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Intelligence

**IDENTIFYING REQUIREMENTS FOR
OBTAINING AND USING GEOSPATIAL
INFORMATION AND SERVICES**

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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OPR: HQ 497 IG/INOT (MSgt Willis)

Certified by: HQ USAF/XOI
(Maj Gen John P. Casciano)

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This instruction implements Air Force Policy Directive (AFPD) 14-1, *Air Force Intelligence Planning and Operations*, 1 October 1995. It provides procedures for identifying requirements for Geospatial Information & Services (GI&S). This includes ordering, supplying, as well as monitoring use of these products and services. This instruction also implements Department of Defense (DoD) Instruction 5000.56, *Programming Unique Mapping, Charting, and Geodesy (MC&G) Requirements for Developing Systems*, 24 August 1992, DoD Instruction 5030.59, *Defense Mapping Agency (DMA) Mapping, Charting, and Geodesy (MC&G) Data, Public Availability and Exceptions*, 19 January 1993, DoD Directive 5105.60, *National Imagery and Mapping Agency (NIMA)*, 11 October 1996, Chairman Joint Chiefs of Staff Instruction (CJCSI) 3901.01, *Requirements for Global Geospatial Information & Services*, 24 May 1996 and CJCSI 3900.01, *Position Reference Procedures*, 21 Mar 1994. It does not include detailed information on Flight Information Publication (FLIP) materials (AFI 11-201, *Flight Information Publications*), Evasion Charts (Joint Publication 3-50.3, *Joint Doctrine for Evasion and Recovery*, 6 Sep 1996), or tactical target materials (Defense Intelligence Agency Manual (DIAM) 57-24, *US/Allied Tactical Target Materials*).

Note: In 1996, DoD adopted GI&S to replace the term "Mapping, Charting and Geodesy" to better define procedures for generating, receiving, sharing, and using digital mapping and associated imagery products and services. The term GI&S includes imagery based geospatial products, but not imagery intelligence. GI&S is a framework of digital data or a visual representation of highly accurate, geo-referenced and attributed information arranged in a coherent structure to support measurement, geographic referencing, mapping, monitoring, modeling, terrain evaluation, and spatial reasoning applications.

SUMMARY OF REVISIONS

This document is substantially revised and must be completely reviewed.

It incorporates changes resulting from the recent reorganization at Headquarters United States Air Force (HQ USAF) and the corresponding changes in responsibilities of HQ USAF GI&S offices. It aligns with

AFPD 14-2, *Intelligence Collection, Production and Application*, 23 July 1993, and supersedes AFI 14-205, *Identifying Requirements for Obtaining and Using Cartographic and Geodetic Products and Services*, 22 March 1994.

Section A—Geospatial Information and Services Responsibilities of DoD and Air Force Organizations

1. NIMA. NIMA furnishes GI&S products to Air Force units, DoD contractors, foreign nations using US weapons systems, the GI&S developmental/technical community, and under certain conditions the general public. Additional NIMA information can be found on the NIMA Homepage at <http://www.nima.mil> on the internet, <http://nima/smil.mil> on INTELlink-S and <http://www.nima.ic.gov> on INTELlink.

2. Air Intelligence Agency, Headquarters 497th Intelligence Group, Directorate of Operations Applications. The Air Force Director of Intelligence, Surveillance and Reconnaissance (HQ USAF/XOI) designates HQ 497 IG/INO as the Air Force GI&S Functional Manager.

2.1. As functional manager, HQ 497 IG/INO formulates, interprets, coordinates, and recommends HQ USAF/XOI policy on all Air Force GI&S planning, training, equipping, programming, and budgeting matters. GI&S personnel utilization and training issues are in the purview of HQ USAF Force Development and Plans Division (HQ USAF/XOIF). HQ 497 IG/INO maintains an Air Force GI&S production requirements database and solicits, collects, analyzes, consolidates, and validates development and production of all GI&S functional, area, software and data requirements supporting Research, Development, Test and Evaluation (RDT&E), training, and operational needs of Air Force weapon systems. HQ 497 IG/INO is the primary Air Force interface with the NIMA on all GI&S matters, not to include commercial/intelligence imagery management. Imagery, measurement, and signal functional management is under the purview of the Surveillance and Reconnaissance Directorate (HQ USAF/XOIR). Order commercial/intelligence imagery IAW AFI 14-201.

