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Introduction

MicrolImages is pleased to distribute **V6.30** of the **TNT** products, which is the 48th release of **TNTmips**. A count of 223 new feature requests submitted by clients and MicroImages' staff were implemented in **V6.30** processes. The master list now contains 2095 requests for new features. The following major features have been added.

- **Unlimited Displays:** Most existing **TNT** licenses and all new ones can use any display resolution and any size and configuration of dual monitors.
- **Free HyperIndexing:** Most existing **TNT** licenses and all new ones can prepare geodata for publication via the **TNTserver** or the free **TNTatlas**.
- **Internet:** A **TNTatlas** can be published without charge for worldwide access via the **TNTclient** and **TNTserver** maintained by MicrolImages.
- **TNTserver/TNTclient:** Expanded to provide InfoTip, Layer, and Legends control panels; cumulative measurements; convenient zooms; coordinate system options; undo views; geospatial control over external linking; and others.
- **Free Training:** 4 different, free, week-long sessions of introductory training are offered for 2000.
- **Navigation:** Improved means to find and select objects anywhere on networks has been added.
- **Thumbnails:** Objects can be previewed before selection.
- **Customizing:** Menus and toolbars can be simplified in the spatial display process.
- **LegendView:** The appearance has been simplified and improved by using hidden reference layers, combining redundant legend entries, and collapsing duplicated layer names.
- **Sketching:** This tool can now create tables and log records for expanded use in photointerpretation and GPS-referenced field mapping.
- **Layouts:** Any layout can be saved as a template for easy modification to create a series of printed products.
- **Importing:** Access to HDF LL3-formatted files has been supported.
- **ODBC:** Accessing records from databases linked via ODBC is now significantly faster.
- **Tabular View:** Access to multiple records in a **TNT** database object and manipulating them is much faster.
- **Tabular View:** This procedure has been completely redesigned to provide automatic scrolling to selected element, realtime scrolling, expanded sorting, HelpTips for records, hiding unattached records, and others.
- **Databases:** Natural, outer, right outer, and left outer table joins have been added.
- **Raster Editing:** An existing raster object can be used as a template to add and edit a new matching raster.
- **QuickGuides:** Single page references have been prepared for 10 important **TNT** operations.
- **Getting Started Booklets:** All 52 booklets are current with the features in **V6.30**.

- Languages: The **TNT** interface has been translated into the following additional languages: French, Spanish, Korean, Indonesian, Thai, and Romanian.
- Prices: Pricing for the **TNT** products is significantly changed, such as the 50% reduction of **TNT** licenses for UNIX platforms.
- Peripheral Support: Almost all optional pricing for using external devices has been eliminated.

Hardware Keys

Changes in Keys.

Mac USB Key.

A USB key is now available for the Mac platform. **V6.20** initiated support for a USB key for PC platforms.

IMPORTANT NOTE: The USB key used for the Mac platform will not work on the Windows or LINUX platform and vice versa.

The manufacturer of these keys has not yet produced a USB key that can be interchanged between the Mac and PC platforms. The price equalization across platforms introduced with **V6.30** permits the new **M50 TNTmips** license to move freely across all supported platforms. As a result, if a universal USB key were available, it would permit **TNTmips**, **TNTedit**, and **TNTview** to be freely moved, tested, and used among Mac, Windows, and LINUX platforms. To confuse us even further, the manufacturer has chosen to make all the currently shipped USB keys look the same, including their purple color.

Windows/LINUX USB key.

The USB key for Windows can be used with LINUX and vice versa except for NT, which does not support USB. LINUX is now being installed on off-the-shelf desktop computers that have USB as the primary connector for external peripherals. In fact, some new desktop platforms running Windows and suitable for use with LINUX have only USB connectors, following the model first introduced by the iMac computers.

Separating Mac and Windows/LINUX USB keys.

The purple USB key for use with a Mac can be identified by the words “**RAINBOW Eve3**” embossed upon it.

The purple USB key for use with Windows and LINUX can be identified by the words “**RAINBOW SuperPro**” embossed upon it.

UNIX Licenses.

The serial I/O key is the only key available for use with the various types of **TNT** licenses for UNIX platforms, but it is not available for LINUX platforms.

Floating Licenses.

The various types of keys outlined above are for use with **TNTmips**, **TNTedit**, and **TNTview**. They can be programmed to support the use of these products for each license type: single-user/single-platform, multi-user/single-platform, and floating licenses.

TNTserver.

A USB or serial I/O key can be supplied for a W2000 platform hosting a **TNTserver**.

Only a serial I/O key can be supplied for the W2000 platform hosting a **TNTserver**, as NT does not support USB.

Key Summary.

The following types of keys are available for the **TNTmips**, **TNTedit**, and **TNTview** product licenses. These same types of keys are available for use with single-user/single-platform, multi-user/single-platform, and floating platform licenses.

- PC USB key interchangeable for LINUX- and Windows-based platforms except for NT, which does not support USB.
- Parallel I/O port key only for Windows- and LINUX-based platforms.
- Serial I/O port key only for UNIX-based platforms.
- Mac USB key for Mac platforms*.
- ADB key with adapter for earlier Mac platforms with an Apple Desktop Bus*.
(*Floating platform licenses are not available for any Mac platform, as FLEXIm does not support Macs.)

Platform Specific News

HPUX.

Hewlett-Packard is rapidly moving toward the use of LINUX. The MEMO for **V6.20** alerted you that **V6.30** of the **TNT** products would not be produced for HPUX. No one has contacted Microlimages indicating that this would inconvenience them. As a result, the **TNT** products for HPUX are not included on the **V6.30** CD. Due to the way in which the **TNT** products are prepared for cross-platform support, it is possible to reinstate support for HPUX when necessary.

Solaris.

TNT products for Solaris 2.6 and higher now support Project Files larger than 2GB (in other words, 64-bit file support is now provided).

LINUX.

There are no longer 2 versions of **V6.30 TNT** products supplied on the CD. The CD contains the **TNT** products for the current official LINUX kernel. If you are running LINUX using an earlier version of the kernel, please move forward to a recent version of LINUX. If for some reason you absolutely have to have the older kernel, please let Microlimages know, and perhaps we can do something about it.

V6.30 of the **TNT** products was checked out with the following versions of LINUX/kernels.

- Red Hat 5.2/kernel 2.0.36
- Red Hat 6.0/kernel 2.2.5-15
- Red Hat 6.1/kernel 2.2.12-20

- Mandrake 7.0/kernel 2.2.14-15mdk

It is very likely that all the **TNT** products will work with other popular, current versions of LINUX. If your choice does not, contact MicrolImages.

Macintosh.

USB Key.

The tiny USB key is now supported for the convenient use of **TNTmips**, **TNTedit**, and **TNTview** on Mac platforms. The purple USB key for use with a Mac can be identified by the words "**RAINBOW Eve3**" embossed upon it.

Revised Paths.

The **TNT** products now recognize and use the forward slash "/" and the trademark symbol "™" allowed in paths on the Mac platform. These characters were not allowed in paths used in **V6.20**.

Performance.

The following comments were published in an on-line Mac magazine from a client using **TNTmips 6.2**.

From MacCentral Online The #1 Source for Mac News on the Web!
(email@maccentral.com)

"Some final words on GIS. by Dennis Sellers, dsellers@maccentral.com, August 21, 1999."

"Steve Farone has been involved in GIS, cartography, and RS work since 1991. Since 1994, he's gradually moved all his software to the MacOS. He recommends checking out ArcView GIS."

"ArcView is, of course, becoming the standard for desktop mapping,' Farone says. 'However, you may also know that their commitment to Mac is waning or perhaps dead. [So why would you recommend it?] There's no current update plans for the Mac version of the software. Also, nearly every software package listed in the three-part series is EITHER a GIS or Desktop Mapping system or Remotely-Sensed image processing and modeling system. Only one package is ALL of these, MicrolImages' TNTmips. True, it's not Mac-native and runs on a motif X-server. However, the company's president is a big Mac fan and their commitment to the Mac remains."

"Farone says he's currently running a beta of the next version, which is due out soon. 'TNTmips v.6.2 for the Mac contains some tweaks to the X-server buffering scheme that have produced a startling speed boost,' Farone says."

"TNTmips on the Mac now blows away TNTmips on NT,' he adds. 'It could also be very interesting to watch once OS X is here."

Editorial and Associated News [by Dr. Lee D. Miller, President]

Moving.

As you know, over the Christmas and New Year's holiday period, MicrolImages moved to new facilities. This move to a higher and better place was after 13 years of residence at our prior address. Unfortunately, the offices we had leased for 10 years were in a building sold several years ago. The new owner's maintenance of them was so poor

that we could no longer tolerate the constant disruptions caused by power outages, phone outages, frequent water leaks, low maintenance, poor security, and so on.

Planning for and then moving an entire company, internal network, Internet hosts, many computers, and so on with a minimum of disruption and loss of momentum is not a trivial matter. For example, even though work orders were put in months in advance, our phone company could not provide proper high-speed DSL lines for 3 weeks after we moved, which cut off most of our external email access. Furthermore, a large group of people can certainly accumulate a lot of "stuff" after 13 years in one location. Fortunately, most of the disruption of this move is now recent history.

Unfortunately, this major move, the longest holiday period of the year, and two significant low-level major software modifications caused Microlmages major disruptions for a couple of months. I apologize for being unable to deliver Microlmages' prompt service in fixing **TNT** errors in that period and the subsequent delays it has caused in the release of **V6.30** of the **TNT** products.

The two major disruptive software modifications noted do not immediately create obvious new **TNT** application features. One was the implementation in the **TNT** products for the use of the Universal Naming Convention (UNC) required for the full utilization of local and remote directory structures in Windows 95, 98, NT, and 2000 without having to map remote drives. This sounds like a simple change, but it disrupted many **TNT** processes. The most significant adjustment was in the conversion of the **TNT** Geospatial Rendering Engine (**GRE**) so that it could be used to simultaneously support the current X/Motif user interface approach and a planned Windows interface. This complete rewrite required that the **GRE** conform to the use of the Windows Foundation Classes and become object-oriented, whereby each major geospatial data type (raster, vector, CAD, ...) become objects as referred to in object-oriented programming.

The View from Up Here?

At this point, if you want my personal opinion about moving an entire company, don't do it unless you absolutely have to! But, we did take the occasion of the move to improve both our facilities and equipment. For example, complete new 100 Mbps switched networks were installed using 32,000 feet of wire. New computers were purchased with dual monitors for many staff members. Now, we are finally all settled in much better surroundings and are back on top of things—literally, since our main entrance is on the 11th floor of the Sharp Tower, one of the tallest buildings in Lincoln.

Our new offices are two blocks from the historic Capitol Building where the laws are made for the State of Nebraska. By statute, no other office building in Lincoln can be higher than this 400' historical building. Its gold tower is topped by a statue of the Sower, a 32 foot sculpture of a man hand sowing grain across the vast plains of the central United States. The Sower serves to remind us that Nebraska is dominantly a breadbasket state that helps feed the United States and other nations.

My new corner office windows look directly out at this building and the Sower. There is a web camera located at www.starcitymall.com/webcam/ on an adjacent building. It is at the same height and has almost the identical view as my windows. You can check it anytime, day or night, to see why I will now have the lofty "view from up here". If you want to check out other views of downtown Lincoln that would be similar to those of the many other staff windows at Microlmages, try the other web cameras at www.starcitymall.com/webcam/pictures.html.

Enterprise Products.

This term is used more and more in connection with software products in general and with geospatial analysis in particular. In my "view from up here", almost all **TNT** clients are engaged in some aspect of using features being added to the **TNT** software to "meet the enterprise challenge". These may range from the use of Microsoft's PowerPoint or Microlmages' **TNTatlas** to deliver specific results to the use of Microsoft's Terraserver or Microlmages' **TNTserver** to widely publish and distribute geodata. They range from free viewers to easier-to-use power tools such as ArcView and **TNTview**, to powerful geodata assembly and analysis tools such as ARC/INFO and ERDAS or **TNTmips**.

Today, none of you hesitates to take on a project on your desktop with a few hundred images, large vector objects, and complicated database tables. Certainly, this requires that you use an organized, enterprise kind of approach or you will quickly become lost in a sea of files, file names, and intermediate products. Large images and collections of images from the many satellites and orthophoto production programs are becoming commonplace. Often, you acquire and use these for very specific project objects. More and more, you will get this data from its manufacturer in ready-to-use orthoimage formats. Vector objects will no longer be old and dated, but updated frequently from these readily-interpreted georeferenced images. Off-shore digitizing is now common. Can off-shore vector/CAD updating by photointerpretation be that far behind?

Today, many of you are taking on even larger projects to organize the geospatial data of entire organizations. Maryland's MERLIN is one example of where this activity leads. It took about 10 years to create its contents and provide them for internal organizational use via **TNTatlas** and another 2 years to provide them to the public via **TNTserver**. You have similar projects underway or have contemplated some that will not take anywhere near as much time. You have the advantage over Maryland because large georeferenced data sets are either available or at least more easily created. For example, it took a year of intermittent effort to acquire, mosaic, and publish the more than 5000 DOQQ images used in the Nebraska Statewide atlas. A reliable **TNTclient** and **TNTserver** and improvements that eliminate the need to mosaic would now shrink this effort to a couple of man-months.

Enterprise efforts are larger projects that must deal with many components and a variety of kinds of end users. The institution they serve may be real, such as a private corporation or state agency, or virtual, such as an Internet customer base or a distributed group of employees in the field and many branch offices using a Virtual Private Network (VPN). More and more, you and our future **TNT** clients require access to a suite of products at different price points to deal with the data preparation and analysis and then its final use by a variety of end users. These products must efficiently deal with the compatible storage, indexing, and display of all types of geodata. They must range from simple to the most complex. They must work together like the individual instruments in an orchestra to provide a harmonious symphony to those who are paying but not directly involved in the production.

Some vendors are building enterprise products piecemeal from kit and a la carte components. Instead of the a la carte approach, the **TNT** products provide the "scaled approach," where different products provide capabilities that can be scaled up into a complete enterprise solution. I am of the opinion that there are few product suites left today that can make this claim.

Please recall that MicroImages does not professionally apply the products it creates, has not engaged in contracts for their use, and does not hire experienced GIS specialists. Over the years, your requests and requirements have guided MicroImages into the role of producing a suite of comprehensive products that can satisfy any enterprise-wide requirement.

As each product niche is filled, the **TNT** enterprise approach must respond to more, better, and larger sets of geodata on your desk or on the enterprise's file servers. MicroImages now needs to strive to provide means for you and your clients to better inventory, manage, locate, inspect, and subsequently exploit these ever-growing masses of geospatial materials. As you know, our Project File approach has been the focal point of this activity, as it provides a convenient container for any size and quantity of geodata. Small new steps are taken in this release to further exploit its versatility by providing full network access for object selection, a thumbnail object view, and a Project File Preview window. Faster access to ODBC-linked database tables supports better use of large existing institutional databases. **TNTclient**, **TNTbrowser**, and **TNTserver** improvements help you exploit your materials in institutional settings. MicroImages continues to plan similar new improvements, features, and approaches to help you "meet the enterprise challenge".

Observations on Global Internet Access.

An attached color plate entitled EMERGING-MARKET INDICATORS provides interesting insight into the current penetration of the use of the Internet. The histogram of INTERNET ACCESS CHARGES clearly demonstrates that price is a big impediment to its wider use in many nations with telephone monopolies that charge by the minute for all land-line usage. These kinds of factors determine the expanding usefulness of products like CD-based **TNTatlases** versus on-line **TNTservers** in various nations. MicroImages is quite aware that many nations do not enjoy the luxury of widely used, low-cost, high-speed Internet access.

As you know, MicroImages places a heavy emphasis on the sales of the **TNT** products outside the United States. I try to keep information such as these network access charges in view as MicroImages evolves its products to better service all clients worldwide. This is why many more of you using **TNTmips 6.3** will have access to **TNTlink** without charge to prepare HyperIndex stacks for distribution as **TNTatlases** on low-cost CDRs. Similarly, we are providing you with the opportunity to experiment with the **TNTserver** without buying it or paying for high priced phone or other local charges to set up a web server.

Recently, in the following article, I was able to express my viewpoint on using appropriate guidelines, not vendor hype, for appraising geoservers to provide materials for worldwide use. Nearly 9 months later, nothing has changed my opinions.

Don't Hit Warp Speed with the Wrong Equipment. by W. Fredrick Limp. *GeoWorld* November 1999. pp. 44 to 48.

"Selecting Web-based mapping software is difficult at best. To help users choose the package that's right for their applications, GeoWorld shows how the competition stacks up."

This entire article can be read or printed from the on-line *GeoWorld* archives located at <http://www.geoplace.com/gw/1999/1199/1199Imp.asp>.

[This article compares products from 18 vendors, including the **TNTserver**, based upon questionnaires completed by each vendor [and not verified]. These are presented in 3 tables: System Characteristics, System Data Formats, and Functions. Generalized discussion of each of these tables is provided without reference to any specific product. This article contains 1 external quote that merits reproduction here.]

“Performance”

“Another question not represented in the tables is about performance. With few exceptions, the answer [from the vendors] was ‘fast,’ but that didn’t seem very useful. A thoughtful answer was provided by the MicrolImages developers, and it deserves to be quoted.”

“Some of your questions request information relating to performance. For geoservers, such responses are directly related to the communication rate used: T1, DSL, cable modem or 56KB modem. It’s important to ask the communication rate used in connection with the performance reported. Most nations have only slow, introductory Internet service and are fortunate if they can access a site at 56KB.”

“Geoserver developers have to choose a definite minimum communication rate and a browser version as the lower limit for useful access. This decision, in turn, directly affects the design of the approach used. For example, if the ‘design user’ has access faster than 56KB, they can be asked to download Sun’s Java 2 engine to access the geoserver. However, if the ‘design user’ has only 56KB or slower access, this download isn’t practical, and Java 1 must be used, because it’s supplied with Internet Explorer and Netscape Navigator. But clients created with Java 2 can have many more built-in features than those restricted to Java 1 for widespread international access.”

Image Price Competition.

SPOT has just significantly lowered its prices for new scenes to compete with IKONOS. With all the new 1-meter devices planned, can price wars be that far ahead?

On an even more encouraging note is the following press release:

SPOT and USGS Sign Satellite Imagery Deal. *SPACE NEWS* March 20, 2000. Page 16.

“SPOT Image Corp. signed an agreement with the U.S. Geological Survey (USGS) EROS Data Center under which the center will archive and distribute historical SPOT satellite imagery to government users.”

“The 700,000 SPOT scenes were acquired over the U.S. from 1986 through 1998.”

“USGS will answer questions about the catalog, fill orders and make products for government research and operational users. Products will be distributed at the cost of reproduction, plus a royalty fee paid to SPOT for the use of the data.”

This applies only to images of the United States. But, Landsat 7 has collected extensive images of the world, and its operation will soon be assumed by the USGS.

CAD is Dead, Long Live GIS?

This is a quote from an on-line newsletter where various specialists were discussing the death of the original concept of CAD programs:

“I think the biggest disadvantage of CAD is the loss of spontaneity. With a pencil and paper, you can scribble as fast as you can move your hand while your mind is processing the ideas that are hidden in the scribbles. This allows for many more design related

thoughts before a single hard line is put to paper. This process is vastly slowed down with CAD. Due to the easy ability to 'snap' endpoints, etc., CAD almost forces you to a level of detail that paper and pencil save till the presentation of construction documents require."

These same observations may soon apply to the original concept of GIS. Recently, more and more people and organizations are using the term "geospatial" in one form or another. I believe this is to distance themselves from GIS, which has been defined by previous products and their uses in many settings as little more than mechanical tools for digitizing and printing maps.

TNTsdk[®] 6.3

Wider Possible Use.

TNTsdk has been selected for inclusion in large proposals of two well-known defense contractors. Should these proposals be funded, the **TNTsdk** library and the **TNT** Geospatial Rendering Engine in particular, would be used to develop other kinds of presentation and analysis systems totally separate from MicroImages and the **TNT** products. As an interesting note, one of these projects would utilize the X-based **TNTsdk**, while the other would use the Windows-based **TNTsdk**. **TNTsdk** has already been used as the basis for extending the capabilities of the **TNTview** into other specialized products.

Turkey Taps Diverse Processing Tools to Build Frequency Management Center. By Kevin P. Corbley. This article has been written and awaits publication in a European publication. It describes an application of the **TNTsdk** by the Communication and Spectrum Management Research Center at Bilkent University in Ankara. Their product is being placed in the Turkish government's frequency monitoring stations to implement the latest spectrum engineering, frequency propagation modeling, and geospatial data viewing technologies.

