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RESEARCH AND DEVELOPMENT PROGRAM
AMENDED FY 1992/FY 1993 BIENNIAL BUDGET SUBMISSION
FOR THE
DEFENSE MAPPING AGENCY
JANUARY 1992

STATEMENT A
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COMPONENT: DEFENSE MAPPING AGENCY
 Amended FY 1992/FY 1993 Biennial Budget Estimates

Program Element: 0305139B

Budget Activity: Intelligence and
 Communications #5

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

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

Project Number and Title	FY 1991 Actual	FY 1992 Estimate	FY 1993 Estimate	To Complete	Total Program
(U) 100 Source Collection Optimization	562	1,350	1,614	Cont	Cont
(U) 200 Product Definition and Production Implementation	7,202	8,170	13,587	Cont	Cont
(U) 300 Product Independent Production Improvements	550	24,346	28,202	Cont	Cont
(U) 400 MC&G Standardization	2,329	3,003	2,546	Cont	Cont
(U) 500 Distribution Modernization	0	0	0	0	0
(U) 700 Digital Production System(DPS)	213,082	189,921	0	0	2,006,324
(U) TOTAL PROGRAM ELEMENT 0305139B	223,725	226,790	55,949	NA	NA

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- B. (U) BRIEF DESCRIPTION OF ELEMENT: This program element includes all R&D costs associated with improving DMA's production system including source collection optimization activities, MC&G product related developments, new MC&G production and distribution improvements and efforts in standardizing MC&G digital products. This PE also supports costs associated with the completion of the Digital Production System (DPS). DPS is the development, acquisition, and installation of a capability to produce MC&G products using digital source materials.
- C. (U) JUSTIFICATION FOR PROJECTS LESS THAN \$10.0M IN BOTH FY 1992 AND FY 1993: FY 1991 through FY 1993 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.
- D. (U) COMPARISON WITH FY 1991 DESCRIPTIVE SUMMARY: Project definitions have not changed, however, the individual project descriptions have been updated to reflect new requirements. The most significant of these are the results from the DMA Digital Products Study (DDPS), and the Defense Hydrographic Initiative (DHI). The DDPS addressed a future concept of operations for DMA, including media, product lifecycle, and production approaches. The DHI program was initiated to improve hydrographic/bathymetric production through cooperative R&D and data processing between Navy, DMA, and NOS.

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A. (U) RESOURCES (\$ IN THOUSANDS) THEN YEAR DOLLARS

PROJECT NUMBER AND TITLE	FY1991 ACTUAL	FY1992 ESTIMATE	FY1993 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) 100 SOURCE COLLECTION OPTIMIZATION		1,350	1,614	Cont	Cont

B. (U) BRIEF DESCRIPTION OF PROJECT: To evaluate new collection systems or enhance the use of existing systems in order to provide adequate and affordable source data from which MC&G products can be derived.

C. (U) JUSTIFICATION FOR PROJECTS LESS THAN \$10.0M IN BOTH FY 1992 AND FY 1993:

(U) FY 1991 ACCOMPLISHMENTS: (a) Defined a processing architecture and layered gridded database to support gravimetric products. (b) Revised G&G requirements for future programs. (c) Continued GPS processing software development. (d) Procured GPS geodetic receivers. (e) Implemented methods to process GPS Block II satellite data. (f) Continued to research and evaluate alternate source data such as multispectral imagery (MSI) to support DMA production.

(U) FY 1992 PLANS: (a) Initiate prototype for an improved digital sounder for bathymetric data collection. (b) Complete GPS Block II satellite data processing implementation. (c) Implement gravimetric data processing and storage design. (d) Continue efforts to research and evaluate alternate source data such as multispectral imagery (MSI) to support DMA products. (e) Initiate a development effort to modify the Source Acquisition Segment (SA/S) to interface with the Requirements Management System (RMS) which is external to DMA.

(U) FY 1993 PLANS: (a) Continue the development of improved digital sounder for bathymetric data collection. (b) Provide support and analysis for studies associated with advanced Air Force aircraft inertial navigation systems by developing concepts and methods for production of gravity products to support these systems. (c) Continue implementation of gravimetric data processing and storage design. (d) Continue efforts to research and evaluate alternate source data such as multispectral imagery (MSI) to support DMA products. (e) Continue RMS interface activities.

(U) WORK PERFORMED BY: The Analytical Sciences Corp. (TASC), Reading, Massachusetts; U.S. Naval Oceanographic and Atmospheric Research Laboratory (NORAL), Bay St. Louis, Mississippi; Naval Surface Warfare Center (NSWC), Dahlgren, Virginia; Science Applications International Corporation (SAIC), U. S. Air Force Geophysical Laboratory (AFGL), Lawrence G. Hanscom Field, Massachusetts, The Applied Research Laboratory at the University of Texas at Austin and other competitively selected contractors.

