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Intelligence

**IDENTIFYING REQUIREMENTS FOR
OBTAINING AND USING CARTOGRAPHIC
AND GEODETIC PRODUCTS AND SERVICES**

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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(MSgt Ronald E. James)
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This instruction implements AFR 14-2, *Intelligence, Collection, Production, and Application*. It provides procedures for identifying requirements for cartographic and geodetic products and services. It also provides procedures for ordering and supplying as well as using and monitoring the use of these products and services. This instruction also implements DoD Instruction 5000.56, *Programming Unique Mapping, Charting, and Geodesy (MC&G) Requirements for Developing Systems*, September 11, 1991; DoD Instruction 5030.59, *Defense Mapping Agency (DMA) Mapping, Charting, and Geodesy (MC&G) Data, Public Availability and Exceptions*, January 19, 1993; DoD Directive 5105.40, *Defense Mapping Agency (DMA)*, December 6, 1990, procedures for ordering and stocking standard maps, charts, digital cartographic data, air target materials, point positioning data bases, geodetic surveys, and related products and services; and Chairman Joint Chiefs of Staff (CJCS) Memorandum of Policy (MOP) 31, *Submitting and Assigning Priorities to Requirements for Mapping, Charting, and Geodesy Support*. It does not include detailed information on flight information publication (FLIP) materials (AFI 11-201, *Flight Information* [formerly AFR 60-7]) or tactical target materials (*Defense Intelligence Agency Manual* [DIAM] 57-24).

SUMMARY OF REVISIONS

This instruction aligns with AFR 14-2 and supersedes AFR 96-3.

Chapter 1

MC&G FUNCTIONS OF AIR FORCE ORGANIZATIONS

1.1. DMA. DMA furnishes MC&G products and services to Air Force units, Department of Defense (DoD) contractors, foreign nations using US weapons systems, the MC&G technical community, and (under certain conditions) the general public. DMA also establishes procedures for ordering maps, charts, digital cartographic data, FLIPs, air target materials, and related items from DMA offices throughout the world (see DoD Instruction 5000.56 and DoD Directive 5105.40).

1.2. Air Intelligence Agency, 497th Intelligence Group, MC&G Division (497 IG/INTB). As the Headquarters US Air Force (HQ USAF) focal point for MC&G matters, the Assistant Chief of Staff, Intelligence (ACS/I) designated 497 IG/INTB to serve as the Air Force center for MC&G. 497 IG/INTB formulates MC&G policy and objectives, and provides guidance and oversight relating to planning, programming, budgeting, training, equipping, and inspecting of Air Force forces on MC&G matters. 497 IG/INTB coordinates MC&G issues with other Air Staff directorates and divisions, the Secretary of the Air Force, the Joint Staff, and the Secretary of Defense; and is the Air Force principal point of contact for DMA, other DoD and non-DoD agencies, and the larger MC&G technical community. 497 IG/INTB provides technical MC&G support to the Air Staff, major commands (MAJCOM), direct reporting units (DRU), and field operating agencies (FOA); and maintains historical MC&G records. 497 IG/INTB determines Air Force requirements for MC&G products; monitors the use of MC&G products and services; develops and evaluates MC&G products and technology to support advanced weapon systems; and identifies future MC&G needs.

1.3. Air Force Flight Standards Agency Instrument Flight Center, Aeronautical Information Division (AFFSA IFC/AI). As outlined in AFI 11-201, the AFFSA IFC/AI investigates, defines, assembles, validates, and lists, in order of priority, Air Force operational requirements for FLIP and related products. AFFSA IFC/AI is the Air Force point of contact with DMA on FLIP matters.

1.4. Rome Laboratory, Directorate of Intelligence and Reconnaissance (RL/IRRP). RL/IRRP is the US Air Force MC&G technical point of contact for the Director, DMA (see Assistant Secretary of Defense for Command, Control, Communications, and Intelligence Memorandum of 6 April 1989). RL/IRRP is the service laboratory for MC&G issues and requirements. It conducts activities such as consolidation of technical reviews of new MC&G products and prototypes, assessments of product accuracy, and evaluations of the impact of new technologies on US Air Force MC&G requirements. Tasking of RL/IRRP for MC&G technical support will be through AFMC/IN.

1.5. Air Force Components of Unified Commands, MAJCOMs, DRUs, and FOAs. These organizations must establish an office to handle all MC&G matters and notify 497 IG/INTB. The designated office will:

1.5.1. Issue supplemental instructions to this instruction and provide copies to 497 IG/INTB.

1.5.2. Set up MC&G stock and issue units to:

- Start DMA distribution accounts (as per instructions in paragraph 3.1.2.).
- Maintain files of pertinent DMA instructions, manuals, and catalogs identified in paragraph 3.3. and Attachment 1.

- Submit automatic distribution (AD) requests and periodic orders as outlined in the "General Information, Ordering Procedures, and Crisis Support" section of any DMA catalog or bulletin.
- Establish inventory control procedures and reorder levels for each product to ensure sufficient MC&G items stock to sustain routine operations and adequate time to resupply before stocks are depleted.
- Keep specified reserve stocks when tasked in a command's Operation Plan (OPLAN) or Contingency Plan (CONPLAN).
- Issue maps, charts, FLIPs, and related items when required.

1.5.3. Aid units in preparing requests and requirement statements for digital or hard-copy cartographic, photogrammetric, and geodetic products and services.

1.5.4. Actively coordinate with command operations, plans, training, logistics, requirements, inspection, and intelligence staffs to ensure that doctrine, strategy, tactics, logistics, and research and development efforts adequately address MC&G requirements.

1.5.5. Certify and submit command MC&G requirements according to DoD, CJCS, and Air Force direction. Submit the command's, DRU's, and FOA's area requirements (see paragraph 2.1.) and ensure that MC&G requirements for new systems or techniques are included in the appropriate system acquisition documents (see AFI 10-601, *Mission Needs and Operational Requirements Guidance and Procedures* [formerly AFR 57-1]). When a new system requires MC&G products or services, distribute the requirements documents to AFMC/IN and RL/IRRP, with information copies to 497 IG/INTB.

