



[Skip Navigation \(press 2\)](#)

Search NASA:

SETTING UP THE RADIO TELESCOPE

CHOOSING THE RIGHT ANTENNA SETUP (Jupiter or the Sun)

The easiest way to get started is to listen for solar radio noise bursts. Since the Sun is generally stronger than Jupiter you only need to put up a **single dipole antenna** at a height of 10 ft. Another reason to start with solar observations is that you can listen for a couple of hours either side of local noon, rather than late at night. This can be a real advantage for school groups. A downside of monitoring the sun is that solar radio noise bursts are not predictable, so you may have to listen for several days or even a few weeks before succeeding. Solar bursts often occur when there are visible sunspots. You can check solar conditions at <http://www.spaceweather.com/>

Listening for Jupiter is a bit more ambitious, and you will need to put up both dipoles. The height of the dipoles is a function of your latitude, as explained in the **antenna assembly manual**. Jupiter noise storms are generally predictable, although sometimes the predicted noise storms don't materialize. To observe Jupiter effectively you should use **prediction information** on this website and also learn to use **Radio Jupiter Pro**. This program predicts when Jupiter storms are most likely to occur and provides guidance regarding the optimum antenna configuration. Jupiter noise storms are best heard from a few hours after sunset till sunrise, when the Earth's ionosphere is most transparent. It may be more difficult to organize nighttime Jupiter monitoring sessions for students, than daytime solar sessions.

Regardless if you choose the Sun or Jupiter for your studies, you need to consider where to erect the antenna.

WHERE TO SETUP?

Your success in hearing Jupiter or the Sun will depend in part on picking a good, radio-quiet location to set up your radio telescope. There are many sources of interference that can completely mask the signals that you are trying to hear. Arcing insulators on power lines are one of the worst. There are many others including light dimmers, electric fences, automobile ignition systems, electrical machinery, computers, arc welding equipment, bad fluorescent light starters, etc, etc. The Homeplug devices that are used in some local area networks to transfer data over the power lines can be a source of strong interference.

Keep these potential radio noise sources in mind when you choose an observing site. As a general rule it is a good idea to get as far away as possible from power lines, busy highways, buildings full of computers, or industrial sites with electrical machinery. The middle of an athletic field may be a

good choice, or a residential area with underground power, or perhaps a rural setting. The radio Jove antenna was designed to make it easy to go to a "remote" radio quiet observing site. **However, we have had some good successes with Radio JOVE antennas near buildings; local conditions are extremely variable and trial-and-error may give you good results.**

Part of the problem in setting up the radio telescope is finding a location where your receiver and other equipment can be reasonably close to the antenna. The Jove antenna kit comes with a 32 foot long section of coax to connect the receiver to the dual dipole antenna. If you decide on the single dipole antenna for the Sun, then approximately 60 ft of coax is available in the antenna kit for the run from the antenna to the receiver. If you need to space the antenna and receiver even further apart, then you can extend the cable running to the receiver up to a total length of about 200 feet.

There are many different manufacturers and qualities of coaxial cable. The 75-ohm cable supplied with the kit is RG-59 manufactured by Belden. Radio Shack, Lowes, and Home Depot, among others, carry RG-6 and the higher grade RG-6QS (quad shield), which is also 75-ohm cable. You can use any of these cables to extend the run to your receiver. Just be sure to obtain the proper F-connectors to mate with your cable. RG-59 requires a slightly different connector than RG-6 or RG-6 QS. The better cables have a higher percentage of shield (over 90% is desirable) and lower loss.

WHAT ELSE IS NEEDED?

With the Radio Jove receiver, antenna, a 12-volt power source (battery or power supply), and headphones, you can hear the Sun and Jupiter. However, you may want to go beyond this basic set-up. A stand-alone amplified loudspeaker, or your computer sound system, will let several people listen in. The free edition of Radio-SkyPipe software (available [here](#) and on the Jove CD) will let you generate on-screen plots of received signal strength. Running the **Pro Edition of Radio-SkyPipe**, you can generate on-screen plots and also record audio .wav files on your computer. If your computer is running Radio-SkyPipe and is connected to the Internet, then you can chat with other observers in real-time and share data with them.

