Radio JOVE Telescope Set-Up
Hands-On Tutorial

Detailed Set-Up Configurations

6. Detailed Set-Up Configurations

There are 6 different set-ups, as described previously, which can be used with your completed Radio JOVE antenna and receiver. All 6 set-ups depend on the resources you have available.

The configurations range from simple to relatively complicated. However, by following the steps listed below, set-up should be straightforward and become almost automatic with practice.

We now go through all 6 set-up configurations, choose the one which best fits your available resources (associated diagrams are available on the last page). Keep in mind that you can combine set-ups because you have two audio outputs from the receiver:

A. One Person Listen

1. The power cable supplied in the kit has a female power plug on one end and stripped leads on the other.

a. Connect the lead wire that has a black (or red) stripe to the (+) side of the 12 Volt power source (either a portable lantern battery or a regulated power supply as mentioned earlier).
b. Connect the other lead wire (no stripe) to the (-) side of your power source.
c. Connect the female power plug end into the +12 VDC socket on the Jove receiver.

2. Turn on the power to the Jove receiver and set the volume level to the 12 O'clock position (this position can later be changed depending on your configuration).
3. Use a pair of headphones (with a 3.5mm plug on one end) and connect it to one of the audio outputs on the back of the Jove receiver.
4. Put on your earphones. You should hear the signal coming from the receiver. It should sound like a background hiss with occasional pops, whistles, etc. that are likely man-made interference.

B. **Group Listen**

1. The power cable supplied in the kit has a female power plug on one end and stripped leads on the other.
   a. Connect the lead wire that has a black (or red) stripe on the (+) side of the 12 Volt power source (either a portable lantern battery or a regulated power supply as mentioned earlier).
   b. Connect the other lead wire (no stripe) to the (-) side of your power source.
   c. Connect the female power plug end into the +12 VDC socket on the Jove receiver.
2. Turn on the power to the Jove receiver and set the volume level to the 12 O'clock position (this position can later be changed depending on your configuration).
3. Use a 3.5mm mono phone cable (Radio Shack 42-2420A) to connect one of the audio outputs from the Jove receiver into the input on your mini audio amplifier speaker (Radio Shack 277-1008C).
4. Turn on your mini audio amplifier speaker. You should hear the signal coming from the receiver. It should sound like a background hiss with occasional pops, whistles, etc. that are likely man-made interference.

C. **Record on Tape-** Remember to use a tape recorder that allows ALC to be turned **off** as mentioned earlier.

1. The power cable supplied in the kit has a female power plug on one end and stripped leads on the other.
   a. Connect the lead wire that has a black (or red) stripe on the (+) side of the 12 Volt power source (either a portable lantern battery or a regulated power supply as mentioned earlier).
   b. Connect the other lead wire (no stripe) to the (-) side of your power source.
   c. Connect the female power plug end into the +12 VDC socket on the Jove receiver.
2. Turn on the power on the Jove receiver and set the volume level to the 12 O'clock position (this position can later be changed depending on your configuration).
3. Follow the steps from one of the following two options.
   a. One person listen
      - Use a pair of headphones (with a 3.5mm plug on one end) and connect it to one of the audio outputs on the back of the Jove receiver.
      - Put on your headphones. You should hear the signal coming from the receiver. It should sound like a background hiss with occasional pops, whistles, etc. that are likely man-made interference.
   b. Group listen
      - Use a 3.5mm mono phone cable (Radio Shack 42-2420A) to connect one of the audio outputs from the Jove receiver into the input on your mini audio amplifier speaker (Radio Shack 277-1008C).
      - Turn on your mini audio amplifier speaker. You should hear the signal coming from the receiver. It should sound like a background hiss with occasional pops, whistles, etc. that are likely man-made interference.
4. Connect a mono phone cable from one of the audio outputs on the back of the RJ receiver to the input on your tape recorder. Your input could also be called mic (microphone) or aux (auxiliary).
5. Turn on your tape recorder and hit the pause button. Then push the play and record buttons at the same time. If you have a level meter display on the cassette recorder, you should see the level go up and fluctuate as the sound fluctuates. If the cassette recorder has no level meter display, move on to step seven.
6. Turn the volume up or down on your tape recorder and receiver till the level meter is at about 30 to 40 percent of full scale.
7. Make sure you have a blank tape in your recorder and take the pause button off to record. After a few seconds, hit stop. Rewind the tape and play back to make sure you are recording what you hear through the audio amplifier. If not, make the appropriate adjustments to the volume control on the tape recorder. Try recording again, if the signal is still bad, make adjustments to the volume

