

# MoonSked 1.4

A Moon Bounce Scheduling program, designed for Radio Amateur EME enthusiasts.

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Available for both the Apple Macintosh and the PC Windows platform.

MoonSked is ShareWare, the Registration page is  
[http://www.gm4jjj.co.uk/MoonSked/moonsked\\_registration.htm](http://www.gm4jjj.co.uk/MoonSked/moonsked_registration.htm)

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Like most users you probably don't need to read the documentation to run the software, however to get the most from this program, you may find the following pages explain some features...

- **Shareware Registration**

MoonSked is distributed as shareware. It is a demo copy and you may try it for 30 days, after which we ask that you either delete your copy or register it online. The shareware fee is \$30, upon registration, you will receive free technical support, free upgrades, and a code to disable the reminder messages which appear at regular intervals as well as add the new features which are available only with the full version.

The Registration page is [http://www.gm4jjj.co.uk/MoonSked/moonsked\\_registration.htm](http://www.gm4jjj.co.uk/MoonSked/moonsked_registration.htm)

Please include your Amateur Radio Callsign, it is used to generate your registration code.

If you have any problem with registration please contact the author by email at [gm4jjj@amsat.org](mailto:gm4jjj@amsat.org)

- **Differences between Macintosh and Windows PC versions**

The screen shots shown are from the Macintosh version of MoonSked. There may be minor cosmetic differences between the Windows and the Macintosh versions. Where possible the functionality is exactly the same, while trying to keep to the recommended human interface guidelines for the platform.

Some features of the Macintosh version are not available on the Windows Version due to hardware/software limitations of the Windows platform. e.g. There is no Map Control Panel on a PC.

Menu Key short cuts on the PC are CTRL and the letter, while on the Mac the Command Key is used. ESC is used to cancel a predictions calculation on the PC and Command Period is used on the Macintosh.

# Getting Started

- **Installation**

If you have read this far you have installed the software! MoonSked looks for its associated files within the folder that it is located in. You can move the folder wherever you like but just leave the files inside it where they are.

- **Callsign Database file**

The text file DIR.SKD must reside in the MoonSked Folder with the MoonSked Application to allow the Callsign Database to load. If it is not there then you will not be able to enter callsigns in the Preferences dialog panel. DIR.SKD is regularly updated and available by email. It may be also be edited with a text editor.

VHFSCHE.D.SKD and FREQ.SKD files are used to make the SkedDatabase and FreqDatabase files when they are imported. See the Databases menu.

The Sked Maker window is the main result screen. It can be resized to fit the whole area of the monitor if required.

The screenshot shows the 'Sked Maker - Registered to GM4JJJ' window. It includes input fields for Start and Finish dates and times, an Interval selector (1 hour, 30 mins, 10 mins), and a Calculate button. Below these are sections for Station A and Station B, each with a list of callsigns, latitude/longitude/loc fields, and a frequency field. A 'More' section with navigation buttons is also present. At the bottom, a large table displays predicted signal data for various dates and times.

DATE	UTC	AZ A	EL A	MNR	POL	AZ B	EL B	DEC	DGR	TSky	RGE Km	DOP
Sun, Feb 10, 2002	12:00	192°	+18°	2 dB	+73°	115°	-0°	-23°	4.4dB	344°K	399945	+125 Hz
Sun, Feb 10, 2002	12:30	199°	+9°	1 dB	+74°	118°	+6°	-23°	4.4dB	343°K	400000	+105 Hz
Sun, Feb 10, 2002	13:00	205°	+7°	1 dB	+74°	122°	+11°	-23°	4.3dB	341°K	400055	+82 Hz
Sun, Feb 10, 2002	13:30	212°	+5°	1 dB	+74°	125°	+17°	-23°	4.3dB	339°K	400109	+58 Hz
Sun, Feb 10, 2002	14:00	218°	+3°	2 dB	+73°	130°	+22°	-23°	4.3dB	338°K	400163	+33 Hz
Sun, Feb 10, 2002	14:30	224°	+0°	2 dB	+71°	135°	+27°	-23°	4.3dB	336°K	400217	+6 Hz
Mon, Feb 11, 2002	13:00	195°	+12°	2 dB	+73°	114°	+3°	-20°	4.3dB	326°K	402432	+130 Hz
Mon, Feb 11, 2002	13:30	202°	+11°	1 dB	+75°	117°	+9°	-20°	4.3dB	326°K	402476	+109 Hz
Mon, Feb 11, 2002	14:00	208°	+9°	1 dB	+75°	121°	+15°	-20°	4.3dB	326°K	402520	+86 Hz
Mon, Feb 11, 2002	14:30	215°	+7°	1 dB	+75°	125°	+21°	-20°	4.3dB	326°K	402564	+60 Hz
Mon, Feb 11, 2002	15:00	221°	+4°	2 dB	+73°	129°	+26°	-20°	4.3dB	SUN!	402608	+34 Hz
Mon, Feb 11, 2002	15:30	228°	+2°	2 dB	+71°	135°	+31°	-20°	4.3dB	SUN!	402651	+6 Hz
Tue, Feb 12, 2002	13:30	191°	+16°	2 dB	+73°	109°	+1°	-17°	4.0dB	SUN!	404341	+156 Hz
Tue, Feb 12, 2002	14:00	198°	+15°	1 dB	+74°	112°	+7°	-17°	4.0dB	SUN!	404374	+135 Hz
Tue, Feb 12, 2002	14:30	206°	+13°	1 dB	+76°	116°	+14°	-17°	4.0dB	SUN!	404407	+112 Hz
Tue, Feb 12, 2002	15:00	212°	+11°	1 dB	+76°	120°	+20°	-17°	3.9dB	SUN!	404440	+87 Hz
Tue, Feb 12, 2002	15:30	219°	+9°	1 dB	+76°	124°	+25°	-17°	3.9dB	SUN!	404472	+61 Hz
Tue, Feb 12, 2002	16:00	226°	+6°	1 dB	+74°	129°	+31°	-17°	3.9dB	SUN!	404504	+33 Hz

