HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq

Date: 31 May 2017

Object: Jupiter – Io-B

Observer: JB/RF

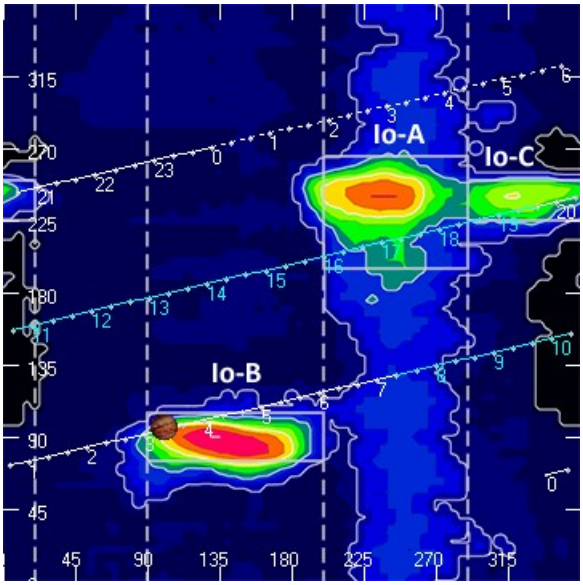
Start of pass:	**0321 UT**	**Planetary K-index:**	**1-2**
Jupiter Altitude (deg):	**39.5**	**Jupiter Azimuth (deg):**	**214.6**
Jupiter CML:	**100.99**	**Jupiter Io Phase:**	**095.22**
Jupiter RA (hr/min):	**12:51**	**Jupiter Dec (hr/min):**	**-03:50**
Hour Angle (hr/min):	**01:44**	**Polarization**	**RCP**
Sun Altitude (deg):	**-22.6**	**Sun Azimuth (deg):**	**332.2**
Sun RA (hr/min):	**04:25**	**Sun Dec (hr/min):**	**21:39**

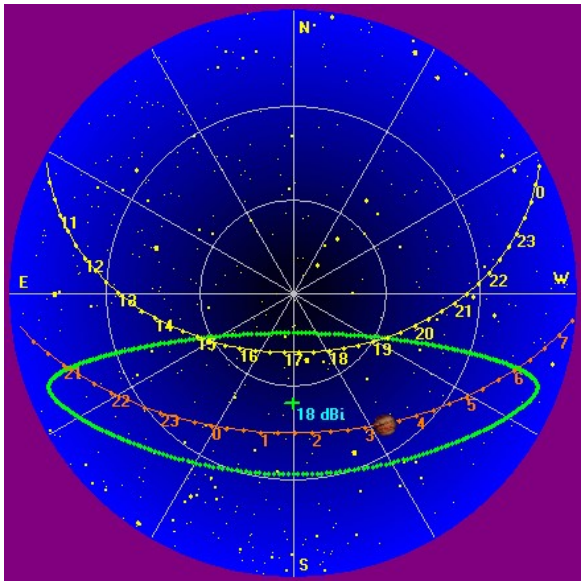
End of pass:	**0405 UT**		
Jupiter Altitude (deg):		**Jupiter Azimuth (deg):**	
Jupiter CML:		**Jupiter Io Phase**	
Hour Angle (hr/min):			
Sun Altitude (deg):		**Sun Azimuth (deg):**	

Observations made using:

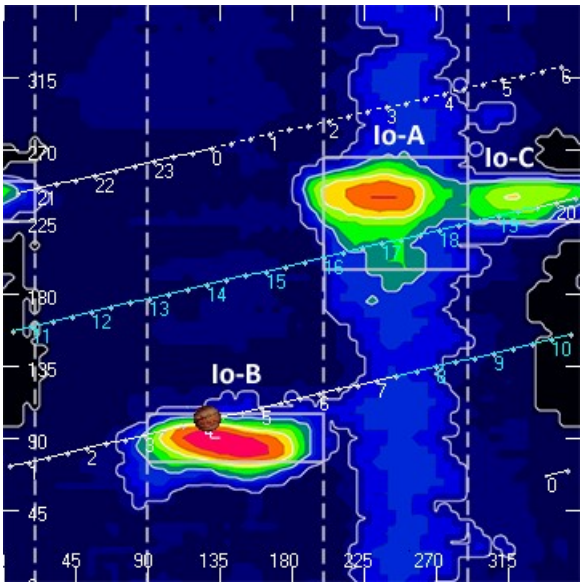
1. FSX-8S fed by the TFD array
    a. 7.7 dB loss between TFD and Multicouplers.
    b. Connect to array through HNRAO Multicoupler #1 and #2, port 2
        i. HNRAO Multicoupler #1 – TFD/LCP
        ii. HNRAO Multicoupler #2 – TFD/RCP
            1. Port 1 having 10 dB of gain, all other ports have 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)

