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RESEARCH AND DEVELOPMENT PROGRAM

FY 1991 BUDGET ESTIMATES

FOR THE

DEFENSE MAPPING AGENCY

JANUARY 1990

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FY 1991 BUDGET ESTIMATES RDT&E DESCRIPTIVE SUMMARY

Program Element: 0305139B

Budget Activity: Intelligence and  
Communication #5

PE Title: DMA Mapping, Charting, and Geodesy (MC&G) Production System Improvements

A. (U) RESOURCES (\$ in Thousands)

<u>Project Number and Title</u>	<u>FY 1989 Estimate</u>	<u>FY 1990 Estimate</u>	<u>FY 1991 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
(U) 100 Source Collection Optimization	575	538	847	Continuing	Continuing
(U) 200 Product Development Definition	3681	3313	5738	Continuing	Continuing
(U) 300 Production Development	398	94	3440	Continuing	Continuing
(U) 400 Distributed Production Development	1366	1013	1316	Continuing	Continuing
(U) 500 Distribution Modernization	0	301	302	Continuing	Continuing
(U) 700 Digital Production System(DPS)	293997	255703	213082	189297	2,005,700
(U) TOTAL PROGRAM ELEMENT 0305139B	300017	260962	224725	NA	NA

B. (U) BRIEF DESCRIPTION OF ELEMENT:

This program element includes all R&D costs associated with improving DMA's production system and related MC&G developments such as source collection optimization, new production development, and improvements to distribution management. This PE also is for costs associated with the completion of the Digital Production System (formerly the Exploitation Modernization Program). The DPS includes the development, acquisition, and initial installation of a capability to produce all MC&G products using digital source materials and other data collected through advanced acquisition systems. FY 1989 costs for project 100 through 500 are shown for comparison. These costs were included in PEs 0602716B, 0603701B, and 0604701B in those years, but beginning in FY 1990, costs are included in the redefined PE 0305139B.

C. (U) JUSTIFICATION FOR PRODUCTS LESS THAN \$10.0 MILLION IN BOTH FY 1990 AND 1991:

FY 1989, FY 1990, and FY 1991 accomplishments and plans are discussed in the individual project descriptions for this program element. All other information such as related activities, work performed by, and other appropriation data is also included in the individual project descriptions.

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A. (U) RESOURCES (\$ in Thousands)

<u>Project Number and Title</u>	<u>FY 1989 Estimate</u>	<u>FY 1990 Estimate</u>	<u>FY 1991 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
(U) 100 Source Collection Optimization	575	538	847	Continuing	Continuing

B. (U) BRIEF DESCRIPTION OF PROJECT:

Source Collection Optimization activities examine potential and develop new collection systems from which MC&G data can be derived to enhance the DMA production capabilities and provide DMA customers with improved products. Collection Systems include gravity measurement, hydrographic collection and geodetic positioning using GPS. FY 1989 data is shown for comparison. Funds for this project were included in PEs 0603701B and 0604701B in those years.

C. (U) JUSTIFICATION FOR PROJECTS LESS THAN \$10.0 MILLION IN BOTH FY 1990 AND  
FY 1991:

(U) FY 1989 Plans: Continuation of the HIHAN/ABS interface development; development of software for processing GPS data with software turn-over to the production centers; and funding to the Navy for testing of a Canadian Airborne System.

(U) FY 1990 Plans: a. Examine innovative techniques to handle, store and process data supporting Advanced Gravity Products for future programs such as Strategic Defense Initiative (SDI). b. Support precise positioning capability for the Global Positioning System (GPS). c. Begin development on next generation Bathymetric/ Hydrographic Collection data system and begin design of a digital sounder.

(U) FY 1991 Plans: Continue development of advanced Bathymetric/Hydrographic collection systems.

(U) Work Performed By: Private contractors and government research laboratories.

(U) Related Activities: a. Synergistic exploitation research; b. Bathymetric and Hydrographic modifications to production; and c. G&G Modernization.

(U) Other Appropriation Funds: NA

(U) International Cooperative Agreements: NA

FY 1991 BUDGET ESTIMATES RDT&E DESCRIPTIVE SUMMARY

Program Element: 0305139B

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PE Title: DMA Mapping, Charting, and Geodesy (MC&G) Production System Improvements

A. (U) RESOURCES (\$ in Thousands)

Project Number and Title	FY 1989 Estimate	FY 1990 Estimate	FY 1991 Estimate	To Complete	Total Program
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(U) 200 Product Development/Definition	3681	3313	5738	Continuing	Continuing
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B. (U) BRIEF DESCRIPTION OF PROJECT:

This project investigates the techniques, methodologies, and systems for satisfying the user MC&G product and service needs. It involves the investigation and implementation of emerging technologies as they relate to MC&G products and services. Included in this activity is the implementation of new and existing products into the Digital Production System (DPS). FY 1989 data is shown for comparison. Funds for these projects were included in PEs 0603701B and 0604701B in those years.

