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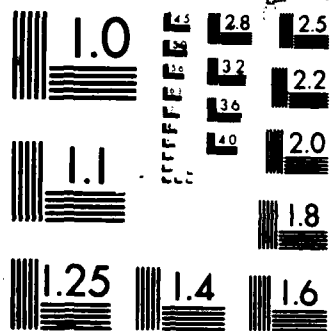
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FY 86 proved to be a banner year for both the Digital Topographic Support System (DTSS) and Quick Response Multicolor Printer (QRMP) Programs. Significant progress has been made in the areas of program management, schedule milestones, technology demonstrations, system capabilities and operational concepts. We are closer than ever to achieving our goal of providing greatly improved topographic support on the battlefield.

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ABSTRACT

FY 86 proved to be a banner year for both the Digital Topographic Support System (DTSS) and Quick Response Multicolor Printer (QRMP) Programs. Significant progress has been made in the areas of program management, schedule milestones, technology demonstrations, system capabilities and operational concepts. We are closer than ever to achieving our goal of providing greatly improved topographic support on the battlefield.)

INTRODUCTION

Key decisions and events have occurred during the last year that have culminated in increased Army recognition and support for new topographic systems that when fielded will revolutionize topographic support on the battlefield. The purpose of this paper is to provide the MC&G community with an update on the status and achievements of the Digital Topographic Support System and Quick Response Multicolor Printer Programs.

PROGRAM FUNDAMENTALS

Nothing moves, shoots, communicates or gets resupplied on the battlefield without being affected either positively or negatively by the terrain and its condition at that particular time. Commanders at all levels need to know as much as possible about the battlefield terrain if they truly expect to control the action on it.

Existing manual terrain analysis and reproduction methods and tools are very time consuming and labor intensive and cannot possibly keep up with the pace and requirements of the modern battlefield. DTSS and QRMP, now ready for engineering development, will provide the right products in the right quantities in the time necessary to give Commanders the edge they need to gain the advantage.

DTSS

The purpose of the Digital Topographic Support System is to provide Engineer Topographic Units at Division, Corps and

EAC levels with automated capabilities to store, update and manipulate digital topographic data. The system includes a computer, plotter, printer, digitizer, dual screen work station and other associated peripherals, and communication and COMSEC devices, all of which will be installed on a standard S-280 tactical shelter, mounted on a 5-ton truck, and powered by a 30-KW generator. DTSS will be issued to active Reserve and National Guard Engineer Topographic units; one system per Division, two per Corps and two per Theater organization. The DTSS units will be collocated with the All Source Analysis System (ASAS), an automated intelligence system being developed by the Joint Tactical Fusion Program Office (JTFPO) to improve the Army's intelligence analysis and electronic warfare capabilities. DTSS will provide Intervisibility and Mobility analyses and products necessary in support of such ASAS functions as intelligence preparation of the battlefield and sensor management.

QRMP

The purpose of the Quick Response Multicolor Printer is to provide Engineer Topographic units at Division and Corps level with a fast, low volume, multicolor reproduction capability required to support combat operations.

The printing presses used today by the Army's topographic units cannot meet this demand. Topographic reproduction in the field currently relies on single-color off-set lithography. While such presses can print large quantities of maps at reasonable cost, they are not designed to handle small runs of multicolor terrain graphics and special products. Nor are they capable of quick response. Printing a single five-color product requires a long set-up and production time -- and time is precisely what the field commanders won't have when maps and terrain graphics are needed.

Unlike conventional lithographic presses, the QRMP uses a dry printing process. The addition of a laser scanner improves the "dry copying" process and provides the high resolution required for map reproduction. This combination of technologies gives the QRMP the fast, high-quality, multicolor capabilities that are required.

The QRMP is a full-color printer that uses the three process colors plus black to produce all colors and shades and is capable of both accepting as inputs and providing as outputs, special topographic products in paper, transparency and digital forms. After a thirty minute warmup, QRMP will



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be able to turn out 75 full-color or 225 single-color, full-size graphics per hour while nearly matching the quality achieved by lithographic printing equipment.

