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BEHAVIORAL OBJECTIVES
FOR
AIR INTERCEPT CONTROLLER
PROTOTYPE TRAINING SYSTEM

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This report presents an in-depth Job Task Analysis of the Air Intercept Controller with a graphic representation of the AIC's tasks in a Task Flow Diagram. From the analysis, Behavioral Objectives are developed to mission, terminal and enabling levels.

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FOREWORD

This is the first in a series of reports describing the design, implementation, and tests of the use of computer speech recognition technology in the tactical training area. The technical issues in psychology, training, and speech recognition will require a highly complex integration effort in order to be successful. This report will provide the framework around which an automated, adaptive, stand alone Air Intercept Controller Experimental Prototype Training System will be produced. The system will provide a research tool whereby fleet personnel may evaluate and select advanced technologies for incorporation into the specification of follow-on operational trainers.

Thanks are extended to the command and staff of the Fleet Combat Training Center, Pacific. The continuing efforts of LCDR Robert Cleveland, OSCS Jerry Billups, OSC John Lindsay, all of Code 31, and Mr. Charlie Spencer of Code 9A have been invaluable.

R. BREAUX, Ph.D.
Scientific Officer

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SECTION I

OVERVIEW

INTRODUCTION

The Behavioral Objectives Report has multiple functions and purposes, both to the contractor and to the Government. For the contractor, this report provides the impetus to perform an extremely close review of the Air Intercept Controller (AIC) Job Task Analysis previously performed by Logicon. From this careful survey came the behavioral objectives which make up the core of this report. Often, as in this case, the step-by-step review of the job also (1) helps to define areas of the job previously undefined or loosely defined and (2) helps to uncover job tasks previously unaddressed.

For the Government, the report serves at least two functions. First, the report allows the contracting agency a means for detecting the direction and scope of the work being done by the contractor. In this way, any existing misunderstandings can be cleared up at an early date. Second, the report serves as a baseline document for establishing mutually defined concepts of the training development task ahead.

LOGICON APPROACH

Working with information provided by U.S. Navy documents, information provided by AIC school instructors, a former Master Chief Operations Specialist's (OSCM) 20 years of in-depth experience, and the *AIC Job Task Inventory* (included as Appendix A), Logicon has developed a model of the AIC's job which presents discrete tasks of the job and shows the relationship between those tasks. A graphic display of that model is included as the task flow diagram in Section II. The process of developing this task flow diagram revealed some important aspects of the AIC's job heretofore unaddressed in task listing or course development. These AIC job aspects will be addressed in Section II of this report where "The AIC's Job in Detail" is discussed.

From the task flow diagram was developed a training oriented set of behavioral objectives. The behaviors stated for the objectives differ from the stated task behaviors in that the behavioral objectives often contain action verbs which are artificial representations of the real task. This artificiality must often be introduced into training objectives to make the monitored behavior observable and measurable.

REPORT ORGANIZATION

This report will be presented in three additional sections. Section II of this report will present details of the job task analysis. First, a general discussion of the context of the AIC's job will be presented. That will be followed by an in-depth review of the AIC job: the tasks and the sequence of their accomplishment.

Section III of this report presents the behavioral objectives. This section starts with a brief introduction to the objectives. The introduction is followed by a description of the course mission objective. The objectives listing, presenting conditions, behaviors, and standards is contained in Appendix B.

The final section of this report is a discussion of the methods/means utilized by the Air Intercept Controller Prototype Training System, otherwise known as ACE, for diagnosis and remediation within the context of the present program.

SECTION II

JOB TASK ANALYSIS

INTRODUCTION

The job of the AIC is a complicated and complex one. The AIC must deal with numerous inputs and outputs of data in his attempt to project a dynamic picture of the tactical environment which is current and accurate. This section will provide the results of Logicon's intense survey of the AIC's job at two levels of detail. The first level of detail will provide a discussion of the general tasks and context of the AIC's job. That part of this section is titled "The AIC's Job in General." The second level of detail provides a task-by-task sequence analysis of the AIC's job. This discussion will be centered around a task flow diagram which graphically depicts the task sequence. That part of this section is titled "The AIC's Job in Detail."

THE AIC's JOB IN GENERAL

The relationships of the AIC within the air defense organization are depicted in Figure 1 which shows communication links.

The Officer in Tactical Command (OTC) (1) with a deployment of ships will usually designate someone to be (2) the Antiair Warfare Coordinator (AAWC). The OTC has the ultimate responsibility for all elements of the tactical situation (air, surface, and subsurface) for that group of ships. The AAWC assumes responsibility for just the antiair warfare (AAW) or air defense portion of the tactical situation. The AAWC adopts the voice radio call sign "ALPHA WHISKEY", or AW, and will be referred to as AW henceforth in this report.

Working directly for AW can be (3) a Force Weapons Coordinator (FWC). The FWC can assign certain air defense tasks to individual ships and may or may not act as an intermediary between AW and (4) the Tactical Action Officer (TAO).

Each ship has a TAO working in its Combat Information Center (CIC). This officer is responsible for dealing with threats to his ship and for carrying out orders from AW. As with the OTC, the TAO is concerned with all elements of the tactical situation (air, surface, and subsurface) as they impact on his ship's mission and the safety of his ship.

Working directly for the TAO in the CIC is (5) the Ship's Weapons Coordinator (SWC). The SWC's task is to assign specific weapons to carry out the orders issued by AW or to meet the threats identified by the TAO.

Depending on the size of ship, the next link in the chain of air defense is either (8) the Air Intercept Controller (AIC) or (6) the Air Intercept Controller Supervisor (AICS). On larger ships, the AICS supervises each of a number of AICs. The smaller ships may have only one AIC and no need for a supervisor. The AIC is the only person in this organization who communicates directly with (12) the aircrews (A/C).

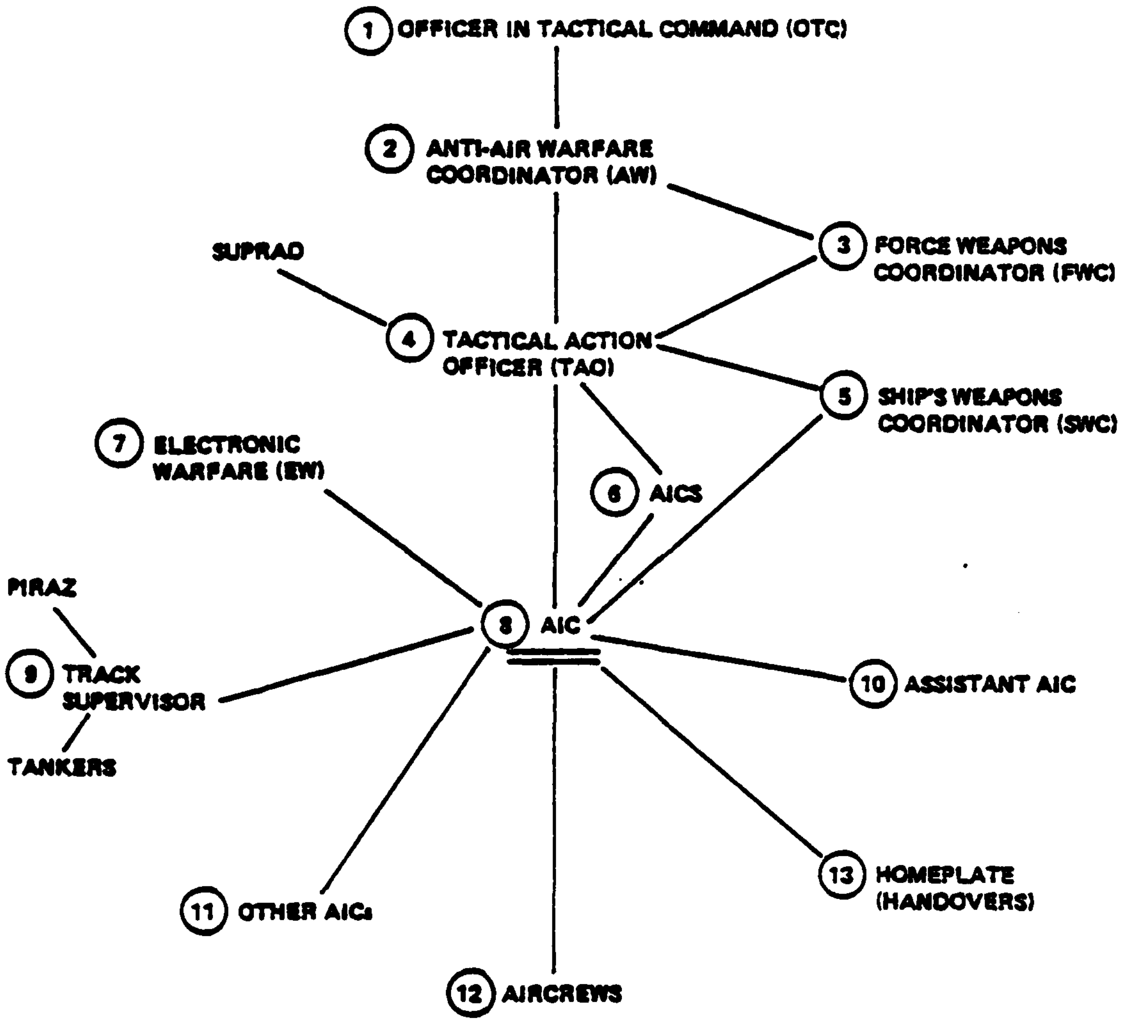

Figure 1. AIC Communication Links in the Air Defense Organization

Other personnel in this network who communicate with the AIC can include (9) the track supervisor, who has radar, communications, and an assortment of special tracker and PIRAZ (Primary Identification Radar Advisory Zone) information available to him; (10) the assistant AIC, who monitors the Anti Air Warfare Coordination (AAWC) net, who relays state and status reports to homeplate via the AAWC talker, who logs important aspects of the tactical situation in the AIC log, and who assists with TAO/SWC liaison; and (7) the Electronic Warfare (EW) personnel, who can provide information about Electronic Counter Measures (ECM). The AIC can also contact (11) other AICs for coordination and (13) the aircraft's parent carrier (homeplate) for handovers.

