

HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



Date: 18 January 2017

Object: Jupiter – Io-B

Observer: JB

Start of pass:	1030 UT		
Jupiter Altitude:	41.6 degrees	Jupiter Azimuth:	172.1 degrees
Jupiter CML:	127.62	Jupiter Io Phase:	082.69
Jupiter RA:	13:24	Jupiter Dec:	-07:24
Sun Altitude:	-23.4 degrees	Sun Azimuth:	098.0 degrees
Sun RA:	19:55	Sun Dec:	-20:50

End of pass:	1149 UT		
Jupiter Altitude:	40.3 degrees	Jupiter Azimuth:	198.1 degrees
Jupiter CML:	175.38	Jupiter Io Phase	093.77
Sun Altitude:	-08.9 degrees	Sun Azimuth:	109.9 degrees

 Observations made using:
 FSX-8S fed by the TFD array
 Connect to array through HNRAO Multicoupler #1 and #2, port 2
 HNRAO Multicoupler #1 – TFD/LCP
 HNRAO Multicoupler #2 – TFD/RCP
 Port 1 having 10 dB of gain, all other ports on Multicoupler have approximately 3 dB gain.
 FSX-2 fed by the LWA array directly
 LWA element configuration – 90 degrees
 JOVE 2 receiver fed by phased JOVE dipoles @ 10' – phased for 2016-17 season
 Calibrated 28 Nov. 2016
 Connected to dipoles through HNRAO Multicoupler #3, port 1.
 Icom R75 receiver fed by experimental DDRR antenna directly.
 Calibrated 28 Nov. 2016

HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



Observing conditions here were not ideal. Line noise that has plagued the observatory for the past week continues unabated. There were heavy rains during part of the observation. The precipitation static created by the rain gave the appearance of raising the galactic background level. In the plot of the GB during the session, the high deviations in the plot were periods of heavy rainfall. In spite of that, some of the emissions were strong enough to resolve. I was expecting a lot of activity since this was nearly a center pass Io-B event. From this location, it was not. There were only a few instances of strong bursts. A mix of S-bursts began the pass followed by L-bursts which is typical of Io-B activity. All emissions were Right Circular Polarization, originating from the northern hemisphere of Jupiter.

Activity at both Alachua (LGM) and AJ4CO observatories were more active, especially at the Radio JOVE frequencies. It's not known if the geomagnetic storm in progress played a part in the attenuated signals received here created by the storm affecting the ionosphere.

First indications of S-burst emissions began here at about 1030 UT. The strongest recorded S-burst activity here at the Radio JOVE frequency (20.1 MHz) happened between 1044 UT and 1046 UT. Other Radio JOVE observers should review their charts if they were recording. The most intense L-burst activity observed here was between 1124 UT to 1131 UT.

The entire observed event spanned 16 MHz to 29 MHz. Emissions began below 16 MHz with a positive slope arc, reaching the peak about 1100 UT at 29 MHz, then became a negative slope passing below 16 MHz at the end of emissions.

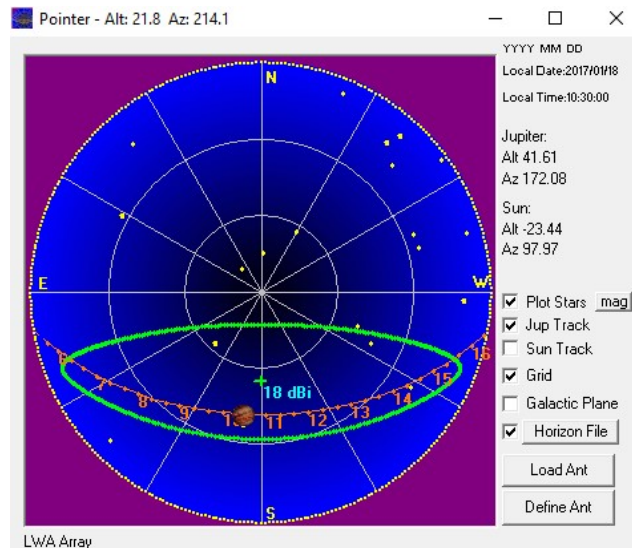
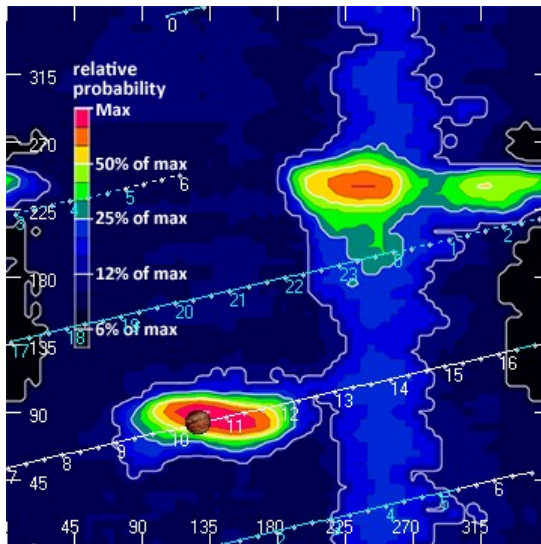
At the time of observations, the following advisory was posted, "A G1 (Minor) Geomagnetic Storm Watch was issued for the 18th and 19th of January, 2017 (UTC days) due to likely effects from an enhanced solar wind environment associated with the anticipated arrival of a polar-connected, positive-polarity CH HSS.

