WinAPRS™

Windows Automatic Position Reporting System

A Windows™ Version of APRS™

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Abstract

WinAPRS is a Windows version of the popular *APRS*, Automatic Position Reporting System. WinAPRS is fully compatible with ***APRS ™***, The DOS version, and *MacAPRS™*, the Macintosh version. Due to the larger amounts of memory available in the Windows operating system, WinAPRS, just like MacAPRS has many additional features not available in the DOS version.

WinAPRS

WinAPRS is growing rapidly. Just like APRS and MacAPRS, the users are finding more and more things to do with this technology. We (Bob Bruninga and the Sproul Brothers)are committed to keeping the on-air protocols the same and are working with many different groups to expand and add many different capabilities to the APRS group of programs. One of the recent developments along these lines is a large interest from several National Weather Service groups across the country.

WinAPRS uses the exact same map files as MacAPRS, and will also use the map files from DOS APRS. Most of the source code of WinAPRS is the exact same code as MacAPRS, so it has been around for a few years, and has been thoroughly tested. See the discussion below about the development system used for MacAPRS/WinAPRS.

WinAPRS is a full Windows-95 32-bit application that follows the Windows User Interface Guidelines. It runs under Windows-95 and Windows-NT, and will run under Windows 3.1 and 3.1.1 if you have the Win32 DLLs installed that allow Win95 applications to run under the older versions of Windows.

History of APRS

1992

APRS™ was first introduced by Bob Bruninga, WB4APR, in the fail of 1992 at the ARRL Computer Networking Conference in Teaneck, New Jersey. [1]. We, (Mark and Keith) were at this conference and saw Bob's program. Keith commented that he wanted to do some of this, but when we asked how much a GPS (Global Positioning Unit) cost, we got an answer of $3000!. We decided to wait.

1993

APRS started gaining popularity. There were several articles in different magazines and many new uses for this growing technology. The article that caught a lot of attention was about using APRS to track the football from the Naval Academy to the Army-Navy game in Philadelphia. [2]

1994

In the fall of 1993, just about a year later, Keith started working on MacAPRS. [3] He contacted Bob Bruninga in February of 1994 and went to see him, with a working version of APRS that ran on a Macintosh. This version had many enhancements over the basic APRS features, including Call sign look-up from CD-ROM, and multiple maps open at the same time.

When Bob introduced APRS, all of his maps were made by hand! Keith, having had experience in college doing Cartography programming, refused to do maps by hand and did all of the maps for MacAPRS using USGS (US Geological Survey) map data, available on CD-ROM. Soon after Keith's visit to Bob, he started using the USGS CDs too. This improved the map quality greatly.

1995

By this time, APRS, and MacAPRS were becoming very popular and the uses of this technology had expanded much beyond the original concepts. The APRS programs have been used for Fox Hunting, Balloon Tracking, Weather Networks, DX Cluster monitoring, and many other applications. [4] [5]

At the Dayton Hamvention in April of 1995 Mark and Keith presented more and more of the fancy capabilities of MacAPRS. During 1995, we were invited to give talks at other hamfests and clubs in the New York/New Jersey/Connecticut area. During this time, one of the more common questions was "... do you have a WINDOWS version?..."

One of the more 'popular' features was the fact that MacAPRS did not really have any limitation as to the number of points that could be in a map. The DOS version, which when it first came out, was limited to 1,500 points had been upgraded so that it could handle **3,000** points, But the typical MacAPRS maps STARTED at 10,000 points, with some maps as large as **300,000** points. Other features that people were interested in that were not in the DOS version were the interface to the many different types of call-sign databases on CD-ROM.

At the Dayton Hamfest, we started getting more and more pressure from the Ham Radio community to do a Windows version. This PRESSURE got really severe at the ARRL DCC in Arlington, Texas.

When Keith got back from the ARRL DCC in Texas, we had long talks about doing a Windows version. Mark made the comment:

"I have never had so much peer pressure in all of my life..."

