

DX ToolBox Version 6.4.0 March 8, 2024

DX Toolbox searches the world for you, gathering information on solar and geomagnetic conditions that affect radio propagation. DX Toolbox also has several built in propagation forecasting tools. There are also databases of SWBC stations, and NDBs. Plus much more! Please take a moment to read through this documentation to see all the DX ToolBox features. An active internet connection is required to use DX ToolBox.

It displays in real-time the following important readings:

- Solar Flux
- A-Index
- K-Index
- X-Ray Flux levels
- X-Ray flares
- Solar Wind
- Earth's Magnetic Field
- Radio Blackout conditions
- Geomagnetic Storm conditions
- Solar Radiation Storm conditions

In addition, the last month's worth of Solar Flux, A-Index, K-Index, Sun Spot Number, and background X-Ray Flux are plotted.

Maps showing auroral levels, as well as the maximum F layer frequency (related to MUF) over various parts of the world are also displayed. In addition, images of the Sun from the SOHO satellite are also shown.

A grayline map of the world is also available, showing the daytime, dark, and most importantly the grayline region, where propagation is often greatly enhanced.

Propagation conditions can be estimated between two points on the Earth.

DX ToolBox is free to try out. If you decide to continue using it, you then buy your copy for just \$29.99, which gives you a registration code to remove the reminder messages. Take a look at the Purchase part of this document for details on how to buy your copy.

DX ToolBox features many windows, each described in a section in the following pages:

Preferences

The first time you use DX ToolBox, you should set your preferences:

Latitude: The latitude of your location as a decimal number. Use a positive number if you are north of the equator, negative if south. For example, 39.5 for 39 degrees, 30 minutes.

Longitude: The longitude of your location as a decimal number. Use a positive number if you are east of the prime meridian, negative if west. For example, -77.25 for 77 degrees, 15 minutes west.

Alarm Settings: You can set thresholds for the K index, X-Ray flux, and Bz (z component of the Earth's magnetic field). If the current readings exceed these levels, and "Play Alert Sound" is checked in the Current Conditions window, an alert sound will be played if these values are exceeded. This can be used to alert you that a solar flare is occurring, or auroral conditions or poor propagation is expected. Here is how it works:

For the K index, enter a number from 1 to 9. If the K index reaches or exceeds this value, an alarm will sound.

For the X-Ray flux, enter either C, M, or X to specify the minimum flare intensity that will cause an alarm.

For Bz, enter the *maximum* Bz value. Usually, you will enter a negative number, since negative Bz values usually produce aurora conditions. For example, if you enter a value of - 20, then any Bz value equal to -20, or more negative, will produce an alarm.

Add callsign prefixes instead of countries to location menus: When checked, callsign prefixes will be used instead of country names, in the location menus. Note that DX ToolBox requires the cty.dat file for the country list. This file comes with the download, and must be kept in the same folder as the application itself.

Proxy Support: if you are behind a firewall and need to use a proxy for web access, you can check the Use Proxy box, and enter in the server address and port number. You must then quit and re-start DX ToolBox for the change to take effect. Only proxies that do not require authentication can be used.

Gain Offset: This value (in dB) will be added to all estimated signal levels. It can be used to adjust the values computed by DX ToolBox, if you believe they are too low or high for your uses.

app. See the section on SdrDx further down for detailed information

Interfacing with SDR software:

DX TooBox can interface with several SDR programs, to set/get the frequency. Several of the windows in DX ToolBox make use of this feature Use the popup menu in the lower left corner of the Preferences window to set which program to interface with:

SdrDx TCP: Allows DX TooBox to get and set the frequency and mode in the SdrDx SDR running on the same computer. Set the TCP Port.

SdrDx UDP: Allows DX TooBox to get and set the frequency and mode in the SdrDx SDR The Rcv and Send ports must be set to match the network settings in SdrDx.

Black Cat SDRuno plugin: Note that communications between SDRuno and this app use UDP ports 58283, 58284, and 58286. Make sure you do not have any Firewall or other settings blocking these ports or blocking this application or SDRuno from using networking, or the plugin will not work.

Elad FDM-SW2: Set the address of the computer running FDM-SW2. The default TCP port of 1893 must be configured in SW2.

SDR# NetRemote: Set the address of the computer running SDR#. The default TCP port of 3382 must be configured in the NetRemote plugin, which you must install into SDR#.

Current Conditions

Current Conditions

UTC: 1908

☐ Play Alert Sound

Solar Flux: 137

SSN: 99

A-Index: 12

K-Index: 1.00 at 1800 UTC

Past 24 Hours:

Next 24 Hours:

Space weather : None

Geomagnetic storms: G1

Solar radiation storms: None

Radio blackouts: None

None

None

None

None

Solar Flux Graph

S W Alerts 1

S W Alerts 2

GOES X-Ray Flux

Current: 2024-03-08T19:06:00Z B5.1

Begin: 2024-03-08T18:37:00Z B5.4

Max: 2024-03-08T18:42:00Z B9.7

End: 2024-03-08T18:47:00Z B6.8

-

Magnetic Field Bx: 3.3 By: -1.6 Bz: -3.1 Bt: 4.8 nT Lat: 39.8 Long: 334.5 deg

Graph:

6 Hours

1 Day

3 Days

7 Days

Solar Wind

Mag Field

Proton Flux

Electron Flux

Planetary Kp

Boulder K

Planetary K

Alerts

Planetary A

The Current Conditions window displays real-time readings for the following:

Solar Flux: A measurement of the energy output of the Sun at certain radio frequencies. This is an indication of how strong the ionosphere is. The higher the solar flux, the better able the ionosphere is able to reflect shortwave radio waves, and the higher the frequency of waves which may be reflected.

A-Index: A measurement of the disturbance of the Earth's geo-magnetic field. Lower numbers are better. Higher numbers indicate poor conditions. The range of values is from 0 to 400. Only one A-Index value is computed for each day, after the end of the day.

K-Index: Another measurement of the disturbance of the Earth's geo-magnetic field. Lower numbers are better. Higher numbers indicate poor conditions. The range of values is from 1 to 9. A new K-Index value is computed every three hours.

The current space weather conditions, geomagnetic storms, solar radiation storms, and radio blackout conditions are reported, as well as the forecast for the next 24 hours. None means that there is no adverse weather for that condition.

Clicking Solar Flux Graph brings up a graph of solar flux readings for the current year. You can use the up and down arrow keys to cycle through readings for previous years.

Clicking S W Alerts 1 or SW Alerts 2 brings up a timeline chart of previous events.

Next are x-ray readings from the primary GOES satellite. These show the current readings, as well as the time, duration, and intensity of the last detected solar flare.

Solar wind and geomagnetic readings are also shown. A Coronal Mass Ejection (CME) from the Sun, impacting the Earth, will cause an increase in solar wind speeds. If the geomagnetic field Z component is pointing South (negative) at this time, it is possible for auroral conditions to be produced.

Clicking one of the four graph buttons (6 hours or 1, 3, 7 days) brings up a window graphing x-ray flux from the GOES satellites. High levels of x-ray flux generally lead to noisy conditions, and flares (large peaks) can cause blackouts over much or even all of the HF spectrum.

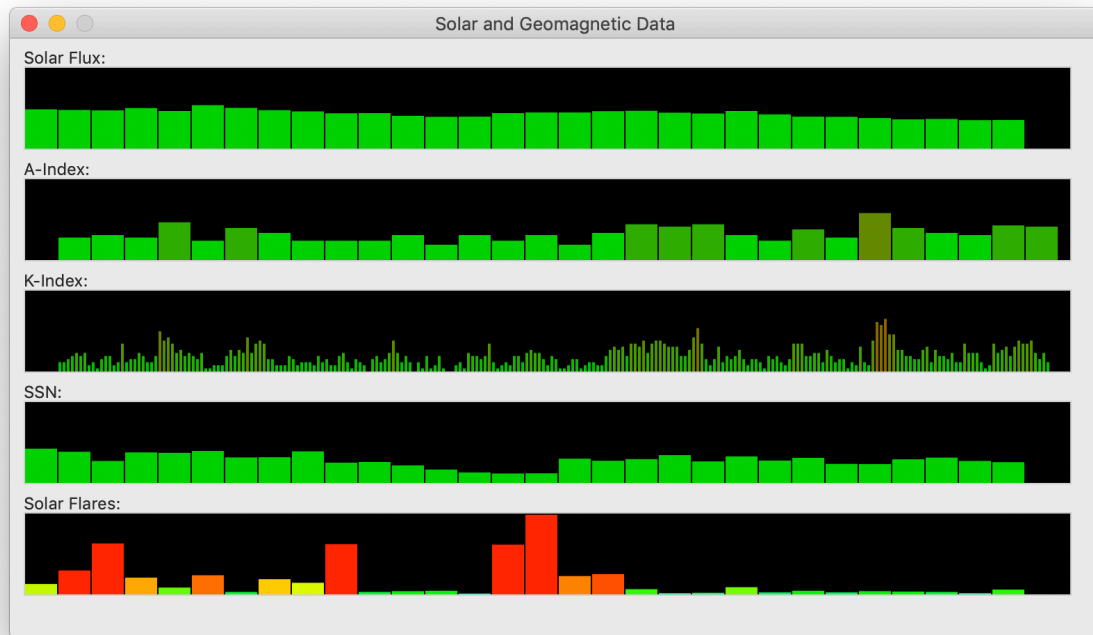
Clicking the "Solar Wind" or "Mag Field" buttons will bring up a window with a graph of values for the solar wind or the Earth's magnetic field. Likewise, there are buttons to display graphs of proton and electron flux readings.

The Planetary A button brings up a chart of previous A Index readings.

Clicking Alerts brings up a window showing Spacde Weather text Alert messages,

The Boulder K and Planetary K buttons bring up graphs of recent real time (1 minute) readings. Note that these often have dropouts down to zero.

Solar and Geomagnetic Data



This window graphs five important values - the daily Solar Flux, A-Index, Sun Spot Number, and Solar Flares, as well as the K-Index readings produced every three hours.

The higher the solar flux and SSN, the higher the frequencies that will be reflected by the ionosphere. The lower the A and K Index values fewer solar flares, the better the overall shortwave radio conditions.

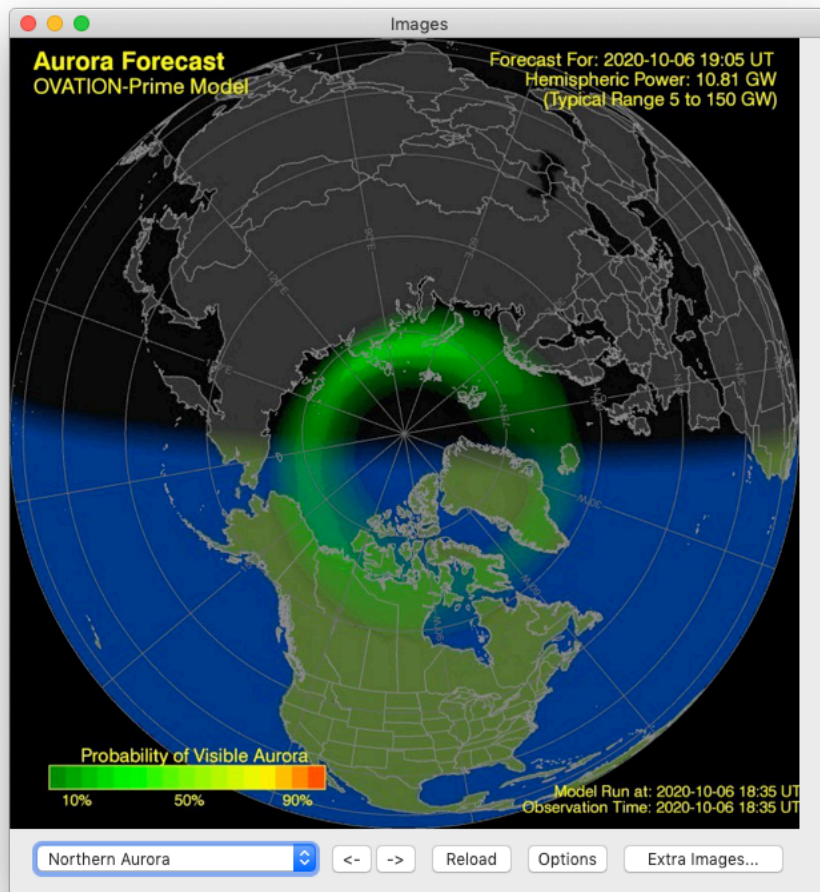
Hi K-Index values, especially in the 7-9 range, can indicate that auroral conditions are possible.

Images

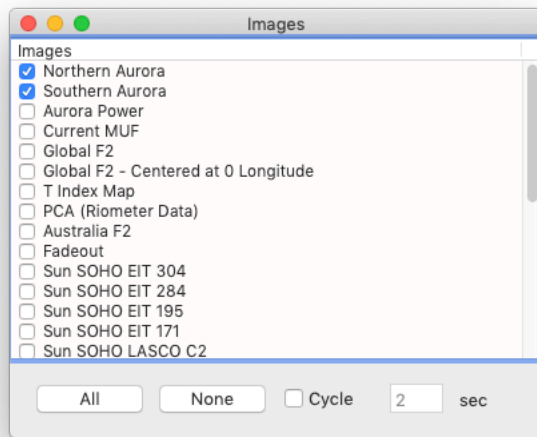
The Images window allows you to display several different images and graphs from the web, such as the extent of the auroral oval shown here. Other auroral and propagation related images are available by selecting them from the popup menu in the lower left corner of the window.

It takes several moments to load these images when DX ToolBox is started, especially on a slow internet connection. Clicking the Reload button will reload all of the images.

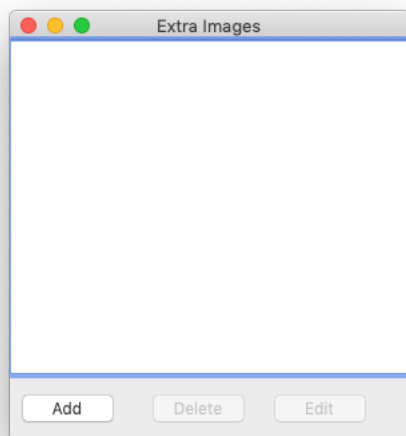
The right and left arrow buttons let you shift through the loaded pictures.



Clicking on the Options button will bring up a list of all of the images, you can select which are loaded by checking the box next to that image name.



You can also specify additional images to load. Click on the Extra Images button, and you will see a window like the following:



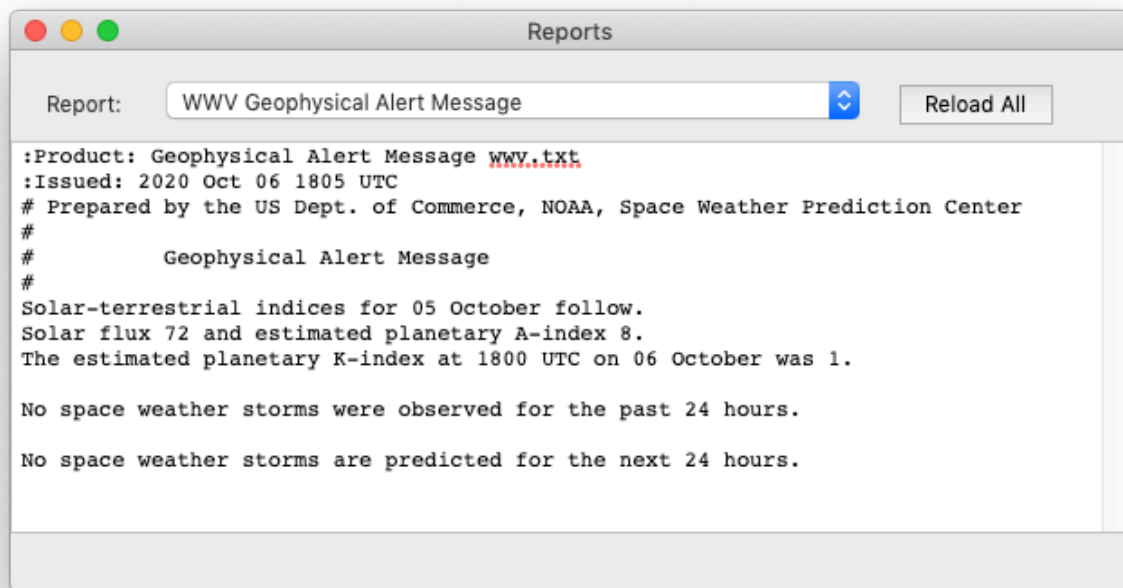
Click on the Add button, and you will get another window, allowing you to enter in a name for the image, and the URL to load:

You can usually copy the URL from your web browser, and paste it into the URL line. After adding additional images, be sure to close and re-open the Images window for the changes to take effect.