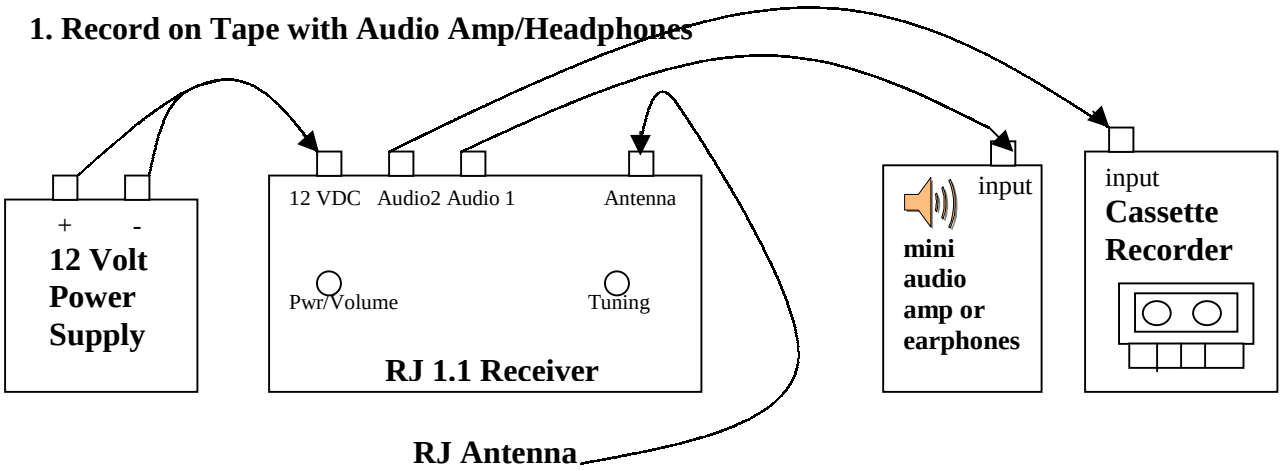
on your receiver, and make sure you connected the mono phone cable to the input connection on your tape recorder.

8. Once you get a good signal being recorded, stop your tape, rewind, and set the tape counter to 0. You are now ready to record. (It is a good observing practice to make note of times and corresponding tape counter values of when significant events occurred, use the blank Observing Log Form found on the Radio JOVE website, http://radiojove.gsfc.nasa.gov/control/obs_handbook.htm)

   This procedure can also be done to record on a HI-FI VCR as described earlier.

Diagrams for Common Set-Ups

1. Record on Tape with Audio Amp/Headphones



D. **Generate a Computer Data Record-**

This option goes through the steps for recording your data straight to a PC with the Radio-SkyPipe strip chart software program from either your RJ receiver or cassette player. **NOTE:** When you playback your cassette recording into Radio-SkyPipe, the time marks on the strip chart will be incorrect because Radio-SkyPipe is using the current time on your computer's internal clock, not the actual time of your observation. In order for Radio-SkyPipe to input the correct time stamps to the strip chart you can either change the internal clock on your computer **before** you start the Radio-SkyPipe program (this allows Radio-SkyPipe to read the new time) or you can upgrade your version of Radio-SkyPipe to the Pro version, available at http://radiosky.com/skypipeishere.html, which allows you to edit the start time in Radio-SkyPipe.

