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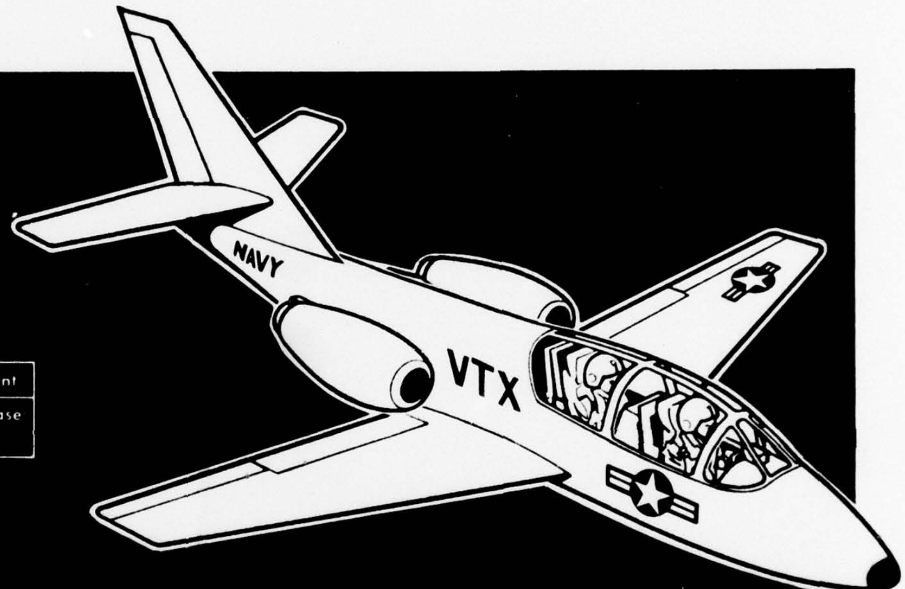
NAVY UNDERGRADUATE PILOT TRAINING JET PIPELINE TRAINING SITUATION ANALYSIS



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NAVY UNDERGRADUATE PILOT TRAINING JET PIPELINE TRAINING SITUATION ANALYSIS

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report documents the results of the Training Situation Analysis conducted for the Navy Undergraduate Pilot Training Jet Pipeline Training Situation Analysis. The objective of the Training Situation Analysis was to determine and identify the individual and tutorial media required to support the training in the Jet Advanced Flight Training Phase, which will utilize the VTX aircraft, beginning in mid 1980s. The results of Training Situation Analysis identified a complex of 5 devices which will provide optimum (continued on reverse side)

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support for the Jet Advanced Flight Training Phase. These devices are the Scan Trainer, VTX Cockpit Procedures Trainer, VTX Operational Flight Trainer, Operational Flight Trainer/Visual and VTX Air Combat Maneuvering Trainer. Since the VTX aircraft will replace both the T-2 and T-A4 which are utilized in the current jet flight training, the Training Situation Analysis, in addition to the recommendations for media, makes recommendations relative to the characteristics of the VTX aircraft.

SUMMARY

This report documents the results of a 15-month study, by a two-member team of Training Specialists, with assistance from other disciplines as necessary, in the conduct of the Navy Undergraduate Pilot Training (UPT) Jet Pipeline Training Situation Analysis (TSA). The objective of the TSA was to determine and identify the individual and tutorial media required to provide optimum training support for the Advanced Jet Flight Training Phase. A secondary objective was, if results of the TSA so indicate, to make recommendations relative to the desired characteristics of the proposed VTX aircraft.

The Operational Requirement (OR) 0944-PN, Multi-Role Jet Trainer Aircraft (VTX) (Draft) establishes the requirement for a training aircraft for both the intermediate and advanced undergraduate jet training. The VTX aircraft will replace both the T-2B/C and T-A4J aircraft, currently in use, in the mid-1980's. Concurrently with the planning for the development of the VTX aircraft, Chief of Naval Education and Training Support (CNET SUPPORT) Field Task Assignment (FTA) 50304-21-OR-57 tasked the Naval Training Equipment Center (NAVTRAEQUIPCEN) to conduct the TSA to determine and identify media requirements, which would be integrated with total VTX program plan. Procedures utilized in the conduct of the TSA were in accordance with an approved Plan of Action and Milestones (POA&M) and in harmony with CNET SUPPORT Instruction 1551.5 of 27 January 1975.

The results of the TSA are the determination and identification of the Individual and Tutorial Media which will provide optimum support for the Jet Advanced Flight Training Phase. The Individual Media for Academics Training and Flight Support Training is a multimedia mix and is documented in Appendix A. Based on the requirements of the specific behavioral objectives and the micro-analytical empirical analysis, a complex of five devices have been identified to be utilized in Flight Support Training. These devices correctly utilized within the training program, based on an optimum training sequence as documented within the report, will provide the necessary support to achieve the desired behaviors. These devices are identified as the Scan Trainer, VTX Cockpit Procedures Trainer, VTX Operational Flight Trainer, VTX Operational Flight Trainer with Visual, and VTX Air Combat Maneuvering Trainer. The micro-analytical translations for these devices are documented in Appendix E and the devices are described in Appendix F.

Recommendations are also made relative to the design characteristics of the VTX aircraft. Based on the available information pertinent to the future characteristics of strike fleet aircraft, it is recommended the VTX cockpit instruments, displays, controls, etc., reflect the technology and configuration of the strike fleet aircraft to affect a smooth pilot transition from the VTX aircraft to the fleet aircraft.

PREFACE

This report presents the results of the TSA for the proposed Navy UPT Jet Pipeline Training (Advanced Flight Training Phase). The TSA was conducted by the NAVTRAEQUIPCEN during the period of July 1976 through September 1977, under the sponsorship of CNET SUPPORT. The principal NAVTRAEQUIPCEN investigators were:

Mr. W. M. Komanski, Training Specialist, NAVTRAEQUIPCEN
Mr. R. E. Picton, Training Specialist, NAVTRAEQUIPCEN

We are indebted to Mr. R. W. Camp, Education Specialist, NAVTRAEQUIPCEN, for his contributions, midway through the task in the analysis and structuring of the material. The support, assistance and cooperation of CDR. D. Windsor, Chief of Naval Air Training (CNATRA) Staff (Code N-22), throughout the TSA is gratefully acknowledged. Other personnel providing assistance at intervals during the task were CDR. G. Norrington, Chief of Naval Operations (CNO) (OP-596) and CDR. J. Cade, Chief of Naval Education and Training (CNET) (Code N-422). We are also pleased to acknowledge the counsel and support of Dr. C. Havens (CNET SUPPORT, Code 01A), who developed and described the basic procedures for conducting Training Situation Analyses as set forth in CNET SUPPORT Instruction 1551.5, and Mr. C. Harrison (CNET SUPPORT, Code 01A1), who has coordinated this project at the CNET SUPPORT Staff level.

WMKomanski
W. M. KOMANSKI
Team Leader

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SECTION I

INTRODUCTION

BACKGROUND

This report describes the activities and methodologies utilized in the conduct of the Navy UPT Jet Pipeline TSA. The jet pilot pipeline training program being considered within this report will be implemented in 1986 and the VTX aircraft will be used. At the present, planning has been implemented to determine the follow-on replacement for the T-2 and TA-4 aircraft currently utilized in the jet pipeline flight training. The OR 0944-PN for Multi-Role Jet Trainer Aircraft (VTX) established the requirement for the VTX aircraft. Since the VTX aircraft will replace both the T-2 aircraft, used in the Intermediate Flight Phase, and the TA-4 aircraft, used in the Advanced Flight Phase, it is anticipated that the two phases will be consolidated into one VTX Flight Training Phase.

TRAINING SITUATION ANALYSIS OBJECTIVE

There are two TSA objectives:

a. To determine and identify the necessary instructional/simulation media requirements which will provide optimum support to the Navy UPT Jet Pipeline using the VTX aircraft.

b. To identify, through the TSA process, the desired characteristics of the VTX aircraft which will provide optimum support for the future Navy UPT Jet Pipeline Training.

SCOPE OF THE TASK

The TSA for the Navy UPT Jet Pipeline is unique in that it is timely, deals with a future time period (1986-2000) and that it will not only determine the media, but may influence the design characteristics of the VTX aircraft. It is timely since the TSA will be completed and media determined prior to the requirement for a budget submission for the VTX aircraft. The media are to be included as part of the overall VTX aircraft program. Dealing in the future is always a challenge. The Initial

Operational Capability (IOC) of the VTX aircraft is projected for 1986. Therefore, in performing the various stages of the TSA, the thought and analytical processes must reflect and be sensitive to the timeframe of 1986-2000 in the areas of: The role the naval aviator will have, the type of aircraft and weaponry that will be available, and the state of engineering technology in the media identified to support the training program. The scope of a TSA is usually confined to the identification and determination of media to support a training program. However, in this TSA, due to the future timeframe and since the characteristics and configuration of the VTX aircraft have not been established, the VTX aircraft is regarded as training media. As such, if results of the TSA so indicate, recommendations will be made to incorporate in the proposed VTX aircraft capabilities which would achieve the required pilot behavior.

The CNET SUPPORT, by FTA 50304-21-OR-57, tasked the NAVTRAEQUIPCEN to conduct the Navy UPT Jet Pipeline TSA, based on a POA&M which outlined a 15-month program, to accomplish the analysis. The TSA was initiated on 1 July 1976 and completed on 30 September 1977 with the publishing of the final report.

OPERATIONAL REQUIREMENT 0944-PN MULTI-ROLE JET TRAINER AIRCRAFT (VTX)

The OR for the VTX aircraft was released by CNO for comment in March 1977. At this point in time the TSA efforts were well under way; however, the information on the proposed capabilities of VTX aircraft was helpful in making comparisons of the proposed aircraft capabilities and the requirements of the developed specific behavioral objectives. In addition, the OR reinforced the requirement for the conduct of the TSA by stating the following: "In order to maximize the economies and training improvement projected, a system of training devices and simulators must be identified through the Instructional Systems Development (ISD) process to complement this aircraft. These training devices must be integral to the training matrix so that their full capability can be achieved. Further, their development and acquisition should be concurrent so that the entire system can be implemented together." It recognized that a TSA is an integral part of an ISD process.

The system and performance parameters/criteria cited in the VTX OR are as follows:

a. Criteria

Propulsion:	Twin-Jet/Turbofan
Crew Station:	Two-Seat, Tandem
Basing:	Carrier-Suitable
Armament:	Guns, Rockets and Practice Bombs

b. Parameters

Parameters	Threshold	Goal
Maximum Gross Weight	14,000 lb.	10,000 lb.
Maximum Level Flight Speed @ 40,000 ft.	0.8 Mach	0.9 Mach
Approach Speed (@ Maximum Landing Wt.)	115 Kts.	105 Kts.
Service Ceiling	40,000 ft.	40,000 ft.
Takeoff Run Critical Field Length	8,000 ft.	8,000 ft.
Maneuverability Sustained @ 15,000 ft. (at ACM Mission Wt.)	3.0 g.	4.0 g.
Range at Best Cruise w/Reserve (Internal Fuel Only)	1,000 NM (3.0 Hr. End)	1,000 NM (3.0 Hr. End)
Maintainability	7 DMMH/FH	5 DMMH/FH
Hourly Operating Cost (FY77 $) (POL + Limited Spares)	$210.00	$190.00
Low Level Segment of Hi-Lo-Hi Profile @ 500 Ft. & 360 Kts.	150 NM Radius	150 NM Radius

GUIDELINES UTILIZED IN THE CONDUCT OF THE TRAINING SITUATION ANALYSIS

The guidelines used in the conduct of the TSA are as delineated below:

a. It is recognized that many terms have been used to describe behavioral objectives; i.e., specific, criterion, terminal, primary, enabling, learning, etc. Basically, they are all objectives and describe behavior, conditions and standards. In the conduct of this TSA the term Specific Behavioral Objective (SBO) is used as specified in CNET SUPPORT Instruction 1551.5 of 27 January 1975.

b. The language of all SBO's to be compatible with that used in Bloom's et al Taxonomy of Educational Objectives.

c. All SBO's are considered equal and independent; there is no hierarchy of objectives.

d. Terminology used throughout the TSA conforms with the terms and definitions of CNET Instruction 1500.12 of 27 January 1975, Glossary of Navy Education and Training terminology, except as noted.

e. The conduct of the TSA is in consonance with the procedures set forth in CNET SUPPORT Instruction 1551.5, Procedures for Conducting Training Situation Analysis. However, due to the scope and character of the analysis as delineated in the approved POA&M, additional efforts and analysis beyond those cited in CNET SUPPORT Instruction 1551.5 were necessary in order to complete the TSA.

f. The analytical process to include examination of each SBO in the framework of frequency, difficulty and criticality.

g. Each SBO identified within this TSA is the required behavior at the indicated proficiency level achieved at and/or prior to graduation from UPT.

h. Each stage of the TSA was coordinated with representatives of CNATRA for review and comment.

TRAINING COMPLETED PRIOR TO ADVANCED (VTX) FLIGHT TRAINING

Prior to the initiation of the TSA process, it is essential to establish the Student Naval Aviator's pilot cognitive and psychomotor skill level on entry to the Jet Advanced Flight Training Phase. This information is used in the development of SBO's, assignment of proficiency level and the determination of difficulty and criticality. It is also helpful in the later stages of the TSA of identifying and determining media. Those SBO's achieved prior to the Jet Advanced Flight Training Phase and requiring no reinforcement will be identified as such, and will not be considered for further training. Behaviors achieved prior to the Jet Advanced Flight Phase and requiring reinforcement to maintain proficiency will be so annotated. New behaviors peculiar to, and to be achieved in the Jet Advanced Flight Training Phase will receive in-depth analysis in the areas of difficulty and criticality.

The training the Jet Student Naval Aviator receives in the present Navy Integrated Flight Training System (NIFTS) is reflected in figure 1. It is seen in figure 1 that prior to any flight training, the Student Naval Aviator received Environmental Indoctrination from the Naval Aviation Schools Command in the areas of:

AVIATION PHYSIOLOGY

a. Homeostasis
b. Body circulation and respiration
c. Acceleration - effects of g-forces
d. Hearing conservation
e. Disorientation - spatial disorientation
f. Hypoxia and hyperventilation
g. Dysbarism
h. Oxygen equipment
i. Hypoboric chamber flight
j. Vision - adaption to night vision.

PHYSICAL FITNESS

SWIMMING

a. Underwater swim
b. Treading water
c. Swim one mile (wearing flight suit)
d. Water survival - Dilbert Dunker Trainer.

SURVIVAL (LAND/SEA)

a. Safety/survival publications
b. Knowledge of equipment, and emergency and rescue procedures
c. Physiological requirements for life
d. Parachutes, personnel flight equipment
e. Signalling - search and rescue
f. Water survival laboratory and helicopter pickup

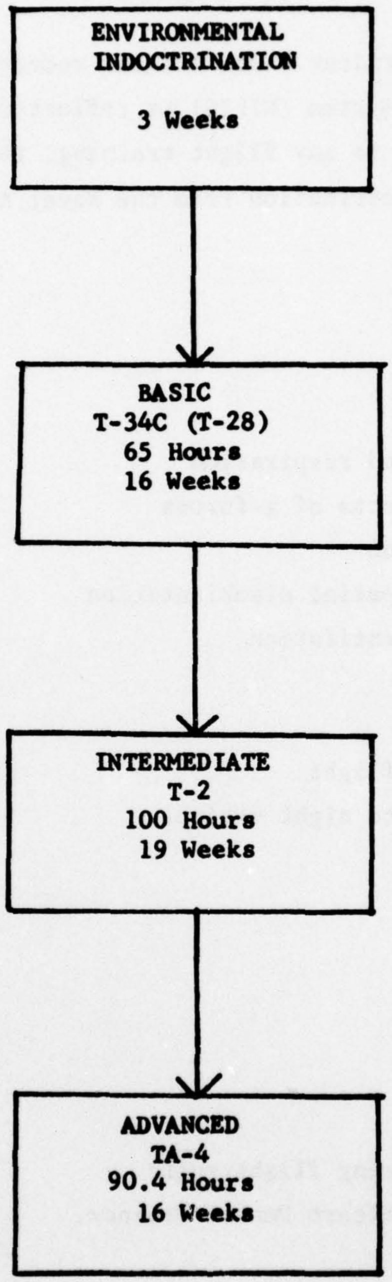


Figure 1. Jet Navy Integrated Flight Training System

g. Land survival laboratory

h. Parachute landing techniques

i. Parachute drag (LCM Trainer)

j. Survival hazards/first aid

k. Survival field training

l. POW survival

As seen in the present NIFTS (see figure 2) in the Basic Flight Training Phase, the Student Naval Aviator completes a 65-hour flight syllabus in the T-34C aircraft in which he acquires the necessary skills for entry in the present NIFTS Intermediate Flight Training Phase (with the advent of the VTX aircraft, it will be the Advanced Flight Training Phase). These skills, which the Student Naval Aviator will have upon completion of Basic Flight Training, are documented in Technical Report: NAVTRAEQUIPCEN IH-236. The training the Student Naval Aviator received in the Schools Command, and in Basic Flight Training, reflects the achievement of a number of SBO's to a definitive level of proficiency. In subsequent analysis, it was determined which of these SBO's require further reinforcement training to maintain proficiency, and/or additional training to achieve a higher level of proficiency, in order to meet the required standards for graduation from the CNATRA Jet UPT.

SPECIFIC BEHAVIORAL OBJECTIVE ALPHANUMERIC NUMBERING SYSTEM

The SBO alphanumeric numbering system was developed through a series of evolutions during the task analysis phase of the TSA. To facilitate use and identification of the SBO's, the alphanumeric numbering system directly correlates to the CNATRA training categories of Flight, Flight Support and Academics; i.e., F---nth Flight, FS---nth Flight Support, A---nth Academics. All SBO's listed in Appendix A are the behaviors the Naval Aviator should have achieved to the proficiency level indicated upon completion of the CNATRA UPT Program. The SBO's listed in the F category are generally achieved in Flight Training, with the exception of those SBO's with an interim proficiency level which are achieved in Flight Support Training and are so annotated in Appendix A. SBO's listed in FS category and A category are achieved in Flight Support Training and Academics Training.

FLIGHT TRAINING

STAGE	FLIGHTS	HOURS
Familiarization	17	25.8
Basic Instruments	8	13.0
Radio Instruments	6	11.2
Precision/Acrobatics	5	7.6
Formation	3	4.8
Night Familiarization	2	2.6
TOTALS	41	65.0

FLIGHT SUPPORT TRAINING

SIMULATOR	PERIODS	HOURS
T-34C CPT (2C42)	6	6.0
T-34C FIT (2B37)	16	20.8
TOTALS	22	26.8

SUBJECT	PERIODS	HOURS
Course Rules	1	1.0
Safety	1	1.0
Emergency Procedures	12	7.5
Flight Procedures	18	18.5
TOTALS	32	28.0

ACADEMICS TRAINING

SUBJECT	PERIODS	HOURS
Engineering	11	10.0
Aerodynamics	9	7.0
Flight Rules & Regulations	4	4.0
ASI	4	4.0
Meteorology	30	36.8
Instrument Navigation	18	20.8
TOTALS	76	82.6

Figure 2 . NIFTS Basic Phase Syllabus Summary

REPORT ORGANIZATION

In addition to Section I, there are two other major sections in the report. Section II, Description, outlines the methodology and procedures used to accomplish the Navy UPT Jet Pipeline TSA. Section III, Results, summarizes the findings and recommendations developed from the TSA. The appendixes contain substantive material which support the TSA findings and recommendations.

SECTION II

DESCRIPTION

INVESTIGATION AND DATA COLLECTION

In the preparation for the conduct of the Navy UPT Jet Pipeline TSA, one of the initial considerations was the role the Naval Aviator will have in the time period of 1986-2000, type of fleet aircraft to be flown and the mission to be completed. All these factors need to be examined carefully to determine whether the pilot tasks (behavioral requirements) in the future environment will change, which in turn will impact the subsequent task analysis effort of the TSA. Through discussions with CNO, Naval Air Systems Command (NAVAIRSYSCOM), CNET, CNATRA, and Naval Air Development Command (NADC) representatives, it appears that the dominant jet aircraft in the time period under investigation will be the F-18/A-18; the F-18 to replace the F-4; and the A-18 (attack version) to replace the A-7. Other jet aircraft in Navy inventory today, and will continue to be in inventory during the time period under investigation, are the F-14 and S-3. Thus, the UPT Jet Pipeline will primarily service the F-18/A-18, F-14 and S-3 pilot requirements. It is surmised that the role and mission of the Naval Aviator will remain relatively unchanged.

Based on the results of investigation and currently available information, the F-18/A-18 aircraft will be the dominant aircraft and the aircraft representing the latest technology in the time period of 1986-2000. The F-18/A-18 aircraft, under contract to McDonnell-Douglas, will be operational in the mid-1980's. A visit was made to the aircraft manufacturer to determine whether the new aircraft would have any new capabilities and/or characteristics which would require new pilot skills and/or increased emphasis on existing pilot skills. Based on the information obtained from the aircraft manufacturer and the on-site observations, the F-18 aircraft represents a fundamental change in configuration and technology from the present day fighter aircraft in use today; i.e., F-4 and F-14.

The F-18 aircraft is a single cockpit, one crewman (pilot) aircraft vice the F-4 and F-14 which are a two cockpit, two crewman (pilot and radar intercept officer) aircraft. With the single crewman concept, the pilot workload is increased; the pilot must perform his tasks in addition to the tasks of the radar intercept officer. To resolve this problem and allow one man to do the work of two, easily and efficiently, the traditional functional design of the cockpit has been extensively changed. The major changes include:

a. Elimination of the traditional round (dial) instruments and replace with Cathode Ray Tube (CRT) displays and digital readouts. There are multiple CRT's on the instrument panel with multimoded capability. All engine instruments are digital.

b. Heads-up display as the primary flight instrument which will provide all the information for flight and weapons delivery.

c. Communication and navigation control panel up front below the heads-up display for ease of pilot use.

d. Hands-on-throttle-and-stick concept which allows the pilot to control the aircraft, select and fire any of the weapons, or to control the radars and change its modes in the combat arena, while keeping his eyes on target.

The vast change in the configuration of the F-18/A-18 cockpit and the change to a single crewman concept infers changes and/or additions to specific areas of pilot skills. In subsequent phases of this TSA, as a result of the F-18/A-18 investigation, careful consideration was given to the preparation of SBO's in the areas of: heads-up display operation, interpretation of heads-up display, CRT, and radar symbology, aircraft systems management, and scanning techniques. Additionally, a case can be made for incorporating the F-18/A-18 cockpit technology into the VTX aircraft cockpit design characteristics. It appears that if the VTX aircraft cockpit reflected the same type of technology, which will be utilized in the F-18/A-18 aircraft, it would enhance the Jet Pipeline UPT by having the Student Naval Aviator in the posture of having the necessary skills to lessen the transition requirements to fleet type aircraft.

As part of the investigation and data collection phase, visits were made and discussions were held to establish the scope of the TSA, working relationships/coordination requirements, and current training materials used in the Jet Pipeline UPT program were collected. Visits to the various Naval Air Stations (Chase, Kingsville, Meridian, Pensacola) presently conducting the jet flight training were not required as the TSA team members were very familiar with the training operation, having visited these Naval Air Stations and observed the training on numerous occasions prior to the implementation of the TSA.

The NADC, chartered by the NAVAIRSYSCOM to develop the conceptual design characteristics of the VTX aircraft, conducted workshops on the status of their project. These were attended by a member of the TSA team. Pertinent information obtained was used as applicable in the conduct of the TSA. On a continuous basis, liaison was maintained with CNO, CNET, CNATRA, CNET SUPPORT, and NAVAIRSYSCOM representatives to gain and exchange information, as required.

TASK ANALYSIS

Using all the available sources of information and data resulting from the investigation, the UPT job/task inventory was instigated. Several approaches were used to develop the pilot job/task inventory. The first approach was to use the methodology developed and documented in the CNATRA UPT Task Analysis, Phase II report. This methodology separates the pilot tasks into six pilot roles: Controller, Environmental Analyst, Systems Manager, Navigator, Communicator, and Tactician. Using the pilot tasks already identified under these roles in the CNATRA Task Analysis, adding, modifying and refining the tasks as necessary, a pilot job/task inventory was prepared.

The second approach was mission oriented. Typical fighter/attack aircraft mission scenarios were developed and pilot tasks were identified for each stage of the mission; mission planning, takeoff, en route, tactics, return, and landing. The procedure was used on several mission scenarios.

The third approach was to use the Flight Stages, typically used in CNATRA UPT; i.e., Familiarization Stage, Basic Instruments Stage, Radio Instruments Stage, Formation Stage, etc. Pilot tasks were identified for each Flight Stage, culminating in a pilot job/task inventory.

An analytical examination of each approach was conducted to determine which would be more suitable for this particular TSA. The three pilot job/task inventories had many tasks in common; however, in the mission oriented inventory the emphasis was the tactical area and in the opinion of the TSA team would be more appropriate for use in a Fleet Readiness Squadron (FRS) situation. Examination of the pilot roles approach revealed an overlap of tasks between the pilot roles, which represented a redundancy which would present difficulties in accomplishing the later stages of the TSA, particularly in the effort to logically sequence the Student Naval Aviator achievement of the SBO's. The third approach of using the CNATRA Flight Stages as the basis for the pilot job/task inventory, and subsequent development of SBO's, appears to be the most suitable approach. With no hierarchy of objectives, use of the Flight Stages provides the opportunity for shaping the pilot behaviors by which existing simple skills are built upon to effect new and more complex skills. However, before the mission oriented and the pilot roles approaches were discarded, tasks within the two approaches regarded as valid for UPT were extracted and blended into one of the Flight Stages.

Having a completed pilot job/task inventory, and organized into a workable format, the next event was to translate the pilot job/task inventory into SBO's. The performance (psychomotor) objectives were prepared first. Next, the cognitive and affective objectives were written. Through a series of iterations the objectives were refined to reflect the action verbs and the format which are in accordance with Bloom's et al Taxonomy of Educational Objectives. Conditions and standards were written for all psychomotor and cognitive objectives; none were written for the affective objectives.

The TSA team recognized that the pilot job/task inventory and SBO's, in their present state, represented a self-generated effort. To assure validity of the SBO's, verification would be required from CNATRA and the FRS, who received the UPT graduate for training in fleet type aircraft. The SBO's were submitted to CNATRA for review and comment. Concurrently, the FRS's were visited with the objectives to:

a. Receive comment on the SBO's developed for the Navy UPT Jet Pipeline.

b. Discuss the capabilities of the present UPT graduate to meet fleet requirements.

c. Discuss Navy pilot skills/requirements for the future.

All of the FRS's surveyed expressed general satisfaction with the quality of UPT pilot graduates. The elimination rate was very minor or nonexistent. Individually, each FRS identified areas where increased emphasis in UPT would be of benefit in FRS training.

a. VS-41 (S-3)

(1) Low level flight (200-400 feet)
(2) Basic radar, Electronic Warfare (EW) training
(3) Inertial navigation
(4) Air refueling

b. VF-124 (F-4*) and VF-121 (F-14)

(1) Basic Air Combat Maneuvering (ACM) (one-on-one situation)
(2) High angle of attack, low airspeed (edge of the envelope) maneuvering
(3) Tactical formation
(4) Basic EW training
(5) Air refueling

c. VA-174 (A-7*)

(1) Two aircraft maneuvering flight (closures)
(2) Formation flight
(3) Dead Reckoning (DR) low level navigation
(4) Field Carrier Night Landing Practice
(5) Departed flight

*Replacement aircraft will be the F-18 and A-18.

SORT TO SPECIFIC BEHAVIORAL OBJECTIVES TO DOMAIN AND LEVEL (STAGE A)

Upon receipt of CNATRA's comments, resulting from their review of the SBO's and with the assimilation of the information gained from the FRS's, the SBO's were further refined to reflect the acquired information. The SBO's were now in the form to institute the analytical procedure leading to the classification of each SBO, as delineated in CNET SUPPORT Instruction 1551.5, and identified as Stage A, Sort to Domain and Level. Since the SBO's were prepared in accordance with Bloom's et al Taxonomy of Educational Objectives and with the correct use of verbs, the domain is readily established by the initial verb of the SBO. Figures 3, 4 and 5 illustrate represented verbs used for each domain.

The assignment of the proficiency level the Student Naval Aviator is to achieve for each SBO at graduation from UPT requires a thorough analysis of several factors. One of the prime factors considered was the terminal behavior requirements established for the pilot graduating from the Advanced Jet Flight Training Phase. CNATRA Instruction 1542.20B dated 20 September 1976, states, "The objective of this curriculum is to produce qualified naval aviators to meet fleet needs and prepare the student for transition to fleet operational aircraft. Each stage within this curriculum provides an indoctrination (exclusive of the instrument stage) to the essential flight experiences that the student will encounter initially in the fleet. The instrument stage will fully qualify the student for a standard instrument rating and develop habit patterns and reflexes that will produce rapid and safe transition while flying on instruments in fleet aircraft. Particular emphasis is placed upon developing self-confidence and judgement in the student pilot."

Other factors considered in the analysis of assigning pilot proficiency levels were:

a. Criticality and/or difficulty of the behavior.

b. Behavior achieved in prior training and requiring no further reinforcement and/or higher proficiency level.

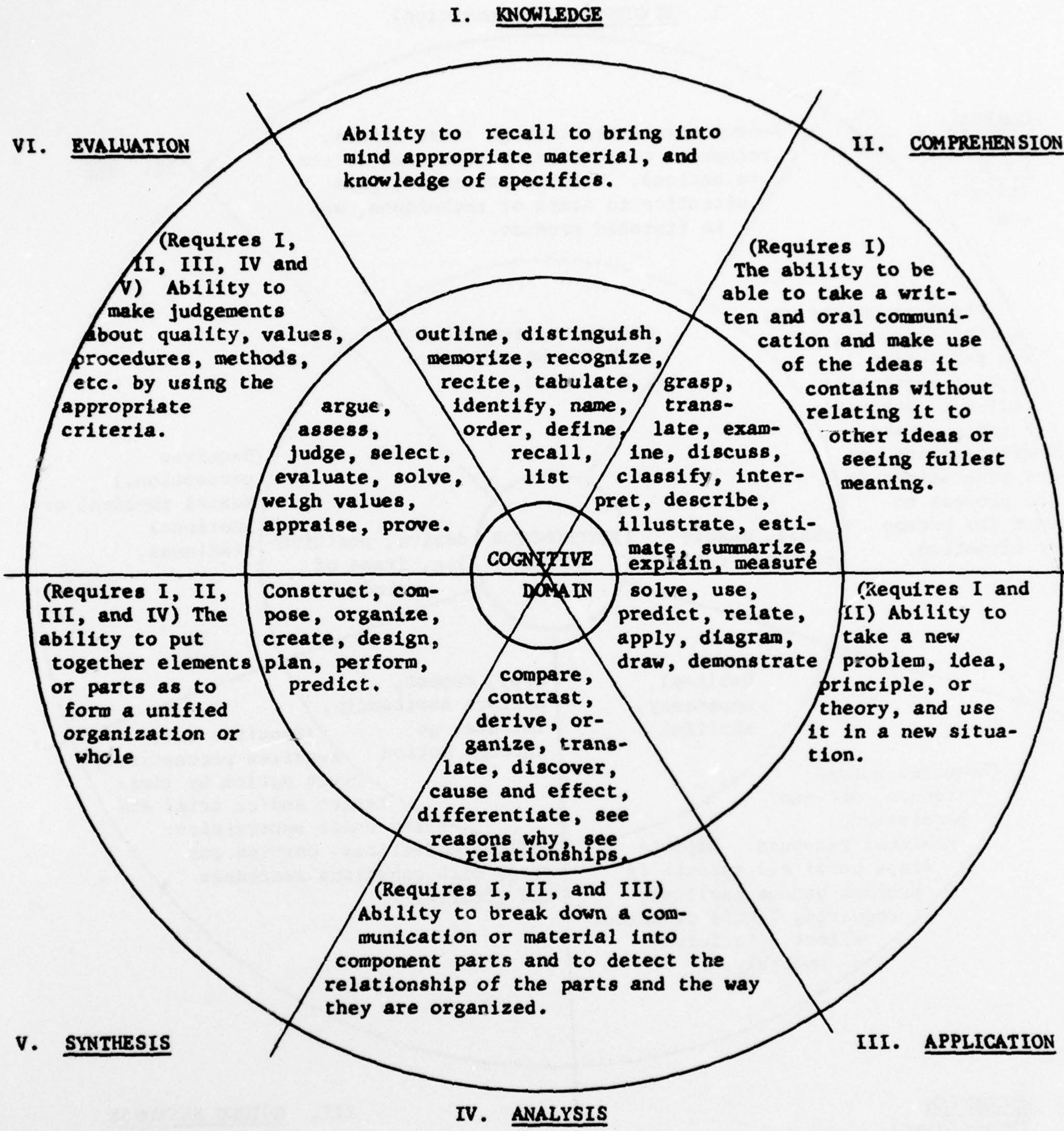


Figure 3. Cognitive Behaviors and Verbs

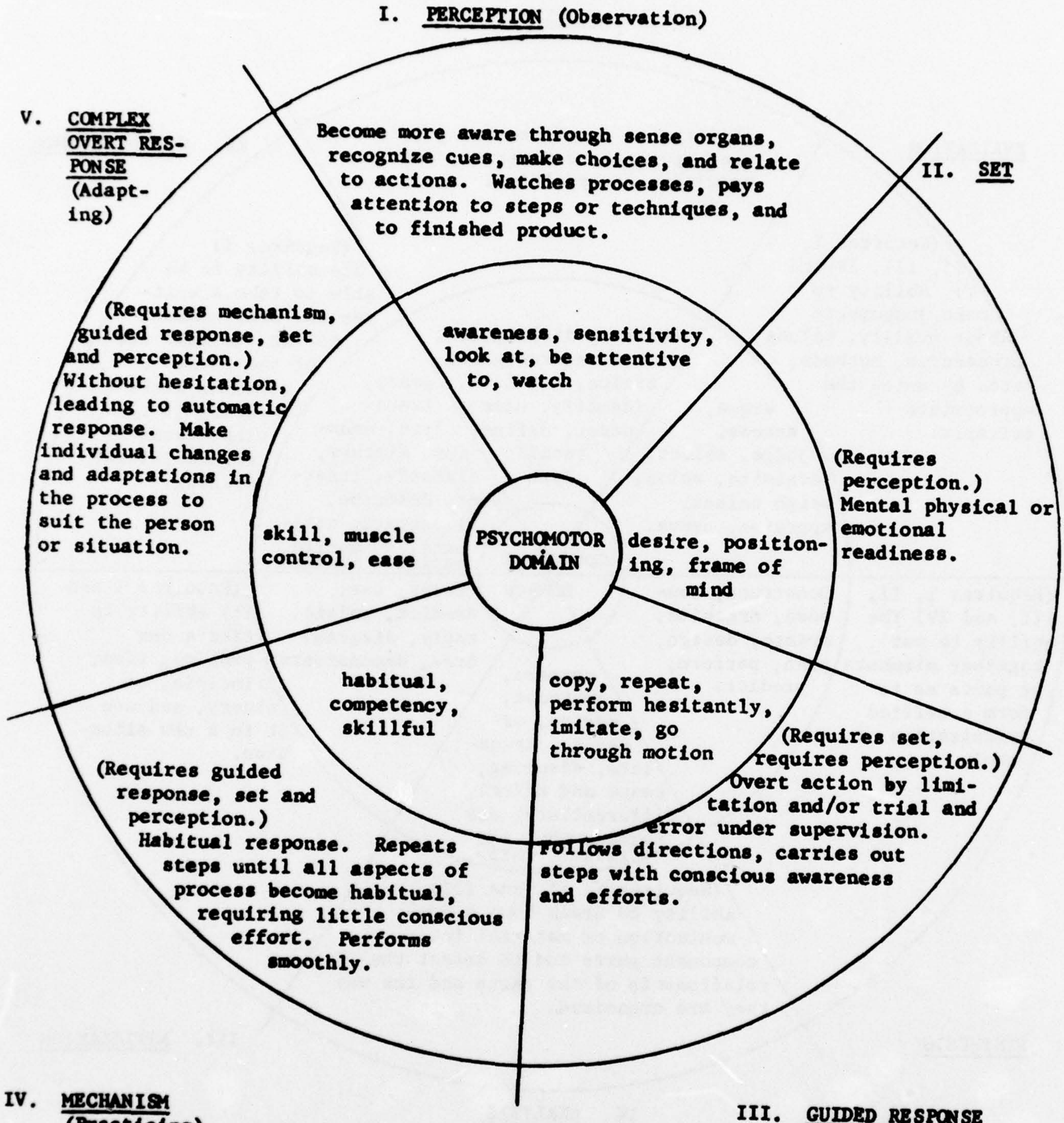


Figure 4. Psychomotor Behaviors and Verbs

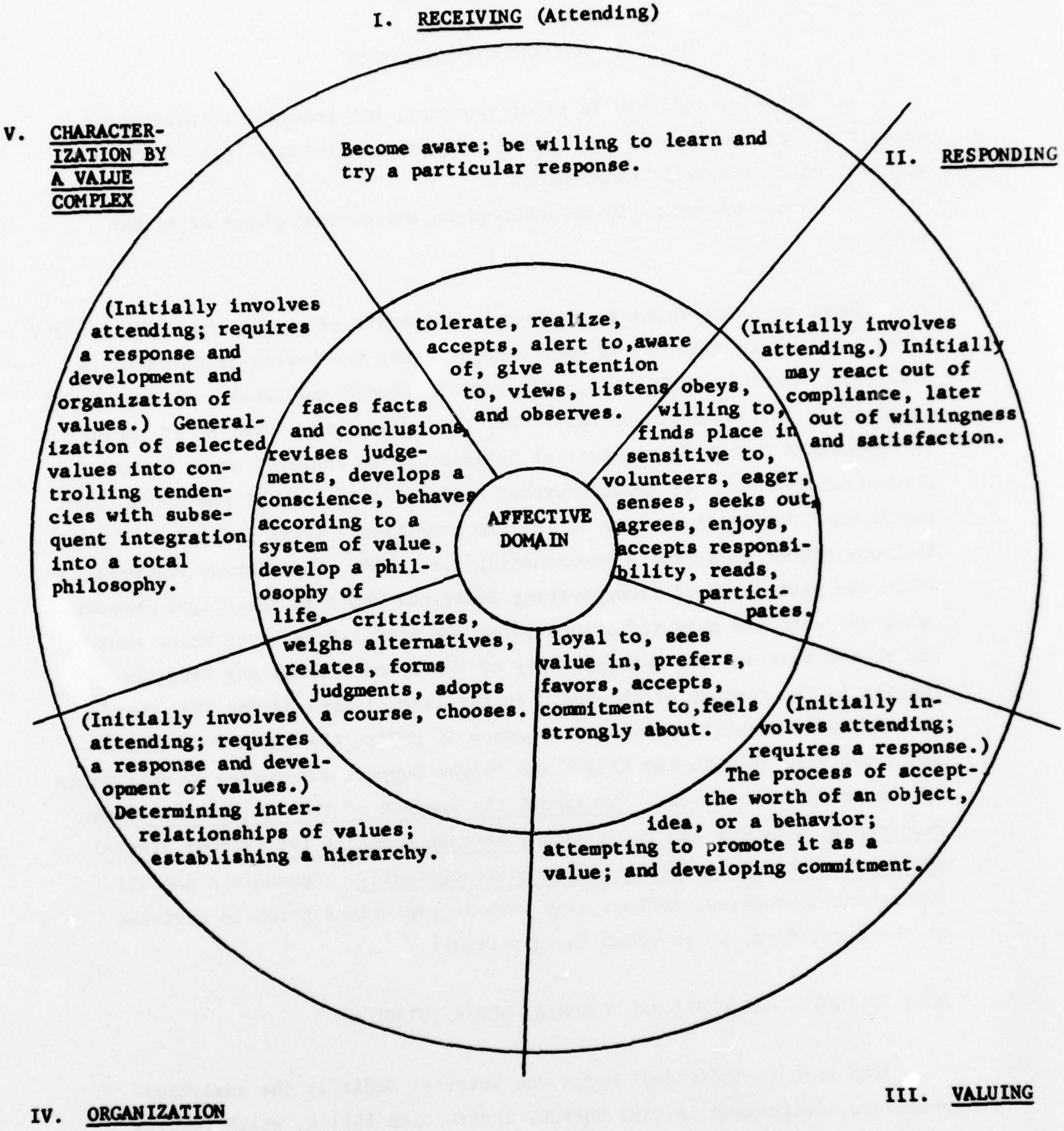


Figure 5. Affective Behaviors and Verbs

c. Behavior achieved in prior training, but requires reinforcement to maintain proficiency or to achieve a higher proficiency level (skill acquisition versus skill maintenance).

d. A new behavior, to be achieved in the current phase of flight training.

Based on these factors, empirical judgements were made and a proficiency level assigned to each SBO of each domain, using the levels illustrated in figures 3, 4 and 5. The SBO's, with sort to Domain and Level, are documented in Appendix A. It should be noted that the proficiency level as it appears in Appendix A is the final level of behavior to be achieved on or before graduation for UPT. It should further be noted that many of the SBO's, with the Alpha F designation, have an interim proficiency level indicated by proficiency number level and a parenthesis; i.e., (4). This format was used to avoid the redundancy of incorporating identical SBO's in the Flight Support category, with the only difference being the proficiency level which would add to the bulk and the manageability of the items without any tangible benefit in the conduct of the TSA. In the later stages of the TSA, particularly media identification and sequence of SBO's, the Alpha F designated SBO's are used in both the Flight and Flight Support categories as determined by the proficiency level. Throughout the conduct of the TSA, events though recorded as singular and in sequence, were in practice (at various stages) multiple, with efforts being conducted concurrently. Appendix A and all subsequent appendixes, reflect many interim evolutions prior to arriving at the final form, as recorded in this report.

SORT TO INDIVIDUAL MEDIA AND TUTORIAL MEDIA (STAGE B)

The sort to Individual Media and Tutorial Media is the analytical procedure, delineated in CNET SUPPORT Instruction 1551.5, which results in the assignment of the SBO's to a type of media which will effectively support the training to achieve the behavior to the designated proficiency level. Individual Media are identified as Print, Audio-visual (Static), Audio-visual (Dynamic) and Part-task Trainer (Static). Tutorial Media are identified as Part-task Trainer (Dynamic), Whole-task Simulator and Flight (Airplane). For the purposes of this TSA, the definitions for the two types of media are:

a. Individual Media - A means for presenting instructional material to learners with a minimum of instructor intervention.

b. Tutorial Media - A means for presenting instructional material to an individual learner by direct interaction with an instructor.

In the actual sort to a category within the Individual and Tutorial Media types, each SBO was analytically examined relative to its Domain and Level, whether it is a new behavior to be achieved or a behavior to be reinforced; and its learning difficulty. As a generality, cognitive SBO's met the criterion for assignment to a category of Individual Media and in contrast psychomotor SBO's met the criterion for assignment to a category of Tutorial Media. The criteria used throughout the sorting procedure was that the lowest order of medium complexity was always selected which would achieve the required behavior. The sort to Individual and Tutorial Media is documented in Appendix B. It should be noted that for many of the SBO's, multiple categories of media are assigned. This is based on the judgement that more than one category of media is required for the student to achieve the designated proficiency level. The final proficiency level for the majority of psychomotor SBO's is achieved only in Flight (Airplane); however, the Individual and Tutorial Media provide the necessary instructional support for the Student Naval Aviator's shaping process, leading to the achievement of the required behavior.

SORT TO ACADEMICS, FLIGHT SUPPORT AND FLIGHT (CNATRA TRAINING CATEGORIES) (STAGE C)

The objective of the sort to Academics, Flight Support and Flight categories is to determine where in the CNATRA instructional environment the SBO's will be achieved; i.e., Academics, Flight Support and Flight. Completion of Stage C identifies within the CNATRA training categories, where each SBO is introduced, where reinforced and where final proficiency level is achieved. Since there is no hierarchy of SBO's, where necessary, to allow for the shaping process in the acquisition of the designated behavior, the SBO's were used in more than one training category.

The analytical procedure utilized to accomplish the sort to the three training categories was to examine each SBO as to its content, domain and level, and then make an assignment to one or more of the training categories. Appendix C documents the results of sort to the training categories. Since Appendix C is a multipurpose form, the pertinent information for the training category sort is identified under the heading, Training Phases. To make the information more relevant, the annotation in the Training Phases column is the numerical proficiency level achieved in that phase.

Upon completion of sorting the SBO's to the CNATRA training categories, Academics, Flight Support and Flight, a further analysis was conducted by performing a correlation to ensure that the SBO's would support each other. Each Academics SBO was examined and a determination made as to what SBO's they supported in the Flight Support and Flight training categories. A count was maintained to see the number of times SBO's were used. Concurrently with this analysis the Academics SBO's were clustered into compatible instructional areas and given titles such as Engineering, Aerodynamics, Radio Instruments, etc., for later use in the TSA. Continuing with the correlation, the same analytical procedure was used to determine the relationship and supportability of the Flight Support SBO's to the Flight SBO's. The procedure was reversed, Flight and Flight Support SBO's were independently examined to determine if an Academics SBO provided adequate support and the number of times it provided support to the Flight and Flight Support SBO's. For example, to perform a takeoff, a pilot uses a wide range of related behaviors where the proficiency level is achieved in Academics (i.e., Engineering, Aerodynamics, Meteorology, Flight Rules and Regulations, etc.). During this exercise, when a void was discovered, additional SBO's were prepared, as necessary, to provide adequate support. The results of this analytical procedure validated the correlation and mutual support of the SBO's. Additionally, a basis was established for the development of an optimum training sequence which is addressed in later stages of the TSA.

MERGE TO COMPOSITE OF MEDIA AND CATEGORIES (STAGE D)

The Merge to Composite of Media (Stage D), as delineated in CNET SUPPORT Instruction 1551.5, is a merging process which compiles the information contained in Stages B and C on one form. However, Stage D, as documented in its final form in Appendix C, provides an additional dimension beyond the requirements of CNET SUPPORT Instruction 1551.5, which is readily usable in implementing the final stage of the TSA; i.e., micro-analytical/empirical translations to relate to specifications or military characteristics. The SBO's in Stage B were sorted only to types of media, Individual or Tutorial, and to categories within the two types. The dimension added to Stage D is the determination, selection and identification of the specific medium which will support each SBO. In the Individual Media sections in the Appendix C format the selected media is identified by name; i.e., Programmed Instruction, Graphic Aid, Safety Publications, Cockpit Procedures Trainer, Operational Flight Trainer, etc. The selected medium is identified either by an abbreviation or a symbol. Appendix D contains a legend which explains the abbreviations and symbols and provides definitions of each medium. Appendix C contains all the results of the TSA analytical processes, completed to this point, condensed on one form. It provided the basis for completing the remaining portions of the TSA.

MICRO-ANALYTICAL EMPIRICAL TRANSLATIONS TO RELATE TO SPECIFICATIONS OR MILITARY CHARACTERISTICS (STAGE E).

The objective of Stage E is to conclude the merging process of the previously classified SBO's by establishing a positive relationship to a specified medium. Stage E is the final stage of the TSA per CNET SUPPORT Instruction 1551.5. The micro-analytical empirical translations provide for full accountability and complete visibility of the SBO's as they relate to the requirement for a medium, and to the specific capabilities required of the selected medium. Stage E was performed in accordance with the format established in CNET SUPPORT Instruction 1551.5. As indicated in CNET SUPPORT Instruction 1551.5, the six media identified in Stage D are the basis for the micro-analytical translations; the airplane is not considered a medium. A total of nine translations are identified to accomplish the analysis and are indicated in figure 6.

NUMBER OF TRANSLATIONS REQUIRED (CUMULATIVE)	MEDIUM	CATEGORY
1	Print	Academics
2	Print	Flight Support
3	A-V Static	Academics
4	A-V Static	Flight Support
5	A-V Dynamic	Academics
6	A-V Dynamic	Flight Support
7	P-T Trainer (Static)	Flight Support
8	P-T Trainer (Dynamic)	Flight Support
9	Whole-Task Simulator	Flight Support

Figure 6. Media Micro-Analytical Translations

It should be noted that in performing the micro-analytical empirical translations, the SBO's identified as achieved in training prior to the Advanced Flight Training Phase and requiring no further reinforcement, and so annotated in Stage A, are not identified to a medium in this process. Additionally, in the selection of simulation media, those SBO's that can be achieved in a lower order of complexity simulator are included and can be achieved in the next higher level of complexity of simulator. In particular, SBO's which can be achieved in a Cockpit Familiarization Trainer are included in and can be achieved in a Cockpit Procedures Trainer; thus, the SBO's which can be achieved in the Cockpit Procedures Trainer are included and can be achieved in the Operational Flight Trainer. The micro-analytical empirical translations are primarily a clustering process resulting in the grouping of tasks which reflect the characteristics of the selected medium.

MEDIUM <u>PRINT</u> CATEGORY <u>ACADEMICS</u>

In the micro-analytical empirical translation for the Academics Training, the print medium identified was Programmed Instruction text. The SBO's identified in Stage D for this medium were first clustered in compatible subject areas, and then to broaden into typical CNATRA Academics Training titles, which will be useful when the curriculum is to be developed. All of the titles which evolved are standard to the current CNATRA Flight Training with the exception of one new title and area. The standard titles are Engineering, Aerodynamics, Meteorology, Flight Rules and Regulations, Instrument Navigation, and Operational Navigation; the new addition is Jet Operations. This is a logical addition as reflected by the requirements of the SBO's. Particularly, with the advent of the VTX aircraft and curriculum, the Student Naval Aviator will progress directly from the Basic Flight Training Phase, utilizing the T-34C aircraft to the Advanced Flight Training Phase, using the VTX aircraft; Appendix E documents the above.

MEDIUM <u>PRINT</u> CATEGORY <u>FLIGHT SUPPORT</u>

The same procedures used for the print medium for Academic Training were used for the print medium to be utilized in Flight Support Training. Again, the SBO's were extracted from, and as identified in Stage D, clustered into compatible subject areas. The subject areas evolved from the SBO's. Some of the identified print material are published standard Navy documents. Other material will have to be prepared as part of the Advanced Flight Training Phase curriculum. Appendix E documents the results.

MEDIUM <u>AUDIO-VISUAL (STATIC)</u> CATEGORY <u>ACADEMICS</u>

The micro-analytical translation of the SBO's to an audio-visual (static) medium revealed 30 applicable SBO's. This audio-visual (static) is a photo-mockup, providing a full size pictorial display of the interior cockpit and side panels, with the capability of being folded into carrying size. The intended use is that the audio-visual (static) be provided to the student on his arrival in the Advanced Flight Training Phase, for his use during all learning situations, to assist him in achieving the required SBO's in Academics and to prepare him for Flight Support Training. Appendix E documents the results.

MEDIUM AUDIO-VISUAL (STATIC) CATEGORY FLIGHT SUPPORT

The micro-analytical translations of SBO's to audio-visual (static) to support Flight Support Training resulted in a requirement for a number of graphic aids. Appendix E documents the requirements. Each graphic aid was given a title dependent upon the subject of the clustered SBO's.

MEDIUM AUDIO-VISUAL (DYNAMIC) CATEGORY ACADEMICS

The micro-analytical translation of SBO's to audio-visual (dynamic) to support Academics Training resulted in a requirement for three dynamic demonstrators. These devices will support the training of the student in the acquisition of cognitive skills in the basics of radar, electronic warfare and heads-up display operation. Appendix E documents and describes the devices.

MEDIUM AUDIO-VISUAL (DYNAMIC) CATEGORY FLIGHT SUPPORT

The micro-analytical translations of SBO's to audio-visual (dynamic) to support Flight Support Training resulted in the requirement for three dynamic demonstrators; one (radar) was previously identified in Academics Training. Appendix E documents and describes the devices.

MEDIUM PART-TASK TRAINER (STATIC) CATEGORY ACADEMICS

VTX Ejection Seat Mockup

The micro-analytical translations of the SBO's to a part-task trainer (static) in support of Academics Training resulted in the requirement for the device, a VTX Ejection Seat Mockup. Appendix E documents and describes the device.

MEDIUM PART-TASK TRAINER (STATIC) CATEGORY FLIGHT SUPPORT

Cockpit Familiarization Trainer (CFT)

The micro-analytical translations of the SBO's to a part-task trainer (static) resulted in the initial requirement for the device, a VTX CFT, supported by 20 SBO's. A subsequent trade-off analysis was conducted to determine the requirements for both the CFT and the Cockpit Procedures Trainer (CPT). Since the analysis had established a definitive requirement for the CPT it was determined to be cost-effective to incorporate the CFT requirements into the CPT. The SBO's were transferred to the CPT and the requirement for the CFT was deleted.

MEDIUM PART-TASK TRAINER (DYNAMIC) CATEGORY FLIGHT SUPPORT

Utilizing the information contained in Stage D, the performance of the micro-analytical empirical translations of the SBO's and the resultant clustering of the objectives established an initial requirement for the types of part-task trainers (dynamic) as identified:

a. Scan Trainer
b. VTX CPT
c. VTX Visual Trainer
d. VTX Flight Instrument Trainer
e. VTX Air Combat Maneuvering Trainer

SCAN TRAINER. The objective of the Scan Trainer is to train the Student Naval Aviator in the effective use of the eyes in the performance of pilot tasks throughout a flight mission (from ground-to-ground). No formal training in the use of the eyes is conducted within the CNATRA Pipeline UPT program. The effective use of eyes in developing pilot effective inside, outside and time-sharing scan patterns within the aircraft cockpit cannot be overemphasized, in view of the flight environment and aircraft performance; i.e., high-performance aircraft, crowded skyways, the mix of civilian, commercial, and military aircraft.

Originally, the requirement for the Scan Trainer was identified for the CNATRA Basic Flight Training Phase and is documented in NAVTRAEQUIPCEN Technical Report: NAVTRAEQUIPCEN IH-238, Training Situation Analysis Study for the T-34C Expanded Primary Flight Training Phase. There are 21 SBO's identified in the performance of the micro-analytical translations. However, as previously explained within the report and annotated in Appendix A, these behaviors are only representative, and are inseparable, from and contiguous to all pilot behaviors. The optimum place to initiate scan pattern training is in Basic Flight Training and then reinforce it in Advanced Flight Training. With the advent of the VTX aircraft in flight training, the Student Naval Aviator will transition from Basic Flight Training where he flew the T-34C, a relatively moderate performance turbo-prop aircraft, to the Advanced Flight Training Phase flying the VTX aircraft. The pilot's reaction time and response to changing flying situations must be quick, including the scanning tasks.

