
Appendix B

ADP Support for Planning and Execution

1. INTRODUCTION. Command and control is the most important function of joint force commanders and their staffs. C2 is where planning and execution thought processes outlined in the Joint Operation Planning and Execution System (JOPES) and automated data processing (ADP) capabilities resident in both the Global Command and Control System (GCCS) and the Global Combat Support System (GCSS) all come together to support joint force commanders. The following definitions of JOPES, GCCS and GCSS are useful:

a. The Joint Operation Planning and Execution System. JOPES is the integrated joint conventional and nuclear command and control system used to support military operation planning, execution, and monitoring (including theater-level nuclear and chemical defense) activities. JOPES incorporates policies, procedures, personnel, and facilities by interfacing with ADP systems, reporting systems, and underlying GCCS ADP support to give senior-level decision makers and their staffs enhanced capability to plan and conduct operations.

b. The Global Command and Control System. GCCS, which continues to evolve, will be the single, global Command, Control, Communications, Computer and Intelligence (C4I) system supporting the warfighter, whether from a foxhole or from a commander-in-chief's (CINC's) command post. A major part of the GCCS application environment is JOPES, which was developed from legacy and prototype subsystems to run on the GCCS hardware. Commanders use JOPES-related tools on GCCS to determine the best course of action (COA) to accomplish assigned tasks and direct the actions to accomplish the mission.

c. The Global Combat Support System. GCSS provides integration and interoperability between combat support functions and command and control to support the operational needs of the warfighter. It directly supports C4I for the Warfighter and CJCS Joint Vision 2020. Using the Defense Information Infrastructure (DII) and/or common operating environment (COE) as well as the shared data environment, it ensures rapid integration of combat support applications, furnishing a seamless flow of operational and sustaining base information to the Warfighter.

2. JOPES – GCCS – GCSS INTEGRATION. This set of applications can be used independently while interacting on shared networks with shared databases. These programs support deliberate planning and crisis action planning as described in JOPES. The JOPES deliberate planning process would be unacceptably slow, unresponsive, and inflexible without the support of JOPES-related automated data processing (ADP). In the deliberate planning process, planners develop, analyze, refine, review, and maintain joint operation plans and prepare supporting plans using JOPES ADP. JOPES-related ADP is also used in crisis action planning to tailor and refine existing operation plans to produce executable OPORDs, or rapidly develop new courses of action (COAs) and work them into executable OPORDs. In deliberate planning, JOPES ADP helps primarily in the plan development phase to build and flow the force list, calculate and flow nonunit cargo and personnel required to sustain the force, complete specialized planning such as civil engineering and medical support, and test for gross transportation feasibility. The product of this process is the Time-Phased Force Deployment Database (TPFDD). The TPFDD is a transportation-feasible database containing all the forces, materiel, and personnel required to execute and support the CINC's concept of operations. The TPFDD can be thought of as an expression of the CINC's concept of operations through the scheduled deployment of the forces and sustainment required to execute it. Throughout the planning process, planners have access to several applications programs designed to initialize the TPFDD (create the database), add forces, schedule support, and enter transportation planning data. Once the TPFDD is built, JOPES-related ADP helps the planners refine it before and during the refinement conferences. In addition to JOPES-related ADP supports plan review, development of supporting plans, and TPFDD maintenance required to keep the database current.

3. THE ENDURING PROCESSES OF JOPES. From the discussion above can be seen enduring planning processes common to both deliberate planning and crisis action planning that have been used by U.S. planners since at least the Mexican-American War.

a. The first of these is the receipt of a strategic or operational mission/task. During the deliberate planning process of JOPES, the strategic task comes from the *Joint Strategic Capabilities Plan*; during crisis action, the task may come as early as a *Warning Order* or as late as an *Execute Order*. Communications capabilities inherent in the C4I system assist in moving information and operational missions and tasks.

b. The second enduring process is to establish situational awareness. Where or what is the enemy and what is it doing? And, where are our own friendly forces and what is their readiness to respond? Intelligence, meteorological, and readiness applications assist in gaining and maintaining situational awareness.