1. The power cable supplied in the kit has a female power plug on one end and stripped leads on the other.
   a. Connect the lead wire that has a black (or red) stripe on the (+) side of the 12 Volt power source (either a portable lantern battery or a regulated power supply as mentioned earlier).
   b. Connect the other lead wire (no stripe) to the (-) side of your power source.
   c. Connect the female power plug end into the +12 VDC socket on the Jove receiver.
2. Turn on the power on the Jove receiver and set the volume level to the 12 O'clock position (this position can later be changed dependi ng on your configuration).
3. Follow the steps from one of the following two options. If your computer has speakers then you can listen from the computer instead of from the audio amplifier, which would free up an audio output from the receiver for another connection.
   a. One person listen
      - Use a pair of headphones (with a 3.5mm plug on one end) and connect it to one of the audio outputs on the back of the Jove receiver.
      - Put on your headphones. You should hear the signal coming from the receiver. It should sound like a background hiss with occasional pops, whistles, etc. that are likely man-made interference.
   b. Group listen
      - Use a 3.5mm mono phone cable (Radio Shack 42-2420A) to connect one of the audio outputs from the Jove receiver into the input on your mini audio amplifier speaker (Radio Shack 277-1008C).
      - Turn on your mini audio amplifier speaker. You should hear the signal coming from the receiver. It should sound like a background hiss with occasional pops, whistles, etc. that are likely man-made interference.
4. Do the same from the other audio output from the receiver to the input on your computer. Your input could be called mic (microphone), aux (auxiliary), or just have symbols as markers.
5. Start the Radio-SkyPipe program on your computer, making sure you have your identity set up correctly.
6. Click the green "Go/Start Chart" 

button. You should see the red strip chart begin on the left and move to the right. If not, click the auto scale  button to see the chart. (For more information on the scrolling buttons, look at the Radio-SkyPipe tutorial or the online help which you can link to from the help button on the menu bar of the program). You should see the background signal go across the chart with a bit of "grass" or "jitter" fluctuation. If not,

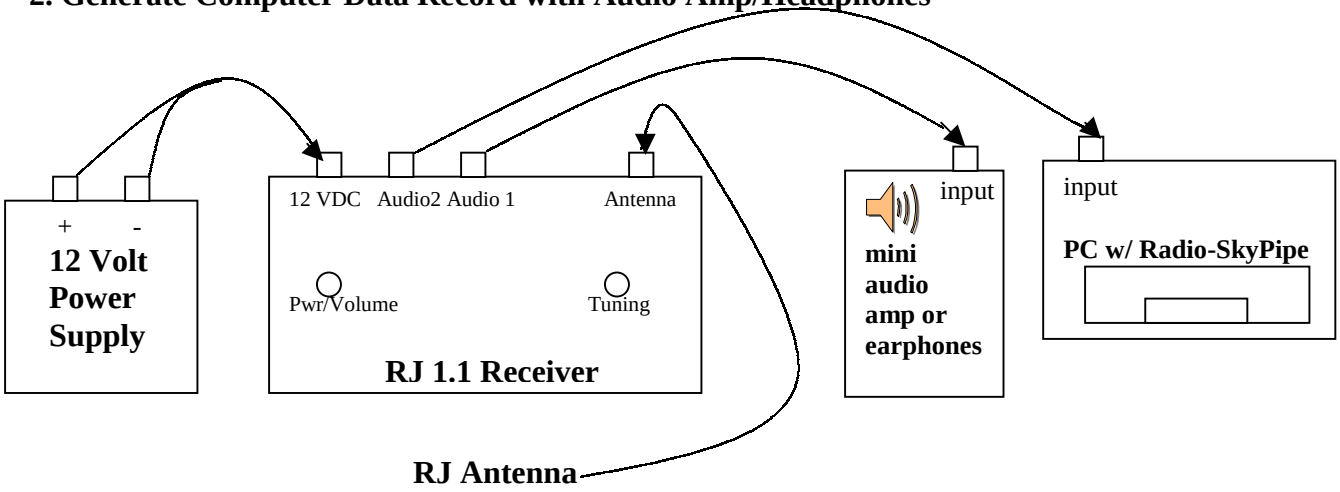
adjust the volume on your receiver/tape player or computer appropriately, then stop and start recording again.