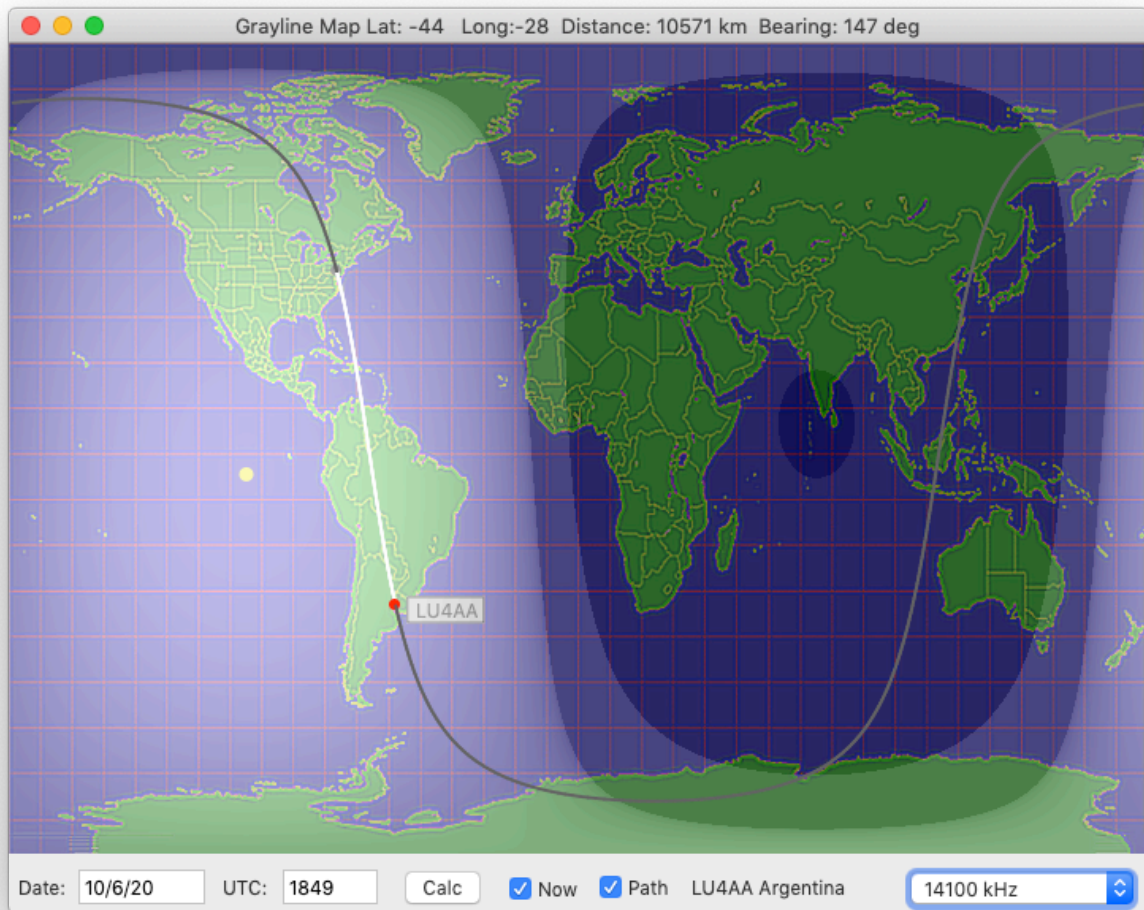
Reports

The reports window displays many different text reports that continue useful information related to propagation conditions:

Select the desired report from the popup menu. It will take a few moments for all of the reports to be loaded, you can watch the download status at the bottom of the window.



Grayline Map



This window displays a map of the world, showing the day and night regions, and the important grayline region between the two.

Propagation is generally enhanced between regions in the grayline. That is, if you are in the grayline, then often you will find excellent propagation conditions to/from other locations also in the grayline.

Due to the tilt of the Earth's axis, the shape of the grayline changes throughout the year, so that certain stations may only be in the grayline along with your location at specific times of the year, if at all.

When the Now checkbox is checked, the map will update in real-time.

Otherwise, you can enter a date and time in the appropriate boxes, and click the Calc button, to be shown the grayline conditions for that date and time.

If you select a frequency from the pop-up menu in the lower right corner of the window, the map will update every 10 seconds, showing the location of the currently active NCDXF/IARU beacon for that frequency. The call of the beacon is also displayed to the left of the pop-up menu.

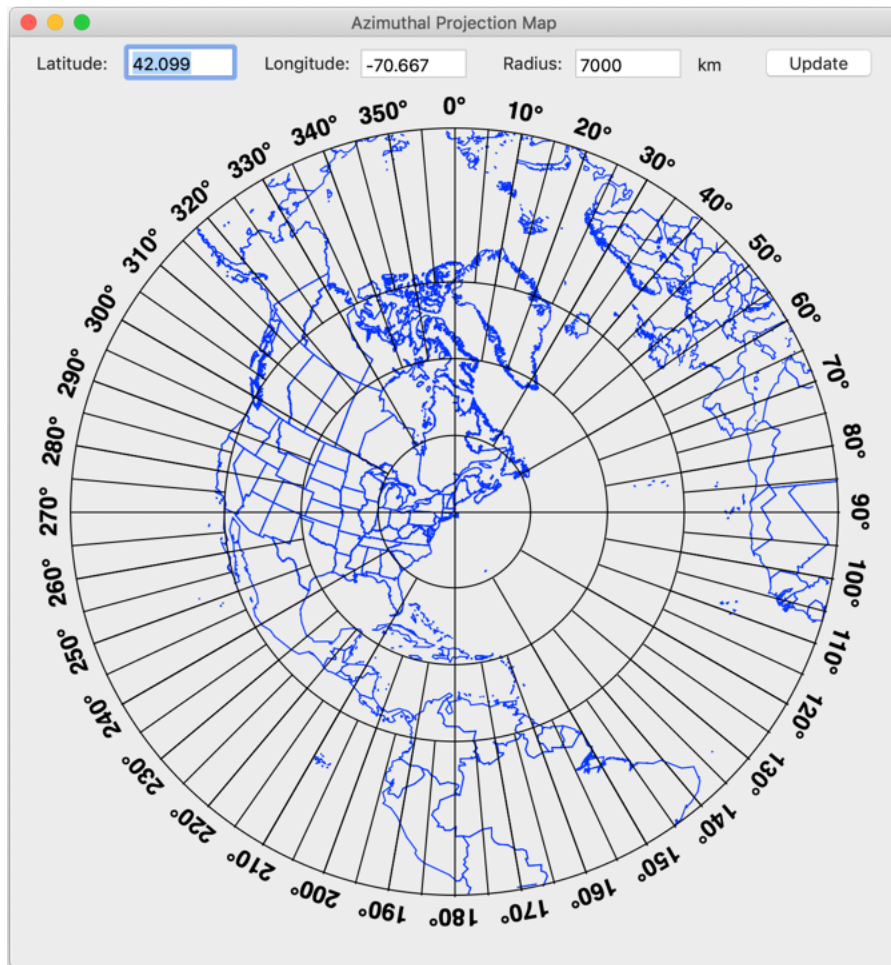
If you have the Path checkbox checked, then the great circle (shortest) path between your location and the other station will be drawn, with the beam heading in the title bar of the window, along with the distance in kilometers. The other station is either the currently active beacon, or determined by the position of the mouse cursor over the map of the world. A more faint line will also be drawn showing the long path.

Clicking on a location with the control key held will bring up the Propagation Path for Time calculator, to help estimate the propagation conditions between your location and that location. Clicking on a location with the alt/option key held will bring up the Propagation Path for Frequency calculator, and clicking on a location with the shift key held will bring up the MUF / LUF calculator.

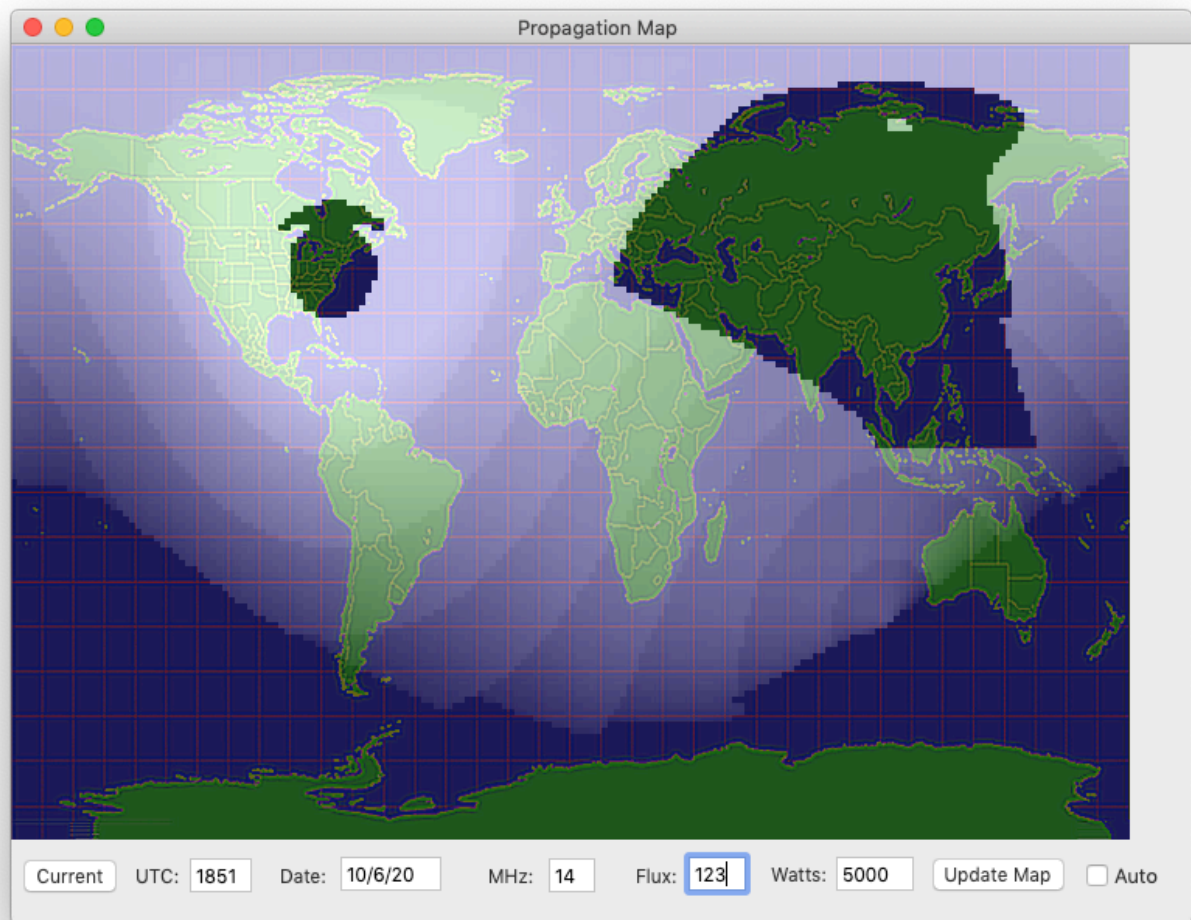
Azimuthal Projection Map

This window displays a map of the Earth centered on your (or another) location, making it easy to view beam headings. The map defaults to being centered on your location, with a display radius of 7000 km. You can change either the location or radius via the text entry fields and clicking the Update button. You can also click on a map location to set the center to it.

Moving the cursor around the map will display the bearing, distance, and location of the point under the cursor in the window title.



Propagation Map



This window allows you to estimate the propagation conditions between two points on the Earth. The required information is the current solar flux, the desired frequency in MHz, the transmitter power level, and the current date and time. Enter this information, and press the Update Map button. The displayed map shows the estimated signal. Your location is taken from the Preferences, and the solar flux is automatically grabbed from the Current Conditions Window. You can of course change these values, as well as the time and date. Clicking on the Current button will place the current date and time in those fields.

As you move the cursor around the map, it will display the estimated signal level in dB. The assumptions are that the receive bandwidth is about 2.5 kHz, and the minimum sensitivity of the receiver is -123 dBm, typical for most modern receivers.

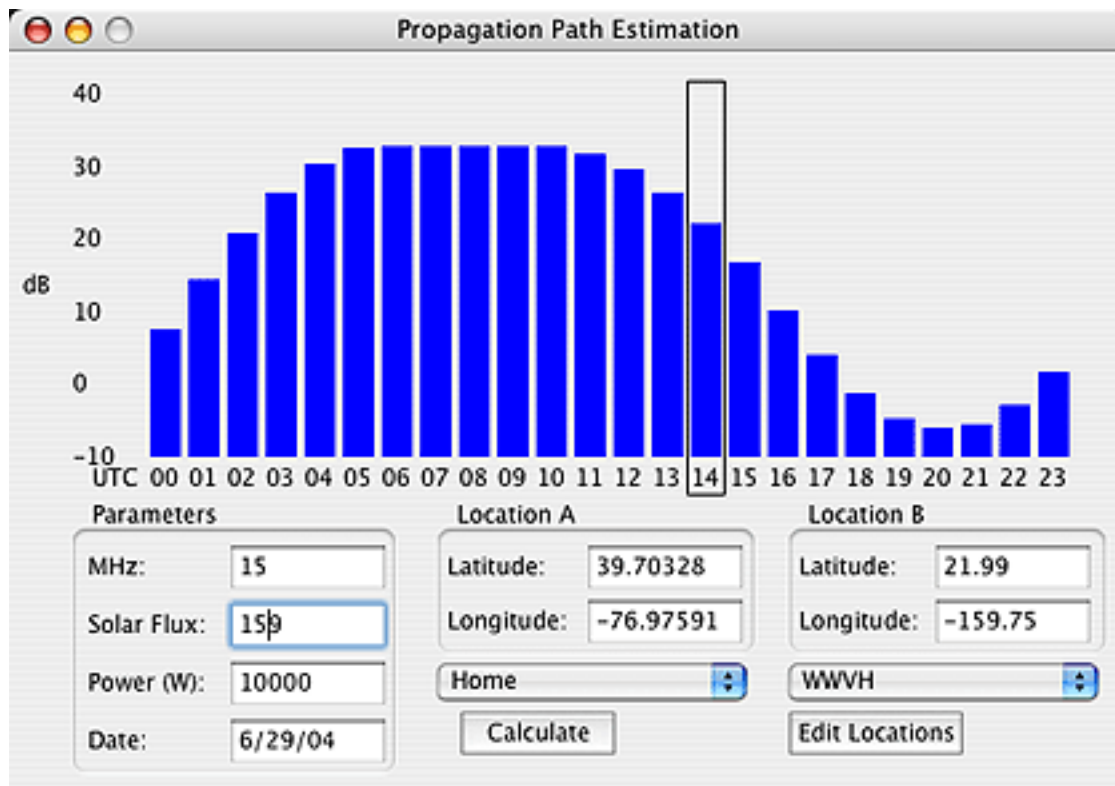
Please note that propagation is a lot like weather forecasting, except it is rarely even that accurate! But it will give you a good guide as to what propagation conditions can be expected.