An expected solar wind stream flowing from a now geoeffective coronal hole has reached our planet. The solar wind is currently above 500 km/s and may increase somewhat over the next 24 hours. A minor (G1) geomagnetic storm watch will be in effect. Sky watchers at high latitudes should be alert for visible aurora while dark outside."

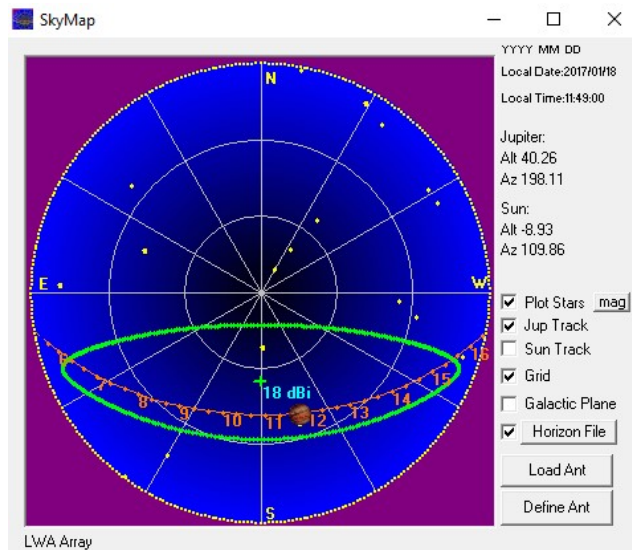
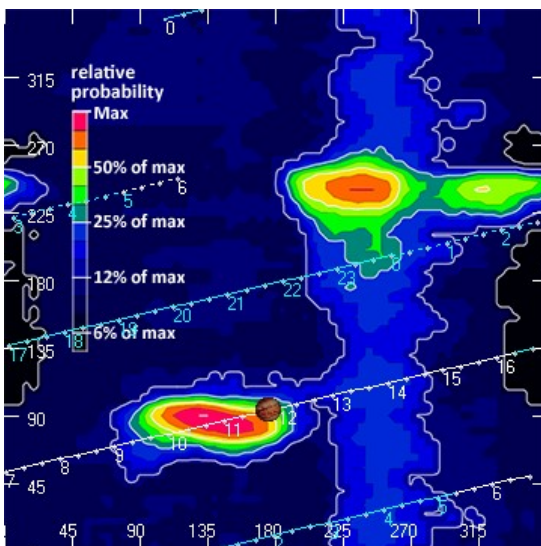
Conditions at HNRAO
41 degrees F. Light rain.
Power line noise very bad on FSX-2/LWA
Power line noise on FSX-8S/TFD bad.
Power line noise on JOVE 2/Dipoles is sawtooth

HNRAO Observing Log

40.673181 N – 80.437885 W
EN90sq



Beginning of Pass



End of Pass

HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



Calibration runs @ 1004 UT for both the FSX-2/LWA and the FSX-8S/TFD.

1. 1031 UT
 - a. S-bursts
 - b. 16-18 MHz
2. 1036 UT
 - a. Cluster of S-bursts at 24 MHz
 - b. AJ4CO DPS showing long string of S-bursts @ 24 MHz
3. 1039 UT
 - a. S-bursts, 16-18 MHz
 - b. RJP, Jupiter probability 84%
4. 1043 UT
 - a. S-bursts
 - b. 24 MHz
5. 1044:08 UT
 - a. JOVE 2/dipoles
 - b. Strong S-sbursts @ 20.1 MHz - 184 kK
6. 1044-1045 UT
 - a. Negative slope S-bursts, 16-18 MHz
7. 1047 UT
 - a. S-bursts at 24 MHz
 - b. Also on SkyPipe
8. 1051 UT
 - a. S-bursts - 16-18 MHz
 - b. All emissions appear negative slope
9. 1056 UT
 - a. S-bursts - 24 MHz
10. 1057 UT
 - a. S-bursts
11. 1059 UT
 - a. S-bursts
 - b. Negative slope. One group at 24 - 22 MHz another group at 20 -18 MHz
12. 1102 UT
 - a. Strong cluster of S-bursts at 23 MHz
 - b. Possibly on SkyPipe 1103 UT
 - c. Rain beginning to taper off
13. 1108 UT
 - a. S-bursts - 27 MHz

HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



14. 1109 UT
 - a. S-bursts - 22-24 MHz
15. 1110 UT
 - a. S-bursts - 19-21 MHz – Positive slope
 - b. On Skypipe
16. 1111 UT
 - a. L-bursts - Positive slope, 16-18 MHz, rising to 20 MHz
17. 1113 UT
 - a. L-bursts - 29 MHz
18. 1120 UT
 - a. HNRAO Line noise reduced
 - i. Again, looks like someone just turned it off, indicates to me an arc is the cause
 - b. GB @ HNRAO rising again
 - i. Rain and windy
19. 1122 UT
 - a. Precipitation static now showing on FSX-8S
 - b. SkyPipe GB now reading 76 kK
 - c. Line noise returned to original level
20. 1125 UT
 - a. L-bursts - 16-19 MHz
 - i. Positive slope with much stronger intensity
21. 1126 UT
 - a. GB @ HNRAO 114 kK
 - i. Rain increasing - Windy
22. 1128 UT
 - a. L-bursts – Strong - 16-20 MHz
 - i. Possibly on SkyPipe but GB so high from rain hard to tell
 - ii. Near vertical
 1. no apparent slope
23. 1130 UT
 - a. L-bursts
 - b. SkyPipe
 - i. Looks like peak around 205 kK
 - ii. NOT on AJ4CO
24. 1131 UT
 - a. L-bursts - Negative slope - 20-18 MHz
25. 1134 UT
 - a. 1133 UT – 1134 UT
 - i. Positive slope
 - b. 1134 UT – 1135 UT

HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



- i. Negative slope
- 26. 1141 UT
 - a. RJP - Jupiter probability 73 %
- 27. 1143 UT
 - a. L-bursts - 18 MHz
- 28. 1145 UT
 - a. L-bursts - 25 MHz
- 29. 1149 UT
 - a. Weak L-bursts - Positive slope 18-19 MHz
 - b. RJP- Jupiter probability 52%
- 30. 1160 UT
 - a. Appears to be the end of the storm with the last bursts at 1149 UT.
- 31. 1435 UT
 - a. No observed follow up Non-Io-A observed here.

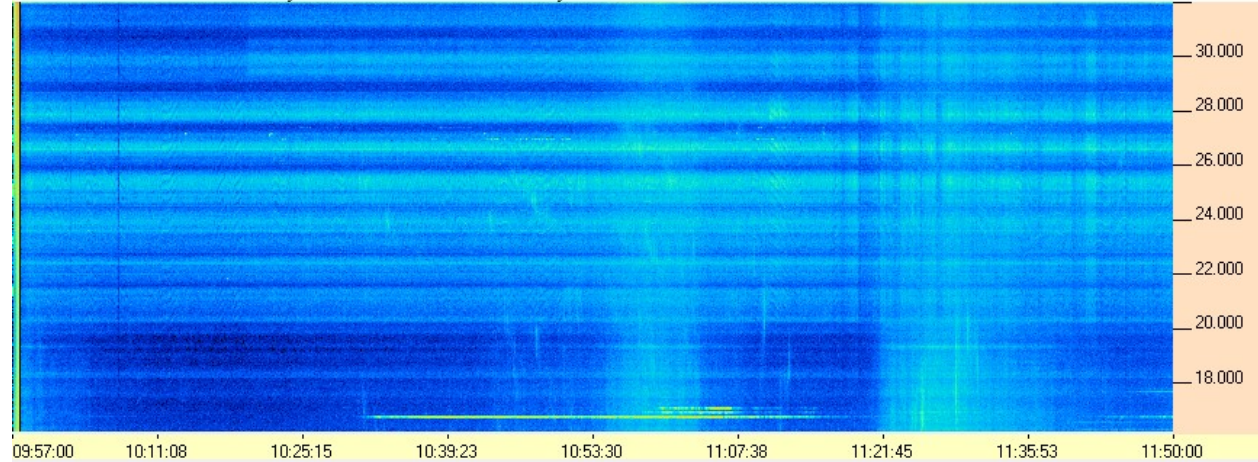
End of report

HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq

