STP 11-25Z4-SM-TG

HEADQUARTERS
DEPARTMENT OF THE ARMY

Soldier's Manual
and Trainer's Guide
MOS
25Z

VISUAL INFORMATION
CHIEF

SKILL LEVEL 4

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SOLDIER'S MANUAL AND TRAINER'S GUIDE

MOS 25Z

VISUAL INFORMATION CHIEF

Skill Level 4

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PREFACE

 This publication is for skill level (SL) 4 soldiers holding military occupational specialty (MOS) 25Z and their trainers and first-line supervisors. It contains standardized training objectives, as task summaries, and a MOS Training Plan (MTP) to assist the supervisors in training and evaluating soldiers on critical tasks that support unit missions. When applicable, a chapter is devoted to listing duty position specific tasks or those tasks and skills that are not common to all soldiers in MOS 25Z SL4.

Soldiers holding the MOS 25Z SL4 should have access to this publication through their assigned work areas, unit learning centers, unit libraries, and the General Dennis J. Reimer Training and Doctrine Digital Library website (www.adtdl.army.mil).

Users of this publication are encouraged to report errors, recommend changes, and submit comments for its improvement. Comments should be keyed to the specific page, paragraph, and line of the text in which the change is recommended. Reasons will be provided for each comment to ensure understanding and complete evaluation. Comments should be made on DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forwarded directly to Commander, US Army Signal Center and Fort Gordon, ATTN: ATZH-DTM-I, Fort Gordon, Georgia 30905-5074.

Unless this publication states otherwise, masculine nouns and pronouns do not refer exclusively to men.

CHAPTER 1

Introduction

1-1. GENERAL

a. This manual identifies the individual MOS training requirement for soldiers in MOS 25Z. This soldier's manual (SM)/trainer's guide (TG) is designed to support the Army Individual Training Evaluation Program (ITEP). The ITEP was established to formalize the role of the individual evaluation in units throughout the Army. The ITEP is described in detail in AR 350-41.

b. The two primary methods used to evaluate soldier proficiency are commander's evaluations and the common task test (CTT).

(1) Commander's evaluations are local tests or assessments of soldier's performance of MOS specific and common tasks critical to the unit's mission. They may be conducted year-round.

(2) The CTT is a hands-on test used to evaluate proficiency on common tasks. Alternate written tests are provided if equipment is not available for hands-on testing.

c. This manual is the soldier's primary reference to prepare for the commander's evaluation of MOS specific tasks and for the self-development and training of every 25Z soldier. It contains task summaries for all the critical tasks specific to the soldier's MOS and SL. Commanders and trainers will use this manual to plan and conduct training and commander's evaluations.

1-2. TASK SUMMARIES

a. Task summaries outline the wartime performance of each critical task in the SM. They provide the soldier proficiency on training. As a minimum, task summaries include information you must know and the skills that you must perform to standards for each task. The format for the task summaries included in this SM is as follows:

(1) **Task Title**. The task title identifies the action to be performed.

(2) **Task Number**. A 10-digit number identifies each task or skill. Include this task number, along with the task title, in any correspondence relating to the task. To determine which tasks are testable at each skill level, refer to Chapter 2, Part 2, Critical Tasks. The first numbers of the last four of each task DO NOT indicate the skill levels testable for that particular task.

(3) **Conditions**. The task conditions identify all the equipment, tools, references, job aids, and supporting personnel that the soldier needs to perform the task in wartime. This section identifies any environmental conditions that can alter task performance, such as visibility, temperature, and wind. This section also identifies any specific cues or events (a chemical attack or identification of a threat vehicle) that trigger task performance.

(4) **Standards**. The task standards describe how well and to what level you must perform a task under wartime conditions. Standards are typically described in terms of accuracy, completeness, and speed.

(5) **Training and Evaluation**. This section may contain the training information outline (performance steps in Automated Systems Approach to Training (ASAT)), evaluation preparation, and evaluation guide (performance measures in ASAT). The training information outline/performance steps include detailed training information. The evaluation preparation subsection indicates necessary modification to task performance in order to train and evaluate a task that cannot be trained to the wartime standard under wartime conditions. It may also include special training and evaluation preparation instructions to accommodate these modifications and any instructions that should be given to the soldier before evaluation. The evaluation guide/performance measures identify the specific actions that the soldier must do to successfully complete the task. These actions are listed in a Pass/Fail format for easy evaluation. Each task contains a feedback statement (Evaluation Guidance in ASAT) that indicates the requirements (for the number of performance measures passed) for receiving a GO on the evaluations.

(6) **References**. This section identifies references that provide more detailed and thorough explanations of task performance requirements than those given in the task summary description.

b. Additionally, some task summaries include safety statements and notes. Safety statements (danger, warning, and caution) alert user to the possibility of immediate death, personal injury, or damage to equipment. Notes provide a small, extra supportive explanation of hint relative to the performance measures.

1-3. SOLDIER'S RESPONSIBILITIES

a. Each soldier must be able to perform every task required by his or her job and shares the responsibility with the trainer to maintain those skills. The MTP indicates the tasks that soldiers in different jobs and skill levels are required to perform. Soldiers are also responsible for all common tasks, at their current Skill Level and below, listed in the Soldier's Manual of Common Tasks (SMCT).

b. To assist the soldier in maintaining task proficiency, each task is written so that it states:

(1) Where and when the task should be performed and what equipment is needed (Conditions statement).

(2) How well the task must be performed (Standards statement).

(3) Which references describe step by step how the task must be performed (References section).

c. In addition, each task contains an Evaluation Guide (in the Training Evaluation section) that can be used to determine if a soldier can perform the task. Periodically, soldiers should ask their supervisor or another soldier to check them out to ensure that they can perform the task. If a soldier has a question about how to do a task or which tasks in this manual he or she must be able to perform, it is the soldier's responsibility to ask the first-line supervisor for clarification. The first-line supervisor knows how to perform each task or can direct the soldier to the

appropriate training materials. These include field manuals (FM), technical manuals (TM), and Training Extension Course (TEC) lessons. It is the soldier's responsibility to use these materials to maintain performance.

d. Another important training resource is Army Correspondence Course Program (ACCP). Soldiers should refer to DA Pamphlet 351-20, the Army Correspondence Course Program Catalog, for information on enrolling in this program and a list of courses, or write to: Army Institute for Professional Development, US Army Training Support Center, ATTN: ATIC-IPS, Newport News, VA 23628-0001.

1-4. COMMANDER'S RESPONSIBILITIES

Each commander must ensure that his or her unit's training plan prepares the unit for war by enabling soldiers to develop and sustain proficiency in the tasks for their MOS and SL. The commander should design the training program to provide individual training for all soldiers assigned to the unit and routinely evaluate soldier proficiency as part of the ITEP. The program should also integrate individual training with crew drills and other collective training. The MTP provides information on which to base integration, cross, train-up, and sustainment training programs and should be used by commanders when developing unit training plans. To properly develop an effective training program, a six-step cycle is recommended:

(1) Set objectives.

(2) Plan resources (that is, personnel, time, funds, facilities, devices and training aids).

(3) Train the trainer.

(4) Provide resources.

(5) Conduct training.

(6) Evaluate soldier performance.

1-5. TRAINING SUPPORT

This manual includes the following appendixes and information that provide additional training support information.

(1) Appendix A. Visual Information Management Tools.

(2) Appendix B. Electronic Imaging Course.

(3) Appendix C. Sample Visual Information (VI) Appendix to Operation Order.

(4) Appendix D. Standing Operating Procedures.

(5) Appendix E. Elements of a Multimedia Product.

(6) Appendix F. DA Form 5164-R (Hands-on Evaluation).

(7) Appendix G. Management Concepts.

(8) Appendix H. Joint Operation Planning and Execution System.

(9) Appendix I. Time-Phased Force and Deployment Data (TPFDD).

(10) Glossary. The Glossary is a single comprehensive list of acronyms, abbreviations, definitions, and letter symbols.

(11) References. This section contains two lists of references, required and related, which support training of all tasks in this SM. Required references are listed in the conditions statement and are required for the soldier to do the task. Related references are materials that provide ore detailed information and more thorough explanation of task performance.

1-6. CAREER MANAGEMENT INFORMATION

a. All MOS 25Z NCOs should be acquainted with the Enlisted Personnel Management System (EPMS), Career Management Field (CMF) structure, skill and training progression for the Visual Information Chief, and training problems unique to MOS 25Z.

b. The Army's EPMS is a management system to improve professionalism of the enlisted ranks. Successful soldiers perform assigned duties efficiently, take advantage of opportunities for training and promotion, and establish career goals. EPMS provides a logical path of career development by establishing a system of career-long training that prepares soldiers to take on duties of the next higher grade. A training program has been designed for the skill levels of each MOS. This publication is an outline of that training program for MOS 25Z.

c. The skill and progression chart for CMF 25 is shown in Figure 1-1. There are no decision points for the 25Z soldier.
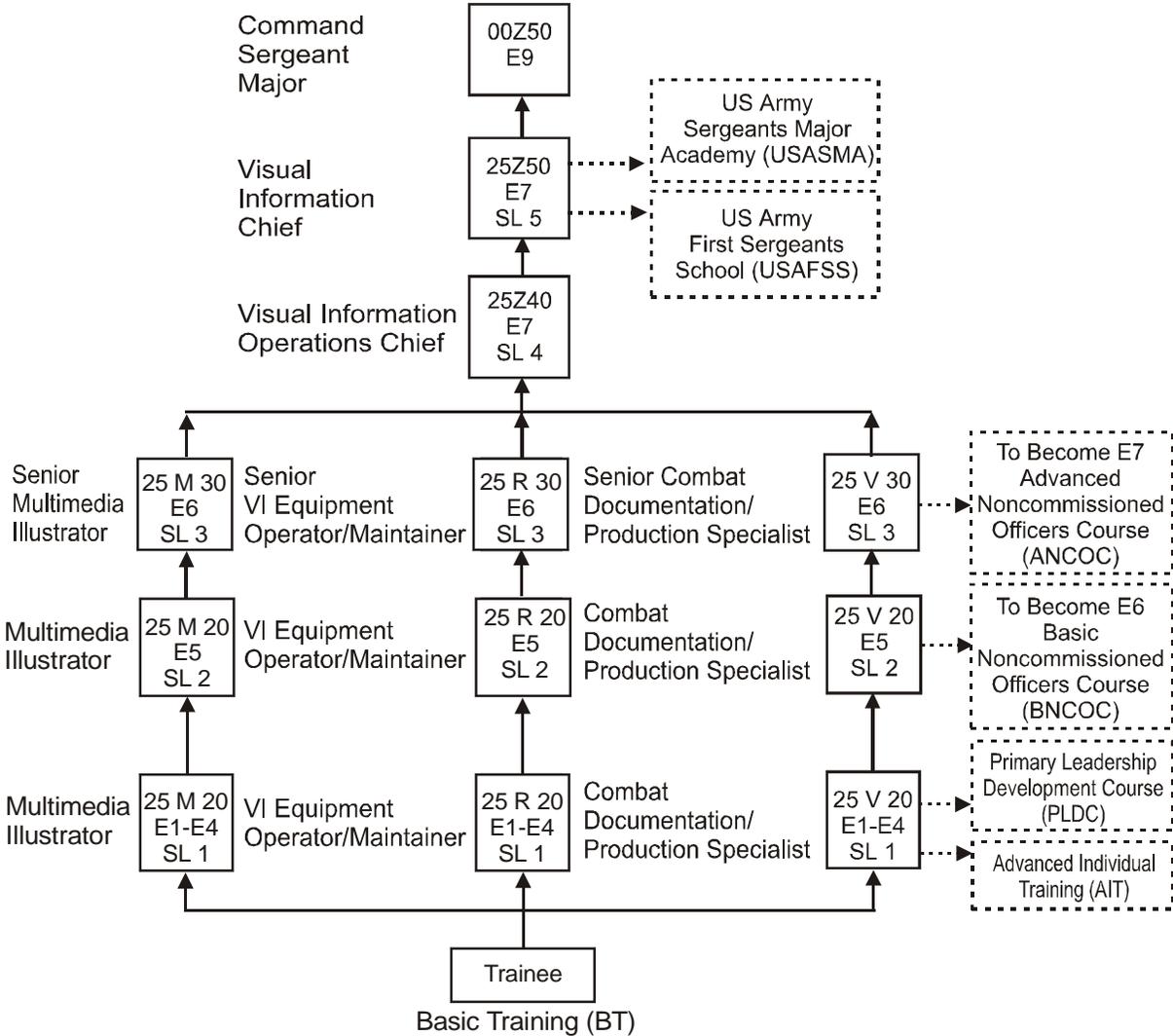
Figure 1-1. Skill and Training Progression, CMF 25.

1-7. TRAINING PROBLEMS UNIQUE TO MOS 25Z

a. The activation of CMF 25 has produced a new alignment of MOSs and created a new set of job responsibilities. The duties of a Visual Information Operations Chief require additional skills and knowledge that were not previously demanded of a Sergeant First Class in the old Audiovisual CMF. With the return to a combat support role for Visual Information soldiers, the need for highly qualified, combat-oriented leaders is mandatory. An operational concept that specifies requirements for a Combat Camera role along with additional guidance in AR 25-1, and DA Pam 25-91, plus a completely new FM 24-40 (currently under development), we will provide the basis for training and operations to support the Army for years to come.

b. In most cases, a unit or facility will have only one Visual Information Operations Chief, MOS 25Z40 assigned. The three feeder MOSs: Multimedia Specialist (25M), Visual Information Equipment Operator-Maintainer (25R), and Visual Information/Audio Documentation Systems Specialist (25V), merge at the Sergeant First Class (SFC) level as MOS 25Z40. This means that the Staff Sergeant promoted to MOS 25Z40 will be required to know the skills and

knowledge's of three disciplines rather than one. Although Visual Information Basic Noncommissioned Officer Course (BNCOC) and Advanced Noncommissioned Officer Course (ANCOC) provide training in all three disciplines the noncommissioned officer (NCO) must seek every opportunity to enhance his own training.

c. Career Management Field 25 is the smallest CMF in the Signal Corps inventory, with a population of approximately 1600 soldiers. The number of NCOs at the Master Sergeant level available as mentors is extremely small. Also, the concept of self-development requires that each NCO provide his own essential training to enhance new skills in the Visual Information (VI) field. For this reason, each NCO will have to work harder at self-development than has been necessary in the past. In addition, most VI units have a day-today operational mission that provides little time for training. Each NCO must be creative in preparing a training schedule for himself and his soldiers. The requirements for Combat Camera mean that each visual information soldier must receive quality training in preparation for this mission. You, the NCO, must provide the time to carry out this training.

d. Comments or questions on material in this manual may be directed to the Branch Chief, US Army, Signal Corps Regimental NCO Academy Detachment, ATTN: ATZH-SDT-T, (Senior Training Developer), Fort George G. Meade, MD 20755-5605, telephone DSN 923-5805/5802 or commercial (301) 677-5805/5802.

CHAPTER 2

Trainer's Guide

2-1. GENERAL

a. The TG identifies the essential components of a unit training plan for individual training. Units have different training needs and requirements based on differences in environment, location, equipment, dispersion (actual manning of graphic shops), and similar factors. Therefore, the TG is a guide used for conducting unit training and not as a rigid standard.

b. The TG provides information necessary for planning training requirements for this MOS.

(1) Identifies subject areas in which to train soldiers.

(2) Identifies the critical tasks for each subject area.

(3) Specifies where soldiers are trained.

(4) Recommends how often each task should be trained to sustain proficiency.

(5) Recommends a strategy for training soldiers to perform higher level tasks.

2-2. BATTLE FOCUSED TRAINING

As described in FM 25-100, *Training the Force,* and FM 25-101, *Battle Focused Training,* the commander must first define the Mission Essential Task List (METL) as the basis for unit training. Unit leaders use the METL to identify the collective, leader, and soldier tasks that support accomplishment of the METL. Unit leaders then assess the status of training and lay out the training objective and the plan for accomplishing needed training. After preparing the long- and short-range plans, leaders then execute and evaluate training. Finally, the unit's training preparedness is reassessed and the training management cycle begins again. This process ensures the unit has identified what is important for the wartime mission, the training focus is applied to the necessary training, and training meets established objectives and standards.

2-3. RELATIONSHIP OF SOLDIER TRAINING PUBLICATIONS (STP) TO BATTLE FOCUSED TRAINING

a. The two key components of enlisted STPs are the TG and SM. The TG and SM give leaders important information to help in the battle focused training process. The TG relates soldier and leader tasks in the MOS and SL to duty positions and equipment. It provides information on where the task is trained, how often training should occur to sustain proficiency, and who in the unit should be trained. As leaders go through the assessment and planning stages, they should use the TG as an important tool in identifying <u>what</u> needs to be trained.

b. The execution and evaluation of soldier and leader training should rely on the Armywide training objective and standards in the SM task summaries. The task summaries ensure that

soldiers in any unit or location have the same definition of task performance, and that trainers evaluate the soldiers to the same standard.

c. The following diagram shows the relationship between battle-focused training and the use of the TG and SM. The left-hand side of the diagram (taken from FM 25-101) shows the soldier training process, while the right side of the diagram shows how the STP supports each step of this process.

BATTLE FOCUS PROCESS   **STP SUPPORT PROCESS**

SELECTS SUPPORTING SOLDIER TASKS	USES TG TO RELATE TASKS TO METL
CONDUCTS TRAINING ASSESSMENT	USES TG TO DEFINE WHAT SOLDIER TASKS TO ASSESS
DETERMINES TRAINING OBJECTIVES	USES TG TO SET OBJECTIVES
DETERMINES STRATEGY AND PLANS FOR TRAINING	USES TG TO RELATE SOLDIER TASKS TO STRATEGY
CONDUCTS PRE-EXECUTION CHECKS	USES SM TO DETERMINE TRAINING PREPARATION
EXECUTES TRAINING AND CONDUCTS AFTER-ACTION REVIEW	USES SM TASK SUMMARY AS SOURCE FOR TASK PERFORMANCE
EVALUATES TRAINING AGAINST ESTABLISHED STANDARDS	USES SM TASK SUMMARY AS STANDARD FOR EVALUATION

2-4. TRAINER'S RESPONSIBILITIES

Training soldier and leader tasks to standard and relating this training to collective mission-essential tasks is the NCO trainer's responsibility. Trainers use the steps below to plan and evaluate training.

(1) **Identify soldier and leader training requirements.** The NCO determines which tasks soldiers need to train using the commander's training strategy. The unit's METL and Army Training and Evaluation Program (ARTEP) and MOS Training Plan (MTP) in the TG are sources for helping the trainer define the individual training needed.

(2) **Plan the training.** Training for specific tasks can usually be integrated or conducted concurrently with other training or during slack periods. The unit's ARTEP can assist in identifying soldier and leader tasks that can be trained and evaluated concurrently with collective task training and evaluation.

(3) **Gather the training references and materials.** The SM task summary list all references which can assist the trainer in preparing for the training of that task.

(4) **Determine risk assessment and identify safety concerns.** Analyze the risk involved in training a specific task under the current conditions at the time of scheduled training. Ensure that your training preparation takes into account those cautions, warnings, and dangers associated with each task.

(5) **Train each soldier.** Show the soldier how the task is done to standard and explain step-by-step how to do the task. Give each soldier one chance to do the task step-by-step.

(6) **Emphasize training at mission-oriented protection posture (MOPP) level 4.** Soldiers may have difficulty performing even the very simple tasks in a nuclear/chemical environment. The combat effectiveness of the soldier and the unit can degrade quickly when trying to perform in MOPP 4. Practice is the best way to improve and ensure performance.

(7) **Check each soldier.** Evaluate how well each soldier performs the tasks in this manual. Conduct these evaluations during individual training sessions or while evaluating soldier proficiency of unit collective tasks. Use the information in the MTP as a guide to determine how often to train the soldier in each task and to ensure that soldiers sustain proficiency.

(8) **Record the results.** The leader book referred to in FM 25-101, Appendix B, is used to record task performance and gives the leader total flexibility on the method of recording training. The trainer may use DA Forms 5164-R (Hands-On Evaluation) and 5165-R (Field Expedient Squad Book) as part of the leader book. The forms are optional and locally reproducible. STP 21-24-SMCT contains a copy of the forms and instructions for their use.

(9) **Retrain and evaluate.** Work with each soldier until he can perform the task to specific SM standards.

2-5. EVALUATION GUIDE

An evaluation guide exists for each task summary in the SM. Each evaluation guide contains one or more performance measures that identify what the trainer needs to observe to

score a soldier's performance. Each step is clearly identified by a P (pass) and F (fail), located under the result column on each evaluation guide. Some tasks involve a process that the trainer must evaluate an "end product" resulting from doing the task. The following are some general points about using the evaluation guide to evaluate soldiers.

(1) Review the guide to become familiar with the information on which the soldier will be scored.

(2) Ensure that the necessary safety equipment and clothing needed for proper performance of the job are on hand at the training site.

(3) Prepare the test site according to the Conditions section of the task summary. Some tasks contain special evaluation preparation instructions. These instructions tell the trainer what modifications must be made to the job conditions to evaluate the task. Reestablish the test site to the original requirements after evaluating each soldier to ensure that conditions are the same for each soldier.

(4) Advise each soldier of the information in the Brief Soldier section of the task summary before evaluating.

(5) Score each soldier according to the performance measures and Evaluation Guidance section in the task summary.

(6) Record the date and task performance (GO or NO-GO) in the leader book.

2-6. TRAINING TIPS FOR THE TRAINER

a. **Prepare yourself.**

(1) Get training guidance from your chain of command on when to train, which soldiers to train, availability of resources, and training site.

(2) Get the training objective (tasks, conditions, and standards) from the task summary in this manual.

(3) Ensure you can do the task. Review the task summary and references in the References section. Practice doing the task or, if necessary, have someone train you on the task.

(4) Choose a training method. Some tasks provide recommended training methods.

(5) Prepare a training outline consisting of informal notes on what you want to cover during your training session.

(6) Practice your training presentation.

b. **Prepare the resources.**

(1) Obtain the required resources identified in the conditions statement for each task.

(2) Gather equipment and ensure it is operational.

(3) Coordinate the use of training aids and devices.

(4) Prepare the training site according to the conditions statement and Evaluation Preparation section of the task summary, as appropriate.

c. **Prepare the soldiers.**

(1) Tell the soldier what task to do and how well it must be done. Refer to the standard statement and Evaluation Preparation section for each task, as appropriate.

(2) Caution soldiers about safety, environment, and security.

(3) Provide any necessary training on basic skills that soldiers must have before they can be trained on the task.

(4) Pretest each soldier to determine who needs training in what areas by having the soldier perform the task. Use DA Form 5164-R and the evaluation guidance in each task summary to make this determination.

d. **Train the soldiers who failed the pretest.**

(1) Demonstrate how to do the task or the specific performance steps to those soldiers who could not perform to SM standards. Have soldiers study the appropriate materials.

(2) Have soldiers practice the task until they can perform to SM standards.

(3) Evaluate each soldier using the evaluation guide.

(4) Provide feedback to those soldiers who fail to perform to SM standards and have them continue to practice until they can perform to SM standards.

e. **Record results in the leader book.**

2-7. MOS TRAINING PLAN

One of the key components of the TG is the MOS Training Plan (MTP). The MTP has two parts to assist the commander in preparing a unit training plan that satisfies integration, cross-train, train-up, and sustainment training requirements for soldiers in this MOS.

(1) Part One of the MTP shows the relationship of an MOS SL between duty position and critical tasks. The critical tasks are grouped by task commonality into subject areas.

(a) Section I list subject area numbers and titles used throughout the MTP. These subject areas are used to define the training requirements for each duty position within an MOS and relate duty positions to subject areas and cross-training and train-up/merger requirements.

- **Duty position column.** This column lists the duty positions of the MOS, by skill level, which have different training requirements.

- **Subject area column.** This column lists, by numerical key (see Section I), the subject areas a soldier must be proficient in to perform in that duty position.

- **Cross train column.** This column lists the recommended duty position for which soldiers should be cross-trained.

- **Train-up/merger column.** This column lists the corresponding duty position for the next higher skill level or MOSC the soldier will merge into on promotion.

(b) Section II identifies the total training requirements in terms of subject areas listed in Section I for each duty position in an MOS.

(2) Part Two lists by subject areas, the critical tasks to be trained in an MOS, task number, task title, location, sustainment training frequency, and training SL.

- **Subject area column.** This column lists the subject area number and title in the same order as Section I, Part One of the MTP.

- **Task number column.** This column lists the task numbers for all tasks included in the subject area.

- **Title column.** This column lists the task title for each task in the subject area.

- **Training location column.** This column identifies the training location where the task is first trained to soldier training publications standards. If the task is first trained to standard in the unit, the word "Unit" will be in this column. If the task is first trained to standard in the training base, it will identify, by brevity code (ANCOC, BNCOC, and so forth), the resident course where the task was taught. Figure 2-1 contains a list of training locations and their corresponding brevity codes.

ANCOC	Advanced NCO Course

Figure 2-1. Training Locations.

- **Sustainment training frequency column.** This column indicates the recommended frequency at which the tasks should be trained to ensure soldiers maintain task proficiency. Figure 2-2 identifies the frequency codes used in this column.

BA	-	Biannually
AN	-	Annually
SA	-	Semiannually
QT	-	Quarterly
MO	-	Monthly
BW	-	Bi-weekly
WK	-	Weekly

Figure 2-2. Sustainment Training Frequency Codes.

- **Sustainment training skill level column.** This column lists the skill levels of the MOS for which soldiers must receive sustainment training to ensure they maintain proficiency to soldier's manual standards.

MOS TRAINING PLAN MOS 25Z PART ONE: SUBJECT AREAS AND DUTY POSITIONS
SECTION I. SUBJECT AREA CODES

Skill Level 4

1	Administration
2	Supervision
3	Plans, Designs, and Develops

MOS TRAINING PLAN MOS 25Z PART ONE
SECTION II. DUTY POSITION TRAINING REQUIREMENTS

DUTY POSITION	SUBJECT AREAS	CROSS-TRAIN	TRAIN-UP MERGER
Visual Information Supervisor	1, 2, and 3	NA	VI Operations Chief
Audio/TV Production Systems Supervisor	1, 2, and 3	NA	VI Operations Chief
VI Documentation Supervisor	1, 2, and 3	NA	VI Operations Chief
VI Staff NCO	1, 2, and 3	NA	VI Operations Chief

MOS TRAINING PLAN MOS 25Z4 PART TWO: CRITICAL TASKS

Skill Level 4		CRITICAL TASKS			
Subject Area	**Task Number**	**Title**	**Training Location**	**Sust Tng Freq**	**Sust Tng SL**
1. Administration	113-631-6002	Establish a Visual Information (VI) Security Program	ANCOC	AN	4
	113-631-6007	Validate a VI Standing Operating Procedure (SOP)	ANCOC	AN	4
	113-631-6005	Determine Dispositions of VI Products	ANCOC	SA	4
2. Supervision	113-635-1001	Direct Deployment of VI Assets to a Tactical Environment	ANCOC	SA	4
	113-635-2002	Direct Sustainment of VI Assets in a Tactical Environment	ANCOC	SA	4
	113-635-7001	Direct Redeployment of VI Assets from a Tactical Environment	ANCOC	SA	4
	113-575-6001	Prepare a Master Broadcast Schedule	ANCOC	SA	4
3. Plans, Designs, and Develops	113-631-7002	Review VI Products	ANCOC	SA	4
	113-631-6014	Validate a VI Maintenance Program	ANCOC	SA	4

Skill Level 4		CRITICAL TASKS			
Subject Area	**Task Number**	**Title**	**Training Location**	**Sust Tng Freq**	**Sust Tng SL**
	113-631-6015	Write a VI Annex to an Operation Order (OPORD)	ANCOC	SA	4
	113-636-1001	Coordinate the VI Assets of a Multimedia Project	ANCOC	SA	4

CHAPTER 3

MOS/Skill Level Tasks

Skill Level 4

Subject Area 1: Administration

Establish a Visual Information (VI) Security Program
113-631-6002

Conditions: In a tactical or garrison environment, given VI equipment inventory, personnel assets list, completed DA Forms 3903, site plan, unit SOP, AR 190-16, AR 380-5, DA Pamphlet 25-91, and DOD Directive 5120.20.

Standards: Establish an effective security program in accordance with (IAW) unit standing operating procedure (SOP), AR 190-16, AR 380-5, DA Pamphlet 25-91, and DOD Directive 5120.20.

Performance Steps
NOTE: The security manager represents the commander on matters pertaining to physical security, personnel security, intelligence, and safeguarding of national security information. The security manager knows specifically what these matters involve and the standard procedures necessary to implement the programs.

1. Establish physical security.
   a. Assess physical security program factor. To determine the type and extent of the commitment of resources toward an installation physical security program, you must assess those factors that will influence this program. The following should be taken into consideration:
      (1) Mission assignment.
      (2) Local threat assessment.
      (3) Definition and analysis of the area to be protected to include:
         (a) Nature and arrangement of activity.
         (b) Number of personnel involved.
         (c) Monetary, tactical, or strategic value of materiel.
         (d) Storage of classified information and equipment.
         (e) Existing natural or man-made hazards.
      (4) Mission essential or vulnerable areas to include:
         (a) Ammunition and explosive storage.
         (b) Arms storage.
         (c) Classified sites or location.
         (d) Communications centers.
         (e) Communication facilities.
         (f) Supply and storage.
         (g) Shipping and receiving terminals.
      (5) Key Control.
   b. Planning considerations.
      (1) Peacetime.
         (a) Ensure integration of physical security requirements into all plans to ensure conservation of physical security resources and effective protection of army personnel, facilities, and equipment.
         (b) Ensure evaluation of peacetime planning considerations to permit adjustments in physical security as the threat changes during mobilization and war.
      (2) Tactical.

Performance Steps

(a) Ensure development of a tactical defense plan for each installation to include support installation and key activities.
(b) Ensure establishment of control of all access roads normally open to civilians.
(c) Ensure restriction of movement within specified areas of the installation as required.
(d) Ensure inclusion of a physical security guard force and civilian police for present or future mission.
(e) Ensure physical security training to include: (1) Use of nuclear, biological, and chemical protective equipment and decontamination procedures. (2) Search seizure and apprehension. (3) Map reading and use of compass. (4) Marksmanship with individual and crew served weapons. (5) Patrolling. (6) Operation and use of security communications equipment and system. (7) Identification and control of personnel. (8) Materiel control. (9) Unarmed defense. (10) Vehicle control. (11) Use of force. (12) Civil disturbance. (13) Countering terrorism.
c. Implement visual information security.
(1) Photographs. Ensure the marking of negatives and positives with the appropriate classification and associated marking. Ensure negatives and positives are kept in containers bearing conspicuous classification marking. Ensure marking of all prints with appropriate classification on the face side of the print. (When using self-processing film or paper to photograph or reproduce classified information, ensure all parts of the last exposure are removed from camera and destroyed as classified waste, or ensure the camera is classified).
(2) Transparencies and slides are marked with applicable classification on the image area of each transparency or slide. On 35mm or similar size, ensure the classification markings are marked on the border, holder, or frame.
(3) Motion picture films and videotapes. Ensure titles are marked at the beginning and end and all markings are visible when projected. Ensure reels and cassettes are marked and kept in containers bearing conspicuous classification and applicable associated marking.
(4) Recordings. Ensure sound, magnetic, or electronic recordings contain a clear statement of the assigned classification at both the beginning and the end and are kept in a container or reels that bear conspicuous classification.

2. Establish personnel security.
a. Determine military positions that require incumbent to have access to classified information.
b. Identify and designate all civilian positions which are critical and require access to classified information.
c. Process request for security clearance.
d. Monitor conduct of personnel who have security clearance or who are eligible for access to classified information. Maintain and submit annual personnel security data report.

3. Establish intelligence security.
a. Brief all personnel on the Subversion and Espionage Directed Against the Army (SAEDA) threat and reporting of incident.
b. Upon receipt of information from an individual concerning a possible approach, report promptly to military intelligence.
c. Conduct security briefing to personnel prior to foreign travel.

4. Establish control of classified materiel.
a. Upon receiving an "Accountable" document, accountability should be immediately established.
(1) Inventory document to ensure it is complete and no pages are missing.
(2) Assign control number.
(3) Log document on DA Form 455. See Figure 3-1.

Performance Steps

CONTROL LOG OR FILE NO.	DATE REC'D	C L A S	NO. OF CYS	DESCRIPTION (Type, File Reference, Unclassified Subject or Short Title, No. of Pages, Copy Numbers, etc.)	ORIGINATING AGENCY	DATE OF DOCU-MENT	ROUTED TO	REMARKS (Disposition, Dest'n Cert No. and Date, Custodian Signature, etc)

DA FORM 455, JUL 62   REPLACES EDITION OF 1 JAN 57, WHICH IS OBSOLETE   **MAIL AND DOCUMENT REGISTER**   PAGE NO.
For use of this form, see AR 380-5; the proponent agency
is Office of the Assistant Chief of Staff for Intelligence.   USAPPC V2.20

Figure 3-1. DA Form 455.

   b. Store classified material.
      (1) TOP SECRET. Ensure TOP SECRET material is stored in:
         (a) A safe container having a three-position, dial-type combination lock.
         (b) A class A vault.
         (c) A container located in a building or room that is locked, guarded, or is equipped with alarms during nonoperating hours.
      (2) SECRET. Ensure SECRET material is stored in:
         (a) A General Services Administration (GSA) approved safe.
         (b) An area equipped with alarms.
         (c) A vault.
         (d) An area under constant surveillance.
      (3) Ensure CONFIDENTLAL material is stored in any steel filing cabinet having a built-in three-position, dial-type combination lock.
   c. Complete required form.
      (1) Ensure Security Container Information (SF 700), is posted on an emergency notification list on the container.
      (2) Record the combination and names of persons having access to container.
      (3) File SF 700 in accordance with local security SOP.
      (4) DA Form 672 (Safe or Cabinet Security Record). Ensure DA Form 672 is conspicuously attached to the outsides of all containers used for the storage of classified material.

Performance Steps

        (5) Emergency Evacuation/Destruction Plan. Ensure each installation or activity has an Emergency Evacuation/Destruction Plan conspicuously posted on or near any classified security container.

   d. Destruction of classified material.

        (1) Methods of destruction. Ensure classified documents and material are destroyed by burning or, with the approval of the cognizant component head or designee, by melting, chemical decomposition, pulping, pulverizing, shredding, or mutilation sufficient to preclude recognition or reconstruction of the classified information.

        (2) Records of destruction. Records of destruction are required for TOP SECRET and SECRET information. Ensure the record is dated and signed at the time of destruction by the person destroying, and two witnesses for TOP SECRET information and one witness for SECRET. In the case of information placed in burn bags for central disposal, the destruction record only need to be signed by the witnessing official or officials when the information is so place. Completion of the "Custodian/Destruction Official" and the "Witnessing Official" blocks of DA Form 3964 satisfy "witness" requirements for TOP SECRET. See Figure 3-2.

Performance Steps

CLASSIFIED DOCUMENT ACCOUNTABILITY RECORD For use of this form, see AR 380-5; the proponent agency is the Office, Assistant Chief of Staff for Intelligence.					Date	
SECTION A-GENERAL						
TO:				FROM:		
DATE RECEIVED		ACTION OFFICE(S)		SUSPENSE DATE(S)	REGISTER OR CONTROL NO .	
CONTROL LOG OR FILE NO .	CLASSIFI-CATION	NUMBER OF COPIES	DESCRIPTION *(Type, File Ref, Unclassified Subject or Short Title and Number of Indorsements/Incls)*		DATE OF DOCUMENT	ORIGINATOR

SECTION B-ROUTING

TO	COPY NO .	DATE	I ACKNOWLEDGE RECEIPT OF THE MATERIAL DESCRIBED HEREON	
			PRINTED NAME	SIGNATURE
1.				
2.				
3.				
4.				
5.				

SECTION C-DESTRUCTION CERTIFICATE *(CHECK APPROPRIATE BLOCK)*

MATERIAL DESCRIBED HEREON HAS BEEN: ☐DESTROYED ☐TORN IN HALF AND PLACED IN A CLASSIFIED WASTE CONTAINER *(AR 380-5)*			PAGE OR COPY NO .
OFFICE SYMBOL	DATE	PRINTED NAME OF CUSTODIAN OR REP	SIGNATURE
DESTRUCTION RECORD NO .	DATE	PRINTED NAME OF CERTIFYING/DESTR. OFF.	SIGNATURE
PAGE OR COPY NUMBER	DATE	PRINTED NAME OF WITNESSING OFFICIAL	SIGNATURE

SECTION D-REPRODUCTION AUTHORITY

NUMBER OF COPIES TO BE REPRODUCED	AUTHORIZED BY	DATE

SECTION E RECEIPT/TRACER *(CHECK APPROPRIATE BOX)*

☐RECEIPT OF DOCUMENT(S) ACKNOWLEDGED ☐DOCUMENT(S) HAVE NOT BEEN RECEIVED ☐TRACER ACTION: SIGNED RECEIPT FOR MATERIAL DESCRIBED ABOVE HAS NOT BEEN RECEIVED		
DATE	PRINTED NAME, GRADE OR TITLE	SIGNATURE
COMMENTS		

DA FORM 3964,JUL 79   EDITION OF 1 NOV 72 IS OBSOLETE   USAPPC V2.00

Figure 3-2. DA Form 3964.

Performance Steps
        (3) Classified waste. Ensure that waste materials, such as handwritten notes, carbon papers, typewriter ribbons, working papers, and so forth, which contain classified information, are protected in a manner to prevent unauthorized disclosure of the information. Ensure classified waste is destroyed when no longer needed.
NOTE: Destruction records are not required.

Performance Measures	**GO**	**NO GO**

1. Ensure establishment of physical security.
   a. Assess physical security program factor.
   b. Planning considerations.
   c. Implement visual information security.
	——	——

2. Ensure establishment of personnel security.
   a. Determine military positions that require incumbent to have access to classified information.
   b. Identify and designate all civilian positions that are critical and require access to classified information.
   c. Process request for security clearance.
   d. Monitor conduct of personnel who have security clearance or who are eligible for access to classified information. Maintain and submit annual personnel security data report.
	——	——

3. Ensure establishment of intelligence security.
   a. Brief all personnel on the SAEDA threat and reporting of incident.
   b. Upon receipt of information from an individual concerning a possible approach, report promptly to military intelligence.
   c. Conduct security briefing to personnel prior to foreign travels.
	——	——

4. Ensure control of classified material.
   a. Upon receiving an "Accountable" document, accountability should be immediately established.
   b. Store classified material.
   c. Complete required form.
   d. Destruction of classified material.
	——	——

Evaluation Guidance: Score the soldier GO if all performance measures are passed (P). Score the soldier NO-GO if any performance measure is failed (F). If any performance measure is failed, show the soldier what was done wrong and how to it correctly.

References
   Required   **Related**
   AR 190-16
   AR 380-5
   DA PAM 25-91
   DOD DIR 5120.20

Validate a VI Standing Operating Procedure (SOP)
113-631-6007

Conditions: Given the VI Organizational SOP, higher headquarters' SOP, and FM 101-5.

Standards: Validate the VI SOP IAW higher headquarters and FM 101-5.

Performance Steps

1. An SOP for a visual information (VI) unit contains instructions concerning everyday activities. A particular unit may have an administrative SOP, a tactical or field SOP, an external SOP, or a combination of all three. The purpose and function of a unit will determine what type of SOP should be written.

2. A VI unit will list procedures unique to its mission and provide guidelines for personnel to follow. See Appendix D for a sample SOP. The SOP will specify actions and specific duties that will result in efficient operation and completion of the mission. Determine the amount of detail according to the size of the unit and the readiness capability of the unit.

3. Base the SOP of a VI unit on those portions of higher headquarters publications that apply the wishes of the commander, and procedures established through experience. As SOP can be changed at a later time to adjust to new conditions or practices.

4. Planning is vital to a workable and effective SOP. The nine steps in the planning sequence include: the forecasting of requirements, examining the requirements, studying the implications, analyzing the mission, establishing guidance, preparing studies, selecting courses of action, preparing the plans, and conducting rehearsals.
   a. Forecasting requirements. The operations officer writing SOP must first have an idea as to what will occur. Usually, this information will come from higher headquarters.
   b. Examining requirements. Take the forecast information and determine priorities for further planning and preparation.
   c. Studying the implications. Review the priority list and decide on primary mission(s) and supporting missions.
   d. Analyzing the mission(s). With the mission(s) clearly in mind, select specific tasks to support it/them. Decide how complex these tasks may be.
   e. Establishing guidance. Set up directions for specific tasks. Write out or give directions orally, incorporating planning directives from the commander and higher headquarters, and other SOPs.
   f. Preparing studies. Prepare planning studies to ensure just what are the key factors in the mission, and the details of these factors. These studies help in deciding on the proper cause of action.
   g. Selecting courses of action. With all reasonable happenings taken under consideration, select a course of action. Decide on additional courses of action for alternate plans (usually attached as annexes to the primary plan).
   h. Preparing plans. With all the information gathered from the first seven steps, make a plan that includes all details of actions required.
   i. Conducting rehearsals. This step may or may not be taken, depending on the command level, the time, and facilities available. If time, resources, and security permit, it is a good idea to hold "a dry run" and see where revisions may be necessary.

5. Preparation, publication and distribution of the command SOP are responsibilities of the operation officer. Other staff officers prepare appropriate portions of the SOP. The SOP is published in the form most suitable for the command. There is no specified format for an SOP. See Appendix D, for guidance and information on SOPs.

Performance Measures	**GO**	**NO GO**
1. Plan the SOP.	——	——

     a. Review higher headquarters SOP.
     b. Forecast to determine probable requirements.
     c. Study probable requirements and establish priority.
     d. Analyze mission to determine tasks.
     e. Establish guidance.
     f. Select course(s) of action.
     g. Prepare complete plans.

	GO	**NO GO**
2. Draft SOP.	——	——

     a. Write title, date, and SOP number.
     b. Write all sections necessary, (purpose, scope, definition).
     c. Compare draft to references and modify as necessary.
     d. Submit draft for approval.

	GO	**NO GO**
3. Prepare the final SOP.	——	——
4. Reproduce and distribute.	——	——

Evaluation Guidance: Score the soldier GO if all performance measures are passed (P). Score the soldier NO-GO if any performance measure is failed (F). If any performance measure is failed, show the soldier what was done wrong and how to do it correctly.

References
    Required   **Related**
    FM 101-5   APPENDIX D (25Z)

Determine Dispositions of VI Products
113-631-6005

Conditions: Given VI products, AR 25-1, AR 380-5, AR 380-13, DA Pamphlet 25-91, DOD Directive 4160.21-M, DOD Directive 5040.2, DD Forms 1149, DD Forms 2537, and FM 24-40.

Standards: Ensure proper disposition of VI products IAW AR 25-1, DA Pamphlet 25-91, DOD Directive 4160.21-M, DOD Directive 5040.2, and FM 24-40.

Performance Steps
NOTE: One of the most important responsibilities you will have as a broadcast supervisor is to review materials for broadcast release. Once a product airs, it can't be retrieved. Local SOPs should provide basic guidance when it comes to release of material for broadcast. The following information outline pertains to both radio and television unless otherwise specified.

1. Make sure the product aired conforms to Security, Accuracy, Policy, and Propriety (SAPP). Security measures for the Army are outlined in AR 380-5. Disclosure of classified information definitely violates this regulation. This would include any visual of areas or equipment that is classified. Always check first when in doubt on a shoot. Also, comments that are sensitive (but not classified) should not air. An example of this would be a pilot who proudly announces that it only takes five minutes for him and his fellow F-16 pilots to get into the air after the first warning. The comment is not classified but would be helpful to an enemy or potential enemy.

2. Make sure the information is accurate. Check the spelling of names; make sure the ranks are correct and unit designations are correct (for example, there are no companies in field artillery units, and so forth). Even stories that are generated and released by the Public Affairs Officer (PAO) should be checked for accuracy.

3. Be familiar with public affairs policy outlined in AR 360-5 (Army Public Affairs, Public Information) and AR 360-81 (Command Information Program). The following regulations also contain policy considerations that reviewing officials need to know. The broadcast supervisor must be familiar with the content of these regulations in case they are needed for quick reference: AR 25-55 (The Department of Army Freedom of Information Act Program), AR 340-21 (The Army Privacy Program), AR 380-5 (Department of the Army Information Security Program), and DOD Directive 5122.10 (American Forces Information Service).

4. Most overseas stations maintain a local sensitivities file. Its purpose is to give guidance concerning the broadcast of issues considered controversial by the host country government. There are also set procedures for reviewing material for host country sensitivities.

5. The owners of copyrighted material have given their permission to the Armed Forces Radio and Television Service (AFRTS) to broadcast their products. There are information and entertainment programs. However, information contained in copyrighted material can be used for background information IF IT IS PARAPHRASED. Paraphrased copyrighted material does not have to be attributed. Be careful here. If the source of the information is identifiable with your information, attribution of the source is required. If you quote directly, you must attribute this source of the information.

6. Because of the Privacy Act, broadcast material should not include certain information without permission of the individual concerned. This includes: street addresses; social security numbers; telephone numbers; information contained in medical and personnel files; and information pertaining to ongoing disciplinary actions which would clearly be an unwarranted invasion of personal privacy.

Performance Steps

7. All libelous information must be deleted from any material intended for broadcast. Basically, you must not say anything about persons, groups, organizations or business that exposes them to hatred or contempt, lowers them in the esteem of others, causes them to be shunned, or injures their business. Examples of some libelous word are: drunk, radical, dishonest, unethical, a cheat, criminal (unless convicted), a traitor, and so forth.

8. Locally reproduced news analysis or commentary is another example of policy violation. They are expressly forbidden. Only those analysis or commentary programs provided by AFRTS-BC may be aired. This material must still be reviewed for broadcast. Certain comments may be fine in Panama but not in Korea because of host country sensitivities. Again, local SOP should provide guidance in this area, but if a news analysis or commentary program is aired, it must be aired in its entirety. Radio news actualities and correspondents' reports may be excerpted from network newscast but must be excerpted in their entirety. News sources/networks that authorize their television programming to be excerpted are identified in AFRTS-PC DP-1.

NOTE: When it is necessary to remove host country sensitivities from entertainment material, AFRTS outlets are authorized to reproduce (dub) the original program to facilitate removal.

9. Propriety is doing what is right and proper. Ensure the broadcast material is in good taste and does not violate the sensitivities of the listening/viewing audience. There are several things that would prevent broadcast material from being aired: vulgarity, obscenity, gore, perversion, excessive violence, and information that will hold the service or its members up to ridicule.

10. A very important technical consideration for television is continuity. Continuity is accomplished when different shots and scenes are combined to make smooth transitions in time and space. In other words, the story is clear and concise without any distracting scenes that interfere with the message you are trying to get across. Another technical consideration for radio and television is to ensure audio and visual quality. You need to assume the role of the listener or viewer. You should be able to understand the intended message by listening to or viewing the material. Check for consistent audio/video levels, good color, and scenes with good composition. A scene with good composition should have a main point of interest, balance and harmony, and an uncluttered background.

11. Make sure the material is correctly timed. Running time for television radio material covers first and last audio. If there is a discrepancy, make sure the person responsible for programming is made aware of its IAW local SOP.

Evaluation Preparation: Setup: Provide the soldier with the material to be reviewed. It is at the evaluation.

Brief Soldier: Tell soldier that he will be evaluated IAW Evaluation Guide.

Performance Measures	**GO**	**NO GO**
NOTE: The following performance steps apply to both radio and television unless indicated otherwise.		
1. Ensure that the material does not violate security, accuracy, policy, or propriety (SAPP).	——	——
2. Demonstrate familiarity (to evaluator's satisfaction) with AR 360-5 and AR 360-81.	——	——
3. Demonstrate knowledge of the salient points (to evaluator's satisfaction) of AFRTS-PC DP-1 and DOD Directive 5120.20, as they apply to broadcast material.	——	——

Performance Measures **GO** **NO GO**

4. Demonstrate knowledge of the following regulations/directives as they apply to the —— ——
   release of broadcast material; AR 25-55, AR 340-21, AR 380-5, and DOD
   Directive 5122.10.

5. Ensure copyrighted material, if used, is paraphrased. —— ——

6. Provide proper attribution, when necessary. —— ——

7. Remove all libelous information from the material. —— ——

8. Ensure material does not violate the Privacy Act. —— ——

9. Ensure that only AFRTS-BC provides news analysis or commentary material is —— ——
   used (aired).

10. Ensure that, if used, AFRTS-BC provided news analysis or commentary material —— ——
    is aired in its entirety.

11. Ensure that local reports contain no commentary or editorials. —— ——

12. Excerpt radio news actualities and correspondents' reports in their entirety, when —— ——
    necessary.

13. Excerpt TV news programming only from sources authorized in AFRTS-PC DP-1. —— ——

14. When necessary, you may excerpt entertainment material by reproducing —— ——
    (dubbing) the original material.

15. Check for visual continuity with television material. —— ——

16. Monitor audio and visual quality of the material. —— ——

17. Check running time of material. —— ——

18. If there are any changes to the running time, notify programming. —— ——

19. Turn in material to supervisor. —— ——

Evaluation Guidance: Score the soldier GO if all performance measures are passed (P). Score the
soldier NO-GO if any performance measure is failed (F). If the soldier fails any performance measure,
show what was done wrong and how to do it correctly.

References
    Required   **Related**
    AR 25-1   AR 25-55
    AR 380-13   AR 340-21
    AR 380-5   AR 360-5
    DA PAM 25-91   AR 360-81
    DOD DIR 4160.21-M   DOD DIR 5122.10
    DOD DIR 5040.2
    DOD DIR 5120.20
    FM 24-40

Subject Area 2: Supervision

Direct Deployment of VI Assets to a Tactical Environment
113-635-1001

Conditions: Given FM 101-5, FM 24-40, DOD Dir 4500.9-R PT2, DA Pamphlet 25-1-1, unit SOP, OPORD, and VI assets.

