BY ORDER OF THE SECRETARY OF THE AIR FORCE

AIR FORCE INSTRUCTION 33-102
30 JUNE 1994



Communications

COMMAND, CONTROL, COMMUNICATIONS, COMPUTERS AND INTELLIGENCE (C4I) CAPABILITIES PLANNING PROCESS

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

NOTICE: This publication is available digitally on the SAF/AAD WWW site at: http://afpubs.hq.af.mil. If you lack access, contact your Publishing Distribution Office (PDO).

OPR: HQ AFC4A/XPPP

(Mr Robert H. Martin)

Supersedes AFR 700-2, 15 December 1987.

Certified by: HQ USAF/SC

(Lt General Carl G. O'Berry)

Pages: 11 Distribution: F

This instruction implements Air Force Policy Directive (AFPD) 33-1, *Command, Control, Communications, and Computer (C4) Systems*, and establishes the management process for Air Force command, control, communications, computers, and intelligence (C4I) capability planning efforts. It provides guidance in applying policy, standards, and resources to the processes used to develop and maintain capability planning for C4I systems. It implements Department of Defense (DoD) Directives 8000.1, *Defense Information Management (IM) Program*, October 27, 1992, and 7740.2, *Automated Information System (AIS) Strategic Planning*, July 29, 1987. Refer conflicts between this and other instructions to the Headquarters Air Force Command, Control, Communications, and Computers Agency (HQ AFC4A), Policy and Procedures Branch (HQ AFC4A/XPXP), Room 1065, 203 West Losey Street., Scott AFB IL 62225-5224, with an information copy to the Headquarters United States Air Force (HQ USAF) Deputy Chief of Staff Command, Control, Communications, and Computers (C4), Directorate of C4 Plans and Policy (HQ USAF/SCXX), 1030 Air Force Pentagon, Washington DC 20330-1030. Send comments and suggested improvements on AF Form 847, **Recommendation for Change of Publication**, through channels, to HQ AFC4A/XPP, 203 West Losey Street., Room 1065, Scott AFB IL 62225-5224.

SUMMARY OF REVISIONS

This revision replaces Air Force Regulation (AFR) 700-2, significantly changes the Air Force C4 planning process, includes intelligence systems, and aligns the instruction with AFPD 33-1.

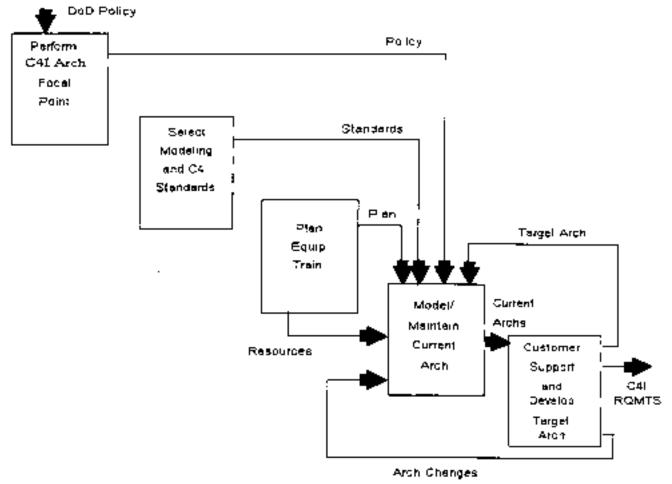
- **1. Purpose.** This instruction provides a planning process, and establishes procedures and responsibilities for developing, using, maintaining, and implementing C4I capability plans. See Air Force Instruction (AFI) 10-1401, *Operations Modernization Planning Documentation*, for operations planning.
- 2. Glossary of References, Abbreviations, Acronyms, and Terms. See Attachment 1.