2.2. HQ 497 IG/INO is the focal point for all Air Staff, Air Force Major Command (MAJCOM), Direct Reporting Unit (DRU), and Field Operating Agency (FOA) customers needing technical assistance in any GI&S or related discipline, new and revised GI&S functional and area (product and service) coverage, and assistance with any issues requiring NIMA support. HQ 497 IG/INO also coordinates GI&S issues with the Joint Staff, other Services, DoD, and non-DoD agencies as necessary. Contact HQ 497 IG/INO at 5113 Leesburg Pike, Ste 600, Falls Church VA 22041-3230 or on the US Air Force Targeting and Geospatial Information & Services Homepage available on INTELlink at <http://www.497ig.aia.ic.gov/target/inothmpg.htm> and INTELlink-S at <http://hq497ig.af.pentagon.smil.mil>.

3. HQ USAF Applications and Production Division. HQ USAF/XOIIA represents HQ USAF/XOI at the DoD level for GDIP/NFIP, TIARA production and resources.

3.1. HQ USAF/XOIIA develops in coordination with HQ 497 IG/INO, Air Force GI&S policy, concepts and architectures.

3.2. HQ USAF/XOIIA advises HQ 497 IG/INO concerning plans, programs, resources, support initiatives, and technological advancements.

4. Air Force Flight Standards Agency, Aeronautical Information Branch . As outlined in AFI 11-201, AFFSA/XOIA investigates, defines, consolidates, assembles, validates and lists, in order of priority, Air Force operational requirements for FLIP, Digital Aeronautical Flight Information File (DAFIF) and related products. AFFSA/XOIA is the Air Force point of contact with NIMA on FLIP and DAFIF matters. Contact AFFSA/XOIA at 1535 Command Dr, Ste D303, Andrews AFB MD 20331-7002.

5. Air Intelligence Agency, Headquarters 497th Intelligence Group, Directorate of Intelligence Systems. HQ 497 IG/IND conducts GI&S technical/software/systems engineering and NIMA product prototype evaluations incorporating MAJCOM inputs. Systems engineering is defined as areas associated with technical review of standard and prototype NIMA products, functions and performance of GI&S software tools, software upgrade, and configuration of GI&S software requirements. Contact HQ 497 IG/IND at 242 Luke Ave, Bolling AFB DC 20332-7020. When tasked by INO, IND supports GI&S programs by:

- 5.1. Acting as Air Force GI&S technical point of contact with NIMA, other Services, DoD, and non-DoD agencies developing Air Force technical training requirements and recommending Air Force GI&S technical positions for INO promulgation.
- 5.2. Coordinating validated requirements for DoD Intelligence Information Systems having GI&S implications to include consolidating and maintaining users' GI&S software applications requirements (both functional and performance) and providing GI&S software life-cycle management as needed.
- 5.3. Identifying and allocating funding to accomplish actions in paragraphs **5.** through **5.2.**

6. Air Force Components of Unified Commands, MAJCOMs, DRUs, FOAs, Air National Guard and Air Force Reserve. Commanders of these organizations will establish an office to handle all GI&S matters. Designated offices will:

- 6.1. Issue supplemental instructions to this instruction.
- 6.2. Appoint GI&S points of contact to establish and maintain GI&S distribution accounts and submit automatic distribution (AD) using Defense Logistics Agency (DLA) guidance (paragraph **10.**). Submit routine orders using DLA or Air Force Standard Base Supply System (SBSS) guidance (paragraph **9.**).
- 6.3. Identify, request and maintain appropriate reserve stocks to support Unified Command Operation Plan (OPLAN) or Concept Plan (CONPLAN) tasking.
- 6.4. Establish procedures to ensure sufficient GI&S items are stocked to sustain routine operations and ensure adequate re-supply. Issue maps, charts, FLIPS, and related items when required. Maintain copies of pertinent NIMA instructions, manuals and catalogs identified in **Attachment 1** and paragraph **15.**
- 6.5. Actively coordinate with command operations, plans, training, logistics, requirements, inspection, and intelligence staffs to ensure doctrine, strategy, tactics, logistics, and RDT&E efforts adequately address GI&S requirements.
- 6.6. Certify and submit GI&S requirements IAW this instruction and supported command guidance. Submit area requirements IAW paragraph **10.** Ensure GI&S 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). When new systems needing GI&S products or services are identified, forward requirements to HQ AFMC/IN.

6.7. Ensure responses to all GI&S NIMA product reviews are routed through HQ 497 IG/INO for Air Force position, consolidation and submission to the requester.

