

April 23, 1995

GREAT CIRCLE
GREAT CIRCLE BEARINGS AND DISTANCES
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Version 1.4

GREATCIR is a program for use by amateur radio operators. Its purpose is to provide antenna direction from one amateur radio station to another. This program calculates, draws and displays a great circle map using the home QTH as the center point. The map will display the location of both stations, the path, and antenna direction and distances between the two locations.

This program was compiled using Borland's Turbo C 2.0 for DOS. The program was tested using 8088, 286, 386 and 486 computers and requires a VGA monitor. Computers with floating point hardware create the map much faster than those requiring software emulation. After the map is created, it is saved as a file. Each time the map is displayed, it is loaded from the file into the video memory. Recalculation and recreation of the map are only necessary if the home QTH information is changed..

A data base containing world wide call areas, latitude, longitude, city and country names is included. A simple editor is provided to delete unwanted locations, add new locations and modify or correct existing records in the data base. The data base is loaded into memory when the program is started. Using this programming method, the data base must meet a size requirement, not to exceeding 64K bytes, which is about 700 records. The included data base contains about 550 records of data, with room for about 150 additional records the user can enter. Unwanted records can be deleted and replaced with desired location data. This will allow the user to tailor the data base to his particular need.

A great circle map is drawn using coordinate data created by the Central Intelligence Agency and placed in the public domain by Fred Pospeschil and Antonio Riveria. Each mapping point and segment is read from a file. The distance and direction from the user's home QTH to that point is calculated. The result is converted to x, y coordinates and displayed on the monitor as a pixel or line segment. The coasts of continents and islands are drawn, then the water areas are color filled. Then the map is saved to a file for loading upon request.

When the operator enters a call area or location of a desired station, the data base is searched for a match to the request. If found, the great circle map is loaded and displayed with the path drawn between the two locations. The antenna direction, distance and location of each station is also displayed.

GREATCIR works well with Microsoft Windows 3.1. An icon and a pif file are included for those users.

INSTALLATION:

To install, place the diskette into the appropriate drive and type in the drive name and install; i.e., "A:INSTALL."

1. The program will ask for the source drive letter. The default drive is "A." If "A" is the correct drive, press <ENTER>. If different, enter the proper drive letter and press <ENTER>.
2. Next you will be prompted for the destination drive letter. The default drive is "C." If "C" is the correct drive, press <ENTER>. If different, enter the proper drive letter and press <ENTER>.
3. You will be asked if the disk information is correct. Enter "Y" or "N" (upper or lower case) and <ENTER>.
4. If you answered yes, the program copies all files from the source to the destination except "INSTALL.EXE."
5. The setup routine will ask the user for his home QTH information:

SETUP:

1. Enter your amateur call sign. You can use any case. The program converts all call sign entries to upper case. There is a limit of six characters for the call sign. Press <ENTER> after the entry.
2. Next enter the city of your home QTH. This entry is saved exactly as typed. You may want to capitalize the first letter of the city name. The city name has a limit of 18 characters. Press <ENTER> after the entry.
3. The country entry has a default of "USA." If this is correct, press <ENTER>. If your country is different, enter the country. Again, this entry is saved exactly as typed. The country name is limited to 12 characters. Press <ENTER> after the entry.
4. If the country is "USA," the user is prompted for the state. If the country is "Canada," the user is prompted for the province. This entry is the standard abbreviation for states and provinces. This entry is not case sensitive. The program will change all entries to upper case. Press <ENTER> after the entry.
5. The user is now requested to enter the home QTH latitude. Latitudes must follow the convention "North latitude is positive" and "South latitude is negative" and these entries must be between 90 degrees and -90 degrees. Enter latitude in degrees and fraction of degrees. As an example, the latitude, "40 degrees 30 minutes North," is entered as "40.5." Follow the latitude with <ENTER>.

6. Next the home QTH longitude is requested. Longitudes must follow the convention "West longitude is positive" and "East longitude is negative" and all entries must be between 180 and -180 degrees. Enter longitude in degrees and fraction of degrees. As an example, the longitude, "110 degrees 15 minutes West," is entered as "110.25." Follow longitude with <ENTER>.

7. The user is asked if the home QTH is correct. If correct enter "Y" (upper or lower case.) If incorrect enter "N" (upper or lower case) and reenter the data. The program will now create the great circle map using your home QTH as the center. Drawing and saving the map can take a few minutes depending on the speed of the computer. After the map is saved, the program is ready for input requests.

NOTE: The current directory must be set to GREATCIR before program execution. Or, you can edit your "AUTOEXEC.BAT" and add "C:\GREATCIR" to the path statement. If you prefer a different directory; i.e., "\HAM\DX\GREATCIR," create the subdirectory and copy the files into that subdirectory. Edit your "AUTOEXEC.BAT" file and add the full path of the subdirectory to the path statement. Don't forget to reboot your system.