Propagation Path Estimation For Frequency

This window allows the propagation for a particular path to be estimated. Enter the frequency in MHz, solar flux, transmitter power, date, and the two locations (location A is pre-set to your location as set in the Preferences) and click Calculate. A plot for the entire day will be generated showing estimated signal levels.

You can also bring this window up by clicking on a location on either the Grayline Map window or the Propagation Map window. Location A will be filled in with your location (as entered into the Preferences) and Location B will be filled in with the latitude and longitude of the location you clicked.

The popup menus can be used to select a location. Click on the Edit Locations button to add, change, or delete a location. You'll need to close and re-open this window for the changes to take effect.



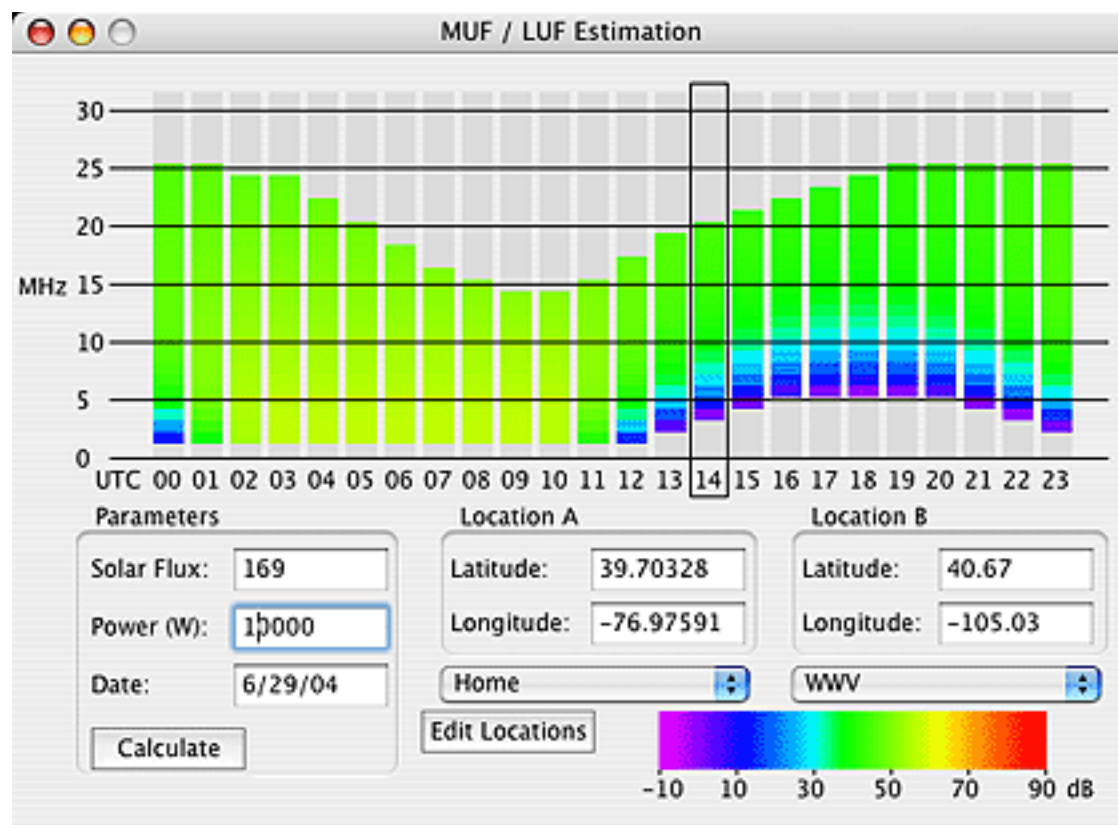
MUF / LUF Estimation Window

This window allows the signal strength for a particular path to be estimated for the range of frequencies over which propagation is expected.

Enter the solar flux, transmitter power, date, and the two locations (location A is pre-set to your location as set in the Preferences) and click Calculate. A plot for the entire day will be generated showing estimated signal levels for the range of frequencies. The color mapping ranges from violet for a weak signal, to red for a strong signal, using the same color order as in a visible light rainbow (violet, blue, green, yellow, orange, red).

The popup menus can be used to select a location.

You can also bring this window up by holding down the shift key while clicking on a location on either the Grayline Map window or the Propagation Map window. Location A will be filled in with your location (as entered into the Preferences) and Location B will be filled in with the latitude and longitude of the location you clicked.

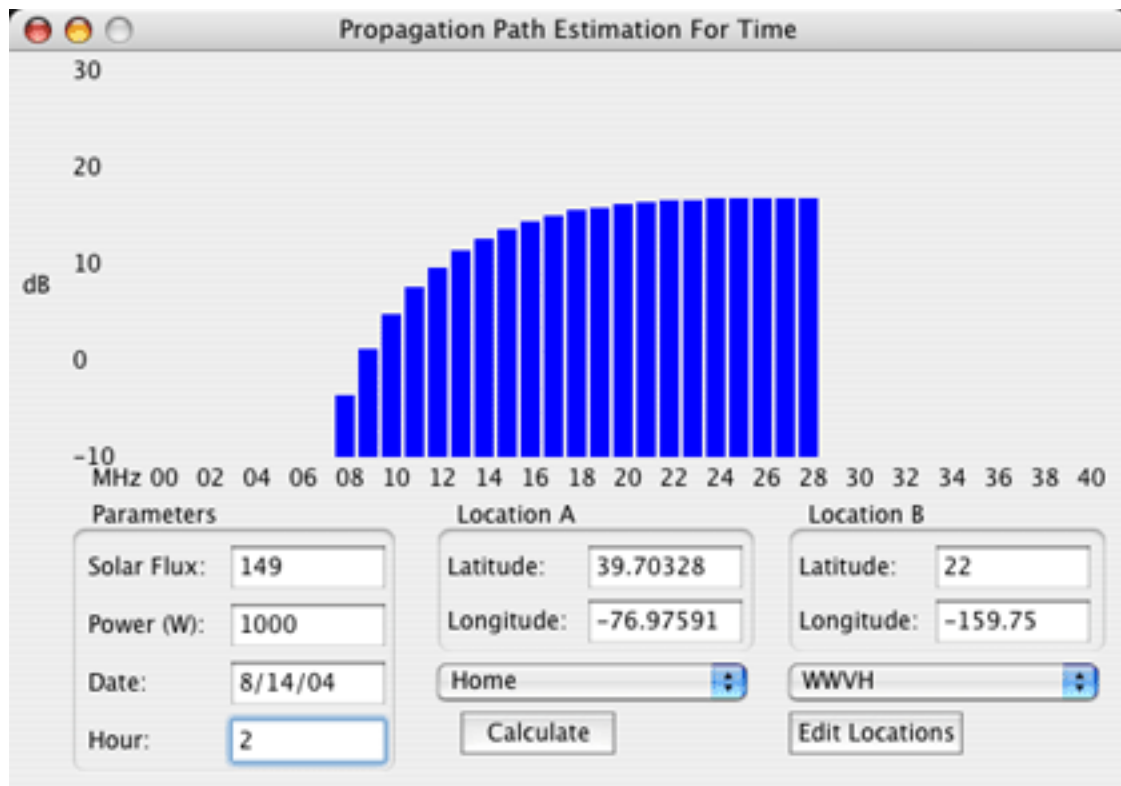


Propagation Path Estimation For Time Window

This window allows the propagation for a particular path to be estimated. Enter the solar flux, transmitter power, date, the current UTC hour, and the two locations (location A is pre-set to your location as set in the Preferences) and click Calculate. A plot for that hour of the specified day will be generated showing estimated signal levels between 0 and 40 MHz.

You can also bring this window up by control-clicking on a location on either the Grayline Map window or the Propagation Map window. Location A will be filled in with your location (as entered into the Preferences) and Location B will be filled in with the latitude and longitude of the location you clicked.

The popup menus can be used to select a location. Click on the Edit Locations button to add, change, or delete a location. You'll need to close and re-open this window for the changes to take effect.



Locations Window

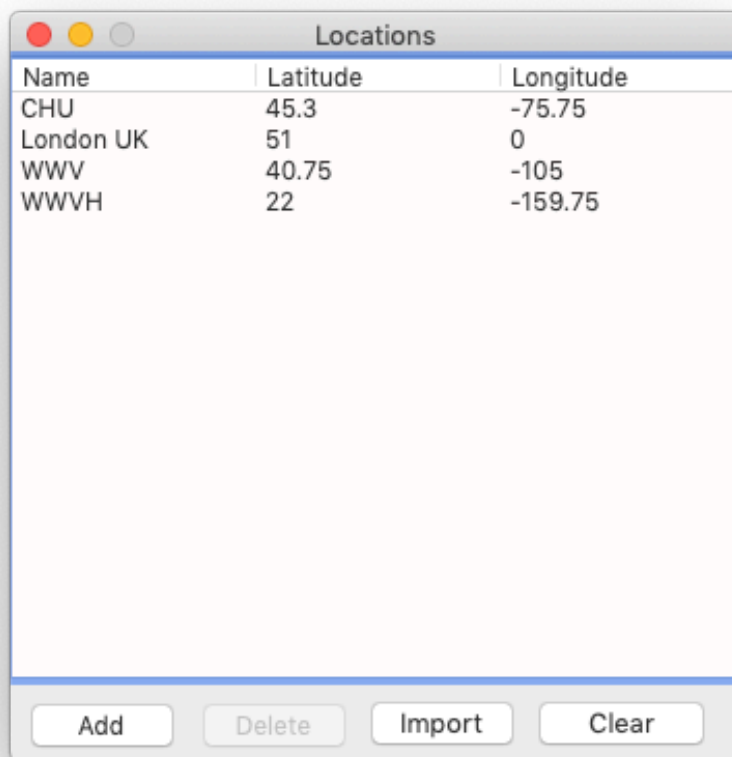
This window allows you to add, edit, and delete locations that appear in popup menus. To add a new location, click the add button, and then type in the location name, latitude (N is positive, S is negative), and longitude (E is positive, W is negative).

To edit a location, double click on that location in this window. To delete a location, click on the location in this window, and then click the Delete button.

You can import a large number of entries at once, using the Import button, by putting them into a comma delimited text file, one on a line, like this:

location,latitude,longitude

You can have a maximum of 100 locations.



SWBC Schedule Window

Station	Frequency	Time	Country	Target	Language	Transmitter Site
China Radio Int.	9525	1900-2000	China	EEu	Russian	Beijing-Chaoyang/Gaobeidian/Shuan...
Voice of Indonesia	9525	1900-2000	Indonesia	Eu	English	Jakarta (Cimanggis) 06S12-106E51
Voice of Indonesia	9525	1900-2000	Indonesia	Eu	English	Jakarta (Cimanggis) 06S12-106E51
Voice of Indonesia	9526	1900-2000	Indonesia	Eu	English	Jakarta (Cimanggis) 06S12-106E51
Rádio Transmundial	9530	1000-1959	Brasil	SAm	Portuguese	Santa Maria, RS 29S44'18"-53W33'...
China Radio Int.	9535	1900-2000	China	SAf	Portuguese	Baoji-Xinjie (Shaanxi; CRI 150 kW; C...
BBC	9545	1930-2000	United Kingdom	Waf	Haussa	Woofferton 52N19-02W43
R.Boa Vontade, P.Alegre	9550	1000-0001	Brasil	B	Portuguese	Esteio (Porto Alegre), RS 29S51'59"-...
BSKSA 1	9555	1800-2300	Saudi Arabia	NAf	Arabic	Riyadh 24N30-46E23
Super Rádio Deus é Amor	9564	0000-2400	Brasil	SAm	Portuguese	Curitiba, PR 25S27'08"-49W06'50"
Radio Cairo	9570	1900-2000	Egypt	Eu	German	Abis 31N10-30E05
Medi 1	9575	0000-2400	Morocco	NAf	A,F	Nador (RTM,Medi1) 34N58-02W55
BSKSA 2	9580	1700-2200	Saudi Arabia	ME	Arabic	Jeddah/Jiddah 21N15-39E10
All India Radio GOS	9620	1945-2030	India	Waf	French	Aligarh (4x250kW) 28N00-78E06
Rádio Aparecida	9630	0000-2400	Brasil	B	Portuguese	Aparecida, SP 22S50'47"-45W13'13"
Voice of Turkey	9635	1930-2030	Turkey	WEu	French	Emirler 39N29-32E51
Rádio Bandeirantes, SP	9645	0000-2400	Brasil	B	Portuguese	Sao Paulo - Radio Bandeirantes, SP 2...
China Radio Int.	9645	1830-2030	China	Waf	French	Kunming-Anning CRI (Yunnan) 24N5...
Radio Guinée	9650	0600-0001	Guinea	Waf	French	Conakry-Sonfonia 09N41'10"-13W3...
China Radio Int.	9655	1800-2000	China	ME	Turkish	Kunming-Anning CRI (Yunnan) 24N5...

This window displays a list of schedules for shortwave broadcast (SWBC) stations. Broadcasts currently on the air will be displayed in bold.

The band buttons can be used to immediately jump to the beginning of one of the shortwave broadcast bands.

The search boxes can be used to search for specific stations, by station name, time on, frequency, and country code. There are two buttons, to allow you to more specifically find the station(s) of interest.

Checking “Only On Now” will, as the name suggests, only display stations that are currently on the air. Likewise, checking the Show Transmitter Site box will add a column on the right hand side of the window, showing the site for each station, if known.

Checking “SWBC Only” will display only those stations above 2000 kHz, as well as attempt to filter out most utility and other broadcasts, although some will still sneak though..

Clicking on Download Schedule will download the current schedule file. Or if you have Check For Updates checked in Settings/Preferences, it will automatically check for a new schedule file each time you open this window. If you wish to manually update the schedule file, download it

from this page: <http://www.eibispace.de/> and rename it eibi-sked.csv, then place it in the same folder as the DX ToolBox application. Then run DX ToolBox.

If you are running the SdrDx app, you can control it with this window, as well as get lists of possible SWBC stations in this window. Go to the preferences for DX Toolbox, and check the SdrDx Support box. Then make sure the receive and send UDP port numbers match the settings in SdrDx (the default values should match). Then open the SWBC Schedule window.

If you double click on an entry in the window, SdxDr will be told to change to that frequency.

Right clicking an entry will give you a popup menu with options to get a window with other transmissions by the same station, on the same frequency, from the same country, in the same language, or to the same target. Note that you can right click entries in this new window as well, to get other related windows. And so on... There is also the option to log an entry, see the Logbook window section after this one.

If you change the frequency in SdrDx, DX Toolbox will be informed, and will change the contents of the window to show all stations that use that frequency. Stations currently on the air will be shown in bold.

You can add your own entries to the schedule window. You need to create a file named "extra-swbc-sked.txt" and place it either in the Documents directory for your user account, or the same directory the DX ToolBox application file is located in. This must be a plain text file (not RTF or any word processing format). It contains a series of lines of text, which define the station schedule. Each line has multiple fields, separated by a semicolon. You can leave some of these fields blank. The fields are:

Frequency in kHz

Sign on Time, a dash, sign off time, both in UTC

An empty field

The country code for the station

The name of the station

Language code

Target area code

Transmitter site code

End with a semicolon

The fields and codes are described here: <http://eibispace.de/dx/README.TXT>

An example file (with a .bak extension that needs to be removed to be used) is included with the download.