The Scan Trainer has the capability of providing training in eye accommodation exercises, speed reading of the cockpit instruments and displays, and eye exercises to improve peripheral vision. Time-sharing training is provided by requiring the student to speed read instruments, make control movements to maintain desired flight attitude and at the same time detect intruders (targets) which enter his field of vision. The micro-analytical translations are documented in Appendix E and the Functional Description (FD) of the device is provided in Appendix F.

VTX COCKPIT PROCEDURES TRAINER. The micro-analytical translation of the SBO's, from Stage D and subsequent clustering of the SBO's as documented in Appendix E, establishes a requirement for a Part-task (Dynamic) Trainer. The trainer will provide training in the acquisition of pilot behaviors related specifically to the VTX aircraft cockpit orientation and familiarization, familiarization and use of the aircraft system, controls and displays, use of checklists, and performance of normal and emergency procedures. Correctly, utilized in the training situation, as proposed in the following Optimum Training Sequence, the Student Naval Aviator will acquire the required procedural skills which are directly transferable to the operation of the VTX aircraft; little or no checkout of the student by the instructor will be required during the initial introduction to the aircraft. The CPT provides the only opportunity for the acquisition of pilot skills in the implementation of many of the emergency procedures; since due to safety considerations, they cannot be practiced in the aircraft. Appendix F provides the FD for the device.

VTX VISUAL TRAINER. The micro-analytical translations of the SBO's, as extracted from Stage D and the subsequent clustering as documented in Appendix E, establish a requirement for a Part-task Trainer (Dynamic) which will provide training in the acquisition of pilot visual task skills related to the VTX aircraft. Based on the requirements of the SBO's the trainer will have the capability to provide training in day/night visual pilot tasks associated with aircraft ground operations, takeoffs, landings, stalls, formation flight, in-flight refueling, and carrier operations. Correct utilization of the VTX Visual Trainer, as indicated via the following Optimum Training Sequence, will allow the achievement of the required proficiency level identified in Flight Support Training for the SBO's documented in Appendix A. This will allow for ease of transition to the final proficiency levels in the VTX aircraft. Appendix F documents the FD for the device. The VTX Visual Trainer, though identified as a separate entity, is not a stand-alone device and in the training situation will be attached to and integrated with the VTX Operational Flight Trainer (OFT) (identified later in this section).

VTX FLIGHT INSTRUMENT TRAINER (FIT). The micro-analytical translations of the SBO's, as identified in Stage D and the subsequent clustering, established an initial requirement for a Part-task Trainer (Dynamic) which will provide training in the acquisition of pilot skills and reinforcement of skills already learned related to operation and use of electronic navigation aids, instrument scan, communication procedures, and limited emergency procedures. Prior to further documentation of this requirement, it was decided to conduct a trade-off/cost analysis as to whether the FIT would be justified in view of the established requirement for an OFT (see Whole-task Trainer identified later in this section).

The trade-off included a comparison of the number of SBO's in each type of device and sequencing the utilization of the FIT and the OFT as an entity, to determine which offered the most training effective/cost-effective approach. Though both the combination and the OFT were both training effective in achieving the required behaviors, a cost analysis determined that the initial procurement cost of the OFT was only ten percent more than the FIT. Even the combination of the two devices versus the OFT did not significantly decrease the cost. Therefore, based on the rationale that no significant cost savings would occur in the initial procurement, and over the trainer life cycle support, the FIT was deleted. The SBO's identified with the FIT were transferred to and incorporated in the OFT.

VTX AIR COMBAT MANEUVERING (ACM) TRAINER. The micro-analytical translations of the SBO's, as identified in Stage D, and the subsequent clustering (documented in Appendix E) established a requirement for Part-task Trainer (Dynamic) which will provide training in air combat maneuvers, air-to-air weapon delivery and air-to-ground weapon delivery to prepare the Student Naval Aviator with the necessary skills and confidence for progression through the ACM Flight Training Stage. Air combat maneuvering and the associated air-to-air weapon delivery and air-to-ground weapon delivery are both difficult and critical pilot tasks requiring precise maneuvering, outstanding airmanship and split-second reaction to ensure mission completion and/or pilot and aircraft survivability. In performance of air combat maneuvers the aircraft are operated to the structural limits under high "G" forces, high angle of attack and low airspeed (edge of the envelope), and in departed flight. The trainer will have the capability to provide training of all in-flight maneuvers such as acrobatics, stalls, spins, departed flight, one-on-one maneuvering, air-to-air weapon delivery, and air-to-ground weapon delivery. Appendix F documents the FD for the device.

MEDIUM <u>WHOLE-TASK SIMULATOR</u> CATEGORY <u>FLIGHT SUPPORT</u>

VTX OPERATIONAL FLIGHT TRAINER. The micro-analytical translations for the SBO's identified in Stage D and the subsequent clustering (documented in Appendix E) established a requirement for a Whole-task Simulator which would provide training in the acquisition and reinforcement of pilot's skills related to the pilot's operational environment. The trainer will have the capability to provide training in ground operations; ground emergencies; instrument operation; instrument and airways navigation; HUD operation and use; and in-flight emergencies. It will support the acquisition of pilot behaviors required in a nonvisual environment. Appendix F documents the FD for the device.

VTX OPERATIONAL FLIGHT TRAINER W/VISUAL (OFT/V). This identification of the Whole-task Simulator is not a micro-analytical translation per se, but a combining and integrating of previously established requirements for a VTX Visual Trainer (identified in Part-task Trainer (Dynamics)) and the OFT (identified in paragraph 1 above) into one integral device. The purpose was to provide flexibility in the subsequent sequencing procedure of the TSA and in the further decision process of selecting the media for procurement. Integration of the two devices expands the capability of providing training in selected visual tasks in union with nonvisual tasks as encountered in the flight operational environment. No separate micro-analytical translations and FD for this device were generated.

OPTIMUM TRAINING SEQUENCE

The key to an effective UPT program is the correct sequence of prerequisite knowledge and skills and the acquisition of these skills at the correct time to allow the shaping process (existing simple skills are built upon to effect new and more complex skills) to take place throughout the training program to achieve the required terminal behavior. A critical element in achieving a behavior is the correct utilization sequence of the selected media, particularly the simulation media. The training effectiveness of simulation media can be diminished, nullified or even negative training can occur by the improper sequencing (too early or too late). The correct sequence will determine not only the optimum sequence for achievement of behaviors and the optimum use of simulators, but the hours each student will use the trainer to achieve the required behavior. From this information the number of trainers needed to support the program can be determined.

The methodology used in developing the sequence was to key the SBO to be achieved prior to and/or during a category of training; i.e., Academics, Flight Support; a stage of Flight Training; i.e., Familiarization, Basic Instruments, etc., and/or a block of training. To develop the sequence, the results of the analysis completed in Stage C, Sort to Academics, Flight Support and Flight (training categories) was utilized as a departure point. The syllabi used in the current NIFTS jet pipeline Intermediate and Advanced

Flight Training Phases were examined as to the sequence of training and how the training hours are utilized to provide background for this sequencing effort. Figures 7 and 8 summarize the syllabi for the NIFTS Intermediate and Advanced Flight Training Phases. Recognizing the technical expertise inherent in the CNATRA community, relative to UPT, assistance was requested, for a prediction as to a future syllabus utilizing the VTX aircraft. CNATRA's conceptual syllabus is reflected in figure 9. It is emphasized that the syllabus in figure 9 is conceptual in nature, has no official CNATRA status and is subject to change as the VTX program is further established. In dealing with future events, it is necessary to hypothesize, in order to initiate planning, based on the best information available. The conceptual syllabus was of notable assistance in the formulation of the optimum training sequence, depicted in figures 10 and 11.

In utilizing the conceptual flight syllabus identified in figure 9, the flight stages Familiarization, Acrobatics and High Angle of Attack were grouped under Familiarization; Radio Instruments, Airways Navigation and Advanced Airways Navigation were grouped under Radio Instruments/Navigation; and Day/Night Formation were grouped under Formation. This terminology is reflected in figures 10 and 11. The flight hours in Basic Instruments were decreased and divided between Operational Navigation and Carrier Qualification based on behavioral requirements. Total flight hours remained unchanged. These modifications are reflected in figure 12. Figure 10 illustrates the sequencing of the SBO's to achieve the shaping process. Figure 11 provides the recommended training sequence to achieve the desired pilot behavior. Figures 10 and 11 should be used together for optimum results.

SIMULATION MEDIA REQUIREMENTS

To determine the number of each type of simulation medium required to support the Jet Advanced Flight Training Phase, each medium had to be placed for optimum utilization within the Optimum Training Sequence and utilization (student) requirements (in hours) resolved. To accomplish the above, the following guidelines/assumptions were used:

FLIGHT TRAINING

STAGE	FLIGHTS	HOURS
Familiarization	19	28.5
Basic Instruments	3	4.5
Radio Instruments	3	4.5
Airways Navigation	5	8.3
Operation Navigation	4	5.2
Formation	16	24.0
Night Familiarization	2	3.0
Gunnery	10	12.0
Carrier Qualification	11	10.0
TOTALS	73	100.0

FLIGHT SUPPORT TRAINING

SIMULATOR	UNITS	HOURS
T-2C OFT (2F-101)	29	43.5
TOTALS	29	43.5

SUBJECT		
ASI	1	2.0
Cockpit Orientation	3	4.0
Course Rules	2	4.0
Emergency Procedures	1	2.5
Flight Procedures	50	48.2
TOTALS	57	60.7

ACADEMICS TRAINING

SUBJECT	UNITS	HOURS
Aeronautics	17	17.8
Instrument Navigation	21	23.0
Meteorology	13	12.7
Visual Navigation	16	20.2
ASI	3	3.0
Communication	3	2.0
Recognition	3	2.0
TOTALS	81	88.2

Figure 7. NIFTS Intermediate Phase Syllabus Summary

FLIGHT TRAINING

STAGE	FLIGHTS	HOURS
Familiarization	6	8.4
Basic Instruments	1	1.4
Radio Instruments	2	2.8
Airways Navigation	6	8.3
Formation	5	7.0
Tactical Formation	3	4.2
Night Familiarization	4	5.6
Operational Navigation	4	5.2
Weapon Delivery	15	16.5
Air Combat Maneuvering	15	18.0
Carrier Qualification	13	13.0
TOTALS	74	90.4

FLIGHT SUPPORT TRAINING

SIMULATOR	PERIODS	HOURS
TA-4J OFT (2F-90)	28	56.0
Visual (2B35)	7	12.5
TOTALS	35	68.5

SUBJECT	PERIODS	HOURS
ASI	3	3.0
Cockpit Orientation	3	4.0
Course Rules	3	1.0
Emergency Procedures	7	8.0
Flight Procedures	15	21.0
TOTALS	29	37.0

ACADEMICS TRAINING

SUBJECT	PERIODS	HOURS
Engineering	20	15.0
Flight Rules and Regulations	6	5.0
Instrument Navigation	20	20.7
Aerodynamics	13	10.5
Meteorology	20	15.1
Operational Navigation	13	10.3
TOTALS	92	76.6

Figure 8. NIFTS Advanced Phase Syllabus Summary

FLIGHT TRAINING

STAGE	FLIGHTS	HOURS
Familiarization	8	11.2
Acrobatics	10	14.0
Basic Instruments	9	12.6
Radio Instruments	6	8.4
Airways Navigation	4	5.6
Night Familiarization	4	5.6
Day Formation	12	16.8
Night Formation	4	5.6
Operational Navigation	6	8.4
High Angle of Attack	4	5.6
Advanced Airways Navigation	4	5.6
Air to Air Gunnery	9	12.6
Air Combat Maneuvering	11	15.4
Air to Ground Weapons	9	12.6
Carrier Qualification	12	10.8
	112	150.8

OPERATIONAL FLIGHT TRAINER

STAGE	PERIODS	HOURS
Emergency Procedures	13	26.0
Night Familiarization	1	2.0
Basic Instruments	10	20.0
Radio Instruments	9	18.0
Airways Navigation	9	18.0
High Angle of Attack	3	6.0
Advanced Airways Navigation	9	18.0
Carrier Qualification	3	6.0
	57	114.0

Figure 9. Conceptual VTX Advanced Phase Syllabus Summary

BLOCK	0	1	
		FAMILIARIZATION	
FLIGHT		SPECIFIC BEHAVIORAL OBJECTIVES INTRODUCED F1-F44, F47-F54-1, F55, F56, F61-F64, F66-F92, F105-F109, F112-F117, F120, F121, F124, F125	SPECIFI F4 F5 F1 F1 NOTE:
FLIGHT SUPPORT		SPECIFIC BEHAVIORAL OBJECTIVES ACHIEVED F1-F33, F38-F44, F47-F54-1, F55, F56, F61-F64, F67-F91, F105-F109, F112-F117, F120, F121, F124, F125, FS1-FS7, FS9-FS29, FS31-FS58, FS60-FS67-1, FS68-FS74, FS79-FS108, FS121-FS131, FS138, FS145-FS156, FS158-FS160, FS162, FS185, FS186, FS248	SPECIFI F4 F5 F1 F1 FS FS FS FS
SIMULATORS	Ejection Seat Trainer (EST) Prior to VTX Flight	See Figure 11	
ACADEMICS	Specific Behavioral Objectives Achieved Prior to Advanced Flight Training. Environmental Survival, A1-A30.	SPECIFIC BEHAVIORAL OBJECTIVES ACHIEVED Engineering: A31-A54, A56-A69, A72, A73 Aerodynamics: A74-A109, A111-A114, A117-A123 Flight Rules & Regulations: A170-A184, A186 Jet Operations: A248-A262	SPECIFI Meteoro A124-

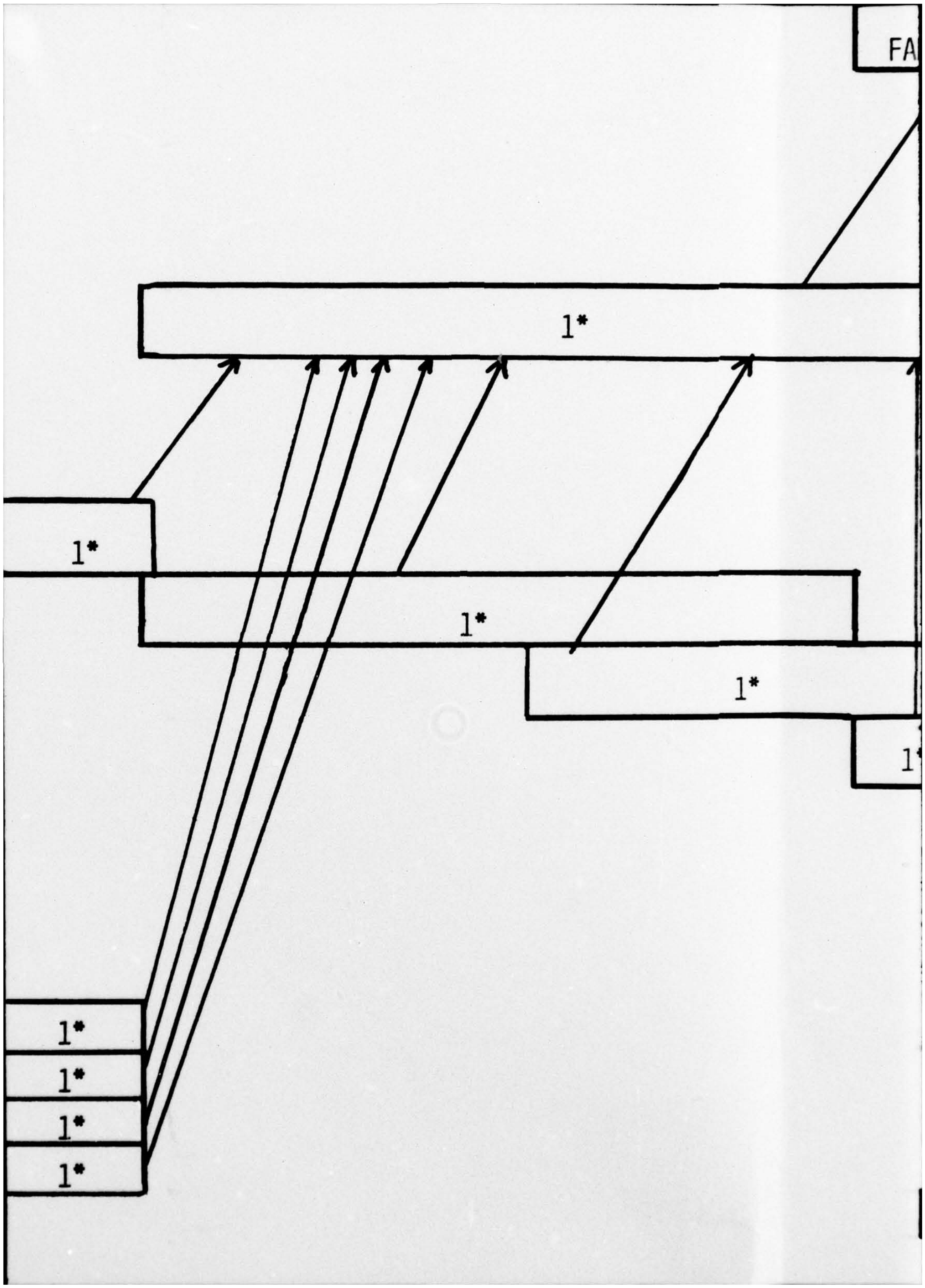
(A)

4	5	6	7	8
RADIO INSTRUMENTS/NAVIGATION	NIGHT FAMILIARIZATION	FORMATION	AIR-TO-AIR GUNNERY	ACM
<u>SPECIFIC BEHAVIORAL OBJECTIVES INTRODUCED</u> F156-F183, F185, F187-F189 <u>NOTE</u>: Includes Airways Navigation	<u>SPECIFIC BEHAVIORAL OBJECTIVES INTRODUCED</u> F190-F210	<u>SPECIFIC BEHAVIORAL OBJECTIVES INTRODUCED</u> F211-F238 <u>NOTE</u>: Includes Day/ Night Formation	<u>SPECIFIC BEHAVIORAL OBJECTIVES INTRODUCED</u> F246-F252	<u>SPECIFIC BEHAVI OBJECTIVES INTRO</u> F253-F260
<u>SPECIFIC BEHAVIORAL OBJECTIVES ACHIEVED</u> F156-F183, F188, F189, FS193-FS195, FS199-FS236, FS238-FS240, FS241-FS247, FS249-FS251	<u>SPECIFIC BEHAVIORAL OBJECTIVES ACHIEVED</u> F190-F196, F200-F210, FS252-FS274	<u>SPECIFIC BEHAVIORAL OBJECTIVES ACHIEVED</u> F212, F214, F218-F223, FS275-FS340	<u>SPECIFIC BEHAVIORAL OBJECTIVES ACHIEVED</u> F246-F252, FS356, FS358-FS368, FS371	<u>SPECIFIC BEHAVI OBJECTIVES ACHI</u> F253-F260, FS369, FS3 FS372-FS37
See Figure 11	See Figure 11	See Figure 11	See Figure 11	See Figure 1
<u>SPECIFIC BEHAVIORAL OBJECTIVES ACHIEVED</u> <u>Meteorology</u>: A160-A169 <u>Instructor Navigation</u> A187-A212 <u>Jet Operations</u>: A232		<u>SPECIFIC BEHAVIORAL OBJECTIVES ACHIEVED</u> <u>Flight Rules & Regulations</u>: A185 <u>Jet Operations</u>: A222-A229, A233-A236	<u>SPECIFIC BEHAVIORAL OBJECTIVES ACHIEVED</u> <u>Engineering</u>: A70, A71 <u>Jet Operations</u>: A230, A239	<u>SPECIFIC BEHAVI OBJECTIVES ACHI</u> <u>Aerodynamics</u>: A110 <u>Jet Operations</u>: A237, A238, A240-A243

8	9	10	11
ACM	AIR-TO-GROUND WEAPONS	OPERATIONAL NAVIGATION	CARRIER QUALIFICATION
IC BEHAVIORAL VES INTRODUCED 53-F260	SPECIFIC BEHAVIORAL OBJECTIVES INTRODUCED F253-F260	SPECIFIC BEHAVIORAL OBJECTIVES INTRODUCED F261-F275	SPECIFIC BEHAVIORAL OBJECTIVES INTRODUCED F276-F294
IC BEHAVIORAL IVES ACHIEVED 253-F260, S369, FS370, S372-FS375	SPECIFIC BEHAVIORAL OBJECTIVES ACHIEVED F253-F260, FS369, FS370, FS372-FS375	SPECIFIC BEHAVIORAL OBJECTIVES ACHIEVED F261, F262, F268, F269, F271, F274, F275, FS30, FS198, FS377-FS401	SPECIFIC BEHAVIORAL OBJECTIVES ACHIEVED F276, F277, F280-F287, F289-F294, FS402-FS414
Figure 11	See Figure 11	See Figure 11	See Figure 11
IC BEHAVIORAL IVES ACHIEVED namics: erations: , A238, -A243		SPECIFIC BEHAVIORAL OBJECTIVES ACHIEVED Aerodynamics: A115, A116 Operational Navigation: A212-A221	SPECIFIC BEHAVIORAL OBJECTIVES ACHIEVED Engineering: A55 Jet Operations: A244-A247

Figure 10. Specific Behavioral Objectives Sequencing Plan

(C)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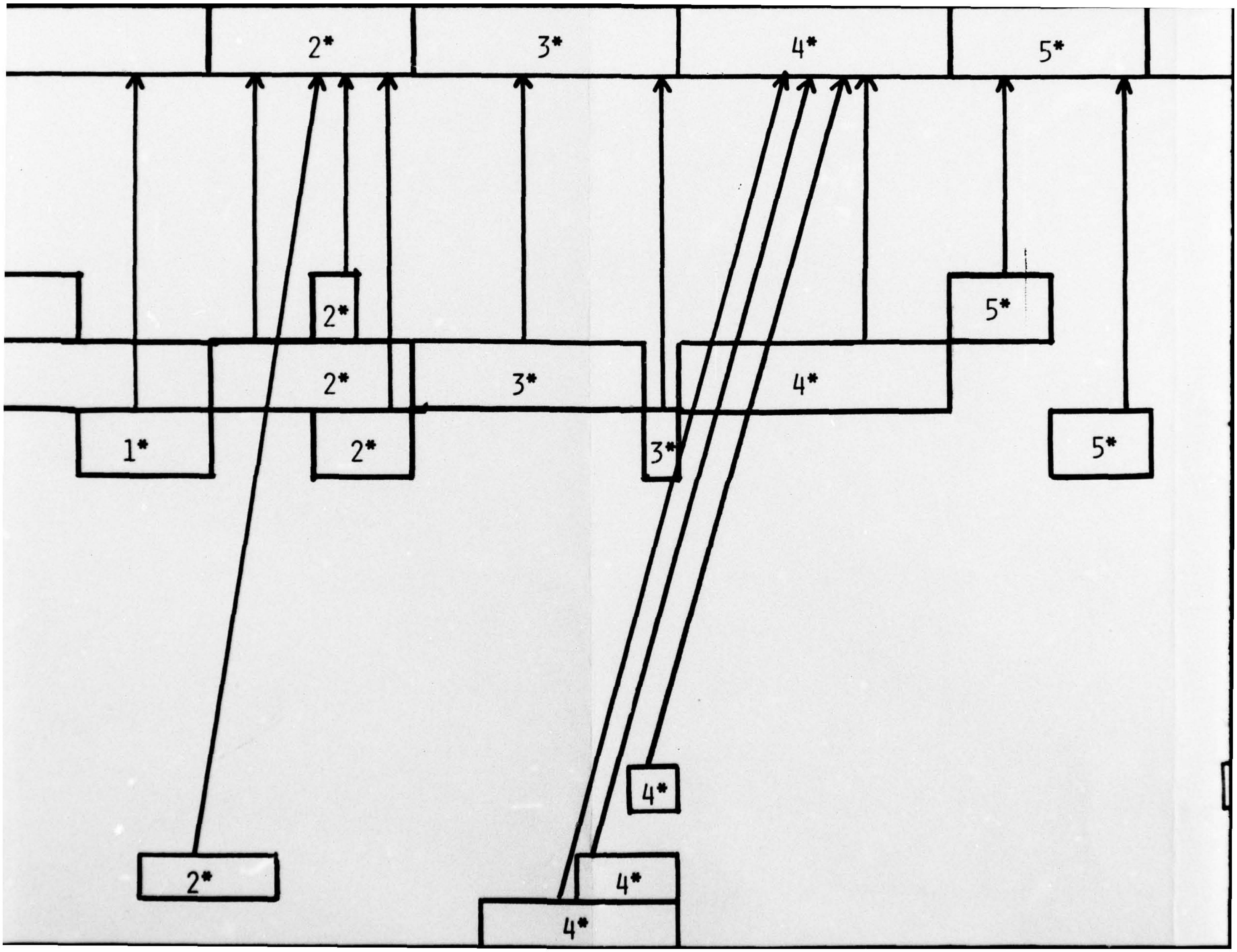

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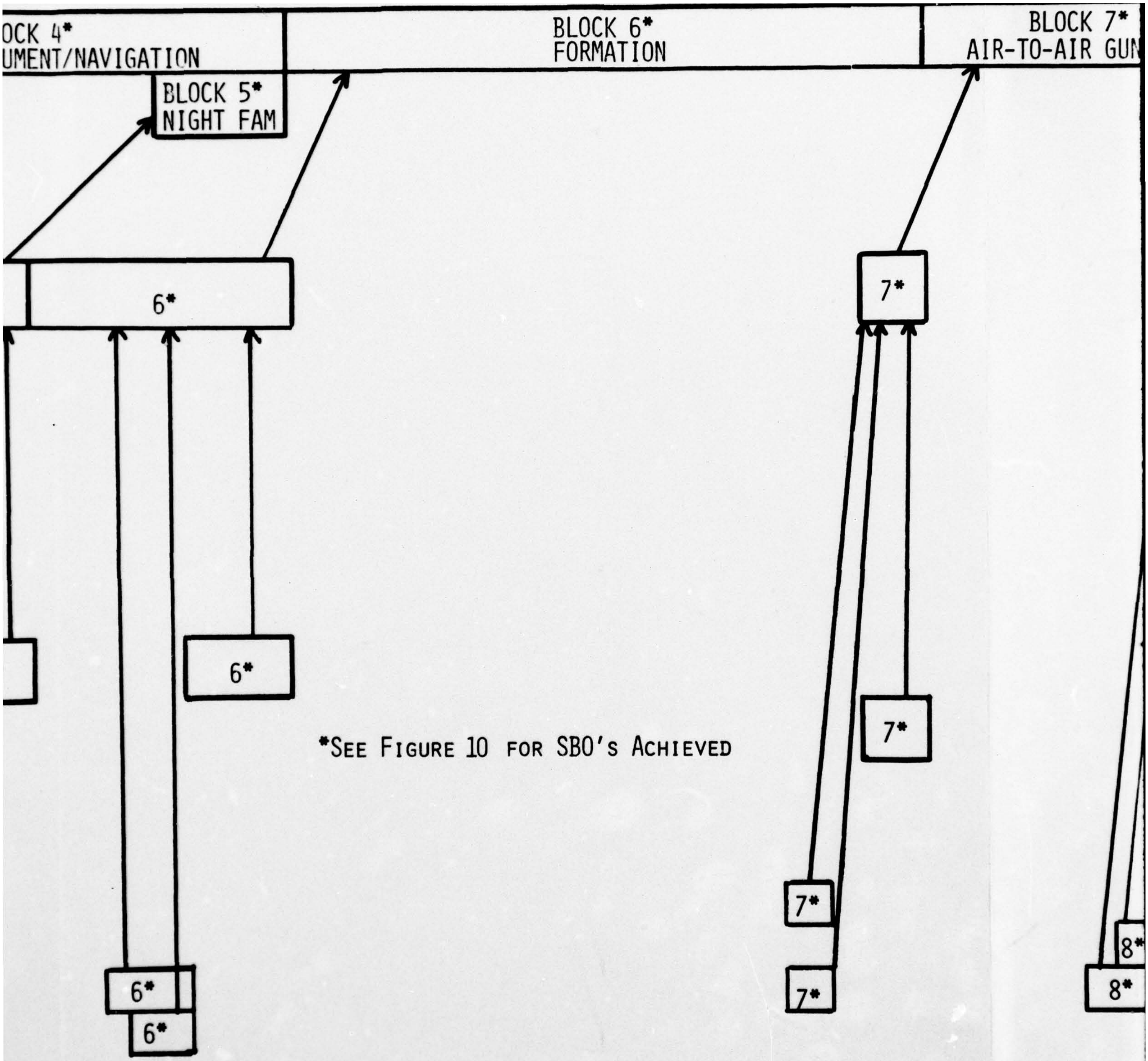

OCK 4*
UMENT/NAVIGATION
BLOCK 5*
NIGHT FAM
BLOCK 6*
FORMATION
BLOCK 7*
AIR-TO-AIR GUN
6*
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6*
6*
7*
7*
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*SEE FIGURE 10 FOR SBO'S ACHIEVED

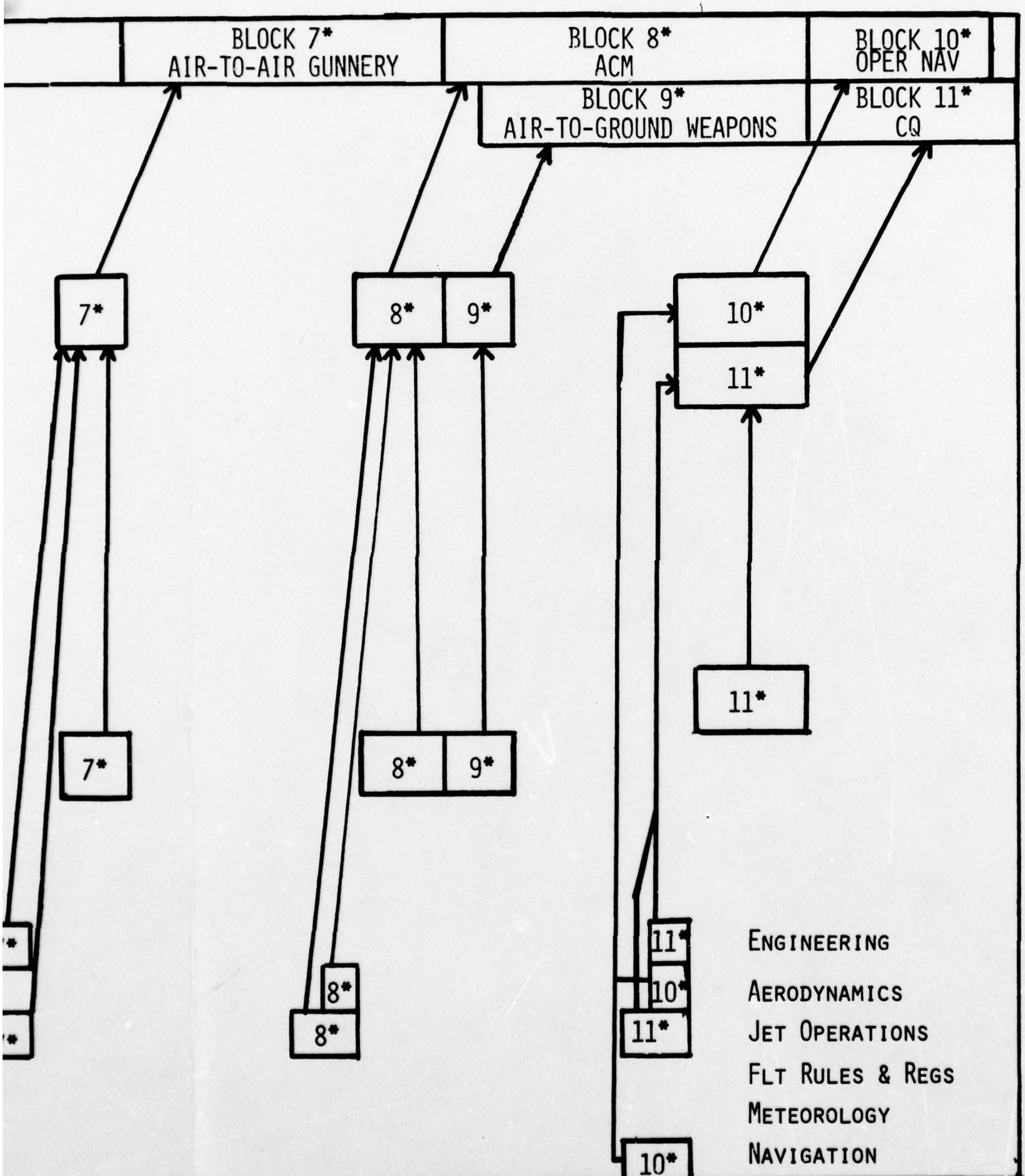

Figure 11. Sequencing Plan for Training

D

FLIGHT TRAINING

STAGE	FLIGHTS	HOURS
Familiarization	22	30.8
Basic Instruments	5	7.0
Radio Instruments/Navigation	14	19.6
Night Familiarization	4	5.6
Day/Night Formation	16	22.4
Operational Navigation	8	11.2
Air to Air Gunnery	9	12.6
Air Combat Maneuvering	11	15.4
Air to Ground Weapons	9	12.6
Carrier Qualification	14	13.6
TOTALS	112	150.8

FLIGHT SUPPORT TRAINING

SIMULATORS	PERIOD	HOURS
Scan	*	6.5
CPT	10	20.0
OFT	25	50.0
OFT/Visual	9	18.0
ACM	10	20.0
TOTALS	54	114.5

SUBJECT

Titles to be determined

ACADEMICS TRAINING

Engineering		
Aerodynamics		
Meteorology	*	*
Flight Rules and Regulations		
Instrument Navigation		
Operational Navigation		
Jet Operations		

*Hours and/or periods to be determined

Figure 12. Proposed VTX Advanced Phase Syllabus Summary (conceptual)

a. The Jet UPT would be conducted at three sites: NAS Meridian, NAS Kingsville and NAS Beeville. (Information furnished by CNATRA.)

b. The Jet Pilot Training Requirement (PTR) in the 1985/6 was 636 (Information furnished by CNO (OP-596)). Allowing for a ten percent attrition, the student pilot input to the Jet Advanced Flight Training Phase is approximately 700.

c. The formula used for determining the number of trainee stations is:

$$\frac{\text{No. of Trainees Per Year} \quad \text{X} \quad \text{No. of Hrs. Req. Per Trainee}}{\text{Training Hours Per Day (12)} \quad \quad \text{Training Days Per Year (240)}} = \text{Basic No. of Trainers}$$

$$\text{Basic No. of Trainee Stations} + \text{10\% Trainee Stations For Trainee Fluctuation} + \text{10\% Basic Trainee Stations For Trainee Changing Position} = \text{Trainee Stations Required}$$

d. Training hours per day used are 12. Training days per year are 240.

Within the Optimum Training Sequence the placement of each specific type of simulator was determined by the SBO's which generated the requirement for the simulator. A thorough analysis of the available information was performed in order to determine the number of hours each student will require in each type of simulator to achieve the stated behavior. The pertinent SBO's were again closely examined as to their criticality and difficulty. CNATRA Jet Intermediate and Advanced Syllabi, shown in figures 6 and 7, were scrutinized relative to the traditional and historical use of "like" simulators. Jet FRS Syllabi were also examined for the same information. Based on this analytical process, an empirical judgement was made as to the number of hours each student would use each simulator to achieve the desired behavior. Using the formula listed in paragraph c. above, the computations were made and the number of devices were determined. The hours and number of types of devices are listed on the following page.

Device	Hours	Computation Number	Actual Number Required for Three Sites
Scan	6.5	1.89	3
CPT	20.0	5.88	6
OFT	50.0	14.70	15
OFT/V	18.0	5.31	6
ACM	20.0	5.88	6

It should be noted that the number of devices will adequately support the 700 student per year input at three sites, with the hours designated for each device, but does not provide for any increase in students or device utilization hours. Any change in these two factors will require a recomputation of the number of devices. It is further noted that, in the opinion of the TSA team, the conceptual flight training syllabus of 150.8 hours represents an austere flight program to achieve the desired pilot behavior; which, without optimum simulation media support, would require an increase in flight hours.

SECTION III

RESULTS

CONCLUSIONS

The results of this TSA provide an opportunity to include, as a part of the overall planning and ultimate acquisition program for the VTX aircraft, the simulation media which will provide optimum support for the Jet UPT Pipeline Flight Training Phase. Simulation media's use as a substitute for flight training is on the increase in the military. This impetus is expected not only to continue, but gain momentum during the next 10 years. There are several substantial reasons for this trend:

a. Anticipated fuel shortages.

b. Department of Defense direction to decrease flight time by 25%.

c. Costs of aircraft operation continues to increase due to fuel and maintenance expenses. The ratio of aircraft hourly operation cost versus hourly simulator cost can be as high as 10:1.

d. Advances in simulation technology continue to reflect increases in sophistication and fidelity of the dynamics and control responsiveness of simulators. Visual systems have made notable advances and awareness is developing as to their potential for flight training. It is anticipated during the next 10 years, with the incentives now present, that additional advances in visual systems technology will be accelerated, resulting in improved training effectiveness. Motion systems will be improved not only to provide on-set pilot cues but to sustain pilot cues through the improvement and use of such devices as the G-Seat.

e. Training environment favors simulators; factors such as simulator reliability and availability vice compromises due to airspace congestion, weather, aircraft availability, and safety.

To realize the full potential of the training effectiveness of the simulation media, not only must specific simulators be scheduled and utilized at the correct intervals within the curriculum to achieve the desired pilot behavior, but the students progress must be evaluated relative to the proficiency level required at the conclusion of a simulator segment of training. Technology exists within the simulation media to provide an objective evaluation of the student performance. What is needed is the development of standards of performance by which the student can be graded objectively. This will allow the student and the instructor to know the exact status of the student's progression toward the achievement of the desired behavior proficiency level. Along with using an objective evaluation to make the most effective use of the simulation media, a systematic training procedure should be established which would require the student, prior to flying the aircraft, to pass a simulator "check ride," equivalent to the flight which would be performed in the aircraft. This procedure would allow for more effective use of the available aircraft flight time.

In correlation with the above, the flight training program should have inherent flexibility to accommodate the student pilot to achieve the required pilot behaviors in the most expeditious and effective manner, consistent with flight safety. The Student Naval Aviator entering the Jet Advanced Flight Training Phase, has successfully completed the Basic Flight Training Phase and has acquired certain pilot skills which will require only reinforcement to maintain the skills. Therefore, students who can demonstrate proficiency on the first flight or any subsequent flight within a particular flight stage, should be able to proceed in the learning of new pilot tasks and applying the flight time to those tasks where proficiency is to be acquired allowing more effective use of the available aircraft flight time.

The OR (0944-PN), Multi-Role Jet Trainer Aircraft (VTX), establishes a requirement for a training aircraft for both Intermediate and Advanced Jet Training. The VTX aircraft is to replace the T-2 and TA-4 aircraft. This is a departure from the traditional approach of using derivatives of contemporary fleet strike aircraft which represent a unique opportunity for the development of an aircraft which will reflect the characteristics to meet the precise Navy training requirements. In the investigative phases of the TSA, inseparable from the information and data obtained relative to the primary objective of the TSA of determining and identifying media, information was obtained which could affect the design characteristics of the VTX aircraft. The cockpit configuration of the VTX aircraft should reflect the same technology of the fleet aircraft in inventory, with the same time-frame as the VTX. Dominant among the fleet aircraft will be the F-18/A-18 aircraft, with its extensive cockpit changes. The inclusion of the technology represented by the F-18/A-18 will accustom the Student Naval Aviator to the environment he will encounter in fleet aircraft and facilitate a smooth transition to fleet aircraft.

FINDINGS

Though previously stated in this report, it is reiterated that optimum simulation media support is required in order for the Student Naval Aviator to graduate from the Advanced Jet Flight Training Phase with the required skills for progression to fleet aircraft. The proposed reduction in flight hours, as indicated in the conceptual syllabus, coupled with the pilot transition requirements from the T-34C aircraft to the VTX aircraft presents a challenge in pilot skill acquisition, which can be achieved only with adequate simulation media support. The simulation media identified, as a result of this TSA and correctly utilized, will provide the necessary training support to prepare the Student Naval Aviator to effectively utilize the available VTX flight training hours and achieve the required pilot behavior.

RECOMMENDATIONS

Individual Media

The individual media (identified in Appendix E), as a result of the micro-analytical empirical translations, will adequately support the Academics Training and Flight Support Training Phases in the acquisition of the necessary prerequisite cognitive skills. This will prepare the Student Naval Aviator with the proper background for progression through the Jet Advanced Flight Training Phase. As identified, the individual medium supports the student centered, individualized instruction and self-paced concept. It is anticipated that in the interval between the present and the implementation of the jet flight training program using the VTX aircraft, some 10 years hence, the individual media will be completely automated by electronic means, such as Computer Aided Instruction (CAI).

New areas requiring training have been identified and as a result of the analysis are recommended for inclusion in Academics Training and are identified in Appendix E. The new subjects to be introduced in Academics Training and reinforced as necessary throughout the training program are the Heads-Up Display, Radar and Electronic Warfare. The VTX aircraft will incorporate the Heads-Up Display system which will be new to UPT as the current aircraft, T-2 and T-A4, do not have this capability. To achieve the desired proficiency in the use and operation of the Heads-Up Display, which the pilot must set up for various modes of operation, interpret and respond to the displayed symbology in the operational flight environment, requires the initial acquisition of system management techniques in Academics Training. An Audio-Visual (Dynamic), identified in Appendix E, provides media support for this requirement. Follow-up training support is provided by the inclusion of the Heads-Up Display system in the Whole-task Simulator.

The requirement for inclusion of radar and electronic warfare is the result of the survey of the Jet FRS's. The survey results indicated that if the Navy pilot entering fleet training was cognizant of the basics of radar and electronic warfare, it would provide the necessary background for acquisition of skills in the complex radar and electronics warfare systems utilized in fleet aircraft. Media support, which will provide an awareness and a familiarity with the capabilities of the two systems will include a programmed text under the subject area of Jet Aircraft Operations and Audio-visual (Dynamic), identified in Appendix E.

It is considered the Audio-visual (Static), Photo Mockup, identified in Appendix E will be an invaluable aid in the introduction of the Student Naval Aviator to the VTX cockpit configuration. Properly used in training, the student will be familiar with and will be able to locate all the controls, instruments, displays, switches, etc., prior to starting Flight Support Training in the simulation media. It is intended that the photo mockup be provided to the student for his continuous use throughout the training program. Commercial Airlines have had great success in the use of this aid in their pilot training program.

Tutorial Media

It is recommended that the complex of five devices, as determined by the micro-analytical translations in Appendix E and described in Appendix F, and listed below, be utilized in the VTX Flight Support Training to achieve the desired behavioral objectives and proficiency levels.

Scan Trainer
Cockpit Procedures Trainer (CPT)
Operational Flight Trainer (OFT)
Operational Flight Trainer/Visual Trainer (OFT/V)
Air Combat Maneuvering Trainer (ACM)

The rationale for the recommendation of the Scan Trainer has been previously discussed within the report. Preferably, the achievement of the pilot scan pattern behaviors should be accomplished in Basic Flight Training in a training program by which results can be measured; no such program exists. The behavioral objectives, with the desired proficiency level, are documented in Appendix A and should be achieved prior to the Student Naval Aviator graduation from UPT; thus, the continuing requirement for a Scan Trainer.

Results of the TSA indicate that this complex of simulation media, correctly utilized, will significantly contribute to the achievement of the required behavioral objectives. The complex of devices will provide the necessary training by the application of the pilot cognitive skills and the development of the pilot psychomotor skills in a simulated VTX aircraft environment, which in turn, enables the Student Naval Aviator to progress in the VTX aircraft flight training to acquire the behavioral objectives and the desired proficiency levels. There is no substitute for the training which can be accomplished in the simulation media that is as training effective and cost-effective. The complex of devices identified to support the Jet Advanced Flight Training Phase will provide the opportunity for the Student Naval Aviator to practice most of the related flight procedures and maneuvers on a repetitive basis, make mistakes in a safe environment and correct the mistakes and develop the pilot skills prior to actual flight. The Student Naval Aviator will be prepared to cope with the VTX aircraft flight training, and be able to utilize available flight time to achieve pilot behaviors which can only be achieved in the aircraft. The recommendation for the ACM Trainer, though the micro-analytical translations justify the requirement, is qualified pending a training effectiveness evaluation of Device 2E6, ACM Trainer, which is scheduled for installation at NAS Oceana, with a "ready for training" date of November 1978. The timing of the installation will allow sufficient time to judge its effectiveness prior to final planning for procurement of the VTX ACM Trainer. The rationale for and the number of devices required to support three training sites has been stated earlier in the report; the number of devices required for each training site is reiterated below:

Device	NAS Chase Field	NAS Kingsville	NAS Meridian	Total
Scan	1	1	1	3
CPT	2	2	2	6
OFT	5	5	5	15
OFT/V	2	2	2	6
ACM	2	2	2	6
	12	12	12	36

Design Characteristics of the VTX Aircraft

A natural result of the TSA, in addition to the determination and identification of the media, is the opportunity to consider the VTX aircraft as a training media. At present, the VTX aircraft is in the advance concept formulation state, its capabilities and configuration are not definitized, offering the flexibility for including specific training capabilities. It is recommended consideration be given to the VTX cockpit configuration to reflect the state of technology utilized on future fleet strike aircraft such as the F-18/A-18. The future aircraft cockpits will utilize digital readouts and multimoded CRT displays, vice the traditional round instruments with needles. Use of the displays will require pilot interpretation and reaction to symbology, with emphasis on accurate systems management. Incorporation of these capabilities in the VTX aircraft will facilitate a smooth transition to fleet strike aircraft. An additional consideration is the incorporation of a dummy probe on the VTX aircraft to provide the capability of practicing hook-up and disconnect in-flight refueling procedures, and basic radar and electronic warfare capability.

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APPENDIX A

SORT OF SPECIFIC BEHAVIORAL OBJECTIVES

TO DOMAIN AND LEVEL

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F1	Perform a pre-flight inspection prior to flight, under day conditions, using the NATOPS checklist, without assistance, omissions or errors.	P	(3) 5
F2	Operate the VTX aircraft canopy system without assistance and without error.	P	(4) 5
F3	Locate and identify, within the VTX aircraft cockpit, the engine(s) associated instruments (displays), indicators and controls, without assistance and without error.	P	(4) 5
F4	Locate and identify, within the VTX cockpit the engine(s) start system associated instruments (displays), indicators, and controls, physically, without assistance and without error.	P	(4) 5
F5	Locate and identify, within the VTX aircraft cockpit, the fuel system associated instruments (displays), indicators and controls, without assistance and without error.	P	(4) 5
F6	Locate and identify, within the VTX aircraft cockpit, the electrical system associated instruments (displays), indicators and controls, physically, without assistance and without error.	P	(4) 5

---

1 Behavioral Objectives achieved prior to **Advanced Flight Training.**

2 Behavioral Objectives achieved in Basic Flight Training, require reinforcement during advanced (VTX) Flight Training to maintain proficiency.

3 Behavior which is continuous and/or repetitive; and is inseparable from and contiguous to all pilot tasks. Only a representative number of these Behavioral Objectives are recorded, to eliminate endless repetition.

( ) Interim proficiency level achieved in Flight Support Training.