1.5.6. Ensure command responses to DMA product reviews are directed to 497 IG/INTB for consolidation and submission to DMA.

1.5.7. Prepare Annex M (Mapping, Charting, and Geodesy) for a command's OPLANs and CONPLANs according to AFMAN 10-401, *Operation Plan and Concept Plan Development and Implementation* (formerly AFRs 28-2, 28-3, 28-4, 28-6, and 28-10; and AFP 28-33) and send an information copy to 497 IG/INTB.

1.5.8. Keep 497 IG/INTB informed of MC&G-related contacts with other commands, DMA, and other agencies, and keep 497 IG/INTB informed of all command MC&G plans, policies, programs, or requirements.

1.5.9. Establish command MC&G training requirements and provide copies of training assessments to 497 IG/INTB.

1.5.10. Participate in periodic meetings and conferences with other Air Force organizations involved in MC&G to address critical MC&G issues.

1.5.11. Ensure that subordinate units comply with this instruction.

1.5.12. Keep 497 IG/INTB apprised of key MC&G staffing and authorization changes within the office.

1.5.13. Order standard MC&G map, chart, and FLIP products as specified in paragraph 3.1.5. of this instruction.

1.6. Air Force MC&G Stock and Issue Units. Units will use the following publications for guidance in ordering and stocking MC&G products and services (see **Attachment 1** for other DMA publications useful to command headquarters):

1.6.1. The *DMA Catalog of Maps, Charts, and Related Products, Parts 1-7*.

1.6.2. AFMAN 10-401.

1.6.3. AFI 11-201.

1.6.4. AFI 13-209, *Instrument Procedures Design and Publication* (formerly AFR 60-27, volume 2).

1.7. DMA Combat Support Center (DMACSC). In times of peace, DMACSC local stock and issue units distribute most MC&G materials through normal mail or logistics channels. For guidance, see the section entitled "General Information, Ordering Procedures, and Crisis Support" in any DMA catalog or bulletin.

Chapter 2

IDENTIFYING REQUIREMENTS FOR MC&G PRODUCTS AND SERVICES

2.1. Area Requirements for MC&G Products. MAJCOMs, FOAs, DRUs, and Air Force components of the unified commands identify their requirements for standard MC&G products to DMA according to CJCS Memorandum of Policy 31 and DMA Instruction 8050.4, *Submission and Validation of Area Requirements for MC&G Standard Products and Services*, 17 June 1987. DMA List 8052.4, *DMA List of Standard Products and Services*, 24 August 1990, identifies the standard MC&G products and services currently available from DMA. Air Force organizations identify requirements through appropriate chains of command as missions change, or when the DMA Air Force, or the unified commands direct revalidations. To support their operational missions, Air Force components of operational commands submit requirements to DMA for training, exercises, and intelligence through the unified command responsible for the operational area. MAJCOMs, FOAs, and DRUs forward requirements in support of research and development, systems acquisition, and all other training and intelligence needs to DMA through 497 IG/INTB. Organizations identifying requirements through operational channels will forward information copies of those submissions to 497 IG/INTB.

2.1.1. Confirming Map and Chart Requirements and Production Status:

2.1.1.1. Area Requirements Document. In January of each year, DMA issues a DoD MC&G Area Requirements Document. This document reflects required products and their JCS priority as submitted by the military services and the unified commands. MAJCOM, FOA, and DRU MC&G POCs should review the document to ensure proper documentation of submitted command requirements.

2.1.1.2. Products Status Document. In January of each year, DMA issues a DMA Products Status Document (Assessment Graphics) to the commands and services. Review this document upon receipt to ensure that DMA is meeting priority production requirements. Also, DMA issues Quarterly Requirements Status Reports to the unified commands and the services. Commands should review these reports to ensure that DMA is meeting priority production requirements. Identify errors or changes to these publications to 497 IG/INTB.

2.1.1.3. Production Status Overlays. These overlays provide additional information on the production program and are designed to be used with both the Area Requirements Document and the Products Status Document.

2.1.1.4. Units interested in obtaining the preceding publications should notify: Director, Defense Mapping Agency, ATTN: PR, Stop A-13, 8613 Lee Highway, Fairfax VA 22031-2137.

2.2. OPLAN/CONPLAN Support. Air Force command units that support a unified command's OPLAN or CONPLAN must:

2.2.1. Submit area MC&G requirements to the air component of unified commands in support of a commander-in-chief's (CINC) OPLAN.

2.2.2. Identify war reserve stocks (WRS) to support a CINC's OPLAN or CONPLAN.

2.2.3. Ensure that the air component of a unified command identifies WRS requirements for movement in the Time Phased Force Deployment Listing (TPFDL) and the OPLAN or CONPLAN Logistic Annex.

2.2.4. Use AFMAN 10-401 when developing and reviewing Annex M (Mapping, Charting, and Geodesy) of an OPLAN or CONPLAN. AFMAN 10-401 provides air components that are preparing plans for an OPLAN with guidance, formats, and procedures consistent with the Joint Operation Planning and Execution System. AFMAN 10-401 also guides MAJCOMs in preparing plans to support Air Force unilateral plans. The instruction also applies to the US Air Force Reserve and the Air National Guard. Procedures for estimating quantities for WRS are detailed in **Attachment 2**.

2.3. MC&G Requirements for Development, Testing, and Initial Operation of New Systems:

2.3.1. The AFMC identifies needs and requests MC&G products (whether analog or digital) or services to support the development and testing of new Air Force systems or programs. AFMC/IN must validate these requirements in coordination with the operating command for submission to 497 IG/INTB. The command MC&G office must validate requests for standard digital data to support developmental efforts and submit the requests to DMACSC/PMSR with an information copy to 497 IG/INTB and DMA/PRA.