Double clicking a line in the results box will open the **schedules window** and fill in the entry boxes with the Date/Time and station information from the Predictions result. It also will fill in the frequency with Station A's preferred sked frequency.

The Prediction results are shown in the following columns:

- **DATE** - The date in the long format chosen by your settings in Date & Time Control Panel
- **UTC** - Time in standard UTC format
- **AZ** - Azimuth bearing in degrees of moon from home station (in blue)
- **EL** - Elevation bearing in degrees of moon from home station (in blue)
- **MNR** - Maximum Non Reciprocity \* See appendix .doc MNR by N1BUG. (Color Coded)
- **POL** - Spatial Polarity angle in degrees between Home and DX station
- **AZ DX** - Azimuth bearing in degrees of moon for DX station
- **EL DX** - Elevation bearing in degrees of moon for DX station
- **DEC** - Declination of the moon in degrees
- **DGR** - Additional Loss (dB) at 144MHz or 432MHz (Degradation over ideal) Sum of losses over 'ideal' conditions. Additional path loss due to moon not being at perigee plus extra contribution from additional sky noise over lowest possible.
- **RX** noise figure is taken as 60jK at 144MHz and 30jK at 432MHz. At 1296MHz the sky noise contribution is assumed to be negligible.
- **TSky** - Background sky temperature in degrees Kelvin at the frequency chosen in the preferences. (50,144 & 432 MHz only) Displays !Sun (in red) if New Moon.
- **RGE Km** - is the Range the moon shown in Km.
- **DOP** - The Doppler shown in the DX station box is the net doppler shift of the DX station as received at the Home Station.
  
- The **Calculate button** starts the moon predictions running, they can be aborted by pressing the command key and period key at the same time. (**ESC** key on Windows PC)
- **Start** - Start Date for predictions - default today.
- **Finish** - Finish Date for predictions - default tomorrow.
- **Interval** - Choice of 10, 30 or 60 minute time period intervals for the calculations.
- **Home button** - makes Station A and B become the same.
- **Next or Previous Weekend or Day** - Calculates again for the next or previous day or weekend.
- **Today Button** - Calculates for today.

The **schedule window** allows you to see schedules for any station in the SkedDatabase by using the **FIND** button.

Station A	Station B	Mon	Day	UTC	Freq	Pa	Pb	Notes
K6PF	LU6KK	01	30	0330	083	I	I	CONFIRMED
K6PF	K9TI	01	30	0430	083	I	I	CONFIRMED
K6PF	SM5TSP	01	30	0500	083	I	I	CONFIRMED
K6PF	F800	01	30	0530	083	I	I	CONFIRMED
K6PF	LU6KK	01	31	0430	083	I	I	CONFIRMED
K6PF	OK1WVP	01	31	0500	083	I	I	CONFIRMED
K6PF	F/G8MBI	01	31	0530	083	I	I	CONFIRMED
K6PF	F800	01	31	0600	083	I	I	CONFIRMED
K6PF	K9TI	01	31	0630	083	I	I	CONFIRMED
K6PF	LU7DZ	01	31	0900	083	I	I	CONFIRMED
ES6RQ	K6AAH	02	02	0630	1230			cancel

Station A	Station B	Mon	Day	UTC	Freq	Pa	Pb	Notes
K6PF	F/G8MBI	01	31	0530	083	I	I	CONFIRMED
9Y4/DL5MAE	F/G8MBI	02	26	2200	XXX	I	I	

Once you find a sked or skeds they appear in the upper scheds list, if you select one of the skeds then all the matching skeds for the other station appear in the lower list.