Standards: VI platoon deploys to the area of operations and establishes VI support for ground commander in a tactical environment IAW OPORD and unit SOP.

Performance Steps
NOTE: Planning is a continuous process in preparation for future assigned tasks that involves a detailed and systematic examination of all aspects of contemplated operations; adequate, practical planning is essential to the success of any military undertaking. During the planning process, remember that out ultimate objective is to win the battle. Good, detailed planning will assist us in doing that.

1. Receive the mission. A mission may be received in a warning order, operation order (OPORD), or a fragmentary order (FRAGO).

2. Analyze the mission. As soon as you receive the order, analyze the mission by taking the following into account.
    a. Determine what the mission is by reviewing requirements.
    b. Determine how the terrain will affect the operation.
    c. Determine personnel required.
    d. Determine how much time is available.
    e. Determine equipment and supplies required.
    f. Determine support required and available.

3. Issue order. Give enough information to your personnel to start preparing for the operation. Do not delay.
NOTE: Unit SOP should prescribe actions to take when order is received.

4. Make a tentative plan. The plan should give you a start point from which to coordinate, organize, and move. Thorough communications planning begins with a complete analysis of the variables of mission, enemy, terrain, troops and time available (METT-T). This formula applies to communications development for all levels, tactical and strategic. Of these components, mission must be the cornerstone that establishes all planning. You should be familiar with the operations for the force you are supporting. This will assist you in developing a detailed plan and, ultimately, providing adequate communications-electronics (C-E) support.
    a. Mission. This is what you must do to complete the objective.
    b. Enemy.
    c. Terrain and weather.
        (1) The terrain and size of area will have a tremendous influence on the communication.
        (2) Employment, type of system, and level of effectiveness will vary due to the variety of terrain and weather.
    d. Troops.
        (1) Know personnel assets needed to complete the mission.
        (2) Know when such asset will be available, for how long, and under what tasking arrangement.
        (3) Knowing the status of these soldiers is important, to include training level, previous experience, morale, and leadership capabilities.
        (4) Transportation. Know type of vehicle required to accomplish the mission.
        (5) Equipment. Select gear.
            (a) Camera.
            (b) Videotape cameras.

Performance Steps

           (c) Still cameras.

           (d) Processing facilities.

        (6) Communications.

           (a) The types and amount of C-E equipment available will determine the type of communication system that can be established. All C-E assets available must be considered.

           (b) Often a requirement cannot be met due to lack of equipment. This will require equipment reconfiguration or use of field expedients. The ability to make do with available assets comes from training, field experience, and the desire to get the job done.

    e. Time available.

5. Coordinate support.

6. Start preparation for movement.
    a. Check gear selected for deployment.
    b. Pack gear for deployment.
    c. Assemble personnel and equipment.
    d. Review team/crew responsibilities and considerations.
    e. Conduct pre-briefing.

7. Deploy assets.
    a. Inspect personnel and equipment.
    b. Load vehicles.
    c. Provide security.

Performance Measures	**GO**	**NO GO**
1. Receive the mission.	——	——
2. Analyze the mission.	——	——
a. Determine what the mission is by reviewing requirements.		
b. Determine how the terrain will affect the operation.		
c. Determine personnel required.		
d. Determine how much time is available.		
e. Determine equipment and supplies required.		
f. Determine support required and available.		
3. Issue order. Give enough information to your personnel to start preparing for the operation. Do not delay.	——	——
4. Make a tentative plan.	——	——
a. Mission.		
b. Enemy.		
c. Terrain and weather.		
d. Troops.		
e. Time available.		
5. Coordinate support.	——	——
6. Start preparation for movement.	——	——
a. Check gear selected for deployment.		
b. Pack gear for deployment.		
c. Assemble personnel and equipment.		
d. Review team/crew responsibilities and considerations.		
e. Conduct pre-briefing.		

Performance Measures	**GO**	**NO GO**
7. Deploy assets.	___	___

    a. Inspect personnel and equipment.
    b. Load vehicles.

Evaluation Guidance: Score the soldier GO if all performance measures are passed (P). Score the soldier NO-GO if any performance measure is failed (F). If any performance measure is failed, show the soldier what was done wrong and how to do it correctly.

References

Required	**Related**
DA PAM 25-1-1	
DOD DIR 4500.9-R PT2	
FM 101-5	
FM 24-40	

Direct Sustainment of VI Assets in a Tactical Environment
113-635-2002

Conditions: In a tactical environment, given: unit SOP, FM 100-5, FM 101-5, FM 100-20, FM 24-40, DA Pamphlet 25-1-1, OPORD, and VI assets.

Standards: Supervise sustained operations of VI activities IAW OPORD, unit SOP, FM 100-5, FM 24-40, and DA Pamphlet 25-1-1.

Performance Measures	GO	NO GO
1. Secure and defend communications site.	——	——
2. Provide personnel service support.	——	——
3. Maintain Logistics support.	——	——
4. Maintain electromagnetic spectrum (EMS) and communications support.	——	——
5. Perform individual camouflage.	——	——
6. Practice noise, light, and litter discipline.	——	——
7. Perform field sanitation measures.	——	——
8. Maintain nuclear, biological, and chemical (NBC) defense.	——	——
9. Operate night vision equipment.	——	——
10. Shoot and edit contingency assignments.	——	——
11. Disseminate audio, graphic, photographic, and audiovisual products.	——	——
12. Provide technical liaison support to the battlefield commander.	——	——

    a. Product Development.
      (1) Provide technical expertise on audio and video products throughout development cycle.
      (2) Ensure all scripts meet broadcast standards.
    b. Quality Control. Ensure all finished products meet broadcast standards.
    c. Transmitter Sites. Ensure site-setup allows signal to reach intended audience.

	GO	NO GO
13. Maintain continuous operations.	——	——

Evaluation Guidance: Score the soldier GO if all performance measures are passed (P). Score the soldier NO-GO if any performance measure is failed (F). If any performance measure is failed, show the soldier what was done wrong and how to do it correctly.

References
    Required   **Related**
    DA PAM 25-1-1
    FM 100-20
    FM 100-5
    FM 101-5
    FM 24-40

Direct Redeployment of VI Assets from a Tactical Environment
113-635-7001

Conditions: In a tactical environment, given, unit SOP, FM 101-5, FM 24-40, DOD Dir 4500.9-R PT2, DA Pamphlet 25-1-1, OPORD, and VI assets.

Standards: Ensure all VI platoon assets are redeployed and all recovery operations are conducted IAW the OPORD, unit SOP, FM 101-5, FM 24-40, DOD Dir 4500.9-R PT2, and DA Pamphlet 25-1-1.

Performance Steps
NOTE: Redeployment is the preparation for and movement of forces, manpower, equipment, and materiel from an existing location to follow-on designated location. The objective of redeployment is to maintain unit integrity off equipment, supplies, and personnel. Redeployment should not be considered as retrograde movement, but as a new deployment.

1. Follow procedures for Direct Deployment of Visual Information Assets to a Tactical environment.

2. Coordinate with Unit Movement Officer (UMO).
    a. Review unit movement documentation/plan.
    b. Coordinate operational and logistical movement requirements.

3. Coordinate with UMO.
    a. Secure classified or protect sensitive material and equipment.
    b. Protect fragile components.
    c. Properly place military shipment labels on equipment.
    d. Stencil appropriate cargo.

4. Upon arrival at the final destination, the unit will perform the following:
    a. Personnel are moved to demobilization station.
    b. Equipment is off-loaded.
    c. A 100 percent inventory is conducted.
    d. All equipment is cleaned.

5. The ultimate success of the redeployment procedure is measured by the safe and timely return of all equipment and personnel to a unit or home station.

Performance Measures	**GO**	**NO GO**
1. Receive the mission.	____	____
2. Analyze the mission.	____	____
3. Issue order. Give enough information to your personnel to start preparing for the redeployment. Do not delay.	____	____
4. Make a tentative plan.	____	____
5. Start preparation for redeployment. a. Inspect and inventory equipment. b. Pack and label all containers. c. Initiate load plan. d. Review team/crew responsibilities and considerations.	____	____
6. Deploy assets.	____	____
7. Final destination. a. Off-load equipment. b. Conduct 100 percent inventory on all equipment and personnel.	____	____

Performance Measures   <u>GO</u>   <u>NO GO</u>

    c. Clean all equipment.

    d. Conduct PMCS and prepare appropriate maintenance forms for equipment.

    e. Conduct mission debrief and after action review (AAR).

Evaluation Guidance: Score the soldier GO if all steps are passed. Score the soldier NO-GO if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly. Have the soldier practice until he can correctly perform the task.

References

    Required   **Related**

    DA PAM 25-1-1

    DOD DIR 4500.9-R PT2

    FM 101-5

    FM 24-40

Prepare a Master Broadcast Schedule
113-575-6001

Conditions: Given available program material, informational announcements, command policy guidance, local SOP, and audience analysis.

Standards: Prepare a master schedule that meets the needs of audience analysis, local SOP, and command policy guidance.

Performance Steps

1. As you get ready to draft the program schedule for your station, strategy is one of the first considerations. You need to consider results from the latest audience survey, selection of programming materials, and appropriate time slots for specific target audience. Schedule your show to coincide with what people do throughout the day. The schedule should be compatible with the cyclic nature of people's daily activities. Most people do not have time to be entertained in the workday morning but are interested in the news. Programming your schedule to be compatible with what people do during the day is called day parting.

NOTE: Schedule so that the audiences flow continues from one show to the next. Keep the audience turned in to your station. An example of this would be to program for the adult female during the early afternoon hours (soaps). As the family activity increases in the later afternoon hours, the adult female audience declines and viewing by children increases. So keep the audience flow by scheduling children shows after the soaps.

2. Before you can implement your strategies, you need to identify the target audience; determine the Prime Time; and determine the available programming. To define the target audience, analyze the results of the station's most recent survey. Prime Time is that part of the broadcast day a station can reach the greatest number of people. You will find most Prime Time programming slots usually run from 6:00 to 9:00 p.m. Other day parts would be the morning, midday, and late hours. During these times the programming will reach very narrowly focused afternoon and evening audience segments. It is your job to research the demographics of each day part to justify programming for a particular audience segment.
    a. The programs that are available for airing are provided in AFRTS-BC shipments and satellite networks (SATNET). TELETIPS, which are provided in AFRTS-BC shipments, can aid you in screening for host country sensitivities. It also describes the shows and lists running times and break times for inserting local spot announcements. A restricted list also accompanies the shipment. This list indicates which shows cannot be aired in certain countries.
    b. SATNET provides its users with time-sensitive programming to help supplement AFRTS-BC shipments (that is, evening newscasts, specials, sports specials, and so forth). AFRTS-BC provides a SATNET program schedule for its users, but once a program is received, it is up to the user as to when it will air.
    c. Another consideration is that you are already working with a TV schedule in place. Evaluate its strengths and weaknesses and make programming changes as needed.

3. Arranging the programs, based upon the considerations contained in paragraphs 1 and 2, is known as Blocking. You can block the programs by using Horizontal, Vertical, or Free Form methods. Programming the news at 6:00 p.m. each weekday evening is an example of horizontal blocking. Any program that is placed in the same time slot for two or more days would show horizontal blocking. Vertical blocking is arranging your programs for a one-day period in a top-to-bottom fashion. Running a three-hour football game from 7:00 to 10:00 p.m. on Monday night would indicate vertical blocking.

4. When preparing your schedule, make sure it is balanced. You should try to simulate stateside prime time blocking with your schedule. Follow family viewing with adult prime time shows. Grouping all the sitcoms on one night or all of the dramas on another night would quickly lead to boredom.

Performance Steps

5. Now that you have laid out the programs for the week, you must decide if you are going to Time Schedule or Off-Time Schedule. When you start your shows on the hour or the half-hour, you are time scheduled. Because AFRTS-BC removes all of the commercials, the programs are shorter than 30 or 60 minutes. Therefore, you must schedule fill material or spots if you decide to Time Schedule the programs (some shows must be Time Scheduled, for example the 6:00 o'clock news). If you decide to Off-Time Schedule the program, they would start at times other than the hour or half-hour. If you Off-Time Schedule the programs, you must publicize the start time of the shows.

6. The completed Master program worksheet should contain the name, length, type, source, and day and time of each program. Submit it for approval IAW local SOP. Copies of the approved Master schedule should be distributed to the section that produces the daily program log (usually Traffic and Continuity). The Weekly program schedule is the publicity aspect of the Master program schedule. Local SOP will determine whose responsibility it is to prepare the weekly schedule. It should include day and time of broadcast, program title, and as an option, a brief synopsis of the show.

It is then distributed IAW local SOP to various military and civilian publications. It is also made available to the audience in high traffic areas such as the commissary, Post Exchange, and so forth.

Evaluation Preparation: Setup: Provide soldier with access to needed materials and references. Give him a deadline.

Brief soldier: Tell soldier that he will be evaluated IAW Evaluation Guide.

Performance Measures	**GO**	**NO GO**
1. Formulate programming strategy.	——	——
2. Ensure programming is compatible with what people do during the day (day parting).	——	——
3. Schedule so that the audience flow continues from one show to the next.	——	——
4. Identify target audience.	——	——
5. Determine prime time.	——	——
6. Determine the available programming.	——	——
7. Consult Teletips for show explanations and host country sensitivities.	——	——
8. Consult restricted list for shows that are restricted in the host country.	——	——
9. Utilize SATNET programming as supplemental programming to AFRTS-BC shipments (if SATNET user).	——	——
10. Evaluate current master program schedule for strengths and weaknesses.	——	——
11. Utilize horizontal and vertical methods of blocking programs.	——	——
12. Ensure program schedule is balanced.	——	——
13. Time schedule programs.	——	——
14. Off time schedule programs.	——	——
15. Utilize fill material and spots if time scheduling is used (PM 13).	——	——
16. Publicize programming if Off-time scheduling is used (PM 14).	——	——

Performance Measures	GO	NO GO
17. Ensure completed master program schedule contains name, length, type, source, and day and time of each program.	——	——
18. Submit master program schedule for approval IAW local SOP.	——	——
19. Provide copies of the approval master program schedule to the department responsible for constructing the daily program log.	——	——

Evaluation Guidance: Score the soldier GO if all performance measures are passed (P). Score the soldier NO-GO if any performance measure is failed (F). If any performance measure is failed, show the soldier what was done wrong and how to do it correctly.

Subject Area 3: Plans, Designs, and Develops

Review VI Products
113-631-7002

Conditions: In a tactical or garrison environment, given VI products, AR 380-5, DA Pamphlet 25-91, DOD Directive 5122.10, local SOP, command policy guidance, and completed work order.

Standards: Ensure the VI product is complete and accurate, and in compliance with AR 380-5, DA Pamphlet 25-91, DOD Directive 5122.10, local SOP, command policy guidance, and completed work order.

Performance Measures	**GO**	**NO GO**
1. Review DA Form 3903 for accuracy and completeness.	——	——
a. Ensure requestor information is complete and correct.		
b. Identify security classification.		
c. Identify alternate point of contact.		
d. Review product requirement date.		
e. Ensure description of work to be done is clearly understood.		
f. Review justification.		
g. Recognize any special instructions.		
h. Validate signature.		
2. Ensure an in-house work order number or the appropriate VIRIN number identifies each VI product.	——	——
3. Reference SOP for quality control (QC) procedures.	——	——
4. Review VI product to ensure it meets requirements of DA Form 3903.	——	——
5. Review final product with customer for final approval.	——	——

Evaluation Guidance: Score the soldier GO if all performance measures are passed (P). Score the soldier NO-GO if any performance measure is failed (F). If any performance measure is failed, show the soldier what was done wrong and how to do it correctly.

References
    Required   **Related**
    AR 380-5
    DA PAM 25-91
    DOD DIR 5122.10

Validate a VI Maintenance Program
113-631-6014

Conditions: In a tactical or garrison environment, given: assigned equipment and personnel, the established VI program SOP, authorized parts and materials, technical manuals, DA Form 2404, current DA Form 2405, DA Form 2407, DA Form 3161, DD Form 314, manufacturers' manuals, and warranty information.

Standards: Ensure that the VI maintenance program complies with the Maintenance Management Update and unit SOP.

Performance Measures	GO	NO GO
1. Check the availability and usage of required supplies, equipment, and technical publications.	——	——

    a. Ensure hand receipt inventories are completed.
    b. Spot-check bench stock.
    c. Spot-check technical reference library.

	GO	NO GO
2. Inspect the work place for safety and health violations.	——	——

    a. Inspect the maintenance and completeness of safety boards and first aid kits.
    b. Inspect equipment safety hazard data on file.
    c. Inspect workstation for frayed wires, faulty switches, shorted outlets, and other hazards; follow-up and ensure that nonconformities are corrected.
    d. Ensure safety and health rules and regulations are enforced.
        (1) Adequate ventilation.
        (2) Exits are not blocked with obstacles.
        (3) Combustibles are stored away from high heat areas.
        (4) Safety and emergency phone numbers are posted.
    e. Ensure hazards reported or identified through accident investigation are promptly evaluated and appropriate action is taken.

	GO	NO GO
3. Ensure personnel are receiving relevant, comprehensive on the job training (OJT) to improve individual proficiency and to develop teamwork.	——	——

    a. Provide guidance in determining training tasks, equipment, and objectives.
    b. Ensure training materials and resources that support OJT objectives are made available.
    c. Evaluate the trainer(s) and provide feedback.
    d. Review certification of personnel qualification to standards and documentation.

	GO	NO GO
4. Oversee assignment of tasks, projects, and work orders.	——	——

    a. Ensure no conflict exists in the scheduling of personnel.
    b. Ensure all areas of responsibility are covered.
    c. Ensure correct unit level maintenance procedures are adhered to.
        (1) Preventive maintenance is scheduled on DD Form 314.
        (2) Performance of tasks are followed up, monitored, and inspected.
        (3) Quality control or assurance of all maintenance work and signal levels is performed.
        (4) Engineering standards are set and enforced.
        (5) Deadlines are met.
        (6) Assist if necessary.

	GO	NO GO
5. Monitor technical assistance.	——	——

    a. Vehicle and generator equipment is requested from the Transportation Motor Pool (TMP).

Performance Measures   **GO**   **NO GO**
     b. Test, Measurement, and Diagnostic Equipment (TMDE) are processed for
        calibration.
     c. Directorate of Public Works (DPW) is contacted for facility maintenance.

6. Verify that equipment operators are trained to perform preventive maintenance   ——   ——
   checks and services (PMCS) within their authorized level of maintenance as
   outlined in applicable TMs.
     a. Operator maintenance includes:
        (1) Cleaning, dusting, and wiping equipment.
        (2) Checking for loose or frayed cables.
        (3) Checking that power is connected to the equipment.
        (4) Maintaining proper operation and levels of equipment.
        (5) Documenting uncorrected faults and inoperative operator controls
           (lamps, meters, indicators, switches, and other noticeable damaged or
           missing parts) on DA Form 2404.
        (6) Submitting a DA Form 2407 for equipment requiring immediate
           corrective maintenance.
     b. Spot-check DA Form 2404 (refer to DA Pam 738-750, paragraph 3-4) for
        inspection and services completed, outstanding faults, parts required, and
        readiness status.

7. Review work orders (refer to DA Pam 738-750, paragraph 3-6); ensure necessary   ——   ——
   corrections are made.

8. Report readiness status of all equipment through the chain of command.   ——   ——

9. Review the Maintenance SOP.   ——   ——

Evaluation Guidance: Score the soldier GO if all performance measures are passed (P). Score the
soldier NO-GO if any performance measure is failed (F). If any performance measure is failed, show the
soldier what was done wrong and how to do it correctly.

References
    Required   **Related**
    AR 750-1   AR 385-10
    DA PAM 738-750   DA PAM 600-8
    DD FORM 314   FM 101-5
                                   FM 24-40
                                   FM 25-101
                                   TB 385-10

Write a VI Annex to an Operation Order (OPORD)
113-631-6015

Conditions: In a tactical or garrison environment, given: FM 101-5, unit SOP, message traffic, DOD Instruction 5040.4, DOD Directive 5040.2, FM 24-40, DA Pamphlet 25-91, and DA Pamphlet 25-1-1.

Standards: VI annex to the OPORD is written IAW FM 101-5.

Performance Steps

1. An annex is an integral part of an order that deals with one aspect of an operation. Its purpose is to keep the basic text of an order short. The number or type of annexes used is governed by the needs of the particular order.
    a. Annexes should increase the clarity and usefulness of the order while providing information and direction to subordinate and supporting units of the command.
    b. Additions that are necessary to amplify an annex are contained in appendixes numbered serially with Arabic numerals, for example, Appendix 5 (Visual Documentation) to Annex H (Communications Electronics).

2. Annexes are normally divided into five sections (paragraphs): the Situation, the Mission, the Execution, Service Support, and Command and Signal (Figure 3-3). All operation plans, annexes, and appendixes use the five-paragraph format.

SITUATION
      a. Enemy Forces
      b. Friendly Forces
      c. Attachments and Detachments
      d. Assumptions

MISSION

EXECUTION
      a. Concept of Operation
      b. Specific Tasks to be Accomplished by Each Element
        of the command

SERVICE SUPPORT

COMMAND AND SIGNAL
      a. Command
      b. Signal
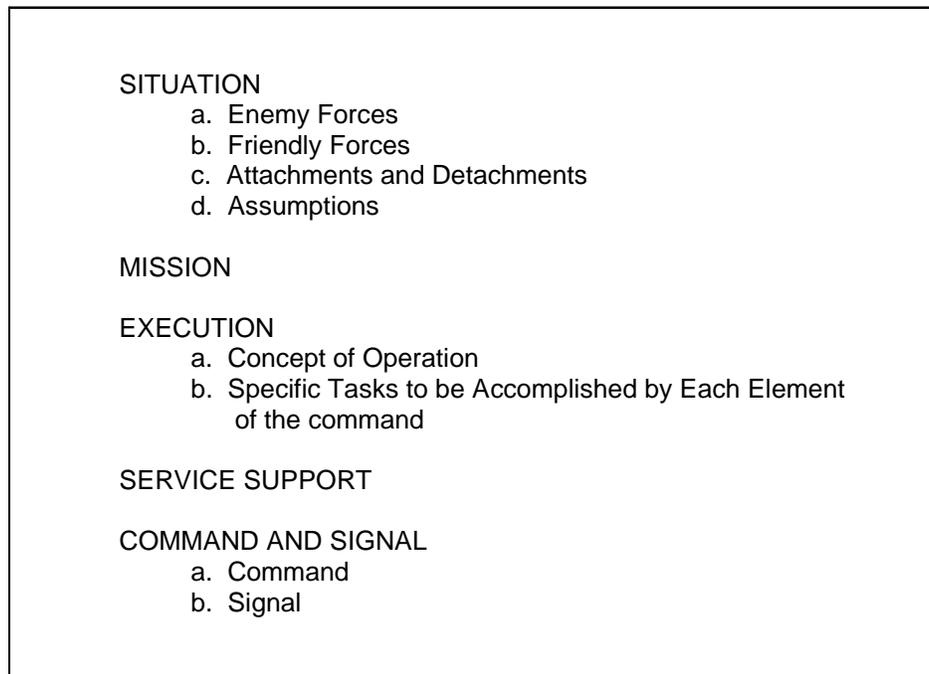
Figure 3-3. Operation Plan Outline.

    a. The Situation is a general statement of administrative and logistic factors affecting support of the operation. It includes information on the general overall situation essential to understand the current situation as it influences combat service support. It always includes subparagraphs: a. Enemy Forces, b. Friendly Forces, and c. Attachments and Detachments.

Performance Steps

      (1) VI units attached to or detached from the issuing headquarters with the time that attachments or detachments are effective, are noted in the Situation section, subparagraph c.

NOTE: If VI units are already noted under Task Organization, record this fact also. In the case of a unit that has been attached for sometime, the term remains attached is used.

      (2) Sometimes a fourth subparagraph, d, Assumptions, is included in the Situation section. It contains those situation or conditions that the commander believes will exist at the time the operation plan becomes an operation order.

  b. A Mission statement is a clear, concise paragraph of the task and its purpose that is to be accomplished by the command. The mission statement is derived from the commander's mission analysis and is stated in full, even if shown on the operation overlay. It never has subparagraphs.

  c. In the Execution paragraph, the concept of operation is a statement of how the selected course of action is to be accomplished. It accurately provides subordinates the commander's intent in order that mission accomplishment is possible in the time available in the absence of additional communications or further instructions.

      (1) The concept clarifies the purpose of the operation and is stated in sufficient detail to ensure appropriate action by subordinates. Style is not emphasized at the expense of substance, but clarity and conciseness must prevail. The amount and detail should be sufficient to indicate what is to be accomplished by the force as a whole. The concept may be a single paragraph, or divided into two or more subparagraphs. If an operation overlay is used, it is referenced here.

NOTE: If the concept is unusually lengthy, it may be prepared as an annex.

      (2) The concept of operation normally includes consideration of the close-in battle as well as deep battle and aspects of rear area protection. When an operation involves two or more distinct phases, the concept of operation may be prepared in subparagraphs describing in each phase the specific tasks to be accomplished by each element of the command changed with the execution of the tactical missions given.

      (3) All information and instructions on personnel matters, including foreign civilian labor used in direct military support functions is included in the concept of operation. When applicable list the installation, location, and time of opening or closing; operating units; the units or area served; rest, leave, and rotation criteria and quotas allocated to units; responsibility for movement or administration of personnel; reports required; requisitions or plans concerning personnel activities; and necessary references to previous order, instructions or SOP.

      (4) The miscellaneous section in the concept of operation covers any points of detail not covered above or referenced to an appendix. If required, necessary items are listed that are not covered above or in the SOPs, or that require action different from that detailed in the SOPs.

  d. The Service Support paragraph contains a statement of the instructions and arrangements supporting the operation that are of primary interest to the units and formations being supported.

      (1) Include information about supply, transportation, maintenance, services, and allocation of labor. It should contain a subparagraph for each class of supply, maps, water, special supplies, excess materiel, salvage materiel, and captured enemy materiel.

      (2) When applicable, each subparagraph contains: the location of the installations concerned with the handling of supplies and materials for supported units; the time of opening and closing; operating units; supported units; levels of supply; methods and schedules of distribution; instructions for submission of routine reports concerning the particular supplies listed; and any other pertinent instructions or information needed by supported units.

Performance Steps

3. The Command and Signal Section contains instructions relative to command and to the operation of C-E. It normally has two subparagraphs Command and Signal. Command instructions may include command post (CP) locations and axis of CP displacement if not shown on an accompanying overlay. Liaison requirements, designation of alternate CP, and succession of command will be entered in this subparagraph if not adequately covered in the SOP. C-E instructions may include rules concerning the use of communications and other electronic equipment (for example, radio silence). As a minimum, it should list the current Communications-Electronic operation Instructions (CEOI) index.

4. An example of an appendix to an annex of an operation order (FM 101-5) is located in Appendix C.

Performance Measures	GO	NO GO

1. Determine and write the Situation statement to include:
   a. Attachments and detachments.
   b. Estimate of conditions.
	——	——

2. Determine the mission and write the statements.	——	——

3. Decide upon Execution and write the section, to include:
   a. Concept of operation.
   b. Specific tasks.
   c. Coordinating instructions.
	——	——

4. Decide on Service Support and write the statement, to include:
   a. General.
   b. Material and services.
   c. Personnel.
   d. Miscellaneous.
	——	——

5. Determine and write the Command and Signal statement to include:
   a. Command.
   b. Signal.
	——	——

Evaluation Guidance: Score the soldier GO if all performance measures are passed (P). Score the soldier NO-GO if any performance measure is failed (F). If any performance measure is failed, show the soldier what was done wrong and how to do it correctly.

References

Required	Related
DA PAM 25-1-1	
DA PAM 25-91	
DOD DIR 5040.2	
FM 101-5	
FM 24-40	

Coordinate the VI Assets of a Multimedia Project
113-636-1001

Conditions: In a tactical or a garrison environment, given: VI assets, work order, command policy guidance, unit SOP, DA Pamphlet 25-91, and DOD Directive 5120.20.

Standards: Multimedia project is completed IAW work order, unit SOP, command policy guidance, and DA Pamphlet 25-91.

Performance Steps

1. After you have been given the assignment, research the topic or subject matter to obtain needed background information. Information can be obtained from the post and public libraries. World Wide Web (WWW), newspapers or magazine articles, individuals who are knowledgeable on the subject matter or have personal experience. Review all information obtained through sources for correctness.

2. Determine the objective(s) of the multimedia project/special event program.

3. Identify the target audience and determine the intended effect on the audience (for example, inform, entertain, instruct, and so forth).

4. Write a script or project plan, if necessary, focusing on one central theme of the project/program. Make sure the "attention getter" attracts the listener's/viewer's attention. Use colorful language to avoid just telling him what is happening. Language use should be a simple grammatical format avoiding slang and jargon. Keep him involved in the program and maintain his interest.

5. Conduct a studio and/or site survey to determine needed personnel and equipment. If the project/program is a remote production/broadcast, consider alternate sites from which to perform. Conditions and event considerations may change or be altered. Select needed personnel and equipment. Ensure that the equipment is in working order.

6. If necessary, contact the project/program event originator to coordinate coverage. Verify the date, place and time of the production. Provide a list of names and equipment, if passes are required. If the media is invited, obtain press credentials of those who will attend.

7. Determine and obtain the logistical support needed to execute the production, if necessary (for example, transportation, housing, food, power, telephone lines, and so forth). The point of contact at the event site may be able to help.

8. Make arrangements to publicize or promote the program (radio, television, newspapers, and so forth).

9. Conduct meetings, as necessary, with all of the people involved in the program. Identify any problems and work them out to your satisfaction. Delegate tasks and follow up to see that those tasks are accomplished. Conduct rehearsals, if appropriate.

10. After the production, evaluate its effectiveness via telephone, written surveys, person-to-person interviews, and so forth. Document post-production decisions, IAW local SOP.

Performance Measures	**GO**	**NO GO**
1. Research topic or subject matter.	——	——
2. Review information obtained during research for correctness (repeat performance measure (PM) 1, if necessary).	——	——
3. Determine the objective(s) of the multimedia project/special event program.	——	——

Performance Measures	GO	NO GO
4. Identify the target audience.	――	――
5. Determine intended effect on the audience.	――	――
6. Write script or project plan.	――	――
7. Focus script on central theme.	――	――
8. Use a simple grammatical format (avoiding slang and jargon).	――	――
9. Conduct studio or site survey.	――	――
10. Select needed personnel and equipment.	――	――
11. Ensure equipment is in working order.	――	――
12. Contact event originator to coordinate coverage.	――	――
13. Determine and obtain logistical support, if necessary.	――	――
14. Ensure program is advertised or promoted.	――	――
15. Conduct meetings, as necessary, with program personnel.	――	――
16. Conduct project/program rehearsals.	――	――
17. Tape or document program for later broadcast, if appropriate.	――	――
18. Evaluate effectiveness of program.	――	――
19. Document post-production decisions, IAW local SOP.	――	――

Evaluation Guidance: Score the soldier GO if all steps are passed. Score the soldier NO-GO if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly. Have the soldier practice until he can correctly perform the task.

References

Required	Related
APPENDIX E (25Z)	
DA PAM 25-91	
DOD DIR 5120.20	

APPENDIX A

VISUAL INFORMATION MANAGEMENT TOOLS
(Excerpts from the VIM Course)

A-1. THE VISUAL INFORMATION PROCESS WITHIN THE DEPARTMENT OF DEFENSE

a. **Visual information. (VI).** The visual information process no longer involves just viewgraphs, photographs, and training videos. The VI delivers seamless, accurate, and on-demand information critical to Department of Defense (DOD) combat and combat-support missions. VI management can be defined in many different ways, but it can be best described as dynamic.

(1) A Visual Information Manager cannot simply pull out a daily schedule and expect to follow what's outlined in the events of that schedule. The day's events are always changing, things go wrong, the unexpected happens, and before you know it, the list of "Things-To-Do" has gone out the window. VI managers' career progresses in the same manner. Just when you think you've become the expert on a certain piece of equipment or mastered a technique, new technology surfaces, and you've got to relearn everything all over again.

(2) The Visual Information Manager (VIM) has a multitude of responsibilities that range form complex to minor, from an emergency situation to normal every day routine, and from mission related to personal. Your role is to advocate, advise, consult, educate, train facilitate, integrate, plan, acquire, and develop VI products and services. As a manager you must provide the following:

- Long-range vision, goals, and objectives for you VI program.
- Input of VI requirements in strategic, tactical, operational, and implementation plans throughout your unit and service.
- Intellectual leadership for applying and managing your VI program.
- Status information and data on VI production and customer satisfaction.
- Guidance, planning, standards, procedures, methods, and training for VI functions. Personnel and customers.
- Planning, programming, and administration of your VI program.
- Interaction with other VI organizations within and outside of your service.
- Resource management to respond to customer needs.

(3) Each VIM is an individual and experience varies greatly in how to handle situations and deal with problems. VIM can best be described as the creative, efficient, and effective use of all resources to reach an objective in a dynamic, challenging environment.

b. **Definition of visual information.**

(1) Visual Information is defined as the use of one or more of the various visual media with or without sound. VI includes but is not limited to, still photography, motion picture photography, video recording with or without sound, graphic arts, visual aids, models, display, visual presentation services, and various support processes.

(2) Within the Department of Defense, visual information is that aspect of information resources dealing with facets of the communications process that use audio and visual processes of photography, videography, graphics arts (conventional and digital) that support DOD and other applications. The communication process is the exchange of ideas, data, and information regardless of the form or technology used.

(3) The DOD VI process manages, consults, acquires, procures, generates, refines, organizes, presents, duplicates, distributes, stores, and disposes of VI products and services that are used efficiently and cost-effectively to satisfy customers' visual communications requirements.

c. **Mission of visual information.**

(1) The general mission of VI is to provide audiovisual-based products and services to support DOD organizations, missions, and functions. This is accomplished through the capture, creation, configuration, reconfiguration, management, and distribution of audio visually based information. This is achieved through the use of a variety of techniques and technologies to capture and use visual images and audio sounds to meet customer communication and information requirements. VI personnel are equipped with specialized knowledge and training to effectively provide visual information support in the areas of videography, photography, illustration and layout, and other information production techniques and technologies.

(2) All DOD missions and organizations are supported with various types of VI products and services. VI is essential to gather, process, analyze, and assess effectively, the vast information in the modern decision-making processes throughout the functional areas of the DOD.

d. **Organization of visual information.**

(1) No functional user has direct and complete responsibility for the entire VI program within the Department of Defense. The individual Services are responsible for their own VI programs and have offices that centrally manage these programs and establish VI policy. At the DOD level, the American Forces Information Service (AFIS) is responsible for advising the Assistant Secretary of Defense (Public Affairs) on development of policies, guidelines, and standards for the management of DOD visual information activities and programs. While AFIS has management responsibility for DOD VI assets, it does not have direct control of the VI assets of each service. In that retard, AFIS acts mainly as an advisory body to each services' VI manager. The responsibilities of AFIS concerning VI include management oversight of the Joint Visual Information Services (JVIS); development of common VI formats and standardization guidelines; and management of the Defense Information School (DINFOS). See Figure A-1 and A-2.
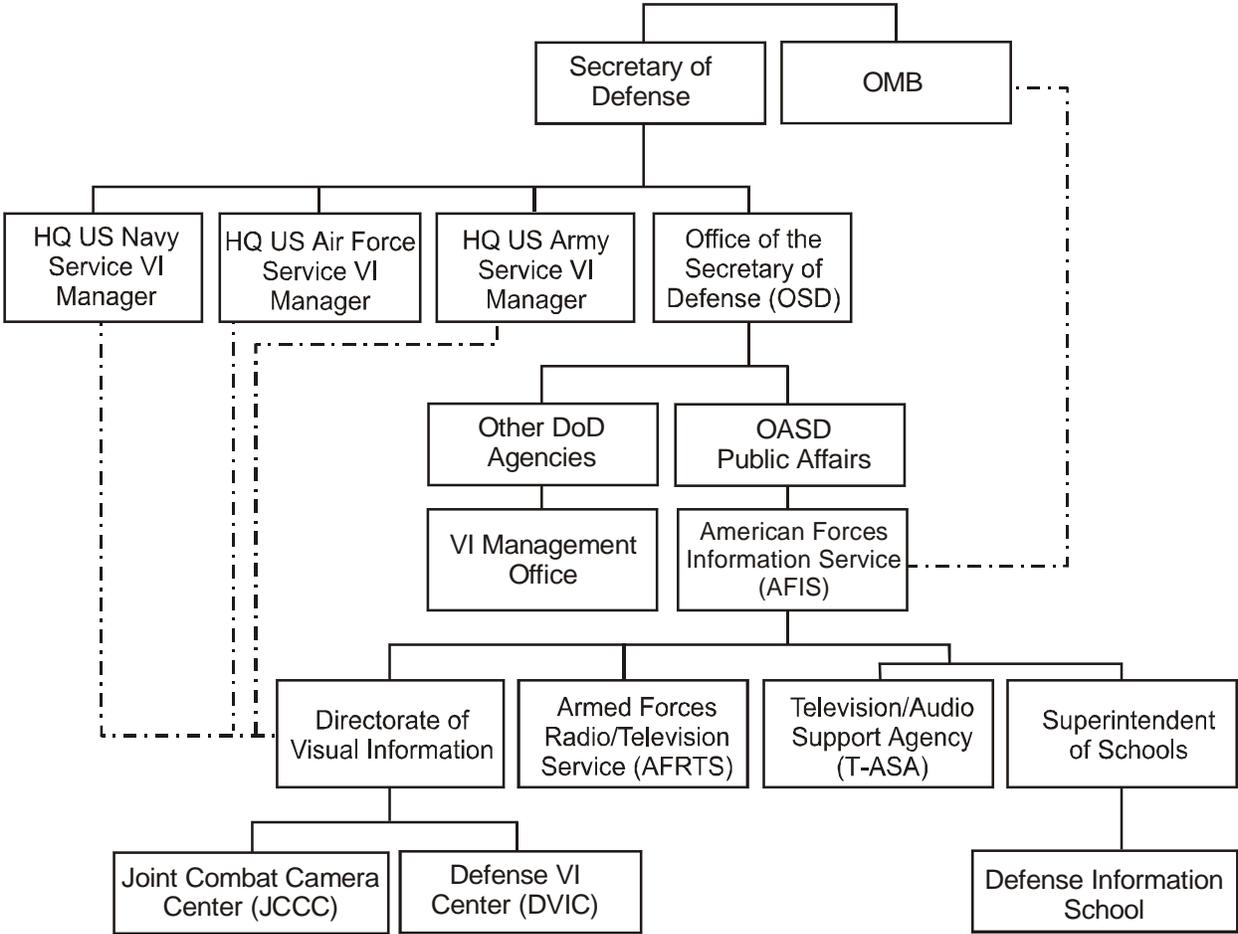
Figure A-1. DINFOS Organizational Chart.

(2) The Joint Visual Information Services are separately authorized and specially managed VI activities that provide regional or DOD-wide support for VI. They include:

- The Defense VI Center (DVIC) – provides VI records center products and services and maintains both the still and motion picture media depository for the DOD and the specific services.
- Television-audio Support Activity (T-ASA) – provides DOD support to design, engineer, and procure VI systems and equipment requirements.
- DOD Joint Combat Camera Center (JCCC) – provides a state of the art electronic imaging environment at a central DOD point to expeditiously receive, process, and distribute current Combat Camera imagery to and from worldwide sources and users.
- Joint Visual Information Services Distribution Activity (JVISDA) – operates and maintains a DOD central visual information product and distribution activity. Serves as the inventory control point for all DOD VI products assigned to them for accountability.
- Joint Visual Information Activity (JVIA) – provides contract services for DOD visual information productions.
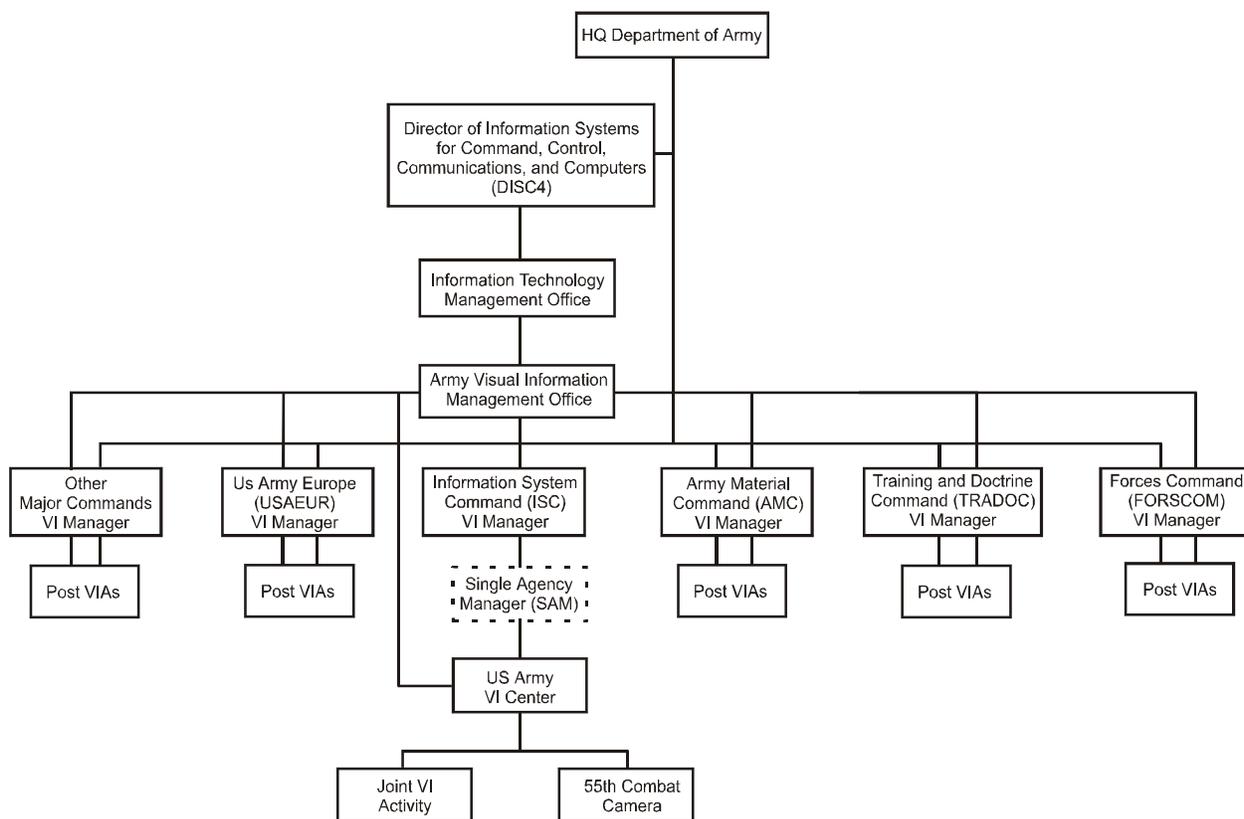
Figure A-2. JVIA Organizational Chart.

A-2. DIRECTIVES, INSTRUCTIONS, AND REGULATIONS

   a. There are numerous guidelines, regulations and instructions that a VIM should become familiar. They will help guide you in the daily accomplishment of your duties.

- Department of Defense Directive (DODD) 5040.2 – Visual Information. Implements OMB Circular A-130. Provides for rapid deployment Combat Camera teams; general purpose VI support for documentation, production, distribution, records centers, and installation-level support; and VI support of medical, intelligence, and research, training capability and career progression for VI personnel. Assigns responsibility for central VI management office for each component Service; Defense Automated Visual Information Service (DAVIS); and central repositories. Establishes procedures for production of annual reports.
- Department of Defense Directive (DODD) 5040.4 – Joint Combat Camera (COMCAM) Program. Defines the purpose of Combat Camera. Establishes policy, assigns responsibilities, and procedures for employing COMCAM resources for joint operations and for the origination, control, and disposition of COMCAM images.
- Department of Defense Directive (DODD) 5040.5 – Alteration of Official DOD Imagery. Establishes policy and assigns responsibilities to ensure the absolute credibility of official DOD imagery in and outside the DOD. Specifies what can and cannot be done with image alteration and enhancement.
- OMB Circular A-130 – Management of Federal Information Resources.

Establishes policy for the management of Federal information resources (visual information included). Provides procedures and analytic guidelines for implementing specific aspects of policy. Requires that each federal agency designate an office with responsibility for management oversight of agency audiovisual productions, along with the proper management of audiovisual productions, facilities, and activities.

- Army Regulation 25-1 – Army Information Resources Management Program. Covers VI missions; VI activities; Army Combat Camera; Army JVIS; VI productions; VI records management; Army VI documentation program (AVIDP); functions of graphic arts, still photo, video teleconferencing, cable television; function of the Visual Information Systems Program (VISP); DAVIS; VI operations; and required VI reports and forms.

b. **Deployment of VI assets.**

(1) COMCAM is defined as VI documentation (VIDOC) covering air, sea, and ground actions of Armed Forces in combat and combat support operations, and in related peacetime training activities such as exercises, war games, and operations.

(2) COMCAM imagery, acquired using still photo, video, and motion picture cameras, provides command, control, and management authorities, that may not be on the scene of deployment, the ability to visualize the essence of ongoing activities. COMCAM records of DOD activities are an important, and often the only, source of operational and technical imagery and information for decision-making at all levels and for informing the public via public affairs (PA) or press media pool requirements. While COMCAM imagery may eventually be used for PA purposes, its primary use is as an operational decision-making tool. COMCAM personnel must be allowed to photograph all aspects of an operation or event; decisions on classification, sensitivity, or public release may be made afterward through intelligence, operations, and PA staff coordination.

(3) COMCAM imagery requirements include, but are not limited to:

- Key actions before, during, and after mobilization, deployment, force generation, and force employment.
- Assess the effectiveness of force preparations, support operations, and attainment of objectives; problem identification; evaluating the effectiveness of weapons systems; intelligence-related activities; medical support and intelligence; PA purposes; and countering enemy propaganda.
- Historical documentation.
- Stock footage.

(4) The use of COMCAM imagery during a conflict shall be prioritized as follows:

- On-scene commander.
- JTF Commander.
- Supported Unified or Specified Command.
- NCA, JCS, Joint Staff, and Military Services.
- PA, when appropriate.
- After-action requirements, historical record, and training.

(5) In every situation, expeditious distribution of imagery to recipients is essential. All original materials and captions should be forwarded to the JCCC; original materials should not be given to anyone who is not in the JCCC distribution chain. Too often, original materials have been lost because they were given to unauthorized individuals who subsequently lost them or retained them for their own use.

(6) COMCAM resources are normally under the operational control of the supported Unified Commander. Regardless of source or composition, COMCAM teams deployed in response to tasking by the JCS, Joint Staff, or a Unified or Specified Command is considered a joint COMCAM team. While COMCAM personnel normally document the activities of their own Military Service, this may not always be practical or possible. However, forming joint multi-Service COMCAM teams must be done only when preparations and training of all team members are adequate and suitable for the deployment environment and mission type. The senior COMCAM officer or NCO serves as an ad hoc member of the J-3 staff. He must coordinate COMCAM requirements and direct the activities of the joint COMCAM team.

c. **Readiness requirements for COMCAM units.**

(1) COMCAM team readiness should be equal to and consistent with the forces with which they are tasked to deploy. COMCAM managers should obtain access to secure voice communications, as needed, to support mission coordination.

(2) COMCAM teams should employ equipment with compatible technical formats or ensure their ability to interface for interoperability while deployed in joint COMCAM operations.

(3) COMCAM teams should have field videotape editing and duplicating capability. Besides providing the capability to support on-scene briefings presented in joint and or combined operations centers, this will also facilitate approval of COMCAM imagery by host-nation officials when deployed outside the CONUS.

(4) Formats and film types shall be coordinated to ensure interoperability and to meet mission requirements.

(5) Most COMCAM units have digital camera systems. Additionally, commercial transportable satellite communications systems are available in CONUS for deployment. Digital cameras used with these systems or commercial telephone, data, Digital Switch Network (DSN); and so forth, systems, provide rapid point-to-point transmission of images from virtually anywhere in the world. Before transmission, appropriate clearance officials must approve transmission of images transmitted in this manner, via nonsecure means.

(6) To the maximum extent possible, TEMPEST consideration should be given to video and communications equipment.

(7) COMCAM units and personnel assigned the mission of rapid response should have sufficient organic field equipment to sustain themselves in hostile and austere environments and to integrate themselves into the joint combat force environment.

(8) COMCAM personnel should maintain at least a SECRET security clearance.

(9) COMCAM personnel should maintain a current official passport that should be carried with them during a deployment.

(10) COMCAM personnel who may be deployed in to a hostile fire environment should be small arms qualified. COMCAM units should maintain mobility stocks of these weapons to accompany teams deployed with combat forces. The COMCAM team must have a sufficient capability to protect itself while integrated into a combat environment.

(11) Deployments in crisis situations or deployments to areas where a US presence is politically sensitive present special challenges to COMCAM personnel – especially those deployed first and especially if the environment is austere, there are airlift constraints within the theater, and the COMCAM team size is limited. In these instances, COMCAM personnel must be experienced in all aspects of their mission. COMCAM personnel must be sufficiently trained to work with limited supervision, coordinate their own support, and make their products available to the field commander. Maximum field training should be conducted to acquire and hone these skills. COMCAM teams should train to operate in the type environment and with the operational forces with which they are tasked to deploy.

(12) While hard quarters are desirable to support field video editing and maintenance for COMCAM teams, in most deployments those quarters will not be available. Consequently, COMCAM teams should maintain organic equipment to allow them to operate in austere environments.