2.3.2. The operating commands or the Air Force component of the unified commands that will use a new system or program must identify the MC&G requirements for that system or program. The MC&G office of the operating command submits area requirements to 497 IG/INTB. The MC&G office must investigate whether area requirements affect other commands, such as air components of unified commands (i.e., USCENTAF, PACAF, and USAFE); other participating commands (AMC, ATC); or FOAs before submitting requirements. Once operating commands have identified initial requirements, participating commands must update and submit their area MC&G requirements for their area of responsibility (AOR). Air components of unified commands will submit requirements through the appropriate CINC. Other participating commands must submit their area requirements to the operating commands. The operating commands will then submit the total area requirements to 497 IG/INTB for validation. 497 IG/INTB will then submit the requirements to DMA.

2.4. Identifying Training Requirements:

2.4.1. The Defense Mapping School (DMS) provides all Air Force MC&G training. Consult the DMS course catalog or contact DMSO, Ft Belvoir VA 22060-5828, DSN 655-2283, commercial (703) 805-2283, for more information on MC&G courses. Submit specific requests for MC&G course billets through local training offices.

2.4.2. DMS develops MC&G course curricula with input from 497 IG/INTB. Submit new MC&G training needs or changes to existing courses to 497 IG/INTB for forwarding to DMS.

2.5. Obtaining Technical Assistance:

2.5.1. Obtain help in ordering MC&G items from the DMA Customer Assistance Office (DMACSC/PMSC) at DSN 287-2495, commercial (301) 227-2495, or toll free 1-800-826-0342.

2.5.2. MAJCOMs, DRUs, and FOAs should contact 497 IG/INTB, 5113 Leesburg Pike, Suite 600, Falls Church VA 22041-3230, DSN 289-1250/1179, or commercial (703) 756-1250/1179, with any questions about MC&G products or services, or to get information on US Air Force MC&G policies. Individual units may also call 497 IG/INTB but should first contact their command MC&G representative.

2.5.3. Contact 497 IG/INTB for MC&G technical support in the areas of geodesy, cartography, photogrammetry, remote sensing, gravity, and spatial data, or for technical assistance in the application of these disciplines or products to weapon systems.

2.5.4. For help in developing functional requirements and technical objectives for US Air Force development programs and systems modifications, contact: AFMC/IN, 4225 Logistics Avenue, Suite 11, Wright-Patterson AFB OH 45433-5057, DSN 787-5047, commercial (513) 257-5047, FAX DSN 787-2146, commercial (513) 257-2146.

Chapter 3

OBTAINING MC&G PRODUCTS AND SERVICES

3.1. DMA MC&G Products and Services:

3.1.1. Ordering Procedures and Crisis Support. Find general ordering and crisis support procedures in any DMA catalog or bulletin under the section entitled "General Information, Ordering Procedures, and Crisis Support."

3.1.2. Units that order maps, charts, air target materials, or associated items through the DMA Automated Distribution Management System (DADMS) must include a DoD Activity Address Code (DODAAC). These codes are standard DoD logistic system designators used in the automated management of accounts to prepare shipping documents. Keep the number of DODAAC accounts for maps and charts to a minimum. Command MC&G offices must develop procedures to ensure a minimum number of DODAAC accounts are opened for units within their command. MC&G issue and stock units must obtain DODAACs from the following office: (Mail) 645 ABW/DMTX-2, 5215 Thurlow Street, Suite 1, Wright Patterson AFB OH 45433-5541; (Message) 645ABW WRIGHT PATTERSON AFB OH//DMTX-2//.

3.1.3. Obtaining or Changing DODAACs. Forward requests for assignment of, changes to, or deletions of DODAACs through the MAJCOM DODAAC monitors listed in AFMAN 23-110, *USAF Supply Manual* (formerly AFM 67-1). Submit requests at least 30 days prior to the desired effective date to allow time to update DODAAC computer systems. To establish a DODAAC, organizations must provide the following information:

3.1.3.1. Name and complete mailing address of the organization. If the location is overseas, also provide a shipping address, including overseas aerial and water ports of debarkation.

3.1.3.2. Parent/host command.

3.1.3.3. Justification. State why the DODAAC is needed and provide assurance that the request is not redundant.

3.1.4. Ordering Directly From DMACSC. Commands may allow organizations with established DODAAC accounts and validated requirements for standard cartographic products to order directly from DMACSC. Base operations offices and wing intelligence offices will usually have map and chart accounts.

3.1.5. Requesting Standard Products and Services:

3.1.5.1. Forward requests for standard products to DMACSC/PMSR, 6001 MacArthur Boulevard., Bethesda MD 20816-5001, via the GETAMAP program (see paragraph 3.1.5.2.), Standard Form 344, **Multiuse Standard Requisitioning/Issue System Document**, or AUTODIN message. Users requesting standard digital MC&G data on 9-track tape to support fielded operational systems will forward their requests to DMACSC/PMSR on the DMA Form 8660-6, **DMA Digital Data Base Request**. Include an information copy for 497 IG/INTB. Users requesting digital data on CD-ROM (e.g., ADRG, DCW, and WVS) can obtain stock numbers from the appropriate DMA catalog and should forward orders to DMACSC via GETAMAP, SF 344, or AUTODIN message.

3.1.5.2. Obtain map ordering software entitled "GETAMAP" through DMACSC/PMSR. The GETAMAP program allows users equipped with personal computers (MS-DOS) to order maps by automated means.

3.1.5.3. Refer problems or issues with product requests to DMACSC/PMSC. Include an information copy for 497 IG/INTB. Refer problems or issues with the content or usage of MC&G products directly to 497 IG/INTB.

3.1.5.4. The designated MC&G office for an Air Force base, unit, or test range will send MC&G requirements or inquiries to the command MC&G officer who will then forward inquiries to 497 IG/INTB or DMA as appropriate.