6.8. As required, prepare GI&S Annexes (Annex M) to Unified Command OPLANs and CONPLANs according to AFMAN 10-401, *Operation Plan and Concept Plan Development and Implementation*, and supported command directives.

6.9. Identify War Reserve Stock (WRS) requirements for movement in the Time Phased Force Deployment Listing (TPFDL) and the OPLAN or CONPLAN Logistic Annex. Use AFMAN 10-401 when developing and reviewing Annex M of an OPLAN or CONPLAN. AFMAN 10-401 provides air components 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. Generic procedures for estimating quantities for WRS are detailed in [Attachment 2](#).

6.10. Participate in annual Air Force GI&S conferences and in periodic meetings with other Air Force organizations to address critical GI&S matters of mutual concern.

6.11. Ensure subordinate units are aware of and comply with Air Force and Joint Chiefs of Staff (JCS) policy regarding use of World Geodetic System and other datums as prescribed in paragraph [16](#) of this instruction.

6.12. Ensure subordinate units comply with this instruction.

7. HQ Air Force Materiel Command, Directorate of Intelligence Applications . HQ AFMC/INA collects, assesses, revises as necessary, and validates all new or updated Air Staff, MAJCOM, DRU, and FOA GI&S functional and RDT&E requirements to support Air Force weapon systems in development. Assures Air Force systems acquisition documents properly reflect the requirements at each developmental milestone as prescribed by AFI 10-601. Forwards validated requirements to HQ 497 IG/INO for translation to and further coordination with NIMA. HQ AFMC monitors GI&S technology and GI&S developments in government and industry for application to new Air Force systems. For assistance, contact HQ AFMC/IN at 4225 Logistics Ave, Ste 11, Wright-Patterson AFB OH 45433-5057 or <http://www.afmc.wpafb.af.mil/HQ-AFMC/IN/mcgi/> on the internet.

8. Air Force GI&S Ordering Guidance. Use the following publications or web sites for guidance on ordering and stocking GI&S products. See Attachment 1 for other NIMA publications useful to command headquarters:

8.1. NIMA Catalogs of Maps, Charts and Related Products, all volumes (see [Attachment 1](#)).

8.2. Local base supply GI&S Ordering Procedures.

8.3. AFMAN 10-401, Operation Plan and Concept Plan Development Implementation.

8.4. AFI 11-201, Instruction for Flight Information Publications (FLIP).

8.5. AFMAN 11-230, Instrument Procedures.

8.6. AFMAN 23-110, Standard Base Supply Customer's Procedures.

8.7. US Air Force Targeting and Geospatial Information & Services Homepage (see paragraph 2.2. for addresses).

8.8. Defense Logistics Agency Internet Homepage (<http://www.dla.mil/>).

8.9. Defense Supply Center Richmond Internet Homepage (http://www.dscr.dla.mil/Product_Centers/PC_9/dscr_maps.htm).

9. Standard Base Supply System (SBSS). Air Force users can order and receive standard NIMA products through the SBSS. The SBSS does not support series all and automatic distribution requisitioning at this time. For specific guidance on ordering NIMA products, contact your local base supply office and review AFMAN 23-110.

10. Defense Logistics Agency (DLA). DLA assumed material management, storage and distribution and catalog production responsibilities for GI&S from NIMA. DLA provides standard NIMA product one-time requisitions, series all requisitions and automatic distribution support to the DoD through the Defense Supply Center Richmond (DSCR). For specific guidance on ordering NIMA products from DLA, review the NIMA Catalog of Maps, Charts and Related Products, US Air Force Targeting and Geospatial Information & Services Homepage, Defense Logistics Agency Homepage and DSCR Homepage referenced in paragraph 8 above.

Section B—Identifying Requirements for Geospatial Information & Services

11. GI&S Area Requirements. MAJCOMs, DRUs and FOAs identify GI&S production requirements through their chain of command to HQ 497 IG/INO IAW CJCSI 3901.01. This process is separate from the Intelligence Support Plan program which was established for intelligence support documentation purposes only. NIMA List 805-1A and NIMA catalogs are the basic references for identifying GI&S products currently available from NIMA. Air Force components of Unified Commands submit requirements to NIMA for operations, area training, exercises (mission rehearsal) and intelligence through the responsible Unified Command. Submit RDT&E and CONUS training requirements to HQ 497 IG/INO. HQ 497 IG/INO will consider OCONUS requirements on a case by case basis.