On-Line Updates and Documentation.

There is increasing interest in the use of the **TNTsdk** to prepare products for use in conjunction with **TNTmips** or as separate products. This trend is increasing as more of the **TNT** library functions making up the **TNTsdk** become available for use in developing Windows products. To support current users of the **TNTsdk**, MicroImages is in the process of setting up microimages.com to allow you to upgrade these libraries on the Tuesday/Thursday schedule for all the other **TNT** products, booklets, and so on. Twice weekly, this will provide you the current versions of all functions being used by MicroImages' software engineers.

As a further support measure, MicroImages has licensed a software package that automatically builds good technical reference documentation from library source code. It has already been tested on **TNTsdk** with excellent results for almost all functions. It creates documentation based upon the declarations and comments already imbedded in the source code written over the years in the thousands of functions that make up the **TNTsdk**. The source for some functions will be reviewed and better annotated over the next several months to improve the documentation it automatically produces.

As noted, the complete **TNTsdk** documentation will be rebuilt automatically every night and updated on microimages.com as part of the regular Tuesday and Thursday routine. Using a browser, you and anyone else who wishes can view this on-line documentation or download all of it.

Current Compilers.

There were no changes in compilers from **V6.20** to **V6.30** of the **TNT** products or in the **TNTsdk**. The following C++ compilers are used for **V6.30** of the **TNT** products and were the same as those used for **V6.20**. [This is unchanged from **V6.20**.]

Windows 95/98/NT/2000 (with Intel)	use Microsoft Visual C++ 6.0
Windows NT (with Alpha)	use Microsoft Visual C++ 6.0
UNIX platforms	use latest version of C++ from GNU
Mac (with PPC)	use Code Warrior Professional 5.0

TNTlite[®] 6.3

IMPORTANT REMINDER: **TNTlite** cannot be used to build HyperIndex stacks for use with any **TNT** product.

Mass Distribution by Dealers.

More **TNTlite 6.3** CDs have already been ordered for distribution by MicrolImages' dealers and clients than any previous version. MicrolImages thanks you for helping others to obtain and use this product.

Indonesian universities and students will receive **TNTlite** from Citradata with their companion instruction book in Indonesian. Thai universities and students will receive **TNTlite** from EIT with their companion instruction book in Thai. Japanese and Korean universities and students will have access to **TNTlite** with a collection of Getting Started Booklets in those languages.

The GIS Team in Germany, a MicrolImages Dealer, prepared and delivered their own German version CD of **TNTlite 6.2** and plans one for **V6.30**. Their CD contains the German translation files for the **TNT** products (also available at microimages.com). It is reproduced as needed as a CDR and has an attractive "stick-on" full color label referencing the GIS Team as its source. It comes attached to a German installation card similar to those used by MicrolImages for **TNTlite** delivery. It is accompanied by a multi-page, colorful German promotional flier assembled from various MicrolImages promotional materials. Kudos to the GIS Team!

Image Analysis in Geology.

The 3rd edition of Dr. Steve Drury's popular hardcover book entitled Image Interpretation in Geology is being published by Blackwell Science in the fall of 2000, hopefully in time for the school year.

The chapters in this 3rd edition are:

- Chapter 1: Electromagnetic Radiation and Materials
- Chapter 2: Human Vision
- Chapter 3: How Data are Collected
- Chapter 4: Photogeology
- Chapter 5: Digital Image Processing
- Chapter 6: Thermal Images
- Chapter 7: Radar Remote Sensing
- Chapter 8: Non-image Data and Geographic Information Systems
- Chapter 9: Geologic Applications of Image Data

- Appendix A: Stereometry
- Appendix B: Image Correction
- Appendix C: Sources of Remotely Sensed Images

The **TNTlite**-sized geologically-oriented tutorial exercises he has prepared for replication onto the **TNTlite** CD included with this book are as follows:

- Exercise 1: Displaying Image Data
- Exercise 2: Working with Additive Primary Colours—Three Channel RGB Images
- Exercise 3: Enhancement of RGB Images by Decorrelation
- Exercise 4: Band Ratios
- Exercise 5: Principal Component Analysis (PCA) Methods
- Exercise 6: Spatial Frequency Filtering
- Exercise 7: Georeferencing Images
- Exercise 8: Digital Elevation Models
- Exercise 9: Creating Reconnaissance Geological Maps from Landsat TM Data
- Exercise 10: Spectral Mapping
- Exercise 11: Fitting Surfaces to Point Data

MicroImages' staff has worked closely with the author for more than a year to cooperate in the preparation of these exercises. All the exercises were tested carefully in the beta version of **TNTlite** before **V6.30** was reproduced. These tests were performed using the author's **TNTlite** sample datasets that will be reproduced on the CD containing **V6.30** and included in this book.

TNTatlas[®] 6.3

TNTlink Free for Most!

The most important new capability in **TNTatlas** is that most of you will now be able to make and distribute them. The sections below on **TNTlink 6.3: No Longer an Option and Price Changes** discuss the details on why **TNTlink** may be available to you for use on your **TNTmips** to assemble HyperIndex stacks to distribute with the free **TNTatlas** on CDs, over your intranet, or via a **TNTserver**.

Inherited New Features.

The following general improvements in all the **TNT** product operations were automatically added to **TNTatlas**. These improvements are detailed below in the major section on New Features for **TNTmips** and include:

- unlimited display resolution
- unlimited support of monitors
- improved network access to object
- much faster use of ODBC-linked tables
- faster operation of TableView
- translation into 6 new languages

New Features.

Most of the activity impacting the **TNTatlas** product for this release has actually taken place in changes to the **TNTserver** and **TNTclient** and will be covered below in those sections. One new, important change was added specifically to prepare better HyperIndex stacks for use with **TNTatlas** and **TNTserver**.

HyperIndex Stacks.

As you construct a HyperIndex link, you can now specify the subportion of a linked object that will be displayed when it is selected by the navigation tool. When the size of the linked object is relatively large, neither opening at full view nor at full resolution may be appropriate due to the dramatic change in scale from the parent object. This feature allows the atlas designer to better control this type of navigation.

This new option is not the same as turning objects on and off according to scale, which is featured in the on-line Nebraska Statewide sample atlas. This new capability allows you to specify what portion of a larger linked object will be shown when it is first displayed by selection during navigation. The designated portion of the larger object will be automatically displayed by your navigation and will be centered on the coordinates of the point you select for navigation. The choices that can be set up in the HyperIndex link are 1/1, 1/2, 1/3, 1/4, 1/5, 1/6, 1/7, or 1/8, and the maximum extent of the object. Full resolution can be also be selected so that 1 image cell is 1 screen pixel.

An example of this new feature can be seen when you navigate to the third or bottom level in the MERLIN on-line atlas. This level will automatically show 1/4 the area of the 7.5' USGS topographic map centered at the point you select in the SPOT image. The color raster of the entire area of each topographic map is linked to the parent SPOT image. However, displaying the entire map would provide a view of it that would be meaningless and unreadable until zoomed, which is, in effect, done automatically by this new option.

Installed Sizes.

Loading **TNTAtlas 6.3** processes onto your hard drive (exclusive of any other products, data sets, illustrations, Word files, and so on) requires the following storage space in megabytes.

	<u>for V6.20</u>	<u>for V6.30</u>
PC using W95, W98, NT, or W2000	23 MB	24 MB
PC using LINUX (with Intel) kernel 2.0.36	23 MB	23 MB
Mac using MacOS 8.x or 9.x	42 MB**	43 MB**
SGI workstation via IRIX	28 MB	25 MB
Sun workstation via Solaris 2.x	24 MB	25 MB
IBM workstation via AIX 4.x (with PPC)	26 MB	28 MB
COMPAQ/DEC workstation via NT (with Alpha)	29 MB	27 MB
COMPAQ/DEC workstation via Tru64 UNIX (with Alpha)	27 MB	28 MB

** The Mac installed size includes the JAPAN1.OF font of 10.4 MB that is automatically installed. Delete this font if you do not require the use of Japanese.

TNTlink™ 6.3: No Longer an Option

Many clients using **TNTmips 6.3** who did not purchase **TNTlink** (option **H10**) now have it added to their system at no additional charge!

The use of **TNTlink** to construct HyperIndex stacks for use with **TNTAtlas** has suddenly become much more popular. This is in part due to sudden worldwide, low-cost availability of write-once CDR drives as a standard peripheral or as easy add-on units. Everyone you deal with also now has a CD drive on their desktop machine capable of reading the CDs you make. Another factor is the rapid growth of your access to, and need to organize, use, and deliver large collections of geodata, especially images. The most re-

cent factor has been the introduction of the **TNTserver** that can be used to publish much larger **TNTatlases** for public use via the Internet. Alternately, using **TNTserver**, you can provide private, organization-wide geodata access via intranet or by way of a Virtual Private Network (VPN) carried on the Internet. You all have clients who are clamoring for access to more and more geodata.

TNTlink (former option **H10**) is a unique and powerful feature among the low-cost desktop GIS and IPS products. It can be used create HyperIndex stacks for use as **TNTatlases** to organize your project materials, distribute your products individually on CD in an organized structure for use in free **TNTatlas**, and publish them widely on the network via **TNTserver**. MicroImages has concluded that every one of our clients who are not using **TNTlink** would benefit significantly by its use and our future plans for its enhancements and extensions. A color plate is attached entitled We Give You the Tools to provide more information on how you can use this new capability.

Thus, all new purchases of **TNTmips** will provide, as standard, the capabilities formerly purchased separately as **TNTlink**. Furthermore, many existing systems not previously equipped with the **TNTlink** option will have it automatically when **TNTmips 6.3** is installed. The details of how this change in the professional license of **TNTmips** is being handled are in the Price Changes section below.

TNTserver™ 2.0: Limited Use by Every Client

If you are using **TNTmips 6.30** and **TNTlink**, you can now publish an atlas on atlas.microimages.com!

Publish a TNTatlas.

All MicroImages clients using the professional version of **TNTmips 6.3** will now have access to limited use of the **TNTserver**. As a result, you will now be concerned with the new features added to **TNTserver 2.0**. Attached to this MEMO are 3 color plates, each entitled Explore Sample Web Atlases. Each plate describes several sample and/or operational on-line atlases that you can try. When you browse these atlases, you may be at a **TNTserver** at atlas.microimages.com or linked to a **TNTserver** hosted at some other client's server. Some operational atlases you can try that are hosted elsewhere (Europe and South Africa) are identified in red type on these color plates.

MicroImages benefits greatly from all our joint experiences in which we keep trying to make our geospatial software tools and your results more meaningful and acceptable to those not familiar with them. It is this kind of result that MicroImages believes can be accomplished with your new access to the **TNTserver 2.0** and all the products that support it.

The section above outlines that you now probably have access to the ability to create your own HyperIndex stacks (atlases) and distribute them on CDs with the free **TNTatlas** software. MicroImages will also provide clients using the professional version of **TNTmips 6.3** with drive space on our **TNTserver** to publish a public **TNTatlas** not to exceed 1 CD in size for 6 months. Extensions beyond 6 months will require that your **TNTmips** product is authorized for the current version and depend on the availability of space and your maintenance and improvement of your atlas.

Promote Your Expertise.

Placing a **TNTatlas** on MicroImages' **TNTserver** site provides you with an opportunity to expose the nature and quality of your work to your clients. Your atlas will be public and can be something you wish to use to promote your geospatial skills and capabilities to the general public. However, you may also choose to prepare an atlas targeted as a demonstration for a specific group or even an individual. MicroImages is hosting private atlases for dealers. These atlases generally have private content provided to the dealers by their clients who wish to experiment with the possible use of **TNTserver** on their intranet or Internet. MicroImages is willing to host your private **TNTatlas** for a short time for some special, logical reason. MicroImages will also host your larger **TNTatlases** for a fee.

Preparing a small **TNTatlas** for free publication at atlas.microimages.com benefits you in several diverse ways:

- You can use this as a parallel distribution channel for a **TNTatlas** you are distributing on CD.
- Your nation or rural area may have modem access to the Internet, but you may not have access to the higher bandwidth needed to maintain a responsive web site.
- You may wish to try out the **TNTserver** before you buy one or convince someone else to do so.
- It will be easier to get your first atlas up and going by starting out focusing only on the effort of assembling meaningful material in an attractive structure.

MicroImages' hosting of your atlas allows you to concentrate on the on-line results without all the technical headaches of setting up both an NT- or W2000-based web server and **TNTserver**.

Please remember that our main site at microimages.com and our **TNTserver** at atlas.microimages.com have many visitors daily who may view your atlas. MicroImages will be advertising the **TNT** products on these sites. However, these advertisements will be low key links to more detailed information elsewhere on microimages.com. They will not suggest that you or your company necessarily recommends our products. As part of the integration of your atlas into the site's structure, there will be one HTML page describing what your atlas is designed to do. This page will also provide a link back to your personal or company web site if you have one and provide your email address, other contact information, logo, and so on. In other words, your atlas and your introductory page will promote you and your interests.

Observing the Necessary Legalities.

As you probably know, the geodata in a published atlas is in the Project File structure and is not usable outside a **TNT** product. While the data can be manipulated and viewed through the **TNTclient** "porthole", it cannot be downloaded except as very small, lossy, compressed JPEG rasters. These pieces are unlikely to be useful for anything except their intended use for direct viewing or for screen snapshot printing. However, as you know from the popular press, no web site is absolutely safe, so please recognize that MicroImages cannot guarantee absolute security for a public or private atlas published on our **TNTserver**.

For our own protection, MicroImages reserves the right to reject or remove any client's **TNTatlas** from our web site at any time without notice. This is a necessary condition in order for MicroImages to react to situations where a copyright, legal, or other public objection may be involved. When you provide a **TNTatlas** for MicroImages' site, you will

also be required to sign a short agreement whereby you state that none of the materials utilized were copyrighted or restricted from public use by law, license, or other restrictions.

Microlimages' Servers.

Details of the server farm and RAID drive(s) that would be used for your **TNTatlas** are published with the atlases at atlas.microimages.com. Recently, Microlimages' **TNTserver** farm was provided with its own separate, commercial DSL access (700 KB to 1 megabit per second), and an additional, larger RAID drive (\$2000 for 150 gigabytes) was added. Additional drive space and processing power can be easily added to atlas.microimages.com as needed, as this was part of the original design goals for the **TNTserver**.

The experimental, single-level Nebraska Statewide atlas now provides direct viewing of all of the more than 5000 digital orthophotos covering the state. To date, 41 of the 93 Nebraska county soil maps have been published in digital format by the Natural Resource Conservation Service (USDA/NRCS) in SSURGO format. This 40% of the state's detailed digital soil maps has been imported into vector objects. The properties of each soil in each county were obtained in the MUIR database format from the USDA/NRCS, imported into 470 soil attribute fields distributed in 26 relational tables, and linked to the detailed soil polygons. These new vector layers are now included in the Nebraska Statewide atlas, and additional counties will be added as they become available in the SSURGO format. Temporarily, a separate single-level Statewide atlas is being assembled to provide access to all the 1/24,000, 1/100,000, and 1/250,000 USGS topographic maps of Nebraska in DRG format. Eventually, these 2 different statewide atlases may be integrated into 1.

Starting soon, Microlimages will begin a critical evaluation and gradual redesign of all of microimages.com. It will begin immediately with a redesign of the appearance and structure of the pages at atlas.microimages.com used to access all the **TNTatlases** we now host. The new structure will also be designed to accommodate easy addition of your atlas.

New Features.

The best way to learn about many of the features, new and old, in **V2.0** of the **TNTclient** and **TNTserver** is by reviewing the colorful pictorial MicroImages MEMO enclosed entitled Announcing **TNTserver™ 2.0: How TNTserver Works with MERLIN**, dated 1 May 2000. It provides materials covering all aspects of this new product available to you for limited use, for purchase, and for content use via one of the operating sites. It uses the large MERLIN atlas site at mdmerlin.net to demonstrate a public, institutional use of the **TNTserver**.

The following key features were added to finalize **TNTserver 2.0** and are subsequent to those reported in the **V6.20** MicroImages MEMO. The availability of these features may not be obvious to you as you consider your use of the **TNTserver** and review the separate, colorful MEMO.

Please note that **TNTserver** is a pure Windows application for NT or W2000. It does not use X or the Motif libraries in any way. **TNTserver** does use the new integrated Geospatial Rendering Engine (**GRE**). This new **GRE** can support requests from **MI/X**-based products or directly from Windows-based products.

Using W2000.

The **TNTserver** is operating now on W2000 as well as NT. For testing and comparison, 2 of the 4 Compaq servers (\$500 each, no monitors needed) used for all the test atlases hosted at atlas.microimages.com now use W2000, and the others use NT. When you use any of these atlases, each successive request submitted via our **TNTclient** or **TNTbrowser** will be randomly assigned to any of the 4 Compaqs. The menu bar at the top line of the client window shows which Compaq computer responded as atlas1, atlas2, ... atlas4. Atlas1 and 2 are currently running NT, and Atlas3 and 4 are running W2000.

Support for TNTbrowser.

TNTserver has been modified to use a list of sites and atlases that can be accessed by the stand-alone equivalent of the **TNTclient** called the **TNTbrowser**. This new **TNTbrowser** product is described below in the section entitled **TNTclient™ and TNTbrowser™**.

Caching Layouts.

Layout caching was added to increase performance of the **TNTserver** as new graphical features were integrated, such as the creation of the graphical legend elements used in the LegendView approach explained below. Caching improves most of the server's functions, including InfoTips, image generation, metadata display, pan and zoom, and others. Cached layouts in many cases require less than 1 second to compute a new view unless it has to retrieve information for the layer from a large vector object.

A layout is cached in memory the first time it is used, so only the first visitor to request that layout experiences a slower response. When a layout requires a series of legends, it must form all the possible legends that might be exposed or hidden. For example, a layout used in the Nebraska Statewide atlas requires about 100 seconds to open the first time but only .4 seconds when it is cached. There are about 354 layouts in the MERLIN atlas that average less than 1 MB each. The single NT platform serving the MERLIN atlas at mdmerlin.net has 1 gigabyte of memory and can indefinitely cache all these layouts.

The manager of a **TNTserver** can set the upper limit of the cache to be whatever maximizes performance on that platform. Most visitors to an atlas take the paths and layer combinations you have designed into your atlas to be convenient and obvious. These layouts will almost always be cached unless **TNTserver** has just been restarted. Micro-Images is currently investigating how to force the **TNTserver** to require some popular and common layouts to stay in the cache. This would then permit the **TNTserver** site, when restarted, to be set up to automatically recompute and cache commonly used layouts.

The automatic caching now built into the **TNTserver** takes advantage of the memory you may wish to add to increase the performance of your **TNTserver**. Adding memory is one important way to accommodate more visitors to a **TNTserver** operating on a single platform. In contrast, when you visit atlas.microimages.com, you are using a server farm based upon several \$500 computers, each with 64 MB of memory. Both approaches benefit from layout caching: the single server because it has more memory to use and the server farm because it has so little memory.

LegendView.

The first time a particular layout in your atlas is requested by a visitor to **TNTserver**, it generates, returns, and caches all the graphical legend elements needed to construct a LegendView. This includes any layer that might be viewed at that time whether it is currently selected by the visitor or the atlas designer. For example, your atlas may have layers turned off in a layout until the visitor exposes them.

These graphical legend elements are not created for your atlas' hidden layers that cannot be exposed by the visitor. Hidden layers are used to include any object you wish to use as a reference layer in a particular atlas layout without confusing the visitor by adding them graphically to the view.

The Java client code receives all these elements and determines what to do with them. For example, the **TNTclient** and **TNTbrowser** show these legend elements in the layer list when the layer is checked off to be combined into the current view. The cache of legend elements is created for all layers in that layout that have been set in the atlas as potentially visible layers (for example, not set as hidden layers).

InfoTips.

The **TNTserver** now supports a request to return the tabular data describing a feature. **TNTserver** uses the same **GRE** as **TNTatlas** and all the other **TNT** products. As a result, this **TNTserver** provides the same features and results that can be achieved in **TNTatlas**, **TNTmips**, **TNTview**, ... when using DataTips. The information returned for the feature from the atlas is the same as for the familiar DataTips. However, the form of its viewing is not the same and is referred to as an InfoTip in the current **TNTclient** and **TNTbrowser**.

Same as DataTips.

