

# Made Simple for Cruisers

## What Frequency do I use?

If you have this question, you are not alone. Everyone who communicates with HF radio has the same question. We are always looking for the best frequency to use for communications.

To help HF communicators have a chance at communications, there are many software applications that you can purchase. The applications calculate the best guess as to what frequencies will work best for the distance between two stations. The distance between stations is typically defined as the difference of Latitude and Longitude between two stations.

### Making a Propagation Tool

If you are using Sailmail and/or Winlink you may already be using the propagation tool for Airmail to determine which station/frequency to use to replicate your email.

To use the Airmail Propagation tool as a general communications tool, we need to create two fake stations in Airmail. The fake stations I call Ham Band and Marine Band B.

If you are not using Winlink and or Sailmail, you may have to download the Airmail software from Sailmail before getting started.

To make this a Made Simple for Cruiser program we should focus on use and not setup.

To make this easy to use later, we will create one fake station using the Ship to Ship B channels for each MHz channel and the center of each Ham band plan frequency allocated for voice communications for the other fake station.

### Marine Band

Marine MHz B Channel	Frequency in KHz
2B	2079.0
4B	4149.0
6B	6227.0
8B	8297.0
12B	12356.0
16B	16531.0
18B	18828.0
22B	22162.0
25B	25103.0

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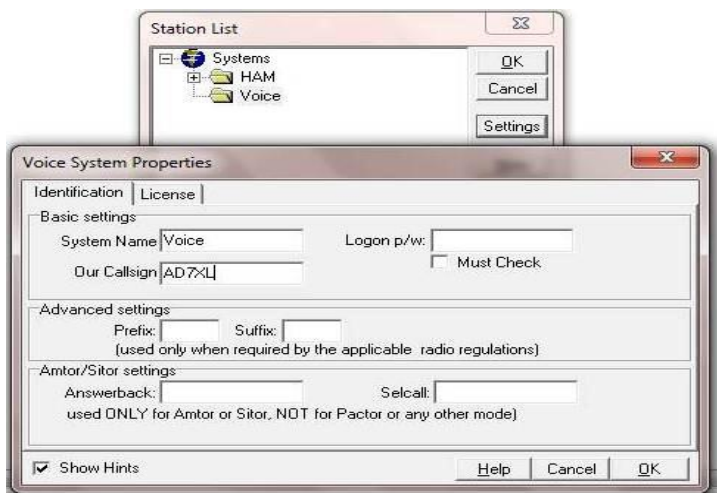
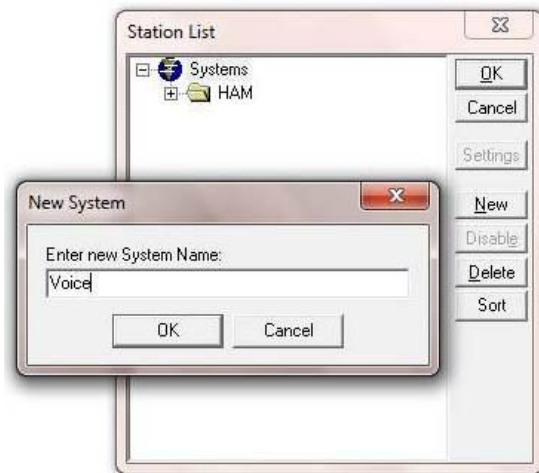
For the new Ham fake station use the middle of the frequencies within each band plan assignment, for voice communications.

## Ham

Meters	Frequency Range	Center
160 Meters	1.800 - 2.000 MHz	1900.0
80 Meters	3.600 - 4.000 MHz	3800.0
40 Meters	7.125 - 7.300 MHz	7212.5
20 Meters	14.150 - 14.350 MHz	14250.0
17 Meters	18.110 - 18.168 MHz	18139.0
15 Meters	21.200 - 21.450 MHz	21325.0
12 Meters	24.930 - 24.990 MHz	24960.0
10 Meters	28.300 - 29.700 MHz	29000.0