C. (U) JUSTIFICATION FOR PROJECTS LESS THAN \$10.0 MILLION IN BOTH FY 1990 AND FY 1991:

(U) FY 1989 Plans: Plans include deploying the revised Digital Point Positioning Data Base (DPPDB) with its newly developed support data media; continued development of a High Resolution Product solution; continued developments of joint standards with the National Oceanic Service; and continued development of the Digital Chart of the World; and completion of prototype development of the Digital Transportation File.

(U) FY 1990 Plans: a. Continue High Resolution, Tactical Terrain Data (TTD) and Digital Point Positioning Data Base (DPPDB) products. b. Initiate production of Digital Chart of the World (DCW). c. Within the Digital Data Development project, establish standards for electronic charts; turnover to production an in-house Arc-second Digitized Raster Graphics (ADRG) capability; initiate development of a World Height System (WHS); continue development of an Electronic Chart Displays System; and complete the Digital Feature Analysis Data (DFAD) on Compact Disk-Read Only Memory (CD-ROM) prototype. d. Prototype development of Digital Bathymetric Data.

(U) FY 1991 Plans: a. Continue development of High Resolution, TTD and DPPDB products. b. For Digital Data Development, start development of new products for emerging systems such as super-Cockpit, and Theatre Mission Planning; continue development of World Height System (WHS); and develop electronic chart prototype for evaluation.

(U) Work Performed By: This work is performed by government research laboratories and private contractors.

(U) Related Activities: Work is closely correlated with the DPS (as proof-of-concept and production capabilities for future digital products).

(U) Other Appropriation Funds: NA

(U) International Cooperative Agreements: NA

FY 1991 BUDGET ESTIMATES RDT&E DESCRIPTIVE SUMMARY

Program Element: 0305139B

Budget Activity: Intelligence and  
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PE Title: DMA Mapping, Charting, and Geodesy (MC&G) Production System Improvements

A. (U) RESOURCES (\$ in Thousands)

Project Number and Title	FY 1989 Estimate	FY 1990 Estimate	FY 1991 Estimate	To Complete	Total Program
(U) 300 Production Development	398	94	3440	Continuing	Continuing

B. (U) BRIEF DESCRIPTION OF PROJECT:

This project develops techniques, processes, and systems to improve the efficiency, timeliness, and capabilities of the DMA Digital Production System (DPS) and DMA production areas to reduce DMA costs and satisfy customer requirements. FY 1989 data is shown for comparison. Funds for these projects were included in PEs 0603701B and 0604701B in those years.

C. (U) JUSTIFICATION FOR PROJECTS LESS THAN \$10.0 MILLION IN BOTH FY 1990 AND FY 1991:

(U) FY 1989 Plans: Began development of software to interface with DPS for Bathymetric and Hydrographic data and develop, with the Navy, an executive geographic data base information system.

(U) FY 1990 Plans: Begin Printing Modernization by evaluating a four-color printing system scheduled for marketing in FY 1990/1991.

(U) FY 1991 Plans: a. Initiate modifications to DPS to incorporate Bathymetric and Hydrographic data processing. b. Begin development of a modern G&G production system. c. Continue the Printing and Graphics modernization.

(U) Work Performed By: In-house activities and private contractors.

(U) Related Activities: NA

(U) Other Appropriation Funds: NA

(U) International Cooperative Agreements: NA



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FY 1991 BUDGET ESTIMATES RDT&E DESCRIPTIVE SUMMARY

Program Element: 0305139B

Budget Activity: Intelligence and  
Communication #5

PE Title: DMA Mapping, Charting, and Geodesy (MC&G) Production System Improvements

A. (U) RESOURCES (\$ in Thousands)

Project Number and Title	FY 1989 Estimate	FY 1990 Estimate	FY 1991 Estimate	To Complete	Total Program
(U) 400 Distributed Production Development	1366	1013	1316	Continuing	Continuing

B. (U) BRIEF DESCRIPTION OF PROJECT:

This project is to develop a DoD capability to store, format, transmit, and receive digital MC&G data for worldwide access by U&S commands, military departments, and other military users. FY 1990 through FY 1994, the majority of funds will be used to develop a capability to access and aggregate all digital geographic information holdings, tailor the data into Military Standards (MIL-STD) data structures and formats, and make the data sets available to DoD users. FY 1989 data is shown for comparison. Funds for these projects were included in PEs 0603701B and 0604701B in those years.

C. (U) JUSTIFICATION FOR PROJECTS LESS THAN \$10.0 MILLION IN BOTH FY 1990 AND FY 1991

(U) FY 1989 Plans: Plans include development of a concept to deploy digital MC&G data and to explore techniques and structures to integrate digital MC&G data with other intelligence and military operations data.