Please understand that you are on your own as far as creating a custom schedule file, I cannot assist with this task.

An example file:

```
12100;2300-0200;;USA;The Station Name;E;NAm;fa;  
6320;2000-0200;;HOL;Various Dutch Pirates;E;;;  
6925;2200-0500;;USA;Various US Pirates;E;;;  
27700;0000-2400;;;Various Outbander SSTV;E;;;
```

Logbook Window

DX ToolBox has a built-in logbook. Open it by selecting Logbook from the Windows menu.

A new entry can be added by selecting New Logging from the Edit menu. Enter in the pertinent information:

- Date as MM/DD/YY such as 10/3/17
- UTC time, both start and end, four digits.
- Frequency should of course be entered in kHz.
- The SIO field is actually a text field, so you can enter in SINPO or another signal strength format if you wish.
- Mode can be AM, USB, CW, etc.
- Station is the station name.
- Country is the country.
- Type can be SWBC, Ham, Pirate, Utility, etc.
- Report Sent and QSL received are the dates you sent a reception report and received a QSL, if applicable.
- Program details and notes are free form, for your own use.

Click OK when you are done entering the information.

You can edit an existing logbook entry by double clicking on it. This also gives you the opportunity to delete it, if you wish.

Right clicking an entry will give you a popup menu with options to get a window with other transmissions by the same station, on the same frequency, or from the same country. Note that you can right click entries in this new window as well, to get other related windows. And so on...

Your logbook can be searched, select Search Logbook from the Edit menu while the Logbook window is frontmost. Enter the text you wish to search for in the fields. All of the fields are ANDed together, that is if you enter 9675 into the Frequency search field and AM into the Mode field, then only logs that satisfy both of those will be returned.

The text search fields (Station, Country, Mode, Type, Details, and Notes) perform partial text matches. For example, if you search for "Radio" in the Station field, then any logging with "Radio" as part of the text will be returned.

For the Time field, enter in one four-digit UTC time, and any logging where the Start and End/Until UTC times contain that time will be entered.

For Date and Frequency, you can enter in one value, or a span using the dash - between them. For example, if you enter 9400-9800 for the Frequency, any log with a frequency in that range will be returned.

If the Report sent, no QSL received box is ticked, then logs where a report has been sent, but no QSL received will be displayed. Likewise, the QSL received box lets you see logs where a QSL was received. Don't tick both of these boxes, or nothing will be displayed.

The All button can be checked to go back to displaying all logbook entries.

SWBC Reminders Window

Never forget about an upcoming shortwave broadcast again! Open this window by selecting it from the Windows menu. There's two ways of entering a transmission to be reminded of:

First, select New Reminder from the Edit menu. You'll get a window that allows you to enter in the pertinent information. Be sure to enter time in UTC. You don't need to enter information in all of the fields, such as country, target, language and transmitter location. Then click OK.

Second, shift click an entry in the Shortwave Schedule window. The details will automatically be added to the reminders window.

The reminders window shows a list of upcoming transmissions you want to hear, sorted by time, with those to air next at the top of the list. Broadcasts currently on the air are displayed in bold.

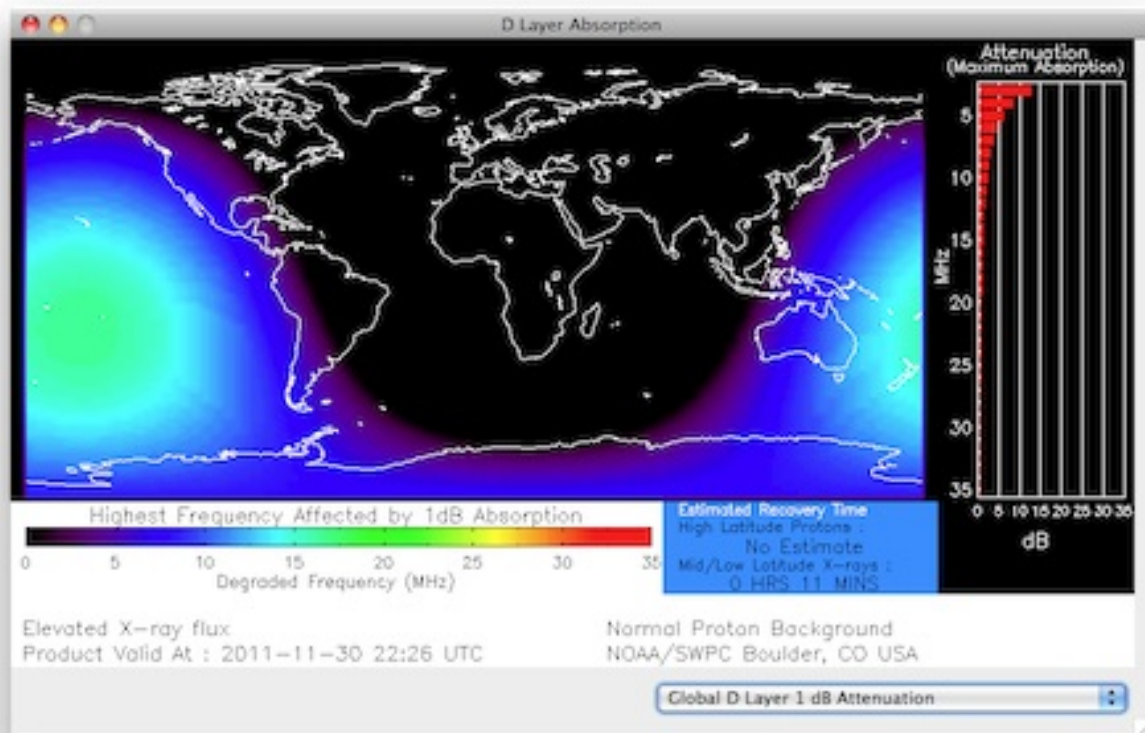
There is an option in the DX ToolBox preferences to alert you via a system notification when any reminded stations go on the air.

Right clicking an entry will give you a popup menu with options to open a logging entry window with many of the fields pre-filled out for you, delete the reminder, or get a window with other transmissions by the same station, on the same frequency, from the same country, in the same language, or to the same target. Note that you can right click entries in this new window as well, to get other related windows. And so on...

D Layer Absorption Window

This window displays various maps of the Earth, showing the level of D layer absorption at various frequencies. Excessive D layer absorption is caused by elevated x-ray flux levels, often due to a solar flare. It first affects lower frequencies, and then moves up to higher frequencies as the D layer starts to more strongly attenuate radio waves.

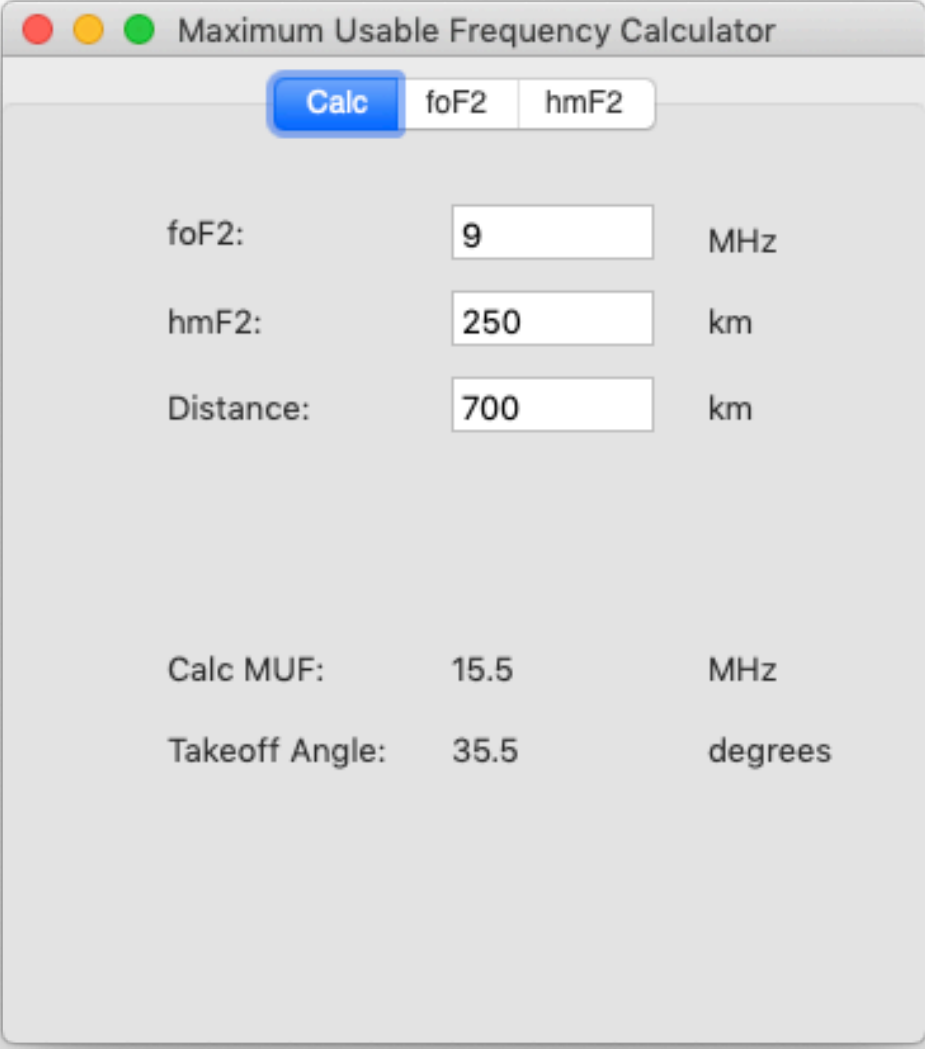
One of 21 different maps can be displayed, or “Cycle through images” can be selected to automatically cycle through the maps. Note that these maps will be blank if no absorption events are taking place. As they are loaded from the internet, it may take a moment for the maps to appear.



MUF Calculator

This window allows you to calculate the estimated MUF based on the current foF2 (maximum vertical incidence reflected frequency for the F2 layer), hmF2 (height of the F2 layer) and the distance between the two locations. In addition, the takeoff angle will be computed.

By selecting the foF2 and hmF2 tabs, maps of their current values around the world will be displayed (assuming you have a working internet connection).



The image shows a macOS-style window titled "Maximum Usable Frequency Calculator". It features a blue "Calc" button and two tabs, "foF2" and "hmF2". The input fields are as follows:

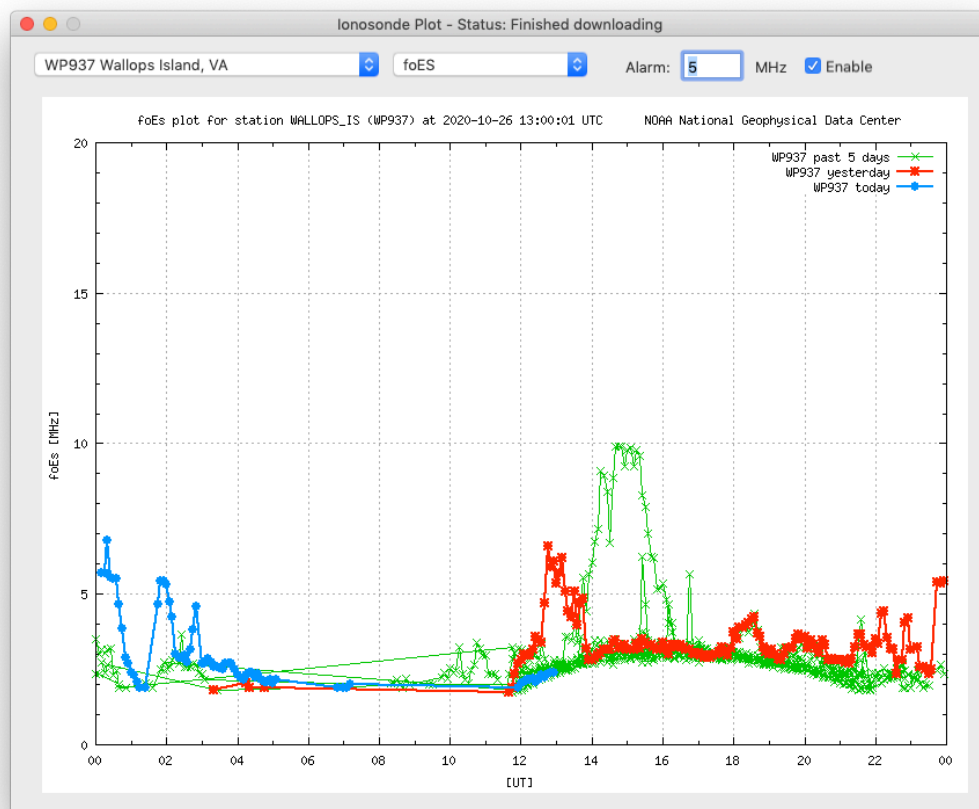
Input	Value	Unit
foF2:	9	MHz
hmF2:	250	km
Distance:	700	km

The output fields are:

Output	Value	Unit
Calc MUF:	15.5	MHz
Takeoff Angle:	35.5	degrees

Ionosonde Plot

This window lets you see graphs of ionosonde data from a number of sites around the world. Note that sometimes sites will not have data. Select the site from the first popup menu, then select the type of graph from the second. There are three types:



foF2:

This is a plot of the highest frequency that will be reflected from the F2 layer of ionosphere when transmitted straight up. As the incident angle is decreased, higher frequencies will be reflected, that is, more distant stations can be heard, or alternatively, more distant locations can receive the signal. This effect explains the “skip zone” around a transmitter site.

foEs:

This is a plot of the highest frequency that will be reflected from the E layer of the ionosphere.

hmF2:

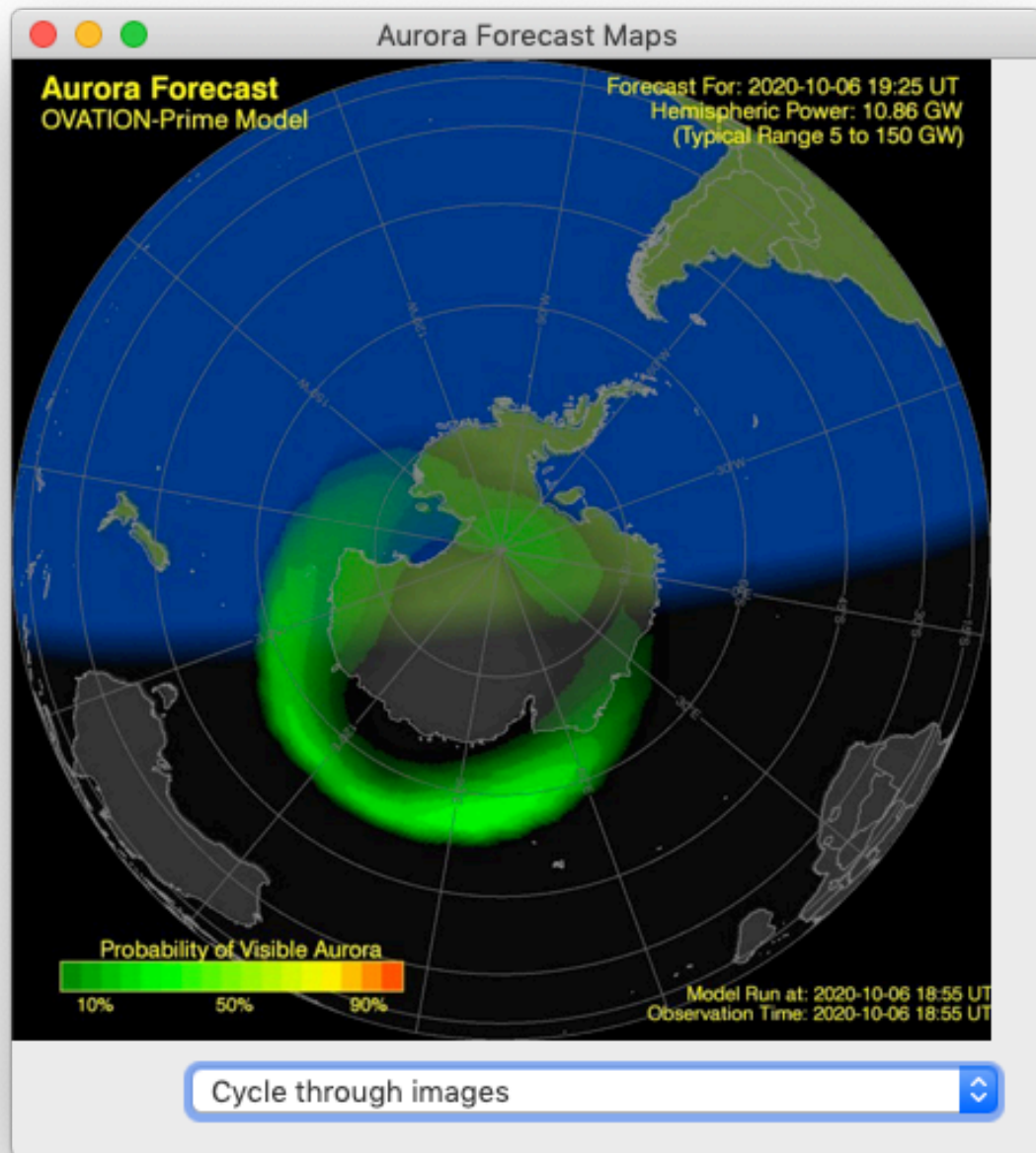
This is a plot of the height of the F2 layer of the ionosphere. Along with the foF2 value, it can be used to calculate the MUF for a given path. See the MUF Calc Window above.