When a visitor is in the InfoTip mode in a Java client, any mouse click in the current view sends the server a request for action using that coordinate position and a description of the current view. The server then assembles these predesigned responses into a string using the **GRE**. It then sends this string to the Java client for interpretation and display to the visitor.

Just as with other **TNT** products, this DataTip response viewed as an InfoTip might include combinations of:

- database fields from any layer, hidden or exposed, with suffixes and prefixes to explain them, such as trailing units
- computed fields where a field's value is converted to new units
- computed fields using an equation and multiple fields to prepare a modeled result
- a memo field to insert descriptive, metadata, or warning messages
- a URL to be used to link to another web site

Using Hidden Layers.

Combining hidden layers and InfoTips provides tools that can incorporate geospatial analysis and meaningful display of all the different kinds of layer types in your atlas. By combining these kinds of **TNT** tools, your images, vectors, CAD, database, text, and URL links can be integrated into your atlas. The key is to design it so the layers can be combined and presented in a way that can be understood and used by your clients.

InfoTips and DataTips can contain computed fields derived on request for features in hidden layers. The element in a hidden layer is still located by the **TNTserver** using the coordinates of the point. The attributes of that specific element are used in an equation for a computed field to model some agronomic (see sample Precision Farming, NE atlas for Royal Bros. farms), economic (Peace Pipe Ranch, TX precision ranching atlas), or other condition for the selected element. These results for that specific point can then be revealed to the user via the InfoTips.

This strategy is very powerful compared to the approach of other competing on-line GIS products. They require that several layers be combined by the model to yield a new layer that is then overlaid, typically as color polygons. This layer(s) is then shown to the visitor, usually as a single layer over a simplified reference vector layer (for example, over roads, rivers, coastline, ...). These products do not even attempt to show the usually fractured, color-coded polygon results of their GIS analysis over an image (for example, a DOQQ) or more complex reference map (for example, a 7.5' topographic map). As a result, this approach provides a confusing, difficult to understand, exotic display without any recognizable, detailed image or map reference layer.

The public, management, consulting client, or other untrained user of your **TNTatlas** on CD or via the **TNTserver** is not experienced or patient when asked to view a complicated spaghetti mess rendering unfamiliar materials. Hidden layers hide the mess and provide the results while the visitor studies a familiar view of 1, 2, or 3 reference layers. It is also very important to note that the use of InfoTips for modeling geospatial analysis is much faster in a server setting with the potential of many simultaneous visitors. The InfoTips approach only computes the model for the single selected point. Think what would happen in the alternate product's approach where some sort of combination of vector layers would have to be prepared every time each visitor requests a combination of layers to model a result.

Precision Ranching Example.

A simple scenario can be outlined illustrating the use of hidden and exposed layers in an on-line atlas used for ranch management. The ranch owner or manager views a recent black and white orthoimage of the ranch with an overlay of their pasture boundaries in red. These fenced management units are polygons that have attributes documenting such things as the most recent grazing history and the current cattle stocking level. The owner or manager is very familiar with their properties and can quickly grasp the information in, and manipulation of, this simple view.

Hidden layers are also present in the atlas to represent an image-derived biomass map or a sequence of maps, past aerial spraying patterns, and other spatial variables. Using the hidden layers and computed fields, several alternate management operations can be modeled, such as moving cattle between pastures or aerial spraying of an area for brush or weed control or for selective fertilization. It is then easy to show them how to probe around in a pasture using InfoTips (or DataTips in a CD **TNTatlas**) to view these results.

A sample of an on-line atlas prepared with these tools by Bert Wallace, the owner of the Peace Pipe Ranch, is already provided at atlas.microimages.com. Bert has been using **TNTmips** for 12 years in the actual precision management of his large Texas cattle ranch. For more about geospatial applications on the Peace Pipe Ranch, see microimages.com/atlasserver/ and

Help From Above: *Brush control made easy with infrared photography.* by Kevin P. Corbley. *Beef*. Volume 34, Number 10, June 1998. pp. 48-52.

Precision Farming Example.

A sample atlas is also available at atlas.microimages.com to illustrate the use of hidden layers and computed fields in the management, analysis, and application of precision farming data. Kevin Royal, leader of MicroImages' support team, farms these acres just southeast of Lincoln together with other family members. Kevin has published several articles on his innovative ideas for the use of the CD-based **TNTatlases** and the **TNTserver**. All these papers can be downloaded from www.micro-images.com/papers/.

Dynamic Models.

The computed field models used for the InfoTips' and DataTips' viewable or hidden layers can even provide dynamic results. The attributes for these layers could be in tables stored in Oracle, updated and maintained by other systems, and accessed via ODBC links.

Navigate Directly to Specified Subareas.

In constructing a **TNTatlas**, you can now specify the subportion of a linked object that will be displayed when selected by the navigation tool. This new option is not the same as turning objects on and off according to scale, which is featured in the on-line Nebraska Statewide sample atlas. This new capability allows you to specify what portion of a larger linked object will be shown when it is first displayed by selection during navigation. The designated portion of the larger object will be automatically displayed by your navigation and will be centered on the coordinates of the point you select for navigation. The choices that can be set up in the HyperIndex link are 1/1, 1/2, 1/3, 1/4, 1/5, 1/6, 1/7, or 1/8, and the maximum extent of the object. Full resolution can be also be selected so that 1 image cell is 1 screen pixel.

You would use this option for the first display of a larger object with content that would be too complicated or busy to be usable if displayed in its entirety. This is a typical situation where the object is a scan of a topographical map. When this kind of object is selected, automatically displaying 1/4 the area of the map centered on the point selected displays a readable map. Zooming out can still be used to display the entire map. The MERLIN **TNTatlas** at mdmerlin.net displays its topographic maps using this feature when you navigate into the map level.

Preset URL Links.

An atlas can now be designed to contain links to URLs. When the geographic area is selected, the **TNTclient** opens a second browser and sends you to that web page in the new browser. For example, you might be linked out to review the boat service facilities for a particular symbol, or all the McDonald's restaurants within a polygon in a hidden vector layer. When that browser is closed or you select the **TNTclient** window, it is active and you can continue on just as before. You can then select another point or atlas action.

Use Multiple Navigation Links.

TNTserver now supports multiple navigation links by sending a list of any concurrent or overlapping links back to the client for display in a pop-in window. The visitor can then select which layer or navigation link they wish to follow. **TNTserver** now lets you design an atlas with multiple coincident objects or links at any level. A typical use would be to avoid the confusion in an atlas with many possible base layers. Using multiple links, the visitor can be asked to choose the appropriate base layer when that level is navigated to. A newer use, principally in **TNTserver**, would be to present a list of URL links to other web sites that provide other local information about the selected point such as the weather, a webcam view, accommodations, and so on.

Spatial URL Links.

It can be time-consuming to link individual URLs to index areas. As a result, an additional extension of this URL concept was added to allow for spatial URLs. These are URLs derived from a database attached to a hidden or viewable layer. When in the InfoTips panel, the selected point is sent to the server. The attribute fields or a computed field can be used to provide the components of the URL. This is composited into a string expression that is sent to the client that presents one or more for your selection within the InfoTips panel. If any URLs are returned, a drop down list containing them automatically appears at the top. The URL can also come back associated with meaningful text names for use in this list, such as "Local Weather", "Download a DOQQ", "Order an Image", "Order a Map", "Restaurant List", and so on. Choose something from the list and "GO", and a new browser will be started and the specific URL request sent through it to that site. When you close that browser, you are back into the **TNTclient** ready for a new step.

Download a DOQQ.

URLs can have parameter strings attached to them that cause actions to occur when a site is visited. The URL you compose in your atlas with computed fields, regular fields, memo fields, and text inserts can actually place an order or cause other specific results at a site.

This feature was refined so recently that it is not yet used in the MERLIN atlas or illustrated elsewhere. However, you can try it out in the latest version of the Nebraska Statewide atlas. This is a single-level atlas. Simply choose the InfoTips panel. Select any point in the view in Nebraska. When the InfoTips appear, you will see a drop down panel at the top giving you a choice of sites, the first of which is going to weather.com to get the current weather forecast for that specific area. These geographically specific local weather URLs are derived from a hidden polygon map of the U.S. postal zip code boundaries of Nebraska. Four additional choices appear, designated for the 7.5' Palmyra quadrangle as DOQ for Palmyra, NE part; DOQ for Palmyra, NW part; DOQ for Palmyra, SW part; and DOQ for Palmyra, SE part. Choosing any one of these will specify that you want to actually go to the site of the Nebraska Natural Resources Commission and immediately begin to download that specific Digital Orthophoto Quarter Quad (DOQQ) for the area viewed. These geographically specific DOQQ URLs are derived from a hidden vector layer containing polygons of all 7.5 minute map quadrangle boundaries of Nebraska.

Watermarks.

TNTserver now provides an option to embed a "logo" image into every view generated by each layout. Watermarks can be used to convey the origin of a view and its creator. Unless deliberately cropped out, it will appear in any screen capture of the view when it is inserted into a presentation product such as PowerPoint, a report preparation product, or a snapshot print. This logo image must be a 24-bit **TNT** RGB raster object. An 8-bit mask in a raster object can be specified for transparency effects. Any NULL values in the raster object containing the logo image are treated as fully transparent.

Control Panel.

A control panel applet has been created for use by the site manager to facilitate management of **TNTserver**. This control panel is used to set **TNTserver** parameters for its operation, including logo insertion, logging, threads, image management, and connection parameters. See the description of the administrative controls this panel provides in the on-line documentation at www.microimages.com/atlasserver/serverad-min.htm.

Site Logs.

TNTserver now generates statistics logs for its use in a format for detailed analysis in other programs. The report is in CSV (Comma Separated Values) format. The documentation for the format is available on-line at atlas.microimages.com in the **TNTserver** administration documentation file. The web site manager can use a spread sheet to import these files and then provide reports and graphs for the use of **TNTserver** for any interval desired. For example, these log files keep track of the use patterns of each user of the atlas. Each visitor is assigned a number when they first start a session. The **TNTclient** stores that number. As long as they keep the **TNTclient** window open, their activities will be recorded in these log files, including which objects and tools they use—in other words, a profile of each request they send from the client to the server.

Choose the Right Server for Your Job.

Make sure you choose the right kind of server for your anticipated on-line geospatial activity. Do you need one that manages and provides access to huge amounts of geospatial data? Does it have to efficiently analyze this geospatial data and provide results that can be understood by the first time user?

The Cadastral/Marketing Approach.

If your client's definition of on-line GIS is to enter a name and then view a stick map of that party's property and its description, then this kind of simple application can be added to **TNTserver**. However, outside the United States, this kind of cadastral information usually does not exist. If it does, its access is restricted. Even inside the United States, with the known exception of Maryland, this kind of information, if digitized, is in the individual possession of each city and county government. This land ownership geodata is not available statewide.

The "Where Am I?" Approach.

The design of the **TNTserver** is to focus first upon enterprise, institutional, cooperative, and similar applications—those that by their very nature require unique geoinformational systems employing geodata of all types. Since such systems will usually contain images, they can be huge. They will often be accessed by requests for information based upon observing the currently displayed map or image and choosing a point of further interest in it.

Earthquake Risk Example Atlas.

A good example of this kind of situation is the sample earthquake risk atlas being assembled by the European Commission's SNAP Project. It is illustrated in the attached color plate entitled Earthquake Risk Analysis and can be explored at snapweb.org. This is just their initial test step, but it clearly indicates the kind of application suitable for those visitors who want to start with an overview of an area. Next, they want to examine more detailed maps, information, and their combinations, all of which might dynamically change at any moment.

Clearly prepared geospatial data and its wide-spread use and analysis can play a major role in this task. Careful geospatial planning and timely availability of special maps and images for rapid relief action can reduce the massive costs in lives and economic resources caused by earthquakes. Just a few obvious application areas are in nationwide seismic risk assessment, zoning, planning for damage mitigation, immediate updating of maps in the areas of events, providing access to pre- and post-event images, post-event response coordination, and so on.

This is typical of an activity that requires many individuals at many locations to have ready access to this kind of geospatial site and tools. However, it does not require that an individual be able to enter his name and view information about his property! At this point, it appears impossible to use the GIS engines of others to quickly implement these kinds of results at all, let alone by simply assembling a **TNTatlas**. If we are truly going to provide geospatial analysis in such beneficial applications, then we are going to have to look beyond, and convince others to look beyond, simple on-line GIS applications.

TNTclient™ and TNTbrowser™

You can now use **TNTclient** and **TNTbrowser** to access your own atlas.

Pick the Right One.

The terms used to describe this rapidly evolving product have and will continue to change. MicroImages refers to you as its clients. Those working with servers refer to the external request programs—things like **MI/X**—as coming from a client. The Internet community uses the word client for such things as downloaded plugins, like **TNTclient**, **TNTbrowser**, and whatever comes next. All this is confusing.

For the present, **TNTclient** refers to the Java program that is automatically downloaded and started up from your browser when you select a site using a **TNTserver**. Depending upon the browser you are using, **TNTclient** may or may not be automatically cached in memory or on your hard drive. If it is, when you connect to a **TNTserver** and atlas again with your browser, it will be automatically loaded and used. This will reduce your connection time to an atlas to a few seconds. Unfortunately, whether or not caching is available and how it operates depend on many things. The specific level of the browser you are using may or may not support caching (for example, caching does not occur on the Mac). Furthermore, the assets of your computer (for example, memory) and how you have set up your browser (drive space or time limits used for caching) will determine if the **TNTclient** is still in your cache.

TNTbrowser was formerly referred to as the “stand-alone version” of the **TNTclient**. It is a complete Java program that you can obtain, keep on your hard drive, and start up at any time as a task. It does not start any browser and can connect over a network and use an atlas on a **TNTserver**. At the present time, **TNTbrowser** and **TNTclient** provide the same interface and tools when connected to the same **TNTserver** and atlas.

TNTbrowser provides an alternative to the requirement for frequent or constant downloading of the **TNTclient**. It should be used by those who know they will be periodically using an atlas. Since **TNTbrowser** is not a general purpose browser, it will not provide other web browser functions. One noticeable difference from **TNTclient** is that the **TNTbrowser** can provide a list of various atlases for connection. These atlases may be anywhere on the network. **TNTbrowser** is downloaded with this list so that it can automatically connect with the atlases at atlas.microimages.com. Atlases at other sites can also be directly connected via this locally maintained list. At the moment, MicroImages has links to all other public **TNTservers**, so the current list provided with the download of **TNTbrowser** contains the addresses of the other known public atlases.

Most of the Java code used in the **TNTbrowser** is the same as that in **TNTclient**, but the packaging is different. When **TNTbrowser** is downloaded, it is combined and integrated with a suitable web engine, since **TNTbrowser** is complete and will not use anything provided by the browser. As a result, the time needed to download the **TNTbrowser** is about twice as long as the average time for a download of the **TNTclient**.

Foolish External Restrictions on Appearance.

Due to the legal entanglements of Microsoft with the U.S. Justice Department and with Sun in particular, many innovative interface components used in all the other **TNT** products cannot be used yet in the **TNTclient**. Only Java 1 is widely available to install with Microsoft Explorer, Netscape Navigator, and others. Java 2, provided free by Sun and others, does provide many advancements. If Java 2 were used for the development of a **TNTclient** or **TNTbrowser**, it would be faster to download, faster to use, and provide many more new and useful features.

Some version of Java 1 is directly available as part of almost any visitor's current browser installation. Java 2 would require the download of about 11 MB of additional code. While this could be done automatically by the **TNTserver's** web site, it is obviously not a practical way to serve first-time and many casual visitors to an on-line, public atlas. Where institutional situations can insure that Java 2 is installed, a much more sophisticated client could be more easily created (many more tool libraries available) with more features and a fancier interface (many more graphical libraries available). Alas, we must all work in a computer world of the possible as defined by the whims of the Justice Department, the competitive nature of capitalism, the bandwidth of the modem, and other resolvable restrictions.

New Features.

Since you can now build and publish an atlas at atlas.microimages.com, you will need to be kept informed of new features **TNTserver** contains. The best way to see how these features work is to get on the Internet and try them. If you do not yet have 56K access to the Internet, then you can review the printed instructions on how to use the **TNTclient/TNTbrowser**. These instructions contain illustrations showing many of these new features. A color printed copy of these instructions is included in the MicroImages MEMO entitled Announcing **TNTserver™ 2.0**: How **TNTserver** Works with MERLIN dated 1 May 2000. The technical discussion of the new features added to these viewers since the release of **V6.20** of the **TNT** products follows.

Layer Control Panel.

A new Layer Control panel was added for selecting the layers requested for the next view of the atlas. It looks familiar and functions much like the LegendView display option in your other **TNT** products. It gives you access to the tree-like structure provided by the current level of the atlas being viewed. With it, the visibility of each group or layer can be turned off and on using the associated checkbox. By toggling the file folder icon in front of them, groups can be opened to show or closed to hide their layer lists. When a layer is turned on (in other words, checked) to be used in the next view, its graphical symbolism will be exposed. This will help you decide if you want to use the layer and provides a convenient legend for the new view.

Additional functions are available for the levels, groups, and layers presented in this panel. Simply use the mouse to select level, group, or layer name and a pop-in window will appear, presenting a list of actions that might be performed. The actions provided for a level are show, hide, expand, or collapse all groups in that level. The actions provided for a group are to show or hide all layers and to immediately zoom the view to the extents of the group. The actions provided for a layer are to immediately pop in a window with the metadata for that layer or immediately zoom to the extent of that layer. Extensive metadata is available for some layers in the MERLIN atlas if you want to see how this works.

Legend Panel.

This new Legend panel provides a familiar legend that is simple to understand. It provides no controls. Toggle back to the Layer Control panel to alter the contents of the view as needed.

The LegendView panel is useful if you are working with an atlas containing many layers and a complicated Layer Control Panel. When you achieve the view you want, you can switch to the LegendView panel. It will show a simple legend containing only those groups, layers, and symbolism appropriate for the view. This provides a combination of a legend and view that can be better understood by someone else who views this display as a printed version of it in a report.

A single-level atlas can be designed for easiest use so that no layer control panel is required or provided. The Nebraska Statewide atlas is something like this kind of design. In it, layers turn on and off according to scale that is in turn associated with the detail presented at that level. The Layer Control panel can be omitted in this kind of atlas and the Legend panel used to provide an attractive legend that changes with scale.

HelpTips.

The second line up from the bottom of the window provides help for each element in the interface when it is touched by a mouse. For example, if the cursor is over a layer's name, the HelpTip will tell the visitor to click on it to access its metadata. The color background of the HelpTip will vary according to the nature of the possible action. For example, after an icon is selected, the normal yellow background will change to pink, and the HelpTip line will indicate some further action.

Timing references are shown in this same line if a **TNTclient/TNTbrowser** is waiting for a first view, a new view, an InfoTip, or some other response from the **TNTserver**. A few seconds after the server responds, this line will again show a HelpTip if the cursor is over an interface component or show the times again whenever it is not.

TimeLines.

TimeLine information is computed by the **TNTserver** and displayed for each action that requires a trip to the **TNTserver**. Connecting time is how long it took the **TNTclient/TNTbrowser** to establish a connection to the **TNTserver**. Sending time is how long it took that request to travel to the **TNTserver**. Computing time is how long it took to process it. Receiving time is how long it took to move the results of the visitor's request, such as a new view, back to the browser. Receiving time does not include the time it takes the **TNTclient/TNTbrowser** program, on the visitor's computer, to execute the necessary actions to decompress, display, parse, or do whatever is required to locally complete the requested action. Usually, this is never more than 1 or 2 seconds.

This idea of telling the visitor where their time goes is very helpful in guiding them to the optimization of their browser, computer, modem, and their setup; the current competition on the network; the current performance of the **TNTserver** on an atlas, and so on. Why don't more sites provide such useful information?

Change Your Coordinate System.

There are currently 3 coordinate systems implemented: Latitude/Longitude, State Plane, and UTM. Other coordinate systems can be added upon request. If you have already been making **TNTatlases**, you know that just as in the other **TNT** products, your objects can be in various, mixed coordinate systems. The MERLIN on-line atlas uses

mixed coordinate objects. However, in preparing an atlas that will be used over and over on the network, it is best to convert all its objects to a single coordinate system that will make it respond somewhat faster via a **TNTserver**.

Regardless, the Internet visitor to your atlas can read out the coordinates of any point in these other coordinate systems. The icon in the lower right near the coordinate readout gets a pop-in window in which to change the coordinate display and its units. It is common to assemble an atlas in latitude/longitude. But, when it is used, it is common to set the coordinate readout in State Plane, UTM, or your national coordinate system.