### Procedure for Marine Band

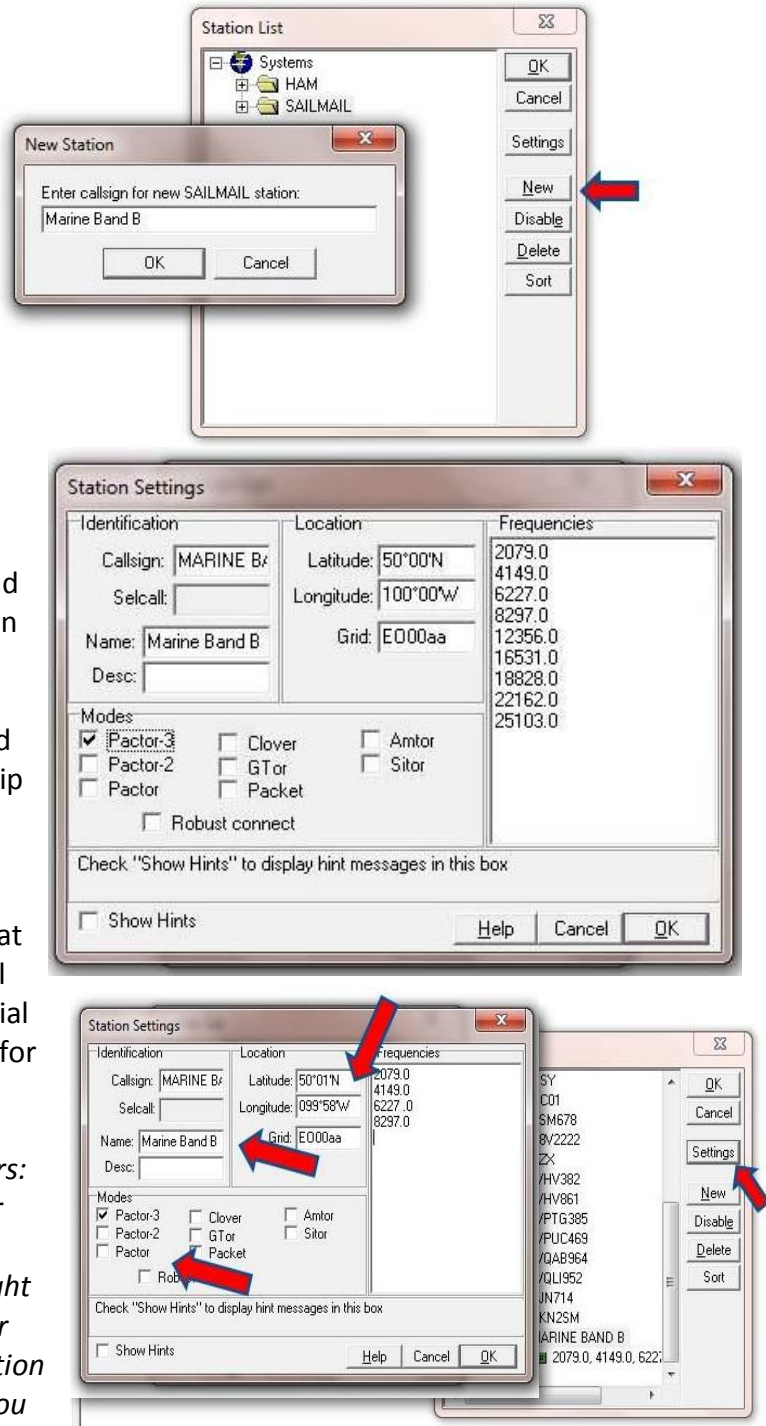
1. Start the Airmail Program.
2. With the mouse, click on **“View”**
3. Then click on **“Station List”**
4. Now click **“New”**.
5. Type in the field provided Voice.
6. Click **“OK”**.
7. Click on **“Settings”**.
8. Type your Call Sign into the field **“Our Callsign”**.
9. Click on **“OK”**.



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10. Click on **“Voice”**
11. Click on **“New”**
12. Type in Marine Band B
13. Click on **“OK”**
14. Locate the new Station **“Marine Band B”** and click on it to highlight **“Marine Band B”**.
15. Click on **“Settings”**.
16. Enter the Marine Band frequencies as noted in the table above into the window **“Frequencies”**.  
E.g. 2079.0, 4149.0, 6227.0, 8297.0, 12356.0, 16531.0, 18828.0, 22162.0, 25103.0
17. Eliminate all the modems and formats, except for clicking on the **“Pactor 3”** checkpoint.
18. Type in the **“Name”** field the text Marine Band B to remind you that these are Ship to Ship **“B”** channels.
19. The software also requires that the station have a Latitude and Longitude so that the propagation program will include the station in the initial station list. See note below for suggestions.

