

HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



Date: 2 July 2017

Object: Jupiter – Io-B

Observer: Unattended

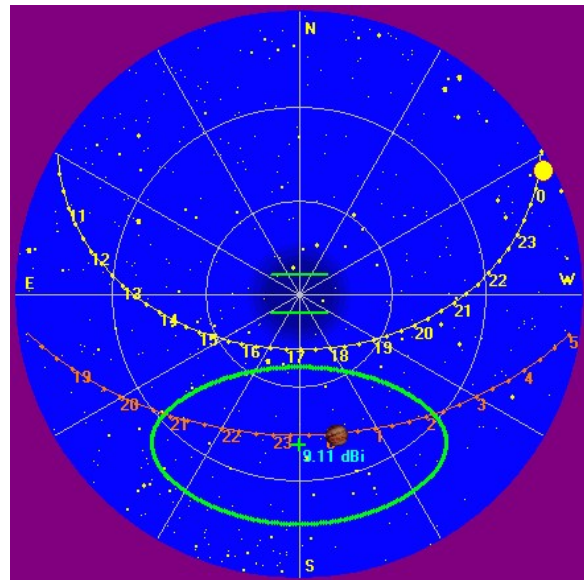
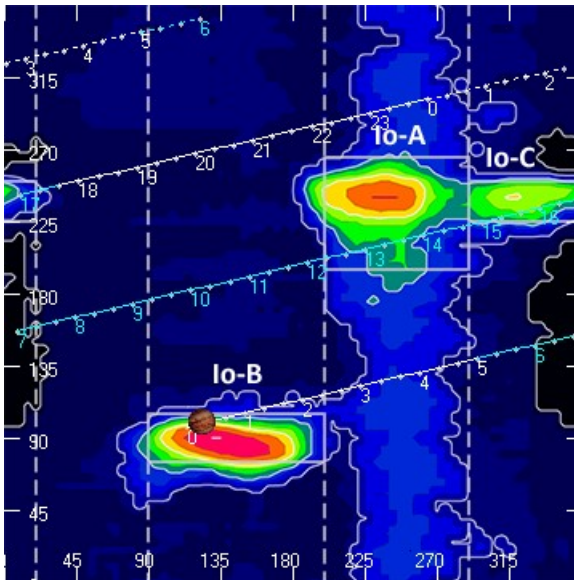
Start of pass:	0016 UT	Planetary K-index:	2
Jupiter Altitude (deg):	44.1	Jupiter Azimuth (deg):	195.1
Jupiter CML:	123.36	Jupiter Io Phase:	099.6
Jupiter RA (hr/min):	12:52	Jupiter Dec (hr/min):	-04:08
Hour Angle (hr/min):	00:43	Polarization	RCP
Sun Altitude (deg):	04.7	Sun Azimuth (deg):	296.8
Sun RA (hr/min):	06:37	Sun Dec (hr/min):	23.10

End of pass:	0045 UT		
Jupiter Altitude (deg):	42.2	Jupiter Azimuth (deg):	204.7
Jupiter CML:	140.89	Jupiter Io Phase	103.71
Hour Angle (hr/min):	01:12		
Sun Altitude (deg):	-00.1	Sun Azimuth (deg):	301.4

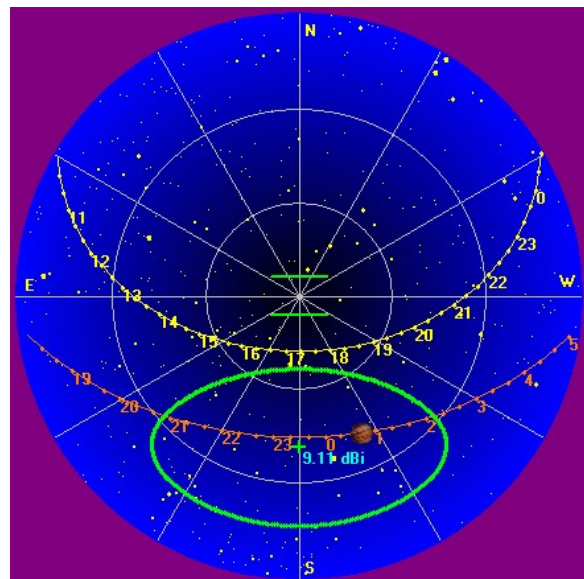
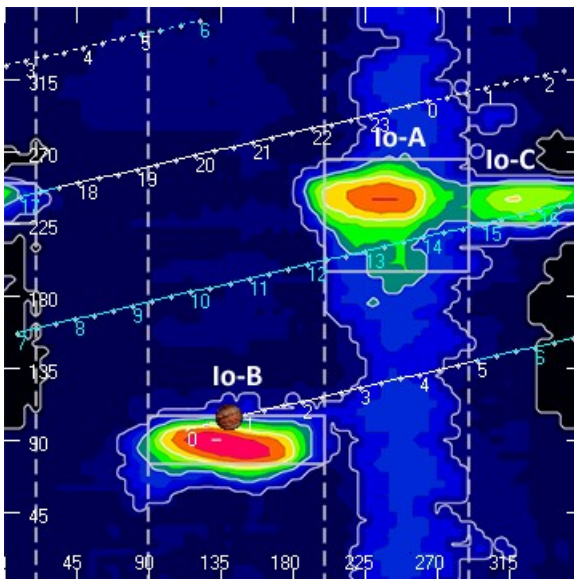
Observations made using:

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 @ 13'
 - a. 12' 6" phase cable - phased for 2016-17 season
 - b. Calibrated 1 June 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 19 April 2017
5. SDRPlay
 - a. RSP1 (2) and RSP2 (1)