3.1.6. Obtaining Point Positioning Support:

3.1.6.1. Units that have an Analytical Photogrammetric Positioning System (APPS) or other analytical stereo plotter capability can use Point Positioning Data Bases (PPDB) to perform their own point positioning. If PPDB coverage is not available, these units should submit a requirement for new PPDB construction. As with all other MC&G requirements, units must submit PPDB requirements through the appropriate command MC&G office.

3.1.6.2. For areas without PPDB coverage, units can obtain point positioning support from DMA. Units should estimate their 6-month to 1-year points requirement and send to: HQ DMA/PRA, Stop A-13, 8613 Lee Highway, Fairfax VA 22031-2137, DSN 356-9339. After quantity submission to HQ DMA/PRA, send actual and individual requests for point positioning via message to: DMAAC ST LOUIS AFS MO//PPD/SDF/SDPA-PT//. Include pin-pricked photography, a description of the point desired, required datum (e.g., WGS 84), type of coordinates desired (i.e., geographic or UTM), CJCS MOP 31 priority, and a justification code with requests. Allow several weeks for completing routine requests and include information copies to the appropriate higher command, DMA/PRA/PPD, and 497 IG/INTB.

3.1.7. Obtaining Geodetic Survey Support. Send requirements for geodetic survey support to 497 IG/INTB through the responsible MAJCOM, DRU, or FOA MC&G office. Use the format of the sample Geodetic Support Worksheet in **Attachment 3** as a guide when preparing submissions. State geodetic survey accuracy requirements as shown in **Attachment 4**. State point position and elevation accuracy requirements as absolute and/or relative.

3.1.8. MC&G Products and Services for Contractors and DoD Systems Developers:

3.1.8.1. Contractors and DoD system developers who need standard MC&G products and services (including digital MC&G data) to support developmental efforts will submit requests through their program's primary contract officer (PCO). The PCO then forwards requests to the appropriate command MC&G office. At a minimum, requests must include the identity of the contractor requiring MC&G support, contract number, expiration date of the contract, shipping address, Air Force point of contact (POC), contractor POC, "need-to-know" statement of justification, and intended use of the requested items. The contract officer must comply with AFI 31-601, *Industrial Security Program Regulation* (formerly AFR 205-4) when submitting contractor requests for release of classified products.

3.1.8.2. Command MC&G offices will review and validate contractor requests and forward the requisitions to DMACSC/PMSR with an information copy to 497 IG/INTB. Requests for standard digital data to support developmental efforts must include a completed DMA Form 8660-6,

DMA Digital Data Base Request. A contract must provide for the return or destruction of all government furnished MC&G property upon contract termination. Under no circumstances will a contractor transfer government furnished MC&G property or data to another project within the company or to another company without prior coordination with the Air Force PCO and written permission from AFMC/IN. AFMC/IN will provide information copies to 497 IG/INTB. In this paragraph, MC&G property means geodetic, geomagnetic, gravimetric, aeronautical, topographic, hydrographic, cultural, and toponymic data presented in the form of maps, charts, graphics, publications, listings, simulated photography, digital data, and point positioning data.

3.1.8.3. Contractors must coordinate with 497 IG/INTB on planned designs, new system development, or existing system modifications that call for MC&G data to facilitate interoperability and compatibility with DMA data or Air Force data bases. All computer software that will use DMA data must be directly compatible with DMA data bases and the DMA format.

3.1.8.4. Contractors should send requests for geodetic and geophysical (G&G) products and services through MAJCOM, DRU, or FOA MC&G offices to 497 IG/INTB.

3.1.9. MC&G Products for Exported US Weapon Systems. A nation that is codeveloping weapons systems with the US or using exported US weapons systems must produce or procure any MC&G products necessary to support the weapons systems. Advise foreign users that some US commercial MC&G products and support may be subject to release and export control restrictions. Release authority for DMA produced data resides with DMA. United States Air Force organizations may not independently authorize release of DMA MC&G data. DMA and the foreign country in question must coordinate directly on foreign military sales of DMA products. Address foreign release matters to HQ DMA/IS.

3.1.10. Public Sale and Availability of MC&G Products. According to DoD Instruction 5030.59, DMA shall offer maps, charts, and other MC&G data at scales of 1:500,000 and smaller (except for classified products) for sale to the public. DMA may make these sales directly, or through its authorized agents. DMA will not release, under the Freedom of Information Act (FOIA), unclassified DoD MC&G materials marked with the legend "Limited Distribution," "DISTRIBUTION LIMITED - DESTROY WHEN NO LONGER NEEDED," "For Official Use Only," or any other restrictions. Refer all FOIA requests for such materials to the Director, DMA, for decision on whether to release.

3.2. Non-DMA MC&G Products and Services:

3.2.1. Contracting With Commercial Firms. Air Force activities may not contract with commercial firms for the production or transformation of any type of analog and/or digital cartographic, photogrammetric, or G&G support without a written statement from 497 IG/INTB that DMA cannot furnish the needed products or services. Air Force activities must initiate such requests through 497 IG/INTB.

3.2.2. Contracting for MC&G Support. Air Force activities may not make contractual commitments for providing MC&G support without written approval from 497 IG/INTB. Air Force activities must coordinate with 497 IG/INTB during the drafting stage of the contract or proposal. DMA may provide contract services, technical assistance, and contractual language for the MC&G product or service.

3.2.3. Arranging for Interagency Support. MAJCOMs, DRUs, and FOAs may make non-reimbursable interagency arrangements with DMA and other government agencies for special MC&G

support. As a rule, these arrangements periodically provide small amounts of cartographic, photogrammetric, or G&G products and services. The arrangements may be in the form of either inter-agency agreements or memoranda of understanding. Send copies of these agreements with other agencies to 497 IG/INTB.