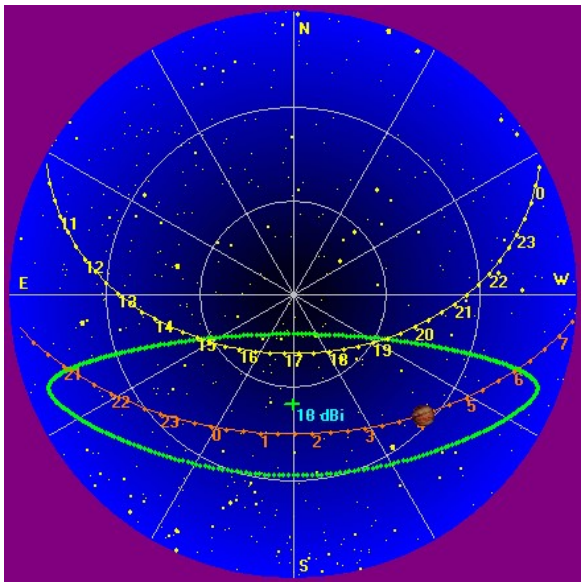
HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq





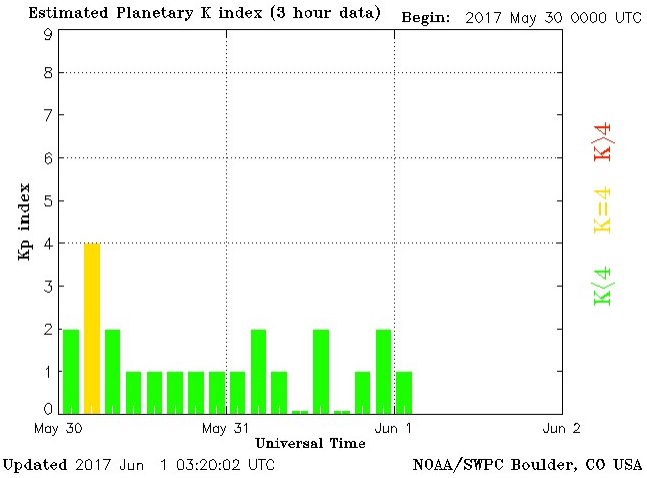
Beginning of Pass





End of Pass

HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



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

A weak RCP Io-B with negative drift L-bursts showing the expected emission period, a quiet period, more emission followed by quiet cycle.

Cross hatched modulation lanes were present throughout the storm. This storm deviated from the pattern seen in previous modulation lane structure. In previous modulation lanes, the drift rate has increased with increasing frequency. This emission patter was the reverse, with lower drift rates with increasing frequency.

The emission group a 0326 UT is diffuse and no lanes are resolute to measure, however, it appears to be composed of cross hatched lanes.

At 0329:10 UT, an emission group appears to have positive drift modulation lanes.

At 0331:40 UT, a small emission at 23 MHz also appears to have cross hatched lanes as does a following group at 0332:35 UT.

At 0334:40 UT, another group appears to have cross hatched modulation lanes. One lane measures 104 kHz/sec while another lane in the same group measures -29 kHz/sec. at 18 MHz. At 23 MHz, at the same time, a lane was measured at 150 kHz/sec.

About 0342:20 UT, the modulation lanes are negative drift above 19 MHz, and between 19 MHz and 16 MHz are cross hatched.

Between 0349 UT and 0350 UT, the modulation lanes are more pronounced from 18 MHz to 24 MHz and measurements were made. Positive drift modulation lanes are present from18.5 MHz. The remainder are negative drift.

Cross hatched modulation lanes are very pronounced at 0351 UT at 21 MH. At 0352:20, more cross hatched modulation lanes are present between 19.5 MHz and 17 MHz.