3. Command, Control, Communications, Computers, and Intelligence Capabilities Planning Objective:

- 3.1. Today's command, control, communications, computers and intelligence (C4I) planners must cope with rapid advancements in technology, proliferation of C4I systems currently in the Air Force inventory, and a wide variety of future C4I options from which to choose. Major Command (MAJ-COM) or functional area C4I planners cannot manually process all of the information available to produce target architectures. The C4I capabilities planning process must be automated to enhance system designers' understanding of the functions being performed. C4I planners and system designers can then work with operational planners to ensure C4I systems are effective.
- 3.2. Air Force agencies will implement defense information management (IM) policies, procedures, and standards for modeling and establishing system requirements as described in DoD 8000 series (Information Management) directives. Implementation includes efforts to support and participate in functional process improvement. The technique to use is the Integrated Definition Language (IDEF). It produces graphical representations of processes and data from a chosen view point. Use these models to produce hardware and software solutions to support user requirements.
- 3.3. MAJCOMs and HQ AFC4A will use automated procedures and models to plan for interoperability, modularity, data base transportability, and the development of open systems to satisfy global Air Force and DoD requirements. It is crucial to plan infrastructure requirements as an integral part of the capabilities planning process. Air Force organizations will use models to determine new requirements or upgrades to systems in a way that reduces life-cycle cost, allows reuse of resources, and permits migration to open systems. Real advantages of the models include (but are not limited to) an ability to accomplish dynamic analysis on "existing" systems and an ability to perform the same dynamic analysis on well-defined proposed systems (or software modules), effectively a fly-before-you-buy capability. In addition, this computer-based approach to capabilities planning satisfies current Air Force programs such as the Air Force C4I Sufficiency Program and the Air Force Modernization Program.
- 3.4. Using a computerized architectural data base of information allows all C4I planners and system designers to quickly access and retrieve information. Through the architectural data base, all users have:
 - Various ways of looking at C4I data.
 - The ability to do "What If" scenarios.
 - The capability to eliminate duplicative or redundant C4I planning efforts.
 - An organized way of incorporating lessons learned.
 - Justified C4I requirements for input to the program objective memorandum process.
 - A methodology to standardize C4I requirements throughout the Air Force.
- **4.** Command, Control, Communications, Computers, and Intelligence Capabilities Planning Process. This process (Figure 1.) uses modeling and standardized procedures to create an architectural data base of data for all C4I personnel to plan and implement C4I systems. This architectural data base is then available for C4I personnel to identify capability shortfalls or to check impacts caused by resource or mission changes. The process results in identifying excess systems, generating justified C4I requirements (see AFIs 10-601, *Mission Needs and Operational Requirements Guidance and Procedures* (formerly AFR 57-1), and 33-103, *Requirements Development and Processing*, for requirements processing) and

simulating technical solutions. This process is iterative with greater detail available through each cycle. This management process has five functions as illustrated in **Figure 1**.

Figure 1. C4I Capabilities Planning Process.



- **4.1. Performing C4I Architecture Focal Point.** In this function, C4I planners develop, manage, and disseminate policies governing the C4I capabilities planning process. This function includes writing and maintaining the Air Force Horizon Document, AFI 33-102, and related documents. HQ USAF Deputy Chief of Staff, Command, Control, Communications, and Computers (HQ USAF/SC) manages the overall architecture development and works closely with MAJCOMs to coordinate schedules and resources through internal agreements. HQ AFC4A is the central point of contact for information and status of projects and related architectural efforts. In addition, the Agency will act as liaison with Air Force and external agencies, and brief selected audiences. HQ AFC4A and MAJCOMs also receive and include inputs from joint agencies.
- **4.2. Select Modeling and Command, Control, Communications, Computers, and Intelligence Standards.** In this function, C4I planners select standards and methods for modeling that control the C4I capabilities planning process. MAJCOM and HQ AFC4A planners use standards to produce models, evaluate technical solutions, test systems for interoperability and certification, and simulate

requirements for analysis. They also create the standard data base structures and linkages necessary to store and index data collected and produced.

- **4.3. Plan, Equip, and Train.** In this function, C4I planners identify and acquire resources to support capabilities planning. MAJCOMs develop implementation plans that direct their schedules. MAJCOMs also plan to acquire the resources for capabilities planning. Headquarters Air Education and Training Command (HQ AETC) conducts training in modeling and simulation for MAJCOMs and HQ AFC4A.
- **4.4. Model and Maintain Current Architecture.** In this function, C4I planners develop the current architecture. The MAJCOMs survey their areas of responsibility and then create functional and physical models. The MAJCOM and Air Force data administrators produce logical data models to establish standard data elements. Data administrators place data elements in architectural data bases for analysis and solution.
- **4.5. Customer Support and Develop Target Architecture.** In this function, C4I planners develop and support target architectures based on customers' particular needs. MAJCOMs use the data gathered in the previous function to highlight areas of concern for analysis and solution. MAJCOMs and HQ AFC4A answer general requests not requiring analysis by data base inquiries and perform technical analysis and simulation to create and test possible solutions. MAJCOMs use these solutions to create target architectures and process requirements for implementation of the target architectures. They also make updates to the current C4I architecture so future efforts can use the information in other target architectures.