**Note:** I typed in some round numbers: 50° 00' North and 100° 00' West for my baseline. If you live on the east coast or in another location, you might want to use something closer to your normal location. However this location is not critical as this is the location you will change when using the program.



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20. Click “OK” to close the window.
21. Click “OK” to close the window.
22. Repeat the procedure to implement a Ham Band station and frequencies using the label “Ham Band” in place of “Marine Band B” and the center frequencies from the “Ham” table frequencies above.

## Using the Propagation Tool

Now that you have the two fake stations loaded, you can use the Airmail propagation tool to find the best frequencies to use.

1. Open Airmail program
2. Press the function key “F8” (or click on “View” and then “Propagation”)
3. Find the “Ham Band” or “Marine Band B” station and click on it.
4. Make sure your Latitude and Longitude are correct under “From our location”.
5. Insert the latitude and longitude of the station you are planning to call under the “To station location”.

**Note:** *The “To station location” latitude and longitude may be slightly different than what we entered when setting up the station. Inside the propagation program it uses a grid system instead of the actual latitude and longitude. So the program modifies the position to the closest grid value and stores that latitude and longitude.*

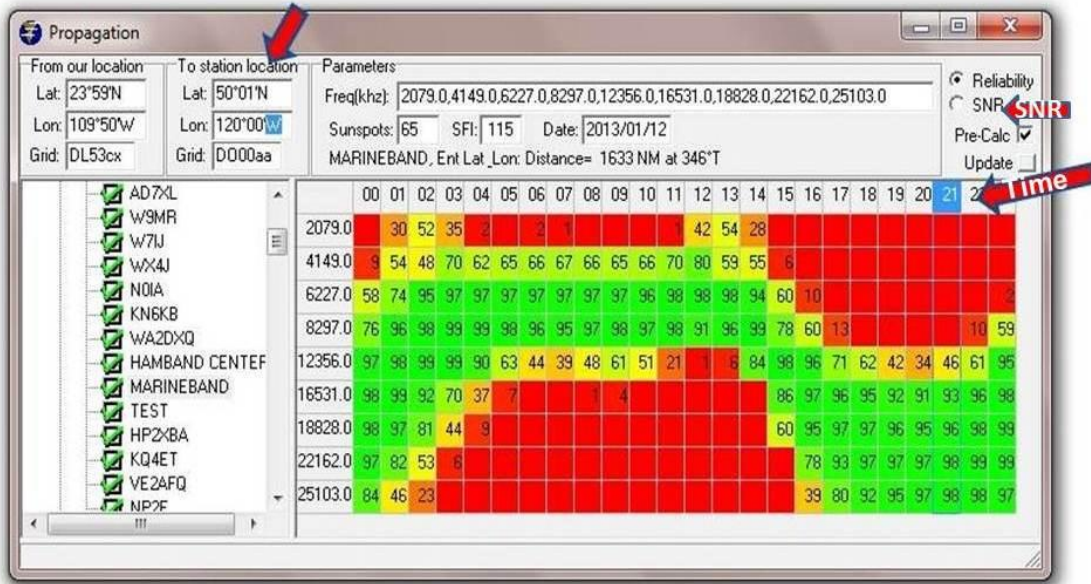
6. Locate the frequencies with the highest Reliability number (numbered from 0 to the maximum of 100) for communications during the UTC time period you plan to communicate.

## Notes:

- *The potentially usable frequencies will be colored green and the non-usable frequencies are colored red. (Make sure the Sun Spots index is reasonable for the present period)*
  - *Sunspot Index: [http://sidc.oma.be/sunspot-index-graphics/sidc\\_graphics.php](http://sidc.oma.be/sunspot-index-graphics/sidc_graphics.php)*
  - *Sunspots are approximately 65-70 In January 2013.*
  - *The time is based on your computer’s time, but is in UTC.*
  - *The present time of day is noted on the Propagation chart with a blue highlight on the hour. See arrow below marked “Time”.*
  - *This program uses a scale of 0 to 100% for reliability of communications between the two locations.*
7. Click on the “SNR” bullet to change the presentation to Signal to Noise Ratio (SNR). See arrow below marked “SNR”. (To expect reasonable communications, SNR numbers should range between 50 and the upper 60s with the largest number being the better SNR condition.)