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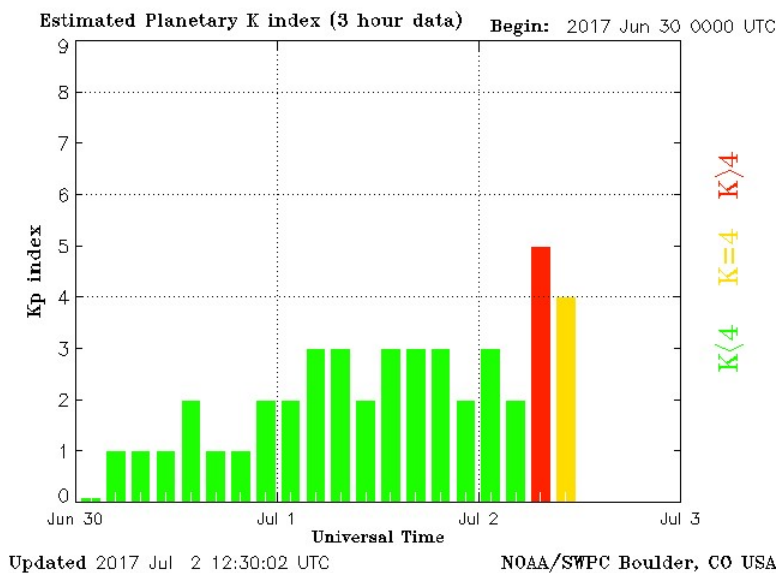


Beginning of Pass



End of Pass

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MODE	CML RANGE	Io RANGE	MAX F	POLAR	ARC	NOTES
Io-D	0-200	95-130	18	LH	Early	Also called "fourth source"
Io-B	(105 - 185)	(80-110)	39.5	RH	Early	Also called "early source"
non Io-B	80-200	0-360	38	RH	Early	Voyager info
Io-A	(200-270)	(205-260)	38	RH	Late	Also called "main source"
non-Io-A	(230-280)	0-360	38	RH	Late	
Io-C	(300-20)	(225-260)	36	RH&LH	Late	Also called "third source"
non-Io-C	300-360	0-360	32	RH&LH	Late	Voyager info

<https://www.radiosky.com/jupmodes.html>

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Considering the time of day, the position of the Sun and Jupiter, a good Io-B storm. Broadcast stations and distant lightning made observations questionable, however, the storm was strong enough to be seen.

Positive drift RCP L-bursts with cross hatched modulation lanes throughout the pass spanned 16 MHz to 30 MHz. The S-bursts that typically precede an Io-B pass were not visible, either because they were not there, or conditions made it impossible to view.

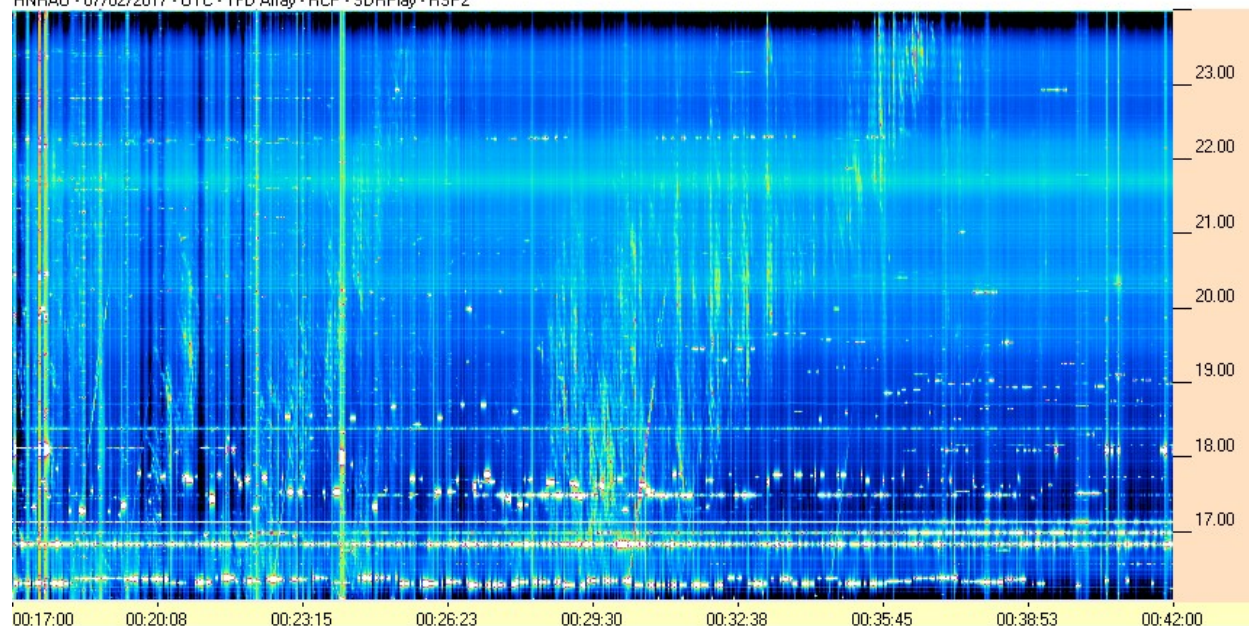
Modulation lane measurements made appear in a table at the end of this report. Strong bursts between 0035 UT and 0037 UT mark the only notable features other than the modulation lanes which were very pronounced.

Due to time and day and proximity of Sun and Jupiter relative to the sun, there was no observable Io-D component, if one existed.

While not as strong, the pass was observed by both the FSX2/LWA and FSX8S/TFD pairs.