5. Roles and Responsibilities.

5.1. HQ USAF/SC Will:

- Define the C4I capabilities planning policy and establish and define the planning process.
- Approve changes to the Air Force C4I capabilities planning process.
- Convene an architectural steering group and a colonel-level working group to identify and strategically plan C4I improvement opportunities.
- Coordinate with the Information Technology Policy Board, the United States Military Communications-Electronics Board, and other related agencies or boards to improve the Air Force capabilities planning process.
- Advocate and support C4I architectural development and maintenance.

5.2. HQ AFC4A Will:

- 5.2.1. Develop, revise, and maintain this instruction to ensure a viable capabilities planning process, and work with MAJCOMs to develop policy objectives, assign specific tasks, and track timelines and milestones governing the capabilities planning process.
- 5.2.2. Perform C4I architecture liaison functions with agencies both internal and external to the Air Force, including:
 - Gather, distribute, and brief information relevant to the C4I architecture process to groups inside and outside the Air Force.
 - Advocate C4I policies and positions to agencies outside the Air Force.
- 5.2.3. Select modeling and C4I standards for the capabilities planning process.

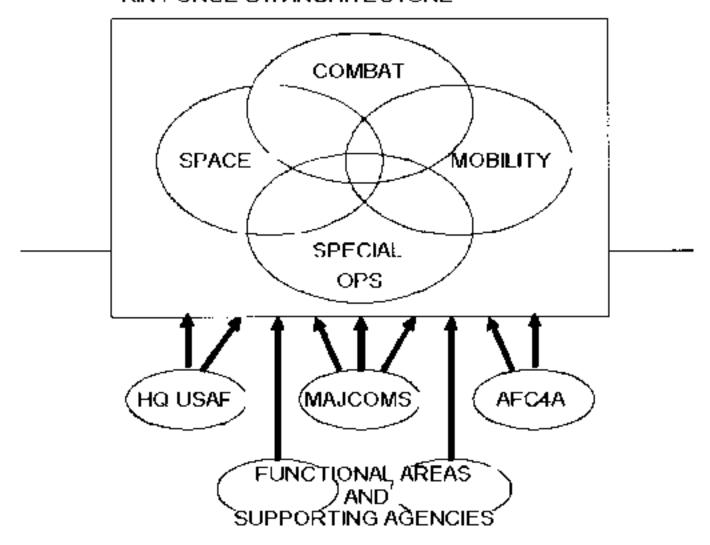
- Select standards and tools to use for modeling, interoperability testing and certification, technical solutions, simulation and analysis.
- Establish and maintain the C4I Data Dictionary and the Air Force Data Model.
- Create data base schema for storage of C4I systems information in an architectural data base.
- 5.2.4. Assist MAJCOMs in identifying and programming their resources to support the capabilities planning process. This includes helping to develop an implementation plan and identifying training requirements for modeling and simulation.
- 5.2.5. Assist the MAJCOMs in modeling and maintaining their portion of the C4I architecture.
 - Facilitate architecture development across MAJCOMs.
 - Perform Air Force data administration to identify Air Force standard data elements.
 - Update and maintain data in the C4I architectural data base to include functional and physical models, logical data models, standard data elements, and architecture changes for which HQ AFC4A is responsible.
- 5.2.6. Provide customer support and assist MAJCOMs in the development of target architectures.
 - Use the C4I architectural data base to answer customer requests for information.
 - Assist customers in highlighting or identifying problems for analysis.
 - Assist MAJCOMs in evaluating problem areas and simulating possible solutions.
 - Assist MAJCOMs in the use of analysis and simulation results to develop technical solutions, and update the C4I architecture in the architectural data base.
- 5.3. Lead commands will Develop and maintain four major force C4I architectures (**Figure 2.**) concerning: combat operations, mobility, space, and special operations.
 - 5.3.1. HQ Air Combat Command (HQ ACC) is the lead command for the C4I combat operations architecture. HQ ACC will:
 - Develop and maintain the C4I combat operations architecture, which provides C4I support for theater battle management, tactical and capabilities command and control (C2), intelligence, theater missile defense, and relationship to non-theater C2 centers.
 - Integrate MAJCOM and other DoD inputs into the combat operations architecture.
 - 5.3.2. HQ Air Mobility Command (HQ AMC) is the lead command for the mobility architecture. HQ AMC will:
 - Develop and maintain the C4I Mobility Architecture, which provides C4I support for airlift and air refueling.
 - Integrate MAJCOM and other DoD inputs into the mobility architecture.
 - 5.3.3. HQ Air Force Space Command (HQ AFSPC) is the lead command for the C4I space architecture. HQ AFSPC will:
 - Develop and maintain the space architecture, which provides C4I support for space infrastructure, existing space assets, and maintenance of space launch capabilities.
 - Integrate MAJCOM and other DoD inputs into the space architecture.