THE JOB

The main tasks of the AIC are (1) to collect data about the air warfare tactical situation in regard to his assigned aircraft and (2) to transmit that data, as necessary, to the A/C and the SWC. In this way the AIC can project a constantly updated picture of the tactical air warfare arena to the aircrew, who must live in that environment, and to the TAO, SWC, and AW, who must command that environment.

As the AIC comes to his watch station each day, he must be aware of the missions his aircraft will be carrying out, the rules of engagement limiting the situation, the present tactical situation, and the special operation code words applying to the day's activities. To gain this information the AIC consults operation orders, status boards, message boards, charts, rules of engagement, and CIC personnel.

Often the AIC has an assistant AIC and/or trackers assigned to him. Before he starts work, if possible, the AIC should brief these personnel concerning the type of help he wants from them.

Sometimes the AIC will relieve another AIC while a combat air patrol (CAP) is in the air on station or even during a tanking. Most often, however, the AIC will be scheduled onto a console a half hour before flights are scheduled.

Generally, when a new CAP is sent up, the CAP is initially controlled by an Aircraft Controller (AC) on the ship from which the CAP is launched. In order for the AIC to obtain control, the CAP must be handed over, normally using data links. This is a simple process and, upon acceptance of the handover, the AIC becomes the aircrew's communications link.

Now the AIC's job becomes one of maintaining a constant surveillance of the tactical situation in regard to his CAP(s). As the tactical situation changes, the type and amount of information needed by the A/C and the TAO also change. The AIC is responsible for getting and relaying that information in an accurate and timely manner.

It is interesting to note at this point that from one perspective the air intercept controller does not really control anything! The pilot is soley responsible for his aircraft, and the AIC "commands" might be strictly considered "recommendations." In practice, however, the AIC's instructions and advisories have direct impact on the aircraft and tactical situation.

The AIC transmits a picture of the tactical environment and TAO/SWC/AW commands to the A/C and relays state and status data to the TAO/SWC. The AIC also relays the Naval Tactical Data System (NTDS) generated heading for nearest collision intercept or nearest collision intercept conversion (NCI/NCIC) and sends heading advisories for area control, set-ups (for aircrew training), and breakaways; advises the TAO of possibly unrecognized problems; and advises tanker aircraft of rendezvous headings. The AIC usually has no authority to initiate intercepts, to move the aircraft off station, or to command the A/C to adopt a new heading.

Most of the AIC's communication with the A/C should be accomplished using data link, especially when two-way data link is available. There should be a minimum of radio/telephone (R/T) backup. When a CAP is on station, the data link (Link 4A) can supply a continuous stream of heading/radio check to make sure the radio works and to keep the A/C alert. The R/T should generally be used as (1) a backup mode to data link when data link goes down, (2) for contact with aircraft who do not have link 4A capabilities (e.g., tankers), and (3) to update CAP state/status information with aircraft which have only one-way data link.

At the end of a mission the AIC will perform another handover, either to an AC on homeplate or to another AIC. This is accomplished, if possible, using data link (Link 11) only.

THE AIC'S JOB IN DETAIL

In December, 1975, the U.S. Navy issued a "refined and purified AIC Job Task Inventory." This document was the result of a very careful analysis of the AIC's job in the fleet and was carried out by the OSCM in charge of the AIC School in San Diego. That document has been the most complete listing of the task elements of the AIC's job. This listing is particularly strong in the areas of preparation tasks preceding the AIC's going on watch and the data gathering and communications equipment skills while on watch.

The Logicon job task analysis used this document as a starting place for a rigorous review of the AIC's job. The results of that survey are presented, in brief, in the Task Flow Diagram which is included in this report as Figures 2-6. The Logicon job task analysis supported the task listing in many areas, but also identified additional important components of the AIC's job. The most important of these additional components are decision processes involved in adequate performance of the AIC's tasks. The AIC must make several types of ongoing decisions which affect the way he goes about his purpose of supplying support information. These decision steps are discussed in some detail in the following discussion of the task flow diagram.

In the development of an AIC trainer, the importance of identifying the decision steps is that these components can now be overtly trained rather than relying on assimilation of the rules by a trail and error process. It also means, however, that decision algorithms must be determined for use in the training.

TASK FLOW DIAGRAM

The task flow diagram is a graphic representation of the sequence and order in which the AIC's tasks must be undertaken. Figure 2 shows the mission and function analysis levels of the job. The mission purpose of the AIC's job is identified as "provide support information, as required, in the use of aircraft on tactical missions." This statement helps to reiterate the role of the AIC as a supporter, rather than a controller. The overall task is divided into four functions. The first two functions are decision steps in the process. The last two functions are more skill oriented activities. Each of the functions is represented in detail in the task flow diagram.

Figure 3 discusses the first task of the AIC, a classification or categorization behavior. As shown, the AIC must first develop a mental picture of the anticipated tactical environment before going on watch. He does this by consulting various documents and other sources of information. Once the AIC has developed a concept of the day's missions, especially in relation to his CAP(s), he must go to his data gathering sources to update the anticipated tactical picture to the actual current occurrences. With the current information about the situation and knowledge of what is anticipated, the AIC can compare the data he has gathered to categories of general aircraft mission phases in order to classify the present situation. The AIC can also determine the specific elements within the situation that act as modifying elements.

The next step in the process is shown in Figure 4. After the AIC has classified the situation, he can apply existing rules to determine (1) what information is required to update the tactical picture of the A/C or the TAO/SWC and (2) which type of information is most important and must be updated first. The AIC can also use these rules to determine what data he must monitor to update his own picture of the situation for a continuing reclassification procedure.

Now that the decisions have been made concerning what type of information is needed by whom and when it is needed, the AIC can utilize his equipment and communications skill behaviors to get that information and transform it into a usable form. This process is displayed in Figure 4. First the AIC obtains raw data through use of the display equipment. Much of this raw data is usable in its initial form. Some of it must be subjected to further manipulations. Before the AIC can do these manipulations, he must ensure that the data is complete and correct. Once that is done, the AIC must transform the unusable raw data through interpretation of displays and data read outs (DROs), through obtaining responses from other CIC personnel, and through calculations (headings, geometry, etc.) when required by the equipment capabilities or the tactical situation.

Figure 5 shows the final step in this process. Here the AIC has obtained the data he needs and knows to whom it must be relayed and when. With the tactical situation and the message destination in mind, the AIC chooses the most appropriate transmission medium. Then, after carefully choosing the word and code vocabulary of the message and deciding upon the appropriate transmission procedures, the AIC uses his transmission equipment to send the all important data (Figure 6).