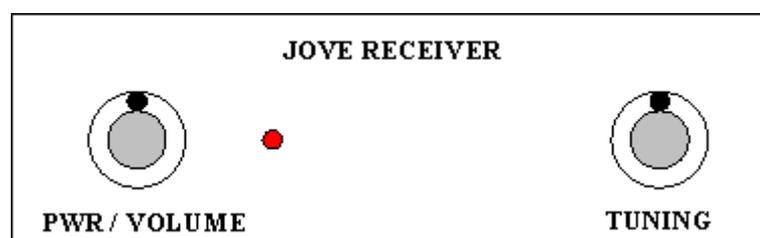
The best answer to "what do I need" depends on what resources are available, and if you want to become involved with the more scientific aspects of the program. Perhaps simply hearing Jupiter or the Sun is what you are after - if so then all you need is the Jove receiver and antenna (plus headphones and a power source). However, if you are a teacher trying to engage a class of science students in a serious project then a more advanced set-up will challenge your students to actually acquire and share data, engage in on-line discussions with other observers, and compare and analyze results.

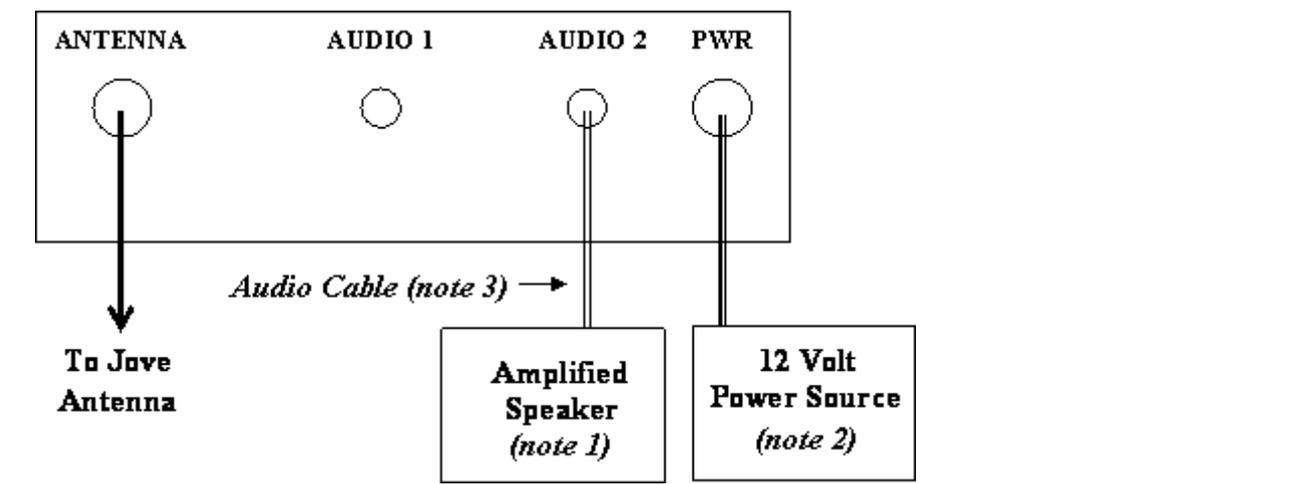
WHAT ARE MY EQUIPMENT SETUP OPTIONS?

A. **Basic** - This is a simple listen-only setup (see diagram 4e and notes).

B. **Advanced** - Add a computer running Radio-SkyPipe - plot signals, chat, share data over the Internet, and record audio (see diagram 4f and notes).

