

HNRAO Observing Log
40.673181 N – 80.437885 W
EN90sq



Date: 3 January 2017

Object: Jupiter Io-A/C

Observer: JB start – Unattended end

Start of pass:	0809 UT		
Jupiter Altitude:	20.7 degrees	Jupiter Azimuth:	119.8 degrees
Jupiter CML:	304.31	Jupiter Io Phase:	250.89
Jupiter RA:	13:19	Jupiter Dec:	-06:59
Sun Altitude:	-50.1 degrees	Sun Azimuth:	077.0 degrees
Sun RA:	18:49	Sun Dec:	-22.58

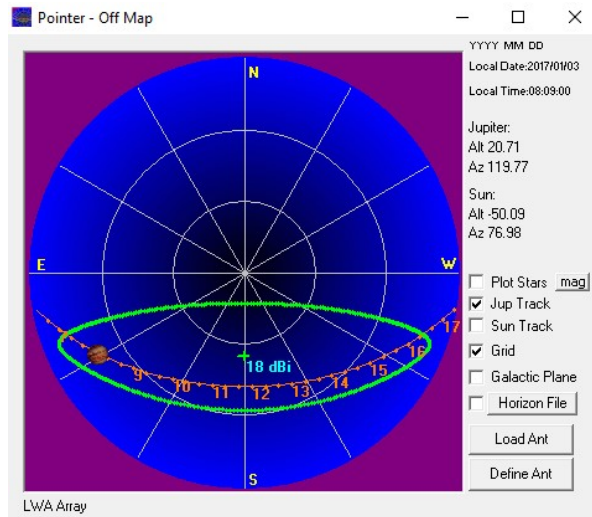
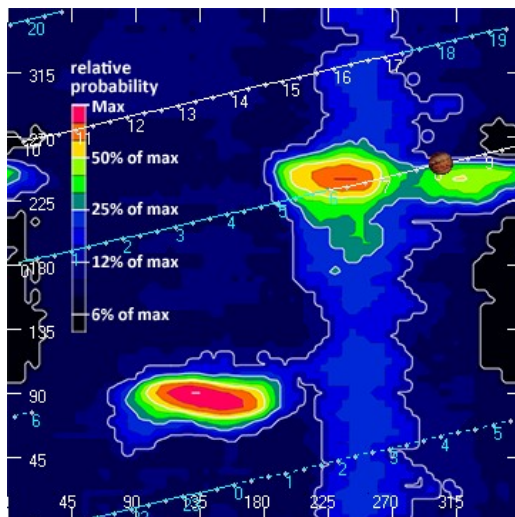
End of pass:	0811 UT		
Jupiter Altitude:	21 degrees	Jupiter Azimuth:	120.2 degrees
Jupiter CML:	305.52	Jupiter Io Phase	251.17
Jupiter RA:	13:19	Jupiter Dec:	-06:59
Sun Altitude:	-49.7 degrees	Sun Azimuth:	077.4 degrees
Sun RA:	18:49	Sun Dec:	-22:58

 Observations made using:

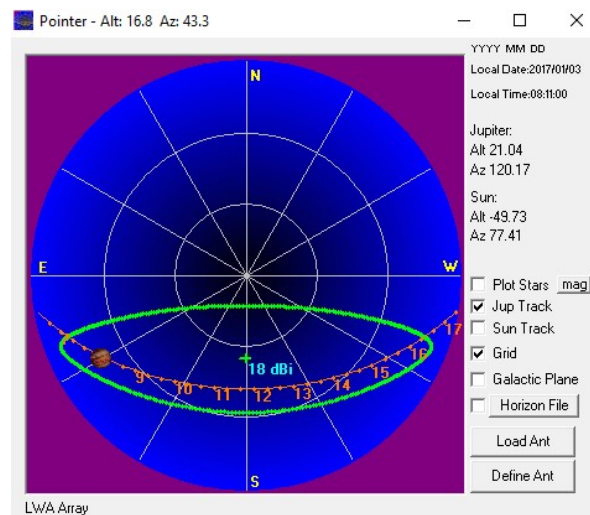
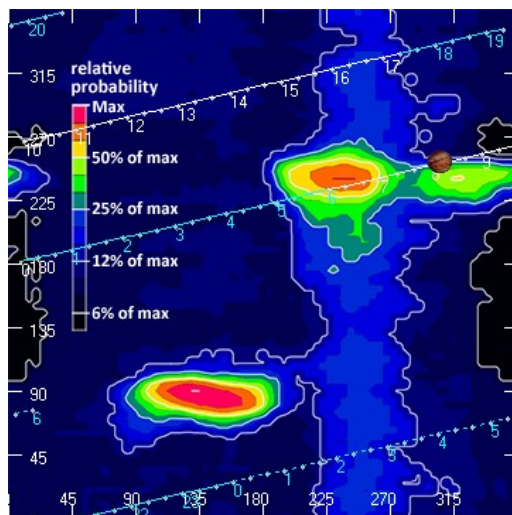
1. FSX-8S fed by the TFD array
 - a. Initially connect to array through HNRAO Multicoupler #1 and #2, port 2
 - i. HNRAO Multicoupler #1 – TFD/LCP
 - ii. HNRAO Multicoupler #2 – TFD/RCP
 - iii. Port 1 having 10 dB of gain, all other ports on Multicoupler have approximately 3 dB gain.
2. FSX-2 fed by the LWA array directly
 - a. LWA element configuration – 90 degrees
3. Spectrograph calibrations (FSX-2 & FSX-8S) completed
 - a. 1800 UT/ 2 Jan 17.
4. JOVE 2 receiver fed by phased JOVE dipoles @ 10' – phased for 2016-17 season
 - a. Calibrated 28 Nov. 2016
 - b. Connected to dipoles through HNRAO Multicoupler #3, port 1.
5. Icom R75 receiver fed by experimental DDRR antenna directly.
 - a. Calibrated 28 Nov. 2016

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Beginning of Pass



End of Pass

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An Io-A and high Io-C pass. No Io-A emissions detected through the attended portion of the observation and into the Io-A/C region. A thunderstorm moving through the Southern states created a substantial amount of lightning static on the JOVE/SkyPipe chart. The lightning discharges were quite noticeable on the JOVE receiver audio but were not affecting either the FSX-2/LWA or FSX-8S/TFD spectrograph. Both LGM and AJ4CO SkyPipe charts as well as their spectrographs were showing a great deal of lightning discharge due to the proximity of the storms (see image at bottom).

The lightning discharge spikes on my SkyPipe chart rendered any Jupiter emissions impossible to detect.

From approximately 0809 UT to 0811 UT, there appeared to be a very brief LCP emissions between 16 MHz and 17 MHz. A look at the Nancay observatory spectrograph indicated some LCP Io-C at this time.

1. 0622 UT

- a. Conditions at HNRAO Observatory
 - i. 44 degrees
 - 1. Cloudy
- b. GB
 - i. HNRAO 32 kK
 - ii. LGM JOVE 32 kK TFD 36 kK
 - iii. AJ4CO TFD 29 kK RJ 29 kK
- c. Jupiter
 - i. Altitude 2.24 degrees
 - ii. Azimuth 101.19 degrees
- d. Step Calibrations
 - i. Arduino & attenuator board prototype
 - ii. FSX-2 and FSX-8S
 - iii. JOVE 2 Receiver
 - 1. Calibration runs at 0645 UT
 - 2. 47 MK, 24 MK, 12 MK, 6000 kK, 3000 kK, 1500 kK, 747 kK, 375 kK, 188 kK, 94 kK, 47 kK.
- e. FSX-2 /LWA in RCP
- f. Minor line noise RFI on FSX-8S
- g. No line noise apparent on FSX-2. Wavy lines from Cable TV present but not bad.