(13) In most crisis situations, it can be anticipated that contract or host-nation transportation assets will not be available. Optimum transportation for COMCAM teams is a four-wheel drive, camouflaged, six-passenger cargo vehicle (or similar suitable alternative) with a covered cargo area. The vehicle should be equipped with a field radio. Lack of four-wheel drive capability will severely limit the ability of the COMCAM team to document visually the activities of deployed combat units.

d. **Concept of employment.**

(1) The primary mission of Combat Camera is to provide a Combatant Command/Joint Task Force with the capability to acquire, process, and deliver still and motion imagery. This capability is required to:

- Communicate the mission (providing both an operational and strategic context).
- Enhance situational awareness.
- Provide mission documentation for planning, legal, training, and PA requirements.
- Support information warfare.

(2) Combat Camera also provides the National Command Authorities, including the Chairman, Joint Chiefs of Staff, with a directed imagery capability in support of information requirements during worldwide crisis, contingency, and wartime operations.

(3) The structure of a typical deployed Combat Camera unit includes a Headquarters Electronic Imagery section and up to three image acquisition teams. The Service Combat Camera forces are designed to provide for tailored unit type code (UTC) imagery acquisition packages to meet smaller contingency requirements.

(4) Under the concept of employment, the J-3 establishes and assigns image acquisition priorities. Combat Camera acquisition teams, equipped with digital still cameras and Hi-8 video

camcorders, will acquire the imagery and download it into imagery workstations. These laptop stations provide for editing and storage, the embedding of textual data in the image file and for image compression prior to transmission over tactical communication links or Combat Camera Inmarsat systems. Advanced editing, printing, and storage capabilities are provided by the Headquarters section.

(5) Imagery acquired by the Combat Camera teams is directly provided to the local commander and electronically transmitted via the Combat Camera Inmarsat systems or over theater/strategic communication assets to the Combatant Command and the JCCC in the Pentagon. Current imagery transmitted to the JCCC is available electronically via a digital image management system to the JCS, the military services, other DOD agencies, and interested joint and service commands.

(6) A typical employment scenario would have the J-3 identify imagery of airfields, port facilities, roads, bridges, and power stations as a priority requirement. The Combat Camera unit would provide the imagery, with embedded textual data, to a Joint Task Force (JTF) staff in either a digital or photographic format for initial operational, intelligence, and logistical planning. To provide senior defense leadership with increased situational awareness, the JTF may simultaneously transmit the same imagery to the Unified Commander and the JCCC. After initial distribution by the Center, the imagery becomes a long-term information resource that is electronically available across DOD in support of ongoing or future mission requirements.

e. **Joint Combat Camera Center.**

(1) The Joint Combat Camera Center, located at the Pentagon, receives all COMCAM imagery from deployed COMCAM teams during joint operations. The JCCC ensures that the imagery is processed, printed, edited, dubbed, and so forth, so the needs of the National Command Authority (NCA), the Chairman of the Joint Chiefs of Staff (CJCS), the Joint Staff, Military Services, operations centers, Office of the Assistant Secretary of Defense (OASD) PA, and other authorized agencies are met.

(2) During a crisis situation, the OSD COMCAM Representative, prepares an immediate precedence message for Joint Staff release advising that the JCCC is operating in an expanded mode and that all COMCAM material shall be shipped and/or transmitted in accordance with DOD Directive 5040.4. The JCCC ensures expeditious handling and distribution of all incoming COMCAM material. It is staffed according to the needs of the operation, and its hours are flexible enough to accommodate the requirements of all customers.

(3) After material has been processed/edited by the appropriate VI activity, the JCCC ensures that the completed material is delivered to the following primary customers immediately upon completion:

- CJCS briefing team.
- Military Services' operations centers, as appropriate.
- Supported Unified Command liaison officer.
- OASD (PA) and Service PA offices, as appropriate.
- Others, as required.

(4) When JCCC requirements have been met, the original COMCAM material is returned to the originating Military Service for that Service's further internal use and accessioning to the DOD VI records centers.

(5) The senior person on duty in the JCCC is the liaison between the primary National Capital Region customers and the COMCAM teams in the field. That person identifies imagery and communicates this to the COMCAM team. He or she also provides feedback to the team on subject matter, image quality, captions, and receipt and use of materials.

f. **Visual Information Record Identification Number.**

(1) The Visual Information Record Identification Number (VIRIN) is the life-cycle number of each unit of media, used to identify all nonproduction media that will be accessioned and/or sent to the JCCC. Completed AV productions are assigned and accessioned to the record centers using PINs or PANs, which are discussed in another section.

(2) A DOD level review of the VIRIN system in 1995 indicated that the system was not effective in supporting imagery acquired in a join operations environment. In addition, it determined that the VIRIN was unnecessarily complex and didn't meet combat camera requirements for a simple numbering system that can be independently generated at the lowest acquisition level be the originator (for example, camera operator, producer, graphic illustrator). To overcome these shortfalls, a new VIRIN system has been developed and implemented in 1996. The new VIRIN applies to all selected imagery intended for submission to either Service accessioning points, the JCCC, or the Defense Visual Information Center (DVIC). All other significant photographic, video and graphic imagery, regardless of the medium in which it is acquired, stored, or displayed, should have a VIRIN applied to support long term record requirements.

(a) The new VIRIN consists of 15 data elements in the format:

   NNNNNN-A-NNNNA-NNN

(b) The data elements of the new VIRIN consist of the following fields (with a dash between each field):

- Field 1 (NNNNNN): Date (Year, Month, Day) image acquired or originated.
- Field 2 (A): Activity/Service affiliation of originator (A = Army, N = Navy, F = Air Force, M= Marine Corps, G = Coast Guard, D = DOD Civilian Employee in joint or other non-Service specific organization, o = all non-DOD civilians and coalition or allied forces).
- Field 3 (NNNNA): Originator personal identification (Last four numbers of the originator's social security number plus the first initial of their last name). NOTE: Imagery acquired by coalition or allied forces should be assigned 9999 for individual's social security number plus the first initial of their last name.
- Field 4: Sequential number (three digit sequential number starting with 001 to differentiate individual images and motion media footage that was acquired or originated by the same individual on the same day).

(c) An example of the new VIRIN in use is: Army Sergeant John Doe, SSN 123-45-6789, would identify his forth image or video segment taken on 2 January 1996 as: 960102-A-6789D-004.

(3) Still Imagery Procedures. Each individual still image selected as record photography will have its own VIRIN. All copies of an image, regardless of medium or format, will retain the same VIRIN as the original. A compressed version of a still digital image will have the same VIRIN as the uncompressed original. The file names of all digital images should be the same as the VIRIN when the software platform allows (as in Macintosh, Unix, and Windows 95). VIRIN data should be entered into the Image Perspective Transformation Caption (IPTC) field "Image Number" if the originator has the ability to embed IPTC caption data in the image file.

(4) Motion Imagery Procedures. A VIRIN will be assigned to identify motion imagery used to record a specific event or activity for record purposes. All copies of this imager, regardless of medium or format, will retain the same VIRIN as the original with the exception of imagery used in support of stand-alone productions of compilations. A VIRIN slate will precede the recording of a specific event or activity. A VIRIN slate should also be used to reestablish identity when there is a significant break in the continuity of the imagery. The consolidation of the motion imagery of separate events on to a videotape, film reel, or digital storage device will include all applicable VIRINs. The physical exterior of each individual videotape, film reel, or digital motion storage device submitted to either a Service accession point, JCCC, or DVIC, will be marked with the applicable subject matter VIRINs. Still and motion imagery intended as long-term records will have a unique VIRIN assigned. The data element for the originator will reflect the individual most responsible for producing the compilation. VIRIN procedures apply to graphic images also that meet record criterion. The data element for the originator will reflect the individual most responsible for creating the graphic.

(5) VIRIN Log. Consider your VIRIN log to be a management tool that keeps track of submission to the depositories. You may use it as a work/job order log also. Entries include: VIRIN, VI center work/job order number, security classification, format, media type, subject matter, date originated, artist's name, and final disposition of the product.

g. **Imagery transmission.** Significant COMCAM imagery from all Services should be sent by the fastest possible means to the JCCC. Before shipping or transmitting COMCAM materials to the JCCC, the senior COMCAM officer or NCO should ensure that field and Unified Command requirements are satisfied and that the joint commander or Unified Command approves the transmission of the imagery to the JCCC. There are numerous ways to ship COMCAM materials. They include, but are not limited to, military air, commercial air counter-to-counter service, air express (FedEx, UPS, Emery Air Freight, and so forth), diplomatic pouch, registered mail, and courier. When materials are shipped to the JCCC, the sender should notify them via telephone or message of the mode of shipment, airport at which the material will arrive, airline, flight number, arrival time, number of packages, and so forth. The sender should include information addressees according to Service requirements.

(1) **Electronic transmission.** Those COMCAM units possessing electronic imaging equipment have the capability to transmit still images directly to the JCCC or any other location that has compatible equipment. This method should be used whenever possible; however, security considerations are paramount. All transmitted images must be approved by appropriate clearance officials before transmission if encryption equipment is not available,.

(2) **Shipment or transmission of classified materials.** The following is general guidance including methods approved for transportation of classified material (up to and including SECRET) to and from overseas locations:

- Armed Forces Courier Service.
- Authorized DOD Component Courier Service.
- Department of State Courier Service.
- Diplomatic Pouch.
- Cleared and designated US military personnel and Government civilian employees travel on a conveyance owned, controlled, or chartered by the US Government or DOD contractors to include the following:
- Surface transportation.
- Scheduled commercial passenger aircraft within and between the US, its territories, and Canada.
- Scheduled commercial passenger aircraft on flights outside the US, its territories, and Canada.
- Cryptologic system.
- US Postal Service registered mail within and between the United States, its territories, and the Army Post Office and/or Fleet Post Office system when outside the United States.
- Canadian registered mail.
- Carriers authorized to transport SECRET information by way of a protective security service.
- The Logistics Aircraft System (items shall be receipted for on a terminal to terminal basis).
- Carriers under appropriate escort; that is, US Government and Government contract vehicles, including aircraft, ships of the US Navy, civil service operated US Naval ships, and ships of US registry.
- For CONFIDENTIAL items only: US Postal Service first class mail when shipped between DOD Component locations anywhere in the United States and its territories.
- For CONFIDENTIAL items shipped within U.S. boundaries only: Transmission of classified video must be done over National Security Agency (NSA) approved systems (STU-III, KY-57, and so forth).

(3) **Transmitting digital images.**

(a) One of the biggest advantages of electronic imaging is time. After a photograph is taken, it can be transmitted anywhere in the world in a matter of seconds. This makes images available immediately. This immediacy is both critical and valuable to civilian media teams and military organizations. With electronic imaging, there is no film processing or printing. What you need to do is activate a transmitter and send it.

(b) Several methods of transmitting electronic images are used. A common method is by use of the Kodak Digital Camera System. This unit can be hooked to a laptop computer, such as a Macintosh PowerBook, which can be connected to a phone line or uplinked to a satellite.

(c) Companies such as Harris Corporation and PhotoTelesis Inc. have built rugged, portable image processing workstations that are compatible with standard military communication systems and encryption devices. These devices provide a secure means for transmitting tactical intelligence images worldwide.

(d) One problem you may encounter when attempting to transmit images is locating a clear phone line or an available satellite. A clear phone line is necessary to ensure that a good image is transmitted.

(e) Another factor you must consider when transmitting image is the amount of time your are tying the circuit. The larger the file size, the longer it takes to transmit the file. It is good practice to compress files before transmission. When files are received at the other end, they can be decompressed without losing quality. You can see the major advantages of electronic imaging. Images that used to take days or even weeks to obtain, can now be obtained in minutes.

APPENDIX B

ELECTRONIC IMAGING COURSE
(Excerpt From Electronic Imaging Course)

B-1. INTRODUCTION TO COMPUTERS

a. **History of Desktop Publishing.**

(1) No one knows exactly when humans first started communicating using the written word, but we do know that the Phoenicians started using some form of a written alphabet at about 2000 BC. There were no printing presses or even paper, (the Chinese invented paper at about 100 AD), so the Phoenicians wrote on clay tablets or on the skins of animals.

(2) Before the printing press was invented, all books were hand written. They were either orally transcribed or copied word for word out of other books. These books, called illuminated manuscripts, were extremely detailed and ornate, and were very rare and costly. This all changed in the 1440's.

(3) A goldsmith from Mainz, Germany, named Johannes Gutenberg, invented the first modern printing press, called a moveable type press. Gutenberg's press used individual cast lead pieces with raised letters that could be arranged into words and sentences. This new invention made books much easier and faster to produce, and opened up the world to literature. Using movable type was much faster than hand illuminating, but required skilled labor. Typesetters, the people who picked the individual letters out and arranged them to print correctly, were only so fast, and this method was time consuming.

(4) In the 1800's printing presses became much faster by replacing much of the manual labor with horse, waterwheel and steam power. In the early 1800's the invention of roll paper, called a web, made it much easier to print, and widely distributed newspapers were born.

(5) The line-casting machine of the late 1880's was the next major change in publishing. This machine allowed an operator to type the lines into a keyboard and the machine then set the type by pouring hot metal into the mold. This created an entire line of type at a time. The metal line of type is called a slug, and this process is known as hot type.

(6) It also became easier to print photographs by using a process called halftoning. Halftoning is a process where the grays in a photo are reproduced by variable sized dots of black ink. The larger the black dot, the darker the area will appear on the printed page. In the 1920's this process was combined with color photography dyes and the four-color printing process was born. In four-color printing, each page is printed four times. Each time it is printed a different ink color is used. There are only four inks used, and all colors can be reproduced by combining these colors. The colors are cyan, magenta, yellow, and black and are called CMYK colors.

(7) The next step in printing is called cold type. In this process, different letters are stored on transparency films and are projected onto a light sensitive emulsion. By using different projection lenses, type could be printed at different sizes. In the 1950's this process quickly replaced hot type.

(8) In the 1970's digital typesetting began to replace this cold type process. Using computers and digital technology, type can be quickly written, set and printed.

b. **Traditional publishing process.**

(1) Traditionally, creating a document involved several distinct steps. Different people, working separately to complete the project, accomplished these steps. Creating a document usually involves bringing words, graphics and photos together into one cohesive, easy to look at layout.

(2) First, the words. A writer writes the story, usually using a computer as a word processor. After it is written, a hard copy or printed copy is given to the editor, who checks it for accuracy and completeness. The editor returns it to the writer, who makes any necessary changes.

(3) At the same time the writer is working on the story, a photographer and a graphic artist are also at work. The photographer is taking pictures, developing the film and making prints to accompany the story. A graphic artist is creating any graphics or illustrations that need to go along with the text and photographs.

(4) Also, a designer is hard at work deciding how all of these elements will be combined onto the page. The designer decides where each element, such as picture words or illustrations will go, and decides what type of headlines, columns, graphic elements and other design elements will be used.

(5) After each respective person has completed his or her part, all the work is sent to the paste-up artist, who literally cuts and pastes the elements into one layout to be printed.

(6) After the pasted layout is approved it goes to the copy camera where films are made. Then the films go to the printing press where the final pages are printed.

c. **Desktop publishing process.**

(1) Although the final product is similar, the process for creating a document electronically is different, as well as much easier and faster. The writer still creates the story, but instead of printing a copy for the editor, the writer electronically transmits the story to the editor. The editor can then edit and make changes immediately. When the story is completed it is again electronically transmitted, this time to the designer.

(2) The photographer and graphic artist also use computers. The photographer takes pictures using a digital camera, and the images are instantly available for editing and enhancement. There is no need to make prints. The final pictures are electronically transmitted to the designer. The graphic artist uses his or her computer to create the illustrations. The artist can use many of the traditional tools, but the tools are all electronic rather than manual. When the illustrations are complete, they too are sent to the designer electronically. Nothing has been printed out thus far.

(3) You will note that we keep saying that each element of the story is sent to the designer. In electronic publishing, there is no paste-up artist. The designer does the layout on the computer and integrates all the elements without the need for hard copies, cutting, or gluing.

(4) Once the designer is completed, films are made on a special high-resolution printer called an image setter. These films are then sent to the printer who prints the final pages.

d. **Desktop publishing tools.**

(1) To create documents on a computer you must first have a computer! When buying a computer with the intent to use it for desktop publishing, there are several things to consider. First is speed. Different computers work at different speeds. For electronic publishing you need a computer that is as fast as you can afford. You will be using files that are very large and a slow computer may take quite a long time to accomplish normal tasks. Second, you should consider memory. Electronic publishing files do get large, and more memory will make even a slow computer seem as if it is running faster. Get as much as you can! To do any serious electronic publishing you should consider 24 megabytes (MB) of memory to be a minimum.

(2) A computer monitor is a high-resolution television that displays your work. A monitor may be one of the most important pieces of hardware that you use, because you spend all day looking at it. When considering a monitor, one of the most important considerations is size. A larger monitor makes it easy to see the entire page or layout at one view. A smaller monitor forces you to scroll around to see the entire document which does not allow you to get the feel of how all the elements of the page work together. Consider a 17" monitor to be the minimum for electronic publishing, but most professionals use a 21".

(3) A scanner is a device to let you get photos, art, or text into the computer. Much like a copier, a scanner copies whatever you put into it and presents it on the screen. There are two types: flatbed and film.

(a) A flatbed scanner scans flat objects: pages, photos, and flat artwork. These are extremely useful for placing existing art or pictures into a new layout.

(b) There are two types of film scanners: drum and transparency. Transparency scanners are usually smaller and faster than drum scanners. Drum scanners are more expensive, but much higher quality. Both types are used to take negatives or slides and scan them for use in the computer.

(4) As we have said, electronic publishing files can get large. We also regularly move these files from one computer to another, usually in different locations. What we use to accomplish this are large, removable, portable storage devices. These can be external hard disks that can be moved, or removable cartridge systems. These are good for backing up information for future reference, as well as for storing files while moving from computer to computer.

(5) Printers are used to produce proof prints and tests before outputting films in the image setter. Any high quality printer can be used, although the best use Post Script, which is a type of printing language that most electronic publishing software use. You would also want the printer to be fast. Who wants to wait all day to see how a layout looks?

(6) Software is what makes the computer do all of its neat tricks. There are many different types and brands of software, but only a few are really needed: word processing, page layout, illustration, and image editing.

(a) Word processing is software that lets the computer act as an expensive fancy typewriter. It allows you to enter words and then rearrange them however you want. You can also spell and grammar checks. Most have a built-in dictionary and thesaurus. You can also do advanced functions like finding a certain word or group of words and replacing them with something else.

(b) Page Layout software is the heart of an electronic publishing system. You can create document layouts and import words, graphics, and pictures from other programs. You can add headlines, boxes, colors, and many other graphic devices. These applications make it very easy to try new ideas and different layouts with just a push of a button.

(c) Graphics/illustration software turns the computer into a powerful artist's canvas. You can use many tools to draw shapes and lines, and create complex illustrations. There are many options for filling and colors. Images can be combined, altered, and saved.

(d) Image-editing software is used to integrate photographs into the computer. Using image-editing software, you can easily get a picture from a digital camera or scanner and do all the traditional darkroom effects. You can lighten, darken, crop, enlarge, dodge, burn, and color correct. Image-editing software also allows the user to create composite photos by combining two or more images into one new photo illustration.

e. **Computer basics.**

(1) The binary system is a system of codes that allows all computers to speak the same language, the language of 1's and 0's. That's all the binary system is, a collection of 1's and 0's arranged in a code to represent other information. Each 1 or 0 is called a bit, and it is the smallest part of information that a computer uses. A 1 represents an "on bit" signal to the computer, and a 0 is an "off bit." These 1's and 0's act as switches that tell the computer to do something.

(2) A 1 or a 0 represent all the letters, numbers and symbols that we use? Well, they can't. Each bit is always part of a larger group called a byte. A byte is a grouping of eight bits, and looks something like this: 01101001. There are 256 different possible combinations of these 1's and 0's (2^8= 256). It is in this format of eight bits that all the letters, numbers, punctuation, and special characters of the English language can be created. Other languages, Japanese for instance, require more bits in a byte, because they have more characters. Japanese binary code is based on bytes with 16 bits.

(3) We also speak about memory size and disk capacity in terms of bytes. It would be extremely inconvenient to say, "I have 32,000,000 bytes of memory." So abbreviations have been formulated. First, 1,000 bytes are abbreviated as 1 Kilobyte or 1 K. Next, 1,000,000 bytes are called 1 Megabyte or 1 Meg. Finally, 1,000,000,000 bytes are called 1 Gigabyte or 1 Gig. There are higher levels, but these three will be enough most of the time. So in the example of 32,000,000 bytes, it would be much easier to say, "I have 32 Meg of memory."

(4) When we create a document or start up an application, where is it stored? How does the computer remember it until the next time we are ready to access it? The computer has two ways of recording information for future use: temporary and permanent storage.

(a) Temporary storage is memory that the computer uses to store information while the power is on. Sometimes called volatile memory because it is not permanent. Random Access

Memory (RAM) is one type of temporary memory. RAM is where the computer stores applications and files that are currently being used. RAM is extremely fast for the computer to access, making the computer run much faster than if it has to use other types of storage. RAM chips come on little cards called single in-line memory modules or SIMM's. Users can buy and install new SIMM's, which will make all of your computing faster. Remember, anything stored in RAM is destroyed when the computer is shut down.

(b) Video Random Access Memory (VRAM) is special RAM memory that is dedicated to running the video output. Adding more video RAM makes the screen re-draw faster, and allows a higher color bit depth to be displayed.

(c) You will use permanent storage to store things that you want to use again. Permanent storage allows you to keep documents and files, and to move them from one computer to another. Floppy disks are one type of permanent storage. New disks hold about 1.4 MB of data, but older disks with capacities of 800 K or 400 K are still around. New disks are called High Density and can be identified by the "HD" letters on the top. They also have an extra hole on the top left of the disk as you are facing it. Floppy disks are relatively slow, so it is not practical to work from a floppy. Floppies are very convenient for moving and storing small files, because they are small, cheap and reliable.

(d) Hard disks are another type of permanent storage. Hard disks are usually internally installed in a computer, although external and portable units are available. While floppies are designed mainly to store files and documents, hard disks are also used to store applications that will be used regularly. Hard disks come in many different capacities, from 80 MB up to many Gigabytes, but the most common are in the 250 to 750 MB range. Hard disks are much faster than floppies, but not nearly as fast as RAM.

(e) Next we have removable media. Removable media are similar to floppies in that they can be removed from the drive and taken to a different computer for use, although they have much higher storage capacity. There are many different types and brands of removable media, and capacities from 44 MB up to 500 MB are not uncommon. Common types of removable media are: Magneto Optical that uses lasers and magnetic coding to store data, Syquest, that uses magnets and platters similar to normal hard disks, Digital Tape, that uses magnetic tape similar to that of audio tape, and many others. Most removable disks are not as fast as hard disks but are much faster than floppies. These are all ideal for moving and storing large files and for transporting large files to other computers. Additionally, these are good for backing up important information and archiving, especially Digital Tape, which can hold very large amounts of data. Some hold more than 8 gigabits (GB) but they are somewhat slow.

(f) Read Only Memory (ROM) is permanent memory installed in the computer. This memory is similar to Random Access Memory (RAM), except RAM is erased when the computer is turned off. ROM usually holds operating instructions and codes that tell the computer to act a certain way. Although very important for the computer, the user does not have to think much about ROM because we cannot really affect it.

(g) Compact Disk-Read Only Memory or CD-ROM uses a system of lasers and binary information stored on a thin metal and plastic disk that holds about 650 MB of data. Much like a record player needle, the laser tracks around the disk reading the small pits and lands that represent the 1's and 0's of the binary code. Although hardware is now available to write your own compact disks, most people do not have it so they rely on disks made by others. Compact disks (CD) hold lots of information and are excellent for storing large databases and images.

Once recordable CDs become more economical, they will be ideal for storing huge amounts of information.

f. **Central processing unit.**

(1) The central processing unit or CPU is essentially the brain of the computer. Millions of tiny switches, resistors, and wires are microscopically etched on a small piece of silicon that replaces the vacuum tubes and wires of the first computers. All information that a computer handles travels through the CPU. When you push a button on the keyboard a small chip in the keyboard converts the letter into the binary code. The code then goes to the CPU, which decides what to do with the information. The CPU decides whether it should display a letter on the screen, or execute a command.

(2) The two main types of current CPUs are made either by Intel or Motorola. Typically, Intel chips are used in IBM personal computers (PC) and compatible clones. Intel chips are identified by a code name, the most recent being the Pentium and before that the 486, 386, and others. The higher the number, the newer or faster the chip.

(3) Motorola makes chips that are used in Macintosh computers and are also identified by code numbers. The 68040 models are the most recent with 68030 and 68020 being older models.

(4) Both of these chips were originally based on a system called Complex Instruction Set Computing (CISC). This technology has been around for a while and is on the verge of being replaced by a newer technology called Reduced Instruction Set Computing (RISC). Motorola was the first to switch to the newer and faster CPU's. RISC processors are much faster at certain operations, although they generally require more RAM and hard disk space. A new chip that uses this RISC technology is the PowerPC chip, made by a joint venture between IBM, Apple, and Motorola. Currently Apple uses it in their Power Macintosh line of computers; however, IBM has recently introduced their version of the RISC processor and these new chips will eventually replace the Intel and Motorola designs.

g. **Monitors.**

(1) As we have learned, a monitor is a high-resolution television that the computer uses to display work. Both televisions and monitors work by displaying picture elements or pixels. A pixel is the smallest individual unit of an image. Pixels are a combination of the three primary colors: red, green, and blue. Depending on how bright each dot of red, green, and blue is determines what color appears on the screen. Depending on how the pixels are arranged determines what the screen looks like.

(2) Pixels are formed by three cathode ray emitters, in a cathode ray tube, one for each color. These emitters are at the back of the monitor and point toward you as you face the screen. As the emitters shoot beams of electrons toward you, they strike a phosphor coating on the back of the glass picture tube. The charged energy caused the phosphor to glow briefly. This glow forms the image you see.

(3) One concern with monitors is resolution. Resolution is the measurement of the number of pixels on a screen at any one time. The more pixels on the screen at one time, the more detail the image will have. Some monitor and computer configurations are able to change resolutions. These monitors, called multisynch, are useful because you can have one resolution

set to allow you to see an entire image, and then change resolution to see just a single part of an image.

(4) A second monitor concern is bit depth. Bit depth is the number of colors that the monitor is capable of displaying at any one time. For example: 1 bit color has only two colors, black or white. 4-bit color is 16 colors (or shades of gray). Common bit depths are 16 bit (32,768 colors or shades) and 24 bit (16,777,210 colors or shades). It is important to have a higher bit depth because the higher the bit depth, the more detail that will be visible. This is especially useful in image editing and illustration software.

(5) A concern with bit depth is that it is dependent on the VRAM the computer has, so you may be limited to lower bit depth if you do not have enough VRAM. Also, the higher the bit depth you have set the more computations the computer takes to redraw the screen, so everything may run slower. It is a good idea to set the bit depth as low as possible so as not to waste speed.

(6) The third concern with monitors is the scanning frequency. The cathode ray tube draws the screen starting at the top left (as you look at it) working to the right. When they get to the end of the first line they move back to the beginning of the second line, just as we read. The beams scan each line of the screen, one pixel at a time. The phosphor glows long enough to make it seem as if the screen is lit continuously. When the entire screen has been drawn, the beam moves back to the top and starts over. The screen is redrawn in this manner 60 to 75 times per second! This is called scanning frequency. If it were to redraw any slower than this you would be able to see the screen "flicker." Scanning frequencies are represented by a number of hertz (Hz), or cycles per second. Therefore, a monitor with a scanning frequency of 65 Hz redraws the screen 65 times per second.

h. **Input devices.**

(1) A keyboard is probably the most common type of input device. A keyboard is a collection of switches and a small microchip that converts the keypunches into binary code. Every time you push a key a circuit is completed, which sends a signal to the CPU and either causes an action or displays a character on the screen. The keyboard that is most common today is called the QWERTY keyboard and it is named for the keys in the top left row: Q, W, E, R, T, Y. The keyboard layout is as it was in the early 1800's to slow typists down by forcing the fingers to move a long distance between keystrokes. Early typists got to be faster than their typewriters, causing many jams, so designers figured out this layout to slow them down. There are other key layouts, most notably the Dvorak keypad, which put the most common letters under the fingers. Although the Dvorak layout has proven to be a much faster way to type, old habits die slow and it has not caught on yet.

(2) A mouse is a device that an operator uses to control the pointer. It is much easier using a mouse than using arrow buttons to move to a specific spot on the screen. A mouse also allows the user to be able to point at specific areas of the screen to do an action without having to remember specific commands or codes. A mouse has at least one button on it that can be used to select objects or perform a task. Some have buttons that can be programmed to perform other functions. The only hard thing about a mouse is to remember that the cord points away from the user. A mouse works by being moved; as the user moves the mouse, a ball in the base of the mouse moves. This ball turns two spindles that rotate two small shutters. A beam of light passes through the shutter. As the mouse moves the light pulses on and off and the computer translates this into a movement.

(3) A graphics tablet resembles a large clipboard or notebook with a non-writing pen called a stylus. The user moves the pointer around on the screen using the stylus. Once a person gets used to a graphics tablet, they can work much more accurately than when drawing with a mouse. Some tablets have a clear covering for placing artwork under while tracing. Tablets work by detecting disruptions in a magnetic field created by the stylus. Stylus can be corded or cordless, however, most have batteries.

(4) There are many other input devices available. The three listed above are the most common for our purposes. Other common devices include, trackballs, touch-screens, and joysticks.

(a) Trackballs resemble a large, upside down mouse. Instead of pushing the mouse around, which rolls the ball, the user of a trackball actually moves the ball. Like the mouse, trackballs have buttons, some of which can be programmed. Trackballs are generally not as accurate as a mouse for fine detailed work, but require less motion for general everyday use.

(b) Touch screens are simple monitors that can sense where you touch them. These are useful for demonstrations or displays where an entire keyboard would be distracting or impractical.

(c) Joysticks are exactly like the controls that many video games use. While great to use if you are pretending to fly a fighter jet, these are not very convenient for work.

i. **Operating Systems.** An operating system is a piece of computer software that tells the CPU how to act. All computers must have some type of operating system. There are many types of operating systems on the market.

(1) Microsoft-Disk Operating System (MS-DOS) is the operating system that most IBM PC and compatible computers use. MS-DOS, usually referred to as "DOS," is a command line interface, meaning, when you use it, all you see is the screen prompt "C:\". At this prompt you must enter coded commands to execute functions. Needless to say this is not a very user-friendly interface, so Microsoft developed an application called "Windows."

(2) "Windows," which is a copy of the Macintosh interface, is called a Graphical User Interface or GUI (pronounced gooey). What Windows does is provide the user with graphical buttons and menus and convert the operator's input into the appropriate DOS commands. Although Windows is much easier to use than DOS, it has several problems. First, having to run both DOS and Windows uses lots of RAM and hard disk space that is not available to other applications. Second, Windows is not as intuitive, or easy to learn and use, as a Macintosh.

(3) While using Windows, you must have DOS also running. With the Macintosh Operating System, all you have is a graphical interface. The operating system is designed from the ground up to be both graphical and easy to use. This type of system runs faster and is much easier to use because there is not that underlying DOS that can cause problems. Additionally, there is currently only one manufacturer of Macintosh system hardware. This assures continuity from machine to machine. Although most computer experts agree that Macs are faster and easier to use, due to different marketing schemes, most companies, including the Federal Government, use DOS based computers.

(4) UNIX is an operating system similar to MS-DOS. Although rare on personal computers, UNIX is common on high-end graphics workstations (Sun and Silicon Graphics) as well as on mainframe computers.

(5) The "Commodore PET" was one of the first true "home computers." The "PET" has been long discontinued, and replaced by the Amiga line. While the Amiga never became generally successful, it does have a large following of dedicated users that are attracted to its powerful video and graphics capabilities. The Amiga runs on a proprietary operating system similar to DOS, with a graphical interface.

B-2. MACINTOSH FUNDAMENTALS

a. **Macintosh setup**. A Macintosh is one of the easiest computers to set up and operate. Macintosh hardware is based on a plug and play theory, which means all you should have to do is plug in a piece of equipment for it to work. Other computers require you to change the system software configuration to use a new device. With a Macintosh this is unnecessary. There are, of course some basic rules and guidelines. When you get your new Macintosh, you will understandably be excited and want to just rip right in and get started. You must, however, control yourself and go step by step.

(1) **Unpacking the equipment**. While unpacking, you want to be careful to not damage the box or any of the packing material. If it is necessary to return a computer, you must do it in the original packing. You should keep all original packing material for at least a week to assure that the equipment is working properly. If space allows, you should keep the packing material forever, because this is the best way to ship equipment. While unpacking the boxes, you should look for an inventory sheet in each box. This will tell you what should be in the box. Check to be sure that you have all of the proper cords, manuals and warranty cards. Once you are sure that you have all of the inventory items, clean up the work area and remove all of the packing material and boxes.

(2) **Connecting all of the equipment**. Look in the owner's manual for exact instructions on connections, but follow these general guidelines.

(a) The first step that Apple recommends is to plug the computer's power cord into the computer and then into a three prong grounded power supply. This assures that the computer is grounded and no static electricity damage will occur during the rest of the setup.

(b) Plug the monitor's power cord into the monitor first and then the computers power outlet or another grounded outlet next, depending on what type of power cord your monitor comes with.

(c) Attach the monitor's cable to the monitor and the computer's monitor port. The type of monitor you have and which Macintosh you use will determine which of the two monitor ports you use, the standard or the audiovision.

(d) Attach the mouse and keyboard. First attach the Apple Desktop Bus (ADB) cable to the ADB port on the back of the computer and then plug the other end into the keyboard. The mouse attaches to the extra ADB port on the keyboard. You can customize this configuration if you have other ADB devices (Trackballs, Graphics Tablets, and so forth) as long as one device is plugged into the Mac and the others are chained together. You must never have the Mac turned on when you plug or unplug ADB devices.

(e) Attach any external devices. Modems and printers attach to the icons marked for these devices. Small Computer System Interface (SCSI, pronounced skuzzy) devices get attached through a chain of cables.

- A SCSI chain is several devices linked together that all connect to one port of the computer. SCSI connections are the hardest part of setting up a Macintosh, but remembering several rules makes things much easier. The first rule for chaining SCSI devices is that each device must have a unique number, called a SCSI ID. You can have a total of seven devices attached to a Macintosh in a SCSI chain. The CPU is assigned SCSI ID 0 and the internal hard disk is usually SCSI ID 7. As long as every other device has a different number everything should work. ID numbers are set on each device with a wheel, DIP Switch or other mechanism. Consult your owner's manual of the specific piece of equipment for instruction on how to set the SCSI ID number.
- A second concern with a SCSI chain is termination. SCSI works by sending a small electrical current down the chain of devices that then lets the Mac know what devices are attached. Terminators act as bumpers at the beginning and end of the chain, absorbing extra electrical signals and preventing data error. The first and last device of a SCSI chain must be terminated. There are two ways to terminate a device. The first is external termination, which utilizes a small electrical device attached to the empty plug on the last device. The second method is called internal termination, which utilizes a built in switch to turn the built in terminator on or off. When creating a SCSI chain, you should try to use the shortest cables possible. If unnecessarily long cables are used errors may occur. More about SCSI chains will be discussed in the Troubleshooting section.

(3) **Turn the power on.** First, turn the power to the power strip or surge suppressor on, next turn on the monitor. If you plugged the monitor into the computer, this will be the only time you have to turn the monitor on. From now on, it will come on when the computer is turned on. Next turn on each external device. Once all external devices are on, push the Power ON key on the Mac's keyboard. If everything works correctly you should here a chord tone, and eventually you will see the desktop.

b. **Desktop components.** When you first start up a Macintosh, the first screen you come to is called the desktop or Finder. These two words, Finder and Desktop are interchangeable. The Finder, or desktop is the heart of the Macintosh system software. What makes a Mac so easy to use is that all there is to the user interface is the Finder. From here you can do just about anything that the Mac is capable of.

(1) Across the top of the desktop screen is the Menu Bar. Each item here has functions that can be accessed by pulling down menus. The menu bar provides access to all of the commands and functions of the finder.

(2) At the right side of the menu bar is a balloon shaped icon with a question mark in it. This is the Help Menu. By pulling down on this icon with the pointer you can turn on Balloon Help. If Balloon Help is turned on when you use the mouse to point to things on the screen, the Mac displays a balloon with information. This is helpful when using the Mac for the first time or when using a new piece of software. Be aware however, that not all software applications are programmed with Balloon Help, so if nothing appears, it is because the software is not programmed for Balloon Help.

(3) At the top, far right of the finder window is the Application Menu. The Application Menus icon looks like a small Macintosh computer. This is where you can change from application to application. For example, if you had both Microsoft Word and Adobe PageMaker running, only one of them would be active at any one time. To switch from one to the other, you would pull down on the Application menu to the one that you wanted to use. Notice that the application that is currently active has a check mark beside it. This menu is extremely useful when you have several applications open and are switching back and forth often. Also in the Application Menu are options to Hide (current application) and Hide Others. These options allow you to clean up the screen by hiding any of the applications.

(4) On the desktop itself are several icons. At the top right corner, beneath the application menu is the Startup Disk. This icon represents the disk that contains the system software that started up the computer. If you have other disks attached to the computer, icons representing them should appear beneath the startup disk icon.

(5) Just as the name implies, the Trash Can is where you put files and applications to be thrown away, or deleted. One nice thing about a Mac is that it does not automatically remove these files. When you put files into the trash can they stay in until you choose Empty Trash from the Special Menu. This is good when you accidentally put a file into the trash that you do not want to delete. It is good to get in the habit of emptying the trash at regular intervals, so that the trash file does not get too large.

(6) The pointer is the little arrow that you control with the mouse.

c. **Mouse techniques.** Using a mouse is relatively easy. Just push the thing around and push the button. There are, however, several special things to be learned.

(1) Pointing is basic mouse operation. Put the mouse on a flat surface; a mouse pad, or special surface works best. Make sure that the cord faces away from you and move it around. Notice that the on-screen pointer moves in conjunction with the mouse. The pointer will only move when the mouse is touching the surface. This is handy when you get to the end of the mouse pad. All you have to do is pick the mouse up, and move it back to the center of the pad. The pointer will not move until you place the mouse back down and roll it.

(2) Clicking is used to select an object. First, move the mouse so that the pointer is on what you want to select and push the mouse button in a rapid click. Do not hold the button in. If you have done this properly, what you pointed at will now be selected.

(3) Double clicking is used to open folders, disk, or to launch an application. To double click, point at the desired folder, disk, or application and push the mouse button two times in quick succession. Click-click. If done correctly, the folder or disk will open or the application will launch (start running).

(4) Click and Hold when you want to see the contents of a pull down menu. First you use the mouse to point to the menu, then click and hold the mouse button in. The menu should appear and stay until you release the mouse button.

(5) Dragging is used to reposition icons or to move things around on the screen. To drag, you first select the object by single clicking on it. Next, you click and hold on the object, keeping

the mouse button pressed in, you move the mouse around to place the object. When you have placed the object where you want it, release the mouse button to drop it.

(6) Modified clicking is a technique where you use regular clicking in conjunction with pressing a keyboard button. For example, to select more than one icon, you can use shift-click. To accomplish this you first single click on the first icon. Next you point to the second icon; press and hold the shift key and click on the second icon. Both icons are now selected and you can release the shift key. There are many different combinations of modified clicks that we will learn.

d. **Pull-Down menus.** As mentioned, across the top of the Desktop is a Menu bar that allows us to perform many functions and actions. The first menu is on the far left and is called the Apple Menu.

(1) The Apple Menu is a list of available applications and Desk Accessories (DA)s. Users can customize their Macintosh by adding things to the Apple Menu. To add an item you place an alias (something like a bookmark) of the item in the Apple Menu Items folder in the System Folder. By having an alias of commonly used applications or folders in the Apple Menu, you can easily open a folder or application by pulling down the Apple Menu instead of having to open many folders and disks and finally double clicking on the desired object.

(2) DA's are miniature programs that help out the user. A calculator, map, puzzle, CD remote, and many other DA's are available.

(3) To the right of the Apple Menu is the File Menu. The File Menu has many different functions, but only several are commonly used.

(a) First, it allows you to create new folders (use the New Folder option) used to file documents.

(b) Second, it allows you to create aliases (use Make Alias) of folders, applications or files. Aliases are bookmarks that can be placed anywhere to make it easy to locate deeply hidden or often used items.

(c) Next, the File Menu has a Find command. This is used to search a disk for a particular file name. Select Find and enter what you want to search for in the field. To narrow the search, click More Choices to add more variables. This feature is extremely useful when you remember the file name (or part of it) but forgot where on the disk the item is located. If the first search does not locate the right file, choose Find Again to look for the next item that matches the search data. Continue this until you locate the correct file.

(4) As you can see there are other options in the File Menu, but these are the most important ones. Read in your owner's manual or other reference about the other options. Also, notice the keyboard shortcuts beside most of the commands under the File Menu. These are shortcuts that you can use instead of pulling down the menu and dragging to the desired command. These commands all use a modifier key in conjunction with a regular key. For example, to create a new folder you could select New Folder from the File Menu, or use the keyboard shortcut: Command-N. The Apple key represents the Command or Apple key. The Mac uses many different keyboard shortcuts, and most are universal from application to application, so try to get in the habit of using them for repetitive tasks. Keyboard shortcuts can save quite a bit of time.

(5) To the right of the File Menu is the Edit Menu. The Edit Menu contains basic editing functions: Undo, Cut, Copy, Paste, Clear, Select All, and Show Clipboard.

(a) The undo command is used to reverse the last action done. If you make a mistake, you can use the Undo command to return you to where you were before you made the mistake. Some applications have multiple layers of undo. This means that you can undo many things a layer at a time until you get back your work at a previous point. This can be useful when you want to try out several different versions of a document or file. If an application only has a single undo, you must select undo immediately after making a mistake because you cannot go back and undo the mistake later. The keyboard shortcut for Undo is Command-Z.

(b) The Cut command is used to remove the selected object. If used in a word processor application, for example, Cut removes whatever text is selected. The Cut information is stored in the Clipboard until something else is cut. The keyboard shortcut for cut is Command-X.

(c) The Copy command is used to copy selected objects. Whatever is selected will be copied to the clipboard, without affecting the original. The keyboard shortcut for Copy is Command-C.

(d) The Paste command is used to paste whatever is in the clipboard to where the insertion point is located. Paste is used in conjunction with Cut and Copy to remove or copy information from one area and place, or paste, it somewhere else. The keyboard shortcut for Paste is Command-V.

(e) The Clear command is much like the Cut command, in that it removes selected items. Unlike Cut, the Clear command removes the selection without pasting it to the clipboard. If you clear something, it is gone. There is no keyboard shortcut for Clear.

(f) Select All is used to select everything in a window. When used in the Finder, it will select all of the folders, files or applications in a window. When used in an application, it will select all of the text, graphics, or images in the document. The keyboard shortcut for Select All is Command-A.

(g) The clipboard is where items that have been cut or copied are stored until they are needed. As we have learned, only one item can reside in the clipboard at any one time. Whenever you cut or copy something it deletes the item currently in the clipboard and replaces it with what you cut. To see what is in the clipboard, choose Show Clipboard from the Edit Menu. There is no keyboard shortcut for this command.

(h) These are all of the commands that are in the Edit Menu in the Finder. As you learn more applications, there will be more commands added to this menu, but the above commands are common to most programs.

(6) The View Menu is used to control how items are displayed in the Finder. You may want to control how the contents of windows are displayed, to do that you will use this menu.

(a) By Small Icon and By Icon are similar options. By Icon is the standard Macintosh view. This displays all of the contents of a disk or folder by normal, large icons. By Small Icon uses the same icons but reduces them to approximately one half size. This is convenient when you want to display many icons in one small window.

(b) By Name, By Size, By Kind, By Label, and By Date are all options used to list contents of folders or disks in the corresponding order. Depending on which option you have selected, it rearranges the order. These lists use a small icon to represent folders and files. If an item is a folder, it will have an arrow beside it. You can click on this arrow to collapse or expand the list. Expand means to show the contents of the folder and collapse means to hide the contents.

(7) The Label Menu is used to color code files, folders or disks. This is extremely useful when working on a project with many different files. You can assign one color to all of the files and quickly locate or identify related files. To assign a Label, you first select the item or items, and then pull down the Label Menu and drag to the color that you want to use. To change the colors on the menu or to change the captions that go with these colors, use the Label Control Panel found in the Control Panel Folder.

(8) The Special Menu contains several miscellaneous but important commands. The first is Clean Up Window.

(a) Clean Up Window is used to reorganize all of the icons in a window. After you've been moving icons around, the window may appear cluttered or messy. Use the Clean Up command to rearrange all of the icons according to the settings found in the Views Control Panel. There are many different combinations available in the Views Control Panel. You can choose to stagger icons or not, to always "snap to grid," and many other options for the List View menu option.

(b) Empty Trash is used to permanently remove items that have been put in the Trash Can. Remember, once you choose Empty Trash, these items are gone.

(c) Eject Disk is used to remove a disk. First select the disk and then choose Eject Disk from the Special Menu, or use the keyboard shortcut Command-E. Another way to eject a disk is to drag its icon to the Trash Can. This does NOT affect any of the files on the disk, all it does it cause the disk to be ejected.

(d) Erase Disk is used to totally remove all of the contents of a disk. Use this with extreme caution.

(e) Restart is used if you need to restart the computer. Remember, restarting will erase any files not saved, so save all files before doing this.

(f) Shut Down is used to turn the computer off. Never turn a computer off by turning the power off or using the emergency switch on the back. By properly using the Shut Down command, you let the computer clear its memory and save system files for the next time you use it.

e. **Macintosh Windows.** The Macintosh uses Windows to display information. A window is simply a box that information appears in. To fully understand a Mac, you must be able to identify parts of a window, and tell how to use them.

(1) Across the top of the window is the Title Bar. In this area you will see the title of the window displayed. If the window represents a disk or folder you will see the name of the disk or folder. If it is a file, you will see the filename.

(2) At the upper left corner, in the Title Bar, is a small box. This box is called the Close Button, and the only thing it does it close the window. When you are done using a window you should click on this box to get rid of the Window.

(3) Just below the Title Bar is the Information Bar. In this bar you will see the following information: On the far left is the number of items in the disk or folder. In the middle is how much information is stored on the disk that contains the window. On the right is how much space is left on the disk.

(4) In the upper right corner of the window, in the Title Bar, is the Zoom Button. This button can do two things. First, when clicked, it shrinks the window to as small as it can get while still displaying all of the files. If the monitor is not big enough to show all of the files, it will fill the screen. If clicked again, it will either expand or collapse the window to the last size set by the user.

(5) Vertically across the right side of the window is the Vertical Slider. If there are more files than can be displayed in the window, this area will be medium gray and will have a Slider Bar Button in it. Scroll Arrows at the top and bottom allow the user to scroll up or down to view more items. You can also drag the Slider Bar Button up or down to quickly reposition the contents. Additionally, you can click in the gray area, either above or below the button to quickly move up or down one page at a time.

(6) In the lower right corner of the window is the Resize Button. This button can be dragged around to change the size of the window. Whatever size is set with this button will be the default size for the window, when the Zoom Button is clicked.

(7) Horizontally across the bottom of the window is the Horizontal Slider. It is just like the Vertical slider except this slider works side to side to reposition the contents of a window.

f. **Selection techniques.** No matter what type of application you are using, you need to know how to select objects. There are four basic techniques: clicking, shift-clicking, using marquees, and selecting all.

(1) Clicking is done to select a single item. You just point at it and click once. Sometimes, when you click on the name of an item, it will become selected. This is used to rename an object. Just point at the name, click and after a moment the name will be selected and you can type a new name.

(2) To select more than one item, you can click on the first item, and then shift-click on other items to add to the selection. If you do not use the Shift key, the first item will become deselected, so you must remember to use this key.

(3) To select a group of items that are close together, position the pointer outside the group and drag a box, or marquee, around the group. Watch out not to select other unintended objects when using this method.

(4) Select All command selects all of the items in a window.

g. **Dialog boxes.**

(1) A Dialog box is another type of window. Sometimes the Macintosh needs more information to complete a command so it will present a Dialog Box. Dialog boxes come in many different shapes and sizes, but there are common contents to all.

(2) Disk and Directory Indicators are either icons or windows that show where the specified file is located. These usually have pull down menus that allow you to change the current disk or directory.

(3) Radio buttons are round buttons that allow you to make only one selection. If there are several options to choose from, but you are only allowed to choose one, you will be presented with radio buttons.

(4) Check boxes are often used to allow the user to select options. You can check as many of these small, square boxes as you wish.

(5) Buttons are oval and have text in them, and are used to execute commands. Examples of buttons are Save, Print, and Open. Usually one of the buttons in a Dialog Box will have a thick double oval around it. This is the default button, and you do not need to click the mouse on it. With a default button, you can just push Return on the keyboard to execute this command.

(6) Dialog boxes that appear when you are saving a file usually have an area where you can enter the name you wish to save the file as.

h. **Alert boxes.** Occasionally the Mac will warn you that what you are about to do may be irreversible or the computer may display an error message. These boxes are called Alert Boxes. One typical Alert Box is displayed when you select Empty Trash. The Mac warns you how many items are in the trash and asks you if you are sure you want to permanently remove these items. You will encounter many other Alert Boxes. Typical Alert Boxes are: System Crashes, System Errors, Out of Memory and many others.

i. **System folder.** Located on the disk that the Macintosh started from is a folder called the System Folder. This folder contains all of the Macintosh System Software, the software that makes a Mac a Mac. Without this folder and its contents the computer would not be able to start up or operate. Depending on which model Macintosh you use and what other software you have you may have more or less in your System Folder, but below are some common items.

(1) Apple Menu Items folder stores items that you wish to appear in the Apple Menu. Common items placed here are aliases to often used folders, files or applications. Desk Accessories are also placed in the Apple Menu for quick access.