- 5.3.4. Air Force Special Operations Command (AFSOC) is the lead command for the C4I special operations architecture. AFSOC will:
 - Develop and maintain the special operations architecture, which provides C4I support for special operations.
 - Integrate MAJCOM and other DoD inputs into the special operations architecture.

Figure 2. Major Force Architecture Development.

JOINT WARFIGHTING ARENA

AIR FORCE C4I ARCHITECTURE



5.4. MAJCOMs Will:

- 5.4.1. Provide resources in support of the C4I capabilities planning process.
 - Develop an implementation plan for collecting and modeling data.
 - Create explicit listings of all resources needed to support the implementation plan.
 - Assign personnel, purchase equipment and services to perform required tasks.
 - Train personnel in modeling and simulation with the assistance of HQ AFC4A and HQ AETC.
- 5.4.2. Model and maintain their MAJCOM portion of the C4I architecture.
 - Work with HQ AFC4A to coordinate with other MAJCOM efforts.
 - Create and maintain functional models describing organizational relationships and processes.
 - From the functional models, create and maintain logical data models for use in physical modeling and data administration.
 - Create and maintain physical models of C4I hardware and software.
 - Assist HQ AFC4A in performing Air Force data administration, using logical data models.
 - Maintain the MAJCOM portion of the C4I architecture to include functional and physical models, logical data models, standard data elements, and architecture changes.
- 5.4.3. Develop target architectures.
 - Use the C4I architectural data base to answer customer requests for information.
 - Assist customers in highlighting or identifying problems for analysis.
 - Identify and prioritize C4I improvement opportunities.
 - Evaluate problem areas and simulate possible solutions.
 - Use analysis and simulation results to develop technical solutions, and update their MAJ-COM portion of the C4I architecture in the architectural data base.
- 5.5. HQ AETC will assist other MAJCOMs and HQ AFC4A personnel in modeling and simulation training.

5.6. Functional areas, field operating agencies, and supporting agencies Will:

- Provide information and resources as necessary to support the MAJCOMs.
- Bring up areas of concern to MAJCOM/SC or HQ AFC4A.
- Work with modelers to clearly define problems, and provide domain experts as leaders to functional modeling teams.

CARL G. O'BERRY, Lt General, USAF DCS/Command, Control, Communications, and Computers

Attachment 1

GLOSSARY OF REFERENCES, ABBREVIATIONS, ACRONYMS, AND TERMS

References

DoD Directive 7740.2, Automated Information System (AIS) Strategic Planning

DoD Instruction 8000.1, Defense Information Management (IM) Program

AFPD 33-1, Command, Control, Communications, and Computer (C4I) Systems

AFI 10-601, Mission Needs and Operational Requirements Guidance and Procedures (formerly AFR 57-1)

AFI 33-103, Requirements Development and Processing

Federal Acquisition Regulations (FAR)

Federal Information Processing Standards (FIPS)

Federal Information Resources Management Regulations (FIRMR)

The Federal Automated Data Processing (ADP) and Telecommunications Standards Index

DoD Directive 4630.5, Compatibility, Interoperability, and Integration of Command, Control, Communications, and Intelligence Systems

DoD Directive 5000.1, Defense Acquisition

DoD Directive C-5200.5, Communications Security (COMSEC)(U)(C3I)

DoD Directive C-5200.19, Control of Compromising Emanations (U)(C3I)

DoD Directive C-5200.28, Security Requirements for Automated Information Systems (AISs)(C3I)

DoD Directive 8120.1, Life-Cycle Management (LCM) of Automated Information Systems (AISs)

DoD Directive 8910.1, Management and Control of Information Requirements

DoD Instruction 4630.8, Procedures for Compatibility, Interoperability, and Integration of C3I Systems