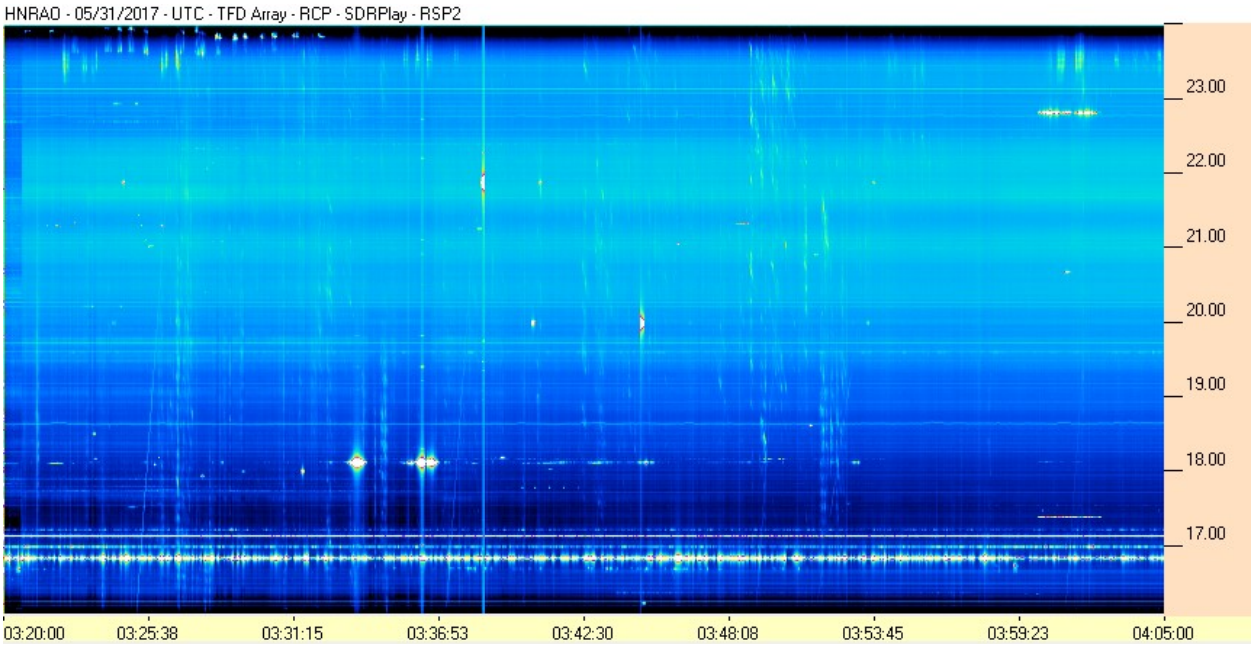
At 0355:15 UT and 0355:40 UT and 0402:00 UT positive drift modulation lanes are visible at 23 MHz.