11.1. Confirming GI&S Requirements and Production Status.

11.1.1. GI&S Requirements Database. NIMA provides a DoD GI&S Area Requirements Database to the Unified Commands and Services. The database reflects required products and their JCS priority as submitted by the Unified Commands and Services. INO maintains the Air Force database and biennially provides the MAJCOMs, DRUs and FOAs documentation needed to thoroughly review and update their current requirements. Resulting new and revised submissions must be sent to HQ 497 IG/INO for validation and forwarding to NIMA as part of the total Air Force GI&S production requirement. Out-of-cycle requirements may be sent to INO at any time in response to changing mission need. NIMA annually updates and reports GI&S production status for Unified Command and Service review. Identify production status errors or changes to HQ 497 IG/INO.

12. Identifying Training Requirements.

12.1. The National Imagery and Mapping College (NIMC) Defense Mapping School (DMS) provides specialized Air Force GI&S training. The 17th Training Group, Goodfellow AFB, TX, provides

broad GI&S training to intelligence initial skills courses. Information on DMS courses is available on the NIMA INTELlink Homepage. Submit specific requests for GI&S course billets to HQ Air Education and Training Command (HQ AETC) through local training offices for validation by the MAJCOM.

12.2. NIMC develops GI&S course curricula with input from HQ AIA Education & Training Division (HQ AIA/DPT) and HQ USAF Force Development and Plans Division (HQ USAF/XOIF). Submit new GI&S training needs or changes to existing courses to HQ AIA/DPT and HQ AF/XOIF for forwarding to NIMC.

Section C—Obtaining Geospatial Information and Services

13. NIMA GI&S Products.

13.1. Crisis Support. Quick response ordering of existing standard NIMA products for crisis/contingency support will be conducted IAW SBSS and DLA techniques prescribed by paragraphs **9.** and **10.** In areas where standard NIMA products are not produced or available through SBSS, identify requirements for substitute, non-standard products through the supported command's GI&S chain of command or HQ 497 IG/INOT as applicable.

13.2. Obtaining Precise Coordinates.

13.2.1. Units having Analytical Photogrammetric Positioning Systems (APPS) and associated Point Positioning Data Bases (PPDB) or a Digital Point Positioning Data Base (DPPDB) capability can perform precise coordinate positioning locally. Hardcopy PPDB coverage is no longer produced or available from NIMA. Identify new DPPDB coverage needs IAW paragraph **11.** above.

13.2.2. For areas without PPDB and DPPDB coverage or where points requirements exceed local mensuration capabilities, units can obtain point positioning support from NIMA. Each year INO tasks the MAJCOMs, DRUs and FOAs to estimate their 6-month to 1-year points requirement and points mensuration priorities IAW paragraph **11.** Those level of effort estimates are forwarded to NIMA in a consolidated Air Force requirement. Throughout the year, as precise point positioning data is needed for individual points, users will send requests directly via electronic means to "NIMA ST LOUIS AFS MO//GIMIF//." Include pin-pricked photography, a description of the point desired, required datum (e.g., World Geodetic System), type of coordinates desired (i.e., geographic or UTM), CJCSI 3901.01 priority and justification with requests. Allow three weeks for completing routine requests and include information copies to the appropriate higher command, and NIMA Air Force Customer Support Team (NIMA/COTF).

13.2.3. Crisis Support. Quick response support for precise points will be submitted through the responsible Unified Command to the appropriate NIMA Customer Support Team. Units can submit requests directly to NIMA if coordinated through the Unified Command and the NIMA Customer Support Team. Allow approximately 2 to 8 hours turn-around time per installation.

13.3. Obtaining Geodetic Survey Support. Send requirements for geodetic survey support through the responsible MAJCOM, DRU or FOA to HQ 497 IG/INO. Format requests as shown in **Attachment 3** State geodetic survey accuracy requirements as shown in **Attachment 4**. Ensure position and elevation are stated as absolute and/or relative.

13.4. GI&S Products for Contractors and DoD System Developers.

13.4.1. Contractors and DoD system developers who need standard GI&S products to support RDT&E will submit requests through their program's primary contract officer (PCO). The PCO then forwards requests to the appropriate command GI&S office. Compliance with AFI 31-601, *Industrial Security Program Management*, is required when submitting contractor requests for release of classified products. A contractor must provide for the return or destruction of all government furnished GI&S property upon contract termination. Under no circumstances will a contractor transfer government furnished GI&S property or data to another project within the company or to another company without prior coordination with the PCO and written permission from HQ AFMC/IN.