3.2.4. Requesting Non-DMA Products. With the exception of USGS products (see paragraph 3.2.7.), submit requests for existing MC&G products that are not produced by DMA or specifically addressed in this instruction to 497 IG/INTB. Send requirements for map and chart products not stocked by DMA and produced by another country (i.e., Native Edition Map) to the MC&G POC of the unified command that has responsibility for the area covered by the products. Air Force policy encourages units to use DMA standard products rather than products produced locally or by other national agencies.

3.2.5. Ordering Central Intelligence Agency (CIA) Maps. Order CIA maps by mail or by FAX (703) 893-1493 (unsecure, 24 hour line) or (703) 742-8642 (STU III, normal duty hours only). Send requisitions to CIA, FBIS/Map Services Center, Washington, DC 20505 or call (703) 742-8642 (STU III) for assistance.

3.2.6. Purchasing Data From Relational World Data Bank II (RWDB II) (formerly CIA World Data Bank II). To purchase data concerning RWDB II (i.e., the world data base, data base management system, applications software, or the RWDB II software) contact: EROS Data Center, Mundt Federal Building, Sioux Falls, SD 57198, or Customer Services at (605) 594-6151.

3.2.7. Ordering USGS Products. DMA does not stock USGS topographic maps but they are available to DoD activities. Refer to the DMA catalog section noted in paragraph 3.1.1. for ordering procedures and quantity limitations. DoD accounts cannot access USGS digital data products because DMA and USGS have no agreement for exchanging digital data. The user must purchase USGS digital data directly.

3.3. DMA Instructions, Manuals, and Catalogs:

3.3.1. Ordering DMA Catalogs. Address requests to DMACSC/PMSR, 6001 MacArthur Boulevard, Bethesda MD 20816-5001, or obtain detailed procedures and specific stock numbers for the DMA catalogs by contacting DMACSC/PMSC at DSN 287-2495, commercial (301) 227-2495, or toll free at 1-800-826-0342.

3.3.2. Requesting DMA Instructions and Manuals. Address distribution requests to HQ DMA/AMO, 6501 Lafayette Avenue, Riverdale MD 20737-1157. Detailed procedures and specific titles can be found in DMA Index 5026.3. Contact HQ DMA/AMO at DSN 296-1045, or HQ DMA/AMO-M at DSN 356-9142 for assistance.

3.3.3. Ordering MC&G Military Specifications, Standards, and Handbooks. Order these through the Standardization Document Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia PA 19111-5094, at DSN 442-1187 through 1198.

Chapter 4

USING MC&G PRODUCTS AND SERVICES

4.1. World Geodetic System 1984 (WGS 84). WGS 84 is the standard DoD reference system (datum) for all DoD analog and digital MC&G products and positional data. Where feasible, Air Force organizations will use WGS 84 for all activities requiring MC&G data. When it is necessary to convert to or from WGS 84 and use a local/regional/global datum, Air Force organizations will use DMA validated datum transformation software.

4.2. MC&G Software. Air Force organizations and supporting contractors will use Common Mapping Program (CMP) or DMA approved standard MC&G software that has been validated by 497 IG/INTB. DMA provides standard MC&G software, which is available on magnetic media. Contractors who wish to use any other MC&G software must get authorization from 497 IG/INTB.

4.3. MC&G Materials. Air Force sites use many MC&G materials in daily operations. These operations include training, exercises, planning, intelligence, research, development, testing, and evaluation. Air Force installations hold additional MC&G materials for crisis, contingency, warfighting, and post-strike reconstitution.

4.4. Supplemental Documents for Update. Use the documents listed below to update aeronautical charts, air target materials, and FLIPs before you use them. Users are responsible for annotating the corrections to DMA publications or products prior to use.

4.4.1. DMA Aeronautical Chart Updating Manual (CHUM) and CHUM supplements.

4.4.2. DMA Consolidated Air Target Materials Notices and Target Materials Bulletin.

4.4.3. FLIP change notices such as Urgent Change Notices, Planning Change Notices, Terminal Change Notices, Enroute Change Notices, and Notices to Airman (see AFJMAN 11-208, *The US Military Notice to Airmen (NOTAM)* (formerly AFR 55-16).

4.5. Processing Obsolete, Superseded, and Excess MC&G Stocks:

4.5.1. Dispose of classified maps, charts, and related materials as specified in AFI 31-401, *Industrial Security Program Management* (formerly AFRs 205-1 and 205-43).

4.5.2. Dispose of unclassified maps and charts as instructed in the DMA Catalog and DMA Guide C5231.1.

4.5.3. Units with a surplus of current MC&G stocks should contact the DMA Customer Assistance Office (DMACSC/PMSC), DSN 287-2495, commercial (301) 227-2495, or toll free at 1-800-826-0342 for disposition instructions.

4.5.4. Air Force contracting officers who oversee contracts requiring MC&G materials to support weapon systems development are responsible for developing procedures to ensure that contractors who receive MC&G materials on loan return the materials to the government. Contracts requiring MC&G materials will indicate that this data is government furnished equipment or property to be returned upon contract completion.

4.6. Correcting MC&G Products. Report changes or errors in MC&G products as follows:

4.6.1. FLIPs. Report changes to FLIPs as directed in AFIs 11-201 and 13-209 and in FLIP, General Planning. Process changes qualifying as Notice to Airman (NOTAM) material according to AFJ-MAN 11-208.

4.6.2. Aerospace, Hydrographic, and Topographic Products. Report errors or omissions on these products to: Director, Defense Mapping Agency, ATTN: PR, Stop A-13, 8613 Lee Highway, Fairfax VA 22031-2137.

4.6.3. Information Copy to 497 IG/INTB. Forward an information copy of change or error reports to 497 IG/INTB if the error has implications for all Air Force users.

4.7. Photocopied or User-Digitized Maps and Charts. Although making copies may be the most expeditious method for preparing strip charts and mission packages, the Air Force discourages using these copies for actual missions. Producing map copies may introduce distortions and errors to the original product. Although DMA produced maps and charts are not copyrighted, many of the foreign produced maps and charts available through DMA are copyrighted. Users of these products are liable for any copyright infringements.