c. Next in the list of enduring processes is the development of a concept of operations. Given situational awareness, how can the friendly forces be used against the enemy to accomplish the mission? The JOPES procedures use the "estimate" process to de-

velop and compare COAs. The selected COA is then developed in a five-paragraph mission type order and issued for further planning. Video-teleconferencing capabilities of the C4I system assist in COA development, analysis and decisionmaking.

d. Once the concept of operations has been determined, forces must be arrayed for deployment and further developed into a concept of deployment. American planners have been doing this at least since the Civil War. Major combat formations are selected, routed and timed for deployment. Within the deliberate planning process, there is a formal “force planning” step; in crisis action planning, deployment planning begins as soon as possible. Since the early 1990’s, major efforts have resulted in at least five force planning applications to be used to create TPFDDs.

e. Once major forces have been arrayed for deployment, support planners may develop a concept of support. They make a best guess about how much “stuff” in the form of supplies, food, ammunition, fuel, etc., it will take to support the concept of operations. Since logistics is a “Service” responsibility in our Armed Forces, it is the Service components using Service planning tools that give the best estimate of support.

f. The concepts of operations, deployment and support finally allow planners to develop an concept of transportation. Answers are sought and found to the following questions: What are the best airfields and ports to use? Is there enough airlift and sealift capacity? Can we close the force and accomplish reception, staging, and onward movement and integration?

g. Following these processes, the decision-makers finally come to the point of execution of the operation. During crisis action, the NCA would make the decision to execute; during deliberate planning, the CINC would exercise or wargame his concept of operations to test his ability to achieve his task. Execution, exercising, and wargaming are enduring processes directly supported by C4I systems.

h. Finally, after planning and executing an operation, the joint commander reports up and down the chain of command. During the operation, Situation Reports (SITREPS) are sent to help maintain situational awareness. After execution of an operation, after action reporting, universal lessons learned, and unit histories give planners a means to avoid continuing the failures of the past.

4. ADP PLANNING AND EXECUTION SUPPORT SYSTEMS. GCCS/GCSS directly support the JOPES enduring planning processes described above and as shown below in figure B-1.

Enduring Process	GCCS/JOPES Application
Mission/tasking	E-mail, Newsgroups, Homepages, Netmeeting, Internet Relay Chatter
Situational Awareness	Common Operational Picture(COP), Global Reconnaissance Information System (GRIS), Global Status of Resources and Training (GSORTS), METOC, Joint Deployable Intelligence Support System (JDISS)
Concept Development	Theater Analysis and Graphical Execution Toolkit (TARGET), Common Operational Planning and Simulation Strategy (COMPASS), Adaptive Course of Action Toolkit (ACOA), Traditional Video Teleconferencing capability for collaborative planning
Force Planning	JOPES Editing Tool (JET), TPFDD Editor in JFAST, Joint Force Requirements Generator II (JFRG-II)
Support Planning	Logistics Sustainability and Feasibility Estimator (LOGSAFE), Sustainment Generator in JFAST, Joint Engineer Planning and Execution System (JEPES)Medical Analysis Tool (MAT)
Transportation Planning	Joint Flow and Analysis System for Transportation (JFAST) Scheduling and Movement (S&M)
Execution	Force Validation Tool (FVT), Common Operational Picture (COP)
Reporting	E-mail, Newsgroups, Homepages, Netmeeting, Internet Relay Chatter

Figure B-1

5. COMMUNICATIONS CAPABILITIES. GCCS/GCSS and JOPES-related information is on a classified network of networks called the SIPRNET (Secret Internet Protocol Router Network). GCCS uses commercial web-browsers, e-mail capability, Internet relay chatter, netmeetings, homepages and newsgroups for communications. These give the most powerful abilities for communications that the U.S. Armed Forces have had for more than fifty years – as long as users remember it is a command and control system and do not use it for normal day-to-day work. – and; as long as users remember that “need to know” still applies. The communications capabilities of GCCS support tasking, planning, execution, monitoring, and reporting information requirements of JOPES.