13.4.2. Command GI&S offices will review and validate contractor requests and forward the requisitions to the Defense Supply Center Richmond-JN (DSCR-JN).

13.4.3. Program Development Offices must coordinate with HQ 497 IG/INO on planned designs, new system development or existing system modifications that call for GI&S data to facilitate interoperability and compatibility with NIMA databases. All computer software that will use NIMA data must be directly compatible with NIMA databases and the NIMA format. The goal is to eliminate the need for translations or transformations that may impact the fidelity of the NIMA data. Contractors should send requests for geodetic and geophysical (G&G) products and services through MAJCOM, DRU, or FOA GI&S offices to HQ 497 IG/INO.

14. Non-NIMA GI&S Products. MAJCOMs DRUs and FOAs will make every effort to ensure only NIMA standard products are used. Therefore, only request non-NIMA products or contract production support when HQ 497 IG/INO or the appropriate Unified Command GI&S office confirms the required support cannot be obtained from NIMA.

14.1. Requesting non-NIMA Products. With the exception of United States Geological Survey (USGS) and Central Intelligence Agency (CIA) products (see [13.3.](#)), submit requests for existing GI&S products not produced by NIMA or specifically addressed in this instruction (e.g., native edition maps) to HQ 497 IG/INO or the GI&S point of contact of the Unified Command responsible for the area covered by the products.

14.2. Ordering CIA Maps. Order CIA maps by contacting the National Technical Information Service. Ordering information is available on the CIA INTELlink Homepage at <http://www.cia.ic.gov/> and at <http://www.ntis.gov/> on the internet.

14.3. Ordering USGS Products. NIMA does not stock USGS topographic maps but they are available to DoD activities. All requests for USGS products must be sent to the NIMA Air Force Customer Support Team (NIMA/COTF). Requests for USGS products will be approved only where there is no adequate NIMA product. Order the minimum quantities of products needed to support operations.

15. NIMA Instructions, Manuals and Catalogs.

15.1. Ordering NIMA Catalogs. NIMA catalogs have national stock numbers and are ordered by addressing requests to the Defense Supply Center Richmond-JN, 8000 Jefferson Davis Highway, Richmond VA 23297-6545.

15.2. Requesting NIMA Instructions and Manuals. Address distribution requests for documents listed in Attachment 1 to NIMA/ISD, 6001 MacArthur Blvd, Bethesda MD 20816-5001.

15.3. Ordering GI&S Military Specifications, Standards and Handbooks. Order these through the Standardization Document Order Desk, Building 4D, 700 Robbins Ave, Philadelphia PA 19111-5094.

Section D—Using Geospatial Information & Services

16. World Geodetic System (WGS). WGS is the standard DoD reference system (datum) for all DoD GI&S products and services. Where feasible, Air Force organizations will use the most current WGS for all activities requiring GI&S data. When it is necessary to convert to or from WGS and local or regional datums, Air Force organizations will use NIMA validated datum transformation software. CJCSI 3900.01, *Position Reference Procedures*, requires selection of a standard datum in areas where operation on WGS is not possible.

17. GI&S Software. HQ 497 IG/INO collects, consolidates and maintains Air Force systems' GI&S functional and performance software requirements. Contractors who wish to use any other GI&S software must get authorization from HQ 497 IG/INO.

18. Supplemental Update Documents. 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 NIMA publications or products prior to use. Report changes to FLIPs as directed in AFI 11-201 and in FLIP, General Planning. Process changes qualifying as Notice to Airman (NOTAM) material according to AFMAN 11-230. Report errors or omissions on aerospace, hydrographic and topographic products to Director, National Imagery and Mapping Agency, ATTN: COTF, 12310 Sunrise Valley Drive, Mailstop P-33, Reston VA 20191-3449.

18.1. NIMA Aeronautical Chart Updating Manual (CHUM), Electronic Chart Updating Manual (ECHUM) and CHUM supplements.

18.2. NIMA Consolidated Air Target Materials Notices and Target Materials Bulletin.

19. Processing Obsolete, Superseded and Excess GI&S Stocks.

19.1. Dispose of classified maps, charts and related materials as specified in AFI 31-401, Managing the Information Security Program. Dispose of unclassified maps and charts as instructed in the applicable NIMA Catalog.