(U) FY 1990 Plans: a. Begin repository studies and utility software developments.  
b. Begin MIL-STD data set requirements analysis.

(U) FY 1991 Plans: Continue MIL-STD data set definition.

(U) Work Performed By: In-house activities and private contractors.

(U) Related Activities: DPS, data standardization programs, and Digital Chart of the World.

(U) Other Appropriation Funds: NA

(U) International Cooperative Agreements: NA

FY 1991 BUDGET ESTIMATES RDT&E DESCRIPTIVE SUMMARY

Program Element: 0305139B

Budget Activity: Intelligence and  
Communication #5

PE Title: DMA Mapping, Charting, and Geodesy (MC&G) Production System Improvements

A. (U) RESOURCES (\$ in Thousands)

Project Number and Title	FY 1989 Estimate	FY 1990 Estimate	FY 1991 Estimate	To Complete	Total Program
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(U) 500 Distribution Modernization	0	301	302	Continuing	Continuing
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B. (U) BRIEF DESCRIPTION OF PROJECT:

This project will design, develop, and deliver modernized distribution and distribution management systems to increase the timeliness of DMA product dissemination to U&S Commands, Military Departments, and other users.

C. (U) JUSTIFICATION FOR PROJECTS LESS THAN \$10.0 MILLION IN BOTH FY 1990 AND FY 1991:

(U) FY 1989 Plans: None

(U) FY 1990 Plans: a. Award contract for development and implementation of CD-ROM and the color ink jet systems. b. Perform analysis of interface between DPS and upgraded Distribution System to determine best method of integration.

(U) FY 1991 Plans: Initiate the integration of the Distribution System with the Digital Production System.

(U) Work Performed By: In-house activities and private contractors.

(U) Related Activities: Digital Production System.

(U) Other Appropriation Funds: NA

(U) International Cooperative Agreements: NA

FY 1991 BUDGET ESTIMATES RDT&E DESCRIPTIVE SUMMARY

Program Element: 0305139B  
 Project Number: 700

Budget Activity: Intelligence and  
 Communication #5

PE Title: DMA Mapping, Charting, and Geodesy (MC&G) Production System Improvements

A. (U) RESOURCES (\$ in Thousands)

<u>Project Number and Title</u>	<u>FY 1989 Estimate</u>	<u>FY 1990 Estimate</u>	<u>FY 1991 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
(U) 700 Digital Production System	293997	255703	213082	189297	2,005,700

B. (U) BRIEF DESCRIPTION OF MISSION REQUIREMENT AND SYSTEM CAPABILITIES:

The Defense Mapping Agency (DMA) Digital Production System (DPS) is an Office of the Secretary of Defense (OSD) mandated, congressionally endorsed, effort to attain an all-digital production capability for DMA utilizing available source material. This capability consists of three fully equipped, interdependent production centers interfaced to produce MC&G products. When completed, DPS will give DMA the flexibility to adapt its production line to future changes in acquisition and collection of source materials. Compared to previous capabilities, the DPS is expected to increase DMA's production capability to support current and new weapon systems and tactical operations, and to produce improved responsiveness through a decrease in product generations time. The DPS objectives are a 50 percent reduction in production costs and a 75 percent reduction in pipeline time as compared to current DMA capabilities. The DPS consists two systems, MARK 85 and MARK 90. MARK 85 is complete. It provides the capability to use new source material in the existing DMA production process. MARK 90 will convert DMA's existing production process to an all digital process. MARK 90 consists of five segments. They are:

(U) Source Preparation Segment - assesses, evaluates, and integrates all source materials for production programs.

(U) Data Extraction Segment - provide for the extraction of terrain evaluation and feature data from available sources.

(U) Product Generation System - supports the generation and revision of MC&G products by capturing and integrating data from various sources.

(U) Data Services Segment - responsible for the centralized management and transfer of source materials and all digital data.

(U) Production Management Segment - provides resource allocation, production monitoring and quality assurance support.

C. (U) PROGRAM ACCOMPLISHMENTS AND PLANS:



FY 1991 BUDGET ESTIMATES RDT&E DESCRIPTIVE SUMMARY

Program Element: 0305139B  
Project Number: 700

Budget Activity: Intelligence and  
Communication #5

PE Title: DMA Mapping, Charting, and Geodesy (MC&G) Production System Improvements

(U) 700 Digital Production System (continued)

(U) FY 1989 Plans: The remaining individual MARK 90 segment Critical Design Reviews (CDRs) have been completed. A MARK 90 System CDR was completed. Based on completion of these reviews, specifications for hardware and software development and segment interfaces are being finalized. Fabrication of the special purpose hardware has begun. The coding and debugging of segment unique software is also beginning.