Undo Views.

TNTclient/TNTbrowser now have the ability to keep information about your last 10 views and return to them. Use the icon provided for this action. The previous view is even kept in memory for instant recall. The other 9 views can be retrieved from the server via the list provided by the icon.

Invariably, you will zoom in too large a jump looking for details in the area of interest, and it will suddenly be "off the edge of the view". In other words, you missed the exact point of interest. The instant undo to the previous view will be very useful in this situation.

Redesigned Measurement Panel.

The Measurement panel was completely redesigned to provide more features in a simpler appearance. Please consult the illustrations in the MEMO entitled Announcing **TNTserver™ 2.0**: How **TNTserver** Works for MERLIN to review images illustrating these new features. Two changes deserve special mention here.

Measuring Large Features. You can now measure features that span several views at the selected scale. First, you measure the portion of the feature (for example, a stream) while zoomed in to the appropriate scale for detail. Add it to the Totals box in the panel. Then scroll the view using the arrows. Repeat this process until the total feature has been measured. This kind of tool shows that geospatial servers can provide an ever-increasing variety of on-screen photointerpretation procedures or specialized measurements such as how much of a stream is in various land use classes overlain as transparent polygons.

Rotating Measurement Box. A common application of the Nebraska Statewide atlas is to measure the agricultural fields common in the central United States. Using the polygon measurement tools, you can always trace a field's boundaries. For rectangular fields, it is easier and more accurate to use an elastic box tool. But, usually, rectangular fields on your images are not oriented so that field boundaries are parallel to the edge of your view. The elastic box can now be rotated as well as resized so that it can easily fit around any orientation of a rectangular field in the view.

Convenient Zooming.

Zooming is a critical function in a complex geospatial web site. It is very frustrating on simple GIS-based web sites to keep clicking and waiting for each new zoom-in. Finally, after many clicks, you get to where you want to go. **TNTserver** supports complex atlases and applications that by their very use require navigation to many locations. The zoom features must conveniently supply a means of getting where you want with few mouse clicks and delays. The 2 zoom icons in the latest **TNTclient/TNTserver** are our latest ideas on how to zoom the whole view at the center and zooming at a selected point in the screen. In either case, you can select the kind of zoom level you want to use.

The current zoom approach will permit the easy addition of other kinds of zoom options. In the current version, you can select an option to zoom the current level to 2 miles, fitting the minimum size of your view. Try this in the Nebraska Statewide Atlas. The orthophotos will automatically be in the view if you zoom with the 2 mile option. Furthermore, a zoom to 2 miles will insure that 1 section (a square mile) of agricultural land in the central U.S. will always be entirely within the view. If you are familiar with a county, this zoom option can be used to move from the statewide startup map to a specific section of land.

Adaptations of this kind of special zoom might be convenient in other settings and atlases. For example, a zoom to 15 minute map option would insure that a 7.5 minute map quadrangle was entirely in the view. If any other land unit is commonly used and widely viewed, it can become part of a zoom request.

Linking to Other Sites.

Using the **TNTserver** to link to other web sites was described in the **TNTserver** section above in detail. The **TNTclient/TNTbrowser** also required considerable alteration to parse (deconstruct) the InfoTip string sent to it to extract the URL, substitute its reference name, and present this in a usable fashion.

Identifying an Atlas.

Every **TNTclient/TNTbrowser** window now provides descriptive information in the window's title bar. It provides the atlas name, the server name, the date of **TNTclient/TNTbrowser**, and the date of **TNTserver** that provided that composite view or other update.

Controlling Functionality.

When using your own **TNTserver** or microimages.com, you can control which interface components are included in the **TNTclient** used with your atlas. You can hide or suppress icons and panels, set defaults for measurement units and coordinate systems, and so on. For example, in a single-level atlas controlled by the scale of the objects used, the Layer Control Panel could be omitted and the Legend panel exposed by default. The Navigation icon could also be deleted, as it is not used. The measurement panel could also be omitted. The interface for this atlas would be simpler, as it does not include features for applications it will not serve.

Controlling Appearance.

Cosmetic elements can also be set up for each **TNTclient** and atlas combination. The color of the background in the view pane can be set, as it will show if your current view does not fill it. The order (left to right) of the icons can be set so that the most useful panel in your operation can be at the left, and that panel will be exposed first by default.

Localizing the Interface.

All the language components in the **TNTclient/TNTbrowser** are in files that can be localized. You will observe by using an atlas that there is not that much text involved, and thus it can be quickly translated in a few hours. Translated files are installed on the **TNTserver** platform for use with downloading by the **TNTbrowser** or for automatic downloading with the **TNTclient**. Many different languages can be served up for use with a single atlas. The visitor's browser or **TNTbrowser** will identify the language installed and in use by platform, and thus the proper language files will be returned and used.

TNTview[®] 6.3

Price Changes.

The price of **TNTview** for use on the UNIX platform is reduced to match the prices of this product on the Mac, Windows, and LINUX platforms. **TNTview** is a very useful tool on existing UNIX installations that have lots of capacity to run many **TNTview** floating licenses to access and use geodata on centrally located file servers.

Inherited New Features.

The following general improvements in all the **TNT** product operations automatically were added to **TNTview**. These improvements are detailed below in the major section on New Features for **TNTmips** and include:

- unlimited display resolution
- unlimited support of monitors
- free training as part of the **TNTmips** introductory training
- improved network access to object
- thumbnail views to preview objects before selection
- create tables and records in sketching tools
- create layouts from templates
- import HDF imagery
- much faster use of ODBC-linked tables
- faster operation of TableView
- translation into 6 new languages
- free peripheral support where applicable

New Features.

Several of the general changes to all the **TNT** products are detailed here, as they are particularly important additions for users of **TNTview 6.3**.

*Thumbnail Views of Objects.

A “preview” thumbnail view of any spatial object (raster, vector, CAD, TIN, region, and so on) is now available during selection in all processes supporting geospatial display. A thumbnail view is a small view of the object displayed immediately when you highlight the name of any object in the Select Objects Window and have the Preview tabbed panel selected. Previewing objects permits you to browse a list of new, unfamiliar, or forgotten objects where the name and description are insufficient to determine which object is desired. Using a button in the Preview tabbed panel, you can toggle between automatically showing a thumbnail view for each new highlight or a manual change of the thumbnail view on demand. Toggle into the manual mode if you know the object is a large vector object that requires some time to create its thumbnail. A portion of a color plate entitled Thumbnail Preview in Object Selection illustrates the appearance of the thumbnail view and how it can assist in object identification and selection.

*Customizing.

Microlmages continues to strive to make the **TNT** products support the complete spectrum of needs of all our clients by adding more features to each **TNT** product. This requires user interface changes that provide all the features, but simplify the interface for a new user, or allow customization for a user with a limited but repetitive task. The challenge is to accomplish these objectives while releasing reliable products across multiple platforms. It is not possible to simply delete specialized features out of **TNTmips** except as whole processes, as was done to provide **TNTview** and **TNTedit**.

It is possible to customize many of the menus and toolbars within the spatial display process in the **TNT** products by turning off unwanted or infrequently-used choices. The attached color plate entitled Customizing Menus and Toolbars illustrates how the control panel provided at Options/Customize can be used to simplify aspects of a **TNT** product’s interface. Using a simple graphical dialog, you can now shut off icons in the toolbar, object types in the selection lists, and so on. The next time you access the display process, these items will no longer appear in its interface. Drive space for programs is no longer a premium, so this does not delete anything from that **TNT** product. As a result, these hidden features can be restored at any time using the same Customize dialog or by restoring the product to the “factory default” to turn all features back on.

An illustration of the use of customization might be to provide fewer choices of the raster types that can be selected. From the factory default condition, you see a long list of raster types whose support is required in a comprehensive product. You decide that you or your client will never need access to rasters stored in most of these data types. If this is the case, as in the example in the attached color plate, simply select the Customize window from the Options menu. Use it to shut off all but the 3 raster types of interest to you: Quick-Add Single, Add RGB rasters, and Add TIFF. When you next open the dialog to select a raster, you will see only the options to select from these 3 raster types.

Modifications Since V6.30 CDs.

Large, cheap hard drive space, large low-cost images, offline CDR and DVD storage, large file server access, and related developments of the last year encourage **TNTmips** users to store and manage many, many objects. Years ago, the original design of the Project File took this scenario into account as one of its principal objectives. Systems that do not offer the organizational discipline of the Project File are suddenly ending up with tens of thousands of scattered individual files to manage for a single project.

Efficient management and use of your ever-increasing number of objects and Project Files now require new **TNT** tools. The new thumbnail view permits quick inspection of individual objects. The next logical tool for object management is one with which to preview all the objects in a Project File. This is now available as a Preview window that you open to view a matrix of thumbnail views for all the objects in a Project File. If there are too many to see in the window, you can scroll its contents.

Your early requests for a Preview window started way back with the introduction of the Project File because of the unique **TNT** approach it provides for management and selection of geospatial objects. This kind of fast preview of raster objects did not present a special problem once automatic pyramiding was introduced into the **TNT** products. Image pyramids contain a small image from which a thumbnail view could be very rapidly computed. However, implementation of a Preview window has been handicapped by the requirement to keep these small views current with the changes you might make in large vector and CAD objects that are not pyramided.

Another serious handicap was the Preview window's requirements for computer power and display area, which were limited by your hardware and Microlimages' previous licenses. The computer power and drive space are now on your desktop. Couple this with the larger display area and dual monitors supported for most existing **TNTmips 6.3** licenses and all new licenses, and this new Preview window is practical. With every object, it creates and stores a revised thumbnail subobject each time the object is changed and displayed for some purpose. Microlimages has completed the prototype of this Preview window. You can download it now for beta testing and provide feedback to improve its design before its formal release in **V6.40**.

Upgrading.

If you did not order **V6.30** of **TNTview** and wish to do so now, please contact Microlimages by FAX, phone, or email to arrange to purchase this upgrade or annual maintenance. Entering an authorization code when running the installation process allows you to complete the installation and immediately start to use **TNTview 6.3** and the other **TNT** professional products it provides to you.

If you do not have annual maintenance for **TNTview**, you can upgrade to **V6.30** via the elective upgrade plan at the cost in the tables below. Please remember that new features have been added to **TNTview** with each new release. Thus, the older your current version of **TNTview** relative to **V6.30**, the higher your upgrade cost will be.

Within the NAFTA point-of-use area (Canada, U.S., and Mexico) and with shipping by UPS ground. (+50/each means \$50 for each additional upgrade increment.)

<u>TNTview Product</u>	<u>Price to upgrade from TNTview:</u>					<u>V5.70</u>
	V6.20	V6.10	V6.00	V5.90	V5.80	and earlier
Windows/Mac/LINUX	\$175	275	400	500	555	+50/each
DEC/Alpha via NT	\$250	350	500	600	700	+50/each
UNIX single user	\$300	475	600	675	725	+50/each

For a point-of-use in all other nations with shipping by air express. (+50/each means \$50 for each additional upgrade increment.)

<u>TNTview Product</u>	<u>Price to upgrade from TNTview:</u>					<u>V5.70</u>
	V6.20	V6.10	V6.00	V5.90	V5.80	and earlier
Windows/Mac/LINUX	\$240	365	465	545	605	+50/each

DEC/Alpha via NT	\$300	450	550	650	750	+50/each
UNIX single user	\$350	550	700	800	850	+50/each

Installed Sizes.

Loading **TNTview 6.3** processes onto your hard drive (exclusive of any other products, data sets, illustrations, Word files, and so on) requires the following storage space in megabytes.

	<u>for V6.20</u>	<u>for V6.30</u>
PC using W95, W98, NT, or W2000	30 MB*	31 MB*
PC using LINUX (with Intel) kernel 2.0.36	25 MB	25 MB
Mac using MacOS 8.x or 9.x	44 MB**	46 MB**
SGI workstation via IRIX	31 MB	29 MB
Sun workstation via Solaris 2.x	26 MB	27 MB
IBM workstation via AIX 4.x (with PPC)	29 MB	30 MB
COMPAQ/DEC workstation via NT (with Alpha)	29 MB	31 MB
COMPAQ/DEC workstation via Tru64 UNIX (with Alpha)	30 MB	32 MB

* W95, W98, NT, or W2000 installed size also includes the native **SML 6.3** interpreter for Windows.

** The Mac installed size includes the JAPAN1.OF font of 10.4 MB, which is automatically installed. Delete this font if you do not require the use of Japanese.

TNTedit™ 6.3

Price Changes.

There is now a drastic 50% reduction in the price of **TNTedit** for UNIX platforms to match the prices for using this product on a Mac, Windows, or LINUX platform. For example, a single-user/single-platform license for **TNTedit** for UNIX is \$3000/NAFTA and \$3600/international. Please see the section below on **Price Changes** for the details.

Many organizations using ARC/INFO have idle capacity on their UNIX platforms, especially as they migrate to its NT version. What better way to use this idle workstation capacity than by adding low-cost licenses to **TNTedit**. At this new low price, **TNTedit** is especially attractive to edit and update existing E00 or shapefiles over new images.

Inherited New Features.

The following general improvements in all the **TNT** product operations were automatically added to **TNTedit**. These improvements are detailed below in the major section on New Features for **TNTmips** and include:

- unlimited display resolution
- unlimited support of monitors
- free training as part of the **TNTmips** introductory training
- improved network access to object
- thumbnail views to preview objects before selection
- create tables and records in sketching tools
- create layouts from templates
- import HDF imagery
- much faster use of ODBC-linked tables
- faster operation of TableView
- new join operation for database table objects
- translation into 6 new languages

- free peripheral support

New Features.

The following new features were made specifically to improve this product and its use in **TNTmips**.

***Creating New Rasters.**

The Raster Creation window now provides a report of the size of the raster you are defining. It now also provides options for default or base cell value. You will usually use this to fill the entire raster object with your null value or some other base value when you are creating an empty raster to edit.

Raster editing is often used to manually prepare an overlay to use as a mask or other purpose in some other raster operation such as viewing or classification. Previously, you had to use processes outside of raster edit to prepare the new, empty raster that matched the existing target rasters. Now, you can select a "template" raster object, and the new raster created will automatically have its cell size, total size, extent, scale, and georeferencing. In other words, after editing, the new raster will be immediately ready for use with the raster object(s) that were selected as the template.

Creating and editing 16-bit color mapped rasters is now available. This is especially useful with new image data sets with more dynamic range, such as some IKONOS images.

Managing Colors.

When you select a color that does not exist in the color map, the editor will now add a new color if possible. You may choose some imported or other raster in which all the colors are assigned. If all of the available colors are allocated, you will be notified that the color cannot be stored, and the "closest" color in the color map will be substituted to approximate the requested color.

Utility Changes.

Status is shown in raster operations that will take a long time, such as creating and copying a raster and the operation of flood filling large polygons.

A cancel button has now been added to all raster tools.

Polygons with 3 to 45 equal sides can now be drawn and filled.

Vector Filters.

The filter that removes sliver polygons no longer combines the attributes from the deleted sliver polygon with those of its neighbor. These records now become unattached and can be dealt with as you choose: forgotten, removed, or edited.

The filters to remove bubble polygons and to remove islands now have an option to define whether or not to combine attributes with their parent or neighbor polygon.

Upgrading.

If you did not order **V6.30** of **TNTedit** and wish to do so now, please contact MicroImages by FAX, phone, or email to arrange to purchase this upgrade or annual maintenance. Entering an authorization code when running the installation process allows you to complete the installation and immediately start to use **TNTedit 6.3** and the other **TNT** professional products it provides to you.

If you do not have annual maintenance for **TNTedit**, you can upgrade to **V6.30** via the elective upgrade plan at the cost in the tables below. Please remember that new features have been added to **TNTedit** with each new release. Thus, the older your current version of **TNTedit** relative to **V6.30**, the higher your upgrade cost will be.

Within the NAFTA point-of-use area (Canada, U.S., and Mexico) and with shipping by UPS ground. (+50/each means \$50 for each additional upgrade increment.)

<u>TNTedit Product</u>	<u>Price to upgrade from TNTedit:</u>					<u>V5.70</u>
	V6.20	V6.10	V6.00	V5.90	V5.80	and earlier
Windows/Mac/LINUX	\$350	550	700	800	875	+50/each
DEC/Alpha using NT	\$500	750	950	1100	1200	+50/each
UNIX single user	\$650	1000	1350	1600	1750	+50/each

For a point-of-use in all other nations with shipping by air express. (+50/each means \$50 for each additional upgrade increment.)

<u>TNTedit Product</u>	<u>Price to upgrade from TNTedit:</u>					<u>V5.70</u>
	V6.20	V6.10	V6.00	V5.90	V5.80	and earlier
Windows/Mac/LINUX	\$500	750	950	1100	1200	+50/each
DEC/Alpha using NT	\$600	900	1150	1400	1500	+50/each
UNIX single user	\$750	1200	1550	1850	2000	+50/each

Installed Sizes.

Loading **TNTedit 6.3** processes onto your hard drive (exclusive of any other products, data sets, illustrations, Word files, and so on) requires the following storage space in megabytes.

	<u>for V6.20</u>	<u>for V6.30</u>
PC using W95, W98, NT, or W2000	47 MB*	48 MB*
PC using LINUX (with Intel) kernel 2.0.36	45 MB	45 MB*
Mac using MacOS 8.x or 9.x	55 MB**	57 MB
SGI workstation via IRIX	62 MB	54 MB
Sun workstation via Solaris 2.x	46 MB	48 MB
IBM workstation via AIX 4.x (with PPC)	56 MB	60 MB
COMPAQ/DEC workstation via NT (with Alpha)	50 MB	52 MB
COMPAQDEC workstation via Tru64 UNIX (with Alpha)	59 MB	65 MB

* W95, W98, NT, and W2000 installation size also includes the native **SML 6.3** interpreter for Windows.

** The Mac installed size includes the JAPAN1.OF font of 10.4 MB, which is automatically installed. Delete this font if you do not require the use of Japanese.

Free Training

During 2000, MicroImages is offering 4 free, scheduled, week-long, introductory training sessions in the use of **TNTmips**.

You can find out more about this free training and sign up for it at <http://www.micro-images.com/announce/freetrain.htm>.

Why Provide It?

Based upon the advanced mailing offering free introductory training in the use of **TNTmips** during the year 2000, MicroImages has already been asked, "Why are you doing this? After all, your competition makes a profit from selling expensive training?"

The obvious answer is that they have the market and MicroImages does not. However, most who have taken the time to examine or use **TNTmips** will agree that it is the most comprehensive product available today for geospatial analysis. Unfortunately, as a result, many of the powerful tools it provides are underutilized. This is often the case when someone first starts to use it for geospatial analysis. Often they have been exposed to or used a popular GIS or IPS product. These are not complete products for geospatial analysis. You, your staff, or your client's previous experience with them immediately limits insight into how to use **TNTmips** for geospatial analysis.

Why Not Use the Tutorials?

Perhaps you feel that you are not getting anywhere near what you could from your **TNTmips** product? You have no previous experience in geospatial analysis? Your previous experience was with some other cumbersome suite of GIS or IPS products? You may not be able to require that your existing staff members spend the 4 to 6 weeks to go through the GSB exercises, monitor them to see that they are capable of this, and quiz them to make sure they complete this assignment with the seriousness you intend. MicroImages realizes that this is not a viable approach in situations where you, or they, are not new hires. It is also the case in organizations where the potential users are only voluntarily going to add geospatial analysis to their technical skills. This is especially pertinent in organizations using floating **TNTmips** licenses that could and should be widely accessed by the professional staff with many varied backgrounds.

A week of free training cannot provide the insight into the operation and application of **TNTmips** that can be achieved with a 4 to 6 week rigorous regime using the GSBs. But, introductory training may be more appropriate for busy people and for those who find it easier or more convenient to be taught than to use self-paced learning. It will be emphasized throughout this introductory training that after its completion, those who attend can continue to expand their detailed knowledge of **TNTmips** using the GSBs. Furthermore, attendees will get their own **TNTlite** CD and the GSBs so that they can continue their experimentation with, and learning of, **TNTmips** anytime and anywhere! One goal of the training will be in part to inspire them to do this as the **TNTmips** products continue to grow and evolve.

Need Advanced Training or Consulting?

It is important to emphasize that what MicrolImages is offering *FREE* is ***introductory training***. It will be given according to a prepared program based upon what MicrolImages feels are the most important skills that need to be acquired by a beginning user with no previous experience. Those already using **TNTmips** who feel that they can benefit from this list of topics are welcome. However, topics of special interest to an experienced user will not be dealt with as part of this training.