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F7	Locate and identify, within the VTX aircraft cockpit, the hydraulic system associated instruments (displays), indicators and controls, without assistance and without error.	P	(4) 5
F8	Locate and identify, within the VTX aircraft cockpit, the flight control system associated instruments (displays), indicators and controls, without assistance and without error.	P	(4) 5
F9	Locate and identify, within the VTX aircraft cockpit, the landing gear associated instruments (displays), indicators and controls, physically, without assistance and without error.	P	(4) 5
F10	Locate and identify, within the VTX aircraft cockpit, the wheel brake system associated instruments (displays), indicators and controls, without assistance and without error.	P	(4) 5
F11	Locate and identify, within the VTX aircraft cockpit, the pitot and static system associated instruments (displays), indicators and controls, physically, without assistance and without error.	P	(4) 5
F12	Locate and identify, within the VTX aircraft cockpit, the air conditioning and pressurization system associated instruments (displays), indicators and controls, physically, without assistance and without error.	P	(4) 5
F13	Locate and identify, within the VTX aircraft cockpit, the oxygen system associated instruments (displays), indicators and controls, without assistance and without error.	P	(4) 5
F14	Locate and identify, within the VTX aircraft cockpit, angle-of-attack system associated instruments (displays) or indicators and controls, physically, without assistance and without error.	P	(4) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F7	Locate and identify, within the VTX aircraft cockpit, the hydraulic system associated instruments (displays), indicators and controls, without assistance and without error.	P	(4) 5
F8	Locate and identify, within the VTX aircraft cockpit, the flight control system associated instruments (displays), indicators and controls, without assistance and without error.	P	(4) 5
F9	Locate and identify, within the VTX aircraft cockpit, the landing gear associated instruments (displays), indicators and controls, physically, without assistance and without error.	P	(4) 5
F10	Locate and identify, within the VTX aircraft cockpit, the wheel brake system associated instruments (displays), indicators and controls, without assistance and without error.	P	(4) 5
F11	Locate and identify, within the VTX aircraft cockpit, the pitot and static system associated instruments (displays), indicators and controls, physically, without assistance and without error.	P	(4) 5
F12	Locate and identify, within the VTX aircraft cockpit, the air conditioning and pressurization system associated instruments (displays), indicators and controls, physically, without assistance and without error.	P	(4) 5
F13	Locate and identify, within the VTX aircraft cockpit, the oxygen system associated instruments (displays), indicators and controls, without assistance and without error.	P	(4) 5
F14	Locate and identify, within the VTX aircraft cockpit, angle-of-attack system associated instruments (displays) or indicators and controls, physically, without assistance and without error.	P	(4) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F15	Locate and identify, within the VTX aircraft cockpit, anti-ice and defrost system associated instruments (displays), indicators and controls, without assistance and without error.	P	(4) 5
F16	Locate and identify, within the VTX aircraft cockpit, the engine fire warning system associated instruments (displays), indicators and controls, without assistance and without error.	P	(4) 5
F17	Locate and identify, within the VTX aircraft cockpit, the communications systems associated instruments (displays), indicators, and controls, without assistance and without error.	P	(4) 5
F18	Locate and identify, within the VTX aircraft cockpit, the escape system associated equipment indicators and controls, without assistance and without error.	P	(4) 5
F19	Perform a pre-start inspection/procedures prior to flight, under day conditions, in accordance with the aircraft NATOPS, in proper sequence, without assistance and without error.	P	(4) 5
F20	Demonstrate the capability to use the VTX aircraft ICS system in all modes including emergency, without assistance and without error.	P	(4) 5
F21	Operate the VTX aircraft electrical system IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5
F22	Operate the VTX aircraft fuel system IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5
F23	Operate the VTX aircraft engine(s) start system IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F24	Perform an aircraft engine(s) start under day conditions, using the NATOPS checklist, in proper sequence, and without assistance and without error.	P	(4) 5
F25	Operate the VTX aircraft engine(s) IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5
F26	Perform the aircraft pre-taxi procedures, using the NATOPS checklist, under day conditions, in proper sequence, without assistance and without error.	P	(4) 5
F27	Operate the VTX aircraft hydraulic system IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5
F28	Operate the VTX aircraft flight control system IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5
F29	Operate the VTX aircraft pitot and static system IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5
F30	Operate the VTX aircraft air conditioning and pressurization system IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5
F31	Operate the VTX aircraft anti-ice and defrost system IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5
F32	Operate the VTX aircraft oxygen system IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5
F33	Demonstrate the capability to communicate using VFR radio procedures with ground control, tower, FSS and base radio without assistance and without sufficient error to violate flight safety and radio discipline.	P	(4) 5
F34	Demonstrate the capability to interpret and respond to all line crewmen and tower visual/ signals/lights, during day shorebased operations, accurately and without hesitation, assistance or error.	P	5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F35	Demonstrate the capability to communicate with the control tower for ground and airborne operations, during day operations, using light and/or aircraft signals, accurately and without hesitation, assistance or error.	P	5
F36	Taxi aircraft, under day conditions and correctly respond and interact with signals from the ground crew, without assistance and without error.	P	5
F37	Taxi aircraft, under day conditions and respond with corrective control action when taxiing cross or down wind, in designated taxiway, maintaining directional and airspeed control by effective use of power, brakes, and rudder, without assistance and without error.	P	5
F38	Operate the VTX aircraft wheel brakes IAW the aircraft NATOPS, without assistance and without error.	P	(3) 5
F39	Taxi aircraft, under day, shorebased conditions, within 5 feet of taxiway centerline, at the proper ground speed, under positive control, with only minor deviations which will not jeopardize aircraft safety.	P	(3) 5
F40	Demonstrate the capability to cope with the VTX aircraft wheel brake malfunction by implementing the correct procedures IAW the aircraft NATOPS, without hesitation, assistance or error.	P	(3) 5
F41	Perform the pre-take-off procedures under day, shorebased, conditions, IAW the aircraft NATOPS, in proper sequence, observing safety precautions, without assistance and without error.	P	(4) 5
F42	Demonstrate the capability to cope with each ground emergency, listed in aircraft NATOPS, by responding with the correct procedure for each ground emergency, without assistance and without error with only minor deviations, which will not jeopardize the pilot and/or aircraft.	P	(4) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F43	Perform the correct procedures in response to an aircraft ground emergency IAW the aircraft NATOPS, without hesitation, without assistance and without major error.	P	(4) 5
F44	Demonstrate the capability to cope with the VTX aircraft engine(s) malfunctions by implementing the correct procedures IAW the aircraft NATOPS, without hesitation, assistance or error.	P	(4) 5
F45	Demonstrate the capability to cope with the VTX aircraft fuel system malfunctions by implementing the correct procedures, IAW the aircraft NATOPS, without hesitation, assistance, or error.	P	(4) 5
F46	Demonstrate the capability to cope with the VTX aircraft electrical system malfunctions by implementing the correct procedures IAW the aircraft NATOPS, without hesitation, assistance or error.	P	(4) 5
F47	Demonstrate the capability to cope with the VTX aircraft hydraulic system malfunctions by implementing the correct procedures IAW the aircraft NATOPS, without hesitation, assistance or error.	P	(4) 5
F48	Demonstrate the capability to cope with the VTX aircraft oxygen system malfunctions by implementing the correct procedures, IAW the aircraft NATOPS, without hesitation, assistance or error.	P	(4) 5
F49	Demonstrate the capability to cope with the VTX aircraft engine fire warning indication by implementing the correct procedures IAW the aircraft NATOPS, without hesitation, assistance or error.	P	(4) 5
F50	Demonstrate the capability to cope with the VTX aircraft angle-of-attack system malfunction by implementing the correct procedures, IAW the aircraft NATOPS, without hesitation, assistance or error.	P	(4) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F51	Demonstrate the capability to cope with the VTX aircraft canopy system malfunction by implementing the correct procedures, IAW the aircraft NATOPS, without hesitation, assistance or error.	P	(4) 5
F52	Demonstrate the capability to cope with the VTX aircraft anti-ice and defrost system malfunction by implementing the correct procedures, IAW the aircraft NATOPS, without hesitation, assistance or error.	P	(4) 5
F53	Demonstrate the capability to cope with the VTX aircraft communications systems malfunctions/degraded operation by implementing the correct procedures, IAW the aircraft NATOPS, without hesitation, assistance or error.	P	(4) 5
F54	Perform a shorebased, day, VFR take-off under conditions listed below, using aircraft NATOPS procedures. Performance, be able to maintain runway alignment $\pm$ 10 KIAS of designated airspeed, implement liftoff + 10, - 0, KIAS and maintain runway track during positive climb angle, without assistance and with only minor deviations, which will not jeopardize pilot and/or aircraft safety. 1. Normal 2. Minimum run 3. Obstacle clearance 4. Cross wind 5. Heavy load	P	(3) 5
F55	Demonstrate the capability to utilize the correct scan pattern in the execution of a day, VFR, shorebased take-off, by using the eyes correctly, without assistance and without error, with only minor deviations.[3]	P	(3) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F56	Demonstrate the capability, if the situation warrants, to implement emergency exit of the aircraft, without hesitation, assistance or error.	P	(3) 4
F57	Perform the aborted take-off procedures, IAW NATOPS, without assistance and without error.	P	(3) 5
F58	Perform the one-engine take-off in accordance with the aircraft NATOPS. Performance, be able to maintain directional control, designated airspeed and climb schedule, without assistance and with minor deviations which will not jeopardize the pilot or aircraft safety.	P	(3) 5
F59	Demonstrate the capability to cope with each take-off emergency listed in the aircraft NATOPS, by responding to an aircraft take-off emergency, with the correct procedure, without assistance and without error, with only minor deviations which will not jeopardize the pilot and/or aircraft.	P	(3) 5
F60	Perform the correct procedure in response to an aircraft take-off emergency, IAW the aircraft NATOPS, without hesitation, without assistance and without error.	P	(3) 4
F61	Operate the VTX aircraft communication systems IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5
F62	Demonstrate the capability to use in-flight all modes/functions of the UHF/VHF transceiver, without assistance and without error.	P	(4) 5
F63	Demonstrate the capability to use in-flight all modes/functions of the auxiliary receiver, without assistance and without error.	P	(4) 5
F64	Demonstrate the capability to use, in-flight, the IFF/SIF equipment for normal and emergency operations, without assistance and without error.	P	(4) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F65	Demonstrate the capability to use the ICS under flight conditions listed below, to advise the other pilot of aircraft, without assistance and without error. 1. In-flight emergencies 2. System malfunctions 3. Checklists and aircraft flight information (e.g., attitude, altitude and position).	P	(4) 4
F66	Demonstrate the ability to interpret and respond to all aircraft-to-aircraft visual signals during day operations, accurately, without hesitation, assistance or error.	P	5
F67	Demonstrate the capability, under VMC conditions to perform the correct scan pattern in the execution of transitions, i.e., inside, outside, time-sharing, without assistance and without error.$_3$	P	(3) 5
F68	Demonstrate the capability to skillfully determine the control inputs required to correct for yaw, pitch and roll tendencies caused by changes in airspeed, or power, without assistance and without error.$_2$	P	(4) 5
F69	Demonstrate the capability to skillfully determine the tab movement required to maintain desired aircraft attitude without assistance and without error.$_3$	P	(4) 5
F70	Demonstrate the capability to correct for a skid and/or slip in the VTX aircraft without assistance and without error.	P	(4) 5
F71	Demonstrate the capability to maintain balanced flight throughout the VTX flight regime, without assistance and with only minor deviations.	P	(4) 5
F72	Control the aircraft, under VMC conditions by the use of the controls within the parameters indicated in the FTI/NATOPS without assistance and with only minor deviations.	P	(4) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F73	Demonstrate the capability, under VMC conditions, to respond correctly to the indication of the instruments/displays and with control required to maintain the Initial Climb to Altitude attitude maneuver without assistance and with only minor deviations.	P	(4) 5
F74	Control the aircraft, under VMC conditions, in the execution of Initial Climb to Altitude maneuvers IAW the desired parameters as designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(3) 5
F75	Demonstrate the capability, under VMC conditions, to respond correctly to the indications of instruments/displays and with control required to maintain the desired heading and altitude during straight and level flight, without assistance and with only minor deviations.	P	(4) 5
F76	Control the aircraft, under VMC *conditions* in straight and level flight, IAW the parameters designated in the FTI/NATOPS without assistance and with only minor deviations.	P	(3) 5
F77	Demonstrate the capability under VMC conditions to respond correctly to the indications of the instruments/displays and with control required to accomplish vertical and turning climb and descent maneuvers, without assistance and with only minor deviations.	P	(4) 5
F78	Control the aircraft under VMC conditions in the execution of climbs and descents, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(3) 5
F79	Demonstrate the capability under VMC conditions to respond correctly to the indications of the instruments/displays and with control required to accomplish the turn maneuvers without assistance and with only minor deviations.	P	(4) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F80	Control the aircraft, under VMC conditions in accomplishing standard rate turn maneuvers within the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(3) 5
F81	Control the aircraft under VMC conditions in accomplishing the ½ standard rate turn maneuvers IAW the desired parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(3) 5
F82	Control the aircraft under VMC conditions in accomplishing the steep turn (to buffet) maneuvers IAW the desired parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(3) 5
F83	Control the aircraft under VMC conditions in accomplishing the reversal maneuvers IAW the desired parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(3) 5
F84	Control the aircraft under VMC conditions in accomplishing the minimum radius turn maneuvers IAW the desired parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(3) 5
F85	Demonstrate the capability under VMC conditions to respond correctly to the indications of the instruments/displays and with control required to accomplish the slow flight maneuver, without assistance and with only minor deviations.	P	(4) 5
F86	Control the aircraft under VMC conditions in the execution of slow flight maneuvers IAW the desired parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(3) 5
F87	Demonstrate the capability, under VMC conditions, to respond correctly to the indications of the instruments/displays and with control required to accomplish the in-flight speed changes, IAW the aircraft NATOPS, without assistance and with only minor deviations.	P	(4) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F88	Control the aircraft under VMC conditions in the execution of speed change flight, IAW the desired parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(3) 5
F89	Demonstrate the capability under VMC conditions to respond correctly to the indications of the instruments/displays and with control required to accomplish the "S" patterns without assistance and with only minor deviations.	P	(4) 5
F90	Demonstrate the capability under VMC conditions to perform the correct scan pattern in the execution of the "S" patterns, i.e., inside, outside, time-sharing, without assistance and with only minor deviations.$_3$	P	(3) 5
F91	Control the aircraft under VMC conditions in accomplishing the "S" patterns, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(3) 5
F92	Perform the entry and recovery from, during day VMC conditions, the aircraft stalls listed below, by returning the aircraft to normal flight, IAW the parameters designated in the FTI/NATOPS without assistance and with only minor deviations. 1. Power off 2. Landing configuration 3. Steep turn 4. Break turn 5. Approach turn	P	(3) 5
F93	Perform the entry and recovery from, during day VMC conditions, an erect spin with landing gear, flaps and speed brakes retracted, by returning the aircraft to normal flight, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F94	Perform a departed flight and recovery in a clean configuration, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	5
F95	Demonstrate the capability to correctly execute a vertical recovery, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	5
F96	Demonstrate the capability to perform the correct scan pattern required for each type of confidence maneuver, i.e., inside, outside, time-sharing, without assistance and with only minor deviations.3	P	(3) 5
F97	Control the aircraft, for each type of confidence maneuver listed below, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations. 1. Wingover 2. Barrell Roll 3. Loop 4. Half Cuban Eight 5. Immelman 6. Aileron Roll 7. Split S	P	(3) 5
F98	Demonstrate the capability to cope with each in-flight emergency, identified in the aircraft NATOPS, without assistance and with only minor deviations which will not jeopardize the pilot and/or aircraft.	P	(3) 5
F99	Perform the correct procedures to control the aircraft in response to an aircraft in-flight emergency, IAW the aircraft NATOPS, without assistance and with only minor deviations, which will not jeopardize the pilot and/or aircraft.	P	(4) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F100	Demonstrate the capability to utilize all elements of time-sharing scan to quickly and accurately identify, classify and determine specific objects for their presence, rate of closure, and relative distance while at the same time determining/maintaining aircraft attitude, with assistance and with only minor deviations.[3]	P	(3) 5
F101	Demonstrate the capability to exercise safe flight procedures, during flight, when encountering hazardous weather, without assistance and without error.	P	(3) 4
F102	Demonstrate the capability to cope with the VTX aircraft flight control system malfunctions by implementing the correct procedures IAW the aircraft NATOPS, without hesitation, assistance or error.	P	(4) 5
F103	Demonstrate the capability to cope with the VTX aircraft pitot and static system malfunction by implementing the correct procedures, IAW the aircraft NATOPS, without hesitation, assistance or error.	P	(4) 5
F104	Demonstrate the capability to cope with the VTX aircraft air conditioning and pressurization system malfunction by implementing the correct procedures, IAW the aircraft NATOPS, without hesitation, assistance or error.	P	(4) 5
F105	Demonstrate the capability to cope with the VTX aircraft escape system malfunctions by implementing the correct procedures, IAW the aircraft NATOPS, without hesitation, assistance or error.	P	(4) 5
F106	Demonstrate the capability to monitor and assess life support systems in the VTX aircraft and initiate the appropriate action in case of malfunction, without hesitation, assistance or error.	P	(4) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F107	Demonstrate the capability to cope with the emergency requiring ejection, IAW the aircraft NATOPS, without assistance and without error.	P	(3) 5
F108	Perform the correct ejection procedures, during an aircraft emergency requiring bailout, IAW the aircraft NATOPS, without hesitation, without assistance and without error.	P	(4) 5
F109	Operate the VTX aircraft escape system when an emergency situation arises, without assistance and without error.	P	(4) 5
F110	Demonstrate the capability as the pilot of the distressed aircraft to exercise the correct communication procedures, without assistance and without any omissions.[2]	P	(4) 5
F111	Perform the correct aircraft in distress procedures during an emergency, IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5
F112	Demonstrate the capability to exercise the correct scan pattern in the execution of a day, VFR, shorebased landing, without assistance and with only minor deviations which will not jeopardize the pilot or aircraft safety.[3]	P	(3) 5
F113	Demonstrate the capability to execute the landing checklist procedures in the execution of a day, VFR, shorebased landing, IAW NATOPS in proper sequence, without assistance and without error.	P	(4) 5
F114	Operate the VTX aircraft landing gear IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5
F115	Use the VTX aircraft angle-of-attack system IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F116	Demonstrate the capability to cope with the VTX aircraft landing gear malfunction by implementing the correct procedures, IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5
F117	Perform a day, VFR, shorebased landing under the conditions listed below, IAW the aircraft NATOPS. Performance, be able to maintain a stabilized final approach with only slight variations in rate of descent, airspeed and angle-of-attack, execute a non-flared two-point touchdown within 1000 feet of the touchdown end of the runway; landing and rollout within 20 feet of centerline of runway. 1. Field entry and break 2. Full flap landing and/or as specified in aircraft NATOPS 3. Touch-and-go landing 4. No flap landing 5. Minimum run landing 6. Cross wind landing 7. Practice precautionary emergency landing (PPEL) 8. Waveoff	P	(3) 5
F118	Demonstrate the capability to cope with each landing emergency, IAW the aircraft NATOPS, without assistance and with only minor deviations which will not jeopardize the safety of the pilot and/or aircraft.	P	(3) 5
F119	Perform the correct landing emergency procedures when a landing emergency exists, IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5
F120	Perform an engine(s) shutdown procedures, under day shorebased conditions, using the NATOPS checklist, in proper sequence, without assistance and without error.	P	(4) 5
F121	Perform a secure aircraft/post-flight inspection, after flight, under day conditions, IAW the aircraft NATOPS checklist, without assistance and without error.	P	(4) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F122	Perform a take-off, under day/night, IFR, shorebased conditions, in accordance with the aircraft NATOPS, without assistance and only minor deviations, which will not jeopardize pilot or aircraft safety.	P	(4) 5
F123	Demonstrate the capability to utilize all elements of scan to quickly and accurately determine aircraft performance and attitude during IMC flight, without assistance and with only minor deviations.[3]	P	(4) 5
F124	Demonstrate the capability to operate the Heads Up Display IAW the aircraft NATOPS, by accurately selecting the required mode of operation, interpreting the displayed information and utilizing the information during flight, without assistance and with only minor deviations.	P	(4) 5
F125	Demonstrate the capability to cope with Heads Up Display malfunctions degraded operation, by implementing corrective procedures and/or using alternative sources of information, without assistance and without error.	P	(4) 5
F126	Control the aircraft, under IMC conditions by the use of the controls, performance and attitude instruments/displays in the execution of transitions, within the desired altitude, airspeed, heading, rate of ascent/descent parameters indicated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(4) 5
F127	Demonstrate the capability to recognize the effects of vertigo/disorientation and exercise the techniques required to minimize its effect, in a timely manner which will not jeopardize the performance and safety of the pilot and/or aircraft.	P	(3) 4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F128	Demonstrate the capability, under IMC conditions to respond correctly to the indication of the instruments/displays and with control required to maintain the desired rate of ascent, heading and airspeed during the Initial Climb to Altitude maneuvers without assistance and with only minor deviations.	P	(4) 5
F129	Control the aircraft, under IMC conditions in the execution of the Initial Climb to Altitude, IAW the desired parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(4) 5
F130	Demonstrate the capability, under IMC conditions to respond correctly to the indications of instruments/displays and with control required to maintain the desired heading and altitude during straight and level flight, without assistance and with only minor deviations.	P	(4) 5
F131	Control the aircraft, under IMC conditions in straight and level flight, IAW the parameters designated in the FTI/NATOPS without assistance and with only minor deviations.	P	(4) 5
F132	Demonstrate the capability, under IMC conditions to respond correctly to the indications of the instruments/displays and with control required to accomplish vertical and turning climbs and descents without assistance and with only minor deviations.	P	(4) 5
F133	Control the aircraft, under IMC conditions in the execution of climbs and descents, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(4) 5
F134	Demonstrate the capability, under IMC conditions to respond correctly to the indications of the instruments/displays and with control required to accomplish the turn maneuvers without assistance and with only minor deviations.	P	(4) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F135	Control the aircraft, under IMC conditions in accomplishing the standard rate turn maneuvers, IAW the desired parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(4) 5
F136	Control the aircraft, under IMC conditions in accomplishing the ½ standard rate turn maneuvers IAW the parameters designated in the FTI/NATOPS without assistance and with only minor deviations.	P	(4) 5
F137	Control the aircraft, under IMC conditions in accomplishing steep turn (to buffet) maneuvers IAW the parameters designated in the FTI/NATOPS without assistance and with only minor deviations.	P	(4) 5
F138	Control the aircraft, under IMC conditions in accomplishing the reversal maneuvers IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(4) 5
F139	Control the aircraft, under IMC conditions in accomplishing the minimum radius turn maneuvers IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(4) 5
F140	Demonstrate the capability, under IMC conditions to respond correctly to the indications of the instruments/displays and with control required in accomplishing the slow flight maneuver, without assistance and with only minor deviations.	P	(4) 5
F141	Control the aircraft, under IMC conditions in the execution of the slow flight maneuver, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(4) 5
F142	Demonstrate the capability, under IMC conditions to respond correctly to the indications of the instruments/displays and with control required to accomplish the in-flight speed changes, without assistance and with only minor deviations.	P	(4) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F143	Control the aircraft, under IMC conditions in the execution of speed changes, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(4) 5
F144	Demonstrate the capability, under IMC conditions to respond correctly to the indications of the instruments/displays and with control required to accomplish the "S" patterns without assistance and with only minor deviations.	P	(4) 5
F145	Demonstrate the capability, under IMC conditions to perform the correct scan pattern in the execution of the "S" patterns, i.e., inside, outside, time-sharing, without assistance and with only minor deviations.[3]	P	(4) 5
F146	Control the aircraft, under IMC conditions in accomplishing the "S" patterns, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(4) 5
F147	Demonstrate the capability, under instrument conditions, to respond correctly to the indications of the instruments/displays and with control required to accomplish the OSCAR, CHARLIE and YANKEE patterns without assistance and with only minor deviations.	P	(4) 5
F148	Demonstrate the capability, under instrument conditions, to perform the correct scan pattern in the execution of the OSCAR, CHARLIE, YANKEE pattern, i.e., inside, outside, timesharing, without assistance and with only minor deviations.[3]	P	(4) 5
F149	Control the aircraft, under instrument conditions in accomplishing the OSCAR, CHARLIE, YANKEE patterns, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(4) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F150	Demonstrate the capability to respond correctly to the indication of failure of instrument/displays during instrument flight, by utilizing alternative or backup instruments/displays, without assistance and without error.	P	(4) 5
F151	Demonstrate the capability, under instrument conditions, to perform the correct scan pattern during the partial panel flight, without assistance and without error. 3	P	(4) 5
F152	Control the aircraft in the accomplishing of partial panel flight during instrument flight, IAW the parameters designated in the FTI/ NATOPS, without assistance and without error.	P	(4) 5
F153	Demonstrate the capability to respond correctly to the indications of the instruments/displays when an unusual attitude occurs, by making the required control inputs to return aircraft to a safe attitude, without assistance and without error.	P	(4) 5
F154	Control the aircraft in the accomplishing of recovery from unusual attitudes, listed below, IAW the parameters designated in the FTI/ NATOPS, without assistance and with only minor deviations which will not jeopardize pilot and/or aircraft safety. 1. Nose Low Recovery 2. Nose High Recovery 3. Stalls 4. Spins	P	(4) 5
F155	Demonstrate the capability to exercise the correct scan pattern in the execution of a day/night, IFR, shorebased landing, without assistance and with only minor deviations.3	P	(4) 5
F156	Demonstrate the capability to, using the correct landing checklist procedures, execute a day/ night, IFR, shorebased landing. Performance, be able to execute a non-flared, two point touchdown within 1,000 feet of touchdown end of runway; landing and rollout within 20 feet of centerline of runway.	P	(4) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F157	Operate the VTX aircraft navigation systems, IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5
F158	Demonstrate the capability to perform a pre-take-off aircraft equipment check in preparation for an instrument departure, without assistance and without error.	P	(4) 5
F159	Assess the VTX aircraft navigation systems for normal/abnormal operation by the interpretation of instruments (displays) and indicators, IAW the aircraft NATOPS, without assistance and without error.	C	(3) 4
F160	Demonstrate the capability to communicate using IFR, ATC radio procedures with approach/departure control. Performance, to be accurate,without assistance and/or sufficient error to violate the clearance.[2]	P	(4) 5
F161	Demonstrate the capability to plan for and utilize a SID by flying a departure under instrument condition, without assistance and with only minor deviations.[2]	P	(4) 5
F162	Perform the correct scan pattern in the execution of a SID, without assistance and with only minor deviations.[3]	P	(4) 5
F163	Control the aircraft in the accomplishment of a SID during instrument flight, IAW the NATOPS, complying with all instructions of the SID, without assistance and without error.[2]	P	(4) 5
F164	Demonstrate the capability to interpret navigation instruments/displays and react correctly in the execution of a day/night, IFR, shorebased take-off, without assistance and with only minor deviations and omissions which will not jeopardize pilot and/or aircraft safety.	P	(4) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F165	Demonstrate the capability under IFR conditions to utilize VOR by executing the following; IAW NIFM, with only minor errors which will not compromise flight safety. 1. Proceeding direct to station 2. Inbound course interception 3. Inbound course 4. Outbound course 5. Time-distance check 6. Holding 7. Non DME high altitude approach 8. Dual VOR high altitude approach 9. VOR low altitude approach	P	(4) 5
F166	Demonstrate the capability to interpret Morse code station identifiers, under all flight conditions, without assistance and without error.[2]	C	(3) 4
F167	Demonstrate the capability under IFR conditions to utilize TACAN by executing the following, IAW NIFM, with only minor errors which will not compromise flight safety. 1. Select and tune station 2. Ground speed check 3. Intercept and maintain a TACAN arc about a station. 4. Intercept an arc from a radial. 5. Intercept a radial from an arc. 6. Fly direct between TACAN fixes. 7. Station Passage 8. Holding pattern to include entry and departure. 9. TACAN approach - High altitude penetration and approach; and low altitude approach. 10. TACAN SID.	P	(4) 5
F168	Demonstrate the capability under IFR conditions to utilize ADF by executing the following, with only minor errors, which will not compromise flight safety.	P	(4) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F168 (Cont)	1. Course interception - Inbound and Outbound 2. Station Passage 3. Outbound - Intermediately after station passage 4. Tracking 5. Time distance check 6. VHF Homing 7. High altitude penetration and approach 8. Low altitude approach		
F169	Demonstrate the capability to utilize the VTX radar during IMC flight for the following, without assistance and without error. 1. Determine position of weather in relation to flight path. 2. Locate and determine relative position of an airborne target. 3. Execute an airborne intercept of a radar target. 4. Fix own position	P	(3) 4*
F170	Demonstrate the capability to cope with the VTX aircraft navigation system malfunctions/ degraded operation by implementing the correct procedures, IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5
F171	Demonstrate the capability, under IMC to perform GCA approaches as listed below, using the correct procedures, without assistance and without error, with only minor deviations.[2] 1. Precision (PAR) 2. Air Surveillance Radar (ASR) 3. No gyro 4. Low Fuel State	P	(4) 5
F172	Demonstrate the capability to utilize and interpret the approach plates, under instrument flight conditions, by flying an approach to a selected airport, without assistance and with only minor deviations. [2]	P	(4) 5
F173	Demonstrate the capability under IFR conditions to utilize the ILS by executing an approach, using the correct procedures, without assistance and with only minor deviations.	P	(4) 5

* VTX aircraft may not have the capability to achieve behavior and/or level.

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F174	Demonstrate the capability to execute the correct communication procedures in the execution of a day/night, IFR, shorebased landing, without assistance and without error.2	P	(4) 5
F175	Demonstrate the capability to implement missed approach if visual contact not established at published minimums, in the execution of a day/night, IFR, shorebased landing, without assistance and with only minor deviations.2	P	(4) 5
F176	Demonstrate the capability to perform the correct instrument approach procedures, in the execution of a day/night, IFR, shorebased landing, without assistance and with only minor deviations.2	P	(4) 5
F177	Demonstrate the capability to interpret the navigation instruments/displays and reacting correctly, in the execution of a day/night, IFR, shorebased landing, without assistance and with only minor deviations.	P	(4) 5
F178	Perform a day/night, IFR, shorebased approach and landing IAW the aircraft NATOPS. Performance, to be in compliance with published approach procedures, align aircraft within runway limits, maintain stabilized approach with only slight variations in rate of descent, airspeed, and angle of attack, execute a non-flared two-point touchdown within 1000 feet of the touchdown end of the runway.	P	(4) 5
F179	Demonstrate the capability to copy an IFR clearance, including SID, without hesitation and without omissions. 2	C	(3) 4
F180	Demonstrate the capability to perform flight en route procedures under IFR conditions, executing the following. Performance, to be accurate for each situation, with only minor errors, which will not compromise flight safety.	P	(4) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F180 (Cont)	1. Maintain aircraft track by on board navigation equipment 2. Enroute clearance 3. Holding 4. IFF/SIF mode selection		
F181	Demonstrate the capability to maintain an accurate, up-to-date fuel plan (fuel/time log HOWGOIZIT) during flight, applying NATOPS fuel consumption charts and figures, without assistance and without error.[2]	P	(4) 5
F182	Demonstrate the capability to interpret the information on the "position" instruments and utilize information accurately for safe flight, without assistance and without error.[2]	P	(4) 5
F183	Demonstrate the capability to communicate using IFR, ATC radio procedures with appropriate controlling agencies, while en route, without assistance and without sufficient error to violate flight safety or radio discipline.[2]	P	(4) 5
F184	Demonstrate the capability to exercise in-flight precautions when icing conditions are encountered, without assistance and without error.	P	(4) 5
F185	Demonstrate the capability to use, during IFR flight conditions, in-flight weather information, without assistance and without error.[2]	P	(3) 4
F186	Demonstrate the capability, to recognize conditions conducive to in-flight weather hazards and exercise the correct action to minimize the danger to insure flight safety, without assistance and without error.[2]	C	(3) 4
F187	Demonstrate the capability to monitor and analyze observed meteorological conditions, while airborne and determine from the analysis, the correct action to be taken, without assistance and without error.[2]	C	4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F188	Demonstrate the capability while airborne to determine appropriate course deviation in the presence of significant weather conditions to optimize aircraft safety and mission requirements, without assistance and without error.[2]	C	(3) 4
F189	Demonstrate the capability to perform all aspects of the terminal procedures required of a flight conducted under IFR conditions, without assistance and with only minor deviations.	P	(4) 5
F190	Perform a preflight inspection prior to flight, under night conditions, using the NATOPS checklist, without assistance, omissions, or errors.	P	(3) 5
F191	Locate and identify, within the VTX aircraft cockpit, the lighting system associated instruments (displays) or indicators and controls, without assistance and without error.	P	(4) 5
F192	Operate the VTX aircraft lighting system IAW the aircraft NATOPS, without assistance and without error.		(4) 5
F193	Perform a prestart inspection/procedures prior to flight, under night conditions, IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5
F194	Perform an aircraft engine(s) start under night conditions using the NATOPS checklist, and without assistance, and with only minor deviations, which will not jeopardize aircraft safety.	P	(4) 5
F195	Perform the aircraft pretaxi procedures, using the NATOPS checklist, under night conditions, without assistance and without error.	P	(4) 5
F196	Demonstrate the capability to interpret and respond to all line crewmen and tower visual signals/lights, during night, shorebased operations, without hesitation, without assistance and without error. [2]	P	5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F197	Taxi aircraft under night conditions and respond with corrective control action when taxiing cross or down wind, in designed taxiway, maintaining directional and airspeed control by effective use of power, brakes and rudders, without assistance and without error.	P	(3) 5
F198	Taxi aircraft under night conditions and correctly respond and interact with signals from the ground crew, without assistance and without error.	P	5
F199	Demonstrate the capability to communicate with the control tower for ground and airborne operations, during night shorebased operations using light and/or aircraft signals, without assistance and without error. [2]	P	5
F200	Taxi aircraft, under night, shorebased conditions. Performance, be able to be within 5 feet of taxiway centerline, at the proper ground speed, under positive control, with only minor deviations, which will not jeopardize aircraft safety.	P	(3) 5
F201	Perform the pre-take-off procedures under night shorebased conditions, IAW the aircraft NATOPS, observing safety precautions, without assistance and without error.	P	(4) 5
F202	Demonstrate the capability to cope with the limitations of night vision, hazards of spatial disorientation and optical illusions, and vertigo, which may be encountered in the execution of night, VFR shorebased take-offs. Performance, be able to recognize the symptoms quickly and implement the corrective procedures, without assistance and without error. [2]	P	(3) 4
F203	Perform a shorebased, night, VFR take-off, under conditions listed below, using the aircraft NATOPS procedures. Performance, be able to maintain runway alignment $\pm$ 10 feet of centerline, implement lift-off + 10 K, - 0 K, maintain runway track, during positive climb angle, which will not jeopardize pilot and/or aircraft safety.	P	(3) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F203 (Cont)	1. Normal Take-off 2. Minimum Run Take-off 3. Obstacle Clearance Take-off 4. Cross Wind Take-off 5. Heavy Load		
F204	Perform the correct scan pattern during night flight operations, i.e., inside, outside, time-sharing, without assistance and without error.3	P	(4) 5
F205	Demonstrate the capability to adjust to the nighttime environment vision problem. Performance, to be such that adequate motion cues, required for flight, will be recognized.2	P	(3) 4
F206	Demonstrate the capability to cope with the VTX aircraft lighting system malfunctions by implementing the correct procedures, without hesitation, assistance or error.	P	(4) 5
F207	Demonstrate the ability to interpret and respond to all aircraft-to-aircraft visual signals, during night operations, without hesitation, without assistance and without error.2	P	5
F208	Perform a landing, under night, VFR, shore-based conditions, listed below, in accordance with the aircraft NATOPS. Performance, be able to align aircraft using runway lights, maintain stabilized final approach with only slight variations in rates of descent, airspeed and angle of attack, execute non-flared two-point touchdown within 1000 feet of the touchdown end of the runway. 1. Field entry and break 2. Full flap landing and/or specified in aircraft NATOPS 3. Touch and go landing 4. No flap landing 5. Cross wing landing 6. Waveoff	P	(4) 5
F209	Perform an engine(s) shutdown procedures, under night shorebased conditions using the NATOPS checklist, without assistance and without error.	P	(4) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F210	Perform a secure aircraft/post-flight inspection, after flight, under night conditions, IAW the aircraft NATOPS checklist, and without assistance and without error.	P	(4) 5
F211	Demonstrate the capability during day or night flight to perform each aircraft-to-aircraft formation visual signal without assistance and without error.[2]	P	5
F212	Execute the correct radio communication procedures during formation flight. Performance, be able to execute the required communications, using standard terminology, and practicing radio discipline, IAW the parameters designated in the FTI/NATOPS, without assistance and without error.	P	(3) 5
F213	Execute the correct visual signals during day/night formation flight, IAW the parameters designated in the FTI/NATOPS, without assistance and without error.[2]	P	5
F214	Execute the correct scan pattern throughout the regime of formation flight, IAW the parameters designated in the FTI/NATOPS, without assistance and without error.[3]	P	(3) 5
F215	Demonstrate the capability to execute the formation maneuvers listed below, smoothly, without degrading flight safety, IAW the parameters designated in the FTI/NATOPS, without assistance and without error. 1. Join Up 2. Cross Under 3. Cross Over 4. Lead Change 5. Break	P	(3) 5

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SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F216	Demonstrate the capability to execute the section formation maneuvers listed below, smoothly, without degrading flight safety, IAW the parameters designated in the FTI/NATOPS, without assistance and without error. 1. Parade Formation a. VMC Parade b. IMC Parade 2. Cruise Formation 3. Column Formation 4. Trail Position	P	5
F217	Control the aircraft in the execution of a section formation take-off, smoothly, and without degrading flight safety, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	5
F218	Control the aircraft in the execution of a section formation climbout, smoothly, and without degrading flight safety, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(3) 5
F219	Control the aircraft in the execution of a section formation climbing rendezvous, smoothly, and without degrading flight safety, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(3) 5
F220	Control the aircraft in the execution of a section formation running rendezvous, smoothly and without degrading flight safety, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(3) 5
F221	Control the aircraft in the execution of a section formation carrier rendezvous, smoothly and without degrading flight safety, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(3) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F222	Control the aircraft in the execution of a section formation TACAN rendezvous safely, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	(3) 5
F223	Control the aircraft in the execution of a section formation air-to-air TACAN and UHF/ADF rendezvous, IAW the parameters designated in the FTI/NATOPS without assistance and with only minor deviations.	P	(3) 5
F224	Control the aircraft in the execution of the section formation recovery procedures, safely, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	5
F225	Demonstrate the capability to control the aircraft safely in the various division formations listed below, smoothly, without degrading flight safety, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations. 1. Parade Formation a. VMC Parade b. IMC Parade 2. Cruise Formation 3. Column Formation 4. Trail Formation	P	4
F226	Control the aircraft in the execution of a division formation take-off safely, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	4
F227	Control the aircraft in the execution of a division formation climbout safely, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F228	Control the aircraft in the execution of the division parade formation flight, safely, IAW the parameters designated in the FTI/ NATOPS, without assistance and with only minor deviations.	P	4
F229	Control the aircraft in the execution of the division cruise formation flight, safely, IAW the parameters designated in the FTI/ NATOPS, without assistance and with only minor deviations.	P	4
F230	Control the aircraft in the execution of a division formation carrier rendezvous, safely, IAW the parameters designated in the FTI/ NATOPS, without assistance and with only minor deviations.	P	4
F231	Control the aircraft in the execution of a division formation running rendezvous, safely, IAW the parameters designated in the FTI/ NATOPS, without assistance and with only minor deviations.	P	4
F232	Control the aircraft in the execution of a division formation TACAN rendezvous, IAW the parameters designated in the FTI/ NATOPS, without assistance and with only minor deviations.	P	4
F233	Control the aircraft in the execution of the division formation recovery procedures, safely, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	4
F234	Demonstrate the capability to utilize an effective scan pattern, in performing tactical formation flight, i.e., inside, outside, time-sharing, for each tactical formation maneuver, without assistance and with only minor deviations. 3	P	4
F235	Control the aircraft in the maintaining of the abeam position in the combat spread formation maneuvers IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F236	Control the aircraft in the execution of combat spread formation turns, maintaining correct interval and position, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	4
F237	Control the aircraft in the execution of the tactical wing formation maneuvers, without degrading flight safety, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	4
F238	Control the aircraft in the execution of the tactical formation loose deuce maneuvering, without degrading flight safety, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor deviations.	P	4
F239	Execute the correct scan patterns during ACM, i.e., inside, outside, time-sharing, IAW the FTI/NATOPS without assistance and with only minor deviations.3	P	(3) 4
F240	Demonstrate the capability to apply the aerodynamics of energy maneuverability during combat tactical flight, by the smooth and positive aircraft control, without exceeding aircraft limitations, without assistance and with only minor deviations.	P	(3) 4
F241	Perform a one-vs-one offensive rear quarter attack, to eliminate an enemy threat, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor error which will not degrade pilot and aircraft survivability.	P	(3) 4
F242	Perform a one-vs-one offensive abeam attack, to eliminate an enemy threat, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor errors which will not degrade pilot and aircraft survivability.	P	(3) 4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F243	Perform a one-vs-one offensive forward quarter attack to eliminate an enemy threat, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor errors which will not degrade pilot and aircraft survivability.	P	(3) 4
F244	Perform a one-vs-one offensive head-on attack to eliminate an emeny threat, IAW the parameters designated in the FTI/NATOPS without assistance and with only minor error which will not degrade pilot and aircraft survivability.	P	(3) 4
F245	Perform the air combat maneuvers during the one-vs-one defensive maneuvering, in a defensive tactical environment, listed below, to eliminate the enemy threat and return to an offensive condition, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor errors which will not degrade pilot and aircraft survivability.	P	(3) 4

1. Defense against a rear quarter attack.
   (a) Long range
   (b) Medium range
      (1) Defense against a high yo-yo
      (2) Defense against a low yo-yo
   (c) Short range
2. Defense against an abeam attack.
3. Defense against a forward quarter attack.
4. Maneuvering after an overshoot by the attackers.
   (a) Reversals
      (1) Rolling reversals
      (2) Horizontal reversals
   (b) Scissors
      (1) Horizontal scissors
      (2) Rolling scissors
5. Last ditch maneuvers and break turns.
   (a) Break turns
   (b) High "G" rolls
      (1) Over the top
      (2) Underneath
      (3) Countering the high "G" roll
6. Maneuvering for separation and disengagement.

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F246	Demonstrate the capability to identify and locate the external store stations of the VTX aircraft IAW the aircraft NATOPS, without assistance and without error.	P	(2) 5
F247	Locate and identify, within the VTX aircraft cockpit, the armament control system indicators, displays, and controls, IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5
F248	Locate and identify, within the VTX aircraft cockpit, the armament fire control system indicators, displays, and controls, IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5
F249	Operate the VTX aircraft armament system IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5
F250	Demonstrate the capability to cope with armament system malfunctions/degraded operation by implementing the correct procedures, IAW NATOPS, without assistance and without error.	P	(4) 5
F251	Demonstrate the capability to manage the aircraft weaponry in the execution of an air-to-air weapon delivery mission, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor error which will not jeopardize the mission, the pilot and aircraft.	P	(3) 4
F252	Perform air-to-air weapon delivery missions to achieve weapon delivery on target, elimination of an adversary aircraft, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor error which would not jeopardize the mission, pilot or aircraft.	P	(3) 4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F253	Demonstrate the capability to utilize the tracking and firing procedures during an air-to-ground weapon delivery attack to deliver weapons on target, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor error which will not jeopardize the mission, pilot or aircraft.	P	(3) 4
F254	Demonstrate the capability during air-to-ground weapon delivery to execute the correct gun firing procedures resulting in destruction of target, IAW the parameters designated in the FTI/NATOPS with assistance and with minor error which would not jeopardize the mission, pilot or aircraft.	P	(3) 4
F255	Demonstrate the capability to execute air-to-ground weapon delivery patterns for accurate delivery of weapon to target, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor error which will not jeopardize the mission, pilot and aircraft.	P	(3) 4
F256	Demonstrate the capability to control aircraft airspeed in air-to-ground weapon delivery by making smooth, coordinated adjustments in a positive manner, without assistance and without error.	P	(3) 4
F257	Demonstrate the capability to correctly utilize the 30 degree and 10 degree attacks and patterns in air-to-ground weapon delivery, to deliver the weapon accurately on target, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor error which will not jeopardize the mission, pilot and aircraft.	P	(3) 4
F258	Demonstrate the capability to utilize a correct time sharing scan pattern in air-to-ground weapon delivery throughout the weapon delivery mission without assistance and without error.[3]	P	(3) 4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F259	Demonstrate the capability to manage the aircraft ordnance in the execution of air-to-ground weapon delivery missions IAW the parameter designated in the FTI/NATOPS, without assistance and with only minor errors and deviations which will not jeopardize the mission, pilot and aircraft.	P	(3) 4
F260	Execute air-to-ground weapon delivery missions effectively, by delivering ordnance on target, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor error and deviations which will not jeopardize the mission, pilot and aircraft.	P	(3) 4
F261	Demonstrate the capability to navigate, using DR techniques, position to position, so as to arrive at each position on target and on time, without assistance and without error, with only minor deviations.[2]	C	(3) 4
F262	Solve inflight problems for ground speed and heading corrections during DR flight that will regain a pre-planned ETA and course, without assistance and without error.[2]	C	(3) 4
F263	Demonstrate the capability to determine aircraft position by interpreting topographical, and by reference to visual landmarks, charts, under day/night VMC conditions during cross-country navigation flight, without assistance and without error.	C	4
F264	Demonstrate the capability to identify terrain features, under day visual conditions that correspond to map features and relate these to own in flight relative position (e.g., relative bearing of aircraft to terrain features), without assistance and without error.	C	4
F265	Demonstrate the capability to accurately determine aircraft position under day visual flight conditions, so as to be able to constantly track aircraft position, by the correct identification of landmarks, at any given time, without assistance and without error.	C	4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F266	Demonstrate the capability, under night visual conditions, to identify map features correlating these features to observed terrain features so as to determine an in flight position accurately, and without assistance and without error.	C	4
F267	Demonstrate the capability to determine, by visual reference, wind direction and approximate velocity, during flight, without assistance and without error.	C	3
F268	Demonstrate the capability to use, during operational navigation missions, under IFR and VFR flight conditions, in-flight weather information accurately, to update flight plan, without assistance and without error.	C	(3) 4
F269	Demonstrate the capability to recognize conditions conducive to in-flight weather hazards and exercise the correct action to minimize the danger and insure flight safety, without assistance and without error.	C	(3) 4
F270	Demonstrate the capability while airborne to monitor and analyze observed meteorological conditions and determine the correct action to be taken, without assistance and without error.	C	4
F271	Demonstrate the capability while airborne to determine appropriate course deviation in the presence of significant weather conditions, so as to optimize aircraft safety and mission requirements, without assistance and without error.[2]	C	(3) 4
F272	Demonstrate the capability to correctly interpret aeronautical charts to identify enroute checkpoints, in the execution of a VFR operational navigation tactical mission, without assistance and without error.	C	4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F273	Execute operational navigation tactical missions as listed below, effectively, by arriving at planned checkpoint within ETA and estimated fuel and completing mission as planned, without assistance and without error, except for minor deviations which do not jeopardize the mission. 1. Day Low Level Navigation Mission 2. Night Low Level Navigation Mission 3. High-Low-High Profile Mission 4. Section Reconnaissance Mission		4
F274	Demonstrate the capability to exercise the correct communication procedures with tanker in the execution of in-flight refueling, without assistance and without error.	P	(4) 5
F275	Execute in-flight refueling by correctly making a hook up with the tanker, taking on fuel, and disconnecting from tanker, IAW the parameters designated in the FTI/NATOPS, without assistance and with only minor error and/or deviations which will not jeopardize the pilot, or aircraft safety.	P	(3) 4
F276	Locate and identify, within the VTX aircraft cockpit, the catapulting and arresting equipment associated instruments (displays), indicators and controls, without assistance and without error.	P	(4) 5
F277	Perform the pre-take-off procedures under day/night shipboard conditions IAW the aircraft NATOPS, observing safety precautions, without assistance and without error.	P	(4) 5
F278	Demonstrate the capability to interpret and respond to all visual signals from shipboard deck personnel/taxi directors, without assistance and without error.	P	5
F279	Demonstrate the capability to respond and interact with the signals/direction of the catapult director in the execution, VFR, shipboard take-off, without assistance and without error.	P	4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F280	Perform a take-off under day, VFR, shipboard conditions IAW the aircraft NATOPS; without assistance and without error.	P	(3) 4
F281	Perform a take-off under night, VFR, shipboard conditions IAW the aircraft NATOPS, without assistance and without error.	P	(3) 4
F282	Demonstrate the capability to exercise the correct scan pattern in the execution of a day/night, VFR, shipboard landing, without assistance and without error, with only minor deviations.[3]	P	(3) 4
F283	Demonstrate the capability to execute the correct communication procedures in the execution of a day/night, VFR, shipboard landing, without assistance and without error.	P	(4) 5
F284	Demonstrate the capability to execute the landing checklist procedures in the execution of a day/night, VFR, shipboard landing, using the appropriate checklist, without assistance and without error.	P	(4) 5
F285	Operate the VTX aircraft catapulting and arresting equipment IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5
F286	Demonstrate the capability to utilize, respond and react with the AOA indexer to maintain aircraft line up in the execution of a day, VFR, shipboard landing, without assistance and with only minor deviations which will not compromise aircraft/pilot safety.	P	(3) 4
F287	Demonstrate the capability to utilize, respond and react with the AOA to maintain aircraft line up in the execution of a night, VFR, shipboard landing, without assistance and with only minor deviations which will not compromise aircraft/pilot safety.	P	(3) 3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
F288	Demonstrate the capability to interpret and respond to LSO signals during FCLP or CV operations, without assistance and without error.	P	4
F289	Perform a day, VFR, FLCP and shipboard landing, IAW the aircraft NATOPS. Performance, be able to align aircraft within ship landing area, maintain stabilized final approach with only slight variations in rate of descent, airspeed, and angle of attack, execute touchdown to a/an: 1. Touch and go landing 2. Arrested landing	P	(3) 4
F290	Perform a night, VFR, FLCP and shipboard landing, IAW the aircraft NATOPS. Performance, be able to align aircraft within ship landing area, maintain stabilized final approach with only slight variations in rate of descent, airspeed, and angle of attack, and execute touchdown to a/an: 1. Touch and go landing 2. Arrested landing	P	(3) 3
F291	Demonstrate the capability to cope with the VTX aircraft catapulting and arresting equipment malfunction by implementing the correct procedures, IAW the aircraft NATOPS, without assistance and without error.	P	(4) 5
F292	Demonstrate the capability, when the situation warrants, to execute a wave-off or bolter in the execution of a day, VFR, shipboard landing. Performance, be able on the LSO signal to react quickly and to execute a wave-off or bolter, without assistance and without error.	P	(3) 4
F293	Demonstrate the capability, when the situation warrants, to execute a wave-off in the execution of a night, VFR, shipboard landing, without assistance and without error.	P	(3) 4
F294	Perform engine(s) shutdown procedures, under shipboard conditions, using the NATOPS checklist, without assistance and without error.	P	(4) 5