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8. Locate the frequencies again that had the highest reliability number and identify which of the frequencies have the highest SNR. Those will be the frequencies with the highest probability for communications.

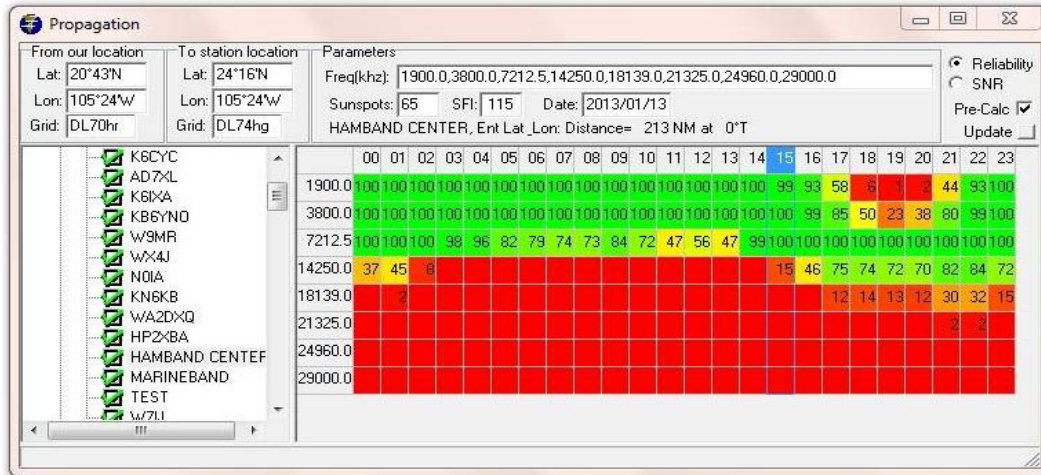


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## Example of Propagation Calculations La Cruz Mexico to La Paz (Ham)

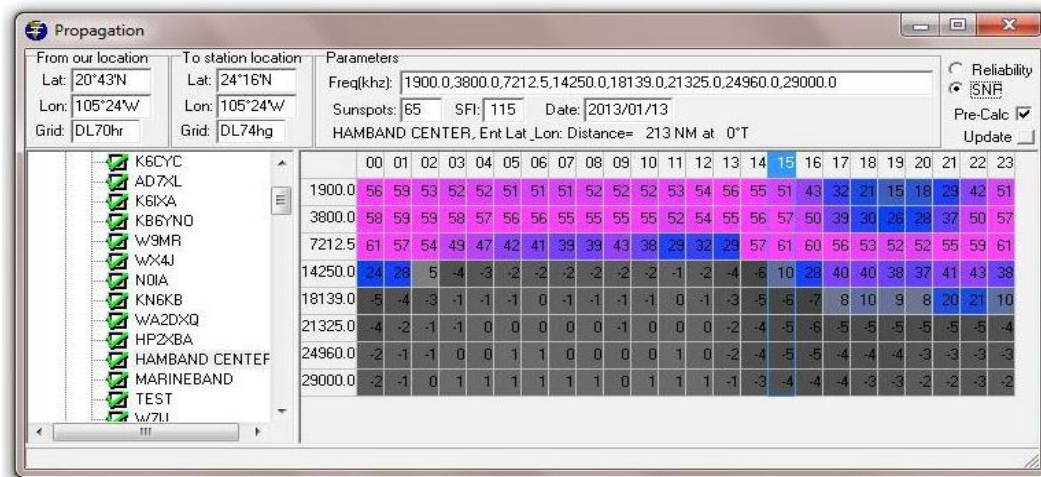
The following examples use the Ham fake station. The examples will be using a location in La Cruz, Mexico of 20° 43' north and 105° 24' west as the "From our location".

To communicate to La Paz, Mexico from La Cruz, we need to set the "To station location" to approximately 24° 16' North and 105° 24' West.



Reliability shows 3.8 MHz and 7.2 MHz.

**Note:** Looking at these charts, it may be clear why the Sonrisa net is on 3968.0 KHz in the morning as that band works well from Puerto Vallarta to La Paz and La Paz to Arizona where a shore base station checks in occasionally.

