

Signing & Sealing Digital Mapping Products

By William Giel, LS (Reprinted with permission of the author.)

Ensure your data integrity

Providing surveys in digital format, e.g. AutoCAD diskettes, ASCII coordinate files, and the like, has become a routine service for many surveyors. The issue of ensuring data integrity in such products is a legitimate concern, as digital data can be easily manipulated and modified and still retain the look and feel of the original.

Typical Current Practice and its Shortfall

Many professionals take the stand that the signed and sealed hardcopy plan or map is the only document that can be relied upon officially. Based on this policy, supplementary digital submissions are provided only as a convenience. It has been recommended that such submissions be specifically disclaimed as such. In some cases, however, such a policy may not be acceptable to the user of the digital product.

For example, a surveyor who provides a digital CADD site plan to an engineer who specifically requests an accurate CADD drawing on disk for design purposes is falling short of his/her professional obligation by disclaiming the accuracy of the digital product. Another example involves a surveyor who posts updated survey data on an electronic project bulletin board (BBS) where it can be downloaded by other members of the design team. (This is a very convenient system for rapidly disseminating data to those who need it.) Unfortunately, it exposes the users of the BBS to a new liability - the survey data could be easily tampered with and it could be very difficult to discover the hack until it became an expensive mistake. It could certainly be a problem for the surveyor, who might be required to prove that the corrupt data was not his. It might be a problem for the

user as well when the surveyor holds up his/her hands and states that someone tampered with the data.

There is no question that we will have to adapt to "paperless" systems. But the issue of data security is a valid one. How can we provide digital data with the electronic equivalents of embossed seals and live signatures to protect ourselves, as well as the users of our information?

Fortunately, there is an inexpensive solution. It is possible to embed a unique electronic signature into a data file without purchasing new hardware.

PKZIP Data Compression

Probably everyone using computers these days is well aware of PKZIP data compression software. Although a few other formats are used occasionally (such as LHArc), PKZIP is the predominant favorite for DOS-based file compression. If you are not familiar with PKZIP, it is a set of programs designed to squeeze a file into less space than it normally occupies and subsequently restore it to its original state. PKZIP is available as shareware on virtually all on-line services, the Internet, and most BBSs. The most current version is 2.04G, and is typically contained in a self-extracting file named PK204G.EXE.

"... the survey data could be easily tampered with and it could be very difficult to discover ..."

With most files, including AutoCAD's DWG files, PKZIP attains a surprisingly high rate of compression, using sophisticated algorithms that remove or encode duplicated patterns of characters and unused or unnecessary spaces in the original files. Such a compressed file is

sometimes called an "archive." Originally intended to speed up transmission time for sending files across telephone lines, it is just as useful to squeeze a two or three megabyte file onto a 1.44 megabyte floppy disk.

PKZIP.EXE is actually the name of the program that performs the compression. PKUNZIP.EXE and its abbreviated version, PKUNZIP.COM are used for decompression. Compressed files can be created that are self-extracting (PKSFX format) using ZIP2EXE, another utility program in the set.

Authentication Verification

Of primary interest is that PKZIP offers the capability of encrypting a unique "Authentication Verification" (AV) message into the archives. This message will be displayed when the archive is unpacked. If the archive is tampered with or changed in any way, the message will NOT be displayed. This was originally intended to protect users from downloading sabotaged or virus-infected software from a BBS. Only software that displayed the author's authenticity message when unpacked was the genuine article.

AV is a simple, elegant way to provide electronic signatures and seals on your digital products. The cost is minimal. No additional hardware is required and it is very easy to do. It is essentially transparent to the user: all that he/she needs to know is to look for the AV message to appear when the file is being unpacked. If it doesn't, it's not an original.

How to Contact PKWARE

The AV feature is not available in the shareware version and can only be requested for use with a registered version of the software. Registering PKZIP is

currently only \$47.00. For further information regarding PKZIP & PKUNZIP, contact:

PKWARE, Inc.

9025 N. Deerwood Drive * Brown Deer, WI 53223

Phone: 414-354-8699 * FAX:-414/354-8559

email: 75300.730@compuserve.com

or type "GO PKWARE" on CompuServe.

Editor's Note: The following email was received from Bill Giel on Mar. 25, 1996.

Hello Brian:

As an aside, I've been told by some computer cryptology "gurus" that the AV encoded zips might be breakable using "brute force" decryption techniques on a very powerful computer. According to PKWARE, nobody has succeeded in doing so yet. In fact, I believe that they have a standing reward of some kind to the first person that breaks it.

In my opinion, anything can be counterfeited ... we should just try to make it as difficult as possible.



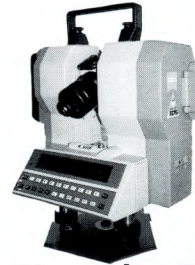
William Giel is a practicing land surveyor in lower Fairfield County, Connecticut and a member of the Connecticut Board of Examiners for Professional Engineers and Land Surveyors. He is also licensed in New York State. He can be reached via the Internet at rvdi@usa.uni.net or by writing to him care of Rocco V. D' Andrea, Inc., PO Box 549, Riverside, CT 06878.

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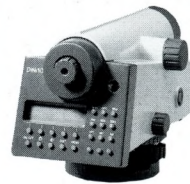
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