HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq

Date: 23 March 2017

Object: Jupiter – Io-B

Observer: JB

Start of pass:	**0225 UT**	**Planetary K indices**	**4**
Jupiter Altitude:	**15.9 degrees**	**Jupiter Azimuth:**	**113.5 degrees**
Jupiter CML:	**114.96**	**Jupiter Io Phase:**	**080.36**
Jupiter RA:	**13:17**	**Jupiter Dec:**	**-06:25**
Hour Angle:	**-04:10**	**Polarization**	**RCP**
Sun Altitude:	**-32.8 degrees**	**Sun Azimuth:**	**304.1 degrees**
Sun RA:	**00:03**	**Sun Dec:**	**00:18**

End of pass:	**0400 UT**		
Jupiter Altitude:	**31.0 degrees**	**Jupiter Azimuth:**	**135.5 degrees**
Jupiter CML:	**172.4**	**Jupiter Io Phase**	**093.70**
Hour Angle:	**-02:35**		
Sun Altitude:	**-45.0 degrees**	**Sun Azimuth:**	**330.5 degrees**

Observations made using:

1. FSX-8S fed by the TFD array
    a. 7.7 dB loss between TFD and Multicouplers.
    b. Connect to array through HNRAO Multicoupler #1 and #2, port 2
        i. HNRAO Multicoupler #1 – TFD/LCP
        ii. HNRAO Multicoupler #2 – TFD/RCP
            1. Port 1 having 10 dB of gain, all other ports have 3 dB gain.
2. FSX-2 fed by the LWA array directly
    a. LWA element configuration – 90 degrees
3. JOVE 2 receiver fed by phased JOVE dipoles @ 10’
    a. 12’ phase cable - phased for 2016-17 season
    b. Calibrated 6 March 2017
    c. Connected to dipoles through HNRAO Multicoupler #3, port 1.
        i. 3.165 dB loss between Multicoupler and dipoles.
4. Icom R75 receiver fed by experimental DDRR antenna directly.
    a. Calibrated 6 March 2017
5. SDRPlay
    a. RSP1 (2) and RSP2 (1)

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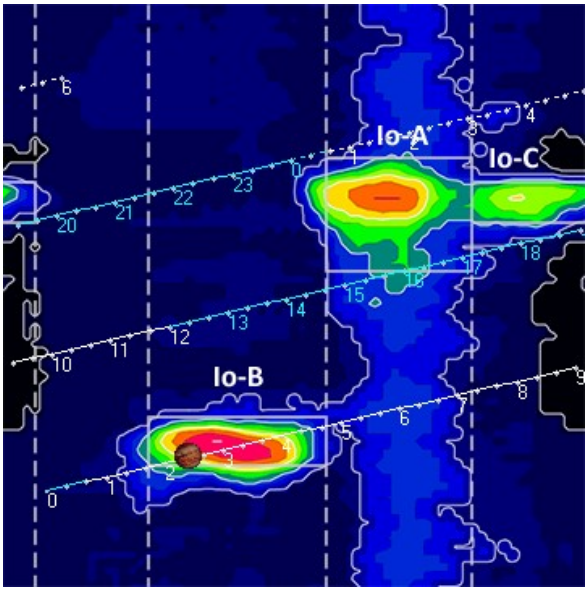
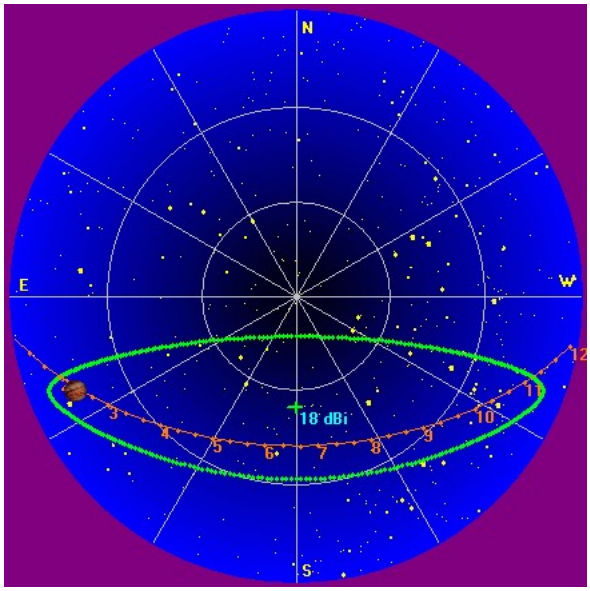
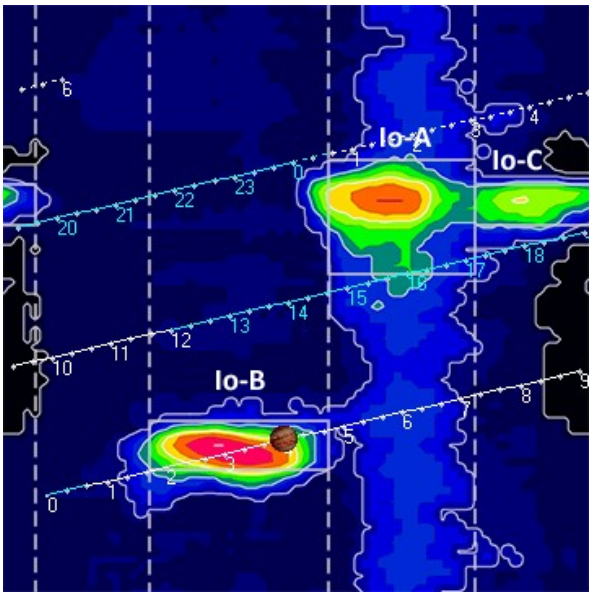
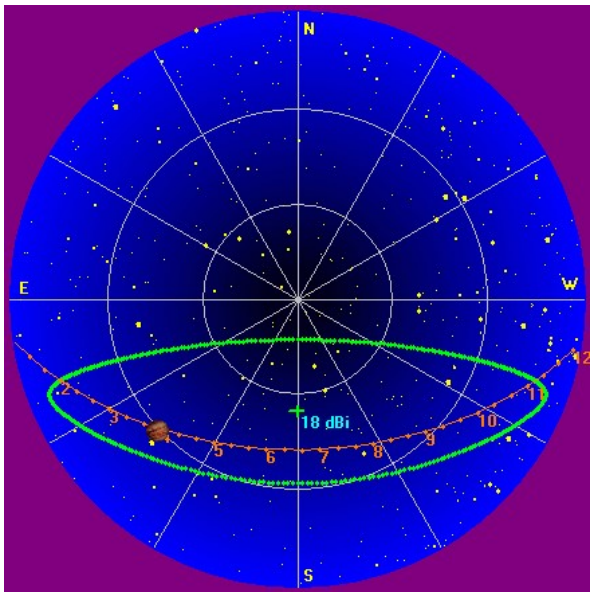