6. SITUATIONAL AWARENESS TOOLS

a. The Common Operational Picture (COP). COP is the basic situational awareness tool designed to give commanders and staffs a friendly, enemy, and neutral picture of their battlespace. It fuses near-real-time tracks of air, land, sea, and subsurface force movements. The picture includes reconnaissance information from the Global Reconnaissance Information System (GRIS), weather data from METOC, and will eventually contain combat support information related to total asset visibility from the Global Combat Support System (GCSS), as well as JOPES scheduling and movement data.

b. Joint Deployable Intelligence Support System (JDISS). Although JDISS normally operates on the SCI-level Joint Worldwide Intelligence Support System (JWICS), there is a collateral level feed of intelligence information available on GCCS to ensure situational awareness through Intelink.

c. Global Status of Resources and Training System (GSORTS). GSORTS provides information about the status and location of registered units of U.S. military forces and selected other foreign or domestic agencies or organizations. GSORTS allows joint commanders to maintain friendly forces awareness.

7. CONCEPT DEVELOPMENT TOOLS. The most important collaborative planning capability of GCCS to date is its video teleconferencing capability. However, the following tools have been fielded to support COA development:

a. Theater Analysis Replanning Graphic Execution Toolkit (TARGET). TARGET was developed as a collaborative planning tool and included a Course of Action Selection Tool (COAST) module. It can be viewed as the Commander's Estimate on line.

b. Common Operational Planning and Simulation Strategy (COMPASS). COMPASS is an Army legacy system that was adopted for joint use in 1999.

c. Adaptive Course of Action Toolkit (ACOA). ACOA is a USCINCPAC initiative still under development but leading the way toward future Web-based collaboration in crisis planning and execution.

8. FORCE PLANNING TOOLS. The JOPES ADP programs use the following terms to represent the CINC's concept of operations in the TPFDD. At least five force planning tools were developed in the 1990's to assist planners and operators in developing a concept of deployment, and aid force planning.

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a. TP-Edit function of DART. The TPFDD-Editor (TP-Edit) function of the Dynamic Analysis Replanning Tool (DART) is a graphic TPFDD editor in which deployment force requirements are shown across a visual time-line along which deployment flow could be adjusted by sliding location information (origins, ports of embarkation and debarkation, and destinations). It is still in use at some CINCDOMs.

b. Requirements Development and Analysis System (RDA). The JOPES force planning application that was introduced with GCCS was the Requirements Development and Analysis (RDA) system. It was first developed for force planning as DART and has been integrated into GCCS. RDA assists the planner in creating a force requirements file, analyzing the data, and changing the data.

c. JOPES Editing Tool (JET). JET, the current force planning tool resident in GCCS. It allows planners to create, analyze, and edit Time-Phased Force and Deployment Data (TPFDD). JET is easier to use than and replaces the Requirements Development and Analysis (RDA) program. TPFDD changes made in JET are networked to all copies of a TPFDD on GCCS.

d. TPFDD Editor of JFAST. The Joint Flow Analysis System for Transportation (JFAST) contains a TPFDD Editor that can be used to create generic (notional) deployment data during crisis action for COA deployment estimates. It can also be used to manipulate deployment data separate from GCCS either by individual requirement or by force module; JFAST TPFDD changes are not networked, but the planner can then cut a new TPFDD or individual transaction records to be loaded on GCCS. The TPFDD Editor in JFAST is evolving into a very powerful and user friendly force planning tool.

e. Joint Force Requirements Generator II (JFRG-II). Based on the Marine Corps MAGTF-II service feeder system to JOPES, JFRG-II promises to be the unit level feeder system to JOPES; it allows units to tailor their deployment information, then feed the actual movement requirements up the chain of command via the Global Transportation Network to JOPES on GCCS.