(U) RELATED ACTIVITIES: N/A

(U) OTHER APPROPRIATION FUNDS: N/A

(U) INTERNATIONAL COOPERATIVE AGREEMENTS: N/A

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A. (U) RESOURCES (\$ IN THOUSANDS) THEN YEAR DOLLARS

PROJECT NUMBER AND TITLE	FY1991 ACTUAL	FY1992 ESTIMATE	FY1993 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) 200 PRODUCT DEFINITION AND PRODUCTION IMPLEMENTATION		8,170	13,587	Cont	Cont

B. (U) BRIEF DESCRIPTION OF PROJECT: To investigate and develop techniques, methodologies and systems for satisfying the MC&G product and service needs of the war fighter. This involves the investigation and implementation of emerging technologies related to MC&G products and services and developing new products to meet user requirements. Included in this project is the introduction of new and existing products in a variety of digital formats that subscribe to vector, raster, text and video standards.

C. (U) JUSTIFICATION FOR PROJECTS LESS THAN \$10.0M IN BOTH FY 1992 AND FY 1993:

(U) FY 1991 ACCOMPLISHMENTS: (a) Continued development of a static radar prediction prototype. (b) Continued G&G modernization through hardware and software designs. (c) Initiated Hydro/Bathymetric draft DoD standards for developing statistical methods/tools, both qualitative and quantitative, for processing, evaluating, tagging and integrating existing and future Hydrographic/Bathymetric data. (d) Developed digitized PPDB tape duplication production capability. (e) Revised the Interim Terrain Data (ITD) product to include the enhanced transportation layer. (f) Initiated efforts for a capability to scan and collect Terrain Feature Data. (g) Developed Special Operations support products. (h) Transitioned VPPDB into production. (i) Initiated development of Arc Digitized Raster Video (ADRV). (j) Developed Statement of Work (SOW) for Terrain Feature Analysis System (TFAS) to support high-resolution DFAD and ITD.

(U) FY 1992 PLANS: (a) Continue TTD, digitized PPDB and ADRV developments. (b) Complete VPPDB efforts. (c) Complete TFAS development. (d) Continue to work toward the establishment of DoD standards for Hydrographic/Bathymetric data evaluation, analysis, integration, and archiving. (e) Initiate additional prototypes of DMA products in Vector Product Format (VPF) and Raster Product Format (RPF). (f) Initiate development efforts to convert current hardcopy products generated from the MC&G database to digital format. (g) Initiate development and implementation of new image based products, including Digital PPDB (DPPDB).

(U) FY 1993 PLANS: (a) Continue TTD and DPPDB development. (b) Continue additional prototypes of DMA products in VPF and RPF. (c) Continue efforts to convert hardcopy DPS products to digital format. (d) Continue development and implementation of new vector and raster products into DPS.

(U) WORK PERFORMED BY: Development efforts will be competitively bid, or may require sole source contracts with DPS contractors (see Project 700).

(U) COMPARISON WITH FY 1991 DESCRIPTIVE SUMMARY:

NARRATIVE DESCRIPTION OF CHANGES

- TECHNICAL CHANGES: G&G improvements have been reclassified as product independent and have been placed in project 300 for FY 1992 and FY 1993. A number of findings from the DDPS are reflected in FY 1992 and FY 1993 plans.
- SCHEDULE CHANGES: None.
- COST CHANGES: Adjustments resulting from the technical changes described above have altered the FY 1992 estimate from \$18,055K to \$8,170K.

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(U) RELATED ACTIVITIES: Direct interface with DoD weapon system developers is effected to assure MC&G product and requirement compatibility and standardization.

(U) OTHER APPROPRIATION FUNDS: PDA(FY93-\$4.62M) Requisite Hydrographic and Bathymetric production equipment, Digital and Video PPDB production equipment.

(U) INTERNATIONAL COOPERATIVE AGREEMENTS: N/A

(U) MILESTONE SCHEDULE: Major efforts associated with this project include research and development of new products associated with developing weapons systems (i.e. TTD and DPPDB); and an initiative to improve Hydrographic/Bathymetric data processing techniques.

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A. (U) **RESOURCES (\$ IN THOUSANDS) THEN YEAR DOLLARS**

PROJECT NUMBER AND TITLE	FY1991 ACTUAL	FY1992 ESTIMATE	FY1993 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) 300 PRODUCT INDEPENDENT PRODUCTION IMPROVEMENTS		24,346	38,202	Cont	Cont

B. (U) BRIEF DESCRIPTION OF PROJECT: To develop production techniques, processes and systems to improve the efficiency, timeliness and capabilities of the DMA production system to better satisfy product requirements and reduce DMA production costs.