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS1	Explain the use of NATOPS checklists for ground and in-flight aircraft operations, verbally and/or in writing, without assistance and without error.	C	2
FS2	Recall that the NATOPS In-Flight Guide (pocket checklist) contents provide a ready reference, during flight, without assistance and without error.	C	1
FS3	Relate the importance of using the NATOPS manuals and checklists to aircraft performance and safety.	A	4
FS4	Discuss the danger areas to be observed in and around the VTX aircraft during the conditions listed below, verbally or in writing, without assistance or error. 1. Engine Runup 2. Towing 3. External Power 4. Hydraulic Pressure 5. Refueling	C	2
FS5	Assess the VTX aircraft engine(s) start system operation by interpretation of the instruments (displays) indicators for normal/abnormal operation IAW the aircraft NATOPS, without assistance and without error.	C	4
FS6	Assess VTX aircraft engine(s) operation IAW the aircraft NATOPS by interpretation of engine(s) instruments (displays)/indicators for normal/abnormal operation, without assistance and without error.	C	4
FS7	Assess VTX aircraft fuel system operation by interpretation of the instruments (displays)/indicators for normal/abnormal operation, without assistance and without error.	C	4
FS8	Assess VTX aircraft electrical system operation by interpretation of the instruments (displays)/indicators for normal/abnormal operation IAW the aircraft NATOPS, without assistance and without error.	C	4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS9	Assess VTX aircraft hydraulic system operation by interpretation of the instruments (displays)/indicators for normal/abnormal operation IAW the aircraft NATOPS, without assistance and without error.	C	4
FS10	Assess VTX aircraft flight control system operation by interpretation of the instruments (displays)/indicators for normal/abnormal operation IAW the aircraft NATOPS, verbally, or in writing, without assistance and without error.	C	4
FS11	Assess VTX aircraft landing gear operation by interpretation of the instruments (displays)/indicators for normal/abnormal operation, verbally, or in writing, without assistance and without error.	C	4
FS12	Assess VTX aircraft wheel brake operation by interpretation of the instruments (displays)/indicators for normal/abnormal operation IAW the aircraft NATOPS, without assistance and without error.	C	4
FS13	Assess VTX aircraft pitot and static system operation by interpretation of the instruments (displays)/indicators for normal/abnormal operation IAW the aircraft NATOPS, without assistance and without error.	C	4
FS14	Assess VTX aircraft air conditioning and pressurization system operation by interpretation of the instruments (displays)/indicators for normal/abnormal operation IAW the aircraft NATOPS, without assistance and without error.	C	4
FS15	Assess VTX aircraft oxygen system operation by interpretation of the instruments (displays)/indicators for normal/abnormal operation IAW the aircraft NATOPS, without assistance and without error.	C	4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS16	Assess VTX aircraft angle-of-attack system operation by interpretation of the instruments (displays) or indicators for normal/abnormal operation IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	4
FS17	Assess VTX aircraft escape system capability to operate by visual check prior to flight IAW the aircraft NATOPS, without assistance and without error.	C	4
FS18	Assess VTX aircraft canopy system operation for normal/abnormal operation, IAW the aircraft NATOPS, without assistance and without error.	C	4
FS19	Assess VTX aircraft anti-ice and defrost operation by interpretation of instruments (displays) indicators for normal/abnormal operation, IAW the aircraft NATOPS, without assistance and without error.	C	4
FS20	Assess VTX aircraft engine fire warning system operation by interpretation of the instruments (displays)/ indicators for normal/ abnormal operation IAW the aircraft NATOPS, without assistance and without error.	C	4
FS21	Assess the VTX aircraft communication systems for normal/abnormal operation by the interpretation of instruments (displays) indicators and audio response, IAW the aircraft NATOPS, without assistance and without error.	C	4
FS22	Apply voice communication procedures by developing voice messages to include phrases, figures, time and position reports, without assistance and without error, with only minor deviations.[2]	C	3
FS23	Identify and interpret signal lights from the control tower and their meaning during shore-based operations, verbally and/or in writing, without assistance and without error.[2]	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS24	Describe the visual signals, used to communicate between aircraft, day or night, verbally and/or in writing, without assistance and without error.[2]	C	2
FS25	Relate the importance of utilizing all elements of time sharing scan to quickly and accurately identify, classify and determine specific objects for their presence, rate of closure and relative distances while at the same time determining/maintaining aircraft attitude.[3]	A	4
FS26	Describe the life support systems required for the VTX aircraft IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2
FS27	Explain the features of the parachute/ejection seat used in the VTX aircraft including how to don/strap in, how to control it during descent, how to control it during landing and how to extricate oneself from it in water or on land, verbally and/or in writing, without assistance and without error.	C	2
FS28	Identify and explain the use of pressure and oxygen equipment available to the VTX pilot, without assistance and without error.	C	2
FS29	Demonstrate the capability to use escape/ ejection systems, under controlled condition, without assistance and without error.	P	3
FS30	Demonstrate the capability to utilize the performance charts, listed in the aircraft NATOPS, for mission planning, without assistance and without error. [2]	C	3
FS31	Demonstrate the capability to calculate CG for the VTX aircraft translating the weight and balance to aircraft performance IAW the NATOPS, by completing Weight and Balance Form, without assistance and without error.	C	4
FS32	Comply with the FAA/OPNAV regulations that govern aircraft flight, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS33	Describe the purpose, authority and operating requirements of local course rules, verbally and/or in writing, without assistance and without error.	C	2
FS34	Examine the aircraft record form and determine the aircraft flight status prior to flight, without assistance and without error. 2	C	3
FS35	Observe the safety precautions in and around the aircraft during pre-flight inspection, without assistance and without error.	C	3
FS36	Demonstrate the capability to identify aircraft systems and components IAW the NATOPS pre-flight inspection checklist and determine the condition of each, without assistance and without error.	C	3
FS37	Describe the pre-start procedures checklist to be utilized upon entry to the cockpit, verbally and/or in writing, without assistance and without error.	C	2
FS38	Demonstrate the capability to identify and explain the operation and function of the aircraft systems and controls to be checked and inspected, during the pre-start procedures, verbally and/or in writing, without assistance and without error.	C	3
FS39	Relate the importance of performing pre-start procedures in accordance with checklist procedures to aircraft performance and safety.	A	4
FS40	Describe the procedures utilized and safety precautions taken prior to engine(s) start, IAW the NATOPS, without assistance and without error.	C	2
FS41	Demonstrate the capability to identify and explain the function and operation of the aircraft system and controls to be checked, activated and controlled during engine(s) start, IAW the NATOPS, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS42	Explain the aircraft indications and limitations during engine(s) start which indicate a normal or abnormal start, IAW the NATOPS, verbally and/or in writing, without assistance and without error.	C	2
FS43	Describe the procedures to be implemented when an abnormal start is indicated, IAW the NATOPS, verbally and/or in writing, without assistance and without error.	C	2
FS44	Relate the importance of using correct NATOPS start procedures, using the aircraft checklist to aircraft performance and safety.	A	4
FS45	Describe the procedures utilized and safety precautions to be observed prior to taxi, IAW the NATOPS, verbally and/or in writing, without assistance and without error.	C	2
FS46	Demonstrate the capability to interpret signals and interact with ground personnel during the execution of the pre-taxi procedures, IAW the NATOPS, without assistance and without error.	C	3
FS47	Demonstrate the capability to identify and explain the function of the systems to be checked, activated during the execution of the pre-taxi procedures IAW the NATOPS, without assistance and without error.	C	3
FS48	Demonstrate the capability to exercise the correct communication procedures, prior to taxi, using standardized language and brevity, without assistance and without error. 2	C	3
FS49	Relate the importance of using correct pre-taxi procedures, using the NATOPS checklist, to aircraft performance and safety.	A	4
FS50	Describe the procedures utilized and safety precautions to be observed during taxi operations, IAW the NATOPS, verbally and/or in writing, without assistance and without error.	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS51	Relate why the correct use of brakes and power is required to maintain directional and speed control when taxiing the aircraft, verbally and/or in writing, without assistance and without error.	C	3
FS52	Relate the importance of performing the correct taxi procedures, to safety and aircraft performance.	A	4
FS53	Describe the procedures utilized and safety precautions observed in the execution of the pre-take-off procedures IAW NATOPS, verbally and/or in writing, without assistance and without error.	C	2
FS54	Identify the systems and explain indications to be checked and related to aircraft performance in the execution of pre-take-off procedures, IAW the NATOPS, verbally and/or in writing, without assistance and without error.	C	2
FS55	Demonstrate the capability to determining aircraft systems "up" status, in the execution of the pre-take-off procedures, IAW the NATOPS, through pre-take-off checks, without assistance and without error.	C	3
FS56	Demonstrate the capability to exercise the correct communication procedures, prior to take-off, without assistance and without error. 2	C	3
FS57	Relate the importance of performing pre-take-off procedures in accordance with the aircraft NATOPS checklist to safety and aircraft performance.	A	4
FS58	Demonstrate the capability to describe the operation of the aircraft systems in sufficient detail to be able to diagnose a system malfunction, IAW the NATOPS, verbally and/or in writing, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS59	See reasons why multiple emergencies, adverse weather and other peculiar conditions may require modification of the emergency procedures identified in the aircraft NATOPS.	A	4
FS60	Relate that it is essential in the application of emergency procedures to determine the correct course of action to insure pilot and aircraft survivability.	A	4
FS61	Relate the importance of the use of common sense and good judgement in the application of the correct emergency procedures, IAW the aircraft NATOPS, to safety and aircraft performance.	A	4
FS62	Identify and describe the ground emergencies listed in the aircraft NATOPS, verbally and/or in writing, without assistance and without major errors.	C	2
FS63	Demonstrate the capability to explain the correct procedure to be implemented for each ground emergency listed in the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS64	Demonstrate the capability to describe the procedures utilized and the safety precautions observed in the execution of a day, VFR, shorebased take-off, IAW the NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS65	Demonstrate the capability to utilize the take-off checklist in the execution of a day, VFR, shorebased take-off, IAW the NATOPS, without assistance and no omissions.	C	3
FS66	Demonstrate the capability to describe the flight rules, regulations, local instructions and course rules applicable to day, VFR, shorebased flight, verbally and/or in writing, without assistance and without error.	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS67	Demonstrate the capability to describe the procedures and techniques to be used during the flight conditions indicated below, in the execution of a day, VFR, shorebased take-off IAW the NATOPS/FTI, verbally and/or in writing, without assistance and without error. 1. Normal Take-off 2. Minimum Run Take-off 3. Obstacle Clearance Take-off 4. Cross Wind Take-off 5. Heavy Load	C	3
FS68	Demonstrate the capability to identify and describe the aircraft systems and controls exercised in the execution of a day, VFR, shorebased take-off, verbally and/or in writing, without assistance and without error.	C	3
FS69	Describe the effects of a Heads Up Display malfunctions and/or degraded mode of operation, verbally and/or in writing, without assistance and without error.	C	3
FS70	Relate the importance of performing the correct take-off procedures, under day, VFR, shorebased conditions to safety and aircraft performance.	A	4
FS71	Identify and describe, the take-off emergencies listed in the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS72	Demonstrate the capability to explain the correct procedure to be implemented for each take-off emergency, listed in the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS73	Demonstrate the capability to describe the procedures utilized and safety precautions observed in the execution of an aborted take-off IAW the NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS74	Demonstrate the capability to describe the communication procedures to be exercised during the abort procedure, verbally and/or in writing, without assistance and without error.[2]	C	2
FS75	Relate the importance of performing the correct abort take-off procedures, to pilot and aircraft safety.	A	4
FS76	Demonstrate the capability to describe the procedures utilized and safety precautions observed in the execution of a one-engine take-off due to an engine failure, IAW the NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS77	Demonstrate the capability to grasp the emergency situation and making a judgment to implement abort procedures or execute one-engine take-off, without assistance and without error.	C	3
FS78	Relate the importance of performing the correct one-engine take-off procedures to pilot and aircraft safety, IAW the NATOPS.	A	4
FS79	Demonstrate the capability to explain the function and use of the position, performance, and attitude instruments/displays, under VMC conditions utilized in the execution of transitions, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.[2]	C	3
FS80	Demonstrate the capability to describe the procedures, under VMC conditions to achieve a given aircraft performance, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.[2]	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS81	Demonstrate the capability to explain the importance of using the trim tabs during all phases of flight to assist the pilot in maintaining aircraft attitude, verbally and/or in writing, without error and without assistance. 3	C	3
FS82	Demonstrate the capability to describe the communication procedures executed during transitions, verbally and/or in writing, without assistance and without error. 2	C	3
FS83	Relate the importance of utilizing the correct procedures in the execution of transitions to safety and aircraft performance.	A	4
FS84	Relate the importance, under VMC conditions of accomplishing transition maneuvers to pilot basic airwork and good airmanship.	A	4
FS85	Demonstrate the capability to describe the procedures, under VMC conditions implemented, during the Initial Climb to Altitude after take-off, verbally and/or in writing, without assistance and without error.	C	3
FS86	Identify and interpret the indications of the instrument/displays used in the execution of Initial Climb to Altitude, under VMC conditions, verbally and/or in writing, without assistance and without error.	C	3
FS87	Relate the importance of using the correct procedures in the execution of the Initial Climb to Altitude maneuvers to safety and aircraft performance.	A	4
FS88	Demonstrate the capability to describe the procedures, under VMC conditions used to achieve straight and level flight IAW NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS89	Identify and interpret, under VMC conditions, the indications on the instruments/displays to maintain straight and level flight IAW NATOPS, verbally and/or in writing, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS90	Relate the importance of using the correct procedures in the execution of straight and level flight.	A	4
FS91	Demonstrate the capability to describe, under VMC conditions, the two general types of constant airspeed and constant rate climbing and descending maneuvers and the techniques to accomplish each IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS92	Identify and interpret the indications on the instruments/displays used to accomplish climbs and descents under VMC conditions IAW aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS93	Demonstrate the capability to describe the techniques required to accomplish a turn while performing the climb and descent maneuvers, under VMC conditions IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS94	Relate the importance of using the correct procedure and techniques in the execution of the climbing and descending maneuvers.	A	4
FS95	Demonstrate the capability to describe the procedure and techniques, under VMC conditions, utilized when performing turns listed below, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error. 1. Standard Rate 2. ½ Standard Rate 3. Steep Turns (To Buffet) 4. Reversals 5. Minimum Radius	C	3
FS96	Identify and interpret, under VMC conditions, the indications on the instruments/displays used to accomplish the turn maneuvers IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS97	Relate the importance of using the correct procedure and techniques in the execution of the turn maneuvers.	A	4
FS98	Demonstrate the capability to describe the procedures and techniques, under VMC conditions, used in accomplishing the slow flight maneuver IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS99	Relate the importance of using the correct procedures and techniques in controlling the aircraft in the execution of the slow flight maneuver.	A	4
FS100	Demonstrate the capability to describe the procedures and techniques, under VMC conditions, used in accomplishing the speed changes IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS101	Relate the importance of using the correct procedures and techniques in controlling the aircraft in the execution of the speed change maneuver.	A	4
FS102	Relate that the vertical "S" maneuvers are proficiency maneuvers designed to improve the pilots airwork and aircraft control, verbally and/or in writing, without assistance and without error.	C	3
FS103	Relate that the vertical "S" maneuvers incorporate fundamental airwork in sequence with continuous changes of attitude and airspeed, required in instrument flight, verbally and/or in writing, without assistance and without error.	C	3
FS104	Demonstrate the capability to describe the procedures and techniques,under VMC conditions, utilized in performing the instrument patterns IAW NATOPS, verbally and/or in writing, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS105	Relate the importance of using the correct procedures and techniques in controlling the aircraft in the execution of the "S" patterns.	A	4
FS106	Relate that recognizing the cause and effect of aircraft stalls and the procedures for entry and recovery is necessary for safe flight, verbally and/or in writing, without assistance and without error.	C	3
FS107	Demonstrate the capability to describe each of the entry and recovery procedures for the stalls listed below, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error. 1. Power off 2. Landing Configuration 3. Steep turn 4. Break turn 5. Approach turn	C	3
FS108	Relate that recognizing the cause and effect of aircraft spins and the procedures for entry and recovery is necessary for safe flight, verbally and/or in writing, without assistance and without error.	C	3
FS109	Demonstrate the capability to describe the entry and recovery procedures for erect spins, with landing gear, flaps and speed brakes retracted IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS110	Demonstrate the capability to describe the procedures used to determine if aircraft is in departed flight or in a spin, verbally and/or in writing, without assistance and without error.	C	3
FS111	Demonstrate the capability to describe the procedures required to recover from departed flight and the altitude required for recovery, verbally and/or in writing, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS112	Relate the importance of using the correct procedures and techniques to affect departed flight recovery to aircraft and pilot safety.	A	4
FS113	Demonstrate the capability to explain the procedures used to recover from a near vertical climb when the airspeed is insufficient to complete the maneuver, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS114	Demonstrate the capability to explain how incorrect vertical recoveries can result in departed flight, verbally and/or in writing, without assistance and without error.	C	3
FS115	Relate that confidence maneuvers are basic aerobatic maneuvers which develop pilot confidence in attitudes of extreme pitch and bank.	A	4
FS116	Relate that the practice of confidence maneuvers develops pilot airmanship, good timing precision, smoothness of aircraft control, increase in speed of scanning, and aids in recovery from unusual attitudes.	A	4
FS117	Demonstrate the capability to describe the relationship between confidence maneuvers and air tactics in combat missions, verbally and/or in writing, without assistance and without error.	C	3
FS118	Demonstrate the capability to describe each of the confidence maneuvers listed below, verbally and/or in writing, without assistance and without error. 1. Wing over 2. Barrel Roll 3. Loop 4. Half Cuban Eight 5. Immelman 6. Aileron Roll 7. Split S	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS119	Demonstrate the capability to describe the correct procedures and techniques used to perform each type of confidence maneuver identified in the NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS120	Relate the importance of performing each type of confidence maneuver, IAW the aircraft NATOPS, to safety and aircraft performance.	A	4
FS121	Identify and describe, the in-flight emergencies and/or system failures listed in the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS122	Demonstrate the capability to explain the correct procedures to be implemented for each in-flight emergency identified in the aircraft NATOPS, without assistance and without error.	C	3
FS123	Relate the importance, of the use of common sense and pilot judgment in coping with in-flight emergencies to pilot safety and aircraft performance.	A	4
FS124	Relate the importance of performing the correct procedures in the execution of an in-flight emergency.	A	4
FS125	Demonstrate the capability to describe the operation of ejection system, installed in the aircraft, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS126	Demonstrate the capability to describe the emergencies, which require the application of the ejection procedures, as identified in the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS127	Relate the importance of the pilot decision to abandon the aircraft, during an emergency, to pilot and/or aircraft survivability.	A	4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS128	Demonstrate the capability to describe the ejection procedures to be utilized in the abandon aircraft emergency, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS129	Demonstrate the capability to describe the alternative bailout procedures to be utilized in the case of failure of the ejection seat to eject, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS130	Demonstrate the capability to use escape/ejection systems, under controlled conditions, without hesitation, without assistance and without error.	P	4
FS131	Relate the importance of performing the correct ejection procedures during an emergency requiring bailout, to pilot safety.	A	4
FS132	Demonstrate the capability to describe the "aircraft in distress" procedures IAW the NATOPS, verbally and/or in writing, without assistance and without error.$_2$	C	3
FS133	Demonstrate the capability to describe the "aircraft in distress" procedures to be implemented as the pilot of an assisting aircraft, in the case of a downed aircraft, verbally and/or in writing, without assistance and without error.$_2$	C	3
FS134	Demonstrate the capability to describe the "aircraft in distress" procedures to be implemented as the first aircraft to arrive over the scene of the crash, verbally and/or in writing, without assistance and without error.$_2$	C	3
FS135	Demonstrate the capability to describe the "aircraft in distress" procedures to be implemented as the second aircraft to arrive over the scene of the crash, verbally and/or in writing, without assistance and without error.$_2$	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS136	Relate the importance of performing the correct "aircraft in distress" procedures IAW the aircraft NATOPS, to the safety of the pilot.$_2$	A	4
FS137	Demonstrate the capability to describe the lost plane procedures to be implemented when a lost plane situation occurs, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.$_2$	C	3
FS138	Demonstrate the capability to describe the lost plane communication procedures to be implemented when a lost plane situation occurs IAW the aircraft NATOPS, verbally and/ or in writing, without assistance and without error.$_2$	C	3
FS139	Perform the correct lost plane procedures, when the situation exists, IAW the aircraft NATOPS, without hesitation and without assistance and without error.$_2$	P	4
FS140	See the reasons for the importance of a pilot acknowledging a lost plane situation exists and implementing the lost plane procedures IAW the aircraft NATOPS.$_2$	A	4
FS141	Describe the ditching procedures to be implemented when the situation warrants IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2
FS142	Demonstrate the capability to cope with the aircraft ditching, IAW the aircraft NATOPS, without hesitation, assistance, or error.$_1$	P	4
FS143	Relate the importance of performing the correct ditching procedures, during the emergency requiring ditching, IAW the aircraft NATOPS, to pilot safety.	A	4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS144	Perform the correct ditching procedures, during an aircraft emergency requiring ditching, IAW the aircraft NATOPS, without assistance and with only minor deviations which will not jeopardize pilot survival.2	P	4
FS145	Demonstrate the capability to describe the procedures utilized and the safety precautions observed in the execution of a day, VFR, shorebased landing, IAW the NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS146	Demonstrate the capability to describe the flight rules, regulations, local instructions and course rules applicable to day, VFR, shorebased landing, verbally and/or in writing, without assistance and without error.	C	3
FS147	Demonstrate the capability to execute the correct communication procedures in the execution of a day, VFR, shorebased landing, using the accepted terminology, without assistance and without error.	C	3
FS148	Demonstrate the capability to describe the procedures used, with landing conditions indicated below, in the execution of a day, VFR, shorebased landing, IAW the NATOPS, verbally and/or in writing, without assistance and without error. 2 1. Field entry and break 2. Full flap landing and/or as specified in aircraft NATOPS 3. Touch-and-go landing 4. No flap landing 5. Minimum run landing 6. Cross wind landing 7. Practice precautionary emergency landing (PPEL) 8. Waveoff	C	2
FS149	Relate the importance of performing the correct landing procedures under day, VFR, shorebased conditions to safety and aircraft performance.	A	4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS150	Identify and describe, the landing emergencies listed in the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS151	Demonstrate the capability to explain the correct procedure to be implemented for each landing emergency, listed in the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS152	Relate the importance of performing the correct procedures, during a landing emergency, IAW the aircraft NATOPS to pilot/aircraft survival.	A	4
FS153	Demonstrate the capability to describe the procedures utilized and the safety precautions observed in the execution of engine(s) shutdown, IAW the NATOPS, verbally and/or in writing, without assistance and without error.	C	2
FS154	Demonstrate the capability to identify the aircraft systems to be checked and deactivated in the execution of engine(s) shutdown, IAW the NATOPS, without assistance and without error.	P	4
FS155	Relate the importance of performing the correct engine(s) shutdown procedures, in accordance with the aircraft checklist to safety and aircraft performance.	A	4
FS156	Demonstrate the capability to describe the secure aircraft procedures to be performed, aircraft systems and controls to be checked prior to leaving the aircraft, IAW with the aircraft NATOPS, verbally and/or in writing, in proper sequence, without assistance and without error.	C	3
FS157	Discuss NATOPS refueling procedures utilized for the VTX aircraft IAW aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS158	Demonstrate the capability to describe the post-flight inspection requirements IAW the NATOPS, verbally and/or in writing, without assistance and without error.	C	2
FS159	Determine during post-flight inspection aircraft flight status and record on "yellow sheet" IAW NATOPS. Performance, be able to record the information on the yellow sheet correctly as to the aircraft flight status, without assistance and without error.[2]	C	3
FS160	Relate importance of secure aircraft/post-flight inspection to aircraft performance and safety. Performance, relate that a properly completed secure post-flight inspection will provide a safe aircraft for the next flight.	A	4
FS161	Demonstrate the capability to describe the procedures and safety precautions to be observed in the execution of a day/night, IFR shorebased take-off, verbally and/or in writing, without assistance and without error.	C	3
FS162	Demonstrate the capability to describe aircraft systems, controls and communication and navigation equipment to be exercised in the execution of a day/night, IFR, shorebased take-off, verbally and/or in writing, without assistance and without error.	C	3
FS163	Demonstrate the capability to describe the instruments/displays to be monitored during a day/night, IFR, shorebased take-off, verbally and/or in writing, without assistance and without error.	C	3
FS164	Relate the importance of using and having confidence in the navigation instruments/ displays during a day/night, IFR, shorebased take-off.	A	4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS165	Relate the importance of performing the correct take-off procedures, under day/night, IFR, shorebased conditions to safety and aircraft performance.	A	4
FS166	Demonstrate the capability to explain the function and use of the position, performance, and attitude instruments/displays under IMC conditions utilized in the execution of transitions, verbally and/or in writing, without assistance and without error.	C	3
FS167	Relate the importance, under IMC conditions, of accomplishing transition maneuvers to pilot basic airwork and good airmanship.	A	4
FS168	Relate the importance of utilizing all elements of scan to quickly and accurately determine aircraft performance during IMC flight.3	A	4
FS169	Demonstrate the capability to describe the procedures, under IMC conditions,to be implemented, during the Initial Climb to Altitude after take-off, verbally and/or in writing, without assistance and without error.	C	3
FS170	Identify and interpret the indications of the instruments/displays utilized in the execution of Initial Climb to Altitude, under IMC conditions, verbally and/or in writing, without assistance and without error.	C	3
FS171	Demonstrate the capability to describe the procedures, under IMC conditions to be implemented to achieve straight and level flight, verbally and/or in writing, without assistance and without error.	C	3
FS172	Identify and interpret, under IMC conditions the indications on the instruments/displays to maintain straight and level flight, verbally and/or in writing, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS173	Demonstrate the capability to describe, under IMC conditions, the two general types of constant airspeed and constant rate climbing and descending maneuvers and the techniques to accomplish each, verbally and/or in writing, without assistance and without error.	C	3
FS174	Identify and interpret the indications on the instruments/displays utilized to accomplish climbs and descents, under IMC conditions, verbally and/or in writing, without assistance and without error.	C	3
FS175	Demonstrate the capability to describe the techniques required to accomplish a turn while performing the climb and descent maneuvers, under IMC conditions, verbally and/or in writing, without assistance and without error.	C	3
FS176	Demonstrate the capability to describe the procedure and techniques, under IMC conditions, utilized when performing turns listed below, verbally and/or in writing, without assistance and without error. 1. Standard rate 2. ½ standard rate 3. Steep turn (to buffet) 4. Reversals 5. Minimum radius	C	3
FS177	Identify and interpret, under IMC conditions, the indications of the instruments/displays utilized to accomplish the turn maneuvers, verbally and/or in writing, without assistance and without error.	C	3
FS178	Demonstrate the capability to describe the procedures and techniques, under IMC conditions, utilized in accomplishing the slow flight maneuver, verbally and/or in writing, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS179	Demonstrate the capability to describe the procedures and techniques, under IMC conditions, utilized in accomplishing the speed changes, verbally and/or in writing, without assistance and without error.	C	3
FS180	Demonstrate the capability to describe the procedures and techniques, utilized in performing the "S" instrument patterns, verbally and/or in writing, without assistance and without error.	C	3
FS181	Relate that the OSCAR, CHARLIE, YANKEE patterns are precision maneuvers designed to improve the pilots airwork and aircraft control.	A	4
FS182	Demonstrate the ability to describe the OSCAR, CHARLIE, YANKEE patterns and procedures, verbally and/or in writing, without assistance and without error.	C	3
FS183	Relate the importance of using the correct procedures and techniques in controlling the aircraft in the execution of the OSCAR, CHARLIE, YANKEE patterns.	A	4
FS184	Grasp that failures in the position, performance and attitude instruments occur and that pilots must be proficient in instrument flight under one or more instrument/display failure, verbally and/or in writing, without assistance and without error.	C	3
FS185	Relate that alternative procedures are available when an instrument/display failure occurs during instrument flight by the use of supporting instruments/displays, verbally and/or in writing, without assistance and without error.	C	3
FS186	Demonstrate the capability to describe the procedure and techniques for each particular failure of an instrument/display during instrument flight, verbally and/or in writing, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS187	Relate the importance of using the correct procedures and techniques in controlling the aircraft during partial panel flight.	A	4
FS188	Relate that an unusual attitude in an aircraft attitude, which occurs inadvertently, can result from one or more factors such as turbulance, instrument/display failure, inattention, and spatial disorientation, verbally and/or in writing, without assistance and without error.	C	3
FS189	See the importance of recognizing that an unusual attitude exists and correctly interpreting the unusual attitude, via the instruments/displays prior to initiating recovery procedures.	A	4
FS190	Demonstrate the capability to describe the recovery procedures and techniques for each type of unusual attitude, listed below, verbally and/or in writing, without assistance and without error. 1. Nose Low Recovery 2. Nose High Recovery 3. Stalls 4. Spins	C	3
FS191	Relate the importance of using the correct procedures and techniques in the execution of recovery from unusual attitudes.	A	4
FS192	Demonstrate the capability to describe the procedures and safety precautions to be observed in the execution of a day/night, IFR, shorebased landing, verbally and/or in writing, without assistance and without error.	C	3
FS193	Locate and identify within the VTX aircraft cockpit, the navigation systems associated instruments (displays), indicators and controls, without assistance and without error.	P	4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS194	Demonstrate the ability to use the aeronautical terms listed in the Navy Instrument Flight Manual, verbally and/or in writing, without assistance and without error.[2]	C	3
FS195	Demonstrate the capability to select the appropriate SID's, en route, area charts, and approach plates that will provide adequate coverage for the proposed route, without assistance and without error.[2]	C	3
FS196	Demonstrate the capability to interpret the information contained in a SID, for use in flight planning, verbally and/or in writing, without assistance and without error.[2]	C	3
FS197	Demonstrate the capability to utilize the information contained in a SID in the planning for an instrument flight, without assistance and without error.[2]	C	3
FS198	Demonstrate the capability to utilize a navigation computer during flight planning or in flight, without assistance and without error.[2]	C	3
FS199	Demonstrate Flight Planning capability by filing DD-175's for an instrument flight and a visual flight from one geographical point to another, without assistance and without major error.[2]	C	4
FS200	Demonstrate the capability to describe the flight rules, regulations, local instructions, and course rules applicable to day/night, IFR, shorebased take-off, verbally and/or in writing, without assistance and without error.	C	3
FS201	Demonstrate the capability to explain the radio procedures required, recalling the format, during an approach/departure for IMC, verbally and/or in writing, without assistance and without error.[2]	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS202	Demonstrate the capability to explain the purpose of a standard instrument departure (SID) and how it is utilized, verbally and/or in writing, without assistance and without error.[2]	C	3
FS203	Relate that SID's prescribe a safe route of flight for a climb out to assigned altitude and course during instrument flight, verbally and/or in writing, without assistance and without error.	C	3
FS204	Relate that SID's minimize radio communications and clearance delays before take-off, and provides an ATC clearance in the event of a two-way failure, verbally and/or in writing, without assistance and without error.[2]	C	3
FS205	Relate the importance of using the correct procedures in the execution of a SID to pilot and aircraft safety.[2]	A	4
FS206	Demonstrate the capability to describe the correct communication procedures utilized in the execution of a SID, verbally and/or in writing, without assistance and without error.[2]	C	3
FS207	Demonstrate the capability to explain the procedural steps for proceeding directly to the station using VOR, verbally and/or in writing, without assistance and without error.[2]	C	3
FS208	Demonstrate the capability to explain the procedural steps required for Inbound Course Interceptions, using VOR, verbally and/or in writing, without assistance and without error.[2]	C	3
FS209	Demonstrate the capability to explain the procedural steps required for Outbound-Immediately after station passage, and for Outbound-Away from the station, using VOR, verbally and/or in writing, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS210	Demonstrate the capability to explain course intercept procedures inbound and outbound, using VOR, verbally and/or in writing, without assistance and without error.[2]	C	3
FS211	Demonstrate the capability to explain the procedures for computing time and distance from an Omni Range, verbally and/or in writing, without assistance and without error.[2]	C	3
FS212	Demonstrate the capability to explain the procedures for holding, using an Omni Range, including entry, turns, timing and wind correction techniques, verbally and/or in writing, without assistance and without error.[2]	C	3
FS213	Demonstrate the capability to explain the procedures for Non-DME Teardrop High Altitude Approach, verbally and/or in writing, without assistance and without error.	C	3
FS214	Demonstrate the capability to explain the procedures for a dual VOR High Altitude Approach, verbally and/or in writing, without assistance and without error.	C	3
FS215	Demonstrate the capability to explain the procedures for a VOR Low Altitude Approach, verbally and/or in writing, without assistance and without error.[2]	C	3
FS216	Demonstrate the capability to explain the procedural steps for conducting a Ground Speed Check, using TACAN, verbally and/or in writing, without assistance and without error.	C	3
FS217	Demonstrate the capability to explain a station passage indication when using TACAN, verbally and/or in writing, without assistance and without error.[2]	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS218	Demonstrate the capability to explain the procedures for maintaining a TACAN arc around the station IAW NIFM, verbally and/or in writing, without assistance and without error.[2]	C	3
FS219	Demonstrate the capability to explain the procedural steps for intercepting an arc from a radial, using TACAN IAW NIFM, verbally and/or in writing, without assistance and without error.[2]	C	3
FS220	Demonstrate the capability to explain the procedural steps for intercepting a radial from an arc, using TACAN IAW NIFM, verbally and/or in writing, without assistance and without error.[2]	C	3
FS221	Demonstrate the capability to explain the techniques of proceeding direct between TACAN fixes IAW NIFM, verbally and/or in writing, without assistance and without error.[2]	C	3
FS222	Demonstrate the capability to explain the procedures utilized in TACAN holding IAW NIFM, verbally and/or in writing, without assistance and without error.[2]	C	3
FS223	Demonstrate the capability to explain the procedures utilized in TACAN SID IAW NIFM, verbally and/or in writing, without assistance and without error.[2]	C	3
FS224	Demonstrate the capability to explain the TACAN approach procedures, high ltitude penetration and approach and low altitude approach, IAW NIFM, verbally and/or in writing, without assistance and without error.	C	3
FS225	Demonstrate the capability to explain the TACAN malfunction "40 Degree Azimuth Error Lock-On" and how it can be detected, verbally and/or in writing, without assistance and without error.[2]	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS226	Demonstrate the capability to explain the procedures utilized in air-to-air rendezvous using TACAN, verbally and/or in writing, without assistance and without error.	C	3
FS227	Demonstrate the capability to explain the procedures using ADF, IAW, NIFM, for the following, verbally and/or in writing, without assistance and without error. 1. Course Interceptions 2. Inbound and Outbound 3. Station passage 4. Outbound - Immediately after Station Passage 5. Tracking 6. Time Distance Check 7. UHF Homing	C	3
FS228	Demonstrate the capability to explain the procedures for an ADF high altitude penetration and approach IAW NIFM, verbally and/or in writing, without assistance and without error.	C	3
FS229	Demonstrate the capability to explain the procedures for an ADF low altitude approach IAW NIFM, verbally and/or in writing, without assistance and without error.	C	3
FS230	Demonstrate the capability to explain the procedures for performing the ILS approach as outlined in the NATOPS Instrument Flight Manual, verbally and/or in writing, without assistance and without error.	C	3
FS231	Demonstrate the capability to explain the voice procedures used for radar instrument approaches, verbally and/or in writing, without assistance and without error.[2]	C	3
FS232	Demonstrate the capability to explain the procedures for using airborne radar to determine the following, verbally and/or in writing, without assistance and without error. 1. Weather Location 2. Target Detection 3. Intercepts 4. Aircraft Position	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS233	Demonstrate the capability to describe the instrument approach/penetration procedures utilized in the execution of a day/night, IFR, shorebased landing, verbally and/or in writing, without assistance or error.2	C	3
FS234	Relate the importance of using and having confidence in the navigation instruments/ displays during a day/night, IFR, shorebased landing.2	A	4
FS235	Demonstrate the capability to explain the use of NOTAMS and what kind of information they provide, verbally and/or in writing, without assistance and without error.2	C	3
FS236	Demonstrate the capability to explain what information is needed about the destination and where the information can be obtained for flight planning, verbally and/or in writing, without assistance and without error.2	C	3
FS237	Demonstrate the capability to explain the procedures for pilot analysis of weather conditions, include sources of weather information, means of interpretation and forecasts, verbally and/or in writing, without assistance and without error.2	C	3
FS238	Demonstrate the capability to explain the considerations involved in selection of route and altitude, verbally and/or in writing, without assistance and without error.2	C	3
FS239	Demonstrate the capability to explain the requirements and the references applicable to the preparation and filing of the DD-175 to include use of NOTAMS, En Route Supplement, FLIP, Weight and Balance Chart, verbally and/or in writing, without assistance and without error.2	C	3
FS240	Demonstrate the capability to explain the basis for selection of appropriate SID, en route area chart, and approach plate for a proposed route, verbally and/or in writing, without assistance and without error.2	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS241	Demonstrate the capability to analyze existing weather conditions to determine acceptability for proposed flight, without assistance and without error.2	C	4
FS242	Determine the best altitude to be flown, for all flight conditions and mission requirements, without assistance and without error.	C	4
FS243	Determine from the terminal forecast whether weather minimums will be exceeded at ETA, to insure flight safety, without assistance and without error.2	C	4
FS244	Demonstrate the capability to explain the symbols used in copying clearances as listed in flight planning documents, verbally and/or in writing, without assistance and without error.2	C	3
FS245	Demonstrate the capability to recall the required format and explain the required en route IMC radio procedures, verbally and/or in writing, without assistance and without error.2	C	3
FS246	Relate the importance of take-off minimums being a final consideration for IFR take-off and that landing minimums are available at airport(s) within the departure area.2	A	4
FS247	Demonstrate the capability to explain en route holding with and without clearance, verbally and/or in writing, without assistance and without error.	C	3
FS248	Demonstrate the capability to explain the purpose of IFF/SIF equipment and how it is used, verbally and/or in writing, without assistance and without error.2	C	3
FS249	Demonstrate the capability to comply with instructions from controlling agencies under all flight conditions IAW NIFM, verbally and/or in writing, without assistance and without error.2	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS250	Demonstrate the capability to interpret the airways charts by navigating from one point to another under various flight conditions, verbally and/or in writing, without assistance and without error.[2]	C	3
FS251	Demonstrate the capability to explain the information provided on an approach plate (e.g., format, notation, type approach, frequencies, minimum, missed approach, etc.), verbally and/or in writing, without assistance and without error.[2]	C	3
FS252	Assess VTX aircraft lighting system operation by interpretation of lighting system, indications for normal/abnormal operation IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS253	Demonstrate the capability to explain the differences/variations in preflight procedures when performed at night versus day, verbally and/or in writing, without assistance and without error.	C	3
FS254	Relate that night flying operations involve all the flight factors of day flying operations plus the additional factors of the lack of sufficient light to enable the pilot to define objects other than lights.	A	4
FS255	Demonstrate the capability to describe the aircraft light management procedures used during the execution of night ground procedures, ground operations, and flight, verbally and/or in writing, without assistance and without error.	C	3
FS256	Relate the importance of performing the correct procedures, during night flight operations, to safety and aircraft performance.	A	4
FS257	Demonstrate the capability to explain the required pilot action of all night signals given by line crewman during shorebased operations, verbally and/or in writing, without assistance and without error.[2]	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS258	Demonstrate the capability to explain the differences/variations in the prestart procedures when performed at night versus day, verbally and/or in writing, without assistance and without error.	C	3
FS259	Demonstrate the capability to explain the differences/variations in the start procedures when performed at night versus day, verbally and/or in writing, with no omissions.	C	3
FS260	Demonstrate the capability to explain the differences/variations in the pre-taxi procedures when performed at night versus day, verbally and/or in writing, with no omissions.	C	3
FS261	Demonstrate the capability to explain the differences/variations in taxi procedures at night versus day, verbally and/or in writing, with no omissions.	C	3
FS262	Demonstrate the capability to explain the differences/variations in the pre-take-off procedures at night versus day, verbally and/or in writing, correctly, with no omissions.	C	3
FS263	Demonstrate the capability to describe the procedures utilized and safety precautions observed in the execution of a night, VFR, shorebased take-off, verbally and/or in writing, without assistance and without error.	C	3
FS264	Demonstrate the capability to describe the differences in operation/procedures in the execution of a night, VFR, shorebased take-off, verbally and/or in writing, with no omissions.	C	3
FS265	Demonstrate the capability to utilize the take-off checklist in the execution of a night, VFR, shorebased take-off, without assistance and without error.[2]	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS266	Describe the flight rules, regulations, local instructions and course rules applicable to night, VFR, shorebased flight, verbally and/or in writing, without assistance and without error.[2]	C	3
FS267	Describe the standard configurations of lights and light colors used in airfield lighting and encountered during night, VFR, shorebased flight, verbally and/or in writing, without assistance and without error.[2]	C	3
FS268	Demonstrate the capability to describe the procedure and techniques to be used with the conditions, indicated below, in the execution of a night, VFR, shorebased take-off, verbally and/or in writing, without assistance and without error. 1. Normal Take-off 2. Minimum Run Take-off 3. Obstacle Clearance Take-off 4. Cross Wind Take-off 5. Heavy Load	C	3
FS269	Relate the importance of performing the correct take-off procedures, under night, VFR, shorebased conditions to safety and aircraft performance.[2] 1. Normal Take-off 2. Minimum Run Take-off 3. Obstacle Clearance Take-off 4. Cross Wind Take-off 5. Heavy Load	A	4
FS270	Demonstrate the capability to describe the procedures utilized and safety precautions observed in the execution of a night, VFR, shorebased landing, verbally and/or in writing, without assistance and without error.[2]	C	3
FS271	Demonstrate the ability to cope with the differences in operation/procedures in the execution of a night, VFR, shorebased landing, verbally and/or in writing, without assistance and without error.[2]	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS272	Relate the importance of performing the correct landing procedures under night, VFR, shorebased conditions to safety and aircraft performance.	A	4
FS273	Demonstrate the capability to explain the differences/variations in engine(s) shutdown procedures at night versus day, verbally and/or in writing, with no omissions.	C	3
FS274	Demonstrate the capability to explain the differences/variations in the secure aircraft/post-flight inspection procedures when performed at night versus day, verbally and/or in writing, with no omissions.	C	3
FS275	Demonstrate the capability to define the responsibilities of the formation flight members (flight leader, wingman, etc.), verbally and/or in writing, without assistance and without error.[2]	C	3
FS276	Relate the importance of air discipline in the execution of formation flight to safety and aircraft performance.	A	4
FS277	Demonstrate the capability to describe the differences/variations in procedures during night formation flight versus day formation flight, verbally and/or in writing, without assistance and without error.	C	3
FS278	Relate the importance of using the correct procedures in controlling the aircraft in the execution of formation flight to safety and aircraft performance.[2]	A	4
FS279	Relate the importance of using the correct procedures in controlling the aircraft in the execution of the following formation elements, to safety and aircraft performance.[2] 1. Join Up 2. Cross Under 3. Cross Over 4. Lead Change 5. Break	A	4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS280	Demonstrate the capability to describe the various elements, listed below, that are part of formation flight and the role of each member of the formation, verbally and/or in writing, without assistance and without error. 1. Join Up 2. Cross Under 3. Cross Over 4. Lead Change 5. Break	C	3
FS281	Demonstrate the capability to describe the various types of formations, listed below, used in formation flight and the role of each flight member, verbally and/or in writing, without assistance and without error. 1. Parade Formation a. VMC Parade b. IMC Parade 2. Cruise Formation 3. Column Formation 4. Trail Position	C	3
FS282	Demonstrate the capability to describe the role and responsibilities of the Flight Leader and Wingman, in the execution of section formation flight, verbally and/or in writing, without assistance and without error.2	C	3
FS283	Demonstrate the capability to describe the section taxi procedures used, during section formation ground operations, verbally and/or in writing, without assistance and without error.	C	3
FS284	Demonstrate the capability to describe the section formation procedures used, during section take-off, verbally and/or in writing, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS285	Demonstrate the capability to describe the procedures and maneuvers used, during the section formation climbout to altitude under VMC conditions, verbally and/or in writing, without assistance and without error.	C	3
FS286	Demonstrate the capability to describe the differences/variations in procedures and maneuvers under IMC conditions versus VMC conditions, in the execution of section formation climbout to altitude, verbally and/or in writing, without assistance and without error.	C	3
FS287	Demonstrate the capability to describe the procedures and maneuvers used, during section formation climbing rendezvous, verbally and/or in writing, without assistance and without error.	C	3
FS288	Demonstrate the capability to describe the procedures and maneuvers used, during section formation running rendezvous, verbally and/or in writing, without assistance and without error.	C	3
FS289	Demonstrate the capability to describe the procedures and maneuvers used, during section formation carrier rendezvous, verbally and/or in writing, without assistance and without error.	C	3
FS290	Demonstrate the capability to describe the procedures and maneuvers used, during section formation TACAN rendezvous, verbally and/or in writing, without assistance and without error.	C	3
FS291	Demonstrate the capability to describe the procedures and maneuvers used, during section formation air-to-air TACAN and UHF/ADF rendezvous, verbally and/or in writing, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS292	Demonstrate the capability to describe the procedures used for each method of VFR entry listed below, into a traffic pattern to an airfield, in the execution of section recovery procedures, verbally and/or in writing, without assistance and without error. 1. Entry into a break 2. Straight-in approach 3. Downwind entry	C	3
FS293	Demonstrate the capability to describe the procedures used for an IFR entry into a traffic pattern to an airfield in the execution of section recovery procedures, verbally and/or in writing, without assistance and without error.	C	3
FS294	Demonstrate the capability to describe the situation in which during an IFR section recovery, a missed approach is executed, verbally and/or in writing, without assistance and without error.	C	3
FS295	Demonstrate the capability to describe the procedures used for the execution of an IFR section missed approach, during section recovery procedures, verbally and/or in writing, without assistance and without error.	C	3
FS296	Demonstrate the capability to describe the role and responsibilities of each of the members of a division formation, verbally and/or in writing, without assistance and without error.	C	3
FS297	Relate that due to the increased number of aircraft involved in division formation flight, that the responsibility of each member of the division is increased, verbally and/or in writing, without assistance and without error.	C	3
FS298	Relate the importance of exercising radio communication discipline in the execution of division formation flight.	A	4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS299	Demonstrate the capability to describe division taxi procedures used during division formation ground operations, verbally and/or in writing, without assistance and without error.	C	3
FS300	Demonstrate the capability to describe the division formation procedures used during division formation ground operations, verbally and/or in writing, without assistance and without error.	C	3
FS301	Demonstrate the capability to describe the procedures and maneuvers used during the division formation climbout to altitude under VFR conditions, verbally and/or in writing, without assistance and without error.	C	3
FS302	Demonstrate the capability to describe the differences/variations in procedures and maneuvers under IMC conditions versus VMC conditions, during division formation climbout to altitude, verbally and/or in writing, without assistance and without error.	C	3
FS303	Demonstrate the capability to explain the relative positions of all the aircraft, within a division parade formation, verbally and/or in writing, without assistance and without error.	C	3
FS304	Relate the importance of flying in the correct position within a division parade formation, e.g. maintaining bearing, step-down position, nose-to-tail distance, wing-tip clearance.	A	4
FS305	Demonstrate the capability to describe the procedures used in performing division parade formation maneuvers, listed below, verbally and/or in writing, without assistance and without error. 1. Climbs and Level Off 2. Parade Turns 3. Turns into/away from Wingman 4. Cross-Under 5. Descents and Level Off	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS306	Relate the importance of performing the correct procedures and maneuvers in the execution of the division parade formation, to safety and aircraft performance.	A	4
FS307	Demonstrate the capability to explain the relative positions of all the aircraft within a division cruise formation, verbally and/or in writing, without assistance and without error.	C	3
FS308	Relate the importance of maintaining nose-to-tail distance and step-down position within the division cruise formation.	A	4
FS309	Demonstrate the capability to describe the procedures used in performing division cruise formation maneuvers, verbally and/or in writing, without assistance and without error.	C	3
FS310	Relate the importance of performing the correct procedures and maneuvers in the execution of the division cruise formation, to safety and aircraft performance.	A	4
FS311	Demonstrate the capability to describe the procedures and maneuvers used during division formation carrier rendezvous, verbally and/or in writing, without assistance and without error.	C	3
FS312	Demonstrate the capability to describe the procedures and maneuvers used during division formation running rendezvous, verbally and/or in writing, without assistance and without error.	C	3
FS313	Demonstrate the capability to describe the procedures and maneuvers used during division formation TACAN rendezvous, verbally and/or in writing, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS314	Demonstrate the capability to describe the procedures used for each method of VFR entry listed below, into a traffic pattern to an airfield, in the execution of division recovery procedures, verbally and/or in writing, without assistance and without error. 1. Entry into a break 2. Straight-in approach 3. Downwind entry	C	3
FS315	Demonstrate the capability to describe the procedures used for an IFR entry into a traffic pattern to an airfield in the execution of division recovery procedures, verbally and/or in writing, without assistance and without error.	C	3
FS316	Demonstrate the capability to describe the situation in which during an IFR division recovery, a missed approach is executed, verbally and/or in writing, without assistance and without error.	C	3
FS317	Demonstrate the capability to describe the procedures used for the execution of an IFR division missed approach during division recovery procedures, verbally and/or in writing, without assistance and without error.	C	3
FS318	Realize that the tactical formation flight provides a basis to achieve maximum aircraft/weapons systems effectiveness in a tactical situation by competent pilots acting as a team, verbally and/or in writing, without assistance and without error.	C	3
FS319	Relate that mastery of tactical formation flight incorporates fleet tactical principles and psychologically prepares the pilot for air combat maneuvering tactics.	A	4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS320	Demonstrate the capability to explain the "Loose Deuce" concept which employs a two aircraft team working in mutual support of one another in a tactical situation, verbally and/or in writing, without assistance and without error.	C	3
FS321	Demonstrate the capability to explain the advantages of the tactical formation "Loose Deuce" concept, relative to early detection, weapon utilization, optimum size, and increased capability for defense, verbally and/or in writing, without assistance and without error.	C	3
FS322	Demonstrate the capability to explain the importance of the tactical formation section (two-man) team concept to achieve mastery in the tactical principles involved, verbally and/or in writing, without assistance and without error.	C	3
FS323	Demonstrate the capability to describe the pilot roles and responsibilities identified below, in tactical formation flight, verbally and/or in writing, without assistance and without error. 1. Flight Lead/Wingman 2. Tactical Lead/Tactical Wingman 3. Free Fighter/Engaged Fighter	C	3
FS324	Relate that an effective lookout doctrine, in performing tactical formation flight, requires mutual visual scan cross coverage for the early detection of targets, verbally and/or in writing, without assistance and without error.	C	3
FS325	Relate that during tactical formation flight, strict radio discipline is mandatory.	A	4
FS326	Demonstrate the capability to describe the need to observe the aircraft structural limitations in performing the tactical formation maneuvers, verbally and/or in writing, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS327	Demonstrate the capability to describe the combat spread formation and the related positions of the leader and wingman, verbally and/or in writing, without assistance and without error.	C	3
FS328	Demonstrate the capability to describe the tactical advantages of a combat apread formation relative to lookout potential, adaptability, flexibility and mutual offensive/defensive capability in a tactical situation, verbally and/or in writing, without assistance and without error.	C	3
FS329	Demonstrate the capability to describe the procedures and techniques used in the execution of the combat spread formation, verbally and/or in writing, without assistance and without error.	C	3
FS330	Demonstrate the capability to describe the roles and responsibilities of the leader and wingman in the execution of the combat spread formation maneuvers, verbally and/or in writing, without assistance and without error.	C	3
FS331	Demonstrate the capability to describe the procedures and techniques used by the wingman in maintaining the abeam position in the combat spread formation, verbally and/or in writing, without assistance and without error.	C	3
FS332	Demonstrate the capability to describe the procedures and techniques required in the execution of combat spread formation turns, verbally and/or in writing, without assistance and without error.	C	3
FS333	Demonstrate the capability to describe the tactical wing formation and the relative positions of the leader and wingman, verbally and/or in writing, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS334	Demonstrate the capability to explain how a tactical wing formation is applicable in a tactical situation, verbally and/or in writing, without assistance and without error.	C	3
FS335	Demonstrate the capability to describe the procedures and techniques used in the execution of a tactical wing formation, verbally and/or in writing, without assistance and without error.	C	3
FS336	Demonstrate the capability to describe the roles and responsibilities of the leader and wingman in the execution of the tactical wing formation maneuvers, verbally and/or in writing, without assistance and without error.	C	3
FS337	Demonstrate the capability to describe the procedures and techniques required for leader/wingman to change from combat spread formation to tactical wing formation, verbally and/or in writing, without assistance and without error.	C	3
FS338	Demonstrate the capability to describe the tactical formation procedures and techniques required to go into loose deuce maneuvering from a combat spread formation, verbally and/or in writing, without assistance and without error.	C	3
FS339	Demonstrate the capability to describe the tactical formation procedures and techniques required to perform loose deuce maneuvering turns, listed below, verbally and/or in writing, without assistance and without error. 1. Break Turns 2. Hard Turns 3. Cross Turns 4. In-Place Turns 5. Tactical Turns	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS340	Relate the importance of team work during the tactical formation loose deuce maneuvering to successful mission completion.	A	4
FS341	Relate the importance of pilot aggressiveness, professionalism, and confidence in the execution of ACM to meet the demands of combat flying.	A	4
FS342	See the reasons why the objective of ACM is to maneuver into the firing envelope for your weapons and to prevent the adversary aircraft from maneuvering into his enclosure, verbally and/or in writing, without assistance and without error.	C	4
FS343	See the relationship between ACM proficiency and the achievement of air-to-air combat mission objectives, verbally and/or in writing, without assistance and without error.	C	4
FS344	Demonstrate the capability to describe how to achieve maximum performance from the VTX aircraft during ACM, IAW NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS345	Demonstrate the capability to describe the maneuvering envelope for the VTX aircraft, to be utilized during ACM, IAW NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS346	Relate how during ACM, knowing the comparative merits of your aircraft versus adversary aircraft so that advantage can be taken of the adversary aircraft weakness and strong points of your aircraft exploited, verbally and/or in writing, without assistance and without error.	C	3
FS347	Relate that during all ACM tactics the advantage may be gained over the adversary aircraft by exploiting aircraft position, altitude, and airspeed, verbally and/or in writing, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS348	Relate that during ACM, in order to exploit the advantages of aircraft position, altitude, and airspeed, the pilot must control range, angle-off and closure rate, verbally and/or in writing, without assistance and without error.	C	3
FS349	Relate the importance of using the correct voice procedure and terminoloty during the execution of ACM.	A	4
FS350	Demonstrate the capability to describe the procedures and techniques exercised to execute the combat maneuvers, listed below, during ACM in the offensive/defensive tactical environment, IAW the aircraft tactics NATOPS, verbally and/or in writing, without assistance and without error. 1. Vertical Recoveries 2. Dive Recoveries 3. Vertical Scissors 4. Horizontal Scissors 5. Rolling Scissors 6. High Yo-yo 7. Low Yo-yo 8. Displacement Rolls 9. High "G" Rolls 10. Barrel Rolls 11. Rolling Reversals 12. Horizontal Reversal 13. Accelerated Turns 14. Break Turn 15. Over/Undershoot 16. Loose Deuce Maneuvering 17. Disengage and Runout 18. High Energy Flight 19. Low, Medium, High Angle Off	C	3
FS351	Demonstrate the capability to explain the types of one-vs-one offensive attacks, listed below, which can be executed on an adversary aircraft, IAW NATOPS, verbally and/or in writing, without assistance and without error. 1. Rear Quarter Attack 2. Abeam Attack 3. Forward Quarter Attack 4. Head On Attack	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS352	Demonstrate the capability to explain the types of air combat maneuvers which would be used during a one-vs-one offensive attacks, IAW NATOPS, listed below, verbally and/or in writing, without assistance and without error. 1. Rear Quarter Attack 2. Abeam Attack 3. Forward Quarter Attack 4. Head On Attack	C	3
FS353	Demonstrate the capability to describe the conditions in which a pilot may find himself during a tactical engagement in a one-vs-one defensive maneuvering situation, verbally and/or in writing, without assistance and without error.	C	3
FS354	Demonstrate the capability to explain that being placed in a defensive situation during a one-vs-one defensive maneuvering that a pilot error has been made, and that a counter-move must be made to eliminate the enemy threat, verbally and/or in writing, without assistance and without error.	C	3
FS355	Demonstrate the capability to describe the defensive maneuvers and techniques used, during one-vs-one defensive maneuvering, to eliminate the enemy threat and return to an offensive condition, for each of the situations listed below, verbally and/or in writing, without assistance and without error. 1. Defense against a rear quarter attack (a) Long range (b) Medium range (1) Defense against a high yo-yo (2) Defense against a low yo-yo (c) Short range 2. Defense against an abeam attack 3. Defense against a forward quarter attack 4. Maneuvering after an overshoot by the attackers (a) Reversals (1) Rolling reversals (2) Horizontal reversals	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS355 (Cont)	(b) Scissors (1) Horizontal scissors (2) Rolling scissors 5. Last ditch maneuvers and break turns (a) Break turns (b) High "G" rolls (1) Over the top (2) Underneath (3) Countering the high "G" roll 6. Maneuvering for separation and disengagement		
FS356	Demonstrate the capability to describe the type of stores, such as listed below, which are carried on the VTX aircraft, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error. 1. Bombs 2. Air-to-air rockets/missiles 3. Air-to-ground rockets/missiles 4. Pods 5. Machine guns/cannon	C	3
FS357	Relate that the objective of ACM in an offensive/defensive tactical environment is the delivery of an air-to-air weapon to destroy an adversary aircraft.	A	4
FS358	Demonstrate the capability to describe the types of weapons, listed below, installed in Navy fighter/attack aircraft and used for weapon delivery in an air-to-air tactical offensive/defensive environment, verbally and/or in writing, without assistance and without error. 1. Machine guns 2. Cannon 3. Missiles	C	3
FS359	Demonstrate the capability to describe the operation and operating envelopes of the weapons, listed below, used for weapon delivery in an air-to-air tactical offensive/defensive environment, verbally and/or in writing, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS359 (Cont)	1. Machine guns 2. Cannon 3. Missiles		
FS360	Relate the importance of management of the aircraft weaponry and associated system during weapon delivery in a tactical air-to-air offensive/defensive environment, IAW aircraft NATOPS.	A	4
FS361	Demonstrate the capability to describe the procedures used in the operation and control of the weaponry used in weapon delivery in a tactical air-to-air offensive/defensive environment, IAW aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS362	Demonstrate the capability to describe the tracking and firing procedures used during air-to-ground weapon delivery attacks, verbally and/or in writing, without assistance and without error.	C	3
FS363	Demonstrate the capability to explain the 30 degree and 10 degree dive angles, attacks and patterns used in air-to-ground weapon delivery, verbally and/or in writing, without assistance and without error.	C	3
FS364	Demonstrate the capability to explain the importance of airspeed control and the importance of the pipper-to-bull delivery techniques as used in air-to-ground weapon delivery, verbally and/or in writing, without assistance and without error.	C	3
FS365	Demonstrate the capability to describe the gun firing procedures used and the safety rules and practices required during air-to-ground weapon delivery, verbally and/or in writing, without assistance and without error.	C	3
FS366	Relate the importance of strict adherence to weapon delivery flight safety instructions during all gun firing flights.	A	4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS367	Demonstrate the capability to describe the gunnery patterns that are used in air-to-ground delivery IAW NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS368	Demonstrate the capability to explain the inverted cone principle pertaining to air-to-ground delivery IAW NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS369	Relate the importance of management of the aircraft ordnance and associated systems during air-to-ground weapon delivery missions IAW NATOPS.	A	4
FS370	Demonstrate the capability to describe the procedures used in the operation and control of the ordnance used in air-to-ground weapon delivery missions, IAW NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS371	Demonstrate the capability to describe the types of ordnance, listed below, installed on Navy fighter/attack aircraft and used in air-to-ground weapon delivery, IAW aircraft NATOPS, verbally and/or in writing, without assistance and without error. 1. General all purpose bombs 2. Cluster bombs 3. Rockets 4. Missiles 5. Cannon 6. Machine gun	C	3
FS372	Demonstrate the capability to describe the operation and operating envelopes of the ordnance, listed below, and used in air-to-ground weapon delivery strike mission, IAW NATOPS, verbally and/or in writing, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS373	Relate that the objective of air-to-ground weapon delivery is an offensive action designed to destroy enemy personnel, equipment and installations, verbally and/or in writing, without assistance and without error.	C	3
FS374	Demonstrate the capability to describe the maneuvers and techniques used in the execution of air-to-ground weapon delivery mission, verbally and/or in writing, without assistance and without error.	C	3
FS375	Relate the importance of using the correct time sharing scan procedures and how they effect safety in air-to-ground weapon delivery. 3	A	4
FS376	Relate that the purpose of operational navigation flight is to provide the basis for performing operational tactical missions, verbally and/or in writing, without assistance and without error.	C	3
FS377	Relate that operational flight include the elements listed below, verbally and/or in writing, without assistance and without error. 1. Flight/Planning 2. VMC/IMC Navigation 3. Low Level Navigation 4. Ground Feature Recognition 5. Aircraft Systems Management 6. Mission Planning 7. Simulated Missions 8. Strike Techniques	C	3
FS378	Realize that during wartime conditions, in the execution of operational navigation flight, radio navigation aids may not be available, and navigation is accomplished by dead reckoning procedures, and reference to geographic check points.	A	4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS379	Demonstrate the capability to describe the types of operational navigation missions, such as listed below, which vary in complexity from basic cross-country navigation to coordinated multiaircraft strikes, verbally and/or in writing, without assistance and without error. 1. Day/Night Low Level Navigation 2. High-Low-High Profile 3. Reconnaissance 4. Defense	C	3
FS380	Relate the importance of pre-flight planning to successful tactical/operational navigation flight.	A	4
FS381	Demonstrate the capability to describe the step by step procedures utilized in planning a tactical operational navigation flight from the initial route selection to the filing of the flight plan, verbally and/or in writing, without assistance and without error.	C	3
FS382	Relate the importance, during the planning of a tactical operational navigation flight, of laying out on an aeronautical chart, enroute landmarks, checkpoints, verbally and/or in writing, without assistance and without error.	C	3
FS383	Demonstrate the capability to perform the step by step procedures utilized in flight planning for typical tactical missions, such as listed below, without assistance and without error. 1. Day Low Level Navigation Flight to Target 2. Night Low Level Navigation Flight to Target 3. High-Low-High Profile Mission to Target 4. Section Reconnaissance Mission	C	3
FS384	Demonstrate the capability to explain the considerations involved in the planning of a low-level navigation, verbally and/or in writing, without assistance and without error.	C	3
FS385	Demonstrate the capability to prepare a low-level navigation route (sand blower, mining) in accordance with FLIP, NATOPS, OPNAV and local directives, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS386	Determine the best altitude to be flown, for all flight conditions and operational mission requirements accurately, without assistance and without error.	C	3
FS387	Demonstrate the capability to analyze the existing weather conditions accurately to determine acceptability for proposed flight, without assistance and without error.	C	3
FS388	Plot on the power curves for the VTX aircraft IAW NATOPS maximum range and maximum endurance airspeeds, without assistance and without error.	C	3
FS389	Relate excess power to climb performance IAW NATOPS for VTX aircraft, verbally and/or in writing, without assistance and without error.	C	3
FS390	Demonstrate the capability to explain how weight, wind, altitude, and configuration affect range and endurance, verbally and/or in writing, without assistance and without error.	C	3
FS391	Apply the effect of a change in temperature, humidity, altitude, weight, configuration, wind, and surface condition to take-off and landing, indicated airspeed, true airspeed, ground speed, distance and time, IAW aircraft NATOPS, without assistance and without error.	C	3
FS392	Demonstrate the capability to explain the procedures for tuning, identifying and fixing aircraft position using radio navigational aids during DR flight, verbally and/or in writing, without assistance and without error.	C	3
FS393	Demonstrate the capability to verify the estimated DR position with radio navigational aids, without assistance and without error.	C	3
FS394	Demonstrate the capability to explain the symbols displayed on various topographical charts using the chart legends without assistance, verbally and/or in writing, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS395	Demonstrate the pilot capability to interpret aeronautical charts, translating symbols and geographic features to objects on the ground to enroute checkpoints accurately, without assistance and without error.	C	3
FS396	Demonstrate the capability to locate an exact set or series of coordinates on an aeronautical chart correctly, without assistance and without error.	C	3
FS397	Demonstrate the capability to give aircraft position in four digit coordinates accurately, without assistance and without error.	C	3
FS398	Relate the importance of the capability of Navy fighter/attack aircraft to in-flight refuel to successful tactical mission completion and aircraft survivability.	C	3
FS399	Demonstrate the capability to describe the procedures and pilot techniques required to successfully and safely accomplish in-flight refueling, verbally and/or in writing, without assistance and without error.	C	3
FS400	Demonstrate the capability to describe the procedures and techniques used to effect rendezvous with tanker for in-flight refueling, verbally and/or in writing, without assistance and without error.	C	3
FS401	Demonstrate the capability to describe the cockpit displays/controls used for refueling, verbally and/or in writing, without assistance and without error.	C	3
FS402	Demonstrate the capability to explain the standard visual signals used by shipboard deck personnel/taxi directors to communicate with aircraft on the flight ceck, verbally and/or in writing, without assistance and without error.	C	3
FS403	Demonstrate the capability to explain the standard LSO signals, verbally and/or in writing, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS404	Assess VTX aircraft catapulting and arresting equipment operation by interpretation of the instruments (displays)/indicators for normal/abnormal operation IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	3
FS405	Demonstrate the capability to describe the procedures utilized and the safety precautions observed in the execution of a day, VFR, shipboard take-off, verbally and/or in writing, without assistance and without error.	C	3
FS406	Demonstrate the capability to describe the procedures utilized and the safety precautions observed in the execution of a night, VFR, shipboard take-off, verbally and/or in writing, without assistance and without error.	C	3
FS407	Demonstrate the capability to utilize the take-off checklist in the execution of a day/night, VFR, shipboard take-off, IAW NATOPS, without assistance and without error.	C	3
FS408	Demonstrate the capability to strictly adhere to prelaunch procedures in the execution of a day, VFR, shipboard take-off, without assistance and without error.	C	3
FS409	Demonstrate the capability to strictly adhere to prelaunch procedures in the execution of a night, VFR, shipboard take-off, without assistance and without error.	C	3
FS410	Relate the importance of performing the correct take-off procedures under day/night, VFR, shipboard conditions to safety and aircraft performance.	A	4
FS411	Demonstrate the capability to describe the mirror/Fresnel landing system and its use in the day/night, VFR, shipboard landing, verbally and/or in writing, without assistance and without error.	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
FS412	Relate the importance of performing the correct landing procedures, during day/night, VFR, shipboard conditions, to safety and aircraft performance.	A	4
FS413	Demonstrate the capability to describe the procedures utilized and the safety precautions observed in the execution of a day/night, VFR, shipboard landing, verbally and/or in writing, without assistance and without error.	C	3
FS414	Demonstrate the capability to describe the carrier landing pattern, utilized in the execution of a day/night, VFR, shipboard landing, verbally and/or in writing, without assistance and without error.	C	3
A1	Explain night flying physiology related to night vision, autokinesis, vertigo (spatial disorientation), verbally and/or in writing, without assistance and without error.[1]	C	2
A2	Describe the procedures utilized to alleviate the effects of limited night vision, autokinesis and vertigo, verbally and/or in writing, without assistance and without error.[1]	C	2
A3	Relate the importance of the pilot's reduced ability to detect relative motion due to the reduced depth perception capability during night flight operations, verbally and/or in writing, without assistance and without error.[1]	C	3
A4	Relate the importance of understanding the mechanisms and limitations of the physiological systems of the pilot as part of the overall flight system.[1]	A	4
A5	Describe the significant characteristics of the atmosphere, as they relate to physiological phenomenon and how this effects flight equipment requirements, verbally and/or in writing, without assistance and without error.[1]	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A6	Describe in layman terms, the basic anatomy and physiology of the human respiratory system sufficiently to permit an understanding of aviation life support equipment, verbally and/or in writing, without assistance and without error.[1]	C	2
A7	Explain as related to Naval Aviation, hypoxia, its causes, symptoms and preventive procedures, verbally and/or in writing, without assistance and without error.[1]	C	2
A8	Explain the difference between hyperventilation and hypoxia, verbally and/or in writing, without assistance and without error.[1]	C	2
A9	Demonstrate the capability to recognize the effects of hypoxia and hyperventilation, and to utilize the techniques to prevent/recover from the effects. Performance, to be able to implement the correct preventive/recovery procedures without assistance and without error.[1]	P	4
A10	Explain what acceleration is and how "G" forces result from it, verbally and/or in writing, without assistance and without error.[1]	C	2
A11	Describe what countermeasures for "G" forces are available to pilots; e.g., exercises, life support equipment and physical conditioning, verbally and/or in writing, without assistance and without error.[1]	C	2
A12	Relate the gas laws to the physiological affect on a pilot and the resultant required life support equipment, verbally and/or in writing, without assistance and without error.[1]	C	3
A13	Explain the procedures to avoid or minimize the physiological effects of changing altitude, verbally and/or in writing, without assistance and without error.[1]	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A14	Explain what is physiological stress and the affects on pilot performance of the self-imposed stresses listed below, verbally and/or in writing, without assistance and without error.[1] 1. Fatigue 2. Obesity 3. Alcohol 4. Coffee 5. Smoking 6. Self-Medication.	C	2
A15	Explain the senses as they affect a pilot's ability to maintain in-flight orientation, verbally and/or in writing, without assistance and without error.[1]	C	2
A16	Define spatial disorientation and explain how it can be minimized, verbally and/or in writing, without assistance and without error.[1]	C	2
A17	Define "Flicker Vertigo" and recall the techniques to minimize its affect on pilot performance, verbally and/or in writing, without assistance and without error.[1]	C	2
A18	Explain the problems associated with night vision and the correct techniques for maintaining it verbally and/or in writing, without assistance and without error.[1]	C	2
A19	Relate the effect of tobacco, altitudes, sunglare and speed on vision, verbally and/or in writing, without assistance and without error.[1]	C	3
A20	Relate the physiological requirements for life, listed below, and continually relate these requirements to all survival situations, verbally and/or in writing, without assistance and without error.[1]	C	3