Beginning of Pass





End of Pass

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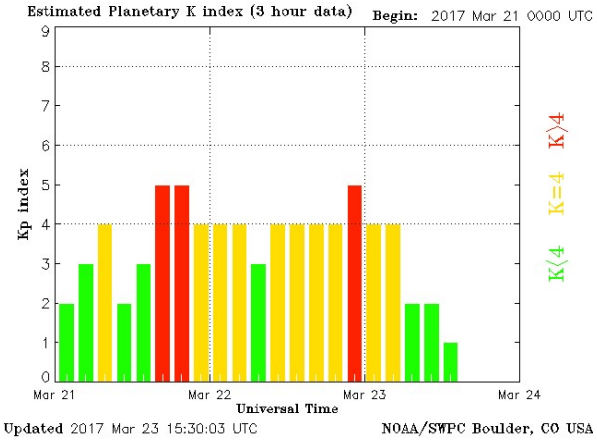

An Io-B storm through the area of highest probability provided, with a few exceptions, an unremarkable pass. All spectrographs and Radio JOVE receivers were limited in use do to power line RFI. The RSP1 is affect less, and so was the primary spectrograph used. The FSX-2/LWA recorded a minimal segment of the pass, while the FSX-8S/TFD recorded none of the pass.

As is typical of an Io-B event, it began with observed S-bursts, barely above the galactic background, starting at approximately 0225 UT. L-bursts mixed with S-bursts began at approximately 0255 UT.

S-bursts spanned the range of the RSP1 frequency settings, 16 MHz to 24 MHz. The FSX-2 spectrograph showed a range of 15 MHz to nearly 29 MHz. L-bursts spanned the same range.

One outstanding feature was an N-event from 0249 UT until 0250 UT. Composed entirely of S-bursts, it had a negative slope of -16 kHz/sec.

The early portion of the storm, both S-bursts and L-bursts had negative slope modulation lanes averaging -27 kHz/sec. At approximately 0330 UT, the L-burst modulation lanes became positive slope with an average of 95 kHz/sec. At 0335 UT, cross hatched modulation lanes were recorded presumably as the transition from negative slope to positive slope began.

There was a brief period of S-bursts recorded here on the Radio JOVE/Dipole pair at 20.1 MHz despite the power line RFI raising the background to 136,000 K.

Changes in the ionosphere at 0238 UT produced a strong signal from a broadcast station in Cuba to appear at 18 MHz, and faded at about 0249 UT.