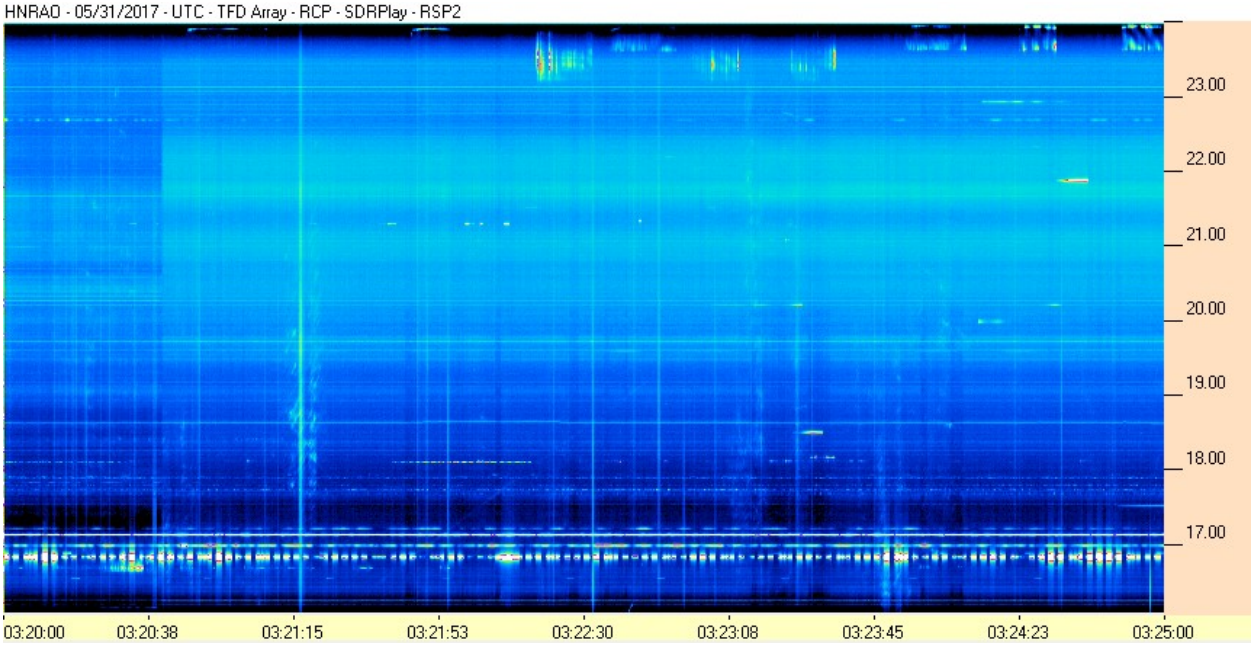
Emissions were not observed with the FSX-2/LWA, FSX-8S/TFD nor the Radio JOVE dipoles.

Other than the cross hatched modulation lanes, there was no other unique objects to report.

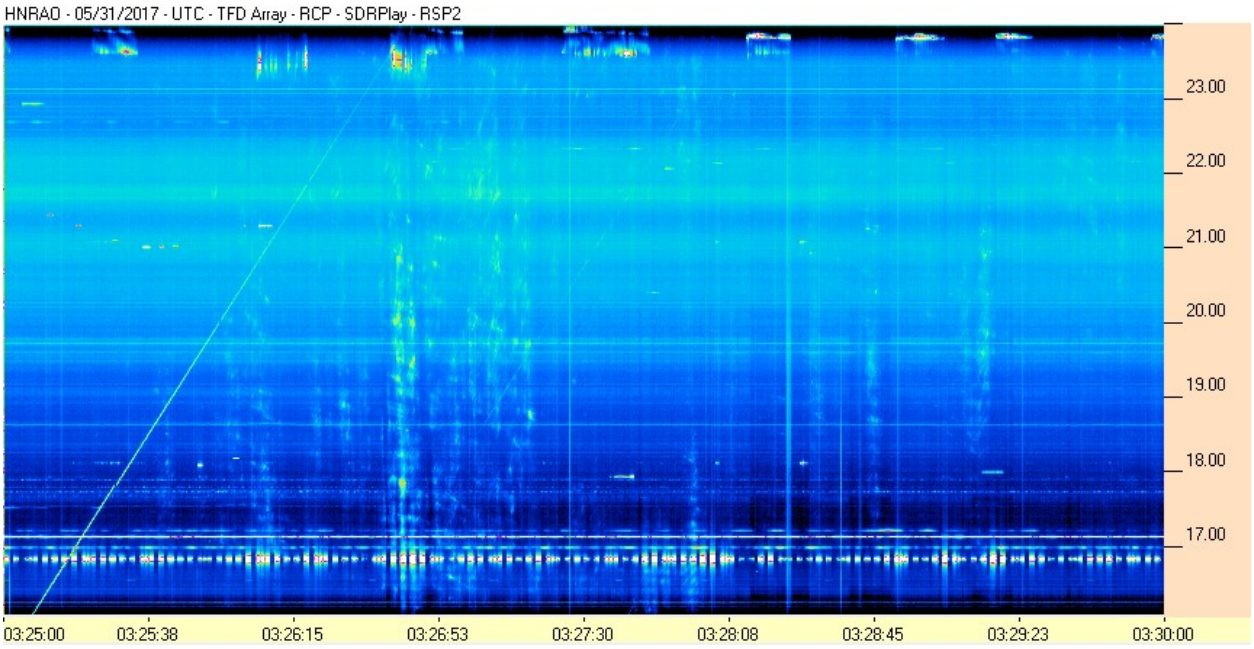
HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq

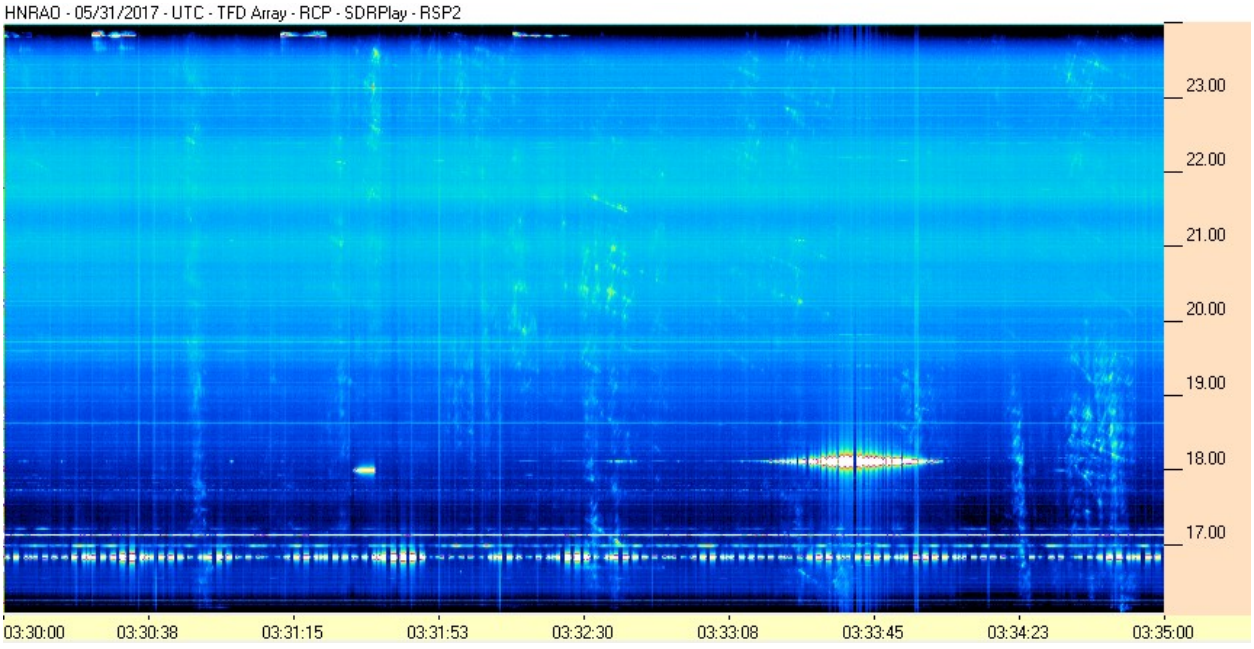
SDRPlay RSP2/TFD Pair



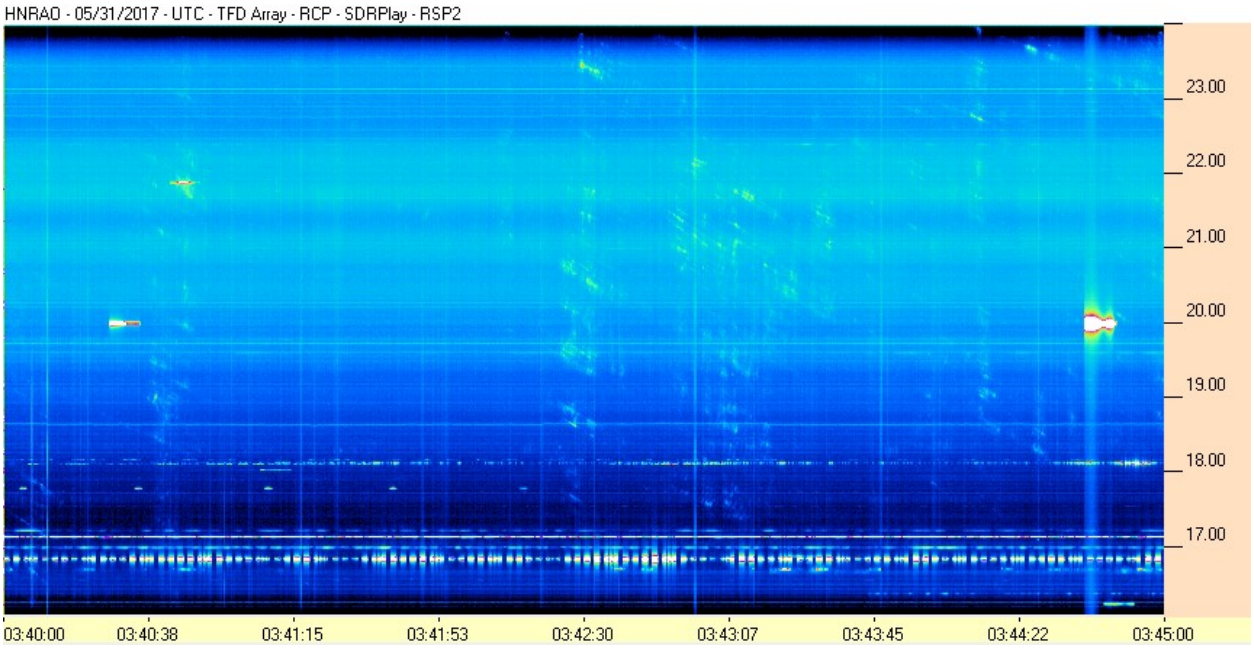