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A20 (Cont)	1. Oxygen 2. Water 3. Food 4. Clothing 5. Shelter 6. Rest 7. Sleep 8. Strong Will to Live		
A21	Realize the factors listed below, that are obstacles to life and continually relate these factors to possible survival situations, verbally and/or in writing, without assistance and without error.[1] 1. Fear 2. Thirst 3. Hunger 4. Pain 5. Loneliness 6. Boredom 7. Fatigue	C	3
A22	Identify the applicability of the different types of land survival techniques, verbally and/or in writing, without assistance and without error.[1]	C	1
A23	Demonstrate the capability to employ the proper land survival techniques for any situation, without assistance and without error.[1]	P	4
A24	Demonstrate the capability to don/strap on the parachute/ejection seat and the capability to extricate oneself from it on land or water under controlled conditions. Performance, to be able to, in a simulated situation, implement release procedures accurately, in a timely manner, without assistance and without error.[1]	P	4
A25	Demonstrate the use of the personal water survival equipment available to the pilot. Performance, to be able to, in a simulated situation, use water survival equipment IAW OPNAVINST 3710.7 without assistance and without error.[1]	P	4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A26	Demonstrate the capability to use, during controlled conditions, the pressure and oxygen equipment available to the pilot. Performance, to be able to, in a simulated situation, (Pressure Chamber), correctly use the pressure and oxygen equipment, without assistance and without error.[1]	P	5
A27	Recall the signaling devices available to a downed pilot and explain their use, verbally and/or in writing, without assistance and without error.[1]	C	2
A28	Demonstrate the capability, under controlled conditions, to correctly use the signaling devices available to a downed pilot on both land and water, without assistance and without error.[1]	P	4
A29	Explain the techniques to be used by a downed pilot to assist his rescuers in locating him and then effecting his rescue on both land and water, verbally and/or in writing, without assistance and without error.[1]	C	2
A30	Explain the ground-to-air and air-to-ground signals for downed aircraft, search parties, etc., verbally and/or in writing, without assistance and without error.[1]	C	2
A31	Describe the organization and content of the NATOPS Manuals, relative to the items listed below, verbally and/or in writing, in sufficient detail to recognize their operational utilization. 1. Aircraft description 2. Systems 3. Servicing 4. Operating limitations 5. Operating procedures 6. Flight procedures and characteristics 7. All weather operation 8. Communication equipment and procedures 9. Performance data 10. Weapon systems 11. Tactics	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A32	Describe the configuration of the VTX aircraft, and distinguishing features, as described in the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A33	Explain the function of miscellaneous equipment aboard the VTX aircraft, listed below, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error. 1. Anti-G-suit provisions 2. Rearview mirrors 3. Data case 4. Stowage provisions.	C	2
A34	Discuss the VTX aircraft systems servicing requirements as delineated in the NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A35	Explain the normal and emergency escape/ejection systems in the VTX aircraft, verbally and/or in writing, without assistance and without error.	C	2
A36	Explain the principles of operation and function of the VTX aircraft engine(s) and associated instruments (displays), indicators and controls, as identified in the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A37	Explain the operation of the VTX aircraft engine(s) start system and associated instruments (displays), indicators and controls, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A38	Explain the operation and function of the VTX aircraft engine fire warning system and associated instruments (displays), indicators and controls, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A39	Explain the operation and function of the VTX aircraft fuel system and associated instruments (displays), indicators and controls, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A40	Explain the operation and function of the VTX aircraft electrical system and associated instruments (displays), indicators and controls, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A41	Explain the operation and function of the VTX aircraft hydraulic system and associated instruments (displays), indicators and controls, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A42	Explain the operation and function of the VTX aircraft flight control system and associated instruments (displays), indicators and controls, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A43	Explain the operation and function of the VTX aircraft pitot and static system and associated instruments (displays), indicators and controls, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A44	Explain the operation and function of the VTX aircraft air conditioning and pressurization system and associated instruments (displays), indicators and controls, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A45	Explain the operation and function of the VTX aircraft oxygen system and associated instruments (displays), indicators and controls, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A46	Explain the operation and function of the VTX aircraft anti-ice and de-ice system and associated instruments (displays), indicators and controls, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A47	Explain the structural icing precautions to be taken when icing conditions are encountered, verbally and/or in writing, without assistance and without error.	C	2
A48	Explain the VTX engine icing indications and the precautions to be taken when icing conditions are encountered, verbally and/or in writing, without assistance and without error.	C	2
A49	Explain the operation and function of the VTX aircraft angle-of-attack system and associated instruments (displays), indicators and controls, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A50	Explain the function of the Heads Up Display and its associated controls IAW aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A51	Describe the types of information; i.e., flight, navigation, radio, etc., which are displayed on the Heads Up Display, verbally and/or in writing, without assistance and without error.	C	2
A52	Explain the symbols and how used on the Heads Up Display, verbally and/or in writing, without assistance and without error.	C	2
A53	Describe how the Heads Up Display controls are used to display the required information for a specific flight environment/mission, verbally and/or in writing, without assistance and without error.	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A54	Explain the operation and function of the VTX aircraft lighting system and associated instruments (displays), indicators and controls, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A55	Explain the operation and function of the VTX aircraft catapulting and arresting equipment and associated instruments (displays), indicators and controls, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A56	Explain the operation and function of the VTX aircraft wheel brake system and associated instruments (displays), indicators and controls, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A57	Explain the operation and function of the VTX aircraft landing gear system and associated instruments (displays), indicators and controls, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A58	Explain the operation of the VTX aircraft canopy system and associated indicators and controls, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A59	Explain the operation of the VTX aircraft escape system and associated indicators and controls, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A60	Explain the function and operation of the VTX aircraft communications systems, listed below, and associated instruments (displays), indicators and controls, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error. 1. Intercommunications System (ICS) 2. VHF/UHF Communication Set (Main) 3. UHF Communication Set (Auxiliary) 4. IFF/SIF	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A61	Explain intercom mode selections, including both normal and emergency use, verbally and/or in writing, without assistance and without error. 2	C	2
A62	Explain the purpose of and how to use the Hot and Cold mike selection switch on the intercom panel, verbally and/or in writing, without assistance and without error. 2	C	2
A63	Explain the use of the ICS in advising other pilot of aircraft performance to include items below, verbally and/or in writing, without assistance and without error. 2 1. In-flight emergencies 2. System malfunctions 3. Checklists and aircraft flight information (e.g., attitude, altitude and position).	C	2
A64	Explain the use of the functions or mode selections on the UHF/VHF pilot control panel, verbally and/or in writing, without assistance and without error. 2	C	2
A65	Explain the function of the guard receiver and how it is used, verbally and/or in writing, without assistance and without error. 2	C	2
A66	Explain how to use the ADF mode of the UHF radio, verbally and/or in writing, without assistance and without error. 2	C	2
A67	Explain the use of the function or mode selection on the auxiliary UHF receiver control panel, verbally and/or in writing, without assistance and without error.	C	2
A68	Explain all of the modes/functions of the IFF/SIF equipment, verbally and/or in writing, without assistance and without error.	C	2
A69	Explain the type signals (purpose) the IFF/SIF equipment reports, verbally and/or in writing, without assistance and without error.	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A70	Describe the function of the VTX aircraft armament control system and associated indicators, displays and controls, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A71	Describe the function of the VTX aircraft armament fire control system and associated indicators, displays and controls, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A72	Relate the importance of observing the VTX aircraft operating limitations restrictions, as identified in the VTX aircraft NATOPS to aircraft performance and safe flight, verbally and/or in writing, without assistance and without error.	A	4
A73	Explain the operating limitations relative to the VTX aircraft items listed below IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error. 1. Engine(s) 2. Starting 3. Ground idle 4. High altitude operation 5. Engine acceleration 6. Maximum thrust operation 7. Oil pressure limits 8. Airspeed 9. Maneuvering 10. Acceleration 11. Weight 12. Crosswind 13. Carrier operation 14. External stores 15. Center of gravity 16. Canopy	C	2
A74	List the major airframe components of the VTX aircraft IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	1

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A75	Recall the three axes of the VTX aircraft and explain the movement about these axes, verbally and/or in writing, without assistance and without error.[2]	C	2
A76	Define and explain equilibrium and acceleration verbally and/or in writing, without assistance and without error.[2]	C	2
A77	Describe the forces acting on the VTX aircraft and explain their relationship to Newton's Law of Physics, verbally and/or in writing, without assistance and without error.[2]	C	2
A78	Explain the purpose and use of the VTX aircraft's ailerons, elevators, rudder, dive brakes and flaps, verbally and/or in writing, without assistance and without error.	C	2
A79	Explain the various factors affecting lift and drag in turning flight, stalls and departed flight, verbally and/or in writing, without assistance and without error.	C	2
A80	Explain why certain control inputs at high angle-of-attack operations will cause departure from controlled flight, verbally and/or in writing, without assistance and without error.	C	2
A81	State the critical angle-of-attack for the VTX aircraft in a clean and dirty configuration, verbally and/or in writing, without assistance and without error.	C	1
A82	Explain why a pilot must eject when a certain altitude is reached in departed flight, verbally and/or in writing, without assistance and without error.	C	2
A83	Explain how departed flight can occur from both high and low airspeed flight conditions, verbally and/or in writing, without assistance and without error.	C	2
A84	Explain static stability (positive, neutral and static), verbally and/or in writing, without assistance and without error.[1]	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A85	Explain dynamic stability (positive, neutral and static), verbally and/or in writing, without assistance and without error.[1]	C	2
A86	Describe the relationship of stability to maneuverability, verbally and/or in writing, without assistance and without error.	C	2
A87	Explain the contribution to longitudinal stability of the following, verbally and/or in writing, without assistance and without error. 1. Horizontal stabilizer 2. Downwash 3. Thrust 4. Normal force 5. Fuselage 6. C.G.'s position relative to the aircraft	C	2
A88	Explain the contribution to directional stability by the vertical stabilizer and fuselage, verbally and/or in writing, without assistance and without error.[1]	C	2
A89	Explain the contribution to lateral stability of the following, verbally and/or in writing, without assistance and without error.[2] 1. Wing (dihedral) 2. Fuselage 3. Vertical stabilizer 4. Flaps 5. Power increase 6. Airspeed decrease	C	2
A90	Explain the contribution to stability that is provided by the use of trim tabs, verbally and/or in writing, without assistance and without error.[2]	C	2
A91	Describe the VTX aircraft ailerons, their location, function and the axis controlled, verbally and/or in writing, without assistance and without error.	C	2
A92	Describe the VTX aircraft elevator, its location, function and the axis controlled, verbally and/or in writing, without assistance and without error.	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A93	Describe the VTX aircraft rudder, its location, function and the axis controlled, verbally and/or in writing, without assistance and without error.	C	2
A94	Describe the VTX aircraft trim tabs, their location, function and the axis controlled, verbally and/or in writing, without assistance and without error.	C	2
A95	Describe the VTX aircraft speed brakes, their location, function and the axis effected by their use, verbally and/or in writing, without assistance and without error.	C	2
A96	Explain a skid and slip and what controls are used to correct the condition, verbally and/or in writing, without assistance and without error.[1]	C	2
A97	Explain balanced and unbalanced flight, verbally and/or in writing, without assistance and without error.[1]	C	2
A98	Explain control lead in the VTX aircraft, verbally and/or in writing, without assistance and without error.	C	2
A99	Explain control overlap in the VTX aircraft, verbally and/or in writing, without assistance and without error.	C	2
A100	Explain how power effects the controls and aircraft attitude, verbally and/or in writing, without assistance and without error.[2]	C	2
A101	Describe the association of control movement and indications of the flight instruments, verbally and/or in writing, without assistance and without error.[2]	C	2
A102	Discuss the difference between initial and final effects of a change in power while maintaining altitude in the aircraft, verbally and/or in writing, without assistance and without error.[1]	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A103	Explain the aerodynamic principles of aircraft performance as effected by speed, verbally and/or in writing, without assistance and without error.[1]	C	2
A104	Define and describe airspeeds and their measurement in the VTX aircraft, verbally and/or in writing, without assistance and without error.[2]	C	2
A105	Explain the VTX pitot static system relating inaccurate readings to flight attitude, verbally and/or in writing, without assistance and without error.[2]	C	2
A106	Explain the five forces acting on the aircraft on take-off, verbally and/or in writing, without assistance and without error.[1]	C	2
A107	Discuss what power is available for acceleration during take-off, verbally and/or in writing, without assistance and without error.[2]	C	2
A108	Name and describe the two types of aircraft braking, verbally and/or in writing, without assistance and without error.[2]	C	2
A109	Explain the factors that must be considered in determining climb performance of the VTX aircraft IAW NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A110	Explain the difference between maximum rate of climb and maximum angle of climb, verbally and/or in writing, without assistance and without error.[2]	C	2
A111	Explain the relationship between glide range and sink rate for the VTX aircraft IAW NATOPS, verbally and/or in writing, without assistance and without error.[2]	C	2
A112	Explain the effect of weight on climb-and-glide performance for the VTX aircraft IAW NATOPS, verbally and/or in writing, without assistance and without error.[2]	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A113	Explain the effects of configuration on climb-and-glide performance (lowering gear, flaps, opening the canopy, etc.) for VTX aircraft IAW NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A114	Relate climb-and-glide angles to angle-of-attack, verbally and/or in writing, without assistance and without error.[1]	C	3
A115	Define the terms, power available and power required, as related to range and endurance, verbally and/or in writing, without assistance and without error.[1]	C	1
A116	Explain the relationship of aircraft configuration, gross weight, cruising altitudes, wind and power setting and fuel consumption to flight range performance, verbally and/or in writing, without assistance and without error.[2]	C	2
A117	Explain the relationship between acceleration, gross weight and airspeed and their effect on aircraft performance, verbally and/or in writing, without assistance and without error.[1]	C	2
A118	Define metal fatigue, verbally and/or in writing, without assistance and without error.[2]	C	1
A119	Define and explain the following terms, verbally and/or in writing, without assistance and without error.[2] 1. Load 2. Load factor 3. Load limit factor 4. Ultimate load factor.	C	2
A120	Define and explain the effect of the following relative to the VTX flight performance, verbally and/or in writing, without assistance and without error.	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A120 (Cont)	1. Redline speed 2. Maneuver speed 3. Aeroelectric limit	C	2
A121	Explain lateral and longitudinal CG limitations and the resultant aerodynamic effects, IAW the VTX NATOPS, as it effects aircraft flight, verbally and/or in writing, without assistance and without error.	C	2
A122	Explain the accelerated stall region of the VTX aircraft IAW NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A123	Explain the effects of weight, altitude, configuration, asymmetric loading, and turbulence on the structural limitations IAW VTX NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A124	Explain the composition and structure of air, e.g., gases, impurities, weight and layers, verbally and/or in writing, without assistance and without error.[1]	C	2
A125	Explain the meteorological elements that are found in the troposphere, verbally and/or in writing, without assistance and without error.[2]	C	2
A126	Explain the principles involved in weather phenomena listed below, verbally and/or in writing, without assistance and without error.[2] 1. Solar radiation and earth radiation 2. Uneven and periodic heating and cooling of the surface of the earth 3. Landmass and watermass heating 4. Local heat distribution and transfer of heat	C	2
A127	Explain the principles involved in weather phenomena resulting from evaporation, condensation and sublimation; saturation; specific humidity and relative humidity, verbally and/or in writing, without assistance and without error.[2]	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A128	Recall what is precipitation and explain its various forms, verbally and/or in writing, without assistance and without error.$_1$	C	2
A129	Recall what is atmospheric pressure and explain how it is measured, verbally and/or in writing, without assistance and without error.$_2$	C	2
A130	Explain the importance of atmospheric pressure changes to weather forecasting, verbally and/or in writing, without assistance and without error.$_2$	C	2
A131	Explain the effect of vertical temperature changes on atmospheric stability recalling the Adiabatic lapse rates for dry and moist air, verbally and/or in writing, without assistance and without error.$_1$	C	2
A132	Define conditional and convective instability, verbally and/or in writing, without assistance and without error.$_1$	C	1
A133	Explain why the major weather hazards to flight are all directly associated with stability or instability and the moisture content in the atmosphere, verbally and/or in writing, without assistance and without error.$_1$	C	2
A134	Recall the definition of airmasses and their basic characteristics; e.g., temperature and humidity, verbally and/or in writing, without assistance and without error.$_2$	C	1
A135	Explain the factors which determine the characteristics of an airmass, naming the source regions, verbally and/or in writing, without assistance and without error.$_1$	C	2
A136	Explain the formation of weather in an airmass, relating the resulting weather to moisture content, surface and air temperature (stability) and terrain (up or down slope), verbally and/or in writing, without assistance and without error.$_2$	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A137	Explain the various types of altitudes (e.g., density altitude, absolute altitudes, pressure altitude, etc.), verbally and/or in writing, without assistance and without error.[1]	C	2
A138	Explain what the altimeter measures, the references it uses and how it is set, verbally and/or in writing, without assistance and without error.[1]	C	2
A139	Explain how a moving airmass effects the path of aircraft over the ground, verbally and/or in writing, without assistance and without error.[1]	C	2
A140	Recall the definitions of wind and pressure. From these definitions, explain how wind intensity is determined, verbally and/or in writing, without assistance and without error.[2]	C	2
A141	Explain the forces acting on air in motion; e.g., coriolis and centrifugal, verbally and/or in writing, without assistance and without error.[1]	C	2
A142	Explain effects of forces on winds aloft; e.g., gradient wind and geostrophic wind, verbally and/or in writing, without assistance and without error.[2]	C	2
A143	Explain what is the friction layer, how it effects surface winds and how the effect varies with surface terrain, verbally and/or in writing, without assistance and without error.[2]	C	2
A144	Explain the relationship between wind and altitude, verbally and/or in writing, without assistance and without error.[1]	C	2
A145	Explain the following principles concerning winds and/or weather forecasting, verbally and/or in writing, without assistance and without error.[2]	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A145 (Cont)	1. Wind versus altitude 2. Buys-Ballot's Law 3. Convergence and divergence as related to cyclonic and anticyclonic, respectively 4. Sea and land breezes 5. Valley and mountain breezes		
A146	Explain circulation in terms of meteorology and the factors that affect it, verbally and/or in writing, without assistance and without error.$_2$	C	2
A147	Explain the three-cell circulation pattern theory; e.g., listed below, as related to prevailing winds, verbally and/or in writing, without assistance and without error.$_1$ 1. The equator 2. 30° N. lat N and S 3. 60° N. lat N and S	C	2
A148	Recall the sea state codes and the wind velocities, verbally and/or in writing, without assistance and without error.$_2$	C	1
A149	Define weather fronts and explain the conditions associated with them to include surface and vertical conditions, pressure, temperature and winds, verbally and/or in writing, without assistance and without error.$_2$	C	2
A150	Explain the characteristics listed below, of a cold and warm front, verbally and/or in writing, without assistance and without error.$_2$ 1. Wind shift across the front 2. Temperature drop/rise across the front 3. Cloud formations 4. Direction of frontal movement 5. Velocity of movement 6. Width of weather band	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A151	Describe an occluded front recalling the types and weather associated with them, verbally and/or in writing, without assistance and without error.[1]	C	2
A152	Explain what is meant by an "Upper Front" and "Trough Lines", verbally and/or in writing, without assistance and without error.[2]	C	2
A153	Describe Intertropical Convergence Zone (ITCA) recalling the weather associated with it, verbally and/or in writing, without assistance and without error.[1]	C	2
A154	Describe the conditions under which hazardous weather, listed below, may occur, verbally and/or in writing, without assistance and without error.[2] 1. Thunderstorms 2. Squall lines 3. Tornadoes and water spouts 4. Turbulence 5. Fog 6. Lightning	C	2
A155	Describe the types and characteristics of weather hazards, listed below, to flight and aviation operations, verbally and/or in writing, without assistance and without error.[2] 1. Thunderstorms 2. Squall lines 3. Tornadoes and water spouts 4. Turbulence 5. Fog 6. Icing	C	2
A156	Explain the characteristics of high altitude weather phenomenon, listed below, where found and hazards associated with each, verbally and/or in writing, in sufficient detail to recognize the danger.	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A156 (Cont)	1. Jet stream 2. Subtropical jet stream 3. Clear-air turbulence 4. Contrails 5. Haze layers 6. Canopy static		
A157	Discuss the effect of airframe icing on aircraft performance, verbally and/or in writing, without assistance and without error.[1]	C	2
A158	Describe safety precautions to be observed, during flight, when encountering hazardous weather, verbally and/or in writing, without assistance and without error.[2]	C	2
A159	Explain the types and conditions under which structural icing will occur; e.g., rime ice, clear ice and frost, verbally and/or in writing, without assistance and without error.[2]	C	2
A160	Describe the four categories of weather information available, listed below, and the type of weather information each provides for pilots' preflight planning, verbally and/or in writing, without assistance and without error.[2] 1. Teletype 2. Facsimile/or automatic computer link 3. Locally prepared weather information 4. Local continuous indicating weather instruments	C	2
A161	Explain how weather information is disseminated by the National Meteorology Center (NMC), verbally and/or in writing, without assistance and without error.[2]	C	2
A162	Identify and interpret standard weather symbols utilized on various types of weather charts, verbally and/or in writing, without assistance and without error.[2]	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A163	Explain the source and type of current weather information and forecast weather information available for pilot preflight planning, verbally and/or in writing, without assistance and without error.[2]	C	2
A164	Explain why it is essential to use both observed and forecast information for flight planning, verbally and/or in writing, without assistance and without error.[2]	C	2
A165	Identify the primary weather charts utilized in pilot preflight planning, verbally and/or in writing, without assistance and without error.[2]	C	1
A166	Explain why weather charts and forecast charts have a time limitation, verbally and/or in writing, without assistance and without error.[2]	C	2
A167	State the use, for preflight planning purposes, that a pilot can make of the information contained in the following, verbally and/or in writing, without assistance and without error.[2] 1. Surface analysis charts 2. Constant pressure charts 3. Winds aloft chart 4. Weather depiction chart 5. Level of maximum wind chart 6. High level horizontal depiction 7. Satellite pictures of mosaics 8. Radar summary chart 9. Freezing level chart 10. Arowagram 11. Pilot reports 12. Sequence reports 13. Aviation severe weather warnings/forecasts 14. Terminal forecasts	C	2
A168	Explain what in-flight weather information services are available to the pilot and how he can make use of it, verbally and/or in writing, without assistance and without error.[2]	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A169	Explain why all weather briefings have a time limitation and why a new briefings must be received if the time has expired for the initial briefing, verbally and/or in writing, without assistance and without error.[2]	C	2
A170	Recall the agencies that maintain control over an aircraft while in flight under various conditions, verbally and/or in writing, without assistance and without error.[2]	C	1
A171	Explain the structure of the Federal Aviation Agency and its various functions including Air Traffic Control, Approach and Departure Control, verbally and/or in writing, without assistance and without error.[2]	C	2
A172	Recall the regulatory authorities that govern Naval Aviation, and explain their interrelationship to each other with the aid of appropriate documents, verbally and/or in writing, without assistance and without error.[2]	C	2
A173	Recall the regulations that apply to specific areas; airspace, aircraft right of way, formation and aerobatic flight, verbally and/or in writing, without assistance and without error.[2]	C	1
A174	Explain the FAR Navy Rules and Regulations as they apply to cloud clearances, semi-circular rules and VFR and IFR minimums, verbally and/or in writing, without assistance and without error.[2]	C	2
A175	Explain the meaning of those OPNAV/BUMED/NATOPS publications which pertain to the qualifications for and performance of the duties of a Naval Aviator, verbally and/or in writing, without assistance and without error.[2]	C	2
A176	Recall the Federal Air Regulations regarding altitude/flight levels, verbally and/or in writing, without assistance and without error.[2]	C	1

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A177	Explain the information and regulations presented, and their application to flight planning of the following Group I publications as delineated in NIFM, verbally and/or in writing, without assistance and without error.[2] 1. NATOPS Flight Manuals 2. Federal Aviation Regulation Part 91 3. OPNAVINST 3710.7 4. Flight Information Publications (FLIPS) 5. NOTAMS	C	3
A178	Explain the information presented and the application to flight planning of the following Group 2 publications as delineated in NIFM, verbally and/or in writing, without assistance and without error.[2] 1. Airman's Information Manual (AIM) 2. DoD Catalog of Charts and Flight Information 3. Air Operations Manuals 4. U.S. Air Force Foreign Clearance Guide 5. Chart Updating Manual (CHUM) 6. DoD Chart Bulletin 7. DoD Bulletin Digest 8. FAA Handbook Series 7110.8 & 7110.9 9. FAA's Aviation Weather for Pilots and Flight Operation Manual 10. OPNAVINST 3722.16 Series 11. Meteorology for Naval Aviators 12. FAA Handbook 6710.4 Series	C	3
A179	Recall standard communication voice terminology utilized in the transmission and receipt of radio communications, verbally and/or in writing, without assistance and without error.[1]	C	1
A180	Describe standardized voice reporting procedures and phrases utilized between aircraft and controlling agencies, verbally and/or in writing, without assistance and without error.[1]	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A181	Explain the format and terms utilized on receipt of radio voice reports and instructions, verbally and/or in writing, without assistance and without error.[1]	C	2
A182	Explain the voice procedures, recalling the format and content under VMC for communications with ground control, tower and Flight Service Station (FSS), verbally and/or in writing, without assistance and without error.[1]	C	2
A183	Explain the required pilot action of all daylight signals given by line crewman during shorebased operations, verbally and/or in writing, without assistance and without error.[1]	C	2
A184	Explain the aircraft signals used to communicate with the control tower for ground and airborne operation, day or night, verbally and/or in writing, without assistance and without error.[2]	C	2
A185	Describe formation flight visual signals, their meanings, action or answer required, day and night, verbally and/or in writing, without assistance and without error.[2]	C	2
A186	Describe the signals utilized and the interaction required with ground personnel during engine(s) starting procedures, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error.	C	2
A187	Explain the function and operation of aircraft navigation systems and associated instruments (displays), indicators and controls listed below, IAW the aircraft NATOPS, verbally and/or in writing, without assistance and without error. 1. Inertial navigation system 2. Radar altimeter 3. Air data computer 4. Aircraft Carrier Landing System (ACLS) 5. Radar 6. Instrument Landing System (ILS)	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A188	Explain the effects of pressure and temperature changes on barometric altimeter, verbally and/or in writing, without assistance and without error.[2]	C	2
A189	Explain the markings, notations, format and publication cycle for airways charts, verbally and/or in writing, without assistance and without error.[2]	C	2
A190	Explain what information is provided and the principles of operation of the VHF Omnidirectional Range (VOR), verbally and/or in writing, without assistance and without error.	C	2
A191	Explain what information is provided and the principle of operation of TACAN, verbally and/or in writing, without assistance and without error.[2]	C	2
A192	Explain what information is provided and the principle of operation of the automatic direction finding (ADF), verbally and/or in writing, without assistance and without error.[2]	C	2
A193	Recall and explain the function of the switches, controls and meters on the ADF control panel, verbally and/or in writing, without assistance and without error.[2]	C	2
A194	Recall what marker beacons are used for and the classes that are in use, verbally and/or in writing, without assistance and without error.	C	1
A195	Recall what information is provided by marker beacons during an ILS approach and how it is used verbally and/or in writing, without assistance and without error.	C	2
A196	Recall what information is provided to the pilot by the ILS verbally and/or in writing, without assistance and without error.	C	1

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A197	Recall the flight instruments that compose the "position" instrument category, verbally and/or in writing, without assistance and without error.[2]	C	1
A198	Explain what navigational information is provided by the aircraft range indicator (DME), verbally and/or in writing, without assistance and without error.[2]	C	2
A199	Explain what navigational information is provided and how it is displayed by instruments listed below, specify correctly, verbally and/or in writing, without assistance and without error. 1. Radio Magnetic Indicator (RMI) 2. Bearing-Distance-Heading Indicator (BDHI) 3. Horizontal Situation Indicator (HSI) 4. Heads Up Display	C	2
A200	Explain what navigational information is provided by the Course Indicator, verbally and/or in writing, without assistance and without error.[2]	C	2
A201	Explain how the Course Indicator is used as a VOR/TACAN display and ILS display, verbally and/or in writing, without assistance and without error.[2]	C	2
A202	Recall the type information displayed to the ground radar operator and its limitations, verbally and/or in writing, without assistance and without error.[2]	C	1
A203	Recall what information the pilot should be aware of to perform an enroute radar descent in a safe manner, verbally and/or in writing, without assistance and without error.[2]	C	1
A204	Recall the two types of radar approach systems listed below, and where the information regarding their availability, frequencies, minimums and glide slope angle can be found, verbally and/or in writing, without assistance and without error.[2]	C	1

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SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A204 (Cont)	1. Airport Surveillance Radar (ASR) 2. Precision Surveillance Radar (PSR)		
A205	Recall the type information included in the Air Traffic Control (ATC) clearance, verbally and/or in writing, without assistance and without error.2	C	1
A206	Explain the component parts or an IFR ATC clearance as described by published directives. Performance, be able to explain the IFR ATC clearance, verbally and/or in writing, without assistance and without error.2	C	2
A207	Recall what constitutes clearance acceptance and action to be taken if clearance cannot be complied with, verbally and/or in writing, without assistance and without error.2	C	1
A208	Explain the procedures and what information is included in the enroute clearance. Performance, be able to specify the procedures, verbally and/or in writing, without assistance and without error.2	C	2
A209	Explain the importance of pilots obtaining track guidance from onboard navigation equipment even though flight is within radar environment, verbally and/or in writing, without assistance and without error.2	C	2
A210	Recall the factors to be considered when determining the type of instrument approach to be used, verbally and/or in writing, without assistance and without error.2	C	1
A211	Recall exactly what an approach clearance constitutes in regard to landing, field minimums, and use of alternate airports, verbally and/or in writing, without assistance and without error.2	C	1
A212	Recall pre-approach course intercept maneuvers, verbally and/or in writing, without assistance and without error.2	C	1

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A213	Identify the aircraft instruments used for dead reckoning navigation, verbally and/or in writing, without assistance and without error.[1]	C	1
A214	Demonstrate the capability to use a navigation plotter and dividers for measuring direction and distance, and plotting latitude and longitude. Performance, be able to use plotter and dividers accurately, without assistance and without error.[1]	C	3
A215	Demonstrate the capability to use a navigational computer and appropriate charts to interpret the following, verbally and/or in writing, without assistance and without error.[1] 1. Wind speed 2. Ground speed 3. Drift/drift correction 4. Timing to ground reference points	C	3
A216	Demonstrate the capability to formulate a course, track and ETA so as to arrive at the desired destination, verbally and/or in writing, without assistance and without error.[1]	C	4
A217	Explain the procedures for correcting course and ground speed in order to regain pre-planned ETA/course, verbally and/or in writing, without assistance and without error.[1]	C	2
A218	Recognize and interpret information printed on an aeronautical chart, verbally and/or in writing, without assistance and without error.[2]	C	2
A219	Identify correctly, specific coordinates on topographical charts by use of relative bearings to topographical landmass, verbally and/or in writing, without assistance and without error.[2]	C	2
A220	Recall the principles and terminology of night topographic visualization and map reading, verbally and/or in writing, without assistance and without error.	C	1

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A221	Identify the various visual indications for determining wind direction and velocity, verbally and/or in writing, without assistance and without error.[1]	C	1
A222	Explain why briefings are required for all pilots who will be involved in a formation flight, verbally and/or in writing, without assistance and without major errors.	C	2
A223	Describe the hazards associated with formation flight, verbally and/or in writing, without assistance and in sufficient detail to insure an awareness of safety of flight.[2]	C	2
A224	Explain the various types of formations that are used and the pilots responsibilities for each position within these formations, verbally and/or in writing, without assistance and without error.[2]	C	2
A225	Explain how the TACAN can be used for a rendezvous and the required procedures, verbally and/or in writing, without assistance and without error.	C	2
A226	Describe the situations, during section formation flight, in which air-to-air TACAN and UHF/ADF rendezvous would be used, verbally and/or in writing, without assistance and without error.	C	2
A227	Explain the reasons for aircraft to fly in division formation, verbally and/or in writing, without assistance and without error.	C	2
A228	Explain how formation flight provides a foundation for tactical formation and air combat maneuvering, verbally and/or in writing, without assistance and without error.	C	2
A229	Recall the primary and secondary missions of VA, VF and VS squadrons, verbally and/or in writing, without assistance and in sufficient detail to recognize the tactical utilization.	C	1

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A230	Describe the symbols used to display aircraft/tactical information; i.e., HUD, Radar Multi-Mode, engine, armament, etc., verbally and/or in writing, in sufficient detail, for effective use during flight.	C	2
A231	Recall the basic principles of radar, verbally and/or in writing, without assistance and without error.	C	1
A232	Recall the type information displayed by the airborne radar and its limitations, verbally and/or in writing, without assistance and without error.	C	1
A233	Explain the tactical uses of airborne radar in the VF, VA and VS communities, verbally and/or in writing, without assistance and without error.	C	2
A234	Explain the importance of airborne EW in offensive and defensive tactical situations, verbally and/or in writing, without assistance and without error.	C	2
A235	Explain how ECM is used in tactical operations, in sufficient detail to insure an awareness of ECM capability, verbally and/or in writing, without assistance and without error.	C	2
A236	Explain how ESM is used in tactical operations, in sufficient detail to insure an awareness of ESM capability, verbally and/or in writing, without assistance and without error.	C	2
A237	Explain how high altitude operations effect aircraft performance, verbally and/or in writing, without assistance and without error.	C	2
A238	Explain why evasive maneuvers at high altitude can result in flight outside the operating envelope, verbally and/or in writing, without assistance and without error.	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A239	Explain why correct procedures during high altitude weapons delivery must be adhered to to ensure remaining within the aircraft flight envelope, verbally and/or in writing, without assistance and without error.	C	2
A240	Explain the factors that contribute to the total energy available to an aircraft maneuvering in-flight at any one instant; relating the use of this energy during tactical maneuvering, verbally and/or in writing, without assistance and without error.	C	2
A241	Explain energy addition rate, the factors that effect it and its application to combat maneuvering, verbally and/or in writing, without assistance and without error.	C	2
A242	Explain how wing loading effects aircraft turn radius and rate, relating this turn performance to tactical maneuvering, verbally and/or in writing, without assistance and without error.	C	2
A243	Explain the effect of gravity on turns in the vertical plane during combat maneuvering, verbally and/or in writing, without assistance and without error.	C	2
A244	Recall the flight deck organization of a U.S. Navy aircraft carrier relating the organization to individual aircraft operations aboard ship. IAW CV NATOPS Manual, verbally and/or in writing, without assistance and without error.	C	1
A245	Explain the pre-launch procedures and the reasons for their use during CV air operations IAW the CV NATOPS Manual, verbally and/or in writing, without assistance and without error.	C	2
A246	Describe the mirror/Fresnel landing system and its use in a CV/FCLP landing in respect to the type information provided the pilot, verbally and/or in writing, without assistance and without error.	C	2

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A247	Explain the function and responsibilities of the Landing Signal Officer during CV aircraft recovery or FCLP operations IAW NATOPS LSO Manual, verbally and/or in writing, without assistance and without error.	C	2
A248	Relate the importance of understanding the mechanism and limitations of the physiological systems of the pilot as part of the overall flight system.$_2$	A	4
A249	Relate the importance of minimizing self-imposed stress in order to provide an effective man-machine relationship.$_2$	A	4
A250	Explain the importance of nutrition, physical condition and proper rest as they effect pilot performance, verbally and/or in writing, without assistance and without error.$_2$	C	2
A251	Explain the factors that affect time sharing scan patterns; e.g., focus, peripheral, accommodation, instrument reading, etc., verbally and/or in writing, without assistance and without error.$_3$	C	2
A252	Relate the importance of utilizing the aircraft checklists IAW VTX NATOPS Flight Manual.$_2$	A	4
A253	Relate the importance of proper flight planning as an essential component in the conduct of a safe and successful flight.$_2$	A	4
A254	Relate the importance of an ATC clearance to flight safety.$_2$	A	4
A255	Relate the importance of being able to recognize the ATC/ARTC responsibilities and the pilot's responsibilities when operating an aircraft.	A	4
A256	Relate the importance of pre-take-off navigation equipment check to clearance compliance and aircraft safety.$_2$	A	4

SBO ALPH-NUM	PLAIN LANGUAGE STATEMENT OF SBO	DOMAIN	LEVEL
A257	Relate the importance of maintaining radio discipline during normal or emergency flight.[2]	A	4
A258	Relate the importance of performing the correct aircraft emergency procedures IAW VTX NATOPS Flight Manual.[2]	A	4
A259	Relate the importance of using correct procedures during formation flight to aircraft safety.[2]	A	4
A260	Relate the importance of using correct weapon delivery procedures to flight safety during low altitude flight.	A	4
A261	Relate the importance of performing correct procedures during high altitude weapons delivery.	A	4
A262	See the reasons why the VTX aircraft, its systems, and weaponry operated IAW NATOPS, results in standardized procedures, optimum performance and safety.	A	4

APPENDIX B

SORT OF SPECIFIC BEHAVIORAL OBJECTIVES TO INDIVIDUAL MEDIA AND TUTORIAL MEDIA

	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
SBO'S ALPHA-NUMERIC IDENTIFIERS	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
F1		X					X
F2					X		X
F3				X			X
F4				X			X
F5				X			X
F6				X			X
F7				X			X
F8				X			X
F9				X			X
F10				X			X
F11				X			X
F12				X			X
F13				X			X
F14				X			X
F15				X			X
F16				X			X
F17				X			X
F18				X			X
F19					X		X
F20					X		X
F21					X		X
F22					X		X
F23					X		X
F24					X		X
F25					X		X
F26					X		X
F27					X		X
F28					X		X
F29					X		X
F30					X		X

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
F31					X		X
F32					X		X
F33						OFT	X
F34							X
F35							X
F36							X
F37							X
F38					X	X	X
F39					X	X	X
F40					X	X	X
F41					X		X
F42					X		X
F43					X		X
F44					X		X
F45					X		X
F46					X		X
F47					X		X
F48					X		X
F49					X		X
F50						X	X
F51					X		X
F52					X		X
F53						X	X
F54					X		X
F55					X		X
F56					X		X
F57					X		X
F58					X		X
F59					X		X
F60					X		X

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	FLIGHT (AIRPLANE)
F61						X	X
F62						X	X
F63						X	X
F64						X	X
F65						X	X
F66							X
F67					X		X
F68						X	X
F69						X	X
F70						X	X
F71						X	X
F72						X	X
F73						X	X
F74						X	X
F75						X	X
F76						X	X
F77						X	X
F78						X	X
F79						X	X
F80						X	X
F81							X
F82							X
F83						X	X
F84						X	X
F85						X	X
F86							X
F87						X	X
F88						X	X
F89						X	X
F90					X		X

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
F91						X	X
F92					X	X	X
F93							X
F94							X
F95							X
F96					X		X
F97						X	X
F98						X	X
F99					X		X
F100					X		X
F101						X	X
F102						X	X
F103						X	X
F104						X	X
F105						X	X
F106						X	X
F107						X	X
F108					X		X
F109						X	X
F110						X	X
F111						X	X
F112					X		X
F113					X		X
F114						X	X
F115						X	X
F116						X	X
F117					X	X	X
F118					X	X	X
F119					X	X	X
F120					X		X

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
F121					X		X
F122					X	X	X
F123					X		X
F124						X	X
F125						X	X
F126					X	X	X
F127					X	X	X
F128					X	X	X
F129					X	X	X
F130					X	X	X
F131					X	X	X
F132					X	X	X
F133					X	X	X
F134					X	X	X
F135					X	X	X
F136					X	X	X
F137					X	X	X
F138					X	X	X
F139					X	X	X
F140					X	X	X
F141					X	X	X
F142					X	X	X
F143					X	X	X
F144					X	X	X
F145					X		X
F146					X	X	X
F147					X	X	X
F148					X		X
F149					X	X	X
F150					X	X	X

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
F151					X		X
F152					X	X	X
F153					X	X	X
F154					X	X	X
F155					X		X
F156					X	X	X
F157						X	X
F158						X	X
F159						X	X
F160						X	X
F161					X	X	X
F162					X		X
F163					X	X	X
F164					X	X	X
F165		Achieved prior to Advanced Flight Training					
F166					X	X	X
F167					X	X	X
F168					X	X	X
F169						X	X
F170						X	X
F171					X	X	X
F172					X	X	X
F173					X	X	X
F174					X	X	X
F175					X	X	X
F176						X	X
F177					X	X	X
F178					X	X	X
F179						X	X
F180					X	X	X

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA: PRINT	INDIVIDUAL MEDIA: A-V (STATIC)	INDIVIDUAL MEDIA: A-V (DYNAMIC)	INDIVIDUAL MEDIA: P-T TRAINER (STATIC)	TUTORIAL MEDIA: P-T TRAINER (DYNAMIC)	TUTORIAL MEDIA: SIMULATOR WHOLE-TASK	TUTORIAL MEDIA: (AIRPLANE) FLIGHT
F181					X	X	X
F182					X	X	X
F183					X	X	X
F184						X	X
F185					X	X	X
F186						X	X
F187							X
F188						X	X
F189					X	X	X
F190							X
F191				X			X
F192					X		X
F193					X		X
F194					X		X
F195					X		X
F196							X
F197					X	X	X
F198							X
F199							X
F200					X	X	X
F201					X		X
F202					X	X	X
F203					X	X	X
F204					X		X
F205					X	X	X
F206						X	X
F207							X
F208					X	X	X
F209					X		X
F210					X		X

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
F211							X
F212					X	X	X
F213							X
F214					X	X	X
F215					X	X	X
F216							X
F217							X
F218					X	X	X
F219					X	X	X
F220					X	X	X
F221					X	X	X
F222					X	X	X
F223					X	X	X
F224							X
F225							X
F226							X
F227							X
F228							X
F229							X
F230							X
F231							X
F232							X
F233							X
F234							X
F235							X
F236							X
F237							X
F238							X
F239					X		X
F240					X		X

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
F241					X		X
F242					X		X
F243					X		X
F244					X		X
F245					X		X
F246							X
F247				X			
F248				X			
F249					X		X
F250					X		X
F251					X		X
F252					X		X
F253					X		X
F254					X		X
F255					X		X
F256					X		X
F257					X		X
F258					X		X
F259					X		X
F260					X		X
F261						X	X
F262						X	X
F263							X
F264							X
F265							X
F266							X
F267							X
F268						X	X
F269						X	X
F270							X

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
F271						X	X
F272							X
F273							X
F274					X	X	X
F275					X	X	X
F276					X		X
F277				X			X
F278							X
F279							X
F280					X	X	X
F281					X	X	X
F282					X	X	X
F283					X	X	X
F284					X		X
F285					X		X
F286					X	X	X
F287					X	X	X
F288							X
F289					X	X	X
F290					X	X	X
F291					X	X	X
F292					X	X	X
F293					X	X	X
F294					X		X
FS1	X						
FS2	X						
FS3	X						
FS4	X	X					
FS5	X				X		
FS6	X				X		

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
FS7	X				X		
FS8	X				X		
FS9	X				X		
FS10	X				X		
FS11	X				X		
FS12	X				X		
FS13	X				X		
FS14	X				X		
FS15	X				X		
FS16	X					X	
FS17	X				X		
FS18	X				X		
FS19	X				X		
FS20	X				X		
FS21	X					X	
FS22						X	
FS23		X				X	
FS24		X					
FS25	X	X					
FS26	X						
FS27			X				
FS28	X						
FS29					X		
FS30	X						
FS31		X					
FS32	X					X	
FS33	X						
FS34	X	X					
FS35		X					
FS36	X	X					

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
FS37	X						
FS38	X				X		
FS39	X	X					
FS40	X						
FS41	X				X		
FS42	X				X		
FS43	X				X		
FS44	X	X					
FS45	X	X			X		
FS46	X	X					
FS47	X				X		
FS48	X					X	
FS49	X	X					
FS50	X				X	X	
FS51	X				X	X	
FS52	X	X					
FS53	X				X		
FS54	X				X		
FS55	X				X		
FS56	X					X	
FS57	X	X					
FS58	X					X	
FS59	X	X					
FS60	X	X					
FS61	X	X					
FS62	X				X		
FS63	X				X		
FS64	X				X	X	
FS65	X				X		
FS66	X						

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
FS67	X				X	X	
FS68	X				X	X	
FS69	X					X	
FS70	X	X					
FS71	X				X	X	
FS72	X				X	X	
FS73	X				X	X	
FS74	X				X	X	
FS75	X	X					
FS76	X				X	X	
FS77	X				X	X	
FS78	X	X					
FS79	X				X	X	
FS80	X				X	X	
FS81	X				X	X	
FS82						X	
FS83	X	X					
FS84	X	X					
FS85	X	X			X	X	
FS86	X	X			X	X	
FS87	X	X					
FS88	X				X	X	
FS89	X				X	X	
FS90	X	X					
FS91	X	X			X	X	
FS92	X	X			X	X	
FS93	X	X			X	X	
FS94	X	X					
FS95	X	X			X	X	
FS96	X				X	X	

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
FS97	X	X					
FS98	X				X	X	
FS99	X	X					
FS100	X				X	X	
FS101	X	X					
FS102	X				X	X	
FS103	X				X	X	
FS104	X				X	X	
FS105	X	X					
FS106	X					X	
FS107	X				X	X	
FS108	X				X	X	
FS109	X				X	X	
FS110	X					X	
FS111	X					X	
FS112	X	X					
FS113	X					X	
FS114	X					X	
FS115	X						
FS116	X						
FS117	X						
FS118	X					X	
FS119	X					X	
FS120	X						
FS121	X					X	
FS122	X				X		
FS123	X						
FS124	X	X					
FS125	X					X	
FS126	X					X	

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
FS127	X	X					
FS128	X					X	
FS129	X					X	
FS130					X		
FS131	X	X					
FS132	X						
FS133	X						
FS134	X						
FS135	X						
FS136	X	X					
FS137	X						
FS138	X					X	
FS139	X					X	
FS140	X	X					
FS141	X					X	
FS142		Achieved prior to Advanced Flight Training					
FS143	X	X					
FS144	X					X	
FS145	X				X	X	
FS146	X	X					
FS147	X				X	X	
FS148	X				X	X	
FS149	X	X					
FS150	X				X	X	
FS151	X				X	X	
FS152	X	X					
FS153	X				X		
FS154	X				X		
FS155	X	X					
FS156	X				X		

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
FS157	X	X					
FS158	X	X					
FS159	X	X					
FS160	X	X					
FS161	X				X	X	
FS162	X				X	X	
FS163	X				X	X	
FS164	X						
FS165	X	X					
FS166	X				X	X	
FS167	X						
FS168	X	X					
FS169	X				X	X	
FS170	X				X	X	
FS171	X				X	X	
FS172	X				X	X	
FS173	X				X	X	
FS174	X				X	X	
FS175	X				X	X	
FS176	X				X	X	
FS177	X				X	X	
FS178	X				X	X	
FS179	X				X	X	
FS180	X				X	X	
FS181		X					
FS182	X				X	X	
FS183		X					
FS184	X				X	X	
FS185	X				X	X	
FS186	X				X	X	

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
FS187	X						
FS188	X					X	
FS189	X	X					
FS190	X					X	
FS191	X						
FS192	X				X	X	
FS193	X				X		
FS194	X						
FS195	X						
FS196	X						
FS197	X						
FS198	X		X				
FS199	X						
FS200	X						
FS201	X				X	X	
FS202	X				X	X	
FS203	X				X	X	
FS204	X				X	X	
FS205	X	X					
FS206	X				X	X	
FS207	X				X	X	
FS208	X				X	X	
FS209	X				X	X	
FS210	X				X	X	
FS211	X				X	X	
FS212	X				X	X	
FS213	X				X	X	
FS214	X				X	X	
FS215	X				X	X	
FS216	X				X		

	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
SBO'S ALPHA-NUMERIC IDENTIFIERS	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
FS217	X				X	X	
FS218	X				X	X	
FS219	X				X	X	
FS220	X				X	X	
FS221	X				X	X	
FS222	X				X	X	
FS223	X				X	X	
FS224	X				X	X	
FS225	X				X	X	
FS226	X				X	X	
FS227	X				X	X	
FS228	X				X	X	
FS229	X				X	X	
FS230	X				X	X	
FS231	X				X	X	
FS232	X		X			X	
FS233	X				X	X	
FS234	X	X					
FS235	X						
FS236	X						
FS237	X						
FS238	X						
FS239	X						
FS240	X						
FS241	X						
FS242	X						
FS243	X						
FS244	X						
FS245	X						
FS246	X						

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
FS247	X				X	X	
FS248	X				X	X	
FS249	X				X	X	
FS250	X				X	X	
FS251	X				X	X	
FS252	X				X		
FS253	X	X					
FS254	X						
FS255	X				X	X	
FS256	X						
FS257	X	X					
FS258	X						
FS259	X						
FS260	X						
FS261	X						
FS262	X						
FS263	X				X	X	
FS264	X						
FS265	X				X		
FS266	X						
FS267		X					
FS268	X				X	X	
FS269	X	X					
FS270	X				X	X	
FS271	X				X	X	
FS272	X	X					
FS273	X						
FS274	X						
FS275	X						
FS276	X						

	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
SBO'S ALPHA-NUMERIC IDENTIFIERS	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
FS277	X						
FS278	X						
FS279	X						
FS280	X						
FS281	X						
FS282	X						
FS283	X						
FS284	X						
FS285	X						
FS286	X						
FS287	X				X	X	
FS288	X				X	X	
FS289	X				X	X	
FS290	X				X	X	
FS291	X				X	X	
FS292	X						
FS293	X						
FS294	X						
FS295	X						
FS296	X						
FS297	X						
FS298	X						
FS299	X						
FS300	X						
FS301	X						
FS302	X						
FS303	X						
FS304	X						
FS305	X						
FS306	X						