7. Adjust the volume on the receiver so that the background level is at a minimum but you still do not loose fidelity in the signal you are receiving.
8. Once your recording session is finished hit the red "Stop Chart" 

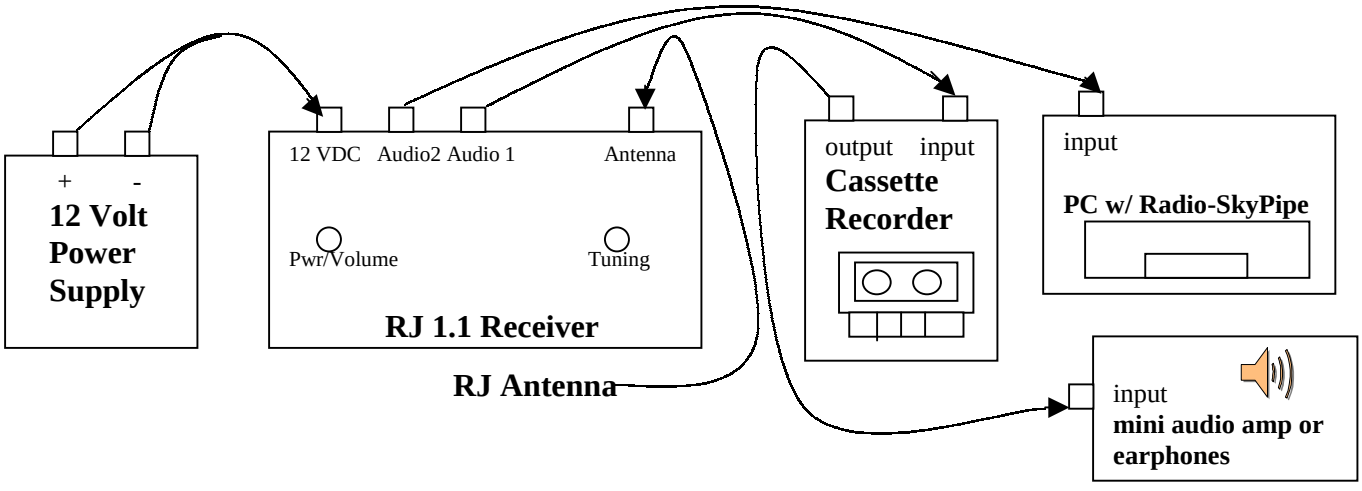
button and you should automatically be given the option to save your data. We recommend you save your data with the default filename. However, if you would like to submit data to the Radio JOVE archive (http://jovearchive.gsfc.nasa.gov) then you should include your name or organization within the filename for identification purposes (this is not necessary for Radio-SkyPipe files, known as .spd files, because this information is in the attached data file, if your identity has been entered correctly).

Diagrams for Common Set-Ups

2. Generate Computer Data Record with Audio Amp/Headphones



3. Generate Cassette and Computer Records At Same Time with Audio Amp/Headphones



E. **Computer Data Record and audio .WAV file-**

For this setup you need to be running the Pro Edition of Radio-SkyPipe available at http://radiosky.com/skypipeishere.html for about $40.

