TNT Products V 6.8

March 2003

Mac OS X

V6.80
New Features

Highlight Features: Access to Oracle Spatial
Cartographic Advances
Formatting Text Editor
SML Interfaces via XML
New Error Management

Color plates illustrating new V6.80 features can be reviewed now at microimages.com/documentation/CPnew6801.htm. Watch this page for additional color plates as they are posted.

Mac OS X Uses Apple's X11 Window Environment.

At Macworld in January 2003, Apple released the X11 Window System for Mac OS X. Apple's X11 is a complete X Window System. V6.80 of the TNT products uses this Apple supplied X11 system that requires Mac OS 10.2 or later.

X11 eliminates the use of the XDarwin X Server and the OroborOSX window manager for the TNT products. These are both excellent products and V6.70 worked well with them. However, their use required that you and MicroImages install, manage, and maintain 4 different software environments (Mac OS, TNT, XDarwin, and OroborOSX). At a minimum this meant that each time Apple upgraded Mac OS X delays were encountered waiting for upgrades to XDarwin and OroborOSX before the TNT products could be operated.

Apple's X11 provides the following advantages for V6.80 relative to V6.70.

- Fast startup and operation as X11 is optimized by Apple for use with Mac OS X.
- Single environment for use with the TNT products and your other X applications.
- Apple supplied integration between X and non-X products operating concurrently under Mac OS X (e.g., cut, paste, ...).
- Easier installation and upgrading.

System Level.

Style Editor.

- Use improved point and line style editors with new features.
- Point Symbols can now contain embedded characters (glyphs) from any language.
- Convert CAD blocks to point symbols.
- Set/define a "Design Scale" for 2D Groups for scaling all elements and styles.

Style Assignment.

- Use improved dialog design for style assignment table editor.
- One-click assignment of styles to attributes.
- Undo style assignments.
- See sample for each listed style.
- Sort styles by name.
- Highlight changed styles in a different color.

MicroImages

microimages.com

Personal Color Palettes.

- Prepare specialized color palettes in a simple XML format.
- Use color selection tools to choose from any available color palette.
- New sample palettes provided in this format (USGS, BLM, CLI, www, and others).

Multi-language Text Editor.

- View text as entered in the selected font, style, and sizes in any language.
- Edit font, style, size, color, … for any selected portion of your text and see it in that format.
- Use new Character Map window to view every character (glyph) in any Unicode font.
- Pick any glyph in this window with cursor to insert in a query, data field, script, layout, label, …

New Map Projections and Coordinate Systems.

- Choose from 7 new ellipsoids.
- Choose from 77 new geodetic datum definitions.

Histograms.

- Create an unsampled histogram when a sampled one has been selected for viewing.
- Histograms of 16-bit rasters can now have 65536 "bins" or data values.

Desktop Management.

- Choose to raise all TNT Windows to foreground in Windows Desktop mode.
- Toggle between Windows or X Desktop mode on first X preference panel.
- Use option to cause a prompt for Window or X desktop type at startup.
- Choose KOI-8 encoding for Cyrillic fonts.

Miscellaneous.

- Link to JP2 files using a larger tile size of 256x256 to improve reading efficiency.
- Compute corner control points for a raster object with an "affine" georeference.
- First save of group or layout will use its name as the default name for the object.
- Change symbols for "nautical mile" and "knots" to "nmi" and "kn" respectively.

2D Geospatial Displays.

GeoLocking Views.

- Lock multiple view windows at differing scales.
- Zoom one window and others auto-zoom at relative scales.
- Pan larger scale view and smaller scale views will auto-pan if new area is not included.
- Use scale control layers: 1 view is synoptic while 2nd view is detailed or shows other layers.

Multi-View Locator Tool.

- Interactively control the areas viewed in multiple views of the same group or layout.

Miscellaneous.

- Faster JP2 image displays by 5 to 10 times from improved buffering.
- Choose options to Select All, Deselect All, or Toggle All on the dialog used to select elements to view by attribute.

3D Geospatial Displays.

- Improved extruded polygons with more precise algorithm in ray trace rendering mode.
- Eliminate sliver artifacts at some view angles by more accurate Z axis rendering mode.

MicroImages
microimages.com

Texture Overlays.