SDRPlay RSP2/TFD Pair

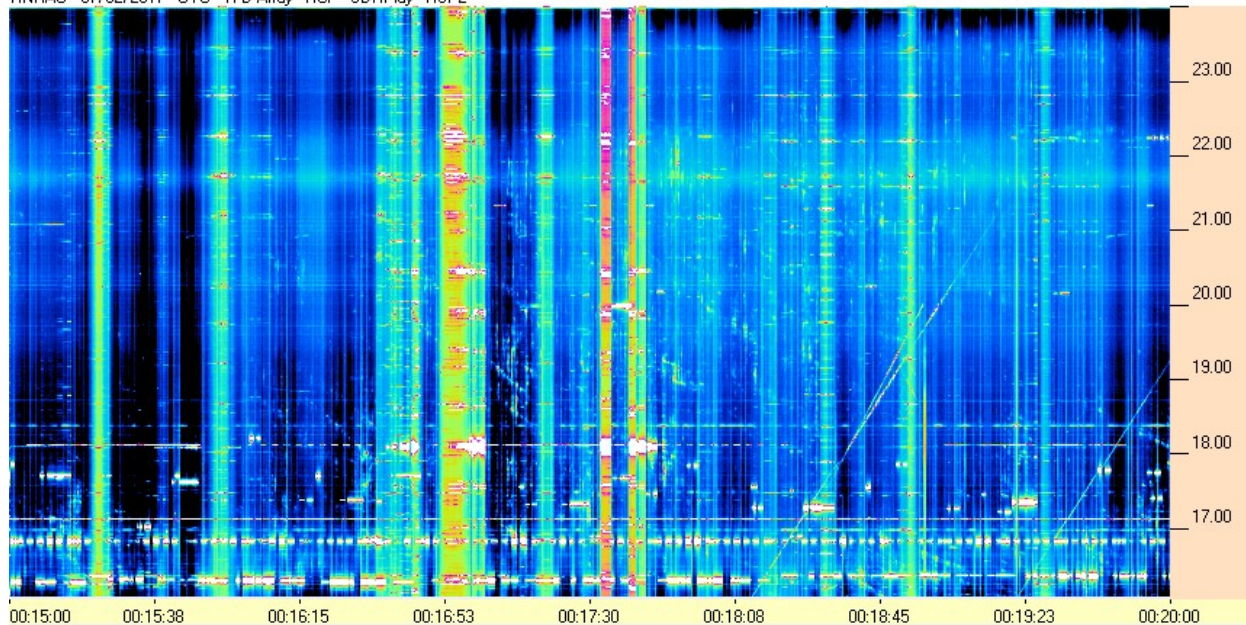
HNRAO - 07/02/2017 - UTC - TFD Array - RCP - SDRPlay - RSP2



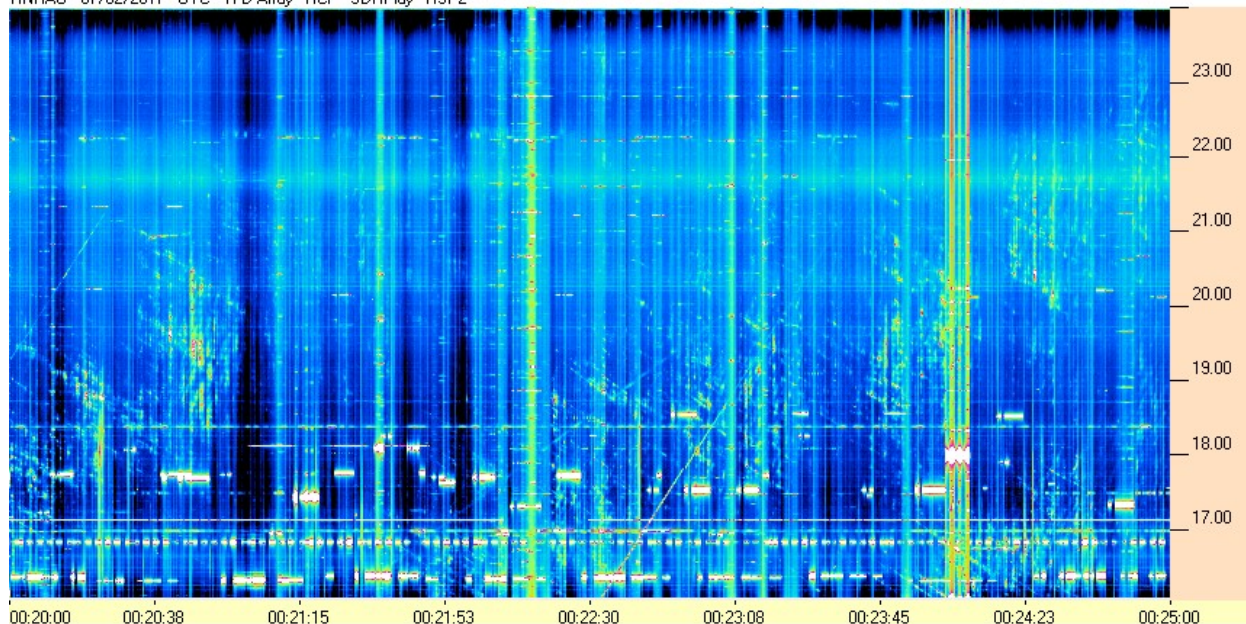
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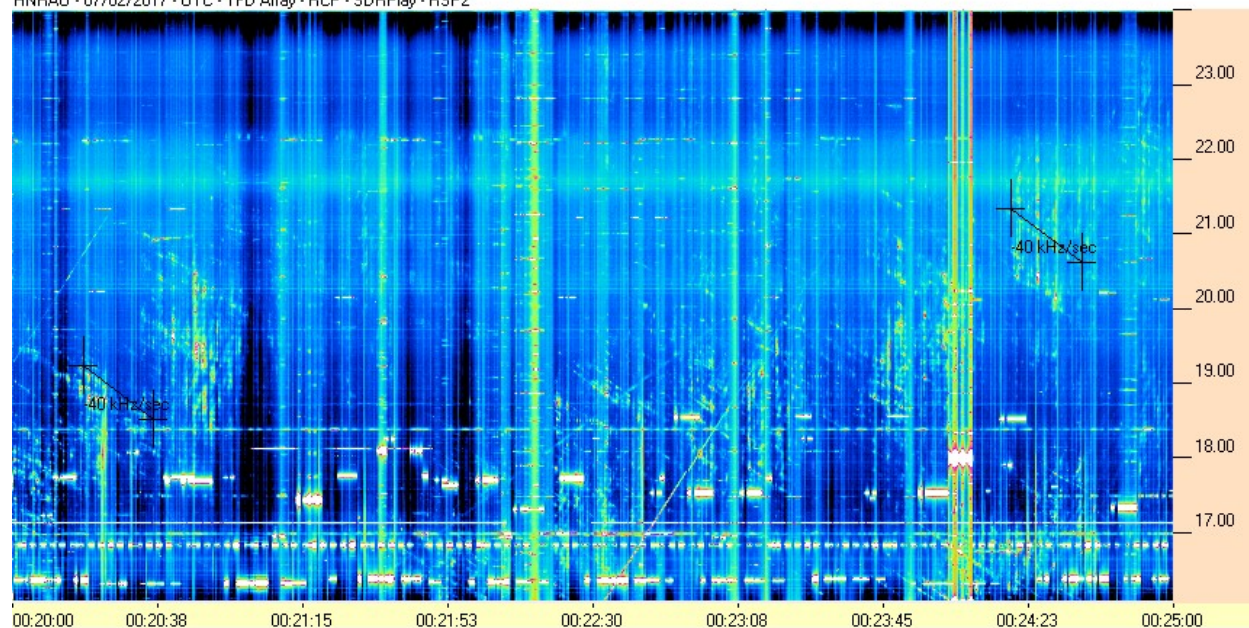


