

Introducing Terrabase II

By Captain Russell Kirby

"Our engineers must be terrain visualization experts so they can help the maneuver commander use the terrain to his advantage to win...The engineer's business is terrain, pure and simple. We own the ground."

*Major General Clair F. Gill
Commandant, U.S. Army Engineer School*

How do engineer officers become terrain visualization experts? One solution from the U.S. Army Engineer School is provided by Terrabase II (TB II) and an instructional CD-ROM. The CD-ROM provides transitional training on the capabilities of TB II and explains how to use digital terrain data to visualize battlespace. TB II and the CD-ROM will be available at no cost to military units in late September 1997. They will enable all officers, not just engineers, to understand, use, and obtain digital topographic products.

The following information provides a brief overview of the TB II software and CD-ROM. Basic knowledge of the TB II software is a first step toward visualizing terrain, but the applied tactical knowledge of the user is what really makes this software powerful.

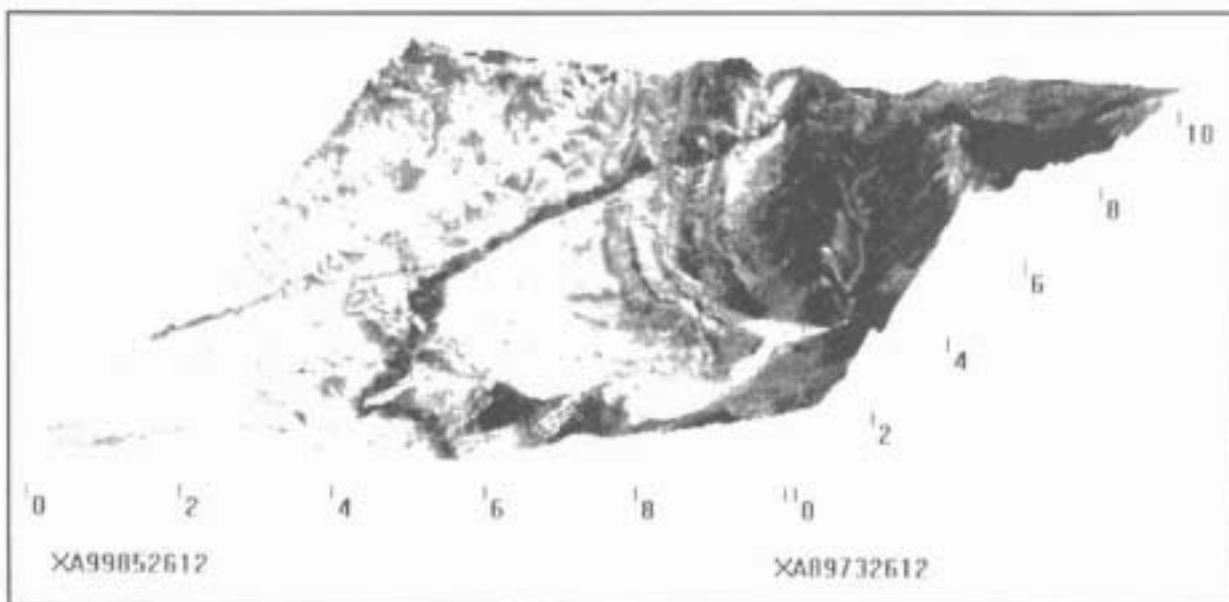
Background

The Terrabase program was written at the U.S. Military Academy in the mid-1980s and was the first automated terrain tool used by military occupational specialty (MOS) 215D topographic warrant officers and MOS 81Q terrain analysts. It allows the user to quickly analyze terrain data and provide warfighting commanders with tactical decision aids (TDAs).

Terrabase runs on IBM 286 computers, and its output is limited to dot matrix printers. The software has changed little since its development. Although it is still widely used at the brigade level and below, Terrabase does not take advantage of automation advances and many improved digital data sets.

Terrabase II

The Engineer School's Department of Tactics, Leadership, and Engineering, in partnership with the Terrain Visualization Center, researched available commercial and government-owned programs to find an updated terrain evaluation tool. None was found, but a government-owned terrain evaluation software package



Digital elevation model (DEM) data with SPOT satellite image draped over it. This image shows an area at Irish Canyon, Colorado.

called MicroDEM, developed by the U.S. Naval Academy, was suitable for tailoring into terrain visualization software. This powerful personal-computer-based package operates under Microsoft Windows and uses a variety of improved digital terrain data available from the National Imagery and Mapping Agency and the U.S. Geological Survey.