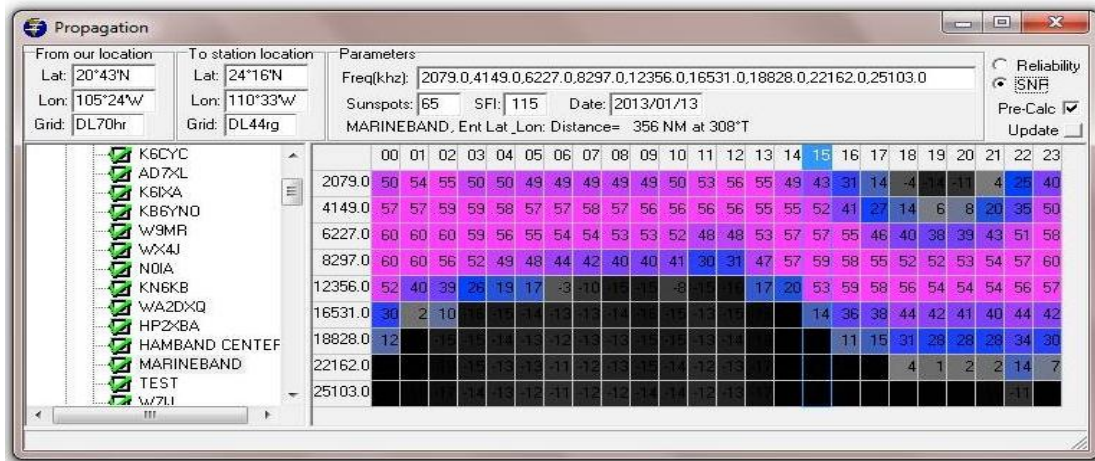
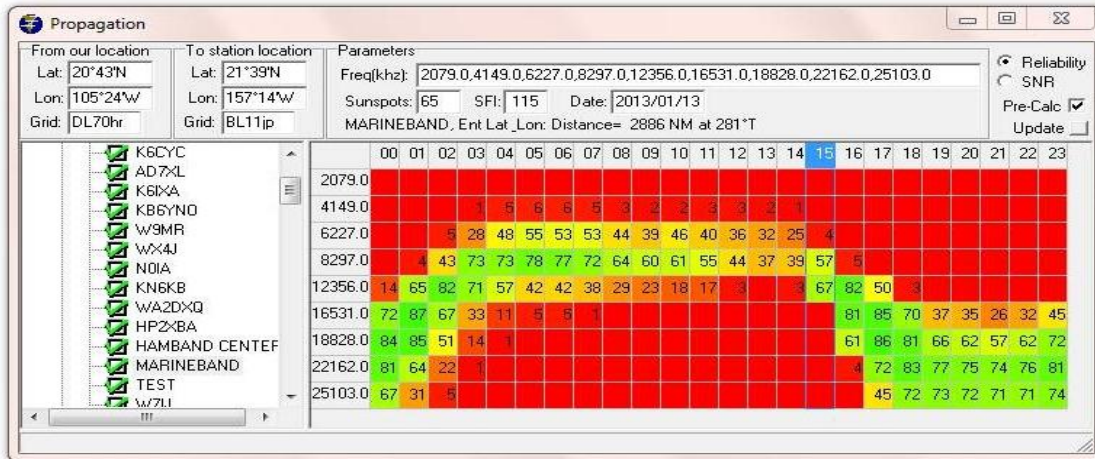


The SNR shows the 3.8 MHz is not quite as good as the 7.2 MHz.

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## Example of Propagation Calculations La Cruz Mexico to Hawaii (Marine)

To communicate to Hawaii from La Cruz, Mexico, we need to set the "To station location" to approximately 21° 39' North and 157° 14' West.



Getting to Hawaii will be more challenging, but it appears we may have a chance at 1500 UTC to connect on 12B. As you can see by inspection of the SNR, we are not looking great.

Based on Reliability and SNR numbers it might be better to plan communications during 1600 - 1800 instead of at 1500 as in the example.

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*Propagation programs are only capable of providing answers based on a radio frequency expected path between two locations. They do not consider noise in the area or your antenna direction.*

*There is a good reason why they call HF communications **MAGIC**.*