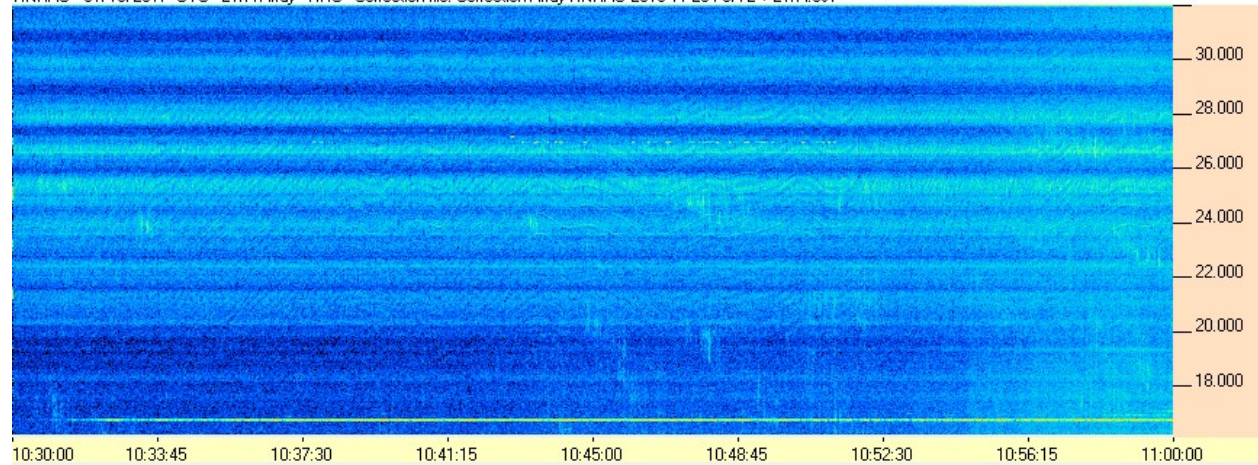


FSX-2 / LWA

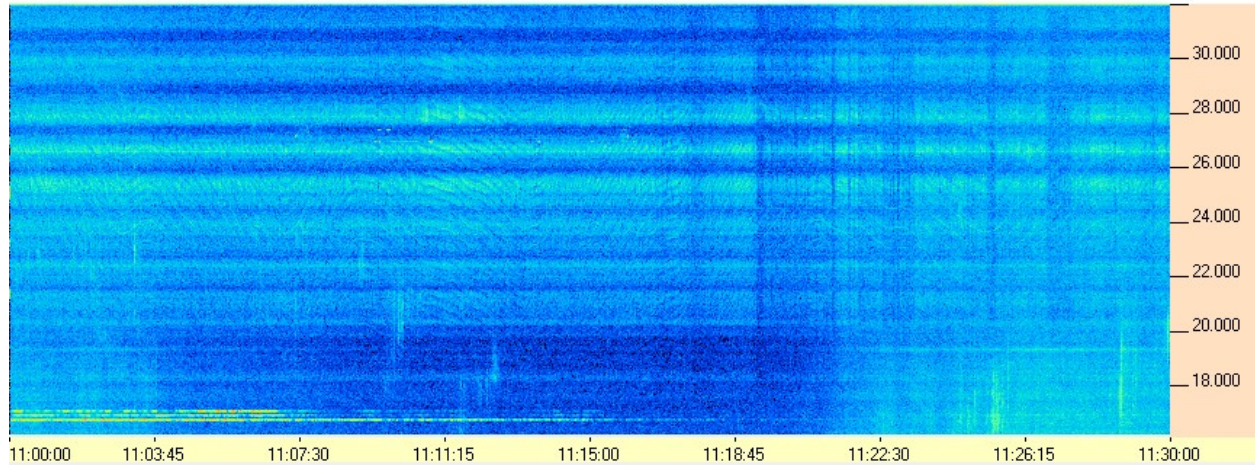
HNRAO - 01/18/2017 UTC - LWA Array - RHC - Correction file: Correction Array HNRAO 2016 11 20 FSX-2 + LWA.csv



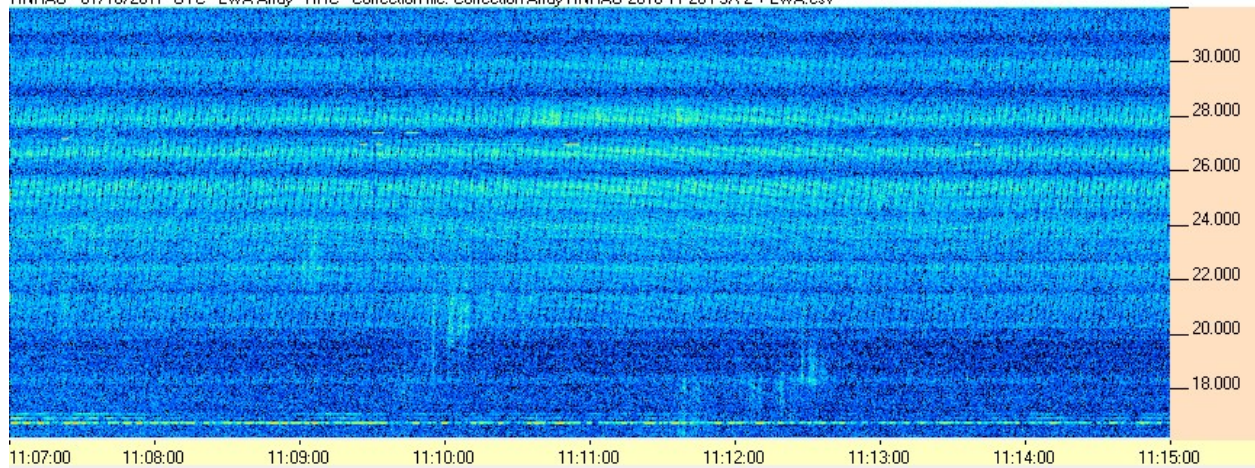
HNRAO - 01/18/2017 UTC - LWA Array - RHC - Correction file: Correction Array HNRAO 2016 11 20 FSX-2 + LWA.csv



HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



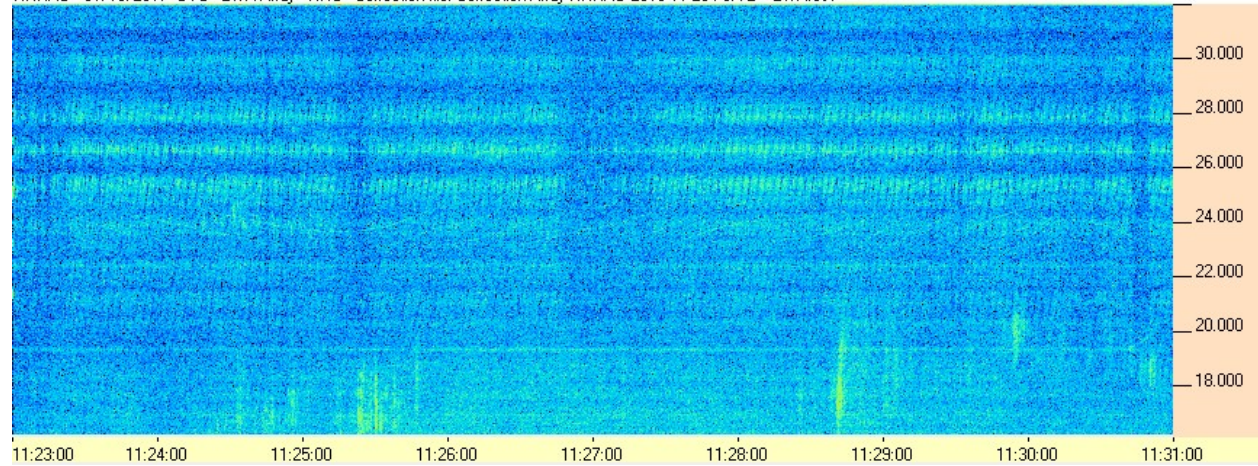
HNRAO - 01/18/2017 UTC - LWA Array - RHC - Correction file: Correction Array HNRAO 2016 11 20 FSX-2 + LWA.csv