HNRAO Observing Log

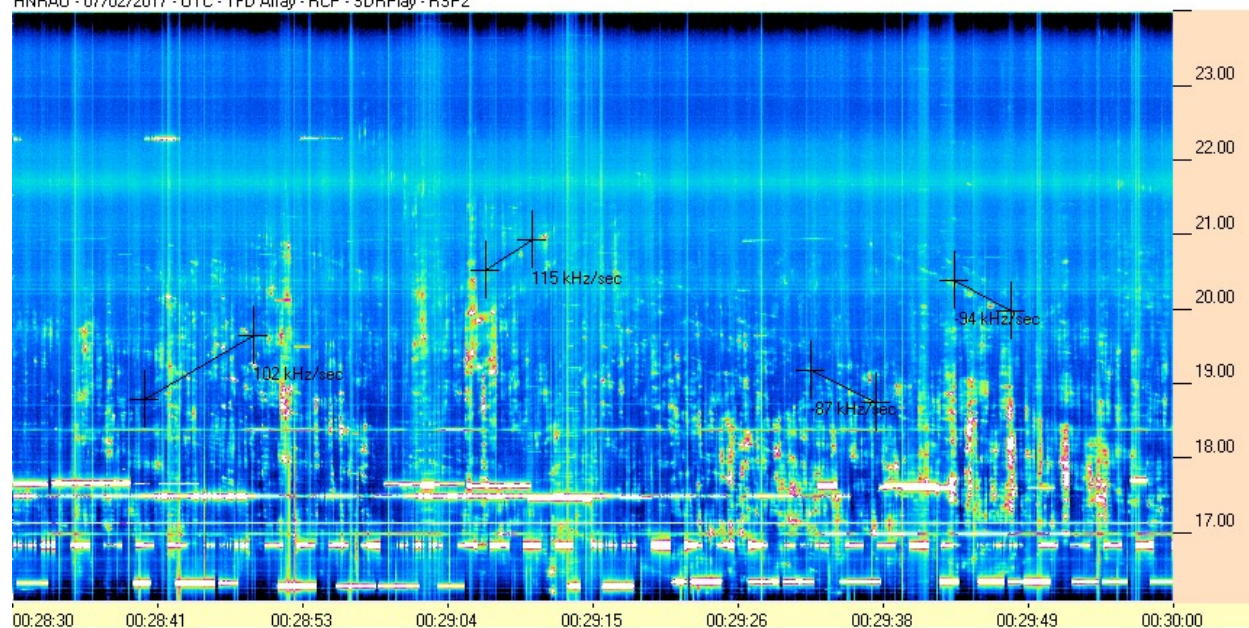
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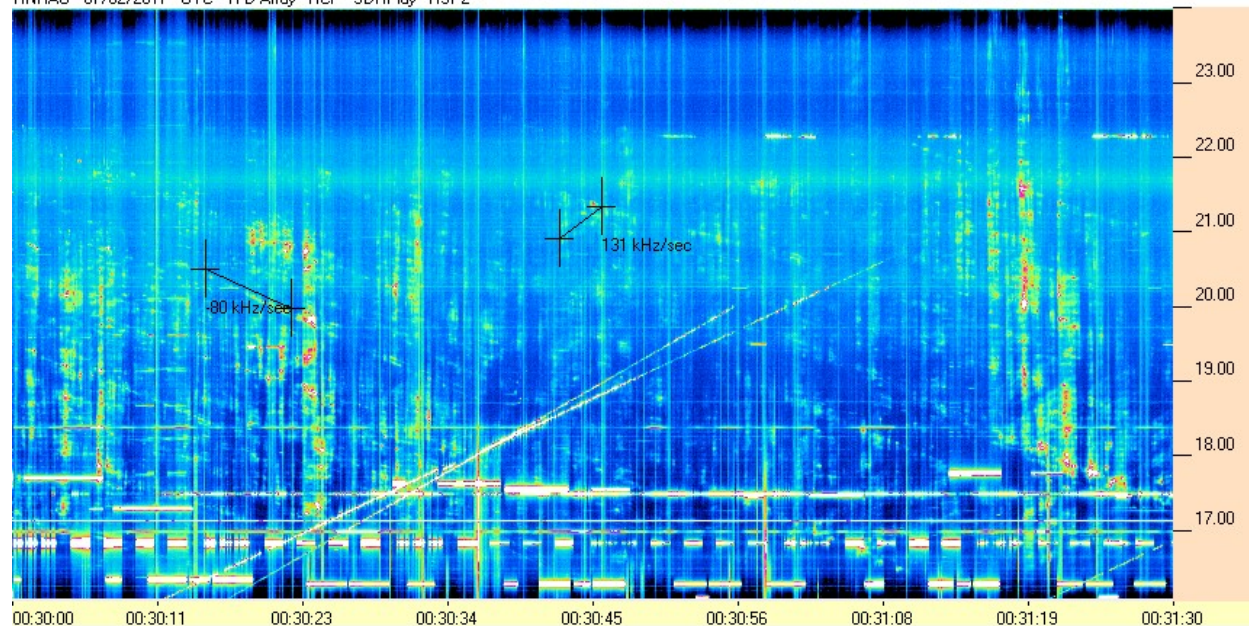


