Listening to Jupiter

By Mike Powell
What your listening to

Jupiter is a source of powerful bursts of natural radio waves that can produce exotic sounds when picked up using Ham or Shortwave receivers.
How it happens

- Where does the radio signal get so much power?
- It starts with Jupiter's volcanic moon Io.
- Tidal forces from Jupiter and its other large satellites superheat the interior of the moon Io and make it the most volcanic body in the Solar System.
- Volcanic materials are thrown far above Io's surface. Much of that enters orbit around Jupiter, forming a huge gaseous donut around the giant planet.
- With a diameter the size of Io's orbit, the electrically conducting "Io torus," as it's known, spans 525,000 miles and has an important impact on Jupiter's magnetic environment.
As Io's orbital motion carries it through this magnetized ring of ionized gas, a huge electrical current flows between Io and Jupiter. Carrying about two trillion watts of power, it's the biggest DC electrical circuit in the Solar System.

This current is the power source for plasma waves that gives rise to the radio signals that travel away from Jupiter's magnetic poles in cone-shaped beams.

The beams rotate with the giant planet every 9 hours and 55 minutes making Jupiter something like a slow-turning pulsar. When the beams sweep past our planet Earth, listeners here can pick up the Jovian radio bursts in the radio bands between 15 MHz and 40 MHz.
RADIO CONE

EMITTING CONE

JUPITER

IO's ORBIT

EARTH

PEFT

Imai Lab.
What you need to Listen

Radio – Ham or Shortwave – 15MHz – 40 MHz

Ham Radio Setup

Shortwave Radio Setup

Spectrum Analyzer Software
Sky Charting Software
To know when Jupiter is in the sky and can be listened to.

(Starry Night Pro Plus 6)
Radio-Jupiter Pro 3

- Predictions and positional information customized to your location.
- Customizable prediction reports simplify long range planning.
- See when Jupiter season is coming with the yearly visibility chart.
- Real time sky map helps you see where Jupiter is in your antenna beam. Plots the Sun, stars, and even the galactic plane.
- Io-Phase chart allows you to visualize and follow Jupiter through high probability areas.
- Observer log with Quick Log feature simplifies observation records with timestamps, position info, and one click burst notation.
- Chart the Jovicentric declination of the Earth.

Only $19.95 USD
Ham or Shortwave Radio

Simply connect Radio “Speaker out” to Computer “Sound card Line in”. Spectrum Analyzer Software will recognize input.
The Antenna

Simple Dipole Antenna

Best to Run Antenna East / West
Spectrum Lab analyzer software will give a visual representation of the signal given off by Jupiter. This can be recorded for future reference.
Radio-SkyPipe II
Picking a Frequency

Pick a frequency between 18 MHz and 28 MHz for the greatest likelihood of success.

Then all you need is “Patience”. Listen for a change in Static.
My Ham Radio Setup
What to Listen for.

2 common types

The “L” Burst
“Waves on the Beach”

The “S” Burst
“Swirls”
Remember --- When it's Cloudy
Jupiter – Can Still be Heard!!!
Day and Night
Same setup can be used for Listening to the SUN
THE END

WARNING
The last person that touched my telescope is in my backyard!