(2) Control Panels are mini programs that allow you to set options and functions of the Macintosh. Control Panels must be placed in the Control Panel Folder to be active.

(3) Extensions are small programs that add features or functions to the Macintosh. When you start up the Mac, you see the Extensions appear across the bottom of the screen as they load. For an Extension to work it must be loaded at start up. To be loaded at start up an Extension must be placed in the Extensions Folder in the System Folder.

(4) Preferences are small files that are created by applications, control panels and extension. When you personalize an application or use a control panel or extension to set up

how the Mac will work, a Preferences file is created to save these settings. All of these Preferences files are stored in the Preferences Folder in the System Folder.

(5) The Finder file in the System Folder is the actual program that creates the desktop and makes the Mac work. This file must be in the System Folder.

(6) Items placed in the Start Up Items Folder will automatically be opened when the computer is turned on. This is useful if you use the same applications everyday. You can simply place an alias of these applications in the Start up Items Folder and when the Mac starts up the files, folders or applications will open.

(7) The Clipboard is where items that have been cut or copied are stored until they are needed. Remember, only one item can be stored in the Clipboard at a time. An item can be a single word, groups of words, a graphic, a picture, or whatever.

(8) The Scrapbook File is similar to the clipboard except it can hold more than one item. You can open this file and scroll through the contents. If you use a graphic, letterhead, or group of text (name, address, and so forth) often, it may save time to copy these items to the Scrapbook. When the item is needed, all you have to do is copy and then paste the item.

(9) The Notepad is just that, a notepad. It can be used just like a paper pad to store short notes and messages. You can cut, copy and paste to and from the notepad.

(10) The System File is a folder that is used to store system resources. Resources can be sounds, keyboard layouts, or other small bits of information that help the Mac work properly. You must have this file for the Mac to work properly.

(11) Fonts are different styles of letters and characters. All fonts must be stored in the Fonts Folder in order to be used. Once new fonts are added, you must restart the Mac to access them.

(12) Simple Text is a rudimentary word processing program. It is usually found in the System Folder. It can be used to open and view Read Me files, graphics, sounds, animation's and Quick Time videos. While it's not necessary, it is a good idea to keep Simple Text around to use to view these files.

j. **Basic control panels.** As you have learned, Control Panels are small programs that allow you to adjust system related settings, such as the time and date settings of the Mac's internal clock. There are many control panels available to you, but these are the basic ones that come with the Mac system software. Remember, Control Panels must be in the Control Panels Folder in the System Folder to be used.

(1) The General Controls control panel is used to set basic Finder options. You can change the color and pattern of the desktop work area, the Rate of Insertion Point Blinking, Rate of Menu Blinking, and the date and time.

(2) The Date/Time control panel can also be used to set the date and time of the Mac's internal clock. Additionally you can change the format of the date and time. You can decide if you would rather use a 24-hour clock, or use the names of months instead of numbers.

(3) The Keyboard control panel is used to set the keyboard layout if you have more than one installed. You can also set the key repeat and delay rate. These are the rates that characters appear at if you hold a key down.

(4) The Mouse control panel is used to customize the actions of the mouse. You can change the speed of the mouse, as well as the double-click speed.

(5) The Color control panel is used to customize the color of windows and highlighted text.

(6) The Labels control panel is used to set the color and captions that go with the labels in the Labels pull down menu.

(7) The Sound control panel controls all of the Mac's sound functions. There is a pull down menu with several options.

(a) The first is Alert Sound. This is where you can set the sound and volume that will be used as an alert. An alert is a sound that is played when the Mac wants to get your attention or inform you of an error. You can use the Add and Remove commands to add or delete alert sounds.

(b) The second option on the pull-down menu is Sound In. This is where you designate where sound input will come from. Use the Options button to select either Microphone, AV connector or Internal CD.

(c) Next is the Sound Out option. This option is used to select how sound will be played back. You can choose the speed (in kHz) for sound playback as well as sound bit depth and stereo or mono sound.

(d) The last option is Volumes. This is where you set the volumes for the Macs sound. You have two sliders. One controls the volume of the built in speaker, while the other sets the volume of the headphone jack on the back of the Mac.

(8) The Numbers control panel is used to control how the Mac handles numbers. You can set what character to use as the decimal separator (usually a ".") as well as what to use to separate the thousands place (usually a ","). Additionally, you can decide what symbol to use with currency and where it will be placed.

(9) The Views control panel is used to set how information in windows will be displayed. We have discussed the use of the Views Pull-Down Menu, the Views control panel is where you set the preferences. You can select font and size of title information, as well as options for list and icon views.

(10) The Start Up Disk control panel is used to select which disk to start from at the next restart. The disk you select must have system software on it.

(11) The PC Exchange control panel is used when accessing files from an IBM PC system. PC files have a code attached to the end of the file name called a suffix. Different suffixes represent different types of files. For example ".txt" means that it is a text file. Using this control panel you can set which application on the Mac will be used to open files with different suffixes. You may have the control panel set so that MS Word open all files with the ".txt" suffix while Photoshop opens all files with the ".gif" suffix.

(12) The Chooser is a desk accessory found in the Apple Menu that allows the user to select which external device to use. When it is opened, the Chooser will show icons of all of the printers that are installed in the Mac. There will also be icons for faxing and file sharing if these items have been installed. The user then clicks on the icon that he wants to use. For example, to print to the laser printer, you would open the Chooser, and select the "LaserWriter" icon. To use the color printer you would select that icon.

k. **Memory control.** To set how the Mac uses memory, you use several different tools that are part of the Mac's System Software.

(1) First, there is the Memory Control Panel.

(a) The Memory Control Panel is broken down into four items. The first is the control of the Cache. A cache is a portion of RAM that is set aside for often used instructions. You can purchase separate Cache Cards that add more memory to be totally devoted to this purpose, or you can allot some of the internal RAM as a Cache. This makes the computer run faster, because common instructions and functions are stored here instead of on the relatively slow hard disk.

(b) The Modern Memory Manager is the portion of the Memory Control Panel is used to control whether or not the Mac uses the modern memory functions. This should always be "On" unless you are using old system software (System 6.0) on a new Mac.

(c) Virtual Memory (VM) is when the computer uses a portion of the hard disk as RAM. It stores things that it would normally put in RAM on the hard disk, if it needs the space. While using this may allow you to open more applications, it is much slower than real RAM, so should not be used as primary memory.

(d) Using VM, you use the disk as RAM. With a RAM Disk, you use RAM as a disk. You create a RAM Disk and it put files or applications in it just like another disk. It is extremely fast, but also uses up a large part of critical RAM.

(e) To find memory information about a Mac you use the About This Mac item under the Apple Menu. This window will provide you with the total amount of RAM installed in the Mac. It will also show you other information about the Mac, such as the System Software version number, and how much RAM each application is allocated and how much it is currently using.

(2) When you first turn the computer on the first thing to use RAM is the system software. As you open applications, they too use RAM. As you close applications, not all of the RAM goes back to the available pool. Eventually, there will not be enough RAM in one continuous block to open anything. This is called Memory Fragmentation. Memory fragmentation is graphed in what is called the System Heap. This is an imaginary graph of how the computer's memory is being handled. To monitor memory usage, use the "About This Macintosh" window. This will list all of the open applications, and how much RAM each one is using. The "Largest Unused Block" section shows the largest block of RAM that is free. If the total amount of RAM in use plus the Largest Unused Block is less than the "Total Memory" then you have Memory Fragmentation. The only way to recover fragmented memory is to restart the computer. The best way to avoid memory fragmentation is to launch often-used applications first. If you use a word processor off and on throughout the day, it is best to launch it once, at startup and leave it

on in the background. Open other applications as needed, but try to close the last opened application first. This will keep the largest unused block as big as possible.

(3) Each application is allotted a certain amount of memory to work with. The user can change this allocation to suit his needs. To find out how much memory an application is allotted, first make sure it is not running, then select it (single click) and choose Get Info from the File menu. A window will appear that has information about the selected item. At the top of this window is the name, icon, type of item, where it is located, when it was created and modified and the version numbers. Then there is a comments box that you can type in. At the bottom is the memory information. There are three amounts in the Memory Requirements.

(a) Suggested Size is the amount that the author of the application thinks is the best for general-purpose use. This is just a suggestion, so we do not have to go by this.

(b) Minimum Size is the second amount. The minimum size is the size that you set to define the minimum amount of memory an application will be given. Generally, you do not want to set this much lower than the recommended amount. If you are having problems with an application and keep getting a warning of a "Type 1 Error" or an "Out of Memory Error" then you have the minimum set too low and should increase it.

(c) Preferred Size is the last amount. This is the amount of memory that you set as the preferred amount. The computer will allocate this amount to the application (If this much is available!). Usually at installation the software is set to amounts that work best, but if you have problems, try setting the minimum to recommended amount and the preferred to twice the minimum.

l. **Network control panels.**

(1) One of the benefits of a Macintosh over a DOS based computer is networking. Networking, or connecting two or more computers, is built in on the Macs, while on a DOS machine it must be purchased separately. The Macintosh comes with a built in network connection, called LocalTalk or AppleTalk. The printer or modem port is the connector for this. You can easily connect two (or more) Macs together using this connection.

(2) Another type of network is Ethernet. Most new Macs come with a built in Ethernet connection, or they can be purchased separately. Ethernet is MUCH faster than LocalTalk, and is used for high-speed networks.

(3) To set up a Mac LocalTalk network just connect two computers at the printer or modem ports. An Ethernet connection requires a Hub, which is a box that fits between the two computers and then wires go from the hub to the computers. Once you have physically connected the computers you must use the system software to tell them that they are connected. To do this there are four Control Panels.

(a) The Network Control Panel is pretty much straightforward. All you have to do is select which type of network you have connected. There will be icons for several different network types, all you do is select which one you have set up.

(b) The Sharing Setup control panel is where you set the identity of the Macintosh you are using, and assign an owner and a password for that owner. You should make sure that every computer has a unique, easy to remember name, such as "David's Mac." This will make it easy

to see what computer you are connected to. When making up passwords, choose unique but easy to remember passwords. Do not use names or other easy to guess passwords. Try using two unrelated words separated by punctuation such as star!dog. This type is hard to guess, but easy to remember if you are supposed to know it. There are two sections of this control panel called File Sharing and Program Linking. These are used to allow you to let others access files or applications or both.

(c) Once you have the Sharing Setup control panel configured, you use the Users and Groups Control Panel to give access to individual users. You create a user folder for each person that you are going to allow access to your computer. You can set different amounts of access to each user. You can also allow Guest access. Guest access is allowing users, who you have not set up access information for, to use your computer.

(d) The File Sharing Monitor is a control panel used to monitor who is connected to your computer. On the left side of the control panel is an area that will show who is connected. On the left are icons representing the shared items. On the bottom is a bar graph that represents the file sharing activity. To kick a person off of your machine, double click on the icon of the person that is connected and choose disconnect.

m. **Monitors control panel.**

(1) The Monitors control panel is used to set options that have to do with the video output. When you first open this control panel, you can choose either color or grayscale. You also can change the bit depth (number of colors displayed) of the monitor. Depending on how much video RAM your computer has, you may have options all the way up to 24 bit or Millions of colors.

(2) At the bottom of this control panel you have a window with an icon of your monitor in it. If you have more than one monitor attached you will have more than one icon. You can drag these icons around on the Virtual Desktop to position how information will flow across multiple monitors. There is also a button labeled Identify that will display a number on each monitor making it easier to identify which monitor is which.

(3) In a multiple monitor setup, one of the monitors will always be the Startup Monitor. In the control panel one of the icons will have a small menu bar in it. The monitor with the menu bar is the startup monitor. To change startup monitors, simply drag the mini menu bar to the desired monitor icon.

(4) There is a button labeled Options that allows you to set the monitor resolution (number of pixels on the screen) as well as allowing you to send the image to a TV if you have the proper equipment.

n. **Software.** So far we have only discussed the Macintosh hardware and System Software. For a computer to be truly productive you must have other software applications that instruct the computer how to do tasks. There are many different types of software and brand names, but most fall in to the general categories below.

(1) Word Processing software is used to write letters, memos, and anything else that you would need. A word processor turns the computer into a fancy typewriter, allowing you to enter text and then easily edit and move entire sections around. Most good word processors have spelling and grammar checkers and a thesaurus built in. Many also allow you to automatically

create outlines, glossaries and indexes. Typical word processors are Microsoft Word and Word Perfect from Novell.

(2) Data Base software is used to keep track of large amounts of information. You can track anything from recipes to parts inventories. You establish fields of data to track (Ingredients, Part number, area code...) and then enter data for each item to track. The data base software can then cross-reference, sort, and create reports about the information you have entered. Typical data programs are FoxPro and Filemaker Pro.

(3) Page Layout. Page Layout software is designed to make it easy to incorporate text, pictures, and graphics into a single document. This software can be used to design and layout anything from simple newsletters to complete books. Page layout software allows you to create text boxes that flow around graphics and have images and illustrations that compliment the design. Common page layout applications are Quark Xpress and Adobe PageMaker.

(4) Image Editing software is used to enhance photographs with the computer. Images can be acquired with a digital camera or scanned into this software. After images are in the application, all normal photographic enhancements (dodging, burning, cropping, and so forth) can be done as well as special effects. Adobe Photoshop and HSC's Live Picture are image-editing applications.

(5) Illustration software is used to create art on the computer. These software applications have all of the functions of painting, drawing and other normal art techniques. They can also be used to create layers and color gradients as well as other special effects. Adobe Illustrator and Macromedia's Freehand are illustration programs.

(6) Like Illustration software, 3D-Drawing software is used to draw images. However, 3D-Drawing programs allow the user to set up illustrations in three dimensions. Users can draw two dimensional illustrations and the computer can add the third dimension. Users can create shadows, textures, and lighting effects. Stratavision 3D is one example of a 3D drawing program.

(7) Fonts are different styles of letters and characters. Clip Art is a professionally drawn picture of every imaginable style. You can get clip art borders, people, signs, backgrounds, and so forth. Fonts and Clip Art can be purchased for use with all of the other types of software. The Image Club is a catalog sales company specializing in fonts and clip art.

(8) Video editing software is used to edit digital video. Users first digitize the video and then rearrange the sequences, add fades, dissolves, and other special effects and create titles. Once the editing is done, the computer reorganizes all of the video into one continuous sequence. Adobe Premiere is used for desktop video editing, while the Avid system is used for professional broadcast quality video editing.

(9) Multimedia is combining text, graphics, video, animation, and sound into one presentation. Many multimedia presentations include user interaction, which means that users control how the presentation flows by clicking on screen buttons or by typing commands. Macromedia Director and Macromedia Authorware are multimedia production software applications.

(10) Communications software is a broad category of applications that allow one computer to interact with other computers. Generally a terminal program turns the Mac into a terminal to

control or access other computers. There are also applications to allow a computer to access the Internet, the global network of computers. White Knight, Apple Remote Access and Timbuktu Remote are just a few examples of communication software applications.

(11) Optical Character Recognition (OCR) software is used to convert scanned pages of text into editable text. When a document is scanned it is basically just a picture of the document. With OCR software you can convert the picture into text that you can edit in a word processor. While very useful, OCR software is not 100% accurate and must be carefully edited.

(12) Utilities software is general software that adds functions and accessories to the Mac. There are many different types of utilities. Diagnostic software is used to diagnose and repair software and hardware problems. Virus detection utilities are used to scan for computer viruses and repair them if any are found.

B-3. TROUBLESHOOTING

a. Troubleshooting is the process that is used when trying to determine the cause of a problem and what to do to fix it. It is important to understand the basics of how things work in order to be able to efficiently repair a problem.

b. One of the most important aspects of troubleshooting is knowing what to do to prevent a problem from arising. It is always better to avoid a problem, than to wait for something to happen and then be forced to try and figure out what to do. With computers and other electronic equipment there are a few things that we can do to prolong the life of the equipment and prevent malfunctions.

(1) **Preventive maintenance.**

(a) Most electronic equipment comes with grounded plugs. It is important to never bypass this ground and to always have a properly grounded outlet. Computers are extremely sensitive to electrical impulses, and properly grounded plugs and outlets can prevent serious damage to the computer hardware. It is absolutely necessary to be grounded when you are doing any activity inside the opened case of a computer (that is, installing RAM, removing cards, and so forth).

(b) One of the most important pieces of electronic equipment to use is the surge suppressor. Electrical voltage can vary widely and often you will have surges of high voltage or fluctuations. This is especially common with deployed units and ships where power is being provided by portable generators. A surge suppressor is an inexpensive device that filters the electricity before it goes into the computer. Suppressors control the actual outgoing voltage and only let regulated amounts into your equipment. Additionally, they can convert one outlet into several. This allows you to plug all of your equipment into one receptacle, providing the receptacle has enough amperage. Most surge suppressors can only protect against minor power surges and spikes. Only uninterruptible power supplies (UPS) can provide against serious electrical problems, as well as providing short battery backup. UPS are strongly recommended to prevent damage to expensive electronic imaging equipment.

(c) Computer equipment is extremely susceptible to shocks and vibrations, especially hard disk drives. You must be extremely careful to never bump or jostle computers or external hard drives while they are turned on. Bumping a hard drive can cause the read-write heads to gouge

the surface of the disk, ruining the drive and the data stored on it. If you must move equipment, it is best to shut it down, and give it a minute to cool down before moving.

(d) When plugging in or unplugging equipment, the computer must always be shut down. Never unplug a computer that is turned on. Also, ensure that the power switch is in the "OFF" position before plugging equipment back in. Damaging power surges often occur when equipment is plugged in while turned "on."

(e) It should seem obvious, but you should never eat or drink around computers. Liquid or crumbs spilled in a keyboard or on removable media can destroy the hardware or data. Also, there is a danger of electric shock if liquid is spilled on an energized piece of equipment.

(f) It is a very good idea to purchase and use a utility program such as Norton Utilities or MacTools Pro. These programs scan your disks and hardware for potential problems and can fix them before they do any damage. They also provide other utilities to recover deleted data, schedule backups, and optimize the disk speed.

(2) **Start-up problems.** One of the most common times for a problem to occur is at start up. When you first switch the computer "on" it runs through several self tests and will report any problems in a variety of ways. A very common start up error is the "flashing question mark" icon. This indicates a SCSI error, usually with a hard disk drive. SCSI or Small Computer Serial Interface is the system used to connect devices such as disk drives, scanners, and printers to the computer. SCSI connections are both fast and reliable, but can sometimes be problematic. There are several things to be concerned with when attaching SCSI devices or troubleshooting SCSI problems.

(a) Each device connected to a SCSI chain must have its own unique ID number. These numbers are usually set with a dial or push button on the unit. There can be a total of seven devices attached, but ID number "0" is reserved for the internal start-up disk and number "7" represents the CPU of the computer itself.

(b) SCSI chains work by sending a small electrical signal through all of the devices attached to the chain. Each device receives the signal and sends a reply back to the computer. When the signal gets to the last device on the SCSI chain this signal needs to be stopped. If it is not stopped it will reflect back down the chain toward the computer, where it will cause errors or malfunctions. To stop this signal we use a small device called a SCSI Terminator. This is attached to the empty plug on the last device and absorbs the signal. Some devices have what is called Internal Termination, which means they have a terminator built in. If your devices are internally terminated, you must be sure to turn the terminator "off" (usually there is a switch on the device to do this) on all of the devices except the last one.

(c) When purchasing cables to use with SCSI equipment you should buy the slightly more expensive shielded cables. These cables have electrical shielding in the insulation to prevent interference from other equipment. You must also be sure that you use the proper cables and that all plugs are securely attached and locked in place. All equipment (including the computer) must be turned "off" when attaching or removing SCSI cables. You should also use the shortest cables possible, for the best performance.

(d) When starting up a computer with external SCSI devices it is necessary to power up the external devices before starting up the computer. Failure to do this will prevent the computer from recognizing the devices and will force you to restart to use the devices.

(3) **Periodic software maintenance.** There is some periodic maintenance to do that will prevent problems from happening.

(a) Rebuild the desktop at least monthly.

(b) Keep only one copy of system software on the startup disk. Having more than one system folder will cause crashes and hangs.

(c) Organize files into folders and hierarchies. Have one folder for applications and keep all programs there. Have another folder for documents, pictures, and so forth. Do not have many files just floating around in the system folder or loose in the disks main or root directory. The better organized your files are, the faster the computer can access them, and the less likely it is to crash.

(d) Use a disk utility to periodically defrag (optimize) the drive and run a background diagnostic program that always watches for potential problems.

(e) Do not keep unnecessary System Extensions or Control Panels in the System Folder. They have the potential to cause conflicts as well as to slow down computer operation.

(4) **Hardware Maintenance.** While there is no real maintenance to be done on the CPU portion of the computer, there are a few things that can be done to prolong the life of the equipment.

(a) First, be sure to keep any air vents clean and clear. This means do not stack books or papers on top of or closely beside the computer. You must allow air to flow in and around any vents. This allows the internal fan to cool the circuits. Occasionally vacuum the area around the vents to remove any dust that may have collected.

(b) Second, be sure to give any cables or connectors plenty of room. One of the leading causes of computer malfunctions is a faulty cable. Cables can be damaged by being bent or crimped, so allow them to attach to the computer and naturally curve away, without forcing them into a small area. This is especially true with monitors that tilt and swivel. Allow the monitor cable plenty of slack for free movement. Never place cables near heaters or radiators.

(c) Due to the static electricity nature of monitors, it is important to keep monitors free from dust. Again, periodically vacuum any dust from the top and side vents. To clean the screen, spray a small amount of a mild glass cleaner onto a soft cloth and wipe the screen. Never spray the cleaner directly onto the screen, as it will drip down into the electronics.

(d) Never spill anything into the keyboard. If, however, a liquid is spilled into a keyboard, immediately turn the computer "off" and turn the keyboard upside down to try to drain any excess liquid. Next, spray the keyboard off with plain water, a bathtub and showerhead is the best method. Lastly, dry the keyboard with a hairdryer set to medium/low heat. You may be able to salvage the keyboard, but do not bet on it. You should also occasionally vacuum the keyboard to remove any dust or crumbs that have accumulated.

(5) **Manufacturer assistance.**

(a) Most manufacturers have technical support or "help" lines that can prove to be infinitely helpful when troubleshooting any problems. You should not immediately call them, however. If you are experiencing problems, first use the owner's manual to try to diagnose the problem. Always start at the beginning and ensure that all setup and startup procedures have been properly accomplished. Usually the biggest cause of computer problems is "operator error."

(b) If you have established that you do indeed need technical help, first prepare yourself. Help lines are usually very busy and the representatives do not have time to wait for you. Gather the following information about your problem and equipment before calling: make/model of all equipment being used, serial numbers of any software/hardware, all technical information about your computer, (amount of RAM, hard disk size, additional boards or devices installed, system software and version number, list of extra extensions or control panels, and so forth). Also have an emergency floppy or CD-ROM with System Software to start up from. Once you call, quickly describe the problem with as much detail as possible.

(c) Usually the representative will try to walk you through several steps while on the phone. For this reason, try to be at the computer when calling. When they tell you to do something, remember that they cannot see your screen. Be sure to tell them what is happening each step of the way.

B-4. DIGITAL CAMERAS

a. **Cameras**. While it is common to scan regular film images and prints into the computer for digital handling, the real advantages come when using a digital camera. The full potential of digital photography, (including the speed, manipulation advantages and minimum of waste) apply when creating images with a fully digital system. While digital cameras can be expensive for high quality systems, in the long run, the savings earned pay for the start-up costs.

b. **Digital vs. traditional photography.**

(1) Traditional photography starts with a regular camera and silver or dye based film. After the film is exposed, it is removed from the camera and processed in up to seven (for slides) different chemical baths, washing, and then drying. Once the film is dry, prints can be made. By projecting the negatives or slides on to photographic paper and again processing using chemicals, prints are made.

(2) This traditional process has several distinct disadvantages. First is the amount of waste. If only one image is needed when shooting roll film, an entire roll must be used. This can become costly. Second, is the amount of time. The processing and printmaking steps take a minimum of about 15 minutes, using expensive automated processing equipment. Slides take at least an hour. Third are the hazardous chemicals involved in the process. While not extremely dangerous, most photo chemicals are at least mildly caustic, and some are rather hazardous. Last is storage of the chemicals. Not only do the bulky, unused chemicals require storage, but the hazardous chemical waste also needs to be properly disposed of.

(3) Digital technology does away with many of these problems. Images are taken with a standard camera that has a Charge Coupled Device (CCD) where the film normally would be located. After images are taken, they can be immediately previewed on the computer. To transfer an image to the computer, just double click on it. To print the image, just click on the

"Print" button. There is no waste when only a few images are needed. There are no chemicals to store or dispose of. (Some digital printers use toner cartridges that are meant to be mailed back to the manufacturer, but the storage and handling of these is negligible compared to traditional chemicals). Not only are these disadvantages eliminated, the entire process is much faster and you have the benefits of being able to electronically edit the photos before printing.

(4) There are, of course, advantages to silver-based images. While digital cameras and associated equipment can produce outstanding images, they do not have anywhere near the quality of medium and large format film. A second advantage to traditional cameras is durability. Electronic cameras have yet to be developed that can handle extreme weather and exposure conditions such as rain forests and arctic conditions.

c. **Electronic cameras.**

(1) There are two types of electronic cameras: still video and digital. A still video camera is like a video camera without the tape storage drive. Still-video cameras take analog images in two passes, first the even rows, then the odd ones. This process is called interlacing, and can result in fuzzy images with fringing on high contrast scenes. To accommodate this interlacing, the still video camera has smaller light sensitive cells rather than full-frame CCD used in digital cameras.

(2) Digital cameras are designed to provide a digital image from the group up. Since digital cameras do not require the extra circuitry needed to interlace the image, the light-sensitive cells can be larger and closer together resulting a higher quality image.

d. **Charge coupled devices.**

(1) Digital photography (as well as video technology) is based on CCD. A CCD is a multilayered silicon chip. In one layer a grid of electrodes divides the surface into pixels. Each electrode is connected to a lead that carries voltage. A color filter layer determines which primary color (Red, Green or Blue) each pixel senses. The image is electronically formed on a layer of silicon substrate.

(2) As a CCD is exposed to light an electromagnetic reaction occurs. Light particles pass through the CCD, freeing electrons in the silicon substrate. A voltage applied to the electrodes draws the freed electrons to gather in special areas (called photo sites) in the substrate. The stronger the light, the greater the number of electrons drawn together at that site. The CCD transfers captured electrons one by one to an analog-to-digital converter, which assigns each site a digital value corresponding to the number of electrons that site holds. In this way the image is saved to the disk. The number of electrons in a photo site determines how light or dark each pixel in the image is.

(3) One consideration with CCD is size. Since most CCDs are smaller than the normal size of film, the effective focal length of the lens is increased. For example; the Kodak digital camera DCS 200 and DCS 420 have a CCD that is 9 x 14 mm. This is less than the normal film size of the 35mm camera (24 x 36 mm) that the camera is based on. Because of this, the effective focal length is increased by 2.5 times. So, a 50mm normal lens becomes the equivalent of a 125mm telephoto lens. In the telephoto range this has advantages because a normal 200mm telephoto becomes a long 500mm super telephoto. But a 20mm wide angle also becomes a 50mm normal lens. Many photographers use a wide angle often, and this is a disadvantage of a digital camera system.

(4) This disadvantage can be overcome by using a digital camera with a larger CCD, such as the Kodak DCS 460. However, these large CCDs are much more expensive to manufacture, so the cameras are very expensive.

e. **Image storage.**

(1) Another difference between a traditional film based camera and a digital camera is how the image is stored once the photo is taken. With a film-based camera, the image is stored on the film in the form of a latent image. Each roll can only hold a limited number of images, and when they are all filled a new roll must be inserted. Digital cameras work on a slightly different principle. After the image is exposed, the digital image is written to built-in memory devices.

(2) There are several different types of storage devices. The DCS 200 has a built in hard disk drive that can store about 50 images. The drawback to a built in drive is that when the drive is full, you must connect the camera to a computer to download or delete images to be able to take more photos. The DC50 has a 1MB hard drive that will store 7-22 images depending on the quality of the image. This camera can also use a PCMCIA card, similar to the DCS 420. The DCS 420 uses a removable PCMCIA (or "PC") card. This card is about the size of a small stack of credit cards, and has a mini hard disk inside. This hard disk can be various sizes up to about 230 Mb, capable of taking about 60 images per disk. The benefit of using a removable PC card is that once one card is full, another can be immediately inserted.

(3) Some of the less expensive digital cameras store images in battery powered internal memory chips called Erasable Programmable Read Only Memory (EPROM). The disadvantage to this memory option is that you must download the images when the memory is full. Also, if the batteries die, you will lose the images.

B-5. OUTPUT FUNDAMENTALS

a. **Printers.**

(1) While creating documents and images on the computer is fun and challenging, the real reward comes from having printed output; called a "hardcopy," a paper or film print of your work that can easily be displayed or reproduced. While it may sound easy to make a print, there are many different facets to the outputting process. Color management, resolution, and line screen are just a few of the complex aspects of printing.

(2) Printer Basics. Basically printers consist of: a paper transport system, a marking engine and a controller. Paper transport is normally belt or roller driven. The marking engine creates the marks on the page and is driven by a print controller.

(3) To create an image, most printers break the image down into small dots called halftones. The dots in this halftone screen control how much ink is deposited at a specific location. Varying the size of the dot creates the optical illusion of variations of gray or continuous color in the image. In the case of a color printout, four halftone screens are used: cyan, magenta, yellow, and black (C,M,Y,K); one for each of the four Process colors.

b. **Types of output.**

(1) Line Art is just that, illustrations or pictures made from solid lines and shapes. Line art is black and white only, with no grays, shadings, or colors. Sometimes line art is printed as a single color, such as red or blue, but the art source is always black and white (or a single color on white) lines only. The text you are reading is line art, it's fully black with no shades of gray or color.

(2) When you take a photo, the resulting image is continuous tone. To your eye, the picture contains even transitions of color across its surface. Curved elements are smooth in their transition from light to dark. In the case of a close-up photo of a young girl's face, there is no noticeable jump in color between the top and bottom of her cheeks. This natural appearing graduation is called continuous tone because the color transitions are even and smooth. Photographs are actually made up of dots like a computer image, but these tiny particles are so numerous, random, and small that they are undetectable without a strong magnifying glass.

(3) Unfortunately, the most popular printing technology today, the lithographic press, can only print a solid ink dot or no ink at all. To print a continuous tone photograph, a solution had to be devised that would allow continuous tones to be printed as a series of dots. The solution is simple: to produce a gray, print only part of a dot and leave part of it white. That way, the paper shows through next to each dot. To the eye, this mix of white paper and a black dot appears as a gray. To create a darker gray, larger black dots let less white show through. To make a lighter gray, smaller dots let more paper show through. This is called halftoning, a term you will hear frequently in publishing.

c. **Printer types.**

(1) A dot matrix printer uses a set of pins or tiny wires that impact on an inked ribbon. Dot matrix printers have as many as 25 to 30 pins. The number of pins a printer has, and the number of passes the pin set makes for each line of type, determines the quality of the output. A second type of impact printer is the daisy wheel printer. These printers have high quality (up to 700 dpi), but don't offer graphics printing, because each character is on a separate wheel or ball and must be loaded onto the print mechanism, whereas dot matrix printers can create any pattern of dots.

(2) Ink jet printers are low-cost, moderate-quality printers that can print either black and white or color output with medium resolution. They operate by squirting ink under pressure through small holes in the print head. Ink jet printers are quite reliable, and a good low-cost solution for desktop publishing and graphics. Using Adobe Type Manager's ability to scale fonts, its print quality can be nearly indistinguishable from a laser printer. Ink used in ink jet printers dries fast but not instantly, and care should be taken in handling fresh copy to avoid smudges. A related technology called bubble jet printing uses heated bubbles to force ink through the nozzles.

(3) Laser printers are based on the xerographic process developed for photocopy machines. The printer gets its name from the computer-guided laser that writes the latent image on a photosensitive drum. Electrostatic toner is then attracted by static attraction created by a transfer corona, an electric field created by a very hot wire. Laser printers are graphics page printers, meaning that whole pages are composed in RAM either in the printer itself or in the computer, and then printed. Most laser printers are built with a CPU to speed up the processing, and come with 1 to 2 Mb of RAM, often upgradeable. As driving the laser requires

considerable data, the instructions must be stored in the laser printer prior to the actual printing. At 300 dpi, 8 million bits of data occupies about 1 Mb of RAM. Most laser printers can print from 5 to 10 pages per minute. Although they are a complex technology, laser printers have excellent reliability and can print several hundred thousand pages or more before failure.

(4) Some of the most common types of color printers are called thermal transfer printers. Most of the high-priced color printers in the $5,000 to $12,000 range are based on this technology. These printers use dye, dyed ribbons, colored plastic or wax or some other material that can be melted onto the page. Often the transfer mechanism in the print head is a set of heated elements similar to those in impact printers. The paper makes three or four passes through the printer to transfer the process colors. This may result in registration problems, where the colors do not all line up properly. Most high quality thermal transfer printers lay down all of the colors in a single pass.

(5) The second kind of color printing is called continuous tone, or "contone." These have near photographic quality because the colors are blended together in a single pixel. One class of thermal transfer printers, dye-sublimation printers, uses nearly the same mechanism as thermal transfer printers to achieve high quality contone printing. These types of printers have resolutions up to about 400 dpi.

(6) An image setter is a precision printer that uses a laser to expose photosensitive paper or film. Imagesetters can produce either a piece of lithographic film that is used to make a printing plate, or some newer imagesetters can print directly onto a printing plate.

(7) A film recorded prints directly to a piece of film (from 35mm up to 8x10). Because film is a continuous tone medium, film recorders offer some of the best resolution output you can achieve from computers. Low-cost film recorders in the $1,000 to $7,000 range employ miniature monochrome cathode ray tubes (CRT) inside a sealed light box; less expensive analog recorders use color CRTs inside a box but have the limitation of poor resolution.

(8) A Raster Image Processor (RIP) is a computer that converts the code from a desktop publishing system into a format acceptable to the imager. It takes the lines and curves that make up graphics, plus the bitmaps that make up halftones, and renders them as a series of pixels matched to the resolution of the specific imager being used. The RIP begins by breaking the file into individual objects, which it processes one by one until it has built a complete high-resolution bitmap. The RIP then passes the bitmap to the printer, where the actual spots are placed onto the paper. A major concern with RIP is the speed of the processor. Because the overall speed of the RIP is dependent on the amount of RAM it contains, most of the newer RIPs have increased memory so that it doesn't hold back the rest of the system.

d. **Resolution and dots per inch (DPI).**

(1) The main difference between an inexpensive ink jet printer and an expensive imagesetter is resolution. Low quality dot matrix printers can create a dot size of around 7mm (around 150 dpi) these are referred to as letter or near-letter quality printers. Laser printers commonly have dot resolutions of 3.3 mm or 300 dpi. This moderate quality permits sharp type down to around 6 point size, and mediocre digital images. Some newer laser printers can print at higher quality, around 600 dpi.

(2) Imagesetters have dot resolutions of 0.4 mm or 2,450 dpi! This is high quality that results in sharp type to around 3 point and medium quality digital images. Put another way, desktop printers produce ragged dots, image setters produce clean dots.

(3) An understanding of resolution is central to effective printing and scanning. The standard measurement of resolution is dots per inch, or DPI. This number specifies the number of dots scanned, displayed or printed within one square inch. A Macintosh screen has a resolution of 72 pixels per inch (ppi), which means that each square inch is composed of 72 by 72 dots (when discussing monitors, these dots are called pixels).

(a) When scanning, the input resolution is the precision at which an image is captured. This resolution is set before the scan is made, although the resolution can be changed from within image editing programs.

(b) The Mac's screen resolution is always 72 ppi. So, if you are looking at a color image scanned at 300 dpi on screen and displayed at actual size, you aren't really seeing all of the information, because the computer monitor can't display it.

(c) The output resolution is specified when the image is output to film on an image setter. This resolution is specified in dpi. Different models of imaging equipment are capable of different levels of resolution, starting at 1,270 dpi and going beyond 3,000 dpi. You can output a scan at a higher resolution than it was scanned with, but the result looks flat because the additional dots are created through interpolation, a mathematical guessing process.

e. **Service bureaus**. Service bureaus are companies that provide computer output in a variety of forms: as film separations, slides, transparencies, and color proofs. They can take Postscript files created on the desktop computer and from them, generate high-resolution film ready to be reproduced by an offset press. Service bureaus can provide high-quality film and image setter output because they have many customers and invest in expensive printers. It is not economical for a small organization to purchase an image setter for only a few prints, when a service bureau may already have the equipment.

f. **Fonts/typefaces.**

(1) When type was crafted out of lead, a printer's type collection could literally weigh a ton. Each size and style of a typeface was a new font, and a type family consisted of many fonts in different sizes and styles. Transporting a large type library from place to place was unthinkable. Phototype, which succeeded metal type, was produced in only three sizes: small for captions, medium for text, and large for displays. Intermediate sizes were obtained by varying the focal length of the projection lens, but many shops used just one size to produce all other sizes of type.

(2) Phototype is fragile, and like metal type, can wear out with constant use. Today's digital type is easily stored on floppy disks that are easily transported. Digital technology redefined the term font. Now a single design is scaled to generate all sizes of type.

(3) Most current digital fonts use one of two core technologies: PostScript, developed by Adobe, and TrueType, developed jointly by Apple Computer and Microsoft Corporation. To understand these technologies, you need to know how monitors and printers display pictures.

(a) Computer displays are made up of a grid of tiny dots called pixels. Computers display type and other images on the screen by turning pixels on or off. This display method is called a bitmap; a bit (short for binary digit) is the smallest unit of information the computer can use, representing one of two values: on or off.

(b) Instead of describing letters as a collection of dots, PostScript and TrueType fonts describe each character as a set of mathematical outlines. A special piece of software called a rasterizer uses this single outline description to create many different sizes of bitmaps at the right resolution for the output device.

(c) The rasterizer may be built into a printer, as with PostScript printers, or it may be a program that runs on the computer itself. Adobe Type Manager (ATM) is a program that rasterizes PostScript fonts both for on-screen use and for printing to non-PostScript printers. The TrueType rasterizer is built into the computer's operating systems, and is also included in some recent PostScript printers. PostScript fonts consist of two separate files: a bitmapped (screen) font and an outline (printer) font.

(4) All computer platforms use a character set based on American Standard Code for Information Interchange (ASCII), which allows 256 characters. The first 128 characters are taken up by the upper and lowercase alphabet, numerals, and standard punctuation. These characters are defined the same way on all computer platforms. Each platform handles the remaining 128 extended characters differently (accented characters, ligatures, special punctuation, and so forth) so translation between platforms can be problematic when using documents with extended characters.

g. **Printing software.**

(1) **PostScript language.**

(a) PostScript provides a consistent format for handling files on different computers. PostScript is actually a programming language for defining pages.

(b) The power of PostScript is that it is capable of accommodating a wide variety of images and is "device independent." This means that once a file is created in this format, it can be output on any device with a PostScript interpreter, and the file will print correctly. The same Postscript file that produces a page at 300 dpi on a laser printer can be produced on an imagesetter at 2,400 dpi.

(c) Adobe has created a standard (called Type I) for describing PostScript fonts. PostScript optimizes the placement and arrangement of the dots on the page so that each character will look good printed or displayed at any size.

(2) **QuickDraw.** QuickDraw is the Macintosh's internal screen drawing language, developed by Apple and used for representing type and graphics on Macintosh monitors. QuickDraw's primary purpose is to represent information on screen, but it can also output images to printers and other devices. QuickDraw translates this information into representations compatible with a video display. QuickDraw can represent complicated images on the screen, but is not as powerful or accurate for printing documents as PostScript. QuickDraw does not create files that can be manipulated like PostScript files.

(3) **Adobe type manager.**

(a) ATM, the acronym for the Adobe Type Manager accurately renders PostScript typefaces on a Macintosh monitor the same way they will print. QuickDraw without ATM cannot render most typefaces smoothly or accurately. ATM is a system extension that replaces QuickDraw's type rendering commands with its own. Without ATM, twelve-point type may look fine inside word processing software, but larger sizes, italic faces, and characters with swirls and flourishes may be barely readable. With ATM installed, all Type 1 fonts will become fully readable in all sizes and formats.

(b) ATM is also important for printing on non-PostScript devices, because it can be used to replace QuickDraw's font routines and produce smooth output for Adobe Type 1 fonts.

(4) **Font handling software.**

(a) When using a Macintosh, all of your fonts must go in a special folder in the system folder. When you turn the computer on, or launch a program, the system software scans this font folder and loads the fonts into the application. The more fonts you have installed, the more system memory is used to manage them. While an average user probably does not have the need for more than a dozen fonts, printing professionals may have hundreds of fonts.

(b) To free valued RAM space we may use font management software, such as Suitcase II or Master Juggler. The programs allow you to store your fonts anywhere you like. You create sets of fonts to load with each program or document. This is useful, because only needed fonts are loaded, but all are accessible. Without these utilities, you have to manually move fonts in and out of the font folder and then restart the computer, a time consuming process.

(c) Another handy font utility displays font listings in the actual typeface of the font. Without this software, you must either print out sample sheets or change some text to see the actual style of a font. One application that does this is called Menu Fonts.

h. **Quality control/color management.**

(1) **Color calibration.** As digital technology becomes more popular, it is even more important to be sure that you are producing the best possible results. One of the most challenging aspects of digital photography and graphic design is to make sure that your final output looks as good as it does on the computer screen. There are several things that we can do to help in this process.

(a) Keeping the light constant. An important aspect of the calibration process is to maintain consistent lighting throughout your workspace. For example, working in a dimly lit room with neutral colored walls minimizes interference from changing daylight and from color reflections from clothing, both of which can interfere with perception of color on-screen.

(b) Accounting for the artists eye. Another aspect is calibrating for perception. Each person sees color and tone differently. What may look good to one person looks bad to another. The operator can compare an image file to several color proof prints of the same file. With the proof in hand and the image on the calibrated monitor screen, you can choose the printed version that, to your own eye, most closely matches the on-screen image.

(2) **Device calibration.**

(a) The first step in calibration is to display and output a test target, including a neutral gray wedge, fleshtone, and RGB/CMYK color wedges. Output a test to as many devices as you have (printers, film recorders, copiers, and so forth). Next, using the screen gamma software supplied with your monitor calibrator, adjust the display to match the printed material as closely as possible.

(b) If you are using a Macintosh, your monitor should be calibrated with a luminance measuring device, like the ones available from display manufacturers. This helps to adjust the monitor's CRT guns so that they reproduce the correct intensity relative to the input they receive from the video card.

(c) Several adjustment tools found in Adobe Photoshop can be used to control the color, brightness, and contrast of scanned images before they are turned into custom prints, halftones, and color separations. Primarily found under the "Image" menu and the "Adjust" sub-menu, they are "Levels," "Curves," "Brightness/Contrast," "Color Balance," and "Hue/Saturation" commands.

B-6. IMAGE ACQUISITION WITH SCANNERS

a. **Scanners.**

(1) Digital photography has many possibilities and uses. We can store images for years with no image loss. We can quickly and easily file, edit, and print these images. Special effects are now easily within reach. What about all of the images taken before the advent of the computer? What about the images that we are still taking with our current film based cameras?

(2) By learning to use scanners we can transfer the negatives, prints, and slides that we already have into the computer and then have all of the digital benefits described above. Scanners also allow us to use any art, image or text that we already have in out digital documents.

b. **Scanning basics.**

(1) A scanner converts the analog images that we already have (negatives, slides, flat art, and so forth) into digital signals that the computer can handle. There are two basic types of scanners: film and flatbed.

(a) A film scanner can either be a small desktop accessory or a large professional pre-press (called a drum scanner) model. Film scanners transmit a high intensity light through the (positive or negative, B&W or Color) film. The light then passes through a series of color filters and a lens onto a light detector, where electronics convert the analog image information to digital data. Slide scanners are typically of a higher resolution and have better detail and focus than flatbed scanners. These type of scanners come in many sizes and prices, and can handle film from 35mm up to 4x5 or larger.

(b) A flatbed scanner resembles a photocopier: the lid is lifted and the original image is placed, face down, on the glass. Beneath the glass, a motorized scan head travels the length of the page on tiny rails, illuminating the original and measuring the intensity of the reflected light. Many flatbed scanners now accept an optional transparency adapter, for scanning slides and

transparencies. These scanners can be used to scan any type of flat art: text, illustrations, paintings, and so forth.

(2) There are other types of scanners, those based on video camera chips, that are generally low-end and do not provide high quality images.

c. **Charge Coupled Devices (CCDs).** A CCD is an electronic chip that reads and measures light and converts it to digital signals for the computer. There are two types of CCDs used in scanning devices: linear and array.

(1) **Linear CCD scanners.**

(a) Scanners employ a linear CCD array, which consists of several thousand charge-coupled device elements arranged in a row on a single silicon chip. Reflective originals are lit by a fluorescent or halogen light source. The light source moves the length of the original and then a mirror directs consecutive lines of image data onto the stationary CCD array.

(b) The full width of an image is read line by line as the sensor and light move the length of the scanning area. Light of a specific color and intensity falling on each CCD element creates a proportional electrical charge within it. An "analog-to-digital converter" turns the voltages from the CCD array into digital values that correspond to image pixels.

(c) Grayscale scanners take a single set of light intensity readings from originals. Color scanners capture three sets of readings from color originals by using red, green, and blue filters. Scanners that incorporate a single linear CCD array sometimes rotate an RGB color filter wheel in the lens unit before each of the three separate passes of the original are made. Single-pass scanners may use three linear CCD arrays, which are individually coated to filter red, green, and blue. The same image data is focused onto each array simultaneously.

(2) **Array CCDs.** The other type of CCD is an array CCD. Where a linear CCD moves the length of the image area, an array CCD is larger and physically covers the entire image. Most scanners use linear CCDs, array CCD's are usually found in digital cameras. Array chips are more expensive to manufacture, because instead of being a few thousand pixels long and one pixel wide, they must be the same dimension as the image to be recorded; usually a few thousand pixels in length and width.

d. **Scanning terms.** To most people the world of scanning is completely foreign, with many new terms and concepts. Most of us have worked with computers and traditional photography, so these areas are not totally foreign, but scanning is almost completely new to us. There are several key terms that we must first understand to be able to effectively use a scanner.

(1) **Final resolution.**

(a) When we are preparing to scan, the first concern we have is how the image is going to be printed (or displayed). It is important to scan with enough detail to get a good output. It is also important to conserve disk space and image processing speed by not scanning too much information into a file. If we scan at the maximum resolution and we are only going to be displaying the image on a screen, we are wasting space and time. This is called over scanning.

(b) If we scan a 4x5 inch image at 72 dpi our file size will be about 365 Kb, if however, we scanned the same image at 300 dpi the file would be about 6 Mb, requiring about 20 times more storage space and processing time. You can see how important it is to determine the proper scan resolution.

(c) Desktop printers have resolutions measured in dots-per-inch (DPI). By knowing the DPI of our intended output device we can tailor the scanner settings to only provide enough information to give us a good output. The general rule for determining scanning resolution is two times the final output resolution. For example, if our images will be printed to a 400 dpi color laser copier, we should set the final resolution to 800 dpi (400 x 2 = 800) before we scan.

(d) Printer resolution depends on the type and brand of printer you are using. Consult your owners manual for your printers maximum dpi. However, most B&W laser printers have an output of 300 or 600 dpi, while color laser copiers are around 400 dpi. The Kodak XLS-8600 PS dye sublimation printer has a 300 dpi output capability.

(e) You may also hear the term pixel-per-inch or PPI. This number is sometimes used interchangeably with DPI, however they are not exactly the same. PPI is the numbers of pixels per inch, and this should be used when referring to a monitor. Macintosh monitors have a display resolution of 72 PPI, although most people just say "72 dpi."

(f) Scanners are classified by their maximum resolution; for example one scanner may be a 300 dpi scanner while another is a 1200 dpi model. These numbers mean that that scanner can scan up to the maximum indicated dpi value. Some scanners (as well as some printers) use software technology to increase the stated maximums. This is called interpolation. By analyzing the picture elements of an image, scanning software may increase the resolution by adding pixels between other pixels. By "guessing" at what color the software thinks the new pixel should be based on the surrounding pixels. This technology helps get better results, but an interpolated 600 dpi scanner will not give as good results as a "true" 600 dpi device. Some laser printers do the same thing, guess at intermediate pixels, to help increase resolution. Interpolation doesn't add detail to a scan, it just helps smooth information that is there and reduces "jaggies" often seen in computer output.

(2) **Line screen.** High-end outputting devices (image setters) produce images on four different plates or pieces of film. Each plate represents the information of one of the CMYK colors. To create the image, pictures are printed as a series of dots, called a halftone screen. The larger the dot, the darker the color appears, if you are preparing scans that will be printed by this process, you need to know the halftone screen frequency, expressed in lines-per-inch (LPI). This number, expressed as 135-line screen is similar to the DPI value above.

e. **Types of images to be scanned.** We may come across many different types of images that we want to scan: color, B&W, line art, and so forth. Knowing how the scanner handles each type of image, we can be assured of getting the best quality with the smallest file size.

(1) **Line art.** Line art, drawings or illustrations that only contain black and white lines and no gray tones are easy to scan. Set your scanner to the "Line" mode or "Black and White." The only quality issue is proper density. Be sure that once scanned, the desired white areas are white.

(2) **Grayscale.** Black and white photos and shaded art can be scanned as grayscale images. Select the proper DPI of your printer and choose how many gray levels you desire.

You again must be sure that you have a true white. You can control this in either your scanning software or image enhancement software but remember it is always better to fix problems in the pre-scan.

(3) **Continuous tone color.**

(a) The most complicated images (and most often scanned) are color images that have many different tones. We need to be sure that we scan correctly to preserve all of the detail of the original. Most scanning software has pre-set values for different film or image types, but we must not rely on these automatic features.