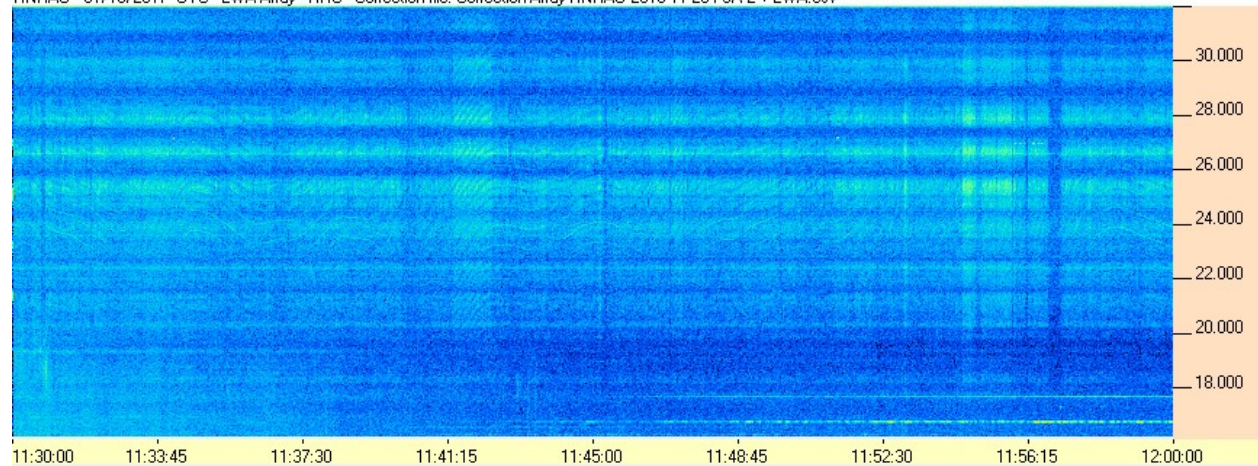
HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



HNRAO - 01/18/2017 UTC - LWA Array - RHC - Correction file: Correction Array HNRAO 2016 11 20 FSX-2 + LWA.csv



HNRAO - 01/18/2017 UTC - LWA Array - RHC - Correction file: Correction Array HNRAO 2016 11 20 FSX-2 + LWA.csv