Schedules are taken from the VHFSCHED.SKD textfile which is updated weekly by email. The SKD file has to be imported into a SkedDatabase to allow MoonSked to display the schedules.

SkedDatabase and FreqDatabase are built from the SKD80 files VHFSCHED.SKD and FREQ.SKD. When you edit or add a sked, you are altering SkedDatabase, **not** VHFSCHED.SKD.

DIR.SKD is required all of the time because it is not converted into a 'database'.

- **Find Call**

Skeds - shows only skeds for the found station.

All - shows all lines of data for the found station

Tip - Leave the callsign field blank and choose All to find all info on all callsigns

- **Find and sort All Skeds**

**By Date** - sorts all of the skeds in the database in chronological order.

**By Call** - sorts all of the skeds in the database in alphabetical order.

- **Entry fields**

The centre coloured edit fields allow you to create a new sked (+), edit an existing sked (=), and look for a common skedtime on a day (?).

- **Adding a new schedule**

+ **Button** - Creates a new schedule using the information entered into the entry fields. Checks for clashes with skeds at same time or on same frequency. Undo works.

- **Amending an existing Schedule**

= **Button** - replaces the selected line in the upper list with the information in the entry fields. Undo works.

- **Finding a Sked time**

? **Button** - takes the date and callsigns and opens up the predictions window and runs the calculation for that day. You can then double click the time you want to sked and the schedule window will come to the front again with the time entered in for you. Press the + Button to add the new sked. Undo Works.

- **Deleting a schedule**

Highlight (Select with the mouse) the schedule or schedules you wish to delete in the upper sched list and press the BACKSPACE Key (On Macintosh the DELETE key). You can use Undo in the Edit menu to undelete. (Shortcut ControlZ)

- **Database Import**

**VHFSCHED** - creates new SkedDatabase from VHFSKED.SKD file which must be in same folder as MoonSked. Backs up existing SkedDatabase as SkedDatabase.bak – Note in the demo version this function is disabled.

**FREQ** - creates new FreqDatabase from FREQ.SKD file which must be in same folder as MoonSked. Backs up existing FreqDatabase as FreqDatabase.bak

**Found** - shows number of lines of data found for a station.

**Copy to Clipboard in SKD80 format checkbox** - If checked then skeds copied to the clipboard for pasting into an email are in comma separated SKD80 format. If not checked they are in a more human readable TAB separated format.

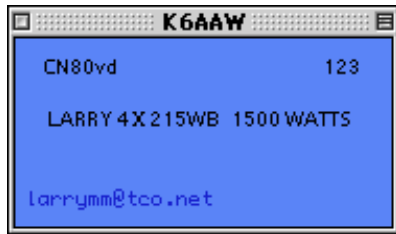
You can highlight (select) a group of skeds from either upper or lower lists and copy them to the clipboard so you can paste them into the body of your email .

### **Email**

e-mail addresses are parsed from the SkedDatabase so they will appear when you highlight a single line in the upper list. You can click on the email address and your email program should open a new message to that station.

### Show Station Info

Station info taken from DIR.SKD,FreqDatabase and calculated Locator can be shown for both stations in floating windows by selecting from the Window menu Station Info or simply by Control I (This toggles station info ON/OFF)



### Menus

(Under the Help menu in Windows)

#### About MoonSked...

Information about MoonSked and special thanks to those who helped directly or indirectly.

#### Register MoonSked...

Enter your registration code here (after paying the Shareware fee). If you have any trouble please email the author.

The Register OnLine button will take you right to the Registration Web Page.

#### Edit Menu

##### Copy Ctrl+C

Allows copying of single or multiple selections from the result lists in the windows.

##### Select All Ctrl+A

Quick selection of all of the items in a result list.