(b) It is best to perform a pre-scan and then judge the quality. Use the scanning controls to perfect the image before the actual scan. Although it is possible to correct a bad scan, it is best to get it right the first time. Much like traditional photography, we can make an acceptable print from a poorly exposed negative, but we will never get super quality.

(c) When scanning images that have previously been halftone printed (art or photos from books and magazines) you will sometimes get an odd pattern called a moir pattern. This is caused by the overlap of the halftone screen that the scanner uses and the halftone screen in the printed material. To reduce this, you must unsharpen the image after scanning. Some scanners attempt to reduce the moir pattern during the scanning process. Be aware of copyright regulations, when scanning pre-printed materials.

f. **Optical Character Recognition (OCR).**

(1) Software that can read typed pages is called Optical Character Recognition, or OCR. When we type a page of text into a computer, we enter the actual letters that we want displayed. These letters are converted to binary code that the computer can understand. We can go back at any time to change parts of the document. When we scan a page of text, all we have is a picture of the page. The computer sees light and dark areas on a blank background, not words and sentences. We are not able to change this text at all. If we use OCR software we may be able to get some editable text.

(2) OCR software works by comparing the patterns of light and dark areas of the scan to known shapes of letters. The software is programmed to identify lines and curves and compare them to the shapes of letters in the alphabet. Generally, OCR is accurate, but we must always proofread the result. There are several things that we can do to increase the accuracy of OCR software.

(a) First, we should use a mono-spaced font when we plan to OCR a scanned document. These fonts keep each letter the same space from their neighboring letters. This helps the OCR software determine where one letter stops and another starts.

(b) Last, make sure that you have a clean copy to scan. You may get better results if you photocopy a fax before scanning in for OCR. Adjusting the density and contrast may also produce better results. Remember, ALWAYS carefully proofread and spell check text that has come from an OCR program.

g. **Scanning with different scanners.**

(1) **Nikon Coolscan Film scanner.**

(a) The Coolscan is a small, desktop scanner that is designed to scan 35mm slides or negatives. The Coolscan has a Photoshop plug-in that we will use to acquire images. The Coolscan is a SCSI device that plugs directly into the Macintosh.

(b) Film is inserted into the Coolscan emulsion up, either in a slide mount or in the provided film strip holder. Gently push the film in as far as it will go without forcing it. Now, use the Photoshop "Acquire" option found under the "File" menu to choose "Nikon Scanner." You will get the Nikon Scanner plug-in dialog box.

(c) This dialog box provides many options for image type, resolution, cropping, and so forth. Consult the Coolscan User's Guide for detailed instructions and Coolscan usage tips.

(2) **Apple ColorOne, Microtec 600 ZS , Umax UC1260 Scanners.** These scanners are all high-resolution flatbed scanner that can scan in full color. They accept material up to 8.5 x 14 inches. They too are SCSI devices that can be chained to other devices attached to the Macintosh. Like all flatbed scanners (and copiers) material to be scanned is placed face down, flush with one corner on the glass beneath the cover. Operation of each of these scanners is similar, but consult the appropriate users manual or software instructions for detailed guidance.

(3) **Color calibration.**

(a) As we have learned, getting consistent color from the original to the scanned image in the computer and then out of the printer is the most challenging part of electronic imaging.

(b) Each device has a different procedure for calibration. Usually, you scan a calibration target or image and then print it to your normal output devices. You next use a monitor calibration program to visually change the output of your monitor to make it compare to the original and to the print. You can either visually compare the two samples or use a densitometer to check the actual color values. Some output devices (film recorders and high-end printers) allow you to calibrate their output as well. Check the operator's manuals for your outputting devices (as well as your scanners) for procedures on calibration and consistency.

B-7. PRESENTATIONS WITH MICROSOFT POWERPOINT

a. **Presentations.** A computer and presentation software together can help you make convincing presentations or speeches. The power of the computer to combine graphics, images, text, sound, and video is unmatched. By following basic rules and guidelines, you can make electronic presentations that will convey your point in a professional manner. Presentation software also speeds up the process of preparing for a presentation. On the other hand, improperly used, presentation software will make your work hard to understand and unwieldy. There is a fine line between an effective presentation and a confusing display.

b. **Preparation.** The key to producing an effective presentation is organization. It is a good idea to sit down and think about a few things before beginning to work:

(1) **Why am I giving this presentation?**

(a) This is perhaps the most important question to ask before creating a presentation. Without a firm grasp of what the ultimate goal of the presentation is, the entire show will appear unorganized and ineffective. You need to decide not only what the topic is, but also what you

want the audience to leave with. Try to create a firm concise statement that will be your goal, for instance:

(b) At the end of my presentation, my audience will have a working knowledge of how a black and white laser printer works. Including: how the image is placed on the paper and made permanent, how the toner is handled in the printer, and how paper is transported through the printer.

(c) As you can see by this example, we now have a clear goal for our presentation. We will be able to refer back to this goal whenever we need to clarify our direction. Also, we will look at this goal after we have finished creating the presentation to see if we did indeed obtain our goal.

(2) **How much time do I have to give the show?** We need to know our time limitations before we start. It would be silly to try to produce an effective presentation using the above goal if we knew that we only had fifteen minutes to give our showing. We may need to go back and change our goal if we realize that we are restricted by time.

(3) **What is my audience's knowledge level?** It is important to know the audience you will be presenting to before creating anything. We must have an idea what our audience's knowledge level is, and then try to tailor our goal. Our presentation must be challenging, but not too hard. We do not want our presentation to be too simple either, or the audience may feel as if we are condescending to them.

(4) **What will the presentation media be?** The last thing we need to look at is how we will be giving the presentation. Although a good presentation can be presented in a variety of ways, it is best if we know what media will be used. If we are using a screen, videotape or video projector we will be able to use more video and sound. If it is going to be printed and handed out, then we will not use color, because color printing is probably cost prohibitive.

c. **Arrangement.** Once we have a basic knowledge of what our presentation goal is, it is time to begin arranging and gathering information. It is important to gather a wide variety of important related material.

(1) **Information.** The type of information that we will use depends on the topic of our presentation. We can use equipment owner's manuals, magazine/newspaper articles, library books, reports, and factual statistics. It is important to gather a wide variety of important related material. The more material and research we have the more professional our presentation will be. Also, if we present facts, data, numbers and figures, our presentations will have more credibility than if we just give opinions or statements. It is also important to find graphics, illustrations, and charts to incorporate into the show. These types of information are easier to understand than long text descriptions or rows and columns of numbers. Remember, the easier it is to understand a presentation, the more information the audience will retain.

(2) **Outline.** Now that we know the types of information that we have available to use we need to create an outline. We should do this in a standard outline format; even better, we should do it in Microsoft Word. Our presentation software, PowerPoint, allows us to import Word outlines directly into a slide show for very easy presentation set-up.

(a) The outline should begin with some sort of introduction and end with a closing where you restate your main points. Do not put too much information into the outline at this point. Concentrate on getting a logical smooth flow. Try to include an entry for every major point that

you want to make, and then put more and more information into logical sequence under the appropriate headings.

(b) Go through all of your references and data and make notes as to where you feel the information fits best in the outline. Do not create any graphs or charts; just get an idea as to where information should be placed.

(c) Now that we are reasonably well organized, it is time to start creating the presentation using Microsoft PowerPoint. (Although we will learn PowerPoint, the same principles apply to any presentation application.)

d. **Microsoft PowerPoint.** PowerPoint is an extremely easy to use and effective presentation application. It is part of the Microsoft Office suite of applications that all work together to blend text, graphs, and illustrations into one seamless show. The first step in creating a presentation with PowerPoint is to choose a slide background (PowerPoint calls each screen of information a "slide"). PowerPoint has an option called "Wizards" that automates presentation production; we will not cover this option, because you have more control if you create the show manually.

(1) When you first launch PowerPoint you are presented with the Startup dialog box. From this box we will choose "Template" to create a new presentation, and choose the background template. PowerPoint has many built-in colorful backgrounds and templates to choose from. These templates not only are professionally colored and designed, they also have formats for many different types of slides. Templates are helpful for creating both beginner and advanced presentations.

(2) When you choose "Template" you are presented with a dialog box to locate the templates. They are in a folder called "Templates." Inside this folder there are several folders of templates depending on which type of presentation you will be doing. Choose the appropriate type of template (slide, screen, overhead) for the presentation you want to create.

(3) Once you have selected the presentation style, you next choose the slide layout for the first slide. Using the pre-configured templates makes presentation production easy. There are many different slide layouts to choose from. These layouts use different color schemes, design elements, and organization to provide you with different "feels" for your presentations. All you do is scroll through the layouts and double click on the one that you want to use for the first slide. Generally a title slide is best for the first slide.

(4) Now you must decide on a title for the first slide. Usually the name of the presentation, or something similar is best. To add text, simply click on the area that is labeled "Click to add title". You now have a title slide! Let's take a look at the parts of the PowerPoint presentation window. This is the window that we will use to create our presentations.

e. **PowerPoint Presentation Window.**

(1)   On the left edge of the screen is the "Drawing Toolbar" this provides you with tools you can use to create illustrations on your slides. Most of these tools are self-explanatory and the best way to learn them is to just try them out.

(2) Like all Macintosh programs, there is a menu bar across the top of the screen. This contains all of the normal commands found in a menu bar, such as options for saving, printing,

viewing, and so forth. We will not explain every feature of the menu bar here, but will refer to commands here as needed.

(3) Beneath the menu bar is the Standard Toolbar. As we have said, PowerPoint is part of the Microsoft Office, so the Standard Toolbar is similar to other Office applications. We find icons here to save, print, cut, copy, paste, and so forth. There are also icons that represent importing Excel graphs and Word tables. A zoom box also allows you to quickly change the size of the on-screen image.

(4) Next is the Formatting Toolbar. This is located directly under the Standard Toolbar and contains all of the standard text formatting options. There is a font and size window, as well as other normal text handling functions.

(5) The main part of the screen is the presentation window. This is where the actual slides will be shown while you are creating them. In addition to scroll bars, there are five buttons in the lower left corner. These buttons control the on screen view of the presentation.

(a) The button on the far left is the slide view button. This button is used to view individual slides. You also have editing controls to add/change text or graphics in this viewing mode.

(b) To the right of the Slide view button is the Outline view button. This is used to view the presentation in outline mode. From here you can work on the title and body text of each slide. You can also easily import outlines from Word into a presentation.

(c) The center button is used to view the presentation in slide sorter mode. This would be similar to viewing a group of slides on a light table. You can move individual or groups of slides around. This is a convenient way to polish a presentation after the text and graphics have been entered.

(d) Notes Pages view: PowerPoint allows you to create and print a lecture notes page. This is a page that has the actual slide printed on it, as well as an area for you to enter any notes that you might want to add.

(e) The last button on the right is the Slide Show view. This button is used to view the slide as it will appear on the computer screen during an electronic presentation. By clicking on this screen, the slide is enlarged to fill the screen and all menu and tool bars are removed. Clicking the mouse button will switch to the next slide in the show. This is a convenient way to preview the actual presentation.

f. **Creating a presentation.** Now that we are familiar with the PowerPoint interface and we have decided on the basics of the presentation setup, it is time to add information to the body of the presentation. Perhaps the easiest and fastest way to get started is to either import or create an outline in the Outline view. This will give you a basic list of slides that you can then add information to.

(1) To create the outline, first click on the Outline view button. The information you entered onto the first slide will be on the first line. This represents slide number one. To add a new slide simply press "return," you can now add information to the title of the second slide.

(2) When presenting material, it is best to use bullet statements rather than long text blocks. It is hard for an audience to read long passages on a screen. Ideally, you should have

simple bullets only a few words long that get your point across. When you give the presentation, you will be able to expand on any points that need to be discussed. Remember, the slides are designed to enhance your presentation, not replace the presentation.

     (3) To create bullet statements, simply click on the arrow button on the far right side of the Formatting toolbar. This button will demote the text on the line to the next lower level. To add a bullet character on the line of text, click on the bullet icon, also on the Formatting toolbar. You can handle text in all normal ways in the outline mode. You can change font, size, formatting, and so forth.

     (4) Now that you have all of your information entered into the outline format it is best to switch to the "Slide View" mode to look through the slides. From this view of each slide you can judge the basic flow of the presentation. You are also ready to format any of the text in any special ways. Just use the arrow pointer to click and select the text. You can now change the text size, color, justification, and so forth. Once you have created enough slides to cover all of your material, you are ready to add graphics and illustrations.

    g. **Graphic slides.**

     (1) PowerPoint makes it easy to draw simple shapes and other objects that you can then use in your presentation. Perhaps the easiest way to draw is to use the AutoShapes Toolbar. Click on the icon in the Drawing Toolbar, to get the AutoShapes Toolbar. This box will give you a selection of 24 commonly used shapes. Click on the desired shape and then simply drag on the slide window to place and resize the shape.

     (2) To draw freehand objects, simply use the "Freeform Tool." With this tool you can click in different spots to draw straight lines, or drag to draw free curved lines. Once you have completed your drawing, you can handle your drawing in the same manner as any of the AutoShapes.

     (3) Once we have the shape placed we can then edit its color, size, and position.

     (a) To change its color, use the arrow icon from the Drawing Toolbar to select the items. (Click near the border of the shape to select it.) Next, click on the "Fill (on/off)" button also on the Drawing Toolbar. This will fill the item with the default color. To change the default color or to add a pattern to the color choose "Colors and Lines..." from the "Format" menu.

     (b) It is easy to change the size or dimensions of an object. Simply select the object (as above) and then drag on any of the control handles (small dots that surround the selected object). In this manner you can resize the object or change it proportionally. If you hold down the "shift" key while dragging a corner, the dimensions will stay proportional.

     (c) Position and rotation are two different ways to change the location of an object. To reposition the object on the slide, select it and then move the cursor into the middle of the object. Now just drag it around on the screen.

     (d) To rotate it, again select it then click on the "Free Rotate Tool" in the Drawing Toolbar. Now drag from any of the selected corner points. This will freely rotate the object to any desired angle. You could also select the object and choose "Rotate/Flip" from the "Draw" menu. This option allows you to flip or rotate in 90° increments.

(4) Professionally drawn clip art can make any presentation look better. PowerPoint allows you to import art from either the Microsoft Clip art collection or from other art sources. To add Microsoft art choose "Clip Art" under the "Insert" menu. Just scroll through the art and choose the art to add. To add other art (or photographs) choose "Picture" from the "Insert" menu. Navigate to the appropriate disk or folder and select the item to add. Images in the following formats can be added: PICT, TIFF, EPS or MacPaint. Once Clip Art or photographs have been added, they can be resized, moved or rotated just as other graphics.

h. **Graphs/chart.**

(1) Graphs and charts can be used to present data in easy to understand formats. PowerPoint can be used to create graphs using the accompanying Microsoft Chart application.

(2) To add a graph/chart, create a new slide and click on the "Chart" button on the Formatting toolbar. The application Microsoft Chart will launch.

(3) You will be presented with a standard example data sheet. The easiest way to create a graph is to change the information in this data sheet to reflect your own needs. You will need to change the actual data, along with the headings and labels. Clicking in the data field will allow you to change each entry. If you are importing information done in Microsoft Excel, all you need to use is the import Excel information button.

(4) There are many different types of charts available. Depending on your type of information, you can create: Pie graphs, bar graphs (horizontal or vertical), scatter diagrams, and several others. You can also create either two- or three-dimensional charts of each type. To change the graph type, pull down on the "Chart Type" drop down menu. Drag to the desired chart type to preview your data in different chart types.

(5) You can add Legends and labels to the chart using the "Add Legend" button on the Standard Toolbar. You can also adjust the rotation, elevation and perspective of 3D graphs by using the "3D View" option under the "Format" menu.

(6) PowerPoint picks the default color for graphs, if you desire to change these colors, click on the graph color you want to change and then just pick a new color or pattern from the graph toolbar.

(7) As you can see, PowerPoint has many options for charts and graphs. We have only briefly covered the beginning options. As we have said before, the best way to learn all of the functions is to just experiment.

i. **Adding QuickTime ideas.** QuickTime is Apple computer's standard digitized video format. PowerPoint allows you to place these digital videos into a presentation. Adding video and sound to a presentation greatly enhances the impact of a presentation. To add a QuickTime video to a presentation, open a new slide and choose "Movie" from the "Insert" menu. You set the play option in the "Play Settings" dialog box found under the "Tools" menu.

j. **Adding organization charts.**

(1) Organizational charts are used to graphically represent the flow or chain of command within an organization. These types of charts are easy to understand, and provide a graphical view of complex management or production flows that is easy to understand.

(2) To add an organizational chart in PowerPoint, create a blank slide and click on the "Insert Org Chart" button on the Standard Toolbar. The application Microsoft Organization Chart will launch and you will have a basic template of an organization chart.

(3) Fill in the boxes with the names and titles of people in the organization. To remove an unneeded box, click on it to select it and then hit "delete." To add levels, choose what type of box you wish to add and click on it in the menu bar. Then click on the box that you want to attach the new box to.

(4) The types of new boxes to add are relatively self explanatory. Adding a "Subordinate" attaches a box under the box you select. "CO-Worker" adds one to the same level. "Manager" adds one above, and "Assistant" adds an assistant box to the level you click on.

(5) The menu bar provides options for colors, line styles, chart types, and other formatting and display options.

k. **Adding tables.** As discussed in the Word chapter, tables can be used to line up rows and columns of information. Creating a table in PowerPoint is exactly like creating one in Word. As a matter of fact, when you choose the "Insert Table" button from the Standard Toolbar, Microsoft Word will launch and you create the table in this application. You can use all of the AutoFormats as well as any other Word functions. When you are satisfied with the look of the table, simply close the window and you will be returned to PowerPoint. Now you can reposition and resize the table. Also, you can add a shadow or change the line color.

l. **Arranging slides, transitions and builds.**

(1) Once you have created the bulk of your slides, it is time to rearrange them if necessary. The best way to do this is to first change to slide sorter mode. In this mode you can see the overall view of the slides. Look through them to see if there are any that obviously need to be moved around. To move a slide (or group of slides), select the slide(s) to be moved and drag until the large marker is where you want the slides to be placed. It is then a good idea to change to "Slide Show" mode and watch the entire presentation to judge the flow and content. Go back and add, remove or change any slides that are not easy to understand. When you are satisfied with the flow of the presentation, you should add transitions and builds to polish it.

(2) Transition effects are used to change from one slide to the next. PowerPoint offers many different transition effects. To choose which effect to use, select the slide (or group of slides) and then use the "Transition" pull down menu to select from the list. There are many different dissolves, fades, checkerboards, window shades and the like. There is an option for random choice as well, where PowerPoint will randomly pick a transition effect. When using transitions, it is best to pick one and use it throughout the entire show to add continuity. Some of the options require a long time to change from slide to slide, so pick one that is fast enough and does not keep you waiting. There is a timing option that you can use to rehearse your show and record the times that you manually leave each slide on screen. PowerPoint will record these times into your presentation, and can automatically advance slides at the correct time, if you desire. To use this option, select the "Rehearse Timing" button on the Slide Sorter Toolbar. To play back using these times select "Slide Show" from the "View" menu and then check the "Use Slide Timings" option.

(3) Builds are similar to transitions, except builds are used to complete a transition between lines of type on an individual slide. For example, you can have the slide title appear as soon as the slide is on the screen, and then you can have the first line of text "fly" in when you click the mouse button (or at a preset time). The next line will then "fly" onto the slide when you are ready for it. Builds are effective when used with bullet text. They keep the audience interested and anticipating the next bit of information that you can "feed" them. There are several ways to set up a build. The first method is to select "Build" from the "Tools" menu, while in Slide View mode. You will be presented with a dialog box with several options.

(a) The first line, "Build Body Text" turns the build on or off. Check this box to activate the build. The second line, "Dim Previous Points" is used to change the color of previous lines of text. Again, this is helpful in keeping the audience on the correct point. The last line allows you to choose how the text will appear. Like transitions, there are many options to choose from, but it is best to pick a simple one and stay with it.

(b) The second way to specify builds is to select the slide or group of slides in the sorter mode and use the pull down menu to select the type of build. This is used to set a build for a group of slides or an individual slide.

m. **Lecture notes and handouts.** Once you have completed the presentation, you may want to make handouts for the audience to use during the presentation. Additionally, you may desire Lecture Notes that can be used by you (or whoever is giving the presentation) during your speech. PowerPoint makes it easy to create both of these.

(1) **Lecture notes.**

(a) Lecture notes are simply sheets of paper that have the slide on the top and space for presenter notes on the bottom. To add notes or comments to the slides, click on the "Notes Page" view button in the lower left of the slide window. You can now enter any information into the Lecture Notes area. You can change the size, font and style of this text.

(b) To change the layout of the Lecture Notes page, choose "Notes Master" from the "Master" pull out menu under the "View" menu. Using this function allows you to change the size, shape and position of the picture of the slide. You can also add text to the master that will appear on every slide. You can add or change text boxes or text attributes using this function.

(c) Lecture notes are often overlooked when creating a presentation. Properly prepared lecture notes will greatly aid in the presentation. Notes help to keep the presenter on track, and focused. They remind you of important things to say or stories to tell. It is important to have some sort of notes to give a professional presentation.

(2) **Handouts.**

(a) Handouts can be used to give the audience something to take with them. When you choose "Handouts" from the print dialog box, PowerPoint prints multiple slides on one piece of paper. You can choose from 2, 3 or 6 slides per page. Handouts are recommended if you use a lot of charts or graphs. It is best to give the handouts after the presentation, so that the audience will focus on you during the show instead of digging around in the handout.

(b) To print handouts, choose "Print" from the "File" menu and then select the number of slides to be printed per page in the "Print What" pull down menu. To change the format of the

handout or to add text to all of the pages, choose "Handout Master" from the "Master" pull out menu under the "View" menu. Now you can add or change things, just as in the Lecture Notes above.

n. **Output.** The last step in creating a presentation is Output. As we have discussed, there are several different ways to give a presentation. PowerPoint provides you with options for outputting to practically any display type you desire. The most practical and easiest way to output is to give a presentation on a computer monitor.

(1) Using a computer monitor is easy when only one or two people will see the presentation at a time, but a large monitor or projection screen is required for a large class. To display to a screen, go to the first slide and click on the "Slide Show" button in the lower left corner of the slide window. The presentation will play, using the builds and transitions you have specified. You can decide whether to have the show self running or to change slides or builds at the click of the mouse button, by choosing "Slide Show" from the View menu.

(2) Printing a presentation is done by choosing "Print" from the File menu. You will be presented with a dialog box asking you what you want to print. You have many choices: Slides with builds, without builds, notes, outlines, and so forth. You will also have other print options depending on what type of printer you are using. This is how you will make overhead transparencies, if your printer is capable of it.

(3) To create 35mm slides that you can project requires a film recorder. The method for recording to film depends on what type of recorder you have. Some film recorders are used exactly like a printer, where you select the recorder from the Chooser, and then just "Print." Other brands require special software and may connect to the SCSI port of the computer.

(4) By putting a presentation on videotape, you can easily and inexpensively transfer the show to many others. To record to video, you must connect a VCR to the computer. Some Macintoshes (the "AV" models) allow you to directly connect the VCR, while non-AV models require a hardware adapter. To record to videotape, set up the hardware, press "record" on the VCR, and show the presentation. If you connect a microphone, you can add narration and sound. Be sure to use high quality videotape to get the best possible image.

B-8. COMPRESSION AND ARCHIVING

a. As we have learned throughout this course, there are many different file formats and types, each with their own uses and benefits. In this chapter we will explore the need for standardized file formats that can compress the data. We need to compress these files to conserve space on our storage devices and to reduce transmission and copy times. It is also important to understand the best way to store images into image archives for quick and easy access. An image or file that is stored but cannot be located is useless.

b. There are basically two different types of compression: lossy and loss-less. As their names indicate, you may lose image quality with one and there will be no loss with the other. There are benefits and disadvantages of each type.

(1) **Lossy compression.**

(a) Lossy compression schemes, such as Joint Photographers Experts Groups (JPEG), squeeze the image data into a much smaller space, but may result in less image quality. As we

have said, the JPEG compression algorithm analyzes the color values of each pixel in the image and performs an average on them. To compress an image JPEG divides the image into many 8 pixel x 8 pixel blocks. It then analyzes each of the pixels in the block and if there are similarly colored pixels it will average them into one color. This averaging process results in a final image that has less detail than the original.

(b) JPEG compression format has a variable compression rate, meaning that you set the amount of compression that you want. When you choose "Save As" in Photoshop and then select the JPEG option you will get a dialog box that asks for the quality level you need, from "Low Quality" to "Max Quality." These options change the amount of compression as well as the final image quality. For example, a 400k TIFF image with maximum JPEG compression is reduced to a 34k file size. The same image with minimum compression (for maximum quality) compresses to about 85k.

(c) When you are using JPEG compression you must be willing to sacrifice a loss of image quality. Usually this loss will be unnoticeable, but if you are printing a JPEG image on a high-resolution printer you will notice the decrease in quality. Areas of the image that have a gradation of color, such as the sky, will usually show banding. This is where there is not an even, gradual color transition, but rather rows of colors that abruptly change to the next color. JPEG should be avoided on these types of images. Whenever you use a lossy compression, you must decide on the trade off of quality versus transmission speed.

(2) **Loss-Less compression.**

(a) There are other options that allow you to compress an image with no loss of image quality. These compression algorithms, called loss-less, cannot compress the files as much as a lossy method, but do not lose any image quality either.

(b) Huffman encoding is a variable word length encoder. This means that redundant data is identified and grouped together as one code. For example, binary data such as a string of 15 "0's "can be grouped together into one code that represents the number fifteen, "101." This saves 12 bits of storage or transmission. When the image is decoded the "101" is converted back into the long string of 15 "O's." Huffman encoding is primarily used to compress binary data, such as a Postscript file. Some programs do not recognize this type of file; PageMaker is one of them. Usually Huffman encoding is transparent, meaning the user does not know that it is even happening. There are no options or settings pertaining to the use of Huffman encoding. Programs that use Huffman will compress and decompress at the appropriate time and you will not even know it.

(c) Limpel-Ziv-Welch (LZW) Compression (named for the people who invented it) is very similar to the Huffman method, except instead of substituting individual characters, LZW searches and substitutes strings of similar data. Again, this is a loss-less compression so there is no loss of data. LZW compression is most commonly associated with the TIFF file format. When you save an image in TIFF using Photoshop you can choose with a check box whether or not to use LZW compression. The only reason not to use LZW is that your file will take slightly longer to open and save, since the computer must do the compression and decompression.

c. File compression programs such as Alladin's StuffIt Deluxe use run-length encoding algorithms such as LZW and Huffman encoding to compress files. These programs are mainly used to compress files that will be sent via modem, or for storing files not often used. These programs are mainly used to compress documents such as word processors and presentations

or binary files for programs that will be transferred. Since images are usually already compressed with either JPEG or one of the loss-less algorithms, using StuffIt will not further reduce the file size.

(1) While not actually a way to compress a file, BinHexing a file allows it to be transmitted through the Internet as a text file. Macintosh files contain two parts: the resource fork and the data fork. If you try to send a Mac file through an email program it may not transmit properly. By BinHexing the file, you convert both parts into plain text that can be easily sent through email. Most email programs actually do all of the conversion for you so you do not need to worry about it.

(2) Much like BinHex, Uuencode converts binary files into text files that can be sent through email. Uuencoded files are much more common among non-Mac computers, but some Mac programs and files come this way if they are stored on other types of machines. Again, most email programs automatically decode these files, or StuffIt Expander can decode them for you.

d. There are applications such as Disk Doubler and Stacker that work on loss-less compression schemes but are designed to compress and decompress the entire hard disk that you use. Usually these programs double your hard drive capacity, but slow down performance because of the transparent compression. Usually these programs work fine, but if your drive crashes any information is totally lost because disk recovery programs like Norton Utilities are incompatible and cannot recover driver level compressed files.

e. When you first take a picture you usually have a use planned for it. It may be newsworthy or perhaps it is simply a photo of a reenlistment or cake cutting. We usually take these pictures and print them to give out or publish. After the immediate uses are over, what then do we do with the pictures? Sometimes they are thrown away or the negatives are filed away (archived), for later use. When we use digital pictures we can easily store many images in a very small space, and have instant access to them. Access is the key to archived images. If we cannot easily locate and get to a picture what good is even keeping it?

(1) Archived images must be easy to find, and they must also be high quality. Kodak has developed the PhotoCD format that is ideal for long term image storing. PhotoCD format saves each image in several different resolutions on one CD-ROM that will last practically forever. When creating PhotoCDs the user can decide which resolutions to save as. This determines the number of images that can fit on each CD disk. The different resolution settings are called the ImagePac format. This format allows the CD author to store in up to five different resolution levels from small low-resolution "thumbnail" reference images to huge high-resolution pictures that can be used for printing. Generally, you should store each image in both a low resolution for fast cataloging and at least one high-resolution file for actual use.

(2) When cataloging with a program such as Adobe Fetch, you attach keywords, captions, photographer data or other information to the image. This attached data is all automatically cross-referenced and can be used to search for images based on any known information. These search functions are the key to archiving images, because as we said unless it is easy to retrieve an image is useless.

f. Adobe Fetch is a cataloging application that is used to catalog, search and retrieve all types of files. Using Fetch you can catalog images, sounds, digital videos, text, presentation files, and practically any other file. Fetch creates a catalog of files that has a thumbnail image

or icon of each cataloged item. A user can create an unlimited number of separate catalogs, with up to 100,000 images per catalog. Each cataloged item can have an unlimited number of keywords attached to it for fast searching and cross-referencing, as well as a 32,000 character caption or description.

(1) A feature of Fetch that is invaluable for cataloging images from CD-ROM is that the images in the catalog do not have to be on the computer that maintains the catalog. For example, you catalog all of the images from a disk and then remove the disk. Fetch keeps small file thumbnails on the hard disk allowing you to search and view the contents of the removed CD. When you try to open a higher resolution copy of an image, Fetch will prompt you to insert the needed CD. This allows you to keep all of your images on separate disks, safely stored away, but still searchable and accessible.

(2) Fetch is one of the easiest programs to learn and use. To catalog a disk or folder of files, just drag the folder onto the Fetch icon. The program will launch, scan the disk for files that can be cataloged, create thumbnails of them and then save them all automatically. You can now remove the disk of images.

(3) When first using Fetch you will have to create a catalog for images. It is a good idea to decide on a cataloging scheme before starting. You should decide on how many or what type of catalogs to use. Perhaps having one catalog for each year, or perhaps one for each type of job (portraits, presentations, and so forty) would be good. However, do not make too many catalogs. This will defeat the purpose of being able to quickly search for documents. The type and amount of work that you do will control your cataloging, but a yearly catalog is a good starter.

(4) Once Fetch has cataloged each item, you can view the thumbnails by choosing "Find..." from the "Search" menu. Click "Find All" to display all of the items in the catalog. You will notice icons for the items with the file type and location printed below. Some items such as sounds and text files will just have a document icon, not a thumbnail.

(5) The most time consuming part of using Fetch is also the most important: key-wording. In order to effectively search for a file or image it must be logically key-worded. This means you must enter in words that Fetch will associate with the cataloged item. When Fetch adds items to a catalog it creates keywords reflecting the item's file type, creation date, size, and so forth. But this is not enough information to efficiently search. You must select the item and then choose "Keywords" from the "Edit" menu. Fetch will display a dialog box that shows the keywords already attached to the item, these cannot be edited. At the top of this dialog box is a line for you to enter words into. Once you enter a keyword click "Add" to add it to the list of searchable keywords.

(a) It is important to be consistent and thorough when adding keywords. The catalog is only as good as its keywords. If more than one person is entering keywords, be sure that some rules are made. For example, have everyone use the word "Airplane" for a picture of an airplane. If one person uses "Aircraft" and another uses "Plane" the catalog will be hard to use. You can however, attach more than one word to an item so that a search for "Plane" will also find "Airplane" and "Aircraft" as well as "Helicopter," "Jet," "F-16", and "A-6" if "Plane" was included with each of these other terms, as it should be. Remember, the more keywords used the better the search will be. See the Adobe Fetch User Guide for in-depth information on key-wording strategies.

(b) You do not need to enter the same information over and over. You can select many items (by "Shift-Clicking") and then choose "Keywords" to add the same keywords to all selected items. This is useful when you have several shots of the same subject from different angles or at different exposures.

(6) There are two methods for searching a Fetch catalog (other than manually browsing through all of the images). You can either do a simple search or a complex search.

(a) A simple search is done by selecting "Find" from the "Search" menu. Click on the box below the "Find items whose" text to make the search area active and then enter a keyword in the field. You can use the two pull down menus to alternate between searching options. When you are satisfied with the searching setup click "Find." Fetch will search through all of the images in the catalog and open a window displaying every image that meets the search criteria.

(b) The second search method is the complex search. This method is done the same way as the simple method, but you click the "More Choices" button to enter more than one search criteria. This allows you to refine the search for a specific image. This is useful if you have a very specific image or desired image in mind. The simple search will find images that match general criteria, while the complex search can narrow this down to a few specific images.

g. Being able to quickly search through large catalogs to find specific images is useful, but integrating Fetch with other programs allows you to also directly copy Fetch images into page layout, image editing or any other application. This is useful when you are creating documents and do not want to manually search disk after disk of images. Below are some of the common applications you may use Fetch with.

(1) **PageMaker 5.0.**

(a) To transfer images from Fetch into PageMaker, first select the desired images in Fetch. Then choose "Copy Reference" from the Edit menu in Fetch. Be sure to choose the "Include Thumbnails" option. Next, switch to PageMaker.

(b) In PageMaker, open the "Library Palette" from the "Window" menu. In the Library palette "Options" menu choose "Import Fetch Items." There will now be a thumbnail image of the placed item in the Library palette. To place the item into a document, click on it in the Library and then click where you would like to place the object.

(2) **Photoshop 3.0.** To include a thumbnail image and to preview a Photoshop 3.0 file, choose the "Preferences" option in Photoshop's "File" menu. Choose "General" preferences and then click the "More" button. Move to the "Image Preview" section and click the "Always Save" option.

(3) **Illustrator 5.5.** To include a thumbnail image and preview an Illustrator file, choose "Save As" from Illustrator's "File" menu. Save the image as an EPS file.

(4) **Microsoft Word.** To preview and catalog Word documents they must be saved as either "Text Only," "Text Only With Line Breaks" or "Text With Layout." Fetch will then be able to include these items in catalogs and will allow you to preview the first 32, 000 characters. Word documents will have a generic file icon in a Fetch catalog.

B-9. COMMUNICATIONS

a. **History.**

(1) **Telegraph.** The first time two machines talked to each other was in 1844 when Samuel Morse sent a message from the US Capitol building in Washington DC to Baltimore, MD, 37 miles away. This was the first use of the telegraph, and it was the beginning of the modern area of communication. With the invention of the telegraph, people hundreds of miles away could now send and receive messages in very little time. Telegraphs allowed users to send a code (Morse Code) of information back and forth across a single wire. While not a computer, a telegraph was the precursor to modern communications, as we now know them.

(2) **Telephone.** The telegraph, which required the user to know Morse code and to have special training, was certainly fast, but it did not bring communications to the individual. The telephone brought communications to the people. The telephone opened up mass communications. Introduced in 1876 by Alexander Graham Bell, the telephone immediately become a success and is still a favored means of communication.

(3) **Teletypewriter.** Around the turn of the century, the teletypewriter became widely used for the communication of non-voice messages. The teletypewriter was ideal to disseminate large amounts of information to multiple stations. A user in New York could type in the information (usually news stories) and at the press of a button, automated machines all along the network would begin printing out the same story. Teletypewriters use the Baudot code instead of Morse. This code is faster than Morse, and allows the machine to print out a maximum of 62 different characters. Teletypewriters are still in use to some extent today, but have been widely replaced by fax machines and modems.

b. **Modern day communications.**

(1) **Modem.**

(a) A modem is a device that allows computers to communicate across telephone lines. Modem stands for modulator/demodulator, and what a modem does is modulate or change the computers binary codes into tones that can travel across the phone lines. When these tones get to the other computer another modem demodulates these tones back into the computers binary language.

(b) Invented in the late 1950's, the Bell 103 was the first modem. This modem allowed two computers to "talk" to each other at a rate of 300 bits per second (bps). Modern modems now talk at more than 28,800 bits per second! While slow by today's standards, the Bell 103 was an important invention because even 300 bits per second is faster than using the post office.

(c) As we have learned, a modem converts the digital 1's and 0's (on's and off's) into tones or pulses. These pulses are then converted back into ones and zeros. An inherent problem with this type of communication is the actual telephone lines. While voices may sound fine, even the slightest static will disrupt data communication. Another problem is speed. Although 28,800 bps is much faster than 300 bps, it is still relatively slow.

(d) At 28,800 bps it will take about 5 minutes to transfer 1Mb of data (at 300 bps it would take 8.6 hours to transfer the same 1 Mb). While this is a relatively little amount of time, it can quickly become longer with large (more than 50 Mb) files. Also, the longer it takes to transfer a

file, the higher the chance of static error. In the future, to increase speed we will have to switch to digital or fiber optic phone lines. These types of lines are already available, but still relatively expensive.

(2) **Speed standardization.**

(a) When any new technology develops everyone wants to jump on the bandwagon. This happened when modems first began developing. Everyone was developing and making their own modems, but problems started developing. Different modem makers were each making their modems slightly different and these differences caused problems. Finally the CCITT, a standards organization, got together and created some industry-wide standards.

(b) V.22bis (bis means "second" in French) was the first standard. The V.22bis standard was the standard for 2400 bps communication. All modems that used this standard could finally communicate.

(c) The next standard was the V.32 standard for 9600 bps communication. This was followed by V.32bis standard for 14,400 bps (sometimes called 14.4 pronounced "fourteen dot four") and V.34 standard for 28,800 bps (28.8 or just "twenty eight eight"). Each of these standards assures that modems from different manufacturers will be able to properly work with each other. You may see a modem labeled "V.fast" these were produced before the V.34 standard was instituted and may not be able to properly communicate at 28,800 bps.

(3) **Compression/error control standardization.** In addition to creating standards that control the rate of data transmission, the CCITT also created some standards for other telecommunications issues.

(4) **Error control/correction.**

(a) Error control or error correction is a way to assure that the information that the sending modem sends is properly received by the receiver. Modems that use Error correction incorporate a code into the transmission. When the receiving modem decodes the message, it will know if any data was lost in transmission. If it discovers missing data it sends a message to the sender and asks for a rebroadcast of the missing area.

(b) The two modern CCITT standards for Error Control/Correction are MNP 5 and V.42. Modems that are designed to use these standards will properly communicate with other modems of these standards.

(5) **Data compression.** The CCITT also created a standard for Data Compression. Compression is a way that the modems squash the data before sending it. They expand the data when it is received. This helps to speed up the transfer of information. However, modems must be able to use the same compression formulas. To assure compatibility, the CCITT created the V.42bis standard for compression. Any two modems that conform to this standard will be able to compress and decompress information properly.

c. **Communication terms.** Whenever you learn about a new technology or subject you must learn a new vocabulary. Communications is certainly no different. Although it may sound complicated, there are not that many new terms.

(1) **Handshaking.** When two modems first connect with each other, they know nothing about each other. They must go through a procedure called handshaking. When this is happening they exchange information such as their speed standard, Compression, Error control, and so forth. This process of negotiations and familiarization is called handshaking.

(2) **Data bit.** When configuring your communication software one of the settings you adjust is the number of Data Bits. When computers send information across telephone lines they break the data down into bits. This makes it easier for the computers to manage the information. Different modems use different numbers of Data Bits, usually either eight or nine. To properly communicate, both computers must be set at the same number of Data Bits.

(3) **Stop bit.** While transferring these bits of data the computer adds a bit called a Stop Bit on the end of the data bit. The Stop Bit tells the receiving computer that all of the information in that bit has been received.

(4) **Networks.** A network is simply more than one computer connected together. It can be both economical and time saving to network computers together. First, when you have a network of computers you can keep one central printer and connect it to the network. Whenever anyone prints something it will come out at the one printer. This eliminates the need to have a printer at every station. A network can also save lots of time, because you can have one central database or file area and everyone on the network can instantly access it without leaving their desk. There are several different types of networks.

(a) **Local Area Networks.** A Local Area Network or (LAN) is the most common type of network. This would be where all of the computers in one office or building are linked together. The computers can all share a printer, databases, and operators can even access information directly from their coworkers' computers. There are different types of LANs. Each type has its pros and cons.

- LocalTalk or AppleTalk is the built in networking that the Macintosh comes with. In a LocalTalk network, individual computers directly link to each other. Although extremely easy to set up and convenient when only two or three computers are networked, LocalTalk networks are relatively slow (only about 28 K bits per second) and unreasonable for large networks.
- Ethernet is a common type of high-speed network. With an Ethernet network, each computer is connected to a central hub that contains a microprocessor. This hub allows extremely fast connections (up to about 10 Mbps). Ethernet networks are the most common type used in LAN's.
- Token-Ring is another common network. A Token-Ring network is similar to Ethernet, but the language is slightly different.
- TCP-IP is the type of network that the Internet uses. Ethernet and Token-Ring are hardware and software networks, meaning that you must have the correct hardware (connectors, wiring, circuit boards) and software language. Transmission Control Protocol-Internet Protocol (TCP-IP) is a language that is common to all computers connected to the Internet. TCP-IP can be used over Ethernet and Token-Ring, but is usually just used on the Internet.

(b) **Wide Area Networks (WAN).** A WAN is nothing more than LANs connected together. For example, a business that has offices in New York and Boston can be connected in a Wide Are Network. Both of these offices will have LANs so that coworkers can share printers and

data. If the company decides to connect these two separate LANs using fiber optics, special telephone lines, or microwaves, then they create a Wide Area Network. While you would not necessarily use a WAN to share a printer, you certainly could set up one data base so that offices all over the world could have access.

(c) **Commercial networks.** A commercial network is one that individuals or companies pay to access. These networks are setup to make money and offer many different resources. Users with access to a commercial network may be able to use on-line encyclopedias, databases, mailing lists, software files, and many other types of resources. The largest group of users of commercial on-line networks is home users. Several common commercial networks are America Online, CompuServe, Delphi and Genie. Another type of commercial network is the BBS or Bulletin Board System. A BBS is usually local to one city or area. A BBS is run by a Sysop or System Operator. BBS offer services similar to the larger commercial services, but on a much smaller scale.

(5) **Internet.**

(a) The Internet is a vast, mostly unorganized, global network of computers. In the 1950's the US Government wanted a way to link all of its computers together, so that in the event of a nuclear war, the military would always have access to data stored across the country. This network became known as the ARPANET or Advanced Research Projects Agency Network. Well, the nuclear war never came, so the ARPANET dissolved into what is the current Internet.

(b) In the 1980's the National Science Foundation or NSF, took over the ARPANET and began linking college and university computers to the existing network, thus allowing students and staff all over the world to access vast data bases and resources.

(c) In the late 1980's and early 1990's many commercial networks and BBS began providing Internet access to home users. The Internet is now estimated to have about 2.5 million computers permanently connected. In addition to these 2.5 million permanent computers, it is estimated that another 18 million computers are connected by either dial-up accounts or through terminals at businesses and colleges.

(d) Presently the Internet is going through some dramatic changes that may seriously affect its future. The NSF is turning their high-speed data backbone and supercomputers over to private industry. This will allow increasing commercialization and profit making on the global network. It is still unclear how these changes will affect the end user, but the general consensus is that services will generally stay the same. There will most likely be an ever increasing amount of data available and the Internet will continue to grow.

(e) Another major concern with the Internet today is censorship. Since its conception the Internet has been unregulated and self-controlling. With all of the current advances and increased popularity, there are concerns that there should be more control over what is on the Internet. Because there are all types of explicit material on the global network, censorship would effectively shut down the Internet. There are many questions that have no answers when it comes to the censorship issue. Who would be in charge of deciding what material is deemed offensive? Who would police the Internet? How do you handle a network of computers that spans the globe and many different cultures? How would you locate and prosecute offenders? When a society begins to pass laws that are unenforceable, as any Internet censorship law would be, this only breeds contempt for other laws. The Internet should remain a free forum for the open exchange of thoughts, ideas and information.

(f) Unlike the commercial on line services, the Internet is not set up as one organized unit. There are several key areas of the Internet and software has been developed to make the functions easier. You will need several different applications to accomplish all of the functions available.

(6) **File transfer protocol (FTP).**

(a) One of the most used Internet services is FTP. FTP is used to transfer files from one computer to another. A file can be anything that is on the computer. Application programs, photographic images, books, documents, video clips, and sounds are all examples of files that can be transferred from one computer to another.

(b) There are many computer sites set up by various universities and organizations that offer huge archives of files that can be downloaded. These sites are usually referred to as anonymous FTP sites. What this means is that anyone can log into these computers and access the files that are stored there. When you attempt to log in to these computers you will be asked for a user ID and a password. Most computer systems that allow public access will accept "anonymous" as a user ID and your email address as a password. When you remotely connect to a computer and control its actions like this, it is called a Telnet session. So, a typical Internet conversation may sound like this: "Why don't you Telnet to my computer and FTP that file." What this means in plain English is "Why don't you connect your computer to mine through the Internet and copy that file." Telnet and FTP work two ways.

- You can log onto other user's computers but they may be able to attach to yours.
- You can get files using FTP, you can send files to others using FTP.

(7) **Gopher, Veronica, Archie.** These weirdly named Internet functions are all used to search for information. To use these, you use a program designed for these functions, log on to a server computer, and enter what you are searching for. The computer then searches through its databases and reports what information matches the search query. The program you use will provide a report listing the number of matches, as well as how close of a match it is. For example, if you search for "Apple Macintosh Computers" the search program looks for all occurrences of these words. Therefore, anything with any of these words will be reported. An item with all three words will be listed first, because it is a 100% match.

(8) **Wide Area Information Servers (WAIS).** The WAIS is similar to Gopher and Veronica, but much more powerful. WAIS allows you to ask specific questions in plain English. The WAIS program then searches vast indexes and reports any matches. WAIS is useful for searching the global network for documents on specific topics. To do research on using a Mac as a graphics workstation for example, you would enter "Tell me everything about using a Macintosh computer as a Graphics Workstation." WAIS would then search all of its databases and give you a list of items. You would read one or two of the items, and then you could modify the search. You tell the WAIS program "Search for more like this one" or "Search again, but ignore items that are similar to this." This makes the search more precise and helps you find better information.

(9) **World Wide Web (WWW).**

(a) The WWW or just the Web, is the newest and perhaps the most functional Internet feature. The WWW uses a graphical interface to present screens of pictures, text, sounds and

video. Using the WWW you can connect to remote machines and access information. Many companies, libraries, and organizations have created homepages on the WWW. A homepage is simply a table of contents for the information on the WWW. Each screen or document on the WWW is linked together with hypertext. Hypertext means that specific keywords, called links, are all joined together. When you come across a link, you can click on it with the mouse to automatically move to another location and more information. For example, if you are at the Apple Computer homepage (located on a computer in Cupertino California), and there is a link to monitor resolution (for example), when you click on the text link, you automatically move to the new computer. This new link may be on the same computer in California, or across the globe in Europe and you would not even know it.

    (b) This hypertext technology makes it quick and easy to find information and related material. You may also find links to FTP sites and searchable databases. The WWW incorporates most of the functions of the Internet into one, easy to use format and interface. The future of global computer networks will probably be something like the World Wide Web.

    (10) **Electronic mail.**

    (a) Electronic mail or simply email, allows you to instantly send notes to anyone with an email address. Much like regular letter mail (called snail mail by the techno-savvy) email can be used for anything from personal letters to business mail.

    (b) Email is basically instant. The time it takes to send a letter and for it to be received can be as little as a few seconds to as much as an hour or two. This makes business run much faster. Unlike regular mail, you can send more than just letters through email. You can attach any file that you would like to an email. You can send pictures, programs or other documents, without having to mess with sending disks or removable media through the mail. Because email is much faster and easier then snail mail, people have a tendency to be short and to the point. You must be careful not to mistake this for rudeness.

    (c) Another concern with email is quoting. Since it is extremely easy and quick to send and reply to email, people quote messages in replies. Quoting helps to refresh the memory of the person who you send email to. It is easy to forget what you say, but if you selectively quote parts of the message in a reply it can jog a memory.

    (11) **Newsgroups.**

    (a) Newsgroups, or Usenet News or Internet News as they are sometimes called, are similar to electronic bulletin boards. There are thousands of different newsgroups, each one devoted to a different topic. You subscribe to groups that interest you, and when you read the news, you read all new messages. After the first time, every time you log onto the news server, you only see messages that are new or you haven't read yet. You can post replies to messages or just read other peoples postings.

    (b) There are two types of newsgroups, moderated or unmoderated. Moderated news groups are controlled by one person. When you post something to a moderated group, the moderator first reviews the posting and decides if the entire group should see it. Unmoderated groups have no control and everything that is posted is sent to everyone. This can lead to problems of having the same questions or information posted over and over.

(c) Newsgroups are sorted using a hierarchy system. One typical newsgroup is comp.mac.sys. The first part of the newsgroup name, comp, means that this group is under the computer topic. It is next broken down into the Macintosh (mac) subdivision and finally the system (sys) subtopic. There are many different major topics: Computers (comp), Alternate (alt), Social (soc), Science (sci), Recreation (rec), and News (news) are the major topics. Each one of these is broken down into many different very specific individual newsgroups.

(12) **Mailing lists.** Mailing lists are similar to newsgroups, but instead of logging on to a central repository to read new messages, mailing lists are delivered through email. Mailing Lists work much like traditional snail mail mailing lists. You sign up (or automatically get signed up) on a list and every time someone sends something to the mailing list, it goes to everyone on the list. There are many topics similar to those of the Internet News.

(13) **Internet relay chat (IRC).**

(a) The IRC is similar to a CB radio. You log on to an IRC computer server, and you can automatically "talk" back and forth to anyone else logged on to the IRC around the world.