MicroDEM was demonstrated to senior leaders and approved for adaptation by Major General Gill on 16 December 1996. The Terrain Visualization Center at the Engineer School arranged for training development funds. Both the 20th Engineer Brigade at Fort Bragg, North Carolina, and the U.S. Space Command at Colorado Springs, Colorado, contributed funding to tailor MicroDEM into Terrabase II. The Naval Academy and the Engineer School worked together to develop the software.

The minimum requirement to run Terrabase II is a 486 computer with 16 MB of RAM and Windows 95. The program creates all the tactical decision aids of the original Terrabase. In addition, Terrabase II can—

- Change datums.
- Make elevation tints, slope tints, contour plots, lines of sight, 3-D views, reflectance maps, weapons fans, and visible area plots.
- Print to scale on any Windows-compatible printer or plotter.

The beauty of this software is that anyone familiar with Microsoft Windows can learn to use it quickly. Terrabase II will be included in the Engineer Officer Advanced Course beginning in July 1997. It can be taught in the same amount of time as the original Terrabase.

CD-ROM

The instructional CD-ROM can be used for distributive training for individuals or groups, such as for officer professional development or commanders' calls. The CD-ROM includes the following segments:

"Introduction to Terrain Visualization" provides an overview of terrain visualization. It includes map fundamentals, datums, grids, symbology, and accuracy.

"Request and Manage Terrain Visualization Data" provides examples and explanations of digital data products from the National Imagery Mapping Agency and U.S. Geological Survey. The examples are explained in bullet comments with an accompanying voice file to provide details. This segment describes the tactical use of each product as well as ordering information and price. This is the first time that a simple-to-use viewer has been available for digital formats from both mapping agencies. TB II makes it possible to import these formats.

Terrabase II Tutorial is a "battledrill" or "how to" version for creating tactical decision aids. These interactive/multimedia battledrills have pictures that show how the

"Terrain visualization is a basic and fundamental leadership skill. ... A battle commander must understand how terrain influences every aspect of military operations. Terrain visualization is a component of battlefield visualization. It portrays and allows a detailed understanding of the background upon which enemy and friendly forces and actions are displayed."

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screen looks as the products are created. The tutorial is an easy-to-use aid that explains how to load the software and digital data, create TDAs, and save and print products.

Database includes data sets for each area of operation for the Engineer Officer Advanced Course practical exercises. A data set includes digital terrain elevation data (DTED), land satellite (LANDSAT) or Systeme Probatoire d'Observation de la Terre (SPOT) satellite imagery, controlled image-based imagery, and aerial photographs. Since all areas of the world do not have complete data, some of the sets are not complete.

Product Index is a list of digital products with "hot keys" that enable the user to choose to "view the product example" or "learn more about the product."

Conclusion

Terrabase II fills the terrain visualization requirement for engineers at the brigade level and below. The instructional CD-ROM educates engineers on how products look, their availability and tactical use, and how to obtain digital data. TB II software is not designed to compete with more advanced terrain analysis systems. Instead, it introduces some of the capabilities of larger systems and enables users to better understand these products.

The increased knowledge and computer capability officers gain from using Terrabase II will give them greater planning flexibility by providing a wide range of options for each mission. The TB II software and instructional CD-ROM enable engineers to become terrain visualization experts and truly earn the title "Masters of Terrain."

Note: TB II will be available on the Fort Leonard Wood home page by late September. The CD-ROM will be reformatted and added to the home page by December 1997.



Captain Kirby is a doctrine instructor/writer in the Department of Tactics, Leadership, and Engineering (DTLE), U.S. Army Engineer School. Previous assignments include G2 GEO Officer, Bosnia-Herzegovina Command, Sarajevo, Bosnia; platoon leader/XO, 29th Engineer Battalion (Topo), Fort Shafter, Hawaii; and Chief, Topographic Operations, DTLE, U.S. Army Engineer School. CPT Kirby holds a bachelor's degree in geology from Iowa State University.