## Preferences...

The screenshot shows the 'Preferences' dialog box for Moonbounce Software. It is divided into two main sections: 'My Location' and 'DX Location'.  
**My Location:** Contains a checkbox 'Use Map Control Panel' (unchecked). Below it are input fields for 'Latitude' (56.0625), 'Longitude' (3.4583333), and 'Locator' (I086GB). At the bottom is a tabbed interface with four tabs: 'Band', 'Tracking', 'Sequence', and 'Misc'. The 'Band' tab is active, showing two columns of radio button options: 144, 1296, 3456, 10368 in the first column, and 432, 2320, 5760, 24G in the second column. The '144' option is selected.  
**DX Location:** Features a scrollable list of call signs: 3A/I21BPN, 3A2MD, 3B8/PA3EPD, 3C5I, 3V8AA, 3V8BB, 3Y0PI, and WB0GGM (which is highlighted with a blue border). To the right of the list are input fields for 'Latitude' (44.89), 'Longitude' (93.37), and 'Locator' (EN34hv). Below the list is a text field containing 'JOHN 4 X MOD 214 650 WATTS'. The 'Moonbounce Software' logo is displayed in blue script. At the bottom right are 'Cancel' and 'OK' buttons.

This is opened when the SELECT button is pressed or from the Edit Menu. Home station and DX station can be chosen from this panel along with the band.

Enter either your Locator Grid square or your Lat/Lon and the other details will be calculated.

Click into or Tab between entry boxes.

The DX Callsign can be selected from the scrollable list or entered into the box and TAB will then search the database for the callsign. You can also enter the DX Lat/Lon or Locator for any station not in the list.

The DX Callsign will then be shown as 'DXstation'.

On a Windows PC there is a 'PC at UTC' checkbox that you have to tick if your computer clock is always set to UTC. Otherwise make sure you also have set your time zone in the Date/Time Control Panel so that UTC is correctly calculated by MoonSked.

On the Macintosh the Date & Time control panel will control whether DST is in effect or not. A Sun symbol is shown in the My Location Group box when DST is in effect.

The **Band** setting determines the calculated Doppler shift as well as the Sky Noise contribution. It also determines which .SKD file is imported. VHFSCHEd.SKD for 144MHz and SCHEd.SKD for 432MHz and above.

Click the OK Button when finished.

## **File Menu**

### **Print...**

Prints Schedules or Predictions (also MoonGraph)

### **Quit**

Quits the Program!

## **Databases Menu**

### **Import VHFSCHEd - Registered Users only**

Creates a new SkedDatabase from the textfile VHFSKED.SKD. Previous SkedDatabase will be renamed SkedDatabase.bak.

#### **Note:**

**If BAND Preferences are set to 432MHz or above then the file SCHEd.SKD is imported instead of VHFSCHEd.SKD.**

**The file UHFDatabase is then created and the backed up as UHFDatabase.bak**

**This allows Multiband operators to maintain UHF and VHF databases.**

### **Import FREQ**

Creates a new FreqDatabase from the textfile FREQ.SKD. Previous FreqDatabase will be renamed FreqDatabase.bak.

## **Window Menu**

### **Sked Maker Ctrl+L**

Selects the main Prediction window

### **Schedules Ctrl+S**

Selects the main Schedule window

### **Station Info Ctrl+I**

2 floating windows with info on both stations appear. This is a toggle on/off.

### **Moon Track Ctrl + M**

Selects the realtime moon tracking window. (Floating Window in Windows version)

### **Noise Sources Ctrl + N**

Selects the realtime SUN, Noise Source tracking window. (Floating Window in Windows version)

### **World Map Ctrl & W**

Selects a World Map showing the Moon's footprint – Size can be set in Preferences.  
(Floating Window in Windows version)

### **Call Finder Ctrl+F**

Finds valid EME callsign from partial callsign fragments. (Floating Window in Windows version)

### **Moon Graph Ctrl+G**

Selects Chart of Moon data for a calendar month



## **MoonSked Features**

- Easy Interface allows rapid choice of suitable date and time for EME schedules
- Home station location from Map Control Panel
- Mutual Station AZ/EL data
- 144MHz/ to 24GHz Doppler shift between Stations
- 144MHz/432MHz Background Sky Temperature
- Database of Stations, Macintosh or DOS format of DIR.SKD file (CR or CR/LF)
- Scrollable list of stations in database
- Grid Location entry
- Display of Grid from Lat/Lon Input
- Moon Elevation Correction for Parallax and Correction for Earth's Oblateness
- Moon Range and DGR dB loss
- Spatial Polarity and Maximum Non Reciprocity
- Station details displayed from database
- Show split of DGR in terms of Additional Sky Noise and Distance.
- Choice of Intervals for results
- Viewing and editing of VHFSCHED.SKD files in a custom database.
- Find skeds for any station.
- List all skeds in chronological order.
- email address lookup from SKD file database.
- HotLinks email address shown to your email program.
- Checks for clashes of sked times or frequencies when creating new sked.
- Copies skeds in SKD80 format or plain text.
- Shows station's preferred sked frequency.
- Integrates Prediction window with Schedules window allowing auto sked entry.
- Radio Sky Map and Noise Source Tracking
- Realtime Moon Tracking
- TX/RX sequence calculator with optional audible alerts
- Moon footprint on World Map.
- Interface with EA4TX Automatic Rotator Control System (Windows Only).
- Moon Graph shows monthly moon data
- Callfinder – finds likely EME callsigns from partial calls heard

