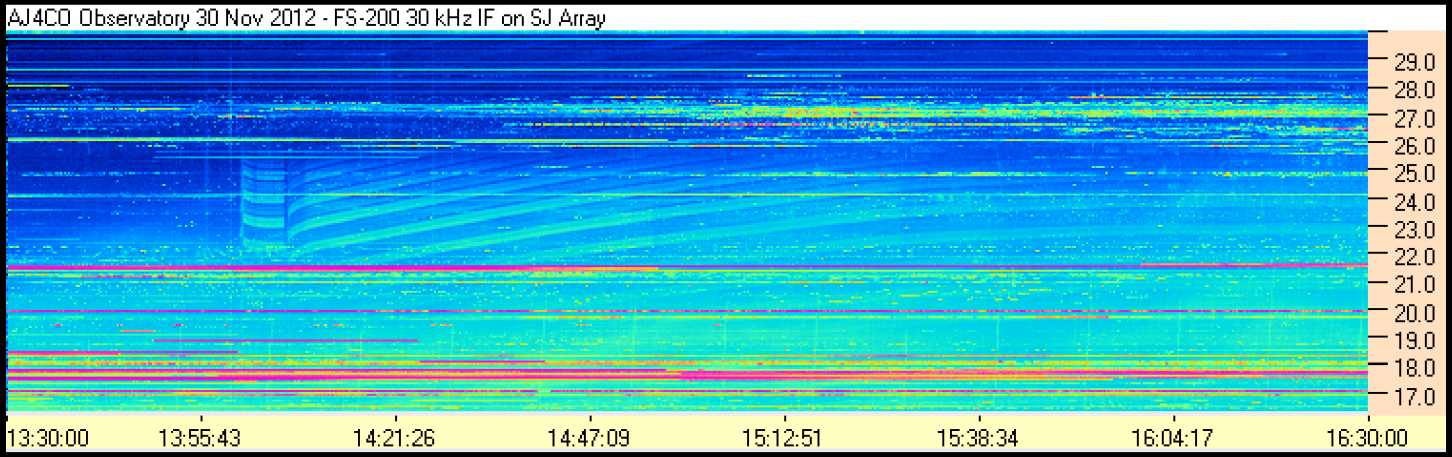


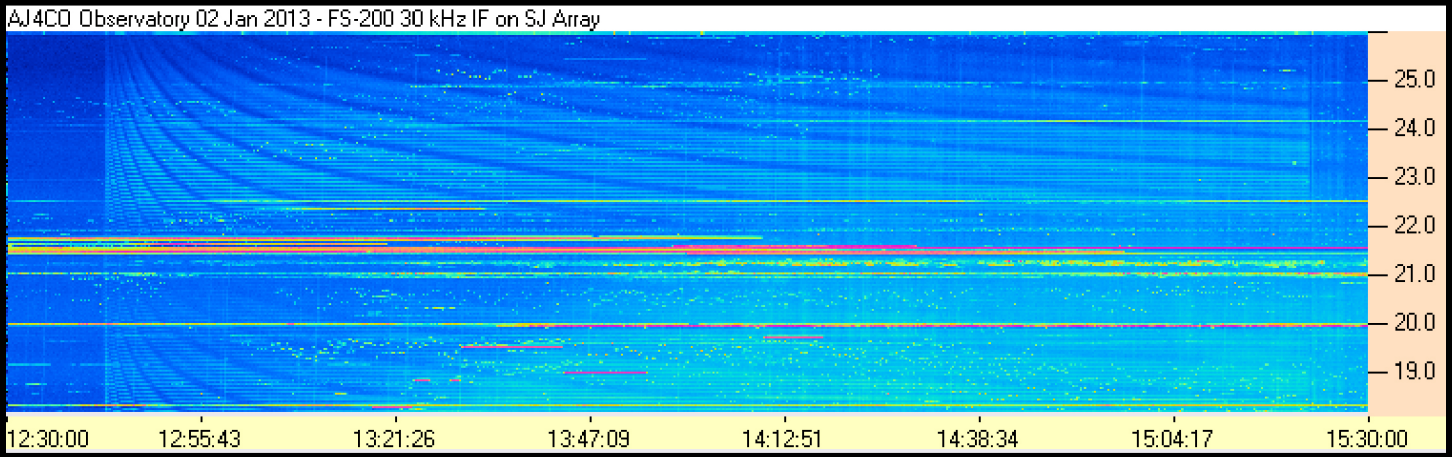


RFI ODDITIES