9. SUPPORT PLANNING TOOLS. This group of applications includes models used to plan personnel, logistics, and other support required to maintain an operation.

a. Logistics Sustainability Analysis and Feasibility Estimator (LOGSAFE). LOGSAFE is the baseline GCCS ADP tool introduced for use in support planning. LOGSAFE allows the planner to estimate logistics sustainment requirements of a proposed OPLAN for deliberate or crisis planning, and evaluate overall logistics feasibility of OPLANs and COAs, and furnishes sustainment data to transportation feasibility analysis tools. It also generates Cargo Increment Number (CIN) records for the TPFDD. This application program calculates the gross non-unit-related equipment and supplies required

to support the OPLAN. These calculations determine the nonunit movement requirements by using numbers of personnel, number and types of UTCs, Service planning factors, and planning guidance from the CINC's Strategic Concept and TPFDD LOI. These gross determinations for supplies are translated into weights and volumes and are added to the TPFDD as movement requirements.

b. Sustainment Generator in JFAST. The Sustainment Generator in JFAST allows a quick estimate of support when running deployment estimates in crisis action. Its major weakness is it does a per-person/per-day estimate rather than a unit consumption estimate of support.

c. Joint Engineer Planning and Execution System (JEPES). JEPES assists the planner in developing the Civil Engineering Support Plan (CESP) appendix to an OPLAN. JEPES allows the planner to add, delete, modify, and analyze data in the JEPES database. JEPES data can be imported into the Logistics Sustainability Analysis and Feasibility Estimator (LOGSAFE) as part of the nonunit records of an OPLAN.

d. Medical Analysis Tool (MAT). MAT is a baseline GCCS application that supports both deliberate and crisis planning. The process considers the population at risk, length of stay in hospital facilities, and Service-developed frequency data for injury and death. The result is a planning tool to determine patient load, requirements for patient evacuations, and both Service and component medical planning requirements.

10. TRANSPORTATION PLANNING. This group includes applications used to analyze transportation feasibility and schedule movement requirements given movement assets.

a. Joint Flow and Analysis System for Transportation (JFAST). JFAST helps planners determine the transportation feasibility of an OPLAN or COA, makes closure estimates, helps planners determine optimum transportation modes, assesses attrition effects, identifies shortfalls, and determines gross lift capability. (Note: JFAST is used for JOPES but is part of GTN)

b. Global Transportation Network (GTN). Although unclassified, data on the GTN is used to feed JOPES on GCCS. Transportation movement information moves from the data base through the Transportation Coordinators Automated Information Management System (TC-AIMS-II) to the GTN; then to GCSS with an aim of giving a combat support element information feed to the Common Operational Picture (COP). GTN also helps in the effort to provide total asset visibility, an aim of Joint Vision 2020.

11. EXECUTION PLANNING TOOLS

a. Force Validation Tool (FVT). FVT allows planners at all levels to validate the accuracy of unit deployment requirements contained in crisis action plan TPFDDs before to releasing the data to USTRANSCOM for lift allocation.

b. Scheduling and Movement (S&M). S&M allows planners to review, update, schedule, and create manifests of both Transportation Component Command (TCC) carriers and commercial U.S. carriers before and during deployment. It offers the capability to review and analyze an extensive variety of validated source requirements and scheduling and movement data.

12. REPORTING. This group of applications produces a variety of predefined or user-defined reports and displays.

a. Rapid Query Tool (RQT). RQT offers an efficient means to develop and save tailored queries to extract data from the JOPES core database.

b. JOPES System Information Trace (JSIT). JSIT furnishes a shortcut method for reviewing information in an OPLAN without having to launch any specific applications. It is a “read only” function.

13. JOPES FILES. The JOPES application programs accessed by the planner while building the TPFDD draw information from numerous data files. Standard reference files, several of which are listed in **Figures B-2 and B-3**, contain basic, relatively imperishable data required to build any TPFDD. Planning and execution files and support files also furnish data for manipulation by JOPES application programs. The user generates many of these through JOPES application programs. Most standard reference files are plan-independent; that is, the data they contain are not plan-specific, but are valid for generating any plan. TUCHA, GEOFILE, and CHSTR are examples of plan-independent files. Plan-unique files contain data valid only for a specific plan. Most plan-unique files are created by JOPES applications while building the TPFDD, and information is drawn from them by various JOPES applications to generate plan-specific TPFDD data. **Figure B-4** lists several examples of plan-unique files. The TPFDD itself is a plan-unique file.