Alarm:

Want to hear an audible alert when either foF2 or foES exceeds a minimum value? Enter this value into the Alarm field. Each time a new image is downloaded, the most recent value will be compared against this setting. If it reaches or exceeds it, you'll hear the alert sound, alerting you to a possible DX opening.

Aurora Forecast Maps Window

This window allows you to view aurora forecast maps for various parts of the world. You can select one map to view, or have DX ToolBox cycle through the various maps.



Grid Calculator

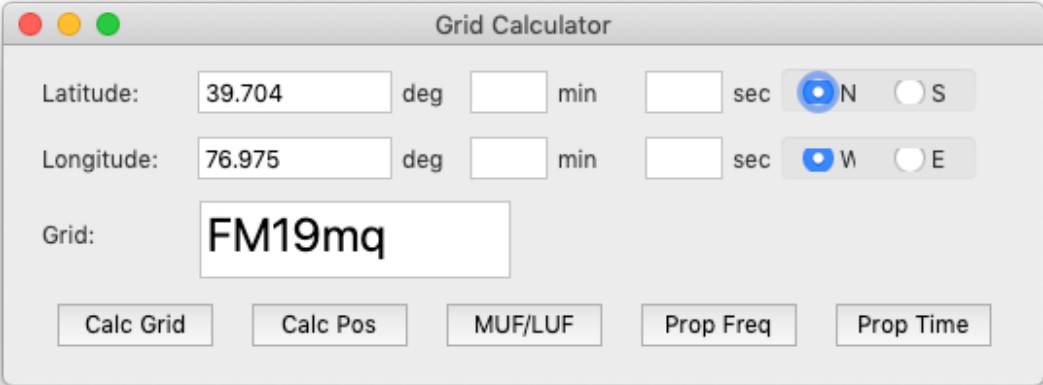
The Grid Calculator lets you determine the grid square from the longitude and latitude. You can enter them as decimal numbers as shown in the above example, or enter integer values for the degrees, minutes, and seconds. Then click on the Calc Grid button.

You can also enter in the grid location, and calculate the latitude and longitude for that grid by clicking on the Calc Pos button.

Each of the other three buttons will display one of the propagation tool windows, with the propagation conditions forecast for the path from your location to the one specified in the Grid Calculator.

There is also the Grid Square and Time Zone Map which shows a map of the world, with the grids marked out. The time zones are also shown.

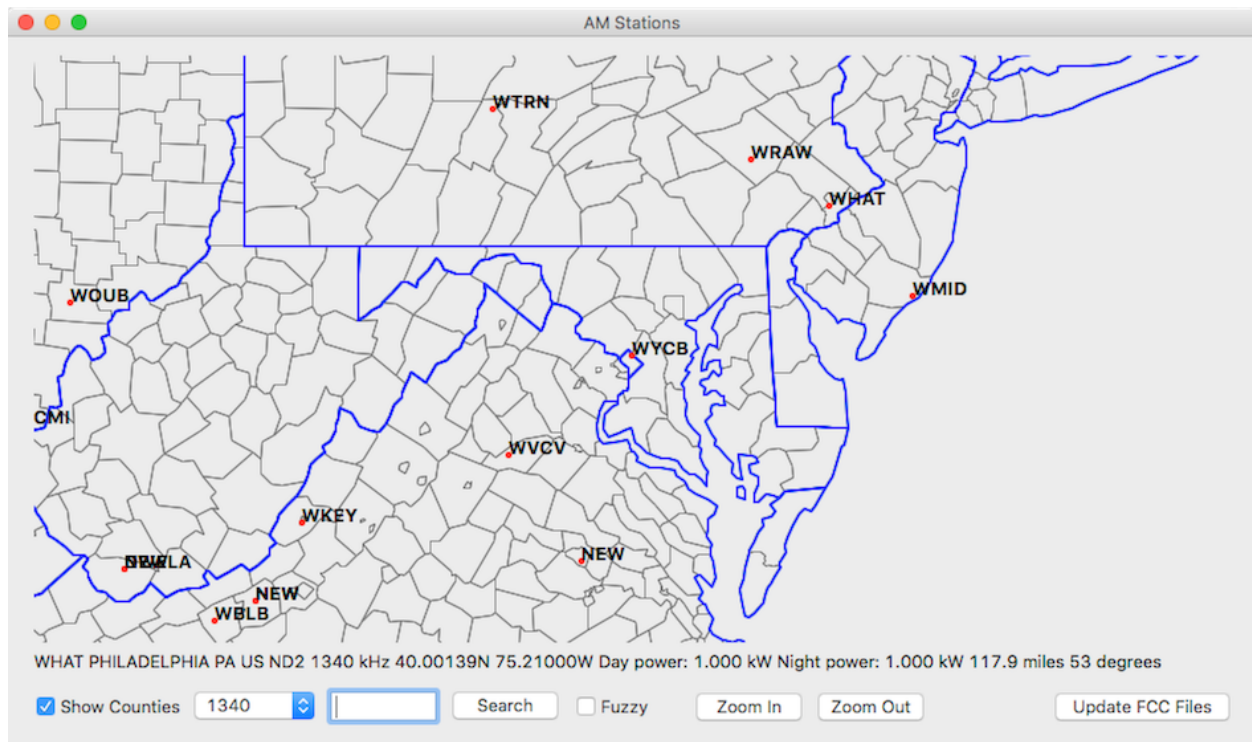
You can type a 4 digit grid square into the text box and click the **Jump To** button, and the map will be re-centered (roughly) at that grid square location.



The screenshot shows a macOS-style window titled "Grid Calculator". It contains input fields for Latitude and Longitude, each with sub-fields for degrees, minutes, and seconds, and radio buttons for North/South and West/East. A "Grid:" field contains the text "FM19mq". At the bottom are five buttons: "Calc Grid", "Calc Pos", "MUF/LUF", "Prop Freq", and "Prop Time".

Latitude:	39.704	deg		min		sec	<input checked="" type="radio"/> N	<input type="radio"/> S	
Longitude:	76.975	deg		min		sec	<input checked="" type="radio"/> W	<input type="radio"/> E	
Grid:	FM19mq								
Calc Grid		Calc Pos		MUF/LUF		Prop Freq		Prop Time	

AM Radio Stations Map



This uses the FCC database to display AM (MW) stations on a map, as well some information about them. The app has a built-in feature to download the zipped file from the FCC (it's pretty large, about 150 MB) and unzip and parse it into a file. This file will be used until the next time you decide to update and download the FCC file. The first time you use this window, you will need to click on the Update FCC Files button to download the FCC database. You can re-download the database again whenever you wish to refresh it, they often update it daily.

Double clicking on a station on the map will bring up a line of text with information about that station. You can also search for stations. Type in the callsign, click search, and if the station can be found, the map will jump to it.

You can also do a "fuzzy" search. Say you heard a callsign, but there's the chance you misheard one of the letters. C sounds a lot like E, for example. With the fuzzy search option enabled, similar letters will be checked as well. A list of all possible matching stations for the specified frequency will be displayed. You can then click on each station to locate it on a map. Note that you must have the correct frequency selected from the popup menu when doing a fuzzy search, only that frequency will be checked.

The FCC database includes foreign stations (although I am not sure how accurate the data is). I've spotted a few obvious errors in their data even for US stations, but it seems to be mostly OK. If you see errors in the station information, please direct your complaints to the FCC, not me, I can't edit their files.

Be sure to set your location in the DX ToolBox preferences before opening this window, so it centers on your location, and uses that when computing distance and bearing to the station.

If you have SdrDx interfacing enabled, you can select a frequency in this window, and SdrDx will be retuned to that frequency. Likewise, if you tune a frequency in SdrDx, the selected frequency in this window will update.

FM Radio Stations Map

This window works the same way as the AM Stations Map window.

TV Stations Map

This window works the same way as the AM Stations Map window.

TIS Stations

Callsign	kHz	City	County	State	Latitude	Longitude	km	Deg
WNAL785	530	BALTIMORE		MD	39.3062	-76.7447	48	156
WNAL786	530	KENT NARROWS	QUEEN ANNE'S	MD	38.9707	-76.2474	103	142
WNHC787	530	MACKINAW CITY	EMMET	MI	45.7833	-84.7334	926	319
WNHC787	1610	SAINT IGNACE	MACKINAC	MI	45.8486	-84.7248	930	320
WNHC788	1610	MONROE	SNOHOMISH	WA	47.8665	-121.9818	3670	299
WNHC788	530	Monroe	SNOHOMISH	WA	47.8628	-121.9821	3670	299
WNHC789	530	LYNNWOOD	SNOHOMISH	WA	47.8306	-122.2629	3691	299
WNVQ787	840	WALNUT CREEK	CONTRA COSTA	CA	37.9007	-122.0714	3872	282
WNVQ787	840	ORINDA	CONTRA COSTA	CA	37.8924	-122.1716	3880	282
WNVQ787	840	ORINDA	CONTRA COSTA	CA	37.8655	-122.2086	3884	282

DX Toolbox can download a list of TIS stations from the FCC website, which can be displayed or searched. There are seven text entry boxes, one for each character of a station callsign. If you leave these blank, all stations will be displayed. Or you can enter a letter or number into one or more boxes, and only those stations with that letter in that position in the callsign will be displayed. This makes it easier to find a station when you only heard part of the callsign.

You can also use the popup menu to restrict the displayed stations to one frequency.

You'll need to download the database the first time you use this window, as well as periodically to get updates. Do this by clicking on the Update Database button. It can take a moment to download and process the data, depending on your internet connection and how busy the FCC site is.

Federal TIS stations are also included. This is a separate database vs the stations licensed by the FCC.

Note that TIS information is from the government, and is incomplete. Not all stations are listed, and some information is missing for some stations, such as location.

AMBC Station Information

This window displays information from the The Canada/US AM Station Info Search Page:

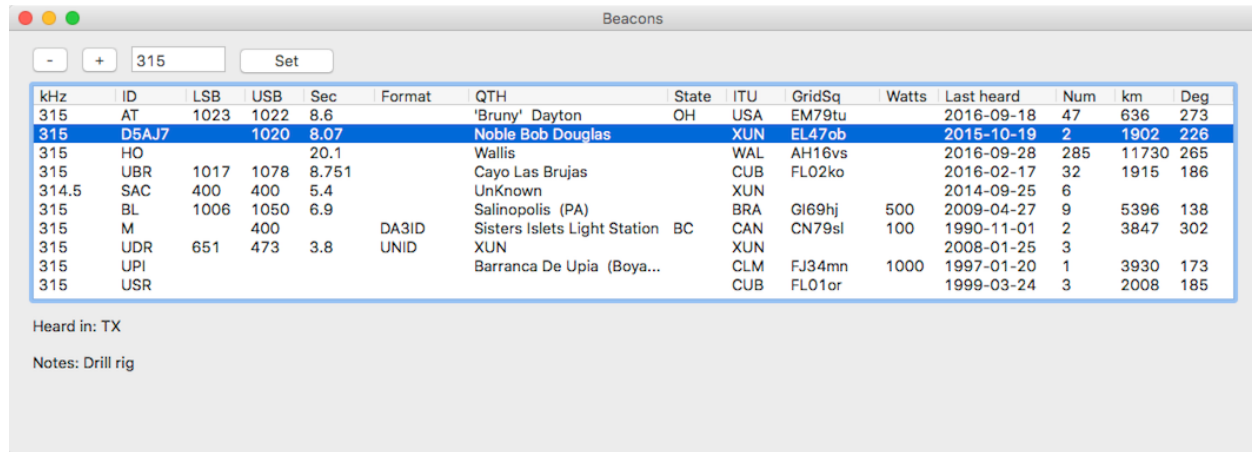
<http://topazdesigns.com/ambc/>

This information can be extremely useful when DXing MW stations, especially the format and station slogan.

Mediumwave Logbook

This is under development. It works much the same as the shortwave logbook, except it is also tied into the MW stations map. More will be written about this feature when it is finished.

Beacons



kHz	ID	LSB	USB	Sec	Format	QTH	State	ITU	GridSq	Watts	Last heard	Num	km	Deg
315	AT	1023	1022	8.6		'Bruny' Dayton	OH	USA	EM79tu		2016-09-18	47	636	273
315	D5AJ7		1020	8.07		Noble Bob Douglas		XUN	EL47ob		2015-10-19	2	1902	226
315	HO			20.1		Wallis		WAL	AH16vs		2016-09-28	285	11730	265
315	UBR	1017	1078	8.751		Cayo Las Brujas		CUB	FL02ko		2016-02-17	32	1915	186
314.5	SAC	400	400	5.4		UnKnown		XUN			2014-09-25	6		
315	BL	1006	1050	6.9		Salinopolis (PA)		BRA	GI69hj	500	2009-04-27	9	5396	138
315	M		400		DA3ID	Sisters Islets Light Station	BC	CAN	CN79sl	100	1990-11-01	2	3847	302
315	UDR	651	473	3.8	UNID	XUN		XUN			2008-01-25	3		
315	UPI					Barranca De Upia (Boya...		CLM	FJ34mn	1000	1997-01-20	1	3930	173
315	USR							CUB	FL01or		1999-03-24	3	2008	185

Heard in: TX

Notes: Drill rig

DX Toolbox can display lists of beacons from the online NDB WebLog. These beacons include NDBs, as well as ham beacons, and other beacons. Open this window by selecting Beacons from the Windows menu. In order to use this window, you first need to download the appropriate file from that website. Go to one of these URLs:

<https://rxx.classaxe.com/en/rna/signals-> for beacons heard in North America.