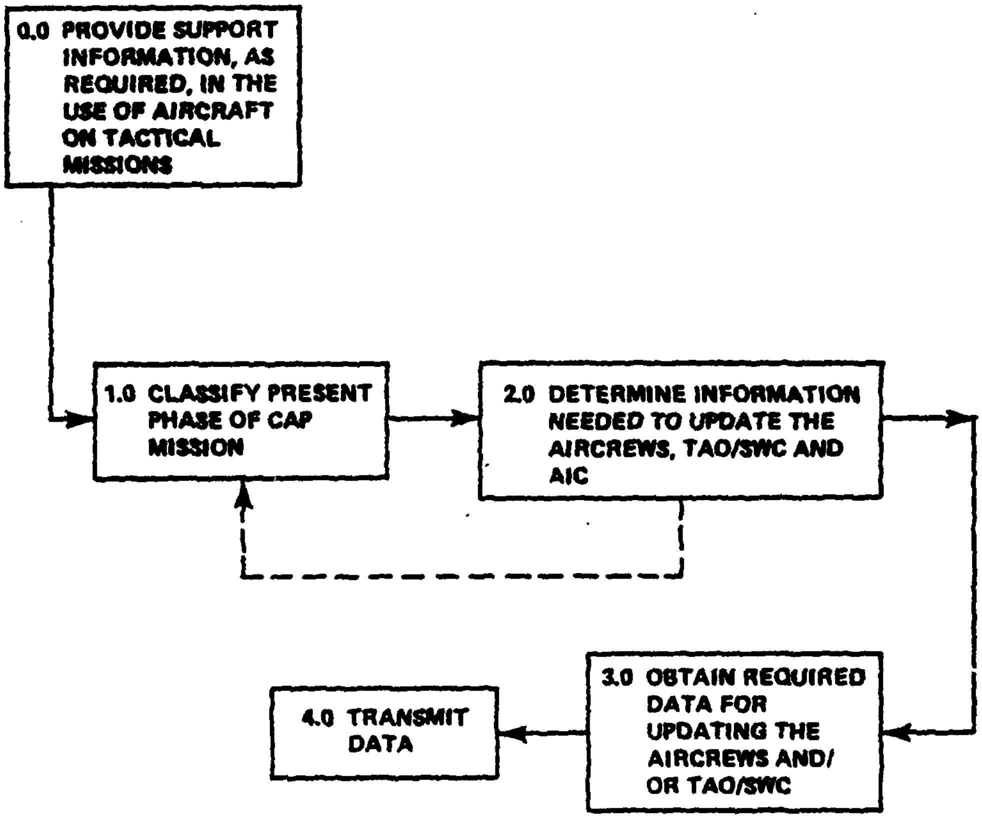

Figure 2. The AIC Job — Mission and Function Analysis Levels

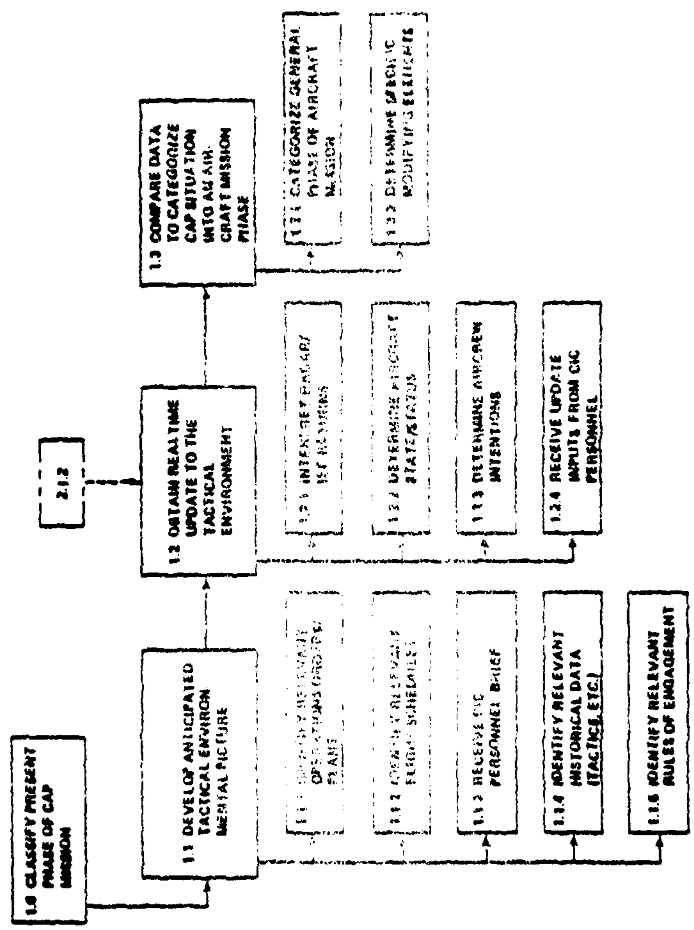

Figure 3. Classify the Present Phase of the CAP Mission

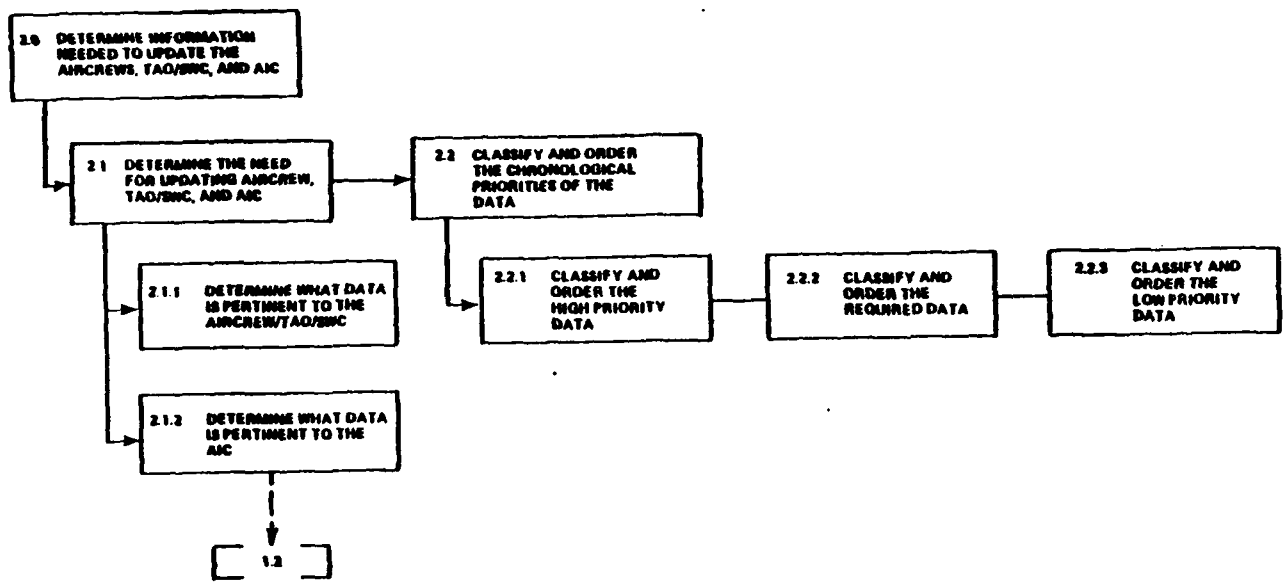

Figure 4. Determine Information Needed to Update the Tactical Picture

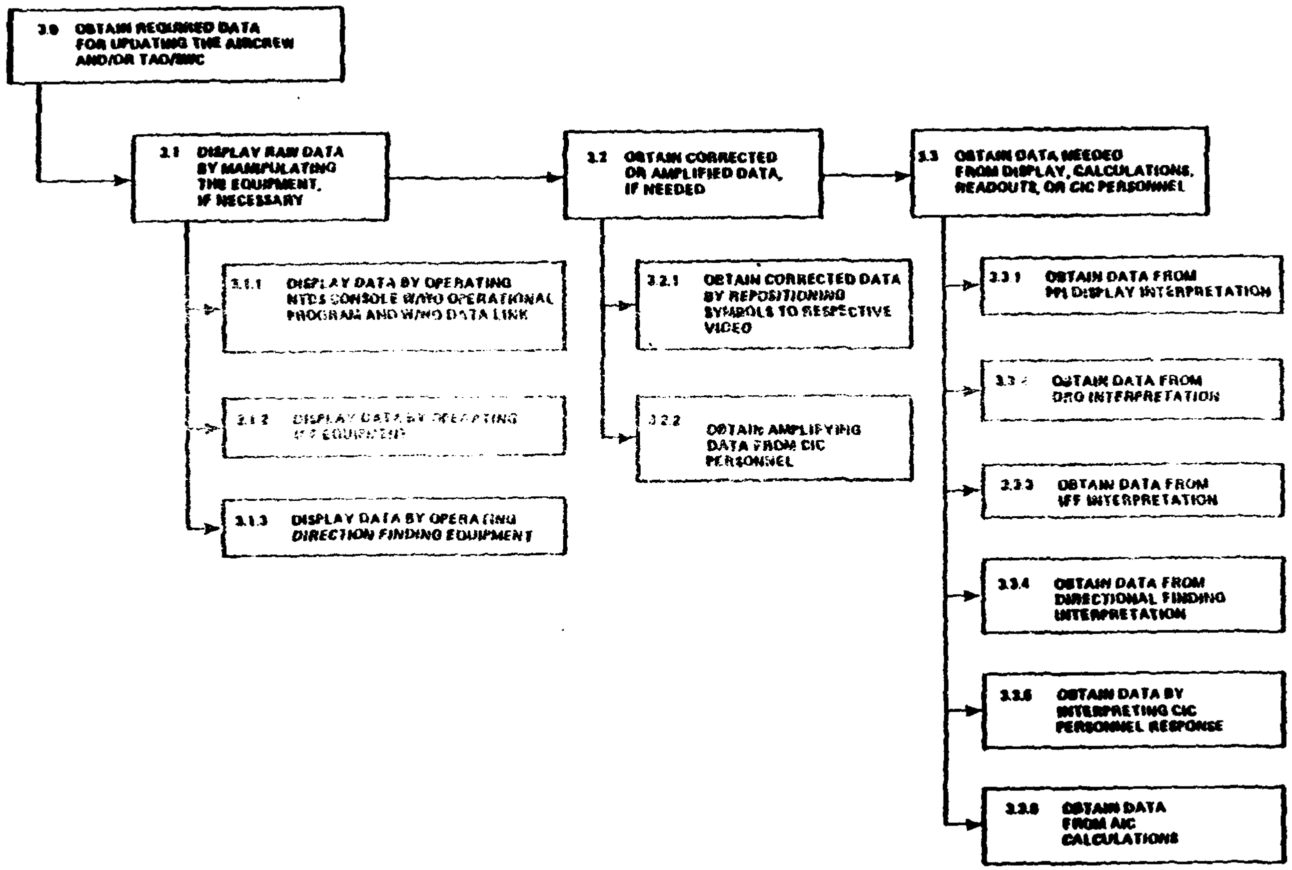

Figure 5. Obtain Required Data

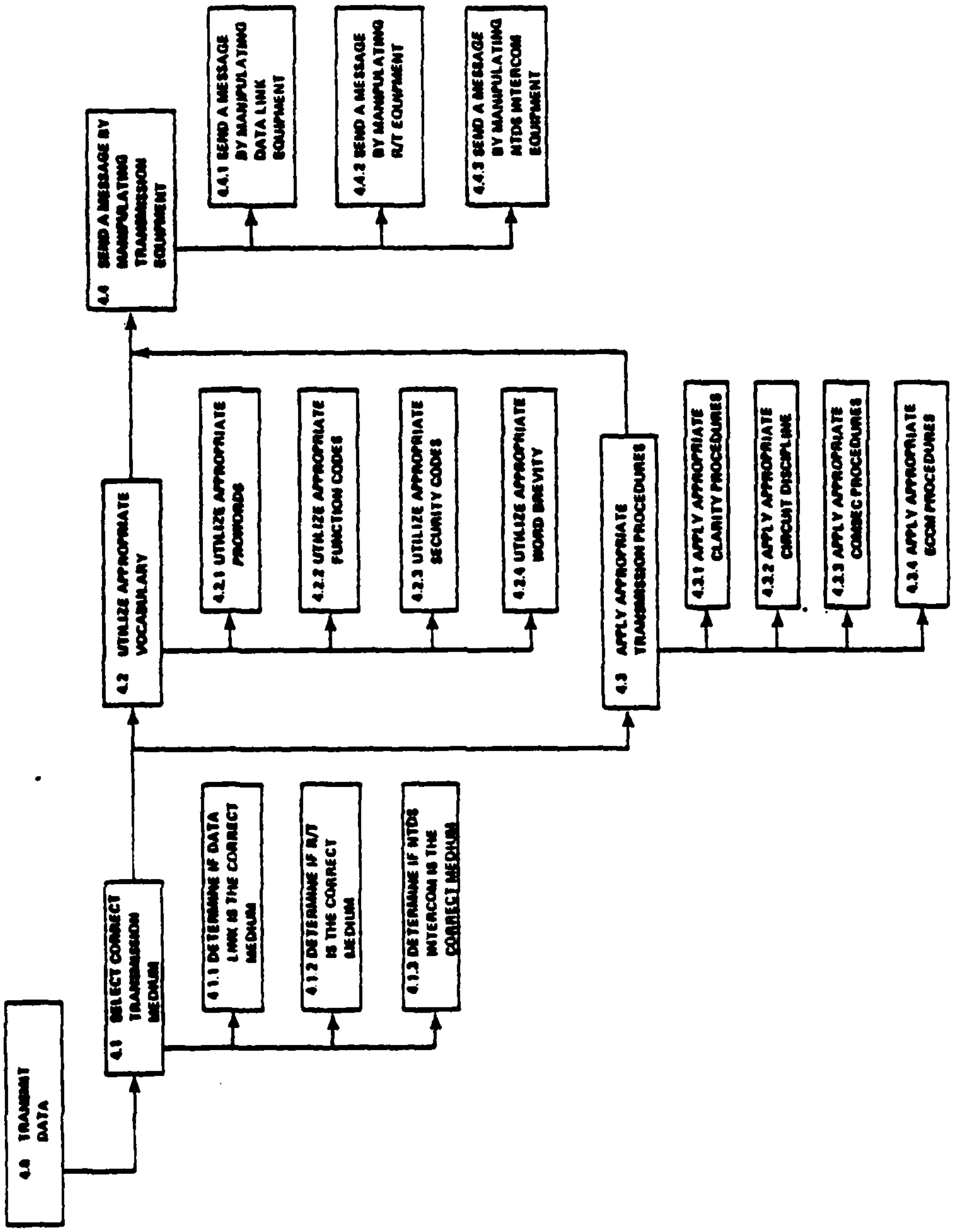

Figure 6. Transmit Data

SUMMARY

The AIC's task involves important decision making processes in addition to basic psychomotor skills in gathering and transmitting data. In relation to the training process, this means that it is important to train the AIC to use his basic data gathering, refining, and transmission skills at a nearly automatic level. This will help leave the AIC with enough time and processing power to better understand the situation and make more appropriate decisions. The support information provided by an AIC who is making more informed and more accurate decisions can only assist in the maintenance of a tactical advantage for his CAP(s), his ship, and his deployment.

SECTION III

BEHAVIORAL OBJECTIVES

INTRODUCTION

This section of the Air Intercept Controller (AIC) Behavioral Objectives Report is an orientation dialogue which discusses the approach and process through which the behavioral objectives listing was developed. The behavioral objectives listing is presented in Appendix B.

The behavioral objectives in this report are stated in the usual three phased description of conditions, behaviors, and standards. To determine these descriptions, each of the three areas had to be carefully evaluated to identify the components.

The establishment of behavioral objectives first involved the delineation of the task behaviors required of the AIC in accomplishing his job. That part of this task was reported in the task flow diagram. The behaviors in these objectives, required to be observable and measurable and the objectives, themselves, are used to form the basis of further development of training materials. For those reasons, and because actual task behaviors are very often covert, not amenable to observation and measurement, the next task was to identify training behaviors which are closely analogous to the actual task behaviors.

The second important determination was to identify the situational requirements of the tasks performed. That is, the conditions under which each task is actually performed. These conditions are affected by several factors including the tactical environment and the number of personnel available in the CIC. The most important condition, the one that has the most effect on what behaviors are performed and on what standards are applied to those behaviors, is the type of data gathering and communications equipments which are available to the AIC. The AIC's task changes considerably as he moves from a conventional console with no data link to an NTDS console with two-way data link.

The third important determination was to define the standards for assessment and measurement of adequate task completion. These statements of performance accuracy include appropriate performance parameters, such as time allowed, in addition to specific numerical levels of accuracy, such as 90 percent accurate.

It is important to note that this behavioral objectives report presents a complete set of upper level behavioral objectives in terms of the tasks the AIC is expected to perform in his job. No delimitations have been made, at this point, in terms of task skills which may be learned by the student AIC prior to coming to AIC school, those which might be learned by them in the basic AIC course, or those which might be learned by them in the fleet following the school. The behavioral objectives are those for performance of the AIC job in the fleet, in both training operations and tactical operations.

Neither AIC school nor ACE will teach all of the behaviors addressed for the following reasons:

a. some tasks are required prerequisites for acceptance into AIC school

b. some tasks are better learned on board ship through practical experience

c. the amount of training time is limited

c. the present training system doesn't have the capability to teach all of the tasks with the given conditions and standards.

COURSE MISSION OBJECTIVE

In keeping with the foregoing explanation of development of the behavioral objectives for the complete AIC job as he must perform in fleet training or in combat, there remains to be defined the mission of the AIC training course as it is to be accomplished through application of the AIC Training System. Accepting the AIC trainee as he arrives at the AIC School, with a yet-to-be-defined base of skills developed in previous OS training, augmented and applied in performance as an OS in the fleet, ACE will develop skills which enable the trainee to perform tasks which are requisite for advanced training and for future development through application of skills in the fleet.

The trainee population will consist of U.S. Navy officers and senior enlisted Operations Specialist (OS) personnel. The training course will be conducted at the Fleet Combat Training Center, Pacific, San Diego, California. The training will be accomplished through a combination of classroom instruction and laboratory applications on a Training Enhancement Console which emulates a UYA-4/V-10 NTDS console with simulated radar display and NTDS functions, with multi-media instruction presenting adaptive training in basic AIC skills through synthetic air intercepts. Training will culminate in the ability to conduct synthetic air intercepts as the prerequisite skill level for advancing to control of live aircraft, under supervision of an instructor.

In the format applied to the objective listing Appendix B, the course mission objective would be stated:

<u>Conduct synthetic intercepts</u>