DoD Instruction 5000.2, Defense Acquisition Management Policies and Procedures

DoD Instruction 8120.2, Automated Information Systems LCM Process, Review, and Milestone Approval Process

DoD Manual 4120.3, Defense Standardization and Specification Program Policies, Procedures, and Instructions (P&L),

DoD Manual 8320, DoD Data Administration

USAFINTEL 201-1(TS), *The Security, Use, and Dissemination of Sensitive Compartmented Information (SCI) (U)*

The DoD Technical Architecture Framework for Information Management (TAFIM)

CJCSI 6212.01, Compatibility, Interoperability, and Integration of Command, Control, Communications, Computers, and Intelligence Systems

AFPD 21-4, Engineering Data Service Center (EDSC)

AFPD 60-1, Standardization

AFPD 60-1, Standardization

AFI 10-601, Mission Needs and Operational Requirements Guidance and Procedures

AFI 33-101, C4 Systems Guidance and Procedures

AFI 33-104, C4 Systems Base Level Planning and Implementation

AFI 33-110, Air Force Data Management and Standards Program

AFP 700-50, Volumes 1, Air Force Communications-Computers Systems Architectures

AFP 700-50, Volume 2, Deployable Communications-Computer Systems Architecture

AFP 700-50, Volume 4, Local Information Transfer

AFP 700-50, Volume 5, Long Haul Information Transfer

AFP 700-50, Volume 6, Integrated Systems Control

AFP 700-50, Volume 7, Air Force Communications-Computer Systems Architecture Software Architecture

Abbreviations and Acronyms

AFI—Air Force Instruction

AFPD—Air Force Policy Directive

AFR—Air Force Regulation

AFSOC—Air Force Special Operations Command

ASG—Architecture Steering Group

C2—Command and Control

C4—Command, Control, Communications and Computers

C4I—Command, Control, Communications, Computers, and Intelligence

DoD—Department of Defense

HQ ACC—Headquarters Air Combat Command

HQ AETC—Headquarters Air Education and Training Command

HQ AFC4A—Headquarters Air Force Command, Control, Communications and Computer Agency

HQ AFSPC—Headquaraters Air Force Space Command

HQ AMC—Headquarters Air Mobility Command

HQ USAF—Headquarters United States Air Force

IDEF—Integrated Definition

IM—Information Management

MAJCOM—Major Command

TAFIM—Technical Architecture Framework for Information Management

Terms

Architecture—A framework or structure that portrays relationships among all the elements of the subject force, system or activity (Approved by JMTGM#002-1369-93(DoD)). A description of all functional activities to be performed to achieve the desired mission, the system elements needed to perform the functions, and the designation of performance levels of those systems. An architecture also includes information on the technologies, interfaces, and location of functions and is considered an evolving description of an approach to achieving a desired mission.

Architectural Data base—The actual data base that will store the data collected and produced by the architecture development process. It contains knowledge about the Air Force C4I enterprise, its goals, entities, records, organizational units, functions, processes, procedures, and application and information engineering. An architectural data base contains functional and physical models, logical data models, standard data elements and architecture change information used to construct Air Force C4I Architectures.

Command, Control, Communications, and Computer system—Integrated system of doctrine, procedures, organizational structure, personnel, equipment, facilities, and communications designed to support a commander's exercise of command and control, through all phases of the operational continuum. Also called C4 systems (Approved by JMTG#020-1357-93 (DoD)).

C4I Systems—Communications, automated information, or intelligence systems or equipment that assist the commander in planning, directing, and controlling forces. C4I systems consist of hardware, software, personnel, facilities, and procedures and represent the integration of information (including data), information processing, and information transfer systems organized to collect, produce, store, display, and disseminate information (Source: CJCSI 6212.01, 30 Jul 1993).

Functional Model—A structured representation of the activities and functions performed by an organization and the information exchanged between them. This is a portion of the architecture.

Implementation Plan—Detailed and specific MAJCOM plan to collect and model data, perform analysis and simulation and provide recommendations.

Logical Data Model—A model of data, derived from the functional model, used to develop data bases and software solutions.

Operational Architecture—An operational architecture is the mapping of a functional model onto a physical model for a given scenario. It shows the allocation of resources to functions and the order in which functions are performed.

Physical Model—Model showing C4I equipment and software that supports the MAJCOM in graphical and technical detail including configurations and locations. This is a portion of the architecture.

Target Architectures—Comprised of the C4I Architecture which is modified by policy, standards, and analysis results.