Some of you would benefit from advanced training or consulting that can be purchased from MicrolImages in Lincoln or at your site. The prices for this kind of one-on-one or group training/consulting remain the same per-day charge. MicrolImages' staff has been at the business of defining and creating geospatial analysis for many years. You define the topics, MicrolImages supplies the experience. Consider consulting with MicrolImages about the use of your new or existing **TNT** product on a new project. Remember, we control all the **TNT** software, and it can be directly and immediately modified if it helps you get the job done. It has been our experience that when such direct help is purchased, it leads directly to the completion of the project at less cost, often exceeds project requirements and timelines, and provides changes and ideas for **TNT** software modifications useful to all.

Training in Your Language?

Anyone from anywhere is welcome to attend the *FREE* introductory **TNTmips** training, even those who have not yet decided to buy it. However, many **TNTmips** systems are used outside the United States with an interface in some other language and by a client who does not know English. Even those who use **TNTmips** in nations that speak English may find it too expensive to travel to this *FREE* training. MicrolImages' Authorized Dealers all operate the **TNTmips** product, and most will provide local, in-country, in-language training at a reasonable price. Not only can this training be in your language, but it will also be tailored to relate to the geospatial analysis problems of particular interest to your nation, industry, or cultural norms. Contact your dealer for information about their scheduled training or for a quote for custom training.

QuickGuides

What are They?

The tutorial Getting Started Booklets (GSBs) are now current with each new release of the **TNT** products. If used, they provide step-by-step exercises to teach you how a **TNT** process operates by working you through an example of a typical application. However, **TNTmips**, **TNTedit**, and **TNTview** have so many varied features that you may not discover or remember some of their important labor saving tricks or features that enhance applications and results. You need some means by which the existence and operation of these features, often unique to the **TNT** products, are easily remembered and reviewed. The first Quick Guides (QGs) are being introduced with **V6.30** for this purpose.

How Did They Come About?

MicrolImages only recently recognized the need for constant reminders about these important, but not always obvious, labor saving tricks. Because of the delays in this release due to our move, it was possible for some to step back and "see the forest rather than the trees". Several different observations pointed out the need for these QGs:

- a client who had been using **TNTmips** for over 10 years was not using geolocking where it was needed
- several experienced clients attending the Annual Advanced Users' Workshop were not aware of useful shortcuts
- confusion in how to use transparency in printing was reported several times over the past months
- the value of dual monitors does not seem to be understood, and so on.

The fact that geolocking was not used caused MicroImages to create a single Quick-Guide to promote its use. Upon examination of the instructions on this sheet, it was determined that part of the problem was in the multiple steps needed to turn it on when georeferenced materials were available. Most of you have evolved with the **TNT** products to the point where you are using georeferenced objects. As a result, it is logical to automatically turn on geolocking by default when you have 2 or more windows open that contain a georeferenced object with any overlap in their geointents. You now must turn off this default condition if you do not wish to use geolocking for some reason. This is now the way geolocking operates in **V6.30**, and the enclosed QG was rewritten to match this improved and much more obvious tool.

What is Available?

Our critical reviews led to a list of several other obvious places where a QG would be helpful to you. This yielded 10 printed QGs enclosed with the **V6.30** release materials on the topics of:

- Using Dual Monitors
- GeoLocking Multiple Views
- Display Transparency
- View-in-View
- 3D Views Assist when Editing
- MultiLine DataTips
- Symbols from TrueType Fonts
- Save/Open Multiple Views
- Incorporate 3D in Your Posters
- Geospatial Formulas

Our list contains several more QGs that will be created and posted on microimages.com.

Please **POST** these QuickGuides on the wall around the **TNT** station so that everyone using it always has immediate access to these labor saving tricks.

Alas, the kind of feedback achieved for the improvement of the way geolocking operates was not immediately obvious or easily added to other actions due to necessary restraints in the use of a tool, the structure of the process providing it, or it was already easy to use.

How To Get More?

Those who have obtained or been involved with the purchase of a **TNT** product since **V6.20** was shipped know that it now comes with notebooks containing color printed versions of the appropriate GSBs. When you buy a new **V6.30 TNT** product, you will receive these notebooks with GSBs concurrent with **V6.30**. For example, **TNTmips** now ships with 2 notebooks containing 52 GSBs (1100 pages, 2526 color illustrations). The QGs are included as cardstock divider inserts in these notebooks.

The enclosed QGs are provided to catch you up. New and updated QGs modified to be concurrent with **TNT** changes will be posted, just as with the Getting Started Booklets,

on microimages.com. You will need to keep these printed QGs handy or download and print your own expanded series. It is likely that any additional new QGs will be printed and provided to you with your **V6.40** upgrade kit.

Getting Started Booklets

Training Microlimages' New Staff!

All new Microlimages employees in any position are required to go through all the Getting Started Booklet exercises before starting their regular duties. Microlimages believes that every employee should have an understanding of the products it creates, sells, and supports! For example, new software engineers who go through the GSBs will understand the objectives of the **TNT** products, how they work, what they might be used for, and how their results must integrate into the whole. Before the GSBs were available for this purpose, it could take as much as 2 years for a new software engineer to get even a reasonable part of this kind of overview. After all, they are not specialists in creating geospatial software when hired.

Several new software engineers have been hired since **V6.20** was released, as well as 1 additional software support specialist. All 5 new employees went through all the GSBs before assuming their regular duties. As a result, they were immediately better prepared to integrate their skills into their day-to-day tasks. But, during this self-guided training, they were required to report all errors in either the **TNT** software or the GSB text and sample geodata sets. This improved the quality of the release of **V6.30**. It has further verified over and over, that if left alone, it takes 4 to 6 weeks to train oneself in the use of **TNTmips** if you have reasonable science background and experience in the use of computers.

New Booklets Available.

All GSBs were updated to reflect the changes that were made in **V6.30** of the **TNT** products. It is important that you install all these new GSBs with your new **V6.30 TNT** product. As part of these modifications, several additional pages were added to the following 7 booklets to cover new features and accommodate other new examples:

- Displaying Geospatial Data
- Using Geospatial Formulas
- Managing Relational Databases
- Building and Using Queries
- 3D Perspective Visualization
- Managing Geoattributes
- Constructing a HyperIndex

One new GSB is being released for the first time with **TNT V6.30**:

- Modeling Watersheds and Land Surfaces

Two new, important GSBs are about 50% complete at this time:

- how to effectively integrate and use GPS with all the **TNT** products
- the setup and management of network licenses (floating licenses)

Other GSB-type booklets have been worked on for possible future release on the topics of:

- an introduction to remote sensing
- an overview of MERLIN as an enterprise-wide use of all of the **TNT** products
- application of geospatial tools for hazard analysis

How to Get All Booklets?

The **TNT** collection of GSBs now contains 52 booklets. Those who buy a **TNTmips** product receive 2 6" by 9" desktop reference notebooks containing all the available color GSBs and QuickGuides matching the version currently shipping. The GSB desktop reference notebooks shipped with a new **TNTmips 6.3** contain 1100 pages, 2526 color illustrations, and use 166 megabytes of **TNTlite**-sized sample geodata sets. New orders for **TNTedit** and **TNTview** are shipped with a single notebook containing an appropriate subset of these same GSBs.

Your **V6.30 TNT** CD contains the electronic versions of the same GSBs in PDF format for direct use from within your **TNT** product or printing in color.

All the **V6.30** booklets, any updated booklets, and any new booklets can be downloaded in either Adobe Acrobat Reader PDF or PageMaker format from <http://www.microimages.com/getstart/>. Beginning with the release of **V6.30**, 3 different sets of GSBs will be maintained at microimages.com and accessible through this URL. All will be available in the same 2 Adobe formats.

Official Release Versions. The first collection will be the unaltered copies released with **V6.30**. Use only this set, which is the same as those you have on your CD, if you have not patched your **TNT** product since installing **V6.30** from your CD (this is referred to as the official release).

Updated Versions. The second collection will contain only those GSBs provided by the official release that have been corrected for significant errors or upgraded to match software changes since the **V6.30** CD. You may wish to obtain these modified GSBs if you are updating your product for new features or error correction between the official semester intervals of official releases on CD.

New Booklets. The third area will provide the GSBs that are completely new since the last official **TNT** release was shipped on CD. These new GSBs will be released as current with the most recent developments in the **TNT** products, so they may contain some features and changes since the last official release was shipped on CD.

On-Line Reference Manual

V6.30 of the Reference Manual for the **TNT** products has 2526 single-spaced pages distributed as follows.

• Basic System Operations	198 pages	• Display	731 pages
• Edit	280 pages	• Process	1102 pages
• Support	97 pages	• Glossary	99 pages
• Appendix	19 pages		2526 total

The HTML version of the Reference Manual installs into 35 MB with the illustrations or into 7 MB without them. The Microsoft Word version of the Manual is 68 MB.

There is no printed, supplemental documentation for **V6.30** of the **TNT** products.

New TNT Features

Paragraphs or main sections preceded by this symbol “” introduce significant new processes or features in existing processes released for the first time in **TNTmips 6.3**.

System Level Changes.

File/Object Selection.

***Thumbnail Views of Objects.**

A “preview” thumbnail view of any spatial object (raster, vector, CAD, TIN, region, and so on) is now available during selection in all processes supporting geospatial display. A thumbnail view is a small view of the object displayed immediately when you highlight the name of any object in the Select Objects Window and have the Preview tabbed panel selected. Previewing objects permits you to browse a list of new, unfamiliar, or forgotten objects where the name and description are insufficient to determine which object is desired. Using a button in the Preview tabbed panel, you can toggle between automatically showing a thumbnail view for each new highlight or a manual change of the thumbnail view on demand. Toggle into the manual mode if you know the object is a large vector object that requires some time to create its thumbnail. A portion of a color plate entitled Thumbnail Preview in Object Selection illustrates the appearance of the thumbnail view and how it can assist in object identification and selection.

*** Modifications Since V6.30 CDs.**

Large, cheap hard drive space, large low-cost images, offline CDR and DVD storage, large file server access, and related developments of the last year encourage **TNTmips** users to store and manage many, many objects. Years ago, the original design of the Project File took this scenario into account as one of its principal objectives. Systems that do not offer the organizational discipline of the Project File are suddenly ending up with tens of thousands of scattered individual files to manage for a single project.

Efficient management and use of your ever-increasing number of objects and Project Files now require new **TNT** tools. The new thumbnail view permits quick inspection of individual objects. The next logical tool for object management is one with which to preview all the objects in a Project File. This is now available as a Preview window that you open to view a matrix of thumbnail views for all the objects in a Project File. If there are too many to see in the window, you can scroll its contents.

Your early requests for a Preview window started way back with the introduction of the Project File because of the unique **TNT** approach it provides for management and selection of geospatial objects. This kind of fast preview of raster objects did not present a special problem once automatic pyramiding was introduced into the **TNT** products. Image pyramids contain a small image from which a thumbnail view could be very rapidly computed. However, implementation of a Preview window has been handicapped by the requirement to keep these small views current with the changes you might make in large vector and CAD objects that are not pyramided.

Another serious handicap was the Preview window’s requirements for computer power and display area, which were limited by your hardware and Microlimages’ previous licenses. The computer power and drive space are now on your desktop. Couple this with the larger display area and dual monitors supported for most existing **TNTmips 6.3** licenses and all new licenses, and this new Preview window is practical. With every object, it creates and stores a revised thumbnail subobject each time the object is changed

and displayed for some purpose. MicrolImages has completed the prototype of this Preview window. You can download it now for beta testing and provide feedback to improve its design before its formal release in **V6.40**.

Object Control Using Tabbed Panels.

Group settings are being used more and more in layouts and related applications. The Group Settings dialogs have been redesigned to use tabbed panels to simplify their use. Projection and Clipping tabbed panels will show for use with a single group and Projection, Clipping, Layout, and Special tabs for use in a layout with other groups. A color plate entitled Tabbed Panels for Groups and Databases illustrates the simplification of these controls by the use of tabbed panels.

Object Network Access.

Your growing use of networks required modifications to better integrate them into the operations of the **TNT** products as Windows platforms evolve away from using drive letters of the DOS era (for example, A, B, C, ...). Project Files can now easily be many in number and scattered over drives and file servers on a network. Other factors also required these improvements, such as the introduction of floating licenses for the **TNT** products.

Network Neighborhood behavior is now supported in the **TNT** file and object selection dialogs and uses the Universal Naming Convention (UNC). It permits the selection of files and objects on other platforms in a Microsoft Windows 95/98/NT/2000 network. This feature is accessed from the "Go To..." icon to bring up the "Network" list of machines available to you on the network and their descriptions. Select a machine, and the list of network directory shares is listed. Select a share to see the list of directories and files under that share. It is no longer necessary to map drive letters to a specific share for the **TNT** products to access Project Files.

The file and object selection dialogs now also show you the entire network path to your selected Project File and object. A portion of a color plate entitled Universal Naming Convention (UNC) illustrates this aspect of the new support of network navigation features.

The **TNT** products now recognize and use the forward slash "/" and the trademark symbol "™" allowed in paths on the Mac platform. These characters were not allowed in paths used in **V6.20**.

Geospatial Display.

*Customizing.

MicrolImages continues to strive to make the **TNT** products support the complete spectrum of needs of all our clients by adding more features to each **TNT** product. This requires user interface changes that provide all the features, but simplify the interface for a new user, or allow customization for a user with a limited but repetitive task. The challenge is to accomplish these objectives while releasing reliable products across multiple platforms. It is not possible to simply delete specialized features out of **TNTmips** except as whole processes, as was done to provide **TNTview** and **TNTedit**.

It is possible to customize many of the menus and toolbars within the spatial display process in the **TNT** products by turning off unwanted or infrequently-used choices. The attached color plate entitled Customizing Menus and Toolbars illustrates how the control

panel provided at Options/Customize can be used to simplify aspects of a **TNT** product's interface. Using a simple graphical dialog, you can now shut off icons in the toolbar, object types in the selection lists, and so on. The next time you access the display process, these items will no longer appear in its interface. Drive space for programs is no longer a premium, so this does not delete anything from that **TNT** product. As a result, these hidden features can be restored at any time using the same Customize dialog or by restoring the product to the "factory default" to turn all features back on.

An illustration of the use of customization might be to provide fewer choices of the raster types that can be selected. From the factory default condition, you see a long list of raster types whose support is required in a comprehensive product. You decide that you or your client will never need access to rasters stored in most of these data types. If this is the case, as in the example in the attached color plate, simply select the Customize window from the Options menu. Use it to shut off all but the 3 raster types of interest to you: Quick-Add Single, Add RGB rasters, and Add TIFF. When you next open the dialog to select a raster, you will see only the options to select from these 3 raster types.

LegendViews.

As legends grow in importance in the **TNT** products, you need new features to improve how they are presented. These new legend features have been added for **V6.30**, and more are planned for future releases.

Hiding Layers.

You can now hide layers in a group so that they will not show in the layer list in a LegendView. This is the case when your group contains layers such as a grid, caption, scale bar, hidden layers used only in DataTips or InfoTips, multiple image layers, and other components. In this situation, you do not want the layer to clutter up the LegendView or you do not want the Control panel in **TNTclient** to be available to be accidentally shut off by your client.

If the layer list for a group is hidden on the Layout Controls dialog and the layout is saved, when the layout is next opened, the layer list will initially be hidden on the LegendView and in the **TNTclient**. For example, when you design an atlas, you can customize the default appearance of the LegendView and Layer Control panel in a complex layout by hiding layers for groups. An attached color plate entitled Simplifying Legends in Complex Layouts illustrates and provides more details about this new feature.

Redundant Element Styles.

In **V6.20**, if you assigned multiple element types in an object to the same drawing styles, the style would be repeated in the legend, once for each type. **V6.30** provides an option to automatically combine all similar entries in the layer's legend into 1 symbol and a list of the data types it represents. The attached color plate entitled Simplifying Legends in Complex Layouts illustrates how various road types assigned a single style can now be represented by a single entry in the legend for the layer.

Collapsing Legends.

The concept of a virtual mosaic is now used more and more in **TNTmips**, especially in the creation of HyperIndex stacks (atlases) or separate layouts for use with **TNTatlas** or **TNTserver**. It allows a layout to be built directly from a group that is managed as if it were a single layer. All the objects in the group have the same data types and symbolology, but the group contains many similar objects with a combined geographic coverage

that is larger (in other words, their combined extent is regional). For example, a group might contain 100s of DOQQ rasters required to cover a county or some other regional unit. These many rasters do not need to be mosaicked before use. There are advantages to keeping the raster objects in their original units, such as smaller objects to manage, easier replacement of a single DOQQ, reading only the needed smaller objects when zoomed in, and so on. Similarly, individual county TIGER data files can be treated as a virtual mosaic of vector objects. In **V6.20**, when the layout for such a group was selected for viewing in LegendView or from the **TNTserver**, it would present a complete, duplicate legend for each layer. **V6.30** provides you an option to “combine” the legend for all layers in a specified group into a single legend and to not show the list of layers in the LegendView.

This option may be used to simplify an atlas layout when all of the layers in a group are of the same data type and have similar legends. The attached color plate entitled Simplifying Legends in Complex Layouts illustrates how various road types assigned a single style can now be represented by a single entry in the legend for the layer.

*GeoToolbox.

The GeoToolbox “Sketch” tool now allows entry of attributes for new elements. Any desired number of fields may be defined in the associated attribute table and the corresponding record completed when each element is sketched.

In **TNTmips 6.2**, a feature was added that would cause a default table view to be opened when an element was highlighted via the selection or GeoToolbox tool. For experienced users, this may not be desired, so it is now possible to turn off this feature.

Import/Export.

Import Rasters.

HDF Import.

Rasters and scientific data can be imported from Hierarchical Data Format (HDF-EOS) version 4.1, release 3. This was added to provide import of Landsat TM images in this format. This format is a mess and makes things that are simple again complicated. MicrolImages recommends that you acquire your Landsat TM images in the FAST-L7A format. It will provide the same images and supporting information as HDF format but will be easier to use in **TNTmips** and other commercial products.

USGS encourages the use of the HDF format for Landsat 7 TM images. They provide lots of information in HDF besides the rasters in the form of database tables such as the georeference data. However, the format lacks any structures that link an image to its georeference information. These tables are also imported, but it is currently up to you to determine their association with the imagery. A feature will be implemented to automatically import and associate at least the georeference table to the appropriate rasters, but due to the lack of positive connecting information, its consistency cannot be guaranteed.

Another problem with this format is that it changes even though the Landsat images on your CD do not. MicrolImages’ initial import activities used HDF 5.0 libraries but had to be switched to HDF 4.1, release 3 to handle Landsat 7 images that clients and USGS supplied on sample CDs. We really do not need 1 more “public” format that is created by a government committee, tries to do everything, is complicated, changes periodically, and is not necessarily backward compatible with existing data in that format!

Sun Raster Import.

The Sun rasters used almost exclusively with Sun products can be imported. This is a simple image format that contains only 1 image per file and has no georeference information, but may contain different data types.

CDED Import.

Canadian Digital Elevation Data (CDED) can be imported.

IRS Import.

IRS1C and IRS1D images from the Indian satellite can be imported from the Super Structure (LGSOWG) format.

JERS.

JERS-1 satellite images from NASDA (Japanese space agency) can be imported.

PNG Import.

The PNG files commonly used to move graphic images around on the network and supported by browsers can be imported into rasters. These files have many useful properties, including transparency. PNG supports lossless compression required for line drawing and other graphics. It does not support lossy compression, as this degrades line-oriented graphics materials.

Export Raster.

GIF89A Raster Export.

GIF (Graphics Interchange Format) rasters used widely by HTML-based and other web sites for sending images to Internet browsers can now be exported, including transparency.

PNG Export.

The raster files can be exported in the PNG format for use in Internet applications.

Import Vector.

3D Shapefiles.

3D shapefiles can be imported into a CAD or vector object. When imported into a vector object, you may specify any of the 4 topologies supported in the **TNT** products.

Database Import.

Text Files.

Many of you are provided with attributes collected in simple ASCII text files with some rudimentary structure. This is a very common way to begin the assembly of rigorous geodata from ill-planned data collation operations or from a field operation or device. MicroImages frequently gets a file of such data and a request for help in reading it into a database table. The Import Database window in the **TNT** import process now contains an option to attempt to automatically import a structured text file into a database table.