c. Given an AIC trainee who possesses prerequisite skills, at an emulated AC mode console, with simulated environmental and tactical inputs, at FCTCP,

b. the trainee will provide support information as required to conduct synthetic intercepts

s. operating the Training Enhancement Console, communicating with the simulated aircrew, and applying correct operating procedures while observing safety procedures for control of aircraft.

Development of the Experimental Prototype Air Intercept Controller Training System, to satisfy this course mission, requires a complete AIC job task analysis which has, in turn, led to the development of the behavioral objectives presented in Appendix B.

BEHAVIORAL OBJECTIVES LISTING

The list of behavioral objectives in Appendix B provides objectives at the mission objective level, the terminal objective level, and two levels of enabling objectives. In most cases, even the lower level enabling objectives supplied will not discuss "button pushing" type behaviors. Instead, the behaviors described tend to be associated with tasks which have verbs like "determine" and "obtain."

Also, since the objectives are training oriented, the verbs and the standards used reflect the use of analogous but artificial behaviors in terms of the actual task. This is because many of the actual tasks are very difficult to monitor and measure.

SECTION IV

DIAGNOSIS AND REMEDIATION

Within the framework of any sophisticated instructional system, an important aspect of the potential success of the system is its ability to diagnose learner weaknesses and problems (both as singular responses and as constellations or syndromes representative of a broader scope learning problem). The automated instructor facets of ACE certainly reflect this necessity for a diagnostic - prescriptive - remediative sequence by having them built in. In the Prototype Air Intercept Controller Training System, these capabilities have been incorporated as an integral part of the instructional philosophy.

ACE divides the instructional task into three distinct areas of learner experience. The first area, Interactive Teaching or IAT, introduces the learner to the basic knowledge and skill components of the task and then tests those components in an isolated instructional environment. In other words, the learner's attention is being focused on that task set, with no other tasks competing for attention. Test and simple skill checks are used as indicators of mastery at this level. If the tests and checks are not passed, the learner, at least, gets additional information in the form of feedback. At most, the learner is required to repeat parts of the instruction which covered the area with which he is having problems.

When the learner shows mastery of the basic IAT skill set, he is placed into an environment, Commented Practice (CP), which asks him to integrate the new skill or knowledge set with previously learned tasks. The learner is required to work at this level until mastery is shown. Here, using automated performance measures which reflect the expected level of behavior for a learner of this sophistication, the system grades the learner's performance. Each performance measure has a set of error messages associated with the various possible mistakes. Each Performance Measurement Variable (PMV) is also linked to an individual remediative segment of basic instruction, which is designed to give the learner a chance to increase his skills to a level where he can return to, and succeed in, the integrated environment.

When the learner performs at mastery level for the limited environment, he is placed into an even less restricted practice environment, Free Practice (FP), where further integration of skills can go on. This environment is the closest approximation of the real life task. Here, too, automated performance measures are used as the basis for judgment of the learner's mastery of the requisite skills. At this level each performance measure is linked to a former limited practice, a CP, which the learner has already passed. Failure on a performance measurement variable causes the learner to be remediated back one of these previous practices to further polish his skills. After remediation, the learner is brought back to the unrestricted environment for further attempts at mastery level performance.

If the learner does not accomplish mastery level behavior at any level, after a given number of attempts and a like number of passes through all the remediative pathways that the system provides, the human instructor associated with the system is notified. The instructor attempts to identify an instructional pathway that will succeed. This pathway can either use the system supplied instruction or can use off-system tutoring. For a further discussion of these remediative pathways, see the Functional Design Report.[1]

Appendix C, Remediation Pathways gives the title of each PMV and shows the remediation pathways that each PMV takes. For a description of the individual PMVs, see the Functional Design Report, the Instructor Handbook,[2] or the Student Guide.[3] For a description of the basic course syllabus, see the Ordinal Syllabus Report[4] or the Instructor Handbook.

---

1. Functional Design for Air Intercept Controller Prototype Training System; Report NAVTRAEQUIPCEN 78-C-0182-8 (Logicon, Inc.). Naval Training Equipment Center, Orlando, Florida; in press. (Confidential)

2. Prototype Equipment Instructor Handbook for ACE (Air Intercept Controller Prototype Training System), Report NAVTRAEQUIPCEN 78-C-0182-9 (Logicon, Inc.). Naval Training Equipment Center, Orlando, Florida; in press.

3. Prototype Equipment Student Guide for ACE (Air Intercept Controller Prototype Training System), Report NAVTRAEQUIPCEN 78-C-0182-10 (Logicon, Inc.). Naval Training Equipment Center, Orlando, Florida; in press.

4. Ordinal Syllabus for Air Intercept Controller Prototype Training System, Report NAVTRAEQUIPCEN 78-C-0182-3 (Logicon, Inc.). Naval Training Equipment Center, Orlando, Florida; in press.