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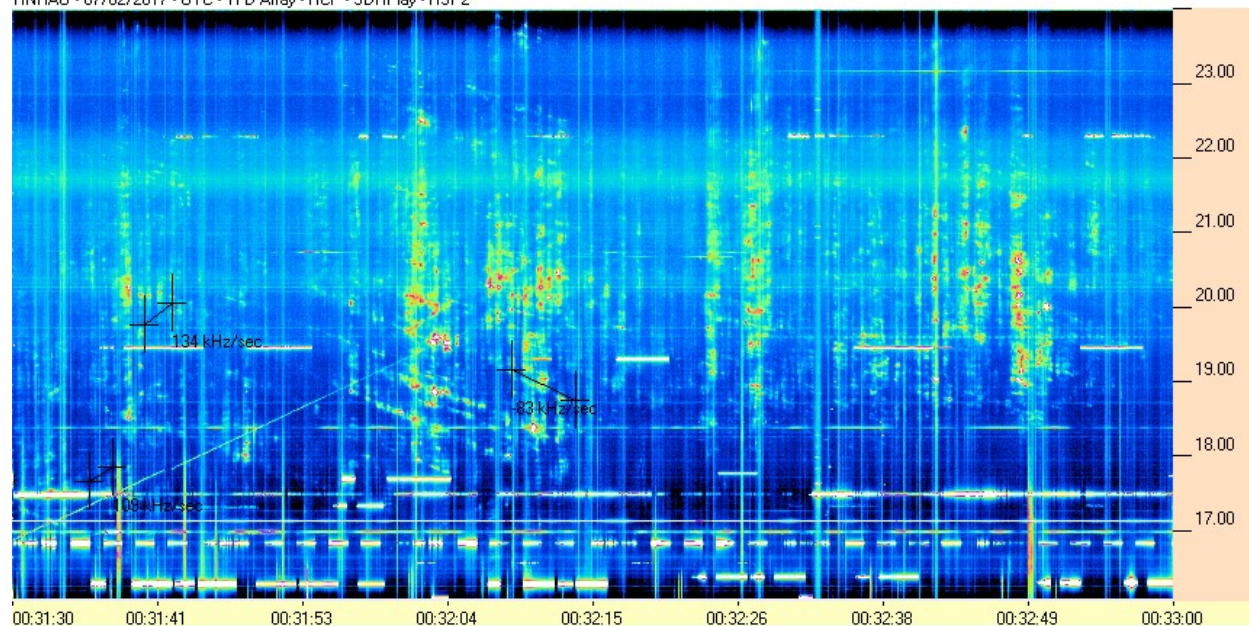
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HNRAO - 07/02/2017 - UTC - TFD Array - RCP - SDRPlay - RSP2



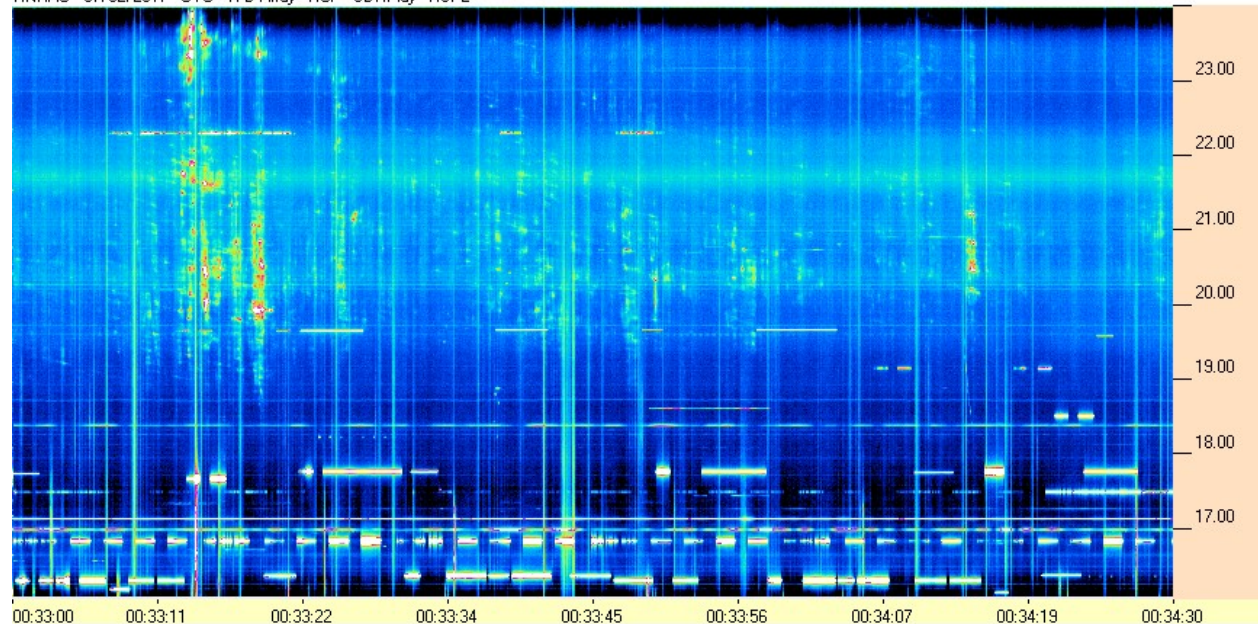
HNRAO - 07/02/2017 - UTC - TFD Array - RCP - SDRPlay - RSP2