This new "Determine From File ..." option will scan the text file and guess what the format is. It will try to determine if data is comma separated or in columns, field types, number of decimal places, number of fields, and other properties. After scanning the file, it opens the Text File Format dialog, which lists each proposed field and lets you modify its format. If the first line of the file contains field names, it will use them, and you

should delete the first record in the imported table that will also contain them. If it does not, you will have to name the fields yourself.

Modifications Since V6.30 CDs.

The following additional import and export capabilities have been added to the **TNT** products since the **V6.30** CDs were duplicated.

CGM Import.

ISO standard Computer Graphics Metafiles files can be imported as CAD objects.

JPEG Export.

Three separate raster objects can be selected as R, G, and B export to JPEG.

MapInfo TAB.

Work is underway to support the import and export of MapInfo's internal file formats to and from **TNT** CAD objects. It will then be determined if these formats can be directly supported in the CAD editing process in **TNTmips** and **TNTview**.

Layouts.

Clipping Attached Groups.

If a group is geographically attached to another group that itself uses specific clipping extents, the attached group will be clipped to the same extents. This enhances the geographic attachment by allowing a single base group to control the clipping.

*Using Templates.

A means of efficiently creating a series of maps, report foldouts, or color plates has been frequently requested. You are now able to create reusable "templates" for layouts. First, design your layout or open an existing layout. Once you have perfected the layout, use this new option to designate the groups that contain the fixed components of the map or plate that will not change. These would be things like common text, logo, north arrow, scale bars, and so on. Save the layout as a template. Certain layer types, such as map grids, will be automatically adjusted to any new location while retaining settings such as grid projection and interval. For example, map grids will automatically expand or contract to compensate for the convergence of the longitude lines or meridians as you create maps in the series to the north or south of your original layout.

When the template is opened, you will be prompted to select the components for the groups that were not set as fixed when the template was saved. For an image map, these would be the image object, the overlaying vector/CAD objects, the sheet name, and other components that must be changed to create the new image map in the series. A layout created from a template can also be saved again as a new layout or template with a new set of fixed elements.

The value of using templates is obvious to those of you who make complex layouts and does not need to be gone into more detail here. At any time, your layout can be opened and used to create a recyclable format for a new complex report plate for your next customer. Many of you already print out these plates on economical 11" by 17" printers and then fold and insert them into a series of individualized reports for your individual clients.

The attached color plate entitled Layout Templates illustrates the use of templates to prepare maps in a series. Errata: this plate notes that new legend text cannot be in-

serted. After the plate was printed, the ability to prompt for new legend text was added and is in **V6.30** for use in layouts.

HyperIndex Stacks.

As you construct a HyperIndex link, you can now specify the subportion of a linked object that will be displayed when it is selected by the navigation tool. When the size of the linked object is relatively large, neither opening at full view nor at full resolution may be appropriate due to the dramatic change in scale from the parent object. This feature allows the atlas designer to better control this type of navigation.

This new option is not the same as turning objects on and off according to scale, which is featured in the on-line Nebraska Statewide sample atlas. This new capability allows you to specify what portion of a larger linked object will be shown when it is first displayed by selection during navigation. The designated portion of the larger object will be automatically displayed by your navigation and will be centered on the coordinates of the point you select for navigation. The choices that can be set up in the HyperIndex link are 1/1, 1/2, 1/3, 1/4, 1/5, 1/6, 1/7, or 1/8, and the maximum extent of the object. Full resolution can be also be selected so that 1 image cell is 1 screen pixel.

An example of this new feature can be seen when you navigate to the third or bottom level in the MERLIN on-line atlas. This level will automatically show 1/4 the area of the 7.5' USGS topographic map centered at the point you select in the SPOT image. The color raster of the entire area of each topographic map is linked to the parent SPOT image. However, displaying the entire map would provide a view of it that would be meaningless and unreadable until zoomed, which is, in effect, done automatically by this new option.

Database Operations.

***Much Faster ODBC.**

Access to records in linked ODBC tables in other database products such as Access and Oracle is now much faster (often orders of magnitude) as multiple records read for each access. Some of these new features added for viewing tables are illustrated in the attached color plate entitled Tabular View Preferences.

***New Tabular View.**

The Tabular View procedure used in all the **TNT** products was rewritten to improve its performance and to add to it several features you have requested.

For more details on how to operate all these new features, see the Getting Started Booklet entitled Managing Geoattributes.

Faster.

Some of you create large, unusual flat database tables with hundreds of fields. Such tables caused slow acquisition of a Tabular View and slow operations in it (for example, scrolling). Improved table reading and record caching make a Tabular View much faster for such tables (often several orders of magnitude).

Realtime Scrolling.

The improved record caching has supported the addition of realtime scrolling to Tabular View. Drag the vertical slider, and the table will update as you drag the slider.

ToolTip For Scrolling.

When you move the vertical scroll bar up and down, a ToolTip will appear, providing the information about the current record that would appear as the top line of your Tabular View if you released the scroll bar. This ToolTip will provide you a synoptic view of just where you are in the table. You can choose the following options for what will automatically appear in this DataTip. These include:

- None—no ToolTip
- Record Number—assigned according to how the records were entered into the table
- Row Number—the count from the top of the Tabular View for the current table sorting selected
- Sorted Field Value—the value of the field(s) the table is sorted on. If the table has been sorted on multiple fields, all of them will be included, separated by commas

For example, you can turn off realtime scrolling and use the Sorted Field Value to show you where you are in a table with many records.

AutoScroll to Selected Element.

This option is on by default and is very useful with tables with many records. Previously, when the Tabular View was showing all records, it could be time consuming to locate the record for a selected element. Now your Tabular View will not only automatically open, but it will jump to a position where the first record at the top of the table matches the selected element. If you have selected multiple elements, the table scrolls to the first record that is selected.

Flexible Sorting.

You can now sort in ascending/descending order and sort on multiple fields in a specified order. To do a hierarchical sort, select the heading of the first field you wish to sort on. Next, hold down the shift key and select the second field you wish to subsort on. You can add additional subsort fields if doing so makes sense. When you have selected the sequence of fields in order for your hierarchical sort, choose Field/Sort from the menu to perform it.

Please remember that this hierarchical record sorting only makes sense if you first select fields that have duplicated values. For example, you can apply it to a table that has state names in one field (choose it first) and county names in another field (choose it second). This hierarchical sort will order the records first by state and then by county.

Hiding Unattached Records.

This toggle permits you to hide records that are not associated with any elements in the current objects. This situation often occurs when the attribute table has been designed to be inclusive and comprehensive for use over larger areas such as a state. The table is then used with each separate object, but a particular object almost never contains all the features described by the table. Use this option to suppress the records that do not occur in the object to simplify the Tabular View of such objects.

Care should be used when you hide records with this option. For example, you may be editing vectors and selecting records from a Tabular View for attachment to the new graphical elements you are creating.

Suppressing Grid Lines.

You can now optionally suppress any combinations of horizontal, vertical, and 3D grid lines from your Table view. For example, if you are using alternating color background

to create a vertical structure in a Tabular View or layout, you can delete the horizontal lines. Or, if your field values have a good vertical structure, you may not need vertical grid lines, and suppressing them will shorten the view window or allow more fields to be viewed. You can now use more combinations of color backgrounds and grid line structures to provide attractive and easy-to-read tables. Grid lines and colors are reproduced in your print as you have them set if you subsequently transfer a table into a layout.

New Record Icon.

A New Record Icon has been added to the window's toolbar to provide more direct access to this feature.

Controlling Deletion of Records.

When you are deleting a record, you must now confirm that you really want to delete the record. The wording of this message is even more protective and specific if the record is attached to any elements.

New Table/Edit Definition.

The dialog box you use to create a new table and modify the structure of existing tables has been redesigned. It now uses tabbed panels to simplify its use. A color plate entitled Tabbed Panels for Groups and Databases illustrates the new dialog using tabbed panels.

The new Table Info tabbed panel provides the tools to edit the table's object description, specify text encoding, and assign attachment type. Changing text encoding is used mainly with links to external databases. The strings in that database may be stored in some Windows or ISO code page that must be selected.

The new Field Info tabbed panel provides the tools to edit the field type, attributes, index key designation, and other properties of any field you select in the table.

The new Constraints tabbed panel makes their possible use easier and more obvious. It will permit you to immediately insert constraints into the table. Use it to specify prefix and suffix labels for the values entered. Add constraints to test any data entered into a field in the table, such as capitalization. Add checks for any operations that might produce invalid entries in a field, such as out-of-range, non-alphabetic, and other wrong data types. When creating new materials in the editor, it is important to use these constraints to insure the quality of your data and the accuracy of its subsequent use.

Importing Automatically from Text.

Many of you are provided with attributes collected in simple ASCII text files with some rudimentary structure. This is a very common way to begin the assembly of rigorous geodata from ill-planned data collation operations or from a field operation or device. MicroImages frequently gets a file of such data and a request for help in reading it into a database table. The Import Database window in the **TNT** import process now contains an option to attempt to automatically import a structured text file into a database table.

This new "Determine From File ..." option will scan the text file and guess what the format is. It will try to determine if data is comma separated or in columns, field types, number of decimal places, number of fields, and other properties. After scanning the file, it opens the Text File Format dialog, which lists each proposed field and lets you modify its format. If the first line of the file contains field names, it will use them, and you should delete the first record in the imported table that will also contain them. If it does not, you will have to name the fields yourself.

DataTips.

Previously, you have used memo fields exceeding 256 characters to pop in DataTips or InfoTips for features. Often these memo fields provide prepared metadata about the nearest element.

You may also have used string expressions to collate or compute attribute fields into unique DataTips or InfoTips from the attributes of each individual element. The attached color plate entitled Multiline DataTip from Computed Field illustrates a simple application of a string expression to present multiple attributes of an element in a readable form. The QuickGuide enclosed entitled MultiLine DataTips illustrates a DataTip made up of a string expression that incorporates a memo field.

String expressions were limited to 256 characters in **V6.20**, but they can now be any length. For example, you want to use a string expression to create a DataTip or InfoTip to send a URL off to cause some other action. This kind of string expression would often exceed the 256 character limit in **V6.20**.

Alas, this feature was added so late in the release cycle that it was not carefully checked and has been found to be inoperable. If you need to use this feature, please download a new needed.zip for Windows platforms or librv capp.dll.hqx for Macs from microimages.com/freestuf/tntpatch/.

Table Joins.

Combine Tables dialog now provides you with 4 new combination options: Natural Join, Left Outer Join, Right Outer Join, and Outer Join. You may be familiar with these operators from your work with other database systems. All 4 combine 2 tables (A and B) that must be related to each other through a primary key field. The single table created by the join operation contains all the fields from both tables. The only exception is that the field the tables are related by (which will exist in both tables) is only included once.

Two color plates entitled Joining Database Tables and Outer Join Operations are attached to illustrate the operation of these new tools for combining tables. The best way to review the operation of each kind of join is to review the table that results when each is applied to the same 2 tables.

TNTedit.

Raster Operations.

*Creating New Rasters.

The Raster Creation window now provides a report of the size of the raster you are defining. It now also provides options for default or base cell value. You will usually use this to fill the entire raster object with your null value or some other base value when you are creating an empty raster to edit.

Raster editing is often used to manually prepare an overlay to use as a mask or other purpose in some other raster operation such as viewing or classification. Previously, you had to use processes outside of raster edit to prepare the new, empty raster that matched the existing target rasters. Now, you can select a "template" raster object, and the new raster created will automatically have its cell size, total size, extent, scale, and georeferencing. In other words, after editing, the new raster will be immediately ready for use with the raster object(s) that were selected as the template.

Creating and editing 16-bit color mapped rasters is now available. This is especially useful with new image data sets with more dynamic range such as some IKONOS images.

Managing Colors.

When you select a color that does not exist in the color map, the editor will now add a new color if possible. You may choose some imported or other raster in which all the colors are assigned. If all of the available colors are allocated, you will be notified that the color cannot be stored, and the "closest" color in the color map will be substituted to approximate the requested color.

Utility Changes.

Status is shown in raster operations that will take a long time, such as creating and copying a raster and the operation of flood filling large polygons.

A cancel button has now been added to all raster tools.

Polygons with 3 to 45 equal sides can now be drawn and filled.

Vector Filters.

The filter that removes sliver polygons no longer combines the attributes from the deleted sliver polygon with those of its neighbor. These records now become unattached and can be dealt with as you choose: forgotten, removed, or edited.

The filters to remove bubble polygons and to remove islands now have an option to define whether or not to combine attributes with their parent or neighbor polygon.

Vector Filters.

The separate vector filter process that operates directly on objects has the same changes in filtering operations as were added to the editor. The filter that removes sliver polygons no longer combines the attributes from the deleted sliver polygon with those of its neighbor. These records now become unattached and can be dealt with as you choose: forgotten, removed, or edited. The filters to remove bubble polygons and to remove islands now have an option to define whether or not to combine attributes with their parent or neighbor polygon.

SML.

The following functions and sample script relate to both **SML/X** and **SML/W**.

New Functions.

Object Functions. (1)

GetObjectExtentsRegion

Get the extents of an object as a region

Style Functions. (4)

StyleReadLineStyle

Read a line style from a style object.

StyleReadPointStyle

Read a point style from a style object.

StyleReadPolyStyle

Read a polygon style from a style object.

StyleReadTextStyle

Read a text style from a style object.

Sample Script.

SOILTEST.SML provides a sample script that fits a Minimum Curvature surface with Tension to selected fields in an attribute table attached to the point elements in a vector object.

Upgrading.

If you did not order **V6.30** of **TNTmips** and wish to do so now, please contact Microlimages by FAX, phone, or email to arrange to purchase this upgrade or annual maintenance. Entering an authorization code when running the installation process allows you to complete the installation and immediately start to use **TNTmips 6.3** and the other **TNT** professional products it provides to you.

If you do not have annual maintenance for **TNTmips**, you can upgrade to **V6.30** via the elective upgrade plan at the cost in the tables below. Please remember that new features have been added to **TNTmips** with each new release. Thus, the older your current version of **TNTmips** relative to **V6.30**, the higher your upgrade cost will be.

Within the NAFTA point-of-use area (Canada, U.S., and Mexico) and with shipping by UPS ground. (+150/each means \$150 for each additional upgrade increment.)

<u>TNTmips Product</u>	<u>Price to upgrade from TNTmips:</u>					<u>V5.70</u>
	<u>V6.20</u>	<u>V6.10</u>	<u>V6.00</u>	<u>V5.90</u>	<u>V5.80</u>	and earlier
Windows/Mac/LINUX	\$500	750	950	1100	1250	+150/each
DEC/Alpha via NT	\$650	1000	1350	1600	1800	+175/each
UNIX single user	\$800	1250	1650	2000	2250	+200/each
UNIX 2 user fixed	\$950	1550	2150	2550	2850	+250/each
UNIX 3 user fixed	\$1100	1900	2550	3050	3500	+300/each

For a point-of-use in all other nations with shipping by air express. (+150/each means \$150 for each additional upgrade increment.)

<u>TNTmips Product</u>	<u>Price to upgrade from TNTmips:</u>					<u>V5.70</u>
	<u>V6.20</u>	<u>V6.10</u>	<u>V6.00</u>	<u>V5.90</u>	<u>V5.80</u>	and earlier
Windows/Mac/LINUX	\$600	900	1150	1400	1600	+150/each
DEC/Alpha via NT	\$750	1200	1550	1800	2000	+175/each
UNIX single user	\$900	1400	1850	2200	2500	+200/each
UNIX 2 user fixed	\$1050	1600	2200	2600	2900	+250/each
UNIX 3 user fixed	\$1150	1950	2600	3100	3550	+300/each

Installed Sizes.

Loading **TNTmips 6.3** processes onto your hard drive (exclusive of any other products, data sets, illustrations, Word files, and so on) requires the following storage space in megabytes.

	<u>for V6.20</u>	<u>for V6.30</u>
PC using W95, W98, NT, or W2000	69 MB*	72 MB*
PC using LINUX (with Intel) kernel 2.0.36	94 MB	94 MB
Mac using MacOS 8.x or 9.x	75 MB**	80 MB**
SGI workstation via IRIX	148 MB	117 MB
Sun workstation via Solaris 2.x	101 MB	100 MB
IBM workstation via AIX 4.x (with PPC)	125 MB	143 MB
COMPAQ/DEC workstation via NT (with Alpha)	81 MB	86 MB

COMPAQ/DEC workstation via Tru64 UNIX (with Alpha) 132 MB 146 MB

* W95, W98, NT, and W2000 installation size also includes the native **SML 6.3** interpreter for Windows.

** The Mac installed size includes the JAPAN1.OF font of 10.4 MB, which is automatically installed. Delete this font if you do not require the use of Japanese.

V6.30 of the HTML version of the Reference Manual, including illustrations, requires 35 MB, and the Word version is 71 MB. Installing all the sample geodata sets for **TNTlite** and **TNTmips** requires 185 MB. The 52 Getting Started booklets require a total of 83 MB.

Internationalization and Localization

Introduction.

The official translators of the **TNT** products continue to expand in number and do a fine job. MicroImages thanks them all, especially those who have plodded through the tedious first translation. The initial translations take considerable time and contemplation. Those who have only needed to update their translation to **V6.30** report that it required only 4 to 6 hours. Thus, the translation protocol is smoothly in place for most operations.

A month ago, MicroImages supplied each translator with a nearly final beta version of **V6.30** of the **TNT** products. Several responded promptly with their updated interface translation files. Some came back so promptly that the files were included on the **V6.30** CD. However, most are being posted in the normal place for your downloading from microimages.com/i18n.

Some translators got so enthusiastic that without being asked, they kept right on going and translated the long **TNT** help files. This is way above and beyond the call of duty. However, as a result, MicroImages has added these help files to the set of translation files you can download and use. This also has required that MicroImages design a way in which a translator can determine those portions of help that must be upgraded for each new release.

Translated user interfaces for **V6.30** have been included for the first time on the **V6.30** CD for the **TNT** products. The following language interface kits made it onto the CD: Greek, Indonesian, Russian, Spanish, and Turkish.

The status of all language kits as of the date of this MEMO are detailed below. However, new languages may be added at any time, so please monitor microimages.com. To obtain all other language kits for **V6.30** that are not on the CD or for kits for earlier versions of the **TNT** products, please see <http://www.microimages.com/i18n/locales/>.

NOTE: If your language is not being translated, please contact MicroImages for information on our plans to add it.

New Language Kits Available.

Thanks again to the official translator from all users of that language for all that hard work in getting out the time-consuming first translation.

French.

(Official translation by Charles Savoie in Montreal).

The premier release of a French user interface is now available for **V6.30** of the **TNT** products.

Charles Savoie is an experienced user of the **TNT** products in Canada.

Spanish.

(Official translation by Alberto Andrade of Aeromapa in Ecuador).

The premier release of a Spanish user interface is now available for **V6.20** and **V6.30** of the **TNT** products.

Aeromapa is a Microlimages Authorized Dealer in Ecuador.

Korean.

(Official translation by DongEun Kim of OpenGIS Korea in Seoul).

The premier release of a Korean user interface is now available for **V6.30** of the **TNT** products.

A selection of the Getting Started Booklets has also been translated into Korean.

OpenGIS Korea is a Microlimages Authorized Dealer in Korea.

Indonesian.

(Official translation by Eko Refia Iswantiaro of Citradata in Jakarta).

The premier release of an Indonesian user interface is now available for **V6.20** and **V6.30** of the **TNT** products.

Citradata Intersystem, PT. is a Microlimages Authorized Dealer in Indonesia.

Thai.

(Official translation by Samart Wongwantanee of EIT in Bangkok).

The premier release of a Thai user interface is now available for **V6.20** and **V6.30** of the **TNT** products. All the comprehensive on-line Help Files are also in Thai for **V6.20**.

Earth Intelligence Technologies also continues to update and publish, in Thai, a 250-page color illustrated workbook consisting of the translation and integration of a core selection of the Getting Started Booklets.

Earth Intelligence Technologies Co., Ltd. is a Microlimages Authorized Dealer in Thailand.

Romanian.

(Official translation by Valentin Donisa of the University of Alexandru Ioan Cuza in Iasi).

The premier release of a Romanian user interface is now available for **V6.20** and **V6.30** of the **TNT** products.

Dr. Donisa is an experienced user of the **TNT** products in the Faculty of Geography and Geology at the University of Alexandru Ioan Cuza in Romania.

New Language Kits in Preparation.

Slovakian.

(Official translation by Slavomir Daniel of Koral in Spisska Nova Ves).