APPENDIX A

AIR INTERCEPT CONTROLLER TASK ANALYSIS

COMMANDER TRAINING COMMAND
UNITED STATES PACIFIC FLEET
SAN DIEGO CALIFORNIA 92147

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19 DEC 1975

To: Distribution List

Subj: Air Intercept Controller Task Analysis

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(b) CNTT 021912Z MAY 75 (NOTAL)
(c) CNET - A10
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Encl: (1) Refined AIC Job Task Inventory

1. Reference (a) is the report of the AIC Conference held 27-29 August 1974 and listed the convening of an Air Intercept Controller Task Analysis as an action item. Reference (b) established the convening of subject Task Analysis. Reference (c) establishes procedures for the planning, design, development and management of the Navy training courses. Reference (d) scheduled the convening of the Job Task Inventory (JTI) Workshop on 18 November 1975 to review and analyze the tentative Racing JTI.

2. Enclosure (1) is the refined and purified Job Task Inventory resulting from the 18 November workshop. Transformation of the behavioral statements listed in enclosure (1) to behavioral learning objectives and subsequent development of AIC course curriculum is ongoing.

3. Action addressees are invited to submit comments/recommendations concerning enclosure (1) to COMTRAPAC by 30 January 1976.

J. E. Evans

J. E. EVANS
Chief of Staff

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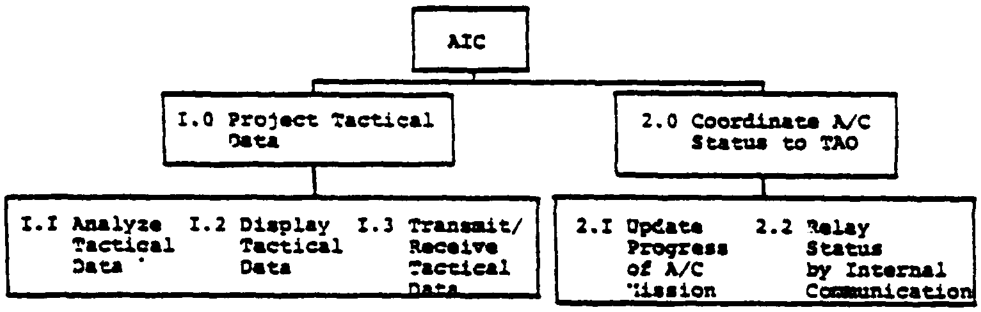
APPENDIX A

AIC Behavioral Statements

A flow diagram depicting the major headings of the inventory is illustrated below:



The Final Job Task Inventory of AIC behavioral statements are listed on the following pages.

ENCLOSURE (1)

APPENDIX A

I.0 Project necessary Tactical Data to the aircrews

I.I Analyze the Tactical Data

I.I.I Identify U. S. & Foreign AC flight characteristics from available sources

I.I.I.I Identify the A/C type (U.S. & Foreign) from MATRIX provided

I.I.I.I.I Determine the number of crew members in each A/C

I.I.I.I.2 Determine the combat radius of each A/C

I.I.I.I.3 Determine the turning diameter of each A/C

I.I.2 Identify Tactics employed in fleet environment

I.I.2.I Identify bomber "Blue Water" threat tactics

I.I.2.2 Identify fighter "ACM" threat tactics

I.I.3 Identify tactics employed in training environment

I.I.3.I Calculate procedures for "set-ups"

I.I.3.I.I Recommend A/C heading for desired intercept geometry

I.I.3.I.I.I Refer to I.2.I

I.I.3.I.2 Calculate the desired angles

I.I.3.I.2.I Refer to I.2.I

I.I.3.I.3 Determine the planning bearing

I.I.3.I.3.I Refer to I.2.I

I.I.4 Determine weapons capabilities of U.S. & Foreign A/C from MATRIX provided

I.I.4.I Obtain weapons system parameters

I.I.4.I.I Obtain max and min range

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I.I.4.I.I.I Determine range for search

I.I.4.I.I.2 Determine range for lock on

I.I.4.I.I.3 Determine the GIMBAL limits

I.I.4.2 Obtain data of air to air missiles

I.I.4.2.I Obtain max and min range

I.I.4.2.2 Determine the requirements for firing

I.I.4.2.2.I Determine optimum firing position

I.I.4.2.2.2 Determine missile capabilities

I.I.4.3 Obtain data of A/C guns

I.I.4.3.I Obtain max and min range

I.I.4.3.2 Determine the requirements for firing

I.I.4.3.2.I Determine optimum firing position

I.I.5 Identify the mission of U.S. A/C from available sources

I.I.5.I Refer to I.I.7, I.2.3.I and I.2.7.3.I.

I.I.5.I.I Identify mission of a MIGCAP

I.I.5.I.2 Identify mission of a BARCAP

I.I.5.I.3 Identify mission for a FORCAP

I.I.5.I.4 Identify mission of a TARCAP

I.I.5.I.5 Identify mission of a RESCAP

I.I.5.I.6 Identify mission of a weather RECCE/PHOTO RECCE

I.I.5.I.7 Identify mission of an aircraft desiring friendly join up or tanking

I.I.5.I.8 Identify mission of a SURCAP

APPENDIX A

I.I.6 Utilize the technique of video interpretation (pipology)

I.I.6.I Distinguish air contact from other returns

I.I.6.I.I Determine video size

I.I.6.I.I.I Compare size to known air targets

I.I.6.I.I.2 Compare shape to known air targets

I.I.6.I.2 Track video motion and speed

I.I.6.I.2.I Refer to I.2.I

I.I.6.I.3 Identify land targets

I.I.6.I.3.I Check position on charts

I.I.6.I.4 Identify ship targets

I.I.6.I.4.I Track video motion and speed

I.I.6.I.4.I.I Refer to I.2.I

I.I.6.I.5 Identify weather

I.I.6.I.5.I Identify spurious video returns

I.I.6.I.6 Identify false contacts

I.I.6.I.6.I Check spurious video returns

I.I.6.I.7 Identify electronic and mechanical interference

I.I.6.I.7.I Refer to I.2.2.2 and I.2.2.3

I.I.6.I.8 Identify Anomalous Propagation

I.I.6.2 Determine number targets

I.I.6.2.1 Interpret from scope presentation

I.I.6.2.2 Obtain from height size operator

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I.I.6.3 Interpret aircraft formation

I.I.6.3.I Interpret from scope presentation

I.I.6.3.2 Obtain from intelligence sources

I.I.6.4 Interpret IFF returns

I.I.6.4.1 Interpret "NORMAL" returns

I.I.6.4.I.I Interpret Mode I returns

I.I.6.4.I.2 Interpret Mode 2 returns

I.I.6.4.I.3 Interpret Mode 3 returns

I.I.6.4.2 Interpret "IDENT" returns

I.I.6.4.3 Interpret "EMERGENCY" returns

I.I.6.4.4 Interpret "MODE 4" returns

I.I.6.5 Determine probable point of intercept

I.I.6.5.1 Project bogey track

I.I.6.5.2 Determine point of collision intercept

I.I.6.5.3 Determine time of intercept

I.I.6.6 Determine probability of intercept

I.I.6.6.1 Interpret intercept progress

I.I.6.6.I.1 Project bogey track

I.I.6.6.I.2 Interpret communcation of the aircrew

I.I.6.7 Determine Pigeons to homeplate or tanker

I.I.7 Interpret operational data

I.I.7.I Interpret operational orders

I.I.7.2 Interpret operational plans

I.I.7.3 Interpret letters of instruction

I.I.7.4 Interpret publications

I.I.7.5 Interpret message traffic

I.I.7.6 Interpret rules of engagement

I.I.7.7 Analyze intelligence information

I.I.7.7.I Evaluate EW information

I.I.7.7.I.I Obtain EW information

I.I.7.7.2 Relay SUPRAD information

I.I.7.8 Interpret Aircraft Tactical Manuals and Airwing TACNOTES

I.I.8 Recognize emergency

I.I.8.I Interpret emergency IFF response

I.I.8.2 Recognize emergency prowords

I.I.8.3 Identify types of emergencies

I.I.8.3.I Identify aircrew emergncies

I.I.8.3.I.I Recognize abnormal speech

I.I.8.3.I.2 Recognize abnormal video movement

I.I.8.3.2 Identify aircraft emergencies

I.2 Display tactical data

I.2.I Operate radar repeater

I.2.I.I Operate NTDS console

I.2.I.I.I Operate NTDS console with program

I.2.I.I.I.I Obtain magnetic bearing from DRO

I.2.I.I.I.2 Obtain range from DRO

I.2.I.I.I.3 Obtain bogey track from DRO

I.2.I.I.I.4 Obtain bogey ground speed from DRO

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I.2.I.I.I.5 Obtain bogey altitude from DRO

I.2.I.I.I.6 Obtain stored data from DRO

I.2.I.I.2 Operate NTDS console without program (Mode 3)

I.2.I.I.2.I Obtain estimate magnetic bearing from Azimuth ring

I.2.I.I.2.2 Obtain estimate range from range rings or range aid

I.2.I.I.2.3 Compute bogey track

I.2.I.I.2.3.I Plot leading edge of video

I.2.I.I.2.3.2 Align grease pencil with two or more plots

I.2.I.I.2.3.3 Move pencil parallel to center of scope

I.2.I.I.2.3.4 Determine mag bearing from plotting head Azimuth ring

I.2.I.I.2.4 Compute bogey ground speed

I.2.I.I.2.4.I Determine antenna rotation rate

I.2.I.I.2.4.2 Plot leading edge of video for at least three sweeps

I.2.I.I.2.4.3 Measure distance between first plot and third plot.

I.2.I.I.2.4.4 Calculate speed

I.2.I.2 Operate conventional PPI repeater

I.2.I.2.I Obtain magnetic bearing from Azimuth ring

I.2.I.2.2 Obtain range from range counter

I.2.I.2.3 Computer bogey track

I.2.I.2.3.I Refer to I.2.I.I.2.3

I.2.I.2.4 Compute bogey ground speed

I.2.I.2.4.I Refer to I.2.I.I.2.4

I.2.I.2.5 Obtain bogey altitude

I.2.2 Ensure that radar master controls are adjusted for optimum performance

I.2.2.I Ensure antenna controls are adjusted for optimum performance

I.2.2.I.I Determine geographical area

I.2.2.I.2 Determine A/C stationing altitude.