## **Registered Users Only**

- Import of VHFSCHED.SKD and SCHED.SKD files (VHF and UHF & Above Schedules).

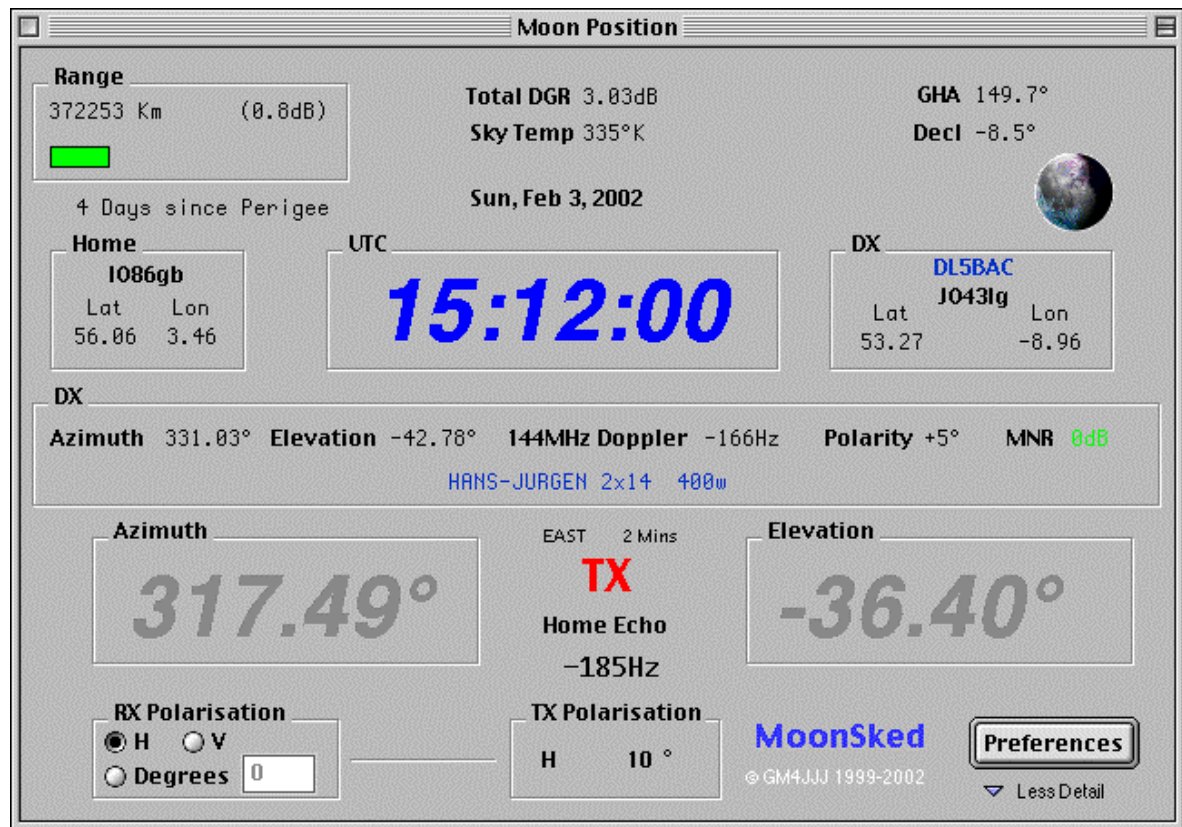
Moon Position is shown in realtime.

Note UTC is shown and is calculated from the local time and the Time zone info stored on your computer.