C. (U) JUSTIFICATION FOR PROJECTS LESS THAN \$10.0M IN BOTH FY 1992 AND FY 1993:

(U) FY 1991 ACCOMPLISHMENTS: (a) Initiated studies to improve current hydrographic production and future incorporation of additional hydrographic products into DPS. (b) Continued development of the new DMA distribution management system (DDMS). (c) Began redesign of the DMA product catalog.

(U) FY 1992 PLANS: (a) Continue catalog improvements through development of the Modern Catalog System (MCS). (b) Initiate improvements to digital distribution processes, including an interface between DDMS and MCS. (c) Develop automated tools for the film libraries and photo lab operations. (d) Initiate development of the DoD Digital Bathymetric Library and the Hydro Source Assessment System (HYSAS). (e) Initiate development of a MPS to Automated Notice to Mariner System (ANMS) and Special Navy Support System (SNSS) interface. (f) Initiate integration of DHI into DPS. (g) Initiate development of comprehensive system integration test facilities and fully integrated system engineering tools for DPS. (h) Initiate an IBM Computer Centralization to consolidate the MC&G database. (i) Initiate development of an interface between DPS and TFAS.

(U) FY 1993 PLANS: (a) Complete catalog improvements and transition to the MCS. (b) Initiate improved data base and product revision management and production capabilities. (c) Turnover the DDMS as the operational distribution management system. (d) Initiate preparations for transitioning to a consolidated distribution facility. (e) Continue development of the DoD Digital Bathymetric Library and HYSAS. (f) Continue integration of DHI into DPS, including the ANMS and SNSS interfaces. (g) Initiate development to interface DPS to the Alternate Image Exploitation System (AIX). (h) Continue development of comprehensive system integration test facilities and fully integrated system engineering tools for DPS. (i) Continue development to interface the DPS to TFAS.

(U) WORK PERFORMED BY: Production improvement efforts which constitute most of these activities will be competitively bid or may require sole source acquisition with DPS contractors (see Project 700). Other activities in this project will be performed by Service Laboratories, academia, Computer Sciences Corporation (CSC), Intergraph, Science Applications International Corporation (SAIC) and other competitively selected contractors.

(U) COMPARISON WITH FY 1991 DESCRIPTIVE SUMMARY:

NARRATIVE DESCRIPTION OF CHANGES

- TECHNICAL CHANGES: The DHI formalized in 1991 created new requirements which are reflected in FY 1992 and FY 1993.
- SCHEDULE CHANGES: None.
- COST CHANGES: The FY 1992 estimate has been changed from \$11,851K to \$24,346K.

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(U) PROGRAM DOCUMENTATION: N/A

(U) RELATED ACTIVITIES: N/A

(U) OTHER APPROPRIATION FUNDS: PDA(FY92-\$470K, FY93-\$11.8M). Equipment for DHI - HYSAS, DoD Digital Bathymetric Library, Data Evaluation Workstations; Digital SAR Workstation; equipment for G&G modernization, computer centralization and system integration test facility.

(U) INTERNATIONAL COOPERATIVE AGREEMENTS: N/A

(U) MILESTONE SCHEDULE: Major efforts associated with this project include system integration test facility development; Catalog improvements and MCS; DDMS and interfaces to PM/S, DHI; and additional production improvement activities.

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A. (U) RESOURCES (\$ IN THOUSANDS) THEN YEAR DOLLARS

PROJECT NUMBER AND TITLE	FY1991 <u>ACTUAL</u>	FY1992 <u>ESTIMATE</u>	FY1993 <u>ESTIMATE</u>	TO <u>COMPLETE</u>	TOTAL <u>PROGRAM</u>
(U) 400 MC&G Standardization		3,003	2,546	Cont	Cont

B. (U) BRIEF DESCRIPTION OF PROJECT: MC&G standardization activities are directed to develop a comprehensive suite of military standards and specifications for the exchange, manipulation, and display of MC&G digital data. The purpose of this effort is to achieve inter-operability of data bases supporting a wide variety of weapons programs, simulators, and command and control systems. Support for this effort will promote the development and use of standards within DoD, other government agencies, and allies to further enhance inter-operability, expand the MC&G production base, and reduce development and production costs. Further, this effort will reduce both weapon system development costs and operational costs by reducing dependencies on system specific MC&G data sets.

C. (U) JUSTIFICATION FOR PROJECTS LESS THAN \$10.0M IN BOTH FY 1992 AND FY 1993:

(U) FY 1991 ACCOMPLISHMENTS: (a) Conducted a comprehensive study of DMA digital products and MC&G standards (DDPS). (b) Began MC&G digital product standards development. (c) Initiated and delivered prototypes of the Digital Chart of the World (DCW) effort. (d) Began utility software development. (e) Began MIL-STD data set requirements analysis. (f) Initiated storage media assessment and product storage compression.