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2. 0700 UT

- a. A lot of atmospherics on JOVE receiver
 - i. Distant lightining
 - ii. See radar map at end of report
 - 1. Lghtning on LGM and AJ4CO SkyPipe charts as well.
 - 2. Storms moving in a NE direction
 - 3. HNRAO Spectrographs unaffected
 - 4. Lightning discharge visible on LGM and AJ4CO spectrograph
- b. GB
 - i. HNRAO 32 kK
 - ii. LGM Jove 32 kK TFD 36 kK
 - iii. AJ4CO TFD 26 kK RJ 29 kK
- c. RJP Probability 55%
- d. Jupiter
 - i. Altitude 9.23 degrees
 - ii. Azimuth 107.58 degrees

3. 0730 UT

- a. GB
 - i. HNRAO 32 kK
 - ii. LGM JOVE 31 kK TFD 35 kK
 - iii. AJ4CO TFD 27 kK RJ 29 kK

4. 0736 UT

- a. Switched FSX-2 to LCP
 - i. Between Io-A and Io-C

5. 0749 UT

- a. No Jupiter emissions. Going to run unattended at this point.

6. 0750 UT

- a. **Unattended @ 0750 UT**

7. 0809 UT

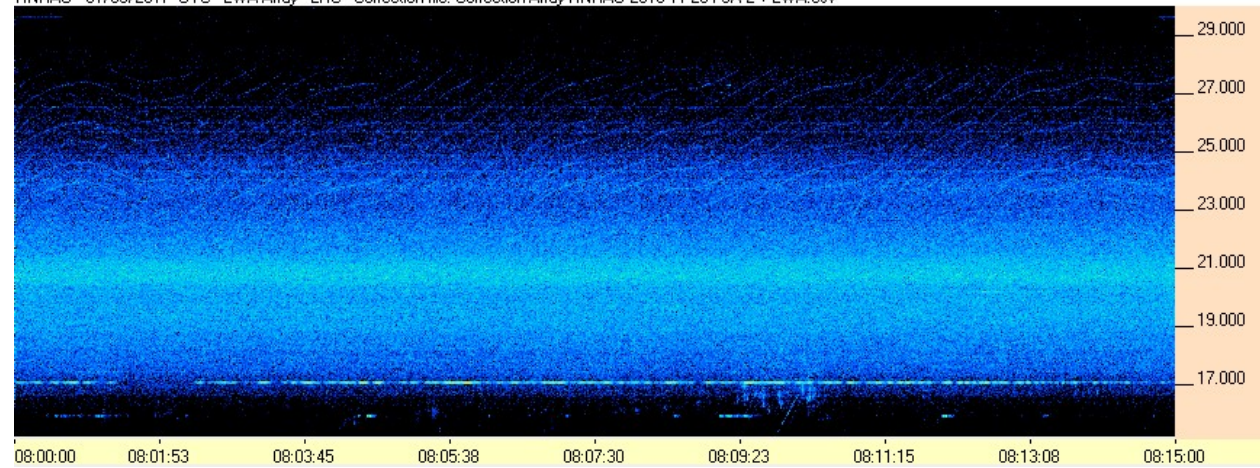
- a. What appears to be a very brief LCP Io-C emissions.
- b. Nancay Observatory spectrographs for the same time indicates this was probably Io-C

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FSX-2/LWA

HNRAO - 01/03/2017 UTC - LWA Array - LHC - Correction file: Correction Array HNRAO 2016 11 20 FSX-2 + LWA.csv