19.2. Units with a surplus of current GI&S stocks should contact DSCR-JN for disposition instructions.

20. 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 to derive coordinates or measure distances. Producing map copies may introduce distortions and errors to the original product. Commercially produced FLIPs and NIMA produced maps and charts are copyrighted, as are many of the foreign produced maps and charts available through NIMA. Users of these products are liable for any copyright infringements.

21. Participating in NIMA Product Reviews. NIMA periodically asks Air Force organizations to evaluate standard and prototype GI&S products. The purpose is to find out if existing products still meet 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. HQ 497 IG/INO tasks MAJCOMs, DRUs and FOAs to participate in these reviews and submits consolidated Air Force positions to NIMA. Air Force component commands tasked by Unified Commands should also respond through INO so inputs can be reflected in a consolidated Air Force position.

MARVIN R. ESMOND, Lt General, USAF
DCS/Air & Space Operations

Attachment 1**GLOSSARY OF REFERENCE AND SUPPORTING INFORMATION*****References***

DoD Instruction 5000.56, *Programming Unique Mapping, Charting and Geodesy (MC&G) Requirements for Developing Systems*

DMA Instruction 8000.2, *DOD Mapping, Charting and Geodesy (MC&G) Libraries*

NIMA List 805-1A, *NIMA List of Standard Products and Services*

DMA Instruction 8052.6, *Crisis Support Procedures*

DMA Manual 8570.1, *DMA Product Maintenance System Manual*

NIMA Instruction 8660.10, *Procedures for Request, Release, Handling and Distribution of NIMA MC&G Digital Products*

DMA Technical Report 80-003, *Geodesy for the Layman*

DoD Glossary of Mapping, Charting and Geodetic Terms, DMA Stock No. GLOSMCGTERMS

National Imagery and Mapping College Catalog and Course Descriptions

DMA Publication No. 22, *Digitizing the Future*, DMA Stock No. DDIPDIGI&STALPAC (Third Edition)

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

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

NIMA Procedural Instruction 390-101, *Identifying and Satisfying Requirements for Global Geospatial Information & Services (GGI&S) Support*

Attachment 2**WAR RESERVE STOCK (WRS) CALCULATION**

A2.1. The WRS formula below is a generic method for calculating GI&S WRS quantities. Use it only as a tool rather than an Air Force directive. The formula is generalized. It may be modified to fit the needs of a particular command, unit, weapon system or mission. Non-flying 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% of the time, its reuse factor is 0.2. Likewise, a 40% reuse rate results in a reuse 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:

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

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

A2.3. Other variables to consider:

A2.3.1. Total line items required in each series will depend on the individual system's combat radius and the geographical limits of the area of operations as determined by the supported command. Reusability factors vary by aircraft type, mission and command preference. If possible, units should consider employing methods that will increase product life expectancy (e.g., lamination when reuse rates are determined as high).

A2.3.2. 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 individual copies for aircrew members as well as others for electronic combat personnel.

A2.3.3. At a minimum, all units should deploy with materials for planning and initial operations as specified by supported command OPLANS/CONPLANS. Planning stocks should provide coverage of the entire area of responsibility and should include as a minimum 25 copies of each Jet Navigation Chart (JNC) and Operational Navigation Chart (ONC) and 50 copies of each Tactical Pilotage Chart (TPC) or digital equivalents on CD-ROM.

Attachment 3**GEODETTIC 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 98-01 (second request would be ACC 98-02, 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 98
Date Final Survey Data Required: 8 Mar 98

A3.4. Support Required: Indicate, as specifically as possible, what needs to be done (e.g., Inertial Navigation System [INS] update points, Precision Measurement Equipment Laboratory [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 F-22 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 : 57 FW/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

HQ ACC/DIOT

Attn: Capt Smith

129 ANDREWS ST, STE 304

Nellis AFB NV 89191-5000

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 and National Geodetic Vertical Datum [NGVD]); and the form of the information (e.g., Military Grid Reference System [MGRS], Universal Transverse Mercator [UTM], or geodetic coordinates).

Type of Data: INS update point and target positions

Datums: The most current WGS 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 4](#) 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 98 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**GUIDE FOR ESTABLISHING 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
Azimuth: +/- 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 the most current World Geodetic System. Azimuths are referenced to astronomic or geodetic north. Gravity surveys are related to the current International Gravity 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 (Circular Error and Linear Error) in keeping with standard NIMA practices for providing GI&S.