(U) FY 1992 PLANS: (a) Continue standardization effort in data definition for vector and raster products. (b) Complete and deliver DCW. (c) Continue to aggressively promote the use of MC&G standards within DoD and other government agencies. (d) Continue to support other agencies through interoperability agreements. (e) Continue prototype development.

(U) FY 1993 PLANS: (a) Continue standardization effort in data definition for vector and raster products. (b) Continue to support other agencies through interoperability agreements. (c) Continue prototype development.

(U) WORK PERFORMED BY: Service Labs, Service Academies, International forums, Civil Agencies, Historically Black Colleges and Universities, competitively selected contractors (ESRI, SAIC, etc.)

(U) RELATED ACTIVITIES: N/A

(U) OTHER APPROPRIATION FUNDS: PDA(FY92-\$696K). Digital mastering facility, and equipment for prototype development.

(U) INTERNATIONAL COOPERATIVE AGREEMENTS: Digital Chart of the World (DCW) International agreements with United Kingdom (UK), Australia, and Canada.

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Program Element: 0305159B Budget Activity: Intelligence and Communication #5

PE Title: Defense Reconnaissance Support Program

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

<u>PROJECT NUMBER</u> <u>AND TITLE</u>	<u>FY 1991</u> <u>ACTUAL</u>	<u>FY 1992</u> <u>ESTIMATE</u>	<u>FY 1993</u> <u>ESTIMATE</u>	<u>TO</u> <u>COMPLETE</u>	<u>TOTAL</u> <u>PROGRAM</u>
(U) 600 DEFENSE RECONNAISSANCE SUPPORT PROGRAM (DRSP)	7,375	6,481	6,127	Cont	Cont

B. (U) BRIEF DESCRIPTION OF ELEMENT: This program evaluates developing or planned advanced systems for potential MC&G data exploitation. Developments 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 \$10.0M IN BOTH FY 1992 AND FY 1993:

(U) FY 1991 ACCOMPLISHMENTS: Tests, demonstrations, and training were conducted to support the DMA source collection activities. Utility studies continued for non-conventional source exploitation. Developed a concept-of-operations (CONOPS) for exploitation of alternative sources and commenced feasibility studies for non-conventional source types. Delivered software for exploitation of alternate source data on softcopy. Completed alternate source point targeting capability for hardcopy. Provided operations engineering support. Began alternate source exploitation studies. Performed requirements and capability studies of alternate sources. Completed upgrade requirements for source screening. These efforts are described in the Congressional Justification Book for Tactical and Intelligence Related Activities (TIARA).

(U) FY 1992 PLANS: Continue studies and analyses of alternate sources for use by DMA in the production of MC&G products. Complete proof-of-concept for alternative sources for use by DMA in the production of MC&G products. These efforts are described in the TIARA.

(U) FY 1993 PLANS: Continue studies and analyses to ensure quality of the products are not degraded and delivery milestones are met. These efforts are further described in the TIARA.

(U) WORK PERFORMED BY: Private contractors and government research laboratories.

(U) RELATED ACTIVITIES: N/A

(U) OTHER APPROPRIATION FUNDS:

	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993</u>
(U) Procurement, Defense Agencies			
Other Capital Equipment	2.725	2.333	2.418
(U) O&M	6.764	6.704	7.137

(U) INTERNATIONAL COOPERATIVE AGREEMENTS: N/A

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A. (U) RESOURCES (\$ IN THOUSANDS) THEN YEAR DOLLARS

PROJECT NUMBER AND TITLE	FY1991 ACTUAL	FY1992 ESTIMATE	FY1993 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) 700 DIGITAL PRODUCTION SYSTEM (DPS)	213,082	189,921	0	0	2,006,324

B. (U) BRIEF DESCRIPTION OF PROJECT: DPS is an Office of the Secretary of Defense (OSD) mandated, congressionally endorsed, effort to attain an all-digital production capability for DMA using available source material. This capability consists of three fully equipped, interdependent production centers generating 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 generation time. The DPS objectives are a 100 percent increase in product output and a 75 percent reduction in pipeline time. The DPS consists of two phases, 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 - provides for the extraction of terrain elevation 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:

(U) FY 1991 ACCOMPLISHMENTS: Testing, debugging, integration and intrasegment demonstration lead to a successful Initial Operating Capability in March 1991. With this achievement DMA has demonstrated the capability to generate four products from digital sources and processes.

(U) FY 1992 PLANS: Testing and debugging of the segment unique software will continue with the delivery of the remaining planned software for DPS. Intercenter production capabilities will be demonstrated leading to Full Operating Capability (FOC) in November of 1992.

(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.

(U) RELATED ACTIVITIES: N/A

(U) OTHER APPROPRIATION FUNDS: PDA (FY92-\$7.2M) Planned modifications to the MARK 90 hardware initially delivered for test and demonstration.

(U) INTERNATIONAL COOPERATIVE AGREEMENTS: N/A