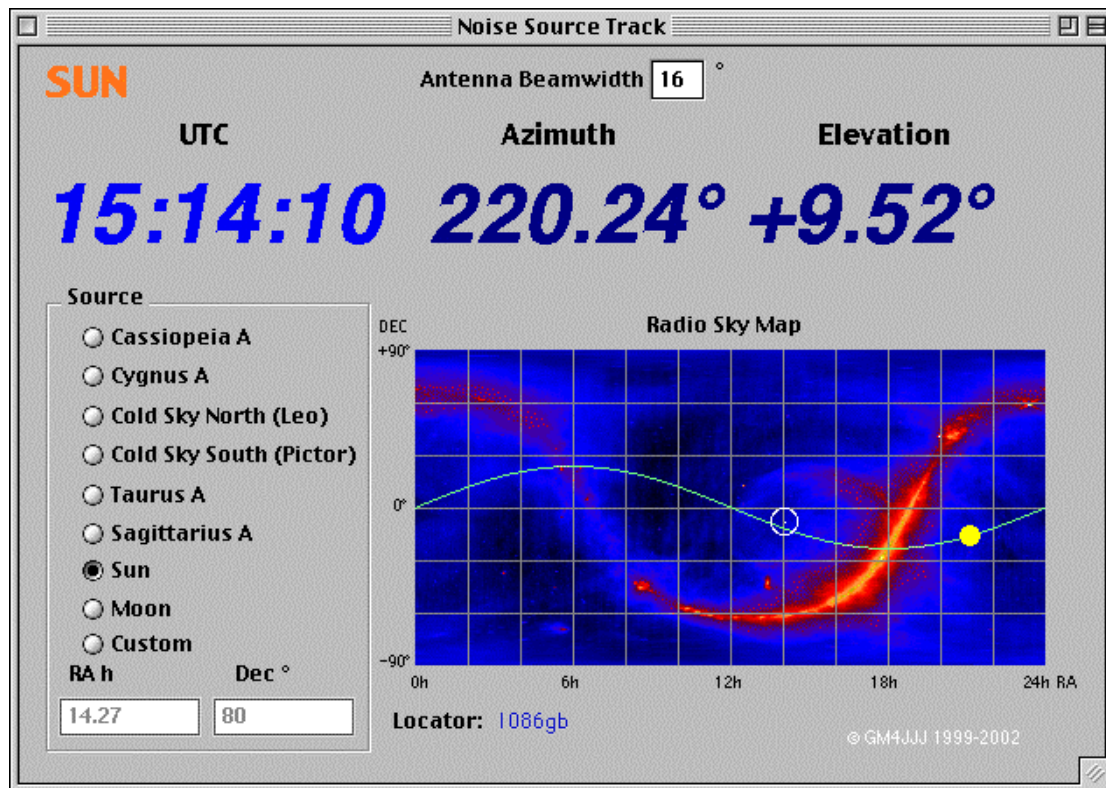
Note:- Summertime also has to be taken into account – see preferences.

- Best TX Polarisation (calculated from Spacial Polarisation and the Best Receive Polarisation)
- Moon Range graphical representation of Pathloss (Green, Yellow, Red)
- MNR result is also color coded.
- Same information as shown in the Predictions Window.
- Total Doppler shift of the DX station as received by you shown as well as the shift of your own echo.
- AZ/EL Data can be sent to EA4TX ARS system.
- Can be reduced to show only basic info by clicking “less detail” triangle
- The Moon’s Phase is shown by the picture above the DX station.

Note: **Unregistered Users** will only be able to view this window for a limited time during any session.



## Realtime Noise Source Tracking -



- UTC calculated from local computer time and Time Zone
- Note:- Summertime (DST) also has to be taken into account – see preferences.
- Position of selected Noise Source shown on Radio Sky Map by flashing circle
- Sun position shown as yellow disc (not to scale)
- Moon Position shown by white circle ( 8 degree radius)
- Custom sources can be input by entering RA and Declination or by clicking on Sky Map.
- Ecliptic (path of sun) through the year) is shown as a sine wave.
- AZ/EL data can be sent to EA4TX ARS system
- Different antenna beamwidths can be entered and the size of the circle around the source will change.

Note: **Unregistered Users** will only be able to view this window for a limited time during any session.

## World Map

The World Map shows the present area illuminated by the Moon, the dark area is not in range of the Moon.

The 'footprint' is updated in realtime.