JOPES ADP STANDARD REFERENCE FILES

APORTS	<i>Aerial Ports and Air Operating Bases File</i>	Airfield planning factors, e.g., throughput capacities for free-world air facilities, runway length & width, weight-bearing capacity, A/C parking space, fuel & cargo storage capacity, etc.
ASSETS	<i>Transportation Assets</i>	Time-phased availability of common-carrier air- & sealift Types and source of military and commercial transportation assets Created from data in JSCP
CHSTR	<i>Characteristics of Transportation Resources</i>	Standard planning factors for airlift available for deployment planning, e.g., utilization rate, passenger & cargo capacity, speed, range, load/off-load times, etc. Standard planning factors for sealift available for deployment planning, e.g., ship category capacity, average speed, load/off-load times, etc.
PORTS	<i>Port Characteristics</i>	Information on physical and operating characteristics of selected free-world ports, e.g., size, depth, number of berths, beach data, categories & capacities of cargo-handling & storage facilities
SDF	<i>Standard Distance File</i>	Distance between POE-POD pairs listing mode of transport, POE-POD, GEOLOC code, Suez/Panama Canal status, OPLAN identification, number of stops, computed distance
TUCHA	<i>Type Unit Data</i>	Movement characteristics for standard deployable units Force descriptions for nondeployable unit types
TUDET	<i>Type Unit Equipment Detail</i>	Descriptions & dimensions of <ul style="list-style-type: none"> • specific pieces of wheel/track equipment for TUCHA file type units • all hazardous cargo • non-self-deployable aircraft • floating craft • items measuring more than 35'
LFF	<i>Logistics Factors File</i>	Standard logistics planning factors to compute resupply, determine ESI, and identify shortfalls
CEF	<i>Civil Engineering Files</i>	Description of deployable facility sets Operational capability of Service construction units Description of Service facility component systems
FM LIBRARY	<i>Force Module Library</i>	Collection of Service/joint force modules for C, CS, CSS forces plus 30 day's sustainment

Figure B-2

STANDARD REFERENCE FILES

GEOFILE	<i>Standard Geographic Locations</i>	Automated repository of the DOD for the registration of military locations, and worldwide geographic locations subject to reference during military planning and operations. Examples: <ul style="list-style-type: none"> • Worldwide geographic locations and sites listed by country & states, installation types, and CINC AORs
GSORTS	<i>Status of Resources and Training System</i>	Report of unit readiness in terms of <ul style="list-style-type: none"> • authorized/actual personnel strength • percent of assigned equipment ready for operations

Figure B-3

PLAN-UNIQUE FILES

TPFDD	<i>Time-Phased Force and Deployment Data File</i>	Description, routing, and aggregated cargo movement characteristics of forces defined for a specific OPLAN as well as the nonunit sustainment, i.e., supplies and cargo
SRF	<i>Summary Reference File</i>	Major repository for summarized or detailed information about specific records in the TPFDD file or other general information relating to the specific OPLAN, i.e., movement tables, cargo details for tailored and nonstandard units, etc.
PFF	<i>Planning Factors File</i>	Planning factors and parameters used in all phases of support planning, i.e., theater factors, lbs. of rations per person per day, etc.
PWF	<i>Personnel Working File</i>	Used in the support planning to designate origins and APOEs for replacement personnel as well as percentages to be routed from each ORIGIN or POE
FREF	<i>Force Record Extract File</i>	File created for LOGSAFE processing that contains cargo re-supply factors, i.e., attrition factors for equipment, based on threat level
POSF	<i>Ports of Support File</i>	Reference file to determine ports of support for the non-unit-related records
UCFF	<i>UTC Consumption Factors File</i>	Resupply consumption factors by UTC that are extracted from Logistics Factors File or introduced by the user, i.e., air defense ordnance used per day, etc.
MWF	<i>Medical Working File</i>	Population at risk records from OPLAN force list and planning factors entered by the medical planner, e.g., admission rates, evacuation policies, combat intensity, etc. (used in MEPES)

References: Applicable users' manuals

Figure B-4

14. APPLICATION OF ADP PLANNING TOOLS

a. Unit movement characteristics.