WINDOWS SUPPORT

One easy way to setup an icon for GREATCIR is to click the "File" menu on the Program Manager, click on "New," click the "Program Item" button, click OK. A chart will appear. Fill in the chart as follows:

Description: Great Circle Map
Command Line: C:\GREATCIR\GREATCIR.PIF
Working Directory: C:\GREATCIR

Click the "Change Icon" button. A new window will appear stating "No Icons Available . . ." Click the "OK" button. A Different window will appear with a number of icons to choose from. Ignore them and edit the "File" box. Change the file name to "C:\GREATCIR\GREATCIR.ICO" and press the "OK" button. The icon should appear. Click the "OK" button again. If everything looks right, click the "OK" button again. Now your GROUP should have an icon for "Great Circle Map."

OPERATION:

There are four ways to get the antenna direction from your home QTH to another QTH. The user can enter the prefix of the call area or the name of the city or state or country. The user can use any mixture of upper or lower case characters. The program will ignore the case for this entry.

1. **CALL AREA:** This is the default mode for searching the data base. Enter the prefix of the call area of the other station; i.e. VK is the prefix for Australia. Press <ENTER> after the entry. The program searches the data base for that prefix. If found, the map displays the direction with the supporting information for that location. When the call area is not found, the entry menu returns with notification of a no find.
2. **CITY:** To search for a location by a city name, press the "F1" key. The user is then prompted for the name of the city. Enter the name of the city and press <ENTER>. If found, the map displays the direction with the supporting information for that location. When the city is not found, the "Call Area" entry menu returns with notification of a no find.
3. **STATE:** When the user wishes to find the direction to a particular state or province, the "F2" key should be pressed. The program now expects the two letter abbreviation of the state or province. Again this is not case sensitive. Upper or lower case characters will work. Enter the two letters and press <ENTER>. If found, the map displays the direction and supporting information for that state or province. When the state or province is not found, the "Call Area" entry menu returns with notification of a no find.
4. **COUNTRY:** Pressing the "F3" will cause a search of the country. Enter the name of the country followed by <ENTER>. Again this is not case sensitive. If found, the map displays the direction and supporting information for that country. When the country is not found, the "Call Area" entry menu returns with notification of a no find.

NOTE:

Searches are performed by comparing the entered data with the data base data. The comparison is made left to right, character by character. If all characters entered, match the first consecutive characters of the data base record, the record is displayed. If "VK" is entered, all records starting with "VK" will be displayed. If "VK3" is entered, all records starting with "VK3" will be displayed. Location searches are accomplished the same way. If "Sy" is entered, all records starting with "Sy" will be displayed; i.e. "Sydney," "Syracuse..."

5. **SETUP:** Pressing the "F4" key will cause the program to ask for the home QTH data again. Corrections or changes to your initial setup can be made using this function. Changes cause the map to be redrawn. Also, it can be fun to redraw the map using another location as the center. A look at the world from an other country is interesting. Be sure to reenter your home QTH and

recreate the map when finished.

6. EDIT: A very basic editor is available after pressing the "F5" key. The editor will let the user view the data base. Movement through the data base is possible with the use of the up and down arrows, and page up and down keys. A data base record or location can be changed by selecting an entry and pressing the "F2" key. Call signs and names of countries are always changing these days. The user can make corrections and modify the data base to meet this need. To add a new entry press the "F1" key and enter the prefix or the prefix with the area number, or the full call sign, perhaps a friend; i.e. W1AW or WWV. Then enter all of the location data. A record can be deleted by selecting an entry and pressing the "F3" key. The data base has a limit of 700 records.

Even after many hours of testing, it is possible to discover errors. Please report any errors with instructions on how to recreate the error directly to the author. Suggestions and criticisms are always welcome.

LIST OF FILES:

Distributed:

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|-----------------|--|
| 1. INSTALL.EXE | Installation Utility |
| 2. GREATCIR.EXE | Main program or executable. |
| 3. WORLMAP.DAT | Records of structures containing lat/long data. |
| 4. LOCATION.DAT | Data Base file of calls, locations and lat/long. |
| 5. GREATCIR.PIF | Windows PIF file. |
| 6. GREATCIR.ICO | Windows Icon. |
| 7. MANUAL.DOC | ASCII file of this document. |
| 8. MANUAL.WP | This document in WordPerfect 6.0 format. |

Created:

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|----------------|---|
| 1. MAP.GRF | Eight records containing sequential video images. |
| 2. HOMEQTH.DAT | Structure containing all Home QTH Information. |

This program is for the exclusive use of Amateur Radio and not authorized for any commercial use. This program is not for sale. The user may make copies and pass them to other amateur radio operators. The program may be placed on a bulletin board for down loading. All distribution of this software must be free of charge, other than reasonable reimbursement for the media.

This product contains/uses data placed in the public domain by Fred Pospeschil and Antonio Riveria. Original coordinate data was created by the Central Intelligence Agency.