4.8. Participating in DMA Product Reviews. DMA will periodically ask units to evaluate standard and prototype MC&G products. The purpose of the reviews is to find out if existing products are meeting user needs, to identify any necessary changes, to determine if requirements still exist, or to determine if new products meet the needs for which they are designed. 497 IG/INTB consolidates responses to the product reviews for all Air Force organizations that are not components of unified commands. Air Force components of unified commands must send information copies of their product reviews to 497 IG/INTB.

4.9. DMA Libraries. DMA has several large MC&G libraries. These libraries have maps, charts, G&G data, air facilities and flight information, and related materials produced by other agencies worldwide. DMA Instruction 8000.2, *DoD Mapping, Charting, and Geodesy (MC&G) Libraries*, 19 September 1990, gives a general description of the libraries. DMA sends copies of library data and materials to Air Force units at no direct cost when accompanied by proper justification. Contact DMAHTC/SD at DSN 287-2109 for assistance.

4.10. Related Products and Services. Many products and services are closely related to MC&G. Users must request them through other channels (see AFI 32-7062, *Base Comprehensive Planning* [formerly AFR 86-4]) for information relative to very large-scale maps (larger than 1:5,000), aerial photographic mosaics, surveys for installation master planning, site selection, military construction, and engineering activities). The 497 IG/INTB will review any requirements for products and services that are special intelligence requirements or are uncertain in nature.

Chapter 5

OBTAINING NEW OR MODIFIED MC&G PRODUCTS AND SERVICES AND IDENTIFYING FUTURE TECHNICAL OBJECTIVES

5.1. Definition of New or Modified MC&G Products and Services. These are products or services not listed in DMA List 8052.4, *DMA List of Standard Products and Services*. Their specifications are usually determined by a system developer or requested by a CINC and cannot be satisfied by existing MC&G products or services.

5.2. Requests. MAJCOM, FOA, and DRU MC&G offices requesting new or modified products or services must go through 497 IG/INTB. These offices must substantiate and validate the need for these products or services in their AOR and coordinate with the unified command. They must clearly identify the operations, systems, programs, and plans that require support and set priorities. MC&G offices must fully investigate the possible use of available standard products and services before submitting requirements for new or modified products and services. This investigation should include a specific explanation of why standard products do not satisfy the requirement. Organizations requiring new or modified MC&G products may have to reimburse DMA for start-up and production costs. The provisions of DoD Instruction 5000.2/Air Force Supplement 1, *Acquisition Management Policies and Procedures*, August 31, 1993, and DoD Instruction 5000.56 provide guidance for required reimbursement. Requirements sent to 497 IG/INTB for action must include the following:

5.2.1. Type of Product or Service. Give the name or brief description of the product; for example, map, chart, or digital cartographic data (including terrain, feature, map or chart, vertical obstruction, and other data).

5.2.2. Product Specifics. Give the specific characteristics or features required. For example, give terrain contours, spot elevations, radar significant features, scale, size, geodetic reference system (WGS 84), datum, grid spacing, grid type, projection, geodetic/astronomic coordinates, azimuths, gravity and magnetic data, elevation post spacing, and digital media format.

5.2.3. Required Accuracy. State the absolute and relative accuracies required for positioning.

5.2.3.1. Horizontal. State the absolute and relative accuracies needed in horizontal positioning of features and points in terms of a circular error (90 percent assurance). Absolute horizontal accuracies are based on geodetic datums (WGS 84). When you need a relative horizontal accuracy, state the distance between points or size of the area in which you must attain the desired relative horizontal accuracy.

5.2.3.2. Vertical. State the absolute and relative accuracies needed in elevation and height values in terms of a linear error (90 percent assurance). Absolute vertical accuracies are based on a vertical datum (usually Mean Sea Level). When you need a relative vertical accuracy, state the surface or point of reference from which you will measure elevations and heights.

5.2.4. Geographic Area. Submit a graphic that identifies or outlines the geographic area the product or service should cover. For cartographic and geodetic products or services covering specific points or small geographic areas, also include size of area and approximate coordinates of the center point, if appropriate.

5.2.5. Statement of Justification. In the statement of justification you must:

5.2.5.1. Specify the intended use of the requested product or service. Fully describe specific uses to allow the widest range of product support. Intended uses include, but are not limited to, penetration analysis, route selection, range planning, mission planning folders, radar prediction, and enroute navigation.

5.2.5.2. State the relationship of this requirement to a particular weapon system, operation, program, or plan.

5.2.5.3. For research and development product requirements, document the research, development, test, and evaluation program. Identify the contract, initial operational capability (IOC) date, Operational Requirements Document (ORD), program management directive (PMD), and program element (PE).

5.2.5.4. Identify the organization that needs the product or service.

5.2.5.5. State whether you will need to periodically update the product or service. State whether the requirement is for a special item to be used for a limited time, or for a product that should be periodically revised over an extended time period. Estimate the required revision frequency.

5.2.5.6. Explain any adverse effect on the installation if 497 IG/INTB does not provide the requested product or service.

5.2.6. Priority of Requirements. In setting priorities, specify the following:

5.2.6.1. MC&G priority taken from the Joint Strategic Planning Document, Annex E.

5.2.6.2. If available, associated Air Force priority and precedence rating in the US Air Force Program Installations, Units, and Priorities document.

5.2.6.3. Required delivery date(s).

5.2.6.4. For large area requirements (such as DTED covering 100 geocells or more), specify a minimum of three subareas, with production preference. Factor in the delivery and intergration schedules for the system in progress when establishing a desired production schedule.

5.2.7. Special Delivery Instructions. Provide shipping address and any special delivery instructions.

5.2.8. Point of Contact. Identify a point of contact including the individual's name, office code, mailing address, DSN telephone number, commercial telephone number, secure telephone number, and FAX number.