(1) Information on movement characteristics of a type (notional) unit is contained in the Type Unit Data File (TUCHA). The acronym "TUCHA" comes from the previous name of the file, Type Unit Characteristics File. The TUCHA describes the capabilities of each type unit in narrative form and defines the unit in terms of total personnel; numbers requiring transportation; categories of cargo in the unit; weight of equipment and accompanying supplies; volume of equipment categorized as bulk, outsize, oversize, or non-air-transportable; and numbers and dimensions of individual units of equipment. The Services maintain the file and update it quarterly.

(2) Data in the TUCHA are accessed by using unit type codes (UTCs). These are five-element alphanumeric codes that identify units by common functional characteristics. Service planning documents and automated files list by type all units and show the number of each type available for planning.

(3) The unit identified by UTC in the TUCHA is a "notional" (generic), unit. As such, it is a representative unit with the approximate physical and movement characteristics of all the actual (real-world) units it represents. It is, for example, *an* infantry

battalion as opposed to, say, *the* 2d Battalion, 11th Infantry; or *a* CVN as opposed to, say, *the* USS *Nimitz*; or *an* F-15 fighter squadron as opposed to, say, *the* 94th Fighter Squadron.

b. Timing of movements. Before development of each force requirement is finished, the key dates for required movement must be determined and entered for each force record. Beginning with the CINC's RDD or CRD, the supported commander and subordinate planners calculate the EAD-LAD window at the POD or POS in addition to the EADs and LADs at intermediate locations. Services, supporting commander, and defense agency planners develop the RLDs and ALDs at the ORIGINS and POEs. Determination of these dates is not automated – the responsible planner must enter them.

c. Unique force record descriptions

(1) After the force list has been finished and assembled, each separate force record, or line entry, in it is assigned a plan-unique alphanumeric code called a force requirement number (FRN). When an FRN has been assigned to a unit in a plan, it generally is not changed in the course of the plan. The FRN is useful because it allows the planner to track a unit that may change sequence position in the TPFDD as the TPFDD is worked and refined. FRNs are two, three, four, or five alphanumeric characters that identify a single force requirement.

(2) Two additional characters, called fragmentation and insert codes, may be added to the FRN in positions 6 and 7. These two additional characters identify a force entry that requires more than one iteration of the FRN to satisfy the force requirement, such as three individual brigades to satisfy the requirement for a division, etc. The resulting identifier becomes the unit line number (ULN).

(3) JOPES and the JSCP both require that force planning be done using force modules. Generally, force modules are groupings of combat, combat service, and combat service support forces, with or without appropriate non-unit-related personnel and supplies. The elements of force modules are linked together or uniquely identified so that they can be tracked, extracted, or adjusted as an entity in the planning and execution databases. Force modules offer an efficient way to do force planning and build forces rapidly in the TPFDD. Each individual ULN is identified as being associated with one or more force modules. Each force module in a plan is identified by a three-character alphanumeric identifier called a force module identifier (FMI).

(4) To differentiate between CINC OPLAN TPFDD files and force modules in the JOPES database, the first characters of ULNs and FMIDs are assigned in JOPES Volume II. Whenever possible, the force module identifiers for a given TPFDD should be identical to the parent ULN for major combat forces.

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d. The preceding descriptors are needed to explain force movements either in narrative form or computer jargon. The JOPES ADP programs use these terms to describe the CINC's concept of operations in the TPFDD. Three basic application programs assist the planner in the force build step.

e. The application program in JOPES/GCCS that deals specifically with force planning is the JOPES Editing Tool (JET). JET assists the planner in creating a force requirements file, analyzing the data, and changing the data. These data will be used later to determine the gross feasibility of transportation. ADP support is introduced here because it includes the manual procedures and a rational process for assembling the force list.