(b) When you log on, you are presented with a list of several hundred channels, each one with a different topic. You can join a channel (or more than one) and see in real time what people are typing back and forth. There are channels devoted to every imaginable topic. From debates over which computer is best Mac or Windows, to cybersex channels where people from around the world discuss explicit sexual matters! (Not for the faint hearted!)

(c) The IRC can be lots of fun to use to meet people from around the world, but it can also be used to get quick advice to problems. For example, you can sign on to a channel devoted to graphic arts and ask professionals how to accomplish certain tasks.

d. **Other internet concerns.**

(1) **Addresses.**

(a) The Internet and this type of communication is new to most people, so there are lots of new terms and information to learn. The first thing we must understand is Internet addressing.

(b) Every computer or user on the Internet has a unique address to identify it. There are several different types of addresses, and they must not be confused. The most common type of address is an email address, which looks something like this: bob_jones@one.af.mil. The part before the @ is the name of the specific user, Bob Jones in this example. Notice that there is no capitalization or spaces. The "_" (underline) is commonly used instead of a space. Additionally, most users choose something easy like "bjones" or "bobj". The @ symbol (shift 2) means "at" and separates the username from the machine name.

(c) After the @ comes the domain name. This is the name of the machine that the user is using. The first part is the name of the computer at the location. Some places, usually schools, have more than one server computer, so the first name is the specific computer. Next, separated by a ".", is the name of the institution, in this case "af" for Air Force. Finally is "mil" meaning that this computer is in the military domain. Other domains are "edu" for education, "gov" for government, "com" for commercial, "net" for network, and "org" for organization. These domains only apply to United States computers, other countries use slightly different

systems. Most computers outside of the US have a two-digit code at the end, such as "fi" for Finland. You can identify where the computer is located by the code.

(d) Another example, maryjane@blue.ut.edu.ca would be said "Mary Jane at blue dot UT (say "U" "T") dot EDU (rhymes with "met you") dot CA ("C" "A")." So, the address is for Mary Jane at the University of Toronto (ut) in Canada (ca) on the computer named "Blue." In the domain of education, that sounds pretty complicated, but it really isn't.

(e) Another type of address is called a URL or Universal Resource Locator. These are common when referring to the location of a file and not a specific person. A common URL looks something like this: "http://www.apple.com/pub/PowerMac/power.mov." This URL points to a file called "power.mov" located on the World Wide Web.

(f) The "http://" part means that the document is part of a hypertext link. "www" means World Wide Web, next is the machine name. In this case, the machine is "apple" in the commercial domain. The next part is the specific directory that the file is located in. In the UNIX world, instead of folders, files are stored in directories, which can be nested inside each other just like folders. So in our example, the file "power.mov" is located in the PowerMac (/PowerMac) directory that is inside the public (/pub) directory.

(g) Again this may seem complicated, but it is a standard used by all computers on the Internet, so you only need to learn one standard.

(h) You may also see URL that look like this: "ftp://" these are like "http://" address, but they point to files that can be downloaded, and not hypertext documents.

(2) **Internet etiquette.**

(a) As we have discussed, the Internet is a new place for most people so there are new sets of common courtesies to learn. We have already discussed email, and the fact that since email does not involve as much forethought as snail mail, we may have a tendency to be less than cordial. Since you cannot see the writer or hear the tone of voice, it's easy to misconstrue the meaning of things. Internet users have developed smileys to help convey emotions. Smileys are simple pictures drawn with characters on the keyboard. When viewed from the side, they look like little faces, for example: this is a regular smiley :-). There are many variations of this smiley. Here is a winkey, or a winking smiley ;-). Now a smiley sticking his tongue out :-p. Here is an unhappy smiley :-(.

(b) Smileys are used in email, newsgroups and on the IRC. They allow you to add a bit of feeling to an otherwise unemotional medium. A well placed smiley can make the difference between making someone happy or making an enemy.

(c) Another etiquette concern is flaming. Flaming is sending hate email or posting derogatory messages on Newsgroups. Flaming usually results when two people disagree or when someone posts something that angers people. While flaming (sometimes called Flame Wars) can be fun to watch, it really wastes a lot of time and space on other people's computers and should be avoided. If you do accidentally upset someone and find yourself being flamed, it is best to either ignore it or send a nice apology.

(d) Next we have FAQ's. A FAQ is a list of "Frequently Asked Questions." These are posted throughout the Internet, usually on Newsgroups. When you are using a new part of the

Internet for the first time, it is best to look for the FAQ's, before asking questions. It can be time consuming and tiring for everyone involved to have to answer the same questions over and over to every new user. This brings us to "Lurking".

(e) Lurking is watching and reading before jumping into an on-line conversation. Whether it be a Newsgroup discussion or a channel on the IRC, it is best to read what others are saying before jumping in with your two cents. This allows you to monitor the discussion. Although lurking is good for beginners, remember, the Internet is all about people, and to use the full potential you must participate.

(3) **File transfer.**

(a) As we have already learned, file transfer or FTP is used to move files from one computer to another. We will probably use this the most of all of the different uses of a computer with a modem. We will want to quickly send and receive photos and other types of images from distant locations to our home bases. There are two principal ways to transfer files.

(b) The first file transfer method involves using the Internet. To use this method, both parties must have Internet access and they must agree on an FTP site. There are many FTP sites that allow users to store files on their computers, and most Internet access providers allow users to do this. So the originator would log onto the Internet, telnet to the agreed upon computer, and FTP the files to it. Then at their convenience, the receivers can telnet to the computer and FTP the file to their own computer.

(c) This method is convenient, because either party can do it at their leisure. The only problem with this method is security. When the files are on a public computer, they are available to anyone with Internet access. There are two ways to work around this. First the file can be encrypted. There are many commercially available encryption programs that will encrypt up to DES standards. This allows the sender to encrypt the file, and only the receiver, who has the key code, can decode and use the file.

(d) Another way to ensure secure communications is to have a secure Internet computer to FTP the file. Most large companies and government agencies have computers attached to the Internet. If the receiver has access to a computer permanently attached to the Internet, they can set up a password and user name for the sender. The sender simply Telnets to the secure computer and FTP the file.

(e) The second way to transfer files through telephone lines is to set up a direct connection. This method involves the sender calling the receivers computer directly (or the other way around, it really doesn't matter who calls who). You can use regular terminal software to do this, but then there has to be someone at the receiver's computer to initiate the receipt of the file. Most people who transfer files this way use special software that allows you to control the remote computer. When using this software, you can see a window of the desktop of the remote computer, you can control it as if you were sitting in front of it. To transfer the files, you simply drag them from your computer, to the remote window. Apple Remote Access and Timbuktu Remote are two programs for the Macintosh that allow you to remotely control a computer.

(4) **Compression.**

(a) Many files, especially photographic images can be rather large. Imagine a picture that is 8 Mb in size, at 28.8 Kbps, it would take almost 50 minutes to transfer the picture. This can get rather expensive, if you pay by the hour, not to mention tying up phone lines. People have developed compression programs that squash the file to a much smaller size. This smaller size obviously takes less time to transfer and saves money. Compression programs compress images by analyzing the binary information that makes up the colors or tones. Since there may be large areas of the same color in a picture, the computer can bunch all of this information together and save space.

(b) Compression programs are defined by their compression ratio, how much they can squash a file. The higher the ratio, the more compression, and the smaller the compressed file. There are two types of compression programs: Lossy and Loss-Less. Lossy yields the best compression ratio, but may lose image quality.

(c) Lossy compression involves a loss of quality, meaning that the decompressed image will not look as good as the original. A common lossy compression is called JPEG. JPEG stands for Joint Photographic Experts Group, which is a bunch of professionals in the photo field who created the compression type.

(d) When using JPEG, you are presented with several quality options. The options correspond to the image quality. For example, if you choose the "Best Quality" option, you will not loose as much quality as if you had chosen the "Fair Quality," but the file will not be as small either.

(e) JPEG compression works by sampling a small area of an image (usually a 64 x 64 pixel square) and analyzing the contents of the area. JPEG uses mathematical formulas to average the color in the sampled area. It then deletes the original color and replaces it with the average. By doing this on the entire image it can greatly reduce the size of the file, but as we have said, JPEG is a lossy compression, so the uncompressed file may not be as good a quality as the original.

(f) Loss-less compression does not degrade the image quality. Stuffit Deluxe is a program that does loss-less compression. This application, and many similar programs, can be used for any file, not just images. This is useful for transferring any file from computer to computer.

(g) While using the Internet and other on-line services you may encounter many different file types. Most files have a three-letter extension on the end of the file that represents the type of compression. Stuffit Deluxe is capable of expanding almost any of these files, so it, or the shareware program Stuffit Expander, is a must for anyone who regularly uses on-line services.

B-10. ETHICS

a. **Today's electronic technology.**

(1) The ethical and legal issues surrounding photography, retouching, and digital imaging are issues of great debate. Being military photographers, you will have access to an abundance of images and footage not available to the civilian media. It is the responsibility of the military to make guidelines and rules for policy of manipulating military images.

(2) The importance of ethics in electronic imaging will grow extensively as computer image processing technology expands. Already, desktop scanners and software packages have become common in the Electronic Media world. Soon, so will digital cameras. Anyone with a properly configured personal computer can extend the limits of a traditional camera.

b. **The accompanying dilemma.**

(1) It's apparent that digital photography has reached the masses at all levels of the civilian and military sectors. This has created a dilemma: to retouch or not to retouch. As more people edit photographs on computers, photographers are finding it difficult to maintain control over their work. When the photographer's point of view as an eyewitness is lost, variance between fact and fiction is easily misinterpreted. Possibilities are almost endless as to what enhancements and manipulations can be made on the computer.

(2) Many photographers have reacted negatively to computer technology after years of seeing their works reproduced without permission. Many of today's photographers are hesitant to allow electronic copies of their images into a publishing world that has become unconcerned about photographic copyrights and the ethics of retouching. Yet computer imaging also offers great promise: new markets, wider and easier distribution of photographs, the ease of transferring an image, and more effective storytelling through multimedia publishing on CD-ROM's.

c . **The ethics of retouching.** It used to be said that, "The camera never lies." That was before digital photography. Now, we are in a new age of picture-perfect image processing. With this new breed of computer imaging comes the tempting power of electronic retouching. Some have called it disturbing and corrupt. Others argue that it is merely a more powerful extension of the creative darkroom.

d. **Photographs as accurate historical records.**

(1) In the past, documentary photographs have been proclaimed as authentic, factual pieces of information. Digital Imaging technology changed that understanding, but the basis for a believable documentary photograph still remains.

(2) Photojournalists have been considered reporters with cameras, recording events as eyewitness observers. They document powerful and unusual events capable of invoking strong emotions. Regardless of branch of service, documentary photography will depict a factual account, and in no way can these images or footage be altered.

e. **The ethics of digital manipulation.**

(1) As photographers we have the responsibility to document society and to preserve its images as a matter of historical record. It is clear that the emerging electronic technologies provide new challenges to the integrity of photographic images. This technology enables the manipulation of the content of an image in such a way that the change is virtually undetectable. The National Press Photographers Association (NPPA), a respected civilian news organization has released the following statement:

> "We believe photojournalist guidelines currently in use should be the criteria for judging what may be done electronically to a photograph. Altering the content of a photograph, in any degree, is a breach of the ethical standards recognized by the NPPA."

(2) Although, military photographers do not necessarily belong to organizations such as this, the policies that they adhere to are good for us as well.

f. **Photographs are not reality.**

(1) A photograph is a three dimensional object that is placed on a two-dimensional plane that is made up of bits of silver or dyes which communicate information about a moment in time. There are properties used in photographing and printing these two-dimensional objects that with common use and agreement have come to be accepted as reality. There are some extent patterns of grain, light, cropping, of dodging and burning, and so forth, which have come to be associated with the intention of truth and accuracy.

(2) These principles are not yet accepted as a whole by the media, television broadcasters, or magazines. Tastes, ethical standards, social expectations, and perception of nature of truth evolve. TV Guide can juxtapose various images to ridicule a point with minimum complaint, but when a magazine with the stature of National Geographic, alters an image it damages its creditability.

(3) There have been numerous instances of editors choosing to spruce up a certain image, like an image of the Challenger space shuttle mishap. The San Jose Register was mocked when they inserted clouds into a photo of the Challenger explosion that they felt was not dramatic enough. To sum it up: There can be no one set of standards applicable to all users of photography at all times. Any set standards must be site specific.

(4) What is needed is a set standard that can be utilized world-wide. It has been suggested that the use of a symbol (M) for electronically manipulated photos be used to identify the images that have been altered in any way. But that can also be considered as prejudicial by only identifying the electronically altered photographs and illustrations.

(5) There are several degrees of change. Major or "essential" changes being those that change the nature of the image. Minor changes are usually just technical changes. For example, spotting out dust and scan lines. Most technical changes will be considered ethical while major changes will be considered unethical.

(6) To put George Bush into a picture from Yalta would be a major change. Whereas moving the pyramids a little closer together, though massive in reality, is only a minor change since it does not change the basic information of the picture. The pyramids picture is no longer an accurate photograph but the essential information has not changed.

g. **Electronically manipulation functions.** The following is a list of specific electronic manipulation functions and discussions of each in terms of electronic versus digital manipulation. Photo labs, schools, newspapers, and magazines wishing to set ethical standards for their publications need to look at these seven areas where abuse can occur and then decide what is the appropriate response for their circumstances.

(1) **Contrast control.** We are used to controlling contrast and photographers know that they can give an apparent sharpness by increasing contrast. Contrast control is a basic, traditionally accepted form of darkroom manipulation. You will find it hard to dispute contrast control, which is widely accepted in both traditional and electronic darkrooms.

(2) **Dodging and burning-in.** Dodging and burning-in are two of the most basic printing skills of a good photographer. Too much burning-in is today considered unacceptable in the traditional darkroom and will also be unacceptable in an electronic darkroom. One of the fears of photographers is that untrained eyes in the production department will dodge and burn for them and take the interpretive function from the photographer. This is a valid fear that only becomes an ethical fear when the dodging and burning change the meaning of the photograph or misrepresents reality.

(3) **Cropping.** Cropping is considered by most to be ethical. By convention, we allow the photographer or editor to define the area we are allowed to view with four sides of his or her choosing. These sides become the limits of the image and nothing else can be added or eliminated from the defined scene. Cropping can, however, become unethical in both types of darkrooms, if important parts of an image are removed and distort the actual events.

(4) **Cut and paste.**

(a) Cut and Paste, or cloning, is one of the greatest fears. For some reason, the concept of a "Decisive Moment" does not seem to apply to computers. One of the most basic tenants held by news photographers is the inviolate nature of the moment. If you miss the picture, you miss the picture. You do not add a ball to a picture from a football game or move the ball around in the frame. Some might say, National Geographic used this logic on the pyramids, "just a few feet to the right and the photographer would have had the shot". We are not in the business of making photographs from spare parts. To destroy the precise relationships within an image at one certain point in time is to change the truth of a picture, or at least its accuracy. To move a pyramid or to add a football or remove a Coke can is to change the nature of photojournalism. The reading public expects photojournalists to adhere to this principle.

(b) Cutting and pasting images has always been with us, but is far easier to accomplish using electronic means. The ethical concerns are the same but the seamlessness of the changes make them more tempting. We need to remember that just because we have a new tool does not make the act of cutting and pasting any more ethical than before.

(c) The cloning function has its use in allowing us to remove dust spots and scan lines. It is considered ethical to use Spottone or a pencil to manually remove this sort of technical imperfection and it should be allowed electronically. The key word being "technical."

(5) **Color correction.** Color correction done on a global scale is considered correct procedure in all color printing. The eye adjusts to color temperature changes but film does not. However, it is usually considered unethical to change one color or one part of the picture all by itself since the eye does not work this way.

(6) **Sharpen.** Sharpening causes a new dilemma, as it is the only electronic manipulation that has not been seen before. Sharpening does not bring into focus an out of focus picture. Rather, it gives the appearance of sharpness by increasing the contrast between pixel groups. To decide if it is ethical to sharpen, we have to ask two questions: does the sharpening change the accuracy of the information in the image and, does the sharpening change the integrity of the moment?

(7) **Flopping.**

(a) It has always been possible to put a negative in the enlarger backwards, but it is considered unethical to do this in the darkroom by most papers and will continue to be unethical at the electronic picture desk.

(b) This particular case leads to another vexing problem. Photographers generally will not flop a negative. If someone without a photographer's background is given the ability to flop an image, he or she might not have the background needed to know why it is wrong. Photographers have developed an interest in ethics now because people outside their world are gaining access to their work and they are afraid of the consequences. It is necessary for photographers to learn all there is to learn about electronic photography and keep as much of the creative function in their own hands as they can. To do this they must be able to follow the process from camera to print and they have to start thinking of the printed final product, not the photographic print itself.

(c) In the final analysis, credibility is the bottom line. If we are perceived as trying to deceive the public, whatever we have done electronically to the photograph will be wrong. If we are perceived as attempting to bring the most accurate representation of reality as we can create to the reader or observer, we will have acted ethically on behalf of our profession. If we produce accurate information, we will have succeeded.

B-11. Department of Defense Policy on Manipulation of Photographs

a. **DOD Policy.** On December 9, 1994 the Deputy Secretary of Defense signed a memorandum that provides DOD policy on the alteration of official photographic and video images. The following is the text of the policy memorandum:

Photographic and video imagery has become an essential tool of decision makers at every level of command and in every theater of military operations. Mission success and ultimately the lives of our men and women in uniform depend on this imagery being complete, timely and above all, highly accurate. Anything that weakens or casts doubt on the credibility of this imagery within or outside the Department of Defense will not be tolerated. The emergence of digital technology has significantly increased the capability of Defense imagery. Since current federal regulations and DOD directives do not specifically address the deliberate alteration of official photographic records, I believe guidance is required. I am providing the guidance by establishing the following as Department of Defense policy on the alteration of Official Photographic and Video imagery.

(1) The alteration of official defense imagery by persons acting for or on behalf of the Department of Defense is prohibited except as outlined below:

(a) Photographic techniques common to traditional darkrooms and digital imaging stations such as dodging, burning, color balancing, spotting, and contrast adjustment that are used to achieve the accurate recording of an event or object are not considered alterations.

(b) Photographic and video image enhancement, exploitation and simulation techniques used in support of unique cartography, geodesy, intelligence, medical, RDT&E (Research, Development, Test, and Evaluation), scientific, and training requirements are authorized if they do not misrepresent the subject of the original image.

(c) The obvious masking of portions of a photographic image in support of specific security and criminal investigation requirements is authorized.

(d) The use of cropping, editing, or enlargement to selectively isolate, link, or display a portion of a photographic or video image is not considered alteration. However, cropping, editing, or image enlargement, which has the effect of misrepresenting the facts or circumstances of the event or object as originally recorded, constitutes a prohibited alteration.

(e) The digital conversion and compression of photographic and video imagery is authorized.

(f) Photographic and video post-production enhancement, including animation, digital simulation, graphics, and special effects, used for dramatic or narrative effect in education, recruiting, safety and training illustrations, publications, or productions is authorized under either of the following conditions:

- The enhancement does not misrepresent the subject of the original image.
- It is clearly and readily apparent from the context or from the content of the image or accompanying text that the enhanced image is not intended to be an accurate representation of any actual event.

(2) Official Defense imagery includes all photographic and video images, regardless of the medium in which they are acquired, stored or displayed, that are recorded or produced by persons acting for or on behalf of Department of Defense activities, functions, or missions.

b. **Copyright law.**

(1) Laws seldom keep pace with changes in society. Those laws that govern the ethics of enhancement and manipulation of images are no different.

(2) Copyright is a form of legal protection for "original works of authorship fixed in any tangible medium of expression." The courts have interpreted the law to include computer software, photographic, artistic, literary, dramatic, musical, and other intellectual works.

(3) Copyright law gives the owner of a copyright the exclusive right to reproduce the image, arrange derivative (not original) works, distribute copies, or perform and display the work in public. While there are legal exceptions such as "fair use" and "compulsory license" clauses, original authors are extended considerable protection. The US Copyright Office, part of the Library of Congress, oversees copyright law.

c. Works that are protected. Copyright protects "original works of authorship" that are fixed in a tangible form of expression. Copyrightable works include the following categories:

- Literary works
- Musical works
- Dramatic works, including any accompanying words
- Pantomimes and choreographic works
- Pictorial, graphic, and sculptural works
- Motion pictures, and other audiovisual works
- Sound recordings
- Architectural works

d. **The law for works created in 1978 or later.** A work created on or after January 1, 1978, is automatically protected from the moment of its creation, and is ordinarily given a term enduring for the author's life, plus 50 years after the author's death. In the case of a "joint work prepared by two or more authors who did not work for hire," the term lasts for 50 years after the death of the last surviving author's death.

e. **Key elements of the laws.** Three basic factors must be present for US copyright laws to protect a new work: fixation, originality, and expression. All three must be considered when determining copyright ownership.

- Fixation is the creation of a work in a tangible, lasting form and occurs at the moment of creation.
- Originality is the conception in the author's mind this is also essential.
- Expression is the final key. Expression of ideas can be copyrighted, but ideas themselves cannot.

f. **Permissible copying.**

(1) The Copyright Act also defines permissible copying. A work can be copied for limited private use in the quest for knowledge, if it is not distributed or displayed and if the owner is not harmed. Works can be copied for fair use if the commercial value of the original is not exploited or if the reproduction is necessary for scholarly discussion or analysis of the work.

(2) Copies of short published works or periodicals also may be made by a teacher for educational use if specific criteria are met. In other instances, multiple copies can be made for handouts in a classroom.

g. **How to copyright a work.** Whenever a work is created it is automatically covered by these copyright laws. However, if you feel that you may need to go to court over a possible infringement of your copyright, you must register the copyright with the Copyright Office in Washington DC. This is simply a matter of filling in the appropriate forms and sending copies of the work for their records. The only time you must do this is when you feel that there may be illegal copying of your work. The courts have awarded higher damage payments to people who have actually registered their works. The bottom line is that you do not need to do anything to copyright a work, it is automatically protected when you create the work.

h. **How does copyright affect DOD personnel.**

(1) As a member of the Armed Forces or an employee of the Federal Government, any images or works that you create on the job are property of the government. This means that you have no rights to these images. Also, any work that you do on your own time using either government film or equipment belongs to the government. You must be very careful to only use personally owned equipment and supplies when freelancing or shooting images that you may want to keep or eventually sell.

(2) Just as the copyright laws prevent you from using equipment for your own gain, they also protect you from performing illegal copying. As we have said, it is against the law to copy another person's work. For this reason, you cannot be ordered to do this illegal copying. We must educate our superiors on copyright laws.

(3) When can we copy copyrighted works? As we have said, it is appropriate to copy (in limited amounts) works for training purposes and presentations. It is also acceptable to copy works for the quest for knowledge or research. Keep these limitations in mind and use your best judgment when determining whether or not to copy something.

i. **Software piracy.**

(1) One last ethical consideration is software piracy. While most people feel that it is wrong to steal a computer or other piece of hardware from their workplace, it is common for employees to copy software taken from work onto their home computers. We must understand that this is just as wrong.

(2) While software is not as tangible as hardware, it is just as valuable. Many hours of labor, research, and development go into each software application. We must understand that to copy an application to an unauthorized computer is stealing it from the manufacturer.

(3) Additionally, moving disks from computer to computer also increases the risks of transporting computer viruses; small, hidden programs than can destroy data. Viruses are written to hurt computers and are usually copied along with software. By not illegally copying software, we also are reducing the chances of spreading computer viruses.

(4) The government has taken a firm stance on the illegal copying of software. There are many laws covering the subject and heavy ($100,000 or more) fines and prison terms are the penalty for software piracy.

j. **Ethics policies.**

(1) Some newspapers use written policies. While numerous branches of the US government, including The White House, now rely on personal computers to process images, few organizations queried in 1993 had devised formal ethics policies.

(2) Are written ethics policies necessary? Yes. Should there be room for interpretation? Of course, but photographs, like words, should be edited with consistency. Is it necessary to enforce policies? If necessary. One pre-press employee left the job to "pursue other interests" shortly after retouching a news photograph.

(3) We all have differing perceptions about what is ethical and what is not, therefore, organizations should not allow individual employees to impose varying values on the group. Consistent policies should be the goal with individual artists and photographers having pivotal roles in identifying ethical guidelines.

APPENDIX C

SAMPLE VISUAL INFORMATION (VI)
APPENDIX TO OPERATION ORDER

CLASSIFICATION

HEADQUARTERS, US EUROPEAN COMMAND
APO NEW YORK 09128
18 August 19XX

APPENDIX 12 TO ANNEX C TO USCINCEUR OPLAN 4999A808 ( )
AUDIOVISUAL AND VISUAL INFORMATION DOCUMENTATION ( )

( ) REFERENCE: List pertinent regulations, manuals, related plans, and other
relevant documents or government policies. Include appropriate
military department visual information regulations.

1. ( ) GENERAL. Include all information necessary to lead to a clear understanding of
documentation requirements, support, and known limitations.

2. ( ) MISSION. Clearly state the specific OPDOC and PA AV/VI objectives or purposes of visual
information documentation in support of the basic plan. Include a statement such as "Normally, the
initial AV/VI team will provide both COMDOC and PA support for operation."

CLASSIFIED BY
DECLASSIFY ON OADR

C-12-1   Format,
CLASSIFICATION   Appendix 12
A-211   to Annex C
To Appendix A

Figure C-1. Sample of Appendix 12 to Annex C of an Operations Order.

UNCLASSIFIED

CJTF – 140
CAMP LEJEUNE, NORTH CAROLINA

Appendix 12 To Annex C to CINCUSACOM Exercise Agile Provider 94
Visual Information and Combat Documentation (U)

(U) REFERENCES: a.   JSC PUB 5-03.1, "Joint Operation Planning
                                  and Execution System", Volume I, 4 August 1993
                           b.   DOD Dir 5040.4 "Joint Combat Camera Operations",
                                  September 30, 1996
                           c.   DODD 5040.2, VI, May1999
                           d.   CINCUSACOMINST 5040.4

1.   (U) GENERAL. This appendix provides guidance for Joint Combat Camera (COMCAM)
       imaging documentation, management, and distribution of exercise activities for AGILE
       PROVIDER 94 (AP-94).

2.   (U) MISSION. To acquire, transmit, duplicate, and archive/manage imagery of the
       participants and activities which occur during all phases of the AP-94 Exercise. COMCAM
       imagery will comply with reference (a) and be used to support operational briefings,
       intelligence activities, historical records, and in direct support to the JTF Commander.

   a. COMCAM will have ability to work with imagery in the following formats: video (HI-MM),
       still slides (35MM), and digital still imagery. COMCAM forces will provide support IAW
       Reference b.

   b. COMCAM will move imagery, from and source, in an expeditious manner through their
       command and control structure to the Joint Combat Management Team (JCCMT).
       COMCAM will emphasize imagery that demonstrates the combined nature of AP-94.
       Imagery of joint activities is highly desired. Component only imagery is a secondary
       consideration. Digital or video imagery will be transmitted from Joint Combat Camera
       Management Team (JCCMT), JTF, J-3 HQS, by the fastest means possible to the Joint
       Combat Camera Center (JCCC), Washington, DC.

   c. Documentation will start with coverage of selected force deployment activities and
       conclude with force redeployment activities which occur after AP-94 Closing
       Ceremonies.

   d. Documentation is required of the following:

       1) Deployment activities including airlift, Airborne, and Sealift Operations.

2) JTF Mission Planning and Briefings

3) Special Operations

4) Flight deck operations on all air-capable ships

5) NEO Operations

6) Amphibious Assault Operations

7) Air, Air Defense, Ground, and Naval Operations

8) Redeployment activities of AP-94

9) Air Drop Operations

3. CONCEPT OF OPERATIONS:

a. Joint Combat Camera Management Team (JCCMT-140) will operate under the Joint Task Force J3 Operations. The senior COMCAM Officer will serve on the J3 staff and will exercise OPCON over Joint and component COMCAM processing and acquisition forces.

b. Joint COMCAM operations will be executed in a two-tier structure. JCCMT will form the first tier. Component COMCAM management teams will form the second tier and will exercise operational control over their subordinate COMCAM and VI resources through their senior COMCAM Officer and their operations directorates.

c. Joint and component COMCAM operations will be conducted to simulate a theater war.

4. RESPONSIBILITIES:

a. AP-94/J-3 (COMCAM) will exercise OPCON over all deployed Joint and component COMCAM forces in the Continental United States through the Senior COMCAM Officer (US Army).

b. COMPONENTS WILL:

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Visual Information and Combat Documentation (U)

1) US ARMY (US FORSCOM), Act as executive agent for Joint COMCAM operations for AP-94. Provide the following (from 55th Signal Company) to the JCCMT; one

67A66 UTC (Modified) comprised of one COMCAM officer to serve as director for the Joint COMCAM Team, one COMCAM NCO to serve as Operations NCO for the JCCMT, two MOS 25V NCO. Provide COMCAM forces sufficient to cover US Army and/or Joint aspects of the exercise and insure accomplishment of TPFDD.

2) US NAVY (CINCLANTFLT) will provide the following to the JCCMT: one N26HQ (Modified) comprised of one COMCOM Officer, to serve as assistant JCCMT director, and two NCOs; one N26VA UTC, Video Documentation Team; and one N26SA

5. POLICY:

a. AP-94 will be documented to the maximum extent possible IAW component regulation and DODI 5040.4.

b. COMCAM forces are trained and equipped to operate in all conditions and security classifications as other forces within their military service.

c. COMCAM forces are operational; they will not release imagery to the public or allied military forces unless competent command, operations and/or Public Affairs authority determines release is in the best interest of the US.

d. COMCAM is a visual information tool that can be used for operations decision making, PSYOPS, Civic Affairs, visual SITREP, historical, medical, and Public Affairs purposes.

e. COMCAM forces can perform all activities within their designed operational capability within the limits of resources deployed into area of responsibility (AOR).

f. US COMCAM forces are a national resource. Documentation activities must portray working partnerships and joint activities between services.

6. OBJECTIVES:

a. All COMCAM forces will:

1) Demonstrate and evaluate their ability to deploy to AP-94 by using their UTCs entered into the JOPES System and travel using line numbers.

2) Evaluate and document their ability to use the Atlantic INMARSAT satellite.

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Visual Information and Combat Documentation (U)

3) Demonstrate the ability to operate in a joint environment coordinating with the JCCMT and JTF HQS. Additionally, evaluate the potential to maximize imaging

support while minimizing manpower and transportation requirements by interoperating to the fullest extent at the Joint Level.

4)   Demonstrate the ability to provide command and control over their component COMCAM and VI (when appropriate) resources.

5)   Demonstrate the ability to document events to meet operational, psychological ops, public affairs, and historical imaging requirements. The priority should be given to meeting operational requirements for this exercise.

6)   Write an after action report and forward to 55th Signal Company (COMCAM) NLT 30 days after index. HQ AMC/IG will forward a copy to the 55th COMCAM. 55th COMCAM will consolidate the reports, provide an executive (joint) summary, and forward to AFIS/DAP, USACOM/J-3, HQ USA/CNO/OP09C4, CG MCCDC/TE-35 VIM, HQ USAF/SCMV, HQ AMC/SCMX, USAVIC, and USA DISC4.

b. AP-94 COMCAM JCCMT will:

1)   Demonstrate the ability to provide command and control over their component COMCAM resources. This includes deconflicting component teams to avoid excessive documentation and shortfalls. Additionally, they will demonstrate the ability to ensure short notice imaging requirements are met.

2)   Demonstrate the ability to receive and properly handle classified imagery. Reception of classified imagery will be simulated if there are no real world opportunities.

3)   Demonstrate and evaluate the capacity of their electronic imaging system by supporting JTF and JCCC.

c. ARFOR (55th Signal Company (COMCAM)) will:

1)   Test capability to act as executive agent.

2)   Test Digital Still Image Transmission over Single Channel Tactical Satellite System.

3)   Determine Team Requirements for coverage of Army Mission at Division and Brigade Level.

d. AFFOR will:

**Appendix 12 To Annex C to CINCUSACOM Exercise Agile Provider 94
Visual Information and Combat Documentation (U)**

1)   Test the XFMAD team's to serve dual roles and perform the mission of a XFMED team with capability to support and sustain JCCMT with standard editing mission.

Provide HQ AMC, USAF/SCMV, and AFIS/DAP with an evaluation on the operability of this concept.

2) Demonstrate the ability to acquire imagery and ship/transmit in less than 24 hours or IAW mission requirements.

3) Demonstrate the ability to handle and transmit classified imagery if there are no real world opportunities that this capability will be simulated.

4) Demonstrate the ability to provide one jump qualified (static and HALO) still photographer with DCS 200 camera for documentation of combat control teams (CCT).

e. USMC will:

1) Test capability to provide imagery to the JCCMT for editing, digitizing and transmission NLT 24 hours after acquiring the image in the field.

2) Test capability to expeditiously collect imagery from organic VI elements participating in AP-94 and move original photography to the JCCMT. Provide an evaluation on the feasibility and effectiveness of this concept to CG MCCDC/TE-35 VIM, CNO/OP09C4, and AFIS/DAP.

f. NAVY will:

1) Deploy Combat Still Photographers to test movement of still imagery using shipboard and organic (INMARSAT) communications assets.

2) Test incorporation of Still and Video Photographers with Marine Amphibious Units (Ground/Air Operations).

3) Integrate Navy COMCAM into a Joint COMCAM Scenario.

4) Collect original imagery, video and still, from organic VI elements participating in AP-94 and move original photography to the JCCMT. Provide an evaluation on the feasibility and effectiveness of this concept to CNO/OP09C4 and AFIS/DAP.

7. COMMAMD AND CONTROL.

a. The senior COMCAM Officer will assume control of the AP-94 COMCAM Center. This officer will:

**Appendix 12 To Annex C to CINCUSACOM Exercise Agile Provider 94
Visual Information and Combat Documentation (U)**

1) Report to and serve on the JTF/J-3 staff.

2) Exercise operational control over component COMCAM resources and has tasking authority over these forces.

3) Consolidate all requests for imagery originating from sources outside the JTF chain of command and program their accomplishments on an asset available basis with the component COMCAM forces.

4) Develop and execute policies and procedures to move selected imagery to the Joint Combat Camera Center.

5) JCCMT will coordinate on component COMCAM concept of operations and ensure theater standardization where necessary.

6) Exercise operational control of COMCAM imagery to support the following:

   (a) Commander, Joint Task Force

   (b) Commander in Chief Atlantic Command

   (c) NCA

   (d) Public Affairs

   (e) After action requirements, historical record, and training.

b. CONTROL:

1) Significant COMCAM imagery will be sent by the fastest possible means to the JCCC.

2) Before shipping or transmitting COMCAM material to the JCCC, the COMCAM Director will ensure that CJTF and USACOM requirements are satisfied and that COMCAM POC has approved the transmission of the imagery to the JCCC.

3) International, direct-dial telephone lines with priority DSN service must be available for electronic imaging transmission. Class AA voice line is also required from the JTF headquarters.

4) COMCAM forces will deploy with INMARSAT terminals, Macintosh computers, and Kodak DCS 200 still digital cameras.

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5) COMCAM products will be transmitted via land telephone line or INMARSAT to JCCC (Washington DC) and CINCUSACOM.

C-12-7

APPENDIX D

STANDING OPERATING PROCEDURES

(This appendix includes an extract from FM 101-5 with information on a Standing Operating Procedure (SOP) and a sample SOP outline for combat camera units.)

Standing operating procedures (SOP) detail how forces will execute unit-specific techniques and procedures that commanders standardize to enhance effectiveness and flexibility. Commanders use the SOP to standardize routine or recurring actions not needing their personal involvement. They develop the SOP from doctrinal sources, applicable portions of the higher headquarters' published procedures, the commander's guidance, and techniques and procedures developed through experience. The SOP must be as complete as possible so that new arrivals or newly attached units can quickly become familiar with the unit's normal routine. There is no specified format for SOPs. In general, an SOP applies until commanders change them to meet altered conditions or practices. The benefits of an SOP include—

- Simplified, brief combat orders.
- Enhanced understanding and teamwork among commanders, staffs, and troops.
- Established synchronized staff drills.
- Established abbreviated or accelerated decision-making techniques.

The operations officer is responsible for preparing, coordinating, authenticating, publishing, and distributing the commands tactical and administrative SOP, with input from other staff sections.

The following is an example of a Standing Operating Procedure outline for a Combat Camera unit:

(Classification)

STANDING OPERATING PROCEDURES

Part One – ORGANIZATION AND FUNCTIONS

Section I. APPLICATION

(Give the purpose and scope of the SOP)

Section II: ORGANIZATION

(Use an organization chart to show the organizational command structure)

Section III: FUNCTIONS

(Explain the major elements of the higher headquarters, their purpose, responsibilities, and functions. List any specific responsibilities and functions of applicable staff divisions, sections, or subordinate elements of the command.)

Part Two – STAFF OPERATIONS

Section I. COMMAND AND STAFF RESPONSIBILITIES

(Outline the relationships, responsibilities, and procedures of each: higher headquarters, staff divisions, staff sections, platoon sergeants, squad leaders, and individuals.)

Section II. PREDEPLOYMENT ACTIVITIES

(Use an outline format to explain each element.)

1. Personal Affairs

    a. Will

    b. Power of Attorney

    c. Allotments

    d. Medical

        (1) Physical

        (2) Immunizations

        (3) AIDS Testing

    e. Documents

        (1) ID Card

        (2) ID Tags

        (3) Shot Record

        (4) Passport

        (5) Government Credit Cards

        (6) DD Form 1610

        (7) Insurance

    f. Family Support

    g. Personnel Records

    h. Geographic Brief

    i. Finance/Payments

2. Basic Equipment Loads

    a. Personal Equipment

        (1) "A" Bag Packing List

        (2) "B" Bag Packing List

        (3) Load Bearing Equipment (LBE)

        (4) NBC Equipment

    (5) Weapons (if applicable)

  b. Mission Related Equipment

    (1) Equipment Packing List

    (2) Operational Checks/Preventive Maintenance Checks and Services (PMCS)

    (3) Maintenance Forms

  c. Non-essential/Expendable Items

    (1) Personal items

    (2) Support

Section III. DEPLOYMENT

1.   Alert Notification Procedures

2.   Team Checklists Considerations

  a. General

  b. Cold Climate

  c. Desert Climate

  d. Jungle Climate

  e. Airborne Deployment

3.   Operation Checklist

  a. Customer Support Checklist

  b. Team Chief Briefing

  c. Transportation

  d. Finance

  e. Billeting

  f. Security

    (1) Weapons

    (2) Masks

    (3) Cameras and equipment

  g. Area Maps

  h. Security Rosters

4.   Supply and Maintenance

  a. Resupply Procedures

  b. Evacuation of Equipment

Section IV. TACTICAL OPERATIONS

1.   On-site OIC/NCOIC Checklist

2.   COMCAM Activities

    a. Contacts and POC

    b. Expediting Visual Media to the Rear

Section V. SOLDIER INFORMATION

1.   Accountability Rosters

    a. Personnel

    b. Equipment

Section VI. TEAM RECOVERY

1.   Personnel and Equipment Procedures

2.   After Action Review (AAR)

APPENDIX E

ELEMENTS OF A MULTIMEDIA PROJECT

E-1. Define Your Audience:

a. Audience Composition

(1) Educational Background
(2) Occupational Background

b. Technical Limitations/Capabilities

(1) Novice Users
(2) Experienced Users
(3) General/Discretionary Users

E-2. Plan the Project Layout:

a. Create a Project outline

b. Element Design

(1) Functionality
(2) Usability

c. Text Design

(1) Hyper Text Mark-up Language (HTML)
(2) Characters Per Line
(3) Lines Per Page
(4) Style
(5) Color

d. Image Design

(1) Avoid Deeply Saturated Primary Colors (Red, Green, Blue)
(2) Avoid Very Low Luminance Colors
(3) Create Complimentary Background Colors

e. Image Size

(1) Image Size Not to Exceed 640 Pixels Wide by 480 Pixels High
(2) Number of Images on a Single Page

f. Image Alignment

(1) Top, Middle and Bottom
(2) Left and Right

g. Navigation Scheme

(1) Structure/Format

- Consistency
- Completeness
- Interaction
- Links
- Image Maps
- Help

(2) Page Layout

- Header
- Color
- Text
- Image

(3) Learnability/Simplicity
(4) User Control
(5) Bullets/Buttons
(6) Functionality

h. Help/Feedback

(1) Availability
(2) Accuracy
(3) Consistency
(4) Flexibility

APPENDIX F

HANDS ON EVALUATION

The DA Form 5164-R allows the trainer to keep a record of the performance measures a soldier passes or fails on each task. Instructions for using this form follows:
Prior to evaluating

- Obtain a blank copy of DA Form 5164-R that you may locally reproduce on 8 ½-inch by 11-inch paper.
- Enter the task title and 10-digit number for the task from the evaluation guide of the SM task summary.
- In column (a), enter the number of each performance measure from the evaluation guide.
- In column (b), enter the performance measure corresponding to the performance measure number in column (a). (You may abbreviate this information if necessary.)
- Enter the feedback statement from the evaluation guide just below the last performance measure.
- Locally reproduce the partially completed form if you are evaluating more than one soldier on the task or the same soldier on more than one task.

During the evaluation

- Enter the date just before evaluating the soldier's task performance.
- Enter the evaluator's name and the soldier's name and unit.
- For each performance measure in column (b), enter a check in column (c) PASS or column (d) FAIL as appropriate.
- Compare the number of performance measures the soldier passes (and if applicable, which ones) against the task standard shown in the Evaluation Guidance statement. If the standard is met or exceeded, check the GO block under STATUS; otherwise, check the NO-GO block.

Figure F-1 is a sample of a completed DA Form 5164-R.

HANDS-ON EVALUATION

For use of this form see AR 350-37. The proponent agency is DCSOPS.

DATE: 01 MAR 96

TASK TITLE: PERFORM ULM ON A DESKTOP IBM OR COMPATIBLE MICROCOMPUTER

TASK NUMBER: 113-580-3069

ITEM a	PERFORMANCE STEP b	SCOPE (Check One)	
		PASS c	FAIL d
1	COLLECT ALL REQUIRED MATERIAL.	✔ P	☐ F
2	INITIATE MAINTENANCE FORMS.	✔ P	☐ F
3	MAINTAIN PERIPHERAL DEVICES.	✔ P	☐ F
4	MAINTAIN CPU.	✔ P	☐ F
5	MAINTAIN HARD DISK DRIVE.	☐ P	✔ F
6	COMPLETE APPROPRIATE DOCUMENTATION.	✔ P	☐ F

EVALUATOR'S NAME	UNIT
SFC WHITMAN	B CO 369TH

SOLDIER'S NAME	STATUS
SP4 ANDERSON	☐ GO ✔ NO GO

DA FORM 5164-R, SEP 85 (EDITION OF 82 TO BE USED)

Figure F-1. DA Form 5164-R.

APPENDIX G

MANAGEMENT CONCEPTS

(Excerpts from the Supervisor Development Course)

G-1. Management Overview

a. There are many privileges, challenges, frustrations, and rewards that go along with the title Manager. Your span of control increases; you become more involved in setting goals, obtaining resources, and become more involved in the infrastructure of the organization by coordinating with upper level management. You will communicate more with subordinates, bosses, and customers.

b. Each manager brings a diverse background of education, training, and experience with them to their jobs. You will use your technical skills less and your human skills more to lead people and manage events.

c. Army Management Philosophy is driven by AR 5-1, and also supports the Total Army Quality (TAQ) principles. We will discuss the following topics:

- Becoming a manager.
- Management defined.
- Interpersonal relationships.
- Systems approach to managing.
- Total Army Quality (TAQ).

d. Becoming a Manager. Management pervades our lives. We use it to organize people and events for a common purpose in an orderly way. All managers basically use the same management functions, from the high school student council president to the CEO of General Motors. For example, they each set objectives, list priorities, and make decisions. Effective managers are competent in both the technical and managerial aspects of their work. They are also competent in leading others to achieve which is their greatest responsibility.

(1) Personal Motivation. Managers possess a healthy desire to exercise power. They influence other and gain personal satisfaction through their achievement. They want to make a difference and are driven by "a will to manage." Successful managers use power for the good of the organization. They enjoy the responsibility and satisfaction of being in charge, but they don't abuse it.

(2) Personal Development. Training and experience are a few ways to become a good manager, but probably one of the best ways to become a good manager is to watch a good manager in action and follow their example. Good managers don't become that way over night. Learn from their valuable mentorship to enrich yourself and continue your experience with training and challenging assignments.

e. Management has many definitions.

(1) Management is an art. The art of management is getting things done through the use of people and resources. Managers are charged with creating order for disorder by way of vision,

craft, and communication. Vision helps define the purpose, set goals, and give direction; the use of technical skills to practice their craft and to control events; and the use of human skills to effectively communicate with people to achieve desired results. Management is the art of getting things accomplished through the collective efforts of others.

(2) Management is a process. Management is the process of planning, organizing, coordinating, directing, and controlling events to achieve an objective.

(a) Planning. Planning is deciding what needs to be accomplished, where and how is it going to be done, when will it be completed, and who is responsible for getting it done or seeing that it gets accomplished.

(b) Organizing. Organizing is providing structure to establish relationships between people and resources to pursue a common goal.

(c) Coordinating. Coordinating is integrating all details and key personnel to accomplish the mission.

(d) Directing. Directing is issuing orders or instructions in order to carry out decisions. Directing also includes the process of leading and supervising.

(e) Controlling. Controlling is applying means to keep the plan of action on track and to analyze the results.

f. Interpersonal Relationships. Managers spend lots of time in people interaction. They must be astute communicators and students of human nature. Managers wear many hats; they are the boss, the counselor, the peer, or the friend. A manager's day-to-day interpersonal relationship can span from:

- Giving thanks to subordinates for a successful mission.
- Providing customer service to a less than satisfied client.
- Engaging in small talk with employees.
- Sending motivational cards on occasions (happy birthday, get well, sympathy) to employees.
- Relaying distressing news to higher management.

(1) Army managers function in a unique environment. Their interaction with both civilians and military creates a diverse workforce. Though often harmonious, the diverse cultural backgrounds sometimes leads to misunderstanding and can create an "us versus them" climate.

(2) Army managers will also encounter great diversity within the military service. The workforce can be made of women, minorities, and soldiers of different ethnic groups. Managers should develop initiatives to lower any cultural barriers and promote trust to build a cohesive Total Army. The managers of the future must develop the perception and empathy needed to meet the challenge of building teamwork out of such diversity.

g. Systems Approach to Managing. An organization is a group of interrelated parts with a single purpose. Actions in one part lead to the affect of the other parts. Keeping this in mind when making decisions will help you to identify causes of problems and not just their symptoms. Figure G-1 reflects the dynamic processes of an organization. The organization exists in a

larger environment. The environment gives the organization inputs and takes its outputs. If the organization functions effectively, the environment will accept its outputs. It will also continue to provide inputs. This assumes the organization has these functions:

- A worthy purpose.
- A demand for products.
- Access to resources.
- Efficient processes.
- Timely feedback to control its processes.
- Product customers want.

```
                              ┌──────────────┐
                              │   External   │
                              │ Environment  │
                              └──────────────┘

┌──────────────────┐      ┌──────────────────┐      ┌──────────────────┐
│ INPUT (Resources)│      │  Transformation  │      │     OUTPUT       │
│ • People         │ ───▶ │       or         │ ───▶ │ • Goods          │
│ • Resources      │      │   Conversion     │      │ • Services       │
│ • Technology     │      │    Process       │      │ • Other          │
│ • Information    │      │                  │      │                  │
└──────────────────┘      └──────────────────┘      └──────────────────┘

                              ┌──────────────┐
                              │   Feedback   │
                              └──────────────┘
```
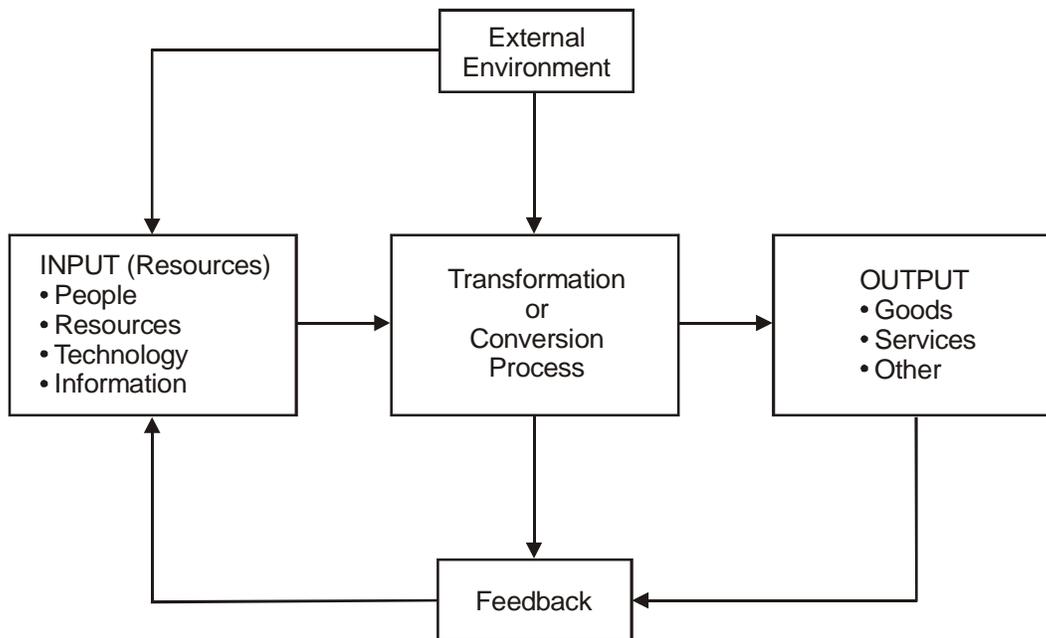
Figure G-1. Systems Model.