I.2.2.I.2.I Refer to I.I.7

I.2.2.2 Ensure radar controls are adjusted for optimum performance

I.2.2.2.I Ensure receiver gain adjusted to proper level

I.2.2.2.2 Ensure radiated power adjusted to proper level

I.2.2.2.3 Ensure frequencies adjusted to minimize interference

I.2.2.2.4 Ensure PRF adjusted to minimize interference

I.2.2.3 Ensure ECCM controls are adjusted to minimize interference

I.2.2.4 Ensure MTI controls are adjusted to minimize slow relative speed returns

I.2.3 Operate IFF controls for optimum performance

I.2.3.I Operate controls to identify A/C

I.2.3.I.I Interpret reply for proper response

I.2.3.2 Operate controls to assist in tracking A/C

I.2.3.2.I Select IFF controls for tracking A/C

I.2.3.2.I.I Ensure bracket pulse aligned to front leading edge

I.2.3.2.I.2 Select correct back panel controls

I.2.3.2.I.2.I Select power to local position

I.2.3.2.I.2.2 Select I2P switch to I2P

I.2.3.2.I.2.3 Select range inhibit to off

I.2.3.2.I.3 Select correct front panel controls

I.2.3.2.I.3.I Set MIX/RAD/IFF switch to MIX

I.2.3.2.I.3.2 Set Decode/Code switch to Decode

I.2.3.2.I.3.3 Set mode select switch to proper mode.

I.2.3.2.I.3.4 Set bracket switch to on

I.2.3.2.I.3.5 Set stretch switch to on

I.2.3.2.I.3.6 Set IP switch to on

I.2.3.3 Operate IFF controls to obtain height

I.2.3.3.I Interpret height from read out display

I.2.4 Operate direction finding equipment

I.2.4.I Ensure equipment is operating properly

I.2.4.I.I Interpret bearing from display

I.2.4.I.2 Select frequency to be monitored

I.2.4.I.3 Check calibration

I.2.5 Ensure TACAN is operating for optimum performance

I.2.5.I Ensure TACAN is emitting on proper frequency

I.2.5.I.I Ensure TACAN is set up in accordance with proper doctrine

I.2.6 Display tactical data on personal chart/map

I.2.6.I Determine appropriate charts to display tactical situation

I.2.6.I.I Plot all NAVAIDS available

I.2.6.I.2 Plot known hazard areas

I.2.6.I.3 Plot friendly areas

I.2.6.I.4 Plot divert fields

I.2.6.I.5 Plot airways from appropriate flip charts

I.2.7 Interpret information appearing on status boards in CDC

I.2.7.I Interpret information appearing on tote board

I.2.7.I.I Gain amplifying information on all air contacts held by the force

I.2.7.2 Ensure information appearing on air status board concerning his assigned A/C is correct

I.2.7.3 Interpret information appearing on A/C event status board

I.2.7.3.I Obtain aircraft mission

I.2.7.4 Obtain identification of A/C from ID status board

I.2.8 Assist in Emergencies

I.2.8.I Maintain track or position of aircraft

I.2.8.2 Maintain position of divert fields

I.2.8.3 Maintain track of position of tanker

I.2.8.4 Maintain track or position of assisting aircraft

I.2.8.5 Maintain position of aircrew

I.3 Transmit and receive information externally

I.3.I Utilize proper communication procedures

I.3.I.I Utilize correct brevity codes

I.3.I.I.I Interpret communication publication

I.3.I.2 Apply rules for clarity

I.3.I.3 Observe circuit discipline

I.3.I.4 Observe COMSEC procedures

I.3.I.5 Observe ECCM procedures

I.3.2 Ensure communications plan is adhered to

I.3.2.I Ensure assigned frequencies are available

I.3.2.2 Ensure communication equipment is operating at optimum performance

I.3.3 Transmit and receive tactical information via voice

I.3.2.I Transmit and receive launch and enroute information

I.3.2.2 Transmit and receive on station information

I.3.3.3 Transmit and receive intercept information

I.3.3.4 Transmit and receive engagement information

I.3.3.5 Transmit and receive return/recovery information

I.3.4 Transmit and receive tactical information via data link

I.3.4.I Transmit and receive launch and enroute information

I.3.4.2 Transmit and receive on station information

I.3.4.3 Transmit and receive intercept information

I.3.4.4 Transmit and receive engagment information

I.3.4.5 Transmit and receive return/recovery information

I.3.5 Transmit and receive information on emergencies

I.3.5.I Provide information on downed aircrew to SAR Unit

I.3.5.2 Alert other aircraft in area

I.3.5.3 Relay information to assist aircrew

2.0 Coordinating information regarding A/C status to TAO

2.I Update progress of A/C Mission

2.I.I Calculate point of intercept

2.I.I.I Refer to I.I.6.5

2.I.2 Calculate time of intercept

2.I.2.I Refer to I.I.6.5.3

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APPENDIX A

2.I.3 Determine probability of intercept

2.I.3.I Refer to I.I.6.6

2.I.4 Determine composition

2.I.4.I Interpret A/C transmissions

2.I.4.2 Refer to I.I.6.2

2.I.5 Interpret State reports

2.I.6 Determine Altitude Information

2.I.7 Interpret Jamming reports

2.I.8 Interpret "Burner" transmissions

2.I.9 Interpret Visual and Tally Ho Reports

2.I.10 Interpret Intercept results

2.2 Relay Status by Internal Communication

2.2.I Relay information by voice

2.2.I.I Transmit point of intercept

2.2.I.2 Transmit time of intercept

2.2.I.3 Transmit probability of intercept

2.2.I.4 Relay composition

2.2.I.5 Relay state reports

2.2.I.6 Relay altitude information

2.2.I.7 Relay jamming reports

2.2.I.8 Relay burner calls

2.2.I.9 Relay visual and Tally Ho reports

2.2.I.10 Relay intercept results

2.2.2 Relay information by NTDS symbology

2.2.2.I Relay point and time of intercept

2.2.2.I.I Select collision geometry

2.2.2.I.2 Select Order send

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2.2.2.2 Relay state reports

2.2.2.2.I Update stored data

2.2.2.3 Relay altitude information

2.2.2.2.2 Update stored data

2.2.2.4 Relay intercept results

2.2.2.4.I Drop tracks

ENCLOSURE (1)

APPENDIX B

BEHAVIORAL OBJECTIVES

FOR

AIR INTERCEPT CONTROLLER

PROTOTYPE TRAINING SYSTEM

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0.0 MISSION OBJECTIVE

Provide support information as required in the use of aircraft in tactical missions

CONDITION: Given an AC mode console, CIC information, A/C inputs and appropriate preparatory documents

BEHAVIOR: the AIC will provide support information as required, in the use of aircraft on tactical missions

STANDARD: within the time and accuracy parameters required by the situation.

(The relationship of the Mission Objective to the Terminal Objective was shown in Figure 2.)

1.0 TERMINAL OBJECTIVE

Classify present phase of CAP mission

CONDITION: Given information from an AC mode console, the A/C, CIC personnel, and appropriate preparatory documents

BEHAVIOR: the AIC will classify the present phase of the CAP mission, by name, and will list the specific modifying factors within the situation

STANDARD: within one minute after activating the console or within one minute after a situation change; 100% on general classification; 90% of specific situation modifiers.

(The relationship of this Terminal Objective to its Enabling Objectives was shown in Figure 3.)

1.1 ENABLING OBJECTIVE

Develop anticipated tactical environmental picture

CONDITION: Given operation plans/orders, flight schedules, CIC information, rules of engagement, historical data

BEHAVIOR: enumerate the major elements of the anticipated tactical environment

STANDARD: prior to going to watchstations, including 90% of the major tactical elements.

1.1.1 ENABLING OBJECTIVE

Identify relevant operation orders/plans

CONDITION: Given information on a "status board"

BEHAVIOR: copy down the operation plans/orders associated with your ship/CAP

STANDARD: prior to going to watchstation, 100% of orders/plans.

1.1.2 ENABLING OBJECTIVE

Identify relevant flight schedules

CONDITION: Given information on a "status board"

BEHAVIOR: copy down the flight schedules which pertain to your CAP

STANDARD: prior to going to watchstation, 100% of flight schedules.

1.1.3 ENABLING OBJECTIVE

Receive a brief from CIC personnel

CONDITION: Given sources of information in the CIC

BEHAVIOR: list the CIC personnel from whom you could receive information and the type of information you could receive from each

STANDARD: prior to going to watchstation, 100% personnel, 90% types of information.

1.1.4 ENABLING OBJECTIVE

Identify relevant historical data (tactics, etc.)

CONDITION: Given message board and status board information, and other historical data,

BEHAVIOR: list the items relevant to your CAP and ship

STANDARD: prior to going to watchstation, 90% of relevant items.

1.1.5 ENABLING OBJECTIVE

Identify relevant rules of engagement

CONDITION: Given the rules of engagement

BEHAVIOR: list the rules of engagement pertaining to CAP

STANDARD: prior to going to watchstation, 100% of rules of engagement.

1.2 ENABLING OBJECTIVE

Obtain real time update to the tactical environment

CONDITION: Given the anticipated tactical environment inputs from an AC mode console, inputs from the A/C, and CIC information

BEHAVIOR: enumerate the major elements of the tactical environment update

STANDARD: within one minute of starting watch and within one minute of a major situational change, including 90% of the major tactical elements.

1.2.1 ENABLING OBJECTIVE

Interpret radar/IFF returns

CONDITION: Given returns on an AC mode console from radar and IFF equipment

BEHAVIOR: name the source of all radar returns and name the meanings of all scope IFF returns

STANDARD: within one minute of sweep, 90% correct on radar, 100% correct on IFF.

1.2.2 ENABLING OBJECTIVE

Determine aircraft state/status

CONDITION: Given information from the aircraft via data link or radio/telephone

BEHAVIOR: list the fuel state and weapons status of the aircraft

STANDARD: within 30 seconds of receiving information, 100% correct.

1.2.3 ENABLING OBJECTIVE

Determine aircrew intentions

CONDITION: Given information from the aircraft via data link or radio/telephone and given aircraft track history

BEHAVIOR: state the aircrew's flight intentions relative to the present mission

STANDARD: detect and report when the aircrew is locked on the wrong contact 100% of the time.