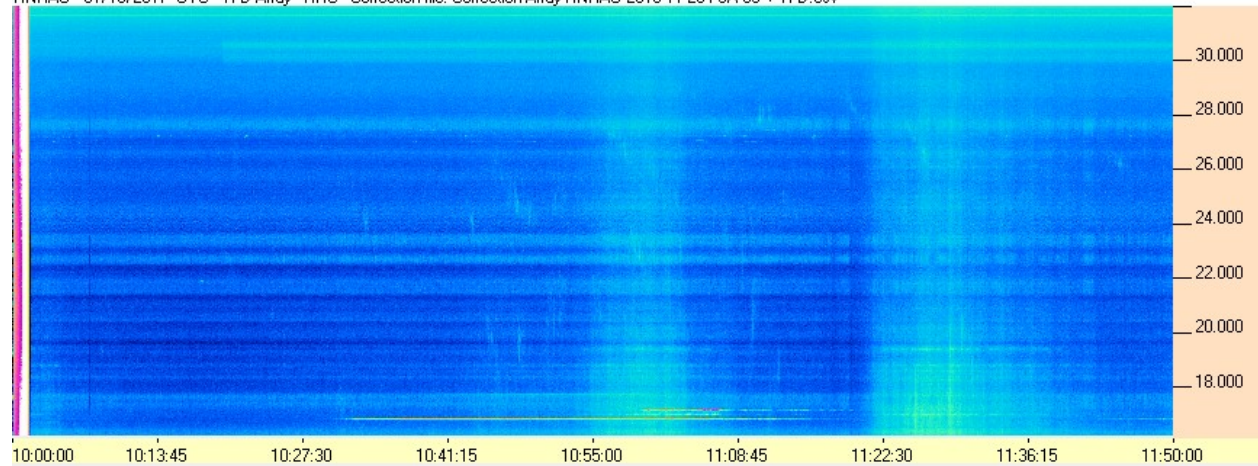


HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq

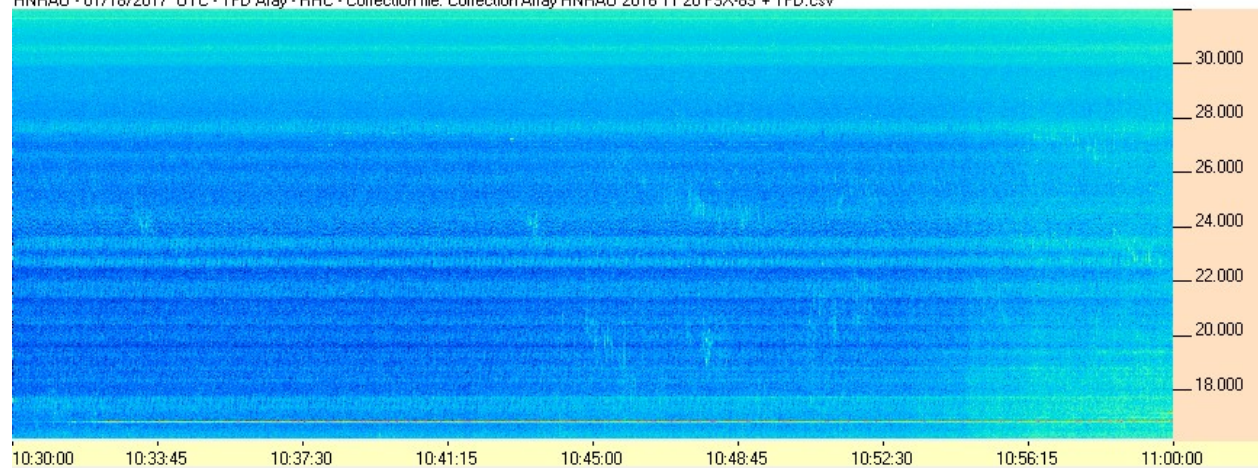


FSX-8S / TFD

HNRAO - 01/18/2017 UTC - TFD Array - RHC - Correction file: Correction Array HNRAO 2016 11 20 FSX-8S + TFD.csv



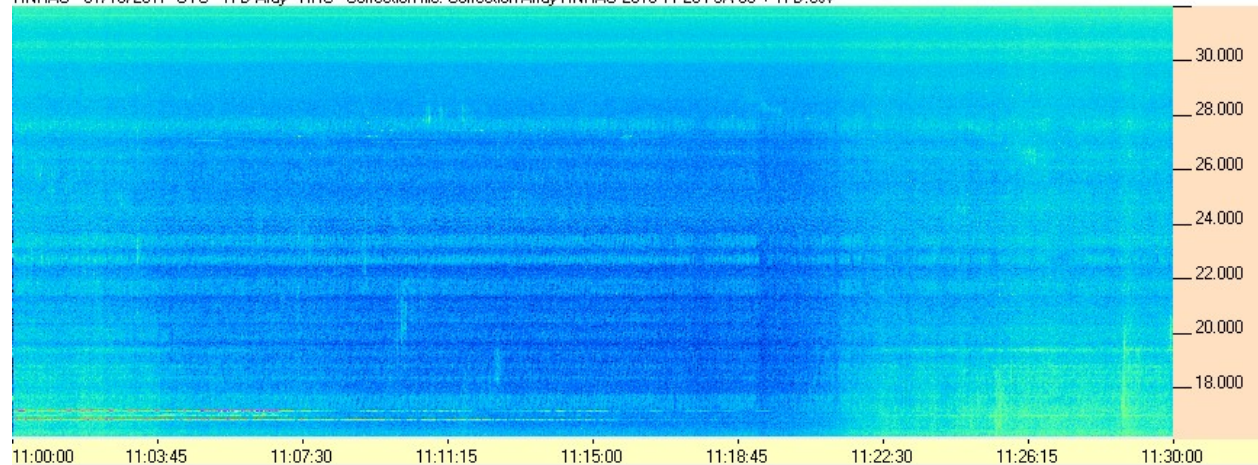
HNRAO - 01/18/2017 UTC - TFD Array - RHC - Correction file: Correction Array HNRAO 2016 11 20 FSX-8S + TFD.csv



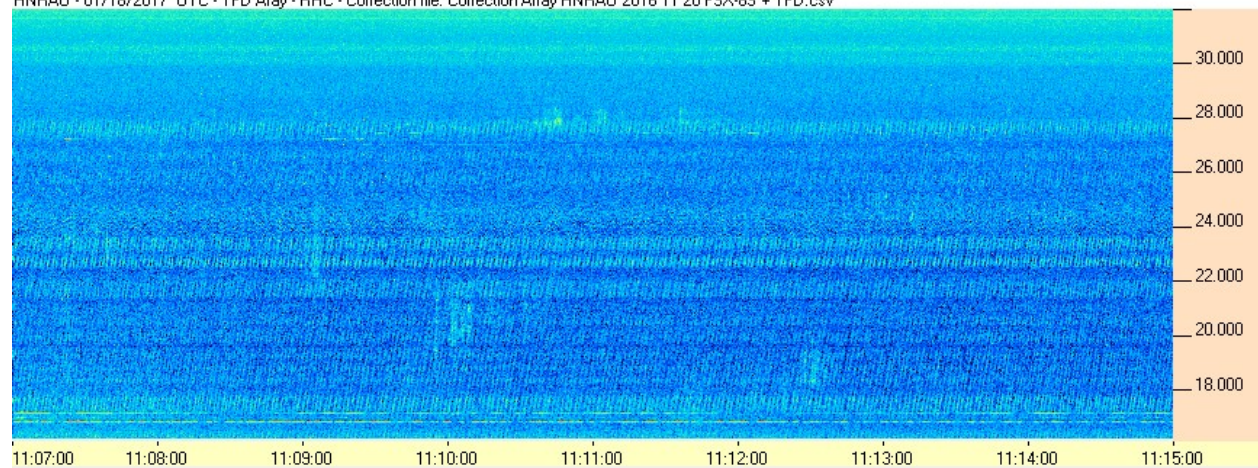
HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