BASIC SETUP



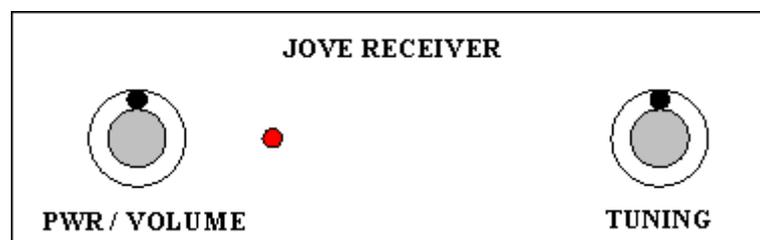


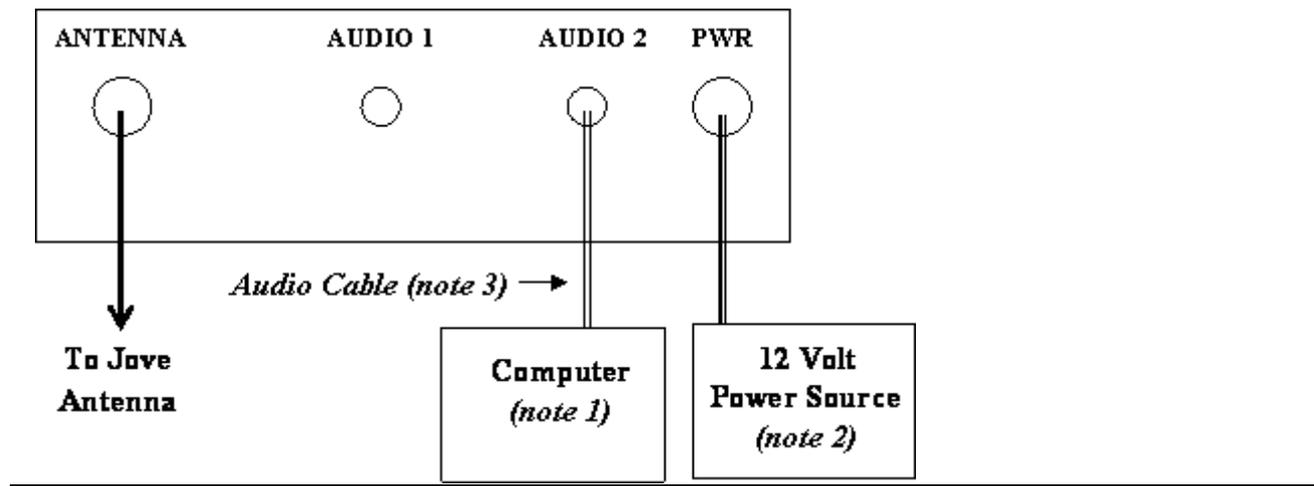
Note 1 - The Radio Shack 277-1008 mini audio amplified speaker, which is powered by an internal 9V battery, is recommended. Alternatively you can use speakers that are part of a laptop computer (see advanced set-up). If you use amplified computer speakers powered by a separate power supply (the black cube type you plug into the wall) be aware that these supplies may cause hum and interference to the Jove receiver.

Note 2 - The 12V DC power source can be a lantern battery (EverReady 732, Radio Shack part # 23-007), or a regulated power supply such as the Jameco 162996. The Jameco unit has been tested and is recommended. It comes with a power cable properly terminated to plug directly into the Jove receiver. If you use battery power, test the battery voltage (with a voltmeter or multimeter) every few hours to make sure it has not dropped below 11 volts. The Jove radio should be turned on for this measurement.

Note 3 - The Jove receiver has two identical stereo audio output jacks (Audio 1 and 2). Each jack provides the same receiver signal to both stereo channels (left and right channel). An audio cable connects the Jove receiver (either Audio 1 or 2) to the amplified speaker. The audio output jack on the Jove receiver is a 3.5mm stereo jack. The audio input jack on the Radio Shack amplified speaker is a 3.5mm (also known as a 1/8") monaural jack. Since the Jove receiver audio is provided as a stereo output you can use either a stereo or monaural audio cable to connect to the external amplified speaker.

ADVANCED SETUP





Note 1 - The computer can be a notebook or desktop running Radio-SkyPipe software. Radio-SkyPipe has been tested to run on Windows machines using Win 98 or later and some Macintosh computers running Windows emulation software.

Note 2 - The 12V DC power source can be a lantern battery (EverReady 732, Radio Shack part # 23-007), or a regulated power supply such as the Jameco 162996 which comes with a power cable properly terminated to plug directly into the Jove receiver. If you use battery power, test the battery voltage every few hours to make sure it has not dropped below 11 volts. The Jove radio should be turned on for this measurement.

Note 3 - The Jove receiver has two identical stereo audio output jacks (Audio 1 and 2). Each jack provides the same receiver signal to both stereo channels (left and right channel). An audio cable connects the Jove receiver (either Audio 1 or 2) to the computer sound card input. Desktop computers have *line* and *mic* inputs while laptops usually have only a *mic* input. The *mic* input is much more sensitive. The *line* input is stereo - supporting both left and right channels. The *mic* input is often monaural, supporting only a single channel (left). Your Windows audio volume control panel selects either *line* or *mic* inputs to your sound card and SkyPipe (Options> Data Source) selects between left and right channels. You can use either mono or stereo audio cables, but be sure to check both your Windows Volume Control Panel and SkyPipe Options to connect the receiver audio to SkyPipe.

+ [Home](#)

Radio JOVE Radio Telescope

+ [How to Solder](#)

+ [Receivers for RJ](#)

+ [Antennas, etc. for RJ](#)



- NASA Official: **[Dr. James Theiman](#)**
- Website Manager: **[James Gass](#)**
- Last modified: 15 Jun 2006