<https://rxx.classaxe.com/en/reu/signals-> for beacons heard in Europe.

<https://rxx.classaxe.com/en/rww/signals-> for beacons heard anywhere in the World.

Download a csv file, you can either download a file containing all entries, or match certain logs. You should end up downloading one of these files:

rna_signals.csv

reu_signals.csv

rww_signals.csv

DX ToolBox will look for this file in three locations, place it in one of them:

- The same directory as DX ToolBox (the EXE or .app file itself)
- \Users\UserName\AppData\Roaming\ (Windows) or /Users/UserName/Library/Application Support (Mac)
- The Documents directory for your user account

It should open the file you have placed in one of these locations, or complain if it could not find the file.

There are a few ways to use the Beacon window. You can type a frequency into the box in the upper left corner, and press enter or click the Set button, or use the - and + buttons, and see a list of all beacons on that frequency. You can click on a beacon, and any additional information about that beacon will be displayed at the bottom of the window.

Or you can put a frequency in the second box, and type part of a callsign, and any beacon that matches that partial callsign, and is on the specified frequency (either with its carrier or either sideband) will appear in the list.

Right click a beacon from the list, and you can log it. Either at the current UTC time, or with a date and time you specify (handy if you are going through previous recordings).

Most of the fields are self-explanatory, the LSB and USB fields are the actual audio frequencies of the LSB and USB tones for NDB beacons that transmit in MCW mode. Sec is the repetition period in seconds. Num is the number of loggings for that beacon. Note that you need to have your location correctly set in DX ToolBox for the distance (km) and azimuth (Deg) fields to be valid.

If you are running SdrDx, and have configured the UDP communications settings in that app as well as DX ToolBox, they will interact, so if you tune a frequency in SdrDx, the window in DX ToolBox will update to the new frequency, likewise you can change it in the window, and control SdrDx.

NDB Beacon Logs and Map

Under the Windows menu are two items for viewing your logs of NDBs.

NDB Beacon Logs brings up the logs of beacons. You enter logs via the NDB Beacons window (described in the previous section). You can delete a log by right clicking on it, and selecting delete.

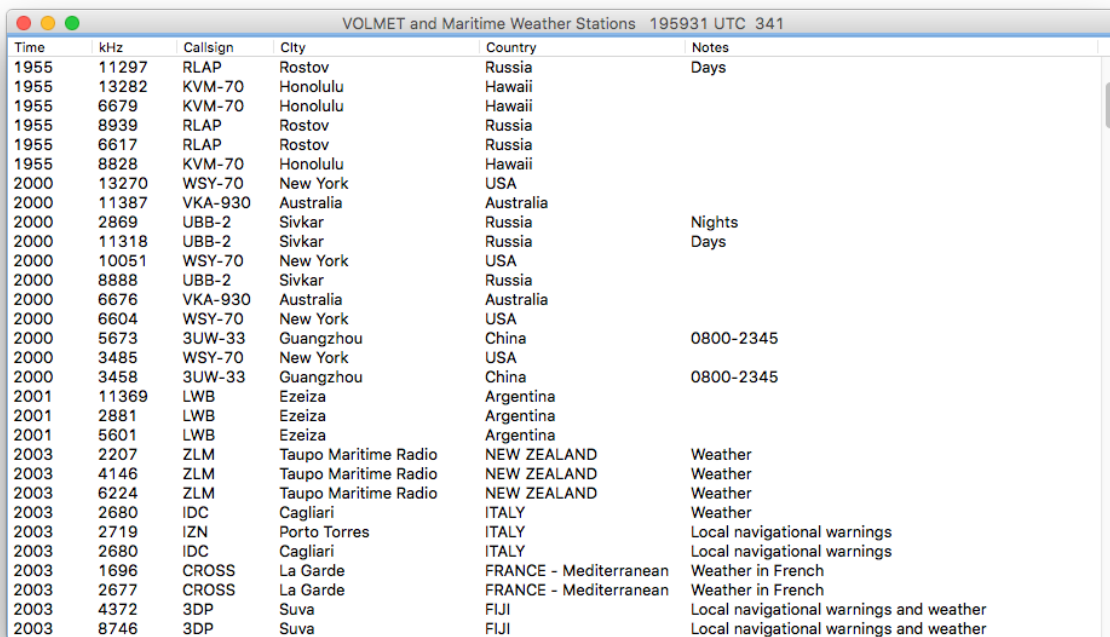
NDB Beacon Logs Map brings up a map showing all your logged NDBs. Each NDB is only displayed once on the map. You can scroll and zoom. You can also specify a single date to display, or a range of dates. Use a dash between the two dates, such as: 12/3/2017-12/10/2017

VOLMET and Maritime Weather Stations

This window displays a list of current and upcoming VOLMET and other weather transmissions, mostly maritime. The title bar of the window displays the current time, then transmissions over roughly a two hour period are displayed, based on start time. Transmissions with a start time from up to about 10 minutes are displayed, so you can see stations that may be currently on the air, in addition to those about to transmit.

The list is ordered by time, making it easier to get ready to listen to an upcoming transmission.

There may be some duplicate entries, as some stations appearing both the VOLMET and maritime databases that the app uses.



Time	kHz	Callsign	City	Country	Notes
1955	11297	RLAP	Rostov	Russia	Days
1955	13282	KVM-70	Honolulu	Hawaii	
1955	6679	KVM-70	Honolulu	Hawaii	
1955	8939	RLAP	Rostov	Russia	
1955	6617	RLAP	Rostov	Russia	
1955	8828	KVM-70	Honolulu	Hawaii	
2000	13270	WSY-70	New York	USA	
2000	11387	VKA-930	Australia	Australia	
2000	2869	UBB-2	Sivkar	Russia	Nights
2000	11318	UBB-2	Sivkar	Russia	Days
2000	10051	WSY-70	New York	USA	
2000	8888	UBB-2	Sivkar	Russia	
2000	6676	VKA-930	Australia	Australia	
2000	6604	WSY-70	New York	USA	
2000	5673	3UW-33	Guangzhou	China	0800-2345
2000	3485	WSY-70	New York	USA	
2000	3458	3UW-33	Guangzhou	China	0800-2345
2001	11369	LWB	Ezeiza	Argentina	
2001	2881	LWB	Ezeiza	Argentina	
2001	5601	LWB	Ezeiza	Argentina	
2003	2207	ZLM	Taupo Maritime Radio	NEW ZEALAND	Weather
2003	4146	ZLM	Taupo Maritime Radio	NEW ZEALAND	Weather
2003	6224	ZLM	Taupo Maritime Radio	NEW ZEALAND	Weather
2003	2680	IDC	Cagliari	ITALY	Weather
2003	2719	IZN	Porto Torres	ITALY	Local navigational warnings
2003	2680	IDC	Cagliari	ITALY	Local navigational warnings
2003	1696	CROSS	La Garde	FRANCE - Mediterranean	Weather in French
2003	2677	CROSS	La Garde	FRANCE - Mediterranean	Weather in French
2003	4372	3DP	Suva	FIJI	Local navigational warnings and weather
2003	8746	3DP	Suva	FIJI	Local navigational warnings and weather

VHF / UHF FCC Database

This window allows searches of the FCC VHF and UHF license files for the various land mobile and paging services.

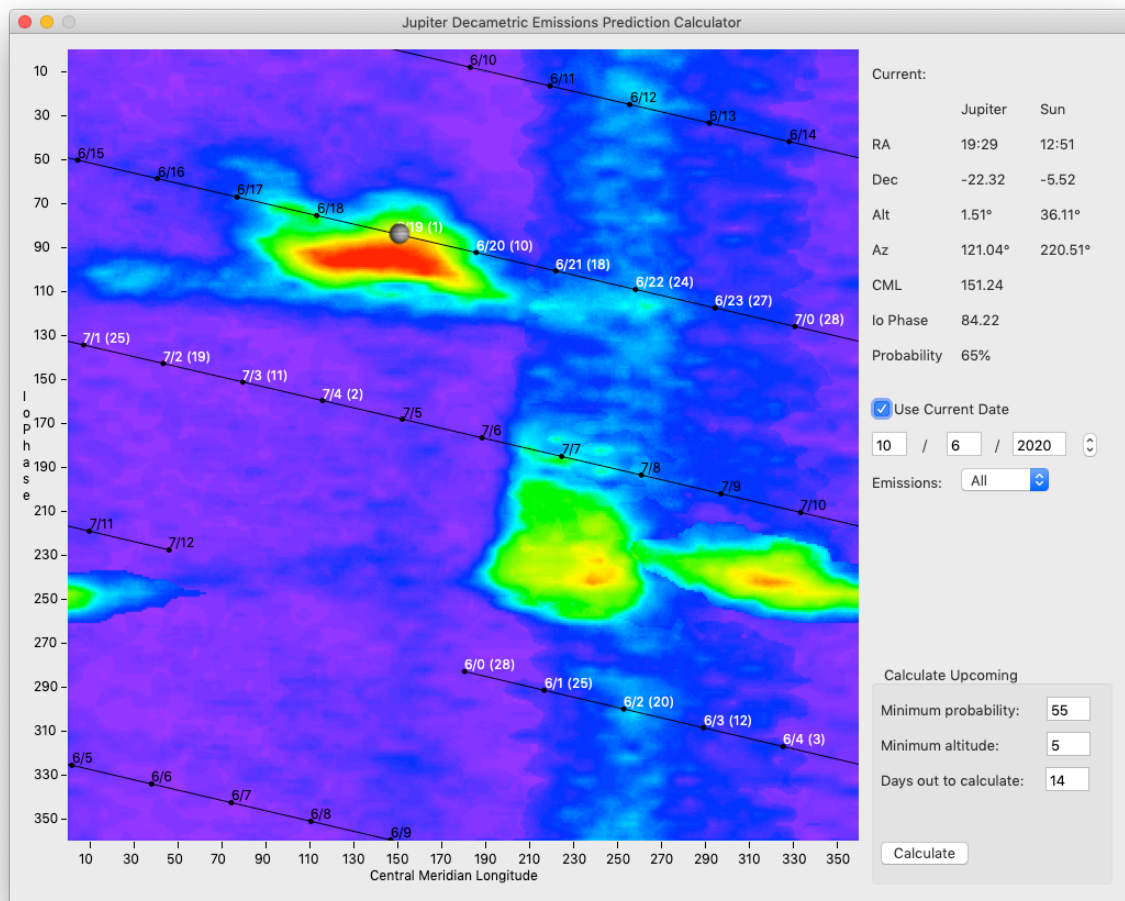
The first thing you must do is have DX ToolBox download and parse the database files. Because there are millions of database records, DX ToolBox will filter them and only use records within a specified radius around your location. Open this window, and click on the Update Database button. A new window will appear. Make sure your latitude and longitude are correct, and enter the radius around your location. There are checkboxes for the various services. You can uncheck those you do not wish to download records for. Click on the Download button to start the process. The files will be downloaded and parsed. This will take several minutes, so go find something to listen to on the radio while it is working. When it is done, click the now enabled Close button to close this window. You typically only need to do this once, although you can re-download the files a few times a year to get any changes.

Records can be searched by one or more fields. The first two are the frequency. If you only want to see records for one frequency, enter it into the first box, leave the second blank. If you want to search a range of frequencies, enter the lower limit in the first box and the upper limit in the second. Frequencies are entered in MHz. Likewise, you can enter in all or part of the callsign, city, county, or state (two letter abbreviation). Click the search button, and results will be displayed in the list below. The Results Order popup menu can be used to select which column will be used by default for sorting.

It's possible you do not want to see all of the table columns. Right click on the table and a popup menu will appear with a list of all of the columns. Uncheck or recheck a column by selecting it from the list.

This window works with SdrDx in the same manner as the other windows, to set the tuned frequency, or search the database when clicking on a frequency in SdrDx.

Jupiter Decametric Emissions (Radio Bursts) Predictions



Jupiter can be a prolific source of radio signals, which can be received right here on Earth, even with modest equipment. These radio bursts are more likely when a certain longitude of Jupiter is facing the Earth, as well as the location of Jupiter's moon Io in orbit around the planet. This window in DX ToolBox tells you when radio bursts are more likely. These bursts are heard between 4 and 40 MHz. They peak at around 8 MHz, most observations are done in the 15 to 25 MHz range, as the same ionosphere which reflects shortwave radio signal here on Earth can also block lower frequency signals from Jupiter.

The right side of the window has a table of numbers, giving the position of Jupiter and the Sun, both as Right Ascension and Declination, as well as the altitude and azimuth angles for your location. (Note that these values are quickly calculated to accuracies suitable for casual radio observation, not exact values for astronomical purposes) Below that, the Central Meridian

Longitude of Jupiter is displayed, as well as the phase of Io in orbit around Jupiter, and the current probability of a radio storm.

To the left, an X-Y scatter plot is displayed, with the CML as the X axis, the phase of Io as the Y axis, and the probability of a radio burst as the color. Superimposed on this plot are lines showing what these values will be for various dates and times. The color of the plot tells you what the probability will be, it is coded much like an SDR waterfall, purple and blue are small values, green higher, yellow and orange higher still, and red the highest of all. The two numbers next to each dot on the line are the day of the month and hour of the day (UTC) for that point. The day is shown because more than one day's worth of values may be plotted. When the numbers are white, Jupiter is above your horizon. When they are black, it is below your horizon and not visible (nor will you hear radio bursts).

Looking at the sample graph above, data is plotted for October 6-7. Examine the period on the 6th around 1900-2000 UTC, markers 6/19(1) and 6/19(2). This period is one with some level of radio activity possible, and Jupiter is above the horizon, just barely. If you move your mouse cursor over the plot, the CML, phase, and probability will be displayed on the right side of the window.

If the Use Current Date checkbox is ticked, the plot will show the current information. Otherwise, you can change the date to look ahead to see when radio bursts may be likely.

Normally, leave the Emissions popup menu set to All, so that all types of bursts will be shown. If you are interested in seeing probabilities for only some types of bursts, you can select that type.

To calculate and display a list of upcoming events, set the minimum probability and altitude values in the lower right corner of the window, and the number of days out to calculate, click the Calculate button. A new window will appear with a list of the possible event periods, if any.

The combination of ingredients necessary for reception of radio bursts from Jupiter are:

1. The CML of Jupiter and phase of Io must be in one of the combinations that makes bursts likely.
2. Jupiter must be visible at your location, and ideally high in the sky.
3. Ideally it is night, or the Sun is low in the sky.
4. Luck!

Satellite Tracking

The satellite tracking window lets you see and predict the position of various ham radio, weather, navigation, and other satellites. Before using this tool, be sure you have correctly set your location (longitude and latitude) as well as altitude in the DX ToolBox preferences. A brief description of the various parts of the window follows.

Satellite Tracking

Map showing the location of BEESAT-3 and its footprint.