If an organization meets these standards, it renews itself and grows. When it fails to meet the standards, it stagnates and dies.

    h. Subsystems. An organization consists of six mutually dependent subsystems. The organization must interact harmoniously if the organization is to flourish and become stronger than the sum of its parts.   See Figure G-2.

    (1) Mission. This includes purpose, vision, goals, objectives, task, and shared values. Though leaders are responsible for maintaining this subsystem, they need everyone's cooperation.

    (2) People. The organization functions with people interacting in formal and informal roles. This subsystem reflects the values if its members. Events occurring throughout the system can profoundly affect the cohesion of its people.

    (3) Structure. This subsystem includes both formal and informal organizations. The formal structure is shown in Figure G-1. The informal organization arises from the emotional ties of

people, no matter what official position they hold. Its members use influence, resources, and information to gain power. People with little official authority may wield great power in the informal organization.

(4) Technology. This subsystem includes equipment, skills, knowledge, training, facilities, tools, and information. It enables the organization to function as an integrated system.

(5) Leadership. Leaders are the glue binding all subsystems together. They form the organization's vision, goals, and values. They set the example with competence, commitment, and ethical behavior.

(6) Environment. This is the larger subsystem hosting the organization. It includes the immediate environment linking the organization to a larger system, for example, Department of the Army. It also includes a still larger environment linking the organization to other institutions, for example, American society.

i. Total Army Quality (TAQ). TAQ is the Army's version of Total Quality Management (TQM) principles. TAQ is a management philosophy that seeks to continuously improve an organization. It relies on commitment and teamwork from everyone. TAQ aims to produce quality products customers want. To achieve this, TAQ focuses on improving work processes to decrease costs and increase productivity. TAQ emphasizes:

- Quality products, as the customer defines them.
- Elimination of errors.
- Elimination of unnecessary procedures.
- Prevention of problems.
- Continuous improvement.
- Teamwork.
- Empowerment of subordinates.

TAQ is not simply another way of managing. It requires lasting commitment from everyone involved. Preparing an organization for TAQ requires extensive training and willingness to change.

j. The systems approach and TAQ tell us that everything we do affects everything else. When making major decisions or seeking change, managers must consider how they affect the organization and its environment.
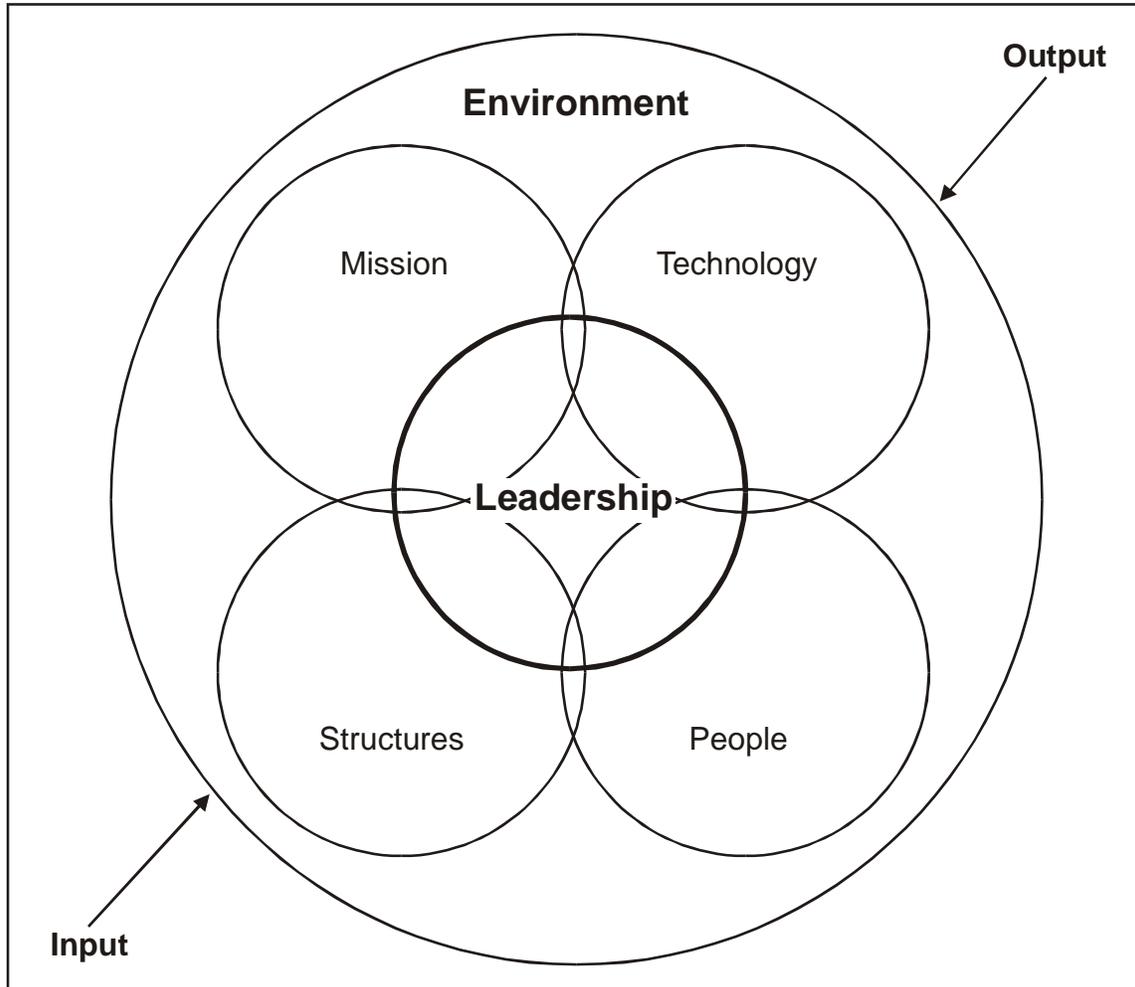
Figure G-2. Organization System.

G-2. Organizational Considerations

a. As a new leader or a leader in a new position, there is a period of assessment for you and your followers. You will assess them and their capabilities and they will assess you and your leadership style. You will also be assessing the organization and its climate and culture.

(1) Climate measures whether people's expectations about working in an organization are being met. Measurements of climate can be very helpful in pinpointing the causes of poor employee motivation.

- Unclear organizational goals.
- Ambiguous roles.
- Pay dissatisfaction.
- Biased selection practices.

Actions to address these sources of dissatisfaction tend to improve motivation and improved motivation results in improved performance.

(2) Culture is the underlying assumptions. Values, beliefs, attitudes and expectations shared by the organization's members. These produce norms that powerfully shape the behavior of individuals and groups in the organization.

(3) While climate measures whether expectations are being met, culture focuses on the nature of these expectations themselves. Climate is often transition, tactical, and manageable over a relatively short term. Culture is usually long-term and strategic. Culture roots are deeply held values and beliefs in which individuals hold a substantial investment resulting from processed data about organizational life. These values and beliefs are manifestations of the culture not the culture itself. They create situational norms observed from behavior.

(4) Behavior becomes the basis for the formation of values and beliefs from which the norm may flow. This "closed loop" accounts for much of the persistence organizational culture exhibit. In most groups, individuals who violate these cultural norms feel the pressure to conform. Group banishment may occur if norms do not change to accommodate violators.

b. It is important to learn all you can about the organization and the way things are done in the organization. Use the following as indicators to assess the organization culture.

(1) Task Support. Observe the degree of free information exchange, willingness to help, the ability to work together towards objectives, and the ability to get necessary information from other work groups.

(2) Task Innovation. Identify perceptions of openness to new ideas and approaches. Check frequency of discussions of new ways of doing things and of development of ideas presented to management for action.

(3) Social Relationships. Focus on freedom of employees to develop social relationships and participate in social activities. Ask yourself this question, "Is there a good working relationship between people?"

(4) Personal Freedom. Looks at the freedom employees have to do their job. Can they express personal preferences on the job? How much freedom do they have to believe in their personal values as opposed to the organization's values?

(5) Communication. Note the perceptions of upward and downward flow of information.

- Does management communicate with the organization about changes?
- Is management knowledgeable about employee attitudes, problems, or ideas?
- Do employees know expected results from work assignments?
- Are employee communications free flowing, honest, and open?

(6) Supervisory Effectiveness. Analyze the perceptions of supervisory effectiveness. Do you provide performance feedback? Is assistance given in solving work problems?

(7) Morale. Look at the general state of morale in your unit. How do people feel about their work? Would they stay if offered a comparable job elsewhere?

(8) Physical Working Conditions. Survey and analyze the perceptions of the overall quality of workspace, facilities, and equipment.

(9) Levels of Awareness. Direct your attention to basic assumptions held by people or the organization and how they are patterned.

(10) Dynamic Consequences. Note how one indicator connects to and is affected by other indicators. Everything affects everything else.

G-3. Time Management

a. Managing both your time and your subordinates, time may be your greatest challenge. Begin with reflecting how you utilize your own time. Make a record of the date, time, activity, and assessment of each activity for the next few days. You'll be amazed how you spend time and what you accomplish.

(1) Numerous tools are available to help assess your time such as the following Time Management checklist:

- I forfeit annual leave.
- I work evenings and weekends.
- The work doesn't get done when I'm not there.
- I know my subordinates' jobs better than they do.
- My subordinates quickly refer all problems to me.
- I have difficulty in making demands.
- I spend most of my time with my subordinates.
- My boss micro manages and so do I.
- My subordinates do as told and nothing more.
- I often re-do or finish my subordinates work.
- I routinely pitch-in to help my people with their work.
- My motto "If you want it done right, do it yourself."
- I frequently search for items I've misplaced.
- I give equal attention to all tasks.
- I handle tasks on a "first come, first served" basis.
- I maintain a very liberal open-door policy.
- I read everything that comes across my desk.
- I put off things I don't like doing.
- I frequently "manage by crisis."
- I tolerate no mistakes and want no surprises.
- I have problems saying "no" to unreasonable requests.
- I still like to keep my hand in my old job.

(2) A journal, telephone log, and the above checklist are simply tools to identify symptoms of time management problems. To solve time management problems you must define the underlying causes and commit to lasting life style changes.

b. Underlying Causes of Poor Time Management. Managers waste time for several reasons.

(1) Overworked and lack resources to control workload.

(2) Lack of experience or skill to manage efficiently and effectively.

(3) Leadership style is inappropriate for the situation.

c. Usually with training and experience, managers learn to use time more effectively.

d. Motivation. There are three motivational forces that influence a manager's effectiveness, the need for achievement, affiliation, and power. Effective managers recognize these needs as powerful motivators and they channel their energies to satisfy them in constructive ways. They also realize the drive to satisfy any one of them can be compelling. This can lead to obsession and such dysfunctional behavior as managing time poorly.

(1) Achievement. A manager driven by the need for personal achievement is likely to manage time poorly. Instead of getting results from others through delegation, he does the task himself to gain feedback and visibility. He neglects his subordinates and squanders time to achieve personal success.

(2) Affiliation. A manager obsessed with the need for affiliation wants to be liked, especially by subordinates. He manages time poorly because he is reluctant to make demands and hold subordinates accountable. To avoid rejection, he may even do his subordinates' work.

(3) Power. A manager seized with the need for personal power spends time acquiring it, usually at the expense of the organization. He bears insecure and jealous feelings towards peers and subordinates by manipulating and scheming to gain more power.

e. Managers filled with anxiety and inhibitions may use defense mechanisms such as avoidance behavior or rationalization to escape and seek comfort.

(1) Avoidance behavior. To avoid anxiety, some managers resort to negative coping behavior such as procrastination, apathy, aggression, rashness, immersion in trivialities, or micro managing.

(2) Rationalization. Some managers rationalize their unwillingness to prioritize, make decisions, give orders, or confront others. They tend to be hard workers, but waste time by doing the work of their subordinates'. They accept less than professional results and make excuses for poor performance. They spend a lot of time complaining, denying, or justifying why they can't achieve satisfactory results.

(3) Well-adjusted managers know what motivates or inhibits them, and can control the forces of anxiety that motivation and inhibitions produce while insecure managers are unable to do the same as a result they cope by managing time poorly.

f. You can quickly gain time by concentrating on essential issues, making a daily schedule, clustering telephone calls, and discouraging drop-in visitors. To make lasting improvements you must confront those motivational forces and psychological barriers preventing you from using time effectively. This requires self-disclosure, feedback, insight, acceptance, and effort. Concentrate on improving your techniques in the areas of setting priorities, delegating authority, and conducting meetings. If done well, these activities save lots of time.

g. Most "How To Manage" books prescribe the following formula for managing priorities:

- Make a list of things to accomplish.
- Place most important task at the top of the list and remaining tasks listed by priority.
- Work on first task until it has been completed and then continue with the next task on the list in the same manner until the list is exhausted.

This is always easier said than done and you must realize that there is always more work than time, energy, or resources to accomplish it. This does not factor in the unexpected—and the unexpected is something you can depend on. As a rule, you'll achieve more spending five uninterrupted hours on one task than you will spend one hour per day for five days on the same task.

h. Delegating authority to subordinates to act on your behalf frees up precious time to attend to more important issues. Failing to delegate or delegating poorly means spending an inordinate amount of time either micromanaging subordinates or doing their work. By delegating you'll gain time for yourself and for meeting the demands of higher management and the system. Managers must prepare subordinates for the challenges of delegated assignments. You probably could accomplish the work yourself in the time it takes to train subordinates to operate with increased freedom and responsibility. But the investment is worth the risk, for it will eventually return great dividends of time to you.

i. Managers spend a great deal of time attending meetings. Before attending a meeting, consider sending a subordinate, if appropriate. This will save you time and provides an opportunity for the subordinate to gain experience.

(1) Before conducting a meeting, ask yourself: Could I achieve the same results by telephone, electronic mail, fax or teleconferencing? How much is the meeting costing the organization? Include in your calculations the length of the meeting, number of attendees, hourly salary rates, travel expenses and preparation. You'll be surprised how expensive meetings can be.

(2) When meetings are necessary, keep to your agenda, set time limits for discussion, and control the tempo of the meeting to make best use of time. Keep in mind that attendees must be away from their work areas. Knowing the participants will also help you to control the meeting. You must plan to neutralize the power of negative people, control dominators, keep out hidden agendas, and encourage the silent ones. You must control, orchestrate, and plan the meeting. Use the following as a guide:

- Set agenda and follow it.
- Set time limit.
- Ensure everyone participates in the meeting.
- Direct remarks to entire group.
- Keep discussions on track.
- Clarify risks. Sell benefits.
- Discourage premature votes and decisions.
- Control meeting dominators.
- Let everyone share the glory.

j. It is of little value to be efficient at planning a calendar or making telephone calls if these activities don't support your key objectives. Likewise, it's worthless to increase your output of work through better time management if it's work your subordinates should be doing in the first

place. As a manager you must recognize what is your work and what is the work of your subordinates. Remember the key to achieving permanent improvement is controlling your needs for achievement, affiliation and power and overcoming the psychological barriers to managing time effectively. Figure G-3.

Goals	Rewrite goals once a month. Post signs to remind you of your goals.
Decision Making	Know when to say "no!" Know when to stop a task. Don't involve unnecessary people.
Your Time	Continually ask, "What is the best use of my time right now?. Set aside chunks of time for task requiring uninterrupted concentration. Relax and smile after making a decision. Reward yourself after the important jobs.
Organize Daily Work	Keep track of tasks to be done daily. Work on things you "really must do." Do your thinking on paper. carry 3x5 cards or notepad to write things down. Keep your desk cleared. Put important things in the center of desk. Get rid of busywork. Throw away things you don't need. Deal with things you hate to do first.
Meetings	Have a purpose when you hold a meeting. Schedule meetings just before lunch or quitting time. try stand-up meetings. They're brief.
Correspondence	Generate as little paperwork as possible. Handle correspondence only once. Write short letters and memos. Use the telephone to reduce your writing. Communicate ideas with simple charts or diagrams.

Figure G-3. Time Management Tips.

G-4. Objectives and Plans

a. Objectives. Setting objectives and developing plans are also essential ingredients in the Time Management process. Objectives demand specific results required to achieving goals and accomplishing the mission. Objectives unify efforts and give meaning to work. The also establish managerial imperatives needed to achieve success.

MANAGERIAL IMPERATIVES

Mission →	What is our business? Who are our customers?
Core values →	What beliefs are shared? In what manner will business be conducted?
Priorities →	What will be considered important to achieve with regards to the mission and core values?
Goals →	What direction does does the organization take to accomplish the mission?
Objectives →	What are the specific results required to achieve set goals and accomplish the mission?
Sub-Objectives →	What does each team member contribute towards meeting the objective?
Tasks →	What is the pertinent work to be done?
Standards →	What are the expectations of the wok to be done?
Rewards →	What are the payoffs for successfully accomplishing the mission?

Figure G-4. Managerial Imperatives.

(1) An organization lacking clear objectives is seldom a successful organization. Its members may work hard, but achieve very little. They engage in useless activity for its own sake--better known as busy-work. An organization that engages in lots of activity but produces no output is a worthless organization.

(2) An organization having worthy objectives usually succeeds because the members work hard but most of all they see the efforts of their work. Worthy objectives are key objectives that produce quality outputs. Outputs are the goods and services that that organization produces and the customers demand. Focusing on the output creates an effective organization.

(3) Objectives related to input and processes are also important but they exist primarily to support outputs. Their purpose is to make the whole organization efficient.

(4) Good objectives should but be:

- Clear.
- Specific.
- Measurable.
- Relevant.
- Reasonable.
- Challenging.
- Attainable.
- Compatible.
- Articulated.
- Understood.
- Accepted.
- Committed to.

b. Plans. A good plan states a precise objective and a clear intent to act. A balanced plan should not consist of too many details, restrict initiative, or lack enough direction. A good plan integrates the four functions of management: organizing, coordinating, directing, and controlling.

(1) There are many benefits to planning. Planning creates time to react when things go wrong. It makes actions easier to defend and reduces the need for direct supervision. Planning builds teamwork through improved communications, better cohesion, enhanced motivation, a clearer grasp of objectives, and increased commitment.

(2) Planning sequence. Planning is a logical series of steps used to achieve the objective. Figure G-5 is an example of a planning sequence. Follow the steps in figure G-5 to build your plan and remember that as with any plan, the sequence should be flexible. Figure G-6 is an example of a planning flowchart. Use these examples as tools when devising your plan.

Step 1	Forecast events. Predict requirements. Reduce reaction.
Step 2	Develop assumption to fill voids.
Step 3	Set objectives.
Step 4	Establish standards for sucess.
Step 5	Derive tasks form objectives.
Step 6	Develop possible courses of action.
Step 7	Select course of action
Step 8	Prepare the complete plan.
Step 9	Execute the plan.
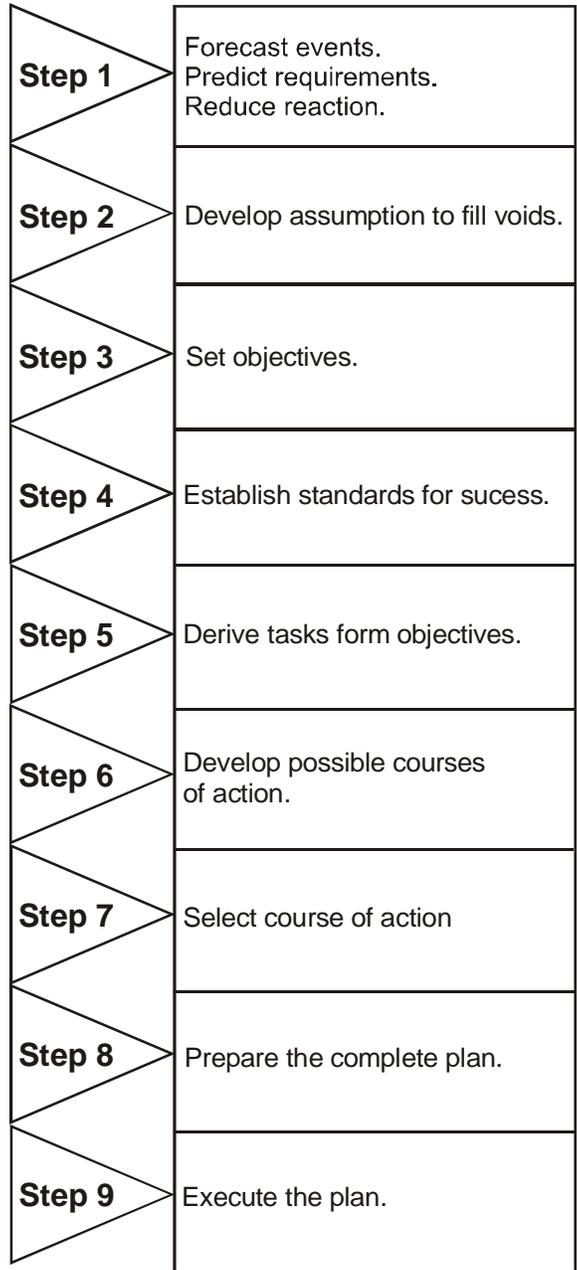
Figure G-5. Planning Sequence.

```
┌──────────────┐      ┌──────────────────────────────────────┐
│  Objective   │ ───▶ │        What is to be achieved?         │ ┄┄┄┐
└──────────────┘      └──────────────────────────────────────┘    ┊
       │                        ┌┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┐    ┊
       ▼                        ┊ • State in qualifiable terms ◀┄┄┄┘
┌──────────────┐      ┌──────────────────────────────────────┐
│ Organization │ ───▶ │      Who is the involved and how?      │ ┄┄┄┐
└──────────────┘      └──────────────────────────────────────┘    ┊
       │                    ┌┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┐               ┊
       │                    ┊ • Tasks               ┊               ┊
       │                    ┊ • People              ┊               ┊
       │                    ┊ • Relationships      ◀┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┘
       │                    ┊ • Responsibilities    ┊
       ▼                    ┊ • Resource allocation ┊
┌──────────────┐      ┌──────────────────────────────────────┐
│ Coordination │ ───▶ │   Who keeps who informed and about what? │ ┄┄┄┐
└──────────────┘      └──────────────────────────────────────┘    ┊
       │                    ┌┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┐               ┊
       │                    ┊ • Integration of details    ┊         ┊
       │                    ┊ • Communications channels  ◀┄┄┄┄┄┄┄┄┄┘
       ▼                    ┊ • Roles of outside players  ┊
┌──────────────┐      ┌──────────────────────────────────────┐
│  Direction   │ ───▶ │   What decisions are whose to make and why? │ ┄┄┄┐
└──────────────┘      └──────────────────────────────────────┘    ┊
       │                        ┌┄┄┄┄┄┄┄┄┄┄┄┄┄┐                    ┊
       │                        ┊ • Instructions  ┊                 ┊
       │                        ┊ • Schedules    ◀┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┘
       ▼                        ┊ • SOP           ┊
┌──────────────┐      ┌──────────────────────────────────────┐
│   Control    │ ───▶ │  Who judges results and by what standard? │ ┄┄┄┐
└──────────────┘      └──────────────────────────────────────┘    ┊
                          ┌┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┐        ┊
                          ┊ • Before starting the task      ┊      ┊
                          ┊ • During the course of the action ◀┄┄┄┄┘
                          ┊ • After completing the action   ┊
                          └┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┘
```

**Figure G-6. Planning Flow Chart.**

c. Responsibility Chart. This simple tool assists in the planning, organizing, and controlling of prior and future events. See figure G-7. It offers the following advantages:

- Displays visually who's doing what.
- Identifies overworked or under utilized individuals.
- Reflects where main efforts are being applied.
- Tells if you are doing the right thing.
- Uncovers voids.
- Reveals if you are wasting resources on the trivial.
- Shows subordinates you care about what they're doing.

TASKS	SSG BROWN	PFC BLACK	SGT GREEN	SPC WHITE
TASK A	L			A
TASK B	L	A		A
TASK C				L
TASK D				

LEGEND	NOTES:
(L) - Lead (A)- Assist	• TASK D not covered. • TASK C not fully covered • SPC White overworked • SGT Green not available (on special project). • PFC Black under utilized.

Figure G-7. Responsibility Chart.

d. Each organization should have a Standing Operating Procedure (SOP). If maintained properly, the SOP is a valuable planning tool by outlining routine and recurring activities. SOPs enhance teamwork, promote efficiency, and reduce confusion.

APPENDIX H

JOINT OPERATION PLANNING AND EXECUTION SYSTEM

Joint operation planning is performed in accordance with policies and procedures established in a formal DOD-directed, CJCS-selected system: JOPES.

    a. JOPES is the approved system for conventional operation planning and execution. JOPES includes policies, procedures, reporting structures, and personnel supported by C4 systems. JOPES supports and integrates joint operation planning activities at the national, theater, and supporting command levels and interrelates with three other national systems: the NSCS, JSPS, and PPBS. JOPES is the principal system within the Department of Defense for translating policy decisions into OPLANs and OPORDs in support of national security objectives. It also provides joint operation requirements to the PPBS for use in making national resource decisions that affect the PPBS and the JSPS. JOPES is a dynamic system that is evolving through the incremental integration and enhancement of two earlier systems: JOPS and JDS. As JOPES evolves, JOPS and JDS will merge and disappear within the improved capabilities of JOPES. JOPES will be the mechanism for providing movement requirements to STRANSCOM for contingencies and all CINC or CJCS-sponsored exercises as directed by CM-1427-92, CJCS approval of VCJCS 21 August 1992 memorandum, "Strengthening Department of Defense Transportation Functions."

    b. JOPES consists of seven interrelated functions that provide a framework for joint military planning and execution. Figure H-1 depicts the five operational functions and the two supporting functions. The operational functions are sequentially related, proceeding in a logical order from identification of a threat, to determination of strategy that counters the threat, to COA development, to detailed planning, and, finally, to actual implementation of military operations. The supporting functions, on the other hand, relate to all of the operational functions and have an impact on each.

    (1) **JOPES Operational Functions.** Figure H-2 displays the operational functions and identifies the major inputs and outputs of each.

    (a) **Threat Identification and Assessment.** This function addresses procedures for describing threats to national security, continuously monitoring the international political and military environment so threats to national security can be detected and analyzed, alerting decision makers, and determining the specific nature of the threat. Defining enemy capabilities and intentions is emphasized using this function. All organizational levels are supported by this function during crisis action planning and execution.

    (b) **Strategy Determination.** Using this function, the NCA, Chairman of the Joint Chiefs of Staff, and Joint Staff formulate suitable and feasible military objectives to counter the threats. This function is used in formulating politico-military assessments, developing and evaluating military strategy and objectives, apportioning forces and other resources, formulating concepts and military options, and developing planning guidance leading to the preparation of COAs, OPLANs, and OPORDs. This process begins with an analysis of existing strategy guidance in light of the intelligence estimate and ends with issuance of either the JSCP in peacetime or a CJCS WARNING or PLANNING ORDER during crisis action planning situations.

    (c) **Course of Action Development.** In COA development during peacetime, the supported command develops the CINC's Strategic Concept based on Joint Staff and Service

planning guidance and resource apportionment provided in the JSCP and Service documents. In crisis situations, the supported command develops COAs based on CJCS planning guidance and resource allocation from approved OPLANs and CJCS WARNING or ALERT ORDERs. Using this JOPES function coupled with the JOPES support function simulation and analysis, force, sustainment, and transportation feasibility are analyzed. The Services, through service component commands, and supporting commands provide supportability estimates of the CINC's Strategic Concept or COAs to the supported command. Products from COA development include CINC's Strategic Concept; CJCS-approved CONOPS; the Commander's Estimate, including COAs; supportability estimates; and, time permitting, an integrated time-phased data base of notional combat, combat support (CS), and combat service support (CSS) force requirements, with an estimate of required sustainment.

    (d) **Detailed Planning.** This function is used in developing a CONPLAN, OPLAN, or OPORD with supporting annexes and in determining preliminary movement feasibility. This function provides a detailed, fully integrated schedule of deployment, employment, mobilization, and sustainment activities based on the CJCS-approved CONOPS or COA. Detailed planning begins with CJCS guidance in the form of an approval for further planning in a peacetime environment or a CJCS ALERT or PLANNING ORDER in a crisis action planning situation and ends with a CJCS-approved OPLAN or NCA-approved OPORD.

    (e) **Implementation.** This function provides decision-makers the tools to monitor, analyze, and control events during the conduct of military operations. It encompasses the execution of military operations and provides procedures to issue OPORDs; conduct mobilization, deployment, employment, and sustainment activities; and adjust operations where required. The ability to monitor and compare actual with scheduled events is crucial to assessing mission accomplishment; controlling, directing, replanning, redirecting, or terminating operations; and conducting redeployment. Planning is a cyclic process that continues throughout implementation. Implementation begins with the CJCS EXECUTE ORDER and usually ends with some type of replanning effort, such as redeployment or redirection of operations.
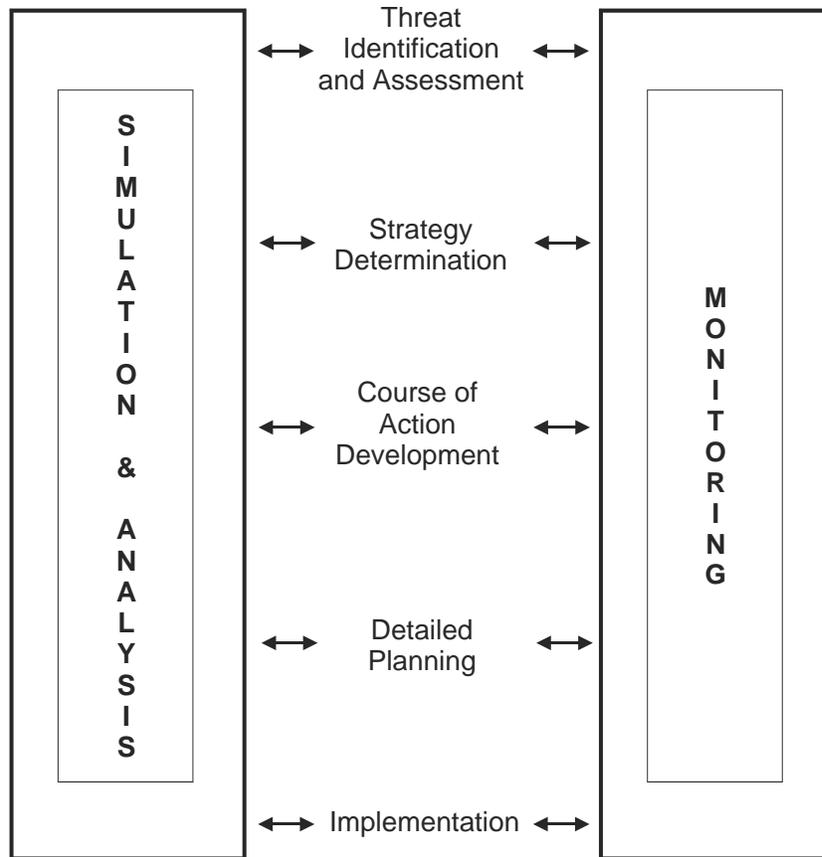
Figure H-1. JOPES Functions.

(2) **Supporting Functions.** Two supporting functions identified in Figure H-1, monitoring and simulation and analysis, complement the operational functions to complete the conceptual framework of JOPES.

(a) **Monitoring.** This supporting function supports each of the other JOPES functions by obtaining current accurate information concerning the status of friendly, enemy, and neutral forces and resources in accomplishing mission tasks. Examples of information processed are objective accomplishment; consumption data; and the status of deployment, procurement, mobilization, forces, and facilities.

(b) **Simulation and Analysis**. This supporting function offers various automated techniques that enhance each of the other JOPES functions. Examples of simulation and analysis applications, when feasible, are force-on-force assessments (suitability); generation of force requirements; comparison of requirements to capabilities, such as consumption data; closure profiles (feasibility); and generation of mobilization and sustainment requirements based on need.
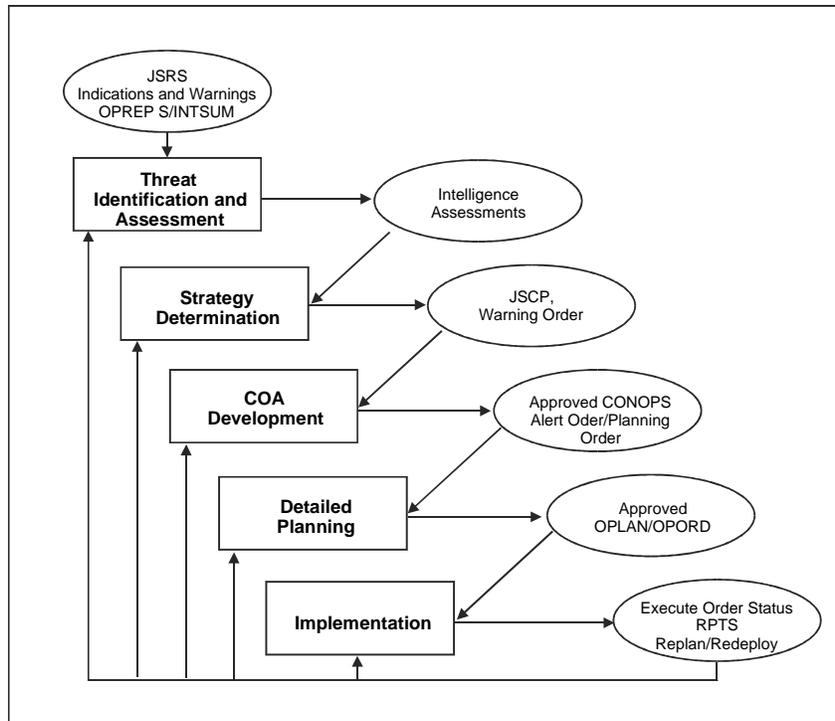
Figure H-2. Functional Process Major Inputs and Outputs.

c. JOPES is a continuous, iterative process. It begins in response to perceived and identified threats to US security interests; continues through military option selection and COA, operation plan, and operation order development and implementation; and ends when the requirement for the plan is canceled, the operation is terminated, or the crisis is satisfactorily resolved.

APPENDIX I

TIME-PHASED FORCE AND DEPLOYMENT DATA (TPFDD)

I-1. Time-phased force and deployment data is the list of units and sustainment requirements needed to execute the operation plan (OPLAN). It phases them into the theater of operations at the times and places required to support the concept of operations. Its development and refinement are critical to achieving executable OPLANs and to developing executable operation orders when using an approved TPFDD in crisis action planning. US Transportation Command uses TPFDD to analyze the flow of forces and cargo from their points of origin to arrival in theater. They distribute the apportioned strategic transportation resources. During this process, Commander in Chief, US Transportation Command follows the Chairman of the Joint Chiefs of Staff guidance and coordinates all major decisions with the supported combatant commander.

I-2. A TPFDD is a computer database used to identify types of forces and actual units required to support an OPLAN or OPORD. In addition, TPFDDs contain estimates of logistics support and designate ports for loading (embarkation) and unloading (debarkation). Finally the TPFDD, based on planner input, establishes the sequence for moving the forces and their support (time phasing) into the Area of Operations. The time-phased forces, and their associated cargo and passenger movement requirement, are used as the basis for actual transportation scheduling. JOPES ADP depends on Service planning systems for these force and support requirements. The JOPES database is distributed worldwide and provides a single information source for movement status.

I-3. Developing a TPFDD involves these main processes:

- Force planning.
- Support Planning.
- Transportation Planning.
- Deployment/ Redeployment Execution.

   a. Force planning begins when the combatant commander identifies the major apportioned forces needed to support his concept of operations, and continues with the identification of combat support and combat service support force requirements. Initially, for gross planning estimates, notional (generic) units may be designated. As the process continues, however, actual units must be identified.

   b. TPFDD development then shifts to support planning. Various software programs use the force list to estimate time-phased lift requirements for supplies, equipment, and replacement personnel needed to sustain the forces specified during force planning. The quantities are determined using planning models to derive gross quantities (weight and volume). Unique computer programs provide support for specialized planning models such as civil engineering and medical support.

   c. During transportation planning, all of the forces are time-phased into the Area of Operations. JOPES software compares apportioned transportation assets to the forces to be moved, factors in their sustainment requirements and time phasing, and determines if the planned forces can be moved to the Area of Operations to meet the CINC's needs. The product of this process is a capabilities-based, transportation-feasible database containing all the forces,

materiel, and personnel needed to execute the CINC's concept of operations. This transportation-feasible database is the TPFDD.

d. The process of developing the TPFRR with the current JOPES ADP software is sequential. This figure depicts the development of a TPFDD based on three of the main processes: force planning, support planning, and transportation planning. Each process must be completed before proceeding to the next one. For example, force planning must be completed before support planning begins, and support planning must be finished before starting transportation planning. Also, it may be necessary to drop back to revisit previous steps, or in the worst case start over. Each step is the responsibility of one or more separate agencies or commands located around the world. This complex operation was acceptable for a multi-year deployment-based deliberate planning cycle. Today, however, emphasis has shifted to an execution-based crisis action planning procedure. A crisis action planning cycle and deployment/redeployment execution require immediate data access and a response time measured in hours, not days.

e. The TPFDD becomes the basis for actual transportation scheduling for force deployment and redeployment. At execution, the TPFDD developed during deliberate planning is refined and movement requirements are validated. This validated TPFDD becomes the basis for actual transportation scheduling for force deployment and subsequent redeployment. Supply and replacement personnel estimates developed during planning are used as a source for establishing transportation channels for sustainment movement. In short, the JOPES database is a single source for force deployment movement requirements and status.

SAMPLE TPFDD LETTER OF INSTRUCTION

This document constitutes the LOI for use of JOPES during Operation BLUENOSE. The overall classification of this document is _____.

TABLE OF CONTENTS

I. Introduction

    a. Purpose

        1. This LOI provides time-phased force and deployment data (TPFDD) procedures for deployment, replacement, and redeployment of Operation BLUENOSE forces. This LOI provides instructions and direction to USCENTCOM components, supporting CINCs, and JOPES planners.

        2. This LOI will be retained in the USCENTCOM host CAT/file string CENT JOPES/BLUENOSE/TPFDD LOI Updated versions of each appendix will be retained in the CAT/file string listed in the table of contents. Appendixes will be updated to reflect current information along with the change date. Periodically, USCENTCOM will list the appendixes with the dates of their current versions in its daily validation message to USTRANSCOM. Comparing the dates on the hard copy appendixes with those on the validation message will ensure use of most current information.

    b. Scope

        1. USCENTCOM CCJ3 exercises office of primary responsibility (OPR) for oversight, review, coordination, and administration of BLUENOSE deployment and redeployment data in JOPES.

        2. USCENTCOM J4/7 (CCJ4/7) is the OPR for validating movement requirements.

        3. CCJ3 is the OPR for monitoring and coordinating all TPFDD movements.

        4. CCJ3 and CCJ4/7 will coordinate the transportation issues affecting the deployment and redeployment of BLUENOSE forces.

        5. CCJ5 is the OPR for oversight, review, coordination, and administration of force planning and associated movement dates.

    c. Coordinating Instructions

        1. USCENTCOM REAR CCJ3-PJ (JOPES) coordinates TPFDD requirements and acts as the OPR for TPFDD issues. Requirements generated within the AOR for deployment and redeployment will be coordinated through USCENTCOM JOPES FORWARD (FWD). USCENTCOM JOPES FWD may interface directly with supporting CINCs and components or through USCENTCOM REAR JOPES.

        2. Coordination of requirements with supporting CINCs requires special consideration. USCINCCENT components translate USCINCCENT direction into Service requirements, establish Service ULN structure, and set movement priorities to match lift allocation. Therefore, direct liaison between USCINCCENT components and supporting CINCs is authorized to ensure immediate resolution of competing movement requirements and proper TPFDD structure.

        (a). For Deployment. In the case of joint requirements, supporting CINCs will coordinate directly with USCENTCOM. USCENTCOM components will validate Service

requirements. Supporting CINCS will validate joint requirements and verify to USCINCCENT and USCINCTRANS that tasked units and equipment are available for movement as indicated in the TPFDD.

          (b). For Redeployment. USCENTCOM components will prioritize and validate Service requirements in accordance with USCINCCENT redeployment priorities and lift allocations. Supporting CINCs and providing organizations will coordinate with appropriate USCENTCOM Service components to manage redeployment movement requirements.

      3. Providing organizations (e.g., AMC, ACC) will coordinate TPFDD requirements directly with USCENTCOM components.

      4. Component responsibility for deployment operations is as follows:

          (a)   Army--FORSCOM//FCJ5//.

          (b)   Air Force--CENTAF REAR//BSD//.

          (c)   Navy--NAVCENT.

          (d)   Marines--MARCENT//G3//.

          (e)   SOF--SOCOM//CAT//.

      5. Component responsibility for redeployment operations is as follows:

          (a)   Army---ARCENT//G5//.

          (b)   Air Force--CENTAF FWD//XPX//.

          (c)   Navy--NAVCENT.

          (d)   Marines--MARCENT//G3//.

          (e)   SOF--SOCCENT.

      6. The primary means of communication and coordination for TPFDD issues is the 104BN (series) WIN Teleconference. GENSER message traffic should be held to a minimum.

    d.   References

      1. Joint Pub 5-03.1, "Joint Operation Planning and Execution System (JOPES), Volume I, 4 Aug 1993, (Planning Policies and Procedures),"

      2. Joint Pub 5-00.2, "Joint Task Force Planning Guidance and Procedures," 13 January 1999.

      3. Joint Pub 4-01.3, "Joint Techniques and Procedures (JTTP) for Movement Control," December 1999.

4. Joint Pub 4-01, " Joint Doctrine for the Defense Transportation System," March 2000.

II. Planning and Execution Instructions

    a. Concept of Operations

        1. TPFDD Concept

            (a) The timeframe of the transition from deployment to unit or nonunit personnel and equipment exchanges (replacements) to redeployment cannot be forecast. The most difficult, and possibly most likely, scenario is for redeployment to occur simultaneously as replacements and additional deployments are ongoing. To keep the process simple and direct, deploying forces, including replacements to the AOR, will continue to be entered into one TPFDD, presently PID 152BN.   Redeploying forces, including replaced units leaving the AOR, will be entered into a second TPFDD, presently designated 152RP.   Because all units and equipment (ULNs) must be prepared to eventually redeploy, all forces deployed to the AOR will be entered into the redeployment TPFDD, 152RP. Redeploying forces (air and sea movements) will be coded "DEP" by the components in the project code field of PID 152RP. When they have departed the AOR, PID 152RP will then reflect the remaining deployed force.

            (b) USCINCCENT components will create force modules in all BLUENOSE TPFDDs files in order to identify the current status of all major units. "Major combat units" for each component are defined as follows:

                CENTAF--Squadron and above.

                ARCENT--Brigade and above.

                MARCENT--MEB, regiment, and aircraft group and above.

                NAVCENT--Current ULN structure in 152BN is appropriate.

                SOCCENT--One force module each for AFSOC, Army SF, and NSWTG components. Supporting CINCS may create additional force modules (e.g., regiments, battalions, squadrons); however, force modules must exist for the designated units.

            (c) The following ULN blocks are designated for indicated components and commands:

Force ULNs

(1st character)	(2d character)
T--Army	C--USCENTCOM
W--Navy/Marine	E--USEUCOM
V--Air Force	F--FORSCOM
U--Joint/Non-US/SOF	P--USPACOM
	S--USSOUTHCOM
	T--ACC

The intent is to provide unit visibility showing parent or subordinate relationships. Therefore, the ULN structure must remain the same for both 152BN and 152RP TPFDDs files. Force modules must be accurate and correct as described in subparagraph IIa(1)(b) above.

(d) All requirements from the 152BN TPFDD that have actually deployed to the AOR will be entered into the 152RP TPFDD immediately. These records will be updated if necessary to reflect actual cargo and passenger (PAX) data. Level 2 detail is acceptable for airlift. Level 4 details will be provided when available. However, a minimum of Level 3 detail is required for sealift to obtain square foot data for sealift planning. The RLD, ALD, EAD, and RDD fields of each ULN will be blanked and the LAD will be coded "9999" (on call) until movement data are known and destination and origin locations (GEOCODEs) are reversed. The providing organization code will not be changed to maintain visibility of the original providing organization. Finally, a Critical Employment Indicator (CEI) code or "R" will be used to distinguish redeployment requirements from other 152RP entries.

(e) ULNs in the redeployment TPFDD will be prioritized according to mode and source as follows:

(1). ULNs redeploying (152RP) via air (AMC or supporting CINC) will be prioritized from 1-999 by each component. No priority number will be repeated unless the ULN is less than 400 passengers or 100 short tons. In this case ULNs can be assigned the same priority number until a total of 400 passengers or 100 short tons is exceeded.

(2). ULNs in the redeployment TPFDD (152RP) requiring movement by sea or MSC will be prioritized from 1-999 by each component. No priority number will be repeated unless the ULN is less than 10,000 MTONs. In this case, ULNs can have the same priority number until 10,000 MTONs is exceeded.

(f) ULNs in the deployment TPFDD, 152BN, will be coded to identify forces deploying by deployment orders. To identify different phases of the deployment, the CEI code for each ULN in the 152BN TPFDD will be coded as follows:

A--Indicates forces ordered deployed as directed by the initial DEPLOYMENT ORDER and subsequent orders (Phase I).

B--Indicates forces ordered deployed as directed after 31 March 1990 and subsequent orders (Phase II).

C--Indicates forces in an on-call status that could be expected to deploy as replacements.

R--Indicates forces in the 152RP TPFDD designated for redeployment to home station. Used to distinguish forces awaiting REDEPLOYMENT ORDER from other 152RP requirements.

2. Unit Personnel and Equipment Movement

(a) Air Large Units. Units moving by AMC will depart from an APOE nearest their origin for deployments and an APOE nearest their AOR location for redeployments. For redeployments, the APOD (APOD will be coordinated with

USTRANSCOM) will be directed by the Service component or the supporting CINC. Because airlift will move more efficiently through established channels, components should make every attempt to use channels. For each mission, units must provide, as a minimum, the airlift control element (ALCE) and/or aerial port commander (APC) with the following information: ULN(s), passengers, cargo (in short tons (STON)), and hazardous cargo documentation.

(b) <u>Air Small Units</u>. Units with less than 100 passengers and/or 10 STONs that have not been grouped at a major APOE will move to consolidated APOE when moving to and from the AOR.

(c) <u>Multiple Aerial Ports</u>. Aircraft will not transit multiple aerial ports for load or offload except in exceptional circumstances, specifically coordinated with USCENTCOM and USTRANSCOM. TPFDD requirements must reflect appropriate APOE and APOD to ensure in-transit visibility.

(d) <u>Sea Movements</u>. SPOE and SPOD for deploying and redeploying requirements are listed in Appendix 1. USCENTCOM through USTRANSCOM will designate an aggregation SPOE in the USCENTCOM AOR when required. Procedures for onward movement from CONUS or OCONUS SPOD to destination will comply with Defense Traffic Management Regulations (DTMR).

3. <u>Nonunit Related Personnel and Equipment Movement</u>. Nonunit related personnel type movement are coded in compliance with Joint Pub 1-03, Appendix B, Table 18. Movement of non-unit cargo will use the Defense Transportation System (DTS). The majority of nonunit cargo moving to the AOR should move through published channels with Military Standard Transportation and Movement Procedures (MILSTAMP) documentation.

4. <u>Redeployment of Sustainment</u>. Redeployment of sustainment and nonunit equipment, under control of deployed units, are aggregated by Service (component) representatives in the AOR.

b. <u>Classification of TPFDD Information</u>. Any Operation BLUENOSE TPFDD is classified SECRET. However, TPFDD movement information such as ULN, UIC, origin, destination, providing organization, EAD/LAD, and number of passengers is UNCLASSIFIED when not associated with a unit name. When the unit name and UIC are used together with either destination or actual deployment dates, the information is classified SECRET.

c. <u>Planning Guidance</u>

(1) Components' airlift and sealift allocation for TPFDD building will be in accordance with Appendix 2.

(2) The 104BNXX (Series) teleconference will continue to be used to coordinate and resolve BLUENOSE TPFDD issues.

(3) C-day and L-hour will remain the same for all deployment and redeployment TPFDD files.

(4) The following ULN assignments will be used in all TPFDD files.

USARCENT: TC-TC999

USCENTAF: VC-VC999

USNAVCENT: WC-WC999

USMARCENT: W1-W9999

SOCCENT: UC-UC999

USCENTCOM: U1-U9999

USEUCOM: UE-UE999

USPACOM: UP-UP999

In accordance with Joint Pub 4-01.3, do not use the characters "I" and "O" in the TPFDD ULN structure. Also, the characters "W," "X," and "Y" are reserved fourth position characters for USAF weather and TACP in support of Army units.

(5) SOCCENT will coordinate the redeployment of JCSE forces in direct support of SOCCENT and USCINCSOC forces provided to CENTAF and ARCENT. SOCCENT will use its lift allocation to move these forces.

d. TPFDD Management

(1) Validation Procedures. Components, supporting CINC, and providing organizations will validate, via teleconference, active PID to USCENTCOM daily by 2100Z. USCENTCOM will validate to USTRANSCOM 4 hours later, 0100Z the following day, via teleconference. Validation will be by EAD 6 days from the current C-day for airlift requirements and 30 days from the current C-day for sealift requirements (see Glossary, for definition of validation). USTRANSCOM and components will report the current status of validated ULN by coding the project code field as instructed in Appendix 3.

(2) Aircraft Allocation and Manifesting

(a) For CONUS units the AMC requirements cell will contact the unit POC to coordinate movement. For OCONUS units, the AMC requirement cell will contact the organization specified by USCINCCENT to coordinate movement.

(b) AMC will initially allocate ULN to aircraft mission numbers and publish the allocation information in the Global Decision Support System (GDSS). USTRANSCOM will update JOPES to show ULN allocated to air missions. Neither components nor supporting CINC or providing organizations are change or reassign ULN(s) or aircraft mission numbers without first notifying USCENTCOM and informing USTRANSCOM via teleconference.