A Slovakian translation for **V6.30** of the **TNT** interface is underway. Please watch microimages.com for its release.

Slavomir Daniel is an experienced user of the **TNT** products in the Slovak Republic.

Finnish.

(Official translation by Pentti Ruokokoski of Geosurf in Helsinki).

A Finnish translation of the user interface is being prepared and will be available for **V6.30** of the **TNT** products for the first release in May.

Geosurf Incorporated is a MicroImages Authorized Dealer in Finland.

Dutch.

(Official translation by Sam T. Blok of the University of Amsterdam in Amsterdam).

A Dutch translation for **V6.30** of the **TNT** interface is underway. Please watch microimages.com for its release.

This translation is being prepared by the Department of Geography at the University of Amsterdam in The Netherlands.

Hindi and Bengali.

(Official translation by Dilip Kumar Paul of PPC in Calcutta).

Hindi and Bengali translations of the user interface are being prepared and will be available for **V6.30** of the **TNT** products for the first release in May.

Physical Planning Consultants (India) Ltd. is a MicrolImages Authorized Dealer in India.

Updated Language Kits.

Japanese.

(Official translation by Dr. Toshihiko Waza of OpenGIS in Tokyo).

Japanese translations of the user interface are now available for **V5.90**, **V6.00**, **V6.10**, **V6.20**, and **V6.30** of the **TNT** products.

Translations are also available for a significant number of the Getting Started Booklets.

OpenGIS Corporation is a MicrolImages Authorized Dealer in Japan.

Russian.

(Official translation by Greg Kochergin in Moscow).

Russian translations of the user interface files are now available for **V5.90**, **V6.00**, **V6.10**, **V6.20**, and **V6.30** of the **TNT** products.

Greg Kochergin was formerly a software engineer at MicrolImages and is now resident in Moscow.

German.

(Official translation by Frank Kohlleppel of GIS Team in Giessen).

German translations of the user interface are now available for **V5.90**, **V6.00**, **V6.10**, **V6.20**, and **V6.30** of the **TNT** products. All the comprehensive on-line Help Files are also in German for **V6.30**.

GIS Team, Ingenieurburo fur Geoinformatik is a MicrolImages Authorized Dealer in Germany.

Turkish.

(Official translation by Alpaslan Savaci of HAT in Ankara).

Turkish translations of the user interface are now available for **V6.00**, **V6.10**, **V6.20**, and **V6.30** of the **TNT** products.

HAT Geographical Information Systems and Trade Inc. is a MicrolImages Authorized Dealer in Turkey.

Greek.

(Official translation by Lefki Stefouli of KLEOS in Athens).

Greek translations of the user interface are now available for **V6.10**, **V6.20**, and **V6.30** of the **TNT** products. All the comprehensive on-line Help Files are also in Greek for **V6.20** and **V6.30**.

KLEOS S.A. is a MicrolImages Authorized Dealer in Greece.

Portuguese.

(Official translation by Gabor Szakacs in Sao Paulo).

Portuguese translations of the user interface are now available for **V6.10**, **V6.20**, and **V6.30** of the **TNT** products.

Gabor Szakacs is an experienced user of the **TNT** products in Brazil.

Polish.

(Official translation by Slawomir Krolewicz of Adam Mickiewicz University in Poznan).

Polish translations of the user interface files are now available for **V6.10**, **V6.20**, and **V6.30** of the **TNT** products.

Slawomir Krolewicz is an experienced user of the **TNT** products in the Institute of Physical Geography, Department of Geographical and Geological Sciences at Adam Mickiewicz University in Poland.

Arabic.

(Official translation by Tamer Fahmy of FOCUS in Cairo).

Arabic translations of the user interface are available for **V6.10** and **V6.20** of the **TNT** products. Please watch microimages.com for the release of **V6.30**. Arabic support does include entering text from right to left.

FOCUS Integrated Systems S.A.E. is a MicroImages Authorized Dealer in Egypt.

Chinese.

Unfortunately, only **V6.00** of the Chinese user interface is available for the **TNT** products. MicroImages is actively seeking an Official Translator for Chinese.

MicroImages Authorized Dealers

Four new dealers were added during the past semester. MicroImages' product sales are principally made through our excellent dealers or by referrals from our current valued client base. As a result, new dealers are being aggressively sought, especially in nations without any. Additional dealers are also sought in larger nations where our current dealer(s) have specialized in one particular application area of geospatial analysis. Any MicroImages client or anyone else interested in becoming a dealer, please contact Terry Peterson (peterson@microimages.com). Inquiries are welcome from anyone, big or small.

For a complete list of all the current MicroImages Authorized Dealers, please check microimages.com/dealers for updated address, email, phone, FAX, and web site information.

Beijing—Beijing Spatial Port Network Technology (SPNT) Ltd.

MicroImages is pleased to present SPNT as a new dealer in China. SPNT is a new company with 44 full and part time staff, organized in 1999 as a subsidiary of Cyber World Technology and Weltron Worldwide Ltd. The focus of this new company is to apply geospatial analysis methodology in planning, government, agriculture, and education. Geospatial analysis projects are currently being conducted by SPNT for the Wuahan City Government, Highway Development Company, Three-Gorge Power Station Ltd., Peking University, and others. For further information, contact Guowei Wang at voice (8610)6262-2938 or FAX (8610)6264-4358 or email at spatial@mail.in

world.com.cn or mail at Room 505 Yuxin Building, No. 42 Haidian Street, Haidian District, Beijing 10080, China. (web www.inworld.com.cn/zhuanjia/3s).

Aleppo—Simon Kaplo Engineering (SKE).

MicrolImages is pleased to present Simon Kaplo Engineering as a new dealer in Syria. SKE is a firm of consulting engineers that has specialized in selling and servicing surveying and CAD products throughout Syria since 1980. More recently, they have been introduced to GIS by marketing WinGIS and related products of PROGIS and using them to conduct projects in cadastral land registration, irrigation management, and urban planning. They also market the PHOTOMOD photogrammetric system developed by RACURS (see below). SKE has acquired **TNTmips** as well as the other **TNT** products to broaden its capabilities to offer GIS services and systems with enterprise-wide capabilities in Syria. For further information, contact Fawaz Kaplo at voice (9632)1221-4767 or FAX (9632)1223-5380 or email at s.kaplo@net.sy or mail at Baron Street, P.O. Box 6793, Aleppo, Syria.

Moscow—ESTI MAP Ltd.

MicrolImages is pleased to present ESTI MAP Ltd. as a new dealer in Russia. ESTI MAP is the distributor in Russia of MapInfo and also acts as a dealer for Lizard Tech (MrSid), ER Mapper, and various CAD products. They are also an authorized reseller of SGI computer products. ESTI MAP also develops specialized image processing and CAD software in support of their product lines. ESTI MAP will sell **TNT** products as well as use them in support of their service business. For further information, contact Alexei Prossianov at voice (7095)241-0057 or FAX (7095)241-5732 or email at estim@ibrae.ac.ru or mail at 29/16 Sivtsev Vrazhek per., Moscow 121002, Russia. (web www.esti-map.ru).

Moscow—RACURS.

MicrolImages is pleased to present RACURS as a new dealer in Russia. RACURS is the developer of the PHOTOMOD Windows-based digital photogrammetric system. This system provides modules for digitizer correction, phototriangulation, stereo pair processing, and DTM production from aerial photographs. RACURS will sell **TNT** products as well as use them in support of their service business. For further information about MicrolImages' products or PHOTOMOD, contact Victor Adrov at voice (7095)928-2001 or FAX (7095)928-6118 or email at info@racurs.ru or mail at Ul. Myasnitskaya, 40-6, Office 605, Moscow 101000, Russia. (web at www.racurs.com).

Discontinued Dealers

The following dealers are no longer authorized to sell MicrolImages' products. Please do not contact them regarding support, service, or information. Please contact MicrolImages directly or one of the other MicrolImages Authorized Dealers.

Geotechnics, Inc. (Charles Moore) of Columbus, OH, USA is discontinued.

Tera Research Inc. (Jack Liu) of Sunnyvale, CA, USA is discontinued.

All inquiries about **TNT** products and services addressed to TTI Production (France) should go only to their office in Nimes. There is no longer a TTI-affiliated MicrolImages Authorized Dealer located in Pau.

Prices

The following price changes are effective 26 April 2000 with the release of this Microlimages MEMO and the first shipment of **V6.30** of the **TNT** products.

IMPORTANT NOTE: These price changes affect only those using **V6.30** or purchasing new **TNT** products.

If your **TNT** product is not authorized for the use of **V6.30**, you do not need to be concerned with these price changes until you upgrade to **V6.30** or acquire a new **TNT** product.

Background.

The first desktop image processing and GIS systems were assembled using expensive PC computers and very expensive peripherals. Video boards introduced for the CAD market but capable of displaying images commonly cost more than \$2000. A suitable large format 19 inch color monitor approached \$2000. The first slow, small format color printers cost at least \$2000 and larger map size printers over \$10,000.

When the original versions of the **TNT** products were first introduced 13 years ago, and for many years thereafter, it was necessary for Microlimages to acquire, operate, maintain, and directly support almost all the different, very expensive video boards and peripherals needed to assemble a working system. As a result, a detailed pricing schedule was adopted that allowed you to purchase only those components that you could use with the computer system you needed and assembled.

Those of you who have been clients since those days will recall that Microlimages participated in the invention of the concept of desktop image processing. This required the expenditure of considerable software engineering time to write display drivers for many graphics boards to extend their use for image display. With the advent of an acceptable version of Windows (such as W95), low-cost video games, and improved video boards and Windows drivers, it was no longer necessary to directly support display boards for high quality image processing. Standard software interfaces were adopted by committees representing manufacturers. Together with the wide-spread use of Windows, it became possible to gain access to and support standard software interfaces for peripheral devices. Windows printer drivers work well for most low cost, commodity level printers. TWAIN drivers support generic use of scanners and some cameras. Wintab makes the installation and use of digitizers on serial ports much more convenient.

Standardization; the low-cost availability of peripherals, new platforms, and operating systems; and Microlimages' introduction of a **TNT** product suite and new kinds of licenses now permit the introduction of new prices. Effective immediately, purchasers of **V6.30** of the **TNT** products can select from a simplified pricing structure.

One Price on All Platforms!

M50 is now the designation for all new **TNTmips** single-user/single-platform licenses on all platforms.

*The price of **TNTmips** is now the same on all platforms:*

Mac, Windows, LINUX, and UNIX.

Since you are a current client, it is necessary to explain in detail how these changes significantly improve the capabilities of **V6.30** of your **TNT** product without cost if it qualifies for automatic upgrade to the new **M50** license. However, your **TNTmips** may not qualify as it is not being upgraded to **V6.30** and/or does not have the necessary prerequisite combination of features. In this case, additional sections are provided so that you can determine your low cost to trade-up your current license to the new **M50** all-inclusive license of bundled features when you do upgrade to **V6.30**.

Unlimited Display Resolution for Windows.

M50 is now the only single-user/single-platform **TNTmips** professional license available for new purchase for Windows platforms!

*The following **TNTmips** products have been discontinued and are no longer available for purchase:*

D30, D35, D40, D45, D50, D60, and D80.

An **M50 TNTmips** license now provides you with unlimited resolution on either screen axis and across as many monitors as you have available. Previously, you would have had to purchase a **TNTmips** at the display level of **D60** to obtain this capability. To determine if your **TNTmips 6.3** license has been converted to be equivalent to a **D60** display level product, please see the subsection below: Automatic Conversion of **V6.30** to **M50**.

Why?

Real-estate! Real-estate! Real-estate! The 2 attached color plates entitled Using Dual Monitors illustrate a few examples of how dual monitors would help you in:

- Seeing the Big Picture in 2D/3D Visualization
- Working with Complex Hardcopy Layouts
- Georeferencing Made Easy
- Photointerpretation in the Geospatial Editor

These examples may not deal with the situation you most frequently encounter that would benefit from dual monitors. But, you can extrapolate how you would use dual monitors to decrease frustration and increase productivity.

Screen resolution in total pixels directly impacts your productivity in **TNTmips**. Reflect on the overall design of **TNT** products and common tasks in geospatial analysis in general and GIS, image processing, and cartographic layout in particular. Invariably, the simplest tasks require a large view window covering one monitor. The second monitor will conveniently provide space to directly expose a dialog, an attribute table, and other reference and control panels.

Low-cost, flat surfaced, quality monitors of 17" (\$300) and 19" (\$500) are now available with typical screen resolutions of up to 1600 by 1200 pixels. These monitor prices continue to decrease, and dual monitor systems are becoming popular for those measuring productivity.

Powerful video boards developed for the game industry now provide high resolution displays and support them with 16, 32, and 64 megabytes of memory at prices ranging from \$100 to \$200. With care, 2 video boards can be combined so that your other W98 and W2000 products (not W95 or NT) and **TNTmips** will span and use both boards. A more convenient approach is to use a single board in this same price range that directly supports dual monitors (Matrox G400 series (AGP bus only) and Appian Gemini series (AGP or PCI bus)) or quadruple monitors (Matrox G200 series and Appian Jeronimo series)! Some of these single slot dual and quad display boards (for example, the Matrox G400) also come with special Windows drivers for Windows 95 and NT.

MicrolImages' new price for **TNTmips** on Windows platforms now encourages the use of all screen real-estate you can assemble. MicrolImages has equipped all its new systems with dual 17 or 19 inch monitors and Matrox G400 boards.

UNIX Prices Slashed!

M50 is now the only single-user/single-platform **TNTmips** professional license available for new purchase for UNIX platforms!

*The following **TNTmips** products have been discontinued and are no longer available for purchase:*

U100, U200, U300, ...

M50 is the designation of a new **TNTmips** single-user/single-platform UNIX license. **M50** replaces the former **U100** product, thereby reducing by 1/2 the price of this **TNT** license for a UNIX platform. This **M50** is equivalent in price, performance, and features to **TNTmips M50** product for the Windows, Mac, and LINUX platforms.

Why?

It is no longer as popular to buy expensive UNIX platforms for the preparation and analysis of geospatial data. Personal desktop systems with multiple monitors, powerful processors, inexpensive peripherals, intranet communications, multiprocessing operating systems, and low cost have drastically reduced the use of UNIX products for this application. However, many viable multi-user UNIX installations are in operation, and new installations are likely to be in an institutional situation using multi-user product licenses.

Many of the UNIX platforms sold today are being used as Internet servers for public access to geospatial materials or on intranet for similar private internal institutional applications. This repositioning of the use of expensive UNIX-based platforms requires new network-oriented products similar to **TNTserver**, **TNTclient**, **TNTview**, and **TNTatlas**.

All the **TNT** products will continue to be developed and provided for popular UNIX platforms at this new, lower price. However, due to significantly lower volume and the associated higher costs of maintaining the required equipment and testing and installation procedures, the higher upgrade and maintenance costs for UNIX-based **TNT** professional products remain unchanged.

Mac Prices Unchanged!

M50 is now the designation of an existing or newly purchased single-user/single-platform **TNTmips** license for the Mac platform.

***M50** is now the only single-user/single-platform license available for purchase for **TNTmips** on all supported platforms.*

All new purchases of single-user/single platform **TNTmips** on any platform are designated **M50**. **M50** is now a **TNTmips** with the same unlimited screen resolution, peripheral support, HyperIndexing, and other features for every platform supported.

LINUX Prices Unchanged!

M50 is now the designation of an existing or newly purchased single-user/single-platform **TNTmips** license for the LINUX platform.

***L50** for LINUX is a discontinued designation for **TNTmips**.*

All new purchases of single-user/single platform **TNTmips** on any platform are designated **M50**. **M50** is now a **TNTmips** with the same unlimited screen resolution, peripheral support, atlas assembly via HyperIndex (alias **TNTlink**), and other features for every platform supported.

Comprehensive Free Peripheral Support.

All new **TNTmips** professional systems now provide all available peripheral support without additional charge, except for option **P15**.

*The following peripheral support options are not available for any new **TNTmips** professional system:*

X3, L3, P3, P5, P8, P10, S5, S7, S10, S15, F5, F8, F15, T7, and T10.

Peripheral support is now included without additional cost in each new **TNTmips** product. You are also being provided this same peripheral support if your **TNTmips 6.3** product qualifies (see section Automatic Conversion of V6.30 to M50). Please see the section below with regard to large format printing using the **P15** option.

Why?

Low-cost peripherals and accompanying free software have created opportunities for their wide-spread use in geospatial analysis. **TNTmips** platforms now often have all these input and output devices connected. Most (except printers) are provided with free software that can be used to operate them. However, the freeware provided with the hardware cannot read or write from a **TNT** Project File and often has other limitations. This creates results that must be manipulated into or out of the appropriate objects in a Project File. This is time consuming and sometimes frustrating. Now that their support is free, you can operate your devices directly from within **TNTmips**.

Optional Large Format Printer Support.

Large format printer support (**P15**) remains optional.

***P15** printer support is the only option available for **TNTmips**.*

Support for printers up to tabloid size (11" by 17") is included with every **TNTmips** product **M50**. Support for large format printers must still be purchased separately but is now the same price for NAFTA and international points-of-use. If you have purchased printer support feature **P15** or **P20** (now included in **P15**), you still have it. Credit for previously purchased printer support at levels **P3**, **P5**, **P7**, and **P10** can still be applied toward the purchase of this optional **P15** large format printer support.

Why?

Large format printers remain expensive specialty items owned by only a fraction of the **TNTmips** users. However, the creation of and improvements in complex layout software for printing primarily benefit those with large format printers. These printers also create greater software support demands than any other **TNT** peripheral. Thus, it is still necessary that those using this special equipment continue to pay for the continued maintenance and improvement of this specialty software.

Everyone Can Now Assemble Atlases.

The **TNTlink** product (**H10**) required to build electronic atlases by assembling HyperIndex stacks is now included in every new **TNTmips**.

*The **TNTlink** product (option **H10** for **TNTmips**) is a standard feature and is no longer available as a separate option.*

Why?

The preparation and use of HyperIndex stacks to make electronic atlases is unique to the **TNT** products. Its use for desktop geodata organization and for CD and web publishing continues to grow. Recently, it has been purchased with many new **TNTmips** systems or added soon after.

In order to encourage even wider use of this **TNTatlas** concept, it will now be included as part of every new **TNTmips** system on every platform. Now everyone using the professional version of **TNTmips** can assemble a HyperIndex stack and distribute it on CD with the free **TNTatlas**. The stack can also be provided to MicroImages, who will host it for public access via our public **TNTserver** (<http://www.microimages.atlas>). Alternately, you can use this feature to assemble HyperIndex stacks for public or private Internet or intranet distribution via **TNTatlas** or your private **TNTserver**. A color plate is attached entitled We Give You the Tools to provide more information on how you can use this new capability.

The free **TNTlite** version of **TNTmips** is not intended for preparing geodata for use in any other product. As a result, **TNTlite** does not provide the **TNTlink** (**H10** option) to construct HyperIndex stacks, for the export of geodata, or the use of its Project Files in a professional **TNTmips**. It is necessary to purchase the appropriate **TNT** product to use to prepare geodata for publishing geodata for distribution with **TNTatlas**, for use in a professional **TNTmips**, or for distribution in other formats.

Automatic Conversion of V6.30 to M50.

Your qualifying single-user/single-platform **TNTmips** will be automatically converted to an **M50** by installing **V6.30**.

*You now have a **TNTmips M50** if your **TNTmips 6.3** qualifies.*

Your **TNTmips 6.3** will automatically become an **M50** license if it was originally purchased at the display level **D50, D60, or D80** for Windows, as a **U100** for UNIX, as **L50** for LINUX, or as **M50** for the Mac.

Your **TNTmips 6.3** at display levels **D30, D35, D40, and D45** for Windows will become an **M50** if it has ever been enhanced by the original or subsequent purchase of optional add-on features bringing its total value to \$5000-NAFTA/\$6000-international or more. Only features added to enhance the use of **TNTmips** as a single-user/single-platform will be credited.

It has not been possible to automatically change every single combination of qualified **TNTmips 6.3** licenses to **M50** during installation. Some situations are simply too complicated. If you think your license qualifies and was not changed, contact MicroImages. Any inquiry must be accompanied by your **TNTmips** 4 or 5 digit serial number found on your hardware key and/or displayed on the main **TNTmips** window title bar so that proper authorization codes can be issued to you.

What will be included for credit.

Add-on features that will be credited toward this \$5000/\$6000 product value include **H10, X3, L3, P3, P5, P8, P10, S5, S7, S10, or S15** purchased for that specific **TNTmips** product at any time.