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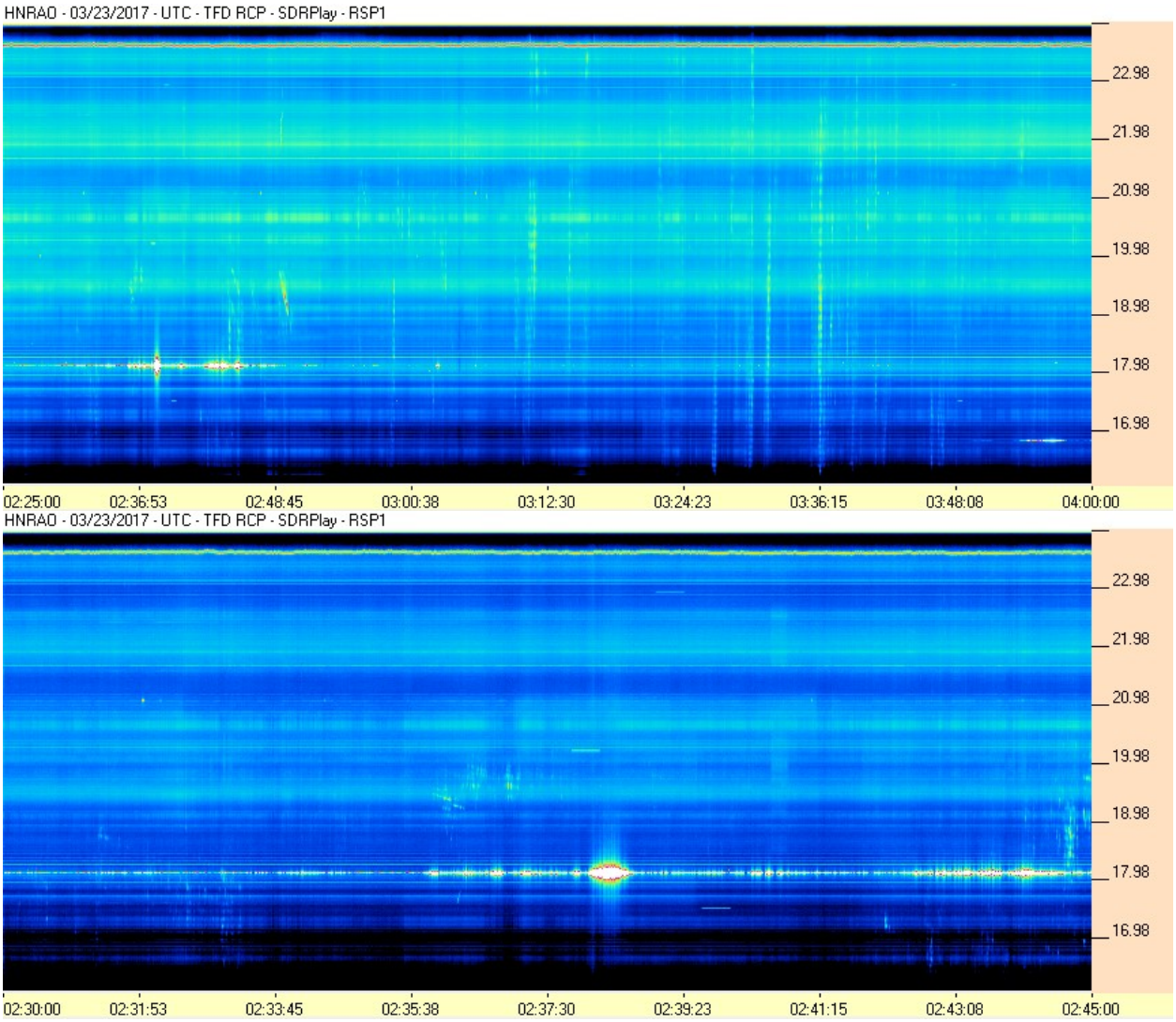
RSP1/TFD Pair



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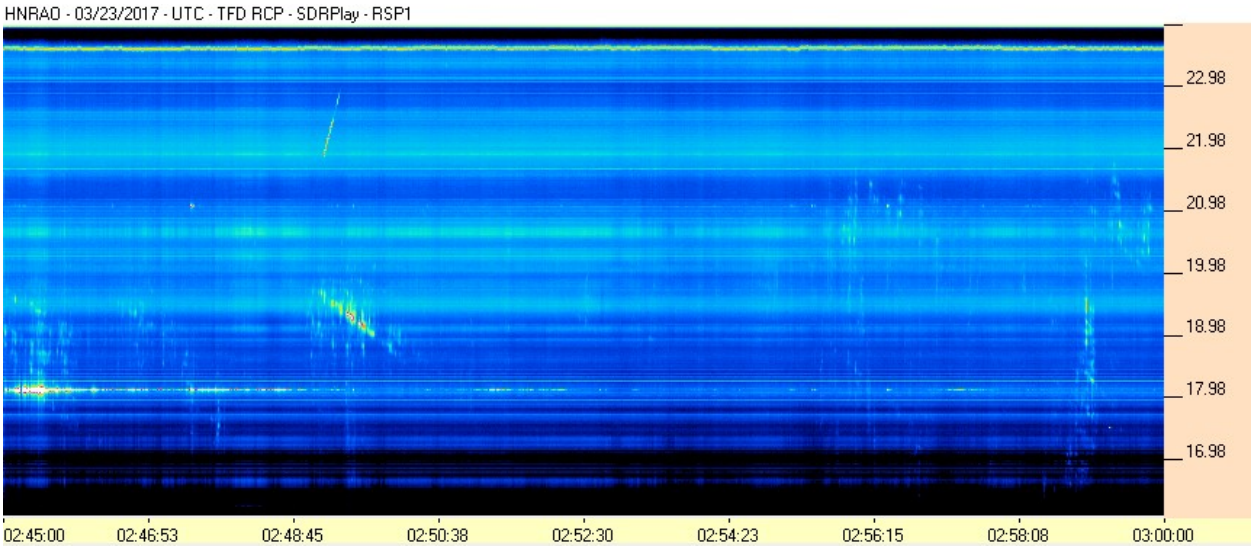