5.3. MC&G Technical Objectives. An MC&G technical objective identifies any type of product or service that is currently beyond existing accuracies or technical capabilities but will be needed in the future given the thrust of US Air Force science and technology efforts. For some weapon systems, you may state technical objectives as MC&G error budgets that can add to overall weapon system effectiveness or accuracy. Establish cartographic, photogrammetric, and geodetic technical objectives to meet projected capabilities of systems or facilities. Set objectives early in the process of developing or modifying major weapon systems (or as operational capabilities dictate) so that you can state firm requirements for improvements to MC&G products or products capabilities that support weapon systems according to AFI 10-601 and DoD Instruction 5000. 2/Air Force Supplement 1. Send technical objectives to AFMC/IN for validation and submission to 497 IG/INTB for approval and forwarding to DMA. MAJCOM, DRU, and FOA offices must identify MC&G technical objectives as early as possible to make sure that capabilities exist when needed to support new or modified systems or facilities. The MAJCOM MC&G officer

should monitor major weapon systems research, development, testing, evaluation, and modification and assess the support facilities to identify any technical objectives for future DMA support. AFMC/IN and 497 IG/INTB will assist MAJCOMs, DRUs, and FOAs in developing technical objectives.

ERVIN J. ROKKE, Maj General, USAF
Assistant Chief of Staff, Intelligence

Attachment 1

RECOMMENDED DMA PUBLICATIONS FOR COMMAND HEADQUARTERS USE

- DMA Instruction 5000.56, *Programming Unique Mapping, Charting, and Geodesy (MC&G) Requirements for Developing Systems*, 24 August 1992
- DMA Index 5026.3, *Index of DMA Publications*, 24 December 1992
- DMA Guide C5231.1, *Mapping, Charting, and Geodesy (MC&G) Classification Management Program (U)*, 29 January 1991
- DMA Instruction 8000.2, *DoD Mapping, Charting, and Geodesy (MC&G) Libraries*, 19 September 1990
- DMA Instruction 8050.4, *Submission and Validation of Area Requirements for MC&G Standard Products and Services*, 17 June 1987
- DMA Instruction 8052.1, *Validation of Requirements for New or Modified Non-Crisis Mapping, Charting, and Geodetic (MC&G) Products and Services*, 27 December 1984
- DMA List 8052.4, *DMA List of Standard Products and Services*, 24 August 1990
- DMA Instruction 8052.6, *Crisis Support Procedures*, 6 November 1992
- DMA Instruction 8052.7, *MC&G Support for Noncombatant Evacuation Operations*, 27 January 1989
- DMA Instruction 8052.9, *MC&G Support to Exercises*, 13 March 1990. *of Mapping, Charting, and Geodesy (MC&G) Transformation Services*, 23 September 1992
- DMA Instruction 8240.1, *Management of Department of Defense (DoD) Geodetic and Geophysical (G&G) Survey Resources*, 25 August 1989
- DMA Handbook 8290.2, *Handbook for Ordering Commercial Land Remote Sensing Satellite Data by the Department of Defense*, August 1989
- DMA Manual 8570.1, *DMA Product Maintenance System Manual*, 12 January 1988
- DMA Instruction 8600.4, *The DMA Policy on Folding Maps and Charts*, 23 February 1993
- DMA Manual S8601.2, *Missile/Air Target Materials Program (U)*, 26 February 1987
- DMA Instruction 8610.1, *Stockage of MC&G Products*, 12 March 1992
- DMA Instruction 8610.2, *Stock Requirements*, 10 November 1992
- DMA Instruction 8660.10, *Procedures for Request, Release, Handling, and Distribution of DMA MC&G Digital Products*, 10 April 1990
- DMA Instruction 8680.1, *Mapping, Charting, and Geodesy (MC&G) War Reserve Stock (WRS)*, 24 May 1991
- DMA Requirements Tutorial, *Submitting Requirements for Mapping, Charting, and Geodetic (MC&G) Products and Services*
- ACIC Technical Report No. 96, *Principles of Error Theory and Cartographic Application*
- DMA Technical Report 80-003, *Geodesy for the Layman*, December 1983
- DoD Glossary of Mapping, Charting, and Geodetic Terms*, DMA Stock No. GLOSMCGTERMS

Defense Mapping School Catalog and Course Descriptions

DMA Publication No. 22, *Digitizing the Future*, DMA Stock No. DDIPDIGITALPAC (Third Edition)

DMA Technical Manual 8358.1, *Datums, Ellipsoids, Grids, and Grid Reference Systems*, 20 September 1990, DMA Stock No. DMATM83581TEXT (Edition 1)

DMA Catalog of Maps, Charts, and Related Products, Parts 1-7

Attachment 2

WAR RESERVE STOCK (WRS) CALCULATION

A2.1. The WRS formula below is a generic method for calculating MC&G WRS quantities. Use it only as a tool rather than an Air Force directive. The formula is generalized. You may modify it to fit the needs of a particular command, unit, weapon system, or mission. Nonflying units should determine WRS needs based on experience and individual unit requirements.

A2.1.1. Formula Elements:

- N = Number of aircraft in the unit.
- D = Duration of operations (number of days being computed).
- S = Sortie generation rate (noted in the US Air Force War and Mobilization Plan). Figures may vary by aircraft type, expected duration of missions, and theater of operations.
- R = Reuse factor. This factor varies among units and is designed to reduce the total WRS by the estimated amount of map use. For example, if a unit reuses its maps about 20 percent of the time, its reuse factor is 0.2. Likewise, a 40 percent reuse rate results in an R factor of 0.4.
- P = Packaging factor. This factor simply increases the WRS for a particular item to the next highest increment of 25 to allow for the use of standard shrink-wrapped map packages.

A2.1.2. Formula:

- $WRS = N \times D \times S \times (1.0 - R) + P$ (x = multiplication symbol)

A2.2. This formula provides estimated WRS quantities for each sheet. The total WRS will be the sum of the quantities calculated for each sheet required in a particular area of operations.