Satellite	AOS	LOS	Max El	Until/Rem
RS-15 (Radio Rosto)	20:26:58	20:55:01	50.2	00:08:02
NOAA-19	20:33:41	20:49:30	89.5	00:02:31
NOAA 4 [-]	20:35:07	20:56:39	42.2	00:09:40
ITU-pSat1	20:37:23	20:51:03	37.2	00:04:04
AO-7 (Phase-2B)	20:38:34	21:00:01	40.1	00:13:02
NOAA 2 (ITOS-D) [-]	20:42:57	21:03:54	32.8	00:16:55
BEESAT-3	20:45:53	20:57:25	23.3	00:10:28
BEESAT-1	20:50:11	21:04:07	52.0	00:03:12
NOAA 8 [-]	20:54:59	21:10:04	64.9	00:08:00
FUNcube-2 (on UKube-1)	20:55:54	21:08:12	29.6	00:08:55
POPACS 2	20:57:43	21:14:28	27.1	00:10:44
FAUNA	21:01:00	21:11:35	22.7	00:14:01
FORMOSAT-3 FM4	21:01:51	21:16:42	36.5	00:14:52
POPACS 1	21:03:32	21:16:06	49.1	00:16:33
GOMX-1	21:05:02	21:18:48	41.1	00:18:03
NOAA 5 [-]	21:06:36	21:28:55	43.9	00:19:37
FORMOSAT-3 FM6	21:27:23	21:43:25	86.9	00:40:24
CO-55 (CUTE-I)	21:32:30	21:46:20	23.9	00:45:31
POPACS 3	21:34:15	21:52:49	27.4	00:47:16
NOAA 10 [-]	21:37:07	21:51:53	42.6	00:50:08
NOAA 6 [P]	21:42:42	21:57:40	61.5	00:55:43
CAS-3C (XW-2C)	21:46:29	21:57:37	30.1	00:59:30

Zoom: - + Minimum elevation: 20

BEESAT-3 NORAD ID: 39135 Lat: 30.364 Lon: -97.380 Elevation: 4.0 Azimuth: 247 Range: 2,263 km
AOS: Monday, June 25, 2018 20:45:53 LOS: Monday, June 25, 2018 20:57:25 Max El: 23.33472 at 6/25/18 20:51 ends in 626 secs

Filter: 170 Settings...

Satellite	Lat	Lon	El	Az	km
AO-7 (Phase-2B)	30.162	-88.484	34.4	228	2,197
AO-73 (FUNcube-1)	-67.544	142.142	-71.6	205	12,776
AO-91 (Fox-1B RadFxSat)	-63.915	-101.951	-51.0	191	10,566
AO-92 (Fox-1D)	26.550	-162.256	-31.9	288	7,607
Athenoxat-1	14.178	-158.937	-34.5	276	8,079
BeEagleSat (TR01)	-50.344	-18.415	-50.6	146	10,305
BEESAT-1	73.921	-44.407	-9.9	14	4,376
BEESAT-2	-2.183	70.504	-65.1	47	12,124
BEESAT-3	30.364	-97.380	4.0	247	2,263
BEESAT-4	-65.016	30.475	-65.3	147	12,131
BIRD-B (Bangladesh BRAC)	16.123	104.857	-61.2	358	11,592
BIRD-J (Japan Toki)	-10.961	-79.938	-21.9	184	5,628
BIRD-M (Mongolia Mazaal...	-3.553	88.847	-70.2	23	12,389
BIRD-N (Nigeria EduSat-1)	-41.932	-42.742	-42.0	155	9,058
CAS-2T	-67.846	2.523	-59.7	154	11,779
CAS-3A (XW-2A)	-79.419	30.093	-65.1	166	12,054
CAS-3B (XW-2B)	-37.283	-39.479	-39.7	151	8,910

Mode	Type	Frequency	Active
4800bps GMSK CW	Downlink	435.9587 +8687	active
4800bps GMSK CW	Beacon	435.9587 +8687	active

AOS	LOS	Max El
6/25/18 19:08:06	6/25/18 19:19:52	31.3
6/25/18 20:45:53	6/25/18 20:57:25	23.3
6/25/18 22:27:51	6/25/18 22:33:40	2.6
6/26/18 01:49:52	6/26/18 01:53:48	1.1
6/26/18 03:25:44	6/26/18 03:36:38	17.2
6/26/18 05:03:03	6/26/18 05:15:03	45.8
6/26/18 06:43:51	6/26/18 06:47:32	1.1
6/26/18 18:52:20	6/26/18 19:04:08	32.0
6/26/18 20:30:10	6/26/18 20:41:40	22.9

In the upper left corner is a map of the world. You can pan around the map using the scroll bars, and adjust the zoom level with the - and + buttons. Once configured, these settings will be remembered. Usually you adjust them so that your region of the world is displayed, as you're most interested in which satellites are currently above your horizon.

The location of the currently selected satellite is displayed on the map, along with a footprint of the satellite's signal (areas where the satellite is above the horizon). The current and next few tracks of the satellite are also drawn on the map. Your location is marked with a small red circle.

To the right of the map is a list of upcoming satellite passes, sorted in chronological order. Currently visible (above the horizon) satellites are displayed in red. The AOS (acquisition of signal, or start of the pass), LOS (loss of signal, or end of the pass) and maximum elevation for each pass is displayed, along with how much time is remaining for current passes, or how long until new passes start.

Click on a satellite in this list, and it will be displayed on the map. In addition, detailed information about the satellite will be displayed in the bottom of the window:

The name of the satellite, the NORAD ID (catalog number), current position, elevation, azimuth, and range. The Acquisition of Signal and Loss of Signal times are displayed, as well as the maximum elevation for the current pass, and what time that will occur as well as how long until the pass ends. If the satellite is not currently visible, the time until the start of the next pass is displayed.

At the bottom of this list is a minimum elevation field, you use this to specify the minimum required maximum elevation for a pass to be displayed. This is useful to filter out low elevation passes that are likely to not be of good quality.

After selecting a satellite in this list, it will stay selected and visible even if you try to scroll the list. If you want to be able to scroll to select another satellite, right click on the list first to de-select the satellite.

Below these two controls is a gray bar, this can be grabbed with the mouse and moved up and down, to increase or decrease the amount of space allocated to these controls.

In the lower part of the window are three lists:

The first is a list of all satellites. The location of each known satellite is displayed, along with the elevation and azimuth (direction) from your location. The distance to the satellite in km is also displayed. Satellites above your horizon are in red. Clicking on a satellite displays it on the map, and also displays detailed information about the satellite, just under the adjustable gray divider. The text entry field called Filter can be used to search for a satellite. Type in some text, and only satellites with that text in their name will be displayed.

The second is a list of the frequencies for the satellite. These vary based on the satellite, and could include uplink, downlink, and beacon frequencies. They could also include bands for transponders. For discrete frequencies, the doppler shift will be calculated. Information as to

whether these frequencies are active is also displayed. This information comes from the satslist.csv file, which the app can periodically download. You can also create your own text file called customslis.csv if you wish to include information about satellites not in the downloaded file. Details about this are available later in this section of the documentation.

The third is a list of upcoming passes for this satellite. The AOS, LOS and maximum elevation for each pass is listed.

Configuration:

Click the Settings button to configure the satellite tracking:

The first field is the URL of the satslist.csv file, which the program will download each time it is launched. The default value should work, you can edit it if necessary, should the URL change.

Below this is a list of URLs for two line element files of satellite orbit data. The program defaults to several popular files, with weather, amateur, and navigation satellites. You can add an entry by double clicking on a blank line and then typing in the URL. You can remove an entry by double clicking on it, and deleting the characters.

Click on the Download All Files button to re-download all of the files.

Click on the Data Folder button to open the folder containing these files. This is useful if you wish to manually add your own TLE file, or customsatlist.csv file.

Click on Satellites To Track to display a list of all satellites. uncheck any you do not want the program to display. If you add additional satellites via a new TLE file, you may need to go back to this window to remove additional new satellites. Clicking on the Active button will toggle the status of ham satellites, based on their current official (supposed) activity.

Right clicking on a satellite in one of the two lists lets you remove it from being tracked, as well as open a second window with a list of upcoming passes. You can set the minimum elevation as well as the number of days out to calculate these passes.

If you wish to create your own customsatlist.csv file, make it with a text editor that can save as a plain text file. It cannot be a word processing, rtf, pdf, or other file format.

Each line of the file contains several semicolon delimited fields:

Satellite name

NORAD ID

Uplink frequency/band

Downlink frequency/band

Beacon frequency/band

Mode

Active

The NORAD ID must be correct, and is used to link this information with a TLE entry.

Each frequency can be a single frequency in MHz, or a range with a dash, such as 144.325-144.375

Mode is free form text that is displayed

The active field should be one of these values:

active

inactive

re-entered

unknown

You can have multiple entries for one satellite.

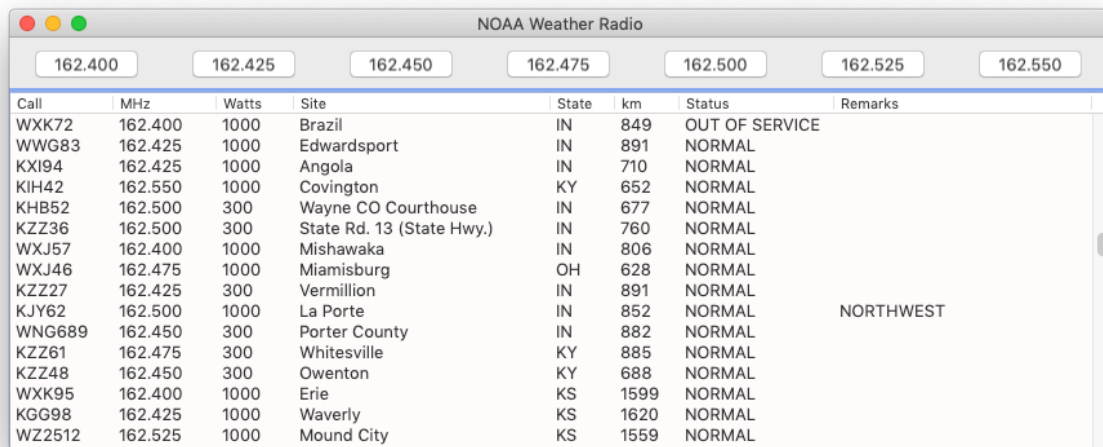
For example:

AO-7 (Phase-2B);7530;432.125-432.175;145.975-145.925;145.970 ;B C;;active

NOAA Weather Radio Window

This window displays a list of NOAA Weather Radio stations in the 162.4 to 162.55 MHz range. The list can be sorted by the various fields.

Clicking one of the seven buttons will tune your radio to that frequency (assuming you have configured radio control and your radio/software is supported).



The screenshot shows a macOS-style window titled "NOAA Weather Radio". At the top, there are seven buttons for different frequencies: 162.400, 162.425, 162.450, 162.475, 162.500, 162.525, and 162.550. Below these buttons is a table with the following columns: Call, MHz, Watts, Site, State, km, Status, and Remarks. The table contains 18 rows of station data. The "Remarks" column has a "NORTHWEST" label that spans from the row for KJY62 down to the row for WZ2512.

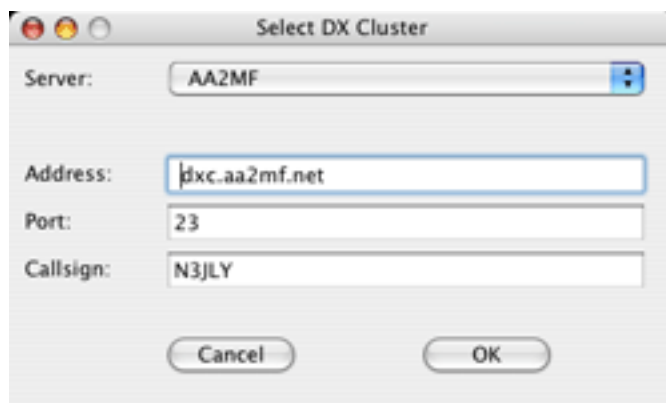
Call	MHz	Watts	Site	State	km	Status	Remarks
WXK72	162.400	1000	Brazil	IN	849	OUT OF SERVICE	NORTHWEST
WWG83	162.425	1000	Edwardsport	IN	891	NORMAL	
KXI94	162.425	1000	Angola	IN	710	NORMAL	
KIH42	162.550	1000	Covington	KY	652	NORMAL	
KHB52	162.500	300	Wayne CO Courthouse	IN	677	NORMAL	
KZZ36	162.500	300	State Rd. 13 (State Hwy.)	IN	760	NORMAL	
WXJ57	162.400	1000	Mishawaka	IN	806	NORMAL	
WXJ46	162.475	1000	Miamisburg	OH	628	NORMAL	
KZZ27	162.425	300	Vermillion	IN	891	NORMAL	
KJY62	162.500	1000	La Porte	IN	852	NORMAL	
WNG689	162.450	300	Porter County	IN	882	NORMAL	
KZZ61	162.475	300	Whitesville	KY	885	NORMAL	
KZZ48	162.450	300	Owenton	KY	688	NORMAL	
WXK95	162.400	1000	Erie	KS	1599	NORMAL	
KGG98	162.425	1000	Waverly	KS	1620	NORMAL	
WZ2512	162.525	1000	Mound City	KS	1559	NORMAL	

DX Cluster

DX Toolbox can let you log into DX Clusters. Select DX Cluster from the Windows menu. Pick one of the cluster servers from the popup menu, which will populate the Address and Port fields, or enter this information in yourself if the server is not in the list. Make sure your Callsign is entered in that field, it is automatically set if you have set your Callsign in the DX Toolbox Preferences.

Click OK and you will get a window showing the connection to the Cluster.

Normally you will be automatically logged into the cluster, otherwise you will need to type in your Callsign. Type into the box at the bottom of the window, and hit enter to have what you've typed sent to the cluster server.



The image shows a macOS-style dialog box titled "Select DX Cluster". It contains four labeled text input fields: "Server:" with a dropdown menu showing "AA2MF", "Address:" with "dx.c.aa2mf.net", "Port:" with "23", and "Callsign:" with "N3JLY". At the bottom are "Cancel" and "OK" buttons.

If you would like to add a new cluster to the list, enter in the address and port number, then click the Add button.

```
AC0X Cluster
QRX ... # 1 in line
*** Connected to: AC0X at 127.0.0.1
Welcome to the AC0X AR-Cluster node Telnet port!
Please enter your call:

Hello Christopher (N3JLY)
Welcome to the W0TDX AR-Cluster Node, serving the
Twin Cities of Minneapolis/St. Paul and the
surrounding area at 1200 baud on 144.930 MHz
via N0AT in Plymouth on 144.970 and 223.440 MHz
and the rest of the world via Telnet to w0tdx.no-ip.com.
Support this node through a membership in TCDXA.
Information at http://www.tcdxa.org.
* AR User client software by Lee Sawkins, VE7CC.
* Free download at http://www.bcdxc.org/ve7cc/default.htm
128 nodes, 10 local / 648 total users Uptime 2 08:34
N3JLY de AC0X 10-Oct 2124Z arc >
DX de PE1IWT: 2365000.0 ON5KTO datv <> palmb 170km!!! ON 2124Z PA
```

Mac OS X Dock

If you are running Mac OS X, the DX ToolBox icon will automatically cycle through displaying the various current conditions, making it easy to check on them:



Purchase

You can buy a copy of DX ToolBox, allowing the use on a single computer. If you wish to run DX ToolBox on multiple computers, you must obtain a license for each system, or the appropriate site license.

Site licenses are also available, allowing copies to be run on multiple computers at a single location (for example, a school or university, or office). Please contact Black Cat Systems for pricing and details about site licensing.

By paying for your copy of DX ToolBox, you'll help support our efforts to develop new versions with additional information. When you purchase, you'll be entitled to use all new releases and updates to DX ToolBox released over the next year, free of charge.

When you purchase and receive your registration code, select **Enter Registration...** from the **Edit** menu, and enter the code. If you purchase DX ToolBox and don't get your registration code within a day or two, please send us an email at info@blackcatsystems.com.

Thanks again for giving DX ToolBox a try.