At this time, several critical items came together. CodeWarrior, the development system that the Sproul brothers used for MacAPRS came out with support for developing Windows programs on the Macintosh. Mark Sproul, who is porting MacAPRS to Windows finally succumbed to the pressure from APRS users. When these things happened, we determined that it was realistic to port the already developed Macintosh code to Windows and decided to do a Windows version of APRS. On September 15th, Keith went to down to see Bob Bruninga to discuss doing a Windows version. On September 16th, the following announcement was put up on the Internet:

MacAPRS™ for Windows (WinAPRS™) Automatic Position Reporting System for Windows

September 16, 1995

NORTH BRUNSWICK, NJ: Mark Sproul (KB2ICI) and Keith Sproul (WU2Z) authors 01 MacAPRS™ the Macintosh version of Bob Bruninga's (WB4APR) popular packet radio mapping system announced today that they will be porting their Macintosh version to Windows. This will be the official version and has the backing of Mr. Bruninga. The current plans are for beta release by Christmas 1995 and for the final release to be al the Dayton Hamvention in May of 1996.

APRS is a multi-faceted system used primarily within Amateur Radio for tracking many different types of things. APRS is used for tracking Weather, for tracking moving cars, boats, weather balloons, and many other things. It can also be used as Graphics Information System for many different aspects of Amateur Radio.

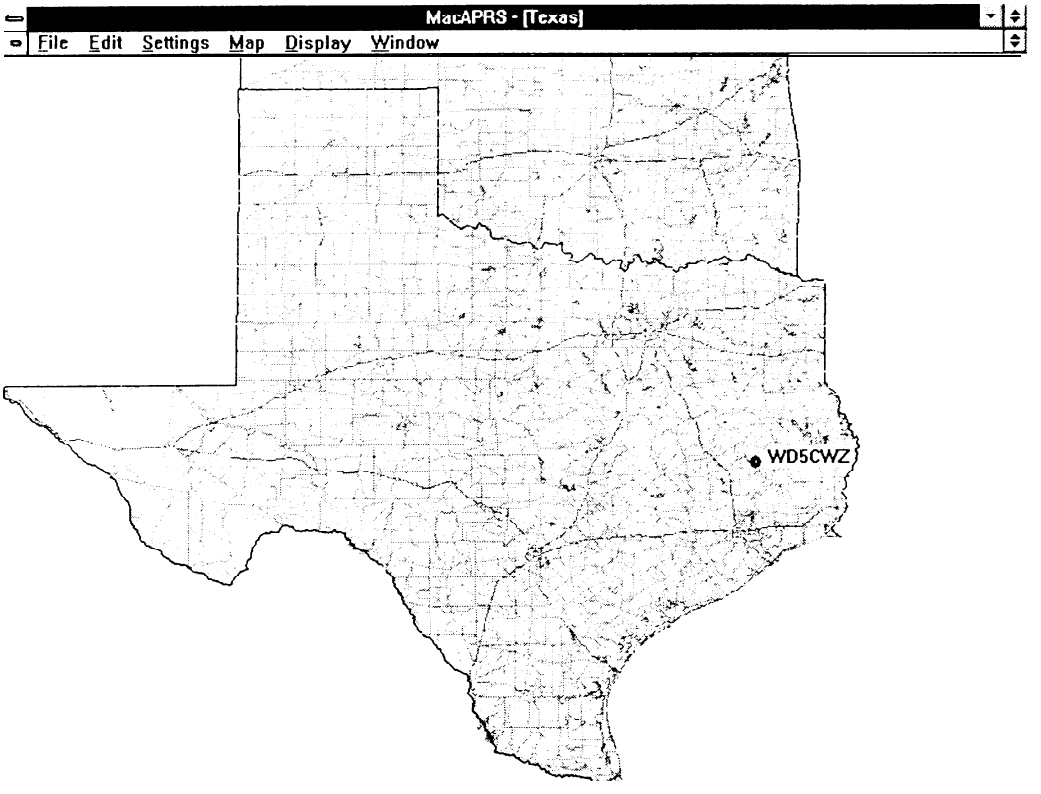
The original version of APRS was developed by Bob Bruninga, WB4APR, to run under DOS and was introduced at the 1992 ARRL Computer Networking Conferences. MacAPRS was released at the Dayton Hamvention in 1994.

The Macintosh version is written entirely in C and will port easily to Windows. Keith and Bob have worked hard at keeping the two versions compatible and by using all of the C code already developed for the Macintosh version, it will ensure complete compatibility on the Windows version. In addition, the two versions will use the exact same map file format so all of the wonderful maps that the Mac users have will be immediately usable by the Windows version.