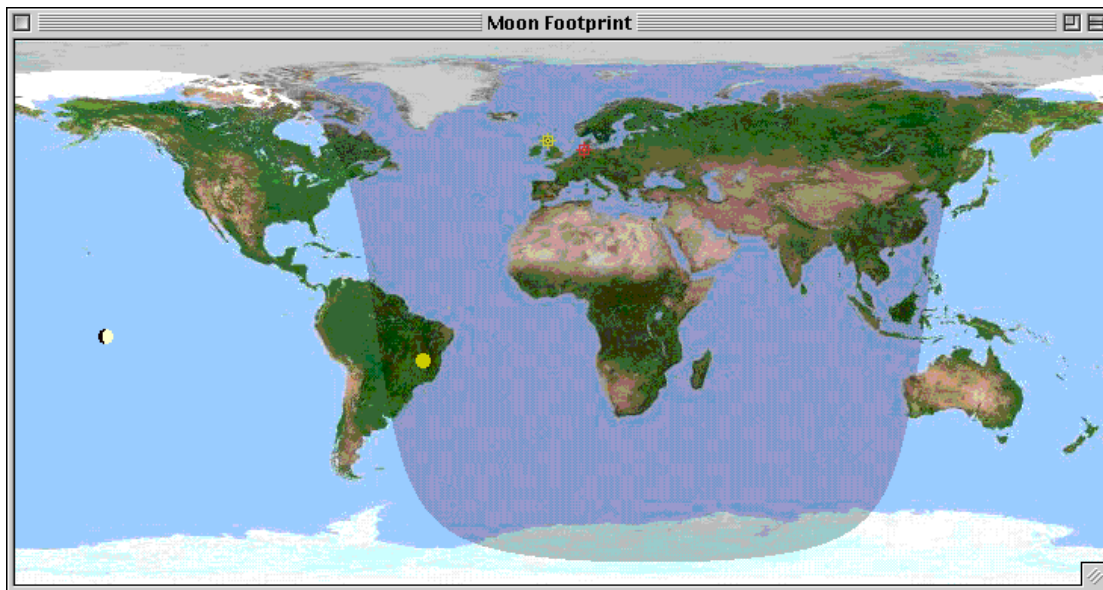
The Position of Home & DX stations are shown.

The Position of the Sun and the Moon are shown.

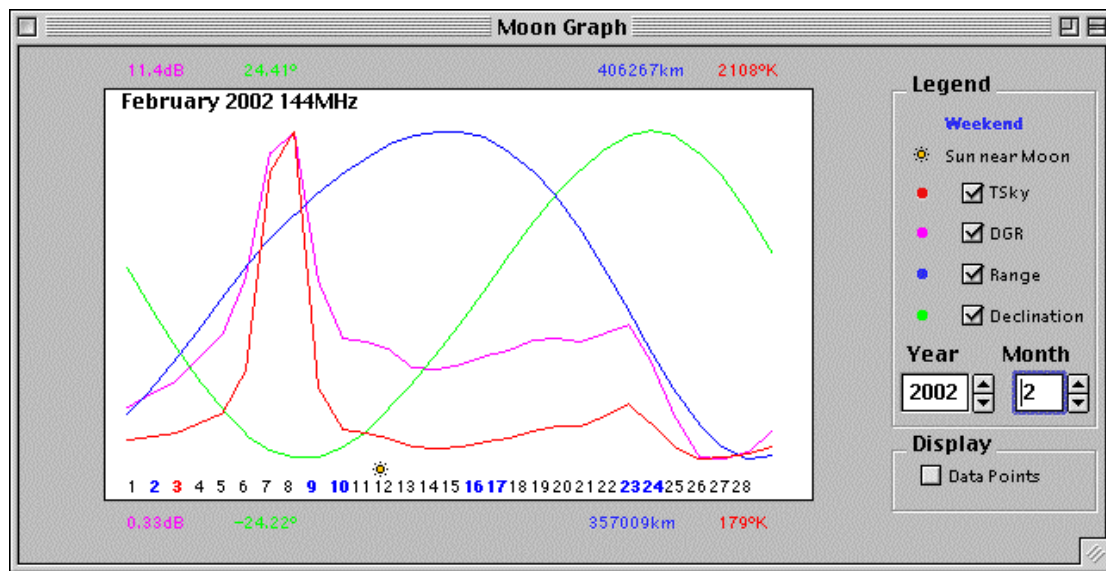
The Phase of the Moon is shown graphically.

Clicking on the Map will display all stations in the database (red dot displays positions)

Note that there are two sizes of maps available – change in the Preferences.