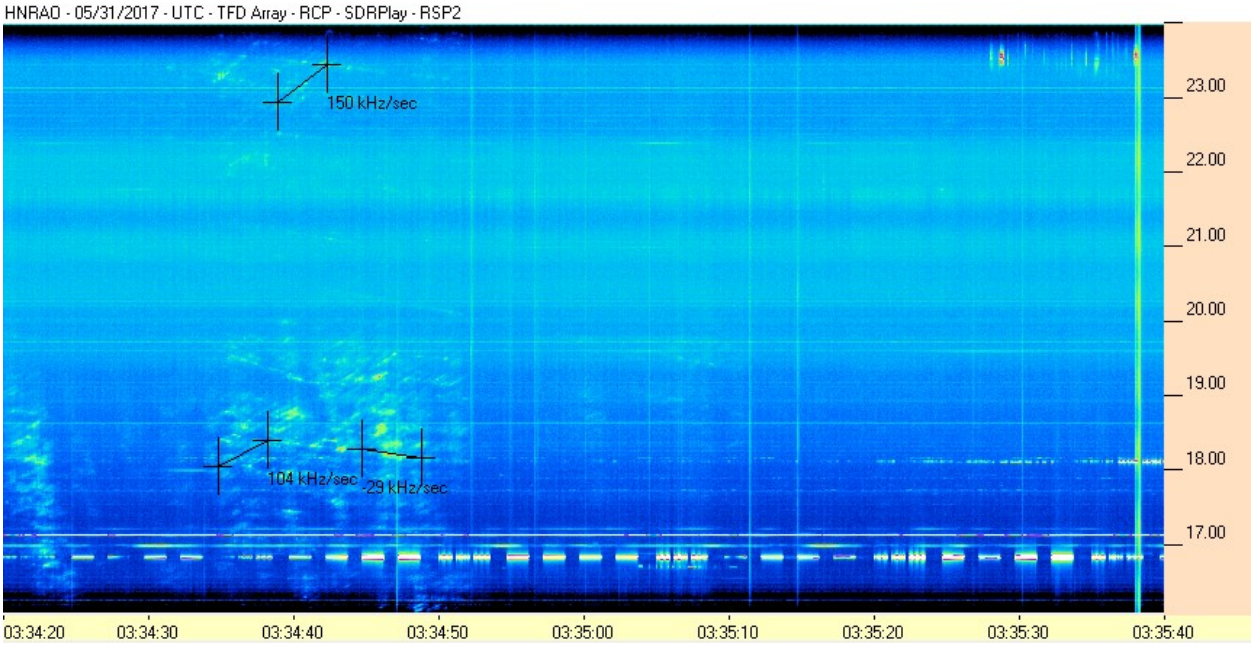
HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