When asked about future plans, Mark said, "When we finish with the Windows version, we are planning on doing an X-Windows version as well."

October 14, 1995

One day less than one month after deciding to do WinAPRS, we had the maps drawing on a Windows computer and put screen-dumps of these maps up on the Web for all to see.



December 22, 1995

As promised in the original announcement, we released WinAPRS before Christmas. This release was to about 20 people.

January 28, 1996

We released a public beta version to the ham radio community. We showed WinAPRS publicly for the first time at the Wharton Hamfest near Chicago, Illinois.

May 1996

Again, as promised in the original announcement, we released WinAPRS version 1 .0.0 at Dayton Hamfest 1996! This release had more features in it than we originally expected to have done at this time.

Development System of WinAPRS and MacAPRS

METROWORKS CODE WARRIOR

The Development system that we have been using for MacAPRS is Code Warrior by Metroworks. This development environment is a full C/C++ development system for the Macintosh. MacAPRS was written entirely in straight 'C', with no C++ at all.

In September 1995, Metroworks added the capability to compile code and create executable files for the Intel processors. You still have to write the code for the operating system that you want, i.e. it will NOT take the Macintosh program and simply recompile it for Windows. You MUST write Windows code for the Windows applications and Macintosh code for the Macintosh applications. However, the routines that are not machine dependent end up being exactly the same.

What we have for done for the MacAPRS/WinAPRS system is to create two different applications that use most of the same code. For example, doing the math for drawing maps from a map file is the same no matter what platform it is on. Similarly, decoding data from a TNC is the same, etc. The source code that is different mostly involves the user interface.

All of the source code is written on the Macintosh. It is then compiled on the Mac. Then the executable file is transferred via TCP/IP-EtherNet to the Windows computer. The Code runs on the Intel processor, but the source-level debugging is done on the Macintosh via the network.

The source code for the entire MacAPRS/WinAPRS project is written with what is called CONDITIONAL COMPILE flags. This means that a specific section of source code may or may-not get compiled, depending on what flags are set. We have Macintosh Flags, Windows Flags, and several other internal flags. The objective of the system is to have as much of the code to be common, i.e. compiled in ALL cases, and as little as possible to be specialized code, i.e. compiled ONLY for Mac, or ONLY for Windows. By doing this, we have a much easier system to maintain, and a much more compatible system across different platforms

X-APRS, APRS for X-Windows (UNIX)

At the Dayton Hamfest in May, we had a SUN workstation running a very preliminary version of X-APRS (X-Windows is the Graphical User Interface for UNIX computers). This too is being done with the conditional compiles described above. Doing the development this way allows us to use code that has been around a long time that has been fully tested, thus speeding up development time. We hope to have X-APRS out sometime next year. (1997)

FUTURE

APRS, MacAPRS, WinAPRS and X-APRS are continuing to evolve. These programs have proven themselves to be useful in many more applications than originally imagined. This type of system is a system that takes full advantage of the technology available only in portable radio communications and cannot be replaced with the Internet.

References

[1] ***Automatic AX.25 Position and Status Reporting***
Bob Bruninga, WB4APR
American Radio Relay League, 11 th Computer Networking Conference
Teaneck, New Jersey, November 7, 1992

[2] ***Up Front In QST,*** December 1994, p 14

[3] ***MacAPRS, Automatic Position Reporting System, A Macintosh version of APRS,***
Keith Sproul, WU2Z and Mark Sproul, KB2ICI
American Radio Relay League, 13th Digital Communications Conference, Bloomington, Minnesota, August 19-21, 1994. pp 133-145

[4] ***Advances in APRS Technology***
Keith Sproul, WU2Z and Mark Sproul, KB2ICI
Proceedings of the 1995 TAPR Annual Meeting
St. Louis, MO, March 1995, pp 55-59.

[5] ***Graphical Information Systems and Ham Radio (The Future of A. P. R.S. Technologies)***
Keith Sproul, WU2Z and Mark Sproul, KB2ICI
American Radio Relay League, 14th Digital Communications Conference, Arlington, Texas, September 8-10, 1995. pp 108-l 17

Internet Resources

Web sites with APRS Information

http://aprs.rutgers.edu/APRS/
http://www.tapr.org/tapr/html/sigs.html