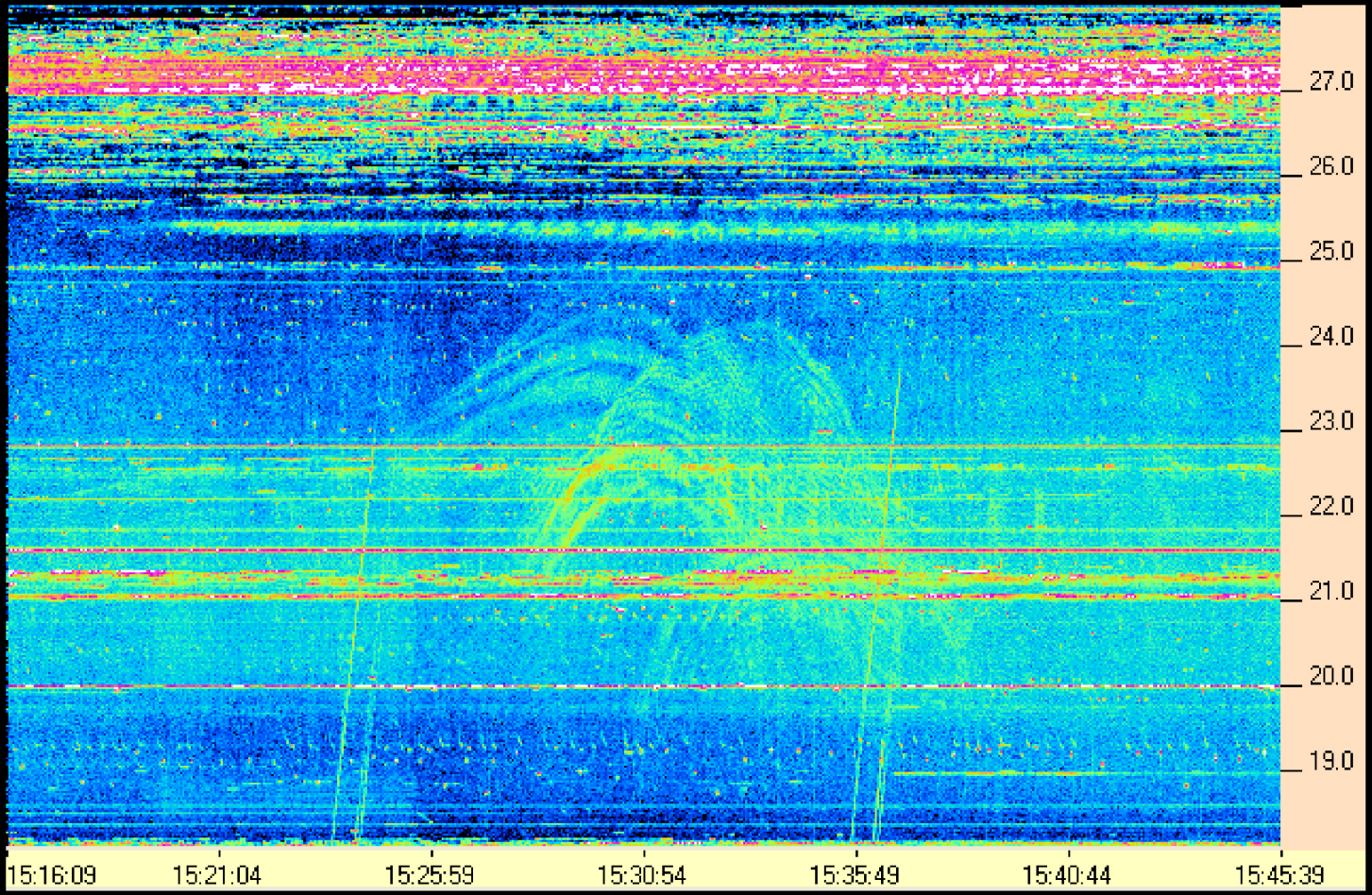


RFI ODDITIES





RFI ODDITIES



LGM – Jan 3, 2012