(U) FY 1990 Plans: Fabrication of special purpose hardware will be completed for most segments. Delivery of MARK 90 equipment to the production centers will begin at the DMA Reston Center (DMARC). This equipment will be used to demonstrate the end-to-end capabilities of digital exploitation to produce MC&G products. The coding and debugging of segment unique software will continue and intensify.

(U) FY 1991 Plans: Delivery of equipment to the other two DMA Production Centers will begin. This equipment will undergo installation, check-out, and test. Intercenter production capabilities will be demonstrated and tested. Testing and debugging of segment unique software will continue with delivery of 75% of the total planned software for DPS. This software will undergo testing, integration and demonstration leading to Initial Operating Capability (IOC) in March of 1991.

D. (U) Work Performed By:

(U) Source Preparation Segment - E-Systems, Garland TX.

(U) Data Extraction Segment - General Dynamics Corporation, San Diego CA.

(U) Product Generation Segment - Intergraph, Huntsville AL.

(U) Data Services Segment - Hughes Aircraft Corporation, El Segundo CA.

(U) Production Management Segment - General Electric, Valley Forge PA.

FY 1991 BUDGET ESTIMATES RDT&E DESCRIPTIVE SUMMARY

Program Element: 0305139B  
Project Number: 700

Budget Activity: Intelligence and  
Communication #5

PE Title: DMA Mapping, Charting, and Geodesy (MC&G) Production System Improvements

(U) 700 Digital Production System (continued)

E. (U) COMPARISON WITH FY 1990/1991 DESCRIPTIVE SUMMARY:

(U) NARRATIVE DESCRIPTION OF CHANGES

(U) 1. Technical Changes: No changes

(U) 2. Scheduled Changes: No changes

(U) 3. Cost Changes: Total DPS costs have not changed. However, funds have been adjusted between Operation and Maintenance and RDT&E due to changes in the Production Management Segment (PM/S). Although there is no change to the overall PM/S milestone dates, nor to the DPS schedule, some PM/S software modules are now scheduled to be delivered after IOC. Maintenance of the modules planned to be financed in O&M are now more properly financed in the RDT&E appropriation.

F. (U) Program Documentation: NA

G. (U) Related Activities: NA

H. (U) Other Appropriation Funds:

(U) Procurement	<u>FY 89</u>	<u>FY 90</u>	<u>FY 91</u>
Defense Agencies, Other Capital Equipment	63912	110675	114369

(U) The procurement funds are for the purchase of two MARK 90 DMA production centers. Purchase of the hardware for the initial DMA production center to have this capability is being accomplished with RDT&E funds.

I. (U) International Cooperative Agreements: NA

J. (U) Milestone Schedule: Initial Operational Capability (IOC) of the Digital Production System is planned in 1991. Full Operational Capability (FOC) should be achieved in 1992.

FY 1991 BUDGET ESTIMATES RDT&E DESCRIPTIVE SUMMARY

Program Element: 0305159B

Budget Activity: Intelligence and  
Communication #5

PE Title: Defense Reconnaissance Support Program

A. (U) RESOURCES (\$ in Thousands)

Project Number and Title	FY 1989 Estimate	FY 1990 Estimate	FY 1991 Estimate	To Complete	Total Program
(U) 600 Defense Reconnaissance Support Program (DRSP)	2650	4524	7375	Continuing	Continuing

B. (U) BRIEF DESCRIPTION OF ELEMENT:

(U) This project evaluates developing or planned sensor systems for potential MC&G data exploitation. Developments also address data extraction algorithms and operational scenarios. Additional activities include test and evaluation to ensure source material support of MC&G product requirements.

C. (U) JUSTIFICATION FOR PROJECTS LESS THAN \$10.0 MILLION IN BOTH FY 1990 AND FY 1991:

(U) FY 1989 Plans: Continue tests to support DMA source collection operations. Develop Concept of Operations for alternative sources. Begin feasibility studies for non-conventional source types.

(U) FY 1990 Plans: Perform studies, analyses and a proof-of-concept for alternative sources for use by DMA in the production of MC&G products. Begin computer upgrade for source screening. These efforts are described in the Congressional Justification Book for Tactical Intelligence and Related Activities.

(U) FY 1991 Plans: Continue studies and analyses of alternate sources for use by DMA in the production of MC&G products. Complete proof-of-concept for an alternative source. Continue computer upgrade for source screening. These efforts are described in the Congressional Justification Book for Tactical and Intelligence Related Activities.

(U) Work Performed By: Private contractors and government research laboratories.

(U) Related Activities: NA

(U) Other Appropriation Funds:

	<u>FY 1989</u>	<u>FY 1990</u>	<u>FY 1991</u>
(U) Procurement, Defense Agencies			
Other Capital Equipment	0	508	2725

(U) International Cooperative Agreements: NA

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