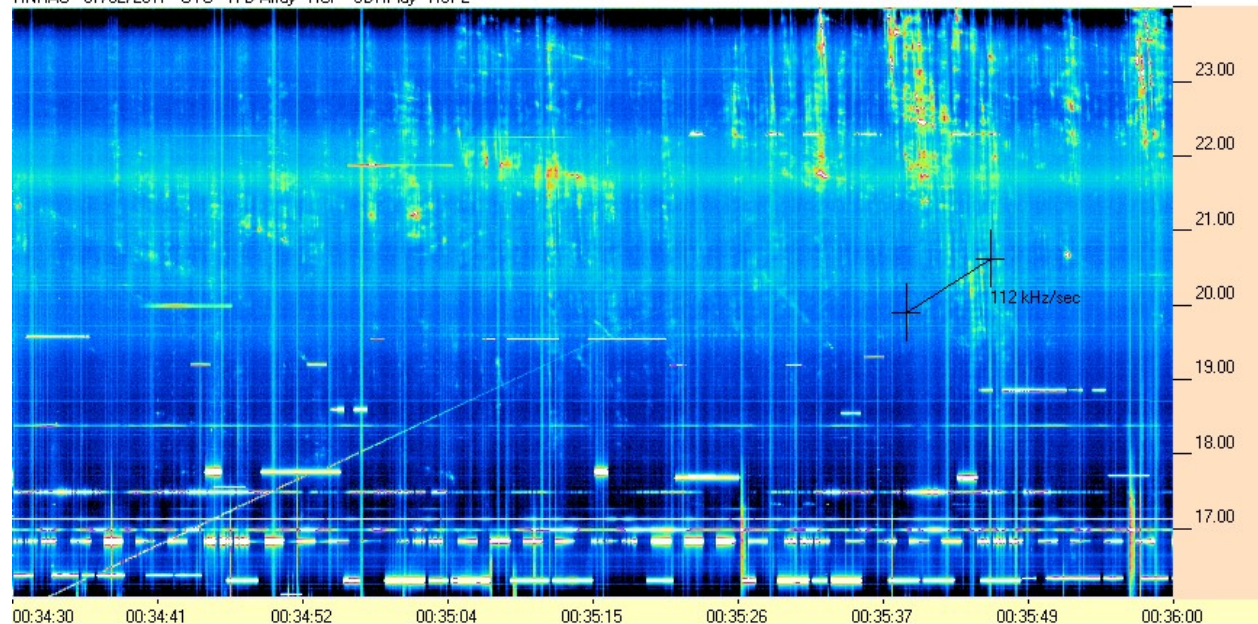
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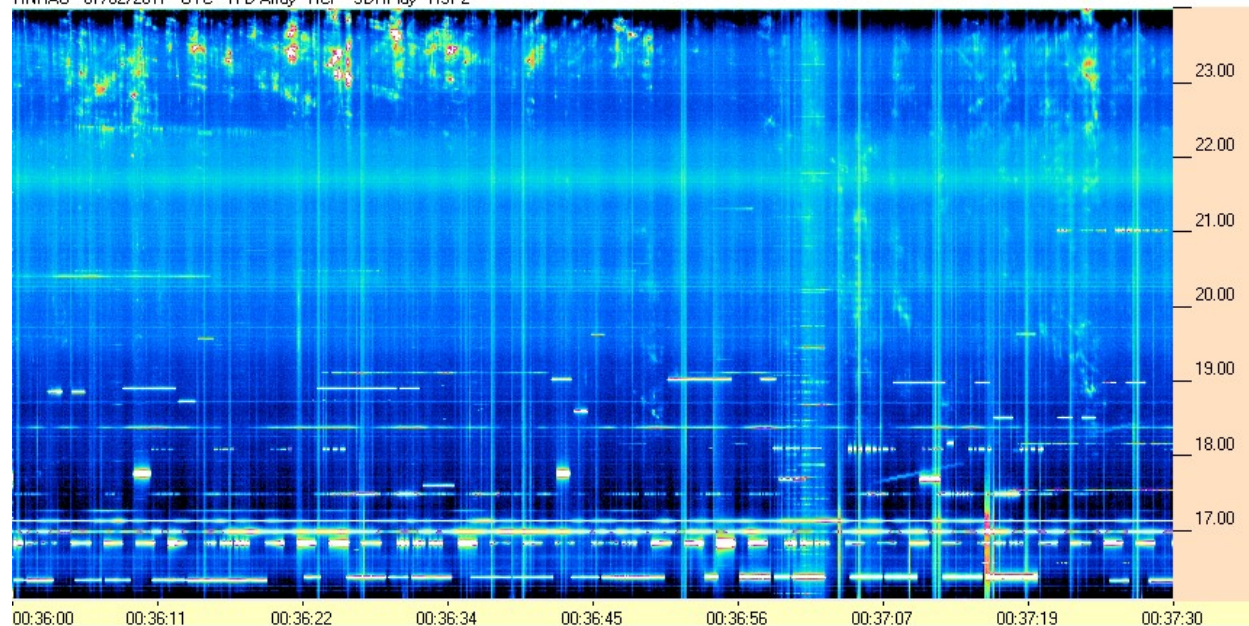
HNRAO - 07/02/2017 - UTC - TFD Array - RCP - SDRPlay - RSP2