## MoonGraph

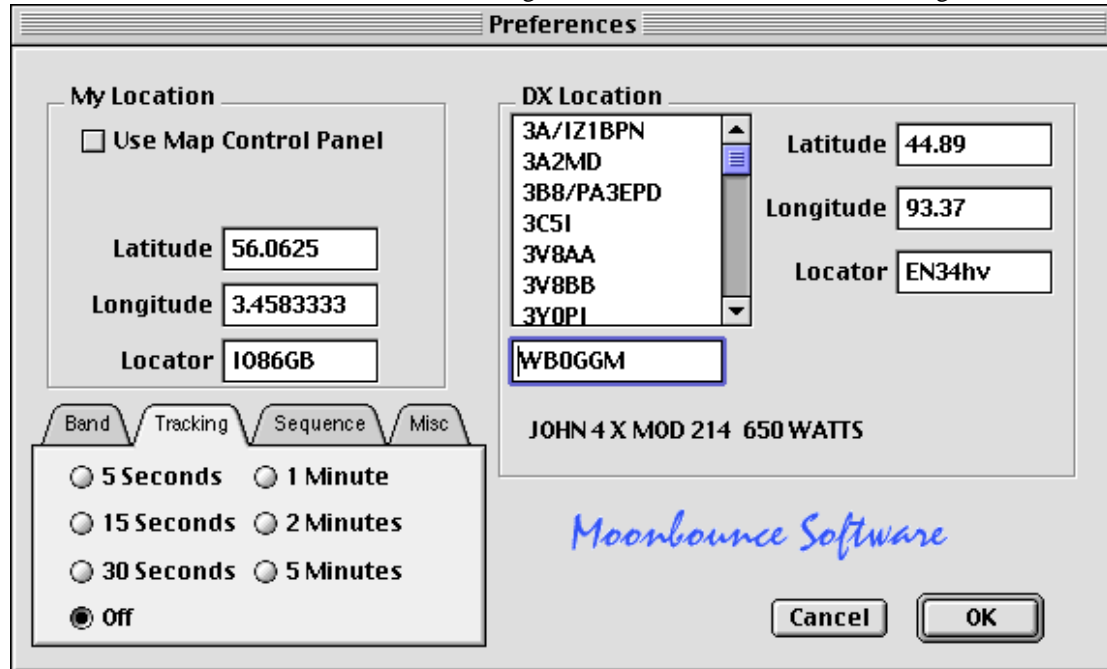


The MoonGraph allows the user to see a whole month at a time.  
New Moon when the Sun is in the same part of the sky as the Moon is indicated by a Sun symbol.  
Weekends are shown in blue. Today 's date is shown in Red.  
The size of the window is scaleable.  
Dots for each day can be added to the graphs.  
Any combination of the four plots can be displayed

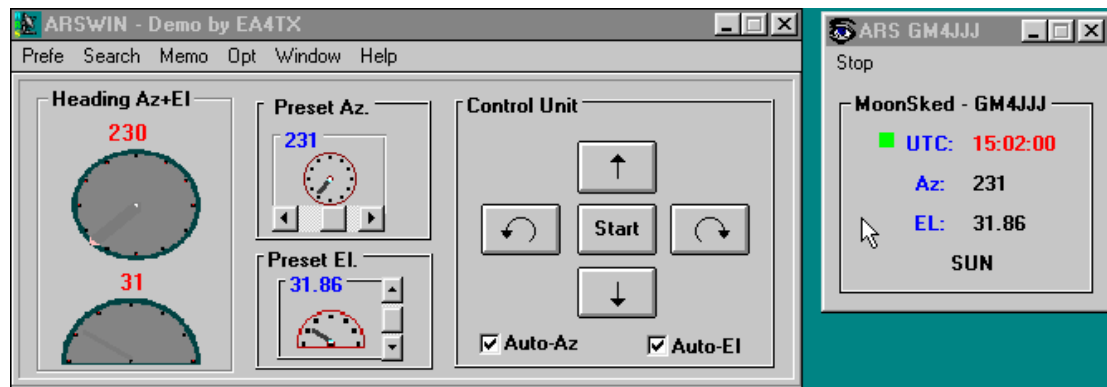
Note: Un Registered users can only view the data for the previous month

## Using MoonSked with the EA4TX Automatic Rotator System

MoonSked can be used to create tracking data for the ARSWIN program by EA4TX. This will allow automatic control of antenna rotators for tracking the Moon, Sun, or other Cosmic Target.



The Tracking Tab Panel sets the time interval used for the creation of the AZEL.DAT tracking data file created for use with the EA4TX Automatic Rotator System (ARS). If set to OFF then no AZEL.DAT file is produced.



The ARSWIN Program is shown with the MoonSkedARS DDE Driver interface software taking data from MoonSked's Noise Source Tracking Window (Not Shown).

ARSWIN must be running before MoonSkedARS is started.

ARSWIN must be installed otherwise the Runtime Libraries used by MoonSkedARS will not be present.

Although I have no reason to suspect that this software could do any damage to either you or your computer, for my protection I must include the following statement.

*Legal Stuff - Standard Disclaimer*

*This is a legal agreement between you, the end user, and David Anderson GM4JJJ*

*Be sure to read the following agreement before using the software.*

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