1.2.4 ENABLING OBJECTIVE

Receive update inputs from CIC personnel

CONDITION: Given a full complement of CIC personnel

BEHAVIOR: list the personnel from whom you can obtain update data inputs and the types of data you can obtain

STANDARD: 100% of the personnel, 90% of the types of information

1.3 ENABLING OBJECTIVE

Compare data to categorize CAP situation into a phase of known aircraft missions

CONDITION: Given current data about the tactical environment and about anticipated tactical occurrences, and given category definitions

BEHAVIOR: name the present CAP mission phase category and the special modifying factors by comparing the current data to the category and modifier definitions

STANDARD: within 15 seconds, 100% correct on general situation, 100% correct on modifications caused by hostile aircraft, 90% correct on other modifiers.

1.3.1 ENABLING OBJECTIVE

Categorize general phase of aircraft mission

CONDITION: Given up-to-date data about the current tactical environment and anticipated tactical occurrences, and given definitions of general phases of aircraft missions

BEHAVIOR: name the general phase of the present CAP mission by comparing the tactical data to the definitions

STANDARD: within 10 seconds, 100% correct on categorization.

1.3.2 ENABLING OBJECTIVE

Determine the specific modifying elements of CAP mission general phase

CONDITION: Given up-to-date data about the current tactical environment and anticipated tactical occurrences, the general phase of the present CAP mission, and a list of possible modifying elements

BEHAVIOR: check the elements on the list which are present in the current situation

STANDARD: within 10 seconds, 100% correct on modifications caused by hostile aircraft, 90% correct on other modifiers.

2.0 TERMINAL OBJECTIVE

Determine information requirements for updating the aircrews, TAO/SWC, and AIC

CONDITION: Given the CAP mission phase classification, the specific modifying factors, and a knowledge already acquired by the A/C and TAO/SWC

BEHAVIOR: list the types of information required to support an update of the tactical situation and list the standards of timeliness and accuracy for each

STANDARD: 90% correct, within one minute of classification.

(The relationship of this Terminal Objective to its Enabling Objectives was shown in Figure 4.)

2.1 ENABLING OBJECTIVE

Determine the need for updating the aircrews, the TAO/SWC, or the AIC

CONDITION: Given the CAP mission phase category, the specific modifying factors, and a knowledge of what support information is already known

BEHAVIOR: list the types of support information that are pertinent to updating the aircrew, the command network (TAO/SWC) or the AIC

STANDARD: within one minute of CAP mission phase categorization; 90% of information types.

2.2 ENABLING OBJECTIVE

Classify and order the chronological priorities of the data

CONDITION: Given the list of types of information pertinent to updating the aircrew, the command network (TAO/SWC), or the AIC and the definitions for priorities

BEHAVIOR: list the information types in the order of their importance to the aircrew, to the TAO/SWC, and/or to the AIC and identify the items on the list as "high priority," "required," and "low priority"

STANDARD: within one minute, 100% accurate classification of high priority and required information types.

2.2.1 ENABLING OBJECTIVE

Classify and order the high priority data

CONDITION: Given the list of types of information pertinent to updating the aircrew, the command network (TAO/SWC), or the AIC, and the definitions and guidelines for priorities

BEHAVIOR: list the high priority information in the order of its importance to the aircrew, to the TAO/SWC, or to the AIC

STANDARD: within one minute, 100% accurate classification of high priority, 90% accurate ordering of importance.

2.2.2 ENABLING OBJECTIVE

Classify and order the required data

CONDITION: Given the list of types of information pertinent to updating the aircrew, the command network (TAO/SWC), or the AIC, and the definitions and guidelines for priorities

BEHAVIOR: list the required, but not high priority, information in the order of its importance to the aircrew, to the TAO/SWC, or to the AIC

STANDARD: within one minute, 100% accurate classification of required priority, 90% accurate ordering of importance.

2.2.3 ENABLING OBJECTIVE

<u>Classify and order the low priority data</u>

CONDITION: Given the list of information types pertinent to updating the aircrew, the command network (TAO/SWC), or the AIC, and definitions and guidelines for priorities

BEHAVIOR: list the low priority information in the order of its importance to the aircrew, the TAO/SWC, or to the AIC

STANDARD: within one minute, 100% accurate classification of low priority, 80% accuracy ordering of importance.

3.0 TERMINAL OBJECTIVE

Obtain required data for updating the aircrew and/or TAO/SWC

CONDITION: Given an AC mode console, communications links to the A/C and CIC personnel, and knowledge of the data required for transmission

BEHAVIOR: obtain the required data for listing through display, inerpretation and calculation, as necessary

STANDARD: within two minutes, 100% of the data, 90% accurate

(The relationship of this Terminal Objective was shown in Figure 5.)

3.1 ENABLING OBJECTIVE

Display the required data by manipulating equipment controls, if necessary

CONDITION: Given an AC mode console, A/C communications link, IFF and direction finding equipment, and a knowledge of the required information

BEHAVIOR: display the data required for further AIC use by manipulating the equipment, if necessary

STANDARD: within 45 seconds, 100% of the required data.

3.1.1 ENABLING OBJECTIVE

Display required data by operating NTDS console with/without operational program and with/without data links

CONDITION: Given 1. an NTDS console with operational program and data link, or

2. an NTDS console with operational program and without data link, or

3. an NTDS console without an operational program and without data link.

BEHAVIOR: display and point out the data required for further AIC use by manipulating the equipment, if necessary

STANDARD: within 1. 20 seconds, 100% of the required data, or

2. 20 seconds, 100% of the required data, or

3. 50 seconds, 100% of the required data.

3.1.2 ENABLING OBJECTIVE

Display required data by operating IFF equipment

CONDITION: Given operating IFF equipment and a PPI scope, and a knowledge of the required data

BEHAVIOR: display and point out the data required for further AIC use by manipulating the equipment, if necessary

STANDARD: within 30 seconds, 100% of the required data.

3.1.3 ENABLING OBJECTIVE

Display required data by operating direction finding equipment

CONDITION: Given operating direction finding equipment and a PPI scope, and a knowledge of the required data

BEHAVIOR: display and point out the data required for further AIC use by manipulating the equipment, if necessary

STANDARD: within 30 seconds, 100% of the required data.

3.2 ENABLING OBJECTIVE

Obtain correct or amplified data if needed

CONDITION: Given symbols that do not correspond to the video or insufficient data

BEHAVIOR: follow the procedures for obtaining corrected or amplified data

STANDARD: 100% correct procedure, with 15 seconds.

3.2.1 ENABLING OBJECTIVE

Obtain corrected data by repositioning symbols to respective video, if needed

CONDITION: Given an NTDS console with an operating program and symbols that do not correspond to the video

BEHAVIOR: correct the video by following the procedure for repositioning symbols

STANDARD: within 15 seconds, 100% correct.

3.2.2 ENABLING OBJECTIVE

Obtain amplifying data from CIC personnel

CONDITION: Given insufficient data regarding the tactical environment, and CIC personnel

BEHAVIOR: list the personnel who can supply data amplification upon request and the types of information available from each

STANDARD: within one minute; 100% correct personnel, 90% correct types of information.

3.3 ENABLING OBJECTIVE

Obtain data needed from display, calculations, readouts or CIC personnel

CONDITION: Given necessary raw data from AC console, A/C, and CIC personnel

BEHAVIOR: list the data required for transmission

STANDARD: within one minute, 100% of the data, 90% accurate.

3.3.1 ENABLING OBJECTIVE

Obtain data from an interpretation of the PPI display

CONDITION: Given an operating PPI display and

1. operating NTDS program, or

2. nonoperative NTDS program

BEHAVIOR: point out the sources and state the meanings of all returns on the display supplying required data

STANDARD: within one minute, 100% of sources, 90% of meanings.

3.3.2 ENABLING OBJECTIVE

Obtain data from DRO interpretation

CONDITION: Given operating AC mode console with complement of DROs

BEHAVIOR: point out the DROs which supply required information and state the meanings of each DRO

STANDARD: within one minute, 100% of sources, 90% of meanings.

3.3.3 ENABLING OBJECTIVE

Obtain data from an interpretation of the IFF display

CONDITION: Given an operating PPI display and IFF equipment

BEHAVIOR: point out and state the meanings of all IFF returns on the display supplying required data

STANDARD: within one minute, 100% of meanings.

3.3.4 ENABLING OBJECTIVE

Obtain data from an interpretation of the direction finding display

CONDITION: Given an operating PPI display and direction finder equipment

BEHAVIOR: point out and state the meanings of all direction finder equipment returns supplying required data;

STANDARD: within 30 seconds, 100% of meanings.

3.3.5 ENABLING OBJECTIVE

Obtain data by interpreting CIC personnel response

CONDITION: Given CIC personnel code or jargon response to an information request

BEHAVIOR: state the functional meaning of each response

STANDARD: within 15 seconds of the response, 90% accurate

3.3.6 ENABLING OBJECTIVE

Obtain data from AIC calculations

CONDITION: Given data, from various sources, which is not appropriate for use without calculations

BEHAVIOR: write down the answer resulting from the calculations required to obtain data in necessary final format

STANDARD: within 30 seconds, 90% accurate answers (90% of the answers 90% or more accurate).

4.0 TERMINAL OBJECTIVE

Transmit data

CONDITION: Given the information required for transmission, the CAP mission phase classification, transmission equipment, and transmission rules and guidelines

BEHAVIOR: transmit the required information according to the rules and guidelines for transmission method selection and use, and for timeliness and accuracy

STANDARD: on the correct transmission equipment, 100% following the rules for use, 100% following the rules for timeliness, 90% following the rules for accuracy.

(The relationship of this Terminal Objective to its Enabling Objectives was shown in Figure 6.)

4.1 ENABLING OBJECTIVE

Select correct transmission medium

CONDITION: Given a situation, data to be sent, a message destination, and a list of alternative transmission media

BEHAVIOR: name the most appropriate transmission medium

STANDARD: within 15 seconds, 100% correct.

4.1.1 ENABLING OBJECTIVE

Determine if data link is the correct transmission medium

CONDITION: Given a situation, data to be sent, and a message destination

BEHAVIOR: name the situations for which data link is the appropriate transmission method

STANDARD: within 30 seconds, 90% correct.