What cannot be used for credit.

The \$5000/\$6000 credits of each single-user/single-platform **TNTmips** product must be evaluated separately.

Features cannot be transferred between individual **TNTmips** to meet this single product \$5000/\$6000 value.

Payments for upgrades and annual maintenance are not included in computing this \$5000/\$6000 value.

Payment for large format printer support features **P15** or **P20** may or may not be applied, but support for large format printers remains an optional feature. Your **P15** and **P20** purchase can be counted in the \$5000/\$6000 value for conversion to **M50** if you want this optional printer support removed from your **TNTmips** license. Alternately, you can leave it out of the computation of the \$5000/\$6000 value and retain it on your new **M50** license. In other words, you can apply the **P15** or **P20** credit in either way: for an **M50** upgrade or to retain **P15** or **P20** support, but not both. (Note: **P20** printer support for electrostatic printers and widths greater than 36" was actually dropped some time ago and incorporated in the **P15** support.)

Purchasing a conversion of V6.30 to the M50 product.

Upgrading a lower value single-user/single-platform **TNTmips 6.30** to an **M50** license.

*Installing **TNTmips 6.3** will not change your license to **M50** if it does not qualify.*

If your **TNTmips 6.3** for Windows does not have a total value as computed above of at least \$5000-NAFTA/\$6000-international, it can be modified to gain access to unlimited display resolution, all peripheral support (except **P15**), and the **TNTlink (H10)** option. The cost for this will be the difference between your original value as defined above and \$5000-NAFTA/\$6000-international.

MicrolImages has complete sales records for every **TNT** product ever sold. If you think your **TNTmips 6.3** has sufficient value to qualify and has not been automatically upgraded by its installation, please contact MicrolImages. If you are uncertain, please contact MicrolImages for a review of the credit value of your **TNTmips**. If you know your system does not qualify, ask MicrolImages or your dealer for a pro forma invoice to show you the adjustment needed. Any inquiry must be accompanied by your **TNTmips 4** or **5** digit serial number found on your hardware key and/or displayed on the main **TNTmips** window title bar so the records for that product can be reviewed.

The most typical modification would be moving from a **V6.30** authorized only for display level **D40** with no other add-on features to an **M50**. This would require the additional payment of \$1000-NAFTA/\$1200-international.

Upgrades and Annual Maintenance.

Prices for upgrades or maintenance contracts for all **TNT** products are unchanged.

*Conversion of your **TNTmips** license to **M50** has not changed any future upgrades you have purchased.*

The prices for upgrades to **V6.30** of the **TNT** products and annual maintenance remain unchanged. As usual, the cost for your upgrade can be found in this MEMO in the section relating to the appropriate **TNT** product.

Future advancements of **TNTmips** for UNIX, together with maintaining the software skills, **TNT** software, and expensive hardware resources is significant. There is now a drastic reduction in original purchase price, but demand for **TNT** products on these platforms is low. As a result, upgrades for **TNT** products for UNIX platforms are still priced at a premium. Please note that the 50% price reduction for **TNTmips** on UNIX platforms to **M50** (\$5000/\$6000) will pay for about 9 future upgrades on that platform.

Example Situations.

Assuming you have installed **TNTmips 6.3**, your license has been altered by the modification of your hardware key. The following are only some examples of the many combinations of changes.

For Windows Platforms.

- Product **D30** is not altered.
- Product **D30** with **H10** is not altered.
- Product **D30** with **H10** and **P10** added becomes **M50**.
- Product **D35** is not altered.
- Product **D35** with **H10** is not altered.
- Product **D35** with **H10** and **P5** added becomes **M50**.
- Product **D35** with **P15** could be altered to **M50** if **P15** is surrendered.
- Product **D40** is not altered.
- Product **D40** with **P8** is not altered.
- Product **D40** with **X3**, **L3**, and **P5** becomes **M50**.
- Product **D40** with **H10** becomes **M50**.
- Product **D40** with **H10** and **P15** becomes **M50** with **P15** added.
- Product **D40** with **P15** is not altered.
- Product **D40** with **P15** could be altered to **M50** if **P15** is surrendered.
- Product **D45** is not altered.
- Product **D45** with **P5** becomes **M50**.
- Product **D45** with **H10** and **P15** becomes **M50** with **P15**.
- Product **D50** becomes **M50**.
- Product **D50** with **H10** becomes **M50**.
- Product **D50** with **H10** and **P15** becomes **M50** with **P15**.
- Product **D60** becomes **M50**.
- Product **D60** with anything added except **P15** becomes **M50**.
- Product **D60** with **P15** becomes **M50** with **P15** added.
- Product **D80** becomes **M50**.
- Product **D80** with anything added except **P15** becomes **M50**.
- Product **D80** with **P15** added becomes **M50** with **P15** added.

For Mac Platforms.

- Product **M50** is not altered.
- Product **M50** with **H10** added becomes **M50**.

For LINUX Platforms.

- Product **L50** becomes **M50**.
- Product **L50** with **H10** added becomes **M50**.

For UNIX Platforms.

- Product **U100** becomes **M50**.
- Product **U100** with **P15** added becomes **M50** with **P15**.

Summary of Simplified New Prices.

A more comprehensive price list and terms will be delivered at a later date. The following provides the simplified current prices for **V6.30** of the **TNT** products (NAFTA/international).

for single-user/single-platform licenses *(NAFTA/international)*

TNTmips for <u>all</u> platforms (product M50)	\$5000/\$6000
TNEdit for <u>all</u> platforms (product E30)	\$3000/\$3600
TNTview for <u>all</u> platforms (product V10)	\$1000/\$1200
TNTAtlas for <u>all</u> platforms (product A0)	<i>FREE</i>
TNTmips option P15 for large format printing (Yes, P15 is now the same price for NAFTA and international points-of-use and for a multiple-user/single-platform license.)	\$1500/\$1500

Note: the only trade-in credits allowed toward this **P15** option are for your printer support feature purchased prior to the release of **TNTmips 6.3**.

TNTsdk for Windows platforms (product SDK3) (Yes, this SDK is now the same price for NAFTA and international points-of-use and covers the license fee paid by Microlimages for the Motif libraries provided in the SDK .)	\$300/\$300
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TNTsdk for LINUX and UNIX platforms (product SDK3)	FREE
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TNTserver for Windows NT and Windows 2000 (product AS50) (Provides 2 simultaneous compute threads. Microsoft recommends using only 1 more compute thread than the number of Intel processors in the single platform.)	\$5000/\$5000
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A multi-user license is not available for a **TNTserver**, since it will respond to as many input and output requests as set by its manager.

Each additional compute thread added to a TNTserver (Yes, TNTserver is the same price for NAFTA or international points-of-use.)	\$2500/\$2500
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TNTclient and its Java source code (licensed with TNTserver)	<i>FREE</i>
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for multiple-user/single-platform licenses

To support 2 simultaneous users of a **TNT** product on all platforms, add 50% to the above prices for a single user.

To support 3 simultaneous users of a **TNT** product on all platforms, add 100% to the above prices for a single user.

To support each additional simultaneous user of a **TNT** product beyond 3 on all platforms, add an additional 20% for each user.

Remember, to take advantage of a multi-user/single-platform license, a network or remote terminal access is necessary. Microlimages recommends that only 2 or 3 simultaneous users operate **TNTmips** with a platform using single or dual Pentium processors. Single PC platforms with more than 2 Pentium processors should be limited to 1 more simultaneous **TNTmips** user than the number of processors.

Expensive institutional single platform workstations running UNIX, LINUX, or W2000 can be assembled to support many simultaneous users. This is why they are now popular as web servers. As a result, the above recommendations for limiting the si-

multaneous **TNTmips**, **TNTedit**, and **TNTview** users connecting to a single desktop PC do not apply to these platforms.

for floating platform licenses

For each individual floating platform license added to a network on all platforms, add 20% to the price of the single-user/single-platform **TNT** product.

Wherever a floating license **TNT** product can circulate to on a network, it will operate as the equivalent full and unshared **TNT** product. Think of it as a virtual version of the hardware authorization key that can be checked out via the network. With it, your local platform functions just as if a real hardware authorization key were attached to it for the duration of the **TNT** product's use. While you have the virtual key checked out, no one else can use it.

Each floating license you purchase can be checked out and used on any Windows, LINUX, or UNIX platform on your network.

Floating platform licenses cannot be used or administered on a Mac platform, as it is not supported by the FLEXlm license manager.

Floating licenses are not available for a **TNTserver**.

Definitions of TNT product Licenses.

The following subsections expand upon the definitions of the various kinds of licenses that can be purchased for your **TNTmips**, **TNTedit**, or **TNTview** products.

Single-user/single-platform licenses are for high-use personal, individual desktop situations.

Single-user/floating-platform licenses are used in institutional settings where there are a large number of potential users who will use the product intermittently. You simply buy enough individual licenses to satisfy the demand for the product most of the time.

Multi-user/single-platform licenses are unique to the **TNTmips** products. They are appropriate to reduce costs in settings where a small number of users wish to make heavy use of the **TNT** products. This type of **TNT** license should only be used in special situations where appropriate computer hardware is available. It is important that you review your potential use and hardware/network setup with MicroImages before getting too excited about using a multi-user/single-platform license.

Single User License. (single-user/single-platform)

This license is widely used on a stand-alone, local computer that may or may not be part of a network. It permits the **TNT** product it controls to be easily moved around by physically moving the license's hardware authorization key from computer to computer.

The hardware authorization key must be attached directly to the computer that will then be permitted to execute one, and only one, copy of the **TNT** products. A second copy of a **TNT** product cannot be started. However, many different **TNT** processes can be started simultaneously within the single **TNT** product as well as any simultaneous use of other non-**TNT** products.

The **TNT** software (executables) can be installed on as many computers of varying types as desired but will execute only if the hardware authorization key is attached.

The appropriate type of key can be physically moved from computer to computer by simply unplugging it and plugging it into the same kind of port on a different computer.

Parallel or USB keys are available for use on Windows or LINUX PCs. ADB (Apple Desktop Bus) or USB keys are available for use on the Mac. Serial keys are provided for UNIX-based workstations. (Note, the USB keys for the Mac and Windows are not the same.)

For example, this license permits the installation of the **TNT** products software on a UNIX office computer with a serial port and a Windows home computer with a serial port. The **TNT** product is then used exclusively at each location by moving the hardware authorization key between the two computers.

This license only requires the FLEXIm license manager to be installed on the UNIX, NT, or W2000 platform with the key attached if the single operation of the **TNT** product is going to be from a remote X terminal or remote computer using MicroImages' **MI/X** server.

Floating License. (single-user/floating-platform)

This license is for institutional networked situations where **TNTmips** will be shared on a network among multiple users who will use it only part time. This kind of license creates a "virtual" authorization key that "floats" from computer to computer under the control of the hardware authorization key and the FLEXIm license manager. It allows any computer on the network that has the exclusive use of the virtual key to check out the virtual authorization and use the **TNT** product. The network can be in a single office, between buildings, or any other network structure that will support continual access to the FLEXIm license manager.

Each floating license allows a single use of a **TNT** product at a given time. If a second attempt is made anywhere on the network to start a second copy of the **TNT** product, that location will be notified that the product is being used until its current user exits the entire **TNT** product. However, more than one floating license can be operated on a network. So, two or more simultaneous floating operations of **TNT** products can be authorized by purchasing additional single-user/floating-platform licenses.

The hardware authorization key of the proper type (serial, parallel, or USB) must be attached to an operating computer on the network. The FLEXIm license manager must be installed on this computer to create and serve up the virtual authorization key(s) to any other computer on the network. The computer using the license manager can be any UNIX, NT, or W2000 platform supported by the **TNT** products. The floating license can float to and be used on any UNIX, LINUX, NT, W95, W98, or W2000 platform. MicroImages and the **TNT** products do not need to know anything about the computer where the license manager is to be installed. Similarly, MicroImages and the **TNT** products do not need to know anything about the remote computers that might use the floating license.

The **TNT** software can be installed all over the network on as many computers of varying types as desired, ready to run the floating license as soon as a virtual authorization key is available and secured. This results in a lot of software duplication and complicates the management of the **TNT** products. As a result, floating license installations often maintain the actual executables on a single file server. A **TNT** product using a floating license can be set up to automatically load and execute as needed each processor module from this remote file server. The proper module can be automatically obtained for each different kind of platform on the network (LINUX, UNIX, W98 ...) that has access to the virtual authorization key.

MicroImages encodes the hardware authorization key before it is shipped to run the one or more floating licenses purchased. It is not necessary to supply any kind of information about your PC or a workstation ID code to obtain an authorization code from MicroImages to install the FLEXIm license on it. The hardware authorization key can be physically moved from computer to computer by simply unplugging and plugging it in to the same kind of port (parallel or serial) on a different computer. The FLEXIm license manager can then be reinstalled on the new platform. This may be periodically required if the license server fails or computer resources are being reallocated or rearranged.

Multiple User License. (multi-user/single-platform)

It is most common for this license to be used by remote access via X terminals or other computers on the network that are using **MI/X**. It can also be used on a single stand-alone machine to start several copies of the **TNT** product.

MicroImages recommends that caution be exercised in the purchase of this license for a Pentium-based platform. Only 2 or 3 simultaneous, independent operations of a **TNT** product can be supported on a platform with single or dual Pentium processors. A single PC platform with more than 2 Pentium processors should be limited to 1 more simultaneous **TNTmips** user than the total number of processors.

Expensive institutional single platform workstations running UNIX, LINUX, or W2000 can be assembled to support many simultaneous users. This is why they are now popular as web servers. As a result, the above recommendations for limiting the simultaneous **TNTmips**, **TNTEdit**, and **TNTview** users connecting to a single desktop PC do not apply to these platforms.

The hardware authorization key for this license must be installed on the computer that will execute all copies of the **TNT** product. A two-user license allows two separate copies of a **TNT** product to be started, each of which can simultaneously use the multiple **TNT** processes within that product. Similarly, a three-user license allows three copies, and so on.

The **TNT** software executables can be installed on as many computers of varying types as desired, but all of the authorized multiple copies must be executed on the computer that has the hardware authorization key attached.

The key can be physically moved from computer to computer by simply unplugging it and plugging it into the same kind of port on another computer. However, moving around the license key is not common with this license type, as several other users may be remotely using the license. Parallel or USB keys are available for use on Windows or LINUX PCs. ADB (Apple Desktop Bus) or USB keys are available for use on the Mac. Serial keys are provided for UNIX-based workstations. (Note, the USB keys for the Mac and for Windows are not the same.)

This license always requires the FLEXIm license manager to be installed on the computer that has the hardware authorization key attached. It is the FLEXIm license which, together with the hardware authorization key, allows the authorized number of multiple copies of the **TNT** product to be operated simultaneously.

MicroImages encodes the hardware authorization key before it is shipped to run the number of simultaneous copies purchased. Thus, it is not necessary to obtain any kind of authorization code from MicroImages to use this license. It is also not necessary to obtain any authorization code when changing computers, changing operating systems, or even moving between computers. Simply attach the key, and reinstall the FLEXIm li-

cense manager. This can easily be done as part of the reinstallation of the **TNT** product.

Papers on Applications

*** TNT Reviews.**

Don't Hit Warp Speed with the Wrong Equipment. by W. Fredrick Limp. *GeoWorld* November 1999. pp. 44 to 48.

"Selecting Web-based mapping software is difficult at best. To help users choose the package that's right for their applications, GeoWorld shows how the competition stacks up."

This entire article can be read or printed from the on-line *GeoWorld* archives located at <http://www.geoplace.com/gw/1999/1199/1199Imp.asp>.

[This article compares products from 18 vendors, including the **TNTserver**, based upon questionnaires completed by each vendor [and not verified]. These are presented in 3 tables: System Characteristics, System Data Formats, and Functions. Generalized discussion of each of these tables is provided without reference to any specific product. This article contains 1 external quote that merits reproduction here.]

"Performance"

"Another question not represented in the tables is about performance. With few exceptions, the answer [from the vendors] was 'fast,' but that didn't seem very useful. A thoughtful answer was provided by the MicrolImages developers, and it deserves to be quoted."

"Some of your questions request information relating to performance. For geoservers, such responses are directly related to the communication rate used: T1, DSL, cable modem or 56KB modem. It's important to ask the communication rate used in connection with the performance reported. Most nations have only slow, introductory Internet service and are fortunate if they can access a site at 56KB."

"Geoserver developers have to choose a definite minimum communication rate and a browser version as the lower limit for useful access. This decision, in turn, directly affects the design of the approach used. For example, if the 'design user' has access faster than 56KB, they can be asked to download Sun's Java 2 engine to access the geoserver. However, if the 'design user' has only 56KB or slower access, this download isn't practical, and Java 1 must be used, because it's supplied with Internet Explorer and Netscape Navigator. But clients created with Java 2 can have many more built-in features than those restricted to Java 1 for widespread international access."

Rewarded Papers.

MicrolImages has discontinued its formal reward system for published papers.

The program for automatically rewarding published papers in widely read materials describing interesting applications of the **TNT** products has not produced the expected results and is canceled. If you have published material containing references to the **TNT** products, please bring it to MicrolImages' attention for a possible reward by providing a reprint.

Online GIS saves resources. Users can access the online GIS via PCs and Internet connections. by Jason Rader. *American City & County*. January 2000. Volume 115, No 1. p. 10.

This article can be read or printed from their on-line archives located at <http://www.americancityandcounty.com/edit/0001/govtech.html>.

[Jason Rader is a **TNT** product support specialist at MicroImages.]

Madagascar Protected Areas Mapped with GPS-Logged Aerial Video and 35mm Air Photos. by Kevin P. Corbley, Lee Hannah, and Dana Slaymaker. *EOM*. January 2000. pp. 26-29.

The articles in *EOM* are posted at www.eomonline.com about 2 months after the printed magazine has been distributed.

Forest Monitoring in Madagascar Protected Areas. Change Detection with 35 mm Air Photos, Video and GPS. A low-cost, GPS logged aerial photography technique for forest monitoring in Madagascar has been developed. by Kevin P. Corbley, Lee Hannah, and Dana Slaymaker. *GIM International*. April 1999. pp. 51-53.

Subtitle: "The technique produces geo-referenced and rectified digital photo mosaics with 1.5 meter spatial resolution. The system consists of a standard 35mm SLR camera, Hi8 video cameras, a GPS receiver, unmodified Cessna aircraft and image processing software. The GPS-logged technique enables low-cost acquisition and processing of aerial imagery."

The articles in *GIM International* are posted at www.gitc.nl/gimag.htm.

Maryland Makes GIS Data Available on the Web. by Kevin P. Corbley. *EOM*. April 2000.

[This updates an earlier article on MERLIN by Kevin Corbley.]

The articles in *EOM* are posted at www.eomonline.com about 2 months after the printed magazine has been distributed.

Turkey Taps Diverse Processing Tools to Build Frequency Management Center. By Kevin P. Corbley.

This article has been written and awaits publication in a European publication. It describes an application of the **TNTsdk** by the Communication and Spectrum Management Research Center at Bilkent University in Ankara. Their product is being placed in the Turkish government's frequency monitoring stations to implement the latest spectrum engineering, frequency propagation modeling, and geospatial data viewing technologies.

Other Papers.

Long Term Management of a Corporate GIS. Tai O. Chan and Ian P. Williamson. *International Journal of Geographical Information Science*. 2000. Vol. 14, No. 3. pp. 283-303.

This paper has nothing to do with the **TNT** products but contains considerable pertinent information. Unfortunately, this is an expensive and thus hard to locate publication.

Promotional Activities

Sample Poster: The British Isles.

The geodata used in this poster are noted in its caption.

Appendix: Abbreviations

For simplicity, the following abbreviations were used in this MEMO:

W95 = Microsoft Windows 95.

W98 = Microsoft Windows 98.

W2000 = Microsoft Windows 2000.

NT or NT4 = Microsoft NT 3.1, 3.5, or 4.0 (3.1 and 3.5 are error prone, and thus the **TNT** products require the use of 4.0 and its subsequent patches). NT4 now has a patch 6.

Mac = Apple Macintosh using the PowerPC 60x or Gx processors and MacOS 7.x or 8.x.

MI/X = MicroImages' X Server for Mac and PC microcomputer platforms and operating systems.

GRE = MicroImages' Geospatial Rendering Engine, which is at the heart of most Micro-Images products. The current **GRE** will respond and render for requests from either X/Motif or Windows.