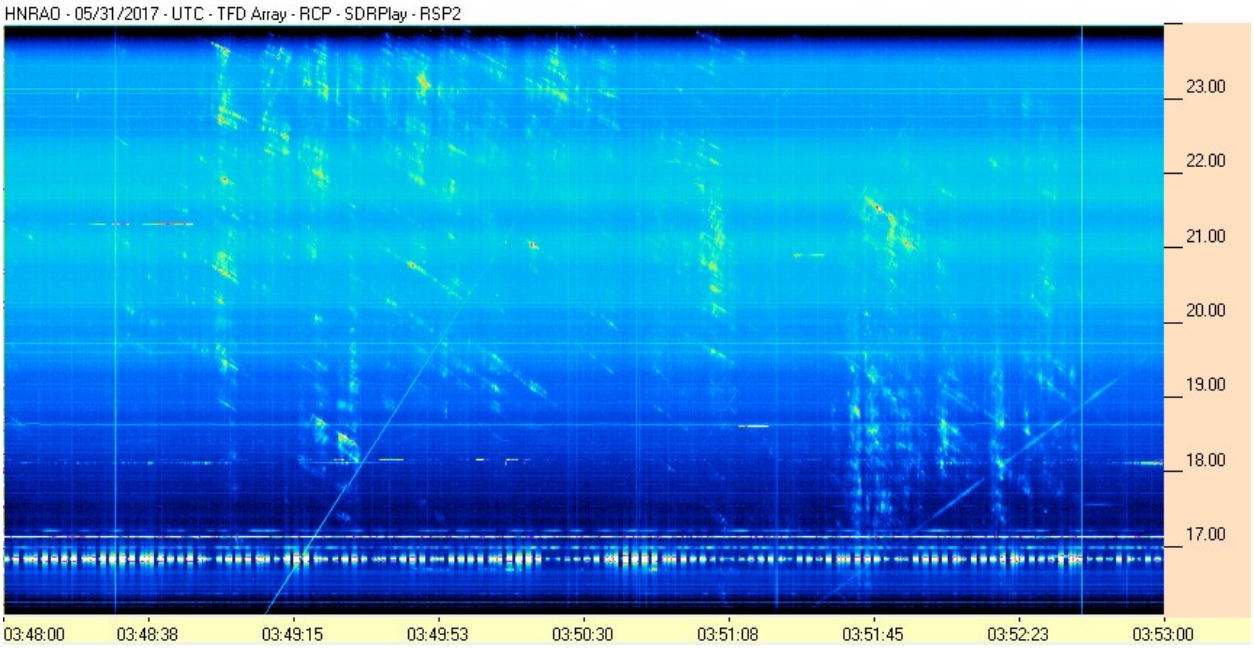


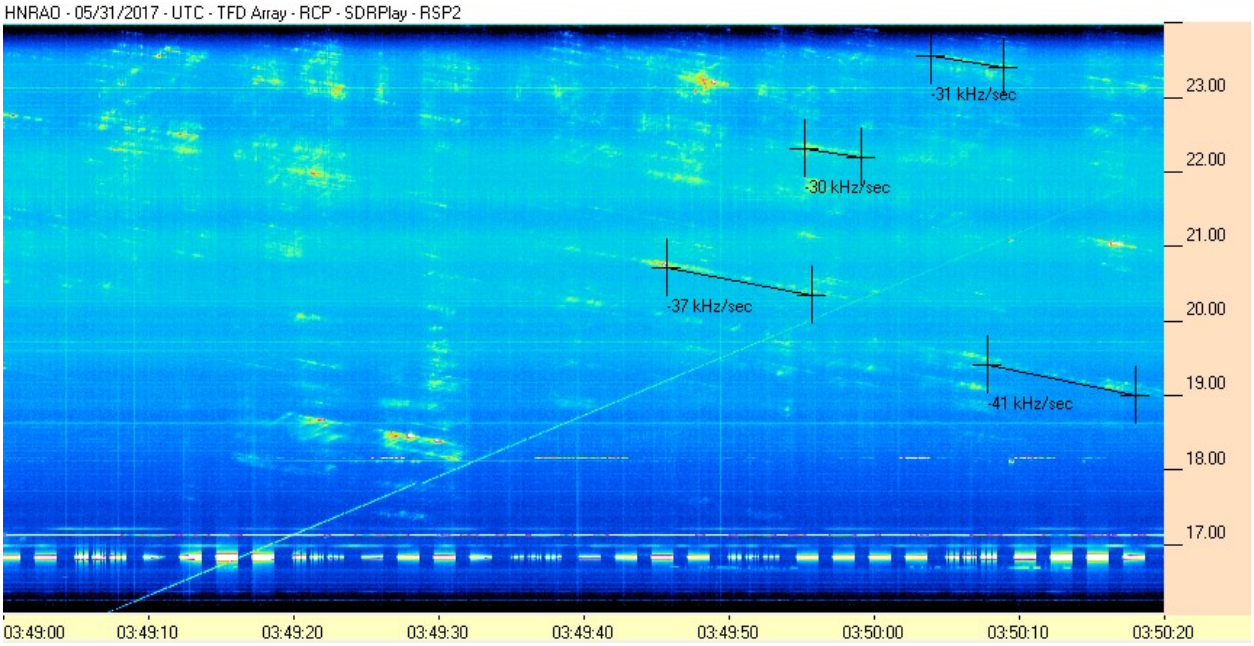
HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