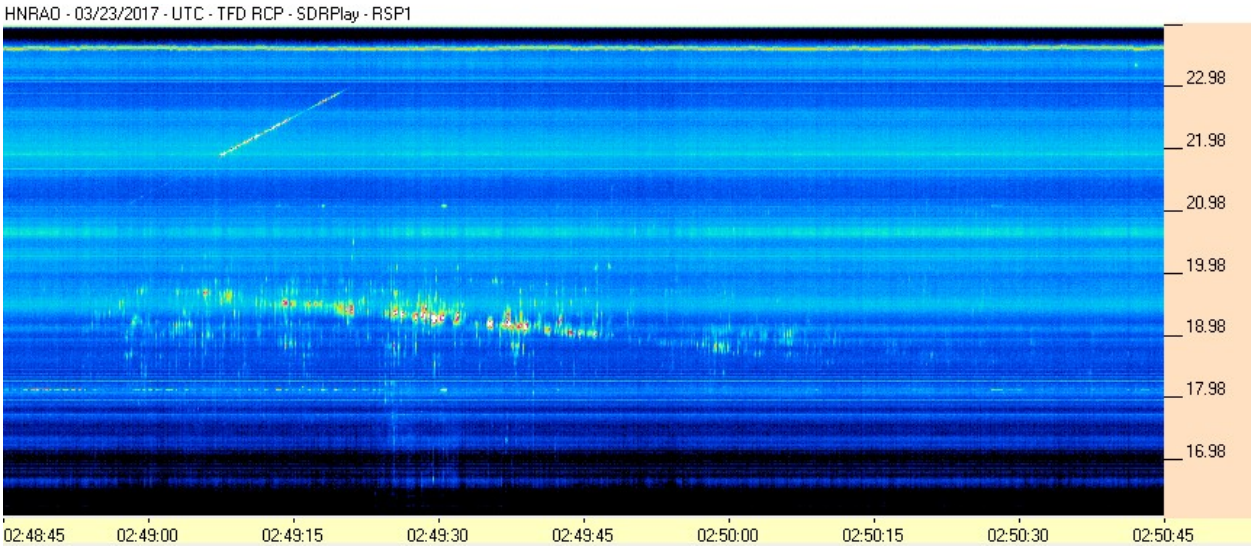

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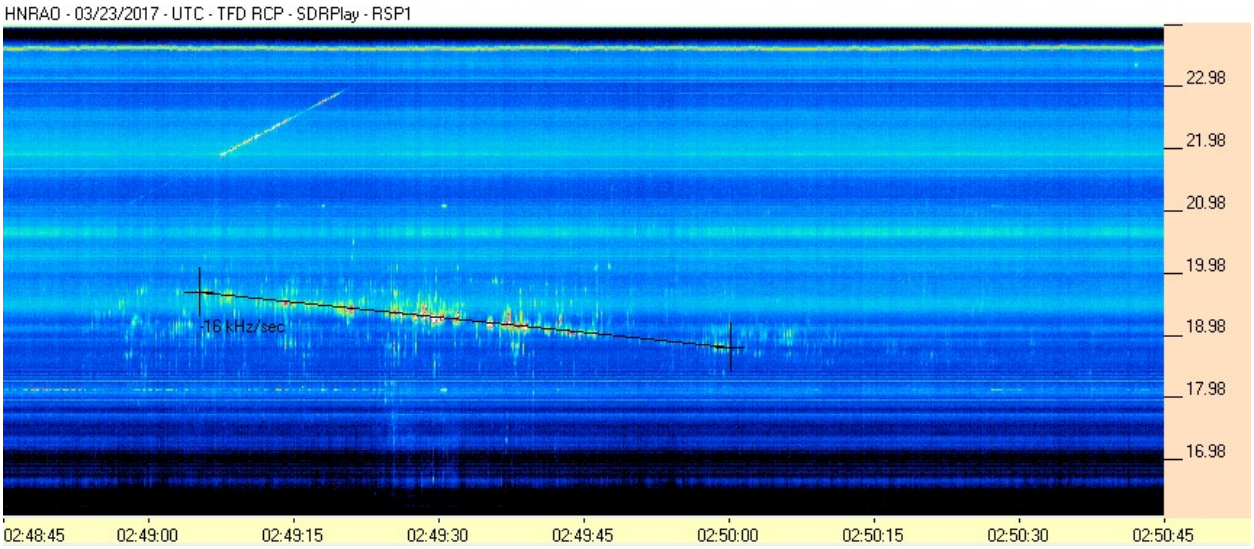