QRMP will also be issued to Engineer Topographic units throughout the total Army on the basis of three systems per Corps and two systems per Division, and like DTSS, will be collocated with ASAS when deployed.

WHAT'S NEW

Technology Demonstrations

During the last year, ETL scientists used a prototype of the DTSS called Terrain Analyst Work Station (TAWS) to conduct a series of garrison and field demonstrations -- a series which began last October in Ansbach, West Germany in support of the 1st Armored Division. During that demonstration researchers taught terrain team members from the 518th and 526th Engineer Detachments how to use TAWS. After the terrain analysts mastered the equipment and software, they used TAWS to generate over 600 products requested by 1st Armored Division officials. Feedback obtained from the soldiers will help ETL scientists improve the system's software design and make DTSS more user-friendly.

A second demonstration was completed in February at Fort Bragg, NC. Officials followed the same "training-production-feedback" pattern. Scientists showed terrain analysts from the 283d Engineer Detachment how to operate the system. The soldiers then used TAWS to provide terrain analysis support to the XVIII Airborne Corps during the Gallant Knight exercise.

A third demonstration was conducted in May at Fort Shafter, Hawaii, in support of WESCOM. TAWS was used to generate products in support of the RIMPAC exercise at the request of Navy and Marine officials.

ETL scientists plan to conduct similar demonstrations with other units. One purpose behind these demonstrations is to introduce Army terrain teams to the digital terrain analysis capabilities and computer-based equipment that they'll use in the future. Feedback from these exercises will help ETL scientists validate and refine the terrain data management techniques and methodologies planned for DTSS, particularly those scheduled for fielding under the Pre-planned Product Improvement (P³I) program. In line with goal, future TAWS demonstrations will focus more extensively on evaluating the system's data base creation and revision capabilities.

New Capabilities

Ongoing research conducted at ETL has resulted in new capabilities to be realized with the fielding of DTSS and QRMP. Elevation layer tints, elevation contour plots, flight line masking plots and minimum altitude detection products are examples of new or improved intervisibility models that have been added to the DTSS software library. QRMP now has the capability to make 2X, 4X and 8X enlargements as well as factor equivalent reductions. These improvements were demonstrated during support of several recent exercises.

Program Management

On 23 September 1986, the Program Manager of the Joint Tactical Fusion Program assumed control of the DTSS and QRMP programs and CECOM was designated as the readiness command for DTSS and QRMP as it already is for ASAS. These shifts in program management and support, from a business point of view, are more practical and are a natural reflection of doctrinal and operational concepts, as well as physical relationships and commonalities. The DTSS, QRMP and ASAS programs are now linked and in sync. The Army should realize integrated and dynamic battlefield capabilities at reduced cost.

SCHEDULE PROGRESS AND FUTURE PLANS

The acquisition strategy for DTSS was approved in December of 1985. QRMP's acquisition strategy is at JTFPO for approval. The Required Operations Capability documents (ROC) for both programs are at TRADOC for approval. The Request for Proposals (RFP) for DTSS full-scale development was released last August and proposals are due in on 14 October 1986. The draft Statement of Work (SOW) for QRMP full-scale development has been prepared.

Both the DTSS and QRMP programs have a milestone II In-Process Review scheduled during 1st Quarter FY87 and plan on awarding contracts in January, 1987 to begin full-scale development. Additionally, the QRMP design improvement study will be completed during the 4th quarter FY87.

SUMMARY

The past twelve months have proved to be an exciting and productive period in the development of these two critically important topographic programs. Today, both DTSS and QRMP are under the same management -- funded, viable programs that are in sync and on schedule. By the end of the next decade, commanders will have access to the accurate, timely and high-quality terrain analysis and topographic reproduction support that they require.

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