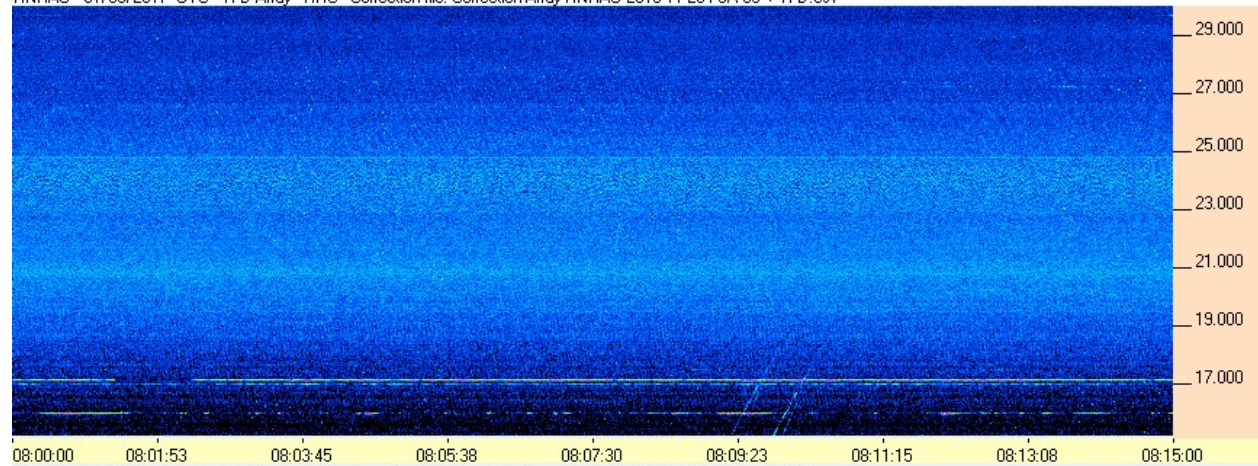


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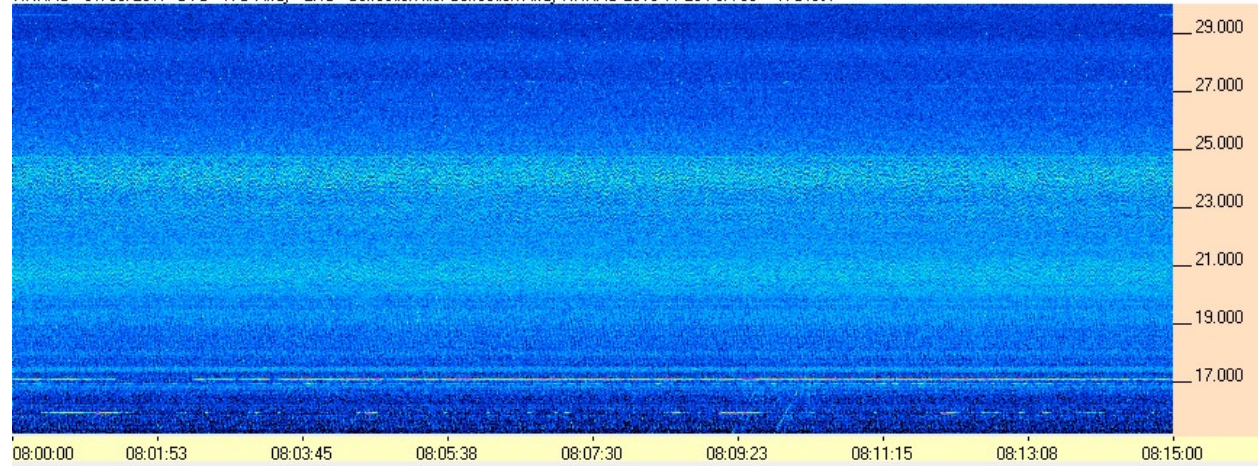


FSX-8S/TFD

HNRAO - 01/03/2017 UTC - TFD Array - RHC - Correction file: Correction Array HNRAO 2016 11 20 FSX-8S + TFD.csv



HNRAO - 01/03/2017 UTC - TFD Array - LHC - Correction file: Correction Array HNRAO 2016 11 20 FSX-8S + TFD.csv



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Thunderstorms causing atmospherics during observations.