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
FS307	X						
FS308	X						
FS309	X						
FS310	X						
FS311	X						
FS312	X						
FS313	X						
FS314	X						
FS315	X						
FS316	X						
FS317	X						
FS318	X						
FS319	X						
FS320	X						
FS321	X						
FS322	X						
FS323	X						
FS324	X						
FS325	X						
FS326	X	X					
FS327	X						
FS328	X						
FS329	X						
FS330	X						
FS331	X						
FS332	X						
FS333	X						
FS334	X						
FS335	X						
FS336	X						

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
FS337	X						
FS338	X						
FS339	X						
FS340	X						
FS341	X						
FS342	X				X		
FS343	X				X		
FS344	X				X		
FS345	X				X		
FS346	X				X		
FS347	X				X		
FS348	X				X		
FS349		Achieved prior to Advanced Flight Training					
FS350	X				X		
FS351	X				X		
FS352	X				X		
FS353	X				X		
FS354	X				X		
FS355	X				X		
FS356	X	X					
FS357	X						
FS358	X						
FS359	X						
FS360	X						
FS361	X						
FS362	X				X		
FS363	X				X		
FS364	X				X		
FS365	X				X		
FS366	X						

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
FS367	X				X		
FS368	X				X		
FS369	X						
FS370	X				X		
FS371	X						
FS372	X						
FS373	X						
FS374	X						
FS375	X	X					
FS376	X						
FS377	X						
FS378	X	X					
FS379	X						
FS380	X	X					
FS381	X						
FS382	X						
FS383	X						
FS384	X						
FS385	X						
FS386	X						
FS387	X						
FS388	X						
FS389	X						
FS390	X						
FS391	X						
FS392	X				X	X	
FS393	X				X	X	
FS394		X					
FS395		X					
FS396		X					

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
FS397		X					
FS398	X						
FS399	X				X	X	
FS400	X				X	X	
FS401	X				X	X	
FS402	X	X					
FS403	X						
FS404	X				X		
FS405	X				X	X	
FS406	X				X	X	
FS407	X				X	X	
FS408	X				X	X	
FS409	X				X	X	
FS410	X	X					
FS411	X				X	X	
FS412	X				X	X	
FS413	X				X	X	
FS414	X				X	X	
A1		Achieved prior to Advanced Flight Training					
A2		Achieved prior to Advanced Flight Training					
A3		Achieved prior to Advanced Flight Training					
A4		Achieved prior to Advanced Flight Training					
A5		Achieved prior to Advanced Flight Training					
A6		Achieved prior to Advanced Flight Training					
A7		Achieved prior to Advanced Flight Training					
A8		Achieved prior to Advanced Flight Training					
A9		Achieved prior to Advanced Flight Training					
A10		Achieved prior to Advanced Flight Training					
A11		Achieved prior to Advanced Flight Training					
A12		Achieved prior to Advanced Flight Training					

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
A13		Achieved prior to Advanced Flight Training					
A14		Achieved prior to Advanced Flight Training					
A15		Achieved prior to Advanced Flight Training					
A16		Achieved prior to Advanced Flight Training					
A17		Achieved prior to Advanced Flight Training					
A18		Achieved prior to Advanced Flight Training					
A19		Achieved prior to Advanced Flight Training					
A20		Achieved prior to Advanced Flight Training					
A21		Achieved prior to Advanced Flight Training					
A22		Achieved prior to Advanced Flight Training					
A23		Achieved prior to Advanced Flight Training					
A24		Achieved prior to Advanced Flight Training					
A25		Achieved prior to Advanced Flight Training					
A26		Achieved prior to Advanced Flight Training					
A27		Achieved prior to Advanced Flight Training					
A28		Achieved prior to Advanced Flight Training					
A29		Achieved prior to Advanced Flight Training					
A30		Achieved prior to Advanced Flight Training					
A31	X						
A32	X						
A33	X						
A34	X						
A35	X						
A36	X	X					
A37	X	X					
A38	X	X					
A39	X	X					
A40	X	X					
A41	X	X					
A42	X	X					

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
A43	X	X					
A44	X	X					
A45	X	X					
A46	X	X					
A47	X						
A48	X						
A49	X	X					
A50	X		X				
A51	X		X				
A52	X		X				
A53	X		X				
A54	X	X					
A55	X	X					
A56	X						
A57	X	X					
A58	X	X					
A59	X			X			
A60	X	X					
A61	X	X					
A62	X	X					
A63	X	X					
A64	X	X					
A65	X	X					
A66	X	X					
A67	X	X					
A68	X	X					
A69	X						
A70	X	X					
A71	X	X					
A72	X						

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA					TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
A73	X						
A74	X						
A75	X						
A76	X						
A77	X						
A78	X						
A79	X						
A80	X						
A81	X						
A82	X						
A83	X						
A84	X						
A85		Achieved prior to Advanced Flight Training					
A86	X						
A87	X						
A88		Achieved prior to Advanced Flight Training					
A89	X						
A90	X						
A91	X						
A92	X						
A93	X						
A94	X						
A95	X						
A96		Achieved prior to Advanced Flight Training					
A97	X						
A98	X						
A99	X						
A100	X						
A101	X						
A102	X						

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
A103		Achieved prior to Advanced Flight Training					
A104	X						
A105	X						
A106		Achieved prior to Advanced Flight Training					
A107	X						
A108	X						
A109	X						
A110	X						
A111	X						
A112	X						
A113	X						
A114		Achieved prior to Advanced Flight Training					
A115		Achieved prior to Advanced Flight Training					
A116	X						
A117		Achieved prior to Advanced Flight Training					
A118	X						
A119	X						
A120	X						
A121	X						
A122	X						
A123	X						
A124		Achieved prior to Advanced Flight Training					
A125	X						
A126	X						
A127	X						
A128		Achieved prior to Advanced Flight Training					
A129	X						
A130	X						
A131		Achieved prior to Advanced Flight Training					
A132		Achieved prior to Advanced Flight Training					

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
A133		Achieved prior to Advanced Flight Training					
A134	X						
A135		Achieved prior to Advanced Flight Training					
A136	X						
A137		Achieved prior to Advanced Flight Training					
A138		Achieved prior to Advanced Flight Training					
A139		Achieved prior to Advanced Flight Training					
A140	X						
A141	X						
A142	X						
A143	X						
A144		Achieved prior to Advanced Flight Training					
A145	X						
A146	X						
A147		Achieved prior to Advanced Flight Training					
A148	X						
A149	X						
A150	X						
A151		Achieved prior to Advanced Flight Training					
A152	X						
A153		Achieved prior to Advanced Flight Training					
A154	X						
A155	X						
A156	X						
A157		Achieved prior to Advanced Flight Training					
A158	X						
A159	X						
A160	X						
A161	X						
A162	X						

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
A163	X						
A164	X						
A165	X						
A166	X						
A167	X						
A168	X						
A169	X						
A170	X						
A171	X						
A172	X						
A173	X						
A174	X						
A175	X						
A176	X						
A177	X						
A178	X						
A179		**Achieved prior to Advanced Flight Training**					
A180		**Achieved prior to Advanced Flight Training**					
A181		**Achieved prior to Advanced Flight Training**					
A182		**Achieved prior to Advanced Flight Training**					
A183		**Achieved prior to Advanced Flight Training**					
A184	X						
A185	X						
A186	X						
A187	X						
A188	X						
A189	X						
A190	X						
A191	X						
A192	X						

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
A193	X	X					
A194	X						
A195	X						
A196	X						
A197	X	X					
A198	X						
A199	X	X					
A200	X						
A201	X						
A202	X						
A203	X						
A204	X						
A205	X						
A206	X						
A207	X						
A208	X						
A209	X						
A210	X						
A211	X						
A212	X						
A213		Achieved prior to Advanced Flight Training					
A214		Achieved prior to Advanced Flight Training					
A215		Achieved prior to Advanced Flight Training					
A216		Achieved prior to Advanced Flight Training					
A217		Achieved prior to Advanced Flight Training					
A218	X						
A219	X						
A220	X						
A221		Achieved prior to Advanced Flight Training					
A222	X						

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
A223	X						
A224	X						
A225	X						
A226	X						
A227	X						
A228	X						
A229	X						
A230	X						
A231	X						
A232	X						
A233	X		X				
A234	X		X				
A235	X		X				
A236	X		X				
A237	X						
A238	X						
A239	X						
A240	X						
A241	X						
A242	X						
A243	X						
A244	X						
A245	X						
A246	X						
A247	X						
A248		Achieved prior to Advanced Flight Training					
A249	X						
A250	X						
A251	X						
A252	X						

SBO'S ALPHA-NUMERIC IDENTIFIERS	INDIVIDUAL MEDIA				TUTORIAL MEDIA		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMULATOR WHOLE-TASK	(AIRPLANE) FLIGHT
A253	X						
A254	X						
A255	X						
A256	X						
A257	X						
A258	X						
A259	X						
A260	X						
A261	X						
A262	X						

APPENDIX C

MERGE TO COMPOSITE OF MEDIA AND CATEGORIES

LEGEND

Print

PI	Programmed Instruction
F/N	FTI/NATOPS
S. Pubs.	Safety Publications
NWP	Naval Warfare Publication
Sense P.	Sense Pamphlet
Reg.	Regulations
FIPS	Flight Information Publications
Y	Yellow Sheet

AV (Static)

Graphic A	Graphic Aid
S/S	Sound/Slide Program
Photo M	Photo Mock-up

AV (Dynamic)

DD	Dynamic Demonstrator
VT	Video Tape

Part-Task Trainer (Static)

Mock-U	Mock-Up
CFT	Cockpit Familiarization Trainer

LEGEND (Cont)

Part-Task Trainer (Dynamic)

EST	Ejection Seat Trainer
CPT	Cockpit Procedures Trainer
Visual	Visual Trainer
FIT	Flight Instrument Trainer
Scan	Scan Trainer
ACM	Air Combat Maneuvering Trainer

Whole-Task Trainer

OFT	Operational Flight Trainer

Flight

VTX	Aircraft

SBO #	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
F1		Graphic A					VTX		P3	P5
F2					CPT		VTX		P4	P5
F3				CFT			VTX		P4	P5
F4				CFT			VTX		P4	P5
F5				CFT			VTX		P4	P5
F6				CFT			VTX		P4	P5
F7				CFT			VTX		P4	P5
F8				CFT			VTX		P4	P5
F9				CFT			VTX		P4	P5
F10				CFT			VTX		P4	P5
F11				CFT			VTX		P4	P5
F12				CFT			VTX		P4	P5
F13				CFT			VTX		P4	P5
F14				CFT			VTX		P4	P5
F15				CFT			VTX		P4	P5
F16				CFT			VTX		P4	P5
F17				CFT			VTX		P4	P5
F18				CFT			VTX		P4	P5
F19					CPT		VTX		P4	P5
F20					CPT		VTX		P4	P5
F21					CPT		VTX		P4	P5
F22					CPT		VTX		P4	P5
F23					CPT		VTX		P4	P5
F24					CPT		VTX		P4	P5
F25					CPT		VTX		P4	P5
F26					CPT		VTX		P4	P5
F27					CPT		VTX		P4	P5
F28					CPT		VTX		P4	P5
F29					CPT		VTX		P4	P5
F30					CPT		VTX		P4	P5
F31					CPT		VTX		P4	P5
F32					CPT		VTX		P4	P5

SBO #	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
F33						OFT	VTX		P4	P5
F34							VTX			P5
F35							VTX			P5
F36							VTX			P5
F37							VTX			P5
F38					Visual	OFT	VTX		P3	P5
F39					Visual	OFT	VTX		P3	P5
F40					Visual	OFT	VTX		P3	P5
F41					CPT		VTX		P4	P5
F42					CPT		VTX		P4	P5
F43					CPT		VTX		P4	P5
F44					CPT		VTX		P4	P5
F45					CPT		VTX		P4	P5
F46					CPT		VTX		P4	P5
F47					CPT		VTX		P4	P5
F48					CPT		VTX		P4	P5
F49					CPT		VTX		P4	P5
F50						OFT	VTX		P4	P5
F51					CPT		VTX		P4	P5
F52					CPT		VTX		P4	P5
F53						OFT	VTX		P4	P5
F54					Visual	OFT	VTX		P3	P5
F55					Scan		VTX		P3	P5
F56					CPT		VTX		P3	P4
F57					Visual	OFT	VTX		P3	P5
F58					Visual	OFT	VTX		P3	P5
F59					Visual	OFT	VTX		P3	P5
F60					CPT		VTX		P3	P4
F61						OFT	VTX		P4	P5
F62						OFT	VTX		P4	P5
F63						OFT	VTX		P4	P5
F64						OFT	VTX		P4	P5

SBO #	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
F65						OFT	VTX		P4	P5
F66							VTX			P5
F67					Scan		VTX		P3	P5
F68						OFT	VTX		P4	P5
F69						OFT	VTX		P4	P5
F70						OFT	VTX		P4	P5
F71						OFT	VTX		P4	P5
F72						OFT	VTX		P4	P5
F73						OFT	VTX		P4	P5
F74						OFT	VTX		P3	P5
F75						OFT	VTX		P4	P5
F76						OFT	VTX		P3	P5
F77						OFT	VTX		P4	P5
F78						OFT	VTX		P3	P5
F79						OFT	VTX		P4	P5
F80						OFT	VTX		P3	P5
F81							VTX		P3	P5
F82							VTX		P3	P5
F83						OFT	VTX		P3	P5
F84						OFT	VTX		P3	P5
F85						OFT	VTX		P4	P5
F86							VTX		P3	P5
F87						OFT	VTX		P4	P5
F88						OFT	VTX		P3	P5
F89						OFT	VTX		P4	P5
F90					Scan		VTX		P3	P5
F91						OFT	VTX		P3	P5
F92					Visual	OFT	VTX		P3	P5
F93							VTX			P5
F94							VTX			P5
F95							VTX			P5
F96					Scan		VTX		P3	P5

SBO #	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
F97							VTX		P3	P5
F98						OFT	VTX		P3	P5
F99					CPT		VTX		P4	P5
F100					Scan		VTX		P3	P5
F101						OFT	VTX		P3	P4
F102						OFT	VTX		P4	P5
F103						OFT	VTX		P4	P5
F104						OFT	VTX		P4	P5
F105						OFT	VTX		P4	P5
F106						OFT	VTX		P4	P5
F107						OFT	VTX		P3	P5
F108					CPT		VTX		P4	P5
F109						OFT	VTX		P4	P5
F110						OFT	VTX		P4	P5
F111						OFT	VTX		P4	P5
F112					Scan		VTX		P3	P5
F113					CPT		VTX		P4	P5
F114						OFT	VTX		P4	P5
F115						OFT	VTX		P4	P5
F116						OFT	VTX		P4	P5
F117					Visual	OFT	VTX		P3	P5
F118					Visual	OFT	VTX		P3	P5
F119					Visual	OFT	VTX		P4	P5
F120					CPT		VTX		P4	P5
F121		Graphic A			CPT		VTX		P4	P5
F122					Visual	OFT	VTX		P4	P5
F123					Scan		VTX		P4	P5
F124						OFT	VTX		P4	P5
F125						OFT	VTX		P4	P5
F126					FIT	OFT	VTX		P4	P5
F127					FIT	OFT	VTX		P3	P4
F128					FIT	OFT	VTX		P4	P5

SBO #	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
F129						OFT	VTX		P4	P5
F130						OFT	VTX		P4	P5
F131						OFT	VTX		P4	P5
F132						OFT	VTX		P4	P5
F133						OFT	VTX		P4	P5
F134						OFT	VTX		P4	P5
F135						OFT	VTX		P4	P5
F136						OFT	VTX		P4	P5
F137						OFT	VTX		P4	P5
F138						OFT	VTX		P4	P5
F139						OFT	VTX		P4	P5
F140					FIT	OFT	VTX		P4	P5
F141					FIT	OFT	VTX		P4	P5
F142					FIT	OFT	VTX		P4	P5
F143					FIT	OFT	VTX		P4	P5
F144					FIT	OFT	VTX		P4	P5
F145					Scan		VTX		P4	P5
F146					FIT	OFT	VTX		P4	P5
F147					FIT	OFT	VTX		P4	P5
F148					Scan		VTX		P4	P5
F149					FIT	OFT	VTX		P4	P5
F150					FIT	OFT	VTX		P4	P5
F151					Scan		VTX		P4	P5
F152					FIT	OFT	VTX		P4	P5
F153					FIT	OFT	VTX		P4	P5
F154					FIT	OFT	VTX		P4	P5
F155					Scan		VTX		P4	P5
F156					Visual	OFT	VTX		P4	P5
F157						OFT	VTX		P4	P5
F158						OFT	VTX		P4	P5
F159						OFT	VTX		C3	C4
F160						OFT	VTX		P4	P5

	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
SBO #	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
F161					FIT	OFT	VTX		P4	P5
F162					Scan		VTX		P4	P5
F163					FIT	OFT	VTX		P4	P5
F164					Visual	OFT	VTX		P4	P5
F165					FIT	OFT	VTX		P4	P5
F166					FIT	OFT	VTX		C3	C4
F167					FIT	OFT	VTX		P4	P5
F168					FIT	OFT	VTX		P4	P5
F169			Scope			OFT	VTX		P3	P4
F170						OFT	VTX		P4	P5
F171					FIT	OFT	VTX		P4	P5
F172					FIT	OFT	VTX		P4	P5
F173					FIT	OFT	VTX		P4	P5
F174					Visual	OFT	VTX		P4	P5
F175					FIT	OFT	VTX		P4	P5
F176						OFT	VTX		P4	P5
F177					Visual	OFT	VTX		P4	P5
F178					Visual	OFT	VTX		P4	P5
F179						OFT	VTX		C3	C4
F180						OFT	VTX		P4	P5
F181					FIT	OFT	VTX		P4	P5
F182					FIT	OFT	VTX		P4	P5
F183					FIT	OFT	VTX		P4	P5
F184						OFT	VTX		P4	P5
F185						OFT	VTX		P3	P4
F186						OFT	VTX		C3	C4
F187							VTX			C4
F188						OFT	VTX		C3	C4
F189					Visual	OFT	VTX		P4	P5
F190		Graphic A					VTX		P3	P5
F191				CFT			VTX		P4	P5
F192					CPT		VTX		P4	P5

SBO #	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
F193					CPT		VTX		P4	P5
F194					CPT		VTX		P4	P5
F195					CPT		VTX		P4	P5
F196							VTX			P5
F197					Visual	OFT	VTX		P3	P5
F198							VTX			P5
F199							VTX			P5
F200					Visual	OFT	VTX		P3	P5
F201					CPT		VTX		P4	P5
F202					Visual	OFT	VTX		P3	P4
F203					Visual	OFT	VTX		P3	P5
F204					Scan		VTX		P4	P5
F205					Visual	OFT	VTX		P3	P4
F206						OFT	VTX		P4	P5
F207							VTX			P5
F208					Visual	OFT	VTX		P4	P5
F209					CPT		VTX		P4	P5
F210		Graphic A			CPT		VTX		P4	P5
F211							VTX			P5
F212					Visual	OFT	VTX		P4	P5
F213							VTX			P5
F214					Visual	OFT	VTX		P3	P5
F215					Visual	OFT	VTX		P3	P5
F216							VTX			P5
F217							VTX			P5
F218					Visual	OFT	VTX		P3	P5
F219					Visual	OFT	VTX		P3	P5
F220						OFT	VTX		P3	P5
F221					Visual	OFT	VTX		P3	P5
F222					Visual	OFT	VTX		P3	P5
F223					Visual	OFT	VTX		P3	P5
F224							VTX		P3	P5

SBO #	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
F225							VTX			P4
F226							VTX			P4
F227							VTX			P4
F228							VTX			P4
F229							VTX			P4
F230							VTX			P4
F231							VTX			P4
F232							VTX			P4
F233							VTX			P4
F234							VTX			P4
F235							VTX			P4
F236							VTX			P4
F237							VTX			P4
F238							VTX			P4
F239					ACM		VTX		P4	P4
F240					ACM		VTX		P4	P4
F241					ACM		VTX		P4	P4
F242					ACM		VTX		P4	P4
F243					ACM		VTX		P4	P4
F244					ACM		VTX		P4	P4
F245					ACM		VTX		P4	P4
F246		Graphic A					VTX		P2	P4
F247				CFT			VTX		P4	P5
F248				CFT			VTX		P4	P5
F249					CPT		VTX		P4	P5
F250					ACM		VTX		P4	P5
F251					ACM		VTX		P4	P4
F252					ACM		VTX		P4	P4
F253					ACM		VTX		P3	P4
F254					ACM		VTX		P3	P4
F255					ACM		VTX		P3	P4
F256					ACM		VTX		P3	P4

SBO #	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
F257					ACM		VTX		P3	P4
F258					ACM		VTX		P3	P4
F259					ACM		VTX		P3	P4
F260					ACM		VTX		P3	P4
F261						OFT	VTX		C3	C4
F262						OFT	VTX		C3	C4
F263							VTX			C4
F264							VTX			C4
F265							VTX			C4
F266							VTX			C4
F267							VTX			C3
F268						OFT	VTX		C3	C4
F269						OFT	VTX		C3	C4
F270							VTX			C4
F271						OFT	VTX		C3	C4
F272							VTX			C4
F273							VTX			C4
F274					Visual	OFT	VTX		P4	P5
F275					Visual	OFT	VTX		P3	P4
F276					CPT		VTX		P4	P5
F277				CFT			VTX		P4	P5
F278							VTX			P5
F279							VTX			P4
F280					Visual	OFT	VTX		P3	P4
F281					Visual	OFT	VTX		P3	P4
F282					Visual	OFT	VTX		P3	P4
F283					Visual	OFT	VTX		P4	P5
F284					CPT		VTX		P4	P5
F285					CPT		VTX		P4	P5
F286					Visual	OFT	VTX		P3	P4
F287					Visual	OFT	VTX		P3	P3
F288							VTX			P4

	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
SBO #	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
F289					Visual	OFT	VTX		P3	P3
F290					Visual	OFT	VTX		P3	P3
F291					Visual	OFT	VTX		P4	P5
F292					Visual	OFT	VTX		P3	P4
F293					Visual	OFT	VTX		P3	P4
F294					CPT		VTX		P4	P5
FS1	NATOPS								C2	
FS2	NATOPS								C1	
FS3	S.Pubs.								A4	
FS4	NATOPS	Graphic A							C2	
FS5	F/N				CPT				C4	
FS6	F/N				CPT				C4	
FS7	F/N				CPT				C4	
FS8	F/N				CPT				C4	
FS9	F/N				CPT				C4	
FS10	F/N				CPT				C4	
FS11	F/N				CPT				C4	
FS12	F/N				CPT				C4	
FS13	F/N				CPT				C4	
FS14	F/N				CPT				C4	
FS15	F/N				CPT				C4	
FS16	F/N					OFT			C4	
FS17	F/N				CPT				C4	
FS18	F/N				CPT				C4	
FS19	F/N				CPT				C4	
FS20	F/N				CPT				C4	
FS21	F/N					OFT			C4	
FS22						OFT			C3	
FS23		Graphic A							C3	
FS24		Graphic A							C2	
FS25	S.Pubs.	Graphic A							A4	
FS26	F/N								C2	

SBO #	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
FS27			VT						C2	
FS28	F/N								C2	
FS29					EST				C3	
FS30	F/N								C4	
FS31		S/S							C3	
FS32	PI					OFT			C3	
FS33	Reg								C3	
FS34	PI	Y							C3	
FS35		Graphic A							C3	
FS36	F/N	Graphic A							C3	
FS37	F/N								C2	
FS38	F/N				CPT				C3	
FS39	S.Pubs.	Graphic A							A4	
FS40	F/N								C2	
FS41	F/N				CPT				C3	
FS42	F/N				CPT				C2	
FS43	F/N				CPT				C2	
FS44	S.Pubs.	Graphic A							A4	
FS45	S.Pubs.	Graphic A			CPT				C2	
FS46	NWP	Graphic A							C3	
FS47	F/N				CPT				C3	
FS48	NWP Reg					OFT			C3	
FS49	S.Pubs.	Graphic A							A4	
FS50	F/N				Visual	OFT			C2	
FS51	F/N				Visual	OFT			C3	
FS52	S.Pubs.	Graphic A							A4	
FS53	F/N				CPT				C2	
FS54	F/N				CPT				C2	
FS55	F/N				CPT				C3	
FS56	NWP Reg					OFT			C3	
FS57	S.Pubs.	Graphic A							A4	
FS58	F/N					OFT			C3	

SBO #	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
FS59	S.Pubs.	Graphic A				OFT			C3	
FS60	S.Pubs.	Graphic A							A4	
FS61	S.Pubs.	Graphic A							A4	
FS62	F/N				CPT				C2	
FS63	F/N				CPT				C3	
FS64	F/N				Visual	OFT			C3	
FS65	F/N				CPT				C3	
FS66	Reg.								C2	
FS67	F/N				Visual	OFT			C3	
FS68	F/N				Visual	OFT			C3	
FS69	F/N					OFT			C3	
FS70	S.Pubs.	Graphic A							A4	
FS71	F/N				Visual	OFT			C3	
FS72	F/N				Visual	OFT			C3	
FS73	F/N				Visual	OFT			C3	
FS74	NWP Reg.				Visual	OFT			C2	
FS75	S.Pubs.	Graphic A							A4	
FS76	F/N				Visual	OFT			C3	
FS77	F/N				Visual	OFT			C3	
FS78	S.Pubs.	Graphic A							A4	
FS79	F/N				FIT	OFT			C3	
FS80	F/N				FIT	OFT			C3	
FS81	F/N				FIT	OFT			C3	
FS82	Reg.					OFT			C3	
FS83	S.Pubs.	Graphic A							A4	
FS84	S.Pubs.	Graphic A							A4	
FS85	F/N				FIT	OFT			C3	
FS86	F/N				FIT	OFT			C3	
FS87	S.Pubs.	Graphic A							A4	
FS88	F/N				FIT	OFT			C3	
FS89	F/N				FIT	OFT			C3	
FS90	S.Pubs.	Graphic A							A4	

	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
SBO #	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
FS91	F/N				FIT	OFT			C3	
FS92	F/N				FIT	OFT			C3	
FS93	F/N				FIT	OFT			C3	
FS94	S.Pubs.	Graphic A							A4	
FS95	F/N				FIT	OFT			C3	
FS96	F/N				FIT	OFT			C3	
FS97	S.Pubs.	Graphic A							A4	
FS98	F/N				FIT	OFT			C3	
FS99	S.Pubs.	Graphic A							A4	
FS100	F/N				FIT	OFT			C3	
FS101	S.Pubs.	Graphic A							A4	
FS102	F/N				FIT	OFT			C3	
FS103	F/N				FIT	OFT			C3	
FS104	F/N				FIT	OFT			C3	
FS105	S.Pubs.	Graphic A							A4	
FS106	F/N					OFT			C3	
FS107	F/N				Visual	OFT			C3	
FS108	F/N				Visual	OFT			C3	
FS109	F/N				Visual	OFT			C3	
FS110	F/N					OFT			C3	
FS111	F/N					OFT			C3	
FS112	S.Pubs.	Graphic A							A4	
FS113	F/N					OFT			C3	
FS114	F/N					OFT			C3	
FS115	Sense P								A4	
FS116	Sense P								A4	
FS117	F/N								C3	
FS118	F/N					OFT			C3	
FS119	F/N					OFT			C3	
FS120	Sense P								A4	
FS121	F/N					OFT			C3	
FS122	F/N				CPT				C3	

SBO #	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
FS123	Sense P								A4	
FS124	S.Pubs.	Graphic A							A4	
FS125	F/N					OFT			C3	
FS126	F/N					OFT			C3	
FS127	S.Pubs.	Graphic A							A4	
FS128	F/N					OFT			C3	
FS129	F/N					OFT			C3	
FS130					EST				P4	
FS131	S.Pubs.	Graphic A							A4	
FS132	F/N,NWP								C3	
FS133	F/N,NWP								C3	
FS134	F/N,NWP								C3	
FS135	F/N,NWP								C3	
FS136	S.Pubs.	Graphic A							A4	
FS137	F/N								C3	
FS138	F/N					OFT			C3	
FS139	F/N					OFT			P4	
FS140	S.Pubs.	Graphic A							A4	
FS141	F/N					OFT			C2	
FS142		Achieved prior to Advanced Flight Training.							P4	
FS143	S. Pubs.	Graphic A							A4	
FS144	F/N					OFT			P4	
FS145	F/N				Visual	OFT			C3	
FS146	Reg.	Graphic A							C3	
FS147	Reg.				Visual	OFT			C3	
FS148	F/N				Visual	OFT			C2	
FS149	Pub.	Graphic A							A4	
FS150	F/N				Visual	OFT			C3	
FS151	F/N				Visual	OFT			C3	
FS152	Pub.	Graphic A							A4	
FS153	F/N				CPT				C2	
FS154	F/N				CPT				P4	

	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
SBO #	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
FS155		Graphic A							A4	
FS156	F/N				CPT				C3	
FS157	F/N	Graphic A							C2	
FS158	F/N	Graphic A							C2	
FS159	PI	Y							C3	
FS160	S. Pubs.	Graphic A							A4	
FS161	F/N				Visual	OFT			C3	
FS162	F/N				Visual	OFT			C3	
FS163					Visual	OFT			C3	
FS164	Sense P								A4	
FS165	S. Pubs.	Graphic A							A4	
FS166	F/N				FIT	OFT			C3	
FS167	Sense P								A4	
FS168	S. Pubs.	Graphic A							A4	
FS169	F/N				FIT	OFT			C3	
FS170	F/N				FIT	OFT			C3	
FS171	F/N				FIT	OFT			C3	
FS172	F/N				FIT	OFT			C3	
FS173	F/N				FIT	OFT			C3	
FS174	F/N				FIT	OFT			C3	
FS175	F/N				FIT	OFT			C3	
FS176	F/N				FIT	OFT			C3	
FS177	F/N				FIT	OFT			C3	
FS178	F/N				FIT	OFT			C3	
FS179	F/N				FIT	OFT			C3	
FS180	F/N				FIT	OFT			C3	
FS181		Graphic A							A4	
FS182	F/N				FIT	OFT			C3	
FS183		Graphic A							A4	
FS184	F/N				FIT	OFT			C3	
FS185	F/N				FIT	OFT			C3	
FS186	F/N				FIT	OFT			C3	

SBO #	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
FS187	Sense P								A4	
FS188	F/N					OFT			C3	
FS189	S. Pubs.	Graphic A.							A4	
FS190	F/N					OFT			C3	
FS191	F/N S.Pubs.								A4	
FS192	F/N				Visual	OFT			C3	
FS193	F/N				CPT				P4	
FS194	PI								C3	
FS195	PI								C3	
FS196	PI								C3	
FS197	PI								C3	
FS198	PI		DD						C3	
FS199	PI								C4	
FS200	Reg.								C3	
FS201	NWP				FIT	OFT			C3	
FS202	F/N				FIT	OFT			C3	
FS203	F/N				FIT	OFT			C3	
FS204	F/N				FIT	OFT			C3	
FS205	S. Pubs.	Graphic A							A4	
FS206	F/N				FIT	OFT			C3	
FS207	F/N				FIT	OFT			C3	
FS208	F/N				FIT	OFT			C3	
FS209	F/N				FIT	OFT			C3	
FS210	F/N				FIT	OFT			C3	
FS211	F/N				FIT	OFT			C3	
FS212	F/N				FIT	OFT			C3	
FS213	F/N				FIT	OFT			C3	
FS214	F/N				FIT	OFT			C3	
FS215	F/N				FIT	OFT			C3	
FS216	F/N				FIT	OFT			C3	
FS217	F/N				FIT	OFT			C3	
FS218	F/N				FIT	OFT			C3	

SBO #	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
FS219	F/N				FIT	OFT			C3	
FS220	F/N				FIT	OFT			C3	
FS221	F/N				FIT	OFT			C3	
FS222	F/N				FIT	OFT			C3	
FS223	F/N				FIT	OFT			C3	
FS224	F/N				FIT	OFT			C3	
FS225	F/N				FIT	OFT			C3	
FS226	F/N				FIT	OFT			C3	
FS227	F/N				FIT	OFT			C3	
FS228	F/N				FIT	OFT			C3	
FS229	F/N				FIT	OFT			C3	
FS230	F/N				FIT	OFT			C3	
FS231	F/N				FIT	OFT			C3	
FS232	F/N		DD			OFT			C3	
FS233	F/N				FIT	OFT			C3	
FS234	S.Pubs.	Graphic A							A4	
FS235	PI								C3	
FS236	PI								C3	
FS237	PI								C3	
FS238	PI								C2	
FS239	PI								C3	
FS240	PI								C2	
FS241	PI								C4	
FS242	PI								C4	
FS243	PI								C4	
FS244	PI								C3	
FS245	PI								C3	
FS246	S.Pubs.								A4	
FS247	F/N				FIT	OFT			C3	
FS248	F/N				FIT	OFT			C3	
FS249	F/N				FIT	OFT			C3	
FS250	FIP				FIT	OFT			C3	

	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
SBO #	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
FS251	FIP				FIT	OFT			C3	
FS252	F/N				CPT				C4	
FS253		Graphic A							C3	
FS254	Sense P.								A4	
FS255	F/N Reg.				Visual	OFT			C3	
FS256	Sense P.								A4	
FS257	PI,NWP	Graphic A							C3	
FS258	F/N								C3	
FS259	F/N								C3	
FS260	F/N								C3	
FS261	F/N								C3	
FS262	F/N								C3	
FS263	F/N				Visual	OFT			C3	
FS264	F/N								C3	
FS265	F/N				CPT				C3	
FS266	Reg.									
FS267		Graphic A							C3	
FS268	F/N				Visual	OFT			C3	
FS269	S.Pubs.	Graphic A							A4	
FS270	F/N				Visual	OFT			C3	
FS271	F/N				Visual	OFT			C3	
FS272	S.Pubs.	Graphic A							A4	
FS273	F/N								C3	
FS274	F/N								C3	
FS275	F/N,PI								C3	
FS276	Sense P.								A4	
FS277	F/N								C3	
FS278	Sense P.								A4	
FS279	Sense P.								A4	
FS280	PI,F/N								C3	
FS281	PI,F/N								C3	
FS282	PI,F/N								C3	

SBO #	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
FS283	PI,F/N								C3	
FS284	PI,F/N								C3	
FS285	PI,F/N								C3	
FS286	PI,F/N								C3	
FS287	F/N				Visual	OFT			C3	
FS288	F/N				Visual	OFT			C3	
FS289	F/N				Visual	OFT			C3	
FS290	F/N				Visual	OFT			C3	
FS291	F/N				Visual	OFT			C3	
FS292	F/N Reg.								C3	
FS293	FIPS								C3	
FS294	FIPS								C3	
FS295	FIPS								C3	
FS296	PI								C3	
FS297	PI								C3	
FS298	Sense P								A4	
FS299	PI								C3	
FS300	PI								C3	
FS301	PI								C3	
FS302	PI								C3	
FS303	PI								C3	
FS304	Sense P								A4	
FS305	PI								C3	
FS306	Sense P								A4	
FS307	PI								C3	
FS308	Sense P								A4	
FS309	PI								C3	
FS310	Sense P								A4	
FS311	PI								C3	
FS312	PI								C3	
FS313	PI								C3	
FS314	PI								C3	

SBO #	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
FS315	PI								C3	
FS316	PI								C3	
FS317	PI								C3	
FS318	PI								C3	
FS319	Sense P								A4	
FS320	PI								C3	
FS321	PI								C3	
FS322	PI								C3	
FS323	PI								C3	
FS324	PI								C3	
FS325	Sense P								A4	
FS326	F/N	Chart							C3	
FS327	PI								C3	
FS328	PI								C3	
FS329	PI								C3	
FS330	PI								C3	
FS331	PI								C3	
FS332	PI								C3	
FS333	PI								C3	
FS334	PI								C3	
FS335	PI								C3	
FS336	PI								C3	
FS337	PI								C3	
FS338	PI								C3	
FS339	PI								C3	
FS340	Sense P								A4	
FS341	Sense P								A4	
FS342	F/N				ACM				C4	
FS343	F/N				ACM				C4	
FS344	F/N				ACM				C3	
FS345	F/N				ACM				C3	
FS346	F/N				ACM				C3	

SBO #	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
FS347	F/N				ACM				C3	
FS348	F/N				ACM				C3	
FS349	Sense P								A4	
FS350	F/N				ACM				C3	
FS351	F/N				ACM				C3	
FS352	F/N				ACM				C3	
FS353	F/N				ACM				C3	
FS354	F/N				ACM				C3	
FS355	F/N				ACM				C3	
FS356	F/N	Graphic A							C3	
FS357	Sense P								A4	
FS358	PI								C3	
FS359	PI								C3	
FS360	Sense P								A4	
FS361	PI								C3	
FS362	F/N				ACM				C3	
FS363	F/N				ACM				C3	
FS364	F/N				ACM				C3	
FS365	F/N				ACM				C3	
FS366	Sense P								A4	
FS367	F/N				ACM				C3	
FS368	F/N				ACM				C3	
FS369	Sense P								A4	
FS370	F/N				ACM				C3	
FS371	PI								C3	
FS372	PI								C3	
FS373	PI								C3	
FS374	PI								C3	
FS375	S.Pubs.	Graphic A							A4	
FS376	F/N								C3	
FS377	F/N								C3	
FS378	Sense P	Graphic A							A4	

SBO #	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
FS379	PI								C3	
FS380	S.Pubs.	Graphic A							A4	
FS381	PI								C3	
FS382	PI								C3	
FS383	PI								C3	
FS384	PI								C3	
FS385	PI								C3	
FS386	PI								C3	
FS387	PI								C3	
FS388	PI								C3	
FS389	PI								C3	
FS390	PI								C3	
FS391	PI								C3	
FS392	F/N				FIT	OFT			C3	
FS393	F/N				FIT	OFT			C3	
FS394		Graphic A							C3	
FS395		Graphic A							C3	
FS396		Graphic A							C3	
FS397		Graphic A							C3	
FS398	F/N								C3	
FS399	F/N				Visual	OFT			C3	
FS400	F/N				Visual	OFT			C3	
FS401	F/N				Visual	OFT			C3	
FS402	NWP	Graphic A							C3	
FS403	F/N								C3	
FS404	F/N				CPT				C3	
FS405	F/N				Visual	OFT			C3	
FS406	F/N				Visual	OFT			C3	
FS407	F/N				Visual	OFT			C3	
FS408	F/N				Visual	OFT			C3	
FS409	F/N				Visual	OFT			C3	
FS410	S.Pubs.	Graphic A							A4	

SBO #	INDIVIDUAL MEDIA: PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	TUTORIAL MEDIA: P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	TRAINING PHASES: ACAD	FLT SPT	FLT
FS411	F/N				Visual	OFT			C3	
FS412	S. Pubs.	Graphic A							A4	
FS413	F/N				Visual	OFT			C3	
FS414	F/N				Visual	OFT			C3	
A1		Achieved prior to Advanced Flight Training						C2		
A2		Achieved prior to Advanced Flight Training						C2		
A3		Achieved prior to Advanced Flight Training						C3		
A4		Achieved prior to Advanced Flight Training						A4		
A5		Achieved prior to Advanced Flight Training						C2		
A6		Achieved prior to Advanced Flight Training						C2		
A7		Achieved prior to Advanced Flight Training						C2		
A8		Achieved prior to Advanced Flight Training						C2		
A9		Achieved prior to Advanced Flight Training						P4		
A10		Achieved prior to Advanced Flight Training						C2		
A11		Achieved prior to Advanced Flight Training						C2		
A12		Achieved prior to Advanced Flight Training						C3		
A13		Achieved prior to Advanced Flight Training						C2		
A14		Achieved prior to Advanced Flight Training						C2		
A15		Achieved prior to Advanced Flight Training						C2		
A16		Achieved prior to Advanced Flight Training						C2		
A17		Achieved prior to Advanced Flight Training						C2		
A18		Achieved prior to Advanced Flight Training						C2		
A19		Achieved prior to Advanced Flight Training						C3		
A20		Achieved prior to Advanced Flight Training						C3		
A21		Achieved prior to Advanced Flight Training						C3		
A22		Achieved prior to Advanced Flight Training						C1		
A23		Achieved prior to Advanced Flight Training						P4		
A24		Achieved prior to Advanced Flight Training						P4		
A25		Achieved prior to Advanced Flight Training						P4		
A26		Achieved prior to Advanced Flight Training						P5		
A27		Achieved prior to Advanced Flight Training						C2		
A28		Achieved prior to Advanced Flight Training						P4		

SBO #	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
A29		Achieved prior to Advanced Flight Training						C2		
A30		Achieved prior to Advanced Flight Training						C2		
A31	PI							C2		
A32	PI							C2		
A33	PI							C2		
A34	PI							C2		
A35	PI							C2		
A36	PI	Photo M						C2		
A37	PI	Photo M						C2		
A38	PI	Photo M						C2		
A39	PI	Photo M						C2		
A40	PI	Photo M						C2		
A41	PI	Photo M						C2		
A42	PI	Photo M						C2		
A43	PI	Photo M						C2		
A44	PI	Photo M						C2		
A45	PI	Photo M						C2		
A46	PI	Photo M						C2		
A47	PI							C2		
A48	PI							C2		
A49	PI	Photo M						C2		
A50	PI		DD					C2		
A51	PI		DD					C2		
A52	PI		DD					C2		
A53	PI		DD					C2		
A54	PI	Photo M						C2		
A55	PI	Photo M						C2		
A56	PI							C2		
A57	PI	Photo M						C2		
A58	PI	Photo M						C2		
A59	PI			Mock U				C2		
A60	PI	Photo M						C2		

SBO #	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
A61	PI	Photo M						C2		
A62	PI	Photo M						C2		
A63	PI	Photo M						C2		
A64	PI	Photo M						C2		
A65	PI	Photo M						C2		
A66	PI	Photo M						C2		
A67	PI	Photo M						C2		
A68	PI	Photo M						C2		
A69	PI							C2		
A70	PI	Photo M						C2		
A71	PI	Photo M						C2		
A72	PI							A4		
A73	PI							C2		
A74	PI							C1		
A75	PI							C2		
A76	PI							C2		
A77	PI							C2		
A78	PI							C2		
A79	PI							C2		
A80	PI							C2		
A81	PI							C1		
A82	PI							C2		
A83	PI							C2		
A84		Achieved prior to Advanced Flight Training						C2		
A85		Achieved prior to Advanced Flight Training						C2		
A86	PI							C2		
A87	PI							C2		
A88		Achieved prior to Advanced Flight Training						C2		
A89	PI							C2		
A90	PI							C2		
A91	PI							C2		
A92	PI							C2		

	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
SBO #	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT.	FLT
A93	PI							C2		
A94	PI							C2		
A95	PI							C2		
A96		Achieved prior to Advanced Flight Training						C2		
A97		Achieved prior to Advanced Flight Training						C2		
A98	PI							C2		
A99	PI							C2		
A100	PI							C2		
A101	PI							C2		
A102		Achieved prior to Advanced Flight Training						C2		
A103		Achieved prior to Advanced Flight Training						C2		
A104	PI							C2		
A105	PI							C2		
A106		Achieved prior to Advanced Flight Training						C2		
A107	PI							C2		
A108	PI							C2		
A109	PI							C2		
A110	PI							C2		
A111	PI							C2		
A112	PI							C2		
A113	PI							C2		
A114		Achieved prior to Advanced Flight Training						C3		
A115		Achieved prior to Advanced Flight Training						C1		
A116	PI							C2		
A117		Achieved prior to Advanced Flight Training						C2		
A118	PI							C1		
A119	PI							C2		
A120	PI							C2		
A121	PI							C2		
A122	PI							C2		
A123	PI							C2		
A124		Achieved prior to Advanced Flight Training						C2		

	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
SBO #	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
A125	PI							C2		
A126	PI							C2		
A127	PI							C2		
A128		Achieved prior to Advanced Flight Training						C2		
A129	PI							C2		
A130	PI							C2		
A131		Achieved prior to Advanced Flight Training						C2		
A132		Achieved prior to Advanced Flight Training						C1		
A133		Achieved prior to Advanced Flight Training						C2		
A134	PI							C1		
A135		Achieved prior to Advanced Flight Training						C2		
A136	PI							C2		
A137		Achieved prior to Advanced Flight Training						C2		
A138		Achieved prior to Advanced Flight Training						C2		
A139		Achieved prior to Advanced Flight Training						C2		
A140	PI							C2		
A141		Achieved prior to Advanced Flight Training						C2		
A142	PI							C2		
A143	PI							C2		
A144		Achieved prior to Advanced Flight Training						C2		
A145	PI							C2		
A146	PI							C2		
A147		Achieved prior to Advanced Flight Training						C2		
A148	PI							C1		
A149	PI							C2		
A150	PI							C2		
A151		Achieved prior to Advanced Flight Training						C2		
A152	PI							C2		
A153		Achieved prior to Advanced Flight Training						C2		
A154	PI							C2		
A155	PI							C2		
A156	PI							C2		

SBO #	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
A157		Achieved prior to Advanced Flight Training						C2		
A158	PI							C2		
A159	PI							C2		
A160	PI							C2		
A161	PI							C2		
A162	PI							C2		
A163	PI							C2		
A164	PI							C2		
A165	PI							C1		
A166	PI							C2		
A167	PI							C2		
A168	PI							C2		
A169	PI							C2		
A170	PI							C1		
A171	PI							C2		
A172	PI							C2		
A173	PI							C1		
A174	PI							C2		
A175	PI							C2		
A176	PI							C1		
A177	PI							C3		
A178	PI							C3		
A179		Achieved prior to Advanced Flight Training						C1		
A180		Achieved prior to Advanced Flight Training						C2		
A181		Achieved prior to Advanced Flight Training						C2		
A182		Achieved prior to Advanced Flight Training						C2		
A183		Achieved prior to Advanced Flight Training						C2		
A184	PI							C2		
A185	PI							C2		
A186	PI							C2		
A187	PI							C2		
A188	PI							C2		

SBO #	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
A189	PI							C2		
A190	PI							C2		
A191	PI							C2		
A192	PI							C2		
A193	PI	Photo M						C2		
A194	PI							C1		
A195	PI							C2		
A196	PI							C1		
A197	PI	Photo M						C1		
A198	PI							C2		
A199	PI	Photo M						C2		
A200	PI							C2		
A201	PI							C2		
A202	PI							C1		
A203	PI							C1		
A204	PI							C1		
A205	PI							C1		
A206	PI							C2		
A207	PI							C1		
A208	PI							C2		
A209	PI							C2		
A210	PI							C1		
A211	PI							C1		
A212	PI							C1		
A213		Achieved prior to Advanced Flight Training						C1		
A214		Achieved prior to Advanced Flight Training						C3		
A215		Achieved prior to Advanced Flight Training						C3		
A216		Achieved prior to Advanced Flight Training						C4		
A217		Achieved prior to Advanced Flight Training						C2		
A218	PI							C2		
A219	PI							C2		
A220	PI							C1		

SBO #	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
A221		Achieved prior to Advanced Flight Training						C1		
A222	PI							C2		
A223	PI							C2		
A224	PI							C2		
A225	PI							C2		
A226	PI							C2		
A227	PI							C2		
A228	PI							C2		
A229	PI							C1		
A230	PI		DD					C2		
A231	PI		DD					C1		
A232	PI		DD					C1		
A233	PI		DD					C2		
A234	PI		DD					C2		
A235	PI		DD					C2		
A236	PI							C2		
A237	PI							C2		
A238	PI							C2		
A239	PI							C2		
A240	PI							C2		
A241	PI							C2		
A242	PI							C2		
A243	PI							C2		
A244	PI							C1		
A245	PI							C2		
A246	PI							C2		
A247	PI							C2		
A248		Achieved prior to Advanced Flight Training						A4		
A249	PI							A4		
A250	PI							C2		
A251	PI							C2		
A252	PI							A4		

SBO #	INDIVIDUAL MEDIA				TUTORIAL MEDIA			TRAINING PHASES		
	PRINT	A-V (STATIC)	A-V (DYNAMIC)	P-T TRAINER (STATIC)	P-T TRAINER (DYNAMIC)	SIMUL WHOLE-TASK	(AIRPLANE) FLIGHT	ACAD	FLT SPT	FLT
A253	PI							A4		
A254	PI							A4		
A255	PI							A4		
A256	PI							A4		
A257	PI							A4		
A258	PI							A4		
A259	PI							A4		
A260	PI							A4		
A261	PI							A4		
A262	PI							A4		

APPENDIX D

DEFINITION OF MEDIA TYPES

PRINT: Material that is used for instruction, consisting of printed pages interlaced with pictures, drawings, graphs, charts and other printed forms that aid in individualized instruction.

Programmed Instruction: A program for self-instruction in which the instructional material is presented in a sequence of small units each of which requires immediate responses from the student and providing immediate knowledge of results. This program may be used in conjunction with other publications.

FTI/NATOPS: The Flight Training Instructions (FTI) are published by the Chief of Naval Air Training as a standardization of instruction, by flight phase, and the Naval Air Training and Operating Procedures Standardization (NATOPS), published by Chief of Naval Operations (CNO) as a means of standardization of operating procedures. These two series of manuals used jointly and/or separately provide the basis for information, standardization of instruction, and guidance of instructors and students in the Naval Air Training Command. They may be used alone and/or with Programmed Instruction.

Safety Publications: Safety Publications are publications issued by the Naval Safety Center, Air Force, Federal Aviation Agency, U.S. Army, U.S. Navy, and other agencies that pertain to Aviation Safety.

Naval Warfare Publication (NWP): Publications promulgated by the CNO that establish Naval Doctrine.

Sense Pamphlet: Manuals that are written in casual and/or informal manner, well illustrated preferably in cartoon style, and stress those situations that affect flight safety, e.g. aircraft systems, environmental conditions, etc.

Regulations: Manuals that are used throughout the Aviation Community and govern Naval Aircraft flight. They include Federal Aviation Publications, Operations Manuals, Controlling Agency Regulations, Local Flight Rules, and other publications.

Flight Information Publications: Department of Defense (DoD) publications that are used primarily during instrument flight and include the information for arrivals, departures, enroute, controlled zones, controlled areas, and uncontrolled flight.

Yellow Sheet: The term used for the Naval Aircraft Flight Record, OPNAV Form 3760/2.

AUDIO-VISUAL (STATIC): A demonstrative audio-visual product utilized to facilitate and reinforce learning through one or both of the physical senses of sight and hearing.

Graphic Aid: A still picture or illustration, such as a chart, poster, diagram, produced from artwork or by photography.

Sound/Slide Program: An audio-visual product consisting of an audio recording and a series of 35mm slides, presented in synchronization. Synchronization may be by the operator or by electro-mechanical means.

Photo Mock-up: A full size pictorial display that shows the interior of the cockpit of the VTX, consisting of the windshield, HUD, instrument panel and both side panels. The mock-up is of a durable stiff material that allows mounting of the photo mock-up to resemble a cockpit so a student can be surrounded by the photos in a life size setting that permits cockpit orientation. When assembled, the mock-up is the same size and shape (generally) as the interior of the cockpit.

AUDIO-VISUAL (DYNAMIC): A demonstrative audio-visual product utilized to facilitate and reinforce learning through one or both of the physical senses of sight and hearing; demonstrates movement in time or space, steps of a procedure, or changes in condition.

Video Tape: Magnetic tape for recording and reproducing pictures and sound that present a unit of instruction using still and/or motion sequences with an audio commentary.

Dynamic Demonstrator - Radar: A device that permits the student to learn the operation of an airborne radar. Preprogrammed programs allow the student to see how the radar is used for navigation, weather information, aircraft intercept, land feature identification, sea surface target identification, etc. All programs to be preplanned, real time information is not required.

Dynamic Demonstrator - EW: A device consisting of an EW control panel and scope. Preprogrammed presentations with audio commentary allow the student to see the function of the EW system and how the controls are used.

Dynamic Demonstrator (HUD): A device consisting of a panel with a Heads-Up-Display (HUD) presentation. Controls provide, when activated, for changes/additions to the HUD presentation. An audio narrative will compliment the visual display.

Navigation Computer: A hand held piece of equipment that permits the student to solve airborne navigation problems such as ground speed, true altitude, true airspeed, temperature conversion, radius of action problems, etc.

Ejection Seat Mock-Up: A three-dimensional, one to one scale model of the VTX aircraft ejection seat capable of providing procedural training for pre-flight/post-flight inspections and ejection.

VTX Cockpit Familiarization Trainer: A trainer incorporating a facsimile of the flight stations of the VTX aircraft. The controls, switches, and instruments are not activated for response to trainee inputs. All annunciator lights are operable from the instructor's panel for demonstration pu poses.

PART TASK (DYNAMIC) TRAINER

Scan Trainer (ST): A grouping of three part task trainers that cumulatively provide training in accomodation, speed reading of the flight instruments, peripheral vision and time sharing in and out of the cockpit.

Ejection Seat Trainer (EST): The trainer incorporates an actual aircraft ejection seat in a simulated cockpit. All controls and other features necessary for completing the pre-ejection procedures are provided, when all procedures have been properly completed and then only when the instructor actuates his safety release, ejection takes place, by allowing the seat and its occupant to rise 8 to 15 feet producing controllable acceleration forces up to a maximum of approximately 10.5G's.

VTX Cockpit Procedure Trainer (CPT): A trainer which incorporates a replica of the VTX aircraft front cockpit and provides cockpit familiarization and training in power plant and systems procedures of normal, alternate, and emergency types. The VTX aircraft instruments and other indicators are activated to respond to trainee control inputs. Exact dynamic simulation of all functions simulated is provided.

Flight Instrument Trainer (FIT): A trainer which incorporates a replica of the VTX aircraft front cockpit. All flight systems are activated and their use reflected in flight performance except for the following systems which are not activated and are for configuration only: Brakes, Static, Air Conditioning, Oxygen, Anti-ice, and Escape.

VTX Air Combat Maneuvering Trainer (ACM): A specialized trainer devoted to teaching heads-up, visible range air to air combat tactics (one on one) and air to ground weapons delivery. There is no simulation of take-off and landing; the mission begins and ends in the air. The simulation envolves the total operating envelope of the VTX aircraft and the complete spectrum of airborne weapon systems.

VTX OFT Visual Attachment (VA): A visual display attached to and integrated with the VTX OFT that provides a field of view of 135° Horizontal (90° Port - 45° Starboard) and 45° vertical (25° Up and 20° Down).

WHOLE-TASK TRAINER

VTX Operational Flight Trainer (OFT): A trainer which incorporates a replica of the VTX aircraft front cockpit. All instruments, indicators, HUD, gauges, controls, trim tabs, lights and switches affecting aircraft operation are provided. Complete ground and in-flight dynamics for both normal and abnormal operation as well as physical cueing are incorporated. The device has provisions for a visual attachment.