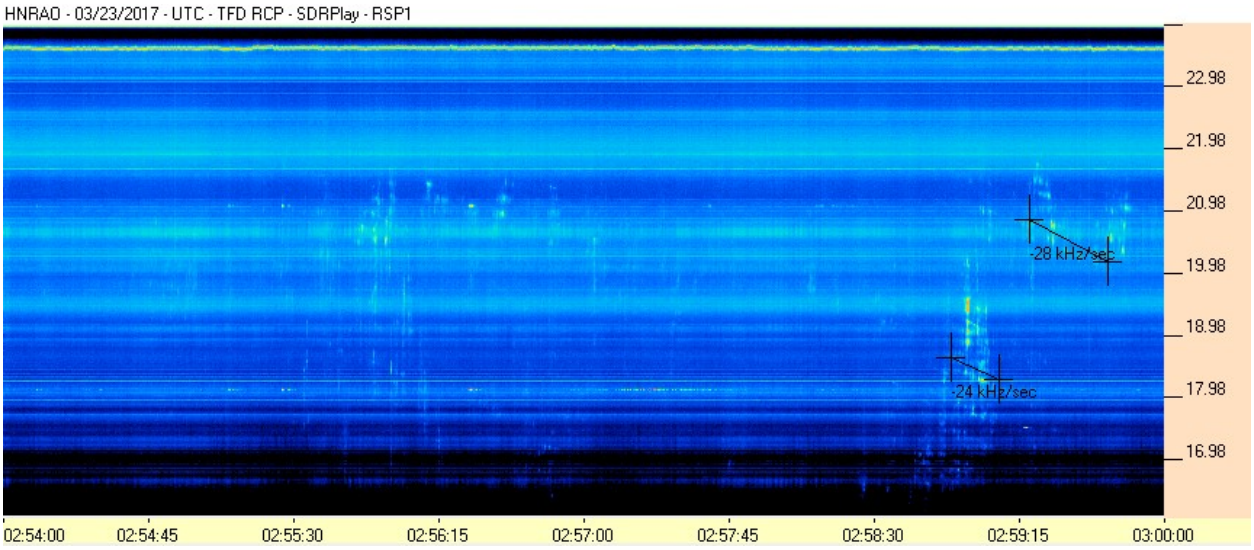

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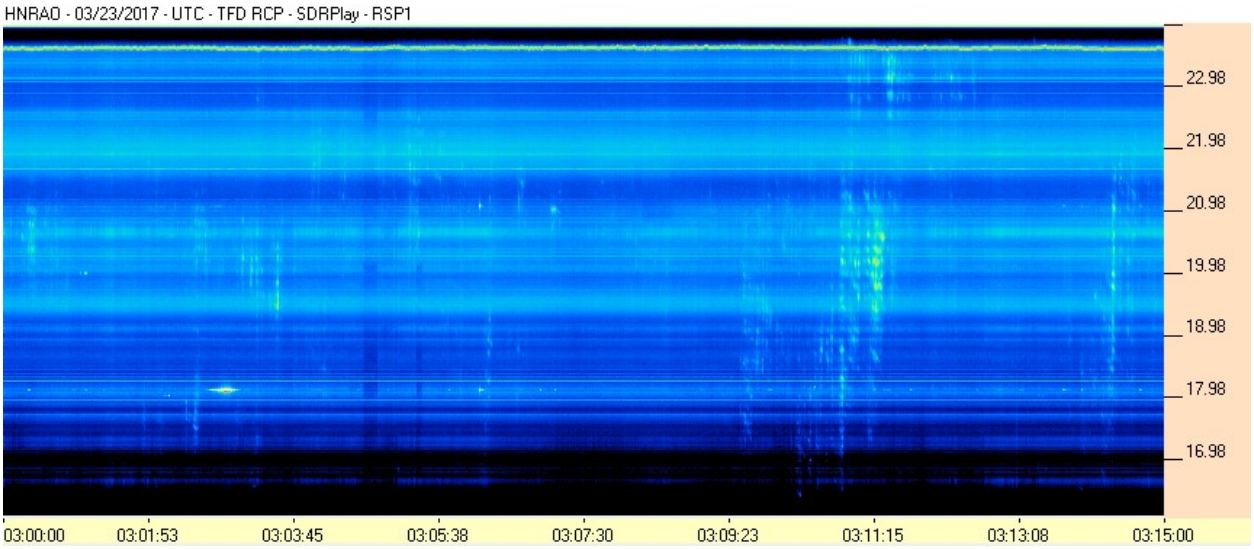