- Render much faster using improved buffering and resampling by TNT software implementations of techniques used in DirectX and OpenGL for games.
- Select from new advanced state-of-the-art convolution options to smooth image from foreground to background.
- Choose conventional nearest neighbor or bilinear sampling methods for fast results.
- Choose intermediate methods of simple mip-mapping for better quality
  (mip-mapping: game industry term for using appropriate pyramid layers for pixel based on its distance into 3D view).
- Choose slower anisotropic mip-mapping for best quality
  (latest computer game method for convolving pixels in bracketing pyramid layers to minimize antialiasing and seams in each pixel).

Terrain.

- Use new state-of-the-art triangulation to represent DEM (abstracted from game industry).
- Choose quality with which triangles represent DEM and thus control the artifacts and rendering rate (e.g. fast on screen view or detailed large 3D poster).
- Choose same quality as prior rendering methods and get much faster rendering.
- Choose high quality setting for more accurate terrain details than prior rendering methods.

Import/Export.

- Export styles with an Arc shapefile.
- Export to JP2 has reduce real memory requirements to handle gigabyte sized rasters.
- Compress TIFF and GeoTIFF rasters exported to 24-bit.
- Faster point to vector imports (1 million points now 10 to 20x = minutes rather than hours)
- Import/auto-link to Talisin Socet Set native DTM format (BAE's soft photogrammetry DTM, see talisin.com).
- Import of CMYK images from JPEG.
- Convert composite fields of numeric and character data into separate fields during E00 import (e.g., 1John, 2Pete, 3Ray …).
- Obtain the null value from the header file, if available, when importing an ESRI BIL/BIP file.
- Determine data type from header, if available, when importing an ESRI BIL/BIP.
- Import from ArcGrid using either the center or corner of the raster cell, as specified.
- SRTM: Provide a toggle for SRTM imports for "Do not show message again" that warns about missing files.

Editing Spatial Data.

- Automatically retain unsaved line/polygon being edited when switching to other edit tool.
- Switch back from some other tool and automatically continue editing unsaved line/polygon.
- Choose cubic or quadratic splining for 3D lines.
- Set/define "Design Scale" for 2D Groups for scaling elements and styles.
- Set preference to determine if the extents of a work copy are updated when saved.
- Provide three coordinate types in Object Properties dialog (2D-XY, 3D-XY, and 3D-XYZ).

Vector to Raster Conversion.

- Use redesigned interface simplified using tab panels.
- Obtain more accurate results with an improved polygon fill algorithm.

- Convert lines more accurately using improved rasterization algorithm.
- Create square cells by default and rectangular only by entering parameters.
- Define the value converted into the raster for each element type from Output All Same, By Attribute, By Query, or By Attachment.
- Select to convert each element type as None, All, or as Selected in View

Vector Warping.

- Specify the desired accuracy for line densification (i.e., improve the curvature represented).
- Automatically insert (densify) line vertices to maintain curvature when changing projections.

Database Operations.

Computed fields (virtual fields) can now use attributes intermixed from the point, node, line, and polygon tables of a vector object. (Computed fields were restricted to the attribute tables for each separate element type). Now these virtual fields can dynamically interrelate the properties of the different element types in the object. The initial use of this feature is in dynamic routing applications. The following is an example of an application:

Define a computed field in the line table that combines an attribute of each end node.
Suppose the attribute used is the pressure of a gas or fluid at the node.
Suppose the virtual field is the difference in pressure between the nodes.
The pressure attribute of each node can be in a linked table that can change at any time.
Now any TNT operation on the lines can use this constantly changing pressure differential.

Working With Other Database Products.

ODBC.

- Faster and improved linking via support for ODBC V3.5 which replaces version V1.
- Link to internationalized data sources using Unicode supported by ODBC V3.5.
- Use database constructed in the local language if the database source supports Unicode.
- Access improved "Memo" fields in a local language using Unicode text.
- Locate and link to a database source from Layer Manager dialog.

Oracle Spatial (prototype data access).

V6.80 introduces MicroImages' initial support of Oracle Spatial 9.x data in the TNT products. A general connection to Oracle tables can be made via ODBC above. Oracle stores elements, which they call geometries, in a spatial object field in records in a table. Alas, these special spatial object fields can not be accessed via ODBC. Thus, the TNT connections to Oracle Spatial is via their Oracle Objects for OLE (OO4O) using their OLE (Object Linking and Embedding) API.

The standard geometric elements stored in this spatial object field can be points or point clusters, line strings, n-point polygons, circular arc line strings, arc polygons, compound polygons, and compound line strings. These elements can be imported into a TNT vector object and its topology created. All or selected elements created or modified in a TNT vector object, including attributes, can also be exported to Oracle Spatial and other related tables.

This is a prototype of a new capability and its use in V6.80 should be considered experimental.