APPENDIX E

MICRO ANALYTICAL/EMPIRICAL TRANSLATIONS TO RELATE TO SPECIFICATIONS OR MILITARY CHARACTERISTICS

1.	PRINT	ACADEMICS
2.	PRINT	FLIGHT SUPPORT
3.	AV (STATIC)	ACADEMICS
4.	AV (STATIC)	FLIGHT SUPPORT
5.	AV (DYNAMIC)	ACADEMICS
6.	AV (DYNAMIC)	FLIGHT SUPPORT
7.	PART-TASK (STATIC)	ACADEMICS
8.	PART-TASK (STATIC)	FLIGHT SUPPORT - NONE
9.	PART-TASK (DYNAMIC)	FLIGHT SUPPORT

a. Scan Trainer
b. VTX Cockpit Procedures Trainer
c. VTX Visual Trainer
d. VTX Air Combat Maneuvering Trainer

10.	WHOLE-TASK TRAINER	FLIGHT SUPPORT

a. VTX Operational Flight Trainer
b. VTX Operational Flight Trainer with Visual

TRAINING SPECIFICATIONS/MILITARY CHARACTERISTICS

MEDIUM Print CATEGORY Academics

Subject: ENGINEERING

1. PI CONTENT AND USE OF NATOPS

Applicable SBOs: A31

2. PI VTX AIRCRAFT DESCRIPTION

Applicable SBOs: A32, A33, A58

3. PI VTX AIRCRAFT SERVICING

Applicable SBOs: A34

4. PI VTX ENGINE(S) OPERATION

Applicable SBOs: A36, A37, A38

5. PI VTX ELECTRICAL SYSTEM

Applicable SBOs: A40

6. PI VTX FUEL SYSTEM

Applicable SBOs: A39

7. PI VTX HYDRAULIC SYSTEM

Applicable SBOs: A41,

8. PI VTX FLIGHT CONTROL SYSTEM

Applicable SBOs: A42

9. PI VTX PITOT AND STATIC SYSTEM

Applicable SBOs: A43, A104, A105

10. PI VTX AIR CONDITIONING AND PRESSURIZATION SYSTEM

Applicable SBOs: A44,

11. PI VTX OXYGEN SYSTEM

Applicable SBOs: A45

TRAINING SPECIFICATIONS/MILITARY CHARACTERISTICS

MEDIUM Print CATEGORY Academics

Subject: ENGINEERING (CONT)

12. PI VTX ANTI-ICE/DE-ICE SYSTEM

Applicable SBOs: A46, A47, A48

13. PI VTX ANGLE-OF-ATTACK SYSTEM

Applicable SBOs: A49, A81

14. PI VTX HEADS-UP DISPLAY SYSTEM

Applicable SBOs: A50, A51, A52, A53

15. PI VTX LIGHTING SYSTEM

Applicable SBOs: A54

16. PI VTX CATAPULT AND ARRESTING EQUIPMENT

Applicable SBOs: A55

17. PI VTX LANDING GEAR AND WHEEL BRAKE SYSTEMS

Applicable SBOs: A56, A57

18. PI VTX ESCAPE SYSTEM

Applicable SBOs: A35, A59

19. PI VTX COMMUNICATION AND ICS SYSTEM

Applicable SBOs: A60, A61, A62, A63, A64, A65, A66, A67, A68, A69

20. PI VTX ARMAMENT SYSTEM

Applicable SBOs: A70, A71

21. PI VTX OPERATING LIMITATIONS

Applicable SBOs: A72, A73

TRAINING SPECIFICATIONS/MILITARY CHARACTERISTICS

MEDIUM Print CATEGORY Academics

Subject: AERODYNAMICS

1. PI VTX NOMENCLATURE AND AIR FOIL TERMINOLOGY

Applicable SBOs: A74, A75, A76, A77, A78

2. PI VTX LIFT AND DRAG

Applicable SBOs: A79, A80, A81, A82, A83

3. PI VTX STABILITY

Applicable SBOs: A86, A87, A89, A90

4. PI VTX FLIGHT CONTROLS

Applicable SBOs: A91, A92, A93, A94, A95, A98, A99, A100, A101

5. PI VTX AIRSPEED MEASUREMENT

Applicable SBOs: A104, A105

6. PI VTX TAKE-OFF AND LANDING PERFORMANCE

Applicable SBOs: A107, A108

7. PI VTX CLIMB/GLIDE PERFORMANCE

Applicable SBOs: A109, A110, A111, A112, A113

8. PI VTX RANGE AND ENDURANCE

Applicable SBOs: A116

9. PI VTX STRUCTURAL LIMITATIONS

Applicable SBOs: A118, A119, A120, A121, A122, A123

Subject: METEOROLOGY

1. PI WEATHER PHENOMENA

Applicable SBOs: A125, A126, A127, A129, A130

TRAINING SPECIFICATIONS/MILITARY CHARACTERISTICS

MEDIUM Print CATEGORY Academics

Subject: METEOROLOGY (CONT)

2. PI AIRMASS WEATHER

Applicable SBOs: A134, A136

3. PI WIND SYSTEMS

Applicable SBOs: A140, A142, A143, A145, A146, A148

4. PI FRONTAL WEATHER

Applicable SBOs: A149, A150, A152

5. PI WEATHER HAZARDS TO FLIGHT

Applicable SBOs: A154, A155, A156, A158, A159

6. PI WEATHER INFORMATION

Applicable SBOs: A160, A161, A162, A163, A164, A165, A166, A167, A168, A169

Subject: FLIGHT RULES AND REGULATIONS

1. PI AGENCIES CONTROLLING AIRCRAFT FLIGHT

Applicable SBOs: A170, A171, A172, A173, A174, A175, A176, A177, A178

2. PI VISUAL COMMUNICATION PROCEDURES

Applicable SBOs: A185, A186

Subject: INSTRUMENT NAVIGATION

1. PI NAVIGATION SYSTEMS OPERATION

Applicable SBOs: A187, A188

2. PI AIRWAYS CHARTS

Applicable SBOs: A189

TRAINING SPECIFICATIONS/MILITARY
CHARACTERISTICS

MEDIUM Print CATEGORY Academics

Subject: INSTRUMENT NAVIGATION (CONT)

3. PI VHF OMNIDIRECTIONAL RANGE (VOR)

Applicable SBOs: A190

4. PI TACTICAL AIR NAVIGATION (TACAN)

Applicable SBOs: A191

5. PI ADF, UHF/ADF, MDF AND RADIO RANGE

Applicable SBOs: A192, A193

6. PI MARKER BEACONS

Applicable SBOs: A194, A195

7. PI INSTRUMENT SYSTEMS

Applicable SBOs: A196, A197, A198, A199, A200, A201, A251

8. PI RADAR NAVIGATION/APPROACHES

Applicable SBOs: A202, A203, A204

9. PI FLIGHT CLEARANCE

Applicable SBOs: A205, A206, A207

10. PI ENROUTE PROCEDURES

Applicable SBOs: A208, A209

11. PI TERMINAL PROCEDURES

Applicable SBOs: A210, A211, A212

Subject: OPERATIONAL NAVIGATION

1. PI NAVIGATION VISUAL/CONTACT TECHNIQUES

Applicable SBOs: A218, A219, A220

TRAINING SPECIFICATIONS/MILITARY
CHARACTERISTICS

MEDIUM Print CATEGORY Academics

Subject: JET OPERATIONS

1. PI TACTICS (FORMATION FLIGHT)

Applicable SBOs: A222, A223, A224, A225, A226, A227, A228

2. PI NAVY FLIGHT MISSIONS

Applicable SBOs: A229

3. PI TACTICAL INFORMATION DISPLAYS AND SYMBOLS

Applicable SBOs: A230

4. PI AIRBORNE RADAR OPERATION AND USE

Applicable SBOs: A231, A232, A233

5. PI EW TACTICAL USE

Applicable SBOs: A234, A235, A236

6. PI HIGH ALTITUDE AIRCRAFT OPERATION

Applicable SBOs: A237, A238, A239

7. PI ENERGY MANEUVERABILITY

Applicable SBOs: A240, A241, A242, A243

8. PI CARRIER OPERATIONS

Applicable SBOs: A244, A245, A246, A247

9. PI FLIGHT SAFETY

Applicable SBOs: A248, A249, A250, A252, A253, A254, A255, A256, A257, A258, A259, A260, A261, A262

TRAINING SPECIFICATIONS/MILITARY
CHARACTERISTICS

MEDIUM <u>Print</u> CATEGORY <u>Flight Support</u>

1. F/N CHECKLISTS, POCKET GUIDES, PROCEDURES

<u>Applicable SBOs</u>: FS1, FS2, FS37, FS65, FS158, FS253, FS265, FS407

2. F/N DANGER AREAS AND DANGER ZONES AROUND AIRCRAFT

<u>Applicable SBOs</u>: FS4

3. F/N VTX EXTERNAL STORES

<u>Applicable SBOs</u>: FS356

4. NATOPS GROUND PROCEDURES

<u>Applicable SBOs</u>: FS50, FS51, FS53, FS156

5. NATOPS AIRCRAFT SYSTEMS OPERATION PROCEDURES

<u>Applicable SBOs</u>: FS5, FS6, FS7, FS8, FS9, FS10, FS11, FS12, FS13, FS14, FS15, FS16, FS17, FS18, FS19, FS20, FS26, FS36, FS40, FS41, FS47, FS54, FS55, FS58, FS68, FS162

6. F/N VTX PRE-START, START AND ENGINE SHUTDOWN PROCEDURES, NORMAL AND EMERGENCY

<u>Applicable SBOs</u>: FS37, FS38, FS42, FS43, FS153, FS154, FS258, FS259

7. F/N VTX GROUND OPERATIONS AND GROUND SAFETY

<u>Applicable SBOs</u>: FS51, FS157

8. F/N VTX TAKE-OFF AND LANDING PROCEDURES

<u>Applicable SBOs</u>: FS64, FS67, FS145, FS148, FS161, FS162, FS192

9. F/N VTX LANDING GEAR OPERATION, NORMAL AND EMERGENCY PROCEDURES

<u>Applicable SBOs</u>: FS11

TRAINING SPECIFICATIONS/MILITARY
CHARACTERISTICS

MEDIUM Print CATEGORY Flight Support

10. F/N VTX COMMUNICATION SYSTEM OPERATION, NORMAL AND EMERGENCY PROCEDURES

Applicable SBOs: FS21, FS248

11. F/N VTX PRESSURIZATION AND OXYGEN SYSTEM OPERATION PROCEDURES

Applicable SBOs: FS28

12. NATOPS USE OF NAVIGATION AND ATTITUDE INSTRUMENTS AND DISPLAYS

Applicable SBOs: FS79, FS86, FS88, FS89, FS92, FS96, FS163, FS166, FS170, FS172, FS174, FS177

13. NATOPS VTX AIRCRAFT PERFORMANCE CHARTS

Applicable SBOs: FS30

14. NATOPS VTX MANEUVER RESTRICTION AND STRUCTURAL LIMITATIONS

Applicable SBOs: FS326

15. F/N VTX TRANSITIONS AND PERFORMANCE PROCEDURES

Applicable SBOs: FS80, FS84, FS85, FS86, FS87, FS88, FS91, FS93, FS98, FS100, FS169, FS171, FS173, FS175, FS176, FS178, FS179

16. F/N VTX TRIM SYSTEM PROCEDURES

Applicable SBOs: FS81

17. F/N SCAN PATTERNS AND PROCEDURES

Applicable SBOs: FS168

18. F/N TURNS AND REVERSAL PROCEDURES

Applicable SBOs: FS95, FS176

TRAINING SPECIFICATIONS/MILITARY CHARACTERISTICS

MEDIUM <u>Print</u> CATEGORY <u>Flight Support</u>

19. F/N "S PATTERNS MANEUVERS AND PROCEDURES

<u>Applicable SBOs</u>: FS102, FS103, FS104, FS180, FS182

20. F/N STALLS, SPINS AND DEPARTED FLIGHT, ENTRY AND RECOVERY PROCEDURES

<u>Applicable SBOs</u>: FS106, FS107, FS108, FS109, FS110, FS111, FS112, FS113, FS114

21. F/N CONFIDENCE MANEUVERS PROCEDURES

<u>Applicable SBOs:</u> FS117, FS118, FS119

22. Sense P. ACROBATICS

<u>Applicable SBOs</u>: FS115, FS116, FS120

23. NATOPS EMERGENCIES AND MALFUNCTION PROCEDURES

<u>Applicable SBOs</u>: FS62, FS63, FS69, FS71, FS72 FS73, FS76, FS77, FS121, FS122, FS126, FS150, FS151

24. F/N AIRCRAFT IN DISTRESS AND LOST PLANE PROCEDURES

<u>Applicable SBOs</u>: FS132, FS133, FS134, FS135, FS137, FS138

25. NATOPS EMERGENCY ESCAPE SYSTEM PROCEDURES

<u>Applicable SBOs</u>: FS125, FS126, FS128, FS129

26. NATOPS DITCHING PROCEDURES

<u>Applicable SBOs</u>: FS141, FS144

27. Sense P. IN-FLIGHT EMERGENCIES

<u>Applicable SBOs</u>: FS61, FS123

28. PI INSTRUMENT FLIGHT PROCEDURES

<u>Applicable SBOs</u>: FS FS194, FS245

TRAINING SPECIFICATIONS/MILITARY
CHARACTERISTICS

MEDIUM Print CATEGORY Flight Support

29. F/N INSTRUMENT FLIGHT COMMUNICATION PROCEDURES

Applicable SBOs: FS204, FS206, FS231, FS245

30. F/N INSTRUMENT FLIGHT, DEPARTURES AND APPROACHES

Applicable SBOs: FS202, FS203, FS213, FS214, FS215, FS223, FS224, FS233

31. F/N INSTRUMENT FLIGHT, ENROUTE, HOLDING, AND INTERCEPTS PROCEDURES

Applicable SBOs: FS207, FS208, FS209, FS210, FS212, FS217, FS218, FS219, FS220, FS221, FS222, FS247, FS249

32. F/N TIME, DISTANCE, AND GROUND SPEED CHECKS PROCEDURES

Applicable SBOs: FS211, FS216

33. F/N NAVIGATION INSTRUMENT MALFUNCTION PROCEDURES

Applicable SBOs: FS225

34. F/N TACAN, ADF, ILS FLIGHT PROCEDURES

Applicable SBOs: FS226, FS227, FS228, FS229, FS230

35. F/N USES OF AIRBORNE RADAR

Applicable SBOs: FS232

36. F/N INSTRUMENT FLIGHT

Applicable SBOs: FS164, FS167, FS187

37. F/N INSTRUMENT FLIGHT, PARTIAL PANEL PROCEDURES AND UNUSUAL ATTITUDES RECOVERY PROCEDURES

Applicable SBOs: FS188, FS190, FS191

38. F/N INSTRUMENT FAILURE PROCEDURES

Applicable SBOs: FS184, FS185, FS186

TRAINING SPECIFICATIONS/MILITARY
CHARACTERISTICS

MEDIUM Print CATEGORY Flight Support

39. NWP COMMUNICATION PROCEDURES (RADIO)

Applicable SBOs: FS48, FS56, FS74, FS132, FS133, FS134, FS135, FS201

40. NWP COMMUNICATION PROCEDURES (VISUAL)

Applicable SBOs: FS46, FS257, FS402

41. Sense P. COMMUNICATIONS

Applicable SBOs: FS298, FS325, FS349

42. F/N NIGHT FLYING PROCEDURES

Applicable SBOs: FS193, FS252, FS255, FS258, FS259, FS260, FS261, FS262, FS263, FS264, FS265, FS268, FS270, FS271, FS273, FS274

43. PI NIGHT SIGNALS

Applicable SBOs: FS257

44. Sense P. NIGHT FLYING

Applicable SBOs: FS254, FS256

45. FTI FORMATION FLIGHT PROCEDURES

Applicable SBOs: FS275, FS277, FS280, FS281, FS282, FS283, FS284, FS285, FS286, FS287, FS288, FS289, FS290, FS291, FS292

46. Sense P. FORMATION

Applicable SBOs: FS276, FS278, FS279, FS304, FS306, FS308, FS310

47. PI SECTION FORMATION FLIGHT

Applicable SBOs: FS275, FS280, FS281, FS282, FS283, FS284, FS285, FS286

TRAINING SPECIFICATIONS/MILITARY
CHARACTERISTICS

MEDIUM Print CATEGORY Flight Support

48. PI DIVISION FORMATION FLIGHT

Applicable SBOs: FS296, FS297, FS299, FS300, FS301, FS302, FS303, FS305, FS307, FS309, FS311, FS312, FS313, FS314, FS315, FS316, FS317, FS318

49. PI TACTICAL FORMATIONS

Applicable SBOs: FS320, FS321, FS322, FS323, FS324

50. PI COMBAT SPREAD FORMATION

Applicable SBOs: FS327, FS328, FS329, FS330, FS331, FS332

51. PI TACTICAL WING FORMATION

Applicable SBOs: FS333, FS334, FS335, FS336, FS337, FS338, FS339

52. Sense P. TACTICAL FORMATION

Applicable SBOs: FS319, FS325, FS340, FS341

53. Sense P. AIR COMBAT MANEUVERING (ACM)

Applicable SBOs: FS357

54. F/N AIR COMBAT MANEUVERING TACTICS

Applicable SBOs: FS342, FS343, FS344, FS345, FS346, FS347, FS348, FS350, FS351, FS352, FS353, FS354, FS355

55. PI AIR WEAPON CAPABILITIES

Applicable SBOs: FS358, FS359, FS361

56. PI TYPES OF ORDNANCE, OPERATING ENVELOPES AND DELIVERY TECHNIQUES

Applicable SBOs: FS371, FS372, FS373, FS374

TRAINING SPECIFICATIONS/MILITARY CHARACTERISTICS

MEDIUM Print CATEGORY Flight Support

57. F/N AIR-TO-GROUND WEAPON DELIVERY PROCEDURES

Applicable SBOs: FS362, FS363, FS364, FS365, FS367, FS368, FS370

58. Sense P. WEAPON DELIVERY

Applicable SBOs: FS360, FS366, FS369

59. PI OPERATIONAL NAVIGATION TACTICS AND PLANNING

Applicable SBOs: FS379, FS381, FS382, FS383, FS384, FS385, FS386, FS387, FS388, FS389, FS390, FS391

60. F/N OPERATIONAL NAVIGATION PROCEDURES

Applicable SBOs: FS376, FS377, FS382, FS393

61. Sense P. DR NAVIGATION

Applicable SBOs: FS378

62. F/N IN-FLIGHT REFUELING PROCEDURES

Applicable SBOs: FS398, FS399, FS400, FS401

63. F/N CARRIER OPERATIONS PROCEDURES

Applicable SBOs: FS403, FS404, FS405, FS406, FS407, FS408, FS409, FS411, FS413, FS414

64. PI NAVIGATION COMPUTER

Applicable SBOs: FS198

65. PI FLIGHT REGULATIONS FOR NAVAL AIRCRAFT

Applicable SBOs: FS32

66. PI YELLOW SHEET USAGE

Applicable SBOs: FS34

TRAINING SPECIFICATION/MILITARY
CHARACTERISTICS

MEDIUM Print CATEGORY Flight Support

67. PI AERONAUTICAL TERMS

Applicable SBOs: FS194

68. PI FLIGHT PLANNING (VFR AND IFR)

Applicable SBOs: FS195, FS196, FS197, FS199, FS236 FS237, FS238, FS239, FS240, FS241, FS242, FS243, FS244

69. PI USE OF NOTAMS

Applicable SBOs: FS235

70. S. Pubs WEEKLY SUMMARY, APPROACH, SAFETY CENTER PUBS, etc.

Applicable SBOs: FS3, FS25, FS39, FS44, FS45, FS49, FS52, FS57, FS59, FS60, FS61, FS70, FS75, FS78, FS83, FS84, FS90, FS94, FS97, FS99, FS101, FS105, FS124, FS127, FS131, FS136, FS140, FS143, FS149, FS152, FS155, FS160, FS165, FS168, FS189, FS191, FS205, FS234, FS246, FS269, FS272, FS375, FS380, FS410, FS412

71. Regs OPERATING NAVAL AIRCRAFT AUTHORITY AND REQUIREMENTS

Applicable SBOs: FS33, FS48, FS56, FS66, FS74, FS82, FS146, FS147, FS200, FS255, FS266, FS292, FS293

72. FIPS FLIGHT INFORMATION PUBLICATIONS

Applicable SBOs: FS250, FS251, FS294, FS295

73. Yellow Sheet NAVAL AIRCRAFT FLIGHT RECORD

Applicable SBOs: FS34, FS159

TRAINING SPECIFICATIONS/MILITARY CHARACTERISTICS

MEDIUM Audio-visual (Static) CATEGORY Academics

1. PHOTO MOCK-UP

This is a full size pictorial display that shows the interior of the cockpit of the VTX. The scene will be a windshield, HUD, instrument panel and both side panels. The mock-up will be made of a durable stiff material that will allow mounting of the photo mock-up to resemble a cockpit so a student can be surrounded by the photos in a life size setting that will permit cockpit orientation. When assembled, the mock-up will be the same size and shape (generally) that the interior of the cockpit. These photo mock-ups are intended to be given to the student for their own personal use.

Applicable SBOs: A36, A37, A38, A39, A40, A41, A42, A43, A44, A45, A46, A49, A54, A55, A57, A58, A60, A61, A62, A63, A64, A65, A66, A67, A68, A70, A71, A193, A197, A199

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UNCLASSIFIED NAVTRAEQUIPC-IH-286 NL

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TRAINING SPECIFICATIONS/MILITARY
CHARACTERISTICS

MEDIUM Audio-visual (Static) CATEGORY Flight Support

1. GRAPHIC AID: PICTORIAL ILLUSTRATION

VTX Aircraft Danger Areas (On the Ground)

Applicable SBOs: FS4

2. GRAPHIC AID: PICTORIAL ILLUSTRATION

Traffic Control Tower Lights

Applicable SBOs: FS23

3. GRAPHIC AID: PICTORIAL ILLUSTRATION

In Flight Visual Signals between Aircraft (Day or Night)

Applicable SBOs: FS24

4. GRAPHIC AID: PICTORIAL ILLUSTRATION

Scan (Inside, Outside, Time-Sharing) Techniques

Applicable SBOs: FS25, FS168, FS375

5. SOUND/SLIDE

How to Calculate for CG

Applicable SBOs: FS31

6. GRAPHIC AID: PICTORIAL ILLUSTRATION

Pre-Flight and Post Flight Safety Precautions

Applicable SBOs: FS35, FS160, F1, F121, F190, F210

7. GRAPHIC AID: CHART

Aircraft Systems and Components Checked During Pre-Flight

Applicable SBOs: FS36

TRAINING SPECIFICATIONS/MILITARY CHARACTERISTICS

MEDIUM Audio-visual (Static) CATEGORY Flight Support

8. GRAPHIC AID: PICTORIAL ILLUSTRATION

Pre-Start, Start and Shutdown Procedures

Applicable SBOs: FS39, FS155

9. GRAPHIC AID: PICTORIAL ILLUSTRATION

Start NATOPS Checklist Importance

Applicable SBOs: FS44

10. GRAPHIC AID: PICTORIAL ILLUSTRATION

Pre-Taxi, Taxi, Pre-Takeoff Procedures

Applicable SBOs: FS45, FS49, FS52, FS57

11. GRAPHIC AID: PICTORIAL ILLUSTRATION

Hand Signals - Ground Personnel

Applicable SBOs: FS45, FS49, FS52, FS57

12. GRAPHIC AID: PICTORIAL ILLUSTRATION

Multiple Emergencies and Procedures

Applicable SBOs: FS59, FS60, FS61

13. GRAPHIC AID: PICTORIAL ILLUSTRATION

Take-off Procedures, Normal, Single Engine

Applicable SBOs: FS70, FS75, FS78, FS165, FS269

14. GRAPHIC AID: PICTORIAL ILLUSTRATION

Transitions

Applicable SBOs: FS83, FS84, FS87, FS90, FS94, FS97, FS99, FS101

TRAINING SPECIFICATIONS/MILITARY
CHARACTERISTICS

MEDIUM Audio-visual (Static) CATEGORY Flight Support

15. GRAPHIC AID: PICTORIAL ILLUSTRATION

"S" Patterns

Applicable SBOs: FS105

16. GRAPHIC AID: PICTORIAL ILLUSTRATION

Departed Flight Procedures

Applicable SBOs: FS112

17. GRAPHIC AID: PICTORIAL ILLUSTRATION

In-Flight Emergencies

Applicable SBOs: FS124, FS127

18. GRAPHIC AID: PICTORIAL ILLUSTRATION

Ejection Procedures

Applicable SBOs: FS131

19. GRAPHIC AID: PICTORIAL ILLUSTRATION

Aircraft in Distress/Lost Plane Procedures

Applicable SBOs: FS136, FS140

20. GRAPHIC AID: PICTORIAL ILLUSTRATION

Ditching Procedures

Applicable SBOs: FS143

21. GRAPHIC AID: CHART

Flight and Local Course Rules

Applicable SBOs: FS146

TRAINING SPECIFICATIONS/MILITARY
CHARACTERISTICS

MEDIUM Audio-visual (Static) CATEGORY Flight Support

22. GRAPHIC AID: PICTORIAL ILLUSTRATION

Landing Procedures and Emergencies

Applicable SBOs: FS149, FS152, FS272

23. GRAPHIC AID: CHART

Refueling Procedures

Applicable SBOs: FS157

24. GRAPHIC AID: CHART

Post-Flight Inspection Requirements

Applicable SBOs: FS158

25. GRAPHIC AID: CHART

Instrument Patterns and Procedures

Applicable SBOs: FS181, FS183

26. GRAPHIC AID: PICTORIAL ILLUSTRATION

Unusual Attitudes

Applicable SBOs: FS189

27. GRAPHIC AID: PICTORIAL ILLUSTRATION

Standard Instrument Departure (SID)

Applicable SBOs: FS205

28. GRAPHIC AID: PICTORIAL ILLUSTRATION

Instrument Displays and Safety (IMC)

Applicable SBOs: FS234

TRAINING SPECIFICATIONS/MILITARY CHARACTERISTICS

MEDIUM Audio-visual (Static) CATEGORY Flight Support

29. GRAPHIC AID: CHART

Day/Night Pre-Flight Differences

Applicable SBOs: FS253

30. GRAPHIC AID: CHART

Day/Night Line Crew Signals

Applicable SBOs: FS257

31. GRAPHIC AID: PICTORIAL ILLUSTRATION

Airfield Lighting

Applicable SBOs: FS267

32. GRAPHIC AID: CHART

Aircraft Structural Limitations

Applicable SBOs: FS326

33. GRAPHIC AID: CHART

VTX Aircraft Armament Stores

Applicable SBOs: FS356

34. GRAPHIC AID: PICTORIAL ILLUSTRATION

DR Navigation Importance

Applicable SBOs: FS378

35. GRAPHIC AID: PICTORIAL ILLUSTRATION

Flight Planning

Applicable SBOs: FS380

TRAINING SPECIFICATIONS/MILITARY
CHARACTERISTICS

MEDIUM Audio-visual (Static) CATEGORY Flight Support

36. GRAPHIC AID: CHART

Aeronautical Chart and Chart Symbols

Applicable SBOs: FS394, FS395, FS396, FS397

37. GRAPHIC AID: PICTORIAL ILLUSTRATION

Shipboard Visual Signals

Applicable SBOs: FS402

38. GRAPHIC AID: PICTORIAL ILLUSTRATION

Carrier Take-off Procedures

Applicable SBOs: FS410

39. GRAPHIC AID: PICTORIAL ILLUSTRATION

Carrier Landing Procedures

Applicable SBOs: FS412

TRAINING SPECIFICATIONS/MILITARY CHARACTERISTICS

MEDIUM Audio-visual (Dynamic) CATEGORY Academics

1. DYNAMIC DEMONSTRATOR (HUD)

A display panel that will show a visual of the HUD and controls that will activate a new visual when more or additional information is required. An audio narrative will compliment the visual display.

Applicable SBOs: A50, A51, A52, A53, A230

2. DYNAMIC DEMONSTRATOR (RADAR)

This is a radar trainer that will permit the student to learn the operation of an airborne radar. Preprogrammed programs will be used whereby the student can see how the radar is used for navigation, weather information, aircraft intercept, land feature identification, sea surface target identification, etc. All programs will be preplanned and real time information is not required.

Applicable SBOs: A231, A232, A233

3. DYNAMIC DEMONSTRATOR (EW)

The EW trainer will be an EW control panel with a scope. The presentation will be preprogrammed and will have an audio commentary explaining the controls and function of the EW system.

Applicable SBOs: A234, A235, A236

TRAINING SPECIFICATIONS/MILITARY
CHARACTERISTICS

MEDIUM Audio-visual Dynamic CATEGORY Flight Support

1. VIDEOTAPE

Demonstrates operation of the VTX ejection seat, procedures utilized and precautions to be observed.

Applicable SBOs: FS27

2. DYNAMIC DEMONSTRATOR (NAVIGATION COMPUTER)

This is a hand held piece of equipment that will permit the student to solve airborne navigation problems such as ground speed, true altitude, true airspeed, temperature conversion, radius of action problems, etc.

Applicable SBOs: FS198

3. DYNAMIC DEMONSTRATOR (RADAR)

This is a radar trainer that will permit the student to learn the operation of an airborne radar. Preprogrammed programs will be used whereby the student can see how the radar is used for navigation, weather information, air intercept, land feature identification, sea surface target identification, etc. All programs will be preplanned and real time information is not required.

Applicable SBOs: FS232, F169

TRAINING SPECIFICATIONS/MILITARY CHARACTERISTICS

MEDIUM Part-task Trainer (Static) CATEGORY Academics

1. VTX EJECTION SEAT MOCK-UP

This is a mock-up of the Ejection Seat installed in the VTX and will permit preflight inspection, post flight inspection, instruction and removal of safety pins, and ejection procedures practice without actually firing the seat.

Applicable SBOs: A59

TRAINING SPECIFICATIONS/MILITARY
CHARACTERISTICS

MEDIUM Part-Task Trainer (Dynamic) CATEGORY Flight Support

Scan Trainer

1. EYE ACCOMMODATION AND SPEED READING OF INSTRUMENTS

Applicable SBO's: F90, F96
F100, F145, F239

2. SCAN AND PERIPHERAL VISION

Applicable SBO's: A251, F90, F96,
F100, F145, F239

3. INSTRUMENT SCAN

Applicable SBO's: FS168, F67, F90,
F96, F123, F145, F148, F151, F133,
F162

4. TIME-SHARING SCAN

Applicable SBO's: A251, FS25, FS375,
F55, F90, F96, F100, F112, F145, F155,
F204, F214, F29, F258, F282

TRAINING SPECIFICATIONS/MILITARY CHARACTERISTICS

MEDIUM Part-Task Trainer (Dynamic) **CATEGORY** Flight Support

VTX Cockpit Procedures Trainer (CPT)

1. STUDENT STATION (COCKPIT) CONFIGURATION

   Applicable SBO's: F1-F32, F113, F115, F124 F157, F191, F247, F248, F276, FS79, FS80, FS81, FS154, FS166, FS193

2. AIRCRAFT SYSTEMS SIMULATION

   Applicable SBO's: F19-F32, F192-F195, FS5-FS15, FS17-FS20, FS38, FS41-FS47, FS53-FS55, FS65, FS153, FS154, FS156, FS252, FS265

3. INTERCOMMUNICATION SYSTEM (ICS) SIMULATION

   Applicable SBO's: F20, FS21

4. AIRCRAFT SYSTEMS MALFUNCTIONS AND FAILURES SIMULATION

   Applicable SBO's: F42-F52, F56 F60, F99, FS16, FS18, FS19, FS62, FS63

TRAINING SPECIFICATIONS/MILITARY
CHARACTERISTICS

MEDIUM Part-Task Trainer (Dynamic) CATEGORY Flight Support

Visual System Attachment to OFT

1. VISUAL SIMULATION (DAY/NIGHT) - AIRCRAFT GROUND OPERATIONS

   Applicable SBO's: F38, F39, F40, F200, FS50, FS51, FS255

2. VISUAL SIMULATION (DAY/NIGHT) - TAKE-OFFS

   Applicable SBO's: FS4, FS7, FS8, FS9, F164, F202, F203, FS64, FS67, FS71, FS72, FS74, FS76, FS77, FS161, FS162, FS163, FS263, FS268

3. VISUAL SIMULATION (DAY/NIGHT) - LANDINGS

   Applicable SBO's: F117, F118, F119, F155, F156, F174, F177, F178, F189, F208, FS145, FS147, FS148, FS150, FS151, FS192, FS270, FS271

4. VISUAL SIMULATION (DAY)- STALLS AND SPINS

   Applicable SBO's: F154, FS107, FS108, FS109

5. VISUAL SIMULATION (DAY) - FORMATION FLIGHT

   Applicable SBO's: F212, F214, F218, F223, FS287, FS289, FS291

6. VISUAL SIMULATION (DAY) - IN-FLIGHT REFUELING

   Applicable SBO's: F274, F275, FS399, FS400, FS401

7. VISUAL SIMULATION (DAY) - CARRIER OPERATIONS

   Applicable SBO's: F280, F281, F283, F286-F293, FS405-FS409, FS411, FS413, FS414

TRAINING SPECIFICATIONS/MILITARY
CHARACTERISTICS

MEDIUM Part-Task Trainer (Dynamic) CATEGORY Flight Support

VTX Air Combat Maneuvering Trainer

1. STUDENT STATION (COCKPUT) CONFIGURATION

Applicable SBO's: F3, F5, F6, F7, F8, F11-F18, F20-22, F25, F27-F32, F115, F124, F191, F247, F248, FS79, FS80, FS81

2. AIRCRAFT SYSTEMS SIMULATION

Applicable SBO's: F250, F251, F253, F258, FS347, FS362, FS364, FS365, FS367, FS370

3. AIRCRAFT IN-FLIGHT OPERATION SIMULATION

Applicable SBO's: F240-F245, F252, F256, FS342, FS343, FS344, FS345, FS347, FS348, FS350, FS351, FS351, FS353, FS354, FS355, FS362, FS363, FS364, FS367, FS368

4. ADVERSARY AIRCRAFT VISUAL SIMULATION

Applicable SBO's: F239, F240, F241, F242, F243, F244, F245, FS346, FS347, FS350, FS351, FS352, FS355

5. GROUND TARGET VISUAL SIMULATION:

Applicable SBO's: F253, F254, F255, F256, F257

6. AIR-TO-AIR WEAPONRY AND AIR-TO-GROUND ORDNANCE DELIVERY VISUAL SIMULATION

Applicable SBO's: F247, F248, F251, F252, F253, F254, F255, F256, F257, F258, F259, F260, FS358, FS359, FS361, FS362, FS363, FS364, FS371, FS372, FS374

TRAINING SPECIFICATIONS/MILITARY CHARACTERISTICS

MEDIUM **Part-Task Trainer (Dynamic)** **CATEGORY** **Flight Support**

VTX Air Combat Maneuvering Trainer

7. ORDNANCE SIMULATION

Applicable SBO's: **F247, F248, F249, F253, F254, F255, F257, F259, F260, FS355, FS356, FS358, FS359, FS362, FS363, FS367, FS368, FS371, FS372**

8. MALFUNCTIONS SIMULATION

Applicable SBO's: **F250**

9. AIRCRAFT MOTION, CUING AND G-FORCE SIMULATION

Applicable SBO's: **F126, F154, F241, F245, F251, F252, F256**

TRAINING SPECIFICATIONS/MILITARY
CHARACTERISTICS

MEDIUM Whole-Task Simulator CATEGORY Flight Support

Operational Flight Trainer (OFT)

1. STUDENT STATION (COCKPIT) CONFIGURATION

Applicable SBO's: F1-F32, F113, F115, F124, F157, F191, F247, F248, F276, FS79, FS80, FS81, FS154, FS166, FS193

2. AIRCRAFT SYSTEMS SIMULATION

Applicable SBO's: F19-F33, F41, F61, F105, F109, F114, F115, F120, F121, F124, F157, F158, F159, F192, F249, F251, F285, F294, FS5-FS21, FS38, FS41, FS42, FS45, FS47, FS54, FS58, FS65, FS153, FS156, FS252

3. AIRCRAFT GROUND OPERATIONS SIMULATION

Applicable SBO's: F19, F23-F32, F41, F193-F197, F201, F209, F210, F277, F284, F285, F294, FS45, FS54, FS55, FS63, FS153, FS154

4. AIRCRAFT IN-FLIGHT OPERATION SIMULATION

Applicable SBO's: F68, F69, F70-F91, F101, F107, F120-F122, F126, F128-F154, F163, F165, F167, F168, F171-F173, F175, F176, F180, F182, F184, F188, FS81, FS85, FS86, FS89, FS91-FS93, FS95, FS96, FS98, FS100, FS102-FS104, FS113, FS166, FS169-FS180, FS182, FS184, FS185, FS186, FS190, FS207-FS230, FS233, FS247, FS249

5. AIRCRAFT NAVIGATION SYSTEMS/COMMUNICATION EQUIPMENT SIMULATION

Applicable SBO's: F20, F33, F62-F65, F110, F160, F161, F163, F165-F168, F171, F173, F175, F179, F180, F183, F184, FS201-FS204, FS206-FS231, FS233, FS247, FS249-FS251, FS392, FS393

TRAINING SPECIFICATIONS/MILITARY
CHARACTERISTICS

MEDIUM Whole-Task Simulator CATEGORY Flight Support

Operational Flight Trainer (OFT)

6. AIRCRAFT SYSTEMS MALFUNCTION AND FAILURE SIMULATION

Applicable SBO's: F42-F53, F56, F60, F98, F101, F103-F106, F109, F116, F150-F154, F159, F170, F171, F184, F186, F188, F269, FS5, FS8, FS184, FS185, FS186, FS232

7. AIRCRAFT NAVIGATION AREA SIMULATION

Applicable SBO's: F180, F181, F182, F183, FS249, FS250

8. AIRCRAFT MOTION CUING AND G-FORCE SIMULATION

Applicable SBO's: F126, F127, F129, F132, F133, F137, F139, F144, F147 F150, F152, F153, F154, F205

APPENDIX F

FUNCTIONAL DESCRIPTIONS

FOR

DEVICES

SCAN TRAINER

VTX COCKPIT PROCEDURE TRAINER (CPT)

VTX VISUAL SYSTEM ATTACHMENT (OFT/V)

VTX AIR COMBAT MANEUVERING TRAINER (ACM)

VTX OPERATIONAL FLIGHT TRAINER (OFT)

FUNCTIONAL DESCRIPTION
FOR
SCAN TRAINER

I. SUMMARY

A. Purpose of the Device

1. To train undergraduate Naval pilots, in the advanced phase (jet pipeline), in the correct use of eyes to develop effective pilot scan patterns, inside the cockpit, outside the cockpit and inside/outside (time-sharing) the cockpit.

B. Origin of Requirement

1. Operational Requirement for Multi-Role Jet Trainer Aircraft (VTX), OR-0944-PN, establishes the requirement for a training aircraft for both intermediate and advanced undergraduate jet training.

2. CNET SUPPORT Field Task Assignment Document No. 50304-21-OR-57 tasked the NAVTRAEQUIPCEN with performing a Training Situation Analysis (TSA) for the VTX Aircraft. Identification of training media to support the aircraft is a product of the TSA.

II. TRAINING ANALYSIS

A. Training Situation Analysis

1. A thorough and complete TSA has been conducted for the VTX Training Pipeline, as documented in report NAVTRAEQUIPCEN IH-286. This analysis considered the following:

a. The type trainer.

b. The knowledge and skills the trainee will have acquired in basic training.

c. The knowledge and skills required to graduate as a Naval Aviator.

d. The ability of today's graduate to meet current fleet requirements.

e. The type aircraft the newly designated avaitor can expect to fly during the years 1986-2000.

f. The operational mission the graduate of 1986-2000 will be expected to perform.

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d. The ability of today's graduate to meet current fleet requirements.

e. The type aircraft the newly designated avaitor can expect to fly during the years 1986-2000.

f. The operational mission the graduate of 1986-2000 will be expected to perform.

2. An undergraduate pilot training job/task inventory was prepared. To complete this inventory, three different methodologies were employed. These were listings of pilot tasks derived from the following:

a. Pilot ròles, i.e., Controller, Environmental Analyst, System Manager, Navigator, Communicator and Tactician.

b. Mission scenarios prepared for typical VA, VF and VS tactical missions.

c. Utilization of the traditional flight stages employed in flight training, i.e., Familiarization, Instruments, Formation, etc. The flight stage methodology was utilized as the method most appropriate for the completion of the inventory as it allowed for shaping of pilot behaviors, i.e., existing skills are built upon to effect new and more complex skills, while at the same time allowed the flexibility of being able to integrate behaviors from the other two approaches into the appropriate flight stage.

3. The pilot job/task inventory was then translated into Specific Behavioral Objectives (SBO's). The SBO's were sorted to the correct domain, i.e., psychomotor, cognitive and affective, and assigned the proficiency level required for graduation as a Naval Aviator. Factors considered in this analysis included:

a. Criticality and/or difficulty of the behavior.

b. Behavior achieved in prior training, but requires reinforcement to maintain proficiency or to achieve a higher proficiency level.

c. Behavior achieved in prior training and requiring no further reinforcement and/or higher proficiency level.

d. A new behavior to be achieved in the current phase of flight training.

A further sort was then made determining where the objective would be accomplished in the CNATRA instructional environment, i.e., Academics, Flight Support and/or Flight. A determination, selection and identification of the specific medium which would support each SBO, could then be determined and the training objectives for a specific media identified.

B. Training Objectives

1. Reduce eye accommodation time, improve speed reading of instruments and displays and improve peripheral vision in order to develop effective scan patterns.

2. Develop the capability to utilize all elements of time-sharing scan to quickly and accurately identify, classify and determine specific objects for their presence, rate of closure and relative distances while at the same time, maintaining instrument/display scan for indications.

3. Develop the capability to utilize all elements outside the cockpit scan during visual ground and air operations.

4. Develop the capability to utilize all elements of inside the cockpit scan during instrument flight conditions.

II. DEVICE DESCRIPTION

A. The device will consist of three sections, each with a student station. Each section will have a separate training capability, i.e., Section One, Eye Accommodation and Speed Reading; Section Two, Scan and Peripheral Vision; and Section Three, Time-Sharing Scan. The three sections of the device provide the capability for the student to practice eye exercises. The exercises are in no way intended or applied to improve vision. The exercises will be in accommodation, instrument speed reading, scan, peripheral vision, and in time-sharing tasks from inside the cockpit to outside. The exercises and evaluation will be basic and is intended to help the student aviator to practice some basic tasks involving the integration of information from inside and outside the cockpit.

1. The eye accommodation and speed reading section will consist of an enclosure which will contain four instruments (artificial horizon, altimeter, airspeed indicator, and turn and bank indicator). These instruments will be mounted in the same position as in an aircraft cockpit. The student station will be opposite to and in line with the four instruments. It will have the capability for the student to optically, via a series of lens, observe and read the instruments at a distance of approximately one meter. The instruments will be introduced in the sequence that forms a basic instrument scan pattern. The introduction will be one at a time, then in groups of two, then the whole cluster. Capability will be provided for the instructor/operator to set the time exposure for viewing the instruments from .01 to 3 seconds and for the recording of student errors in each time setting. For distant viewing, a Landolt C and/or a Block E is used. Response is required to identify the opening of the C/E (up, down, right, left) and the time required and errors in identification will be recorded. (See attached conceptual drawing.)

2. The scan and peripheral vision training section will consist of a one meter radius light bar, forming a 200° arc, mounted vertically and be capable of being placed in any position from vertical to vertical. The student station will be centered within the arc. It will consist of student seat, and a head restrainer that will restrict head movement so that the student must use his eyes instead of head movement to follow the light. Controls and recording capabilities for the instructor/operator will be mounted conveniently behind the student position. Mounted on or in the arc will be a minimum of 200 light-emitting diodes (minimum 1 per degree). The control of the diodes will permit them to be lighted in a sequence that will permit tracking from right to left or down to up or vice versa. The speed must be variable from one diode at a time and stepped as required to an automatic sequencing that will permit transversing from one end to another in 1/10th of a second. Evaluation will not be accomplished on this training; however, a record is required of the exercises completed and time required. Peripheral vision training will use the same light bar and head restraints that is used for scan training. Measurements will be made on the introduction of training and progress measurements will be recorded for each session. Training will be accomplished by light movements from in-vision to out of vision to exercise and improve awareness of movement. (See attached conceptual drawing.)

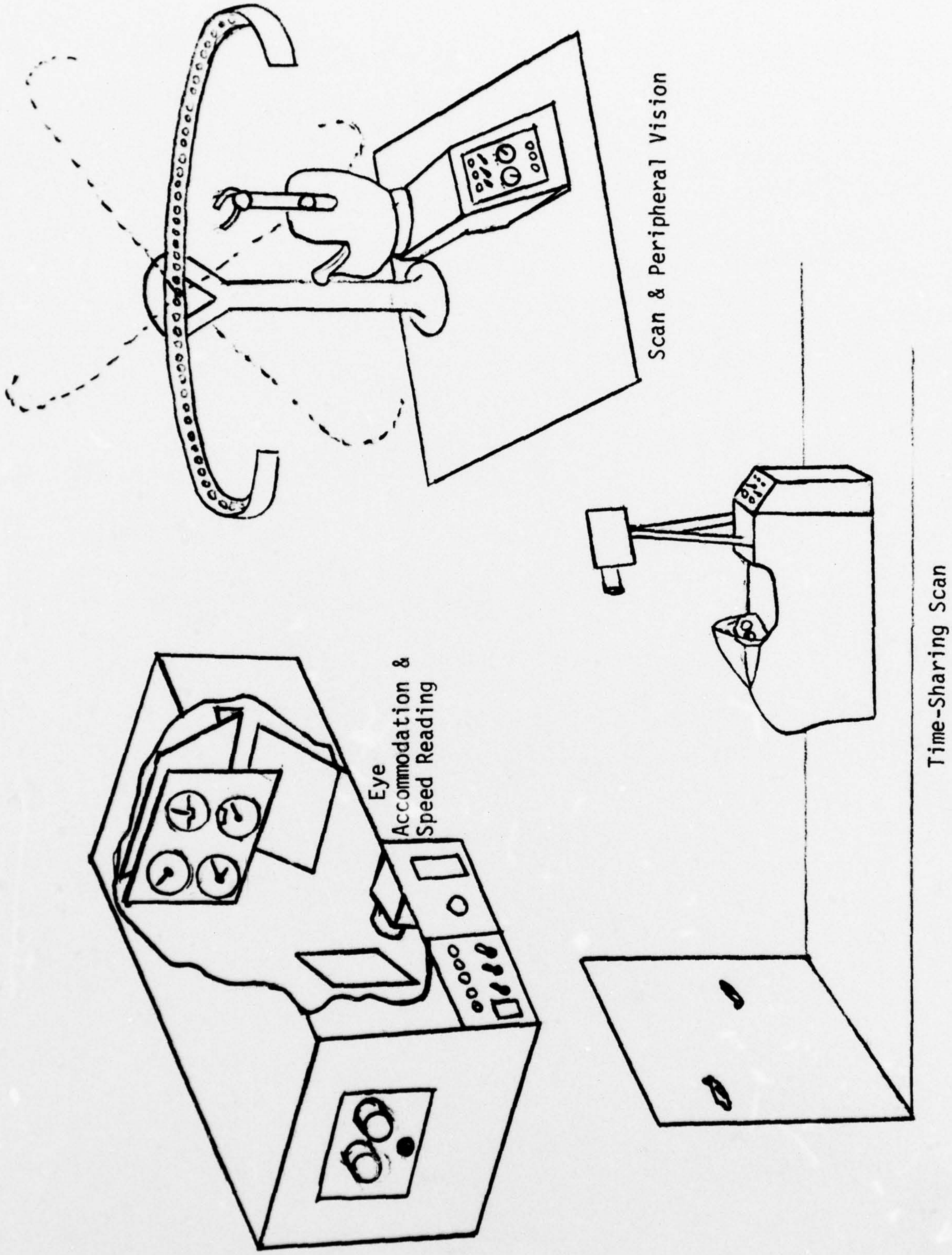
3. The time-sharing training section will consist of a student station resembling a cockpit enclosure with vision restrictions found in an aircraft cockpit such as windshield supports, glare shield, heads-up display, and nose position as seen from the cockpit of an aircraft. The instrument panel will have the capability to display four flight instruments (artificial horizon, altimeter, airspeed indicator, and turn and bank indicator) and four engine instruments (tachometer, EGT indicator, oil pressure indicator, and fuel flow indicator). The instrument panel may be an opaque screen with rear projection means to flash any one, or any combination thereof, including all of the instruments with normal or abnormal readings. In the training situation the student will be required to observe the instruments and indicate a correction by the correct control/controls input to overcome or nullify the error. Controls such as stick, rudder and power control will be active. In addition, the trainer will have a movable (from 5-12 feet distance) screen in front of the student station, with the capability of showing up to three intruders at one time. These intruders may be depicted as silhouettes or non-symmetrical designs and will have a controllable closing rate from zero to six hundred knots. The student will designate that he has observed an intruder by depressing a spring loaded switch. There will be two switches; one will be located on the control stick and one on the power control (throttle). The instructor/operator

station will have the capability to implement the training problem, control the training situation and record the students reaction time.

B. Device Utilization and Proposed Location

1. Device utilization is estimated to be 2880 hours annually based on 12 hours per day for 240 days.

2. Planning indicates the Jet Undergraduate Pilot Training will be conducted at three sites: NAS Meridian, NAS Kingsville and NAS Beeville.



Scan Trainer

FUNCTIONAL DESCRIPTION
FOR
VTX COCKPIT PROCEDURES TRAINER

NAVTRAEQUIPCEN IH-286

FUNCTIONAL DESCRIPTION
FOR
COCKPIT PROCEDURES TRAINER

I. SUMMARY

A. Purpose of the Device

1. To train undergraduate naval pilots in the advanced phase (jet pipeline), in the knowledge and skills necessary to perform normal and emergencies procedures required to safely fly the VTX aircraft.

2. To reduce the cost in terms of time, money and natural resources required for each trainee to achieve the required level of behavior for military jet flight by the transfer of aircraft flight time to simulator flight time.

B. Origin of Requirement

1. Operational Requirement for Multi-Role Jet Trainer Aircraft (VTX), OR-0944-PN, establishes the requirement for a training aircraft for both intermediate and advanced undergraduate jet training.

2. CNET SUPPORT Field Task Assignment Document No. 50304-21-OR-57 tasked the NAVTRAEQUIPCEN with performing a Training Situation Analysis for the VTX Aircraft. Identification of training media to support the aircraft is a product of the Training Situation Analysis.

II. TRAINING ANALYSIS

A. Training Situation Analysis (TSA)

1. A thorough and complete TSA has been conducted for the VTX Training Pipeline, as documented in report NAVTRAEQUIPCEN IH-286. This analysis considered:

a. The type trainee.

b. The knowledge and skills the trainee will have acquired in basic training.

c. The knowledge and skills required to graduate as a Naval Aviator.

d. The ability of today's graduate to meet current Fleet requirements.

e. The type aircraft the newly designated aviator can expect to fly during the years 1986-2000.

f. The operational mission the graduate of 1986-2000 will be expected to perform.

2. An undergraduate pilot training job/task inventory was prepared. To complete this inventory three different methodologies were employed. These were listings of pilot tasks derived from the following:

a. Pilot roles, i.e., Controller, Environmental Analyst, System Manager, Navigator, Communicator and Tactician.

b. Mission scenarios prepared for typical VA, VF and VS tactical missions.

c. Utilization of the traditional flight stages employed in flight training, i.e., Familiarization, Instruments Formation, etc. The flight stage methodology was utilized as the method most appropriate for the completion of the inventory as it allowed for shaping of pilot behaviors, i.e., existing skills are built upon to effect new and more complex skills, while at the same time allowed the flexibility of being able to integrate behaviors from the other two approaches into the appropriate flight stage.

3. The pilot job/task inventory was then translated into Specific Behavioral Objectives (SBO's). The SBO's were sorted to the correct domain, i.e., psychomotor, cognitive and affective, and assigned the proficiency level required for graduation as a Naval Aviator. Factors considered in this analysis included:

a. Criticality and/or difficulty of the behavior.

b. Behavior achieved in prior training but requires reinforcement to maintain proficiency or to achieve a higher proficiency level.

c. Behavior achieved in prior training and requiring no further reinforcement and/or higher proficiency level.

d. A new behavior, to be achieved in the current phase of flight training.

A further sort was then made determining where the objective would be accomplished in the CNATRA instructional environment, i.e., Academics, Flight Support and/or Flight. A determination, selection and identification of the specific medium which would support each SBO could then be determined and the training objectives for a specific media identified.

B. Training Objectives

1. The analysis disclosed that a total of 98 behaviors can be achieved in a Cockpit Procedures Trainer (CPT) either to the level of accomplishment required for graduation as a Naval Aviator or to a lesser level that allows accomplishment to the graduation proficiency level with a minimum of Operational Flight Trainer (OFT) and/or aircraft flight time. In addition, the CPT provides a solid bridge between academic cognitive skills and their psychomotor application in the aircraft.

2. Training objectives for the CPT are as follows:

a. Familiarization with the VTX cockpit, layout of the instrument panel and side panels, location of instruments, circuit breakers, switches and controls. The trainee pilot will be able to locate all items without hesitation and error, and without instructor assistance.

b. The development of knowledge and pilot skills required to perform VTX Aircraft procedures from pre-start to post-flight for both normal and abnormal conditions. the trainee pilot will be able to transfer the procedural skills to the VTX Aircraft operation, but will require instructor coaching and assistance during the initial familiarization flights.

III. DEVICE DESCRIPTION

A. The Trainee Station

1. The trainee station of the device shall be a replica of the front cockpit of the 10th production VTX Aircraft. including consoles, flight controls, canopy and seat. All aircraft flight controls/actuators and indicators including trim tabs shall be provided and located in the same position as the front cockpit of the VTX Aircraft. The pilot seat will be complete, including straps and interial reel, ejection controls and seat adjustment. (See attached conceptual drawing.)

2. All instruments, indicators, gauges, controls, lights, switches, etc., affecting aircraft operation shall be provided, accurately reflecting system's operation and shall be located in the same position as the front cockpit of the VTX Aircraft. All attitude, performance and position instruments will not be activated and are for configuration only, except that when the trainer is in "flight mode" the altimeter and airspeed instrument/indicator will indicate "fixed in" flight readings, e.g , 20,000 - 275 kts.