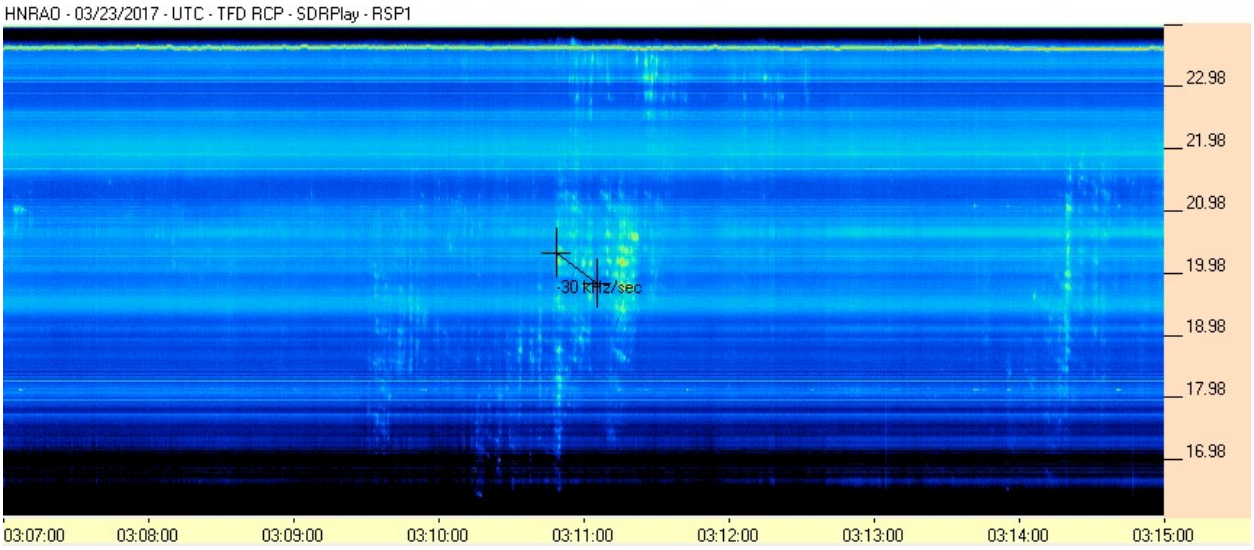

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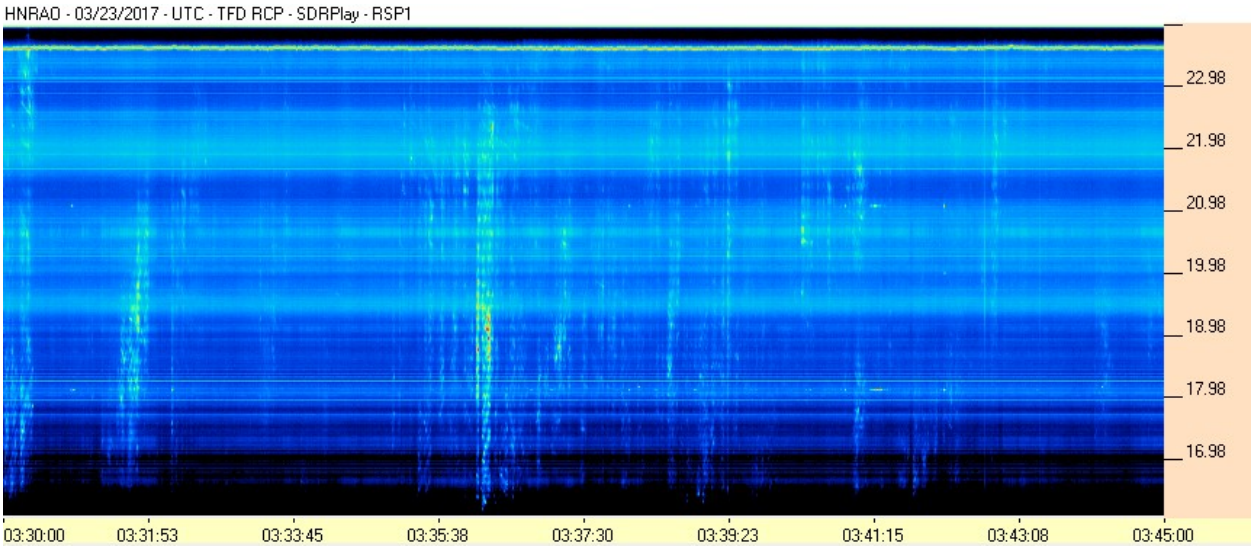