A2.3. There are a number of other variables to consider:

- Total line items required in each series will depend on the geographical limits of the area of operations as determined by the support command.
- Reusability factors vary by aircraft type, mission, and command preference. If possible, units should consider employing methods that will increase product life expectancy (i.e., lamination).
- A particular aircraft may require multiple copies of the same map sheet for the same mission. For example, a COMPASS CALL C-130 may require one map for the pilot and another for the electronic combat personnel in the cargo bay.
- At a minimum, all units should deploy with materials for planning. Planning stocks should provide coverage of the entire area of responsibility and should include 25 copies of each JNC and ONC, and 50 copies of each TPC.

Attachment 3

GEODETIC SUPPORT WORKSHEET

(Use the recommended format below for submitting geodetic survey requirements. Examples of required information are included. Add more information as necessary. Please use one worksheet for each request.)

A3.1. User Identification Code. Command-generated alphanumeric code indicating the command making the request, the fiscal year the request is submitted, and the numerical value of the request for the year.

User Identification Code: ACC 90-01 (second request would be 90-02, etc.)

A3.2. Location of Survey. Identify the range, base, city, state, and country.

Base: Nellis AFB City/State: Las Vegas, NV

Range: Nellis Range 65 Country: USA

A3.3. Suspenses. Identify the date(s) the user would like to have the survey team on site and the date on which the user needs the final survey data. Please allow 60 days after completion of the field survey for reduction, quality control, etc.

Date Survey Required: 8 Jan 91

Date Final Survey Data Required: 8 Mar 91

A3.4. Support Required. Indicate as specifically as possible, what needs to be done (e.g., INS update points, PMEL survey, range targets, radar sites, etc.). Also indicate how many points or sites are involved.

Support Required: Position approximately 12 INS update points at Nellis AFB and 5 targets on Nellis Range 65.

A3.5. Justification. Indicate the system, program, or operation that needs support, and impact if support is not provided.

Justification: Survey required to test the accuracy of the Advanced Tactical Fighter (ATF) avionics system. Lack of support could result in delayed testing and/or degraded test results.

A3.6. Point of Contact/Requesting Office. Indicate a person for the survey team to contact for instructions, questions, or assistance.

POC/Requesting Office:

Rank/Name: Captain Joe Smith

Unit: 57FW/DOO

Msg Address: 57FW NELLIS AFB//DOO//

DSN: 329-0726

Commercial: (406) 789-3245

FAX: 329-1221

Secure: STU-III 767-3245

A3.7. Priority. Indicate the Air Force precedence rating as determined by the US Air Force Program Installations, Units, and Priorities document and the user's relative priority compared to other command requirements.

Air Force Precedence Rating: 03-08

User's Relative Priority: 3

A3.8. Mailing Address(es) for Published Data. Indicate what office(s) should receive the published data.

57 FW/DOOQ

Attn: Capt Smith

Nellis AFB, NV 89191-5000

HQ ACC/INAM

129 ANDREWS ST, STE 304

Langley AFB, VA 23665-2767

A3.9. Required Data and Accuracies. Indicate the type of data needed (e.g., coordinates, astronomic data, azimuths, gravity data, etc.); the datums (if other than WGS-84 and NGVD); and the form of the information (e.g., MGRS, UTM, or geodetic coordinates).

Type of Data: INS update point and target positions

Datums: WGS-84 and NGVD only

Form of Data: Require all positions in both MGRS and geodetic forms

Accuracies: Use standard Air Force accuracies for all points (see attachment 5 of this instruction)

A3.10. Additional Remarks. Include anything that may clarify the requirement, any restrictions on the data or the surveyors, and any deadlines that may affect the survey.

Additional Remarks: Survey must be accomplished by 30 Mar 91 to support initial testing of the ATF avionics system. Range will be inactive 08-19 Jan for cleanup. Range access will be limited at any other time.

Attachment 4

GEODETIC AND GEOPHYSICAL (G&G) ACCURACY STANDARDS FOR GENERIC SURVEYS

A4.1. Aircraft Inertial Navigation System (Ins) Update Initialization Points:

- Horizontal Position: +/- 8 meters
- Vertical Position: +/- 3 meters

A4.2. Ins Test Pedestals:

- Horizontal Position: +/- 3 meters
- Vertical Position: +/- 1 meter
- Azimuth: +/- 30 arc seconds

A4.3. Precision Measurement Equipment Laboratories:

- Horizontal Position: +/- 3 meters
- Vertical Position: +/- 1 meter
- Azimuth: +/- 10 arc seconds
- Gravity: +/- 5 milligals

A4.4. Range Targets:

- Horizontal Position: +/- 3 meters
- Vertical Position: +/- 1 meter

A4.5. Range Instruments: (Cinetheodolites, Threat Emitters, Cameras, Aerial Surveillance Radars, etc.)

- Horizontal Position: +/- 3 meters
- Vertical Position: +/- 1 meter
- Relative Positions: +/- 0.3 meter (Camera to Site Aim Points, etc.)
- Slant Ranges: +/- 0.3 meter
- Azimuths: +/- 15 arc seconds

A4.6. Compass Rose:

- Horizontal Position: +/- 3 meters
- Vertical Position: +/- 1 meter
- Magnetic Azimuth: +/- 6 arc minutes (Declination)

Compass Rose area must not have a magnetic declination variation greater than +/- 12 arc minutes.

NOTE:

Positional accuracies are given with respect to World Geodetic System 1984 (WGS 84). Azimuths are referenced to astronomic or geodetic north. Gravity surveys are related to the current International Grav-

ity Standardization Net (IGSN-71). All positional data accuracies (except for A4.5, Relative Positions and Slant Ranges) are absolute and expressed in terms of 90 percent assurance in keeping with standard Defense Mapping Agency practices for providing MC&G products and services.