(c) Components, supporting CINC, and providing organizations will ensure that units or shippers provide assigned ULN(s) to the airlift control element (ALCE) or aerial port commander (APC) at the APOE along with passenger and cargo quantity. The ALCE

or APC will report the aircraft departure with the actual ULN(s), passengers, and cargo STON hauled for each mission to the appropriate AMC command and control agency. Mission manifesting will be accomplished using JOPES interface of GDSS and crosscheck procedures.

(d) Components, supporting CINC, and providing organizations with requirements departing from locations without an ALCE or APC will manifest the carrier in JOPES with ULN(s), passengers, and cargo STON actually hauled. Before the carrier departs, it may be manifested in JOPES if passengers and cargo STON are known but not later than 12 hours after the aircraft's departure.

III. <u>Action</u>
f0

a. <u>USCENTCOM</u>

1. Coordinate with USTRANSCOM to ensure that Appendixes 1 and 2 are current and correct.

2. Update Appendixes 3 and 4 as required.

3. Update CAT/file strings containing appendixes as required and report periodically the dates of the current versions in the daily validation message to USTRANSCOM.

4. Conduct daily validations by EAD of active TPFDD files, 6 days from the current C-day for airlift and 30 days for sealift. Report to USTRANSCOM the validation by 0100Z via TLCF.

5. Ensure that applicable milestones are met.

b. <u>USTRANSCOM</u>

1. Coordinate with USCENTCOM to ensure that Appendixes 1 and 2 are current and correct.

2. Report to USCENTCOM via TLCF any changes to POC.

3. Ensure Commander Airlift Forces (COMALF) provide a daily list of ALCE or APC locations in the AOR by message to USCENTCOM REAR/JOPES. Also provide USCENTCOM with a current list of CONUS, OCONUS ALCE, and APC locations and advise when a change occurs to ensure that components, supporting CINC, and providing organizations know from which APOE they are required to manifest aircraft.

4. Report the current status of validated ULN according to Appendix 3.

5. Conduct aircraft allocation and manifesting as indicated in Part II, subparagraph II d(2) of this LOI.

6. Ensure applicable milestones are met.

c. <u>Components</u>

1. Report to USCENTCOM any changes or corrections to POC.

2. Conduct daily validations by EAD of active TPFDD files, 6 days from the current C-day for airlift and 30 days for sealift, and report to USCENTCOM the validation by 2100Z via TLCF.

3. Report the current status of validated ULN according to Appendix 3.

4. Insert the proper CEI code for each ULN in the deployment TPFDD to identify its deployment phase.

5. Build redeployment TPFDD of all forces currently deployed to the AOR according to directions provided in this LOI and information contained in the appendixes. The TPFDD must contain force modules showing major combat units and indicate priority of redeployment by ULN according to the priority code field of the ULN record. Report the force module structure of major units via TLCF to USCENTCOM.

6. Ensure the redeployment TPFDD is maintained to reflect forces currently in the AOR that may require redeployment.

7. Manifest assigned carriers at APOE with ALCE and port commanders.

8. Review USCENTCOM's daily validation message to USTRANSCOM to ensure TPFDD planning information provided in the appendixes to this LOI is up to date. Later versions of the appendixes can be obtained from the files listed with the appendixes.

9. Ensure applicable milestones are met.

10. Ensure there is a 24-hour POC for all ULN in the validated period (see subparagraph d of Part II). POC for ULN can be disseminated a number of ways to include established procedures or including the POC and phone number with the ULN data in "nonbaseline" field.

d. <u>Supporting CINC and Providing Organizations</u>

1. Report to USCENTCOM any changes or corrections to POC.

2. Conduct daily validations by EAD of active TPFDD files, 6 days from the current C-day for airlift and 30 days for sealift. Report to USCENTCOM these validations by 2100Z via TLCF.

3. Report the current status of validated ULN according to Appendix 3.

4. Insert the proper CEI code for each ULN in the deployment TPFDD to identify its deployment phase.

5. Coordinate with appropriate USCENTCOM components on movement data for those requirements intended for a particular service. Coordinate with USCINCCENT on movement data for joint requirements.

6. Manifest assigned carriers at APOE without ALCE or port commanders.

7. Review USCENTCOM's daily validation message to USTRANSCOM to ensure that TPFDD planning information provided in the appendixes to this LOI is up to date.

8. Ensure applicable milestones are met.

GLOSSARY

Section I
Abbreviations

AAR	After-Action Review
ABL	automatic brightness limiter
AC	alternating current/Active Component/assistant commandant
ACC	Army Correspondence Course/Automatic Color Control
ACCP	Army Correspondence Course Program
ack	acknowledge
ACT	automatic continuous tuning
AD	archive device
ADB	Apple Desktop Bus
ADG	automatic degaussing
ADP	Automated Data Processing
ADTL	Armywide Doctrinal and Training Literature
AF	audio frequency/Air Force
AFC	automatic frequency control; Army functional course
AFIS	American Forces Information Service
AFPC	automatic frequency and phase control
AFRTS	Armed Forces Radio and Television Service
AFRTS-BC	AFRTS Broadcasting Center
AFT	automatic fine-tuning
AG	Adjutant General/Adjutant General Corps
AGC	automatic gain control
AI	Area of Interest
AIG	address indicator group
AIT	Advanced Individual Training
AL	angle line

ALCE	airlift control element
AM	amplitude modulation
AM/FM	amplitude modulation/frequency modulation
AMC	Army Materiel Command
amp	amplifier
AN	annually (frequency code)
ANCOC	Advanced Noncommissioned Officer Course
AOR	area of responsibility
AP	Antipersonnel
APC	Arial Port Commander; armored personnel carrier
APL	average picture level
app	appendix
AR	Army Regulation/Army Reserve
ARNG	Army National Guard
ARPA	Advanced Research Project Agency: Agency of the US Department of Defense; funded initial work on the Internet
ARPANET	Advanced Research Project Agency Network
ARTEP	Army Training and Evaluation Program
ASA	American Standards Association
ASAT	Automated Systems Approach to Training
AT	anti-tank
ATM	Adobe Type Manager
attn	attention
auto iris	automatic control of the lens diaphragm
AV	audiovisual
AVIDP	Army VI Documentation Program
AVIMO	Army Visual Information Management Office
B	blue
BA	biannually

BB	black burst
BBS	Bulletin Board System
BC	Before Christ; Branch Code
BII	Basic Issue Items
BIO	Biological
BL	low battery/baseline
BNCOC	Basic Noncommissioned Officer Course
BPI	bits per inch; number of bits that can be recorded on one inch of track on a floppy disk
bps	bits per second
BR	battle roster
BT	basic training
BW	Bi-weekly
C	Centigrade
CA	civil affairs or Civil Affairs
CAD	Course Administrative Data; computer-aided design; computer-aided drafting
CAL	Center of Army Leadership
CAS	Close Air Support; Crew Assignment Sheet
CATV	cable television
CB	chemical, biological; common battery; citizens band; common base transistor; color bars
CC	Chemical Corps; Communication Central
CCD	charge-coupled device
CCITT	Command, Control, and Intelligence Technical Test
CCO	circuit control officer
CCT	combat control teams
CCTV	closed-circuit television
CCU	communications control unit; camera control unit

CD	compact disk
CD-E	compack disk-erasable; erasable CD-ROM drive
CD-R	compact disk-recordable
CD-ROM	Compact Disk-Read Only Memory
C-E	communications-electronics
CED	Captured Enemy Documents
CEI	Critical Employment Indicator
CEOI	Communications-Electronics Operating Instructions
chan	channel
ci	command information
CINC	Commander In Chief
CINCLANTFLT	Commander-In-Chief, US Atlantic Fleet
CINCUSACOM	Commander-In-Chief US Atlantic Command
Cir	Circular
CISC	Complex Instruction Set Computing
CJCS	Chairman of Joint Chiefs of Staff
CMF	career management field
CMOS	configuration memory operating system
COA	course of action
COEI	components of end item
COMALF	Commander Airlift Forces
COMCAM	combat camera
COMDOC	Combat Documentation
CONFID	confidential
cons	console
cont	continued
CONUS	Continental United States
COU	cable orderwire unit

CP	Command Post
CPU	central processing unit
CRT	cathode-ray tube
CS	O-chlorobenzyl-malononitrile
CSS	combat services support/communications switching set
CT	control terminal
CTT	Common Task Test
CY	calendar year
DA	Department of the Army; distribution amplifier
DA Form	Department of the Army Form
DA Pam	Department of the Army Pamphlet
DAIG	Department of the Army Inspector General
DAT	digital audiotape
DAVIS	Defense Automated Visual Information System
DC	Dental Corps; direct current; District of Columbia
DCA	Defense Communications Agency
DD	Department of Defense
DD Form	Department of Defense Form
DE	directed energy
decon	decontamination
demo	demolition
DES	dismount extension switch
dest	destroy
DIA	Defense Intelligence Agency/diameter
DINFOS	Defense Information School
DIS	Distributed Interactive Simulation
DISC4	Director of Information Systems for Command, Control, Communications, and Computers
distr	distribute; distribution

DLA	data level adjustment
DMA	Defense Mapping Agency
DO	Delivery Order
DoD	Department of Defense
DODD	Department of Defense Directive
DP	Dual Purpose
DPDM-R	Defense Property Disposal Precious Metals Recovery Office
DPDO	Defense Property Disposal Office
DPI	dots per inch
DPW	Directorate of Public Works
DS	direct support
DSN	Defense Switched Network
DTMR	Defense Traffic Management Regulations
DTS	Defense Transportation System
DVD	digital videodisk; revised format for CD-ROM disks that will increase the capacity of CD-ROM size disks up to 4.7 gigabytes
DVIAN	Defense Visual Information Activity Number
DVIC	Defense Visual Information Center
EAD	earliest arrival date; entered active duty
EI	end item
EMS	electromagnetic spectrum
EPMS	Enlisted Personnel Management System
EPROM	Erasable Programmable Read Only Memory
EPS	Encapsulated Post Script file
F	Fahrenheit; fail
FAQ	frequently asked questions
Flowchart	A graphic representation of the sequence of a specific activity, operation, or algorithm.
FM	field manual; frequency modulation; file maintenance

focal point	center of interest.
FORSCOM.	United States Army Forces Command
FPC	Final Planning Conference - final opportunity to make changes, solidify plans and verify all logistics and tasking
FRAGO	fragmentary order
FTP	File Transfer Protocol
GDSS	Global Decision Support System
GOCO	Government-Owned/Contractor-Operated
GPS	Global Positioning System
GSA	General Services Administration/General Support Agency
GUI	Graphical User Interface
HD	high density; distilled mustard gas
HQ	Headquarters
HTML	Hyper Text Markup Language
IAW	In Accordance With
ICTP	individual and collective training plan
ID	identification
INMARSAT	International Maritime Satellite
IPC	Initial Planning Conference - first gathering of all players involved in a specific exercise, used to set ground work and requirements for the exercise.
IPTC	Image Perspective Transformation Caption
IRC	Internet Relay Chat
ISC	Information Systems Command
ISO	International Standards Organization
ISP	Internet Service Provider; company that has a permanent connection to the Internet and offers access to the Internet as one of its services
ITEP	Individual Training Evaluation Program
ITP	Individual Training Plan
JCCC	Joint Combat Camera Center

JCCMT	Joint Combat Camera Management Team
JCPG	Joint Conference Planning Guide for Combat Camera Officers
JCS	Joint Chiefs of Staff
JDS	Joint Development System
JMETL	Joint Mission Essential Tasking List - a compilation of critical mission tasks a joint unit must be able to perform. The task must be measurable
JOPES	Joint Operation Planning and Execution System
JOPS	Joint Operations Planning System
JPEG	Joint Photographic Expert Group
JSCP	Joint Strategic Capabilities Plan
JTF	Joint Task Force
JVIA	Joint Visual Information Activity
JVIS	Joint Visual Information Service
JVISDA	Joint Visual Information Service Distribution Activity
kbps	kilobits per second
kHz	kilohertz
LAN	local area network
LBE	Load Bearing Equipment
LOGDET	logistical detail - list of equipment each UTC must have for deployment.
LOI	letter of instruction
LZW	Limpel-Ziv-Welch
MACOM	major Army command
MAJCOM	US Air Force Major Command - develops operational plans and policy for its assigned forces.
Mb	megabyte
METL	mission essential task list
METT-T	Mission, Enemy, Terrain, Troops, and Time
MILSTAMP	Military Standard Transportation and Movement Procedure
MM/mm	maintenance manual/millimeter

MO	monthly (frequency code)
modem	modulation/demodulation equipment
MOPP	mission oriented protection/protective positive
MOS	Military Occupational Specialty
MS-DOS	Microsoft Disk Operating System
NBC	nuclear, biological, chemical
NCA	National command authority
NCO	noncommissioned officer
NCOIC	Noncommissioned Officer In Charge
NEO	non-combat evacuation order
NIPRNET	Non-secure Internet Protocol Roster Network - non-secure communication line for transmitting unclassified data
NPPA	National Press Photographers Association
NSA	National Security Agency
NSCS	National Sigint Communication Standard
NSF	National Science Foundation
OADR	On or after Data Release; Originating Agency's Determination Required
OASD	Office of the Assistant Secretary of Defense
OCR	optical character reader/optical character recognition
OIC	officer in charge
OJT	on-the-job training
OM	operation manual
OPDOC	operations document
OPFOR	Opposing Force
OPLAN	Operations Plan
OPORD	operation order
OPR	operate; office of primary responsibility
OSD	Office of Secretary of Defense

P	pass
PA	public affairs; power amplifier
PAO	Personnel Affairs Officer
PAX	passenger
PC	programmable controller; personal computer
PLAD	Plain Language Address for message traffic
PLDC	Primary Leadership Development Course
PM	performance measure
PMCS	preventive maintenance checks and services
POC	point of contact
POI	Program of Instruction
PPBS	Planning, Programming, and Budgeting System
Protocol	call set-up procedures as it pertains to timing and synchronization
PSYOP	psychological operations
QC	quality control
QT	quarterly (frequency code)
RAM	random access memory
RDT&E	Research, Development, Test, and Evaluation
resolution	the measure of how detailed and fine an image is
RGB	red, green, blue
RIP	Raster Image Processor
RISC	Reduced Instruction Set Computing
ROM	read only memory
S0P	standing operating procedure
SA	situational awareness; semiannually (frequency code)
SAEDA	Subversion and Espionage Directed Against the US Army
SAM	single agency manager; surface-to-air missile
SAPP	Security, Accuracy, Policy, and Propriety

SATNET	satellite network
SCSI	small computer system interface
SF	Standard Form
SFC	Sergeant First Class
SIGNIT	signal intelligence
SITREP	Situation Report
SM	soldier's manual
SMCT	Soldier's Manual of Common Tasks
SOE	Schedule of Events - a time limit of the exercise events.
SOP	Standing Operating Procedure
ST	Special Text
STP	soldier training publication
STSL	sustainment training skill level
TACON	tactical control
TAQ	Total Army Quality Management
T-ASA	Television-Audio Support Activity
TC	technical coordinator; training circular; thermocouple
TCF	technical control facility
TCPIP	Transmission Control Protocol Internet Protocol
TDA	Table of Distribution and Allowance
TEC	Training Extension Course
TG	trainer's guide
TM	technical manual
TMDE	test, measurement, and diagnostic equipment
TMP	Terminal Message Processor: Transportation Motor Pool
TOC	tactical operations center
TOE	Table(s) of Organization and Equipment
TPFDD	Time-Phased Force and Deployment Data

TPL	Time-Phased Line
TQM	Total Quality Management
TRADOC	Training and Doctrine Command
typography	the art of type selection and arrangement
UIC	unit identification code
ULN	unit line number
UMO	Unit Movement Officer
UPS	universal power supply; uninterruptible power supply
URL	Universal Resource Locator
US	United States
USAFSS	United States Army First Sergeants School
USAR	United States Army Reserve
USAREUR	United States Army, Europe
USASMA	United States Army Sergeant Major Academy
USAVIC	US Army Visual Information Center
UTC	unit type code
VA	Virginia
VCP	views control panel
VCR	video cassette recorder
VGA	video graphic adapter
VI	visual information
VIDOC	visual information documentation
VIM	Visual Information Manager
VIRIN	visual information record identification number
VISP	Visual Information Systems Program
VM	Virtual memory
VML	Visual Media Library
VRAM	Video Random Access Memory

WAIS	Wide Area Information Servers
WAN	Wide Area Network
WARNO	warning order
WCS	Weapons Control Status
WMD	Weapons of Mass Destruction
WQ	wild cues
WWW	World Wide Web
XO	executive officer

Section II
Terms

access
the process of obtaining data from or placing data into storage

active video lines
all video not occurring in the vertical blanking interval

additive process
process by which white light can be produced by starting with darkness and combining colored lights until white is obtained

advancing colors
colors which appear to come forward, such as red, orange, and yellow. See and compare receding colors

AGC (automatic gain control)
type of circuit used to maintain the output volume of a receiver constant, regardless of variations in the signal strength applied to the receiver

AMERICAN STANDARD CODE FOR INFORMATION INTERCHANGE (ASCII)
the most widely used coding system to represent data, primarily on personal computers and many minicomputers

ampers
unit of electrical current or rate of flow of electrons

amplifier
device which draws power from a source other than the input signal and which produces as an output an enlarged reproduction of the essential features of its input

amplitude
the magnitude of variation in a changing quantity from its zero value

ANALOG COMPUTERS
computers designed to process continuously variable data, such as electrical voltage

ANALOG SIGNAL
signal used in communications lines that consist of a continuous electrical wave

ANALYTICAL GRAPHICS
charts provided by spreadsheet software

anhydrous
free from water (as in ethyl alcohol)

annex
an integral part of an order that deals with one aspect of an operation

anode
the positive electrode such as the plate of a vacuum tube

APPENDIX 12
Appendix 12 to Annex C - (VI Appendix to operations order)

APPLETS
to assist in running multimedia applications on the Web, small programs that can be downloaded and run in browser window

APPLICATION SOFTWARE
programs that tell a computer how to produce information, and reside permanently in storage, such as a disk

approx
approximately

ARCHIE
FTP search tool that is used to find files on a particular subject

Army Training and Evaluation Program (ARTEP)
The US Army's Collective Training Program. ARTEP establishes unit training objectives critical to unit survival and performance in combat. They combine the training and the evaluation processes into one integrated function. The ARTEP is a training program and not a test. The sole purpose of external evaluation under this program is to diagnose unit requirements for future training.

aspect ratio
1. The numerical ratio of picture width to height.   2. The proportions of the television screen and therefore of all television pictures: three units high and four units wide, for HDTV 9 X 16.

astigmatism
the uneven foreground and background blur that is in the image

asymmetrical
not symmetrical or formal in balance, also symmetry

asynchronous
in art, recurrences or repeated operations in unrelated patterns, not synchronous

attenuation
reduction or loss of signal strength, measured in decibels; opposite of gain

audience flow
TV programming to ensure constant audience tune-in

AUDIO FILES
web applications consisting of individual sound files that must be downloaded before they can be played

AUDIO OUTPUT
Consists of sound, including words and music, produced by the computer, audio output device on the computer is a speaker.

automatic gain control
A type of circuit used to maintain the output volume of a receiver constant, regardless of variations in the signal strength applied to the receiver

average picture level (APL)
The average picture level, with respect to the blanking level, during active picture scanning time expressed as a percentage of difference between the blanking and reference white levels.

back focus
The distance between zoom lens and camera pickup device at which the picture is in focus at the extreme wide-angle zoom position.

back light
illumination from behind the subject and opposite the camera

back porch
that portion of the composite video signal that lies between the trailing edge of the horizontal sync pulse and the trailing edge of the horizontal blanking pulse

balance
a pleasing arrangement of the different parts of the opposing elements. In informal balance these parts or elements are not arranged symmetrically; In formal balance the arrangement is symmetrical

bandwidth
term used to define the frequency occupied by a signal and required for the effective transfer of information to be carried by that signal

bar chart
graphics representation comparing numerical values by means of rectangles of equal width

bar generator
Generator of pulses or repeating waves that are equally separated in time. These pulses are synchronized by the synchronizing pulses of a television system so that they produce a stationary bar pattern on a television screen

baselight
Even, nondirectional (diffused) light necessary for the camera to operate optimally. Normal baselight levels are about 2,000 lux (150 to 200 footcandles)

baud
A variable unit of data transmission speed usually equal to one bit per second

BERNOULLI DISK CARTRIDGE
Removable hard disk storage device that works by using a cushion of air to keep the flexible disk surface from touching the read/write head

binary
a numbering system using only the digits 0 and 1; also called base 2

BIOS
basic input/output ; set of instructions that provide the interface between the operating system and the hardware devices, stored on ROM chip.

bit per second
A measure of transmission speed to how many bits of binary data can be transmitted in one second.

BIT(S)
An element of a byte that can represent one of two values, on or off. There are 8 bits in a byte.

blanking
The process of making a channel or device noneffective for the desired interval. A pulse that cuts off the receiver picture tube during return traces.

blending
A method of drawing or painting in which one color or tone merges into another. Also, the process of mixing or incorporating one color or tone with another one.

block diagram
A circuit diagram showing the general configuration of a piece of electronic equipment without showing the individual components. Lines or arrows may indicate the path of the signal or energy.

blocking
Carefully worked out movements and actions by the talent and of all mobile television equipment.

breezeway
The portion of the back porch between the trailing edge of the sync pulse and the start of the color burst.

BUFFERS
Areas of memory used to store data that has been read or is waiting to be sent to an output device.

burn-in
A streak or recognizable image retained by the camera pickup tube. The burn-in is caused by the camera focusing for to long on an extremely bright or high contrast object (studio light), and it renders the tube worthless.

BUS NETWORK
A communications network that has all devices connected to and sharing a single data path.

B-Y
A color difference signal obtained by subtracting the luminance signal from the blue camera signal.

byte
A unit of measure equal to 8 bits of digital information (2). The standard unit of measure of file size. See also megabyte and gigabyte.

cache
A portion of RAM or disk space used to keep often-used data for quicker access.

CACHING
Process of storing a copy of each web paper accessed in local storage by a proxy server.

calligraphy
The art of elegant writing or penmanship.

camera control unit (CCU)
Equipment, separate from the camera head, that contains various video controls, including registration, color balance, contrast, and brightness. With the CCU the video operator can adjust the camera picture during a show.

capacitance
The ability of an object to store an electric charge. Capacitance is represented by the capital letter C in equations and is measured in units called farads.

capacitor (C)
An electronic component capable of storing electrical energy when charged. A capacitor blocks the flow of direct current.

caption
In general, any heading or title; more precisely, a descriptive title for an illustration or table.

caricature
Representation of a person or thing that shows a deliberate exaggeration and distortion of features or mannerisms. Caricatures may be good-humored or bitterly satirical.

cathode
The electron-emitting electrode in a vacuum tube.   In an electron tube, the electrode through which a primary source of electrons enter the interelectrode space. When a semiconductor diode is biased in the forward direction, the terminal of the diode that is negative with respect to the other terminal.

cathode-ray tube (CRT)
Component for obtaining a graphic display of an electronic function such as a waveform or spectral display.

CD-ROM DRIVE
Storage device that uses a low powered laser light to read data from removable CD-ROMs.

central processing unit (CPU)
The CPU is the main part of a computer control system. Where arithmetic and logical operations are performed. It also contains the main memory and instructions to carry out system control functions.

character
Any letter, number, punctuation mark, or space in printing matter. The average number of characters that can be set in 1 pica (approximately 6 picas to 1 inch) is known as "characters per pica."

charge-coupled device (CCD)
Also called chip, a small, solid state imaging device used in cameras instead of a camera pickup tube. Within the device, image sensing elements translate the optical image into a video signal.

chroma keying
The process of overlying one video signal over another, the overlay being defined by a specific range of color, or chrominance, on one of the signals.

chrominance
That property of light that produces a sensation of color in the human eye apart from any variation in luminance that may be present.

Client-server
In information resource sharing on a network process of the server completing some of the processing first, and then transmitting data to the requesting computer.

Clip art
Previously created illustrations and pictures that are sold in collections, and inserted as graphics into work processing documents.

Clipboard
Temporary storage location for text during cut and copy operations.

Cluster
Two to eight track sectors on a floppy disk; the smallest unit of floppy disk space used to store data.

CMYK
cyan, magenta, yellow and black

Coaxial cable
A high-quality communications line consisting of a copper wire conductor surrounded by a non-conducting insulator that is in turn surrounded by a woven metal outer conductor, and finally a plastic outer coating.

collage
The art of arranging and pasting pieces of cloth, newspaper, or other materials on a surface so that they form a composition. Also, work made in this manner.

color bars
A test signal, typically containing eight basic colors: white, yellow, cyan, green, magenta, red, blue, and black, which is used to check chrominance functions of color television systems.

color burst
The portion of the composite signal comprising a few cycles, a sine wave of the chrominance subcarrier frequency that is used to establish a reference for demodulating the chrominance signal.

color dimensions
Hue, value, and intensity are the three ways of measuring any given color. (See Munsell color system.)

color harmony
A unified or aesthetically pleasing effect produced by a combination of colors that are similar in one or more aspects.

color interval
The degree of visual difference between two colors, measured in steps of hue, value, and intensity.

color scale
A series of colors that exhibits a regular change or gradation in hue, value, or intensity.

color scheme
The particular group of colors that dominates a picture or creates a color unity within it.

color separation
Division of colors of a continuous-tone multicolored original or of line copy into basic portions, each of which is to be reproduced by a separate printing plate carrying a color.

color symbolism
The use of color to signify or suggest an emotion, idea, or characteristic.

color wheel
A circular color diagram.

Combined doctrine
Fundamental principles that guide the employment of forces of two or more nations in coordinated action toward a common objective. It is ratified by participating nations.

common task
A critical task for which all soldiers at a given skill level are accountable, regardless of their MOS.

Communications software
Programs that perform data communications tasks such as dialing, file transfer, terminal emulation, and Internet access, allowing data to be transmitted from one computer to another.

Computer drawing programs
Graphics programs that allow an artistic user to create works of art.

Connectivity
The capability to connect a computer to other computers.

Connectors
Couplers contained in ports, used to attach cables to peripheral devices.

Cross Training
The opportunity for an individual to train to additional jobs within his or her MOS.

Cue
A word, situation, or other signal for action. An initiating cue is a signal to begin performing a task or task performance step. An internal cue is a signal to go from one element of a task to another. A terminating cue indicates task completion.

data
The general term used to describe numbers, facts, letters, symbols, names, etc., that can be processed by a computer.

Database server
Network server that provides selected information from files stored on the server, but does not run the application software; contrast with application server.

Data compression
Method of storing data on a disk that reduces storage requirements by substituting codes for repeating patterns of data.

database
A collection of files, or group of files, containing related data arranged for easy and speedy retrieval, by a computer.

Day parting
programming a TV schedule to be compatible with what people do during the day

Digital audio tape (DAT)
Method of storing large amounts of data on tape using helical scan technology to write data at high densities across the tape at an angle.

Digital cameras
Cameras that record photographs in the form of digital data that can be stored on a computer.

Digital computers
Computers that process data including text, sound, graphics, or video, into a digital (numeric) value; describes most computers.

Digital signal
A type of signal for computer processing in which individual electrical pulses that represent bits are grouped together in bytes.

Digital Signal Processor (DSP)
In voice input systems, a board that is added to the computer to convert the voice into digital form.

Digitizer
Converts points, lines, and curves from a sketch, drawing, or photograph to digital impulses and transmits them to a computer.

Dot pitch
The distance between each pixel on the computer screen.

dots per inch (dpi)
A measure of the resolution of printers, image setters and other output devices.

Downlink
A teletraining site that only receives training. The student can see the instructor, but the instructor cannot see the students. The teletraining network is capable of only one-way video over satellite. See "Uplink".

dub
Reproduce a video program.

Dye Diffusion
Process used by a special type of thermal printer; chemically treated paper is used to obtain color print quality equal to glossy magazines.

Electronic mail
e-mail; electronic exchange of messages to and from other computer users.

Embedded object
Changes can be made to the embedded data in the destination document using tools from the application that originally created the data; only the destination document is changed, while the source document is not affected.

Embedded processors
Computers that are built into equipment such as radios, cellular telephones, microwave ovens, copiers, automatic teller machines, and automobiles. These computers play a supporting role in the overall function of the device of which they are a part.

ESP-Code
Emergency and Special Program Code - an alpha-numeric budget code the Air Force uses to reimburse units for exercise participation. This is not a guarantee the unit will be reimbursed.

EXPLAN
Exercise Plan - description of what will occur in the exercise and the force that will participate.

facsimile (FAX)
A process of scanning fixed graphic material and converting that information into signals.

Fiber-optic cable
High-speed transmission media for communications channel that uses smooth, hair-thin strands of glass or plastic to transmit data as pulses of light.

file
Generally, file is a collection of information stored as records. Files are stored on peripheral memory devices, such as a disk memory or a tape memory.

File conversion
Utility program that covers file from one format to another so the file can be used by another application.

File transfer
Communications software that allows the user to move one or more files from one computer system to another. The software generally has to be loaded on both the sending and receiving computers.

File-server
In information resource s haring on a network, method that uses a server to send an entire file at one time to a requesting computer, and then the requesting computer performs the processing.

Fixed disk
Hard disks on monicomputers and mainframes; also called direct-access storage devices.

Flatbed plotter
Plotter that uses software to instruct the pens to move to the down position so the pens contact the flat surface of the paper.

Floppy disk
Type of small, removable magnetic disk storage consisting of a circular piece of thin mylar plastic, which is coated with an oxide material that is recorded on, storing data as magnetic areas. The plastic disk is enclosed in a rigid plastic shell for protection from debris; most widely used portable storage medium.

Floptical
Floppy disk that combines optical and magnetic technologies to achieve high storage rates (currently up to 120 megabytes) on a disk similar to a 3 1/2 inch magnetic floppy disk.

footcandles (fc)
Unit of illuminance.

Forces
Operating forces color codes, red/blue/green/orange. White is neutral.

FWD
forward

gigabyte
A unit of measure equal to 1,024 megabytes of data, or 1,048,576 bytes.

Gopher
Menu-driven program that assists users in locating and retrieving files on the Internet.

graphics
All two-dimensional visuals prepared for the television screen, such as title cards, charts, and graphs. (See camera graphics and generated graphics.) The use of written symbols and visual displays to obtain information. Often the displays are on CRT's, a television-like display.

Graphics Tablet
Converts points, lines, and curves from a sketch, drawing, or photograph to digital impulse and transmit them to a computer; also contains unique characters and commands.

grayscale
The range of gray tones between black and white. A grayscale monitor is able to display distinct gray pixels as well as black and white ones, but not color pixels.

harmony
A pleasing arrangement of picture elements, due to similarity of one or more of their qualities, such as shape or size. Also, see color harmony.

Helical Scan Technology
Used by digital audiotape to record data at high densities across the tape at an angle.

hertz (Hz)
Standard unit of frequency.

High-Definition Television (HDTV)
Television sets designed for digital signals; may eventually replace computer screens.

High-Density Floppy Disk
Floppy disk that can store 1.44 megabytes on a 3 1/2 inch floppy disk.

hue
(1) One of the three basic color attributes, hue is the color itself-red, green, blue, yellow, and so on. (2) The attribute of color perception that determines whether the color is red, green, blue, and so forth.

Hyperlinks
In web documents, built-in links to other related documents, allowing user to move quickly from one document to another.

Icons
In a graphical user interface, on screen pictures that represent an application software program where data is stored.

Image Processing Systems
In source data automation, systems that use scanners to capture and electronically file exact copies of documents.

Image scanner
An input device that electronically captures an entire page of text or images such as photographs or art work, converting the information on the original document into digital data that can be stored on a disk and processed by the computer; also called page scanner.

Individual training
Training which the officer, NCO, or soldier receives in the training base, units, on the job, or by self-study. This training prepares the individual to perform specified duties or tasks related to the assigned or next higher specialty code of MOS skill level and duty position.

Individual Training Evaluation Program (ITEP)
a program which requires commanders to routinely evaluate soldier ability to perform non-specific tasks critical to the unit mission

Informal balance
Elements are not arranged symmetrically.

Information System
Elements required for information processing, including software, hardware, data, users, procedures, and information systems personnel; provides supports for the organization.

Ink-Jet Printer
Non-impact printer that forms characters by using a nozzle that shoots droplets of ink into the page, producing high-quality print and graphics.

Input Devices
Hardware used to enter data into a computer, such as a keyboard and a mouse.

integrated circuit
A chip of silicon etched with electrical paths and components that permits the circuit to perform some complex function.

Integrated software
Software that combined applications such as word processing, spreadsheet, database, and communications into a single, easy-to-use package.

Internal modem
A circuit board containing a modem that is installed inside the computer or inserted into an expansion slot.

JAVA
Object-oriented scripting language used to develop multimedia on the web.

JPEG (Joint Photographers Experts Group)
A set of standards developed by this group for compressing and decompressing digitized images with computers.

juxtaposition
The placement of colors or forms side by side or close together to accentuate each other.

k (kilobyte)
Used to denote size of memory and can be expressed in bytes or words. Example: 2K = 2048 bytes.

Laser printer
Nonimpact page printer that converts data from the computer into a laser beam aimed at a positively charged revolving drum. Each position on the drum touched by the beam becomes negatively charged and attracts doner, which is transferred and fused to paper by heat and pressure to create the text or image.

layout
Arrangement of a book, magazine, or other publication so that text and illustrations follow a desired format. Layout includes directions for margin data, pagination, margin allowances, center headings and sideheads, placement and size of display and body type, and placement of illustration.

LCD
liquid crystal diode; Type of flat panel display screen that has liquid crystal deposited between two sheets of polarizing material. When an electrical current passes between crossing wires, the liquid crystals are aligned so light cannot shine through, producing an image on the screen.

LCD projector
Self-contained data projection devices that have their own light source, and do not require a separate overhead projector.

Light pen
Pen used as an input device by touching it on the display screen to create or modify graphic.

light ratio
The relative intensities of key, back, and fill. A 1:1 ratio between key and backlights means that both light sources burn with equal intensities. A 1:1/2 ratio between key and fill lights means that the fill light burns with the half intensity of the key light. Because light ratios depend on many production variables, they cannot be fixed. A key: back: fill ratio of 1:1:1/2 is used for normal triangle lighting.

Linked object
With a linked object, a user can make changes to linked data using the source application. When the object is selected in the destination application, the source application is opened and changes are reflected in both the source document and destination document.

LPI
lines per inch

lux
Standard unit for measuring light intensity. One lux is the amount of 1 lumen (one candle power of light) that falls on a surface of a 1 square meter that is located I meter away from the light source: 10.75 lux = 1 footcandle. Most lighting people figure roughly 10 lux = 1 ft-c.

Macro
A sequence of commands and keystrokes that are recorded and saved, to be performed when the macro is run.

Magnetic disk
A round piece of plastic or metal, the surface of which is covered with a magnetic material; data is written to (recorded on) or read from the magnetic surface. The most widely used storage medium for all types of computers, offering high storage capacity, reliability, and fast access to data, included floppy disks, hard disks, and removable disk cartridges.

megabyte (Mb)
A unit of information equal to 1,048,576 bytes (usually rounded to 1,000,000 bytes).

megahertz (MHz)
A unit of frequency equal to 1 million hertz.

Merger Training
training that prepares an NCO to supervise one or more different MOS at lower skill levels when the soldier advances in skill level in his career management field

Microwaves
Radio waves that can be used to provide high-speed transmission of both voice communications and digital signals.

Midi
Musical Instrument Digital Interface - serial port interface designed to connect to a musical device such as an electronic music keyboard.

Mission Training Plan (MTP)
A MTP provides comprehensive training and evaluation outlines, and exercise concepts and related training management aids to assist field commanders in the planning and execution of effective unit training. It provides units a clear description of "what" and "how" to train to achieve wartime mission proficiency.

MOS training plan (MTP)
The MTP is a guide for the conduct of individual training in units. An MTP is developed for each MOS and addresses all skill levels of an MOS and all duty positions. The MTP lists all MOS-specific and shared critical tasks for which the MOS is responsible. It will not include common tasks.

MPC
Mid Planning Conference - conference used to solidify and verify all requirements for an exercise before it has been assigned and acted upon.

Multimedia
More than one presentation medium. In training the use of more than one medium to convey the content of instruction. Media available for use may include, but need not be limited to, text, programmed instruction, audiotapes, videotapes, slides, films, television, and computers. Multimedia is also an industry term used to define both presentation and training that is delivered via a multimedia workstation/personal computer. It uses text, graphics, digital audio, animation, and up to full motion digital video. Multimedia is delivered via hard disk, floppy disk, or CD-ROM.

Multimedia Presentation
An interactive computer presentation created using multimedia authoring software, in which the user can choose what amount of material to cover and in what sequence it will be reviewed.

Nonimpact Printing
Printing that occurs without having a mechanism strike against a sheet of paper.

Noninterlaced monitors
Monitors that illuminate each line on screen sequentially so the entire screen is lighted in a single pass.

Nonvolatile
Type of memory (ROM) that retains its contents even when the computer is turned off.

Object linking and embedding
Describes ways to transfer and share information among software applications, by placing objects created in one application into another application.

Operating Environment
A graphical user interface between the user and the operating system.

optical center
Point slightly above the geometric center of a regular plane. Objects placed at the optical center appear to be at the geometric center.

optical spacing
Arrangement of spacing between letters for legibility and appearance, as opposed to mechanical spacing, in which the same space is used between all characters. The spacing varies with the shape of the letters to achieve optical equalization.

organization chart
Block chart or diagram showing the names, titles, departments, and responsibilities of personnel in an organization.

Output device
Devices that convert the results of processing into a form that can be understood by users; most common devices are printers, monitors, and speakers.

parallel port
An input-output port that sends and receives information in (8-bit) groups. All of the group goes and comes at once.

PC Cards
Small, credit card sized device that fits into PCMIA expansions slots; often used with portable computers for storage, communications, and additional memory.

Pen Plotter
Plotter used to create images on a sheet of paper by moving one or more pens over the surface, or by moving the paper under the top of the pens.

performance measures (PM)
Those behavior or product characteristics which the trainer observes/checks to determine if the soldier has performed the task correctly.

Photolithography
Process in chip manufacturing, where an image of the chip design, called a mask, is used as a negative. The photo resist is exposed to the mask using ultraviolet light.

Pie Chart
A graphic representation of proportions used for showing the relationship of parts to a whole, depicted as slices of a pie.

pixel
1. Smallest single picture element with which an image is constructed. 2. The light sensitive elements on a CCD that contain a charge.

Plotter
Output device used to produce high-quality line drawings and diagrams.

Port
A socket used to connect the system unit to a peripheral device such as a printer or a modem.

PPI (pixels per inch)
A measure of the density of scanned information in an image. The finer the optics of the scanner, the higher the scan resolution.

Presentation graphics
Software that allows the user to create documents called slides that are used in making presentations before a group.

Print spool
The reports stored on disk that is waiting to be printed.

Proxy server
A computer that is placed between two separate networks; used to implement a firewall that restricts access to data.

Query
The capability to retrieve database information in a report, based on criteria specified by the user.

SCMOV
Tasking coordinator for Air Force Combat Camera located at HQ Air Mobility Command.

SCMV
Functional manager for Air Force Combat Camera located at HQ Air Mobility Command, Scott AFB.

serial port
A connection on the computer that can send and receive information bit-by-bit. Slow but steady and simple interface.

SIMM's
Single in-line memory module

SIPRNET
Secure Internet Protocol Roster Network - secure communication lines for transmitting classified data.

skill level (SL)
A number that denotes the level of qualification within the total MOS. Levels of qualification are identified by characters 0 through 5 in the position of the MOS code.

Soldier Manual of Common Tasks (SMCT)
A document that contains the critical tasks which every soldier must be able to perform in order to fight and win on the battlefield. It provides the conditions, standards, and performance measures for each common soldier critical task.

Soldier training publication (STP)
Publications that contain critical tasks and other training information used to train soldiers and serve to standardize individual training for the whole Army; provide information and guidance in conducting individual training in the unit; and aid the soldier, officer, noncommissioned officer (NCO), and commander in training critical tasks.   They consist of Soldier's Manuals, Trainer's Guides, Military Qualification Standards Manuals, and Officer Foundations Standards System manuals.

Sound board
Expansion board that enhances the sound-generating capacity of computer.

Sound card
Multimedia device containing electronics that captures sound data input and processes sound output; installed in the computer.

STON
short tons

subtractive color process
A process of forming colors by mixing pigments which absorb certain colors and reflect others. See additive process.

Super Video Graphics Array
Standard for monitors and video adapter cards that display high resolutions. Typically 800 x 600 or 1,024 x 768 pixels, producing images that are almost equivalent to the quality of a photograph.

TAG(S)
Set of special instructions in HTML that specify links to other documents and how the web page is displayed; also called markups.

Technical manual (TM)
A publication that describes equipment, weapons, or weapons systems with instructions for effective use. It may include sections for instructions covering initial preparation for use and operational maintenance and overhaul.

Thermal printer
Printer that uses heat to transfer colored inks from ink sheets onto the printing surface; also called thermal transfer printer.

TIFF (tagged image file format)
A file format used to represent black-and-white, gray-scale, color bit mapped images, particularly those produced by scanners.

Training Circular (TC)
TCs are publications (paper or computer-based) that provide a means to distribute unit or individual soldier training information that does not fit standard requirements for other established types of training publications. TCs are part of the Armywide Doctrinal and Training Literature Program (ADTLP).

Train-Up
The process of increasing the skills and knowledge of an individual to a higher skill level in the appropriate MOS. (It may involve certification.)

Typeface
A specific set of characters that are designed the same, such as Helvetica or Times New Roman.

User interface
Combination of hardware and software that allows user to communicate with a computer system.

value
The lightness and darkness of a color. Also, relative lightness and darkness of a picture as represented in tones, shading, line, balance, layout, and so forth.

vertical blocking
arranging the TV programming for a one-day period, such as a three-hour football game from 7 to 10 p.m. on a Monday night

Video capture
Video input into the computer involving converting analog video signal into a digital format and then compressing and storing the digital video.

Video output
Output consisting of visual images with a video input device, such as a VCR or camera, digitized, and directed to an output device, such as a computer monitor.

Video conferencing
The use of computers, televisions cameras, and communications software and equipment to conduct electronic meetings with participants at different locations.

Virtual reality (VR)
Creation of an artificial environment experienced by the user as 3-D images that can be explored and manipulated interactively, using a pointing device.

Web Page
Hypertext or hypermedia document residing on an Internet computer that contains text, graphics, video, or sound.

Welcome Page
The first page at a Web site; often serves as a table of contents for the other pages at the Web site.

Wireless Transmission
In communications systems, used to connect devices in the same general area such as an office or business park, using one of three transmission techniques: infrared light beams, radio waves, or carrier-connect radio.

REFERENCES

Section I
Required Publications

Required publications are sources that users must read in order to understand or to comply with this publication.

Army Regulations

AR 190-16	Physical Security. 1 May 1991
AR 25-1	Army Information Management. 15 January 2000
AR 25-400-2	The Modern Army Recordkeeping System (MARKS). 26 February 1993
AR 25-50	Preparing and Managing Correspondence 21 November 1988
AR 25-55	The Department of the Army Freedom of Information Act Program. 1 April 1997
AR 360-5	Army Public Affairs, Public Information. 1 October 1989
AR 360-81	Command Information Program. 1 October 1989
AR 380-13	Acquisition and Storage of Information Concerning Nonaffiliated Persons and Organizations. 30 September 1974
AR 380-5	Department of the Army Information Security Program. 25 February 1988
AR 385-10	The Army Safety Program. 23 May 1988
AR 750-1	Army Materiel Maintenance Policy And Retail Maintenance Operations. 1 August 1994

Department of Army Forms

DA FORM 2028	Recommended Changes to Publications and Blank Forms. 1 February 1974
DA FORM 2062	Hand Receipt/Annex Number. 1 January 1982
DA FORM 2064	Document Register for Supply Actions. 1 January 1982
DA FORM 2404	Equipment Inspection and Maintenance Worksheet. 1 April 1979
DA FORM 2405	Maintenance Request Register. 1 April 1962
DA FORM 2407	Maintenance Request. 7 July 1994
DA FORM 2407-1	Maintenance Request - Continuation Sheet. 1 July 1994
DA FORM 3161	Request for Issue or Turn-In. 1 May 1983
DA FORM 3903	Visual Information Work Order (LRA). 1 June 1999
DA FORM 3964	Classified Document Accountability Record. 1 July 1979
DA FORM 455	Mail and Document Register. 1 July 1962
DA FORM 5164-R	Hands-On Evaluation. 1 September 1985

Department of Army Pamphlets

DA PAM 25-1-1	Installation Information Services. 27 August 1991
DA PAM 25-30	Consolidated Index of Army Publications and Blank Forms. 1 July 2000
DA PAM 25-33	User's Guide for Army Publications and Forms. 15 September 1996
DA PAM 25-40	Administrative Publications: Action Officers Guide. 1 October 1997

DA PAM 25-91	Visual Information Procedures. 30 September 1991
DA PAM 351-20	Army Correspondence Course Program Catalog. 1 October 1999
DA PAM 600-8	Management and Administrative Procedures. 1 February 1986
DA PAM 738-750	Functional Users Manual for the Army Maintenance Management System (TAMMS). 1 August 1994

Department of Defense Publications

DD FORM 1149	Requisition and Invoice/Shipping Document. 1 January 1997
DD FORM 1610	Request and Authorization for TDY Travel of DOD Personnel. 1 June 1967
DD FORM 2537	Visual Information Caption Sheet. 1 February 1994
DOD DIR 4160.21-M	Defense Materiel Disposition Manual. 1 August 1997
DOD DIR 4500.9-R PT2	Department Transportation Regulation, Part 2, Cargo Movement. 1 April 1996
DOD DIR 5040.2	Visual Information (Change 2). 10 May 1999
DOD DIR 5040.4	Joint Combat Camera (COMCAM) Program. 1 September 1996
DOD DIR 5040.5	Alteration of Official DOD Imagery. 1 August 1995
DOD DIR 5120.20	Armed Forces Radio and Television Service (AFRTS). 1 December 1991
DOD DIR 5122.10	Armed Forces Information Service (AFIS). 1 February 1995

Field Manuals

FM 100-20	Military Operations in Low Intensity Conflict. 5 December 1990
FM 100-5	Operations. 14 June 1993
FM 101-5	Staff Organization and Operations. 31 May 1997
FM 24-40	Tactical Visual Information Doctrine. 12 December 1991
FM 25-100	Training The Force. 15 November 1988
FM 25-101	Battle Focused Training. 30 September 1990
FM 25-5	Training for Mobilization and War. 25 January 1985
FM 55-65	Strategic Deployment. 3 October 1995

Other Product Types

APPENDIX E (25Z)	Elements of a Multimedia Project.
NAB EH	NAB Engineering Handbook.
NEC	The National Electric Code (NEC).
NTSC STUDIO TIMING (GVG)	National Television Standards Committee (NTSC) Studio Timing (Grass Valley Group (GVG)).
OMB CIRCULAR A-130	Management of Federal Information Resource. 1 February 1996
SF 700	Security Container Information. 1 August 1985
SF 702	Security Container Check Sheet.

Soldier Training Publications

| STP 21-1-SMCT | Soldier's Manual of Common Tasks Skill Level 1. 1 October 1994 |
| STP 21-24-SMCT | Soldier's Manual of Common Tasks (SMCT) Skill Level 2-4. 1 October 1992 |

Special Texts

ST5000   Supervisor Development Course. 1 August 1994
ST6000   Manager Development. 1 March 1999

Training Aids

DD FORM 314   Preventive Maintenance Schedule & Record. 1 December 1953

Section II
Related Publications

Related publications are sources of additional information. They are not required in order to understand this publication.

Army Regulations

AR 25-30   The Army Publishing and Printing Program. 21 June 1999
AR 25-55   The Department of the Army Freedom of Information Act Program. 1 April 1997
AR 340-21   The Army Privacy Program. 12 July 1985
AR 350-1   Army Training. 1 August 1981
AR 350-41   Training in Units. 19 March 1993
AR 360-5   Army Public Affairs, Public Information. 1 October 1989
AR 360-81   Command Information Program. 1 October 1989
AR 380-19   Information Systems Security. 27 February 1998
AR 385-10   The Army Safety Program. 23 May 1988
AR 5-1   Army Management Philosophy. 1 June 1992

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DA PAM 350-100   Extension Training Materials Consolidated MDS Catalog. 19 March 1990
DA PAM 600-8   Management and Administrative Procedures. 1 February 1986
DA PAM 611-21   Military Occupational Classification and Structure. 1 March 1999
DA PAM 750-35   Guide for Motor Pool Operations. 1 August 1994

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DOD DIR 5122.10   Armed Forces Information Service (AFIS). 1 February 1995

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FM 101-5   Staff Organization and Operations. 31 May 1997
FM 24-40   Tactical Visual Information Doctrine. 12 December 1991
FM 25-101   Battle Focused Training. 30 September 1990
FM 25-4   How to Conduct Training Exercises. 10 September 1984

FM 9-43-1	Maintenance Operations and Procedures. 21 February 1997

Joint Publications

JP 4-01	Joint Doctrine for the Defense Transportation System 17. June 1997
JP 4-01.3	Joint Tactics, Techniques, and Procedures for Movement Control. 21 June 1996
JP 5-00.2	Joint Task Force (JTF) Planning Guidance and Procedures. 13 January 1999
JP 5-03.1	Joint Operation Planning and Execution System, VOL I. 4 August 1993

Other Product Types

APPENDIX D (25Z)	Standing Operating Procedures

Technical Bulletins

TB 385-10	Safety Manual for Operating and Maintenance Personnel. 20 December 1973
TB 385-4	Safety Requirements for Maintenance of Electrical and Electronic Equipment. 1 August 1992

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