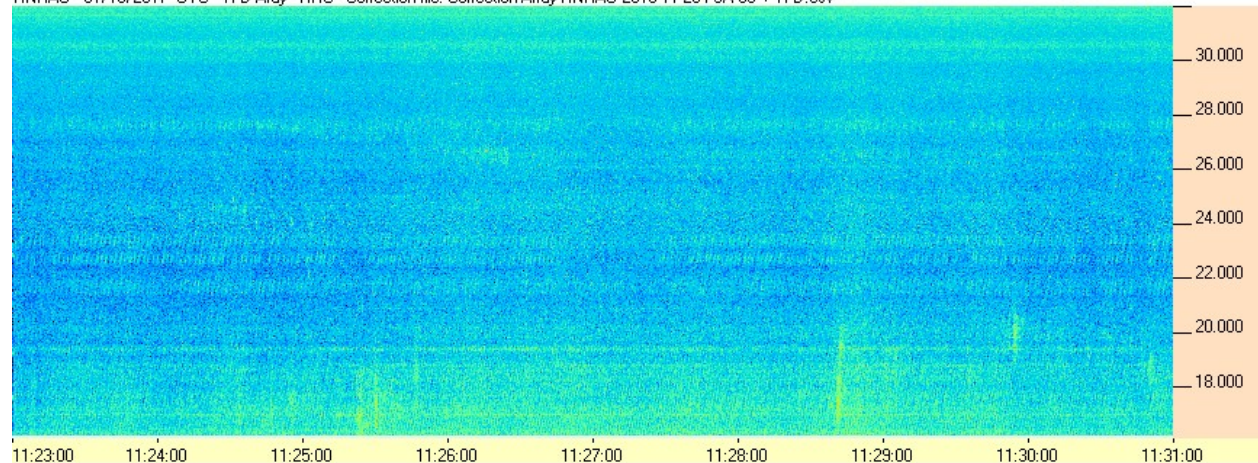
HNRAO - 01/18/2017 UTC - TFD Array - RHC - Correction file: Correction Array HNRAO 2016 11 20 FSX-8S + TFD.csv



HNRAO - 01/18/2017 UTC - TFD Array - RHC - Correction file: Correction Array HNRAO 2016 11 20 FSX-8S + TFD.csv



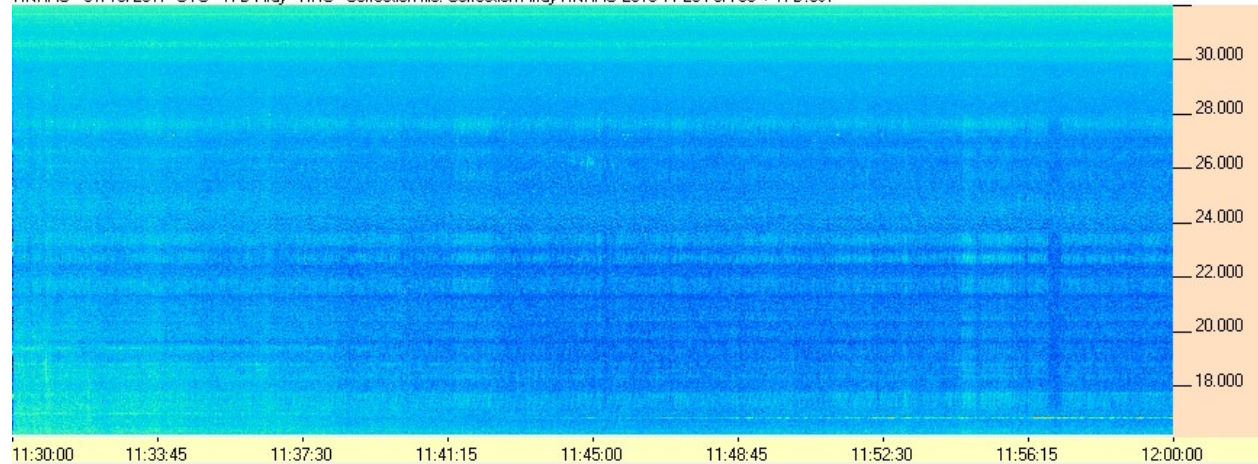
HNRAO - 01/18/2017 UTC - TFD Array - RHC - Correction file: Correction Array HNRAO 2016 11 20 FSX-8S + TFD.csv