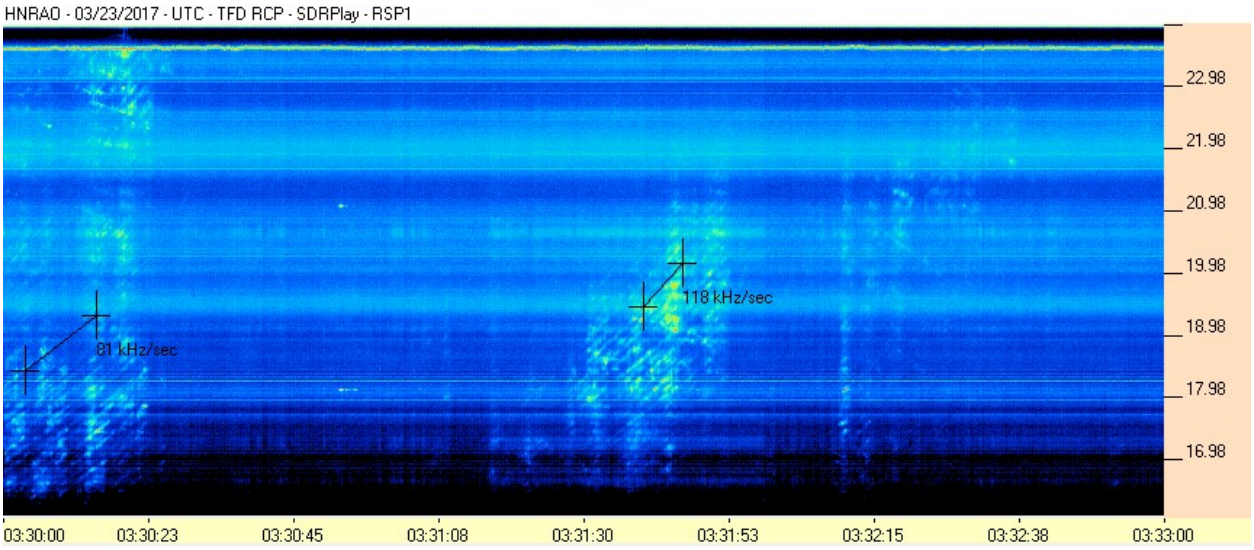
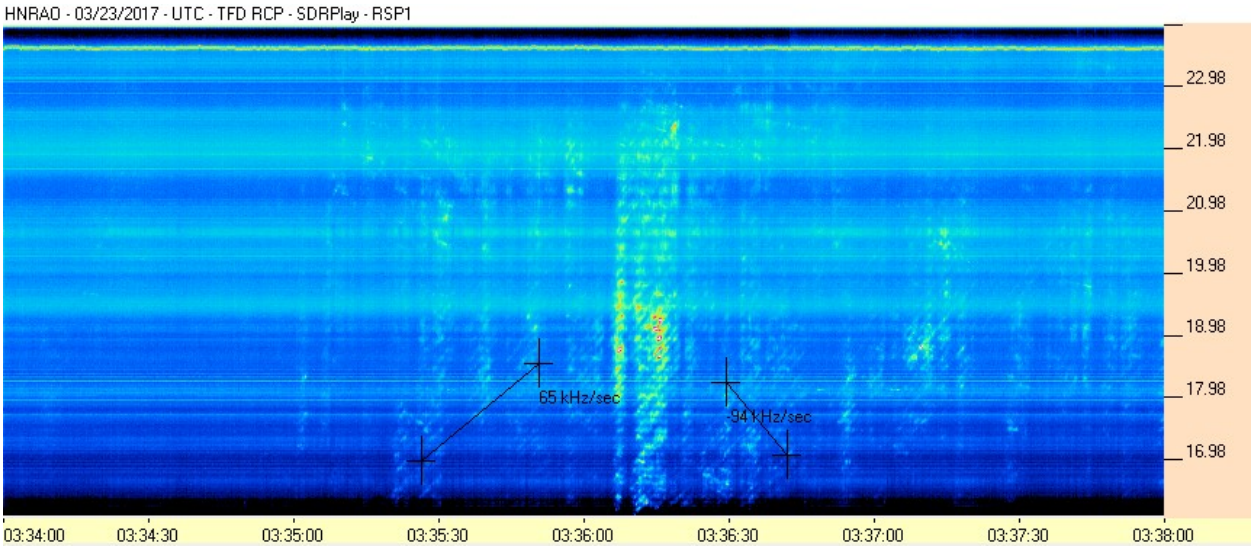
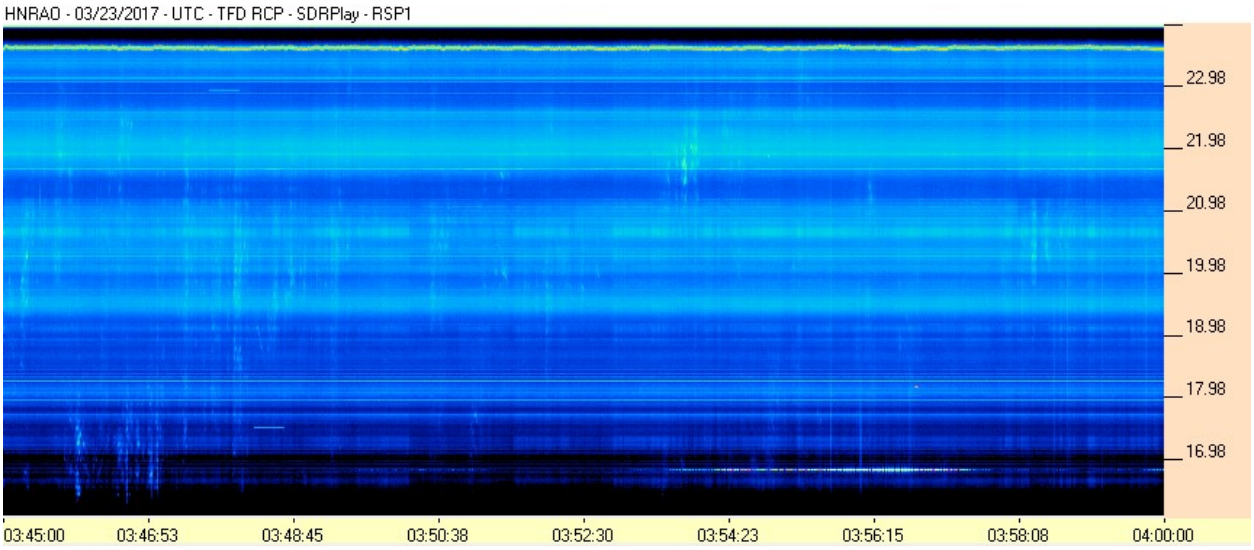
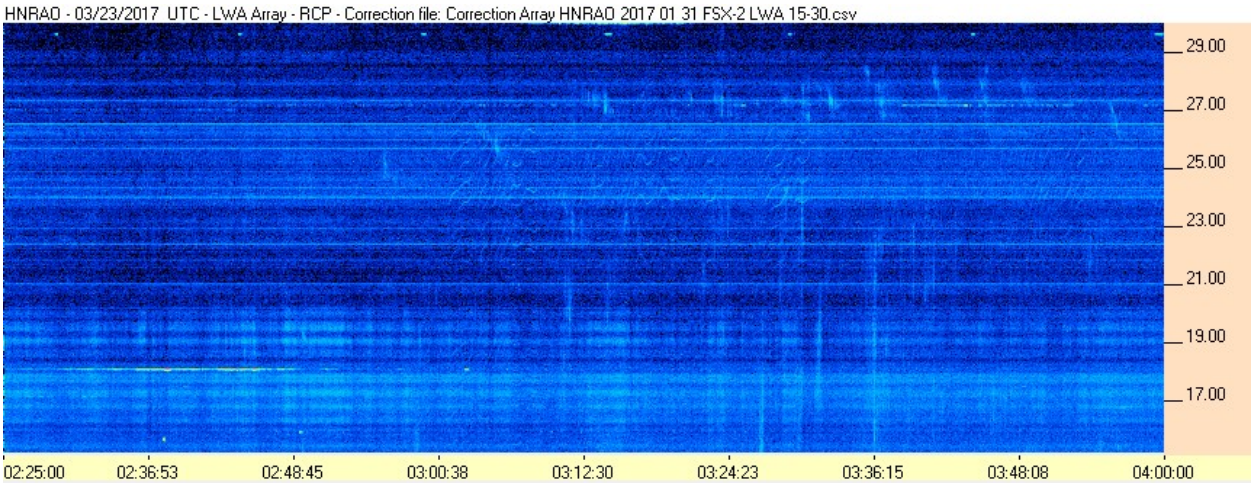