1. The power cable supplied in the kit has a female power plug on one end and stripped leads on the other.
   a. Connect the lead wire that has a black (or red) stripe on the (+) side of the 12 Volt power source (either a portable lantern battery or a regulated power supply as mentioned earlier).
   b. Connect the other lead wire (no stripe) to the (-) side of your power source.
   c. Connect the female power plug end into the +12 VDC socket on the Jove receiver.
2. Turn on the power on the Jove receiver and set the volume level to the 12 O'clock position (this position can later be changed depending on your configuration).
3. Follow the steps from one of the following two options. If your computer has speakers then you can listen from the computer instead of from the audio amplifier, which would free up an audio output from the receiver for another connection.
   a. One person listen
      - Use a pair of headphones (with a 3.5mm plug on one end) and connect it to one of the audio outputs on the back of the Jove receiver.
      - Put on your headphones. You should hear the signal coming from the receiver. It should sound like a background hiss with occasional pops, whistles, etc. that are likely man-made interference.
   b. Group listen
      - Use a 3.5mm mono phone cable (Radio Shack 42-2420A) to connect one of the audio outputs from the Jove receiver into the input on your mini audio amplifier speaker (Radio Shack 277-1008C).
      - Turn on your mini audio amplifier speaker. You should hear the signal coming from the receiver. It should sound like a background hiss with occasional pops, whistles, etc. that are likely man-made interference.
4. Do the same from the other audio output from the receiver to the input on your computer. Your input could be called mic (microphone), aux (auxiliary), or just have symbols as markers.
5. Start the Radio-SkyPipe program on your computer, making sure you have your identity set up correctly.

6. Click the green "Go/Start Chart" 

button. You should see the red strip chart begin on the left and move to the right. If not, click the auto scale  button to see the chart. (For more information on the scrolling buttons, look at the Radio-SkyPipe tutorial or the online help which you can link to from the help button on the menu bar of the program). You should see the background signal go across the chart with a bit of "grass" or "jitter" fluctuation. If not, adjust the volume on your receiver/tape player or computer appropriately, then stop and start recording again.
7. Click Wave in the menu bar.
8. Select Wav File Recorder to create a .WAV file. Then select the Options button on the Radio-SkyPipe Wav Recorder panel.
9. Set your Max Recording Length to the maximum amount of time you would like to record in seconds (this is a safeguard setting).
10. Set your Max Total file Size to the maximum size of your .WAV file in bytes (this is a safeguard setting).
11. Enter a threshold level if you would like the .WAV recorder to automatically begin recording if the background level goes above your entered threshold level. This allows you view the chart while Radio-SkyPipe automatically begins a .WAV recording when the chart goes above the specified level. (For more information, go to http://www.radiosky.com/skypipehelp/wavrecorder.html).
12. Enter a longer time in seconds if you would like the .WAV recorder to continue recording after the level drops under your specified threshold level. This allows your recording to continue after a brief dip under the specified threshold level.
13. Check Allow Multiple Triggered Recordings if you would like the .WAV recorder to allow more than one .WAV recording if the signal goes above you're your threshold level multiple times.
14. Click Save button on the Wav Recorder Options panel if you would like Radio-SkyPipe to save the settings you have set so that they are automatically retrieved the next time you start the recorder.
15. Hit the Record button to start recording.
16. Hit Stop to end the recording. Versions 1.2.8 and higher will have two additional buttons on the Wav Recorder panel that appear after you begin recording. The Kill Rec button 

stops the recording without saving. After using the Kill Rec button, the Record button must be again pushed to start a new recording. The Restart button 

begins a new recording immediately without saving what has been recorded up to this point in time after hitting the Record button. If you want to save what you have been recording, you should use the regular Stop button. The Restart and Kill Rec

buttons are primarily there to allow you to save disk space by not saving during periods when no activity is taking place. They allow you to run the recorder in anticipation of activity but to reclaim your disk space when nothing worth recording actually occurs.

17. Once your recording session is finished hit the red "Stop Chart" 

button and you should automatically be given the option to save your data.

F. Share Data With Other Observers-

You need to have Radio-SkyPipe with an Internet connection in order to share data with other observers.