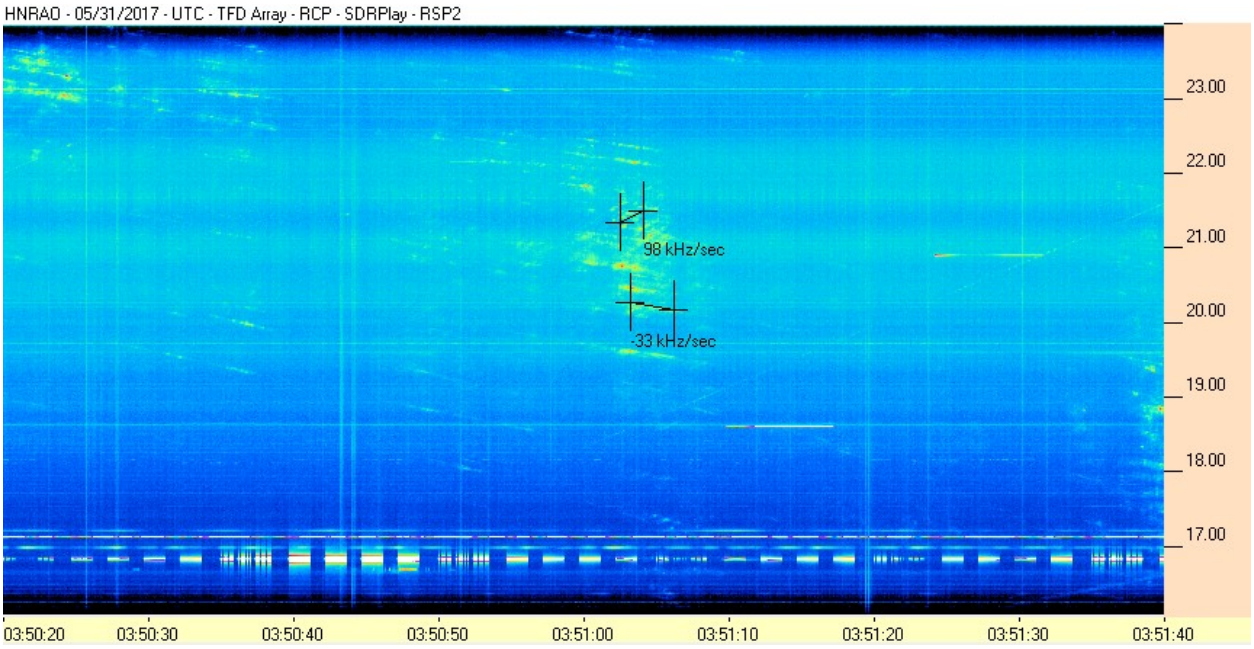


HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq





HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



Modulation Lane Measurements – 0349 UT – 0350 UT

Mid-Time	Freq 1	Freq 2	Mid-Freq	Slope
5/31/2017 03:49	23473	23591	23.5	-36.9
5/31/2017 03:50	23394	23551	23.5	-31.5
5/31/2017 03:49	22174	22292	22.2	-30.3
5/31/2017 03:51	21308	21466	21.4	98.4
5/31/2017 03:49	20305	20679	20.5	-37.4
5/31/2017 03:51	20128	20226	20.2	-32.8
5/31/2017 03:50	18947	19361	19.2	-40.5