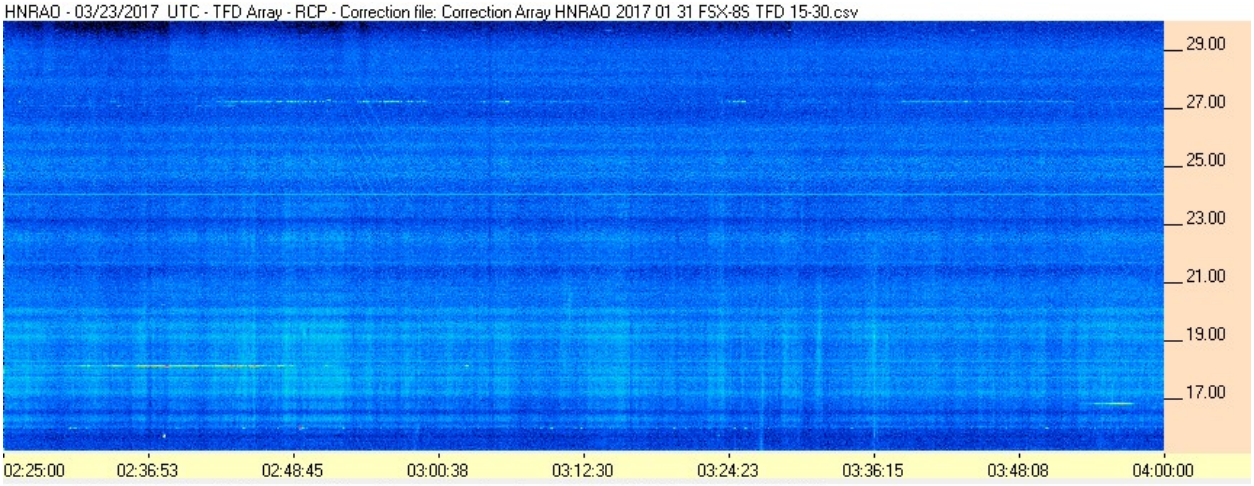

HNRAO - 03/23/2017 - UTC - TFD RCP - SDRPlay - RSP1
22.98
21.98
20.98
19.98
18.98
17.98
16.98
65 kHz/sec
-94 kHz/sec
03:34:00
03:34:30
03:35:00
03:35:30
03:36:00
03:36:30
03:37:00
03:37:30
03:38:00


HNRAO - 03/23/2017 - UTC - TFD RCP - SDRPlay - RSP1
22.98
21.98
20.98
19.98
18.98
17.98
16.98
03:45:00
03:46:53
03:48:45
03:50:38
03:52:30
03:54:23
03:56:15
03:58:08
04:00:00

FSX-2/LWA Pair



FSX-8S/TFD Pair



Radio JOVE/JOVE Dipoles Pair