1. The power cable supplied in the kit has a female power plug on one end and stripped leads on the other.
   a. Connect the lead wire that has a black (or red) stripe on the (+) side of the 12 Volt power source (either a portable lantern battery or a regulated power supply as mentioned earlier).
   b. Connect the other lead wire (no stripe) to the (-) side of your power source.
   c. Connect the female power plug end into the +12 VDC socket on the Jove receiver.
2. Turn on the power on the Jove receiver and set the volume level to the 12 O'clock position (this position can later be changed depending on your configuration).
3. Follow the steps from one of the following two options. If your computer has speakers then you can listen from the computer instead of from the audio amplifier, which would free up an audio output from the receiver for another connection.
   a. One person listen
      - Use a pair of headphones (with a 3.5mm plug on one end) and connect it to one of the audio outputs on the back of the Jove receiver.
      - Put on your headphones. You should hear the signal coming from the receiver. It should sound like a background hiss with occasional pops, whistles, etc. that are likely man-made interference.
   b. Group listen
      - Use a 3.5mm mono phone cable (Radio Shack 42-2420A) to connect one of the audio outputs from the Jove receiver into the input on your mini audio amplifier speaker (Radio Shack 277-1008C).

- Turn on your mini audio amplifier speaker. You should hear the signal coming from the receiver. It should sound like a background hiss with occasional pops, whistles, etc. that are likely man-made interference.

4. Do the same from the other audio output from the receiver to the input on your computer. Your input could be called mic (microphone), aux (auxiliary), or just have symbols as markers.
5. Start the Radio-SkyPipe program on your computer, making sure you have your identity set up correctly.
6. Click on Mode in the menu bar.
7. You should have 3 modes of operation, Stand Alone, Client, and Server.
8. "Checking" Stand Alone mode allows you to work without an Internet connection, thus not able to send or receive data.
9. "Checking" Client mode allows you to receive data real-time from others who are serving out their data.
10. "Checking Server mode allows you to send out your own data to others who are in Client mode (receiving mode).
11. Radio-SkyPipe also allows you to both send and receive data at the same time. To do this do the following:
    a. Start your chart in Stand Alone mode (should be the default mode).
    b. Click on Mode in the menu bar.
    c. "Check" Server Mode
    d. Your data is now ready to be "served" out. You should see a purple "Publish" button like this,  .
    e. Click the Publish button in order to make your data public. Your data is now published and viewable by anyone who is in Client mode
    f. Now open a second Radio-SkyPipe window in order to view other people's data by clicking on View in the menu bar.
    g. Click on "New Client Window"
    h. The new window should already be in Client mode. You can verify this if at the bottom of the chart, you see a beige box with available servers.
    i. Highlight the server you wish to connect to and click connect. (one of the available servers should be your own connection that you made public in the first window).
    j. Now you can compare both your real-time data that is in the original window running in Sever mode and another location's real-time data running in the second Client mode window.

An advanced set-up could combine all of the capabilities listed above (A – F).
One of the most common advanced set-ups is to generate a computer data record and

record on tape at the same time. In order to do this use both receiver audio outputs; run one mono phone cable into the input of your cassette recorder and run another mono phone cable into the input of your computer. Then just follow the steps for configurations C and D above. If you would like to listen to the signal you can use your computer if it has speakers (make sure the mic is turned off), or you can use headphones/mini audio amplifier by connecting it to the output (also known as "ear") of your cassette recorder.

Now that you have collected your data, you can use Radio-SkyPipe to scroll through the data saved on the Radio-SkyPipe file and find times when possible activity occurs. Use the Radio-SkyPipe Tutorial to help you achieve this. By listening to the corresponding signal from the tape recorder (if you were recording) you can verify that this signal is natural activity and not interference. Refer to the example sounds on the Radio JOVE website (http://radiojove.gsfc.nasa.gov/vc/mm_exhibits.htm and http://radiojove.gsfc.nasa.gov/dal/rfi_samples.htm) for what to expect to hear. Once you have found some activity, you can add it to our archive, which is now available through the Internet at: http://jovearchive.gsfc.nasa.gov. Here you will be able to submit and retrieve data, and compare how your data to others who submitted data for the same time frame. To find out what you can learn from analysis of the data, go to the lesson plans on the Radio JOVE website at, http://radiojove.gsfc.nasa.gov/class/lesson_plans/lesson_toc.htm.