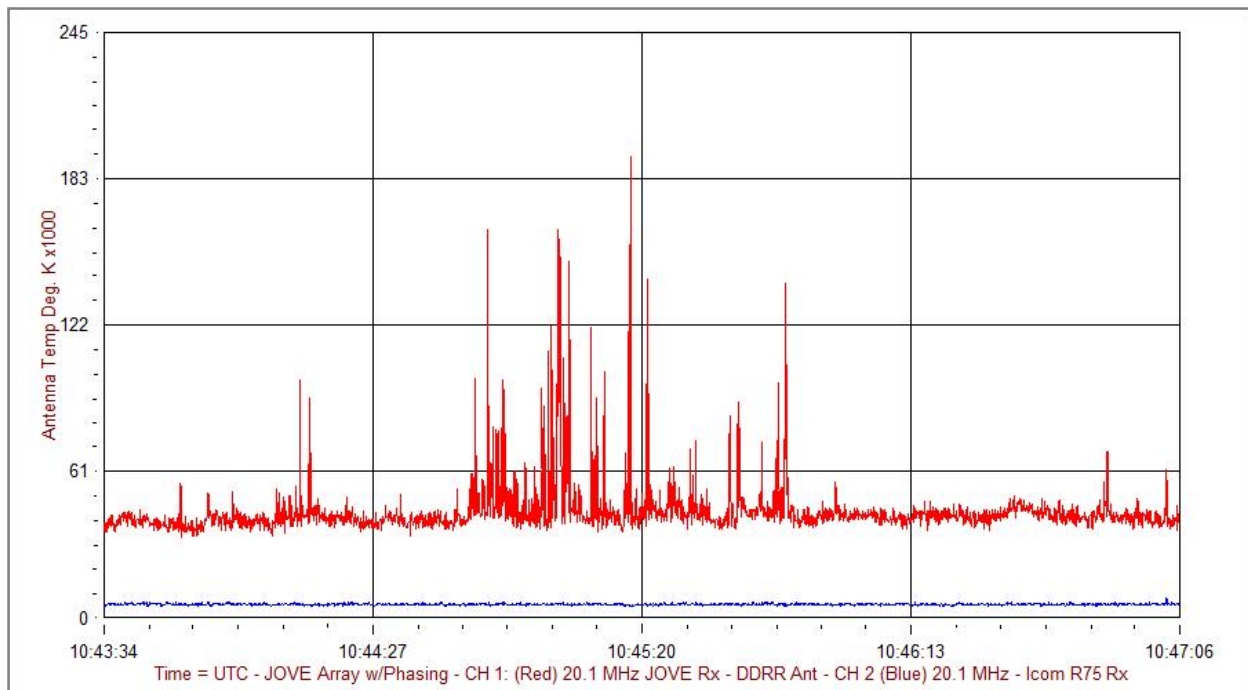
HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



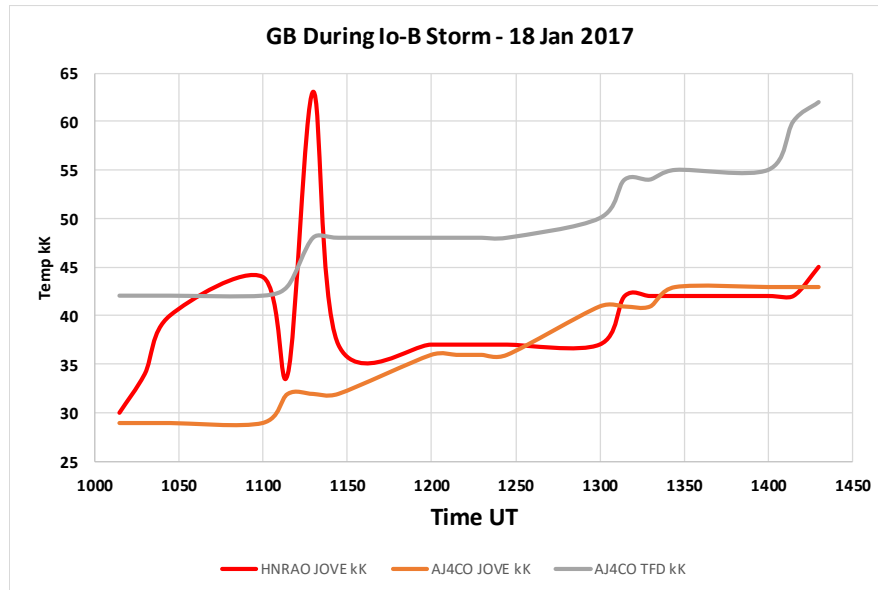
HNRAO - 01/18/2017 UTC - TFD Array - RHC - Correction file: Correction Array HNRAO 2016 11 20 FSX-8S + TFD.csv



JOVE / Dipoles



HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



GB Measurements 18 Jan 2014					
Time UT	HNRAO JOVE kK	LGM JOVE kK	LGM TFD kK	AJ4CO JOVE kK	AJ4CO TFD kK
1015	30	n/c	n/c	29	42
1030	34	n/c	n/c	29	42
1045	40	n/c	n/c	29	42
1100	44	n/c	n/c	29	42
1115	34	n/c	n/c	32	43
1130	63	n/c	n/c	32	48
1145	37	n/c	n/c	32	48
1200	37	n/c	n/c	36	48
1215	37	n/c	n/c	36	48
1230	37	n/c	n/c	36	48
1245	37	n/c	n/c	36	48
1300	37	n/c	n/c	41	50
1315	42	n/c	n/c	41	54
1330	42	n/c	n/c	41	54
1345	42	n/c	n/c	43	55
1400	42	n/c	n/c	43	55
1415	42	n/c	n/c	43	60
1430	45	n/c	n/c	43	62