4.1.2 ENABLING OBJECTIVE

Determine if radio/telephone is the correct transmission medium

CONDITION: Given a situation, data to be sent, and a message destination

BEHAVIOR: name the situations for which radio/telephone is the appropriate transmission medium

STANDARD: within 30 seconds, 90% correct.

4.1.3 ENABLING OBJECTIVE

Determine if NTDS intercom is the correct transmission medium

CONDITION: Given a situation, data to be sent, a message destination

BEHAVIOR: name the situations for which NTDS intercom is the appropriate transmission medium

STANDARD: within 30 seconds, 90% correct.

4.2 ENABLING OBJECTIVE

Utilize correct vocabulary

CONDITION: Given data to be transmitted, a chosen medium, a tactical situation, and a message destination

BEHAVIOR: state the correct words and operation codes to make up the transmission vocabulary

STANDARD: 100% correct codes, 90% correct words.

4.2.1 ENABLING OBJECTIVE

Utilize correct prowords for the message

CONDITION: Given data to be transmitted, a chosen medium, a tactical situation, and a message destination

BEHAVIOR: state the prowords which apply to this message

STANDARD: with 100% accuracy.

4.2.2 ENABLING OBJECTIVE

Utilize correct function codes for the message

CONDITION: Given data to be transmitted, a chosen medium, a tactical situation, and a message destination

BEHAVIOR: state the correct order and details (number, letters) of function codes which apply to sending this message

STANDARD: with 100% accuracy.

4.2.3 ENABLING OBJECTIVE

Utilize appropriate security codes

CONDITION: Given data to be transmitted, a chosen medium, a tactical situation, and a message destination

BEHAVIOR: state the security codes which apply to this message

STANDARD: with 100% accuracy.

4.2.4 ENABLING OBJECTIVE

Utilize appropriate word brevity

CONDITION: Given data to be transmitted, a chosen medium, a tactical situation, and a message destination

BEHAVIOR: state the words of the message as briefly as possible

STANDARD: never exceeding the applicable brevity standards.

4.3 ENABLING OBJECTIVE

Apply correct transmission procedures

CONDITION: Given data to be sent, a chosen medium, a message destination, and a tactical environment

BEHAVIOR: send data using transmission procedures appropriate to the situation;

STANDARD: 100% correct use of the procedures.

4.3.1 ENABLING OBJECTIVE

Apply correct clarity transmission procedure

CONDITION: Given data to be sent, a chosen medium, a message destination, and a tactical environment

BEHAVIOR: send data using appropriate clarity procedures

STANDARD: with 100% correct use of the procedures.

4.3.2 ENABLING OBJECTIVE

Apply correct circuit discipline procedures

CONDITION: Given data to be sent, a chosen medium, a message destination, and a tactical environment

BEHAVIOR: send data using appropriate circuit discipline procedures

STANDARD: with 100% correct circuit discipline.

4.3.3 ENABLING OBJECTIVE

Apply correct communications security (COMSEC) procedures

CONDITION: Given data to be sent, a chosen medium, a message destination, and a tactical environment

BEHAVIOR: send data using appropriate COMSEC procedures

STANDARD: with 100% correct communication security.

4.3.4 ENABLING OBJECTIVE

Apply correct electronic counter-counter measure (ECCM) procedures

CONDITION: Given data to be sent, a chosen medium, a message destination

BEHAVIOR: send data using appropriate ECCM procedures

STANDARD: with 100% correct use of electronic counter-counter measures.

4.4 ENABLING OBJECTIVE

Send a message by manipulating transmission equipment

CONDITION: Given a chosen medium (data link, radio/telephone, or NTDS intercom), a message to be sent, a message destination

BEHAVIOR: send a message by manipulating the transmission equipment

STANDARD: 100% accurate.

4.4.1 ENABLING OBJECTIVE

Send a message by manipulating data link equipment

CONDITION: Given an operating data link system, a message to be sent, and a message destination

BEHAVIOR: send a message utilizing data link equipment

STANDARD: 100% accurate manipulation; 90% accurate input.

4.4.2 ENABLING OBJECTIVE

Send a message by manipulating radio/telephone

CONDITION: Given an operating radio/telephone, a message to be sent, and a message destination

BEHAVIOR: send a message utilizing radio/telephone equipment

STANDARD: 100% accurate manipulation; 90% accurate input.

4.4.3 ENABLING OBJECTIVE

Send a message by manipulating NTDS intercom

CONDITION: Given an operating NTDS intercom, a message to be sent, and a message destination

BEHAVIOR: send a message utilizing NTDS intercom equipment

STANDARD: 100% accurate manipulation; 90% accurate input.

APPENDIX C

REMEDIATION PATHWAYS

Table C1 shows the remediation pathways for each of the 84 Performance Measurement Variables (PMVs) used in the Air Intercept Controller Prototype Training System. The first column presents the PMV number. The second column shows the segment to which the student is sent after commented practice (CP) failure on that PMV. The third column shows the segment to which the student is sent after free practice (FP) failure on that PMV. The fourth column shows the permitted passing score on a PMV for commented practices. The passing score for PMVs in free practice runs is defined within each appropriate practice segment.

TABLE C1. REMEDIATION PATHWAYS

PMV NO.	CP REM	FP REM	CP PASS	PMV NAME
01	203	204	090	Maintain CAP Symbol In Vincity Of CAP Video
02	205	207	100	Engage CAP To Station
03	206	207	100	Transmit Station Bearing And Range
04	206	207	095	Transmit Bearing and Range Of Station
05	211	212	100	Engage CAP To Bogey
06	211	212	100	Vector CAP To Bogey
07	213	214	100	Transmit Initial Bogey Bearing And Range
08	215	216	100	Transmit Initial Bogey Track And Ground Speed
09	215	216	095	Transmit Continuing Bogey Bearing And Range
10	106	216	100	Ensure TEC Communication Switches Are Correct
11	106	216	100	Ensure TEC Control Panel Switches Are Correct
12	304	307	100	Range Scale And Offset
13	305	307	100	Enter CAP Symbol, PIF, and Station Altitude
14	306	307	100	C/S Airborne For Control
15	306	307	100	Ruth, This Is C/S...
16	308	307	100	Update CAP Symbol
17	308	309	100	Ask CAP For State
18	308	309	100	Update NTDS With CAP State (non-training environment)
19	308	309	100	Notify SWC Of Control
20	310	311	100	On Station
21				[Deleted]
22	316	317	100	Transmit Bogey Composition And Altitude
23	316	317	100	Place Bogey On Sequence List
24	316	317	100	Respond To Judy Or Tally Ho
25	316	317	100	Lost Contact
26	316	317	100	Contact
27	322	323	100	Disengage CAP From Bogey At Breakaway
28	322	323	100	Re-Engage CAP To Station After Breakaway
29	322	323	100	Vector CAP To Station After Breakaway
30	322	323	100	Report Results Of Engagement
31	402	403	100	Transmit Jink Call
32	404	405	100	Transmit Vector To Counter Jink

TABLE C1. REMEDIATION PATHWAYS - continued

PMV NO.	CP REM	FP REM	CP PASS	PMV NAME
33	404	405	100	Transmit Updated Bogey Track
34	408	410	100	Transmit Bogey Splitting
35	408	410	100	Transmit New Bogey Composition, Altitude
36	503	509	100	Detect And Report Strangers
37	504	509	095	Call Stranger Bearing And Range
38	506	509	100	Transmit Stranger's Track And Angels
39	508	509	100	Stranger Opening
40	603	607	100	Transmit Vectors For Rendezvous
41	603	607	100	Attain Correct Lateral Separation
42	606	607	100	Transmit To The MAC Bearing And Range To The CAP
43	606	607	100	Transmit MAC's Altitude To CAP For Rendezvous
44	608	610	100	Measure Rendezvous Flight Path
45	608	610	100	Measure Rendezvous Separation
46	609	610	095	Transmit To The CAP Bearing And Range To The MAC
47	702	704	100	Fighter In The Dark
48	702	704	100	Bogey In The Dark
49	708	710	100	Transmitting NTDS Down Message
50	709	710	100	Initial Bearing And Range Transmit, NTDS Down
51	709	710	095	Contin. Bearing And Range Transmit, NTDS Down
52	716	718	100	Establishing Comm. After Alarm (Beeper On Guard)
53	717	718	100	Reporting CAP Emergency To SWC
54	717	718	100	Check Emergency Plot Position
55	805	809	100	Select 32 Mile Range Scale For Set Ups
56	801	803	100	Keep Aircraft In The Area
57	802	803	100	Breakaway
58	802	803	100	Disengage Pseudo Bogey From Point-In-Space (B)
59	802	803	100	Disengage CAP From Point-In-Space (A)
60				[Deleted]
61				[Deleted]
62	802	803	100	Engage Pseudo Bogey to PPOI
63	802	803	100	Engage CAP To PPOI
64	802	803	100	Disengage CAP From PPOI
65	811	812	100	Establish Initial And Final Intercept Condition
66	802	803	100	Vector CAP To Bogey In Training
67	802	803	100	Engage CAP To Pseudo Bogey In Training
68	811	812	100	Measure Setup Separation
69	807	809	100	Establish Lost Communications
70	806	809	100	Update NTDS-State
71	806	809	100	Request Pseudo Bogey State (Training)
72	806	809	100	Request CAP State (Training)
73	805	809	100	Enter CAP Symbols And PIF
74	805	809	100	Range Scale And Offset (Training Environment)
75	805	809	100	Update Turn Rate
76	806	809	090	Pseudo Bogey Symbol Update
77	806	809	100	Update Pseudo Bogey Symbol
78	804	809	100	Direct CAP To Center Of Area
79	802	803	100	Engage Pseudo Bogey To Point

TABLE C1. REMEDIATION PATHWAYS - continued

PMV NO.	CP REM	FP REM	CP PASS	PMV NAME
80	802	803	100	Engage CAP To Point
81	808	809	100	Detach Wingman
82	409	410	100	Disengage CAP From Split At Breakaway
83	409	410	100	Disengage CAP From Bogey After Break Engage Alert
84	409	410	100	Engage CAP To Split
85	409	410	100	Vector CAP To Split
86	409	410	100	Transmit Initial Split Bearing And Range
87	409	410	090	Transmit Continuing Split Bearing And Range

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