(1) JET, TPFDD Editor in JFAST, and JFRG-II allow planners to create, analyze and edit Time-Phased Force and Deployment Data (TPFDD). JET supports force deployment planning during execution, and logistics planners and operators in deliberate and crisis action planning. These tools offer the capability to create and modify force and nonunit requirements associated with OPLANS. These applications allow manipulation of TPFDD data and create graphical displays to ease and compare transportation capabilities. They allow planners to analyze the force records; select, delete, or modify type units or force modules; modify the information that defines movements; modify narrative descriptions; split the movement of a force records into air and sea shipment; assign movement parameters to individual units or groups of force records; reorder the list of movements, using planner-selected descriptions; selectively create summaries of transportation requirements; identify for analysis a categorized listing of support forces; lay the groundwork to analyze the gross transportation feasibility of the force records; audit the file for format and content; and perform various administrative functions.

(2) Files. JET draws information from the following databases: TUCHA; descriptions and characteristics of major equipment or cargo categories listed in the major equipment file (MEF); standard worldwide geographic locations (GEOFILE); characteristics of transportation resources (CHSTR); the permanent databases used for reference, including standard distance files (SDF) and characteristics of airports (APORTS) and seaports (PORTS); transportation assets (ASSETS); and dimensions of equipment found in the type unit equipment detail file (TUDET). The planner creates the TPFDD and Summary Reference File (SRF) described in detail the CINC's concept of operations. The planner may also call for standard or ad hoc printed formats for use in analysis and to satisfy administrative requirements of the OPLAN.

f. Component planners use JOPES ADP force-building applications to compile a total component force list. Given the mission, the planner reviews the type combat forces apportioned in the task-assigning document and called for in the CINC's concept of operations, and determines applicable CS and CSS units from Service planning documents. The plan is built by selecting individual units by UTC or by selecting entire force modules; however, all force requirements are included in force modules.

(1) The merged collection of the components' force lists becomes the CINC's consolidated force list. The database is called the OPLAN Time-Phased Force and Deployment Data file (TPFDD); various working papers can be printed that selectively display elements from the data file.

(2) The summary reference file (SRF) is created in the database along with the TPFDD. It includes administrative information on the plan identification number, date of the concept of operations, and number of records; force and nonunit record summaries describing numbers of unit and force records, fragmented forces, and aggregated cargo shipments; movement data for nonstandard units not included in the TUCHA; and descriptions of the planning factors and simulated environments used in the ADP support process.

(3) The components can use actual (real-world) forces, if they are known, to build their force lists. This obviously solves many problems early in planning by permitting actual data to be used in place of representative sizes, locations, etc. Some Services list actual units in Service planning documents; others, like the Navy, are unable to identify specific units very far in advance because of their mobility. Eventually, the type (notional) units will have to be replaced with more accurate information before the completion of plan development. In the case of the Navy, the geographic locations of both combat and support forces change drastically month to month, and most units are self-deploying. Type units are used for most Navy force requirements throughout the deliberate planning process.

(4) Supported commander's role. The supported commander participates fully in developing the component force lists. The subordinate commander submits the time-phased force list to the CINC for review and approval. By submitting the component force list, the supporting commander indicates full understanding of the concept of operations and confidence that the forces in the force list will support the concept. The CINC's staff merges the component force lists and evaluates the resulting consolidated force list. This consolidated list is analyzed to confirm it is adequate to perform the mission. When the supported commander concurs with the consolidated force list, the components then add any missing information needed to deploy the forces from origin to destination, such as mode and source of transportation, POD, EAD-LAD, priority of off-load at POD, DEST, and RDD.