MicroImages
microimages.com

Cartographic Features.

Formatting Shown in Text Editor.

- Typing and editing in a text block or layer is formatted just as it will appear in layout (i.e., shows font, style, size).
- Highlight any text and change its formatting in same panel.
- Create styled legends in multi-object legends with less effort.
- Text blocks previously styled with markup codes now appear as formatted.
- Use toggle button to redisplay and to add markup codes for bold, italic, underline, ...
- Replace highlighted text when pasting text.

Multi-language Formatting in Text Editor.

- Mix languages with fonts, styles, sizes in a single line of text.
- Open new UNICODE Character Map window from within Text Editor.
- Review all characters (glyphs) in the font and their entry code and name.
- Select any character in this window to auto-insert at cursor position in text editor.

Faster and Easier Interactive Group Placement.

- Use wire frame mode for faster placement/movement of groups.
- Arrows will identify group to group associations.
- Use interactive dimension lines to show precise spacing between groups and to margins.
- Drag outlines of groups to new positions.
- DataTips identify each group when cursor is over its outline.
- Toggle on and off the slower display of the actual contents of all groups.

Map Grid and Corner Marginalia.

- Choose from many new coordinate formats for UTM and Latitude-Longitude labels.
- Annotate and draw other marginalia outside of a "clipped" group using a larger sketch layer.
- Control spacing from end of exterior tick or border to associated labels.
- Tick coordinates automatically have priority over corner coordinates where conflict occurs.
- Choose a "shortened" UTM format where the trailing 000 is not shown.
- Toggle on a direction indicator (N/S/E/W) for Latitude-Longitude.
- Show full UTM coordinate at bottom left.
- Select to use "corner" coordinates without showing other grid coordinates.
- Optionally show "corner" coordinates with accuracy to 1/10 or 1/100 second or meter.

Scaling.

- Set a Design Scale for 2D group to determine how they will be rendered.

Templates.

- Enter new clipping extents at prompts for groups that were clipped when template saved.

Conversion to Other Layout Formats (PDF, SVG, and Illustrator).

- Convert hatch patterns from layouts for direct use in other formats.
- Control conversion of layouts to other formats via options on the "Print To" menu.
- Choose these options to embed system fonts, only link to fonts, or render text into rasters.
- Optionally convert all non-TrueType fonts to Courier to insure availability.
- Optionally choose to embed PNG images in SVG or link to them as external images.
- Choose if SVG linked images are to be compressed or not compressed (for further editing).
- Sample JavaScript included with SVG conversions to show cursor's map coordinates.

MicroImages
microimages.com

Building Landscapes for TNTsim3D.

Terrain.

- Merge terrain and selected textures from several Landscape Files into a single landscape.
- Use terrains that are separated or adjacent side to side.
- Use terrains that are stacked representing different surface layers.

Texture.

- Automatically trim a raster selected for a texture to match the extent of the terrain layers.
- Nulls are no longer inserted to inflate a partial texture to the size of the terrain.
- Choose that an image raster object used for a texture layer is converted to a compressed linked JP2 (JPEG2000) file.
- Choose to convert a graphical/categorical raster object to uncompressed linked JP2 file.
- Define the color depth for a JP2 file (e.g., 15 bits = 5 bits each RGB, 18, 21, or 24-bit).
- Automatically create a binary mask for compressed JP2 linked files to render null areas.

Symbol Layers.

- Use Display process to set up points and associated styles from vector object.
- Convert points to point-of-interest table structure with points, styles, offsets, …
- Set stalk height automatically using extrusion defined in 3D attributes.

Spherical Volumes-of-Interest Layers.

- Use any TNT point selection procedure on a vector object to define points for spheres.
- Convert selected points to relational point-of-interest table structure to define centers, colors, transparency, full or partial spheres, add grids, grid color, …
- Use utility to create "spherical volumes" table for spheres with only color and transparency.

Polygon Layers.

- Use Display process to set up polygons and associated styles from vector object.
- Convert polygons to new vector object used for the Landscape File.

Publishing Geosimulations with FREE TNTsim3D.

Terrains.

- Select from multiple terrains of different extent/detail (e.g., show stacked geologic, ground water, and topographic surfaces).
- Select any available texture for overlay on any terrain layer, even same texture to different terrains if they have the same extents.

Textures.