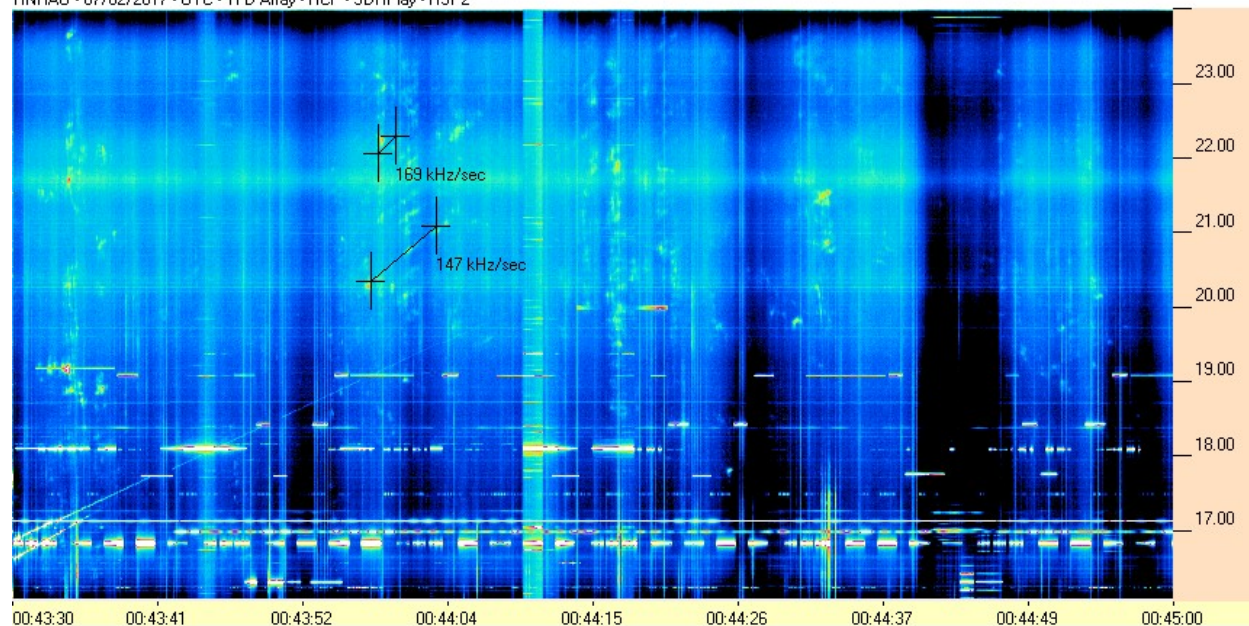
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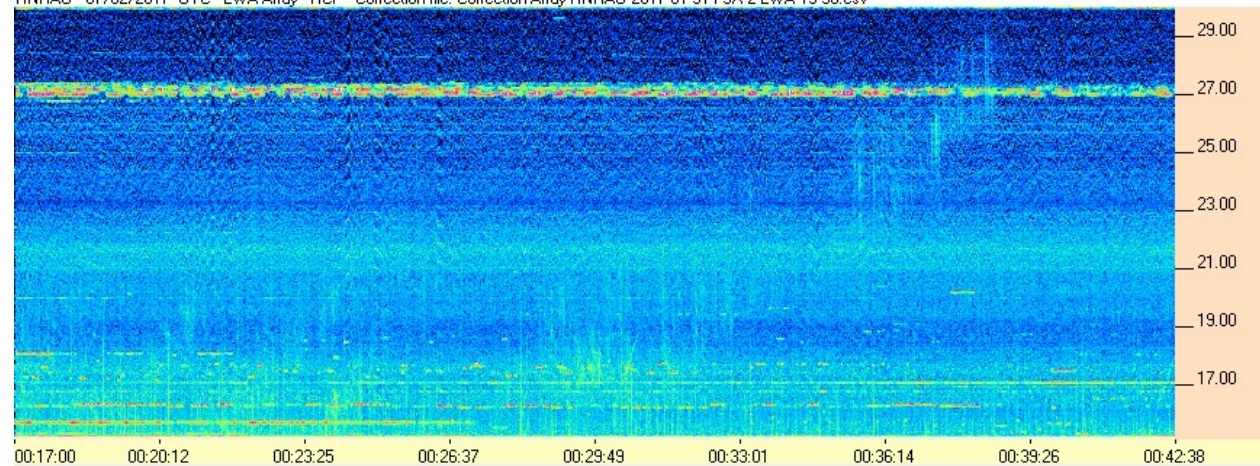


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FSX2/LWA Pair

HNRAO - 07/02/2017 UTC - LWA Array - RCP - Correction file: Correction Array HNRAO 2017 01 31 FSX-2 LWA 15-30.csv