15. SUPPORT PLANNING. LOGSAFE and other support planning estimators allow planners to use data from a reference file to create an OPLAN-dependent ports of support file (POSF) categorized by Service, supply destination, air and sea transport, and munitions and POL; use data from a JOPES ADP reference file to create Planning Factor Files (PFFs) and UTC Consumption Factor Files (UCFFs) based on Service-developed logistics factors; and calculate the nonunit movement requirements. The planner can also selectively aggregate the data to reduce the number of nonunit cargo records using the

EAD-LAD window at each POS; phase the movement requirement for sustainment cargos to support the concept of operations; and efficiently use available lift, port, and materiel handling or transport facilities.

a. Planning parameters for the calculations are chosen from two sources: this involves the use of resupply consumption factors for unit type codes (UTCs) and the PFF includes a wide variety of planning factors that are used throughout the LOGSAFE process. Daily consumption rates for 43 subclasses of supply are computed by either pounds or gallons per UTC, or pounds or gallons per person per day. Fuel, ammunition, repair parts, and major end items are equipment-related supplies and are computed as a function of numbers of force records, for example, number of UTCs that describe 155mm artillery batteries. Other items of supply, such as food, clothing, and medical supplies, are better suited for planning factors listed in units of pounds per person per day. The Logistics Factors File (LFF), a JOPEs standard reference file, is the foundation for the UCFE and PFF. The LFF uses Service-developed consumption rates for UTCs, and origins for resupply. The LFF initializes the PFF, which the user can then update and modify with factors to describe more accurately the situation in the theater.

b. The planner has great flexibility in using planning factors in LOGSAFE. The planner can modify the following parameters:

- Size of the EAD-LAD window
- Beginning day of strategic resupply by sea
- Period of time for resupply by air of specified supply subclasses
- Up to ten origins for each supply class
- Buildup increments by supply class
- Rate of consumption by supply subclass modified by theater multiplier
- Average travel time from POD to DEST in each of up to 26 objective area countries
- Safety level of supplies in number of days to be maintained in-country
- Conversion of up to 35 subclasses of supply from weight to volume
- Identification of fuel types with up to 15 types for each fuel resupply category
- Percentage of attrition of supplies to combat loss for four periods
- 20 subclasses of supply specification of five combat intensity levels over four time periods.

16. TRANSPORTATION PLANNING. The purpose of the three steps of transportation planning is to determine the gross strategic transportation feasibility of the CINC's

OPLAN. The CINC compares each subordinate commander's transportation requirements and the total apportioned strategic transportation capabilities. A GTN application program called the Joint Flow Analysis System for Transportation (**JFAST**) simulates strategic movement.

a. Planners at the supported command run a computer simulation of air, land, and sea movements of the forces and their support requirements from ORIGIN to POE to POD. JFAST uses the transportation assets identified in the JSCP for the OPLAN to "move" the forces and supplies. JFAST incorporates all the factors that influence the movement of force and nonunit requirements and calculates computer-simulated feasible dates to arrive and be unloaded at the POD. The feasibility of the OPLAN is determined when the modeled dates are compared with the CINC's latest arrival dates (LADs). The simulated deployment movement of a requirement that results in an arrival on or before the LAD is considered by the CINC to be grossly transportation feasible.

b. JFAST is especially useful to planners not just because of its speed of analysis, but because it displays the results of that analysis graphically. This greatly enhances the planner's ability to assess the feasibility of the plan and identify transportation shortfalls. The user can modify lift allocation and port throughput capability within JFAST to aid in shortfall resolution. If resolution requires altering the phasing of resources, the TPFDD must be modified outside of JFAST and then brought back into JFAST for further transportation analysis.

17. PLANNING AND EXECUTION ADP SUPPORT SUMMARY. No matter what the command and control system is called, or whether there is a JOPES, there will always be enduring processes, things that must be done to command and control forces the ability to receive missions and tasks; gain and maintain enemy and friendly situational awareness; develop a concept of operations using the estimate process; then accomplish force, support, and transportation planning – and finally execution. This is joint force command and control, which must be supported by ADP systems. The actual applications will change and improve, but the process will remain.