- Select multiple textures of varying surface detail (cell sizes do not need to match).
- Assign the same texture layer to more than 1 terrain layer.
- Create much smaller partial coverage textures equal in size to each texture's extent rather the whole terrain's extent.
- Select textures that are linked to highly compressed JP2 objects (JPEG2000 compression).
- Achieve higher usable frame rates as much smaller JP2 files require less drive access.
- Distribute much smaller Landscape Files or cover larger areas with virtual mosaics.

MicroImages
microimages.com

Overlay Symbols.

- Select layers that draw multicolored point symbols on, above, or below the surface.
- Symbols are 2D and vertical and rotate to always face the viewer.
- Symbols can be offset from surface on a styled line or pedestal.

Overlay Extruded Polygons.

- Select layers that contain polygons viewed as vertically extruded solid objects.
- Change extrusion height of all polygons.

Spherical Volumes-of-Interest.

- Select point-of-interest table to show colored and gridded spherical volumes-of-interest (referred to as threat domes in military simulations).
- Change the transparency of these spherical shapes.

Controls.

- Change altitude by rotating the mouse's thumb wheel while moving in view.
- Choose any TNT coordinate report option for the Lat/Lon mouse and viewer positions.
- Toggle to show/hide selected point-of-interest view locations on all views.
- Use a menu to select and display the tabular contents of one or more point-of-interest tables.
- Reset all projection parameters to their original default settings.
- Set if spherical shapes should expand in Z only or not with changes in vertical exaggeration.
- Set if polygon height should expand or not with changes in vertical exaggeration.
- See direction of main view (forward, left, right, …) and altitude lock on/off in corner of view.

TNTatlas for X.

- Open more than one view window, which can be geolocked or not.
- Scale lock multiple view windows at different scales (e.g., 1 synoptic and 1 detailed).
- Set atlas to start up showing multiple views with these new interrelationships.
- Set atlas to startup multiple views in positions specified (e.g., above/below, side by side, …).

TNTserver and TNTclient.

- Use highly compressed linked JP2 rasters in atlases used in TNTserver.
- Choose to send either JPEG or smaller JP2 images to a TNTclient.

Spatial Manipulation Language (SML) for Windows and X.

Edit Attributes in Other Databases Using Visual Basic.

You can now start or connect to your executing Visual BASIC, C++ or other program from SML and transfer selected elements attributes to it via OLE. The following is an example of this SML application.

- Use an SML macro script started from an icon you add to the tool bar to select any element from the active layer in the current composite TNT view (e.g., select a polygon).
- The SML script starts your Visual BASIC program or identifies it if it is already running.
- The selected element's ID is sent to your Visual Basic program via OLE.
- All this active layer's attributes are linked via this ID in SQL Server or Access tables by ODBC.
- Your Visual Basic program is a form that retrieves fields from the tables for editing.

MicroImages
microimages.com

- Or the Visual Basic program is a form that collects data for the fields in the tables.
- TNTmips has immediate access to these changes since the relational tables are linked to the active object in the view.
- A redisplay of the View, which could be done by SML, will reflect these attribute changes.

User Interface Design via XML.

- New classes added to permit SML to convert XML into user interface components.
- Use XML documents to define user interface components.
- Example XML documents provided for dialog, nested dialog, tabbed panels, menu bar, menu button, label, push button, toggle button, color button, edit text, edit number, radio group, combo box, list box, item, and others.

Other.

- SML now has the option to enforce stricter syntax checking.
- New classes to convert selected polygon to raster and embed into raster object, a tool to draw a polygon in a view, and others.

Miscellaneous.

- OpenGL is directly supported in MicroImages' X server for future use by 3D processes.
- Regions can now be converted into vector objects.
- Choose coordinates sort order in Map Calculator "Read File" operation.
- Change colors of elements in rose diagram used in Directional Analysis.
- Allow saving a new mosaic over existing/current mosaic layout.
- Optionally transfer metadata when extracting part of a raster.

Tutorial Materials.

New Booklets.

- Making Image Maps.

Major Revisions.

- Vector Analysis Operation (updated and pages added).
- Sketching and Measuring (major update).
- Managing Relational Databases (major update).

New Error Management System.

New features being added after the release of V6.80 will no longer be made in the same code base as the official V6.80 TNT products. Thus these modifications will no longer have any impact on the correction of errors in the V6.80 code base.

For Official V6.80 Release.

- Correction of errors will be kept isolated from changes related to new developments.
- Download a single, large patch-in-place file periodically to correct errors in this release.
- Patch TNTlite 6.8 for errors using the same single patch.

V6.90 Development Version.

- Download and install DV separately from V6.80 if TNT product is licensed to use V6.90.

MicroImages
microimages.com