3. The following systems will be simulated and will react in accordance with VTX Aircraft system performance data:

a. Brake System

b. Landing Gear System

c. Engine System

d. Engine Fire Warning

e. Hydraulic System

f. Fuel System

g. Electrical System

h. Canopy System

i. Angle of Attack

j. Flight Control System

k. Catapulting and Arresting Equipment

l. Lighting System

m. Pitot and Static System

n. Air Conditioning and Pressurization System

o. Anti-Ice and Defrost System

p. Oxygen (Life Support System)

q. Escape System

r. Armament System

s. Internal Communications System (ICS)

The navigation system, radar, heads-up display, communication system other than ICS and fire control systems will not be activated. These instruments, indicators, switches and controls will be for configuration only.

B. Simulation of Aircraft Performance

1. Flight dynamics are not required and will not be provided.

2. The device shall operate in the following two modes:

a. Ground

b. Flight.

3. System simulation in both modes shall be dynamic, reacting to trainee input/response or lack of. The system simulation performance shall meet aircraft specifications except those portion(s) of system simulation that would be affected by aircraft aerodynamics reaction to a system's performance. These will not be simulated.

4. Life support system simulation shall be limited to procedures required to activate and/or monitor the system operation, e.g., pressurization, oxygen, ejection capability not provided. Simulation for these systems shall respond dynamically in that instruments indicators, switches, controls shall react accurately to trainee input.

5. The flight mode of the trainer shall be fixed (constant altitude, airspeed and heading). The flight mode purpose is to exercise those systems where there is a different performance at altitude than on the ground, e.g., engine driven fuel pump, icing of static system, air start, etc.

6. The device shall be capable of simulating VTX Aircraft system malfunction and/or failures for the items listed below. This simulation will include instrumentation cues. Incorrect/correct trainee response shall be reflected in simulated aircraft system performance. Aircraft system simulation shall provide for the correct pilot procedures as identified in the aircraft NATOPS.

a. Engine(s)

(1) Internal engine fire

(2) False start

(3) Hung start

(4) Hot start

(5) Vibration

(6) Power control linkage failures.

b. Brake Failure

(1) Partial (left-right)

(2) Complete

c. Electrical Power System

(1) Fire in system

(2) Failure of one generator

(3) Failure of both generators

(4) Instrument A-C power (invertor) failure

(5) Complete system failure

d. Angle of Attack System

(1) Out of tolerance

e. Fuel System

(1) Fuel power failures above and below 20,000

(2) Fuel gauge

f. Hydraulic Power System

(1) Loss of one pump

(2) Complete failure

(3) Boost failure

(4) Landing gear extension

(5) Speed brake retraction

(6) Arresting hook extension

g. Yaw Damper System

h. Trim System

(1) Runway elevator trim

i. Nose Wheel Shimmy Damper

j. Landing Gear

(1) Unsafe indication

(2) Loss of hydraulic pressure

(3) Handle will not go down

(4) Main gear not down and locked; gear handle down.

(5) Nose gear not down and locked; gear handle down.

k. Air Conditioning System

l. Cockpit Pressurization System

m. Oxygen System

n. Ejection System

(1) Escape

(2) Life support

C. Navigation Systems/Communication Equipment

1. The device shall provide for dynamic simulation of the ICS system for all modes of operation.

2. Dynamic simulation of all other communications system equipment will not be provided.

3. Dynamic simulation of the navigation system will not be provided.

D. Instructor Station

1. The instructor station shall have the capability of inserting malfunctions, monitoring the trainee and evaluating his performance. Specific capability to include:

a. Capability of establishing simulated initial conditions in order to establish a specific training situation and will include the following:

(1) Ground operations

(2) In-flight operations.

b. Capability for the introduction of gradual and abrupt malfunctions and failure (see malfunctions and emergencies for listing). Introduction of a malfunction shall produce the appropriate visual stimuli.

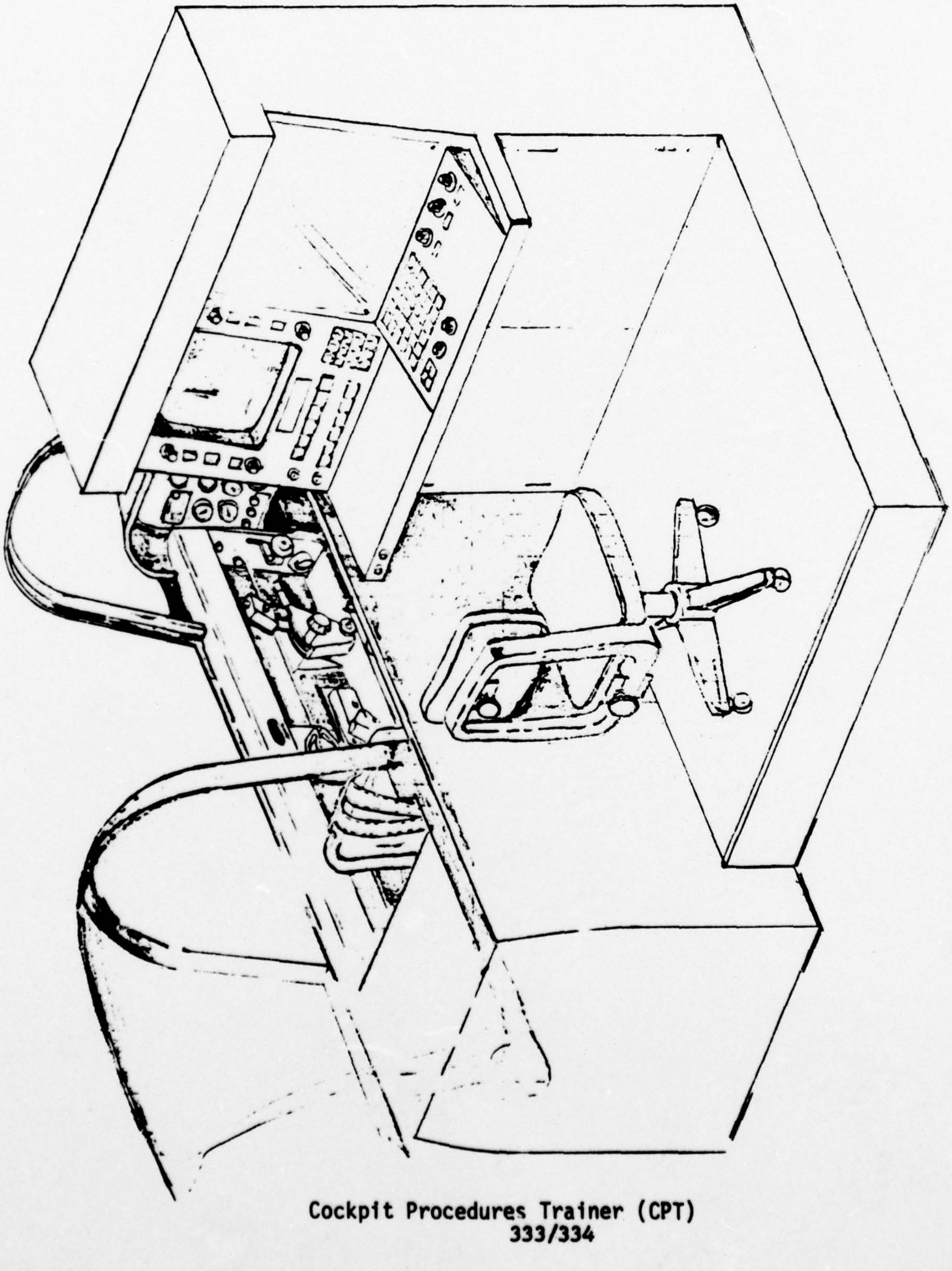
c. The instructor station/operator console shall be designed to afford a full view of the instruments, controls and indicators in the cockpit to eliminate unnecessary duplication. It will be so designed that the instructor/operator console can be positioned and utilized by the trainee to implement the training problem without the instructor/operator being present.

d. A means will be provided at the instructor/operator console to display the training problem and monitor the results of trainee action in the performance of a procedure. There will be a controllable, resetable elapsed time clock up to five minutes of elapsed time for timing trainee response.

E. Device Utilization and Proposed Location

1. Device utilization is estimated to be 2,880 hours annually based on 12 hours a day for 240 days.

2. Planning indicates the Jet Undergraduate Pilot Training will be conducted at three sites: NAS Meridian, NAS Kingsville and NAS Beeville.



Cockpit Procedures Trainer (CPT)

FUNCTIONAL DESCRIPTION
FOR
VISUAL SYSTEM ATTACHMENT FOR
VTX OPERATIONAL FLIGHT TRAINER

NAVTRAEQUIPCEN IH-286

FUNCTIONAL DESCRIPTION
FOR
VISUAL SYSTEM ATTACHMENT FOR
VTX OPERATIONAL FLIGHT TRAINER

I. SUMMARY

A. Purpose of the Device

1. To train undergraduate Naval pilots in the advanced phase (jet pipeline) in the procedures and skills of flying a high performance fixed wing jet aircraft.

2. To reduce the cost in terms of time, money and natural resources required for each trainee to achieve the required level of behavior for military jet flight by the achievement of interim flight proficiency skills in the simulator, thereby transferring aircraft flight time to simulator flight time.

B. Origin of Requirement

1. Operational Requirement for Multi-Role Jet Trainer Aircraft (VTX), OR-0944-PN, establishes the requirement for a training aircraft for both intermediate and advanced undergraduate jet training.

2. CNET SUPPORT Field Task Assignment Document No. 50304-21-OR-57 tasked the NAVTRAEQUIPCEN with performing a Training Situation Analysis (TSA) for the VTX aircraft. Identification of training media to support the aircraft is a product of the TSA.

II. TRAINING ANALYSIS

A. Training Situation Analysis

1. A thorough and complete Training Situation Analysis (TSA) has been conducted for the VTX Training Pipeline, as documented in report NAVTRAEQUIPCEN IH-286. This analysis considered the following:

a. The type trainee.

b. The knowledge and skills the trainee will have acquired in basic training.

c. The knowledge and skills required to graduate as a Naval Aviator.

d. The ability of today's graduate to meet current fleet requirements.

e. The type aircraft the newly designated aviator can expect to fly during the years 1986-2000.

f. The operational mission the graduate of 1986-2000 will be expected to perform.

2. An undergraduate pilot training job/task inventory was prepared. To complete this inventory three different methodologies were employed. These were listings of pilot tasks derived from the following:

a. Pilot roles, i.e., Controller, Environmental Analyst, System Manager, Navigator, Communicator, and Tactician.

b. Mission scenarios prepared for typical VA, VF and VS tactical missions.

c. Utilization of the traditional flight stages employed in flight training, i.e., Familiarization, Instruments, Formation, etc. The flight stage methodology was utilized as the method most appropriate for the completion of the inventory as it allowed for shaping of pilot behaviors, i.e., existing skills are built upon to effect new and more complex skills, while at the same time allowed the flexibility of being able to integrate behaviors from the other two approaches into the appropriate flight stage.

3. The pilot job/task inventory was then translated into Specific Behavioral Objectives (SBO's). The SBO's were sorted to the correct domain, i.e., psychomotor, cognitive and affective, and assigned the proficiency level required for graduation as a Naval Aviator. Factors considered in this analysis included:

a. Criticality and/or difficulty of the behavior.

b. Behavior achieved in prior training, but requires reinforcement to maintain proficiency or to achieve a higher proficiency level.

c. Behavior achieved in prior training and requiring no further reinforcement and/or higher proficiency level.

d. A new behavior, to be achieved in the current phase of flight training.

A further sort was then made determining where the objective would be accomplished in the CNATRA instructional environment, i.e., Academics, Flight Support and/or Flight. A determination, selection and identification of the specific medium which would support each SBO could then be determined and the training objectives for a specific media identified.

B. Training Objective

1. The analysis disclosed that a total of 81 behaviors can be achieved in an Operational Flight Trainer (OFT), equipped with a visual system attachment, either to the level of accomplishment required for graduation as a Naval Aviator or to a lesser level that allows accomplishment to the graduation proficiency level with a minimum of aircraft flight time In addition, the visual system attachment makes possible the measurement of a trainee's adaptability to fleet tasks that because of resource restrictions may not be possible or practical in the training aircraft.

2. Training objectives for the visual system attachment are as follows:

a. Provide the trainee the ability to perform all procedural tasks for taxi, takeoff, landing, formation rendezvous, formation flying, in-flight refueling, and shipboard operations in a smooth, competent and skillful manner.

b. Provide the trainee the ability to perform in a smooth, competent, and skillful manner performance behaviors required of instrument flight for instrument takeoff and instrument landing under varying visibility and ceiling conditions.

c. Provide the trainee the ability to imitate all performance behaviors, with a conscious awareness of the control manipulation required to perform the task(s) for:

(1) Aircraft taxi, including wheel brake malfunctions.

(2) All types of VTX Aircraft takeoffs, for both normal and abnormal conditions.

(3) All types of VTX Aircraft landings, for both normal and abnormal conditions.

(4) Flying formation wing position and one plane rendezvous.

(5) In-flight refueling.

(6) Shipboard operations including bolter.

III. DEVICE DESCRIPTION

A. The visual system attachment shall be an integral part of the VTX OFT and shall generate and present real-time (i.e., visual response lag below the perceptible threshold for command inputs) color infinity images of simulated visual environments. (See attached conceptual drawing.)

B. The visual image presented to the trainee shall correspond to simulation of the VTX Aircraft attitudes and correlate faithfully with all aircraft translations and angular velocities and rates of change.

C. Scene requirements for specific training areas are as follows: (Figure 1 provides a composite of required field of view.)

1. Ground Operations (Day/Night)

a. Day scene minimum dusk/dawn, VMC presentation must have definite horizon.

b. Center line on taxi-way.

c. Arrows for direction to duty runway.

d. Taxi-way lights (edge lighting).

e. Obstructions on edge of taxi-way.

f. Pilots field of view of:

(1) 90° H - 45° each side of aircraft nose.

(2) 30° V - 20° down 10° up.

2. Takeoffs (Day/Night-VFR/IFR)

a. Day scene minimum dusk/dawn, VMC presentation must have definite horizon.

b. Center line on runway.

c. Runway lights.

d. Runway markers.

e. Obstacle end of runway.

f. Variable visibility and ceiling.

g. Pilot field of view of:

(1) 60° H - 30° each side nose.

(2) 30° V - 10° down - 20° up.

3. Landings (Day/Night-VFR/IFR)

a. Day scene minimum dusk/dawn, VMC presentation must have definite horizon.

b. Runway center line.

c. Runway markers.

(1) Hash marks

(2) Waveoff point.

(3) Foot markers.

d. Runway lights.

e. Obstacle approach end of runway (removable).

f. Taxi turn-off.

g. Pilot's field of view of:

(1) 120° H - 90° Port - 30° Starboard

(2) 30° V - 20° Down - 10° Up.

4. Stall - Spins (Day-VFR)

a. Day scene minimum dusk/dawn, VMC with definite horizon.

b. Surface scene section lines and/or roads to indicate N-S and E-W.

c. Pilot's field of view of:

(1) 90° H - 45° each side nose.

(2) 30° V - 20° down - 10° up.

5. Formation Flight (Day-VFR - Trainee Fly Wingman Position Only)

a. Day scene minimum dusk/dawn, VMC with definite horizon.

b. Lead aircraft controllable at instructor station (heading and speed).

c. Pilot's field of view of:

(1) 90° H - 45° each side nose.

(2) 30° V - 5° down - 25° up.

6. In-Flight Refueling (Day-VFR - Trainee Flys Aircraft To Be Fueled) Visual Scene Requirements:

a. Day scene minimum dusk/dawn, VMC with definite horizon.

b. Tanker aircraft controllable at instructor station (heading and speed).

c. Pilot's field of view of:

(1) 90° H - 45° each side nose.

(2) 30° V - 10° down - 20° up.

7. Carrier Operations (Day/Night, VFR)

a. Day scene minimum dusk/dawn, VMC with definite horizon.

b. Aircraft carrier.

c. Deck and ship lights,

d. Mirror System.

e. Pilot's field of view of:

(1) 120° H - 90° Port, 30° Starboard

(2) 30° V - 20° down, 10° up.

D. <u>Device Utilization and Proposed Location</u>

1. Device utilization is estimated to be 2880 hours annually based on 12 hours per day for 240 days.

2. Planning indicates the Jet Undergraduate Pilot Training will be conducted at three sites: NAS Meridian, NAS Kingsville and NAS Beeville.

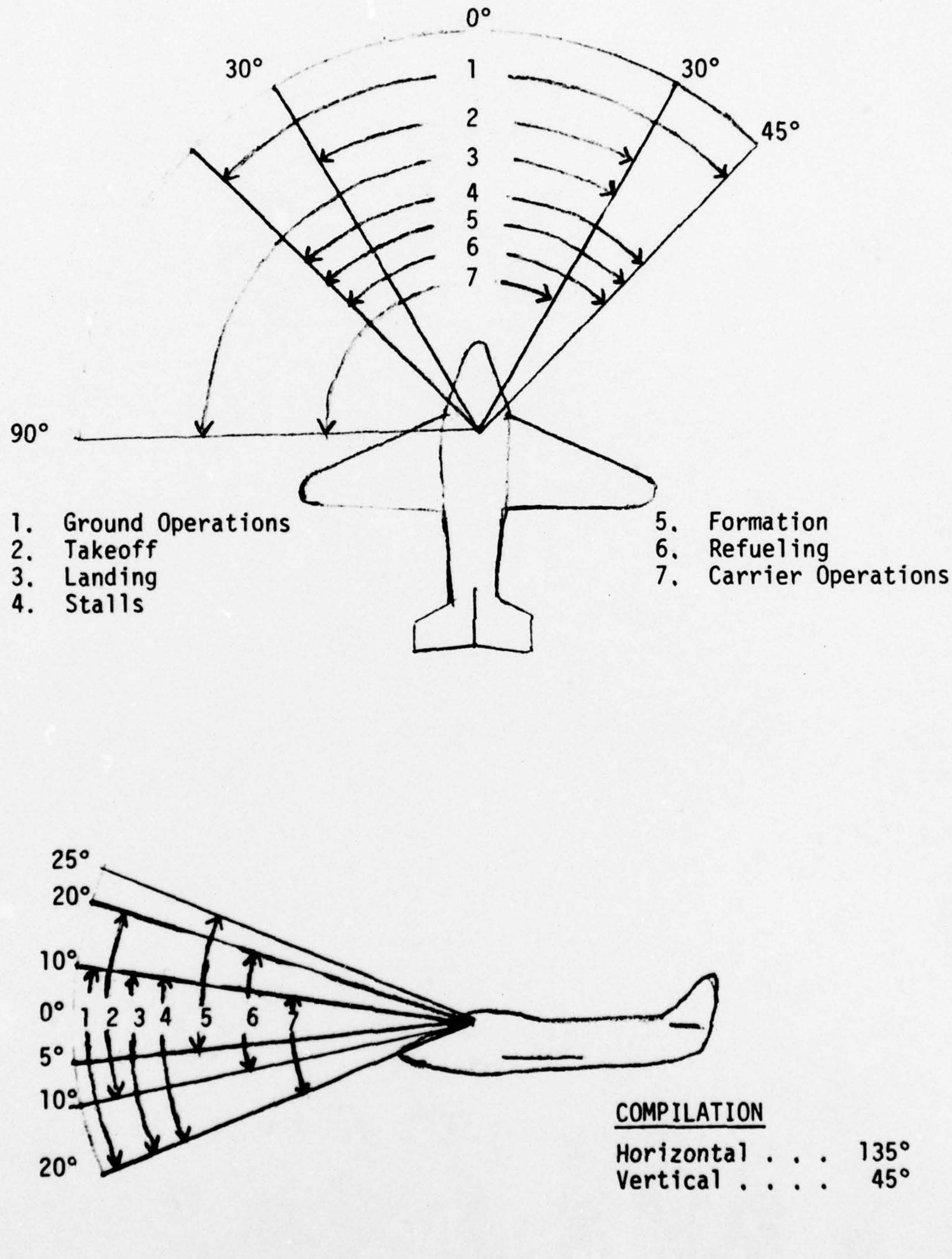
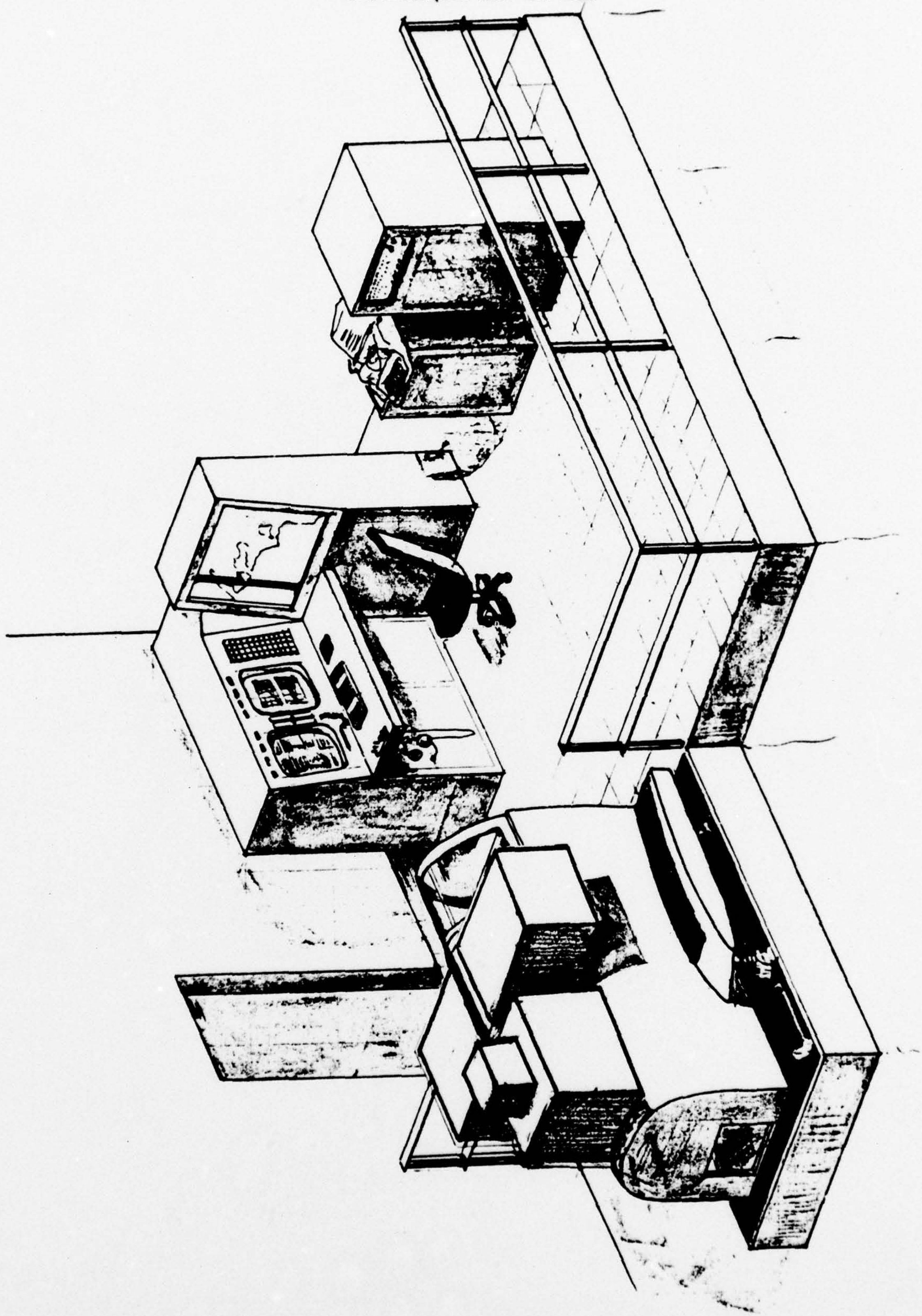


Figure 1. Field-Of-View Requirements



Operational Flight Trainer (OFT) with Visual System

FUNCTIONAL DESCRIPTION

FOR

VTX AIR COMBAT MANEUVERING TRAINER

FUNCTIONAL DESCRIPTION
FOR
AIR COMBAT MANEUVERING TRAINER

I. SUMMARY

A. Purpose of the Device

1. To train undergraduate Naval pilots in the advanced phase (jet pipeline) in the unique skills, techniques and tactics required in the operation of high performance aircraft and the sophisticated weapon system during air-to-air combat.

2. To provide the undergraduate Naval pilot with extended hands-on practice in air combat maneuvering, that is essential to achieve the skill level required for graduation, while at the same time reducing the cost in terms of time, money and natural resources required for each trainee by transferring a percentage of the aircraft flight time required to achieve this level to ACM simulator time.

B. Origin of Requirement

1. Operational Requirement for Multi-Role Jet Trainer Aircraft (VTX), OR-0944-PN, establishes the requirement for a training aircraft for both intermediate and advanced *undergraduate jet training*.

2. CNET SUPPORT Field Task Assignment Document No. 50304-21-OR-57 tasked the NAVTRAEQUIPCEN with performing a Training Situation Analysis (TSA) for the VTX Aircraft. Identification of training media to support the aircraft is a product of the TSA.

II. TRAINING ANALYSIS

A. Training Situation Analysis

1. A thorough and complete TSA has been conducted for the VTX Training Pipeline, as documented in report NAVTRAEQUIPCEN IH-286. This analysis considered the following:

a. The type trainee.

b. The knowledge and skills the trainee will have acquired in basic training.

c. The knowledge and skills required to graduate as a Naval Aviator.

d. The ability of today's graduate to meet current fleet requirements.

e. The type aircraft the newly designated aviator can expect to fly during the years 1986-2000.

f. The operational mission the graduate of 1986-2000 will be expected to perform.

2. An undergraduate pilot training job/task inventory was prepared. To complete this inventory three different methodologies were employed. These were listings of pilot tasks derived from:

a. Pilot roles, i.e., Controller, Environmental Analyst, System Manager, Navigator, Communicator, and Tactician.

b. Mission scenarios prepared for typical VA, VF and VS tactical missions.

c. Utilization of the traditional flight stages employed in flight training, i.e, Familiarization, Instruments, Formation, etc. The flight stage methodology was utilized as the method most appropriate for the completion of the inventory as it allowed for shaping of pilot behaviors, i.e., existing skills are built upon to effect new and more complex skills, while at the same time allowed the flexibility of being able to integrate behaviors from the other two approaches into the appropriate flight stage.

3. The pilot job/task inventory was then translated into Specific Behavioral Objectives (SBO's). The SBO's were sorted to the correct domain, i.e., psychomotor, cognitive and affective, and assigned the proficiency level required for graduation as a Naval Aviator. Factors considered in this analysis included:

a. Criticality and/or difficulty of the behavior.

b. Behavior achieved in prior training, but requires reinforcement to maintain proficiency or to achieve a higher proficiency level.

c. Behavior achieved in prior training and requiring no further reinforcement and/or higher proficiency level.

d. A new behavior, to be achieved in the current phase of flight training.

A further sort was then made determining where the objective would be accomplished in the CNATRA instructional environment, i.e., Academics, Flight Support and/or Flight. A determination, selection and identification of the specific medium which would support each SBO could then be determined and the training objectives for a specific media identified.

B. Training Objectives

1. The analysis disclosed that a total of 38 behaviors can be achieved in an Air Combat Maneuvering (ACM) Trainer either to the level of accomplishment required for graduation as a Naval Aviator or to a lesser level that allows accomplishment to the graduation proficiency level with a minimum of aircraft flight time. In addition, the ACM Trainer provides the trainee the opportunity to gain the experience of flying the aircraft at edge of the operating envelope.

2. Training objectives for the ACM Trainer are as follows:

a. Provide the trainee the ability to perform all one versus one offensive ACM tactics in a competent and skillful manner.

b. Provide the trainee the ability to perform all one versus one defensive ACM tactics in a competent and skillful manner.

c. Afford the opportunity to apply the aerodynamics of energy maneuverability in the execution of ACM by providing the trainee the ability to fly the aircraft in a smooth and skillful manner while not exceeding aircraft limitations.

d. Provide the trainee the ability to skillfully control the aircraft at the edge of the operating envelope and to experience spins and departures while attempting to perform "high performance" maneuvers associated with ACM.

e. Provide the trainee the ability to manage the VTX Aircraft weaponry and armament system in an habitually smooth manner.

f. Provide the trainee the ability to perform, under supervision, air-to-ground tracking and firing attack patterns.

III. DEVICE DESCRIPTION

A. The Trainee Station

1. The trainee station of the device shall be a replica of the front cockpit of the 10th production VTX Aircraft, including consoles, flight controls, canopy and seat. All aircraft flight controls/ actuators shall be provided and located in the same position as the front cockpit of the VTX Aircraft.

2. The following systems will not be activated and are for configuration only.

a. Canopy

b. Engine start and engine shutdown

c. Communications

d. Landing gear

e. Brakes

f. Air conditioning and pressurization

g. Oxygen

h. Pitot and static

i. Anti-ice and defrost

j. Navigation

k. Radar

l. Escape

3. All other flight systems shall be activated and their use reflected in flight performance. The pilot seat shall be complete, including straps and interial reel, ejection controls (configuration only), and seat adjustment.

4. All instruments, indicators, HUD, gauges, controls, lights, switches, etc., affecting aircraft operation shall be provided and located in the same position as the front cockpit of the VTX Aircraft. All attitude, performance and positions - instruments shall be activated. Flaps, trim tabs, speed brakes, and slots/slats controls shall be activated and reflected in the flight dynamics. Engine, oil and fuel systems indicators shall be activated and reflect flight performance including fuel consumption. All armament system controls and indicators shall be activated and reflect simulated ordnance and usage. Flight dynamics shall reflect ordnance stores usage.

B. <u>Simulation of Aircraft Performance</u>

1. Complete in-flight dynamics for both clean and dirty configuration shall be provided. Simulation to include all in-flight maneuvers (acrobatics, stalls, spins, and departed flight). Performance curves for simulated flight dynamics shall meet those of the VTX Aircraft.

2. The device shall be capable of simulating VTX armament system malfunctions and/or failures. Specific malfunctions will include:

a. Aircraft fire control (AFCS)

b. Bomb release

c. Gun/rocket trigger

d. Selector switches for bombs, rockets and guns.

3. Simulated motion cues of those experienced in the VTX Aircraft as a result of changes in attitude and/or flight path shall be provided. Simulated aircraft motion conditions will include skids, slips, buffet, stall, spin, banks, turns, vertical ascent and descent, dives, rolls, acceleration, deceleration, vibration, oscillation and departed flight. These motion cues to be based upon six degrees of aircraft freedom; i.e., six degrees of motion, and/or G seat cueing systems. The system will provide onset, transient and sustained motion cue simulation.

C. <u>Simulation of Navigation/Communication Equipment</u>

1. VTX Aircraft communication and navigation equipment shall not be simulated.

2. A device communication system will be provided to permit intercom between student and instructor station.

D. <u>Visual Simulation</u>

1. Field of view

a. Minimum horizontal $\pm$ 170°.

b. Minimum vertical 90° up, 60° down, except as restricted by pilot head motion within canopy with helmet and shoulder harness.

2. Color background of sky and earth and monochrome aircraft images will be simulated within the sphere.

3. The viewing envelope from the pilot's cockpit shall be representative of the VTX cockpit.

4. The distance at which aircraft images can be seen in plan view will be from 300 feet to 4 nautical miles.

5. The visual display target, background and cockpit instruments will simultaneously dim and darken with increasing G forces.

6. Visual cues will include indications of opposing aircraft firing guns, launching missiles, missile trajectory and visible destruction when a "kill" is made by the viewer.

E. Adversary Aircraft

1. The device shall have one adversary aircraft with complete in-flight dynamics for both clean and dirty configurations. Simulation shall provide for all in-flight maneuvers to include acrobatics, stalls, spins and departed flight.

2. Performance curves for simulated flight dynamics for the adversary aircraft shall meet those of the VTX Aircraft.

3. Simulated flight of the target/adversary aircraft shall be both programmable and/or manually controlled at the instructor station.

F. Ground Target

1. The device shall provide one circular/ring ground target with markings indicating a round bullseye of 100 feet in diameter and two rings 200 feet wide. Total target diameter shall be 500 feet.

2. Ordnance onboard the target/adversary aircraft will be the same as that of the VTX Aircraft with dynamic flight simulation reflecting its use.

G. Simulated Ordnance

1. Ordnance stores simulated for both the trainee station and the adversary aircraft will be compatible with those of the VTX Aircraft. Restriction as to numbers, mix of bombs, rockets and conventional ammunition shall conform to VTX Aircraft restrictions.

2. Simulated ordnance trajectory and dynamic performance shall meet that of the actual ordnance. Simulation of ordnance shall include the following:

a. Visual indication of hits on the trainee and adversary aircraft.

b. Visual indications of hits on the ground target.

c. Tracer ammunition trajectory.

H. Instructor Station

1. The instructor station will have the capability of implementing training flights, inserting armament system malfunctions, monitoring the trainee and evaluating his performance, specific capability to include the following:

a. Automated flight for the adversary aircraft.

b. Manual control by the instructor of the adversary aircraft.

c. Capability of inserting barometric pressure, altitude and temperature changes.

d. Capability to establish simulated flight initial conditions in order to establish a specific training situation and will include for both the trainee aircraft and adversary aircraft:

(1) Aircraft position

(2) Aircraft altitude

(3) Aircraft heading

(4) Aircraft airspeed

(5) Aircraft rate of climb

(6) Aircraft rate of turn

(7) Aircraft ordnance load.

e. Capability for the introduction of gradual and abrupt malfunctions and failures (see malfunctions for listing).

f. Problem controls shall be provided to allow for:

(1) Freeze and release

(2) Indications of automatic crash which will stop the problem when the simulated aircraft is flown into the water/ground or when VG limitations are exceeded.

(3) Crash override control which will allow continuation of a flight even though the automatic crash condition exists.

(4) Hits on trainee or adversary aircraft.

g. The instructor station shall have the capability of inserting wind from a direction of 0 to 360 degrees and wind velocity from 0 to 50 knots.

h. Displays appropriate for pilot trainee debriefing without further processing shall be provided. These devices shall record the following:

(1) For ACM - heading, altitude and airspeed of trainee and adversary aircraft.

(2) For Air-to-Ground - heading, ground track, altitude and airspeed.

2. The plotting device shall provide background chart data necessary to effect on-line use by the instructor and for debriefing purposes.

I. Device Utilization and Proposed Location

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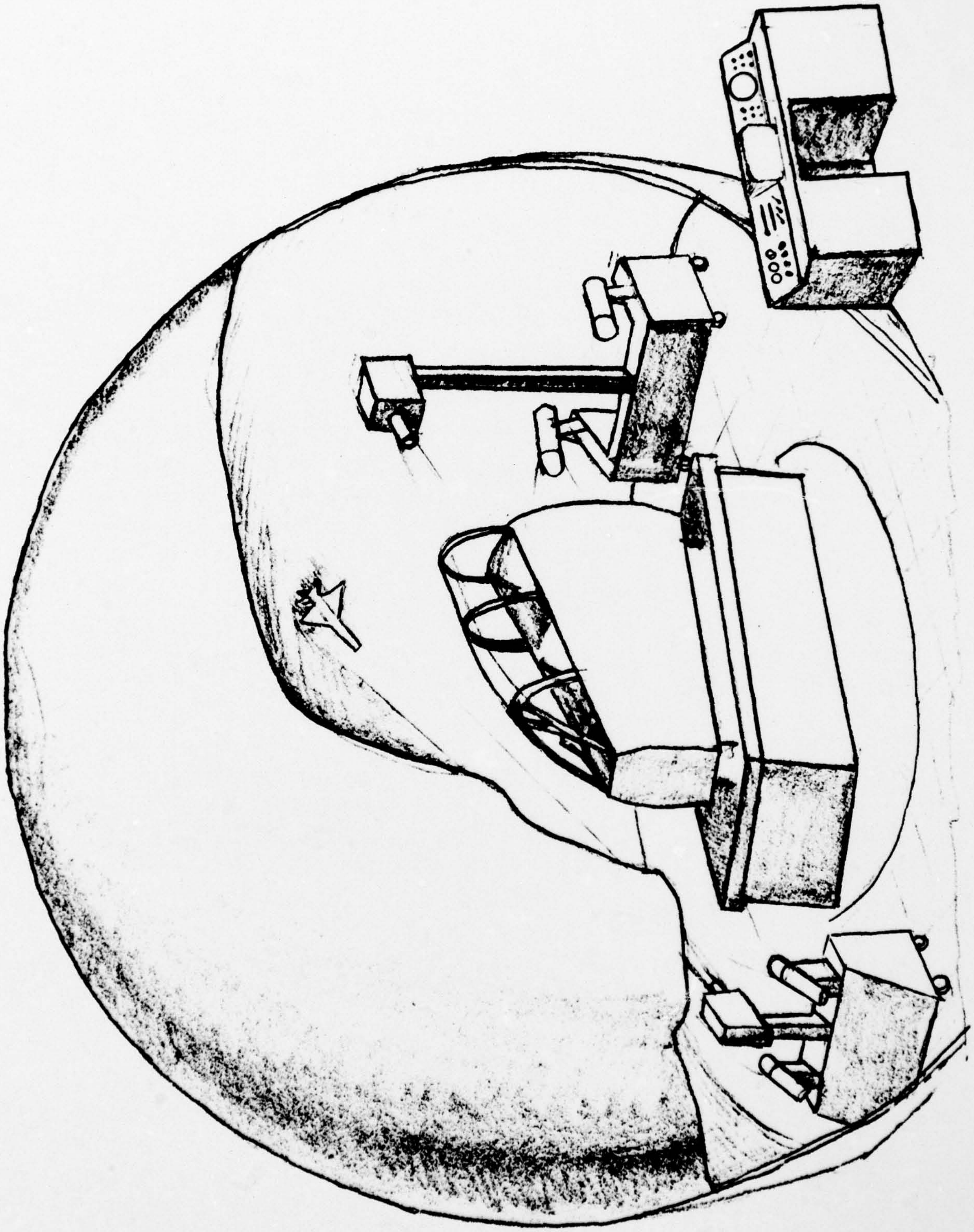

Air Combat Maneuvering (ACM) Trainer

FUNCTIONAL DESCRIPTION
FOR
VTX OPERATIONAL FLIGHT TRAINER

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VTX OPERATIONAL FLIGHT TRAINER

I. SUMMARY

A. Purpose of the Device

1. To train undergraduate Naval pilots in the advanced phase (jet pipeline), in the procedures and skills of flying a high performance fixed wing jet aircraft.

2. To reduce the cost in terms of time, money and natural resources required for each trainee to achieve the required level of behavior for military jet flight by the transfer of aircraft flight time to simulator flight time.

B. Origin of Requirement

1. Operational Requirement for Multi-Role Jet Trainer Aircraft (VTX), OR-0944-PN, establishes the requirement for a training aircraft for both intermediate and advanced undergraduate jet training.

2. CNET SUPPORT Field Task Assignment Document No. 50304-21-OR-57 tasked the NAVTRAEQUIPCEN with performing a Training Situation Analysis (TSA) for the VTX Aircraft. Identification of training media to support the aircraft is a product of the TSA.

II. TRAINING ANALYSIS

A. Training Situation Analysis

1. A thorough and complete TSA has been conducted for the VTX training pipeline, as documented in report NAVTRAEQUIPCEN IH-286. This analysis considered the following:

a. The type trainee.

b. The knowledge and skills the trainee will have acquired in basic training.

c. The knowledge and skills required to graduate as a Naval Aviator.

d. The ability of today's graduate to meet current fleet requirements.

e. The type aircraft the newly designated aviator can expect to fly during the years 1986-2000.

f. The operational mission the graduate of 1986-2000 will be expected to perform.

2. An undergraduate pilot training job/task inventory was prepared. To complete this inventory three different methodologies were employed. These were listings of pilot tasks derived from:

a. Pilot roles, i.e., Controller, Environmental Analyst, System Manager, Navigator, Communicator, and Tactician.

b. Mission scenarios prepared for typical VA, VF, and VS tactical missions.

c. Utilization of the traditional flight stages employed in flight training, i.e., Familiarization, Instruments, Formation, etc. The flight stage methodology was utilized as the method most appropriate for the completion of the inventory as it allowed for shaping of pilot behaviors, i.e., existing skills are built upon to effect new and more complex skills, while at the same time allowed the flexibility of being able to integrate behaviors from the other two approaches into the appropriate flight stage.

3. The pilot job/task inventory was then translated into Specific Behavioral Objectives (SBO's). The SBO's were sorted to the correct domain, i.e., psychomotor, cognitive and affective, and assigned the proficiency level required for graduation as a Naval Aviator. Factors considered in this analysis included:

a. Criticality and/or difficulty of the behavior.

b. Behavior achieved in prior training, but requires reinforcement to maintain proficiency or to achieve a higher proficiency level.

c. Behavior achieved in prior training and requiring no further reinforcement and/or higher proficiency level.

d. A new behavior, to be achieved in the current phase of flight training.

A further sort was then made determining where the objective would be accomplished in the CNATRA instructional environment, i.e., Academics, Flight Support and/or Flight. A determination, selection and identification of the specific medium which would support each SBO could then be determined and the training objectives for a specific media identified.

B. <u>Training Objectives</u>

1. The analysis disclosed that a total of 169 behaviors can be achieved in an Operational Flight Trainer (OFT) either to the level of accomplishment required for graduation as a Naval Aviator or to a lesser level that allows accomplishment to the graduation proficiency

level with a minimum of aircraft flight time. In addition, the OFT provides reinforcement for an additional 80 behaviors achieved in part-task trainers such as the Cockpit Procedures Trainer (CPT). Combined, these behaviors encompass the complete spectrum of flight from pre-flight to shutdown excluding tactics, i.e., ACM and Weapons Delivery.

2. Training objectives for the OFT are as follows:

a. Reinforcement of all "in aircraft" pre-flight, start, pre-taxi and pre-takeoff procedures for both normal and abnormal conditions. Accomplishment to be to a level that allows the trainee to perform these tasks in a smooth, competent and skillful manner.

b. Provide the trainee the ability to imitate all in-flight maneuvers from takeoff to landing, including slow flight, speed changes, rate turns, minimum radius turns, spins, departed flight and confidence maneuvers with a conscious awareness of the control manipulation required to perform the task.

c. Provide the trainee the ability to perform in a smooth, competent and skillful manner all in-flight procedures for the above maneuvers.

d. Provide the trainee the ability to perform in a smooth, competent and skillful manner all psychomotor tasks required for utilization of the following:

(1) The VTX communication system for both normal and abnormal operation including IFF, SIF and ICS.

(2) The angle of attack indicator for both normal and abnormal operations,

(3) The Heads-Up Display (HUD) for all modes of operation.

(4) All aircraft flight systems for both normal and abnormal operations.

(5) Aircraft trim tabs.

e. Provide the trainee the ability to perform in a smooth, competent and skillful manner the performance skills required for coordinated flight and interpretation/response to the indications of the aircraft's instruments and displays.

f. Provide the trainee the ability to perform in a smooth, competent and skillful manner all in-flight, (from takeoff to landing), performance behaviors required of instrument flight including procedures, scan patterns, pattern flying, radio navigation, clearance receipt and compliance, departures and terminal procedures.

III. DEVICE DESCRIPTION

A. Trainee Station

1. The device shall be a replica of the front cockpit of the 10th production VTX Aircraft, including consoles, flight controls, canopy and seat. All aircraft flight controls/actuators and indicators shall be provided and located in the same position as the front cockpit of the VTX aircraft. The pilot seat will be complete, including straps and interial reel, ejection controls and seat adjustment. (See attached conceptual drawing.)

2. All instruments, indicators, HUD, AOA, gauges, controls, trim tabs, lights, switches, etc., affecting aircraft operation shall be provided accurately, reflecting system's operation and shall be located in the same position as the front cockpit of the VTX Aircraft. All attitude, performance and position instruments will be activated.

3. The following systems will be simulated and will react in accordance with VTX Aircraft performance data:

a. Brake System

b. Landing Gear System

c. Engine System

d. Hydraulic System

e. Fuel System

f. Electrical System

g. Canopy System

h. Angle of Attack

i. Navigation System

j. Radar

k. Heads-Up Display

l. Lighting

m. Pitot and Static

n. Air Conditioning and Pressurization

o. Anti-Ice and Defrost

p. Oxygen (Life Support System)

q. Escape System

r. Armament

s. Internal Communication System (ICS)

(1) ICS

(2) UHF/VHF

(3) IFF/SID

B. <u>Simulation of Aircraft Performance</u>

1. The device shall provide for complete ground and in-flight dynamics for both normal and abnormal operation.

a. Ground operations shall provide for aircraft systems utilization and checks in accordance with the appropriate NATOPS Manual.

b. Flight dynamics shall be provided for both clean and dirty configurations and will include pre-start, start, taxi, braking, takeoff, climb, in-flight maneuvers to include acrobatics, stalls, spins, departed flight, degraded performance, approaches, and landings.

2. The device shall be capable of simulating VTX Aircraft system malfunction and/or failures and environmentally caused degraded aircraft performance for the items listed below. This simulation will include kinetic, aural and instrumentation cues. Incorrect/correct trainee response will be reflected in simulated aircraft performance. Aircraft system simulation shall provide for the correct pilot procedures as identified in the aircraft NATOPS.

a. Engine

(1) Internal engine fire

(2) False start

(3) Hung start

(4) Hot start

(5) Vibration

(6) Power control linkage failures

b. Brake failure

(1) Partial

(2) Complete

c. Electrical Power System

(1) Fire in system

(2) Failure of one generator

(3) Failure of both generators

(4) Instrument A-C Power (Invertor) Failure

(5) Complete system failure

d. Failure of attitude, performance and position instruments; individually, progressive or abrupt.

e. Angle of Attack System

(1) Out of tolerance

f. Fuel System

(1) Fuel power failure (above and below 20,000)

(2) Fuel gauge

(3) Starvation

g. Hydraulic Power System

(1) Loss of one pump

(2) Complete failure

(3) Boost failure

(4) Landing gear extension

(5) Speed brake retraction

(6) Arresting hook extension

h. Yaw Damper System

i. Trim System

(1) Runway elevator trim

j. Nose Wheel Shimmy Damper

k. Landing Gear

(1) Unsafe indication

(2) Loss of hydraulic pressure

(3) Handle will not go down

(4) Main gear not down and locked, gear handle down.

(5) Nose gear not down and locked, gear handle down.

l. Air Conditioning System

m. Cockpit Pressurization System

n. Oxygen System

o. Ejection System

(1) Escape

(2) Life Support

p. Canopy System

q. Communication System

(1) ICS

(2) UHF/VHF Transceiver

r. Navigation System

(1) Interial navigation

(2) Individual electronic navigation aids, e.g., TACAN, ADF, etc.

(a) Complete and/or inaccurate readings

s. Anti-Ice and Defrost

(1) Structural ice

(2) Engine ice

(3) Static system ice

(4) Defrost

t. Environmental Conditions

(1) Pressure changes

(2) Turbulence

(a) Moderate

(b) Severe

(3) Wind

(a) Velocity

(b) Direction

(4) Icing

(5) Severe Weather

(a) Radar target

3. Simulated motion cues of those experienced in the VTX Aircraft as a result of changes in attitude and/or flight path shall be provided. Simulated aircraft motion conditions will include skids, slips, buffet, stall, spin, banks, turns, vertical ascent and descent, dives, rolls, acceleration, deceleration, vibration, oscillation and departed flight. These motion cues to be based upon six degrees of aircraft freedom; i.e., six degrees of motion, and/or G seat cueing systems. The system will provide onset, transient and sustained motion cue simulation.

C. Navigation Systems/Communication Equipment

1. The device shall provide for cockpit selection, instrumentation and simulation of TACAN, VOR, ILS, ADF, marker beacons, GCA's, and IFF/SIF.

2. Simulated communication equipment to include simulation of UHF/VHF transceiver, ICS and auxiliary receiver for both normal and emergency operation.

3. Each communication system simulated (less ICS) in the aircraft will require ground communication and navigational facilities. A minimum of 50 separate ground communication and navigation facilities capable of simultaneous and selective operations shall be provided.

D. Gaming Area

1. The device will provide for a problem world of 1000 nautical mile radius of home base.

2. Home base airport plus three additional airports each with complete approach facilities will be provided.

3. Enroute facilities within the problem world will include all navigational aids in the VTX Aircraft.

E. Visual System Attachment

1. The device will have the capability to:

a. Structurally accommodate the addition of a visual system.

b. Integrate and interface with a visual system.

F. Instructor Station

1. The instructor station shall have the capability of implementing training flights, inserting malfunctions, monitoring the trainee and evaluating his performance. Specific capability to include:

a. Automated modes of operation.

(1) Demonstration. Capability to automatically demonstrate an aircraft maneuver or series of maneuvers to include SID, jet penetration, TACAN/VOR approaches. The demonstrations shall be developed from recorded trainer flight. The trainer shall have the capability and shall reflect appropriate cockpit instrument indications, flight control movement and motion, and shall include recorded verbal instructions.

(2) Record and Playback. At all times, up to 5 minutes of simulated aircraft, performance shall be recorded and shall be available to the instructor, selectable to ½ minute increments, for immediate replay to the trainee in the cockpit. The replay shall exercise the instruments, flight control and physical cues (motion/vibration/G forces) to recreate the aircraft performance during the period of time being recorded.

b. Capability of inserting barometric pressure, altitude and temperature changes.

c. Capability of inserting aircraft noise from start to shutdown.

d. Capability of establishing simulated flight initial conditions in order to establish a specific training situation and will include:

(1) Aircraft position

(2) Aircraft altitude

(3) Aircraft heading

(4) Aircraft airspeed

(5) Aircraft rate of climb

(6) Aircraft rate of turn.

e. Capability for the introduction of gradual and abrupt malfunctions and failure (see malfunctions and emergencies for listing). Introduction of a malfunction shall produce the appropriate visual, aural and motion stimuli.

f. Problem controls will be provided to allow for:

(1) Freeze and release.

(2) Indications of automatic crash which will stop the problem when the simulated aircraft is flown into the water/ground of when VG limitations are exceeded.

(3) Crash override control which will allow continuation of a flight even though the automatic crash condition exists.

g. Station displays and controls appropriate for pilot trainee debriefing without further processing shall be provided. These devices shall record ground track, altitude and airspeed, using scales appropriate for local approaches and cross-country flights within the problem world. The plotting device shall provide background chart data necessary to effect on-line use by the instructor and for debriefing purposes.

h. GCA information which is relayed to the trainee by the instructor when the instructor is acting as the ground controller shall be displayed at the instructor station.

i. Information required by the instructor when simulating ground communication stations, e.g., weather reports, shall be displayed at the instructor station.

j. Information identifying the communication equipment frequencies in use by the trainee shall be displayed at the instructor station.

k. The station shall contain all controls necessary for the instructor to simulate each ground communication and navigation facility in the problem world.

l. The instructor station shall have the capability of inserting wind from a direction of 0 to 360 degrees and wind velocity from 0 to 250 knots.

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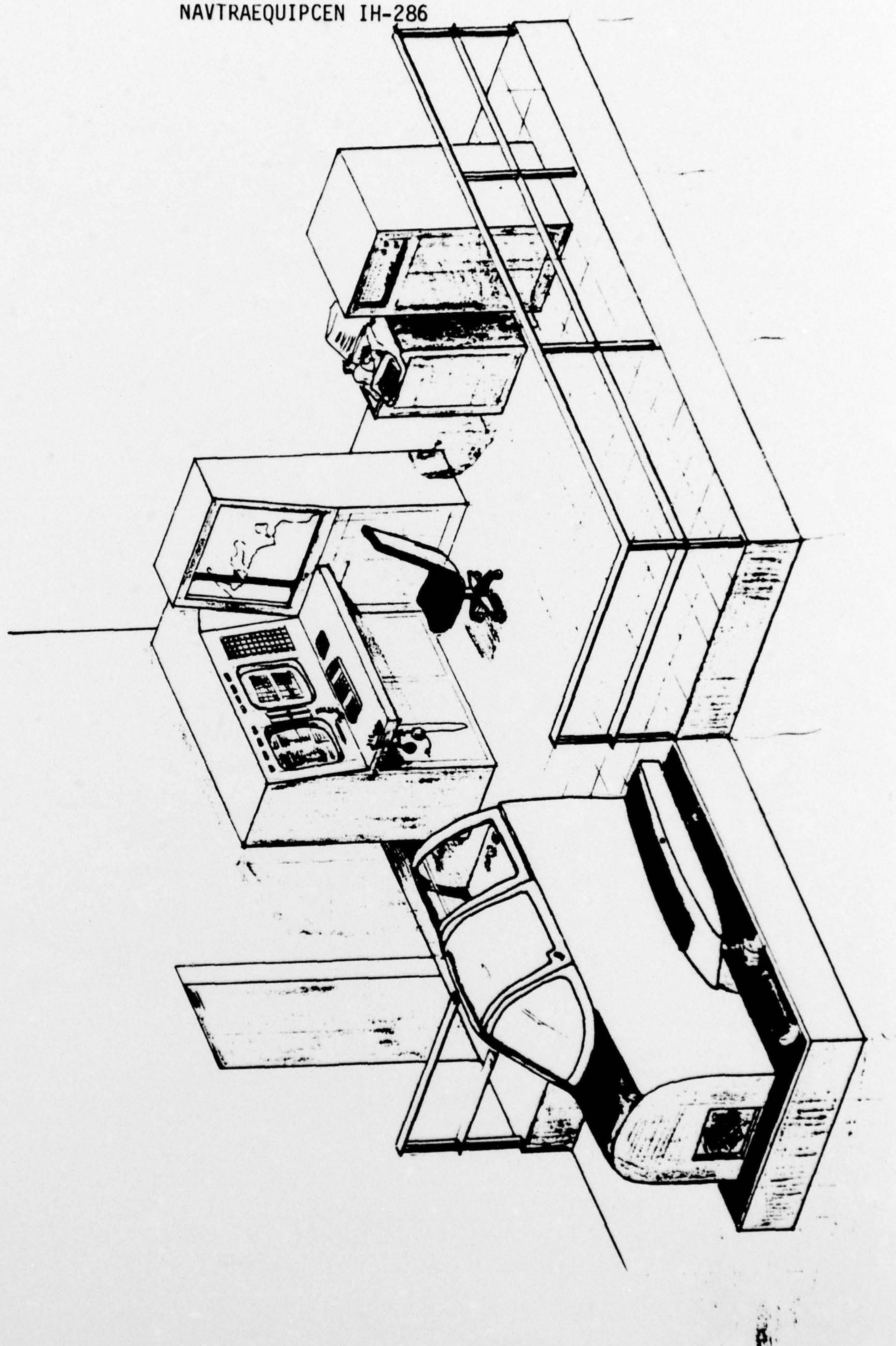

Operational Flight Trainer (OFT)

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