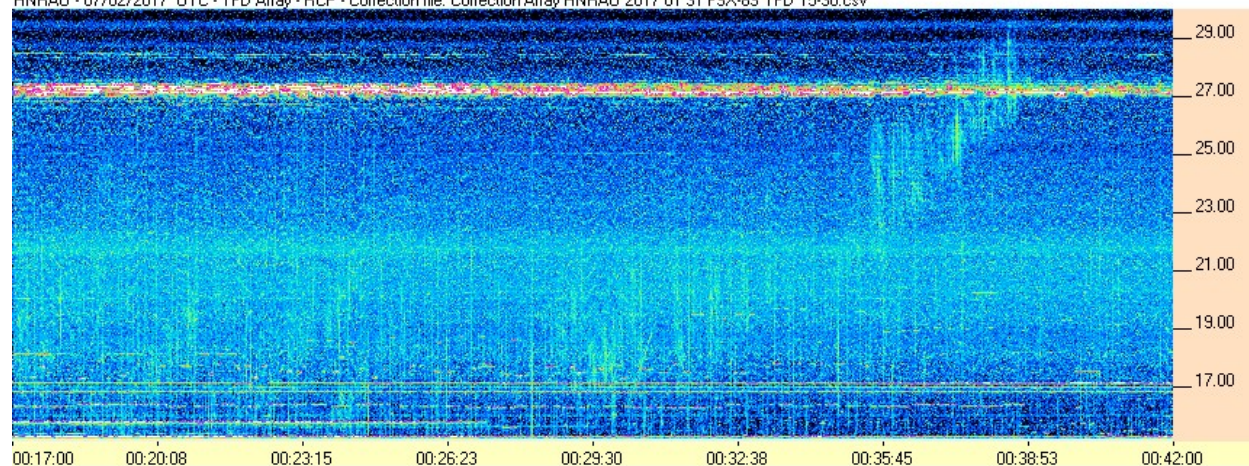


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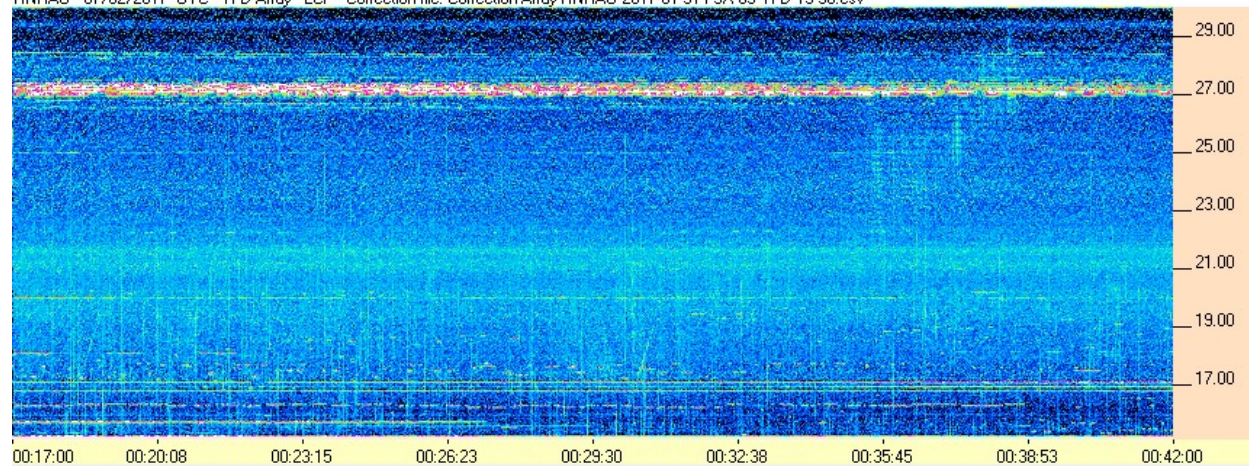


FSX8S/TFD Pair

HNRAO - 07/02/2017 UTC - TFD Array - RCP - Correction file: Correction Array HNRAO 2017 01 31 FSX-8S TFD 15-30.csv



HNRAO - 07/02/2017 UTC - TFD Array - LCP - Correction file: Correction Array HNRAO 2017 01 31 FSX-8S TFD 15-30.csv



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Modulation Lane Measurements

Antenna	Start	Stop	Mid	Freq 1 MHz	Freq 2 MHz	Mid Freq MHz	Khz/sec
TFD	7/2/2017 00:20	7/2/2017 00:20	7/2/2017 00:20	18	19	19	-40
TFD	7/2/2017 00:24	7/2/2017 00:24	7/2/2017 00:24	21	21	21	-40
TFD	7/2/2017 00:28	7/2/2017 00:28	7/2/2017 00:28	19	20	19	102
TFD	7/2/2017 00:29	7/2/2017 00:29	7/2/2017 00:29	19	19	19	-87
TFD	7/2/2017 00:29	7/2/2017 00:29	7/2/2017 00:29	20	20	20	-94
TFD	7/2/2017 00:29	7/2/2017 00:29	7/2/2017 00:29	20	21	21	115
TFD	7/2/2017 00:30	7/2/2017 00:30	7/2/2017 00:30	19	20	20	-80
TFD	7/2/2017 00:30	7/2/2017 00:30	7/2/2017 00:30	20	20	20	-81
TFD	7/2/2017 00:30	7/2/2017 00:30	7/2/2017 00:30	21	21	21	131
TFD	7/2/2017 00:31	7/2/2017 00:31	7/2/2017 00:31	18	18	18	109
TFD	7/2/2017 00:31	7/2/2017 00:31	7/2/2017 00:31	20	20	20	134
TFD	7/2/2017 00:32	7/2/2017 00:32	7/2/2017 00:32	19	19	19	-83
TFD	7/2/2017 00:35	7/2/2017 00:35	7/2/2017 00:35	20	21	20	112
TFD	7/2/2017 00:43	7/2/2017 00:44	7/2/2017 00:44	20	21	21	147
TFD	7/2/2017 00:43	7/2/2017 00:44	7/2/2017 00:43	22	22	22	169