Black Cat Systems
4708 Trail Court Westminster, MD 21158

email: info@blackcatsystems.com

Web: <http://www.blackcatsystems.com/software/dxtoolbox.html>

Purchase Online

To buy online with a credit card, go to the following URL:

<http://www.blackcatsystems.com/register/dxtoolbox.html>

You will be sent to our order page at PayPal. They handle our credit card payment processing.

Please make sure you provide a valid email address when you purchase online. That way we can send the registration code to you. If you do not send us a valid email address, we have no way to send you the code.

Purchasing by Check or Money Order

To order by check, please fill out and mail the following form, along with your payment. You can pay with a wide variety of cash from different countries but at present if you pay via check, it must be a check or money order drawn in US Dollars on a US bank, no exceptions. While there is the risk of loss in the mail, currency is also OK, including foreign currency.

Please make sure you include your email address with your payment. That way we can send the registration code to you. If you do not send us a valid email address, we have no way to send you the code.

----- DX ToolBox CHECK / MONEY-ORDER ORDER FORM -----

I would like to buy _____ copies of DX ToolBox @ \$29.99 apiece

Total amount enclosed: _____ in US funds.

Maryland Residents please add 6% sales tax.

Name: _____

Address: _____

City: _____ State: _____ Zip or Postal

Code: _____ Country: _____

Operating System: _____

Please send my registration code to:

Email address: _____

Including your email address is VERY important as this is how we will contact you with your registration code.

Please make checks or money orders out to: Black Cat Systems. Checks are only accepted from residents of the USA. Maryland residents add 6% sales tax.

Mail this form, along with payment, to:

Black Cat Systems

4708 Trail Court Westminster, MD 21158 USA

Revision History

March 8, 2024 – 6.4.0

Added solar flares to the Solar and Geomagnetic Data window, replacing X-ray flux readings.

Added Boulder K Index graph window.

Added Planetary K Index graph window.

Added Planetary A Index chart.

Added Space Weather Alerts And Warnings Timeline charts.

Added Space Weather Text Alerts window.

Beacons window renamed NDB Beacons for clarity.

Updated the data source for the AM Broadcast Station Information window.

NOAA Weather Radio station data source parsing updated as needed.

Made the GOES X-Ray Flux graph line thinner for better clarity.

Fixed numerical sorting in the MW logbook, FM logbook, Shortwave logbook, and Other Broadcasts windows.

May 23, 2023 – 6.3.0

Updates to Satellite Tracking

April 8, 2022 – 6.2.2

Improvements to the SWBC schedule window

Updated Geospace URLs

Better restoring of window positions

November 28, 2021 – 6.2.1

Updates for changes to FCC site databases.

October 6, 2021 – 6.2.0

Prevent FCC files from being downloaded when a download is already in progress.

Updates for changes to FCC site databases.

Added date of last data download to titles of some windows.

Added more utility stations to the list of ignored UTEs in the SWBC schedules window.

Optimized checking for UTEs in the SWBC window, speeding up opening.

Added Azimuthal Projection Map window.

Improved appearance of other vector drawn map windows.

August 6, 2021 – 6.1.1

Added more detailed descriptions for AM station operations (day/night/patterns/etc).

Keeps track of last update of FCC AM/FM/TV database.

Keeps track of last update of satellite kepler files.

Better catching of exceptions.

Accommodated new FCC download URL.

January 28, 2021 – 6.1.0

Added estimated sunrise/sunset times for AM stations.

January 28, 2021 – 6.1.0

Added remote control for SDR#.

Added remote control for Elad FDM-SW2.

Added NOAA Weather Radio window.

Added FM stations logbook.

Added upcoming satellite passes window.

Updated NDB data source from xls to csv file format.

Updates to deal with changes to the FC site regarding downloading files.

December 31, 2020 – 6.0.1

Fixed a bug with doppler frequency calculation in the Satellite Tracking window.

Fixed a bug that could cause a crash in the FM Stations window.

November 17, 2020 – 6.0.0

Numerous bug fixes and UI improvements.

Added FM Stations window

Added TV Stations window

Added an alarm feature to the Ionosonde window.

Fixes for macOS Catalina.

Added SDRuno option in preferences, for inter-application communications

Added graphs of x-ray flux

Added solar flux graph

Added Geospace Activity window

Added Mediumwave Logbook window. - Under Development!

Added TIS Stations window.

Added AMBC Station Information window.

Added VOLMET / Maritime Weather Schedule window.

Added VHF/UHF FCC Database window.

Added predictions of upcoming events to the Jupiter Emissions window.

Lots of small UI tweaks, improvements, and fixes.

Updated/removed some data source URLs.

Updates/bug fixes related to updating FCC files.

Removed some data sources that no longer exist.

Updates/bug fixes related to updating FCC files.

Fixed several minor bugs in the satellite tracking window.

Fixed a bug with the propagation map - hops not always displayed

Updates for NOAA/SWPC data sources.

Added Federal TIS stations.

July 11, 2018 - 5.4.0:

Added Satellite Tracking window.

Several minor bug fixes, including to the Jupiter Prediction window.

May 17, 2018 - 5.3.0:

Updated to 64 bit app for macOS.

Several minor bug fixes.

February 9, 2018 - 5.1.0:

Added prediction of Jupiter radio bursts.

Now checks for active internet connection at launch.

Several bug fixes.

January 3, 2018 - 5.0.0:

Added NDB log, and log map windows.

Added search window for logbook.

Added SWBC logbook.

Added SWBC reminders window.

Added other transmissions with the same frequency/station/language/country/target window.

September 26, 2017 - 4.8.1:

Improvements to the SWBC Schedules window.

September 1, 2017 - 4.8.0:

Updates for changes to several data sources.

December 5, 2016 - 4.7.1:

Updates for changes to some NOAA SWPC data.

October 10, 2016 - 4.7.0:

Updates for macOS 10.12 Sierra.

Added preferences option to check for updates.

Added Beacons window.

Added a checkbox to the SWBC Schedule window to only display stations currently on the air.

The language name is now displayed in the SWBC Schedule window.

The transmitter site is now displayed in the SWBC Schedule window.

You can add your own entries to the SWBC Schedule window.

Added interfacing support for SdrDx in the AM Stations window.

Added option for using a TCP connection to SdrDx, in addition to UDP.

June 28, 2016 - 4.6.3:

Fixed a bug that could cause a crash when adding a new DX cluster server.

Added additional stations to Ionosonde Plot window

February 22, 2016 - 4.6.0:

Added AM Station Map window.

Added additional stations to Ionosonde Plot window

April 17, 2014 - 4.3.0:

Added Ionosonde Plot window

July 12, 2012 - 4.1.1: Packet map removed

July 12, 2012 - 4.1.1:

The SWBC schedule window updates periodically when in On Now mode.

Fixed a bug in the DX Cluster window, the enter button got lost when the window was resized.

June 15, 2012 - 4.1.0:

Added SdrDx support to the SWBC Schedules window.

March 12, 2012 - 4.0.0:

Added Aurora Forecast Map window.

January 13, 2012 - 3.9.0:

Added D Layer Absorption window.

December 1, 2011 - 3.8.0:

Added D Layer Absorption window.

October 27, 2011 - 3.7.0:

Added SWBC Schedule window.

September 22, 2011 - 3.6.4:

Additional changes to where temporary files are created. Sorting of user-entered locations.

August 5, 2010 - 3.6.2:

Changes to where temporary files are created.

March 4, 2010 - 3.6.1:

Corrected display of GOES X-Ray data.

DX Cluster - Fixed a bug under Windows, sometimes the return key could not be used.

September 8, 2009 - 3.6.0:

Can add servers to the DX Cluster window.

Propagation map updates in real time as the frequency slider is moved. Corrected several URLs in the Images Window.

June 11, 2009 - 3.5.0:

Added the VHF Propagation Map.

Changed X-Ray Flux display to reflect only one operational satellite.

March 20, 2008 - 3.3.0:

Added HTTP Proxy support.

Added a graph of the Planetary Kp Index.

Can now copy the Grayline map to the clipboard.

Updated for the new Space Environment Center URL which affects data for the Proton and Electron Flux graphs.

January 31, 2008 - 3.2.0:

Moving the cursor over the map in the grayline or propagation map window will automatically update the three propagation forecast windows.

Window positions automatically saved and restored.

Dock updates now working again (Mac OS X).

Longitude and Latitude in MUF Map title text abbreviated to fit.

Checks to see if running on a write-only volume, like a disk image; if so, alerts you to move the program to your hard drive.

December 6, 2007 - 3.1.4:

Update for new solar wind and mag field graph URLs.

Added estimated S unit values to propagation forecasting tools.

Corrected a bug with the three propagation forecasting windows, the initial values for some fields were not being used.

October 6, 2007 - 3.1.2:

Updated for the new Space Environment Center URL which affects data for the X-Ray Flux and Reports.

September 27, 2007 - 3.1.1:

Fixed a bug with country longitude values being negative.

September 27, 2007 - 3.1.0:

Country/Prefix locations added to propagation forecasting windows. Updated location of the VE8AT beacon.

Deletes any remaining temporary files when quitting the program.

May 24, 2007 - 3.0.0:

Universal Binary release for Intel Mac OS X systems.

Better parsing of x-ray flux data.

Fixed a bug that could cause a crash if no location was chosen in one of the three propagation path forecasting windows.

December 7, 2006 - 2.7.3:

Update to correctly display GOES satellite Solar Flux data due to a change in how the data is made available by the Space Environment Center.

May 15, 2006 - 2.7.2:

Fixed a bug which caused some images to look distorted when running under Windows. Fixed a bug which caused the DX Cluster window to not show the list of servers when running under Windows.

May 6, 2006 - 2.7.1:

Minor bugfix with registration message.

May 2, 2006 - 2.7.0:

Grid Calculator tool can calculate propagation conditions between your location and the specified grid location.

Added feature to import a list of locations from a text file.

Default frequency and transmitter power values are now saved and shared between the various propagation forecasting tools.

Fixed a bug with garbled text in the Report Window.

February 16, 2006 - 2.6.0:

Added DX Cluster Window.

Added Proton and Electron Flux graphs

July 28, 2005 - 2.5.1:

UTC time displayed in Current Conditions window. Several minor bug fixes.

May 5, 2005 - 2.5.0:

You can enter a grid square and have the map jump to that location. Current conditions window reports "None" for no adverse conditions. Grayline window: 'Now' and 'Path' are checkboxes instead of buttons.

November 24, 2004 - 2.4.1:

Fixed a bug in the Windows version which could cause a crash when the Images window is opened.

November 18, 2004 - 2.4.0:

Won't try to use internet if no active connection. Added audio alert on K Index, Bz, X-Ray Flux. Added Alert window.

Resets dock icon (Mac OS X) when you quit. Windows now have the metal look in Mac OS X.

October 7, 2004 - 2.3.0:

Long path displayed on grayline graph.

Clicking on prop map copies tx power to other chart windows. Can enter commas now instead of periods if internationalized. Images now display with correct number of colors.

August 23, 2004 - 2.2.0:

Added Propagation Path Estimation For Time window.

Images can now be scaled to the window size.

Added left/right arrow buttons to scan through images.

A Index graph is now logarithmic.

Dock icons change color with current conditions.

Added graphs of solar wind and magnetic field values.

Fixed a bug that could cause images to not load under Windows.

July 13, 2004 - 2.1.0:

Added ability to specify additional images to load.

Reduced time between loading each image.

Clicking on the map to bring up the Propagation Path Estimation window now updates the frequency in that window.

June 29, 2004 - 2.0.0:

Can now use cmd-W (control-W on Windows) to close a window.

Current time boxed in MUF/LUF and Propagation Path windows.

Added locations popup menu to MUF/LUF and Propagation Path windows.

June 6, 2004 - 1.9.0:

Added MUF / LUF Estimation Window.

May 7, 2004 - 1.8.0:

Added display of GOES x-ray flux graphs.

Changes made to OSX version so it can run on OS9 systems as a carbon application.

May 1, 2004 - 1.7.0:

Added propagation forecast map.

Added propagation path forecast window.

Fixed a bug with display of reports on Windows machines.

April 13, 2004 - 1.6.0: Added grid lookup window. Added grid map window.

February 16, 2004 - 1.5.0:

Added reports window.

Sped up the update of the grayline window.

February 1, 2004 - 1.4.0:

Added NCDXF/IARU Beacon display to Grayline window.

Added Sun Spot Number (SSN) to Current Conditions window.

Under Mac OS X, the icon in the Dock displays various real-time information, updating every two seconds.

Added plot of great circle path, distance, beam heading.

Added update in OSX Dock.

January 15, 2004 - 1.3.1:

Added additional SOHO satellite images of the Sun.

Fixed bugs on grayline map dealing with sign of the longitude. Fixed bug with display of images not showing enough colors.

January 7, 2004 - 1.3.0:

Added additional SOHO satellite images of the Sun.

December 26, 2003 - 1.2.1:

Added window to select which images are loaded. Added several SOHO solar images

Several small bug fixes.

December 21, 2003 - 1.2.0: Added MUF/LUF window.

December 16, 2003 - 1.1.1:

Fixed a bug that could cause a crash in Mac OS 8/9.

December 14, 2003 - 1.1.0: Added grayline map.

December 5, 2003 - 1.0.2:

Fixed a bug in the Windows version which could cause a crash when launched.

December 3, 2003 - 1.0.1:

Windows menu now contains each window, whether visible or not, so closed windows can be re-opened.

November 22, 2003 - 1.0.0: Initial Release.

Software License Agreement

This is a legal agreement between you and Black Cat Systems, covering your use of DX ToolBox (the "Software"). Be sure to read the following agreement before using the Software. BY USING THE SOFTWARE (REGARDLESS IF YOU HAVE REGISTERED THE SOFTWARE OR NOT), YOU ARE AGREEING TO BE BOUND BY THE TERMS OF THIS AGREEMENT. IF YOU DO NOT AGREE TO THE TERMS OF THIS AGREEMENT, DO NOT USE THE SOFTWARE AND DESTROY ALL COPIES IN YOUR POSSESSION.

The Software is owned by Black Cat Systems and is protected by United States copyright laws and international treaty provisions. Therefore, you must treat the Software like any other copyrighted material (e.g., a book or musical recording). Paying the license fee allows you the right to use one copy of the Software on a single computer. You may not network the Software or otherwise use it or make it available for use on more than one computer at the same time. You may not rent or lease the Software, nor may you modify, adapt, translate, reverse engineer, decompile, or disassemble the Software. If you violate any part of this agreement, your right to use this Software terminates automatically and you must then destroy all copies of the Software in your possession.

The Software and its related documentation are provided "AS IS" and without warranty of any kind and Black Cat Systems expressly disclaims all other warranties, expressed or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Under no circumstances shall Black Cat Systems be liable for any incidental, special, or consequential damages that result from the use or inability to use the Software or related documentation, even if Black Cat Systems has been advised of the possibility of such damages. In no event shall Black Cat Systems's liability exceed the license fee paid, if any.

This Agreement shall be governed by the laws of the State of Maryland. If for any reason a court of competent jurisdiction finds any provision of the Agreement, or portion thereof, to be unenforceable, that provision of the Agreement shall be enforced to the maximum extent permissible so as to effect the intent of the parties, and the remainder of this Agreement shall continue in full force and effect.

The Software and documentation is provided with RESTRICTED RIGHTS. Use, duplication, or disclosure by the Government is subject to restrictions as set forth in subdivision (b)(3)(ii) of the Rights in Technical Data and Computer Software clause as 252.227-7013. Manufacturer is Black Cat Systems., 4708 Trail Court, Westminster, MD 21158, United States of America.

The name "Black Cat Systems", and "DX ToolBox" are trademarks of Black Cat Systems. DX ToolBox is
©2003-2024 by Black Cat Systems. All rights reserved worldwide.